FCC PART 74, SUBPART H
CPC-2-1-28
TEST AND MEASUREMENT REPORT

For

Lectrosonics, Inc.

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

FCC ID: DBZDCHTB
IC: 8024A-DCHTB

Report Type:	**Product Type:**
Original Report	Body-Worn Wireless Microphone Transmitter
Prepared By:	Xavier Kelley RF Test Engineer
Report Number:	R2405163-74
Report Issue Date:	2024-08-23
Reviewed By:	Christian McCaig RF Lead Engineer
Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: 1 (408) 732-9162 Fax: 1 (408) 732-9164	

ACCREDITED
CERTIFICATE #3297.02

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2405163-74	Original Report	2024-08-23

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 model: *DCHT-B1C1*, FCC ID: DBZDCHTB, IC: 8024A-DCHTB, which henceforth is referred to as the EUT (Equipment Under Test). The EUT is a body-worn wireless microphone transmitter. The EUT operates in the frequency range: 537.600 MHz – 662.950 MHz.

1.2 Mechanical Description of EUT

The EUT measures approximately: 88 mm (L), 62 mm (W) x 19 mm (H), and weighs approximately 5.75 oz

The data gathered are from the typical production sample provided by the Lectrosonics, Inc. with serial numbers 841, 842, and 843.

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 CPC-2-1-28 Issue 2, December 2019.

The objective was to determine compliance with Part 74 of the FCC Rules, and CPC-2-1-28 Issue 2, December 2019, limits for RF output power, Emission bandwidth, Field strength of spurious radiation and Frequency stability.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15.236 Equipment Class: DWM with FCC ID: DBZDCHTB.

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI/TIA-603-E-2016, FCC KDB 971168 D01 Power Meas License Digital Systems v03r01, KDB 206256 D01v02 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.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5%
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48 dB
Unwanted Emissions, conducted	±1.57 dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2°C
Humidity	±5%
DC and low frequency voltages	±1.0%
Time	±2%
Duty Cycle	±3%

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 Innovation, Science and Economic development 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 Appendix 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 17025:20127 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 17025:2017 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 17025:2017 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 (Innovation, Science and Economic development Canada - ISEDC):
    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 (Infocomm Media Development Authority - IMDA):
    1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IMDA MRA Recognition Scheme: 2011, Annex 2
    2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IMDA 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: (Innovation, Science and Economic development Canada - ISEDC) 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 Media Development Authority - IMDA) 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 ANSI/TIA-603-E-2016, ANSI C63.26-2015, and KDB 971168 D01 v03r01.

2.2 EUT Exercise Software

EUT configurations were managed via a integrated menu within the device. Options to change the frequency and power were displayed on the screen of the EUT.

Power Setting:

TX: 537.600 – 656.950 MHz

Frequency (MHz)	Power Setting (mW)
537.600	50
572.775	50
607.950	50
653.050	20
656.950	20

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

None

2.5 Local Support Equipment

None

2.6 Interface Ports and Cables

None

3. Summary of Test Results

FCC & ISEDC Rules	Descriptions of Test	Result (s)
FCC 2.1093 ISEDC RSS-102	RF Exposure	Compliant[1]
§74.861(e.1.ii) CPC-2-1-28 (5.1)	RF Output Power	Compliant
FCC§2.1049& §74.861(e.5, e.6,e.7) CPC-2-1-28 (5.1) ETSI EN 300 422-1(4.2.4)	Operating Bandwidth & Emission Mask	Compliant
§74.861(e.7) RSS-210(G4) ETSI EN 300 422-1(4.2.4)	Spurious Emissions at the Antenna Port	Compliant
§74.861(e.7) RSS210(G4) ETSI EN 300 422-1(4.2.4)	Field Strength of Spurious Emissions	Compliant
FCC §2.1055 §74.861 (e.4) RSS-210(G2)	Frequency Stability	Compliant

BACL is responsible for all the information provided in this report, except when information is provided by the customer as identified in this report. Information provided by the customer, e.g., antenna gain, can affect the validity of results.

Note[1]: Refer to SAR test report for test results.

4. FCC §74.861(e.1ii) & CPC-2-1-28 (5.1) -RF Output Power

4.1 Applicable Standards

According to FCC §74.861 (e.) For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply: (1) The power may not exceed the following values. (ii) 470-608 and 614-698: 250 mW conducted power

According to CPC-2-2-38 (5.1)

Table 1 lists the frequency bands for use by wireless microphones that have been certified under RSS-210 and the maximum bandwidth and power allowed for the operation of these devices.

Table 1: Frequency bands for wireless microphones certified under RSS-210*

Frequency band (MHz)	Transmit e.i.r.p.** (mW)	Maximum bandwidth (kHz)
VHF TV Band 54-72, 76-88, 174-216	50	200
UHF TV Band 470-608	250	200
600 MHz Band 614-616, 653-663	20	200

* In case of any discrepancies with this table, refer to the most recent issue of the RSS.

** Equivalent isotropically radiated power

4.2 Test Procedure

KDB 971168 D01 v03r01

4.3 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
697	ETS-LINDGREN	Power Sensor	7002-006	160097	2024-03-06	1 year
1128	Agilent	EXA Signal Analyzer	N9010A	MY48030852	2024-05-23	1 year
	-	RF Cable	-	-	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".*

4.4 Test Environmental Conditions

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

The testing was performed by Xavier Kelley on 2024-06-11 to 2024-06-13 at RF site.

4.5 Test Setup Diagram

4.6 Test Results

Max Power @ 50mW

Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
537.6	12.91	2.15	15.06	23.98
572.775	12.84	2.15	14.99	23.98
607.95	12.87	2.15	15.02	23.98

Max Power @ 20mW

Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
653.05	8.49	2.15	10.64	13.01
656.95	8.43	2.15	10.58	13.01

Below For Reference Purposes Only:

Max Power @ 50mW (Peak)

Frequency (MHz)	Conducted Power (dBm)
537.6	15.90
572.775	15.76
607.95	15.16

Max Power @ 20mW (Peak)

Frequency (MHz)	Conducted Power (dBm)
653.05	11.78
656.95	11.82

5. FCC §2.1049, §74.861(e.5, e.6,e.7) & CPC-2-1-28 (5.1) - Occupied Bandwidth & Emission Mask

5.1 Applicable Standards

FCC §2.1049

According to FCC §74.861 (e.5, e.6):

(e) For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply: (5) The operating bandwidth shall not exceed 200 kHz. (6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule: (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43 + 10\log_{10}$ (mean output power in watts) dB.

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 CPC-2-1-28 (5.1)

Table 1 lists the frequency bands for use by wireless microphones that have been certified under RSS-210 and the maximum bandwidth and power allowed for the operation of these devices.

Table 1: Frequency bands for wireless microphones certified under RSS-210*

Frequency band (MHz)	Transmit e.i.r.p.** (mW)	Maximum bandwidth (kHz)
VHF TV Band 54-72, 76-88, 174-216	50	200
UHF TV Band 470-608	250	200
600 MHz Band 614-616, 653-663	20	200

* In case of any discrepancies with this table, refer to the most recent issue of the RSS.

** Equivalent isotropically radiated power

5.2 Test Procedure

The OBW is according to KDB 971168 D01 v03r01

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

5.3 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
1128	Agilent	EXA Signal Analyzer	N9010A	MY48030852	2024-05-23	1 year
912	Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008k39 -101203-UW	2023-06-02	13 months
912[1]	Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008k39 -101203-UW	2024-07-25	12 months
	-	RF Cable	-	-	Each time[2]	N/A

Note[1]: analyzer was only used for testing performed on 2024-08-22. This set of testing was performed after the re-calibration of asset #912.
Note[2]: 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".*

5.4 Test Environmental Conditions

Temperature:	22-23ºC
Relative Humidity:	42-45%
ATM Pressure:	101.2 kPa

The testing was performed by Xavier Kelley from 2024-06-11 to 2024-06-13, and Michael Papa on 2024-08-22 and 2024-08-29 at RF site.

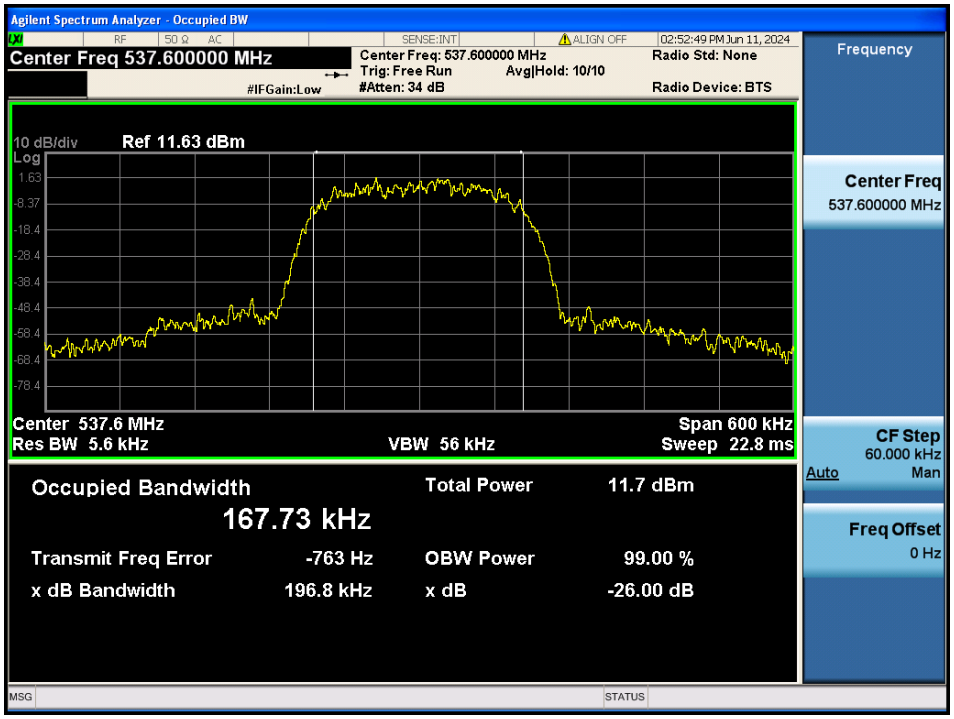
5.5 Test Setup Diagram

5.6 Test Results

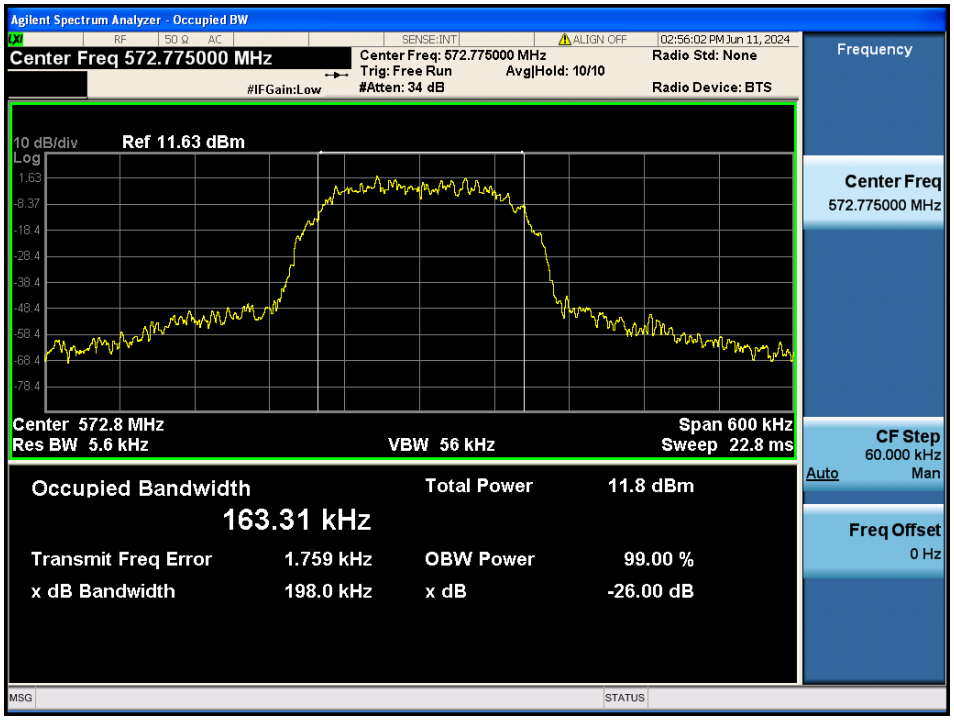
Center Frequency (MHz)	Power Setting (mW)	99% Bandwidth (kHz)	Limit (kHz)	Result
537.60	50	167.72	<200	Pass
572.77	50	163.31	<200	Pass
607.95	50	166.17	<200	Pass
653.05	20	166.79	<200	Pass
656.95	20	166.82	<200	Pass

