Cellphone-Mate, Inc.

EMC TEST REPORT FOR

Public Safety Amplifier
Model: RSNGUARD-2QR

Tested to The Following Standard:

FCC Part 90I

Report No.: 101319-7

Date of issue: July 5, 2018

ACCREDITED

Test Certificate # 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Cellphone-Mate, Inc.
48346 Milmont Drive
Fremont, CA 94538

Representative: Dennis Findley
Customer Reference Number: CKC05242018

REPORT PREPARED BY:

Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 101319

DATE OF EQUIPMENT RECEIPT: Juen 1, 2018
DATE(S) OF TESTING: June 1 - 7, 2018

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.
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Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
1120 Fulton Place
Fremont, CA 94539

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.11
EMITest Immunity	5.03.10

Site Registration & Accreditation Information

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Fremont, CA	US0082	SL2-IN-E-1148R	3082B-1	US1023	A-0149

SUMMARY OF RESULTS

Standard / Specification: FCC Part(s) 90I

KDB 935210 D05 Indus Booster Basic Meas v01r02, 10/27/2017		FCC Part Section Correlation		Mods	Results
Guidance Sec #	**Guidance Description**	**FCC Sec #**	**FCC Rule Description**		
3.4	Input-versus-output signal comparison	Section 2.1049	Occupied Band width	NA	Pass
4.3	Out-of-band rejection	Part 90 Section 219 (b)	Frequency Bands	NA	Pass
4.4	Input-versus-output signal comparison and Out of Band Emissions	Part 90 Section 219 (b) and Part 90 section 543 (e) Out of Band Emission	Out of Band Emission	NA	Pass
4.5	Input/output power and amplifier/booster gain	Part 90 Section 219 (e)(1)	Power Limit	Mod. #1	Pass
4.6	Noise figure measurements	Part 90 Section 219 (e)(2)	Noise Figure Limit	NA	Pass
4.7.2	Out-of-band/out-of-block emissions conducted measurements	Part 90 Section 219 (e)	Intermodulation Limit	Mod. #1	Pass
4.7.3	EUT spurious emissions conducted measurements	Part 90 Section 219 (e)	Spurious emission	NA	Pass
4.8	Frequency stability measurements	Part 90 Section 219 (e)(4)(i)	Power Limit	NA	NA1
4.9	Radiated Spurious Emission	Part 90 Section 219 (e)	Spurious Emission	NA	Pass
7.13 a) - c)	Spectrum Block Filter		NA	NA	NA1

NA = Not Applicable

NA**1** = Not applicable because the EUT does not alter the input signal in ways that can influence the output signal

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
Modification #1: Manufacturer changed the firmware from the old firmware name: "SC Gu_public_V1_0.hex" to the new firmware: "SC S1_Public_2QR_1dB.hex" to reduce the output power for Intermodulation section and output power.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
Public Safety Amplifier	Cellphone-Mate, Inc.	RSNGUARD-2QR	1

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Equipment	Zone Enhancer
Operating Frequency Range:	UL: 788-798, 799-805, 806-816 MHz DL: 758-768, 769-775, 851-861 MHz
Modulation Type(s):	P25-C4FM SC-FMDA (LTE) OFDM (LTE) 10K1F3E
Number of TX Chains:	1
Antenna Type(s) and Gain:	Dedicated, See antenna kitting information
Beamforming Type:	NA
Antenna Connection Type:	UL: 50 Ohm/ N Type DL: 50 Ohm/ N Type
Nominal Input Voltage:	120VAC,60Hz
Firmware used for Test:	SC Gu_public_V1_0.hex and SC S1_Public_2QR_1dB.hex

FCC PART(S) 90I

General Test Setup

Summary of Conditions
Configuration 1 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port. The EUT Server port is a type N connector and 50-ohm impedance. The EUT Donor port is type N connector and 50-ohm impedance. All switches are in the on position UL: 788-798, 799-805, 806-816 MHz DL: 758-768, 769-775, 851-861 MHz Firmware: SC Gu_public_V1_0.hex and SC S1_Public_2QR_1dB.hex Test environment conditions: as noted in individual section Test Procedure: 935210 D05 Indus Booster Basic Meas v01r02 Dated October 27,2017

2.1049 Occupied Bandwidth

Engineer: Hieu Song Nguyenpham
Test Date: 6/1/2018

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
P06797	Attenuator	Narda	766-20	4/10/2017	4/10/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019

Environmental Conditions					
Temperature (ºC)	22.5	Relative Humidity (%):	49	Atmospheric Pressure (kPa):	101.9

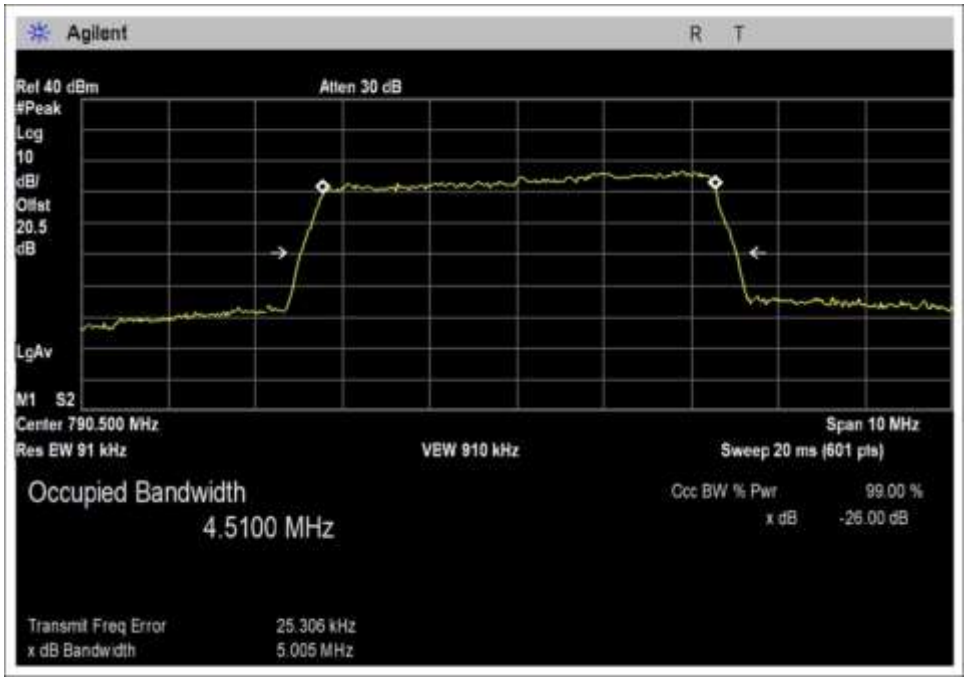
Summary of Results

Pass: As summarized in tables and plots below, the spectral shape of the output is similar to input for all modulations.
Worst case results are reported for occupied bandwidth comparison test done with and without AGC circuitry activated.

Public Safety 700MHz/800MHz bands

Band	Modulation	Carrier Frequency (MHz)	OBW PreAGC (Hz)	OBW AGC+3 (Hz)	OBW Input (Hz)	Max In&Out Difference (PreAGC)	Max In&Out Difference (AGC)
UL_806-816MHz	P25-C4FM	815.975	8542	8495	8495	0.55%	0.00%
UL_806-816MHz	P25-C4FM	811	8460	8460	8473	0.15%	0.16%
UL_806-816MHz	P25-C4FM	806.0125	8657	8569	8431	2.68%	1.63%
UL_806-816MHz	FM	815.975	10123	10123	10134	0.11%	0.11%
UL_806-816MHz	FM	811	10123	10109	10108	0.14%	0.14%
UL_806-816MHz	FM	806.0125	10123	10123	10133	0.10%	0.10%
UL_799-805MHz	P25-C4FM	804.99375	8551	8477	8430	1.43%	0.55%
UL_799-805MHz	P25-C4FM	802	8487	8487	8458	0.34%	0.35%
UL_799-805MHz	P25-C4FM	799.00625	8486	8595	8486	0.00%	1.29%
UL_788-798MHz	SC-FMDA	790.5	4510000	4517900	4518100	0.18%	0.00%
UL_788-798MHz	SC-FMDA	793	4498000	4510700	4514300	0.36%	0.08%
UL_788-798MHz	SC-FMDA	795.5	4515200	4519000	4513700	0.03%	0.12%
DL_851-861MHz	P25-C4FM	860.975	8423	8464	8477	0.64%	0.16%
DL_851-861MHz	P25-C4FM	856	8431	8430	8456	0.30%	0.30%
DL_851-861MHz	P25-C4FM	851.0125	8435	8438	8448	0.16%	0.13%
DL_851-861MHz	FM	860.975	10123	10123	10149	0.26%	0.26%
DL_851-861MHz	FM	856	10109	10109	10125	0.16%	0.17%
DL_851-861MHz	FM	851.0125	10121	10122	10140	0.19%	0.18%
DL_769-775MHz	P25-C4FM	774.99375	8464	8464	8440	0.29%	0.28%
DL_769-775MHz	P25-C4FM	772	8486	8464	8422	0.76%	0.49%
DL_769-775MHz	P25-C4FM	769.00625	8536	8564	8572	0.42%	0.09%
DL_758-768MHz	OFMA	760.5	4514900	4511200	4522200	0.16%	0.24%
DL_758-768MHz	OFMA	763	4548900	4537900	4508800	0.89%	0.65%
DL_758-768MHz	OFMA	765.5	4472200	4475700	4515700	0.96%	0.89%

Plots



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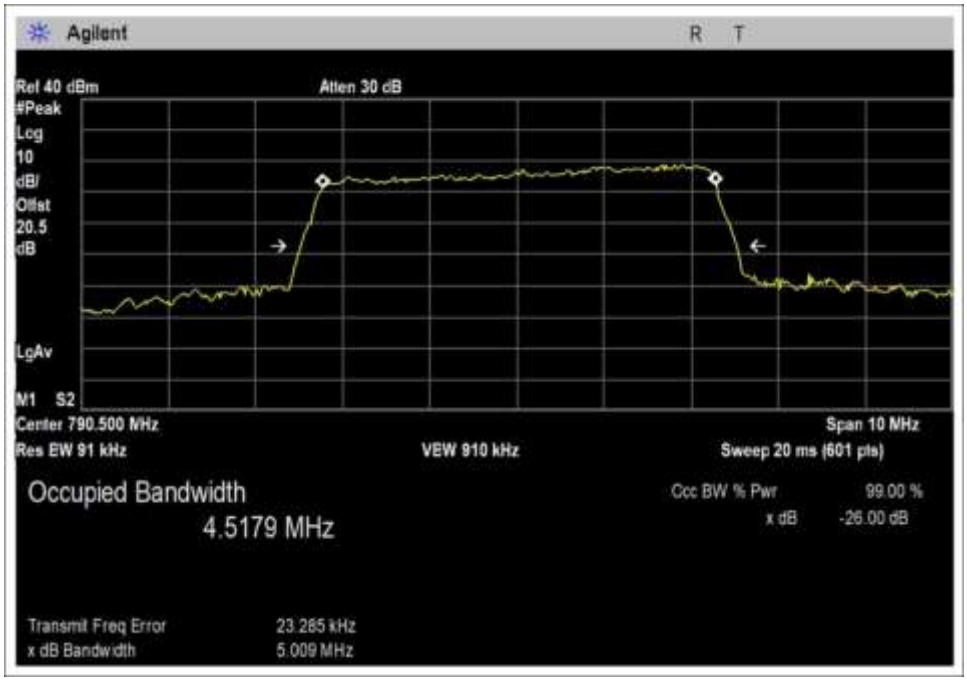

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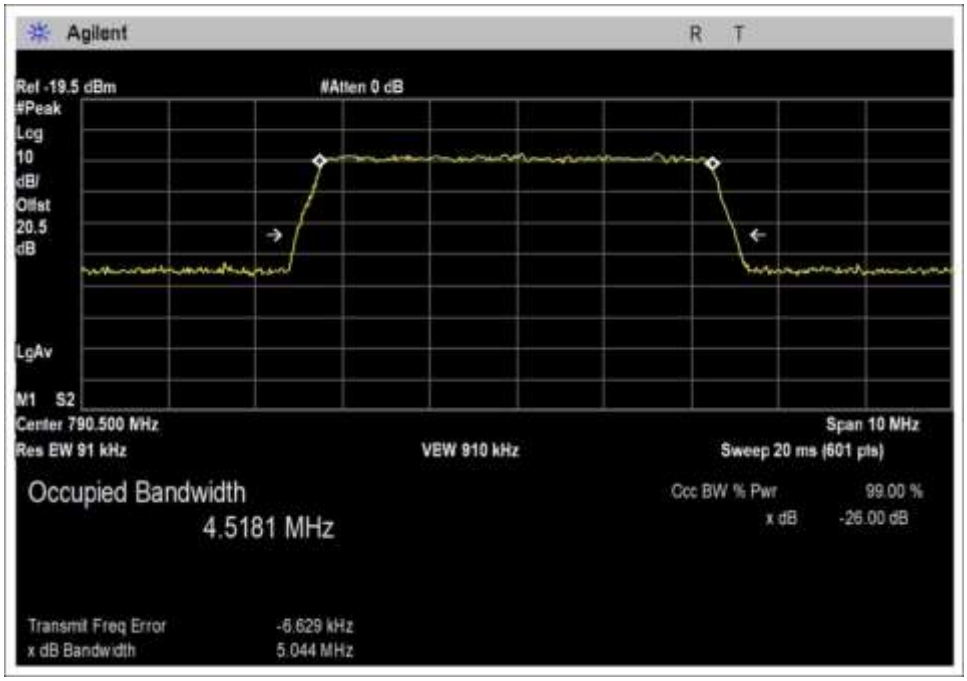

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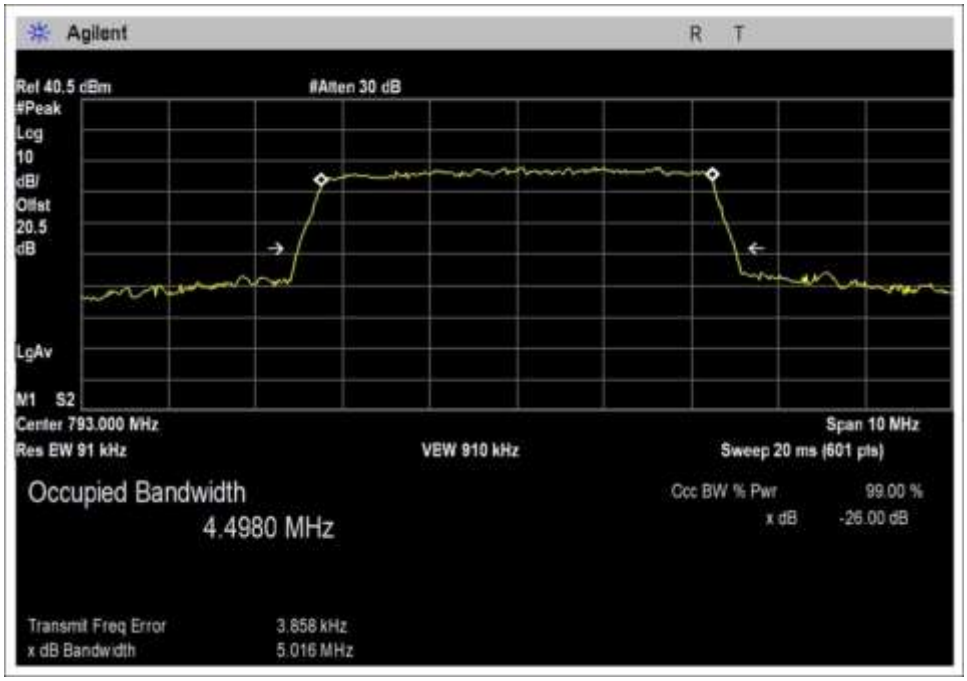

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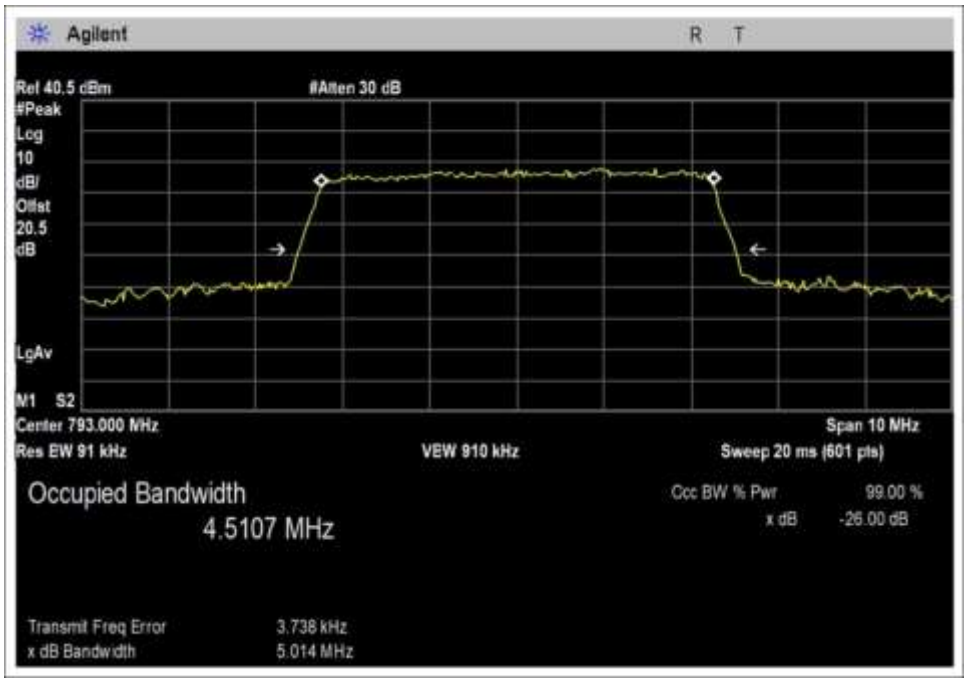

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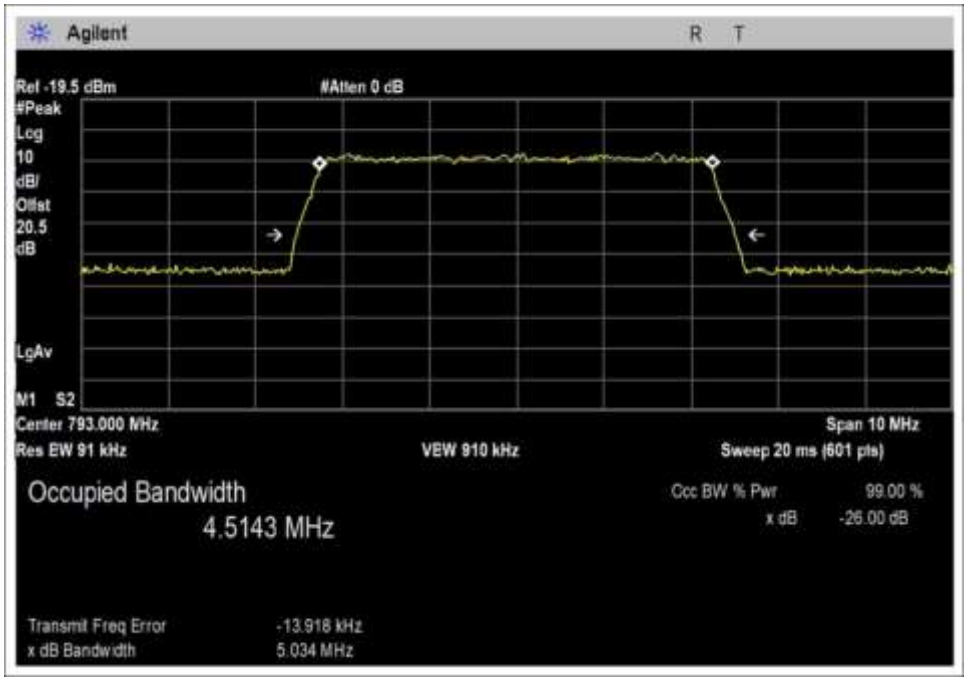

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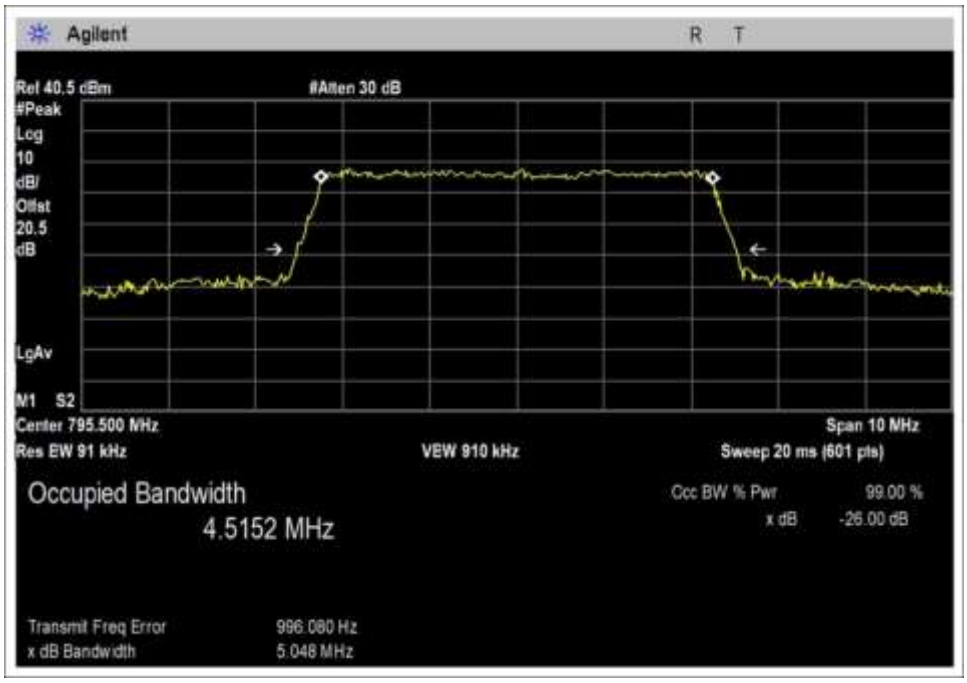

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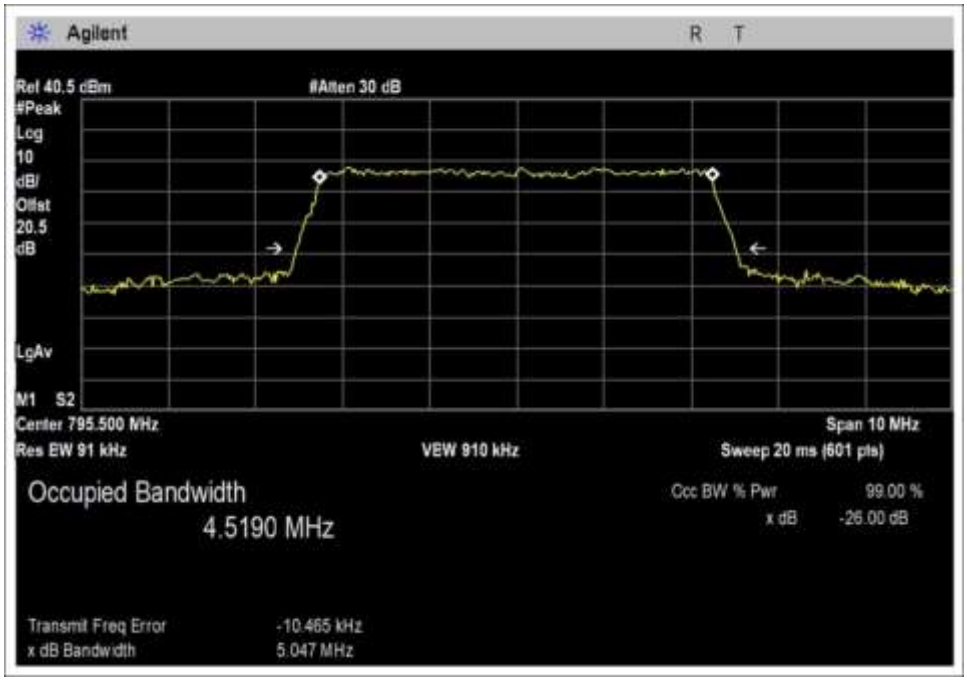

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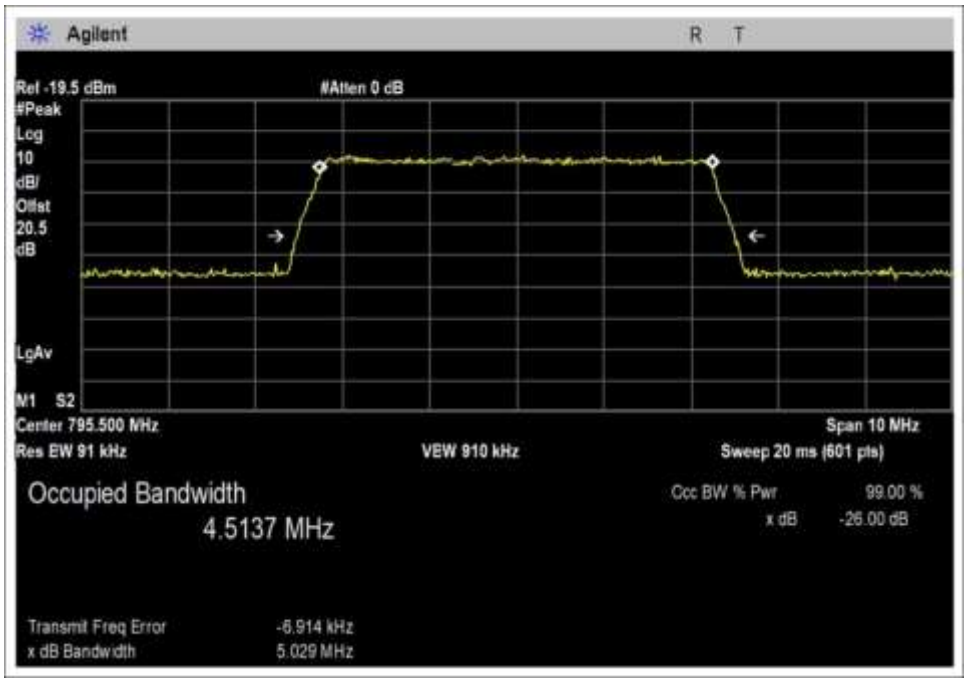

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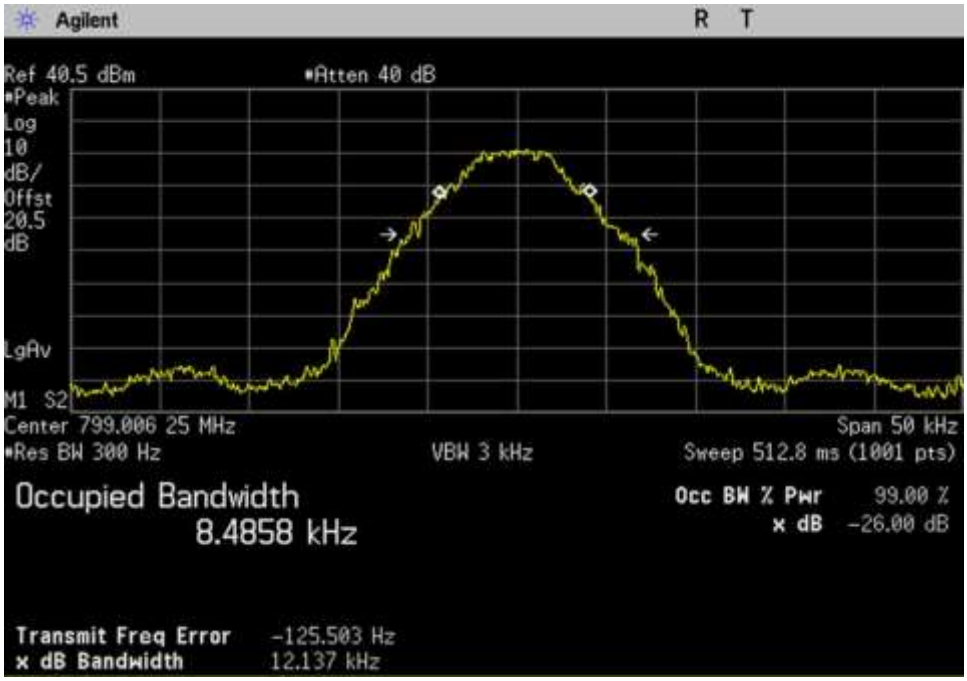

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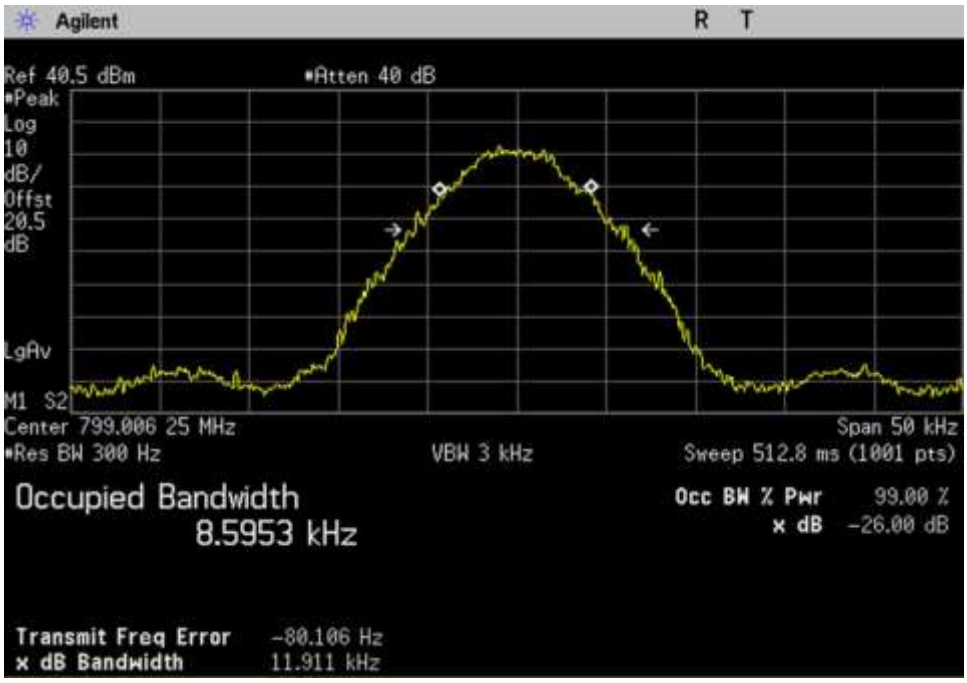

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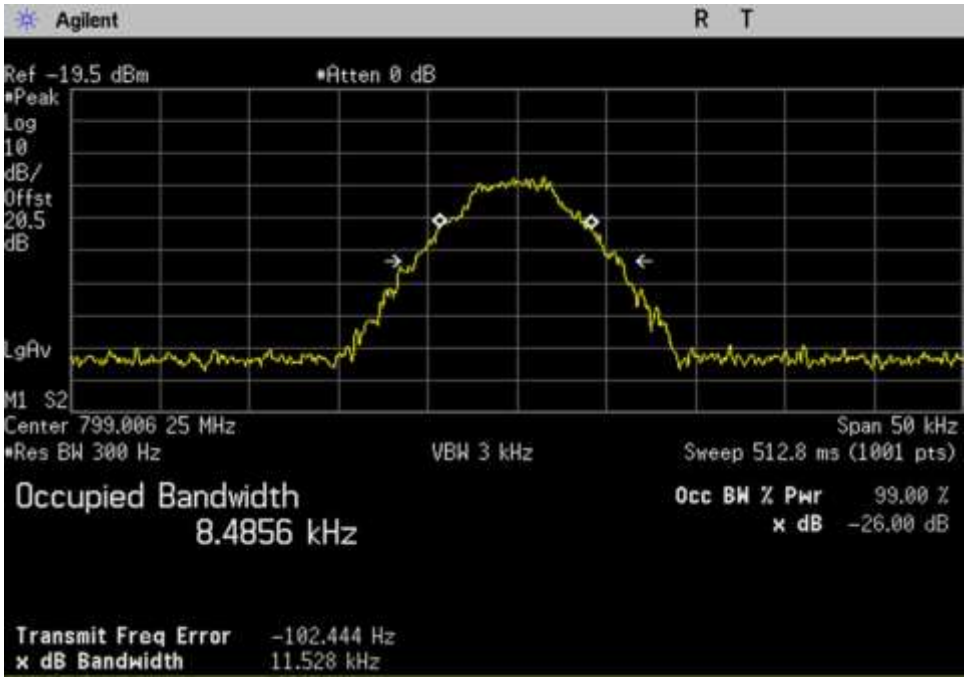

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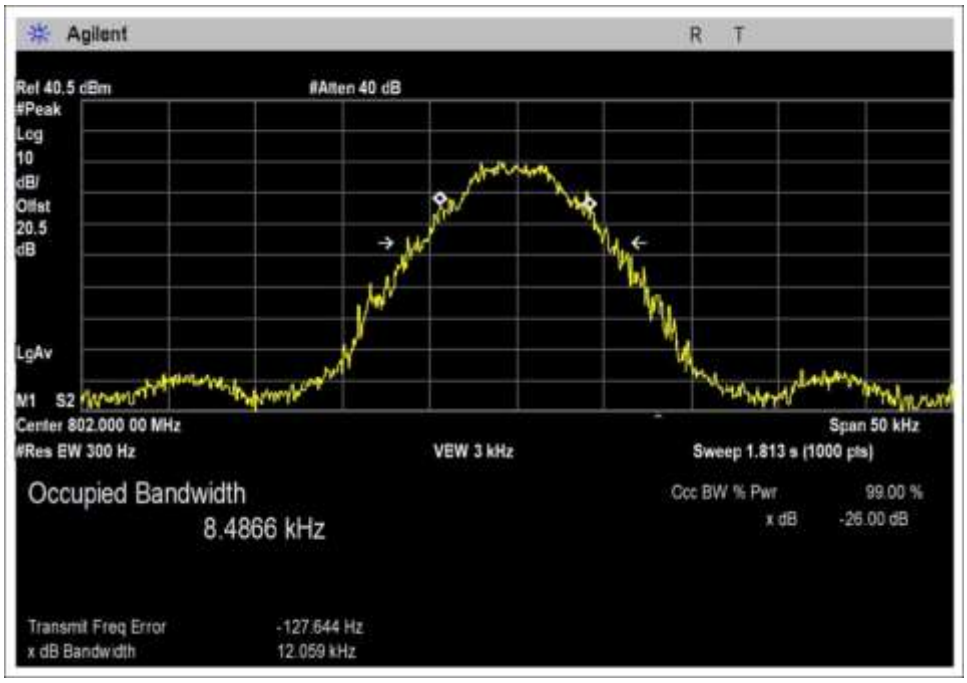

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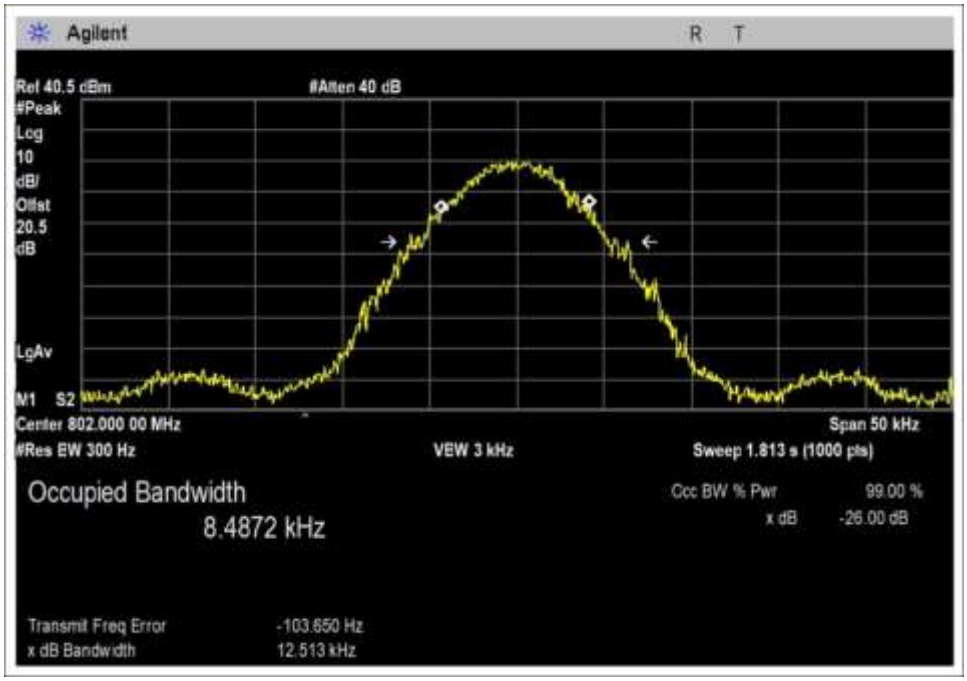

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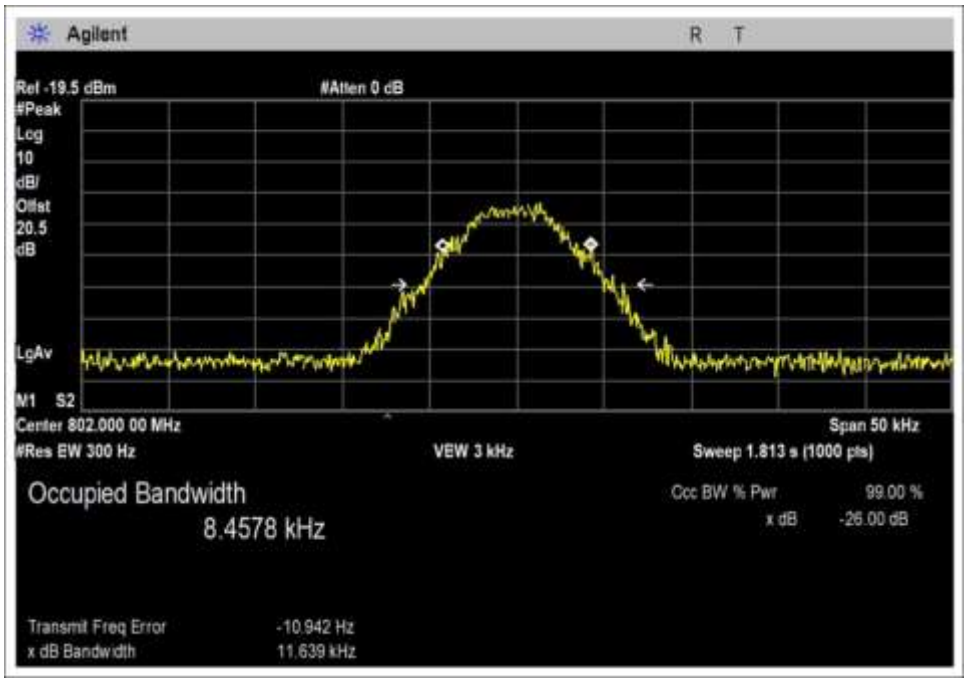

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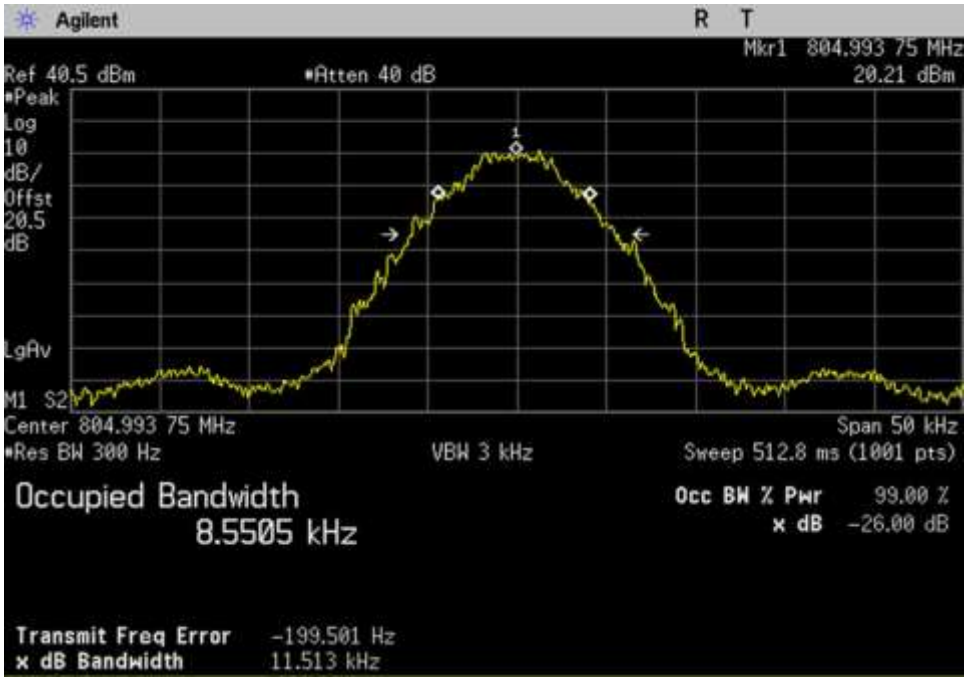

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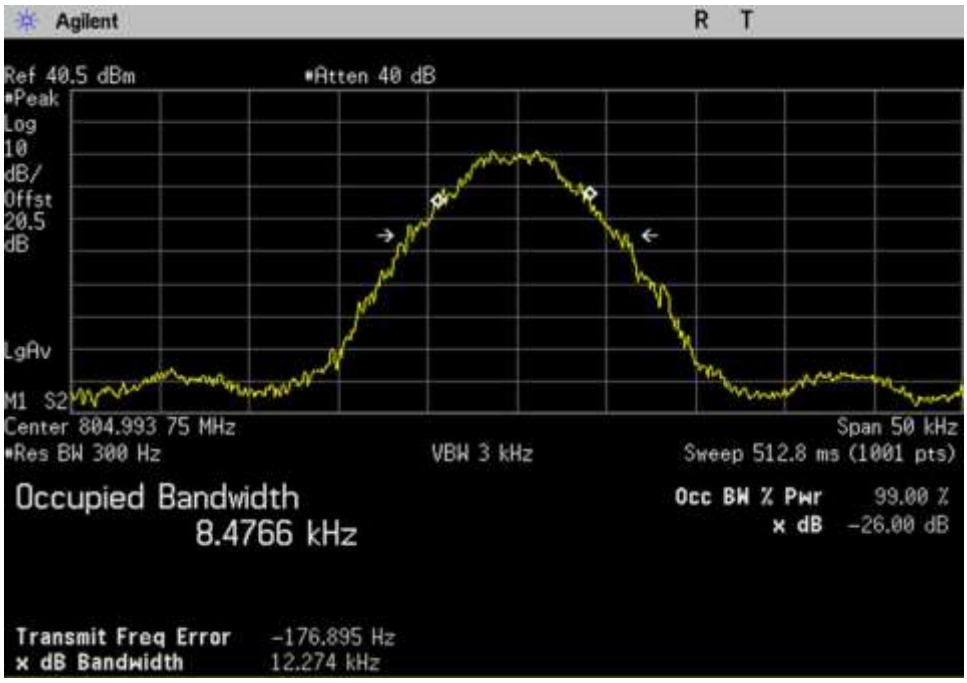

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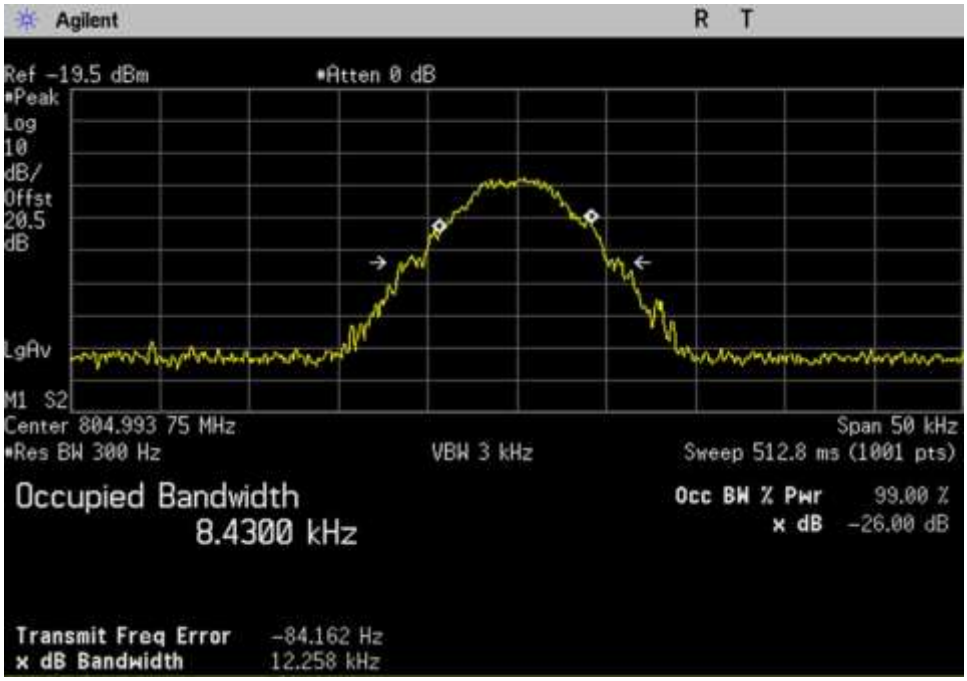

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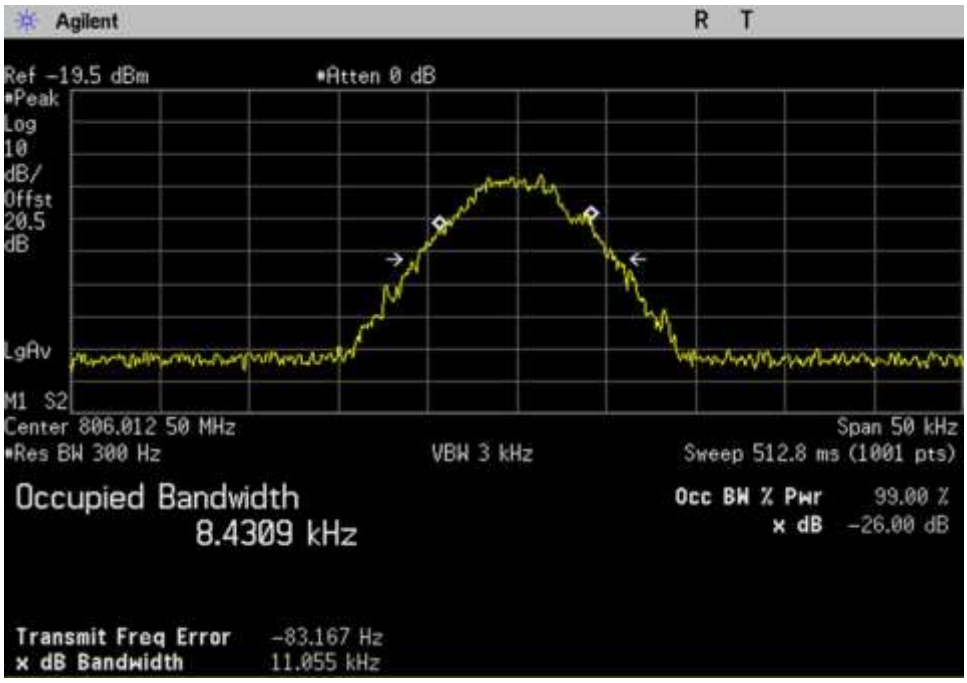

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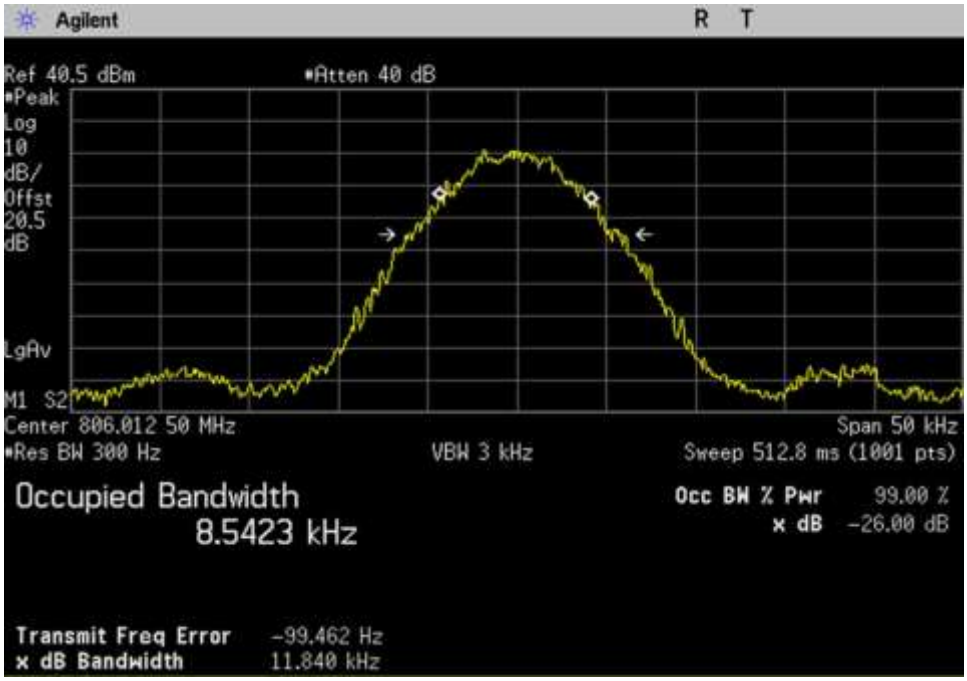

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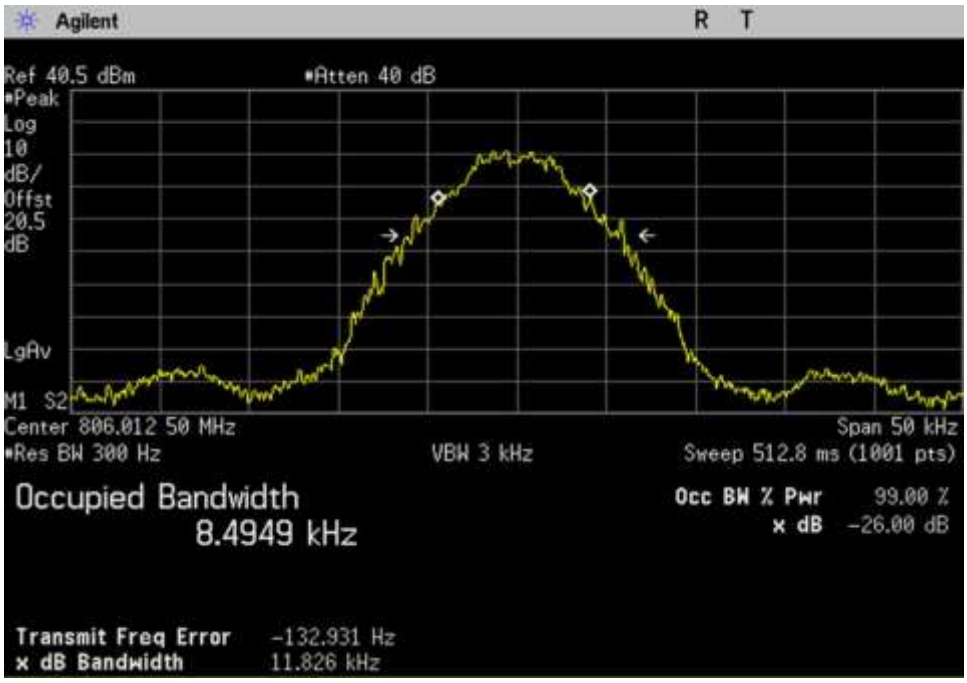

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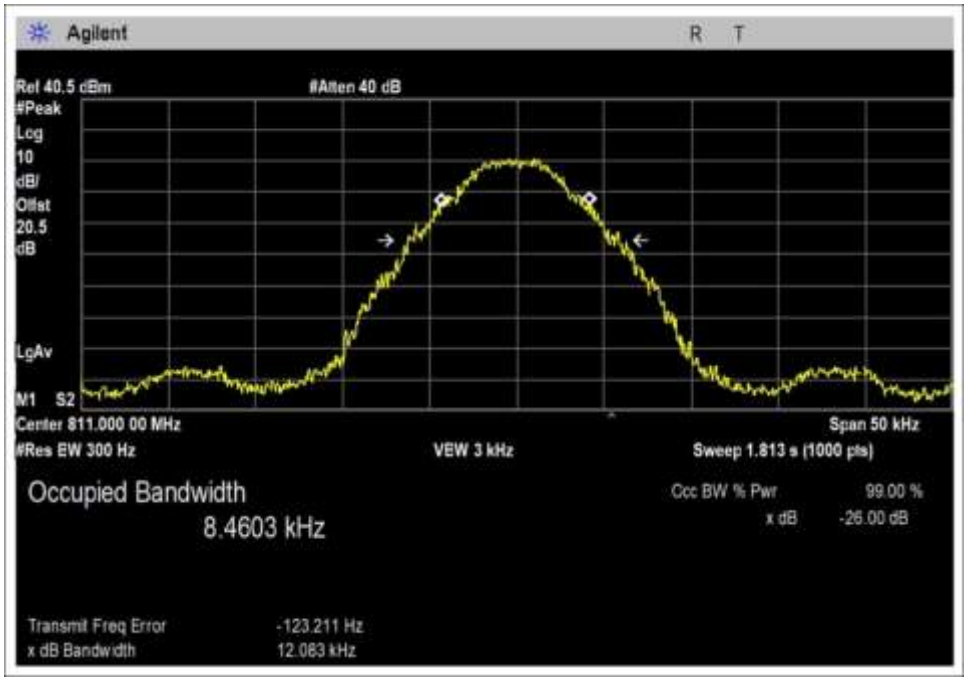

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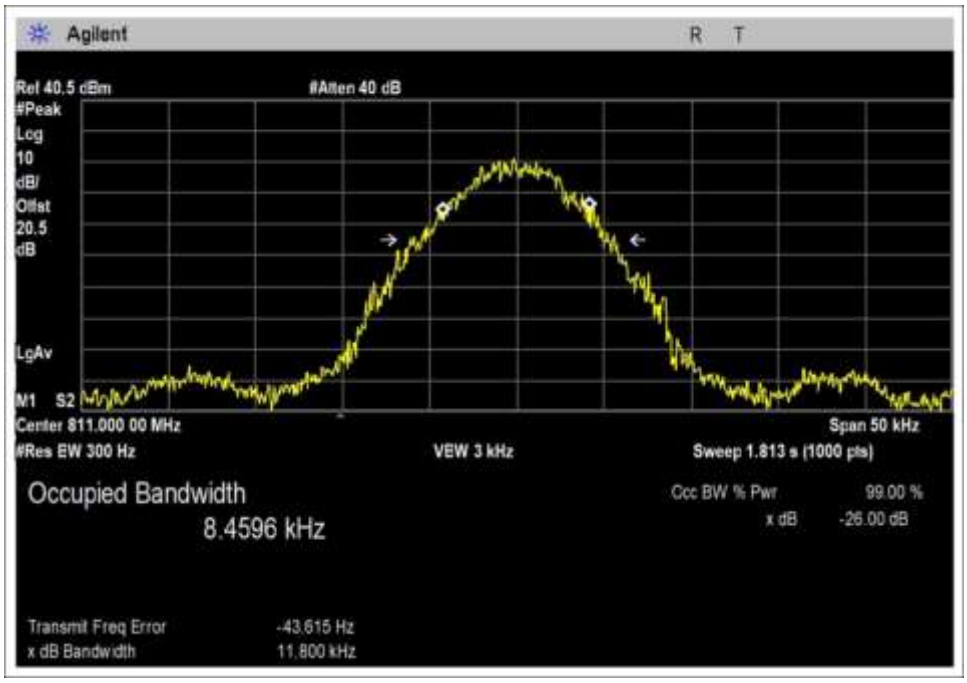

