

8.2.4 Spurious emissions conducted

Description:

The following steps outline the procedure used to measure the conducted emissions from the mobile station.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency.
2. Determine mobile station transmits frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	Pre-measurement with 1 MHz On spurious detection re-measurement below 1 GHz with 100 kHz Above 1 GHz with 1 MHz
Resolution bandwidth:	Pre-measurement with 1 MHz On spurious detection re-measurement below 1 GHz with 100 kHz Above 1 GHz with 1 MHz
Span:	30 MHz – 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC	-/-
Spurious Emissions Conducted	
Attenuation $\geq 43 + 10\log(P)$ (P, Power in Watts)	
-13 dBm	

Results: for 1.4 MHz channel bandwidth

QPSK:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3701.4	No emissions detected.	2	3760.0	No emissions detected.	2	3818.6	No emissions detected.
3	5552.1		3	5640.0		3	5727.9	
4	7402.8		4	7520.0		4	7637.2	
5	9253.5		5	9400.0		5	9546.5	
6	11104.2		6	11280.0		6	11455.8	
7	12954.9		7	13160.0		7	13365.1	
8	14805.6		8	15040.0		8	15274.4	
9	16656.3		9	16920.0		9	17183.7	
10	18507.0		10	18800.0		10	19093.0	
Measurement uncertainty						± 0.5dB		

16-QAM:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3701.4	No emissions detected.	2	3760.0	No emissions detected.	2	3818.6	No emissions detected.
3	5552.1		3	5640.0		3	5727.9	
4	7402.8		4	7520.0		4	7637.2	
5	9253.5		5	9400.0		5	9546.5	
6	11104.2		6	11280.0		6	11455.8	
7	12954.9		7	13160.0		7	13365.1	
8	14805.6		8	15040.0		8	15274.4	
9	16656.3		9	16920.0		9	17183.7	
10	18507.0		10	18800.0		10	19093.0	
Measurement uncertainty						± 0.5dB		

Results: for 3 MHz channel bandwidth

QPSK:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3701.4	No emissions detected.	2	3760.0	No emissions detected.	2	3818.6	No emissions detected.
3	5552.1		3	5640.0		3	5727.9	
4	7402.8		4	7520.0		4	7637.2	
5	9253.5		5	9400.0		5	9546.5	
6	11104.2		6	11280.0		6	11455.8	
7	12954.9		7	13160.0		7	13365.1	
8	14805.6		8	15040.0		8	15274.4	
9	16656.3		9	16920.0		9	17183.7	
10	18507.0		10	18800.0		10	19093.0	
Measurement uncertainty						± 0.5dB		

16-QAM:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3701.4	No emissions detected.	2	3760.0	No emissions detected.	2	3818.6	No emissions detected.
3	5552.1		3	5640.0		3	5727.9	
4	7402.8		4	7520.0		4	7637.2	
5	9253.5		5	9400.0		5	9546.5	
6	11104.2		6	11280.0		6	11455.8	
7	12954.9		7	13160.0		7	13365.1	
8	14805.6		8	15040.0		8	15274.4	
9	16656.3		9	16920.0		9	17183.7	
10	18507.0		10	18800.0		10	19093.0	
Measurement uncertainty						± 0.5dB		

Results: for 5 MHz channel bandwidth

QPSK:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3705.0	No emissions detected.	2	3760.0	No emissions detected.	2	3815.0	No emissions detected.
3	5557.5		3	5640.0		3	5722.5	
4	7410.0		4	7520.0		4	7630.0	
5	9262.5		5	9400.0		5	9537.5	
6	11115.0		6	11280.0		6	11445.0	
7	12967.5		7	13160.0		7	13352.5	
8	14820.0		8	15040.0		8	15260.0	
9	16672.5		9	16920.0		9	17167.5	
10	18525.0		10	18800.0		10	19075.0	
Measurement uncertainty						± 0.5dB		

16-QAM:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3705.0	No emissions detected.	2	3760.0	No emissions detected.	2	3815.0	No emissions detected.
3	5557.5		3	5640.0		3	5722.5	
4	7410.0		4	7520.0		4	7630.0	
5	9262.5		5	9400.0		5	9537.5	
6	11115.0		6	11280.0		6	11445.0	
7	12967.5		7	13160.0		7	13352.5	
8	14820.0		8	15040.0		8	15260.0	
9	16672.5		9	16920.0		9	17167.5	
10	18525.0		10	18800.0		10	19075.0	
Measurement uncertainty						± 0.5dB		

Results: for 10 MHz channel bandwidth

QPSK:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3710.0	No emissions detected.	2	3760.0	No emissions detected.	2	3810.0	No emissions detected.
3	5565.0		3	5640.0		3	5715.0	
4	7420.0		4	7520.0		4	7620.0	
5	9275.0		5	9400.0		5	9525.0	
6	11130.0		6	11280.0		6	11430.0	
7	12985.0		7	13160.0		7	13335.0	
8	14840.0		8	15040.0		8	15240.0	
9	16695.0		9	16920.0		9	17145.0	
10	18550.0		10	18800.0		10	19050.0	
Measurement uncertainty						± 0.5dB		

16-QAM:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3710.0	No emissions detected.	2	3760.0	No emissions detected.	2	3810.0	No emissions detected.
3	5565.0		3	5640.0		3	5715.0	
4	7420.0		4	7520.0		4	7620.0	
5	9275.0		5	9400.0		5	9525.0	
6	11130.0		6	11280.0		6	11430.0	
7	12985.0		7	13160.0		7	13335.0	
8	14840.0		8	15040.0		8	15240.0	
9	16695.0		9	16920.0		9	17145.0	
10	18550.0		10	18800.0		10	19050.0	
Measurement uncertainty						± 0.5dB		

Results: for 15 MHz channel bandwidth

QPSK:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3701.4	No emissions detected.	2	3760.0	No emissions detected.	2	3818.6	No emissions detected.
3	5552.1		3	5640.0		3	5727.9	
4	7402.8		4	7520.0		4	7637.2	
5	9253.5		5	9400.0		5	9546.5	
6	11104.2		6	11280.0		6	11455.8	
7	12954.9		7	13160.0		7	13365.1	
8	14805.6		8	15040.0		8	15274.4	
9	16656.3		9	16920.0		9	17183.7	
10	18507.0		10	18800.0		10	19093.0	
Measurement uncertainty						± 0.5dB		

16-QAM:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3701.4	No emissions detected.	2	3760.0	No emissions detected.	2	3818.6	No emissions detected.
3	5552.1		3	5640.0		3	5727.9	
4	7402.8		4	7520.0		4	7637.2	
5	9253.5		5	9400.0		5	9546.5	
6	11104.2		6	11280.0		6	11455.8	
7	12954.9		7	13160.0		7	13365.1	
8	14805.6		8	15040.0		8	15274.4	
9	16656.3		9	16920.0		9	17183.7	
10	18507.0		10	18800.0		10	19093.0	
Measurement uncertainty						± 0.5dB		

Results: for 20 MHz channel bandwidth

QPSK:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3720.0	No emissions detected.	2	3760.0	No emissions detected.	2	3800.0	No emissions detected.
3	5580.0		3	5640.0		3	5700.0	
4	7440.0		4	7520.0		4	7600.0	
5	9300.0		5	9400.0		5	9500.0	
6	11160.0		6	11280.0		6	11400.0	
7	13020.0		7	13160.0		7	13300.0	
8	14880.0		8	15040.0		8	15200.0	
9	16740.0		9	16920.0		9	17100.0	
10	18600.0		10	18800.0		10	19000.0	
Measurement uncertainty						± 0.5dB		

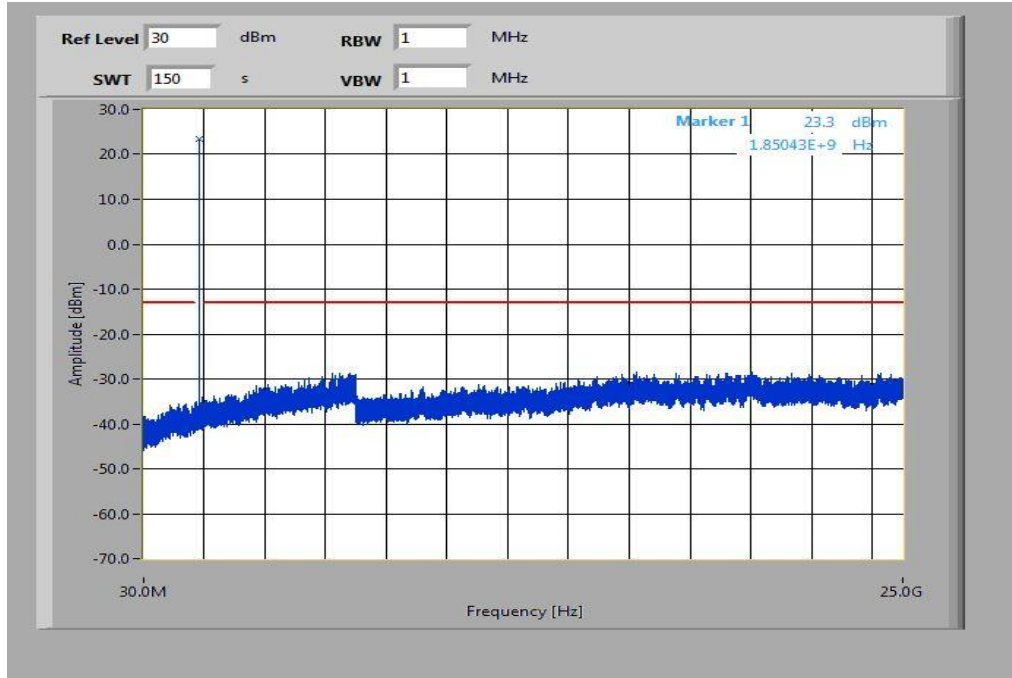
16-QAM:

Spurious Emission Level (dBm)								
Harmonic	Lowest channel Freq. (MHz)	Level [dBm]	Harmonic	Middle channel Freq. (MHz)	Level [dBm]	Harmonic	Highest channel Freq. (MHz)	Level [dBm]
2	3720.0	No emissions detected.	2	3760.0	No emissions detected.	2	3800.0	No emissions detected.
3	5580.0		3	5640.0		3	5700.0	
4	7440.0		4	7520.0		4	7600.0	
5	9300.0		5	9400.0		5	9500.0	
6	11160.0		6	11280.0		6	11400.0	
7	13020.0		7	13160.0		7	13300.0	
8	14880.0		8	15040.0		8	15200.0	
9	16740.0		9	16920.0		9	17100.0	
10	18600.0		10	18800.0		10	19000.0	
Measurement uncertainty						± 0.5dB		

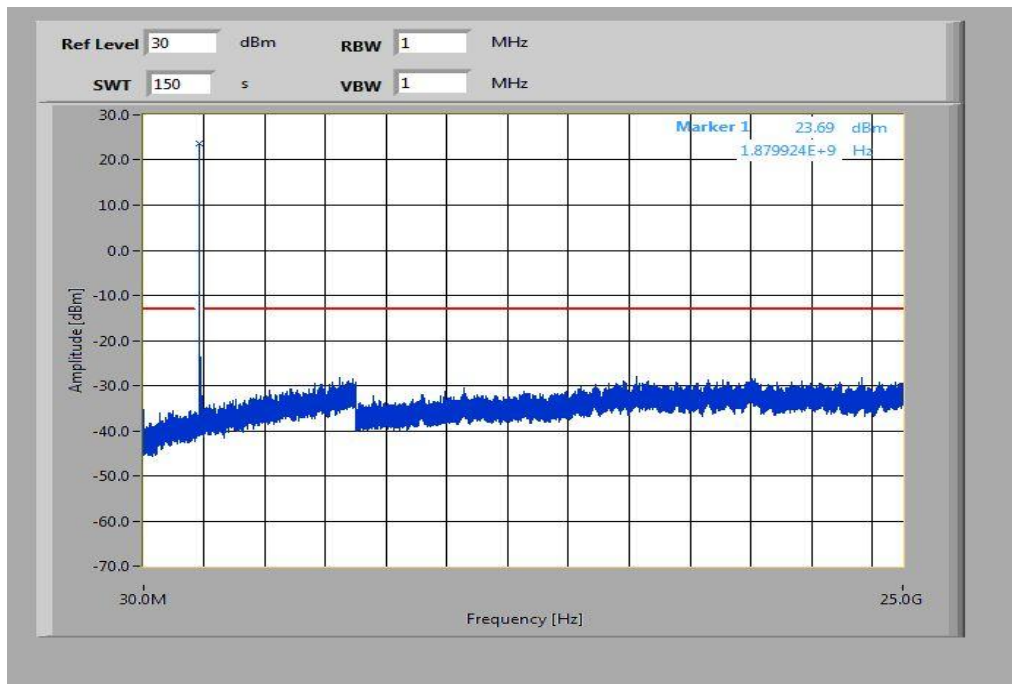
Result: Passed

Plots: QPSK with 1.4 MHz channel bandwidth

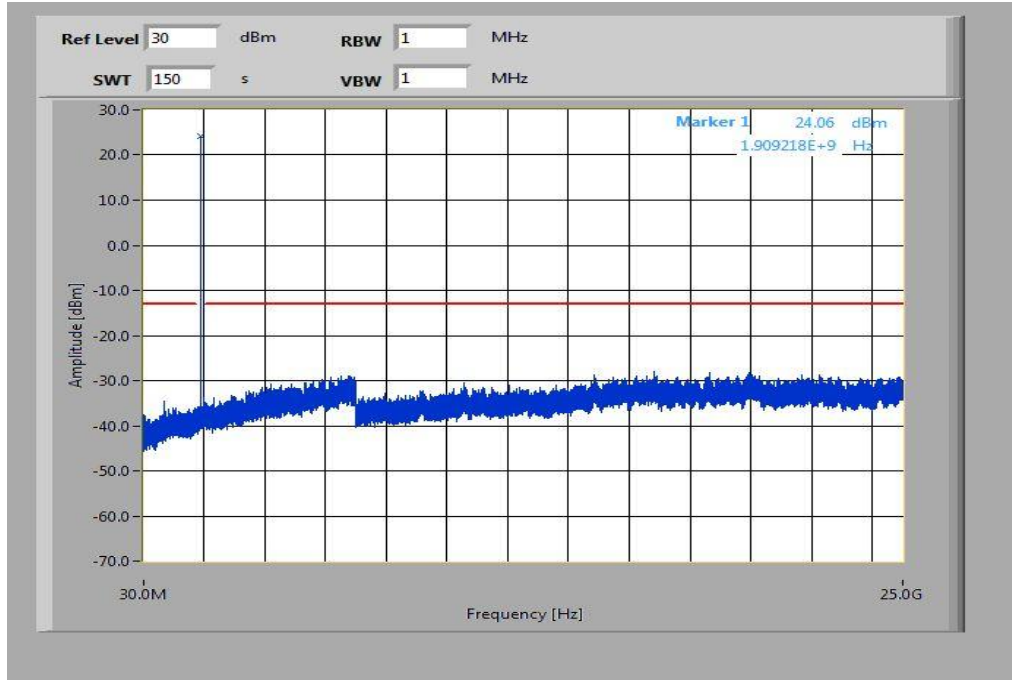
Plot 1: Lowest Channel (30 MHz - 25 GHz)



Plot 2: Middle Channel (30 MHz - 25 GHz)

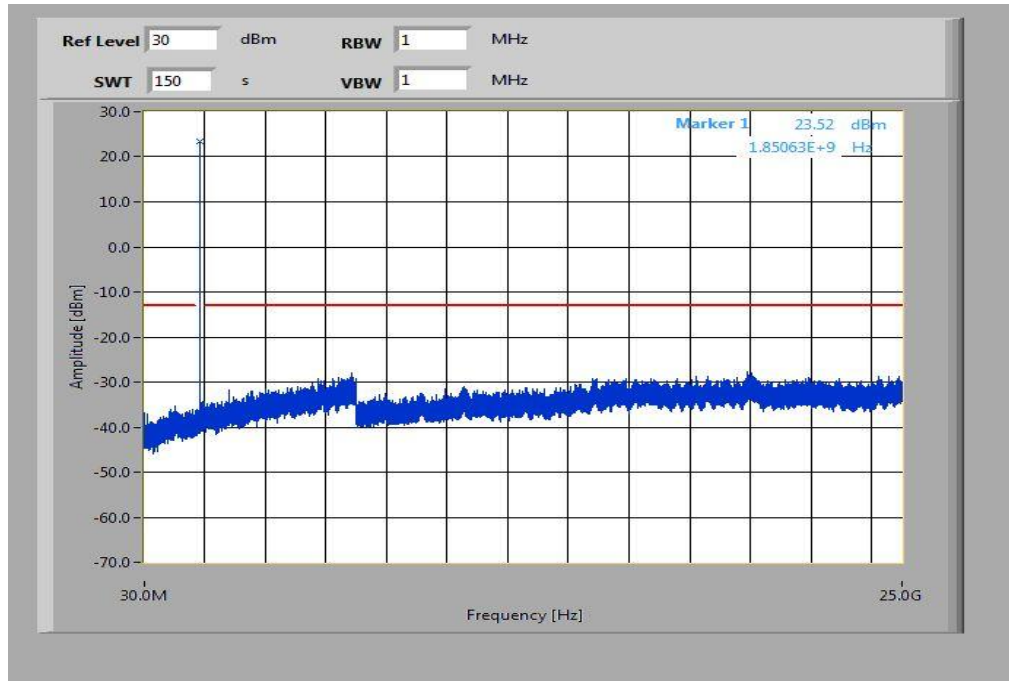


Plot 3: Highest Channel (30 MHz - 25 GHz)

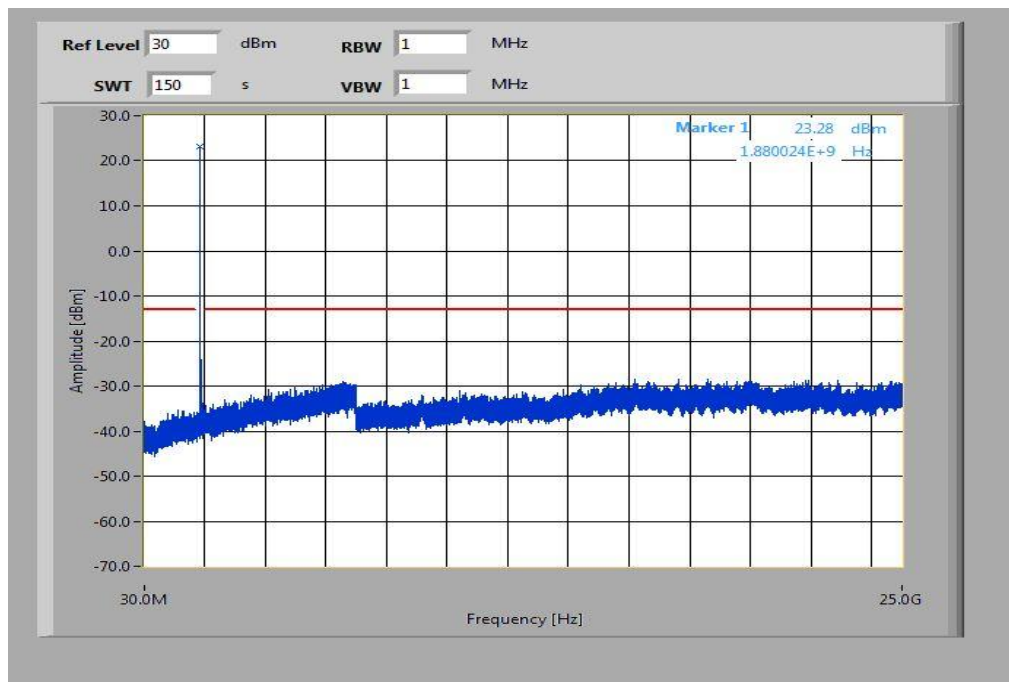


Plots: 16-QAM with 1.4 MHz channel bandwidth

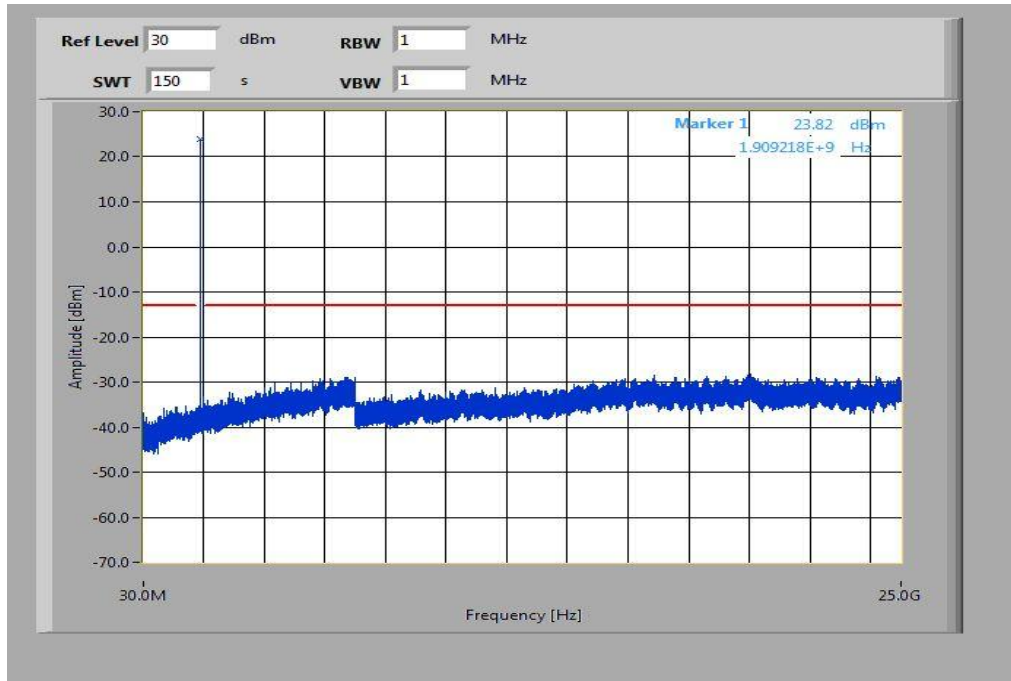
Plot 4: Lowest Channel (30 MHz - 25 GHz)



