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DATE: 11 February 2020

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

For

Corning Optical Communication Wireless

Equipment under test:

Remote eXpansion Unit

RxU67

600 MHz Services

Tested by: _____
I. Kaganovich

Approved by: _____
D. Shidlowsky

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ISRAEL TESTING LABORATORIES
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Measurement/Technical Report for
Corning Optical Communication Wireless

Remote eXpansion Unit

RxU67

(600 MHz)

FCC ID: OJF1RXU67

This report concerns:	Original Grant: X Class II change: Class I change:
Equipment type:	Part 20 Industrial Booster (CMRS)
Limits used:	47CFR Parts 2; 27

Measurement procedure used is KDB 935210 D05 v01r03 April 2019 and ANSI IEEE C63.26-2015

Substitution Method used as in ANSI TIA-603-E-2016

Application for Certification
prepared by:
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Lod 7120101
Israel
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Applicant for this device:
(different from "prepared by")
Isaac Nissan
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e-mail: NissanI@corning.com

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1 General Information

1.1 Administrative Information

Manufacturer:	Corning Optical Communication Wireless
Manufacturer's Address:	8253 1st Street Vienna, VA 22812 U.S.A. Tel: +1-703 855-1773
Manufacturer's Representative:	Isaac Nissan
Equipment Under Test (E.U.T):	Remote eXpansion Unit
Equipment Model No.:	RxU67
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	28.12.2020
Start of Test:	29.12.2020
End of Test:	05.02.2020
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St, Lod, Israel 7116002
Test Specifications:	FCC Parts 2; 27

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by/registered with the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), FCC Designation Number is IL1005.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-20025, R-2729, T-20028, G-20068.
5. Department of Innovation, Science and Economic Development (ISED) Canada, CAB identifier: IL1002.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

Remote Expansion Unit RxU67 is an add-on module that expands the service distribution at remote locations to include 600MHz and 700MHz FirstNet bands.

RxU67 is part of the Corning optical network evolution (ONE™) solutions. It is designed to plug-into the remote access unit (RAU5x), expanding the five services supported by the RAU5x to include 600MHz and 700MHz FirstNet bands.

All seven services are distributed over the same infrastructure: routed to the RAU5x over a single optic fibre, distributed over the same footprint and managed as a single element – as the RAU5x.

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in KDB 935210 D05 v01r03 April 2019 and ANSI/TIA-603-E-2016. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

Both conducted and radiated emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and its FCC Designation Number is IL1005.

1.6 Measurement Uncertainty

Conducted Emission (CISPR 11, EN 55011, CISPR 32, EN 55032, ANSI C63.4)
0.15 – 30 MHz:
Expanded Uncertainty (95% Confidence, K=2):
± 3.44 dB

Radiated Emission (CISPR 11, EN 55011, CISPR 32, EN 55032, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.98 dB

2 System Test Configuration

2.1 Justification

The E.U.T. has been fully tested receiving signals from the RAU5x.

The test setup was configured to closely resemble the standard installation.
All source signals are represented in the setup by appropriate signal generators.

An “Exercise” SW on the computer was used to enable / disable transmission of the RAU5x, while the EUT output was connected to the spectrum analyzer.
All channels transmitted during the testing.
There is neither an intermediate amplified nor donor antenna in the uplink.
All components included in the UL path are connected by cables.

2.2 EUT Exercise Software

HCM 3.6 build26-RC1

2.3 Special Accessories

No special accessories were needed in order to achieve compliance.

2.4 Equipment Modifications

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

Product Name	Remote Expansion Unit
Model Name	RxU67
Working voltage	37-57 VDC
Mode of operation	Industrial Booster
Modulations	16QAM, 64QAM, 256QAM, BPSK
Frequency Range	**600** (DL: 617-652, UL:663-698) **FN700** (DL:758-768, UL: 788-798), **LTE700** (DL:728-756, UL:698-716, 777-787)
Transmit power	15 dBm (Max) per band
Antenna Gain	Internal 0dBi; External Antenna 6dBi.
DATA rate	N/A
Modulation BW	5; 10; 15; 20

