

8.5 CONDUCTED BAND EDGE MEASUREMENT

Limit

FCC §24.238(a), Band 25

For operations in the 1850-1910 and 1930-1950 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.

RSS-133 section 6.5

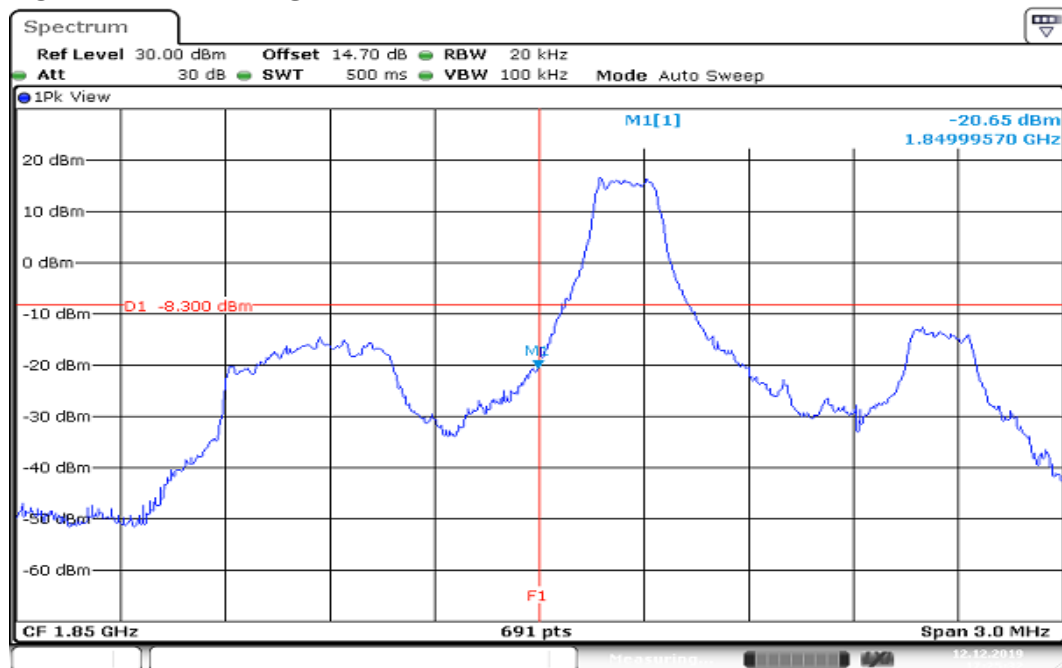
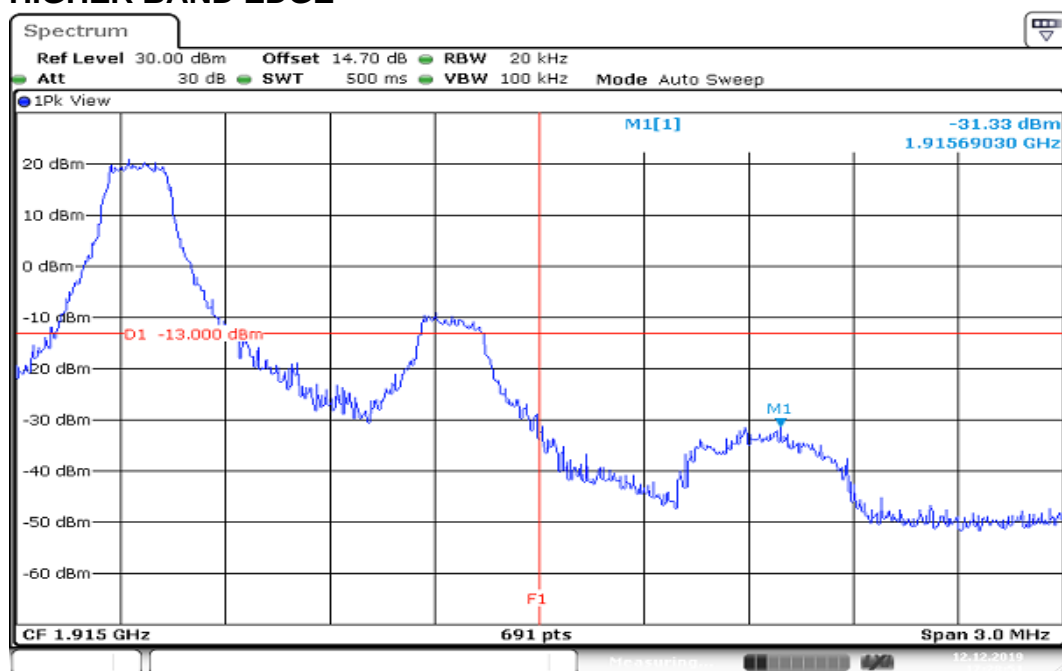
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

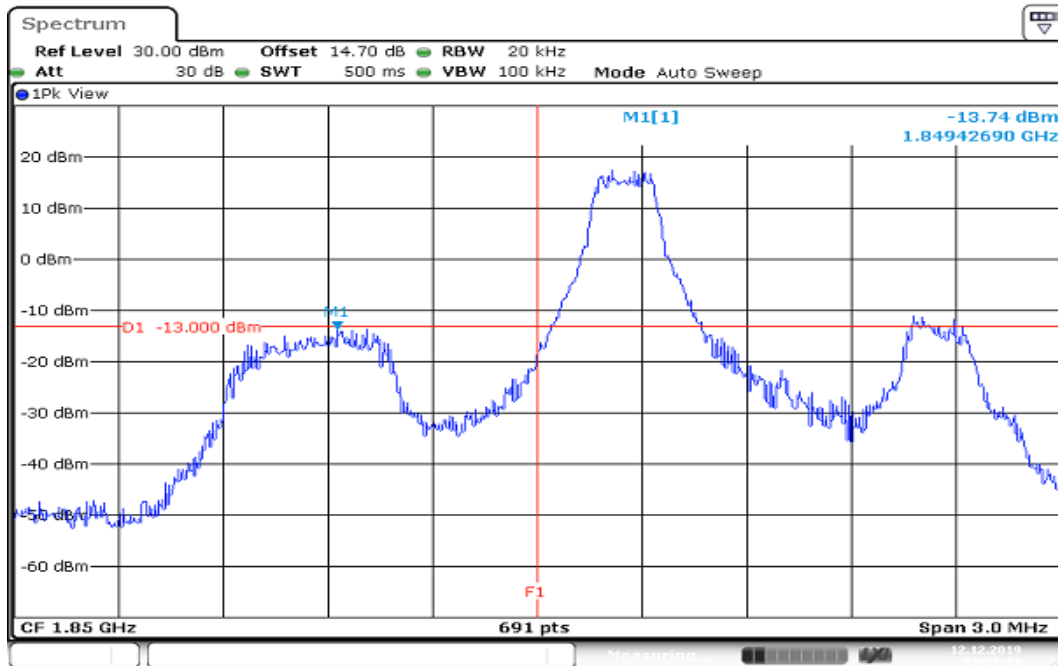
Test Procedures

KDB 971168 D01,

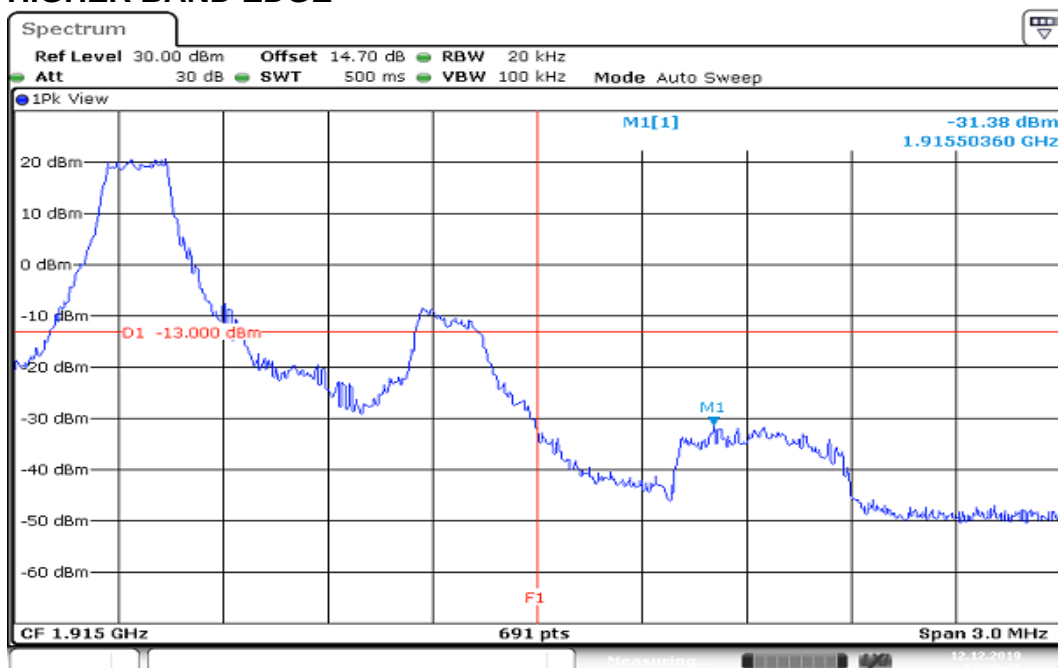
1. RBW $\geq$ 1% of the emission bandwidth
2. VBW $\geq$ 3 x RBW
3. Span was set large enough so as to capture all out of emissions near the band edge.