Plot 5: Middle Channel (30 MHz - 25 GHz)

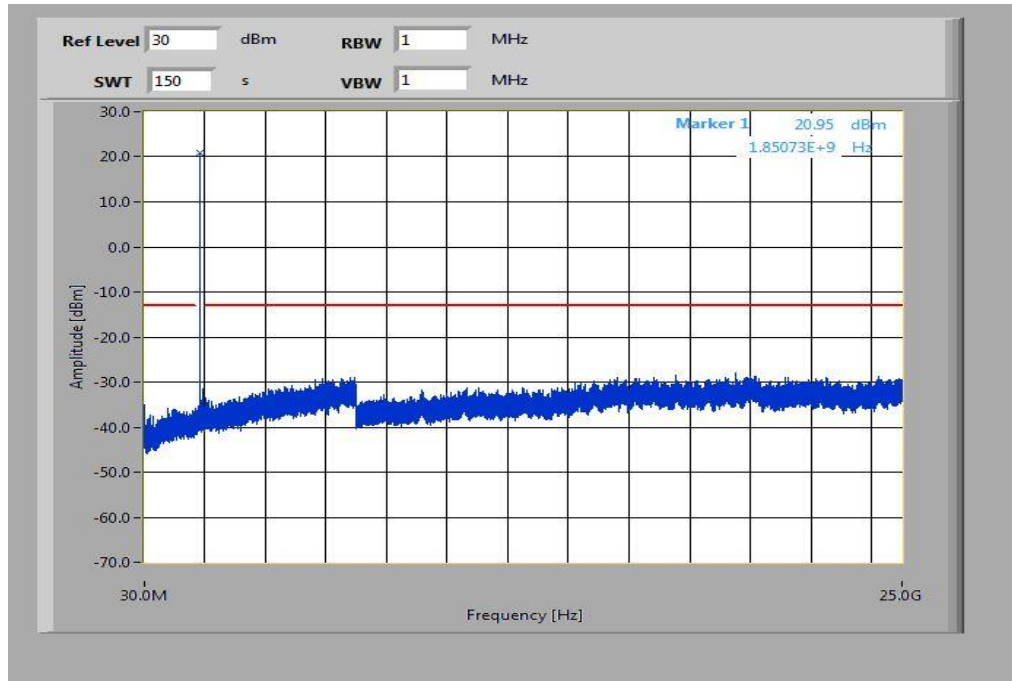


Plot 6: Highest Channel (30 MHz - 25 GHz)

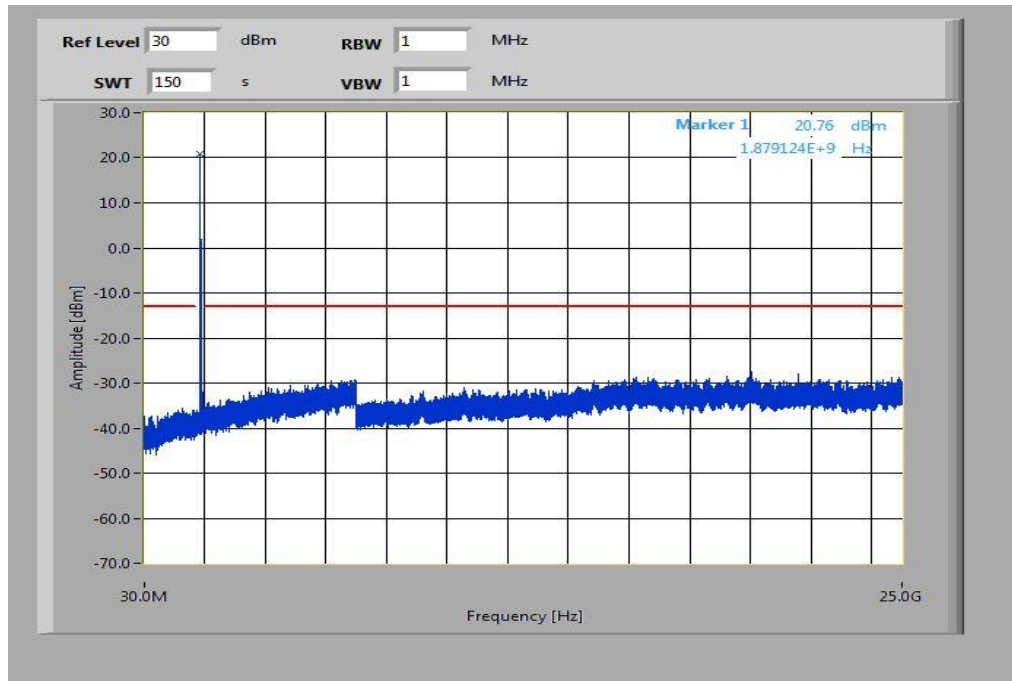


Plots: QPSK with 3 MHz channel bandwidth

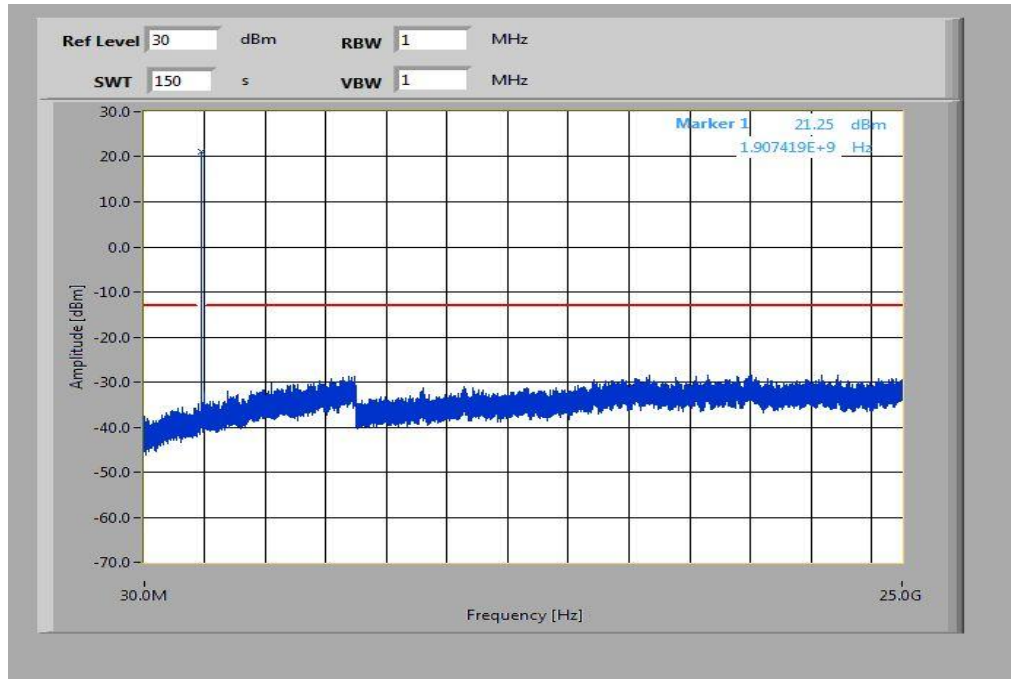
Plot 1: Lowest Channel (30 MHz - 25 GHz)



Plot 2: Middle Channel (30 MHz - 25 GHz)

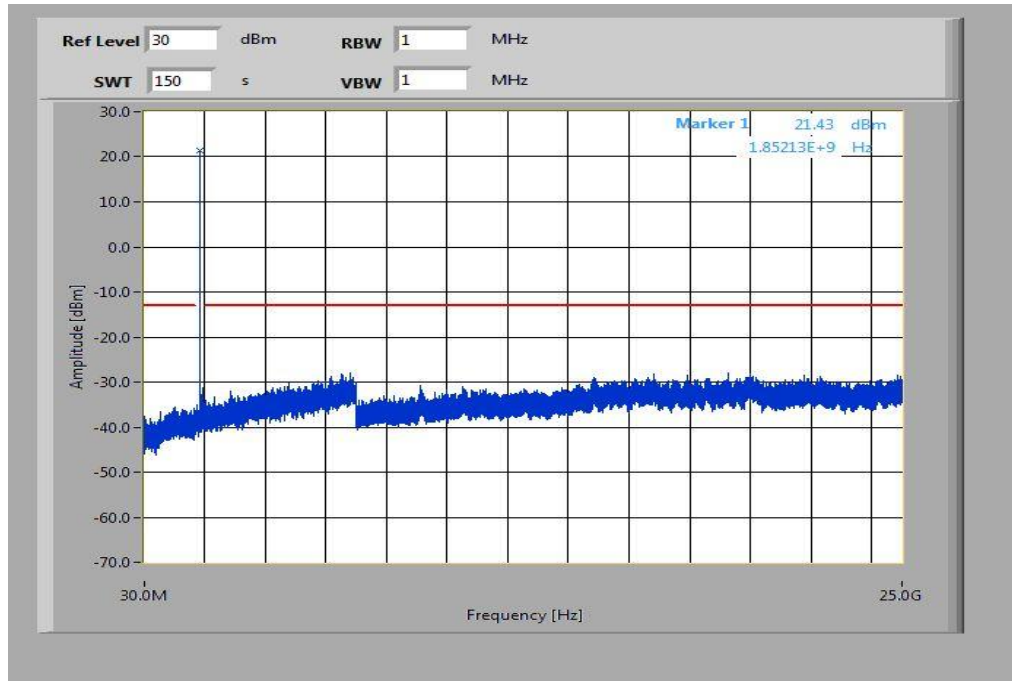


Plot 3: Highest Channel (30 MHz - 25 GHz)

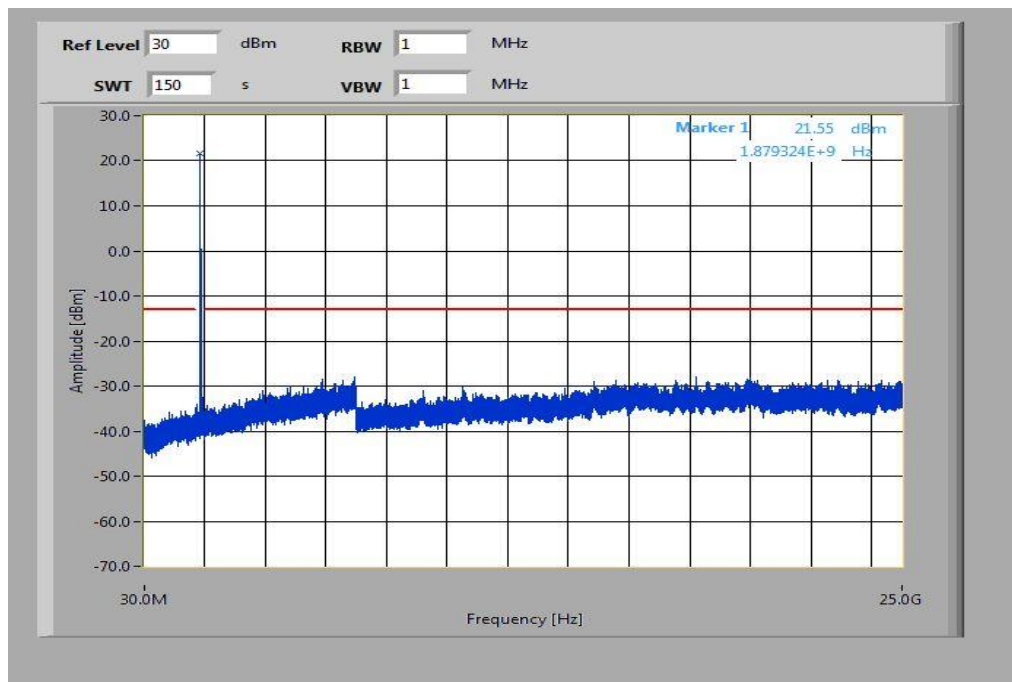


Plots: 16-QAM with 3 MHz channel bandwidth

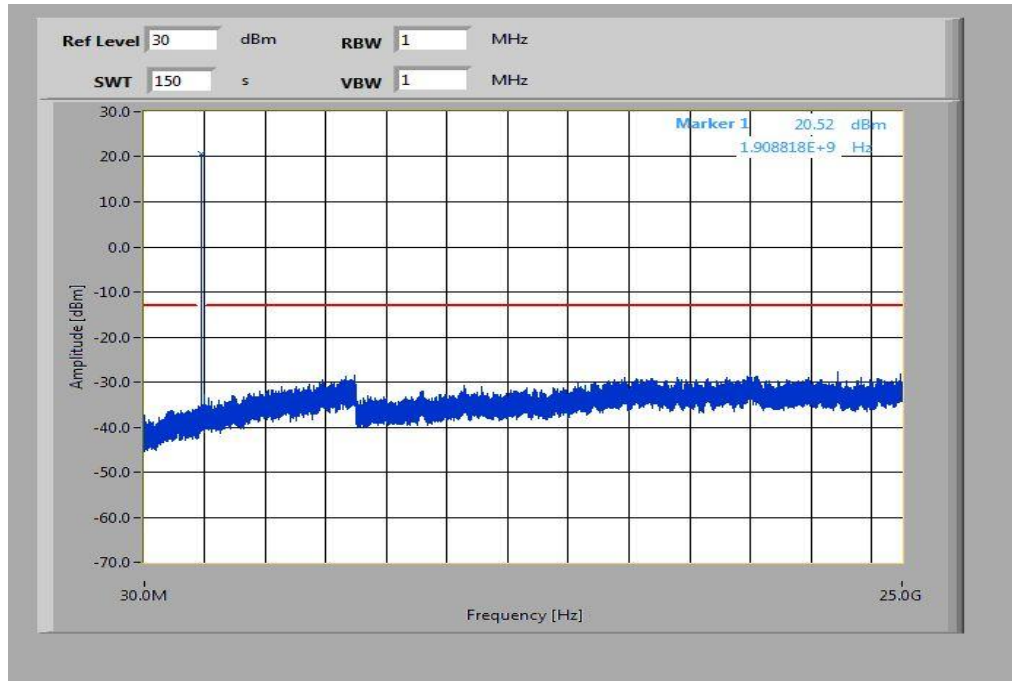
Plot 4: Lowest Channel (30 MHz - 25 GHz)



Plot 5: Middle Channel (30 MHz - 25 GHz)

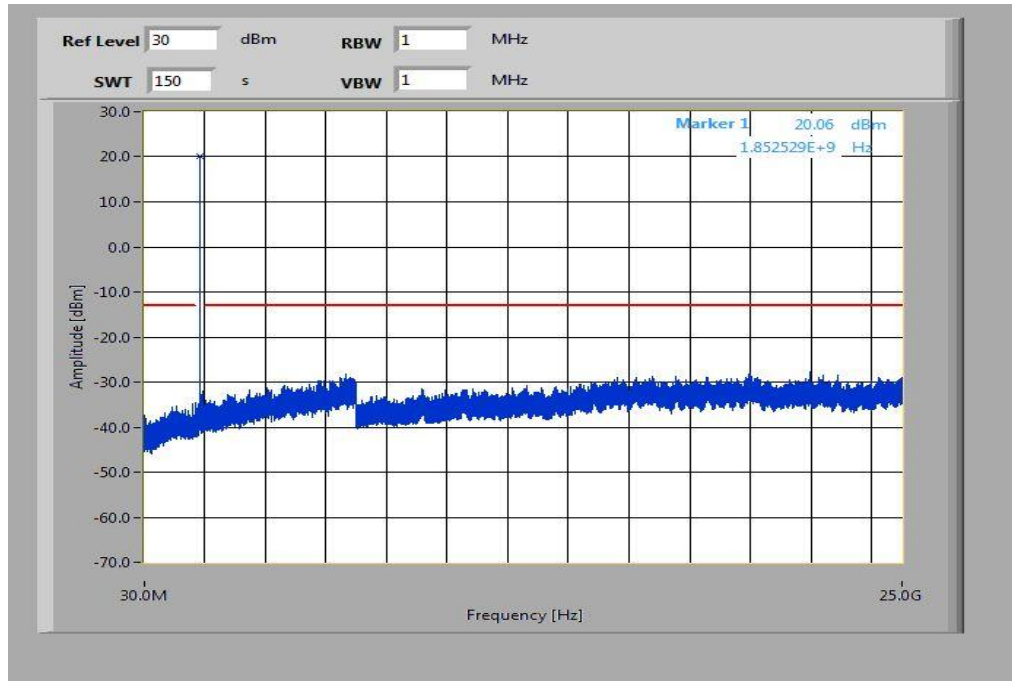


Plot 6: Highest Channel (30 MHz - 25 GHz)

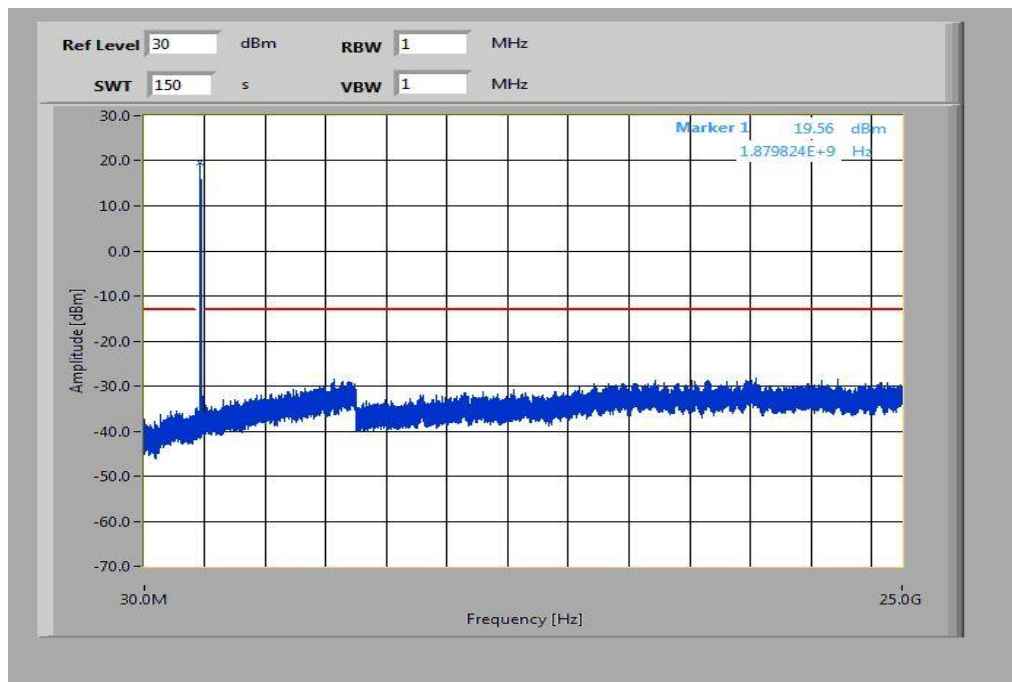


Plots: QPSK with 5 MHz channel bandwidth

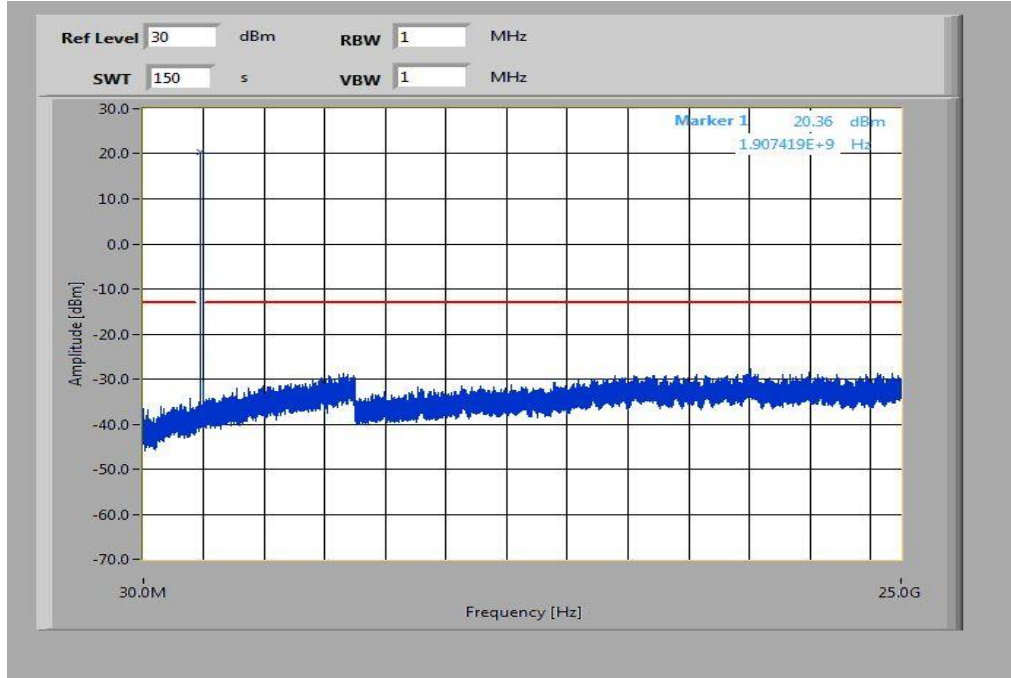
Plot 1: Lowest Channel (30 MHz - 25 GHz)



Plot 2: Middle Channel (30 MHz - 25 GHz)

