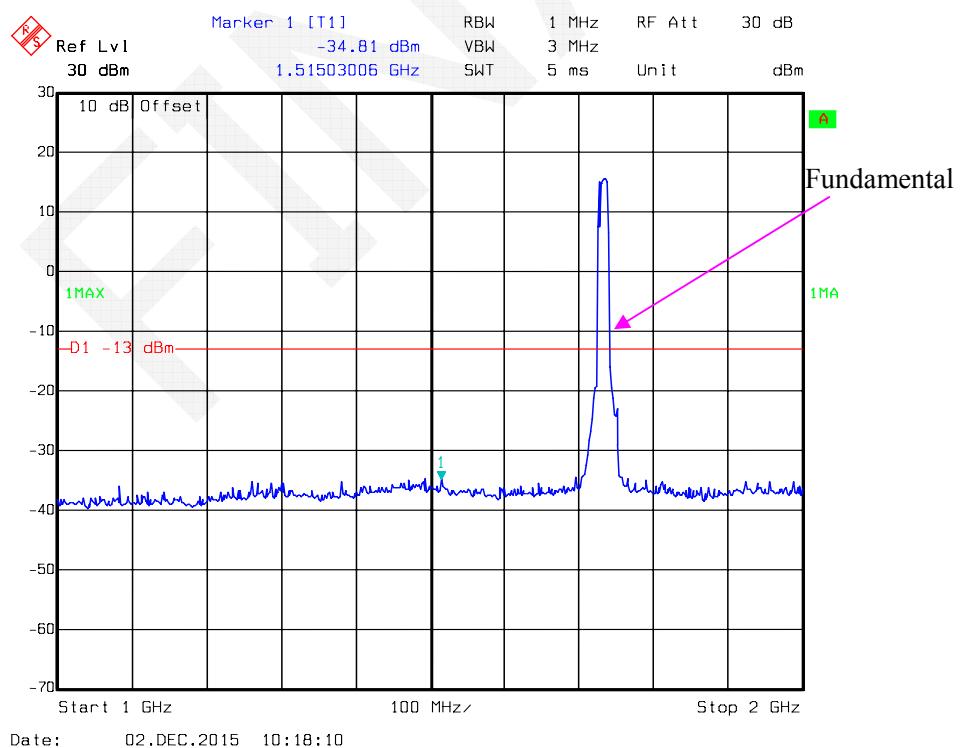
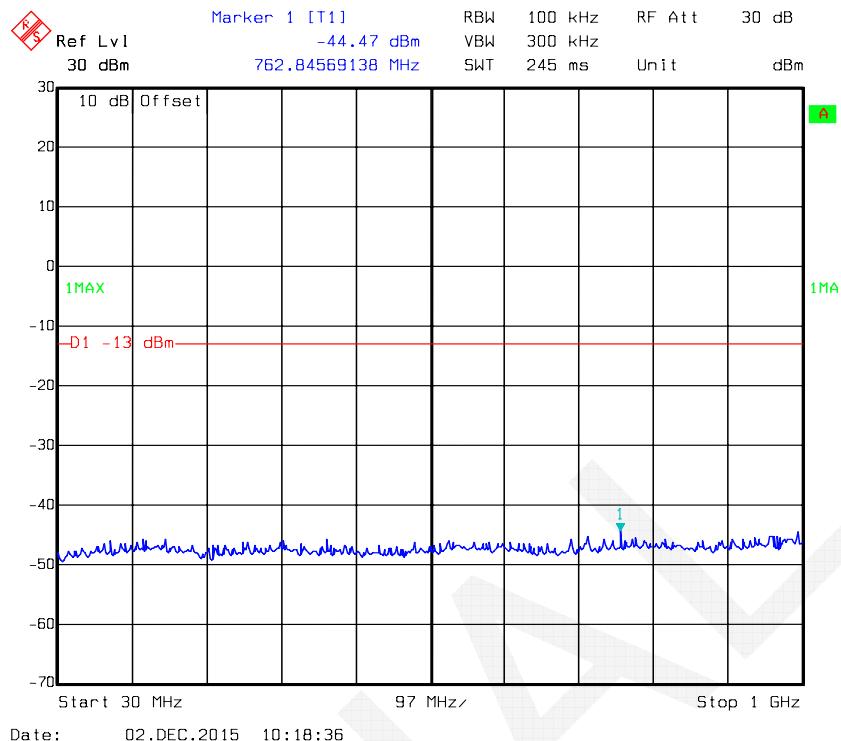
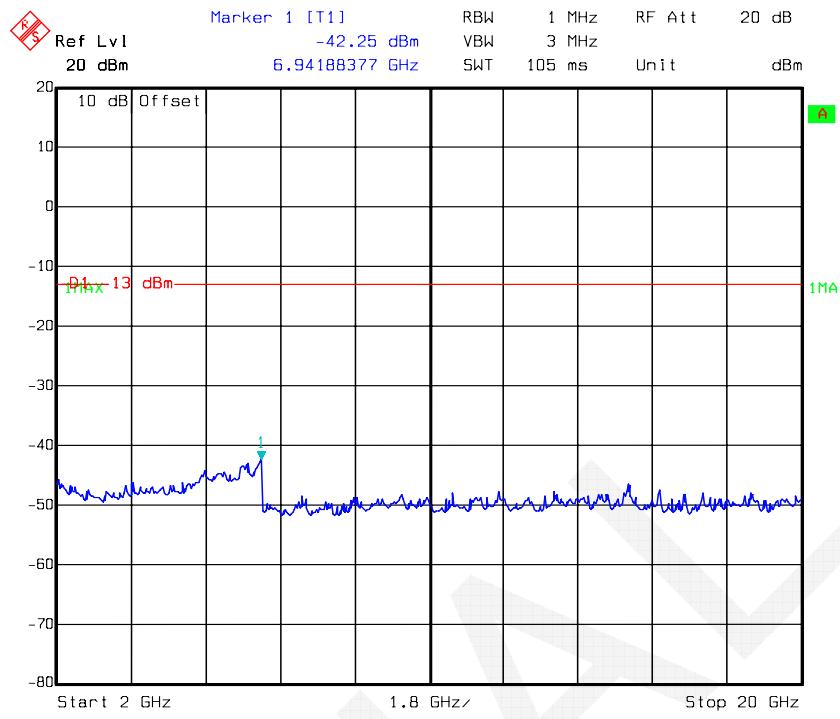
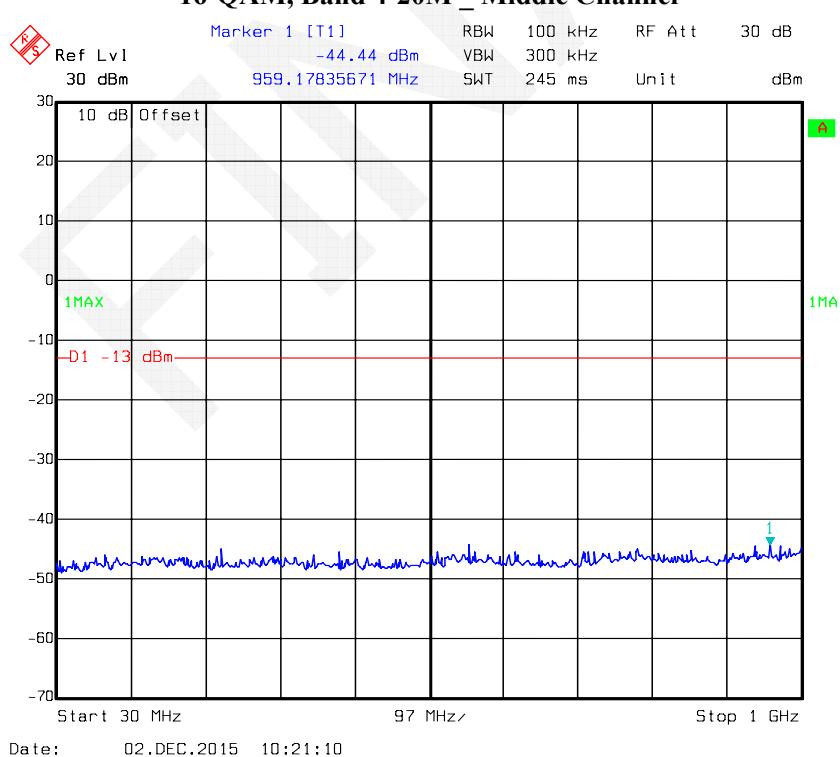
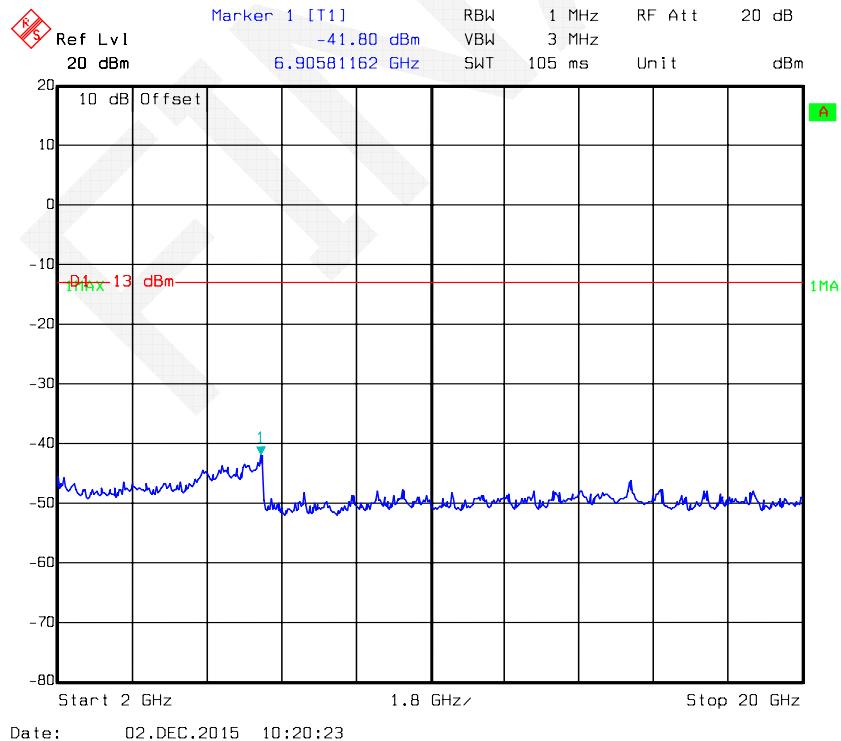
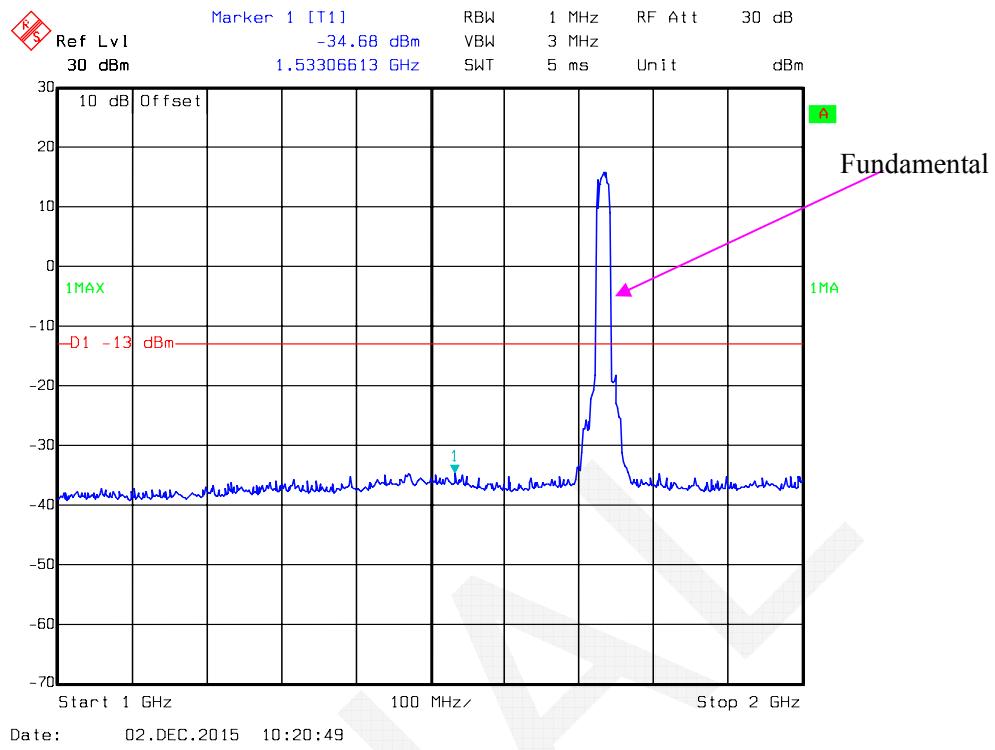
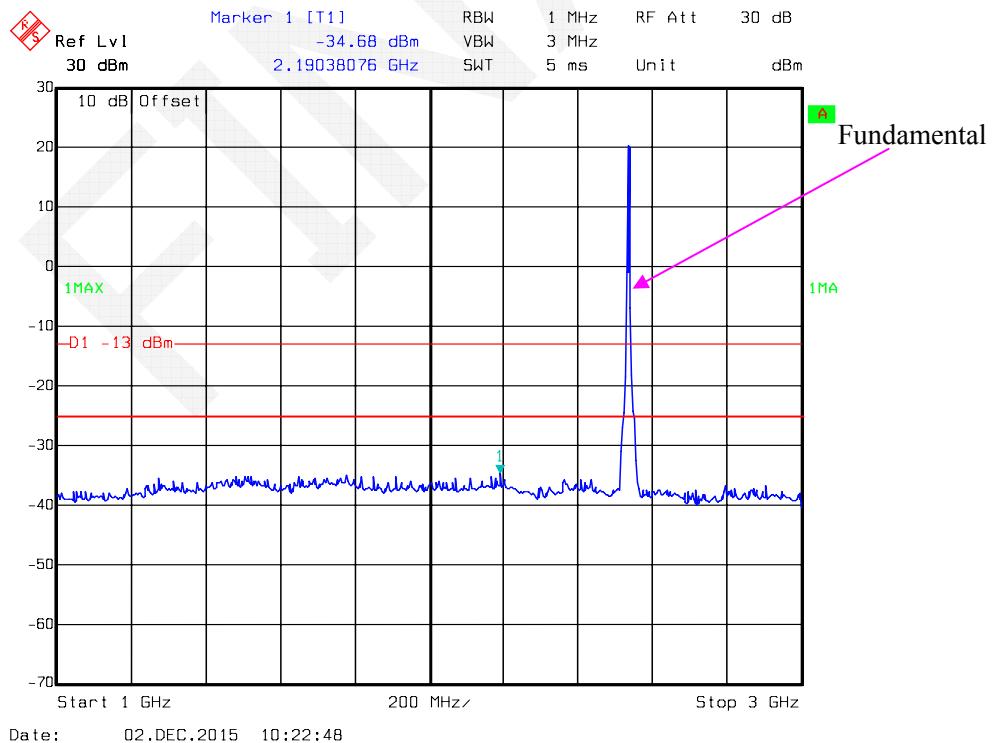
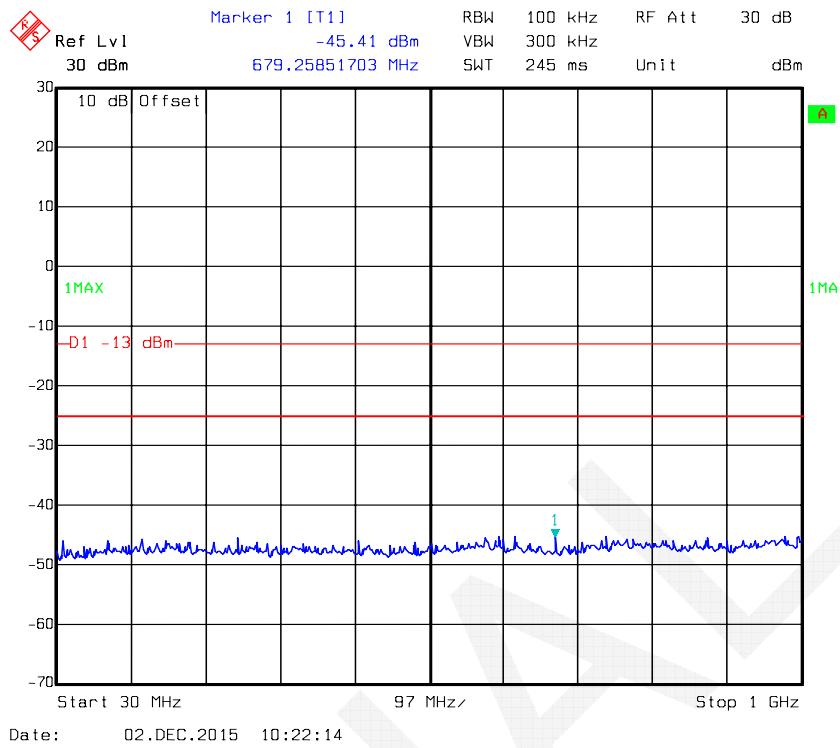
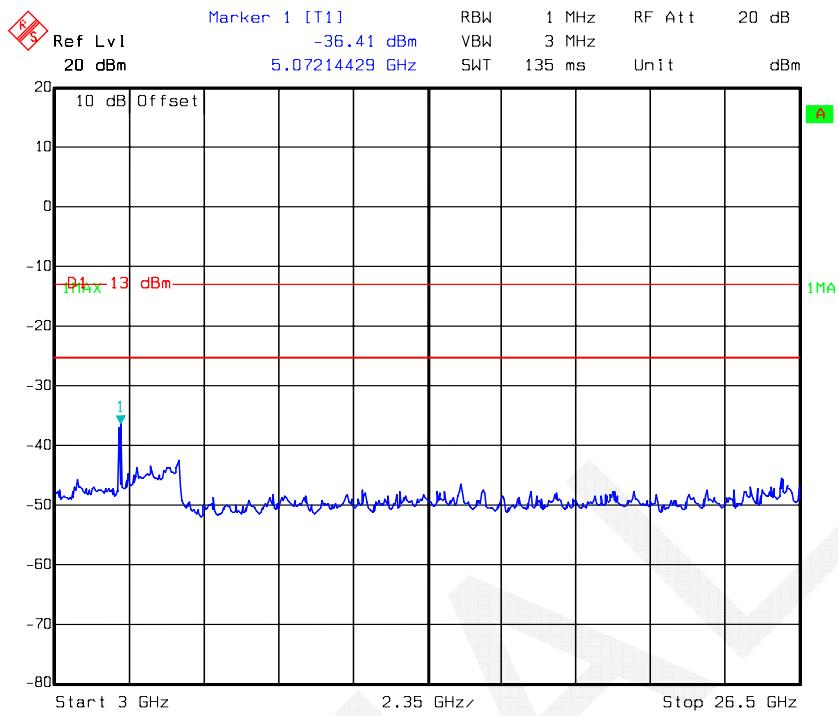
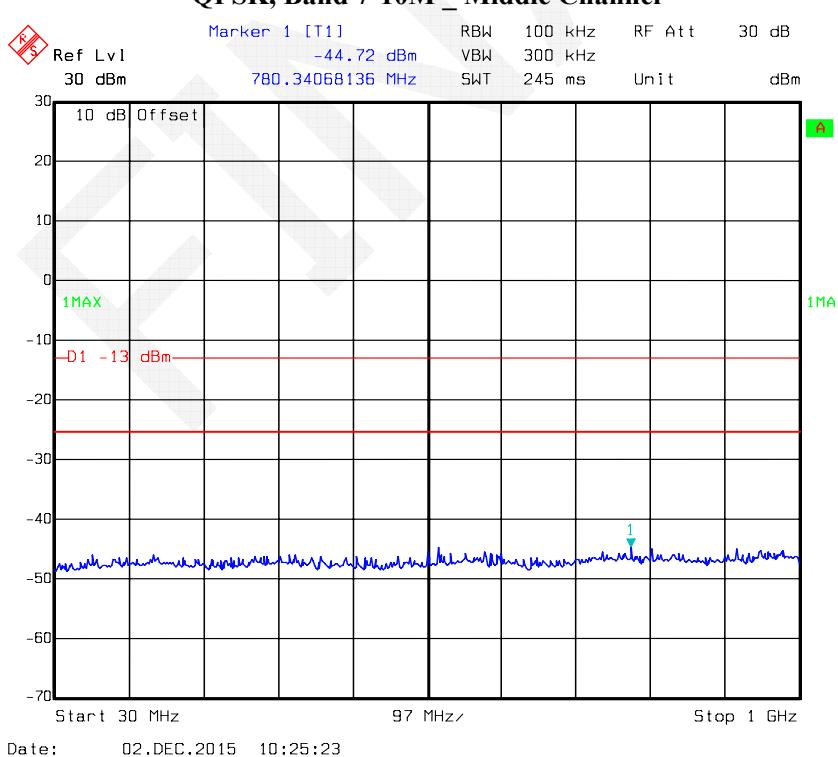


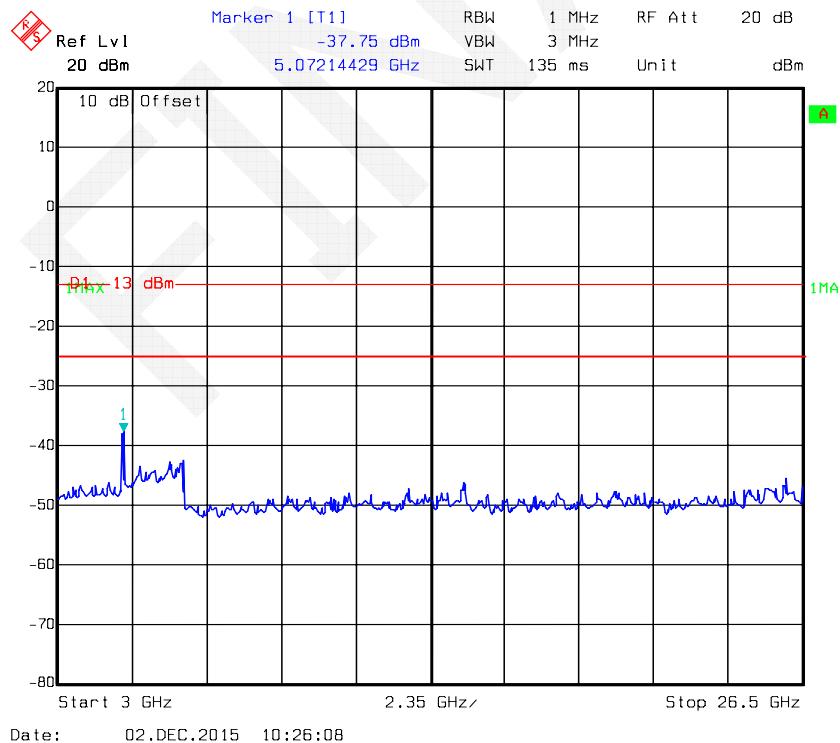
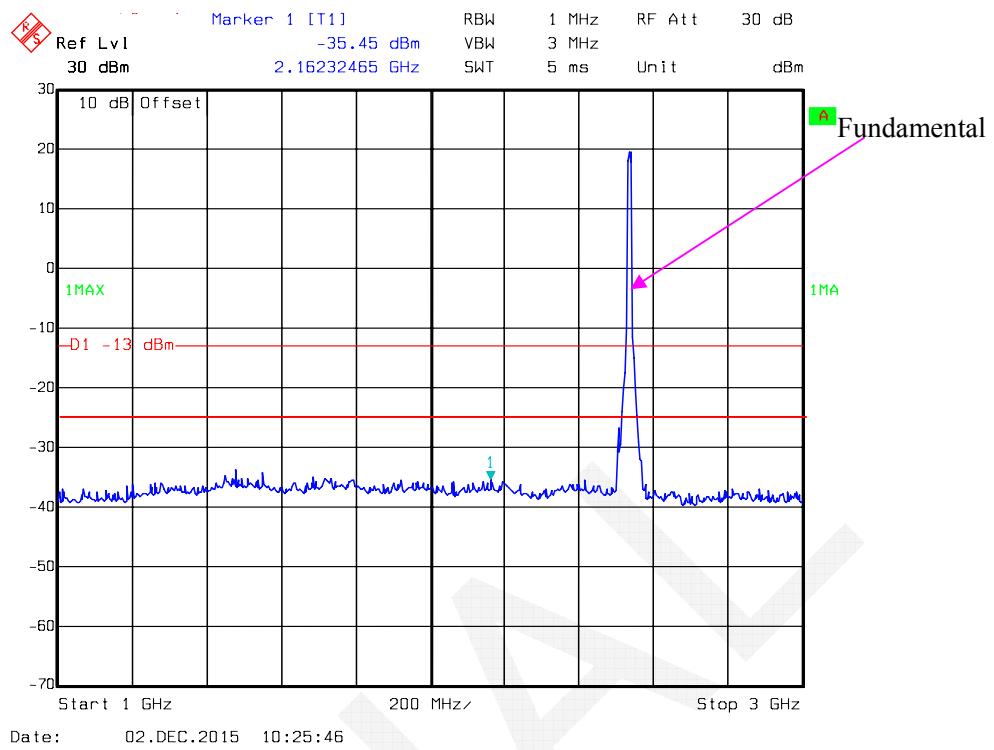
**16-QAM, Band 4-15M \_ Middle Channel**

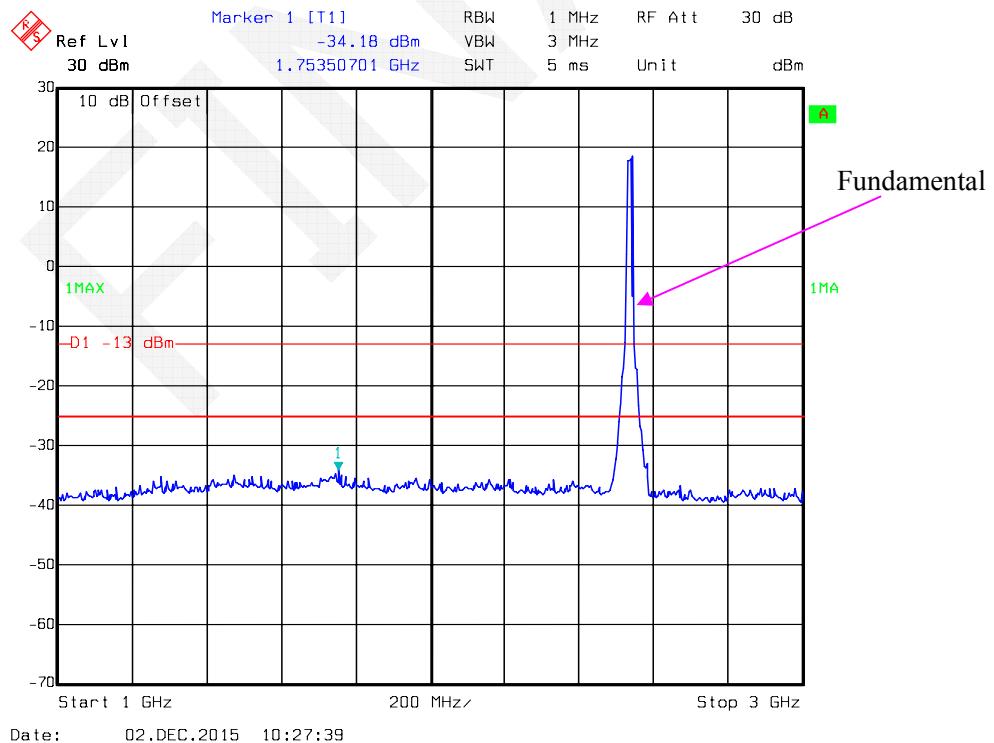
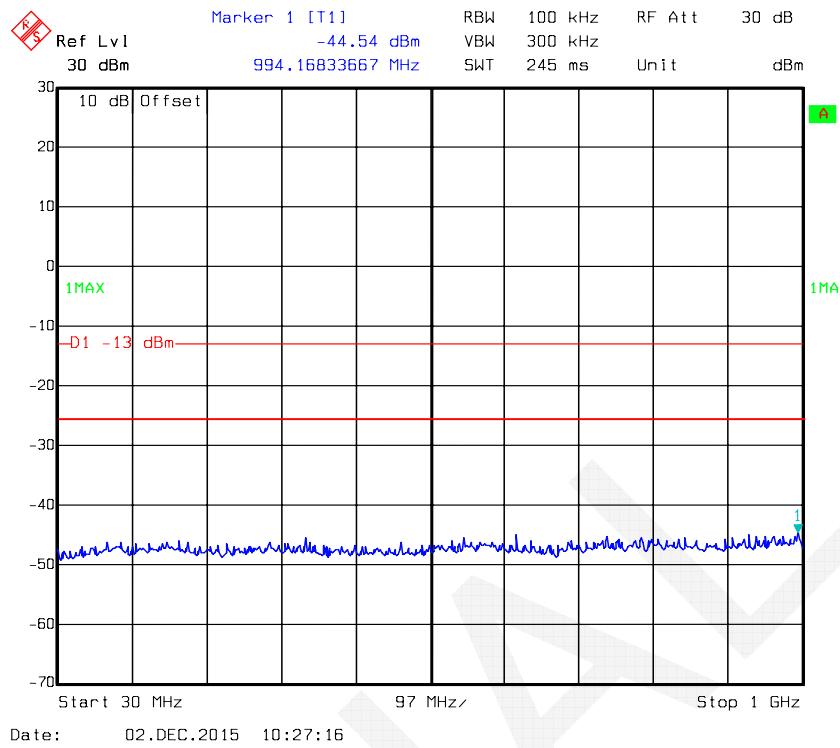
**16-QAM, Band 4-20M \_ Middle Channel**

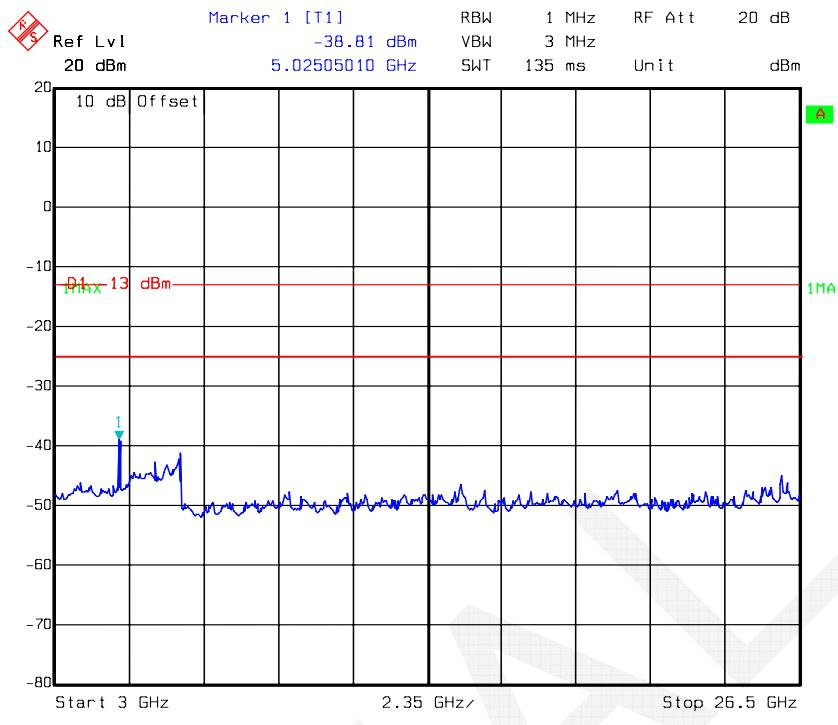
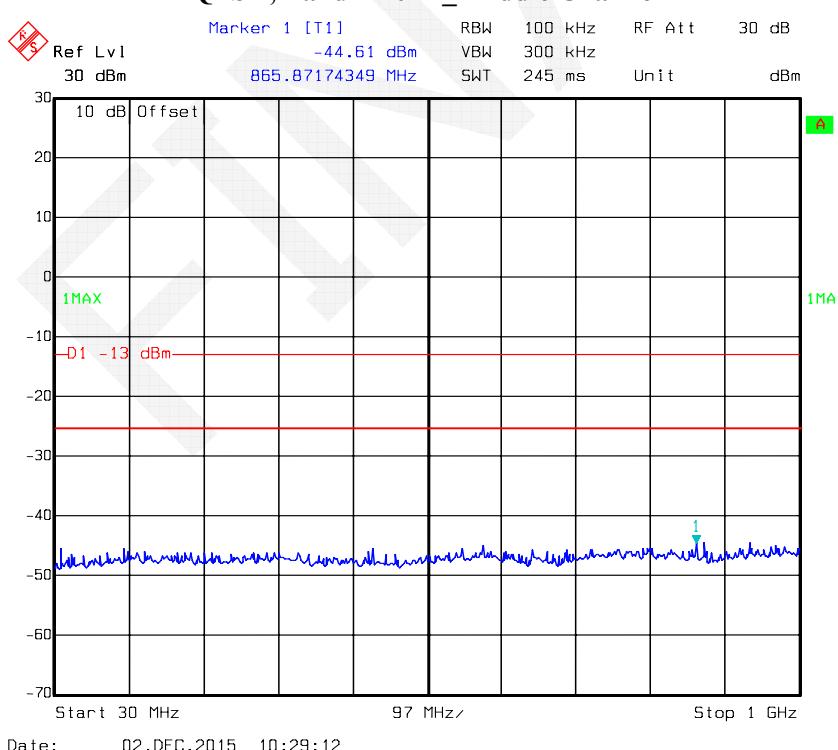


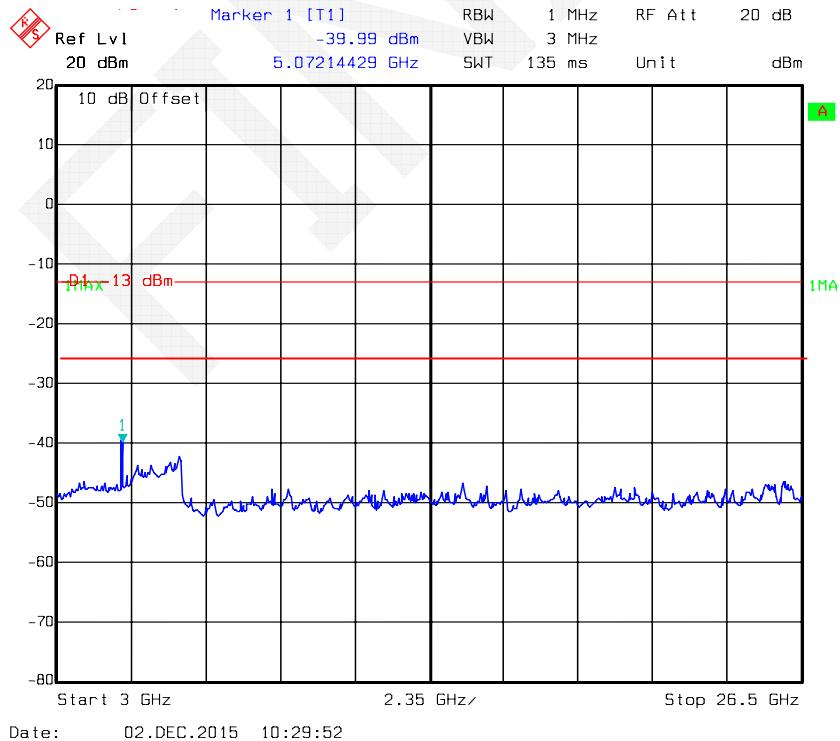
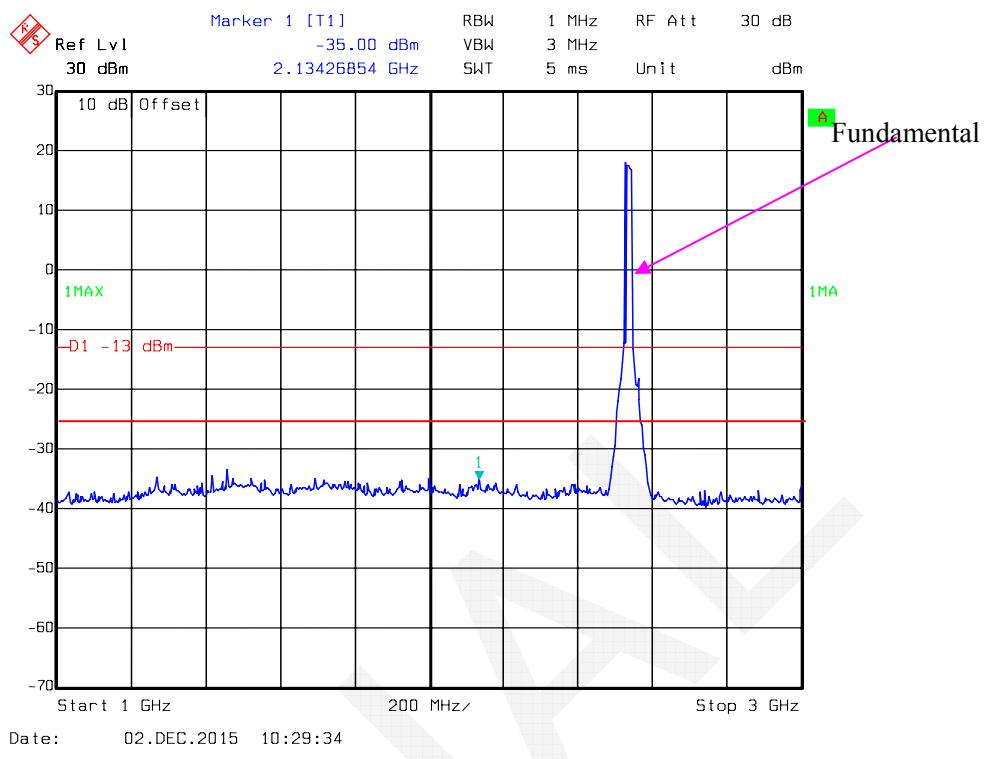
**QPSK, Band 7-5M \_ Middle Channel**

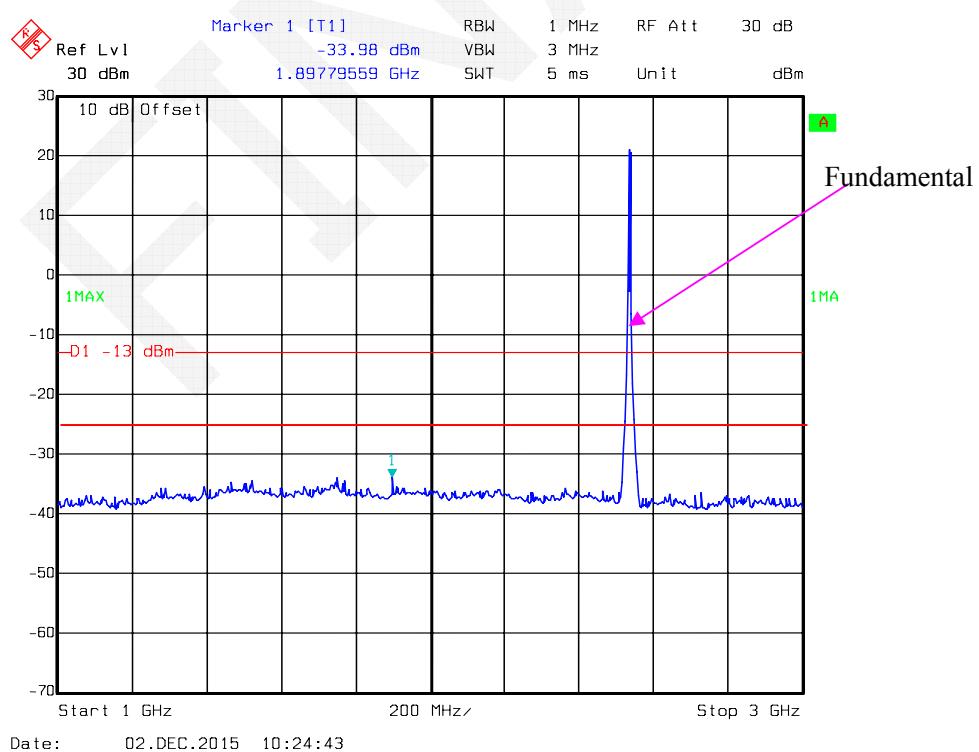
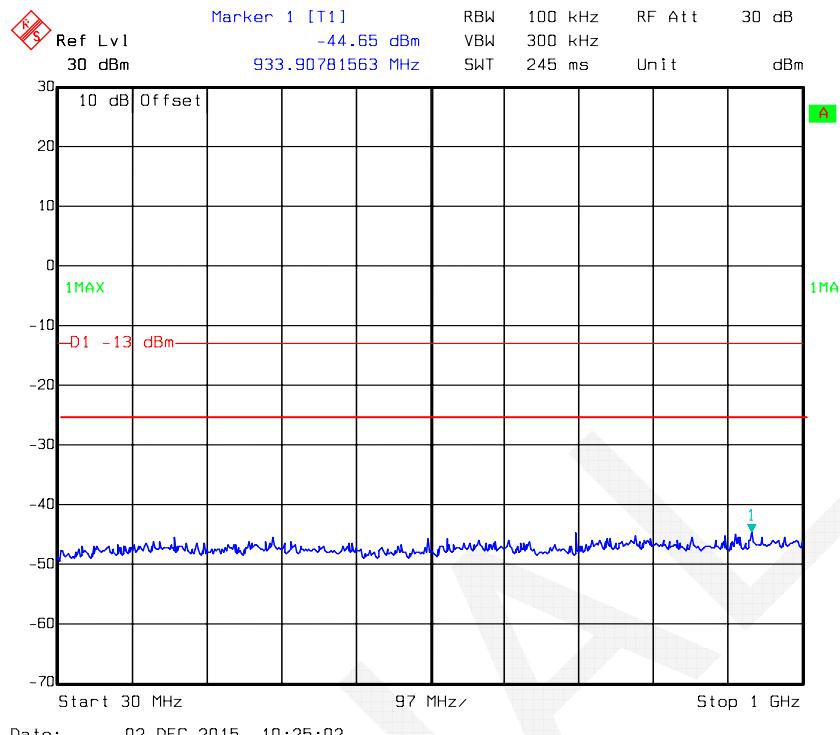
**QPSK, Band 7-10M \_ Middle Channel**

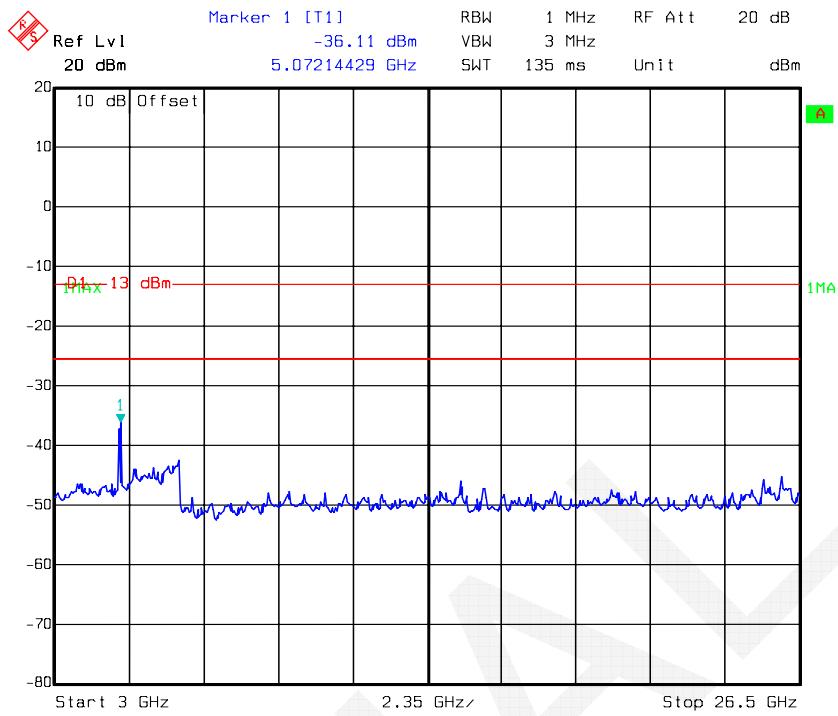
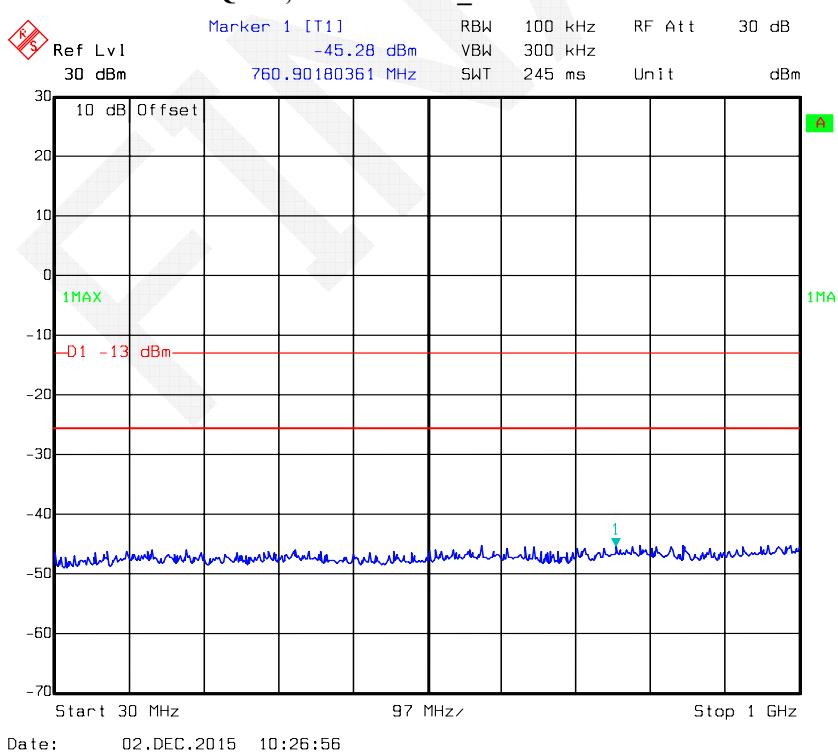
**QPSK, Band 7-10M \_ Middle Channel**