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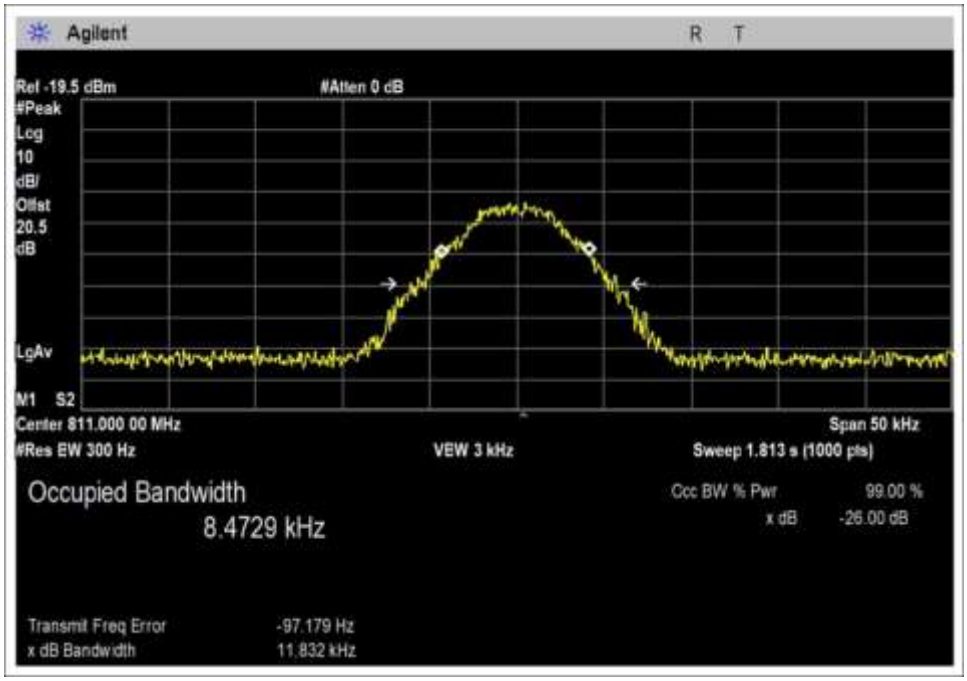

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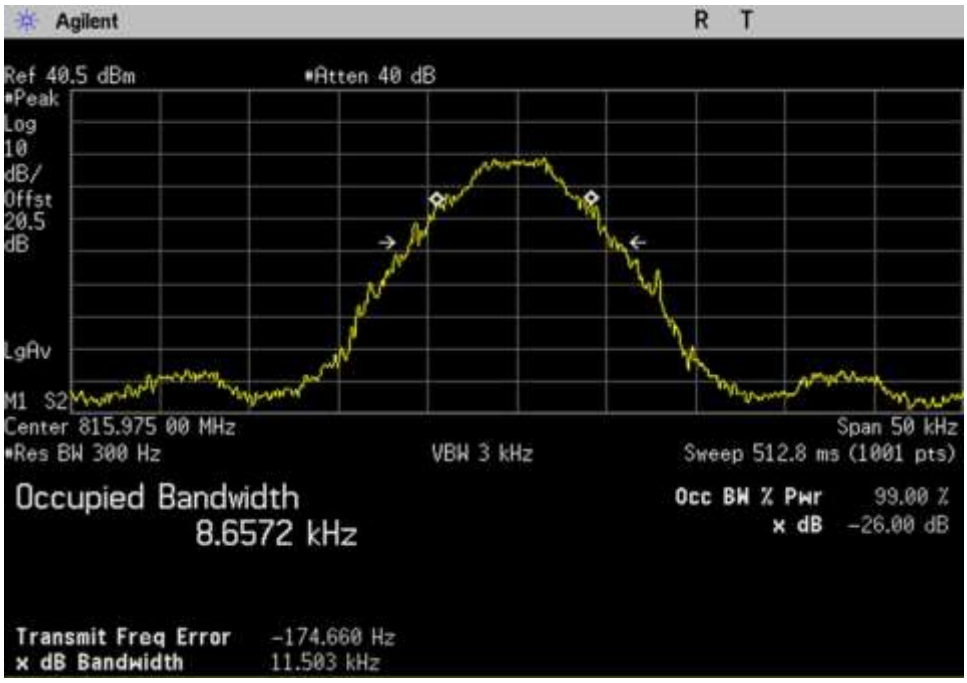

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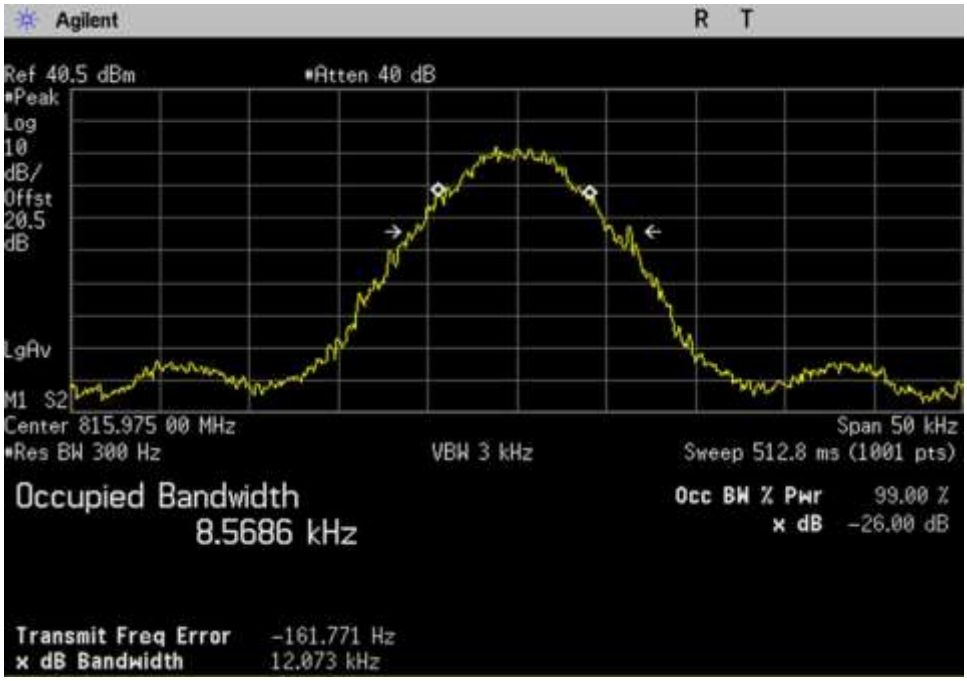

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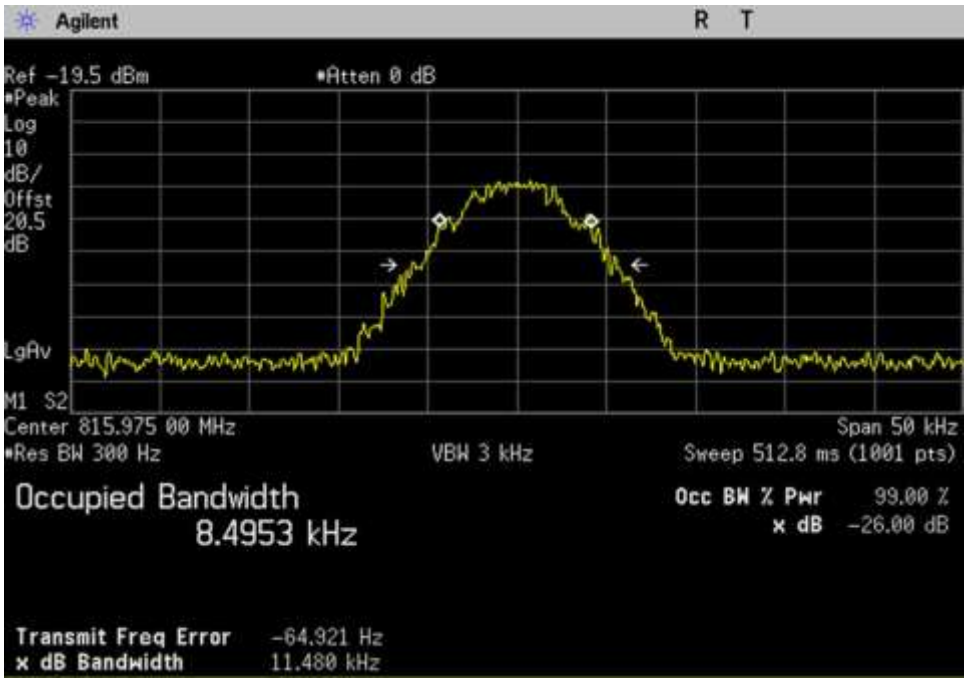

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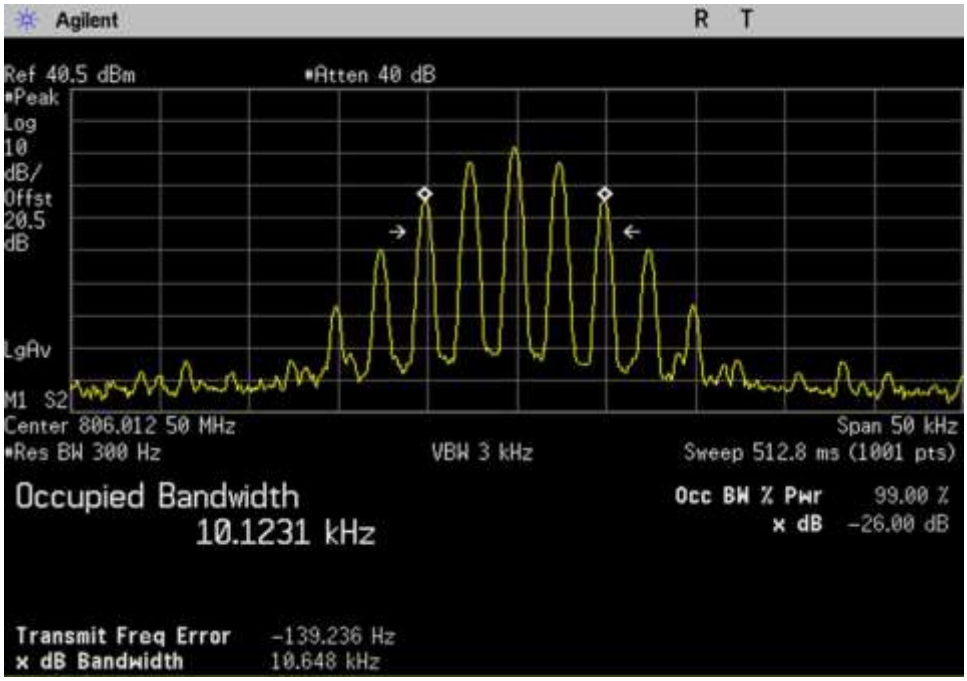

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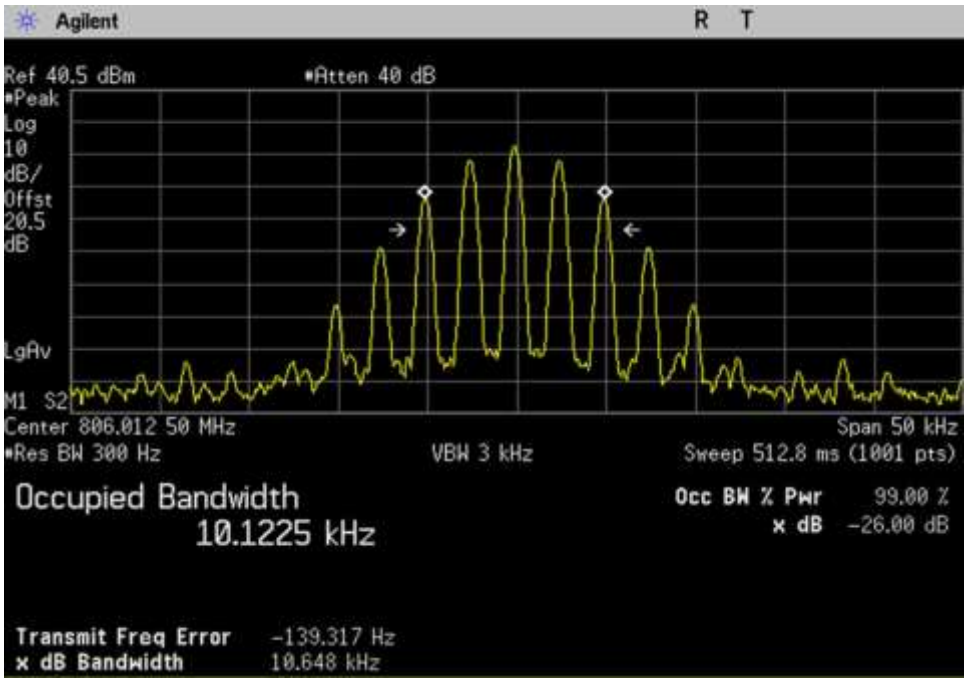

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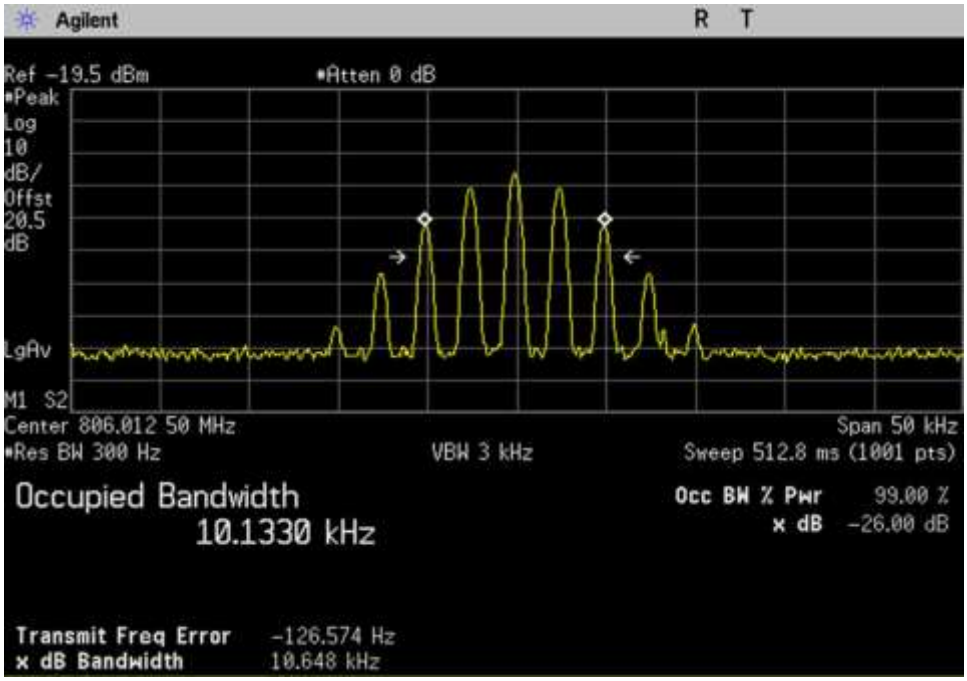

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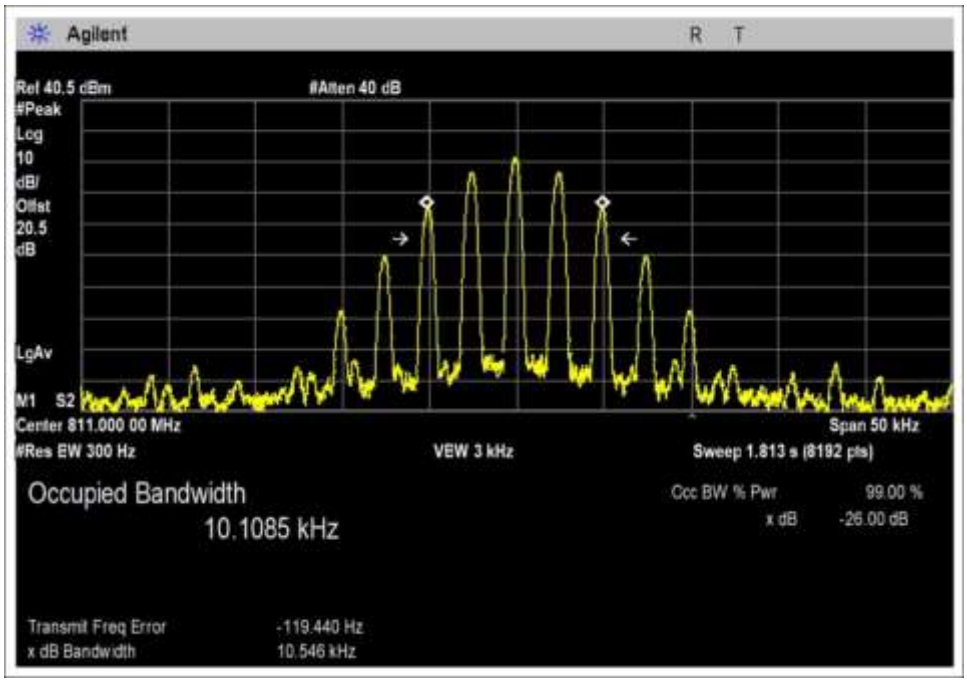

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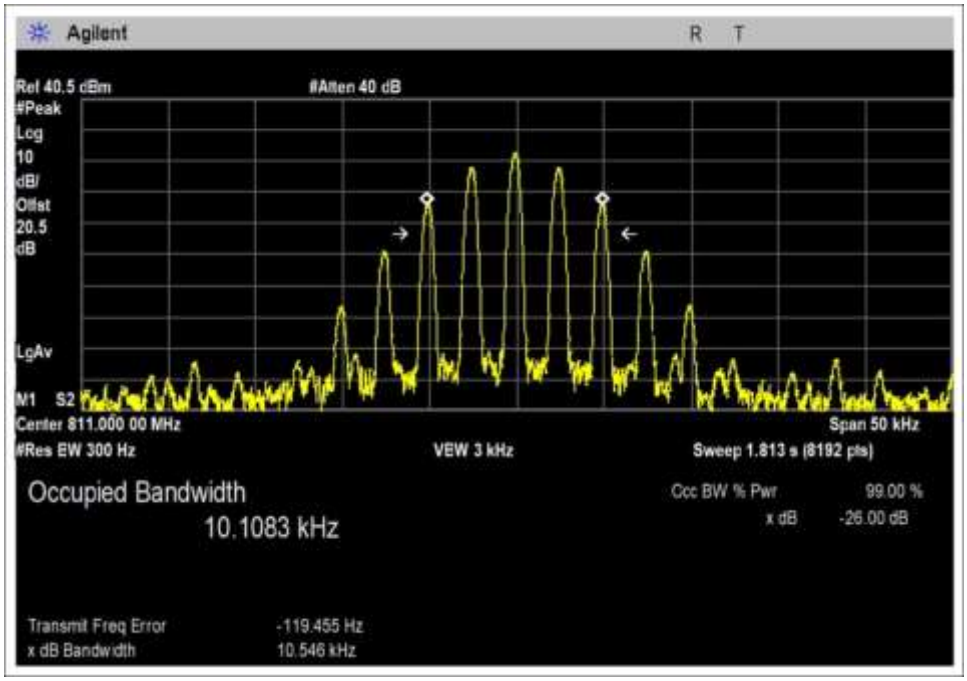

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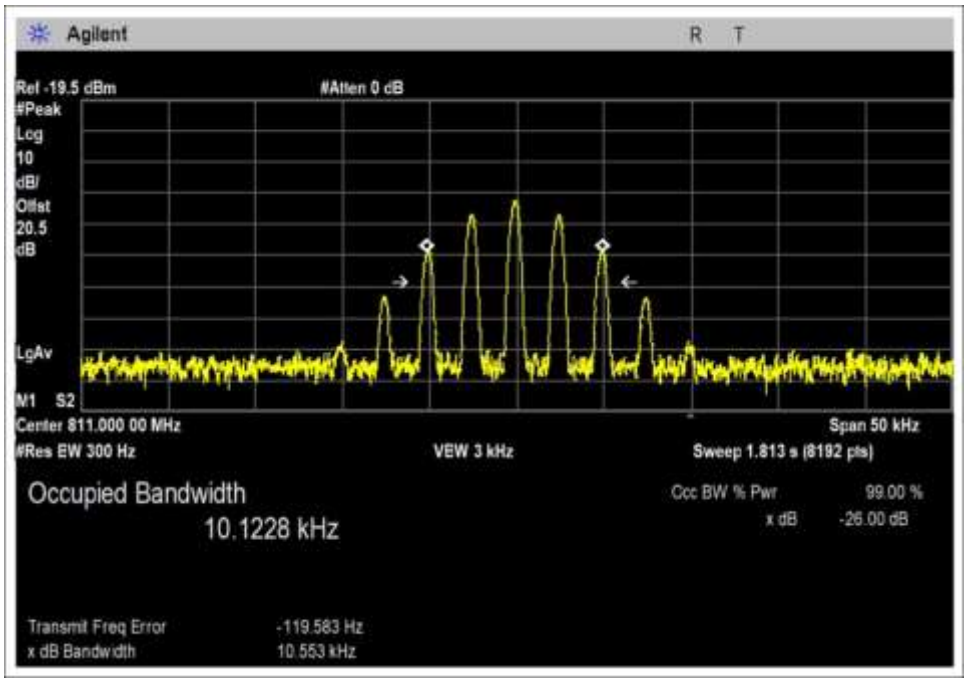

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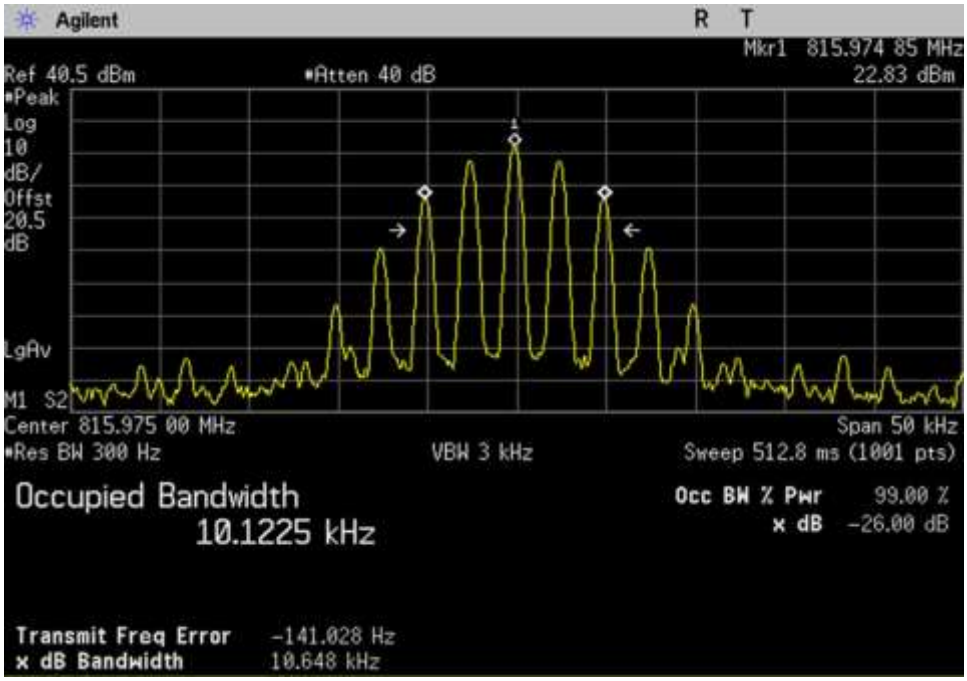
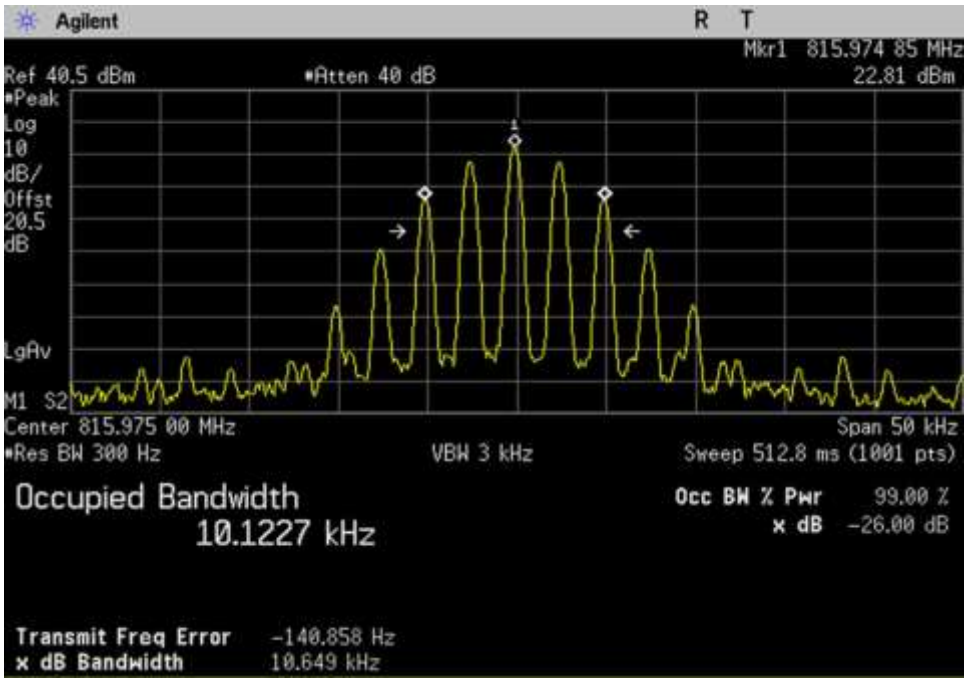
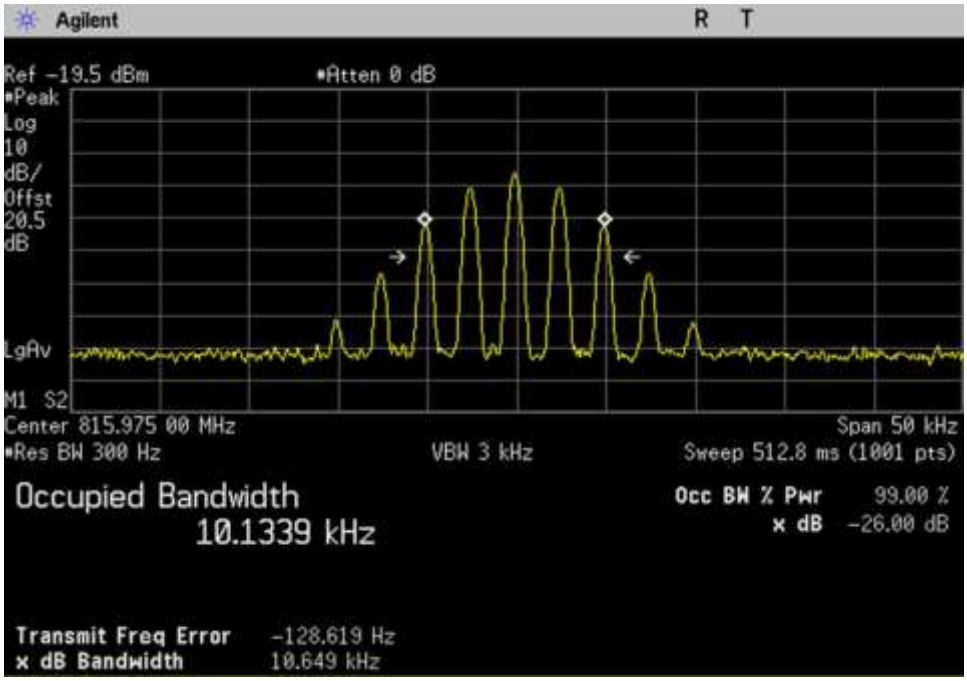