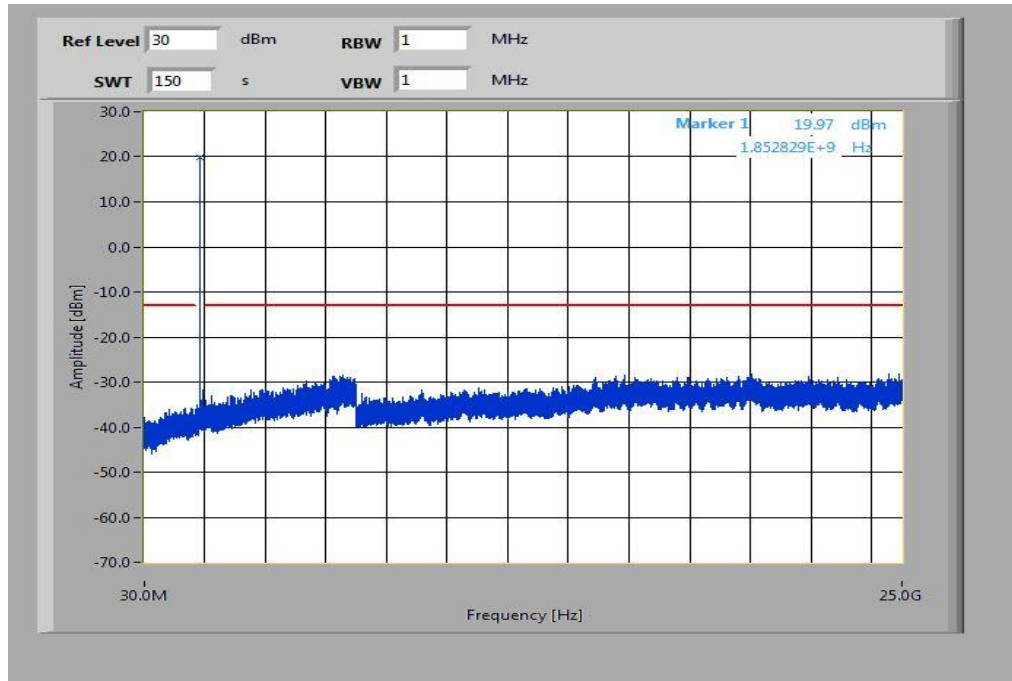


Plot 3: Highest Channel (30 MHz - 25 GHz)

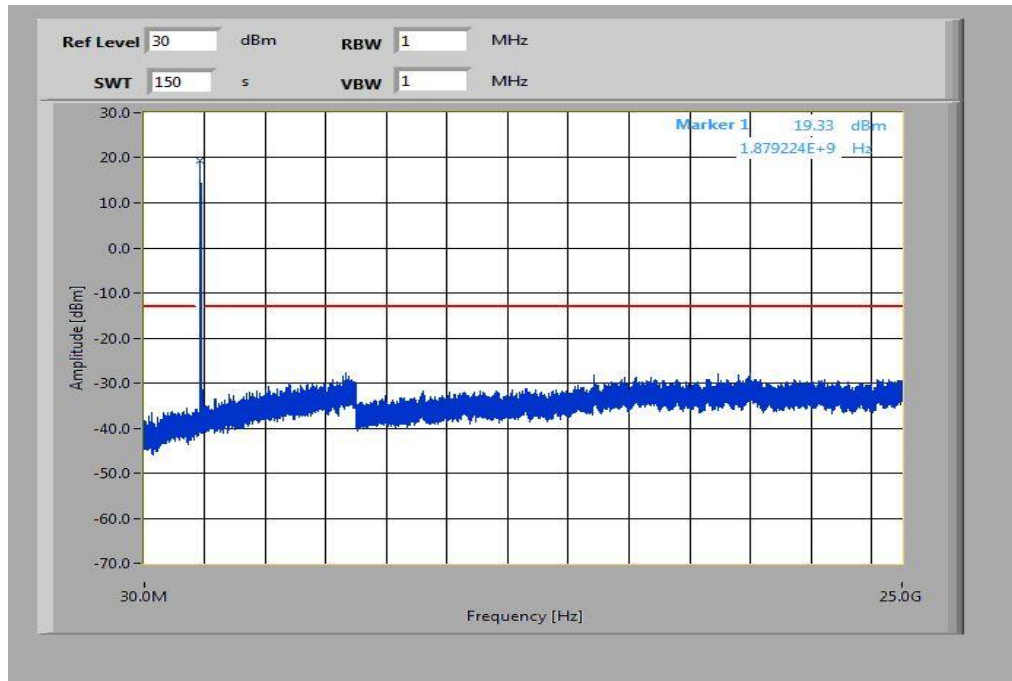


Plots: 16-QAM with 5 MHz channel bandwidth

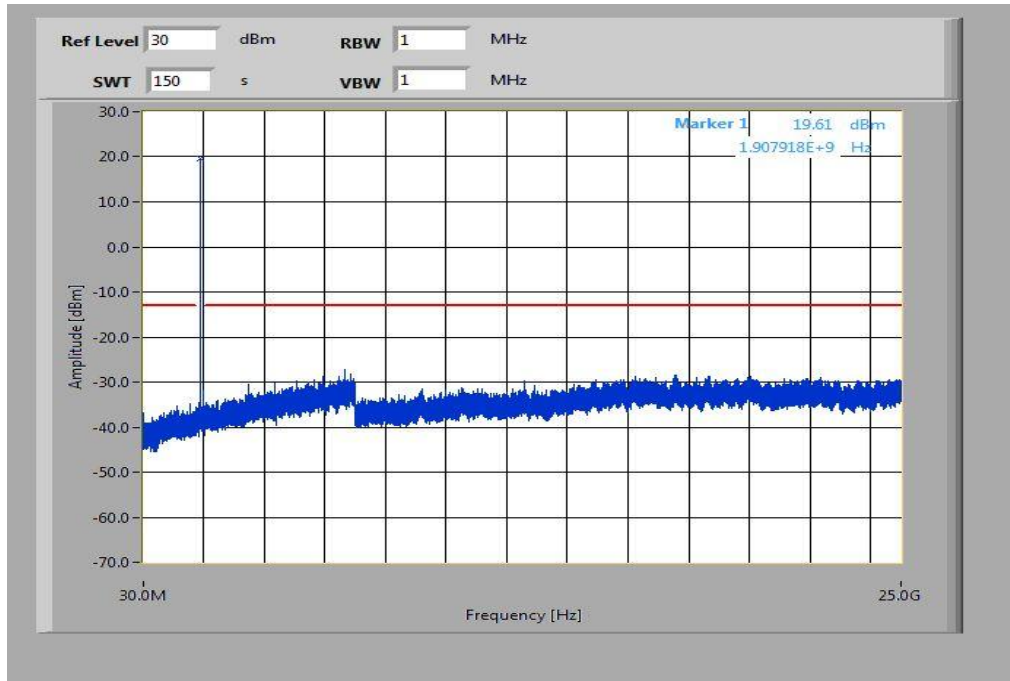
Plot 4: Lowest Channel (30 MHz - 25 GHz)



Plot 5: Middle Channel (30 MHz - 25 GHz)

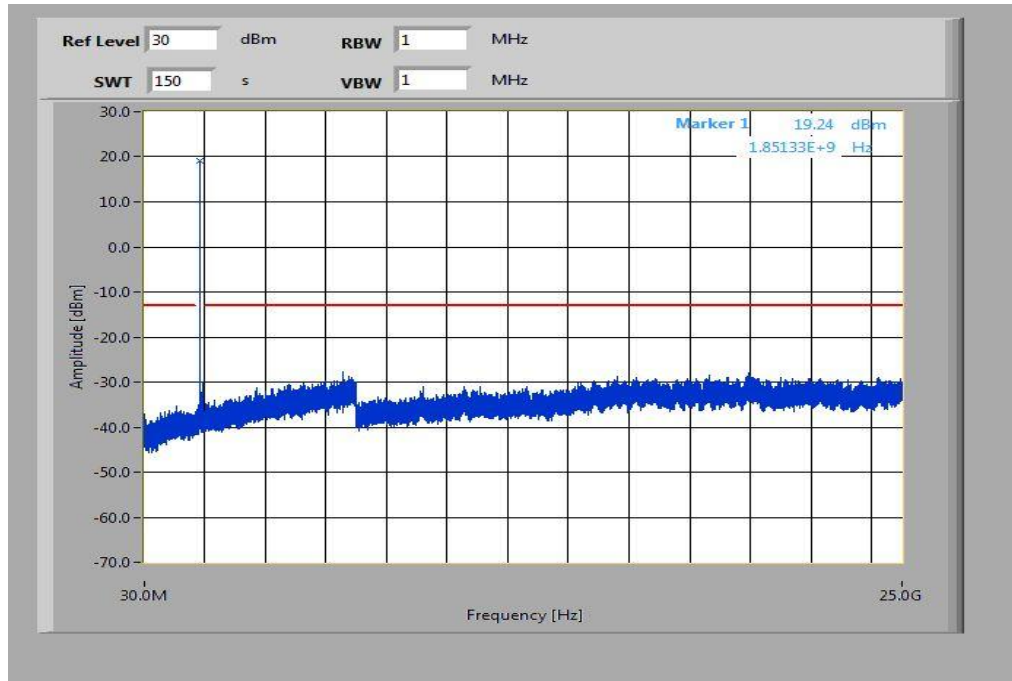


Plot 6: Highest Channel (30 MHz - 25 GHz)

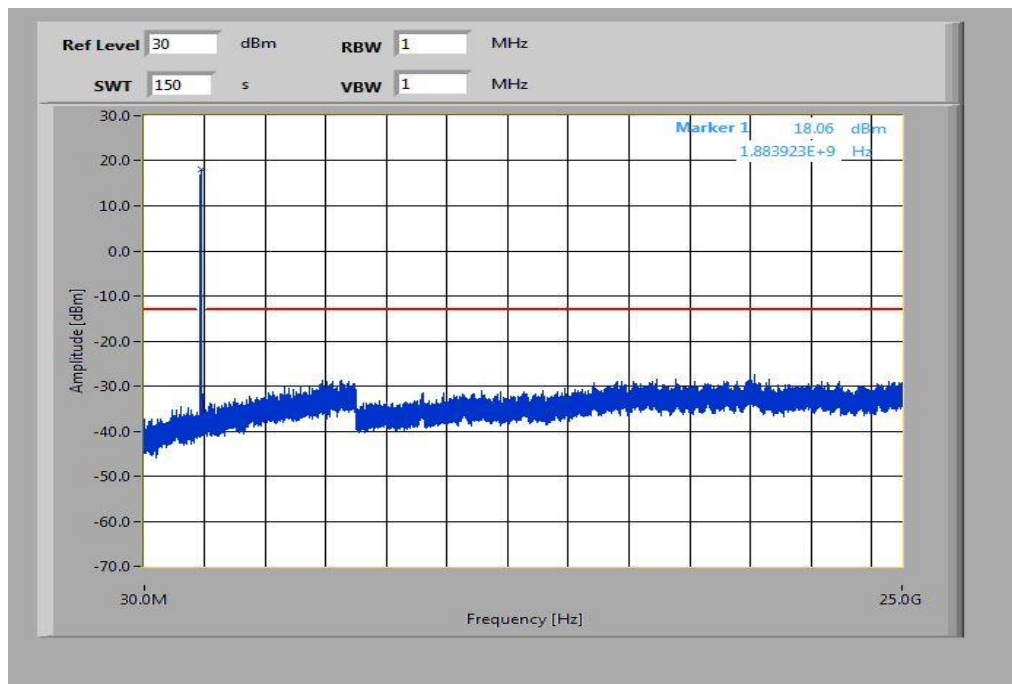


Plots: QPSK with 10 MHz channel bandwidth

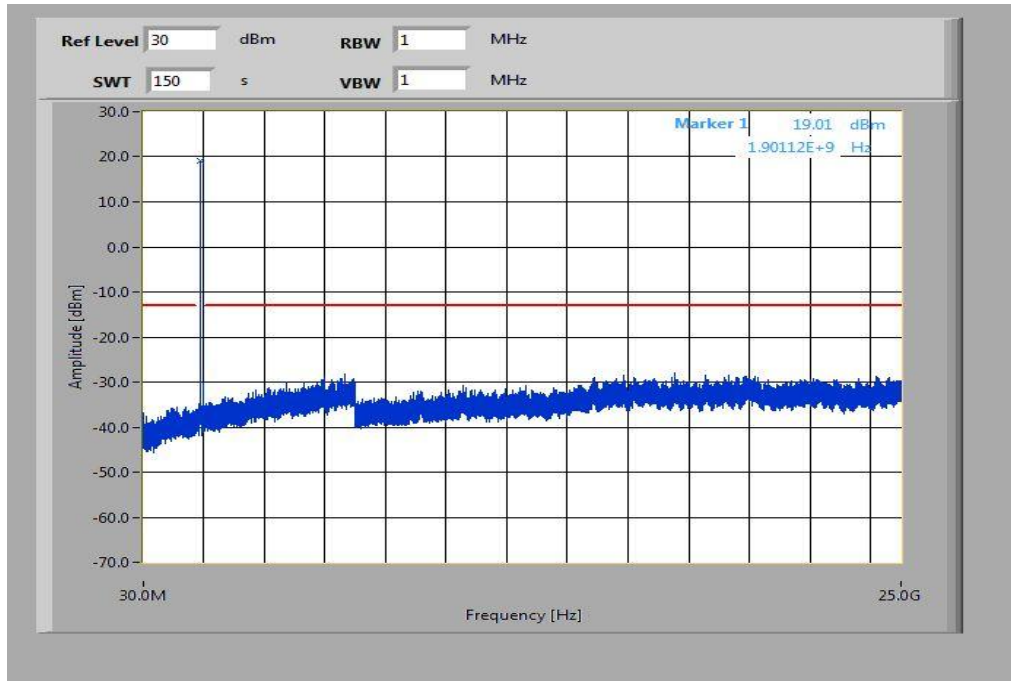
Plot 1: Lowest Channel (30 MHz - 25 GHz)



Plot 2: Middle Channel (30 MHz - 25 GHz)

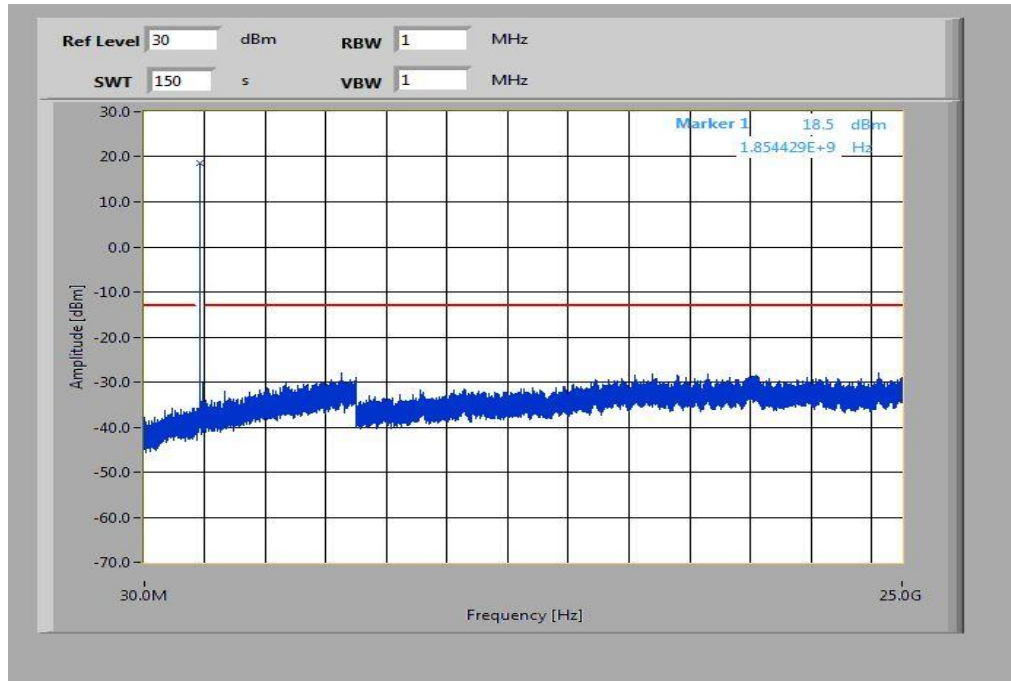


Plot 3: Highest Channel (30 MHz - 25 GHz)

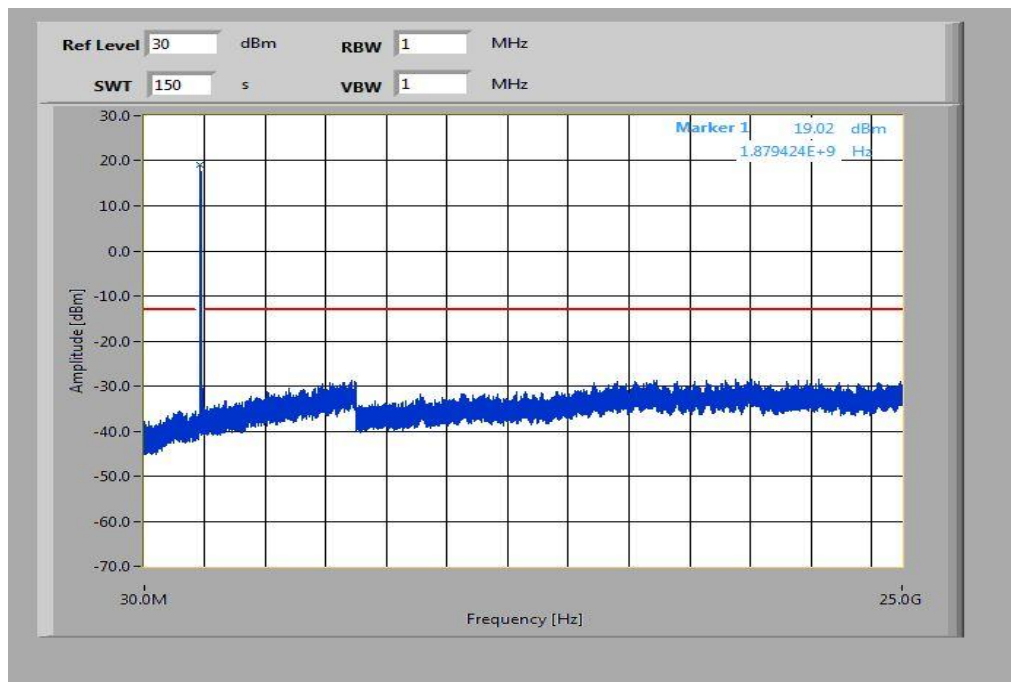


Plots: 16-QAM with 10 MHz channel bandwidth

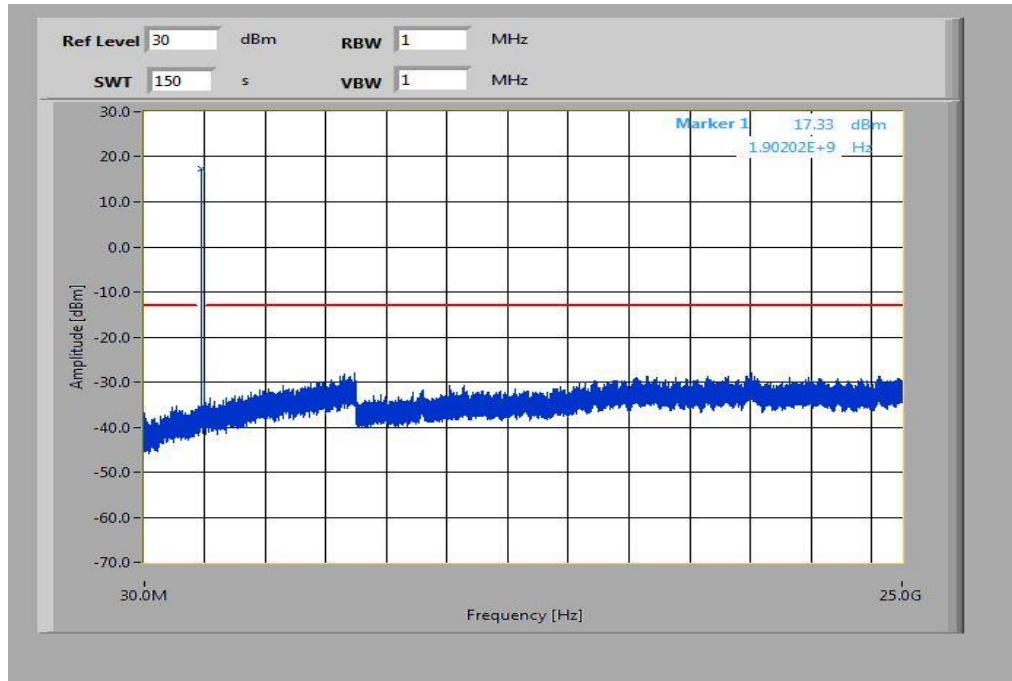
Plot 4: Lowest Channel (30 MHz - 25 GHz)



Plot 5: Middle Channel (30 MHz - 25 GHz)

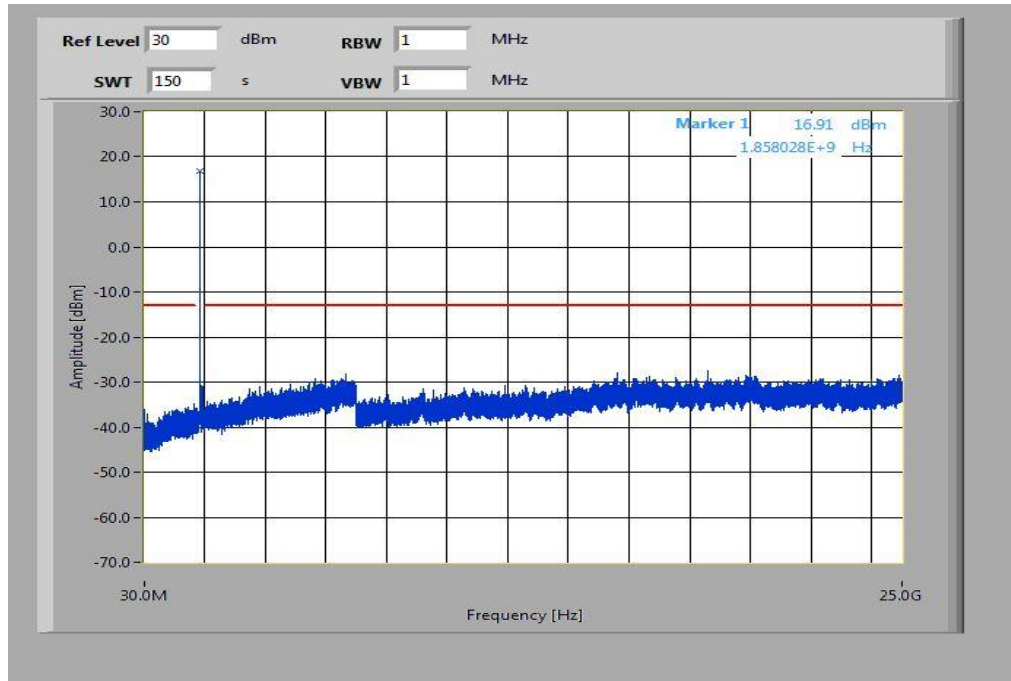


Plot 6: Highest Channel (30 MHz - 25 GHz)

