

8.5 CONDUCTED BAND EDGE MEASUREMENT

Limit

FCC Part 90.691, FCC Part 90.543

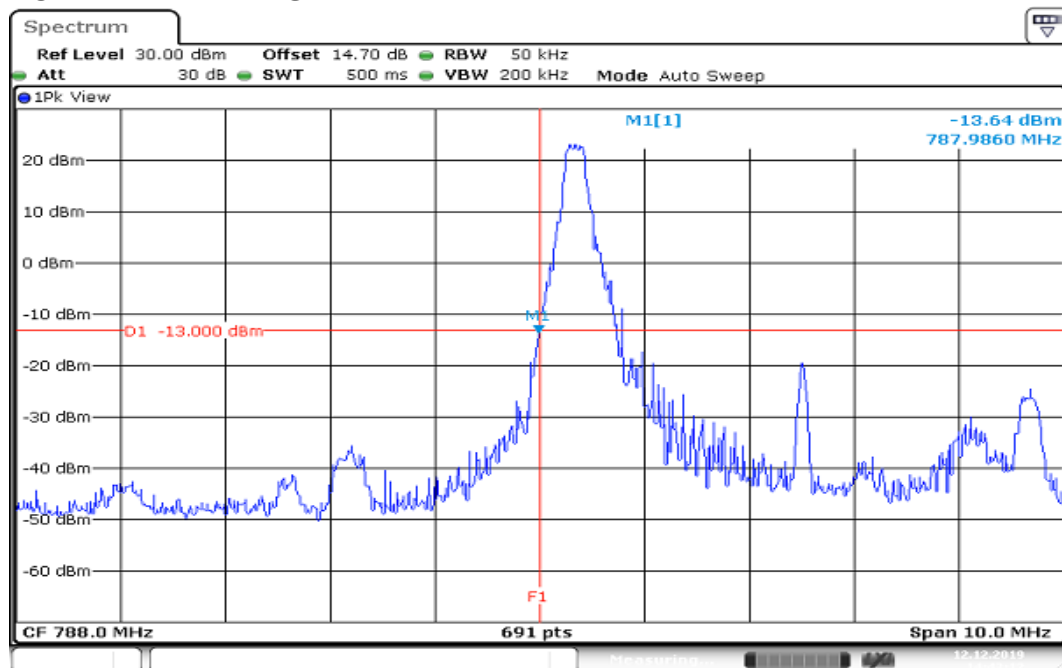
Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedures

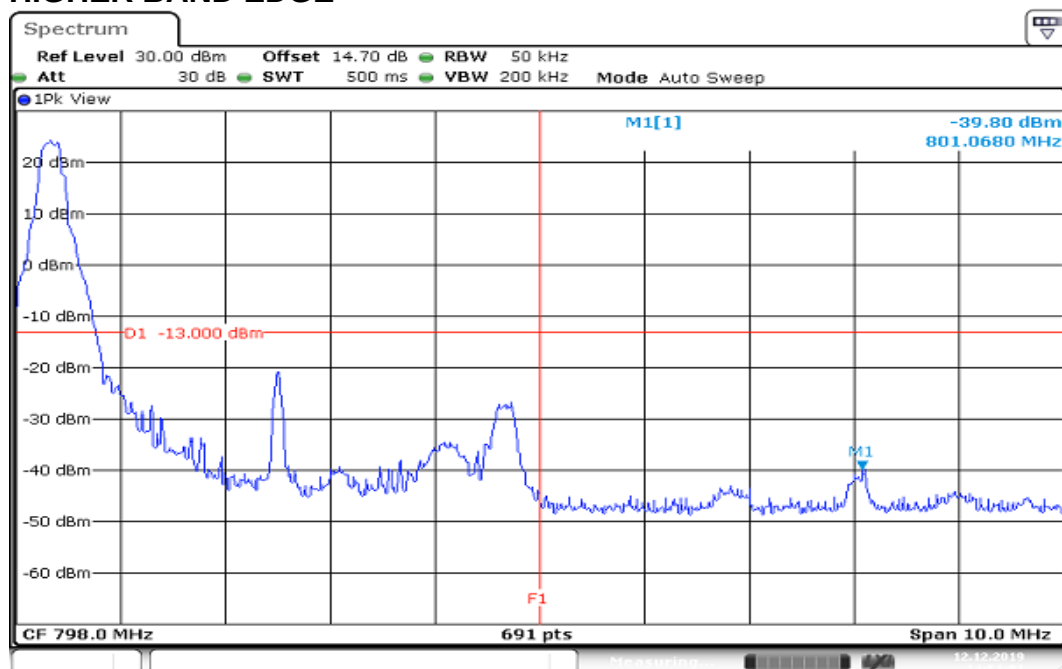
KDB 971168 D01,

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.

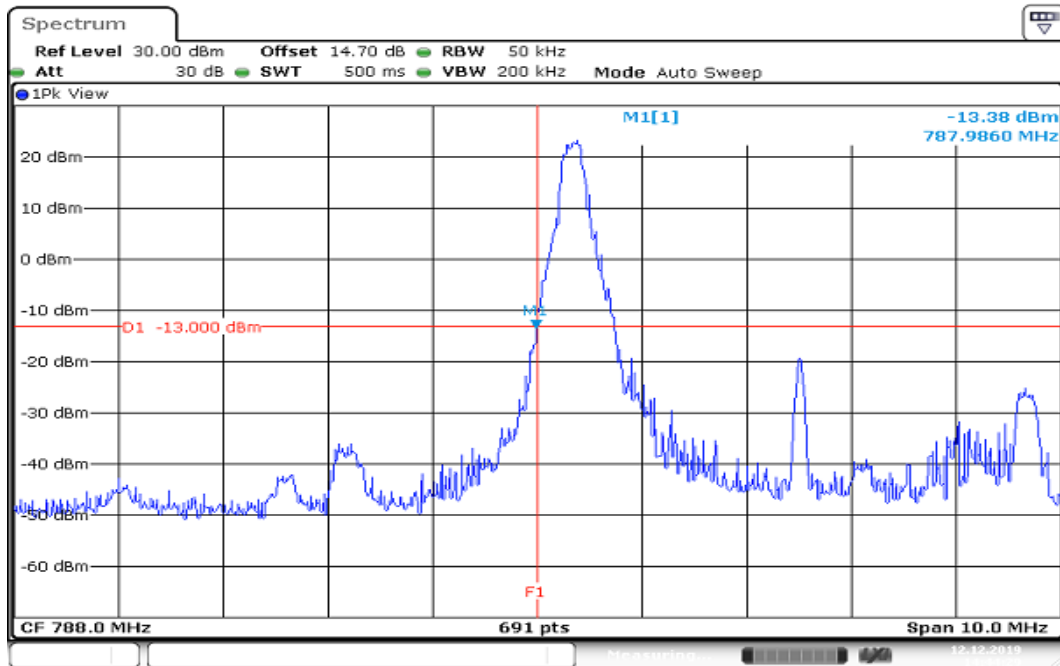
Report No.: T191105W01-RP14

Test Results:**LTE Band 14****CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB ALLOCATED****LOWER BAND EDGE**

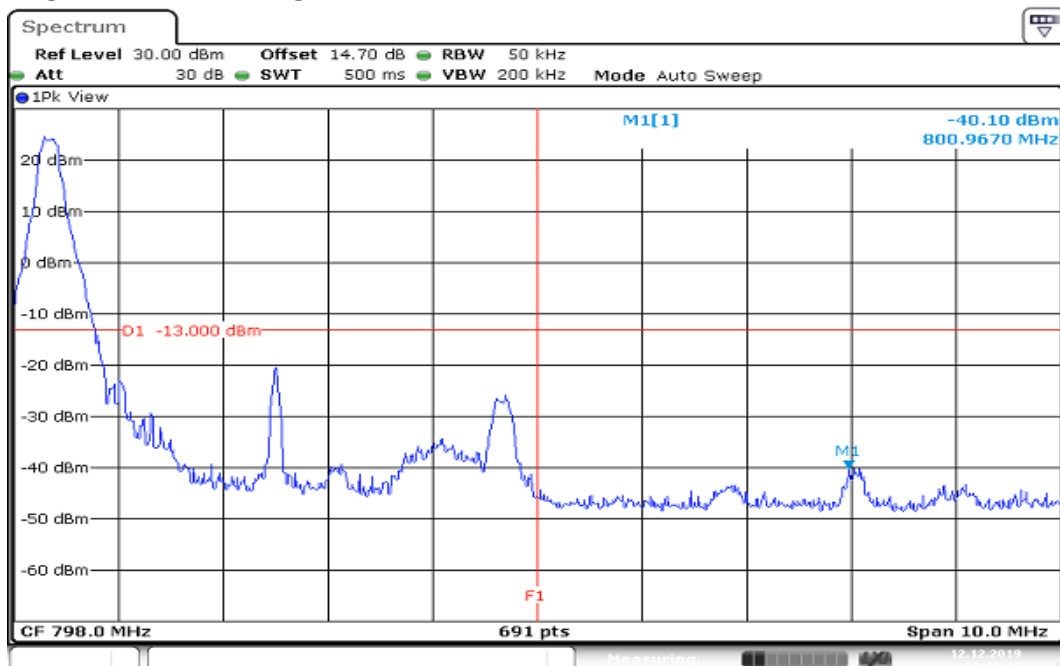
Date: 12-DEC-2019 14:43:13

HIGHER BAND EDGE

Date: 12-DEC-2019 14:51:01

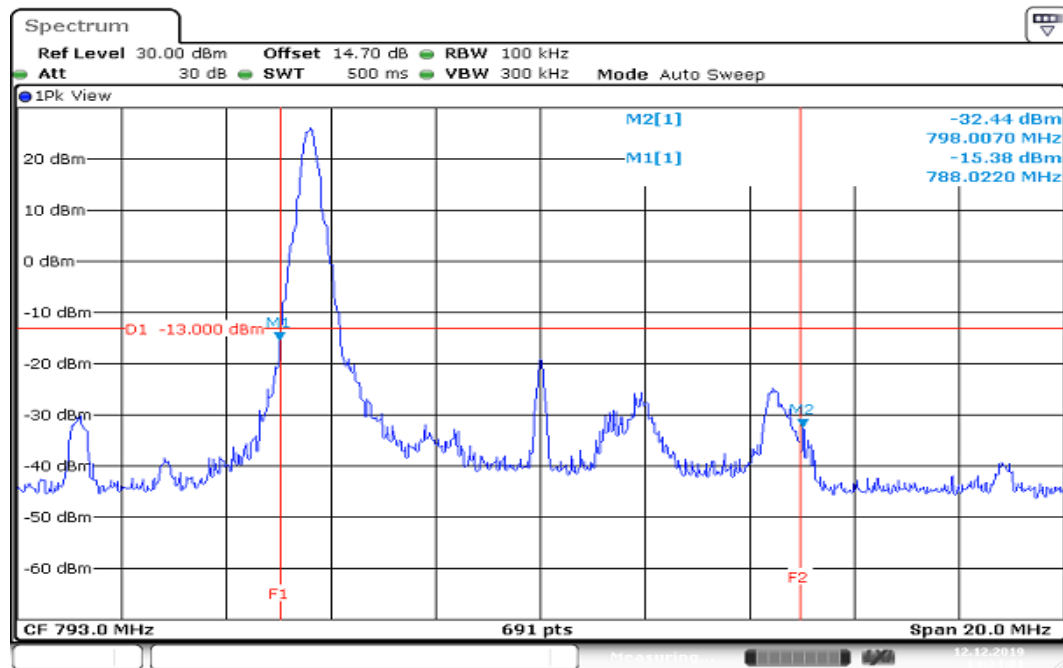
**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 14:44:30

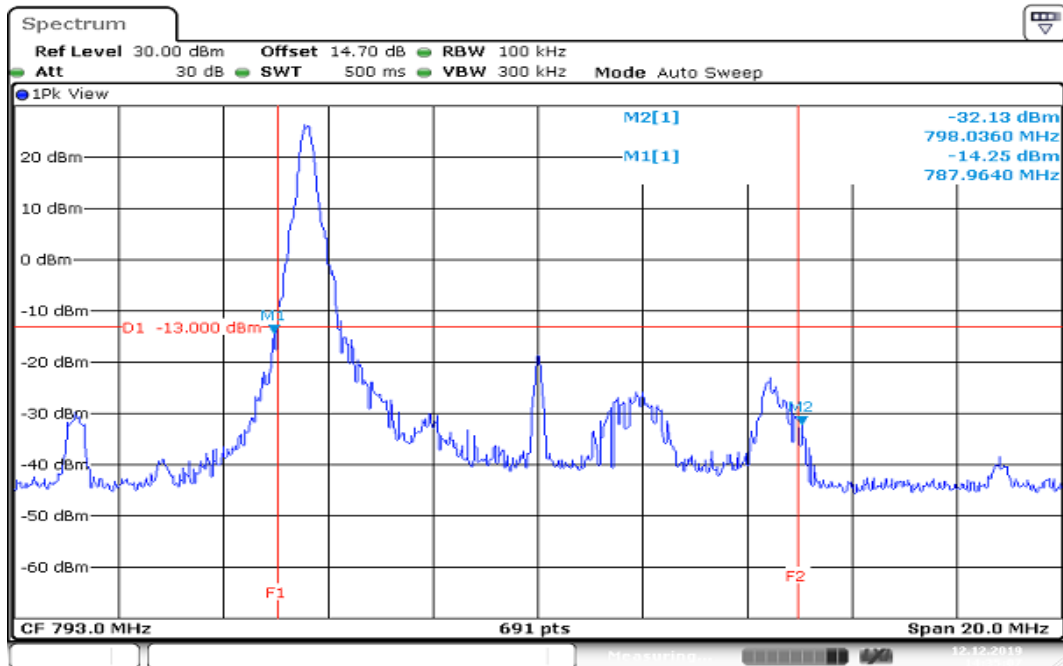
HIGHER BAND EDGE

Date: 12.DEC.2019 14:49:15

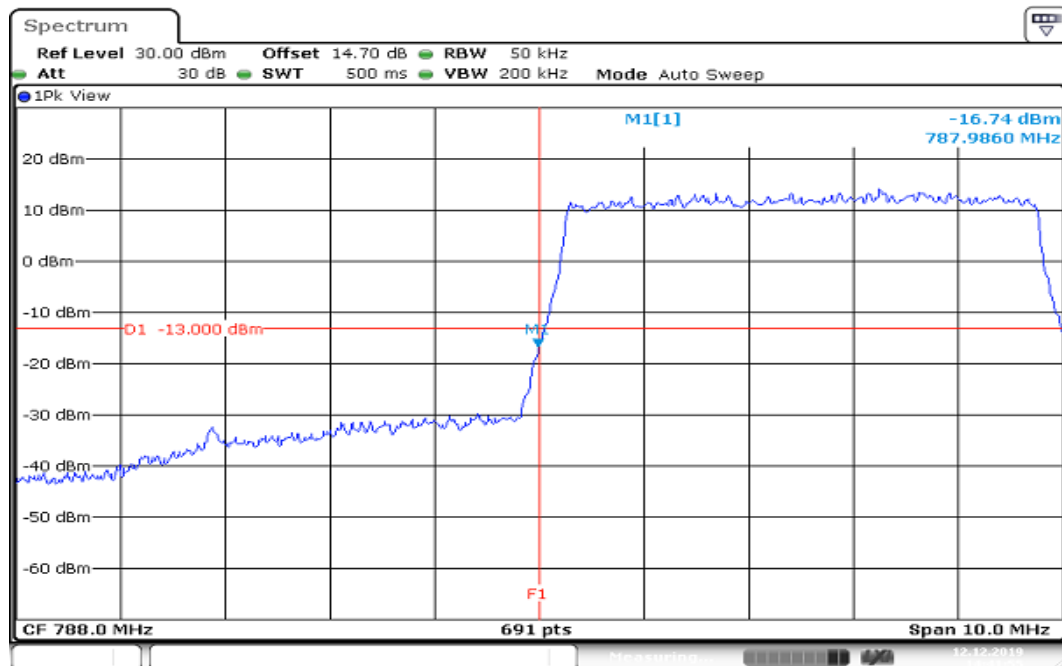
**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB ALLOCATED
MIDDLE BAND EDGE**



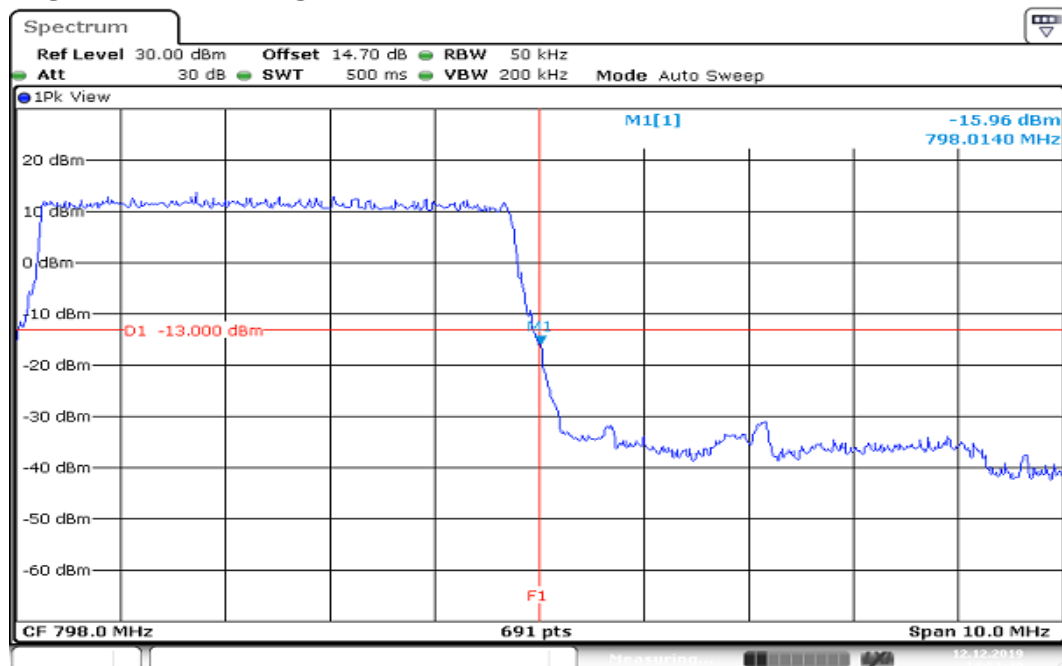
Date: 12.DEC.2019 14:34:02

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB ALLOCATED
MIDDLE BAND EDGE**