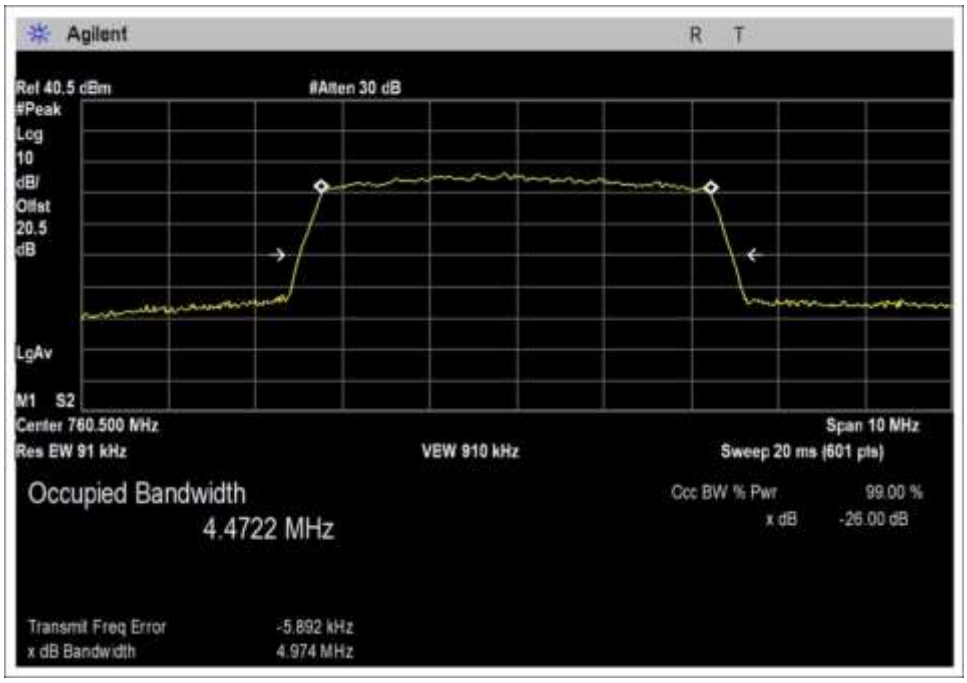
OBW_UL_806-816-FM_ 815.975MHz_HC-AGC



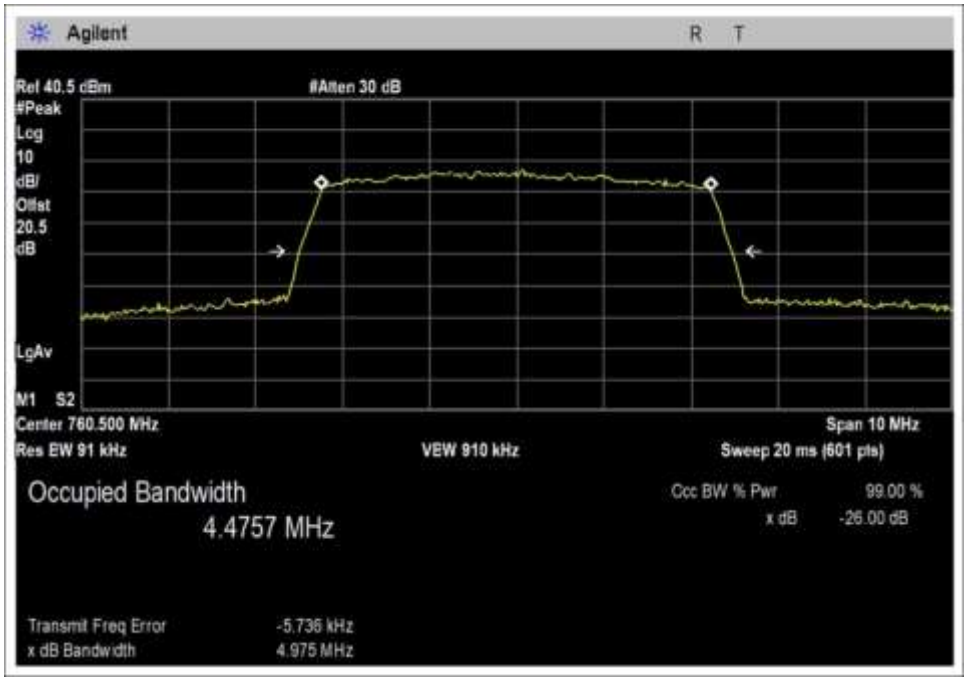
OBW_UL_806-816-FM_ 815.975MHz_HC-AGC+3



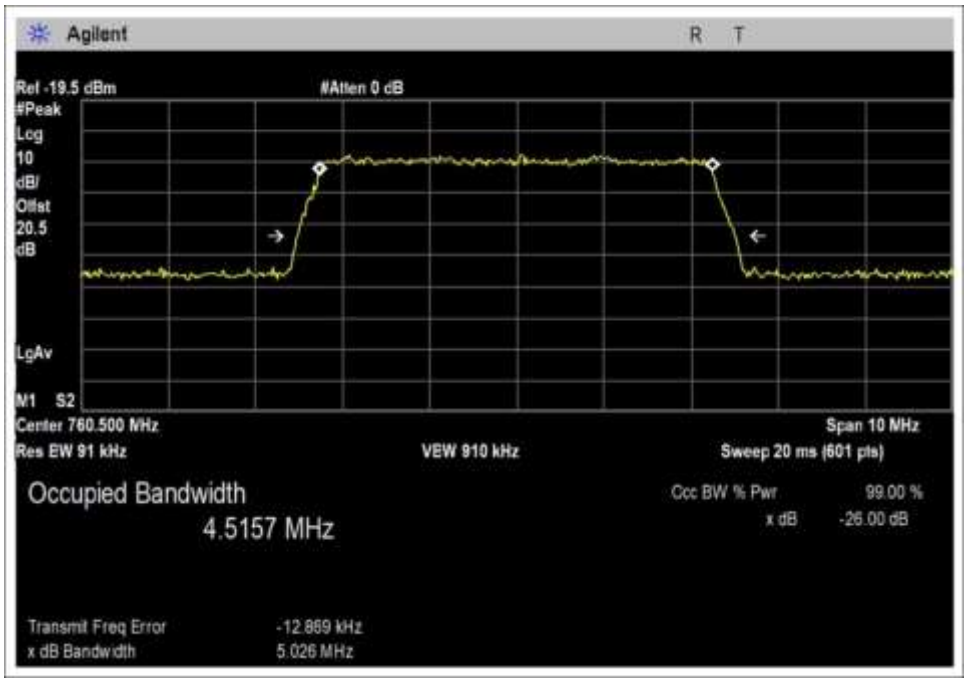
OBW_UL_806-816-FM_ 815.975MHz_HC-Input



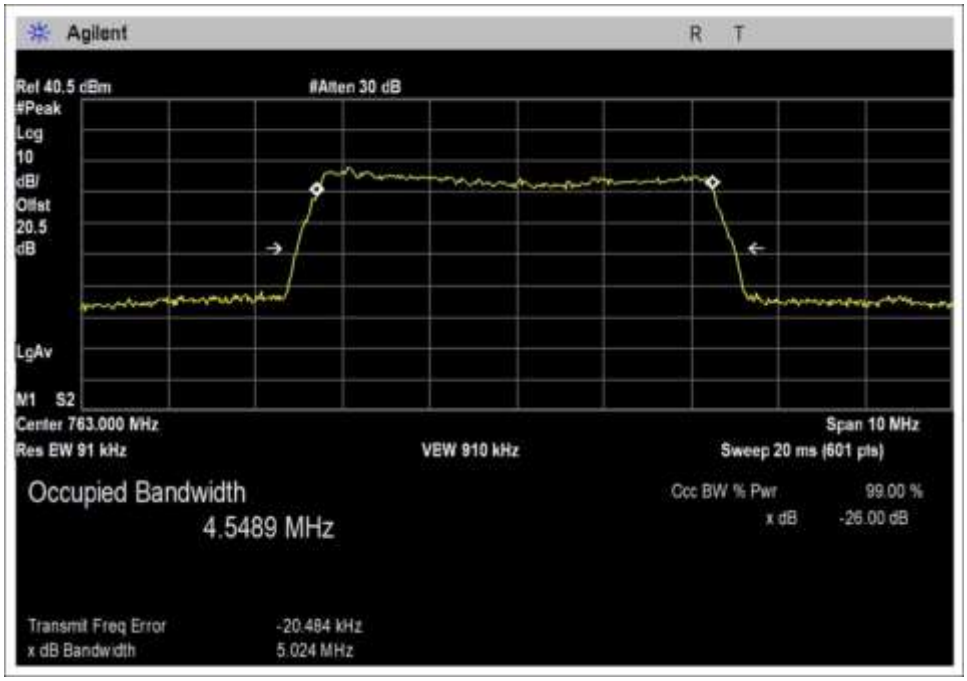
OBW_DL_758-768_ 760.5MHz_LC+AGC



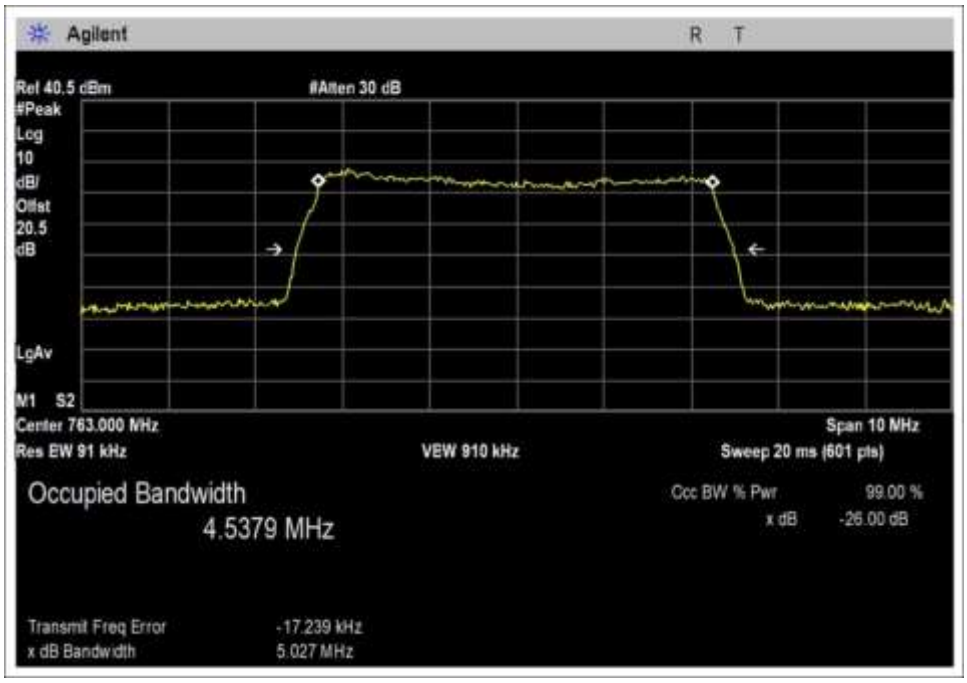
OBW_DL_758-768_ 760.5MHz_LC-AGC+3



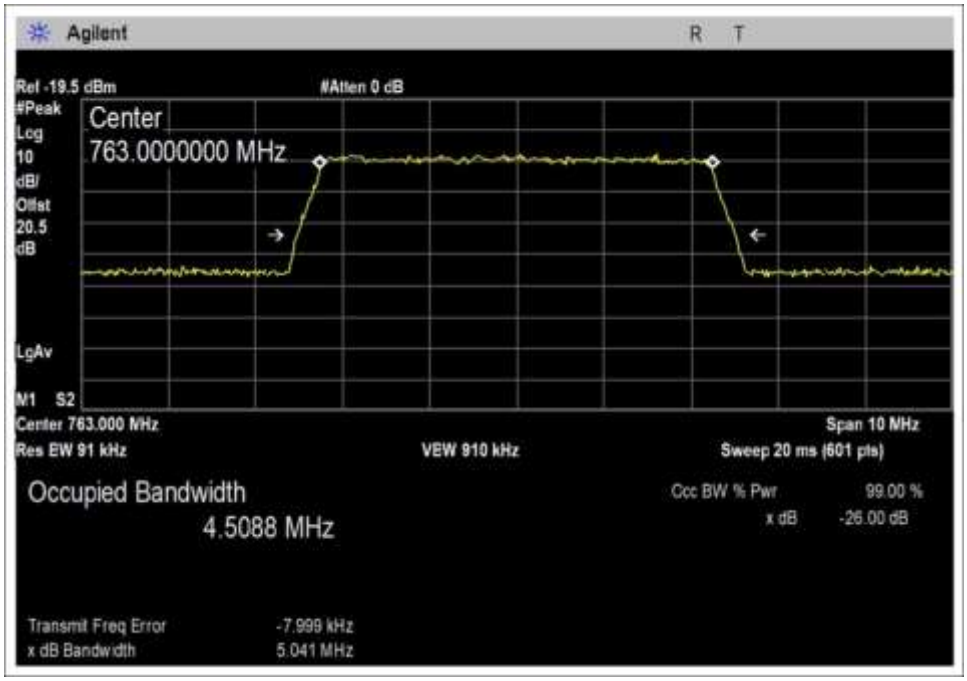
OBW_DL_758-768_ 760.5MHz_LC-Input



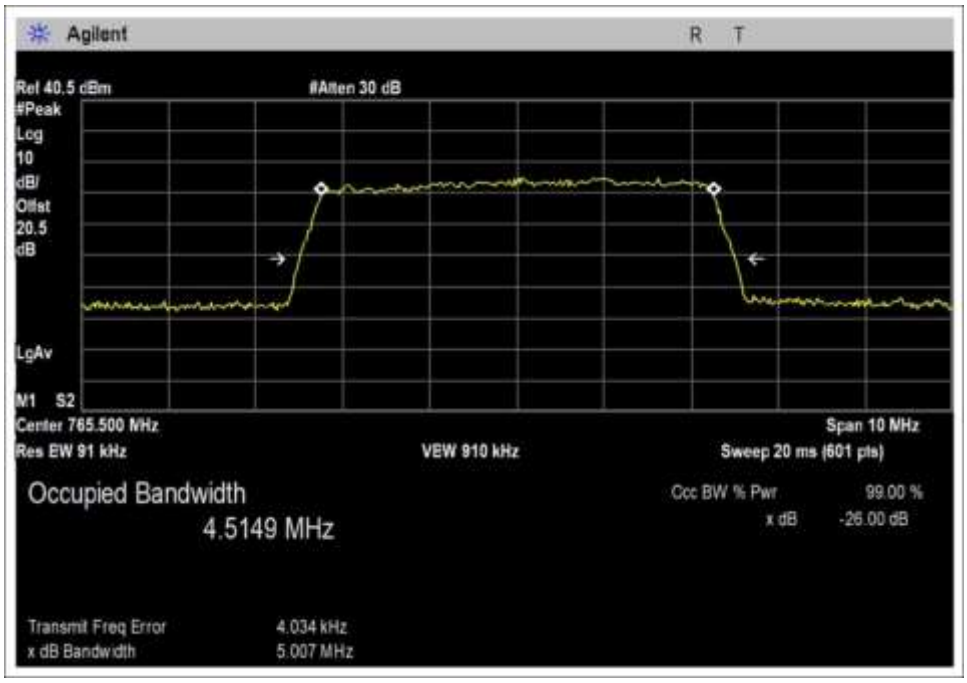
OBW_DL_758-768_ 763MHz_MC-AGC



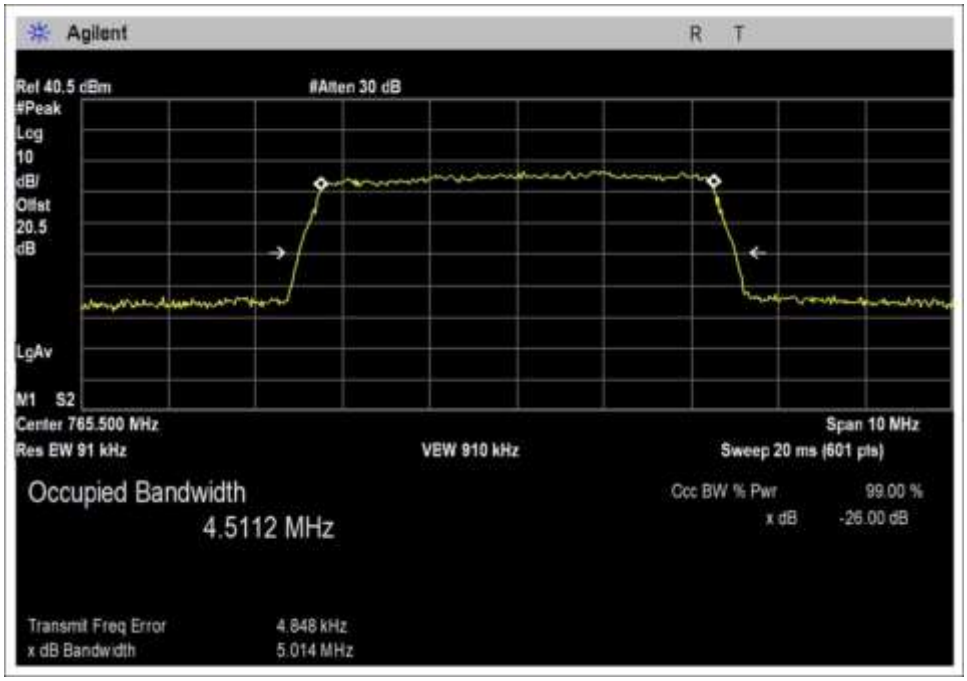
OBW_DL_758-768_ 763MHz_MC-AGC+3



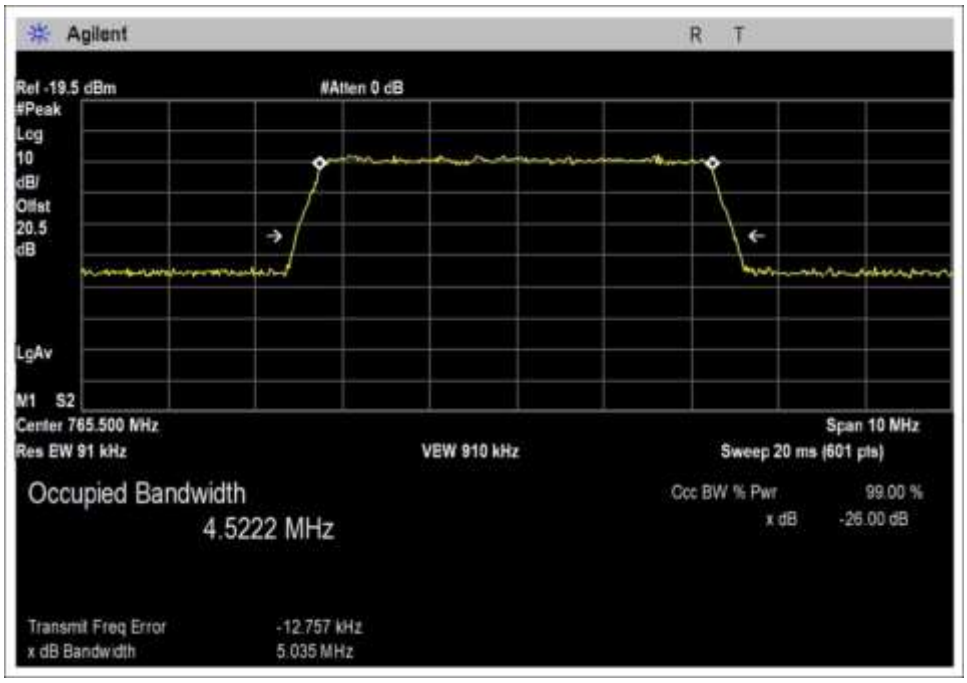
OBW_DL_758-768_ 763MHz_MC-Input



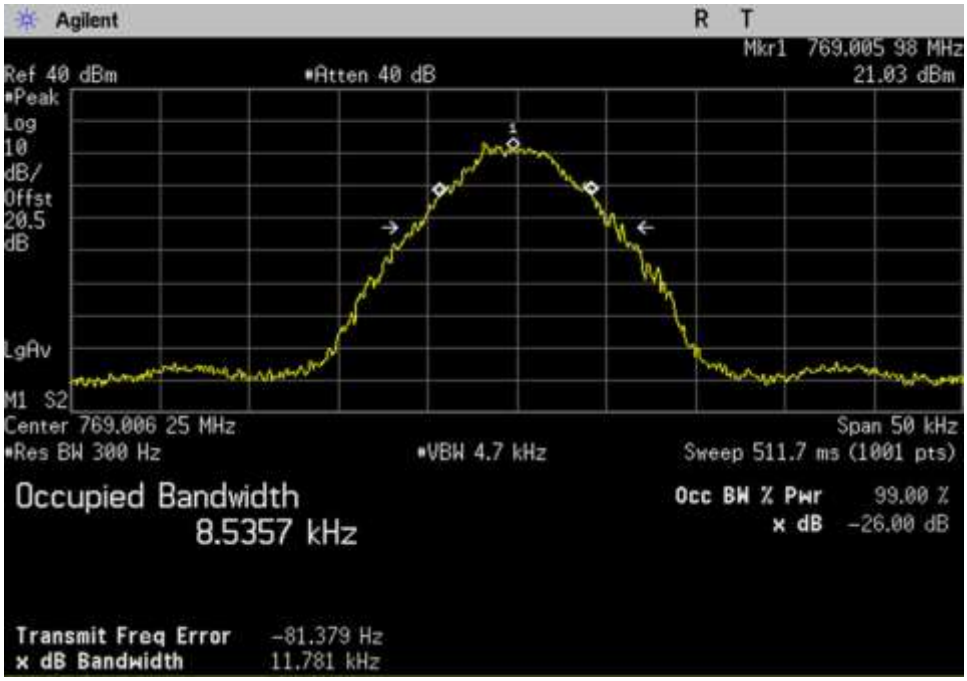
OBW_DL_758-768_ 765.5MHz_HC-AGC



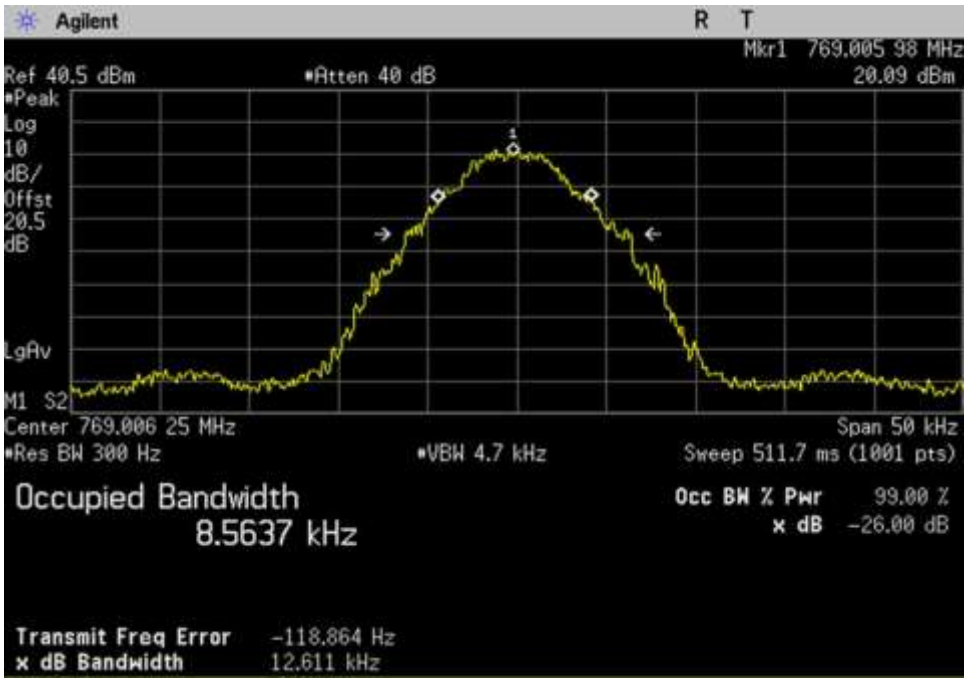
OBW_DL_758-768_ 765.5MHz_HC-AGC+3



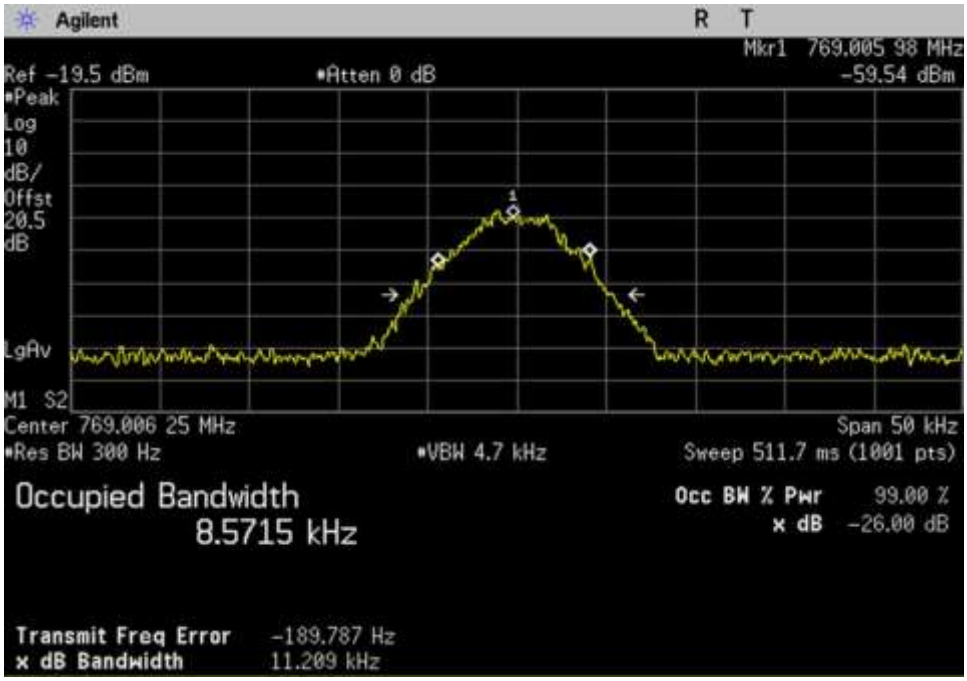
OBW_DL_758-768_ 765.5MHz_HC-Input



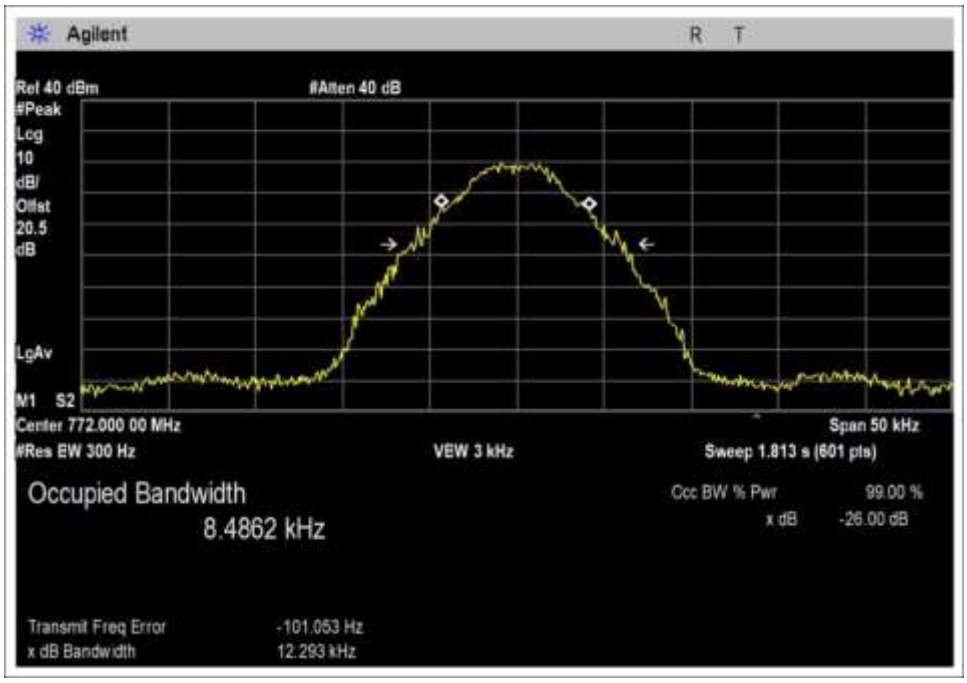
OBW_DL_769-775_ 769.00625MHz_LC-AGC



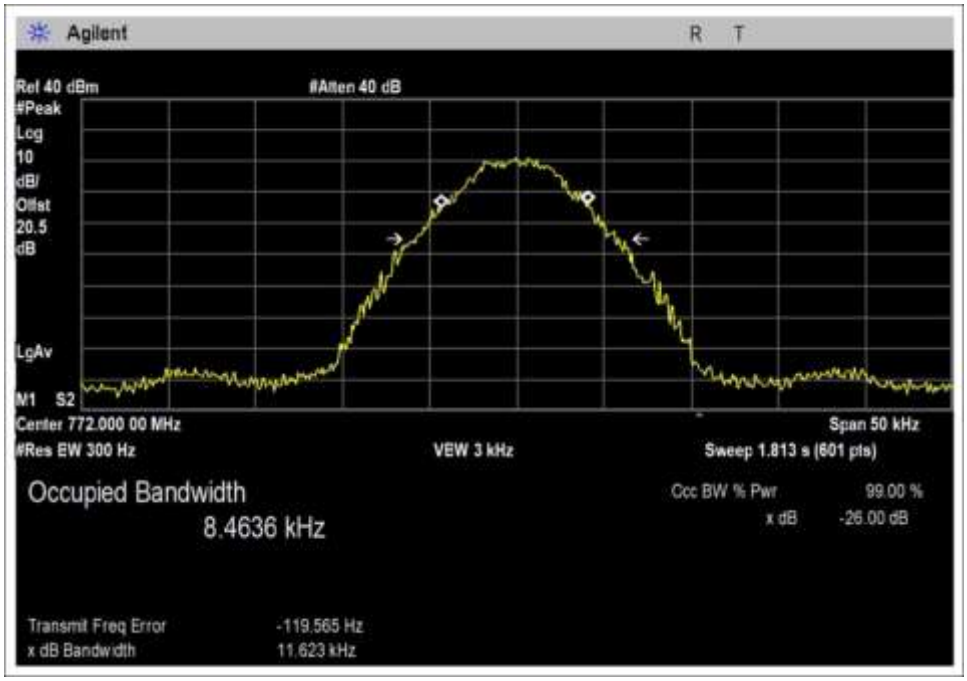
OBW_DL_769-775_ 769.00625MHz_LC-AGC+3



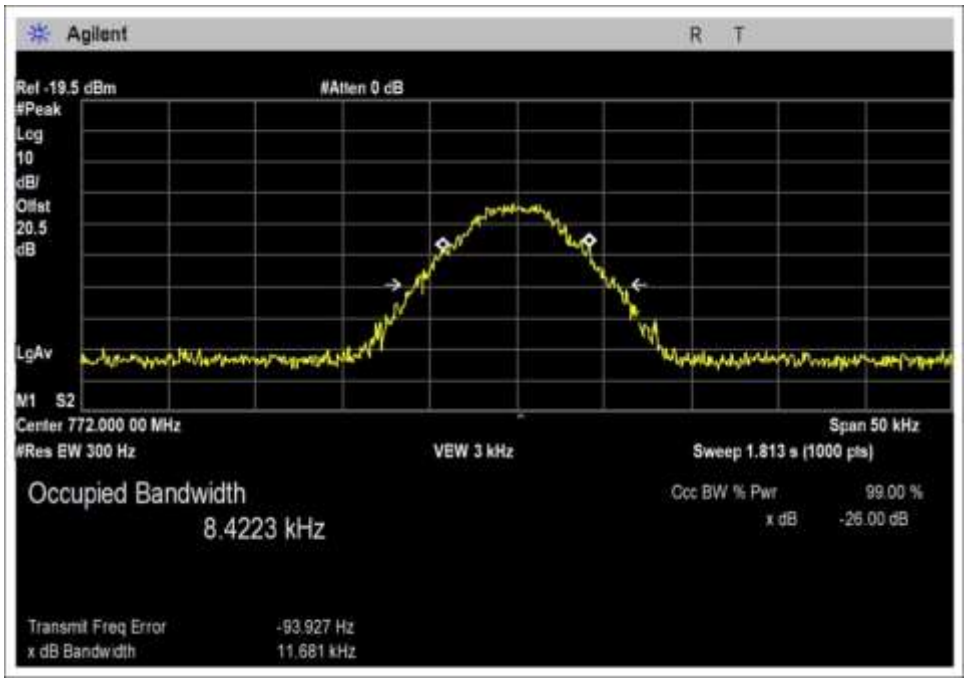
OBW_DL_769-775_ 769.00625MHz_LC-Input



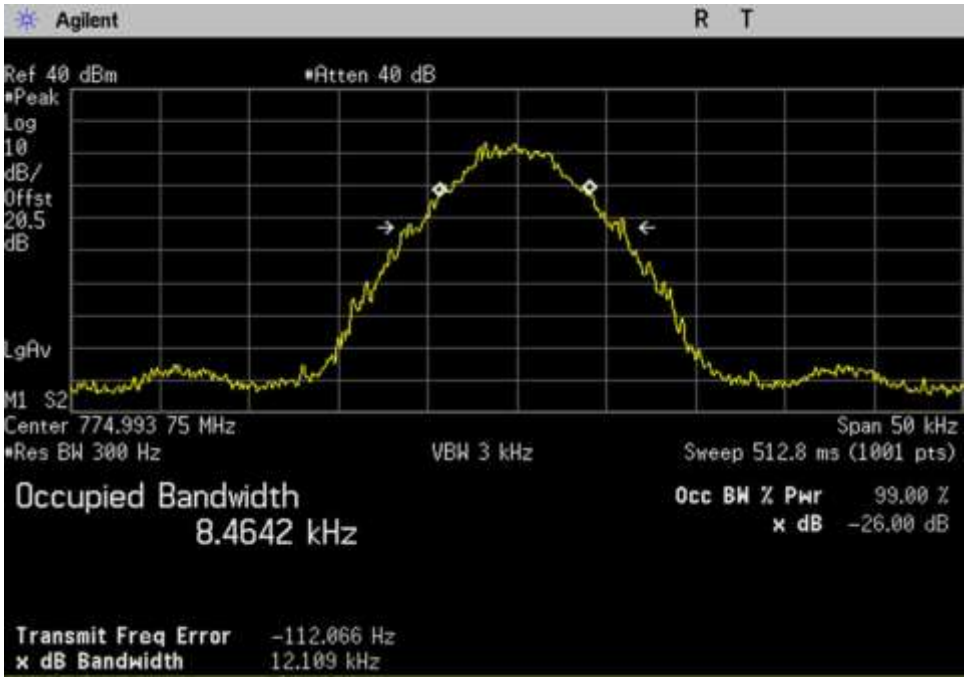
OBW_DL_769-775_ 772MHz_MC-AGC



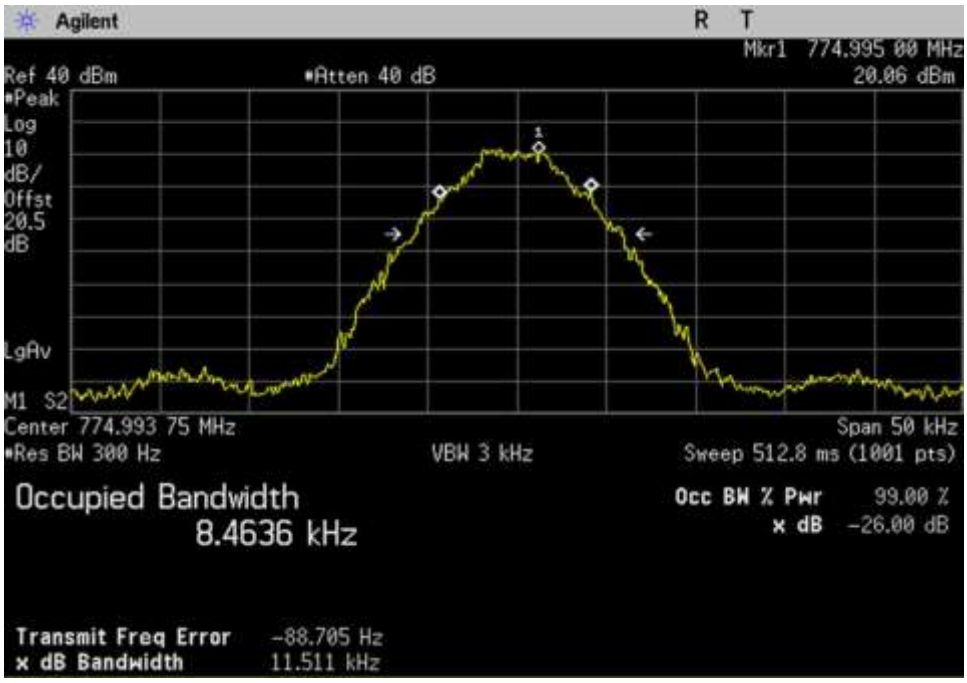
OBW_DL_769-775_ 772MHz_MC-AGC+3



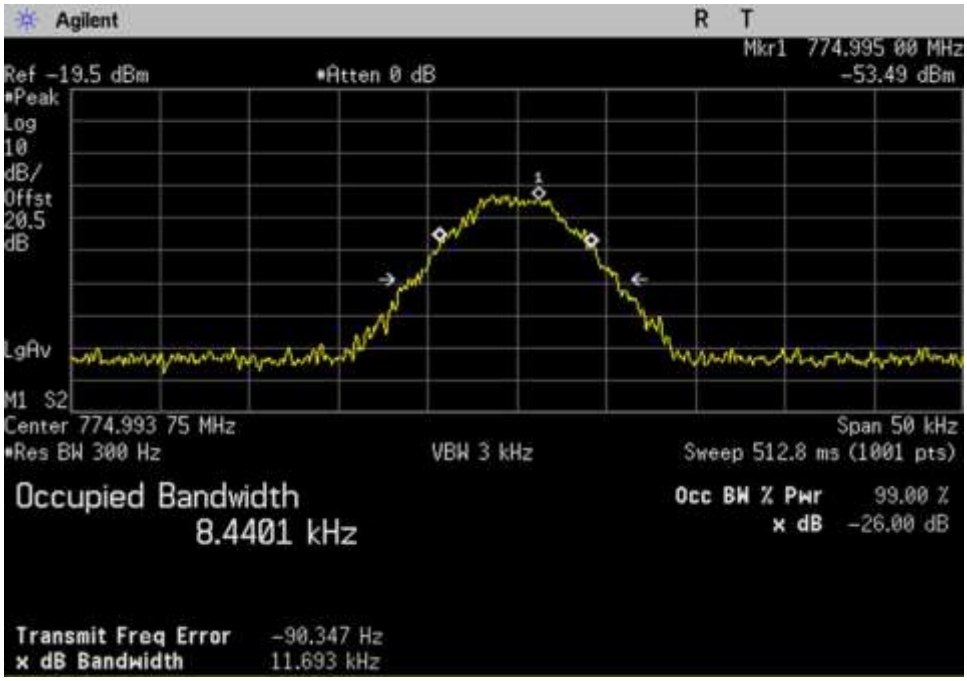
OBW_DL_769-775_ 772MHz_MC-Input



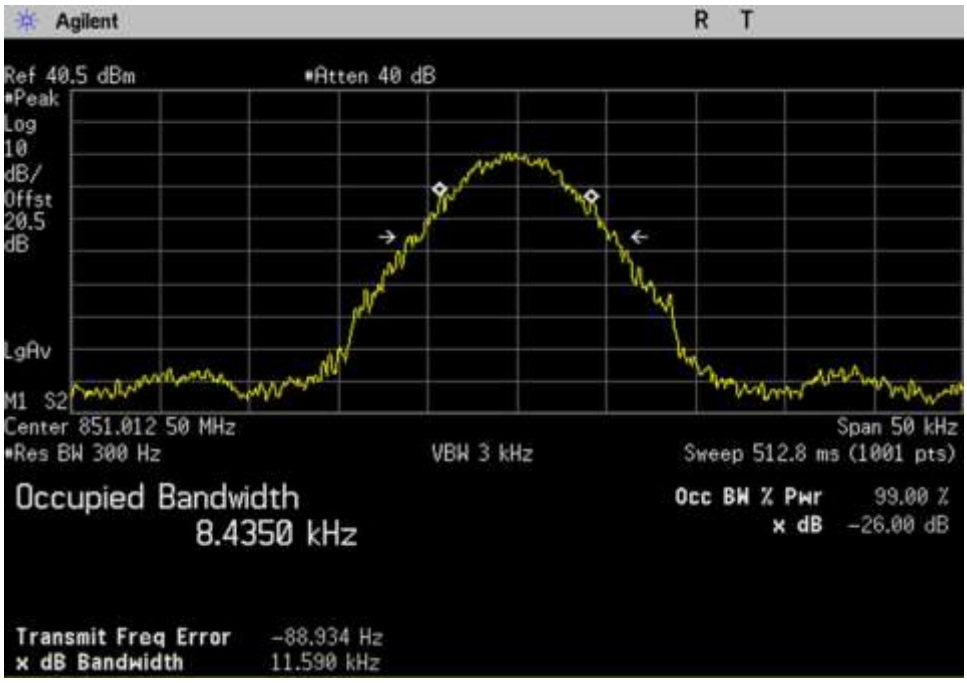
OBW_DL_769-775_ 774.99375MHz_HC-AGC



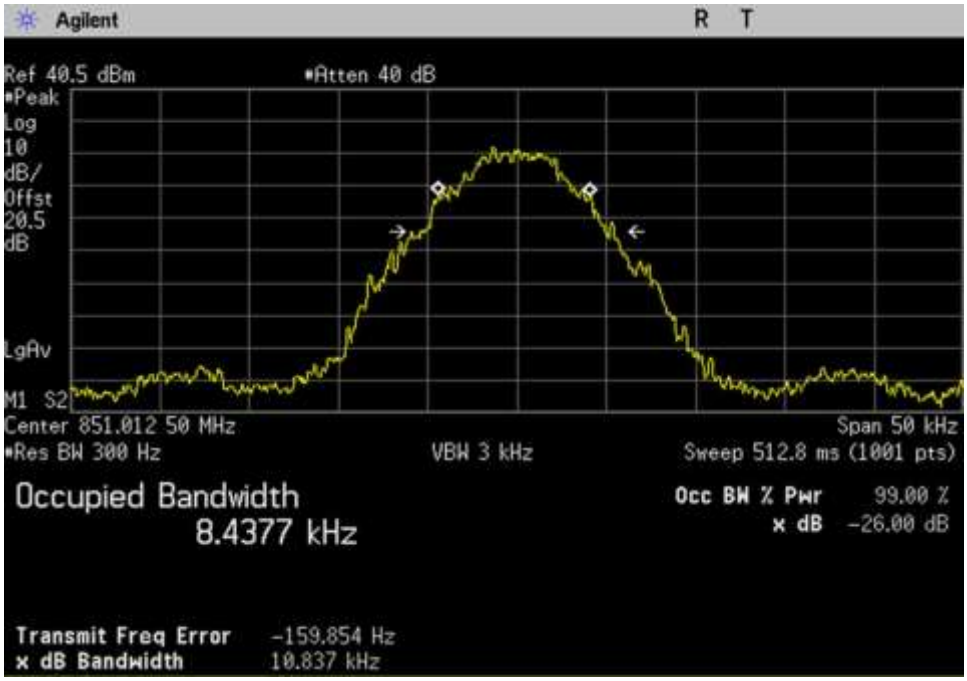
OBW_DL_769-775_ 774.99375MHz_HC-AGC+3



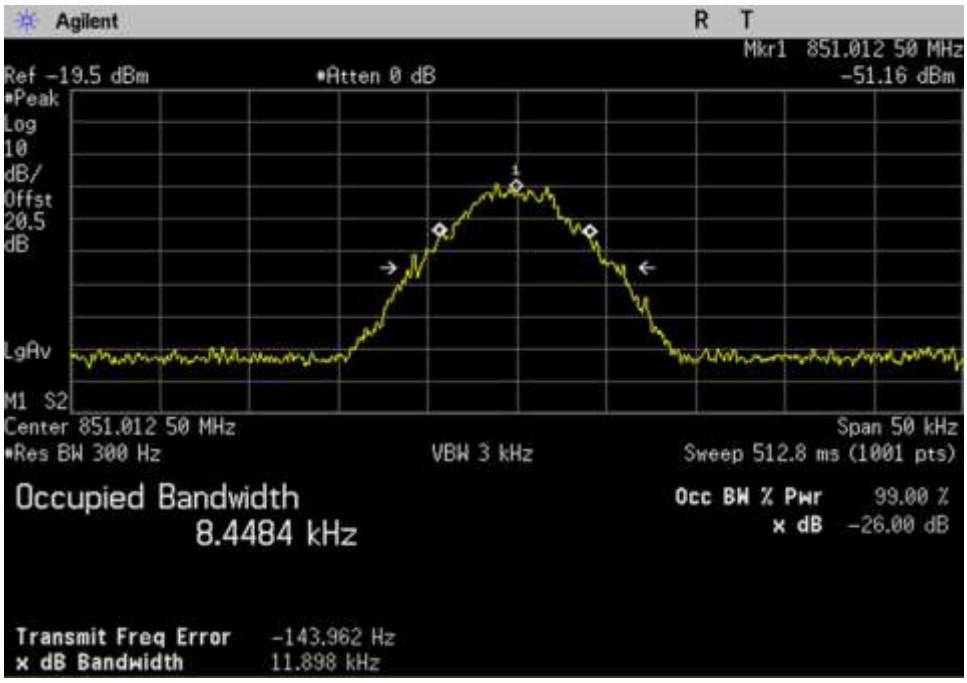
OBW_DL_769-775_ 774.99375MHz_HC-Input



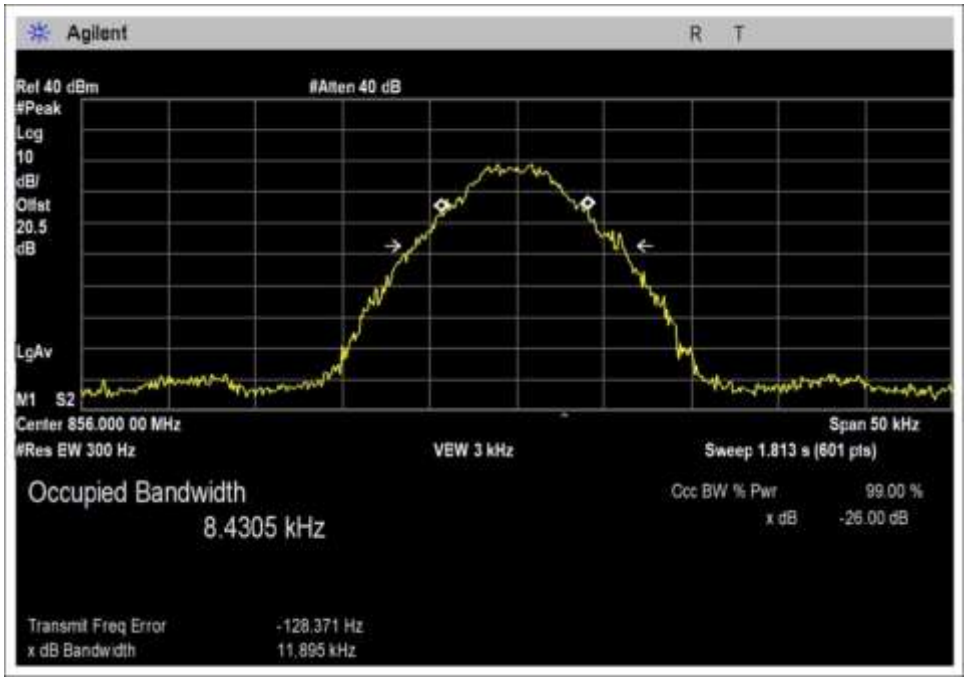
OBW_DL_851-861-CF4_ 851.0125MHz_LC-AGC



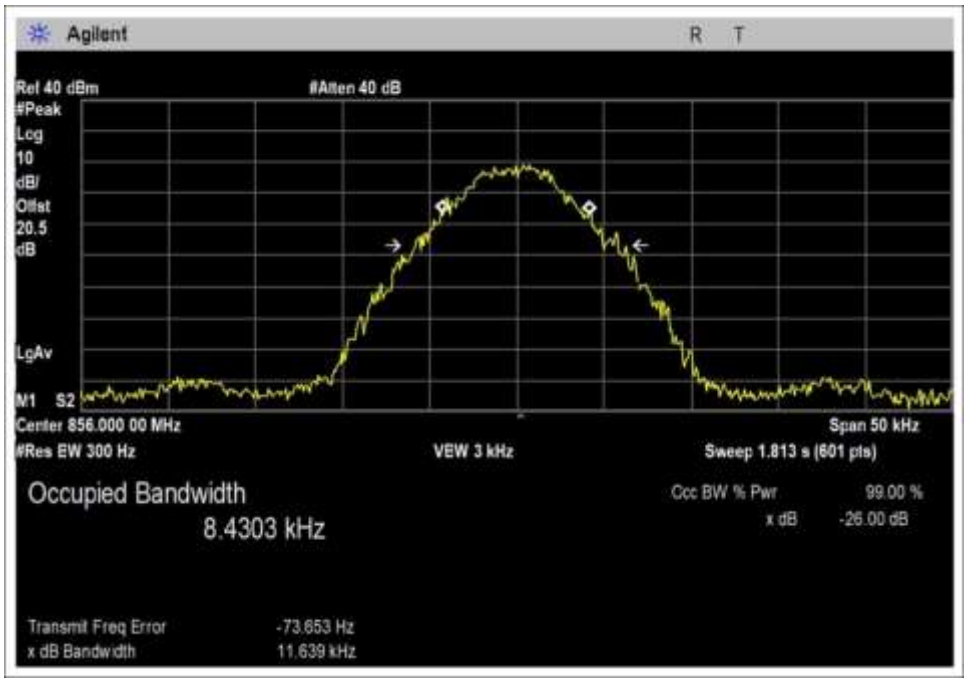
OBW_DL_851-861-CF4_ 851.0125MHz_LC-AGC+3



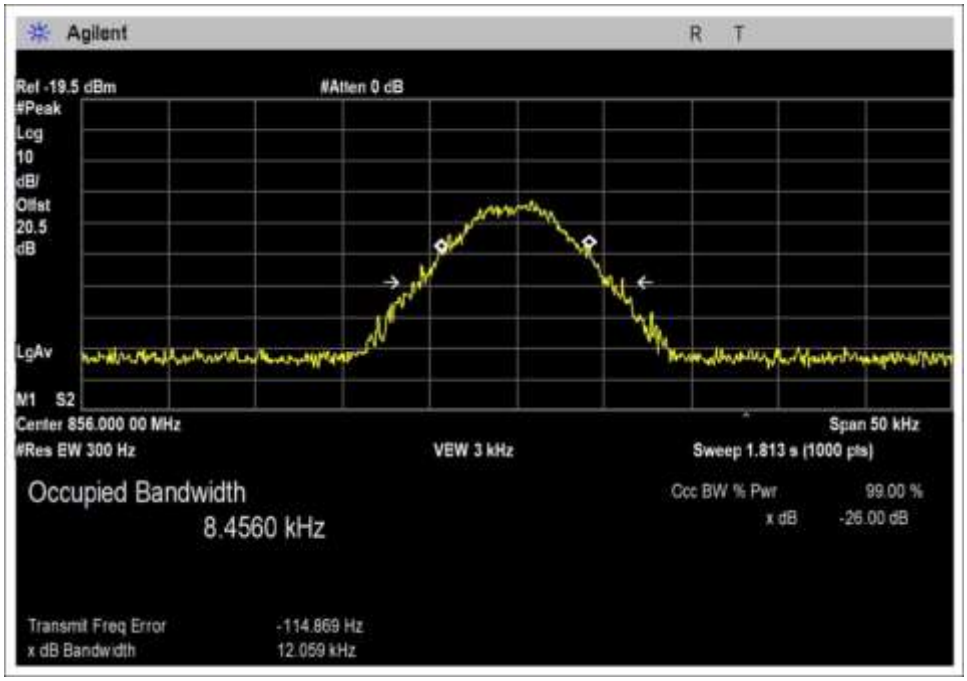
OBW_DL_851-861-CF4_ 851.0125MHz_LC-Input



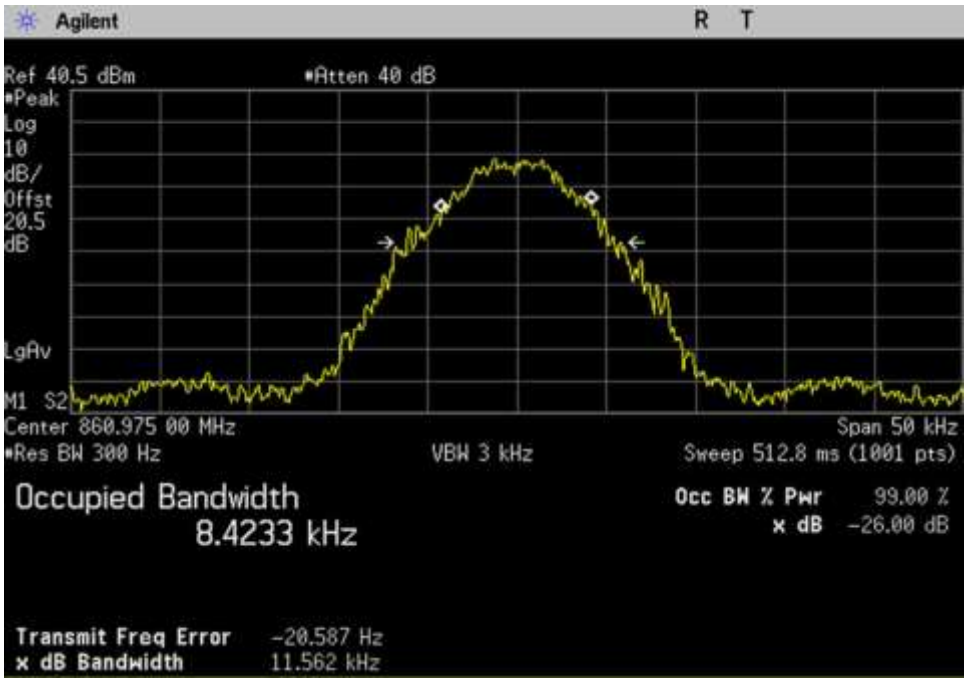
OBW_DL_851-861-CF4_ 856MHz_MC-AGC



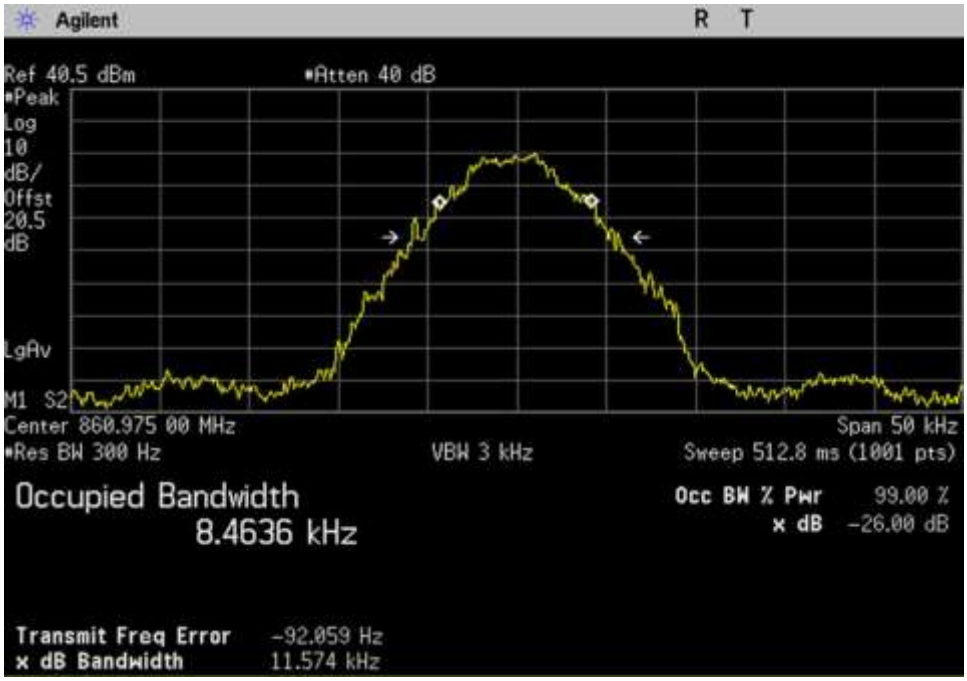
OBW_DL_851-861-CF4_ 856MHz_MC-AGC+3



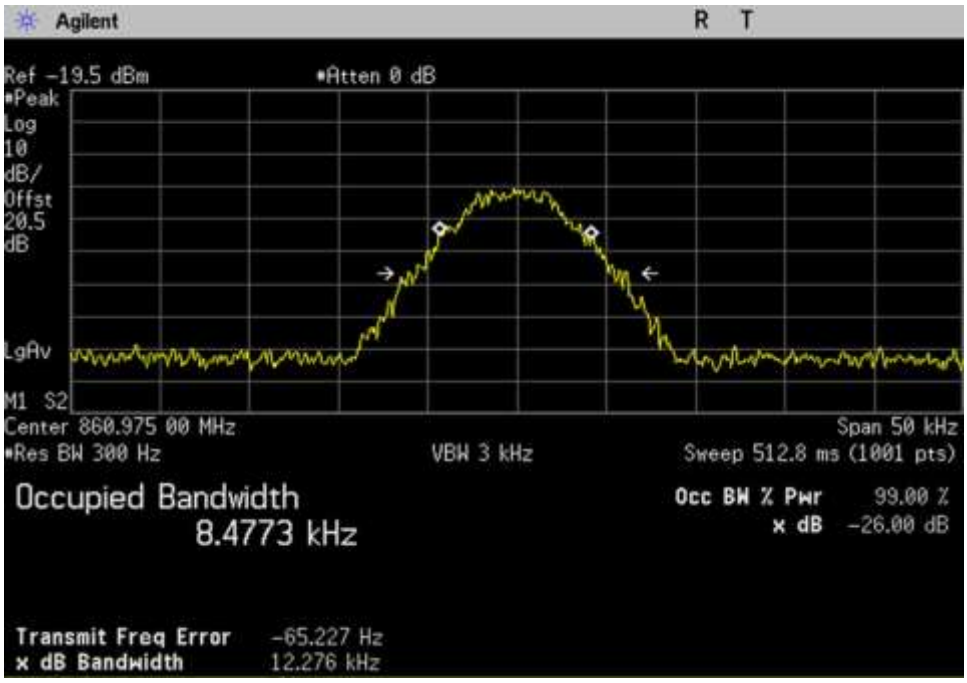
OBW_DL_851-861-CF4_ 856MHz_MC-Input



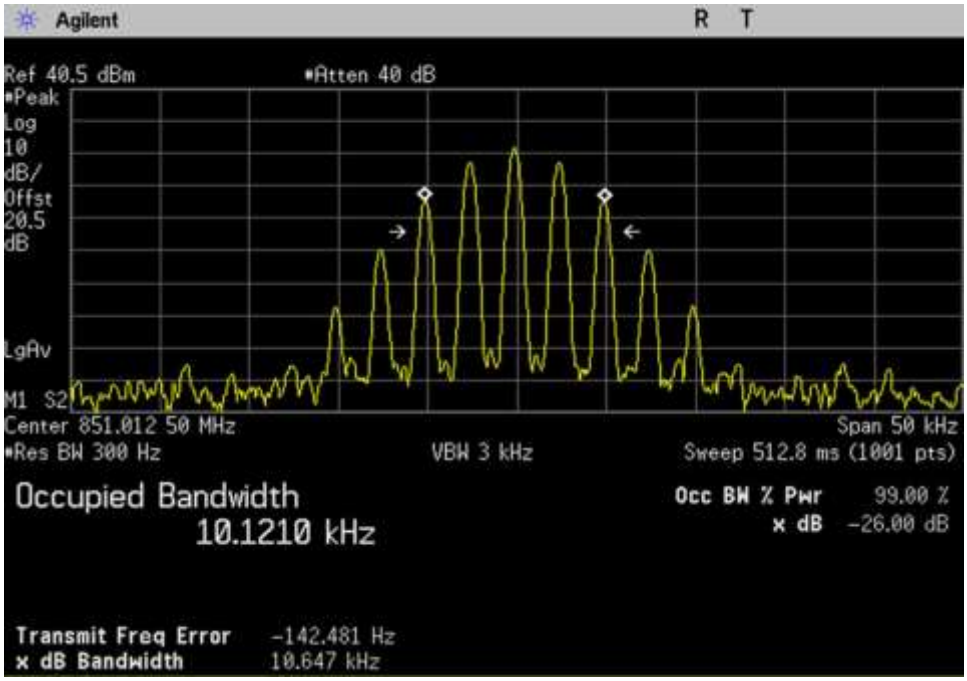
OBW_DL_851-861-CF4_ 860.975MHz_HC-AGC



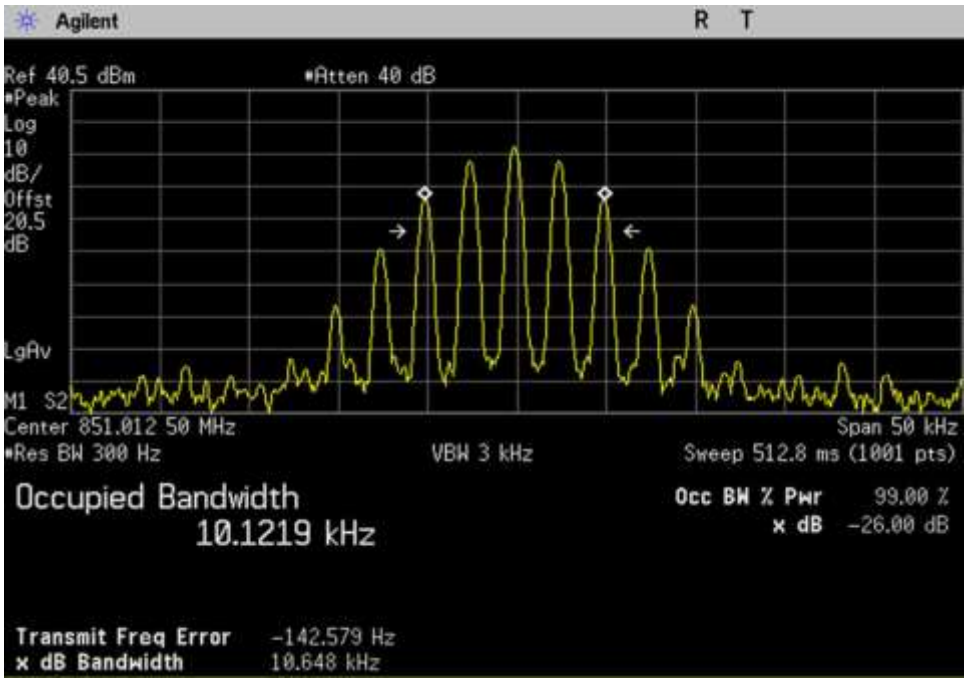
OBW_DL_851-861-CF4_ 860.975MHz_HC-AGC+3



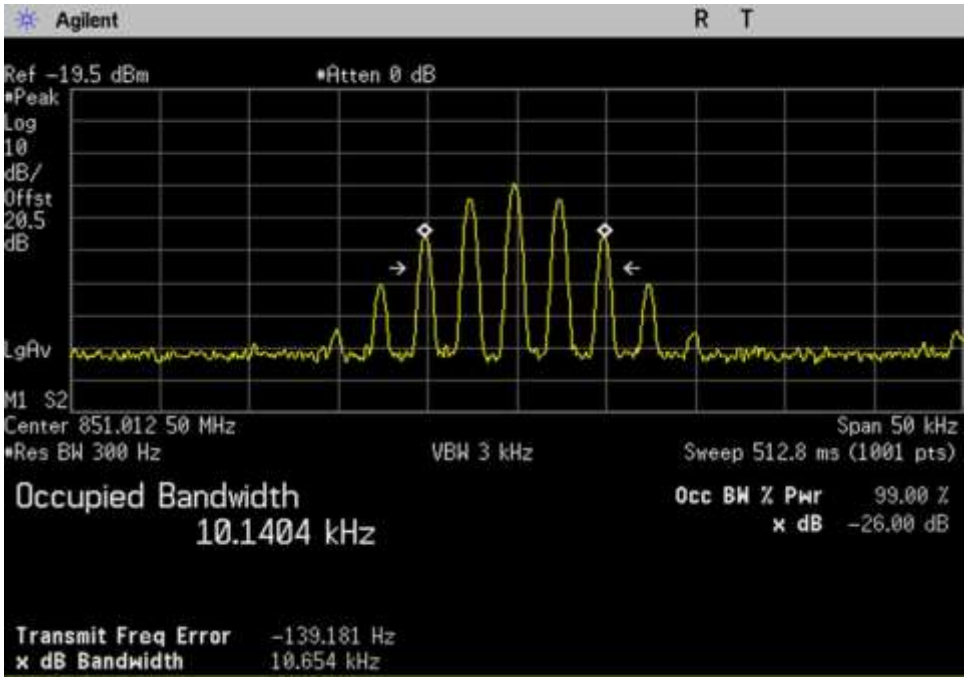
OBW_DL_851-861-CF4_ 860.975MHz_HC-Input



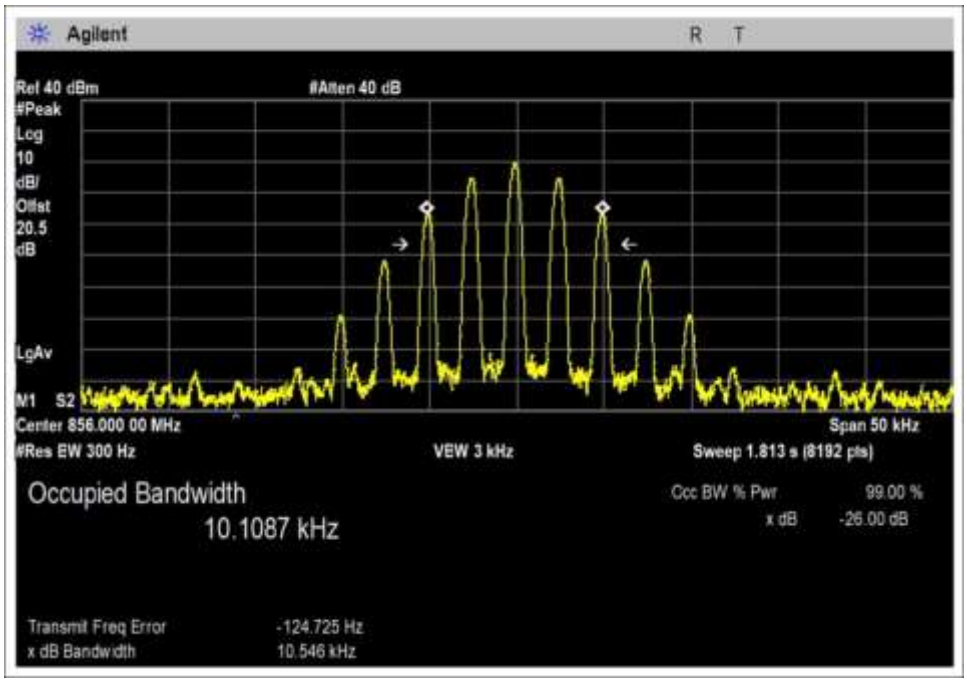
OBW_DL_851-861-FM_ 851.0125MHz_LC-AGC



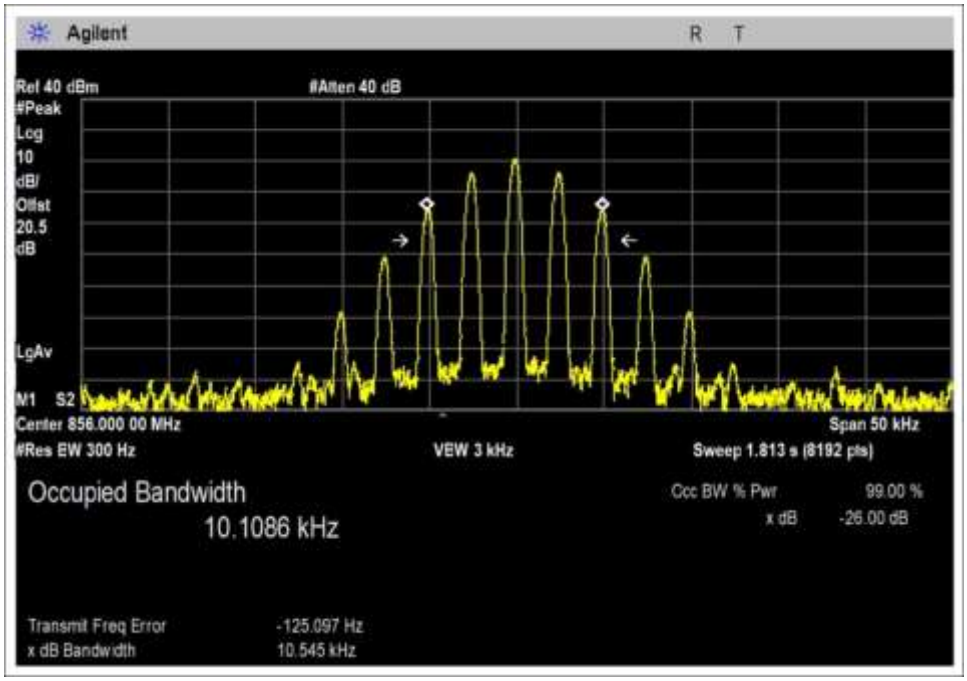
OBW_DL_851-861-FM_ 851.0125MHz_LC-AGC+3



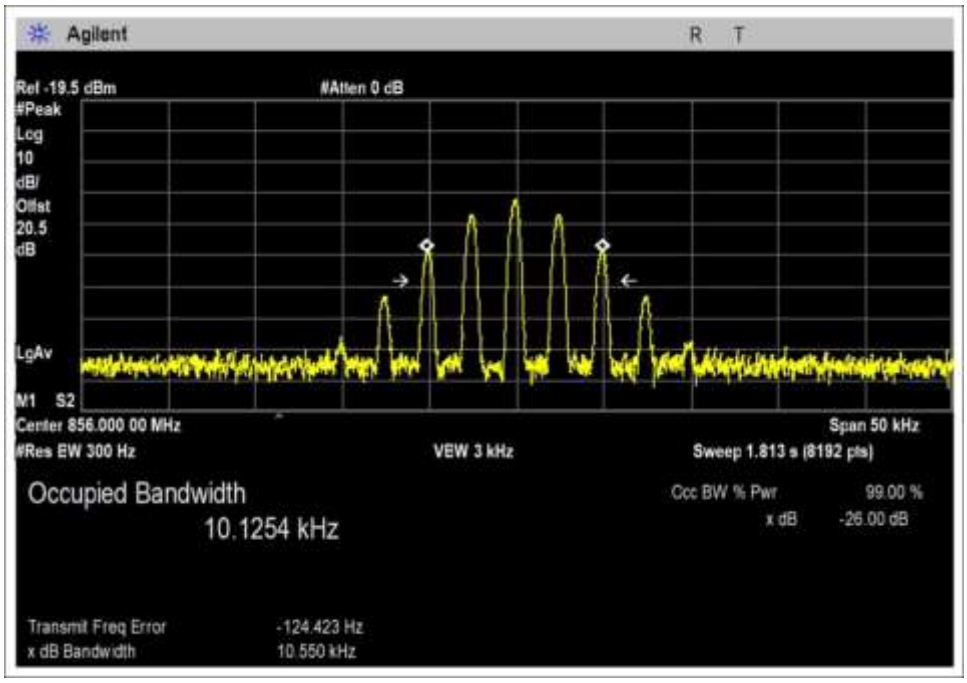
OBW_DL_851-861-FM_ 851.0125MHz_LC-Input



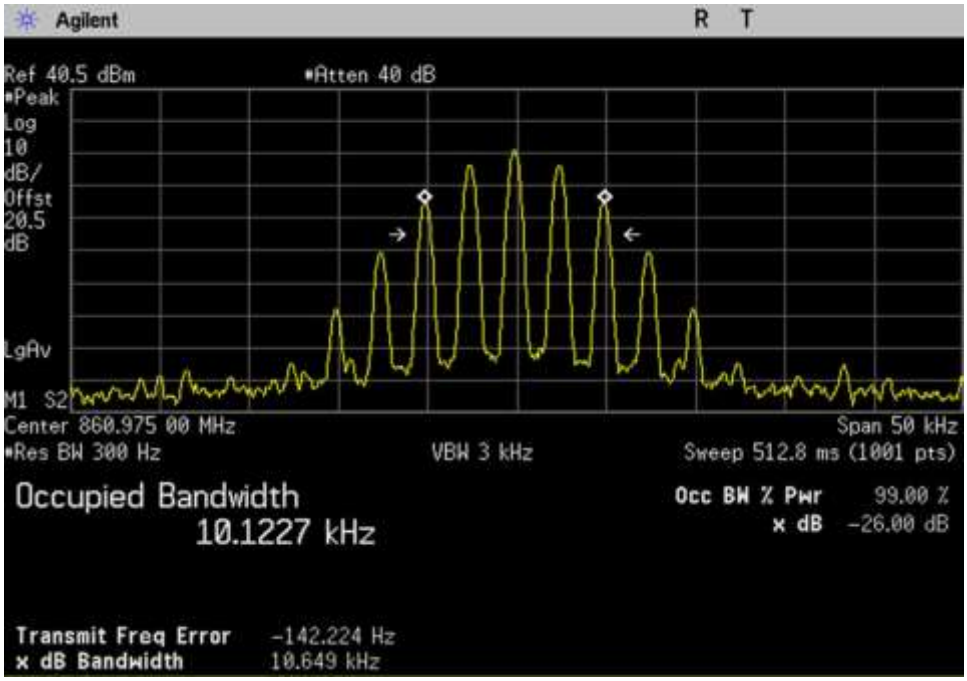
OBW_DL_851-861-FM_ 856MHz_MC-AGC



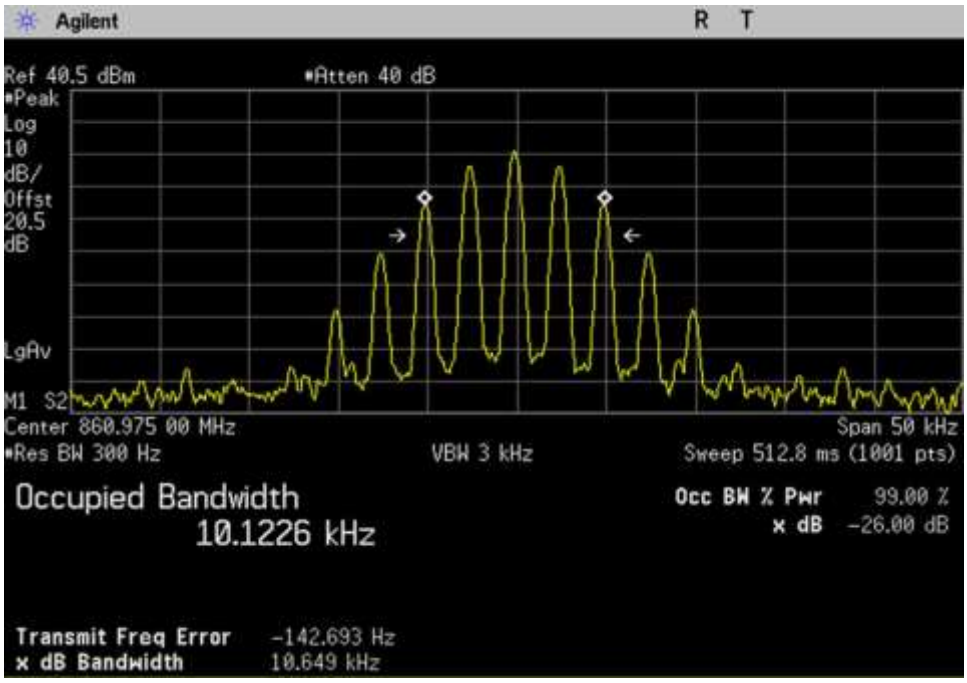
OBW_DL_851-861-FM_ 856MHz_MC-AGC+3



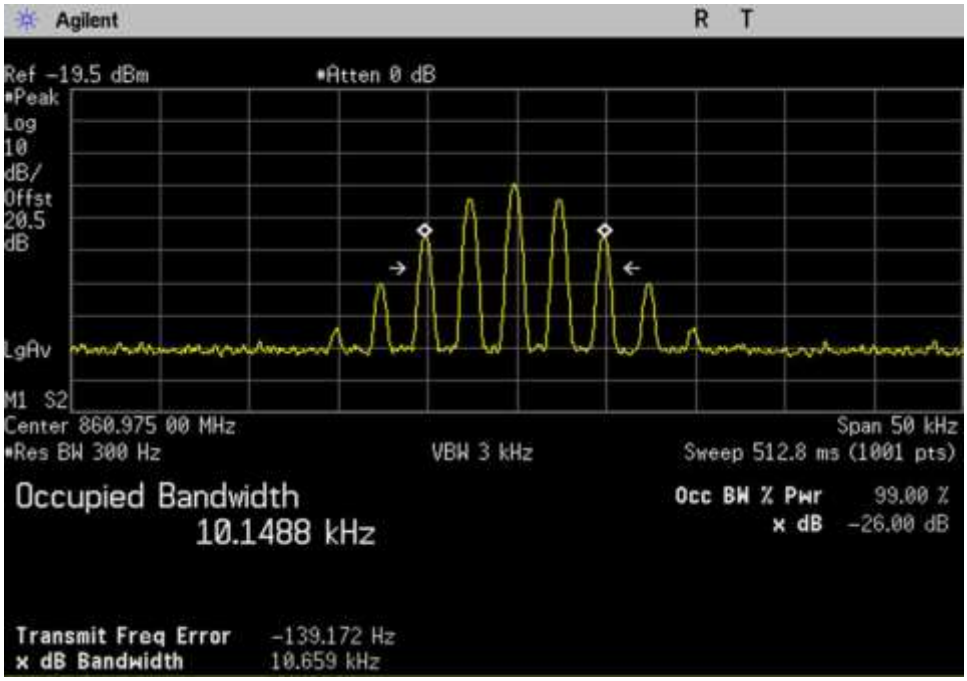
OBW_DL_851-861-FM_ 856MHz_MC-Input



OBW_DL_851-861-FM_ 860.975MHz_HC-AGC

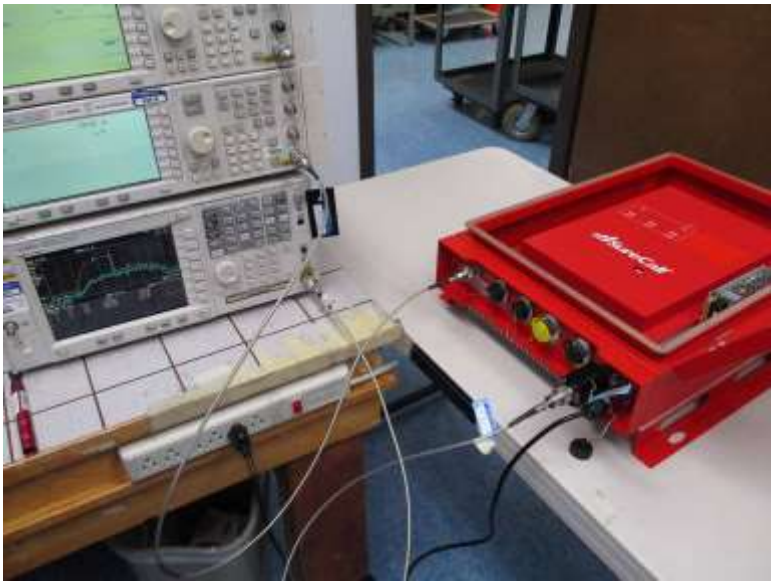


OBW_DL_851-861-FM_ 860.975MHz_HC-AGC+3



OBW_DL_851-861-FM_ 860.975MHz_HC-Input

Test Setup Photo



Part 90: 219(b) Frequency Bands

Engineer: Hieu Song Nguyenpham
Test Date: 5/30/2018

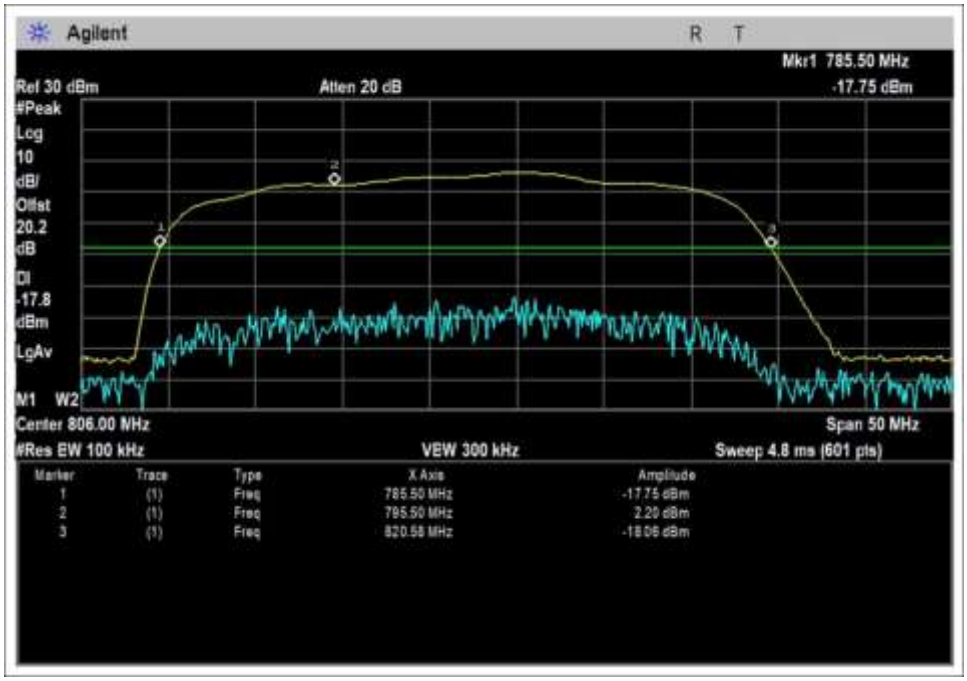
Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
P06797	Attenuator	Narda	766-20	4/10/2017	4/10/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019

Environmental Conditions					
Temperature (ºC)	21.3	Relative Humidity (%):	47	Atmospheric Pressure (kPa):	102.3

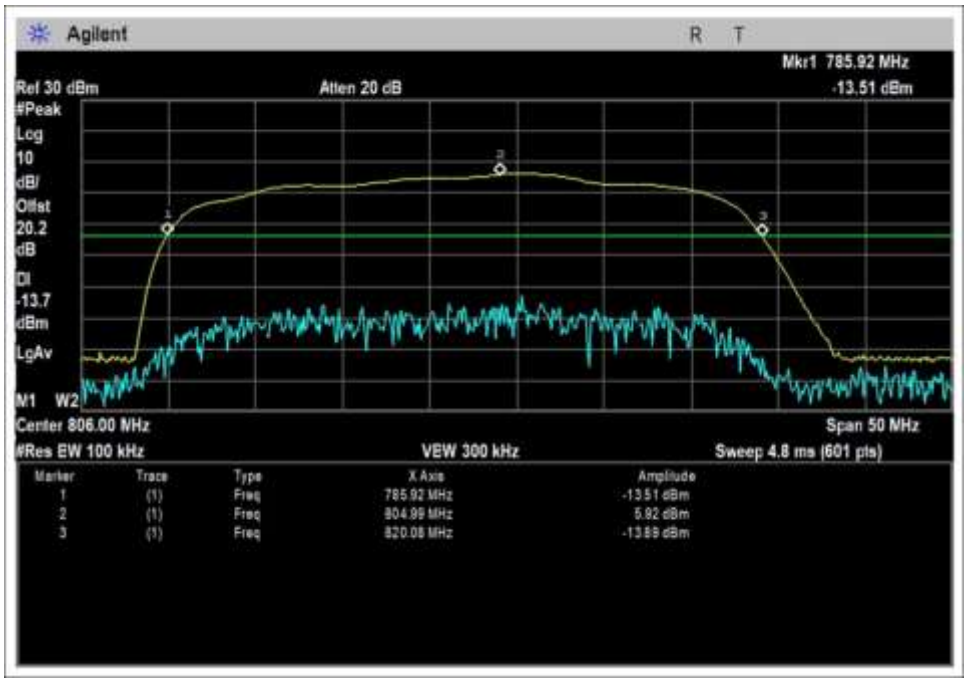
Summary of Results

Pass: Plots show that gain out of band does not increase beyond that value which is present at the edge of each band.

