FCC PART 74, SUBPART H
ISEDC RSS-210, ISSUE 10
TEST AND MEASUREMENT REPORT

For

Lectrosonics, Inc.

581 Laser Road NE, Rio Rancho, NM 87124, USA

FCC ID: DBZDBSMA
IC: 8024A-DBSMA

Report Type: Original Report	**Product Type:** Digital Wireless Microphone Transmitter

Prepared By:	Vang Lee Test Technician
Report Number:	R2011233-74
Report Date:	2021-01-19
Reviewed By:	Christian McCaig RF Engineer

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CERTIFICATE #3297.02

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2011233-74	Original Report	2021-01-19

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report has been compiled on behalf of *Lectrosonics, Inc.* and their product models: *DBSM-A1B1& DBSMD-A1B1, FCC ID: DBZDBSMA, IC: 8024A-DBSMA,* which henceforth is referred to as the EUT (Equipment Under Test). The EUT is a Digital wireless microphone transmitter. The EUT operates in the frequency range: 470.1-607.95 MHz.

Note: DBSM-A1B1& DBSMD-A1B1 are electrically identical; DBSMD-A1B1 was selected for testing. Please refer to Annex D Declaration of Similarity for detail.

1.2 Mechanical Description of EUT

DBSM-A1B1: 49.632 mm (L) x 60.096 mm (W) x 16.307 mm (H) and weighs approximately 90.719 g with battery.
DBSMD-A1B1: 62.865 mm (L) x 60.096 mm (W) x 16.307 mm (H) and weighs approximately 136.078 g with batteries.

Data gathered from both models are from typical production samples provided by the Lectrosonics, Inc. with serial number: 1 & 2.

1.3 Objective

The following test report was prepared on behalf of *Lectrosonics, Inc.* in accordance with Part 74, Subparts H of the Federal Communications Commission rules and ISEDC RSS-210, Issue 10, December 2019.

The objective was to determine compliance with Part 74 of the FCC Rules and ISED RSS-210 Issue 10, limits for RF output power, Modulation characteristics, Emission bandwidth, Field strength of spurious radiation and Frequency stability for license-exempt, low-power radio apparatus operating in the television bands.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with FCC KDB 971168 D01 Power Meas License Digital Systems v03r01, and EN 300 422-1 v1.4.2 Electromagnetic compatibility and Radio Spectrum Matters; Wireless microphones in the 25MHz to 3GHz frequency range.

All tests were performed at Bay Area Compliance Laboratories Corp.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from ±2.0 dB for Conducted Emissions tests and ±6.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Annex B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02)*****,** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body***
- - For the USA (Federal Communications Commission):

1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
3- All Telephone Terminal Equipment within FCC Scope C.

- For the Canada (Industry Canada):
    1- All Scope 1-Licence-Exempt Radio Frequency Devices;
    2- All Scope 2-Licensed Personal Mobile Radio Services;
    3- All Scope 3-Licensed General Mobile & Fixed Radio Services;
    4- All Scope 4-Licensed Maritime & Aviation Radio Services;
    5- All Scope 5-Licensed Fixed Microwave Radio Services
    6- All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.

For Singapore (Info-Communications Development Authority (IDA)):
    1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
    2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2

- For the Hong Kong Special Administrative Region:
    1 All Radio Equipment, per KHCA 10XX-series Specifications;
    2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
    3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.

- For Japan:
    1 MIC Telecommunication Business Law (Terminal Equipment):
        - All Scope A1 - Terminal Equipment for the Purpose of Calls;
        - All Scope A2 - Other Terminal Equipment
    2 Radio Law (Radio Equipment):
        - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
        - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
        - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products

- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other

- For Water Coolers (ver. 3.0)

D. A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Industry Canada - IC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
  - Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
  - Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Development Authority - IDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
  - Nationally Recognized Test Laboratory (NRTL) – US OSHA
- Vietnam: APEC Tel MRA -Phase I;

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to KDB 971168 D01 v03r01.

2.2 EUT Exercise Software

None

2.3 Special Equipment

There were no special accessories were required, included, or intended for use with EUT during these tests.

2.4 Equipment Modifications

N/A

2.5 Local Support Equipment

None

2.6 Interface Ports and Cables

None

3 Summary of Test Results

FCC & ISED Rules	Descriptions of Test	Result (s)
FCC §2.1093 ISED RSS-102	RF Exposure	Compliant[1]
FCC §74.861(e)(1) ISED RSS-102 G3.1	RF Output power	Compliant
ISED RSS-Gen §6.8	Transmit Antenna	Compliant
FCC §74.861(e)(3) ISED RSS-210 G.3.5	Modulation Characteristics	Not applicable[2]
FCC §74.861(e)(5)(7), ISED RSS-210 G.3.2 & G.3.4	Operating Bandwidth & Emission Mask	Compliant
FCC §74.861(e) (7) ISED RSS-210 Annex G §G.3.4	Spurious Emissions at the Antenna Port	Compliant
FCC §74.861(e) (7) ISED RSS-210 Annex G §G.3.4	Field Strength of Spurious Emissions	Compliant
FCC §74.861 (e) (4) ISED RSS-210 Annex G §G.3.3	Frequency Tolerance	Compliant

Note 1: Please refer to report R2011233-SAR
Note 2: Not applicable: The EUT only supports digital modulation (8PSK).

4 FCC §2.1093 & ISEDC RSS-102 - RF Exposure

Please refer to report R2011233-SAR for results.

5 ISEDC RSS-Gen §6.8 - Antenna Requirements

5.1 Applicable Standards

According to ISEDC RSS-Gen §6.8: Transmit Antenna

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list. For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).
When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.
The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.
For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:
This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

5.2 Antenna Description

Antennas are included with the transmitter, and are shipped from the factory pre-cut and fully assembled. The chart below is the frequency ranges for each antenna. The maximum antenna gain is 2.15 dBi.

Frequency Block	Frequency Range (MHz)	Cap Color	Antenna Length	Gain (dBi)
470	470.100-495.600	Black	4.73”	2.15
19	486.400-511.900	Black	4.51”	2.15
20	512.00-537.500	Black	4.05”	2.15
21	537.600-563.100	Brown	3.80”	2.15
22	563.200-588.700	Red	3.48”	2.15
23	588.800-607.900	Orange	3.36”	2.15

Note: antenna information was provided by customer.

6 FCC §74.861(e) (1) & ISEDC RSS-210 Annex G §G.3.1- RF Output Power

6.1 Applicable Standards

According to FCC §74.861 (e) (1): the power may not exceed the following values:

(i) 54-72, 76-88, and 174-216 MHz bands—50 mW EIRP
(ii) 470-608 and 614-698 MHz bands—250 mW Conducted power
(iii) 600 MHz duplex gap: 20 mW EIRP

According to ISDEC RSS-210 Annex G §G.3.1:

Table G1 — Specification for Low-Power Radio Apparatus

Frequency Bands (MHz)	Transmit e.i.r.p. (mW)	Authorized Bandwidth (kHz)	Frequency Stability (ppm)
54-72 76-88 174-216	50	200	± 50
470-608 614-698[Note]	250	200	± 50

6.2 Test Procedure

KDB 971168 D01 v03r01

6.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
ETS-LINDGREN	Power Sensor	7002-006	160097	2018-12-31	2.5 years
-	RF Cable	-	-	Each time[1]	N/A
-	10dB Attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".*

6.4 Test Environmental Conditions

Temperature:	22 ºC
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

The testing was performed by Vang Lee on 2021-01-04 at RF site.

6.5 Test Results

Model: DBSM-A1B1

FCC:

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limits (dBm)	Rated Power (mW/dBm)
Low	470.100	16.44	24	50/17
		13.68	24	25/14
		9.60	24	10/10
Middle	539.025	16.36	24	50/17
		13.57	24	25/14
		9.48	24	10/10
High	607.950	16.48	24	50/17
		13.64	24	25/14
		9.64	24	10/10

ISEDC:

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	EIRP (dBm)	Limits (dBm)
Low	470.100	16.44	2.15	18.59	24
		13.68	2.15	15.83	24
		9.60	2.15	11.75	24
Middle	539.025	16.36	2.15	18.51	24
		13.57	2.15	15.72	24
		9.48	2.15	11.63	24
High	607.950	16.48	2.15	18.63	24
		13.64	2.15	15.79	24
		9.64	2.15	11.79	24

Model: DBSMD-A1B1

FCC:

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limits (dBm)	Rated Power (mW/dBm)
Low	470.100	16.34	24	50/17
		13.58	24	25/14
		9.47	24	10/10
Middle	539.025	16.35	24	50/17
		13.56	24	25/14
		9.42	24	10/10
High	607.950	16.36	24	50/17
		13.56	24	25/14
		9.48	24	10/10

ISEDC:

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	EIRP (dBm)	Limits (dBm)
Low	470.100	16.34	2.15	18.49	24
		13.58	2.15	15.73	24
		9.47	2.15	11.62	24
Middle	539.025	16.35	2.15	18.5	24
		13.56	2.15	15.71	24
		9.42	2.15	11.57	24
High	607.950	16.36	2.15	18.51	24
		13.56	2.15	15.71	24
		9.48	2.15	11.63	24

Note: Antenna gain of 2.15 dBi provided by customer.

7 FCC §74.861(e)(5)(7) & ISEDC RSS-210 Annex G §G.3.2, G.3.4 - Occupied Bandwidth & Emission Mask

7.1 Applicable Standards

According to FCC §74.861 (e) (5) (7):

The operating bandwidth shall not exceed 200 kHz.

Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08).

According to ISEDC RSS-210 Annex G §G.3.2:

The occupied bandwidth for low-power radio apparatus shall not exceed the authorized bandwidth specified in Table G1.

Table G1 — Specification for Low-Power Radio Apparatus

Frequency Bands (MHz)	Transmit e.i.r.p. (mW)	Authorized Bandwidth (kHz)	Frequency Stability (ppm)
54-72 76-88 174-216	50	200	± 50
470-608 614-698[Note]	250	200	± 50

As per ISED RSS-210 Issue 10, G.3.4:

The transmitter unwanted emissions shall meet the requirements in sections 8.3 and 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08), *Electromagnetic compatibility and radio spectrum matters (ERM); Wireless microphones in the* 25 MHz *to*3 GHz *frequency range; Part 1: Technical characteristics and methods of measurement*

7.2 Test Procedure

The OBW was measured according to KDB 971168 D01 v03r01

The Emission mask was measured according to sections 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08).

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSV40	1321.3008K39-101203-UW	2019-08-06	18 Months
-	10dB Attenuator	-	-	Each time[1]	N/A
-	RF Cable	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".*

7.4 Test Environmental Conditions

Temperature:	22 ºC
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

The testing was performed by Vang Lee on 2021-01-06 and 2021-01-08 at RF site.

7.5 Test Results

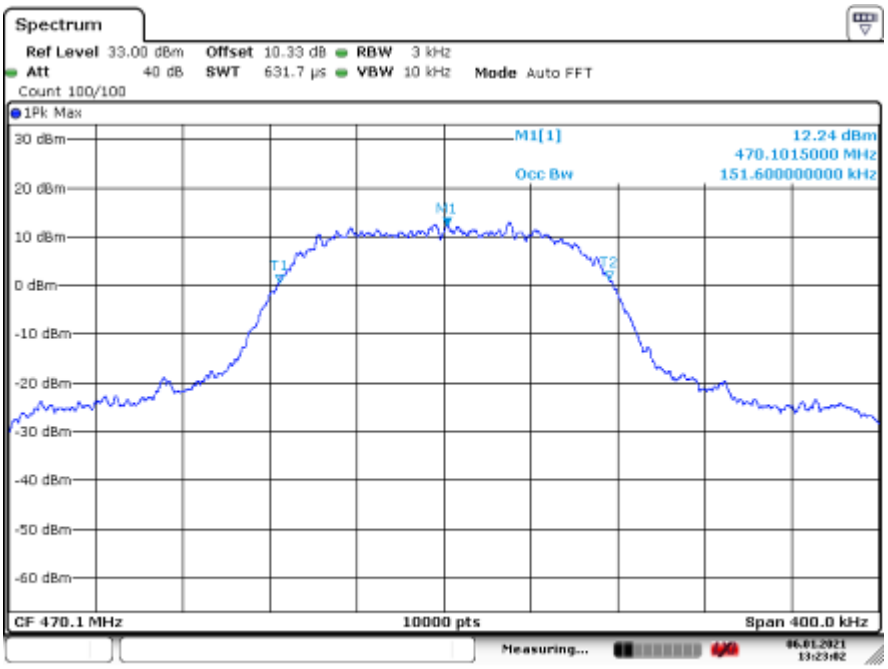
Center Frequency (MHz)	Power Setting	99% Bandwidth (kHz)	Limit (kHz)	Result
470.10	High (50 mW)	151.60	< 200	Pass
	Low (10 mW)	148.12		Pass
539.025	High (50 mW)	150.44		Pass
	Low (10 mW)	148.60		Pass
607.95	High (50 mW)	150.68		Pass
	Low (10 mW)	148.52		Pass

Please refer to the following plots for detailed test results

Occupied Bandwidth

Low Channel: 470.10 MHz

50 mW Power Setting



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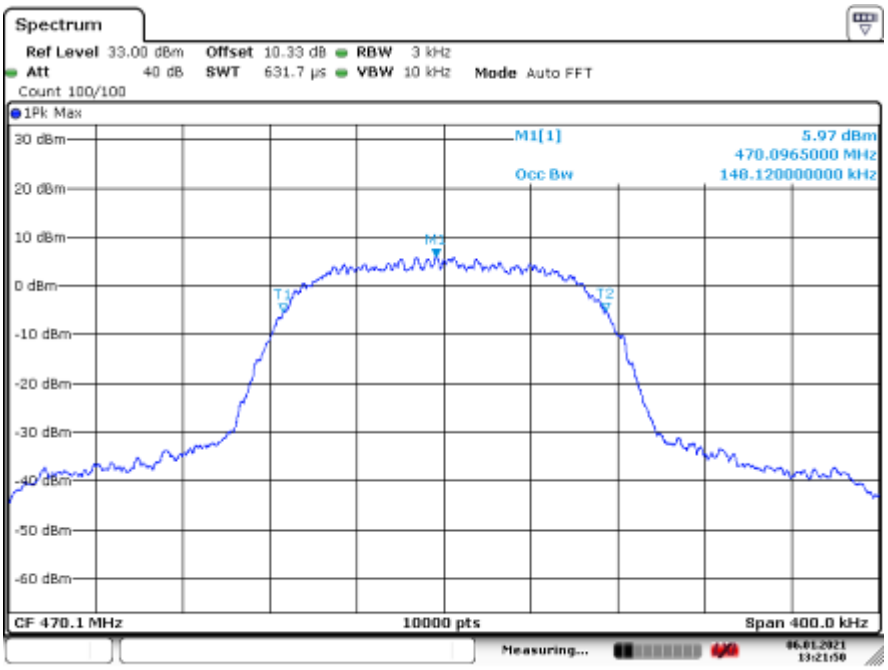
10 mW Power Setting



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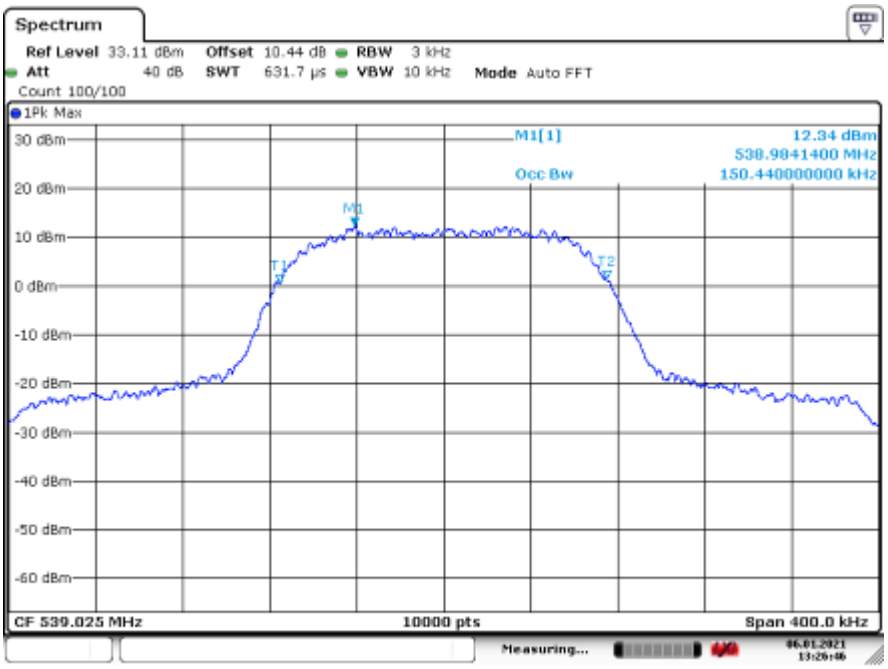
Middle Channel: 539.025 MHz

50 mW Power Setting



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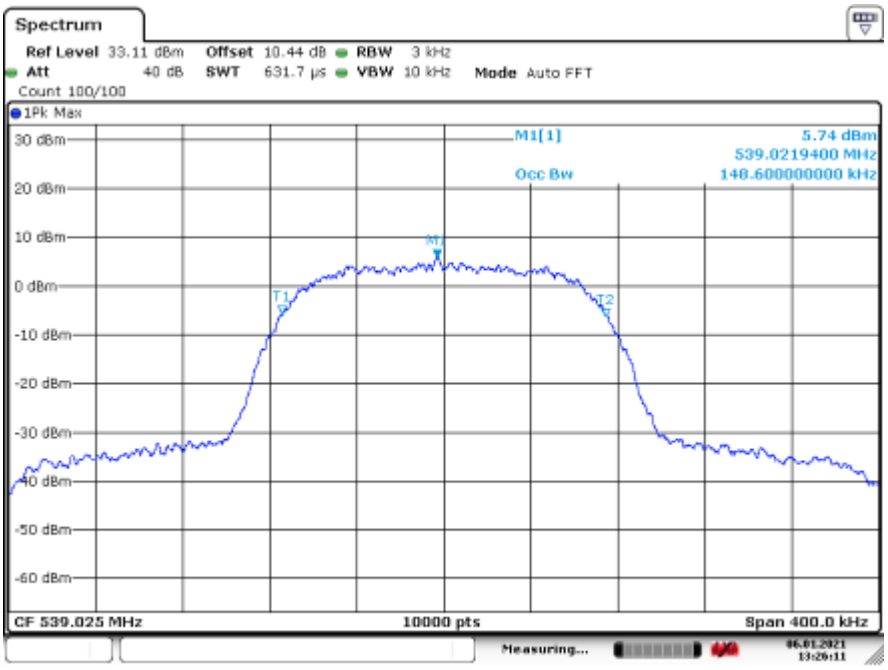

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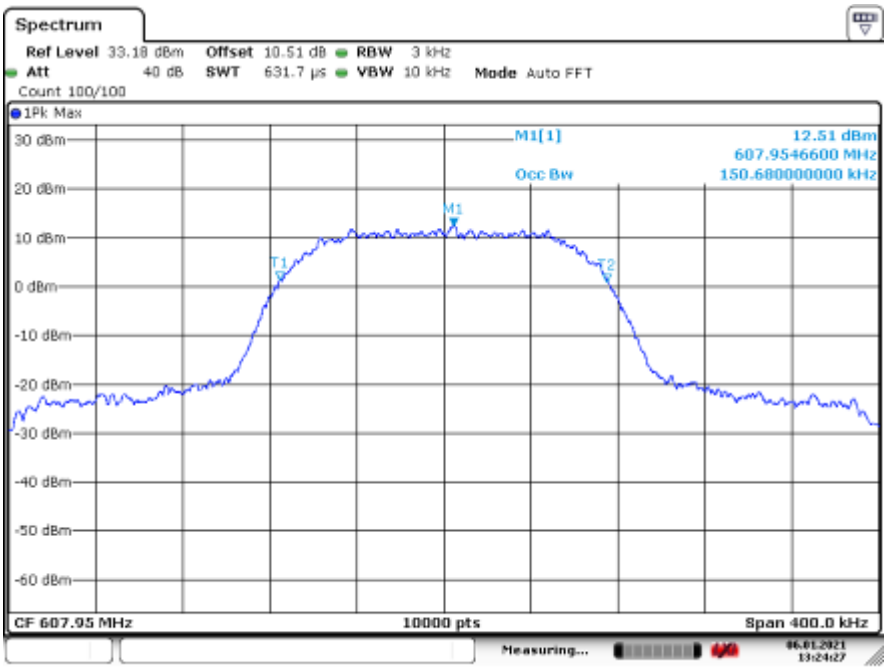
High Channel: 607.95 MHz