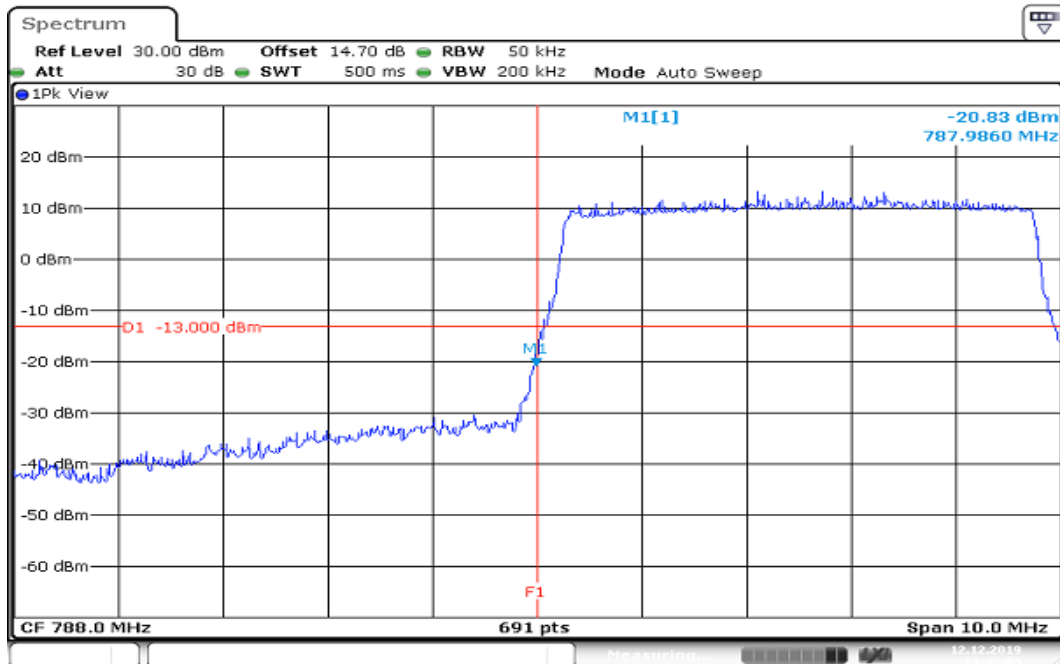
Date: 12-DEC-2019 14:35:07

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

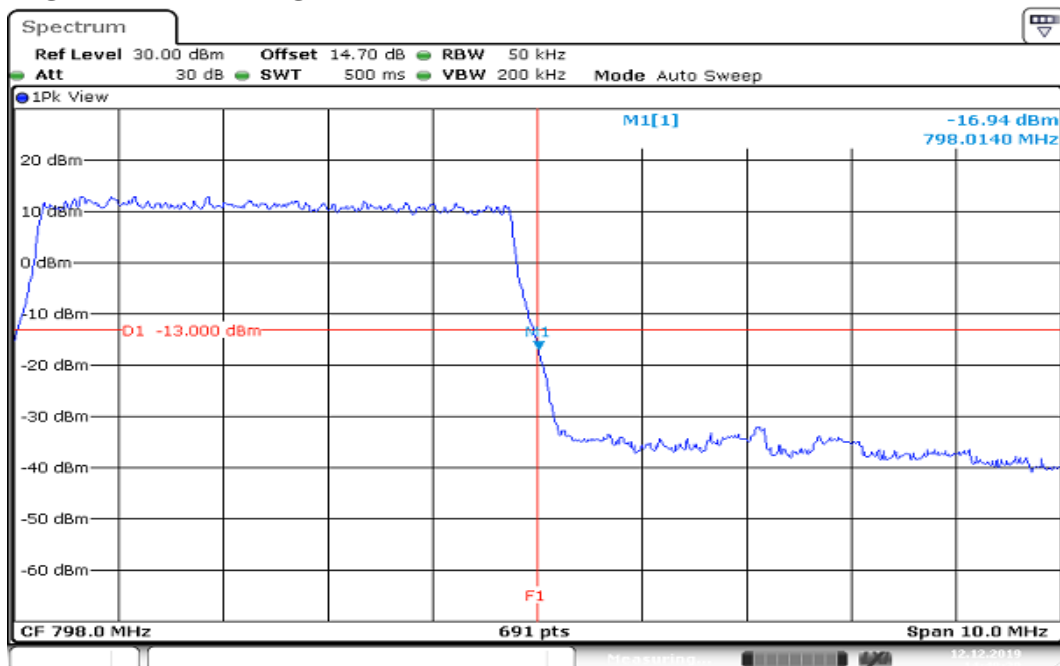
Date: 12.DEC.2019 14:41:55

HIGHER BAND EDGE

Date: 12.DEC.2019 14:51:40

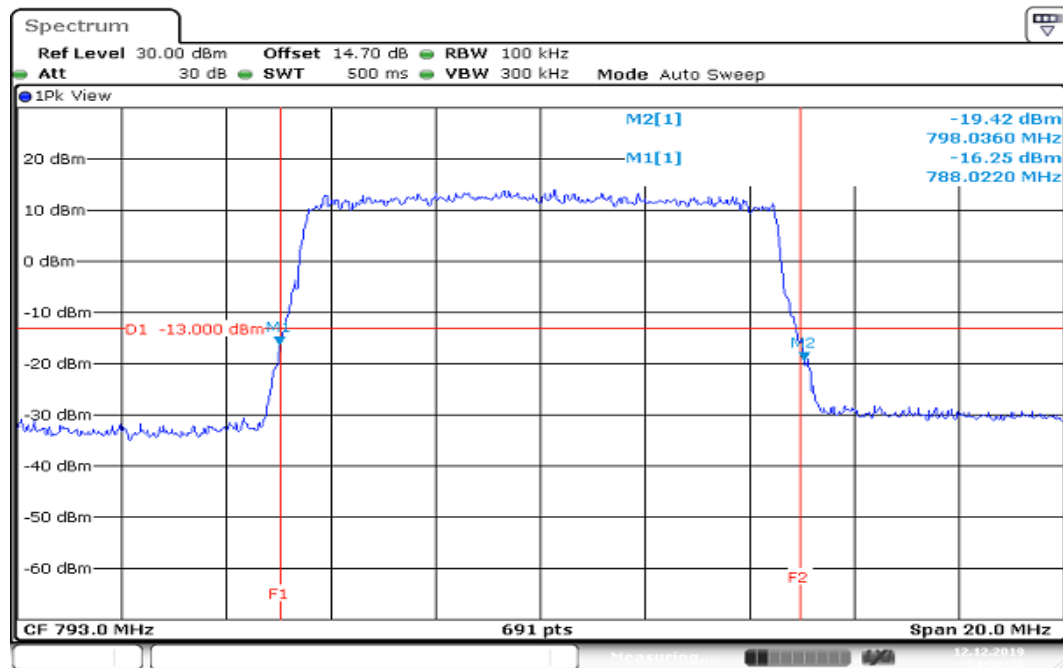
**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 14:45:05

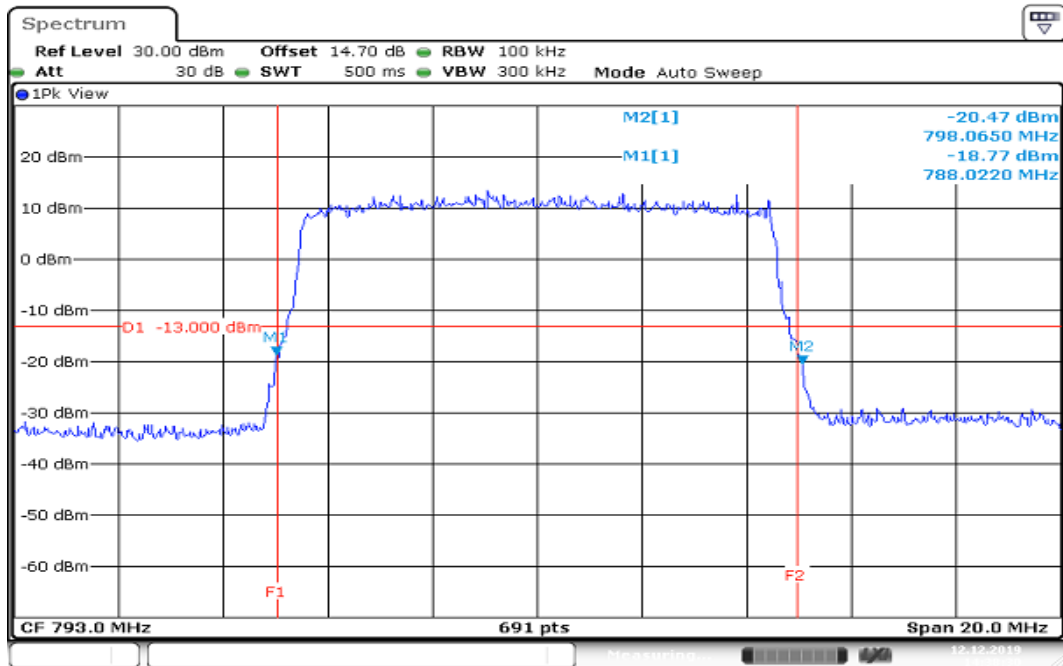
HIGHER BAND EDGE

Date: 12.DEC.2019 14:48:38

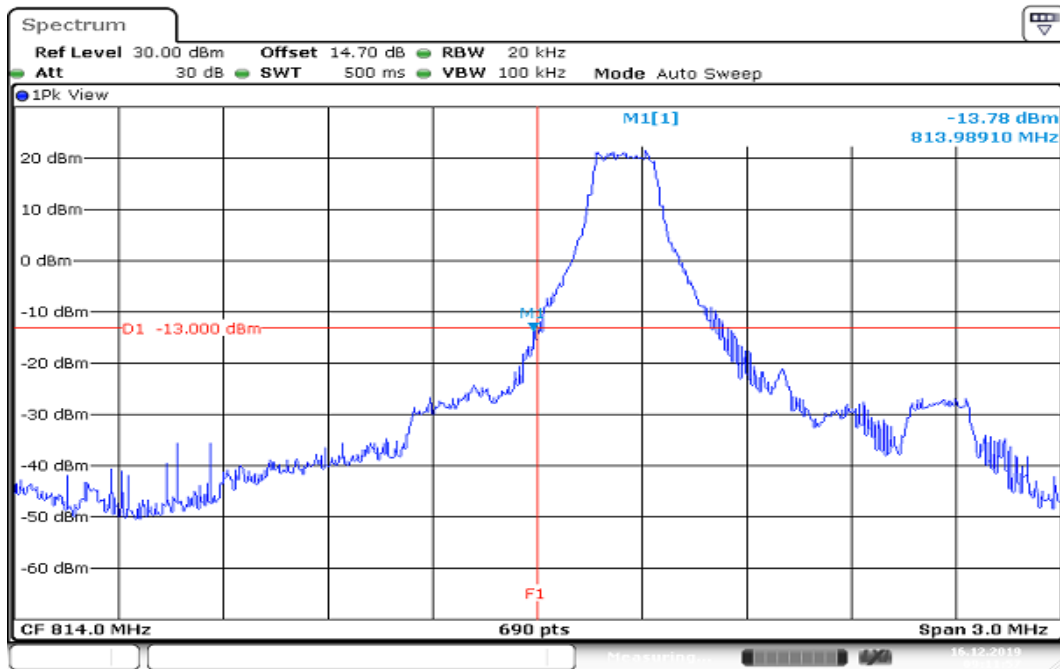
CHANNEL BANDWIDTH: 10MHz / QPSK / 100% RB ALLOCATED MIDDLE BAND EDGE



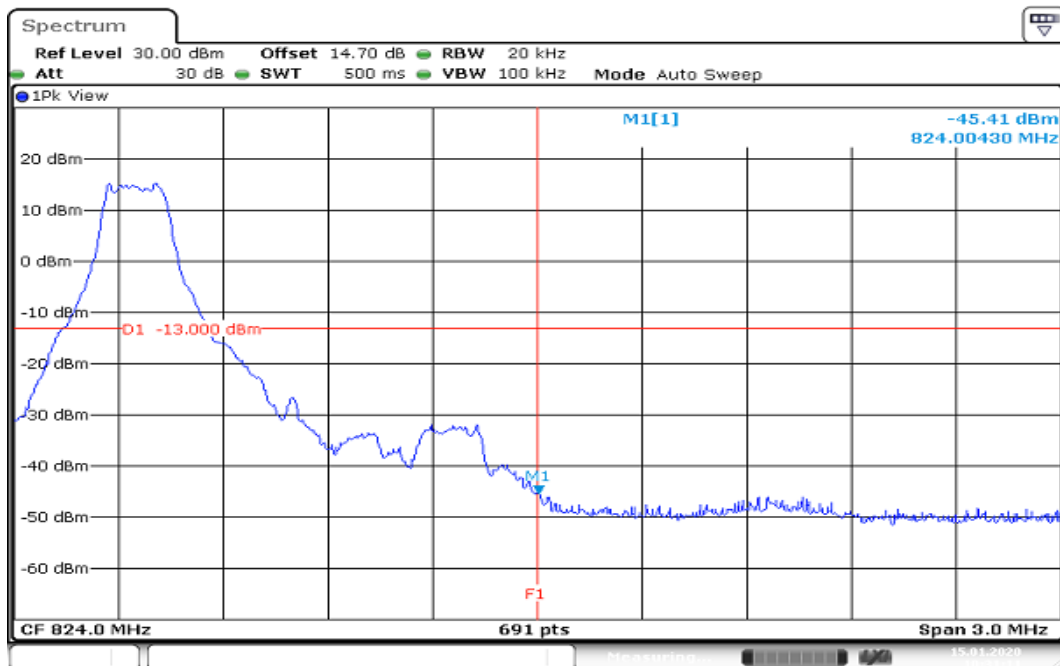
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**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100% RB ALLOCATED
MIDDLE BAND EDGE**

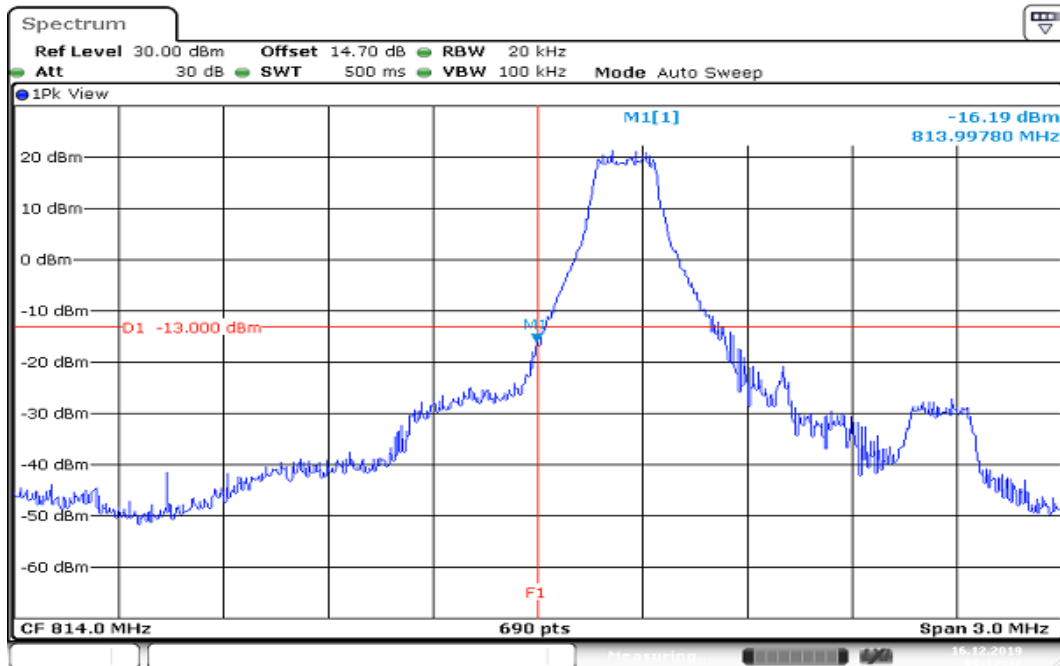
Date: 12.DEC.2019 14:38:30

LTE Band 26**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATED****LOWER BAND EDGE**