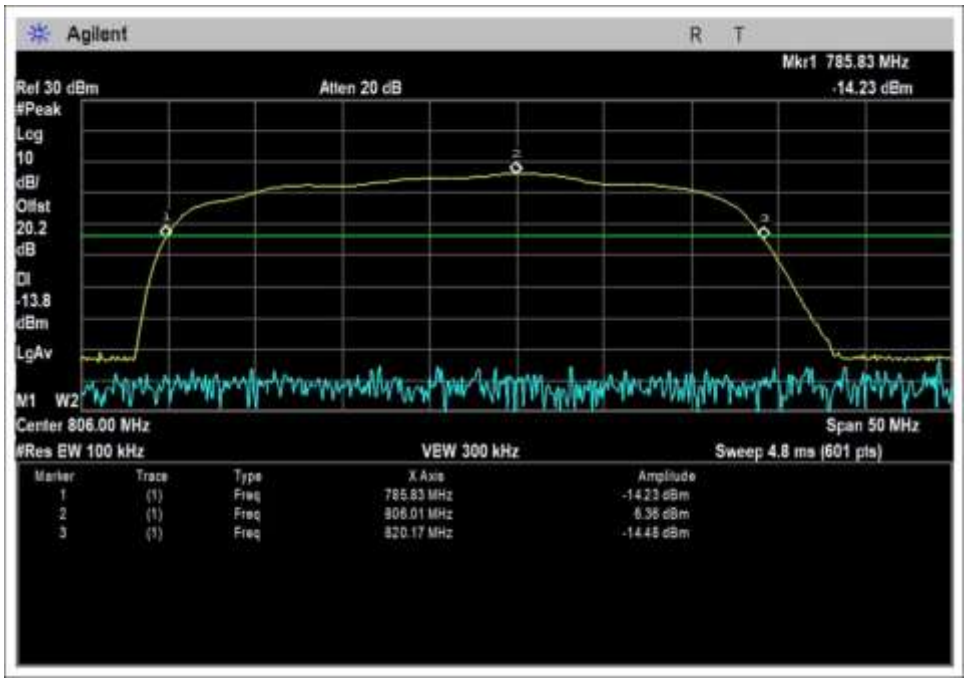
Plots



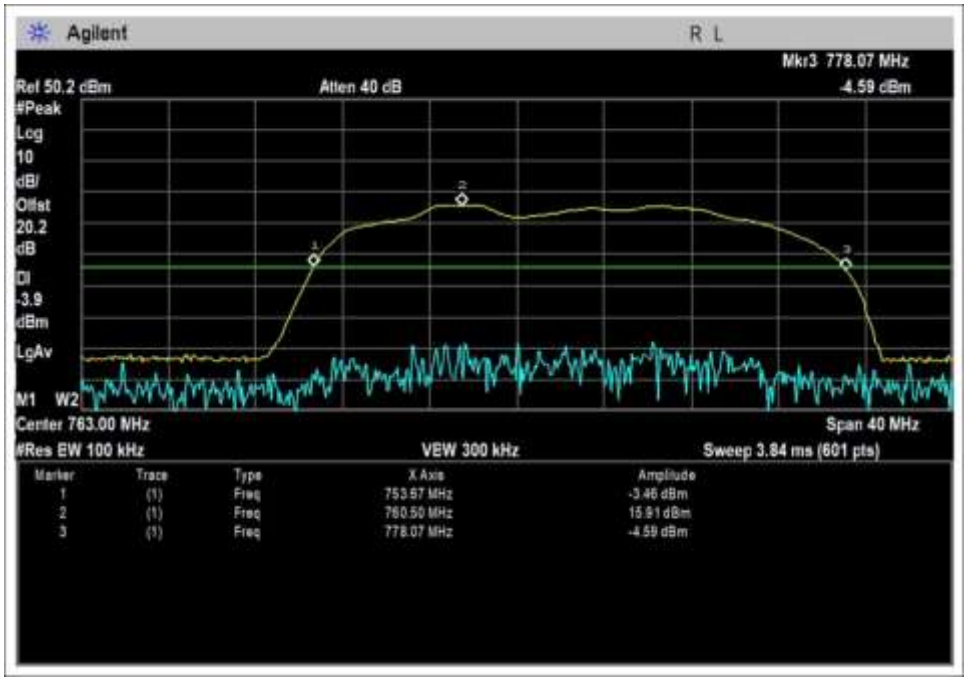
UL 788_798



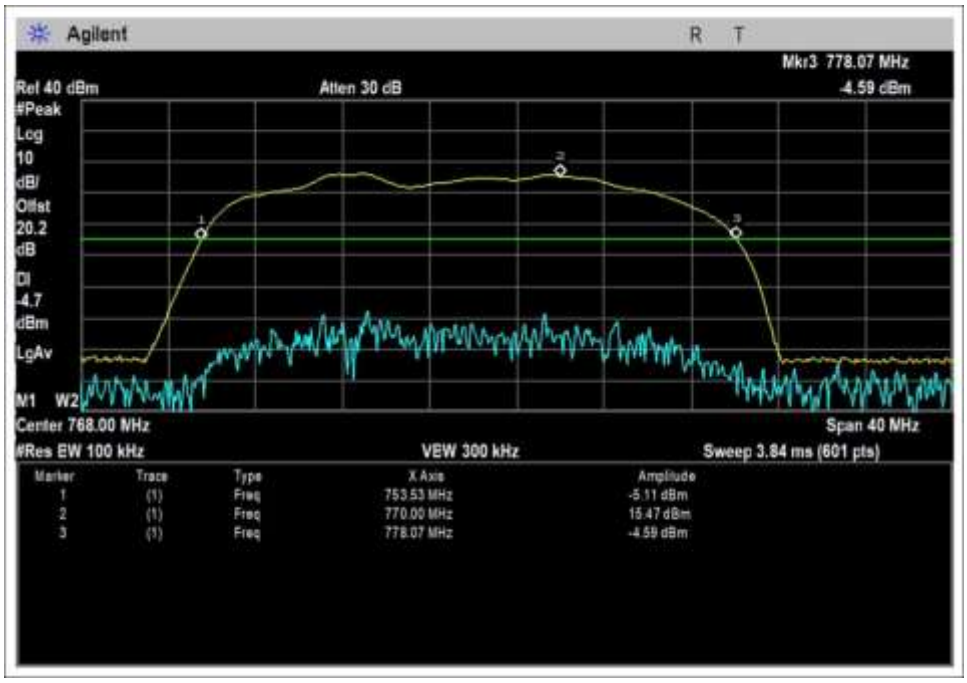
UL 799_805



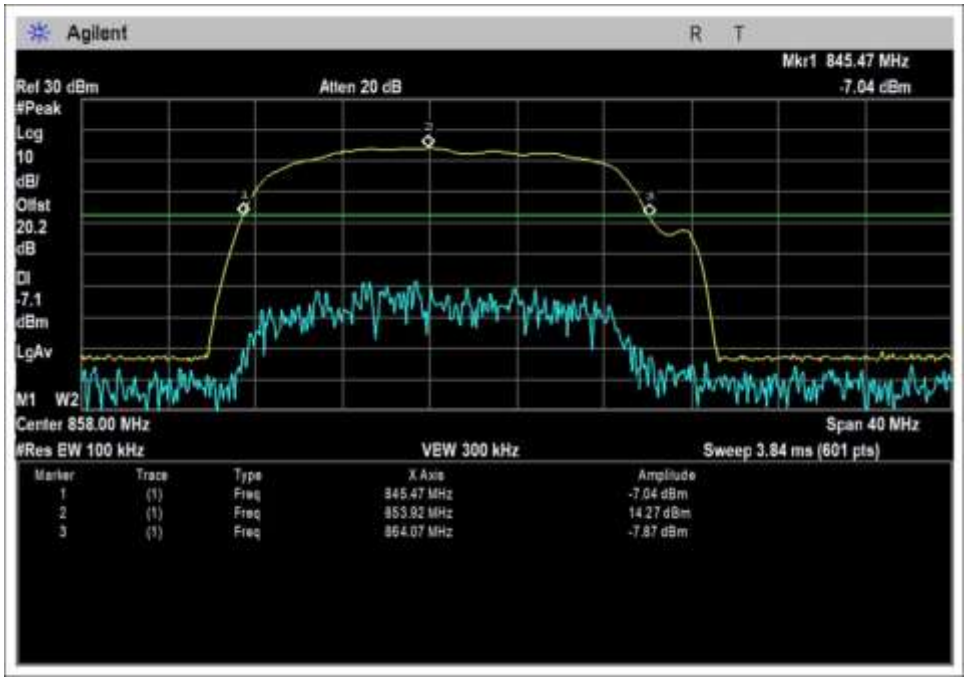
UL 806_816



DL 758_768

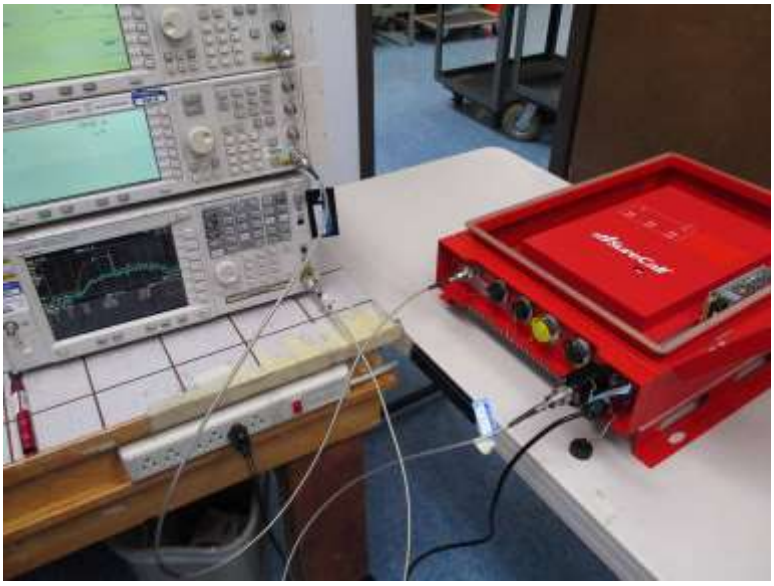


DL 769-775



DL 851-861

Test Setup Photo



Part 90: 219(b) EMask Out of Band Emissions

Engineer: Hieu Song Nguyenpham
Test Date: 6/4/2018

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
P06797	Attenuator	Narda	766-20	4/10/2017	4/10/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019

Environmental Conditions					
Temperature (ºC)	23.5	Relative Humidity (%):	46	Atmospheric Pressure (kPa):	101.5

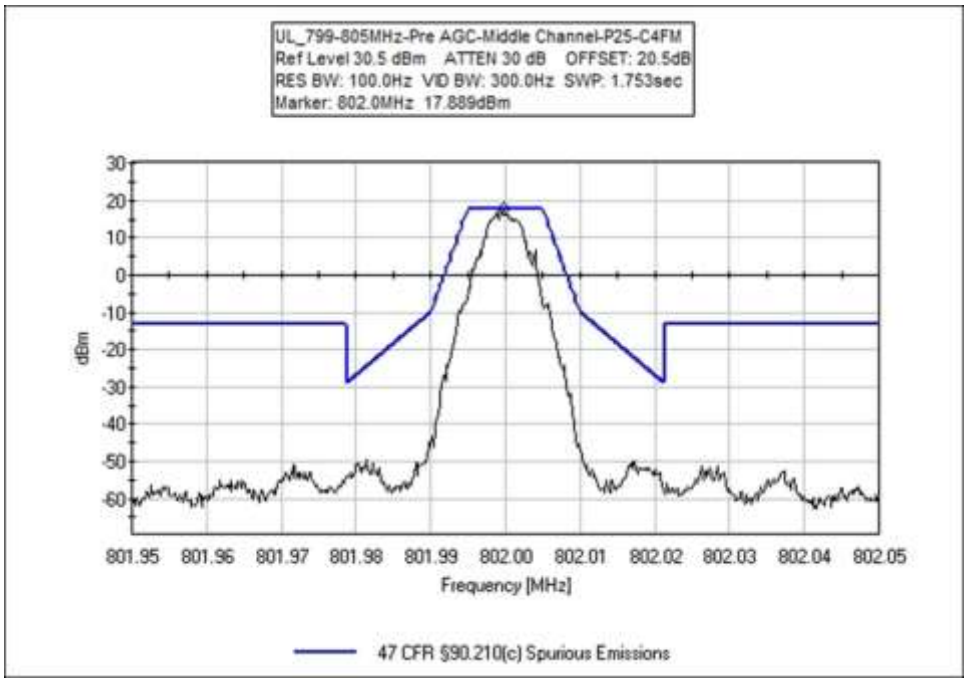
Summary of Results

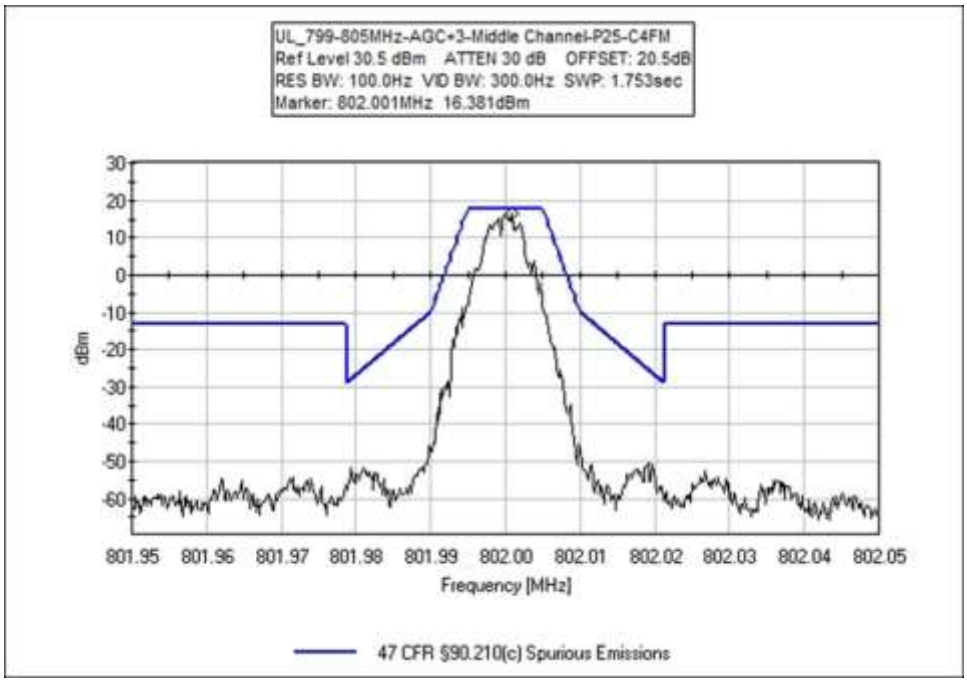
Pass: As indicated in plots below, all emissions are under the applicable masks.

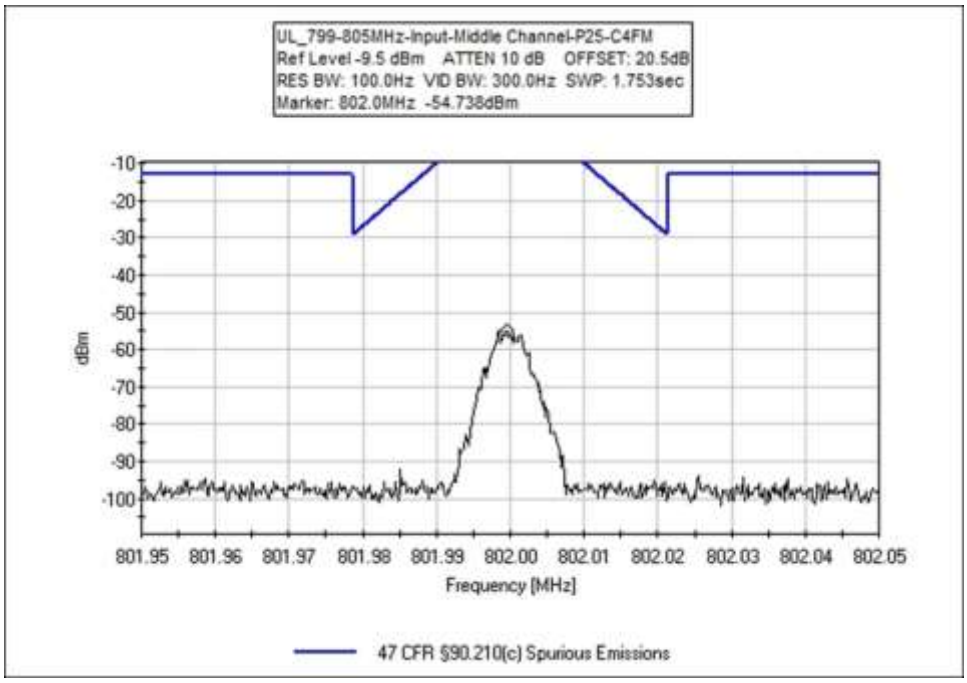
Applicable Masks / OOB Public safety						
	UL		**DL**		**UL**	**DL**
	788-805		758-775		806-816	851-861
	788-798	799-805	758-768	769-775		
OOB	LMH		LMH			
Mask C		LMH		LMH		
Mask H					LMH	LMH
Mask G					LMH	LMH

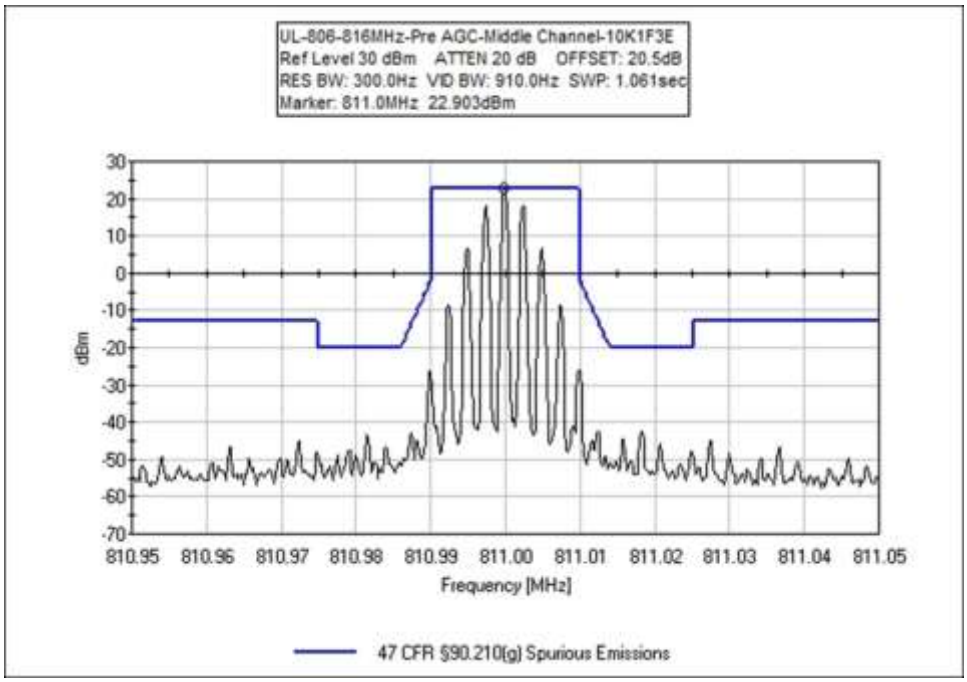
LMH: Low, Middle and High channels

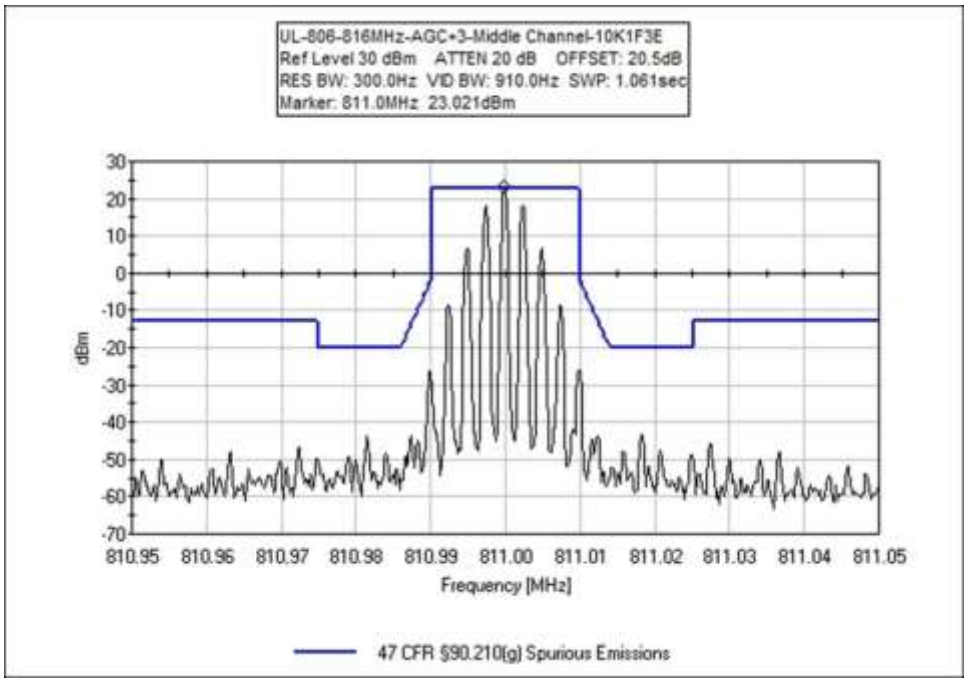
Plots

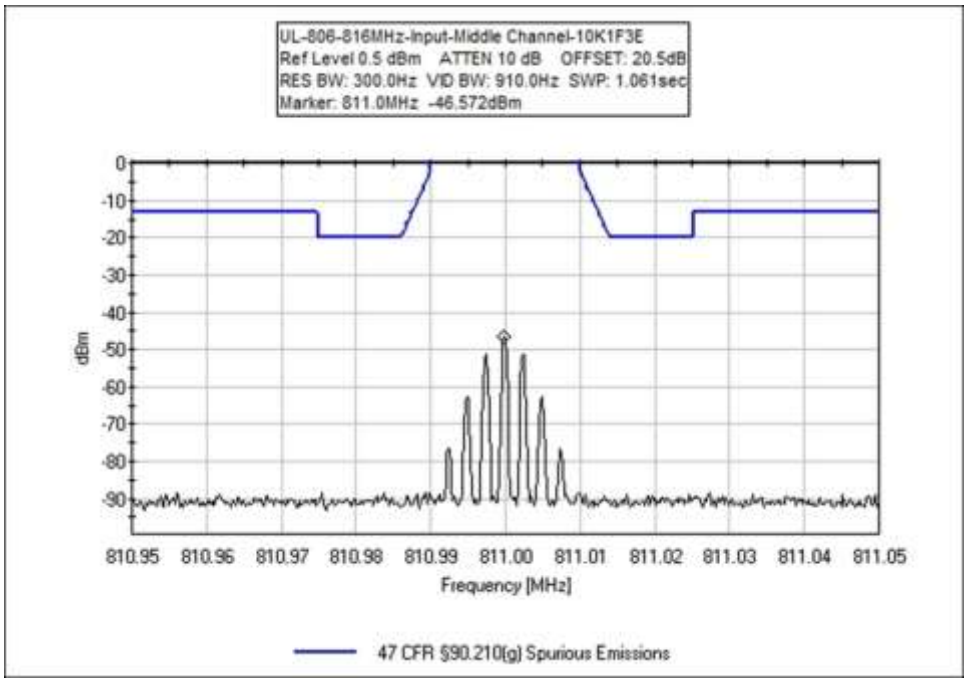

UL_799-805MHz-Pre AGC-Middle Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 802.0MHz 17.889dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
801.95 801.96 801.97 801.98 801.99 802.00 802.01 802.02 802.03 802.04 802.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

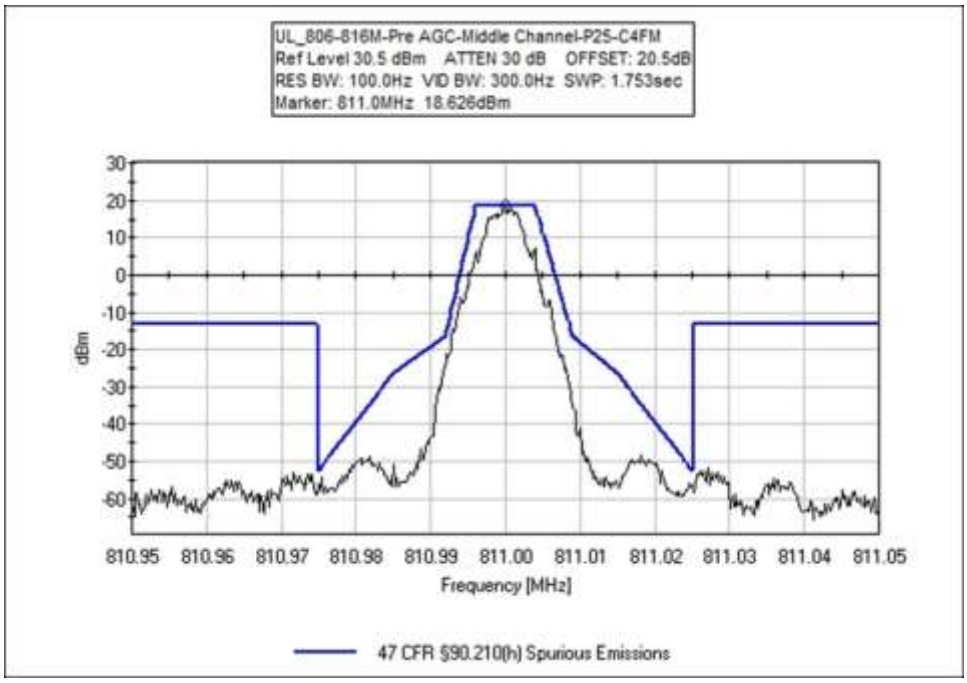

UL_799-805MHz-AGC+3-Middle Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 802.001MHz 16.381dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
801.95 801.96 801.97 801.98 801.99 802.00 802.01 802.02 802.03 802.04 802.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

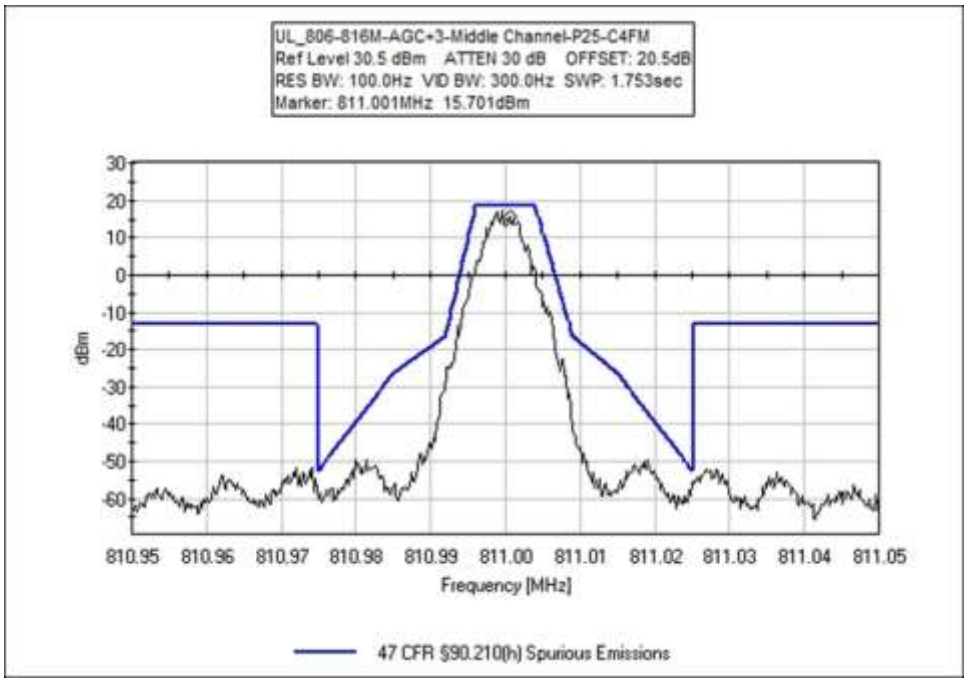

UL_799-805MHz-Input-Middle Channel-P25-C4FM
Ref Level -9.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 802.0MHz -54.738dBm
dBm
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
801.95 801.96 801.97 801.98 801.99 802.00 802.01 802.02 802.03 802.04 802.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

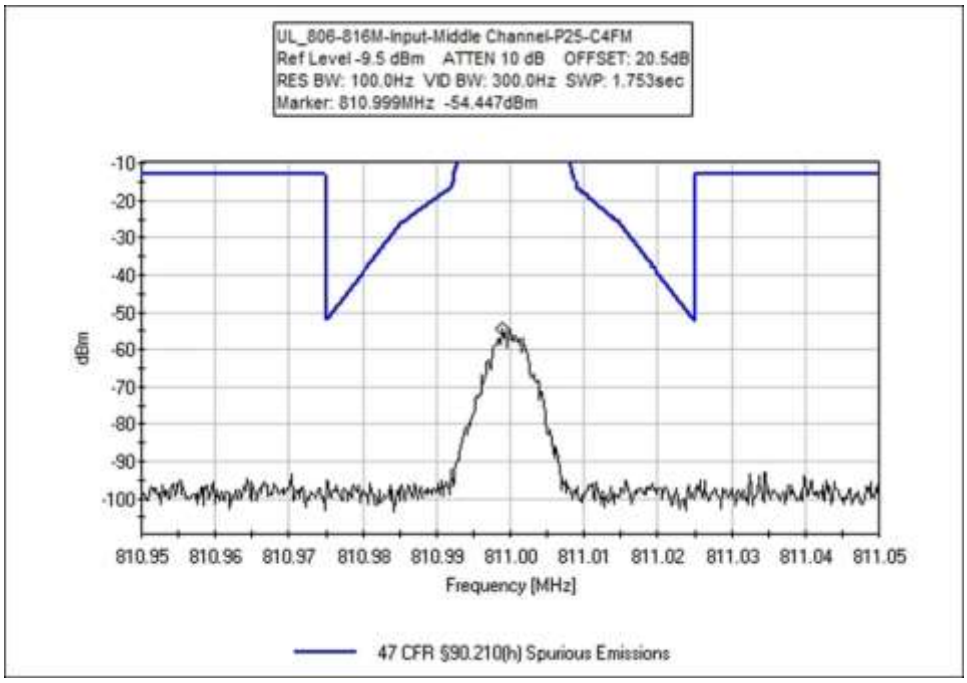

UL-806-816MHz-Pre AGC-Middle Channel-10K1F3E
Ref Level 30 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 811.0MHz 22.903dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

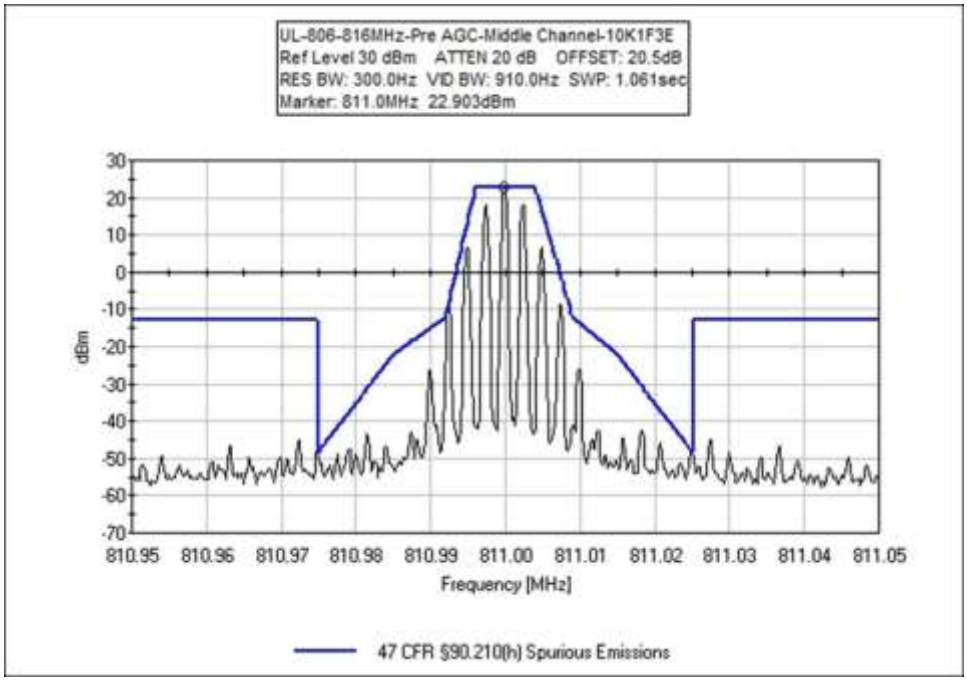

UL-806-816MHz-AGC+3-Middle Channel-10K1F3E
Ref Level 30 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 811.0MHz 23.021dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

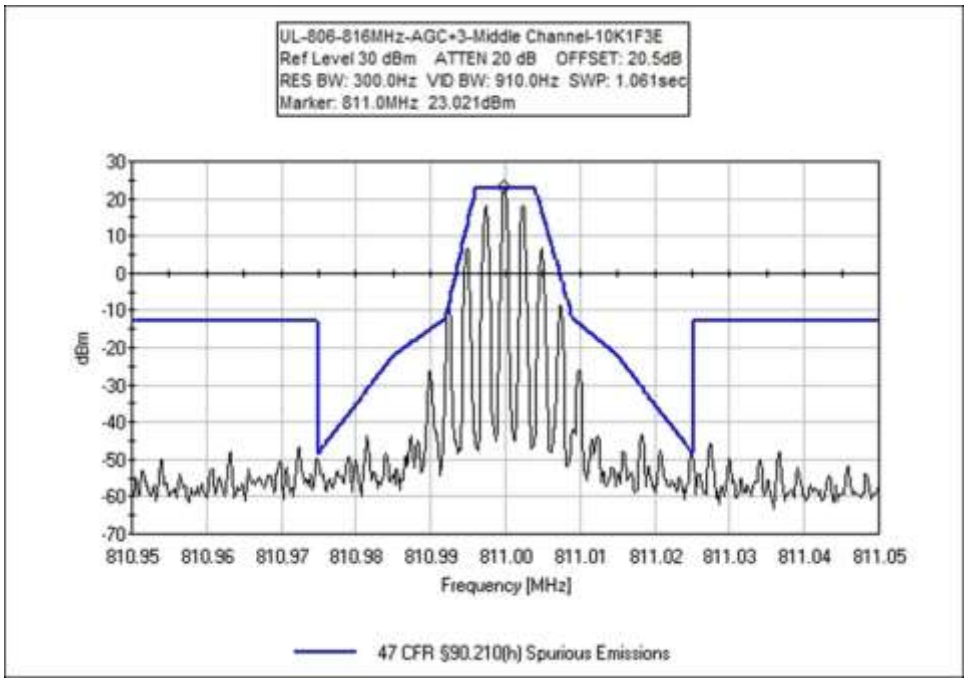

UL-806-816MHz-Input-Middle Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 811.0MHz -46.572dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

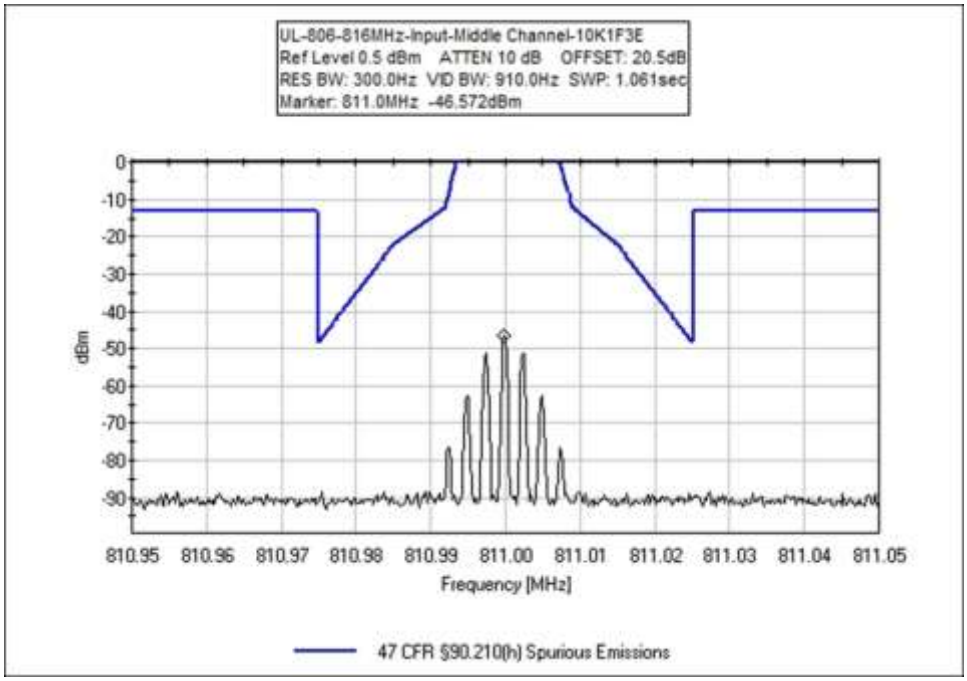

UL_806-816M-Pre AGC-Middle Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 811.0MHz 18.626dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

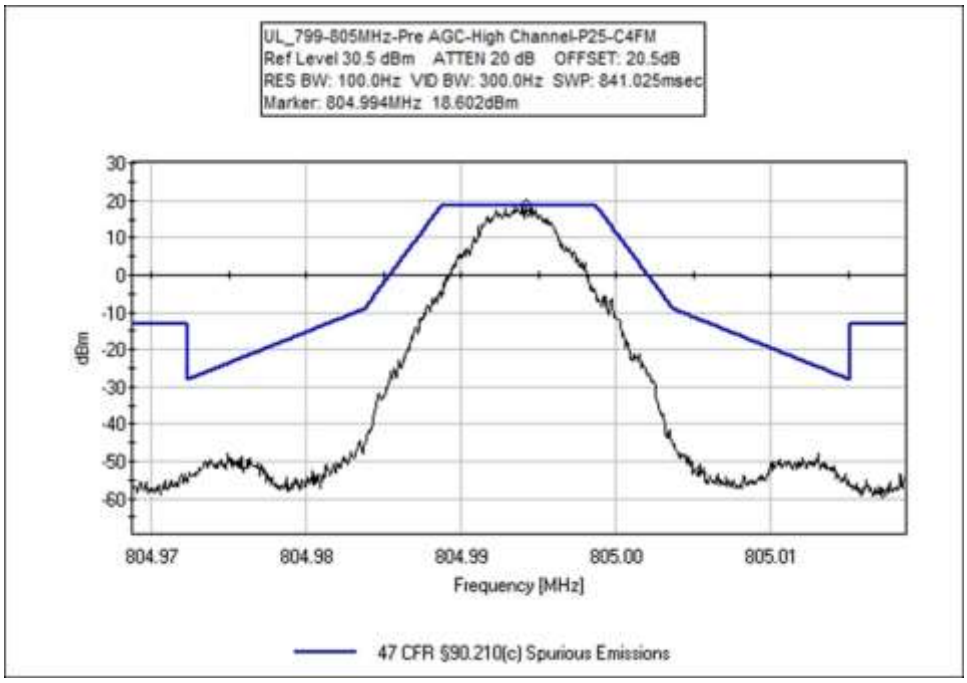

UL_806-816M-AGC+3-Middle Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 811.001MHz 15.701dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

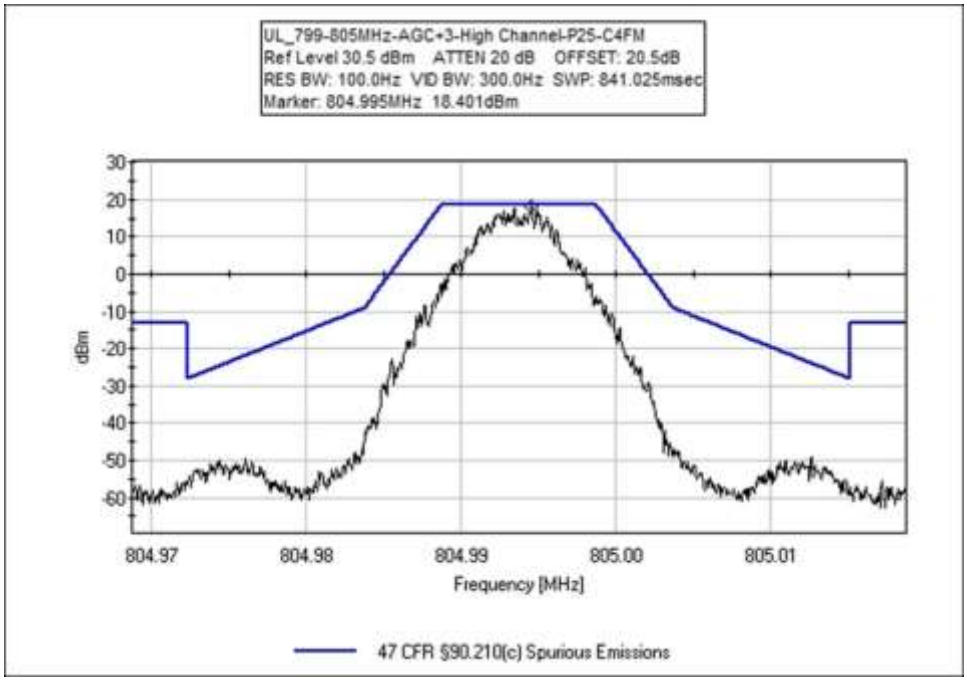

UL_806-816M-Input-Middle Channel-P25-C4FM
Ref Level -9.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 810.999MHz -54.447dBm
dBm
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

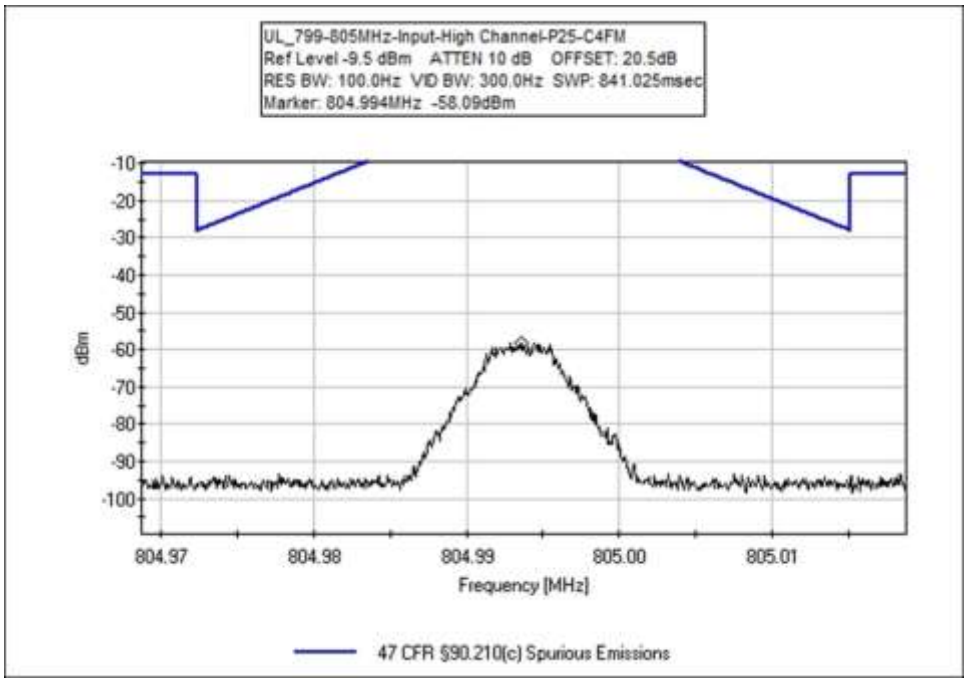

UL-806-816MHz-Pre AGC-Middle Channel-10K1F3E
Ref Level 30 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 811.0MHz 22.903dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

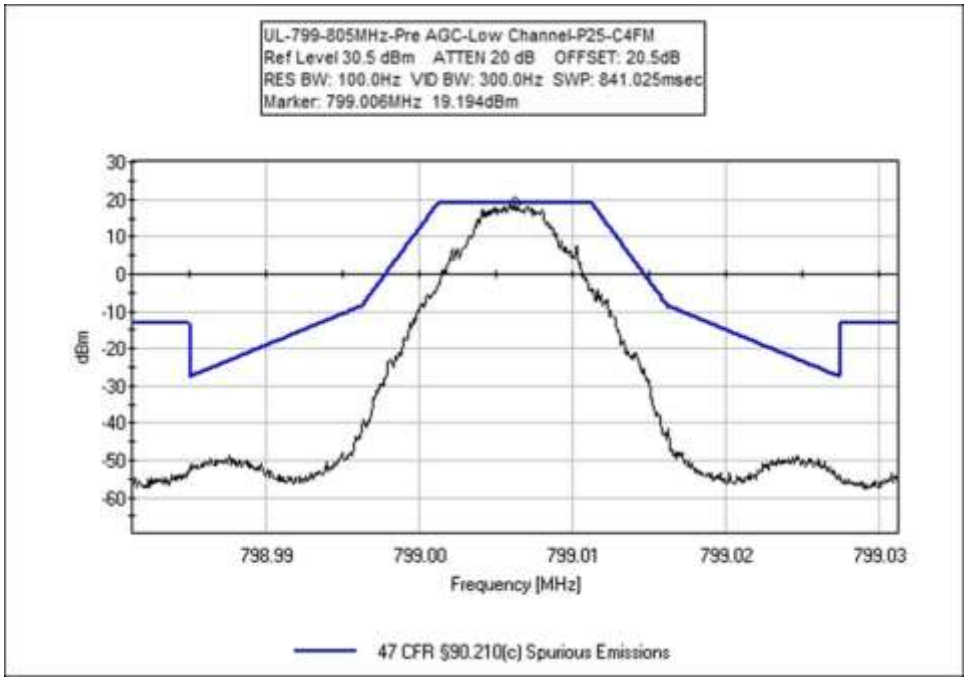

UL-806-816MHz-AGC+3-Middle Channel-10K1F3E
Ref Level 30 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 811.0MHz 23.021dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

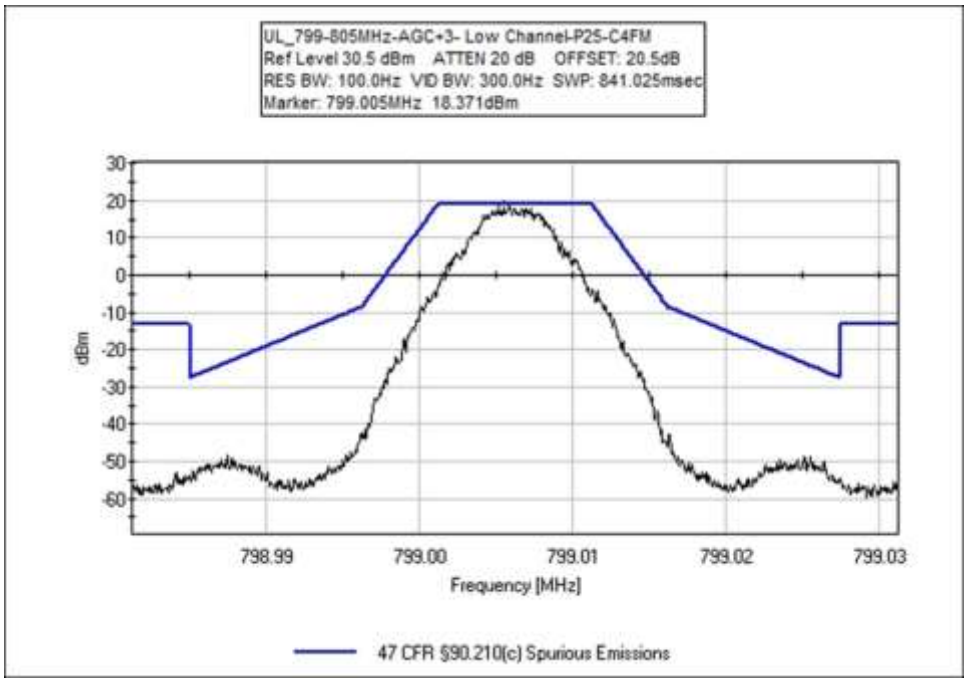

UL-806-816MHz-Input-Middle Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 811.0MHz -46.572dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
810.95 810.96 810.97 810.98 810.99 811.00 811.01 811.02 811.03 811.04 811.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

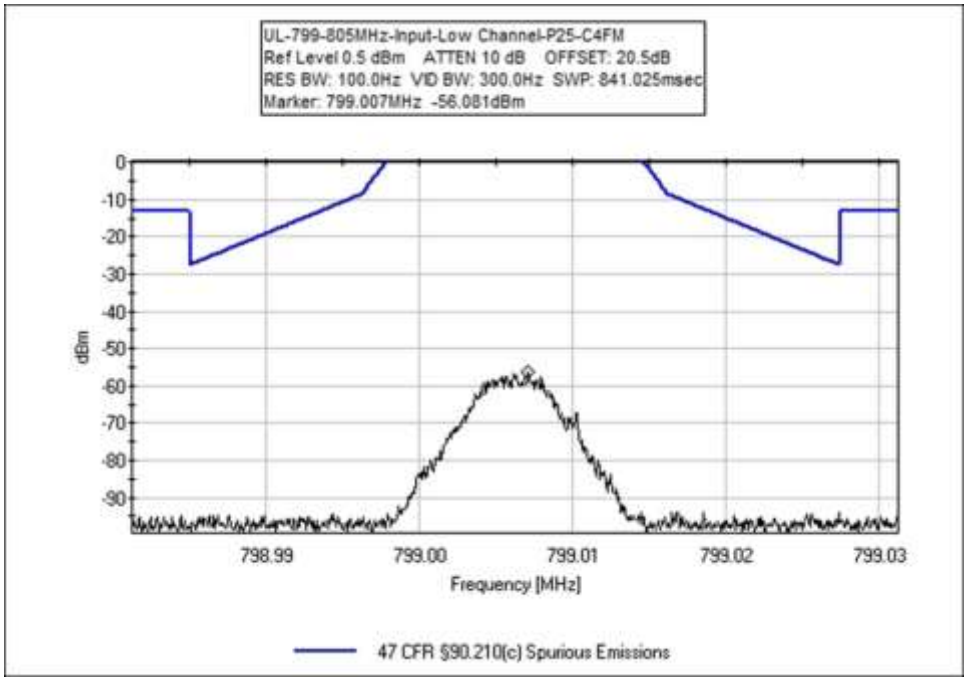

UL_799-805MHz-Pre AGC-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 841.025msec
Marker: 804.994MHz 18.602dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
dBm
804.97
804.98
804.99
805.00
805.01
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

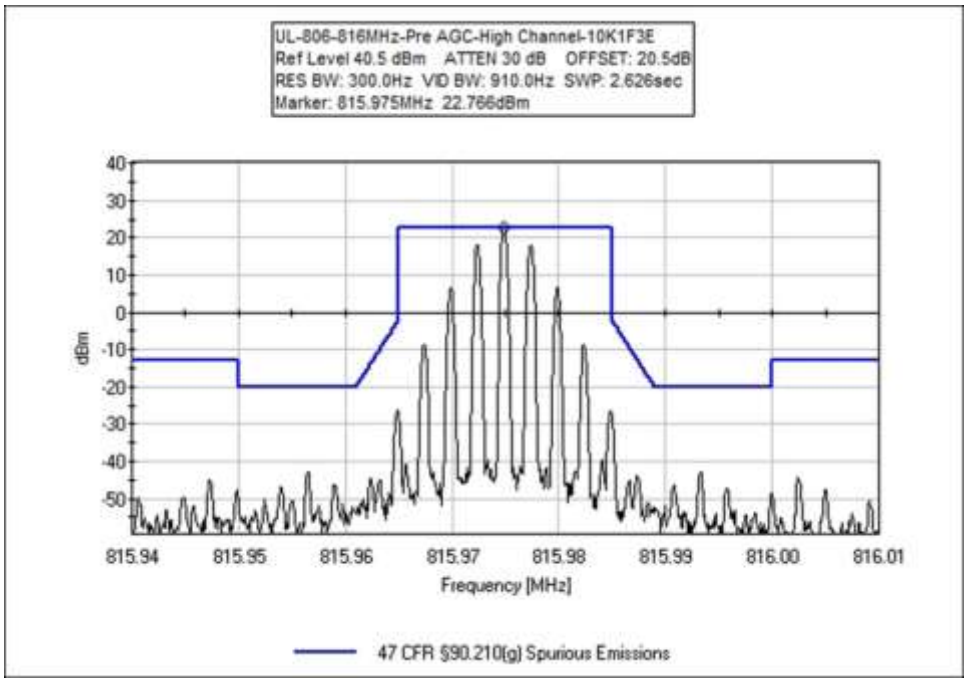

UL_799-805MHz-AGC+3-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 841.025msec
Marker: 804.995MHz 18.401dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
dBm
804.97
804.98
804.99
805.00
805.01
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