50 mW Power Setting



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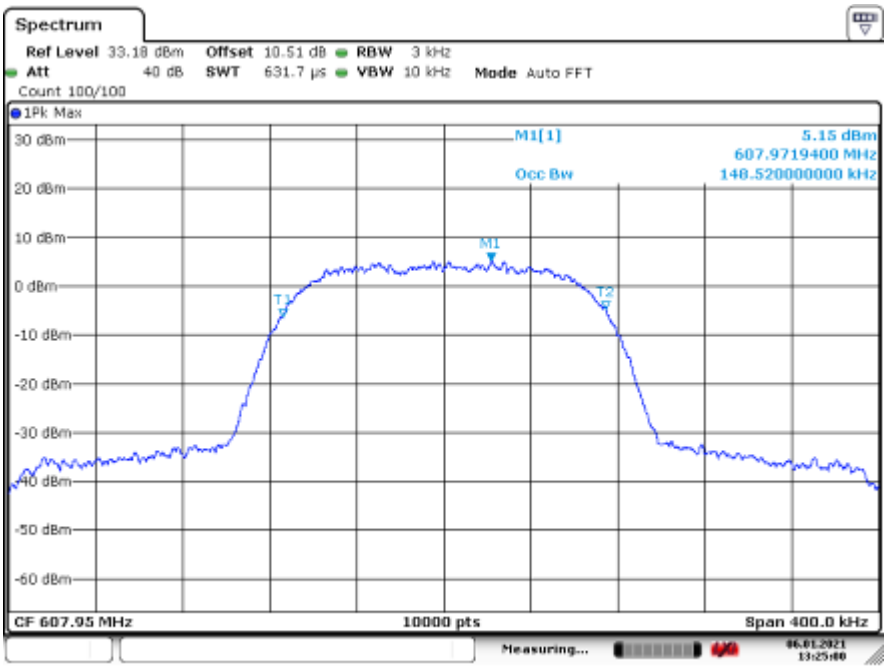

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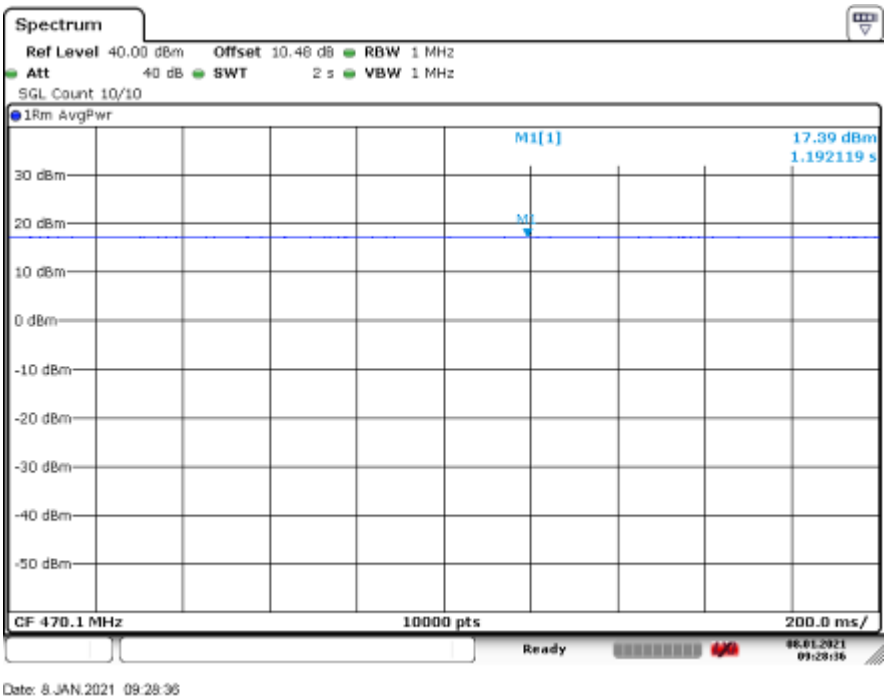
Emission Mask

Low Channel: 470.10 MHz

Reference Level at 50 mW Power Setting



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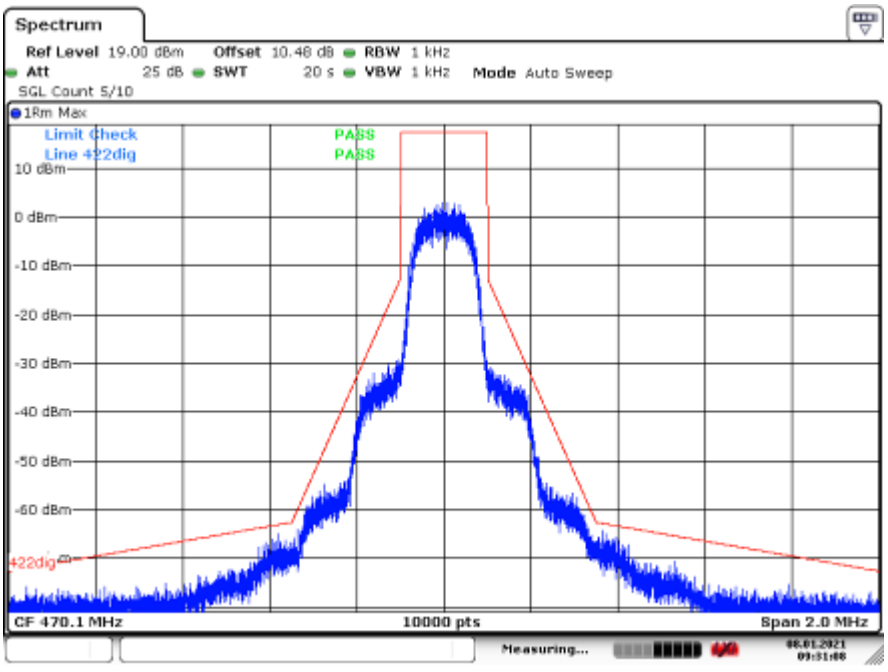
Emission Mask at 50 mW Power Setting



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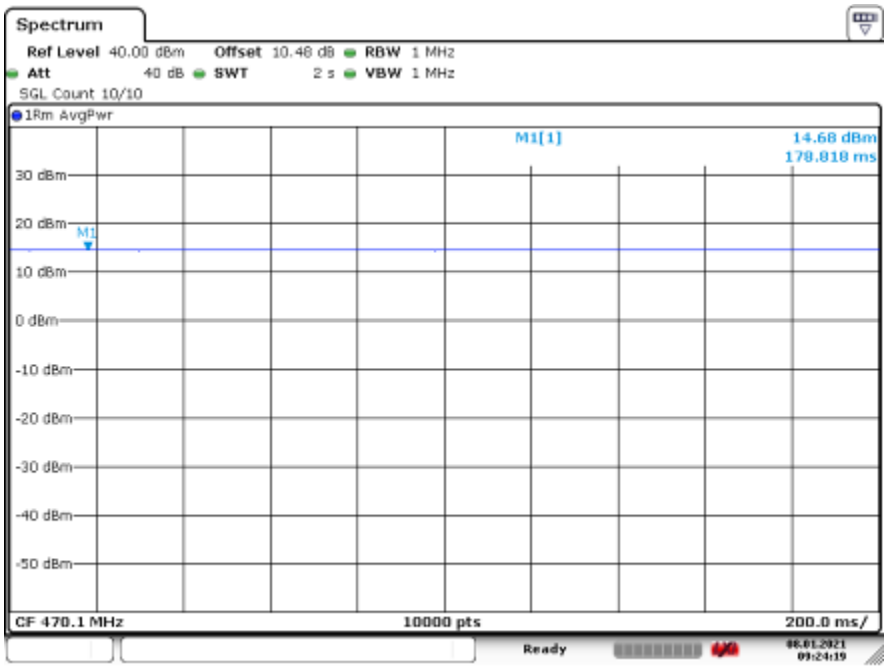
Reference Level at 25 mW Power Setting



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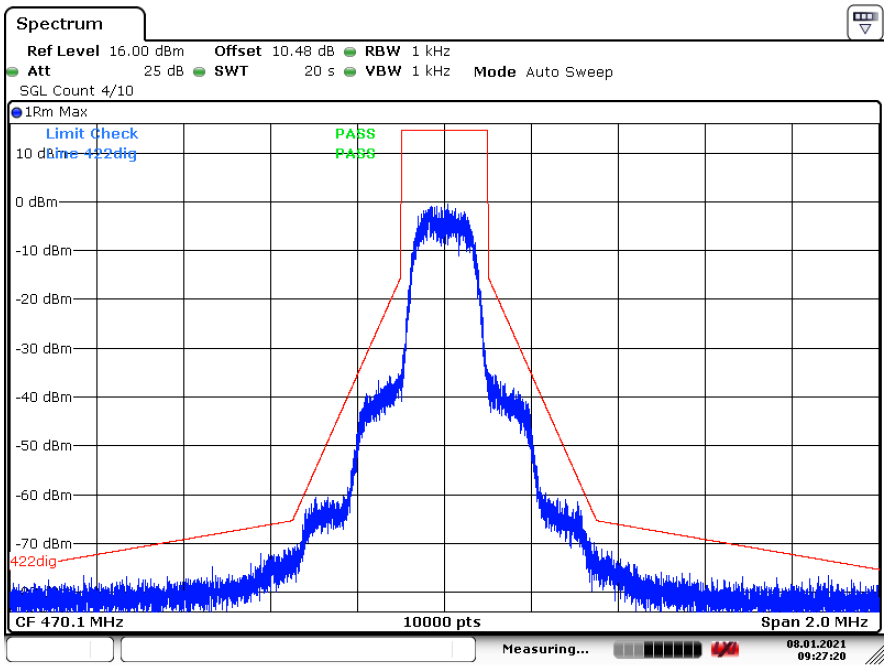
Emission Mask at 25 mW Power Setting



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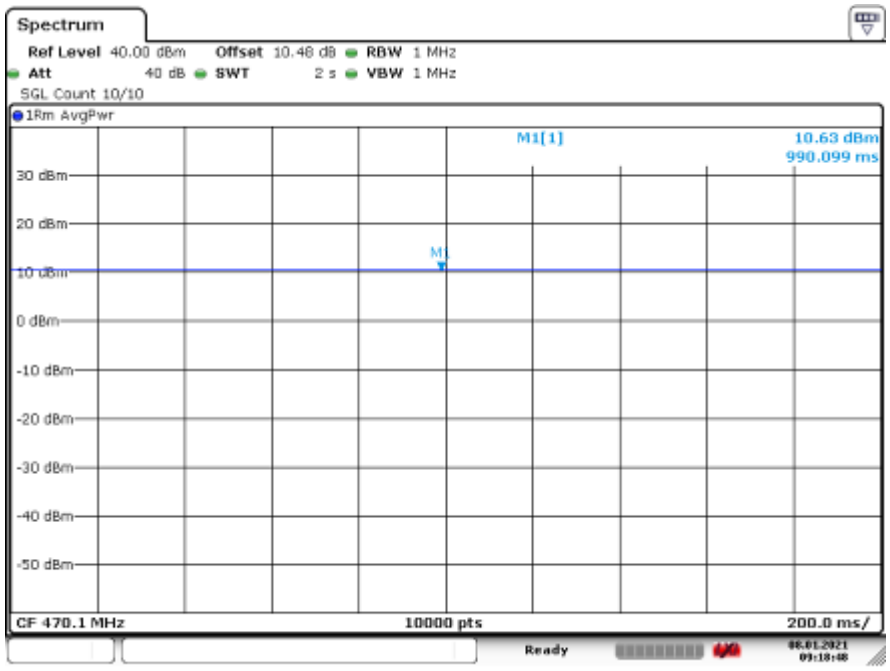
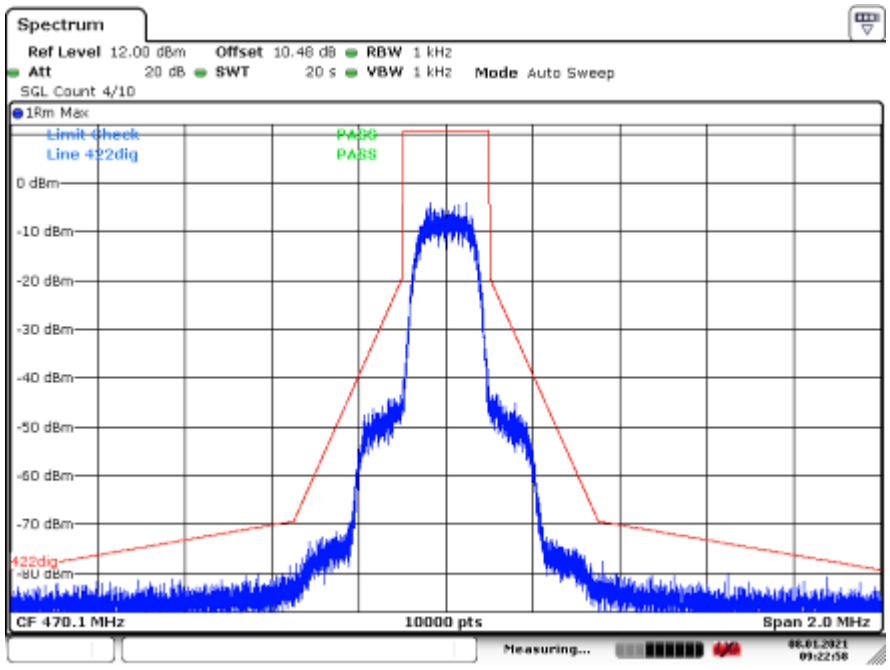
Reference Level at 10 mW Power Setting