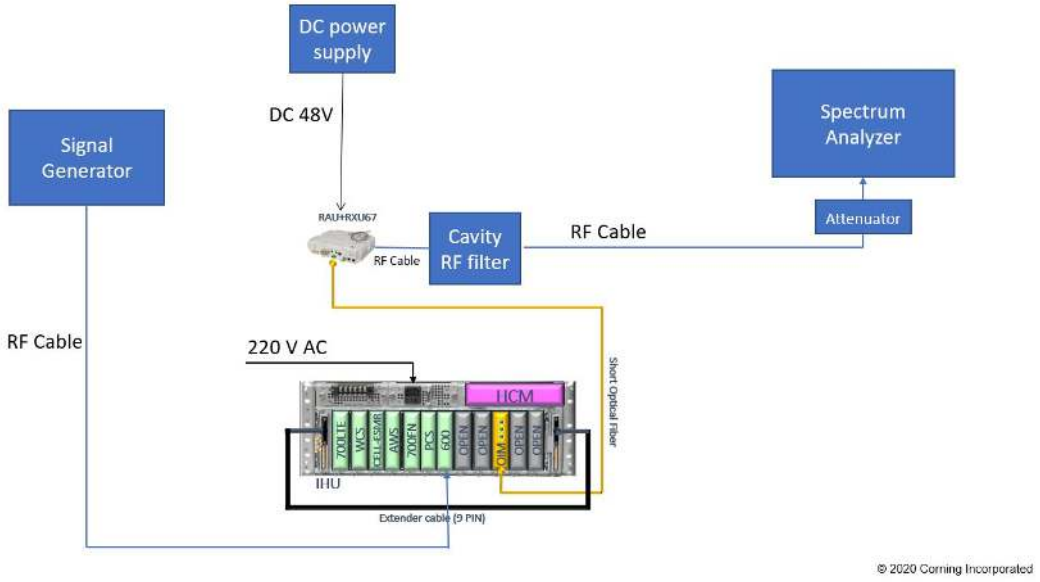

Figure 1. Conducted Test Set-Up

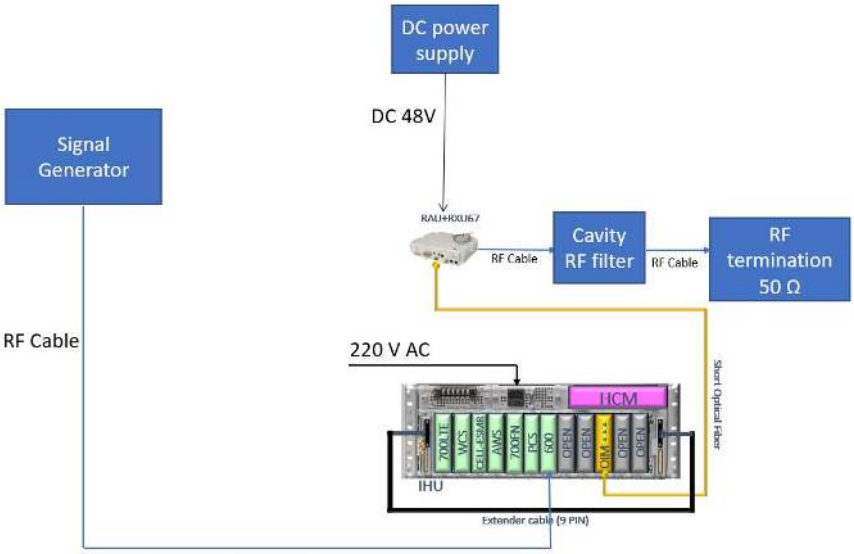

Figure 2. Radiated Test Set-Up With Termination

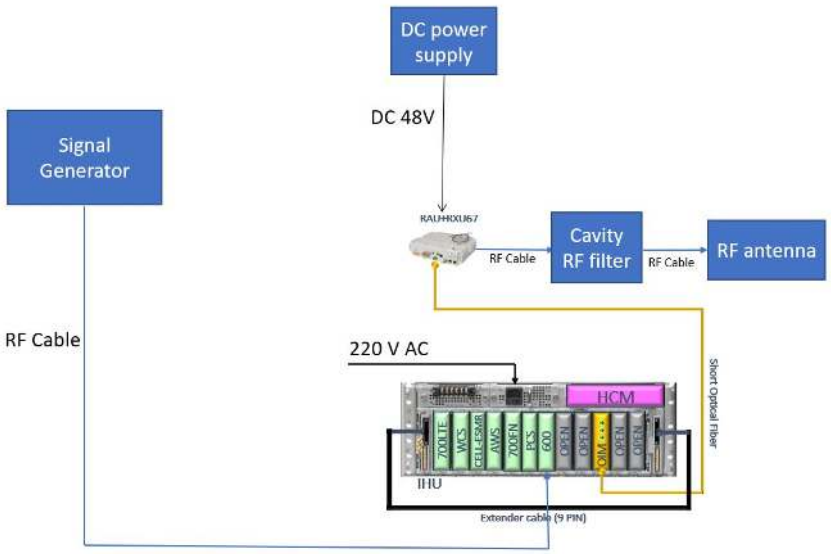

Figure 3. Radiated Test Set-Up

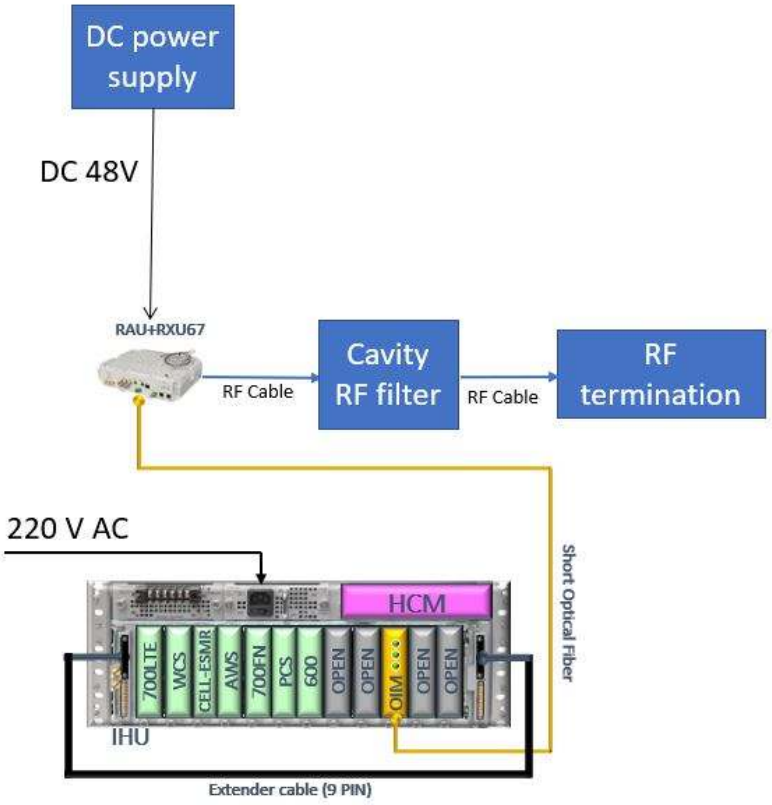

Figure 4. Radiated Test Set-Up

3 Test Set-Up Photos

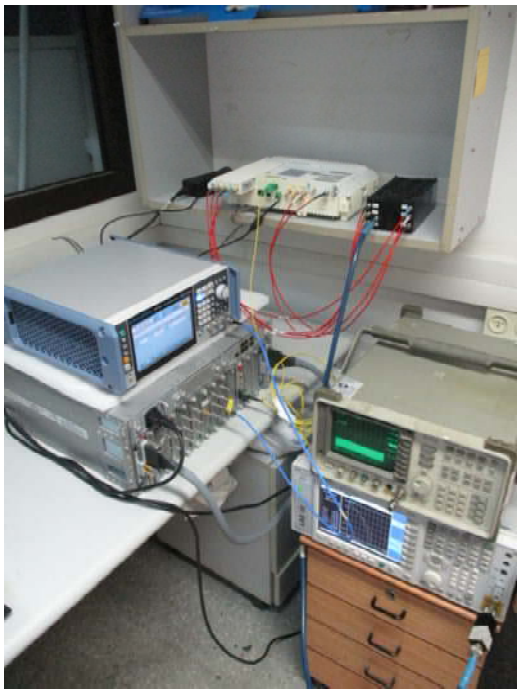

Figure 5. Conducted Emission From Antenna Port Tests

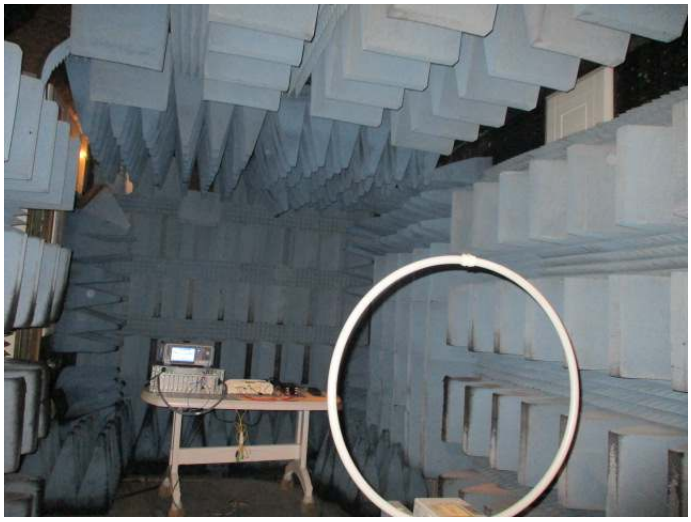

Figure 6. Radiated Emission Test 9kHz - 30MHz

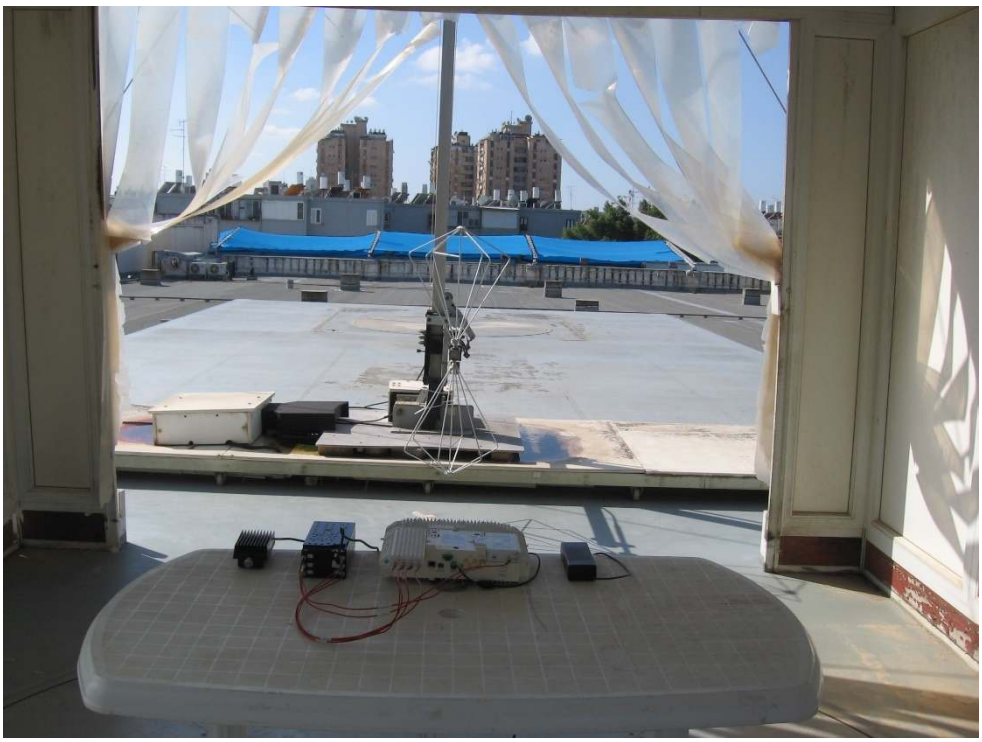

Figure 7. Radiated Emission Test 30 - 200 MHz

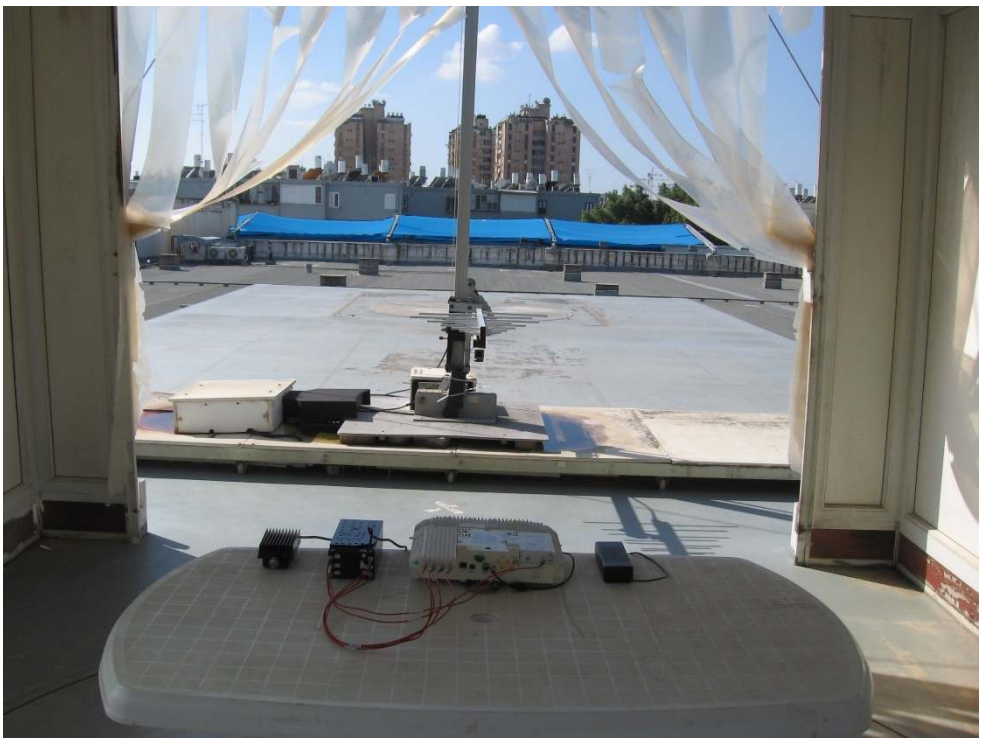

Figure 8. Radiated Emission Test 200 - 1000MHz

Figure 9. Radiated Emission Test 1.0 - 8.0GHz

4 RF Power Output

4.1 Test Specification

FCC Part 27, Subpart C (27.50)

4.2 Test Procedure

(Temperature (22°C)/ Humidity (36%RH))

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (20.8 dB) and an appropriate coaxial cable. Special attention was taken to prevent Spectrum Analyzer RF input overload.

For modulations 16QAM and 64QAM, the Spectrum Analyzer was set to 120 kHz RBW for bandwidth 5 MHz; 240 kHz RBW for bandwidth 10 MHz;
360 kHz RBW for bandwidth 15 MHz; and 470 kHz RBW for bandwidth 20 MHz.

For modulation 256QAM, the Spectrum Analyzer was set to 91 kHz RBW for bandwidth 5 MHz; 180 kHz RBW for bandwidth 10 MHz; 270 kHz RBW for bandwidth 15 MHz; and 390 kHz RBW for bandwidth 20 MHz.

For modulation QPSK, the Spectrum Analyzer was set to 91 kHz RBW for bandwidth 5 MHz; 270 kHz RBW for bandwidth 10 MHz; 270 kHz RBW for bandwidth 15 MHz; and 390 kHz RBW for bandwidth 20 MHz.

4.3 Test Limit

Peak Power Output must not exceed 1000W (60 dBm).

4.4 Test Results

JUDGEMENT: Passed

See additional information in Table 1 to Table 4 and Figure 10 to Figure 138.

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading	Antenna Gain	EIRP	Limit	Margin
	(MHz)	(kHz)	(MHz)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
16QAM	5	15	619.5	14.96	6	20.96	60	-39.0
		30		15.11		21.11	60	-38.9
		15	634.5	14.90		20.90	60	-39.1
		30		15.15		21.15	60	-38.9
		15	649.5	15.08		21.08	60	-38.9
		30		15.11		21.11	60	-38.9
	10	15	622.0	15.15		21.15	60	-38.9
		30		14.98		20.98	60	-39.0
		60		15.08		21.08	60	-38.9
		15	634.5	15.12		21.12	60	-38.9
		30		15.08		21.08	60	-38.9
		60		14.95		20.95	60	-39.1
		15	647.0	15.03		21.03	60	-39.0
		30		15.00		21.00	60	-39.0
		60		15.07		21.07	60	-38.9
	15	15	624.5	14.94		20.94	60	-39.1
		30		15.12		21.12	60	-38.9
		60		14.99		20.99	60	-39.0
		15	634.5	15.00		21.00	60	-39.0
		30		15.03		21.03	60	-39.0
		60		15.13		21.13	60	-38.9
		15	644.5	14.97		20.97	60	-39.0
		30		14.97		20.97	60	-39.0
		60		15.14		21.14	60	-38.9
	20	15	627.0	14.99		20.99	60	-39.0
		30		14.94		20.94	60	-39.1
		60		15.13		21.13	60	-38.9
		15	634.5	15.05		21.05	60	-39.0
		30		15.03		21.03	60	-39.0
		60		15.16		21.16	60	-38.8
		15	642.0	15.09		21.09	60	-38.9
		30		15.07		21.07	60	-38.9
		60		15.18		21.18	60	-38.8

Table 1 RF Power Output 16QAM

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading	Antenna Gain	EIRP	Limit	Margin
	(MHz)	(kHz)	(MHz)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
64QAM	5	15	619.5	14.98	6	20.98	60	-39.0
		30		15.11		21.11	60	-38.9
		15	634.5	15.11		21.11	60	-38.9
		30		14.86		20.86	60	-39.1
		15	649.5	15.05		21.05	60	-39.0
		30		15.12		21.12	60	-38.9
	10	15	622.0	15.13		21.13	60	-38.9
		30		15.14		21.14	60	-38.9
		60		14.20		20.20	60	-39.8
		15	634.5	15.89		21.89	60	-38.1
		30		15.02		21.02	60	-39.0
		60		14.97		20.97	60	-39.0
		15	647.0	15.02		21.02	60	-39.0
		30		15.05		21.05	60	-39.0
		60		14.95		20.95	60	-39.1
	15	15	624.5	14.97		20.97	60	-39.0
		30		15.11		21.11	60	-38.9
		1560		14.97		20.97	60	-39.0
		15	634.5	14.98		20.98	60	-39.0
		30		14.89		20.89	60	-39.1
		60		14.65		20.65	60	-39.4
		15	644.5	15.06		21.06	60	-38.9
		30		14.99		20.99	60	-39.0
		60		14.89		20.89	60	-39.1
	20	15	627.0	14.97		20.97	60	-39.0
		30		15.04		21.04	60	-39.0
		60		14.98		20.98	60	-39.0
		15	634.5	14.98		20.98	60	-39.0
		30		15.06		21.06	60	-38.9
		60		15.01		21.01	60	-39.0
		15	642.0	15.01		21.01	60	-39.0
		30		15.05		21.05	60	-39.0
		60		15.09		21.09	60	-38.9

Table 2 RF Power Output 64QAM

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading	Antenna Gain	EIRP	Limit	Margin
	(MHz)	(kHz)	(MHz)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
256QAM	5	15	619.5	15.41	6	21.41	60	-38.6
		30		15.50		21.50	60	-38.5
		15	634.5	15.47		21.47	60	-38.5
		30		15.38		21.38	60	-38.6
		15	649.5	15.63		21.63	60	-38.4
		30		15.50		21.50	60	-38.5
	10	15	622.0	15.94		21.94	60	-38.1
		30		15.01		21.01	60	-39.0
		60		15.29		21.29	60	-38.7
		15	634.5	15.28		21.28	60	-38.7
		30		15.39		21.39	60	-38.6
		60		15.42		21.42	60	-38.6
		15	647.0	15.67		21.67	60	-38.3
		30		15.54		21.54	60	-38.5
		60		15.59		21.59	60	-38.4
	15	15	624.5	15.63		21.63	60	-38.4
		30		14.99		20.99	60	-39.0
		60		15.07		21.07	60	-38.9
		15	634.5	15.32		21.32	60	-38.7
		30		15.49		21.49	60	-38.5
		60		15.68		21.68	60	-38.3
		15	644.5	14.95		20.95	60	-39.1
		30		15.17		21.17	60	-38.8
		60		15.36		21.36	60	-38.6
	20	15	627.0	15.32		21.32	60	-38.7
		30		15.33		21.33	60	-38.7
		60		15.35		21.35	60	-38.7
		15	634.5	15.39		21.39	60	-38.6
		30		15.80		21.80	60	-38.2
		60		15.75		21.75	60	-38.3
		15	642.0	15.52		21.52	60	-38.5
		30		15.62		21.62	60	-38.4
		60		15.58		21.58	60	-38.4

Table 3 RF Power Output 256QAM

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading	Antenna Gain	EIRP	Limit	Margin
	(MHz)	(kHz)	(MHz)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
QPSK	5	15	619.5	14.96	6	20.96	60	-39.0
		30		15.12		21.12	60	-38.9
		15	634.5	15.02		21.02	60	-39.0
		30		14.95		20.95	60	-39.1
		15	649.5	15.01		21.01	60	-39.0
		30		15.11		21.11	60	-38.9
	10	15	622.0	14.96		20.96	60	-39.0
		30		14.97		20.97	60	-39.0
		60		14.99		20.99	60	-39.0
		15	634.5	14.84		20.84	60	-39.2
		30		14.91		20.91	60	-39.1
		60		14.99		20.99	60	-39.0
		15	647.0	15.06		21.06	60	-38.9
		30		14.81		20.81	60	-39.2
		60		14.94		20.94	60	-39.1
	15	15	624.5	15.01		21.01	60	-39.0
		30		14.93		20.93	60	-39.1
		60		15.10		21.10	60	-38.9
		15	634.5	15.11		21.11	60	-38.9
		30		15.04		21.04	60	-39.0
		60		14.94		20.94	60	-39.1
		15	644.5	15.14		21.14	60	-38.9
		30		15.17		21.17	60	-38.8
		60		15.07		21.07	60	-38.9
	20	15	627.0	14.95		20.95	60	-39.1
		30		15.35		21.35	60	-38.7
		60		15.30		21.30	60	-38.7
		15	634.5	15.14		21.14	60	-38.9
		30		15.85		21.85	60	-38.2
		60		15.86		21.86	60	-38.1
		15	642.0	15.03		21.03	60	-39.0
		30		15.64		21.64	60	-38.4
		60		15.68		21.68	60	-38.3