Please refer to the following plots for detailed test results

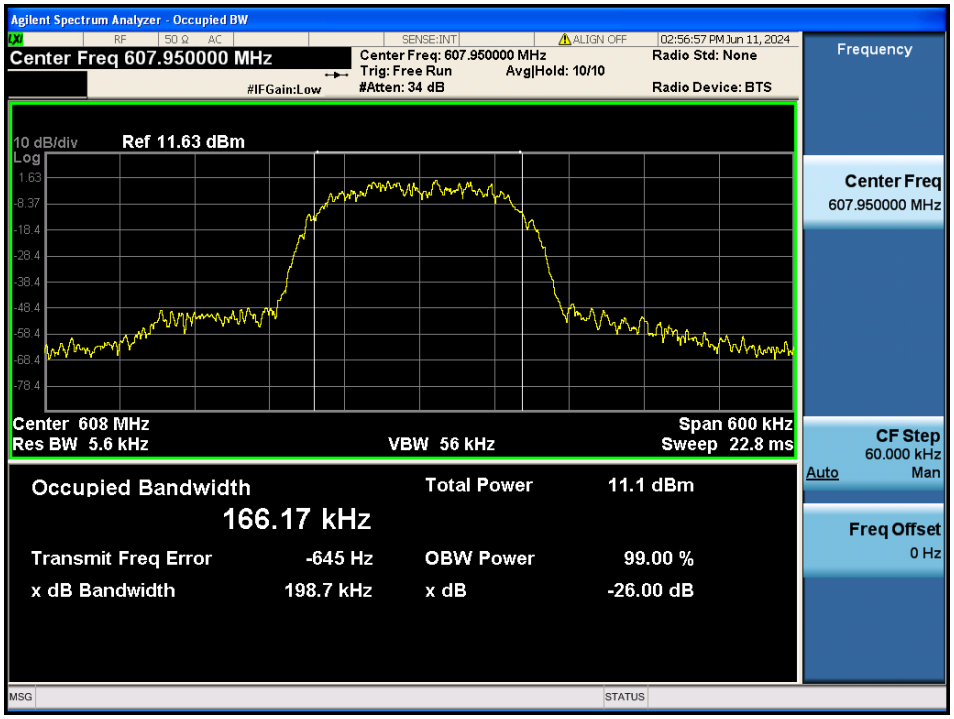
537.6 MHz, 50mW, 99% OBW



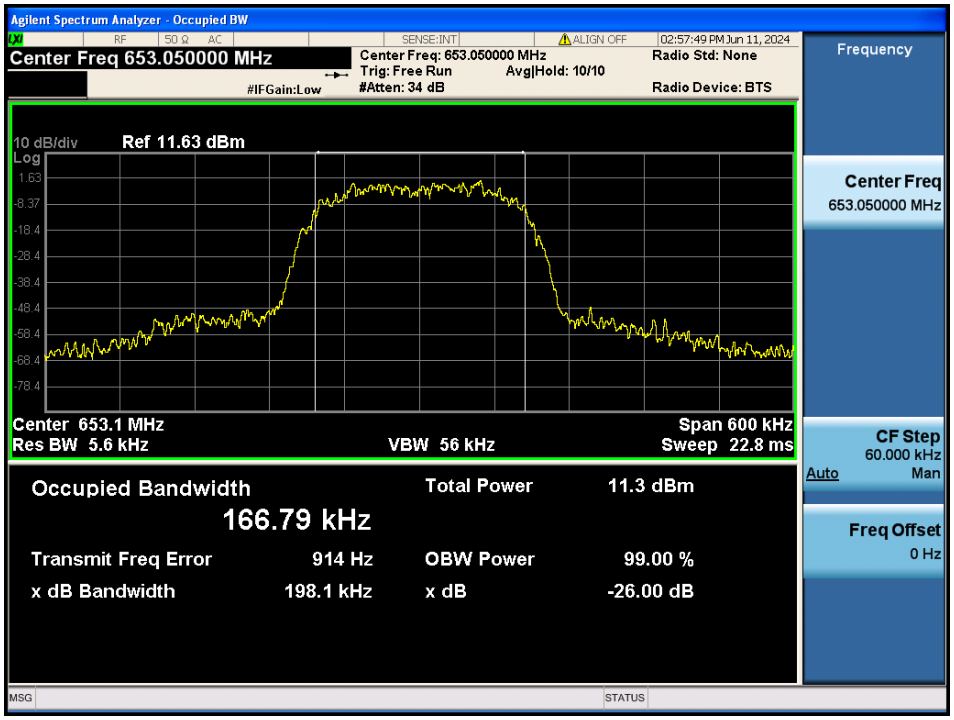
572.775 50mW, 99% OBW



607.95 MHz, 50mW, 99% OBW

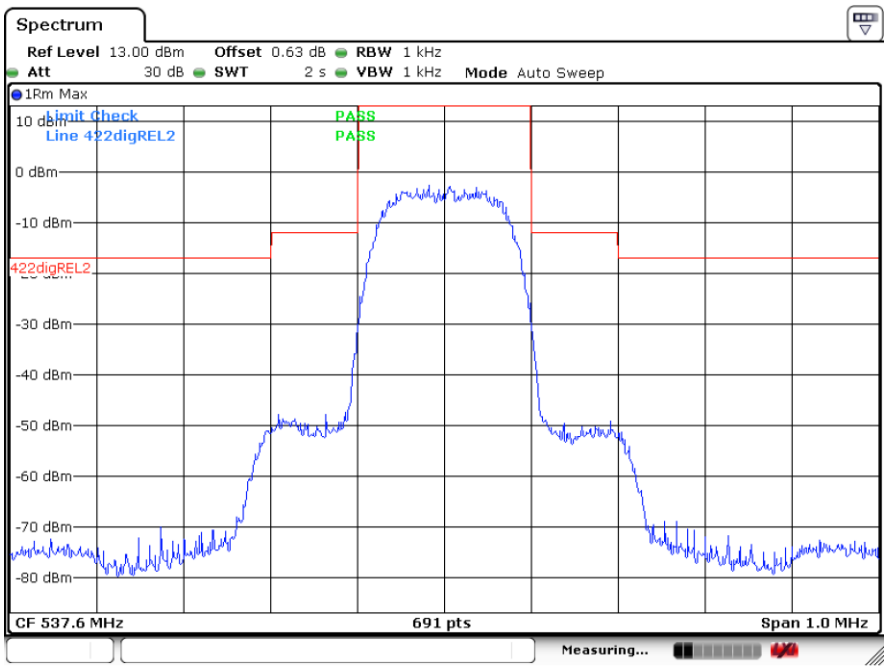


653.05 MHz, 20mW, 99% OBW



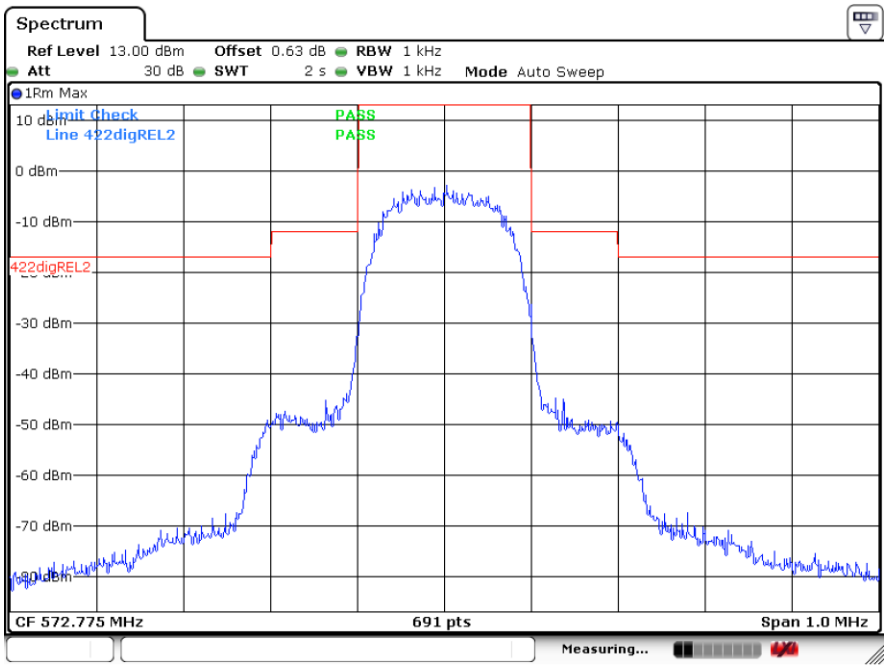
656.95 MHz, 20mW, 99% OBW

537.60 MHz, 50mW, Emission Mask



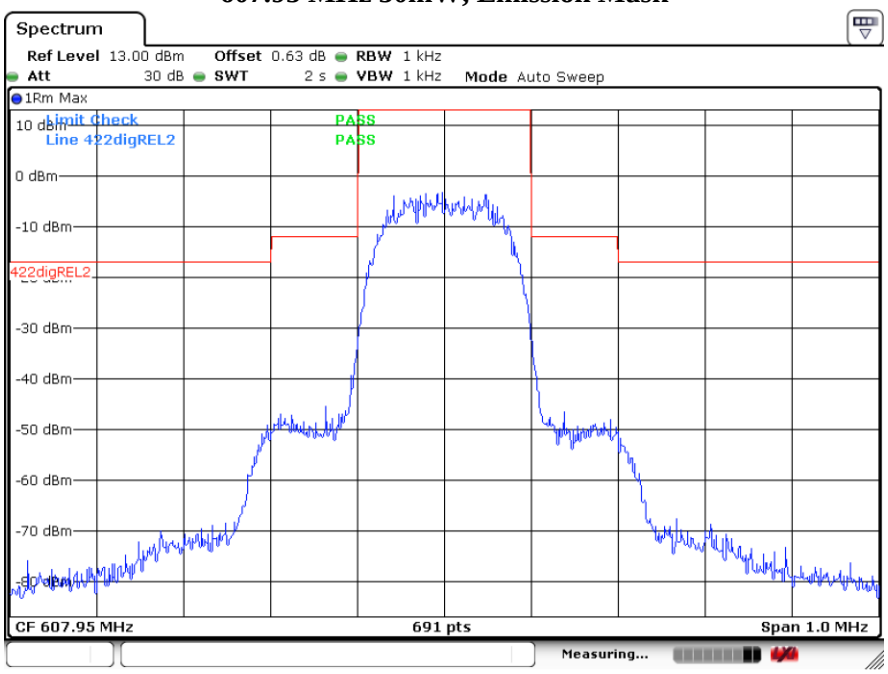
Date: 13.JUN.2024 14:15:37

572.775 MHz, 50mW, Emission Mask



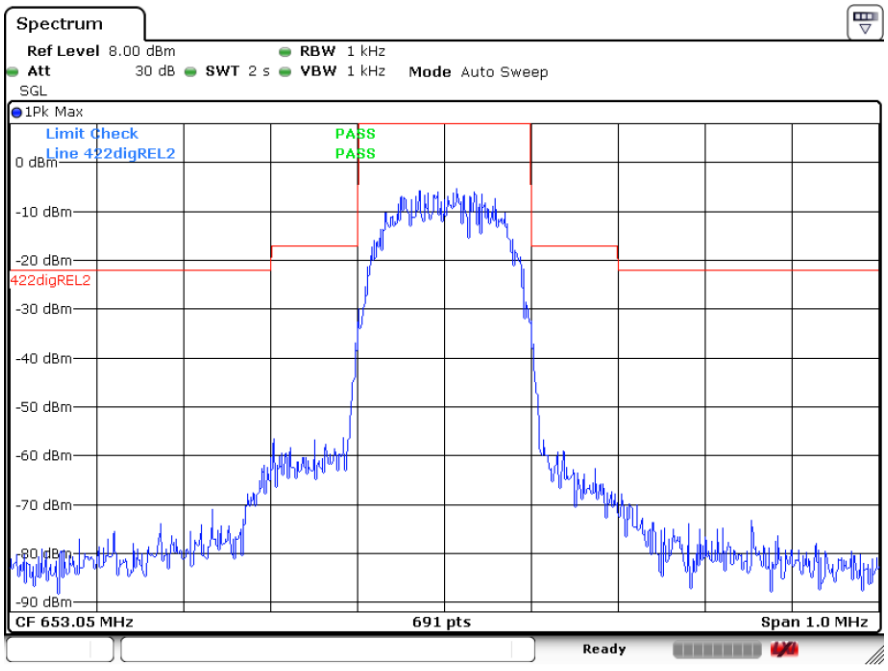
Date: 13.JUN.2024 14:17:09

607.95 MHz 50mW, Emission Mask



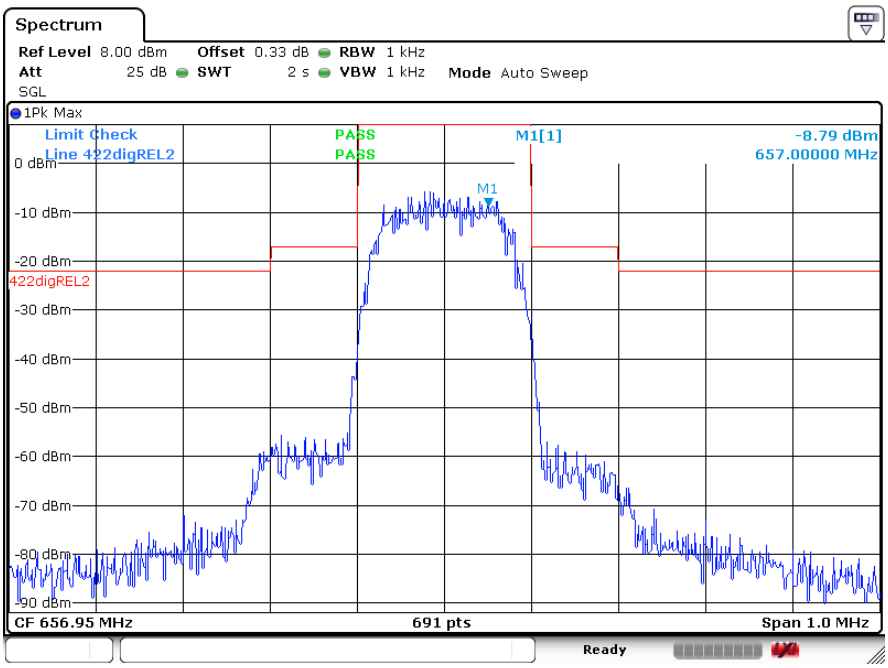
Date: 13.JUN.2024 14:18:07

653.05 MHz, 20mW, Emission Mask

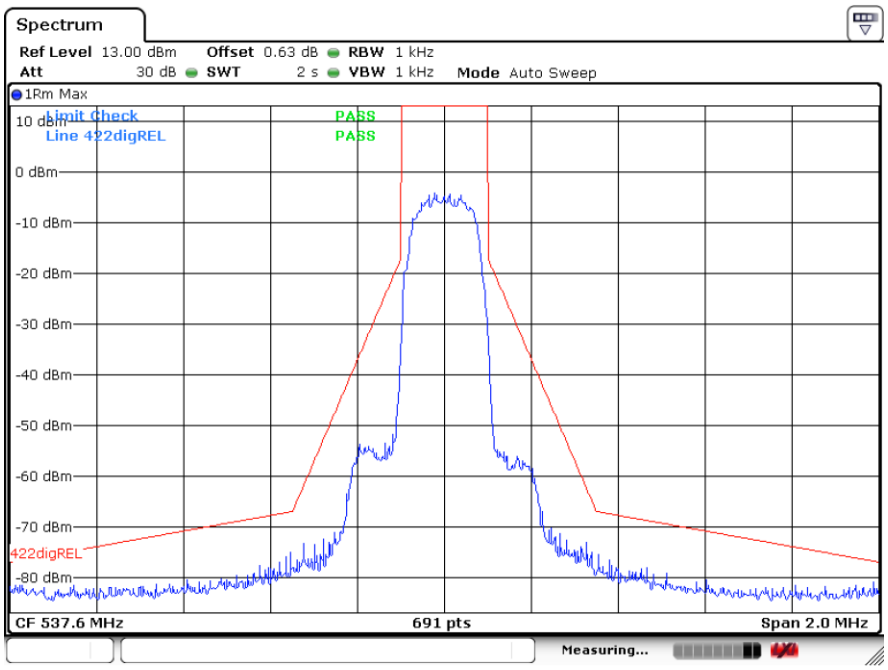


Date: 5.AUG.2024 14:42:10

656.95 MHz, 20mW, Emission Mask

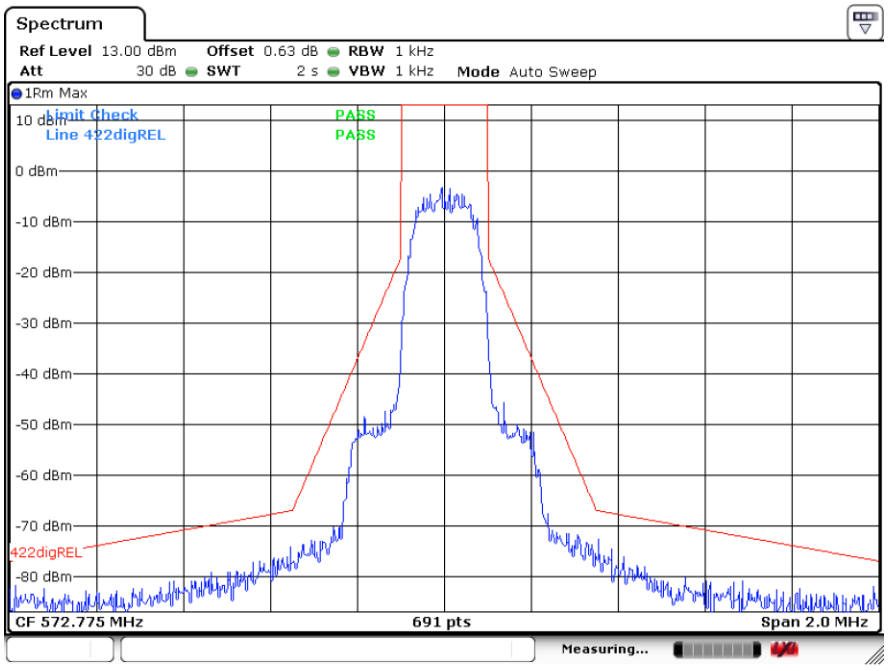


537.60 MHz, 50mW Emission Mask (Set 2)



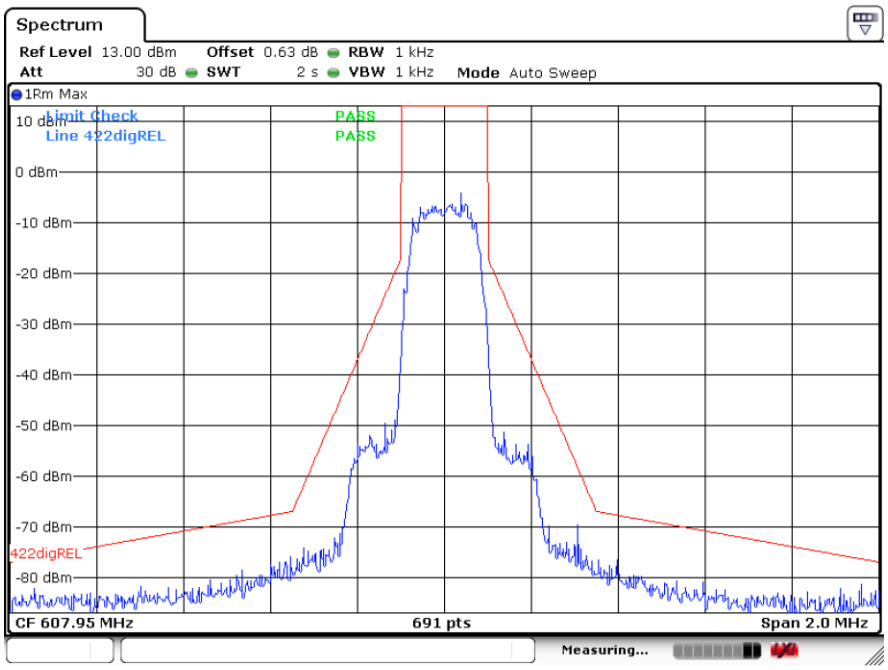
Date: 13.JUN.2024 10:27:42

572.775 MHz, 50 mW Emission Mask (Set 2)



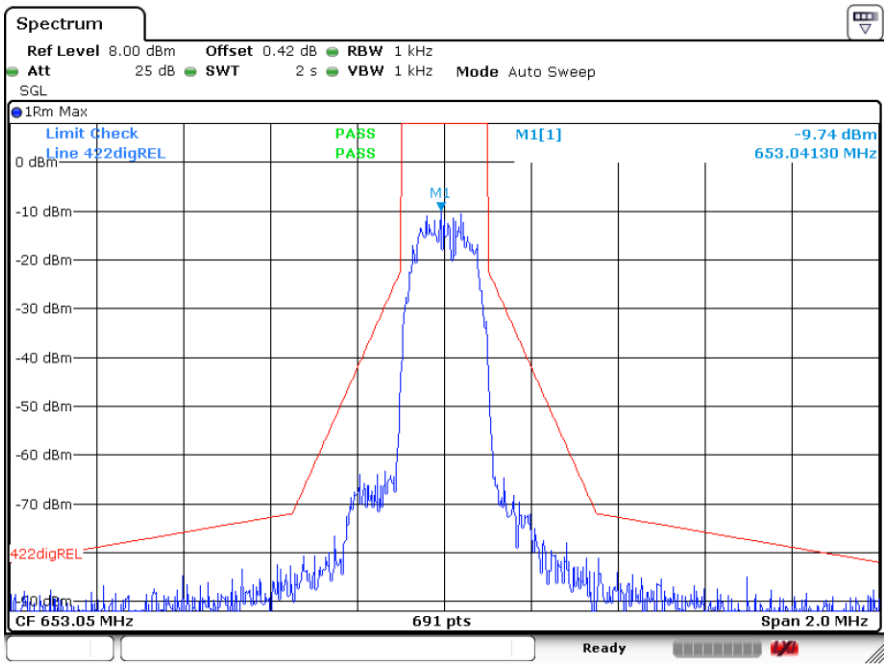
Date: 13.JUN.2024 10:29:25

607.95 MHz, 50 mW Emission Mask (2)



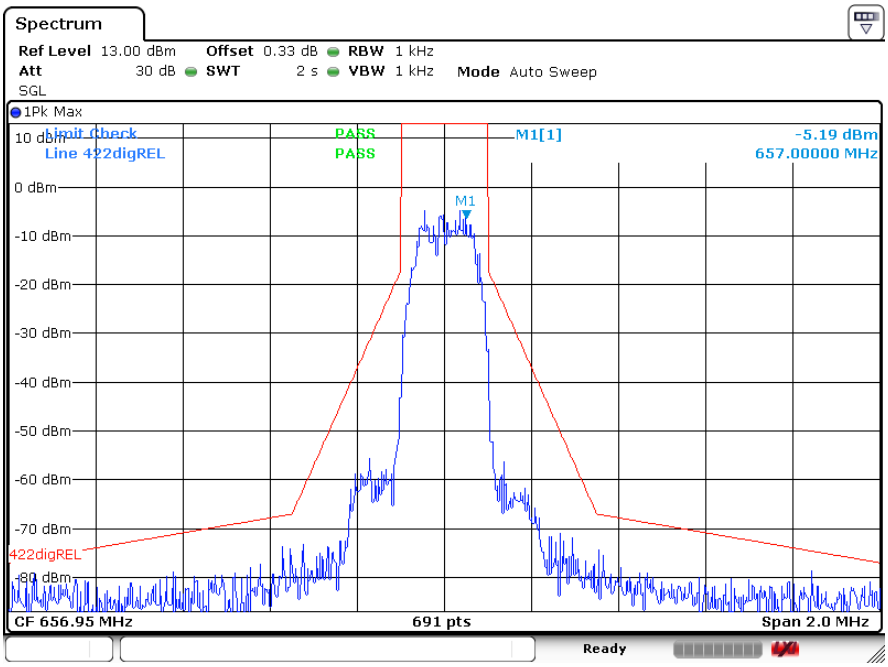
Date: 13.JUN.2024 10:30:36

653.05 MHz, 20 mW Emission Mask (2)



Date: 22.AUG.2024 13:39:01

656.95 MHz, 20 mW Emission Mask (2)



Date: 29.AUG.2024 15:24:36

6. FCC §74.861(e.7), RSS-210(G4) & ETSI EN 300 422-1 (4.2.4) -Conducted Spurious Emissions at Antenna Port

6.1 Applicable Standards

According to FCC §74.861 (e)(7):

> For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply:
>
> 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 RSS-210 (G)(4):