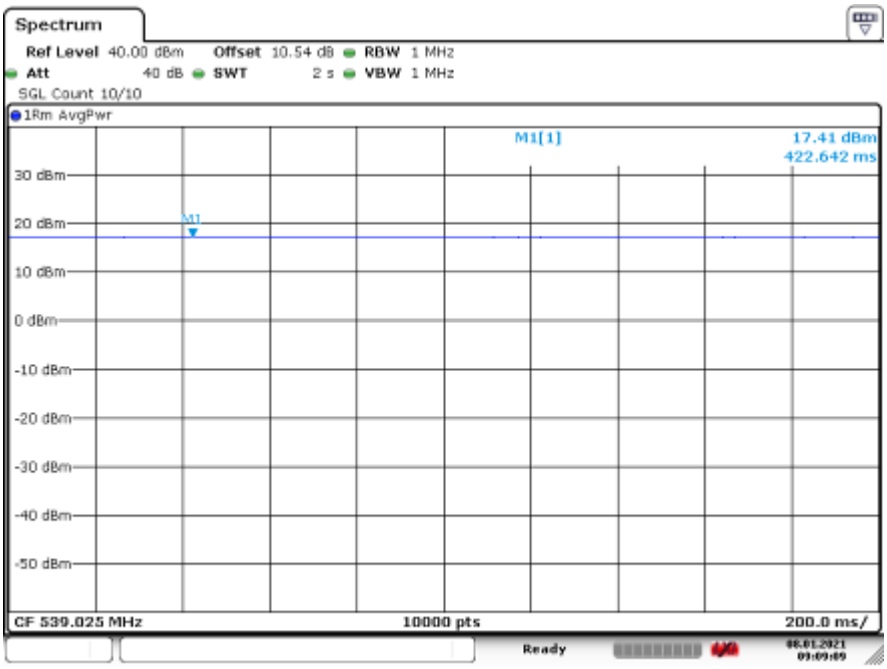


Emission Mask at 10 mW Power Setting

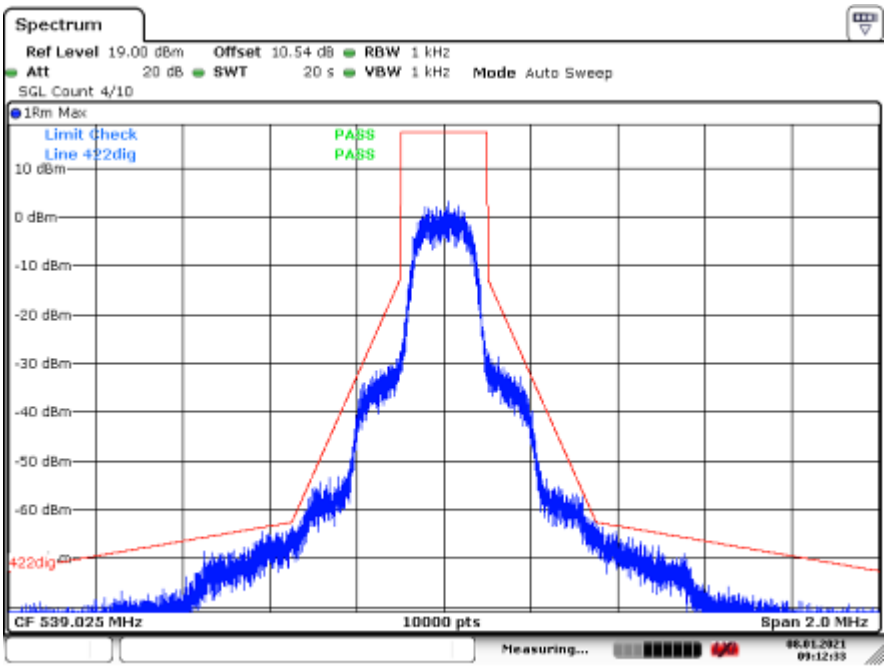


Middle Channel: 539.025 MHz

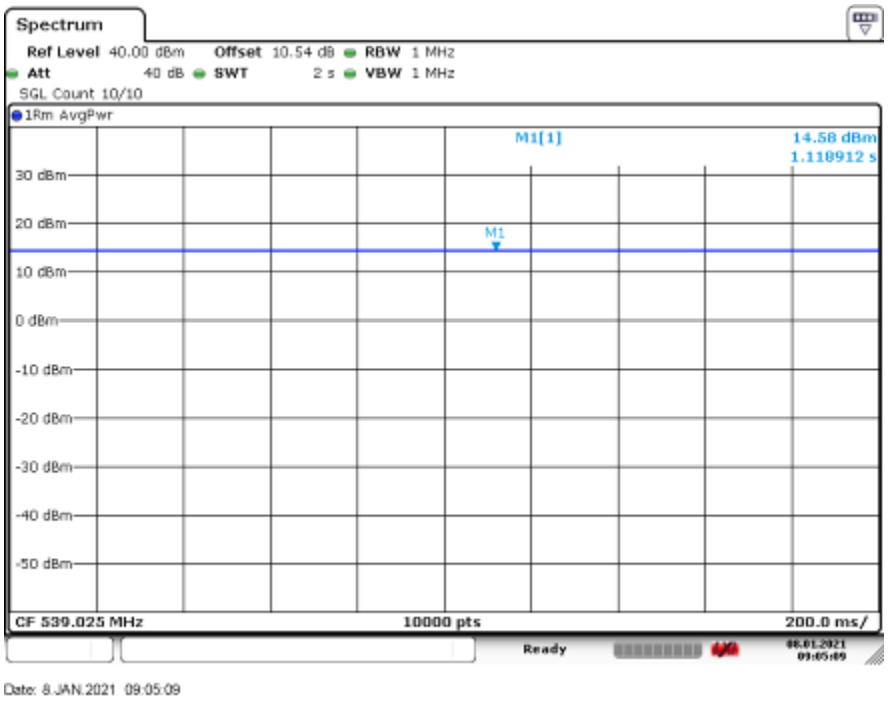
Reference Level at 50 mW Power Setting



Emission Mask at 50 mW Power Setting

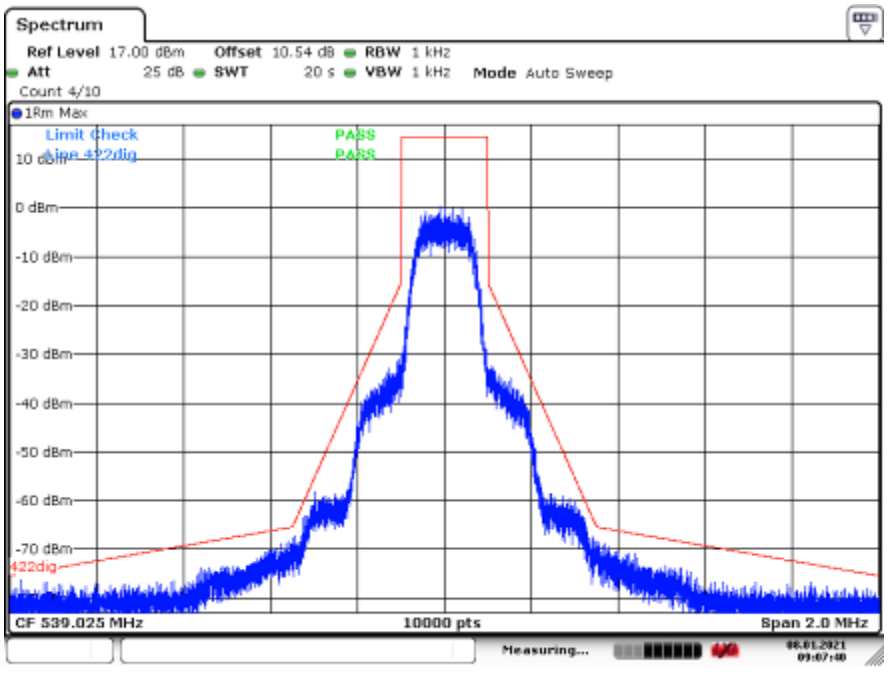


Reference Level at 25 mW Power Setting



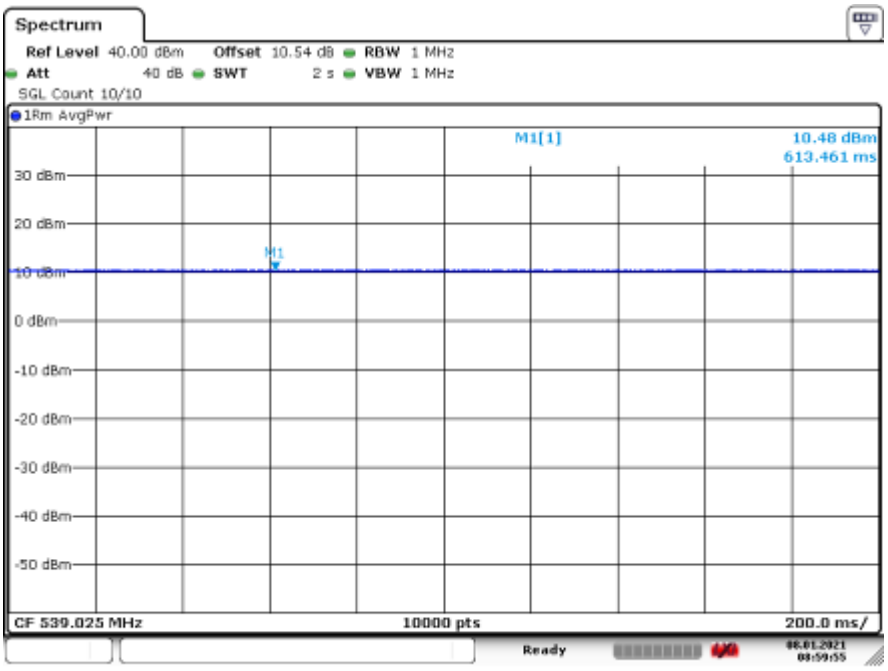
Date: 8.JAN.2021 09:05:09

Emission Mask at 25 mW Power Setting



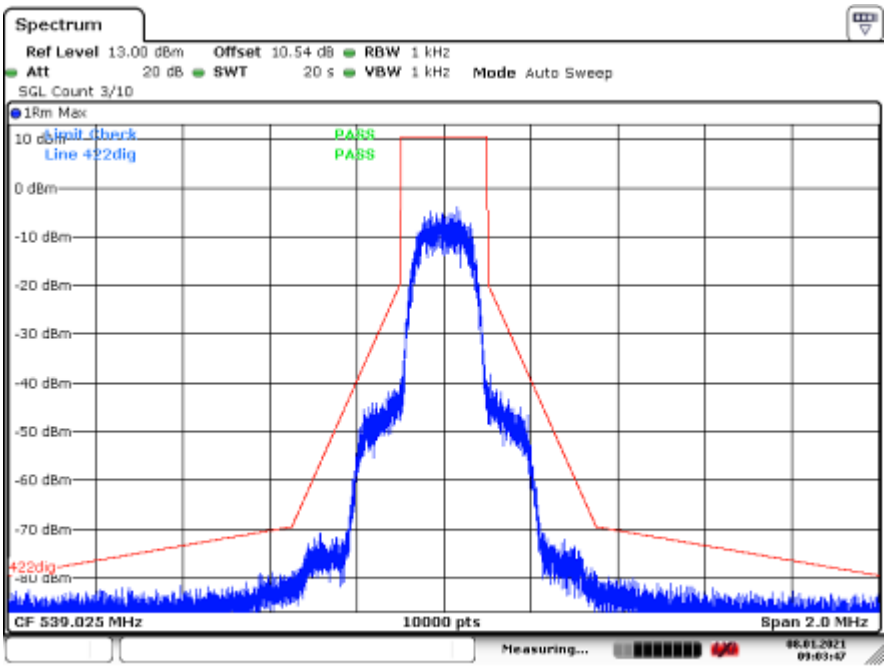
Date: 8.JAN.2021 09:07:40

Reference Level at 10 mW Power Setting



Date: 8.JAN.2021 08:59:56

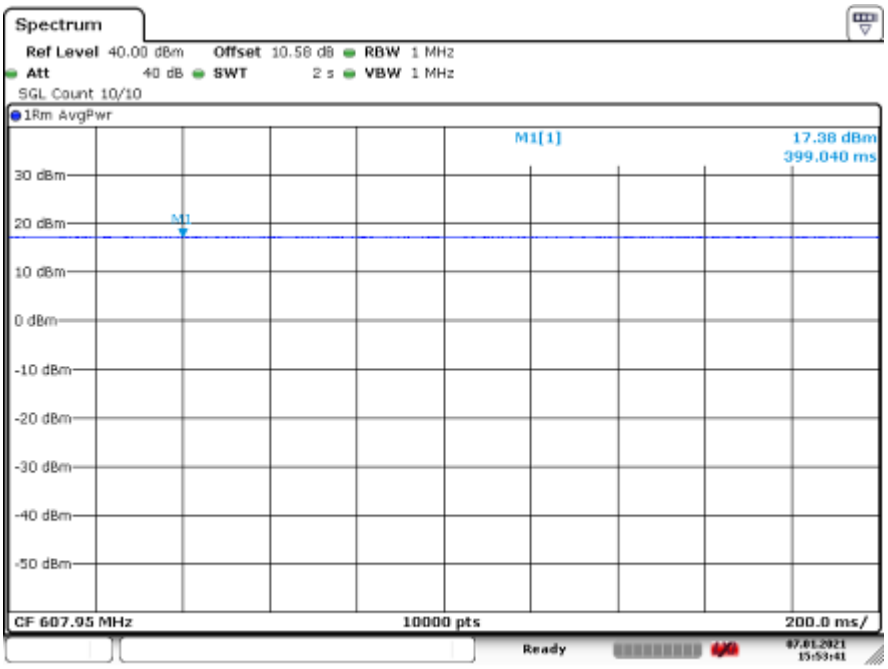
Emission Mask at 10 mW Power Setting



Date: 8.JAN.2021 09:03:47

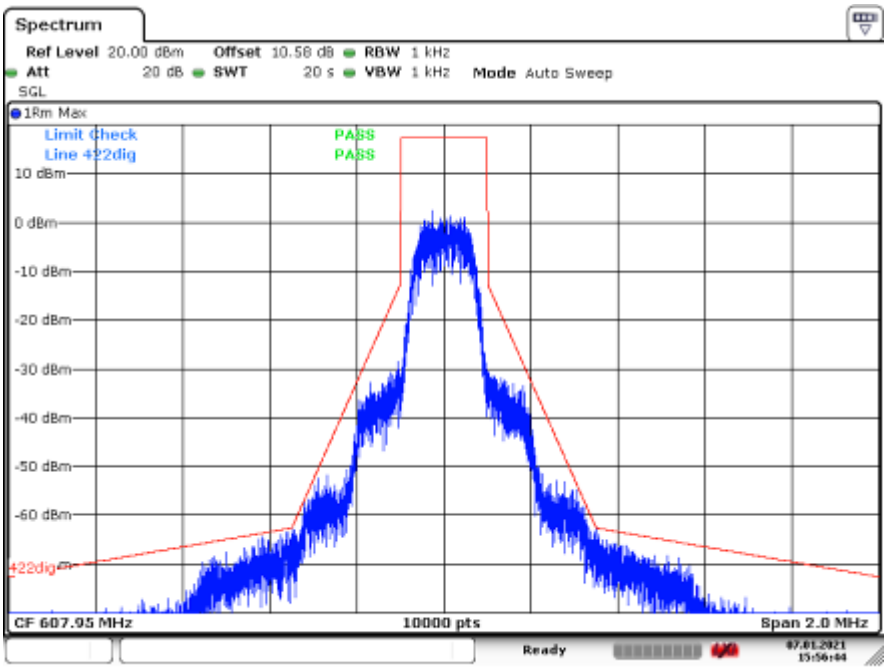
High Channel: 607.95 MHz

Reference Level at 50 mW Power Setting



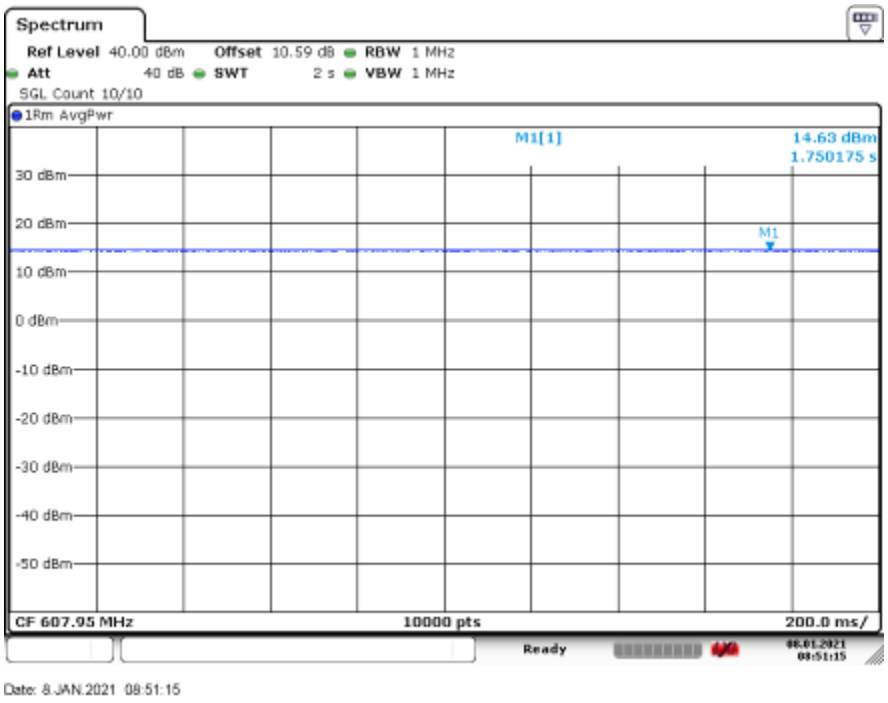
Date: 7.JAN.2021 15:53:41

Emission Mask at 50 mW Power Setting



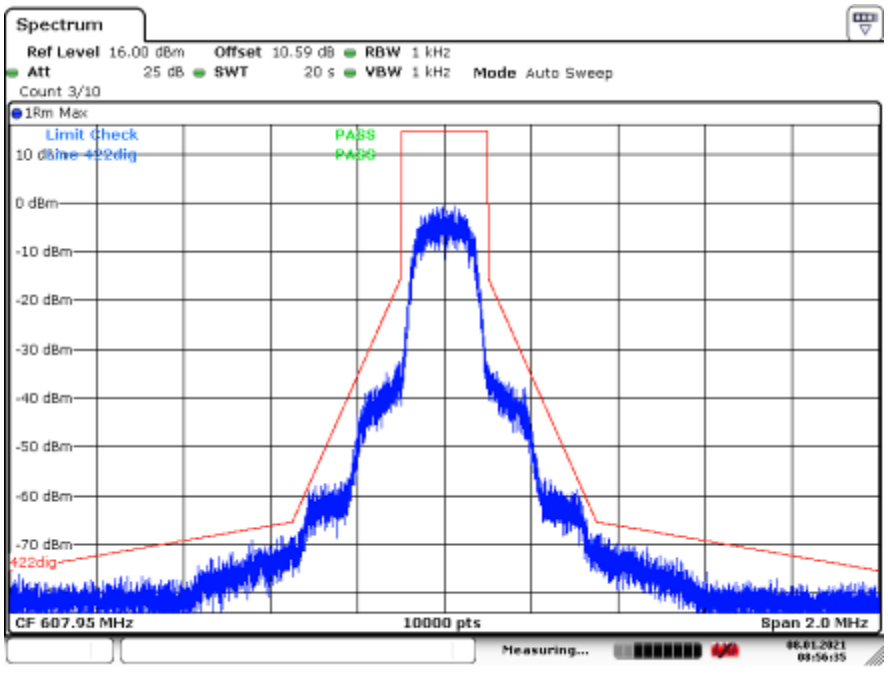
Date: 7.JAN.2021 15:56:45

Reference Level at 25 mW Power Setting



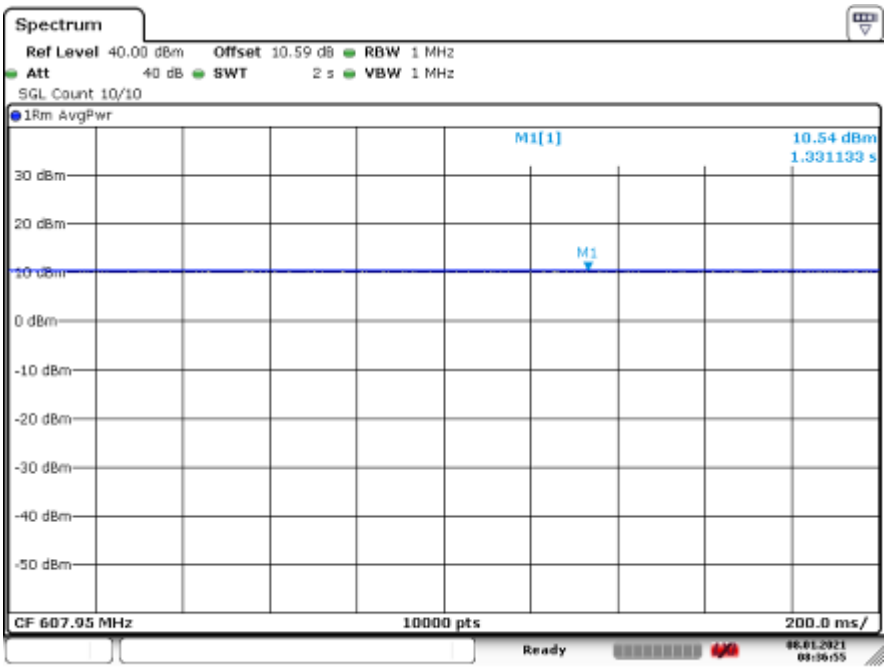
Date: 8.JAN.2021 08:51:15

Emission Mask at 25 mW Power Setting

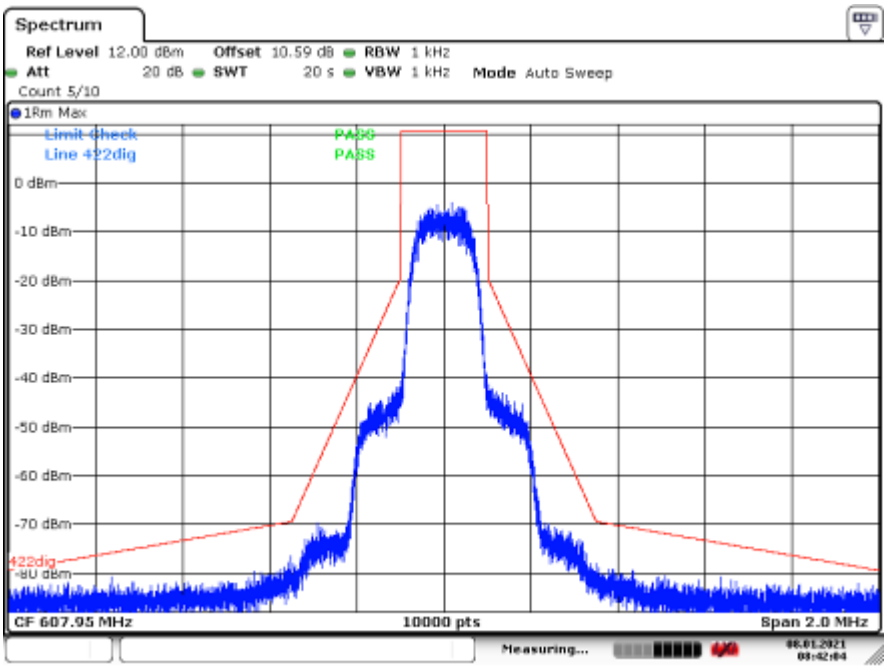


Date: 8.JAN.2021 08:56:35

Reference Level at 10 mW Power Setting



Emission Mask at 10 mW Power Setting



8 FCC §74.861(e)(7) & ISEDC RSS-210 Annex G §G.3.4-Conducted Spurious Emissions at Antenna Port

8.1 Applicable Standards

According to FCC §74.861 (e) (7):

Analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter.

According to ISEDC RSS-210 Annex G §G.3.4:

The transmitter unwanted emissions shall meet the requirements in sections 8.3 and 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08), *Electromagnetic compatibility and radio spectrum matters (ERM); Wireless microphones in the* 25 MHz *to*3 GHz *frequency range; Part 1: Technical characteristics and methods of measurement*

8.2 Test Procedure

KDB 971168 D01 v03r01 and ETSI EN 300 422-1 V1.4.2 (2011-08).