Table 4 RF Power Output QPSK

Figure 10: 16QAM 5MHz B.W; 619.5MHz, 15kHz

Figure 11: 16QAM 5MHz B.W; 619.5MHz, 30kHz

Figure 12: 16QAM 5MHz B.W; 634.5MHz, 15kHz

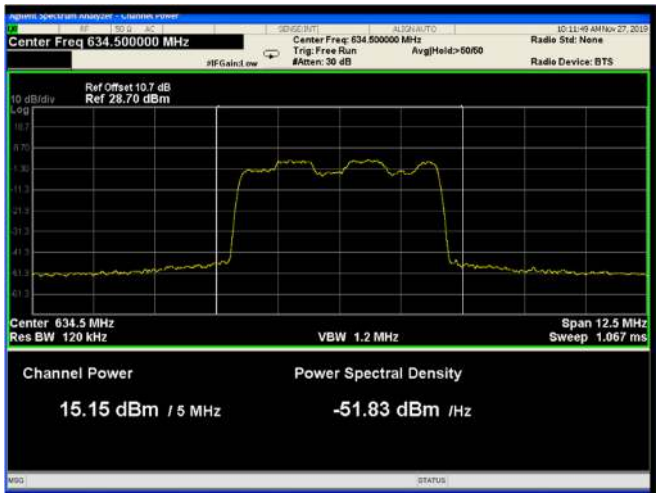

Figure 13: 16QAM 5MHz B.W; 634.5MHz, 30kHz

Figure 14: 16QAM 5MHz B.W; 648.5MHz, 15kHz

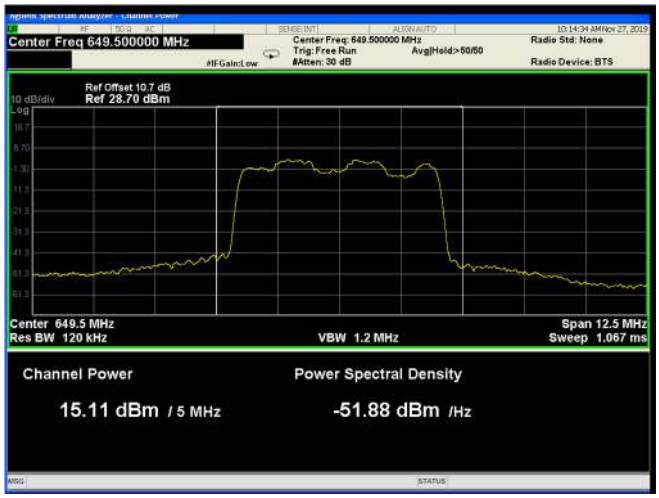

Figure 15: 16QAM 5MHzC.S; 619.5MHz, 15kHz

Figure 16: 16QAM 10MHz B.W; 622.0MHz, 15kHz

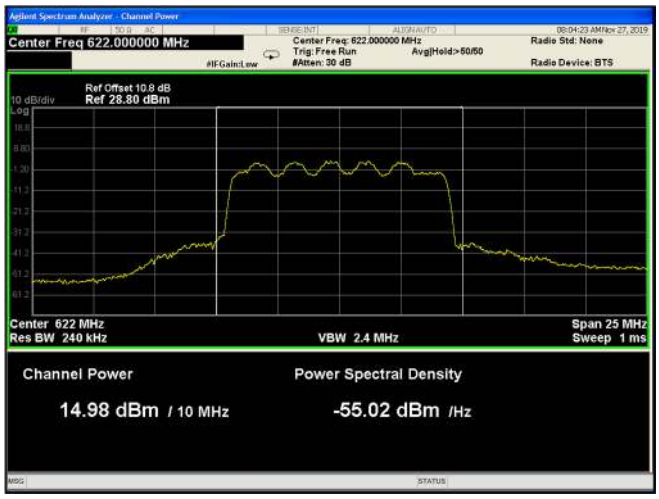

Figure 17: 16QAM 10MHz B.W; 622.0MHz, 30kHz

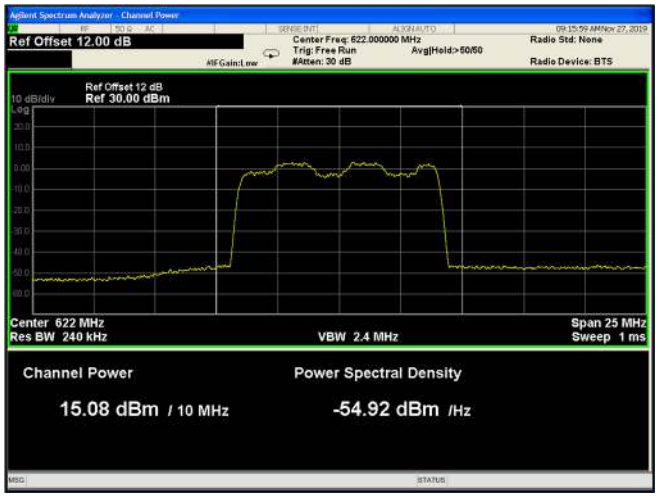

Figure 18: 16QAM 10MHz B.W; 622.0MHz, 60kHz

Figure 19: 16QAM 10MHz B.W; 634.5MHz, 15kHz

Figure 20: 16QAM 10MHz B.W; 634.5MHz, 30kHz

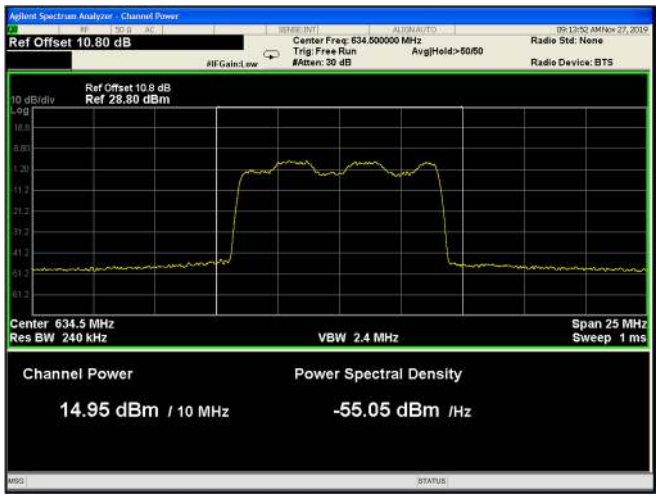

Figure 21: 16QAM 10MHz B.W; 634.5MHz, 60kHz

Figure 22: 16QAM 10MHz B.W; 647.0MHz, 15kHz

Figure 23: 16QAM 10MHz C.S; 647.0MHz, 30kHz

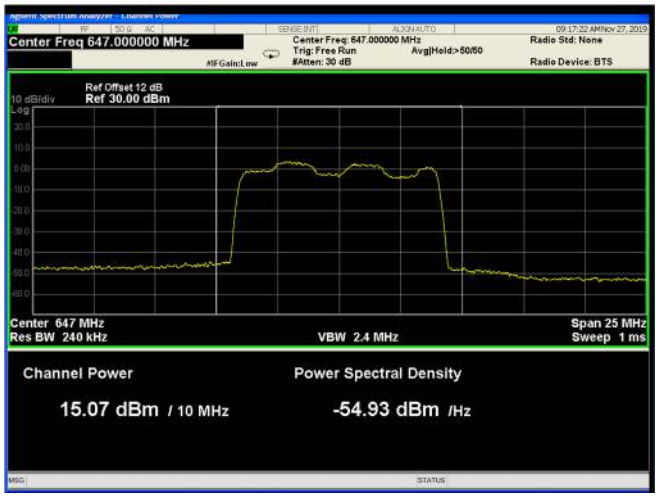

Figure 24: 16QAM 10MHz B.W; 647.0MHz, 60kHz

Figure 25: 16QAM 15MHz B.W; 624.5MHz, 15kHz

Figure 26: 16QAM 15MHz B.W; 624.5MHz, 30kHz

Figure 27: 16QAM 15MHz C.S; 624.5MHz, 60kHz

Figure 28: 16QAM 15MHz B.W; 634.5MHz, 15kHz

Figure 29: 16QAM 15MHz B.W; 634.5MHz, 30 kHz

Figure 30: 16QAM 15MHz B.W; 634.5MHz, 60kHz

Figure 31: 16QAM 15MHz B.W; 644.5MHz, 15kHz

Figure 32: 16QAM 15MHz B.W; 644.5MHz, 30kHz

Figure 33: 16QAM 15MHz B.W; 644.5MHz, 60kHz

Figure 34: 16QAM 20MHz B.W; 627.0MHz, 15 kHz

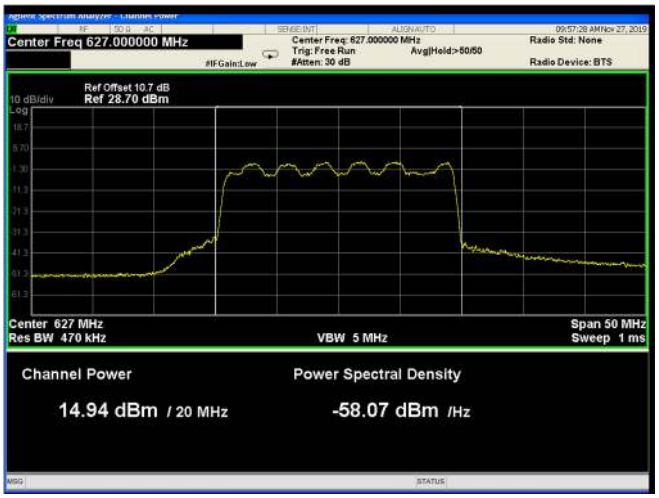

Figure 35: 16QAM 20MHz B.W; 627.0MHz, 30kHz

Figure 36: 16QAM 20MHz B.W; 627.0MHz, 60kHz

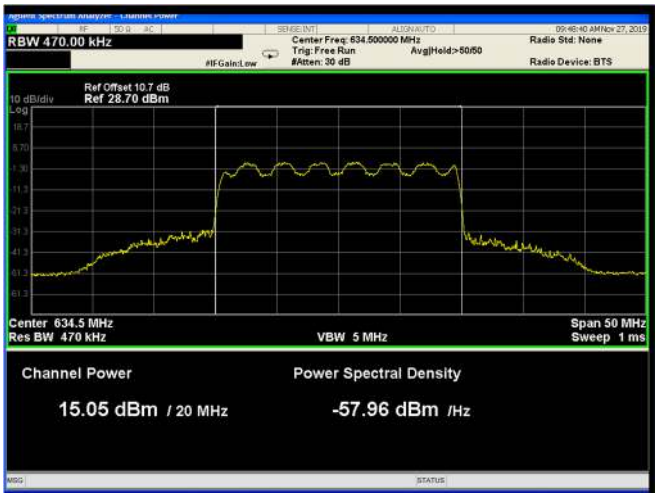

Figure 37: 16QAM 20MHz B.W; 634.5MHz, 15kHz