> The frequency stability of wireless microphones shall comply with the limits specified in table G1, when tested under the frequency stability testing conditions specified in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*. The frequency stability for WMAS shall be sufficient to ensure that the authorized bandwidth stays within the TV channel (6 MHz) when tested to the temperature and supply voltage variations specified in RSS-Gen.

According to ETSI EN 300 422-1 (4.2.4):

> Transmitter unwanted emissions in the spurious domain are emissions on a frequency or frequencies immediately outside the limit of 250 % of the declared channel bandwidth above and below the centre frequency of the emission. The limits of unwanted emissions in the spurious domain from the transmitter into the antenna port are in terms of mean power. The mean power of any spurious domain transmission from a burst transmitter is the mean power averaged over the burst duration. The level of spurious emissions shall be measured by either: a) the power level from an external Antenna port; and their effective radiated power when radiated by the cabinet and structure of the equipment (cabinet radiation); or b) their effective radiated power when radiated by the cabinet and the integral antenna, in the case of hand-portable equipment fitted with such an antenna and no external Antenna port.

6.2 Test Procedure

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

6.3 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
1128	Agilent	EXA Signal Analyzer	N9010A	MY48030852	2024-05-23	1 year
	-	RF Cable	-	-	Each time[1]	N/A

Note[1]: attenuator and 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".*

6.4 Test Environmental Conditions

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

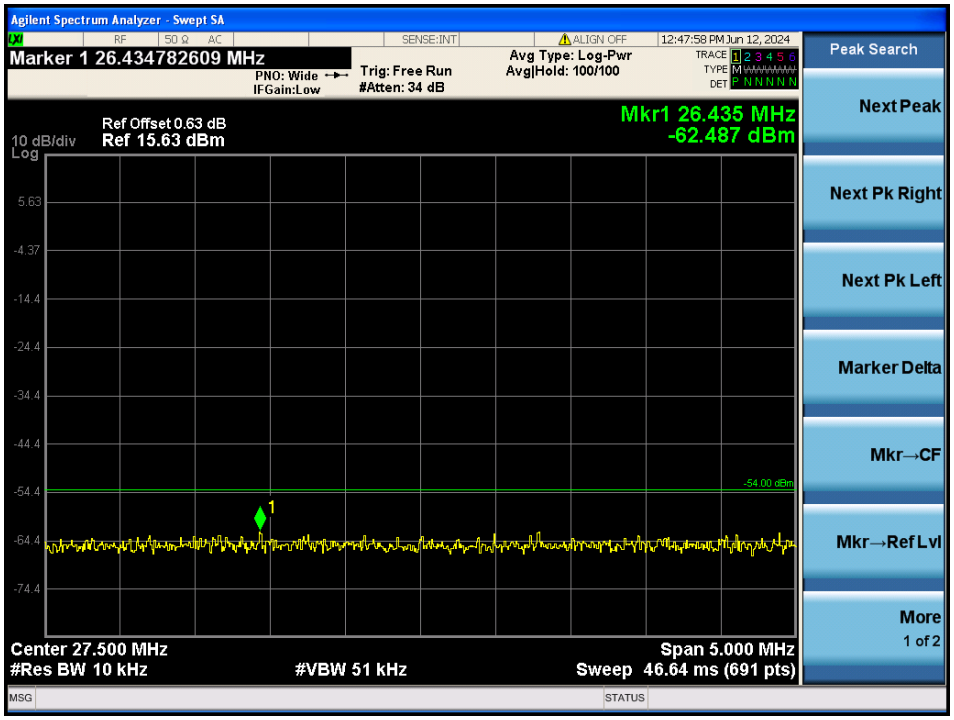
The testing was performed by Xavier Kelley on 2024-06-11 to 2024-06-13 at RF site.

