Cellphone-Mate, Inc.

REVISED TEST REPORT TO 104339-26

Orion SC-O-28GHz

Tested to The Following Standard:

FCC Part 20.21 / 30

Report No.: 104339-26A
Volume 1 of 2

Date of issue: December 15, 2020

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 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.

Test Certificate # 803.01

Testing the Future
CKC LABORATORIES, INC.

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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: CKC20200723

REPORT PREPARED BY:

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

Project Number: 104339

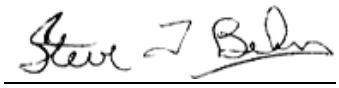
DATE OF EQUIPMENT RECEIPT: August 10, 2020
DATE(S) OF TESTING: August 10-31, 2020 and September 1-4, 2020

Revision History

Original: Testing of the Orion SC-O-28GHz to FCC Part 20.21 / 30.
Revision A: To remove reference to the antenna description for the EUT in the General Test Setup.

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.



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	5.03.19
EMITest Immunity	5.03.10

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Japan
Canyon Park, Bothell, WA	US0081	US1022	A-0136
Brea, CA	US0060	US1025	A-0136
Fremont, CA	US0082	US1023	A-0136
Mariposa, CA	US0103	US1024	A-0136

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html

SUMMARY OF RESULTS

Standard / Specification: FCC Part 20.21 Industrial and Non-Consumer Signal Booster, Repeater, and Amplifier Devices Measurement Guidance KDB 935210 D05, v01r03 April 15 2019

Correlation Matrix & Results					
Guidance Section	**Guidance Description**	**FCC Section**	**FCC Rule Description**	**Mods**	**Results**
3.3 a)-j)	Out of band rejection	20.21(c)	Frequency Bands	NA	Pass
3.4 a)-q)	Input-versus-output signal comparison	2.1049/20.21	Occupied Band Width	NA	Pass
3.5 a)-j)	Mean Output power and amplifier/ booster gain	2.1046/20.21/ 30.202(c)	Power Limit	Mod. #1	Pass
3.6.2 a)-t)	Out of Band/Out Of Block Emission Conducted Emission	2.1051/20.21(c)/30.203 (a)	Out of Band Emission	Mod. #1 Note*	Pass
3.6.3 a)-r)	Conducted Spurious Emission	2.1051/20.21/ 30.203 (a)	Spurious emission	Mod. #1	Pass
3.7	Frequency Stability	NA	NA	NA	NA1

NA = Not Applicable
NA1 = Not applicable because the device does not alter the input signal in anyway.
*Note: Single test signal is referred to 104339-26 Volume 2.

ISO/IEC 17025 Decision Rule
The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

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

Summary of Conditions
Modification 1: Lower output power of UL-V path by 1dB

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
Orion SC-O-28GHz	Cellphone-Mate, Inc.	Orion SC-O-28GHz	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	Industrial Booster/Zone Enhancer
Operating Frequency Range:	UL: 27500-28350MHz DL: 27500-28350MHz
Emissions Type(s):	G7D W7D
Modulation Type(s):	Pi/2-BPSK (G7D) QPSK (G7D) 16AM (W7D) 64QAM (W7D) 256QAM (W7D)
Multiple Access Scheme	CP-OFDM for Downlink DFT-s-OFDM and CP-OFDM for Uplink
Number of TX Chains:	Refer to Operational Description
Antenna Type(s) and Gain:	Refer to Operational Description
Beamforming Type:	Refer to Operational Description
Antenna Connection Type:	Refer to Operational Description
Nominal Input Voltage:	120V, 60Hz
Firmware used for Test:	OrionMIMO_V0.0.15.hex

FCC PART 20.21

General Test Setup

Summary of Conditions
The equipment under test (EUT) is a 5GNR mm Wave Booster. It has 4 antennas for Server Ports and 4 antennas for Donor Ports. There are eight ports, four RF paths, two UL paths and two DL paths. During final installation, Server ports, two port transmitting UL and two port receive DL signal Each UL signal Transmitting server port is connected to a dish antenna vertical or horizontal polarity. Each DL signal Receiving server port antenna is connected to a dish antenna vertical or horizontal polarity In final installation, all ports are connected to crossed polarized antenna element. Linear summation of measured parameter is not applicable. Conducted measurement was performed at each RF output port. Donor ports, two port transmitting DL and two port receive UL signal Each DL signal Transmitting server port is connected to 17dBi Patch antenna vertical or horizontal polarity. Each UL signal Receiving server port is connected to 17dBi Patch antenna vertical or horizontal polarity.
Radiated Emission Method: The EUT is placed on Styrofoam table and mounted 1.5 height above the ground plan as the set-up picture to manipulate the EUT several positions in space. The measurement antenna is in the far field of the EUT per formula 2D^2/λ where D is the larger dimension of the measurement Antenna. The Signal Generator which is outside of the chamber is connected to the input of the EUT to produce the max power of the Pre AGC level. Absorbers are placed on the floor between the measurement antenna and turning table for above 1GHz to reduce the reflections. For below 1GHz, Absorbers are removed.
Conducted Emission Method: The EUT is placed on the table. It is connected straight to the Signal Generator and the Spectrum Analyzer. The EUT Server and Donor ports are a 2.92mmWave connector UL: 27500-28350MHz DL: 27500-28350MHz
Test procedure: The test was performed IAW the FCC document: 935210 D05 Indus Booster Basic Meas v01r04, 662911 D01 Multiple Transmitter Output v02r01, 842590 D01 Upper Microwave Flexible Use Service v01r01 and ANSI C63.26 2015 **Test Investigation:** 1/ Per 2.1057 (a) 2, Spurious Emission were investigated up to 100GHz. 2/ Multiple Access Scheme: CP-OFDM and DFT-s-OFDM, various modulations including Pi/2-BPSK, QPSK, 16QAM, 64QAM, 256 QAM with 120kHz subcarrier spacing, 100MHz and 400MHz Bandwidth, Single Carrier, Full and Single Number of Resource Block were tested. 3/The EUT was set up to produce the Pre-AGC power

3.3 Out of Band Rejection

Test Setup/Conditions			
Test Location:	Fremont	Test Engineer:	H. Nguyenpham
Test Date(s):	8/17/2020		
Configuration:	1		
Test Setup:	See General Test Setup		

Environmental Conditions					
Temperature (ºC)	23.2	Relative Humidity (%):	55	Pressure: kPa	102.1

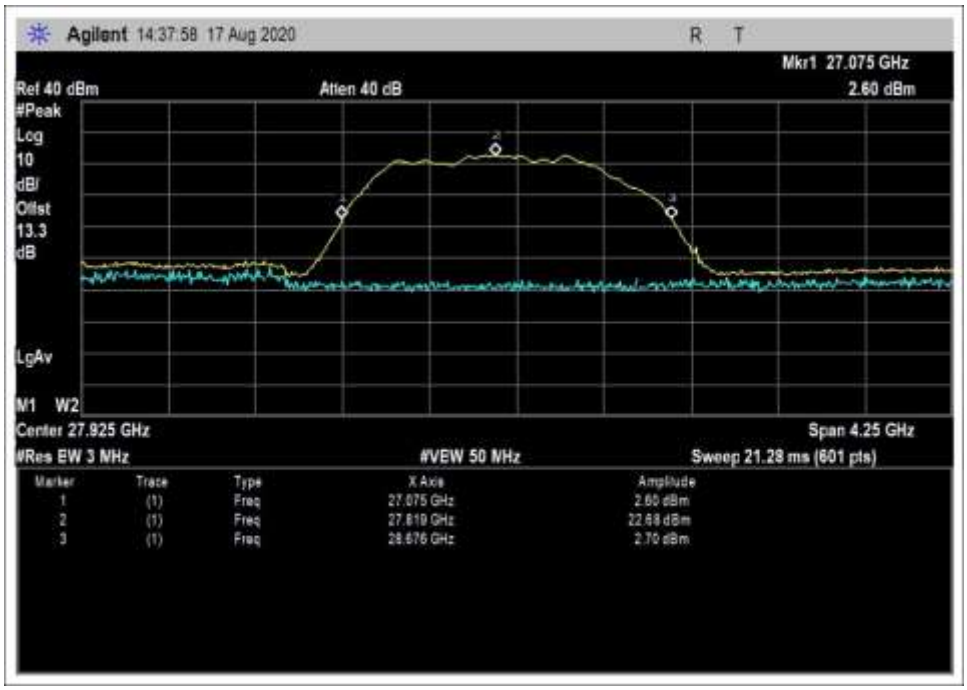
Test Equipment

Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
P05411	Attenuator	Weinschel	54A-10	11/27/2019	11/27/2021
P07192	Cable	Astro	32022-29094K-29094K-48TC	11/27/2019	11/27/2021
03360	Cable	Astrolab	32022-2-29094-36TC	4/9/2020	4/9/2022
02668	Spectrum Analyzer	Agilent	E4446A	12/17/2019	12/17/2020
R00173	Vector Signal Generator	Rohde & Schwarz	SMW200A-B140	7/22/2019	7/22/2022

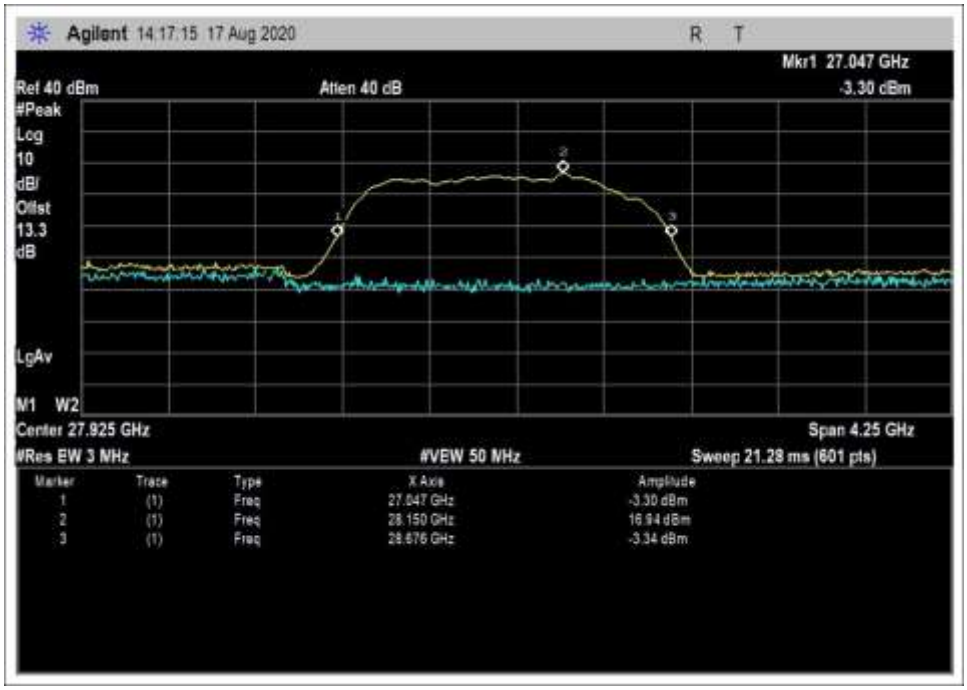
Summary of Results

Pass: The plots above show the device only operates on the CMRS frequency bands authorized for use by the NPS.

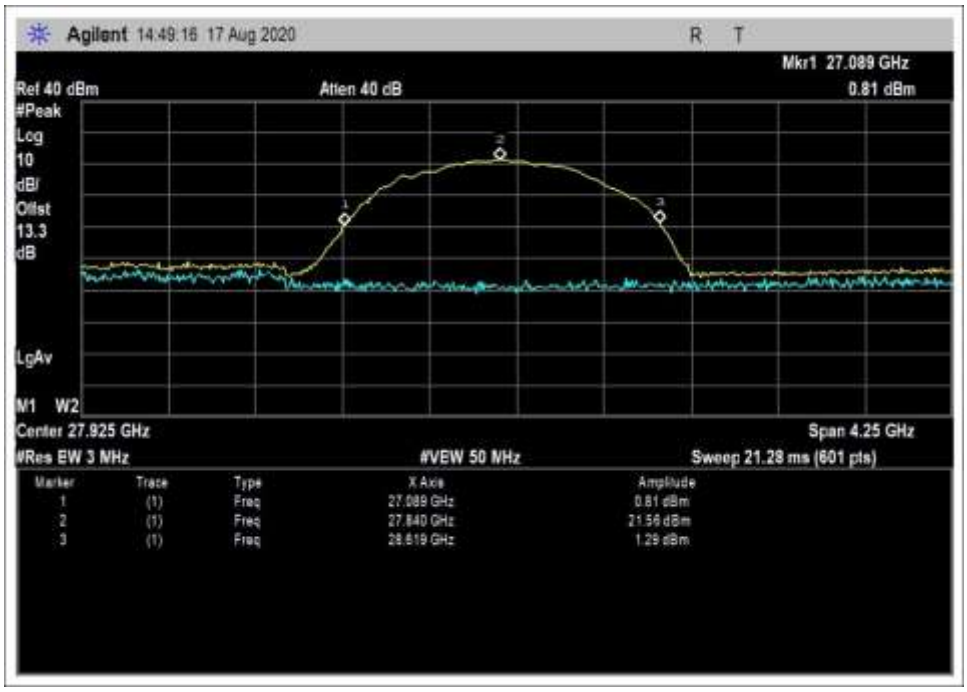
Plots



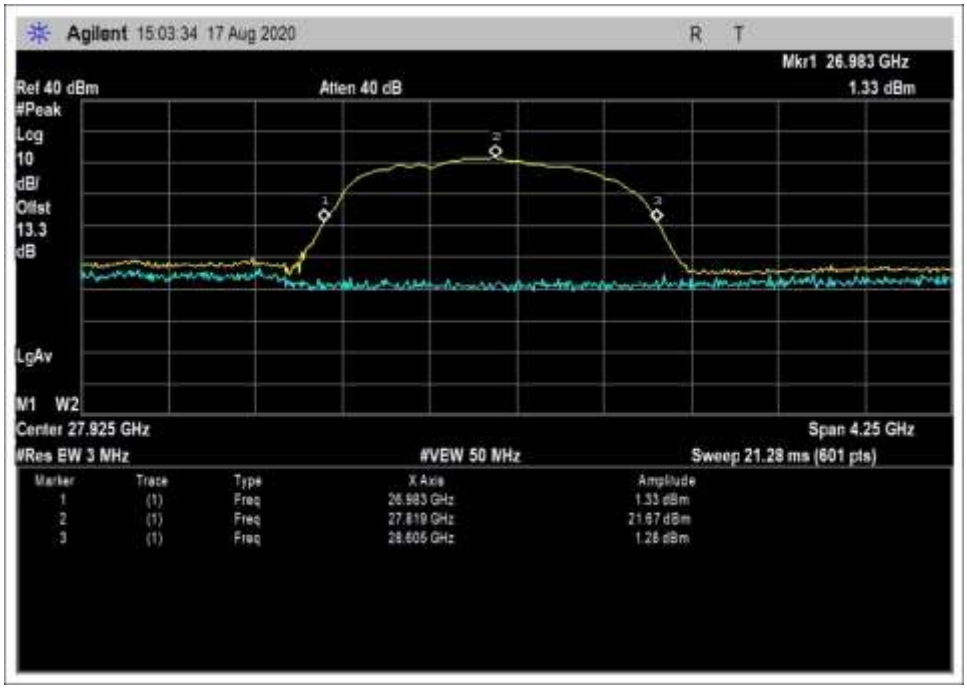
UL_27500-28350MHz Horizontal



UL_27500-28350MHz Vertical



DL_27500-28350MHz Horizontal



DL_27500-28350MHz Vertical

3.4 Input-Versus-Output Signal Comparison

Test Setup/Conditions			
Test Location:	Fremont	Test Engineer:	H. Nguyenpham
Test Date(s):	8/10/2020		
Configuration:	1		
Test Setup:	See General Test Setup		

Environmental Conditions					
Temperature (ºC)	23.4	Relative Humidity (%):	39	Pressure: kPa	100.2

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
P05411	Attenuator	Weinschel	54A-10	11/27/2019	11/27/2021
P07192	Cable	Astro	32022-29094K-29094K-48TC	11/27/2019	11/27/2021
03360	Cable	Astrolab	32022-2-29094-36TC	4/9/2020	4/9/2022
02668	Spectrum Analyzer	Agilent	E4446A	12/17/2019	12/17/2020
R00173	Vector Signal Generator	Rohde & Schwarz	SMW200A-B140	7/22/2019	7/22/2022

Summary of Results

Pass: As summarized in plots and tables below, the uniformity of the output signal relative to the input signal are practically identical. Therefore, the comparison is within limits.

OBW-Input-Pre-AGC (Multiple Access Scheme: CP-OFDM) (MHz)							OBW-Output-Pre-AGC (Multiple Access Scheme: CP-OFDM) (MHz)			
Channel BW (MHz)	Direction	QPSK	16QAM	64QAM	256QAM		QPSK	16QAM	64QAM	256QAM
100	UL-H	94.404	94.440	94.423	94.465		94.837	94.952	94.986	94.902
100	UL-V	94.430	94.451	94.397	94.424		94.578	94.643	94.605	94.550
400	UL-H	377.078	376.867	376.898	376.975		378.488	378.555	378.669	378.826
400	UL-V	376.973	377.114	377.073	377.049		377.608	377.582	377.569	377.639
100	DL-H	94.418	94.353	94.347	94.426		94.932	94.829	94.961	94.942
100	DL-V	94.403	94.432	94.412	94.458		94.668	94.548	94.525	94.462
400	DL-H	377.157	377.352	377.122	377.093		377.913	377.950	377.795	377.852
400	DL-V	377.082	377.272	377.195	377.105		378.662	378.620	378.597	378.709

Max Difference In&Out-Pre AGC (Multiple Access Scheme: CP-OFDM) Occ BW 99% Pwr				
Frequency Range	QPSK	16QAM	64QAM	256QAM
UL 27500-28350	0.46%	0.54%	0.59%	0.46%
UL 27500-28350	0.16%	0.20%	0.22%	0.13%
UL 27500-28350	0.37%	0.45%	0.47%	0.49%
UL 27500-28350	0.17%	0.12%	0.13%	0.16%
DL 27500-28350	0.54%	0.50%	0.65%	0.54%
DL 27500-28350	0.28%	0.12%	0.12%	0.00%
DL 27500-28350	0.20%	0.16%	0.18%	0.20%
DL 27500-28350	0.42%	0.36%	0.37%	0.42%

OBW-Input-AGC+3 (Multiple Access Scheme: CP-OFDM) (MHz)							OBW-Output-AGC+3 (Multiple Access Scheme: CP-OFDM) (MHz)			
Channel BW (MHz)	Direction	QPSK	16QAM	64QAM	256QAM		QPSK	16QAM	64QAM	256QAM
100	UL-H	94.404	94.440	94.423	94.465		94.399	94.478	94.316	94.431
100	UL-V	94.430	94.451	94.397	94.424		94.689	94.678	94.703	34.699
400	UL-H	377.078	376.867	376.898	376.975		377.364	377.372	377.410	378.310
400	UL-V	376.973	377.114	377.073	377.049		377.490	377.533	377.525	378.390
100	DL-H	94.418	94.353	94.347	94.426		94.899	94.830	94.874	94.895
100	DL-V	94.403	94.432	94.412	94.458		94.616	94.618	94.554	94.471
400	DL-H	377.157	377.352	377.122	377.093		379.651	379.741	379.329	379.086
400	DL-V	377.082	377.272	377.195	377.105		378.167	378.616	378.938	378.711

Max Difference In&Out-AGC+3 (Multiple Access Scheme: CP-OFDM) Occ BW 99% Pwr				
Frequency Range	QPSK	16QAM	64QAM	256QAM
UL 27500-28350	0.01%	0.04%	0.11%	0.04%
UL 27500-28350	0.27%	0.24%	0.32%	0.29%
UL 27500-28350	0.08%	0.13%	0.14%	0.35%
UL 27500-28350	0.14%	0.11%	0.12%	0.35%
DL 27500-28350	0.51%	0.50%	0.56%	0.49%
DL 27500-28350	0.23%	0.20%	0.15%	0.01%
DL 27500-28350	0.66%	0.63%	0.58%	0.53%
DL 27500-28350	0.29%	0.36%	0.46%	0.42%

OBW-Input-Pre-AGC (Multiple Access Scheme: DFT-s-OFDM) (MHz)								OBW-Output-Pre-AGC (Multiple Access Scheme: DFT-s-OFDM) (MHz)				
Channel BW (MHz)	Direction	QPSK	16QAM	64QAM	256QAM	Pi/2-BPSK		QPSK	16QAM	64QAM	256QAM	Pi/2-BPSK
100	UL-H	91.627	91.655	91.594	91.540	91.591		91.728	91.943	91.808	91.825	91.596
100	UL-V	91.519	91.731	91.611	91.997	91.540		91.803	91.646	91.854	91.772	91.666
400	UL-H	365.755	365.723	365.680	365.703	365.775		366.063	366.162	366.504	366.439	364.982
400	UL-V	366.017	365.516	366.095	365.582	365.639		365.869	366.353	366.449	366.478	364.548

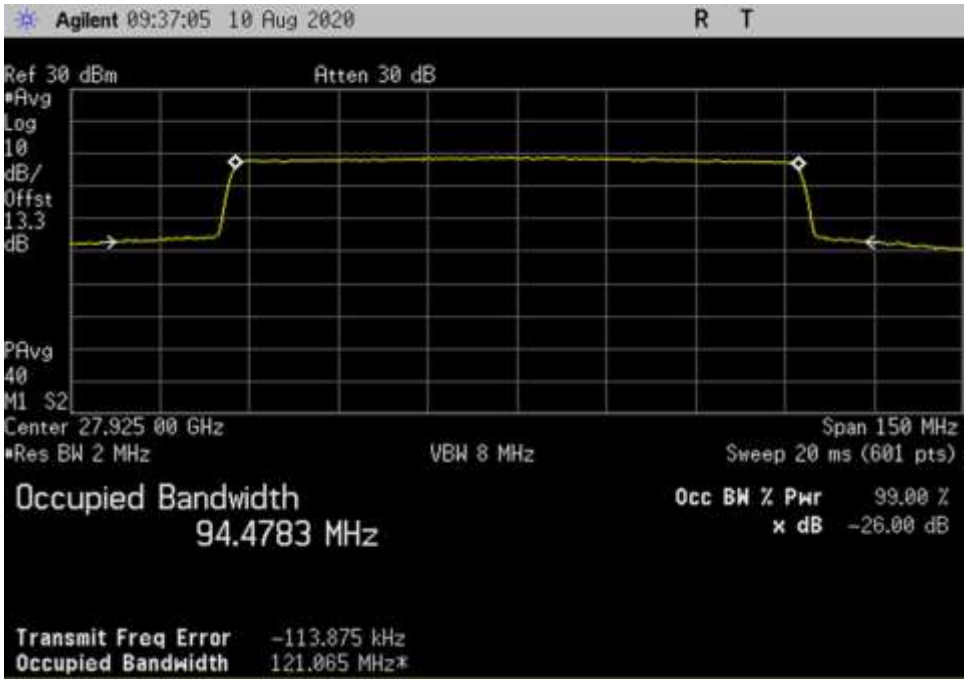
Max Difference In&Out-Pre AGC (Multiple Access Scheme: DFT-s-OFDM) Occ BW 99% Pwr					
Frequency Range	QPSK	16QAM	64QAM	256QAM	Pi/2-BPSK
UL 27500-28350	0.11%	0.31%	0.23%	0.31%	0.01%
UL 27500-28350	0.31%	0.09%	0.26%	0.25%	0.14%
UL 27500-28350	0.08%	0.12%	0.22%	0.20%	0.22%
UL 27500-28350	0.04%	0.23%	0.10%	0.24%	0.30%

OBW-Input-AGC+3 (Multiple Access Scheme: DFT-s-OFDM) (MHz)								OBW-Output-AGC+3 (Multiple Access Scheme: DFT-s-OFDM) (MHz)				
Channel BW (MHz)	Direction	QPSK	16QAM	64QAM	256QAM	Pi/2-BPSK		QPSK	16QAM	64QAM	256QAM	Pi/2-BPSK
100	UL-H	91.627	91.655	91.594	91.540	91.591		91.617	91.449	91.620	91.574	91.213
100	UL-V	91.519	91.731	91.611	91.997	91.540		91.619	91.666	91.610	91.746	91.415
400	UL-H	365.755	365.723	365.680	365.703	365.775		365.746	365.679	365.820	365.921	365.192
400	UL-V	366.017	365.516	366.095	365.582	365.639		365.539	366.162	366.278	366.146	364.992

Max Difference In&Out-AGC+3 (Multiple Access Scheme: DFT-s-OFDM) Occ BW 99% Pwr					
Frequency Range	QPSK	16QAM	64QAM	256QAM	Pi/2-BPSK
UL 27500-28350	0.01%	0.23%	0.03%	0.04%	0.41%
UL 27500-28350	0.11%	0.07%	0.00%	0.27%	0.14%
UL 27500-28350	0.00%	0.01%	0.04%	0.06%	0.16%
UL 27500-28350	0.13%	0.18%	0.05%	0.15%	0.18%

Plots

CP – 16QAM



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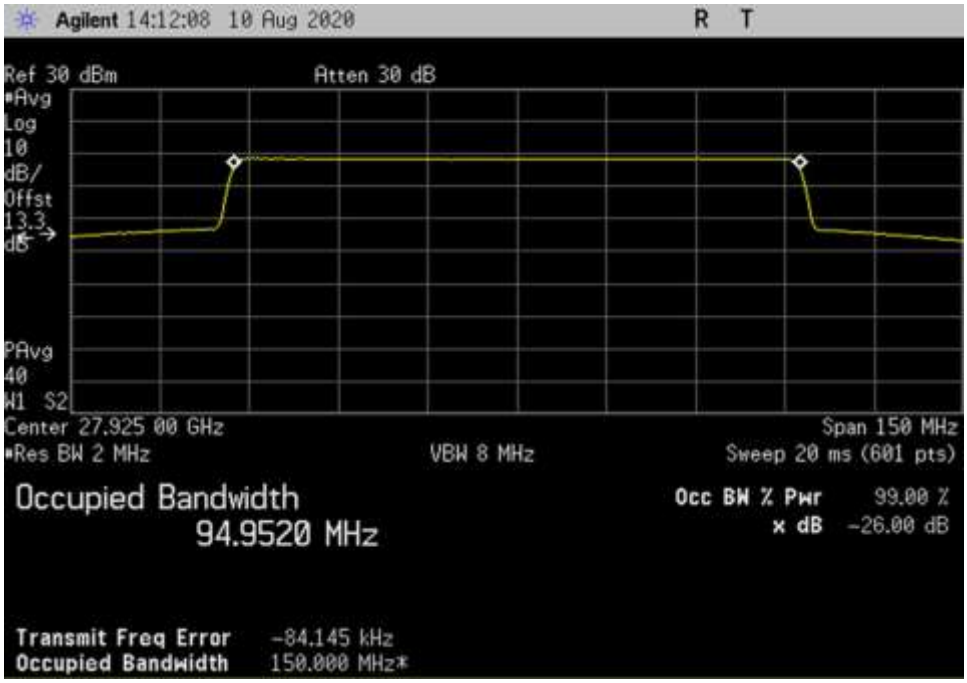

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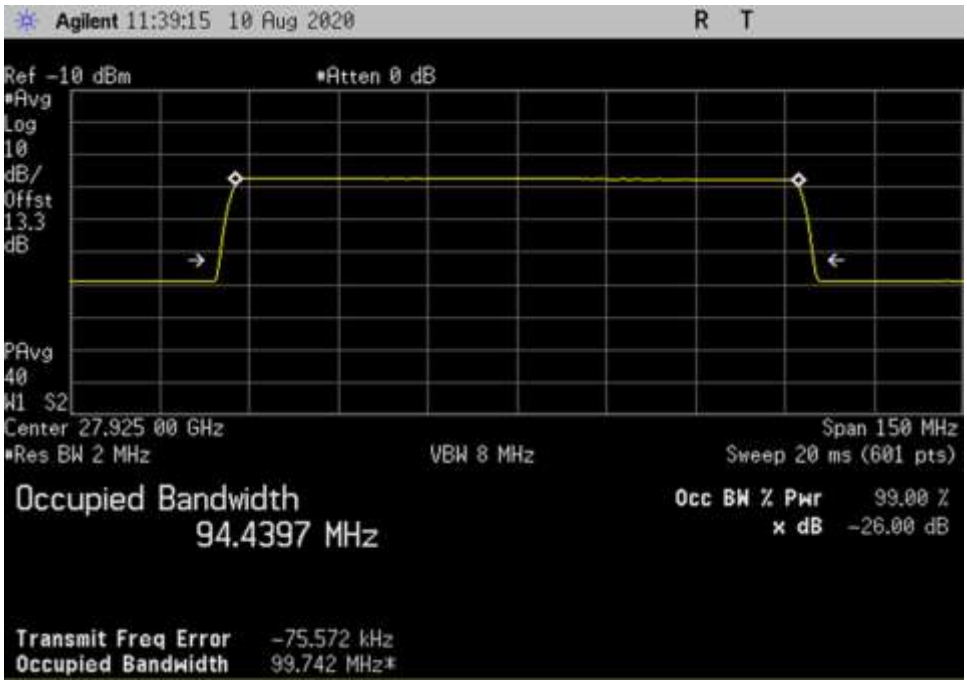

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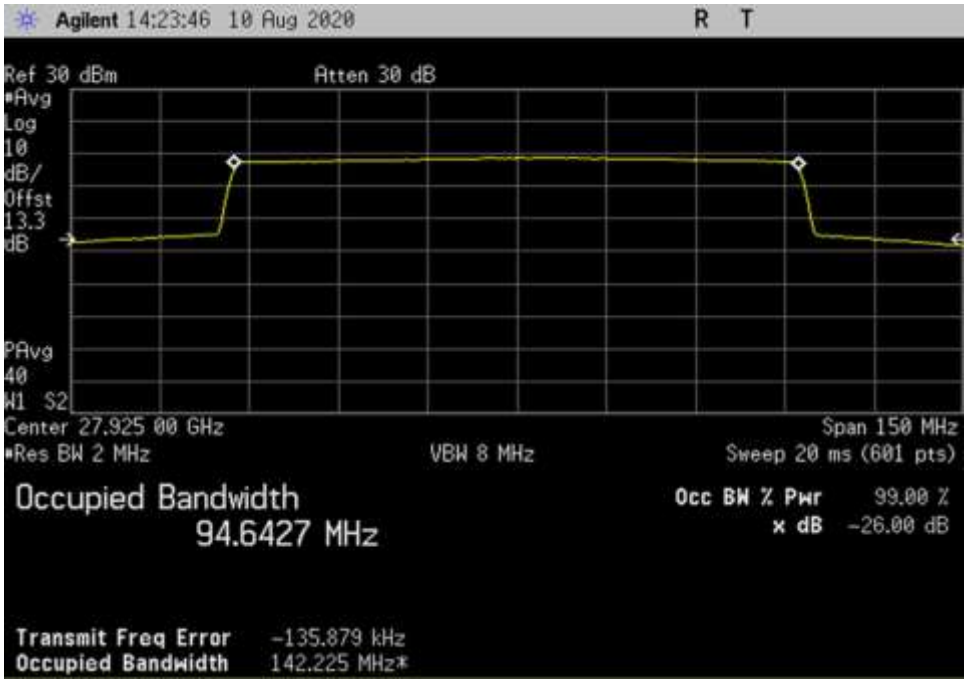

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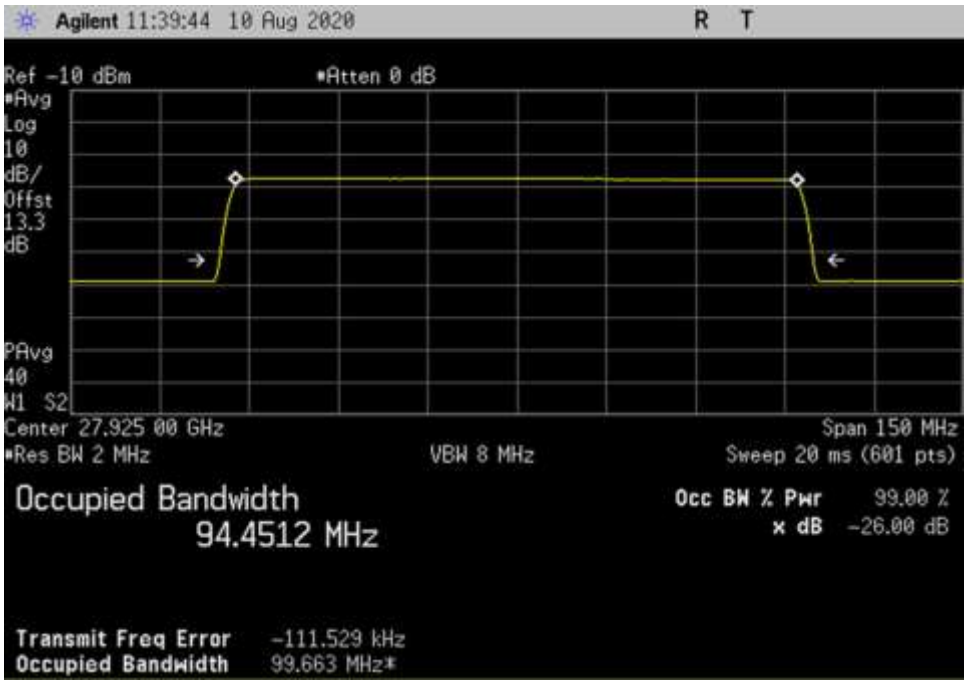

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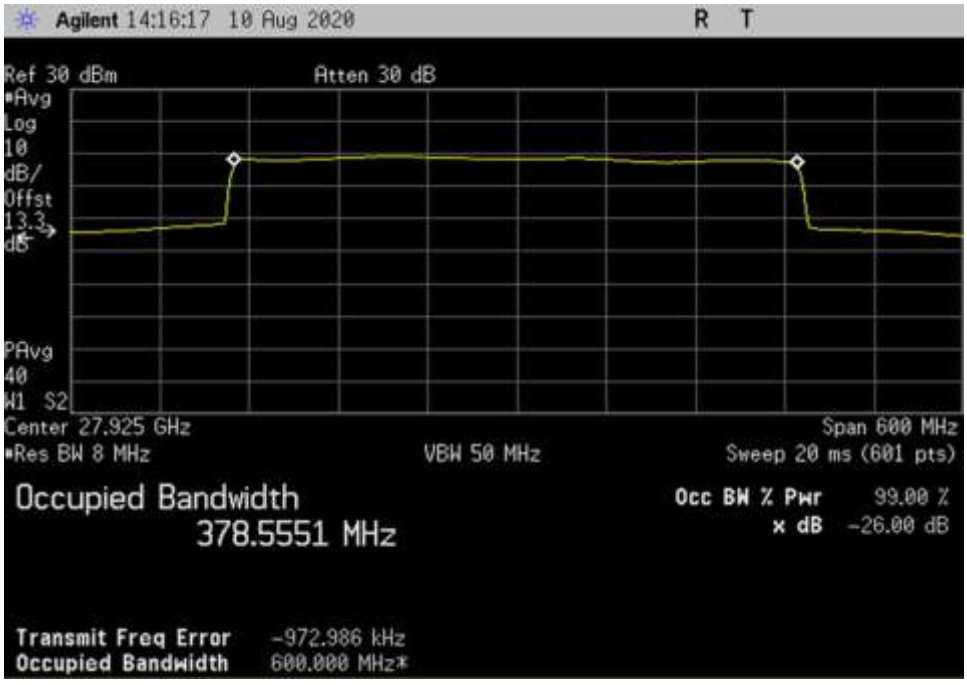

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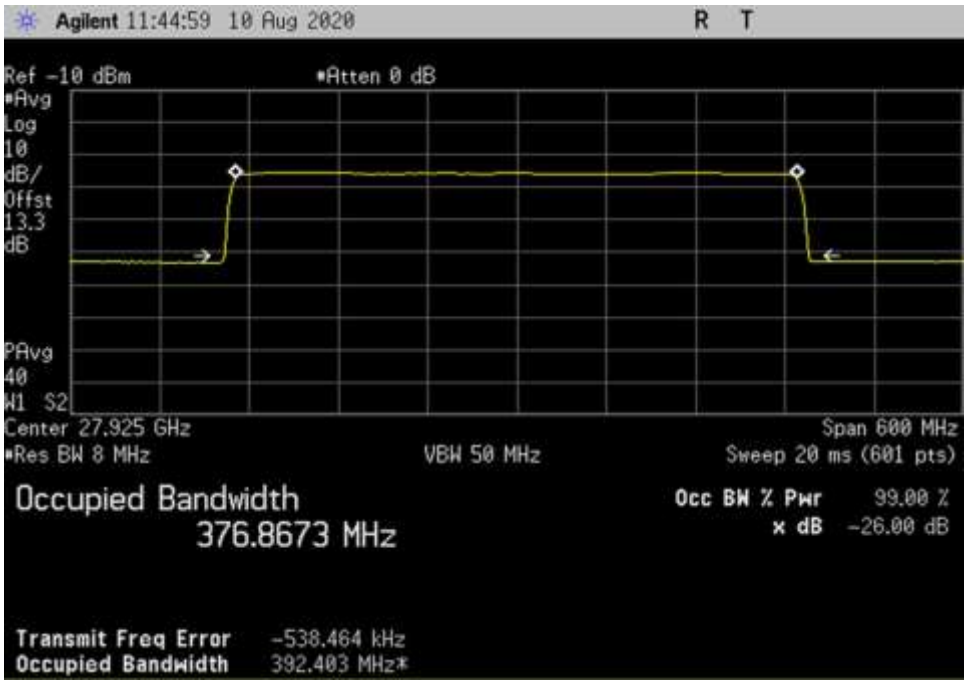

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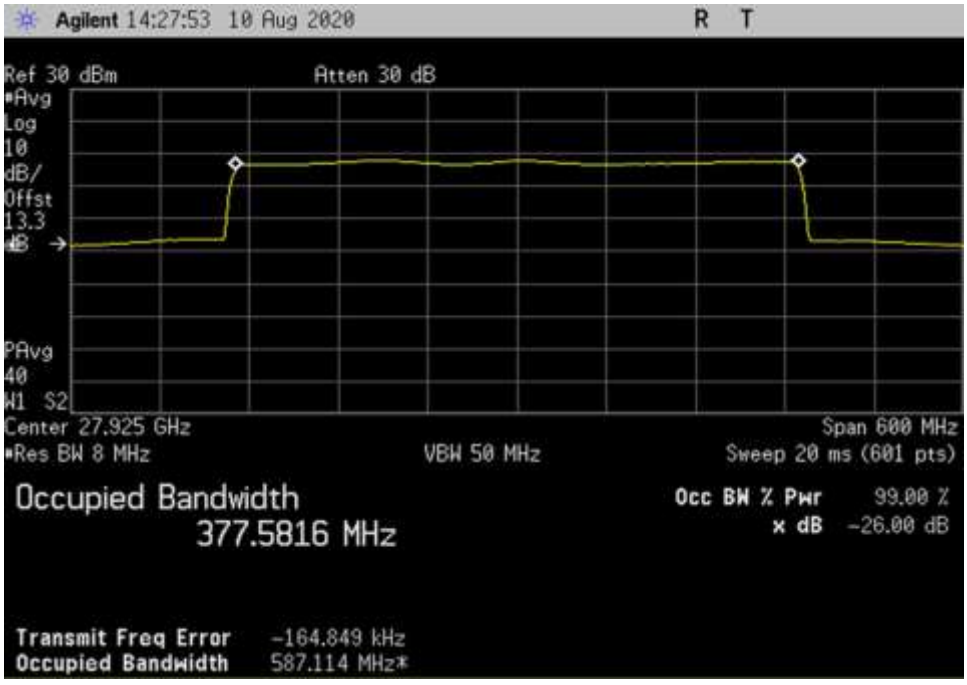

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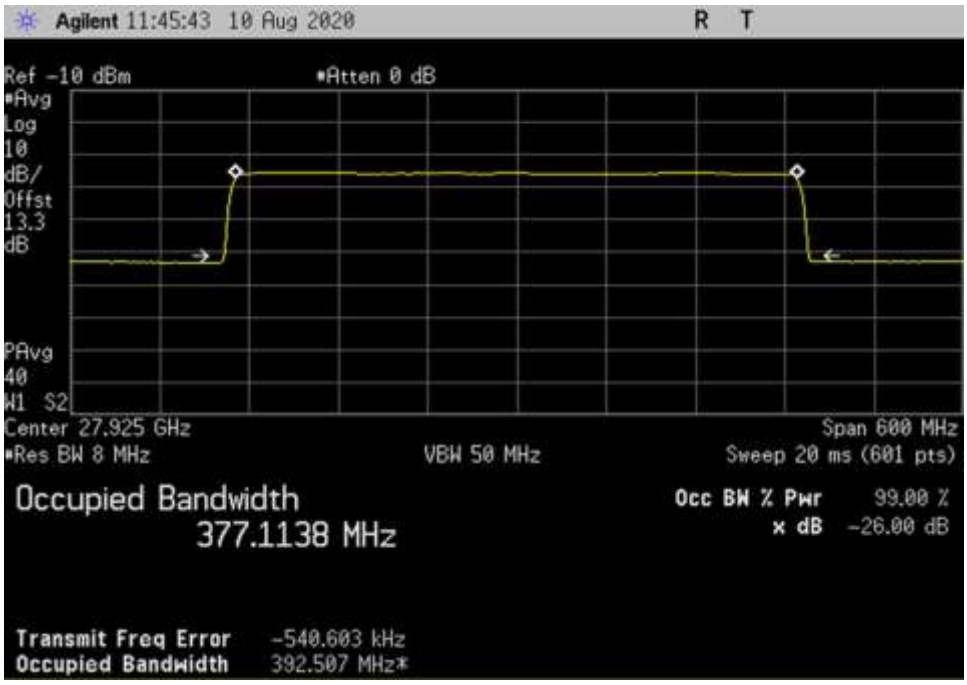

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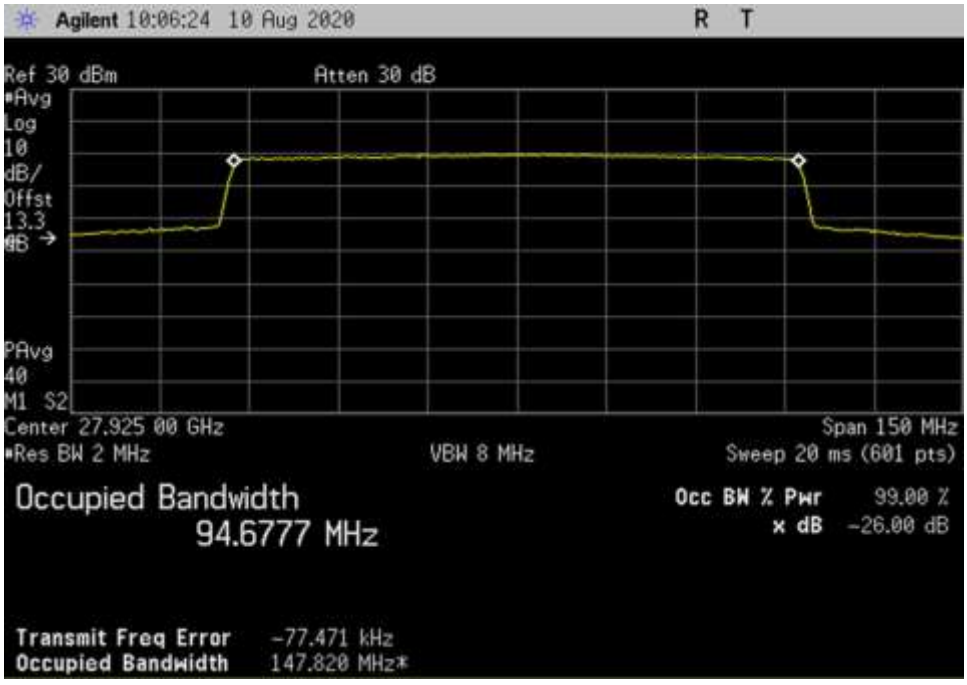

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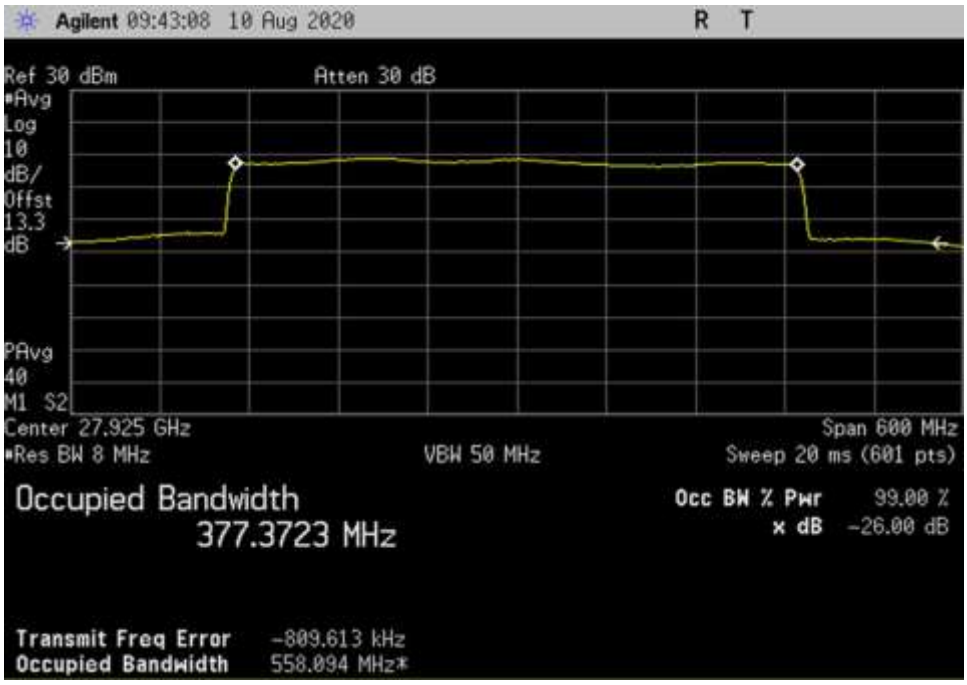

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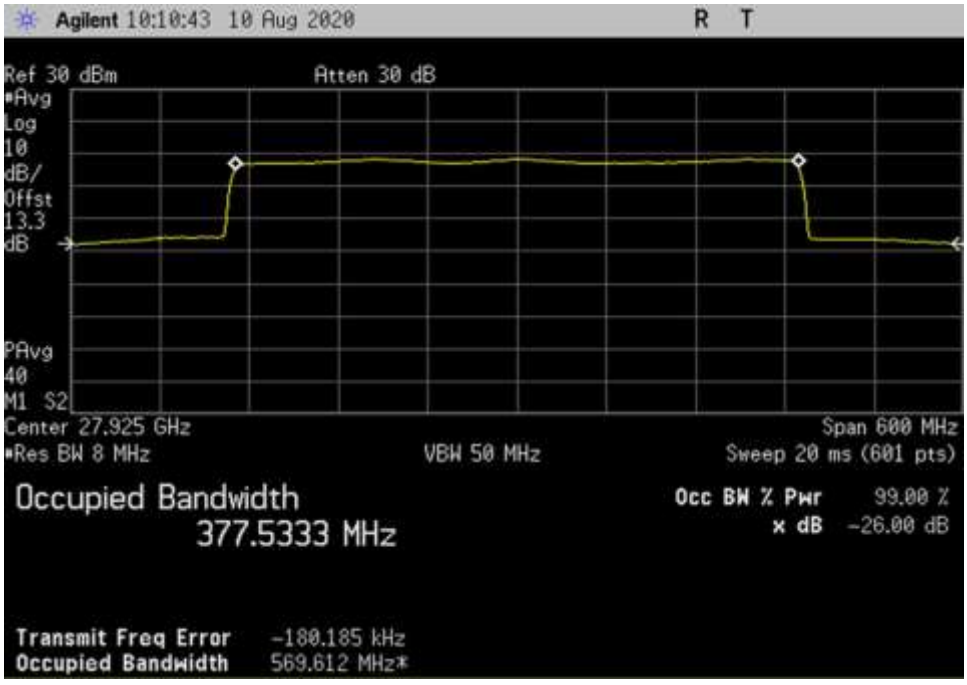

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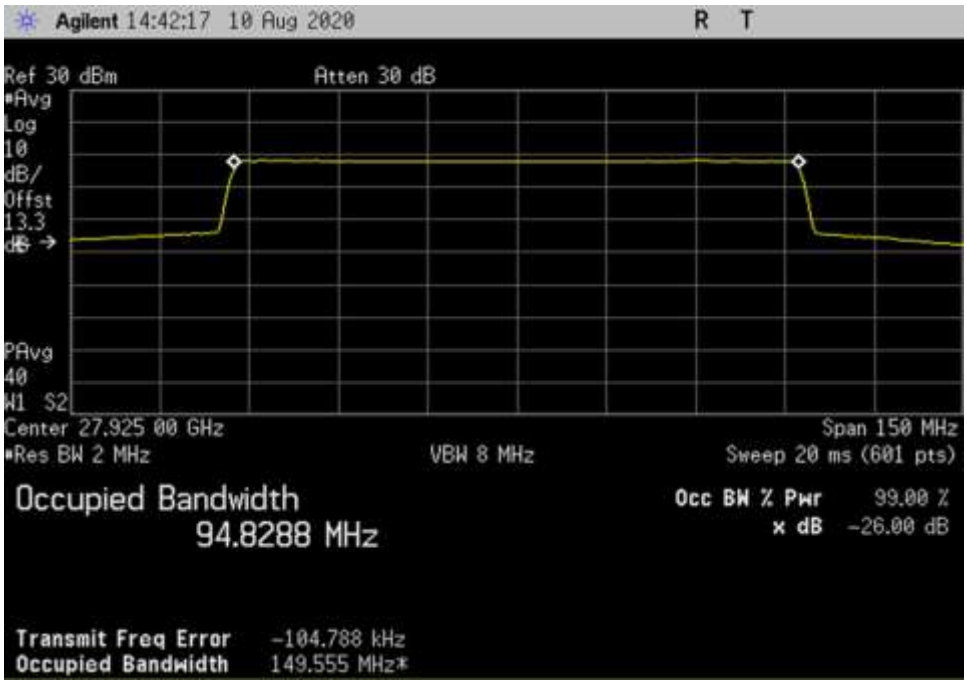
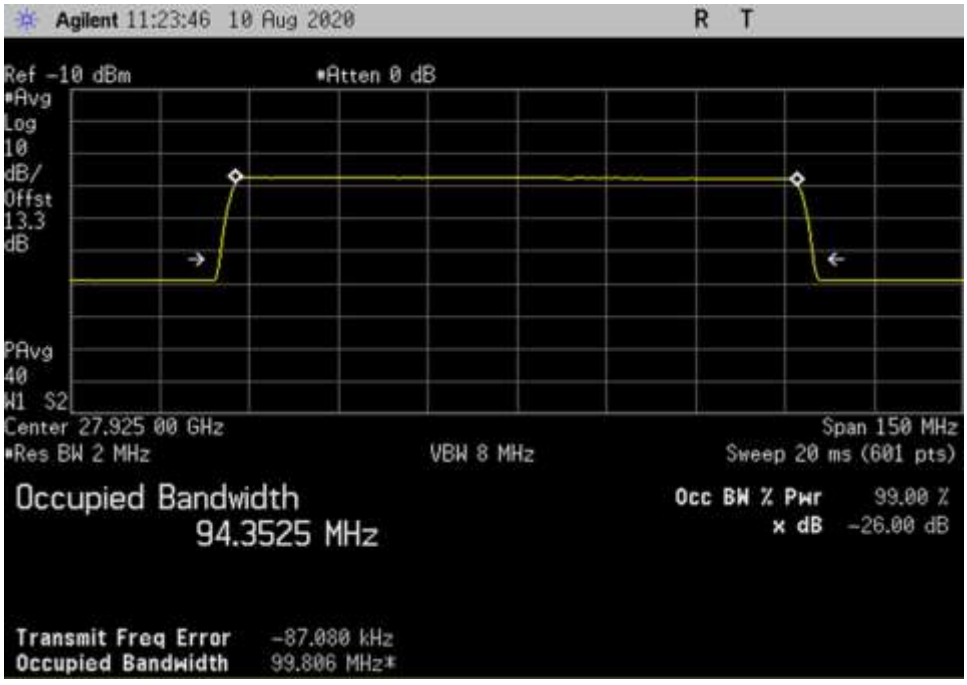
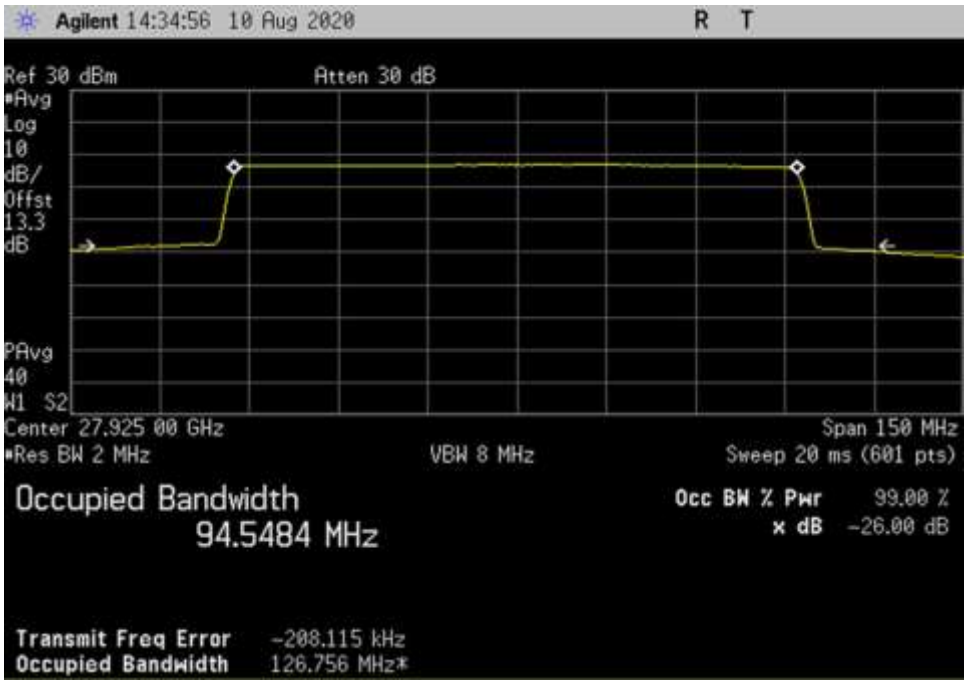


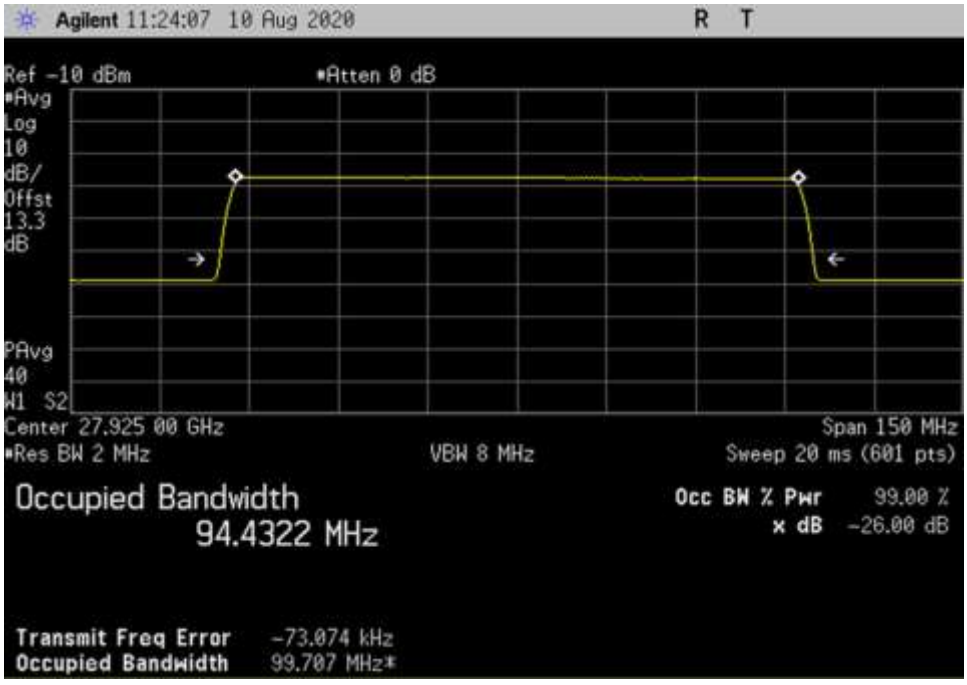
DL_27500-28350- 16QAM-100MHz-H-CP OFDM_ 27925MHz_MC



DL_27500-28350- 16QAM-100MHz-H-CP OFDM-Input_ 27925MHz_MC



DL_27500-28350- 16QAM-100MHz-V-CP OFDM_ 27925MHz_MC



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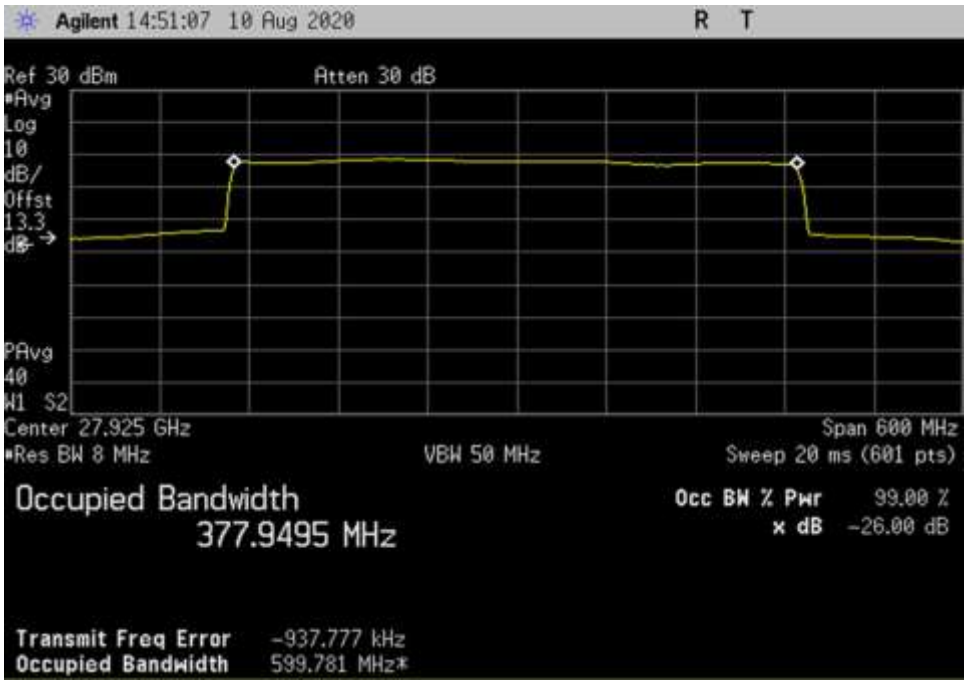

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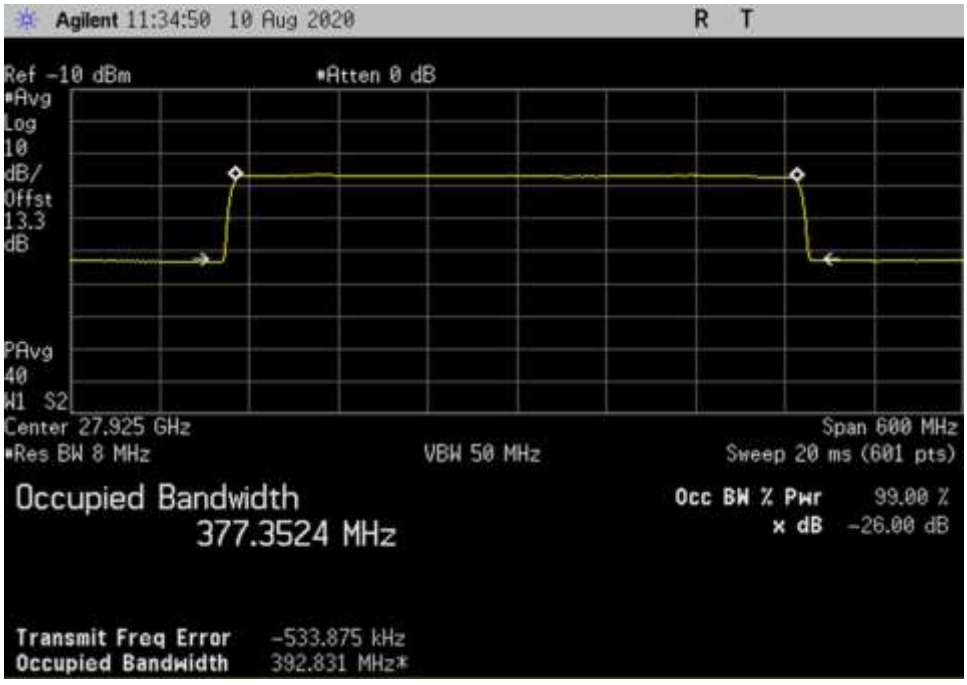

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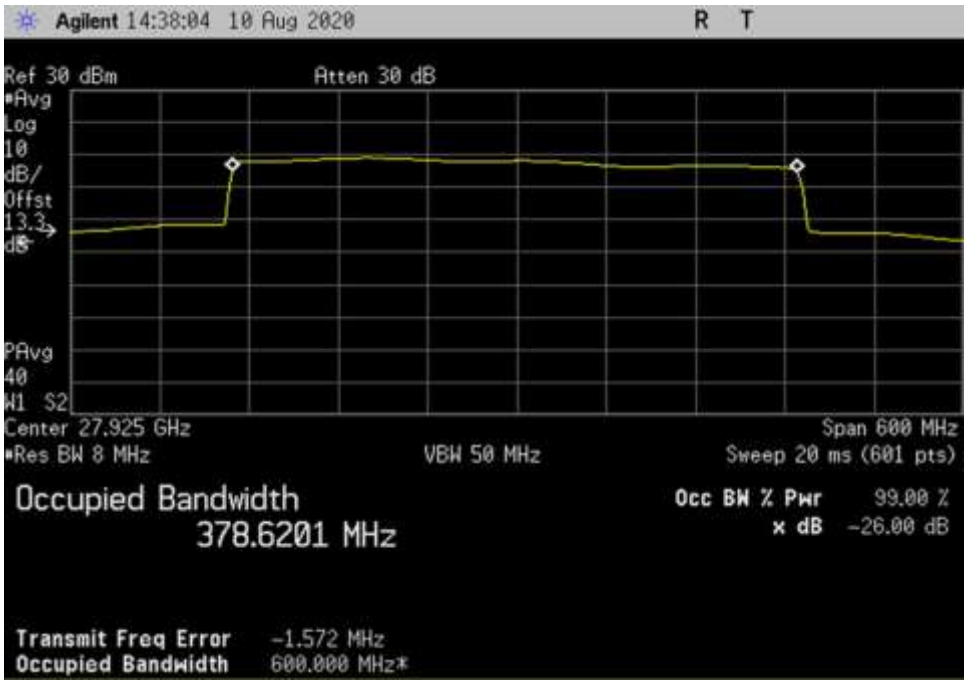

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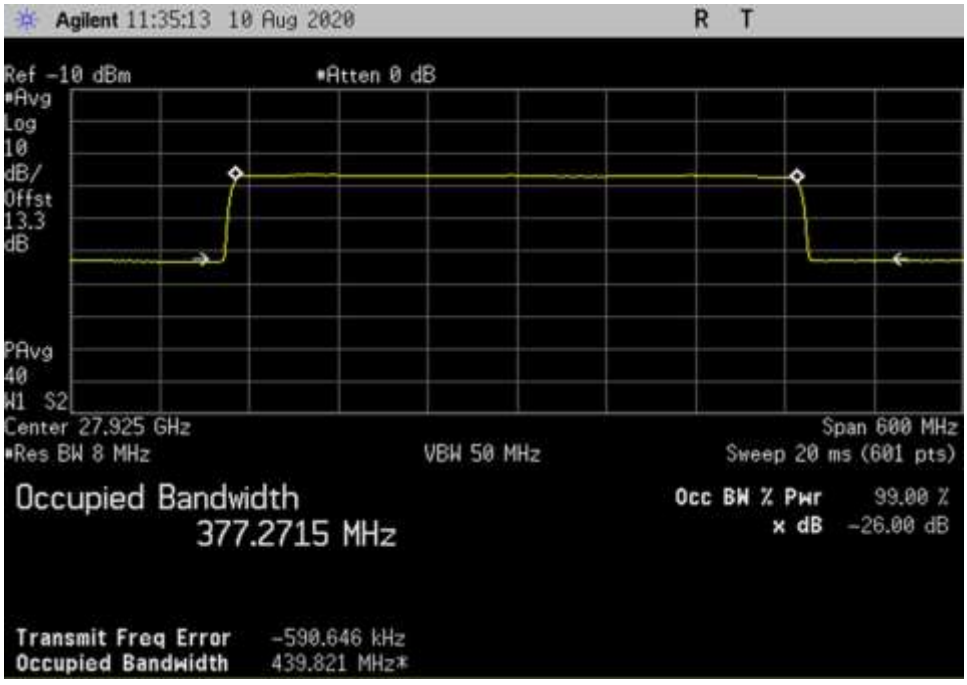
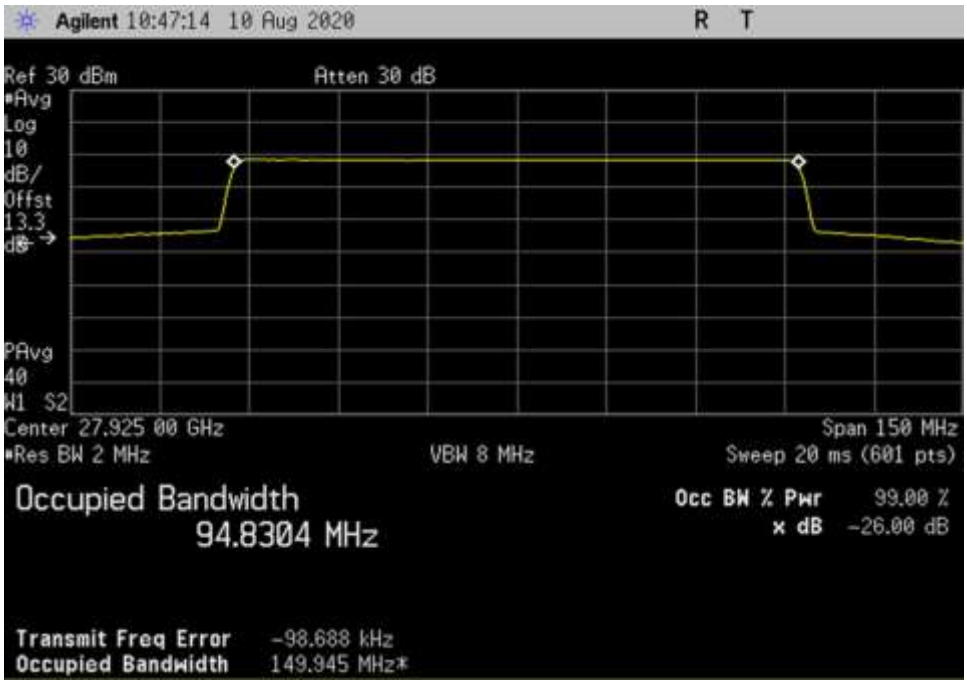