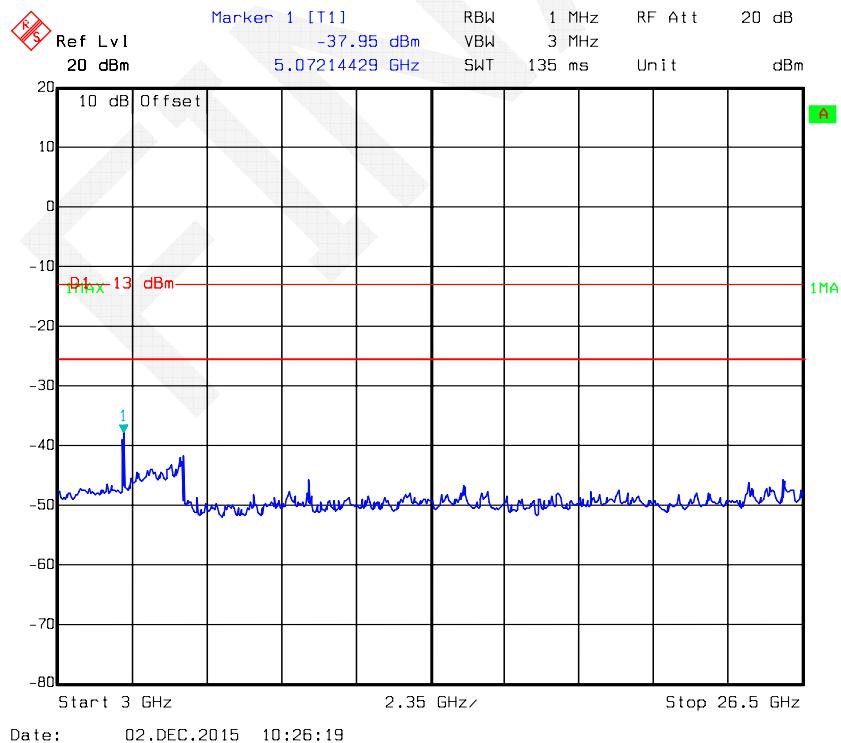
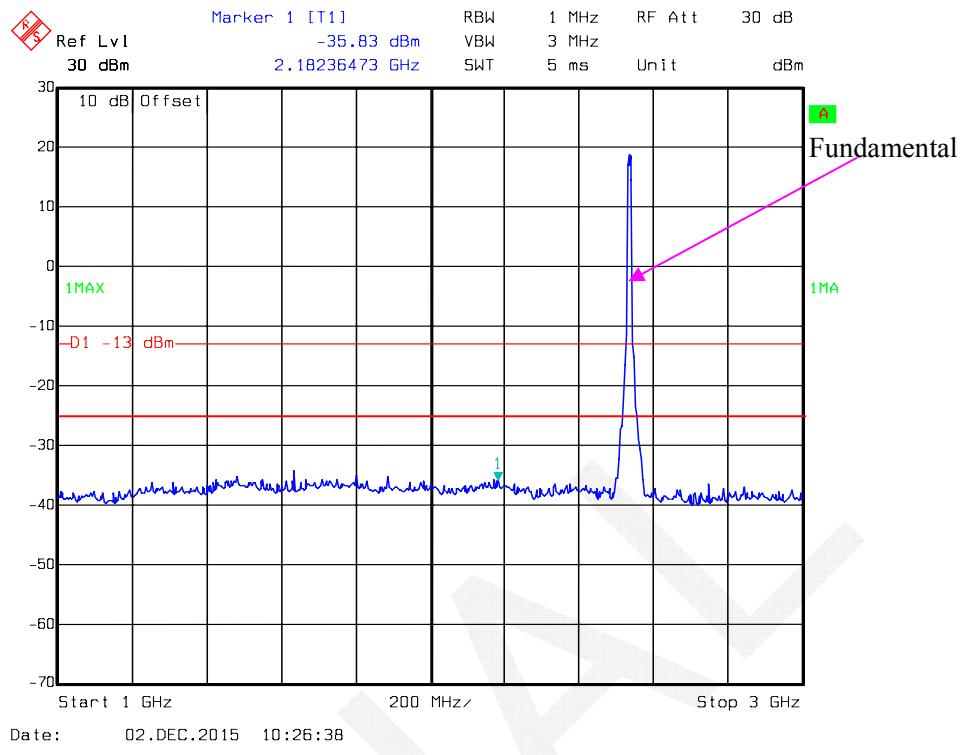
**QPSK, Band 7-15M \_ Middle Channel**

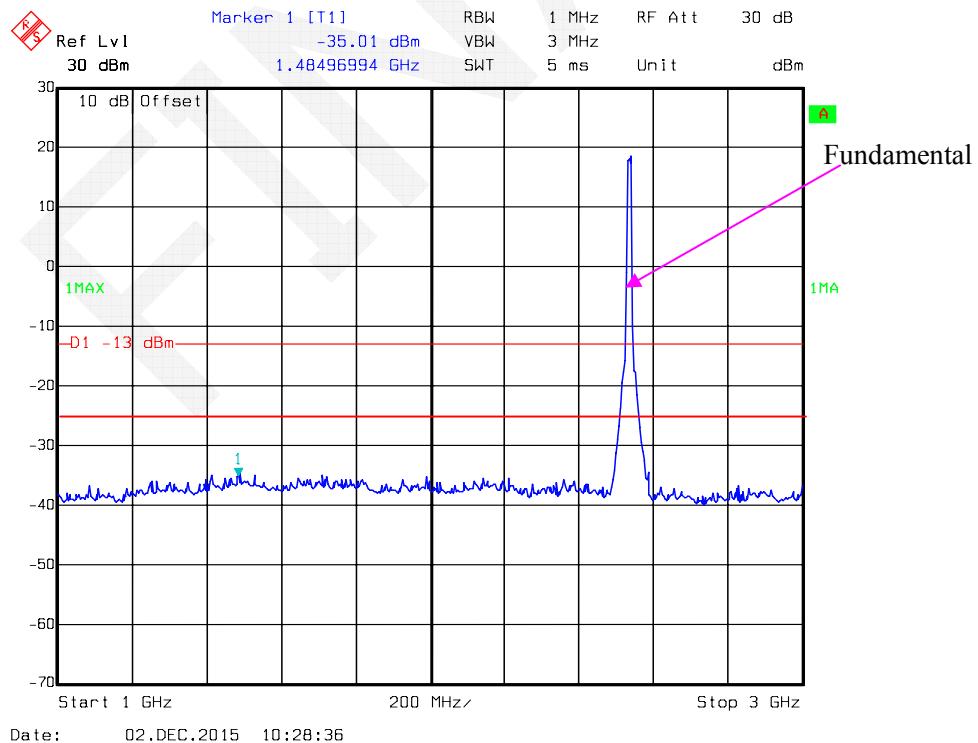
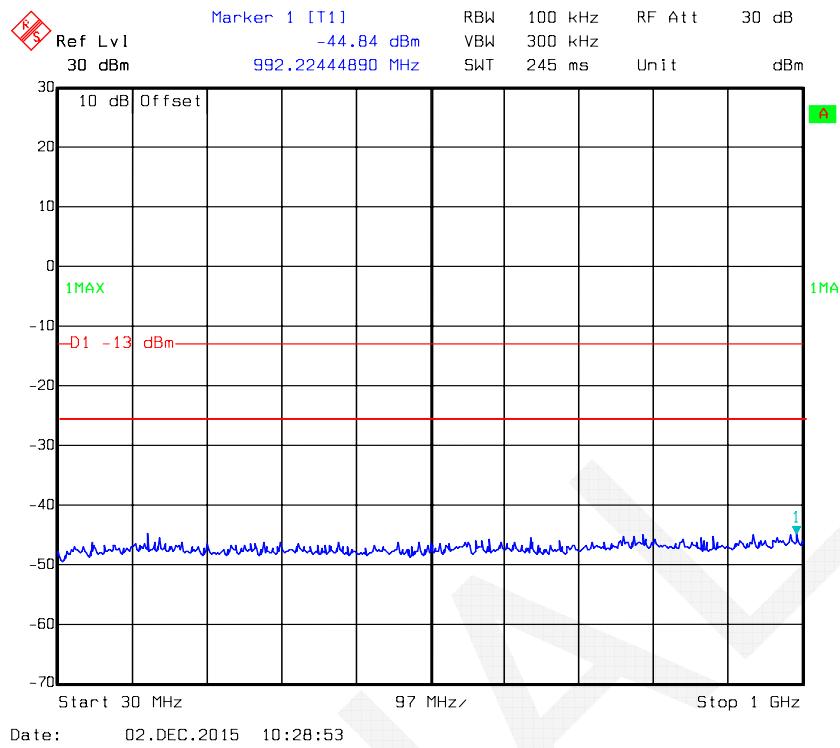
**QPSK, Band 7-20M \_ Middle Channel**

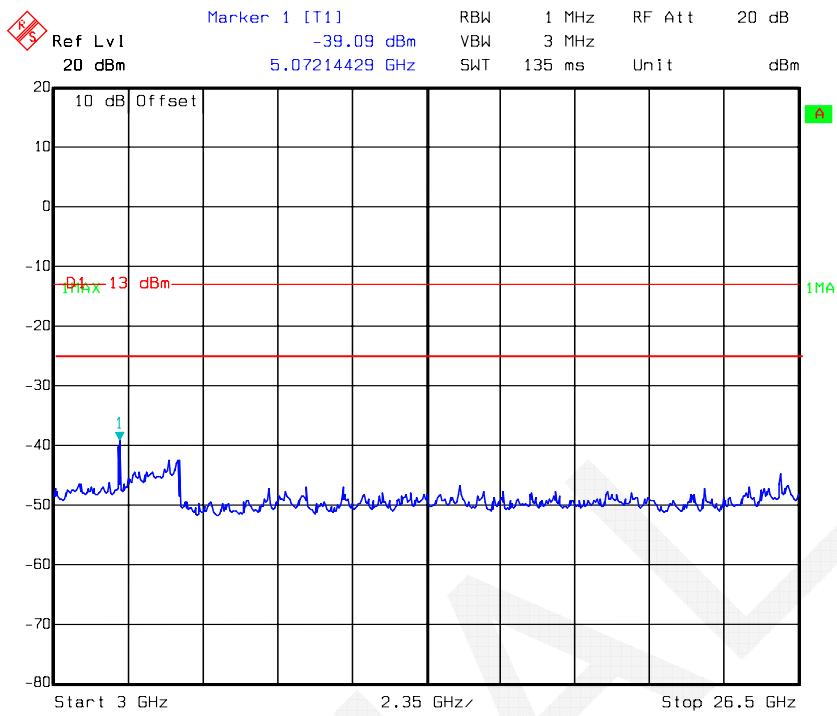


**16-QAM, Band 7-5M \_ Middle Channel**

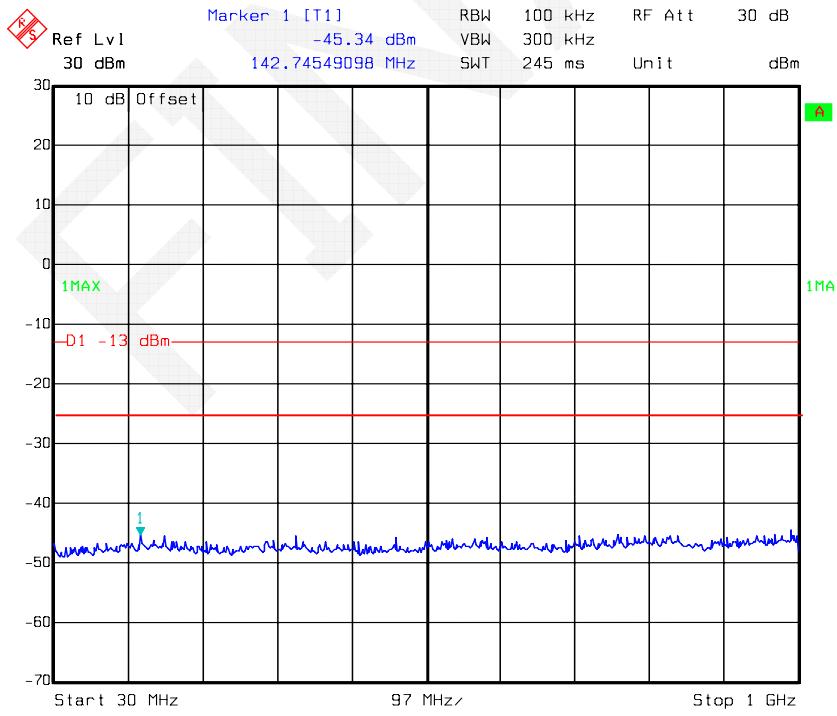
**16-QAM, Band 7-10M \_ Middle Channel**



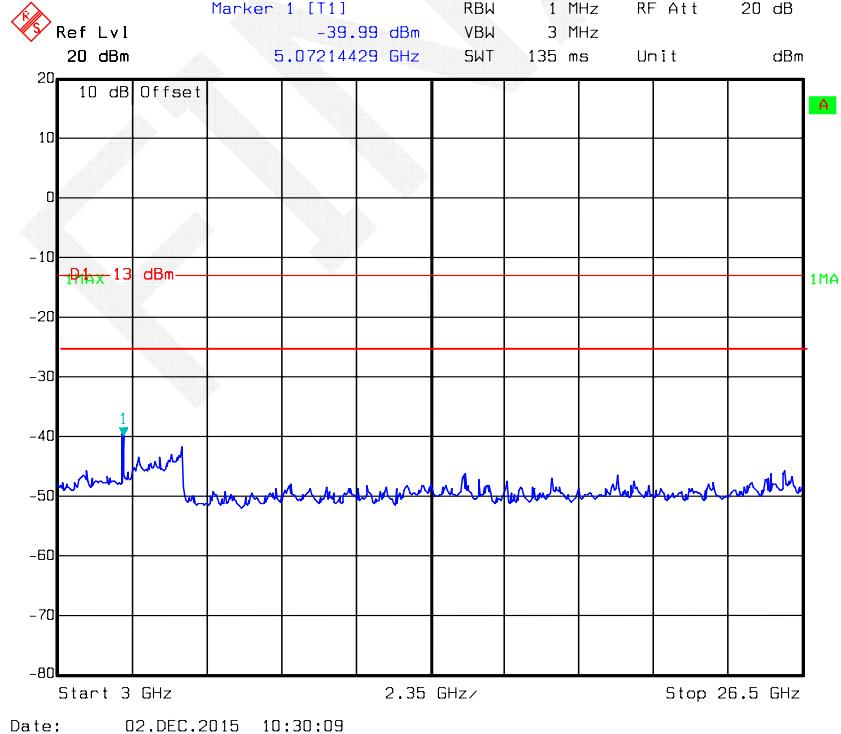
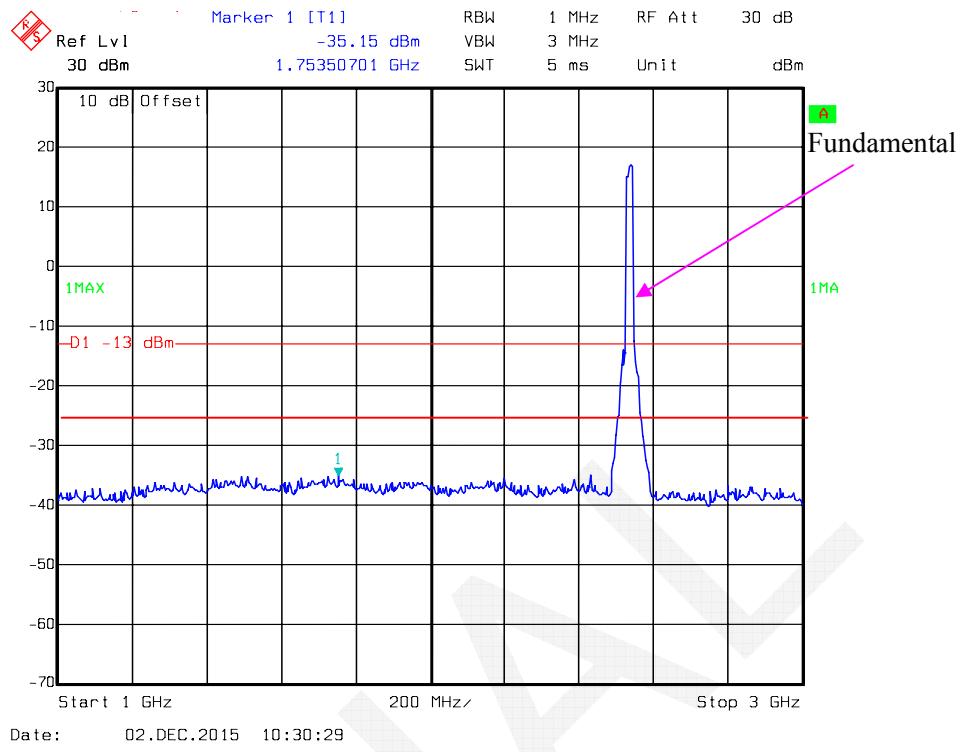
**16-QAM, Band 7-15M \_ Middle Channel**



Date: 02.DEC.2015 10:28:15

**16-QAM, Band 7-20M \_ Middle Channel**

Date: 02.DEC.2015 10:30:46



## FCC §2.1053, §22.917 & §24.238 & §27.53- SPURIOUS RADIATED EMISSIONS

### Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53.

### Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \lg (\text{TXpwr in Watts}/0.001)$  – the absolute level

Spurious attenuation limit in dB =  $43 + 10 \log_{10}$  (power out in Watts)

Spurious attenuation limit in dB =  $55 + 10 \log_{10}$  (power out in Watts) for band 7

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2015-11-23	2016-11-22
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2015-09-06	2018-09-06

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Data

### Environmental Conditions

<b>Temperature:</b>	25.1 °C
<b>Relative Humidity:</b>	46 %
<b>ATM Pressure:</b>	101.5 kPa

The testing was performed by Allen Qiao on 2015-11-30.

EUT Operation Mode: Transmitting

### Cellular Band (PART 22H)

#### 30 MHz-10 GHz:

<b>Frequency (MHz)</b>	<b>Polar (H/V)</b>	<b>Receiver Reading (dB<math>\mu</math>V)</b>	<b>Substituted Method</b>			<b>Absolute Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
			<b>S.G. Level (dBm)</b>	<b>Antenna Gain (dBd/dBi)</b>	<b>Cable Loss (dB)</b>			
Frequency: 836.6 MHz								
1673.200	H	45.24	-55.8	10.6	1.5	-46.7	-13.0	33.7
1673.200	V	51.33	-50	10.6	1.5	-40.9	-13.0	27.9
2509.800	H	42.75	-55.3	13.1	2.8	-45.0	-13.0	32.0
2509.800	V	43.16	-53.9	13.1	2.8	-43.6	-13.0	30.6

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

### WCDMA Band V

<b>Frequency (MHz)</b>	<b>Polar (H/V)</b>	<b>Receiver Reading (dB<math>\mu</math>V)</b>	<b>Substituted Method</b>			<b>Absolute Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
			<b>S.G. Level (dBm)</b>	<b>Antenna Gain (dBd/dBi)</b>	<b>Cable Loss (dB)</b>			
Frequency: 836.6 MHz								
1673.200	H	36.46	-64.6	10.6	1.5	-55.5	-13.0	42.5
1673.200	V	39.39	-62	10.6	1.5	-52.9	-13.0	39.9

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

**PCS Band (PART 24E)****30 MHz-20 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 1880 MHz								
3760.000	H	36.36	-57.9	13.8	2.9	-47.0	-13.0	34.0
3760.000	V	36.53	-56.5	13.8	2.9	-45.6	-13.0	32.6

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

**WCDMA Band II**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 1880 MHz								
3760.000	H	32.69	-61.6	13.8	2.9	-50.7	-13.0	37.7
3760.000	V	32.88	-60.2	13.8	2.9	-49.3	-13.0	36.3

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

## Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = SG Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

**LTE Band 2****30 MHz-20 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency:1880 MHz								
3760.000	H	35.11	-59.2	13.8	2.9	-48.3	-13.0	35.3
3760.000	V	34.40	-58.7	13.8	2.9	-47.8	-13.0	34.8
5640.000	H	34.81	-56.9	14.0	2.1	-45.0	-13.0	32.0
5640.000	V	36.02	-55.6	14.0	2.1	-43.7	-13.0	30.7
16- QAM, Frequency:1880 MHz								
3760.000	H	34.67	-59.6	13.8	2.9	-48.7	-13.0	35.7
3760.000	V	34.14	-58.9	13.8	2.9	-48.0	-13.0	35.0
5640.000	H	34.67	-57	14.0	2.1	-45.1	-13.0	32.1
5640.000	V	35.89	-55.8	14.0	2.1	-43.9	-13.0	30.9

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

**LTE Band 4****30 MHz-20 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency:1732.5 MHz								
3465.000	H	35.44	-61.5	13.9	1.9	-49.5	-13.0	36.5
3465.000	V	33.63	-62.5	13.9	1.9	-50.5	-13.0	37.5
5197.500	H	40.60	-50.4	14.0	2.3	-38.7	-13.0	25.7
5197.500	V	39.32	-53.2	14.0	2.3	-41.5	-13.0	28.5
16- QAM, Frequency:1732.5 MHz								
3465.000	H	35.02	-61.9	13.9	1.9	-49.9	-13.0	36.9
3465.000	V	33.35	-62.8	13.9	1.9	-50.8	-13.0	37.8
5197.500	H	40.36	-50.6	14.0	2.3	-38.9	-13.0	25.9
5197.500	V	39.11	-53.4	14.0	2.3	-41.7	-13.0	28.7

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

**LTE Band 7****30 MHz-20 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency:2535 MHz								
5070.000	H	37.13	-54.2	13.9	2.4	-42.7	-25.0	17.7
5070.000	V	35.86	-56.3	13.9	2.4	-44.8	-25.0	19.8
7605.000	H	34.04	-53.4	13.2	3.1	-43.3	-25.0	18.3
7605.000	V	33.65	-53.8	13.2	3.1	-43.7	-25.0	18.7
16- QAM, Frequency:2535MHz								
5070.000	H	36.70	-54.6	13.9	2.4	-43.1	-25.0	18.1
5070.000	V	35.60	-56.5	13.9	2.4	-45.0	-25.0	20.0
7605.000	H	33.82	-53.7	13.2	3.1	-43.6	-25.0	18.6
7605.000	V	33.44	-54.1	13.2	3.1	-44.0	-25.0	19.0

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = SG Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

**FCC §22.917(a) & §24.238(a) & §27.53(g)§27.53(h) §27.53(m) - BAND EDGES****Applicable Standard**

According to § 22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

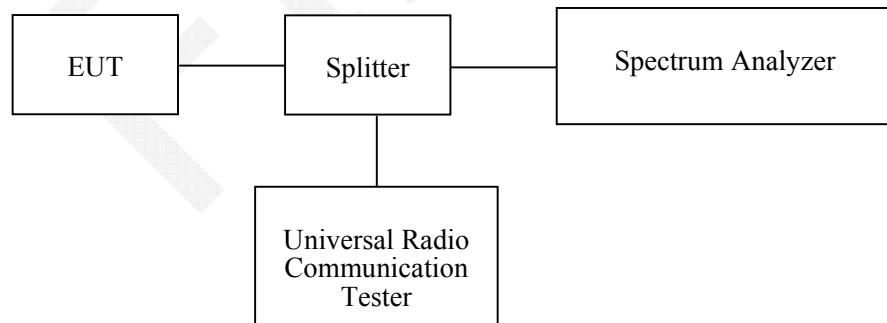
According to §27.53 (h), AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

According to §27.53 (m), (4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

**Test Procedure**

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.



## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
R&S	Universal Radio Communication Tester	CMU200	109038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2014-12-19	2015-12-19

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

## Test Data

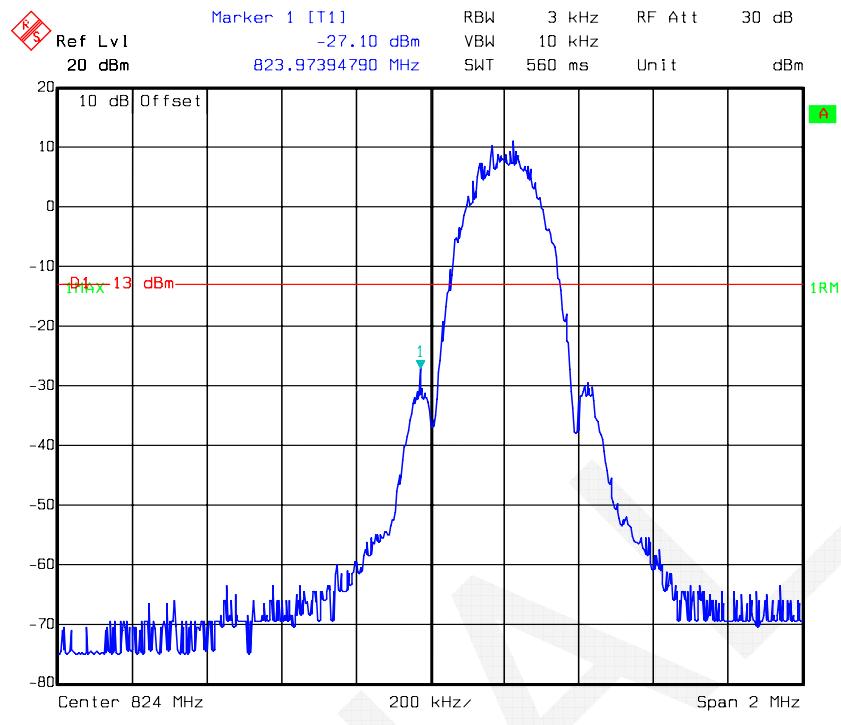
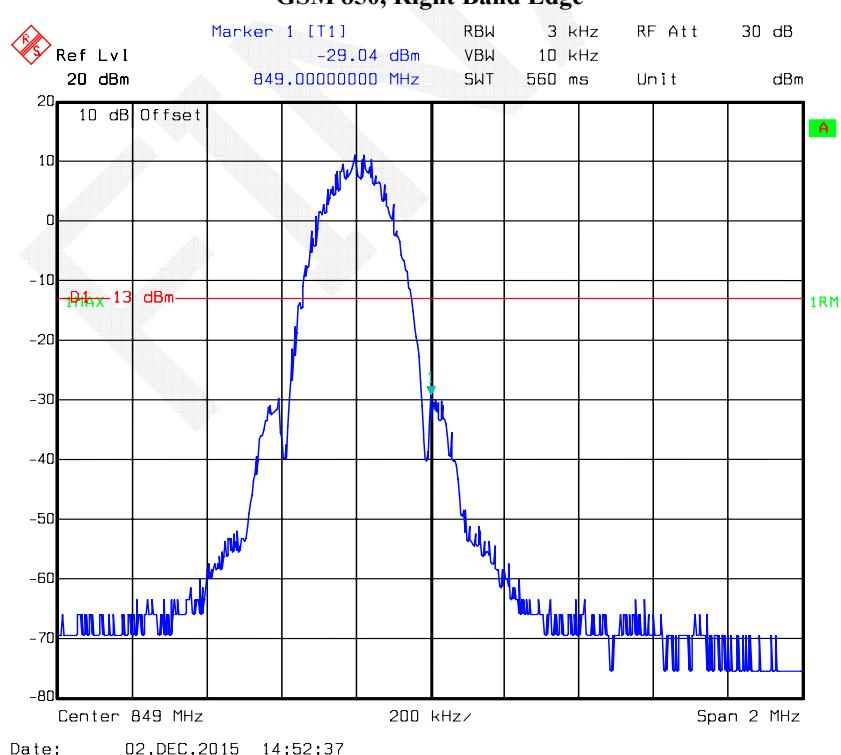
### Environmental Conditions

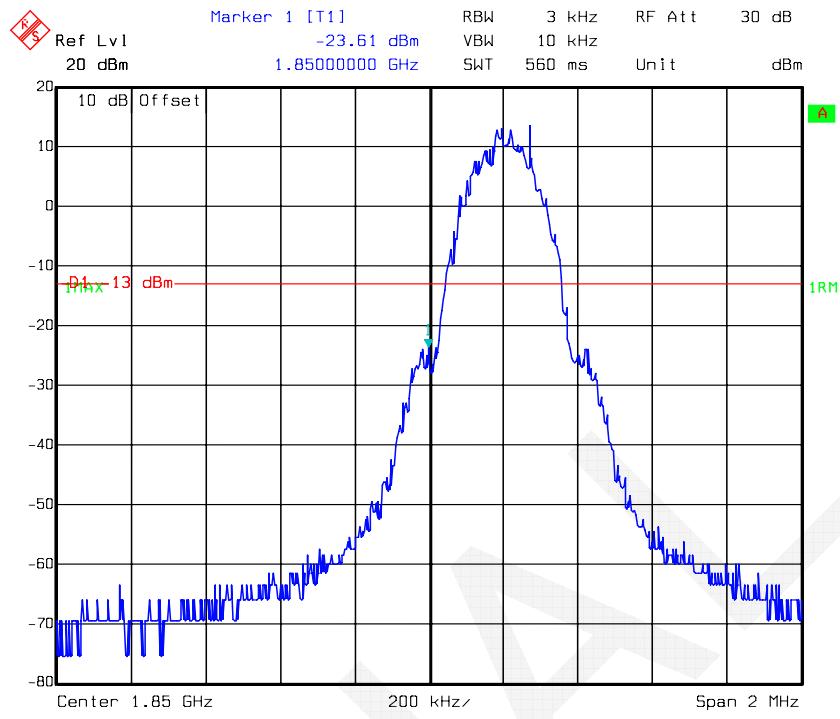
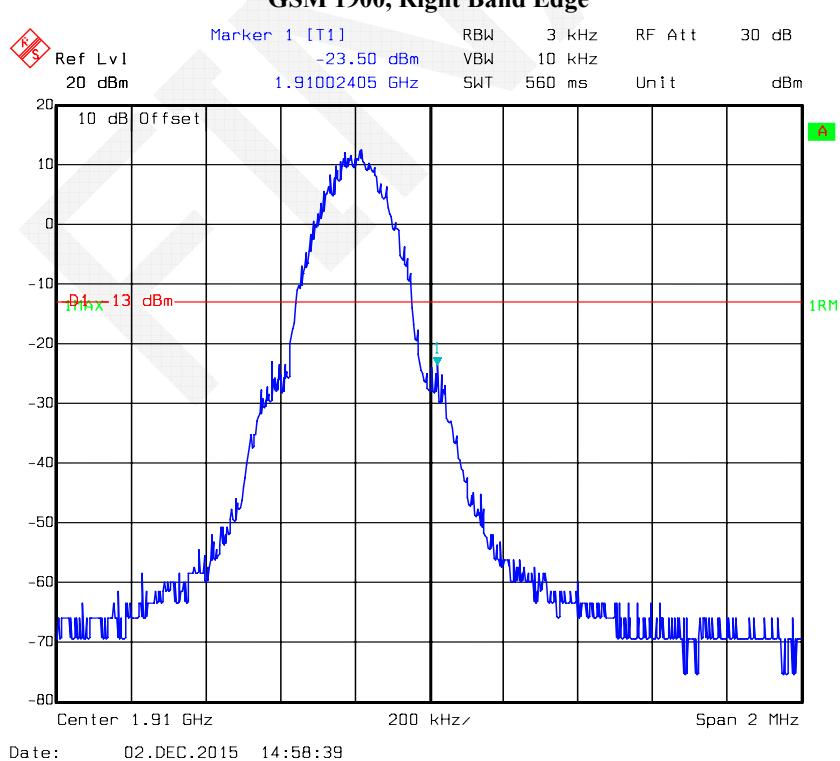
Temperature:	25.1 °C
Relative Humidity:	46 %
ATM Pressure:	101.5 kPa

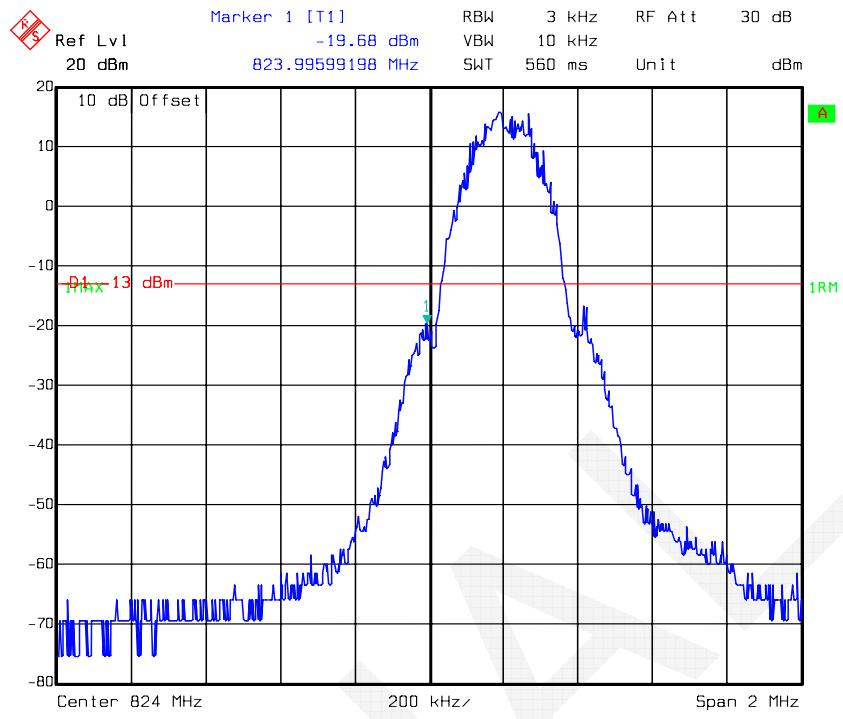
The testing was performed by Allen Qiao on 2015-12-01.

Test Mode: Transmitting

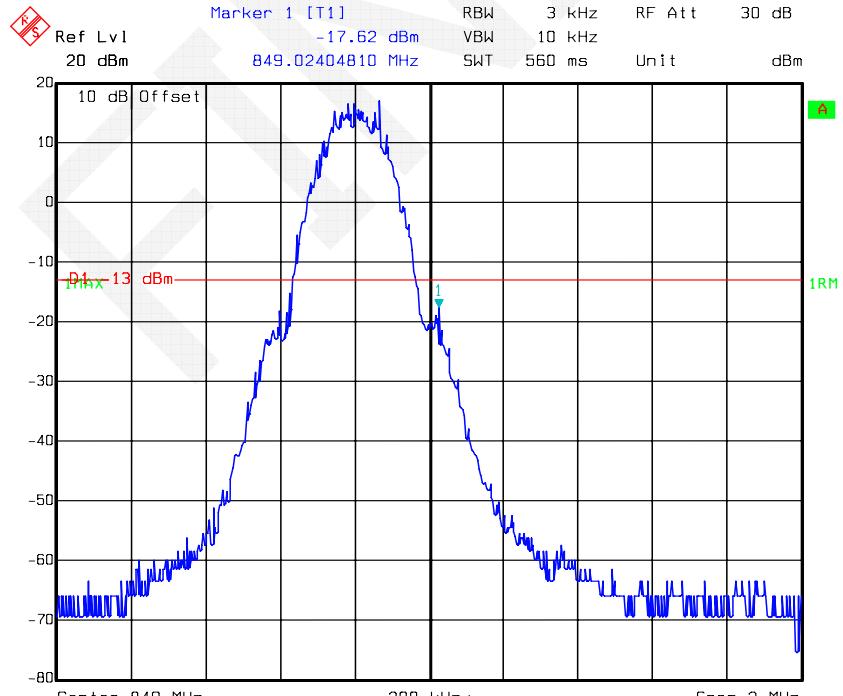
Test Result: Compliance. Please refer to the following plots.

**GSM 850, Left Band Edge****GSM 850, Right Band Edge**

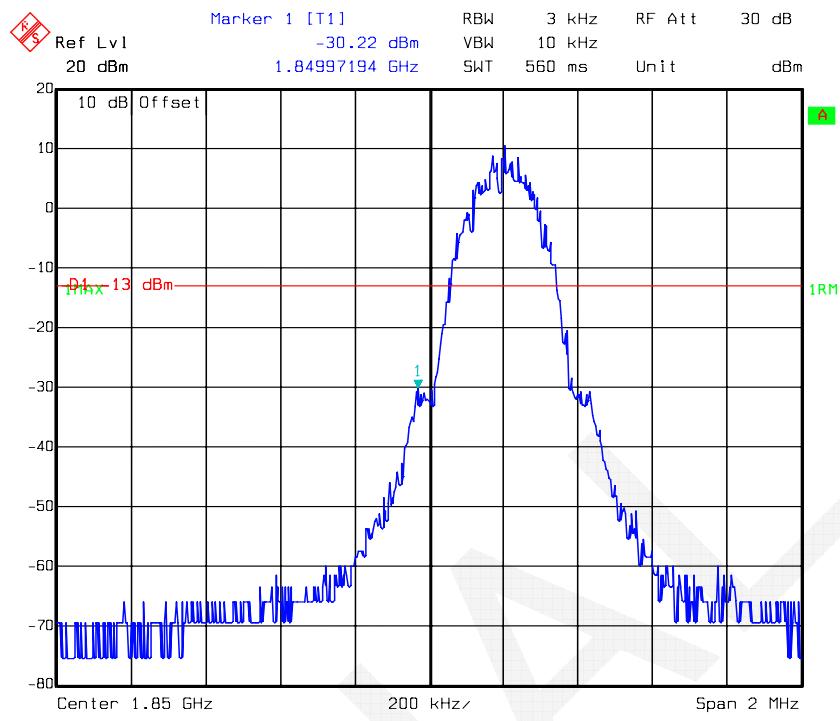
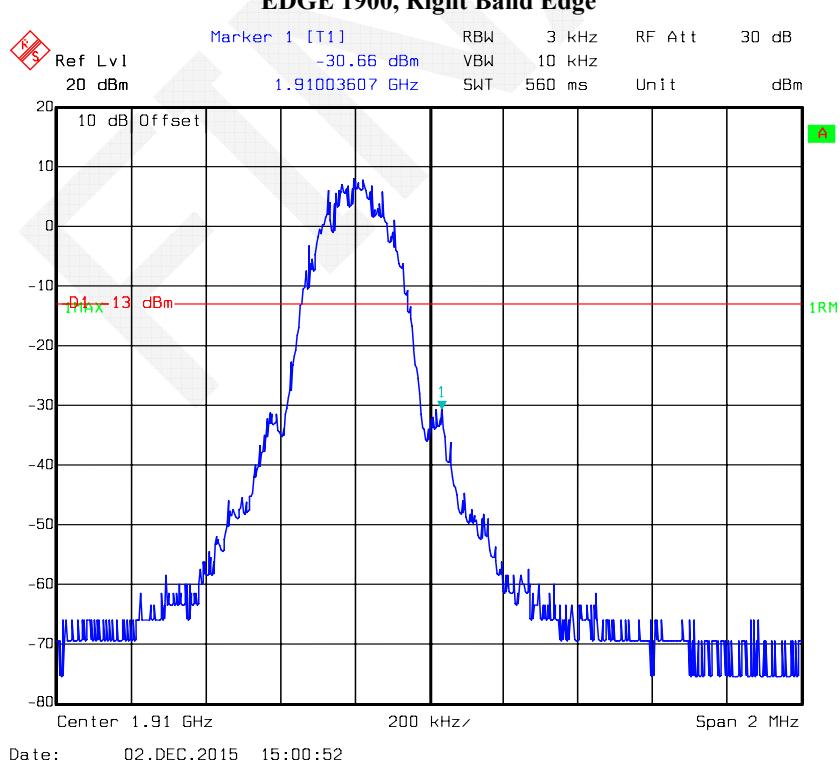
**GSM 1900, Left Band Edge****GSM 1900, Right Band Edge**

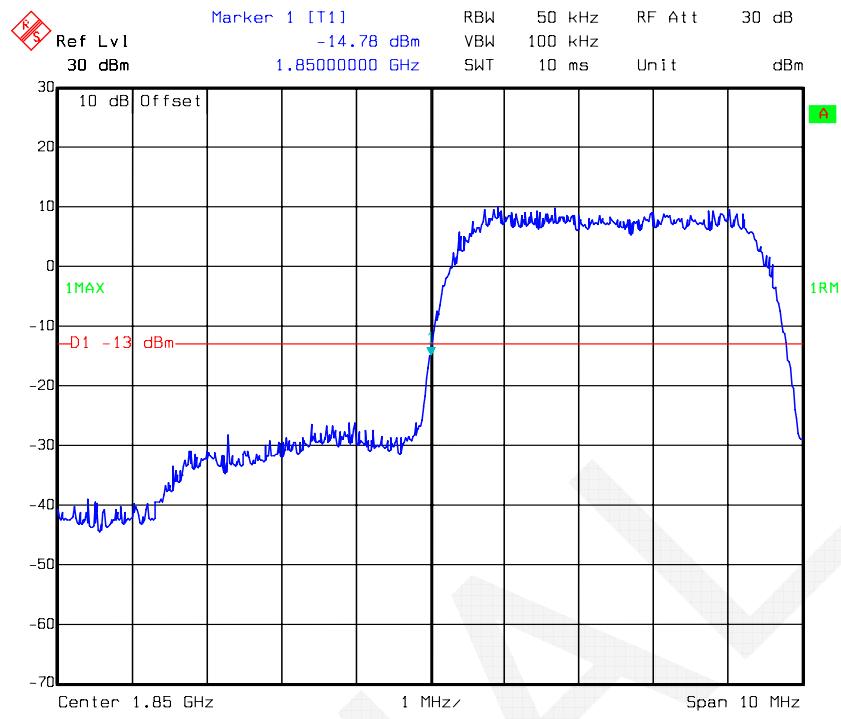
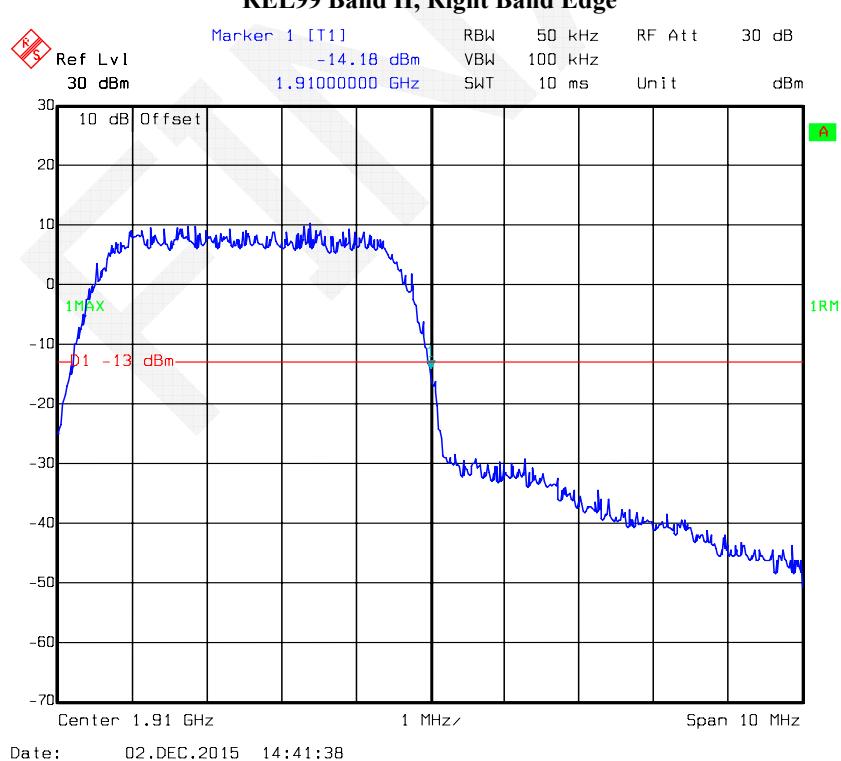
**EDGE 850, Left Band Edge**

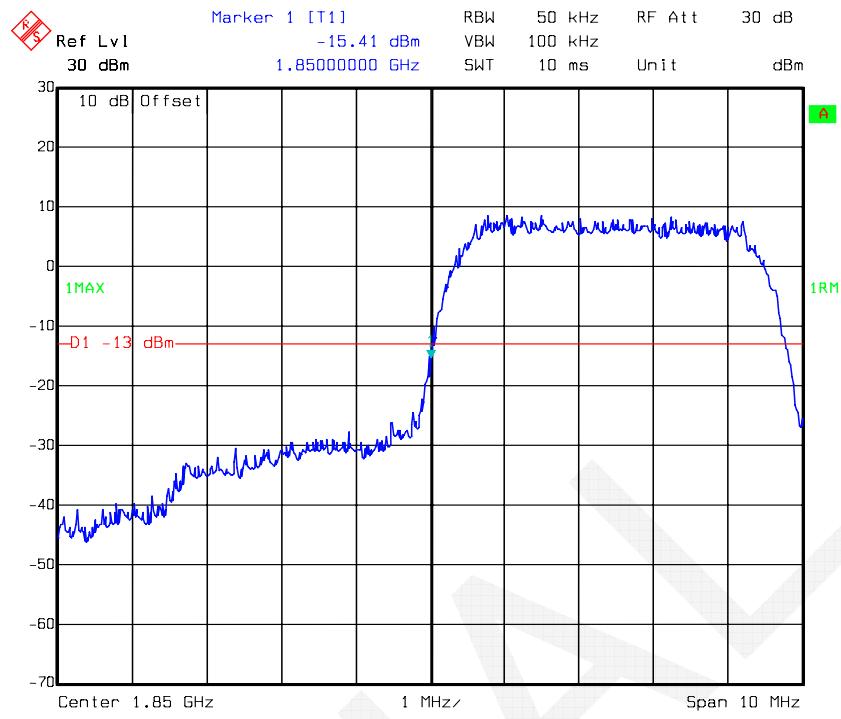
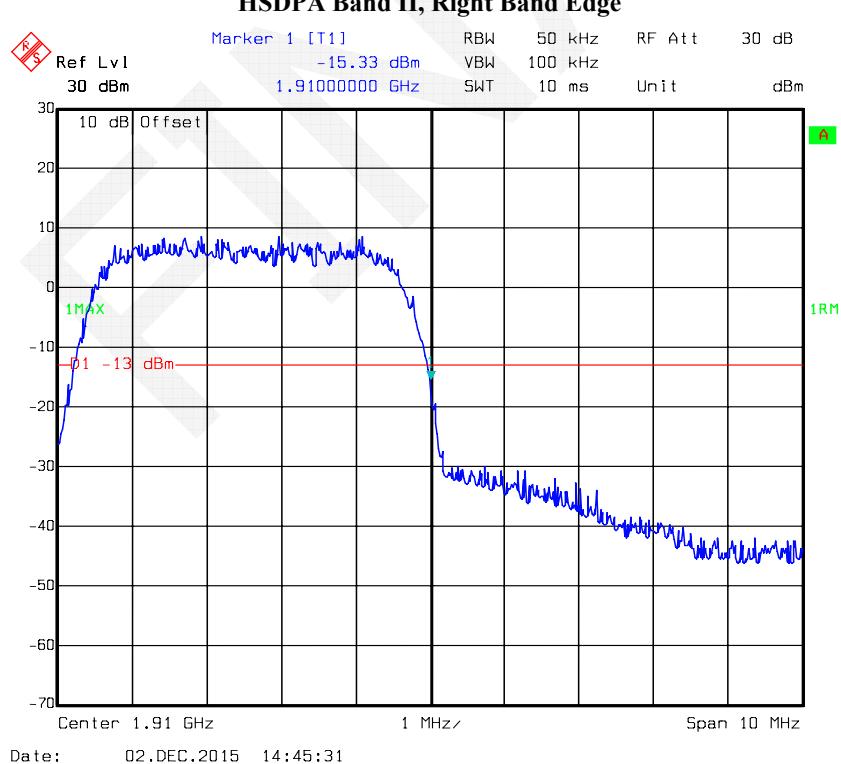
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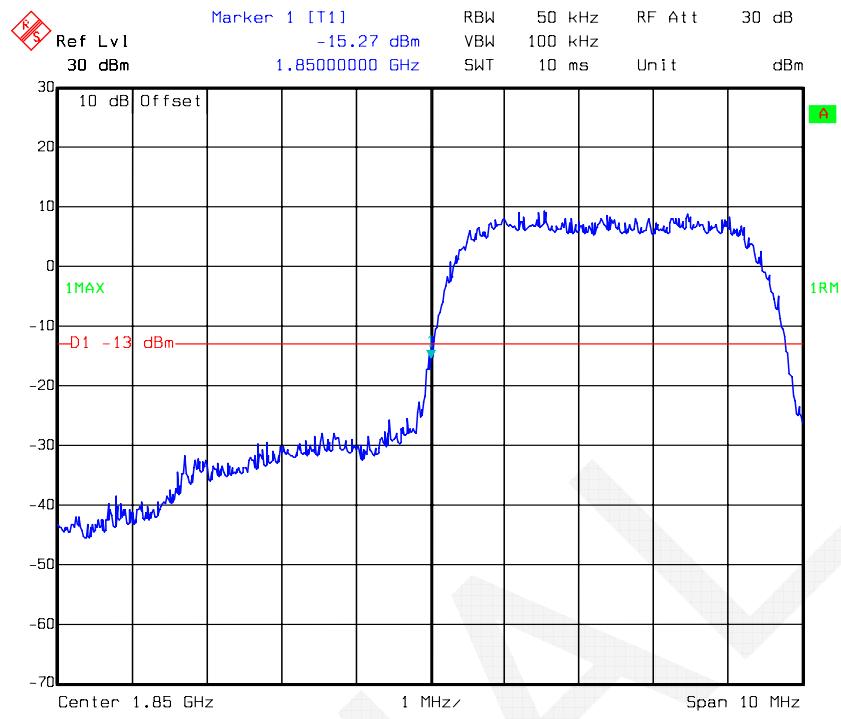
**EDGE 850, Right Band Edge**