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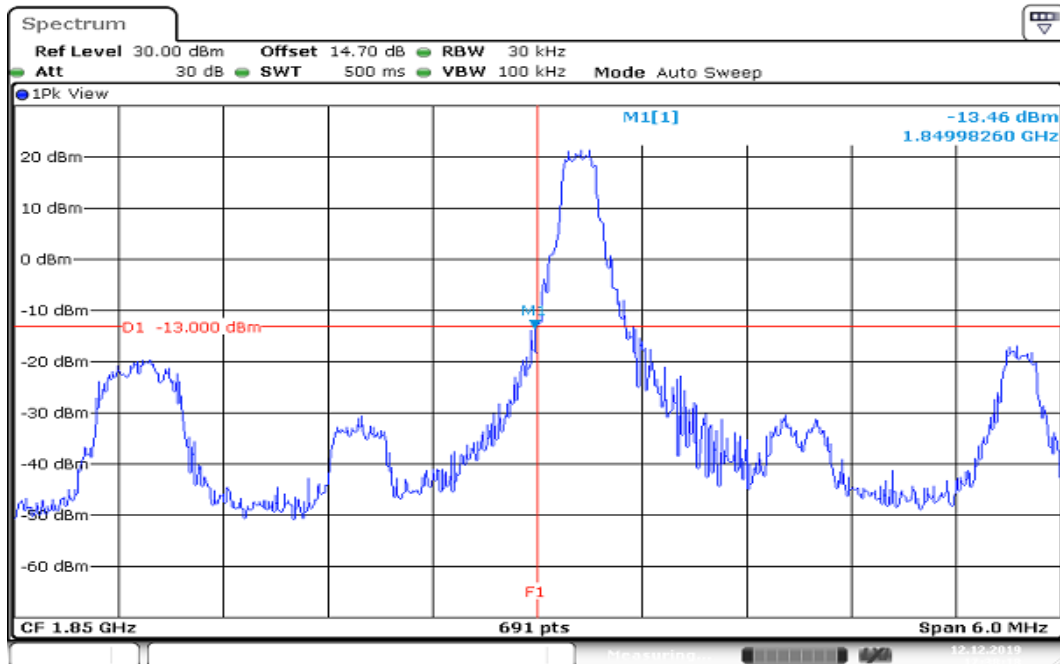
Test Results:**LTE Band 25****CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATED****LOWER BAND EDGE****HIGHER BAND EDGE**