Figure 38: 16QAM 20MHzB.W; 634.5MHz, 30kHz

Figure 39: 16QAM 20MHz B.W; 634.5MHz, 60kHz

Figure 40: 16QAM 20MHz B.W; 642.0MHz, 15kHz

Figure 41: 16QAM 20MHz B.W; 642.0MHz, 30kHz

Figure 42: 16QAM 20MHz B.W; 642.0MHz, 60kHz

Figure 43: 64QAM 5MHz B.W; 619.5MHz, 15kHz

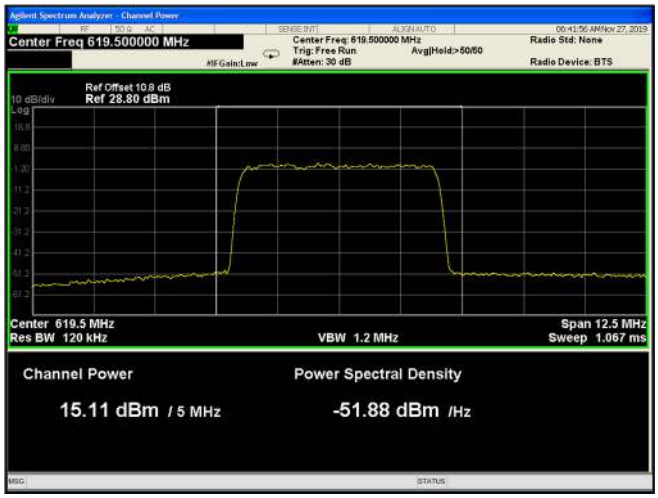

Figure 44: 64QAM 5MHz B.W; 619.5MHz, 30kHz

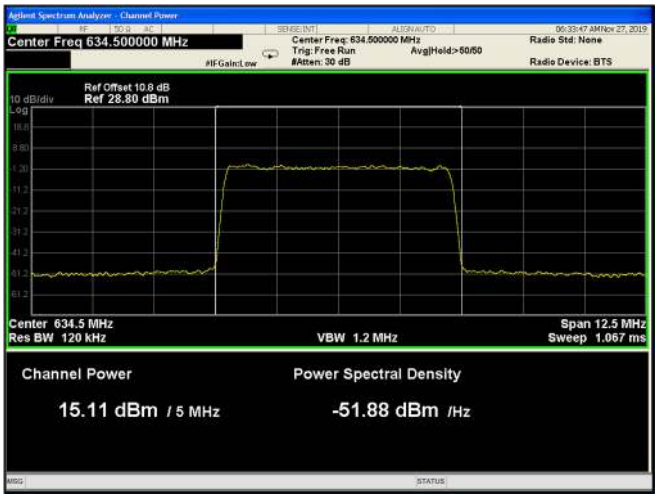

Figure 45: 64QAM 5MHz B.W; 634.5MHz, 15kHz

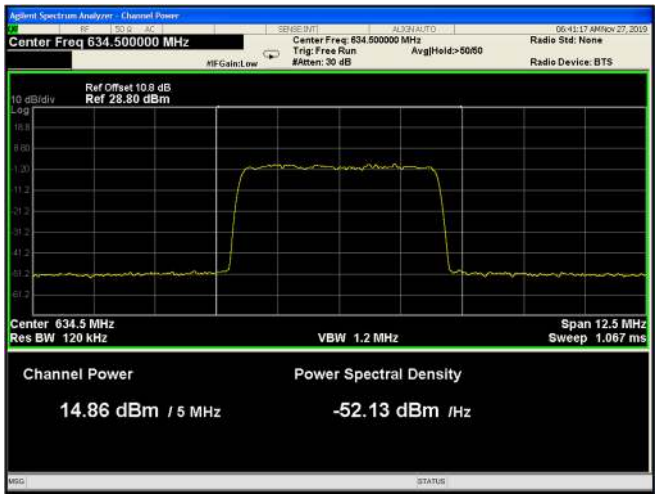

Figure 46: 64QAM 5MHz B.W; 634.5MHz, 30kHz

Figure 47: 64QAM 5MHz B.W; 649.5MHz, 15kHz

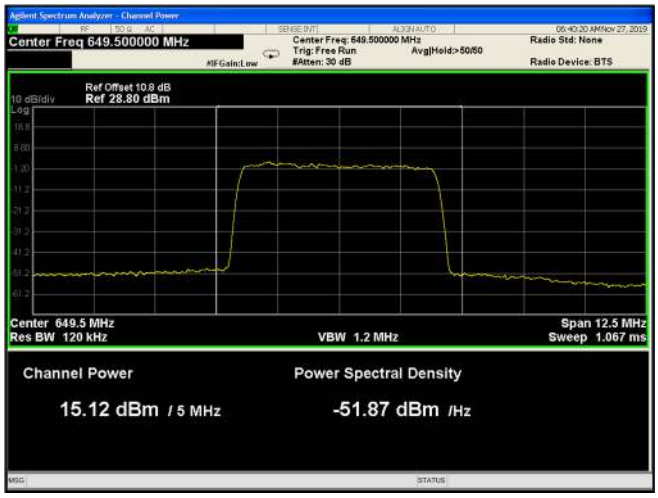

Figure 48: 64QAM 5MHz B.W; 649.5MHz, 30kHz

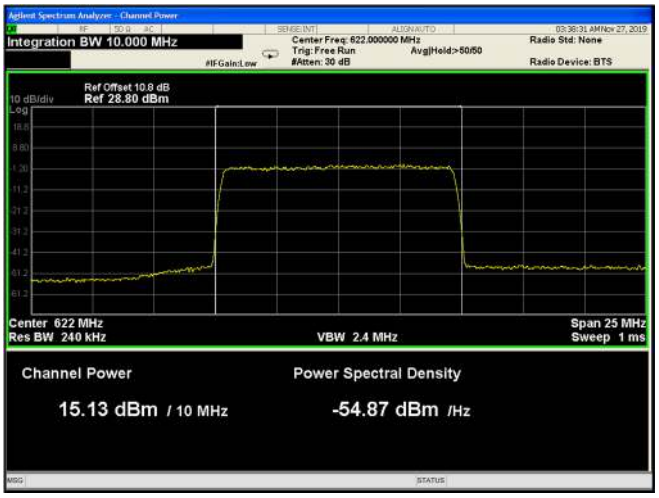

Figure 49: 64QAM 10MHz B.W; 622.0MHz, 15kHz

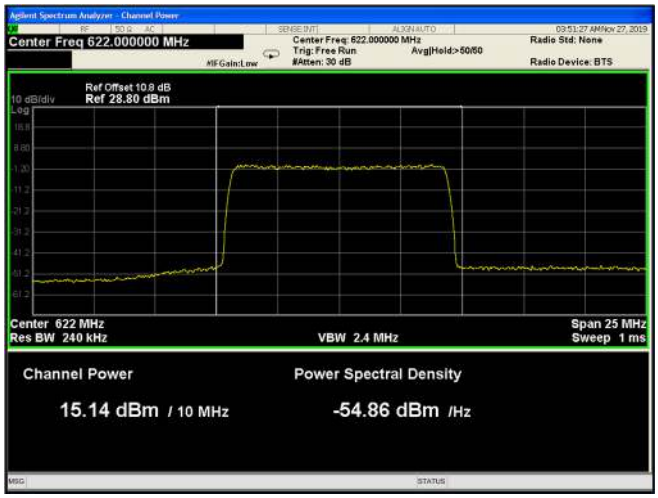

Figure 50: 64QAM 10MHz B.W; 622.0MHz, 60kHz

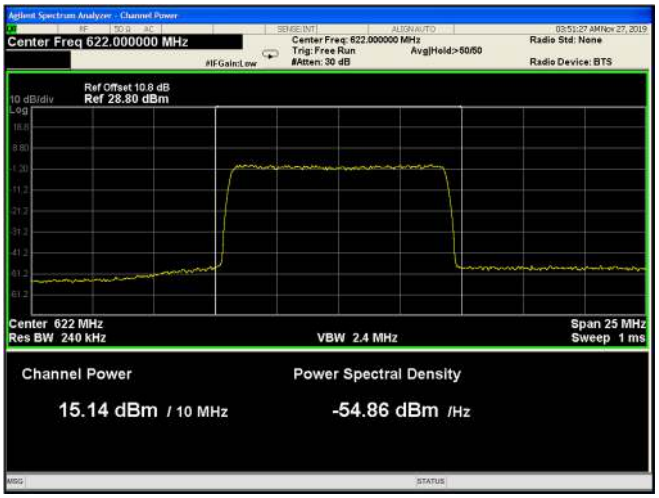

Figure 51: 64QAM 10MHz B.W; 622.0MHz, 60kHz

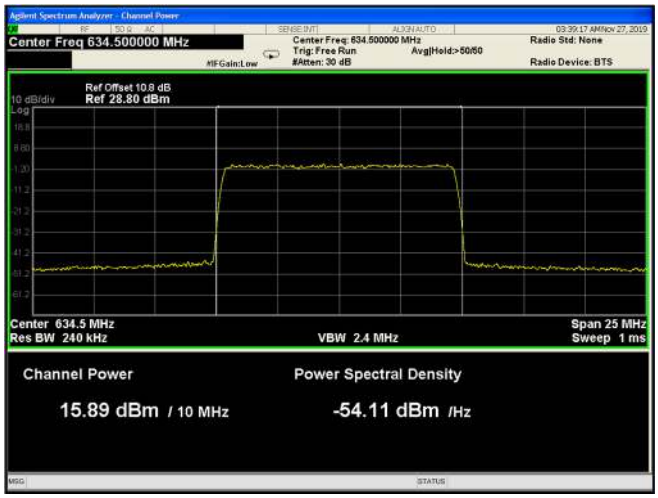

Figure 52: 64QAM 10MHz B.W; 634.5MHz, 15kHz

Figure 53: 64QAM 10MHz B.W; 634.5MHz, 30kHz

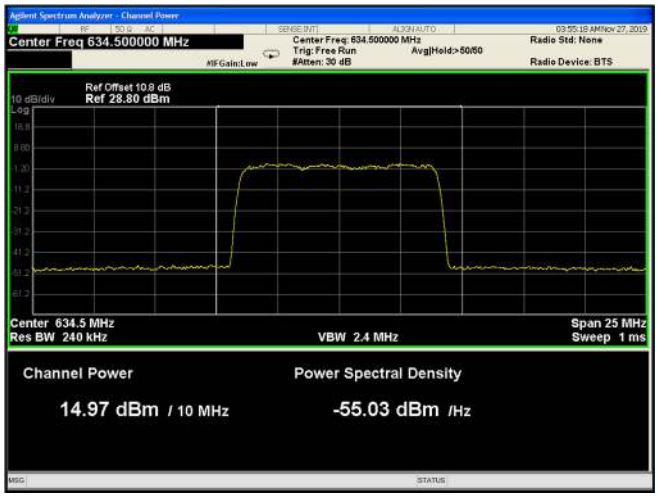

Figure 54: 64QAM 10MHz B.W; 634.5MHz, 60kHz

Figure 55: 64QAM 10MHz B.W; 647.0MHz, 15kHz

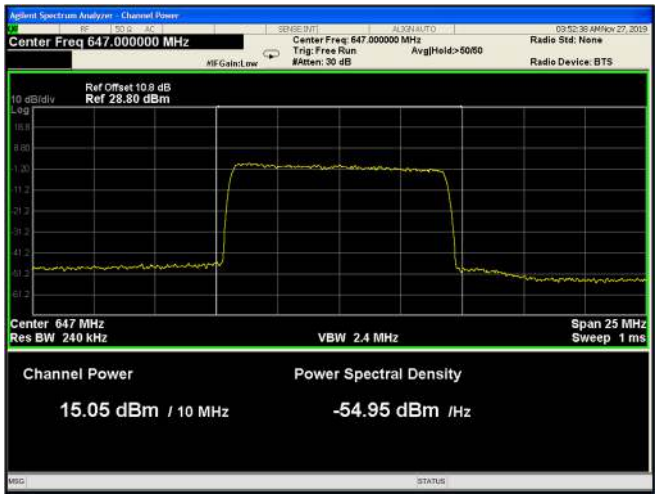

Figure 56: 64QAM 10MHz B.W; 647.0MHz, 30kHz

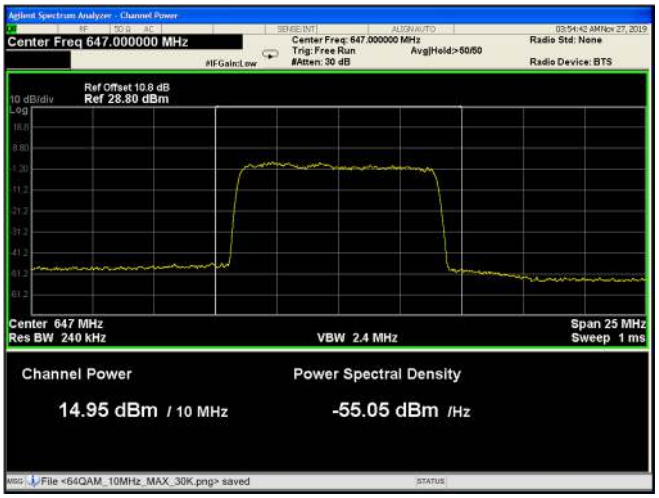

Figure 57: 64QAM 10MHz B.W; 647.0 MHz, 60kHz

Figure 58: 64QAM 15MHz B.W; 624.5MHz, 15kHz

Figure 59: 64QAM 15MHz B.W; 624.5MHz, 30kHz

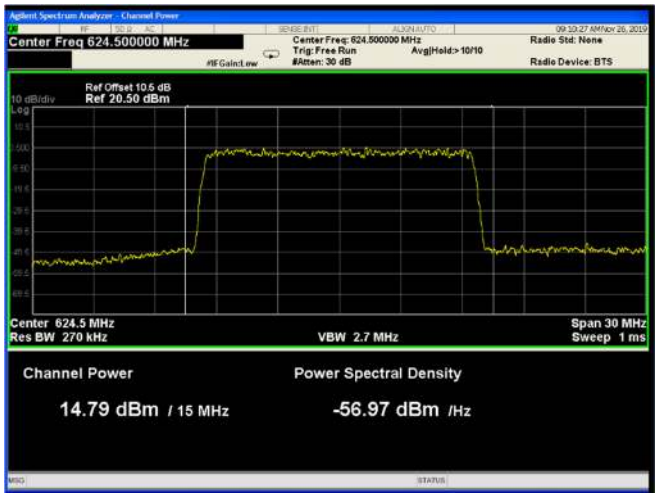

Figure 60: 64QAM 15MHz B.W; 624.5MHz, 60kHz

Figure 61: 64QAM 15MHz B.W; 634.5MHz, 15kHz

Figure 62: 64QAM 15MHz; 634.5MHz B.W, 30kHz

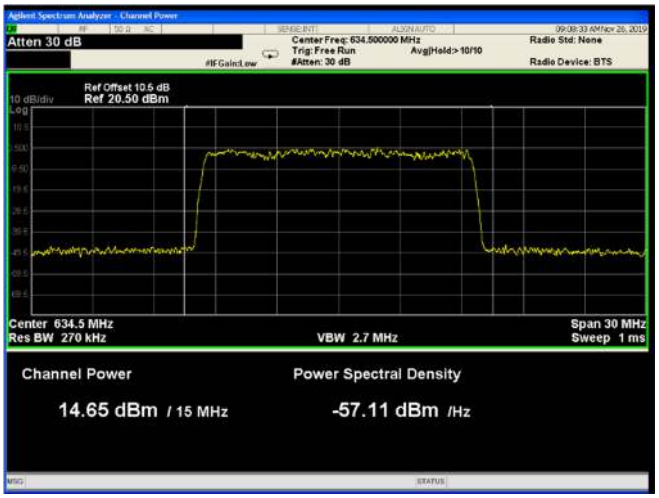