Date: 02.DEC.2015 14:55:07

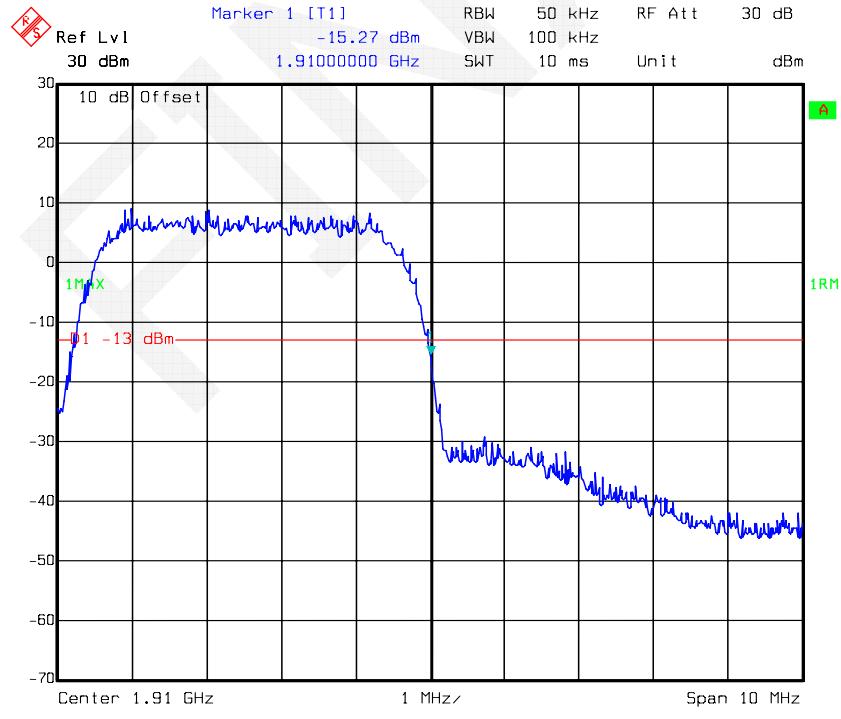
**EDGE 1900, Left Band Edge****EDGE 1900, Right Band Edge**

**REL99 Band II, Left Band Edge****REL99 Band II, Right Band Edge**

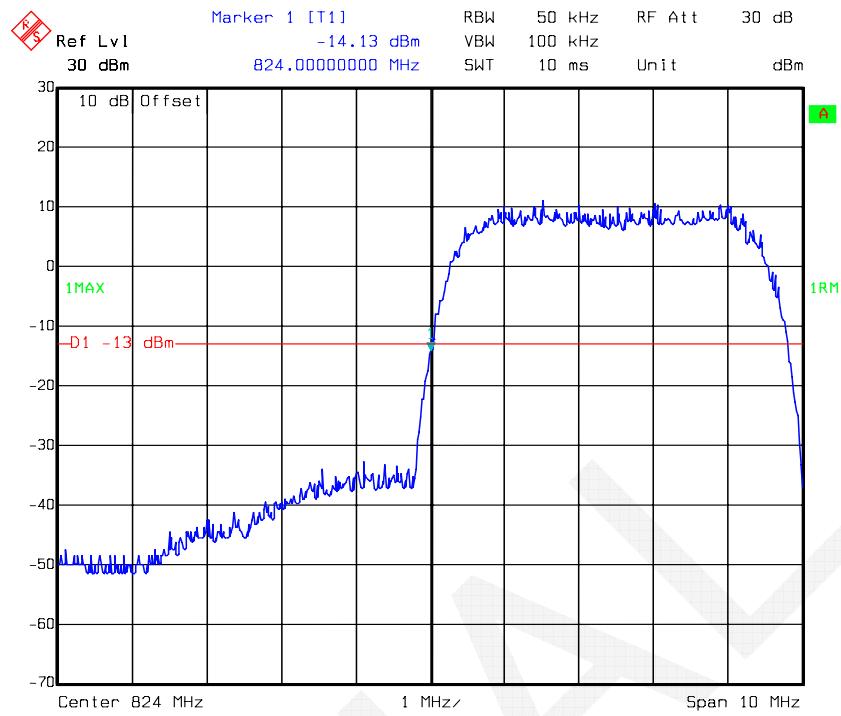
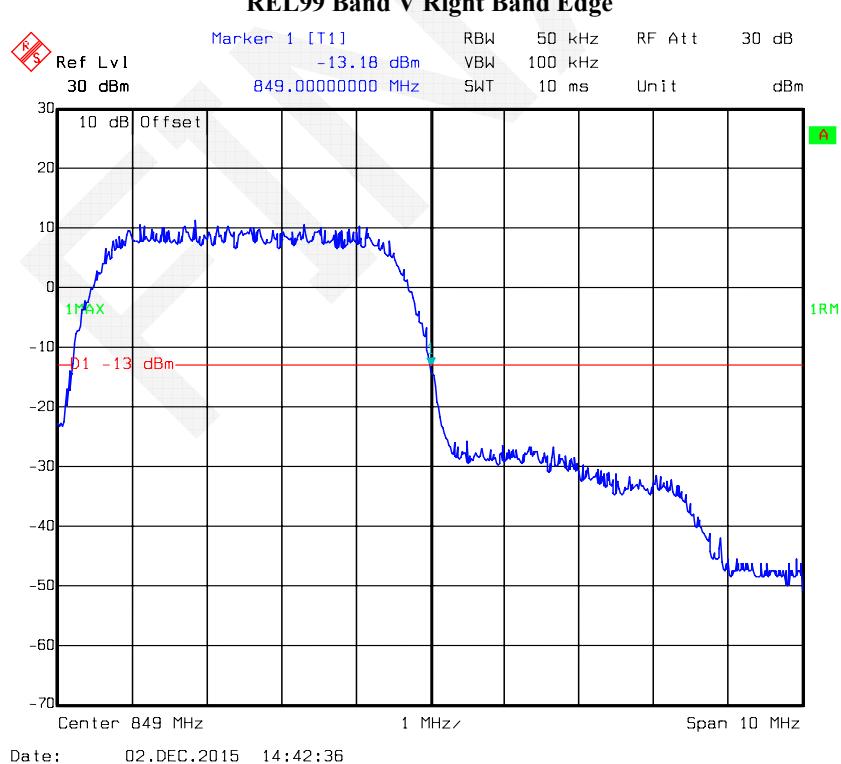
**HSDPA Band II, Left Band Edge****HSDPA Band II, Right Band Edge**

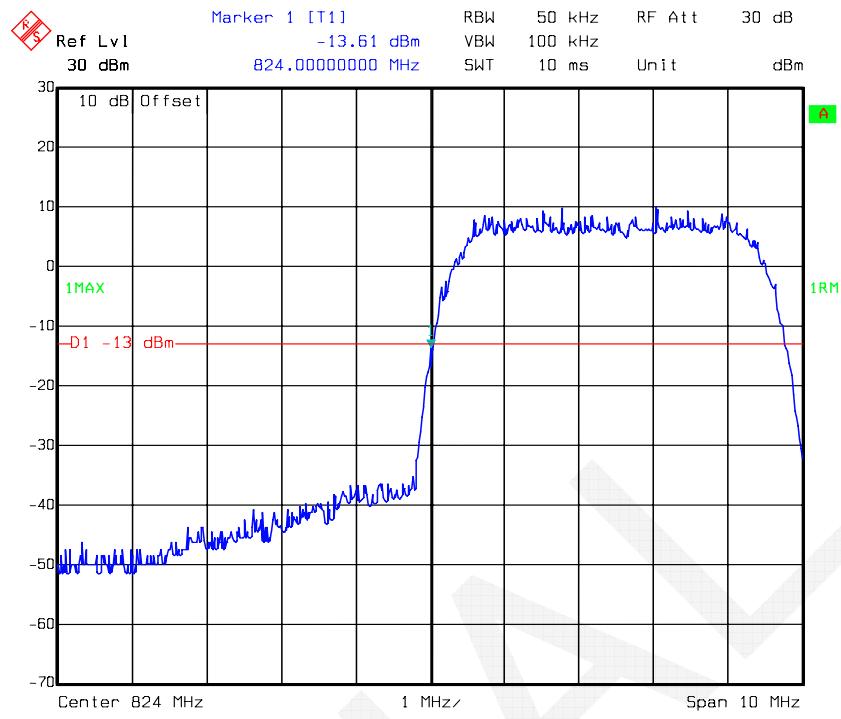
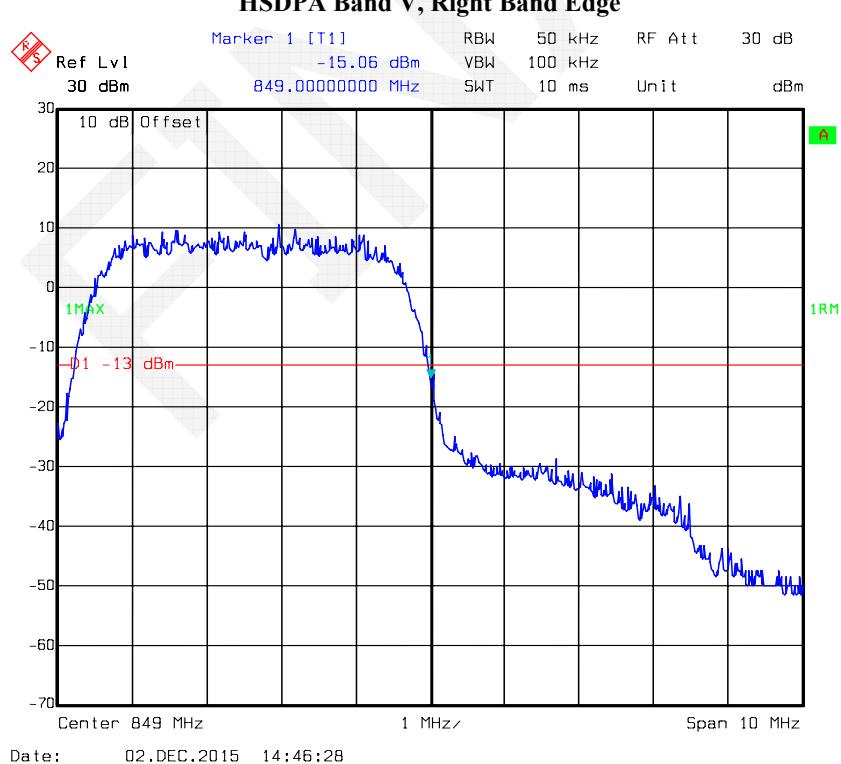
**HSUPA Band II, Left Band Edge**

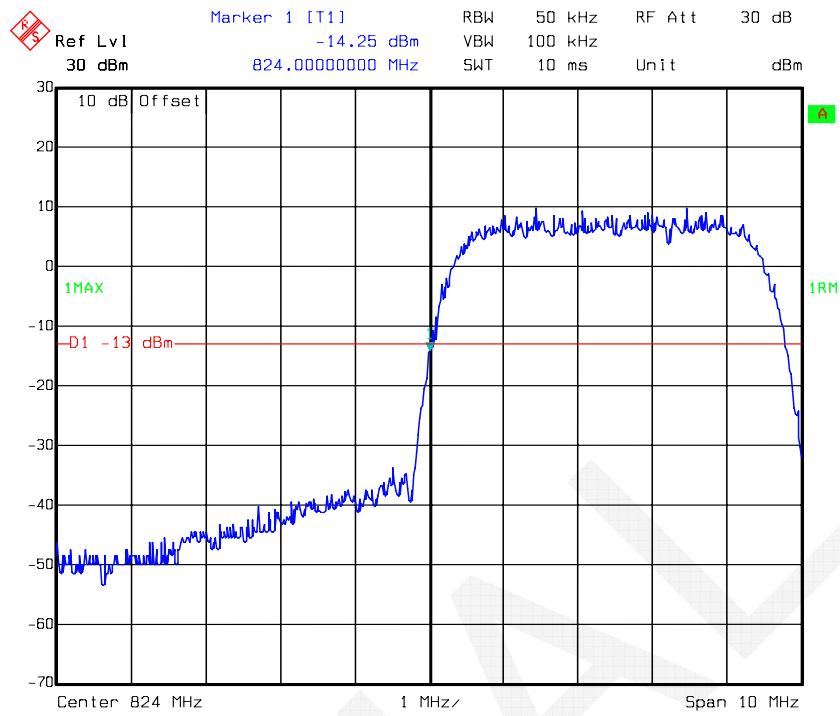
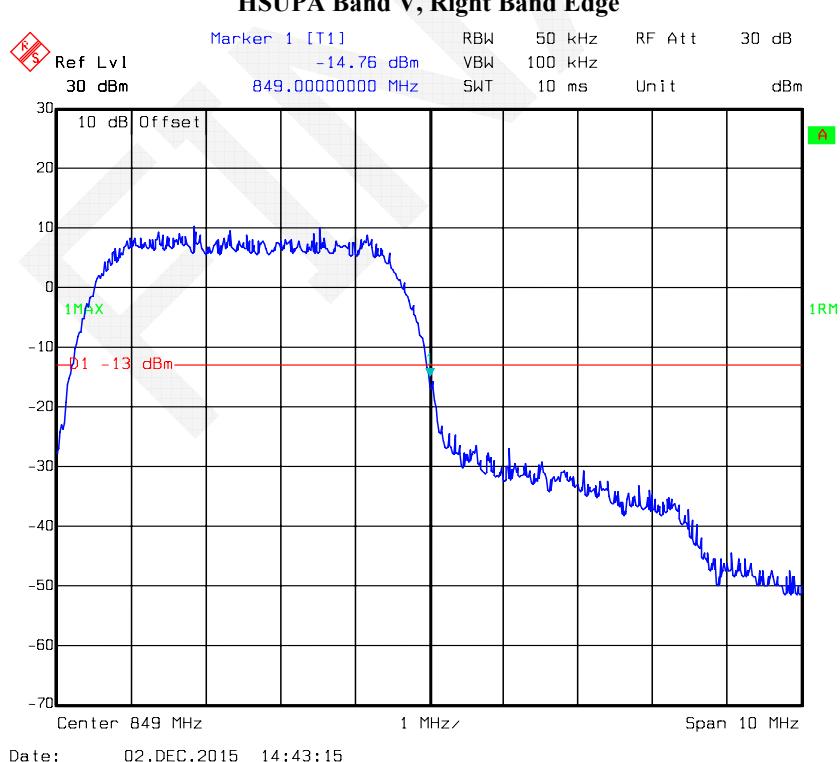
Date: 02.DEC.2015 14:44:17

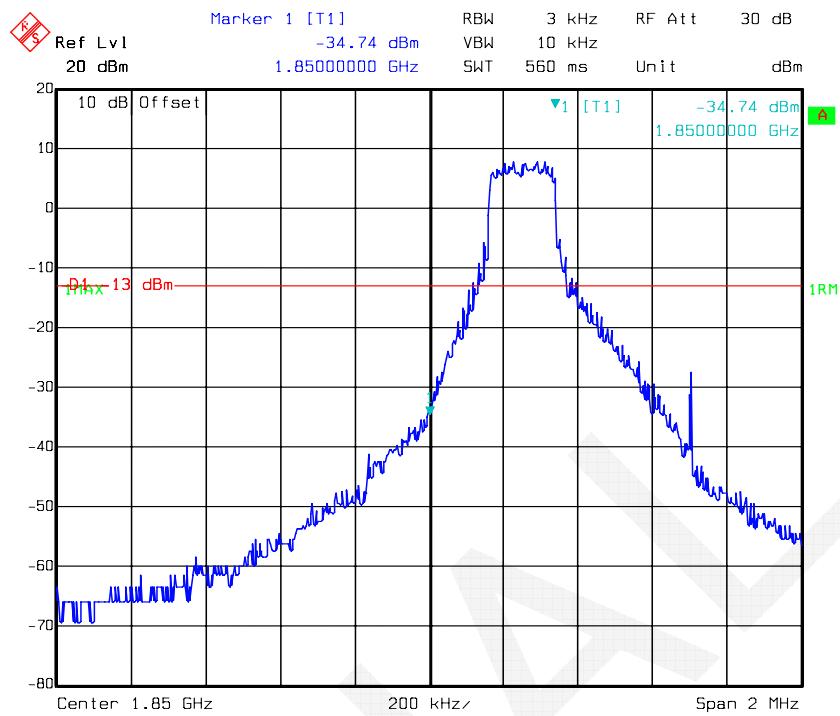
**HSUPA Band II, Right Band Edge**

Date: 02.DEC.2015 14:43:58

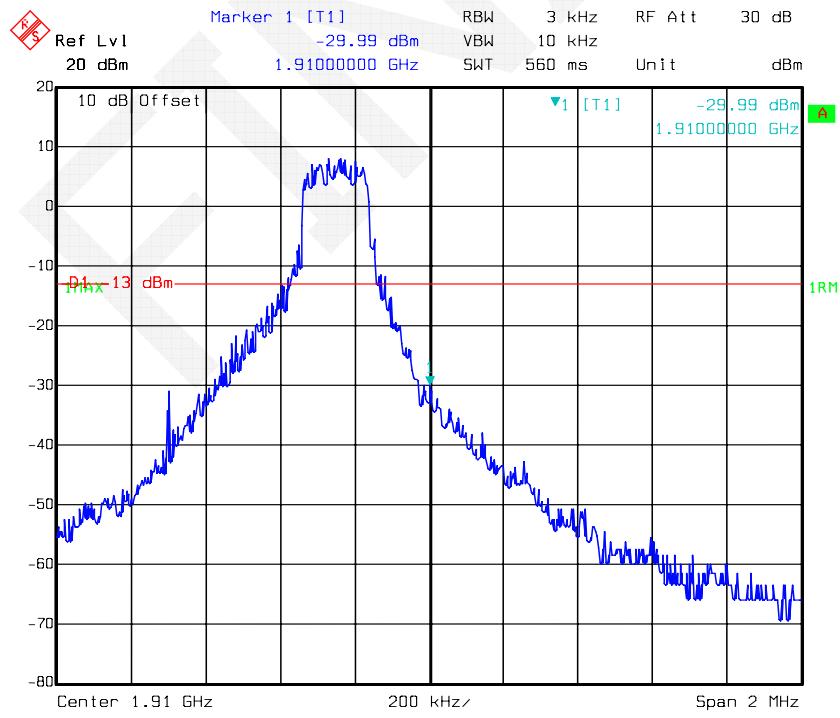
**REL99 Band V, Left Band Edge****REL99 Band V Right Band Edge**

**HSDPA Band V, Left Band Edge****HSDPA Band V, Right Band Edge**

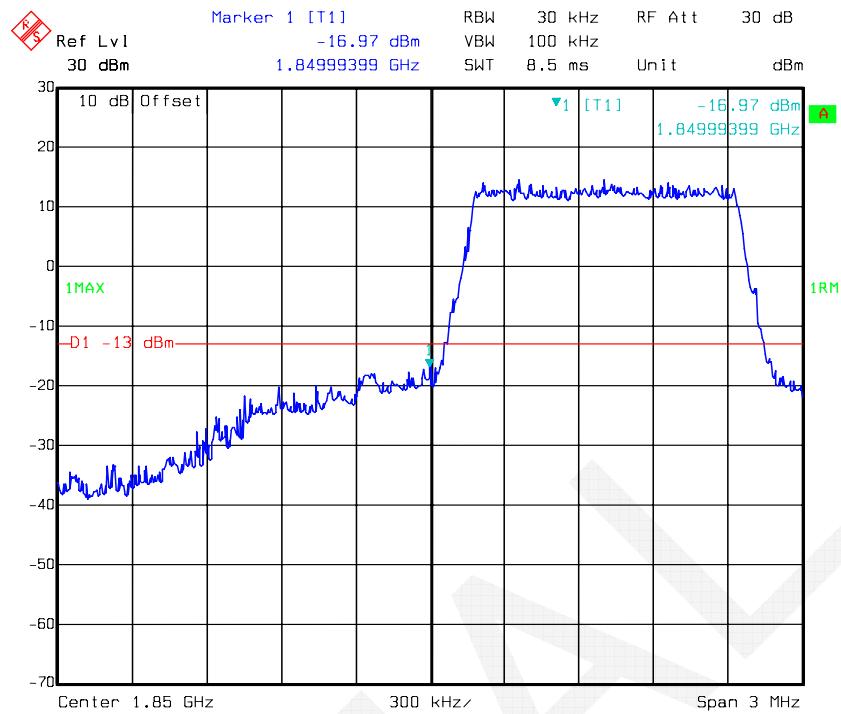
**HSUPA Band V, Left Band Edge****HSUPA Band V, Right Band Edge**

**LTE Band 2****QPSK-1.4M 1RB, Left Band Edge**

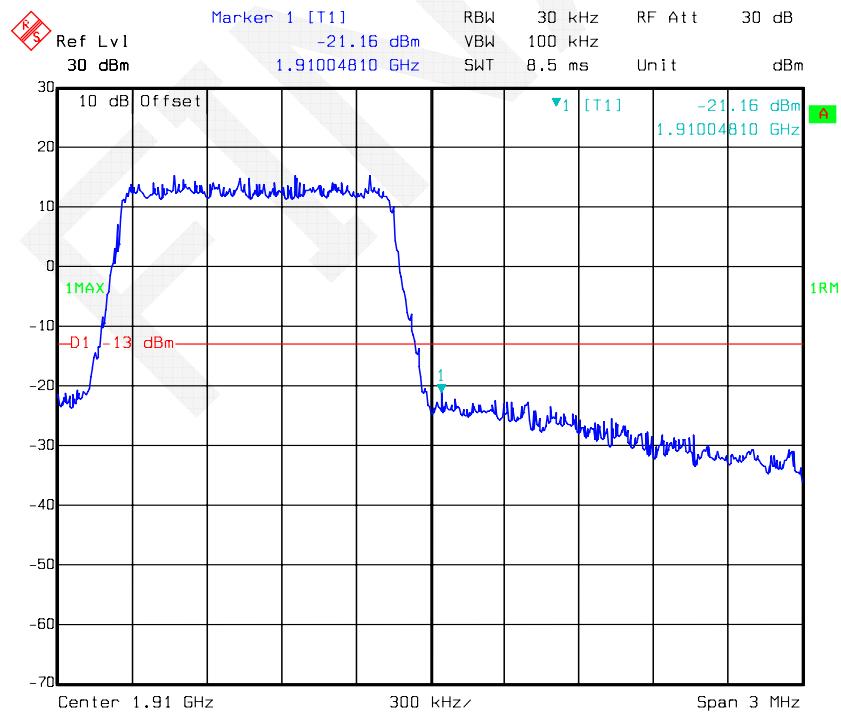
Date: 01.DEC.2015 17:05:39

**QPSK-1.4M 1RB, Right Band Edge**

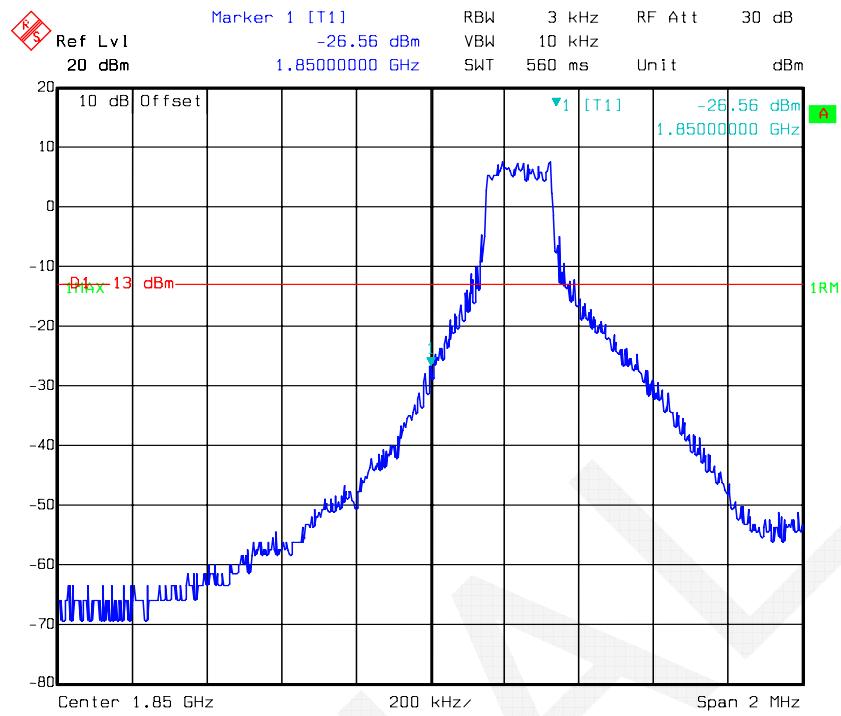
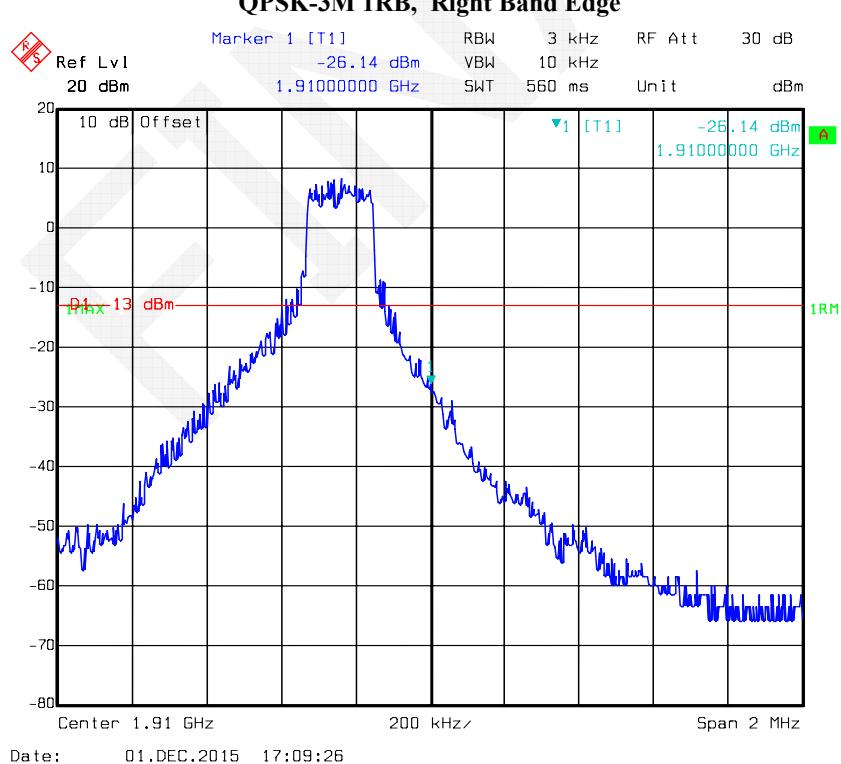
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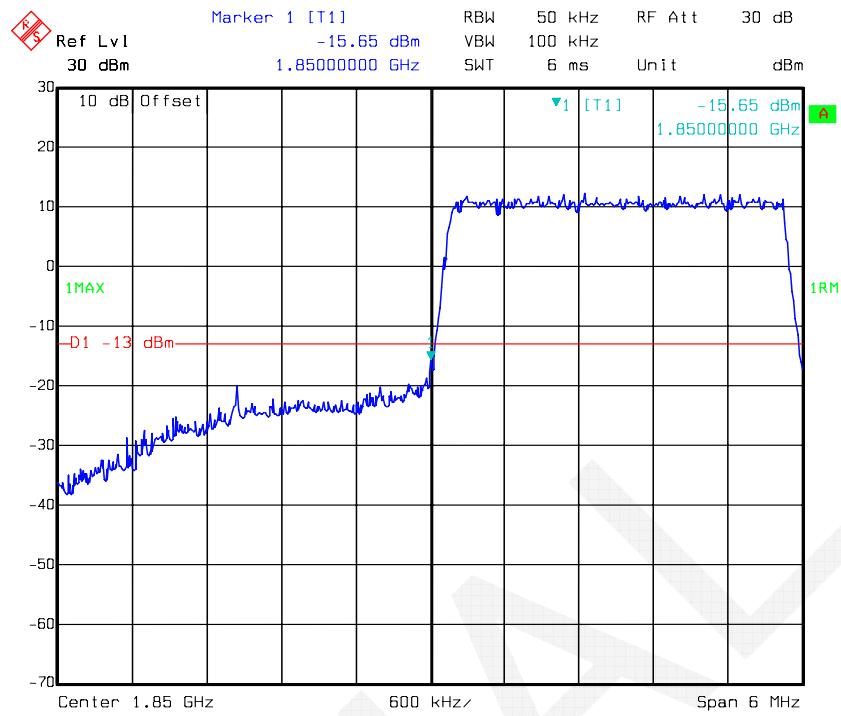
**QPSK-1.4M Full RB, Left Band Edge**

Date: 01.DEC.2015 18:44:22

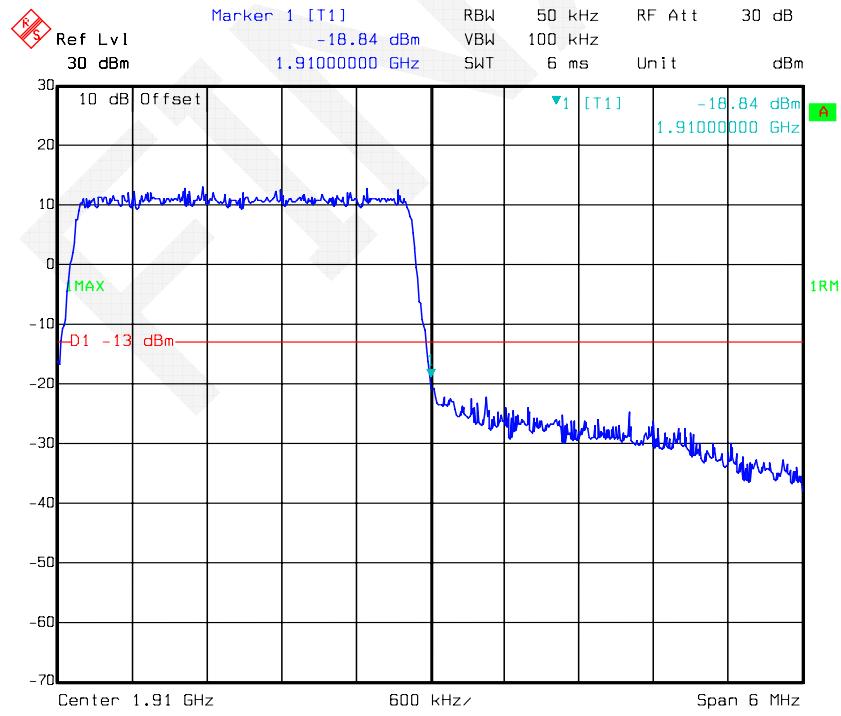
**QPSK-1.4M Full RB, Right Band Edge**

Date: 01.DEC.2015 18:45:29

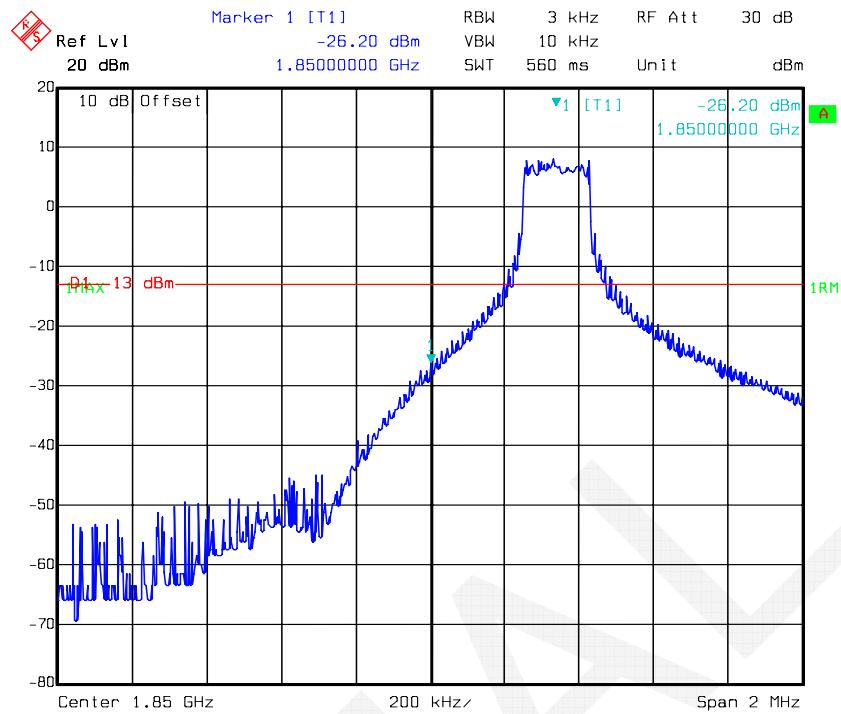
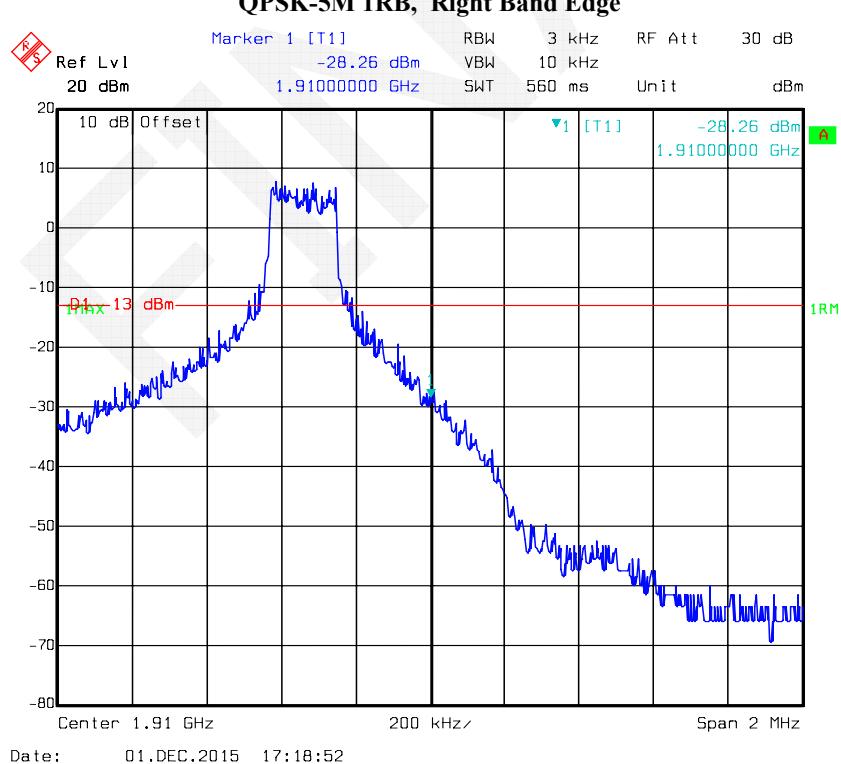
**QPSK-3M 1RB, Left Band Edge****QPSK-3M 1RB, Right Band Edge**

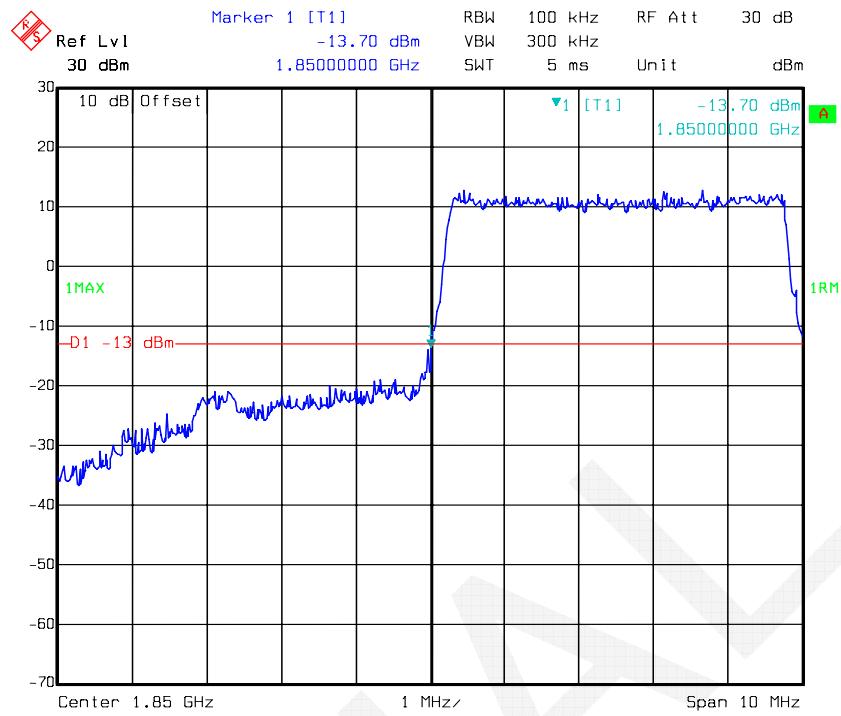
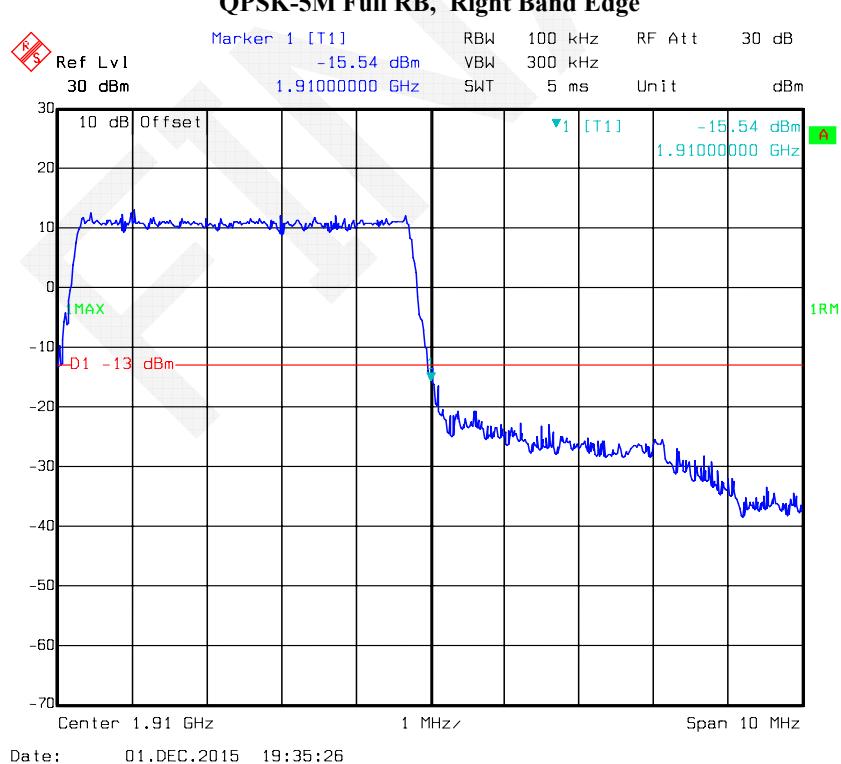
**QPSK-3M Full RB, Left Band Edge**

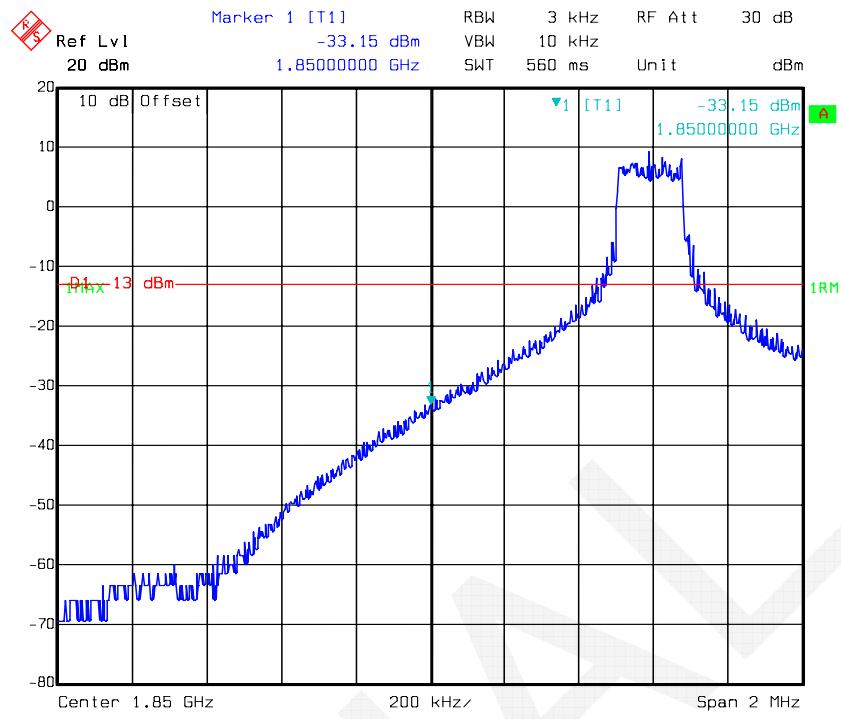
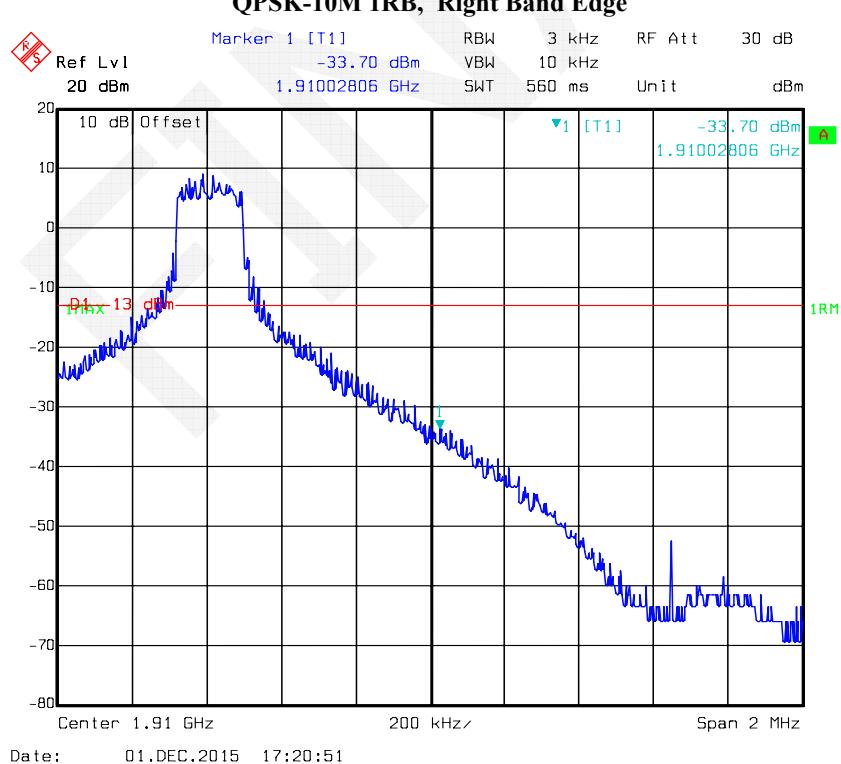
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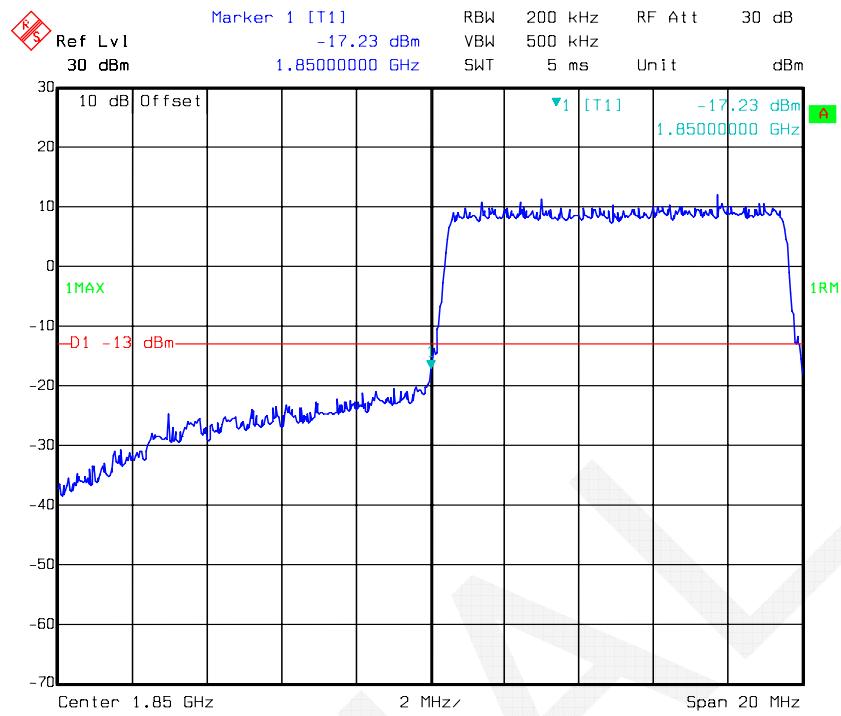
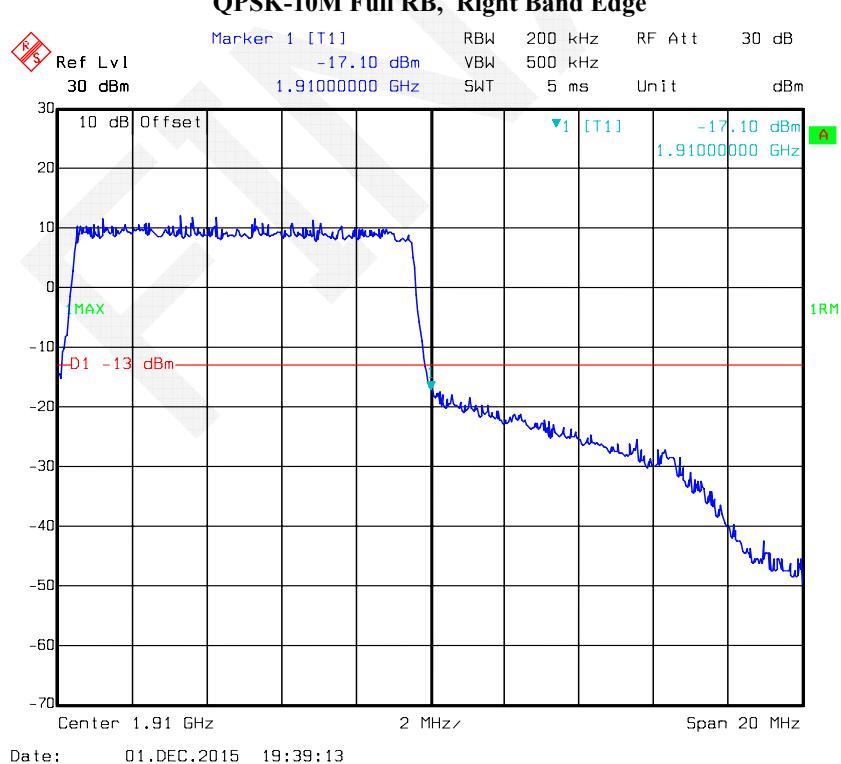
**QPSK-3M Full RB, Right Band Edge**

