

8.5 CONDUCTED BAND EDGE MEASUREMENT

Limit

FCC §22.917(a), Band 5

For operations in the 824-849 MHz band ,Out of band emissions. 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.

Test Procedures

KDB 971168 D01,

1. RBW $\geq$ 1% of the emission bandwidth
2. VBW $\geq$ 3 x RBW
3. Span was set large enough so as to capture all out of emissions near the band edge.

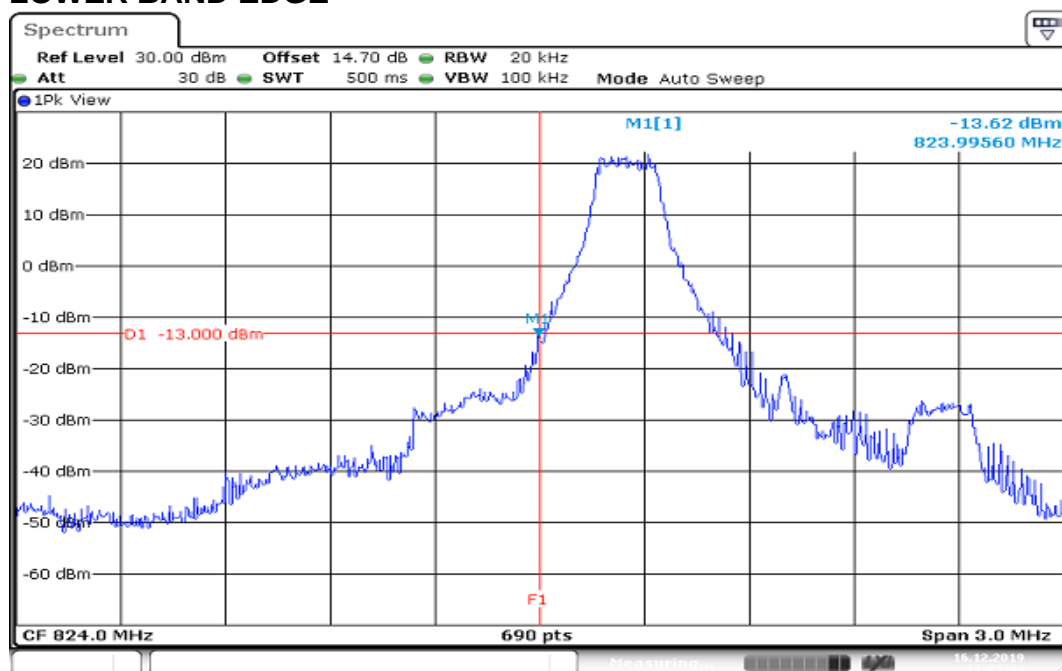
Report No.: T191105W01-RP15

Test Results:

LTE Band 26

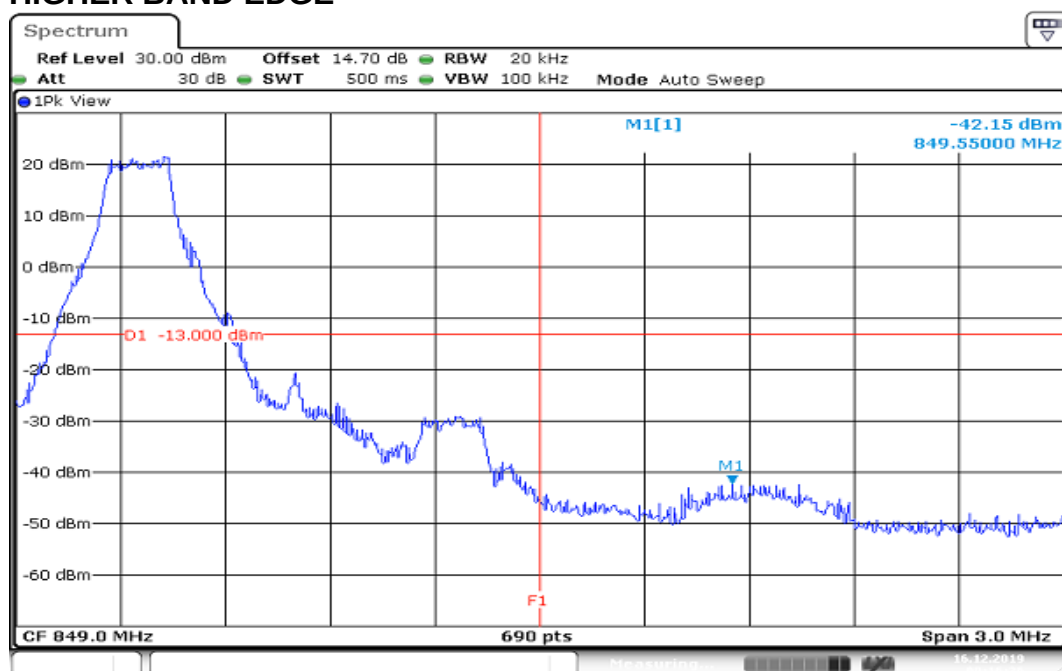
CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATED

LOWER BAND EDGE



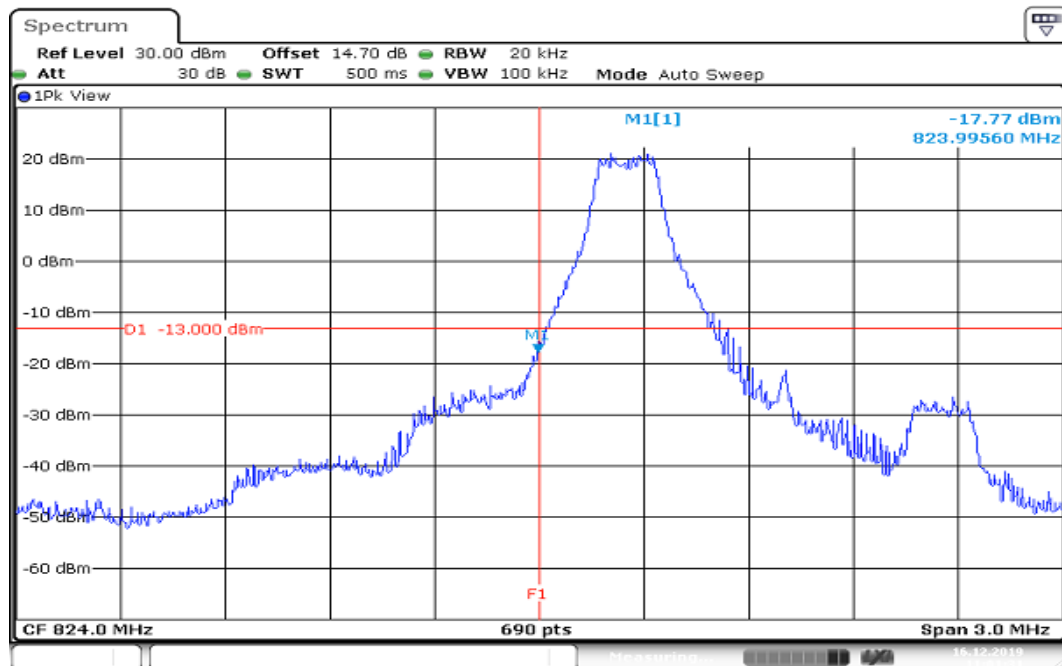
Date: 16.DEC.2019 11:02:44

HIGHER BAND EDGE



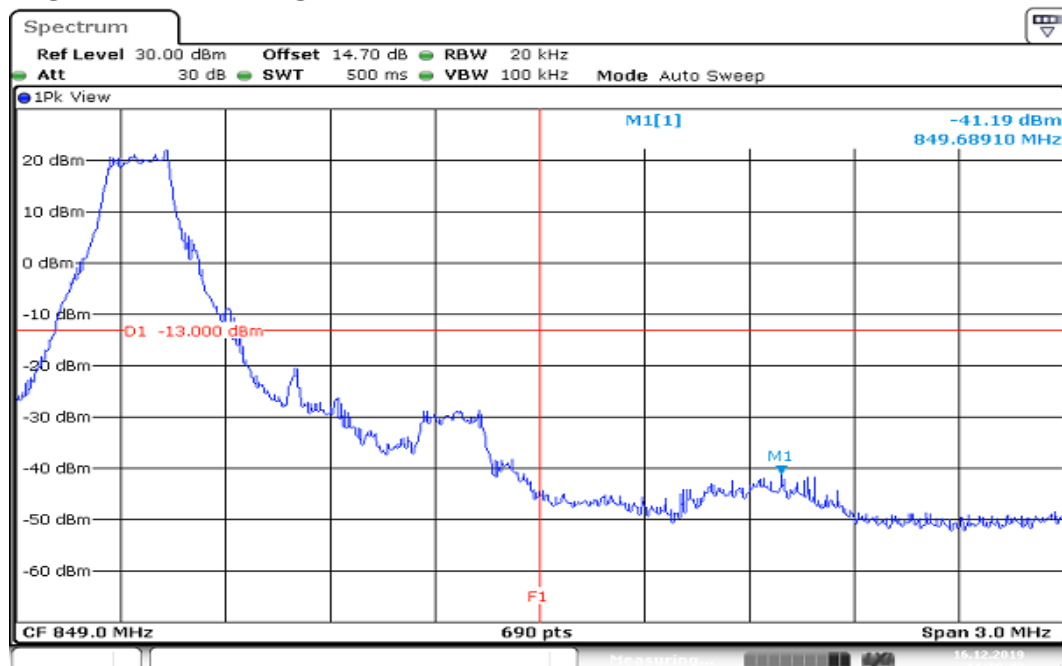
Date: 16.DEC.2019 09:16:36

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB ALLOCATED LOWER BAND EDGE

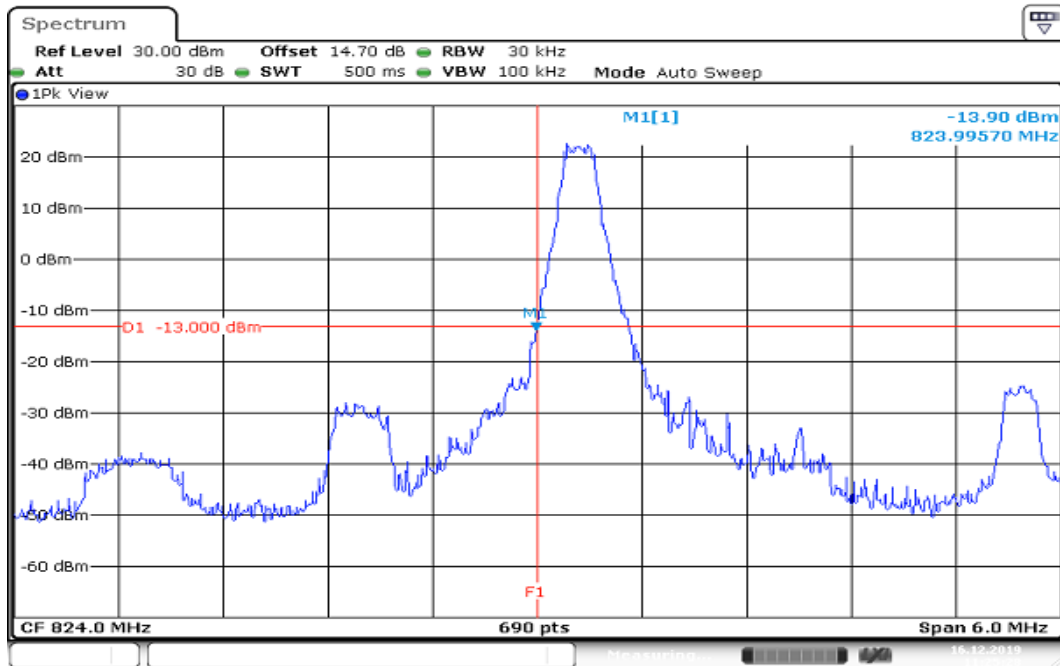


Date: 16.DEC.2019 11:01:31

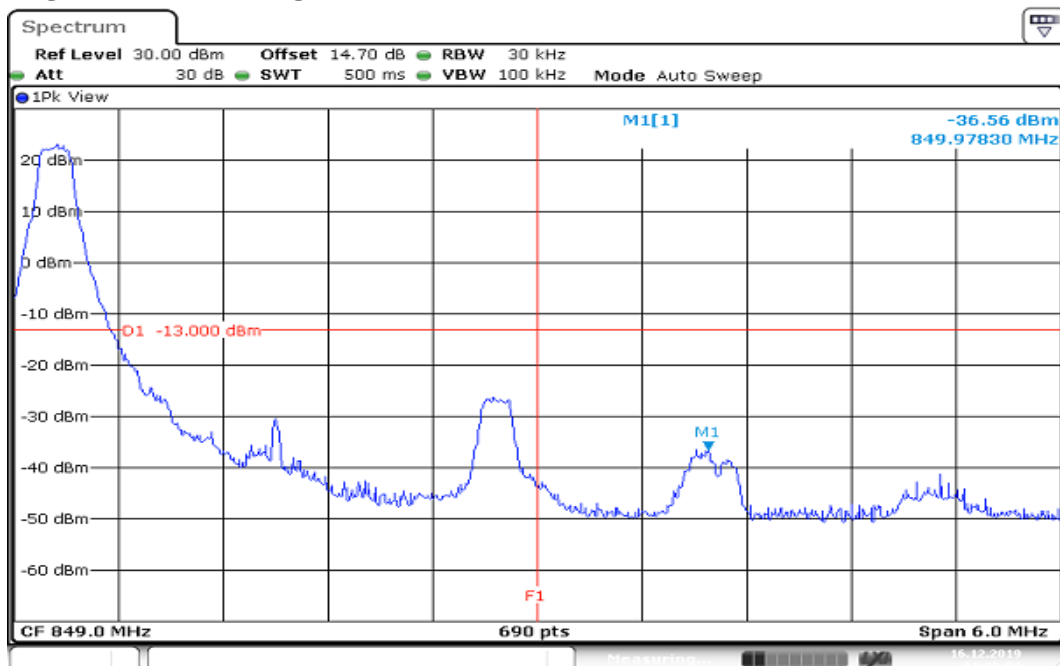
HIGHER BAND EDGE



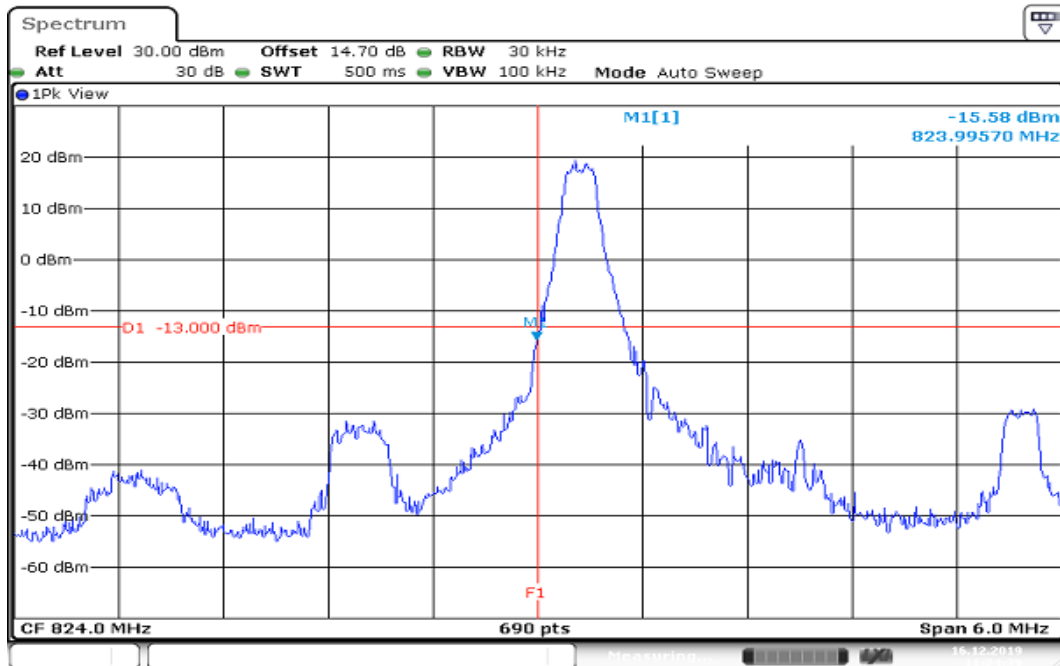
Date: 16.DEC.2019 11:10:43

**CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB ALLOCATED
LOWER BAND EDGE**

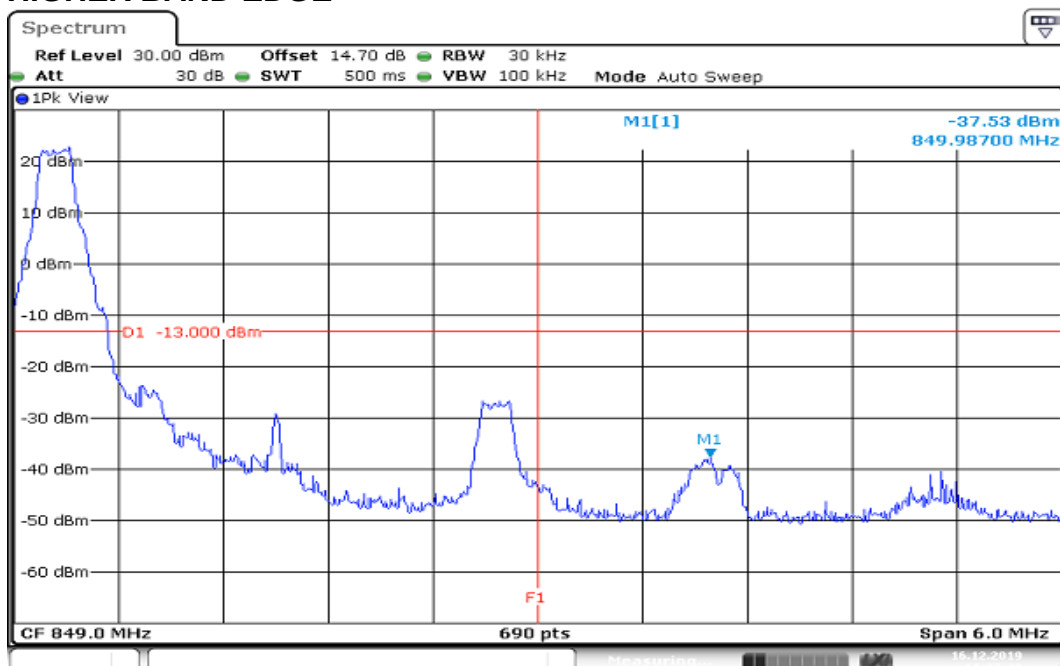
Date: 16.DEC.2019 11:25:28

HIGHER BAND EDGE

Date: 16.DEC.2019 11:26:58

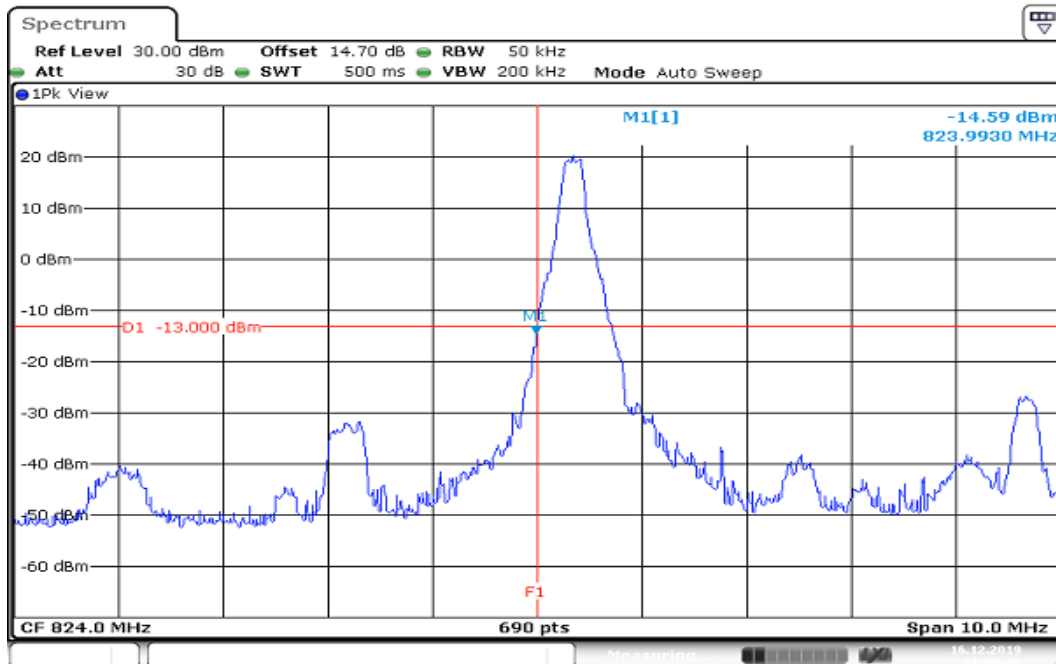
**CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