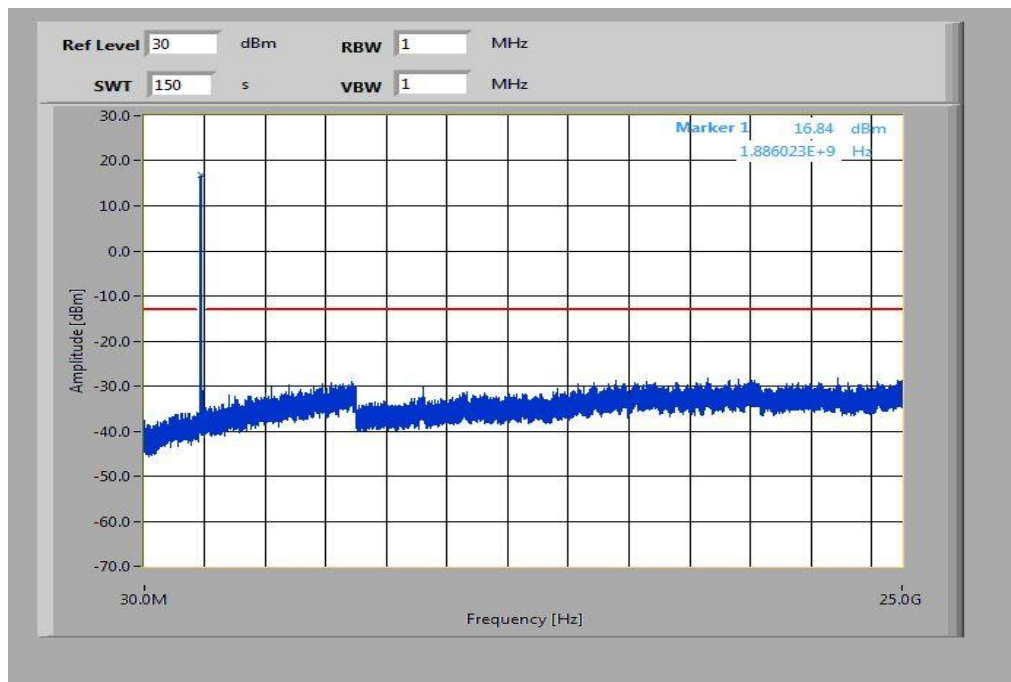


Plots: QPSK with 15 MHz channel bandwidth

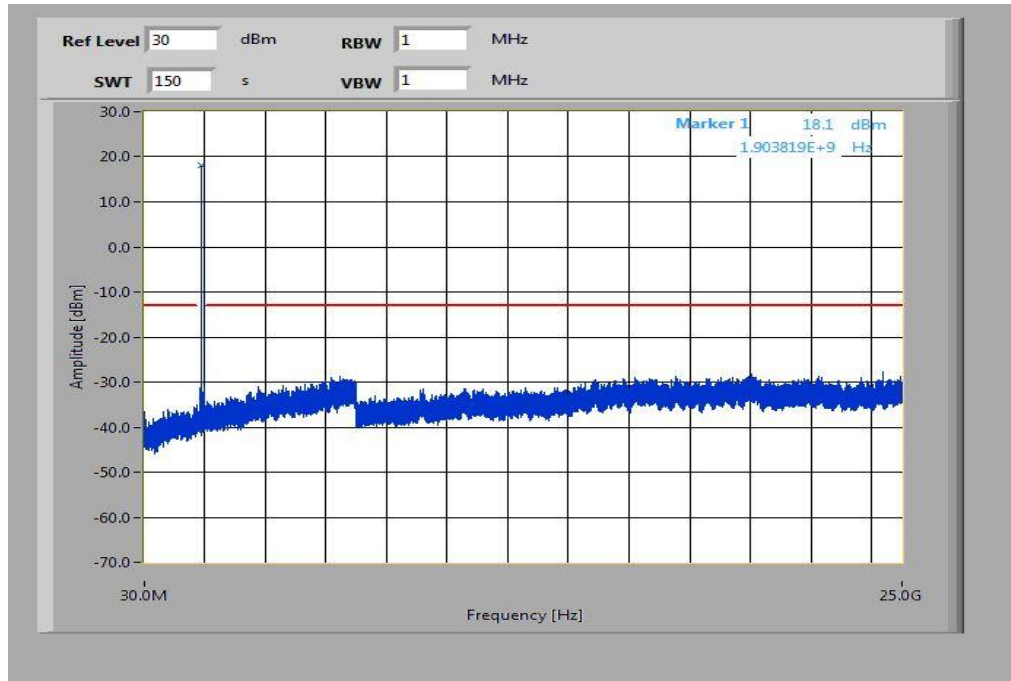
Plot 1: Lowest Channel (30 MHz - 25 GHz)



Plot 2: Middle Channel (30 MHz - 25 GHz)

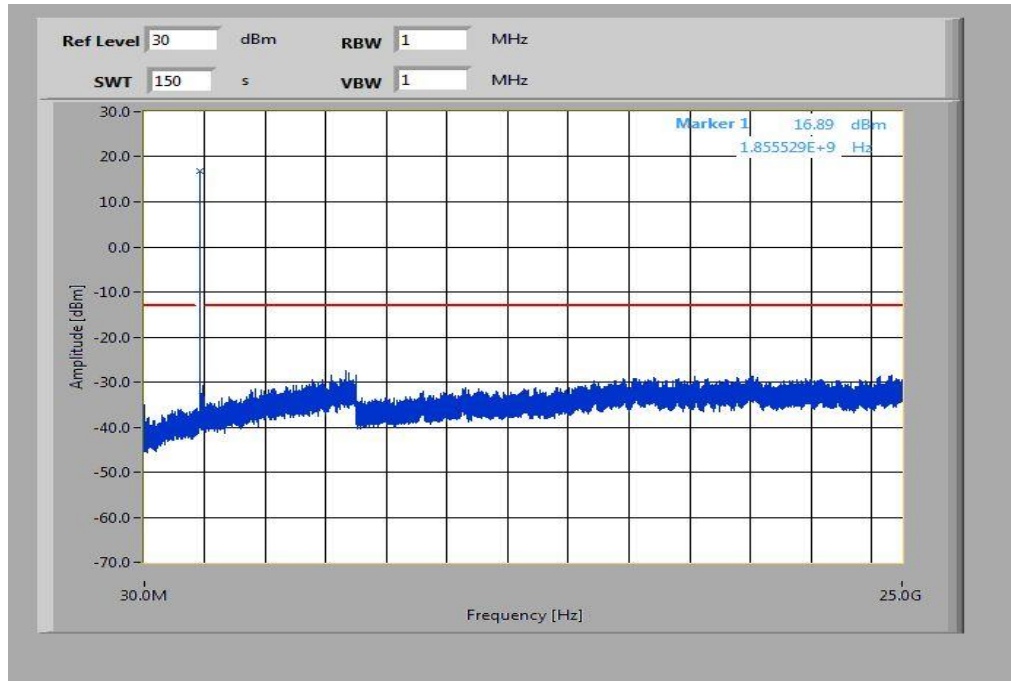


Plot 3: Highest Channel (30 MHz - 25 GHz)

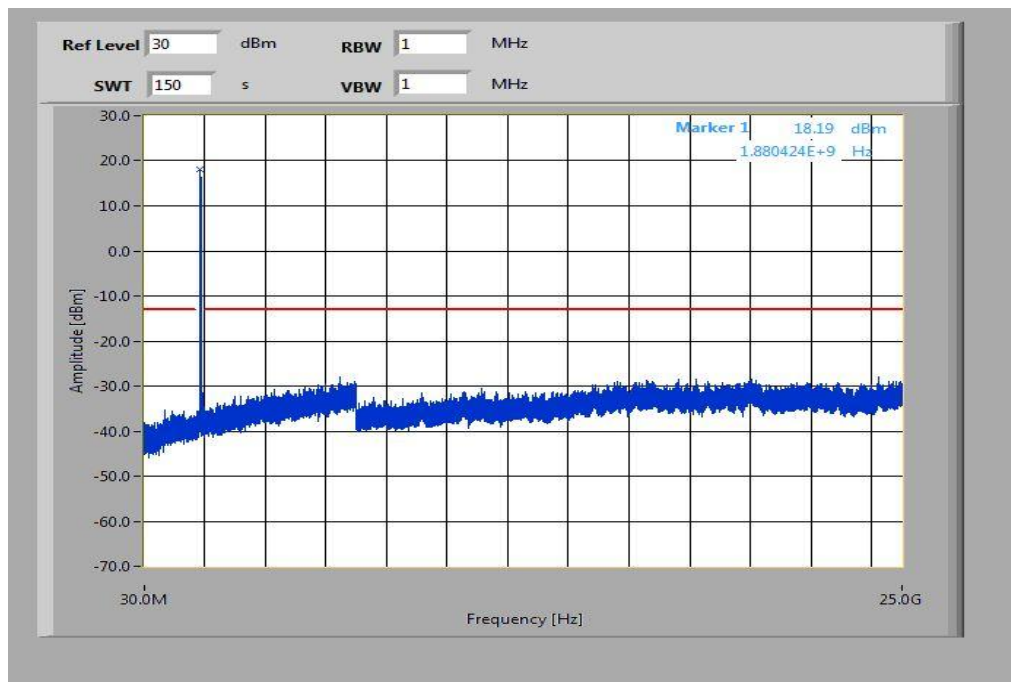


Plots: 16-QAM with 15 MHz channel bandwidth

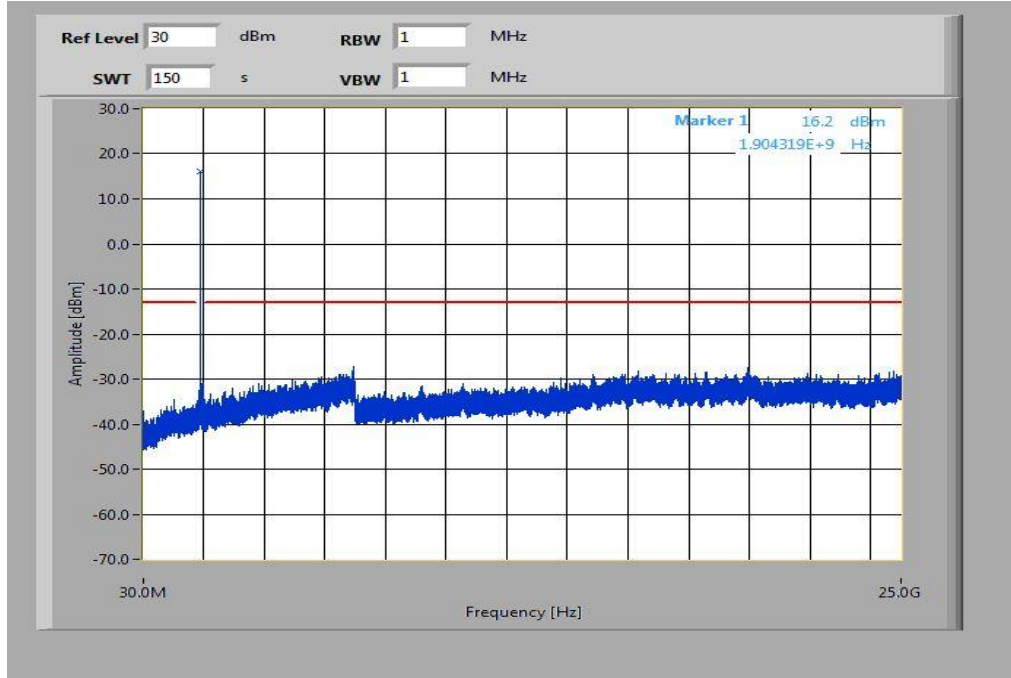
Plot 4: Lowest Channel (30 MHz - 25 GHz)



Plot 5: Middle Channel (30 MHz - 25 GHz)

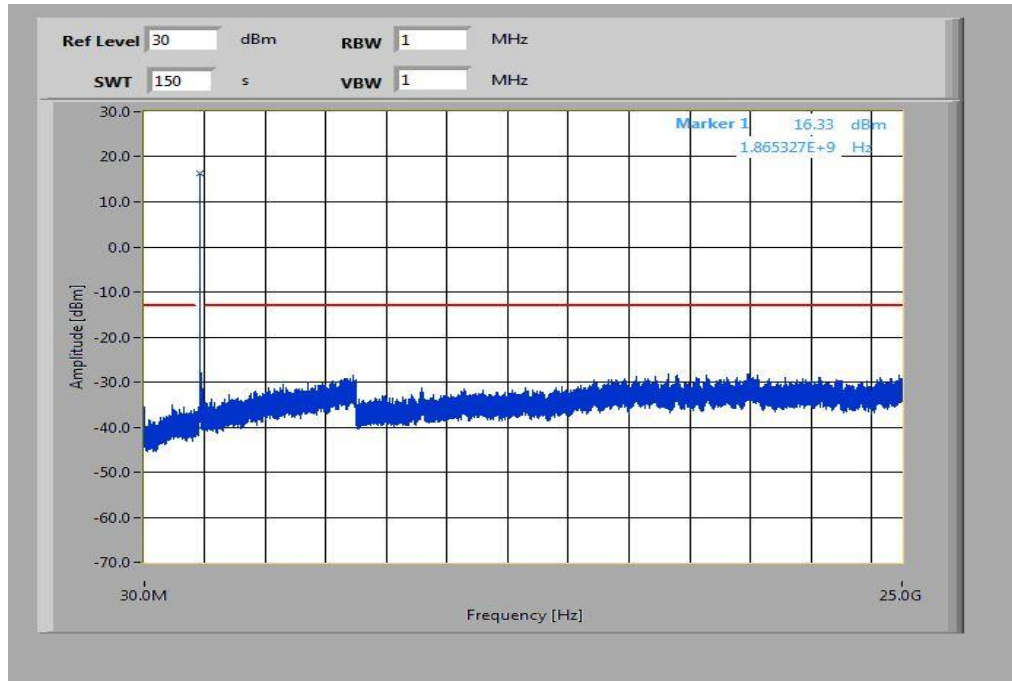


Plot 6: Highest Channel (30 MHz - 25 GHz)

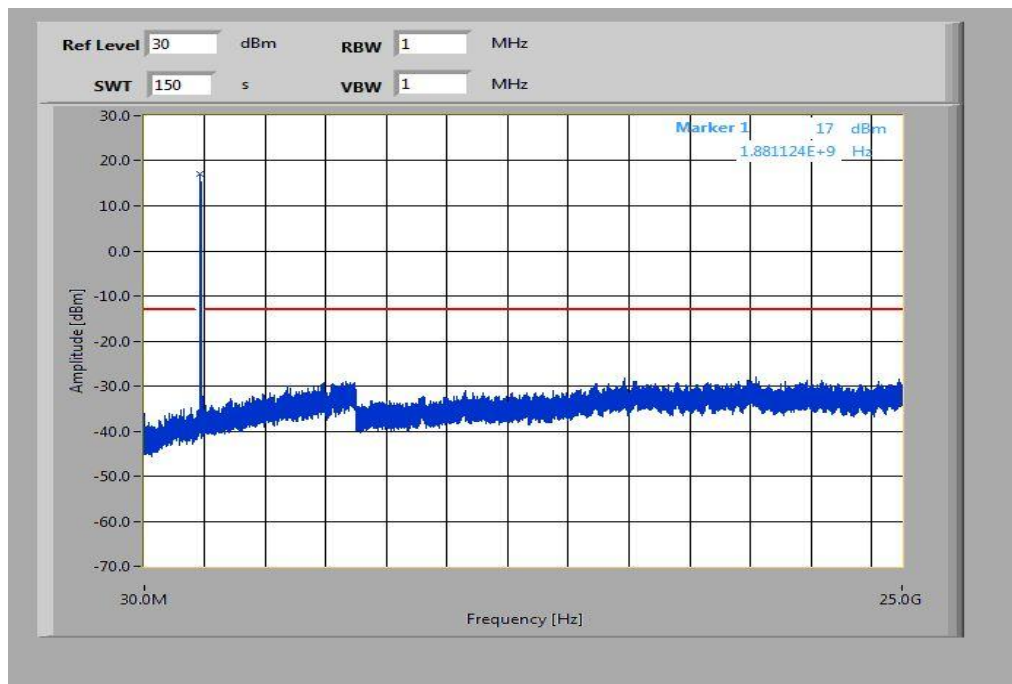


Plots: QPSK with 20 MHz channel bandwidth

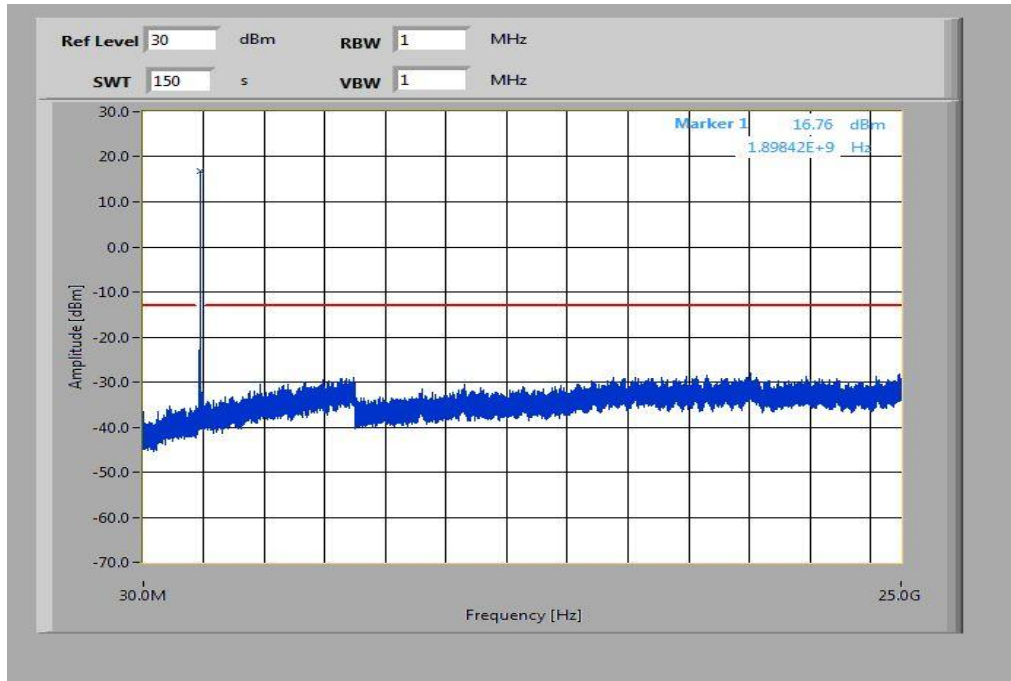
Plot 1: Lowest Channel (30 MHz - 25 GHz)



Plot 2: Middle Channel (30 MHz - 25 GHz)

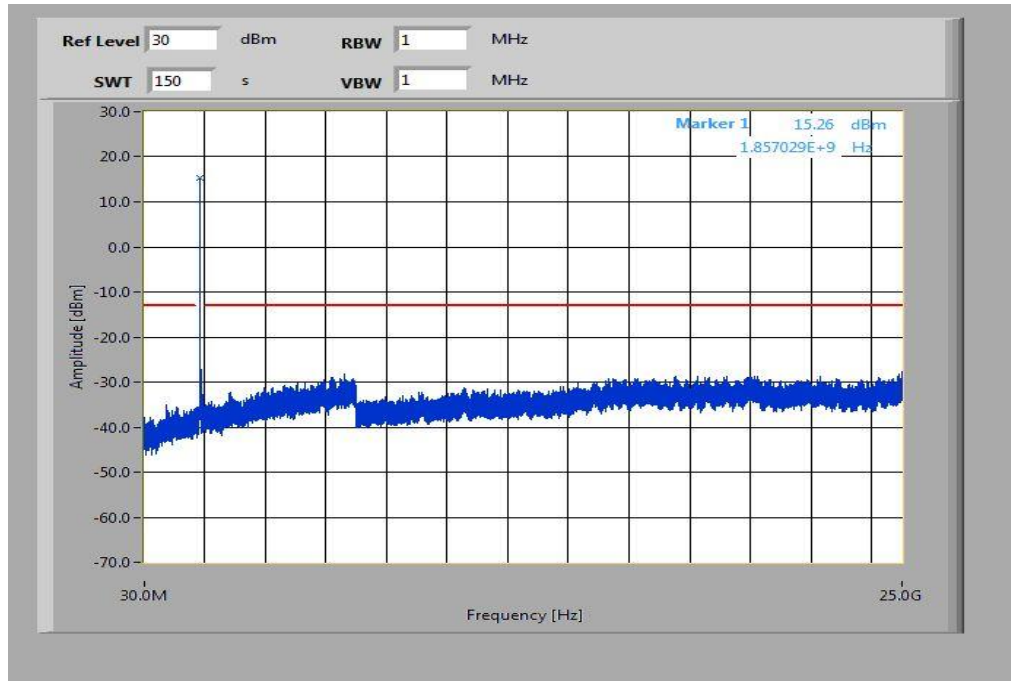


Plot 3: Highest Channel (30 MHz - 25 GHz)