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

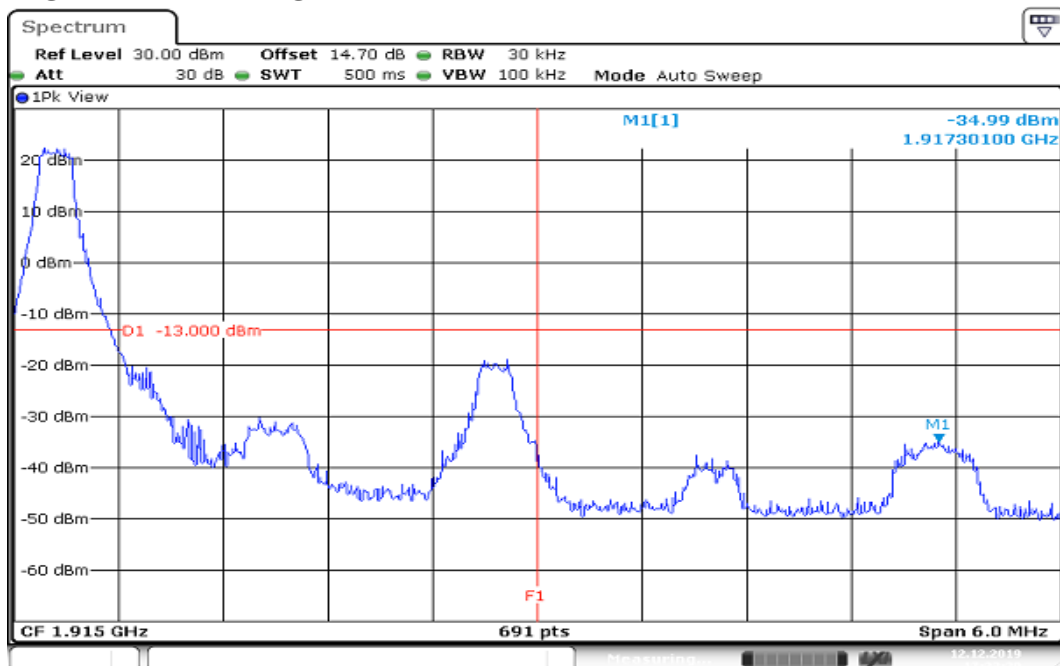
Date: 12-DEC-2019 17:27:22

HIGHER BAND EDGE

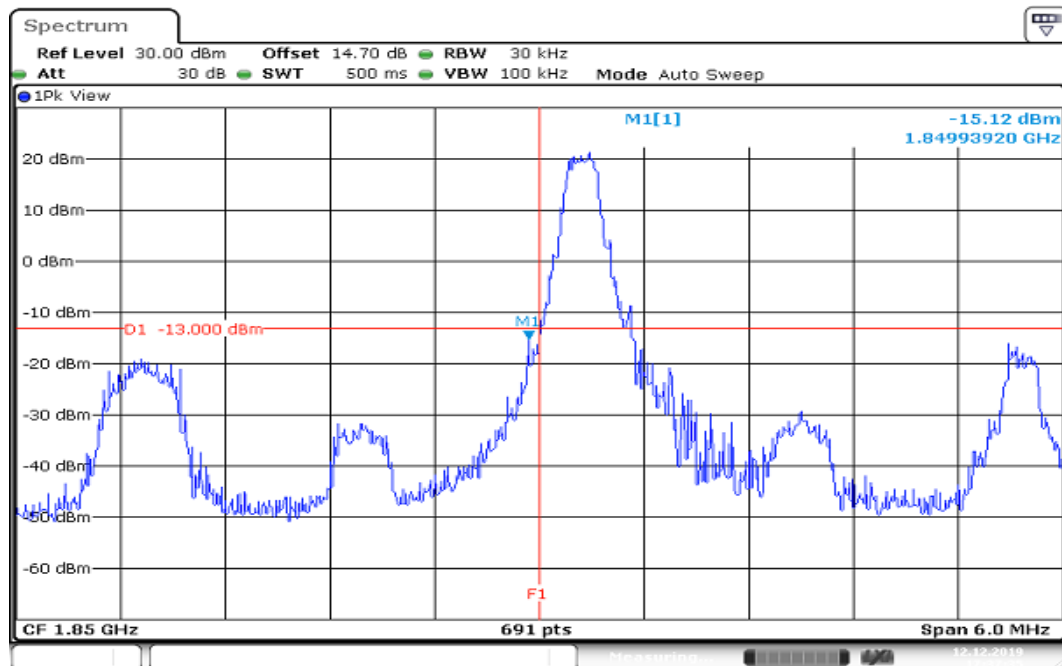
Date: 12-DEC-2019 17:28:19

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

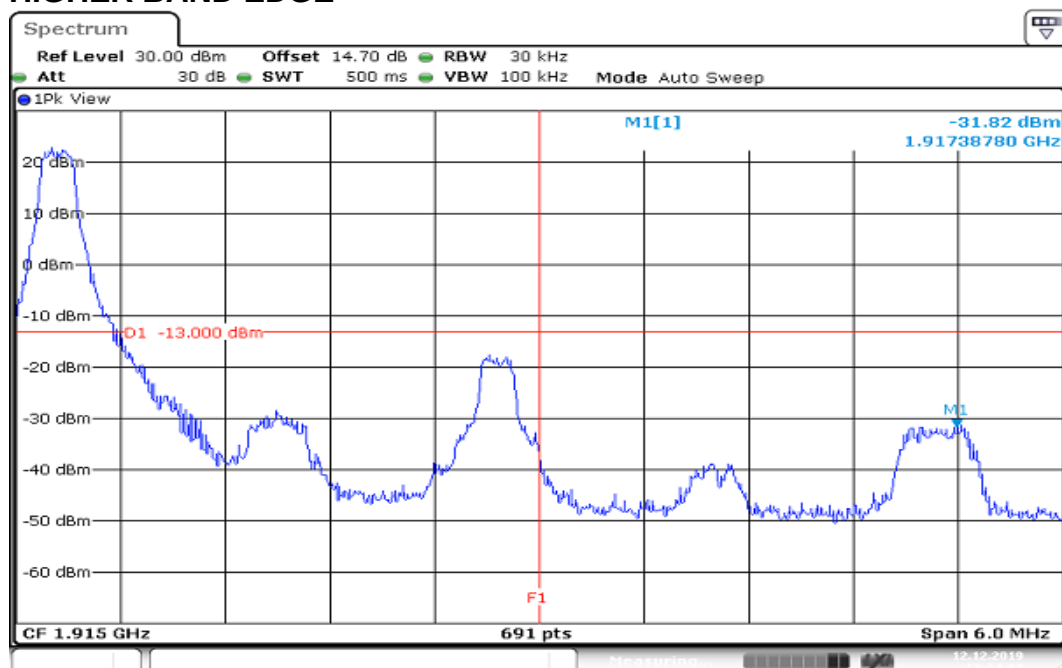
Date: 12.DEC.2019 17:38:19

HIGHER BAND EDGE

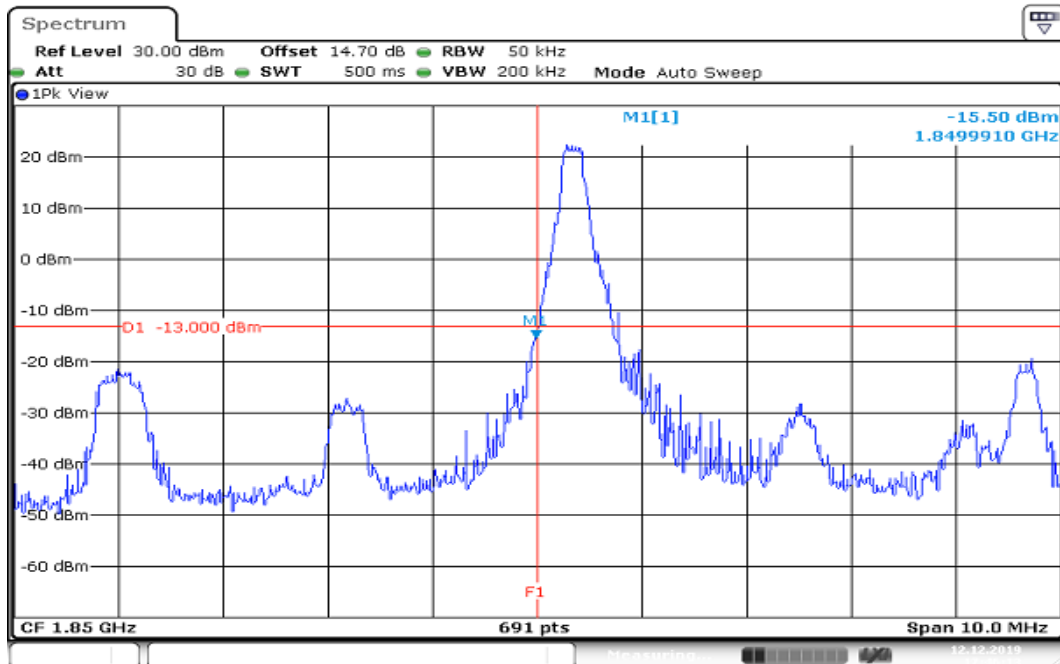
Date: 12.DEC.2019 17:33:29

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

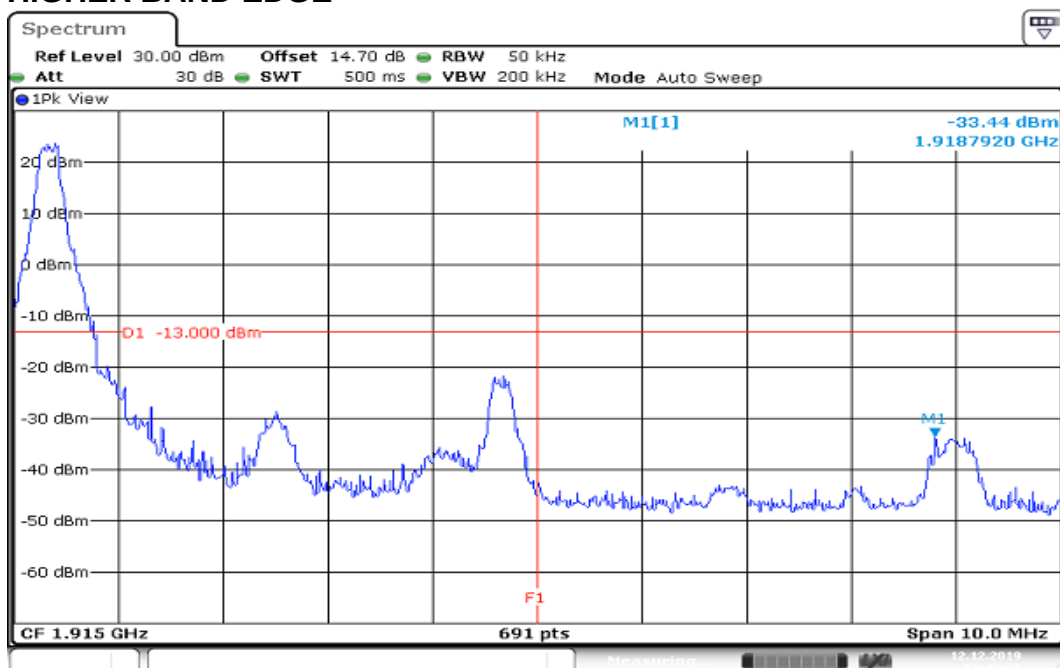
Date: 12.DEC.2019 17:37:35

HIGHER BAND EDGE

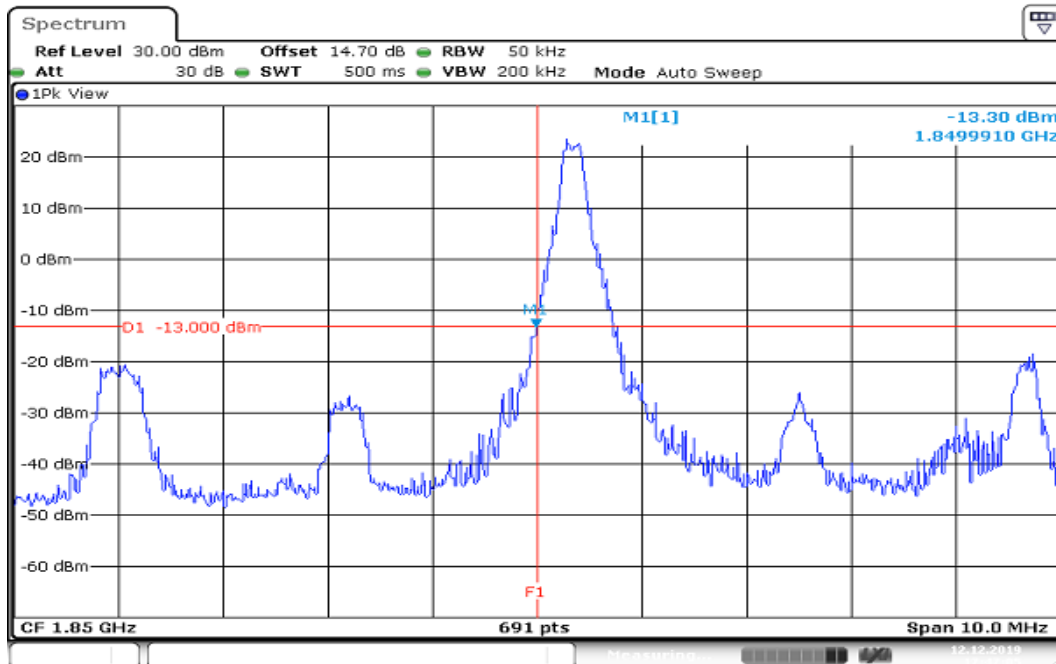
Date: 12.DEC.2019 17:34:08

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

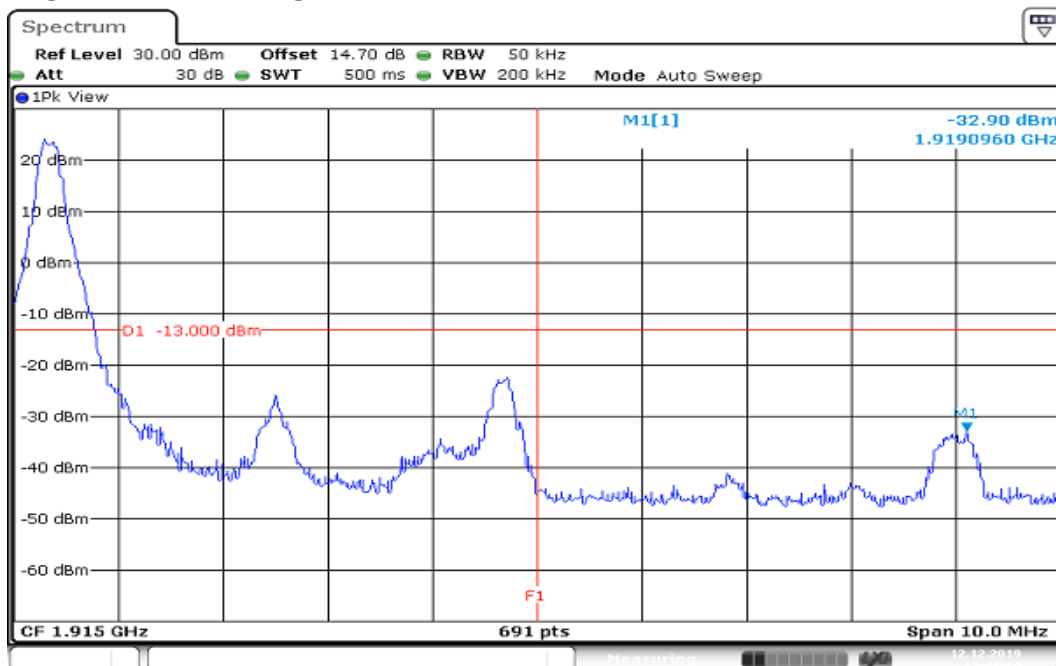
Date: 12.DEC.2019 17:46:13

HIGHER BAND EDGE

Date: 12.DEC.2019 17:48:28

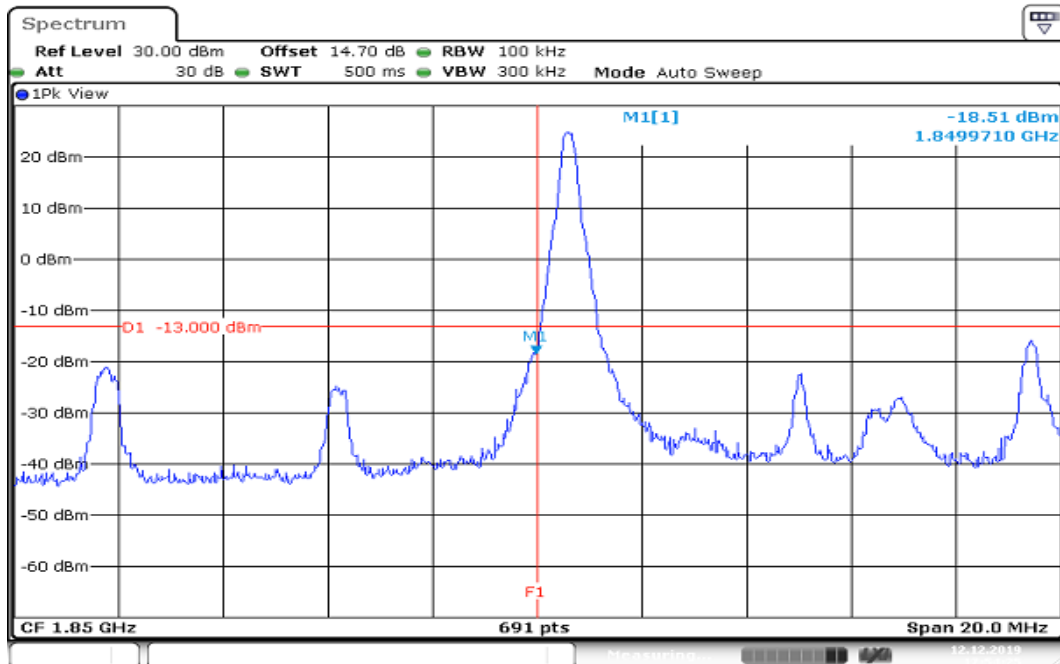
**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 17:47:05