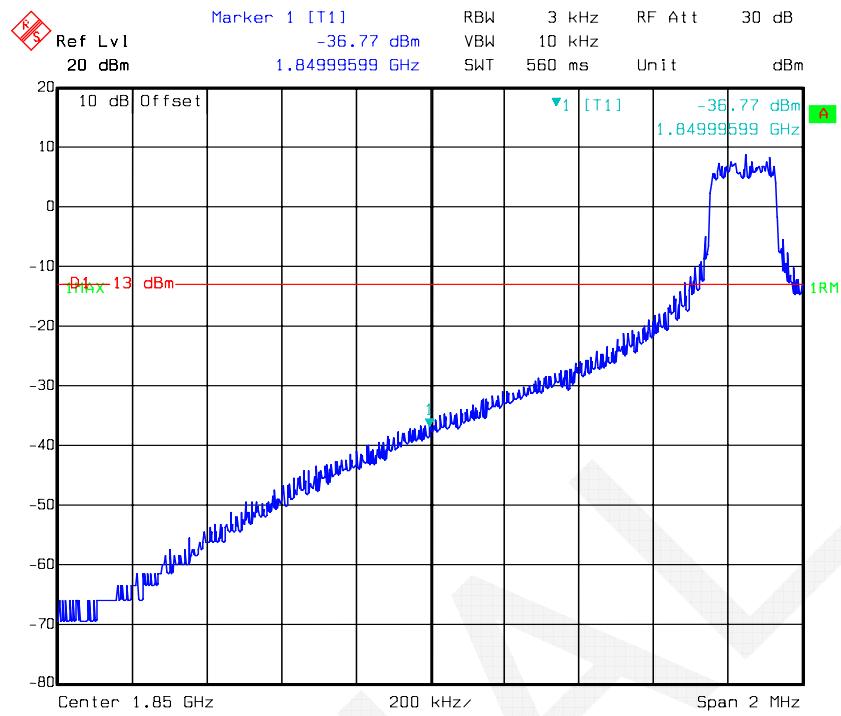
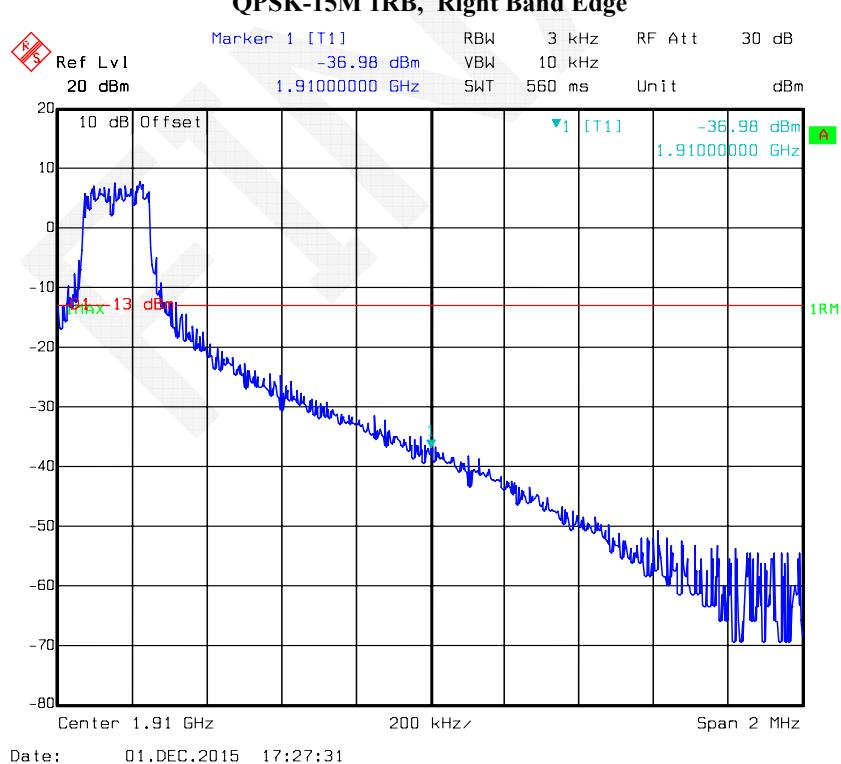
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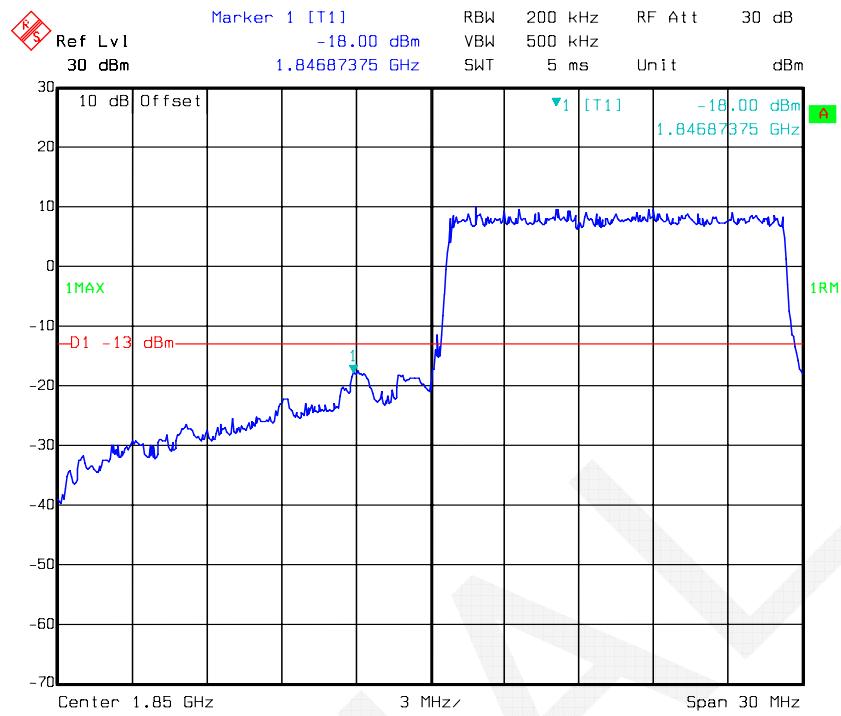
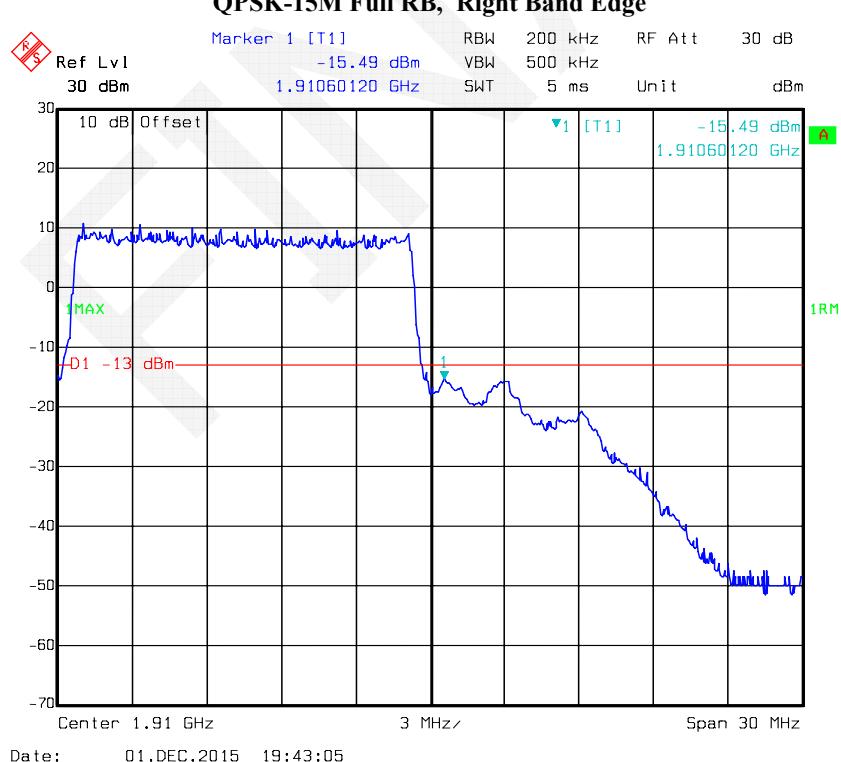
**QPSK-5M 1RB, Left Band Edge****QPSK-5M 1RB, Right Band Edge**

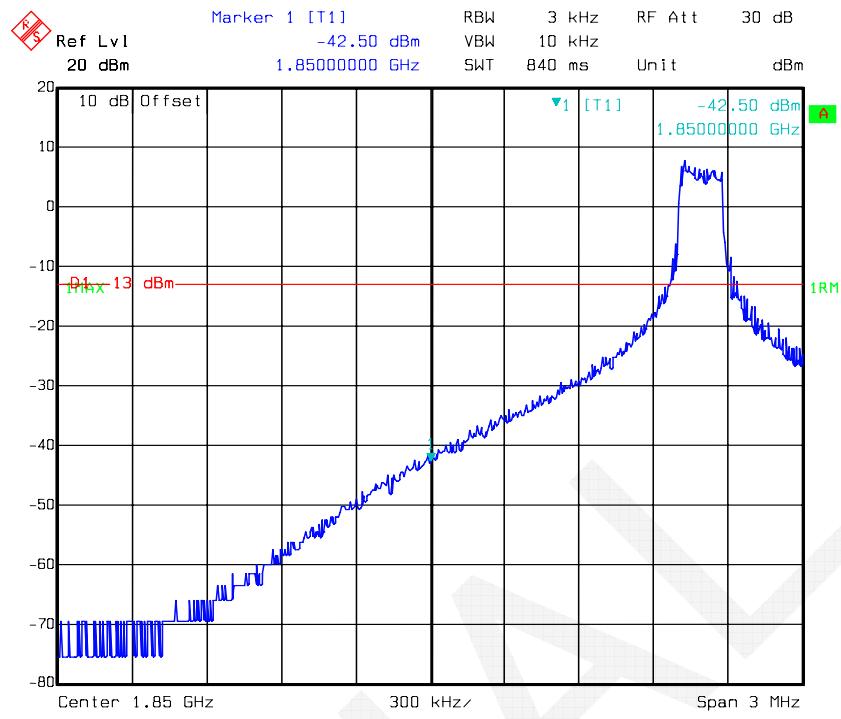
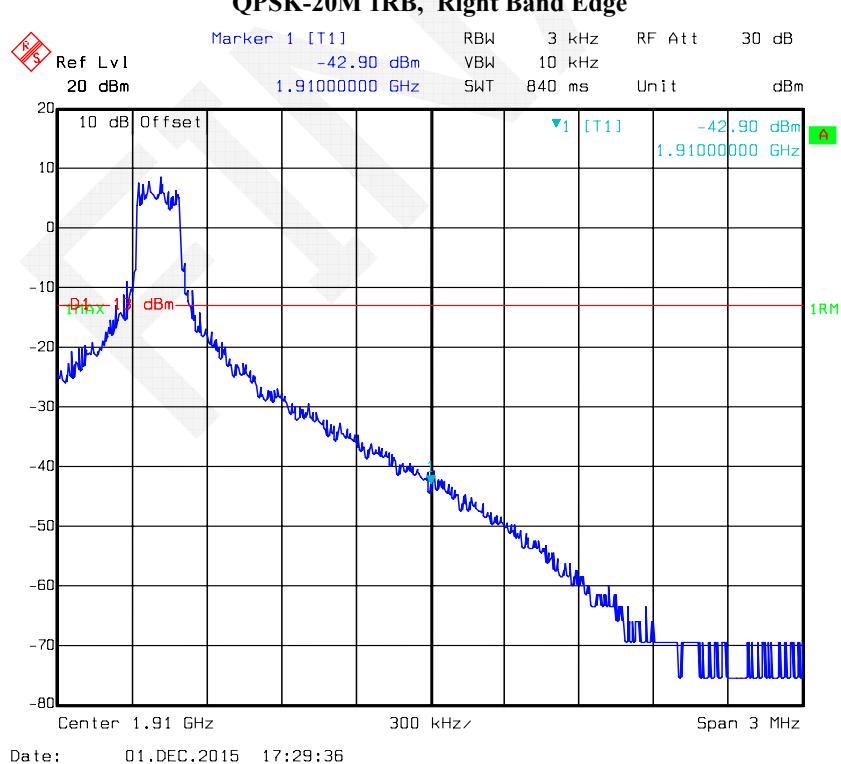
**QPSK-5M Full RB, Left Band Edge****QPSK-5M Full RB, Right Band Edge**

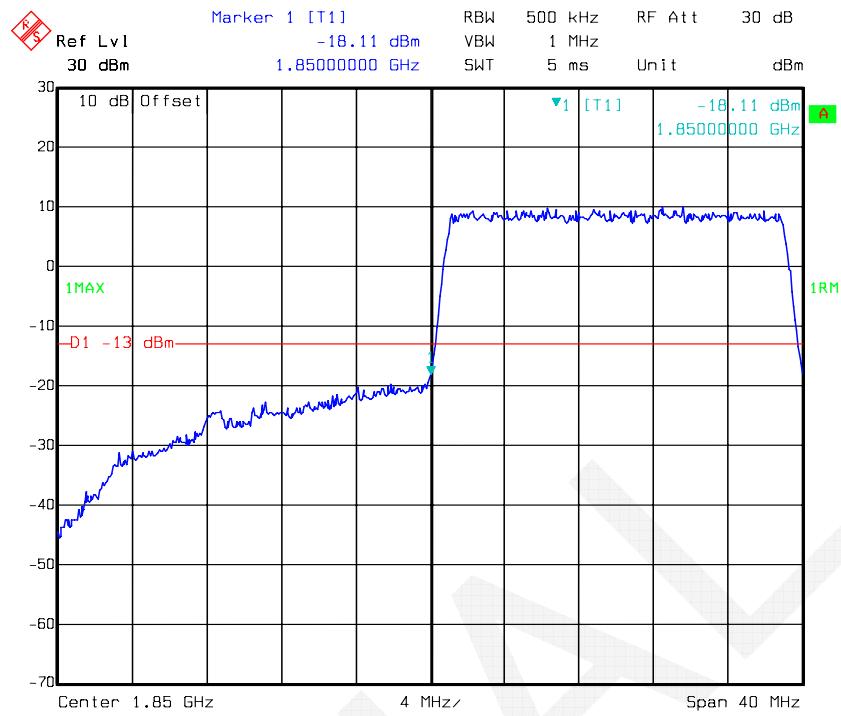
**QPSK-10M 1RB, Left Band Edge****QPSK-10M 1RB, Right Band Edge**

**QPSK-10M Full RB, Left Band Edge****QPSK-10M Full RB, Right Band Edge**

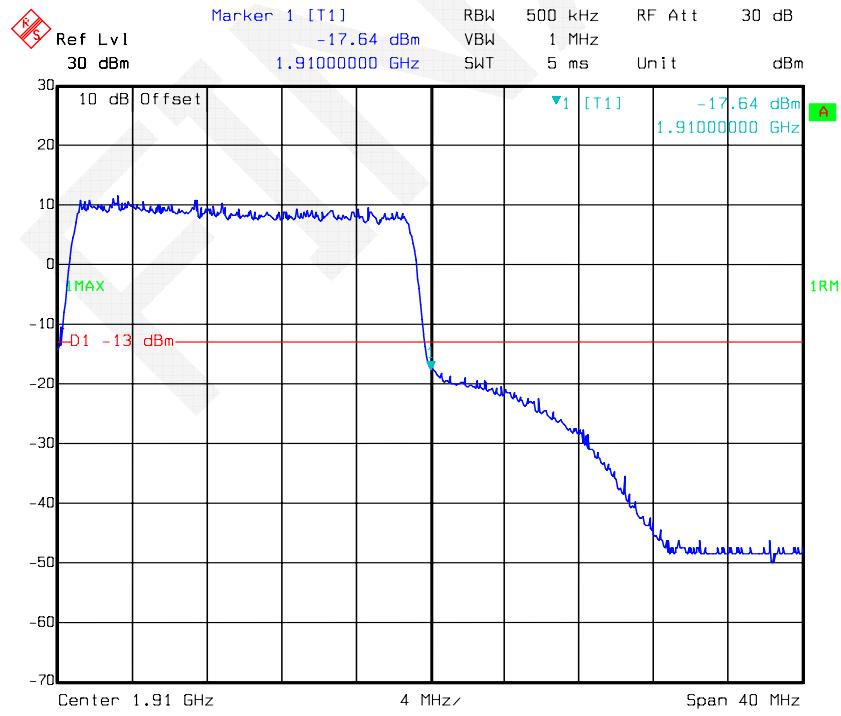
**QPSK-15M 1RB, Left Band Edge****QPSK-15M 1RB, Right Band Edge**

**QPSK-15M Full RB, Left Band Edge****QPSK-15M Full RB, Right Band Edge**

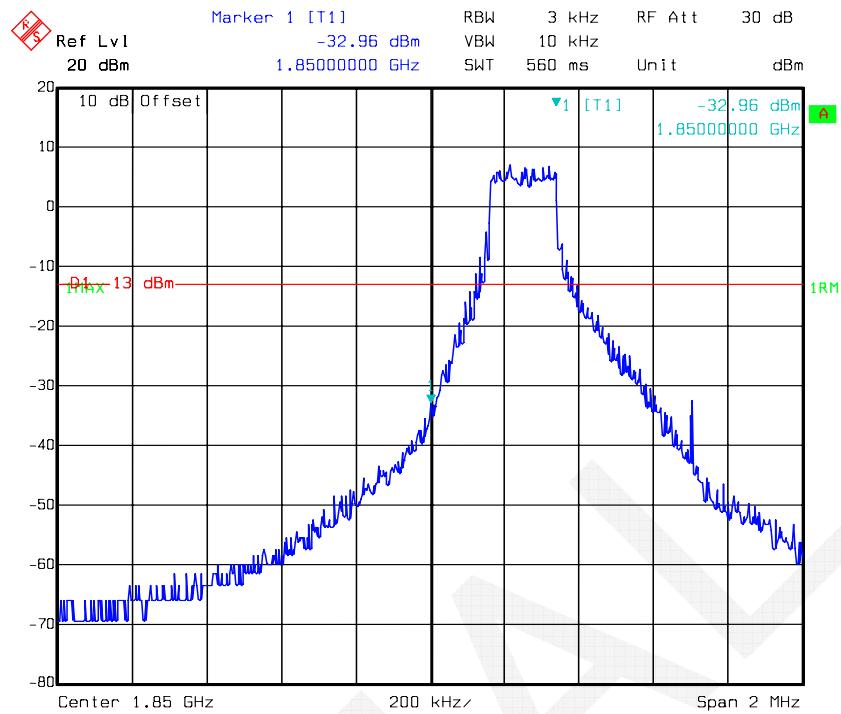
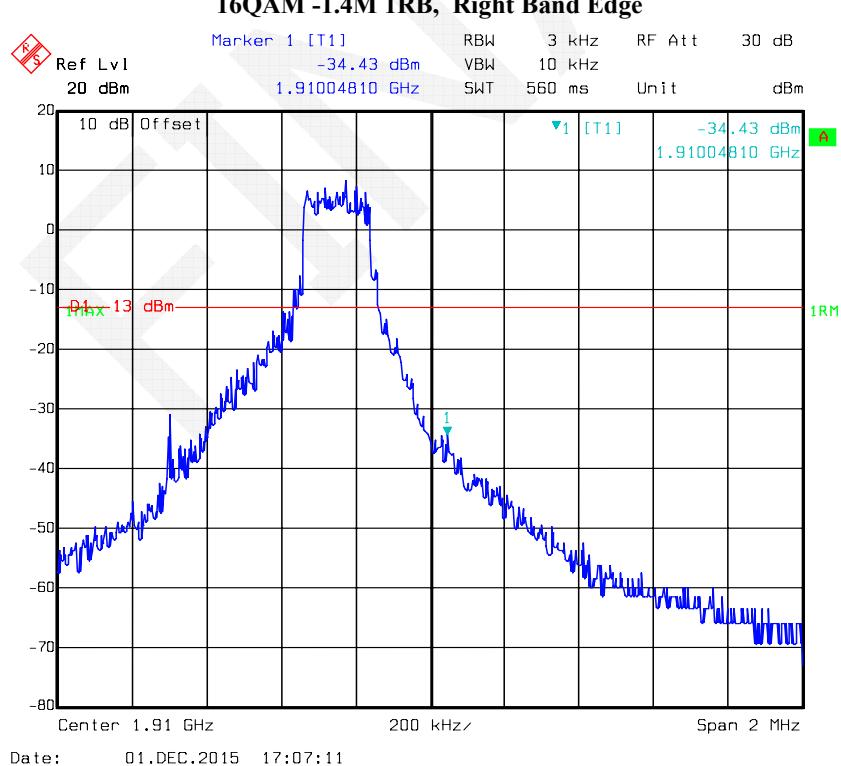
**QPSK-20M 1RB, Left Band Edge****QPSK-20M 1RB, Right Band Edge**

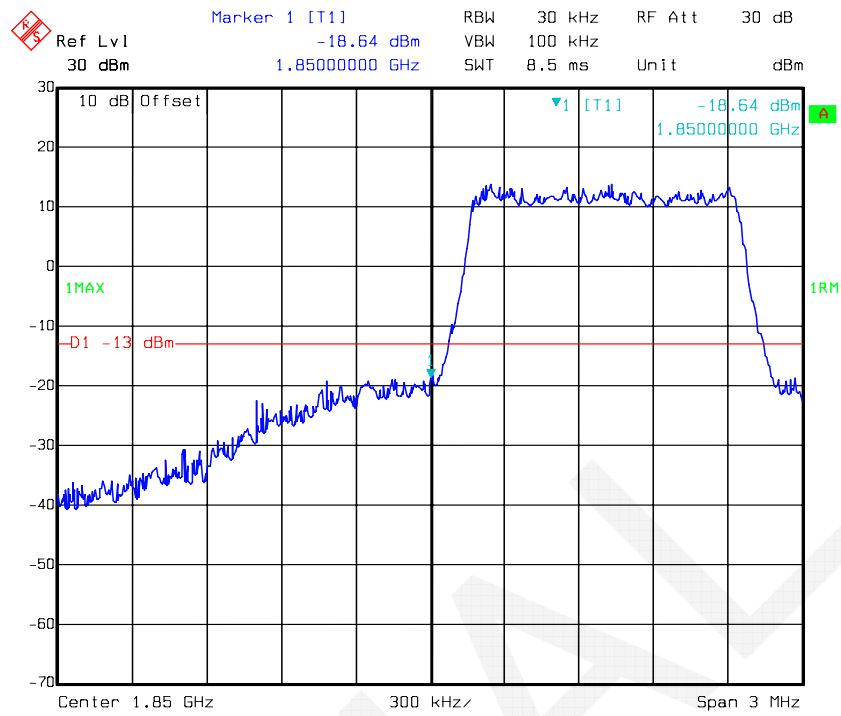
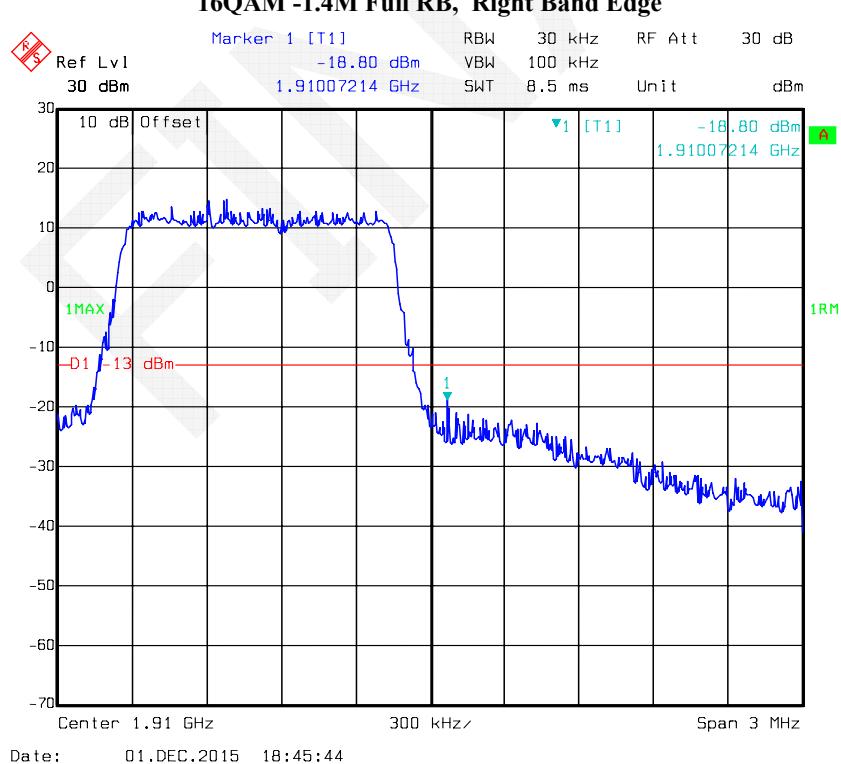
**QPSK-20M Full RB, Left Band Edge**

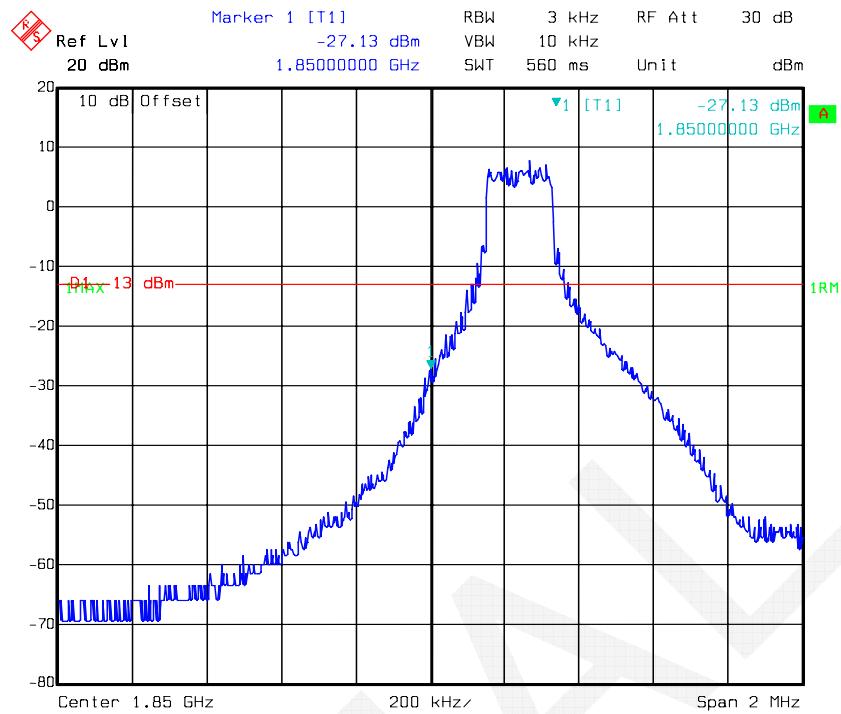
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**QPSK-20M Full RB, Right Band Edge**

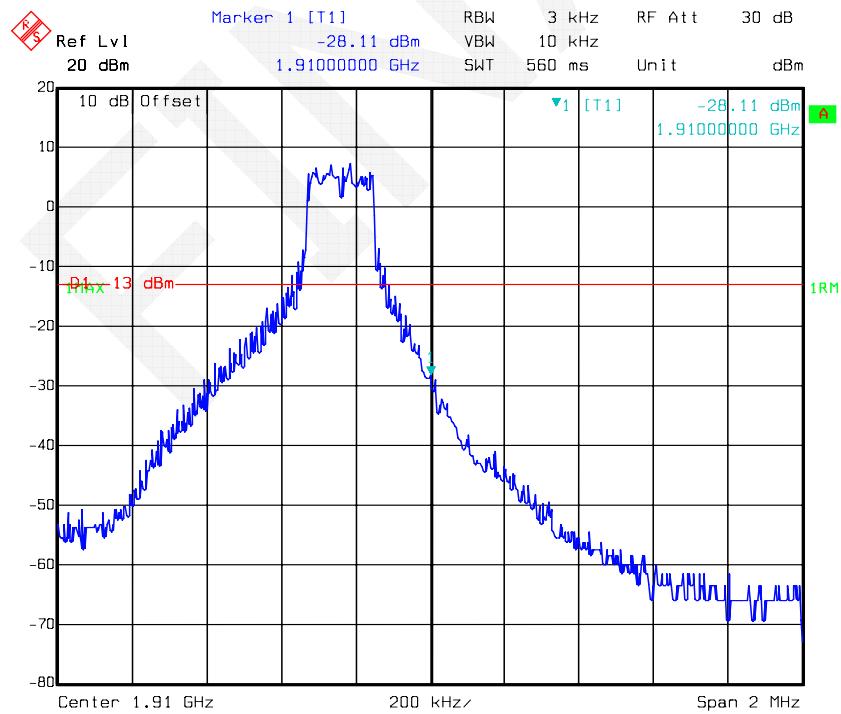
Date: 01.DEC.2015 19:46:29

**16QAM -1.4M 1RB, Left Band Edge****16QAM -1.4M 1RB, Right Band Edge**

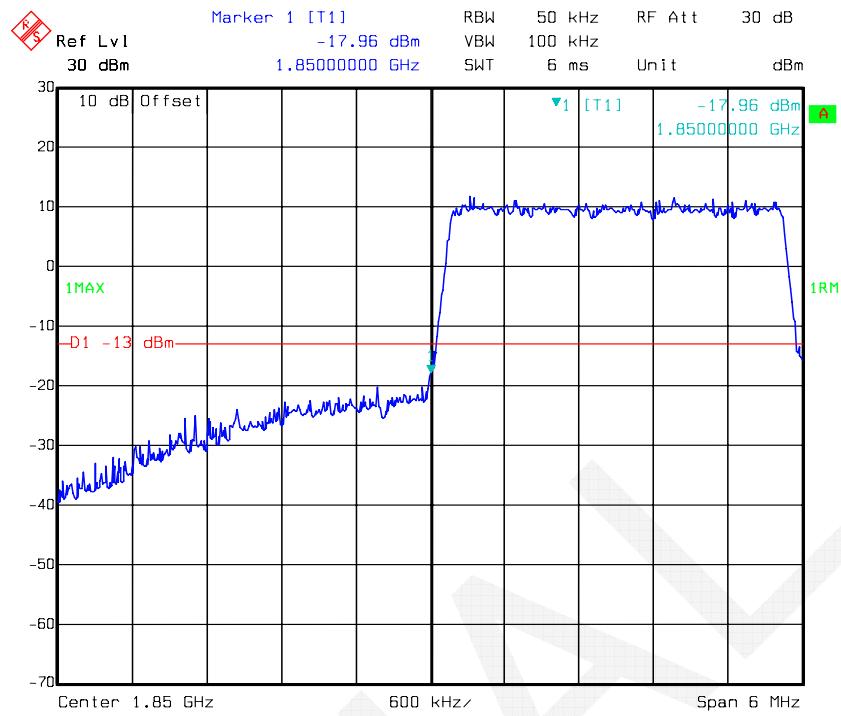
**16QAM -1.4M Full RB, Left Band Edge****16QAM -1.4M Full RB, Right Band Edge**

**16QAM -3M 1RB, Left Band Edge**

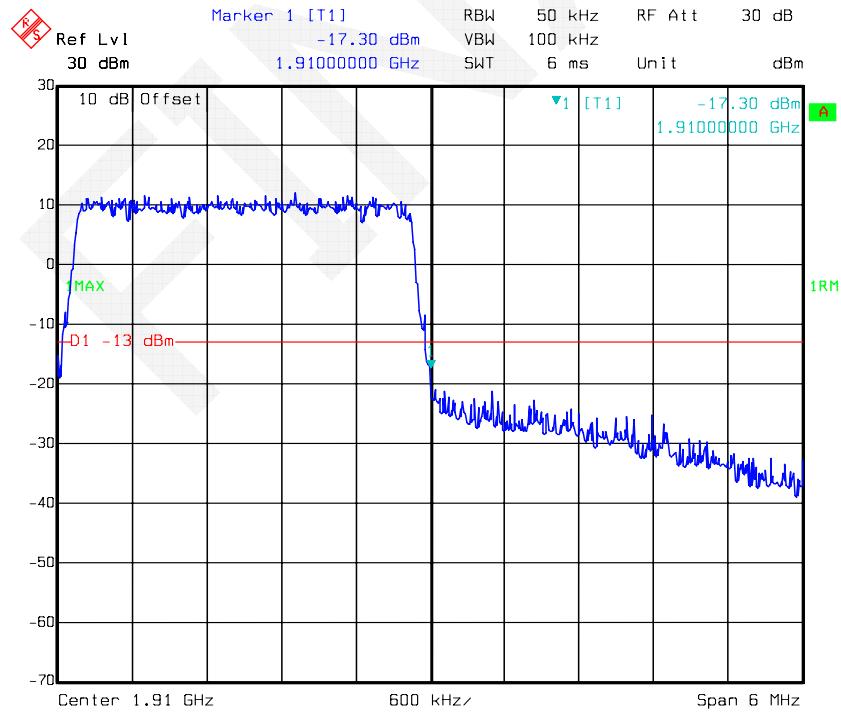
Date: 01.DEC.2015 17:10:19

**16QAM -3M 1RB, Right Band Edge**

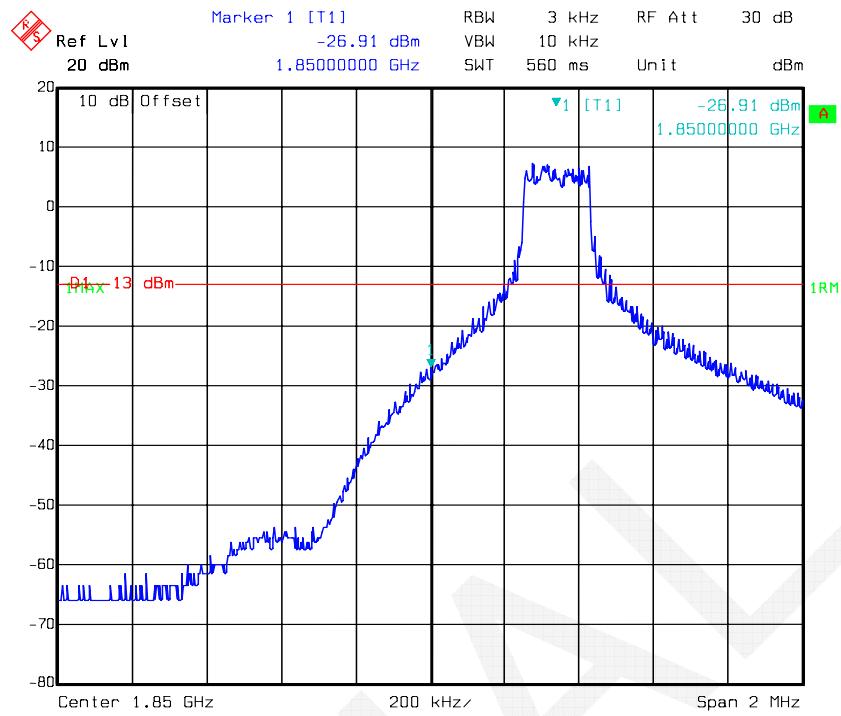
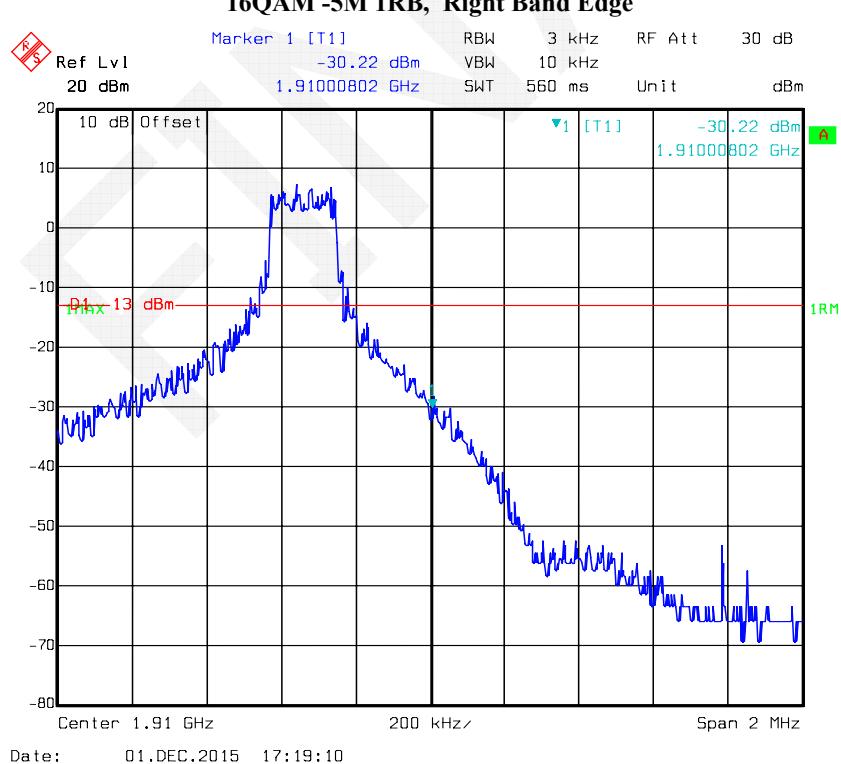
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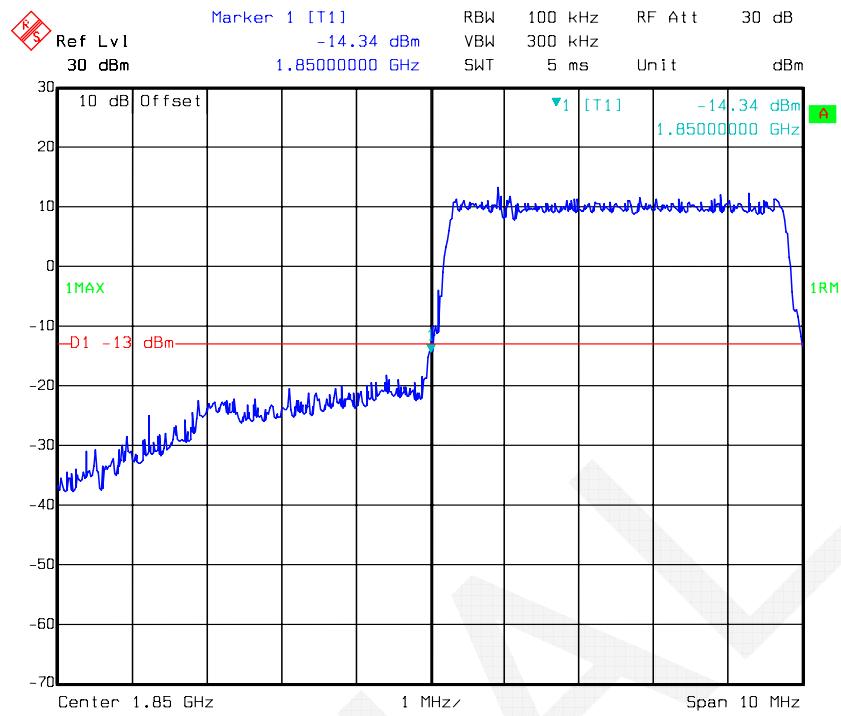
**16QAM -3M Full RB, Left Band Edge**

Date: 01.DEC.2015 19:29:05

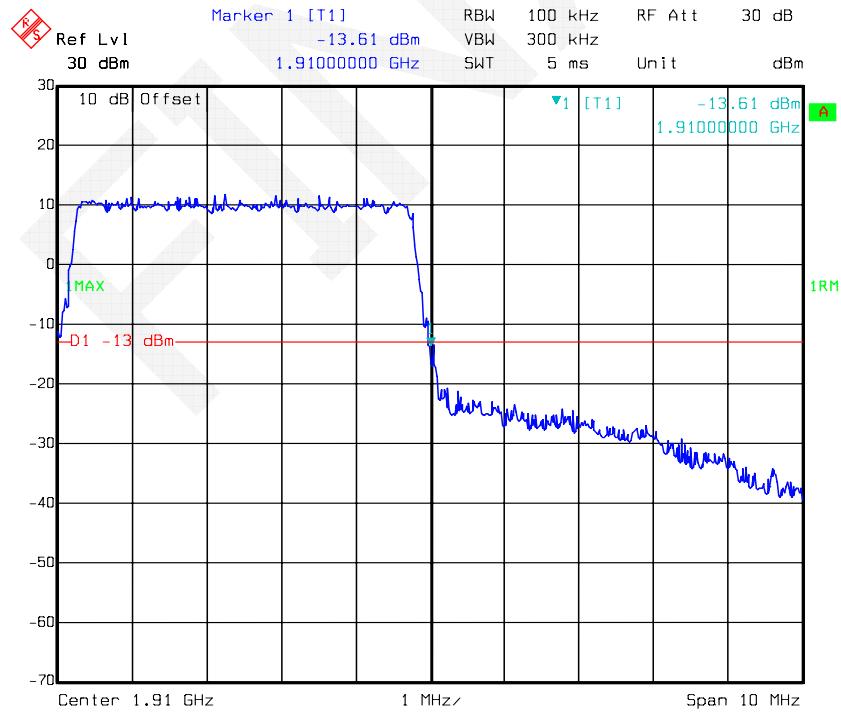
**16QAM -3M Full RB, Right Band Edge**

Date: 01.DEC.2015 19:30:07

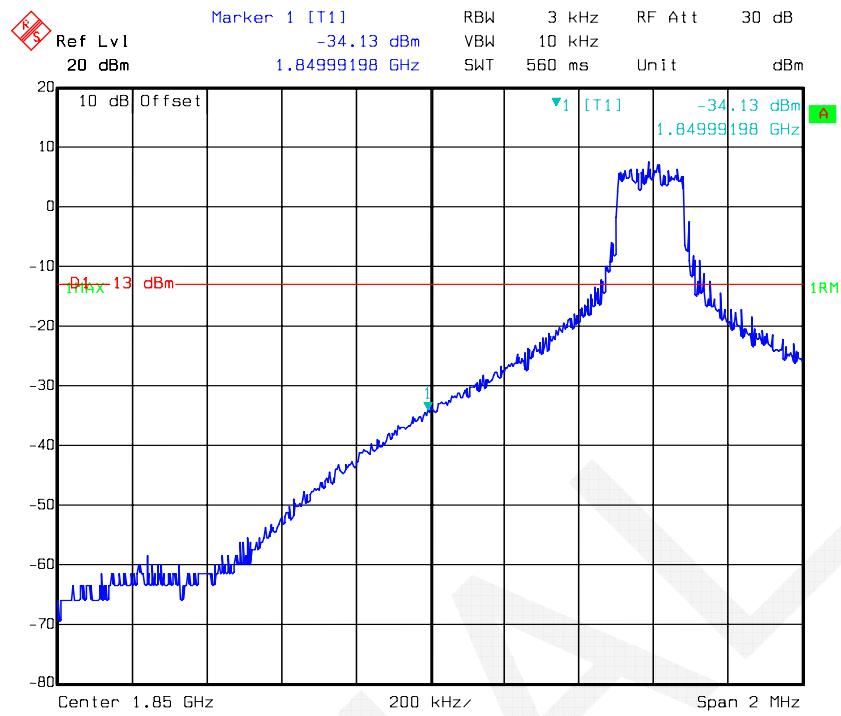
**16QAM -5M 1RB, Left Band Edge****16QAM -5M 1RB, Right Band Edge**

**16QAM -5M Full RB, Left Band Edge**

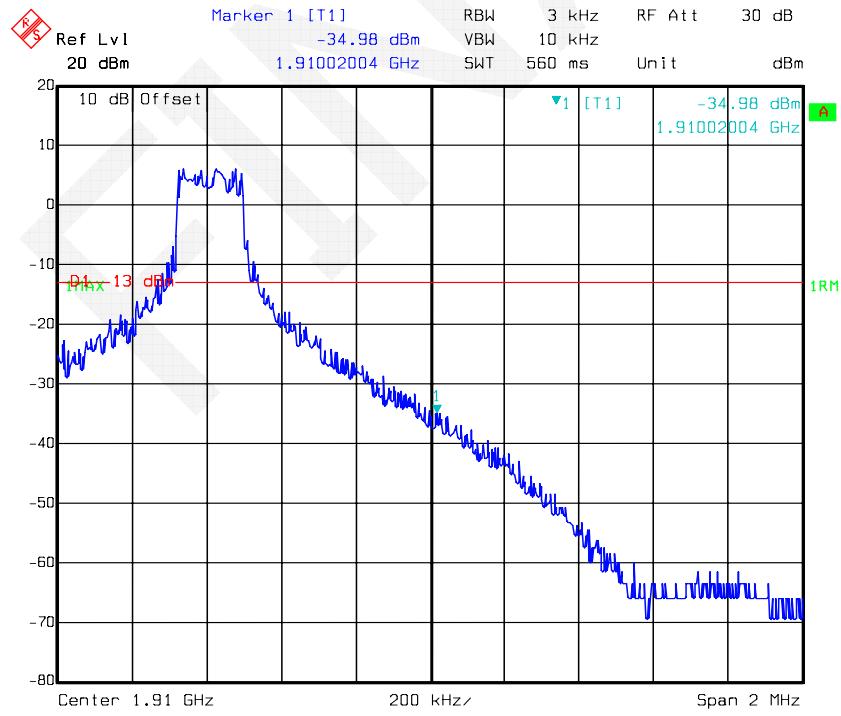
Date: 01.DEC.2015 19:34:46

**16QAM -5M Full RB, Right Band Edge**

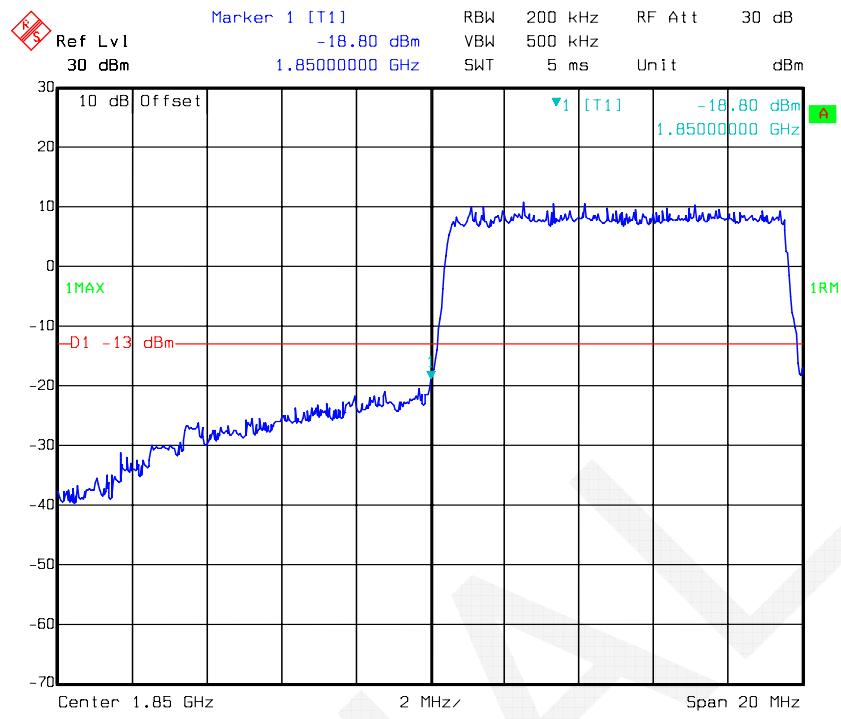
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**16QAM -10M 1RB, Left Band Edge**