Date: 16.DEC.2019 11:24:39

HIGHER BAND EDGE

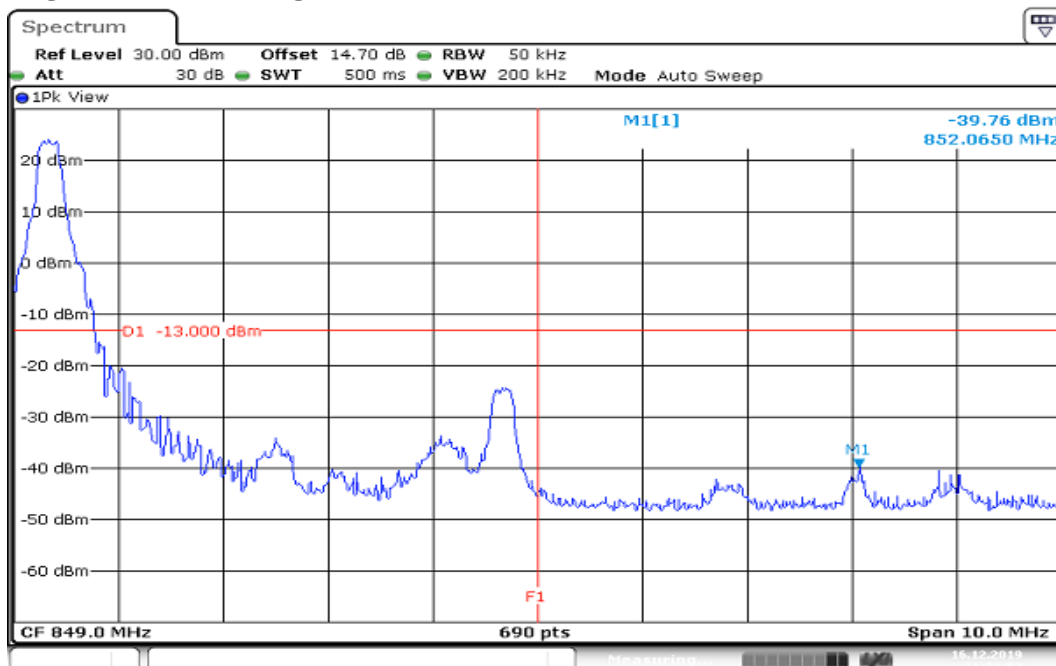
Date: 16.DEC.2019 11:27:38

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB ALLOCATED LOWER BAND EDGE

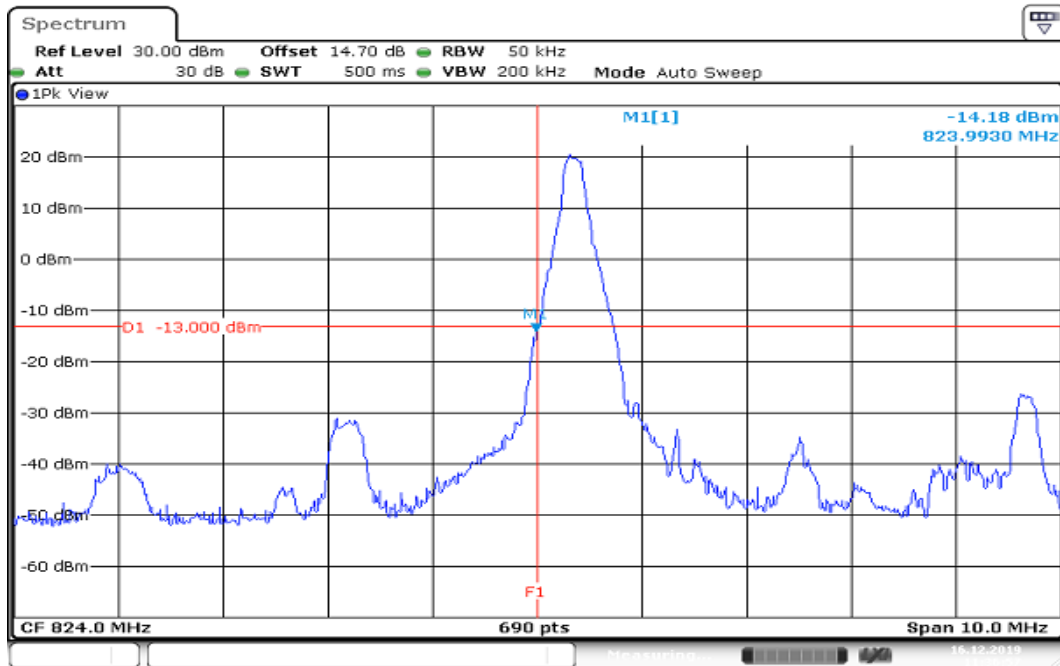


Date: 16.DEC.2019 11:36:12

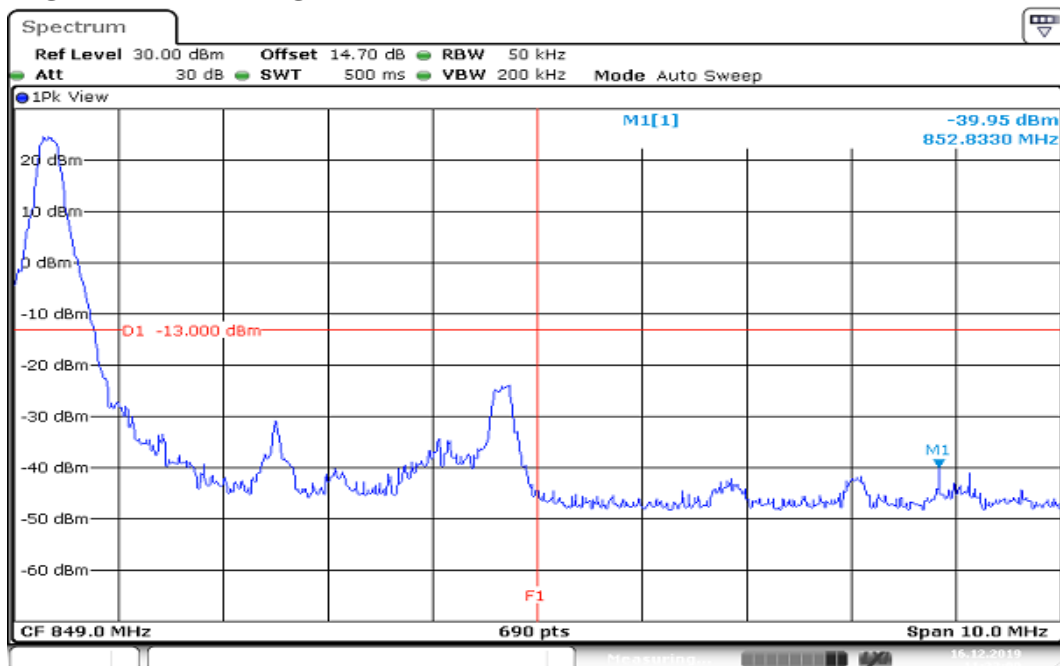
HIGHER BAND EDGE



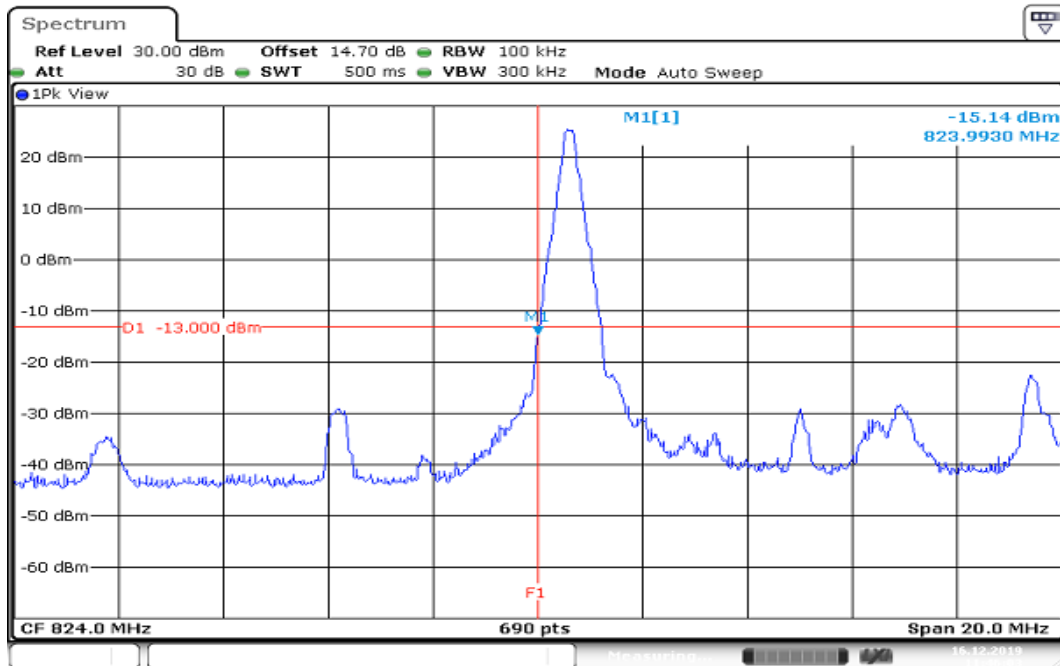
Date: 16.DEC.2019 11:33:53

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

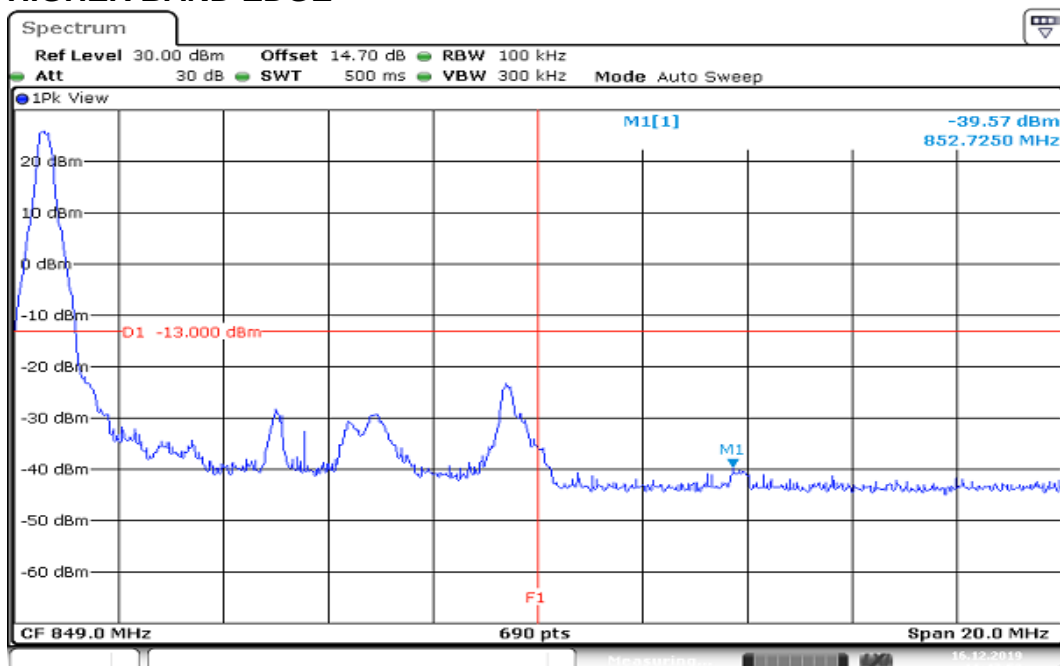
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HIGHER BAND EDGE

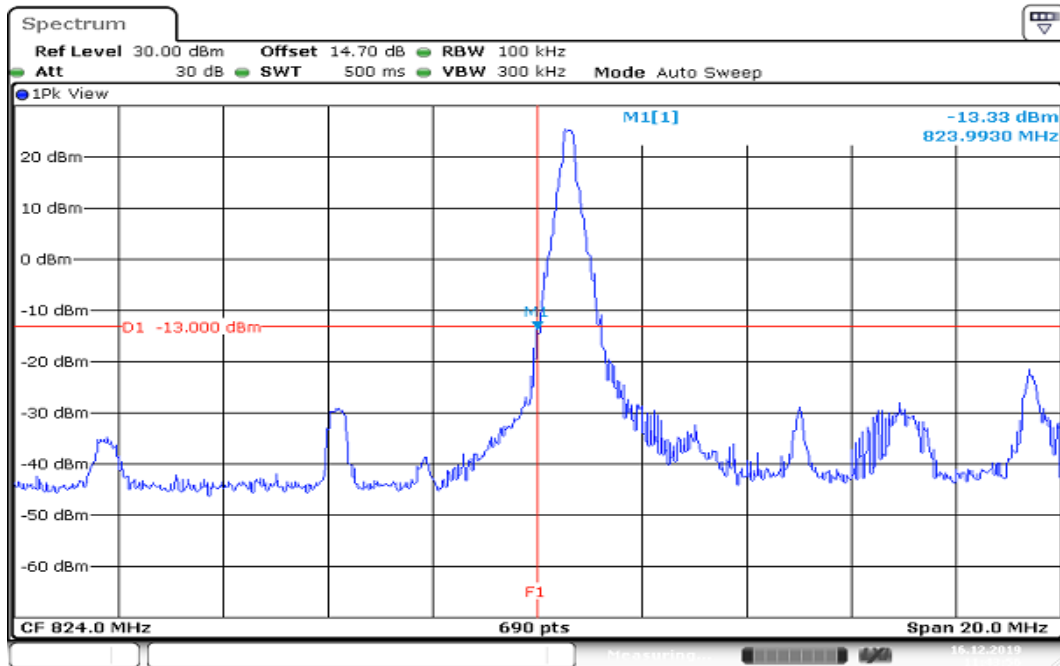
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**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB ALLOCATED
LOWER BAND EDGE**

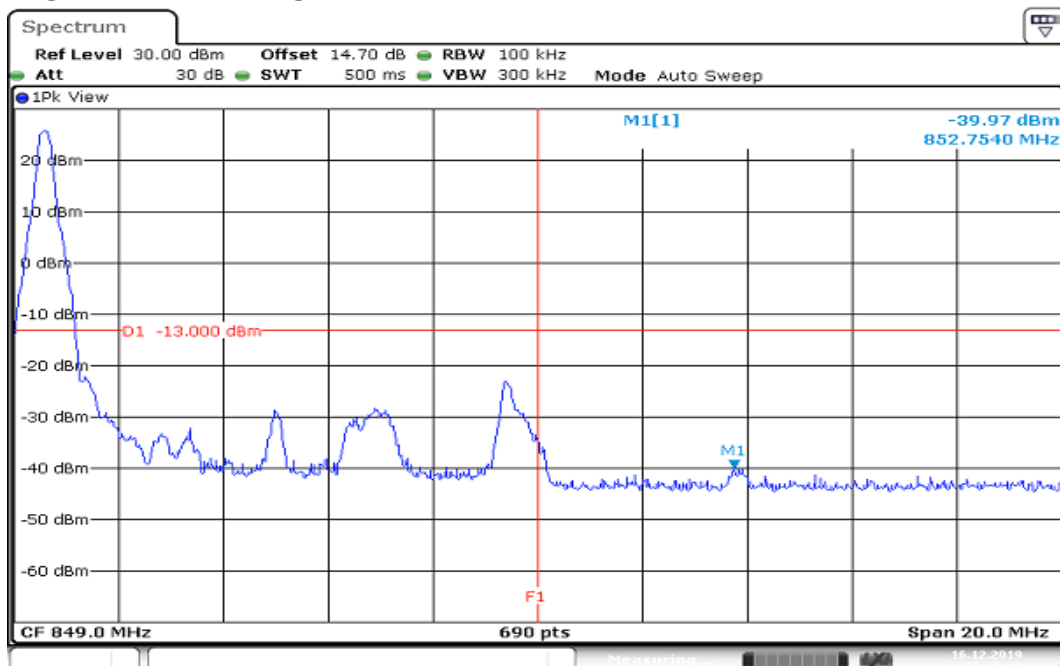
Date: 16.DEC.2019 11:46:03

HIGHER BAND EDGE

Date: 16.DEC.2019 11:47:53

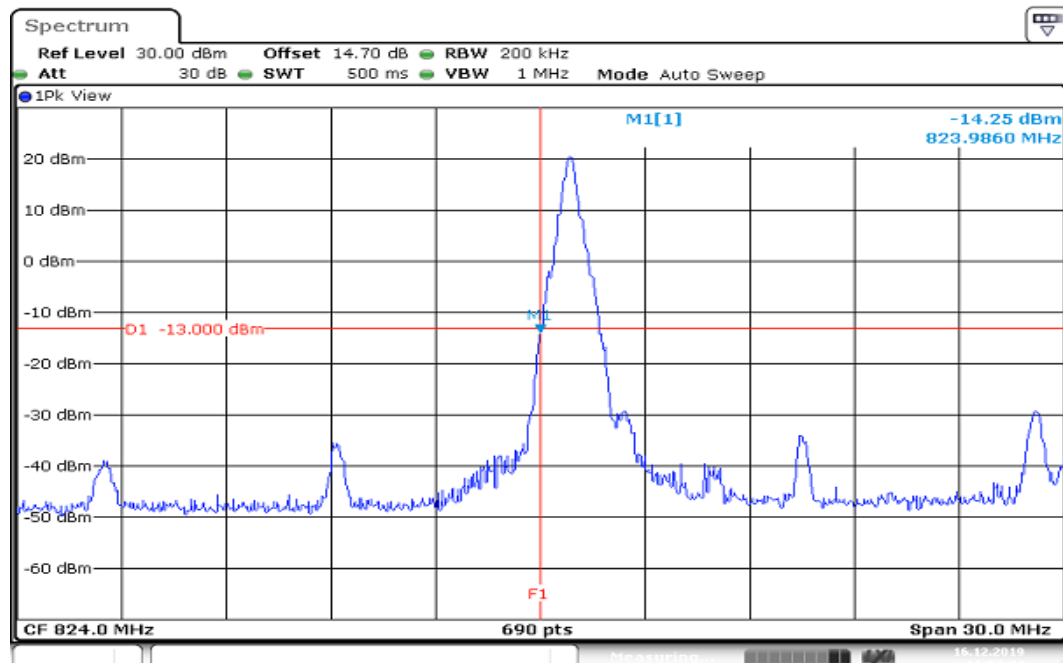
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LOWER BAND EDGE**

Date: 16.DEC.2019 11:43:57

HIGHER BAND EDGE

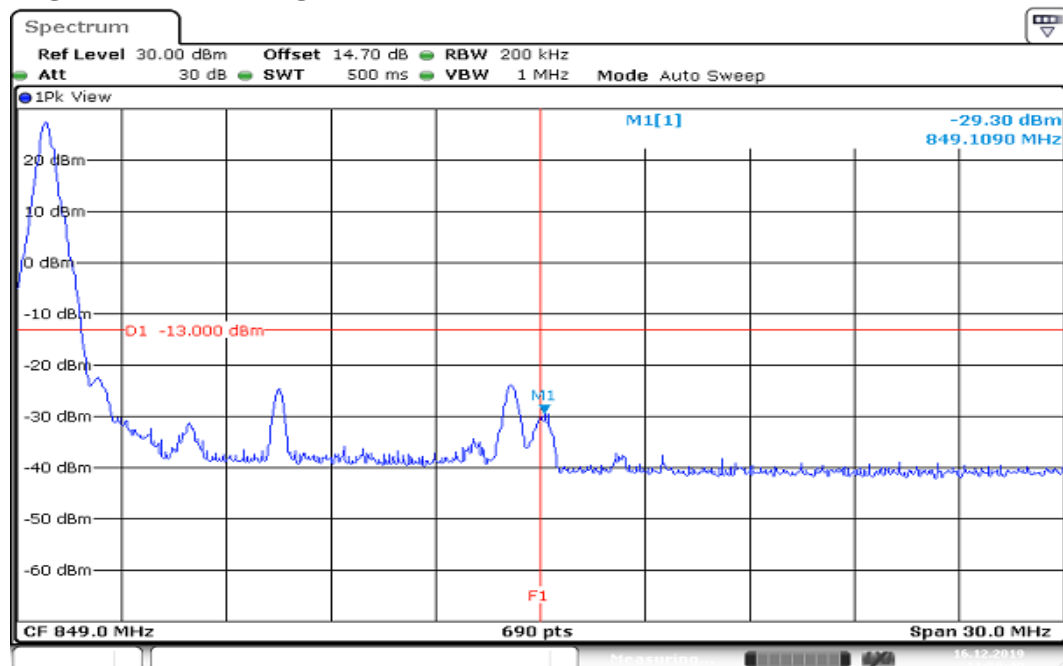
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CHANNEL BANDWIDTH: 15MHz / QPSK / 1RB ALLOCATED LOWER BAND EDGE