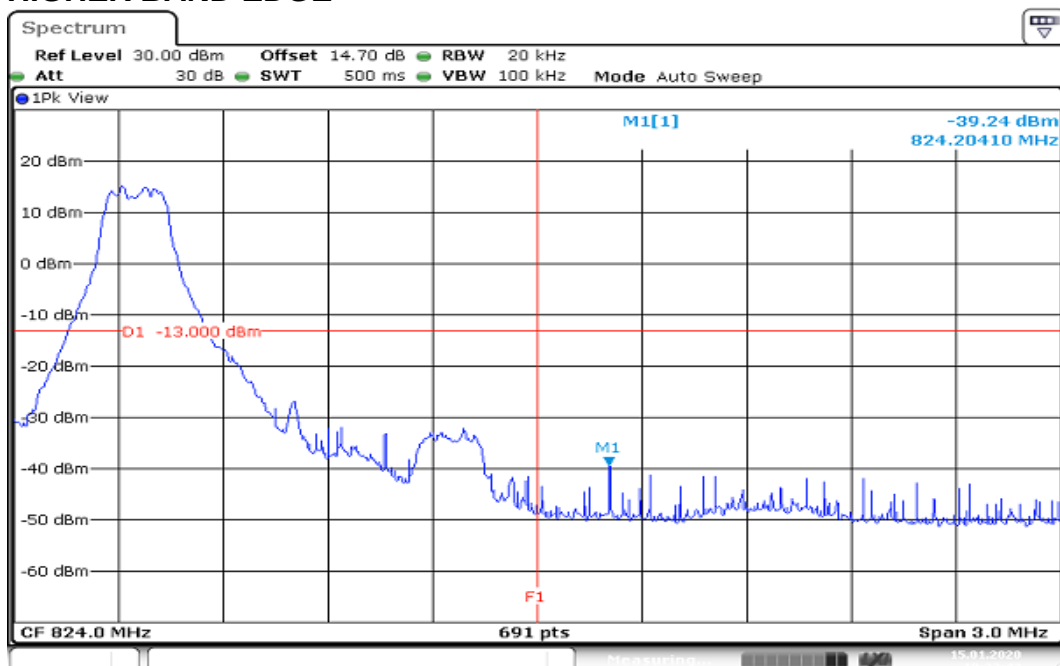
Date: 16.DEC.2019 09:11:57

HIGHER BAND EDGE

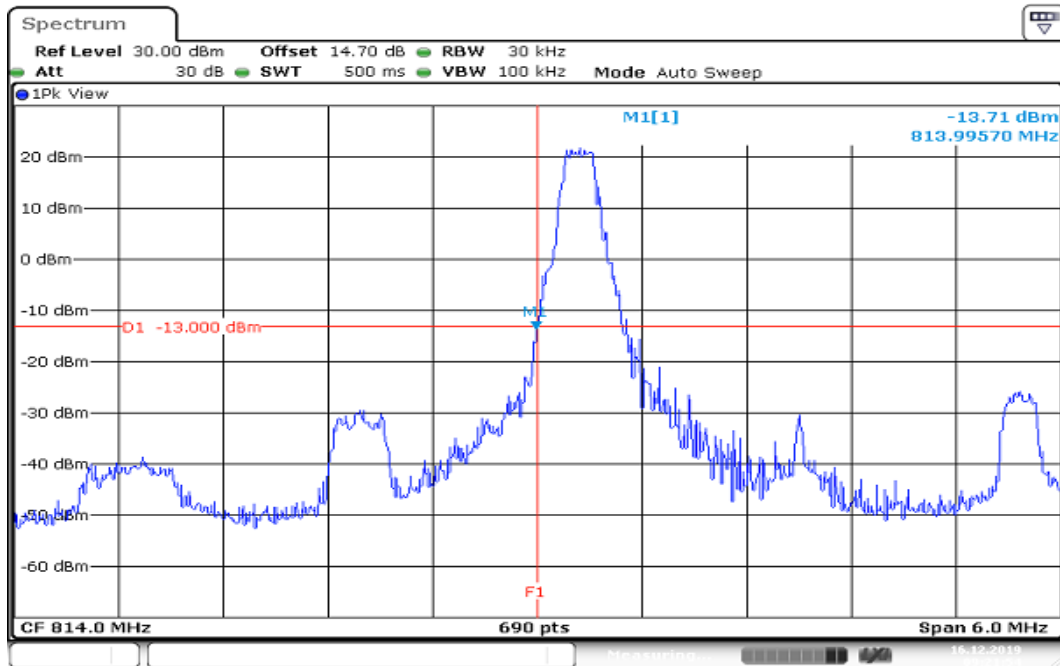
Date: 15.JAN.2020 10:31:11

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

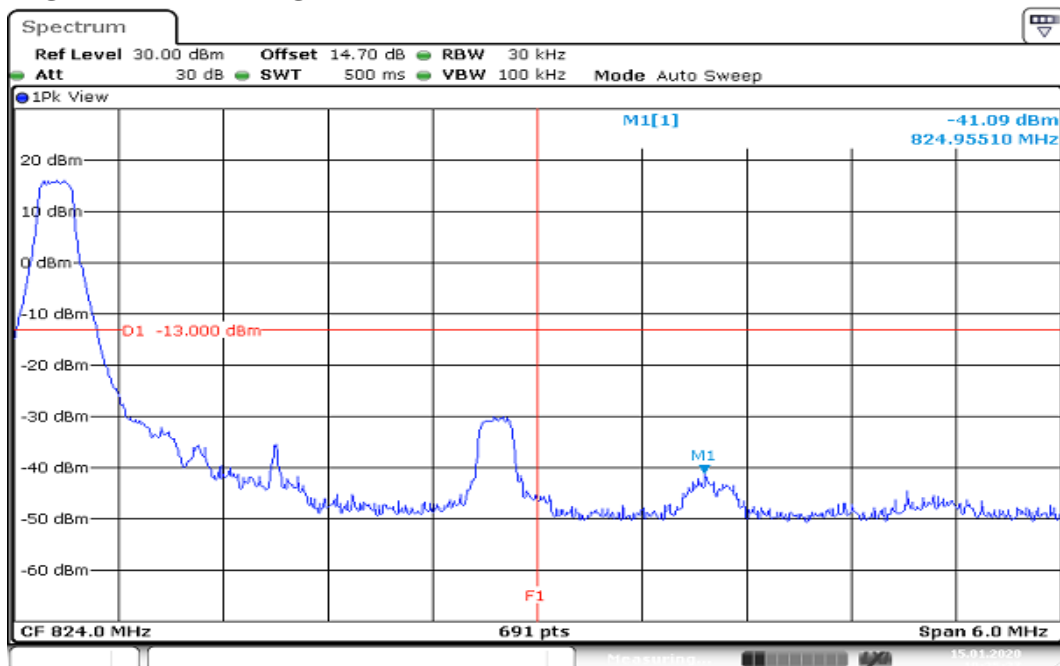
Date: 16.DEC.2019 09:12:38

HIGHER BAND EDGE

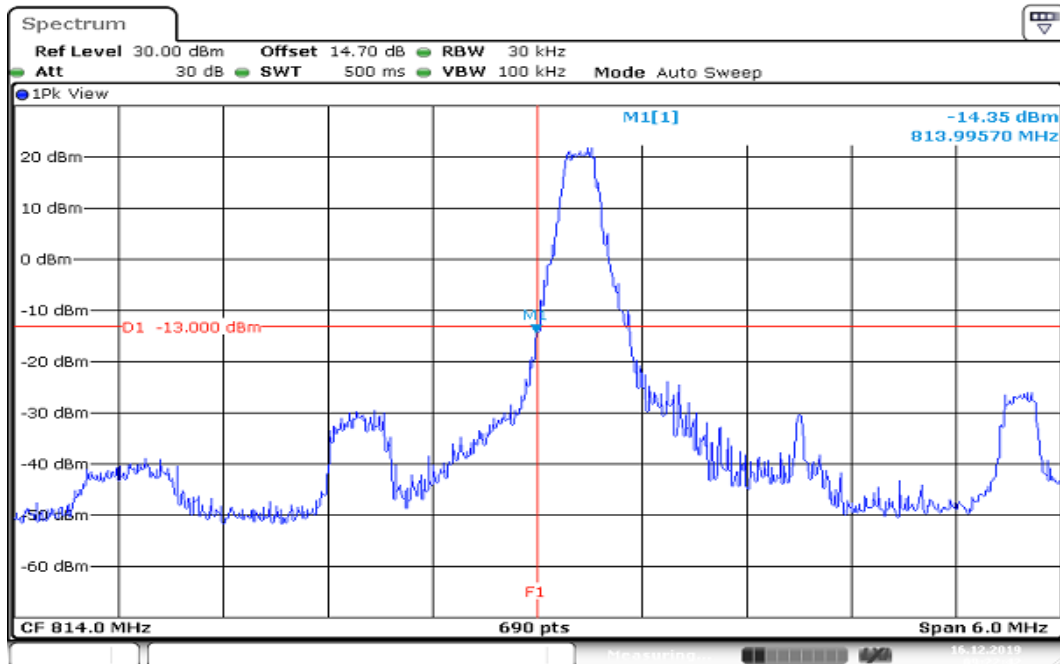
Date: 15.JAN.2020 10:33:43

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

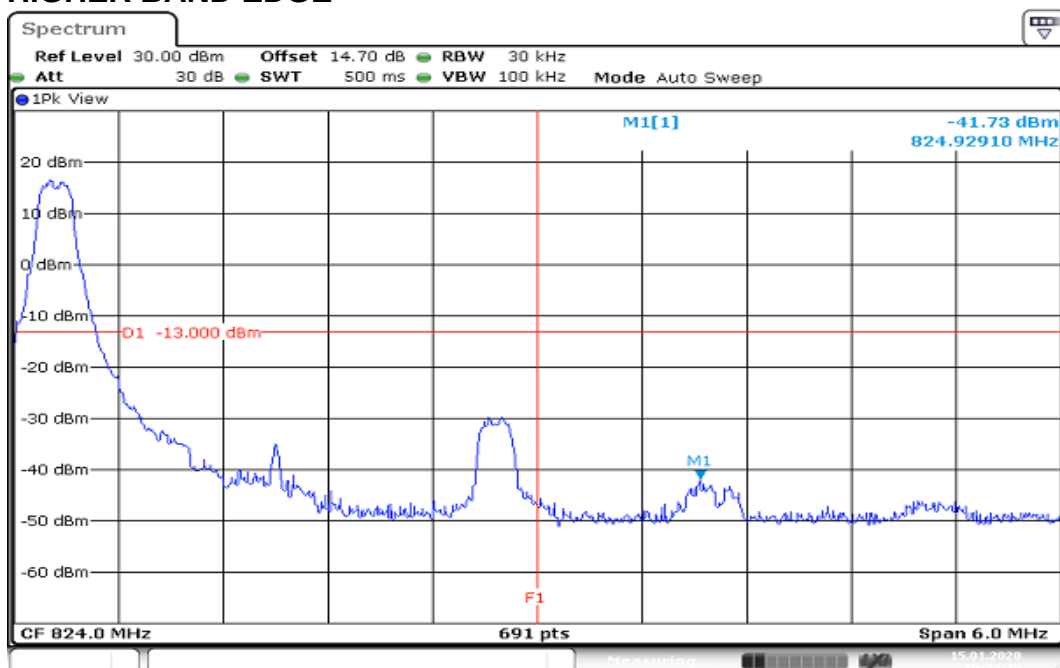
Date: 16.DEC.2019 09:21:54

HIGHER BAND EDGE

Date: 15.JAN.2020 10:25:37

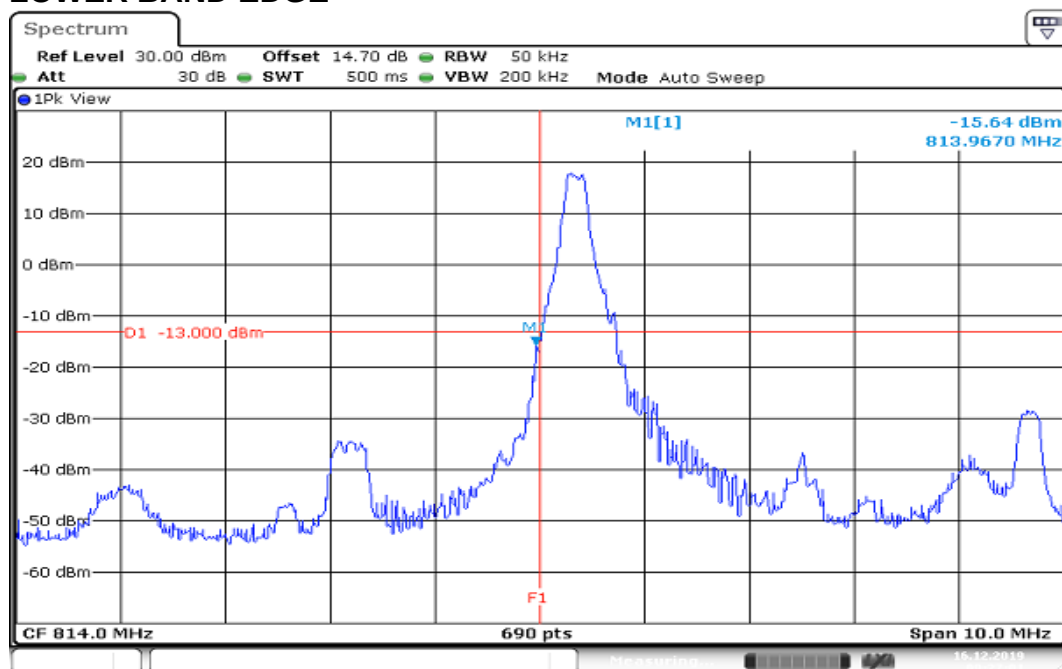
**CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

Date: 16.DEC.2019 09:22:42

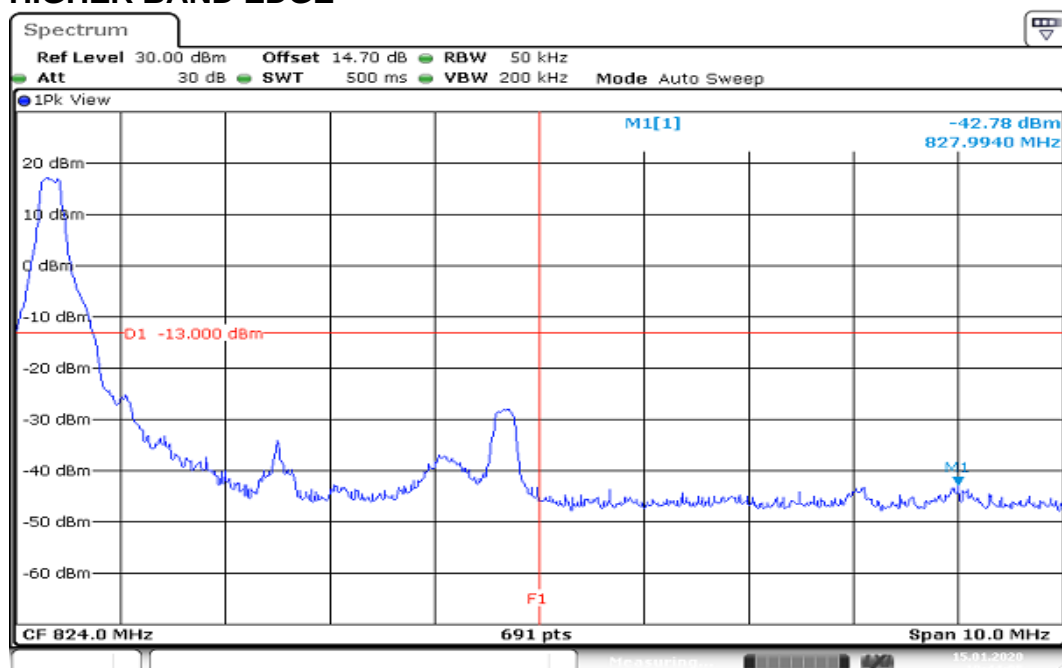
HIGHER BAND EDGE

Date: 15.JAN.2020 10:24:20

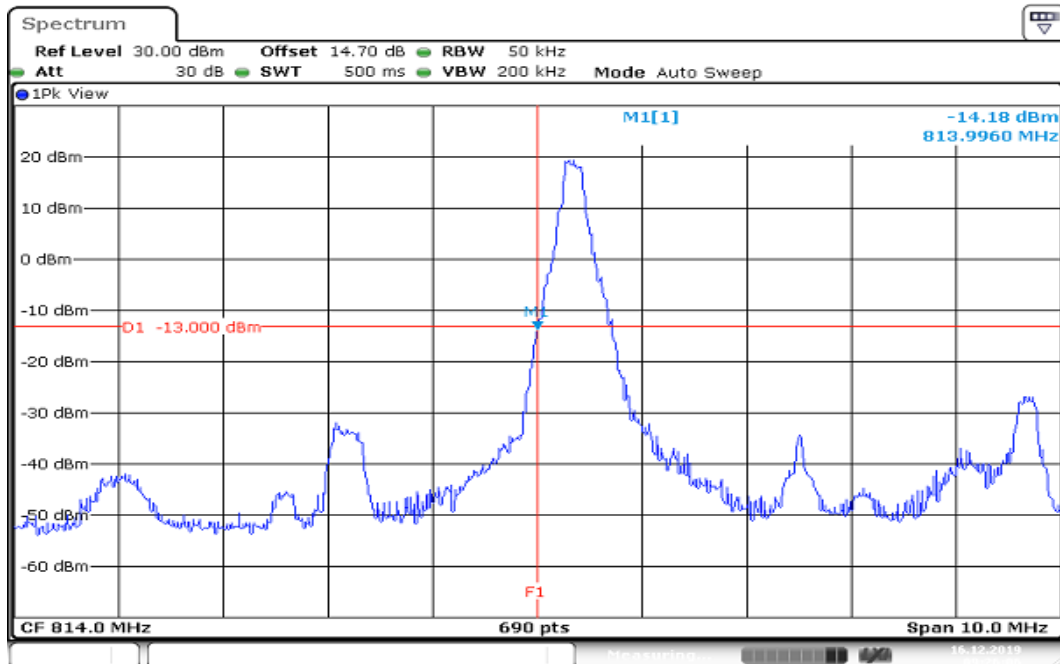
Report No.: T191105W01-RP14

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

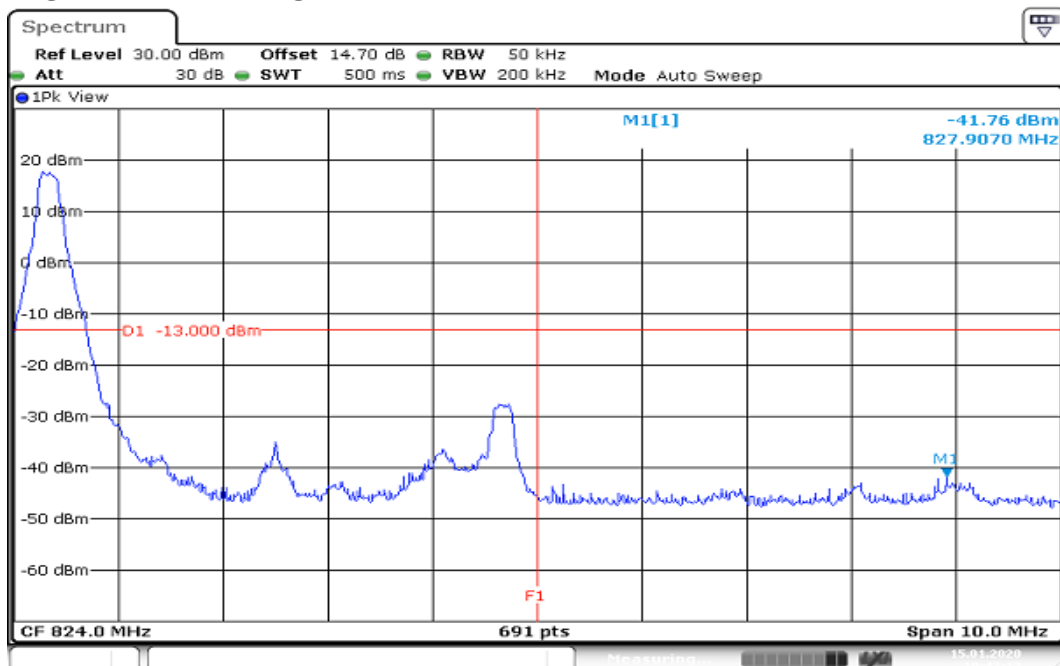
Date: 16.DEC.2019 09:27:01

HIGHER BAND EDGE

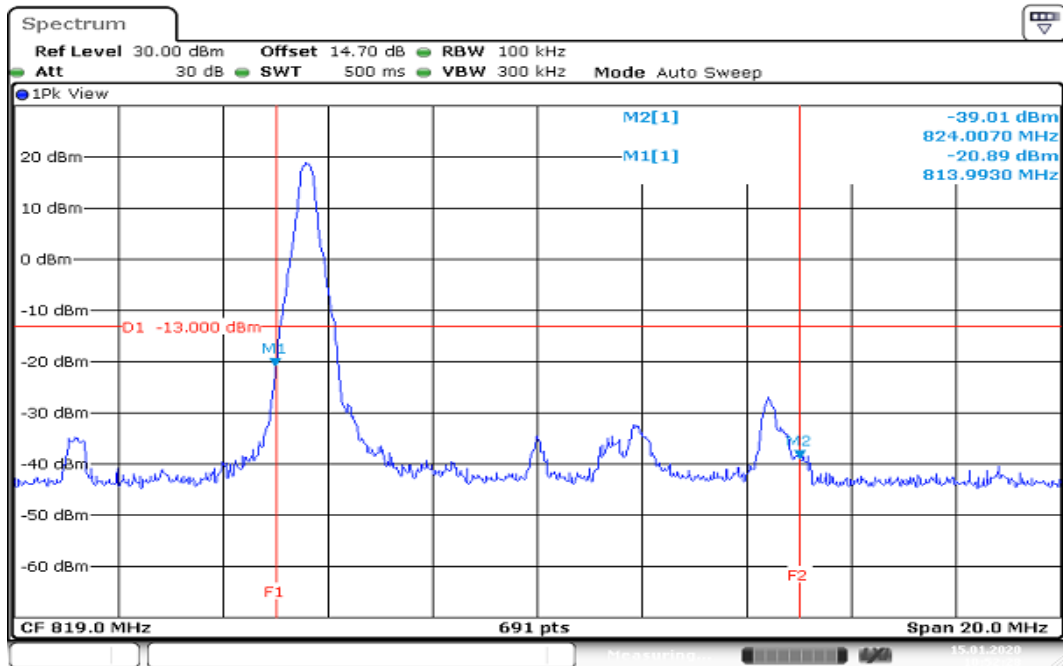
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**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

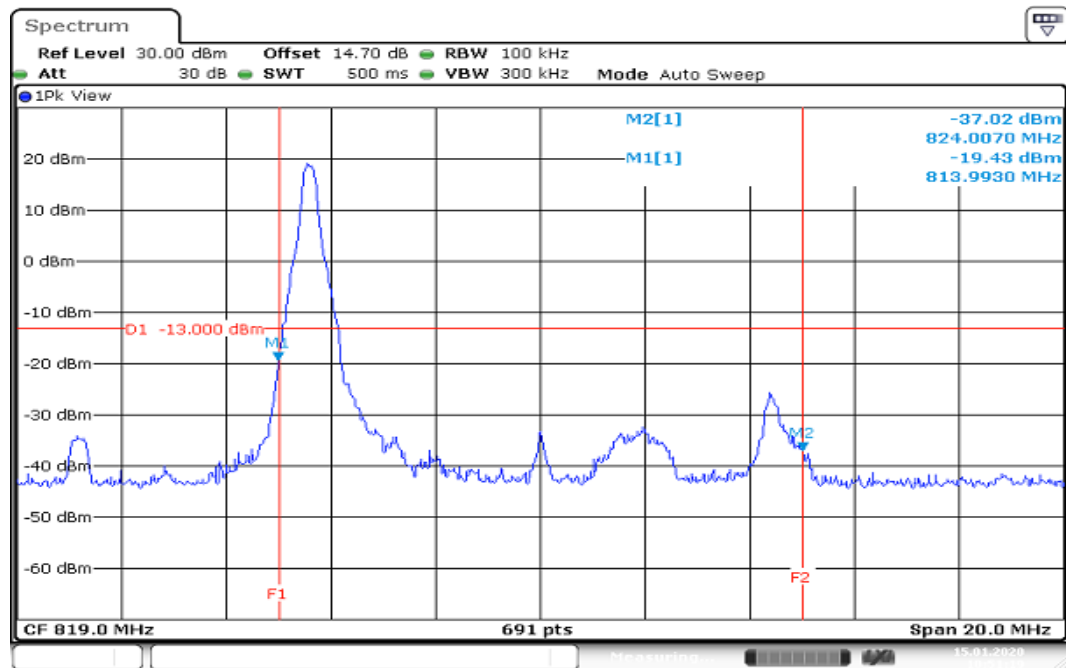
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HIGHER BAND EDGE

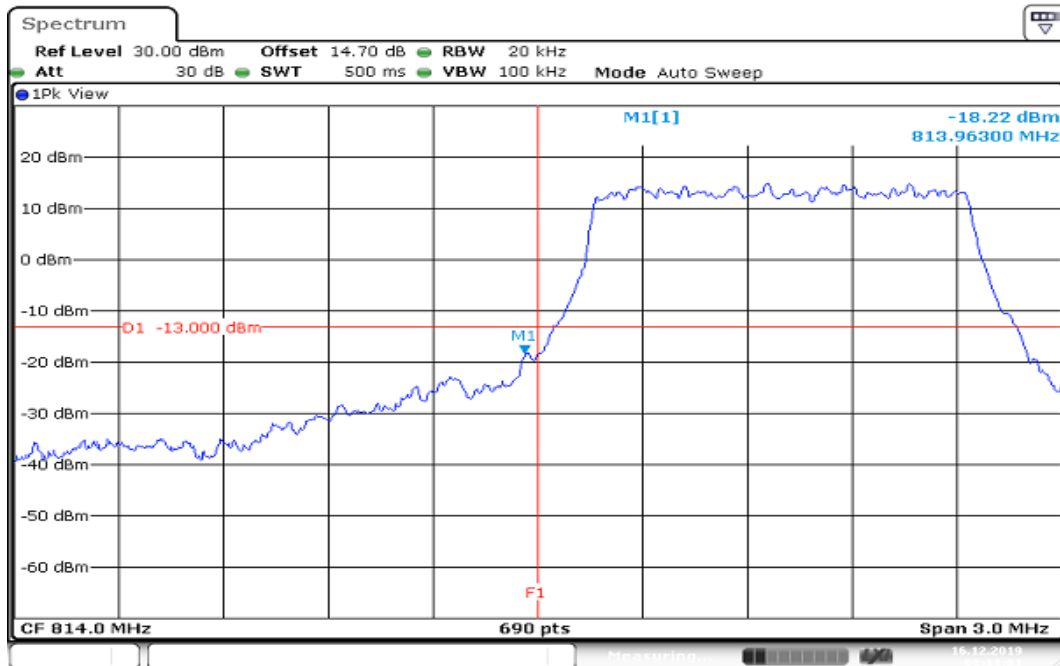
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**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB ALLOCATED
MIDDLE BAND EDGE**

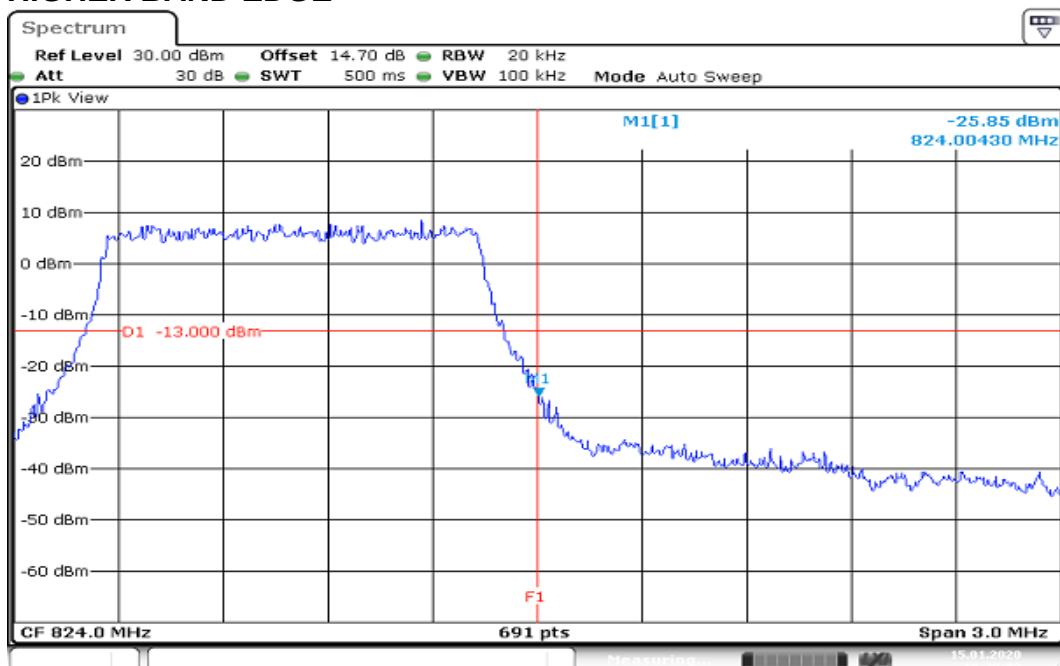
Date: 15.JAN.2020 10:52:28

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB ALLOCATED
MIDDLE BAND EDGE**