8.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSV40	1321.3008K39-101203-UW	2019-08-06	18 Months
-	10dB Attenuator	-	-	Each time[1]	N/A
-	RF Cable	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".*

8.4 Test Environmental Conditions

Temperature:	22 ºC
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

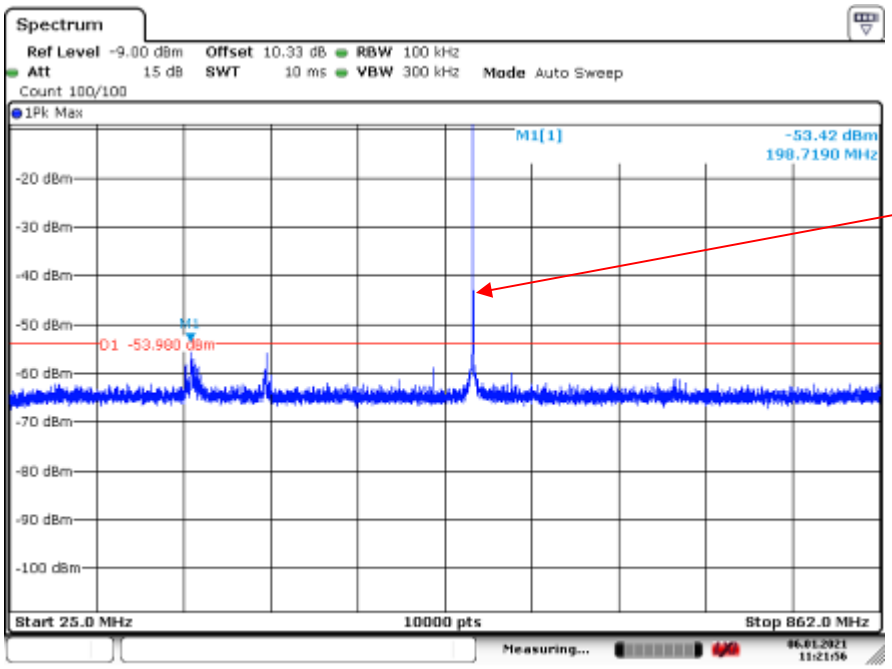
The testing was performed by Vang Lee on 2021-01-06 at RF site.

8.5 Test Results

Please refer to the following table plots for detailed test results, testing were done at the highest power setting as the worst case.