Figure 63: 64QAM 15MHz B.W; 634.5MHz, 60kHz

Figure 64: 64QAM 15MHz B.W; 644.5MHz, 15kHz

Figure 65: 64QAM 15MHz B.W; 644.5MHz, 30kHz

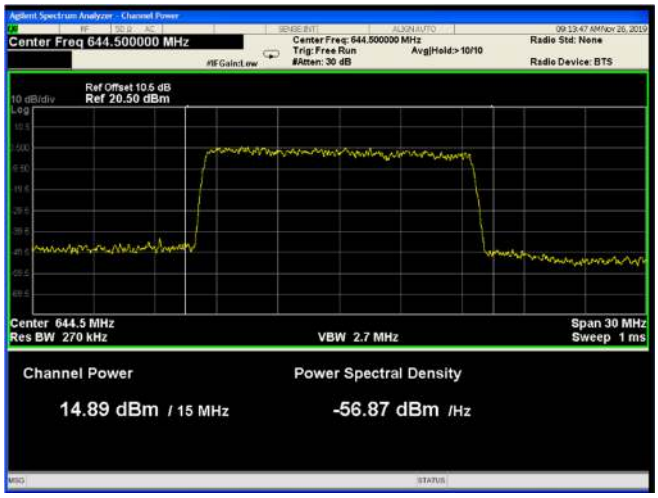

Figure 66: 64QAM 15MHz B.W; 644.5MHz, 60kHz

Figure 67: 64QAM 20MHz B.W; 627.0MHz, 15kHz

Figure 68: 64QAM 20MHz B.W; 627.0MHz, 30kHz

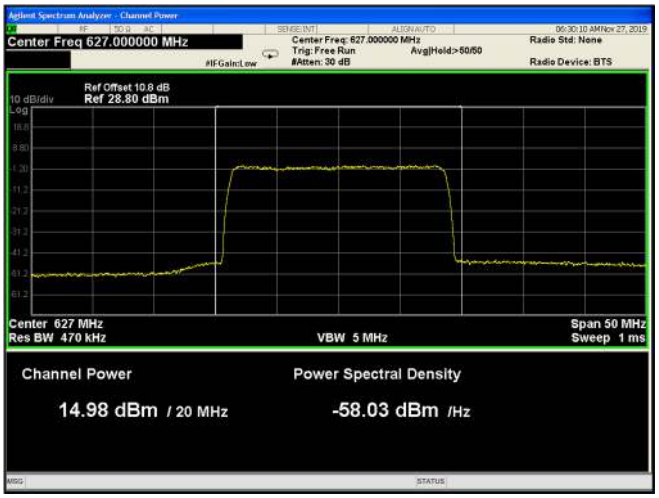

Figure 69: 64QAM 20MHz B.W; 627.0MHz, 60kHz

Figure 70: 64QAM 20MHz B.W; 634.5MHz, 15kHz

Figure 71: 64QAM 20MHz B.W; 634.5MHz, 30kHz

Figure 72: 64QAM 20MHz B.W; 634.5MHz, 60kHz

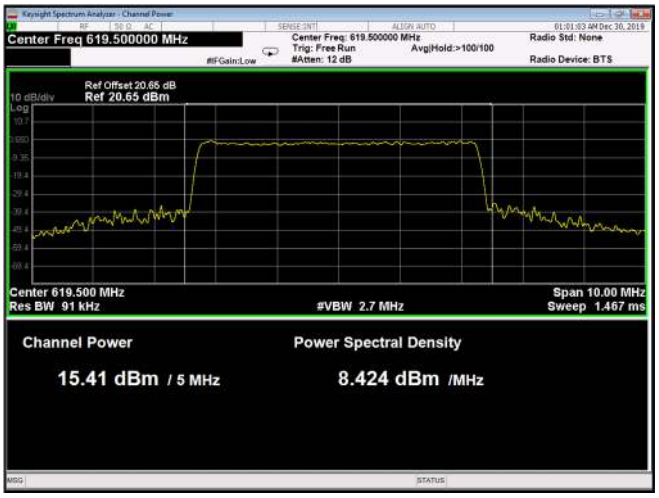

Figure 73: 256QAM 5MHz B.W; 619.5MHz, 15kHz

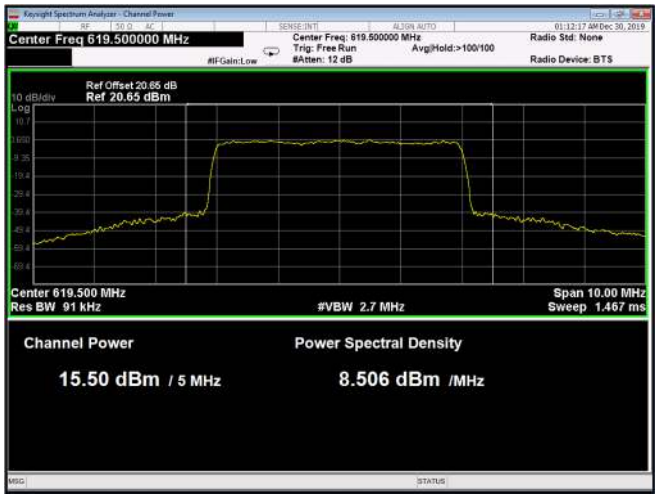

Figure 74: 256QAM 5MHz B.W; 619.5MHz, 30kHz

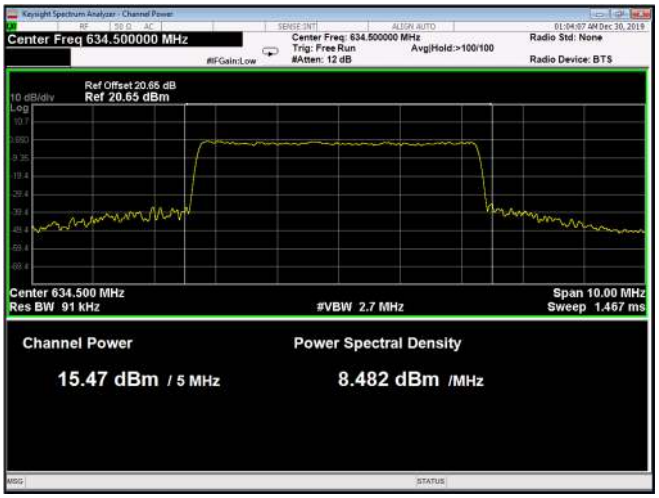

Figure 75: 256QAM 5MHz B.W; 634.5MHz, 15kHz

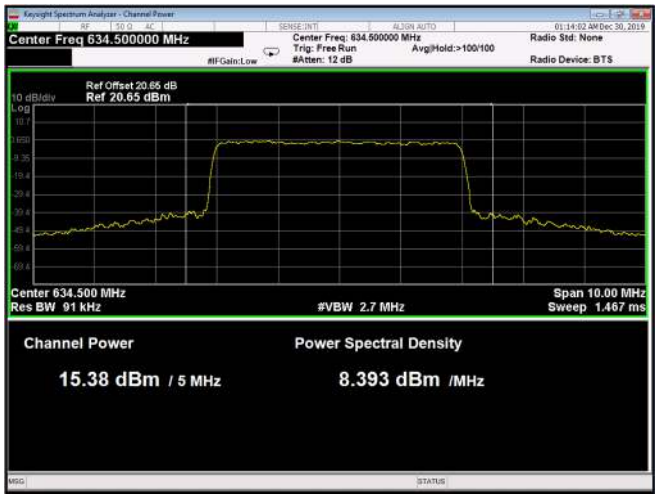

Figure 76: 256QAM 5MHz B.W; 634.5MHz, 30kHz

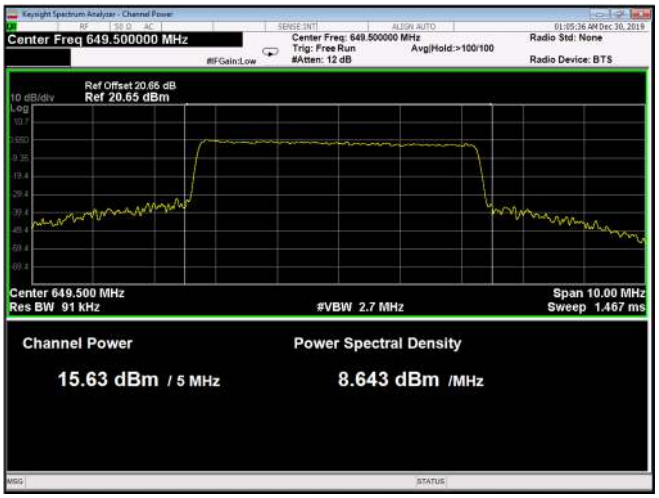

Figure 77: 256QAM 5MHz B.W; 649.5MHz, 15kHz

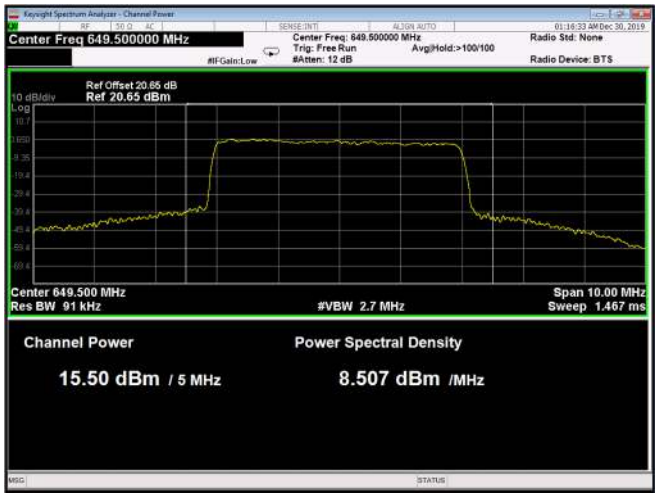

Figure 78: 256QAM 5MHz B.W; 649.5MHz, 30kHz

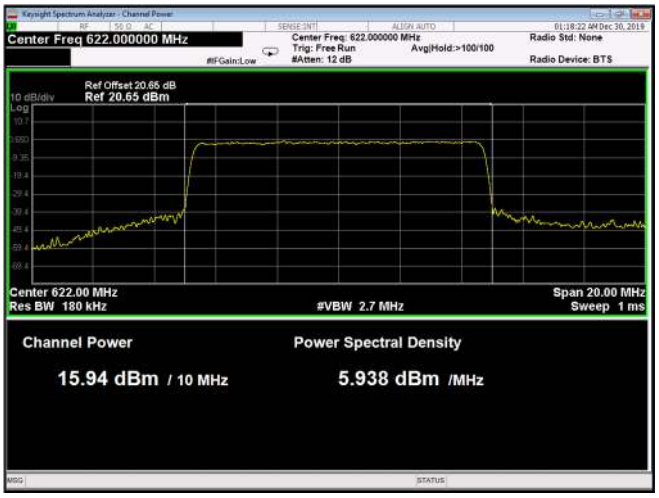

Figure 79: 256QAM 10MHz B.W; 622.0MHz, 15kHz

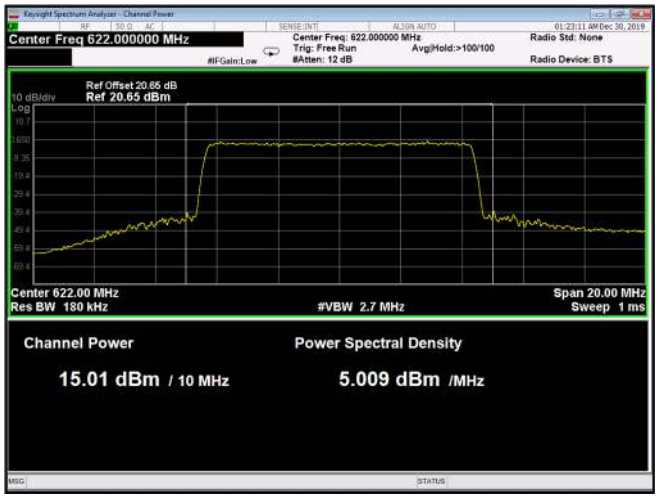

Figure 80: 256QAM 10MHz B.W; 622.0MHz, 30kHz

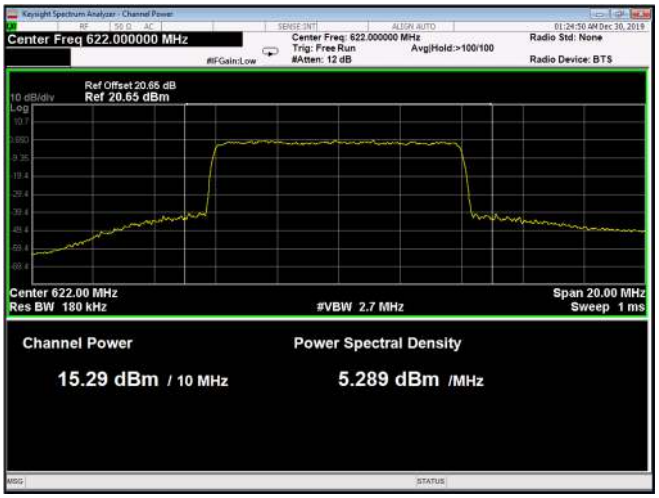

Figure 81: 256QAM 10MHz B.W; 622.0MHz, 60kHz

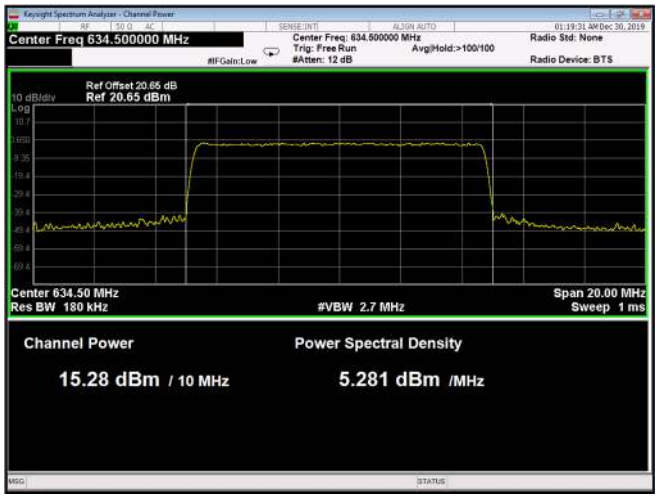

Figure 82: 256QAM 10MHz B.W; 634.5MHz, 15kHz

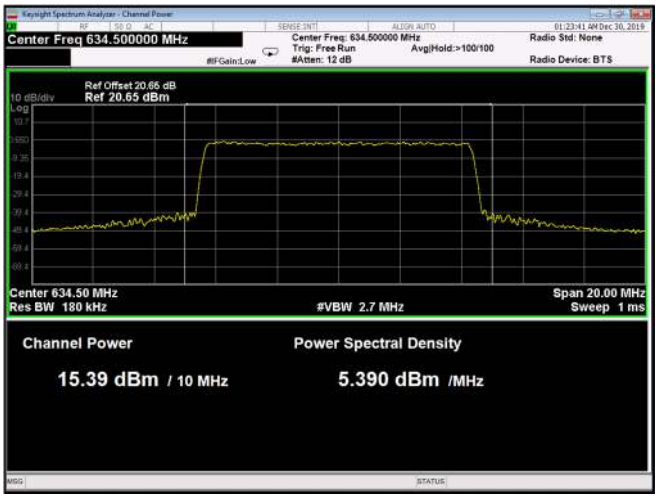

Figure 83: 256QAM 10MHz B.W; 634.5MHz, 30kHz

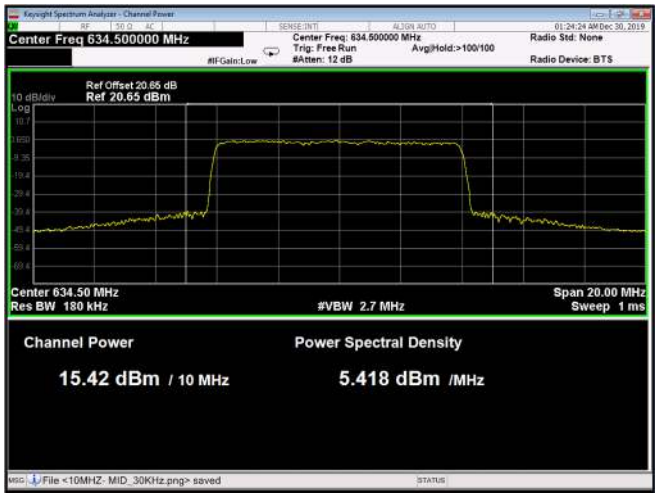

Figure 84: 256QAM 10MHz B.W; 634.5MHz, 60kHz

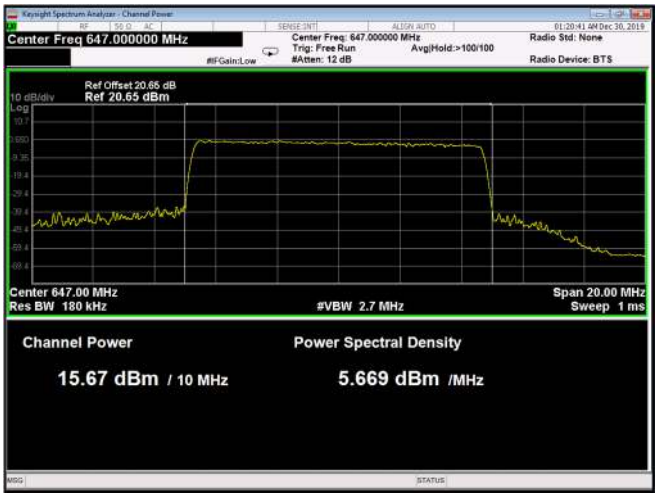