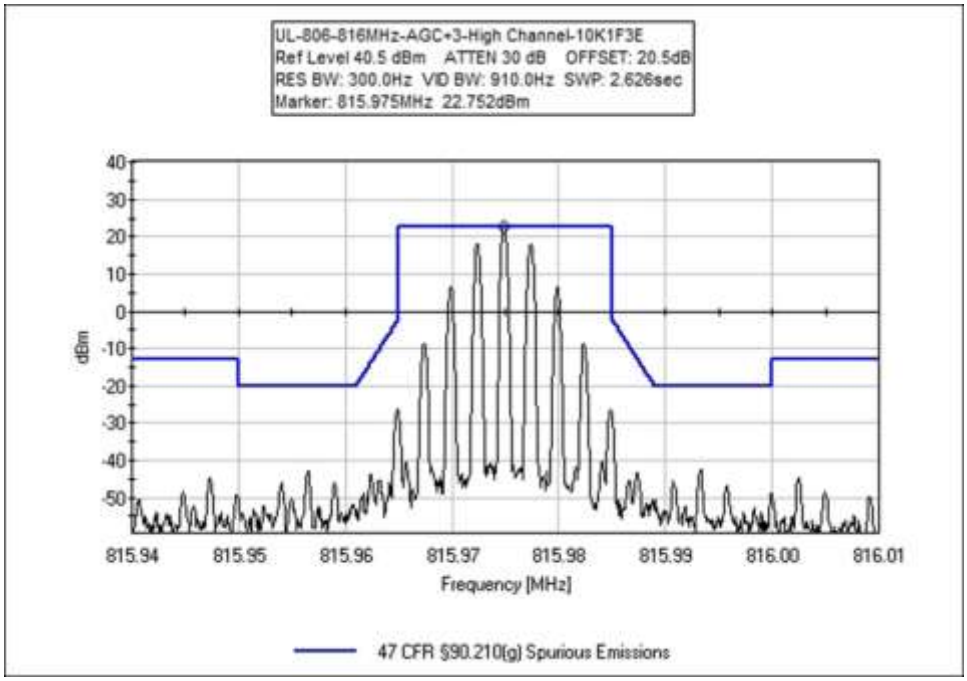

UL_799-805MHz-Input-High Channel-P25-C4FM
Ref Level -9.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 841.025msec
Marker: 804.994MHz -58.09dBm
dBm
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
804.97
804.98
804.99
805.00
805.01
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

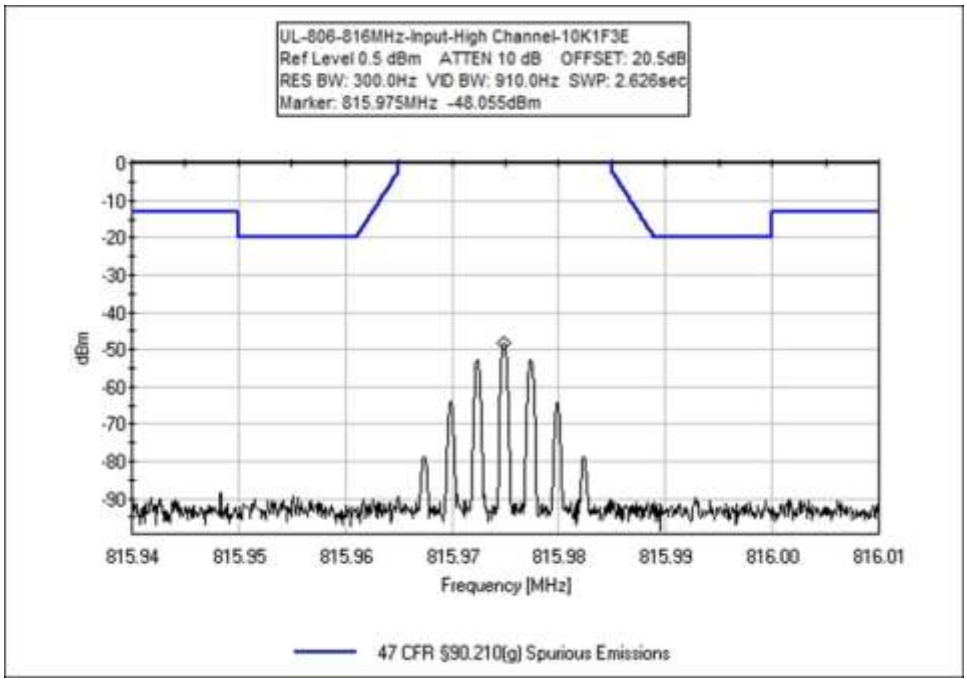

UL-799-805MHz-Pre AGC-Low Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 841.025msec
Marker: 799.006MHz 19.194dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
798.99
799.00
799.01
799.02
799.03
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

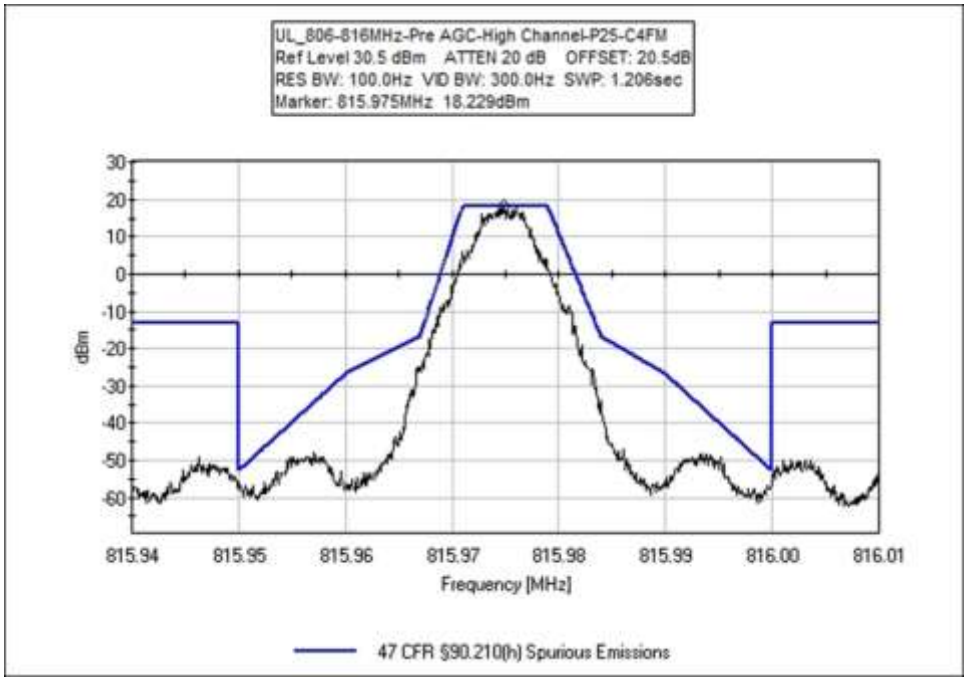

UL_799-805MHz-AGC+3- Low Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 841.025msec
Marker: 799.005MHz 18.371dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
dBm
798.99
799.00
799.01
799.02
799.03
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

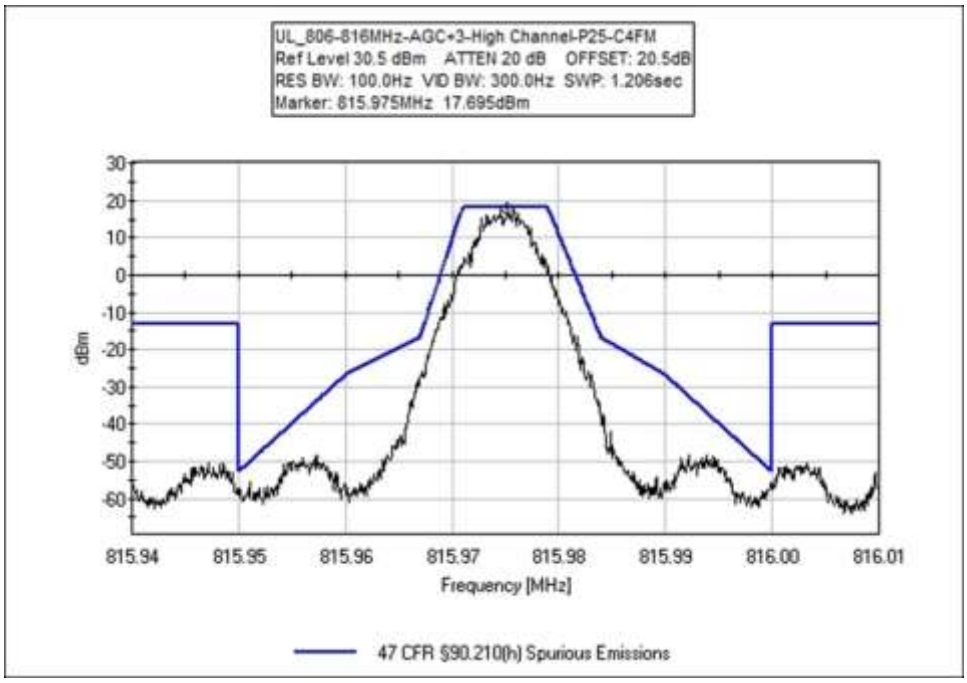

UL-799-805MHz-Input-Low Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 841.025msec
Marker: 799.007MHz -56.081dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
dBm
798.99
799.00
799.01
799.02
799.03
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

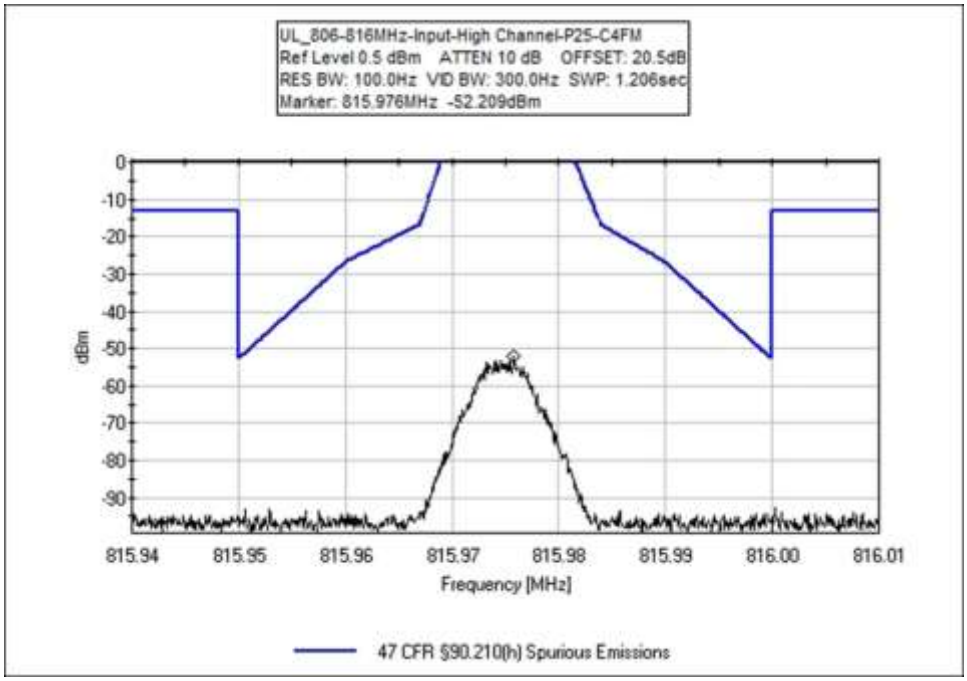

UL-806-816MHz-Pre AGC-High Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 815.975MHz 22.766dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

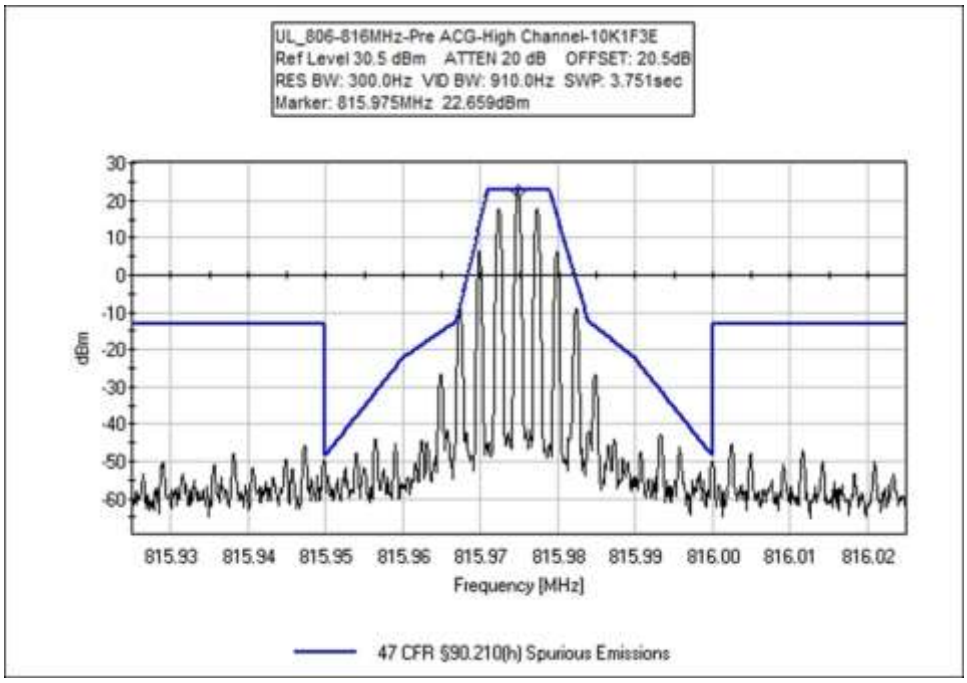

UL-806-816MHz-AGC+3-High Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 815.975MHz 22.752dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

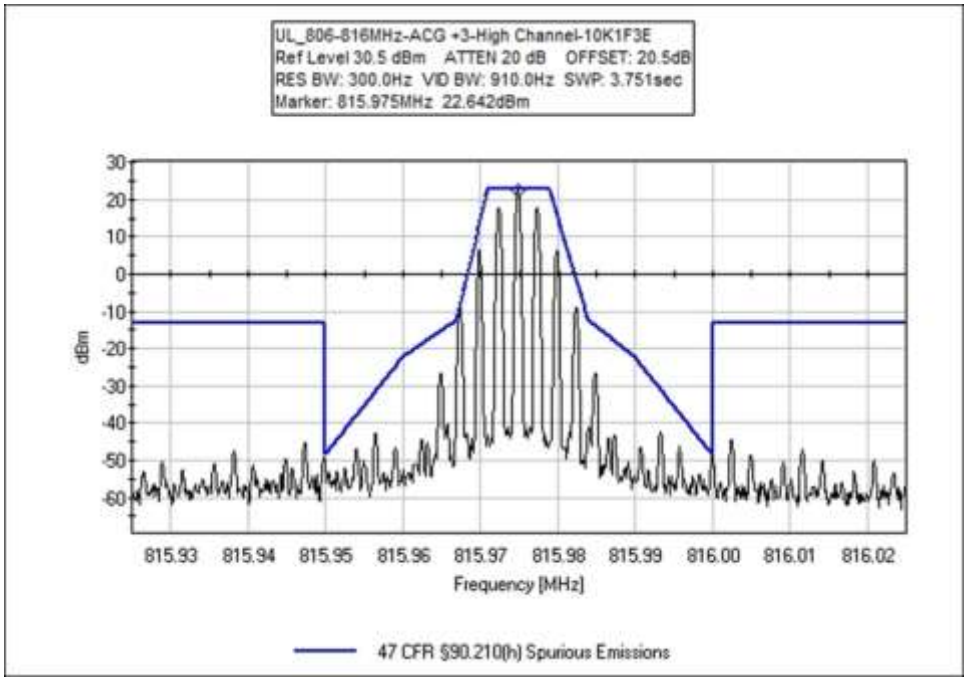

UL-806-816MHz-Input-High Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 815.975MHz -48.055dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

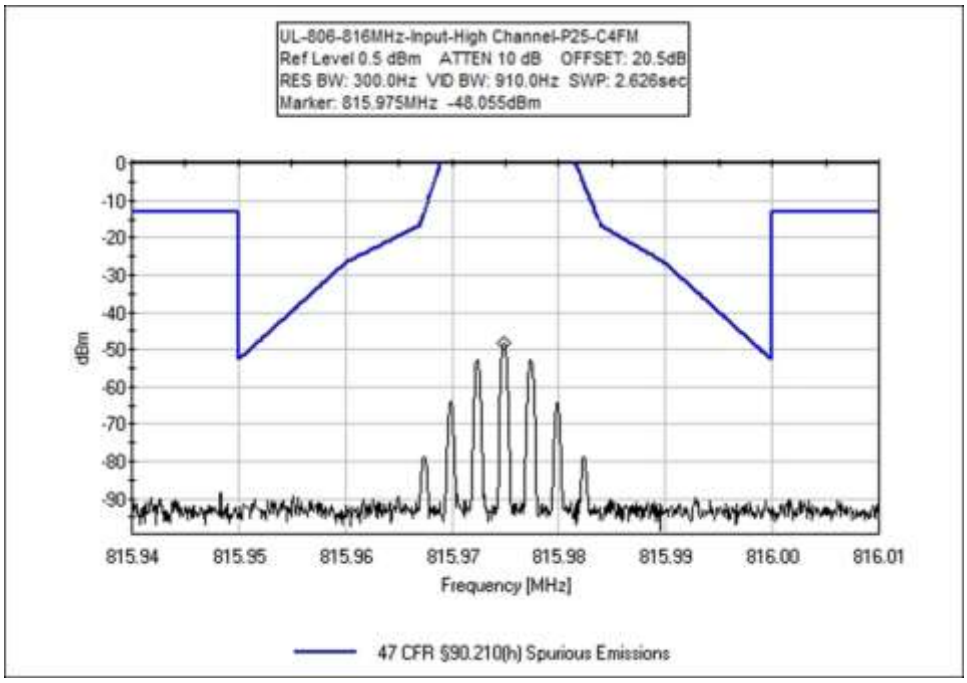

UL_806-816MHz-Pre AGC-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.206sec
Marker: 815.975MHz 18.229dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

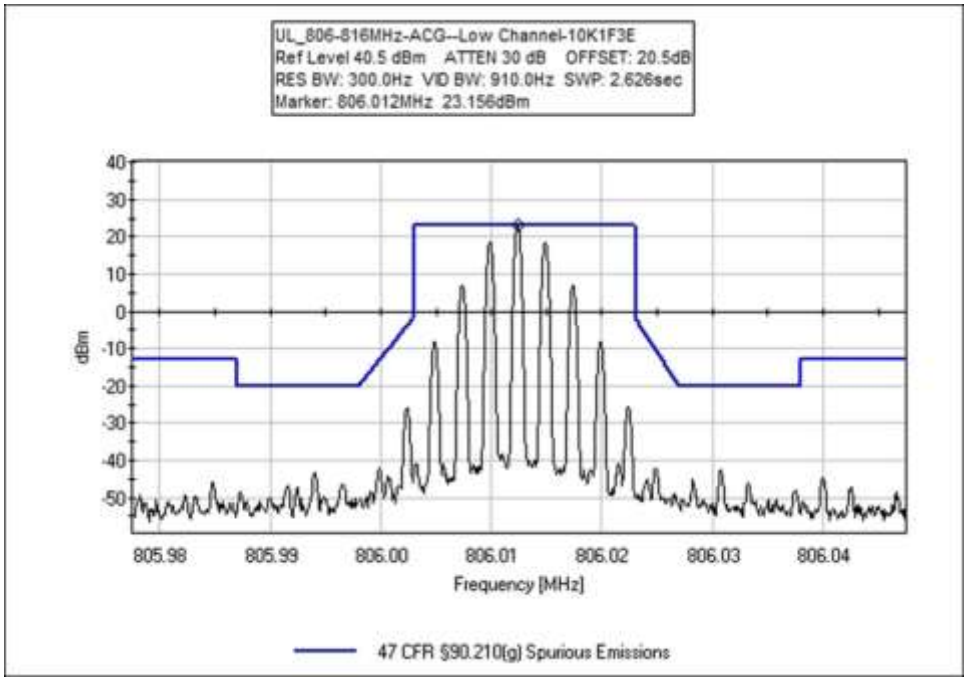

UL_806-816MHz-AGC+3-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.206sec
Marker: 815.975MHz 17.695dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

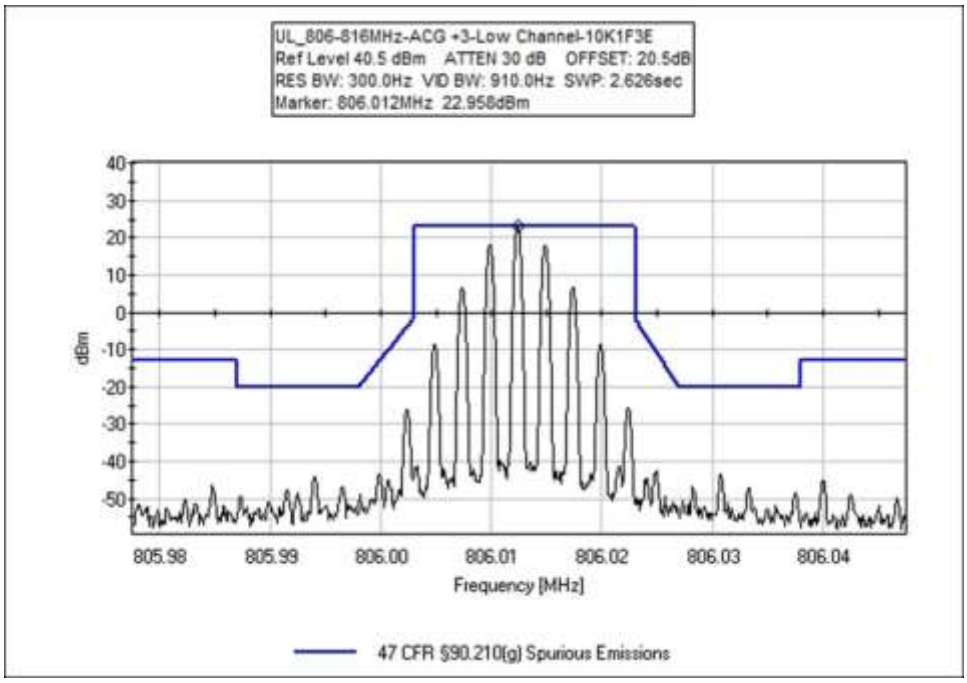

UL_806-816MHz-Input-High Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.206sec
Marker: 815.976MHz -52.209dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

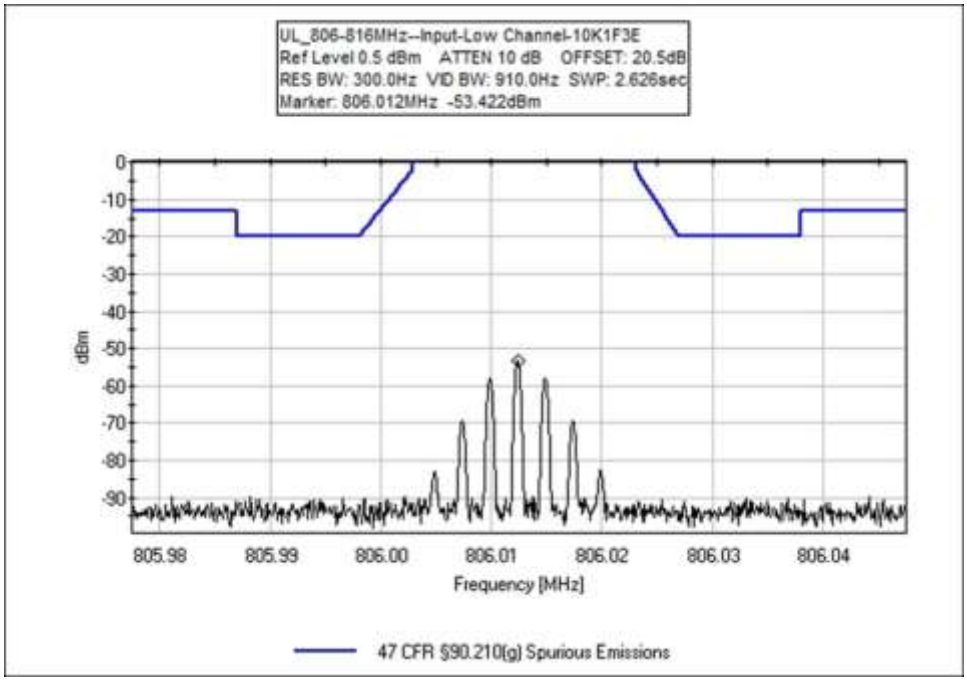

UL_806-816MHz-Pre ACG-High Channel-10K1F3E
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 3.751sec
Marker: 815.975MHz 22.659dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
815.93
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
816.02
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

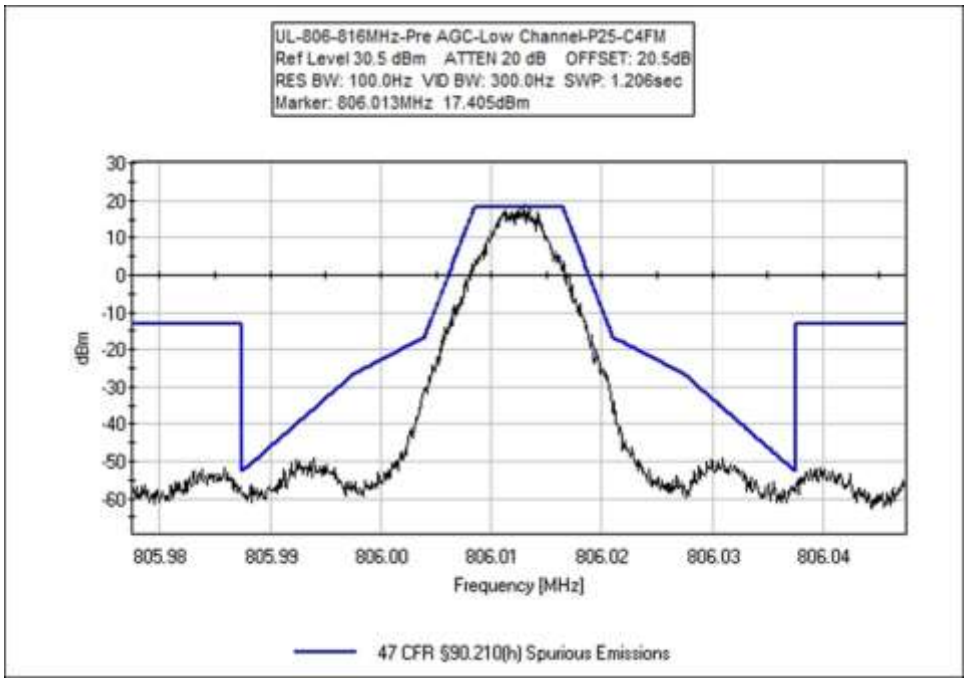

UL_806-816MHz-ACG +3-High Channel-10K1F3E
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 3.751sec
Marker: 815.975MHz 22.642dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
815.93
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
816.02
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

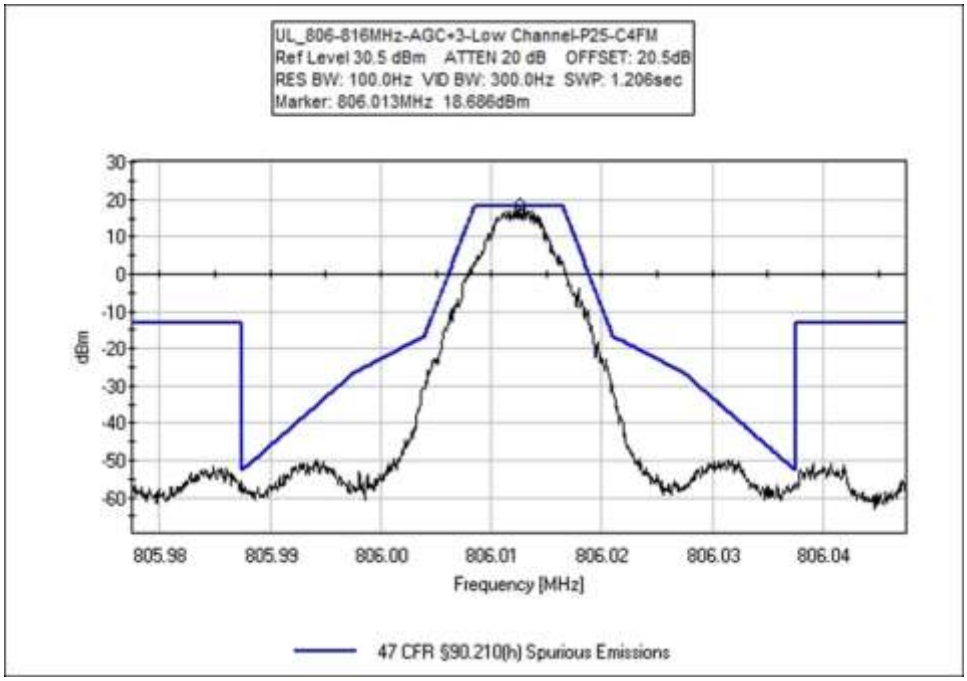

UL-806-816MHz-Input-High Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 815.975MHz -48.055dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
815.94
815.95
815.96
815.97
815.98
815.99
816.00
816.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

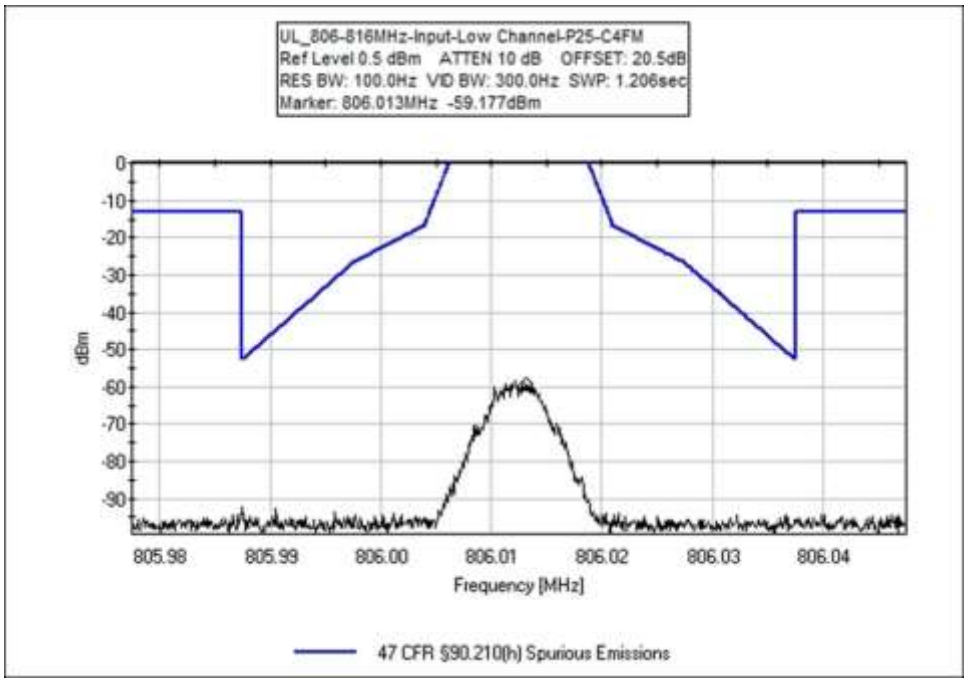

UL_806-816MHz-ACG--Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 806.012MHz 23.156dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

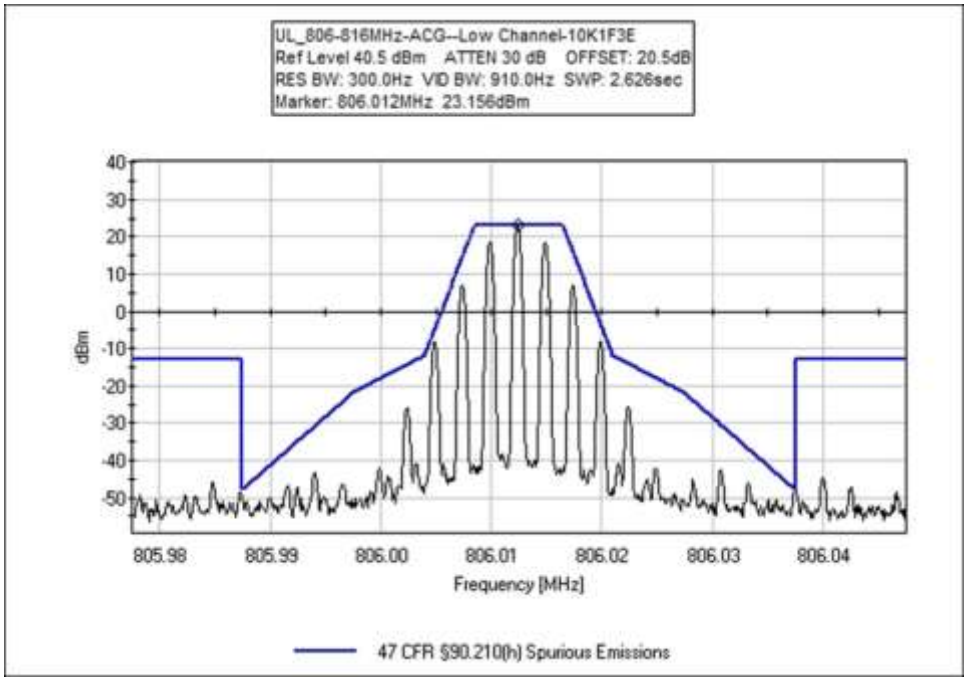

UL_806-816MHz-ACG +3-Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 806.012MHz 22.958dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

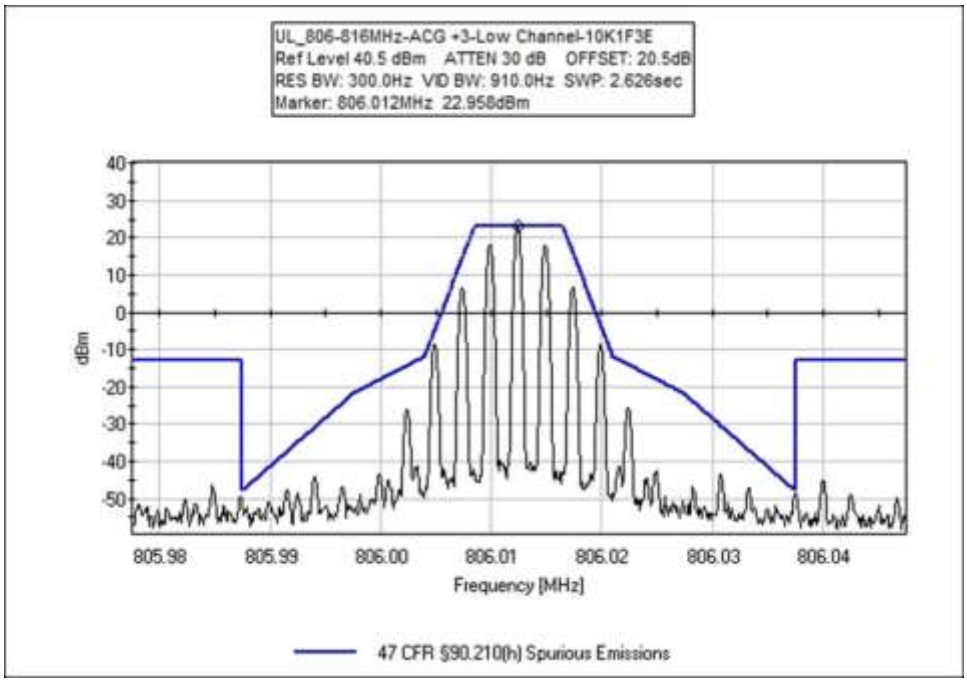

UL_806-816MHz--Input-Low Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 806.012MHz -53.422dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

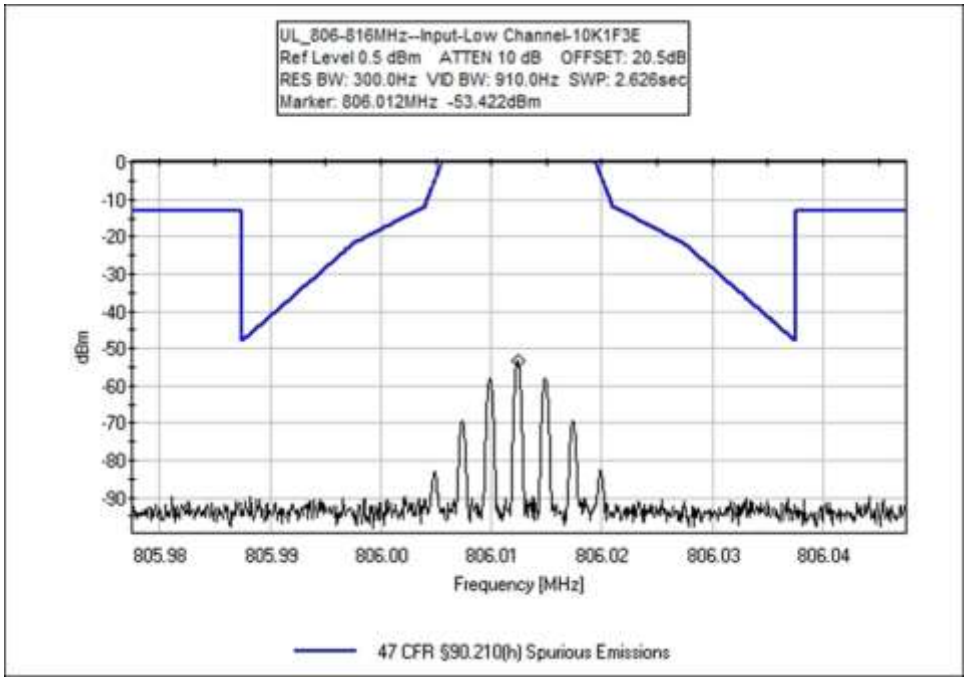

UL-806-816MHz-Pre AGC-Low Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.206sec
Marker: 806.013MHz 17.405dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

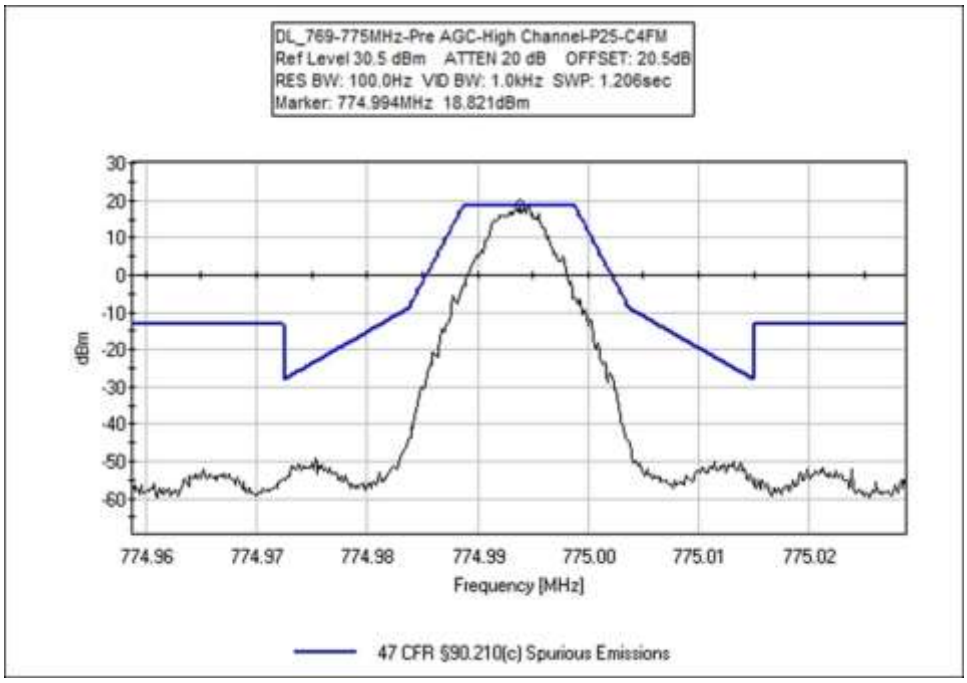

UL_806-816MHz-AGC+3-Low Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.206sec
Marker: 806.013MHz 18.686dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

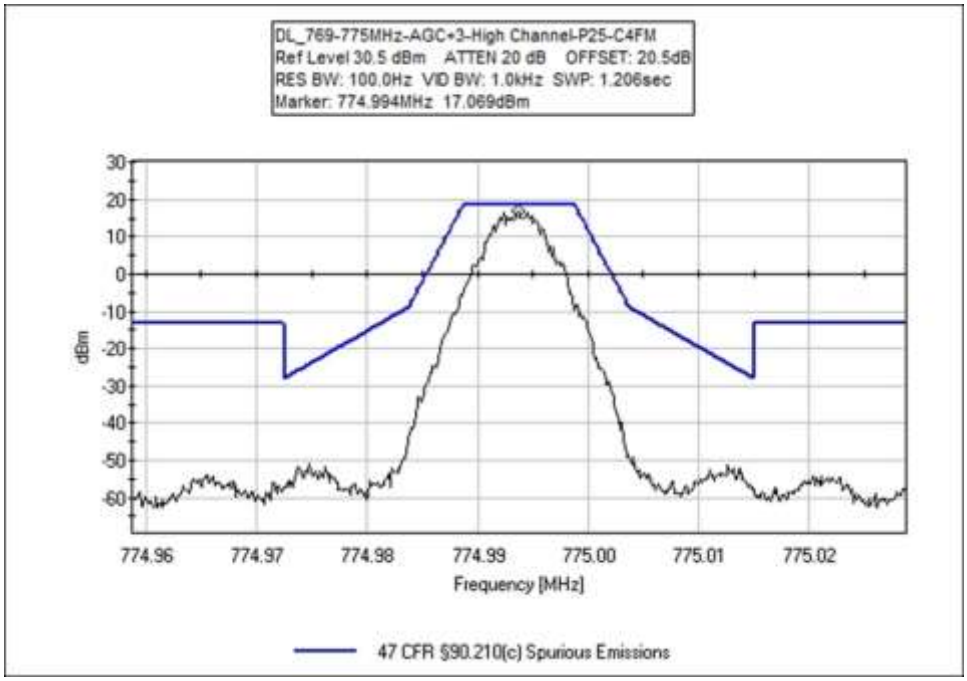

UL_806-816MHz-Input-Low Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.206sec
Marker: 806.013MHz -59.177dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

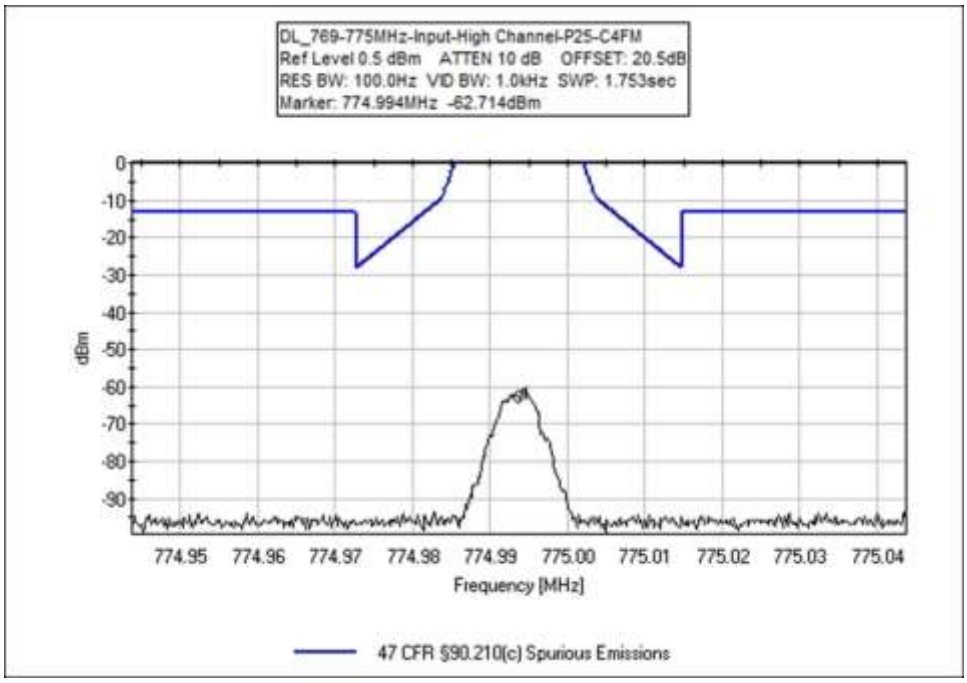

UL_806-816MHz-ACG--Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 806.012MHz 23.156dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

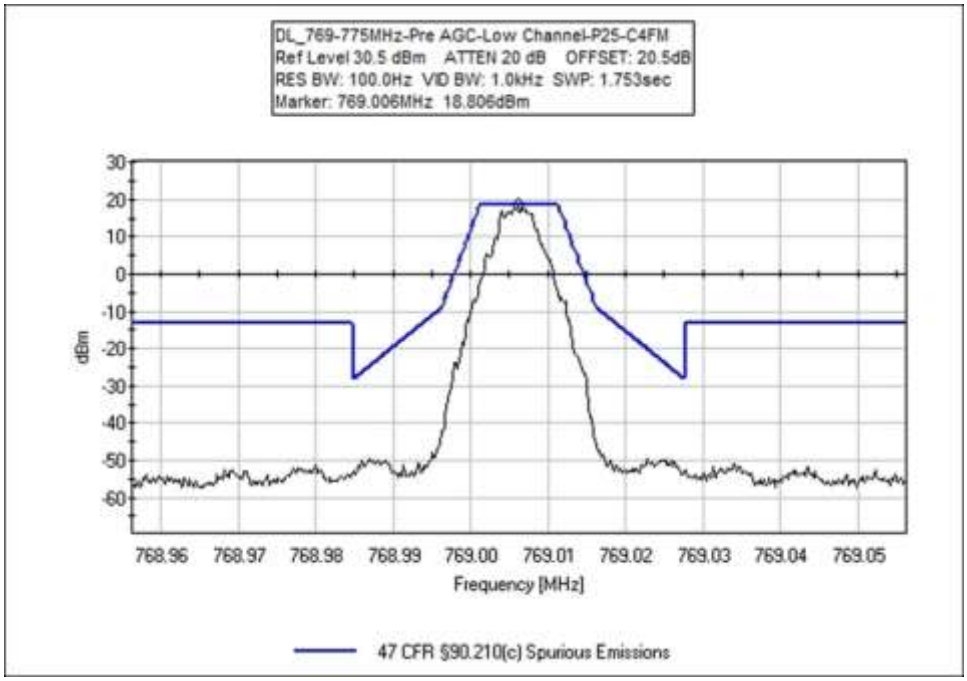

UL_806-816MHz-ACG +3-Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 806.012MHz 22.958dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

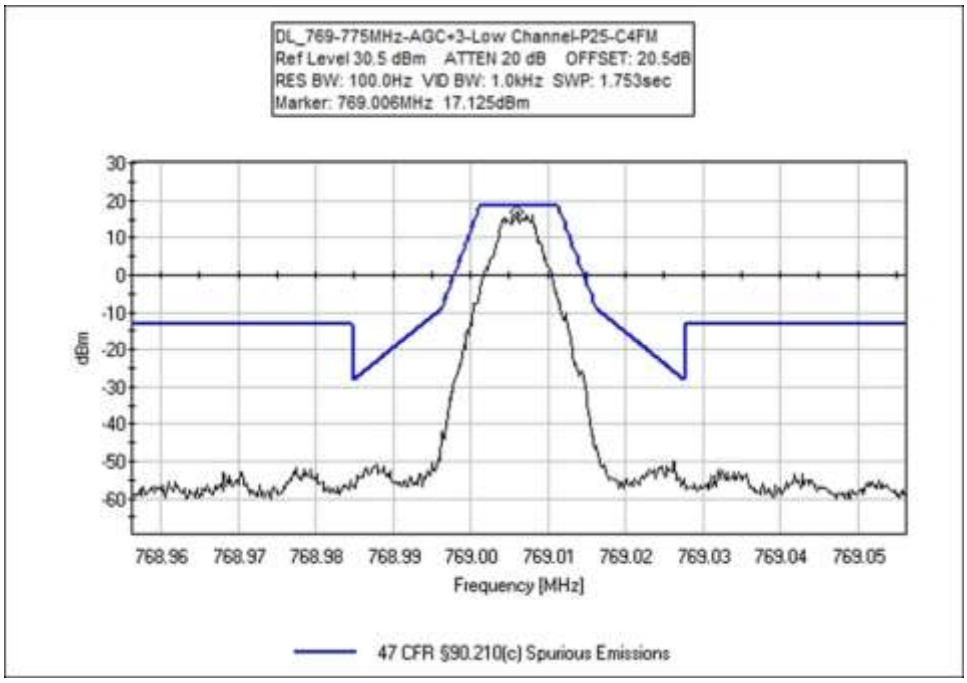

UL_806-816MHz--Input-Low Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 2.626sec
Marker: 806.012MHz -53.422dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
805.98
805.99
806.00
806.01
806.02
806.03
806.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

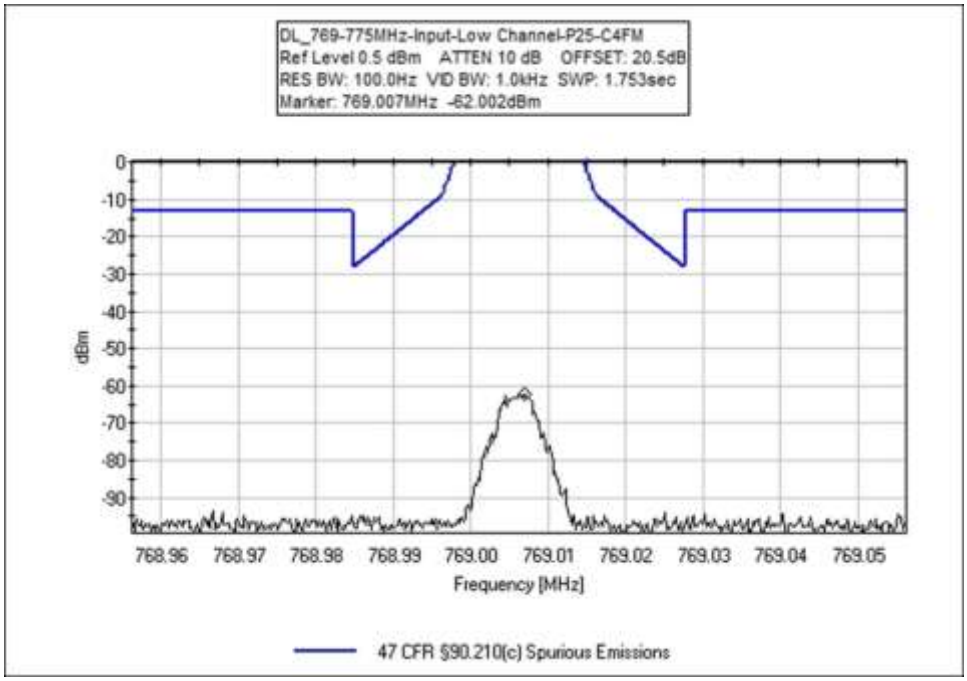

DL_769-775MHz-Pre AGC-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 774.994MHz 18.821dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
774.96
774.97
774.98
774.99
775.00
775.01
775.02
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

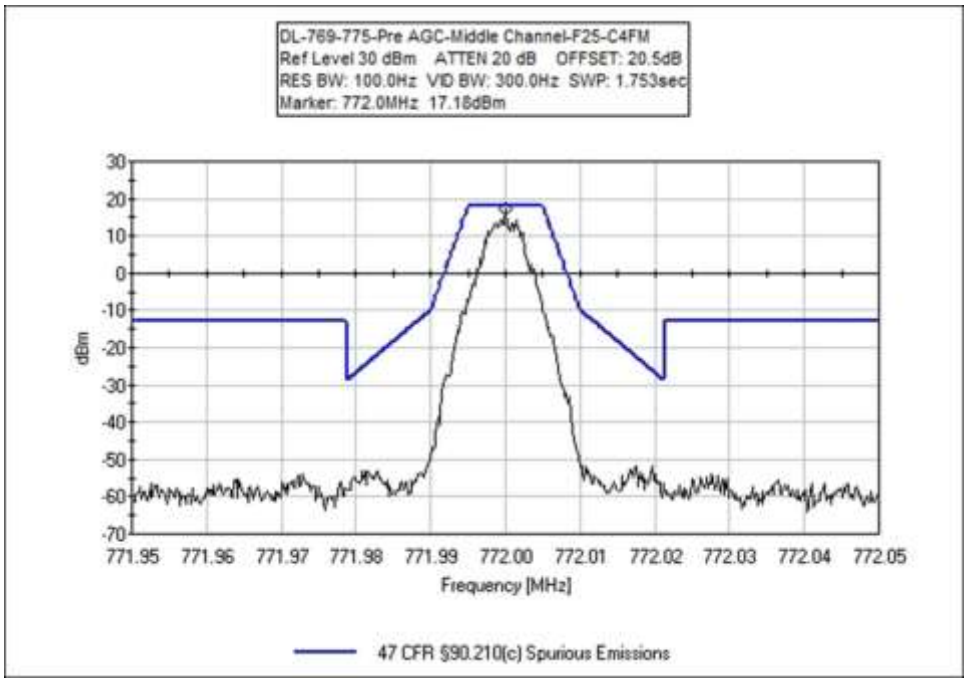

DL_769-775MHz-AGC+3-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 774.994MHz 17.069dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
774.96
774.97
774.98
774.99
775.00
775.01
775.02
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