DL_27500-28350- 16QAM-400MHz-V-CP OFDM-Input_ 27925MHz_MC



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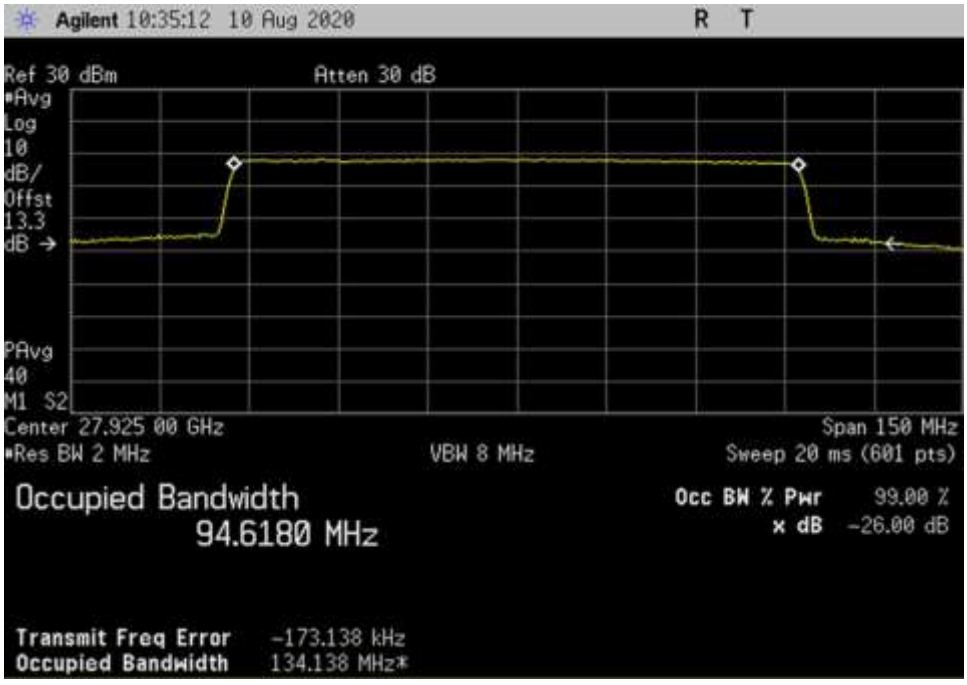
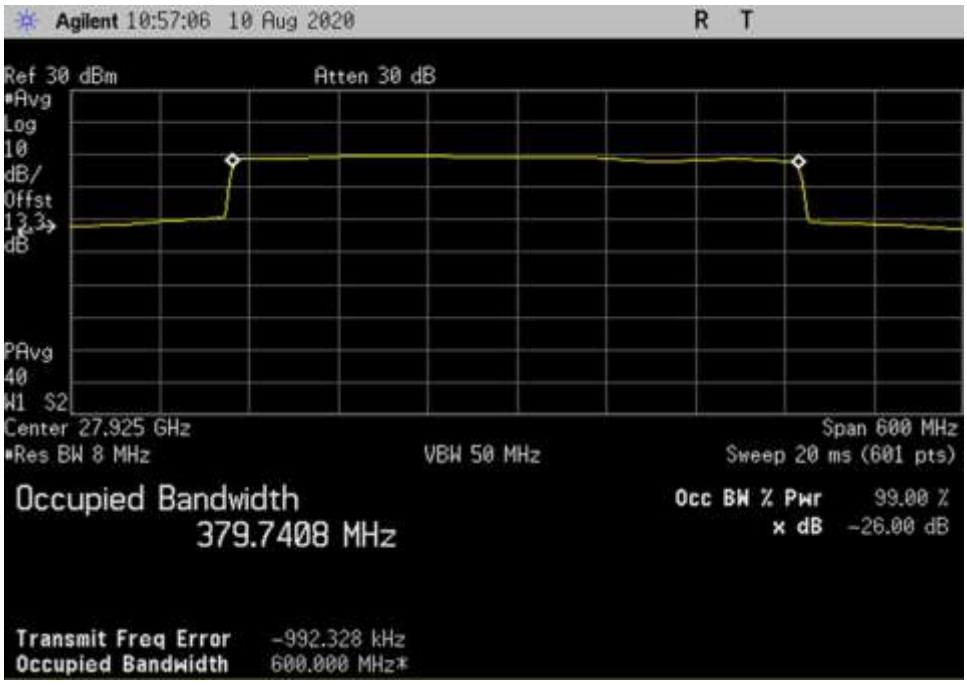
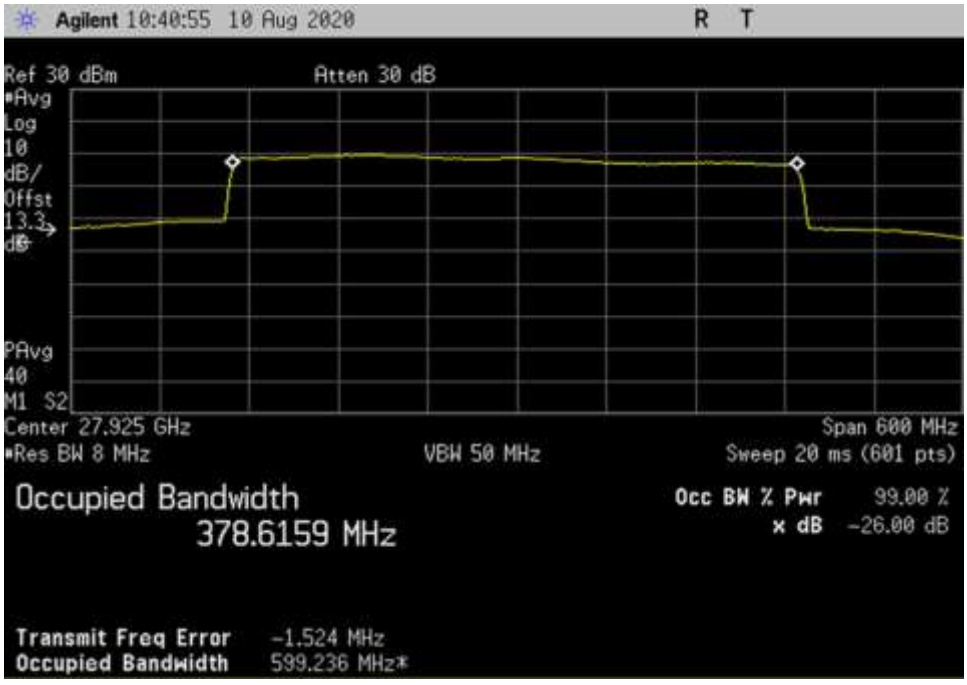


DL_27500-28350-16QAM-100MHz-V-CP OFDM-AGC+3_ 27925MHz_MC

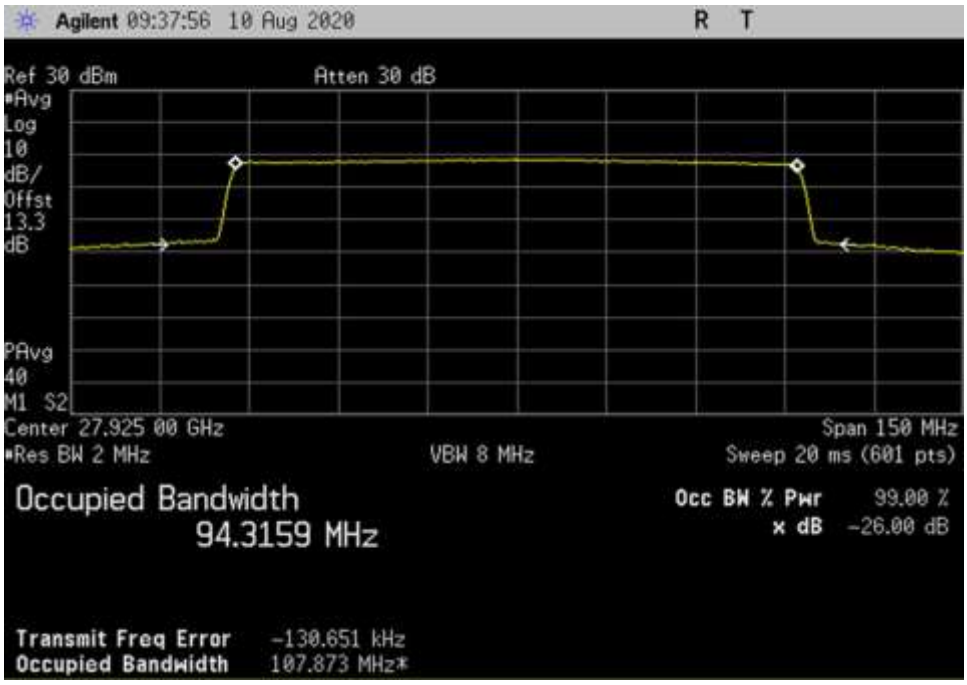


DL_27500-28350-16QAM-400MHz-H-CP OFDM-AGC+3_ 27925MHz_MC

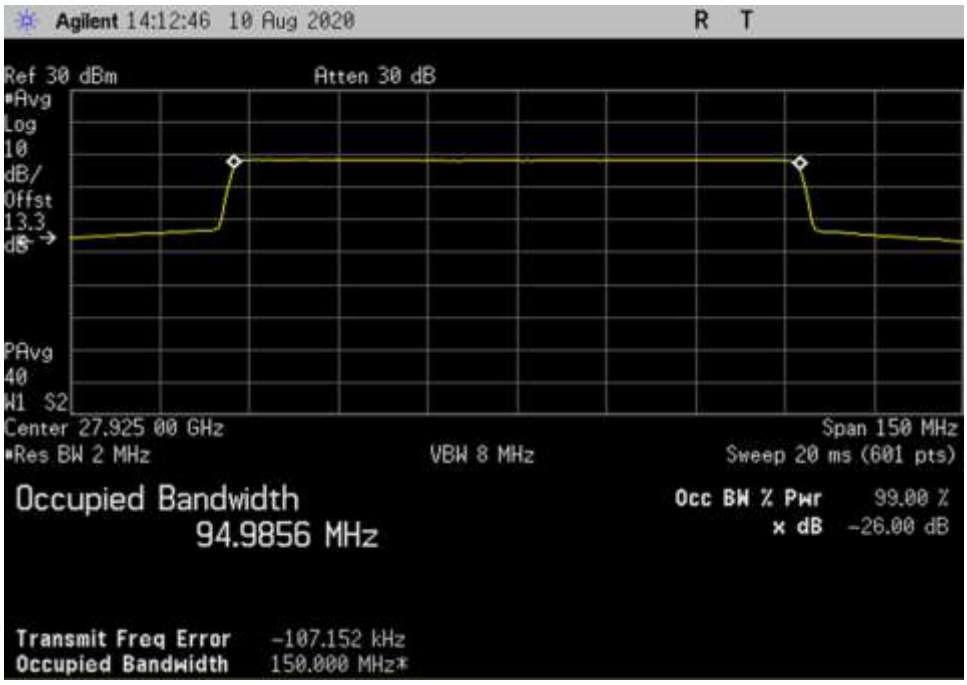


DL_27500-28350-16QAM-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC

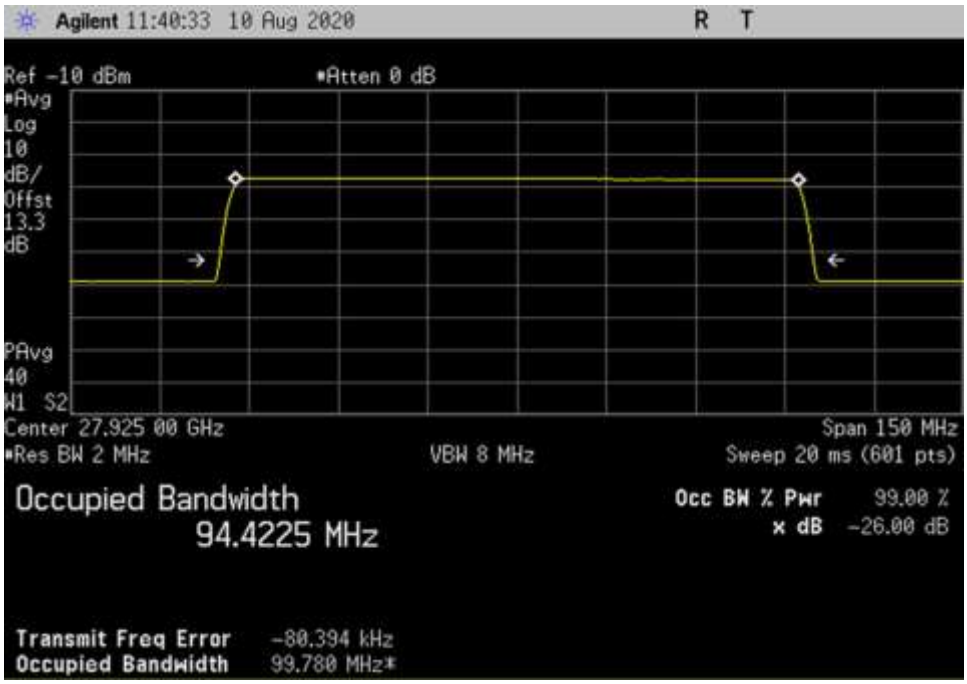
CP – 64QAM



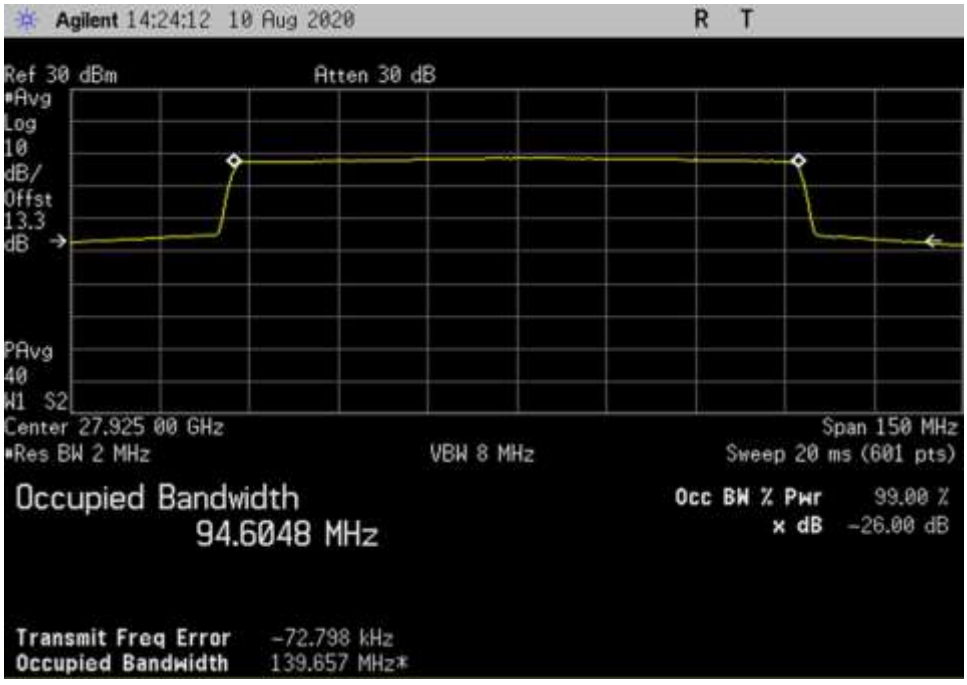
UL_27500-28350- 64QAM-100MHz-H_CP OFDM-AGC+3_ 27925MHz_MC



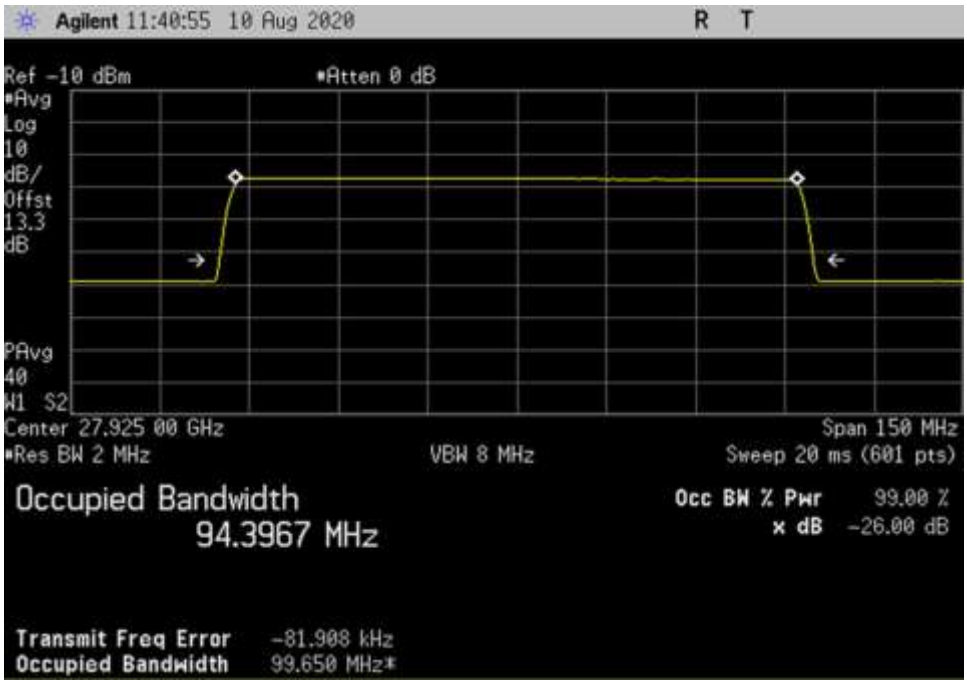
UL_27500-28350- 64QAM-100MHz-H-CP OFDM_ 27925MHz_MC



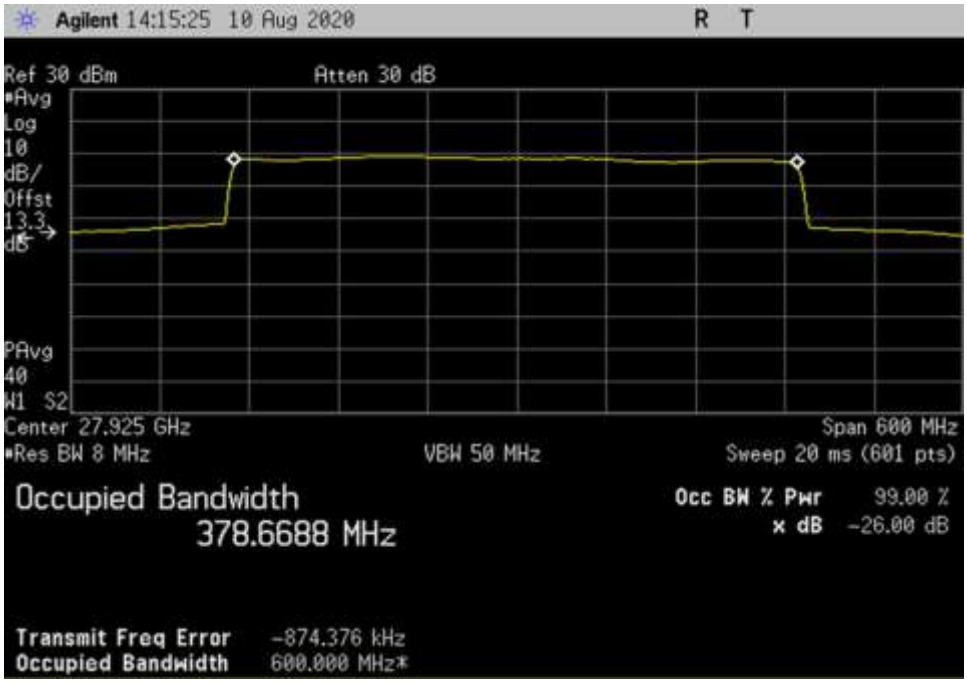
UL_27500-28350- 64QAM-100MHz-H-CP OFDM-Input_ 27925MHz_MC



UL_27500-28350- 64QAM-100MHz-V-CP OFDM_ 27925MHz_MC



UL_27500-28350- 64QAM-100MHz-V-CP OFDM-Input_ 27925MHz_MC



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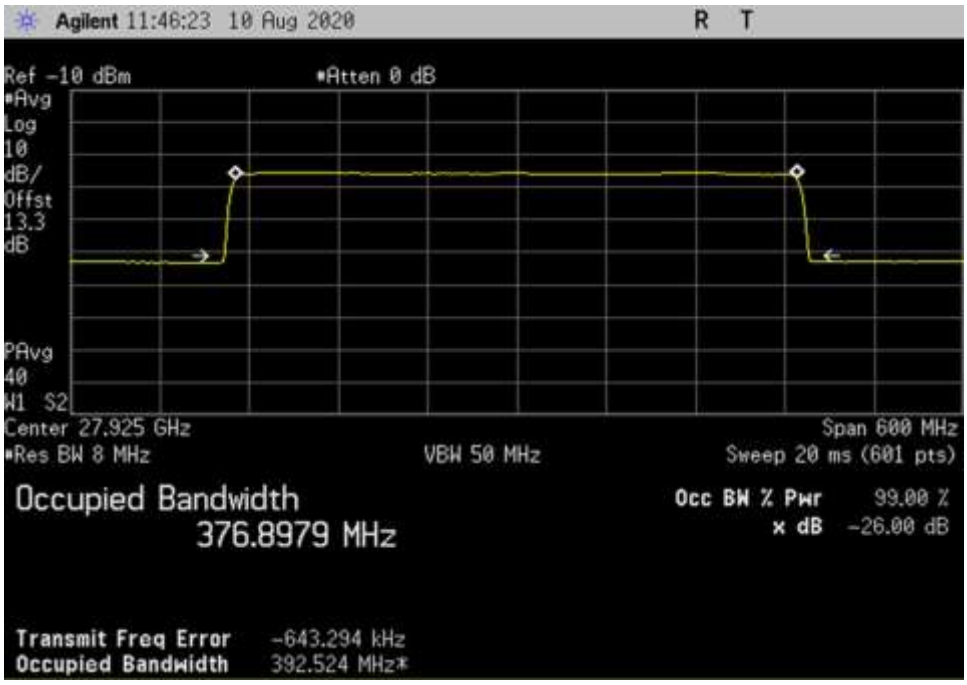
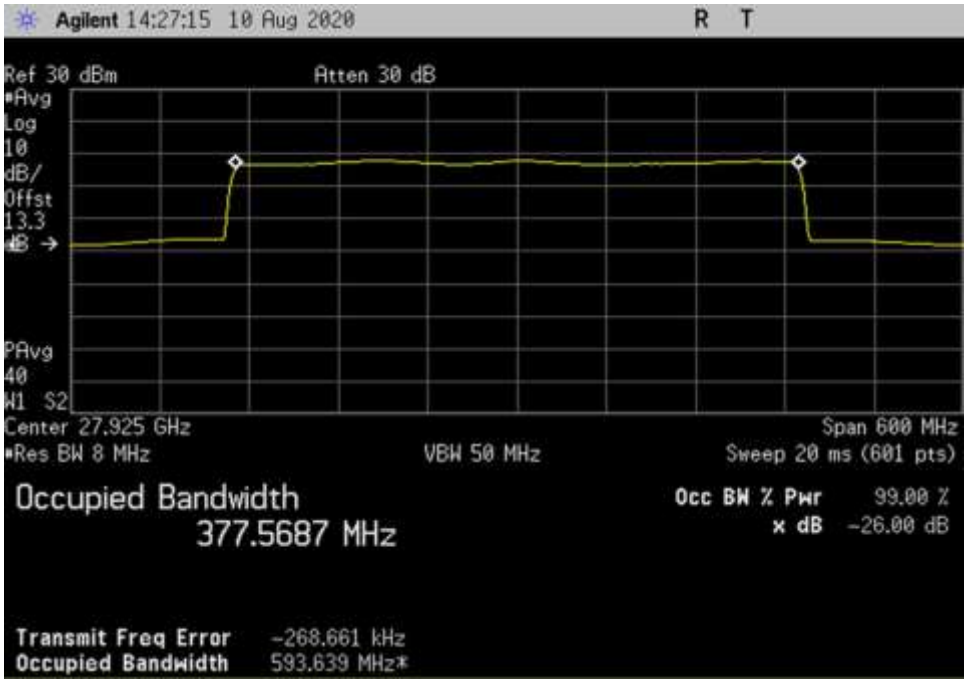
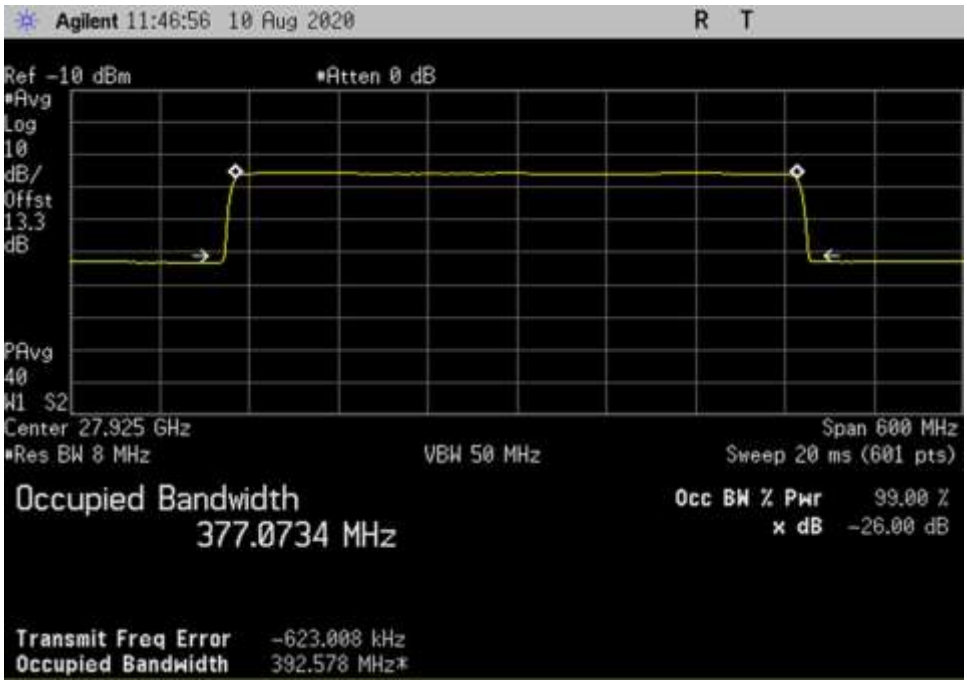


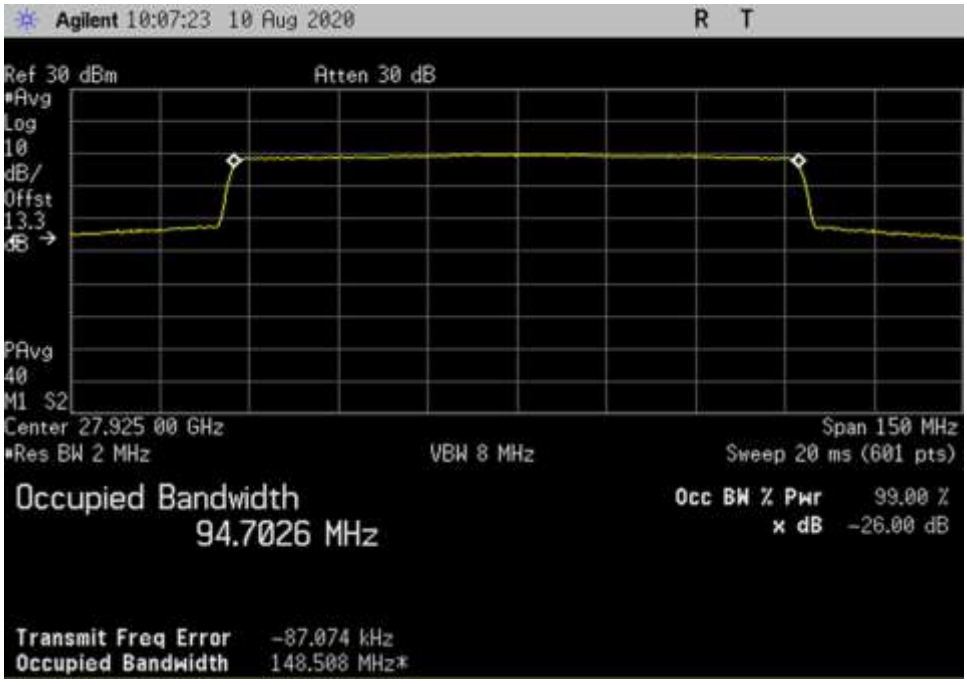
UL_27500-28350- 64QAM-400MHz-H-CP OFDM-Input_ 27925MHz_MC



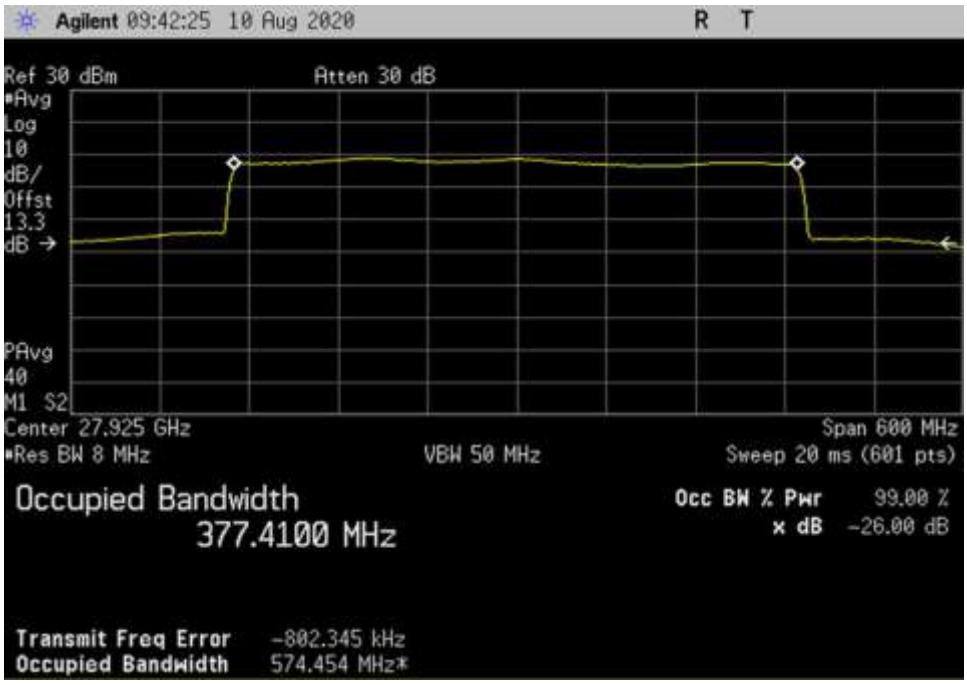
UL_27500-28350- 64QAM-400MHz-V-CP OFDM_ 27925MHz_MC



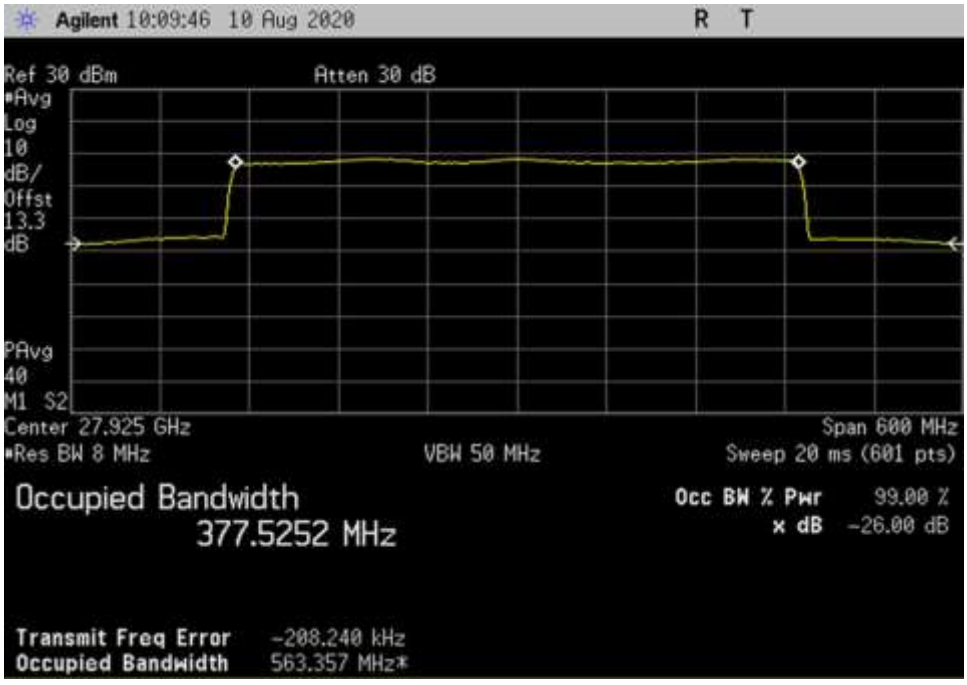
UL_27500-28350- 64QAM-400MHz-V-CP OFDM-Input_ 27925MHz_MC



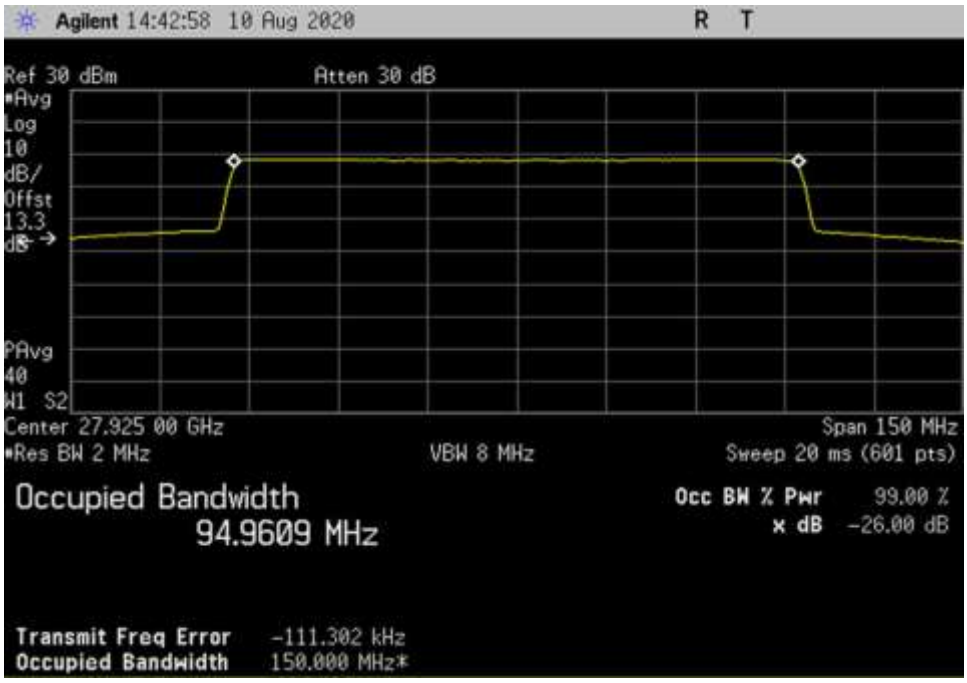
UL_27500-28350-64QAM-100MHz-V-CP OFDM-AGC+3_ 27925MHz_MC



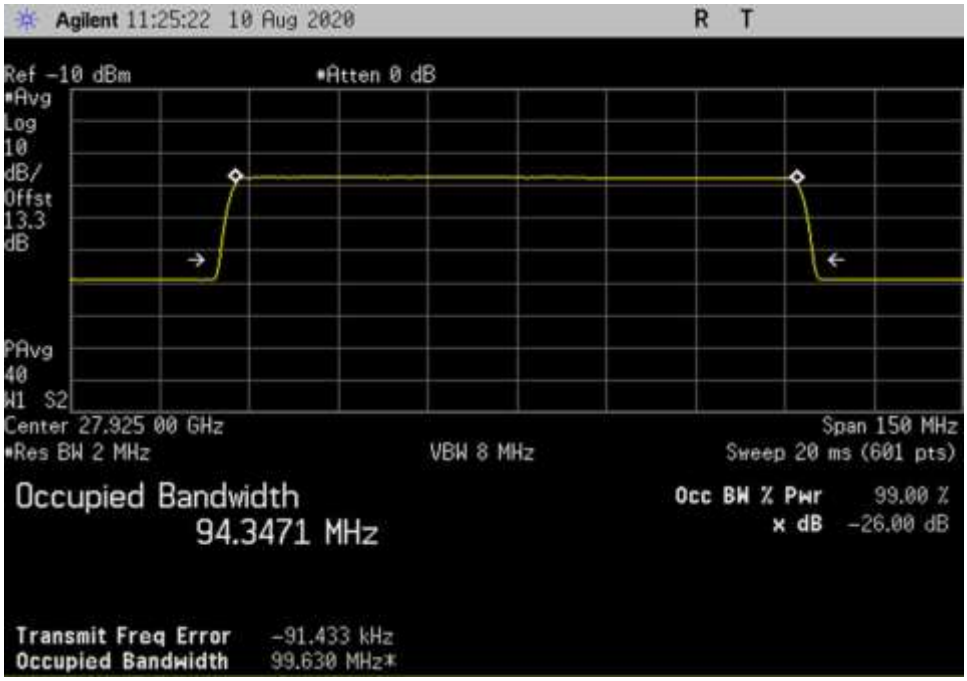
UL_27500-28350-64QAM-400MHz-H-CP OFDM-AGC+3_ 27925MHz_MC



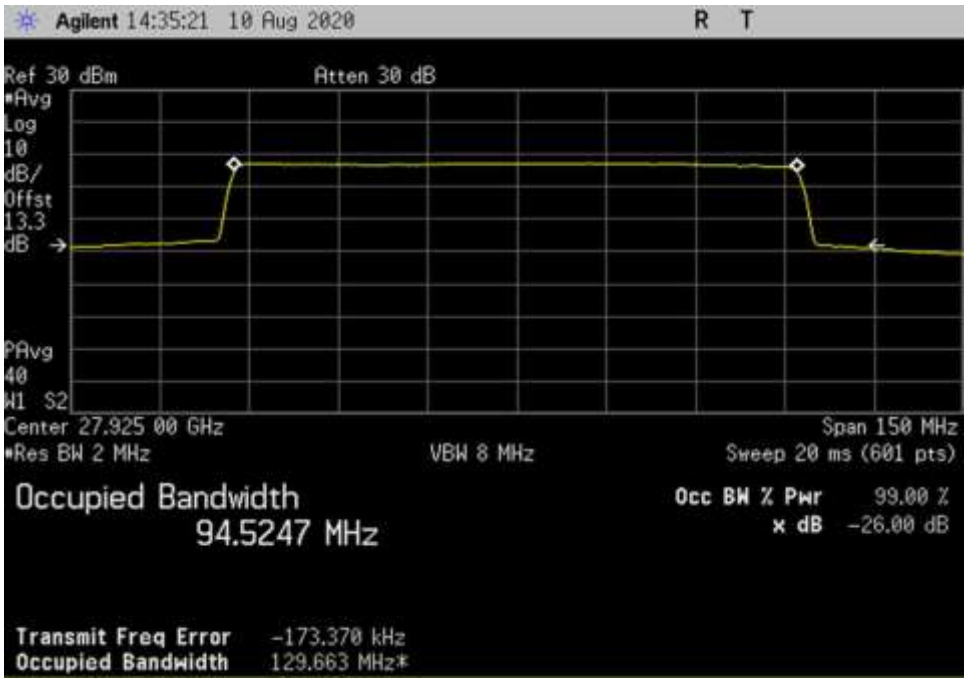
UL_27500-28350-64QAM-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC



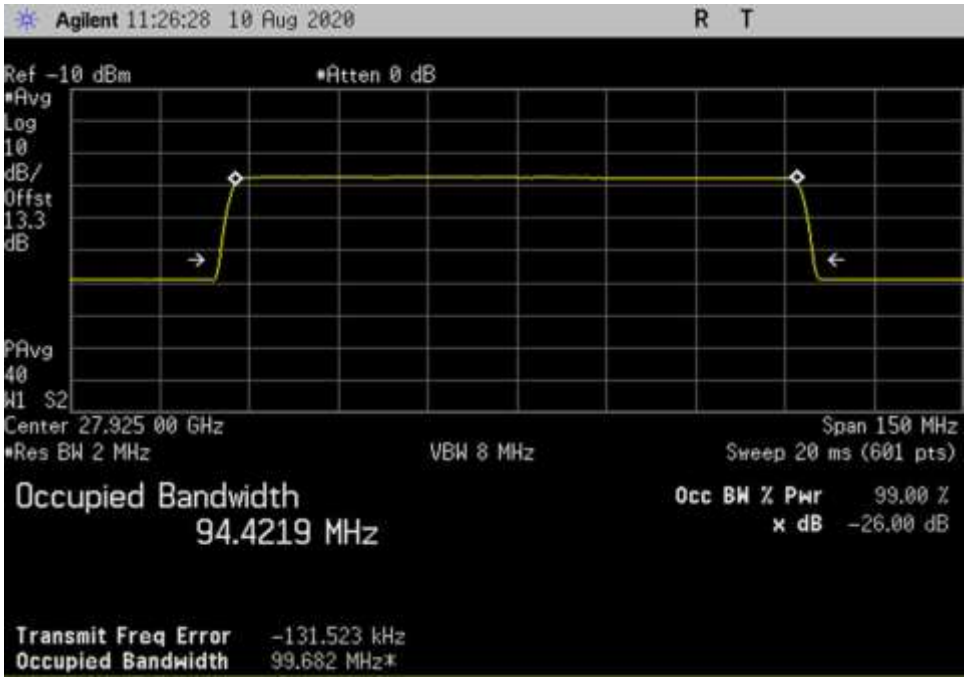
DL_27500-28350- 64QAM-100MHz-H-CP OFDM_ 27925MHz_MC



DL_27500-28350- 64QAM-100MHz-H-CP OFDM-Input_ 27925MHz_MC



DL_27500-28350- 64QAM-100MHz-V-CP OFDM_ 27925MHz_MC



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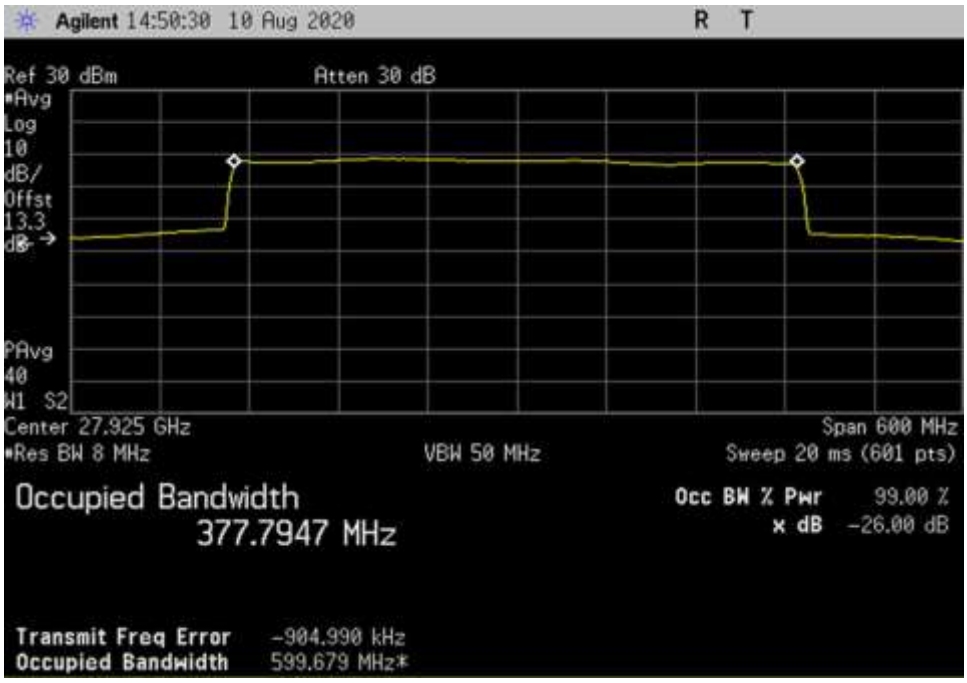

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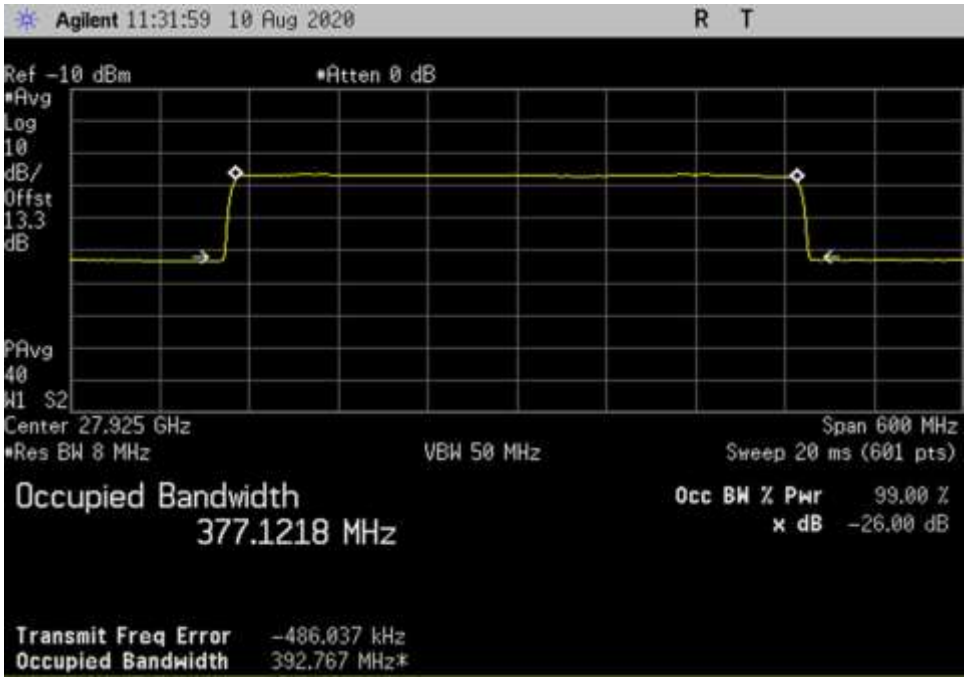
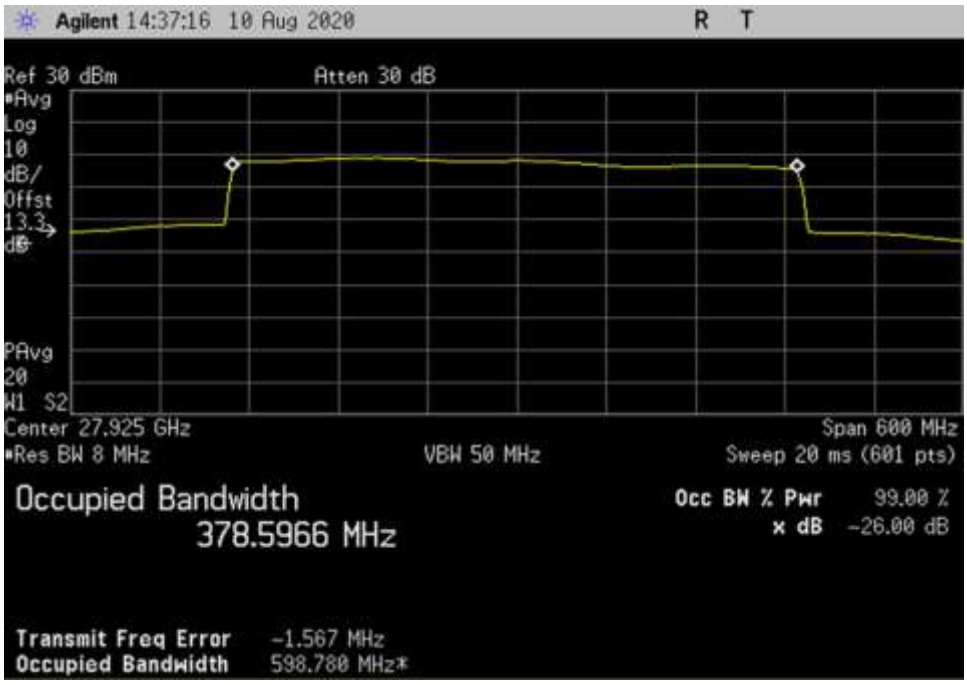
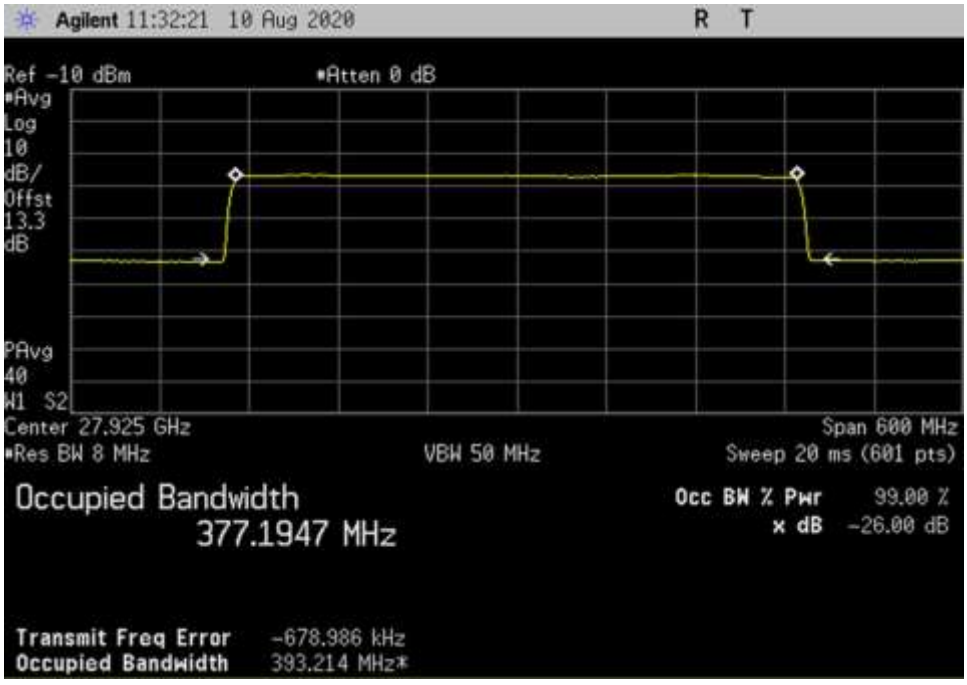


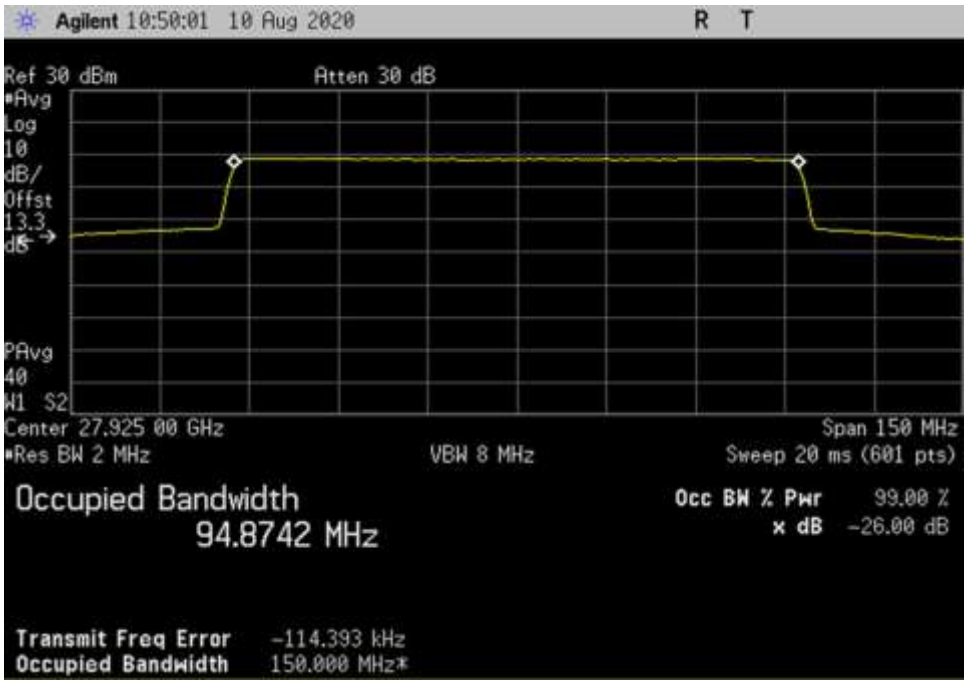
DL_27500-28350- 64QAM-400MHz-H-CP OFDM-Input_ 27925MHz_MC



DL_27500-28350- 64QAM-400MHz-V-CP OFDM_ 27925MHz_MC



DL_27500-28350- 64QAM-400MHz-V-CP OFDM-Input_ 27925MHz_MC



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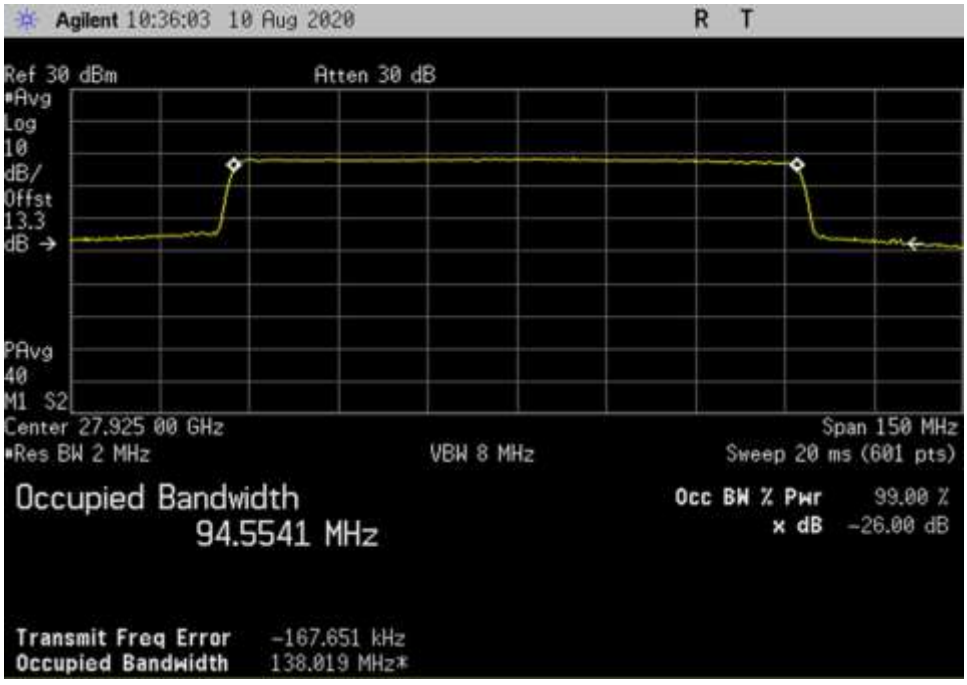
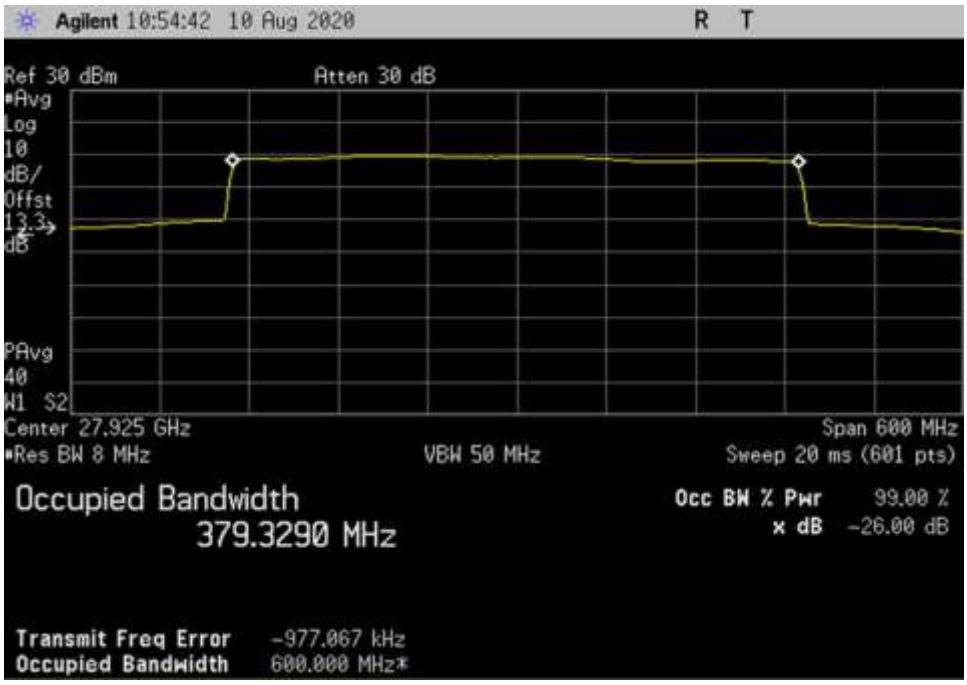
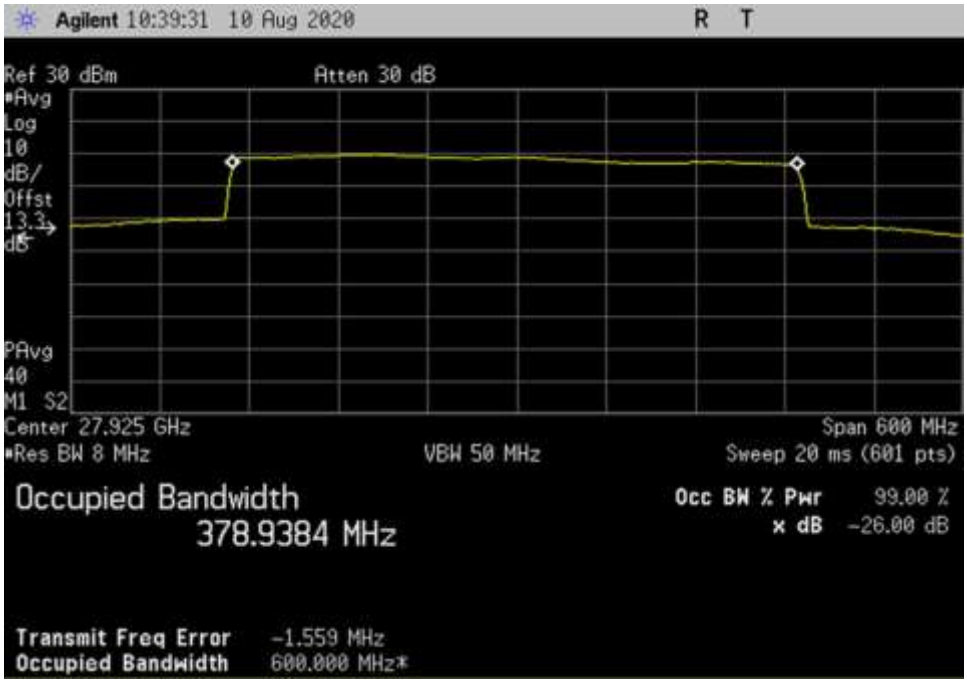


DL_27500-28350-64QAM-100MHz-V-CP OFDM-AGC+3_ 27925MHz_MC

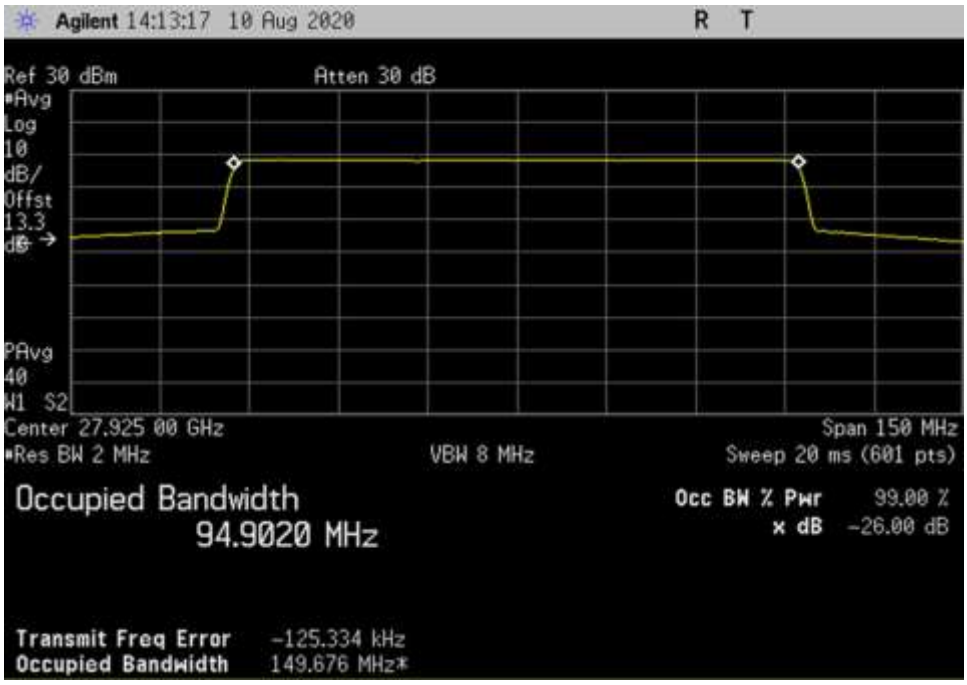


DL_27500-28350-64QAM-400MHz-H-CP OFDM-AGC+3_ 27925MHz_MC

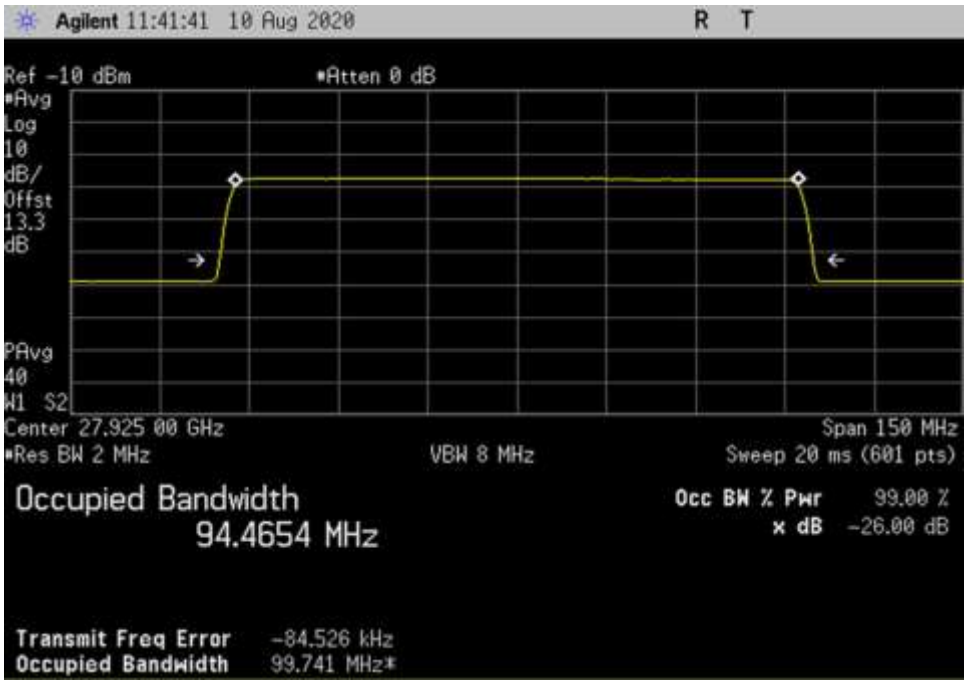


DL_27500-28350-64QAM-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC

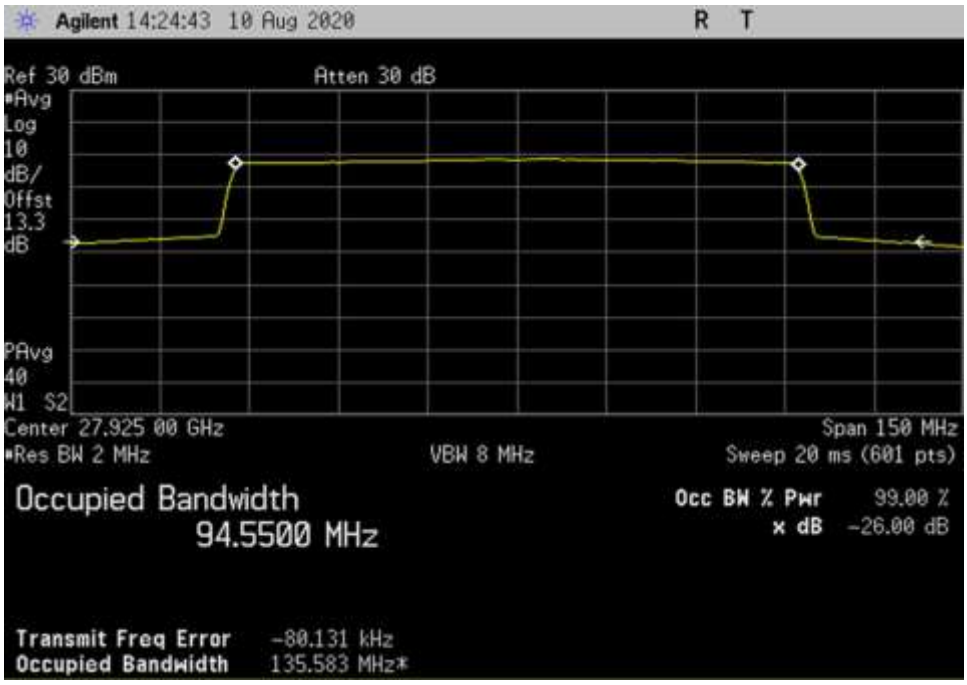
CP – 256QAM



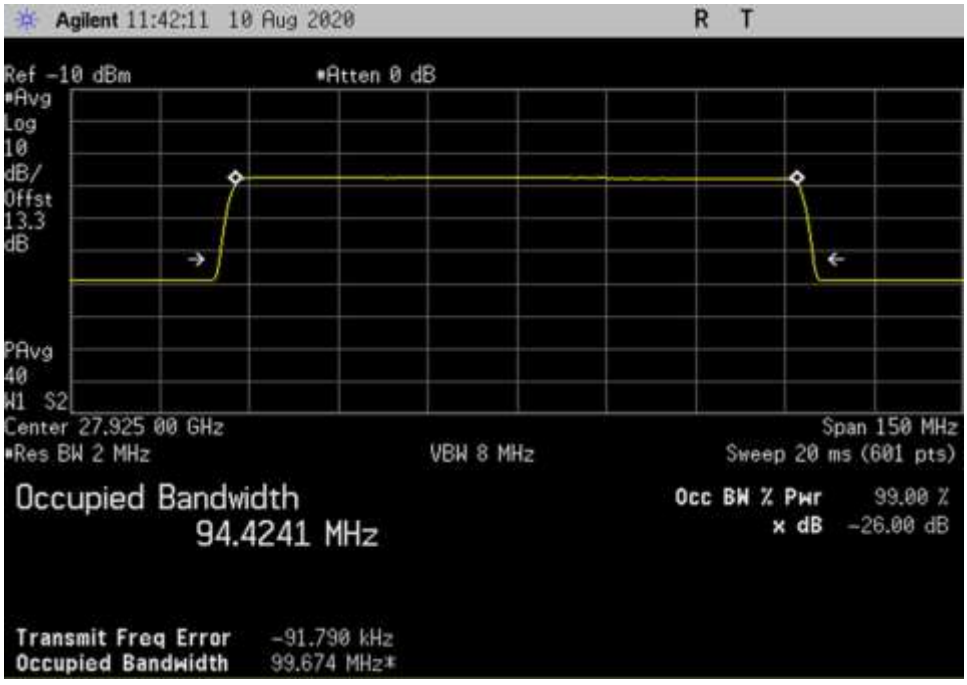
UL_27500-28350- 256QAM-100MHz-H-CP OFDM_ 27925MHz_MC