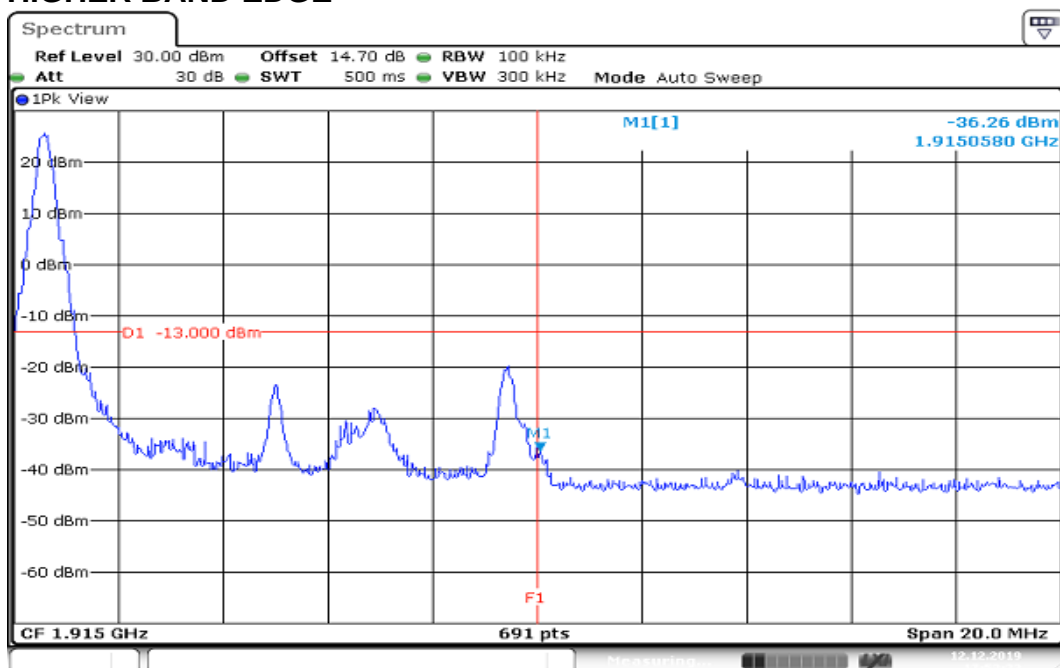
HIGHER BAND EDGE

Date: 12.DEC.2019 17:47:59

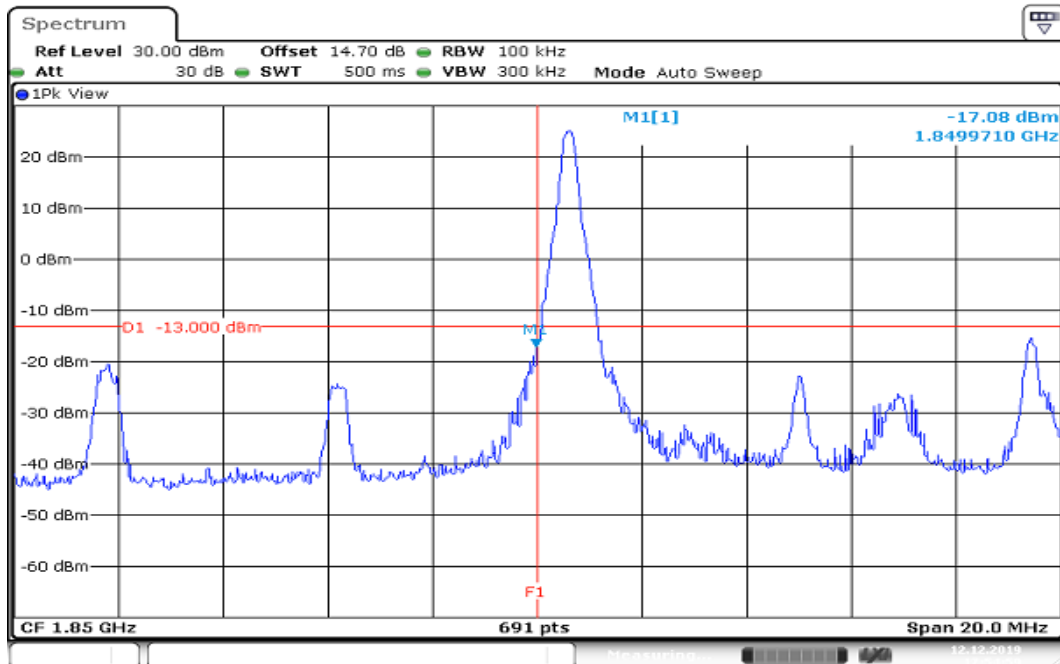
Report No.: T191105W01-RP9

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

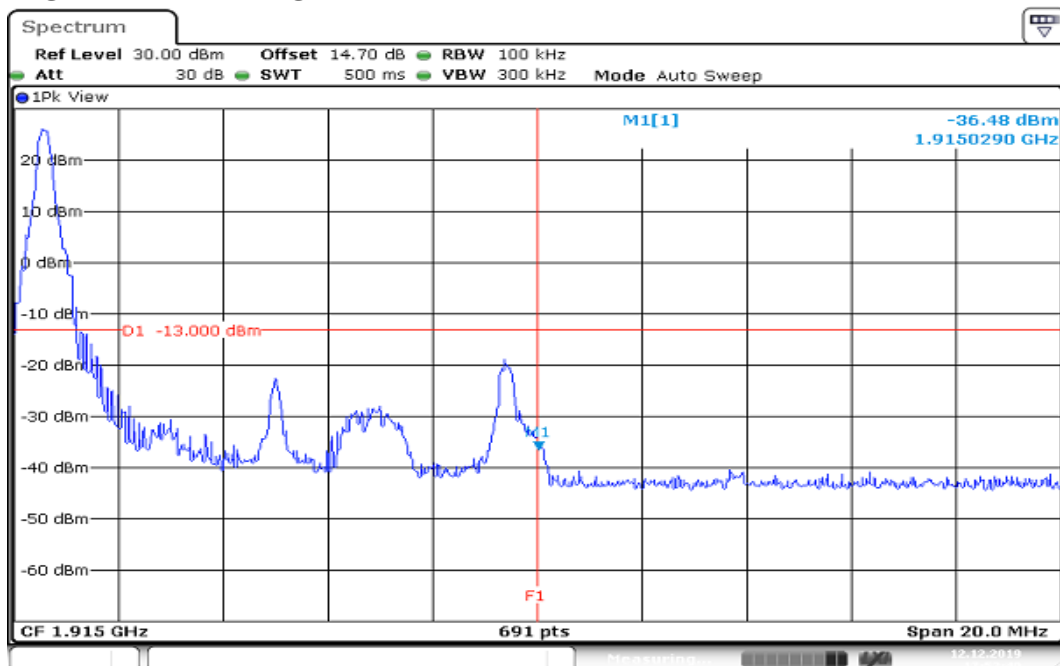
Date: 12.DEC.2019 17:54:25

HIGHER BAND EDGE

Date: 12.DEC.2019 17:53:24

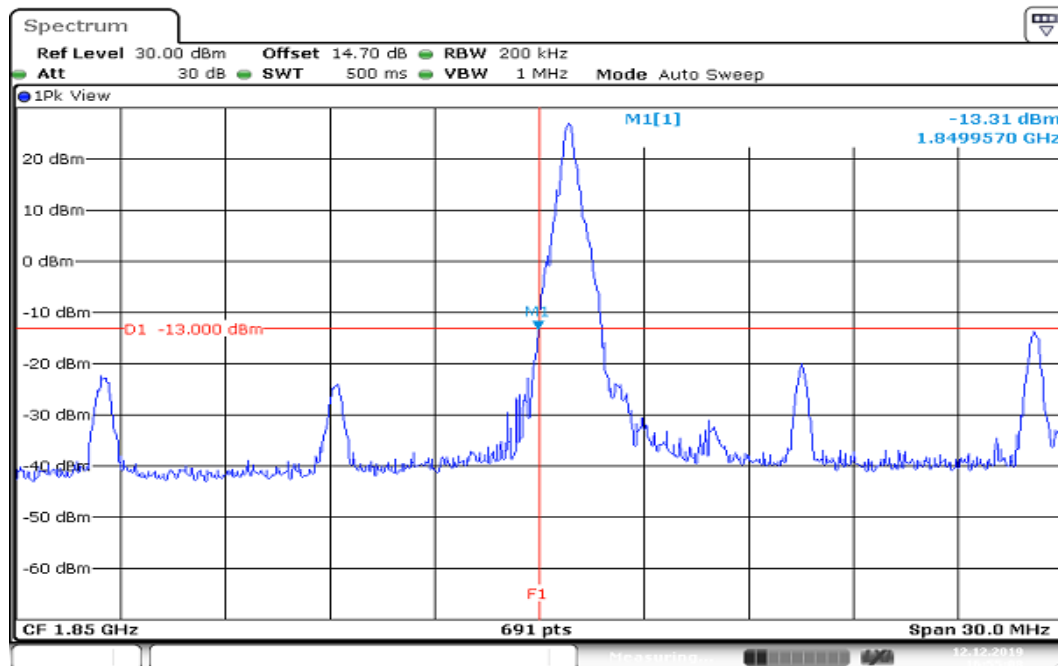
**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 17:54:59