6.5 Test Setup Diagram

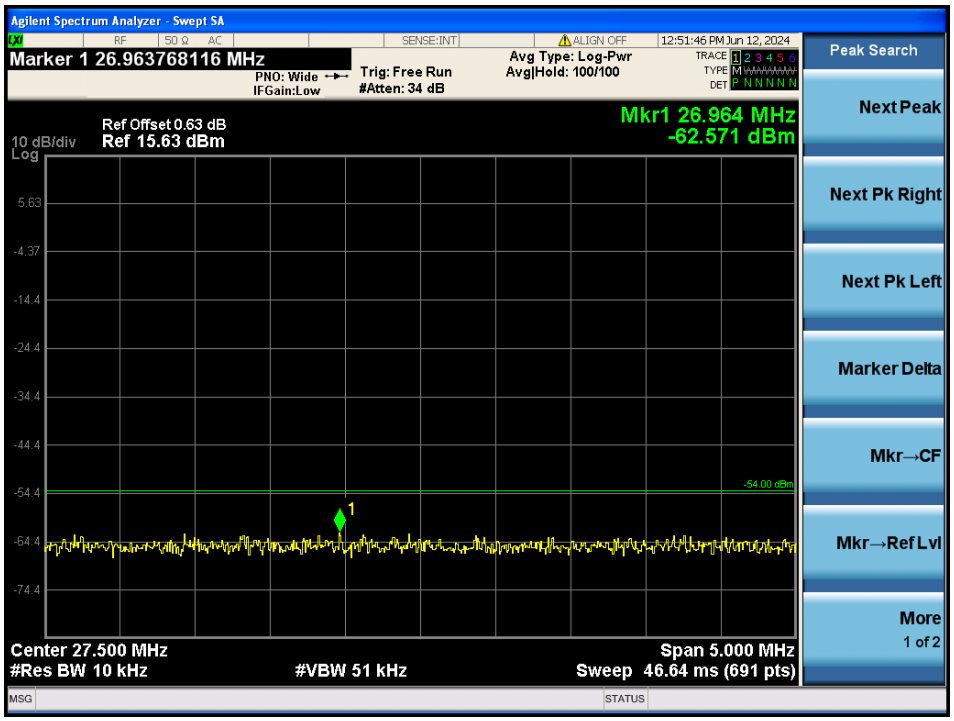
6.6 Test Results

25 MHz to 30 MHz

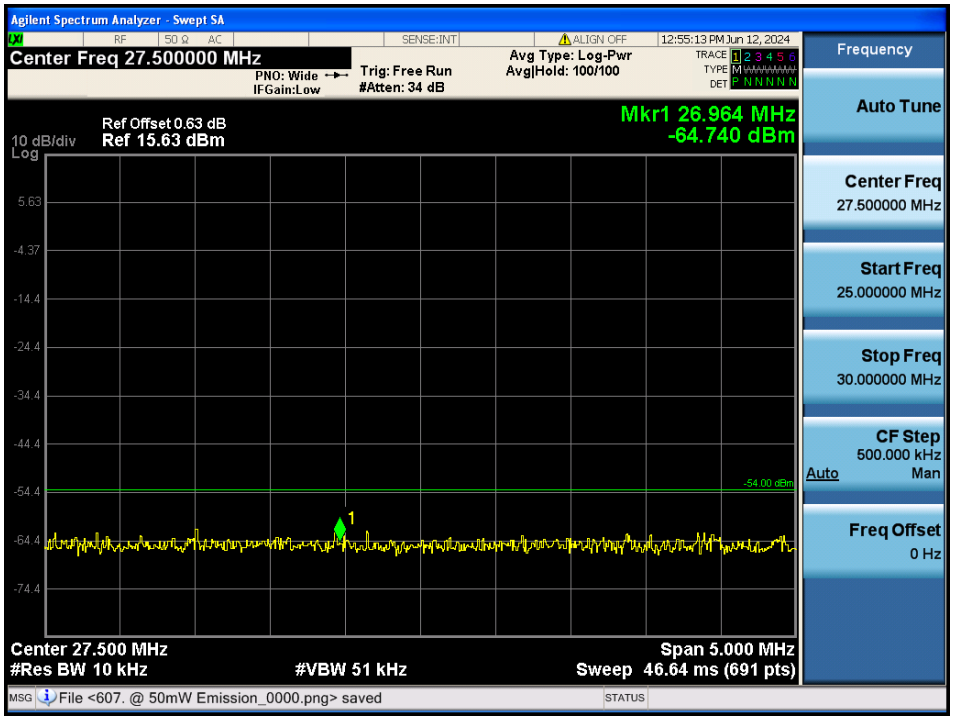
537.6 MHz, 50mW, Spurious Emission



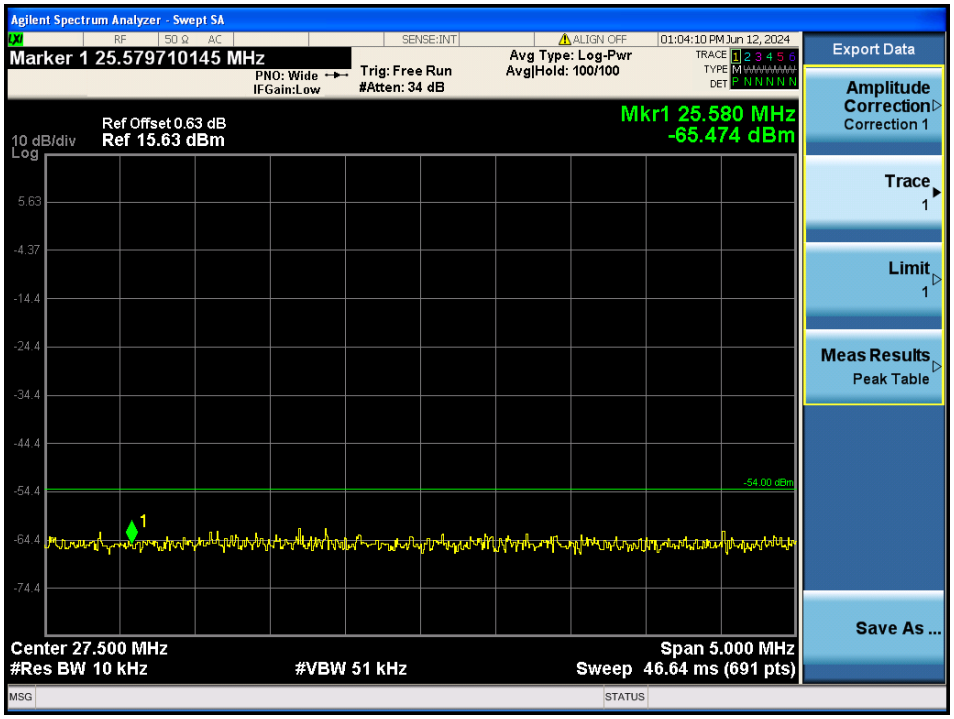
572.775 MHz, 50mW, Spurious Emission



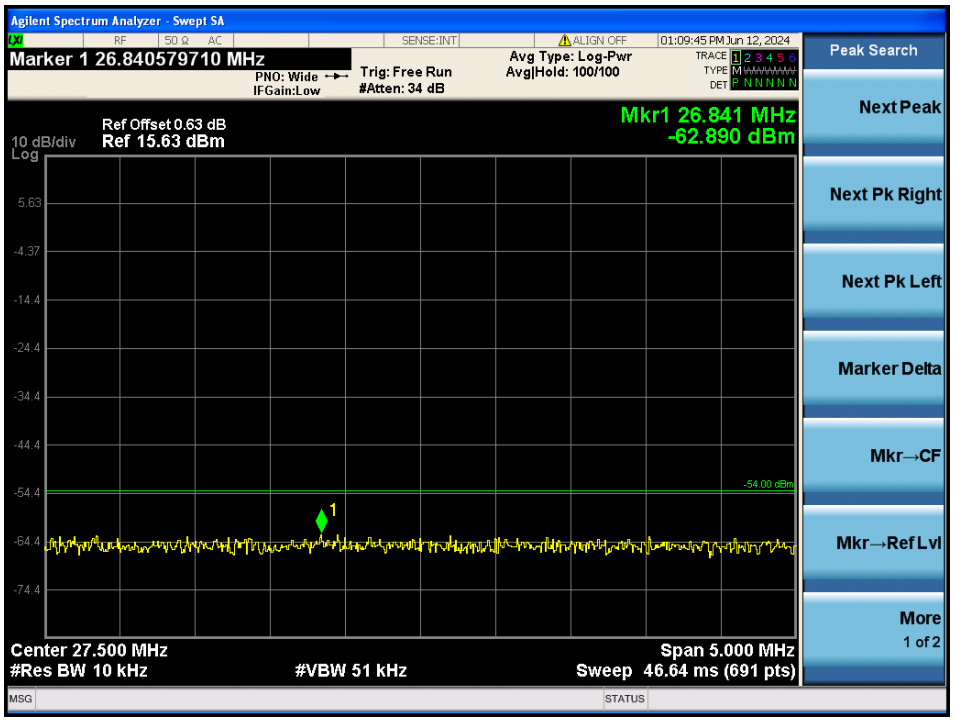
607.95 MHz, 50mW, Spurious Emission



653.050 MHz, 20mW, Spurious Emission



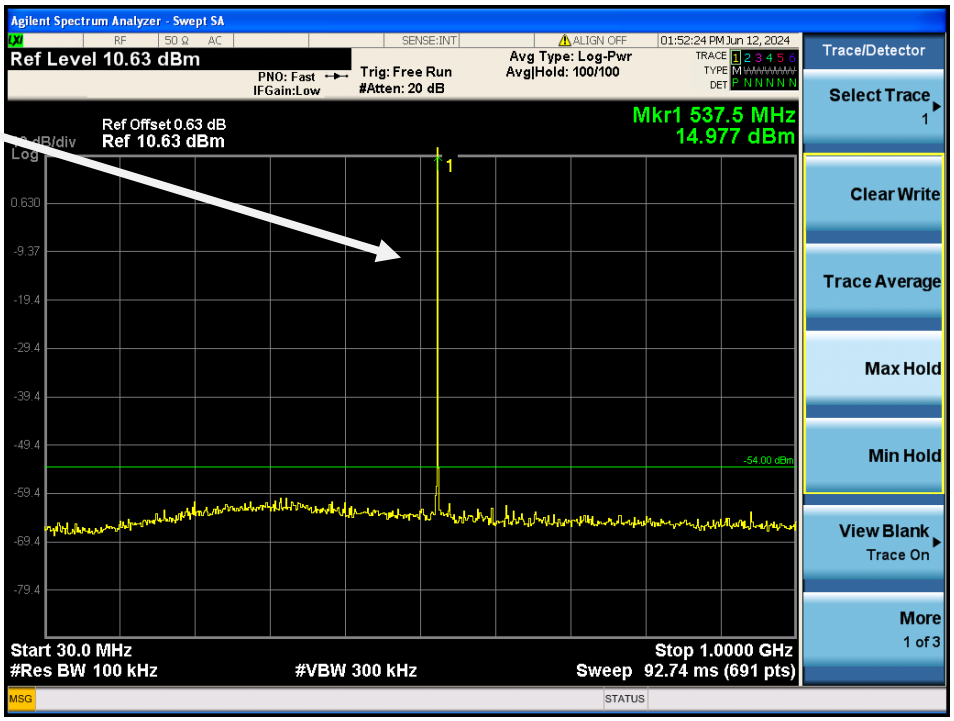
656.950 MHz, 20mW, Spurious Emission



30 MHz – 1 GHz

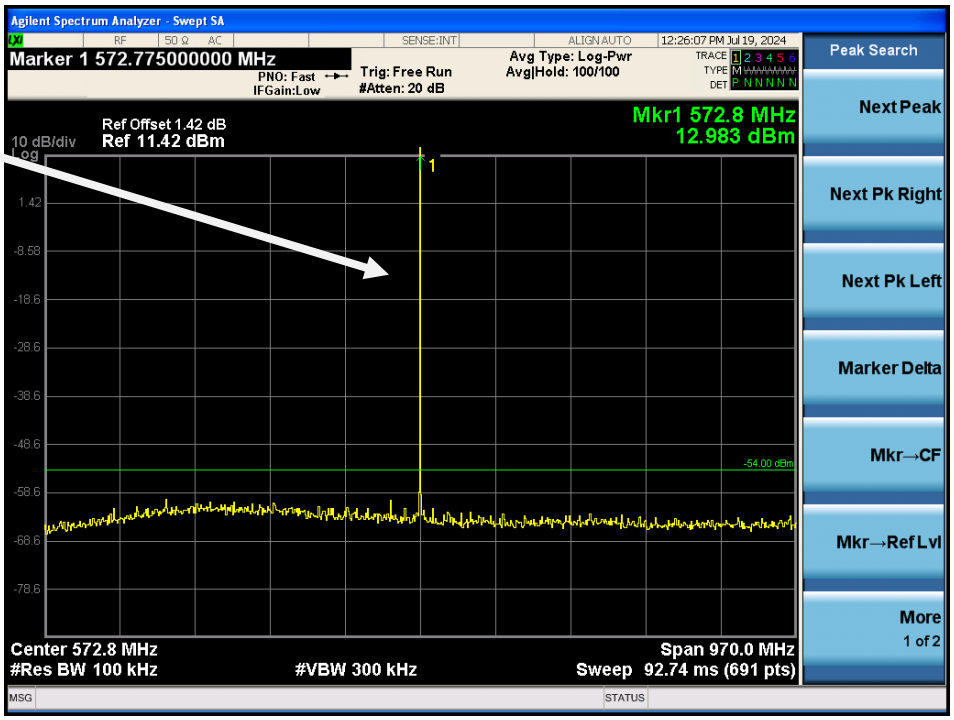
537.6 MHz, 50mW, Spurious Emission

Fundamental



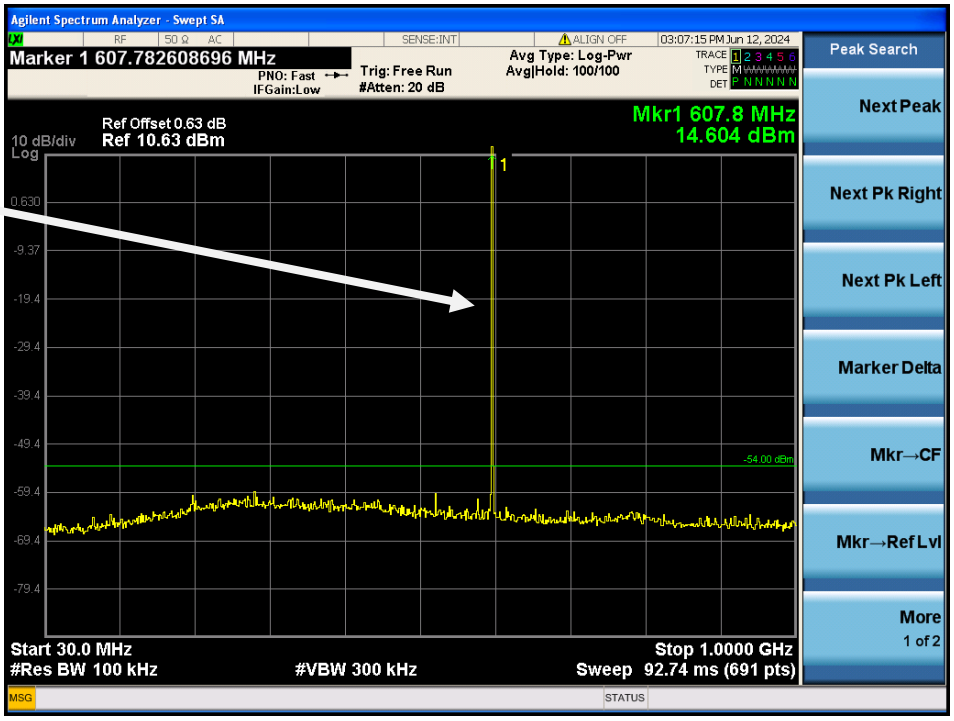
572.775 MHz, 50mW, Spurious Emission

Fundamental



607.90 MHz, 50mW, Spurious Emission

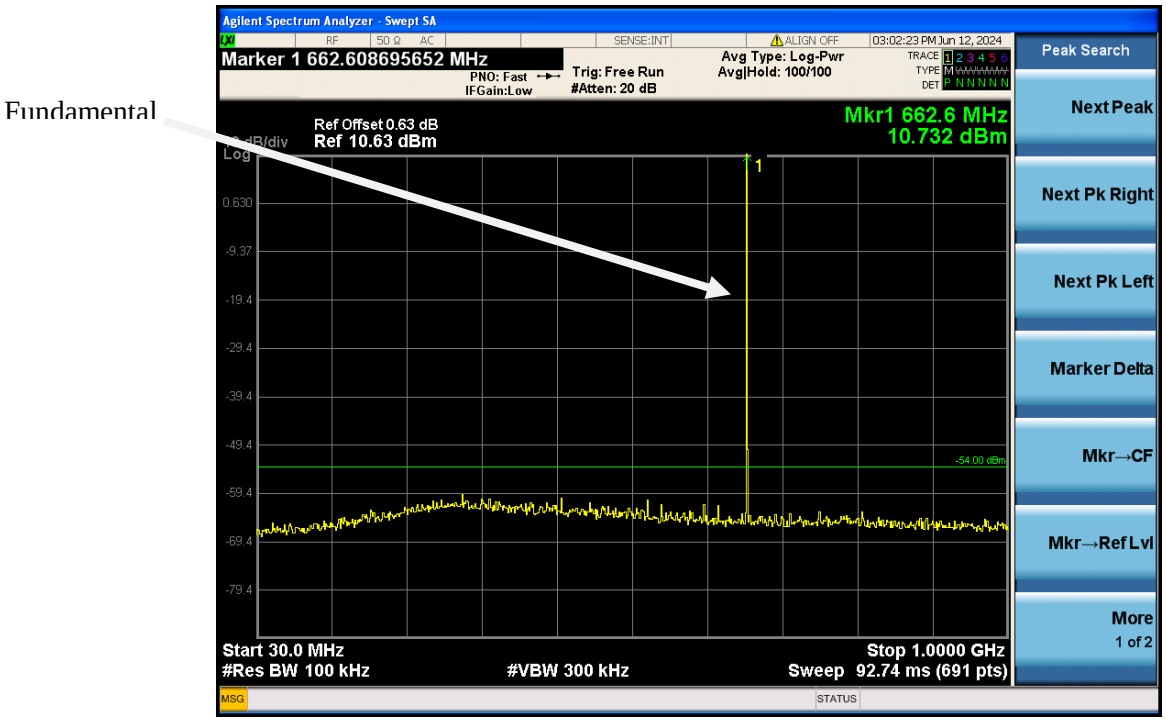
Fundamental



653.05 MHz, 20mW, Spurious Emission

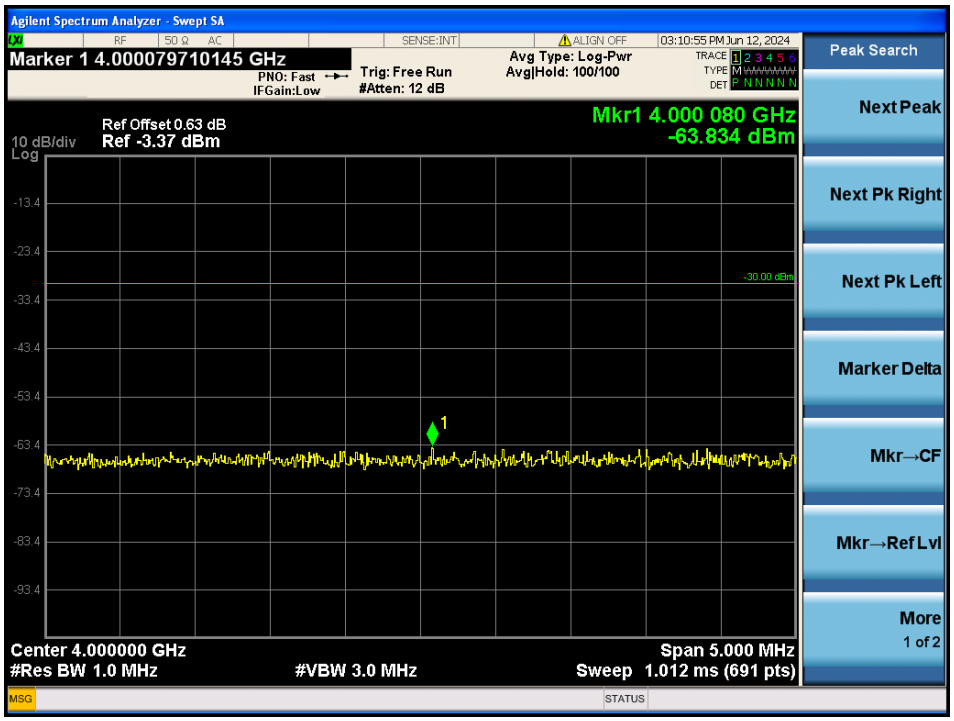
Fundamental

656.950 MHz, 20mW, Spurious Emission

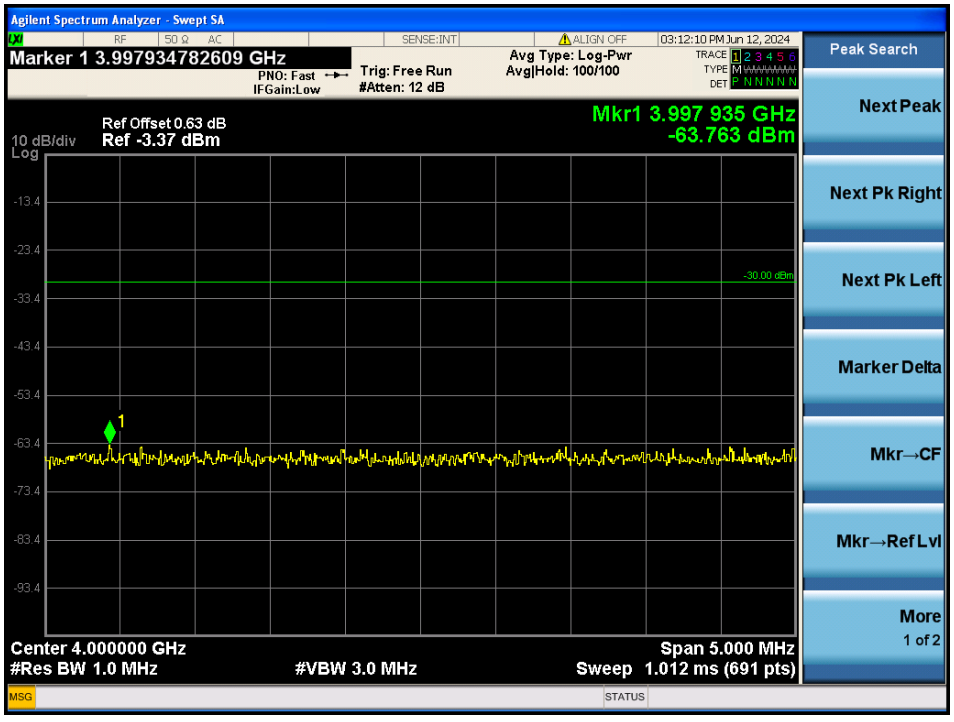


1 GHz to 7 GHz

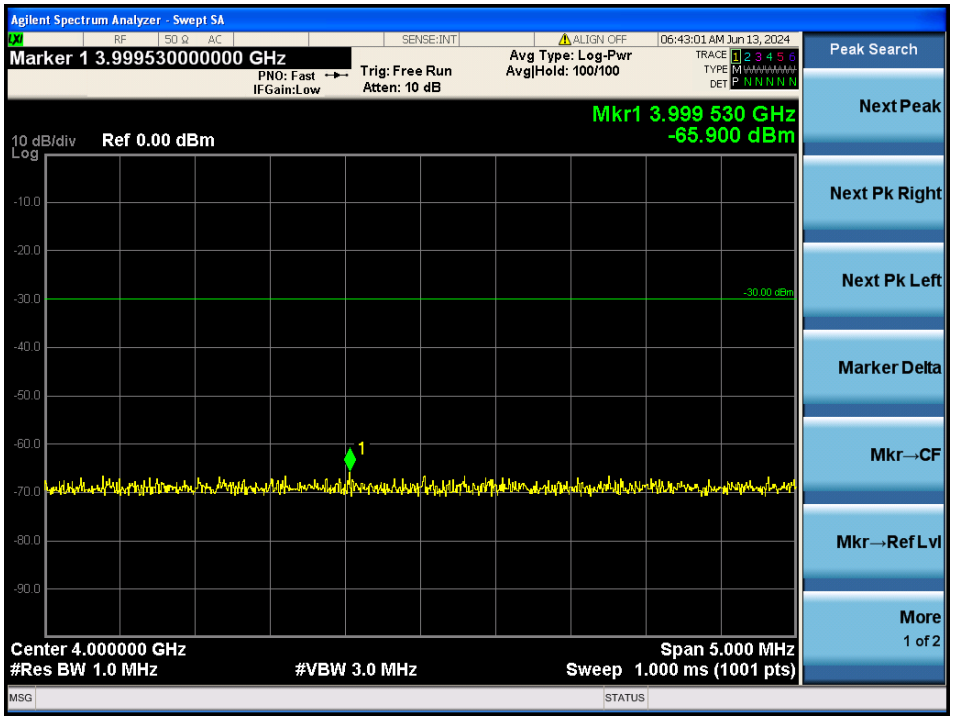
537.6 MHz, 50mW, Spurious Emission



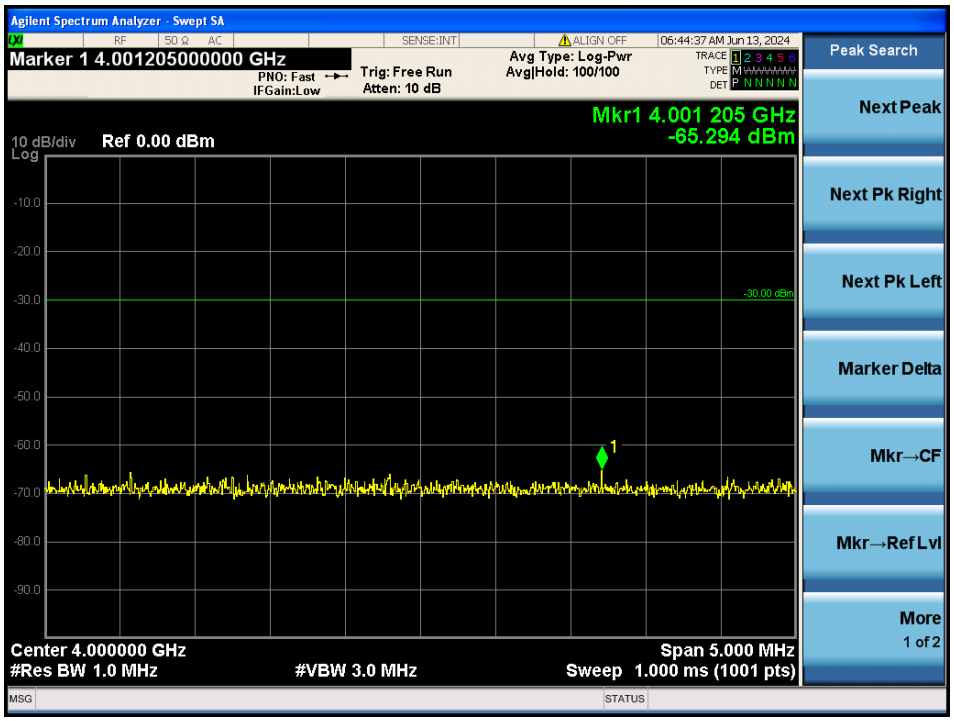
572.77 MHz, 50mW, Spurious Emission



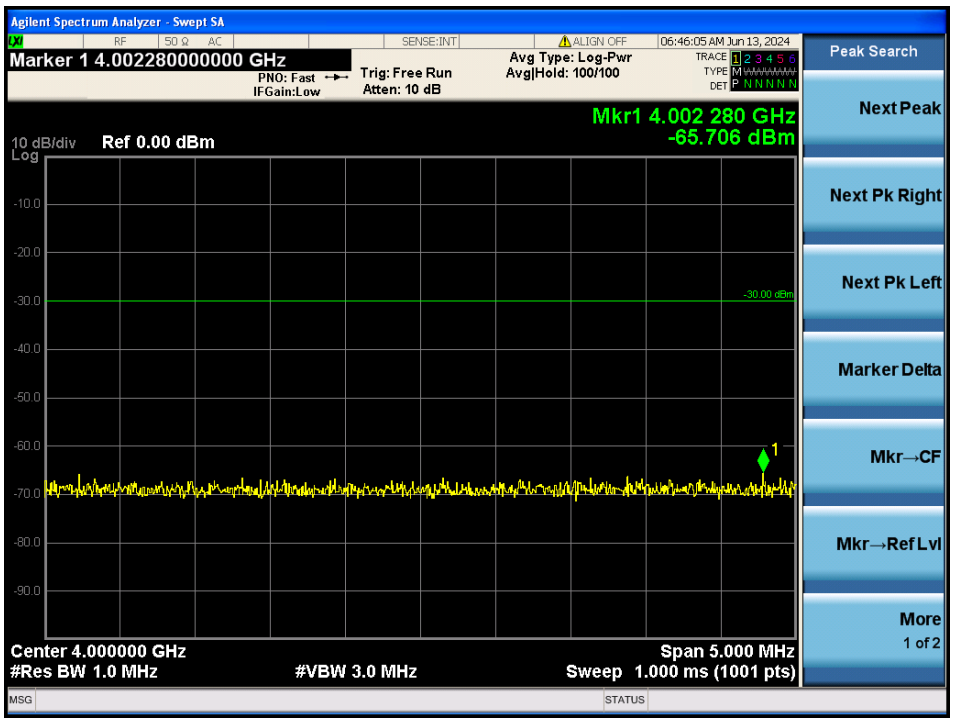
607.95 MHz, 50mW, Spurious Emission



653.05 MHz, 20mW, Spurious Emission



656.95 MHz, 20mW, Spurious Emission



7. FCC §74.861 (e.7), RSS-210 (G4) & ETSI EN 300 422-1(4.2.4) -Field Strength of Spurious Radiation

7.1 Applicable Standards

According to FCC §74.861 (e)(7):

(e) For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply: (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 RSS-210 (G4)

The frequency stability of wireless microphones shall comply with the limits specified in table G1, when tested under the frequency stability testing conditions specified in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*.

The frequency stability for WMAS shall be sufficient to ensure that the authorized bandwidth stays within the TV channel (6 MHz) when tested to the temperature and supply voltage variations specified in RSS-Gen.

According to ETSI EN 300 422-1(4.2.4)

Transmitter unwanted emissions in the spurious domain are emissions on a frequency or frequencies immediately outside the limit of 250 % of the declared channel bandwidth above and below the centre frequency of the emission. The limits of unwanted emissions in the spurious domain from the transmitter into the antenna port are in terms of mean power. The mean power of any spurious domain transmission from a burst transmitter is the mean power averaged over the burst duration. The level of spurious emissions shall be measured by either: a) the power level from an external Antenna port; and their effective radiated power when radiated by the cabinet and structure of the equipment (cabinet radiation); or b) their effective radiated power when radiated by the cabinet and the integral antenna, in the case of hand-portable equipment fitted with such an antenna and no external Antenna port.

7.2 Test Procedure

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

7.3 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
1128	Agilent	EXA Signal Analyzer	N9010A	MY48030852	2024-05-23	1 year
327	Sunol Science Corp	System Controller	SC110V	122303-1	N/R	N/R
321	Sunol Sciences	Biconi-Log Antenna	JB3	A020106-2; 1504	2023-12-18	2 years
1192	ETS Lindgren	Horn Antenna	3117	00218973	2022-09-29	2 years
658	HP/ Agilant	Pre-Amplifier	8449B OPT HO2	3008A01103	2024-06-18	6 months
316	Sonoma Instruments	Preamplifier 10 kHz - 2.5 GHz	317	260406	2024-02-27	6 months
1186	Pasternack	Coaxial Cable, RG214	PE3062-1050CM	N/A	2024-04-09	6 months
183	Agilent	Generator, Signal	83650B	3614A00276	2023-08-22	1 year