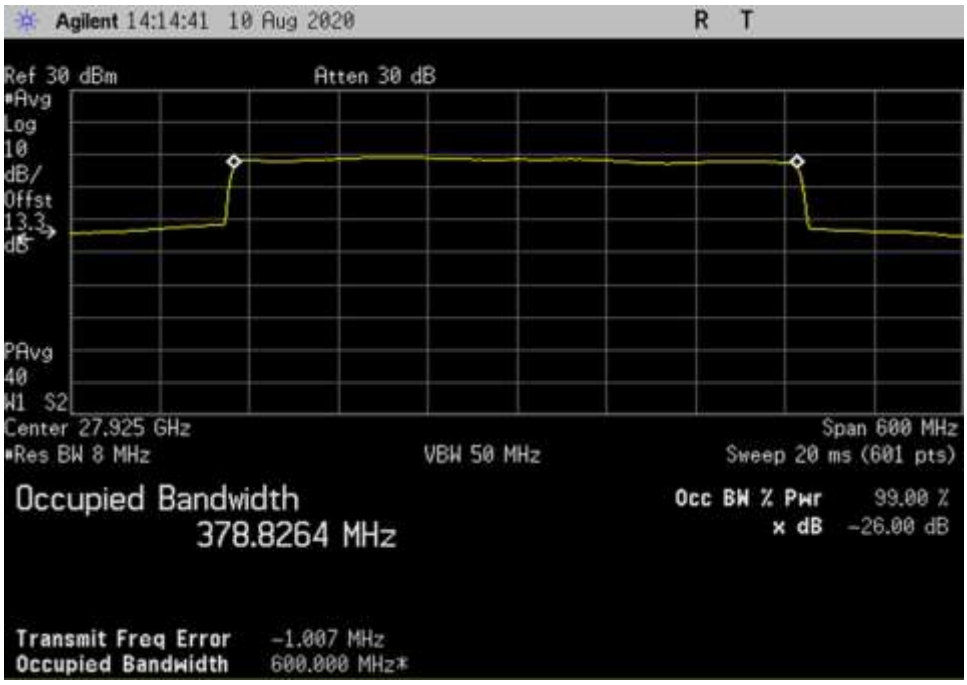
UL_27500-28350- 256QAM-100MHz-H-CP OFDM-Input_ 27925MHz_MC



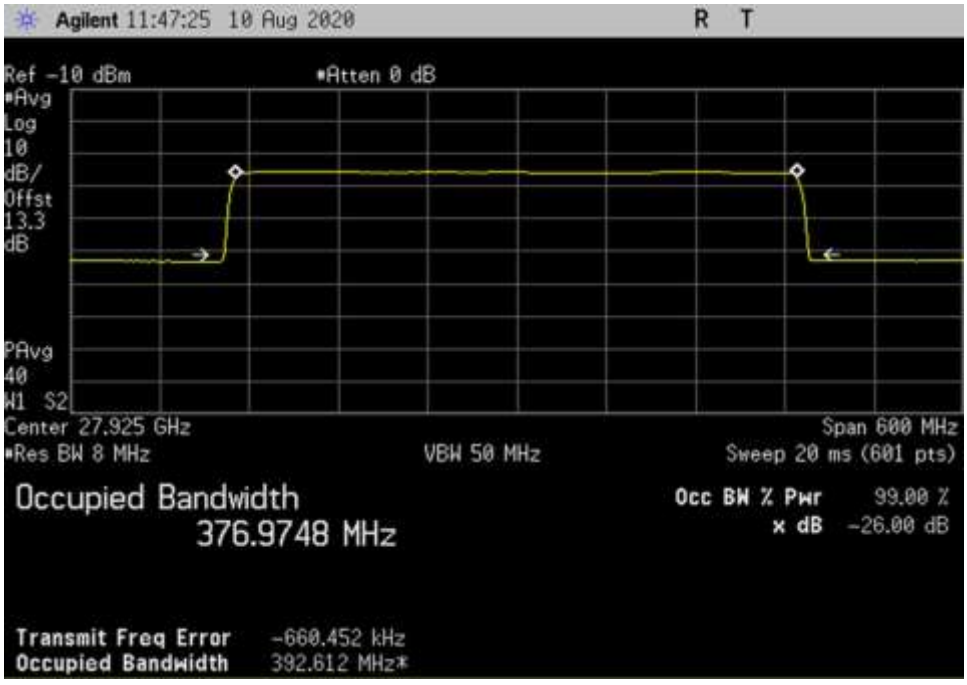
UL_27500-28350- 256QAM-100MHz-V-CP OFDM_ 27925MHz_MC



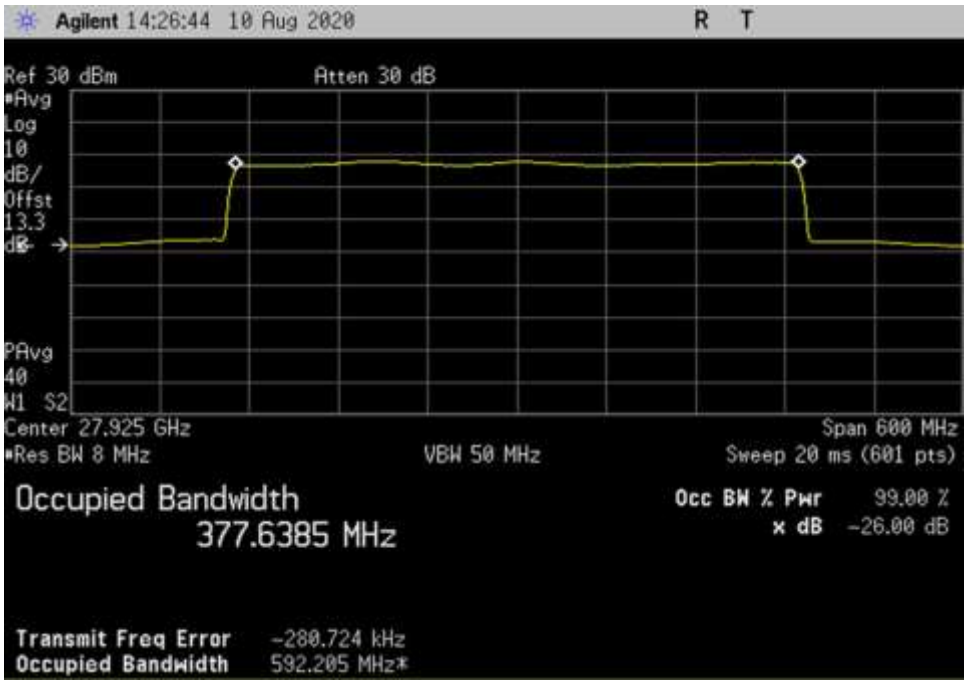
UL_27500-28350- 256QAM-100MHz-V-CP OFDM-Input_ 27925MHz_MC



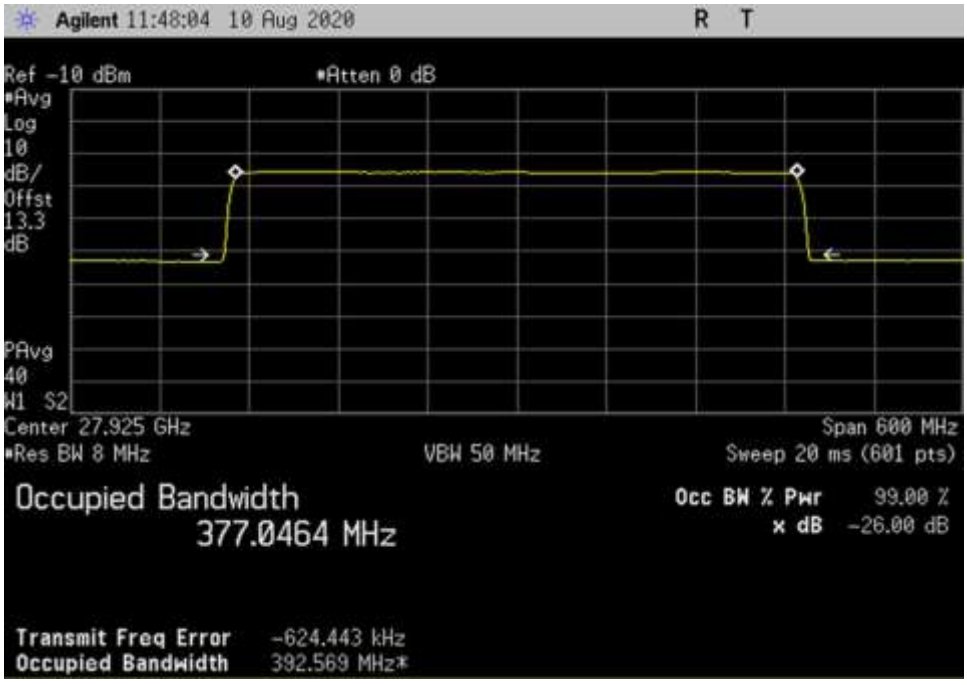
UL_27500-28350- 256QAM-400MHz-H-CP OFDM_ 27925MHz_MC



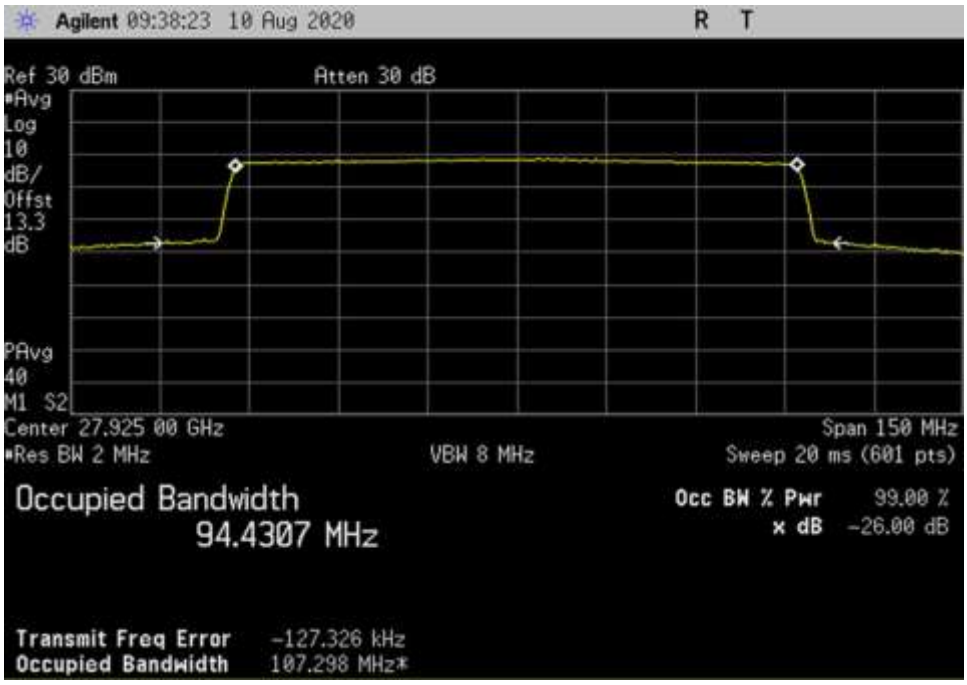
UL_27500-28350- 256QAM-400MHz-H-CP OFDM-Input_ 27925MHz_MC



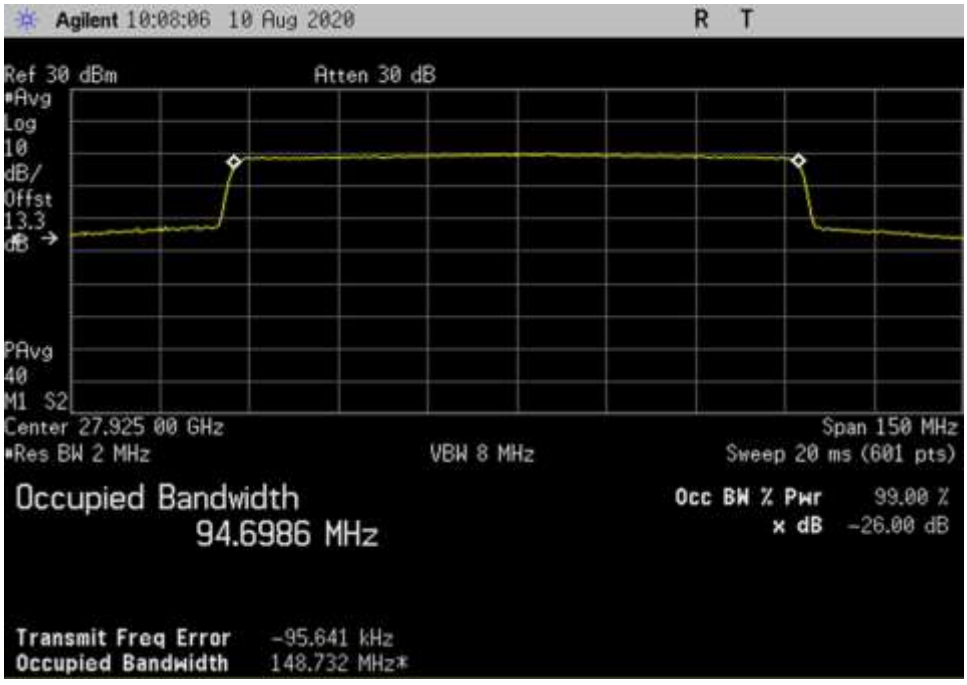
UL_27500-28350- 256QAM-400MHz-V-CP OFDM_ 27925MHz_MC



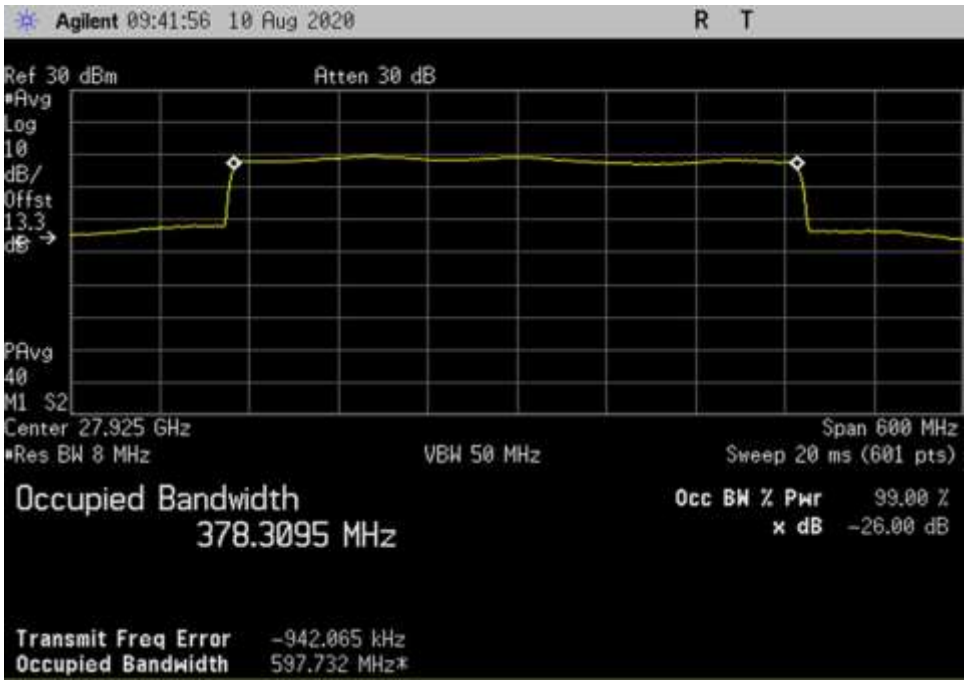
UL_27500-28350- 256QAM-400MHz-V-CP OFDM-Input_ 27925MHz_MC



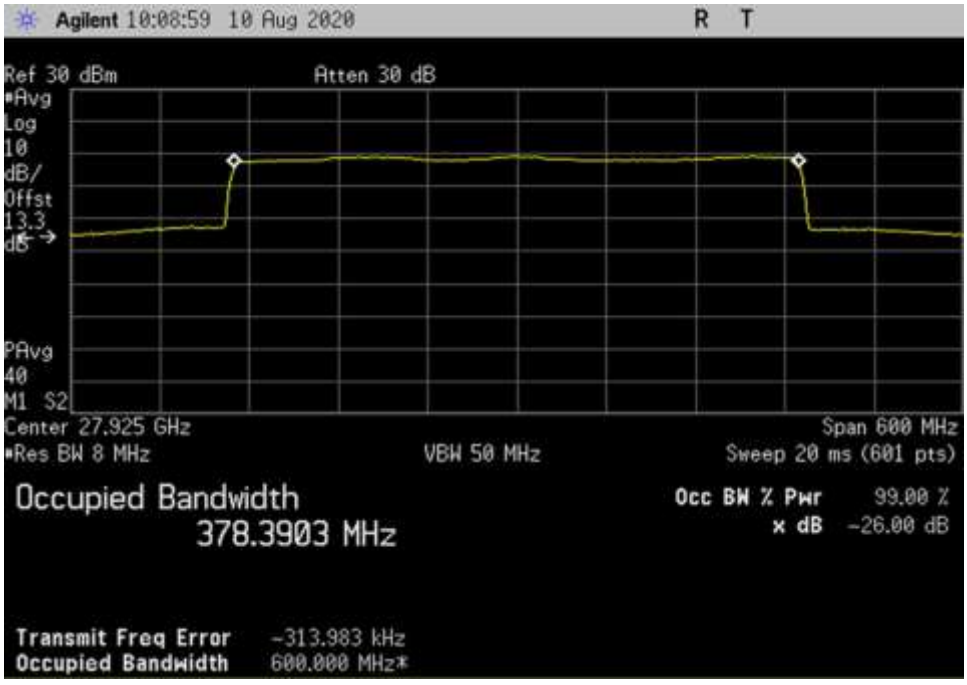
UL_27500-28350-256QAM-100MHz-H-CP OFDM-AGC+3_ 27925MHz_MC



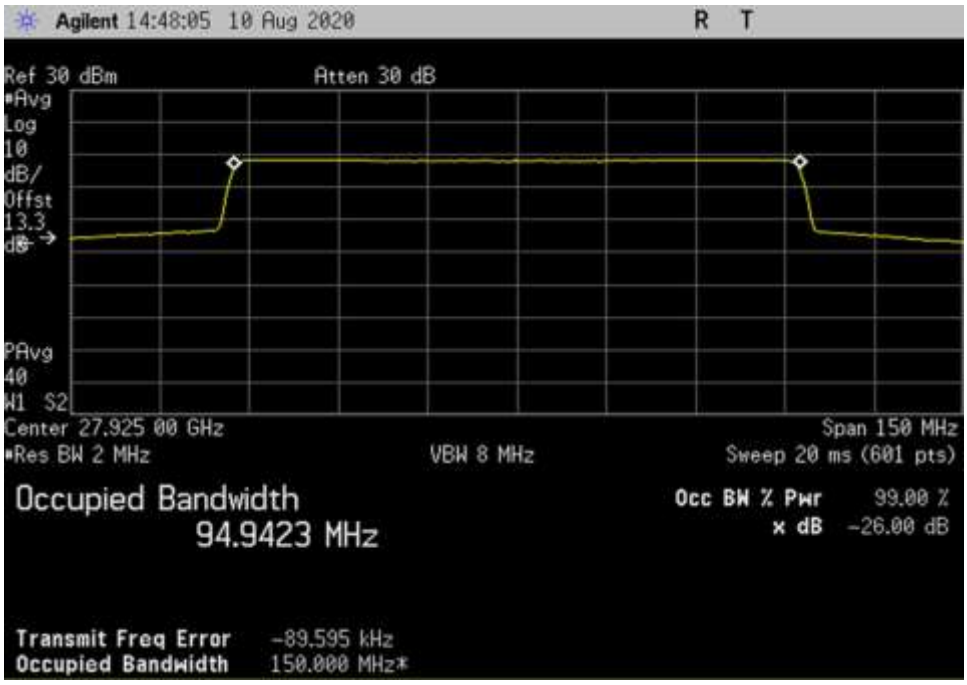
UL_27500-28350-256QAM-100MHz-V-CP OFDM-AGC+3_ 27925MHz_MC



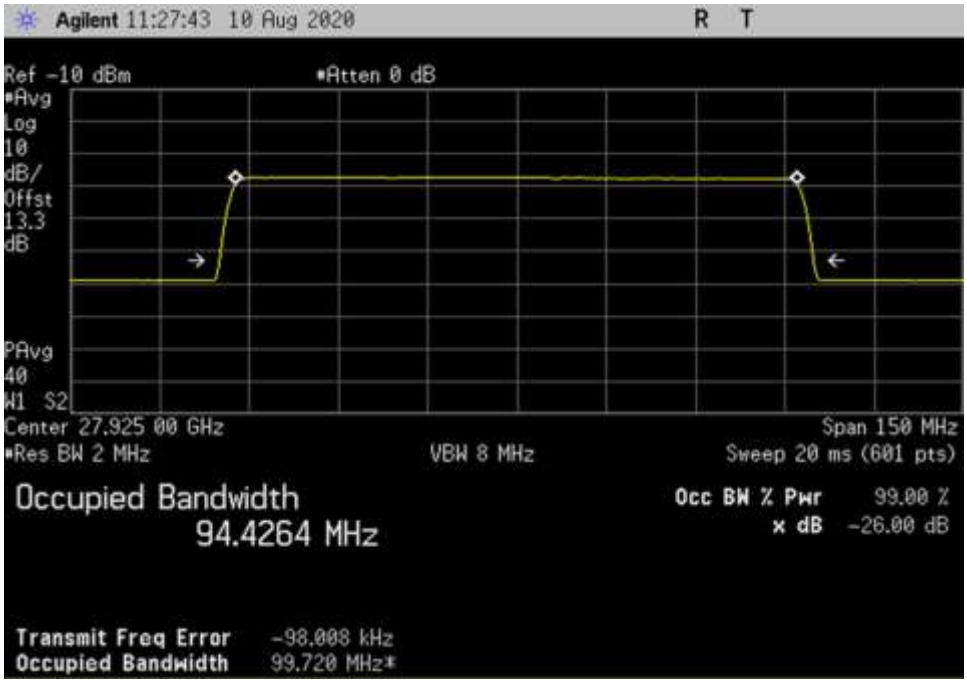
UL_27500-28350-256QAM-400MHz-H-CP OFDM-AGC+3_ 27925MHz_MC



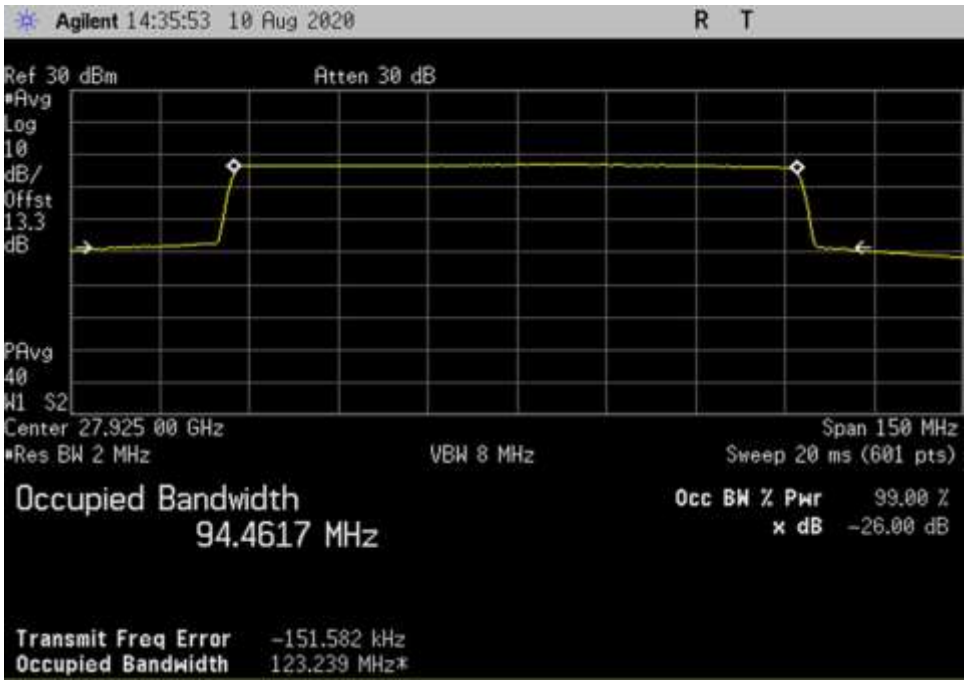
UL_27500-28350-256QAM-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC



DL_27500-28350- 256QAM-100MHz-H-CP OFDM_ 27925MHz_MC



DL_27500-28350- 256QAM-100MHz-H-CP OFDM-Input_ 27925MHz_MC



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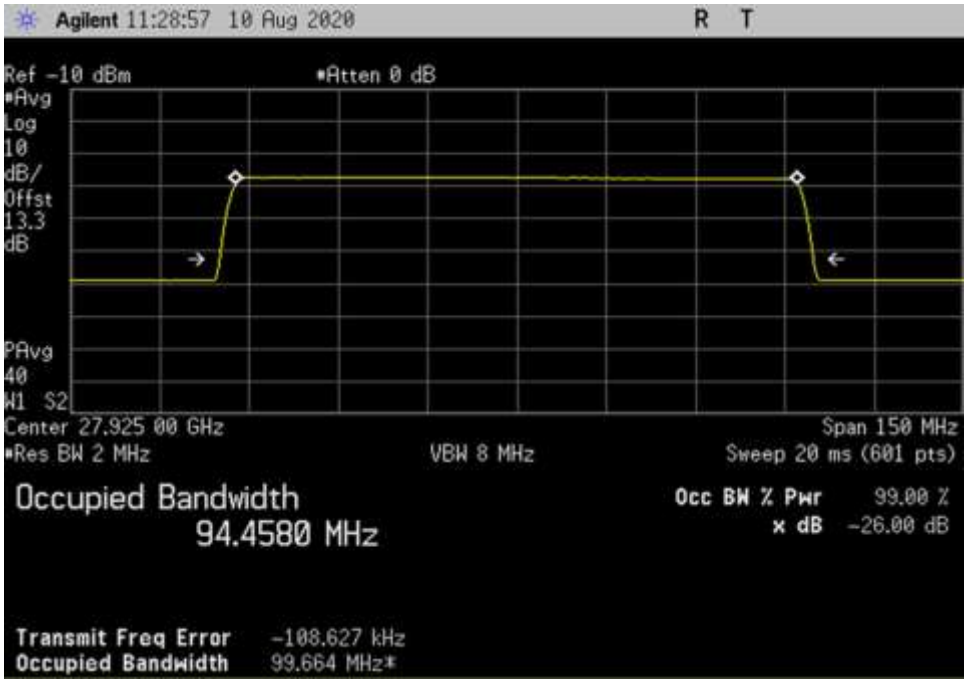

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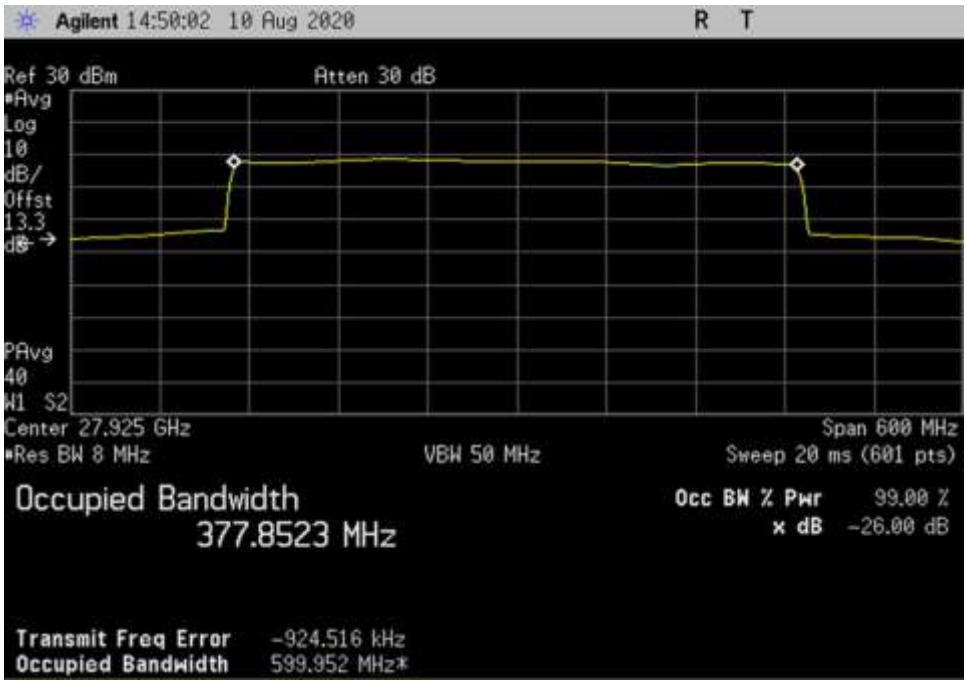

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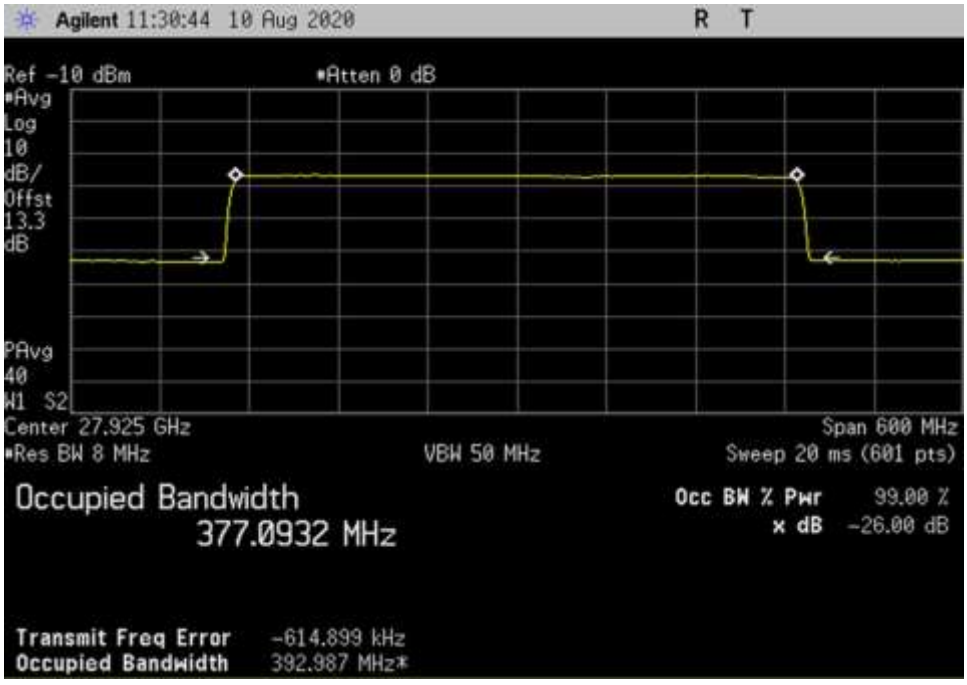

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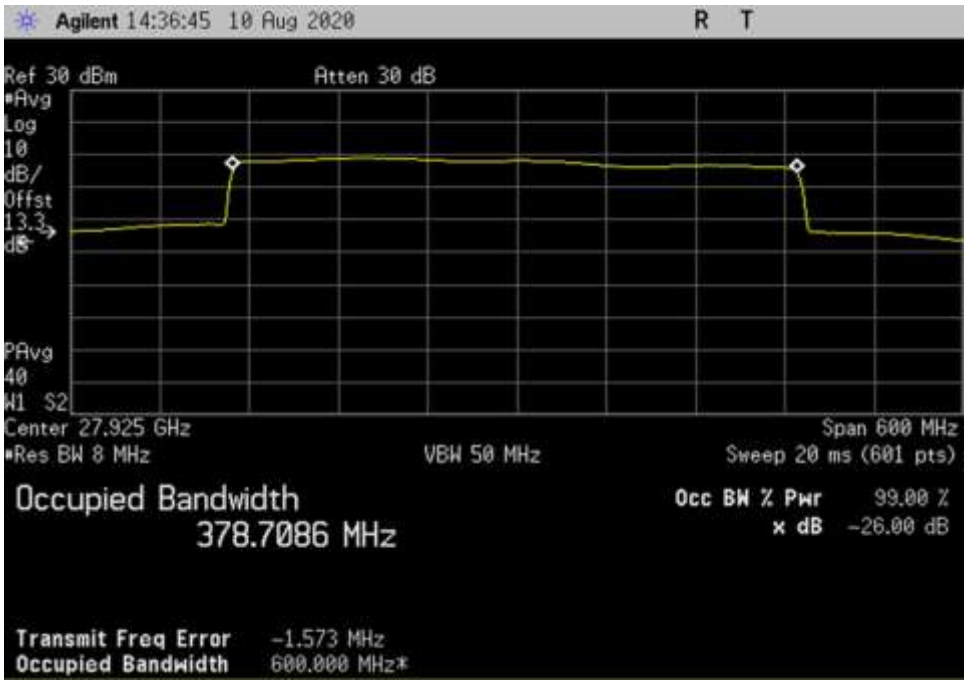

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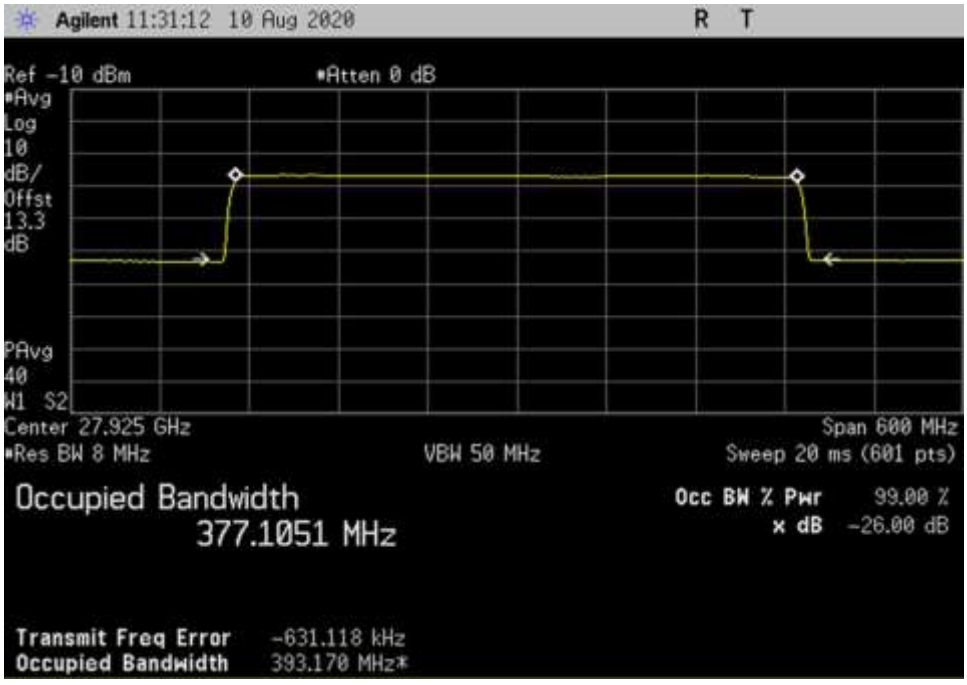

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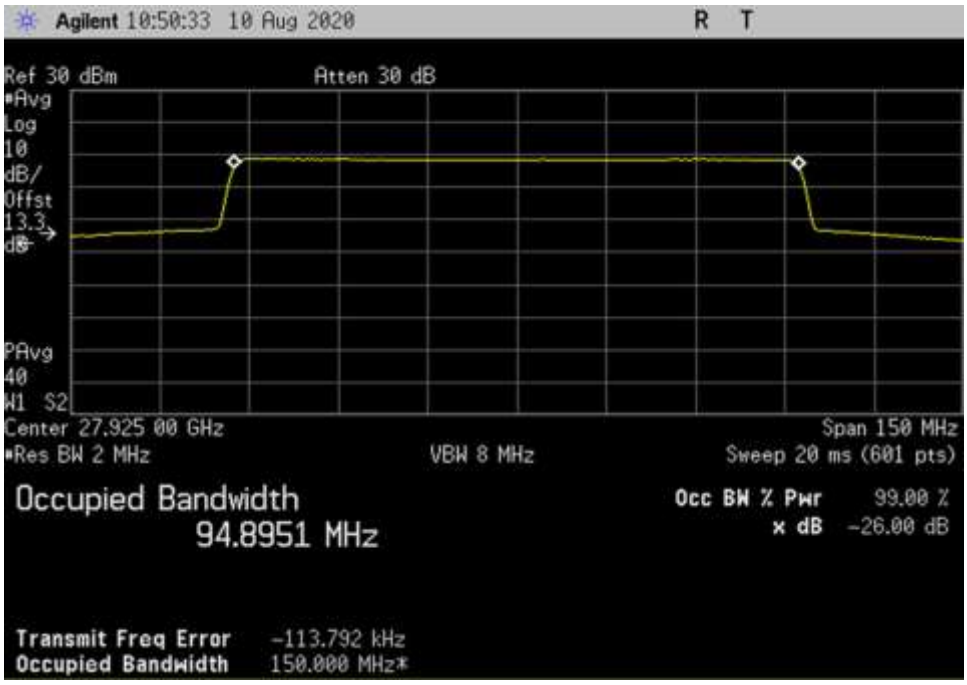

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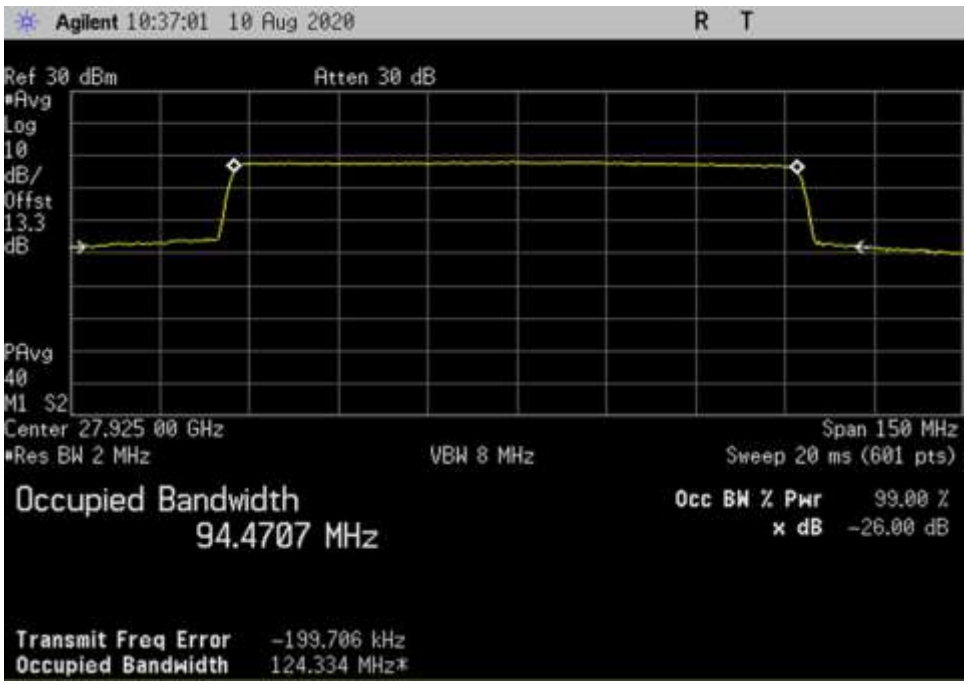

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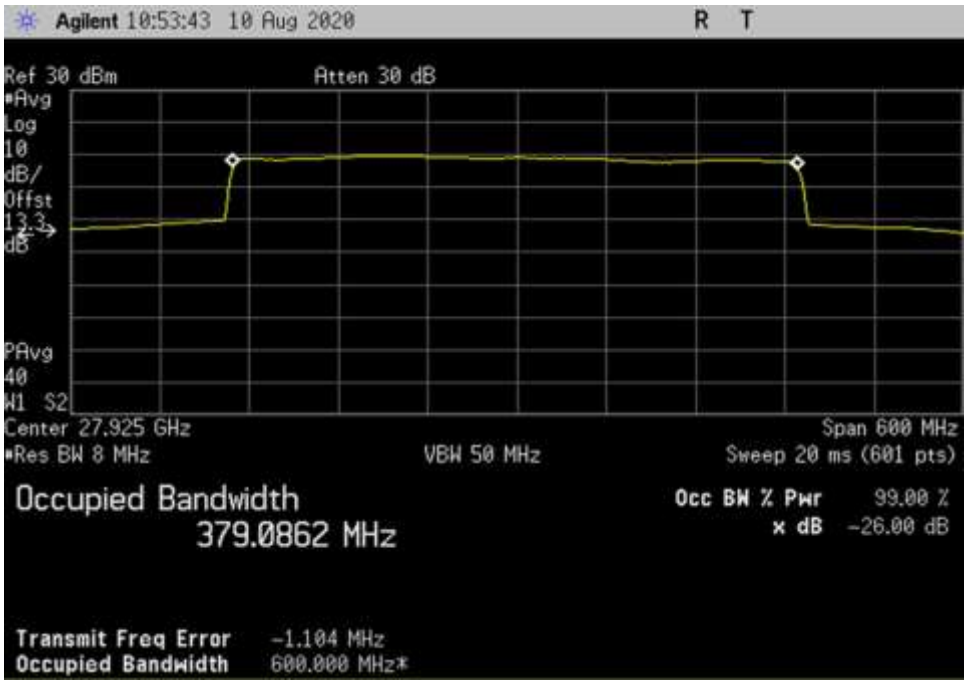

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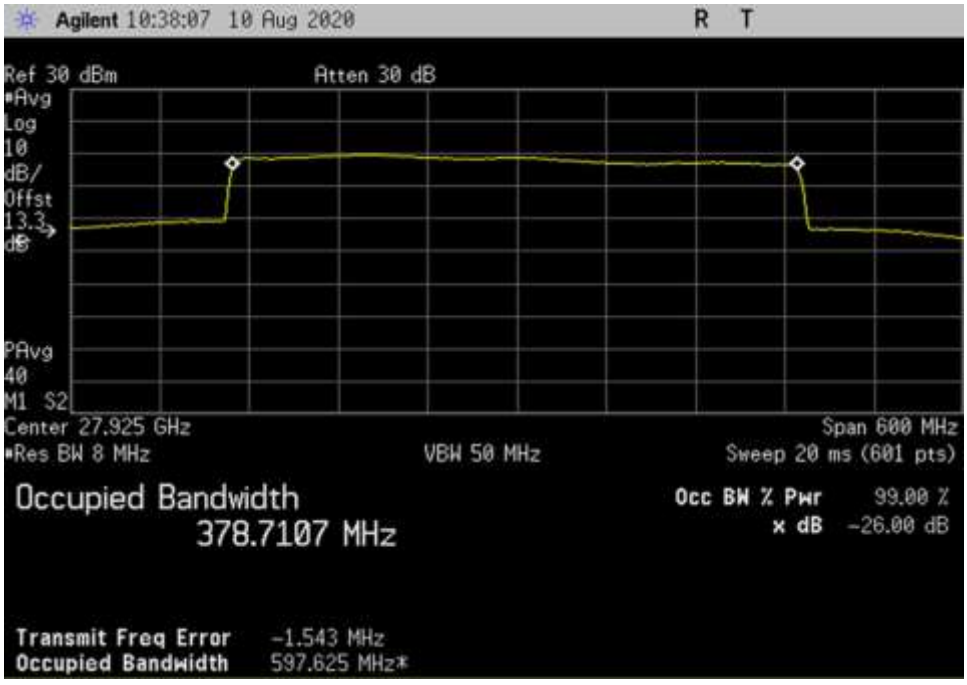
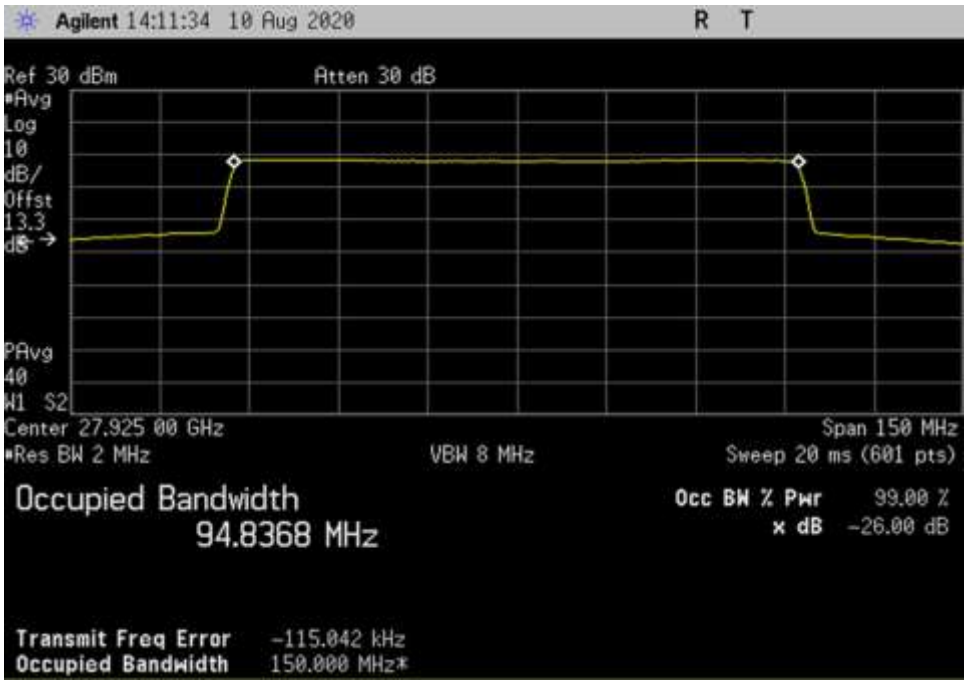
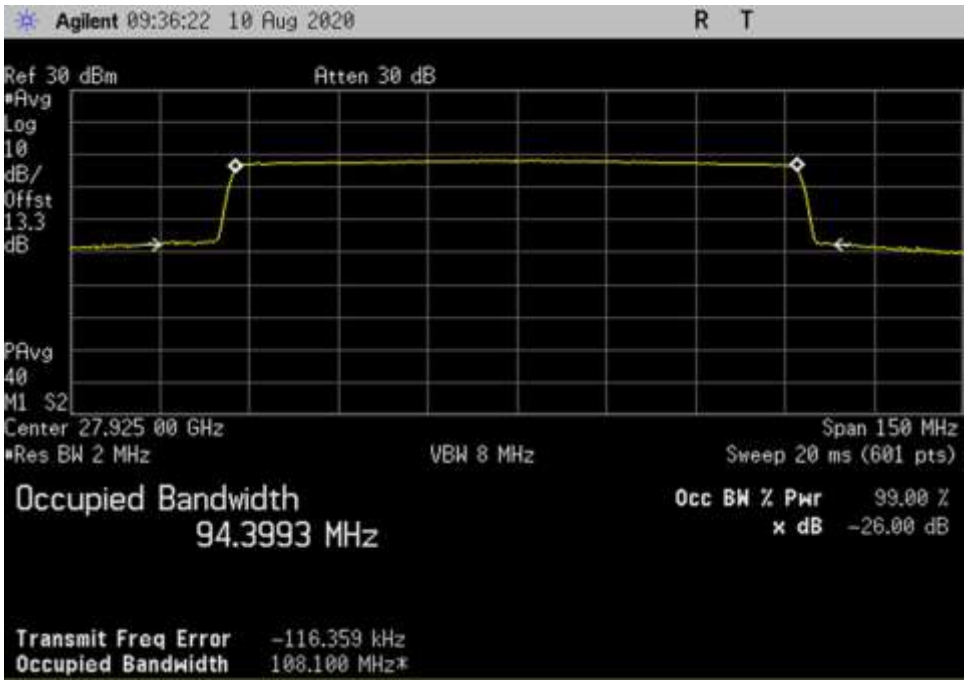


DL_27500-28350-256QAM-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC

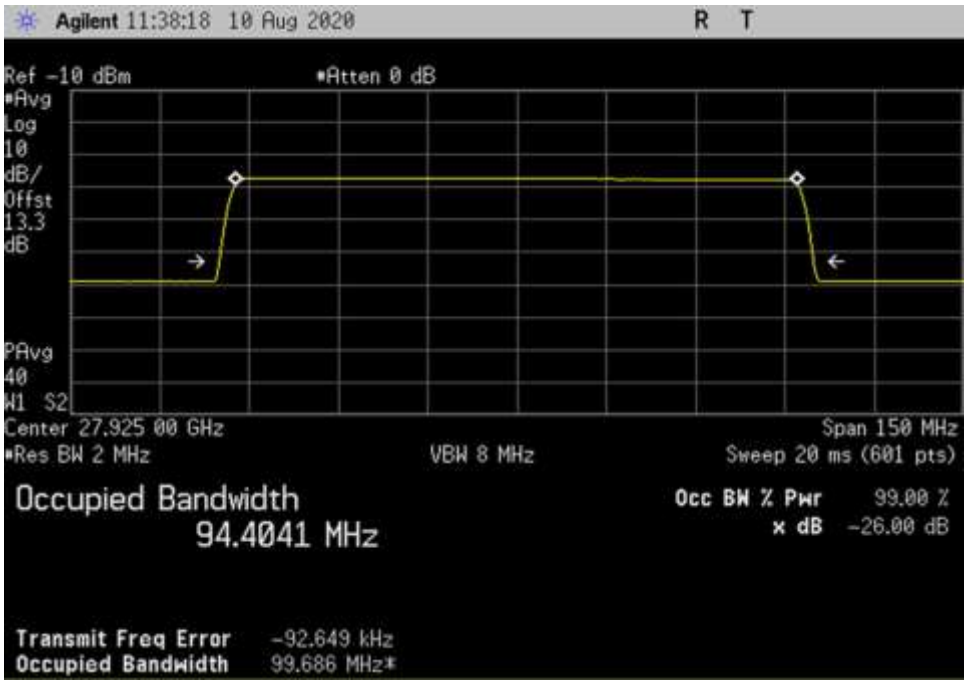
CP – QPSK



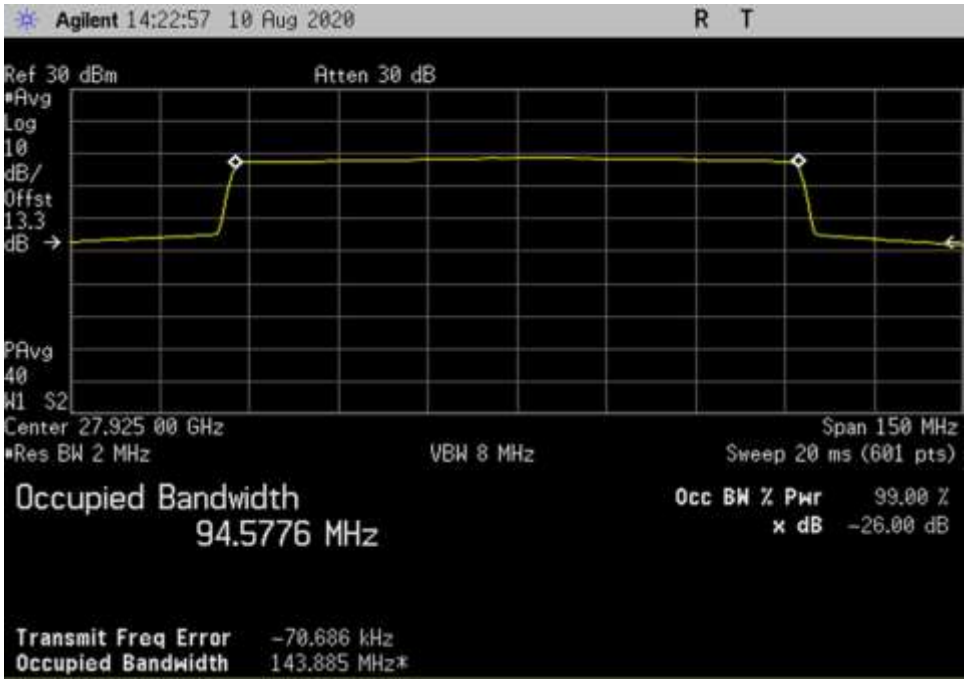
UL_27500-28350- QPSK-100MHz-H-CP OFDM_ 27925MHz_MC



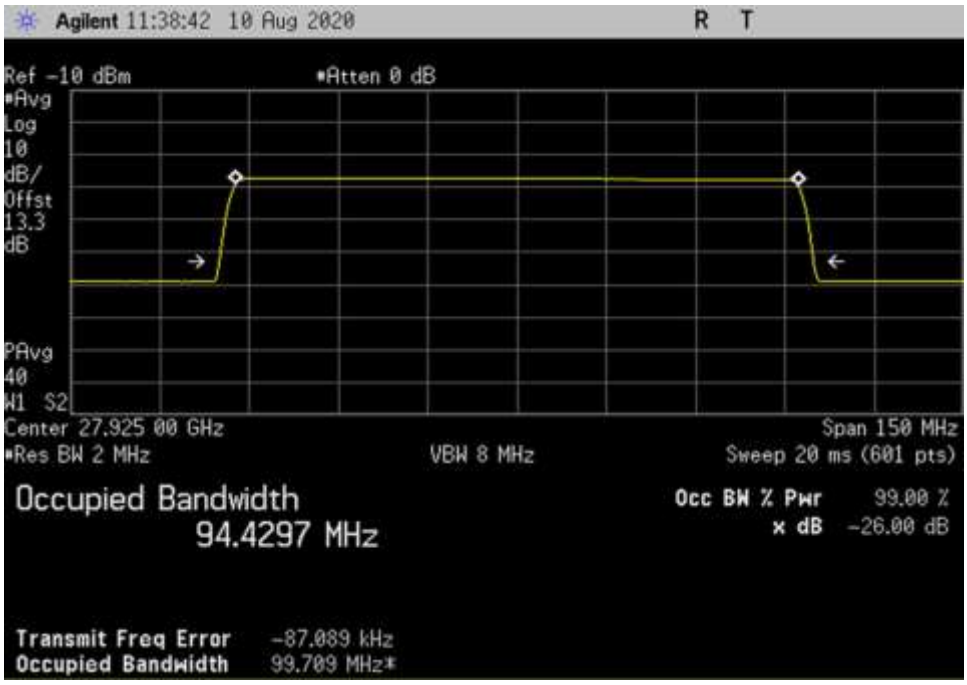
UL_27500-28350- QPSK-100MHz-H-CP OFDM-AGC+3_ 27925MHz_MC



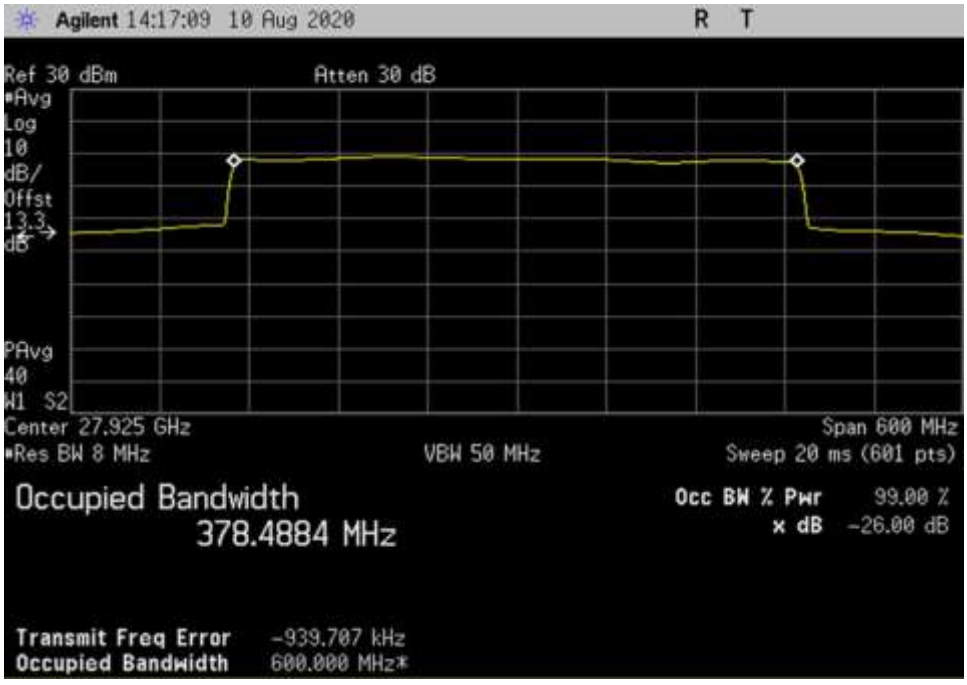
UL_27500-28350- QPSK-100MHz-H-CP OFDM-Input_ 27925MHz_MC



UL_27500-28350- QPSK-100MHz-V-CP OFDM_ 27925MHz_MC



UL_27500-28350- QPSK-100MHz-V-CP OFDM-Input_ 27925MHz_MC



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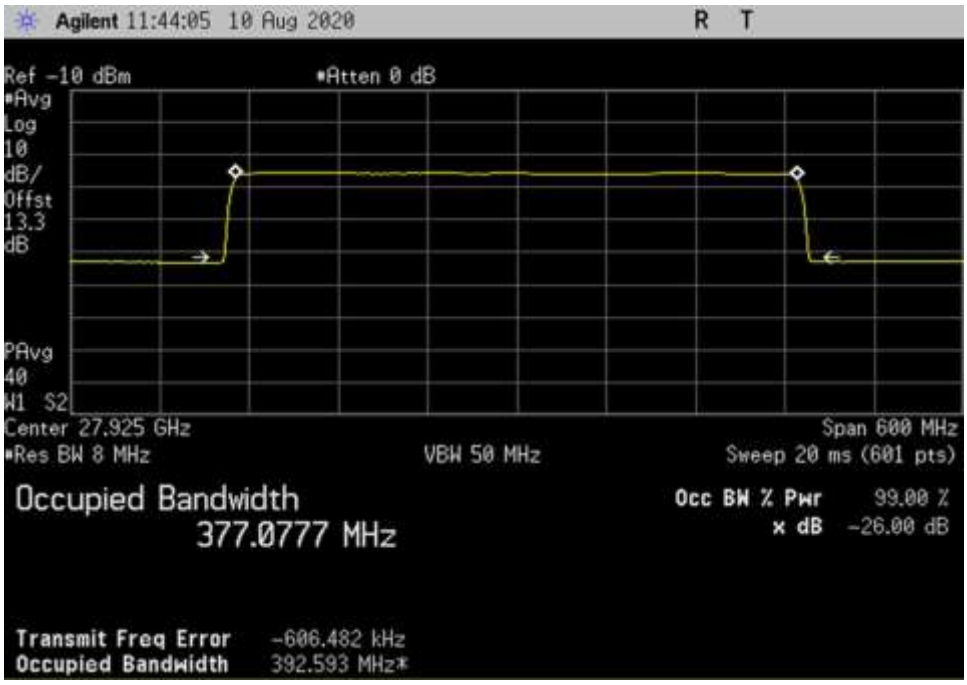

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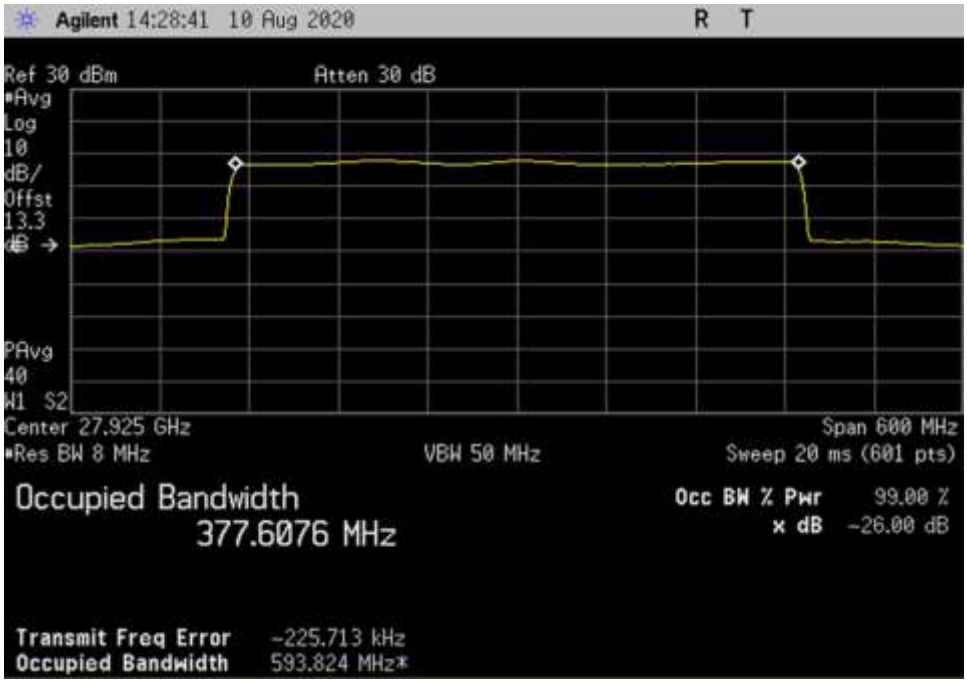

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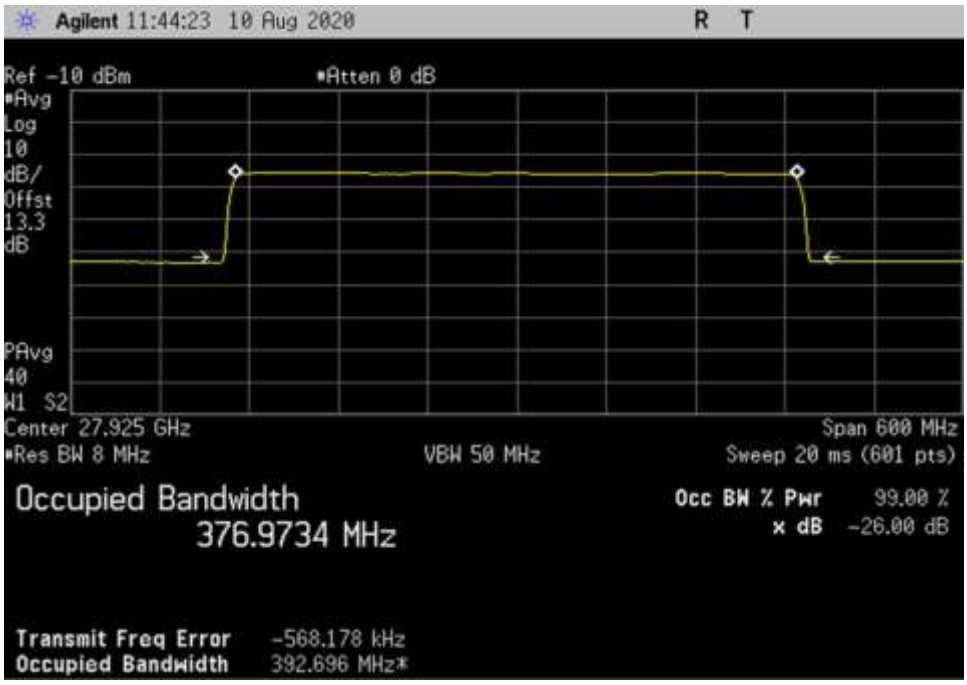
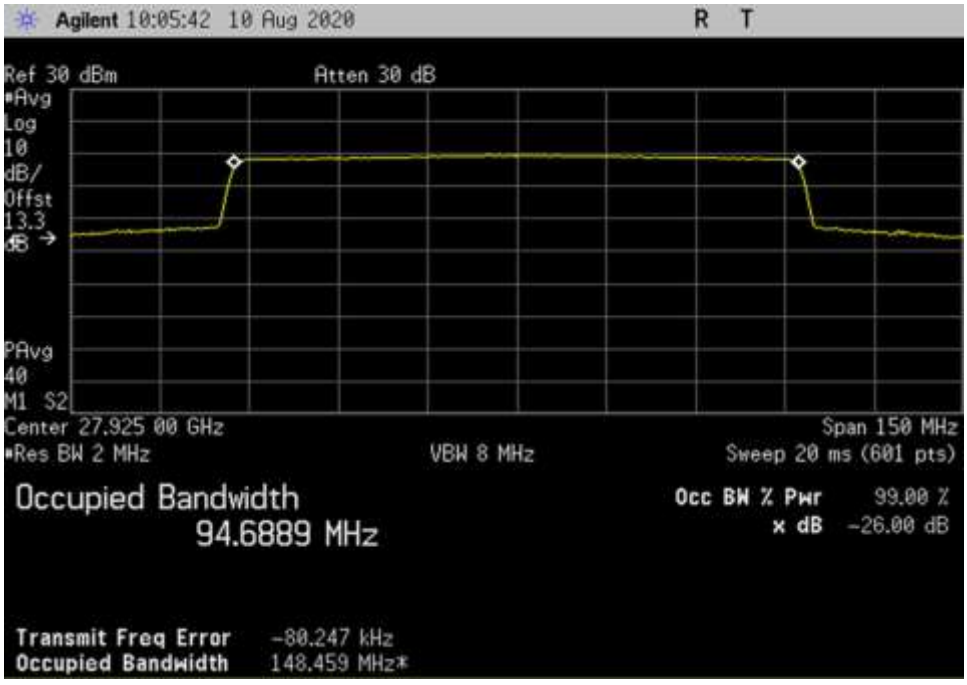
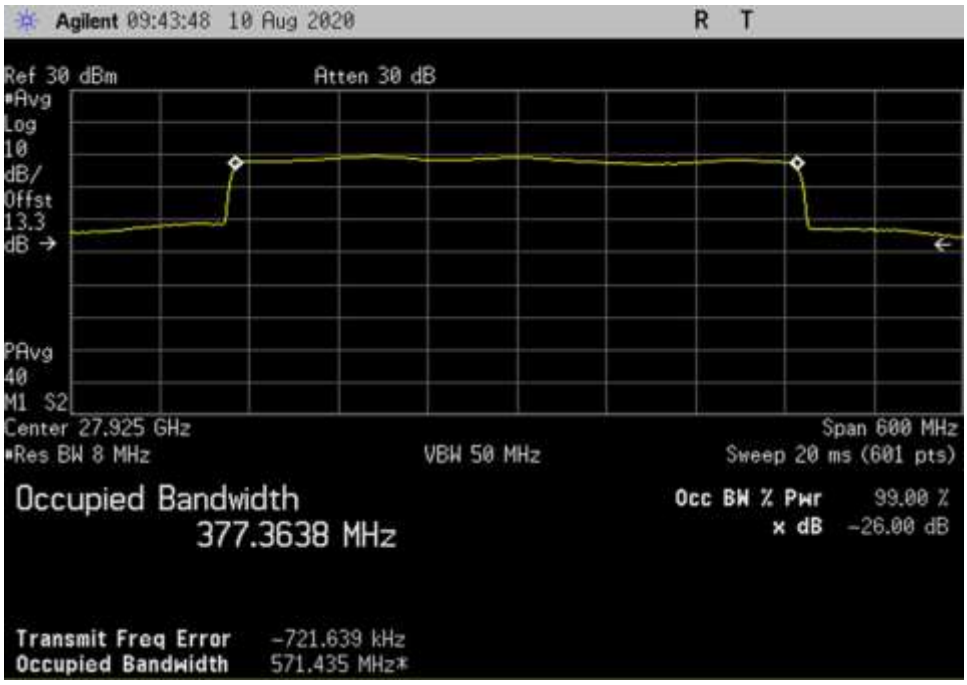