Date: 15.JAN.2020 10:51:19

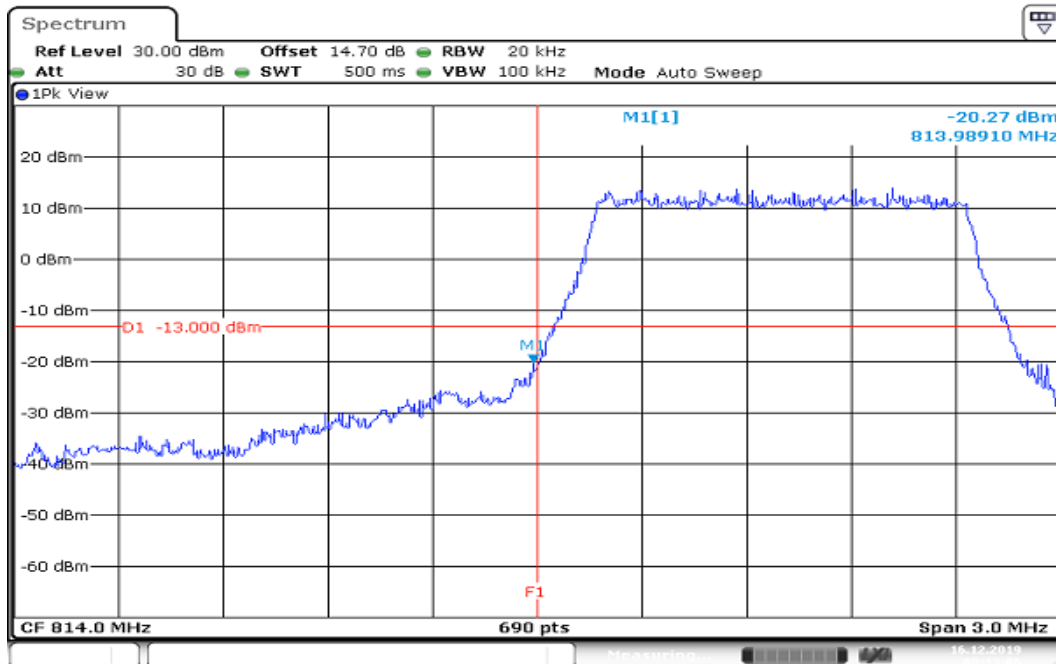
**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 16.DEC.2019 09:11:01

HIGHER BAND EDGE

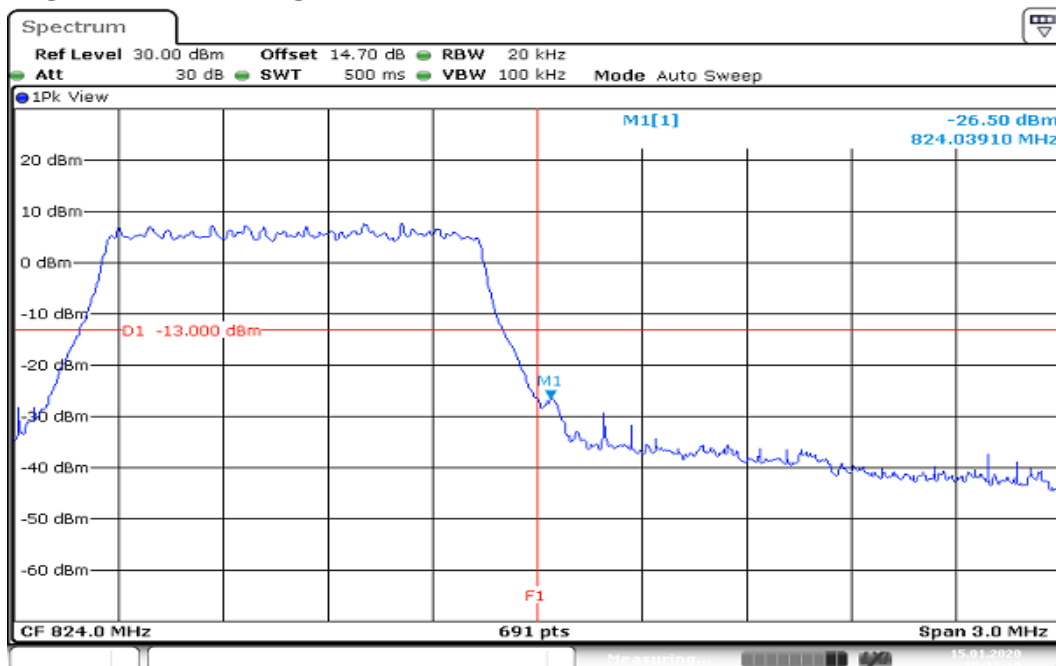
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CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE

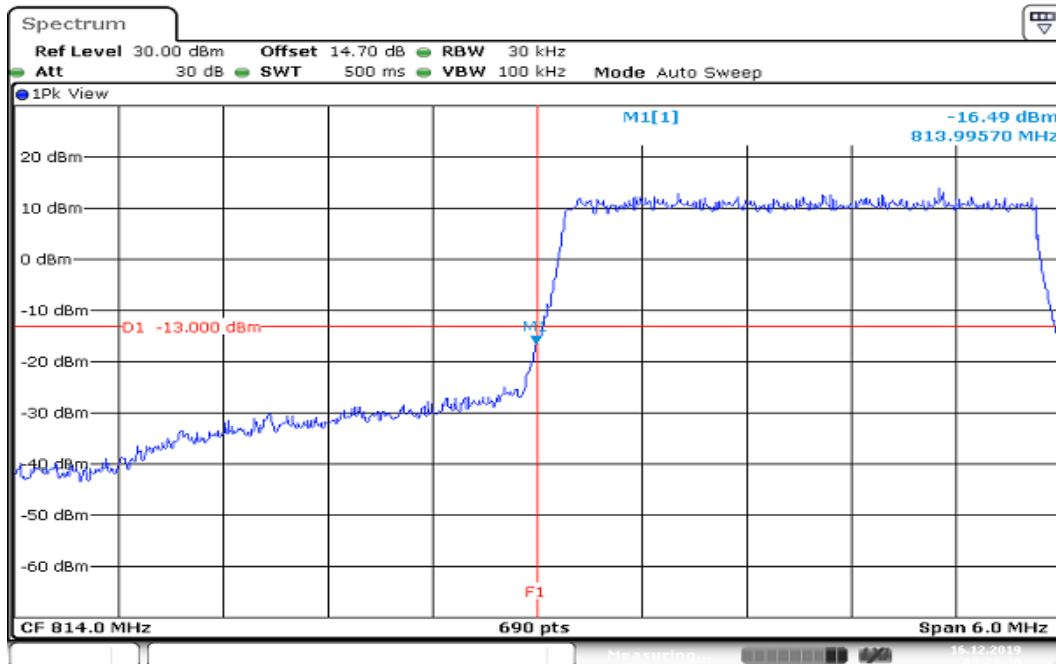


Date: 16.DEC.2019 09:13:06

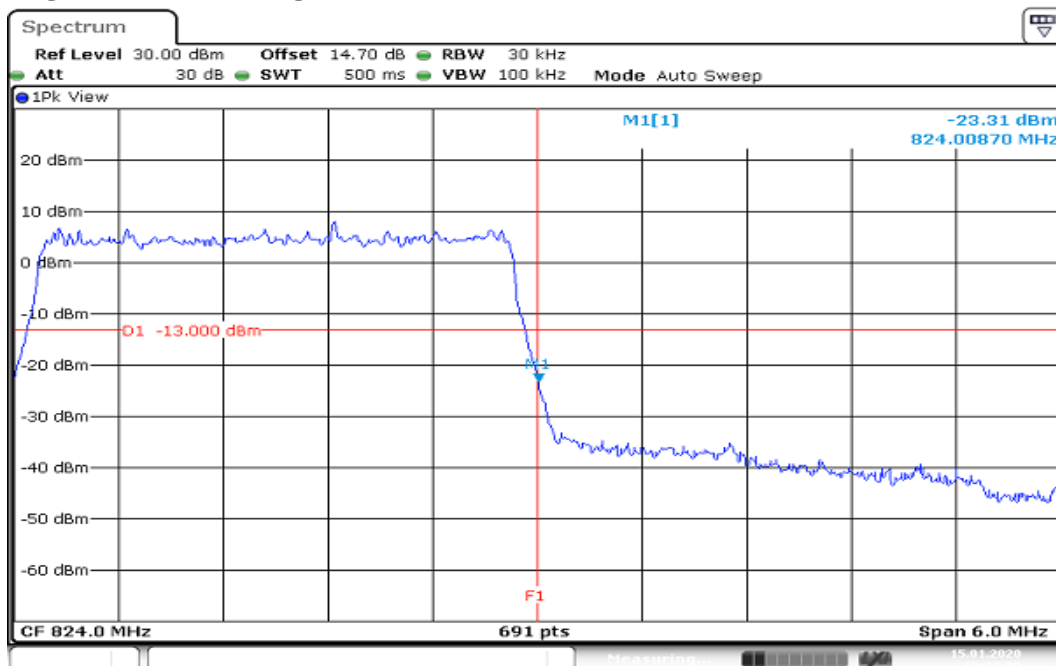
HIGHER BAND EDGE



Date: 15.JAN.2020 10:37:19

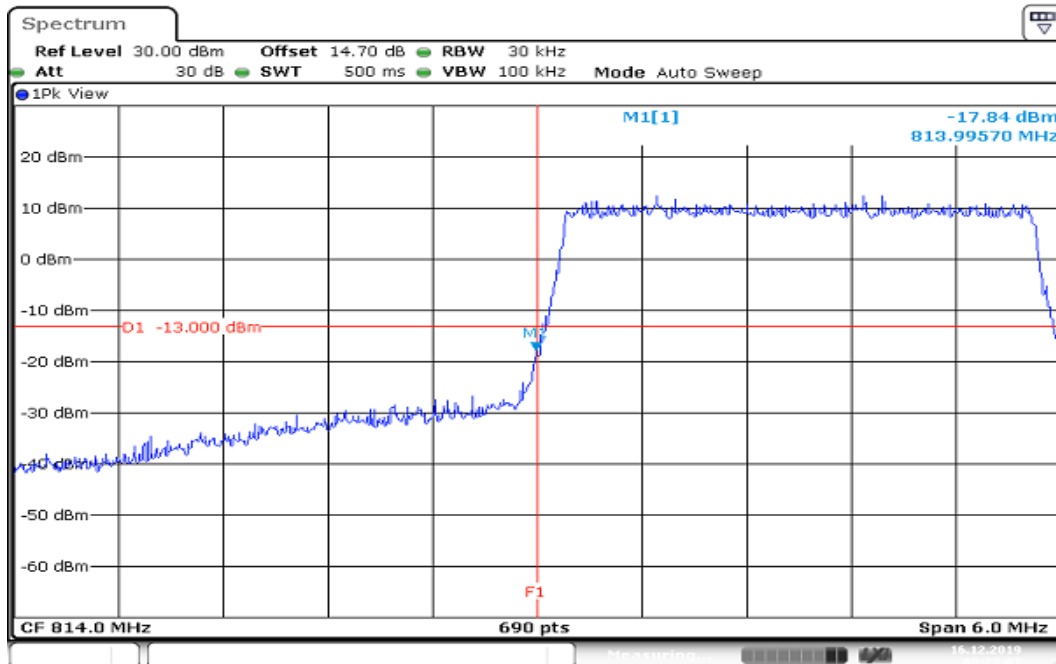
**CHANNEL BANDWIDTH: 3MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 16.DEC.2019 09:23:31