HIGHER BAND EDGE

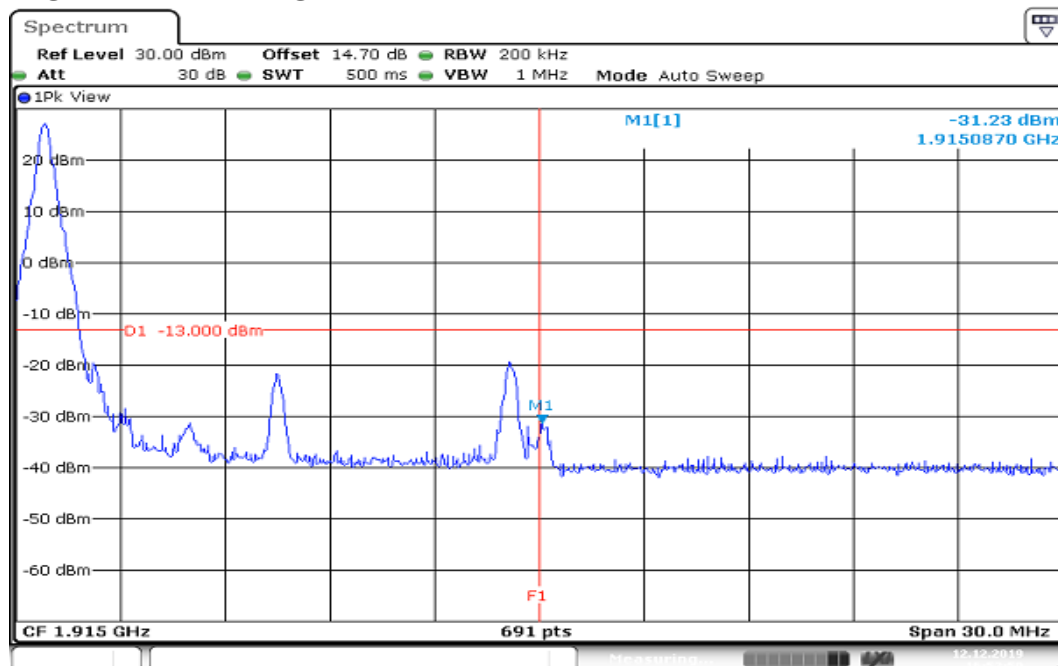
Date: 12.DEC.2019 17:52:49

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



Date: 12.DEC.2019 16:55:08

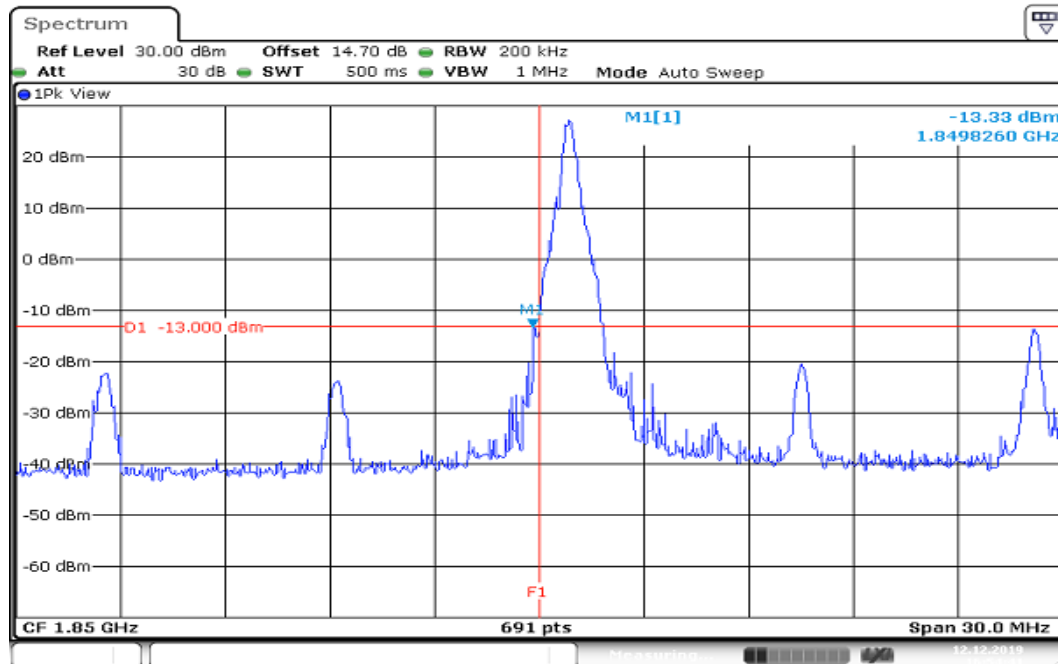
HIGHER BAND EDGE



Date: 12.DEC.2019 16:52:50

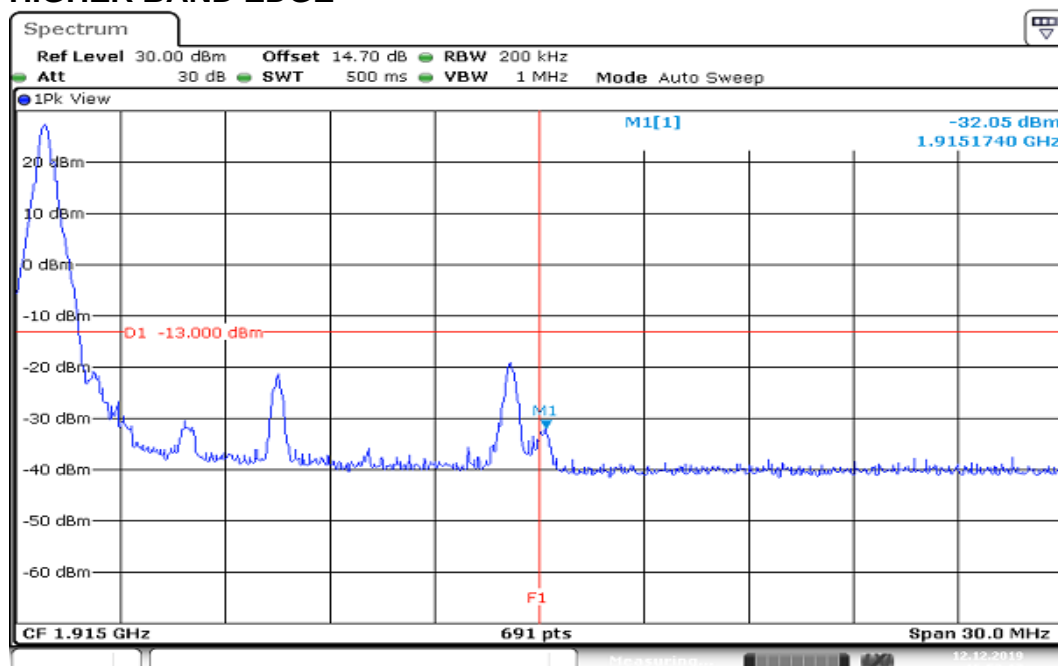
Report No.: T191105W01-RP9

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



Date: 12.DEC.2019 16:54:41

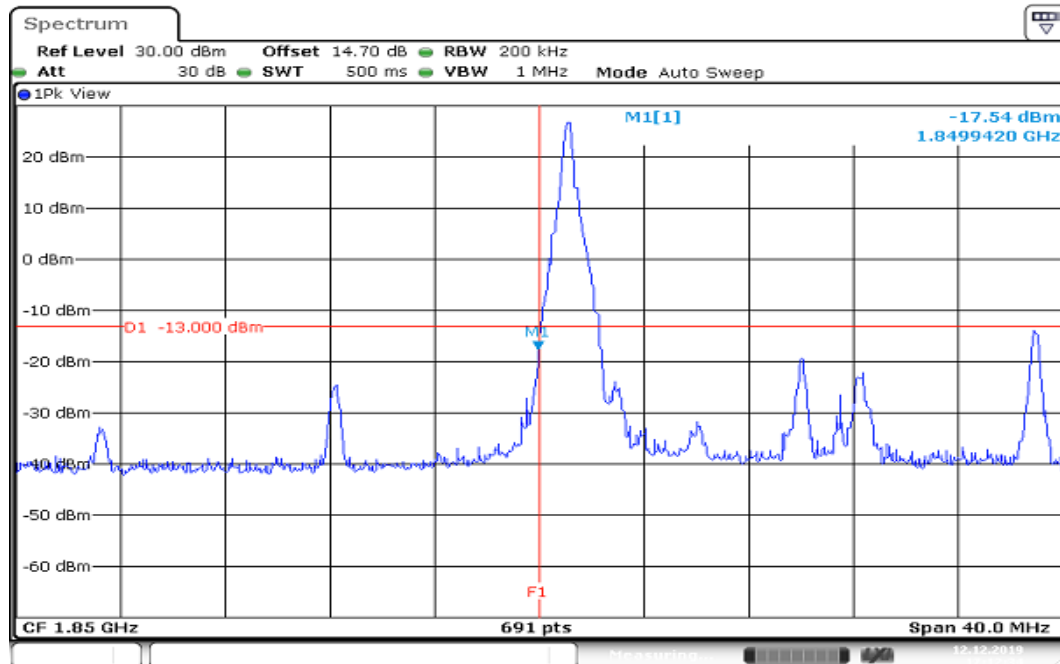
HIGHER BAND EDGE



Date: 12.DEC.2019 16:53:18

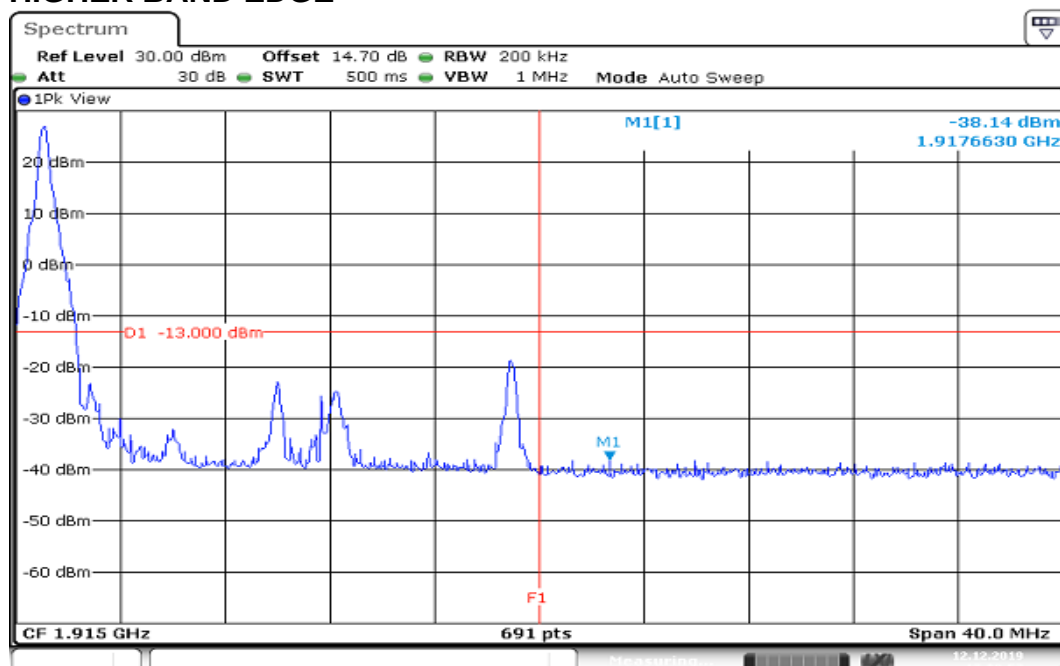
Report No.: T191105W01-RP9