1295	Carlisle	10m Ultra Low Loss Coaxial Cable	UFB142A-1-3937-200200	64639890912-001	2024-05-01	6 months
473	EMCO	Antenna, Horn	3115	9511-4627	2022-11-22	2 years
-	-	RF Cable	-	-	Each time[1]	N/A
568	COM-POWER	Dipole Antenna	AD-100	721033DB1, 2, 3, 521921	2023-07-11	2 years
393	Com-Power	Antenna, Loop Active	AL-130	17043	2023-05-26	2 years
1346	RFMW	2.92 mm 10 ft RF cable	KMSE-160SAW-240.0-KSME	N/A	2024-05-03	6 months
1329	Pasternack	2.92 mm short coaxial cable	PE360-12	N/A	2024-05-06	6 months
827	AH Systems	Preamplifier	PAM 1840 VH	170	2024-05-05	6 months
1292	Micro-Tronics	>1GHz High-pass Filter	HPM20242	001	2024-04-11	1 year

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".*

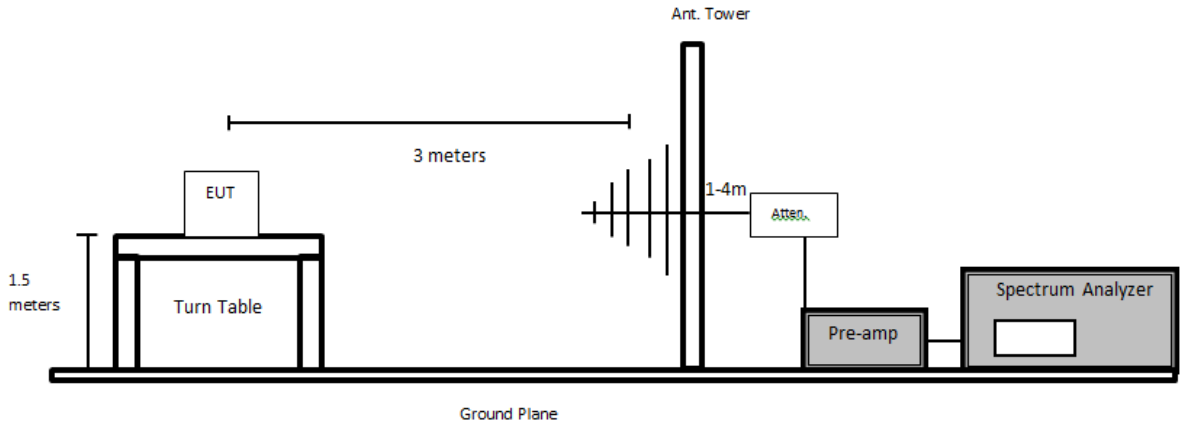
7.4 Test Environmental Conditions

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

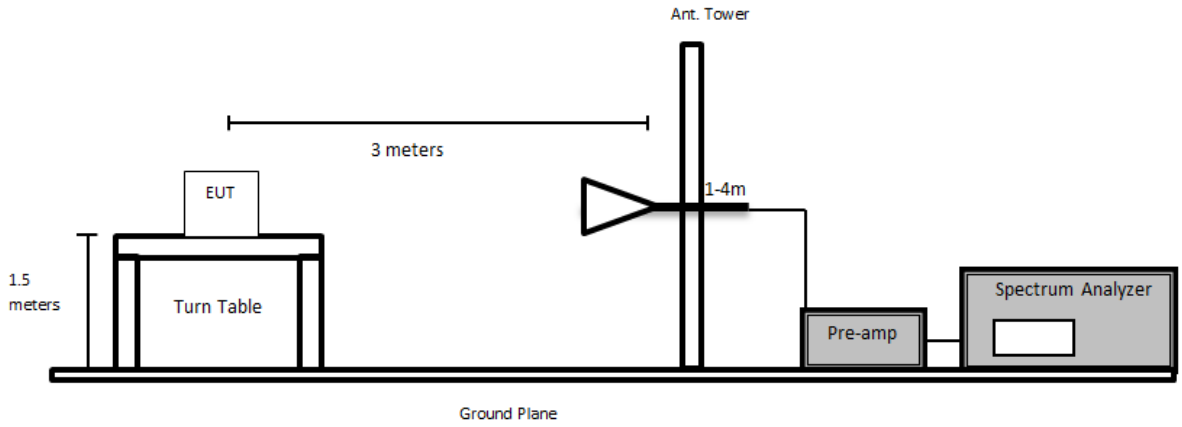
The testing was performed by Libass Thiaw on 2024-06-24 in 5m3.

7.5 Test Setup Diagram

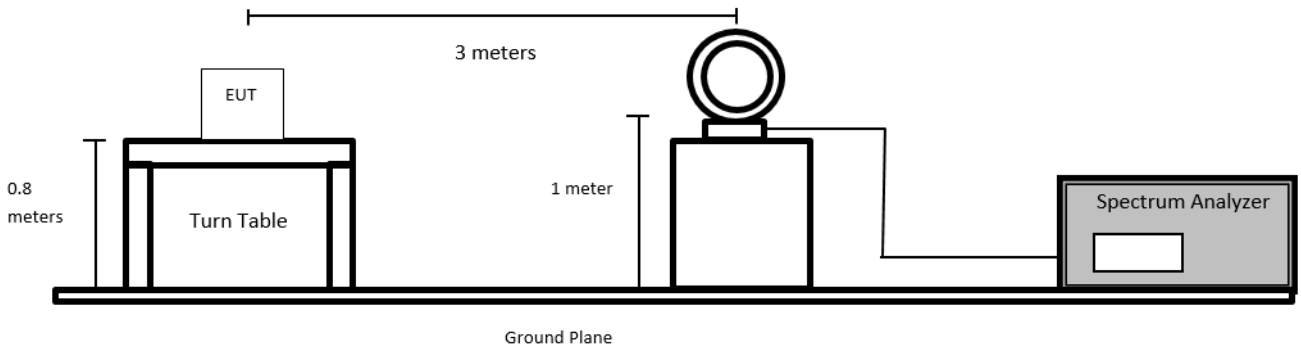
Below 1 GHz:



1-18 GHz:



Below 30 MHz:



7.6 Test Results

TX at the maximum output power:

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)			
572.775 MHz											
6891	48.32	263	175	H	6891	-46.21	11.63	2.67	-37.25	-30	-7.25
1145	42.81	99	169	V	1145	-69.90	6.31	1.07	-64.65	-30	-34.65
88.48	37.42	118	154	H	88.48	-84.33	2.10	0.31	-82.55	-54	-28.55
88.48	41.04	272	157	V	88.48	-78.01	2.10	0.31	-76.21	-54	-22.21
653.050 MHz											
1723	43.48	204	197	H	1723	-65.96	8.65	1.23	-58.53	-30	-28.53
6976	48.46	239	168	V	6976	-44.85	11.74	2.68	-35.79	-30	-5.79
88.5	37.03	251	156	H	88.5	-84.72	2.10	0.31	-82.93	-54	-24.13
88.5	43.53	212	152	V	88.5	-75.51	2.10	0.31	-73.72	-54	-21.80

8. FCC §2.1055, 74.861 (e.4) & RSS-210 (G2)-Frequency Stability

8.1 Applicable Standards

According to FCC 74.861 (e)(4):

For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply: The frequency tolerance of the transmitter shall be 0.005 percent.

According to RSS-210(G)(2):

Table G1 — Specifications for wireless microphones

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	250	200	50
614-616 653-663	20	200	50

The occupied bandwidth for wireless microphones shall not exceed the authorized bandwidth specified in table G1 (above).

8.2 Test Procedure

According to FCC 2.1055, (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.
(2) From −20° to + 50° centigrade for equipment to be licensed for use in the Maritime Services under part 80 of this chapter, except for Class A, B, and S Emergency Position Indicating Radio beacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the Local Television Transmission Service and Point-to-Point Microwave Radio Service under part 21 of this chapter, equipment licensed for use aboard aircraft in the Aviation Services under part 87 of this chapter, and equipment authorized for use in the Family Radio Service under part 95 of this chapter.
(3) From 0° to + 50° centigrade for equipment to be licensed for use in the Radio Broadcast Services under part 73 of this chapter.

(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. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(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.
(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

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

8.3 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
1128	Agilent	EXA Signal Analyzer	N9010A	MY48030852	2024-05-23	1 year
1060	BACL	Temp and Humi Chamber	BTH-150-40	30078	2023-11-22	1 year
	-	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:	23ºC
Relative Humidity:	43%
ATM Pressure:	101.1 kPa

The testing was performed by Xavier Kelley on 2024-06-11 to 2024-06-13 at RF site.