UL_27500-28350- QPSK-400MHz-V-CP OFDM-Input_ 27925MHz_MC



UL_27500-28350-QPSK-100MHz-V-CP OFDM-AGC+3_ 27925MHz_MC



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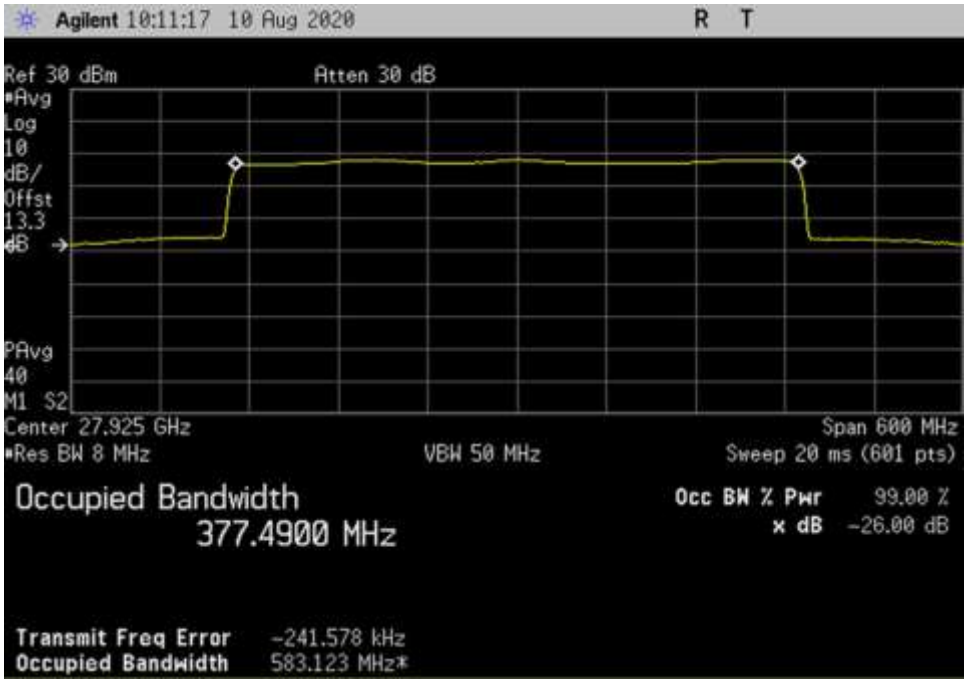
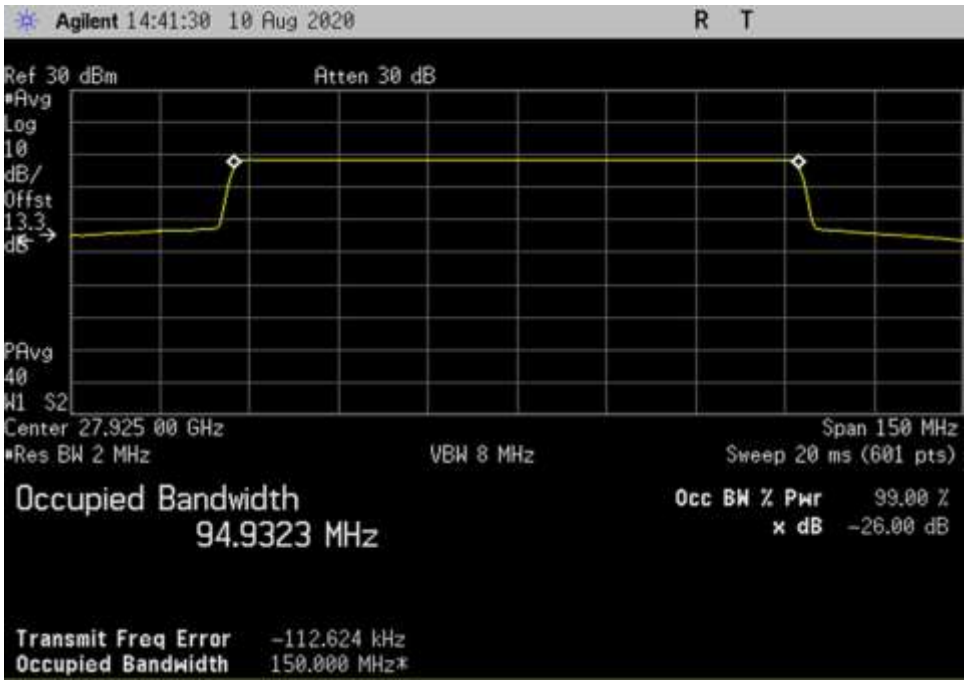
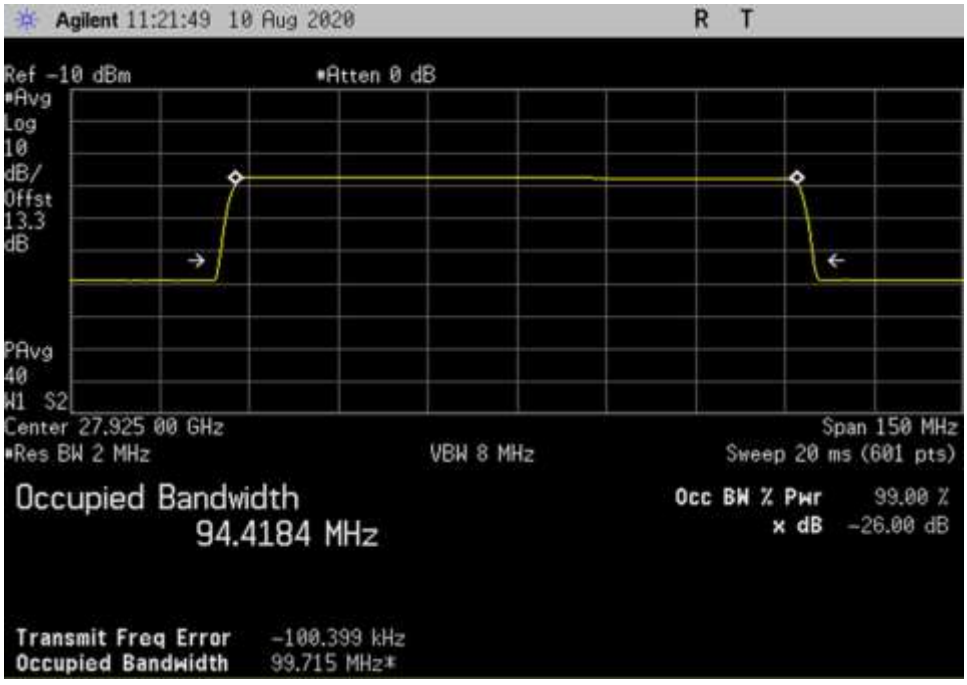


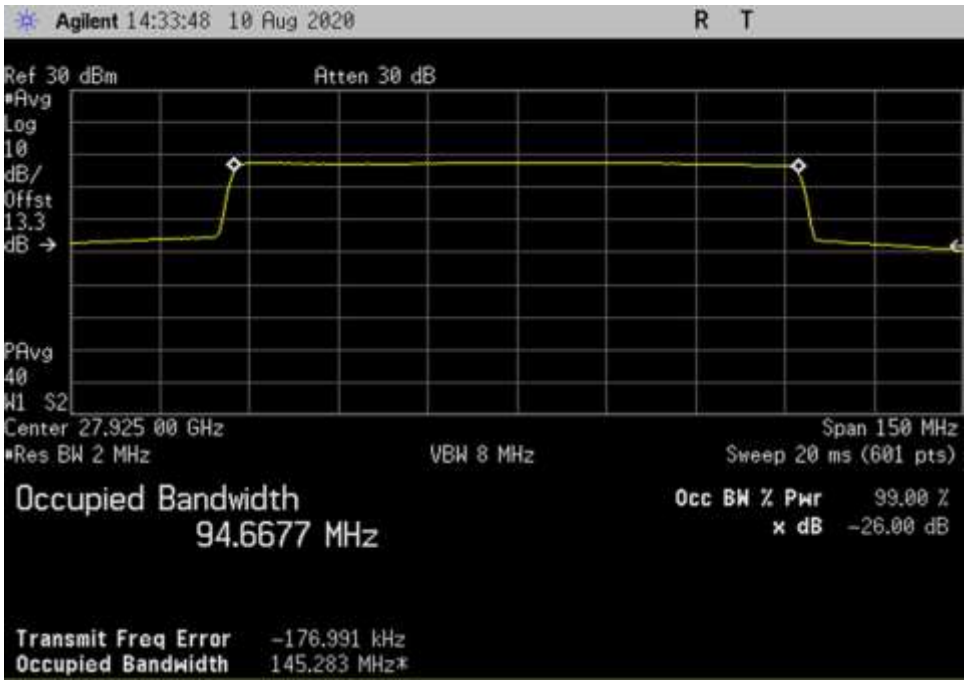
UL_27500-28350-QPSK-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC



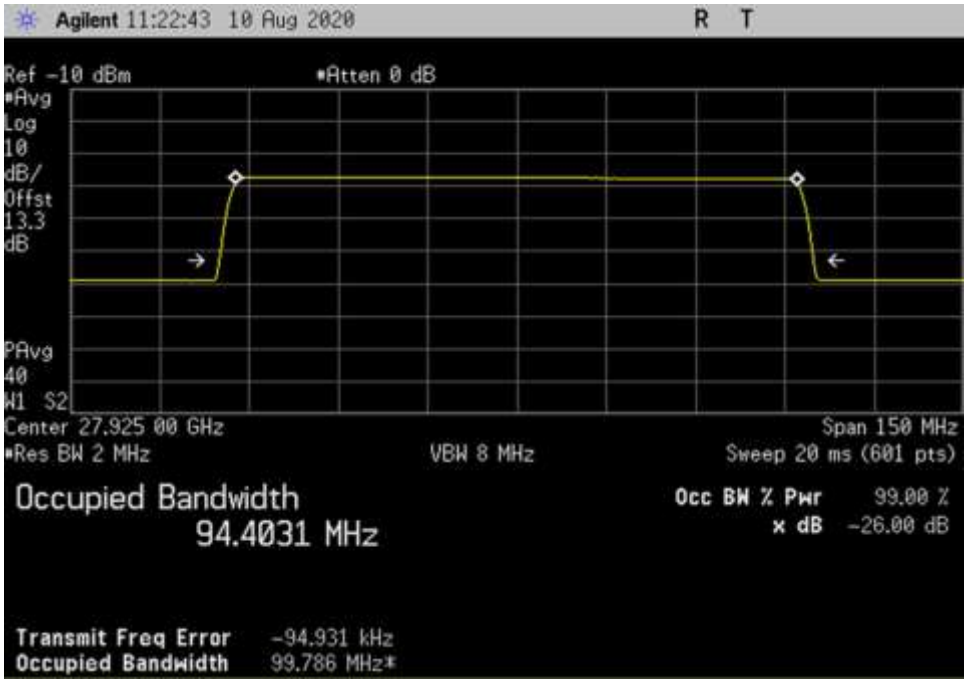
DL_27500-28350- QPSK-100MHz-H-CP OFDM_ 27925MHz_MC



DL_27500-28350- QPSK-100MHz-H-CP OFDM-Input_ 27925MHz_MC



DL_27500-28350- QPSK-100MHz-V-CP OFDM_ 27925MHz_MC



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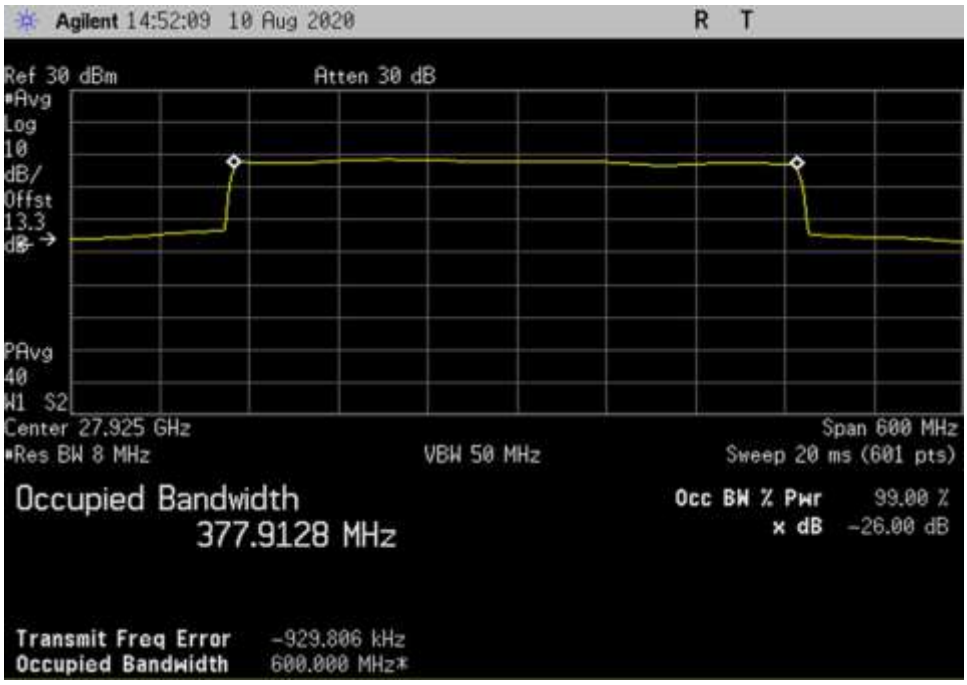

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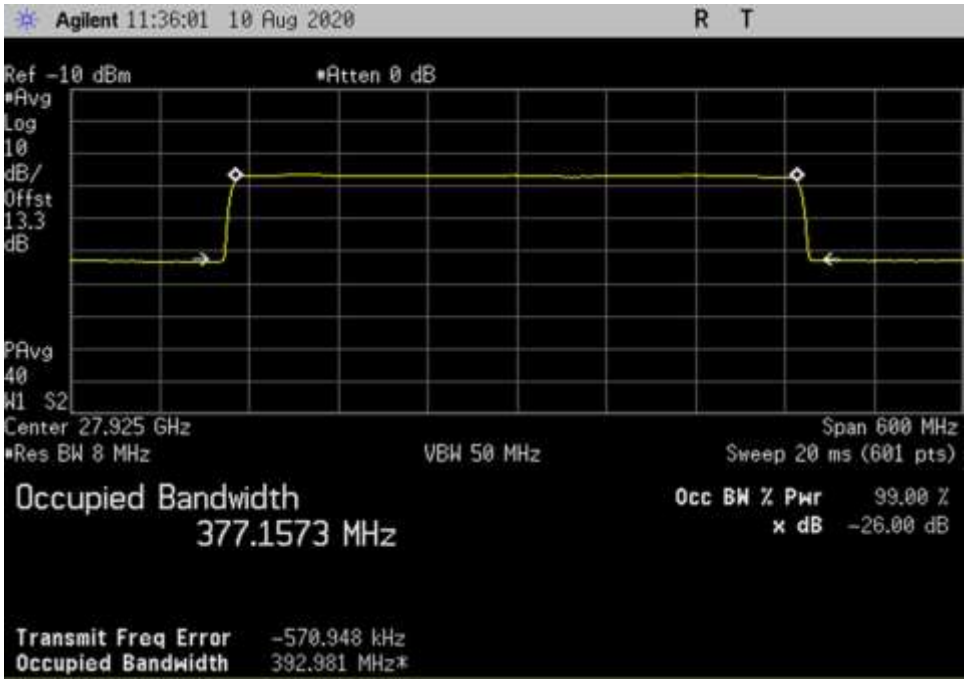
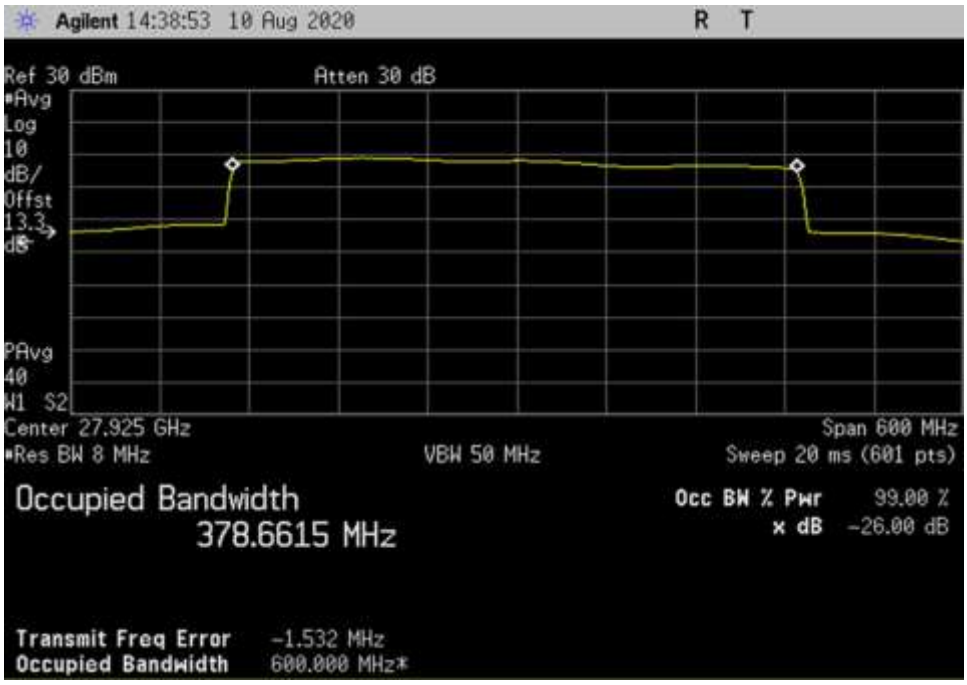
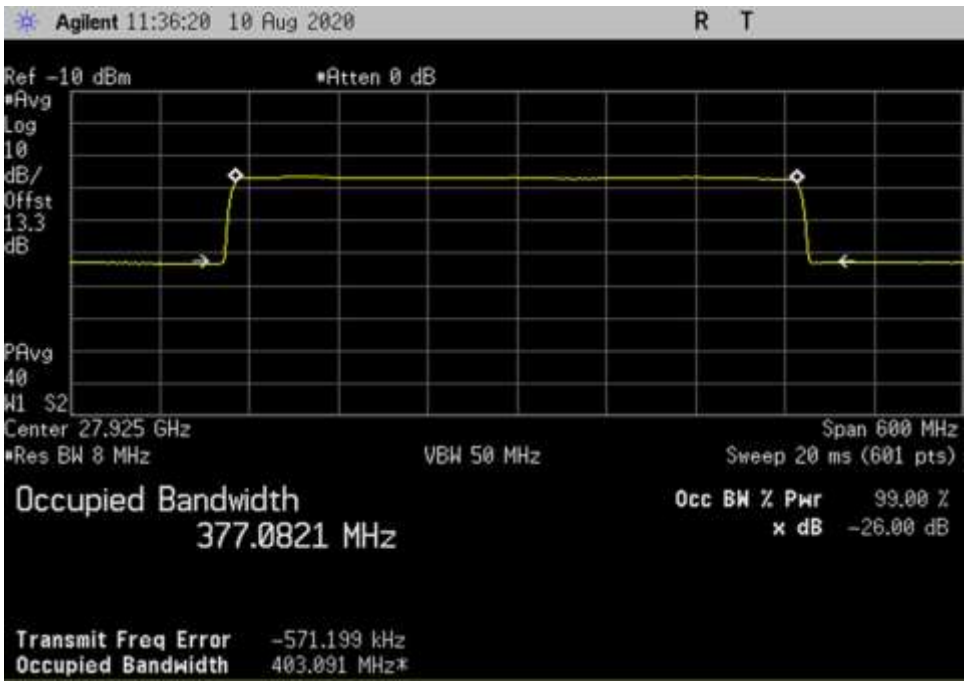


DL_27500-28350- QPSK-400MHz-H-CP OFDM-Input_ 27925MHz_MC



DL_27500-28350- QPSK-400MHz-V-CP OFDM_ 27925MHz_MC



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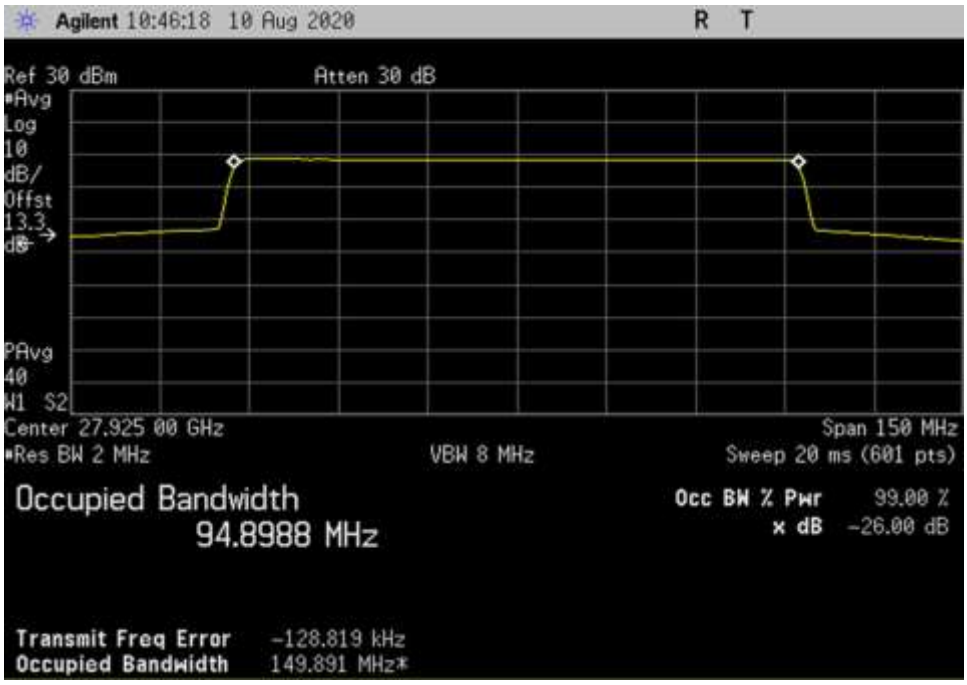

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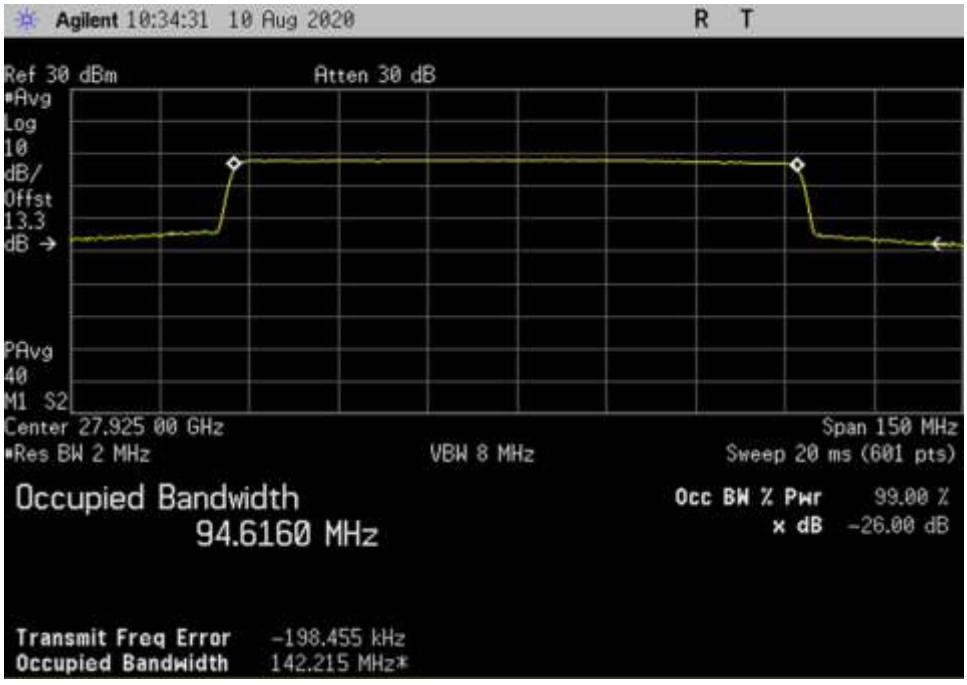

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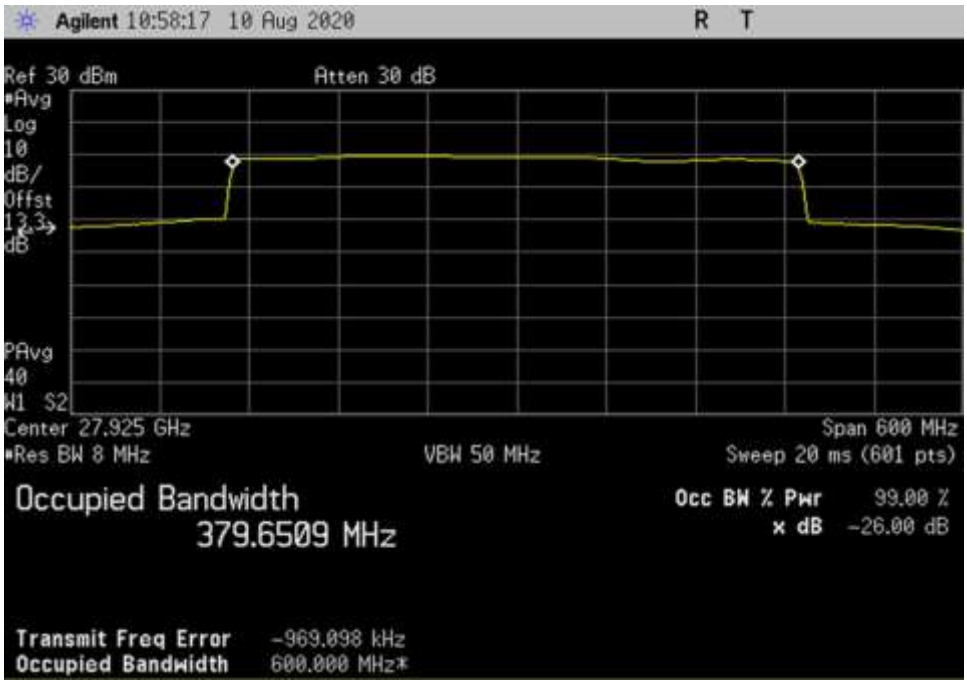

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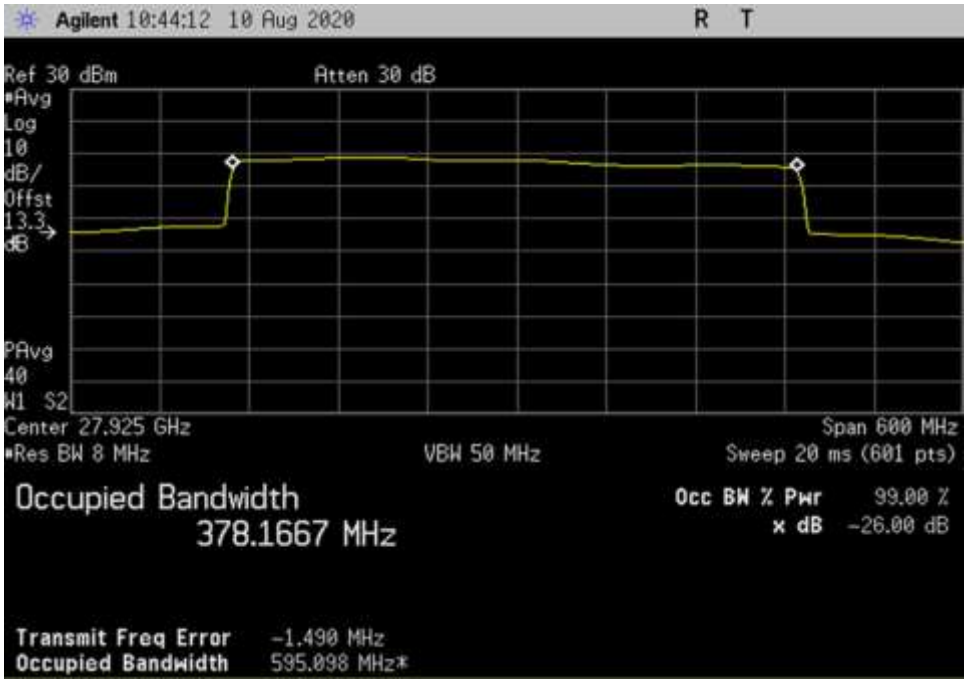
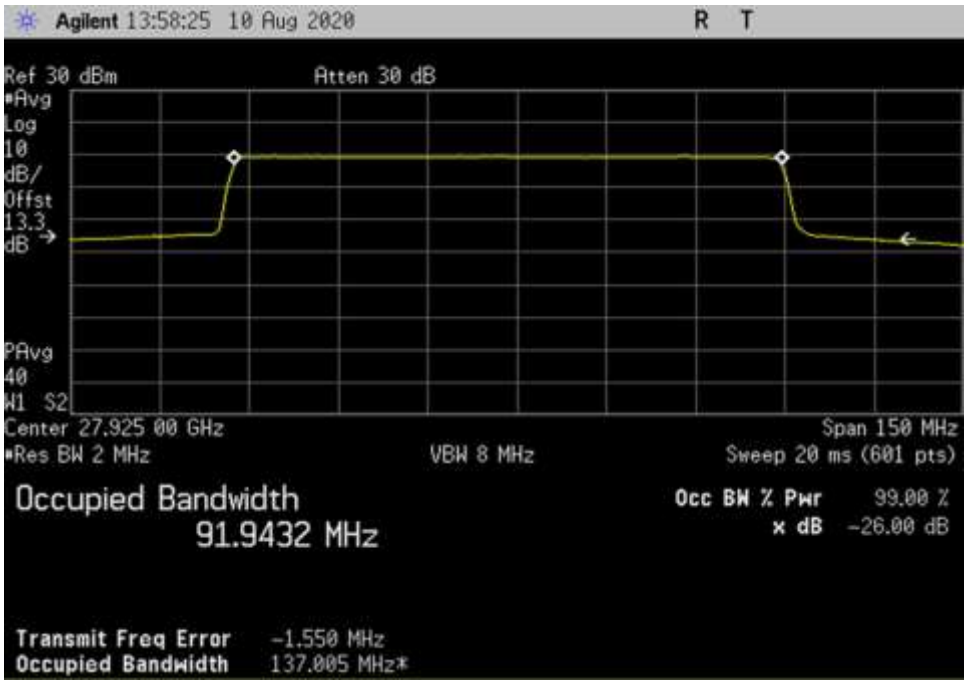
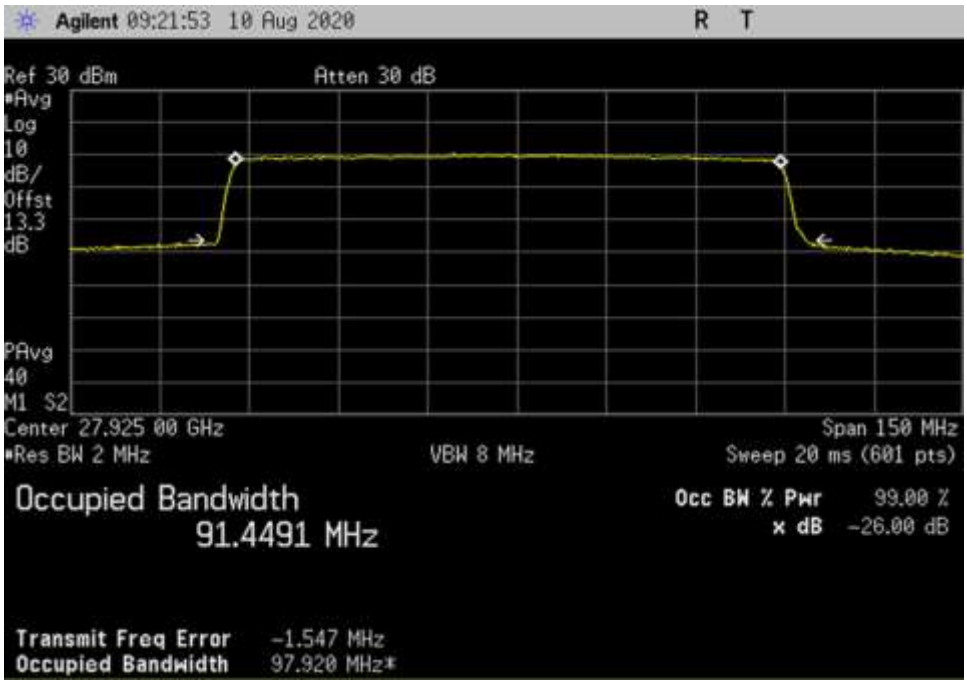


DL_27500-28350-QPSK-400MHz-V-CP OFDM-AGC+3_ 27925MHz_MC

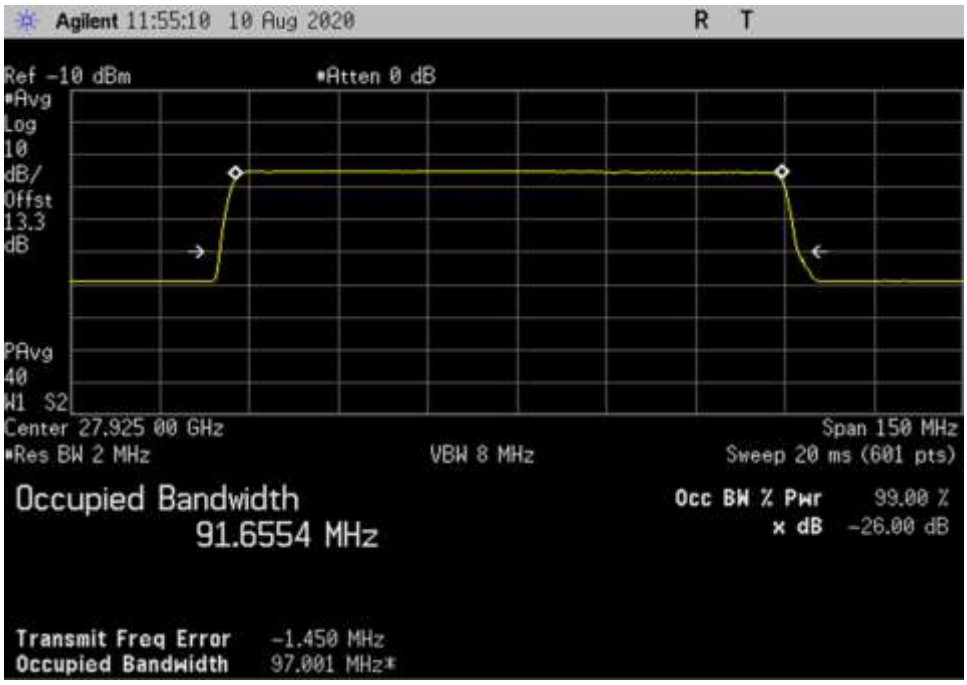
DFT – 16QAM



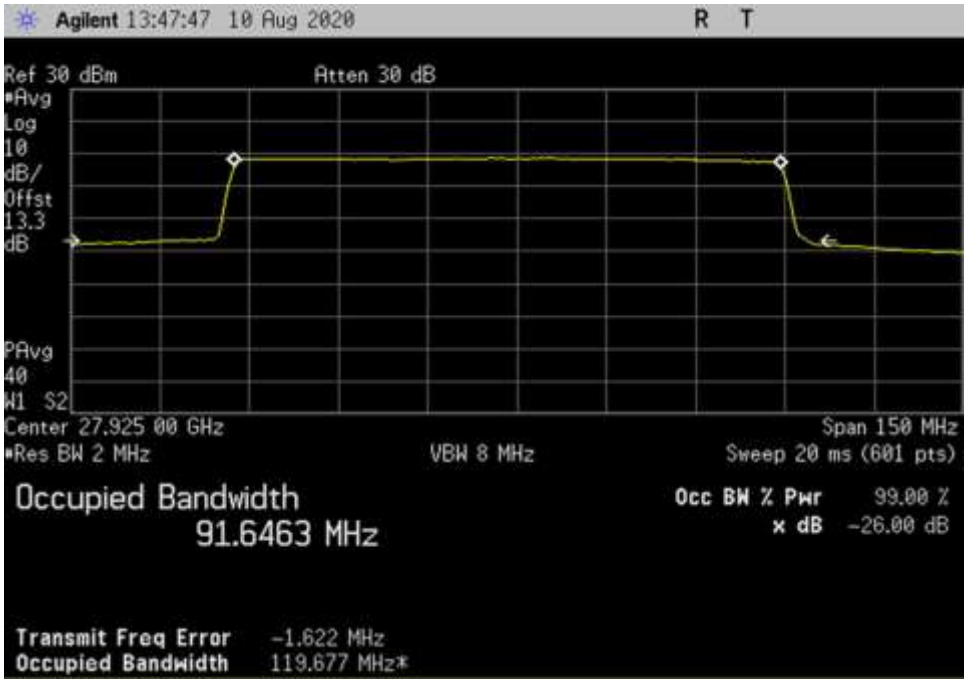
UL_27500-28350- 16QAM-100MHz-H-DFT OFDM_ 27925MHz_MC



UL_27500-28350- 16QAM-100MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



UL_27500-28350- 16QAM-100MHz-H-DFT OFDM-Input_ 27925MHz_MC



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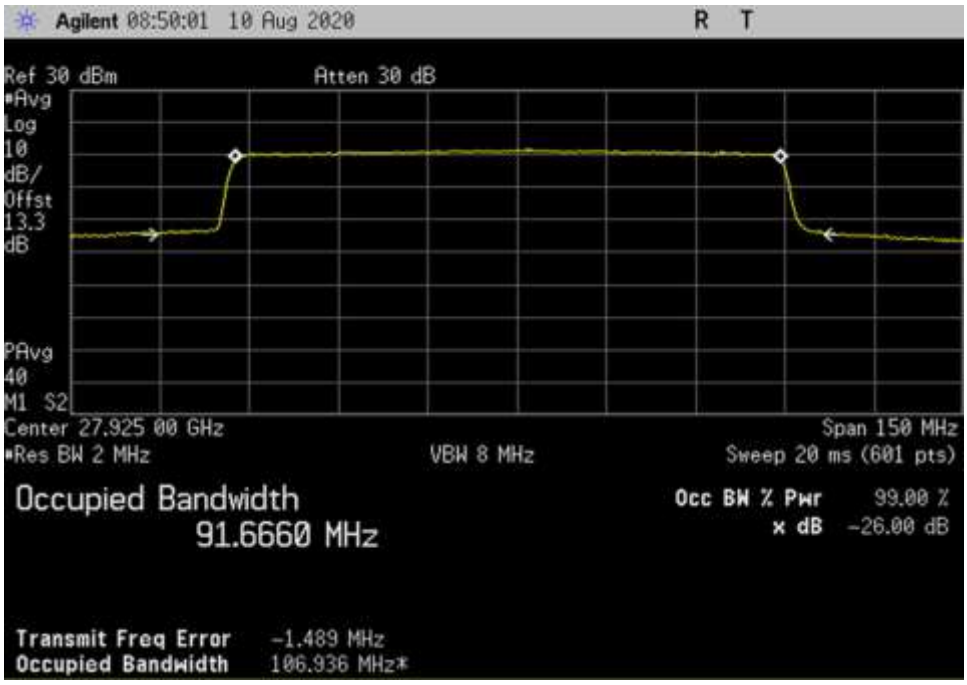
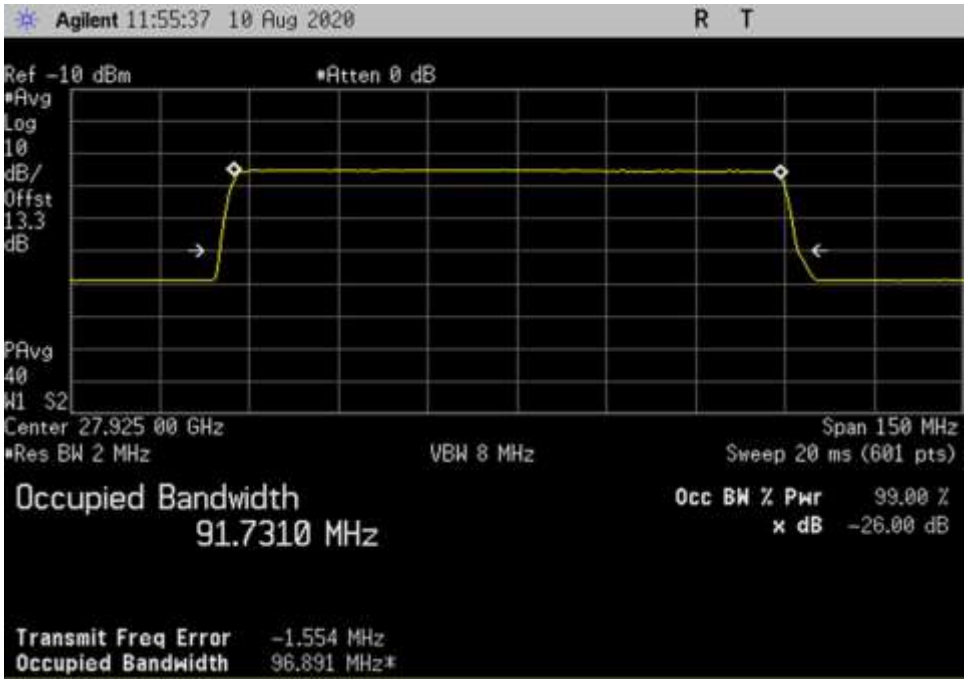
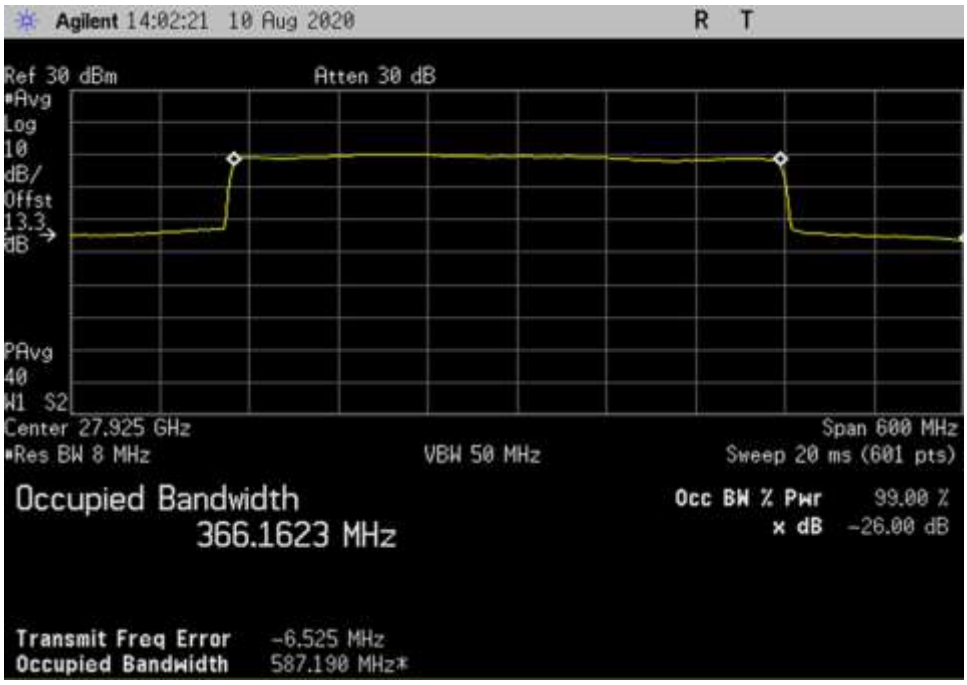


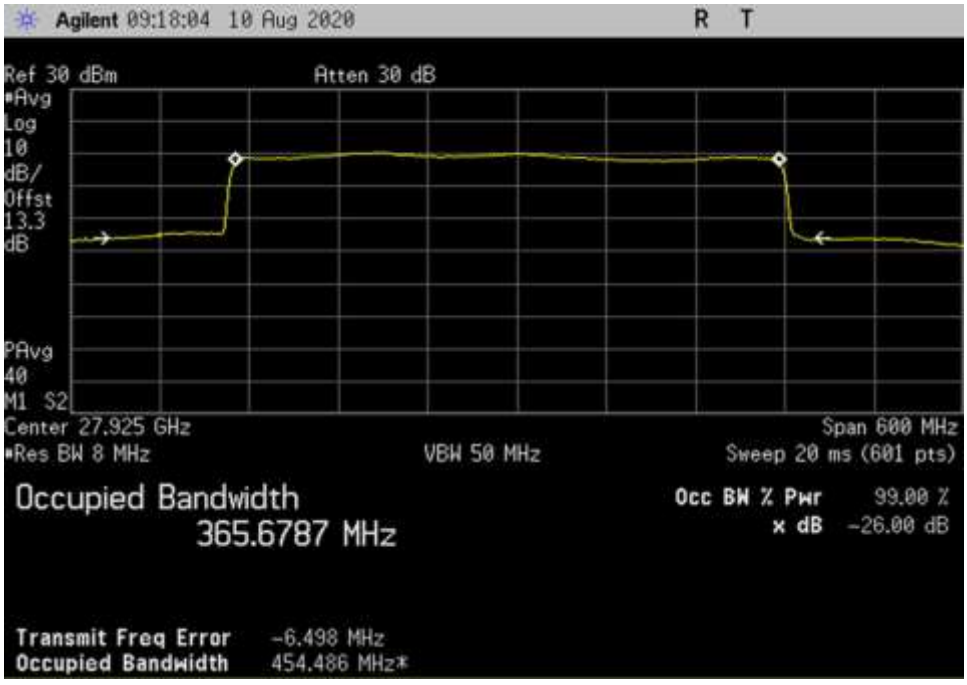
UL_27500-28350- 16QAM-100MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC



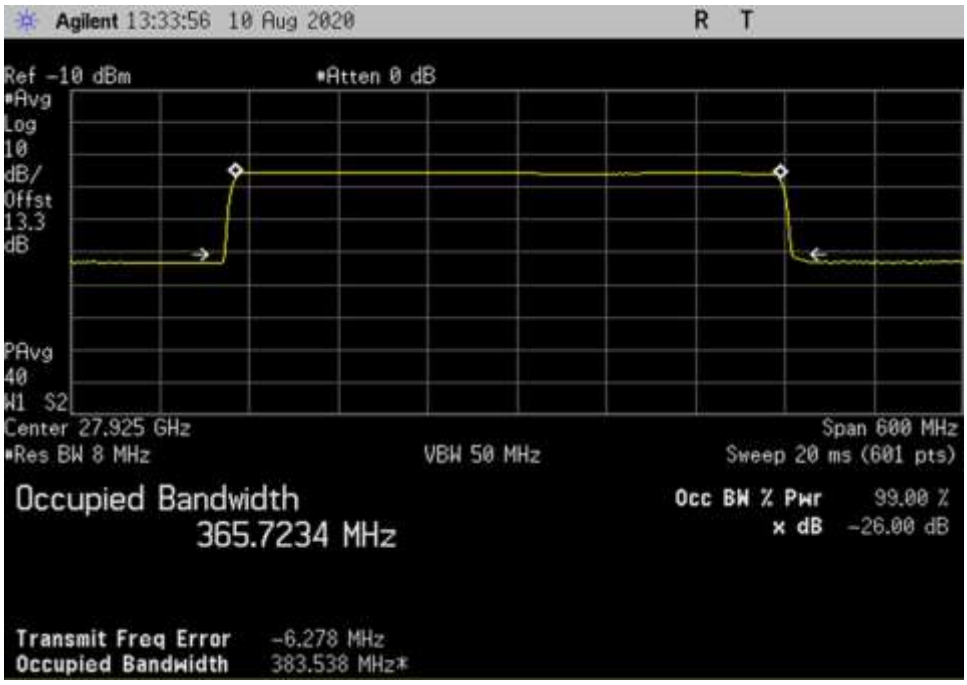
UL_27500-28350- 16QAM-100MHz-V-DFT OFDM-Input_ 27925MHz_MC



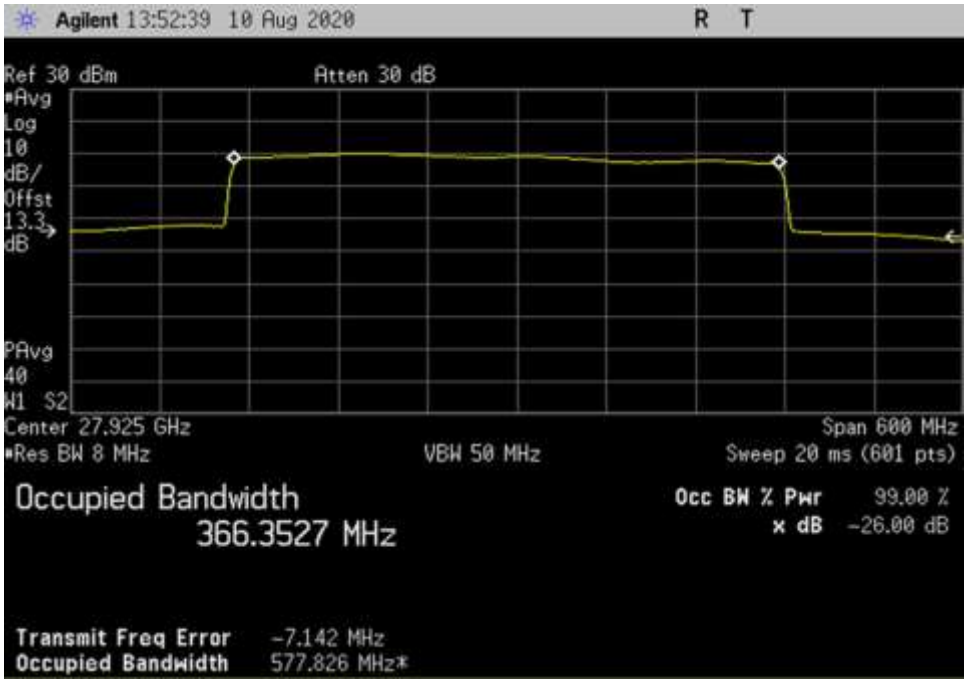
UL_27500-28350- 16QAM-400MHz-H-DFT OFDM_ 27925MHz_MC



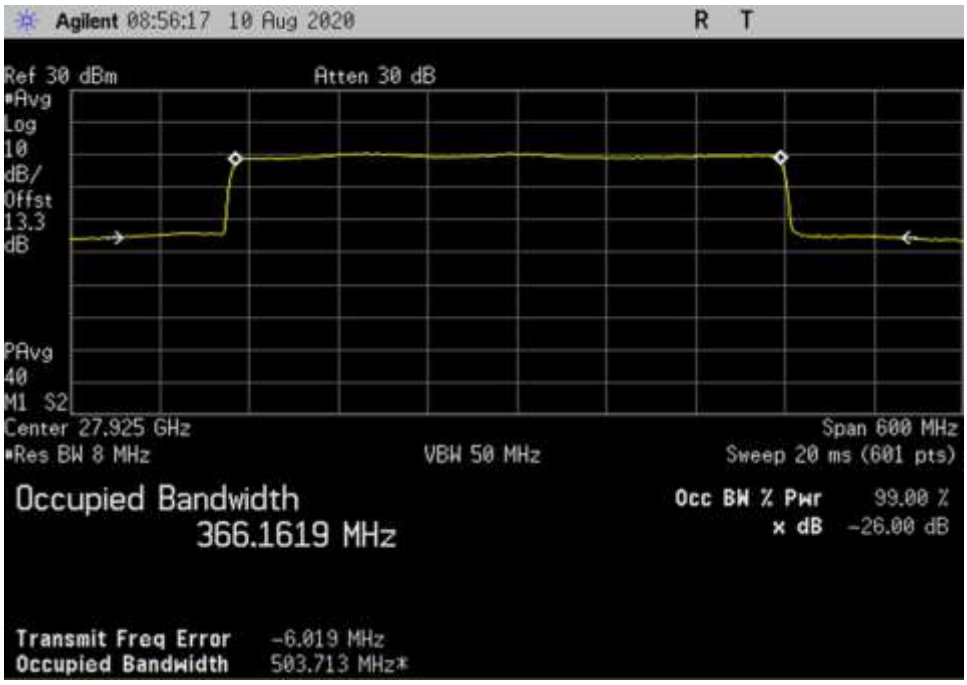
UL_27500-28350- 16QAM-400MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



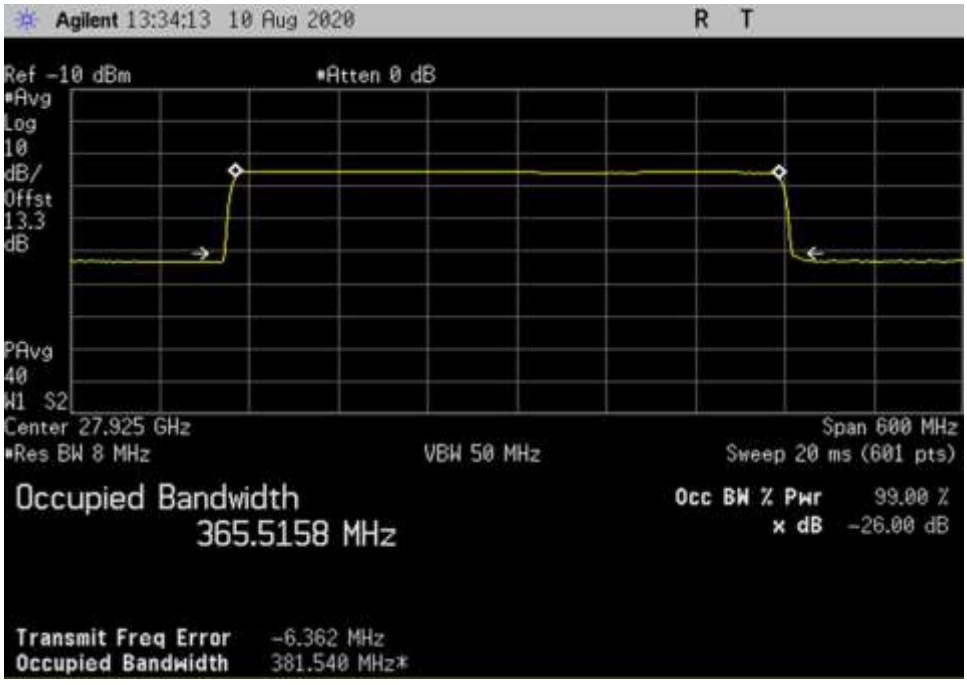
UL_27500-28350- 16QAM-400MHz-H-DFT OFDM-Input_ 27925MHz_MC



UL_27500-28350- 16QAM-400MHz-V-DFT OFDM_ 27925MHz_MC

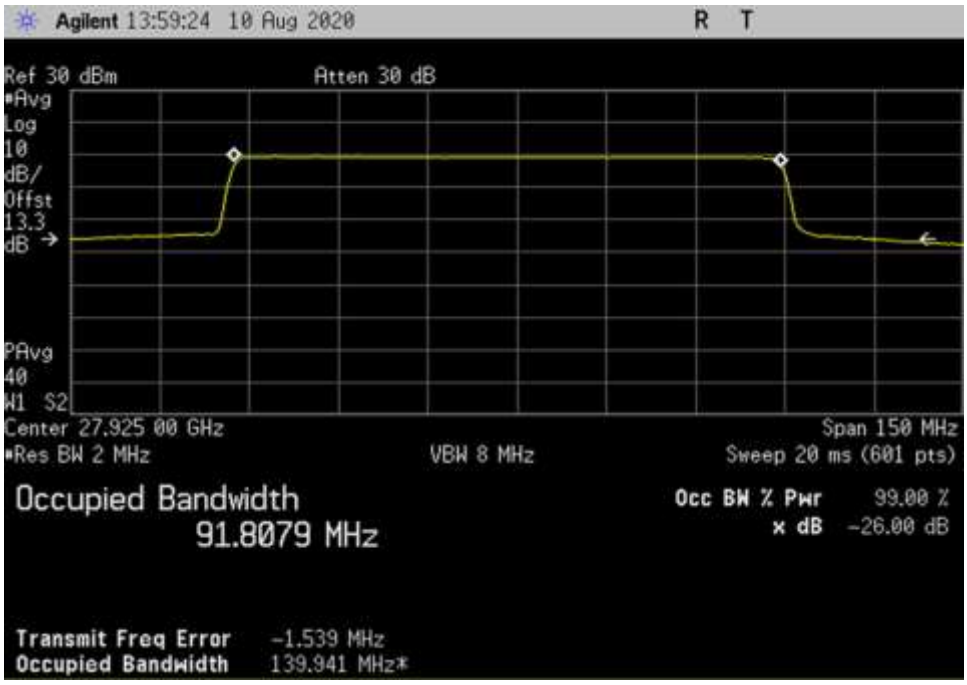


UL_27500-28350- 16QAM-400MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC

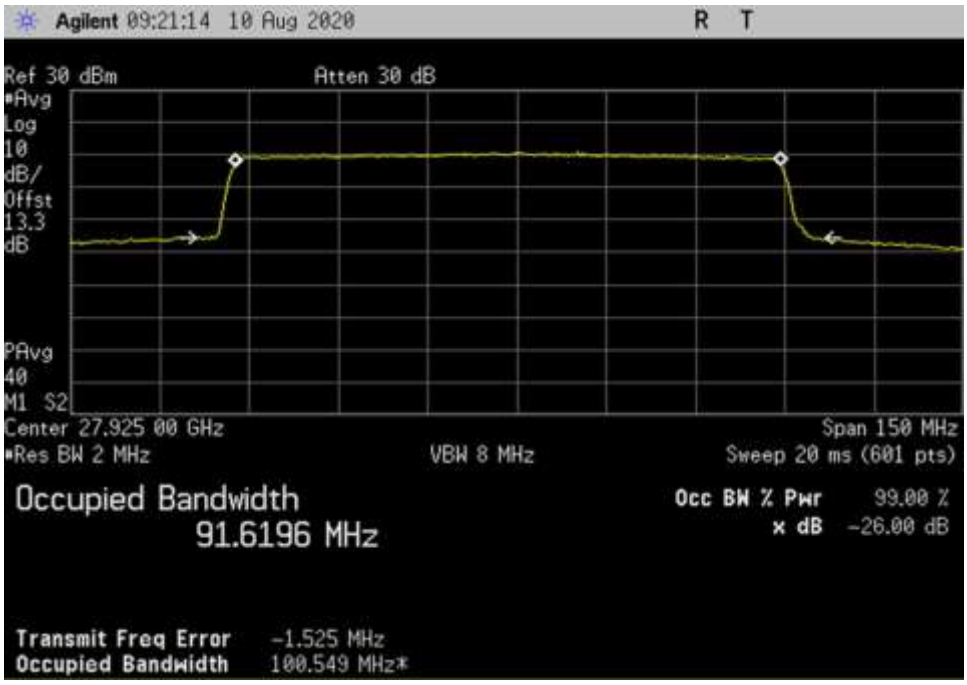


UL_27500-28350- 16QAM-400MHz-V-DFT OFDM-Input_ 27925MHz_MC

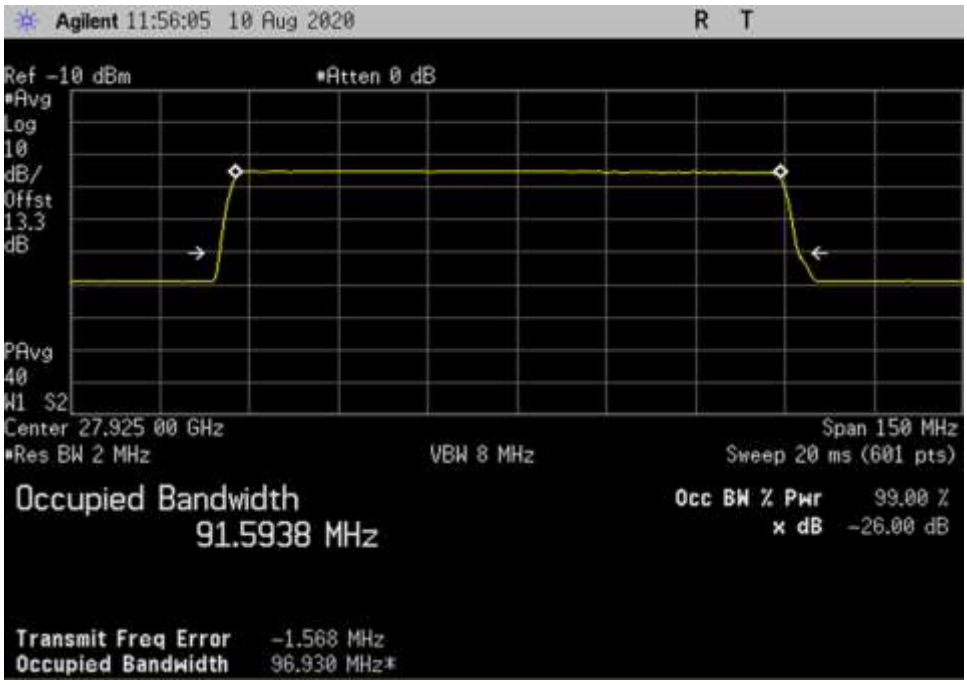
DFT – 64QAM



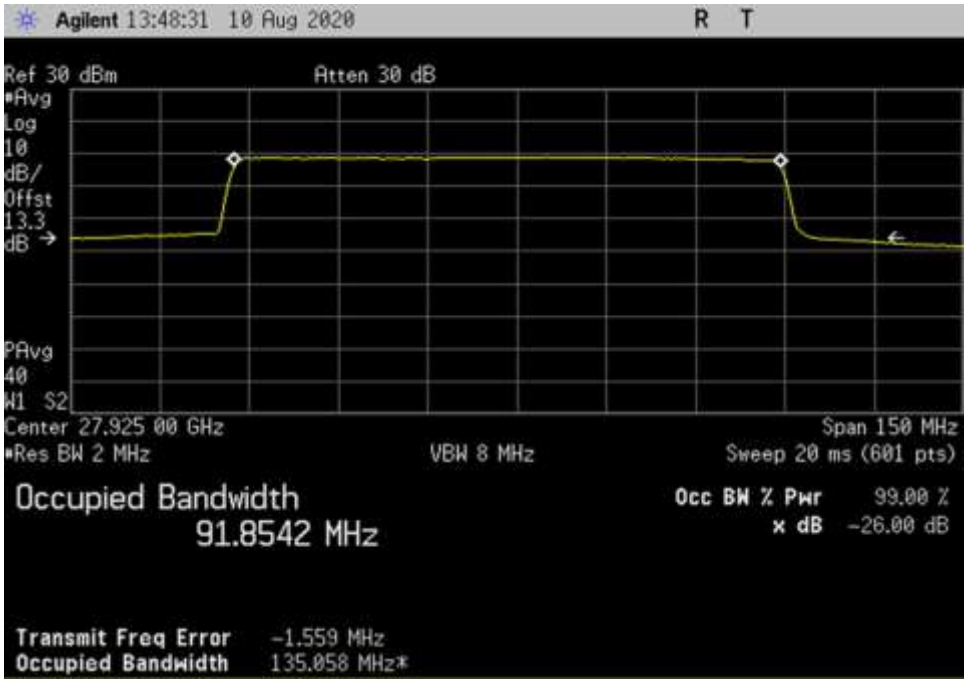
UL_27500-28350- 64QAM-100MHz-H-DFT OFDM_ 27925MHz_MC



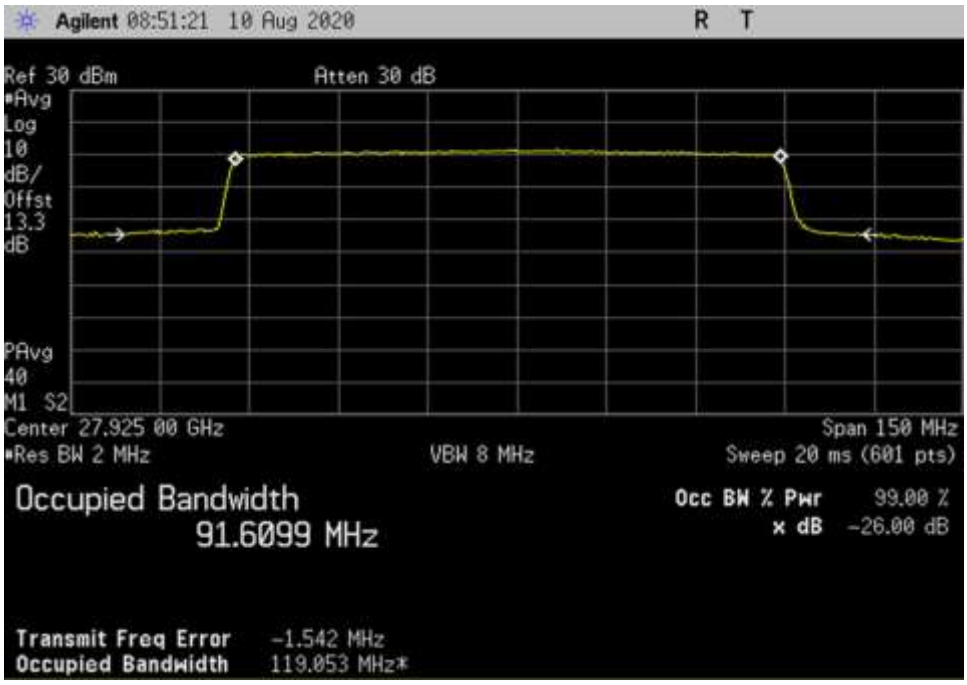
UL_27500-28350- 64QAM-100MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