CHANNEL BANDWIDTH: 20MHz / QPSK / 1RB ALLOCATED LOWER BAND EDGE



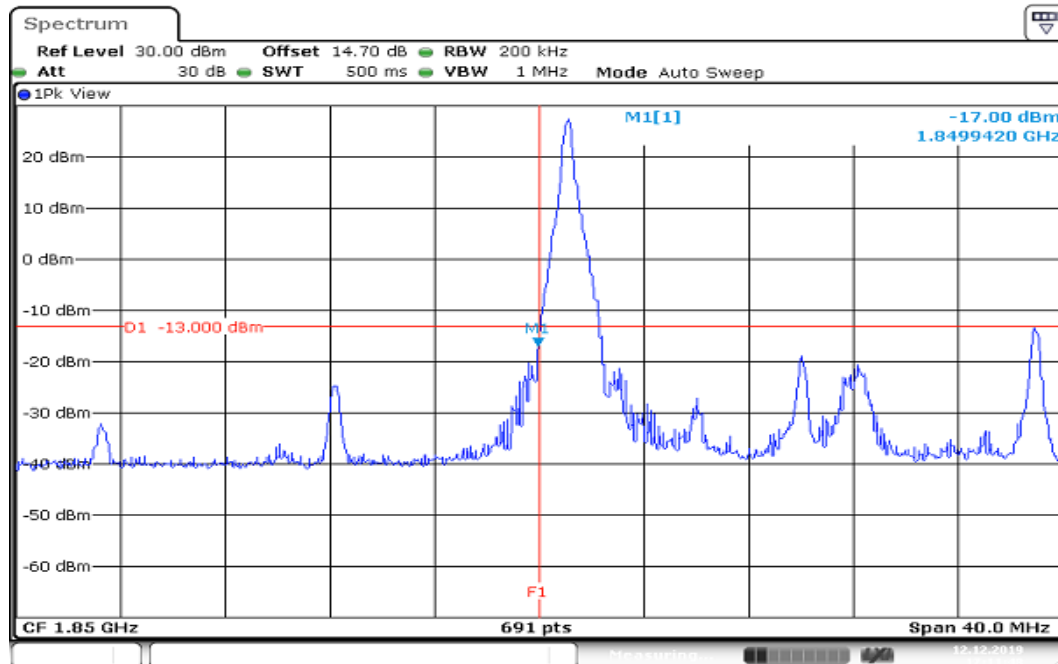
Date: 12.DEC.2019 17:12:34

HIGHER BAND EDGE

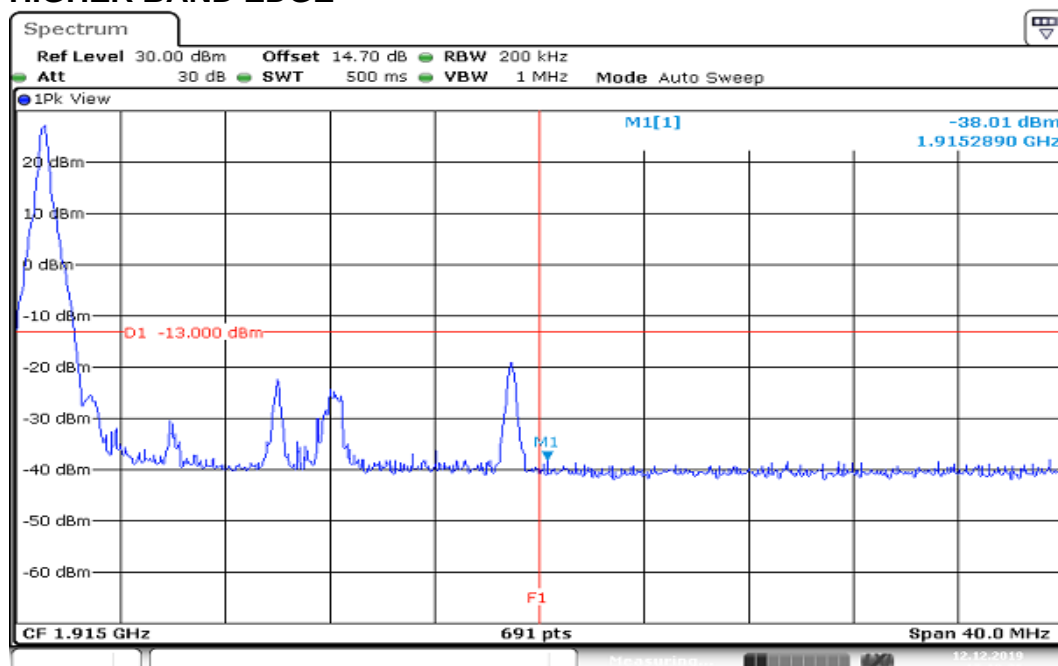


Date: 12.DEC.2019 17:09:57

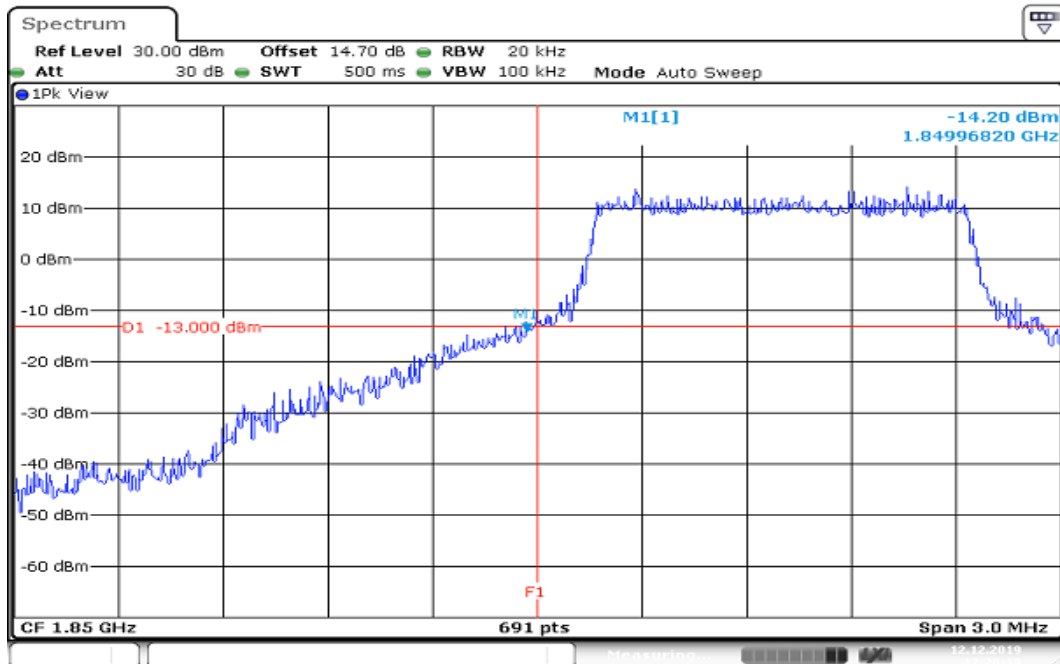
Report No.: T191105W01-RP9

**CHANNEL BANDWIDTH: 20MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE**

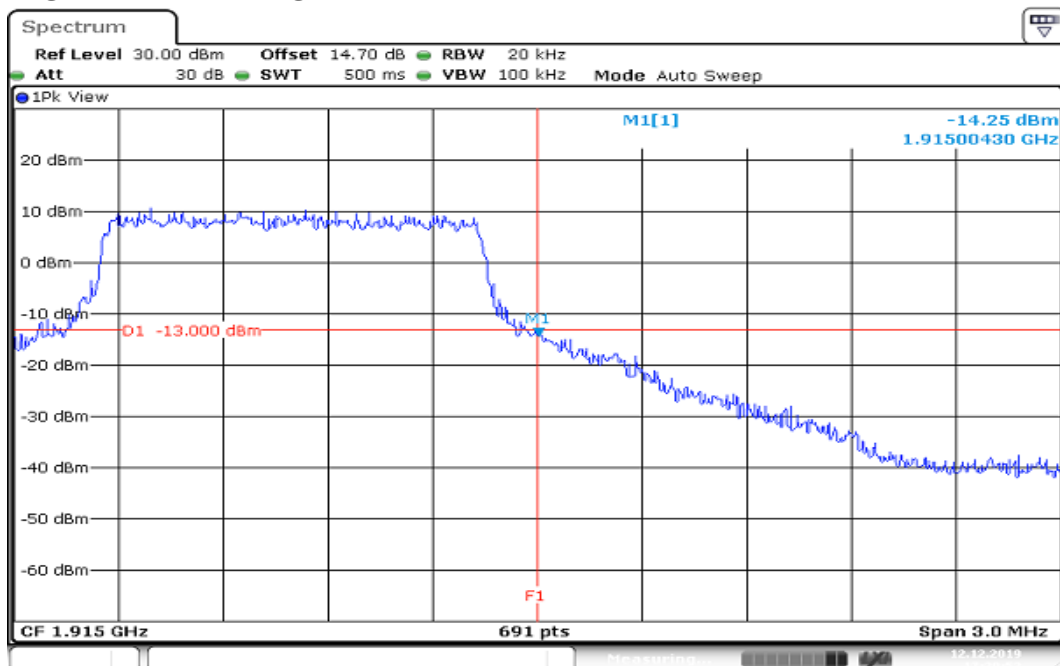
Date: 12.DEC.2019 17:11:48

HIGHER BAND EDGE

Date: 12.DEC.2019 17:10:27

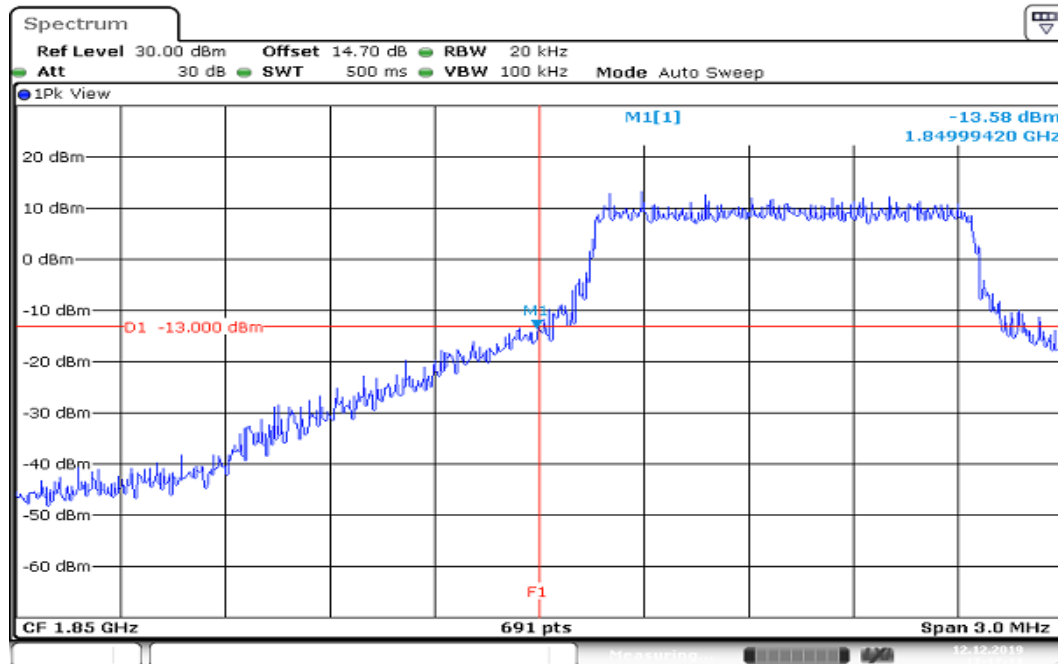
**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 17:20:18