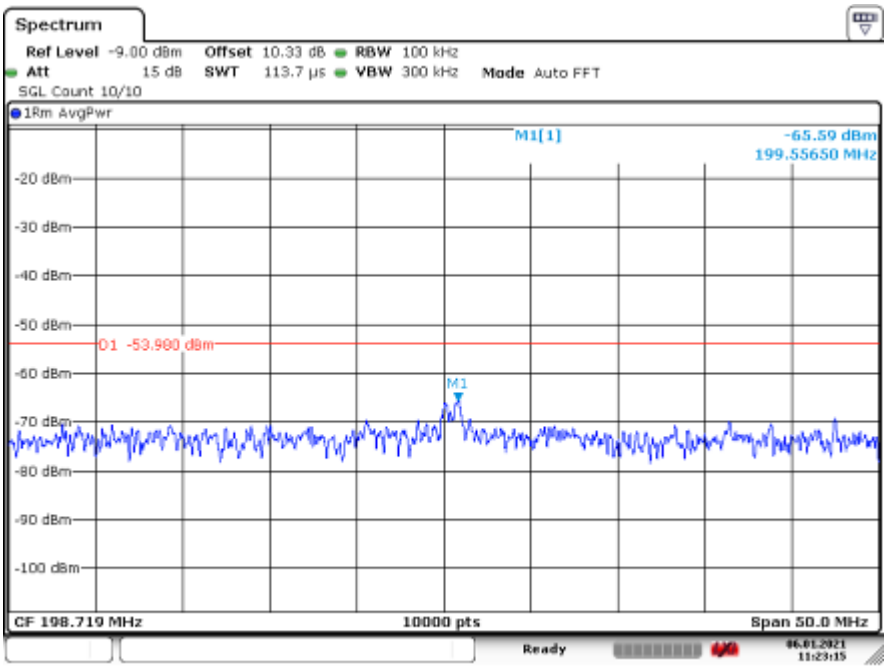
Low Channel: 470.1 MHz

25 MHz to 862 MHz Step1



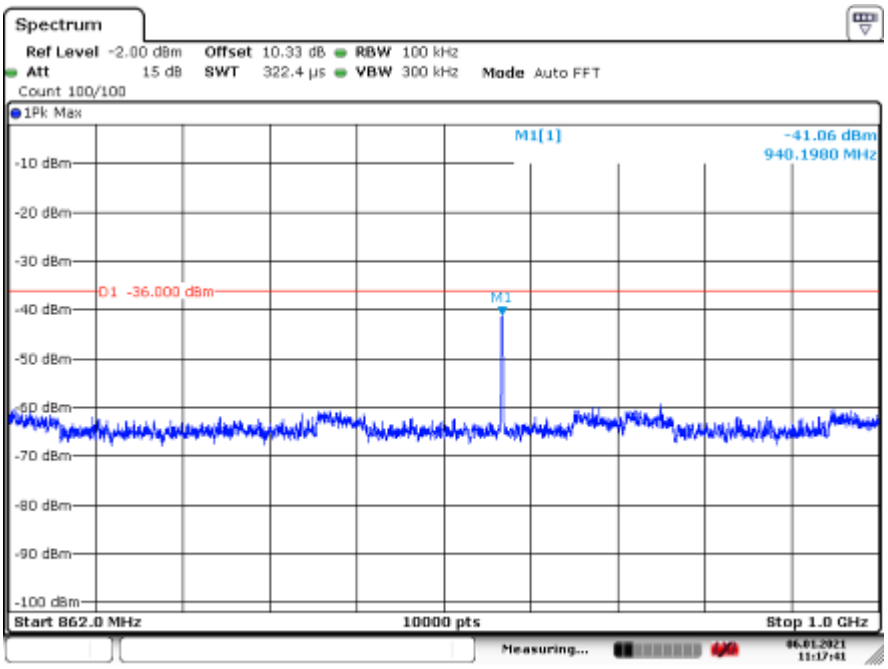
Date: 6.JAN.2021 11:21:56

25 MHz to 862 MHz Step 2



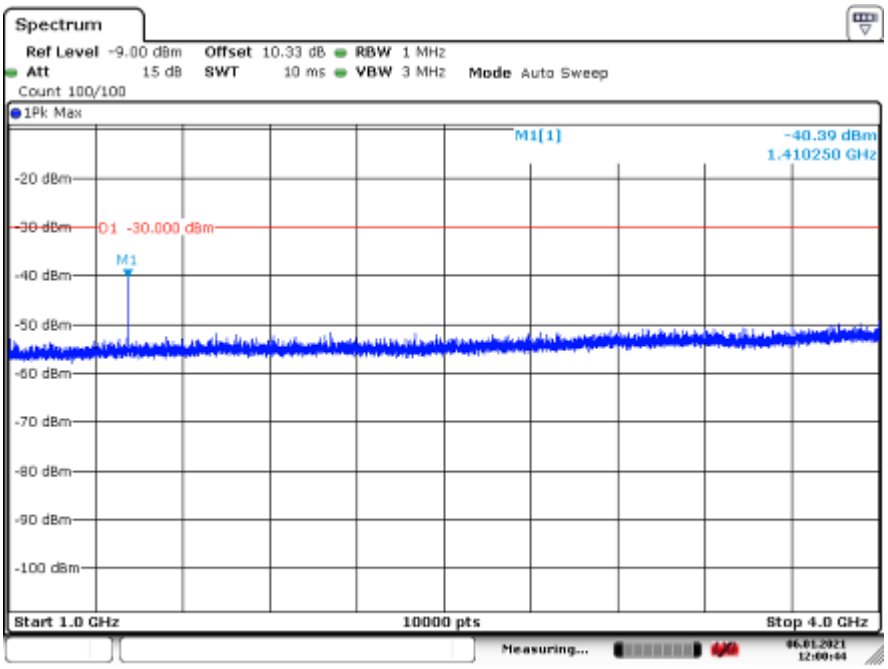
Date: 6.JAN.2021 11:23:15

862 MHz to 1 GHz



Date: 6.JAN.2021 11:17:42

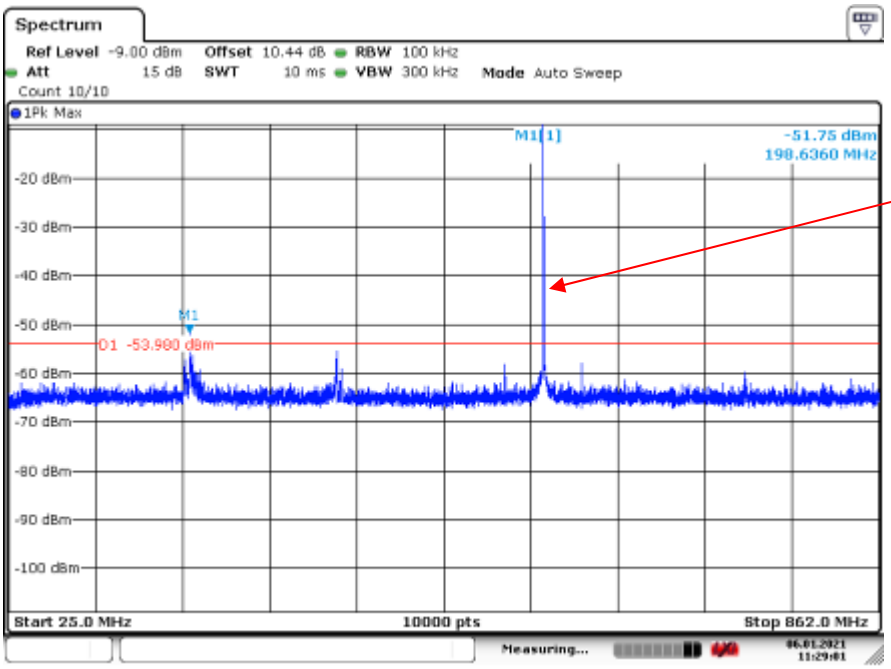
1 GHz to 4 GHz



Date: 6.JAN.2021 12:00:44

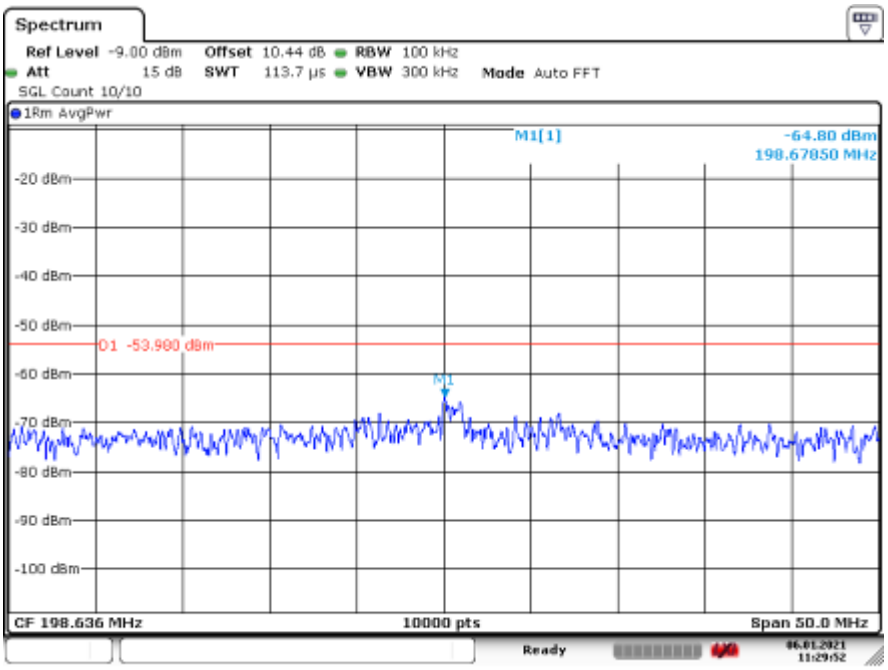
Middle Channel: 539.025 MHz

25 MHz to 862 MHz Step1



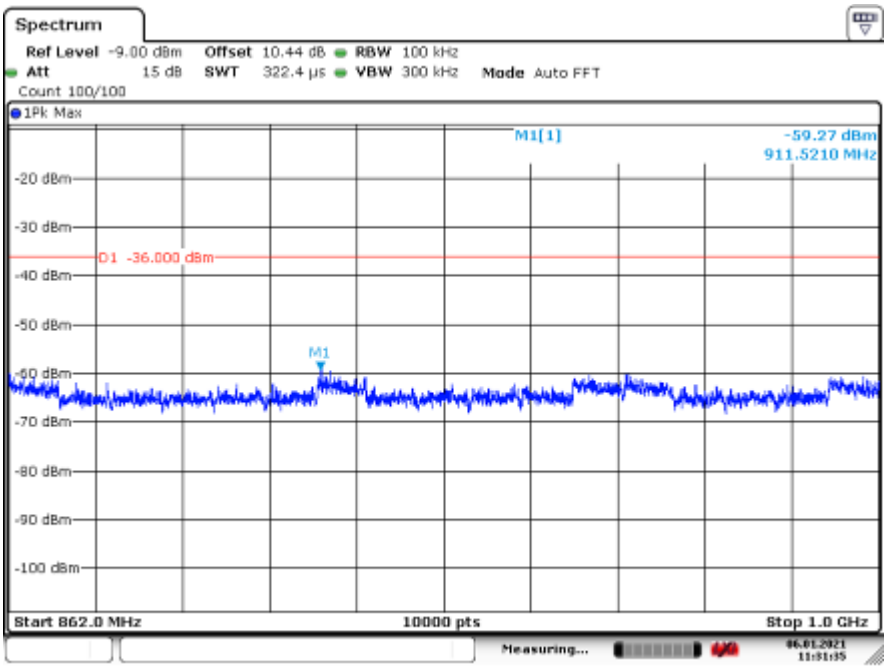
Date: 6.JAN.2021 11:29:02

25 MHz to 862 MHz Step 2



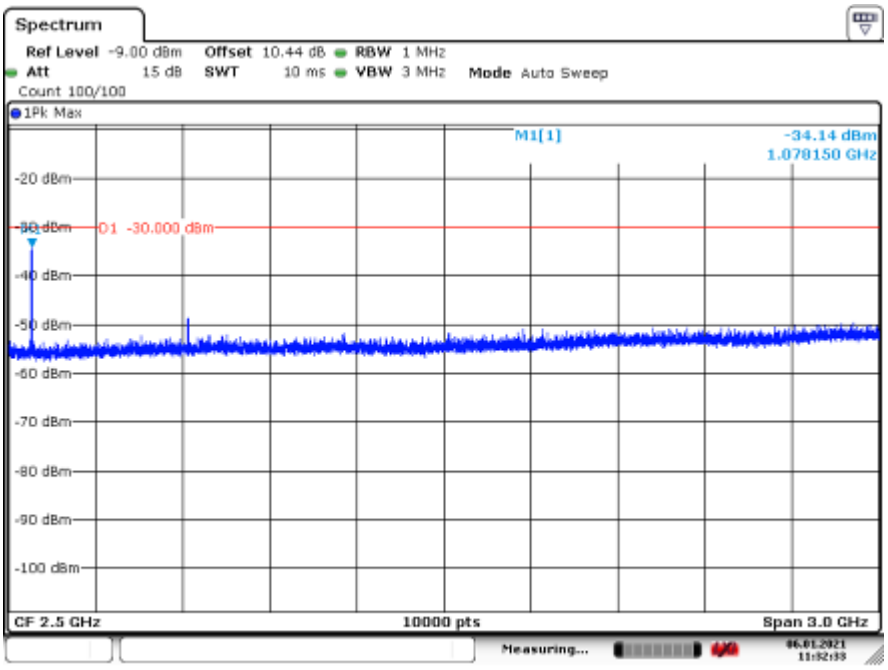
Date: 6.JAN.2021 11:29:52

862 MHz to 1 GHz



Date: 6.JAN.2021 11:31:35

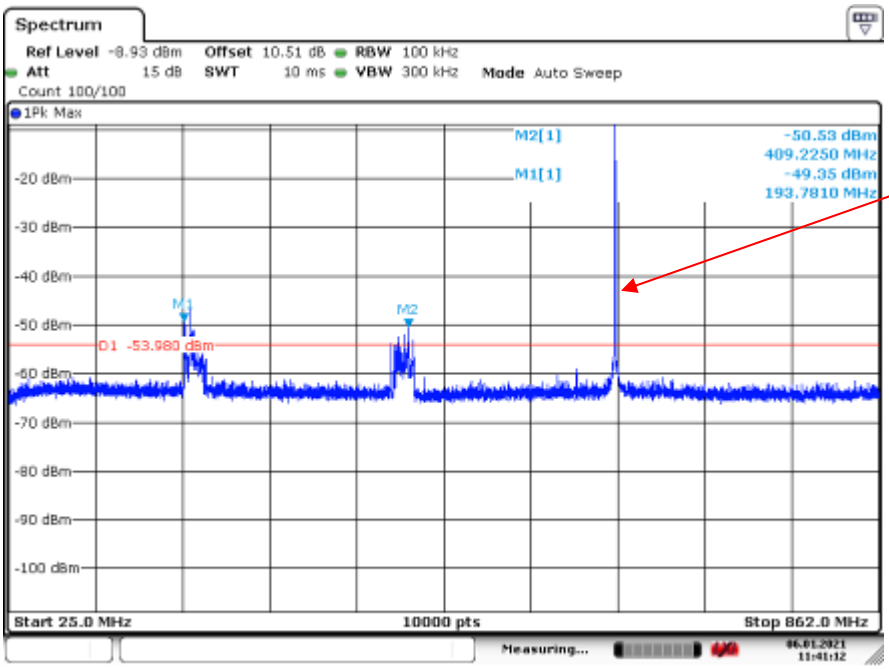
1 GHz to 4 GHz



Date: 6.JAN.2021 11:32:34

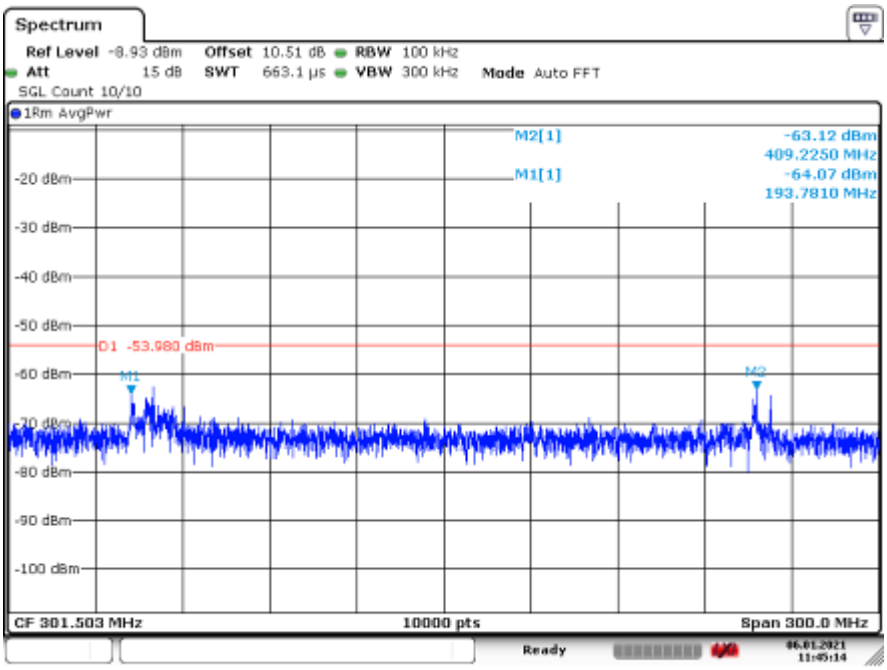
High Channel: 607.95 MHz

25 MHz to 862 MHz Step1



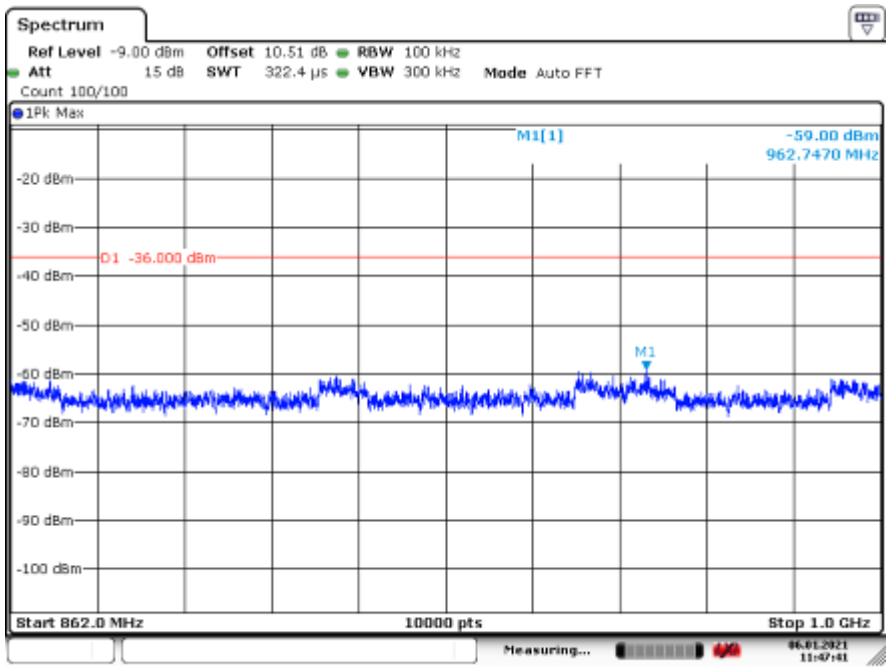
Date: 6.JAN.2021 11:41:12

25 MHz to 862 MHz Step 2



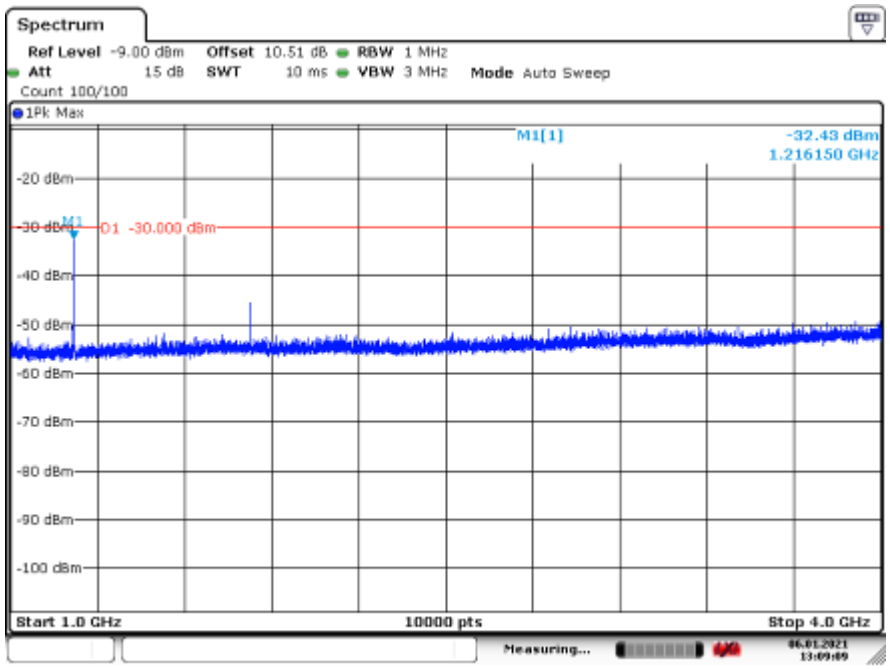
Date: 6.JAN.2021 11:45:15

862 MHz to 1 GHz



Date: 6.JAN.2021 11:47:41

1 GHz to 4 GHz



Date: 6.JAN.2021 13:09:10

9 FCC §74.861(e)(7) & ISEDC RSS-210 Annex G §G.3.4-Field Strength of Spurious Radiation

9.1 Applicable Standards

According to FCC §74.861 (e) (7):

Analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter.

According to ISEDC RSS-210 Annex G §G.3.4:

The transmitter unwanted emissions shall meet the requirements in sections 8.3 and 8.4 of ETSI EN 300 422-1 v1.4.2(2011-08)

9.2 Test Procedure

KDB 971168 D01 v03r01 and ETSI EN 300 422-1 V1.4.2 (2011-08).

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rohde & Schwarz	Analyzer, Spectrum	FSV40	1321.3008K39-101203-UW	2019-08-06	18 months
Sunol Science Corp	System Controller	SC110V	122303-1	N/R	N/A
Sunol Sciences	Biconilog Antenna	JB3	A020106-2	2019-11-20	2 years
HP	Pre-Amplifier	8447D	2944A07030	2020-08-17	1 year
HP	Pre-Amplifier	8449B	3147A00400	2020-02-27	1 year
ETS Lindgren	Horn Antenna	3117	00218973	2019-02-13	2 years
A.R.A.	Horn Antenna	DRG-118/A	1132	2020-02-25	2 years
ETS Lindgren	Passive Loop Antenna	6512	34167	2018-11-14	2.5 years
Agilent	Vector Signal Generator	N5182B	MY51350070	2020-02-11	1 year
Rohde & Schwarz	Spectrum Analyzer	FSQ26	200749	2019-03-14	2 years
COM-POWER	Dipole Antenna	AD-100 DB-4	721033DB1,721033DB2,721033DB3,521921	2019-03-06	2 years
IW Microwave	157 Series Cable Armored with 2.92mm Male Plugs on Both Sides	KPS-1571AN-2400	DC 1922	2020-06-06	1 year
MDP Digital	Times Microwave LMR 400 UltraFex Coaxial Cable 35'	LMR400UF	BACL1904161	2020-05-20	1 year
-	RF Cable	-	-	Each time[1]	N/A
	Band Reject Filter	-	-	Each time[1]	N/A

Note[1]: cable included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".*

9.4 Test Environmental Conditions

Temperature:	22 ºC
Relative Humidity:	40 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen Huang from 2021-01-11 to 2021-01-12 at 5 meter chamber 3.

9.5 Test Results

EUT was configured to the highest power setting. Please refer to the following tables for test results.

Low Channel: 470.1 MHz

Freq. (MHz)	S.A. Amp. (dBmV)	Table Azimuth (Degrees)	Test Antenna		Substitution				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Freq. (MHz)	S.G. Level (dBm)	Antenna Gain (dB)	Cable Loss (dB)			
940.2	30.2	300	170	H	940.2	-67.22	3.6	0.22	-63.84	-54	-9.84
940.2	30.11	305	125	V	940.2	-64.49	3.6	0.22	-61.11	-54	-7.11
4000	46.31	160	150	H	1787	-53.77	9.888	1.00	-44.882	-30	-14.882
4000	45.93	85	150	V	1787	-54.77	9.888	1.00	-45.882	-30	-15.882

Mid Channel: 539.025 MHz

Freq. (MHz)	S.A. Amp. (dBµV)	Table Azimuth (Degrees)	Test Antenna		Substitution				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Freq. (MHz)	S.G. Level (dBm)	Antenna Gain (dBi/dBd)	Cable Loss (dB)			
940.2	30.2	300	170	H	940.2	-67.22	3.6	0.22	-63.84	-54	-9.84
940.2	30.11	305	125	V	940.2	-64.49	3.6	0.22	-61.11	-54	-7.11
4000	45.18	160	150	H	4000	-54.9	9.888	1.00	-46.012	-30	-16.012
4000	45.32	85	150	V	4000	-55.38	9.888	1.00	-46.492	-30	-16.492

High Channel: 607.950 MHz

Freq. (MHz)	S.A. Amp. (dBµV)	Table Azimuth (Degrees)	Test Antenna		Substitution				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Freq. (MHz)	S.G. Level (dBm)	Antenna Gain (dBi/dBd)	Cable Loss (dB)			
940.2	30.2	300	170	H	940.2	-67.22	3.6	0.22	-63.84	-54	-9.84
940.2	30.11	305	125	V	940.2	-64.49	3.6	0.22	-61.11	-54	-7.11
4000	45.12	160	150	H	4000	-54.9	9.888	1.00	-46.072	-30	-16.072
4000	45.72	85	150	V	4000	-55.38	9.888	1.00	-46.092	-30	-16.092

10 FCC §74.861(e)(4) & ISEDC RSS-210 Annex G §G.3.3- Frequency Stability

10.1 Applicable Standards

According to FCC §74.861 (e) (4):

The frequency tolerance of the transmitter shall be 0.005 percent

According to ISDEC RSS-210 Annex G §G.3.3:

The frequency stability of equipment shall comply with the limits specified in Table G1, when tested under the frequency stability testing condition specified in RSS-Gen.

Table G1 — Specification for Low-Power Radio Apparatus

Frequency Bands (MHz)	Transmit e.i.r.p. (mW)	Authorized Bandwidth (kHz)	Frequency Stability (ppm)
54-72 76-88 174-216	50	200	± 50
470-608 614-698[Note]	250	200	± 50

10.2 Test Procedure

According to RSS- Gen issue 5 Section 6.11, frequency stability is a measure of frequency drift due to temperature and supply voltage variations with reference to the frequency measurement at an appropriate reference temperature and the rated supply voltage.

Unless specified otherwise in the RSS that is applicable to the device, the reference temperature for transmitters is +20°C.

A hand-held device that is only capable of operating using internal batteries shall be tested using a new battery without any further requirement to vary the supply voltage. Alternatively, an external supply voltage can be used and set at the batter nominal voltage, and again at the battery operating end point voltage which must be specified by the equipment manufacturer.

The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determining circuit element shall be made subsequent to this initial set-up.

With the transmitter installed in an environment test chamber, the unmodulated carrier frequency shall be measured under the conditions specified below. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement. The following temperatures and supply voltage ranges apply, unless specified otherwise in the applicable RSS.

a) At temperature of -30°C, +20°C and +50°C, and at the manufacturer's rated supply voltage; and
b) At a temperature of +20°C and at ±15 percent of the manufacturer's rated supply voltage.

If the frequency stability limits are only met at a different temperature range than specified in (a), the frequency stability requirement will be deemed met if the transmitter is automatically inhibited from operating outside this different temperature range and the published equipment operating characteristics are revised to reflect this different temperature range.

If an unmodulated carrier is not available, the measurement method shall be described in the test report.

Modulated Measurement Method:

1. With the peak of the fundamental being the reference, 10dB down is measured on each side of the fundamental and these two frequencies are recorded.
2. The average of these two frequencies is then calculated and recorded as the "Measured Frequency(MF)".
3. This value is then compared to the "Reading Frequency(RF)" in order to calculate Frequency Tolerance.
4. Frequency Tolerance[ppm]= ((MF-RF)/RF)*1000000

10.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSV40	1321.3008K39-101203-UW	2019-08-06	18 Months
BACL	Temp and Humi Chamber	BTH-150-40	30078	2020-06-25	1 year
-	10dB Attenuator	-	-	Each time[1]	N/A
-	RF Cable	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".*

10.4 Test Environmental Conditions

Temperature:	23 ºC
Relative Humidity:	43 %
ATM Pressure:	101.1 kPa

The testing was performed by Vang Lee on 2021-01-15 and 2021-01-18 at RF site.

10.5 Test Results

Varying Temperature:

470.1 MHz:

Temperature (℃)	Measured Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (± ppm)
-30	470.0991	470.1	-1.914	50
-20	470.1002	470.1	0.425	50
-10	470.0993	470.1	-1.489	50
0	470.1003	470.1	0.638	50
10	470.0998	470.1	-0.425	50
20	470.1010	470.1	2.127	50
30	470.1002	470.1	0.425	50
40	470.0990	470.1	-2.127	50
50	470.1005	470.1	1.064	50

539.025 MHz:

Temperature (℃)	Measured Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (± ppm)
-30	539.0251	539.025	0.186	50
-20	539.0247	539.025	-0.557	50
-10	539.0245	539.025	-0.928	50
0	539.0252	539.025	0.371	50
10	539.0244	539.025	-1.113	50
20	539.0252	539.025	0.371	50
30	539.0259	539.025	1.670	50
40	539.0254	539.025	0.742	50
50	539.0243	539.025	-1.299	50

607.95 MHz:

Temperature (℃)	Measured Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (± ppm)
-30	607.9491	607.95	-1.480	50
-20	607.9489	607.95	-1.809	50
-10	607.9494	607.95	-0.987	50
0	607.9501	607.95	0.164	50
10	607.9499	607.95	-0.164	50
20	607.9502	607.95	0.329	50
30	607.9501	607.95	0.164	50
40	607.9503	607.95	0.493	50
50	607.9499	607.95	-0.164	50

Varying Voltage:

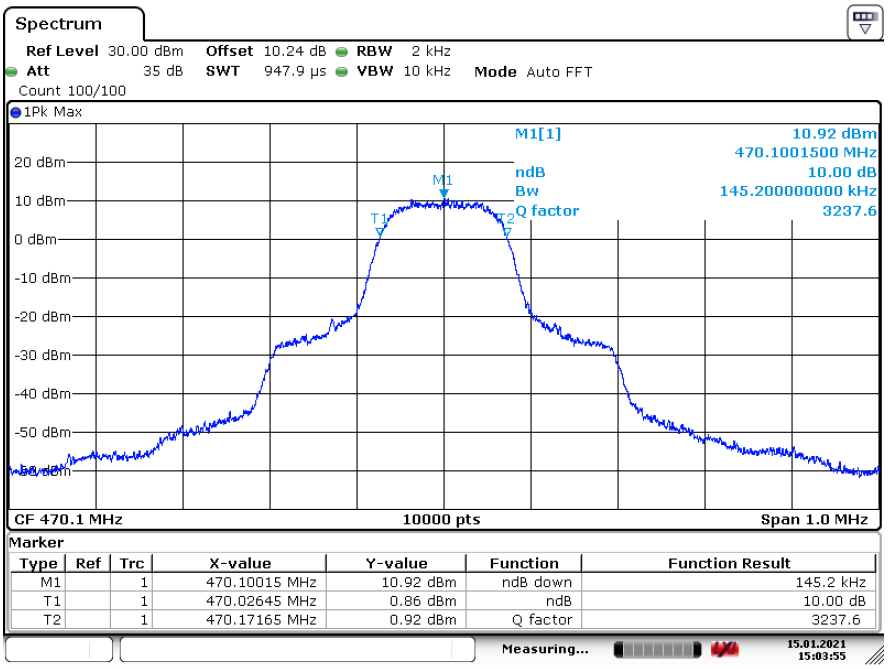
Temperature (℃)	Voltage	Measured Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (± ppm)
25	1.275V	470.0988	470.1	-2.5526484	50
		539.02505	539.025	0.0927601	50
		607.9497	607.95	-0.4934616	50
	1.725V	470.0994	470.1	-1.2763242	50
		539.02485	539.025	-0.2782802	50
		607.95035	607.95	0.5757052	50

Note: Only highest power setting 50 mW was tested for worst case results.

Please refer to plots for detailed test results.

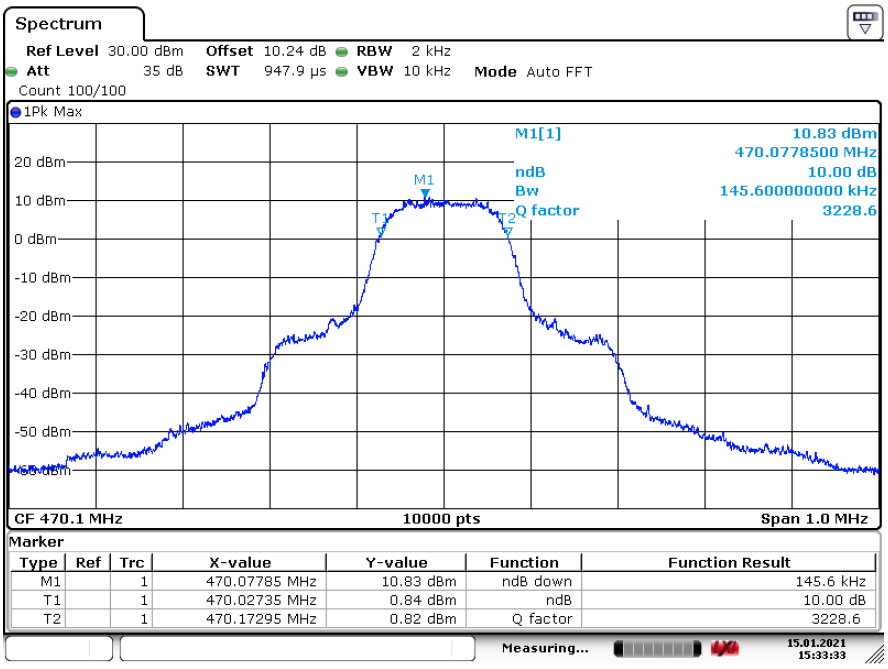
470.1 MHz:

-30 °C



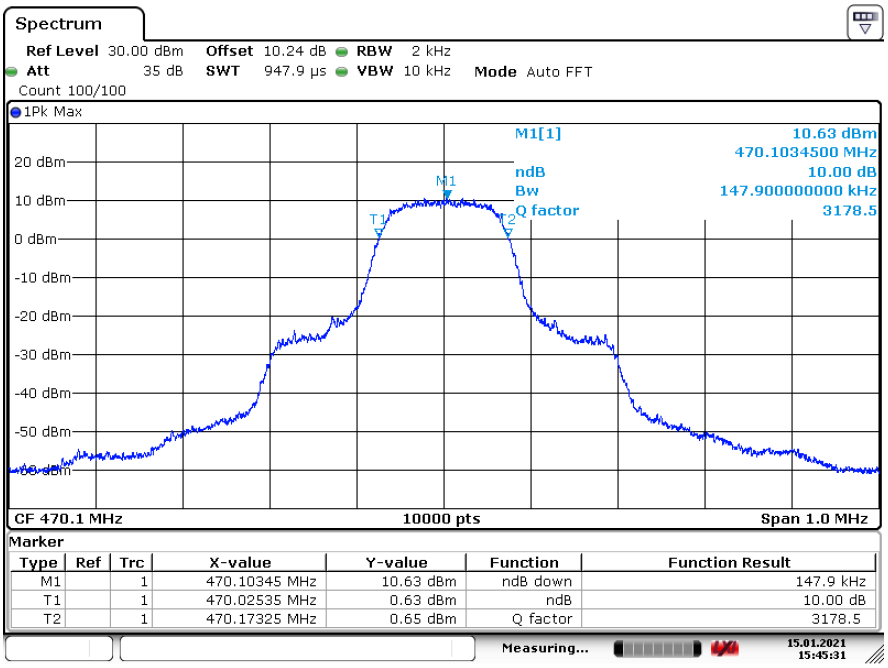
Date: 15.JAN.2021 15:03:55

-20 °C



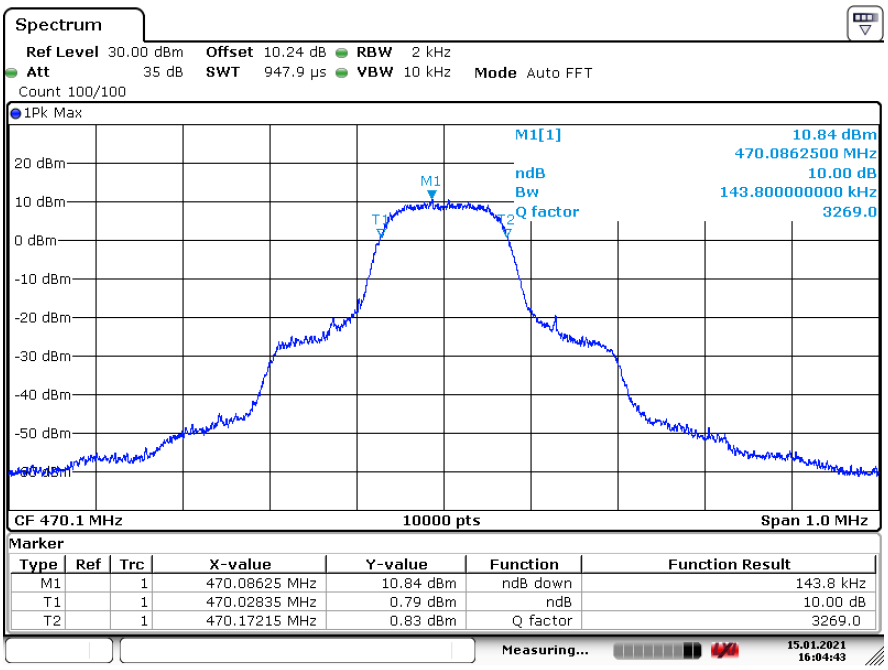
Date: 15.JAN.2021 15:33:33

-10 °C



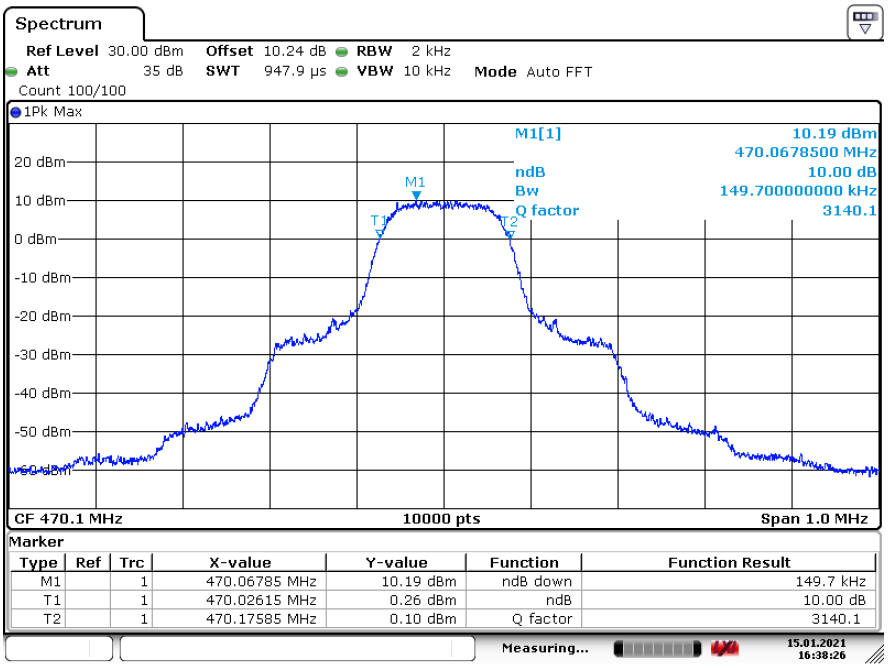
Date: 15.JAN.2021 15:45:31

0 °C



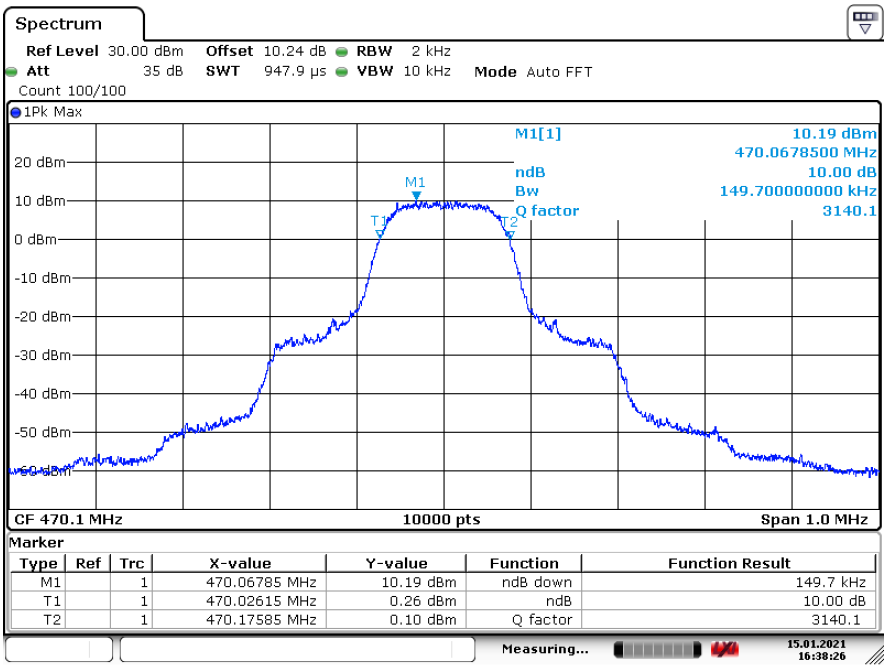
Date: 15.JAN.2021 16:04:43

10 °C



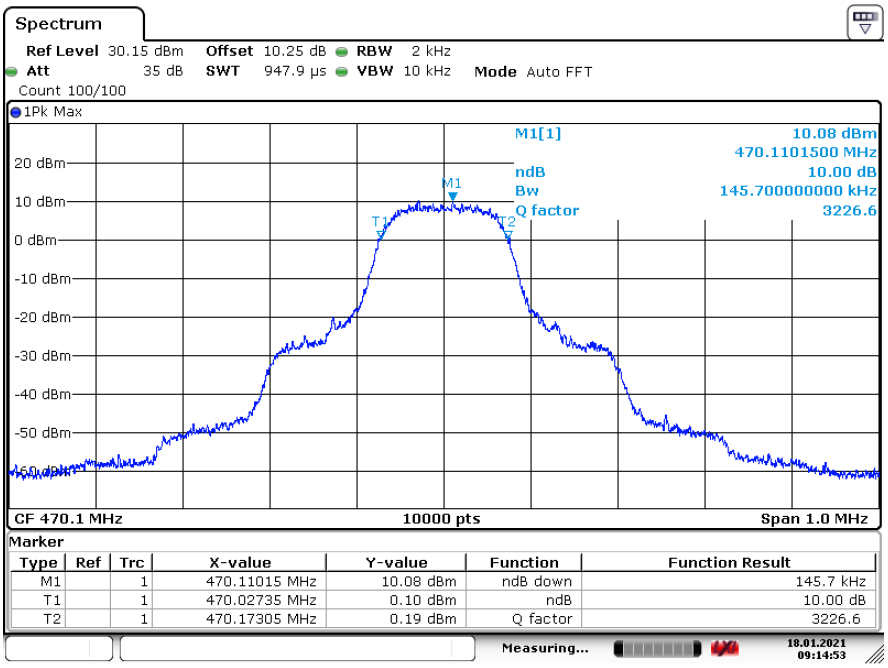
Date: 15.JAN.2021 16:38:26

20 °C



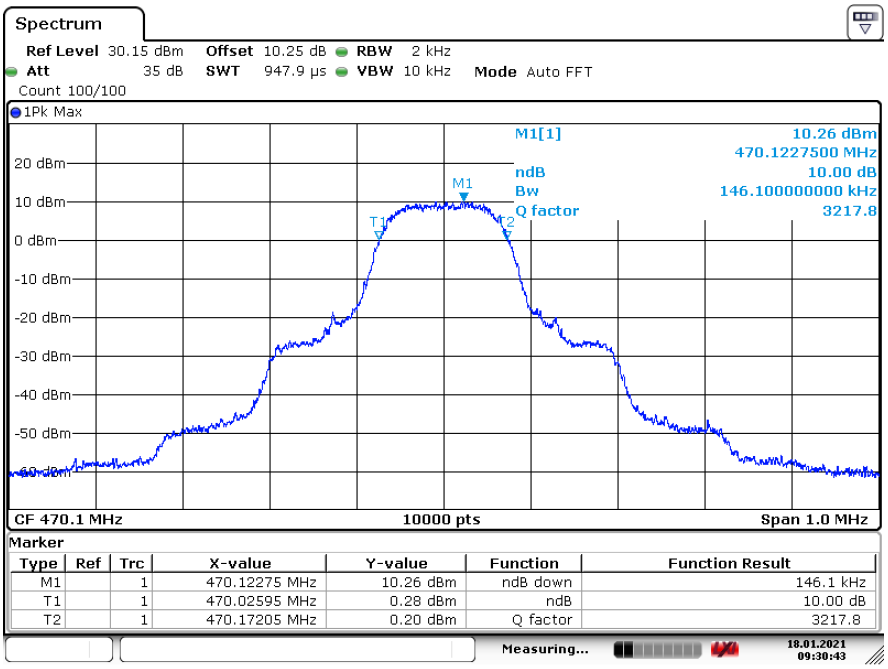
Date: 15.JAN.2021 16:38:26

30 °C



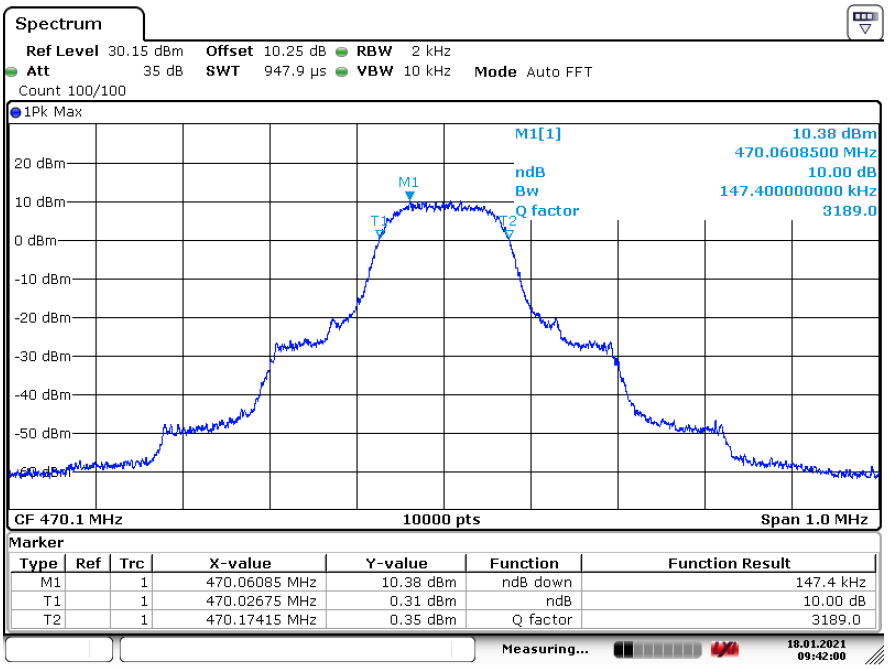
Date: 18.JAN.2021 09:14:53

40 °C



Date: 18.JAN.2021 09:30:43

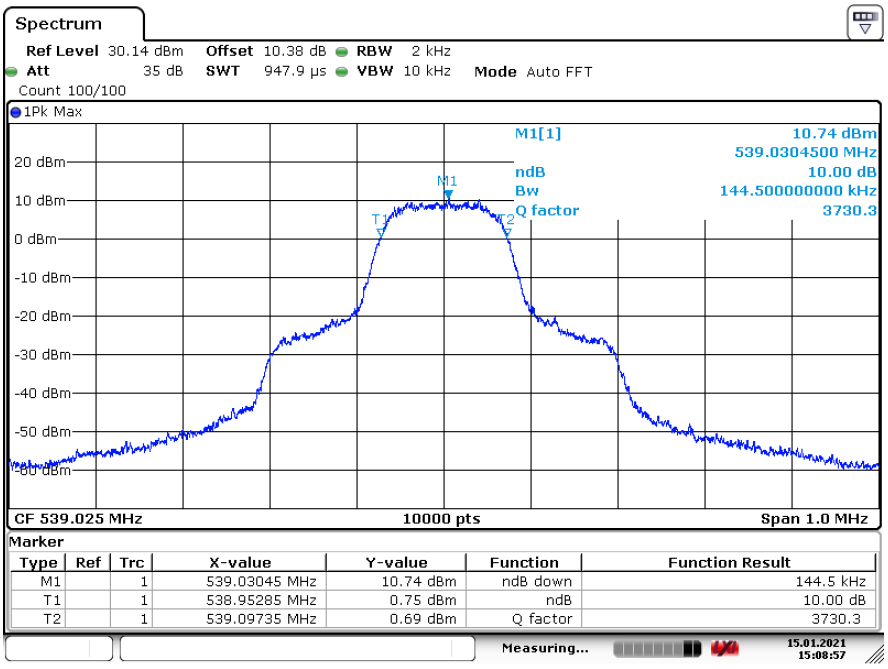
50 °C



Date: 18.JAN.2021 09:42:00

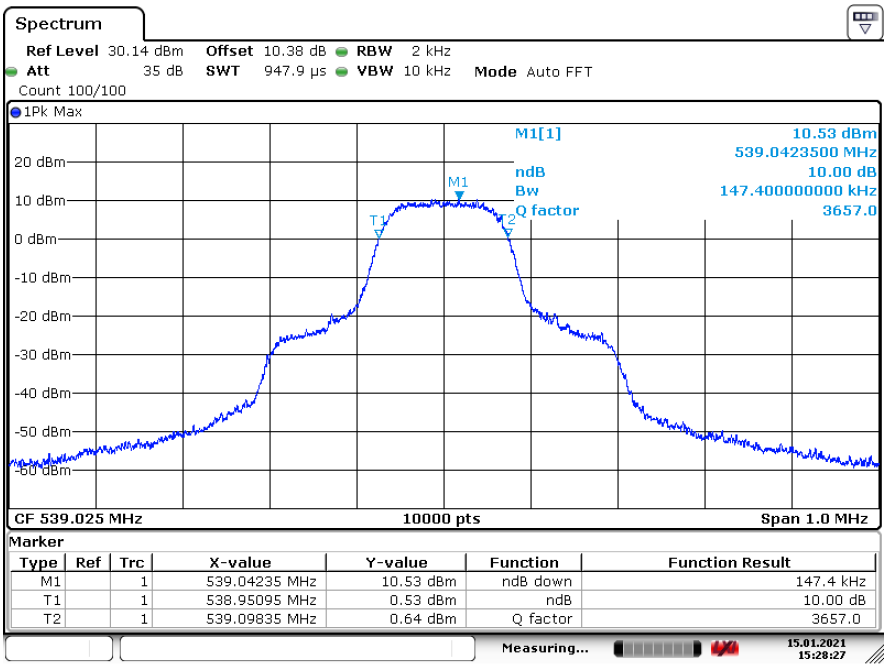
539.025 MHz:

-30 °C



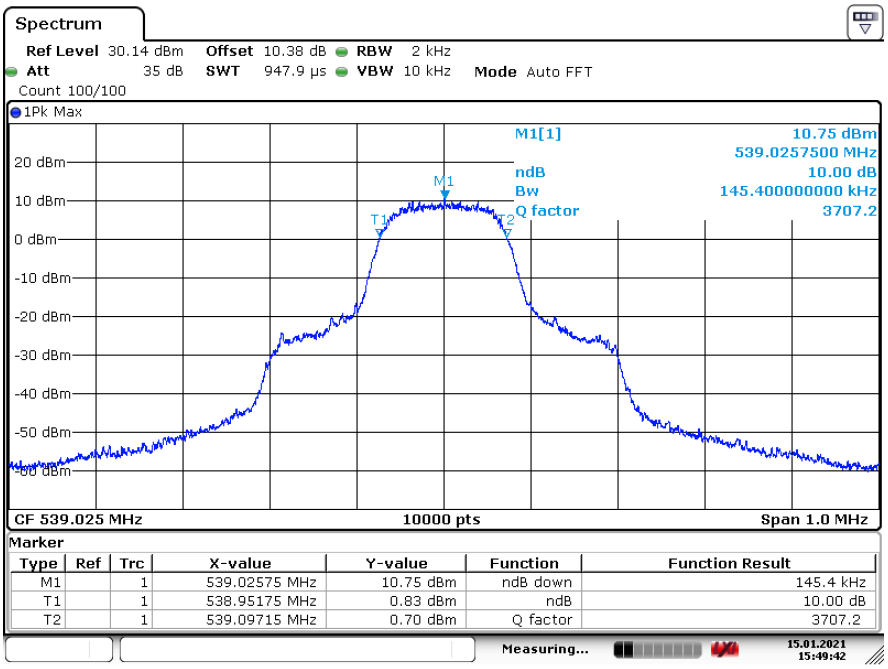
Date: 15.JAN.2021 15:08:57

-20 °C



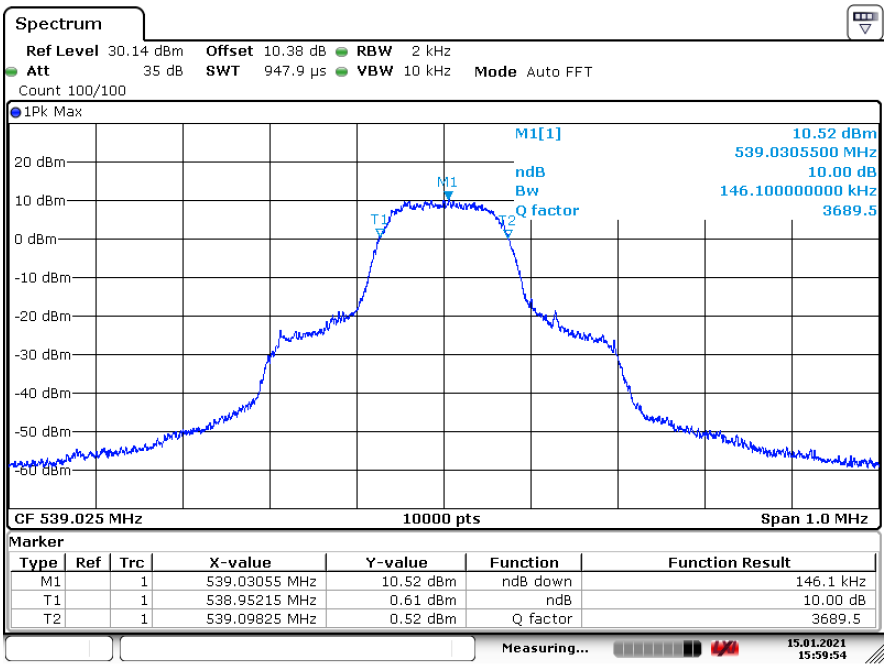
Date: 15.JAN.2021 15:28:27

-10 °C



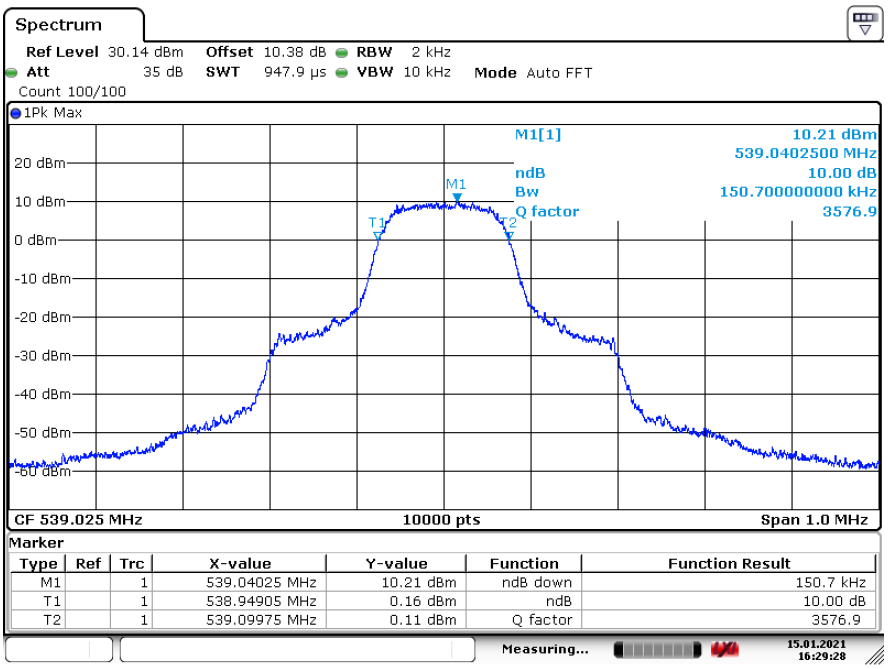
Date: 15.JAN.2021 15:49:42

0 °C



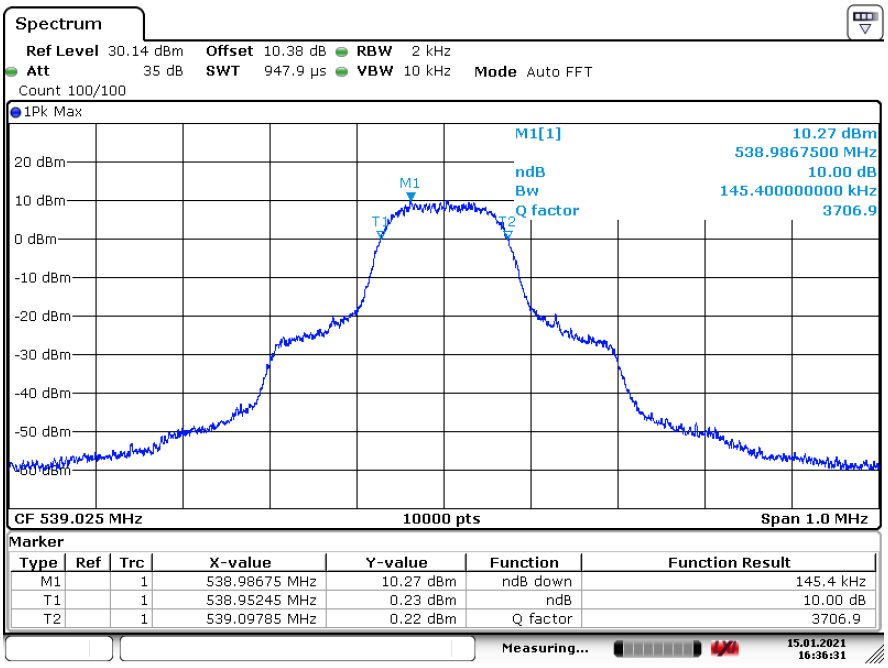
Date: 15.JAN.2021 15:59:54

10 °C



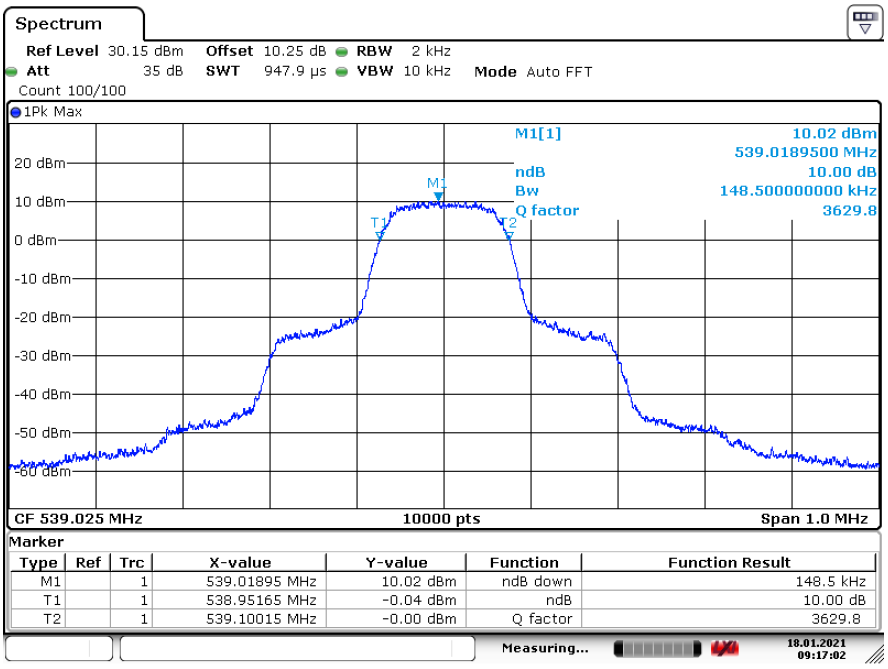
Date: 15.JAN.2021 16:29:28

20 °C



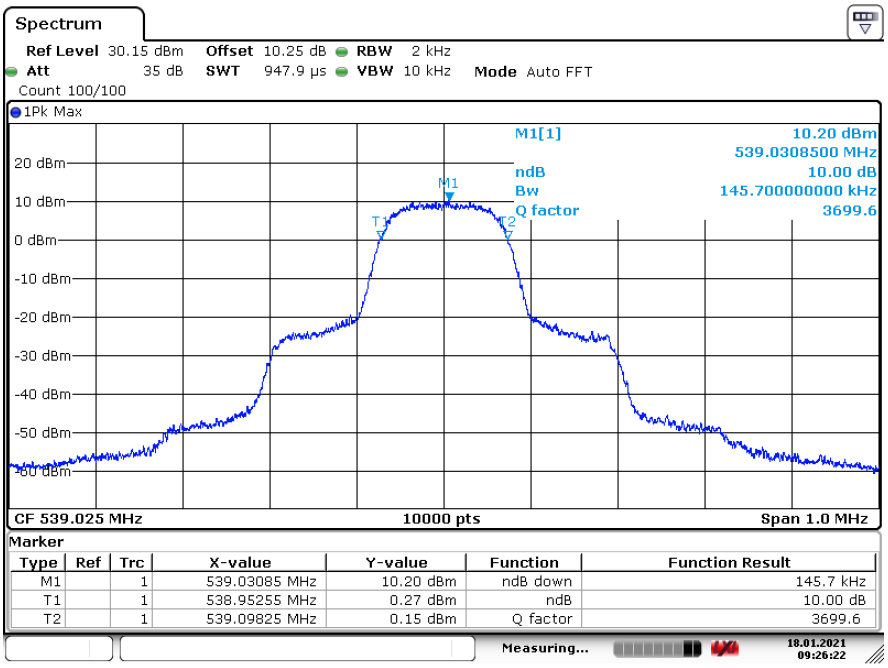
Date: 15.JAN.2021 16:36:32

30 °C



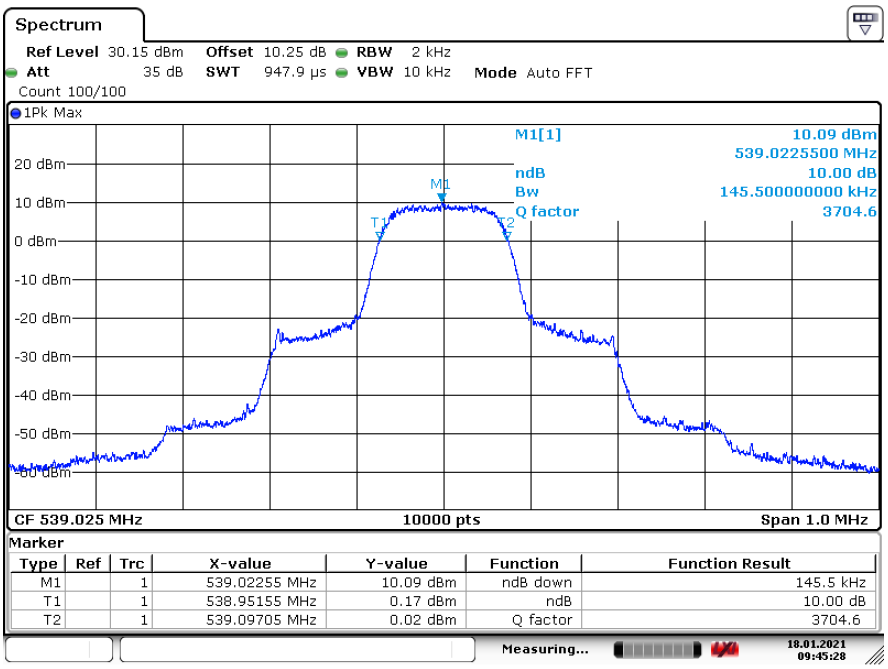
Date: 18.JAN.2021 09:17:03

40 °C



Date: 18.JAN.2021 09:26:22

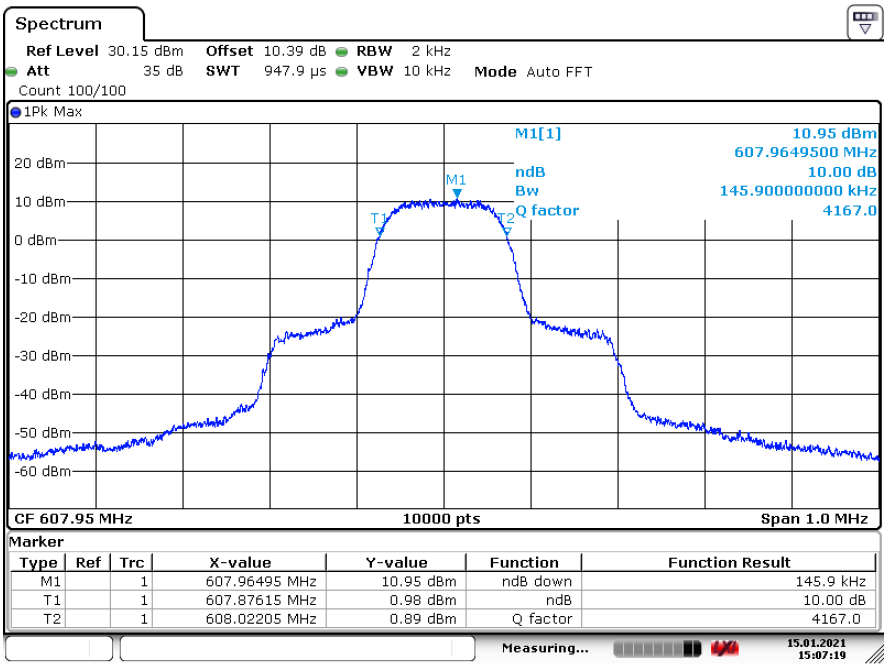
50 °C



Date: 18.JAN.2021 09:45:28

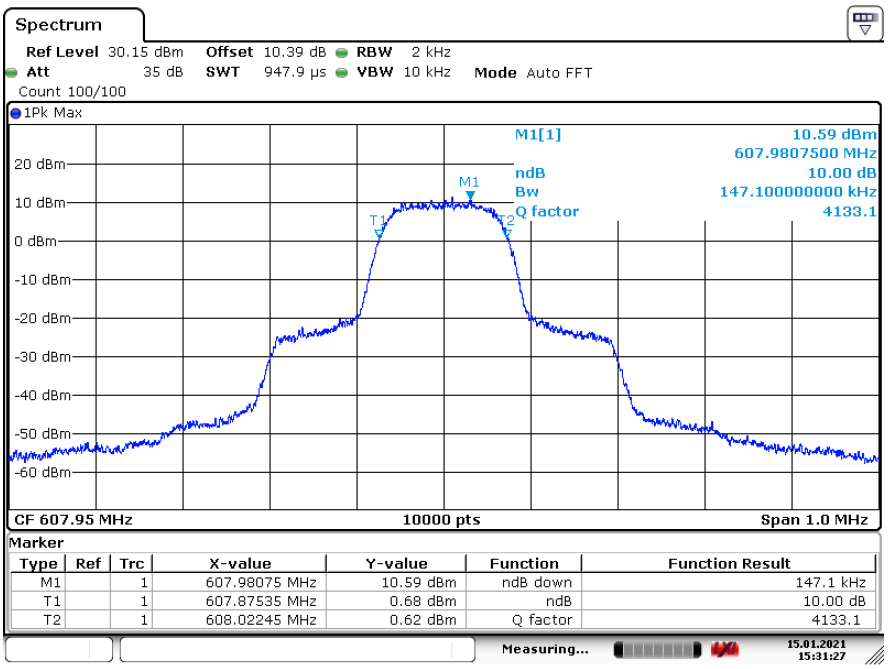
607.95 MHz:

-30 °C



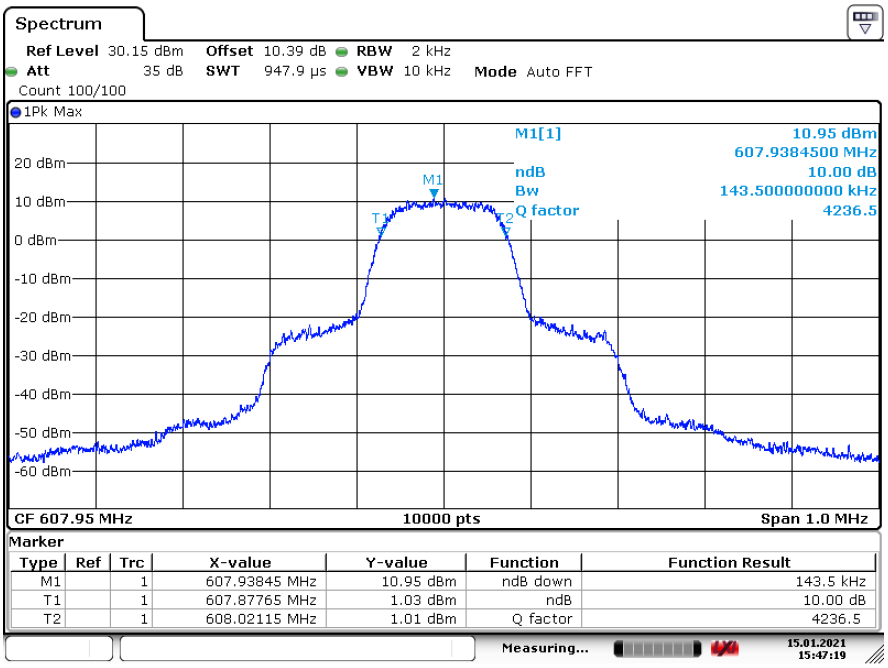
Date: 15.JAN.2021 15:07:20

-20 °C



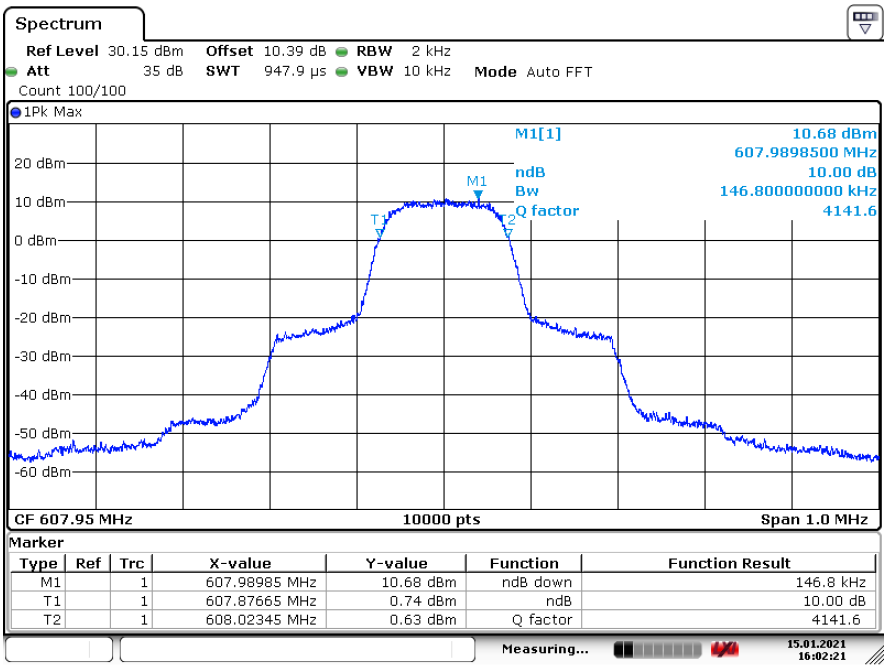
Date: 15.JAN.2021 15:31:28

-10 °C



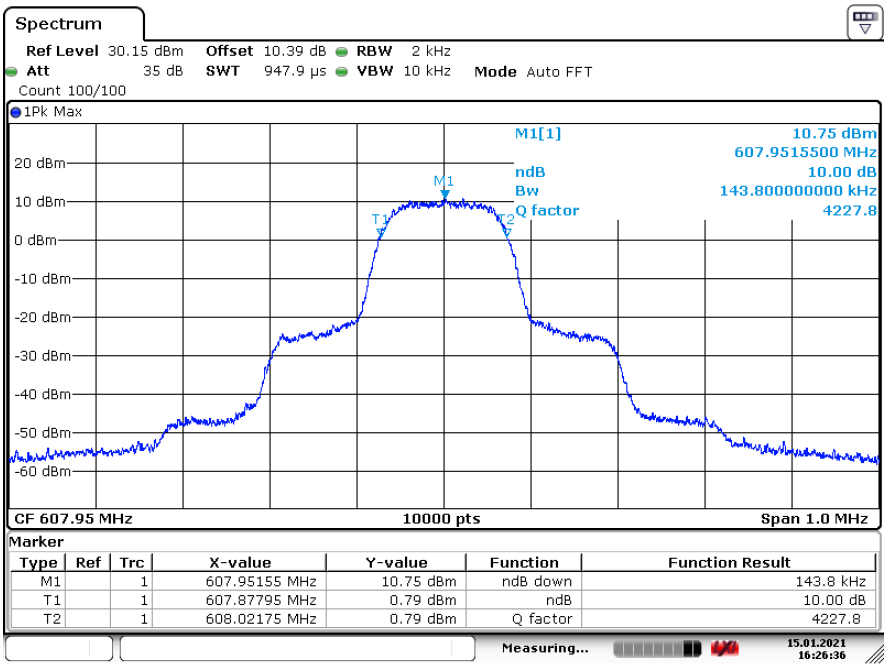
Date: 15.JAN.2021 15:47:20

0 °C



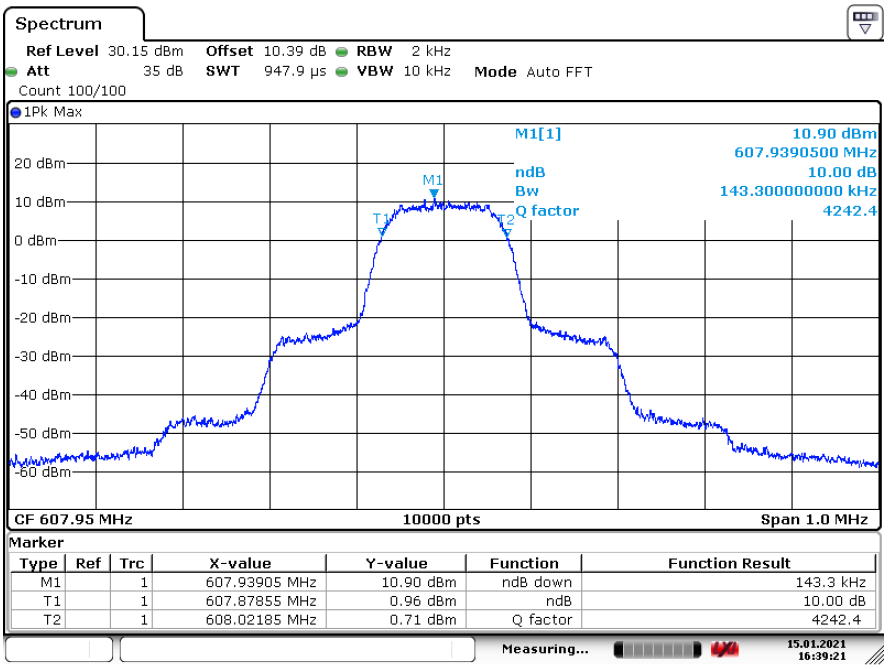
Date: 15.JAN.2021 16:02:21

10 °C



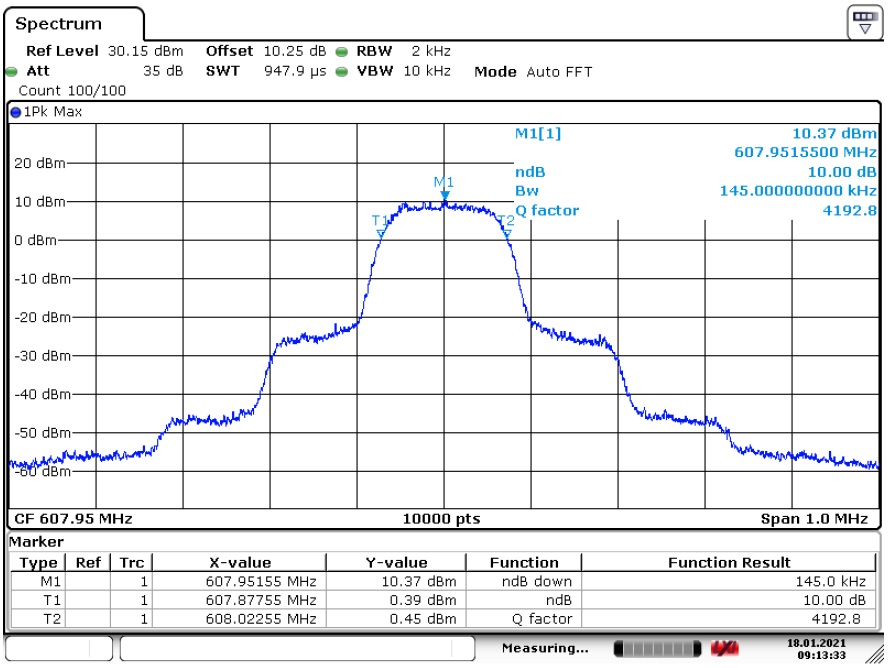
Date: 15.JAN.2021 16:26:36

20 °C



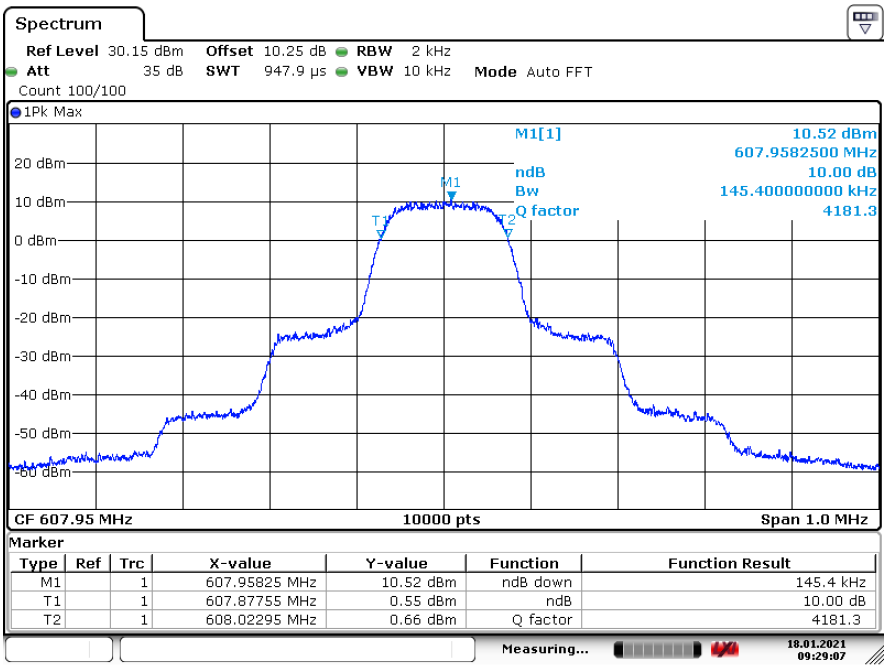
Date: 15.JAN.2021 16:39:22

30 °C



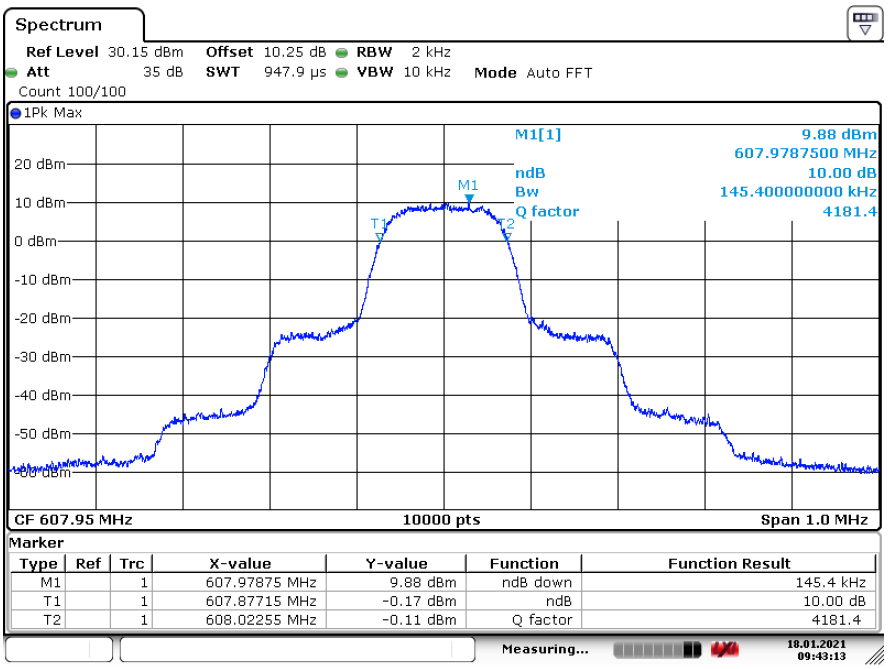
Date: 18.JAN.2021 09:13:34

40 °C



Date: 18.JAN.2021 09:29:08

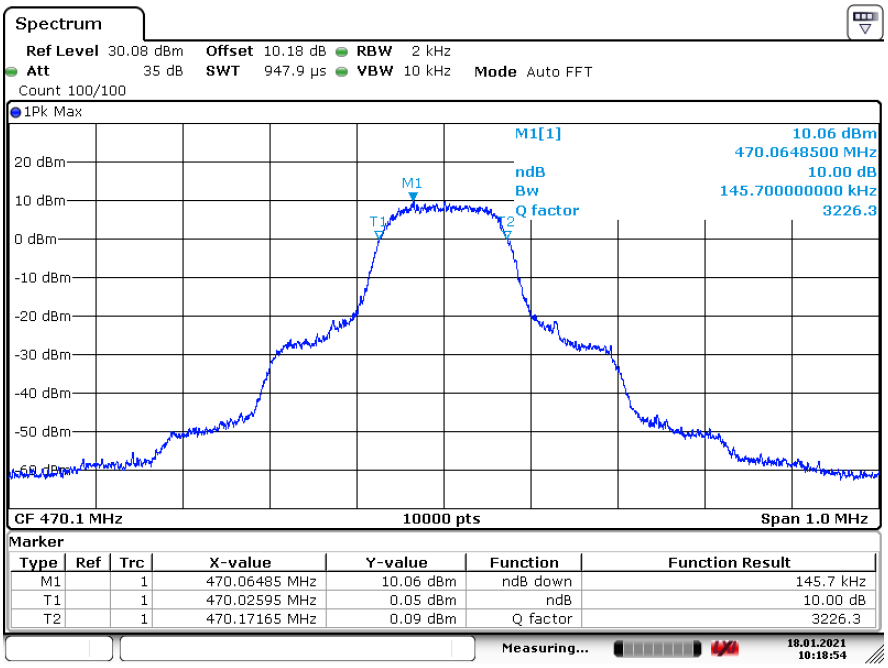
50 °C



Date: 18.JAN.2021 09:43:13

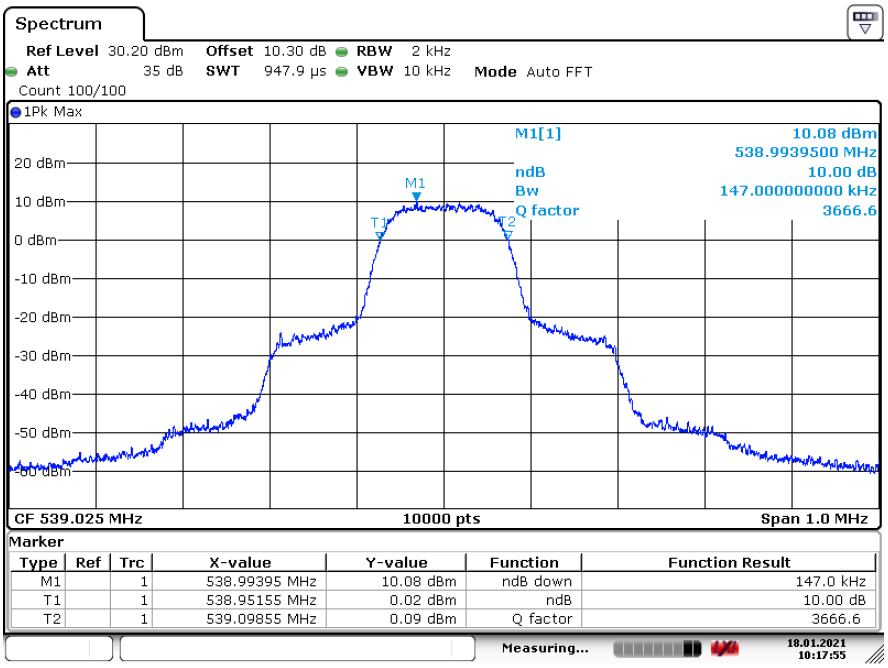
Low Voltage:

470.1 MHz



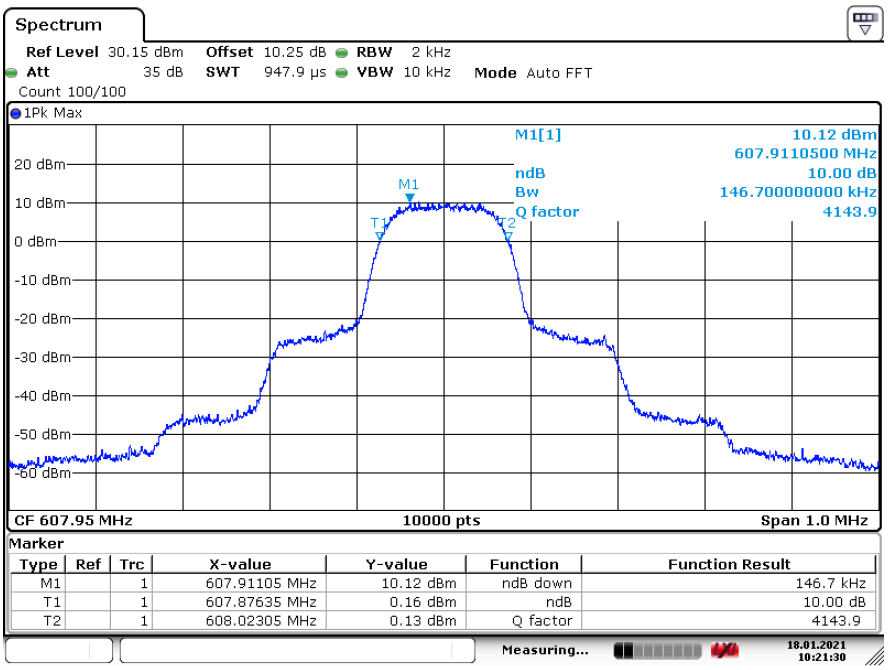
Date: 18.JAN.2021 10:18:54

539.025 MHz



Date: 18.JAN.2021 10:17:55

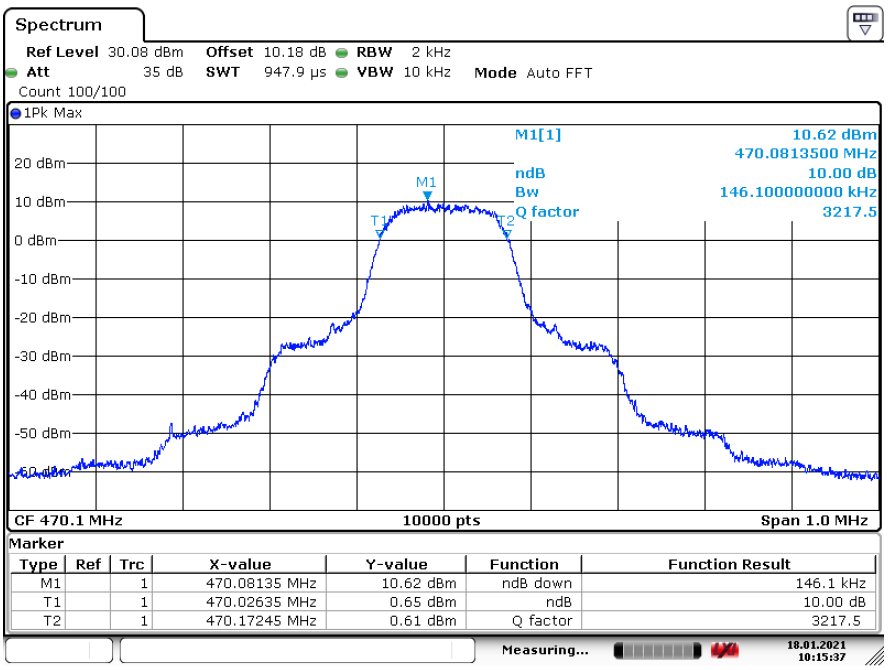
607.95 MHz



Date: 18.JAN.2021 10:21:30

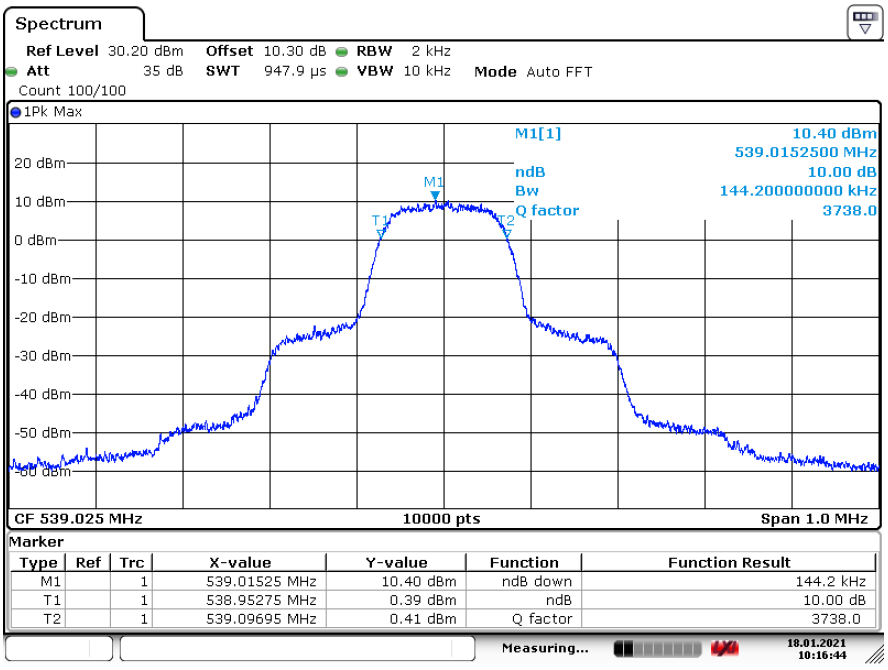
High Voltage:

470.1 MHz



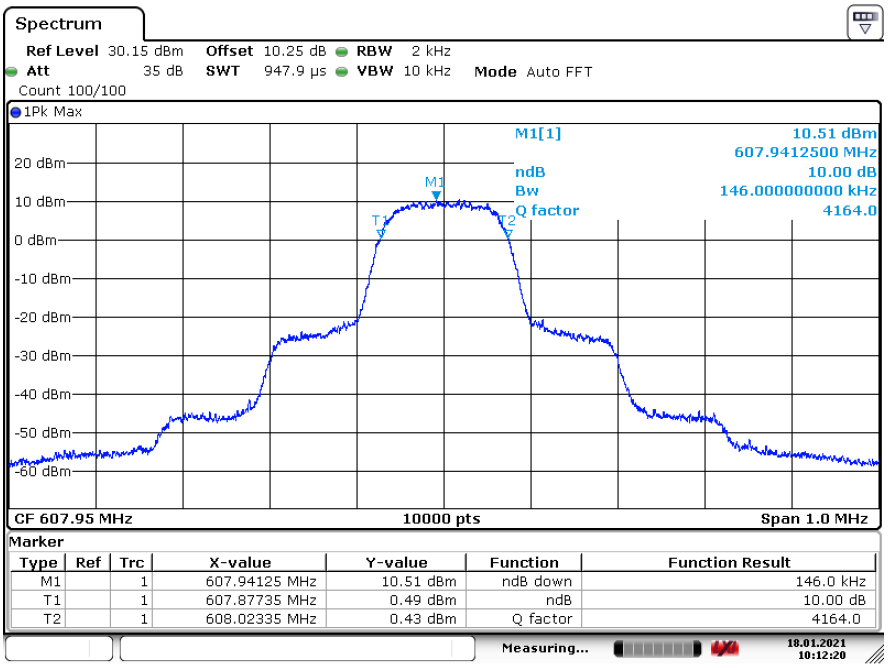
Date: 18.JAN.2021 10:15:38

539.025 MHz



Date: 18.JAN.2021 10:16:44

607.95 MHz



Date: 18.JAN.2021 10:12:21

11 Annex A - EUT Test Setup Photographs

Please refer to the attachment

12 Annex B - EUT External Photographs

Please refer to the attachment

13 Annex C - EUT Internal Photographs

Please refer to the attachment

14 Annex D (Informative) – Declaration of Similarity

LECTROSONICS®
P.O. Box 15900 - Rio Rancho, NM - 87174 - USA
Phone: (800)821-1121 or (505)892-4501 - Fax: (505)892-8243
web: www.lectrosonics.com - email: sales@lectrosonics.com

DECLARATION OF SIMILARITY

January 21, 2021

To:

FEDERAL COMMUNICATIONS COMMISSIONS
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

Innovation, Science and Economic Development Canada
Certification and Engineering Bureau
P.O. Box 11490, Station 'H'
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2
Canada

Dear Sir or Madam:

We, Lectrosonics, Inc. hereby declare that product: model: DBSM-A1B1 (FCC ID: DBZDBSMA; IC: 8024A-DBSMA) is electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics as model: DBSMD-A1B1 tested by BACL, the results of which are featured in BACL project: *R2011233.*

A description of the differences between the tested model and those that are declared similar are as follows:

The DBSM-A1B1 model is powered by one AA battery; the DBSMD-A1B1 model is powered by two AA batteries wired in parallel. Because it uses only one battery, the width of the DBSM-A1B1 case is truncated by 13 mm on one side but the layout of connectors and controls is identical in both products.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Robert Cunnings, V.P. Engineering
Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124

15 Annex E (Normative)- A2LA Electrical Testing Certificate

Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIANCE LABORATORIES CORP.

Sunnyvale, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets A2LA R222 - *Specific Requirements EPA ENERGY STAR Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 2nd day of October 2018.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to February 28, 2021
Revised December 04, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

Please follow the web link below for a full ISO 17025 scope

https://www.a2la.org/scopepdf/3297-02.pdf

----- END OF REPORT -----