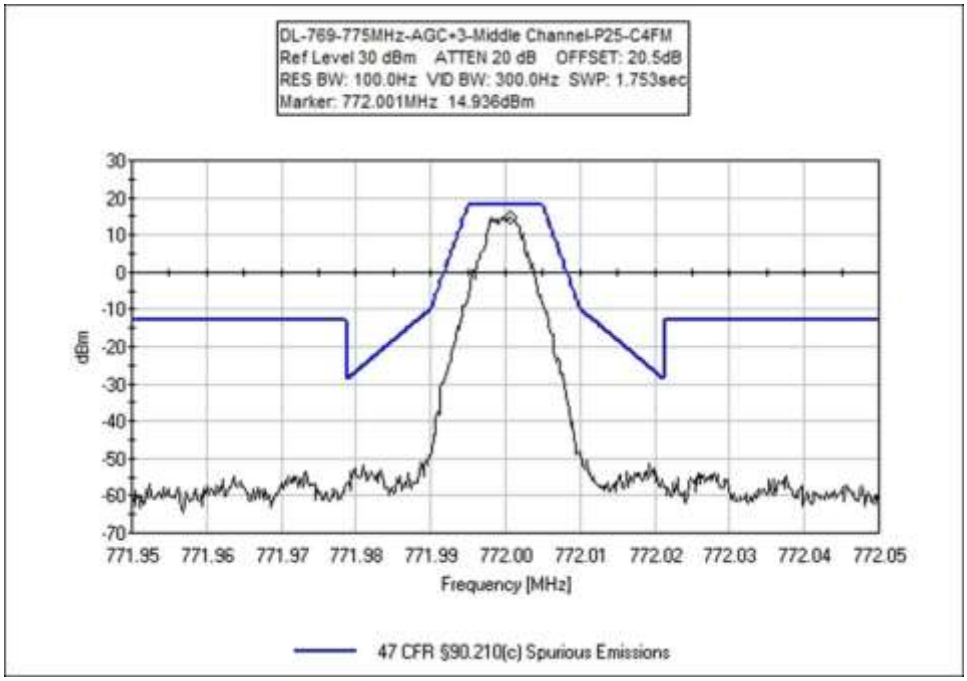

DL_769-775MHz-Input-High Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.753sec
Marker: 774.994MHz -62.714dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
774.95 774.96 774.97 774.98 774.99 775.00 775.01 775.02 775.03 775.04
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

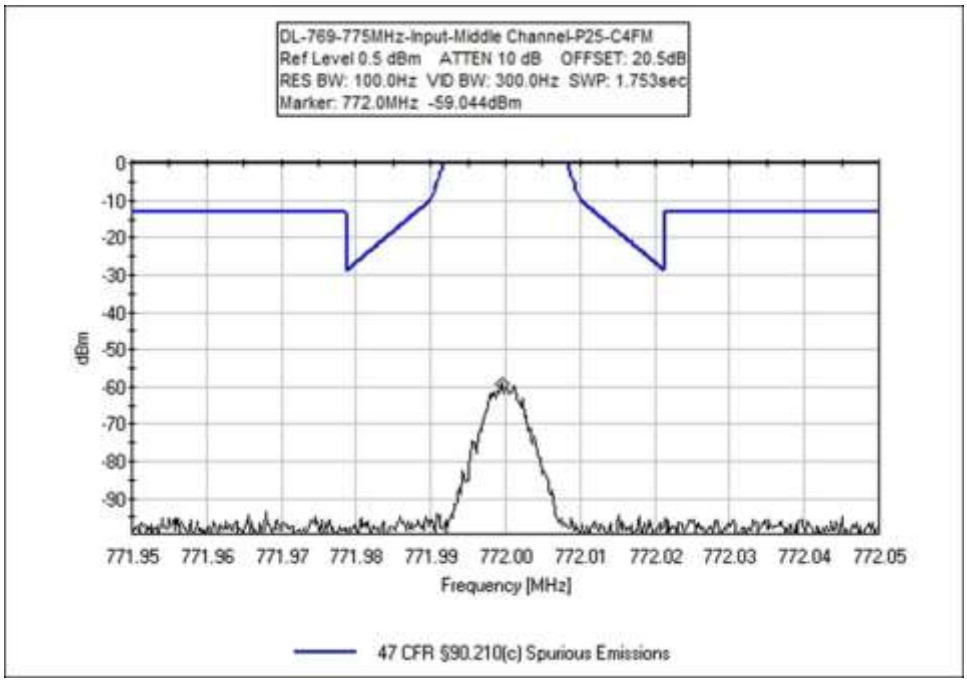

DL_769-775MHz-Pre AGC-Low Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.753sec
Marker: 769.006MHz 18.806dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
768.96 768.97 768.98 768.99 769.00 769.01 769.02 769.03 769.04 769.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

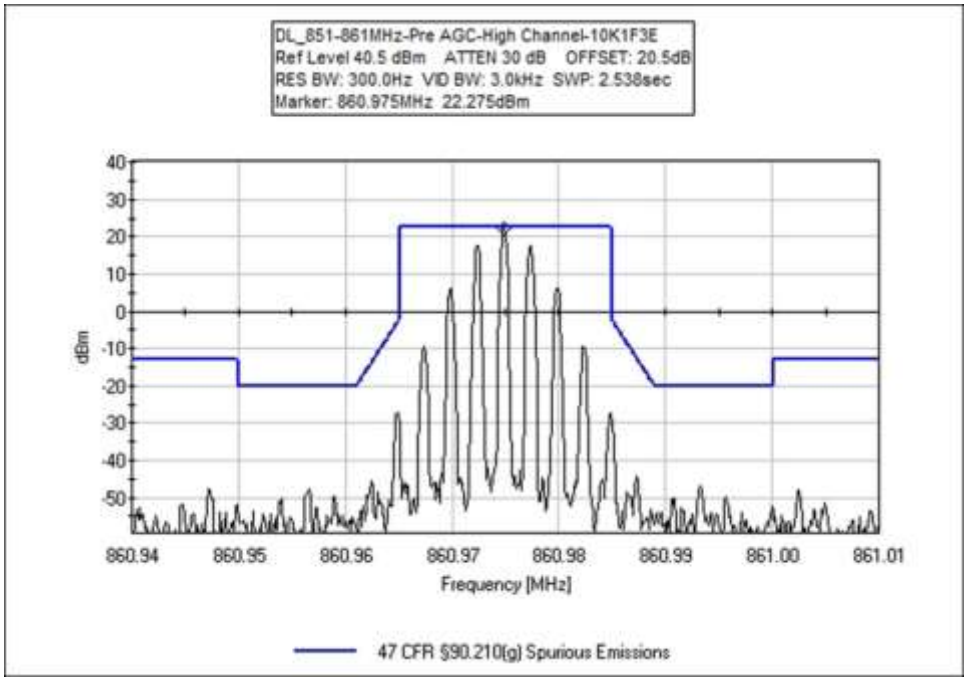

DL_769-775MHz-AGC+3-Low Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.753sec
Marker: 769.006MHz 17.125dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
768.96 768.97 768.98 768.99 769.00 769.01 769.02 769.03 769.04 769.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

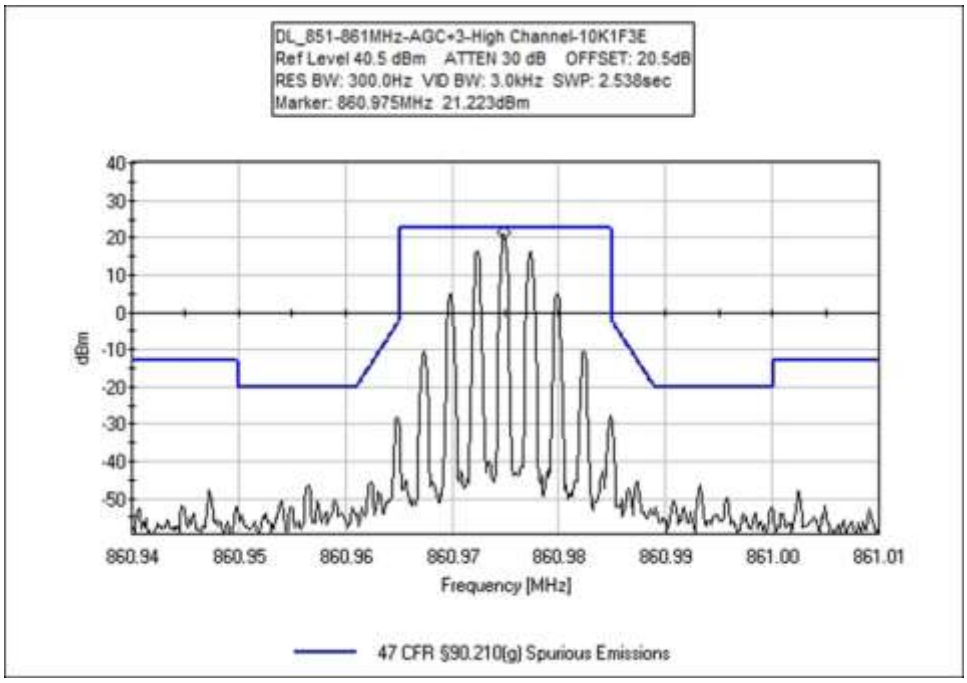

DL_769-775MHz-Input-Low Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.753sec
Marker: 769.007MHz -62.002dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
768.96 768.97 768.98 768.99 769.00 769.01 769.02 769.03 769.04 769.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

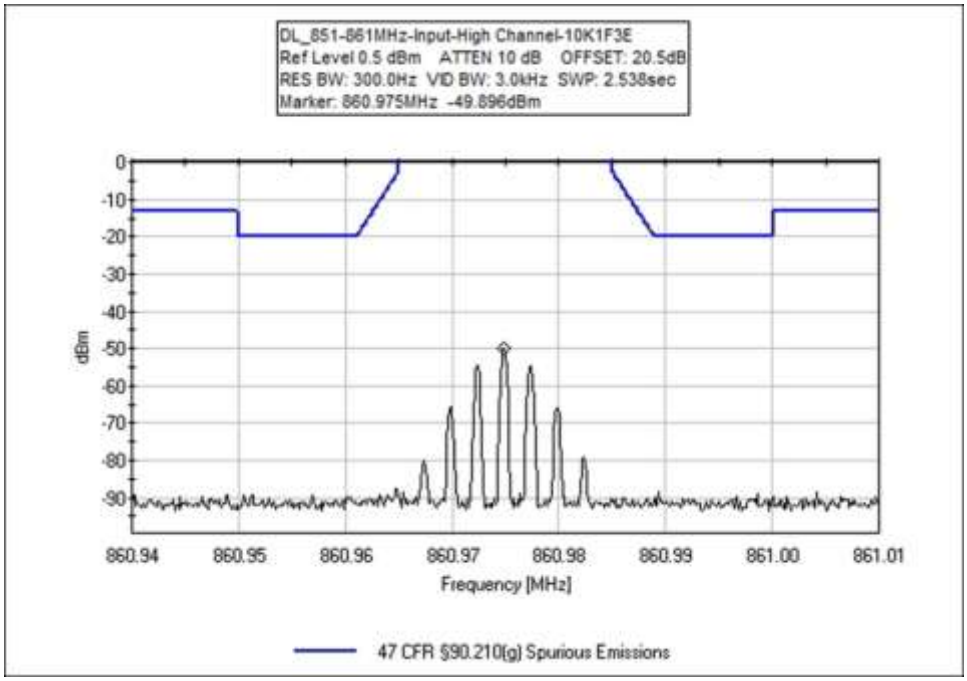

DL-769-775-Pre AGC-Middle Channel-F25-C4FM
Ref Level 30 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 772.0MHz 17.18dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
771.95 771.96 771.97 771.98 771.99 772.00 772.01 772.02 772.03 772.04 772.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

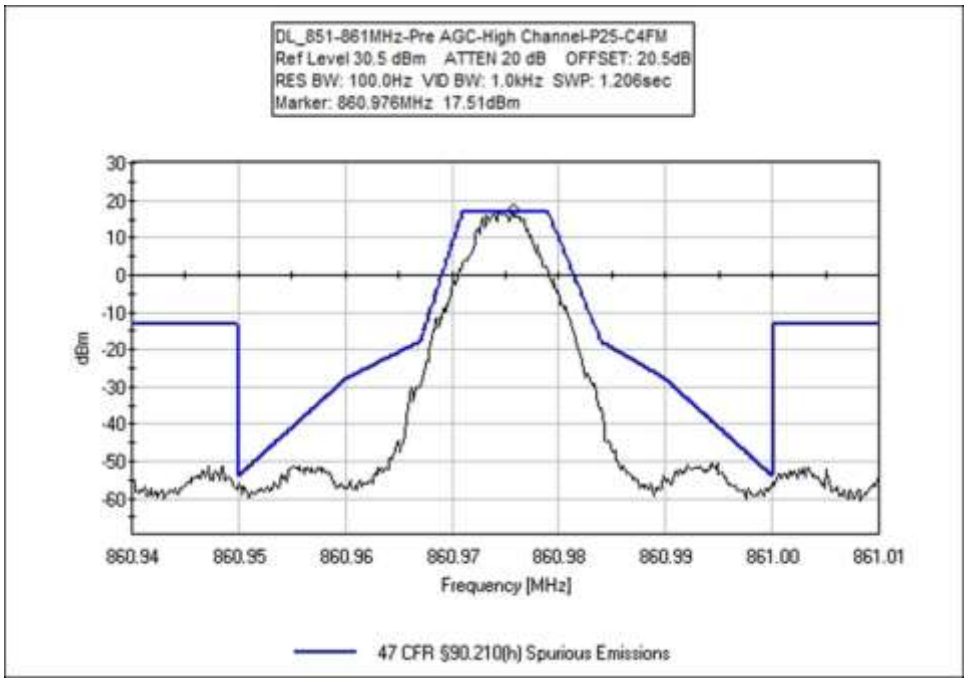

DL-769-775MHz-AGC+3-Middle Channel-P25-C4FM
Ref Level 30 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 772.001MHz 14.936dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
771.95 771.96 771.97 771.98 771.99 772.00 772.01 772.02 772.03 772.04 772.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

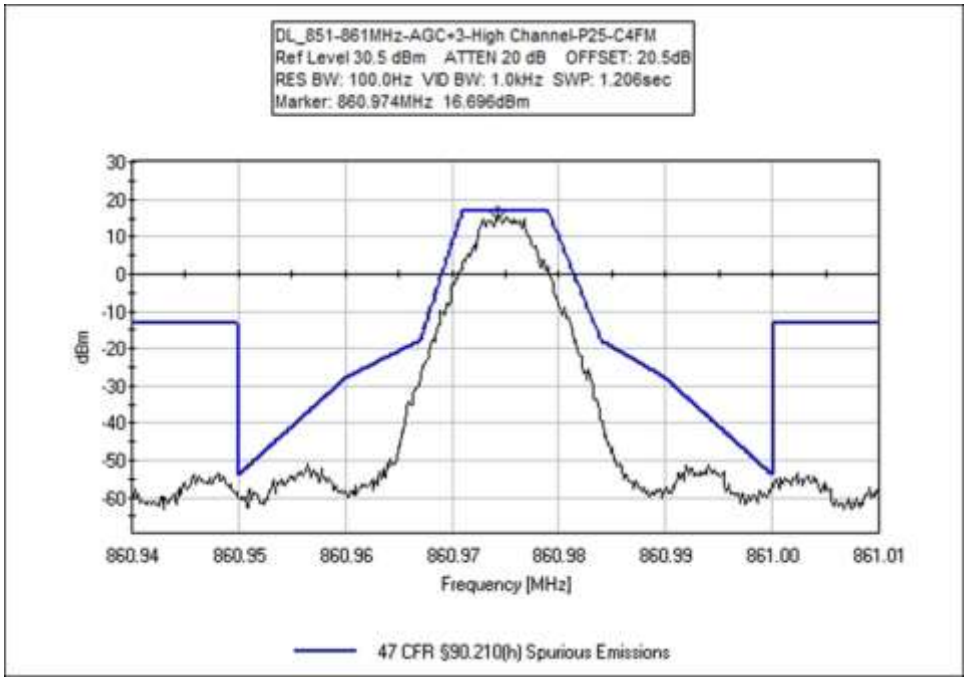

DL-769-775MHz-Input-Middle Channel-P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 772.0MHz -59.044dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
771.95 771.96 771.97 771.98 771.99 772.00 772.01 772.02 772.03 772.04 772.05
Frequency [MHz]
47 CFR §90.210(c) Spurious Emissions

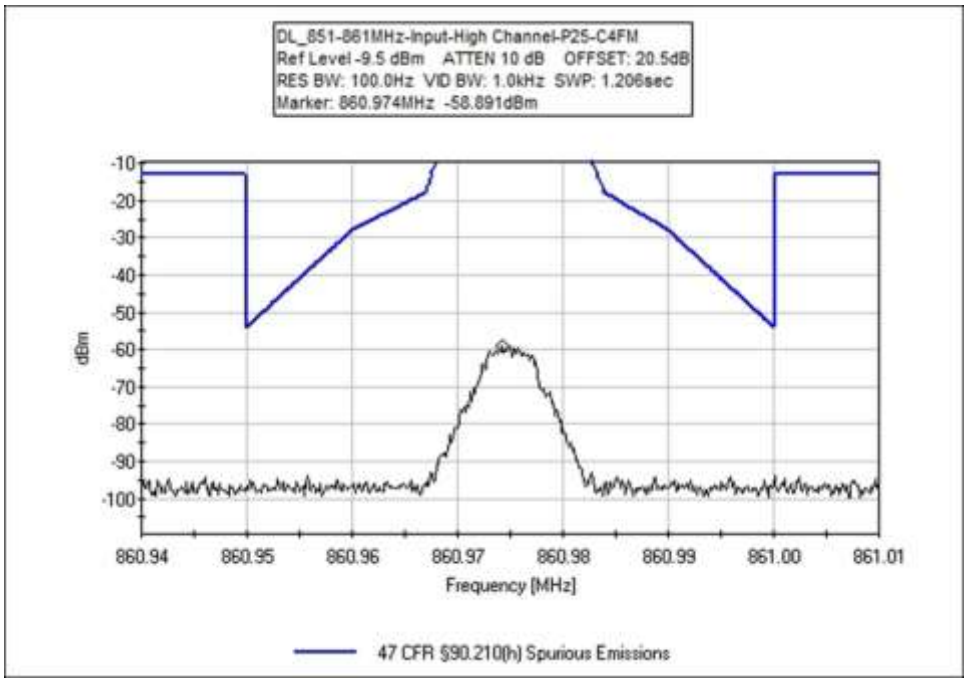

DL_851-861MHz-Pre AGC-High Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 860.975MHz 22.275dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
860.94 860.95 860.96 860.97 860.98 860.99 861.00 861.01
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

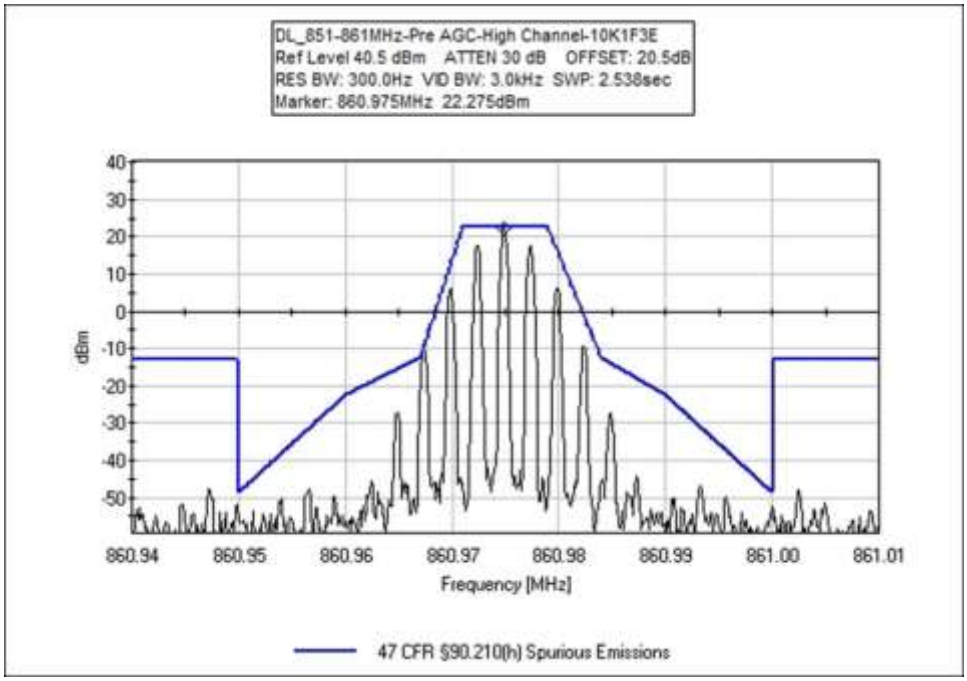

DL_851-861MHz-AGC+3-High Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 860.975MHz 21.223dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

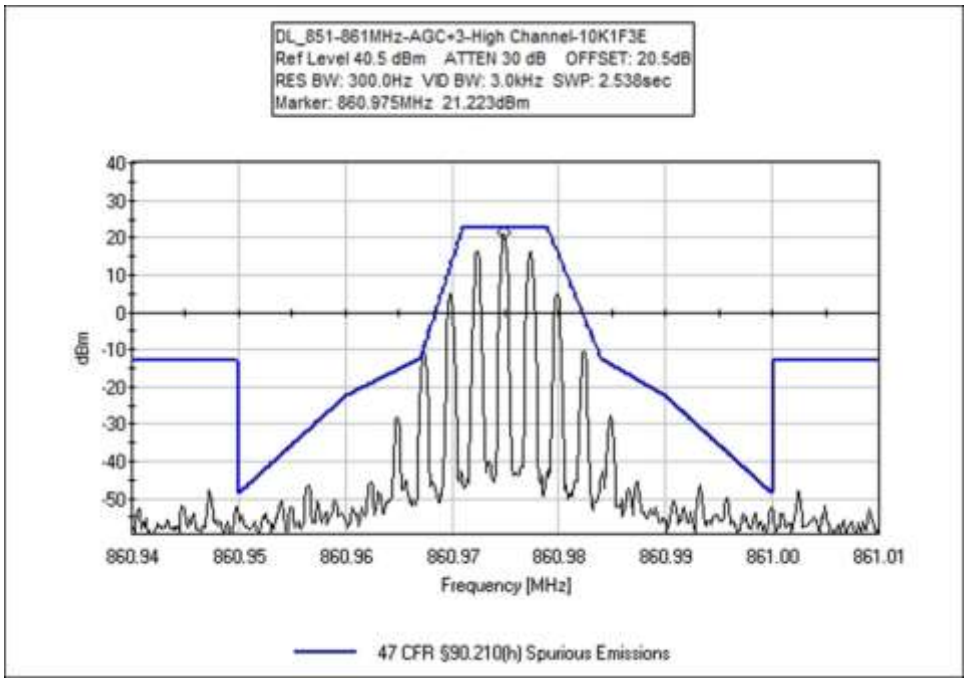

DL_851-861MHz-Input-High Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 860.975MHz -49.896dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

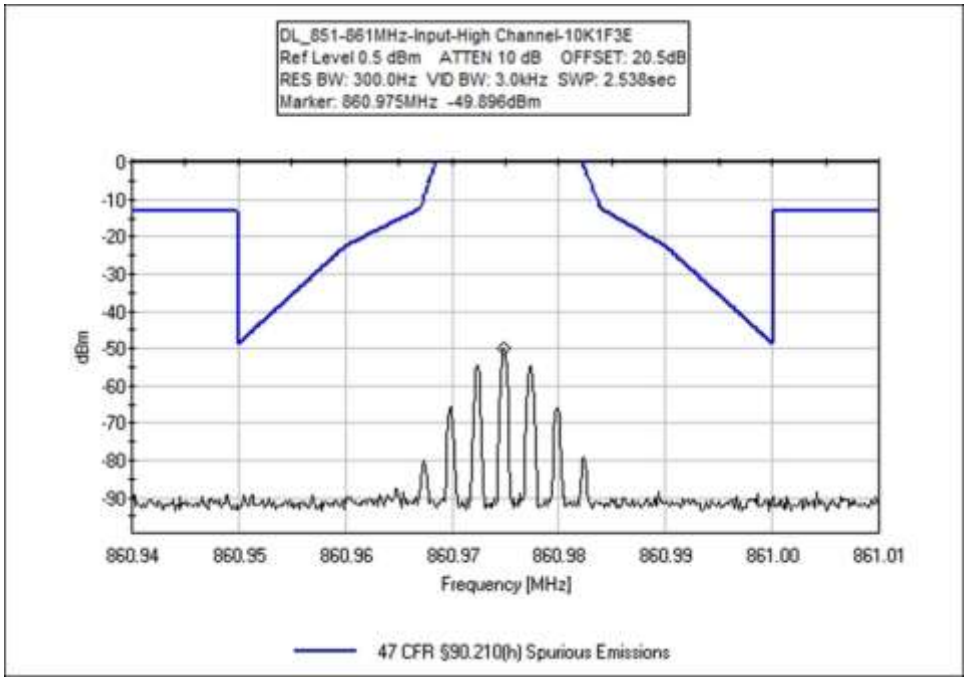

DL_851-861MHz-Pre AGC-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 860.976MHz 17.51dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

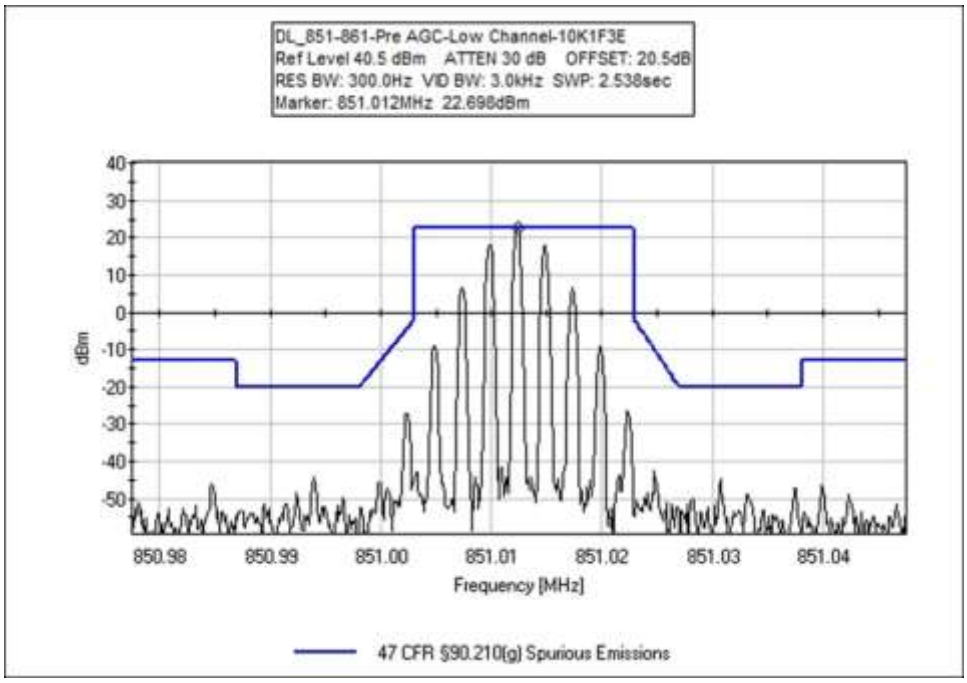

DL_851-861MHz-AGC+3-High Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 860.974MHz 16.696dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

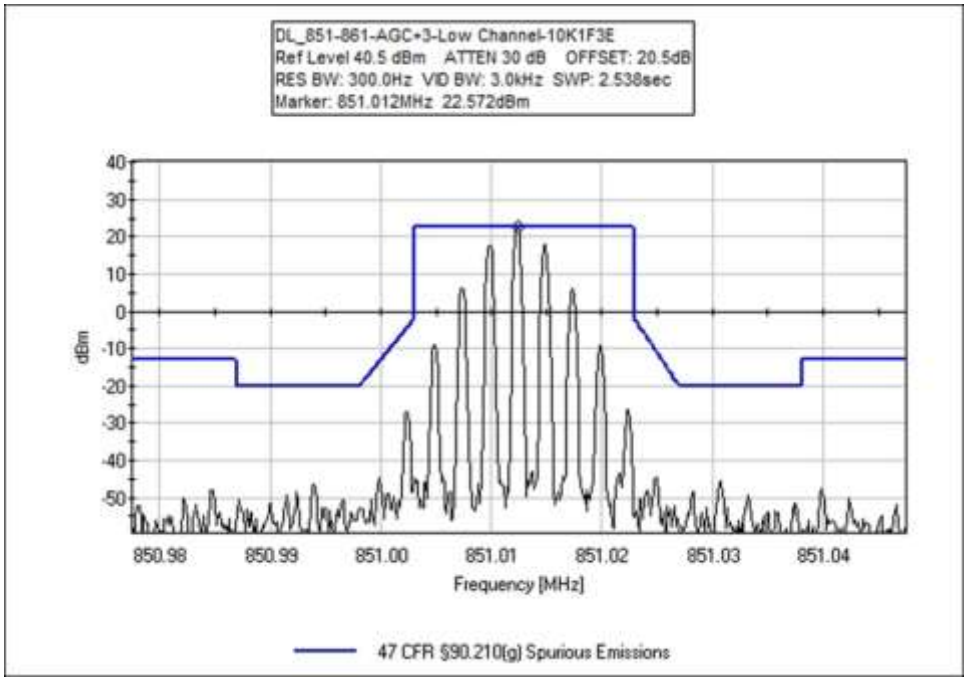

DL_851-861MHz-Input-High Channel-P25-C4FM
Ref Level -9.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 860.974MHz -58.891dBm
dBm
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

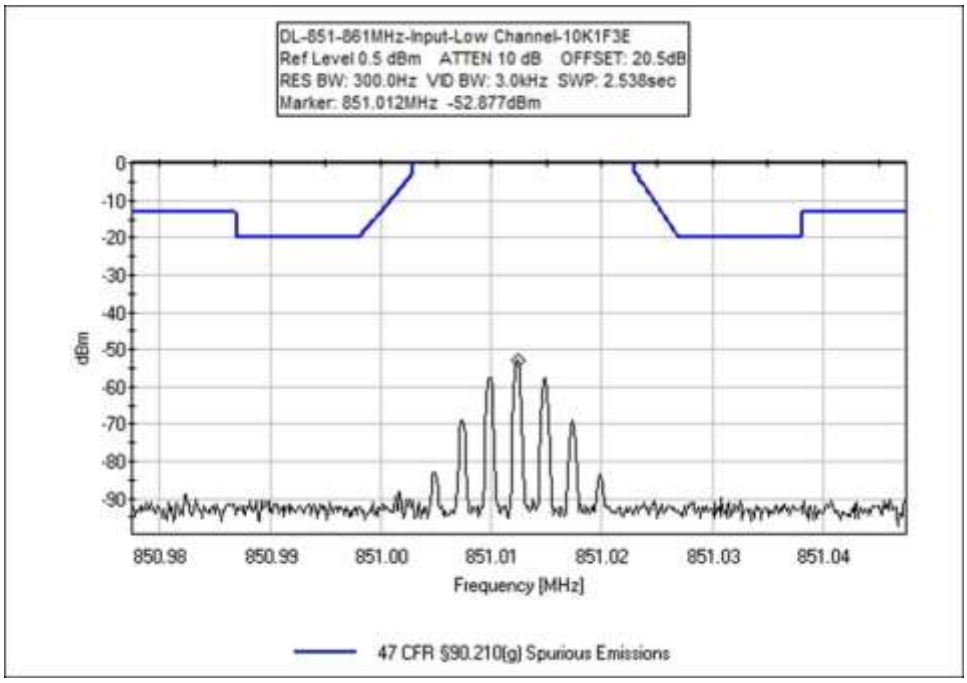

DL_851-861MHz-Pre AGC-High Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 860.975MHz 22.275dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

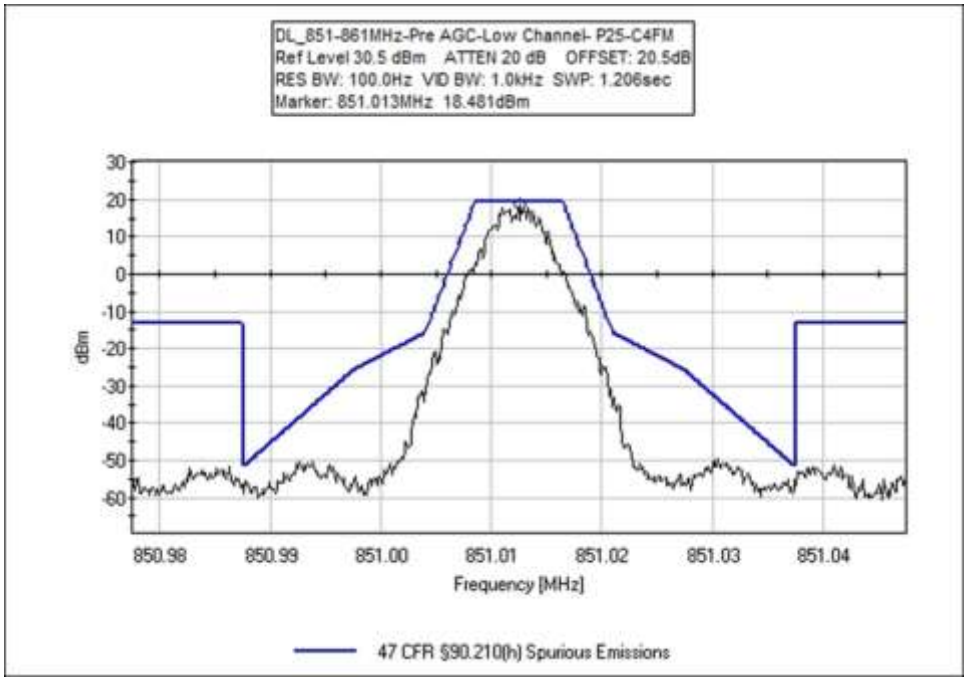

DL_851-861MHz-AGC+3-High Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 860.975MHz 21.223dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

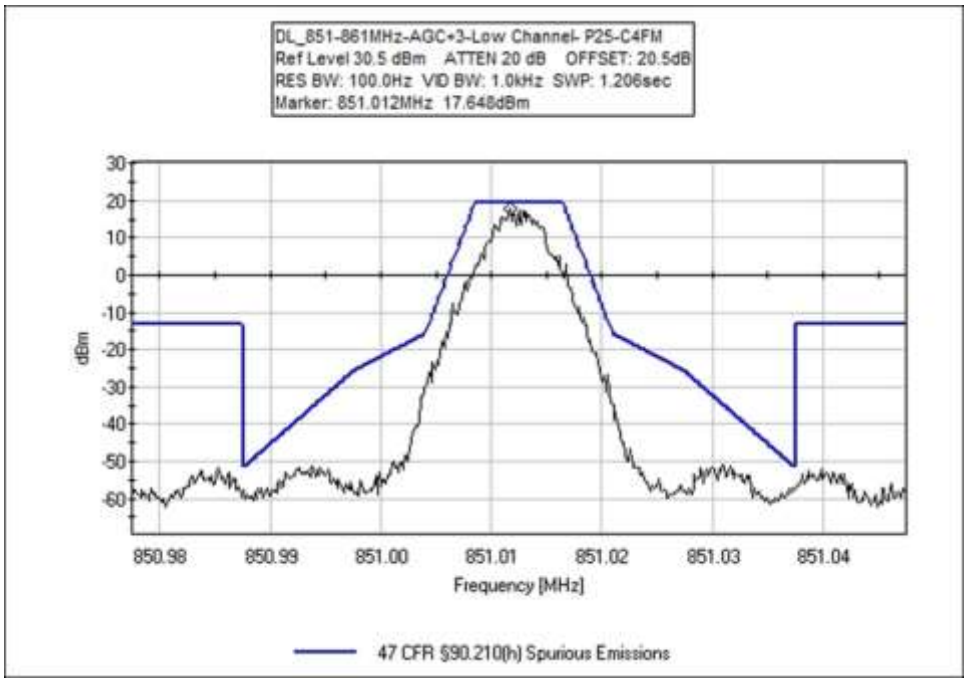

DL_851-861MHz-Input-High Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 860.975MHz -49.896dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
860.94
860.95
860.96
860.97
860.98
860.99
861.00
861.01
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

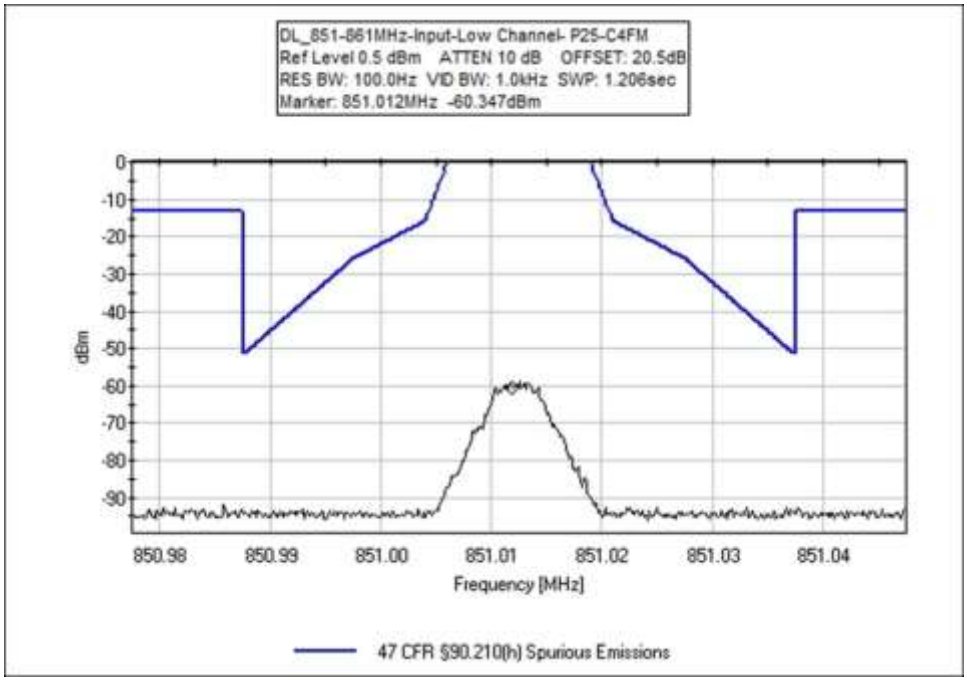

DL_851-861-Pre AGC-Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 851.012MHz 22.698dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

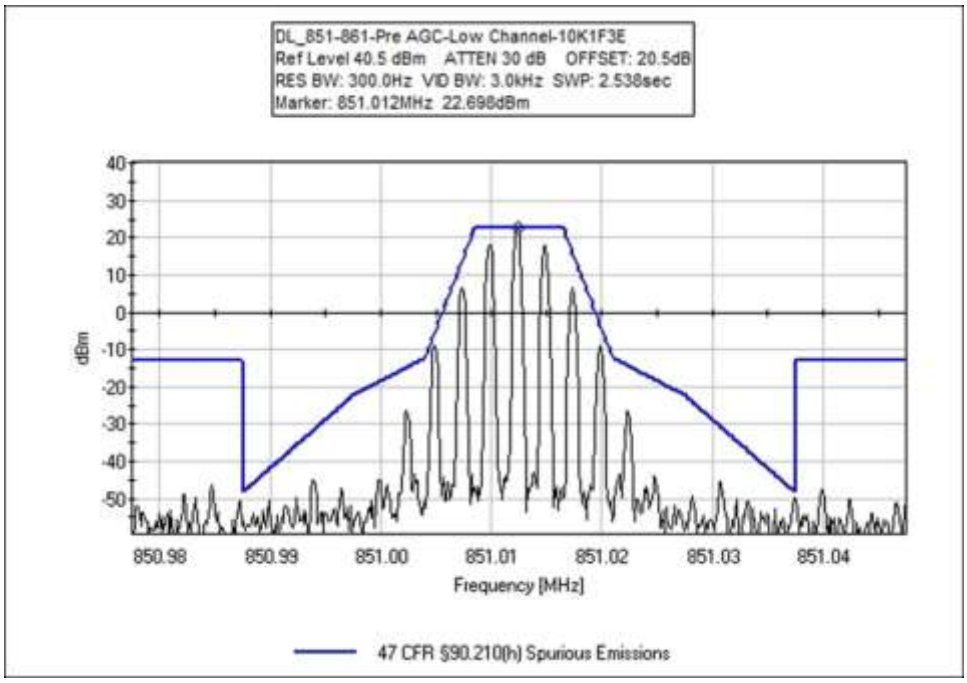

DL_851-861-AGC+3-Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 851.012MHz 22.572dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

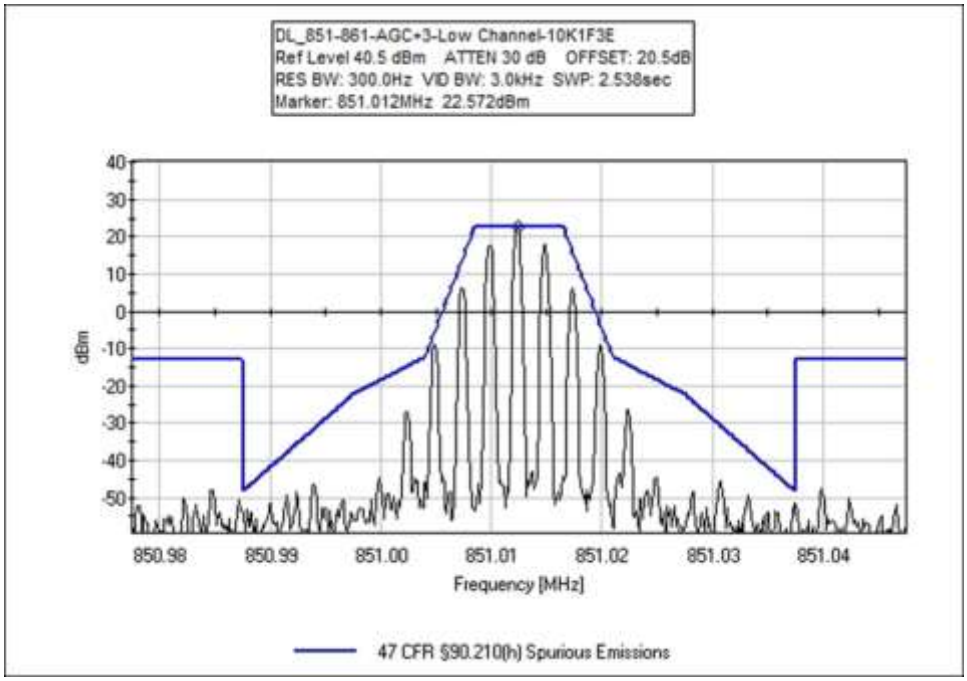

DL-851-861MHz-Input-Low Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 851.012MHz -52.877dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

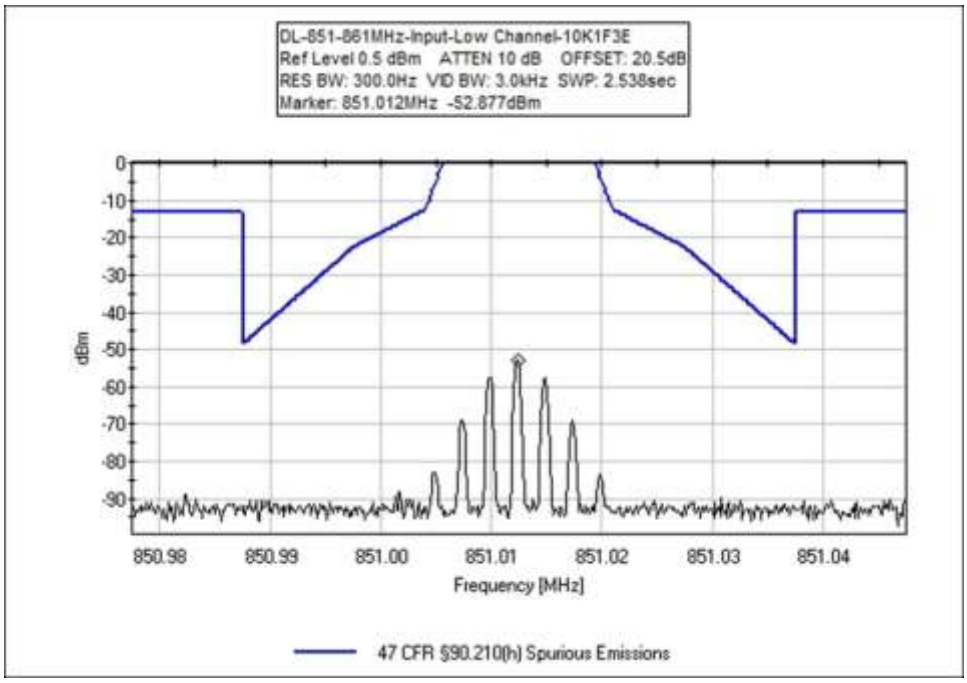

DL_851-861MHz-Pre AGC-Low Channel- P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 851.013MHz 18.481dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

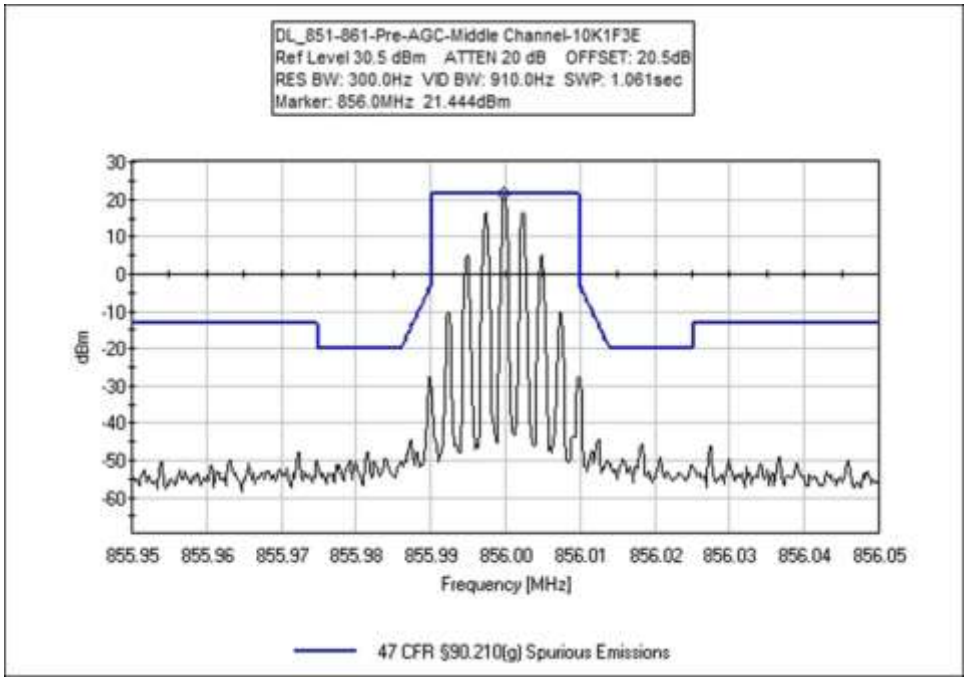

DL_851-861MHz-AGC+3-Low Channel- P25-C4FM
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 851.012MHz 17.648dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

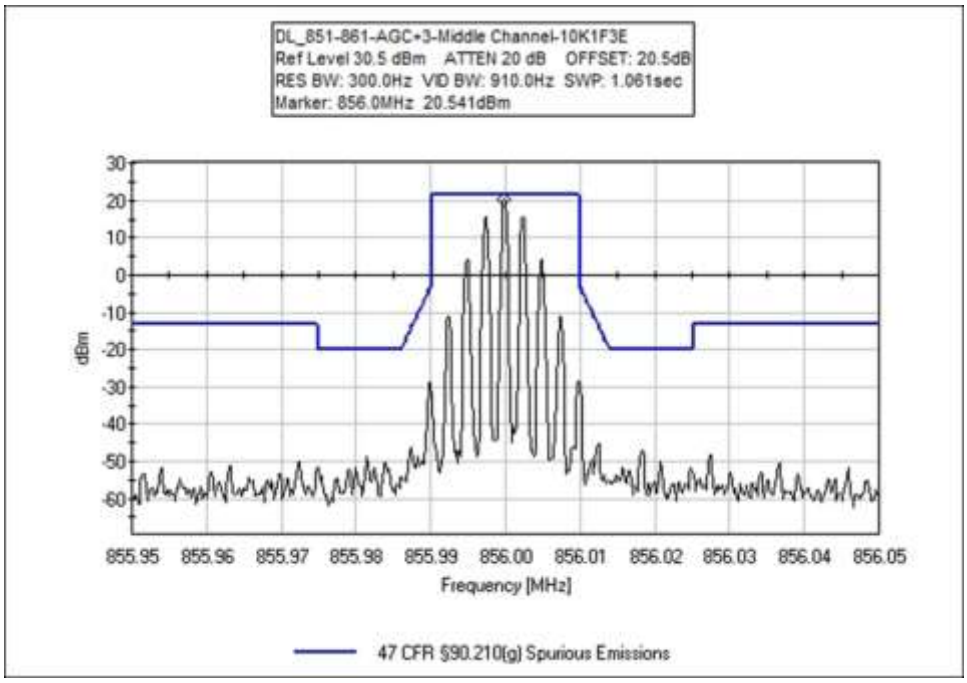

DL_851-861MHz-Input-Low Channel- P25-C4FM
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 1.0kHz SWP: 1.206sec
Marker: 851.012MHz -60.347dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

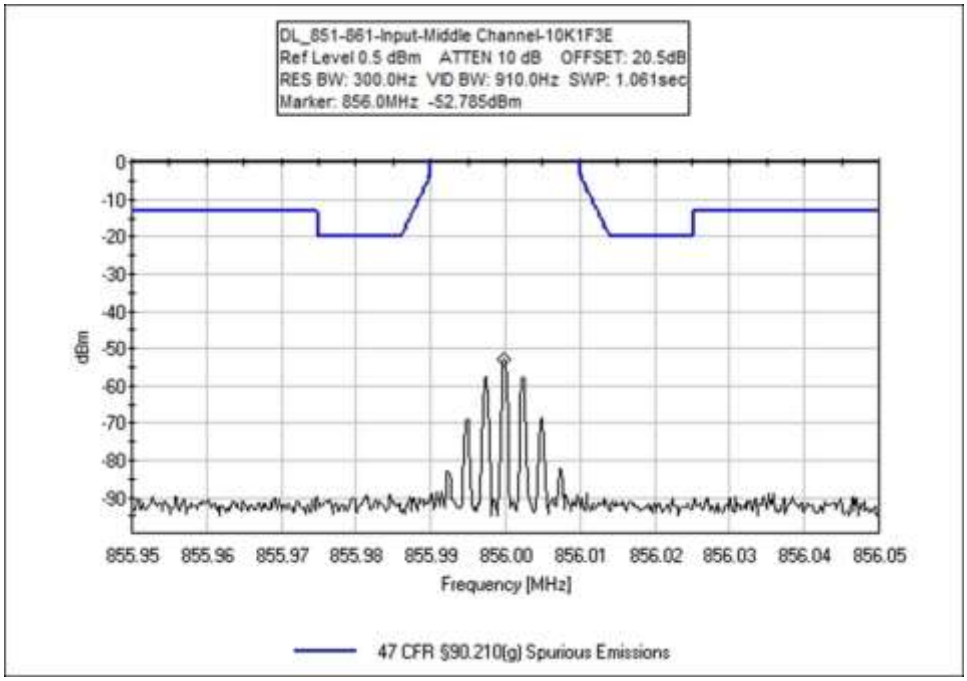

DL_851-861-Pre AGC-Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 851.012MHz 22.698dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

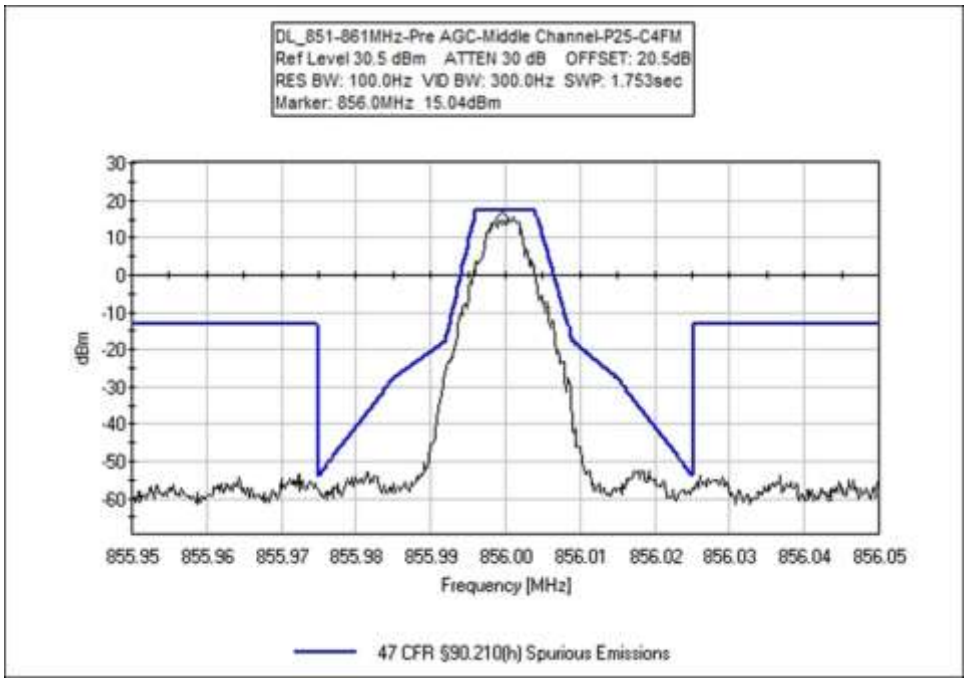

DL_851-861-AGC+3-Low Channel-10K1F3E
Ref Level 40.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 851.012MHz 22.572dBm
dBm
40
30
20
10
0
-10
-20
-30
-40
-50
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

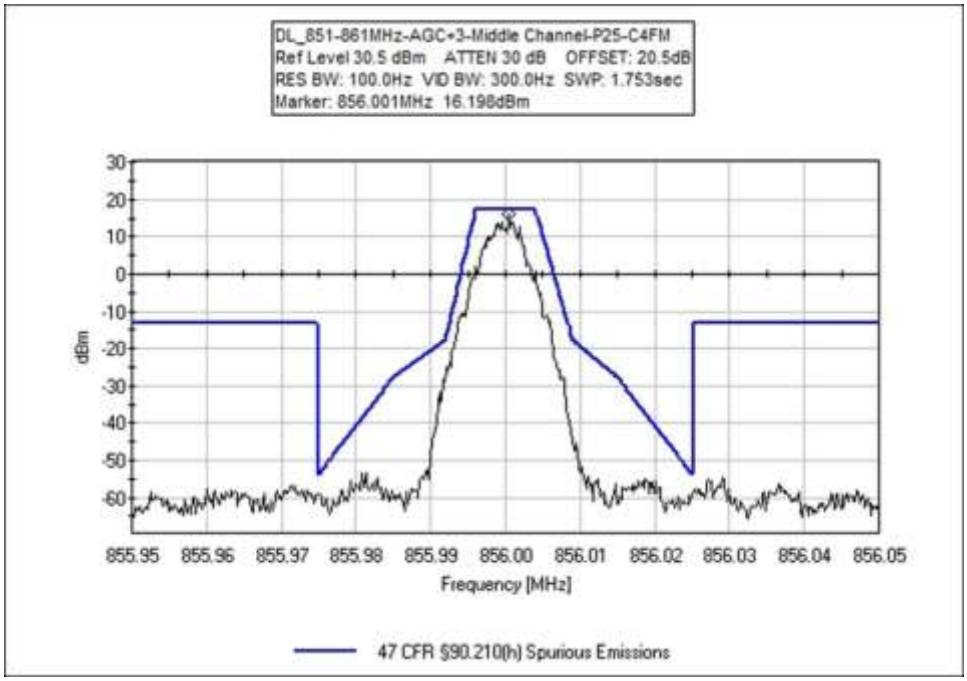

DL-851-861MHz-Input-Low Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 3.0kHz SWP: 2.538sec
Marker: 851.012MHz -52.877dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
850.98
850.99
851.00
851.01
851.02
851.03
851.04
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