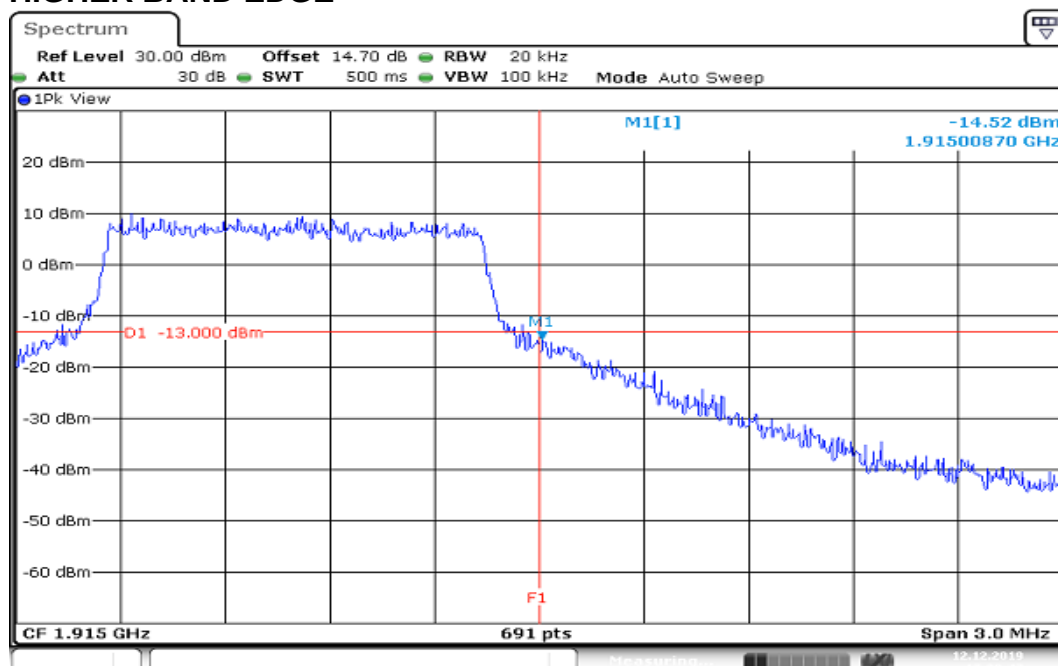
HIGHER BAND EDGE

Date: 12.DEC.2019 17:29:53

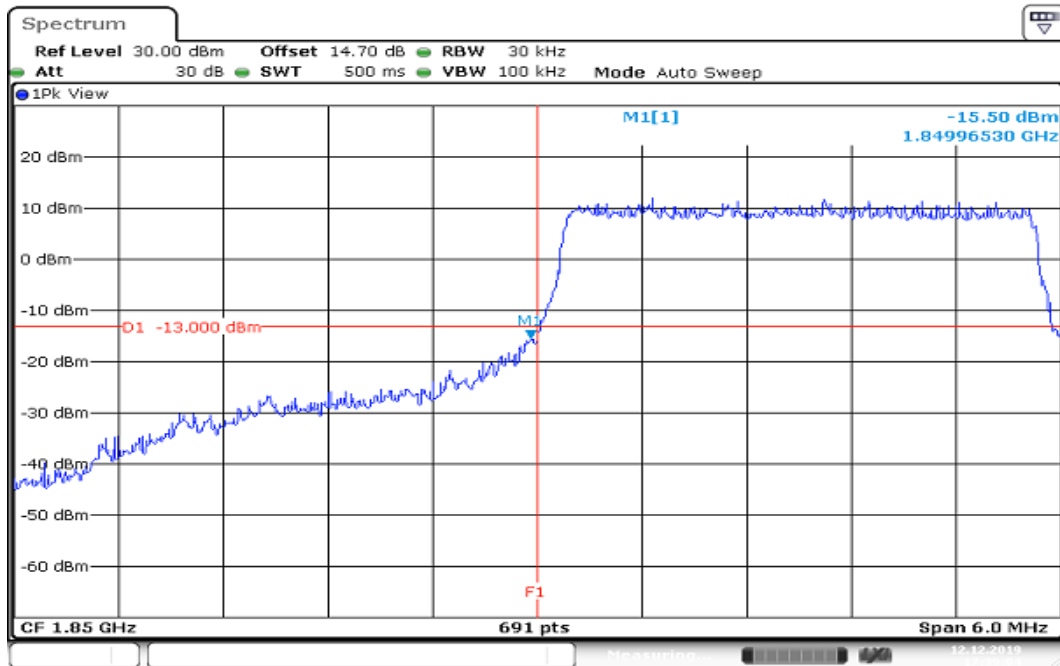
Report No.: T191105W01-RP9

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

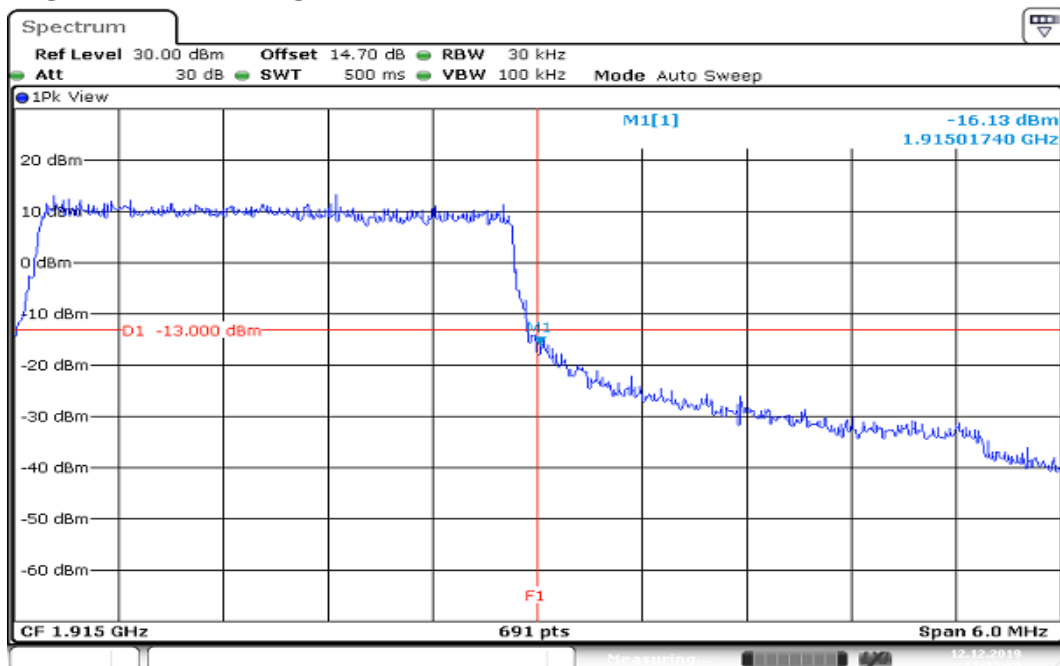
Date: 12.DEC.2019 17:17:11

HIGHER BAND EDGE

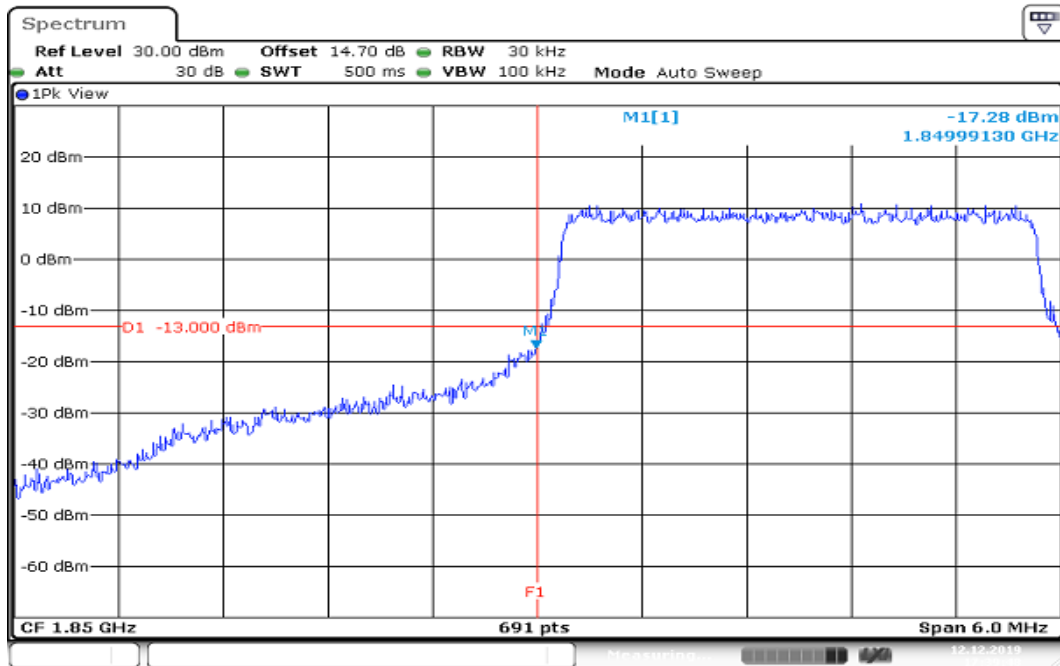
Date: 12.DEC.2019 17:30:48

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

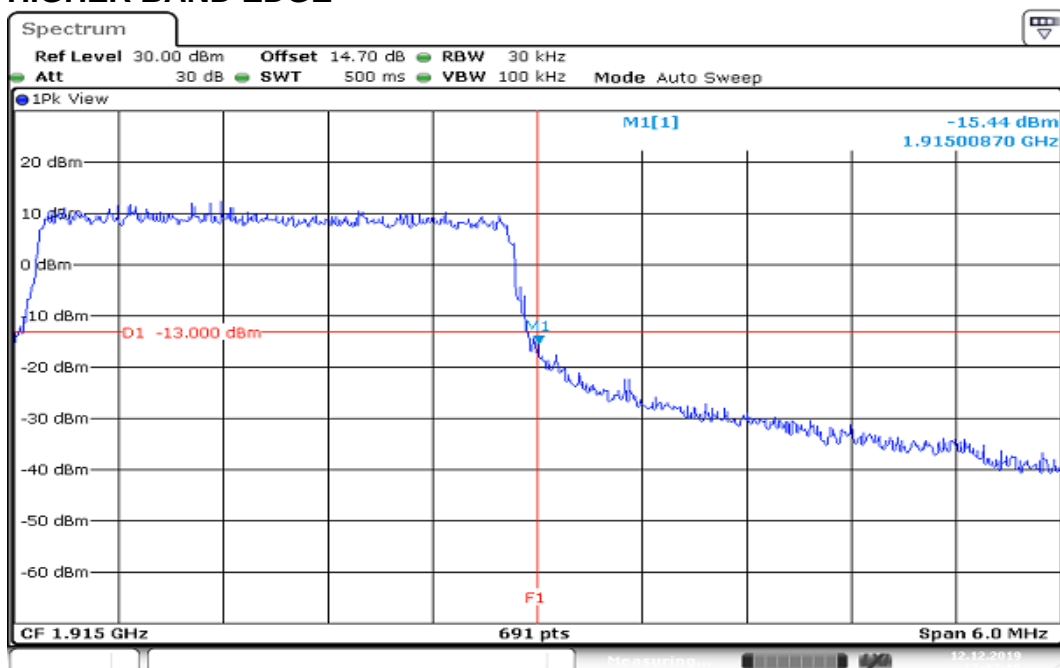
Date: 12.DEC.2019 17:39:05

HIGHER BAND EDGE