HIGHER BAND EDGE

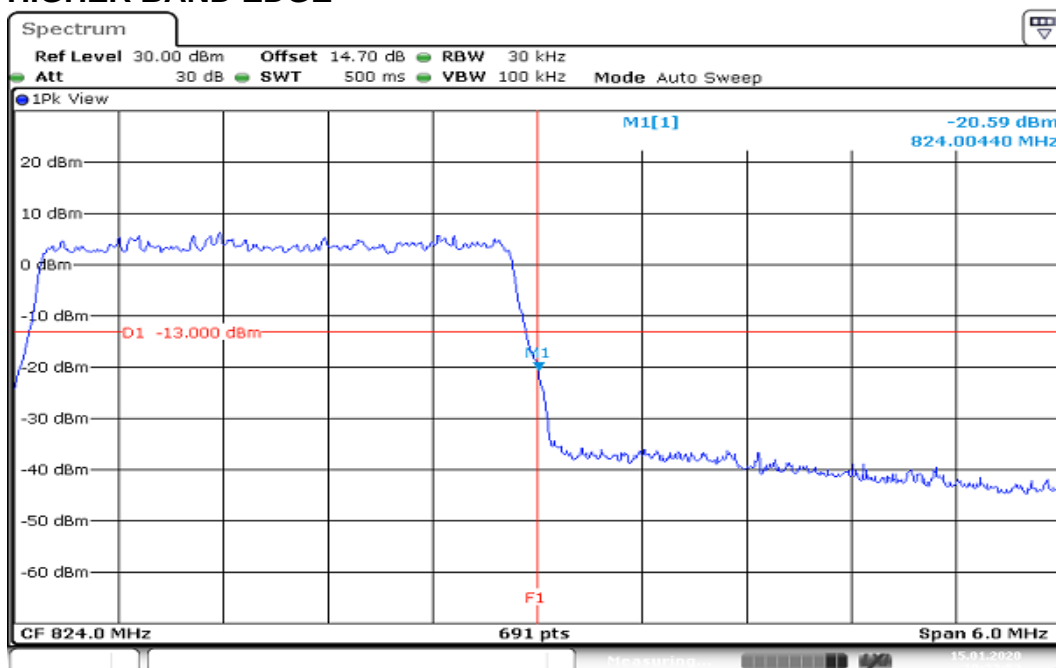
Date: 15.JAN.2020 10:27:00

CHANNEL BANDWIDTH: 3MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE

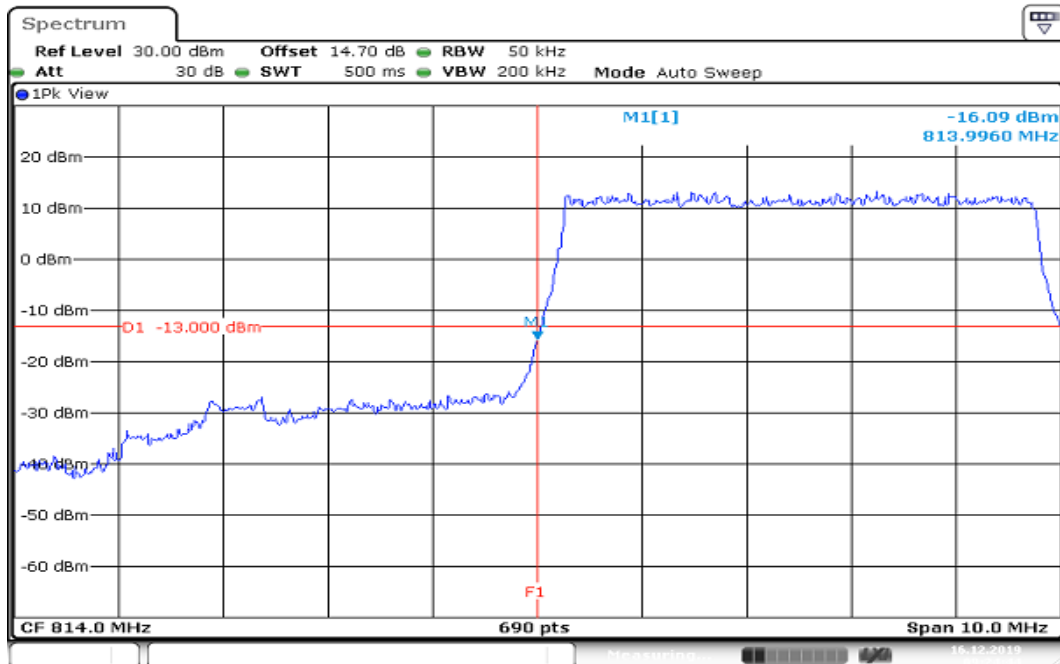


Date: 16.DEC.2019 09:23:07

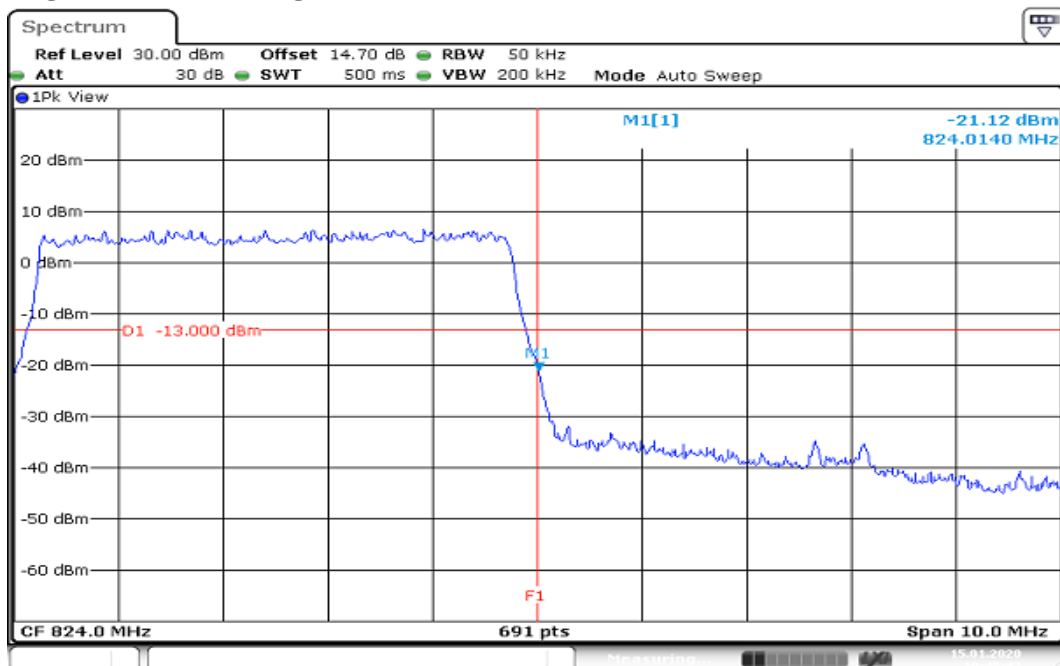
HIGHER BAND EDGE



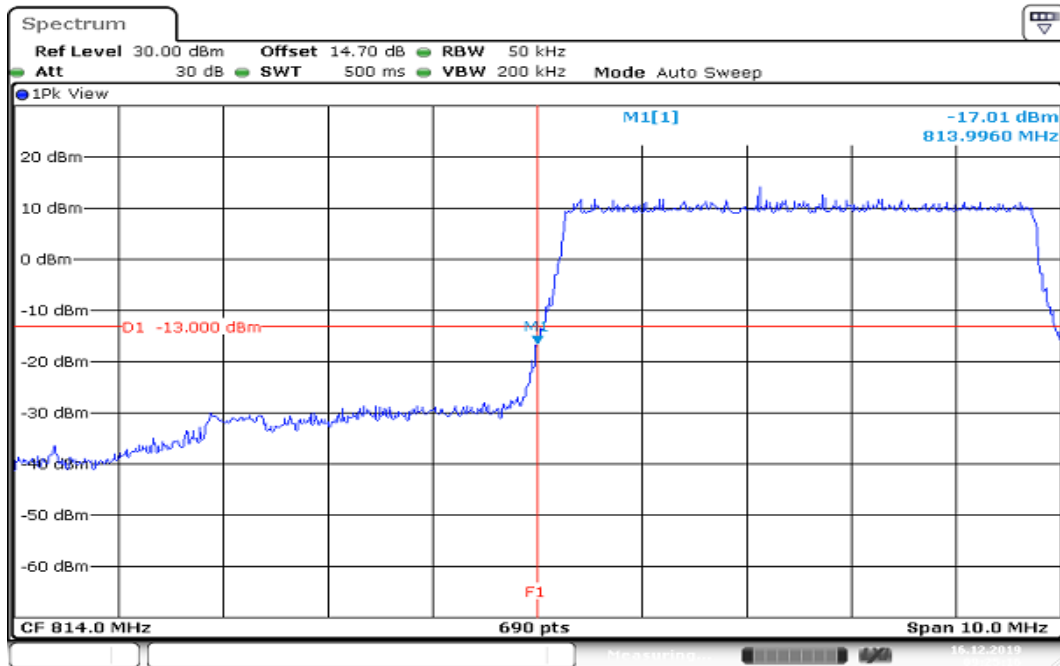
Date: 15.JAN.2020 10:22:52

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

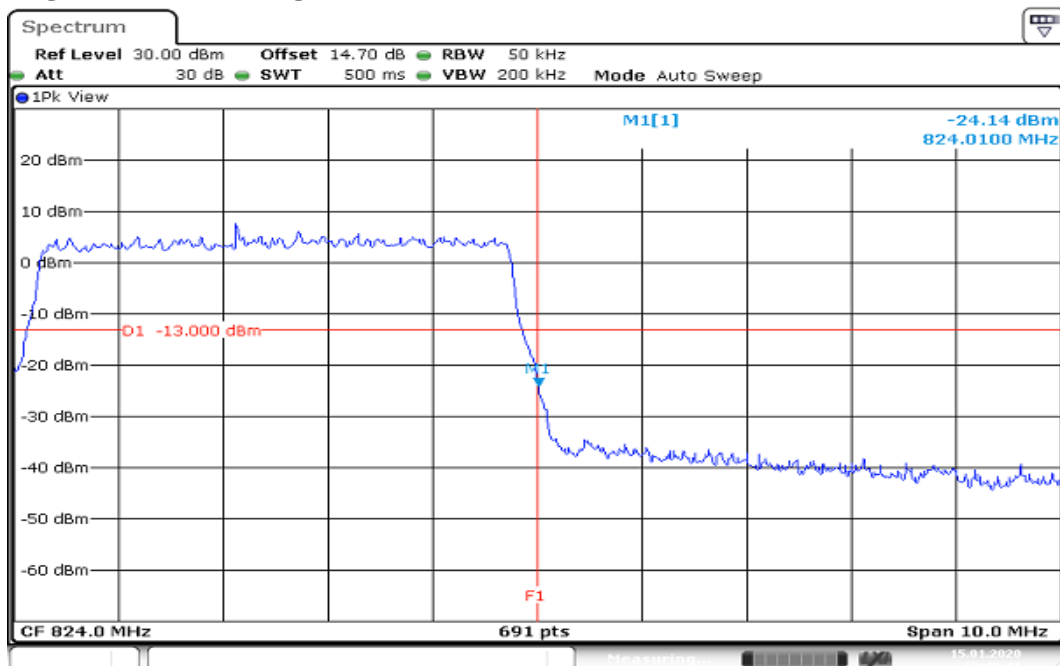
Date: 16.DEC.2019 09:24:45

HIGHER BAND EDGE

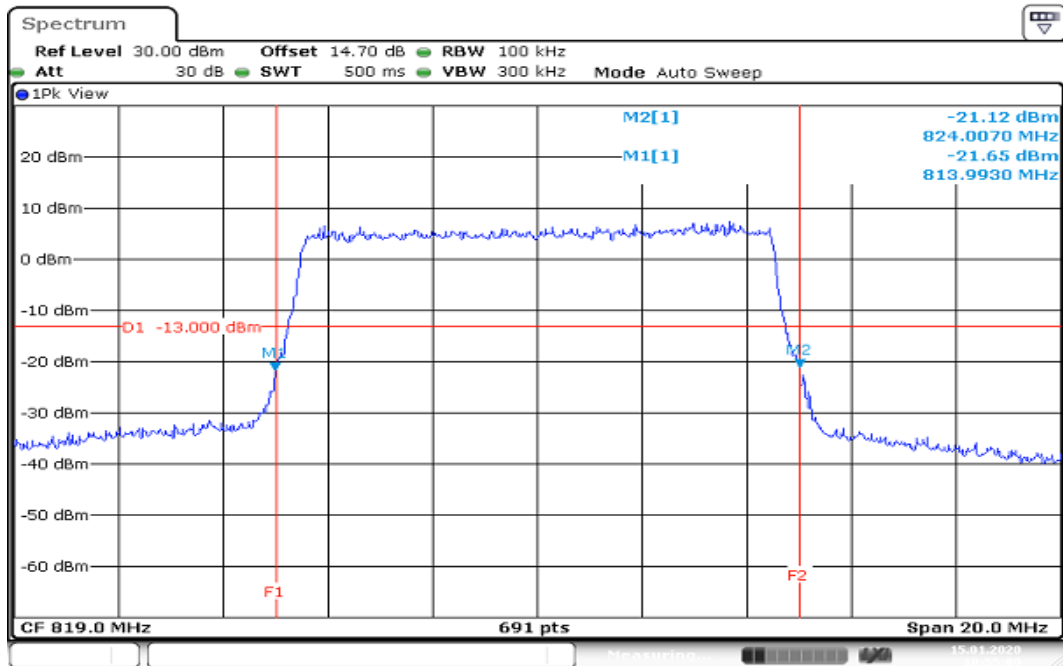
Date: 15.JAN.2020 10:45:43

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

Date: 16.DEC.2019 09:25:16

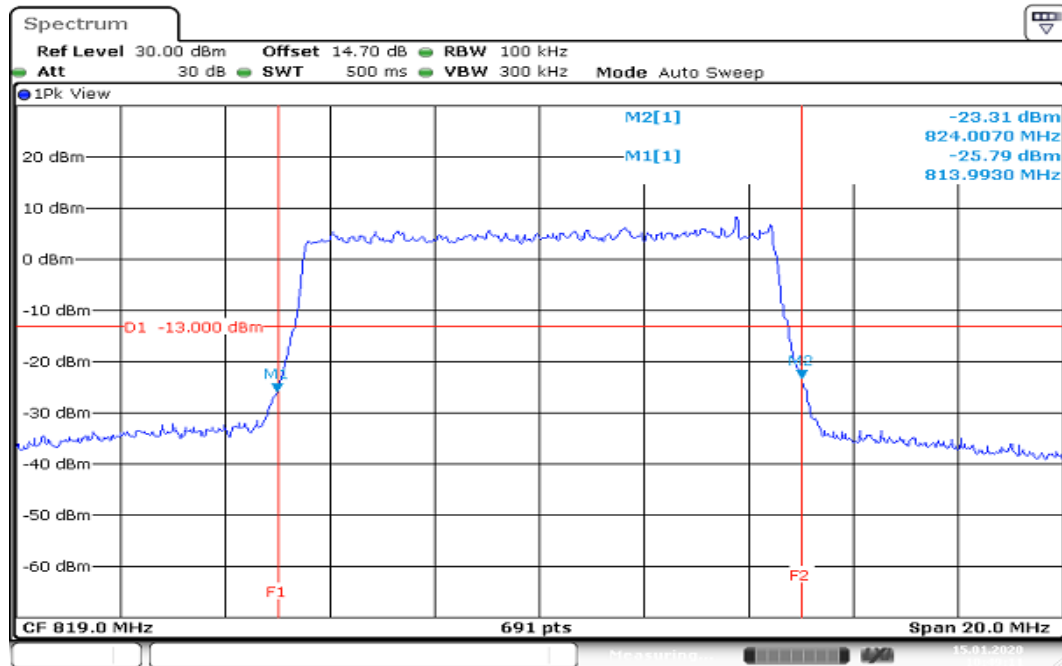
HIGHER BAND EDGE

Date: 15.JAN.2020 10:40:41

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100% RB ALLOCATED
MIDDLE BAND EDGE**

Date: 15.JAN.2020 10:55:00

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



Date: 15.JAN.2020 10:49:11

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

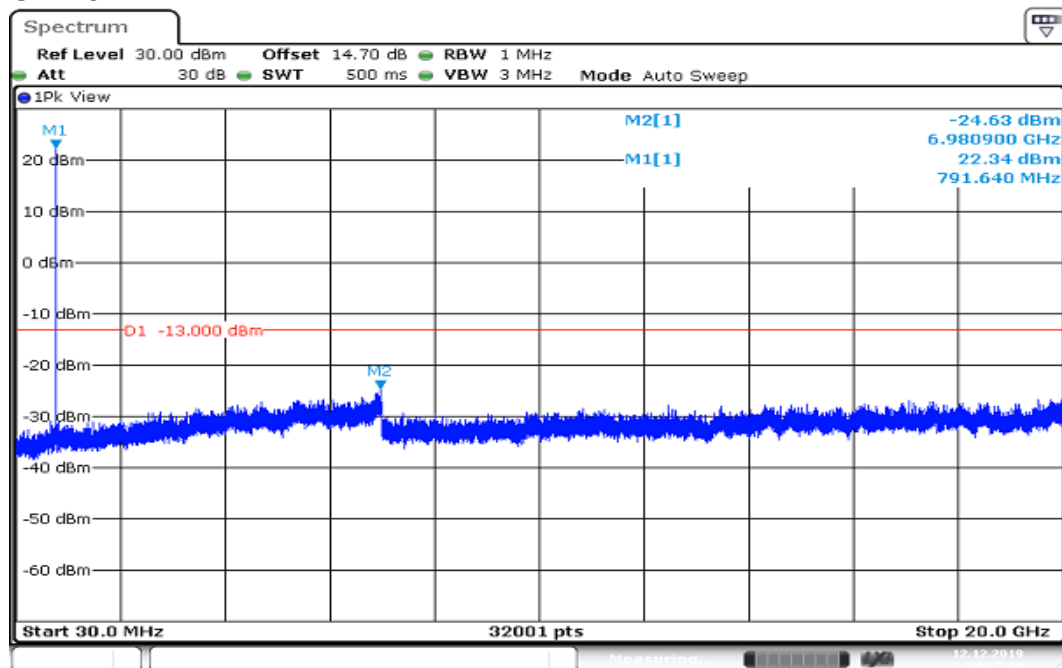
1. According to KDB 971168 D01,
2. The EUT was connect to spectrum analyzer and call box.
3. The RF output of EUT was connected to the spectrum analyzer.
4. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
5. Record the maximum spurious emission.
6. The fundamental frequency should be excluded against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

Test Results

LTE Band 14

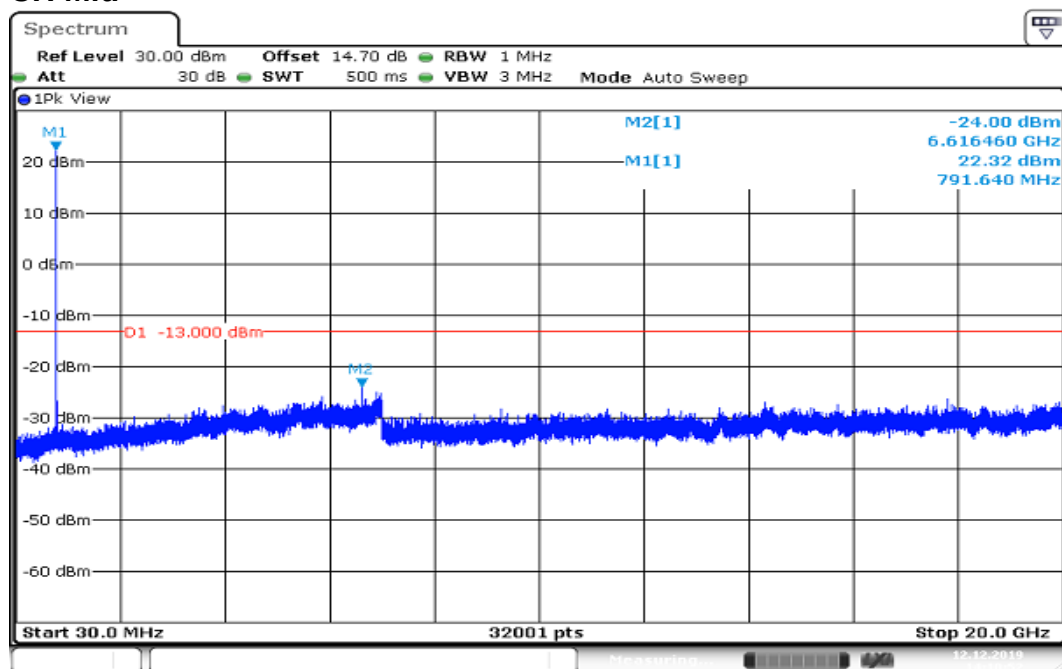
CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low



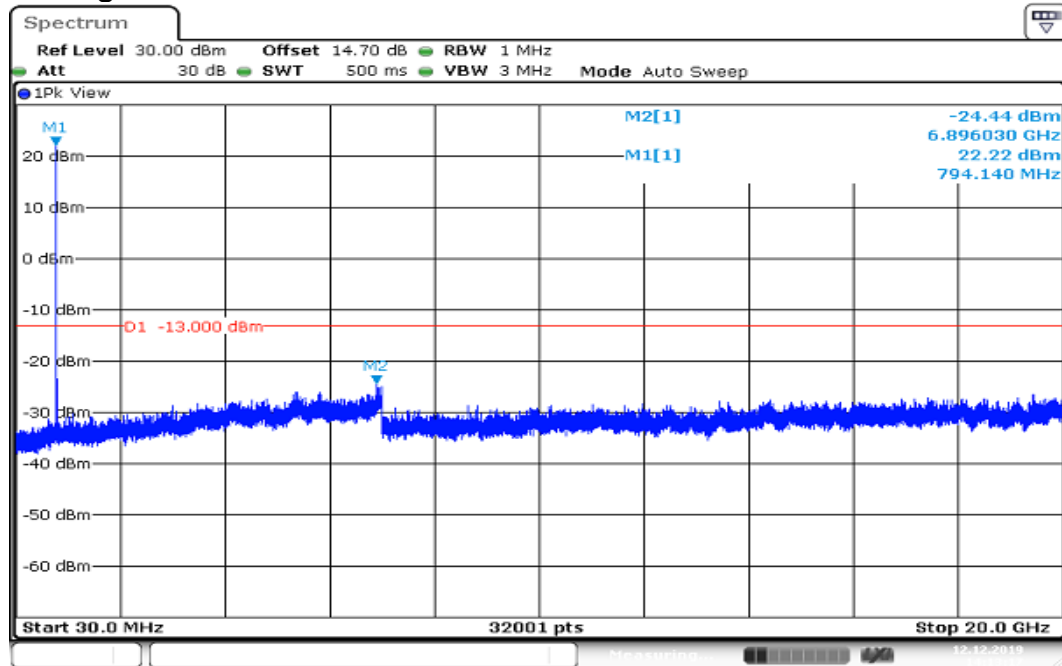
Date: 12.DEC.2019 14:12:38

CH Mid



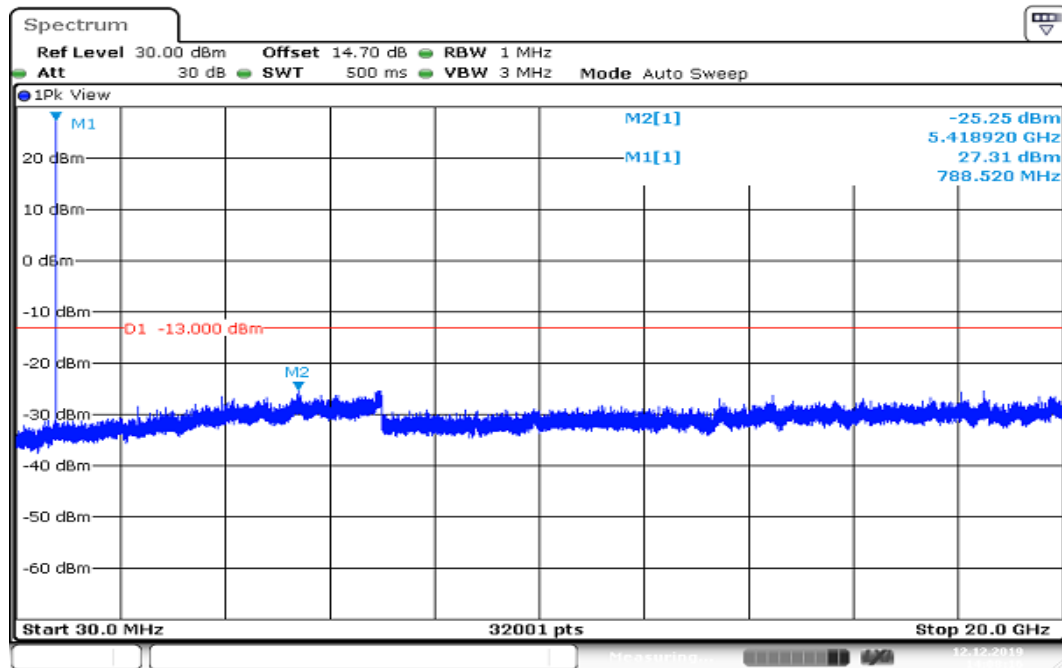
Date: 12.DEC.2019 14:10:52

CH High



Date: 12.DEC.2019 14:13:17

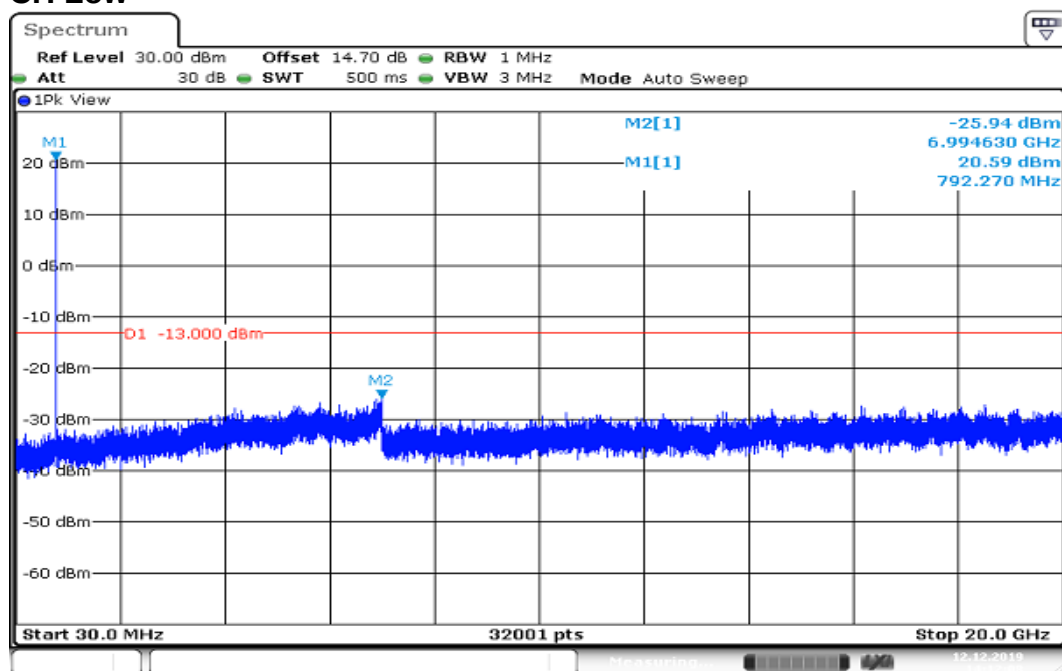
CHANNEL BANDWIDTH: 10MHz / QPSK CH Mid



Date: 12.DEC.2019 14:08:17

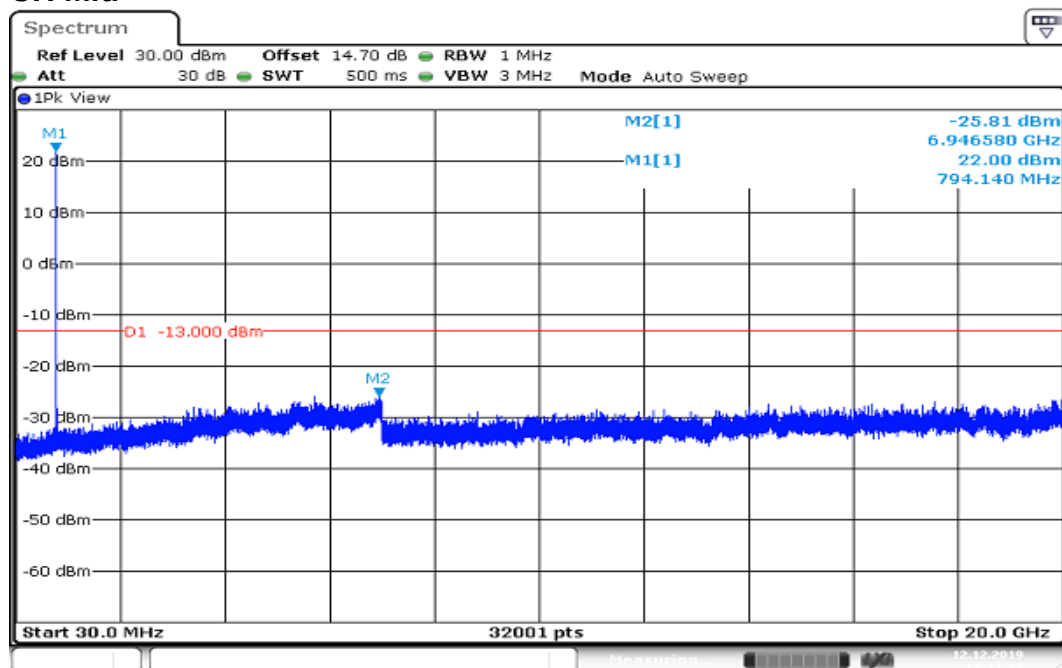
Report No.: T191105W01-RP14

CHANNEL BANDWIDTH: 5MHz / 16QAM
CH Low



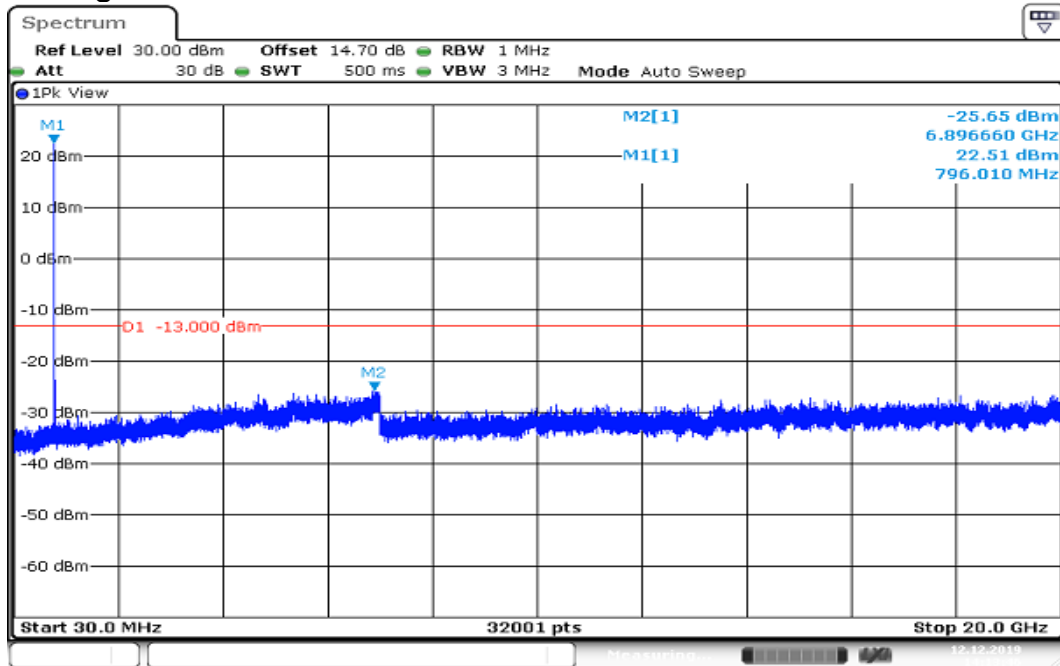
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CH Mid