8.5 Test Setup Diagram

8.6 Test Results

572.775 MHz:

Varying temperature:

Temp. (℃)	Left Frequency (MHz)	Right Frequency (MHz)	Center Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (%)	Limits (%)	Results (ppm)	Limits (ppm)
-30	572.68145	572.86807	572.77476	572.7750	-0.00004	0.005%	-0.41901	±50
-20	572.68145	572.868.01	572.77473	572.7750	-0.00004	0.005%	-0.47139	±50
-10	572.68145	572.86801	572.77473	572.7750	-0.00004	0.005%	-0.47139	±50
0	572.68183	572.86715	572.774915	572.7750	-0.00008	0.005%	-0.1484	±50
10	572.68225	572.86665	572.774915	572.7750	-0.00009	0.005%	-0.1484	±50
20	572.68219	572.86785	572.77502	572.7750	0.000003	0.005%	0.034918	±50
30	572.68309	572.86851	572.7758	572.7750	0.0001	0.005%	1.396709	±50
40	572.68249	572.86797	572.77523	572.7750	0.00004	0.005%	0.401554	±50
50	572.68285	572.86701	572.77493	572.7750	-0.00005	0.005%	-0.12221	±50

Varying supply voltage (+/-15%V):

Voltage	Left Frequency (MHz)	Right Frequency (MHz)	Center Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (%)	Limits (%)	Results (ppm)	Limits (ppm)
1.275v (Low)	572.68229	572.86807	572.77518	572.7750	0.00003	0.005%	0.31426	±50
1.725v (High)	572.67887	572.86849	572.77368	572.7750	-0.0002	0.005%	-2.30457	±50

660 MHz:

Varying temperature:

Temp. (℃)	Left Frequency (MHz)	Right Frequency (MHz)	Center Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (%)	Limits (%)	Results (ppm)	Limits (ppm)
-30	659.90441	660.09379	659.9991	660	-0.0001	0.005%	-1.36364	±50
-20	659.90471	660.09391	659.99931	660	-0.0001	0.005%	-1.04545	±50
-10	659.90537	660.09475	660.00006	660	0.000009	0.005%	0.90909	±50
0	659.91071	660.08875	659.99973	660	-0.00004	0.005%	-0.40909	±50
10	659.91077	660.08905	659.99991	660	-0.00001	0.005%	-0.13636	±50
20	659.90867	660.08989	659.99928	660	-0.0001	0.005%	-1.09091	±50
30	659.90927	660.08953	659.9994	660	-0.00009	0.005%	-0.90909	±50
40	659.90735	660.09295	660.00015	660	0.00002	0.005%	0.22727	±50
50	659.90735	660.09355	660.00045	660	0.00006	0.005%	0.68182	±50

Varying supply voltage (+/-15%V):

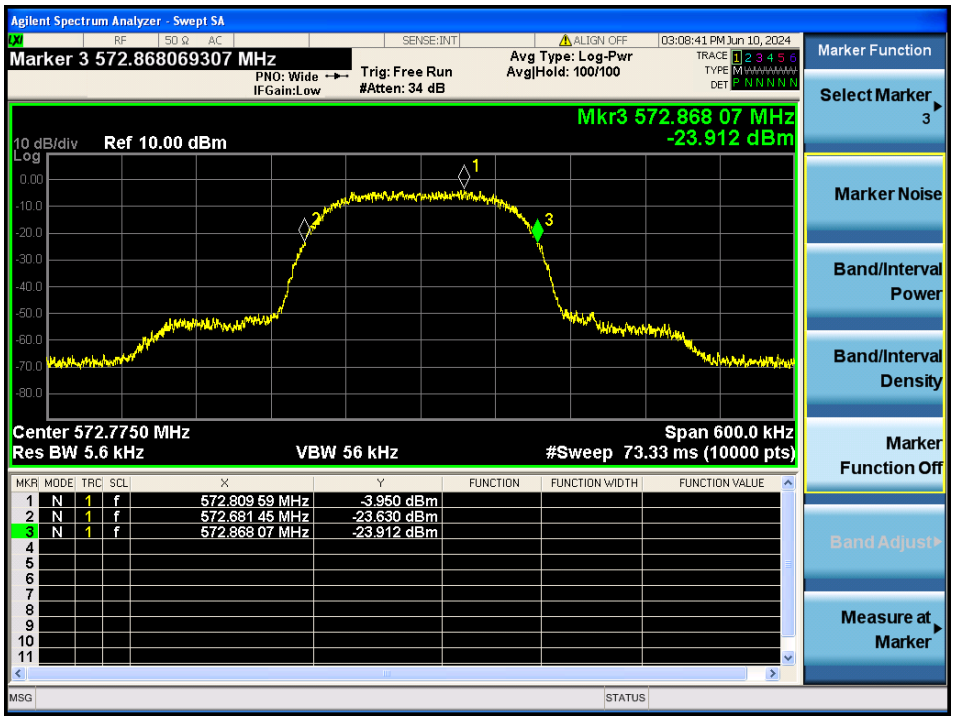
Voltage	Left Frequency (MHz)	Right Frequency (MHz)	Center Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (ppm)	Results (ppm)	Limits (ppm)
1.275v (Low)	659.90615	660.09484	660.000495	660	0.00007	0.005%	0.75	±50
1.725v (High)	659.90639	660.09445	660.00042	660	0.00006	0.005%	0.63636	±50

Note: Center frequency (MHz) = Left Frequency (MHz) + Right Frequency(MHz) /2

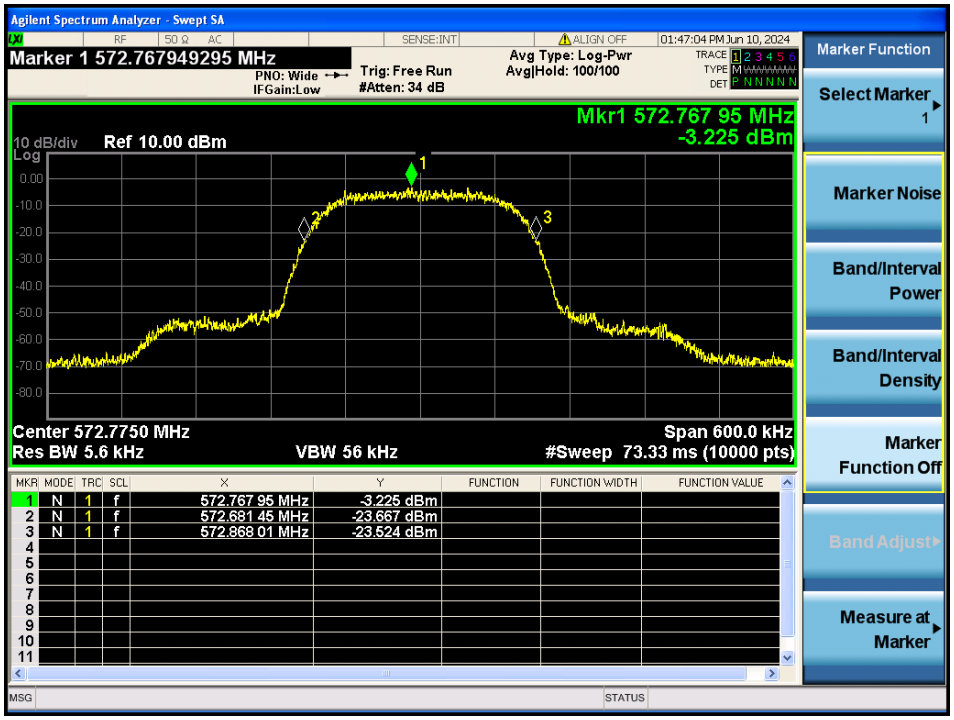
*Note: PPM = Center Frequency(MHz) – Channel Frequency(MHz) /Channel Frequency(MHz) * 1,000,000*

NOTE: this testing was performed at frequency outside of operational range but is still sufficient in evaluating the frequency tolerance performance of the EUT.