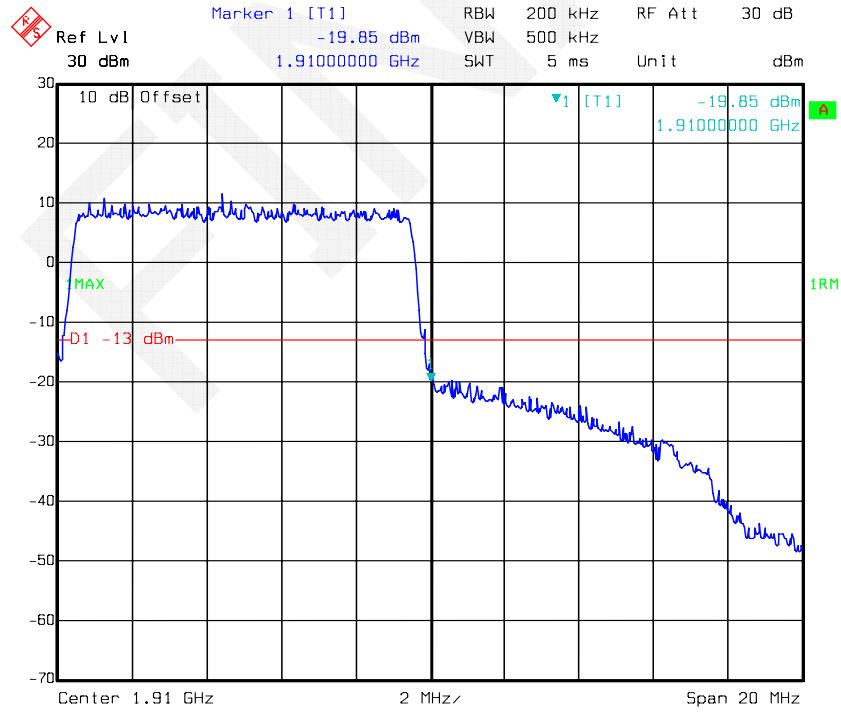
Date: 01.DEC.2015 17:21:59

**16QAM -10M 1RB, Right Band Edge**

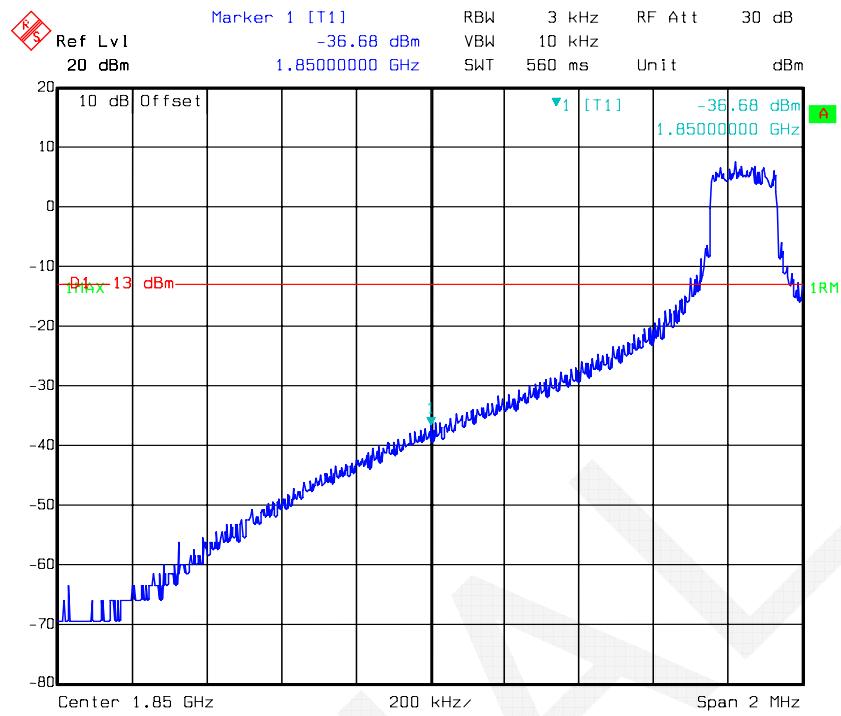
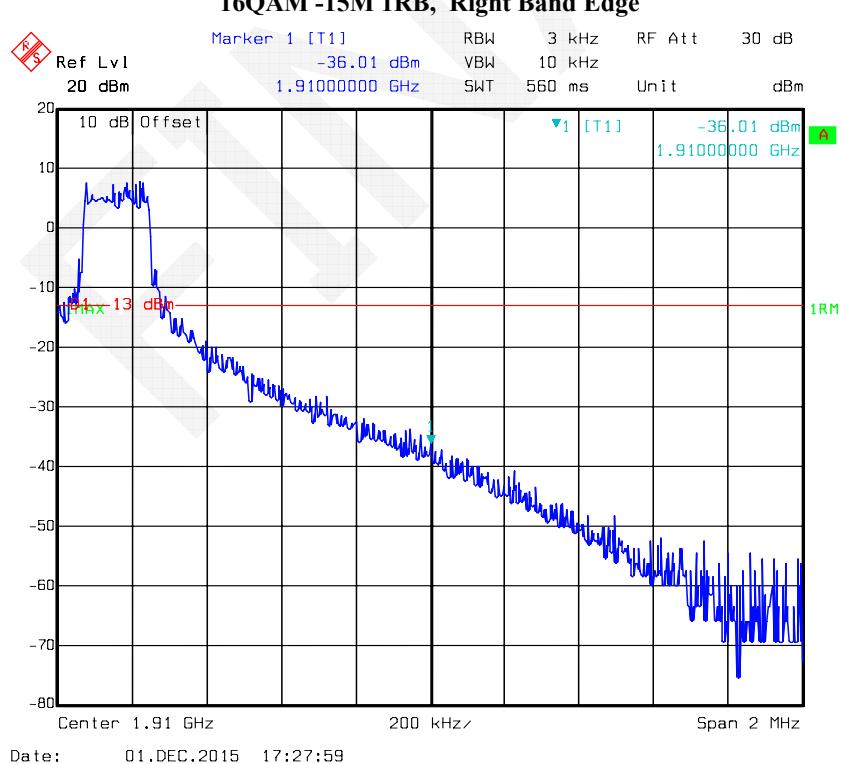
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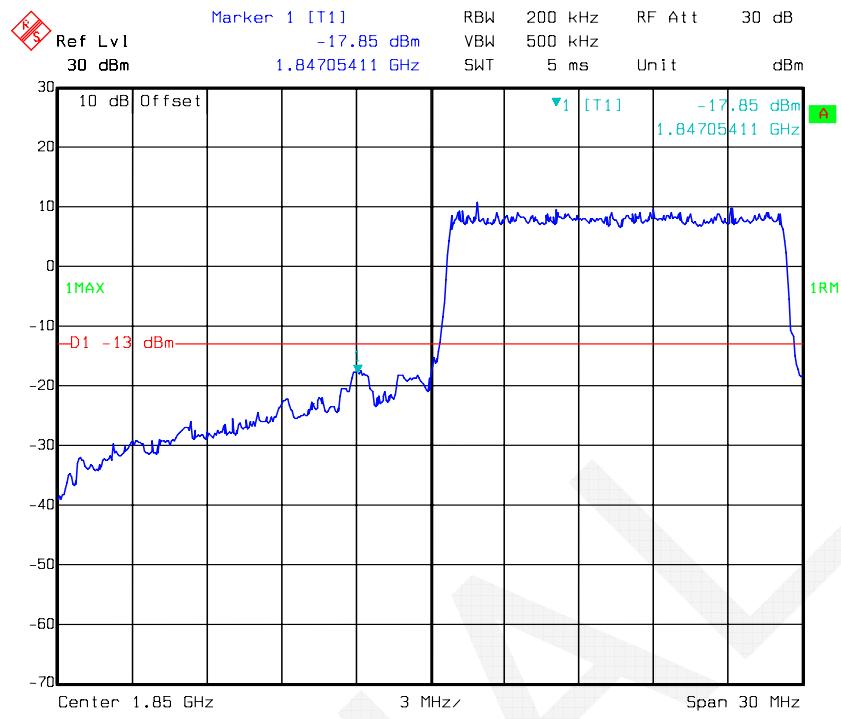
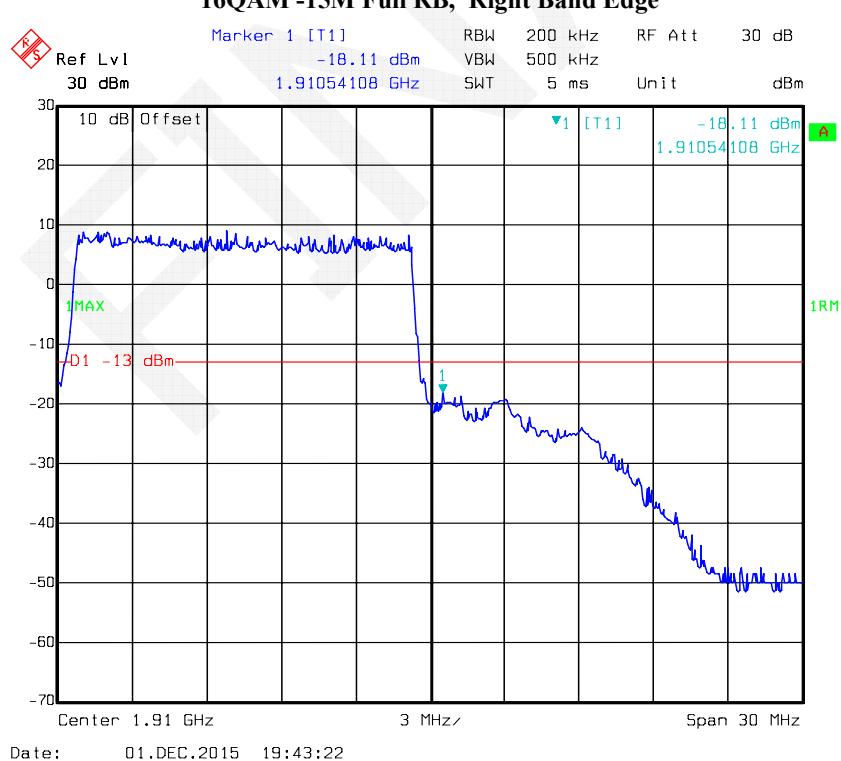
**16QAM -10M Full RB, Left Band Edge**

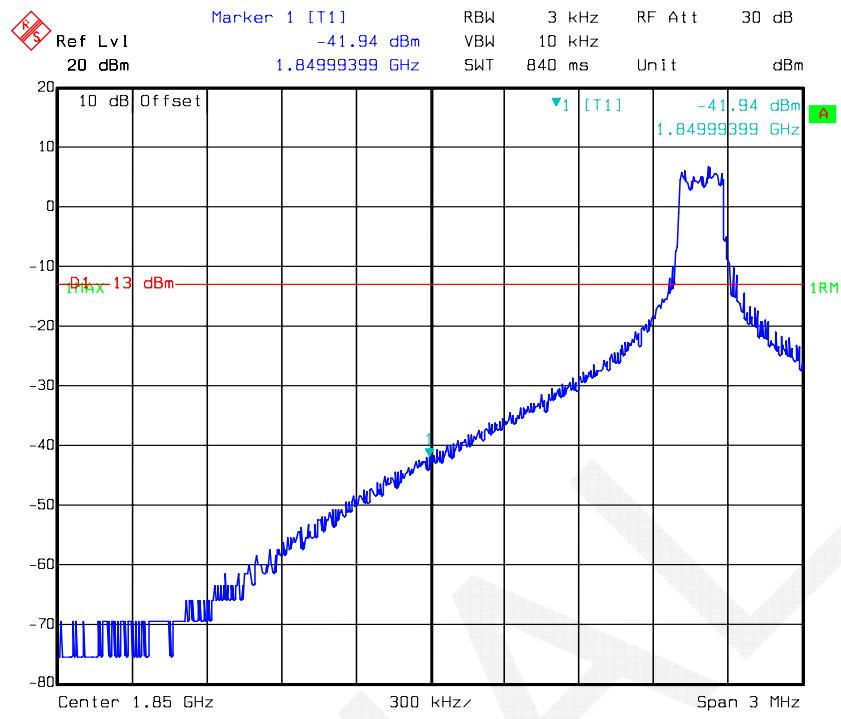
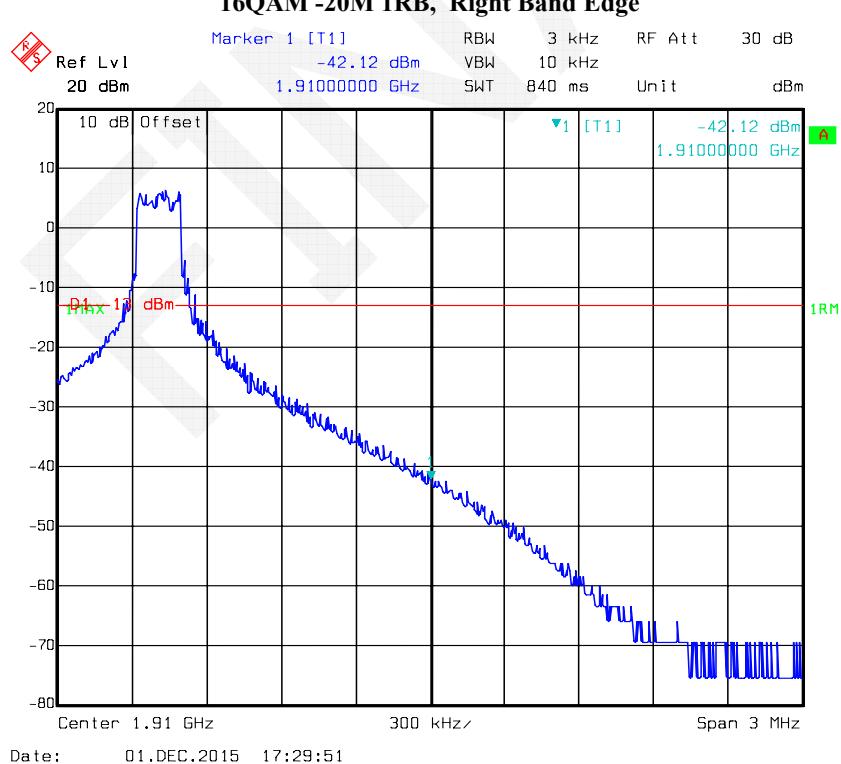
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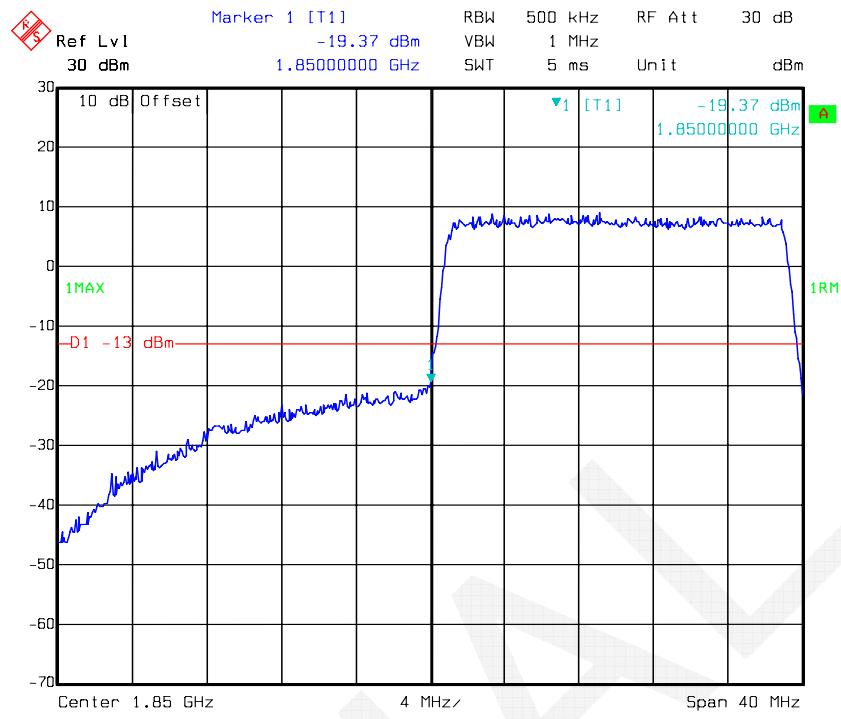
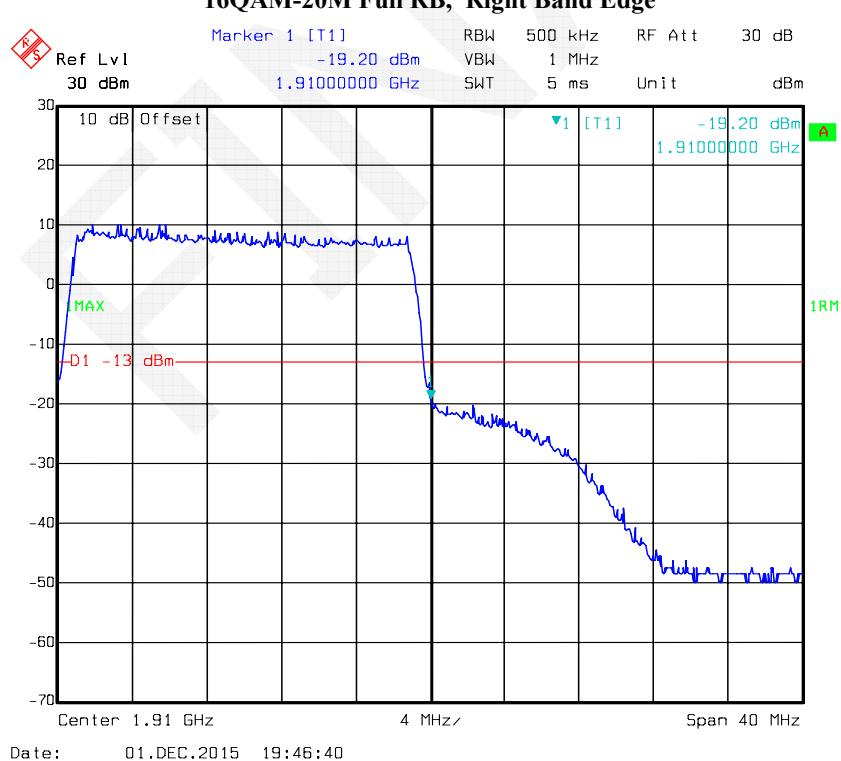
**16QAM -10M Full RB, Right Band Edge**

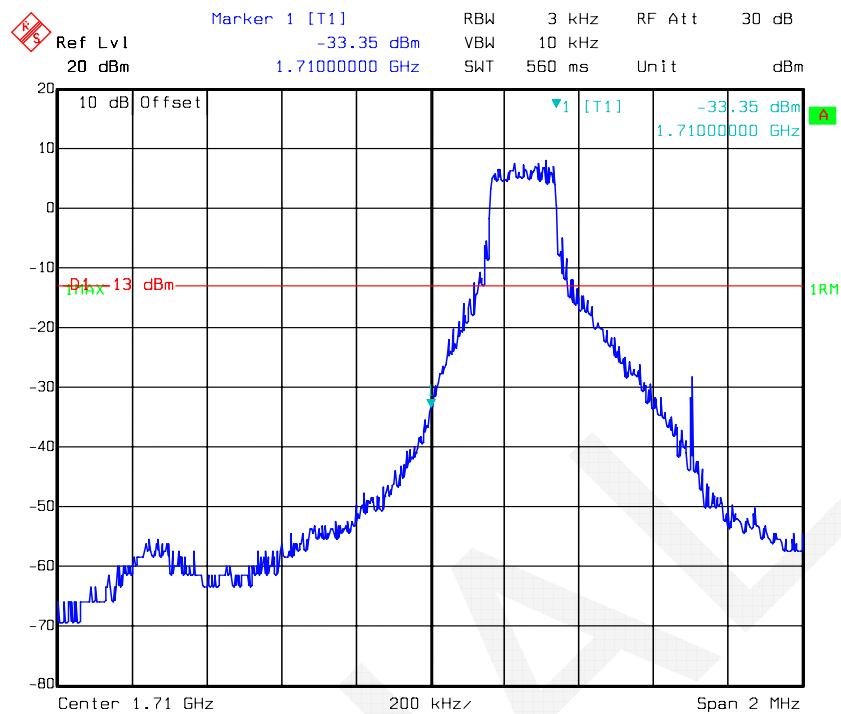
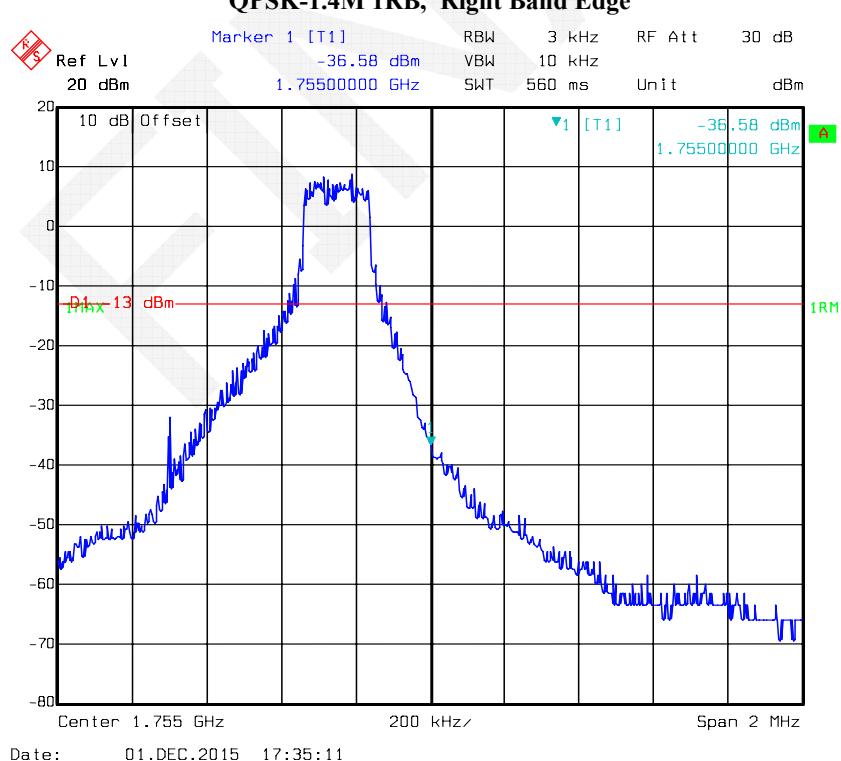
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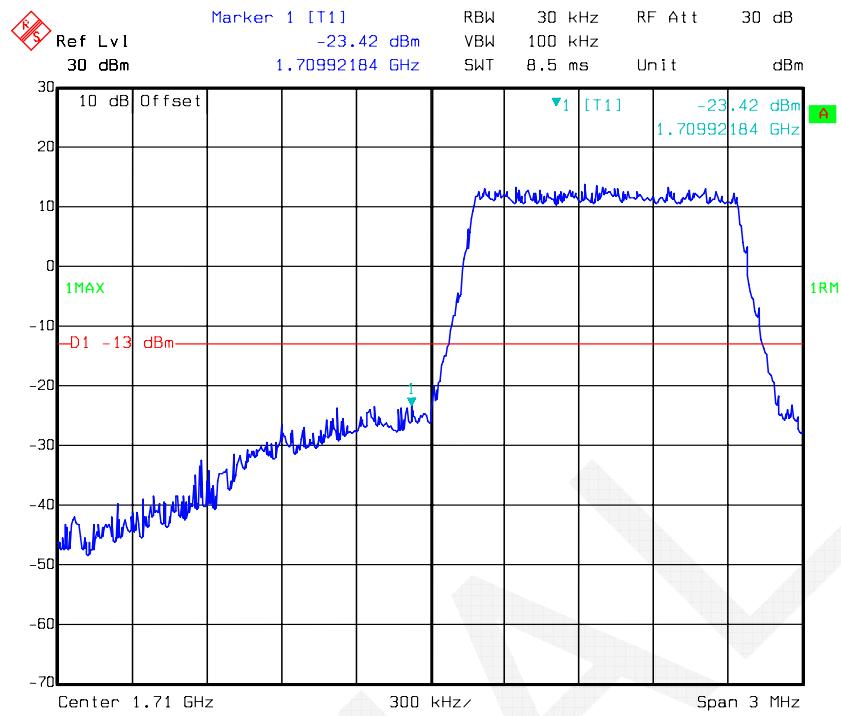
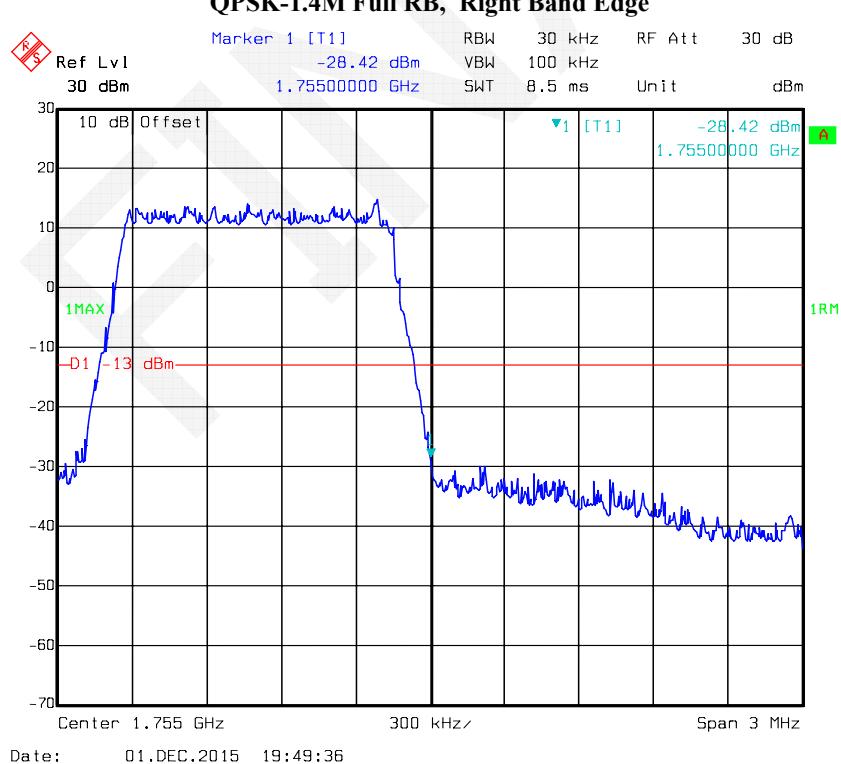
**16QAM -15M 1RB, Left Band Edge****16QAM -15M 1RB, Right Band Edge**

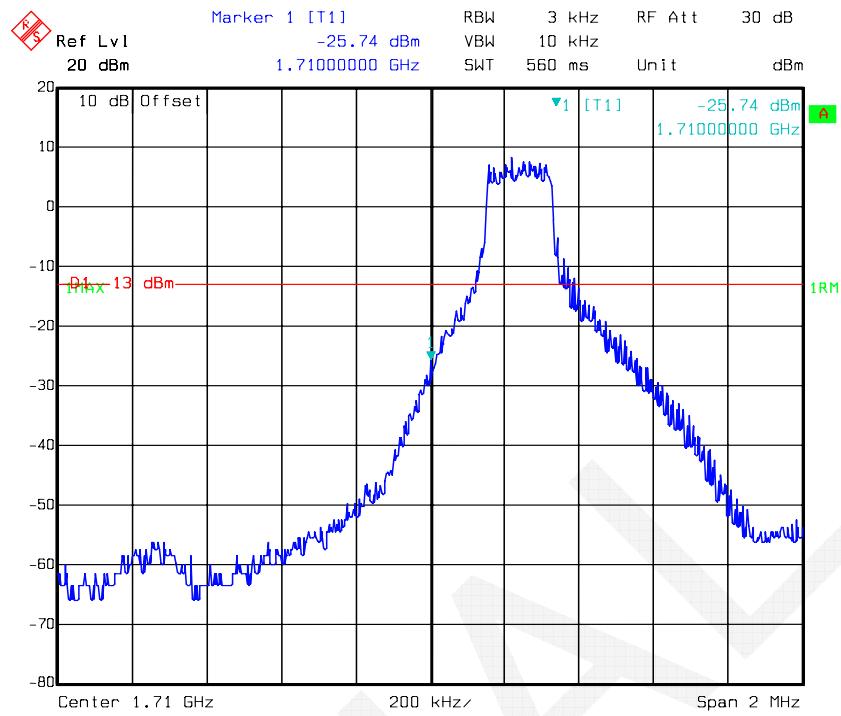
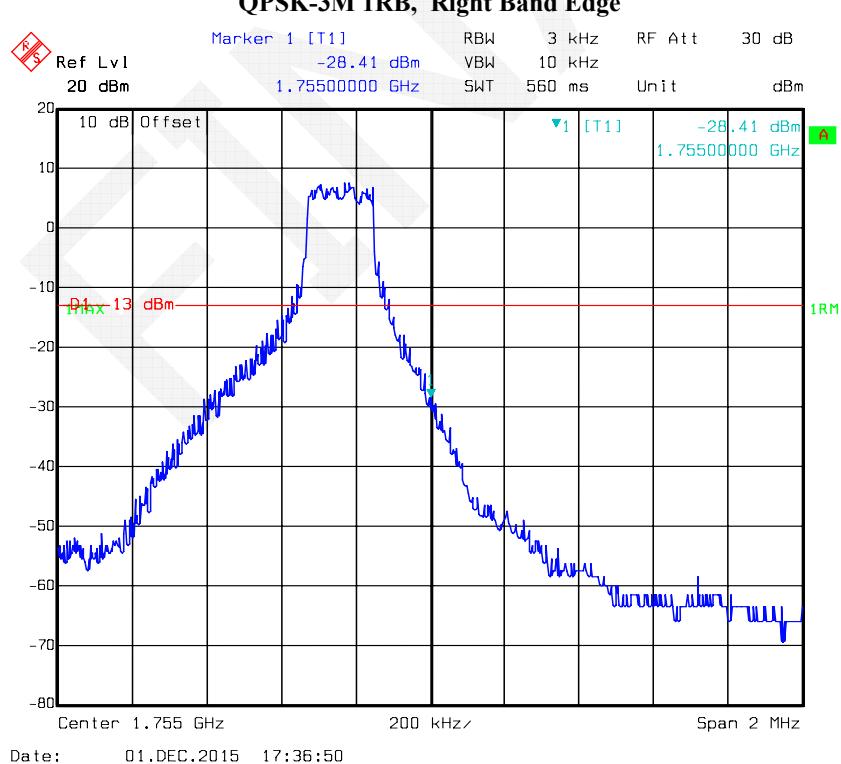
**16QAM -15M Full RB, Left Band Edge****16QAM -15M Full RB, Right Band Edge**

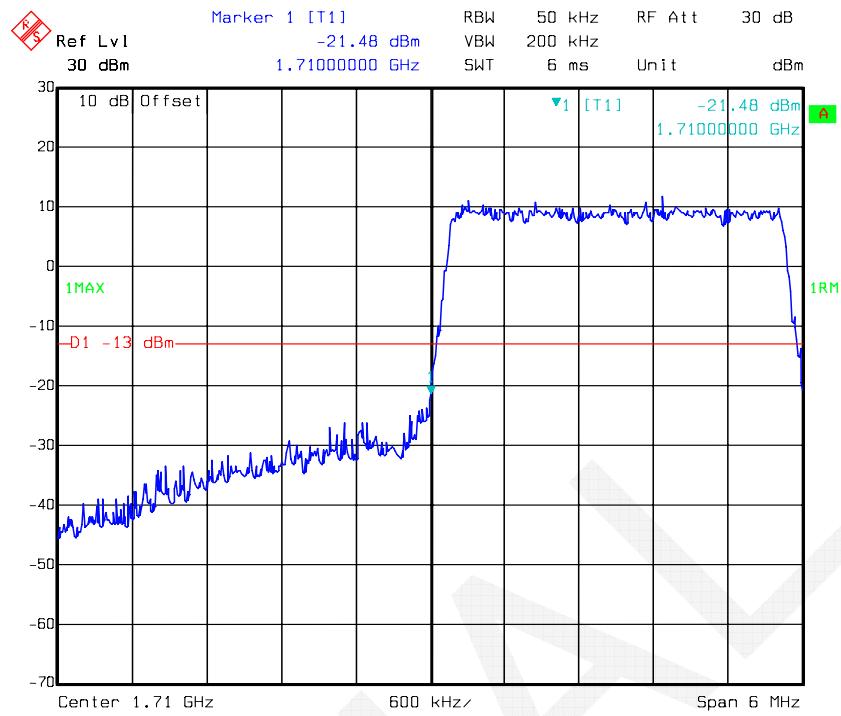
**16QAM -20M 1RB, Left Band Edge****16QAM -20M 1RB, Right Band Edge**

**16QAM -20M Full RB, Left Band Edge****16QAM-20M Full RB, Right Band Edge**

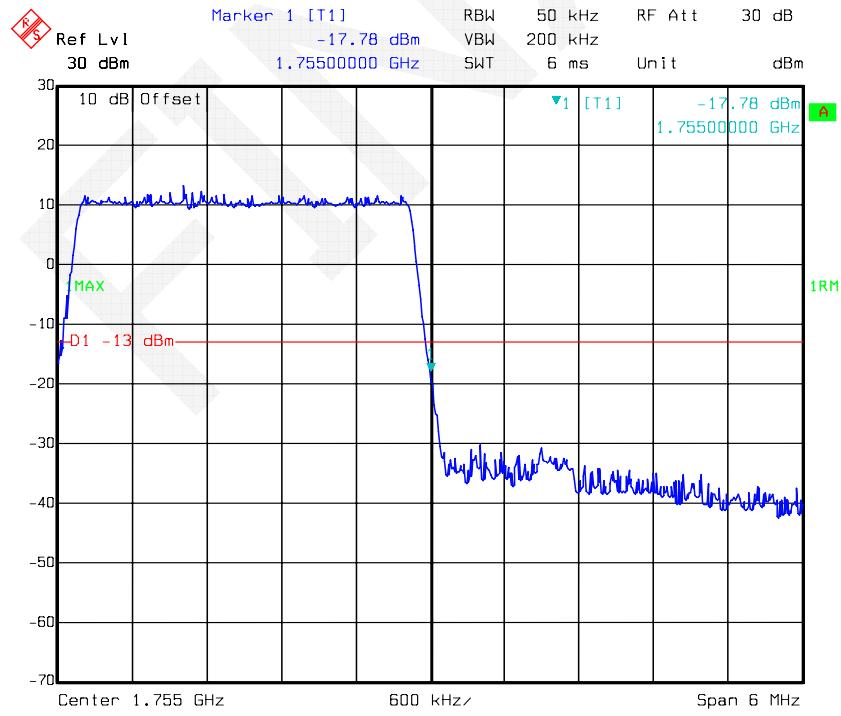
**LTE Band 4:****QPSK-1.4M 1RB, Left Band Edge****QPSK-1.4M 1RB, Right Band Edge**

**QPSK-1.4M Full RB, Left Band Edge****QPSK-1.4M Full RB, Right Band Edge**

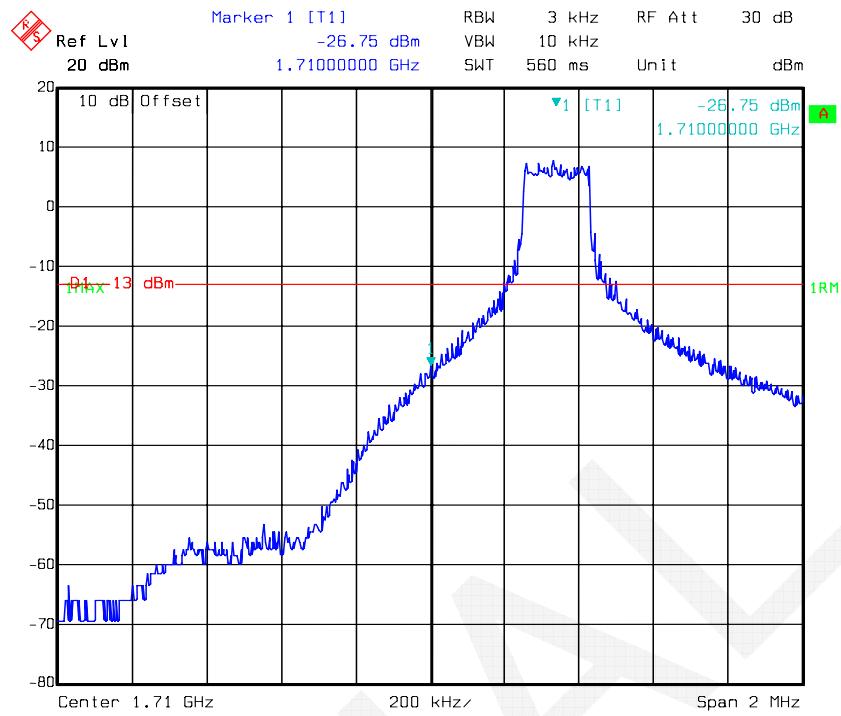
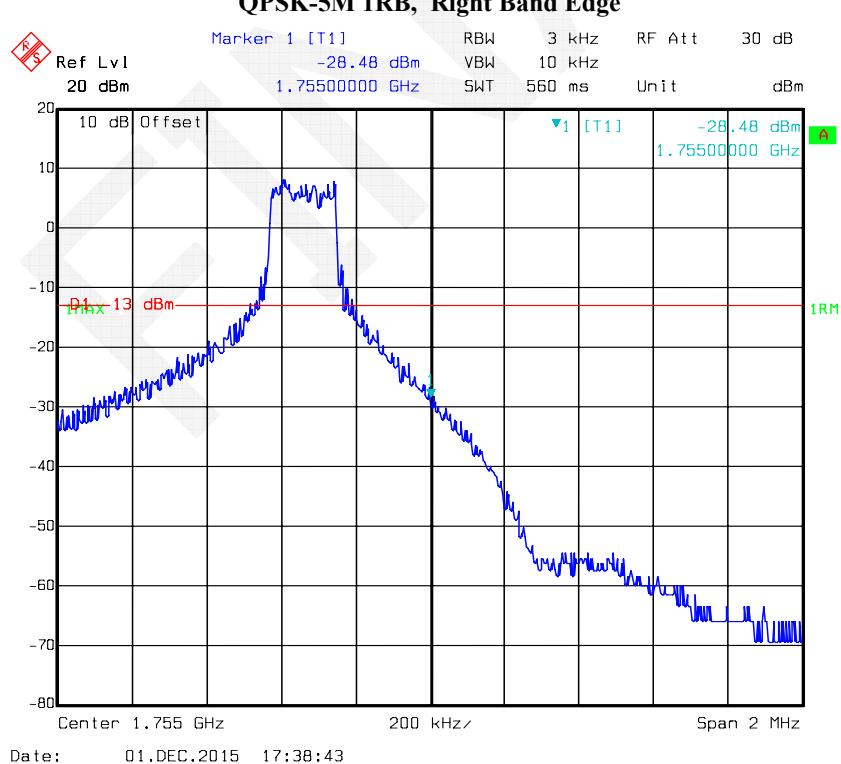
**QPSK-3M 1RB, Left Band Edge****QPSK-3M 1RB, Right Band Edge**

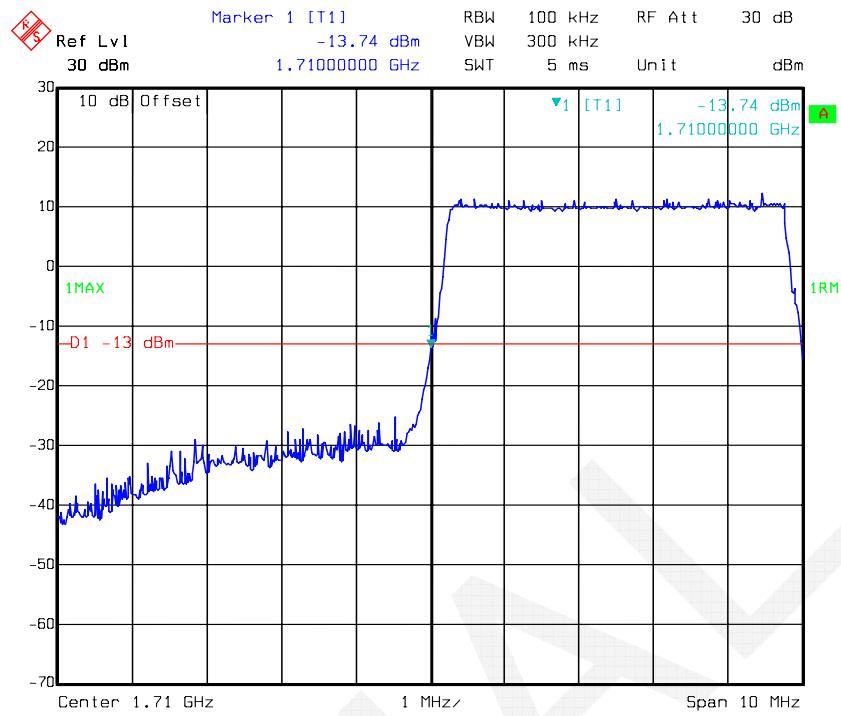
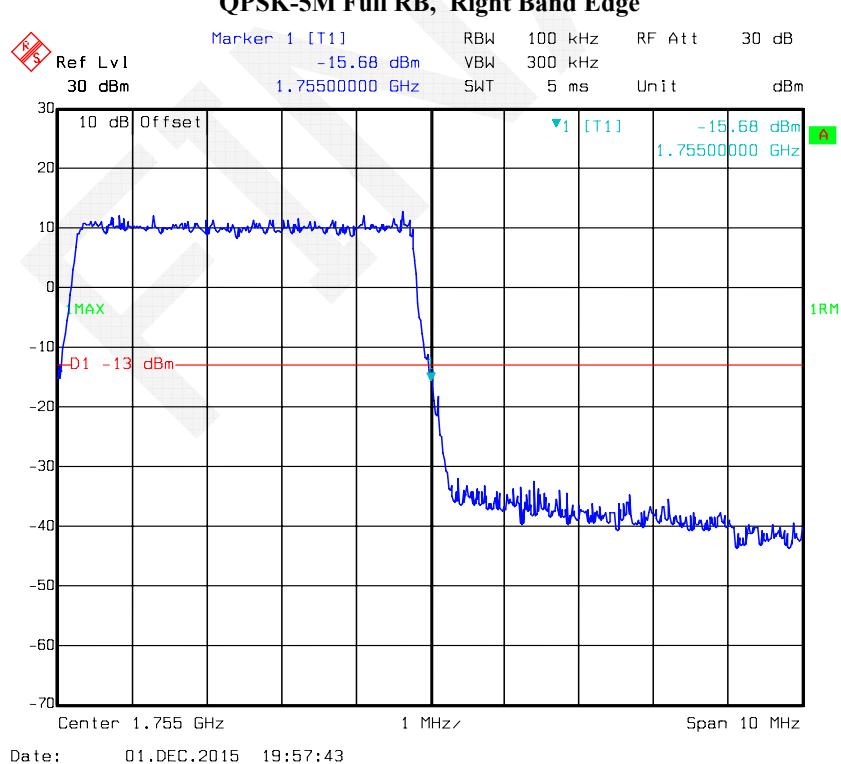
**QPSK-3M Full RB, Left Band Edge**

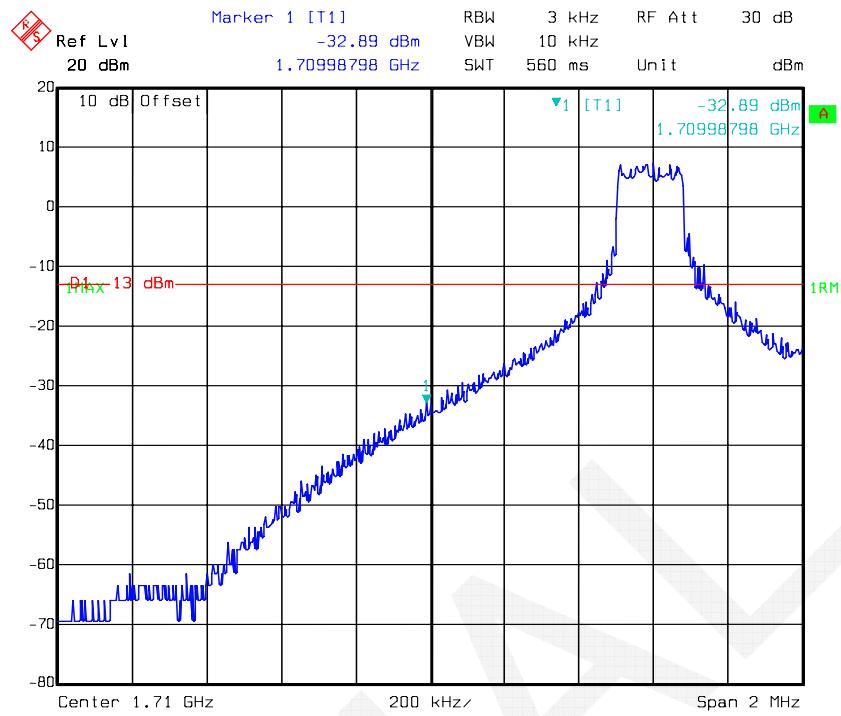
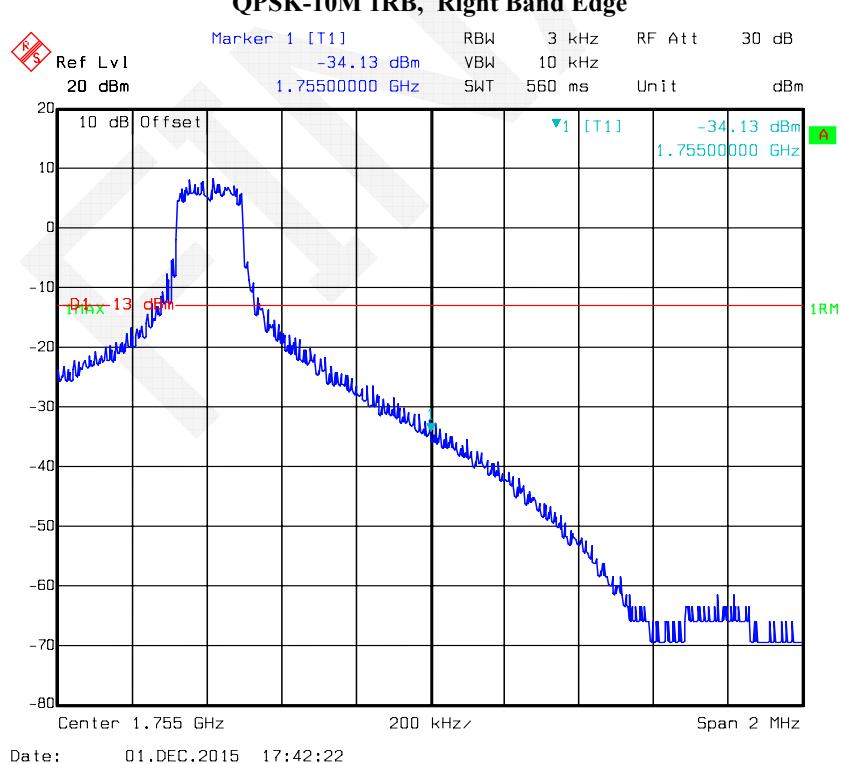
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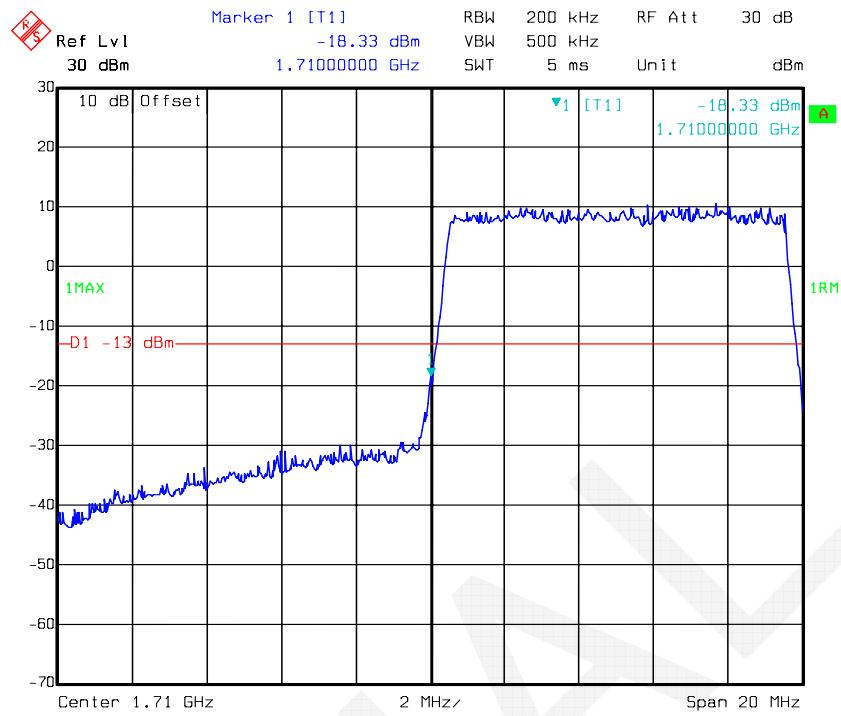
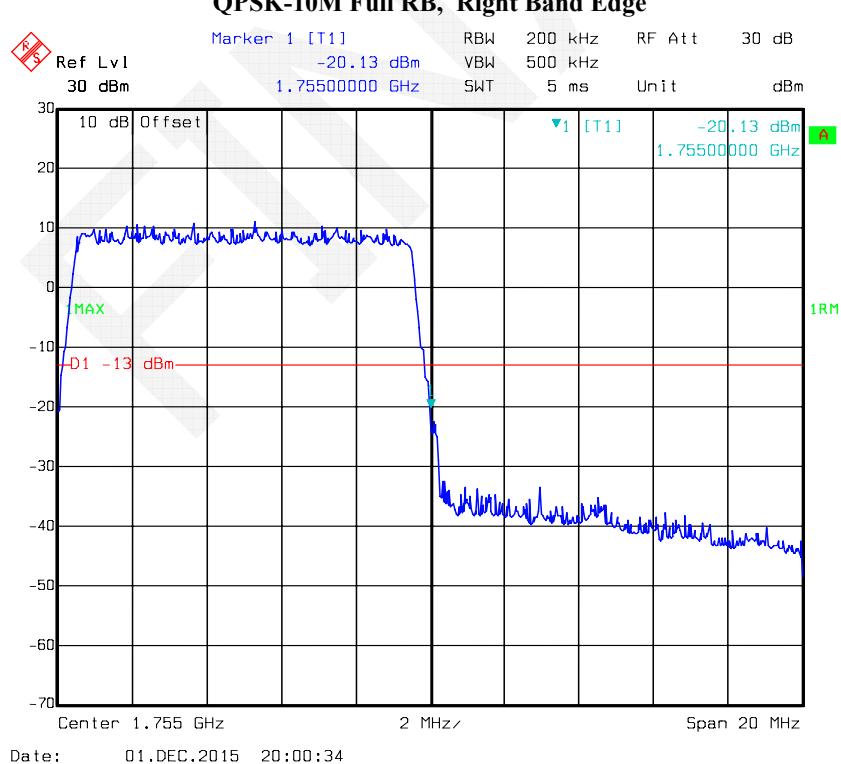
**QPSK-3M Full RB, Right Band Edge**