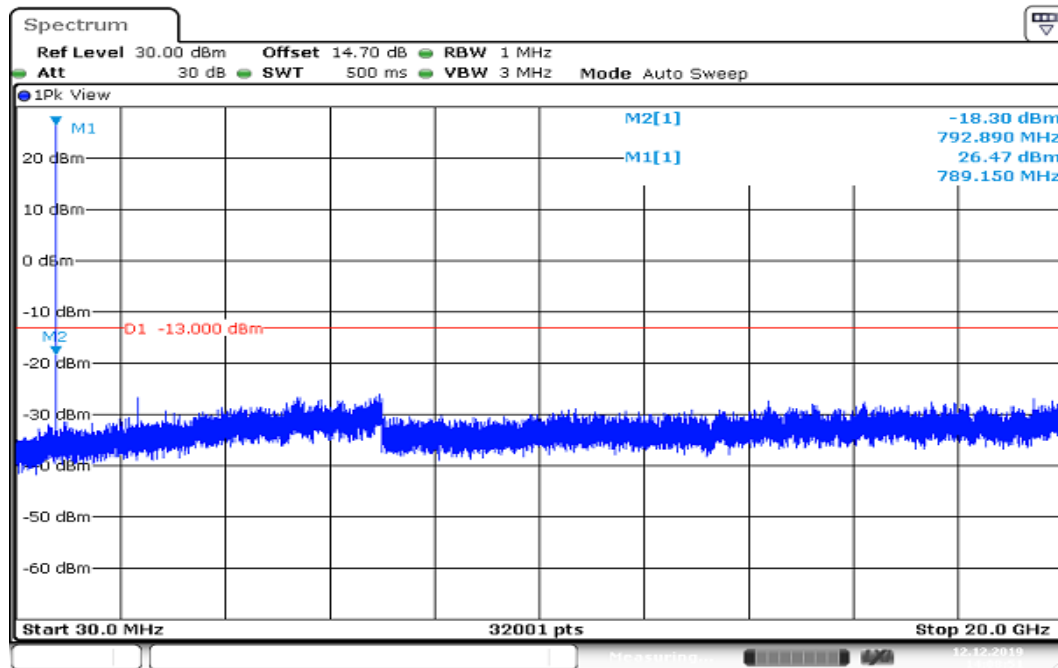
Date: 12.DEC.2019 14:11:28

CH High



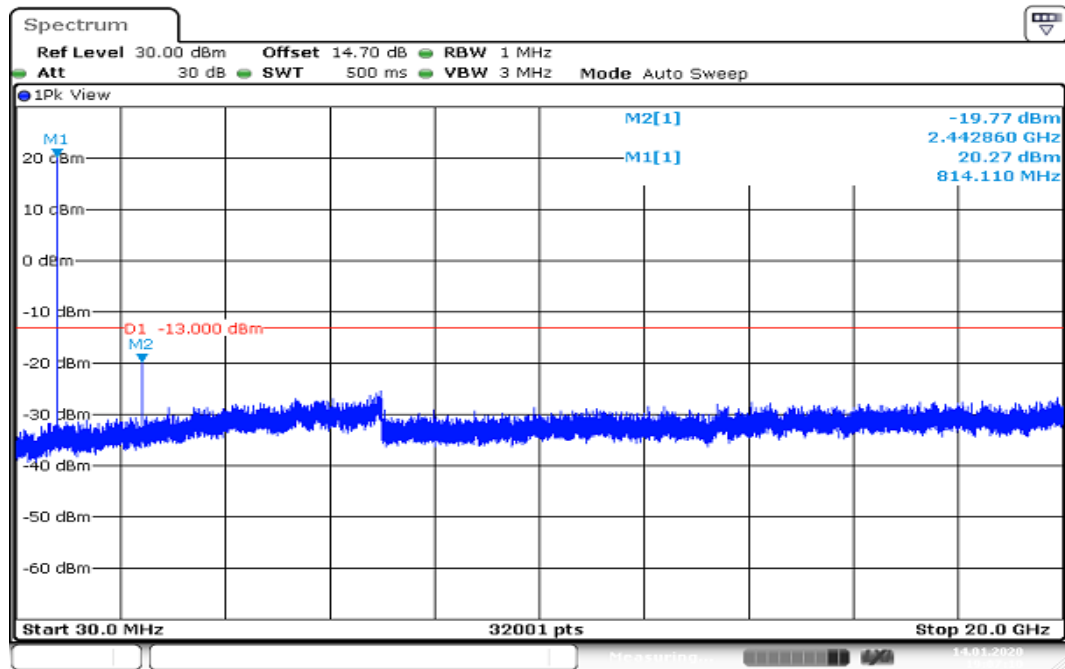
Date: 12.DEC.2019 14:13:46

CHANNEL BANDWIDTH: 10MHz / 16QAM CH Mid

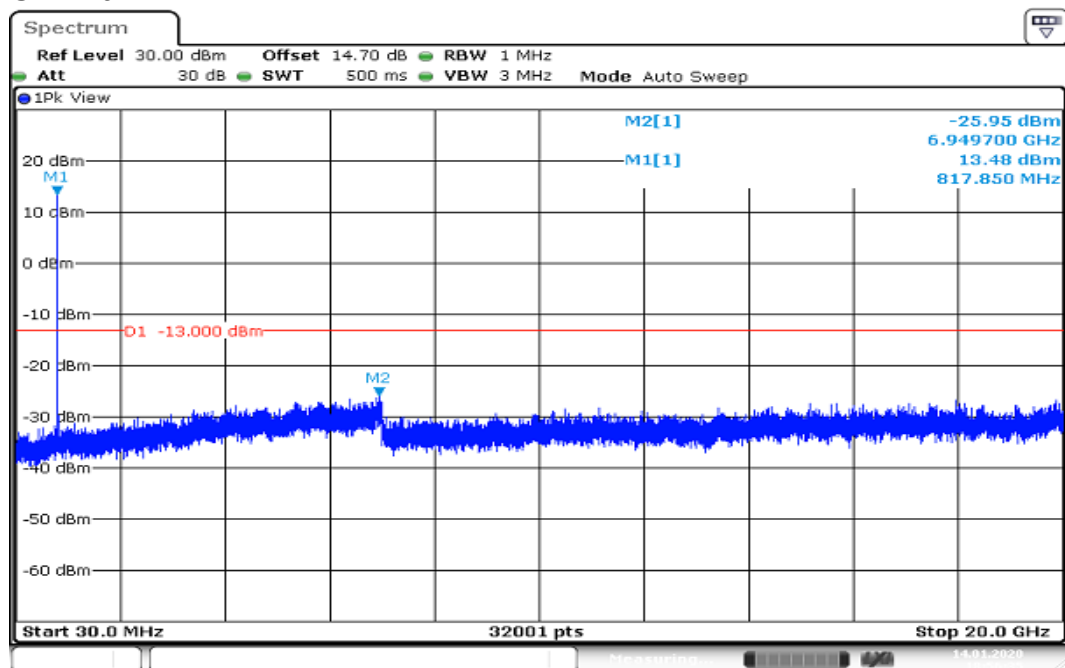


Date: 12.DEC.2019 14:08:51

Report No.: T191105W01-RP14

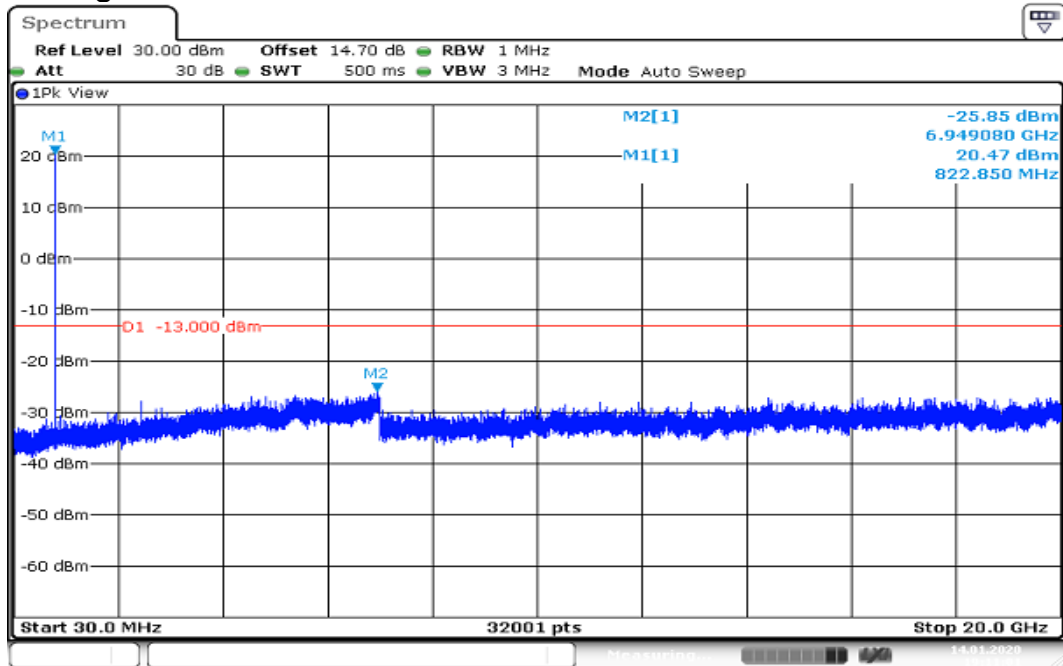
LTE Band 26**CHANNEL BANDWIDTH: 1.4MHz / QPSK****CH Low**

Date: 14.JAN.2020 19:07:10

CH Mid

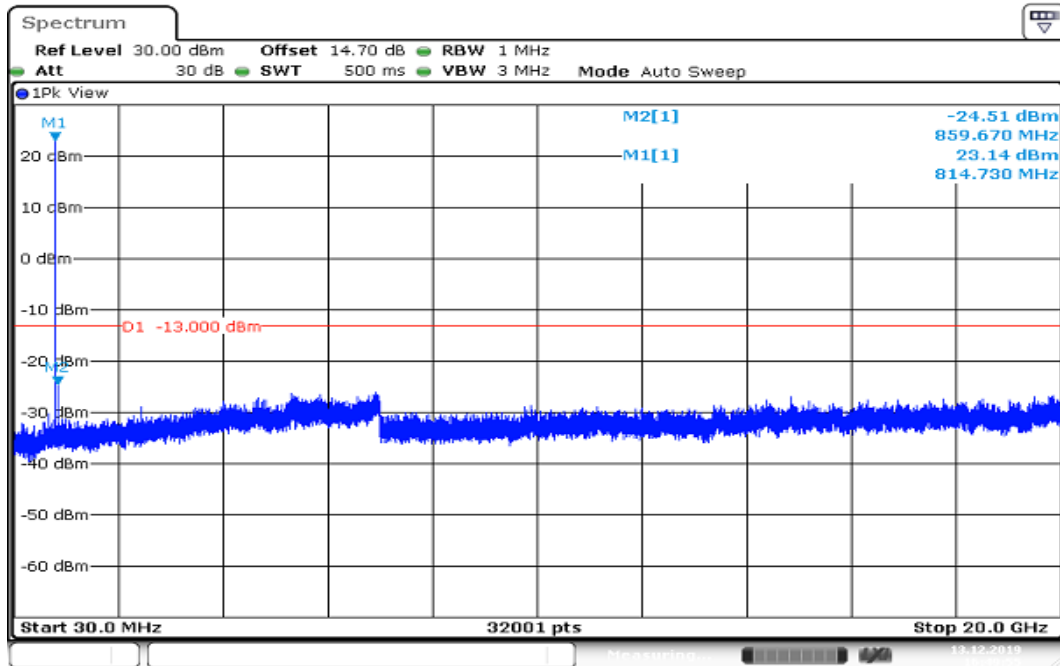
Date: 14.JAN.2020 18:56:35

CH High

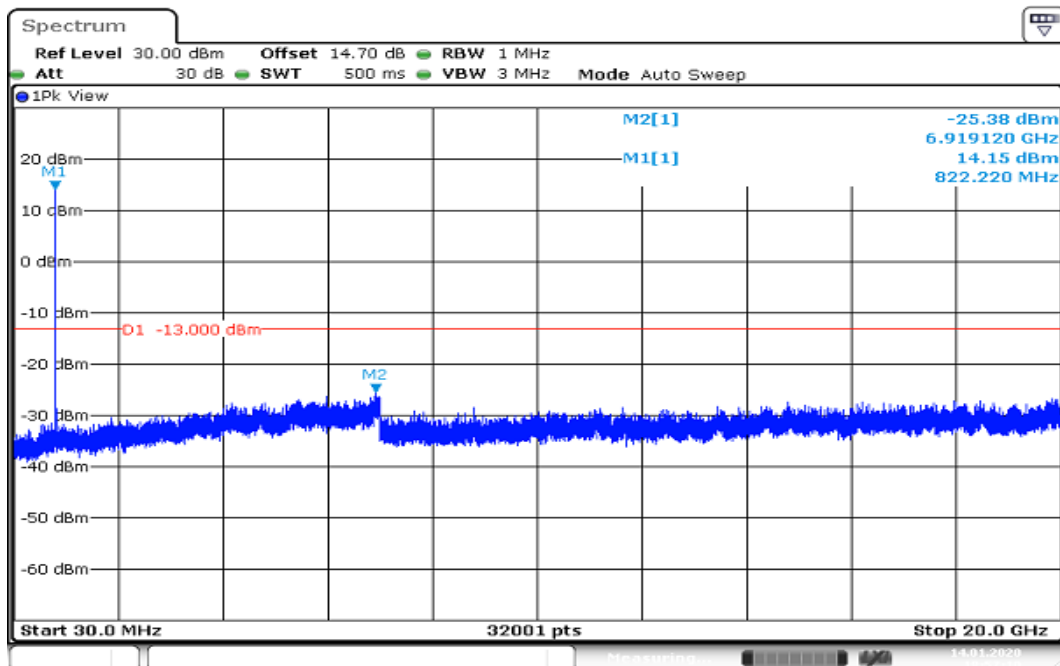


Date: 14.JAN.2020 19:11:01

Report No.: T191105W01-RP14

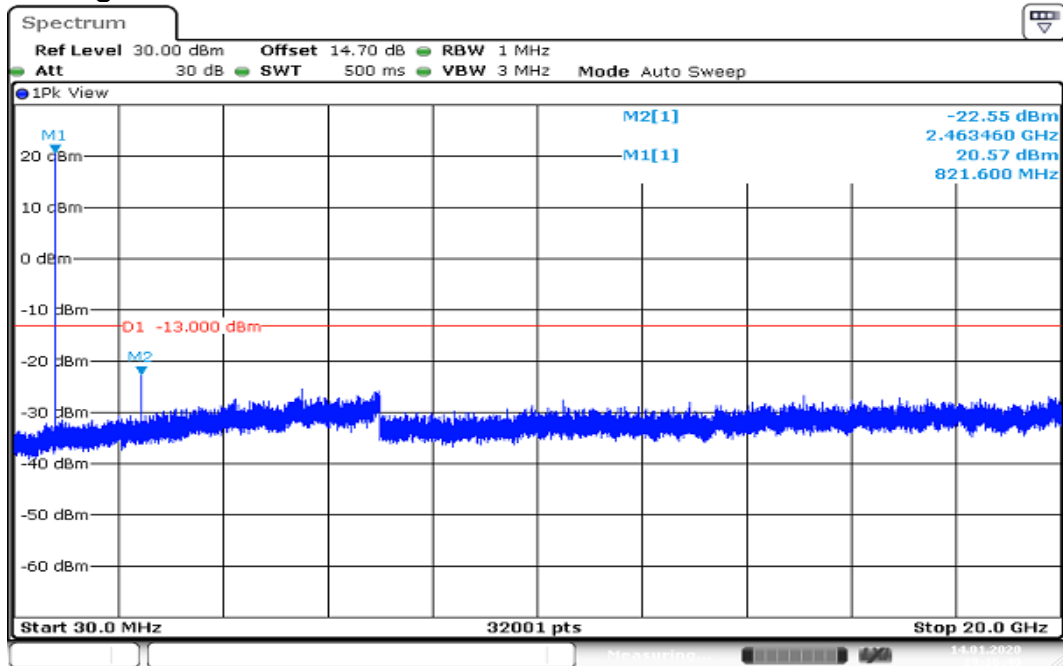
CHANNEL BANDWIDTH: 3MHz / QPSK
CH Low

Date: 13.DEC.2019 16:49:55

CH Mid

Date: 14.JAN.2020 18:57:10

CH High

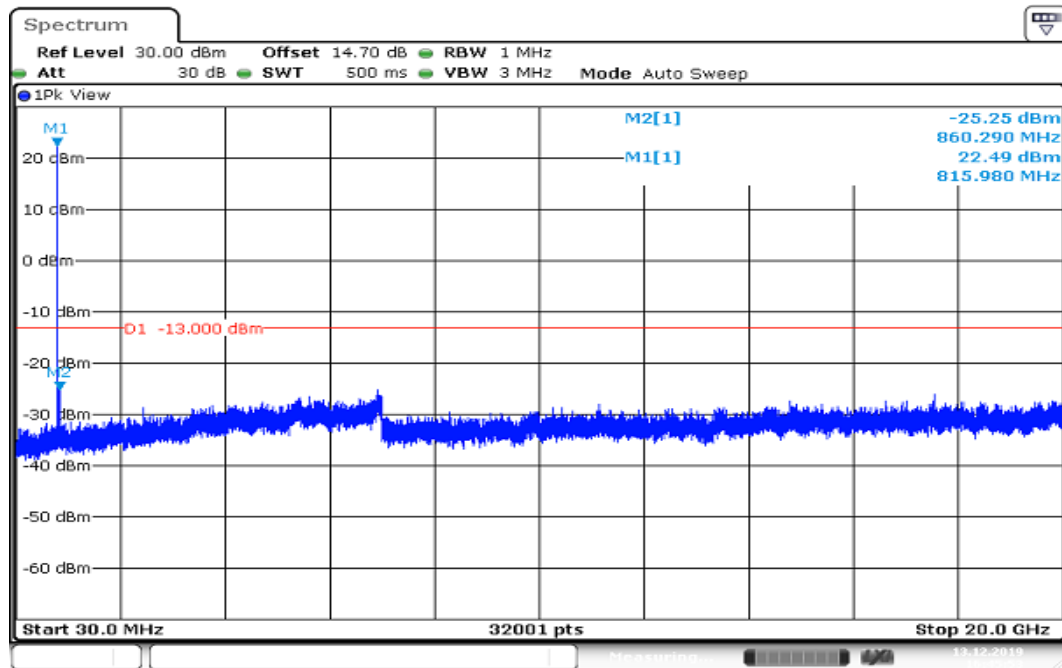


Date: 14.JAN.2020 19:16:49

Report No.: T191105W01-RP14

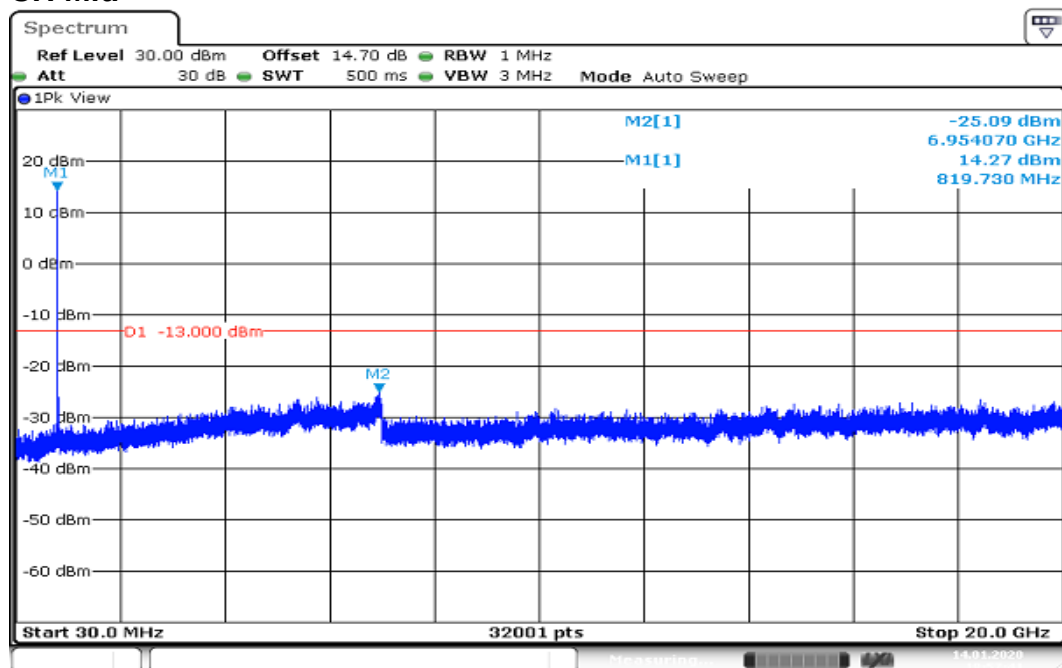
CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low