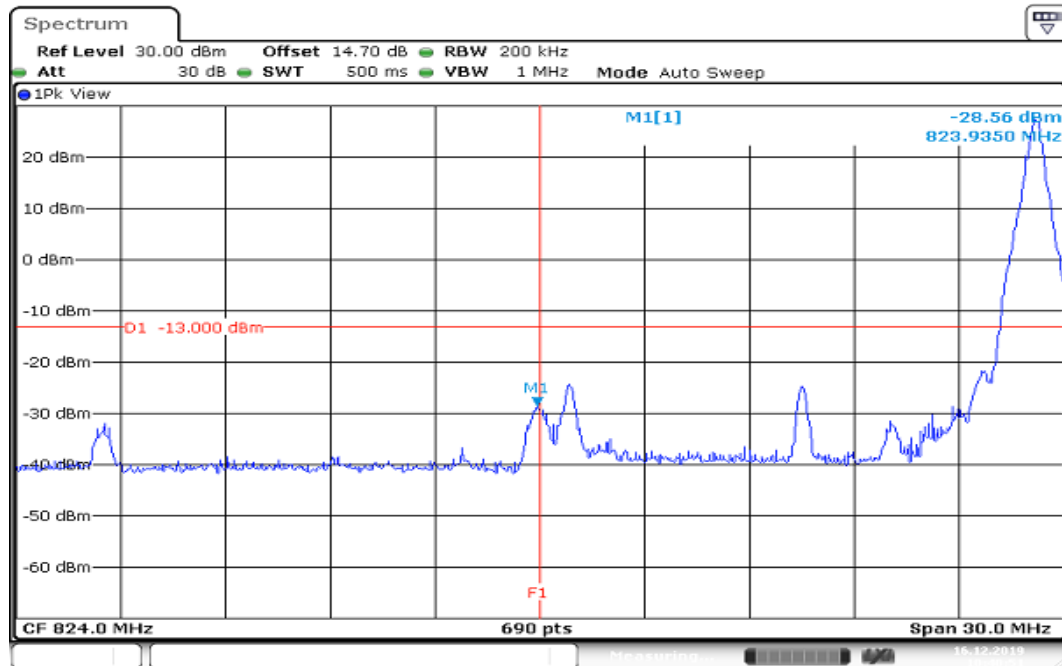
Date: 16.DEC.2019 11:57:44

HIGHER BAND EDGE

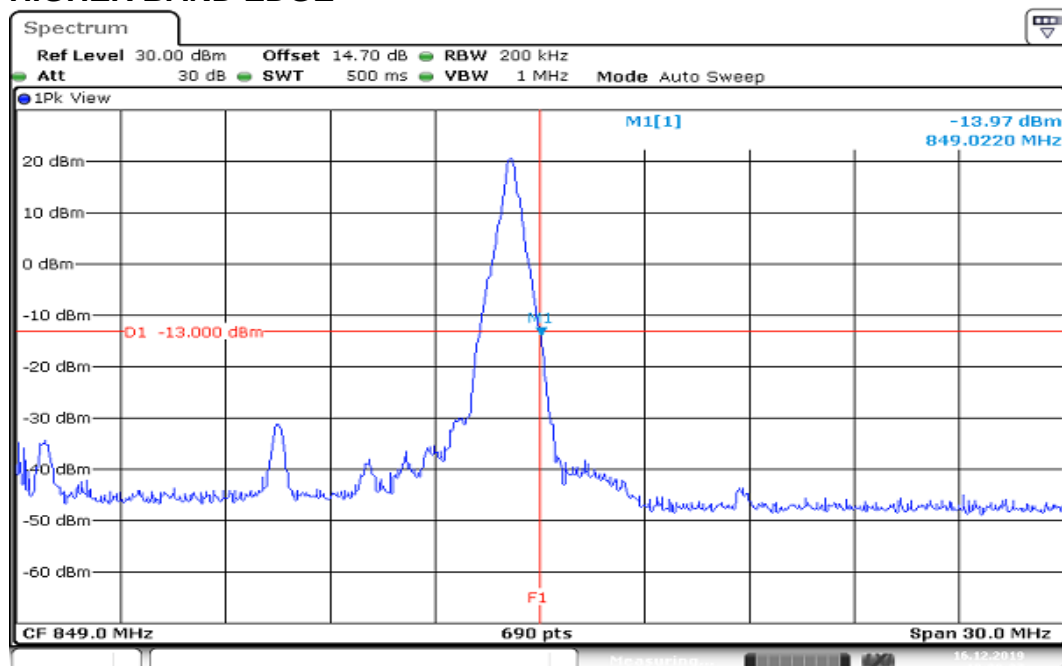


Date: 16.DEC.2019 11:58:41

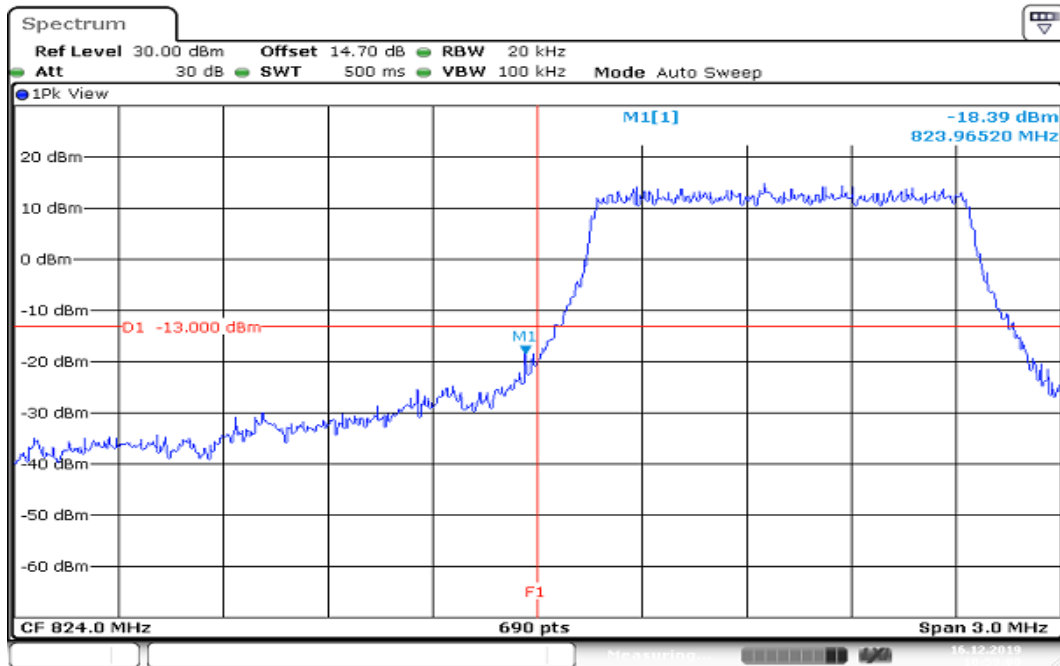
Report No.: T191105W01-RP15

**CHANNEL BANDWIDTH: 15MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

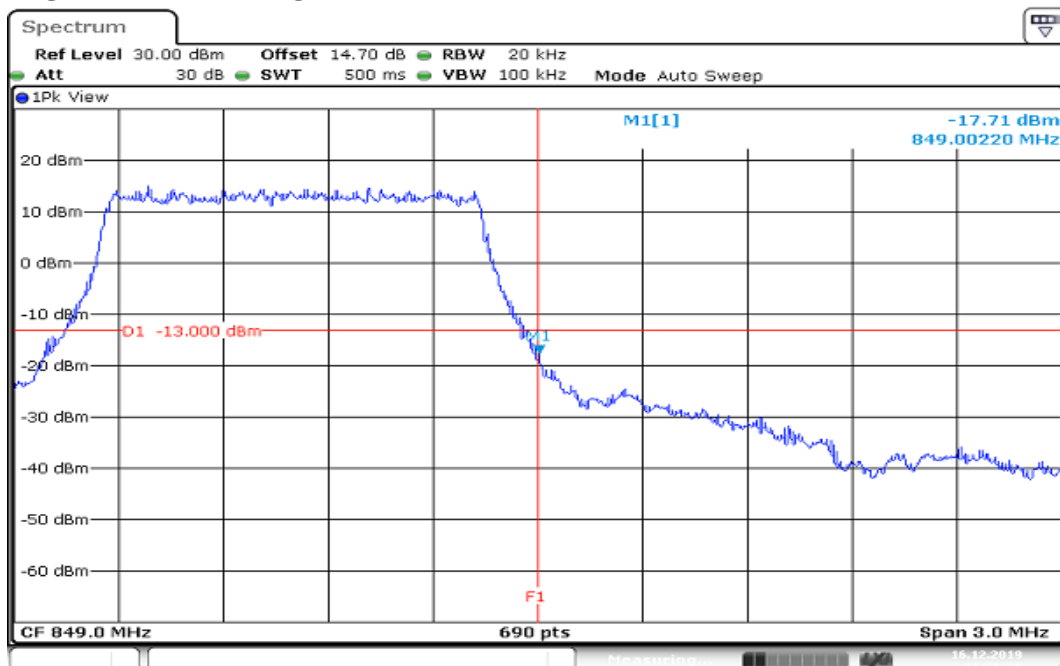
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HIGHER BAND EDGE

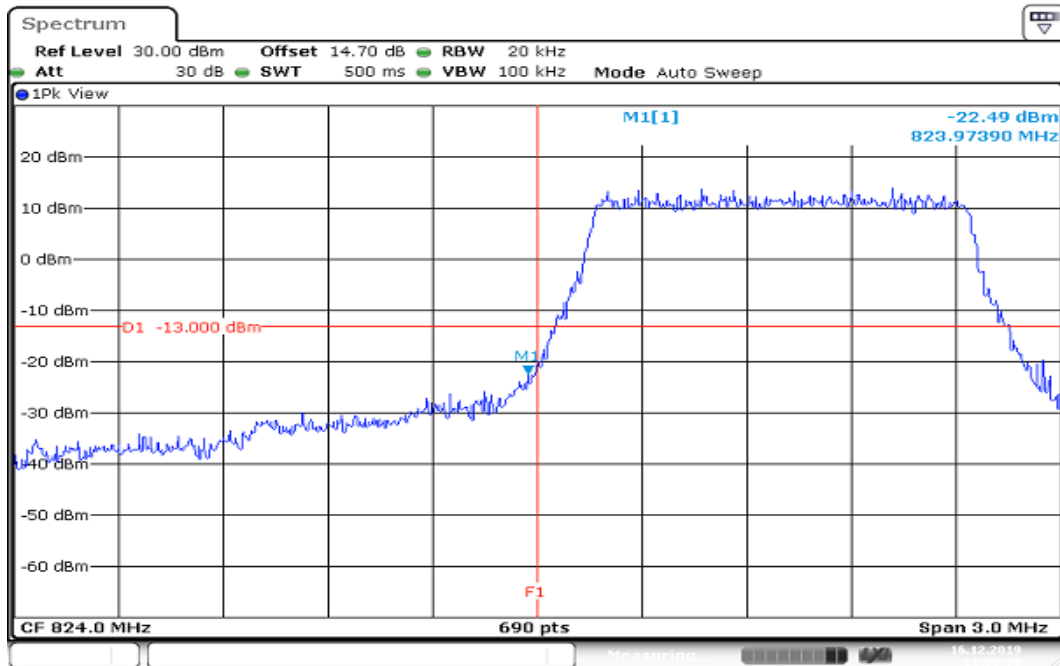
Date: 16.DEC.2019 10:28:27

**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

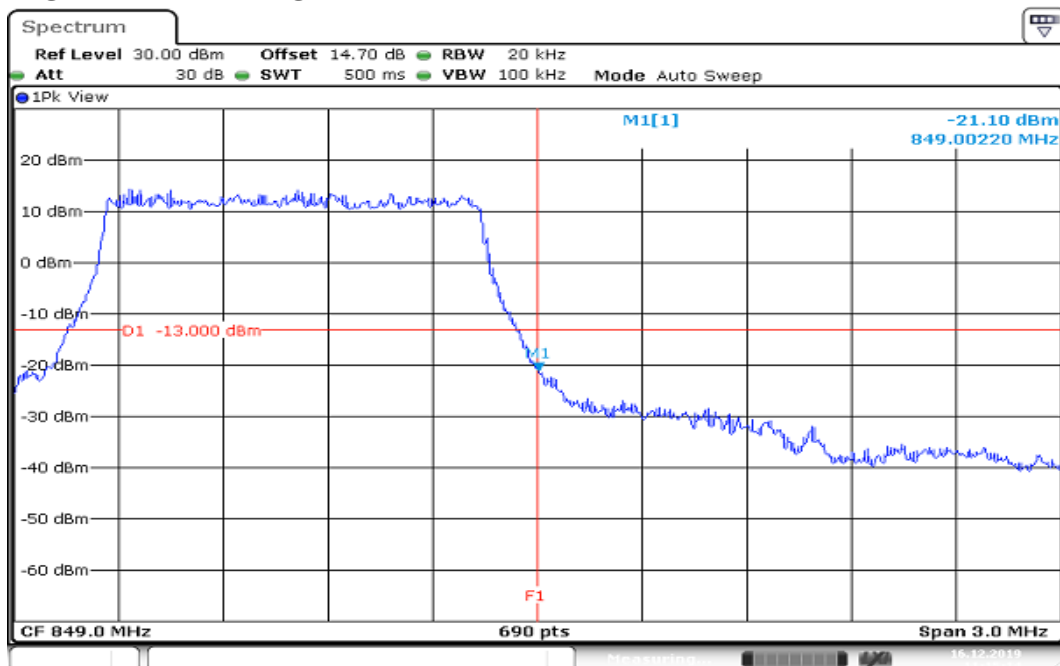
Date: 16.DEC.2019 10:59:00

HIGHER BAND EDGE

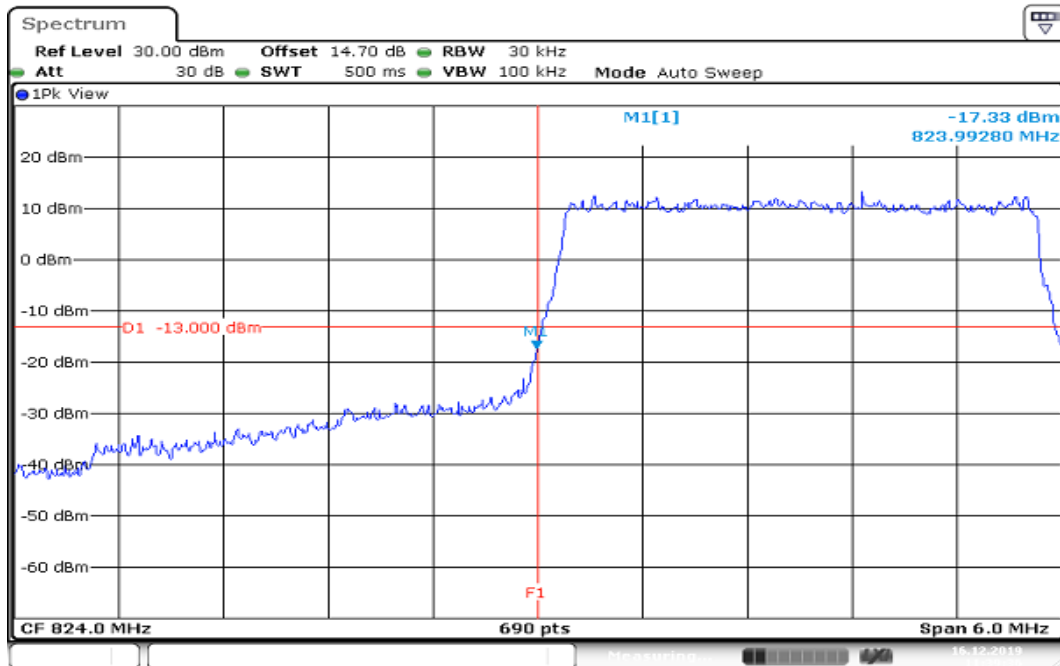
Date: 16.DEC.2019 11:16:31

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

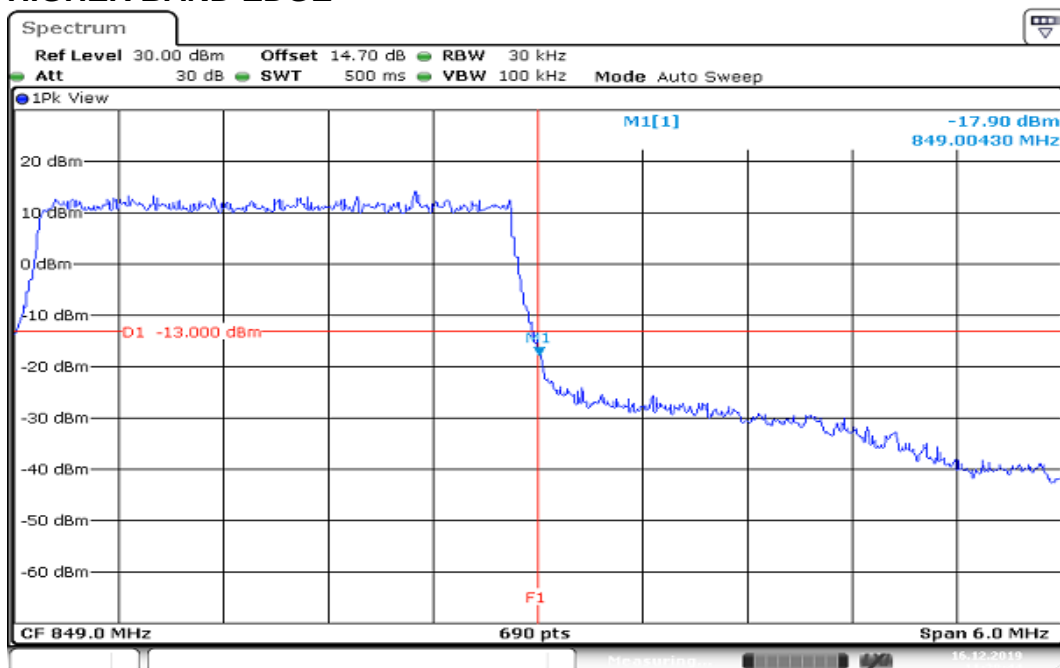
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HIGHER BAND EDGE

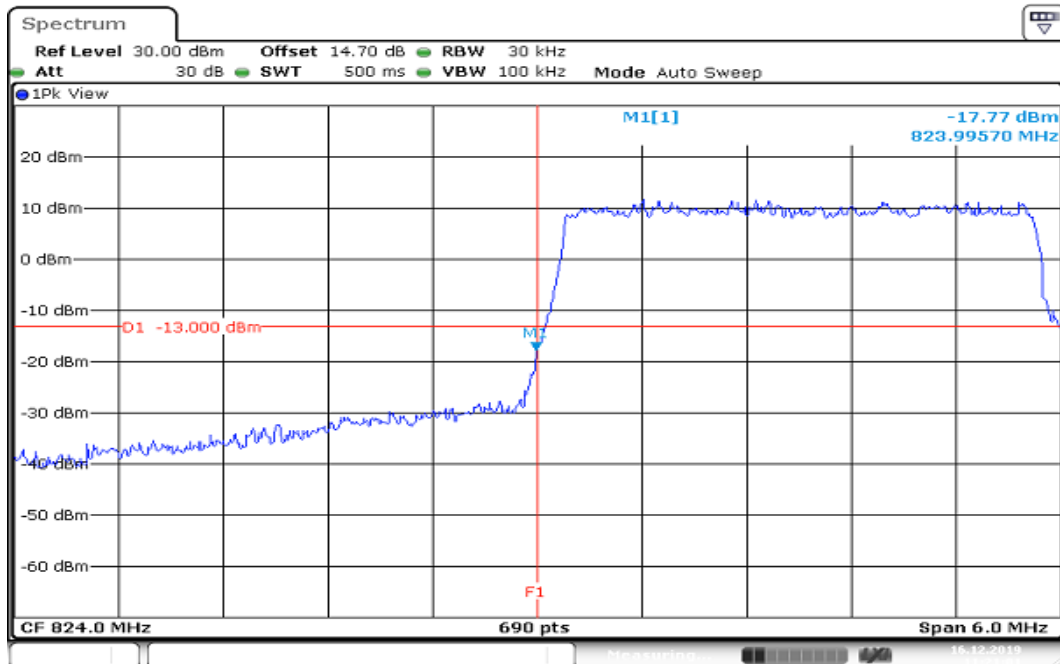
Date: 16.DEC.2019 11:15:14

**CHANNEL BANDWIDTH: 3MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

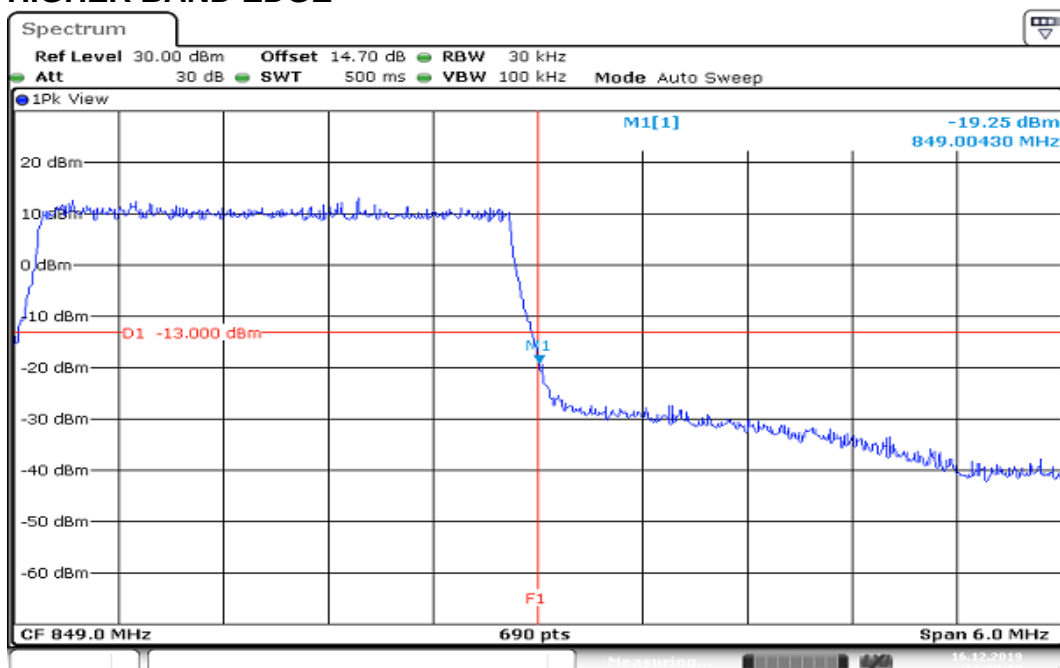
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HIGHER BAND EDGE

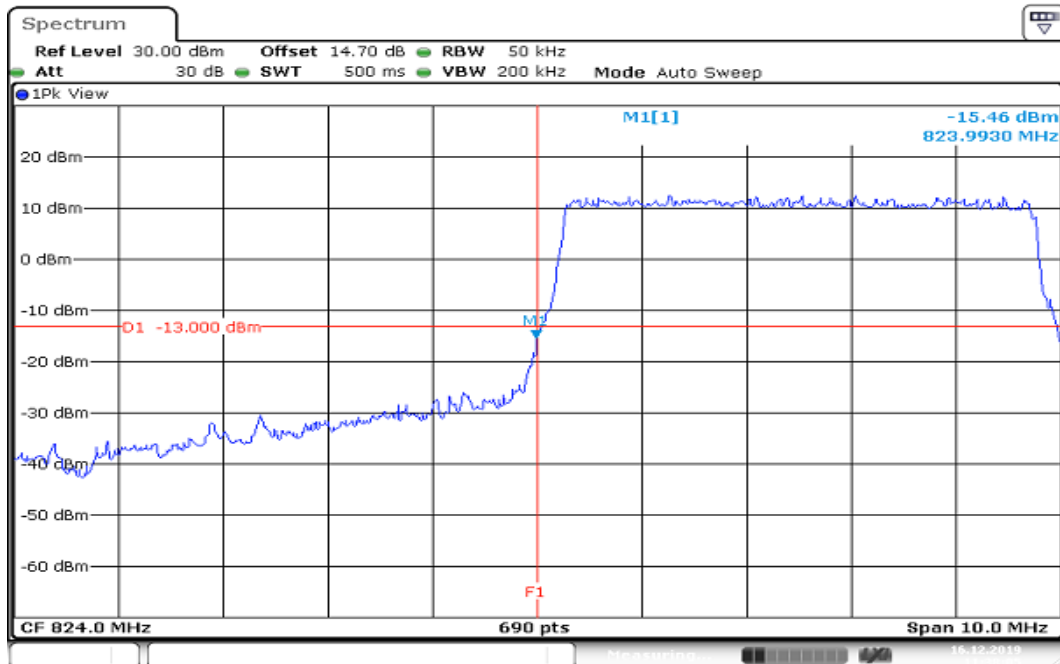
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LOWER BAND EDGE**

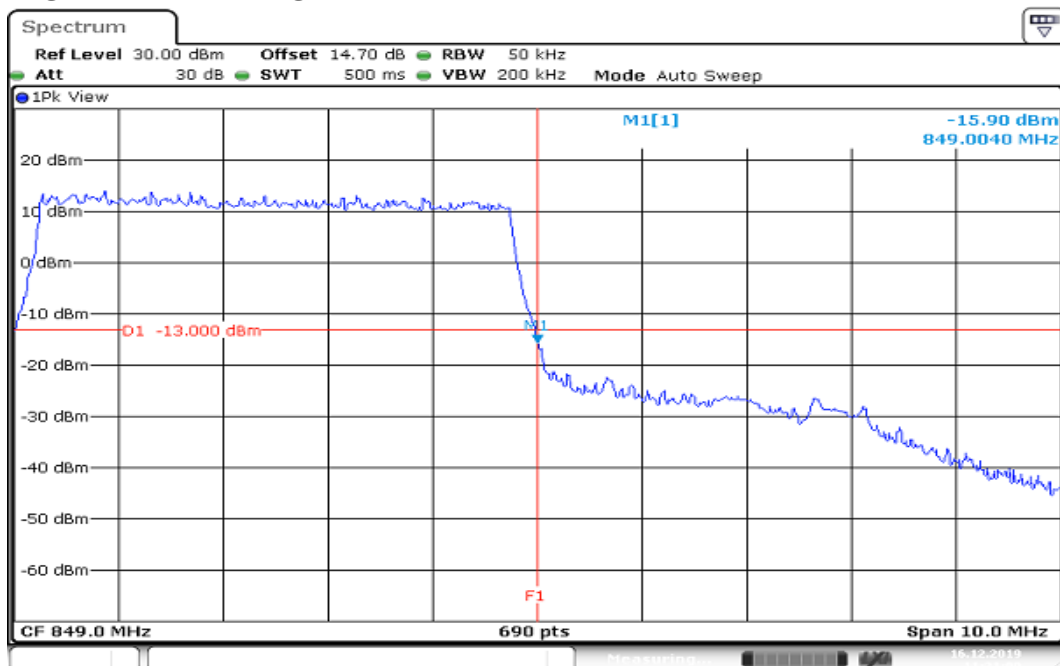
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HIGHER BAND EDGE