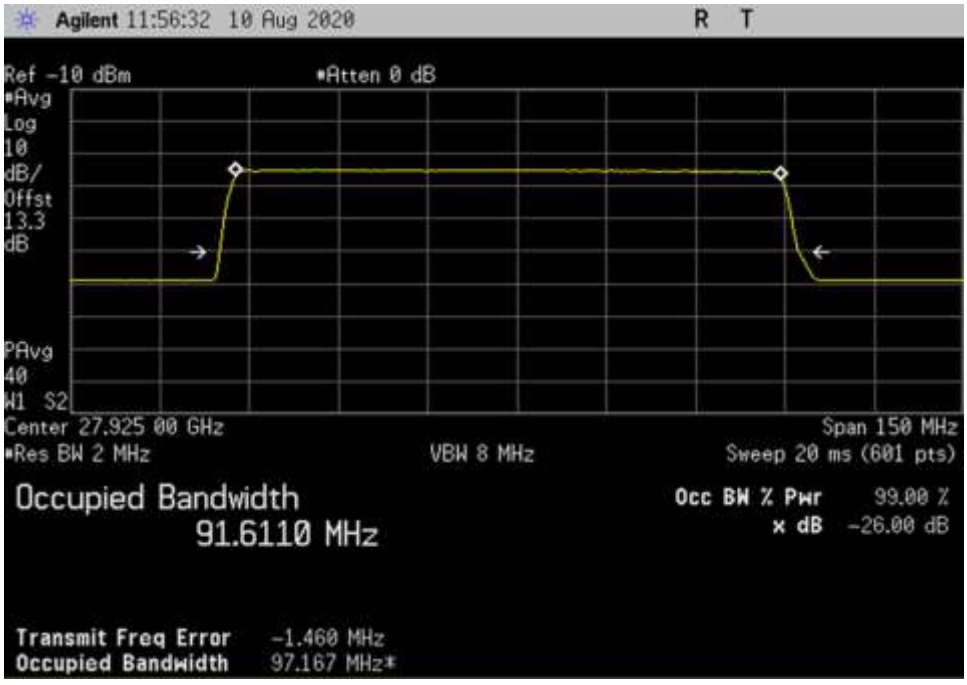
UL_27500-28350- 64QAM-100MHz-H-DFT OFDM-Input_ 27925MHz_MC



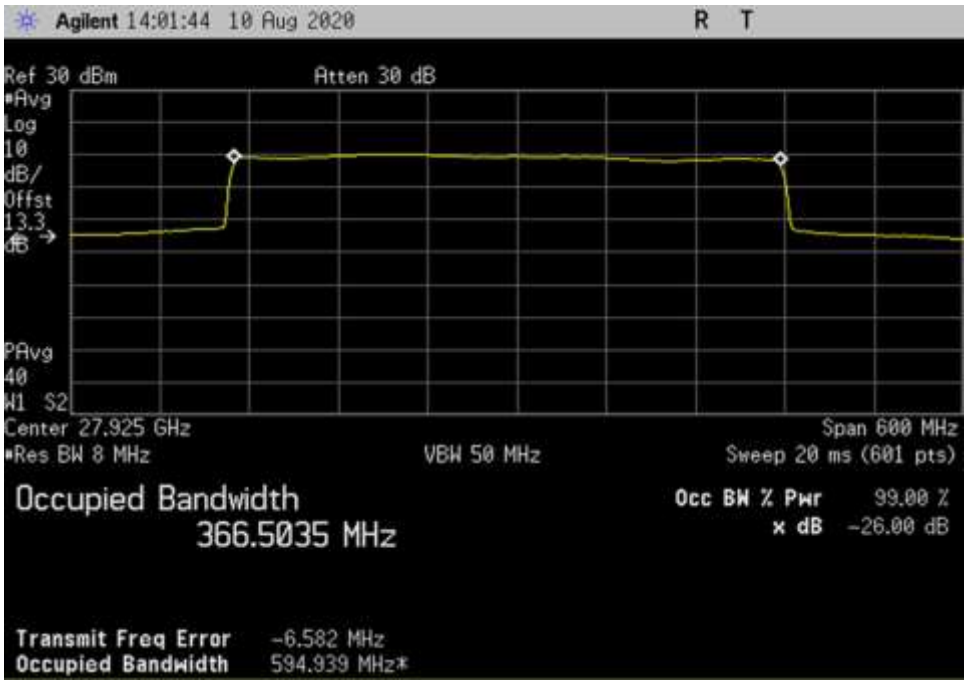
UL_27500-28350- 64QAM-100MHz-V-DFT OFDM_ 27925MHz_MC



UL_27500-28350- 64QAM-100MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC



UL_27500-28350- 64QAM-100MHz-V-DFT OFDM-Input_ 27925MHz_MC



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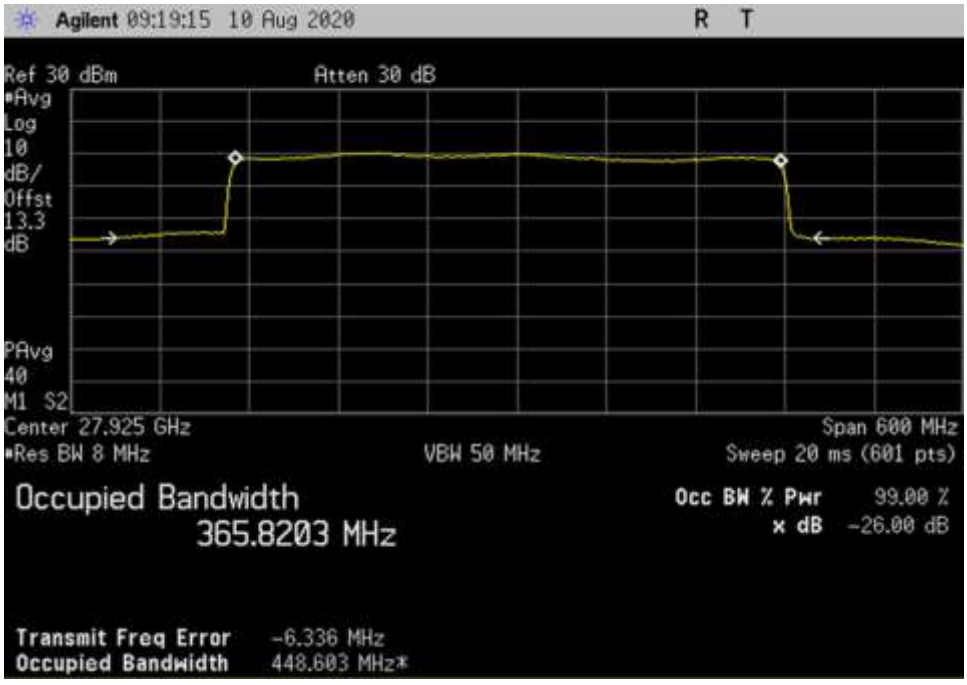
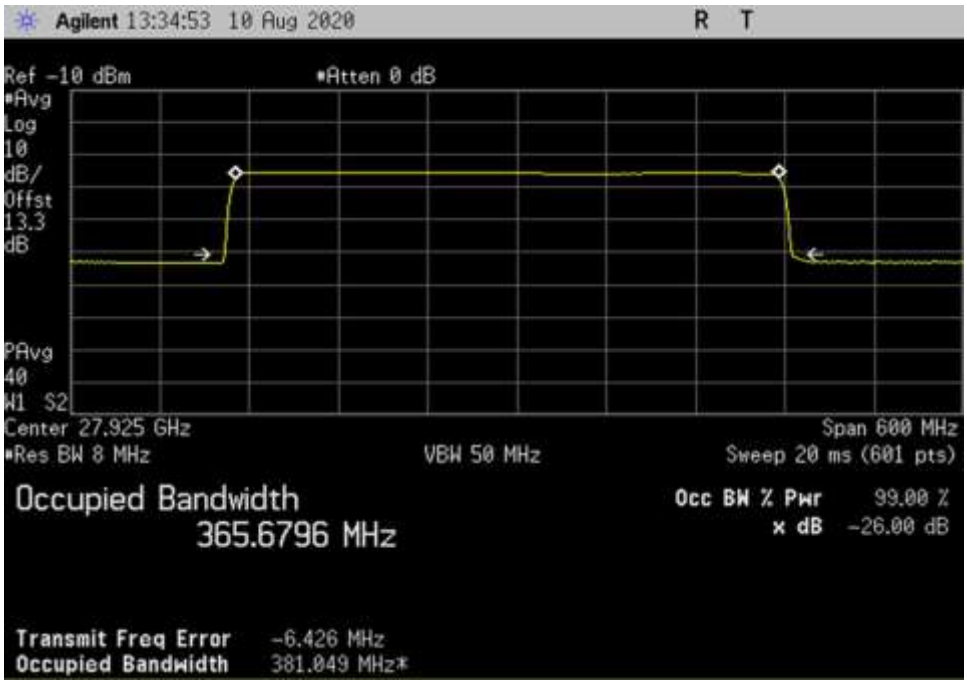


UL_27500-28350- 64QAM-400MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



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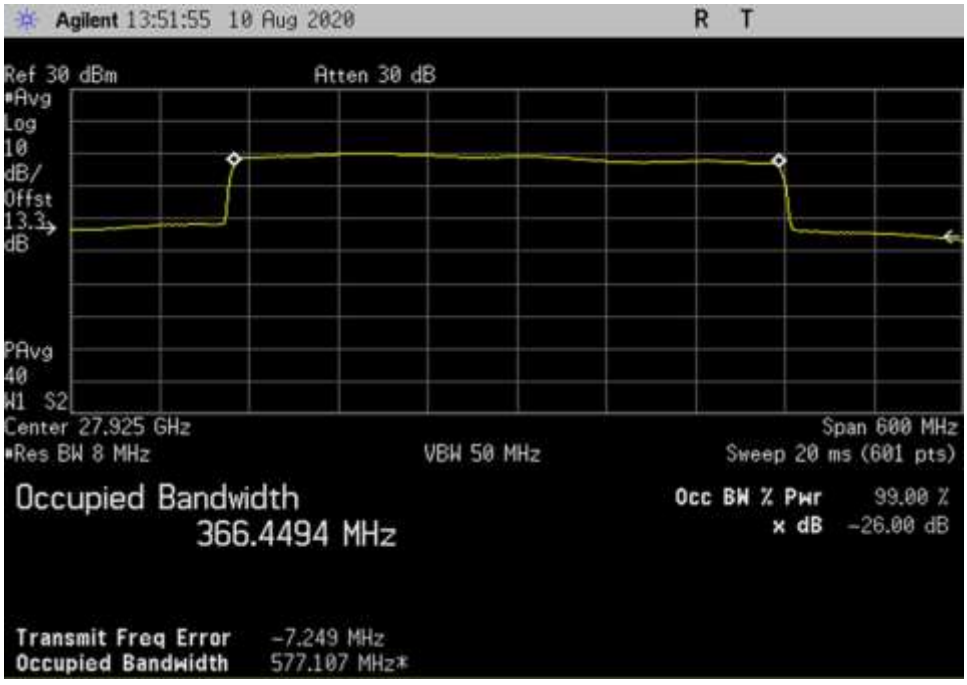

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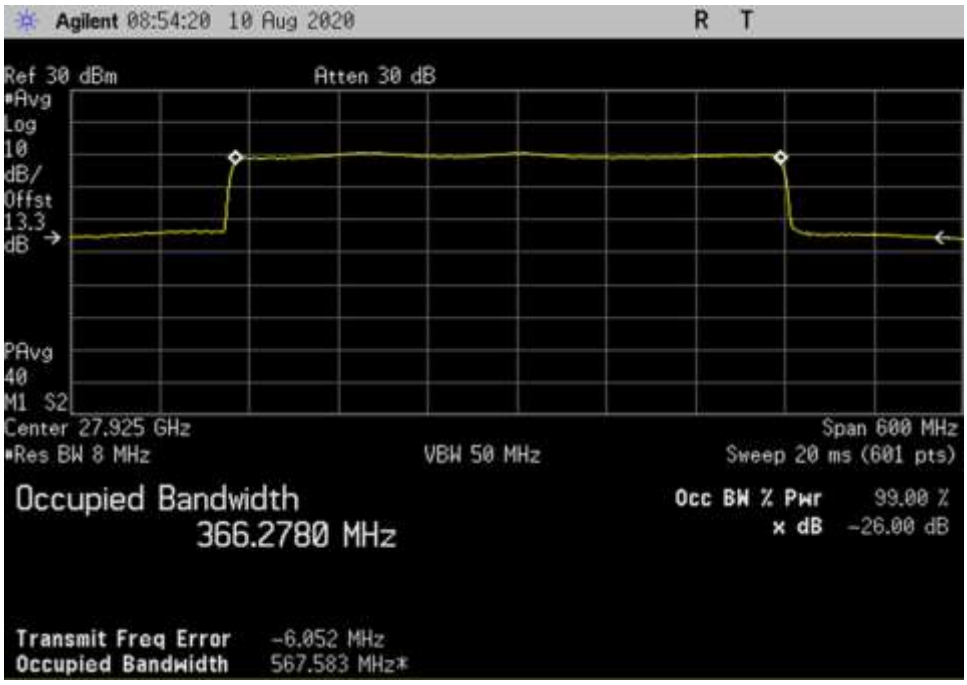

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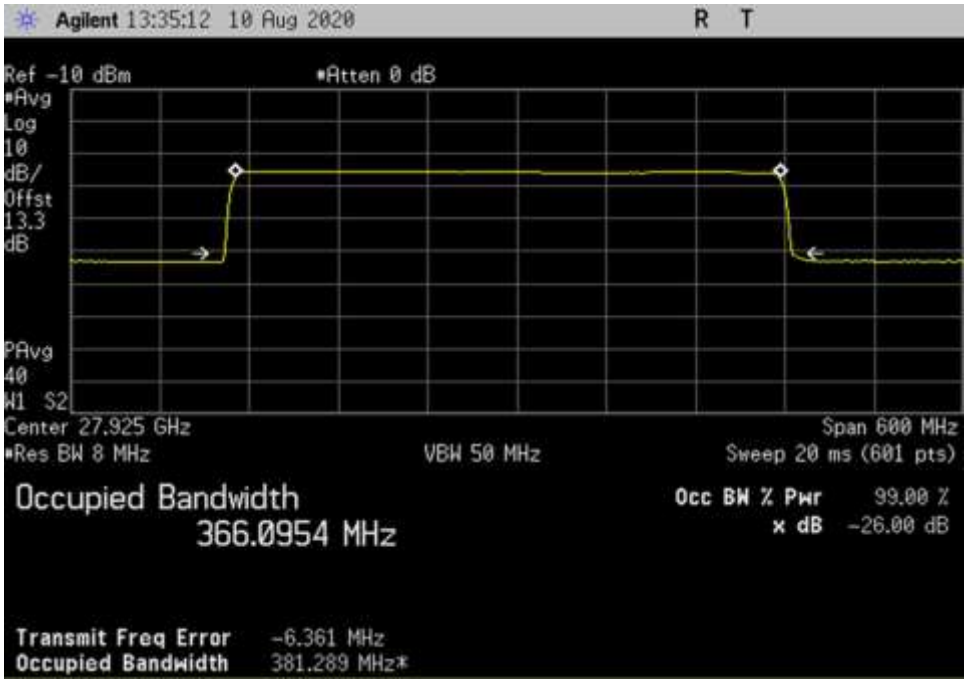
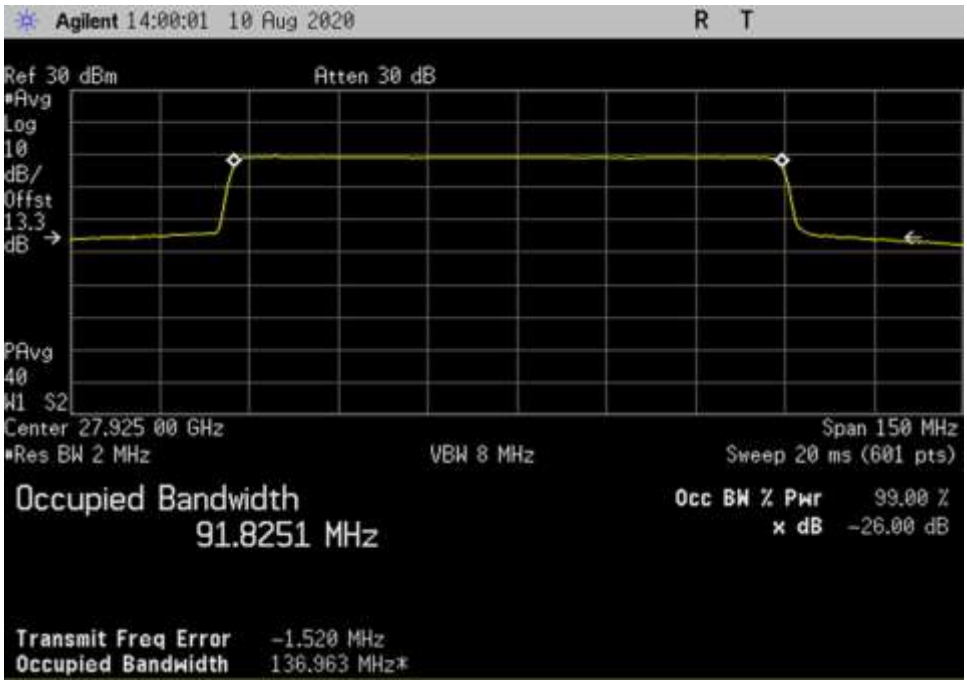
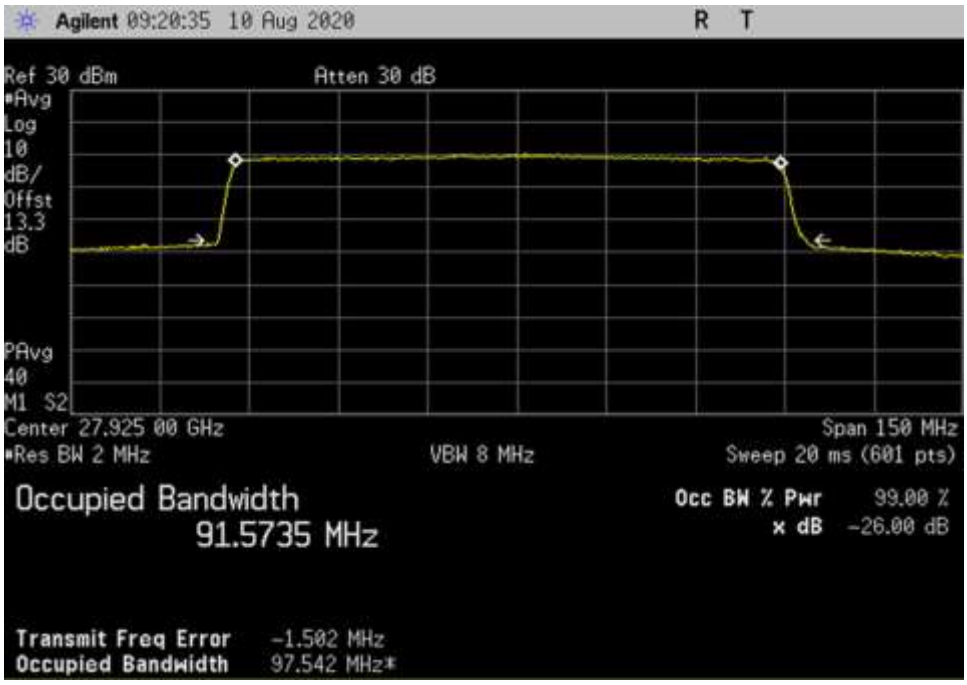


UL_27500-28350- 64QAM-400MHz-V-DFT OFDM-Input_ 27925MHz_MC

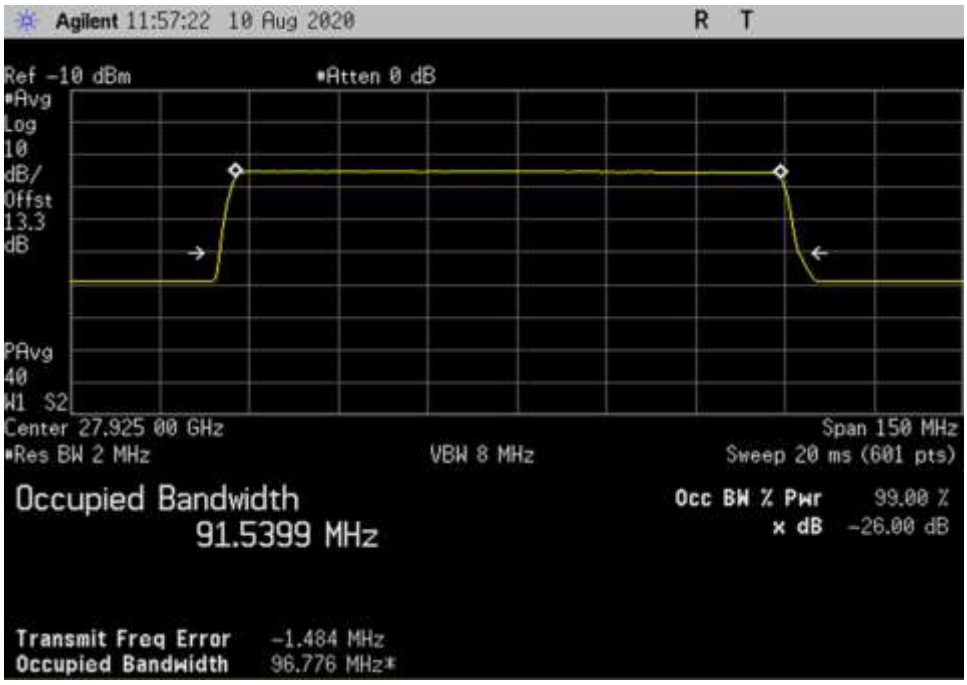
DFT – 256QAM



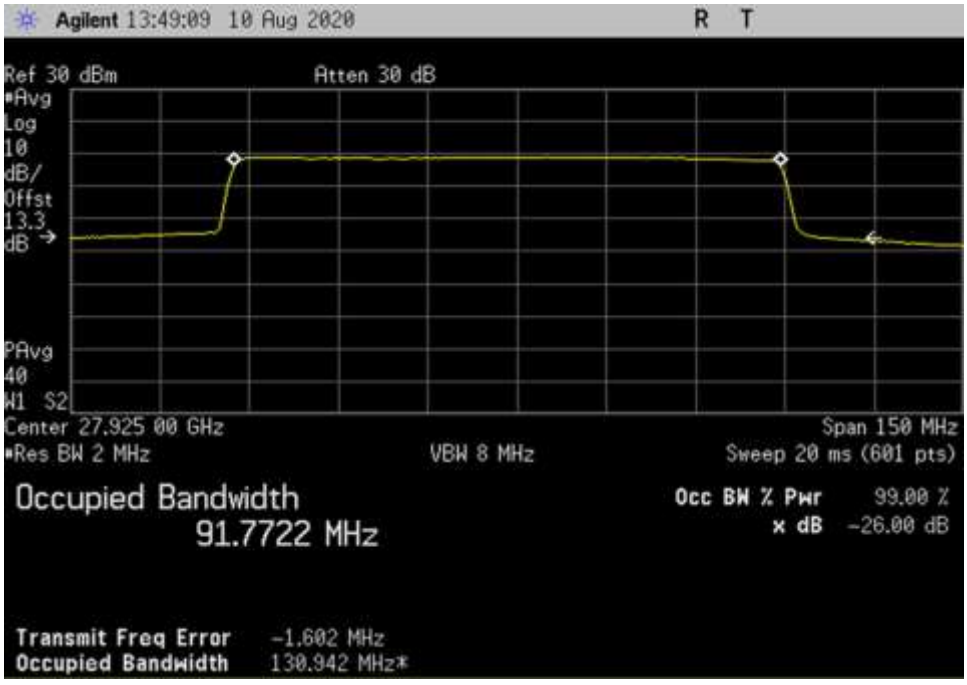
UL_27500-28350- 256QAM-100MHz-H-DFT OFDM_ 27925MHz_MC



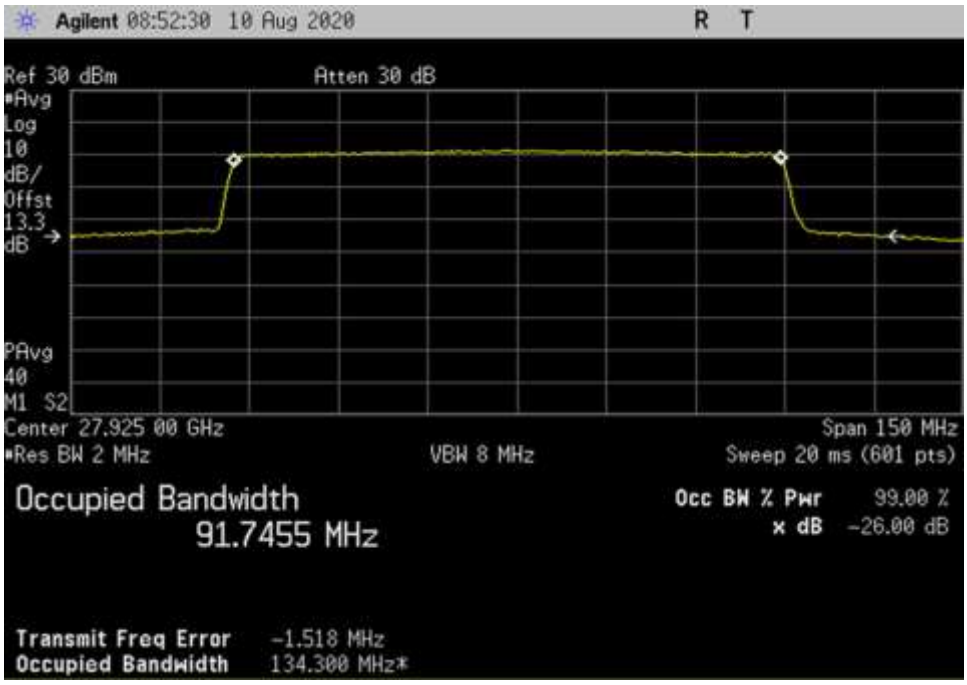
UL_27500-28350- 256QAM-100MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



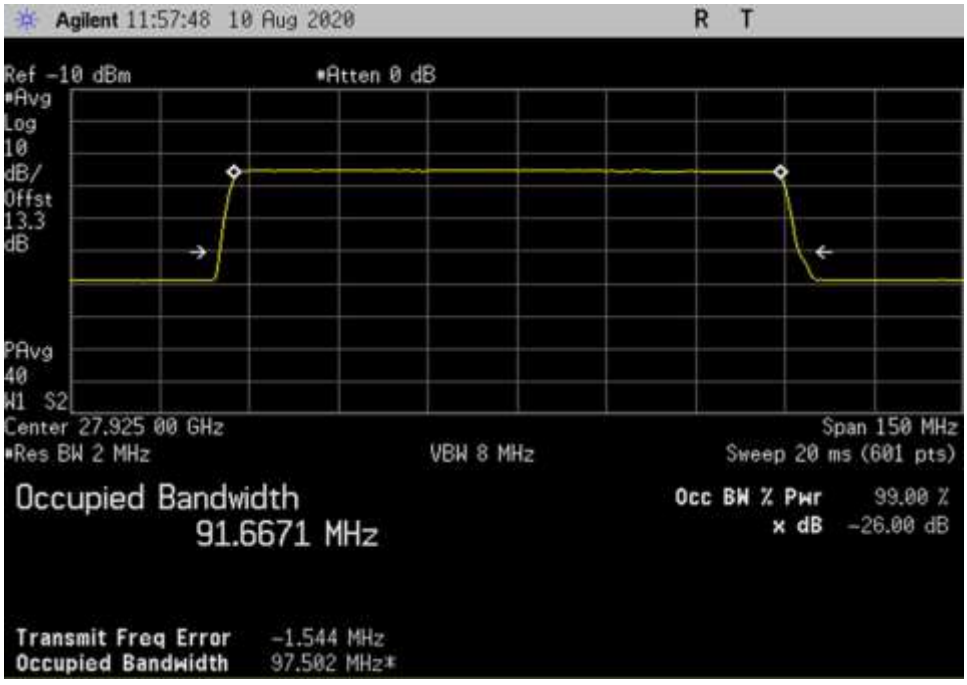
UL_27500-28350- 256QAM-100MHz-H-DFT OFDM-Input_ 27925MHz_MC



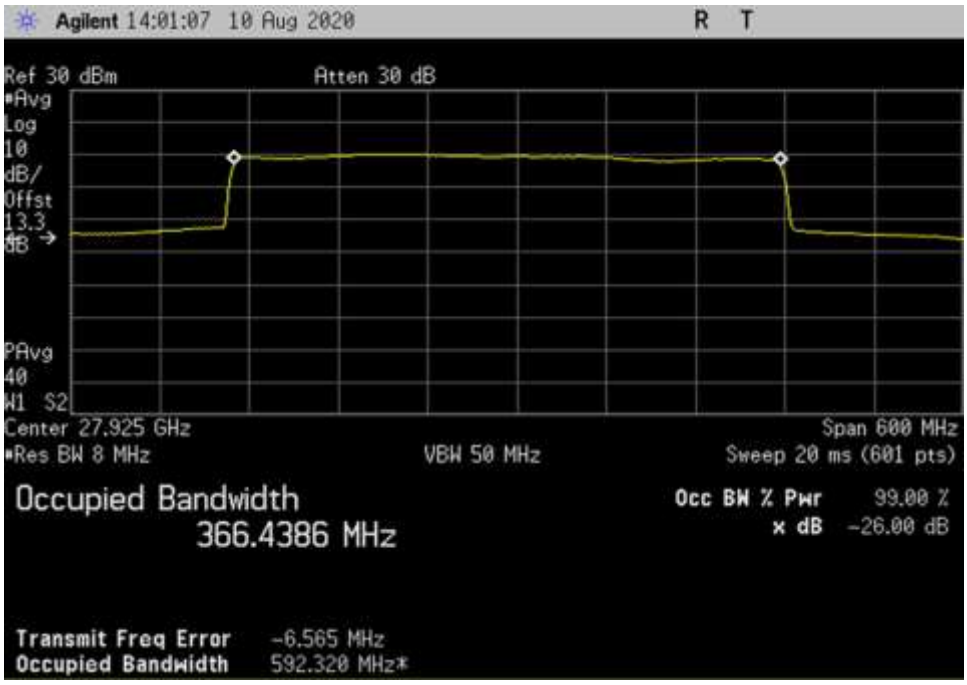
UL_27500-28350- 256QAM-100MHz-V-DFT OFDM_ 27925MHz_MC



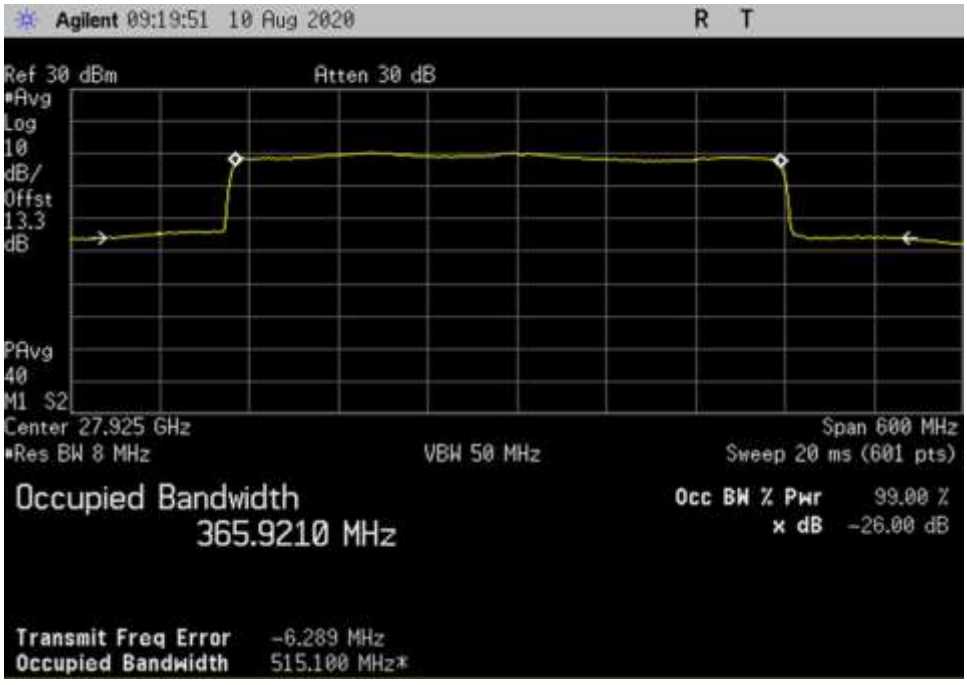
UL_27500-28350- 256QAM-100MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC



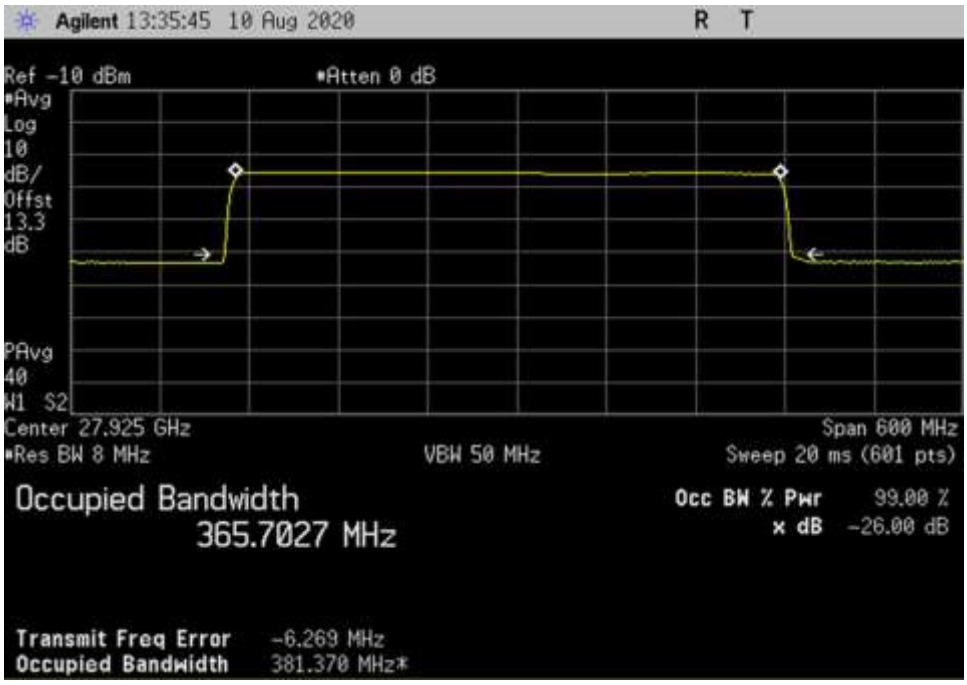
UL_27500-28350- 256QAM-100MHz-V-DFT OFDM-Input_ 27925MHz_MC



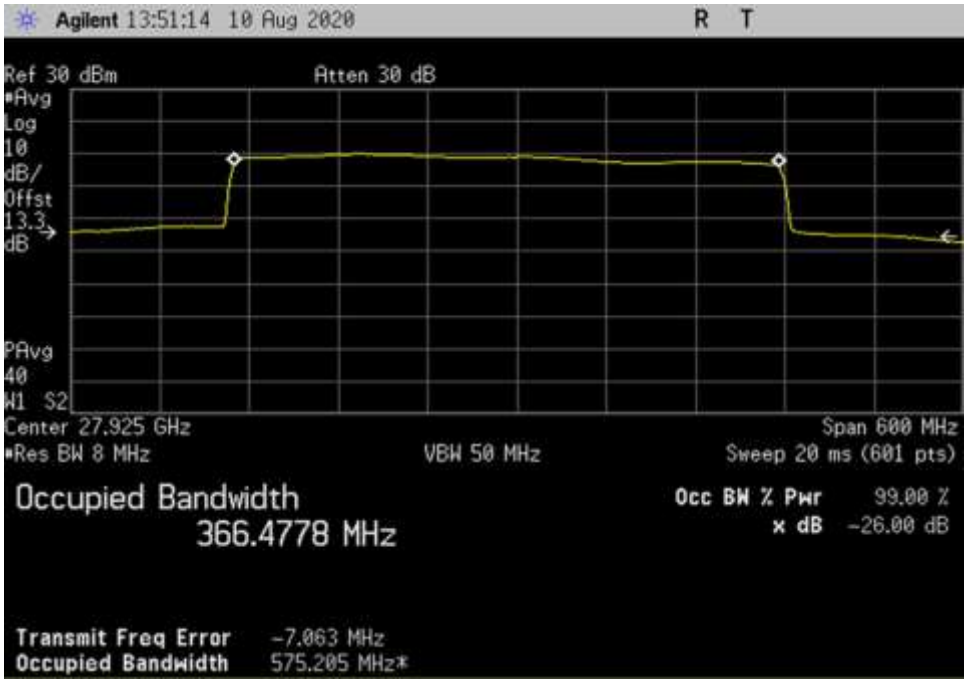
UL_27500-28350- 256QAM-400MHz-H-DFT OFDM_ 27925MHz_MC



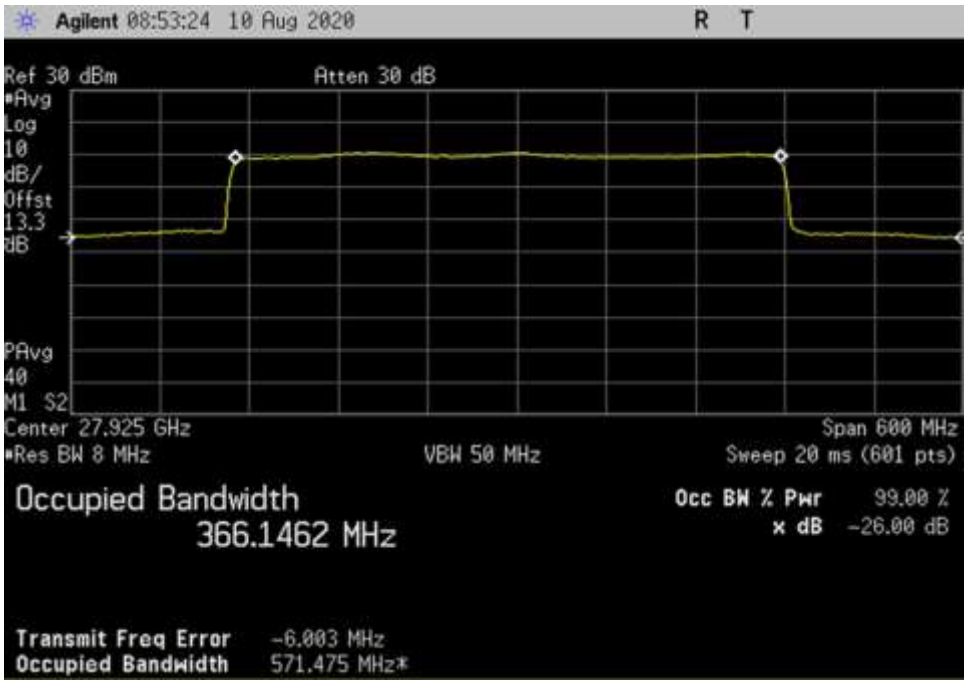
UL_27500-28350- 256QAM-400MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



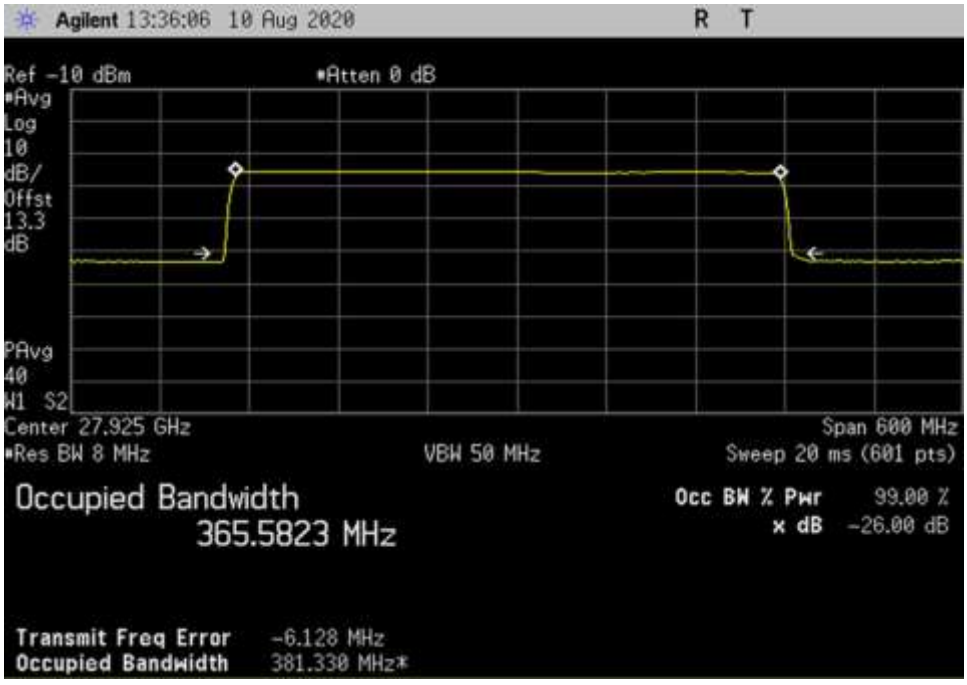
UL_27500-28350- 256QAM-400MHz-H-DFT OFDM-Input_ 27925MHz_MC



UL_27500-28350- 256QAM-400MHz-V-DFT OFDM_ 27925MHz_MC

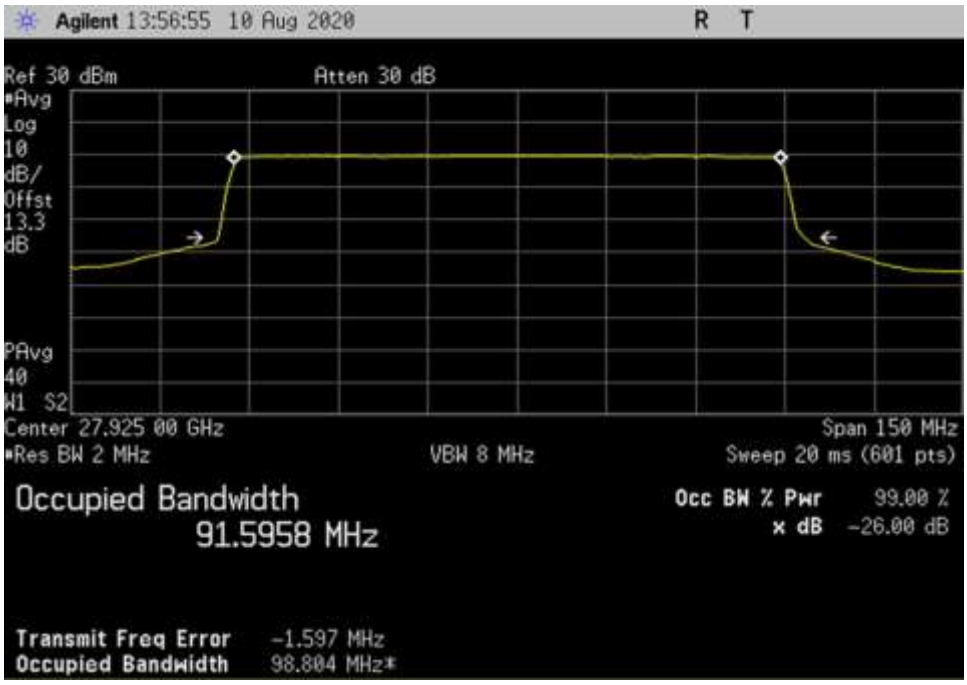


UL_27500-28350- 256QAM-400MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC

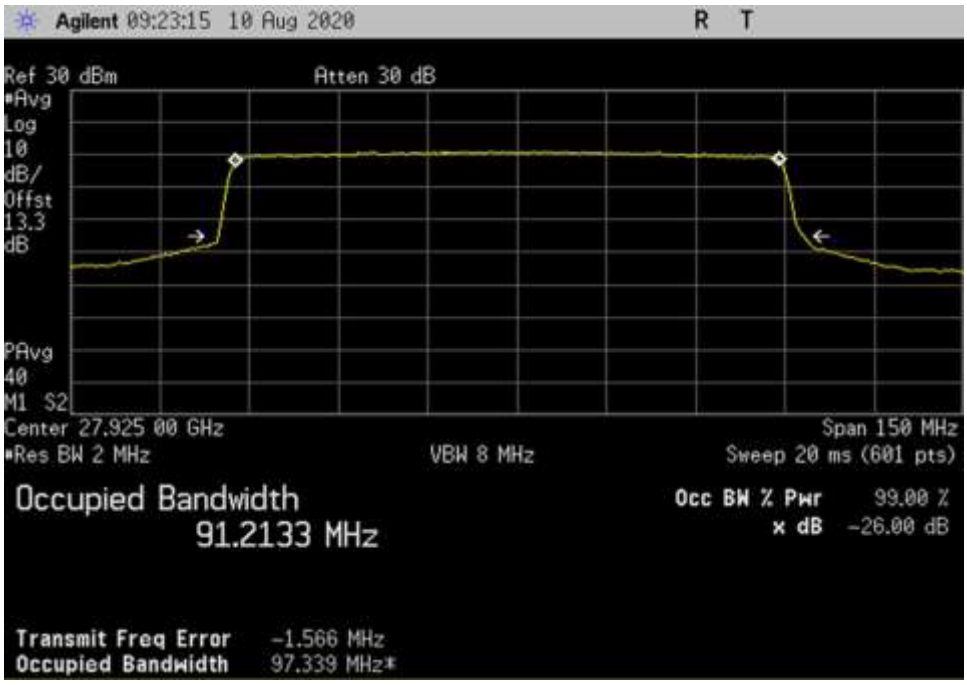


UL_27500-28350- 256QAM-400MHz-V-DFT OFDM-Input_ 27925MHz_MC

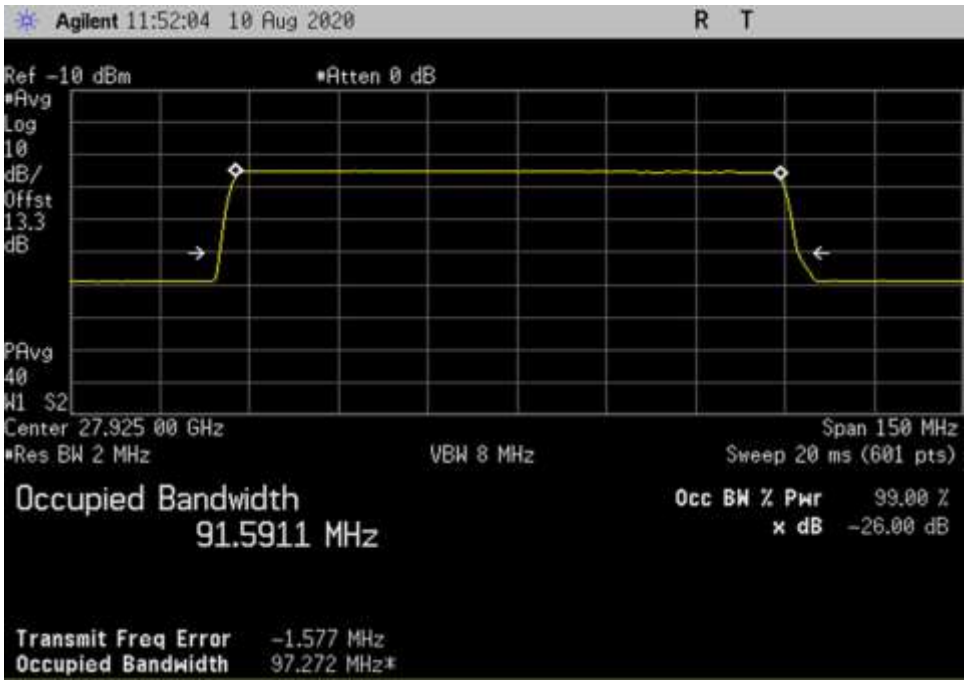
DFT – Pi/2-BPSK



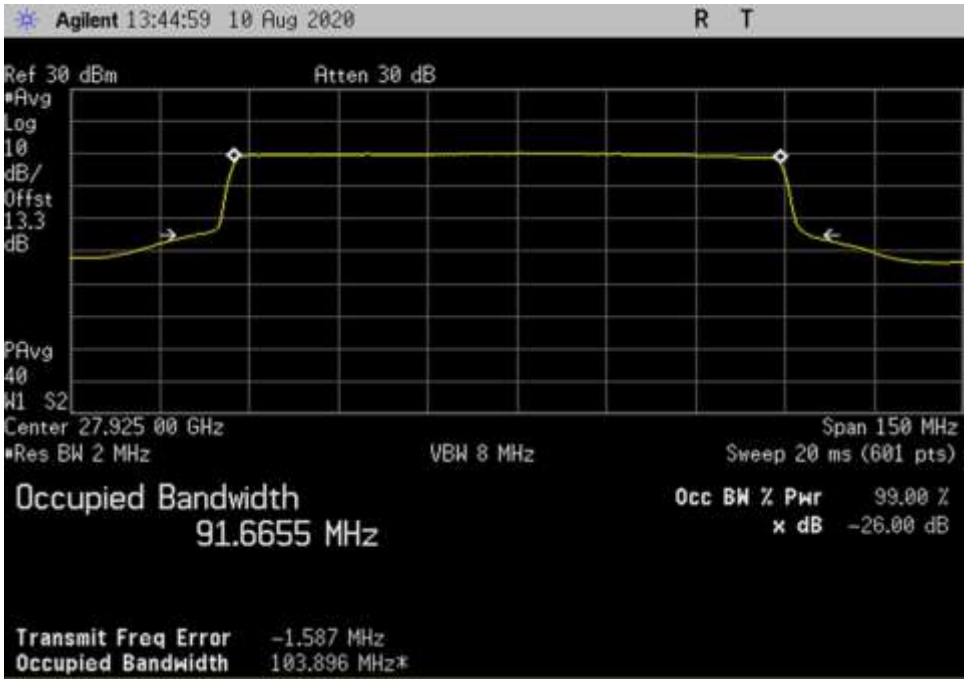
UL_27500-28350- Pi/2- BPSK-100MHz-H-DFT OFDM_ 27925MHz_MC



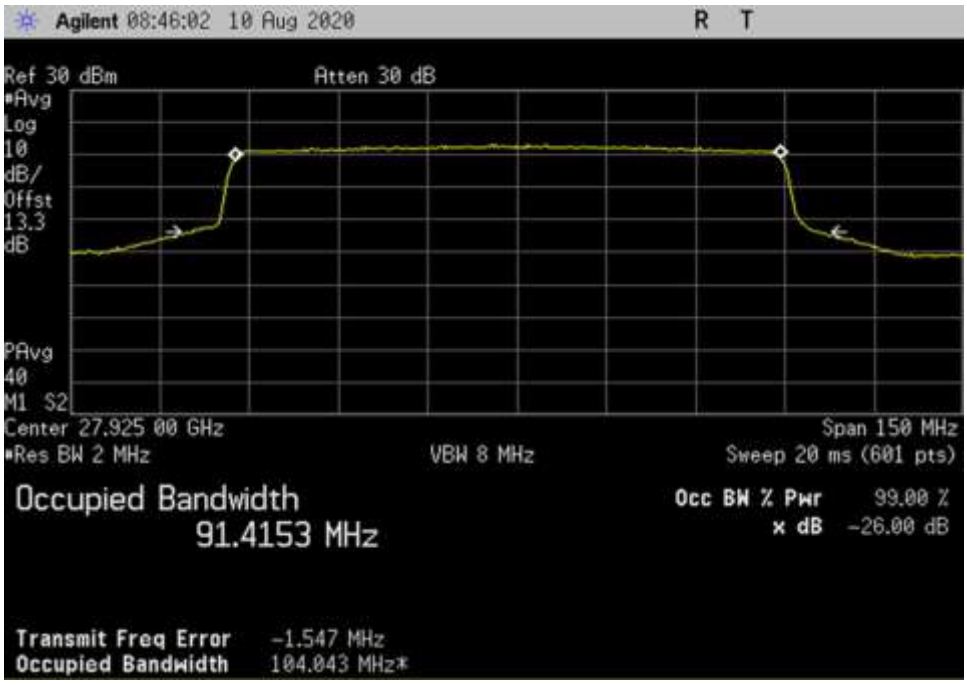
UL_27500-28350- Pi/2- BPSK-100MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



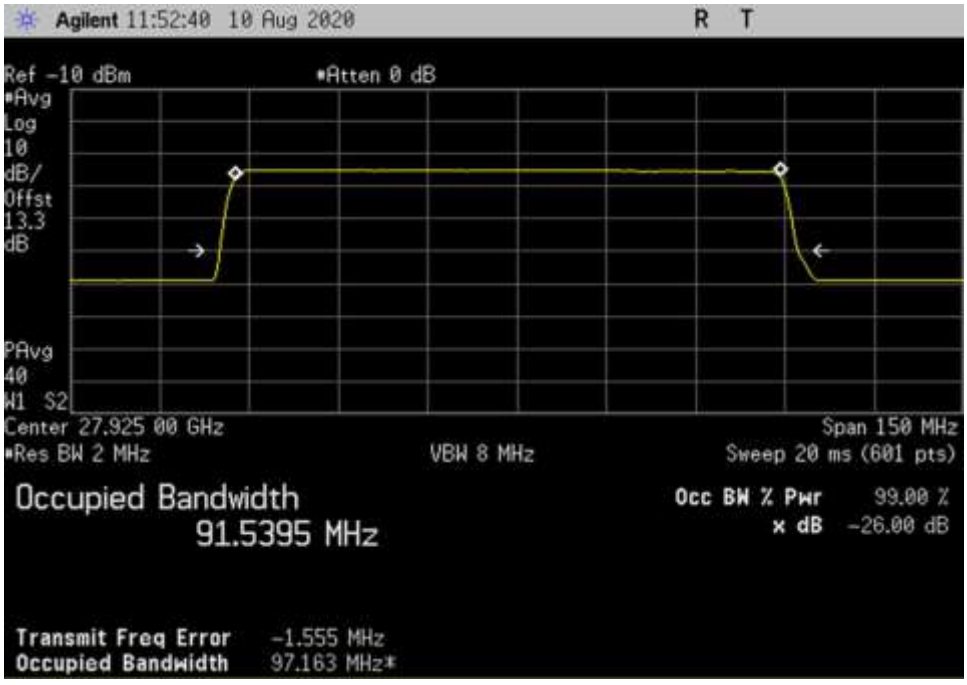
UL_27500-28350- Pi/2- BPSK-100MHz-H-DFT OFDM-Input_ 27925MHz_MC



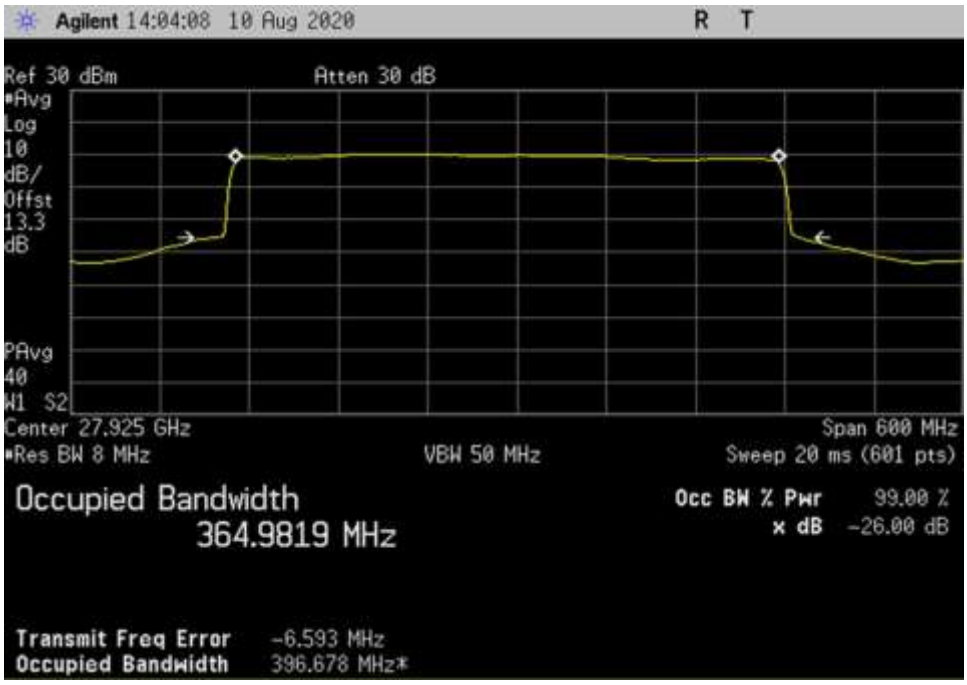
UL_27500-28350- Pi/2- BPSK-100MHz-V-DFT OFDM_ 27925MHz_MC



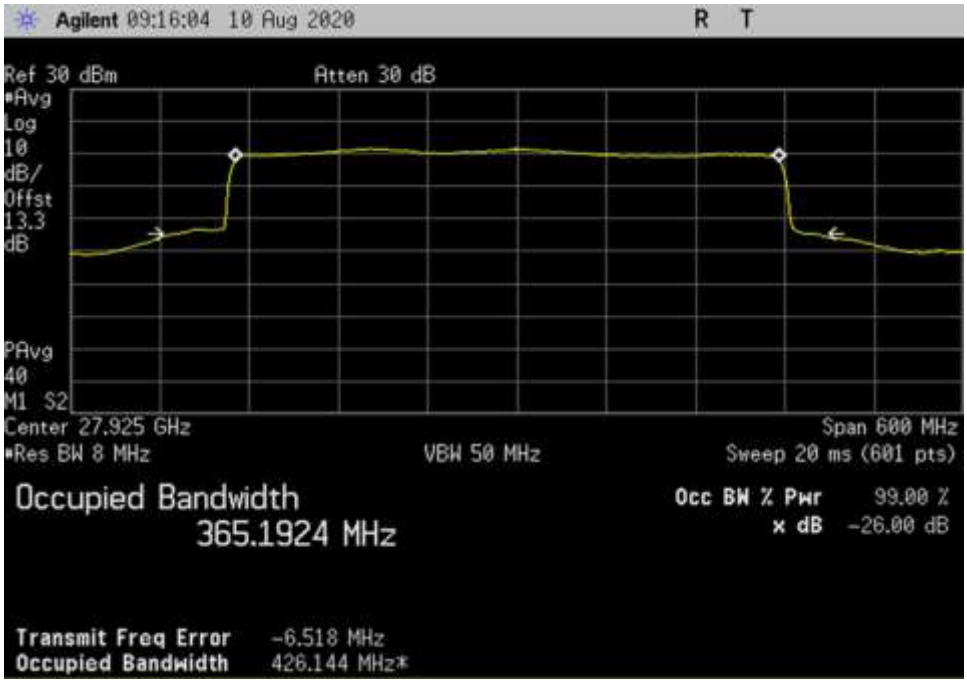
UL_27500-28350- Pi/2- BPSK-100MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC



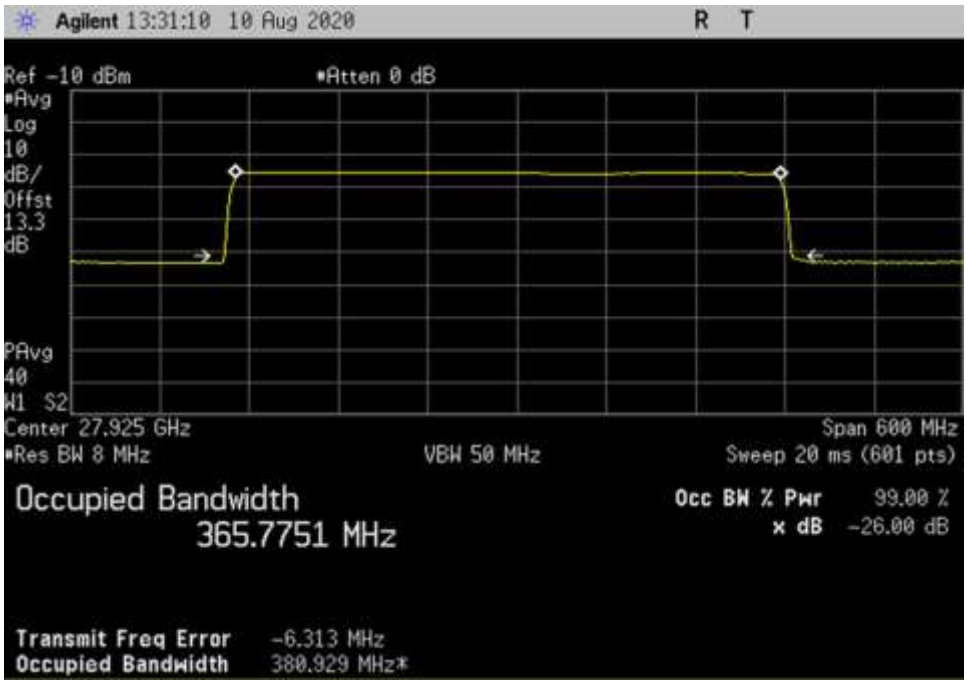
UL_27500-28350- Pi/2- BPSK-100MHz-V-DFT OFDM-Input_ 27925MHz_MC



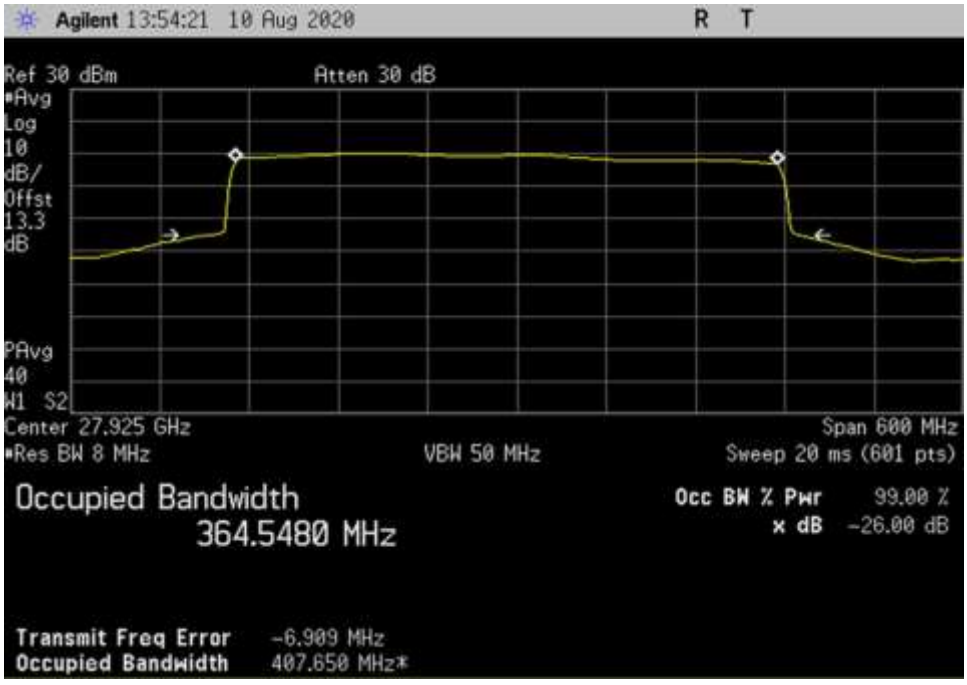
UL_27500-28350- Pi/2- BPSK-400MHz-H-DFT OFDM_ 27925MHz_MC



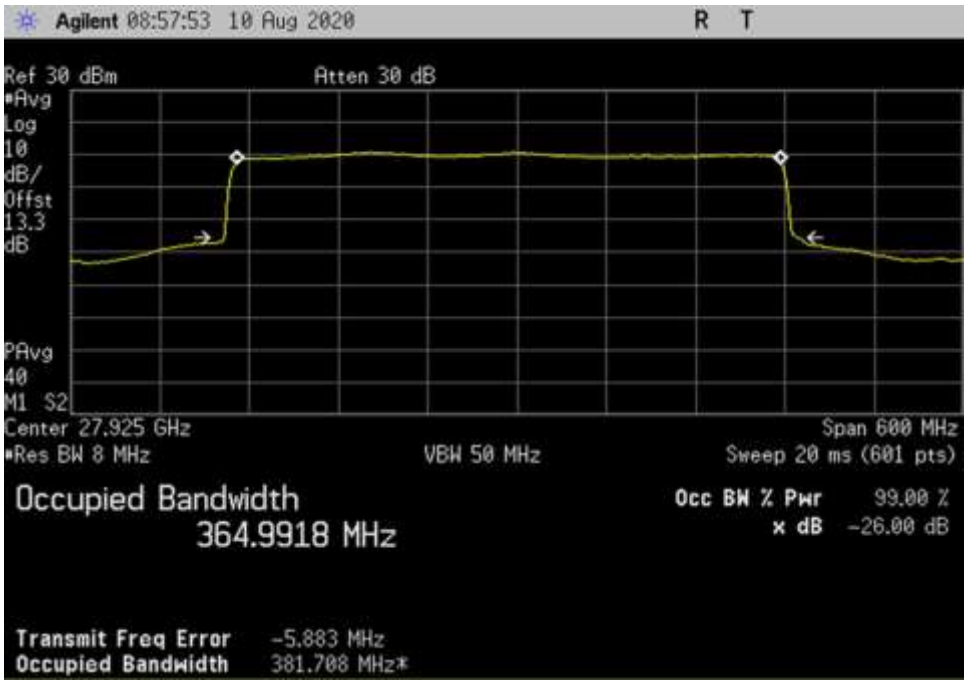
UL_27500-28350- Pi/2- BPSK-400MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



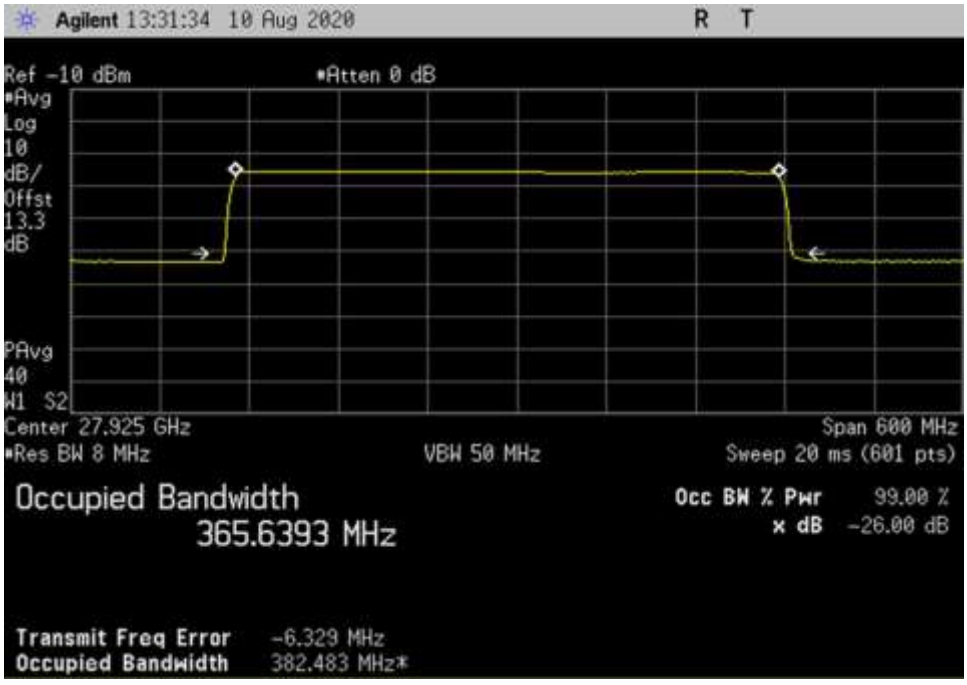
UL_27500-28350- Pi/2- BPSK-400MHz-H-DFT OFDM-Input_ 27925MHz_MC