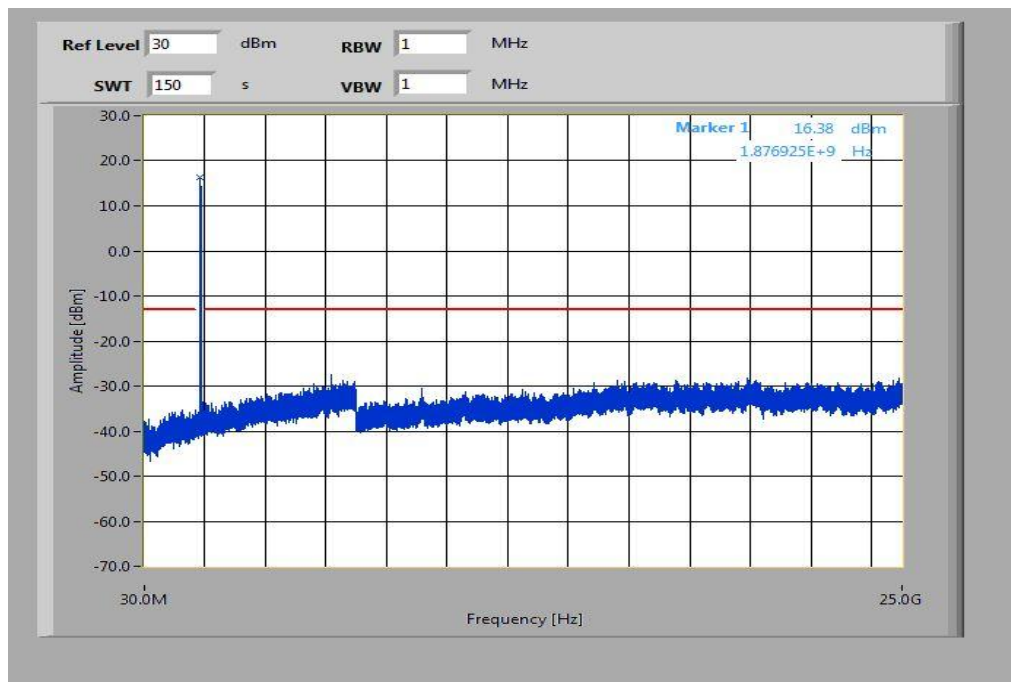


Plots: 16-QAM with 20 MHz channel bandwidth

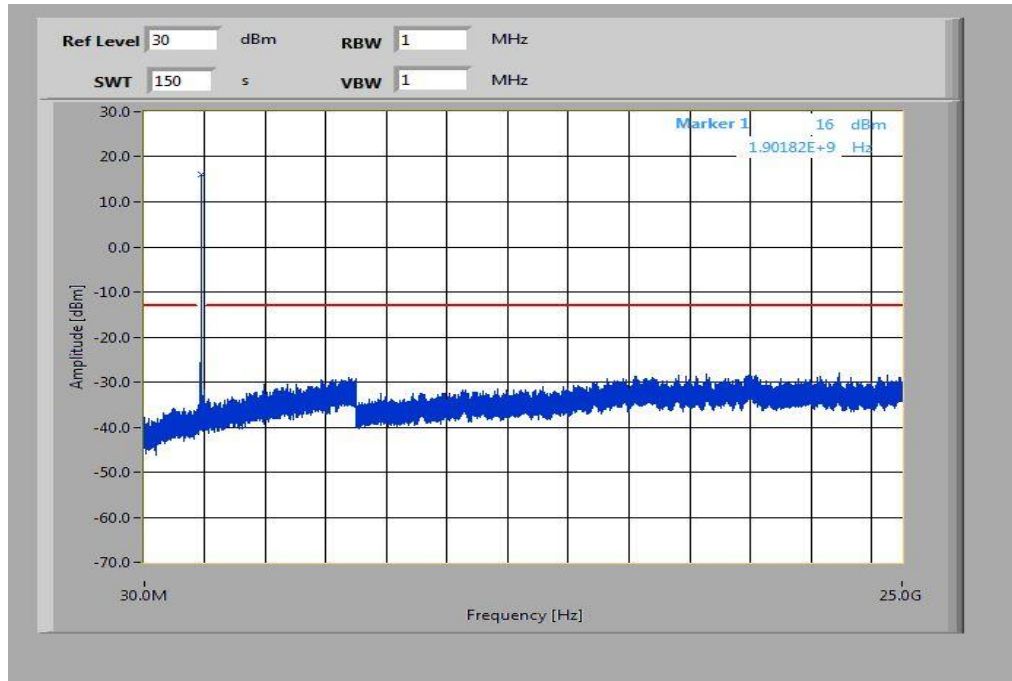
Plot 4: Lowest Channel (30 MHz - 25 GHz)



Plot 5: Middle Channel (30 MHz - 25 GHz)



Plot 6: Highest Channel (30 MHz - 25 GHz)



8.2.5 Block edge compliance

Description:

The spectrum at the band edges must comply with the spurious emissions limits.

Measurement:

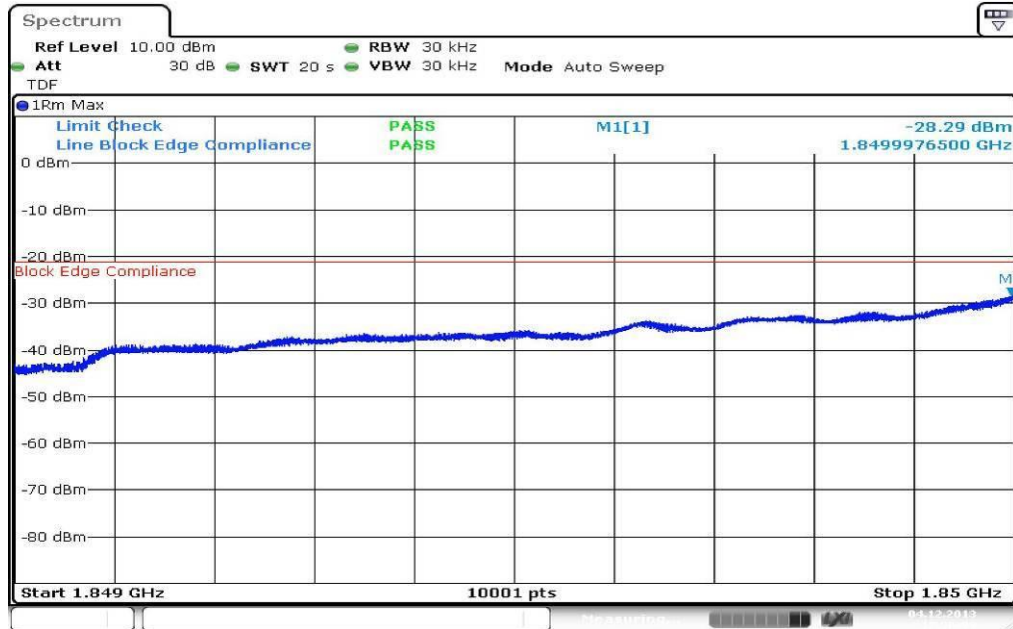
Measurement parameters	
Detector:	RMS
Sweep time:	60 sec.
Video bandwidth:	30 kHz
Resolution bandwidth:	30 kHz
Span:	1 MHz
Trace-Mode:	Max Hold

Limits:

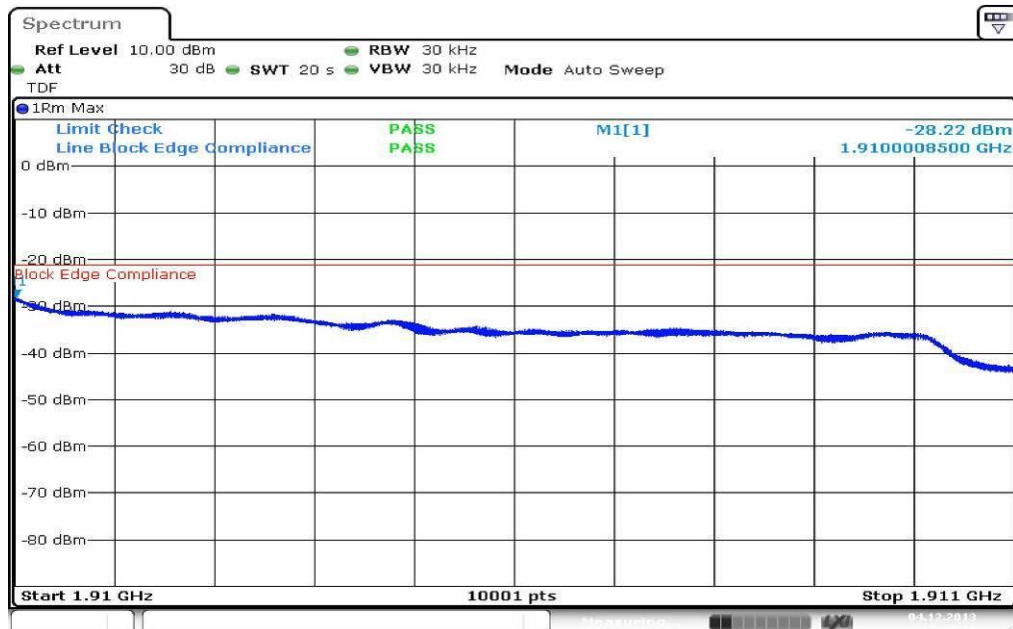
FCC	-/-
Block Edge Compliance	
<p>Part 24.238 specifies that “the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.”</p> <p>However, in publication number 890810, The FCC Office of Engineering and Technology specified the following correction to the limits when a resolution bandwidth smaller than 1% of the emission bandwidth is used:</p> <p>“An alternative is to add an additional correction factor of 10 Log (RBW1/ RBW2) to the 43 +10 Log (P) limit. RBW1 is the narrower measurement resolution bandwidth and RBW2 is either the 1% emissions bandwidth or 1 MHz.”</p> <p>When using a 30 kHz bandwidth, this yields a -2.2185 adjustment to the limit [10log(30kHz/200kHz) = -8.239]. When this adjustment is applied to the limit, the limit becomes -21.24.</p>	
-21.24 dBm (worst case over all channel BW)	