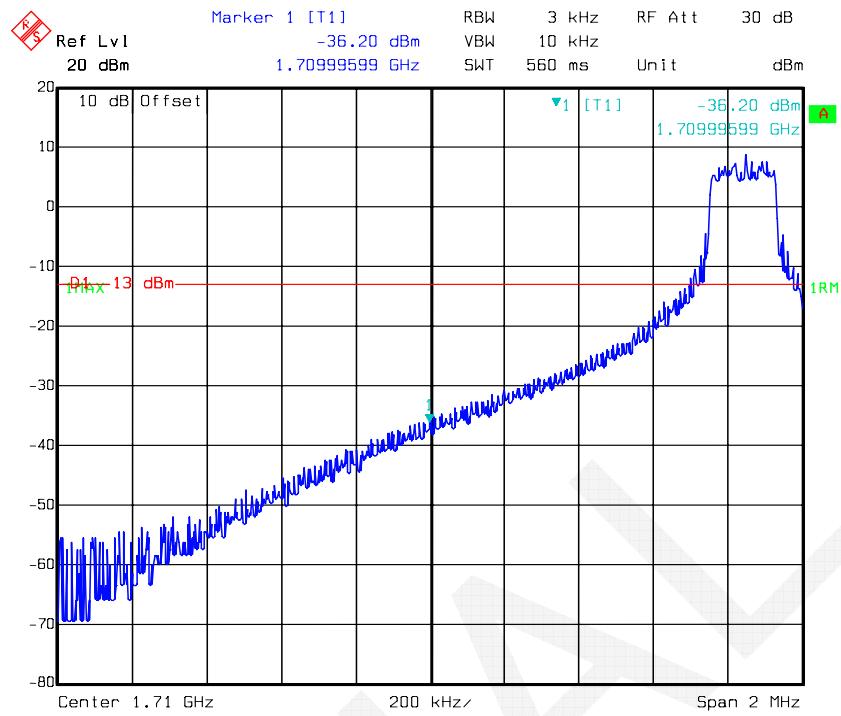
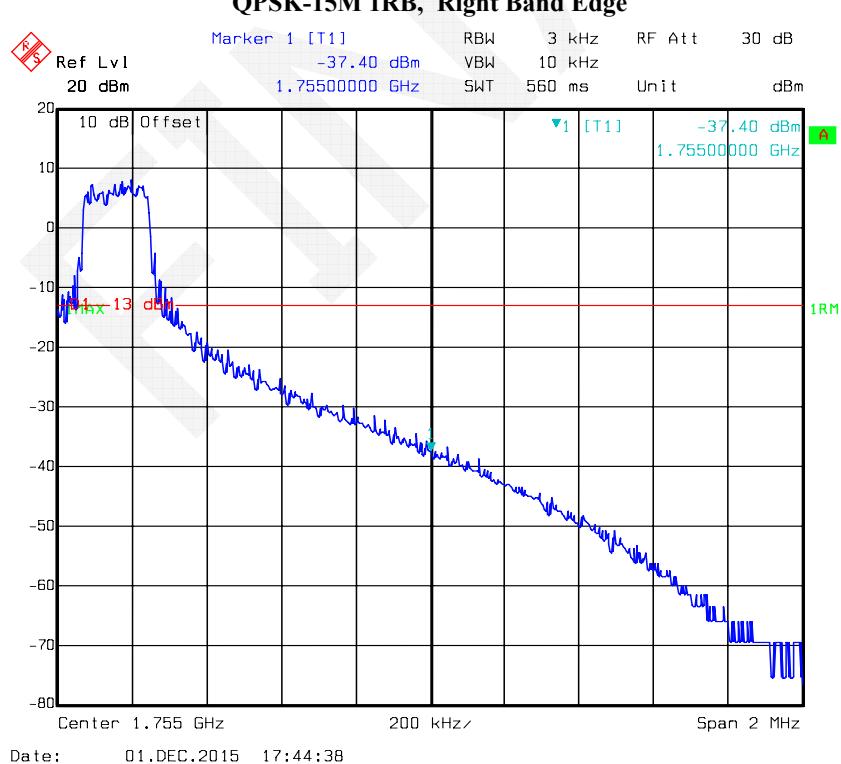
Date: 01.DEC.2015 19:53:05

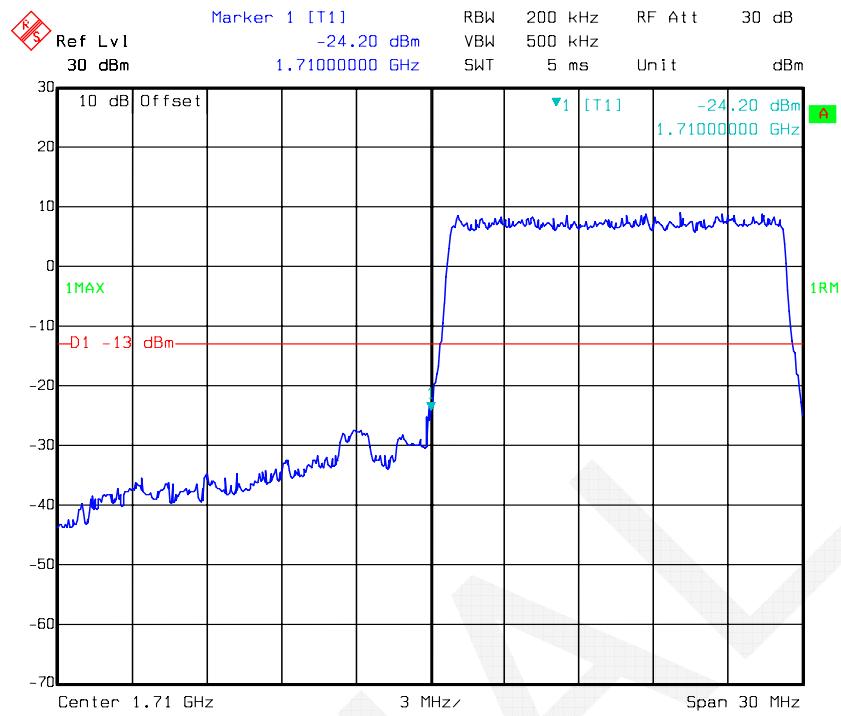
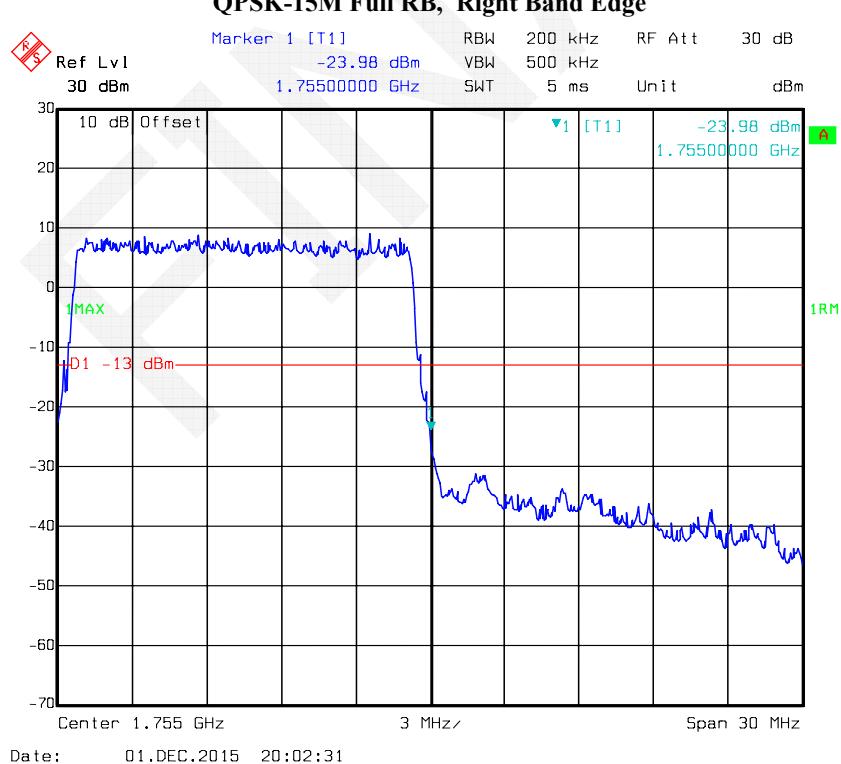
**QPSK-5M 1RB, Left Band Edge****QPSK-5M 1RB, Right Band Edge**

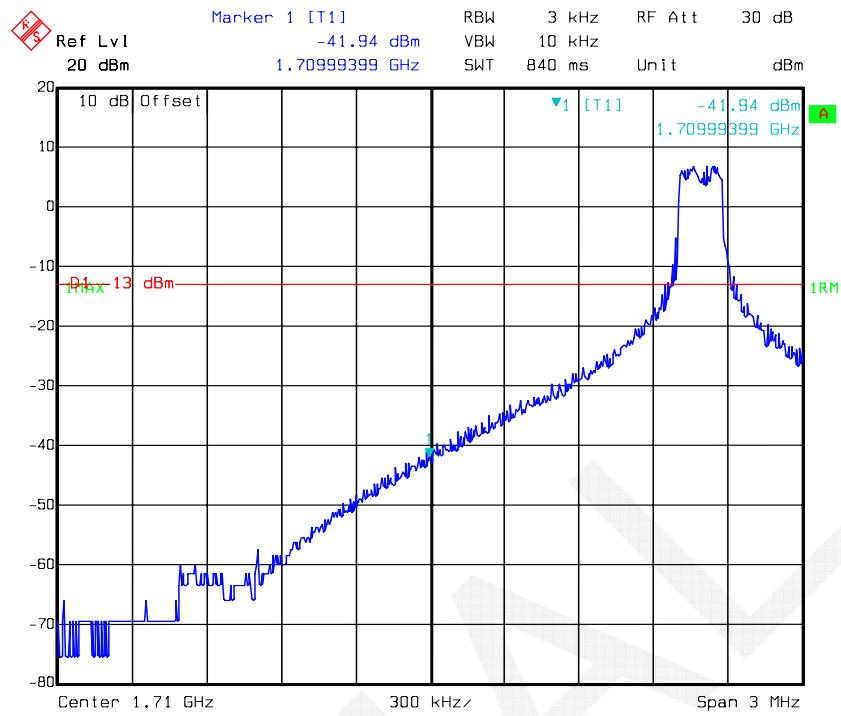
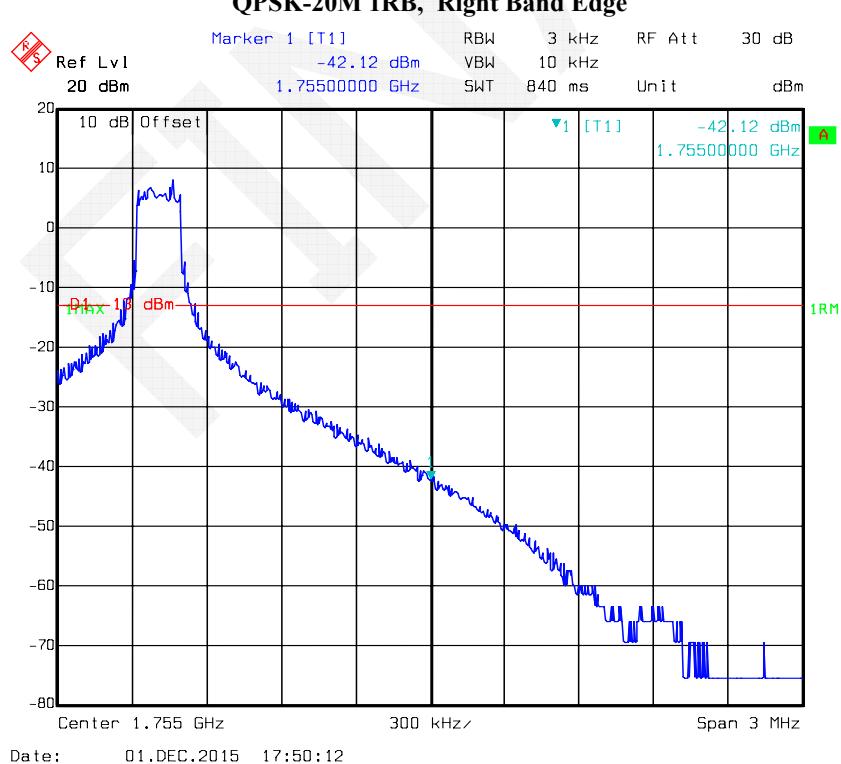
**QPSK-5M Full RB, Left Band Edge****QPSK-5M Full RB, Right Band Edge**

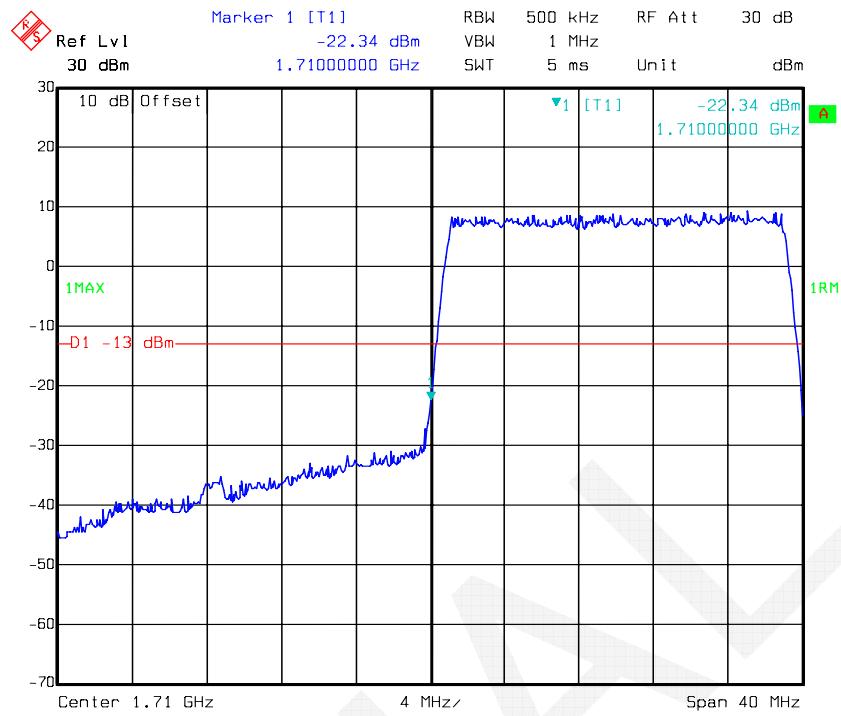
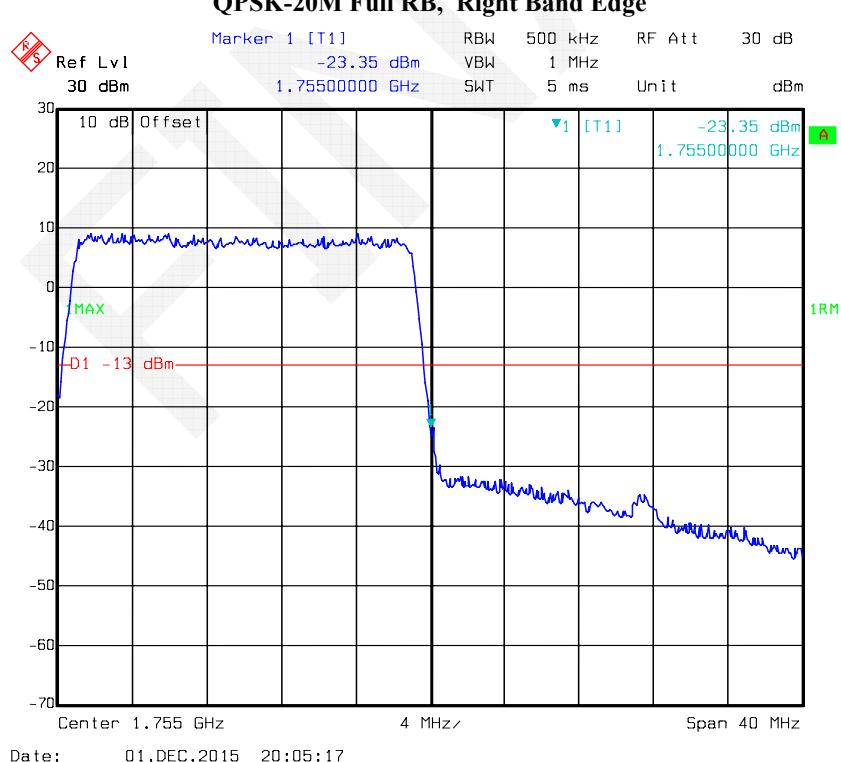
**QPSK-10M 1RB, Left Band Edge****QPSK-10M 1RB, Right Band Edge**

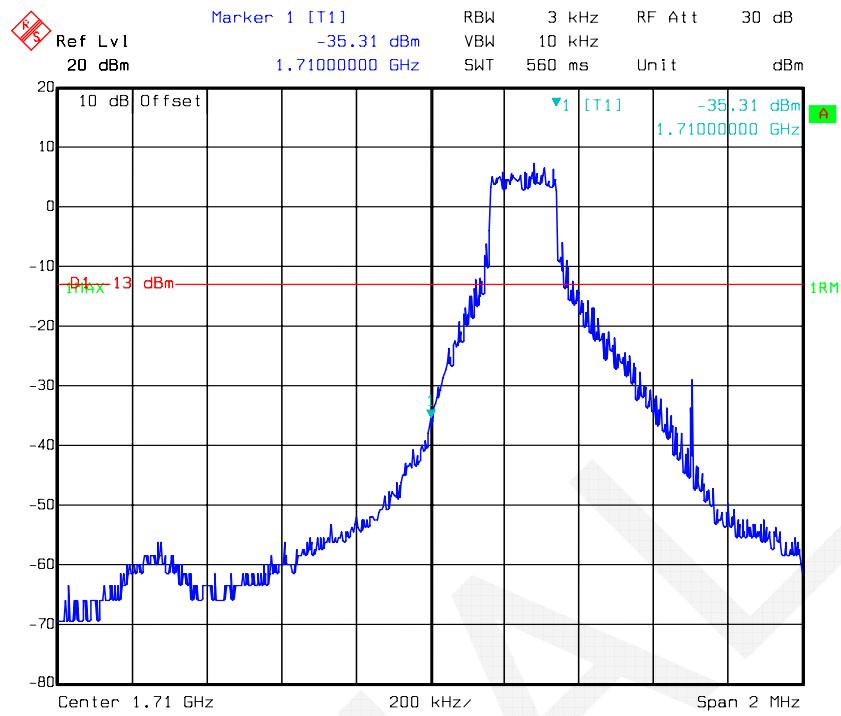
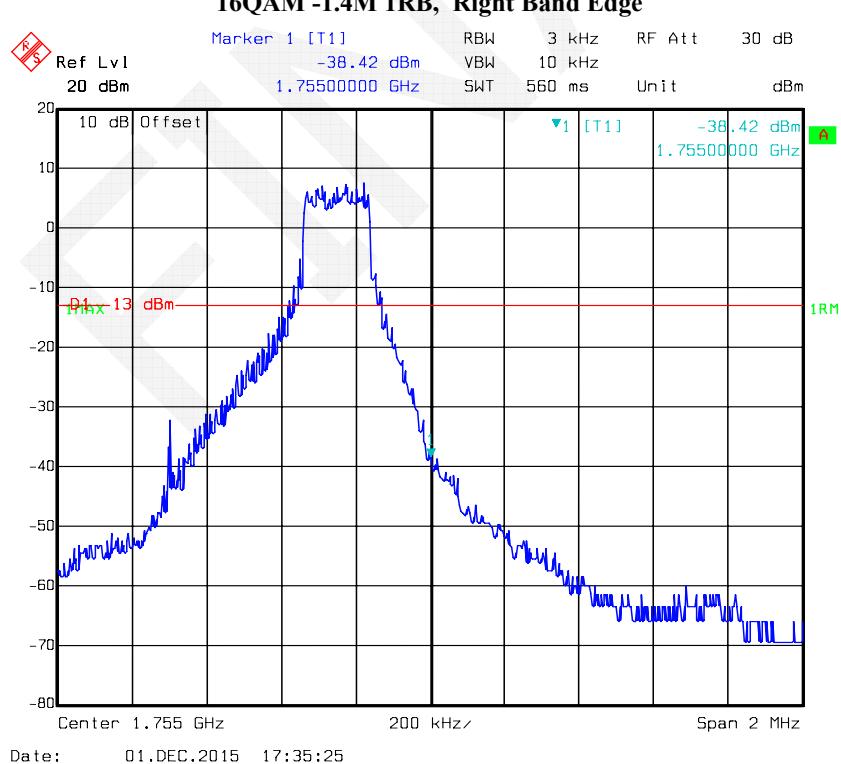
**QPSK-10M Full RB, Left Band Edge****QPSK-10M Full RB, Right Band Edge**

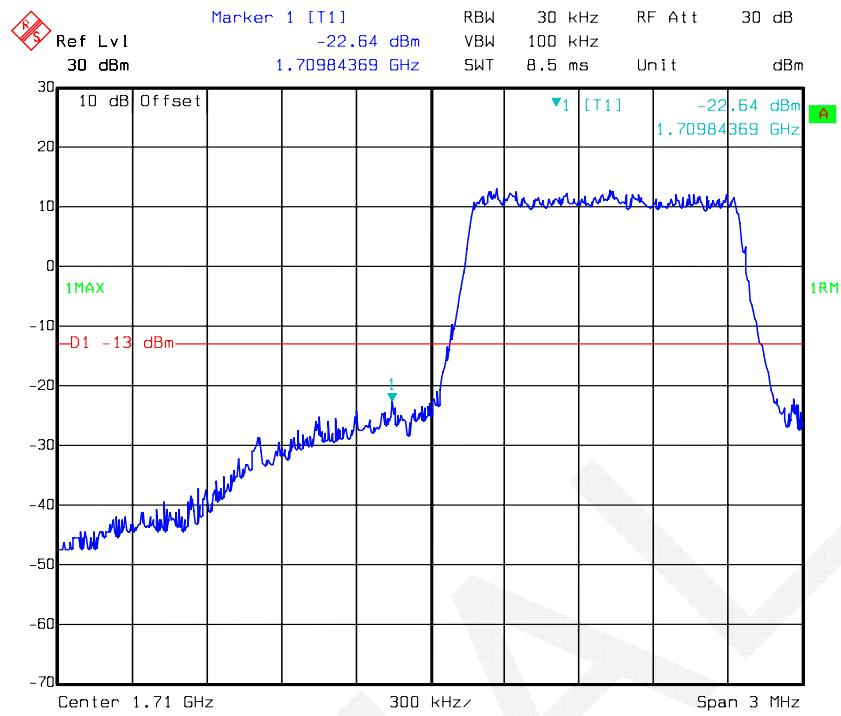
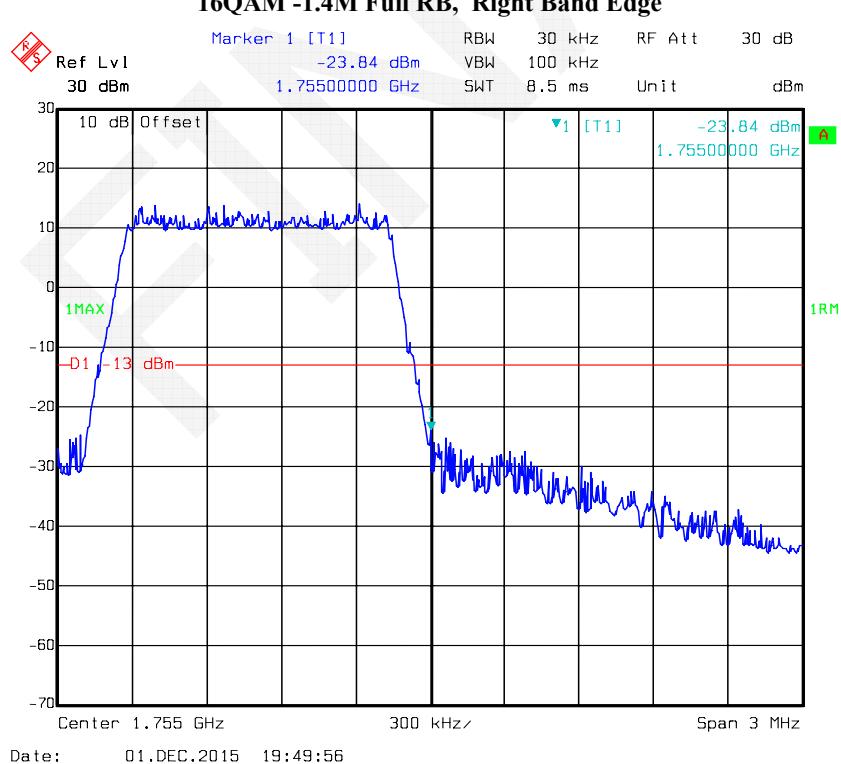
**QPSK-15M 1RB, Left Band Edge****QPSK-15M 1RB, Right Band Edge**

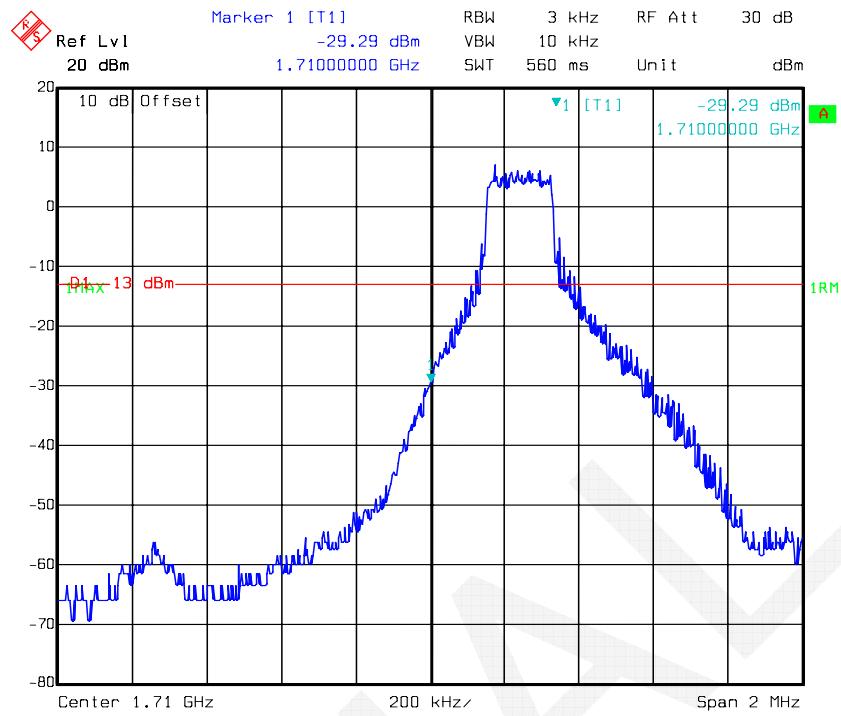
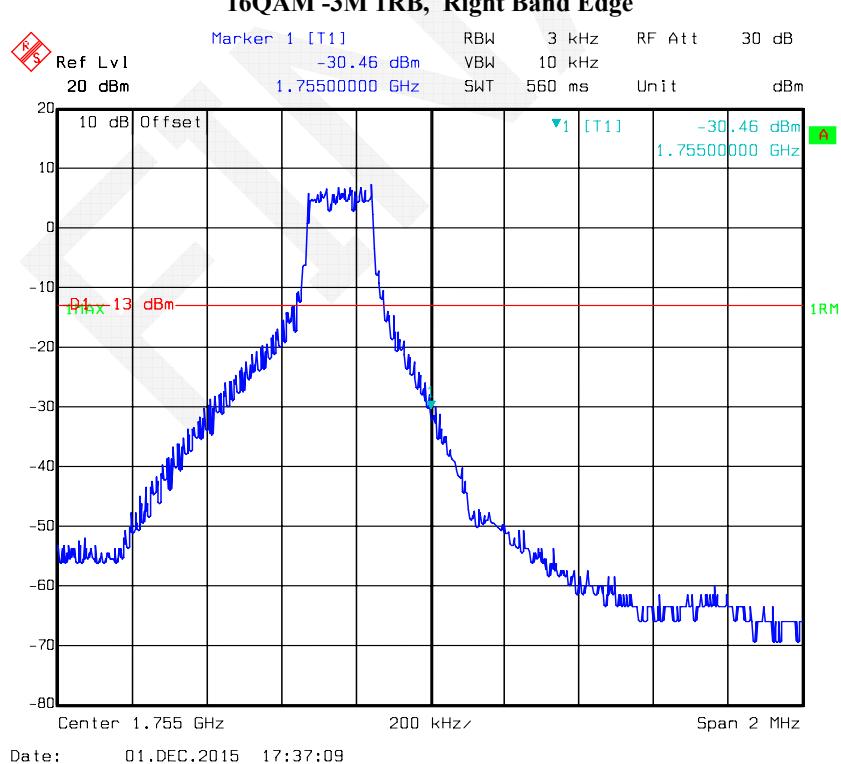
**QPSK-15M Full RB, Left Band Edge****QPSK-15M Full RB, Right Band Edge**

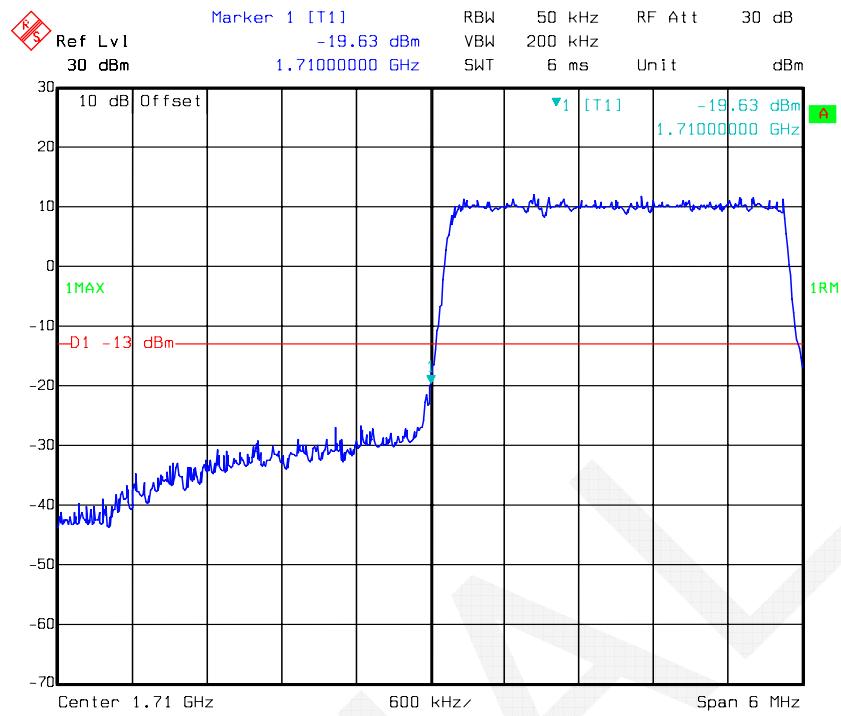
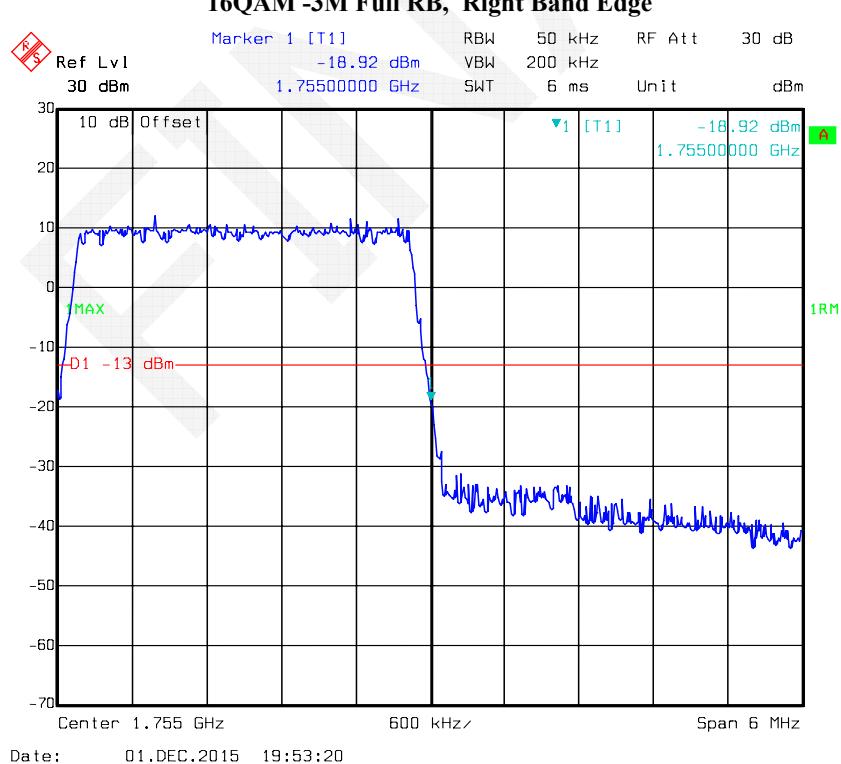
**QPSK-20M 1RB, Left Band Edge****QPSK-20M 1RB, Right Band Edge**

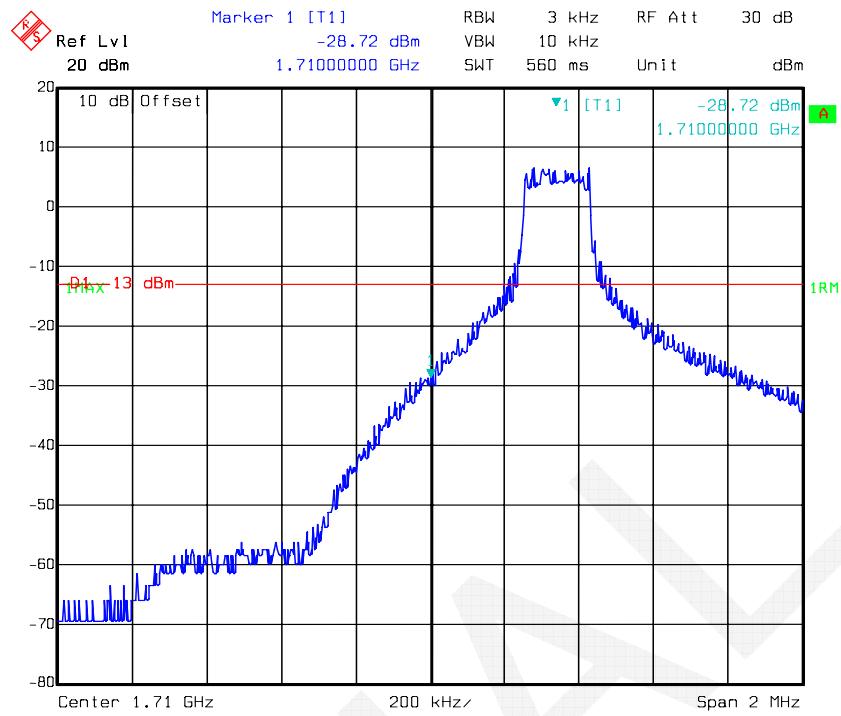
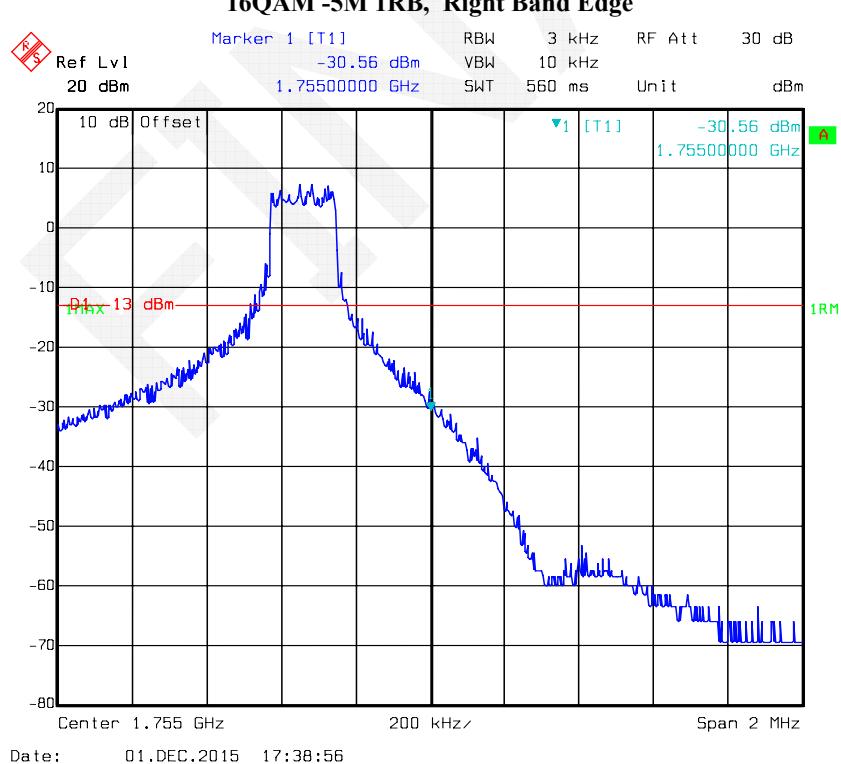
**QPSK-20M Full RB, Left Band Edge****QPSK-20M Full RB, Right Band Edge**

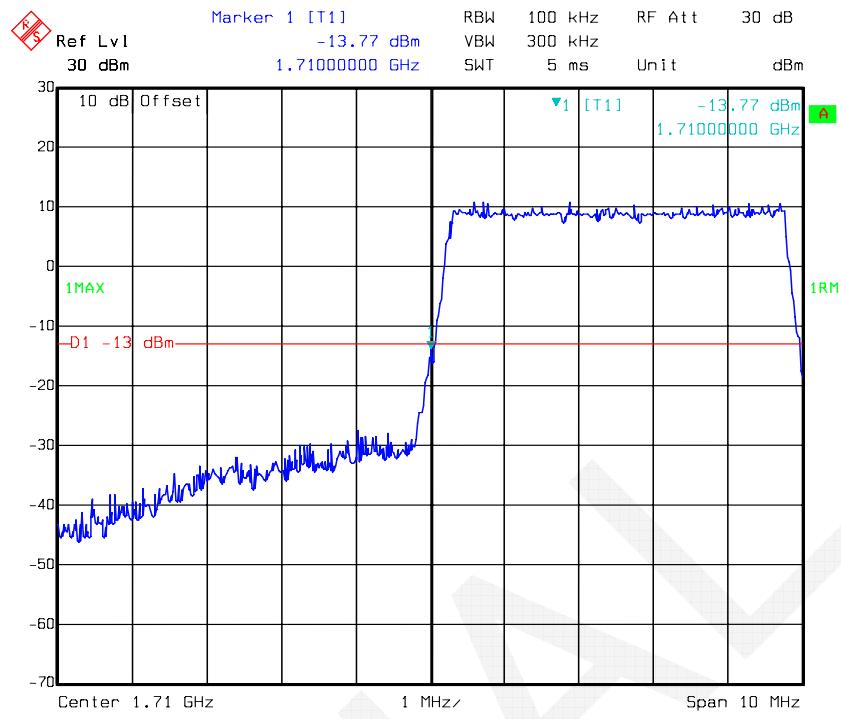
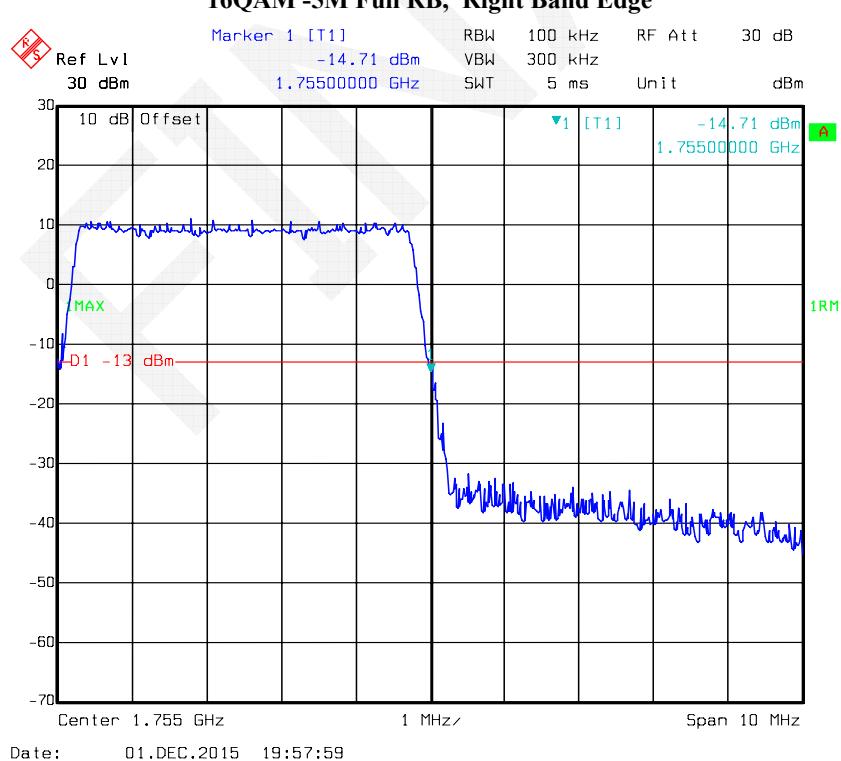
**16QAM -1.4M 1RB, Left Band Edge****16QAM -1.4M 1RB, Right Band Edge**

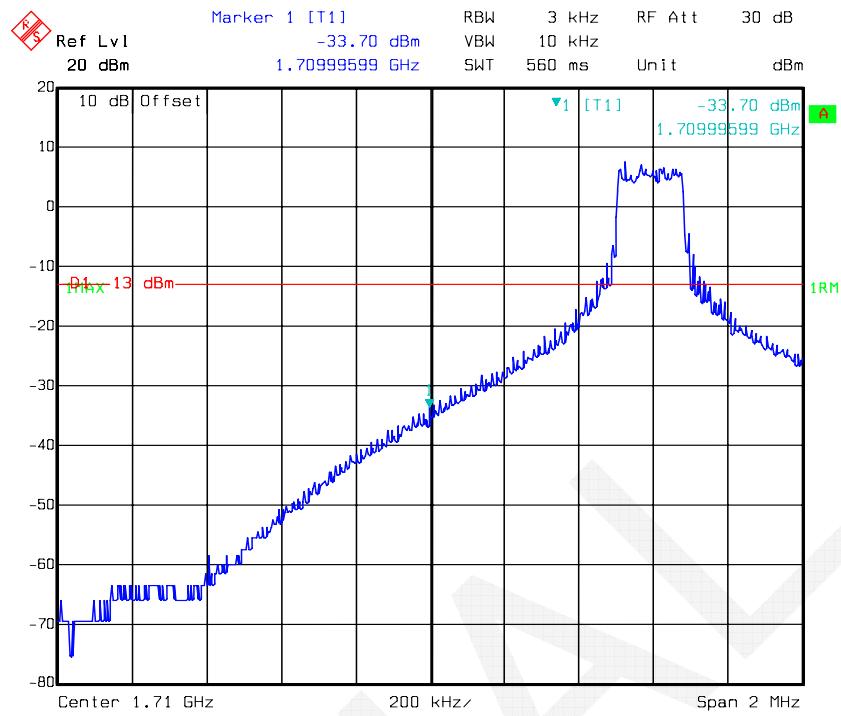
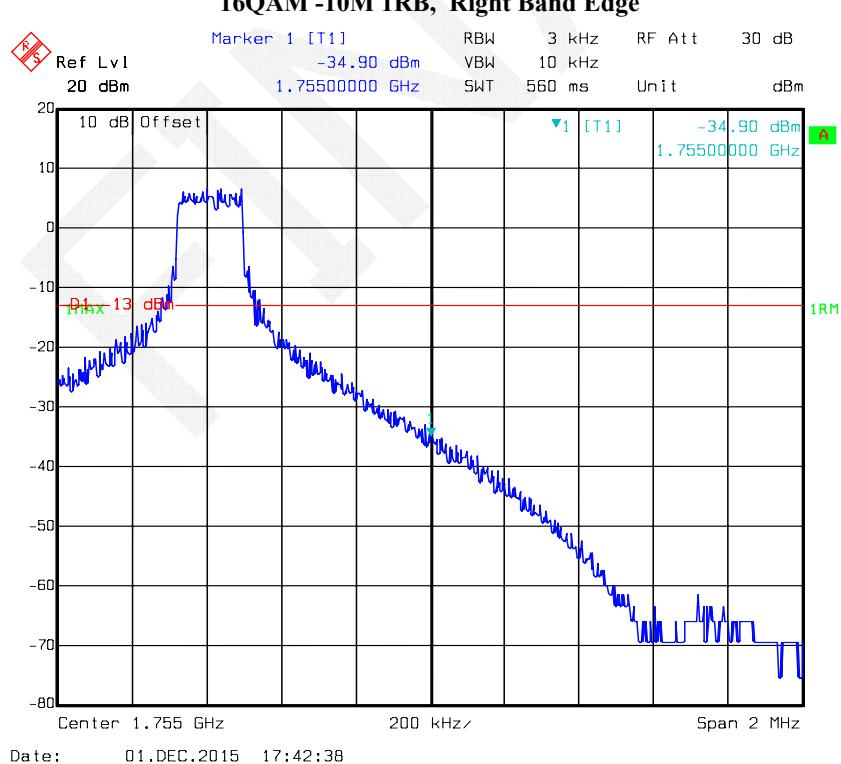
**16QAM -1.4M Full RB, Left Band Edge****16QAM -1.4M Full RB, Right Band Edge**