UL_27500-28350- Pi/2- BPSK-400MHz-V-DFT OFDM_ 27925MHz_MC

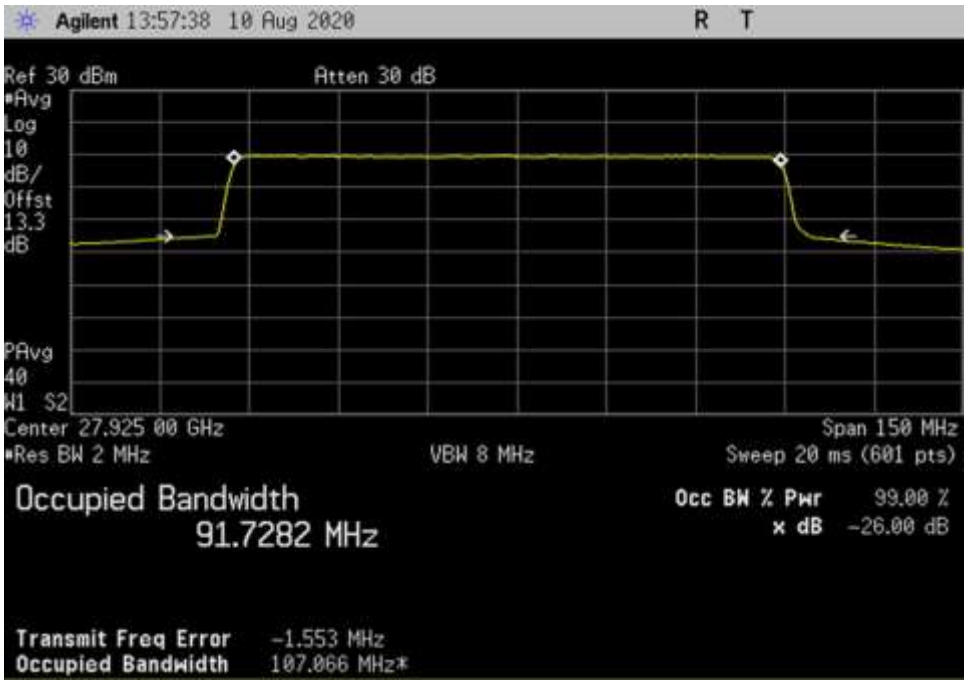


UL_27500-28350- Pi/2- BPSK-400MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC

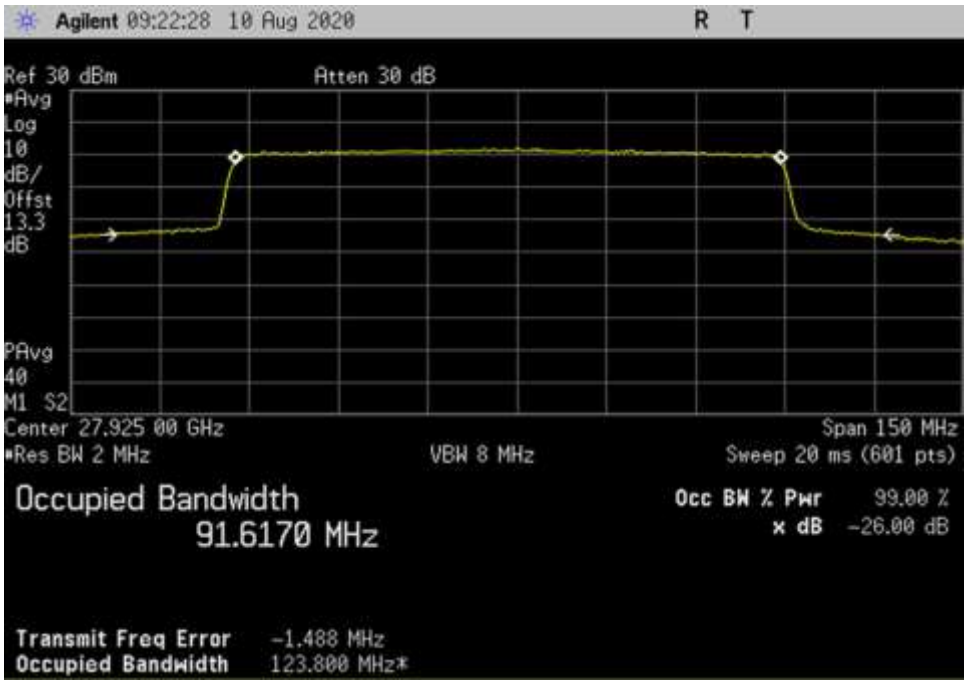


UL_27500-28350- Pi/2- BPSK-400MHz-V-DFT OFDM-Input_ 27925MHz_MC

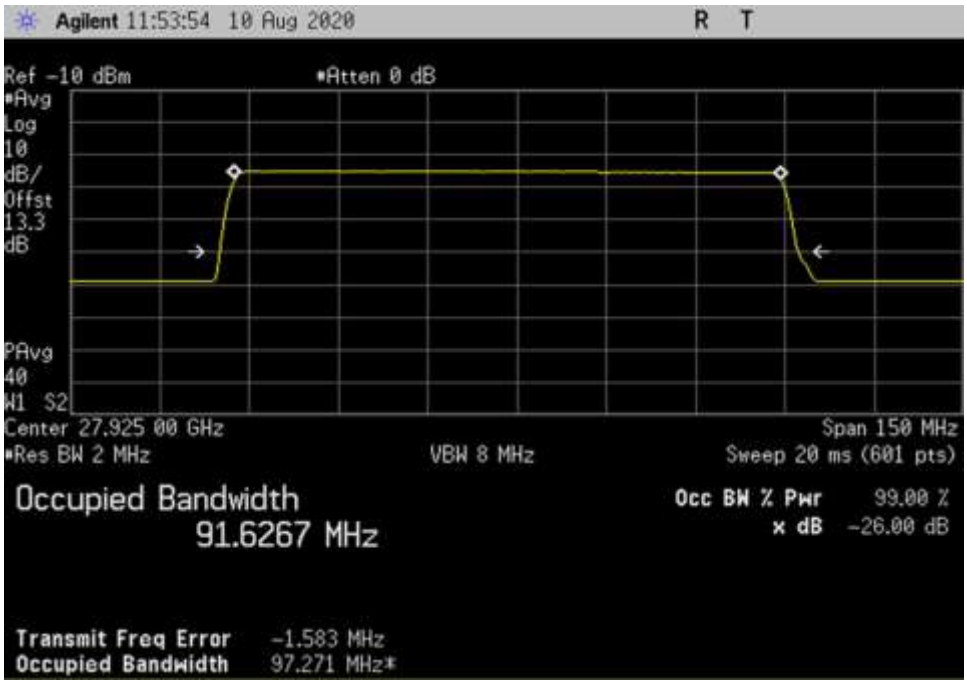
DFT – QPSK



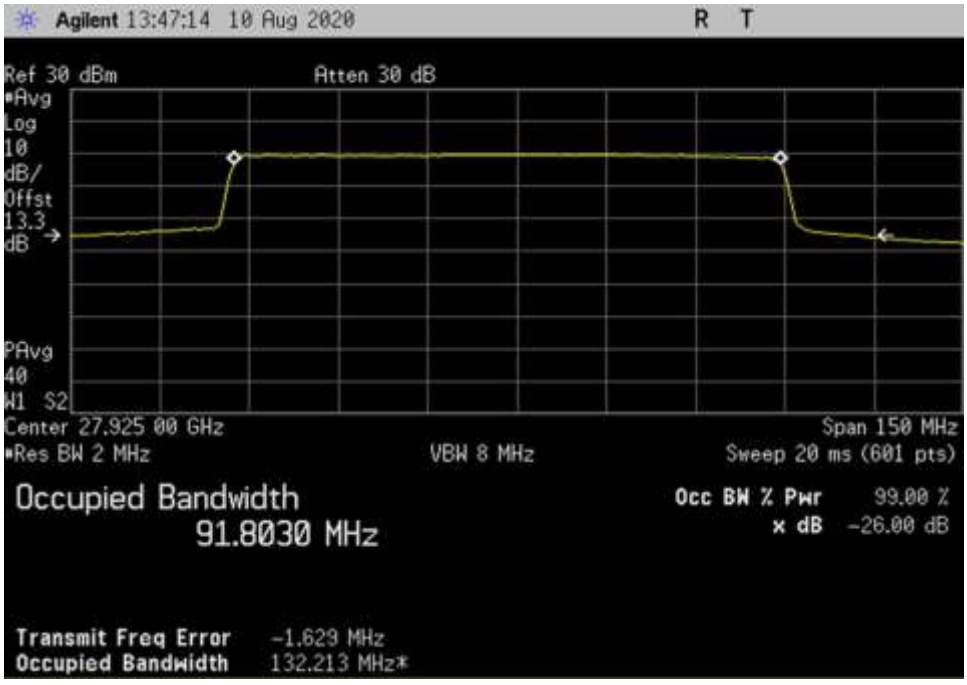
UL_27500-28350- QPSK-100MHz-H-DFT OFDM_ 27925MHz_MC



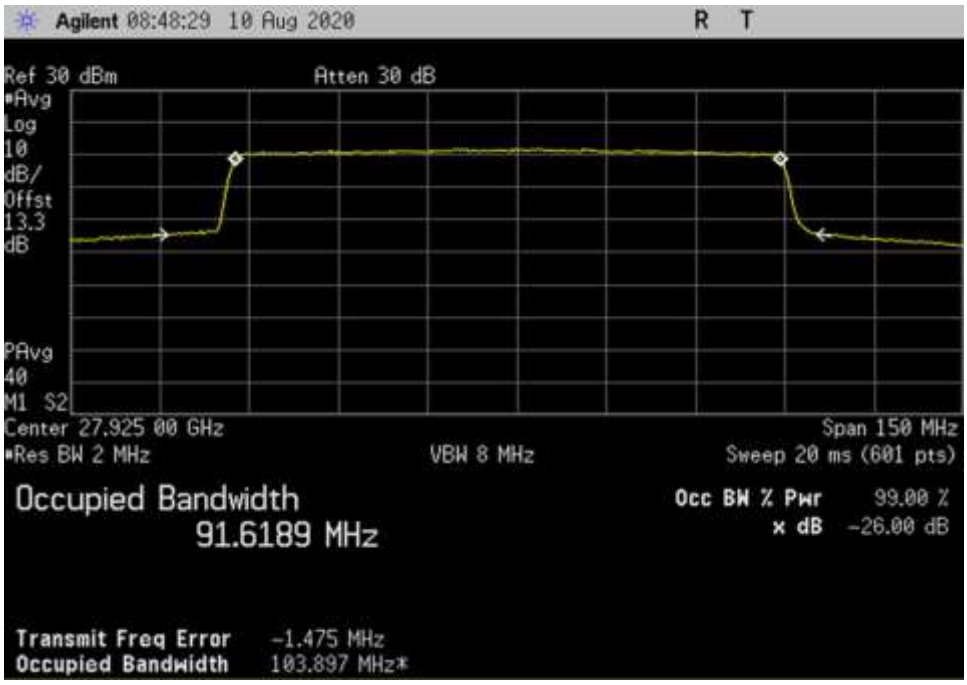
UL_27500-28350- QPSK-100MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



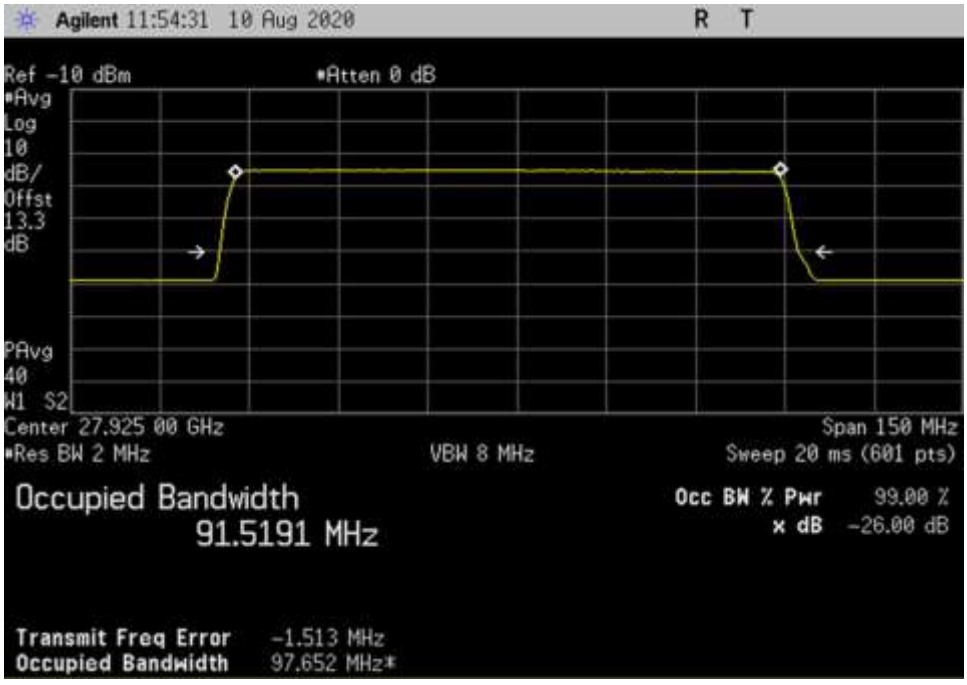
UL_27500-28350- QPSK-100MHz-H-DFT OFDM-Input_ 27925MHz_MC



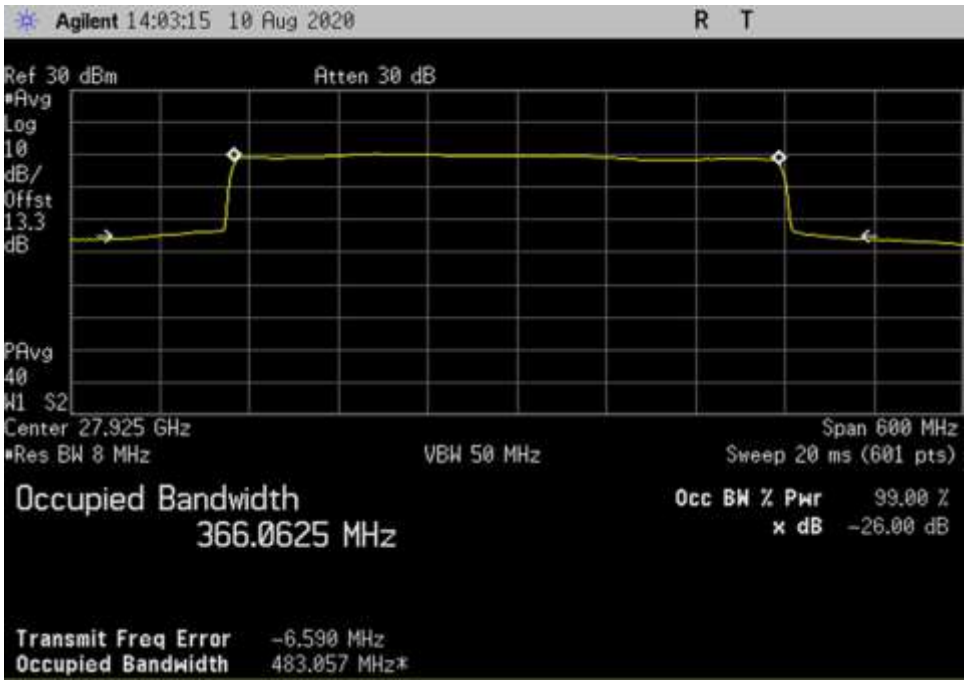
UL_27500-28350- QPSK-100MHz-V-DFT OFDM_ 27925MHz_MC



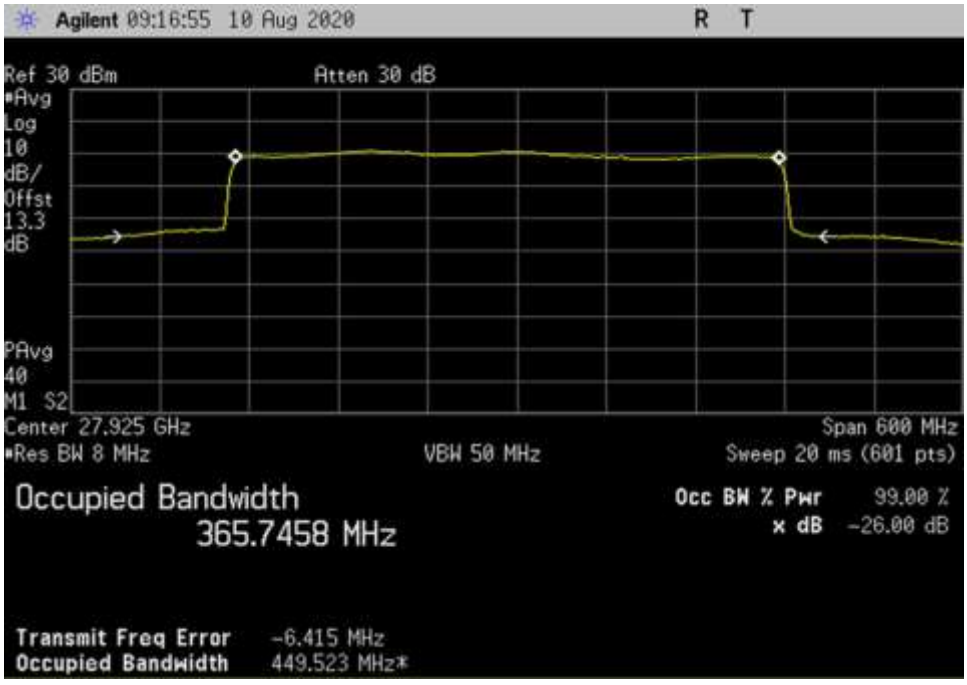
UL_27500-28350- QPSK-100MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC



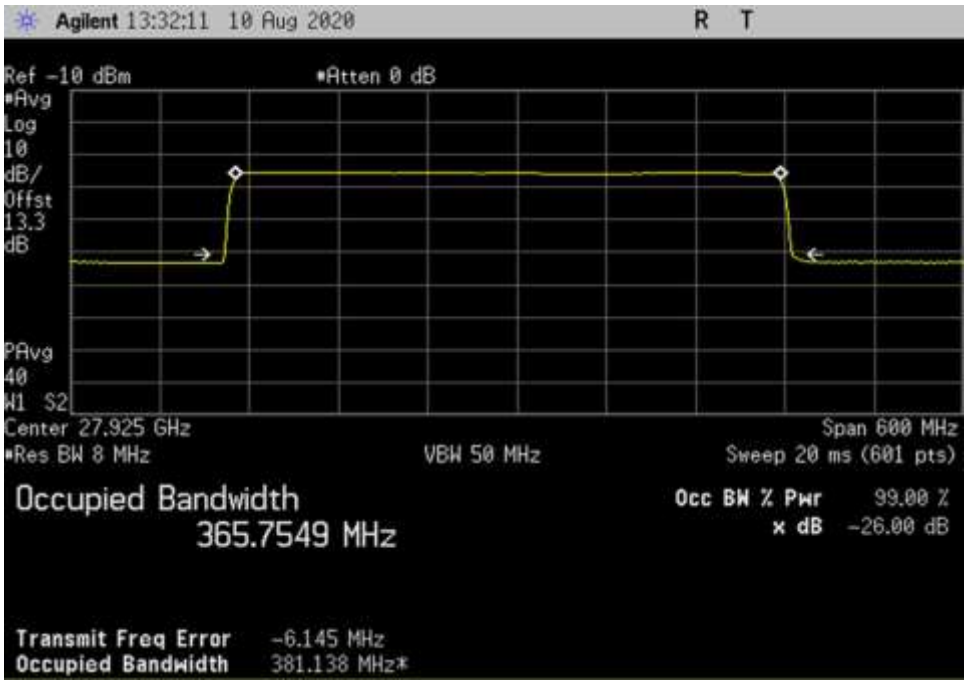
UL_27500-28350- QPSK-100MHz-V-DFT OFDM-Input_ 27925MHz_MC



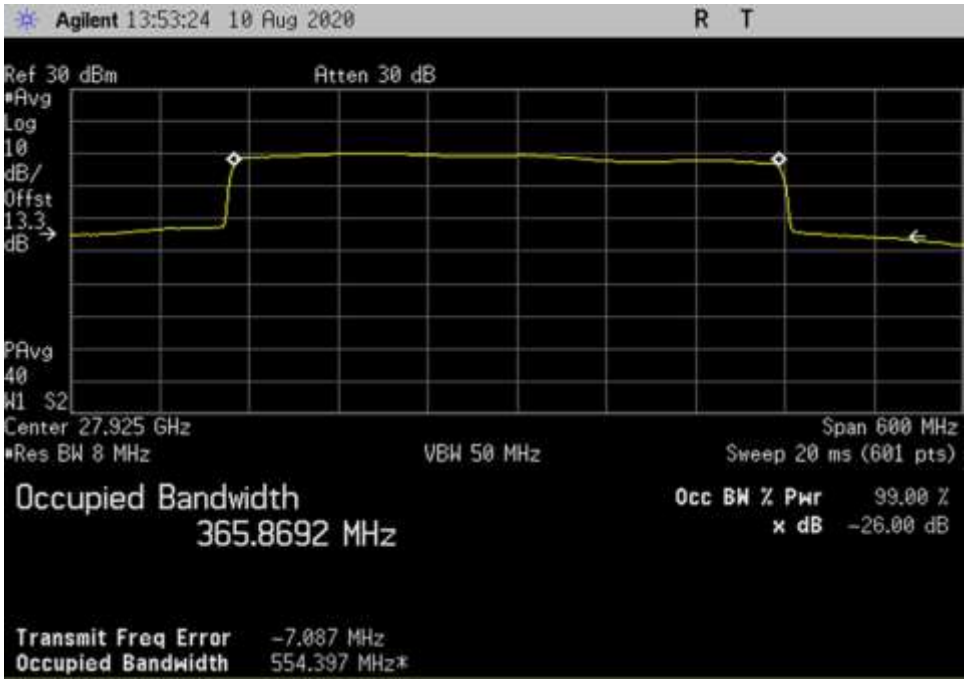
UL_27500-28350- QPSK-400MHz-H-DFT OFDM_ 27925MHz_MC



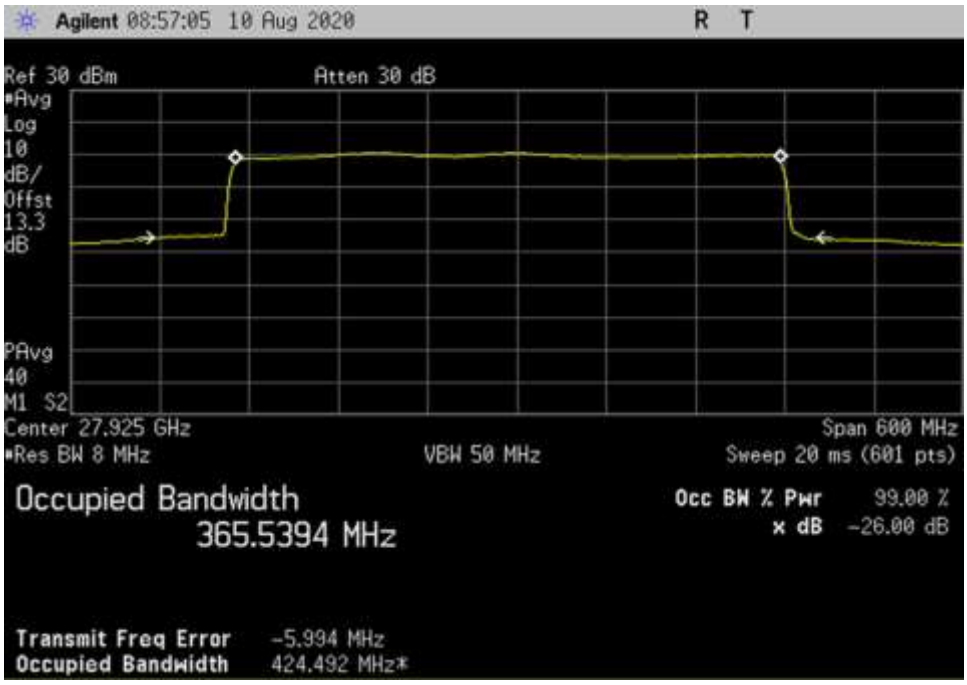
UL_27500-28350- QPSK-400MHz-H-DFT OFDM-AGC+3_ 27925MHz_MC



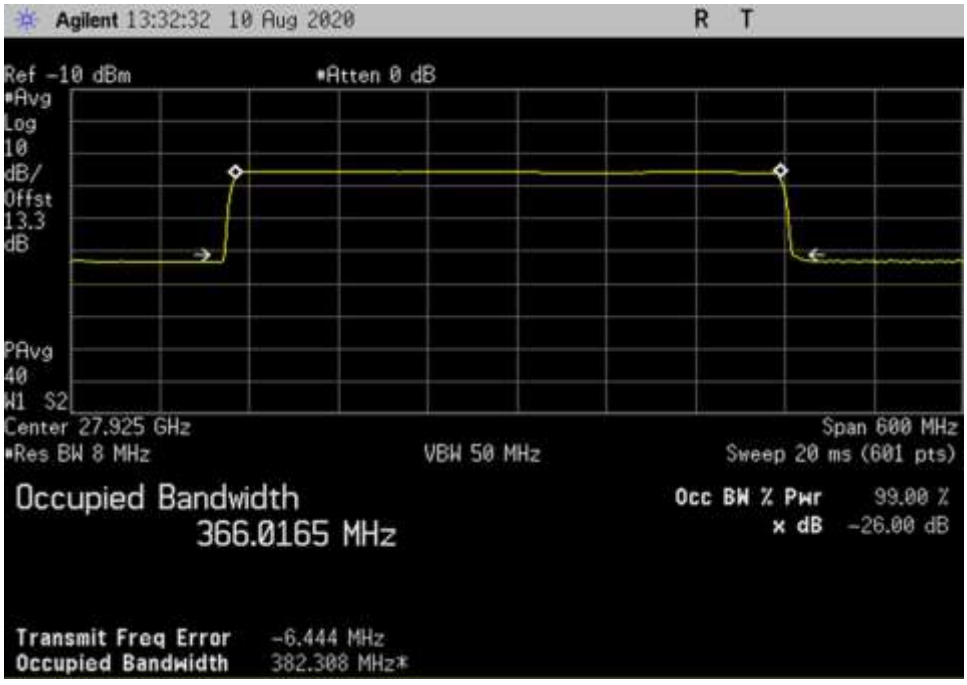
UL_27500-28350- QPSK-400MHz-H-DFT OFDM-Input_ 27925MHz_MC



UL_27500-28350- QPSK-400MHz-V-DFT OFDM_ 27925MHz_MC



UL_27500-28350- QPSK-400MHz-V-DFT OFDM-AGC+3_ 27925MHz_MC



UL_27500-28350- QPSK-400MHz-V-DFT OFDM-Input_ 27925MHz_MC

3.5 Mean Output Power and Amplifier / Booster Gain

Test Setup/Conditions			
Test Location:	Fremont	Test Engineer:	H. Nguyenpham
Test Date(s):	8/13, 18, 24, and 25/2020		
Configuration:	1		
Test Setup:	See General Test Setup Spectrum Analyzer= Channel Power Function with integrated emission occupy bandwidth RBW=1-5% of EOW VBW > 3XRBW Detector=RMS Trace Mode= Over 100 Sweeps Number of Sweep points > 2 X Span/ RBW §30.202 Power limits (a) For fixed and base stations operating in connection with mobile systems, the average power of the sum of all antenna elements is limited to an equivalent isotopically radiated power (EIRP) density of +75dBm/100MHz. For channel bandwidths less than 100 megahertz the EIRP must be reduced proportionally and linearly based on the bandwidth relative to 100 megahertz.		
Declaration:	Modification #1 was in place during testing.		

Environmental Conditions			
Test Date	**Temperature (ºC)**	**Relative Humidity (%):**	**Pressure: kPa**
8/13/2020	22.5	42	102.1
8/18/2020	23.4	53	100.5
8/24/2020	22.4	47	101.5
8/25/2020	23.5	48	100.8

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
P05411	Attenuator	Weinschel	54A-10	11/27/2019	11/27/2021
P07192	Cable	Astro	32022-29094K-29094K-48TC	11/27/2019	11/27/2021
03360	Cable	Astrolab	32022-2-29094-36TC	4/9/2020	4/9/2022
02668	Spectrum Analyzer	Agilent	E4446A	12/17/2019	12/17/2020
R00173	Vector Signal Generator	Rohde & Schwarz	SMW200A-B140	7/22/2019	7/22/2022

Summary of Results

1/ UL-H (CP-OFDM)

Multiple Access Scheme	Polarity	Direction	Modulation	Channel Bandwidth (MHz)	No RBS	RB Offset	Center Frequency (MHz)	Conducted Power (dBm)	Sis Gen Output (dBm)	Cable Loss output (dB)	Gain (dB)
CP-OFDM	Horizontal	UL	QPSK	100	Full	0	27550	25.7	-40.4	-3.9	70
CP-OFDM	Horizontal	UL	QPSK	100	Full	0	27819	25.7	-43.1	-3.9	72.7
CP-OFDM	Horizontal	UL	QPSK	100	Full	0	28300	25.7	-41.5	-3.9	71.1
CP-OFDM	Horizontal	UL	QPSK	400	Full	0	27700	26.2	-41.1	-3.9	71.2
CP-OFDM	Horizontal	UL	QPSK	400	Full	0	27819	26	-41.7	-3.9	71.6
CP-OFDM	Horizontal	UL	QPSK	400	Full	0	28150	25.7	-41.8	-3.9	71.4
CP-OFDM	Horizontal	UL	QPSK	100	1	0	27550	24.8	-42.5	-3.9	71.2
CP-OFDM	Horizontal	UL	QPSK	100	1	0	27819	24.8	-44	-3.9	72.7
CP-OFDM	Horizontal	UL	QPSK	100	1	0	28300	24.4	-42.5	-3.9	70.8
CP-OFDM	Horizontal	UL	QPSK	400	1	0	27700	25.3	-41.7	-3.9	70.9
CP-OFDM	Horizontal	UL	QPSK	400	1	0	27819	25.6	-42.8	-3.9	72.3
CP-OFDM	Horizontal	UL	QPSK	400	1	0	28150	25.5	-41.8	-3.9	71.2
CP-OFDM	Horizontal	UL	16QAM	100	Full	0	27550	25.8	-40.2	-3.9	69.9
CP-OFDM	Horizontal	UL	16QAM	100	Full	0	27819	25.7	-42.7	-3.9	72.3
CP-OFDM	Horizontal	UL	16QAM	100	Full	0	28300	25.7	-40.9	-3.9	70.5
CP-OFDM	Horizontal	UL	16QAM	400	Full	0	27700	26	-41.4	-3.9	71.3
CP-OFDM	Horizontal	UL	16QAM	400	Full	0	27819	26	-42	-3.9	71.9
CP-OFDM	Horizontal	UL	16QAM	400	Full	0	28150	25.9	-41.3	-3.9	71.1
CP-OFDM	Horizontal	UL	16QAM	100	1	0	27550	25	-41	-3.9	69.9
CP-OFDM	Horizontal	UL	16QAM	100	1	0	27819	24.8	-43.2	-3.9	71.9
CP-OFDM	Horizontal	UL	16QAM	100	1	0	28300	24.1	-44.2	-3.9	72.2
CP-OFDM	Horizontal	UL	16QAM	400	1	0	27700	25.3	-42.1	-3.9	71.3
CP-OFDM	Horizontal	UL	16QAM	400	1	0	27819	25.7	-43.4	-3.9	73
CP-OFDM	Horizontal	UL	16QAM	400	1	0	28150	25.5	-41.8	-3.9	71.2
CP-OFDM	Horizontal	UL	64QAM	100	Full	0	27550	25.6	-40.5	-3.9	70
CP-OFDM	Horizontal	UL	64QAM	100	Full	0	27819	25.8	-42.9	-3.9	72.6
CP-OFDM	Horizontal	UL	64QAM	100	Full	0	28300	25.6	-41.1	-3.9	70.6
CP-OFDM	Horizontal	UL	64QAM	400	Full	0	27700	25.8	-40.7	-3.9	70.4
CP-OFDM	Horizontal	UL	64QAM	400	Full	0	27819	25.3	-43.9	-3.9	73.1
CP-OFDM	Horizontal	UL	64QAM	400	Full	0	28150	25.3	-43.9	-3.9	73.1
CP-OFDM	Horizontal	UL	64QAM	100	1	0	27550	24	-43.4	-3.9	71.3
CP-OFDM	Horizontal	UL	64QAM	100	1	0	27819	24.8	-42.9	-3.9	71.6
CP-OFDM	Horizontal	UL	64QAM	100	1	0	28300	24.8	-41.8	-3.9	70.5
CP-OFDM	Horizontal	UL	64QAM	400	1	0	27700	26.1	-41.2	-3.9	71.2
CP-OFDM	Horizontal	UL	64QAM	400	1	0	27819	26	-42	-3.9	71.9
CP-OFDM	Horizontal	UL	64QAM	400	1	0	28150	25.9	-41.2	-3.9	71
CP-OFDM	Horizontal	UL	256QAM	100	Full	0	27550	25.7	-40.3	-3.9	69.9
CP-OFDM	Horizontal	UL	256QAM	100	Full	0	27819	25.7	-43	-3.9	72.6
CP-OFDM	Horizontal	UL	256QAM	100	Full	0	28300	25.7	-41.3	-3.9	70.9
CP-OFDM	Horizontal	UL	256QAM	400	Full	0	27700	26.1	-41.2	-3.9	71.2
CP-OFDM	Horizontal	UL	256QAM	400	Full	0	27819	26	-41.9	-3.9	71.8
CP-OFDM	Horizontal	UL	256QAM	400	Full	0	28150	25.9	-41.4	-3.9	71.2
CP-OFDM	Horizontal	UL	256QAM	100	1	0	27550	24.2	-41.2	-3.9	69.3
CP-OFDM	Horizontal	UL	256QAM	100	1	0	27819	24.7	-44	-3.9	72.6
CP-OFDM	Horizontal	UL	256QAM	100	1	0	28300	24.6	-44.3	-3.9	72.8
CP-OFDM	Horizontal	UL	256QAM	400	1	0	27700	25.4	-41.8	-3.9	71.1

CP-OFDM	Horizontal	UL	256QAM	400	1	0	27819	25.5	-43.7	-3.9	73.1
CP-OFDM	Horizontal	UL	256QAM	400	1	0	28150	25.1	-44.5	-3.9	73.5

2/ UL-H (DFT-s-OFDM)

Multiple Access Scheme	Polarity	Direction	Modulation	Channel Bandwidth (MHz)	No RBS	RB Offset	Center Frequency (MHz)	Conducted Power (dBm)	Sis Gen Output (dBm)	Cable Loss output (dB)	Gain (dB)
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	100	Full	0	27550	26.3	-40.1	-3.9	70.3
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	100	Full	0	27819	26.4	-42.5	-3.9	72.8
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	100	Full	0	28300	26.2	-40.7	-3.9	70.8
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	400	Full	0	27700	26.9	-41.4	-3.9	72.2
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	400	Full	0	27819	26.8	-42.2	-3.9	72.9
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	400	Full	0	28150	26.6	-41.8	-3.9	72.3
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	100	1	0	27550	25.7	-41.7	-3.9	71.3
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	100	1	0	27819	25.9	-43.3	-3.9	73.1
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	100	1	0	28300	25.7	-42.2	-3.9	71.8
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	400	1	0	27700	26.2	-40.4	-3.9	70.5
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	400	1	0	27819	26.4	-42.9	-3.9	73.2
DFT-s-OFDM	Horizontal	UL	<pi>/2-BPSK	400	1	0	28150	26.4	-43.2	-3.9	73.5
DFT-s-OFDM	Horizontal	UL	QPSK	100	Full	0	27550	26.4	-39.7	-3.9	70
DFT-s-OFDM	Horizontal	UL	QPSK	100	Full	0	27819	26.4	-42.4	-3.9	72.7
DFT-s-OFDM	Horizontal	UL	QPSK	100	Full	0	28300	26.2	-41	-3.9	71.1
DFT-s-OFDM	Horizontal	UL	QPSK	400	Full	0	27700	26.7	-40.8	-3.9	71.4
DFT-s-OFDM	Horizontal	UL	QPSK	400	Full	0	27819	26.7	-41.9	-3.9	72.5
DFT-s-OFDM	Horizontal	UL	QPSK	400	Full	0	28150	26.5	-41.5	-3.9	71.9
DFT-s-OFDM	Horizontal	UL	QPSK	100	1	0	27550	25.7	-41.3	-3.9	70.9
DFT-s-OFDM	Horizontal	UL	QPSK	100	1	0	27819	26.1	-42.2	-3.9	72.2
DFT-s-OFDM	Horizontal	UL	QPSK	100	1	0	28300	25.9	-41.3	-3.9	71.1
DFT-s-OFDM	Horizontal	UL	QPSK	400	1	0	27700	26.2	-40.8	-3.9	70.9
DFT-s-OFDM	Horizontal	UL	QPSK	400	1	0	27819	26.1	-42.8	-3.9	72.8
DFT-s-OFDM	Horizontal	UL	QPSK	400	1	0	28150	26.3	-43.1	-3.9	73.3
DFT-s-OFDM	Horizontal	UL	16QAM	100	Full	0	27550	26.1	-39.7	-3.9	69.7
DFT-s-OFDM	Horizontal	UL	16QAM	100	Full	0	27819	26.1	-42.6	-3.9	72.6
DFT-s-OFDM	Horizontal	UL	16QAM	100	Full	0	28300	26	-41.1	-3.9	71
DFT-s-OFDM	Horizontal	UL	16QAM	400	Full	0	27700	26.4	-41.2	-3.9	71.5
DFT-s-OFDM	Horizontal	UL	16QAM	400	Full	0	27819	26.3	-42	-3.9	72.2
DFT-s-OFDM	Horizontal	UL	16QAM	400	Full	0	28150	26.2	-41.5	-3.9	71.6
DFT-s-OFDM	Horizontal	UL	16QAM	100	1	0	27550	25.7	-39.7	-3.9	69.3
DFT-s-OFDM	Horizontal	UL	16QAM	100	1	0	27819	25.9	-42.8	-3.9	72.6
DFT-s-OFDM	Horizontal	UL	16QAM	100	1	0	28300	25.4	-41.2	-3.9	70.5
DFT-s-OFDM	Horizontal	UL	16QAM	400	1	0	27700	26.3	-40.2	-3.9	70.4
DFT-s-OFDM	Horizontal	UL	16QAM	400	1	0	27819	26.3	-42.1	-3.9	72.3
DFT-s-OFDM	Horizontal	UL	16QAM	400	1	0	28150	26.1	-42.8	-3.9	72.8
DFT-s-OFDM	Horizontal	UL	64QAM	100	Full	0	27550	26	-40	-3.9	69.9
DFT-s-OFDM	Horizontal	UL	64QAM	100	Full	0	27819	26	-42.4	-3.9	72.3
DFT-s-OFDM	Horizontal	UL	64QAM	100	Full	0	28300	26	-40.9	-3.9	70.8
DFT-s-OFDM	Horizontal	UL	64QAM	400	Full	0	27700	26.3	-41.3	-3.9	71.5
DFT-s-OFDM	Horizontal	UL	64QAM	400	Full	0	27819	26.4	-41.9	-3.9	72.2
DFT-s-OFDM	Horizontal	UL	64QAM	400	Full	0	28150	26.2	-41.3	-3.9	71.4
DFT-s-OFDM	Horizontal	UL	64QAM	100	1	0	27550	25.7	-42.6	-3.9	72.2
DFT-s-OFDM	Horizontal	UL	64QAM	100	1	0	27819	26.1	-43.2	-3.9	73.2
DFT-s-OFDM	Horizontal	UL	64QAM	100	1	0	28300	25.7	-40.8	-3.9	70.4

DFT-s-OFDM	Horizontal	UL	64QAM	400	1	0	27700	26.1	-39.6	-3.9	69.6
DFT-s-OFDM	Horizontal	UL	64QAM	400	1	0	27819	25.9	-42.6	-3.9	72.4
DFT-s-OFDM	Horizontal	UL	64QAM	400	1	0	28150	26	-42	-3.9	71.9
DFT-s-OFDM	Horizontal	UL	256QAM	100	Full	0	27550	26.1	-39.5	-3.9	69.5
DFT-s-OFDM	Horizontal	UL	256QAM	100	Full	0	27819	26.1	-42.4	-3.9	72.4
DFT-s-OFDM	Horizontal	UL	256QAM	100	Full	0	28300	25.8	-40.8	-3.9	70.5
DFT-s-OFDM	Horizontal	UL	256QAM	400	Full	0	27700	26.5	-40.8	-3.9	71.2
DFT-s-OFDM	Horizontal	UL	256QAM	400	Full	0	27819	26.2	-41.6	-3.9	71.7
DFT-s-OFDM	Horizontal	UL	256QAM	400	Full	0	28150	26.3	-41.5	-3.9	71.7
DFT-s-OFDM	Horizontal	UL	256QAM	100	1	0	27550	25.8	-42.5	-3.9	72.2
DFT-s-OFDM	Horizontal	UL	256QAM	100	1	0	27819	26.2	-43.2	-3.9	73.3
DFT-s-OFDM	Horizontal	UL	256QAM	100	1	0	28300	25.8	-42.9	-3.9	72.6
DFT-s-OFDM	Horizontal	UL	256QAM	400	1	0	27700	26.1	-40.3	-3.9	70.3
DFT-s-OFDM	Horizontal	UL	256QAM	400	1	0	27819	26.1	-42.6	-3.9	72.6
DFT-s-OFDM	Horizontal	UL	256QAM	400	1	0	28150	25.9	-42.8	-3.9	72.6

3/ UL-V (CP-OFDM)

Multiple Access Scheme	Polarity	Direction	Modulation	Channel Bandwidth (MHz)	No RBS	RB Offset	Center Frequency (MHz)	Conducted Power (dBm)	Sis Gen Output (dBm)	Cable Loss output (dB)	Gain (dB)
CP-OFDM	Vertical	UL	QPSK	100	Full	0	27550	25.1	-37.8	-3.9	66.8
CP-OFDM	Vertical	UL	QPSK	100	Full	0	28150	24.8	-40.1	-3.9	68.8
CP-OFDM	Vertical	UL	QPSK	100	Full	0	28300	24.8	-39.8	-3.9	68.5
CP-OFDM	Vertical	UL	QPSK	400	Full	0	27700	25.8	-38.8	-3.9	68.5
CP-OFDM	Vertical	UL	QPSK	400	Full	0	27925	26	-38.7	-3.9	68.6
CP-OFDM	Vertical	UL	QPSK	400	Full	0	28150	25.6	-39.5	-3.9	69
CP-OFDM	Vertical	UL	QPSK	100	1	0	27550	24.4	-37.3	-3.9	65.6
CP-OFDM	Vertical	UL	QPSK	100	1	0	28150	24.5	-37.1	-3.9	65.5
CP-OFDM	Vertical	UL	QPSK	100	1	0	28300	24.5	-41.3	-3.9	69.7
CP-OFDM	Vertical	UL	QPSK	400	1	0	27700	25.2	-39.3	-3.9	68.4
CP-OFDM	Vertical	UL	QPSK	400	1	0	27925	24.6	-41.4	-3.9	69.9
CP-OFDM	Vertical	UL	QPSK	400	1	0	28150	25.3	-40.5	-3.9	69.7
CP-OFDM	Vertical	UL	16QAM	100	Full	0	27550	25.2	-39.8	-3.9	68.9
CP-OFDM	Vertical	UL	16QAM	100	Full	0	28150	25.1	-41	-3.9	70
CP-OFDM	Vertical	UL	16QAM	100	Full	0	28300	25.2	-41.1	-3.9	70.2
CP-OFDM	Vertical	UL	16QAM	400	Full	0	27700	25.8	-38.1	-3.9	67.8
CP-OFDM	Vertical	UL	16QAM	400	Full	0	27925	25.7	-39.2	-3.9	68.8
CP-OFDM	Vertical	UL	16QAM	400	Full	0	28150	25.6	-38.8	-3.9	68.3
CP-OFDM	Vertical	UL	16QAM	100	1	0	27550	24.9	-38.2	-3.9	67
CP-OFDM	Vertical	UL	16QAM	100	1	0	28150	24.7	-40.3	-3.9	68.9
CP-OFDM	Vertical	UL	16QAM	100	1	0	28300	24.8	-42.1	-3.9	70.8
CP-OFDM	Vertical	UL	16QAM	400	1	0	27700	25	-38.7	-3.9	67.6
CP-OFDM	Vertical	UL	16QAM	400	1	0	27925	25.3	-39.9	-3.9	69.1
CP-OFDM	Vertical	UL	16QAM	400	1	0	28150	24.7	-40.2	-3.9	68.8
CP-OFDM	Vertical	UL	64QAM	100	Full	0	27550	25.3	-39.5	-3.9	68.7
CP-OFDM	Vertical	UL	64QAM	100	Full	0	28150	24.8	-41.8	-3.9	70.5
CP-OFDM	Vertical	UL	64QAM	100	Full	0	28300	25.1	-40.8	-3.9	69.8
CP-OFDM	Vertical	UL	64QAM	400	Full	0	27700	25.7	-38	-3.9	67.6
CP-OFDM	Vertical	UL	64QAM	400	Full	0	27925	25.9	-38.2	-3.9	68
CP-OFDM	Vertical	UL	64QAM	400	Full	0	28150	25.9	-38.9	-3.9	68.7
CP-OFDM	Vertical	UL	64QAM	100	1	0	27550	24.9	-38.4	-3.9	67.2
CP-OFDM	Vertical	UL	64QAM	100	1	0	28150	24.6	-40.5	-3.9	69

CP-OFDM	Vertical	UL	64QAM	100	1	0	28300	25.5	-40.8	-3.9	70.2
CP-OFDM	Vertical	UL	64QAM	400	1	0	27700	24.9	-39	-3.9	67.8
CP-OFDM	Vertical	UL	64QAM	400	1	0	27925	24.5	-41.2	-3.9	69.6
CP-OFDM	Vertical	UL	64QAM	400	1	0	28150	24.9	-41.1	-3.9	69.9
CP-OFDM	Vertical	UL	256QAM	100	Full	0	27550	25.1	-39	-3.9	68
CP-OFDM	Vertical	UL	256QAM	100	Full	0	28150	24.9	-41.2	-3.9	70
CP-OFDM	Vertical	UL	256QAM	100	Full	0	28300	25	-40.3	-3.9	69.2
CP-OFDM	Vertical	UL	256QAM	400	Full	0	27700	25.6	-38.1	-3.9	67.6
CP-OFDM	Vertical	UL	256QAM	400	Full	0	27925	25.8	-38.6	-3.9	68.3
CP-OFDM	Vertical	UL	256QAM	400	Full	0	28150	25.6	-38.3	-3.9	67.8
CP-OFDM	Vertical	UL	256QAM	100	1	0	27550	25.1	-37.4	-3.9	66.4
CP-OFDM	Vertical	UL	256QAM	100	1	0	28150	24.9	-40.8	-3.9	69.6
CP-OFDM	Vertical	UL	256QAM	100	1	0	28300	25.3	-39.9	-3.9	69.1
CP-OFDM	Vertical	UL	256QAM	400	1	0	27700	24.6	-39.3	-3.9	67.8
CP-OFDM	Vertical	UL	256QAM	400	1	0	27925	24.9	-40.1	-3.9	68.9
CP-OFDM	Vertical	UL	256QAM	400	1	0	28150	24.8	-40.9	-3.9	69.6

4/ UL-V (DFT-s-OFDM)

Multiple Access Scheme	Polarity	Direction	Modulation	Channel Bandwidth (MHz)	No RBS	RB Offset	Center Frequency (MHz)	Conducted Power (dBm)	Sis Gen Output (dBm)	Cable Loss output (dB)	Gain (dB)
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	100	Full	0	27550	26.5	-35.9	-3.9	66.3
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	100	Full	0	28150	26.2	-37.8	-3.9	67.9
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	100	Full	0	28300	26.3	-37.9	-3.9	68.1
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	400	Full	0	27700	26.6	-37.6	-3.9	68.1
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	400	Full	0	27925	26.3	-38.6	-3.9	68.8
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	400	Full	0	28150	26.5	-38.8	-3.9	69.2
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	100	1	0	27550	26	-37	-3.9	66.9
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	100	1	0	28150	26.1	-38.7	-3.9	68.7
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	100	1	0	28300	26.3	-37.2	-3.9	67.4
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	400	1	0	27700	26	-37.3	-3.9	67.2
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	400	1	0	27925	26.1	-38.7	-3.9	68.7
DFT-s-OFDM	Vertical	UL	<pi>/2-BPSK	400	1	0	28150	25.9	-38	-3.9	67.8
DFT-s-OFDM	Vertical	UL	QPSK	100	Full	0	27550	26.2	-36.3	-3.9	66.4
DFT-s-OFDM	Vertical	UL	QPSK	100	Full	0	28150	26.3	-38.3	-3.9	68.5
DFT-s-OFDM	Vertical	UL	QPSK	100	Full	0	28300	26.3	-37.8	-3.9	68
DFT-s-OFDM	Vertical	UL	QPSK	400	Full	0	27700	26.7	-37	-3.9	67.6
DFT-s-OFDM	Vertical	UL	QPSK	400	Full	0	27925	26.6	-38	-3.9	68.5
DFT-s-OFDM	Vertical	UL	QPSK	400	Full	0	28150	26.5	-37.8	-3.9	68.2
DFT-s-OFDM	Vertical	UL	QPSK	100	1	0	27550	26.1	-36.7	-3.9	66.7
DFT-s-OFDM	Vertical	UL	QPSK	100	1	0	28150	25.8	-38.7	-3.9	68.4
DFT-s-OFDM	Vertical	UL	QPSK	100	1	0	28300	25.9	-39.8	-3.9	69.6
DFT-s-OFDM	Vertical	UL	QPSK	400	1	0	27700	25.2	-37.2	-3.9	66.3
DFT-s-OFDM	Vertical	UL	QPSK	400	1	0	27925	25.9	-39.1	-3.9	68.9
DFT-s-OFDM	Vertical	UL	QPSK	400	1	0	28150	26.3	-39.1	-3.9	69.3
DFT-s-OFDM	Vertical	UL	16QAM	100	Full	0	27550	26	-36.4	-3.9	66.3
DFT-s-OFDM	Vertical	UL	16QAM	100	Full	0	28150	25.9	-38.6	-3.9	68.4
DFT-s-OFDM	Vertical	UL	16QAM	100	Full	0	28300	25.9	-38.2	-3.9	68
DFT-s-OFDM	Vertical	UL	16QAM	400	Full	0	27700	26.3	-37.5	-3.9	67.7
DFT-s-OFDM	Vertical	UL	16QAM	400	Full	0	27925	26.3	-37.1	-3.9	67.3
DFT-s-OFDM	Vertical	UL	16QAM	400	Full	0	28150	26.2	-38.1	-3.9	68.2
DFT-s-OFDM	Vertical	UL	16QAM	100	1	0	27550	25.4	-37.3	-3.9	66.6

DFT-s-OFDM	Vertical	UL	16QAM	100	1	0	28150	25.9	-38.6	-3.9	68.4
DFT-s-OFDM	Vertical	UL	16QAM	100	1	0	28300	25.4	-39.7	-3.9	69
DFT-s-OFDM	Vertical	UL	16QAM	400	1	0	27700	25.7	-37.7	-3.9	67.3
DFT-s-OFDM	Vertical	UL	16QAM	400	1	0	27925	25.8	-39	-3.9	68.7
DFT-s-OFDM	Vertical	UL	16QAM	400	1	0	28150	26.2	-38.4	-3.9	68.5
DFT-s-OFDM	Vertical	UL	64QAM	100	Full	0	27550	25.8	-36.5	-3.9	66.2
DFT-s-OFDM	Vertical	UL	64QAM	100	Full	0	28150	25.8	-38.7	-3.9	68.4
DFT-s-OFDM	Vertical	UL	64QAM	100	Full	0	28300	25.9	-38.2	-3.9	68
DFT-s-OFDM	Vertical	UL	64QAM	400	Full	0	27700	26.2	-37.6	-3.9	67.7
DFT-s-OFDM	Vertical	UL	64QAM	400	Full	0	27925	26.2	-38.4	-3.9	68.5
DFT-s-OFDM	Vertical	UL	64QAM	400	Full	0	28150	26.3	-38.6	-3.9	68.8
DFT-s-OFDM	Vertical	UL	64QAM	100	1	0	27550	25.3	-36.3	-3.9	65.5
DFT-s-OFDM	Vertical	UL	64QAM	100	1	0	28150	25.2	-38.3	-3.9	67.4
DFT-s-OFDM	Vertical	UL	64QAM	100	1	0	28300	25.3	-39.9	-3.9	69.1
DFT-s-OFDM	Vertical	UL	64QAM	400	1	0	27700	25.7	-37.3	-3.9	66.9
DFT-s-OFDM	Vertical	UL	64QAM	400	1	0	27925	26	-38.4	-3.9	68.3
DFT-s-OFDM	Vertical	UL	64QAM	400	1	0	28150	26.2	-37.7	-3.9	67.8
DFT-s-OFDM	Vertical	UL	256QAM	100	Full	0	27550	25.9	-36.3	-3.9	66.1
DFT-s-OFDM	Vertical	UL	256QAM	100	Full	0	28150	25.8	-38.7	-3.9	68.4
DFT-s-OFDM	Vertical	UL	256QAM	100	Full	0	28300	25.8	-38.3	-3.9	68
DFT-s-OFDM	Vertical	UL	256QAM	400	Full	0	27700	26.3	-37.4	-3.9	67.6
DFT-s-OFDM	Vertical	UL	256QAM	400	Full	0	27925	26.5	-37.7	-3.9	68.1
DFT-s-OFDM	Vertical	UL	256QAM	400	Full	0	28150	26.2	-38.3	-3.9	68.4
DFT-s-OFDM	Vertical	UL	256QAM	100	1	0	27550	25.5	-36.8	-3.9	66.2
DFT-s-OFDM	Vertical	UL	256QAM	100	1	0	28150	25.2	-38.4	-3.9	67.5
DFT-s-OFDM	Vertical	UL	256QAM	100	1	0	28300	25.1	-38.2	-3.9	67.2
DFT-s-OFDM	Vertical	UL	256QAM	400	1	0	27700	26.3	-35.7	-3.9	65.9
DFT-s-OFDM	Vertical	UL	256QAM	400	1	0	27925	26.2	-38.4	-3.9	68.5
DFT-s-OFDM	Vertical	UL	256QAM	400	1	0	28150	25.9	-39	-3.9	68.8

5/ DL-H (CP-OFDM)

Multiple Access Scheme	Polarity	Direction	Modulation	Channel Bandwidth (MHz)	No RBS	RB Offset	Center Frequency (MHz)	Conducted Power (dBm)	Sis Gen Output (dBm)	Cable Loss output (dB)	Gain (dB)
CP-OFDM	Horizontal	DL	QPSK	100	Full	0	27550	25.4	-30.3	-3.9	59.6
CP-OFDM	Horizontal	DL	QPSK	100	Full	0	27840	25.5	-33.5	-3.9	62.9
CP-OFDM	Horizontal	DL	QPSK	100	Full	0	28300	25.5	-30.3	-3.9	59.7
CP-OFDM	Horizontal	DL	QPSK	400	Full	0	27700	26.2	-31.3	-3.9	61.4
CP-OFDM	Horizontal	DL	QPSK	400	Full	0	27840	26.2	-32	-3.9	62.1
CP-OFDM	Horizontal	DL	QPSK	400	Full	0	28150	26.2	-31.3	-3.9	61.4
CP-OFDM	Horizontal	DL	QPSK	100	1	0	27550	25.3	-30.2	-3.9	59.4
CP-OFDM	Horizontal	DL	QPSK	100	1	0	27840	25.5	-34	-3.9	63.4
CP-OFDM	Horizontal	DL	QPSK	100	1	0	28300	25.3	-31.4	-3.9	60.6
CP-OFDM	Horizontal	DL	QPSK	400	1	0	27700	26.1	-30.7	-3.9	60.7
CP-OFDM	Horizontal	DL	QPSK	400	1	0	27840	26.4	-35.3	-3.9	65.6
CP-OFDM	Horizontal	DL	QPSK	400	1	0	28150	26.4	-35	-3.9	65.3
CP-OFDM	Horizontal	DL	16QAM	100	Full	0	27550	25.3	-30.6	-3.9	59.8
CP-OFDM	Horizontal	DL	16QAM	100	Full	0	27840	25.4	-33.7	-3.9	63
CP-OFDM	Horizontal	DL	16QAM	100	Full	0	28300	25.5	-30.3	-3.9	59.7
CP-OFDM	Horizontal	DL	16QAM	400	Full	0	27700	26.3	-31.3	-3.9	61.5
CP-OFDM	Horizontal	DL	16QAM	400	Full	0	27840	26.3	-32.2	-3.9	62.4
CP-OFDM	Horizontal	DL	16QAM	400	Full	0	28150	26.2	-31.1	-3.9	61.2

CP-OFDM	Horizontal	DL	16QAM	100	1	0	27550	25.1	-30.4	-3.9	59.4
CP-OFDM	Horizontal	DL	16QAM	100	1	0	27840	25.6	-33.8	-3.9	63.3
CP-OFDM	Horizontal	DL	16QAM	100	1	0	28300	25.3	-32	-3.9	61.2
CP-OFDM	Horizontal	DL	16QAM	400	1	0	27700	26.1	-30.3	-3.9	60.3
CP-OFDM	Horizontal	DL	16QAM	400	1	0	27840	26.3	-34.4	-3.9	64.6
CP-OFDM	Horizontal	DL	16QAM	400	1	0	28150	26.2	-33.6	-3.9	63.7
CP-OFDM	Horizontal	DL	64QAM	100	Full	0	27550	25.5	-30.2	-3.9	59.6
CP-OFDM	Horizontal	DL	64QAM	100	Full	0	27840	25.6	-33.2	-3.9	62.7
CP-OFDM	Horizontal	DL	64QAM	100	Full	0	28300	25.6	-30.1	-3.9	59.6
CP-OFDM	Horizontal	DL	64QAM	400	Full	0	27700	26.7	-34.7	-3.9	65.3
CP-OFDM	Horizontal	DL	64QAM	400	Full	0	27840	26.7	-35.2	-3.9	65.8
CP-OFDM	Horizontal	DL	64QAM	400	Full	0	28150	26.7	-34.1	-3.9	64.7
CP-OFDM	Horizontal	DL	64QAM	100	1	0	27550	25.1	-30.8	-3.9	59.8
CP-OFDM	Horizontal	DL	64QAM	100	1	0	27840	25.3	-34.4	-3.9	63.6
CP-OFDM	Horizontal	DL	64QAM	100	1	0	28300	25.1	-31.8	-3.9	60.8
CP-OFDM	Horizontal	DL	64QAM	400	1	0	27700	26	-30.9	-3.9	60.8
CP-OFDM	Horizontal	DL	64QAM	400	1	0	27840	26.1	-34.6	-3.9	64.6
CP-OFDM	Horizontal	DL	64QAM	400	1	0	28150	26.2	-34.1	-3.9	64.2
CP-OFDM	Horizontal	DL	256QAM	100	Full	0	27550	25.5	-30.2	-3.9	59.6
CP-OFDM	Horizontal	DL	256QAM	100	Full	0	27840	25.4	-33.8	-3.9	63.1
CP-OFDM	Horizontal	DL	256QAM	100	Full	0	28300	25.5	-30.3	-3.9	59.7
CP-OFDM	Horizontal	DL	256QAM	400	Full	0	27700	26.7	-34.3	-3.9	64.9
CP-OFDM	Horizontal	DL	256QAM	400	Full	0	27840	26.6	-34.7	-3.9	65.2
CP-OFDM	Horizontal	DL	256QAM	400	Full	0	28150	26.6	-33.6	-3.9	64.1
CP-OFDM	Horizontal	DL	256QAM	100	1	0	27550	25.4	-30.2	-3.9	59.5
CP-OFDM	Horizontal	DL	256QAM	100	1	0	27840	25.4	-34.4	-3.9	63.7
CP-OFDM	Horizontal	DL	256QAM	100	1	0	28300	25.5	-31.6	-3.9	61
CP-OFDM	Horizontal	DL	256QAM	400	1	0	27700	25.6	-31.5	-3.9	61
CP-OFDM	Horizontal	DL	256QAM	400	1	0	27840	26	-34.7	-3.9	64.6
CP-OFDM	Horizontal	DL	256QAM	400	1	0	28150	26.1	-34.4	-3.9	64.4

6/ DL-V (CP-OFDM)

Multiple Access Scheme	Polarity	Direction	Modulation	Channel Bandwidth (MHz)	No RBS	RB Offset	Center Frequency (MHz)	Conducted Power (dBm)	Sis Gen Output (dBm)	Cable Loss output (dB)	Gain (dB)
CP-OFDM	Vertical	DL	QPSK	100	Full	0	27550	25.1	-34	-3.9	63
CP-OFDM	Vertical	DL	QPSK	100	Full	0	27819	24.9	-35.6	-3.9	64.4
CP-OFDM	Vertical	DL	QPSK	100	Full	0	28300	24.6	-32.5	-3.9	61
CP-OFDM	Vertical	DL	QPSK	400	Full	0	27700	25.5	-34.5	-3.9	63.9
CP-OFDM	Vertical	DL	QPSK	400	Full	0	27819	25.2	-34.7	-3.9	63.8
CP-OFDM	Vertical	DL	QPSK	400	Full	0	28150	25	-33.6	-3.9	62.5
CP-OFDM	Vertical	DL	QPSK	100	1	0	27550	25.1	-33.4	-3.9	62.4
CP-OFDM	Vertical	DL	QPSK	100	1	0	27819	24.6	-34.9	-3.9	63.4
CP-OFDM	Vertical	DL	QPSK	100	1	0	28300	24.3	-33.1	-3.9	61.3
CP-OFDM	Vertical	DL	QPSK	400	1	0	27700	25.5	-32.9	-3.9	62.3
CP-OFDM	Vertical	DL	QPSK	400	1	0	27819	25.3	-35.1	-3.9	64.3
CP-OFDM	Vertical	DL	QPSK	400	1	0	28150	25.2	-35.1	-3.9	64.2
CP-OFDM	Vertical	DL	16QAM	100	Full	0	27550	25.2	-34	-3.9	63.1
CP-OFDM	Vertical	DL	16QAM	100	Full	0	27819	24.8	-35.2	-3.9	63.9
CP-OFDM	Vertical	DL	16QAM	100	Full	0	28300	24.5	-32.6	-3.9	61
CP-OFDM	Vertical	DL	16QAM	400	Full	0	27700	25.5	-34.1	-3.9	63.5
CP-OFDM	Vertical	DL	16QAM	400	Full	0	27819	25.2	-34.9	-3.9	64

CP-OFDM	Vertical	DL	16QAM	400	Full	0	28150	24.9	-33.7	-3.9	62.5
CP-OFDM	Vertical	DL	16QAM	100	1	0	27550	24.9	-33.4	-3.9	62.2
CP-OFDM	Vertical	DL	16QAM	100	1	0	27819	24.9	-34.3	-3.9	63.1
CP-OFDM	Vertical	DL	16QAM	100	1	0	28300	24.4	-32.5	-3.9	60.8
CP-OFDM	Vertical	DL	16QAM	400	1	0	27700	25.1	-33.6	-3.9	62.6
CP-OFDM	Vertical	DL	16QAM	400	1	0	27819	25	-36.6	-3.9	65.5
CP-OFDM	Vertical	DL	16QAM	400	1	0	28150	24.9	-34.7	-3.9	63.5
CP-OFDM	Vertical	DL	64QAM	100	Full	0	27550	25.2	-33.9	-3.9	63
CP-OFDM	Vertical	DL	64QAM	100	Full	0	27819	24.8	-35.5	-3.9	64.2
CP-OFDM	Vertical	DL	64QAM	100	Full	0	28300	24.4	-32.6	-3.9	60.9
CP-OFDM	Vertical	DL	64QAM	400	Full	0	27700	25.9	-35.9	-3.9	65.7
CP-OFDM	Vertical	DL	64QAM	400	Full	0	27819	25.6	-36.2	-3.9	65.7
CP-OFDM	Vertical	DL	64QAM	400	Full	0	28150	25.2	-34.7	-3.9	63.8
CP-OFDM	Vertical	DL	64QAM	100	1	0	27550	25.3	-33.6	-3.9	62.8
CP-OFDM	Vertical	DL	64QAM	100	1	0	27819	25	-34.8	-3.9	63.7
CP-OFDM	Vertical	DL	64QAM	100	1	0	28300	24.4	-33.3	-3.9	61.6
CP-OFDM	Vertical	DL	64QAM	400	1	0	27700	25.4	-33.7	-3.9	63
CP-OFDM	Vertical	DL	64QAM	400	1	0	27819	25.5	-35.5	-3.9	64.9
CP-OFDM	Vertical	DL	64QAM	400	1	0	28150	25	-33.6	-3.9	62.5
CP-OFDM	Vertical	DL	256QAM	100	Full	0	27550	25.2	-33.9	-3.9	63
CP-OFDM	Vertical	DL	256QAM	100	Full	0	27819	24.7	-35.6	-3.9	64.2
CP-OFDM	Vertical	DL	256QAM	100	Full	0	28300	24.5	-32.8	-3.9	61.2
CP-OFDM	Vertical	DL	256QAM	400	Full	0	27700	25.7	-35.4	-3.9	65
CP-OFDM	Vertical	DL	256QAM	400	Full	0	27819	25.5	-36.1	-3.9	65.5
CP-OFDM	Vertical	DL	256QAM	400	Full	0	28150	25.3	-34.6	-3.9	63.8
CP-OFDM	Vertical	DL	256QAM	100	1	0	27550	25	-33	-3.9	61.9
CP-OFDM	Vertical	DL	256QAM	100	1	0	27819	24.7	-34.1	-3.9	62.7
CP-OFDM	Vertical	DL	256QAM	100	1	0	28300	24.2	-32.1	-3.9	60.2
CP-OFDM	Vertical	DL	256QAM	400	1	0	27700	25.2	-32.2	-3.9	61.3
CP-OFDM	Vertical	DL	256QAM	400	1	0	27819	25.3	-34.7	-3.9	63.9
CP-OFDM	Vertical	DL	256QAM	400	1	0	28150	25.2	-34.9	-3.9	64

3.6.2 Out of Band / Out of Block Emission Conducted Emission

Test Setup/Conditions			
Test Location:	Fremont	Test Engineer:	H. Nguyenpham
Test Date(s):	8/11, 12, 13/2020		
Configuration:	1		
Test Setup:	See General Test Setup According to Section 30.203(a), 12 the conductive power or the total radiated power of any emission outside a licensee's frequency block13 shall be −13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10% of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower Base on the result of section 3.5 Mean output power and gain, all the modes and the worst configuration are reported in this section as below 1/ DL-H and DL-V: Low and High Channel with all modulation types, all multiple access schemes, Number of Resource Blocks =Full 2/ UL-H and UL-V: Low and High Channel with all modulation types, all multiple access schemes, Number of Resource Blocks =Full Note: Signal test signal is referred to 104339-26 Volume 2		
Declaration:	Modification #1 was in place during testing.		