Results: 1.4 MHz channel bandwidth

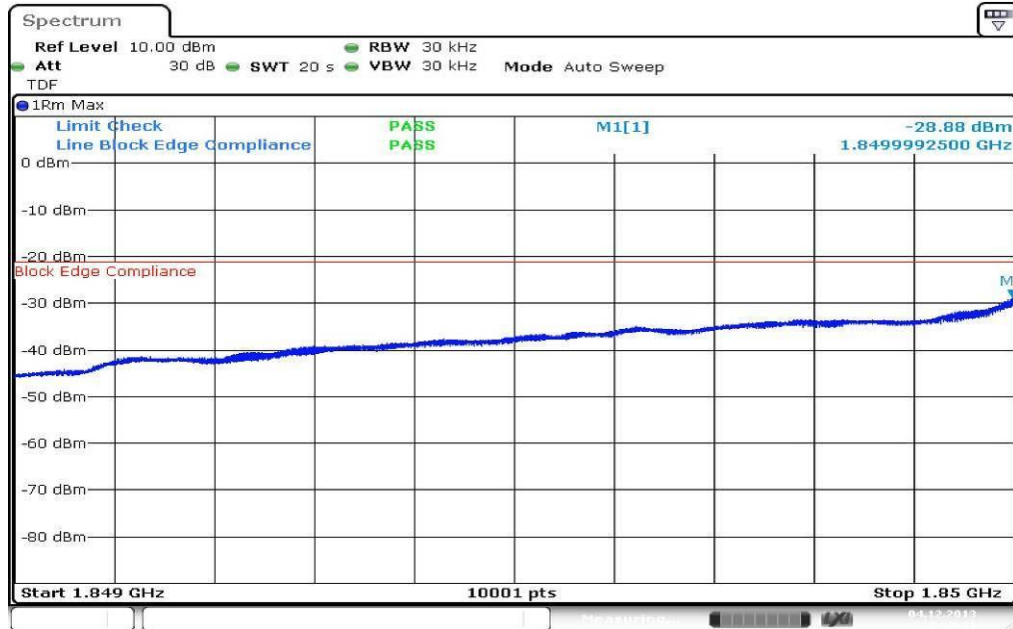
Plot 1: Lowest channel – QPSK



Plot 2: Highest channel – QPSK

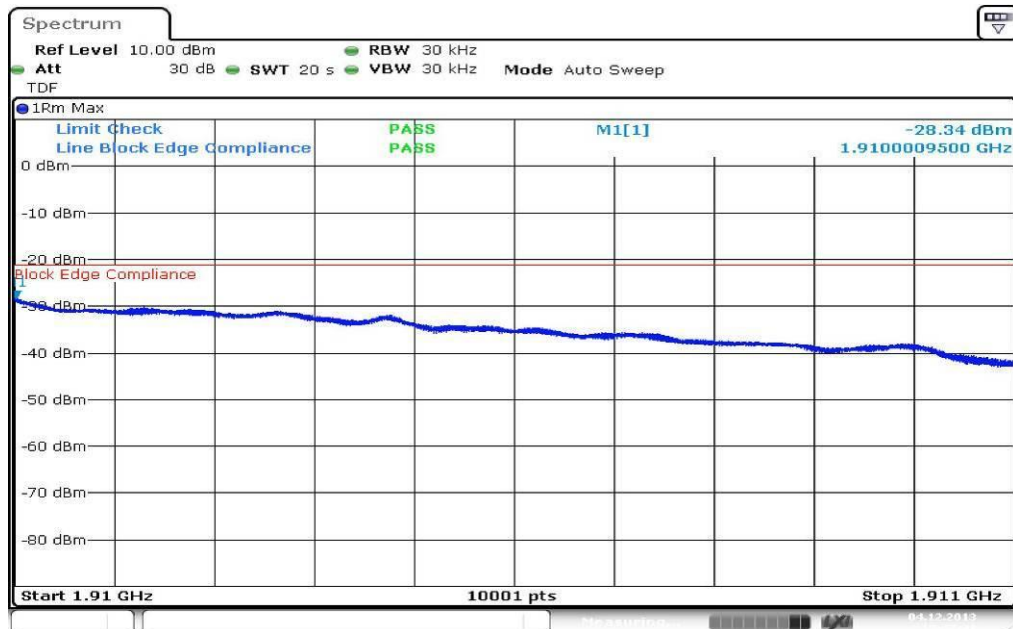


Plot 3: Lowest channel – 16-QAM



Date: 4.DEC.2013 12:30:32

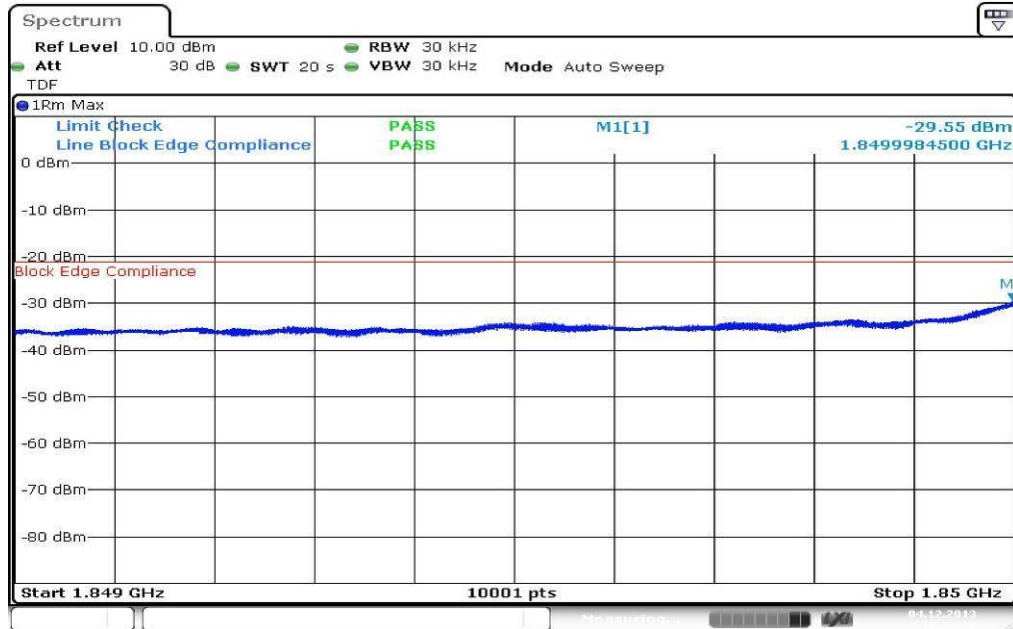
Plot 4: Highest channel – 16-QAM



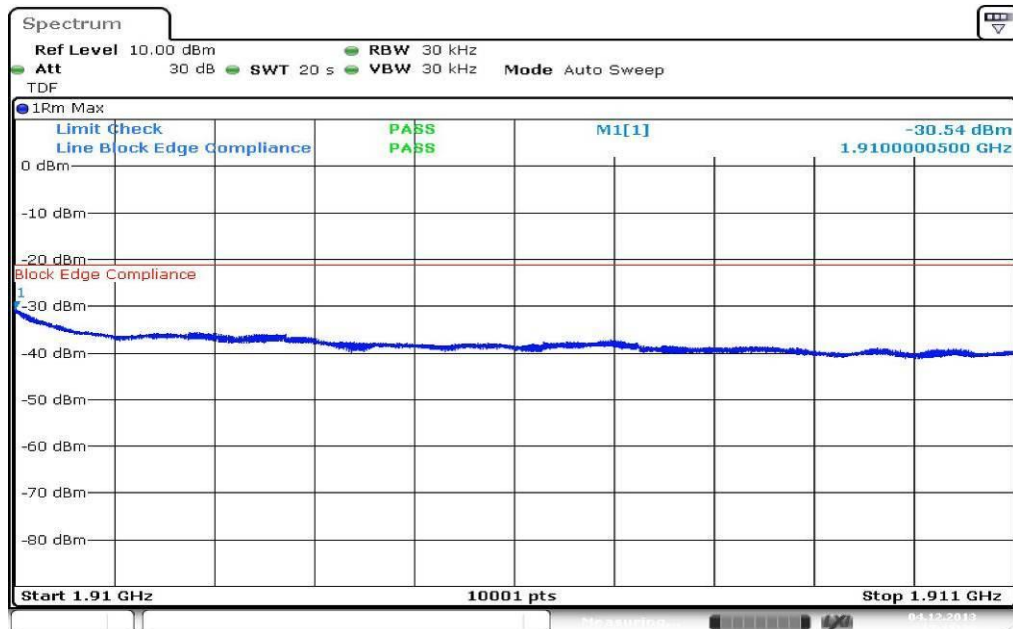
Date: 4.DEC.2013 12:47:42

Results: 3 MHz channel bandwidth

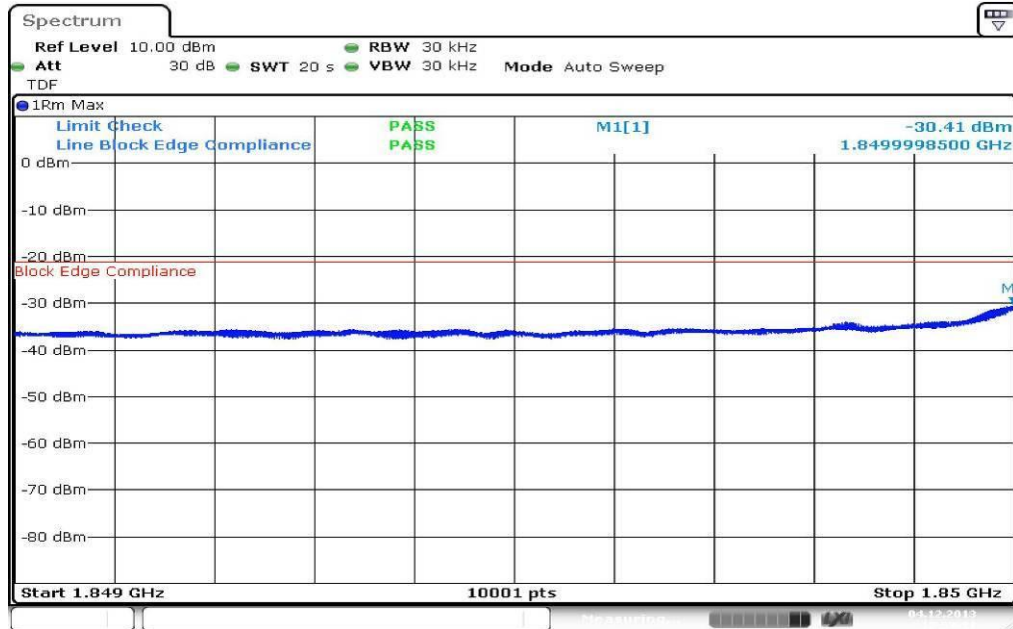
Plot 1: Lowest channel – QPSK



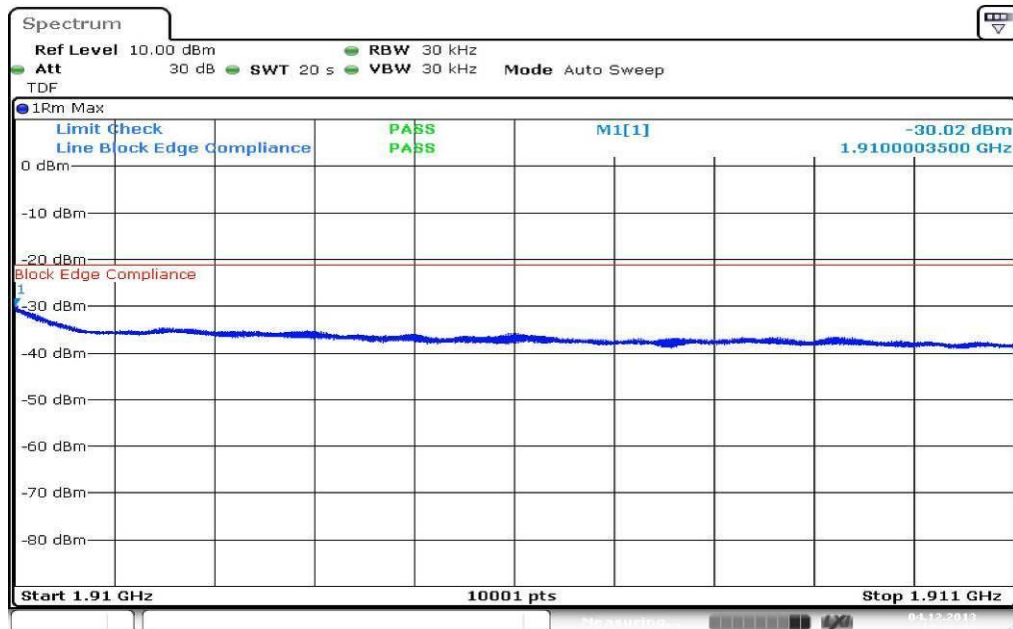
Plot 2: Highest channel – QPSK



Plot 3: Lowest channel – 16-QAM

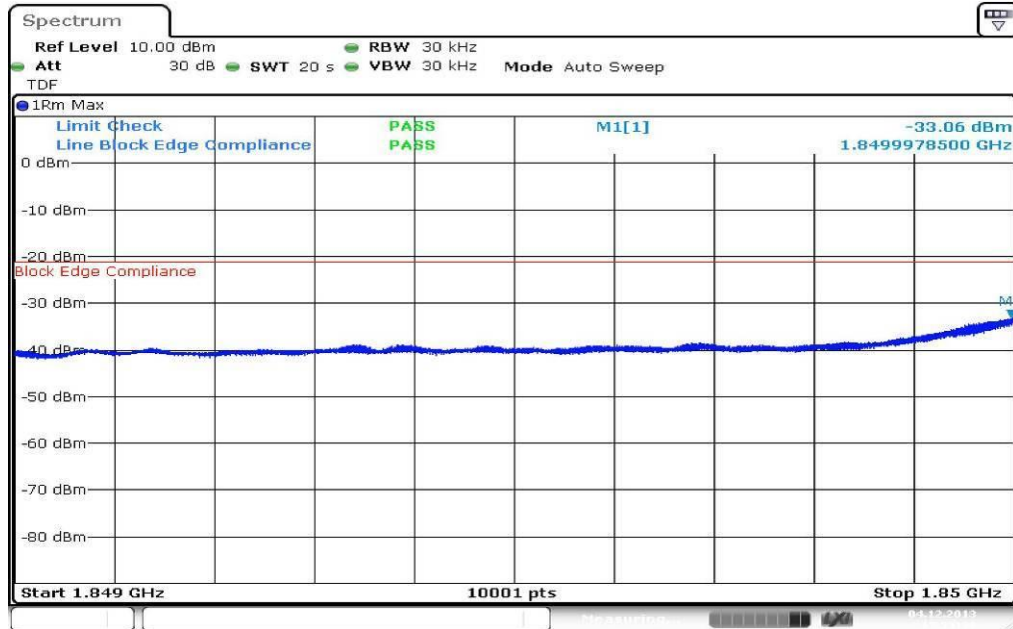


Plot 4: Highest channel – 16-QAM

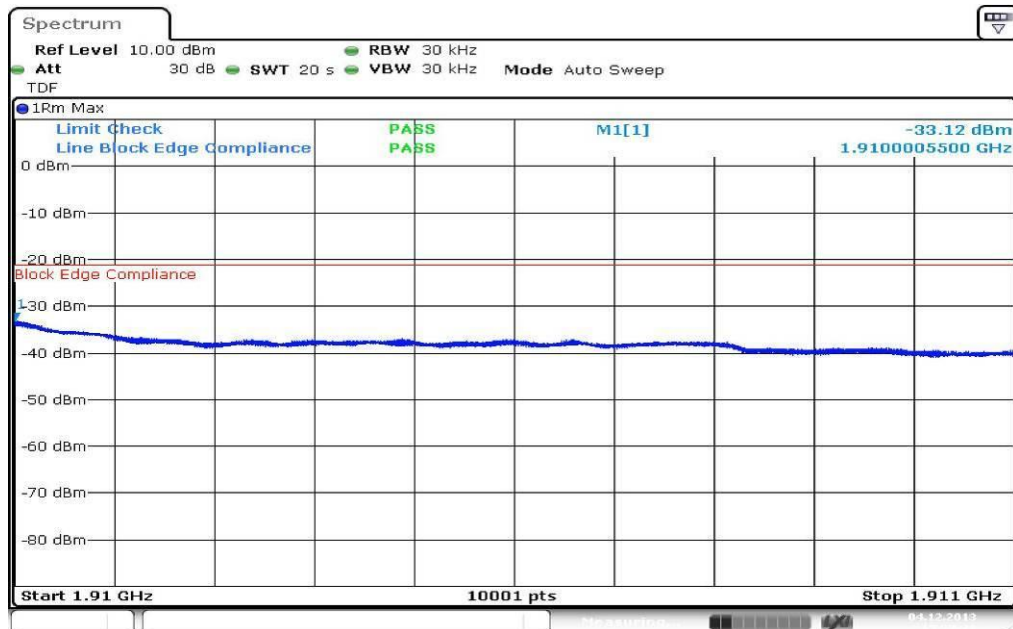


Results: 5 MHz channel bandwidth

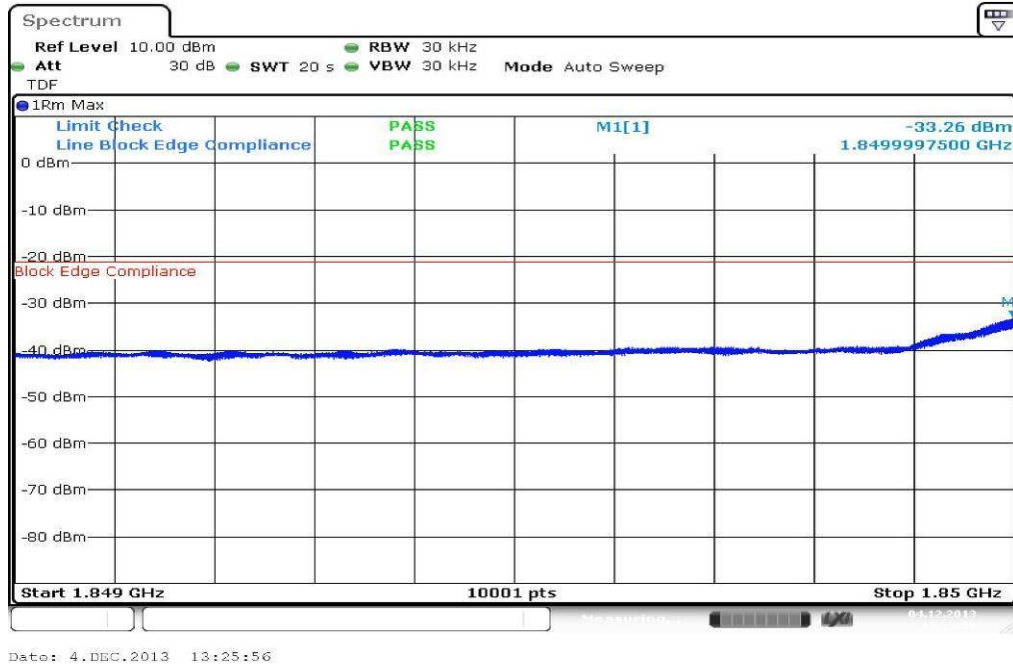
Plot 1: Lowest channel – QPSK



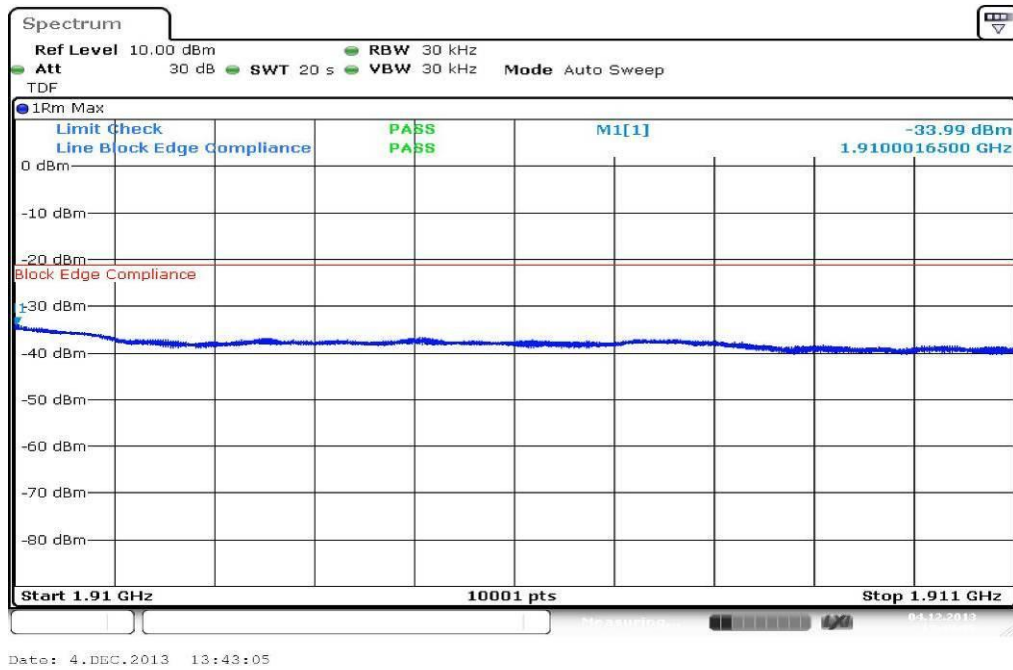
Plot 2: Highest channel – QPSK



Plot 3: Lowest channel – 16-QAM

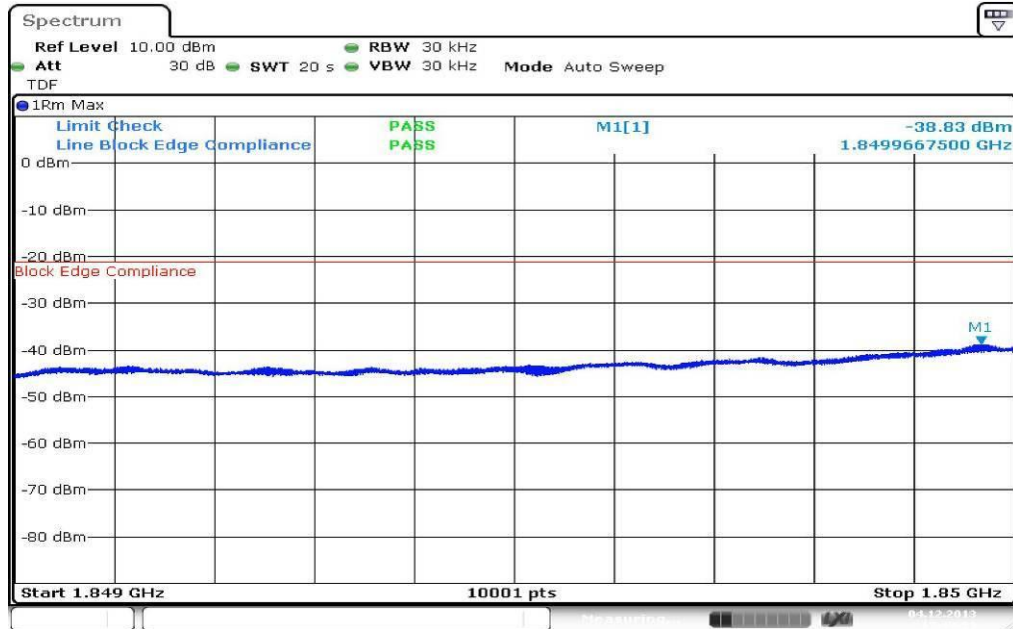


Plot 4: Highest channel – 16-QAM

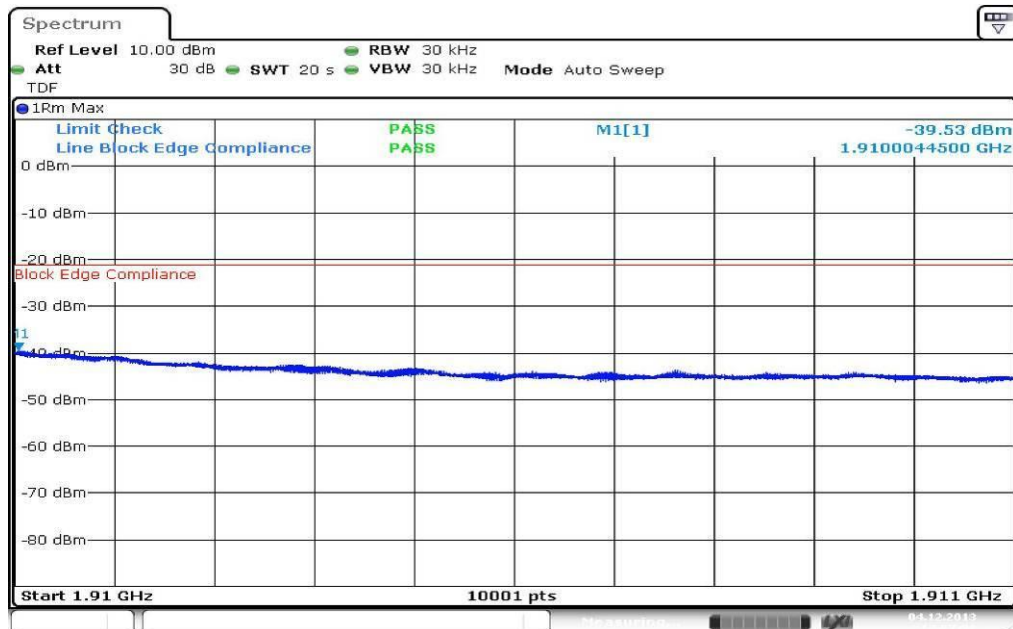


Results: 10 MHz channel bandwidth

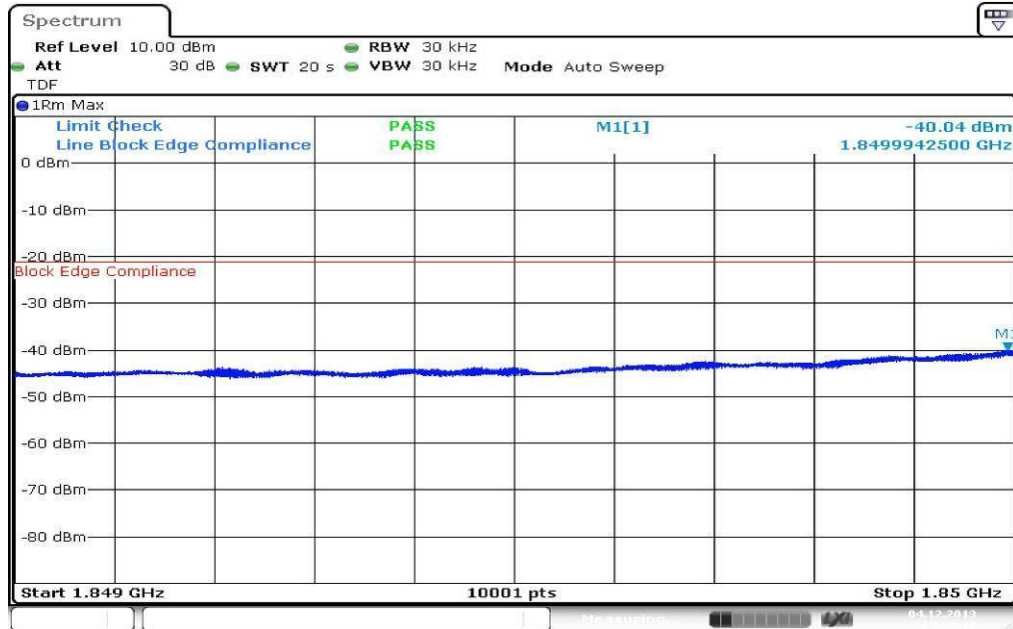
Plot 1: Lowest channel – QPSK



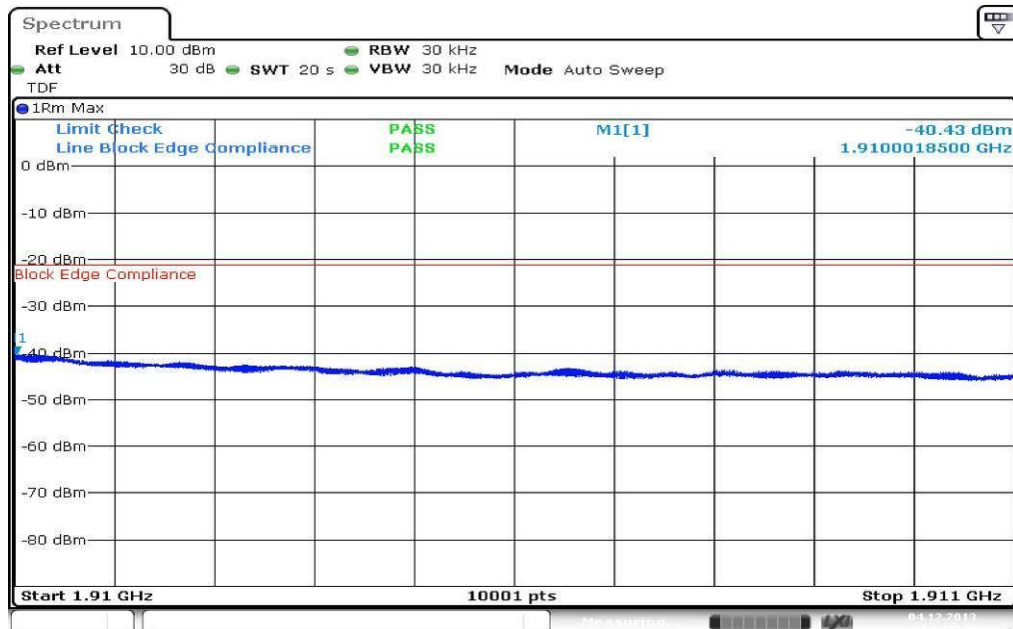
Plot 2: Highest channel – QPSK



Plot 3: Lowest channel – 16-QAM

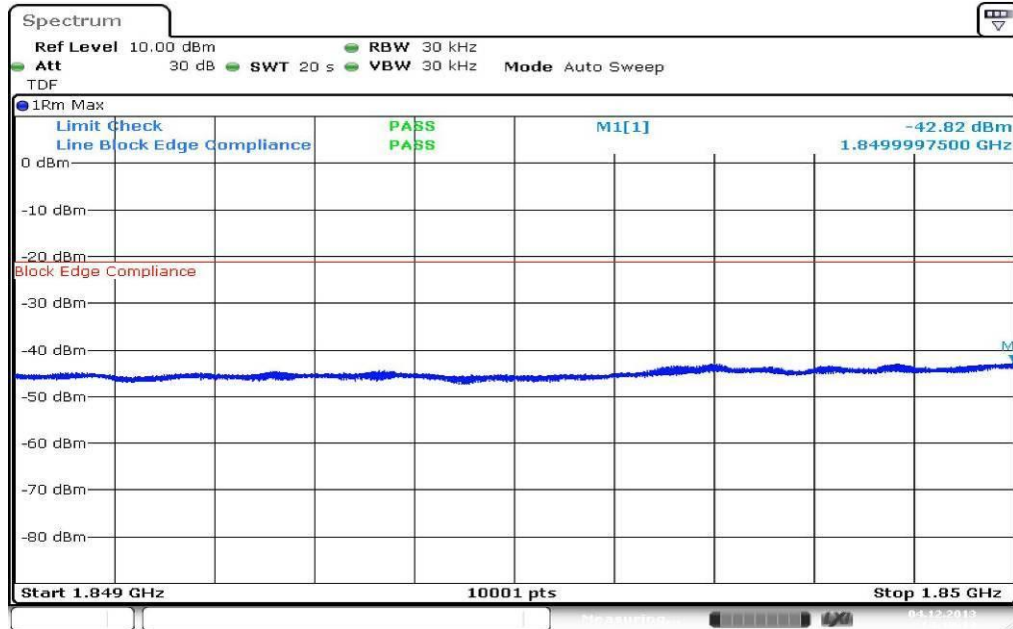


Plot 4: Highest channel – 16-QAM

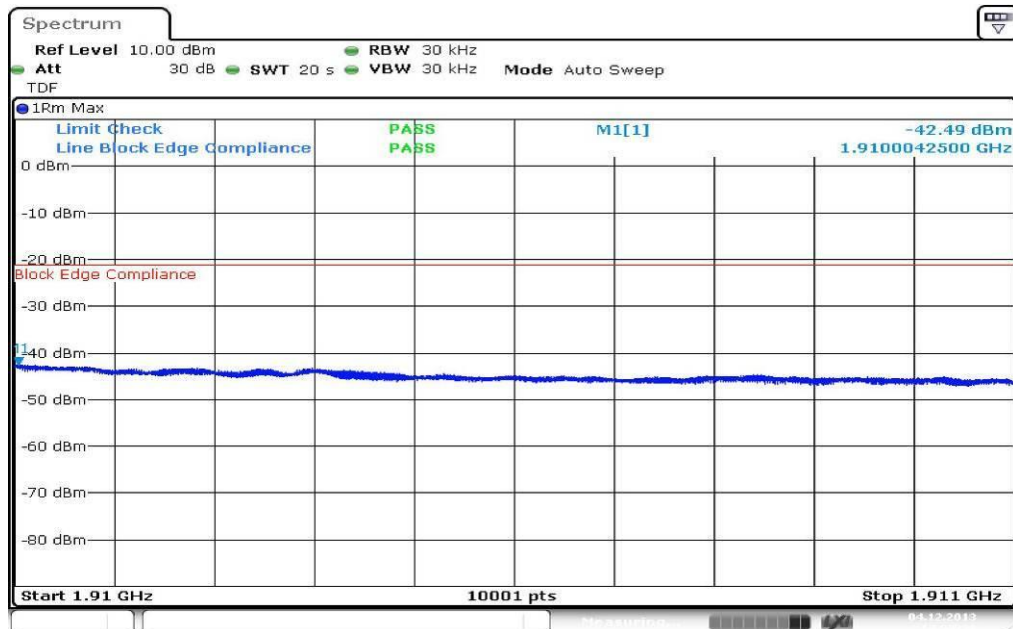


Results: 15 MHz channel bandwidth

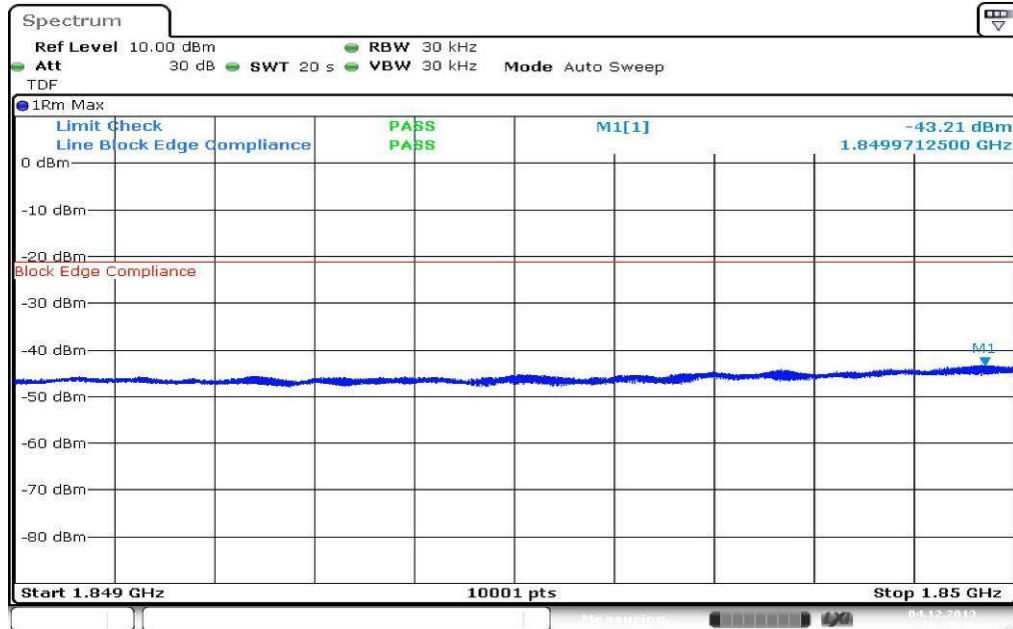
Plot 1: Lowest channel – QPSK



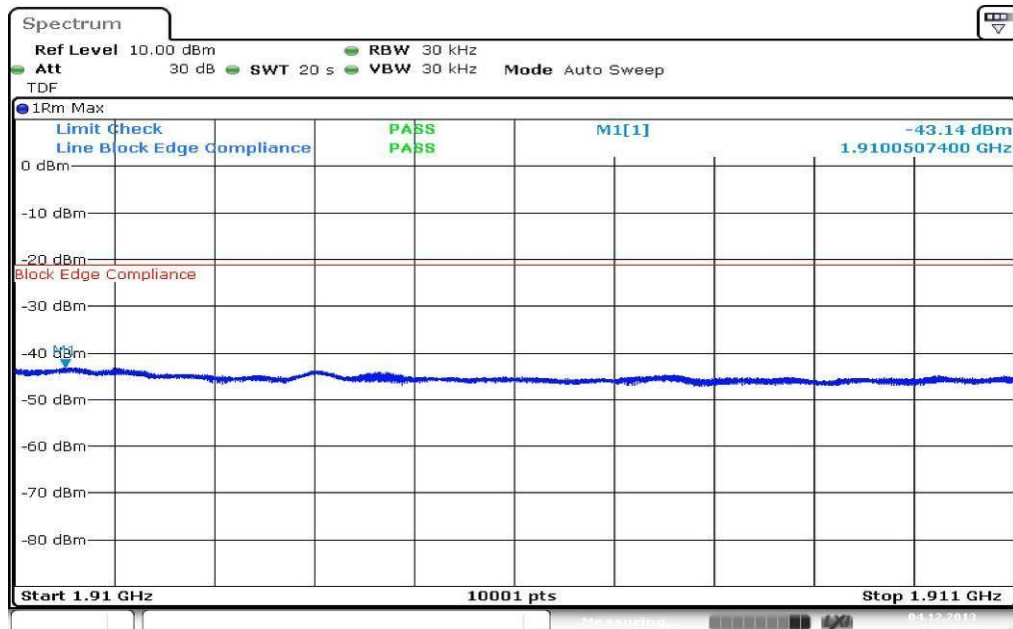
Plot 2: Highest channel – QPSK



Plot 3: Lowest channel – 16-QAM

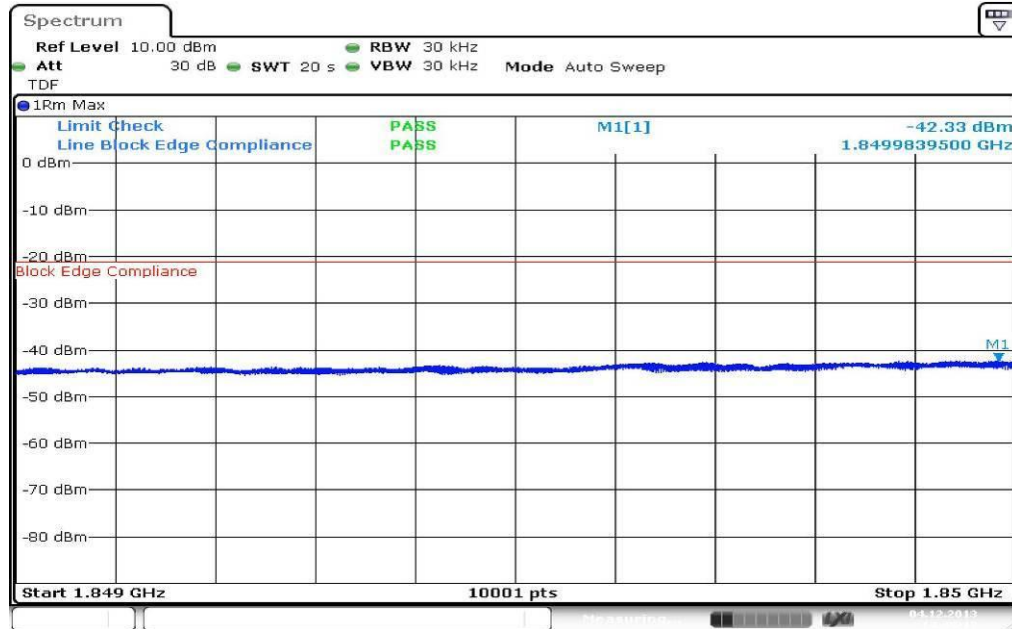


Plot 4: Highest channel – 16-QAM



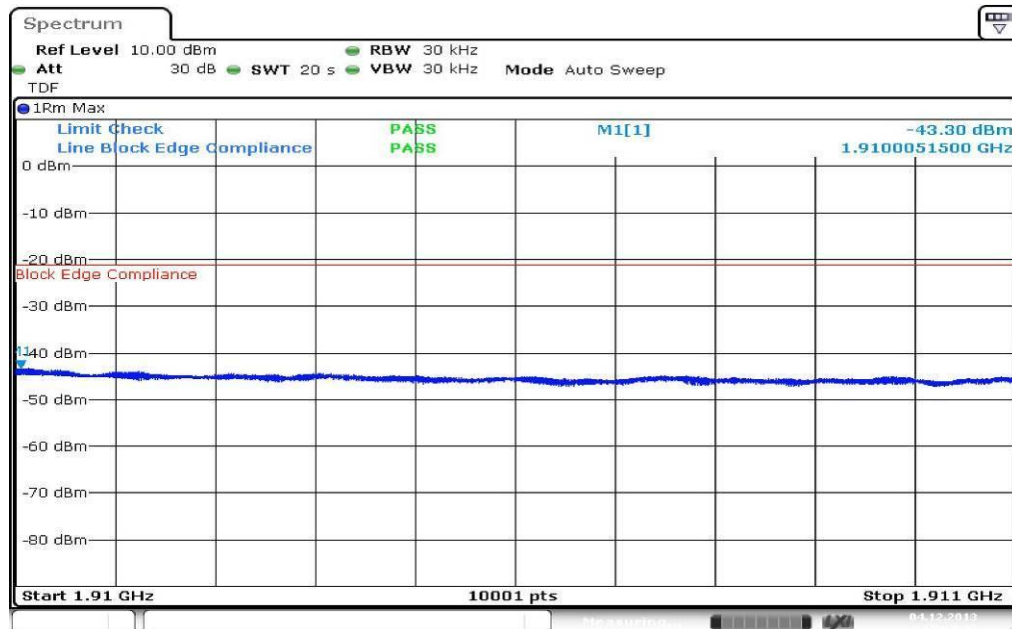