Figure 85: 256QAM 10MHz B.W; 647.0MHz, 15kHz

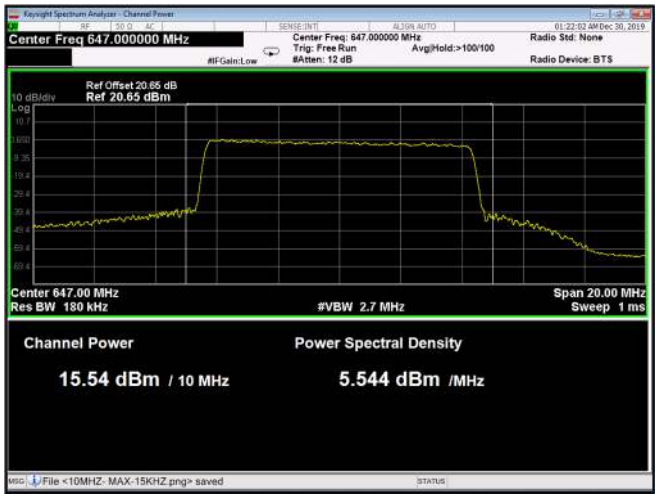

Figure 86: 256QAM 10MHz B.W; 647.0MHz, 30kHz

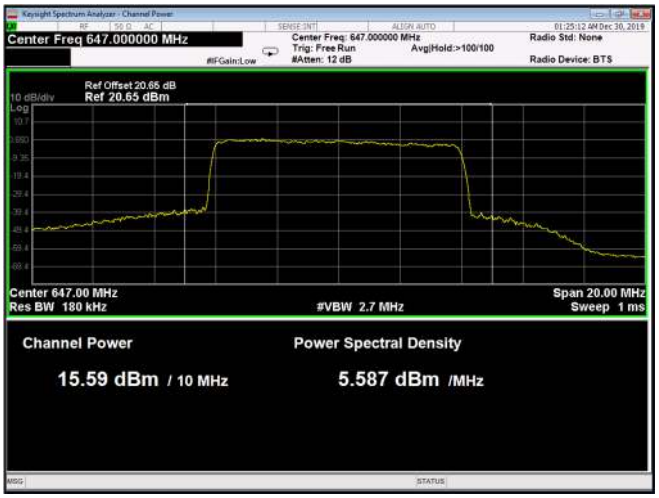

Figure 87: 256QAM 10MHz B.W; 647.0MHz, 60kHz

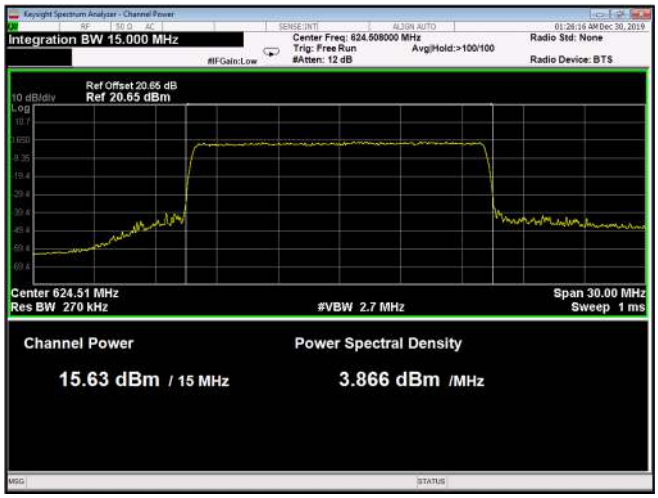

Figure 88: 256QAM 15MHz B.W; 624.5MHz, 15kHz

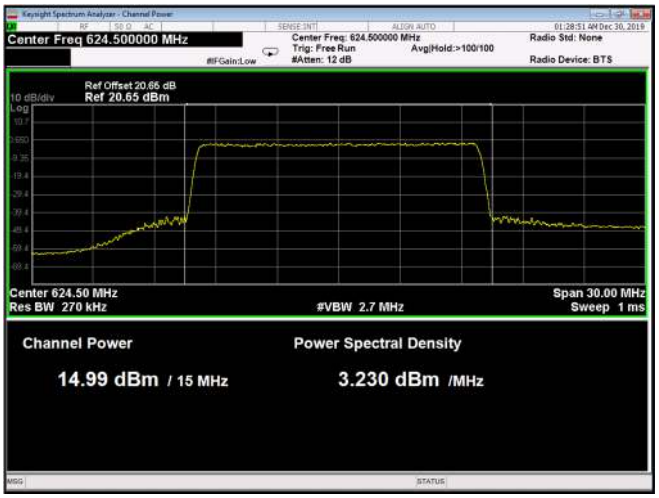

Figure 89: 256QAM 15MHz B.W; 624.5MHz, 30kHz

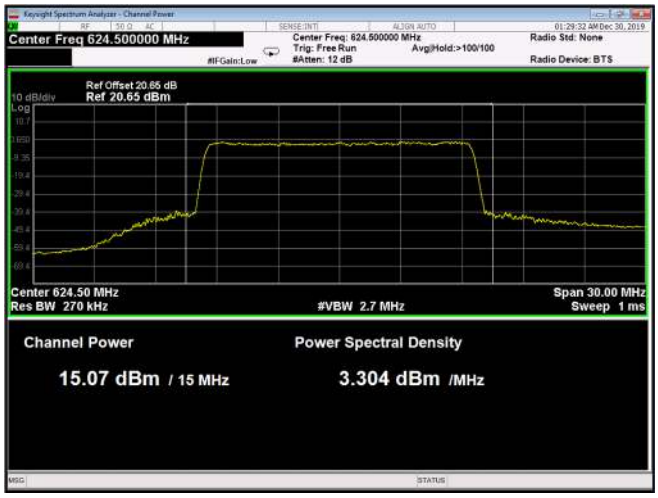

Figure 90: 256QAM 15MHz B.W; 624.5MHz, 60kHz

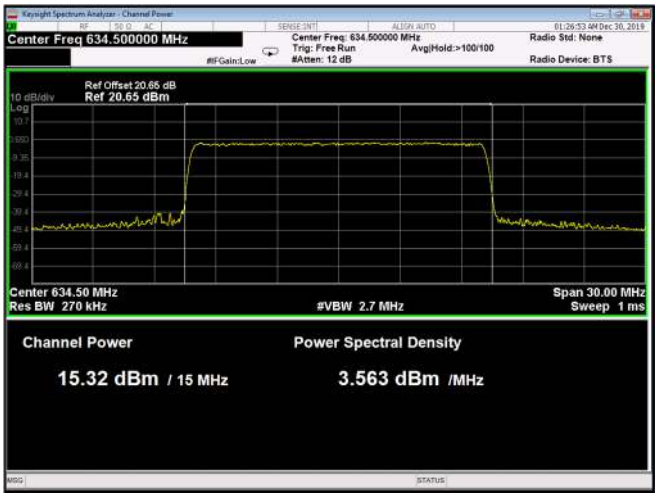

Figure 91: 256QAM 15MHz B.W; 634.5MHz, 15kHz

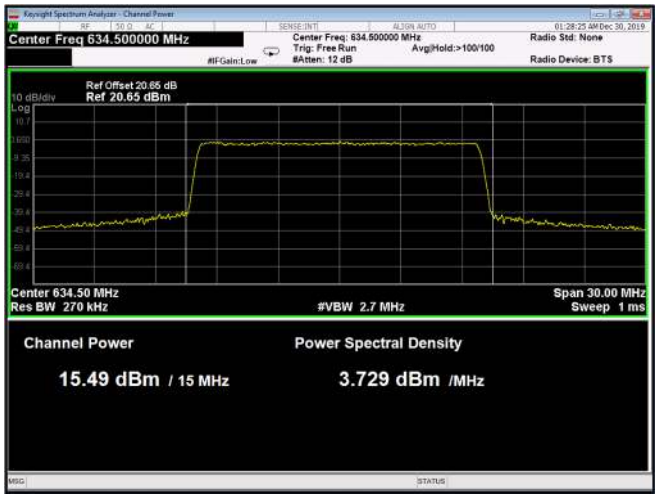

Figure 92: 256QAM 15MHz B.W; 634.5MHz, 30kHz

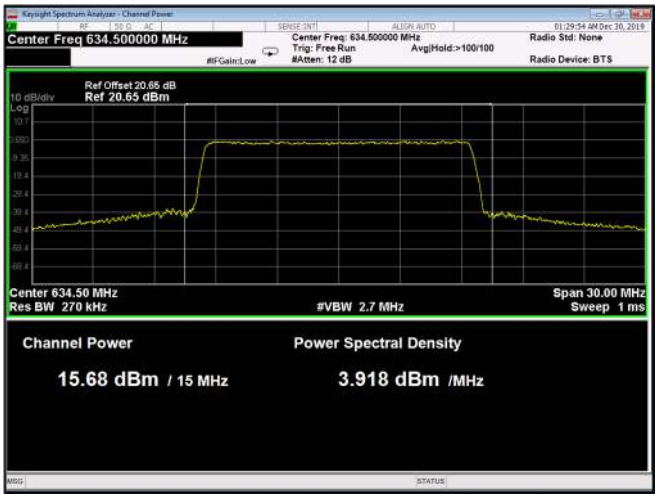

Figure 93: 256QAM 15MHz B.W; 634.5MHz, 60kHz

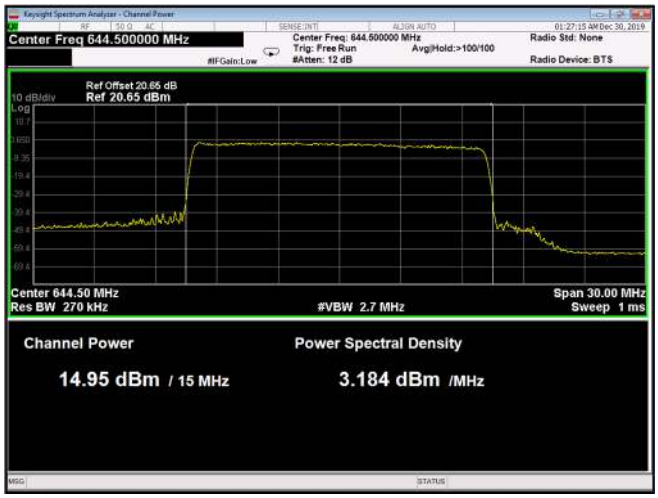

Figure 94: 256QAM 15MHz B.W; 644.5MHz, 15kHz

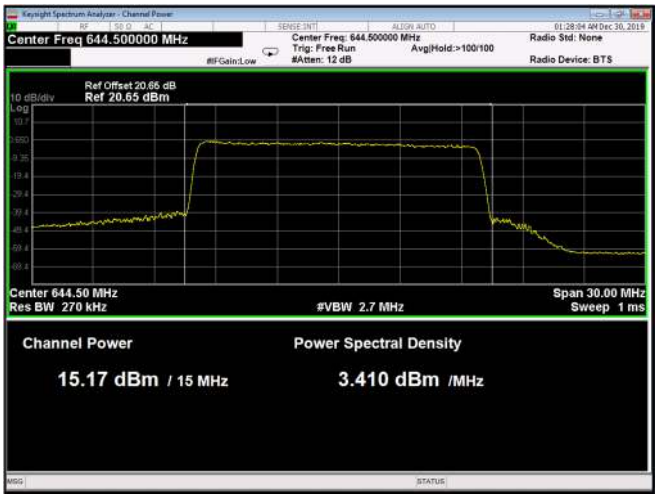

Figure 95: 256QAM 15MHz B.W; 644.5MHz, 30kHz

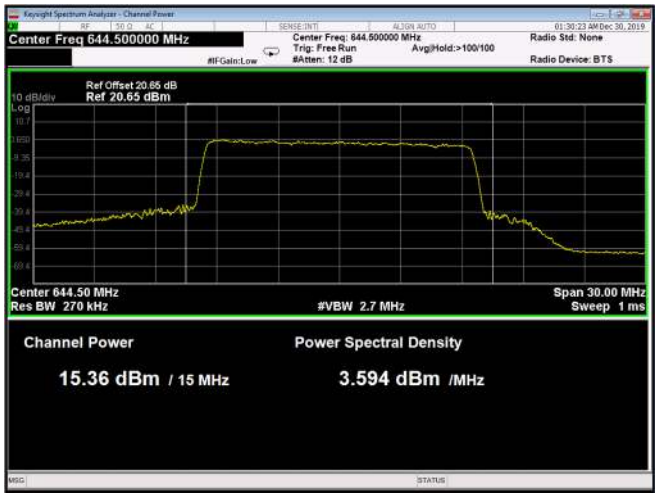

Figure 96: 256QAM 15MHz B.W; 644.5MHz, 60kHz

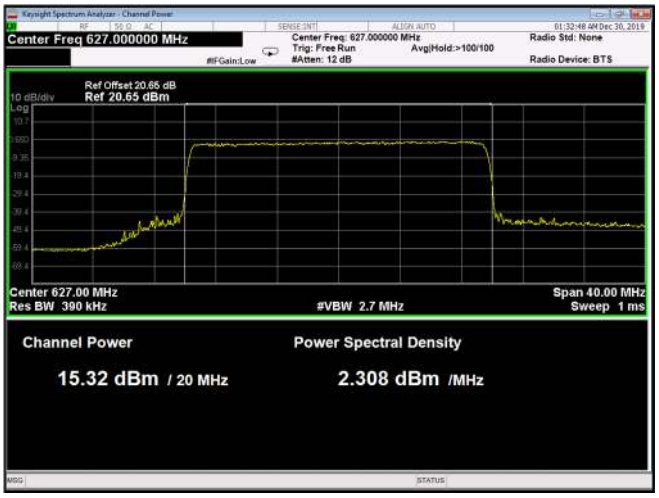

Figure 97: 256QAM 20MHz B.W; 627.0MHz, 15kHz

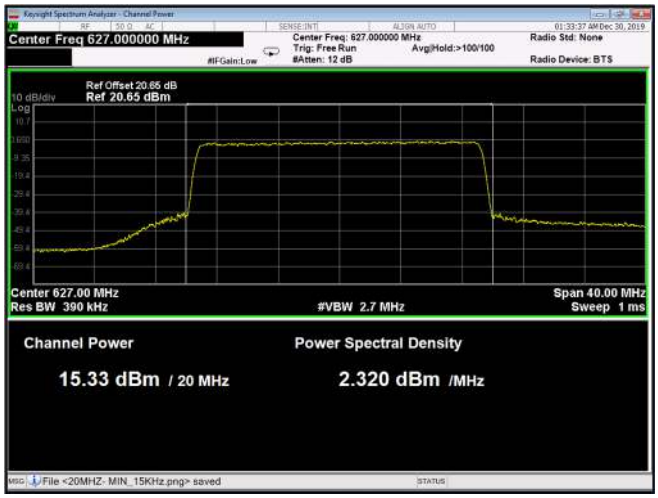

Figure 98: 256QAM 20MHz B.W; 627.0MHz, 30kHz

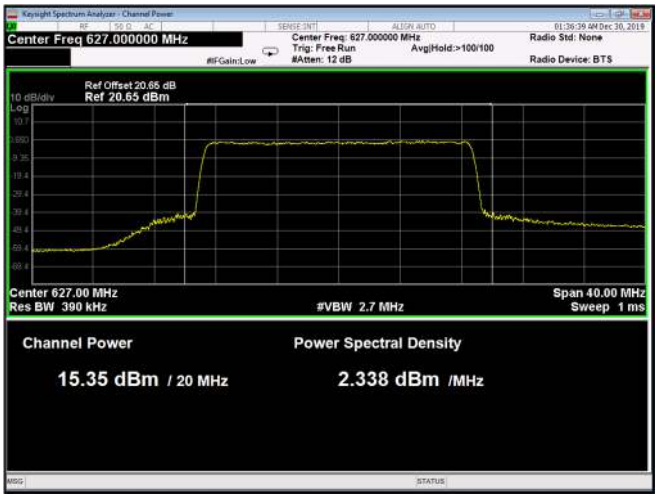

Figure 99: 256QAM 20MHz B.W; 627.0MHz, 60kHz

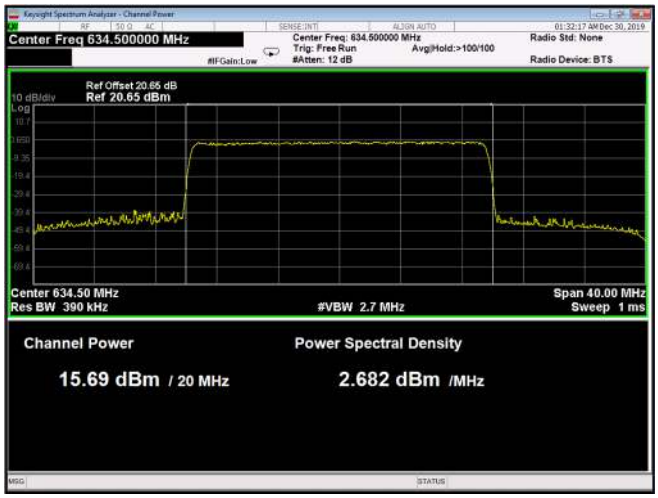

Figure 100: 256QAM 20MHz B.W; 634.5MHz, 15kHz

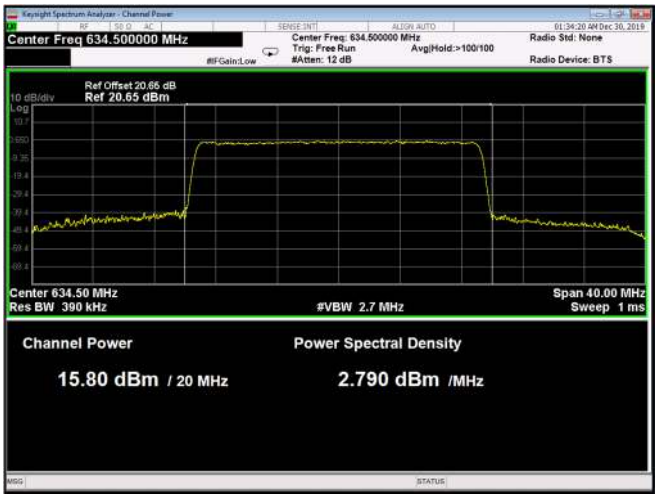

Figure 101: 256QAM 20MHz B.W; 634.5MHz, 30kHz

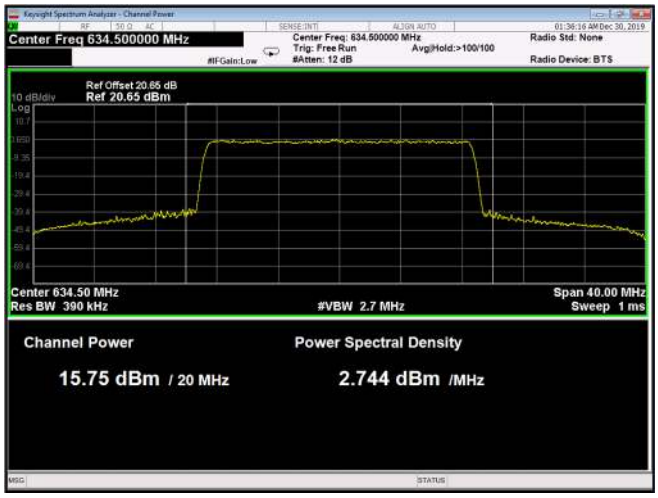

Figure 102: 256QAM 20MHz B.W; 634.5MHz, 60kHz

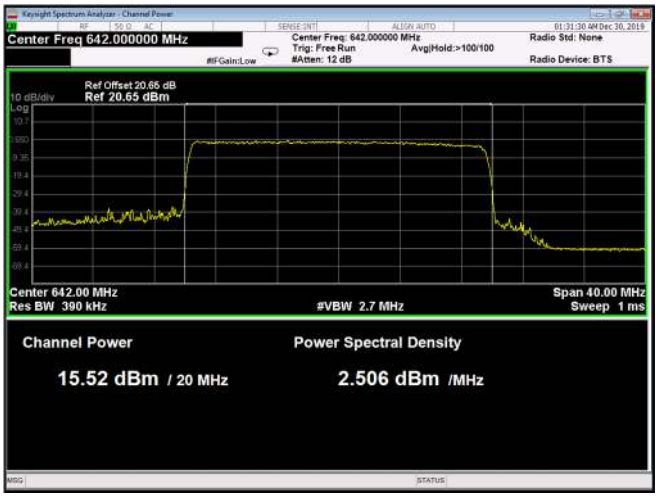

Figure 103: 256QAM 20MHz B.W; 642.0MHz, 15kHz