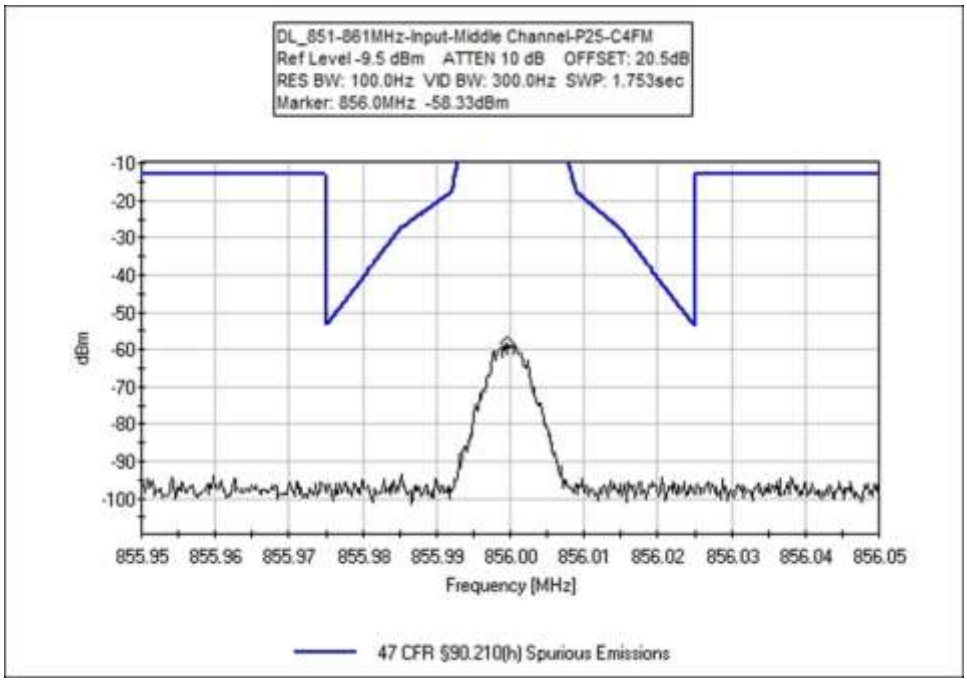

DL_851-861-Pre-AGC-Middle Channel-10K1F3E
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 856.0MHz 21.444dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
855.95
855.96
855.97
855.98
855.99
856.00
856.01
856.02
856.03
856.04
856.05
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

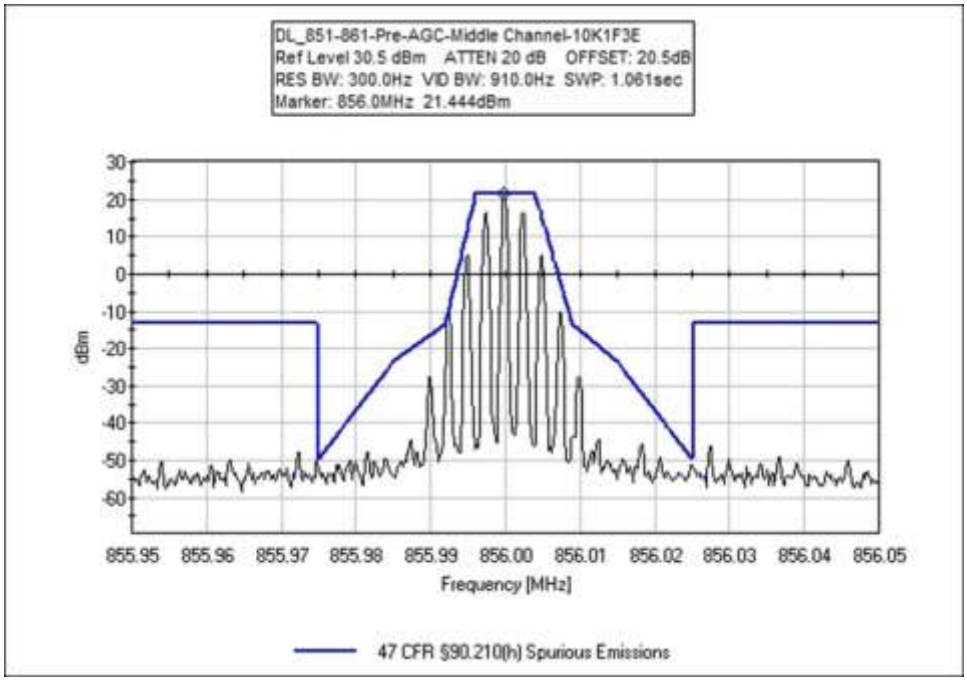

DL_851-861-AGC+3-Middle Channel-10K1F3E
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 856.0MHz 20.541dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

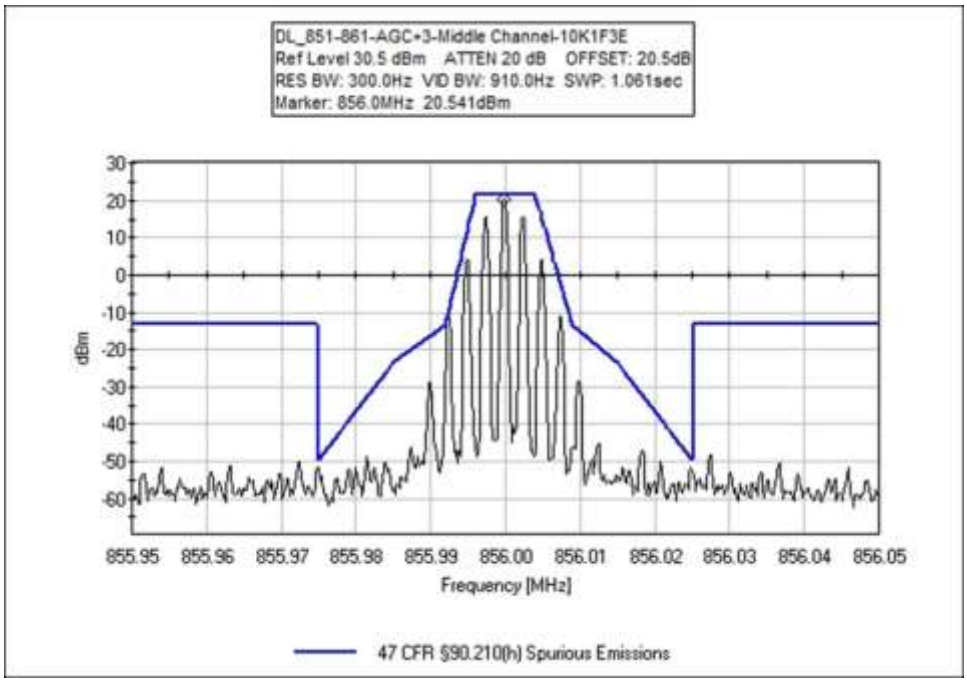

DL_851-861-Input-Middle Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 856.0MHz -52.785dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(g) Spurious Emissions

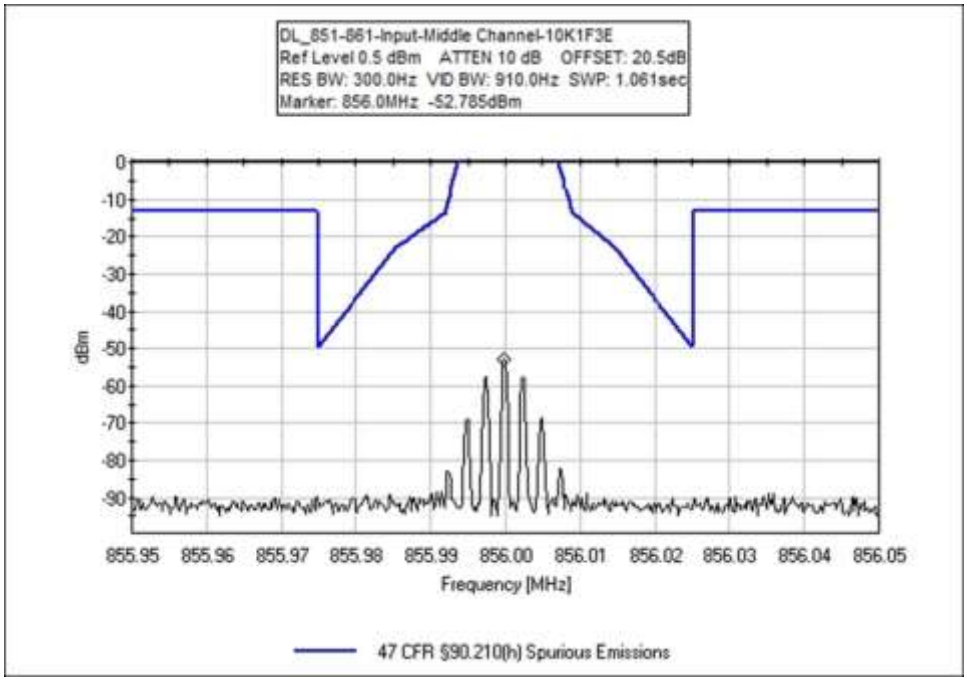

DL_851-861MHz-Pre AGC-Middle Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 856.0MHz 15.04dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions


DL_851-861MHz-AGC+3-Middle Channel-P25-C4FM
Ref Level 30.5 dBm ATTEN 30 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 856.001MHz 16.198dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

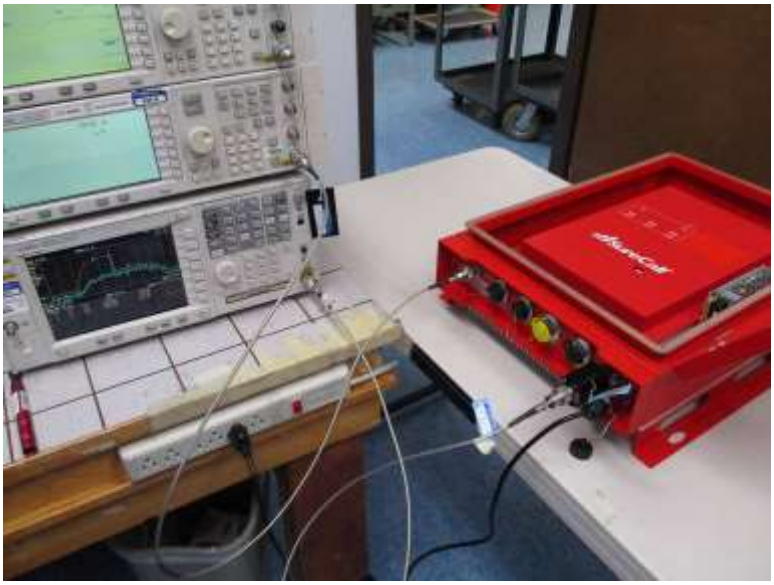

DL_851-861MHz-Input-Middle Channel-P25-C4FM
Ref Level -9.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 100.0Hz VID BW: 300.0Hz SWP: 1.753sec
Marker: 856.0MHz -58.33dBm
dBm
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions


DL_851-861-Pre-AGC-Middle Channel-10K1F3E
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 856.0MHz 21.444dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions


DL_851-861-AGC+3-Middle Channel-10K1F3E
Ref Level 30.5 dBm ATTEN 20 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 856.0MHz 20.541dBm
dBm
30
20
10
0
-10
-20
-30
-40
-50
-60
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions


DL_851-861-Input-Middle Channel-10K1F3E
Ref Level 0.5 dBm ATTEN 10 dB OFFSET: 20.5dB
RES BW: 300.0Hz VID BW: 910.0Hz SWP: 1.061sec
Marker: 856.0MHz -52.785dBm
dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
855.95 855.96 855.97 855.98 855.99 856.00 856.01 856.02 856.03 856.04 856.05
Frequency [MHz]
47 CFR §90.210(h) Spurious Emissions

Test Setup Photo



Part 90: 543(e) Out of Band Emissions

Engineer: Hieu Song Nguyenpham
Test Date: 6/4/2018

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
P06797	Attenuator	Narda	766-20	4/10/2017	4/10/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019

Environmental Conditions					
Temperature (ºC)	23.5	Relative Humidity (%):	46	Atmospheric Pressure (kPa):	101.5

Summary of Results

Pass: As indicated in plots below, all OBE are under the limit of -13dBm.

LTE

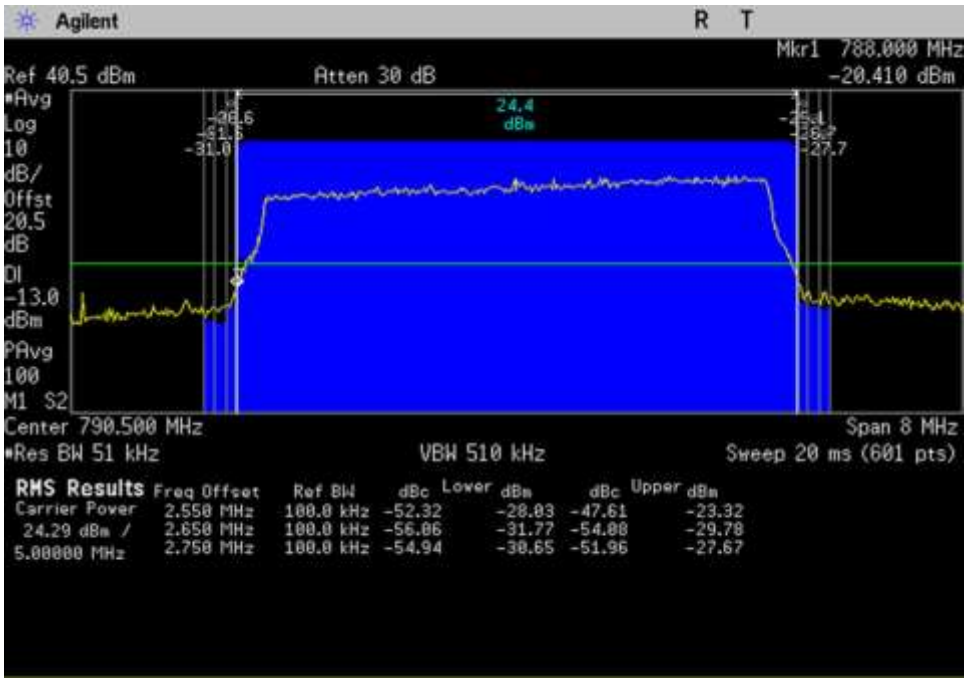
Low

Out of Band Emission			
Frequency	**AGC**	**AGC + 3dB**	**Limit**
MHz	**dBm**	**dBm**	**dBm**
UL 788-798	-20.410	--21.950	-13.0
DL 758-768	-30.273	-30.115	-13.0

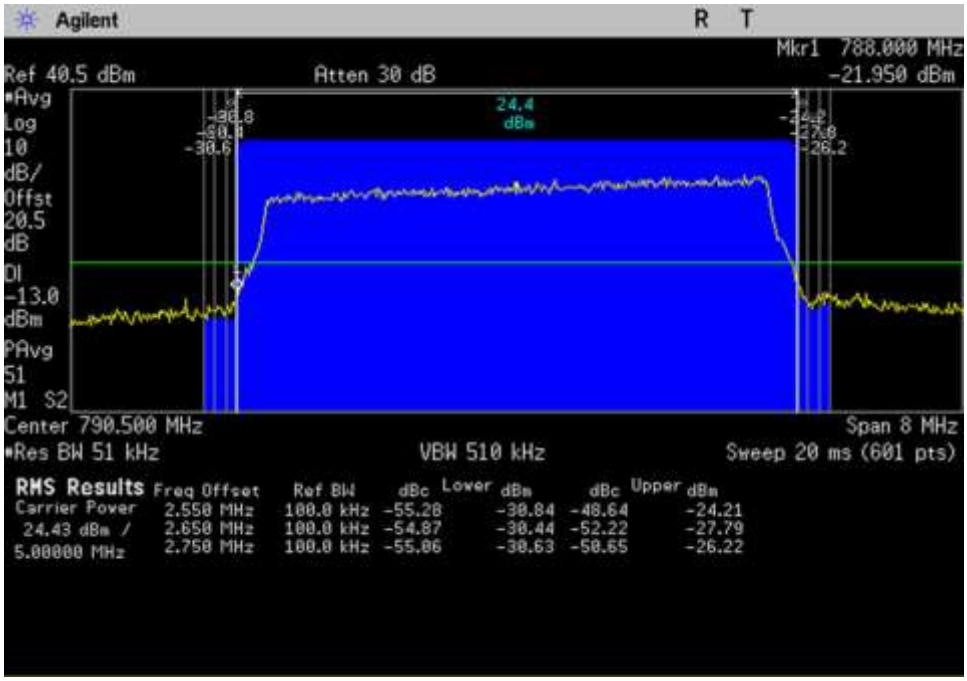
High

	Out of Band Emission		
Frequency	**AGC**	**AGC + 3dB**	**Limit**
MHz	**dBm**	**dBm**	**dBm**
UL 788-798	-18.494	-24.618	-13.0
DL 758-768	-26.196	-26.519	-13.0

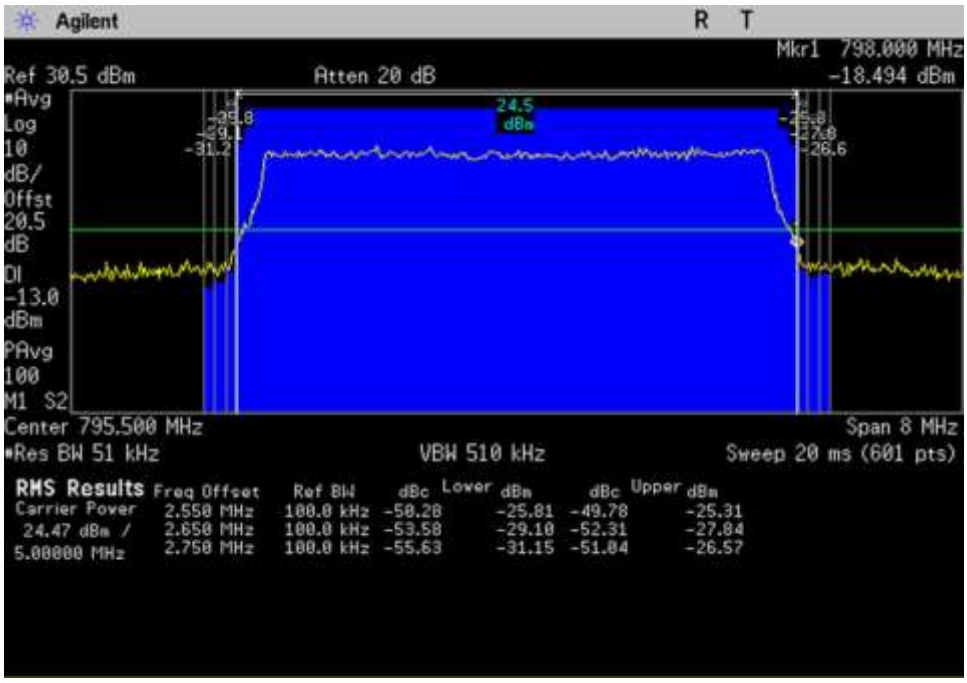
Plots



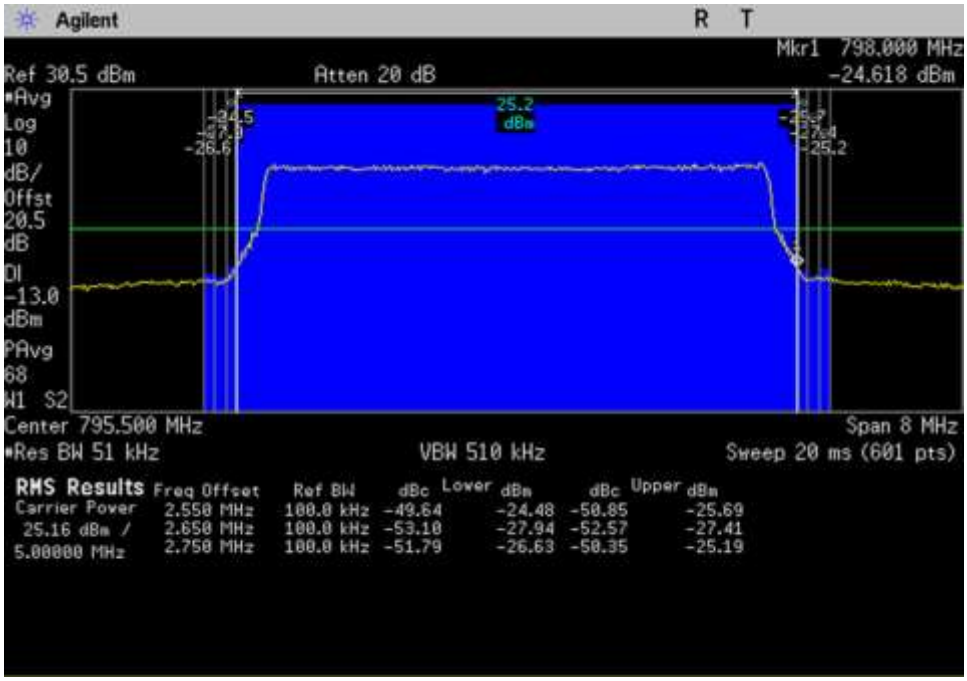
OBE_UL788-798_ 786.5- 794.5MHz_LC-AGC



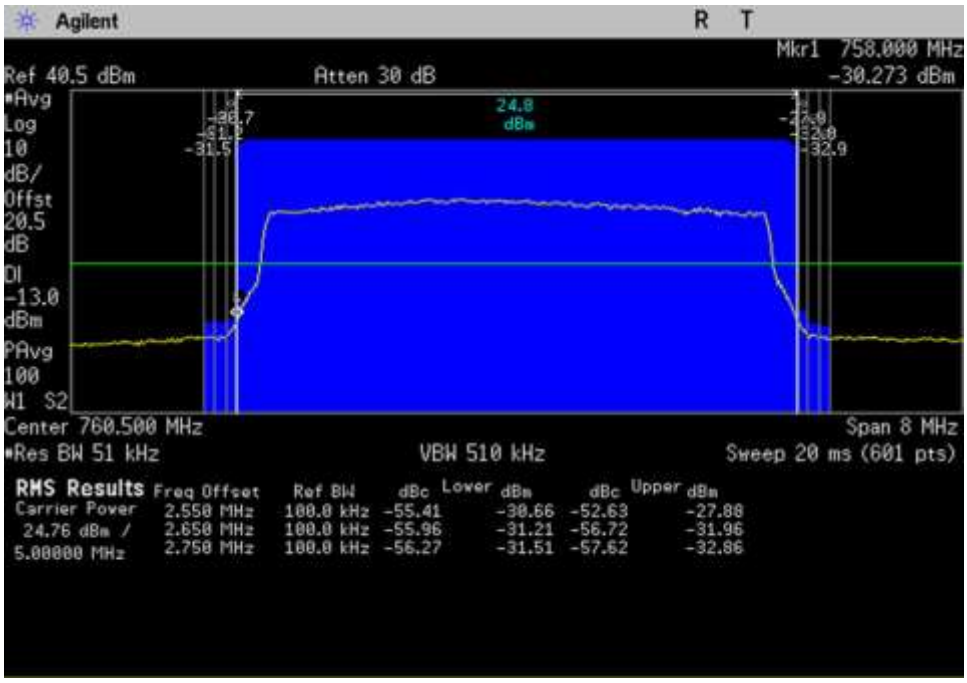
OBE_UL788-798_ 786.5- 794.5MHz_LC-AGC+3



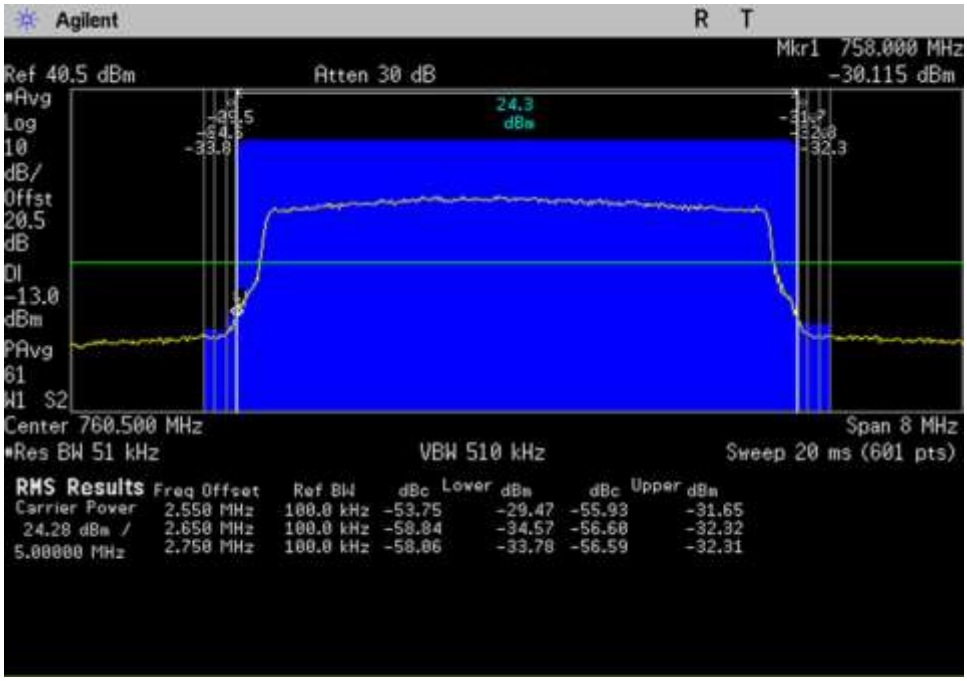
OBE_UL788-798_ 791.5- 799.5MHz_HC-AGC



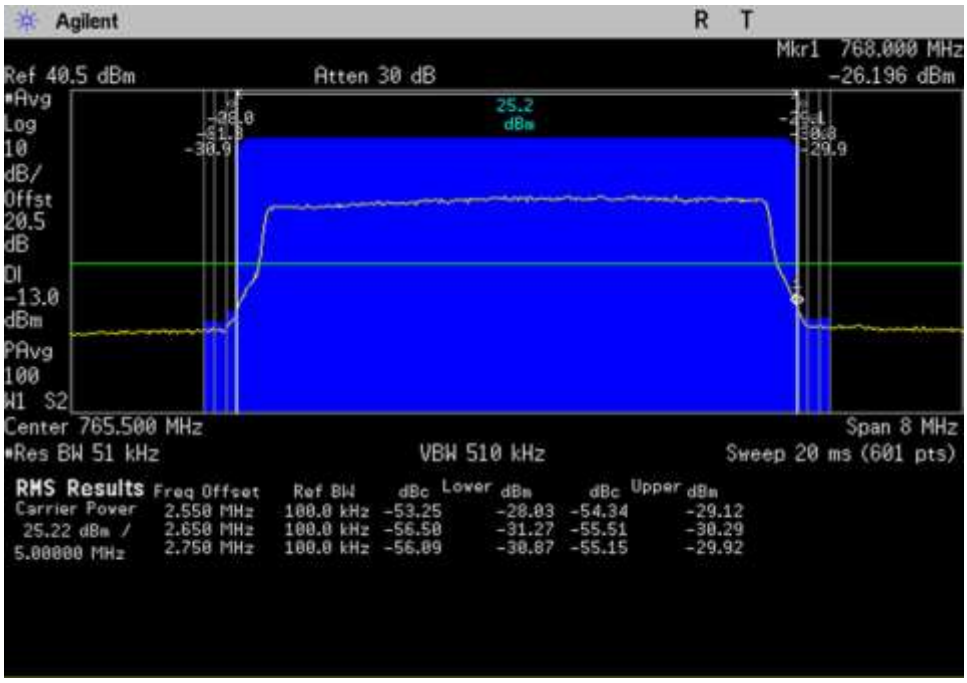
OBE_UL788-798_ 791.5- 799.5MHz_HC-AGC+3



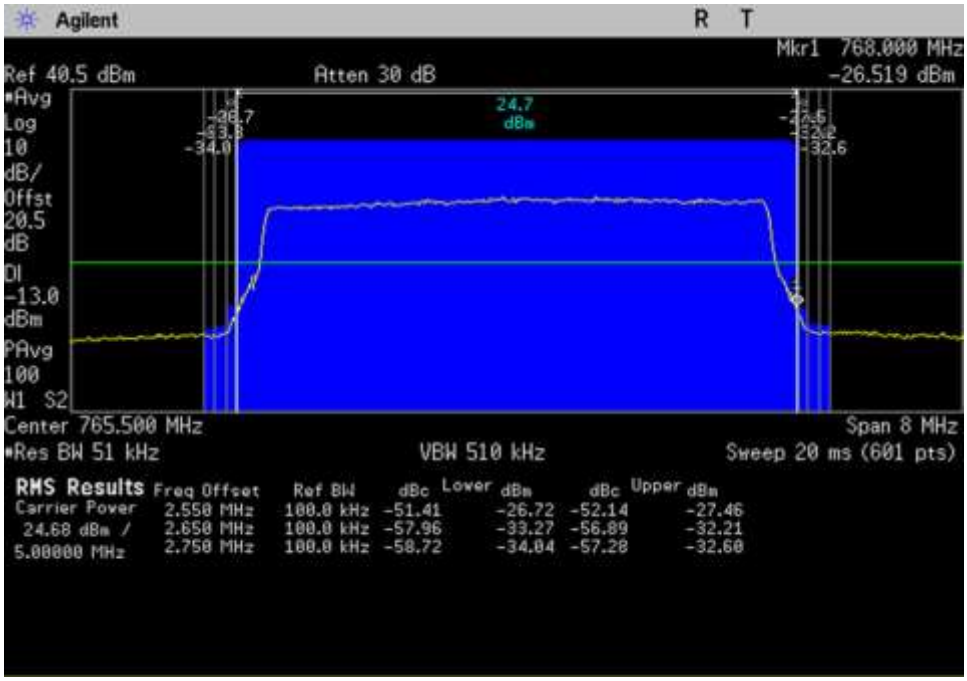
OBE_DL_758-768_ 756.5- 764.5MHz_LC-AGC



OBE_DL_758-768_ 756.5- 764.5MHz_LC-AGC+3

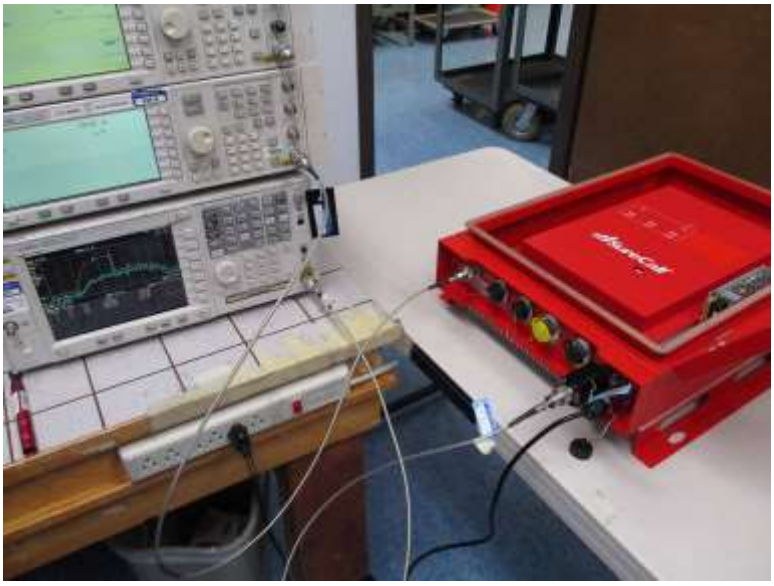


OBE_DL_758-768_ 761.5- 769.5MHz_HC-AGC



OBE_DL_758-768_ 761.5- 769.5MHz_HC-AGC+3

Test Setup Photo



Part 90: 219(e)(1) Power Limit

Engineer: Hieu Song Nguyenpham
Test Date: 5/30/2018
Modification #1 was in place during testing.

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
P06797	Attenuator	Narda	766-20	4/10/2017	4/10/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019

Environmental Conditions					
Temperature (ºC)	21.3	Relative Humidity (%):	47	Atmospheric Pressure (kPa):	102.3

Summary of Results

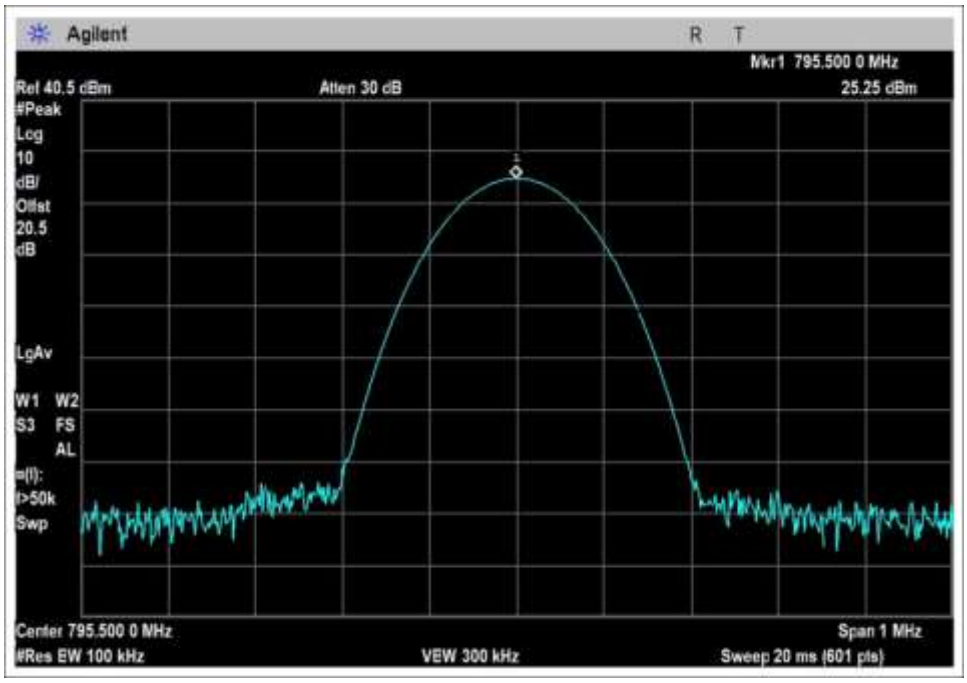
Pass: As summarized in tables below, calculated ERP from measured Conducted Power and Gain, are within limits.

Public Safety 700MHz/800MHz bands

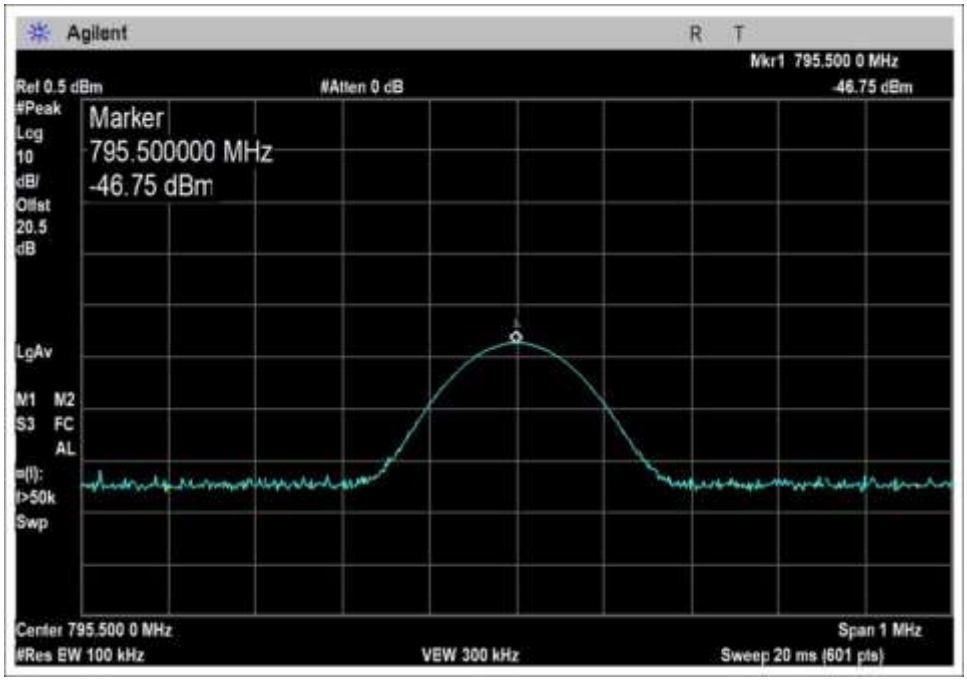
Pre AGC-CW				
Frequency	**Input(dBm)**	**Output (dBm)**	**Gain (dB)**	**Limit (dBm)**
UL_806-816MHz	-50.6	25.6	76.2	37
UL_799-805MHz	-50.4	25.5	75.9	37
UL_788-798MHz	-46.8	25.3	72.0	37
DL_851-861MHz	-52.3	26.4	78.7	37
DL_769-775MHz	-56.9	23.1	80.0	37
DL_758-768MHz	-56.6	23.8	80.5	37

AGC+3-CW				
Frequency	**Input(dBm)**	**Output (dBm)**	**Gain (dB)**	**Limit (dBm)**
UL_806-816MHz	-47.6	25.4	73.0	37
UL_799-805MHz	-47.4	25.4	72.8	37
UL_788-798MHz	-43.8	25.3	69.0	37
DL_851-861MHz	-49.8	25.4	75.2	37
DL_769-775MHz	-53.9	22.8	76.7	37
DL_758-768MHz	-53.5	23.7	77.2	37

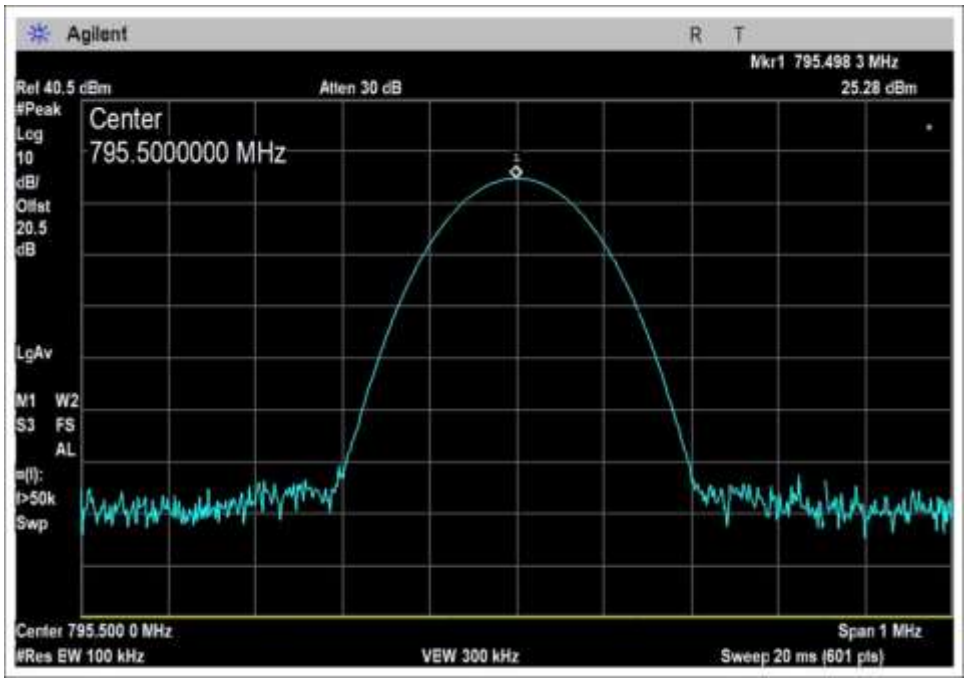
Plots



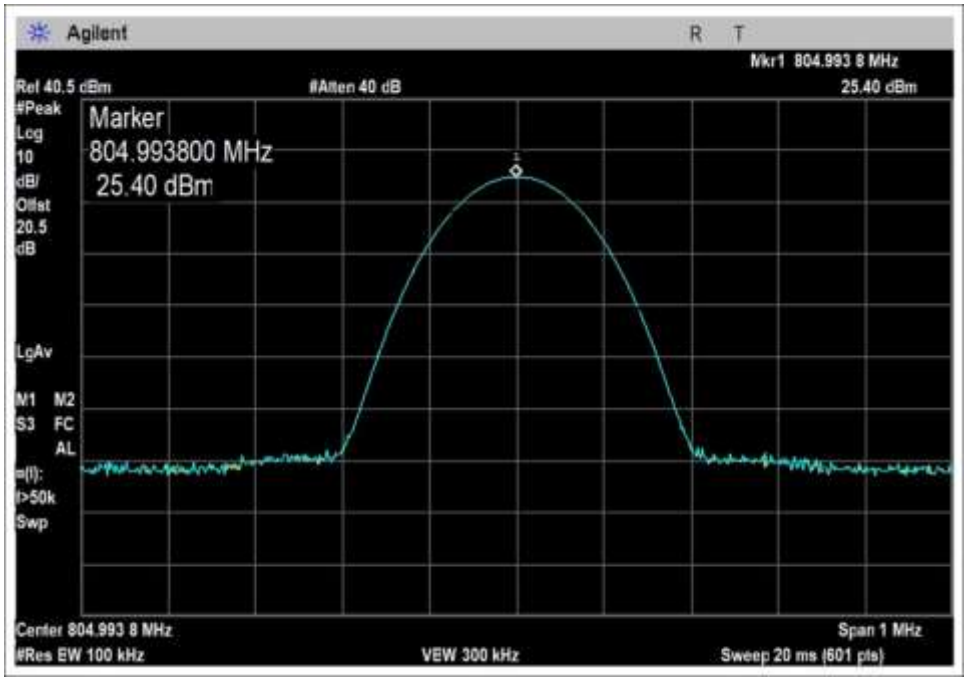
UL 788_798_ 795.5MHz_AGC+3



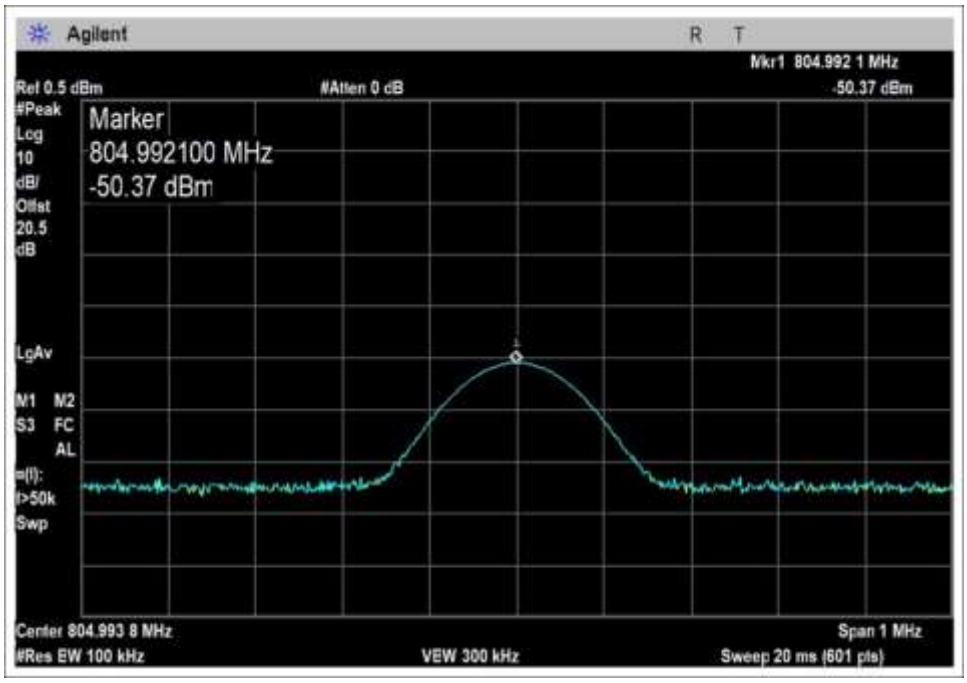
UL 788_798_ 795.5MHz_Input



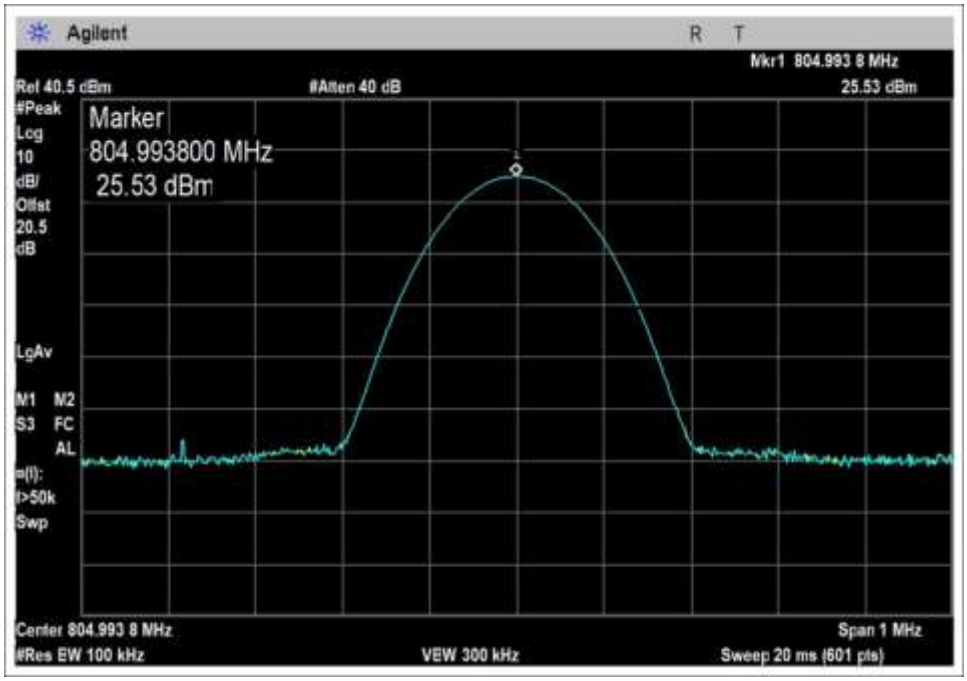
UL 788_798_ 795.5MHz_Pre AGC



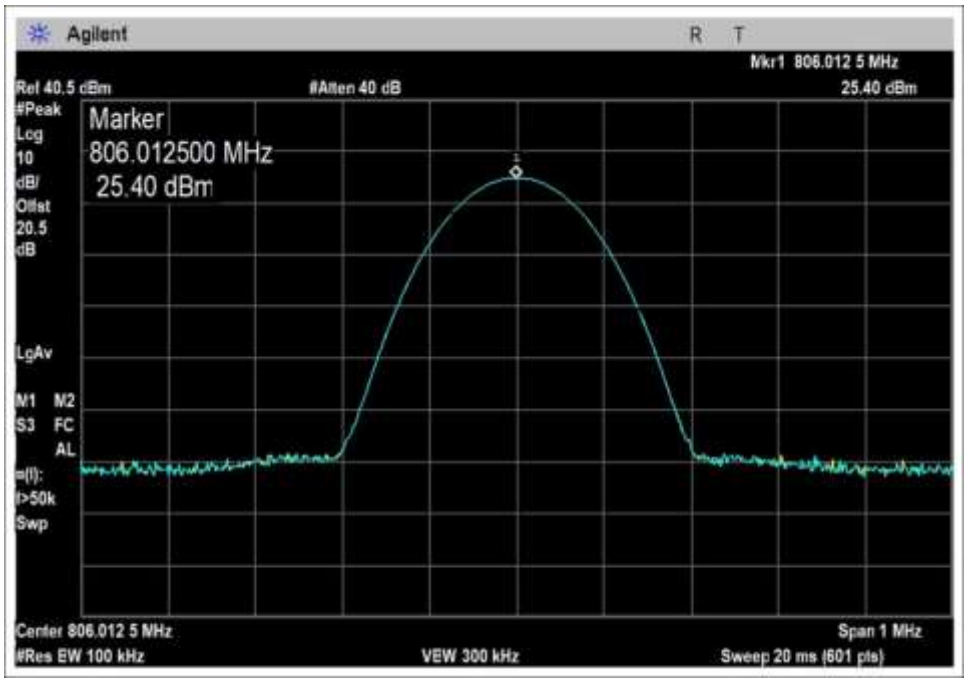
UL 799-805_ 804.99375MHz_AGC+3



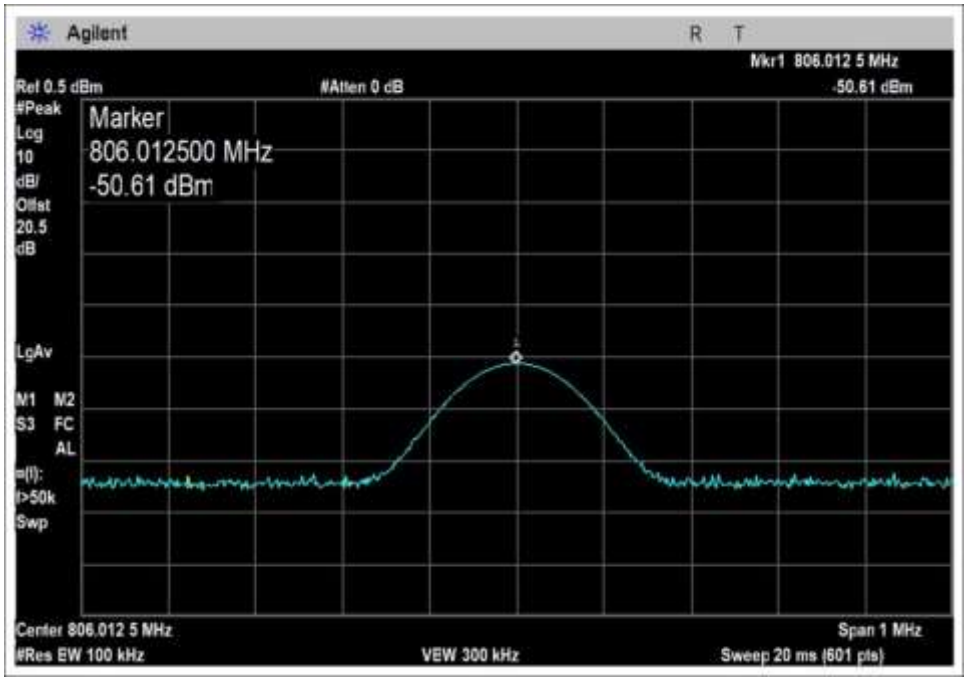
UL 799-805_ 804.99375MHz_Input



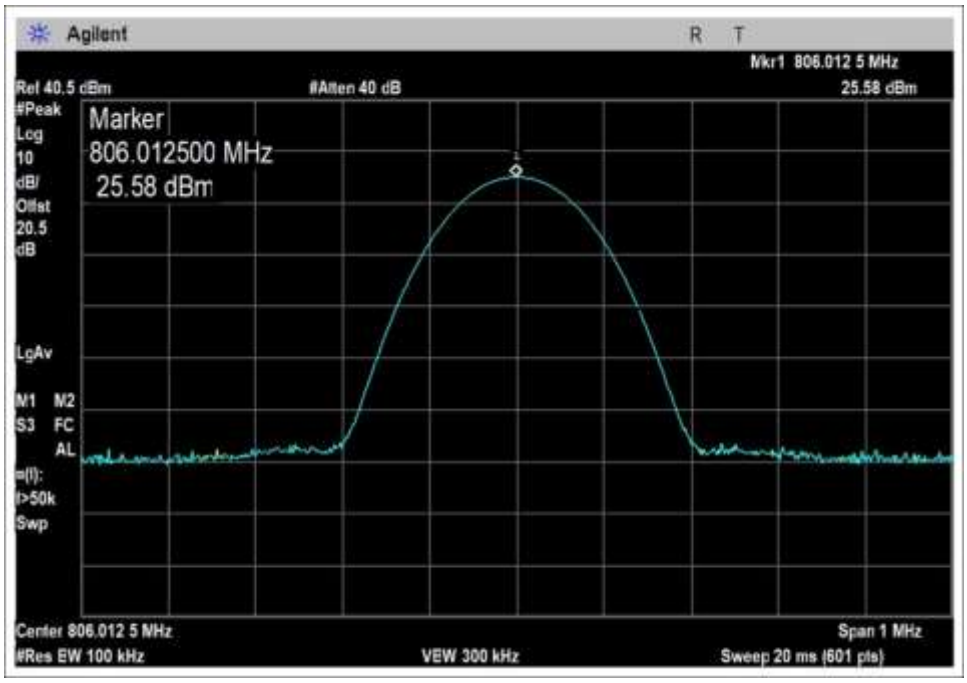
UL 799-805_ 804.99375MHz_Pre AGC.