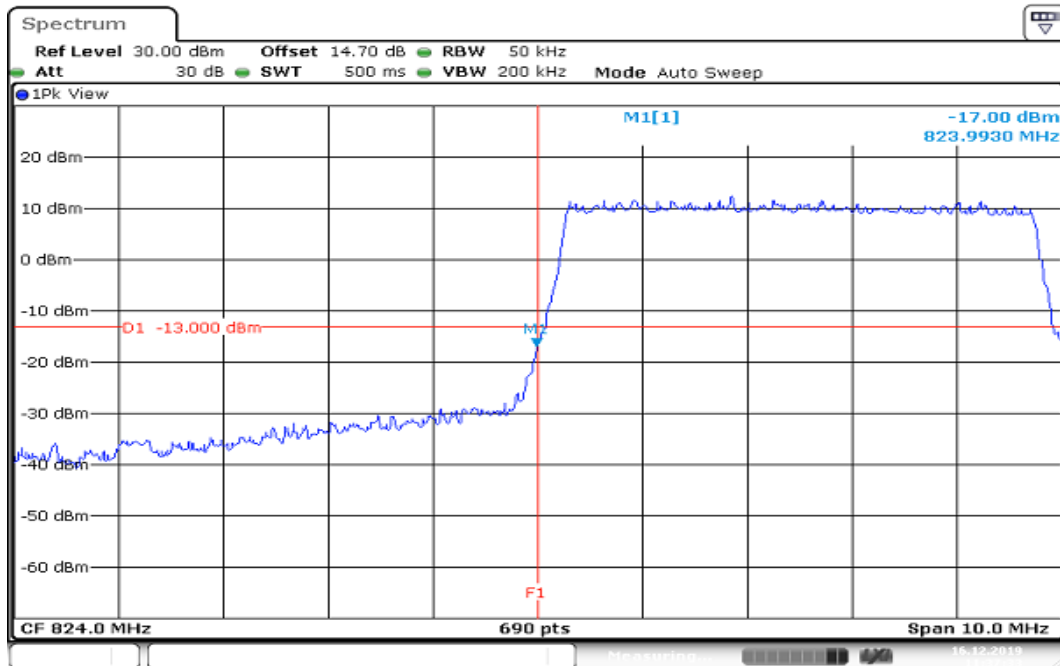
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**CHANNEL BANDWIDTH: 5MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

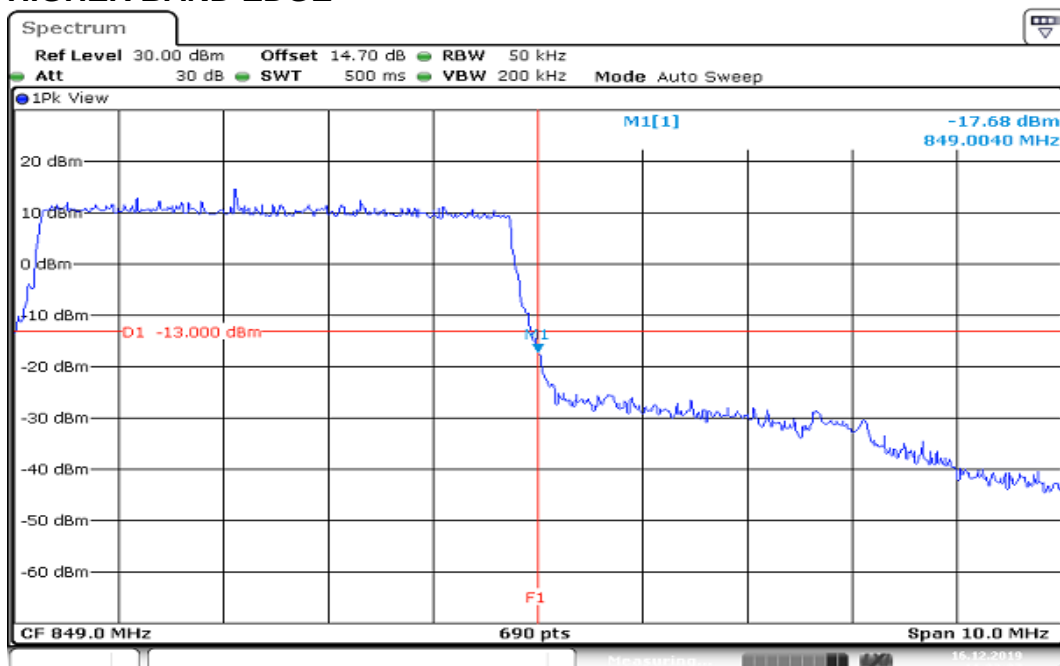
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HIGHER BAND EDGE

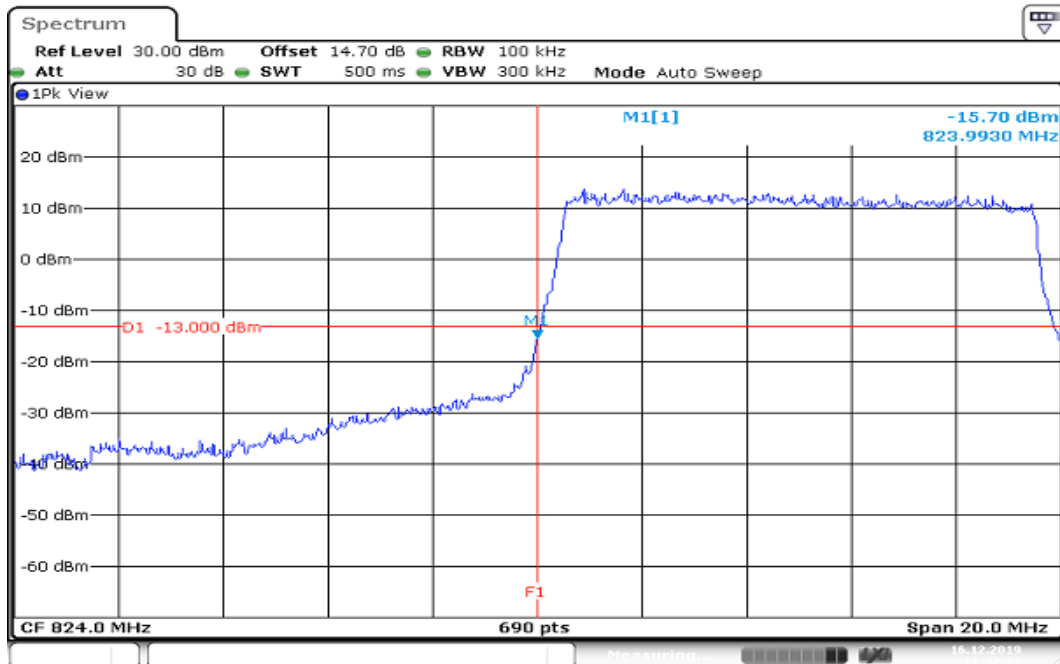
Date: 16.DEC.2019 11:31:00

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

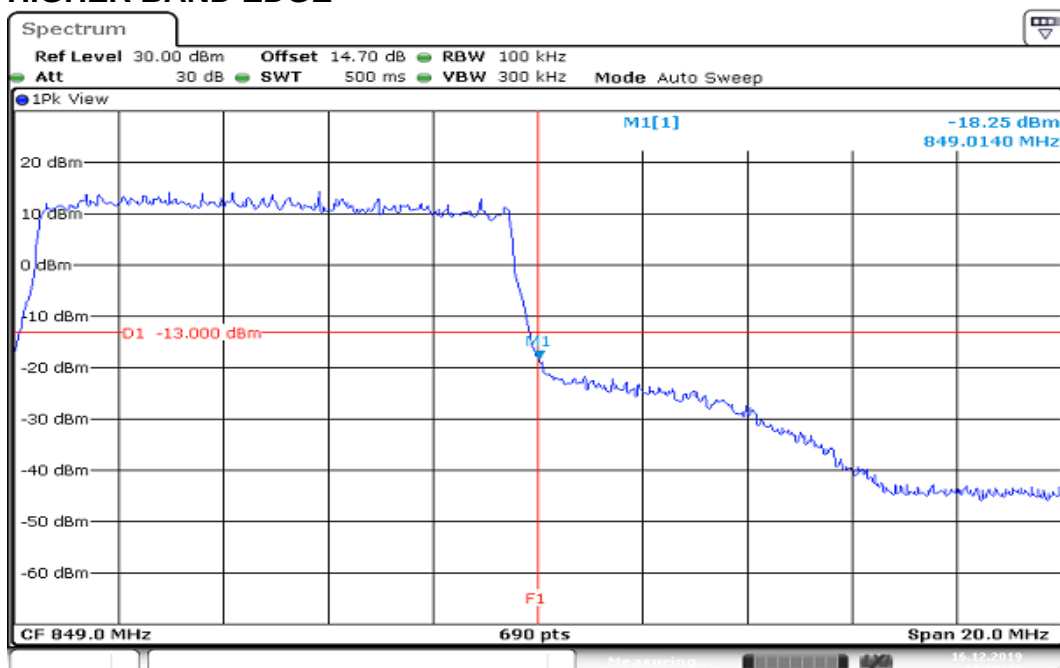
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HIGHER BAND EDGE

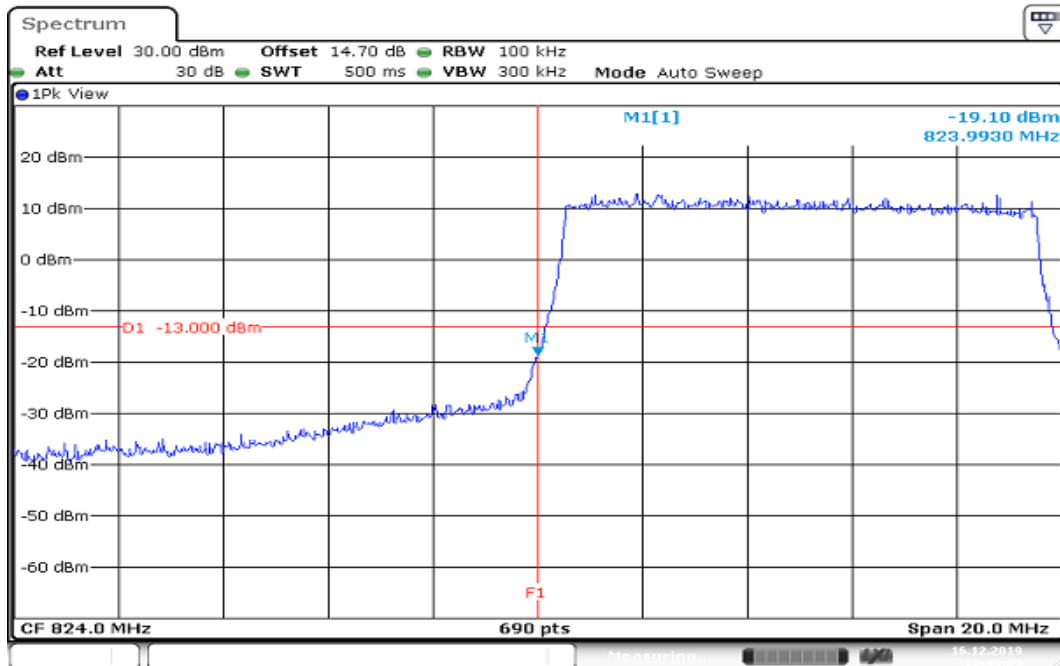
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**CHANNEL BANDWIDTH: 10MHz / QPSK / 100% RB ALLOCATED
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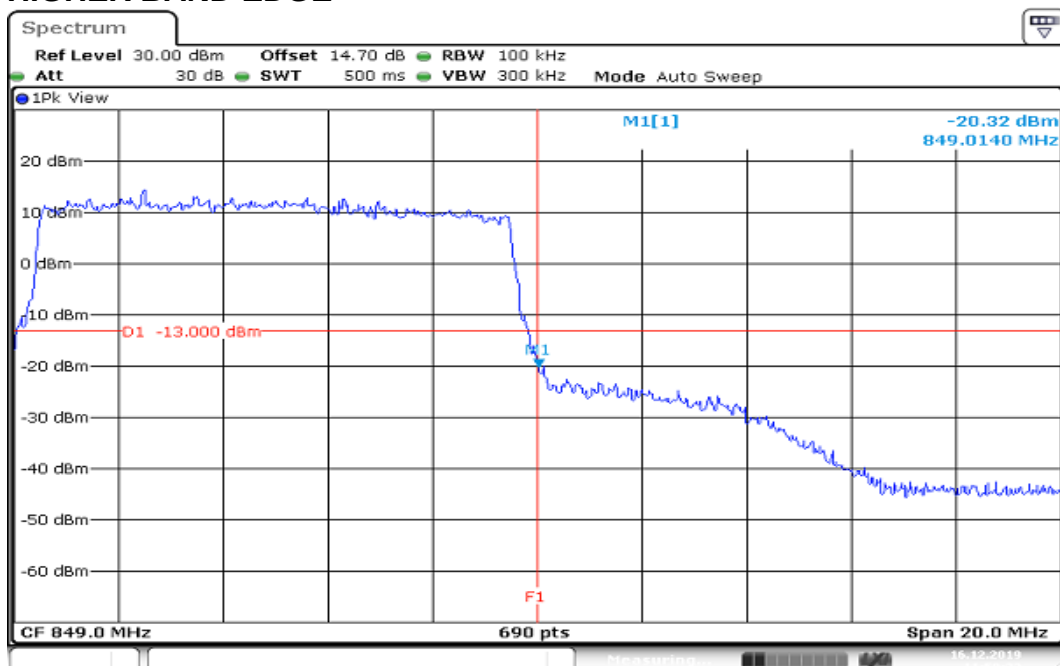
Date: 16.DEC.2019 11:42:12

HIGHER BAND EDGE

Date: 16.DEC.2019 11:50:47

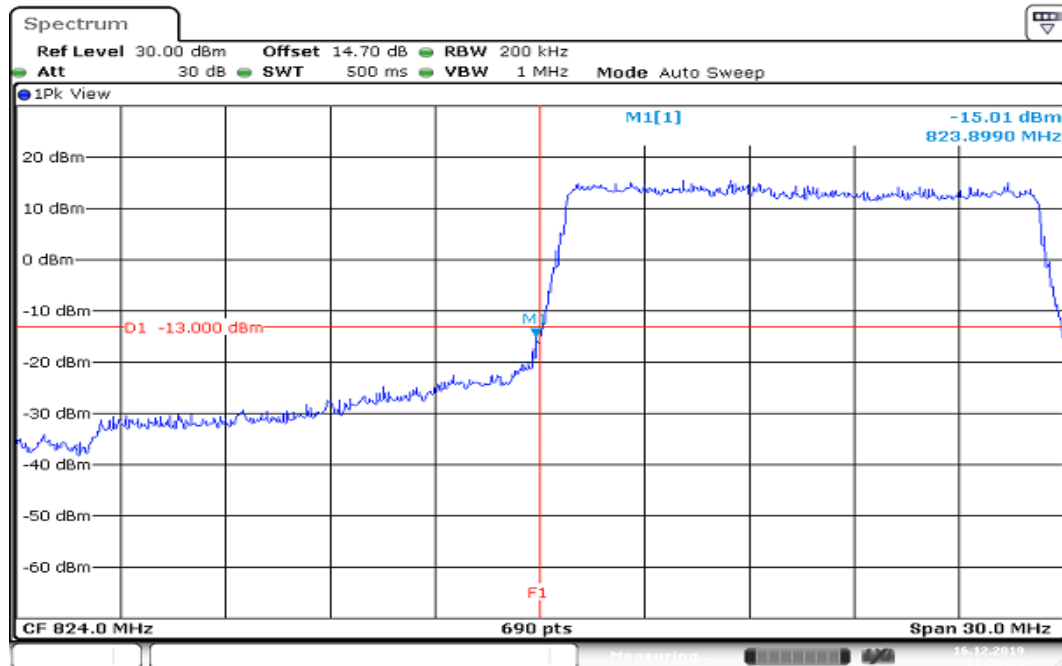
**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 16.DEC.2019 11:43:09

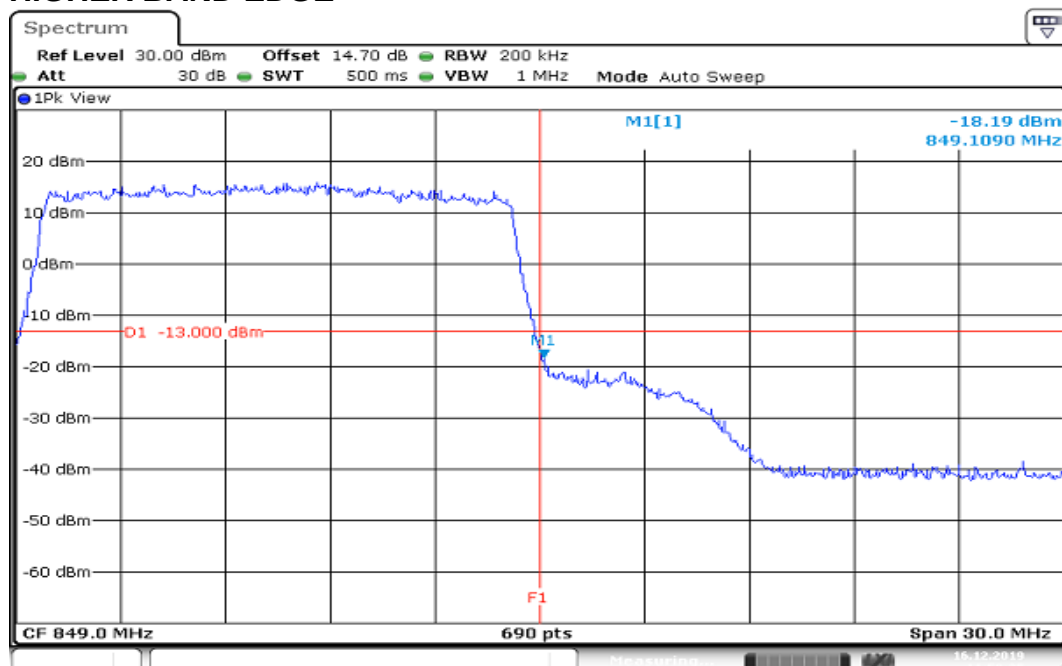
HIGHER BAND EDGE

Date: 16.DEC.2019 11:50:24

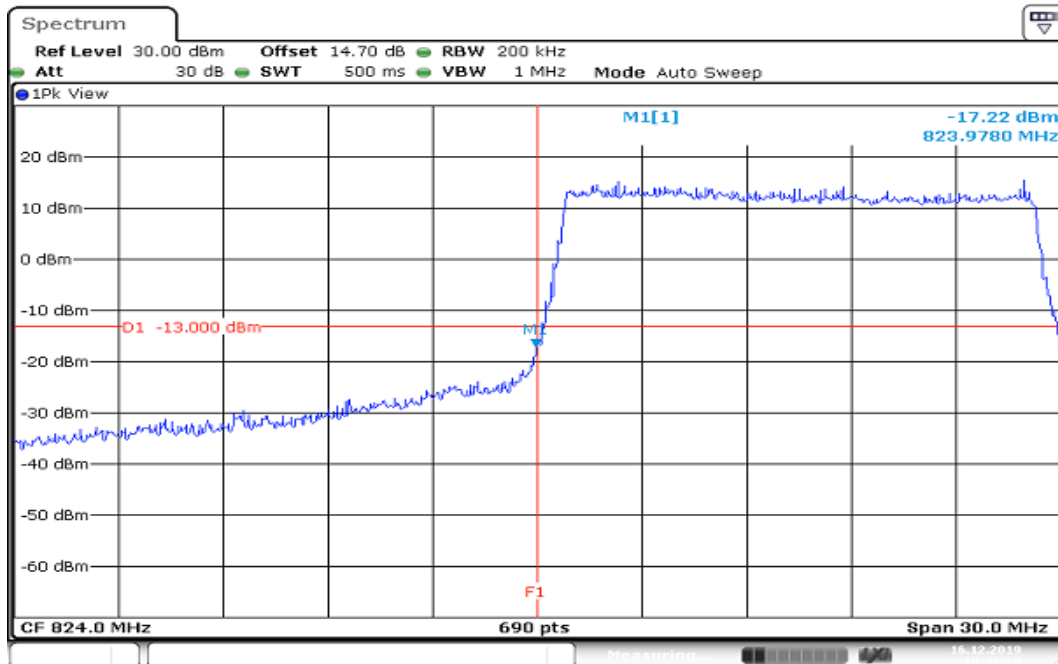
Report No.: T191105W01-RP15

**CHANNEL BANDWIDTH: 15MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

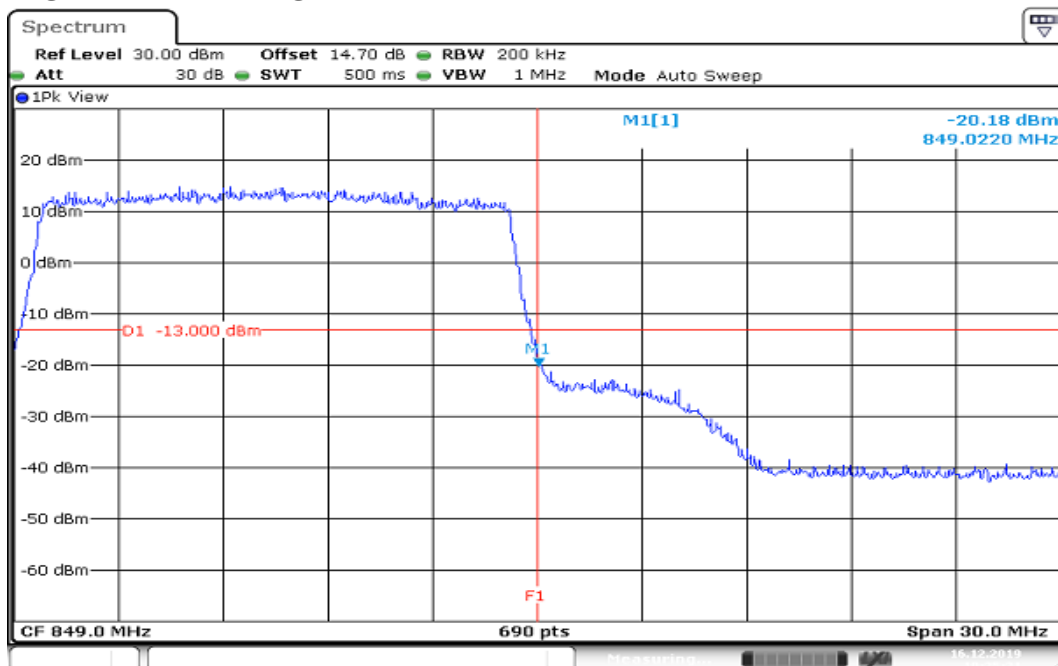
Date: 16.DEC.2019 11:56:33

HIGHER BAND EDGE

Date: 16.DEC.2019 11:59:26

**CHANNEL BANDWIDTH: 15MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 16.DEC.2019 10:42:19

HIGHER BAND EDGE

Date: 16.DEC.2019 10:25:32

8.6 CONDUCTED SPURIOUS EMISSIONS

Limits

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

Test Procedures

1. According to KDB 971168 D01,
2. The EUT was connect to spectrum analyzer and call box.
3. The RF output of EUT was connected to the spectrum analyzer.
4. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
5. Record the maximum spurious emission.
6. The fundamental frequency should be excluded against the limit in operating band.