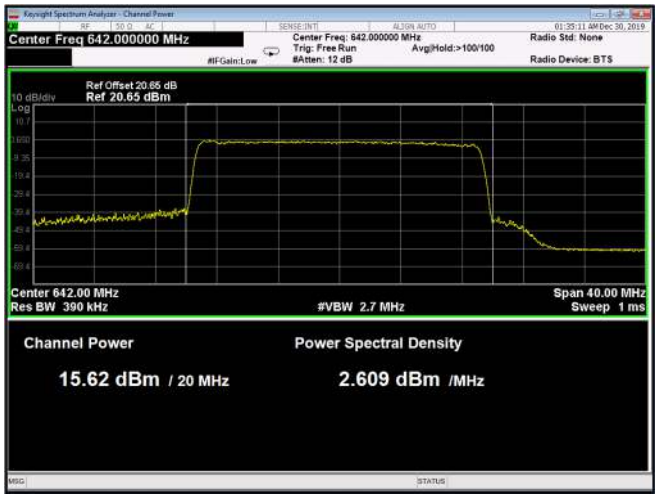

Figure 104: 256QAM 20MHz B.W; 642.0MHz, 30kHz

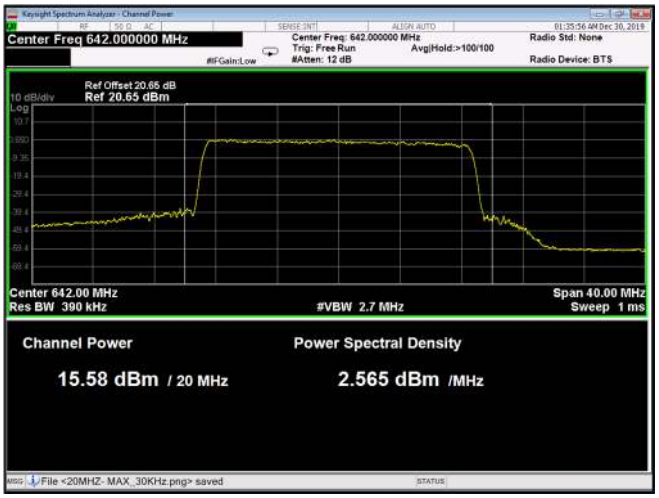

Figure 105: 256QAM 20MHz B.W; 462.0MHz, 60kHz

Figure 106: QPSK 5MHz B.W; 619.5MHz, 15kHz

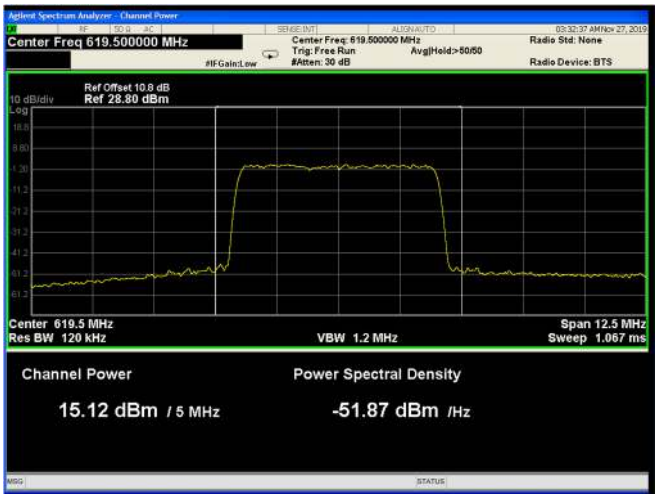

Figure 107: QPSK 5MHz B.W; 619.5MHz, 30kHz

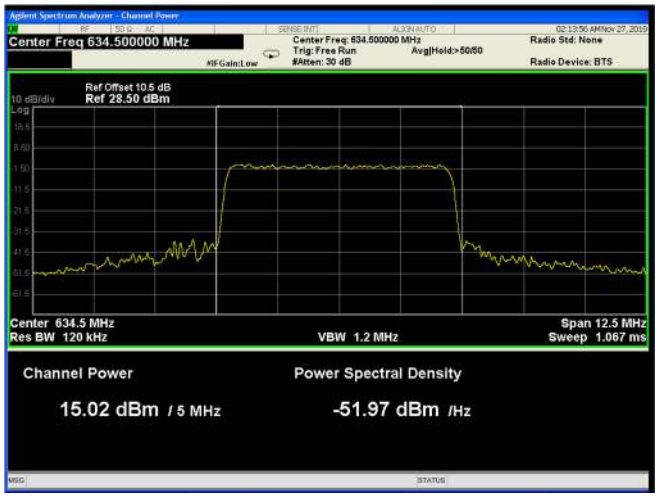

Figure 108: QPSK 5MHz B.W; 634.5MHz, 15kHz

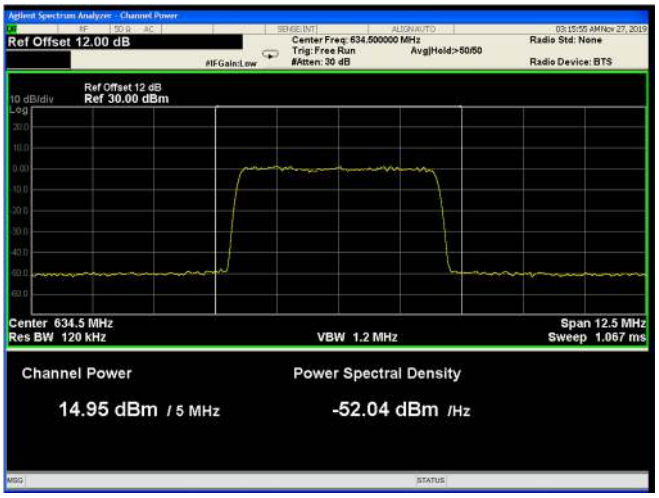

Figure 109: QPSK 5MHz B.W; 634.5MHz, 30kHz

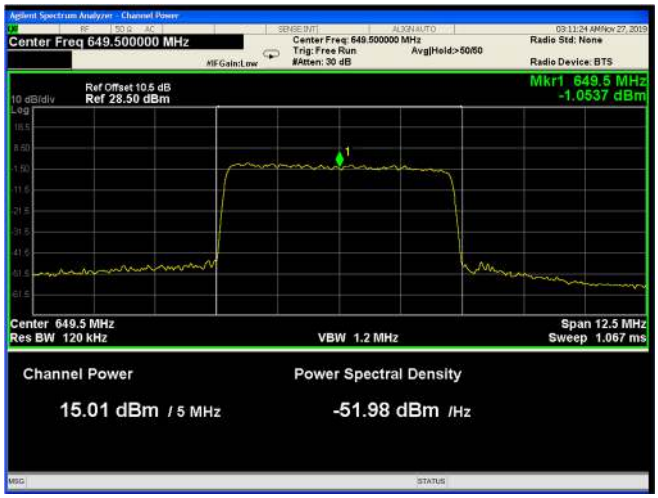

Figure 110: QPSK 5MHz B.W; 649.5MHz, 15kHz

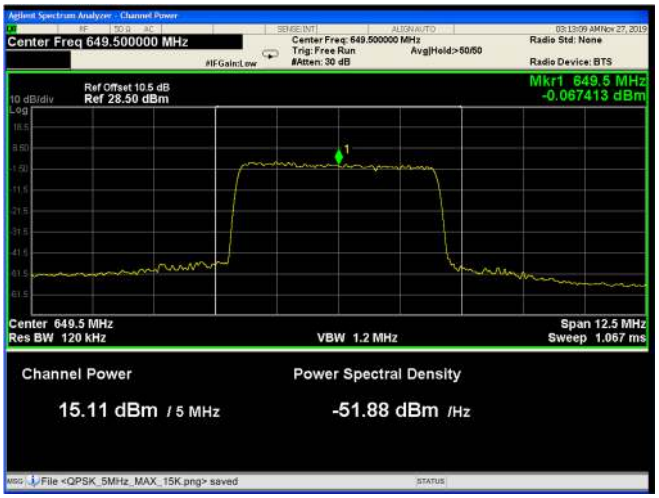

Figure 111: QPSK 5MHz B.W; 649.5MHz, 30kHz

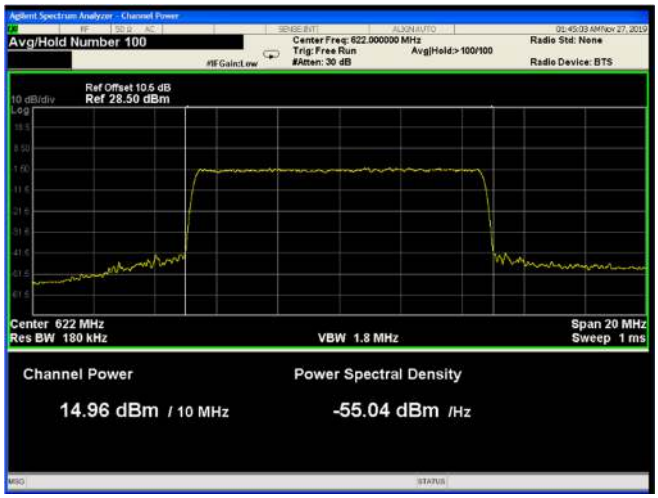

Figure 112: QPSK 10MHz B.W; 622.0MHz, 15kHz

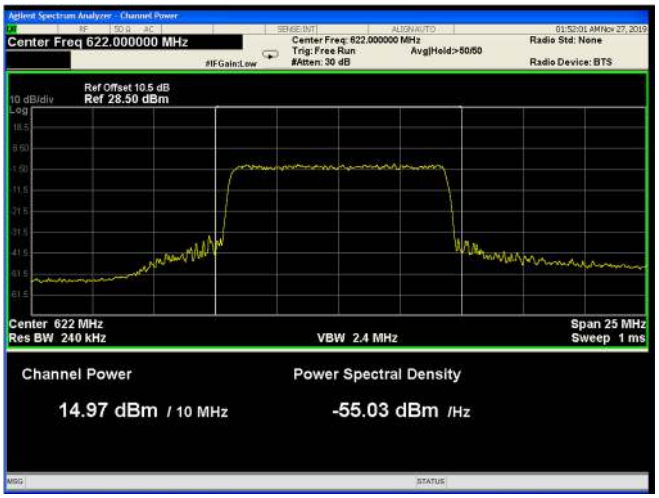

Figure 113: QPSK 1MHz B.W; 622.0MHz, 30kHz

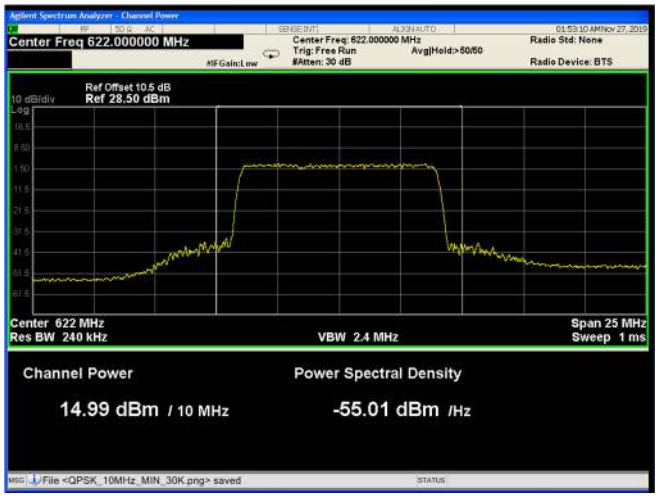

Figure 114: QPSK 10MHz B.W; 622.0MHz, 60kHz

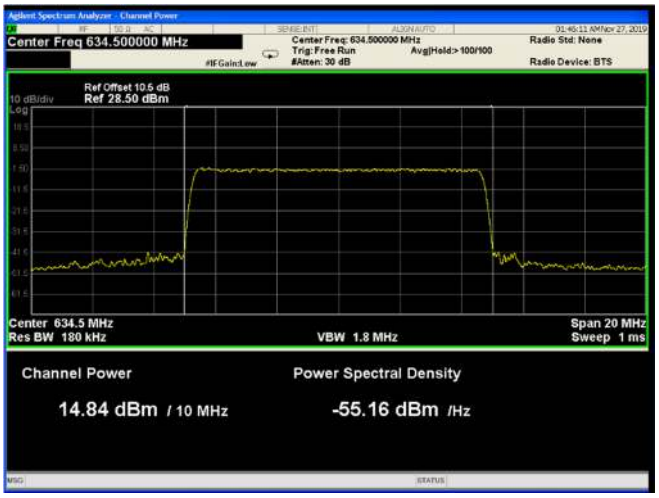

Figure 115: QPSK 10MHz B.W; 634.5MHz, 15kHz

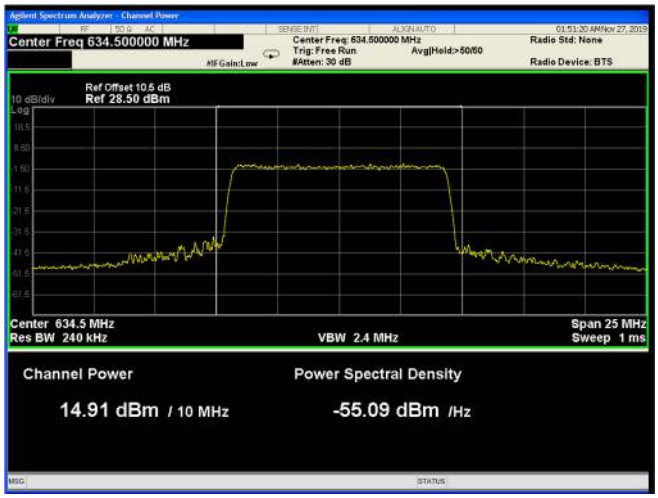

Figure 116: QPSK 10MHz B.W; 634.5MHz, 30kHz

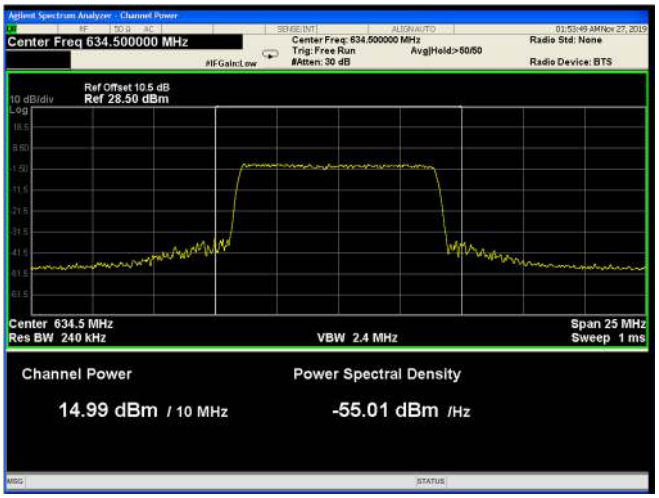

Figure 117: QPSK 10MHz B.W; 634.5MHz, 60kHz

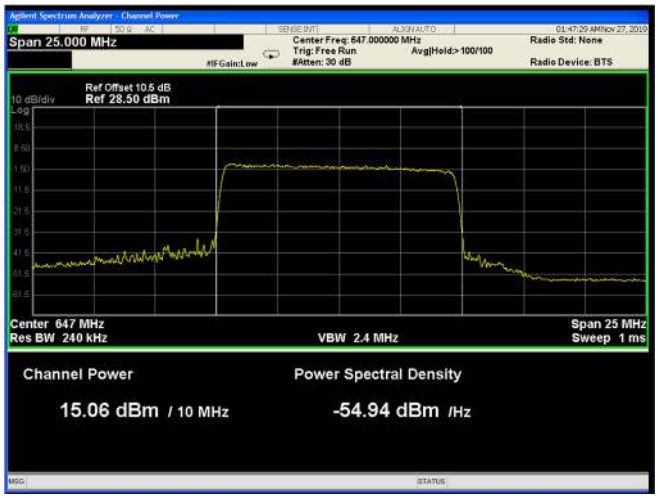

Figure 118: QPSK 10MHz B.W; 647.0MHz, 15kHz

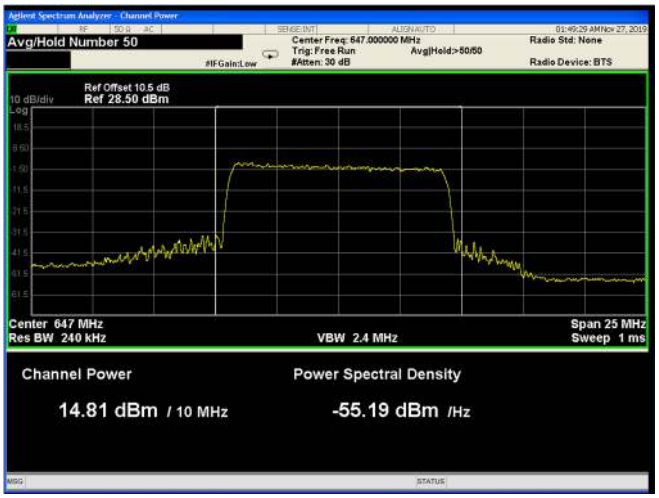

Figure 119: QPSK 10MHz B.W; 647.0MHz, 30kHz

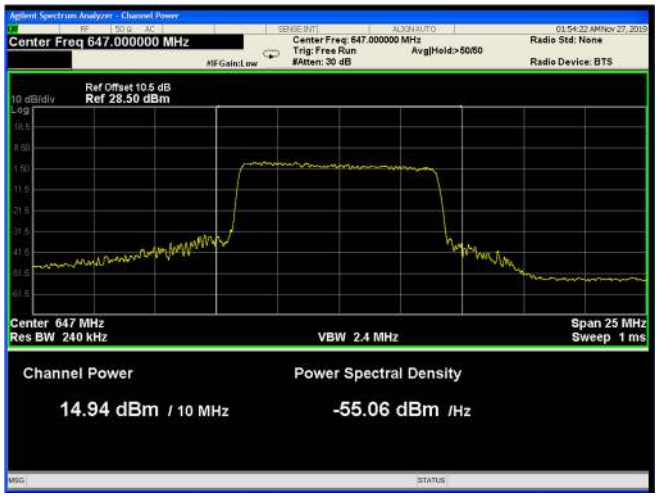

Figure 120: QPSK 10MHz B.W; 647.0MHz, 60kHz

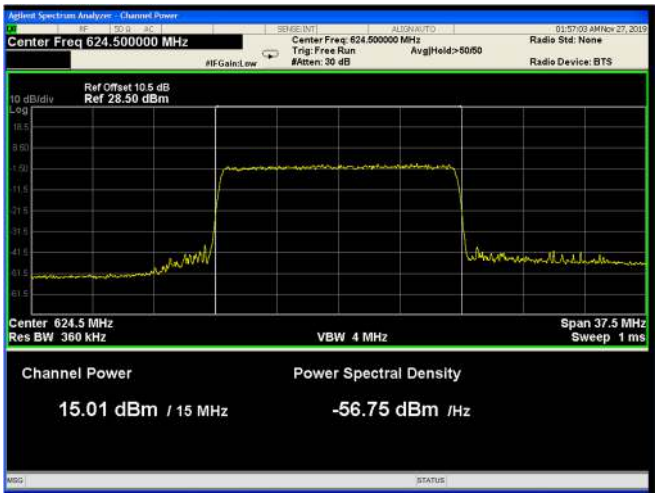

Figure 121: QPSK 15MHz B.W; 624.5MHz, 15kHz

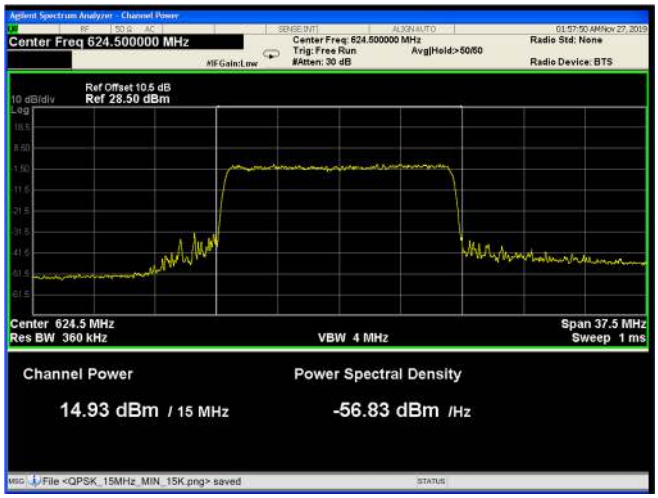

Figure 122: QPSK 15MHz B.W; 624.5MHz, 30kHz

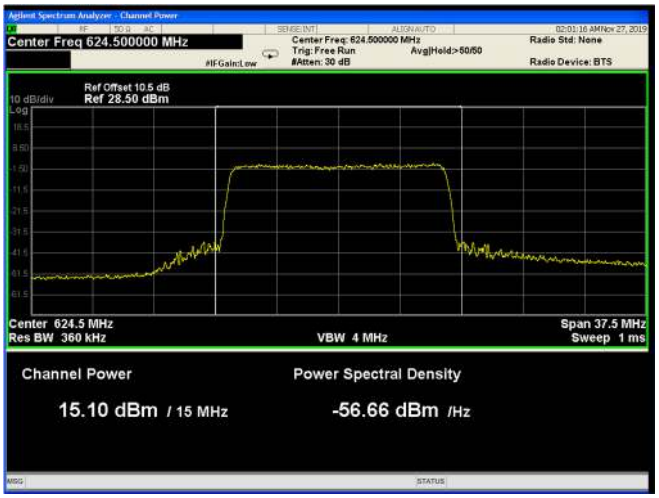