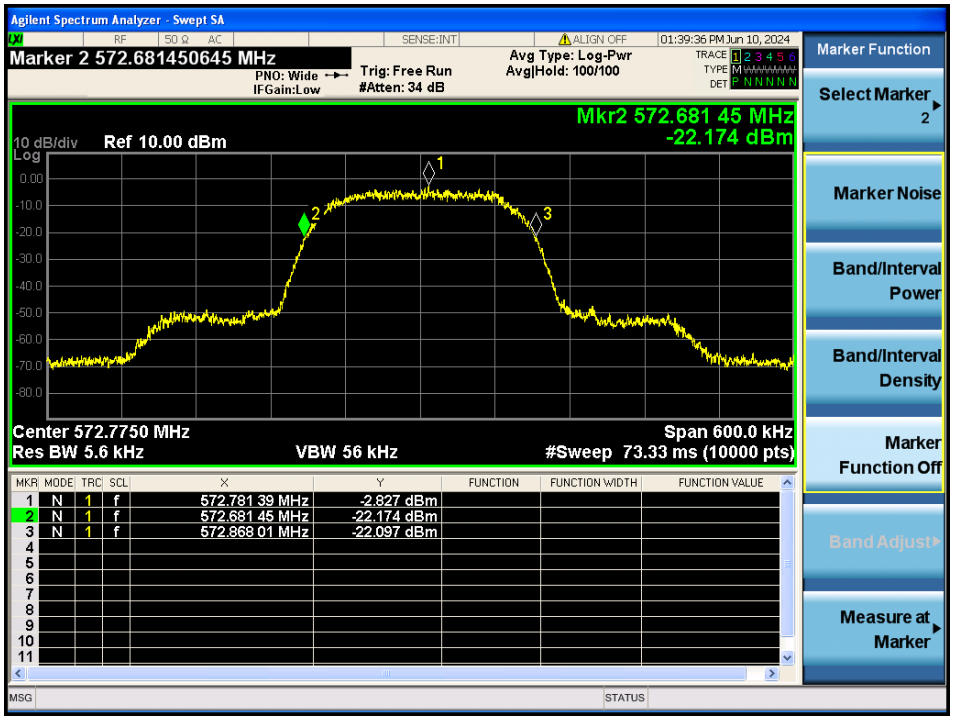
572.775 MHz @ -30



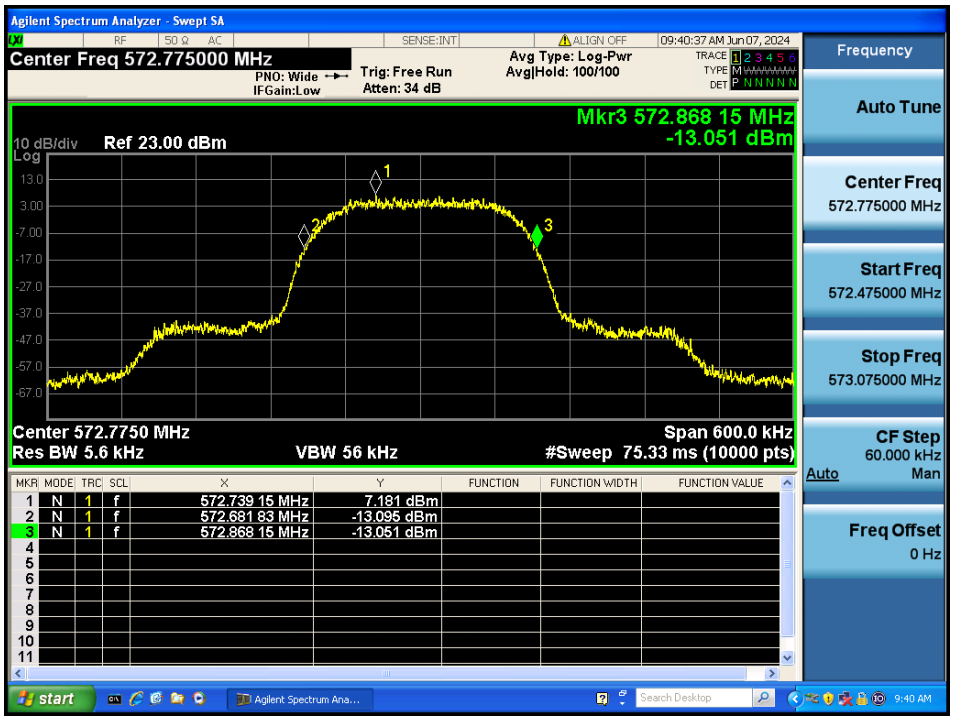
572.775 MHz @ -20



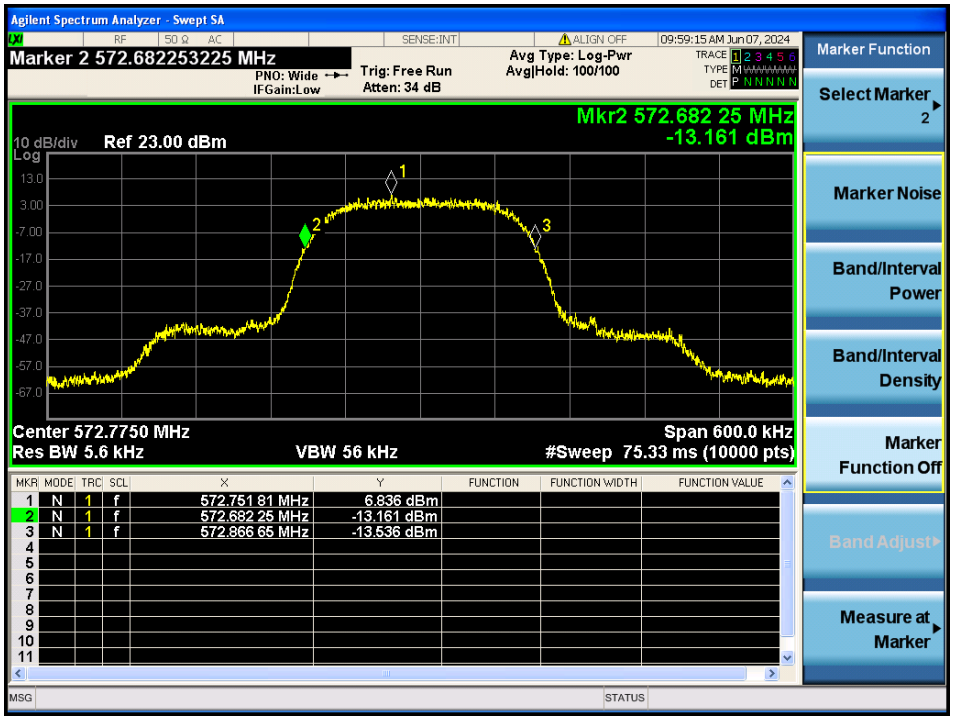
572.775 MHz @ -10



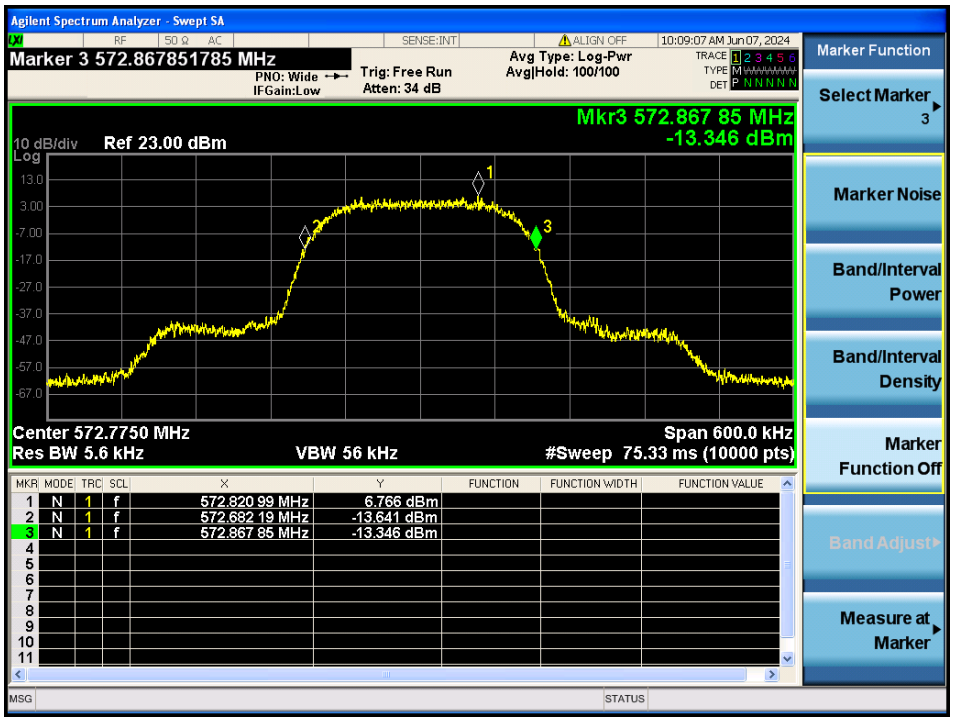
572.775 MHz @ 0



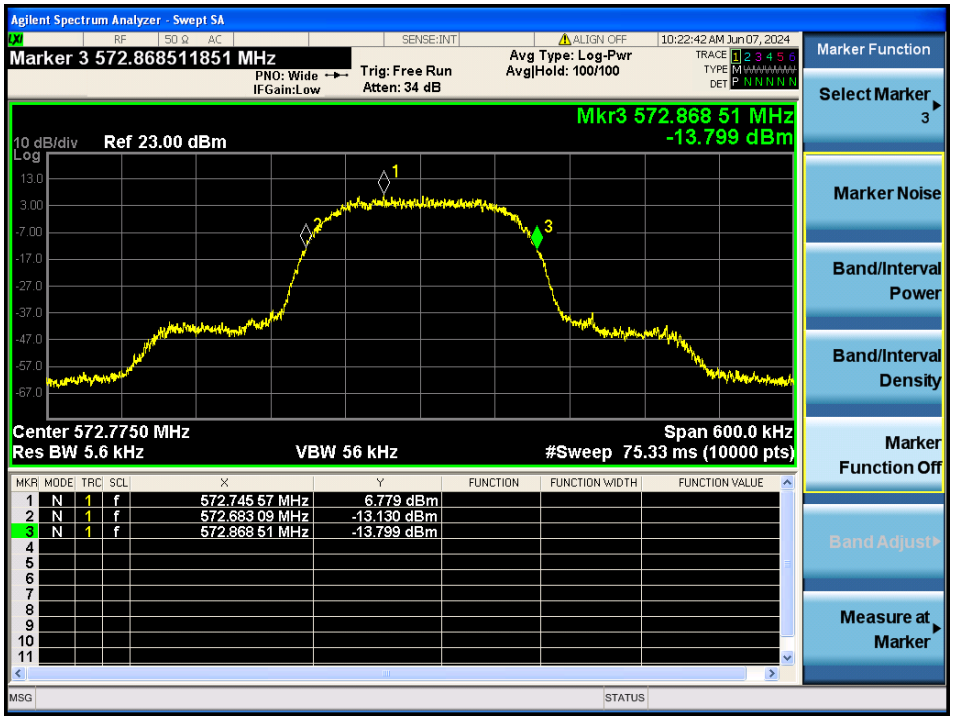
572.775 MHz @ 10



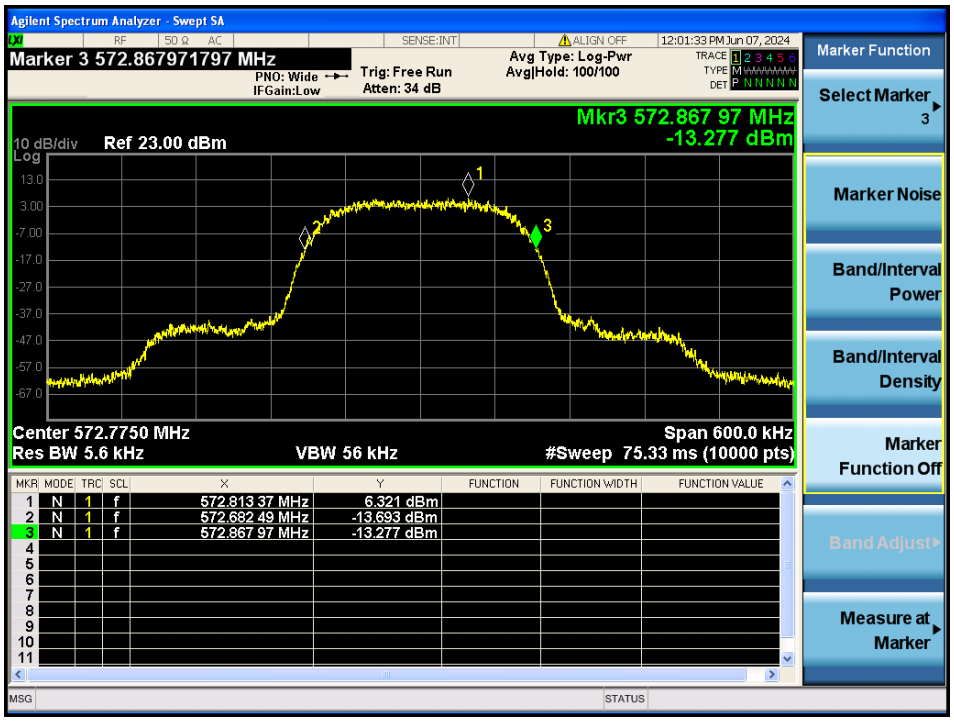
572.775 MHz @ 20



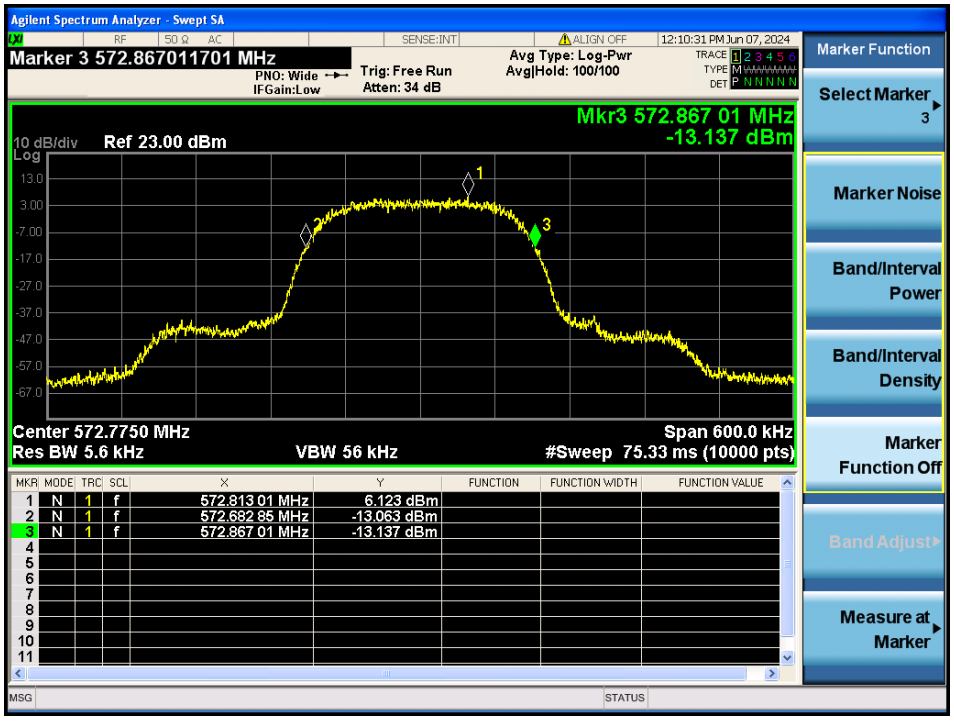
572.775 MHz @ 30



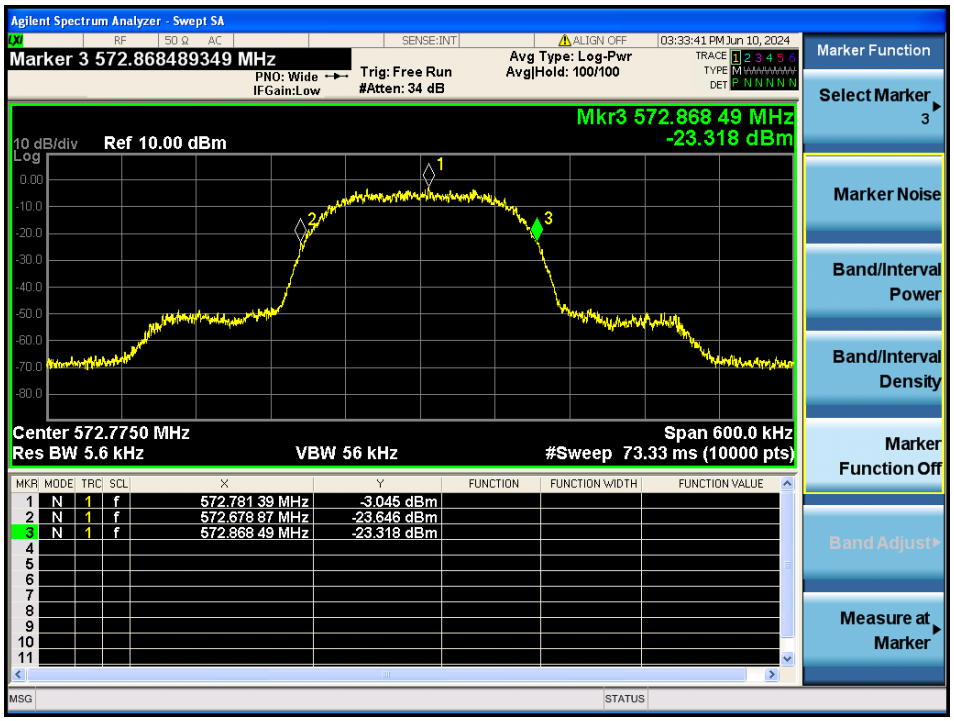
572.775 MHz @ 40



572.775 MHz @ 50

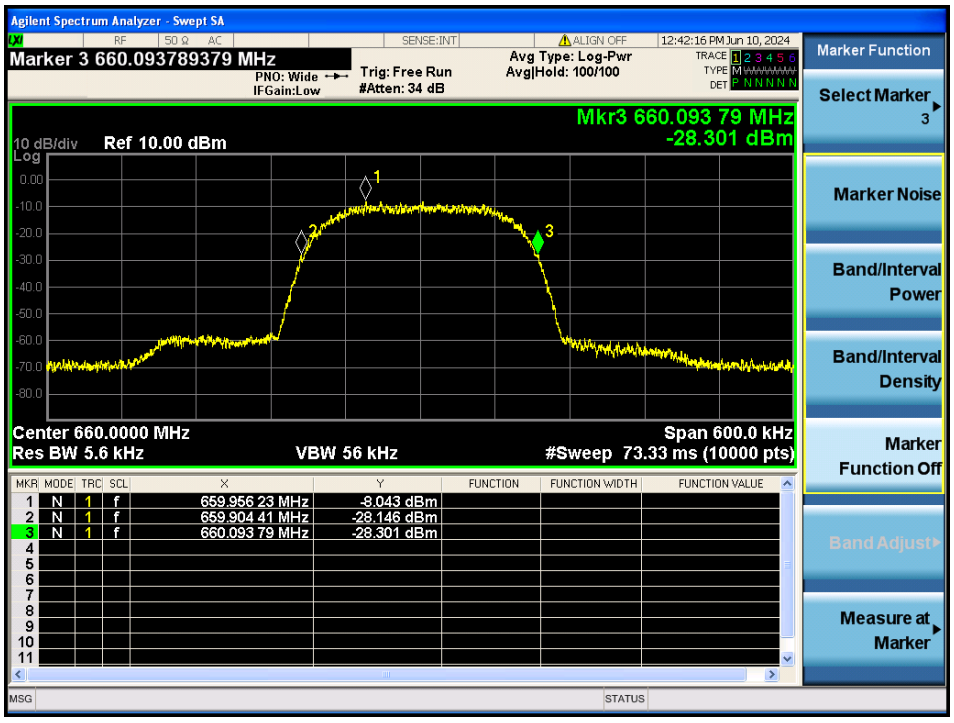


572.775 MHz @ High Voltage

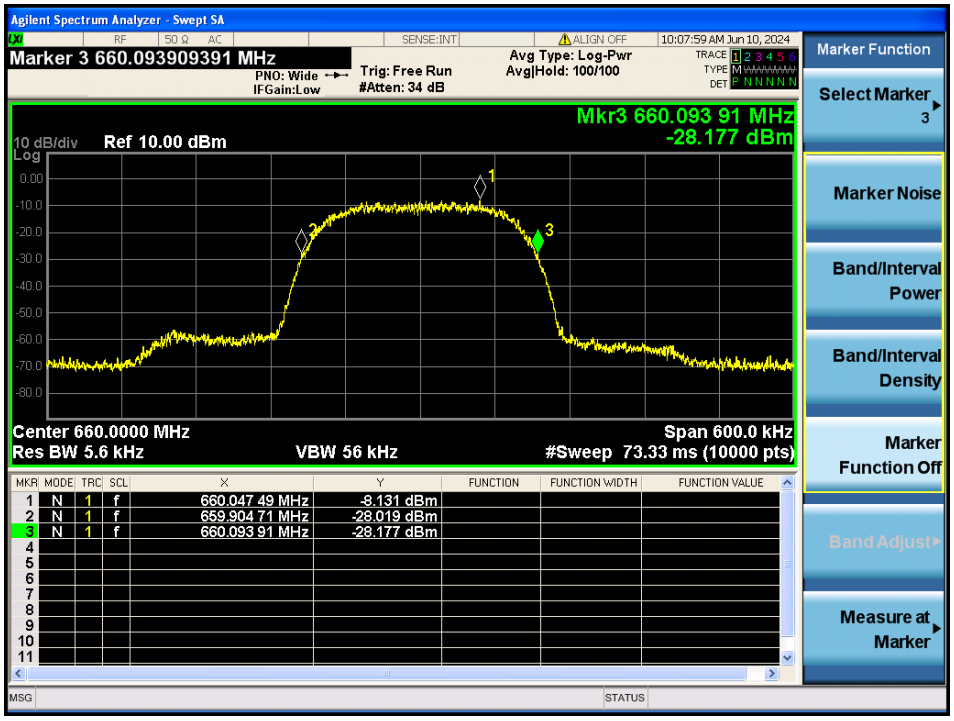


572.775 MHz @ Low Voltage

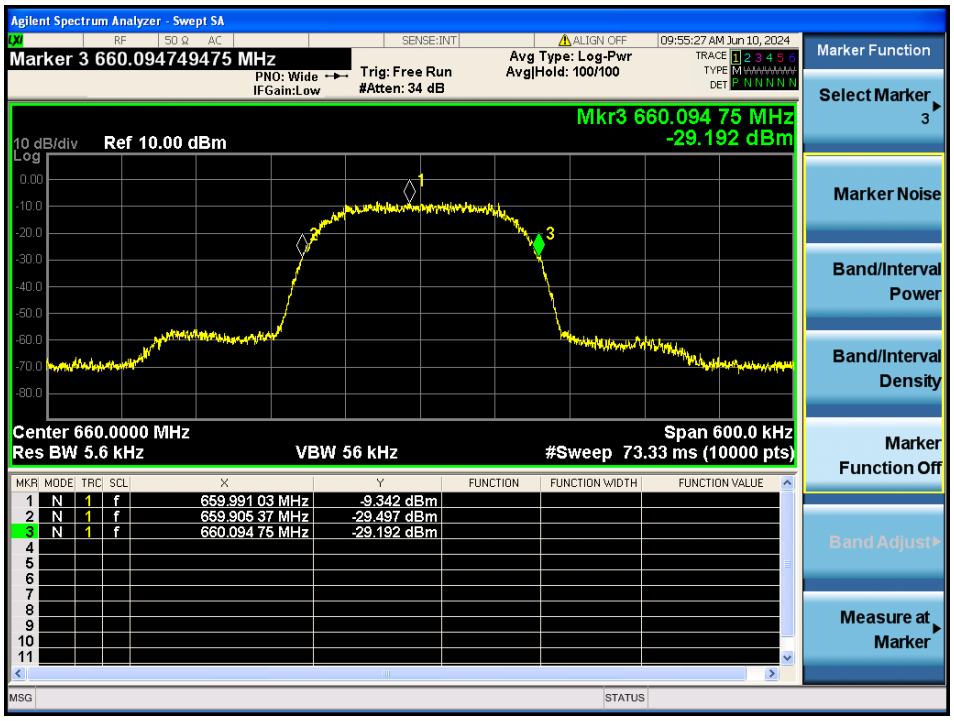
660 MHz @ -30



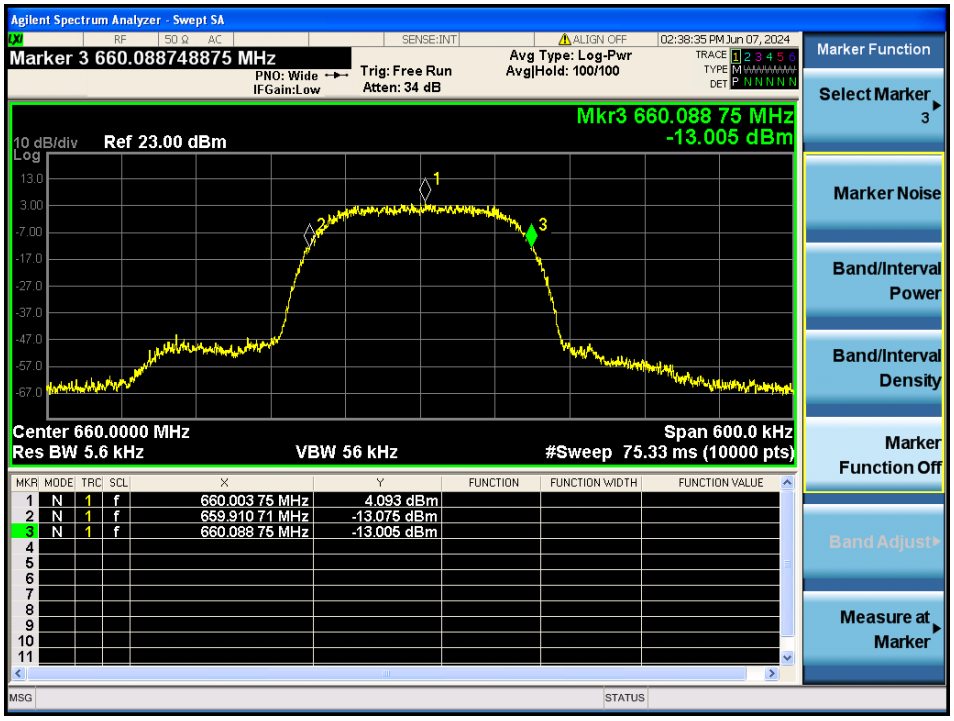
660 MHz @ -20



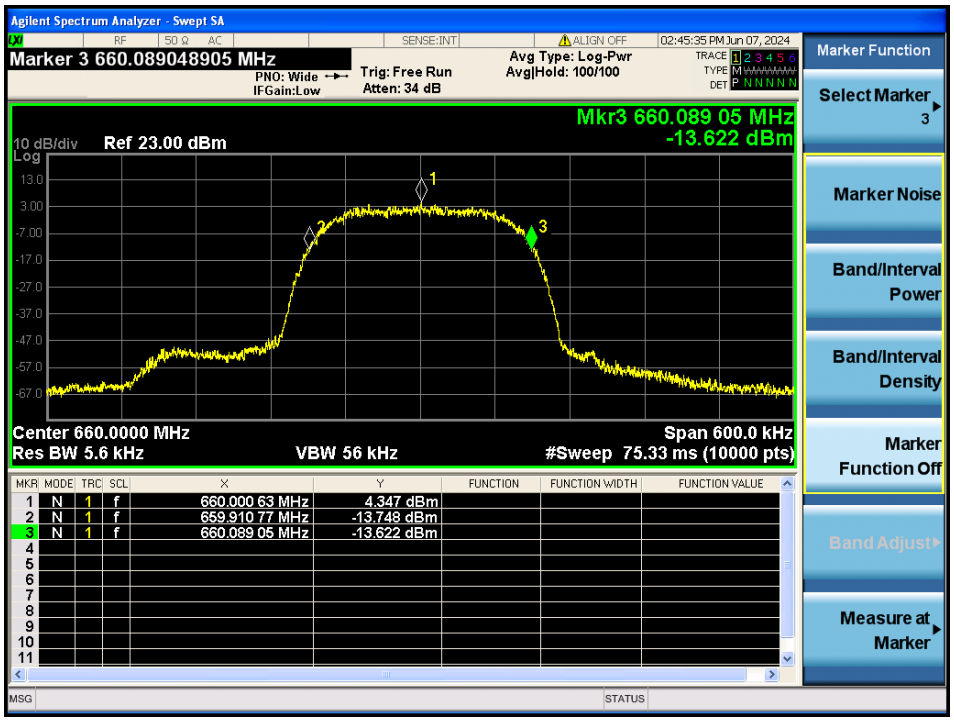
660 MHz @ -10



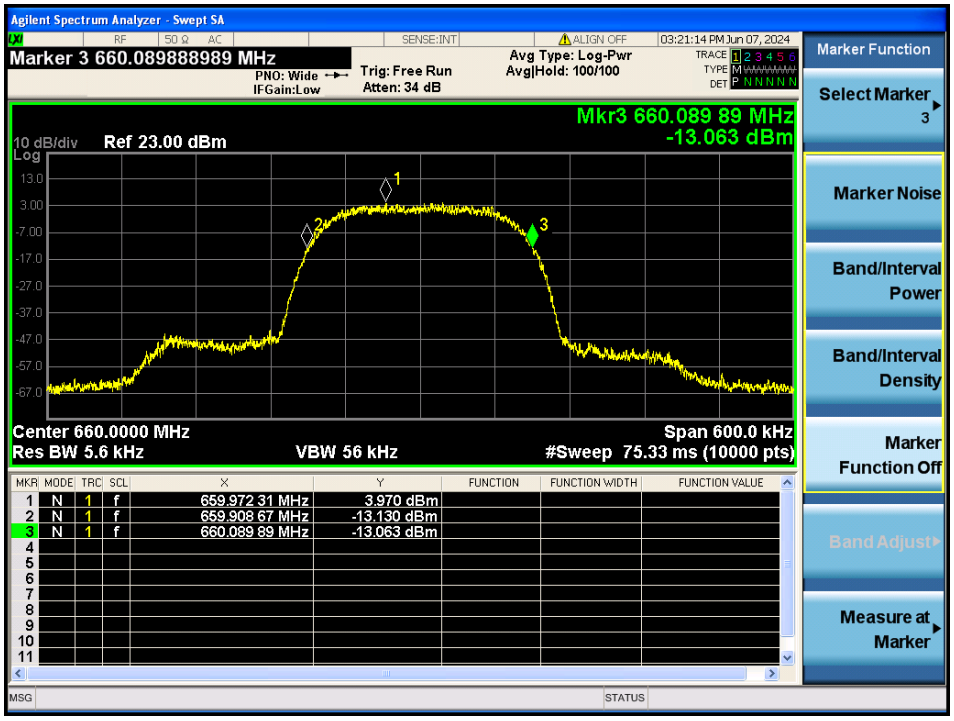
660 MHz @ 0