Date: 13.DEC.2019 16:45:54

CH Mid



Date: 14.JAN.2020 18:57:41

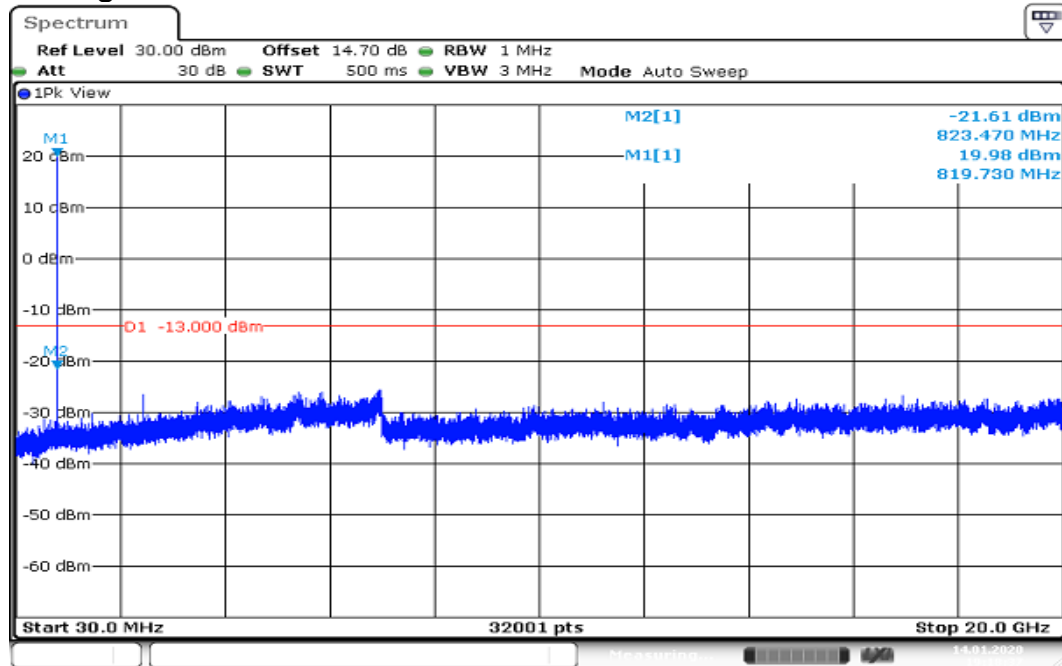


Report No.: T191105W01-RP14

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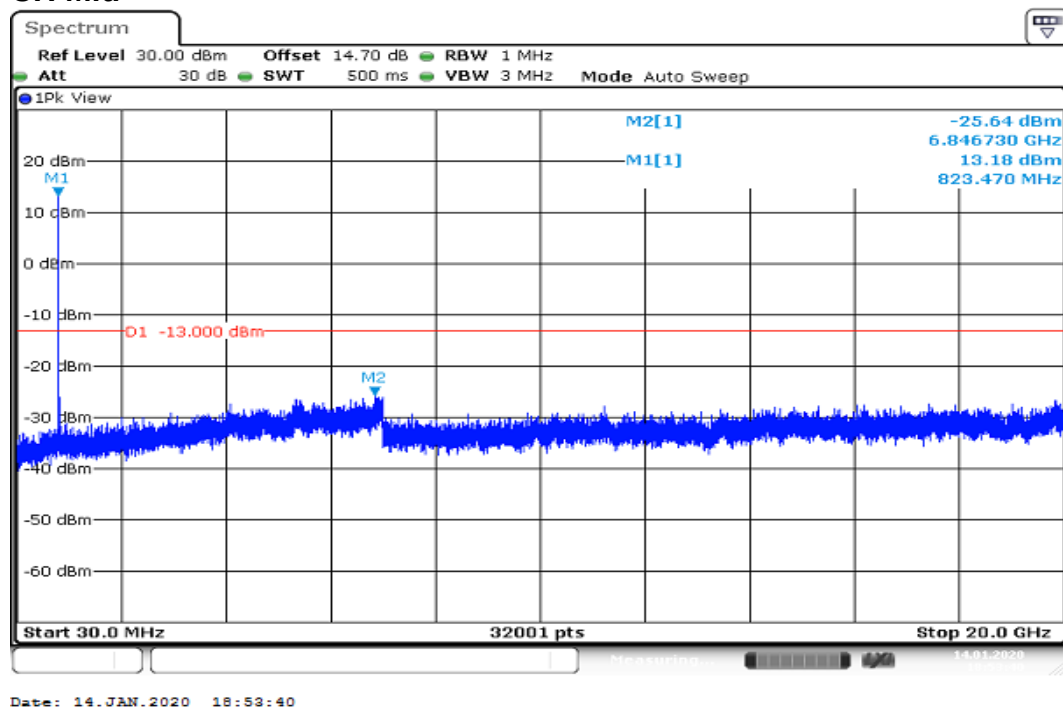
Rev.: 00

CH High



Date: 14.JAN.2020 19:18:37

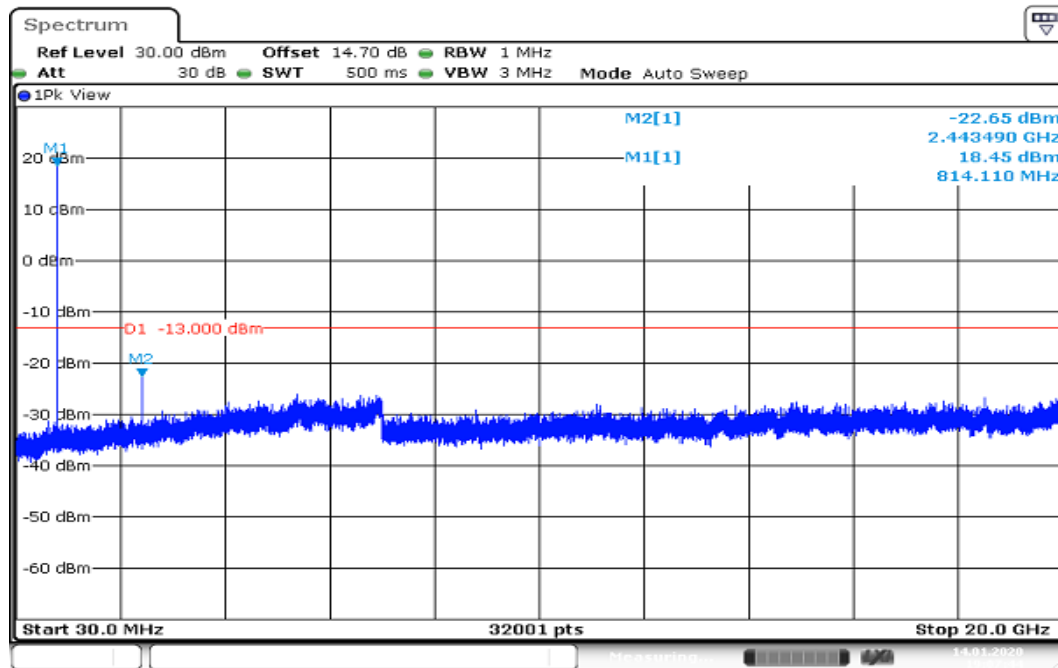
CHANNEL BANDWIDTH: 10MHz / QPSK
CH Mid



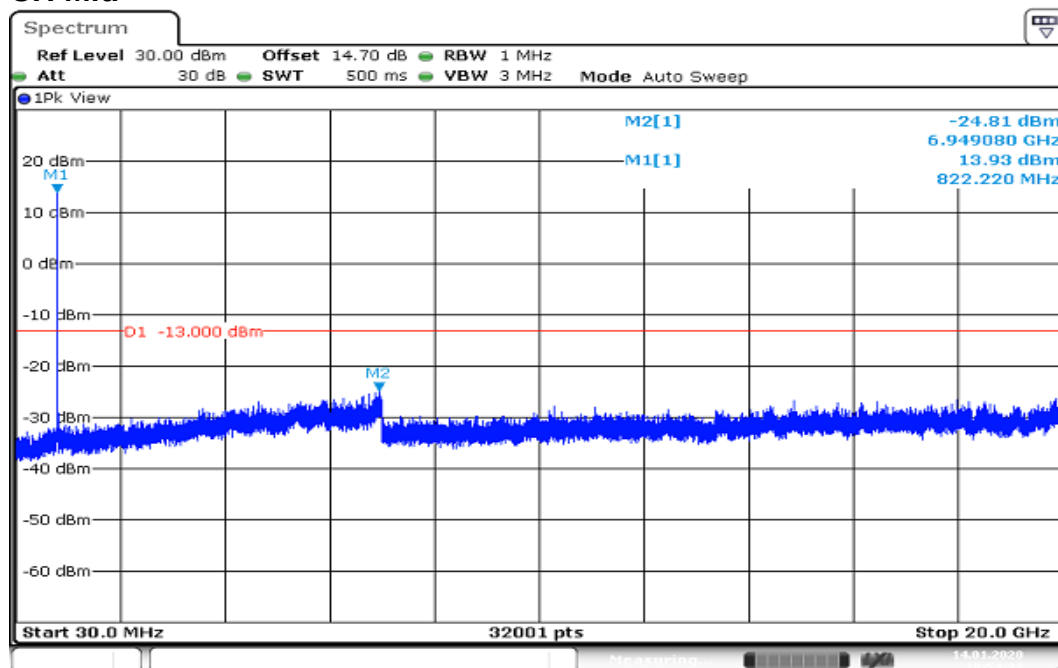
Report No.: T191105W01-RP14

CHANNEL BANDWIDTH: 1.4MHz / 16QAM

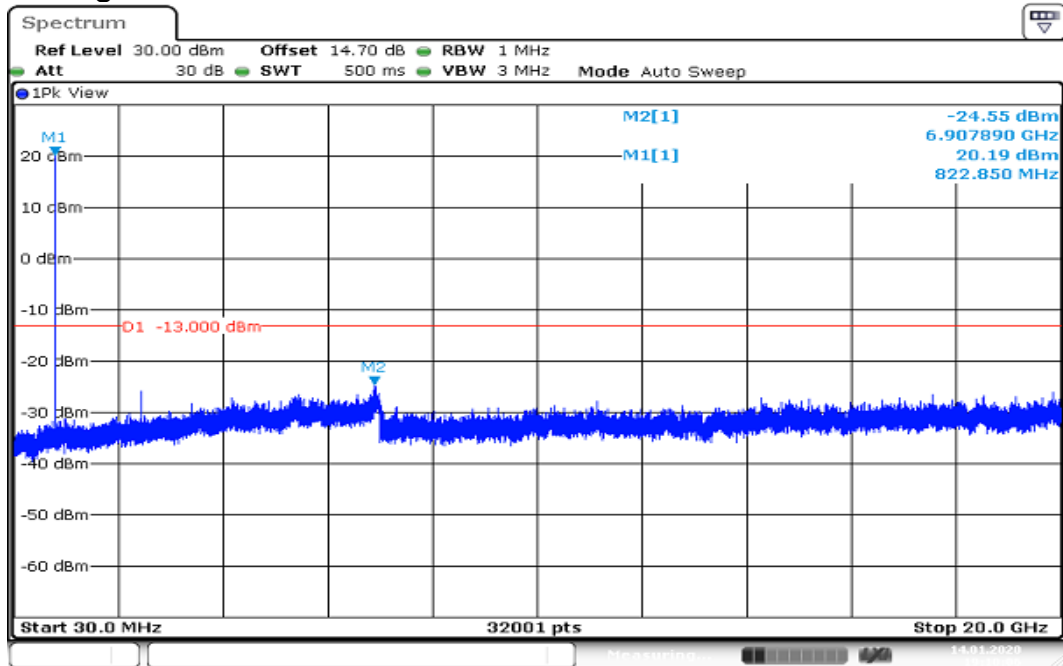
CH Low



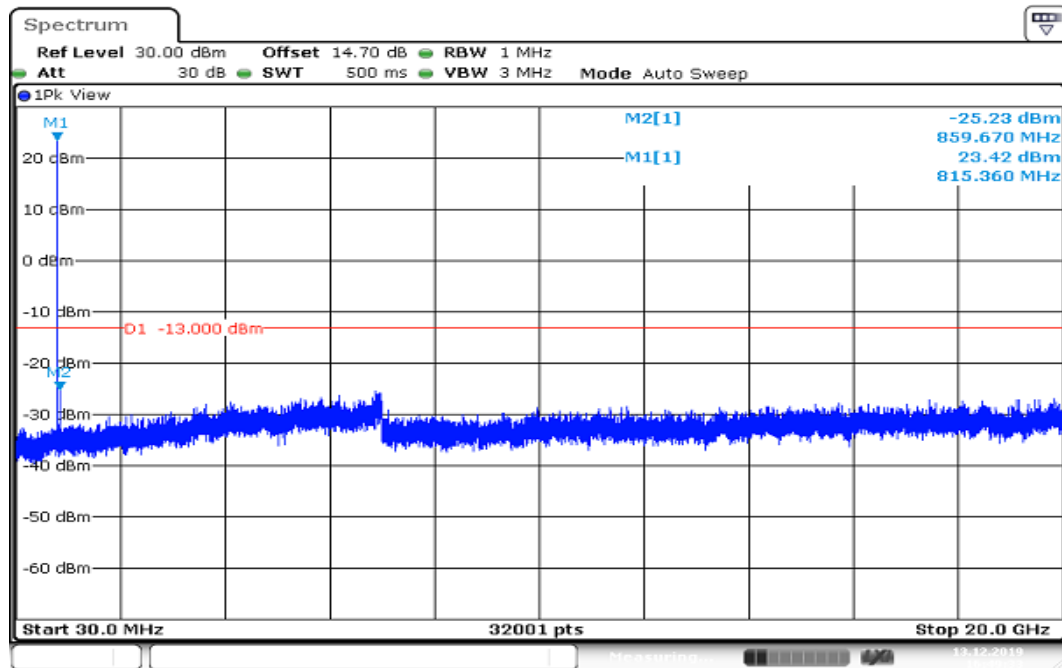
CH Mid



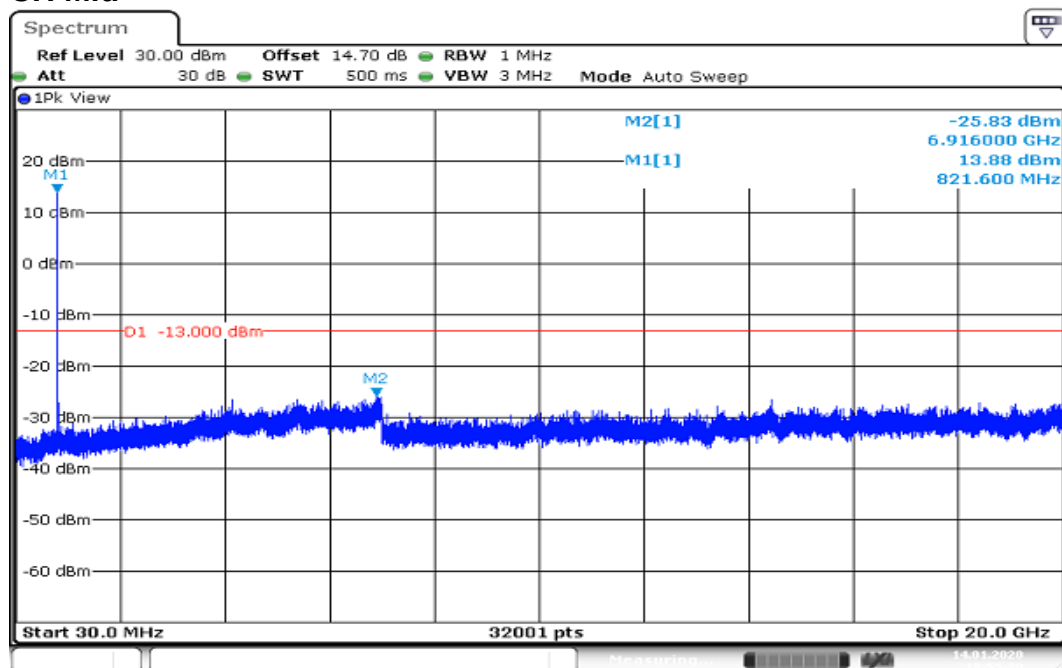
CH High



Date: 14 JAN 2020 19:10:06

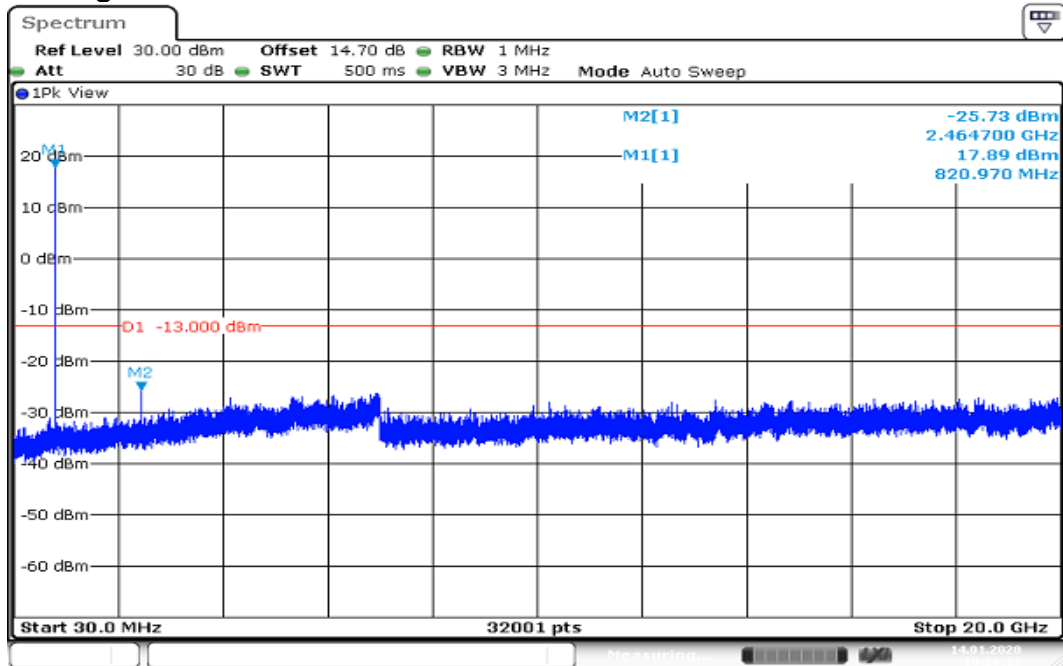
CHANNEL BANDWIDTH: 3MHz / 16QAM**CH Low**