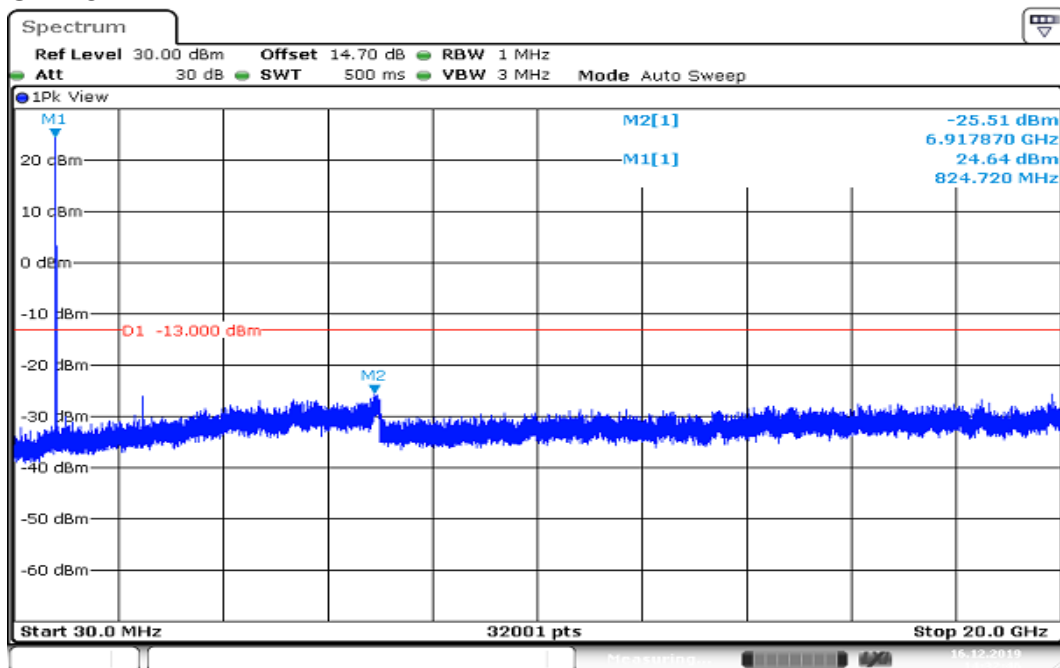
Report No.: T191105W01-RP15

Test Results

LTE Band 26

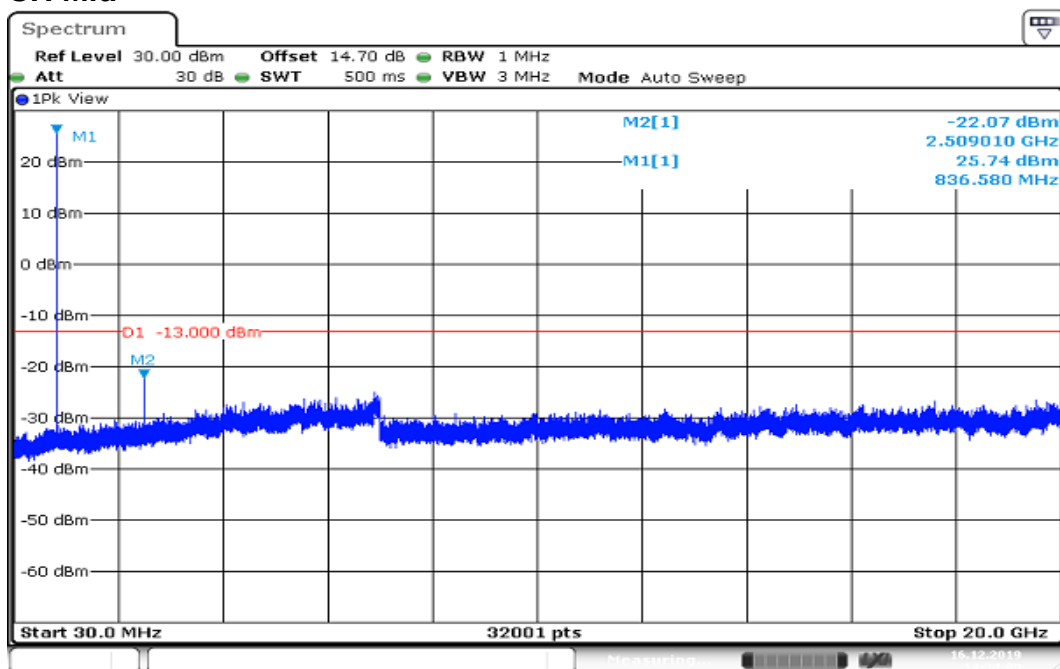
CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH Low



Date: 16.DEC.2019 14:32:46

CH Mid



Date: 16.DEC.2019 14:34:10

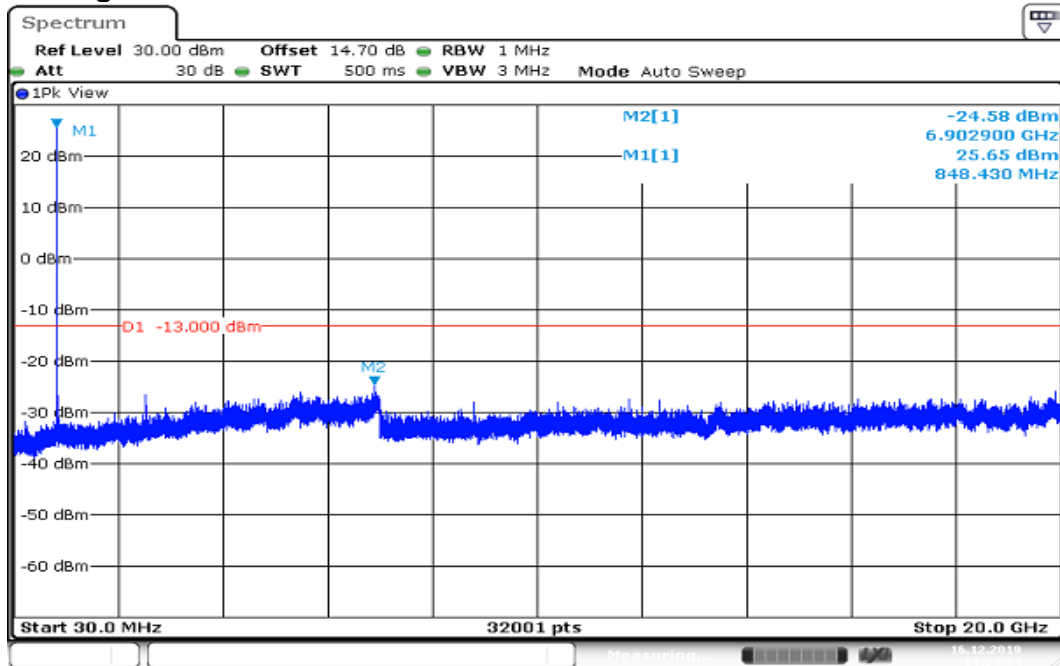


Report No.: T191105W01-RP15

Page: 71 / 97

Rev.: 00

CH High

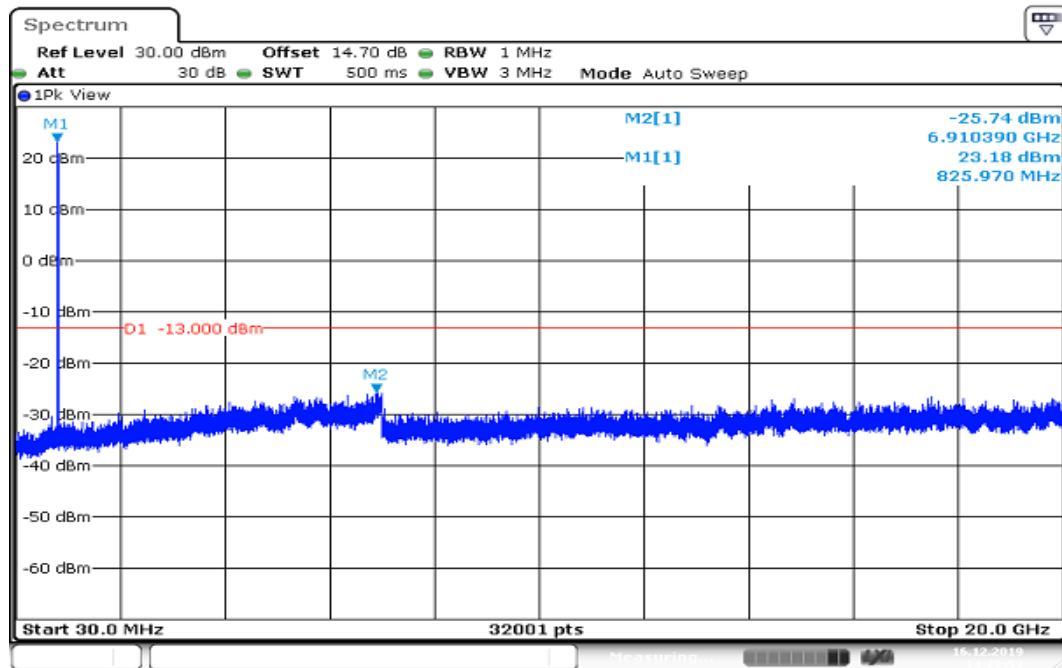


Date: 16.DEC.2019 14:34:35

Report No.: T191105W01-RP15

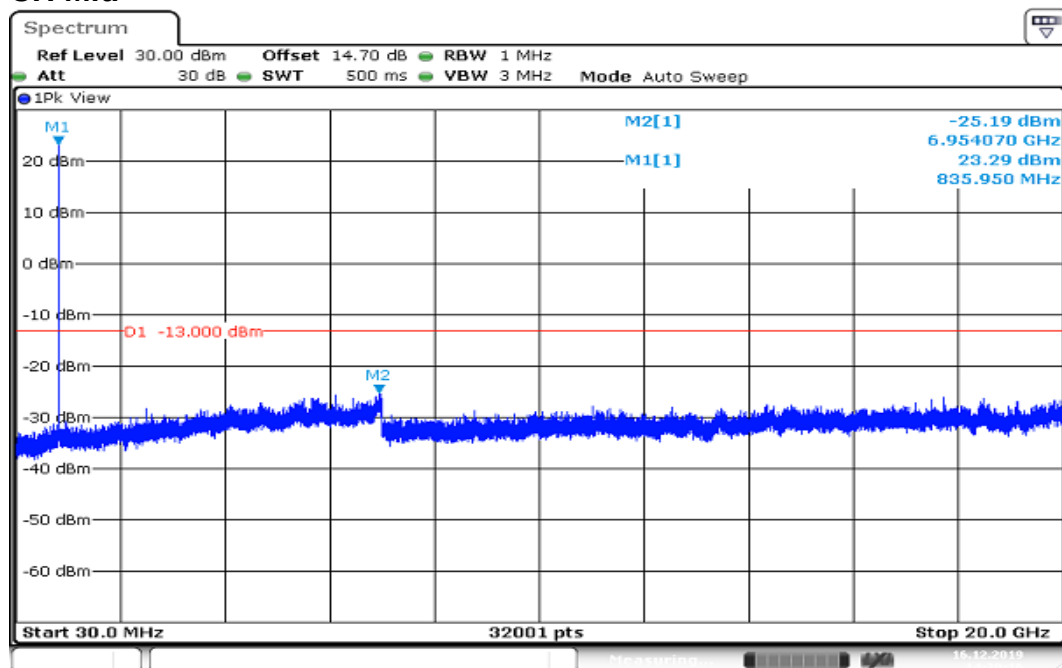
CHANNEL BANDWIDTH: 3MHz / QPSK

CH Low



Date: 16.DEC.2019 14:28:53

CH Mid



Date: 16.DEC.2019 14:30:17

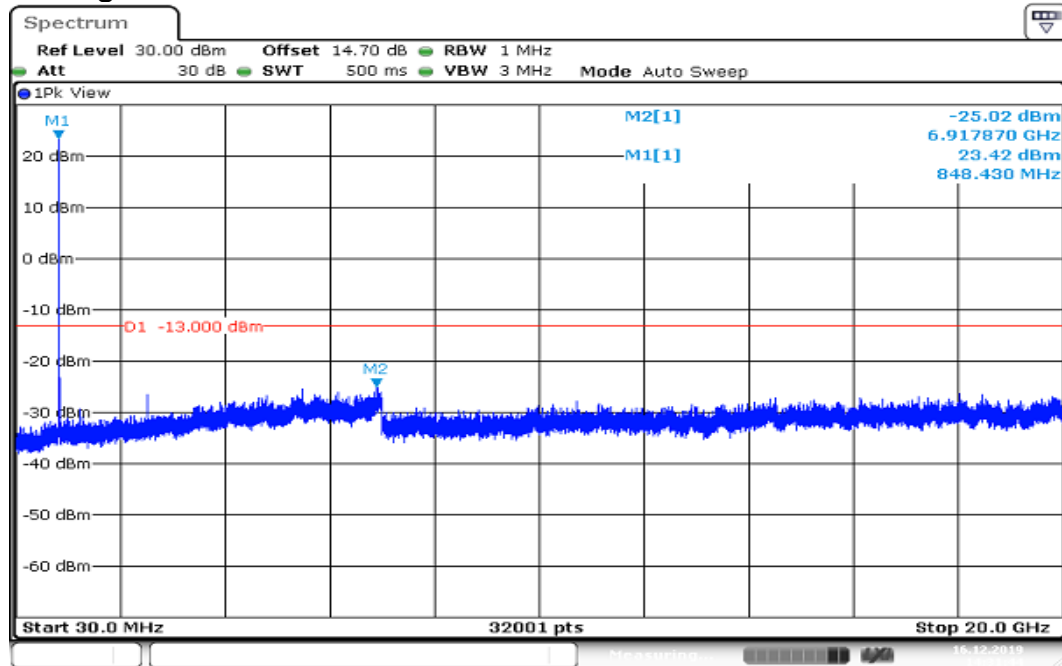


Report No.: T191105W01-RP15

Page: 73 / 97

Rev.: 00

CH High

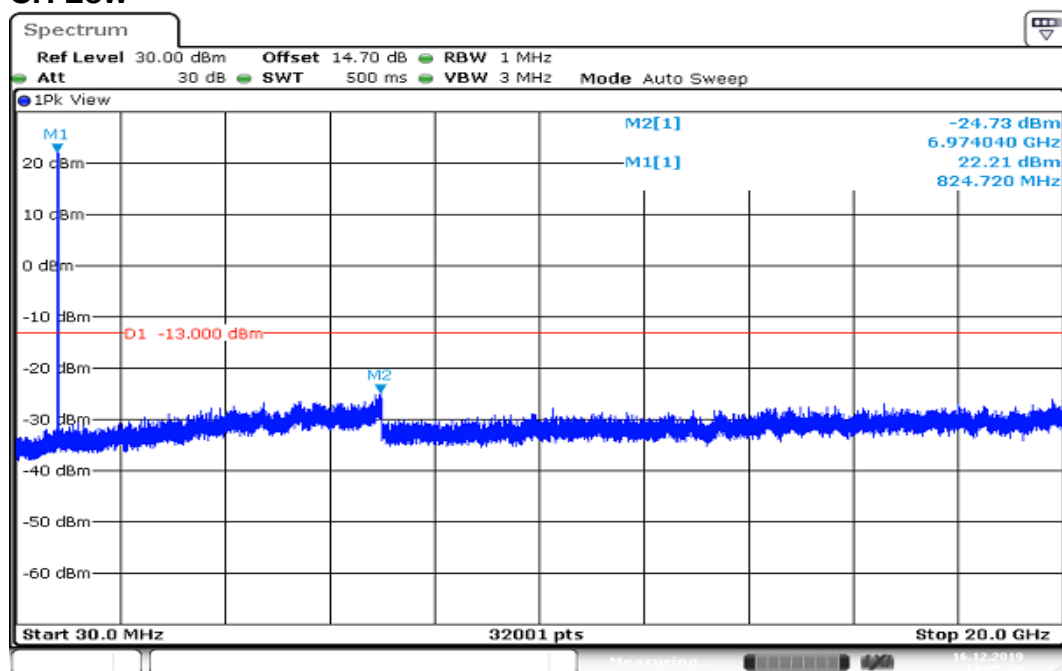


Date: 16.DEC.2019 14:31:44

Report No.: T191105W01-RP15

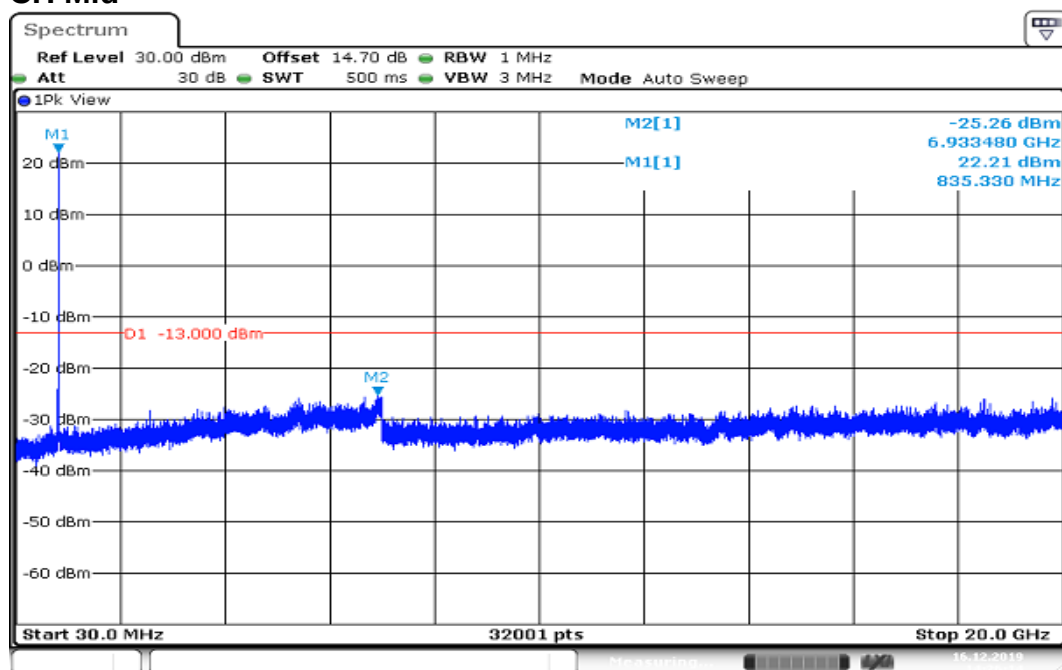
CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low