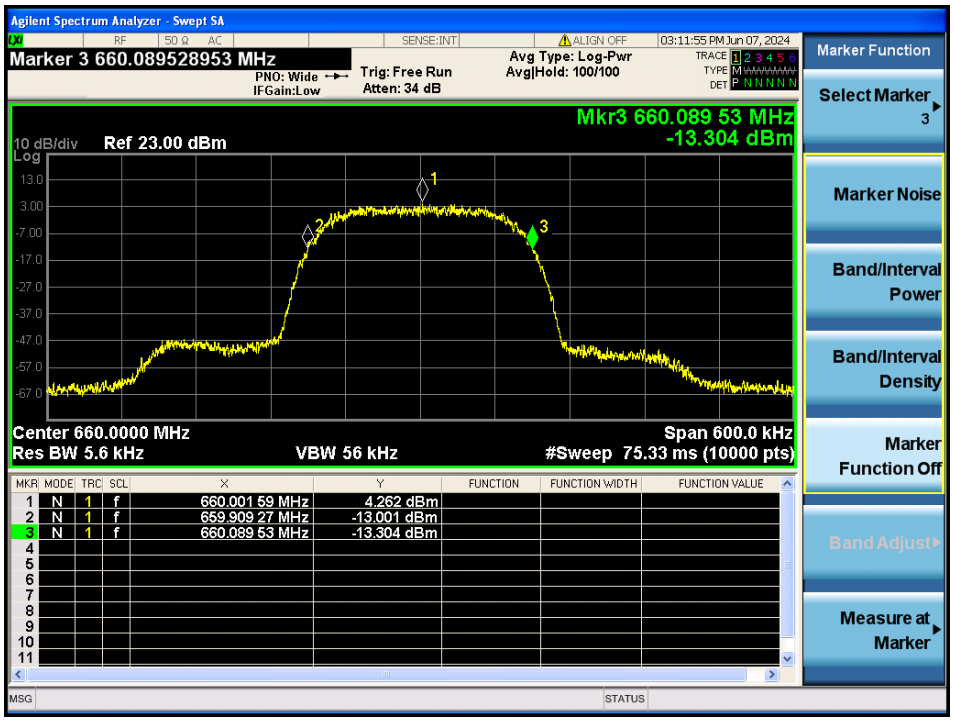
660 MHz @ 10



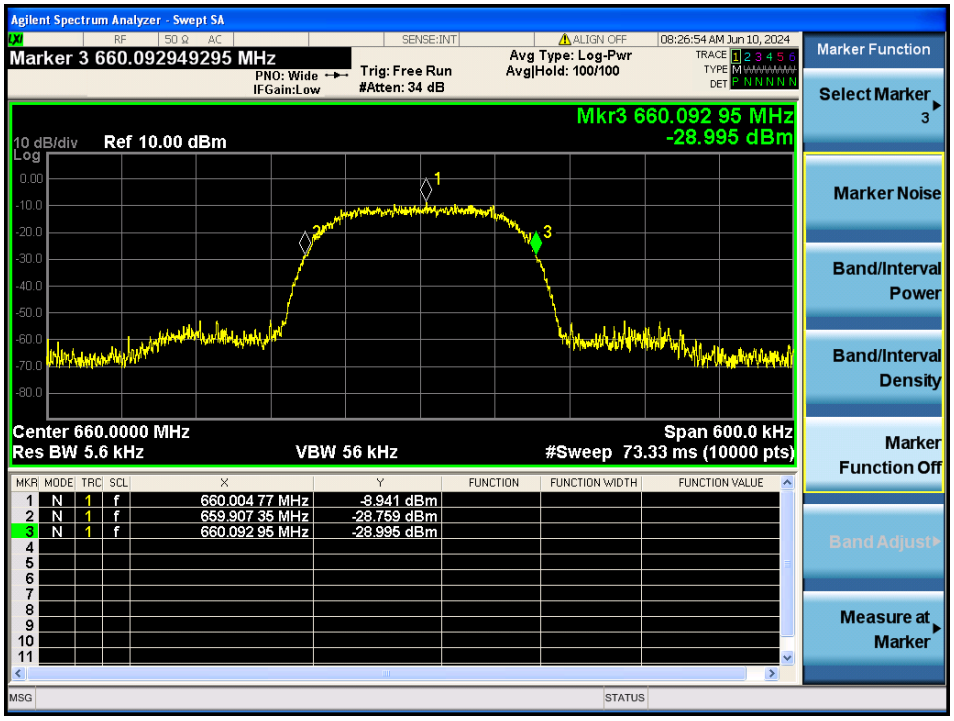
660 MHz @ 20



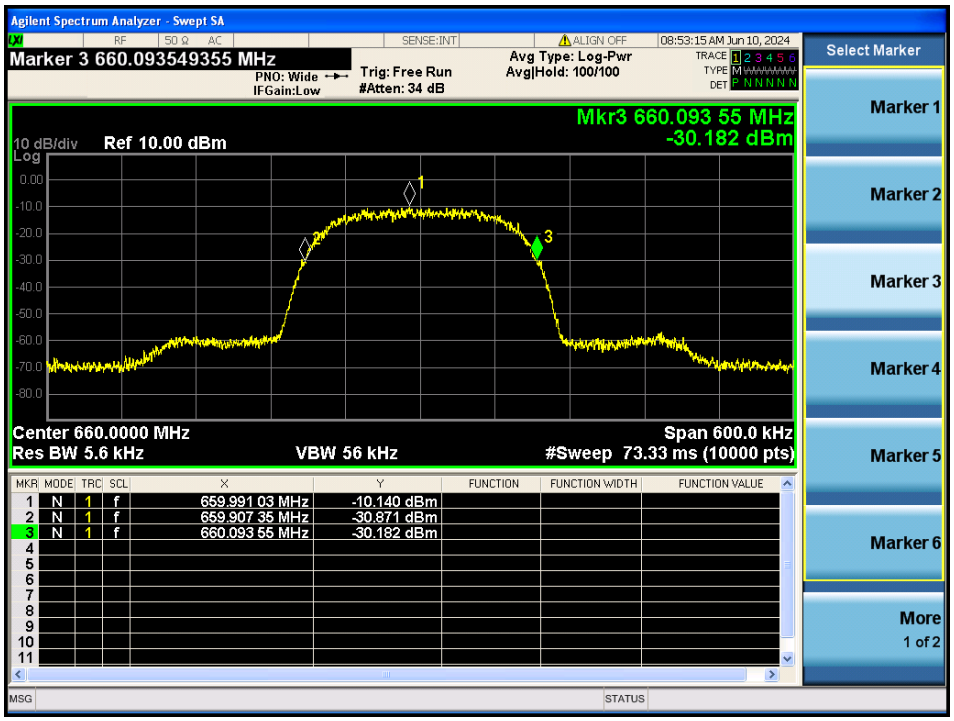
660 MHz @ 30



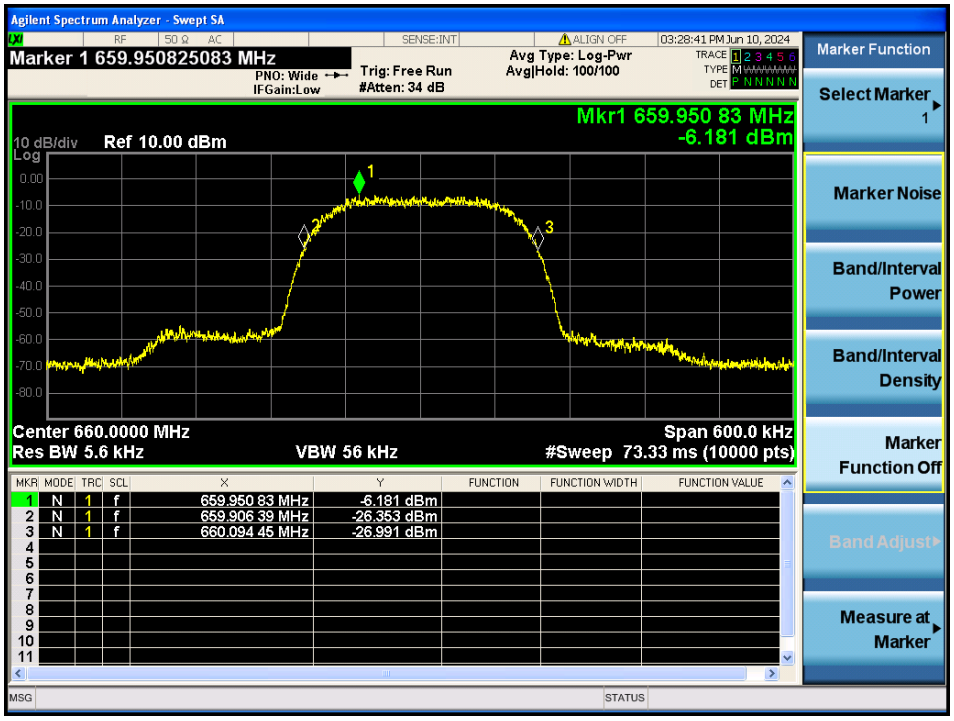
660 MHz @ 40



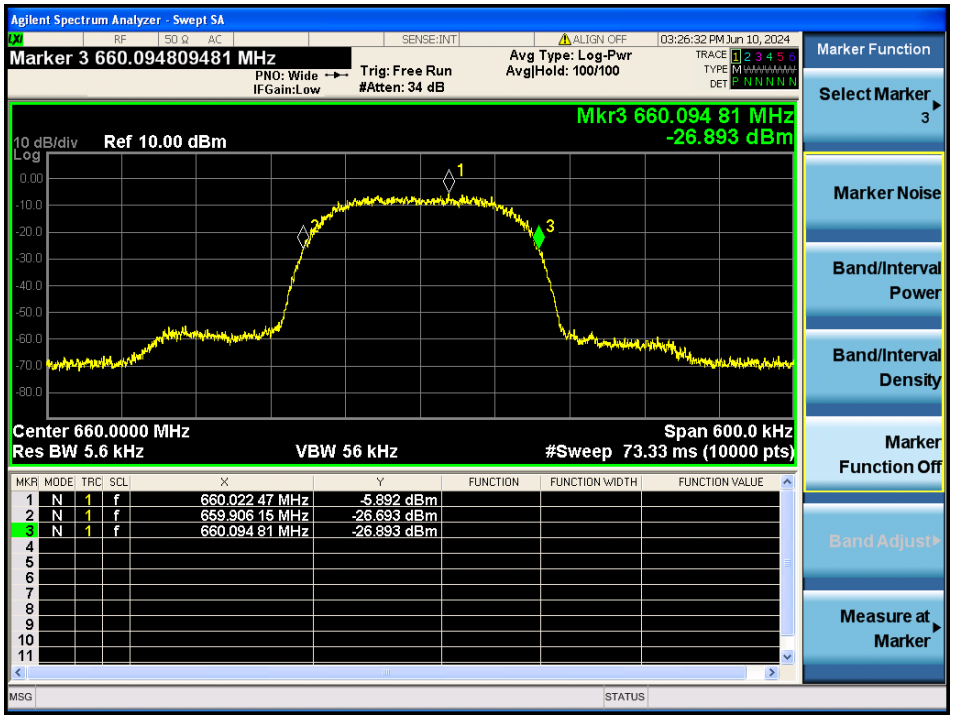
660 MHz @ 50



660 MHz @ High Voltage



660 MHz @ Low Voltage



9. Annex A - EUT Test Setup Photographs

Please refer to the attachment

10.Annex B - EUT External Photographs

Please refer to the attachment

11.Annex C - EUT Internal Photographs

Please refer to the attachment

12.Annex D (Normative) - A2LA Electrical Testing Certificate

Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIACE 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 21st day of December 2022.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2024

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 ---