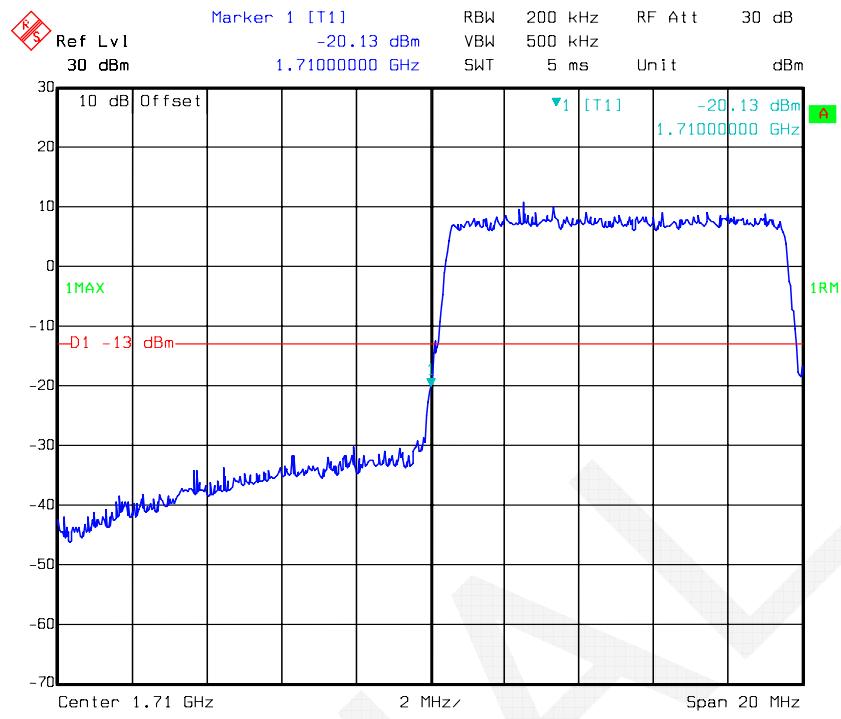
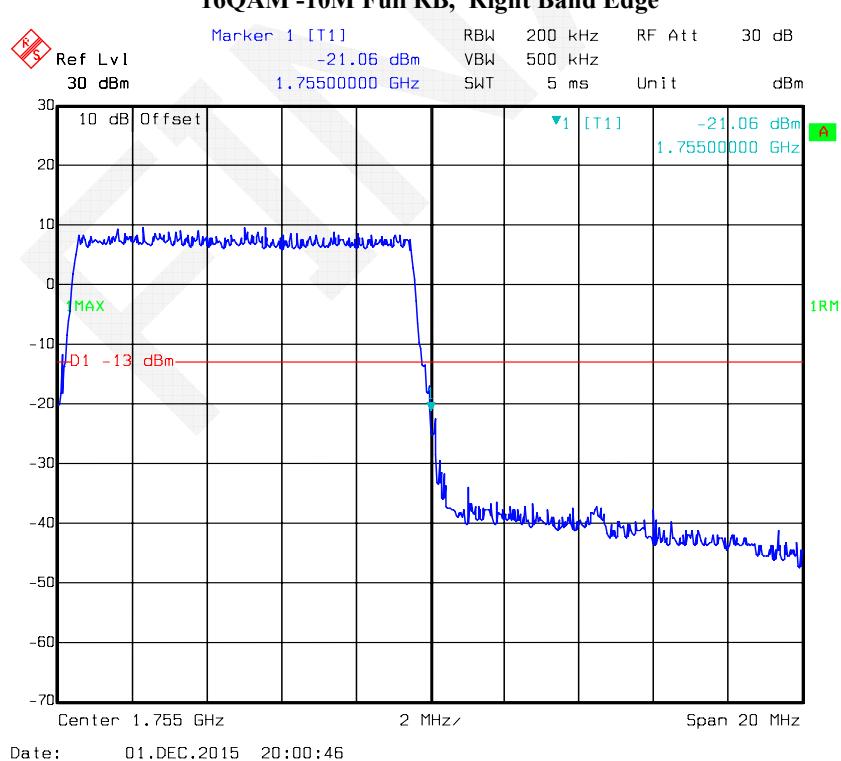
**16QAM -3M 1RB, Left Band Edge****16QAM -3M 1RB, Right Band Edge**

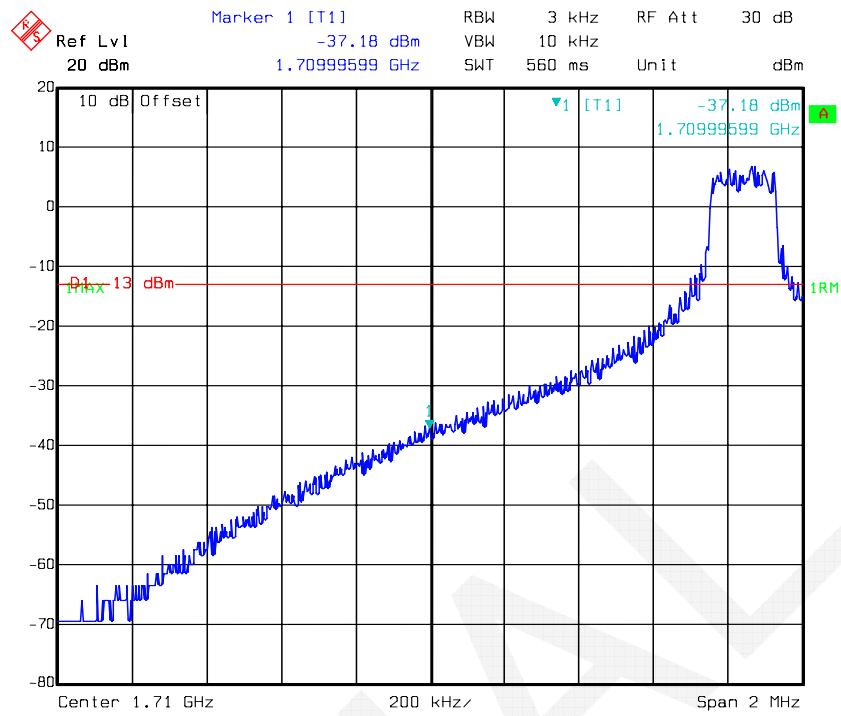
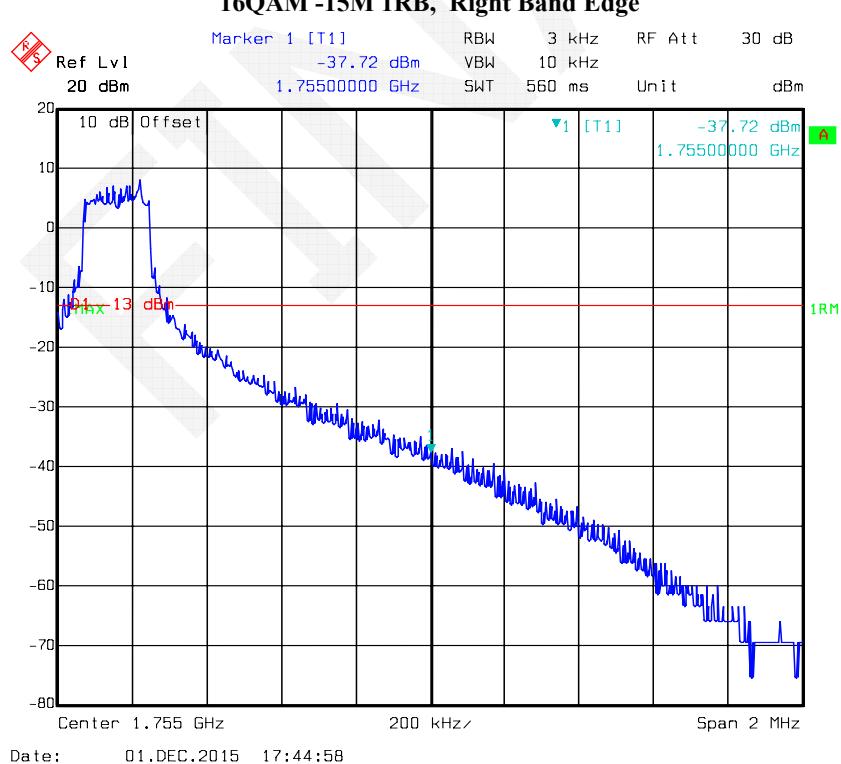
**16QAM -3M Full RB, Left Band Edge****16QAM -3M Full RB, Right Band Edge**

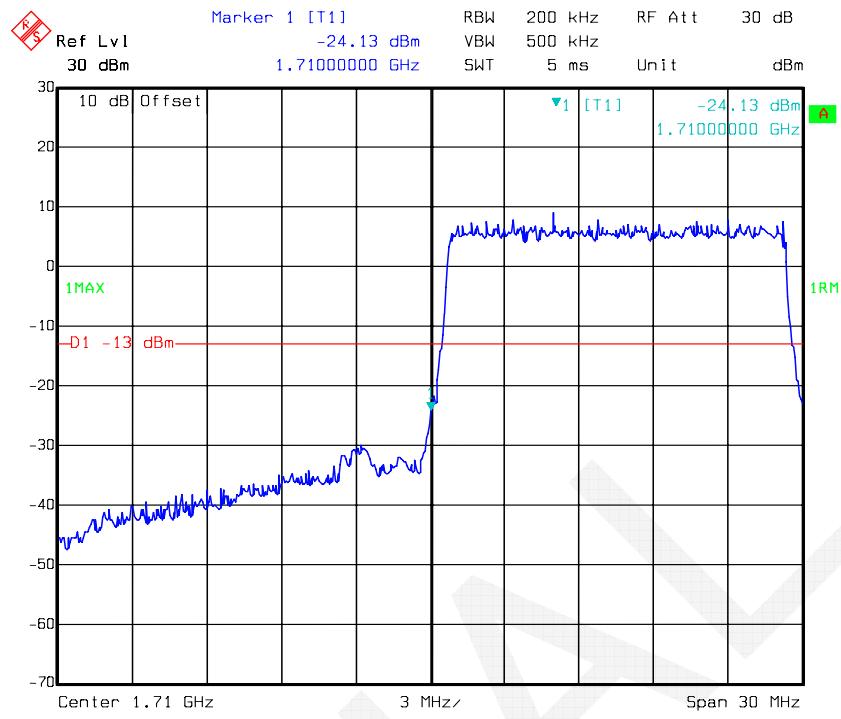
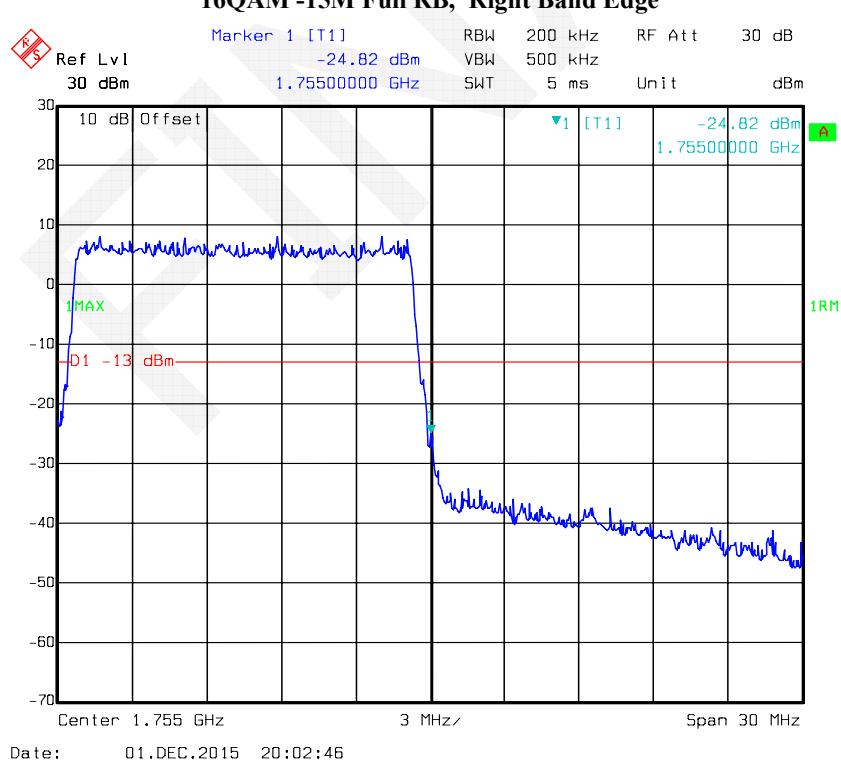
**16QAM -5M 1RB, Left Band Edge****16QAM -5M 1RB, Right Band Edge**

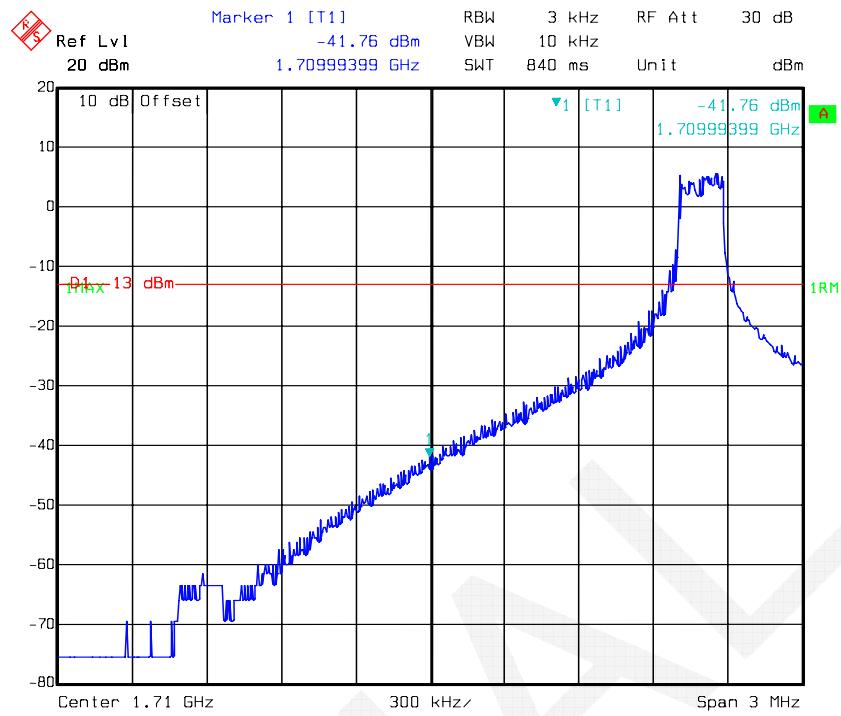
**16QAM -5M Full RB, Left Band Edge****16QAM -5M Full RB, Right Band Edge**

**16QAM -10M 1RB, Left Band Edge****16QAM -10M 1RB, Right Band Edge**

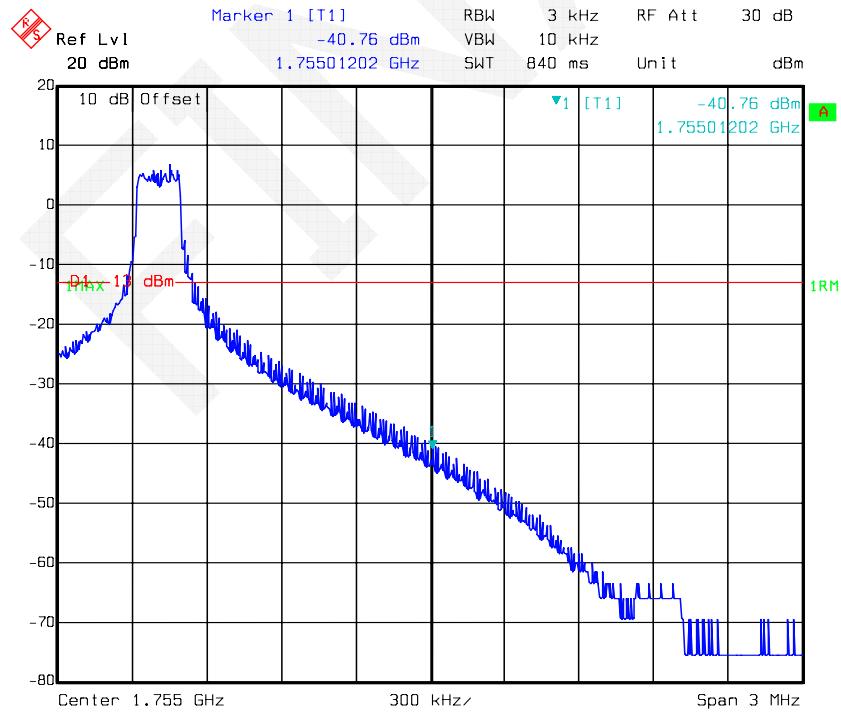
**16QAM -10M Full RB, Left Band Edge****16QAM -10M Full RB, Right Band Edge**

**16QAM -15M 1RB, Left Band Edge****16QAM -15M 1RB, Right Band Edge**

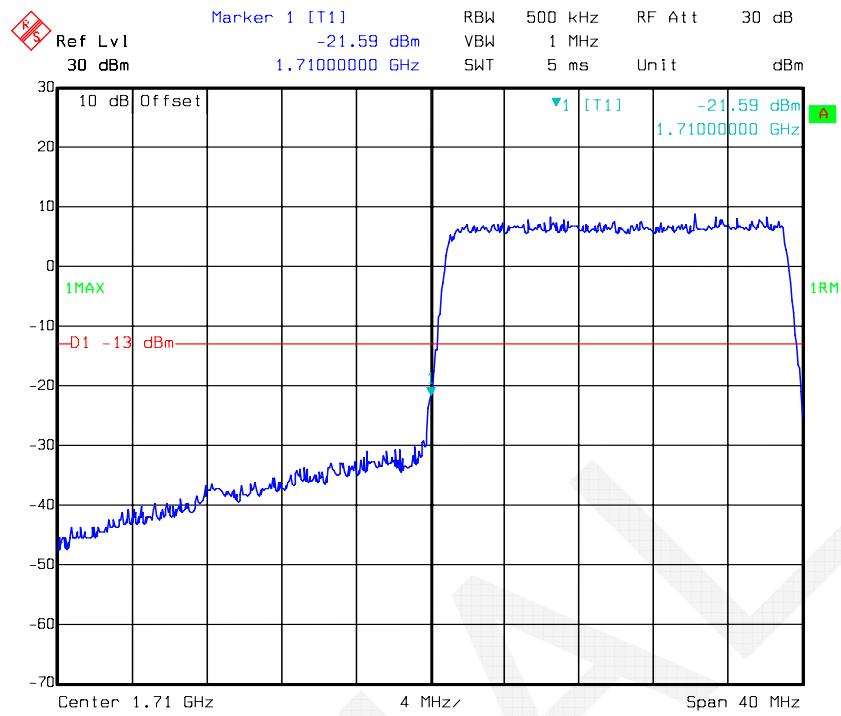
**16QAM -15M Full RB, Left Band Edge****16QAM -15M Full RB, Right Band Edge**

**16QAM -20M 1RB, Left Band Edge**

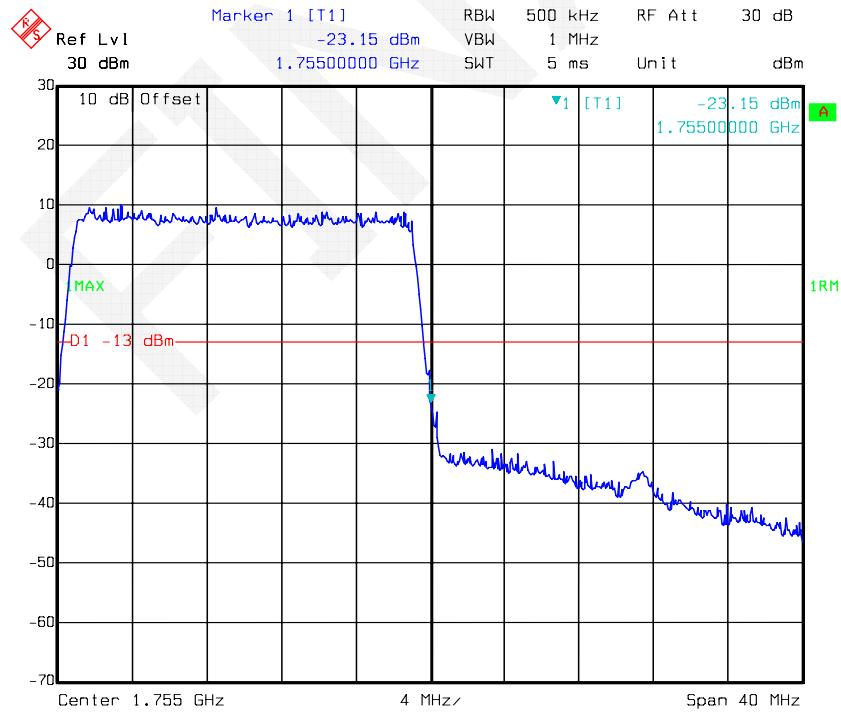
Date: 01.DEC.2015 17:49:38

**16QAM -20M 1RB, Right Band Edge**

Date: 01.DEC.2015 17:50:58

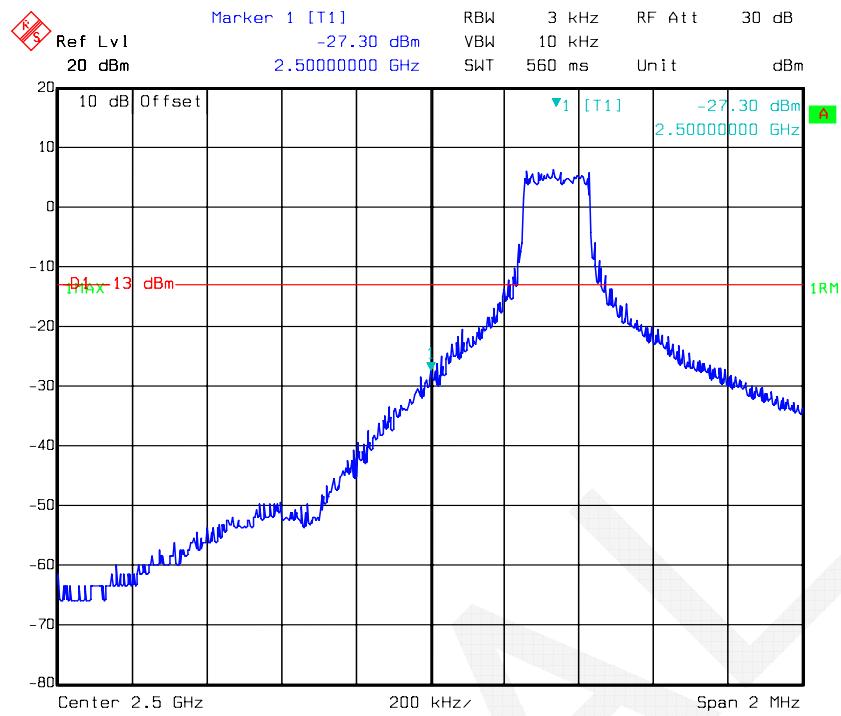
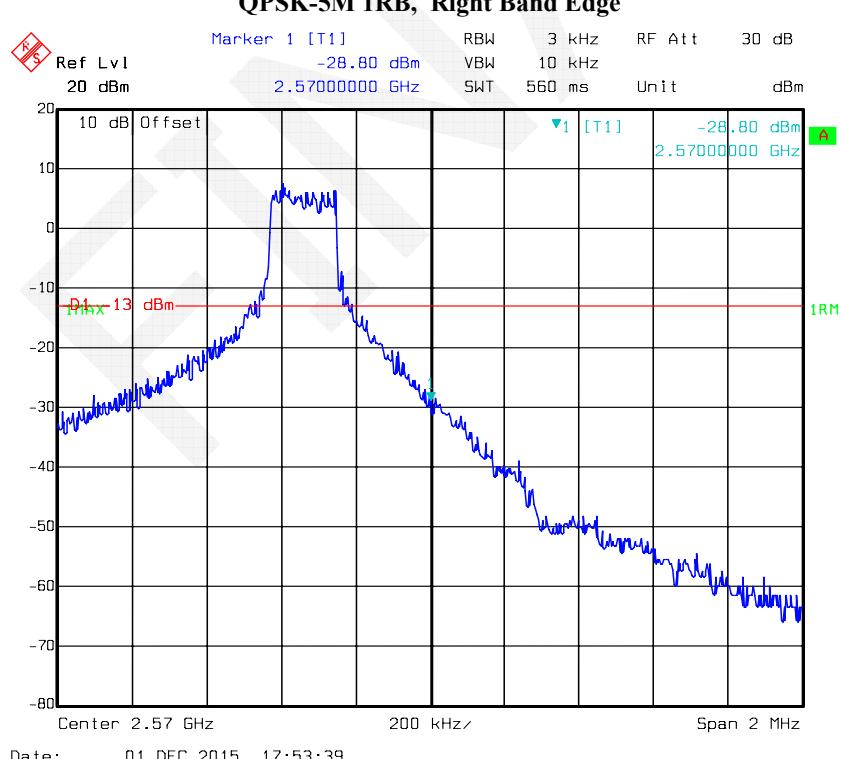
**16QAM -20M Full RB, Left Band Edge**

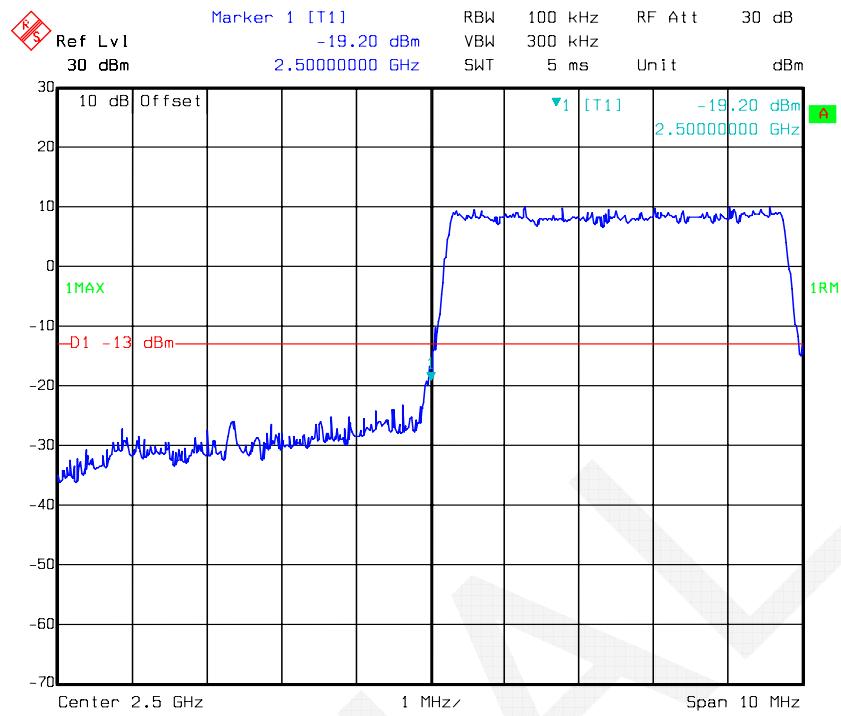
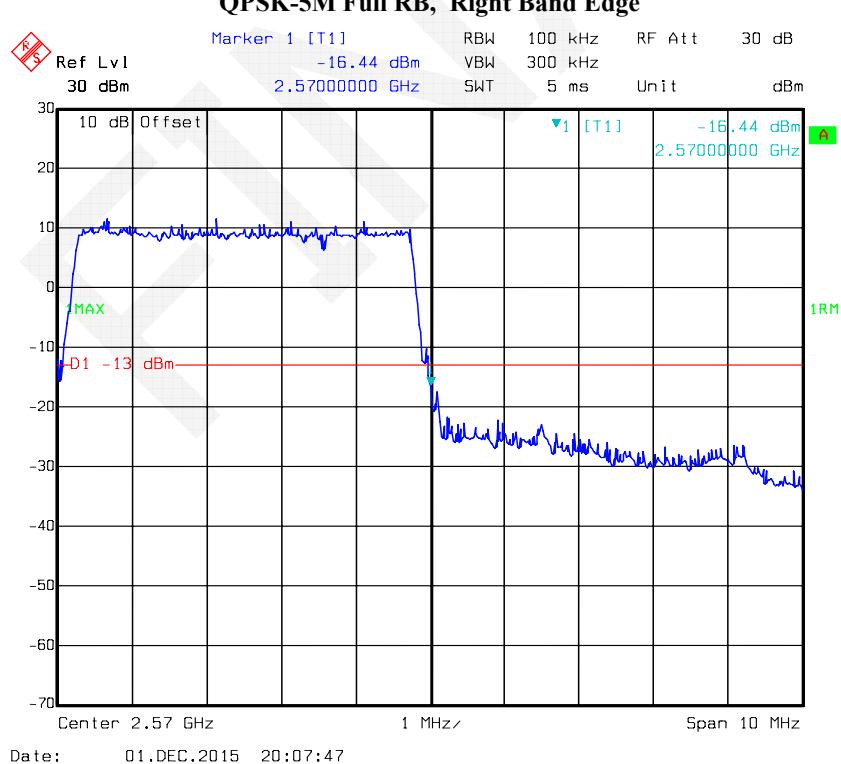
Date: 01.DEC.2015 20:04:56

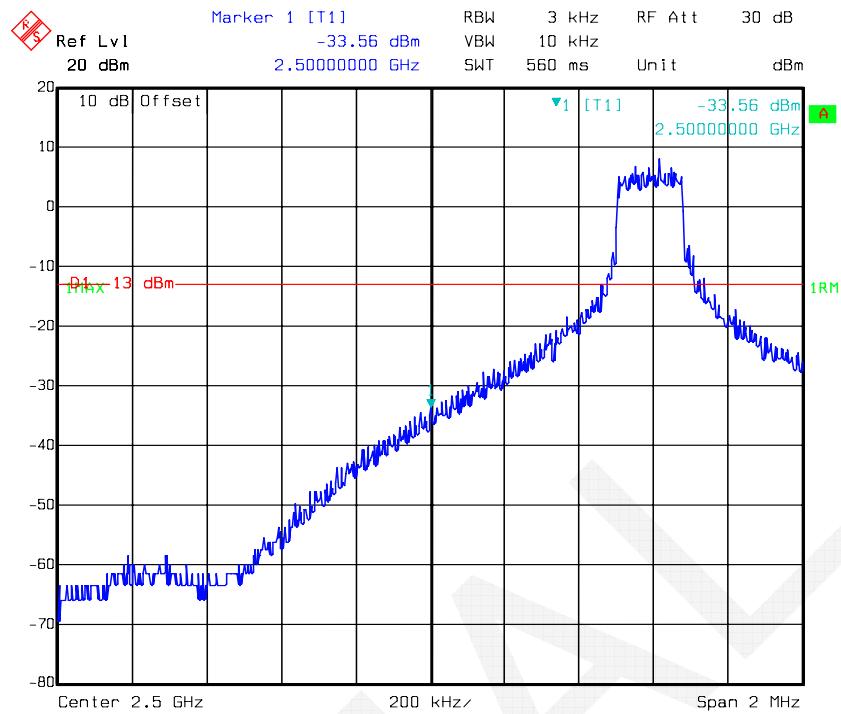
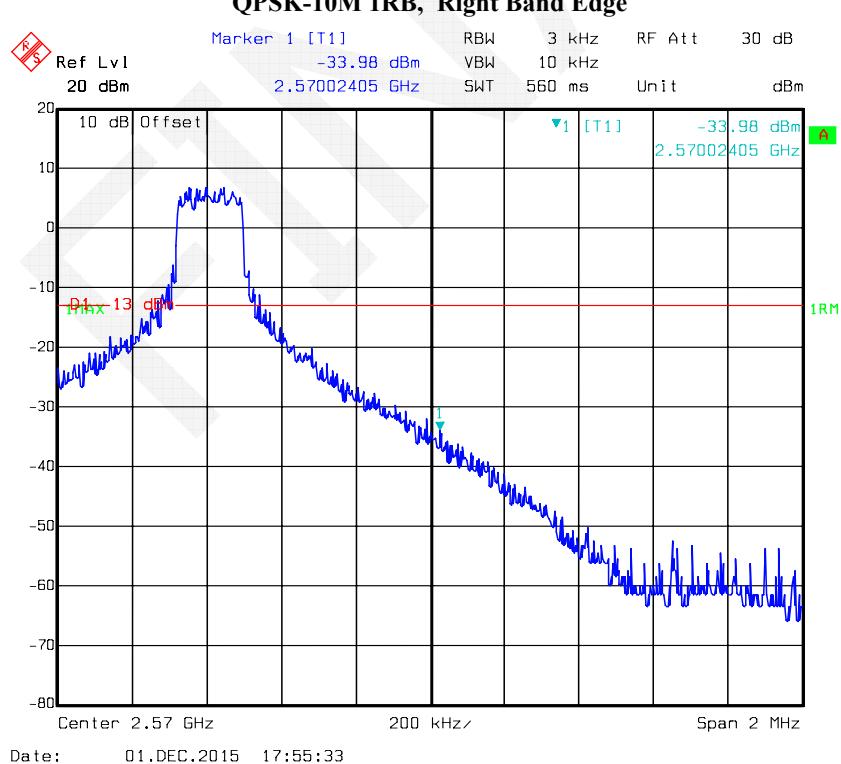
**16QAM-20M Full RB, Right Band Edge**

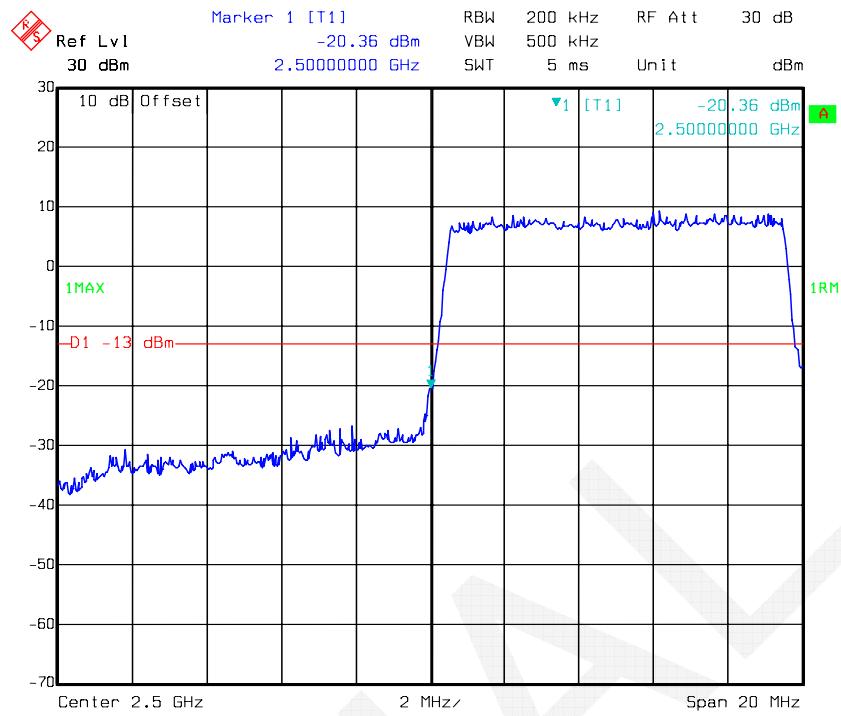
Date: 01.DEC.2015 20:05:26

**LTE Band 7**

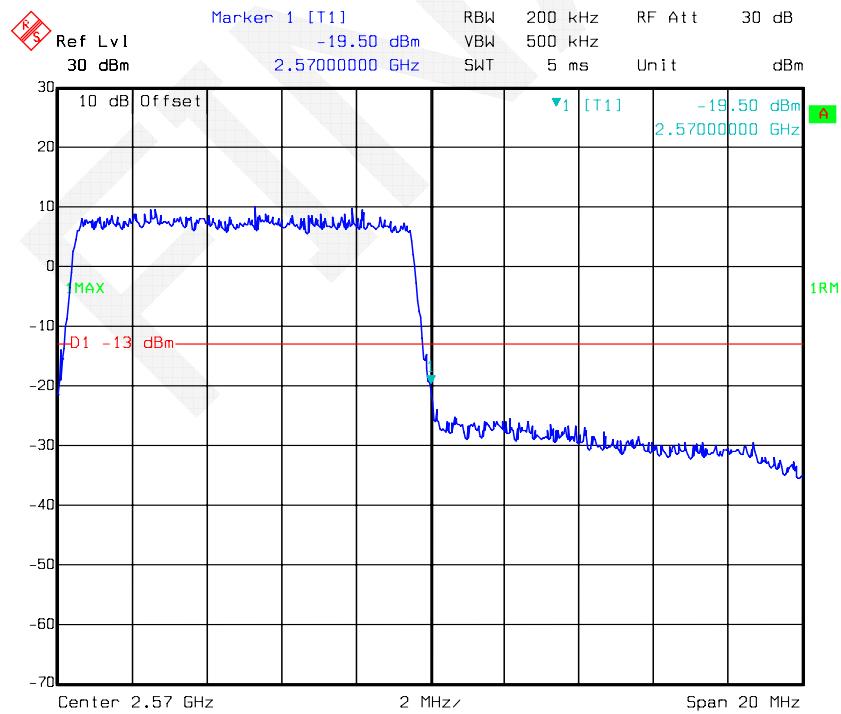
**QPSK-5M 1RB, Left Band Edge****QPSK-5M 1RB, Right Band Edge**

**QPSK-5M Full RB, Left Band Edge****QPSK-5M Full RB, Right Band Edge**

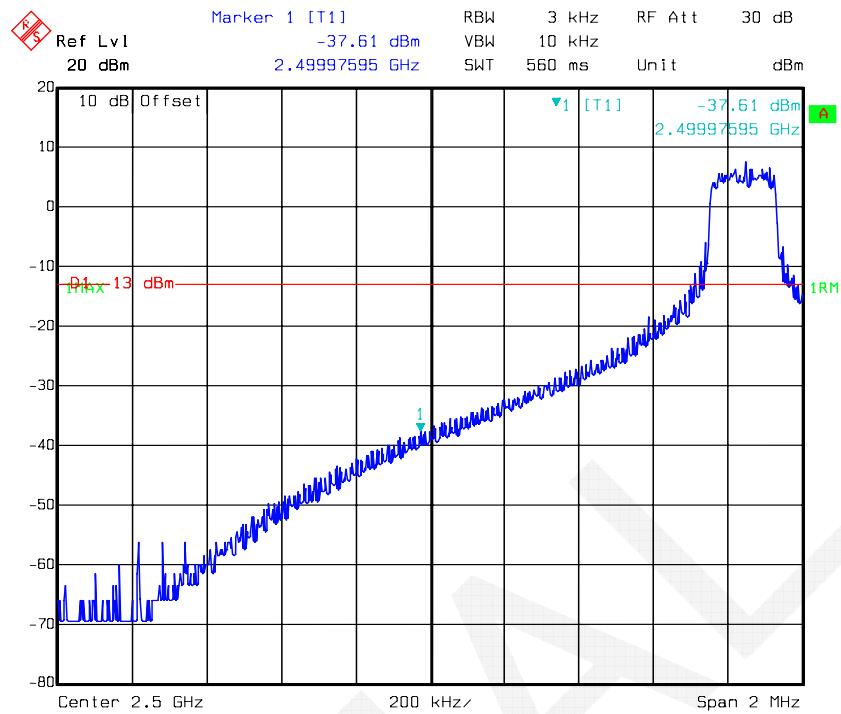
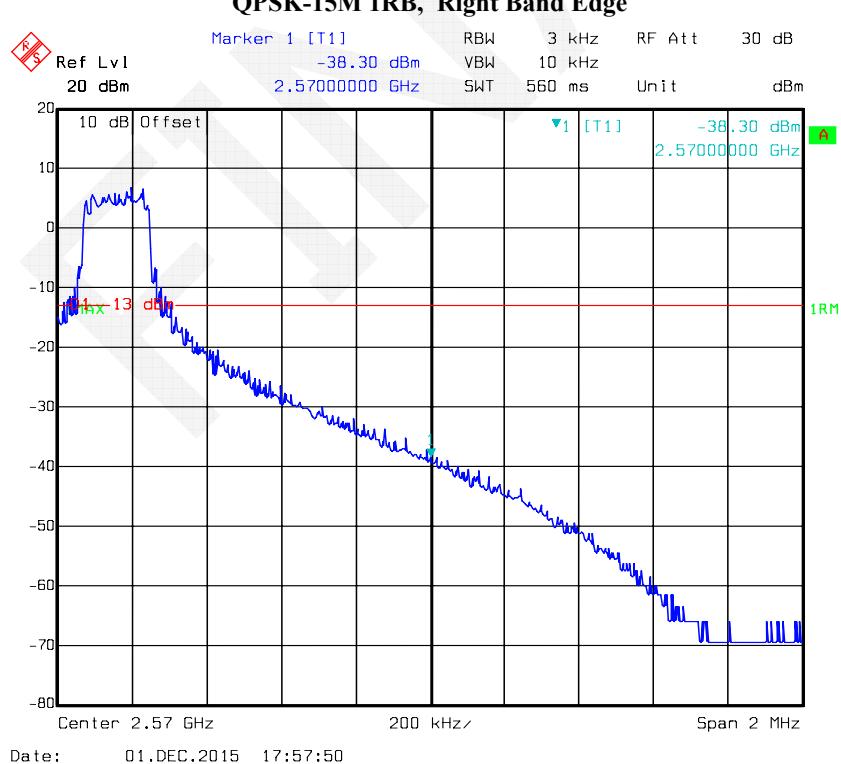
**QPSK-10M 1RB, Left Band Edge****QPSK-10M 1RB, Right Band Edge**

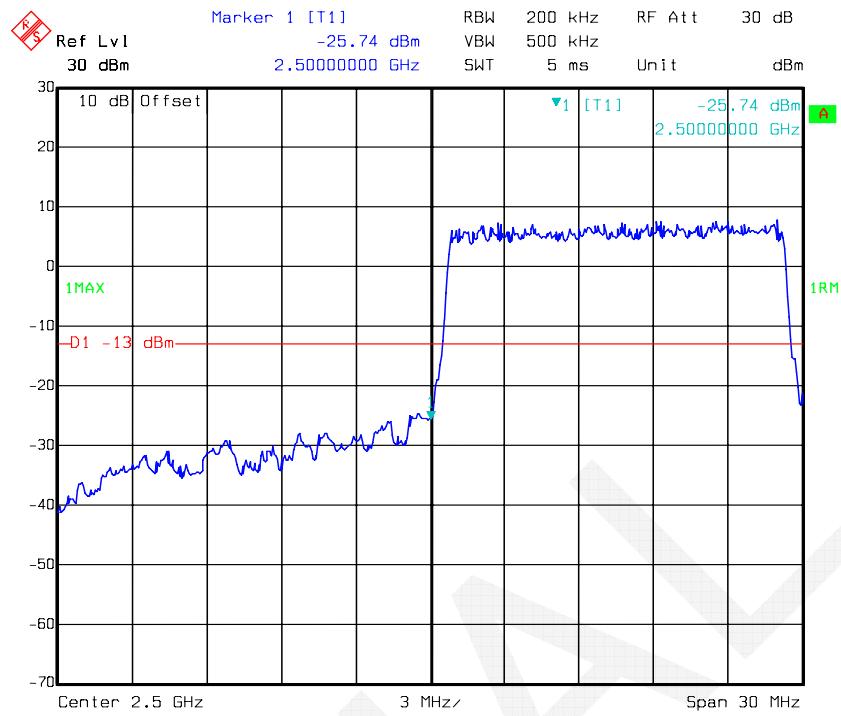
**QPSK-10M Full RB, Left Band Edge**

Date: 01.DEC.2015 20:14:37

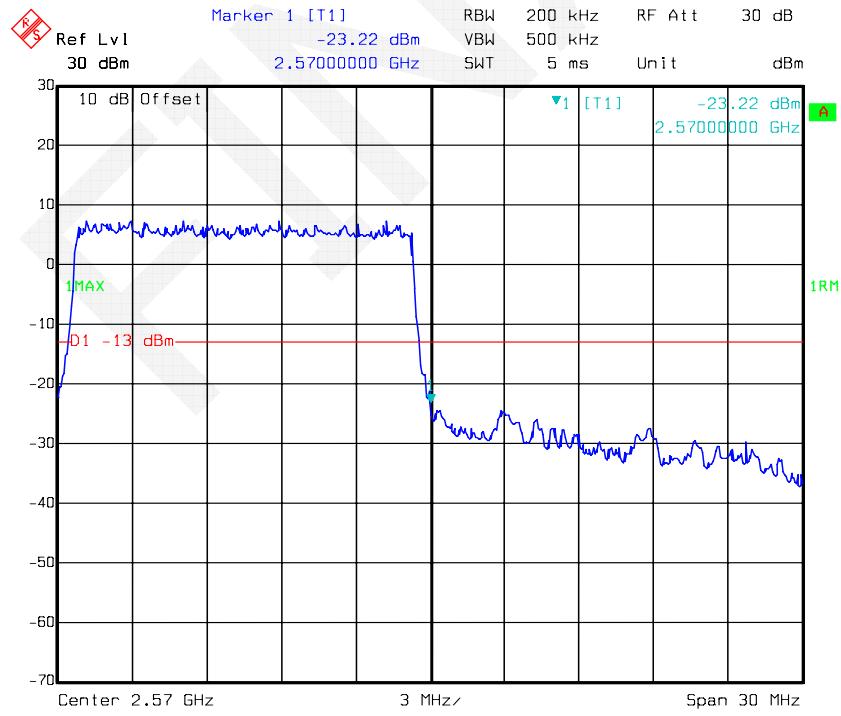
**QPSK-10M Full RB, Right Band Edge**

Date: 01.DEC.2015 20:15:41

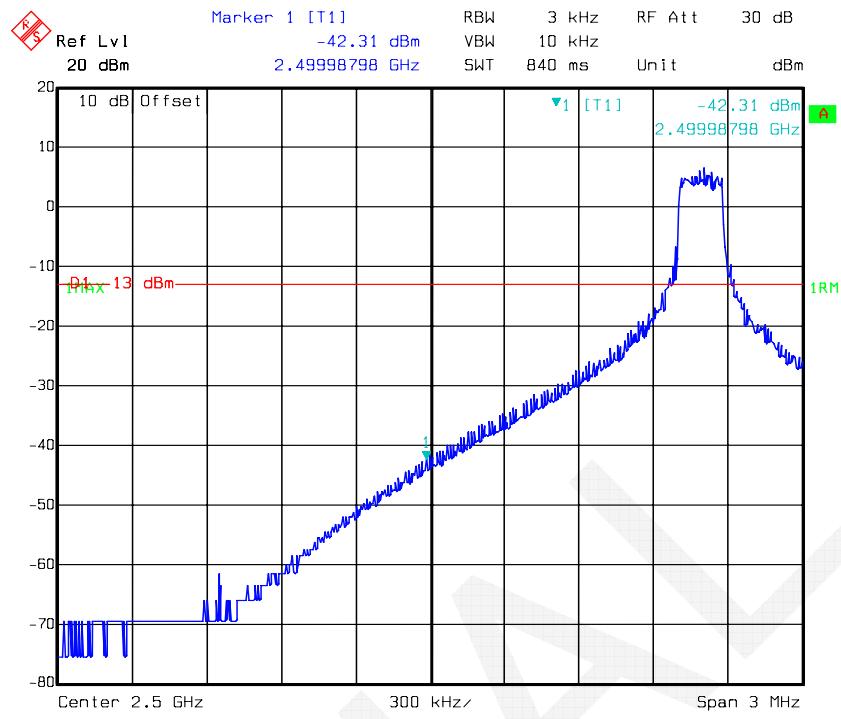
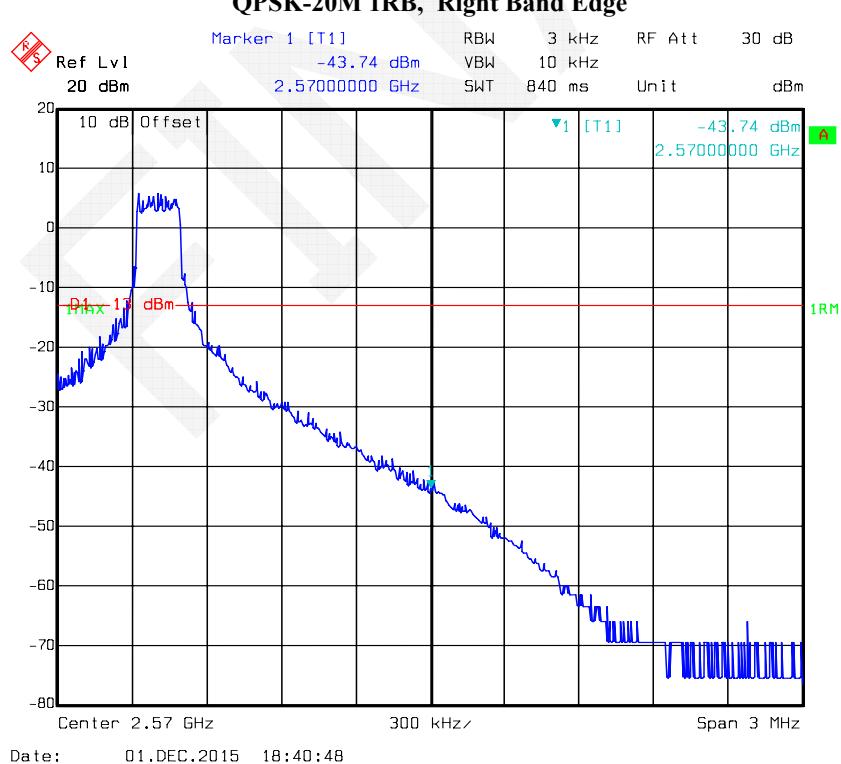
**QPSK-15M 1RB, Left Band Edge****QPSK-15M 1RB, Right Band Edge**