Results: 20 MHz channel bandwidth

Plot 1: Lowest channel – QPSK



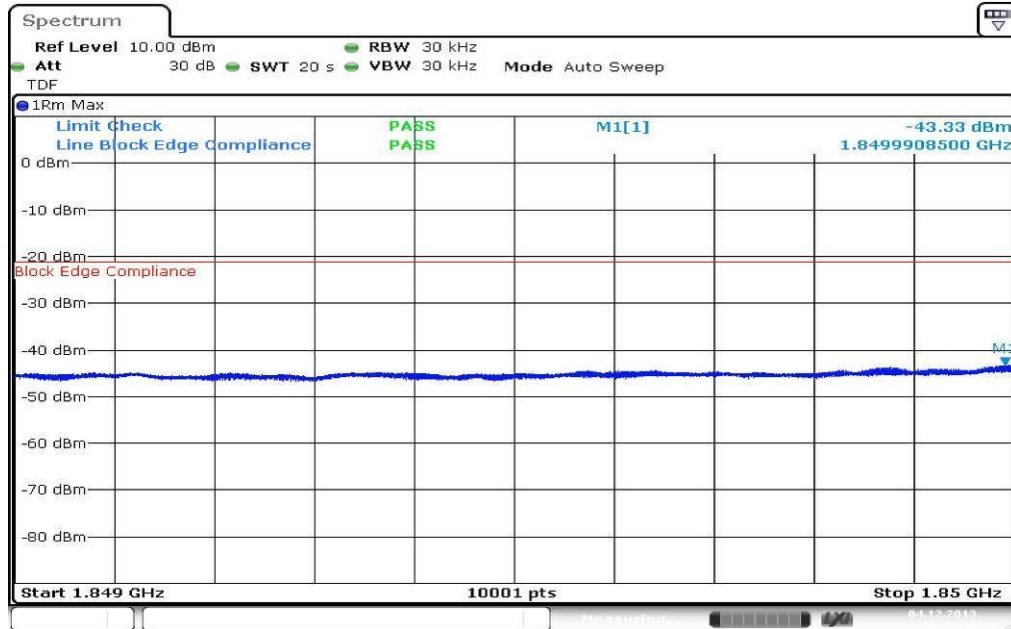
Date: 4.DEC.2013 14:45:18

Plot 2: Highest channel – QPSK

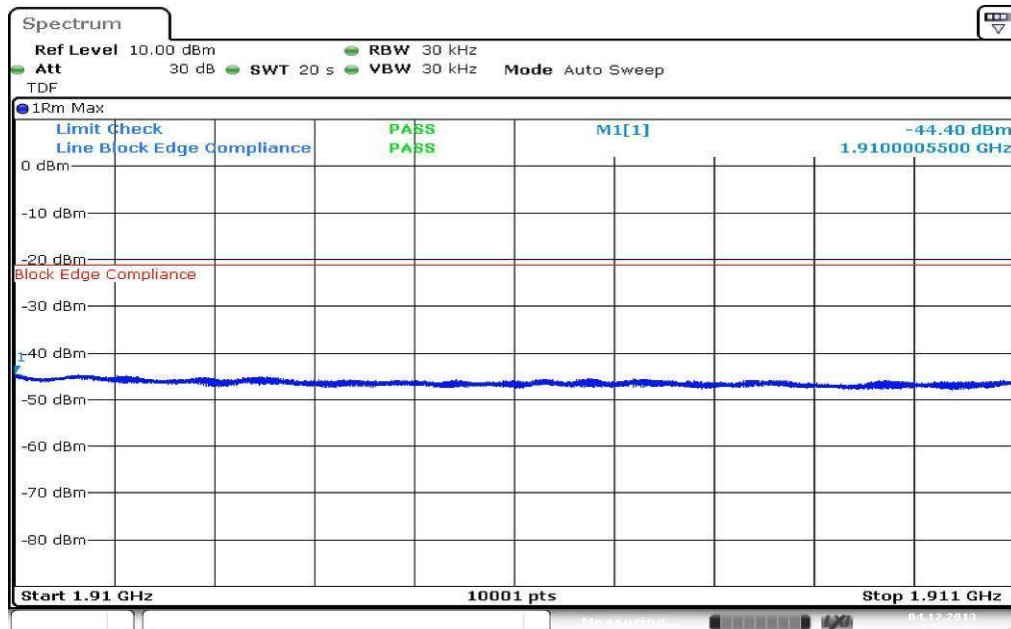


Date: 4.DEC.2013 15:02:27

Plot 3: Lowest channel – 16-QAM



Plot 4: Highest channel – 16-QAM



Result: Passed

8.2.6 Occupied bandwidth

Description:

Measurement of the occupied bandwidth of the transmitted signal.

Measurement:

Similar to conducted emissions, occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the LTE band II frequency band. The table below lists the measured 99% power and 26dB occupied bandwidths. Spectrum analyzer plots are included on the following pages.

Measurement parameters	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	100 kHz to 2 MHz
Resolution bandwidth:	30 kHz to 500 kHz
Span:	2 x nominal bandwidth
Trace-Mode:	Max Hold

Limits:

FCC	-/-
Occupied Bandwidth	
Spectrum must fall completely in the specified band	

Results:

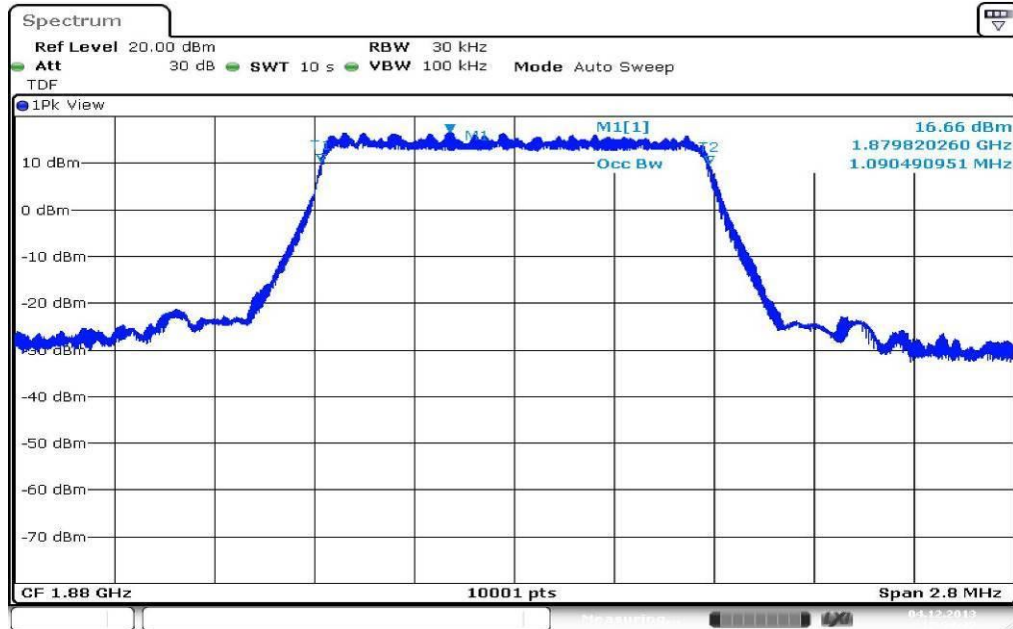
Occupied Bandwidth – QPSK		
Bandwidth (MHz)	99% OBW (kHz)	26dB bandwidth (kHz)
1.4	1090	1284
3.0	2733	3052
5.0	4500	4982
10.0	9063	10149
15.0	13424	14699
20.0	17914	19606
Measurement uncertainty	± 30 kHz to ± 500 kHz depending on channel bandwidth	

Occupied Bandwidth – 16-QAM		
Bandwidth (MHz)	99% OBW (kHz)	26dB bandwidth (kHz)
1.4	1096	1307
3.0	2726	3054
5.0	4516	5026
10.0	9055	10047
15.0	13421	14675
20.0	17922	19610
Measurement uncertainty	± 30 kHz to ± 500 kHz depending on channel bandwidth	

Result: Passed

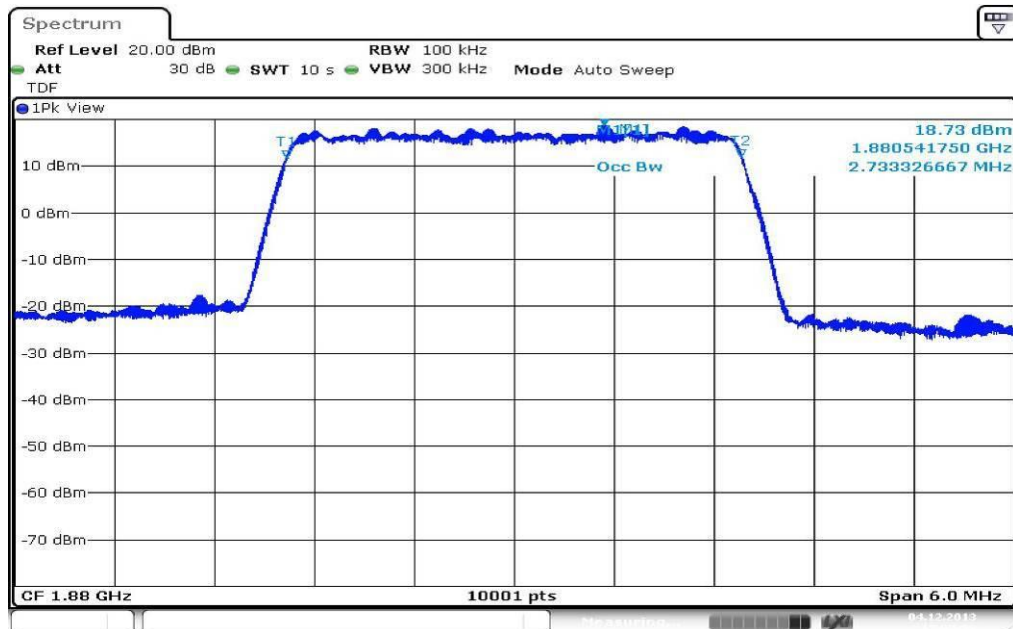
Plots: QPSK

Plot 1: 1.4 MHz (99% - OBW)



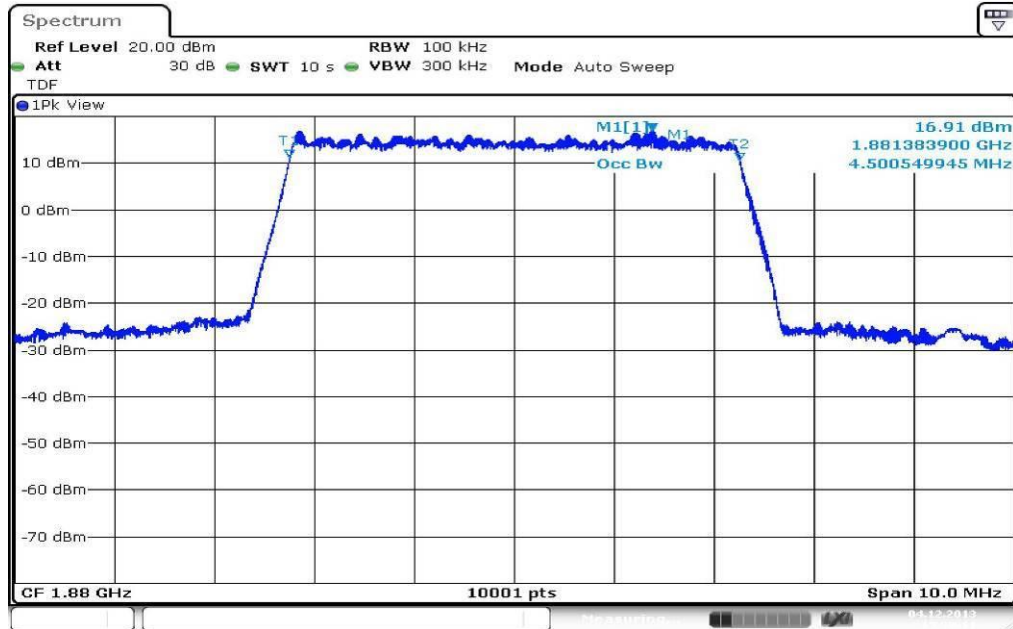
Date: 4.DEC.2013 12:34:48

Plot 2: 3 MHz (99% - OBW)