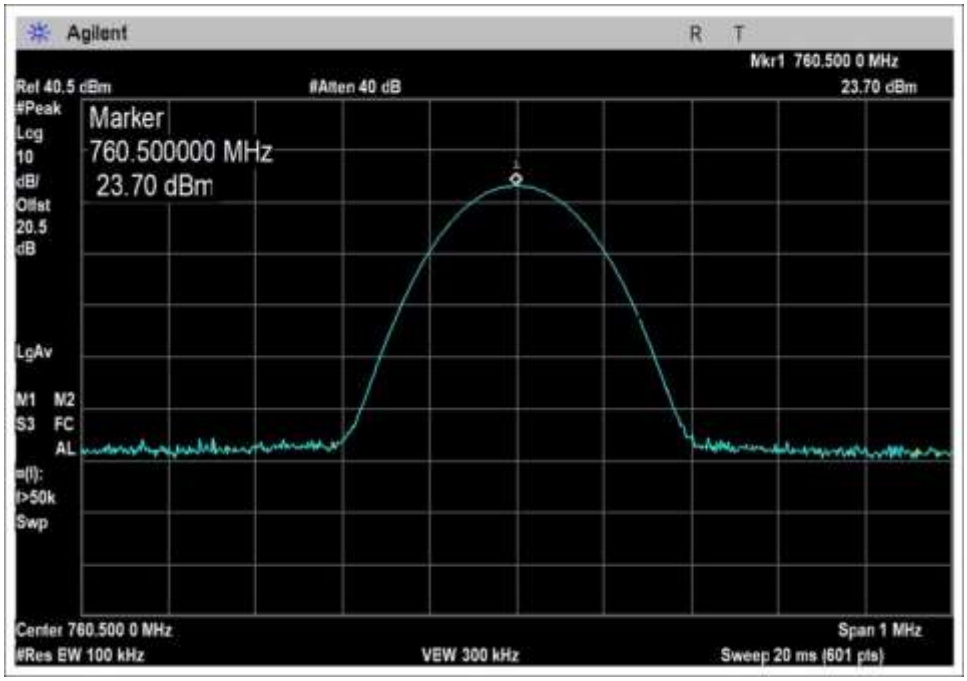
UL 806-816_ 806.0125MHz_AGC+3



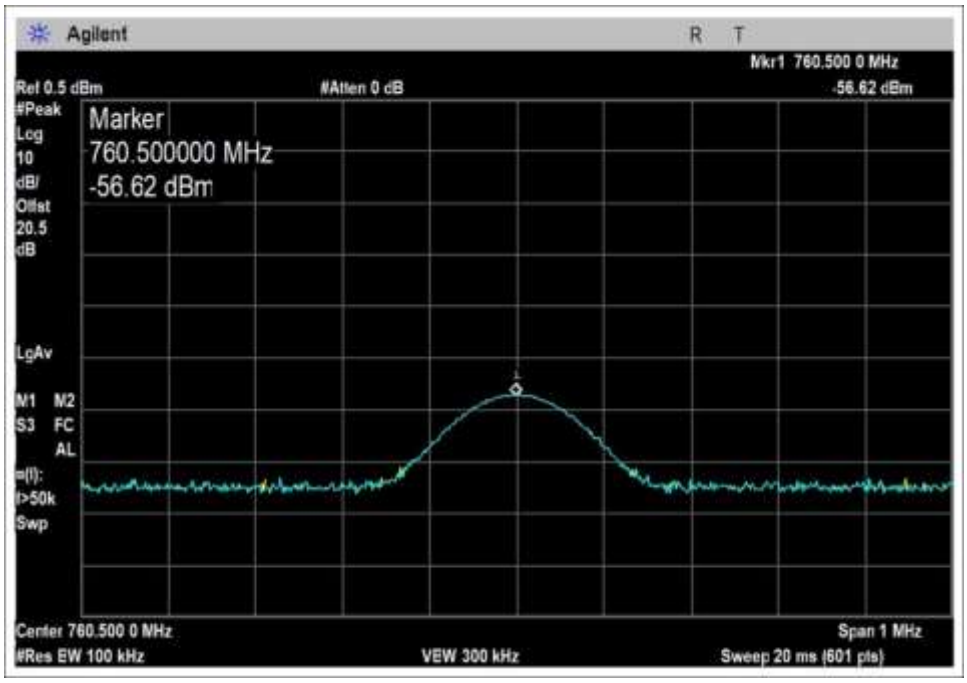
UL 806-816_ 806.0125MHz_Input



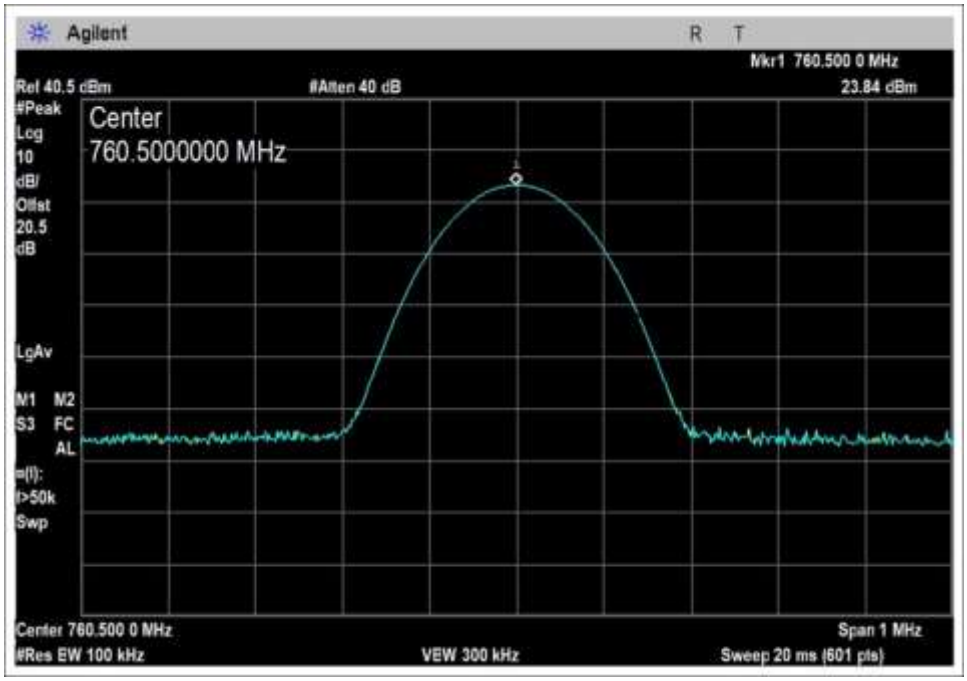
UL 806-816_ 806.0125MHz_Pre AGC



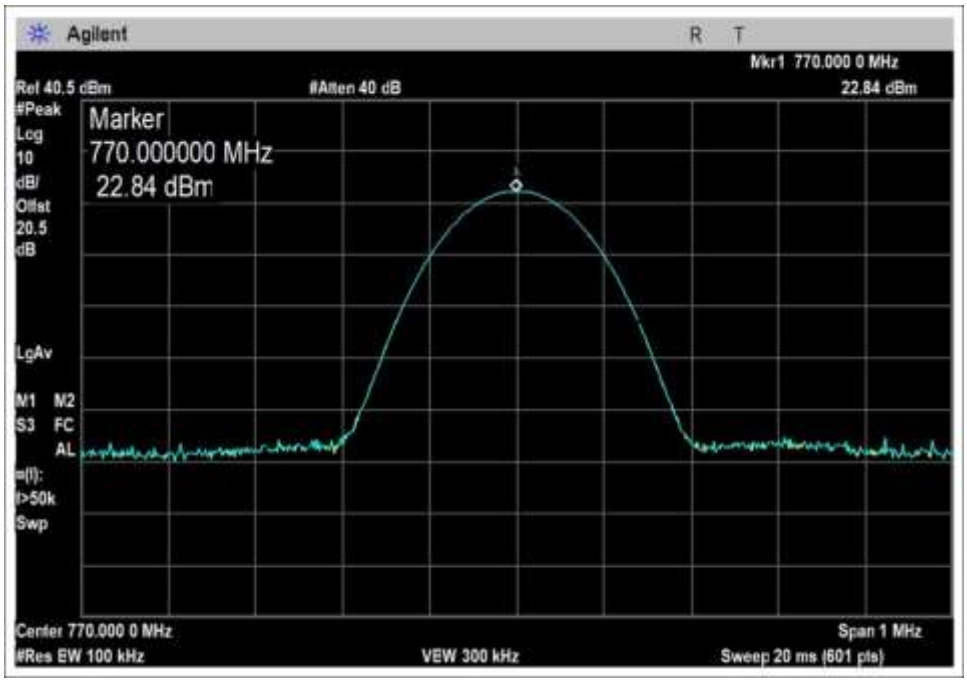
DL 758-768_ 760.5MHz_AGC+3



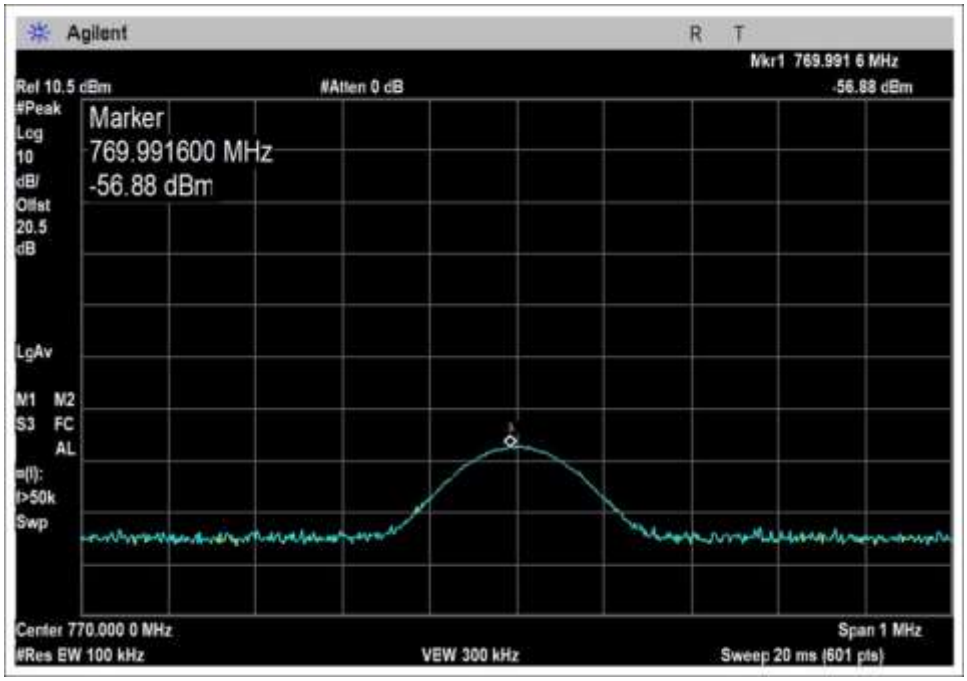
DL 758-768_ 760.5MHz_Input



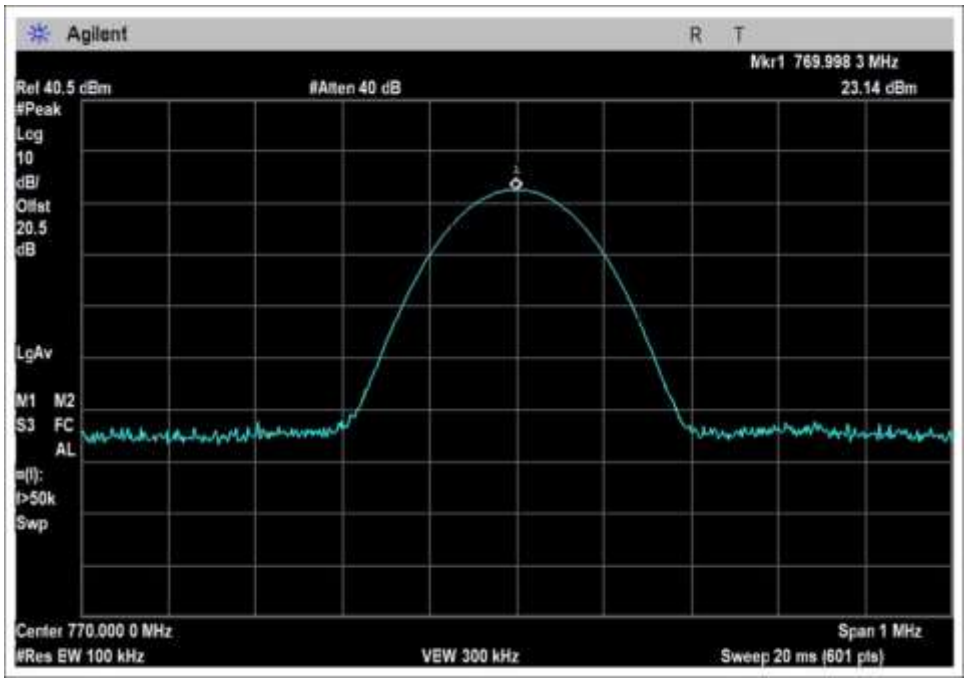
DL 758-768_ 760.5MHz_Pre AGC



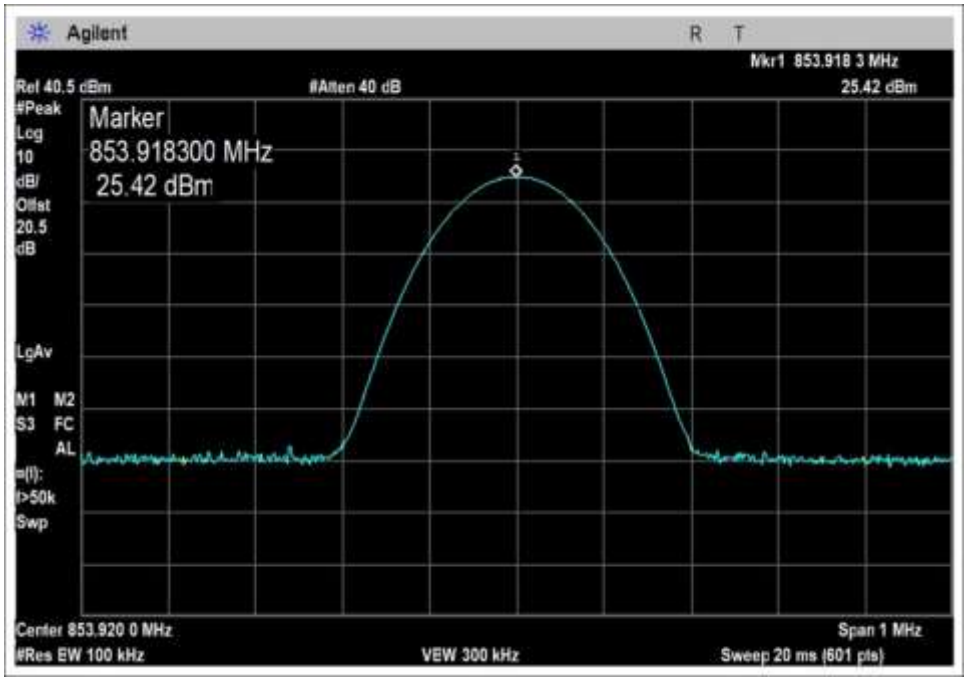
DL 769-775_ 770MHz_AGC+3



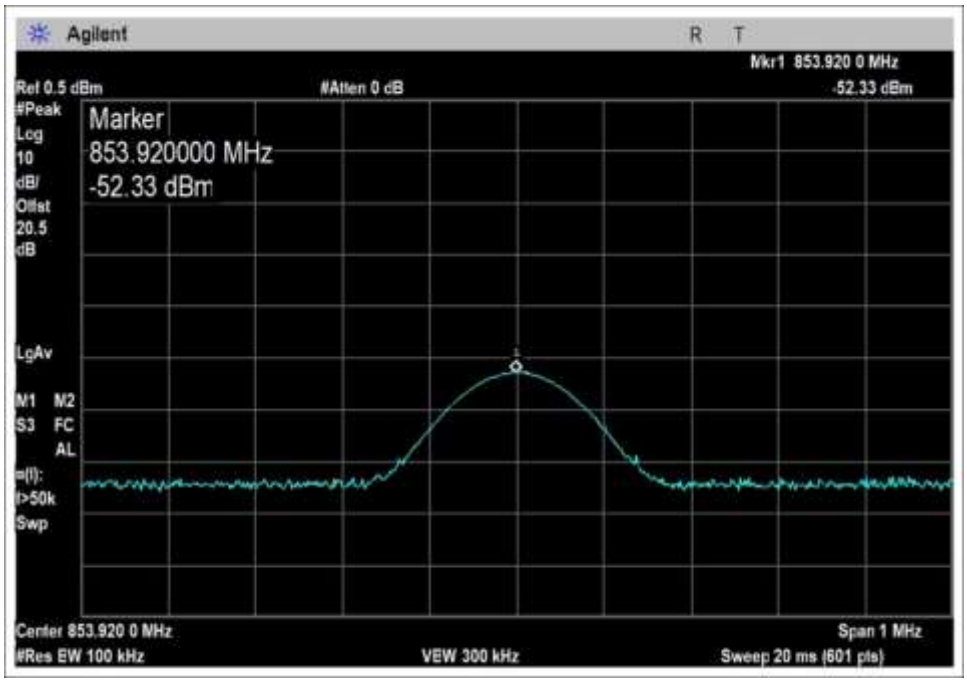
DL 769-775_ 770MHz_Input



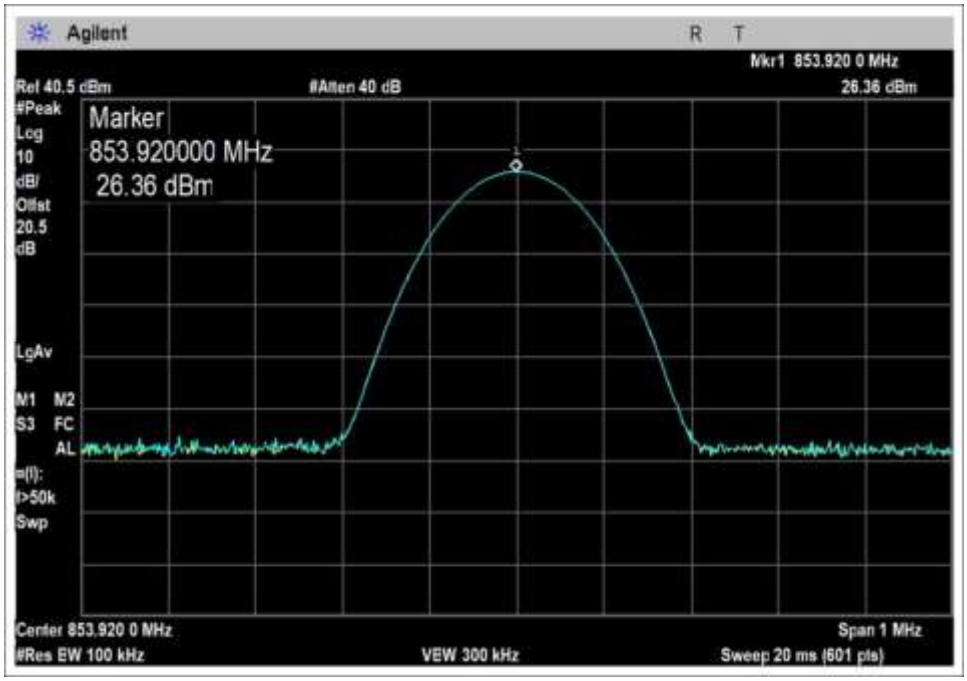
DL 769-775_ 770MHz_Pre AGC



DL 851-861_ 853.92MHz_AGC+3

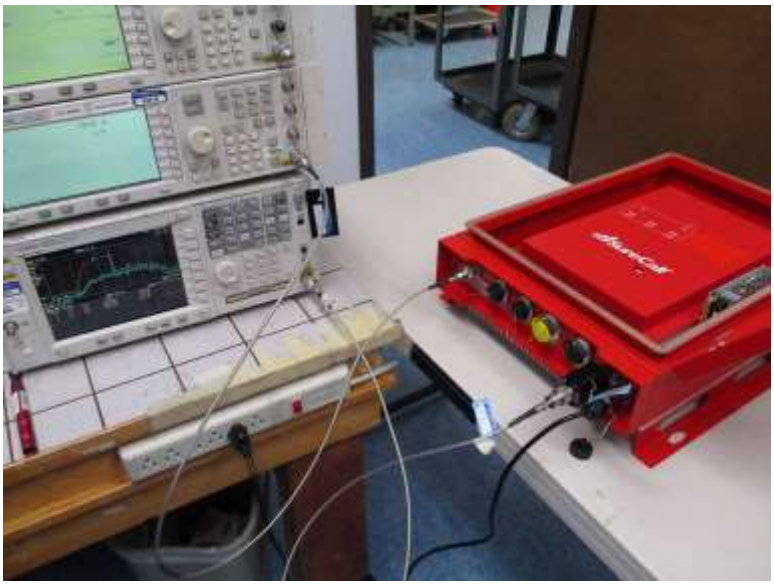


DL 851-861_ 853.92MHz_Input



DL 851-861_ 853.92MHz_Pre AGC

Test Setup Photo



Part 90: 219(e)(2) Noise Figure Limit

Engineer: Hieu Song Nguyenpham
Test Date: 6/6/2018

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
03537	Site Equipment	HP	346A	7/14/2017	7/14/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019

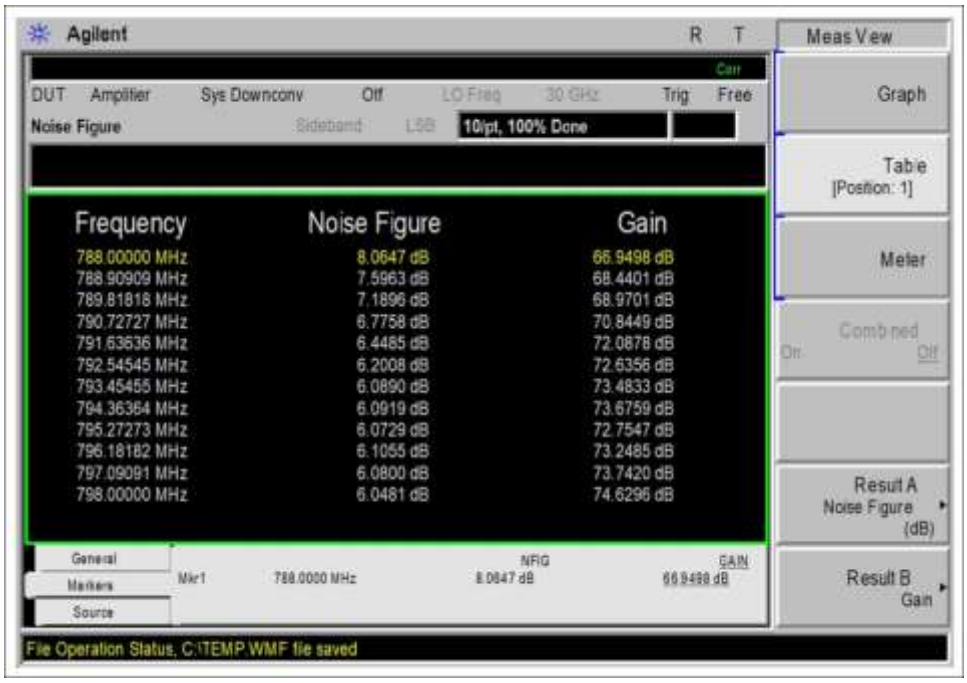
Environmental Conditions					
Temperature (ºC)	21.3	Relative Humidity (%):	47	Atmospheric Pressure (kPa):	102.3

Summary of Results

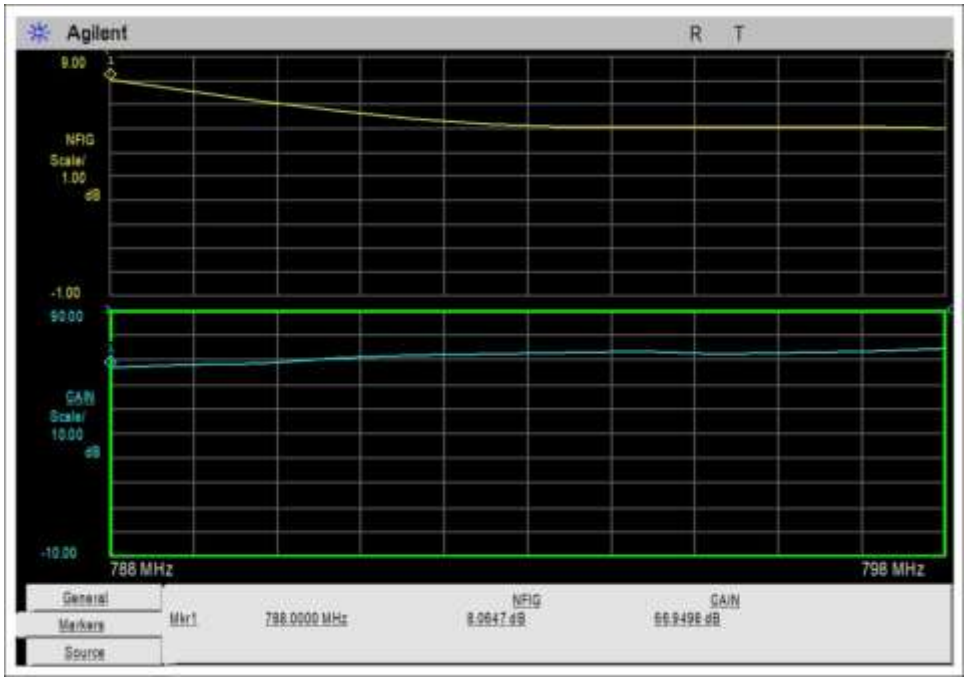
Pass: As summarized in tables and plots below, the noise figure are within limits.
Noise figure measurements was made with AGC circuitry be disabled over the duration of the measurement.

Link	Band	Noise Figure (dB)	Limit (dB)	Margin (dB)
UL	788-798	8.0647	9	0.9353
UL	799-805	6.0054	9	2.9946
UL	806-816	6.3957	9	2.6043
DL	758-768	6.2756	9	2.7244
DL	769-775	7.6498	9	1.3502
DL	851-861	6.6939	9	2.3061

Plots

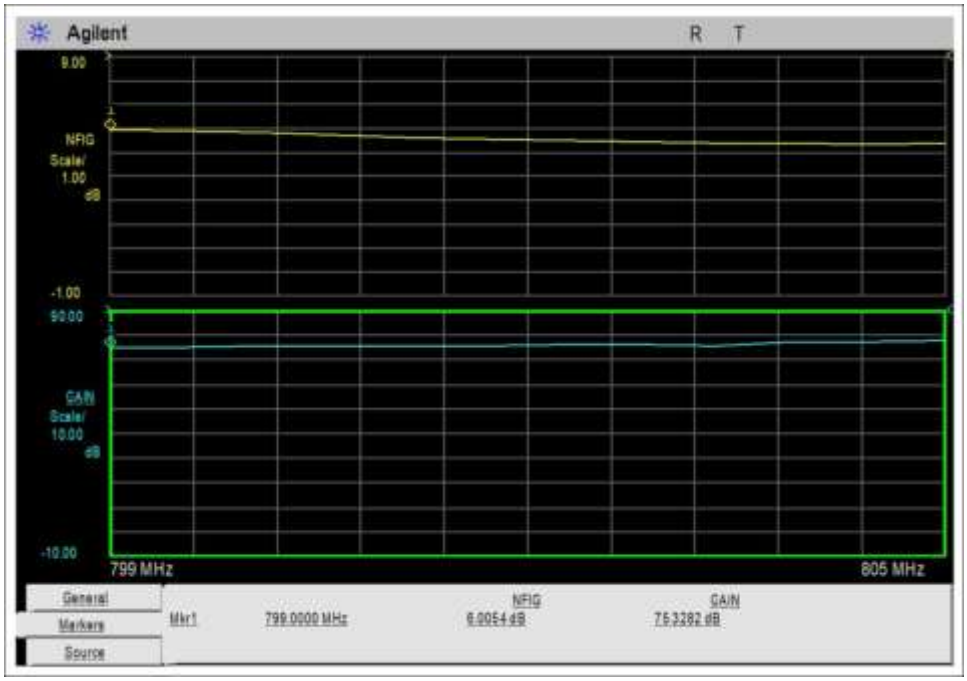


UL_788-798M-Data



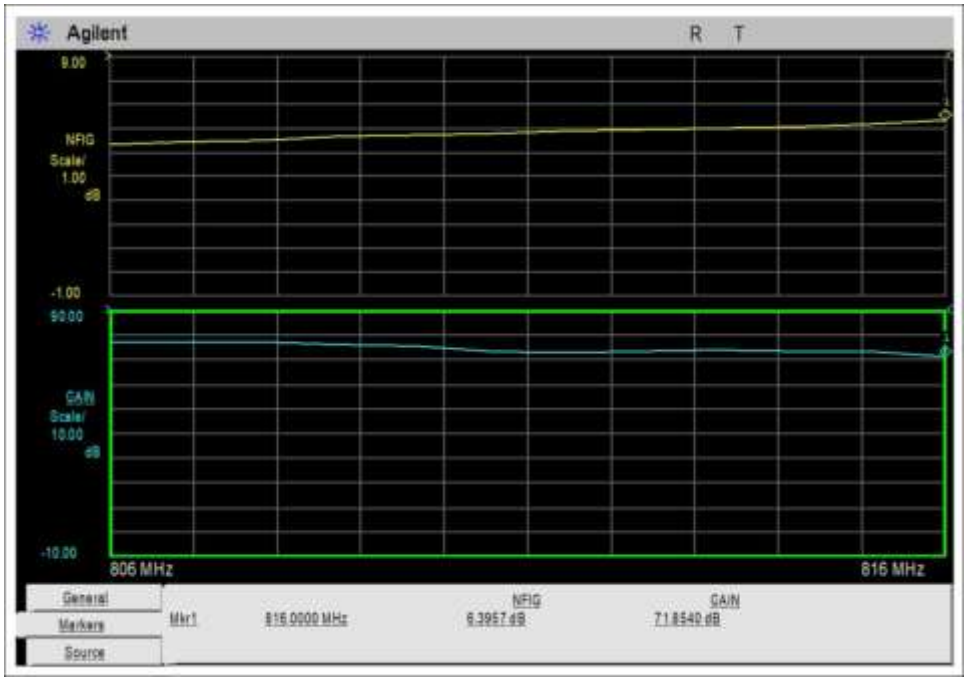
UL_788-798M-Graph

UL_799-805M-Data

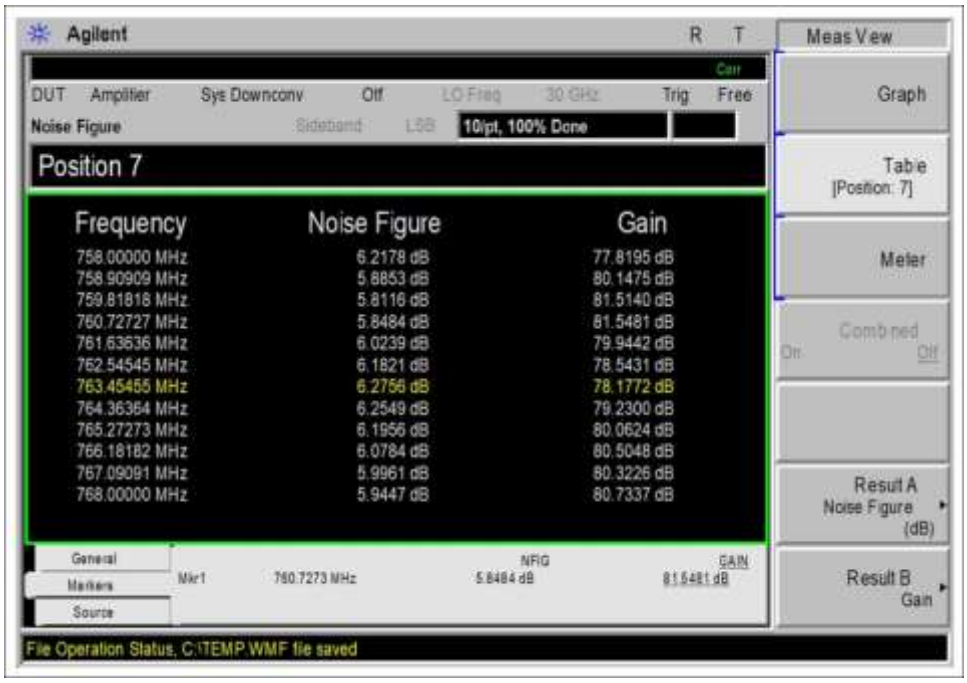


UL_799-805M-Graph

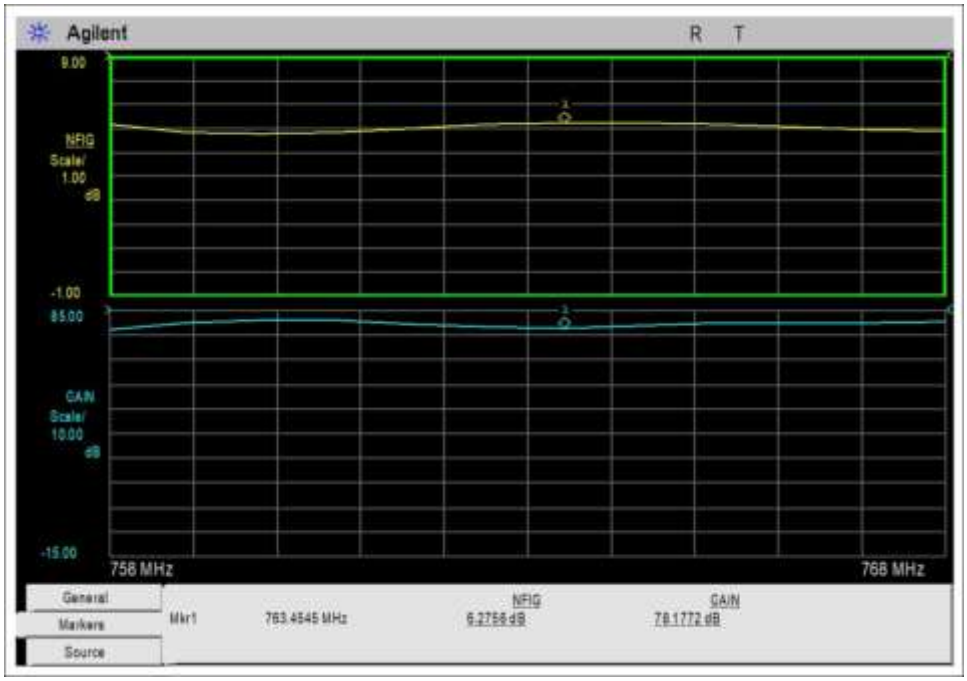
UL_806-816M-Data



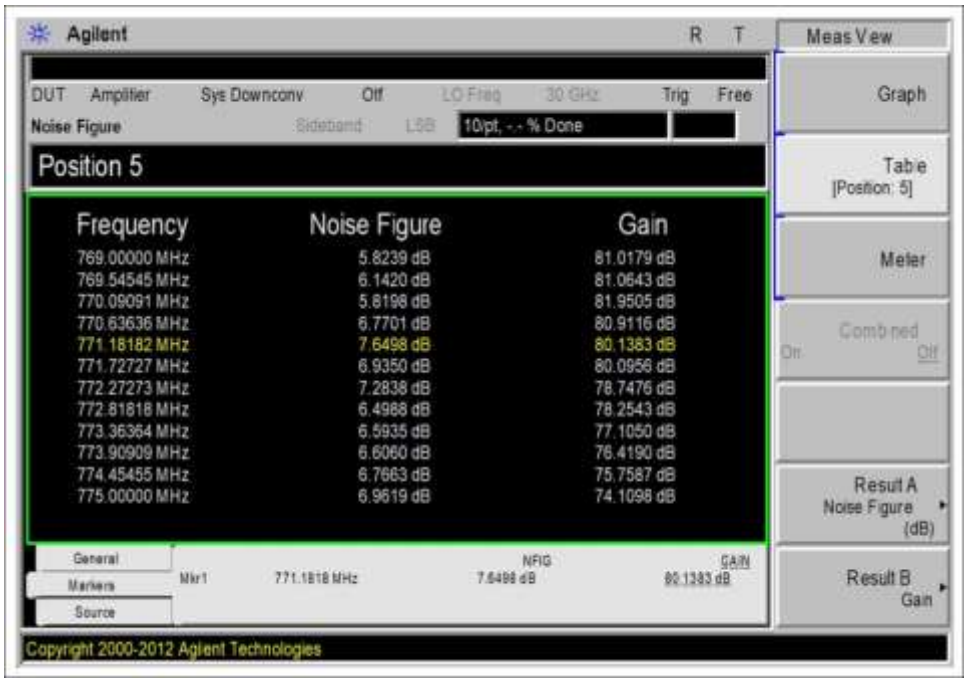
UL_806-816M-Graph



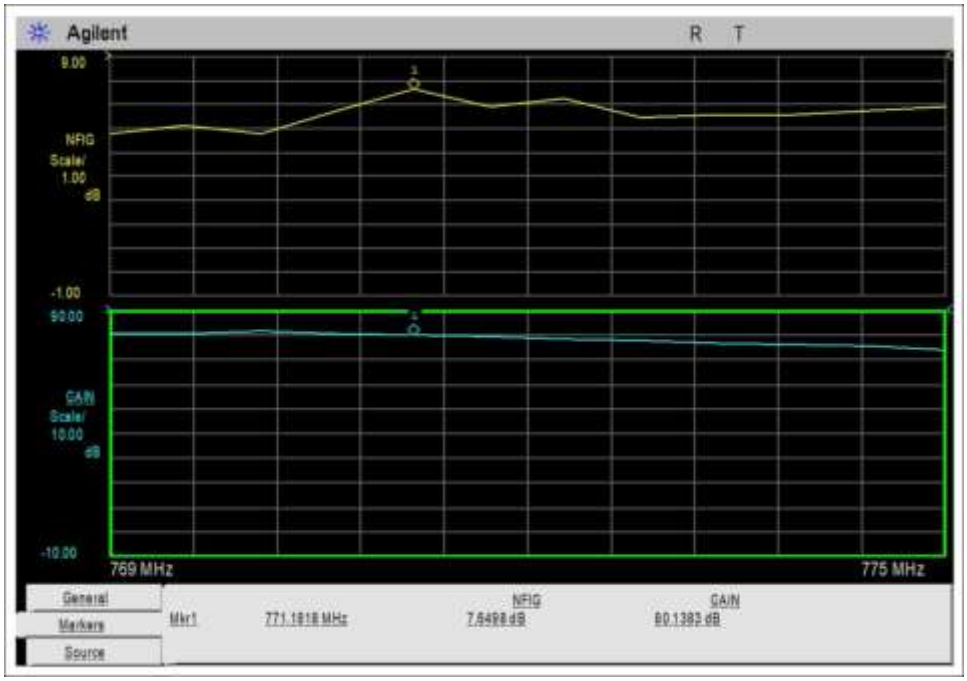
DL_758-768M-Data



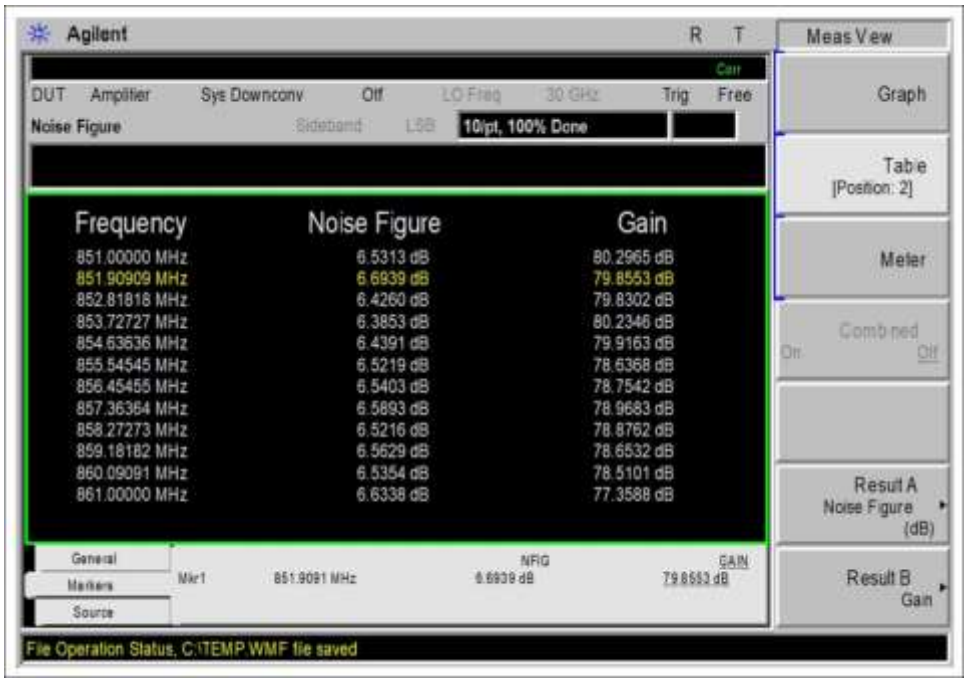
DL_758-768M-Graph



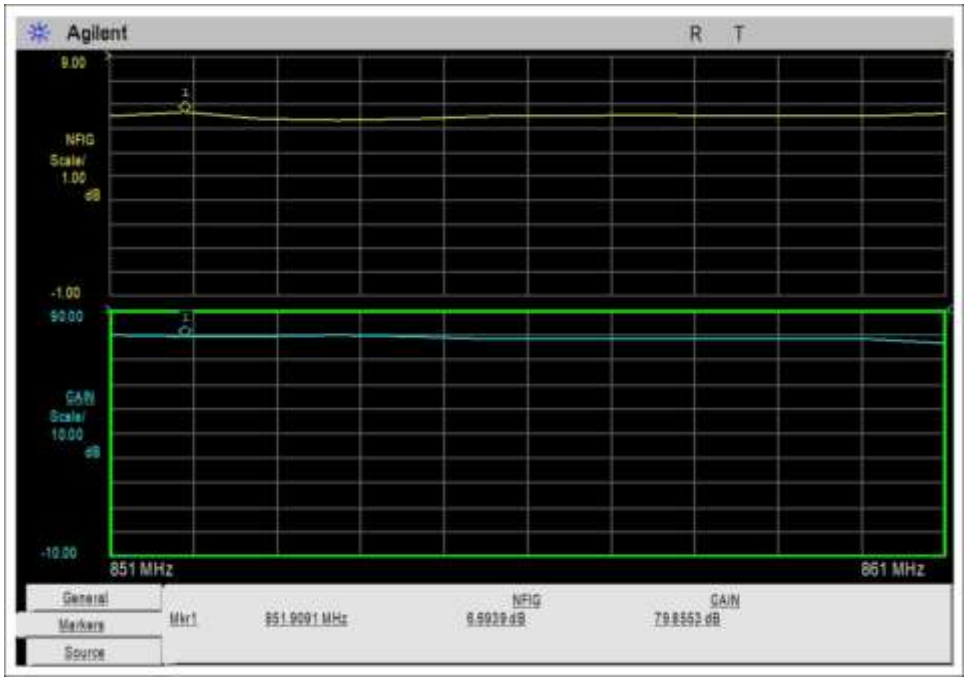
DL_769-775M-Data



DL_769-775M-Graph

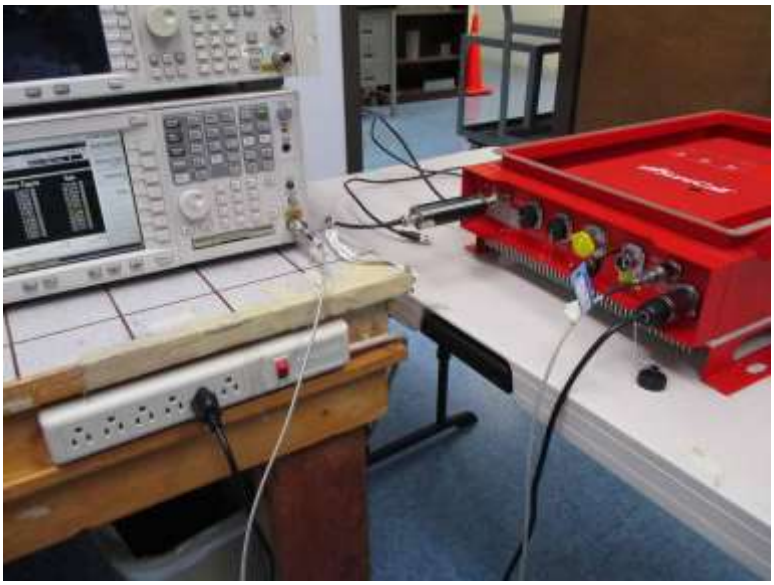


DL_851-861M-Data



DL_851-861M-Graph

Test Setup Photo



Part 90: 219(e) Intermodulation Limit

Engineer: Hieu Song Nguyenpham
Test Date: 6/6/2018
Modification #1 was in place during testing.

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
P06797	Attenuator	Narda	766-20	4/10/2017	4/10/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019

Environmental Conditions					
Temperature (ºC)	23.2	Relative Humidity (%):	43	Atmospheric Pressure (kPa):	101.8

Summary of Results

Pass: As summarized in tables and plots below, all intermodulation products are measured below -13dBm
Worst case results are reported for intermodulation test, done with and without AGC circuitry activated.

Public Safety 700MHz/800MHz bands

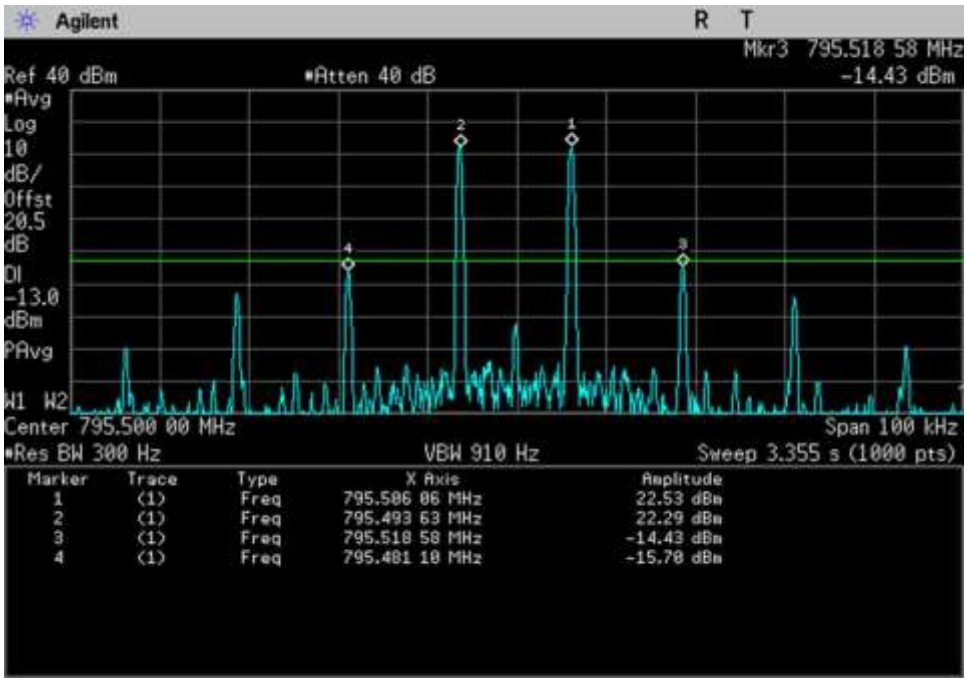
Channel Spacing=12.5kHz

Band	Frequency (MHz)	PreAGC (dBm)	AGC+3dB (dBm)	Limit (dBm)	Result
UL_806-816MHz	815.99375	-13.54	-13.58	-13.0	Pass
UL_806-816MHz	806.01215	-13.24	-13.94	-13.0	Pass
UL_806-816MHz	806.01875	-13.23	-16.20	-13.0	Pass
UL_799-805MHz	804.98438	-13.68	-15.81	-13.0	Pass
UL_799-805MHz	804.9875	-13.90	-14.27	-13.0	Pass
UL_799-805MHz	799.015625	-16.24	-15.93	-13.0	Pass
UL_788-798MHz	797.984375	-14.27	-13.75	-13.0	Pass
UL_788-798MHz	795.5	-14.43	-14.10	-13.0	Pass
UL_788-798MHz	788.015625	-19.27	-18.76	-13.0	Pass
DL_851-861MHz	860.99375	-20.68	-17.64	-13.0	Pass
DL_851-861MHz	853.92	-13.49	-13.71	-13.0	Pass
DL_851-861MHz	851.01875	-14.88	-19.09	-13.0	Pass
DL_769-775MHz	774.99375	-26.17	-26.31	-13.0	Pass
DL_769-775MHz	770	-25.27	-25.57	-13.0	Pass
DL_769-775MHz	769.01875	-25.38	-25.45	-13.0	Pass
DL_758-768MHz	767.99375	-25.3	-25.16	-13.0	Pass
DL_758-768MHz	760.5	-26.59	-26.64	-13.0	Pass
DL_758-768MHz	758.01875	-26.17	-26.19	-13.0	Pass

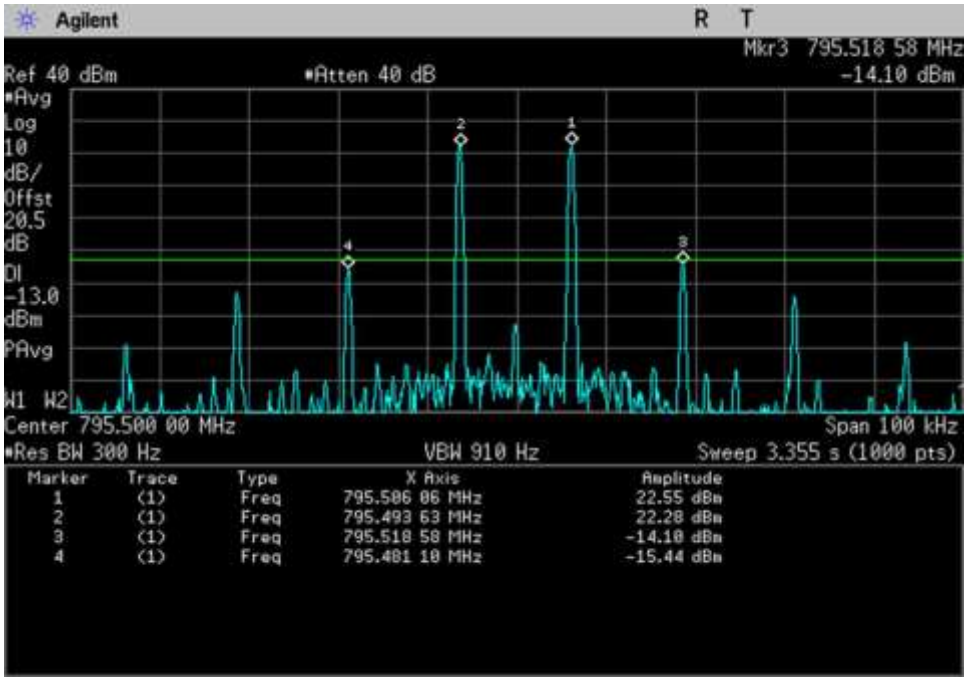
Channel Spacing=25kHz

Band	Frequency (MHz)	PreAGC (dBm)	AGC+3dB (dBm)	Limit (dBm)	Result
UL_806-816MHz	815.9875	-16.80	-16.74	-13.0	Pass
UL_806-816MHz	806.0125	-15.43	-15.90	-13.0	Pass
UL_806-816MHz	806.0375	-15.22	-15.25	-13.0	Pass
UL_799-805MHz	804.9625	-16.75	-16.46	-13.0	Pass
UL_799-805MHz	804.9875	-15.68	-15.62	-13.0	Pass
UL_799-805MHz	799.0375	-17.63	-17.43	-13.0	Pass
UL_788-798MHz	797.9625	-19.22	-19.12	-13.0	Pass
UL_788-798MHz	795.5	-17.26	-16.52	-13.0	Pass
UL_788-798MHz	788.0375	-18.70	-18.39	-13.0	Pass
DL_851-861MHz	860.9875	-19.75	-19.6	-13.0	Pass
DL_851-861MHz	853.92	-13.23	-16.98	-13.0	Pass
DL_851-861MHz	851.0375	-17.78	-17.78	-13.0	Pass
DL_769-775MHz	774.9875	-28.78	-28.15	-13.0	Pass
DL_769-775MHz	770	-27.49	-27.75	-13.0	Pass
DL_769-775MHz	769.0375	-27.99	-28.21	-13.0	Pass
DL_758-768MHz	767.9875	-27.61	-27.72	-13.0	Pass
DL_758-768MHz	760.5	-29.2	-28.73	-13.0	Pass
DL_758-768MHz	758.0375	-28.60	-28.90	-13.0	Pass

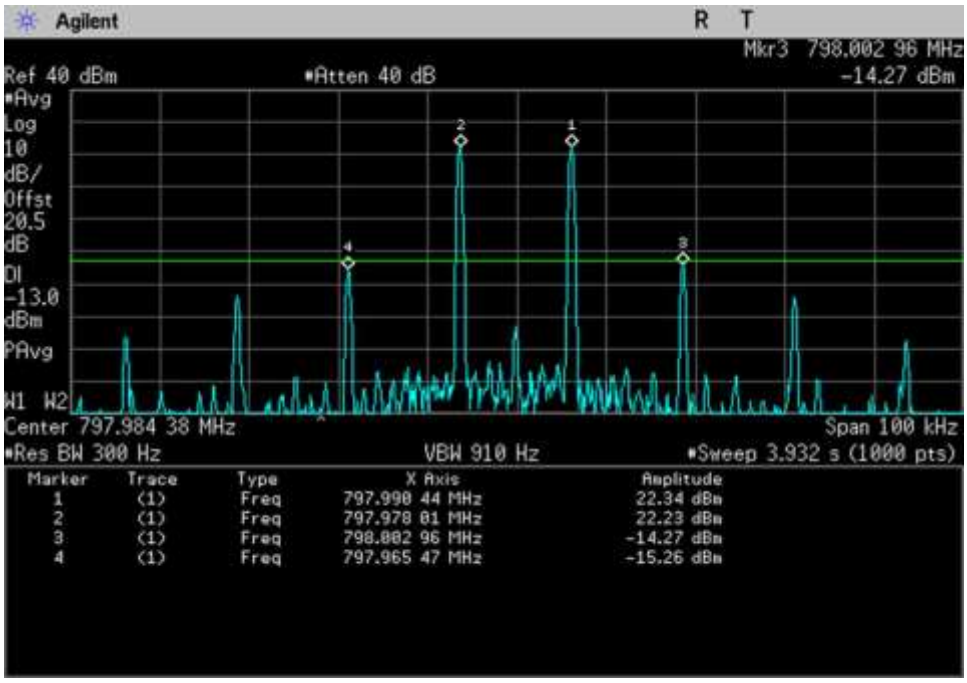
Plots



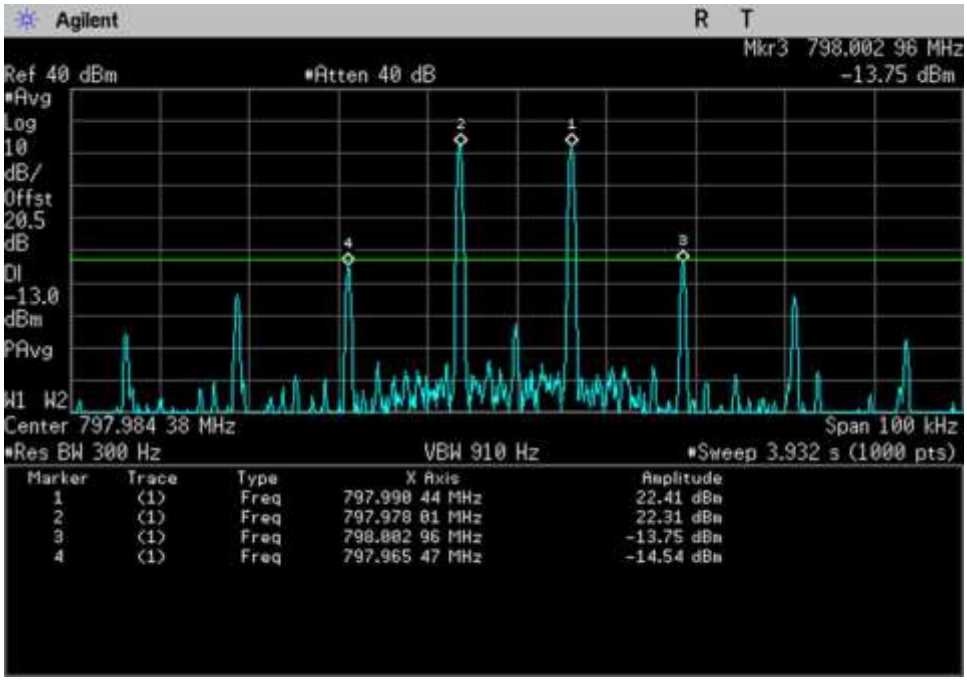
Intermodulation _UL_788-798-F0-AGC_ 795.5MHz_12.5kHz



Intermodulation _UL_788-798-F0-AGC+3_ 795.5MHz_12.5kHz



Intermodulation _UL_788-798-HC-AGC_ 797.984375MHz_12.5kHz



Intermodulation _UL_788-798-HC-AGC+3_ 797.984375MHz_12.5kHz