Date: 13.DEC.2019 16:49:34

CH Mid

Date: 14.JAN.2020 18:55:30

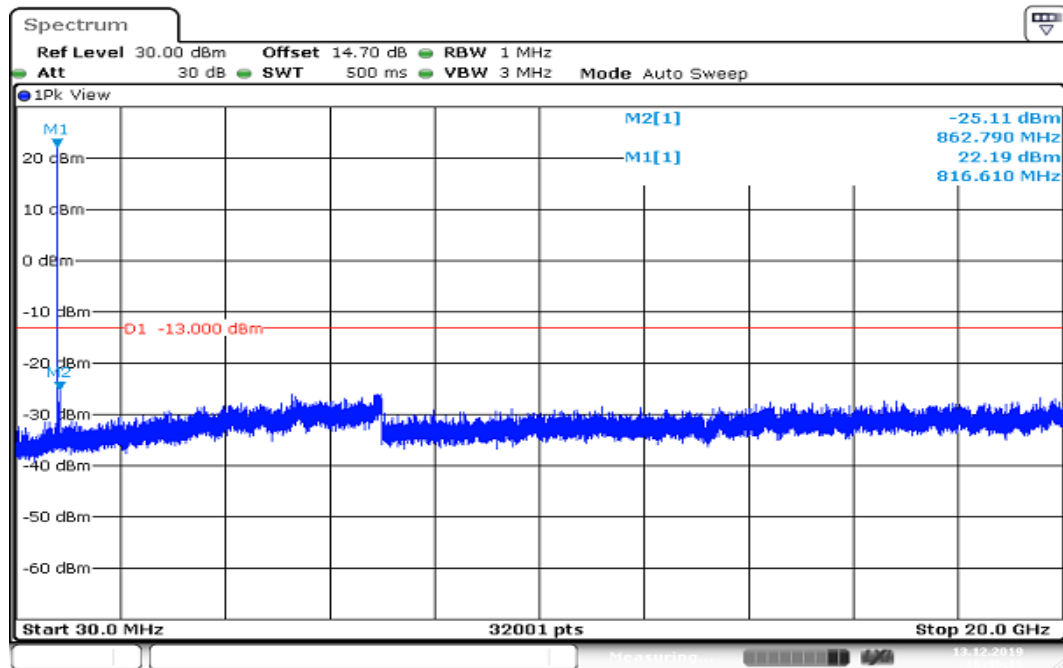
CH High



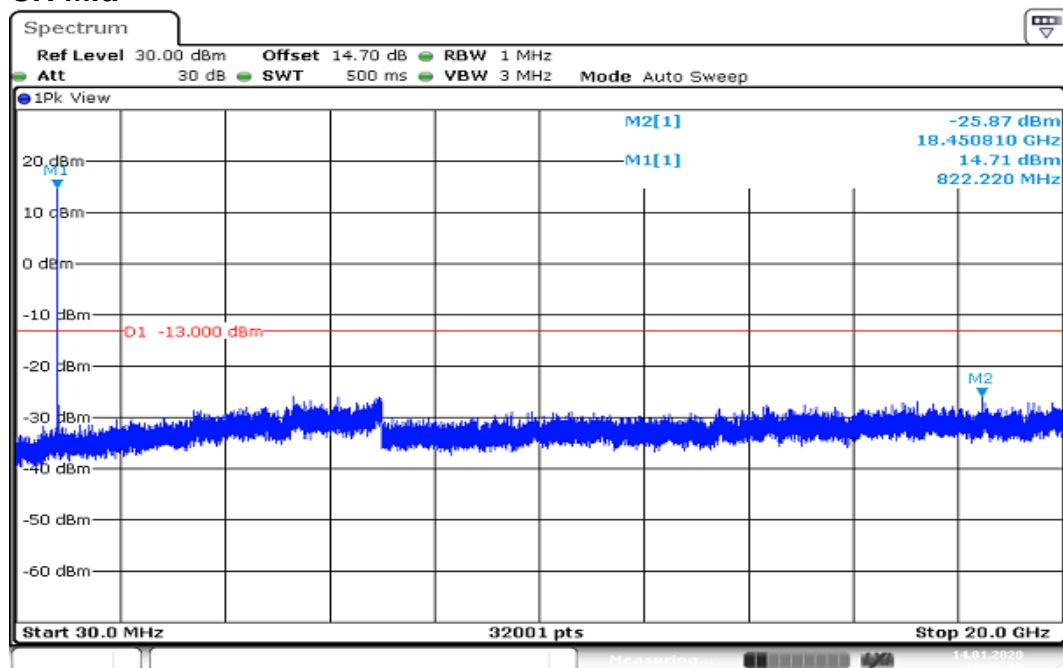
Date: 14.JAN.2020 19:16:11

CHANNEL BANDWIDTH: 5MHz / 16QAM

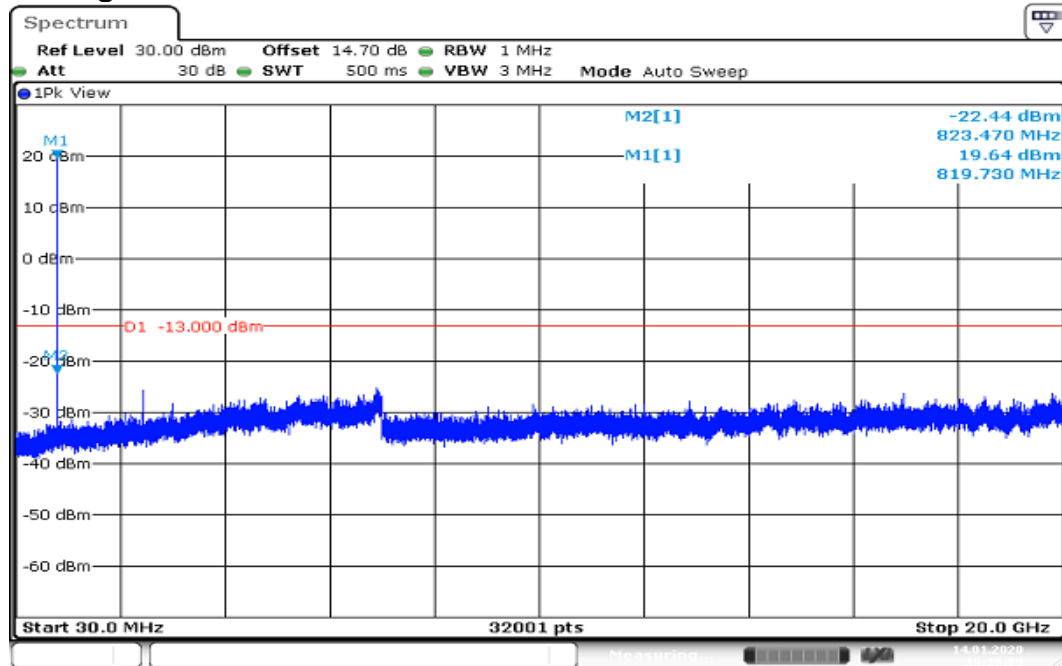
CH Low



CH Mid



CH High

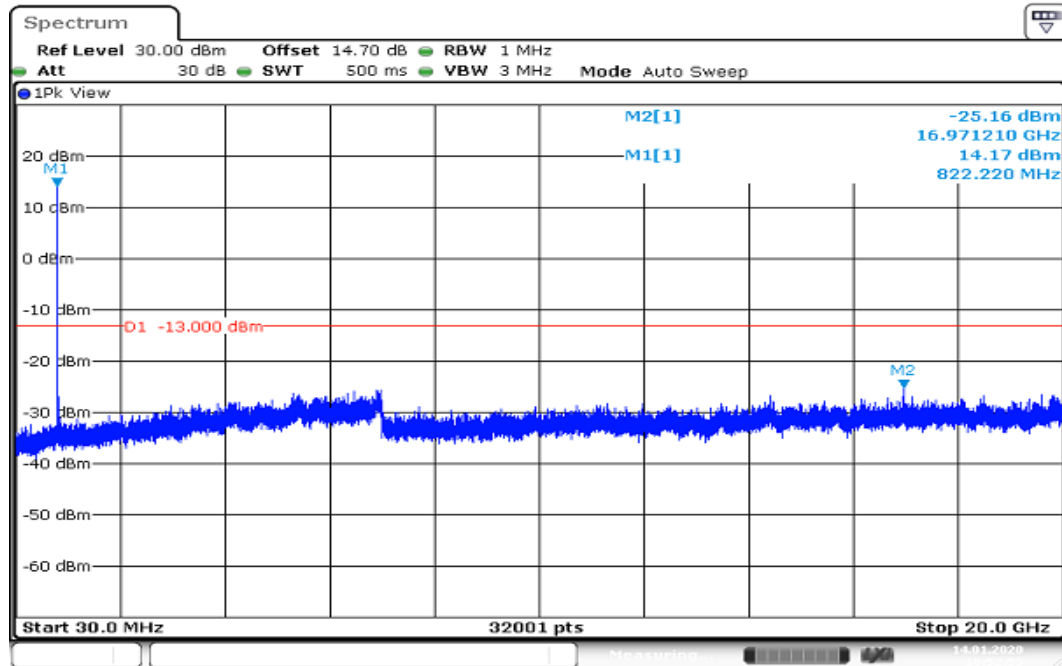


Date: 14.JAN.2020 19:19:09

Report No.: T191105W01-RP14

CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Mid



Date: 14.JAN.2020 18:52:55

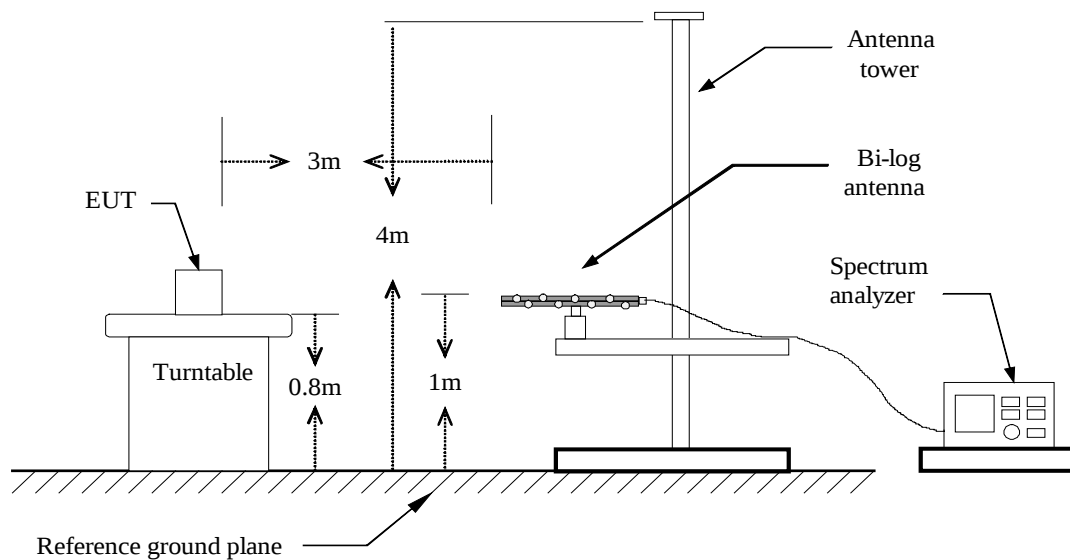
8.7 SPURIOUS RADIATION MEASUREMENT

LIMIT

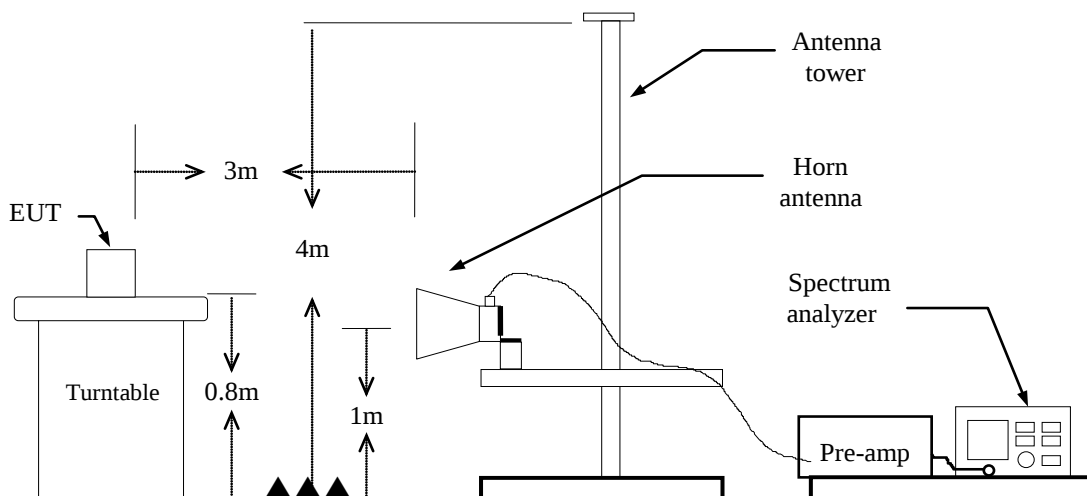
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

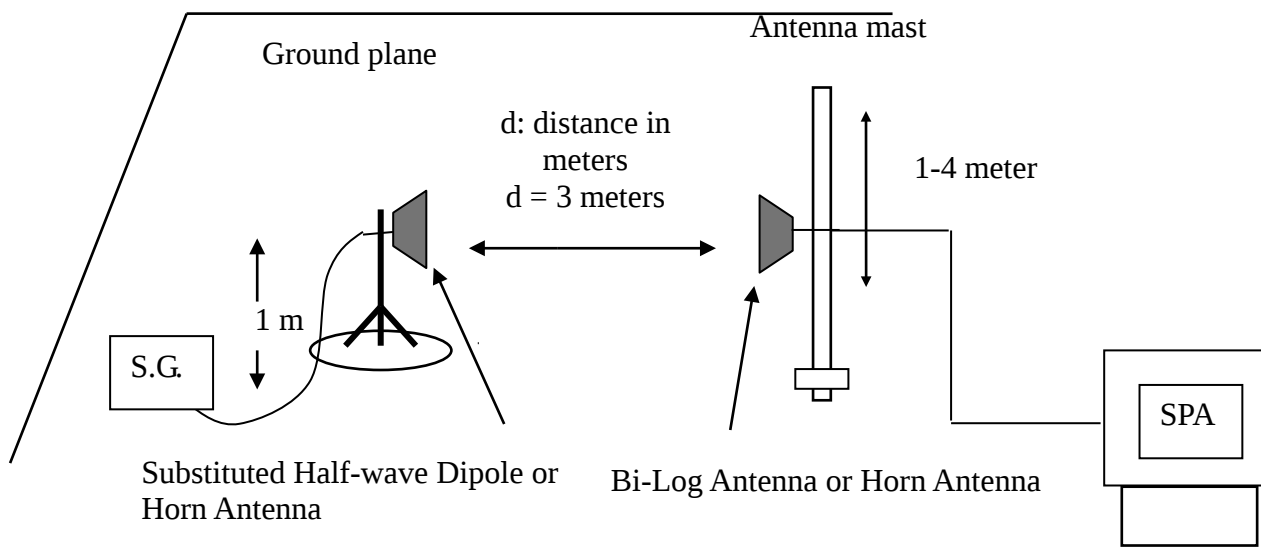
Test Configuration

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.

Report No.: T191105W01-RP14

Test Results**LTE Band 14 / BW: 10MHz / QPSK / RB =1, RB Offset = 0****Operation Mode:** Tx / Low CH**Test Date:**

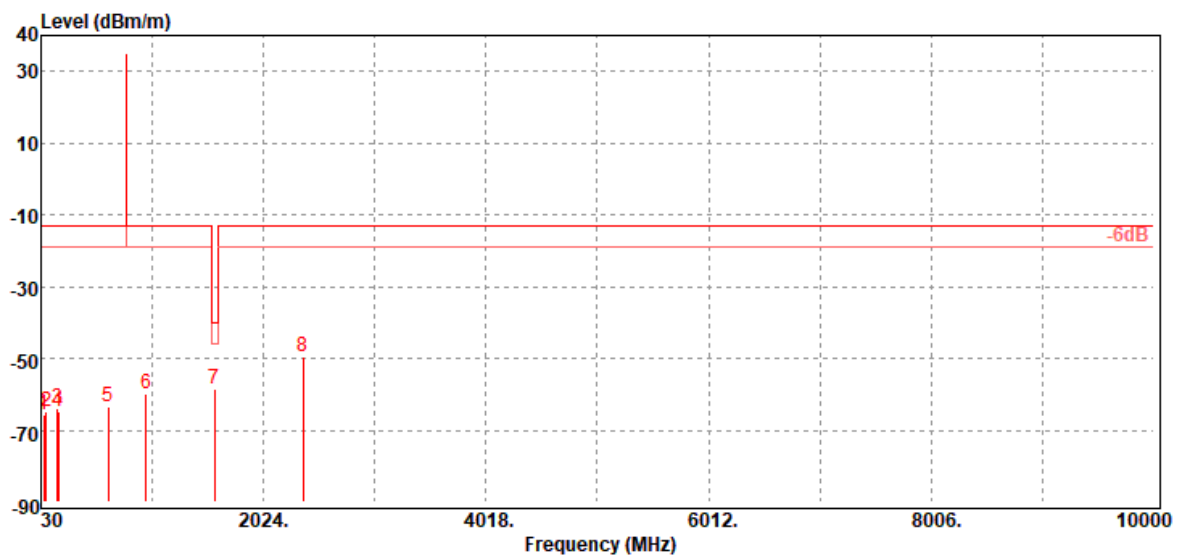
December 18, 2019

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	-65.55	-54.44	-10.50	-0.61	-13.00	-52.55	V
78.50	-64.66	-55.38	-8.55	-0.73	-13.00	-51.66	V
175.50	-64.06	-58.12	-4.85	-1.09	-13.00	-51.06	V
185.20	-64.94	-59.74	-4.08	-1.12	-13.00	-51.94	V
633.34	-63.57	-59.82	-1.63	-2.12	-13.00	-50.57	V
973.81	-59.76	-55.74	-1.38	-2.64	-13.00	-46.76	V
1586.00	-58.39	-64.44	9.52	-3.47	-40.00	-18.39	V
2379.00	-49.30	-55	10.13	-4.43	-13.00	-36.30	V

Operation Mode: Tx / Low CH

Test Date:

December 18, 2019

Temperature: 18.6°C

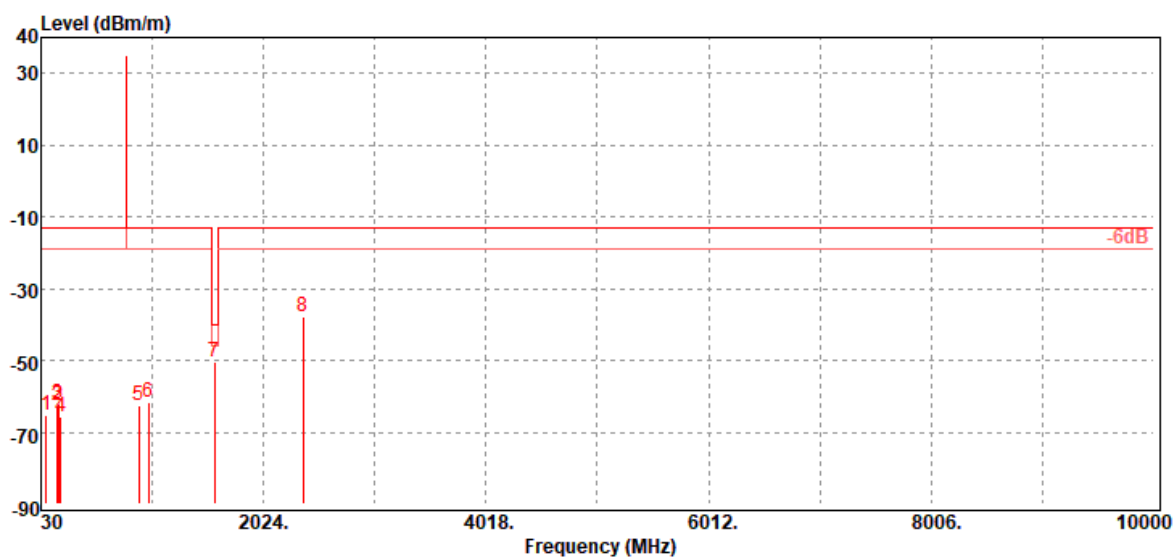
Tested by:

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	-65.11	-55.92	-8.46	-0.73	-13.00	-52.11	H
175.50	-62.34	-56.4	-4.85	-1.09	-13.00	-49.34	H
185.20	-62.03	-56.83	-4.08	-1.12	-13.00	-49.03	H
204.60	-65.51	-61.37	-2.96	-1.18	-13.00	-52.51	H
904.94	-62.53	-58.68	-1.30	-2.55	-13.00	-49.53	H
992.24	-61.69	-57.62	-1.40	-2.67	-13.00	-48.69	H
1586.00	-50.46	-56.51	9.52	-3.47	-40.00	-10.46	H
2379.00	-37.88	-43.58	10.13	-4.43	-13.00	-24.88	H

LTE Band 26 / BW: 10MHz / QPSK / RB =1, RB Offset = 0

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

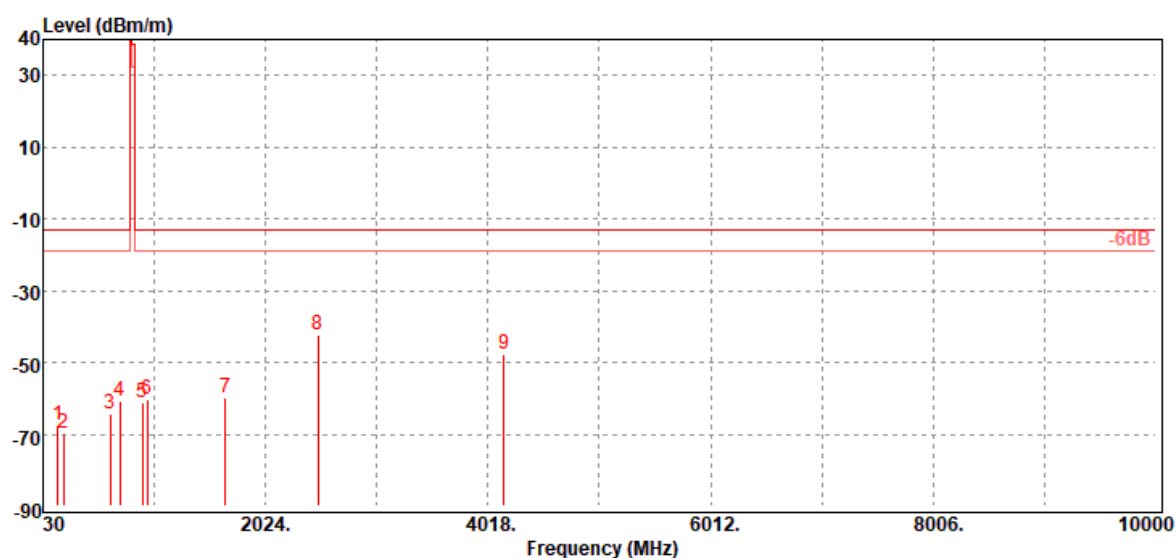
Tested by:

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)
160.95	-67.48	-60.33	-6.11	-1.04	-13.00	-54.48	V
216.24	-69.56	-66.27	-2.08	-1.21	-13.00	-56.56	V
633.34	-64.53	-60.78	-1.63	-2.12	-13.00	-51.53	V
720.64	-60.73	-57.07	-1.40	-2.26	-13.00	-47.73	V
919.49	-61.02	-57.15	-1.30	-2.57	-13.00	-48.02	V
963.14	-60.35	-56.42	-1.30	-2.63	-13.00	-47.35	V
1663.00	-59.91	-66.12	9.78	-3.57	-13.00	-46.91	V
2494.50	-42.43	-48.64	10.78	-4.57	-13.00	-29.43	V
4157.50	-47.81	-54.65	12.90	-6.06	-13.00	-34.81	V

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

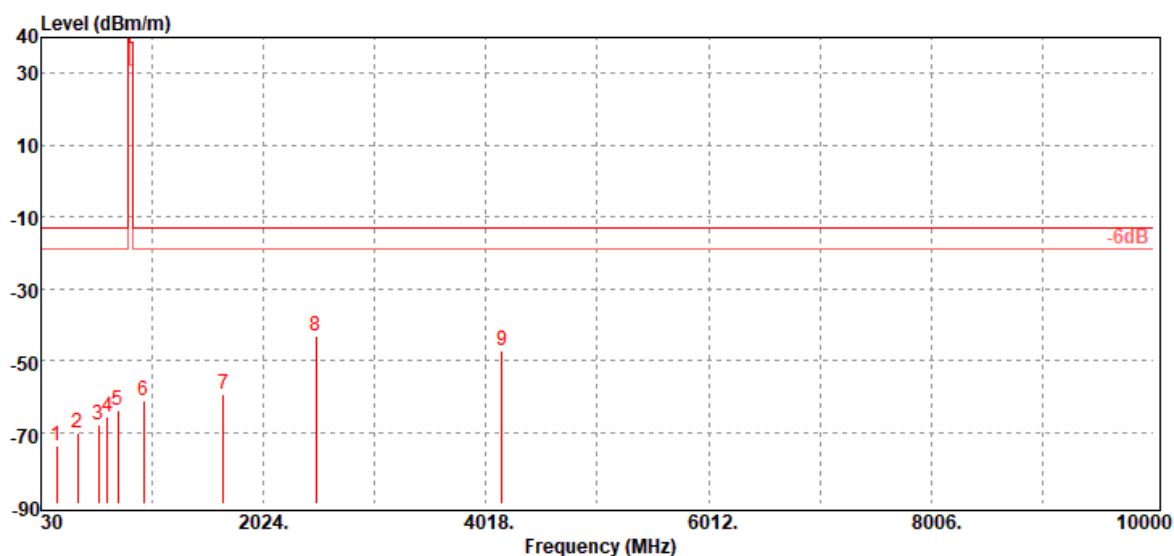
Tested by:

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)
172.59	-73.67	-67.45	-5.14	-1.08	-13.00	-60.67	H
357.86	-70.27	-67.07	-1.63	-1.57	-13.00	-57.27	H
547.01	-68.15	-65.01	-1.20	-1.94	-13.00	-55.15	H
628.49	-65.70	-62.12	-1.47	-2.11	-13.00	-52.70	H
721.61	-64.06	-60.4	-1.40	-2.26	-13.00	-51.06	H
951.50	-61.22	-57.4	-1.20	-2.62	-13.00	-48.22	H
1663.00	-59.62	-65.83	9.78	-3.57	-13.00	-46.62	H
2494.50	-43.15	-49.36	10.78	-4.57	-13.00	-30.15	H
4157.50	-47.30	-54.14	12.90	-6.06	-13.00	-34.30	H

- End of Test Report -