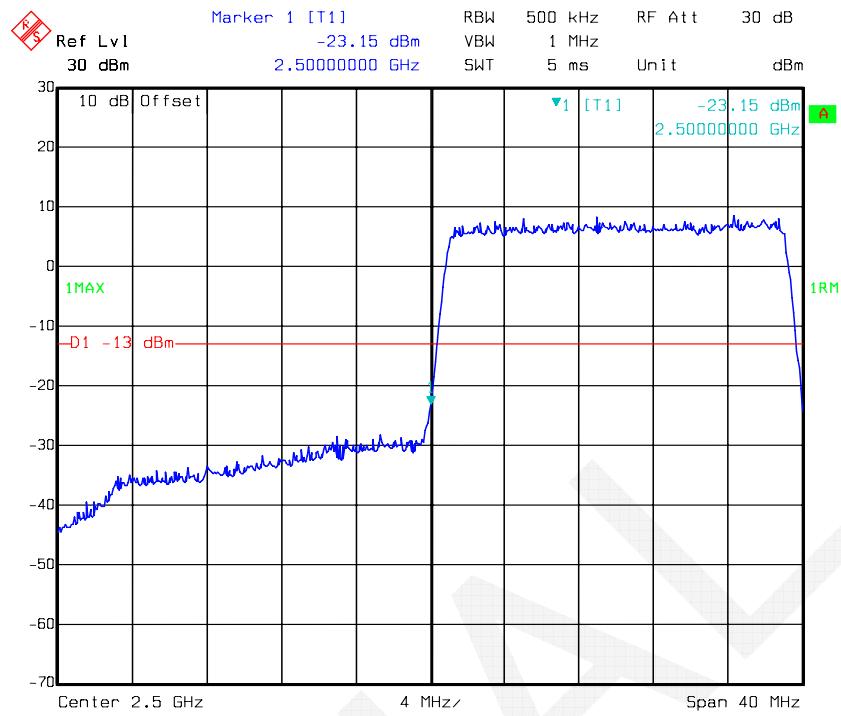
**QPSK-15M Full RB, Left Band Edge**

Date: 01.DEC.2015 20:18:39

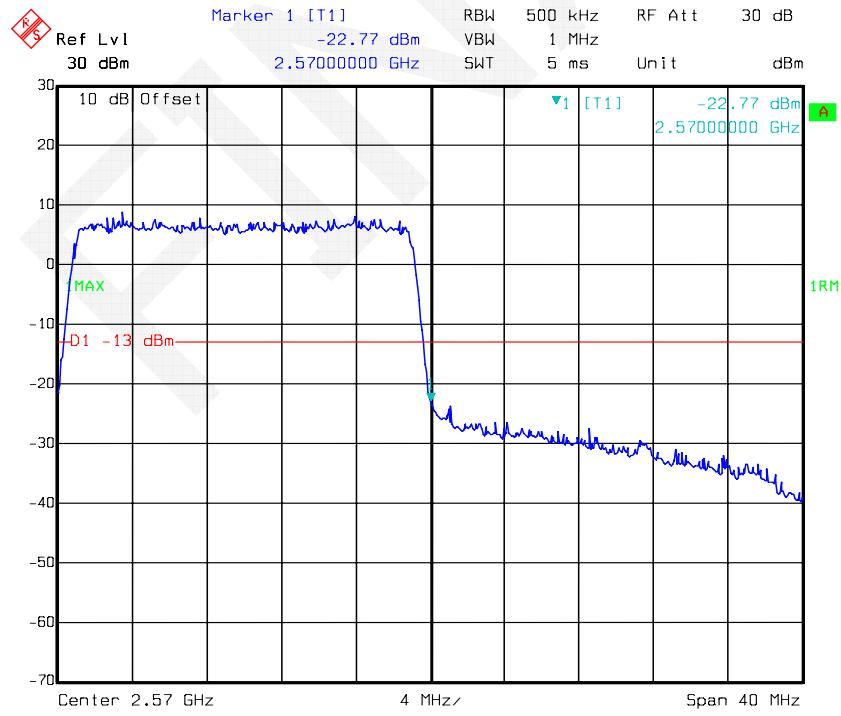
**QPSK-15M Full RB, Right Band Edge**

Date: 01.DEC.2015 20:19:29

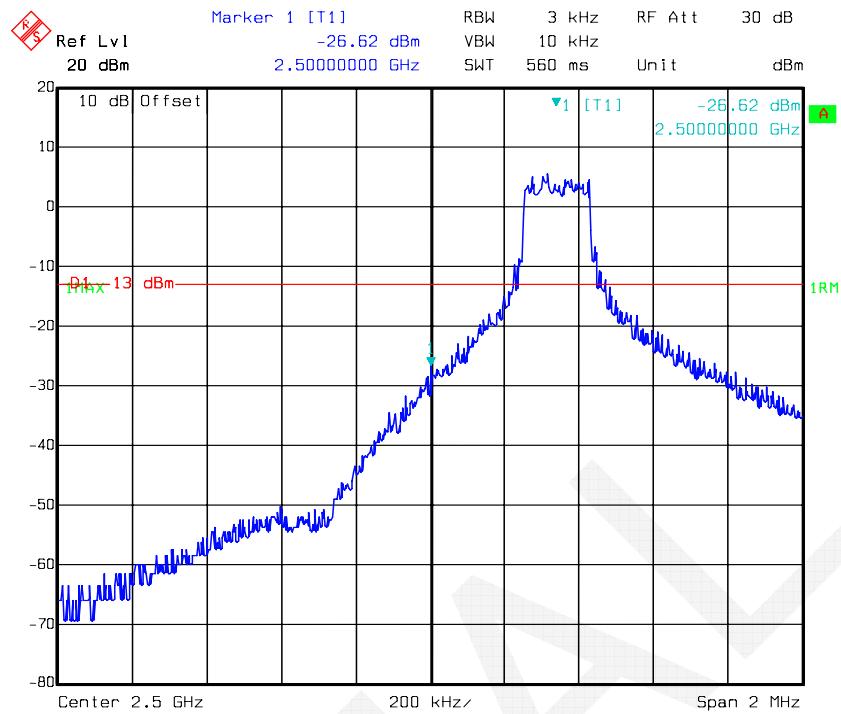
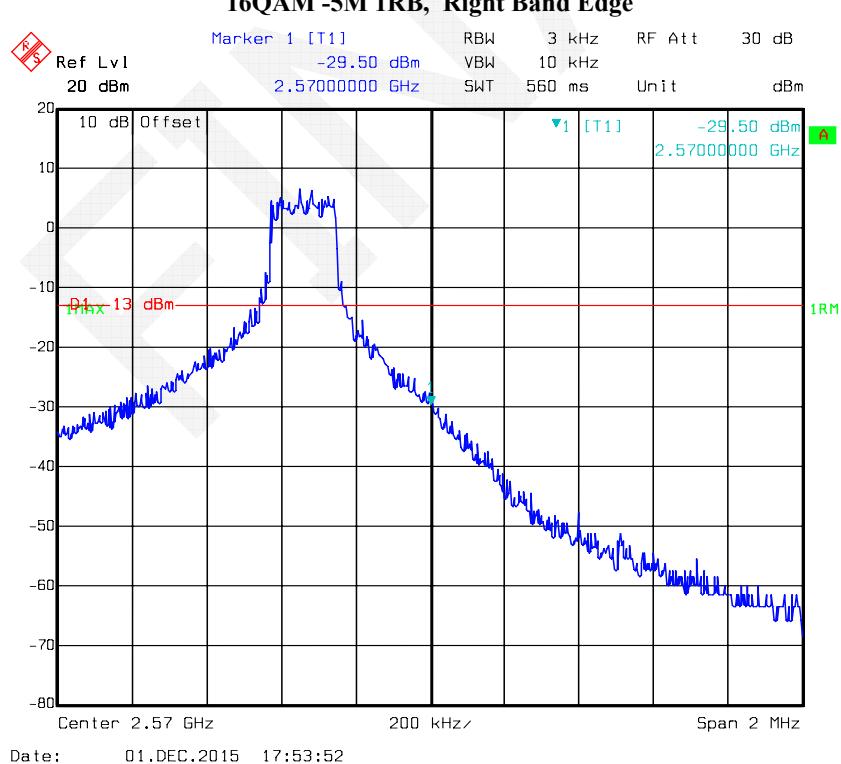
**QPSK-20M 1RB, Left Band Edge****QPSK-20M 1RB, Right Band Edge**

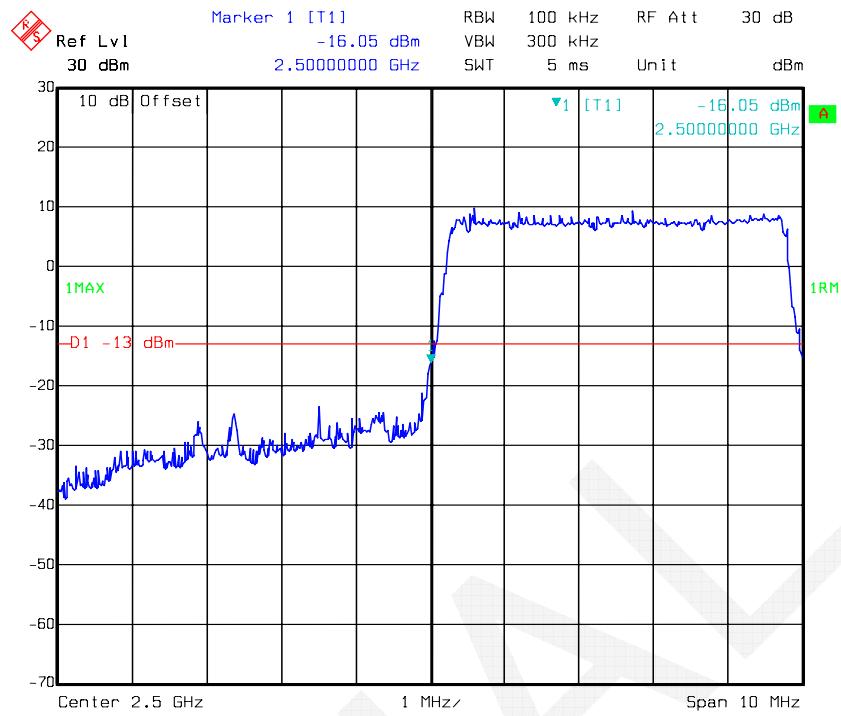
**QPSK-20M Full RB, Left Band Edge**

Date: 01.DEC.2015 20:20:25

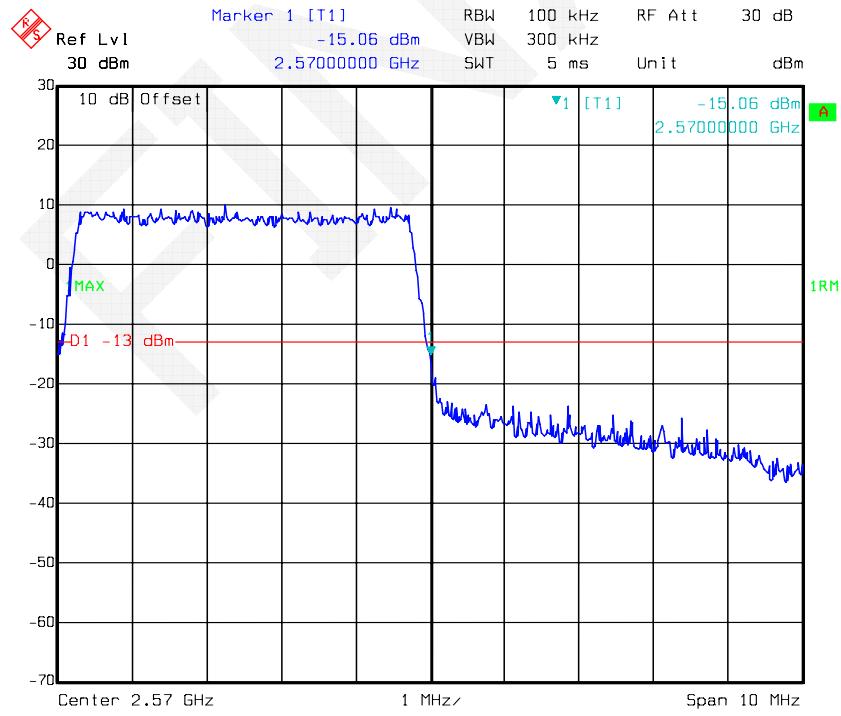
**QPSK-20M Full RB, Right Band Edge**

Date: 01.DEC.2015 20:20:56

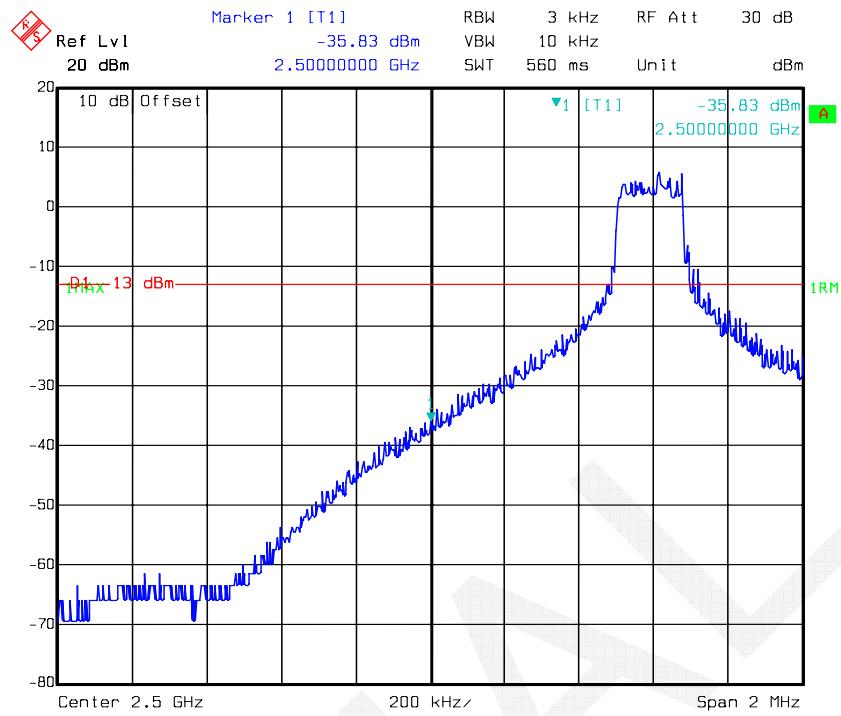
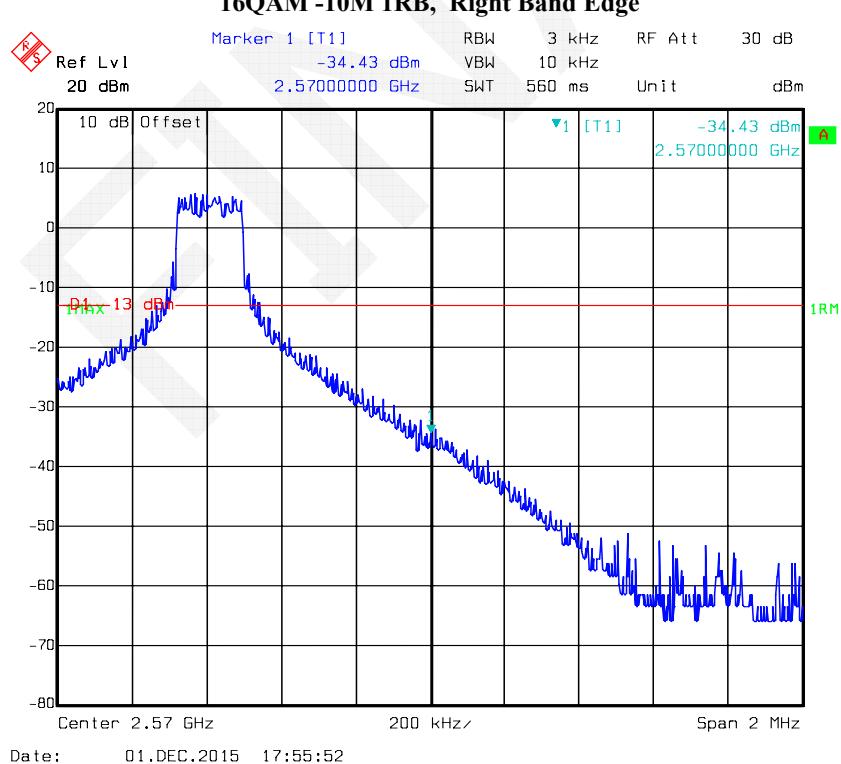
**16QAM -5M 1RB, Left Band Edge****16QAM -5M 1RB, Right Band Edge**

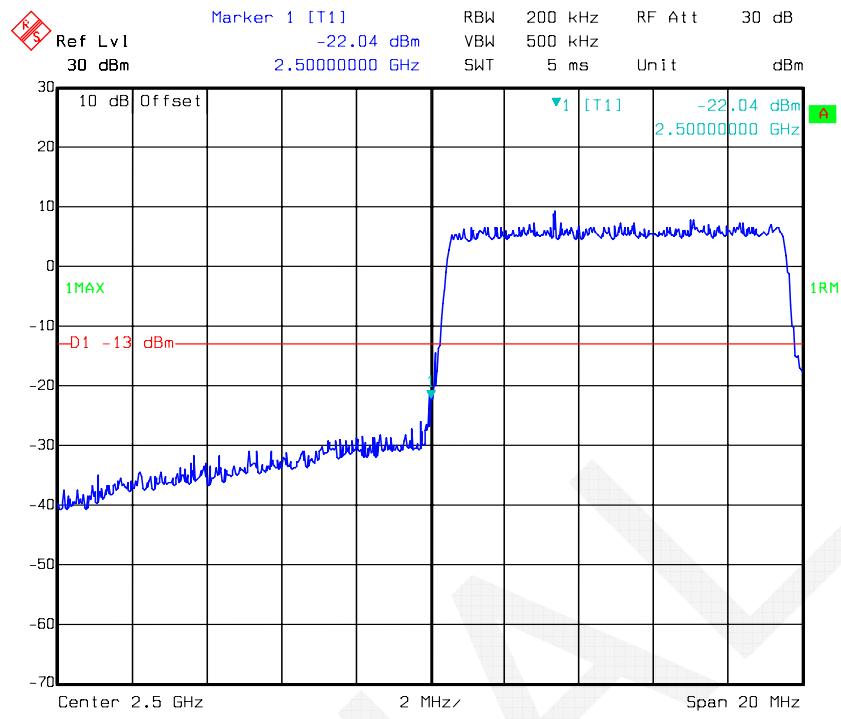
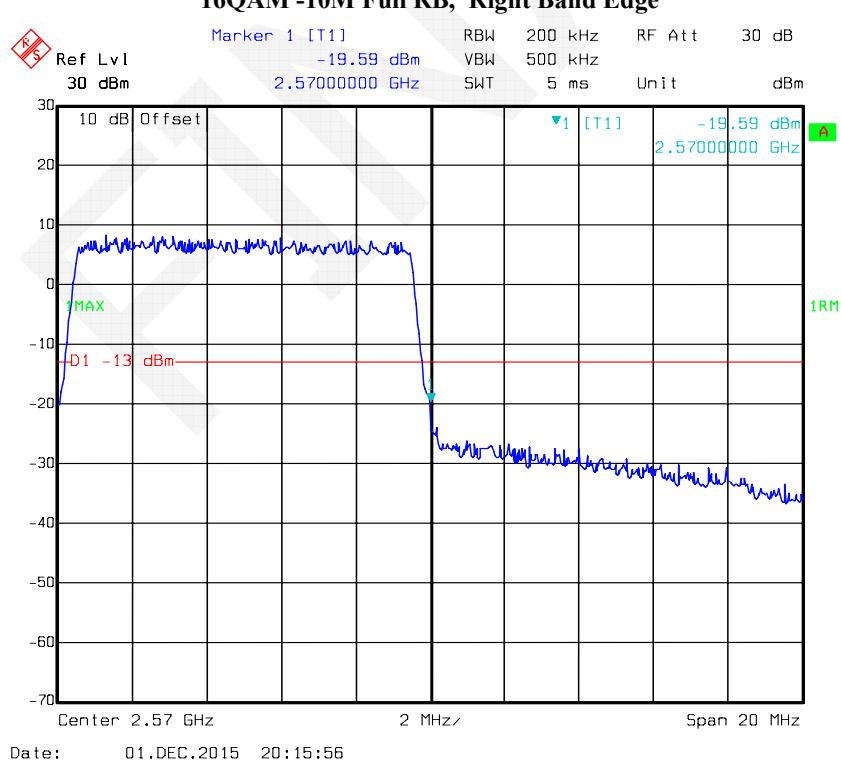
**16QAM -5M Full RB, Left Band Edge**

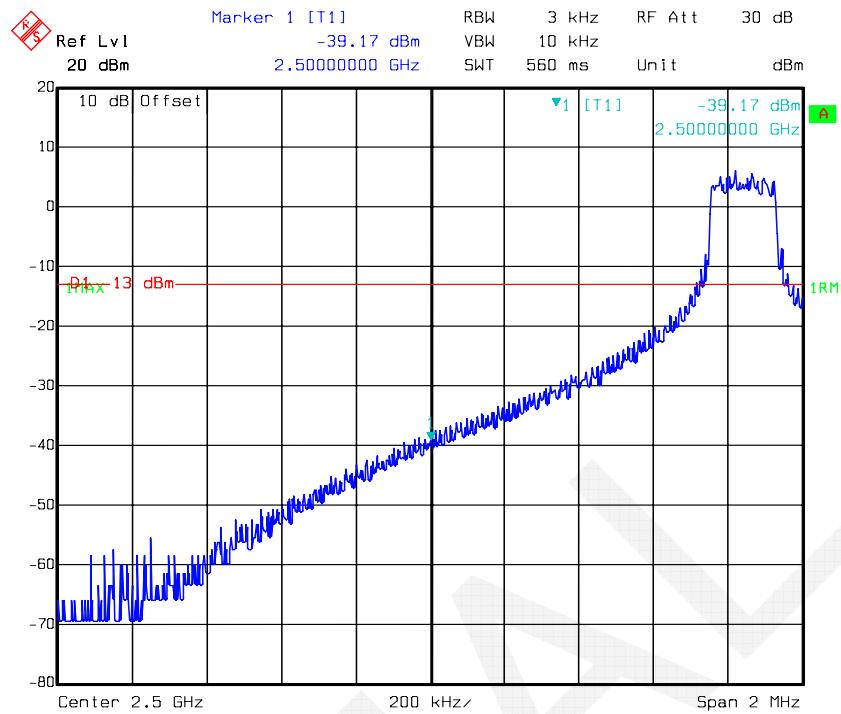
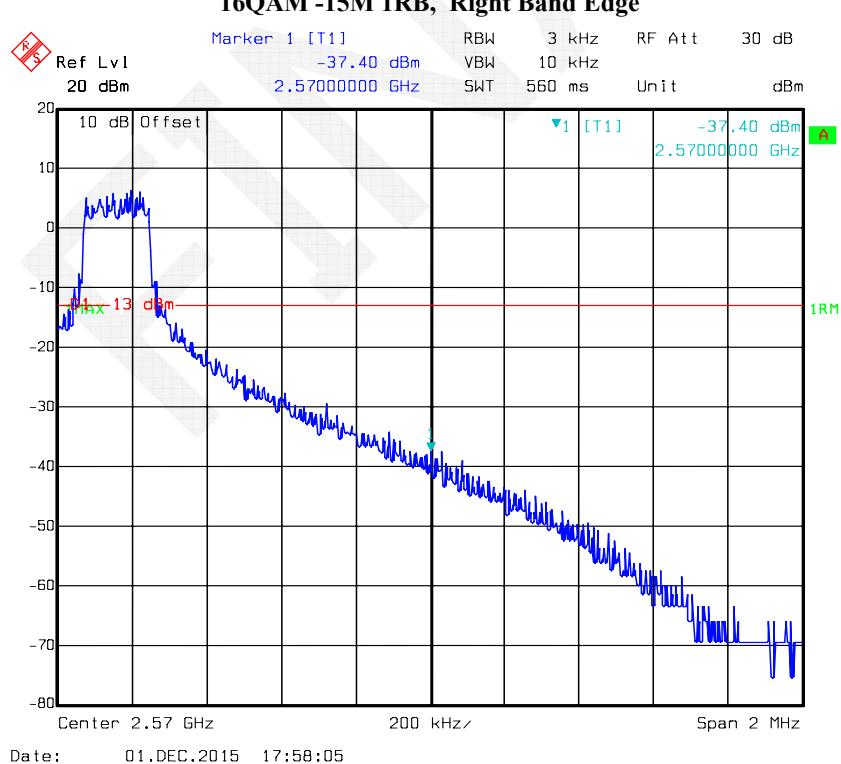
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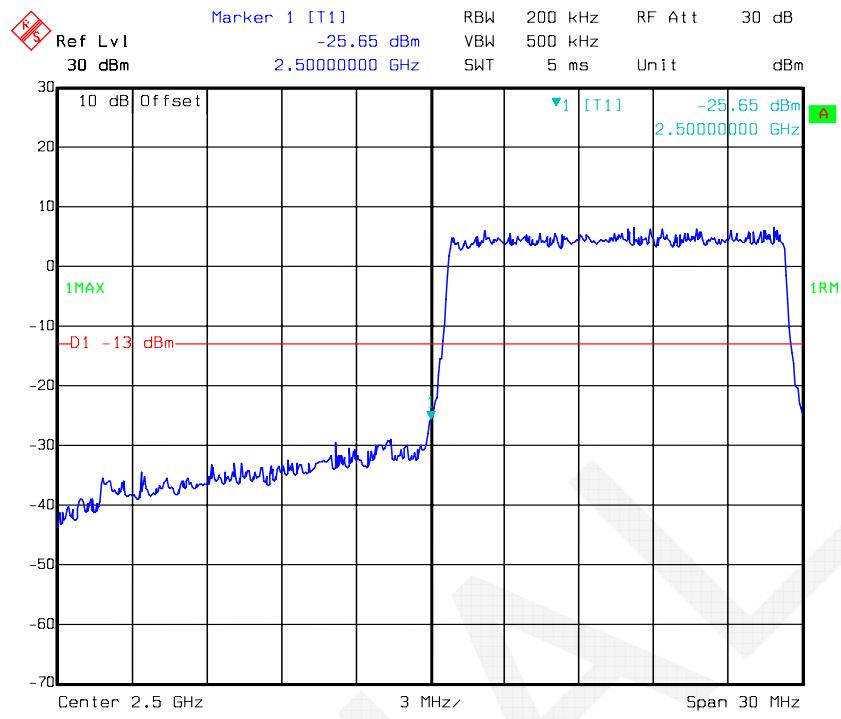
**16QAM -5M Full RB, Right Band Edge**

Date: 01.DEC.2015 20:08:15

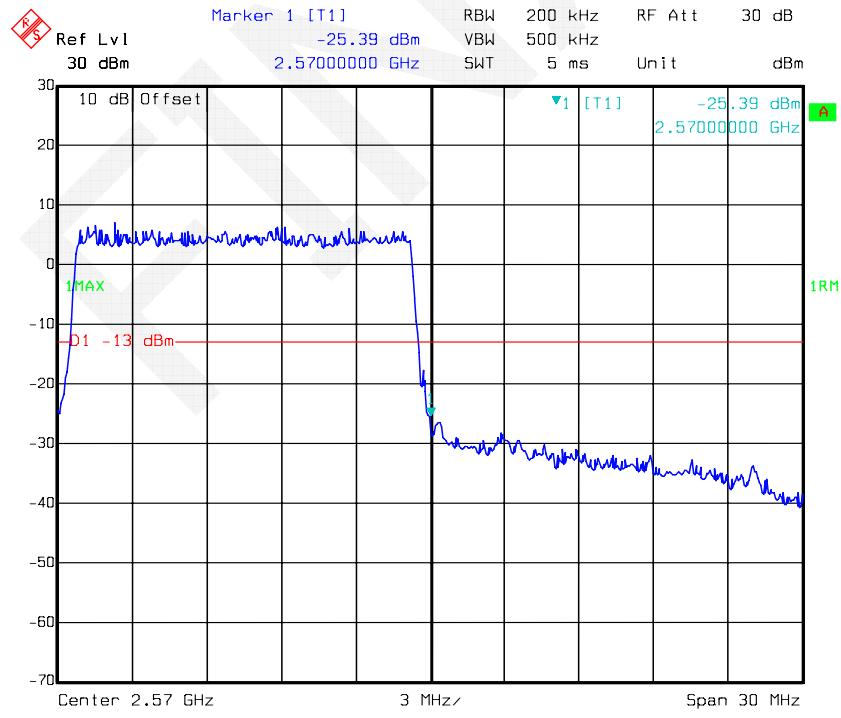
**16QAM -10M 1RB, Left Band Edge****16QAM -10M 1RB, Right Band Edge**

**16QAM -10M Full RB, Left Band Edge****16QAM -10M Full RB, Right Band Edge**

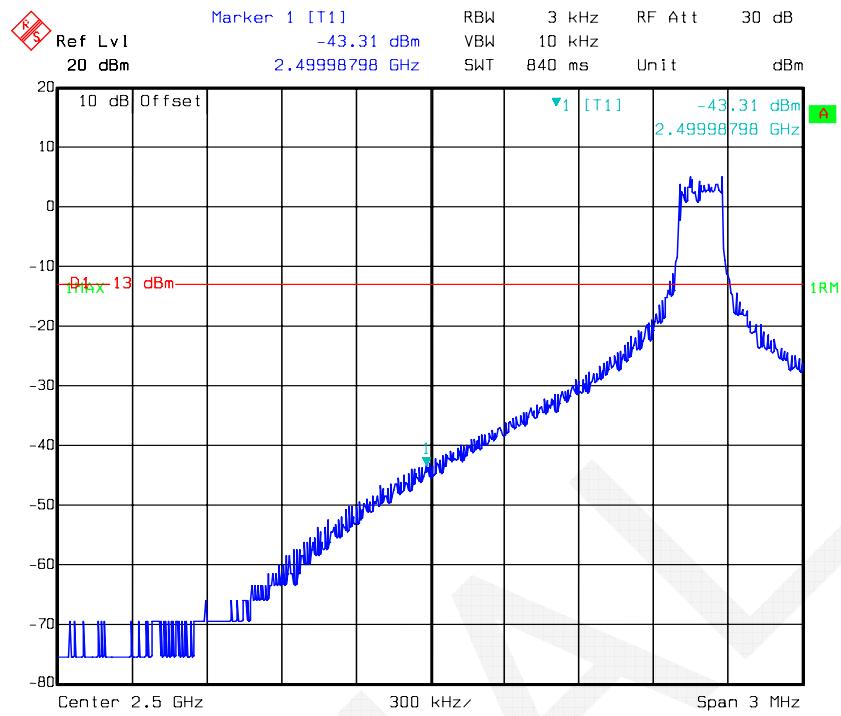
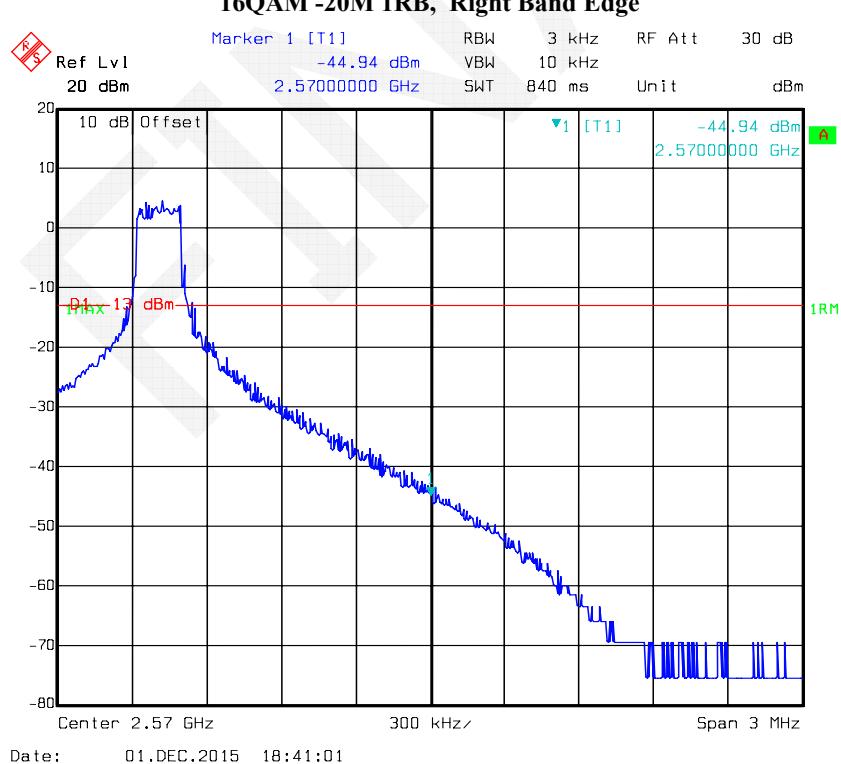
**16QAM -15M 1RB, Left Band Edge****16QAM -15M 1RB, Right Band Edge**

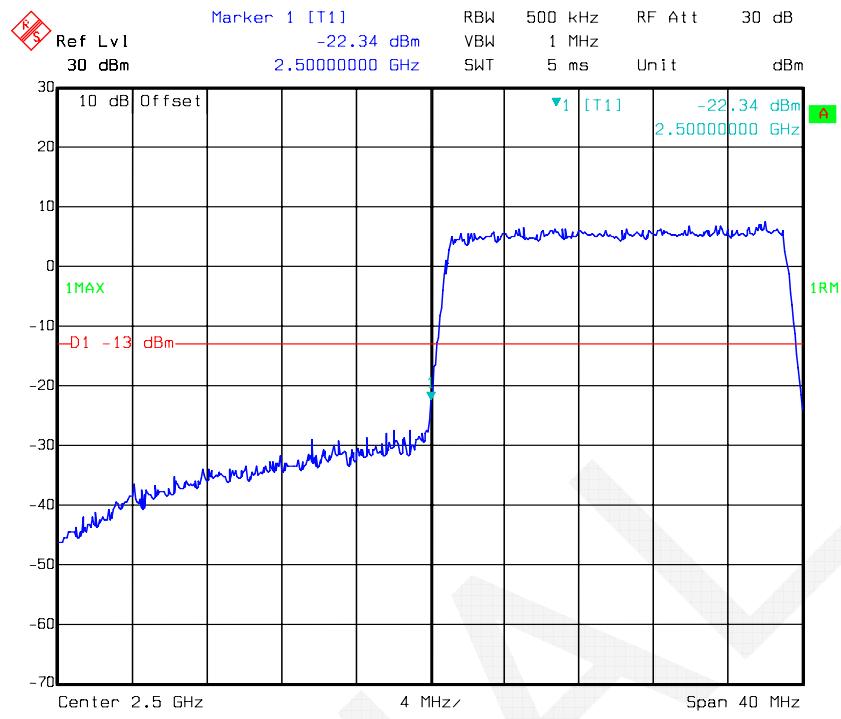
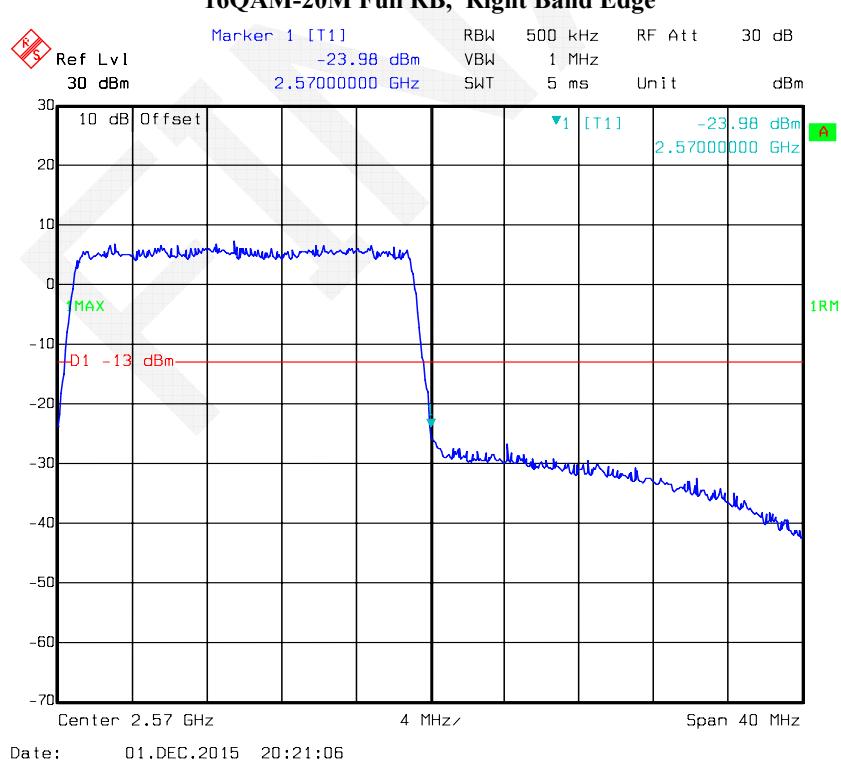
**16QAM -15M Full RB, Left Band Edge**

Date: 01.DEC.2015 20:18:56

**16QAM -15M Full RB, Right Band Edge**

Date: 01.DEC.2015 20:19:42

**16QAM -20M 1RB, Left Band Edge****16QAM -20M 1RB, Right Band Edge**

**16QAM -20M Full RB, Left Band Edge****16QAM-20M Full RB, Right Band Edge**

## FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY

### Applicable Standard

FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235 , §27.54

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

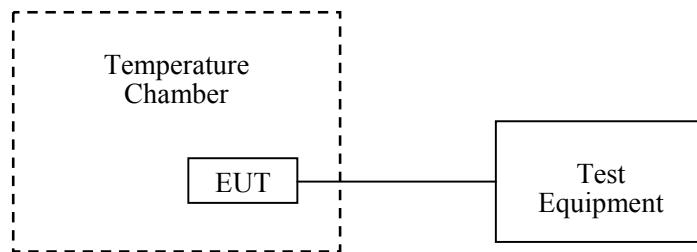
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

### Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-3	2015-09-10	2016-09-09
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2014-12-19	2015-12-19

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Data

### Environmental Conditions

<b>Temperature:</b>	24.6 °C
<b>Relative Humidity:</b>	43 %
<b>ATM Pressure:</b>	101.5 kPa

The testing was performed by Allen Qiao on 2015-12-01.

### Cellular Band (Part 22H)

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
	$V_{DC}$	Hz	ppm	ppm
-30	3.8	11	0.013	2.5
-20	3.8	13	0.016	2.5
-10	3.8	14	0.017	2.5
0	3.8	11	0.013	2.5
10	3.8	15	0.018	2.5
20	3.8	12	0.014	2.5
30	3.8	15	0.018	2.5
40	3.8	13	0.016	2.5
50	3.8	14	0.017	2.5
25	3.6	15	0.018	2.5
25	4.3	12	0.014	2.5

EDGE, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
	V <sub>DC</sub>	Hz	ppm	ppm
-30	3.8	13	0.016	2.5
-20	3.8	16	0.019	2.5
-10	3.8	15	0.018	2.5
0	3.8	14	0.017	2.5
10	3.8	13	0.016	2.5
20	3.8	14	0.017	2.5
30	3.8	10	0.012	2.5
40	3.8	17	0.020	2.5
50	3.8	16	0.019	2.5
25	3.6	14	0.017	2.5
25	4.3	13	0.016	2.5

**WCDMA Band V: Re199**

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
	V <sub>DC</sub>	Hz	ppm	ppm
-30	3.8	10	0.012	2.5
-20	3.8	12	0.014	2.5
-10	3.8	16	0.019	2.5
0	3.8	14	0.017	2.5
10	3.8	13	0.016	2.5
20	3.8	11	0.013	2.5
30	3.8	15	0.018	2.5
40	3.8	13	0.016	2.5
50	3.8	10	0.012	2.5
25	3.6	12	0.014	2.5
25	4.3	15	0.018	2.5

**WCDMA Band V: HSDPA**

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
	$V_{DC}$	Hz	ppm	ppm
-30	3.8	15	0.018	2.5
-20	3.8	12	0.014	2.5
-10	3.8	13	0.016	2.5
0	3.8	16	0.019	2.5
10	3.8	12	0.014	2.5
20	3.8	11	0.013	2.5
30	3.8	14	0.017	2.5
40	3.8	13	0.016	2.5
50	3.8	16	0.019	2.5
25	3.6	15	0.018	2.5
25	4.3	13	0.016	2.5

**WCDMA Band V: HSUPA**

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
	$V_{DC}$	Hz	ppm	ppm
-30	3.8	12	0.014	2.5
-20	3.8	13	0.016	2.5
-10	3.8	13	0.016	2.5
0	3.8	16	0.019	2.5
10	3.8	15	0.018	2.5
20	3.8	10	0.012	2.5
30	3.8	12	0.014	2.5
40	3.8	14	0.017	2.5
50	3.8	10	0.012	2.5
25	3.6	16	0.019	2.5
25	4.3	14	0.017	2.5

**PCS Band (Part 24E)**

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>	Hz	ppm	ppm	
-30	3.8	18	0.010	Compliance
-20	3.8	15	0.008	Compliance
-10	3.8	11	0.006	Compliance
0	3.8	19	0.010	Compliance
10	3.8	18	0.010	Compliance
20	3.8	14	0.007	Compliance
30	3.8	16	0.009	Compliance
40	3.8	12	0.006	Compliance
50	3.8	15	0.008	Compliance
25	3.6	12	0.006	Compliance
25	4.3	16	0.009	Compliance

EDGE, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>	Hz	ppm	ppm	
-30	3.8	13	0.007	Compliance
-20	3.8	16	0.009	Compliance
-10	3.8	17	0.009	Compliance
0	3.8	10	0.005	Compliance
10	3.8	17	0.009	Compliance
20	3.8	14	0.007	Compliance
30	3.8	10	0.005	Compliance
40	3.8	14	0.007	Compliance
50	3.8	16	0.009	Compliance
25	3.6	20	0.011	Compliance
25	4.3	13	0.007	Compliance

**WCDMA Band II: Re199**

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
	$V_{DC}$	Hz	ppm	
-30	3.8	11	0.006	Compliance
-20	3.8	12	0.006	Compliance
-10	3.8	13	0.007	Compliance
0	3.8	15	0.008	Compliance
10	3.8	18	0.010	Compliance
20	3.8	11	0.006	Compliance
30	3.8	12	0.006	Compliance
40	3.8	17	0.009	Compliance
50	3.8	13	0.007	Compliance
25	3.6	15	0.008	Compliance
25	4.3	18	0.010	Compliance

**WCDMA Band II: HSDPA**

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
	$V_{DC}$	Hz	ppm	
-30	3.8	11	0.006	Compliance
-20	3.8	15	0.008	Compliance
-10	3.8	14	0.007	Compliance
0	3.8	13	0.007	Compliance
10	3.8	17	0.009	Compliance
20	3.8	12	0.006	Compliance
30	3.8	13	0.007	Compliance
40	3.8	15	0.008	Compliance
50	3.8	14	0.007	Compliance
25	3.6	18	0.010	Compliance
25	4.3	12	0.006	Compliance

**WCDMA Band II: HSUPA**

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
-30	3.8	11	0.006	Compliance
-20	3.8	17	0.009	Compliance
-10	3.8	12	0.006	Compliance
0	3.8	14	0.007	Compliance
10	3.8	16	0.009	Compliance
20	3.8	11	0.006	Compliance
30	3.8	15	0.008	Compliance
40	3.8	13	0.007	Compliance
50	3.8	15	0.008	Compliance
25	3.6	11	0.006	Compliance
25	4.3	14	0.007	Compliance

**LTE Band 2:**

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>		Hz	ppm	
-30	3.8	-11.47	-0.0061	Compliance
-20	3.8	-11.21	-0.0060	Compliance
-10	3.8	-11.33	-0.0060	Compliance
0	3.8	-11.20	-0.0060	Compliance
10	3.8	-11.32	-0.0060	Compliance
20	3.8	-11.40	-0.0061	Compliance
30	3.8	-11.21	-0.0060	Compliance
40	3.8	-11.61	-0.0062	Compliance
50	3.8	-11.71	-0.0062	Compliance
25	3.6	-11.49	-0.0061	Compliance
25	4.3	-11.58	-0.0062	Compliance

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>		Hz	ppm	
-30	3.8	-11.19	-0.0060	Compliance
-20	3.8	-11.17	-0.0059	Compliance
-10	3.8	-11.24	-0.0060	Compliance
0	3.8	-11.4	-0.0061	Compliance
10	3.8	-10.9	-0.0058	Compliance
20	3.8	-11.45	-0.0061	Compliance
30	3.8	-11.43	-0.0061	Compliance
40	3.8	-10.98	-0.0058	Compliance
50	3.8	-11.54	-0.0061	Compliance
25	3.6	-11.08	-0.0059	Compliance
25	4.3	-11.36	-0.0060	Compliance

**LTE Band 4:**

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1732.5$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>		Hz	ppm	
-30	3.8	10.24	0.0059	Compliance
-20	3.8	10.48	0.0060	Compliance
-10	3.8	10.19	0.0059	Compliance
0	3.8	10.41	0.0060	Compliance
10	3.8	10.09	0.0058	Compliance
20	3.8	10.13	0.0058	Compliance
30	3.8	10.49	0.0061	Compliance
40	3.8	10.32	0.0060	Compliance
50	3.8	10.37	0.0060	Compliance
25	3.6	10.59	0.0061	Compliance
25	4.3	10.30	0.0059	Compliance

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1732.5$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>		Hz	ppm	
-30	3.8	10.39	0.0060	Compliance
-20	3.8	10.42	0.0060	Compliance
-10	3.8	10.13	0.0058	Compliance
0	3.8	10.27	0.0059	Compliance
10	3.8	10.53	0.0061	Compliance
20	3.8	10.53	0.0061	Compliance
30	3.8	10.35	0.0060	Compliance
40	3.8	10.37	0.0060	Compliance
50	3.8	10.31	0.0060	Compliance
25	3.6	10.67	0.0062	Compliance
25	4.3	10.42	0.0060	Compliance

**LTE Band 7:**

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 2535$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>		Hz	ppm	
-30	3.8	11.14	0.0044	Compliance
-20	3.8	11.14	0.0044	Compliance
-10	3.8	10.98	0.0043	Compliance
0	3.8	11.10	0.0044	Compliance
10	3.8	11.31	0.0045	Compliance
20	3.8	10.89	0.0043	Compliance
30	3.8	11.27	0.0044	Compliance
40	3.8	11.23	0.0044	Compliance
50	3.8	10.92	0.0043	Compliance
25	3.6	11.10	0.0044	Compliance
25	4.3	11.46	0.0045	Compliance

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 2535$ MHz				
Temperature	Voltage	Frequency	Frequency	Result
		Error	Error	
V <sub>DC</sub>		Hz	ppm	
-30	3.8	10.96	0.0043	Compliance
-20	3.8	11.08	0.0044	Compliance
-10	3.8	11.26	0.0044	Compliance
0	3.8	11.13	0.0044	Compliance
10	3.8	11.01	0.0043	Compliance
20	3.8	11.02	0.0043	Compliance
30	3.8	11.17	0.0044	Compliance
40	3.8	10.72	0.0042	Compliance
50	3.8	11.04	0.0044	Compliance
25	3.6	11.25	0.0044	Compliance
25	4.3	11.22	0.0044	Compliance

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***