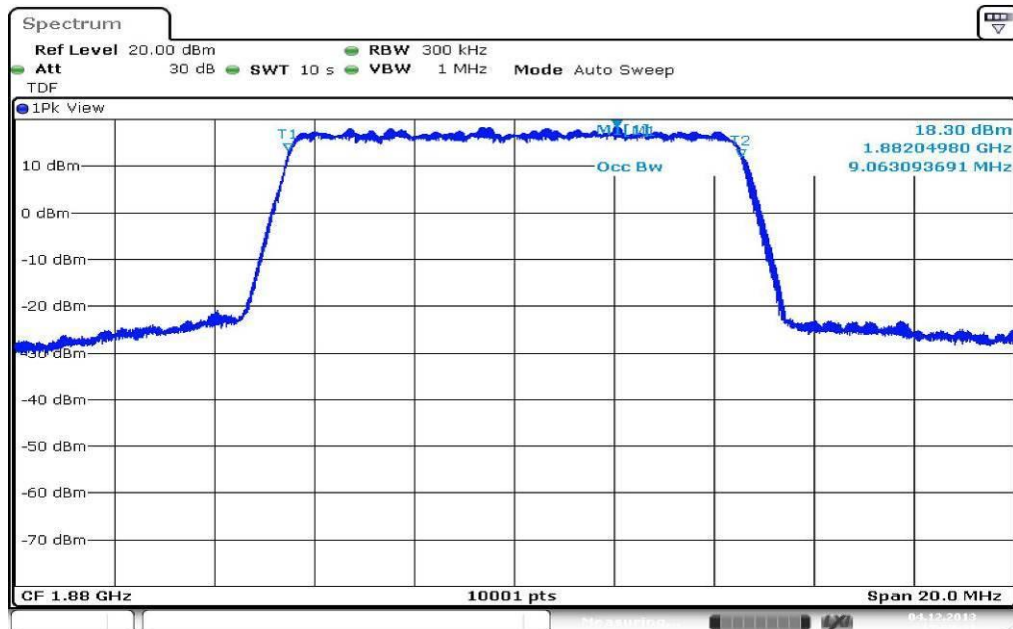
Date: 4.DEC.2013 13:03:06

Plot 3: 5 MHz (99% - OBW)



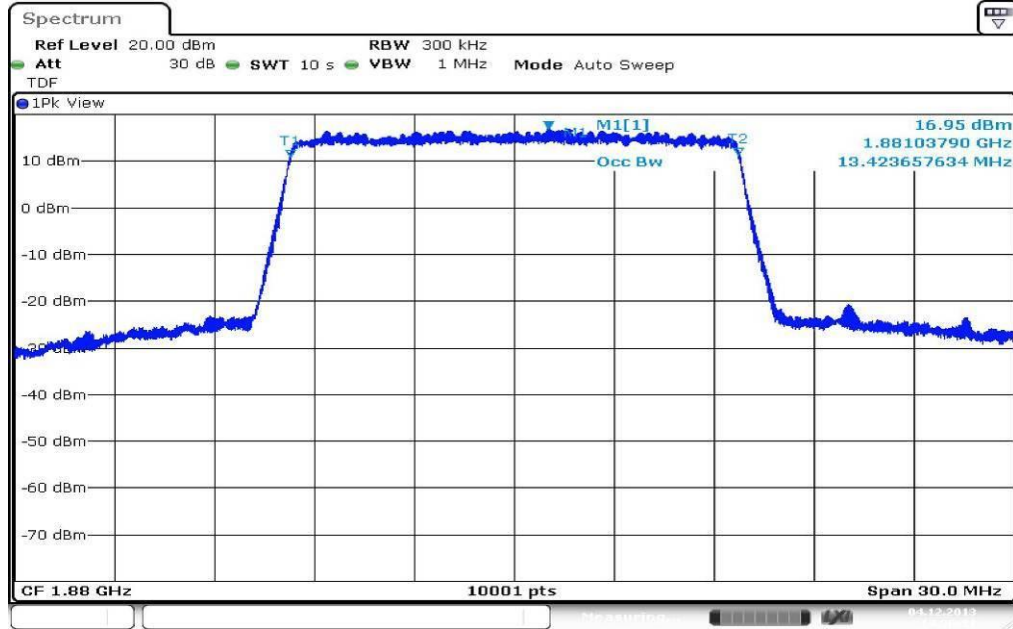
Date: 4.DEC.2013 13:30:11

Plot 4: 10 MHz (99% - OBW)



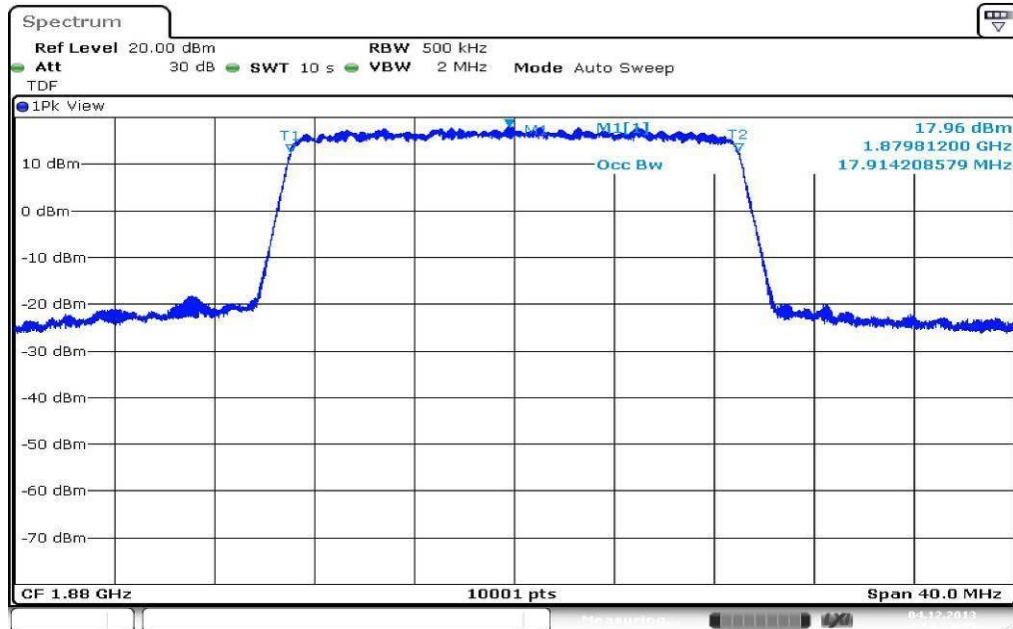
Date: 4.DEC.2013 13:58:31

Plot 5: 15 MHz (99% - OBW)



Date: 4.DEC.2013 14:26:52

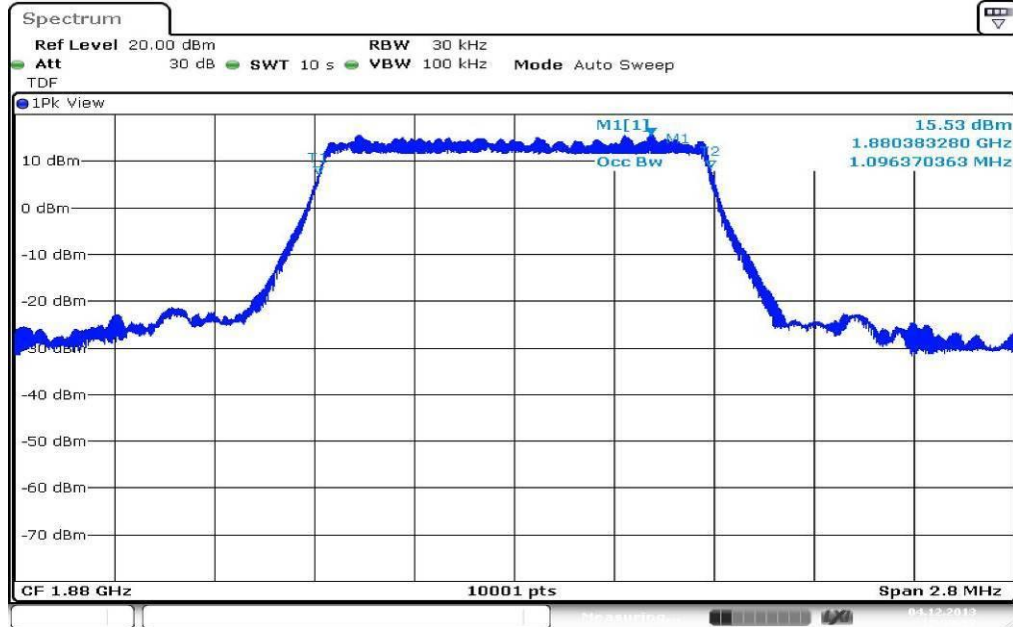
Plot 6: 20 MHz (99% - OBW)



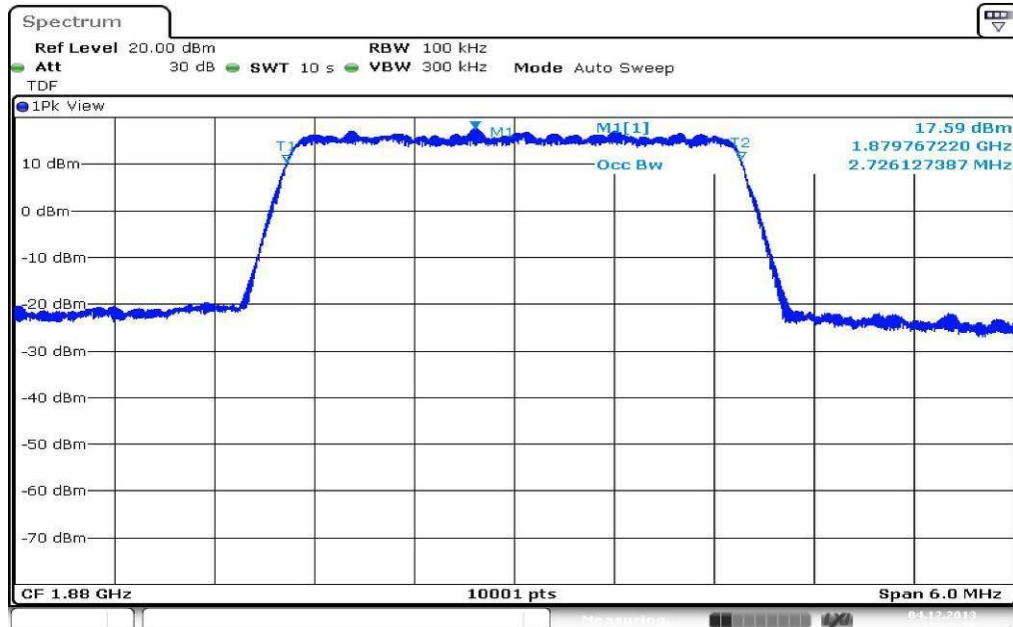
Date: 4.DEC.2013 14:53:55

Plots: 16-QAM

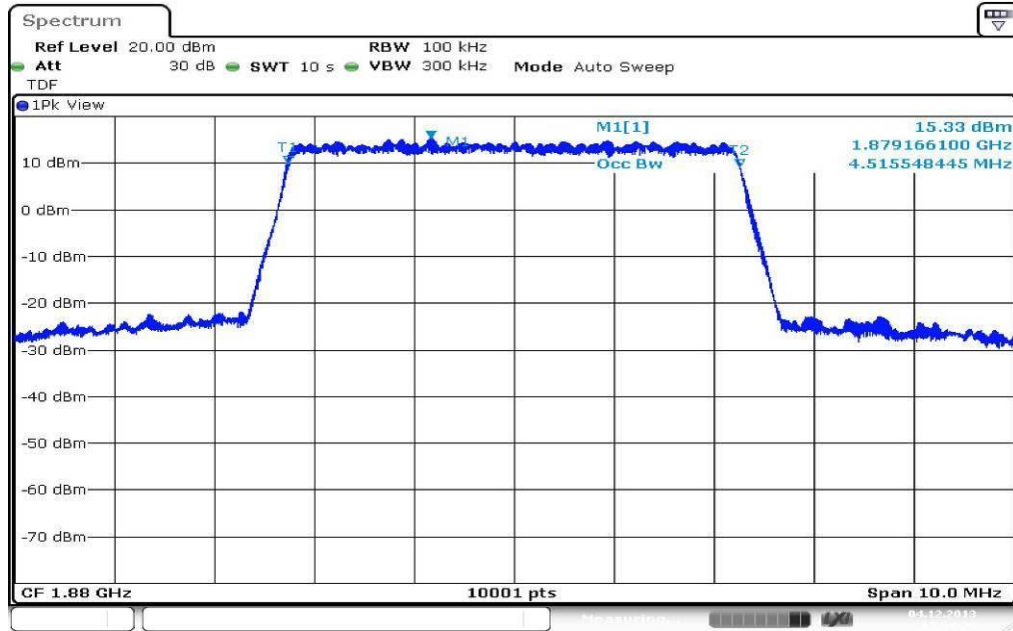
Plot 1: 1.4 MHz (99% - OBW)



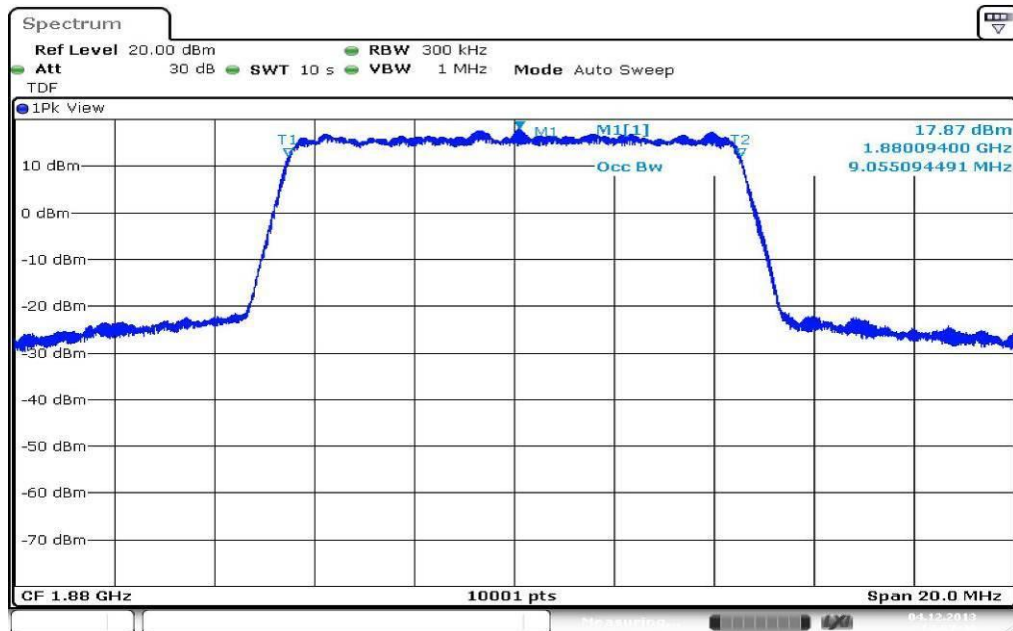
Plot 2: 3 MHz (99% - OBW)



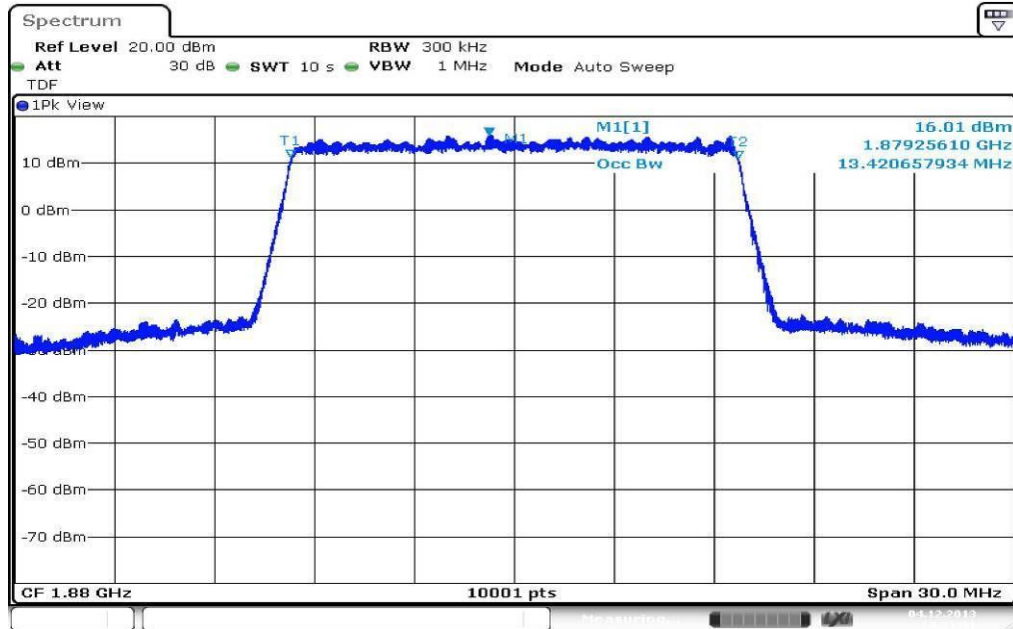
Plot 3: 5 MHz (99% - OBW)



Plot 4: 10 MHz (99% - OBW)

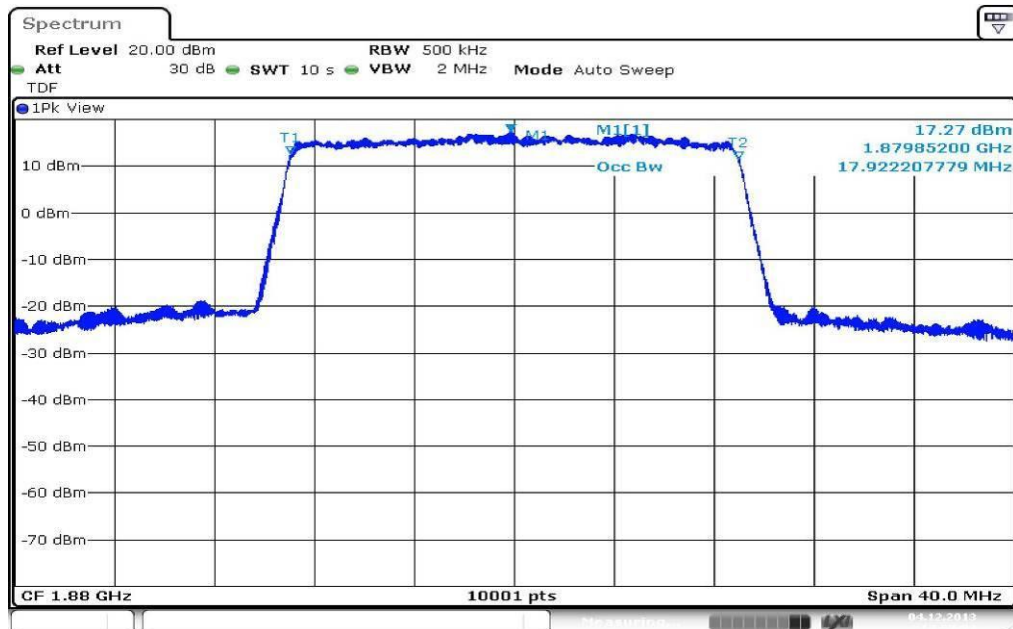


Plot 5: 15 MHz (99% - OBW)



Date: 4.DEC.2013 14:31:01

Plot 6: 20 MHz (99% - OBW)



Date: 4.DEC.2013 14:58:05

9 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	08.05.2013	08.05.2015
2	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
3	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
4	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2012	06.01.2014
5	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
6	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
7	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
8	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
9	n. a.	Amplifier	js42- 00502650- 28-5a	Parzich GMBH	928979	300003143	ne		
10	n. a.	Band Reject filter	WRCG185 5/1910- 1835/1925- 40/8SS	Wainwright	7	300003350	ev		
11	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	371	300003854	vIKI!	14.10.2011	14.10.2014
12	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k	21.02.2013	21.02.2014
13	11b	Microwave System Amplifier, 0,5- 26,5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
14	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
15	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
16	n. a.	Temperature Test Chamber	VT 4002	Heraeus Voetsch	521/84193	300003889	Ve	26.09.2013	26.09.2015
17	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.10.2012	22.01.2014
18	n. a.	Power Supply 0-20V, 0-5A	6632B	Agilent Technologi es	GB42110541	400000562	vIKI!	10.01.2013	10.01.2016
19	n. a.	Wideband Radio Communication Tester	CMW500	R&S	102375	300004187 _0	k	16.07.2013	16.07.2015

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlk!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

10 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2014-01-15
A	Canada removed / EUT name changed	2014-01-22

Annex B Further information**Glossary**

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

Annex C Accreditation Certificate

Front side of certificate

DAkKS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Befehlense gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung

Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium
CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

- Drahtgebundene Kommunikation einschließlich xDSL
- VoIP und DECT
- Akustik
- Funk einschließlich WLAN
- Short Range Devices (SRD)
- RFID
- WiMax und Richtfunk
- Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
- Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
- Produktsicherheit
- SAR und Hearing Aid Compatibility (HAC)
- Umweltsimulation
- Smart Card Terminals
- Bluetooth
- Wi-Fi-Services

Die Akkreditierungskunde gilt nur in Verbindung mit dem Bescheid vom 18.01.2013 mit der Akkreditierungsnummer D-PI-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 80 Seiten.

Registrierungsnummer der Urkunde: D-PI-12076-01-01

Frankfurt am Main, 18.01.2013

Im Auftrag
Dirk Wegmann, PHJ, Abteilungsleiter

Sehe Hinweis auf der Rückseite

Back side of certificate

Deutsche Akkreditierungsstelle GmbH

Standort Berlin Spittelmarkt 10 10117 Berlin	Standort Frankfurt am Main Gartenstraße 6 60594 Frankfurt am Main	Standort Braunschweig Rundesalle 100 38116 Braunschweig
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Die auszugsweise Veröffentlichung der Akkreditierungskunde bedarf der vorherigen schriftlichen Zustimmung der Deutsche Akkreditierungsstelle GmbH (DAkKS). Ausgenommen davon ist die separate Weiterverbreitung des Deckblatts durch die umseitig genannte Konformitätsbewertungsstelle in unveränderter Form.

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt, die über den durch die DAkKS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten (Abt. L 218 vom 9. Juli 2008, S. 30). Die DAkKS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Note:

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

<http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>