Environmental Conditions			
Test Date	**Temperature (ºC)**	**Relative Humidity (%):**	**Pressure: kPa**
8/11/2020	22.5	41	101.9
8/12/2020	21.2	50	101.7
8/23/2020	22.5	42	102.1

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
P05411	Attenuator	Weinschel	54A-10	11/27/2019	11/27/2021
P07192	Cable	Astro	32022-29094K-29094K-48TC	11/27/2019	11/27/2021
03360	Cable	Astrolab	32022-2-29094-36TC	4/9/2020	4/9/2022
02668	Spectrum Analyzer	Agilent	E4446A	12/17/2019	12/17/2020
R00173	Vector Signal Generator	Rohde & Schwarz	SMW200A-B140	7/22/2019	7/22/2022

Summary of Results

Pass: As indicated in plots below, all out-of-band/block emissions are under the limit of -13dBm.

1/ UL-H

Multiple Access Scheme	Polarity	CH	Channel BW (MHz)	Modulation	OOB PreAGC (dBm)	OOB AGC+3dB (dBm)	OOB Limit (dBm)	Margin OOB Pre AGC (dB)	Margin OOB AGC+3 (dB)
CP-OFDM	UL_H	L	100	QPSK	-22.99	-24.33	-13	-9.99	-11.33
CP-OFDM	UL_H	H	100	QPSK	-19.06	-19.57	-13	-6.06	-6.57
CP-OFDM	UL_H	L	400	QPSK	-22.16	-22.90	-13	-9.16	-9.90
CP-OFDM	UL_H	H	400	QPSK	-22.95	-23.74	-13	-9.95	-10.74
CP-OFDM	UL_H	L	100	16QAM	-19.48	-19.73	-13	-6.48	-6.73
CP-OFDM	UL_H	H	100	16QAM	-22.26	-24.17	-13	-9.26	-11.17
CP-OFDM	UL_H	L	400	16QAM	-20.78	-22.53	-13	-7.78	-9.53
CP-OFDM	UL_H	H	400	16QAM	-22.87	-23.68	-13	-9.87	-10.68
CP-OFDM	UL_H	L	100	64QAM	-18.53	-19.60	-13	-5.53	-6.60
CP-OFDM	UL_H	H	100	64QAM	-21.56	-22.47	-13	-8.56	-9.47
CP-OFDM	UL_H	L	400	64QAM	-22.92	-23.21	-13	-9.92	-10.21
CP-OFDM	UL_H	H	400	64QAM	-22.61	-23.27	-13	-9.61	-10.27
CP-OFDM	UL_H	L	100	256QAM	-20.27	-18.89	-13	-7.27	-5.89
CP-OFDM	UL_H	H	100	256QAM	-22.31	-24.33	-13	-9.31	-11.33
CP-OFDM	UL_H	L	400	256QAM	-21.34	-22.43	-13	-8.34	-9.43
CP-OFDM	UL_H	H	400	256QAM	-22.12	-23.56	-13	-9.12	-10.56
DFT-s-OFDM	UL_H	L	100	Pi/2 BPSK	-17.49	-16.44	-13	-4.49	-3.44
DFT-s-OFDM	UL_H	H	100	Pi/2 BPSK	-19.68	-21.46	-13	-6.68	-8.46
DFT-s-OFDM	UL_H	L	400	Pi/2 BPSK	-24.57	-23.86	-13	-11.57	-10.86
DFT-s-OFDM	UL_H	H	400	Pi/2 BPSK	-22.11	-23.31	-13	-9.11	-10.31
DFT-s-OFDM	UL_H	L	100	QPSK	-15.72	-16.64	-13	-2.72	-3.64
DFT-s-OFDM	UL_H	H	100	QPSK	-19.13	-17.87	-13	-6.13	-4.87
DFT-s-OFDM	UL_H	L	400	QPSK	-21.85	-21.23	-13	-8.85	-8.23
DFT-s-OFDM	UL_H	H	400	QPSK	-22.57	-24.09	-13	-9.57	-11.09
DFT-s-OFDM	UL_H	L	100	16QAM	-16.26	-16.55	-13	-3.26	-3.55
DFT-s-OFDM	UL_H	H	100	16QAM	-19.21	-20.76	-13	-6.21	-7.76
DFT-s-OFDM	UL_H	L	400	16QAM	-21.67	-21.18	-13	-8.67	-8.18
DFT-s-OFDM	UL_H	H	400	16QAM	-21.67	-23.14	-13	-8.67	-10.14
DFT-s-OFDM	UL_H	L	100	64QAM	-17.31	-16.19	-13	-4.31	-3.19
DFT-s-OFDM	UL_H	H	100	64QAM	-19.81	-23.15	-13	-6.81	-10.15
DFT-s-OFDM	UL_H	L	400	64QAM	-21.10	-20.64	-13	-8.10	-7.64
DFT-s-OFDM	UL_H	H	400	64QAM	-21.68	-21.53	-13	-8.68	-8.53

DFT-s-OFDM	UL_H	L	100	256QAM	-16.46	-16.73	-13	-3.46	-3.73
DFT-s-OFDM	UL_H	H	100	256QAM	-19.75	-22.90	-13	-6.75	-9.90
DFT-s-OFDM	UL_H	L	400	256QAM	-22.6	-22.08	-13	-9.60	-9.08
DFT-s-OFDM	UL_H	H	400	256QAM	-20.6	-20.61	-13	-7.56	-7.61

2/ UL-V

Multiple Access Scheme	Polarity	CH	Channel BW (MHz)	Modulation	OOB PreAGC (dBm)	OOB AGC+3dB (dBm)	OOB Limit (dBm)	Margin OOB Pre AGC (dB)	Margin OOB AGC+3 (dB)
CP-OFDM	UL_V	L	100	QPSK	-13.29	-13.50	-13	-0.29	-0.50
CP-OFDM	UL_V	H	100	QPSK	-16.42	-17.58	-13	-3.42	-4.58
CP-OFDM	UL_V	L	400	QPSK	-19.13	-18.70	-13	-6.13	-5.70
CP-OFDM	UL_V	H	400	QPSK	-20.67	-19.18	-13	-7.67	-6.18
CP-OFDM	UL_V	L	100	16QAM	-14.38	-14.58	-13	-1.38	-1.58
CP-OFDM	UL_V	H	100	16QAM	-17.87	-17.26	-13	-4.87	-4.26
CP-OFDM	UL_V	L	400	16QAM	-19.40	-19.53	-13	-6.40	-6.53
CP-OFDM	UL_V	H	400	16QAM	-19.14	-18.71	-13	-6.14	-5.71
CP-OFDM	UL_V	L	100	64QAM	-13.86	-14.47	-13	-0.86	-1.47
CP-OFDM	UL_V	H	100	64QAM	-17.39	-17.35	-13	-4.39	-4.35
CP-OFDM	UL_V	L	400	64QAM	-19.50	-19.54	-13	-6.50	-6.54
CP-OFDM	UL_V	H	400	64QAM	-17.83	-18.71	-13	-4.83	-5.71
CP-OFDM	UL_V	L	100	256QAM	-14.94	-13.75	-13	-1.94	-0.75
CP-OFDM	UL_V	H	100	256QAM	-17.58	-16.98	-13	-4.58	-3.98
CP-OFDM	UL_V	L	400	256QAM	-18.92	-18.86	-13	-5.92	-5.86
CP-OFDM	UL_V	H	400	256QAM	-18.47	-18.80	-13	-5.47	-5.80
DFT-s-OFDM	UL_V	L	100	Pi/2 BPSK	-14.78	-13.99	-13	-1.78	-0.99
DFT-s-OFDM	UL_V	H	100	Pi/2 BPSK	-16.10	-15.27	-13	-3.10	-2.27
DFT-s-OFDM	UL_V	L	400	Pi/2 BPSK	-17.76	-19.34	-13	-4.76	-6.34
DFT-s-OFDM	UL_V	H	400	Pi/2 BPSK	-17.68	-18.08	-13	-4.68	-5.08
DFT-s-OFDM	UL_V	L	100	QPSK	-15.76	-14.37	-13	-2.76	-1.37
DFT-s-OFDM	UL_V	H	100	QPSK	-13.84	-14.50	-13	-0.84	-1.50
DFT-s-OFDM	UL_V	L	400	QPSK	-19.19	-18.54	-13	-6.19	-5.54
DFT-s-OFDM	UL_V	H	400	QPSK	-18.51	-17.44	-13	-5.51	-4.44
DFT-s-OFDM	UL_V	L	100	16QAM	-15.16	-13.93	-13	-2.16	-0.93
DFT-s-OFDM	UL_V	H	100	16QAM	-17.34	-16.90	-13	-4.34	-3.90
DFT-s-OFDM	UL_V	L	400	16QAM	-18.51	-18.25	-13	-5.51	-5.25
DFT-s-OFDM	UL_V	H	400	16QAM	-17.77	-18.45	-13	-4.77	-5.45
DFT-s-OFDM	UL_V	L	100	64QAM	-14.58	-14.26	-13	-1.58	-1.26
DFT-s-OFDM	UL_V	H	100	64QAM	-15.25	-15.85	-13	-2.25	-2.85

DFT-s-OFDM	UL_V	L	400	64QAM	-18.36	-18.99	-13	-5.36	-5.99
DFT-s-OFDM	UL_V	H	400	64QAM	-18.45	-17.31	-13	-5.45	-4.31
DFT-s-OFDM	UL_V	L	100	256QAM	-14.24	-13.59	-13	-1.24	-0.59
DFT-s-OFDM	UL_V	H	100	256QAM	-15.39	-15.52	-13	-2.39	-2.52
DFT-s-OFDM	UL_V	L	400	256QAM	-18.11	-19.26	-13	-5.11	-6.26
DFT-s-OFDM	UL_V	H	400	256QAM	-17.53	-19.07	-13	-4.53	-6.07

3/ DL-H

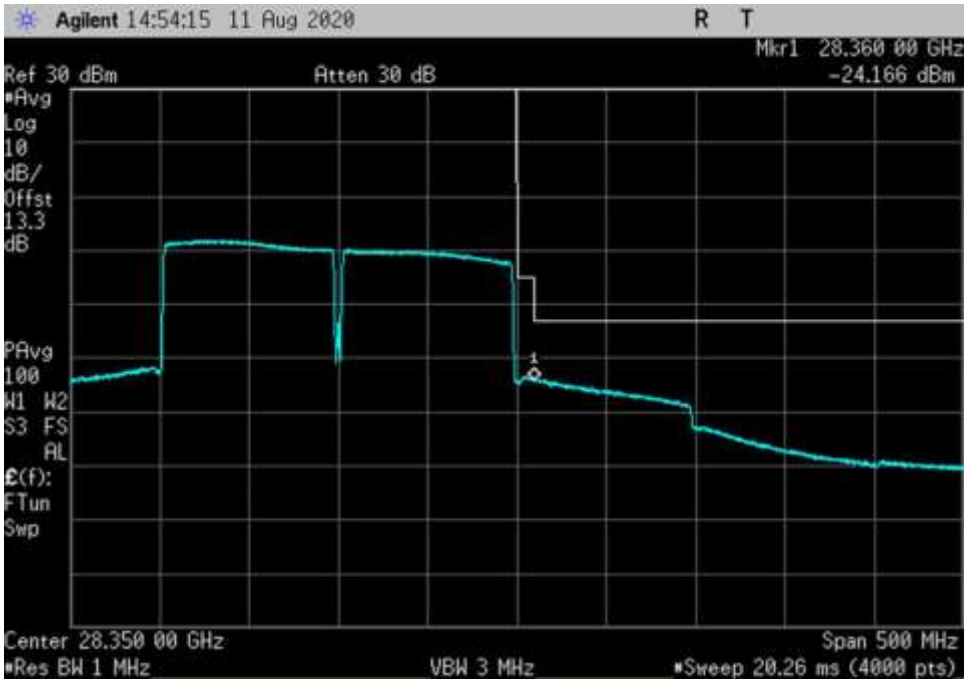
Multiple Access Scheme	Polarity	CH	Channel BW (MHz)	Modulation	OOB PreAGC (dBm)	OOB AGC+3dB (dBm)	OOB Limit (dBm)	Margin OOB Pre AGC (dB)	Margin OOB AGC+3 (dB)
CP-OFDM	DL_H	L	100	QPSK	-16.23	-15.77	-13	-3.23	-2.77
CP-OFDM	DL_H	H	100	QPSK	-18.02	-19.38	-13	-5.02	-6.38
CP-OFDM	DL_H	L	400	QPSK	-19.89	-20.35	-13	-6.89	-7.35
CP-OFDM	DL_H	H	400	QPSK	-21.89	-19.15	-13	-8.89	-6.15
CP-OFDM	DL_H	L	100	16QAM	-16.09	-16.70	-13	-3.09	-3.70
CP-OFDM	DL_H	H	100	16QAM	-18.96	-18.99	-13	-5.96	-5.99
CP-OFDM	DL_H	L	400	16QAM	-18.94	-19.77	-13	-5.94	-6.77
CP-OFDM	DL_H	H	400	16QAM	-19.27	-19.31	-13	-6.27	-6.31
CP-OFDM	DL_H	L	100	64QAM	-18.57	-16.58	-13	-5.57	-3.58
CP-OFDM	DL_H	H	100	64QAM	-18.04	-18.67	-13	-5.04	-5.67
CP-OFDM	DL_H	L	400	64QAM	-18.27	-20.52	-13	-5.27	-7.52
CP-OFDM	DL_H	H	400	64QAM	-19.13	-18.94	-13	-6.13	-5.94
CP-OFDM	DL_H	L	100	256QAM	-18.59	-16.31	-13	-5.59	-3.31
CP-OFDM	DL_H	H	100	256QAM	-19.49	-18.03	-13	-6.49	-5.03
CP-OFDM	DL_H	L	400	256QAM	-19.77	-19.67	-13	-6.77	-6.67
CP-OFDM	DL_H	H	400	256QAM	-19.69	-18.93	-13	-6.69	-5.93

4/ DL-V

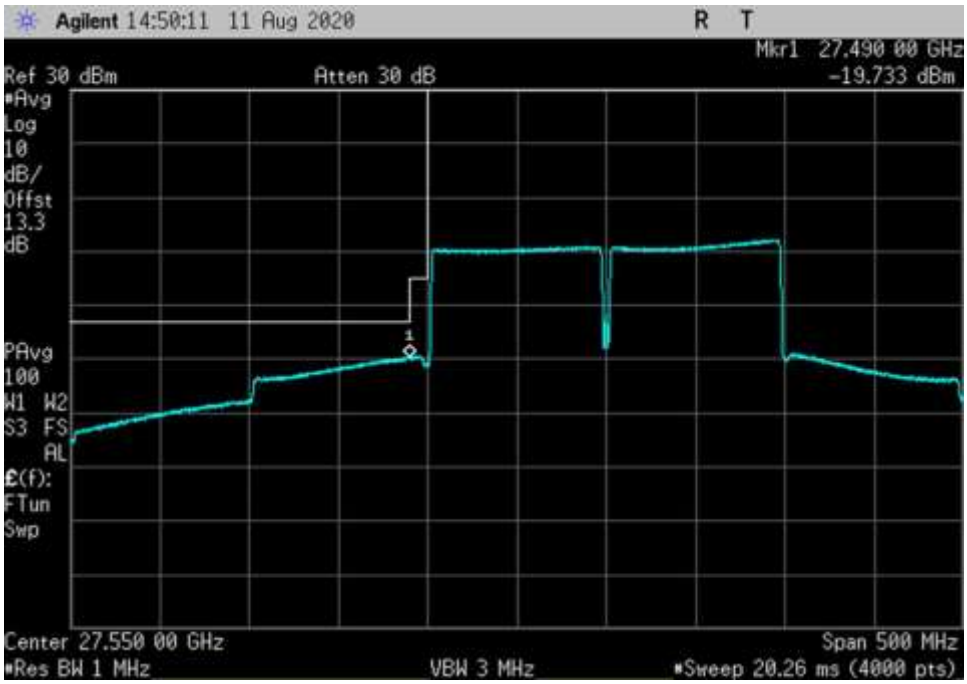
Multiple Access Scheme	Polarity	CH	Channel BW (MHz)	Modulation	OOB Pre AGC (dBm)	OOB AGC+3dB (dBm)	OOB Limit (dBm)	Margin OOB Pre AGC (dB)	Margin OOB AGC+3 (dB)
CP-OFDM	DL_V	L	100	QPSK	-16.99	-18.70	-13	-3.99	-5.70
CP-OFDM	DL_V	H	100	QPSK	-21.03	-22.49	-13	-8.03	-9.49
CP-OFDM	DL_V	L	400	QPSK	-21.30	-20.95	-13	-8.30	-7.95
CP-OFDM	DL_V	H	400	QPSK	-24.69	-24.54	-13	-11.69	-11.54
CP-OFDM	DL_V	L	100	16QAM	-17.67	-16.96	-13	-4.67	-3.96
CP-OFDM	DL_V	H	100	16QAM	-20.29	-20.21	-13	-7.29	-7.21
CP-OFDM	DL_V	L	400	16QAM	-22.96	-21.16	-13	-9.96	-8.16
CP-OFDM	DL_V	H	400	16QAM	-22.37	-23.91	-13	-9.37	-10.91
CP-OFDM	DL_V	L	100	64QAM	-17.80	-16.87	-13	-4.80	-3.87
CP-OFDM	DL_V	H	100	64QAM	-20.41	-21.87	-13	-7.41	-8.87
CP-OFDM	DL_V	L	400	64QAM	-18.42	-20.19	-13	-5.42	-7.19
CP-OFDM	DL_V	H	400	64QAM	-21.49	-21.97	-13	-8.49	-8.97
CP-OFDM	DL_V	L	100	256QAM	-16.12	-16.86	-13	-3.12	-3.86
CP-OFDM	DL_V	H	100	256QAM	-20.62	-19.91	-13	-7.62	-6.91
CP-OFDM	DL_V	L	400	256QAM	-20.29	-20.25	-13	-7.29	-7.25
CP-OFDM	DL_V	H	400	256QAM	-21.11	-22.29	-13	-8.11	-9.29

Plots

CP – UL H



UL_27500-28350- 16QAM-100MHz-H-AGC+3-CP OFDM_HC



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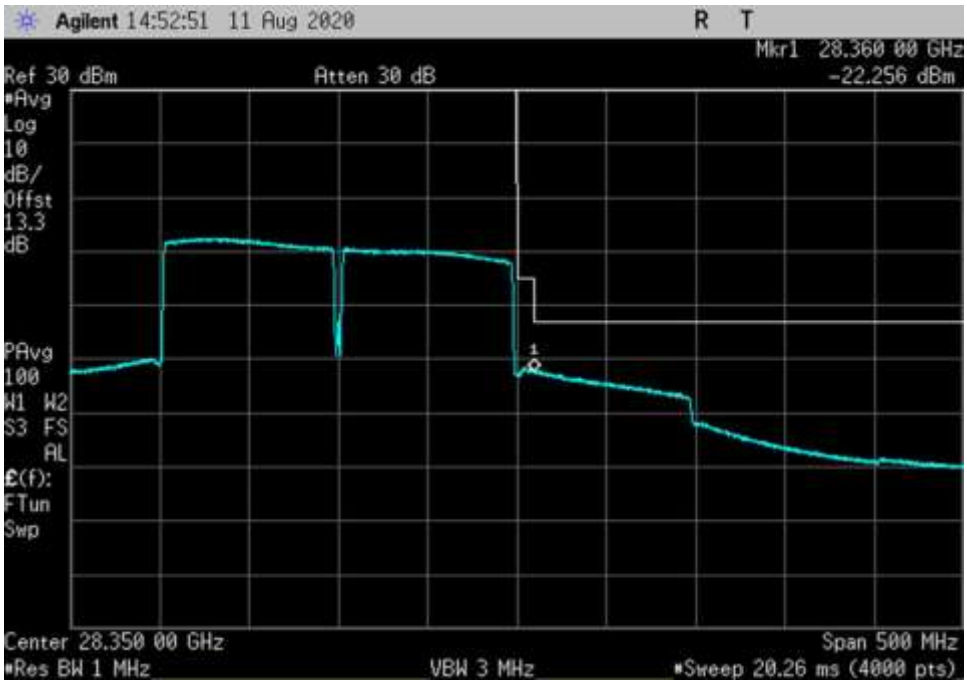

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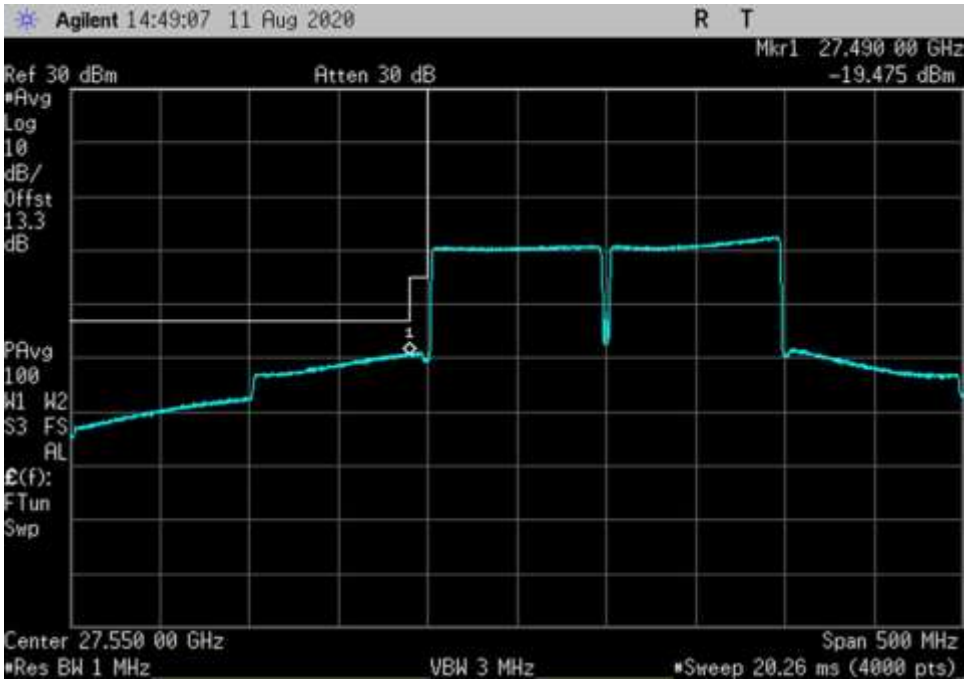

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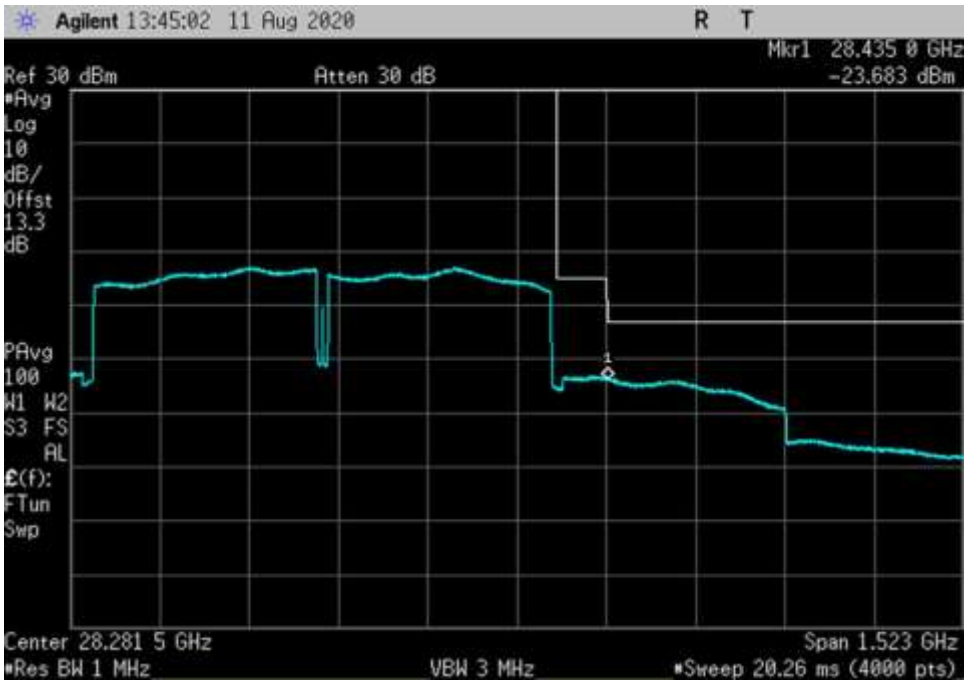
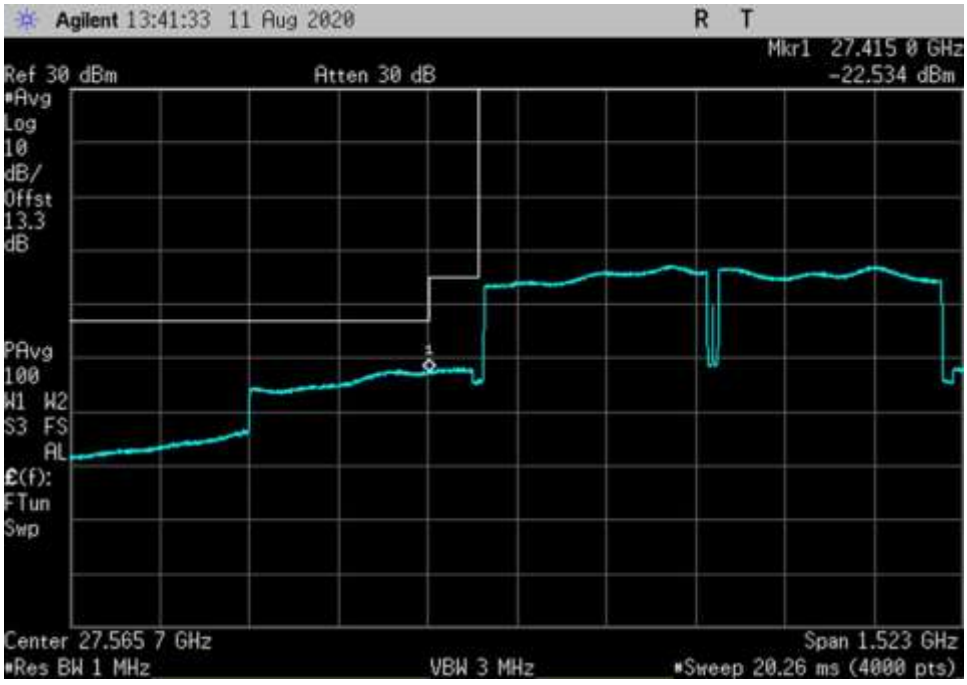


UL_27500-28350- 16QAM-400MHz-H-AGC+3-CP OFDM_HC



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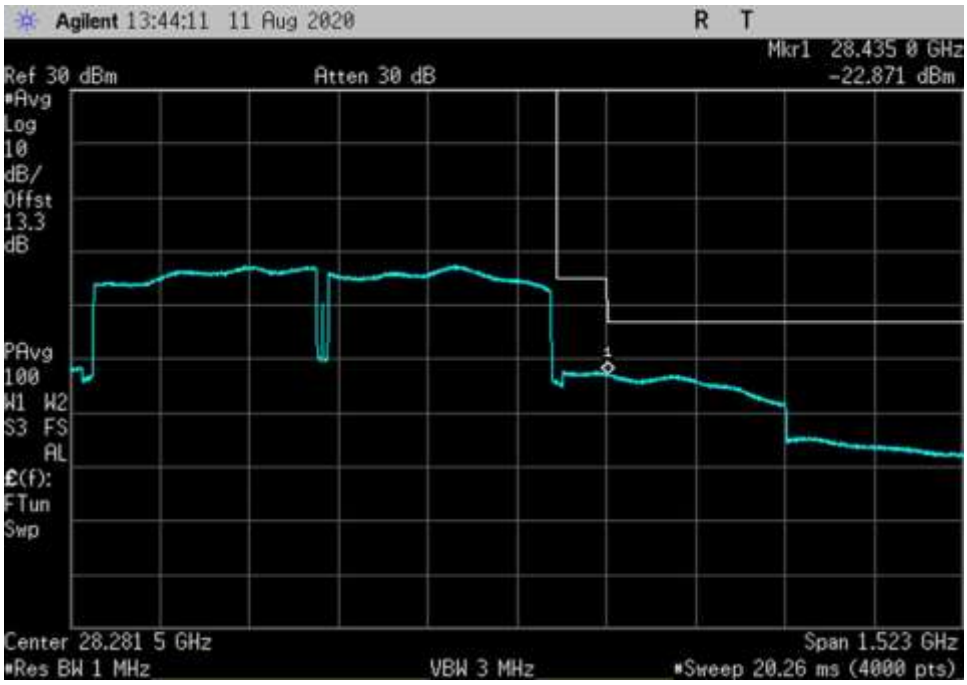

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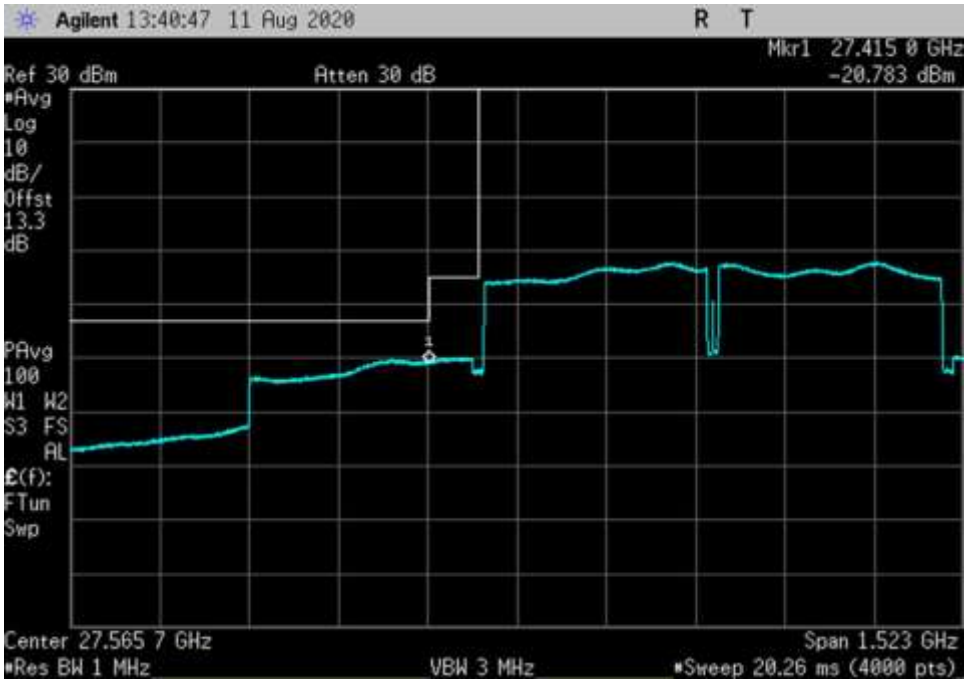

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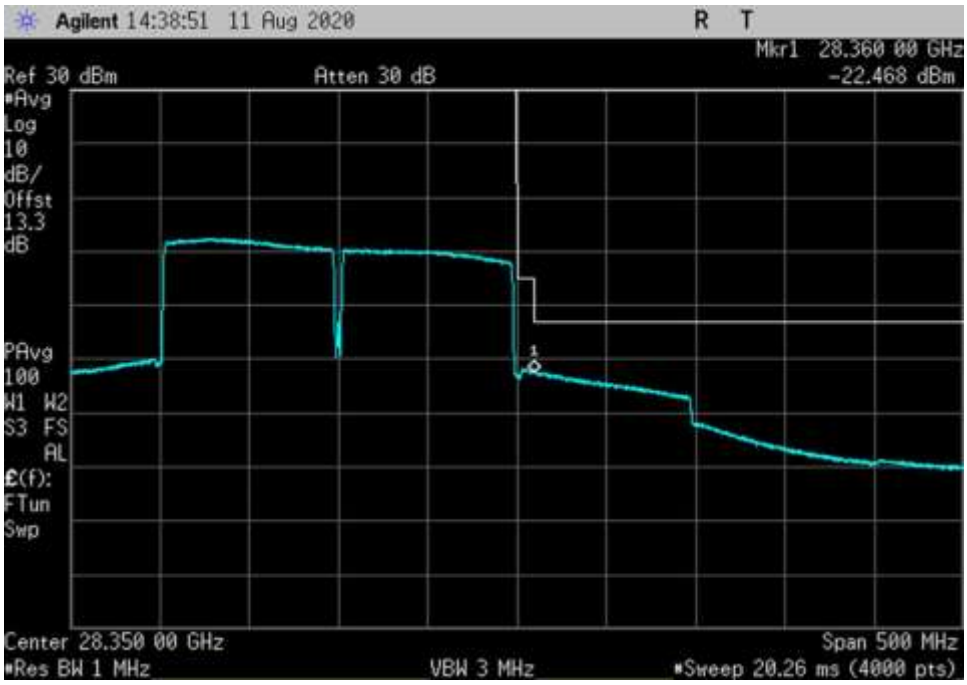

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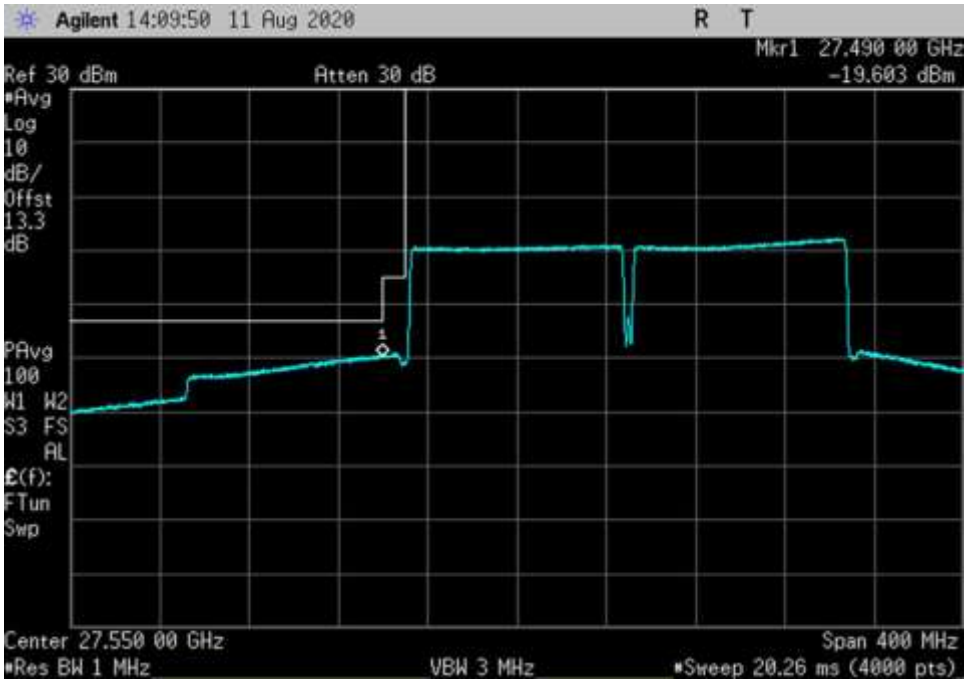

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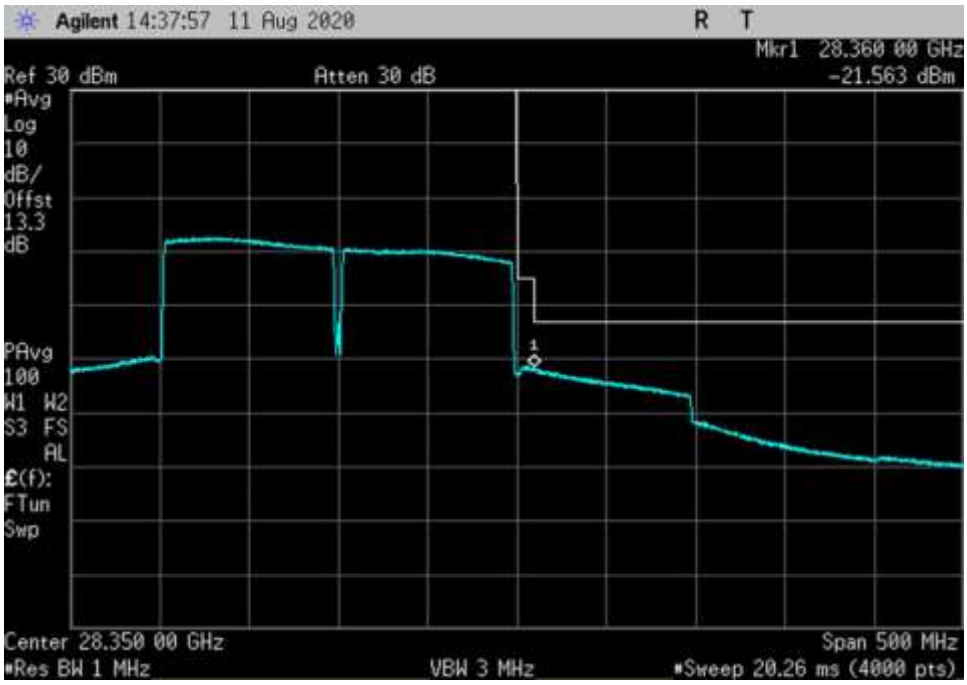

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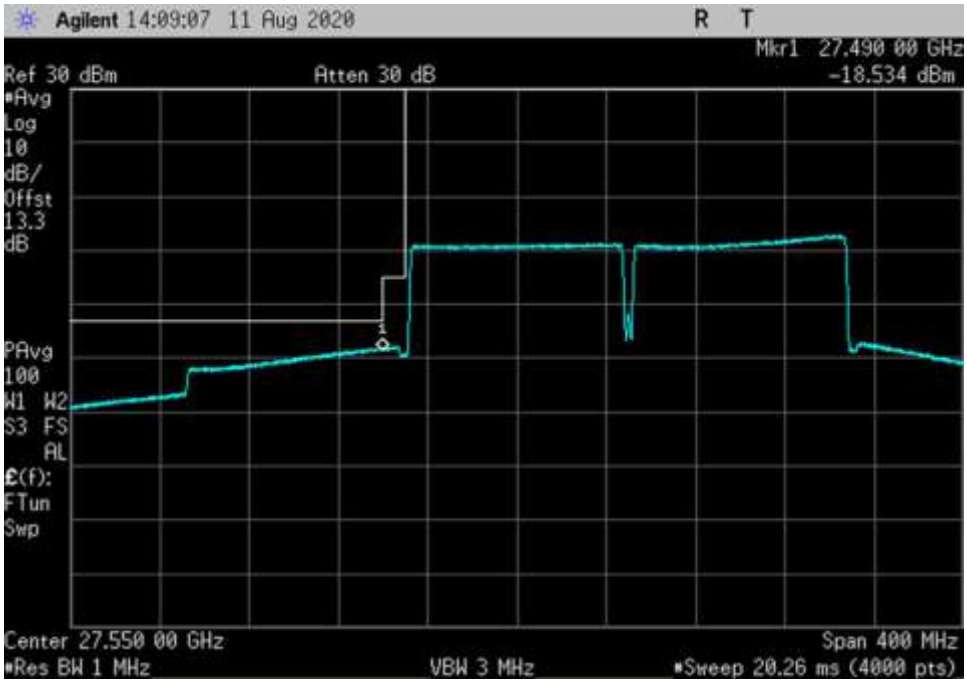

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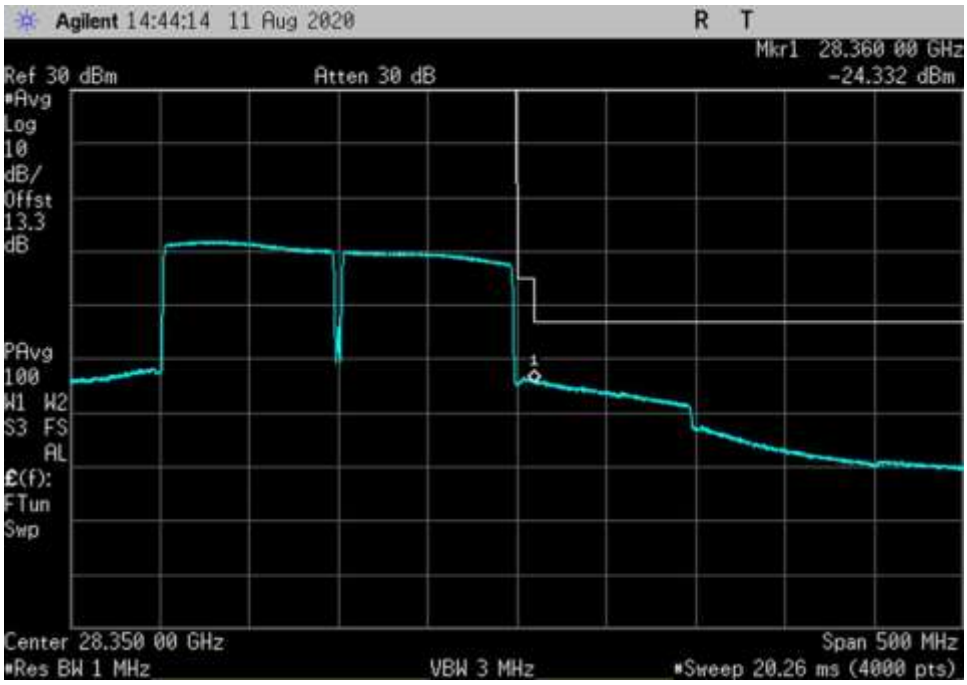

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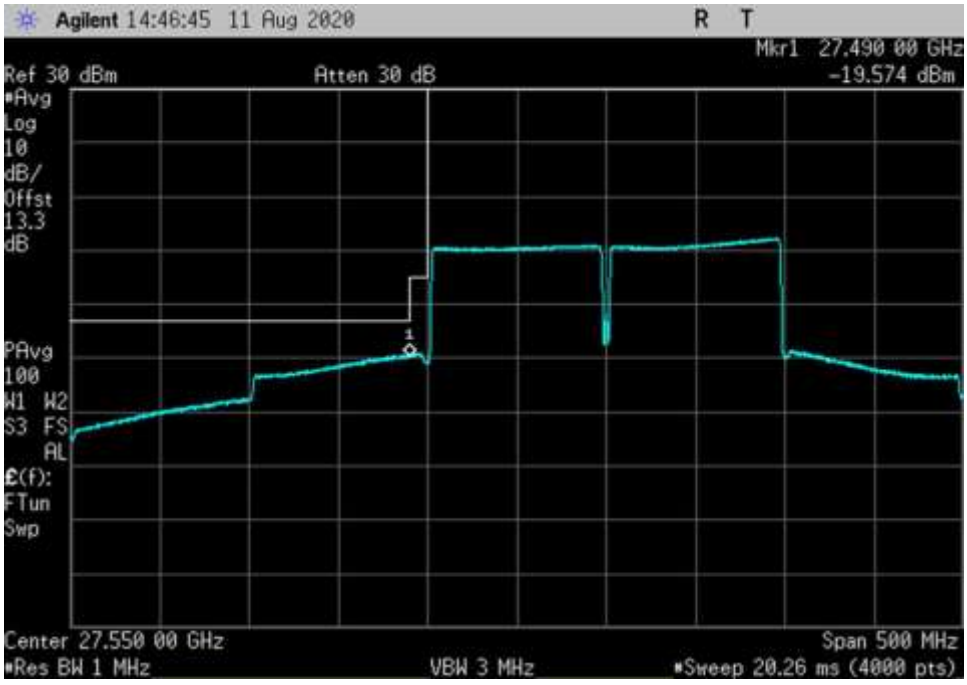

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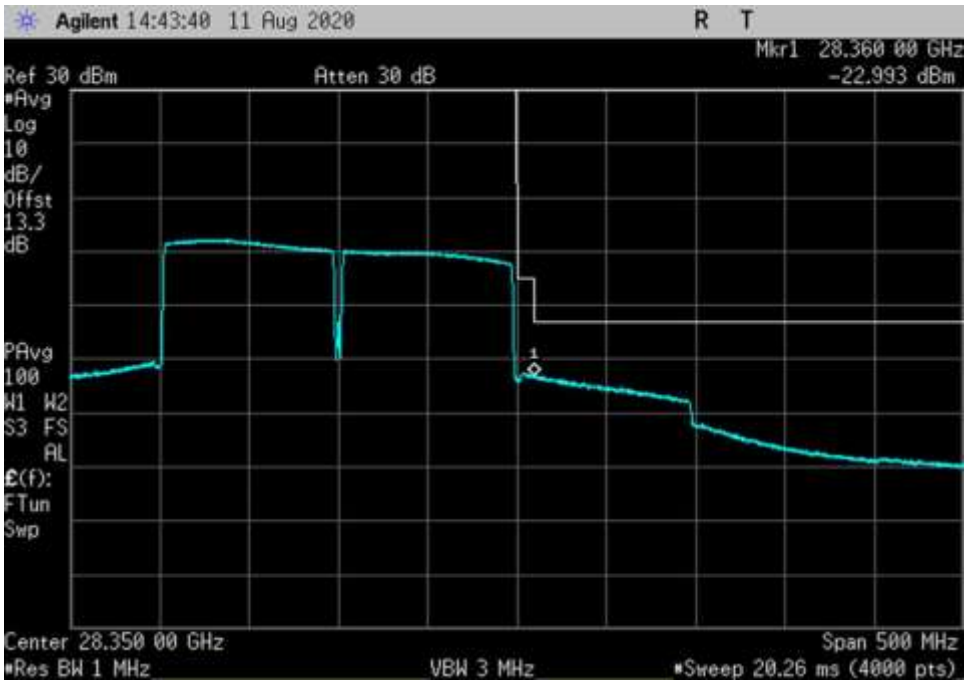

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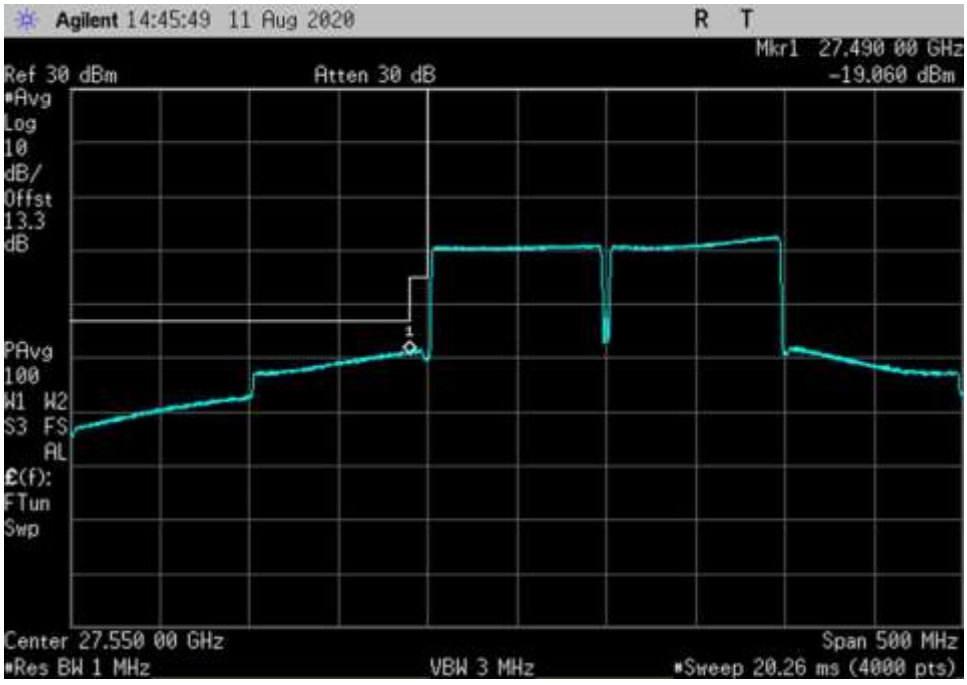

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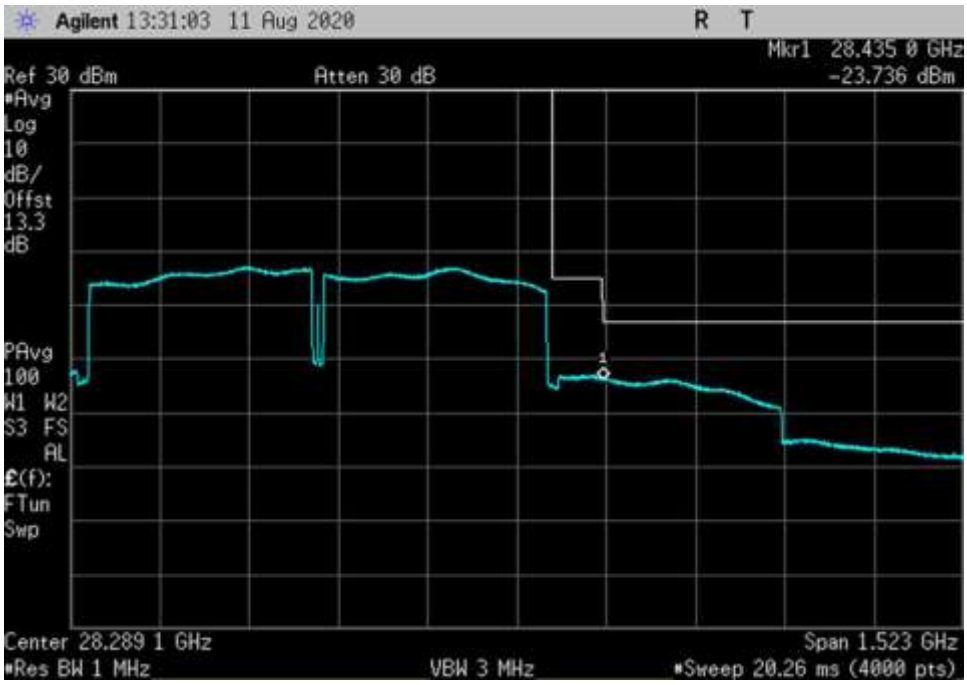

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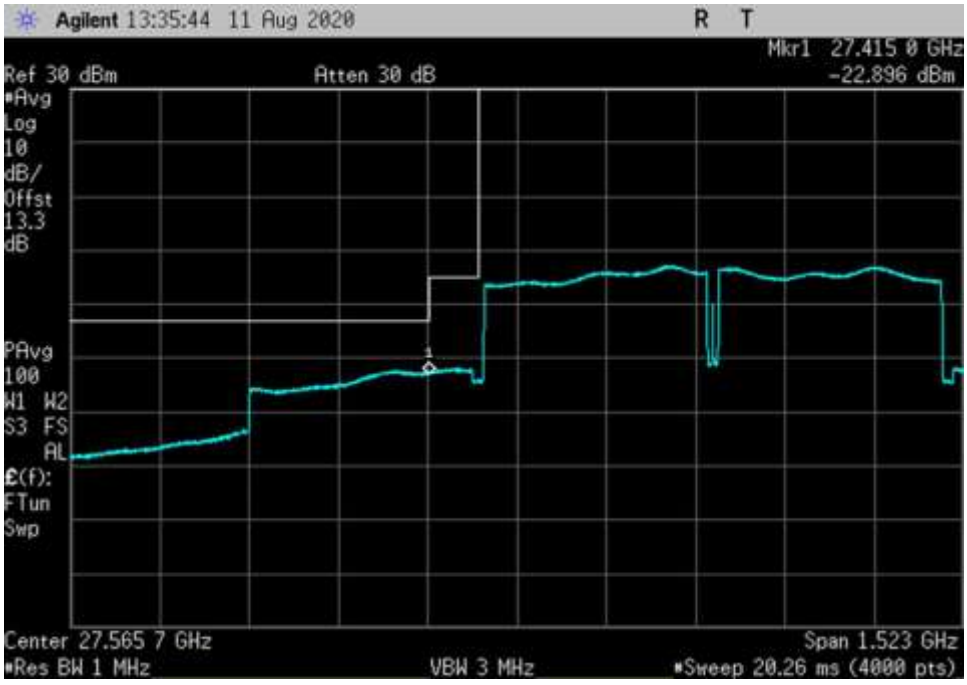

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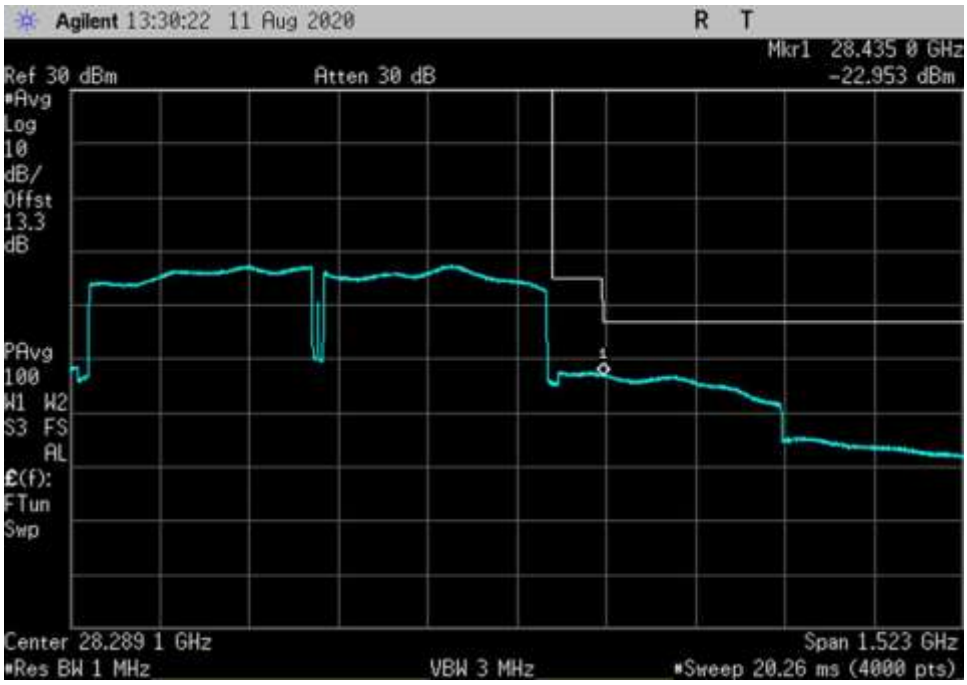

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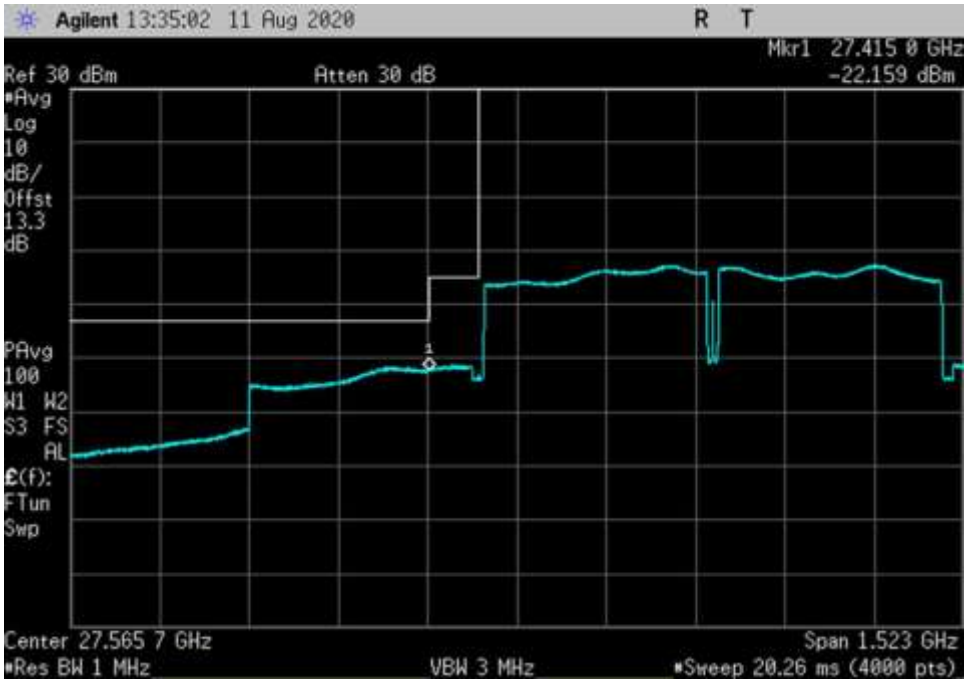

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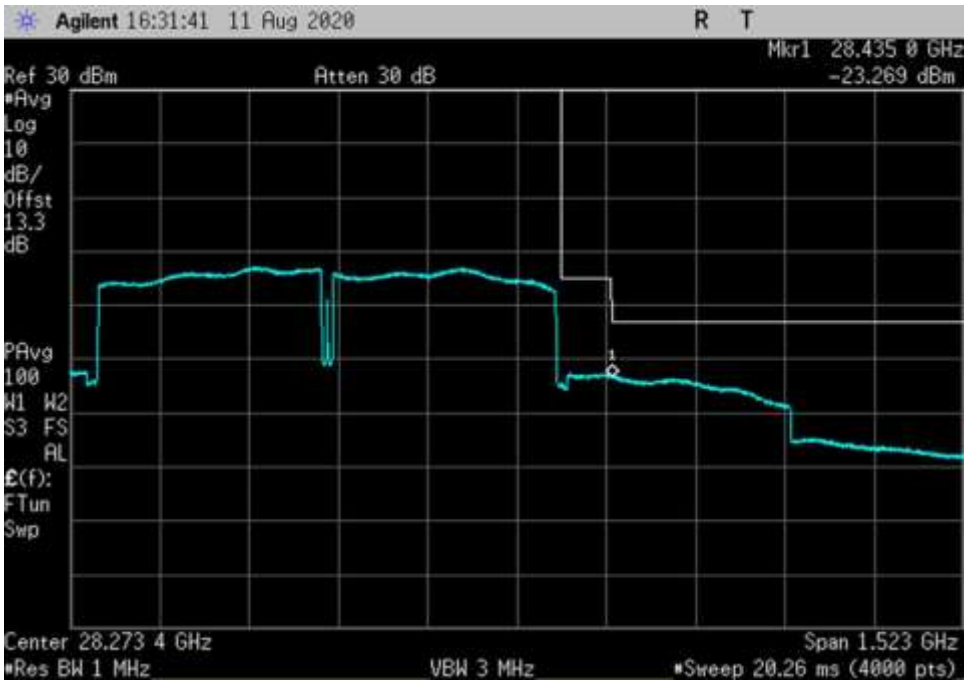
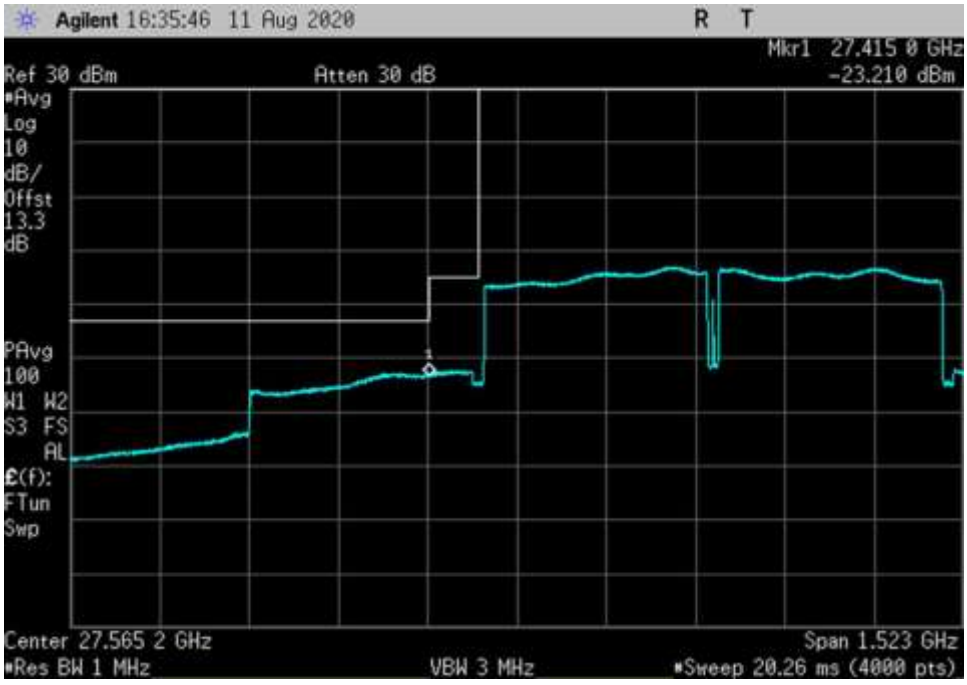


UL_27500-28350-64QAM-400MHz-H-AGC+3-CP OFDM_HC



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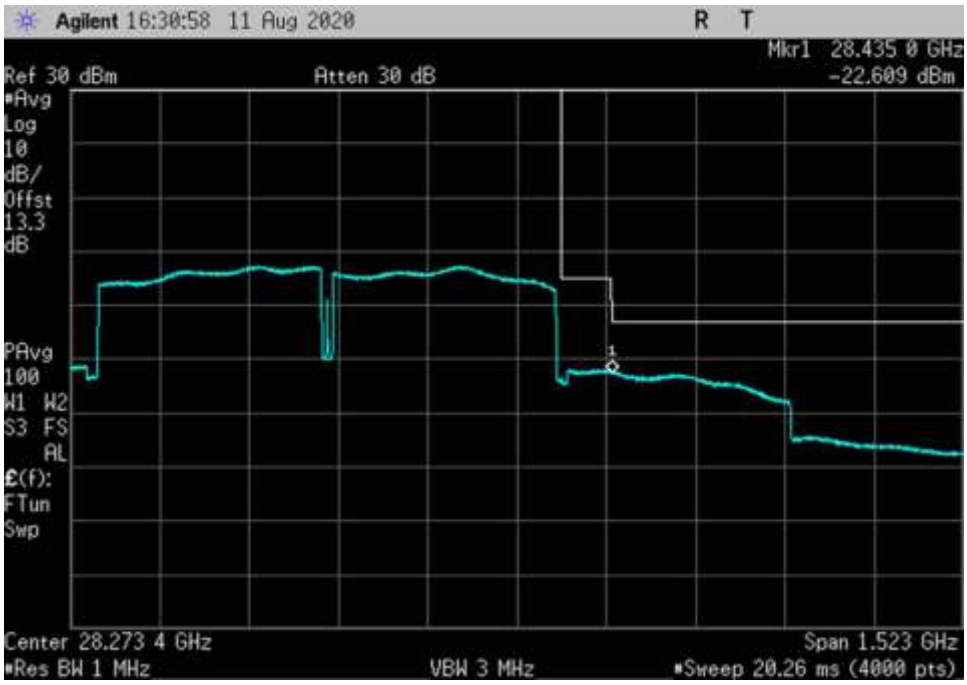

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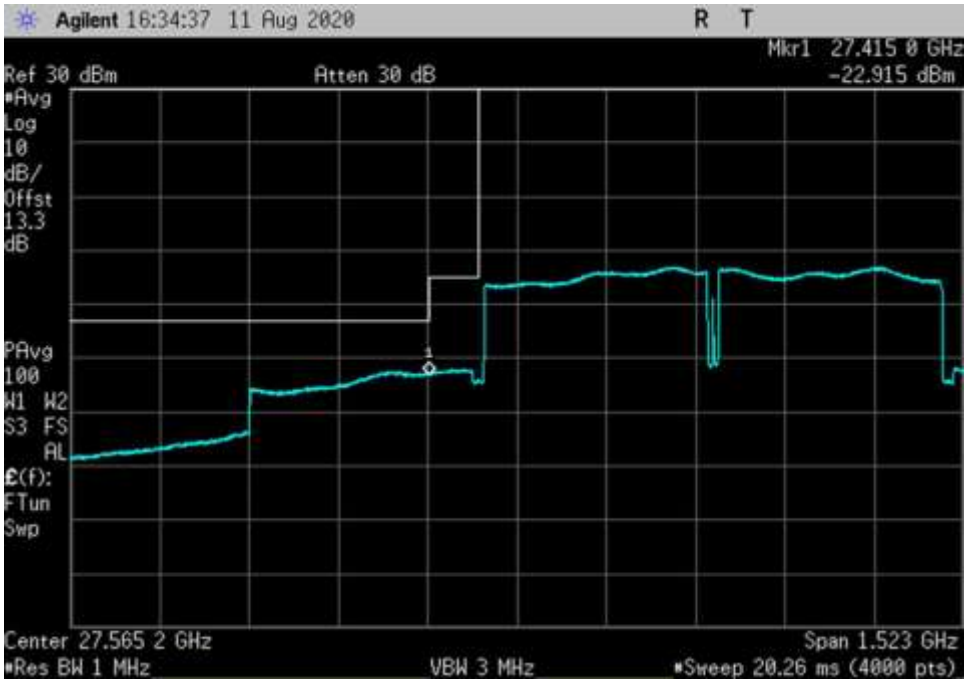

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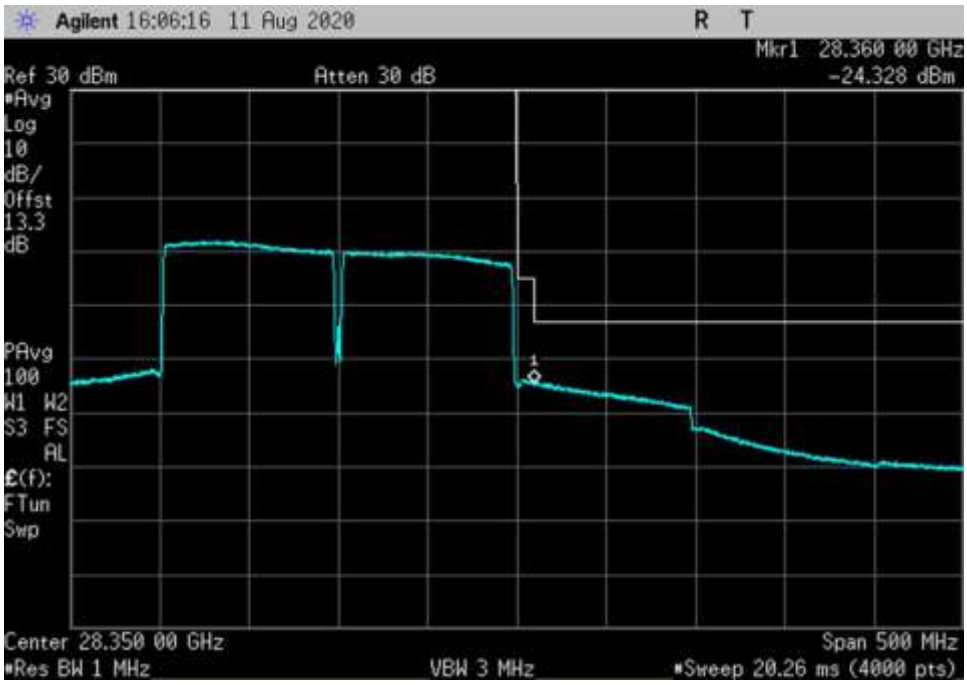