Figure 123: QPSK 15MHz B.W; 624.5MHz, 60kHz

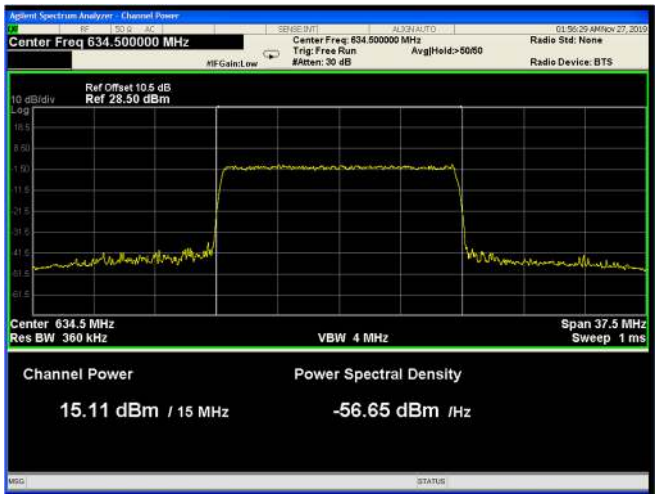

Figure 124: QPSK 15MHz B.W; 634.5MHz, 15kHz

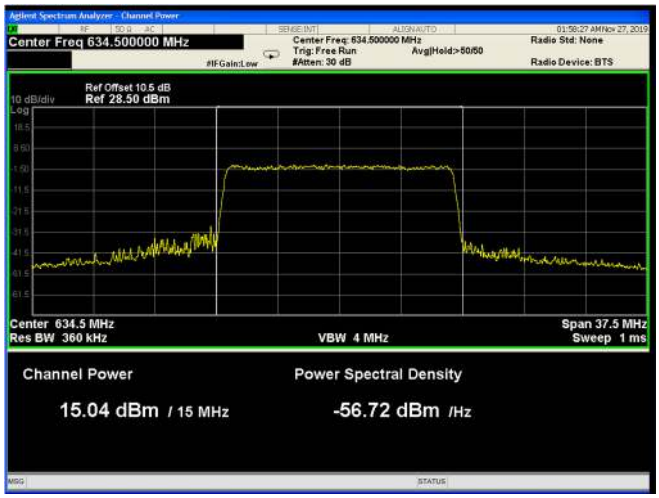

Figure 125: QPSK 15MHz B.W; 634.5MHz, 30kHz

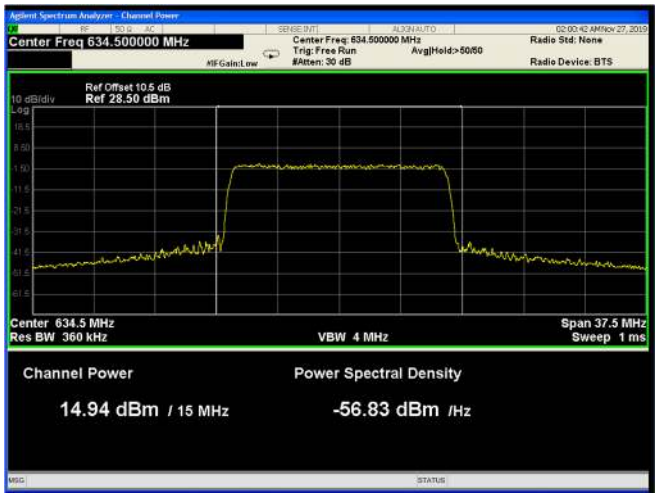

Figure 126: QPSK 15MHz B.W; 634.5MHz, 60kHz

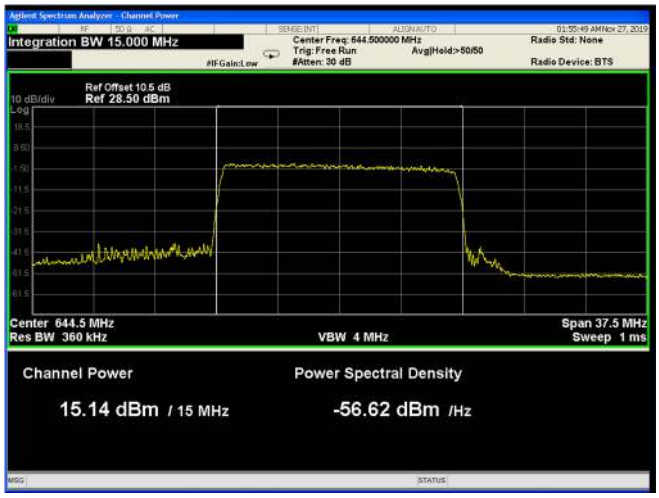

Figure 127: QPSK 15MHz B.W; 644.5MHz, 15kHz

Figure 128: QPSK 15MHz B.W; 644.5MHz, 30kHz

Figure 129: QPSK 15MHz B.W; 644.5MHz, 60kHz

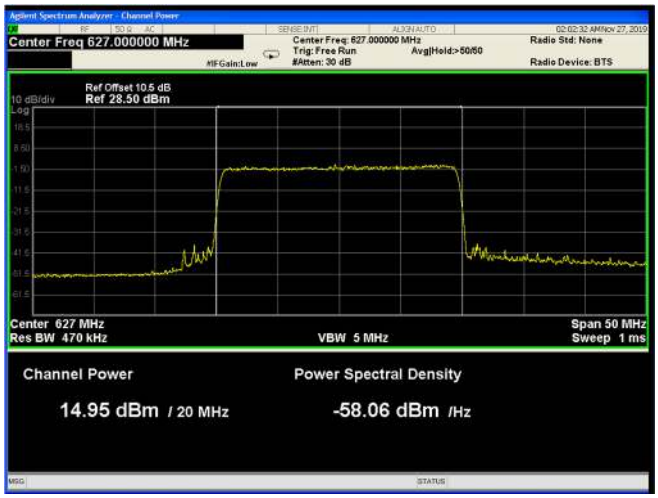

Figure 130: QPSK 20MHz B.W; 627.0MHz, 15kHz

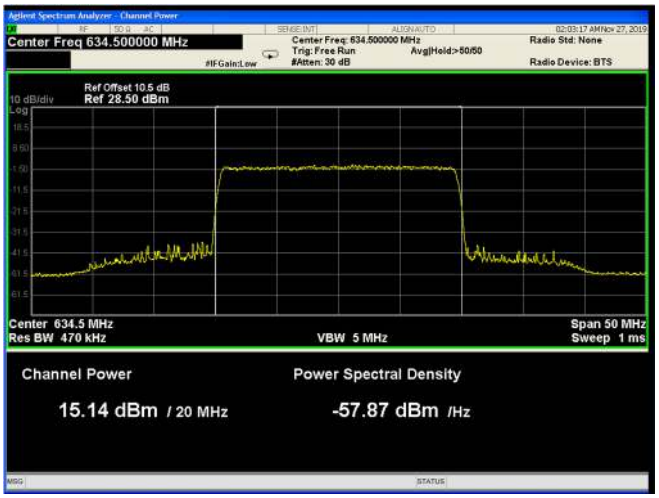

Figure 131: QPSK 20MHz B.W; 634.5MHz, 15kHz

Figure 132: QPSK 20MHz B.W; 642.0MHz, 15kHz

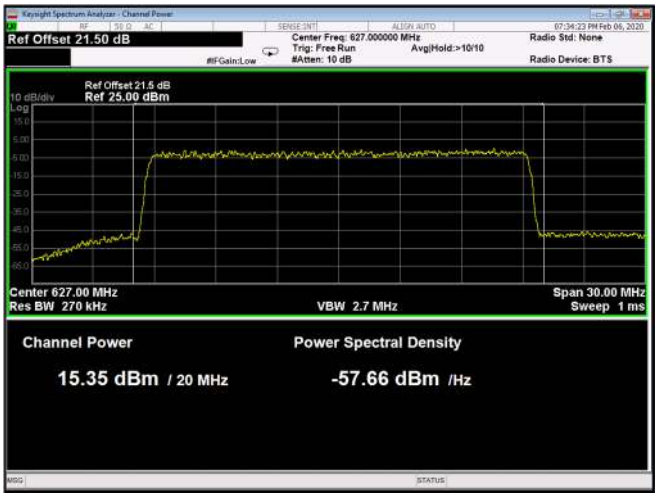

Figure 133: QPSK 20MHz B.W; 627.0MHz, 30kHz

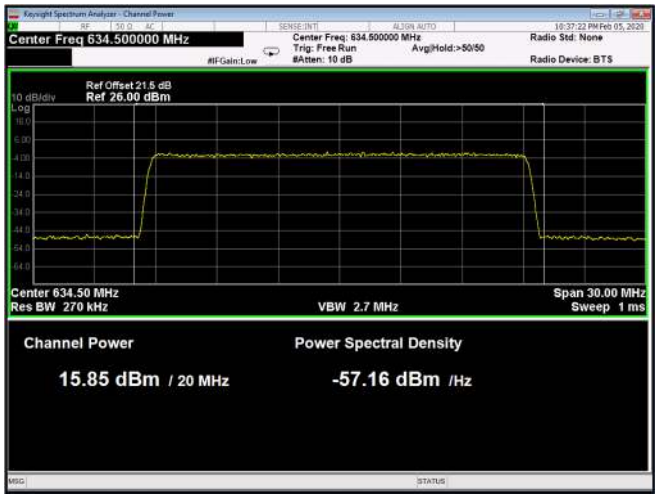

Figure 134: QPSK 20MHz B.W; 634.5MHz, 30kHz

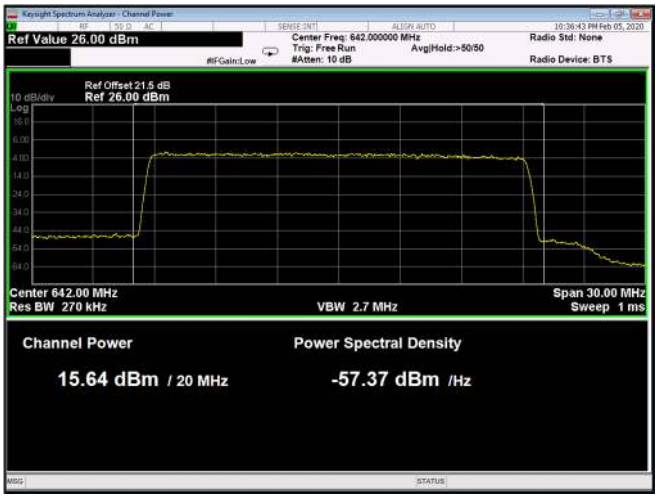

Figure 135: QPSK 20MHz B.W; 642.0MHz, 30kHz

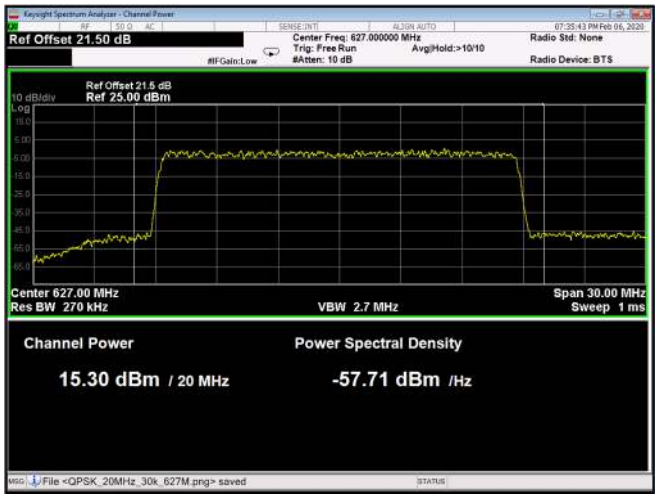

Figure 136: QPSK 20MHz B.W; 627.0MHz, 60kHz

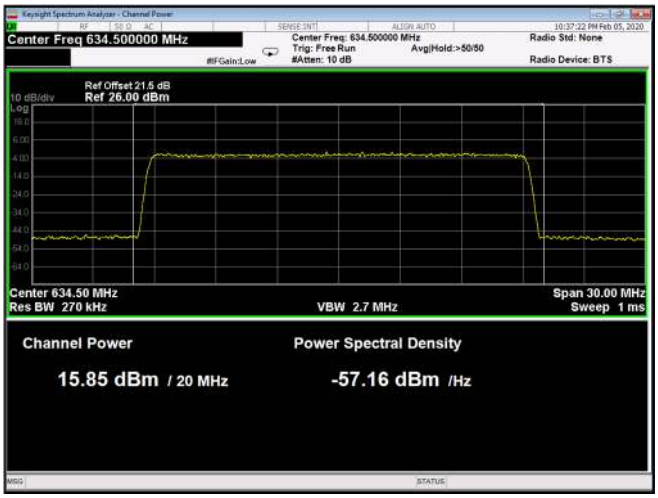

Figure 137: QPSK 20MHz B.W; 634.5MHz, 60kHz

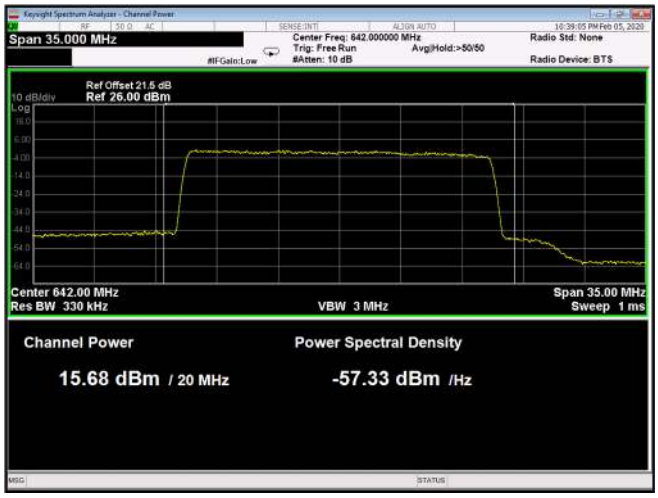

Figure 138: 64QAM 20MHz B.W; 642.0MHz, 60kHz

4.5 Test Equipment Used; RF Power Output

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Next Calibration Due
EXA signal Analyzer	Agilent Technologies	N9010A	MY52220686	28 November 2018	28 November 2020
EXG Vector Signal Generator	Agilent Technologies	N5172B	MY51350437	03 December 2018	03 December 2020
20 dB Attenuator	Bird	8304-N20DB	-	24 December 2019	24 December 2020

Table 5 Test Equipment Used