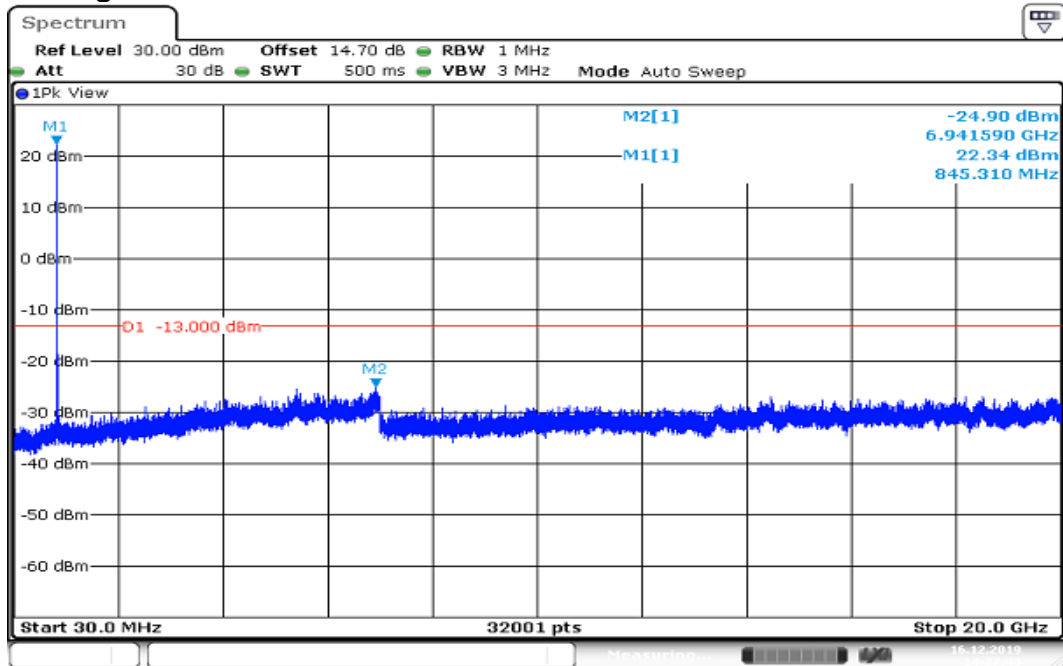
Date: 16.DEC.2019 14:25:36

CH Mid



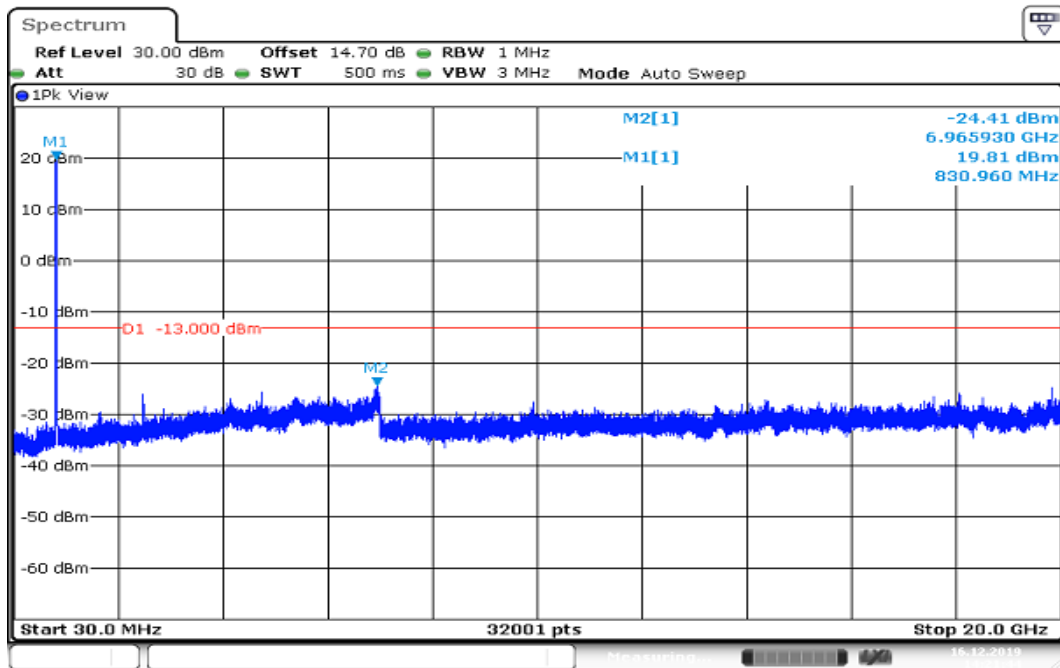
Date: 16.DEC.2019 14:26:15

CH High

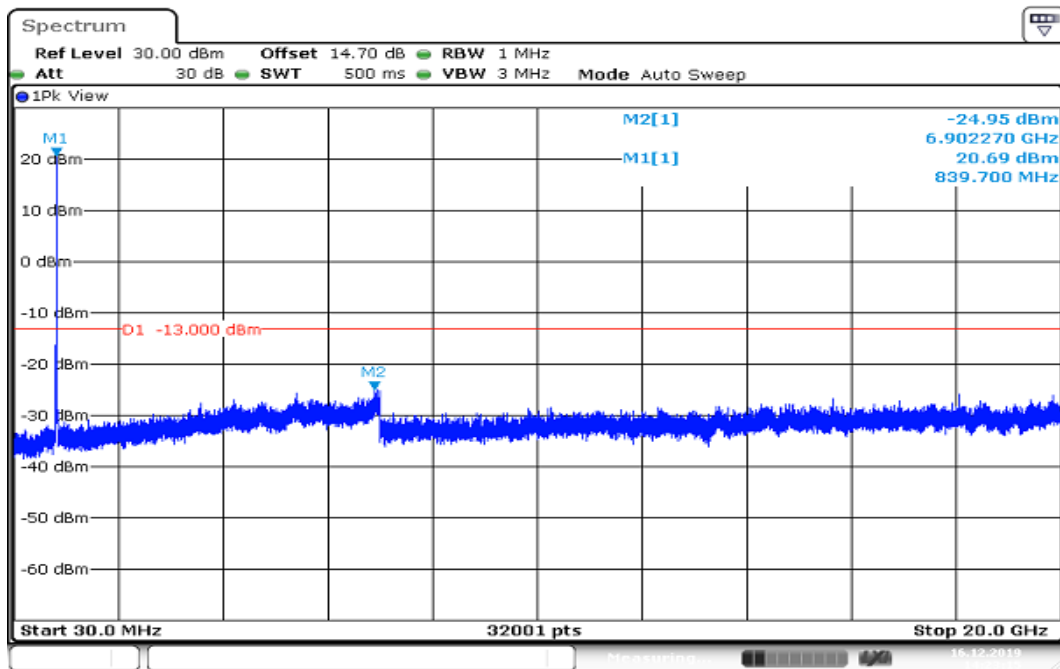


Date: 16.DEC.2019 14:27:40

Report No.: T191105W01-RP15

CHANNEL BANDWIDTH: 10MHz / QPSK**CH Low**

Date: 16.DEC.2019 14:21:44

CH Mid

Date: 16.DEC.2019 14:23:15

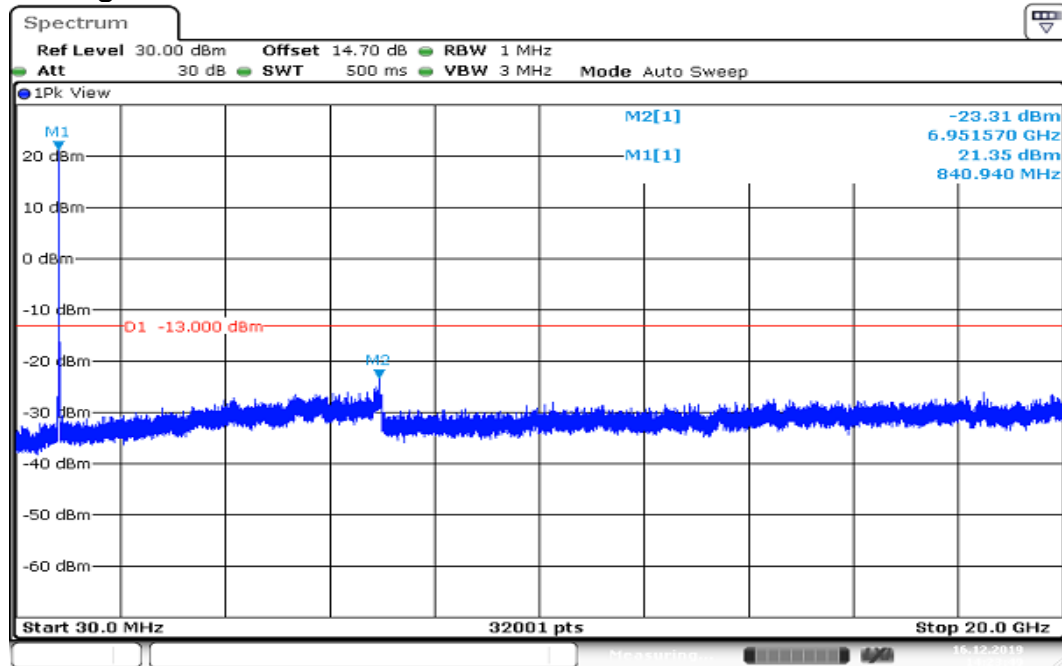


Report No.: T191105W01-RP15

Page: 77 / 97

Rev.: 00

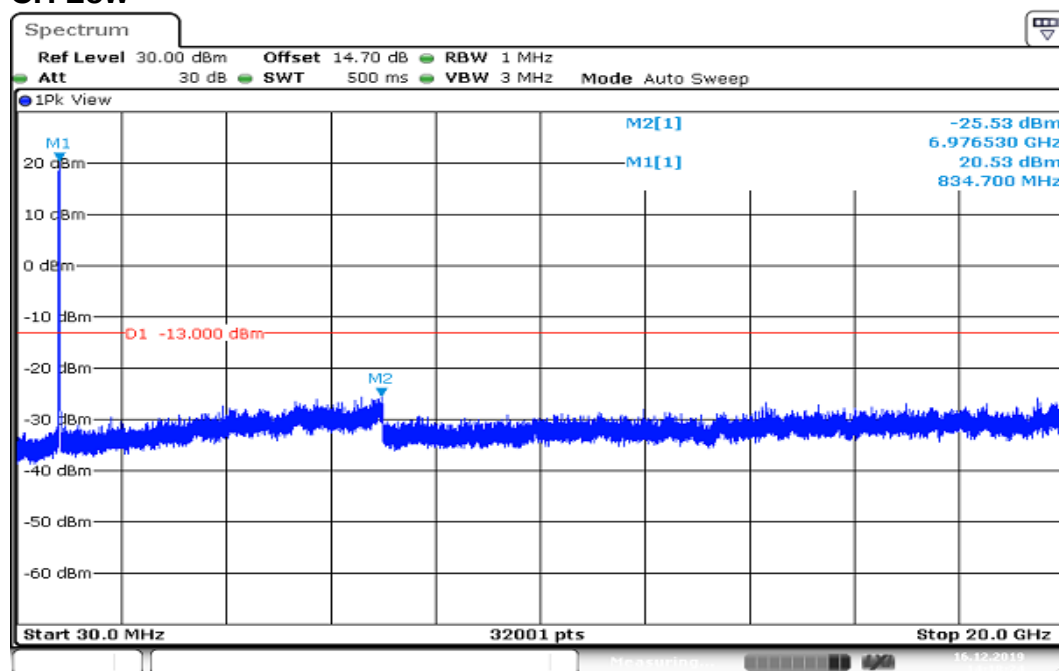
CH High



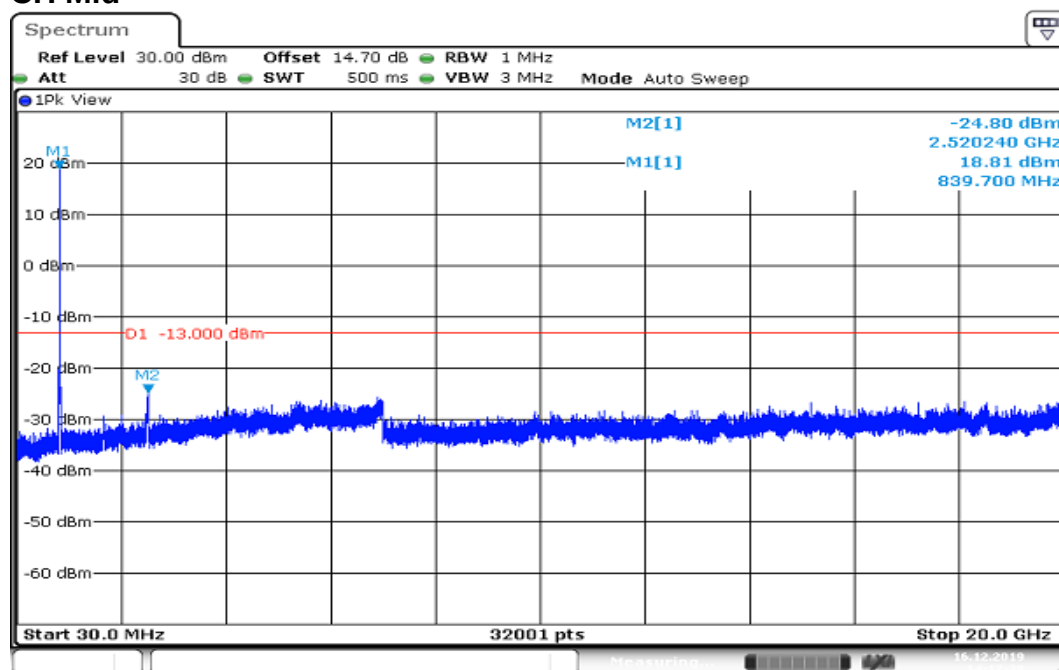
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Report No.: T191105W01-RP15