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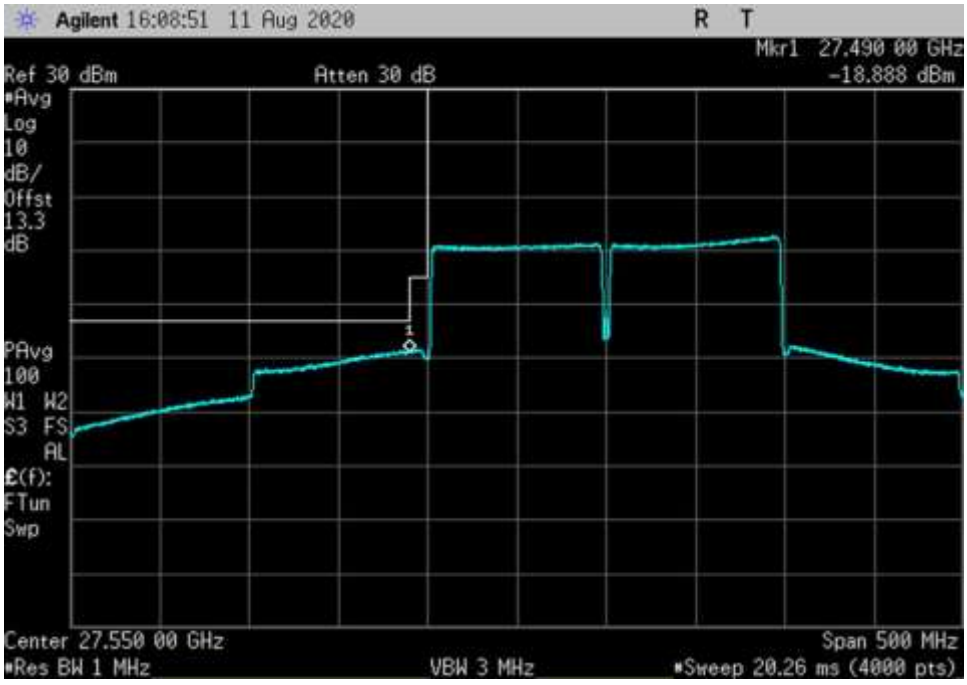

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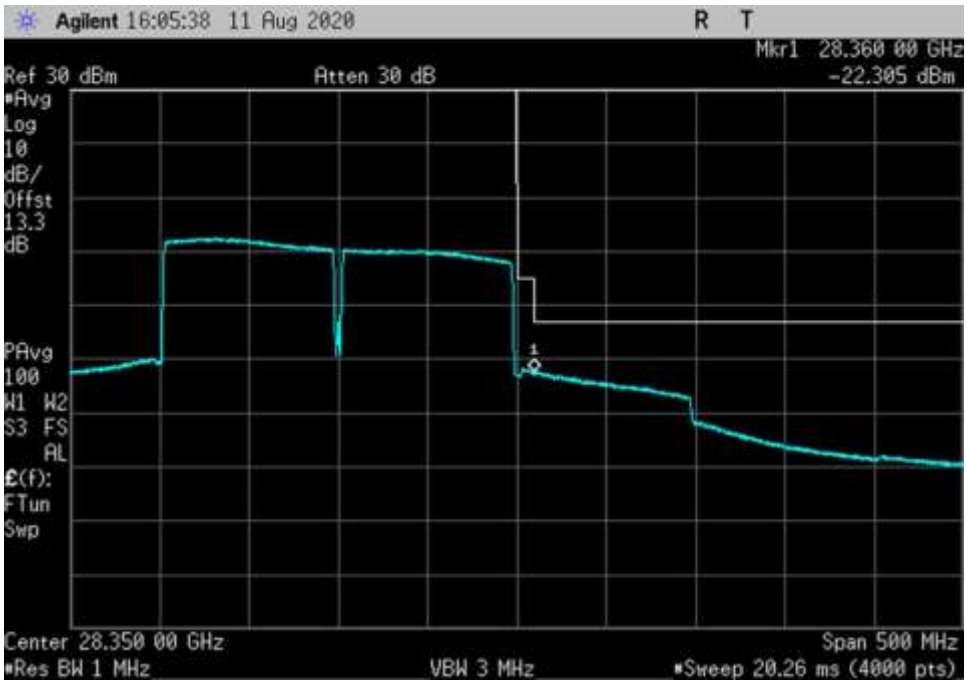

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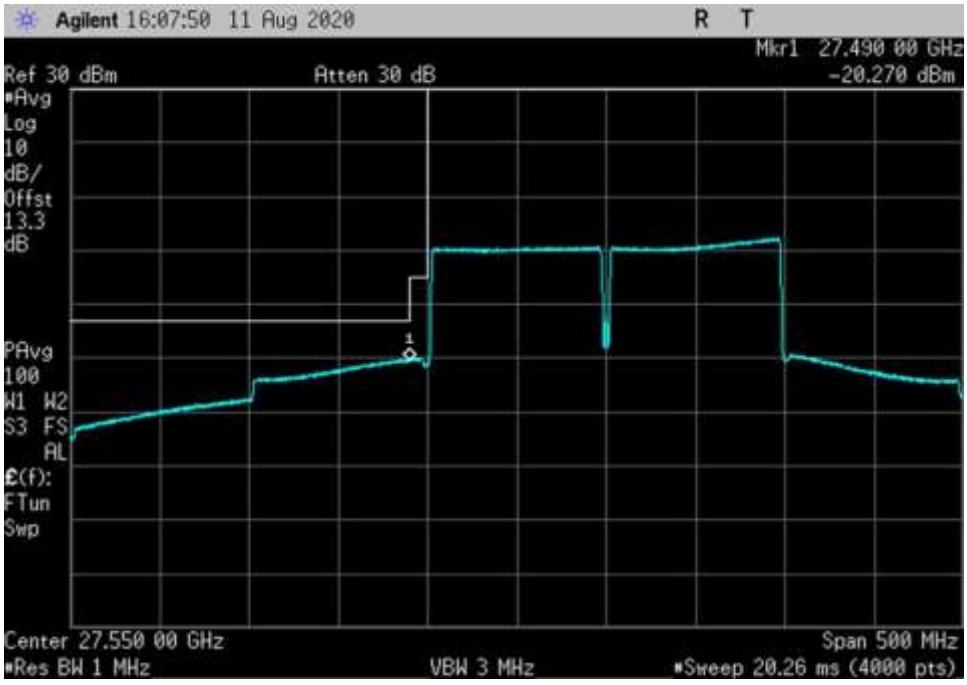

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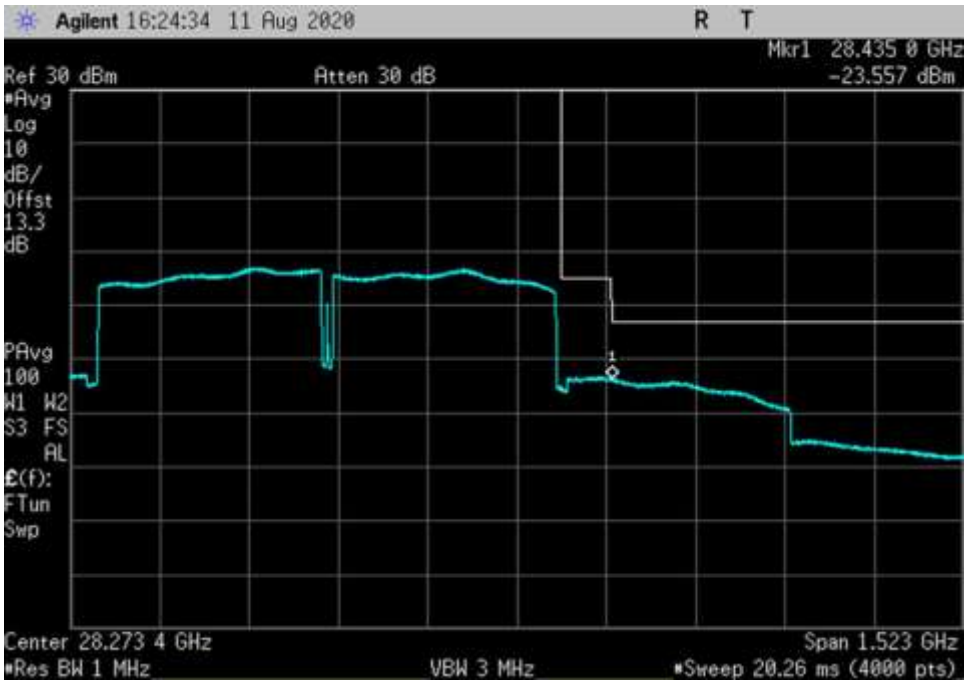

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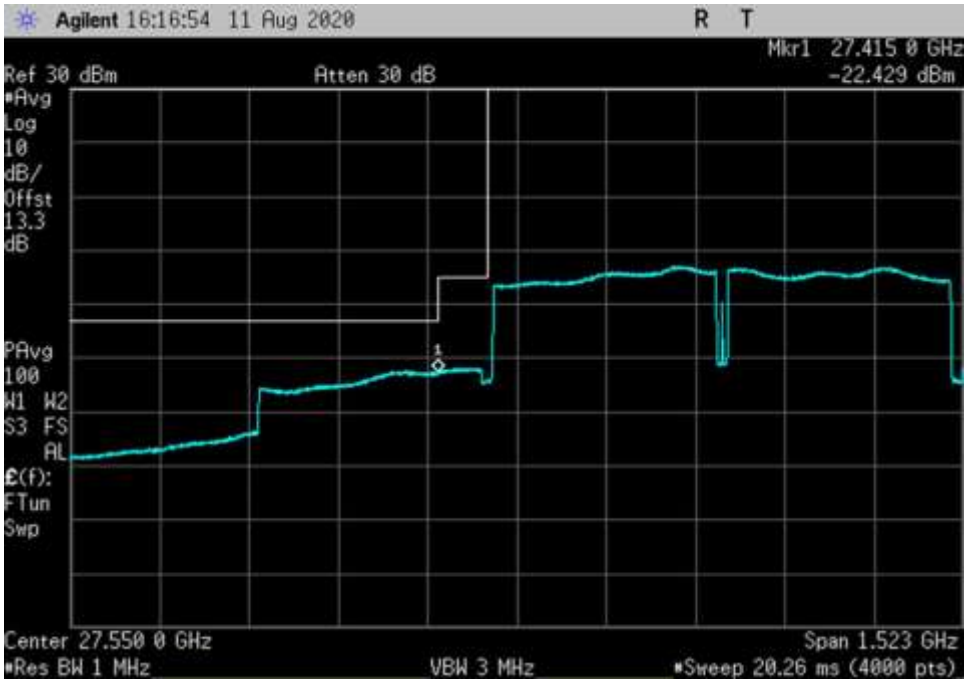

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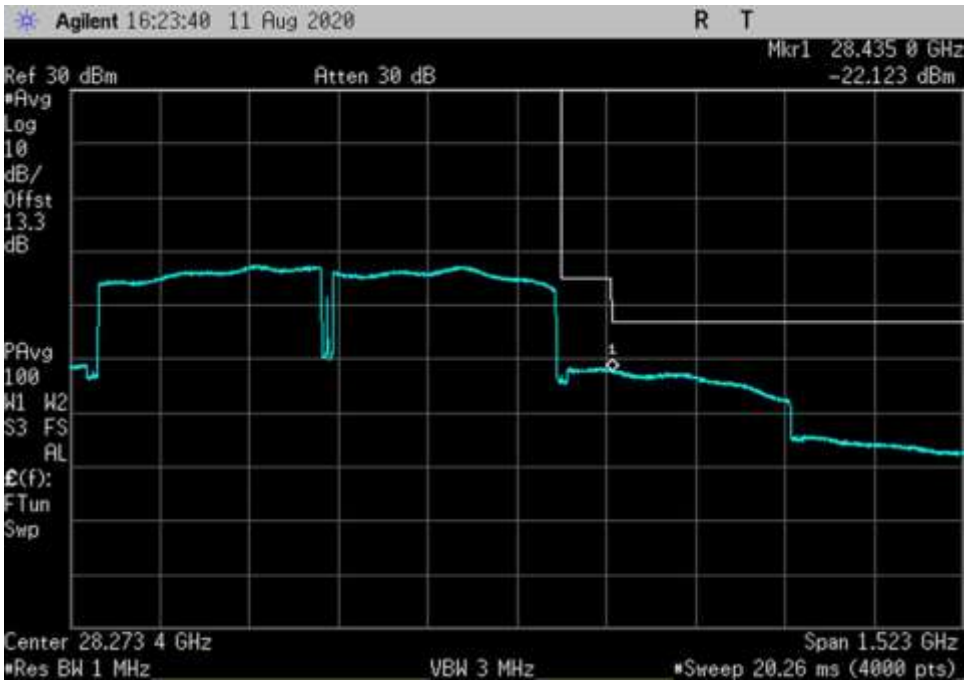

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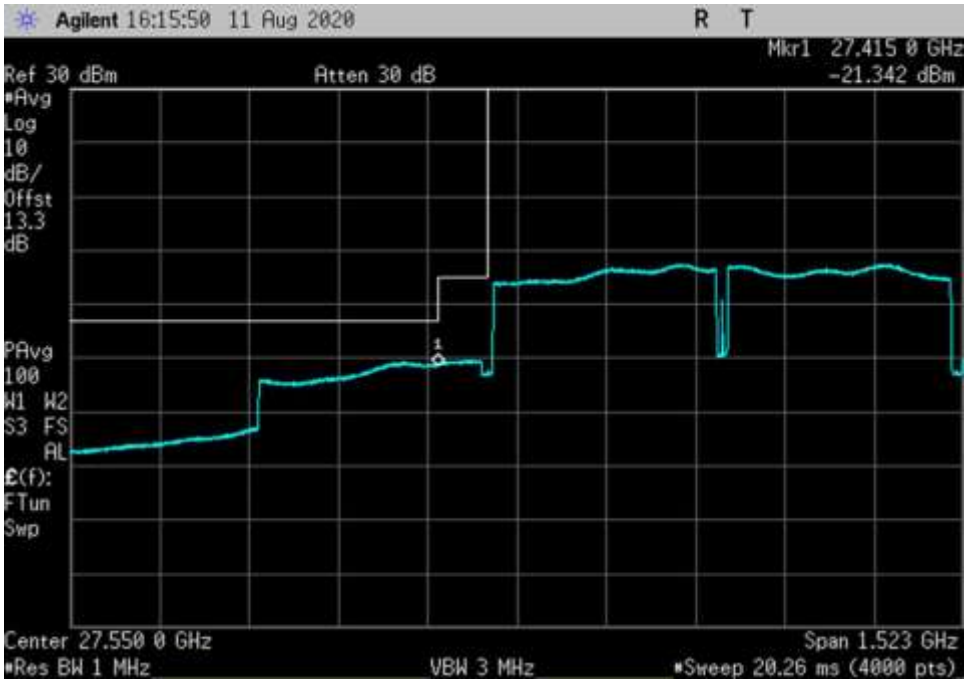
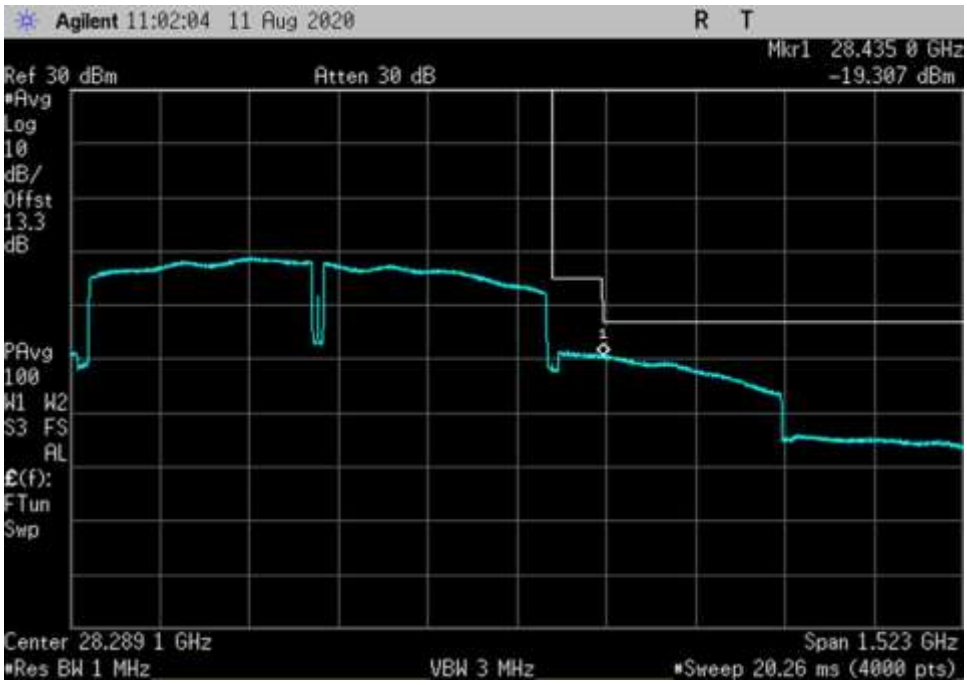
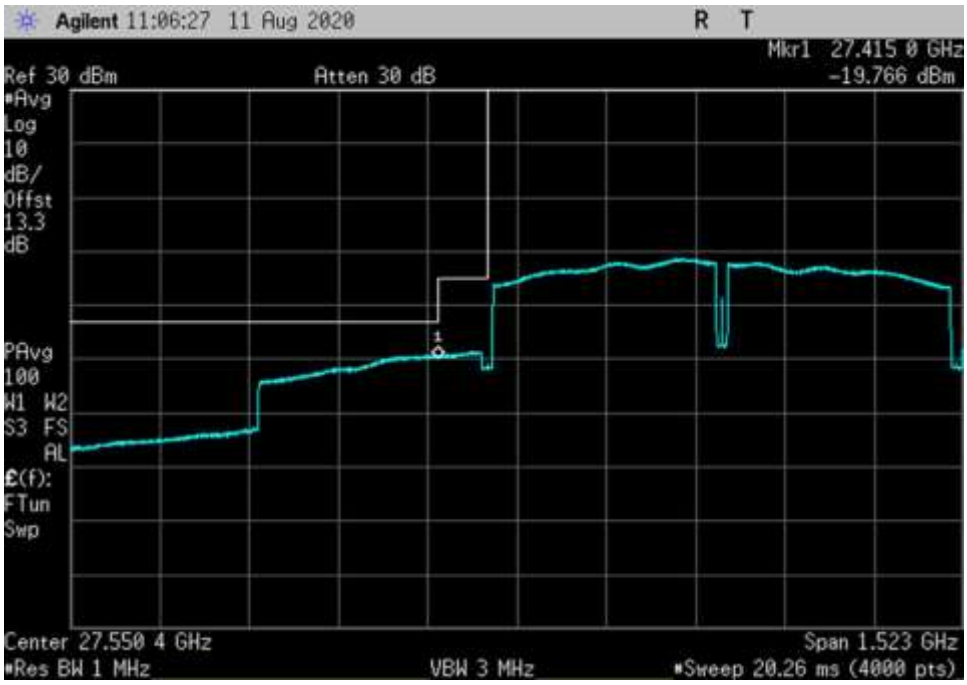


UL_27500-28350-256QAM-400MHz-H-CP OFDM_LC

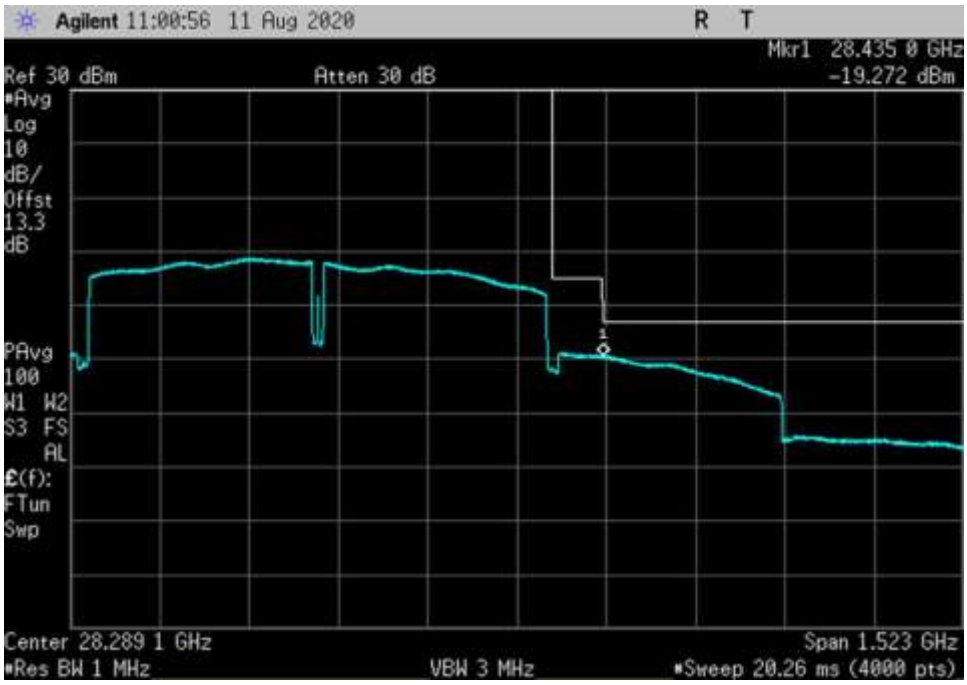
CP – DL H



DL_27500-28350- 16QAM-400MHz-H-AGC+3-CP OFDM_HC



DL_27500-28350- 16QAM-400MHz-H-AGC+3-CP OFDM_LC



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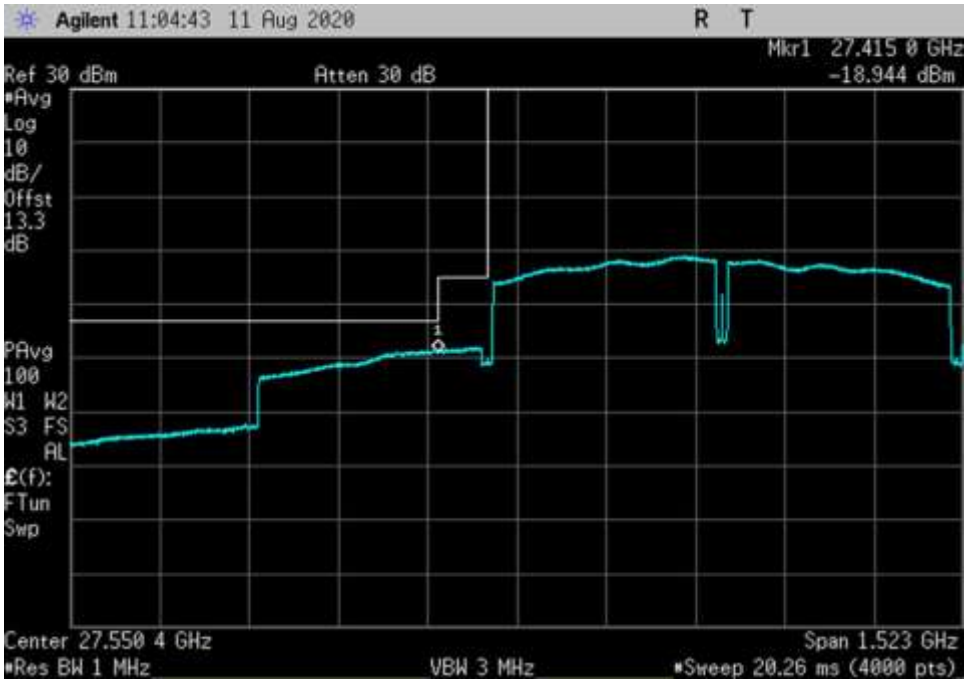
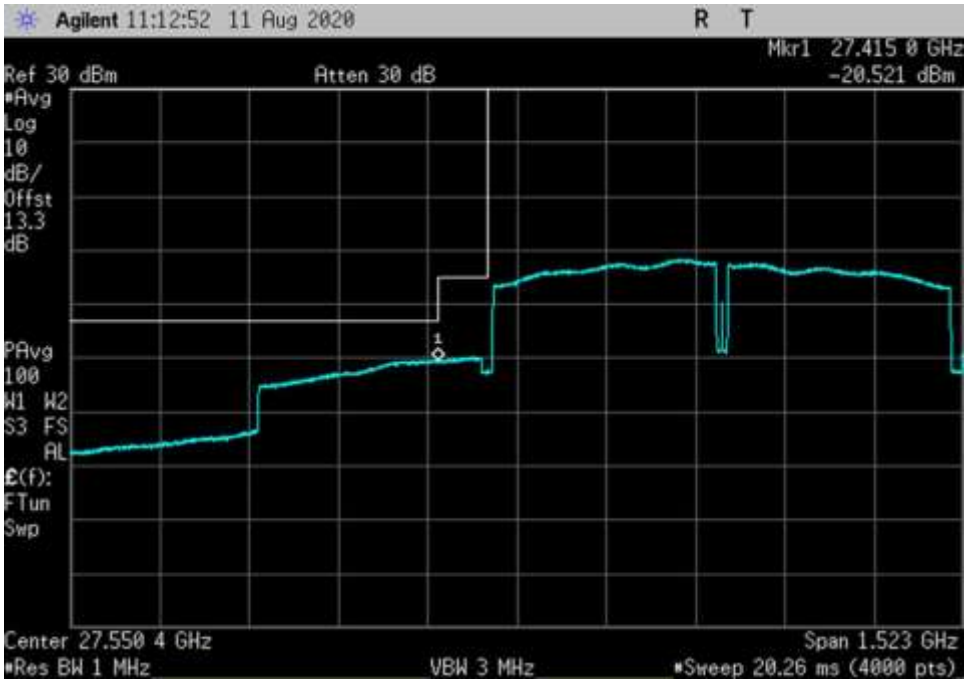


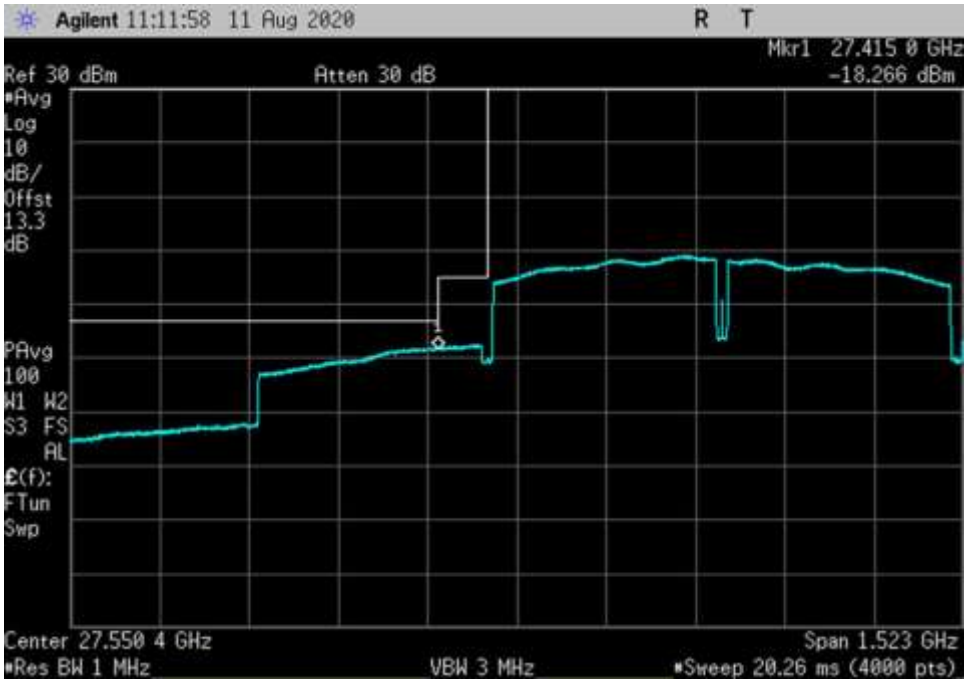
DL_27500-28350- 16QAM-400MHz-H-CP OFDM_LC

DL_27500-28350- 64QAM-400MHz-H-AGC+3-CP OFDM_HC



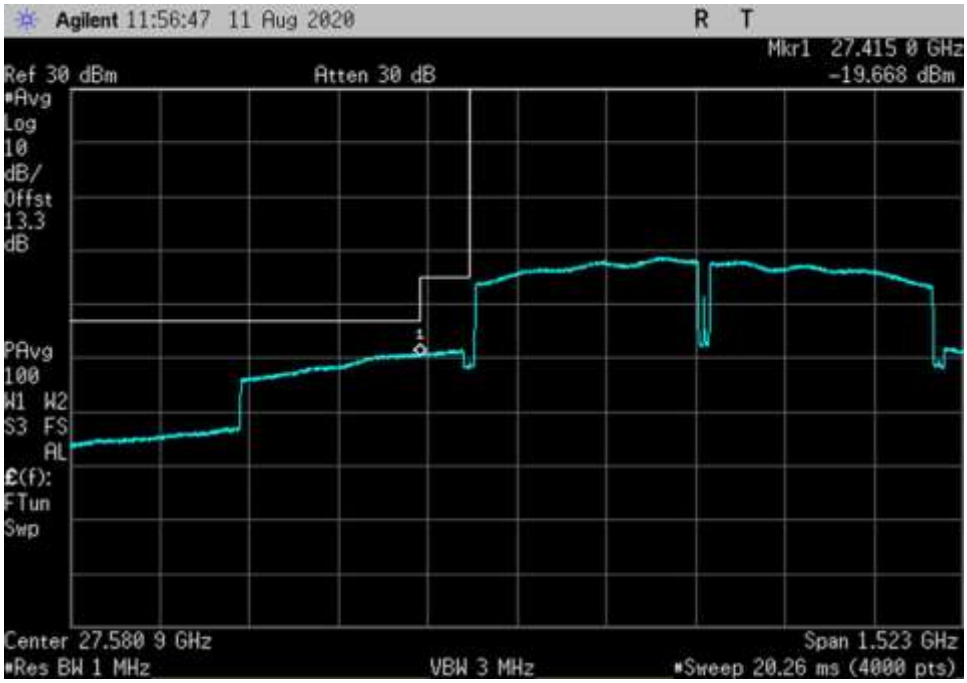
DL_27500-28350- 64QAM-400MHz-H-AGC+3-CP OFDM_LC

DL_27500-28350- 64QAM-400MHz-H-CP OFDM_HC



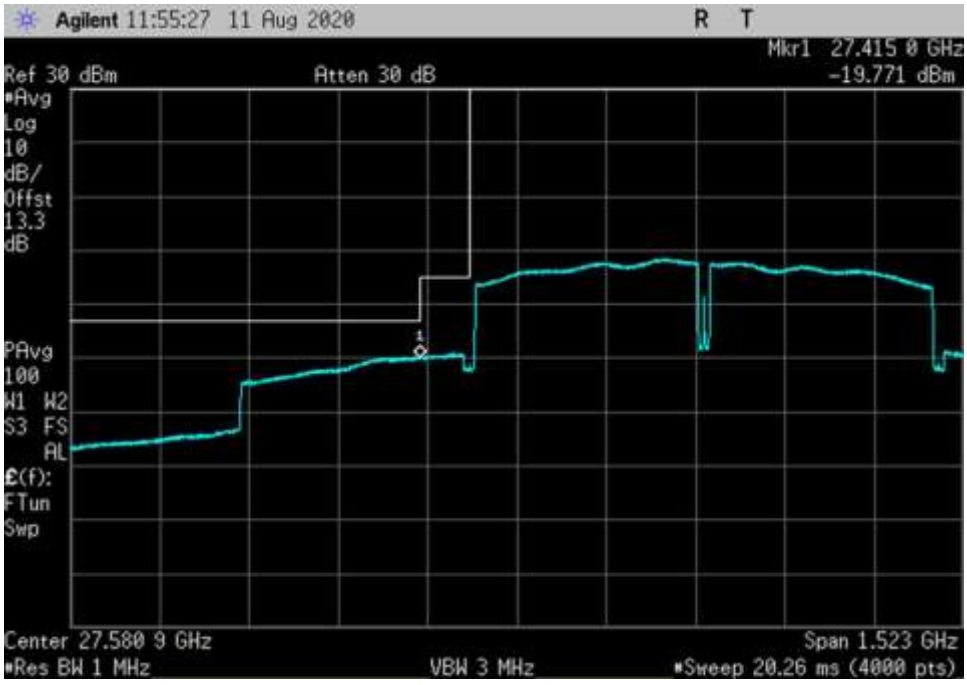
DL_27500-28350- 64QAM-400MHz-H-CP OFDM_LC

DL_27500-28350- 256QAM-400MHz-H-AGC+3-CP OFDM_HC



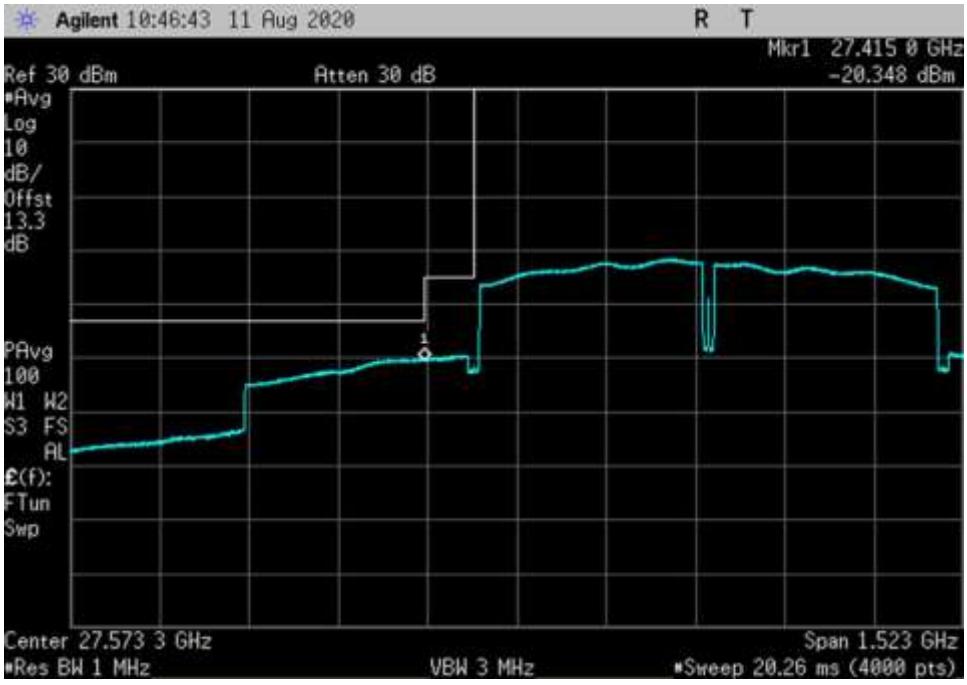
DL_27500-28350- 256QAM-400MHz-H-AGC+3-CP OFDM_LC

DL_27500-28350- 256QAM-400MHz-H-CP OFDM_HC



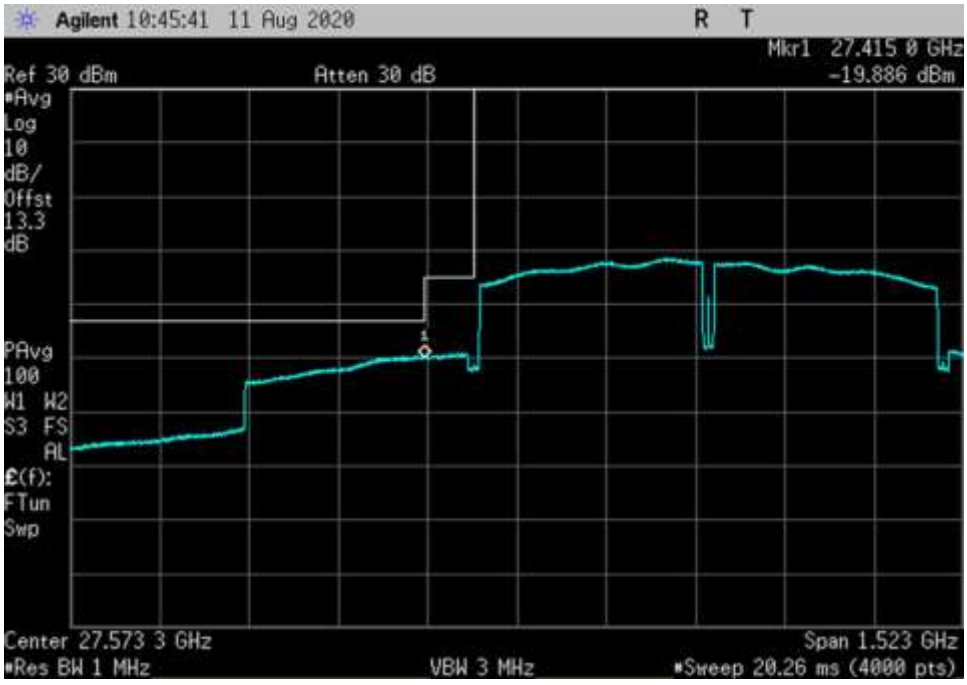
DL_27500-28350- 256QAM-400MHz-H-CP OFDM_LC

DL_27500-28350- QPSK-400MHz-H-AGC+3-CP OFDM_HC



DL_27500-28350- QPSK-400MHz-H-AGC+3-CP OFDM_LC

DL_27500-28350- QPSK-400MHz-H-CP OFDM_HC



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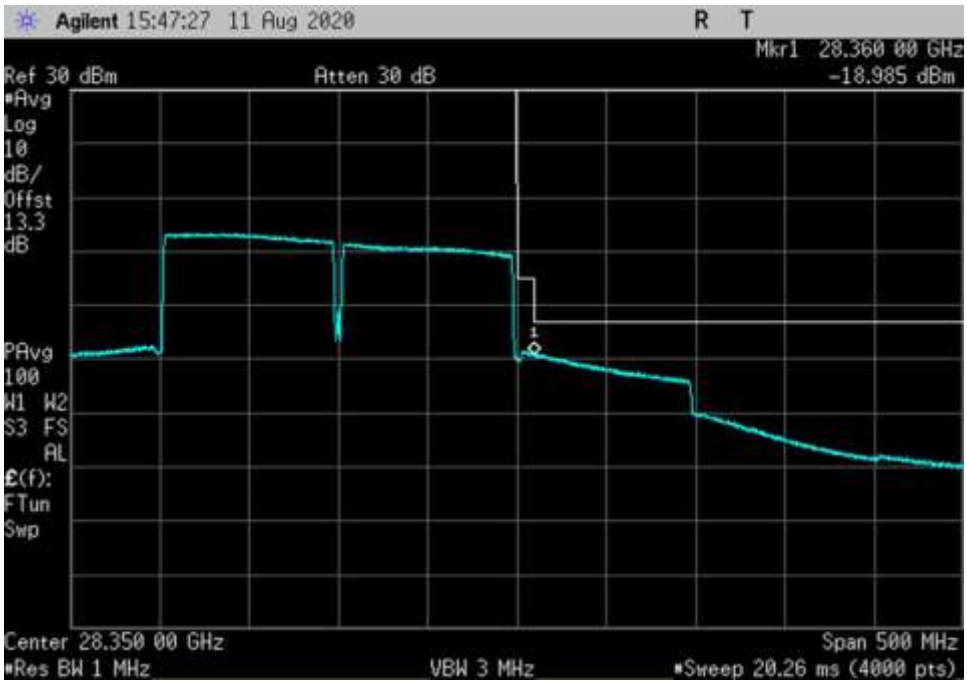
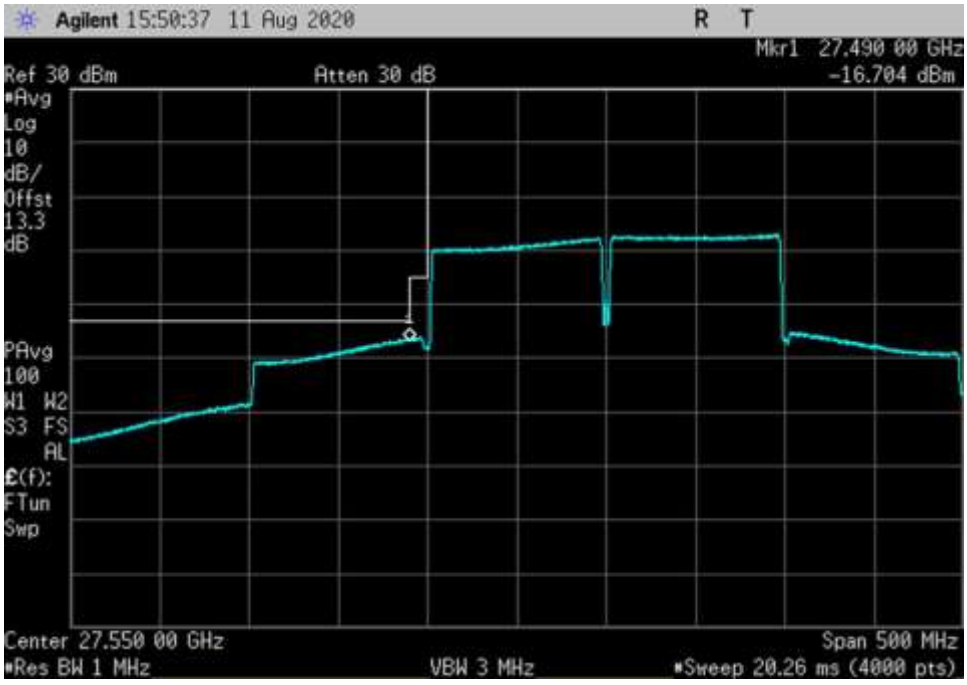
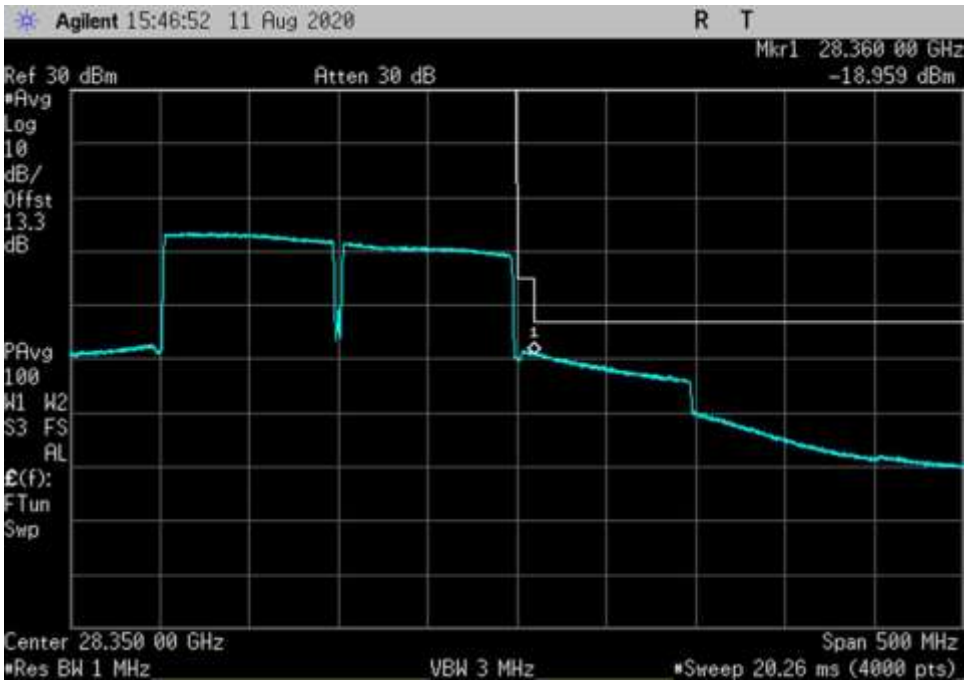


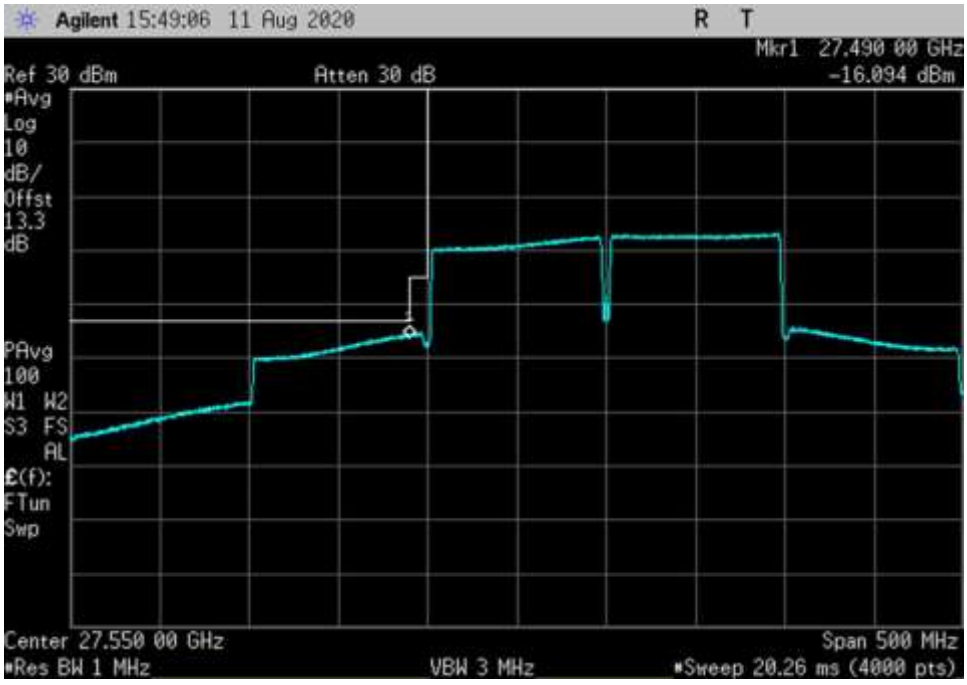
DL_27500-28350-16QAM-100MHz-H-AGC+3-CP OFDM_HC



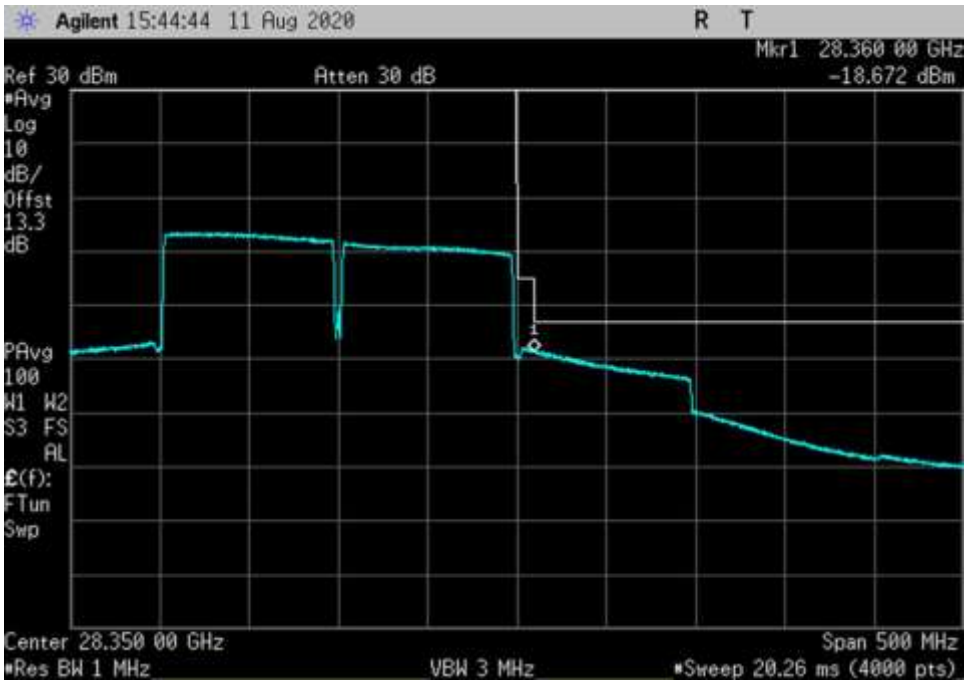
DL_27500-28350-16QAM-100MHz-H-AGC+3-CP OFDM_LC



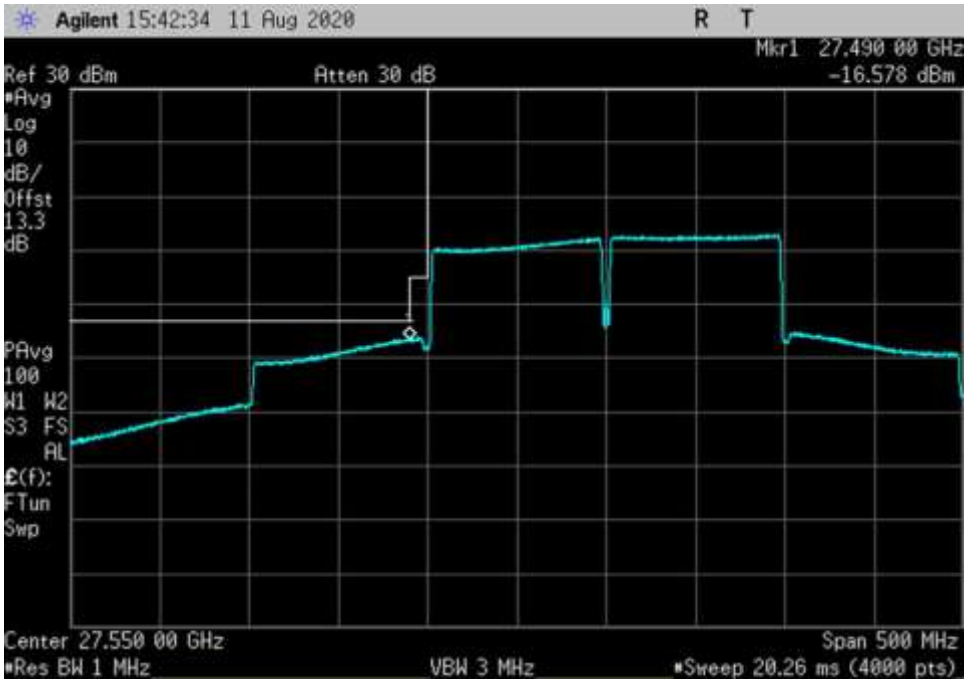
DL_27500-28350-16QAM-100MHz-H-CP OFDM_HC



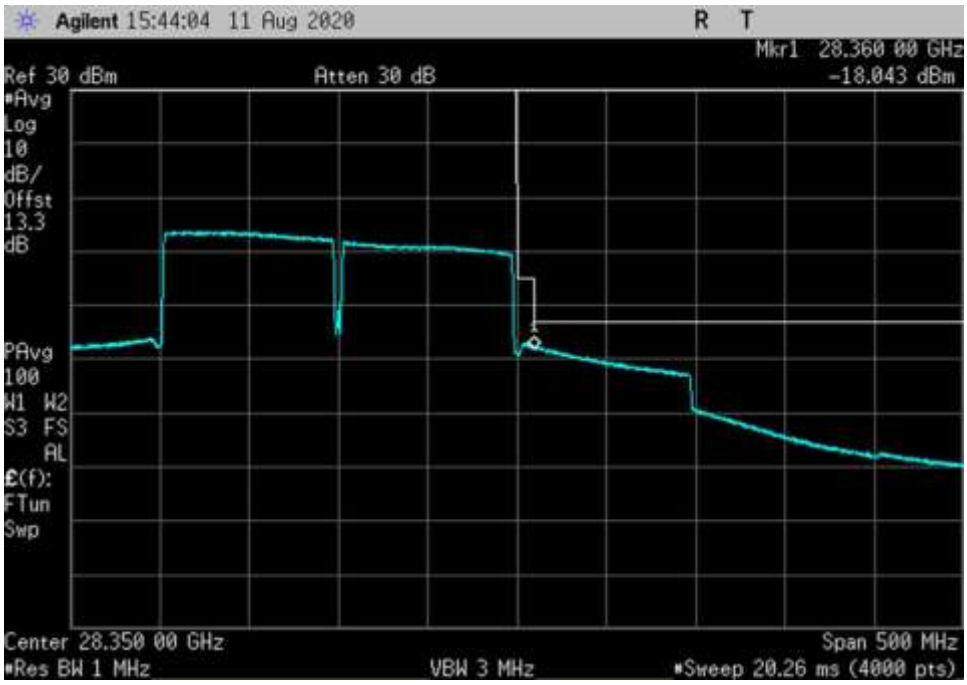
DL_27500-28350-16QAM-100MHz-H-CP OFDM_LC



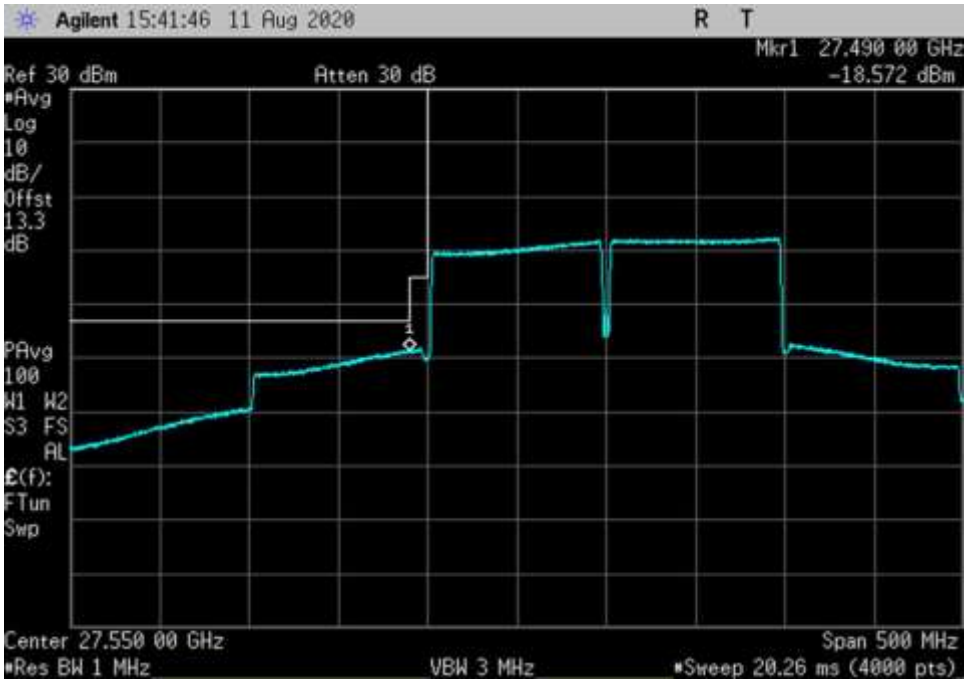
DL_27500-28350-64QAM-100MHz-H-AGC+3-CP OFDM_HC



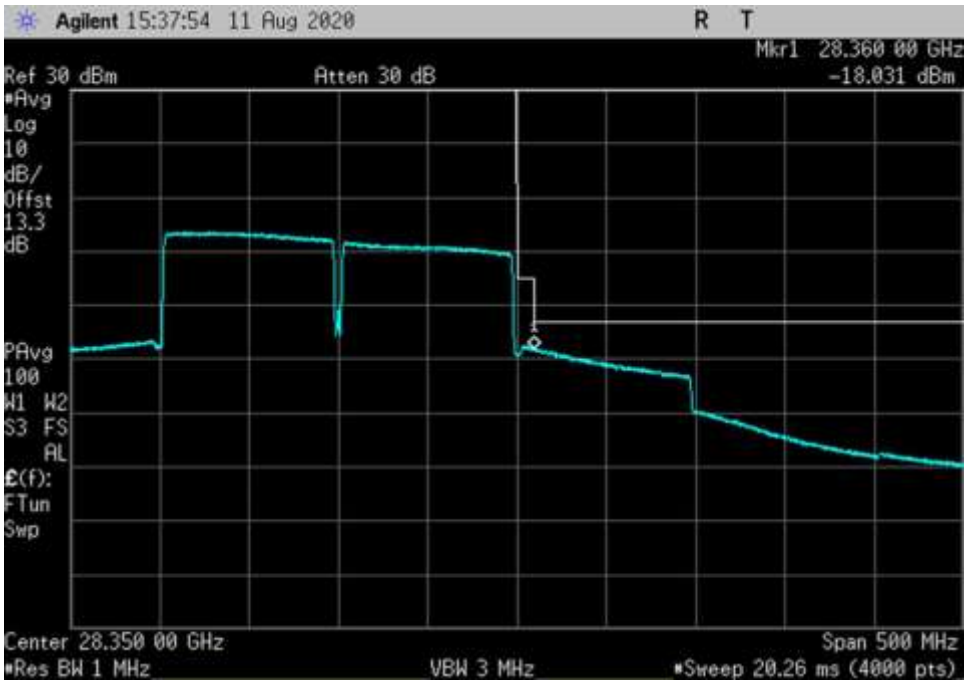
DL_27500-28350-64QAM-100MHz-H-AGC+3-CP OFDM_LC



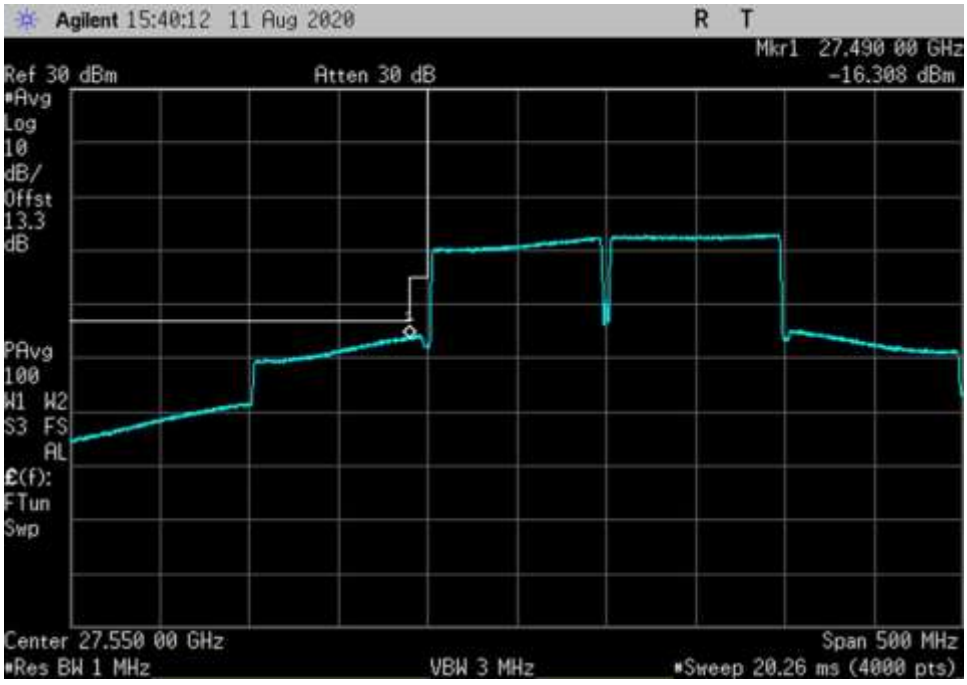
DL_27500-28350-64QAM-100MHz-H-CP OFDM_HC



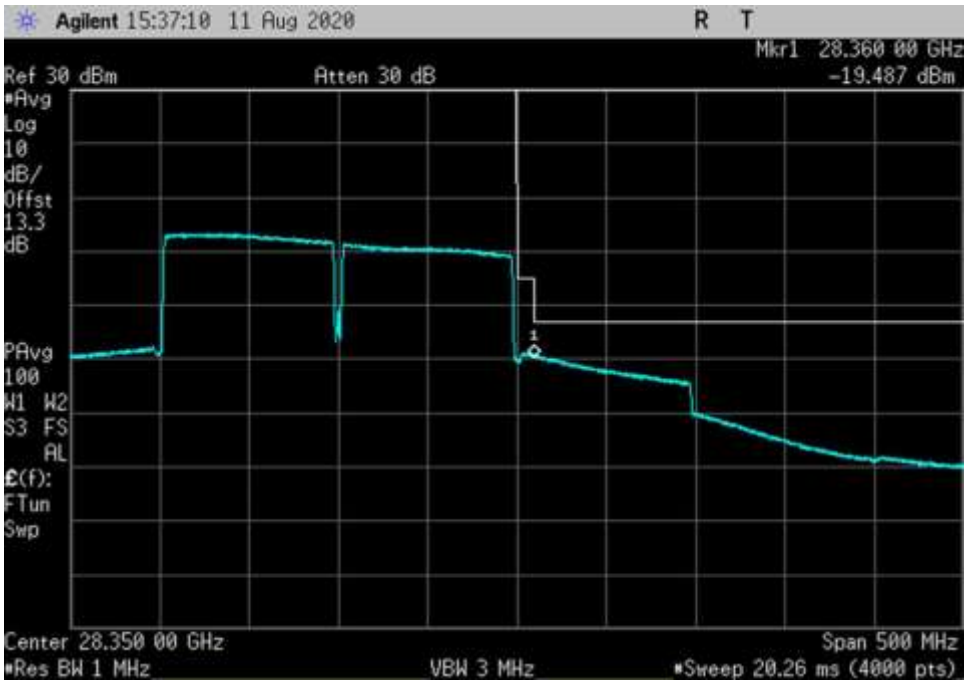
DL_27500-28350-64QAM-100MHz-H-CP OFDM_LC



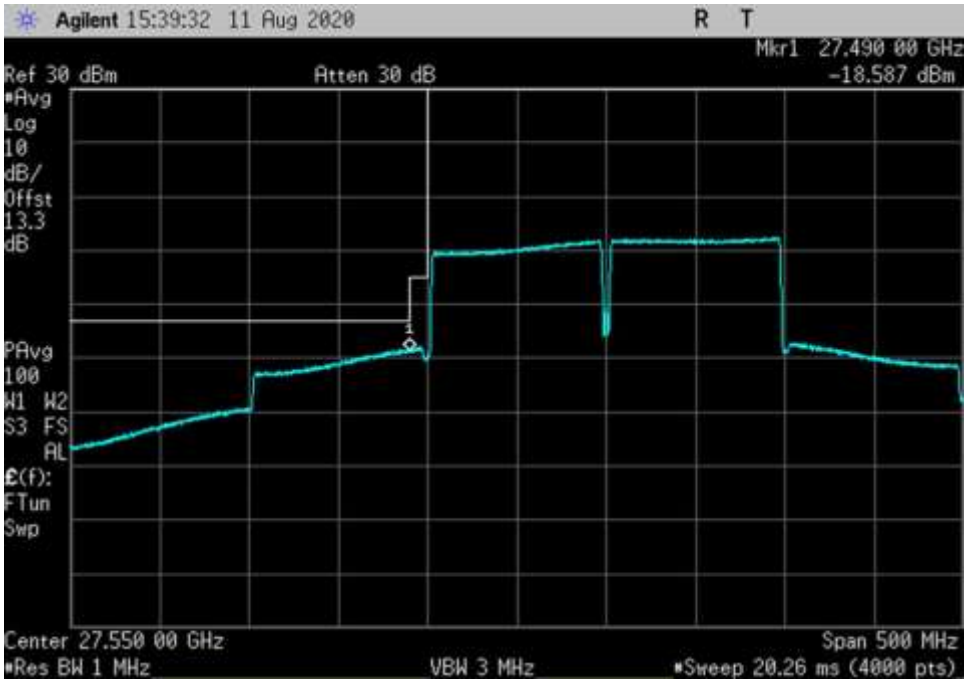
DL_27500-28350-256QAM-100MHz-H-AGC+3-CP OFDM_HC



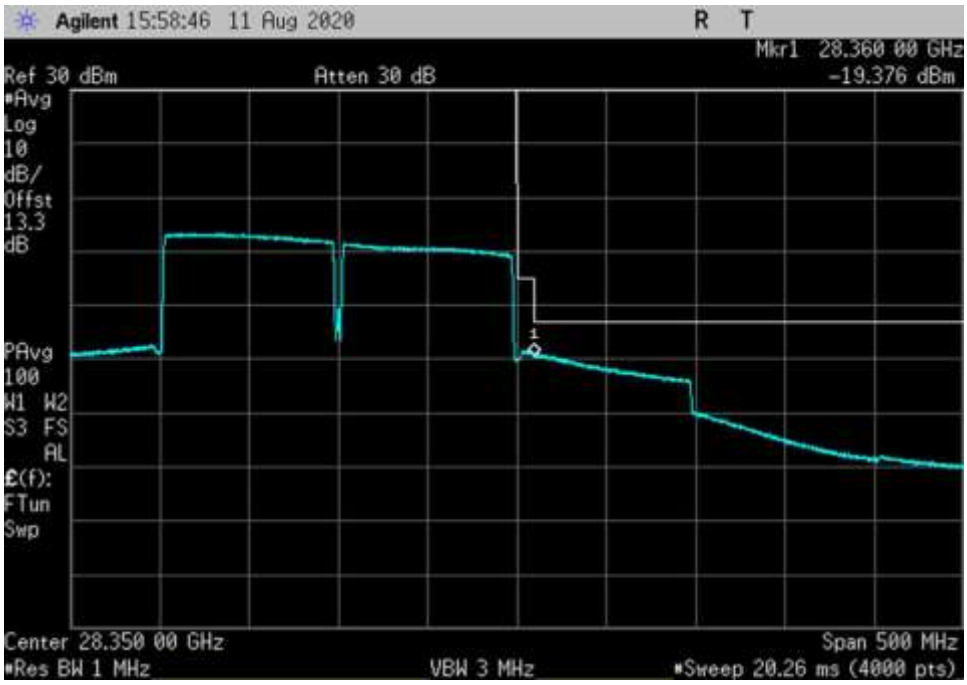
DL_27500-28350-256QAM-100MHz-H-AGC+3-CP OFDM_LC



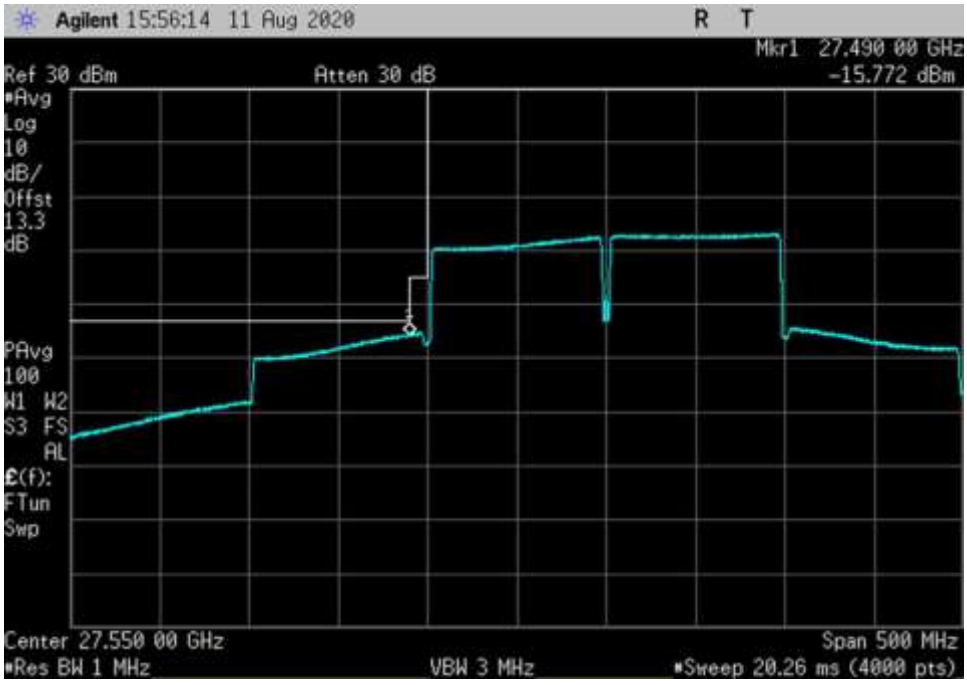
DL_27500-28350-256QAM-100MHz-H-CP OFDM_HC



DL_27500-28350-256QAM-100MHz-H-CP OFDM_LC



DL_27500-28350-QPSK-100MHz-H-AGC+3-CP OFDM_HC



DL_27500-28350-QPSK-100MHz-H-AGC+3-CP OFDM_LC