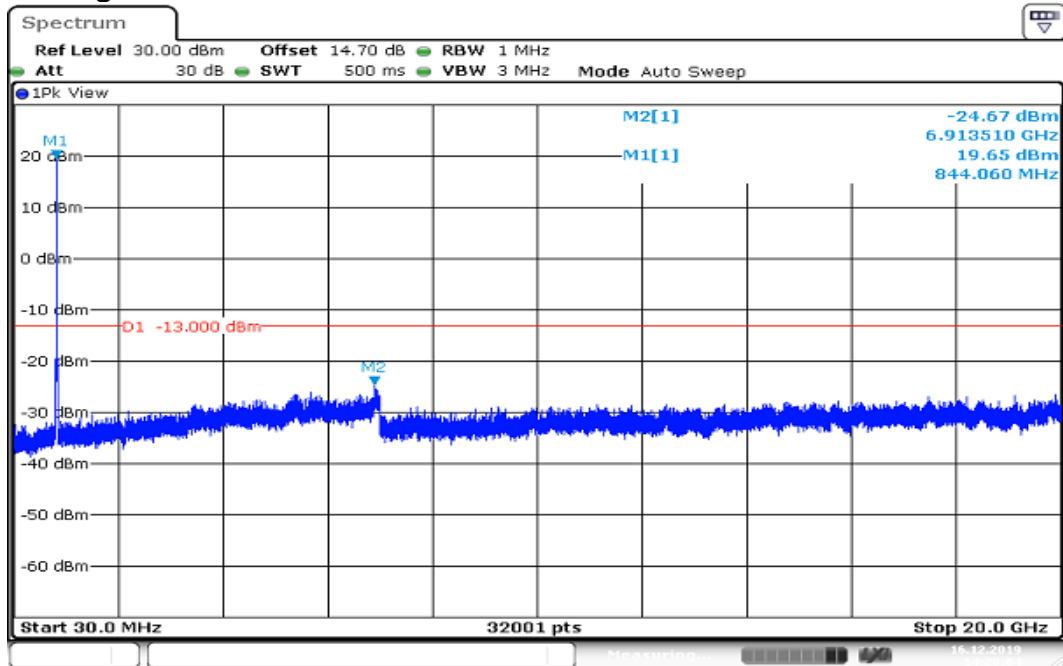
CHANNEL BANDWIDTH: 15MHz / QPSK CH Low



CH Mid

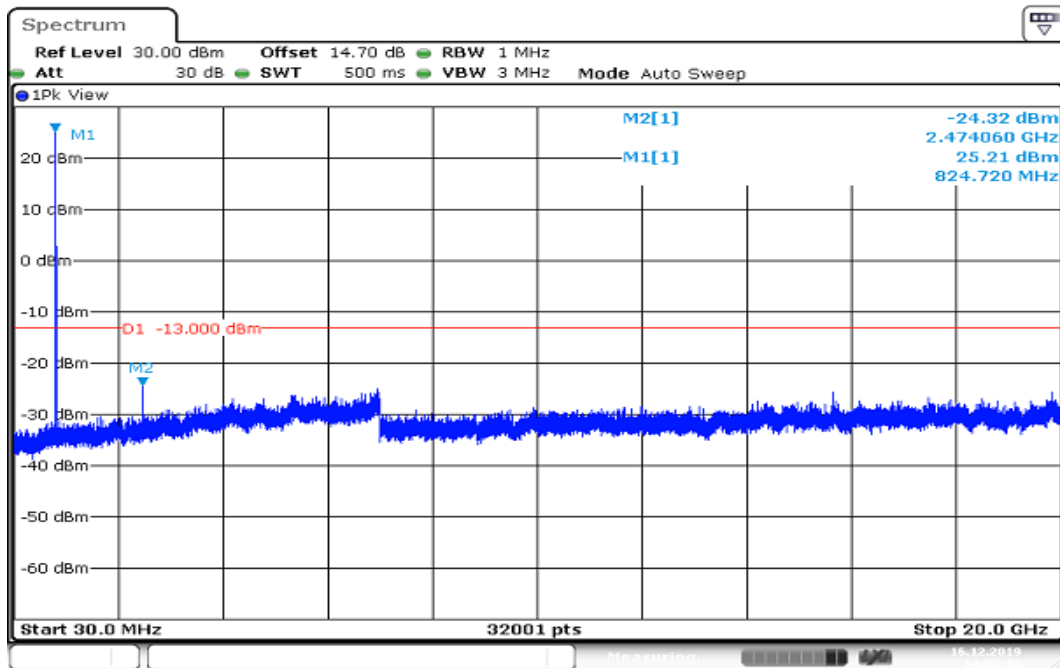


CH High

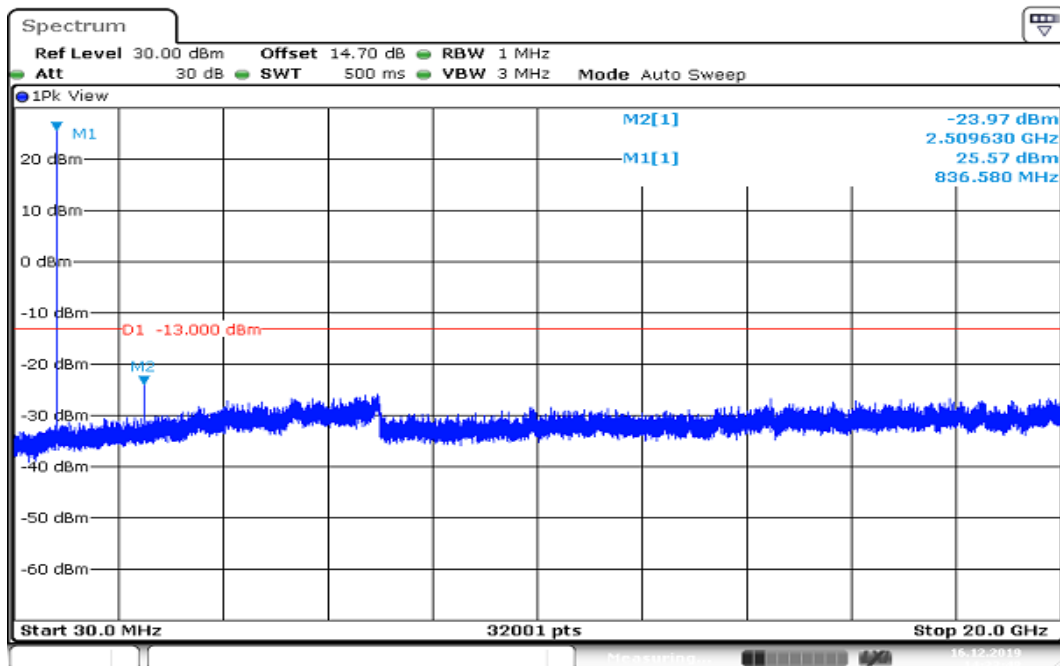


Date: 16.DEC.2019 14:20:04

Report No.: T191105W01-RP15

CHANNEL BANDWIDTH: 1.4MHz / 16QAM**CH Low**

Date: 16.DEC.2019 14:33:13

CH Mid

Date: 16.DEC.2019 14:33:48

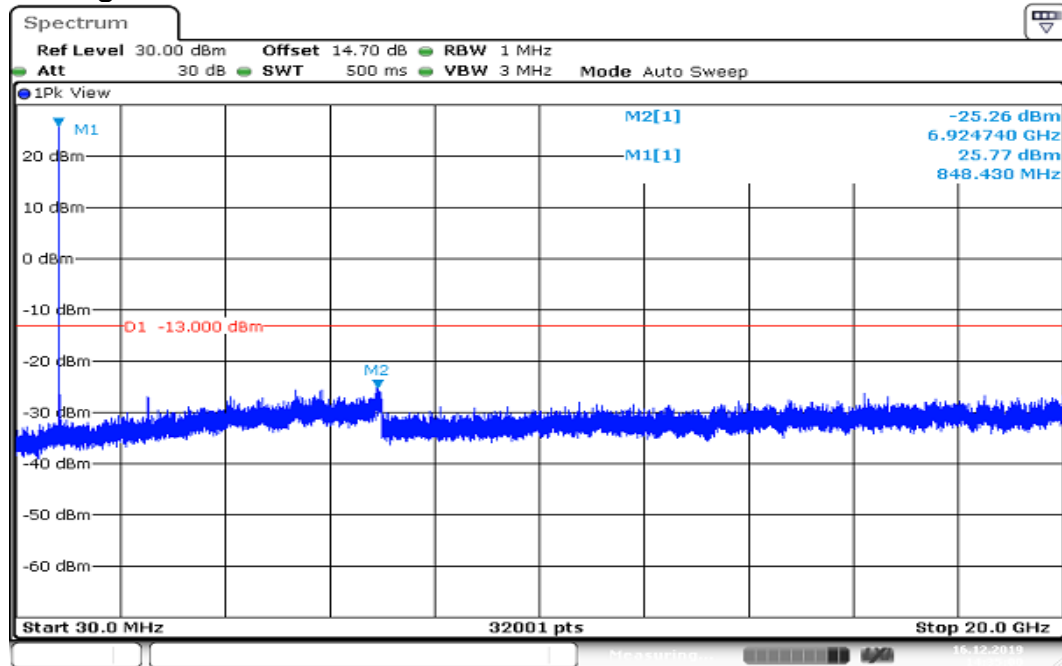


Report No.: T191105W01-RP15

Page: 81 / 97

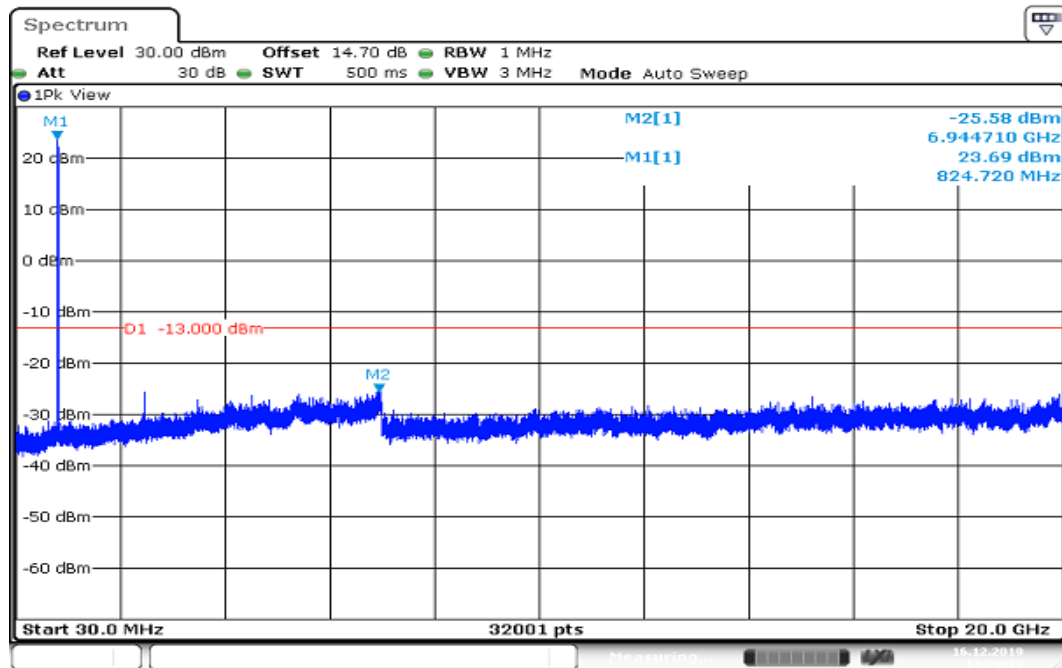
Rev.: 00

CH High

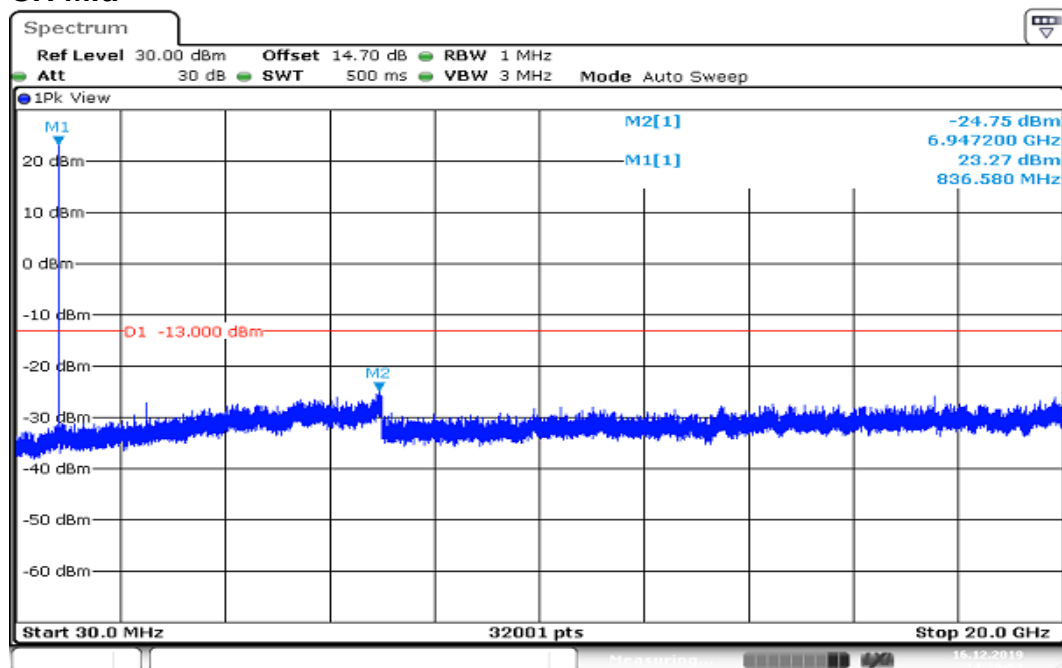


Date: 16.DEC.2019 14:35:01

Report No.: T191105W01-RP15

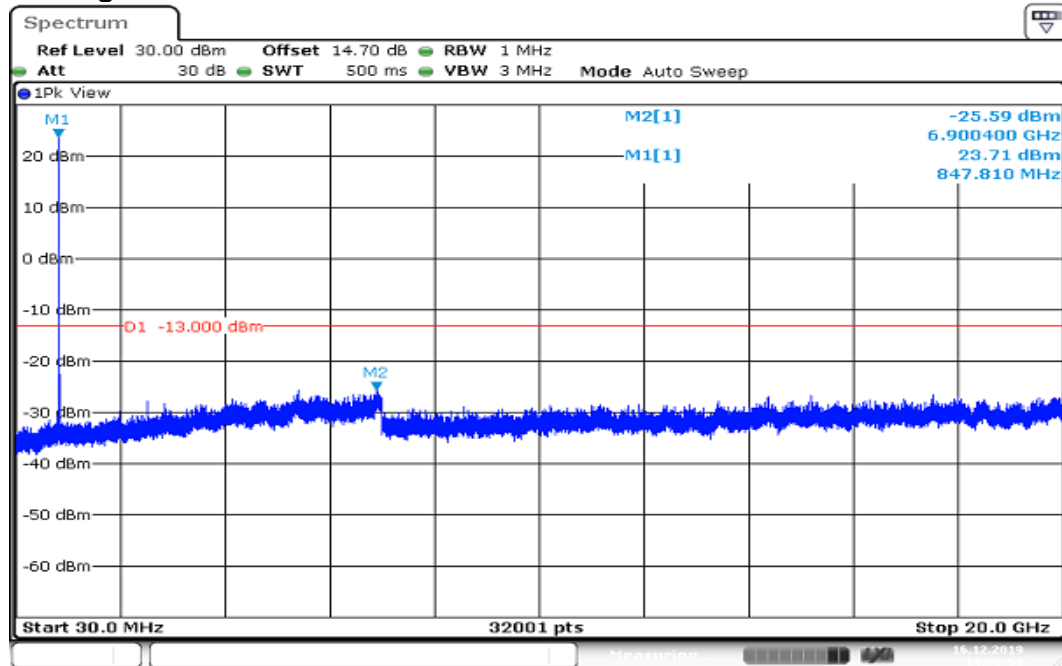
CHANNEL BANDWIDTH: 3MHz / 16QAM
CH Low

Date: 16.DEC.2019 14:29:19

CH Mid

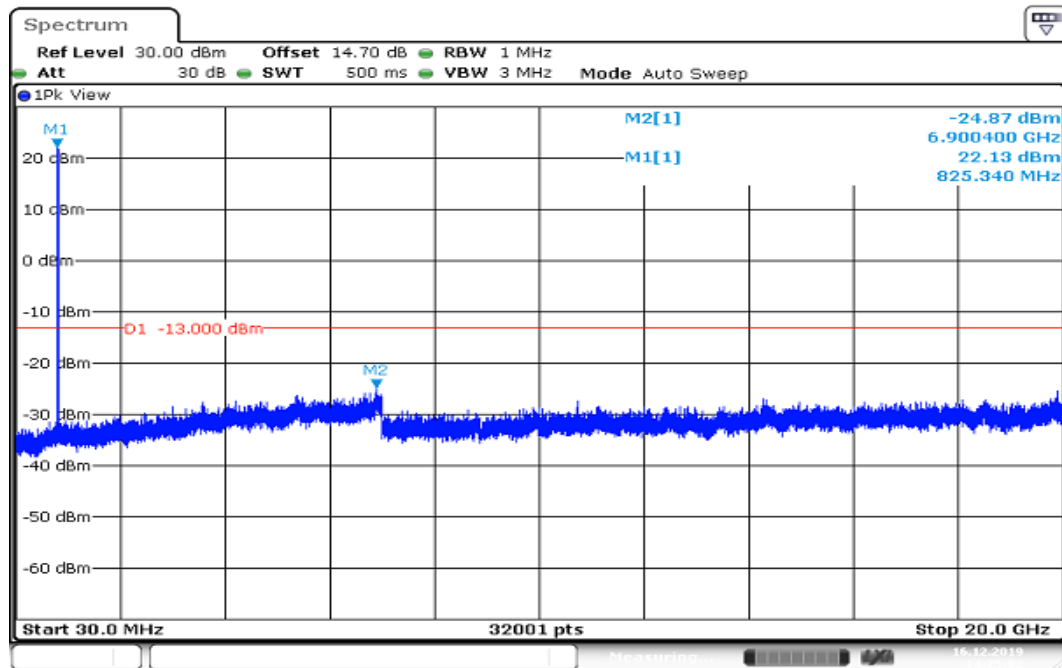
Date: 16.DEC.2019 14:29:52

CH High

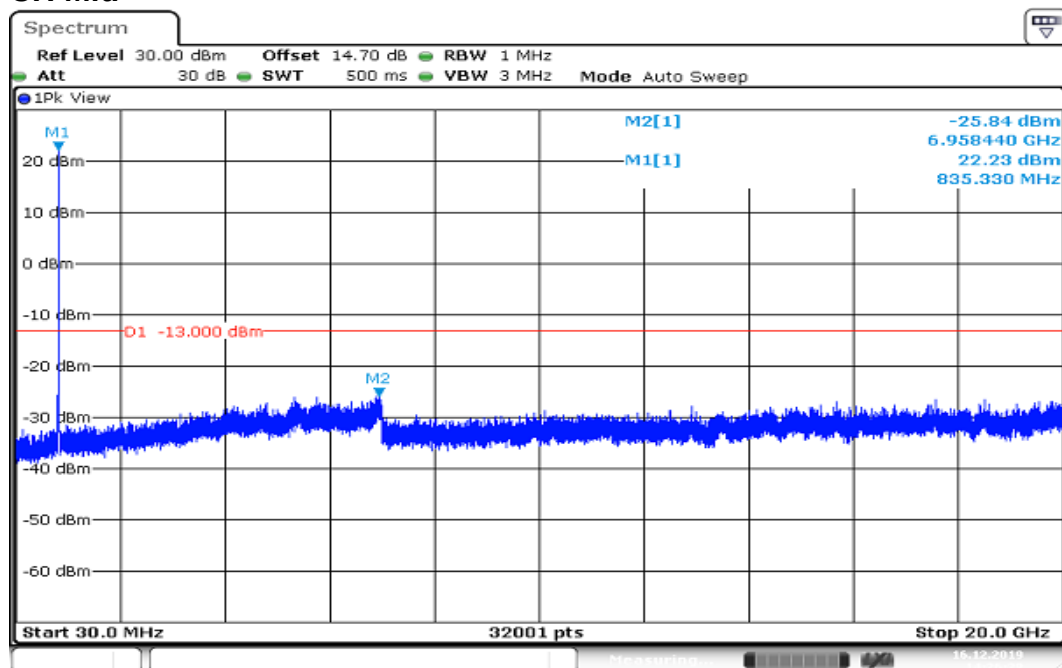


Date: 16.DEC.2019 14:30:58

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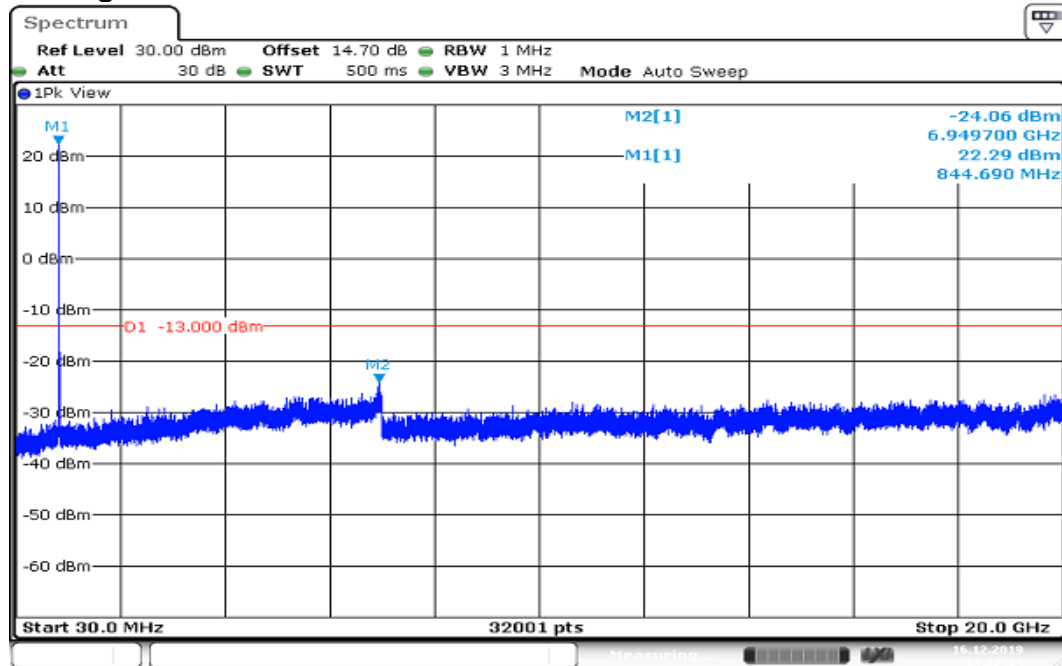
CHANNEL BANDWIDTH: 5MHz / 16QAM**CH Low**

Date: 16.DEC.2019 14:25:03

CH Mid

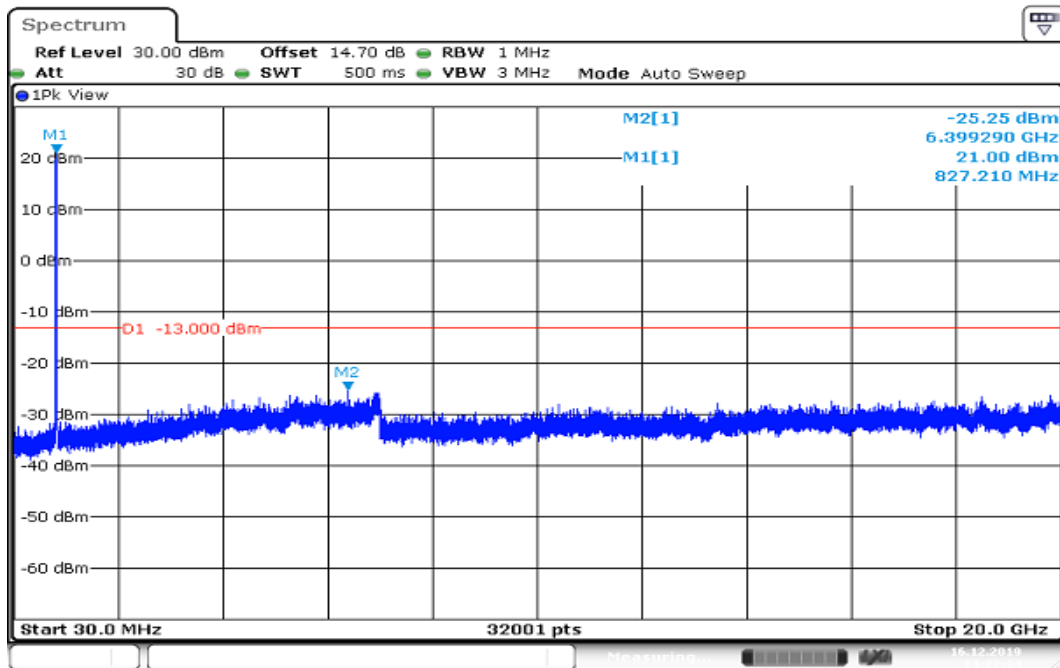
Date: 16.DEC.2019 14:26:38

CH High

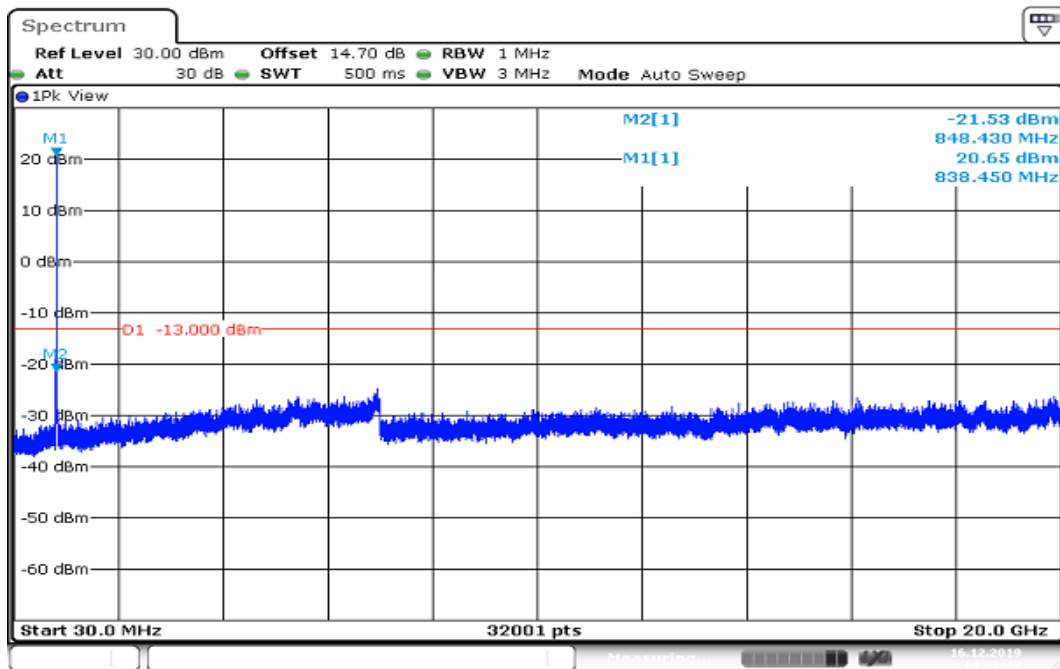


Date: 16.DEC.2019 14:27:14

Report No.: T191105W01-RP15

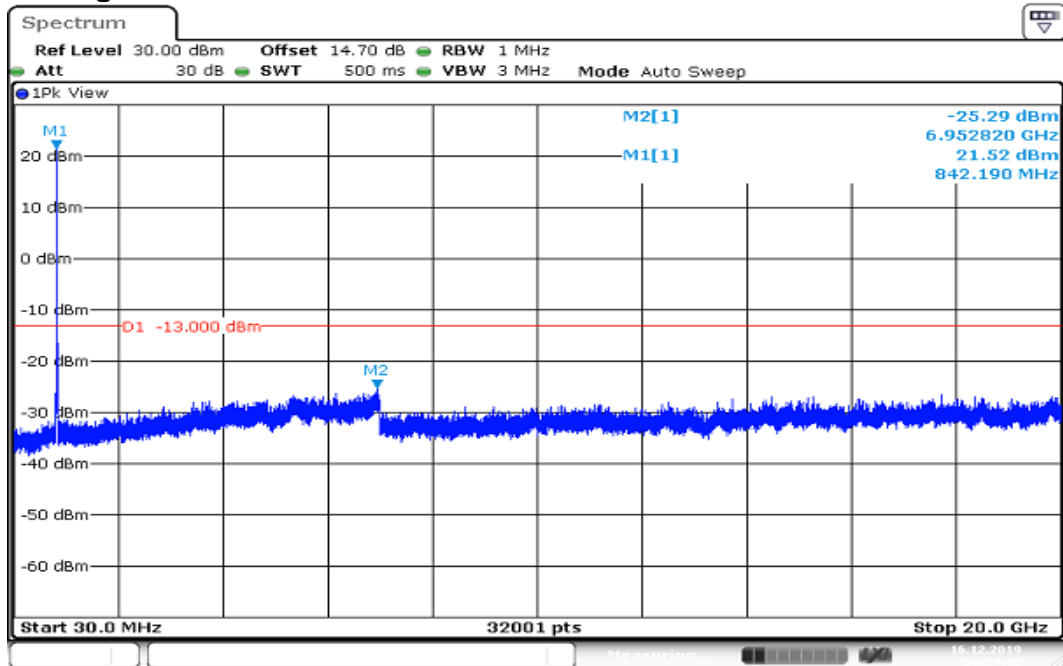
CHANNEL BANDWIDTH: 10MHz / 16QAM**CH Low**

Date: 16.DEC.2019 14:22:14

CH Mid

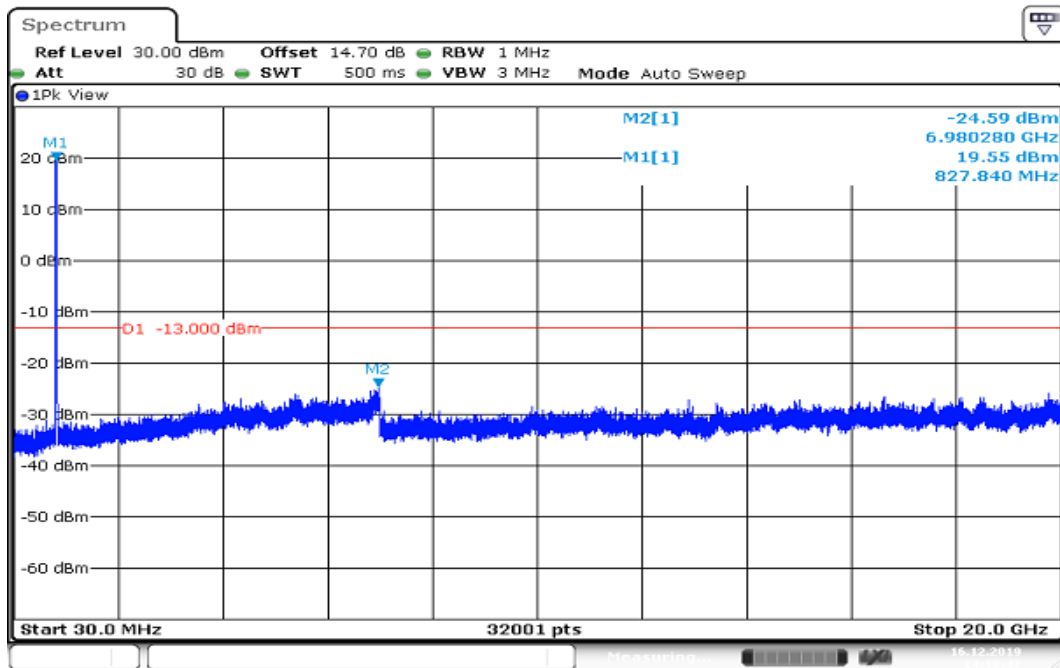
Date: 16.DEC.2019 14:22:43

CH High

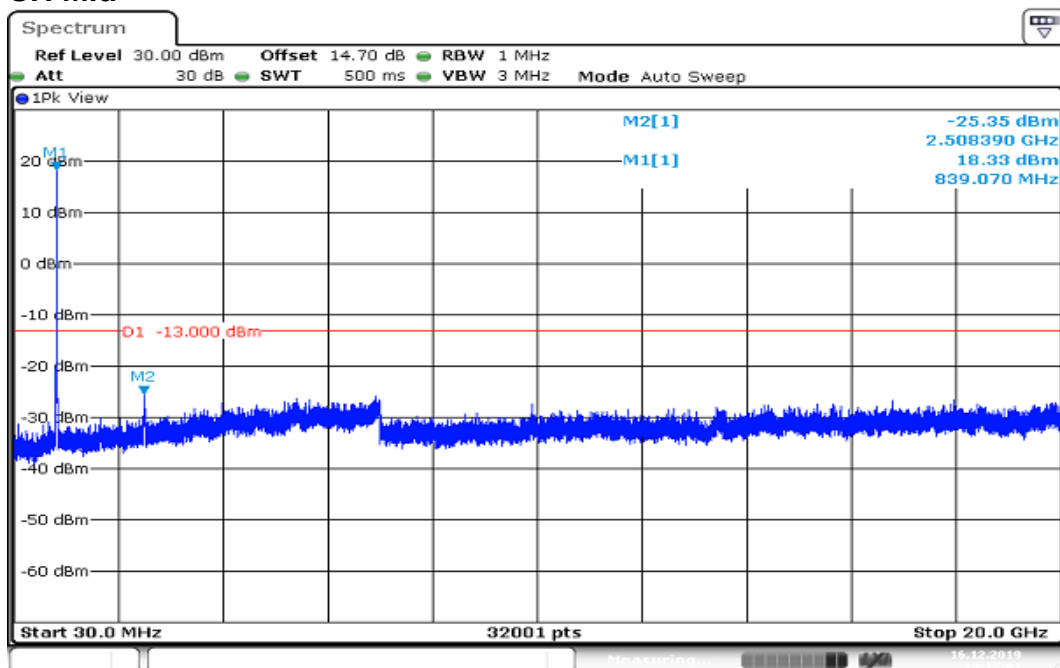


Date: 16.DEC.2019 14:24:12

Report No.: T191105W01-RP15

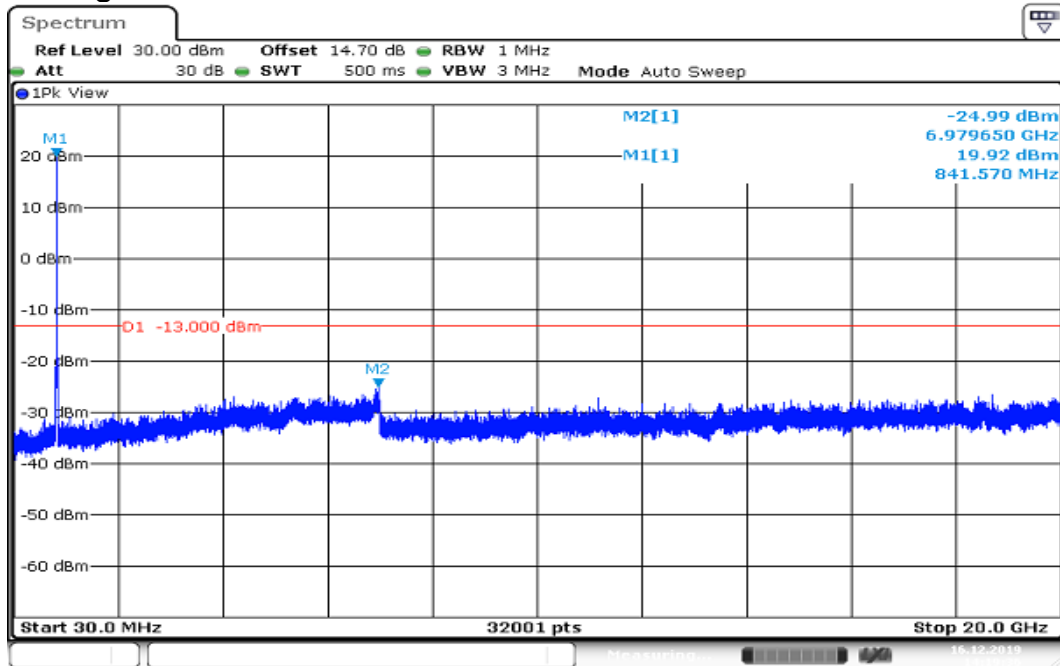
CHANNEL BANDWIDTH: 15MHz / 16QAM**CH Low**

Date: 16.DEC.2019 14:18:47

CH Mid

Date: 16.DEC.2019 14:17:01

CH High



Date: 16.DEC.2019 14:19:36

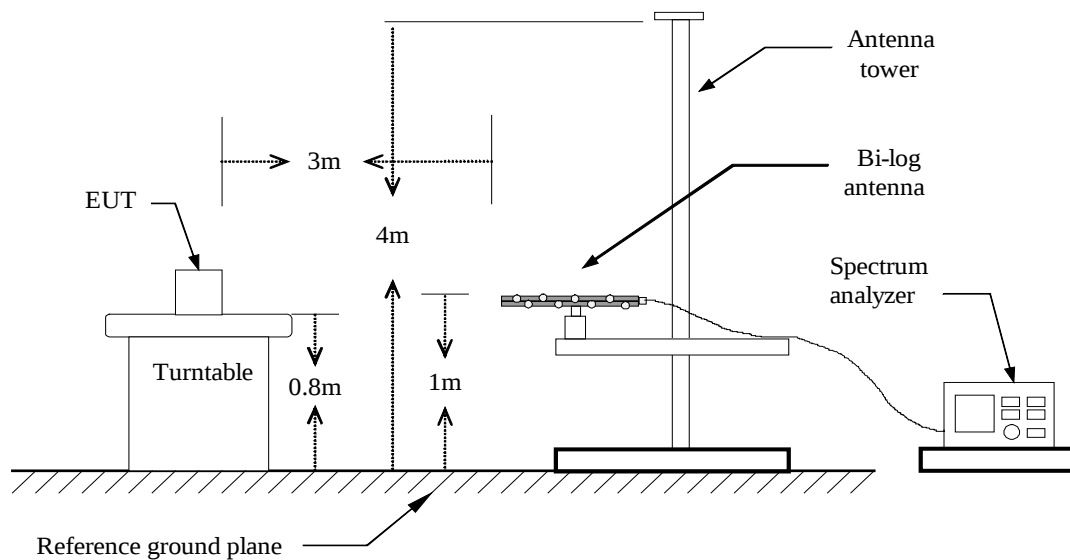
8.7 SPURIOUS RADIATION MEASUREMENT

LIMIT

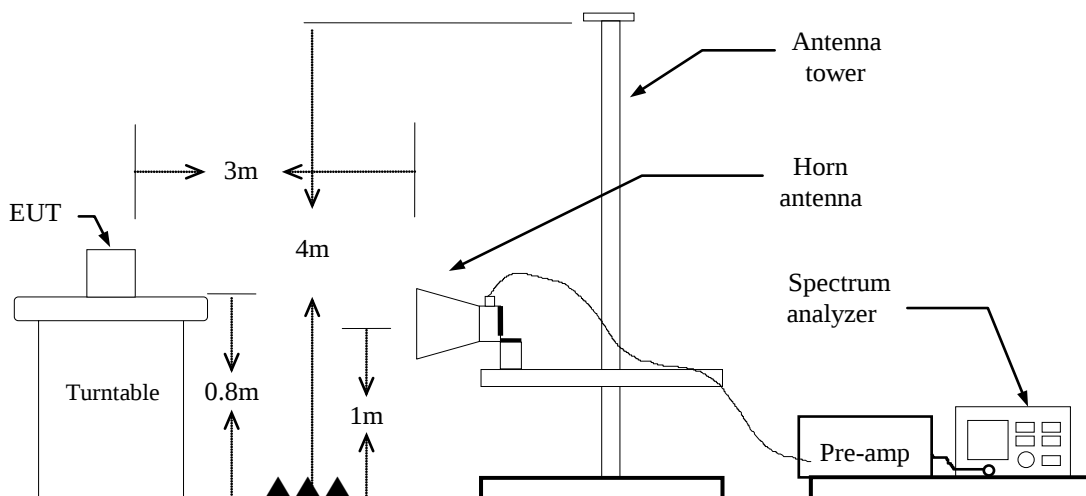
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

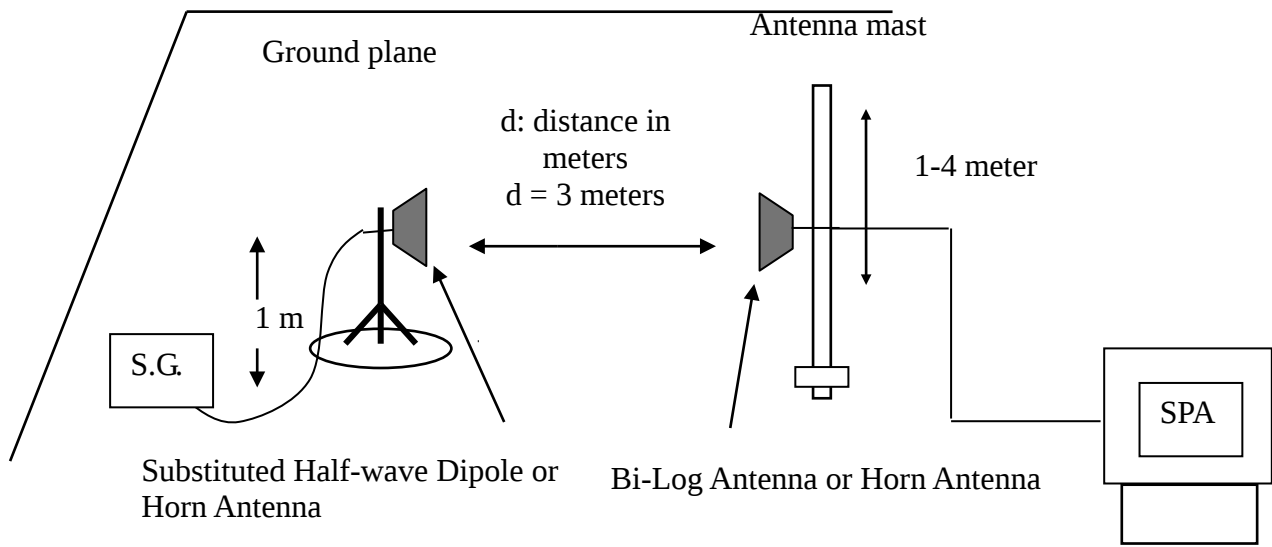
Test Configuration

Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up**TEST PROCEDURE**

1. According to KDB 971168 D01 Power Meas License Digital Systems and TIA-603-E Section 2.2.12.
2. The EUT was placed on a turntable
 - (1) Below 1G : 0.8m
 - (2) Above 1G : 0.8m
 - (3) EUT set 3m from the receiving antenna
 - (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)} - 2.15$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

TEST RESULTS

Refer to the attached tabular data sheets.

Remark: Above 1GHz

Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Results**LTE Band 26 / BW: 15MHz / QPSK / RB =1, RB Offset = 0****Operation Mode:** Tx / Low CH**Test Date:**

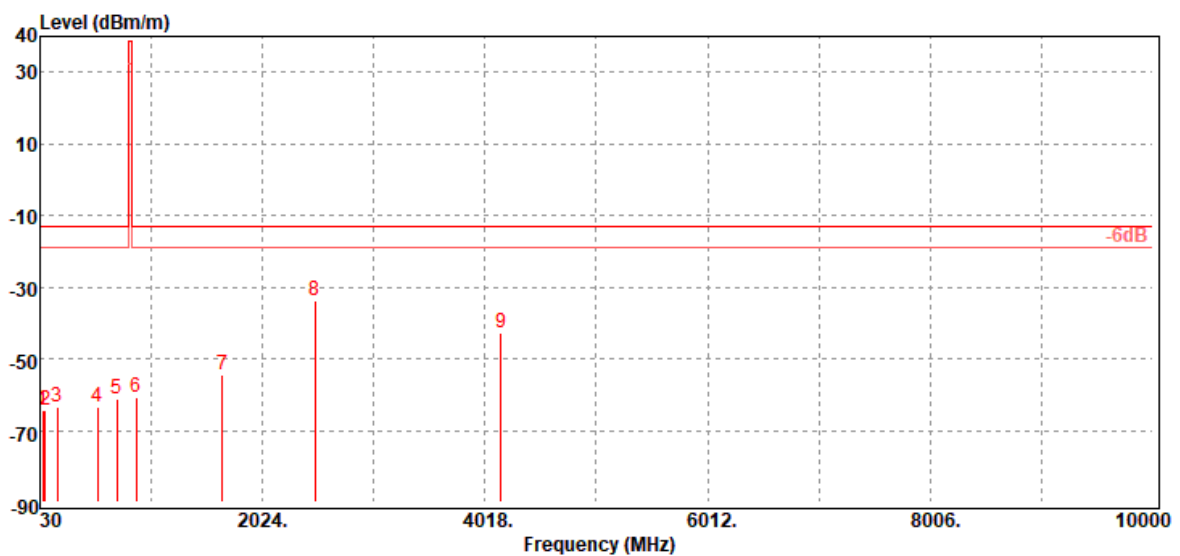
December 19, 2019

Temperature: 18.6°C**Tested by:**

Jerry Chang

Humidity: 59% RH**Polarity:**

Ver.



Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
56.19	-64.57	-53.46	-10.50	-0.61	-13.00	-51.57	V
78.50	-64.32	-55.04	-8.55	-0.73	-13.00	-51.32	V
188.11	-63.45	-58.42	-3.90	-1.13	-13.00	-50.45	V
546.04	-63.61	-60.47	-1.20	-1.94	-13.00	-50.61	V
721.61	-61.27	-57.61	-1.40	-2.26	-13.00	-48.27	V
891.36	-60.67	-56.91	-1.23	-2.53	-13.00	-47.67	V
1663.00	-54.48	-60.69	9.78	-3.57	-13.00	-41.48	V
2494.50	-33.56	-39.77	10.78	-4.57	-13.00	-20.56	V
4157.50	-42.56	-49.4	12.90	-6.06	-13.00	-29.56	V

Operation Mode: Tx / Low CH

Test Date:

December 19, 2019

Temperature: 18.6°C

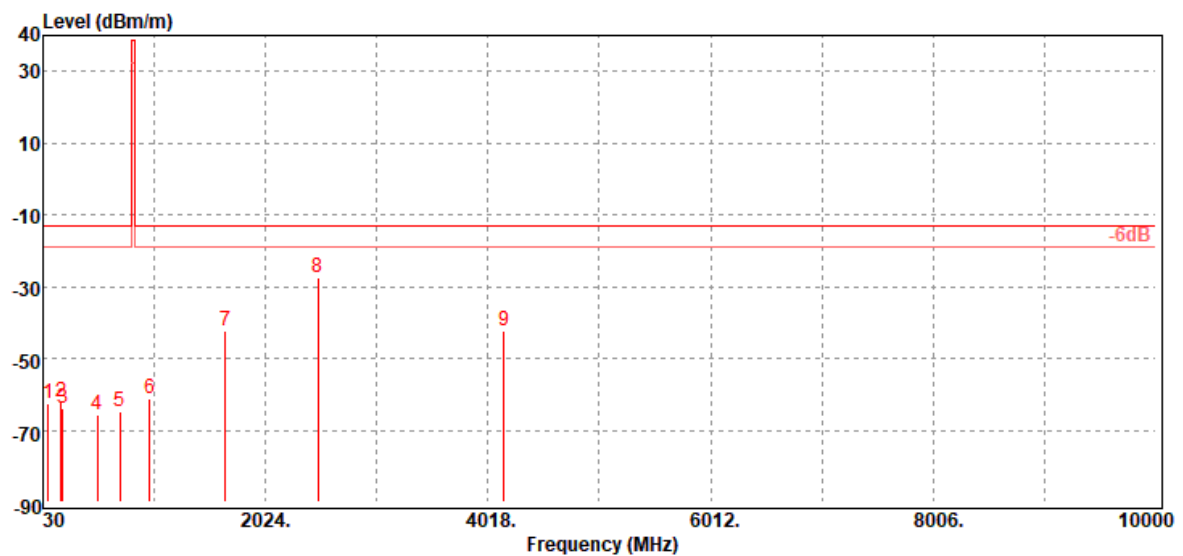
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
75.59	-62.52	-52.83	-8.98	-0.71	-13.00	-49.52	H
192.96	-61.93	-56.69	-4.10	-1.14	-13.00	-48.93	H
207.51	-63.87	-60.24	-2.45	-1.18	-13.00	-50.87	H
519.85	-65.73	-62.42	-1.40	-1.91	-13.00	-52.73	H
721.61	-64.71	-61.05	-1.40	-2.26	-13.00	-51.71	H
988.36	-61.43	-57.37	-1.40	-2.66	-13.00	-48.43	H
1663.00	-42.17	-48.38	9.78	-3.57	-13.00	-29.17	H
2494.50	-27.66	-33.87	10.78	-4.57	-13.00	-14.66	H
4157.50	-42.29	-49.13	12.90	-6.06	-13.00	-29.29	H

Operation Mode: Tx / Mid CH

Test Date:

December 19, 2019

Temperature: 18.6°C

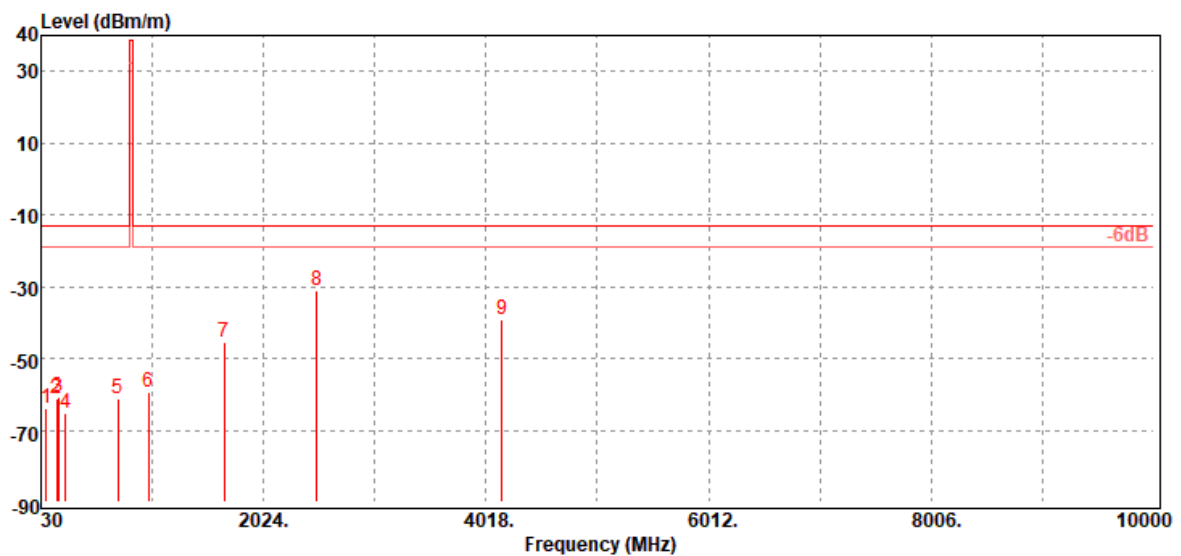
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Ver.



Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
78.50	-63.75	-54.47	-8.55	-0.73	-13.00	-50.75	V
173.56	-61.02	-54.95	-4.99	-1.08	-13.00	-48.02	V
188.11	-60.94	-55.91	-3.90	-1.13	-13.00	-47.94	V
250.19	-65.36	-62.27	-1.79	-1.30	-13.00	-52.36	V
715.79	-61.43	-57.78	-1.40	-2.25	-13.00	-48.43	V
990.30	-59.63	-55.57	-1.40	-2.66	-13.00	-46.63	V
1668.00	-45.25	-51.49	9.81	-3.57	-13.00	-32.25	V
2499.50	-31.13	-37.35	10.80	-4.58	-13.00	-18.13	V
4162.50	-39.11	-45.95	12.90	-6.06	-13.00	-26.11	V

Operation Mode: Tx / Mid CH

Test Date:

December 19, 2019

Temperature: 18.6°C

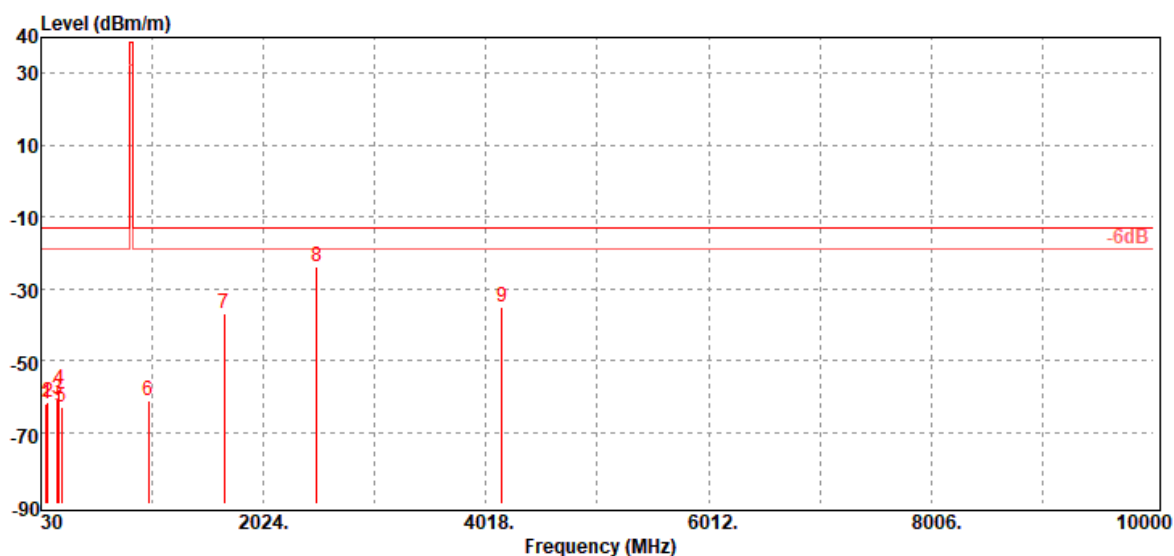
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
80.44	-61.91	-52.72	-8.46	-0.73	-13.00	-48.91	H
91.11	-61.78	-54.09	-6.91	-0.78	-13.00	-48.78	H
178.41	-60.76	-55.1	-4.56	-1.10	-13.00	-47.76	H
190.05	-58.17	-53.04	-4.00	-1.13	-13.00	-45.17	H
214.30	-62.87	-59.57	-2.10	-1.20	-13.00	-49.87	H
993.21	-61.19	-57.12	-1.40	-2.67	-13.00	-48.19	H
1668.00	-37.06	-43.3	9.81	-3.57	-13.00	-24.06	H
2499.50	-23.86	-30.08	10.80	-4.58	-13.00	-10.86	H
4162.50	-35.33	-42.17	12.90	-6.06	-13.00	-22.33	H

Report No.: T191105W01-RP15

Page: 96 / 97

Rev.: 00

Operation Mode: Tx / High CH

Test Date:

December 19, 2019

Temperature: 18.6°C

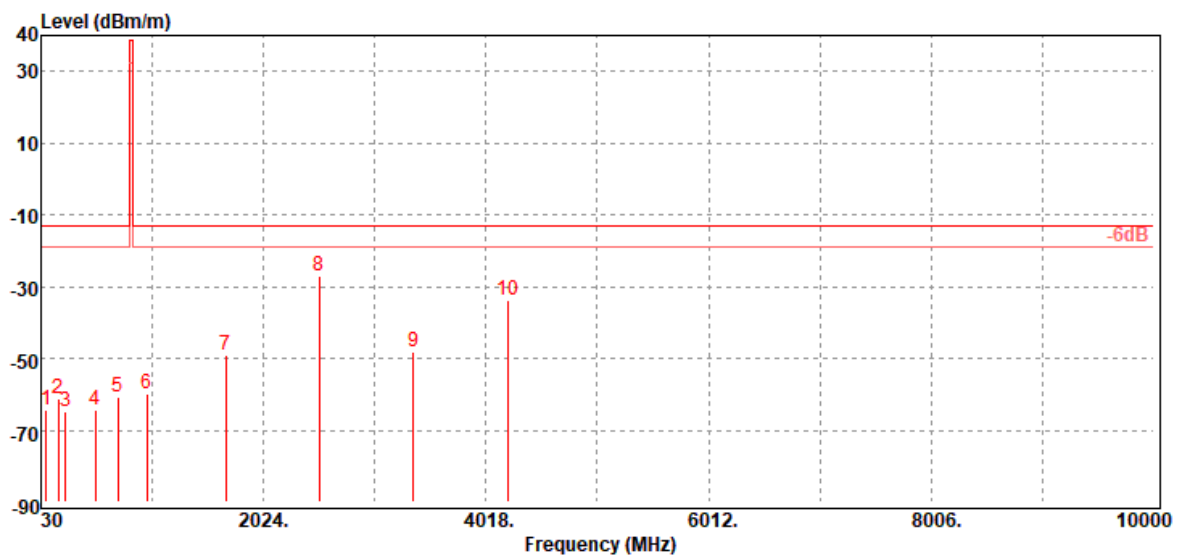
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Ver.



Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
78.50	-64.34	-55.06	-8.55	-0.73	-13.00	-51.34	V
187.14	-61.34	-56.22	-3.99	-1.13	-13.00	-48.34	V
253.10	-64.96	-61.97	-1.68	-1.31	-13.00	-51.96	V
517.91	-64.16	-60.82	-1.44	-1.90	-13.00	-51.16	V
721.61	-60.72	-57.06	-1.40	-2.26	-13.00	-47.72	V
975.75	-59.86	-55.84	-1.38	-2.64	-13.00	-46.86	V
1683.00	-49.21	-55.52	9.90	-3.59	-13.00	-36.21	V
2524.50	-27.13	-33.32	10.80	-4.61	-13.00	-14.13	V
3366.00	-48.23	-55.65	12.87	-5.45	-13.00	-35.23	V
4207.50	-33.56	-40.35	12.88	-6.09	-13.00	-20.56	V

Operation Mode: Tx / High CH

Test Date:

December 19, 2019

Temperature: 18.6°C

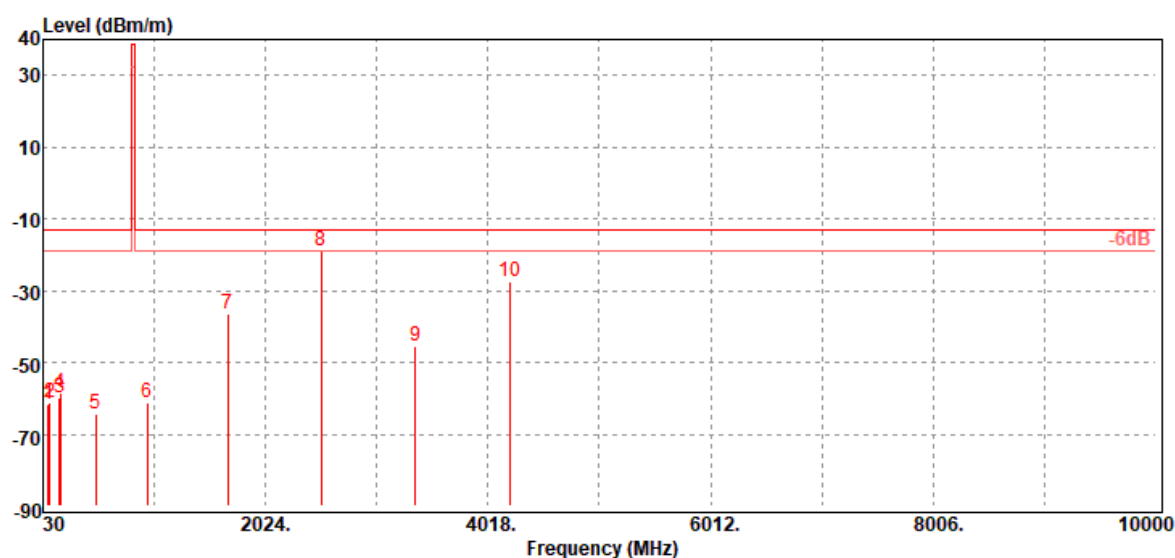
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
80.44	-61.61	-52.42	-8.46	-0.73	-13.00	-48.61	H
91.11	-61.42	-53.73	-6.91	-0.78	-13.00	-48.42	H
175.50	-59.86	-53.92	-4.85	-1.09	-13.00	-46.86	H
188.11	-58.61	-53.58	-3.90	-1.13	-13.00	-45.61	H
502.39	-64.31	-60.48	-1.95	-1.88	-13.00	-51.31	H
966.05	-61.27	-57.34	-1.30	-2.63	-13.00	-48.27	H
1683.00	-36.51	-42.82	9.90	-3.59	-13.00	-23.51	H
2524.50	-18.99	-25.18	10.80	-4.61	-13.00	-5.99	H
3366.00	-45.57	-52.99	12.87	-5.45	-13.00	-32.57	H
4207.50	-27.54	-34.33	12.88	-6.09	-13.00	-14.54	H

- End of Test Report -