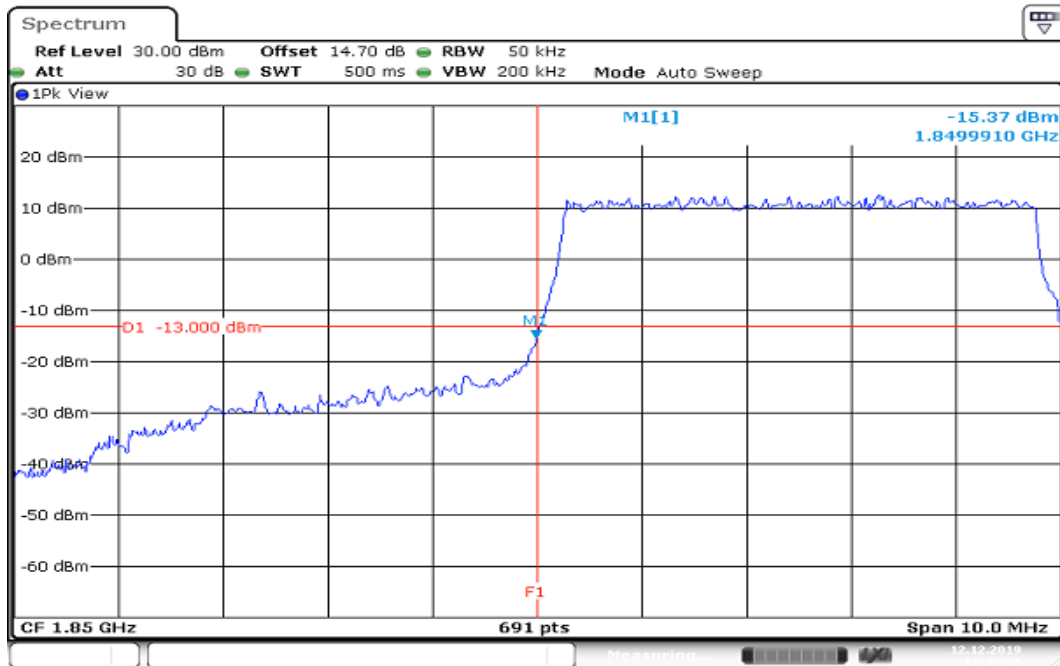
Date: 12.DEC.2019 17:32:50

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

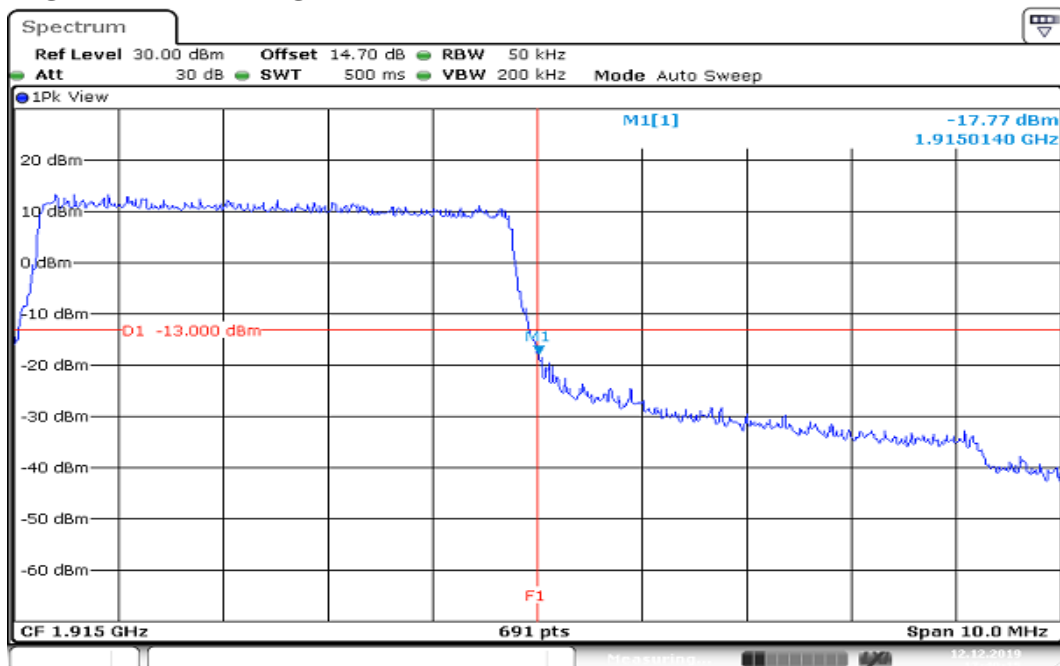
Date: 12.DEC.2019 17:39:48

HIGHER BAND EDGE

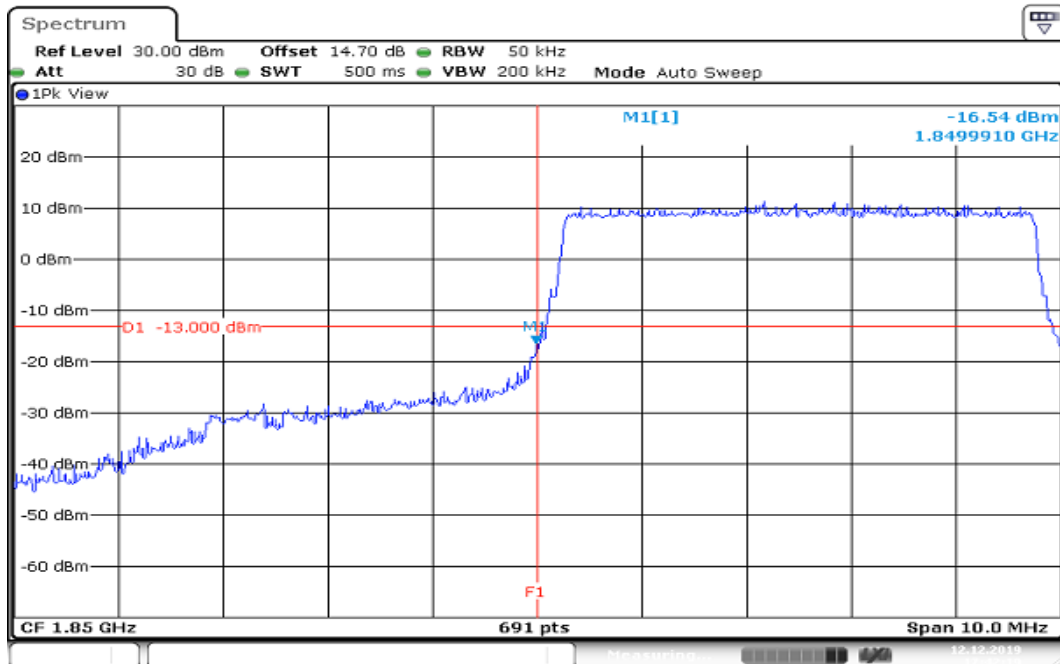
Date: 12.DEC.2019 17:32:15

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

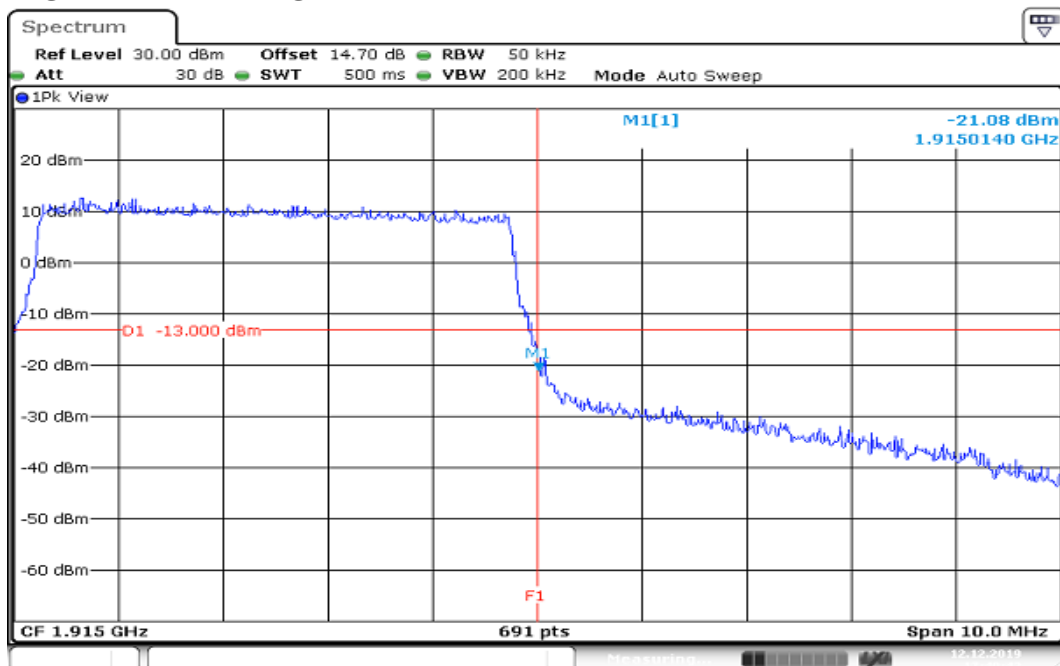
Date: 12.DEC.2019 17:43:36

HIGHER BAND EDGE

Date: 12.DEC.2019 17:49:15

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

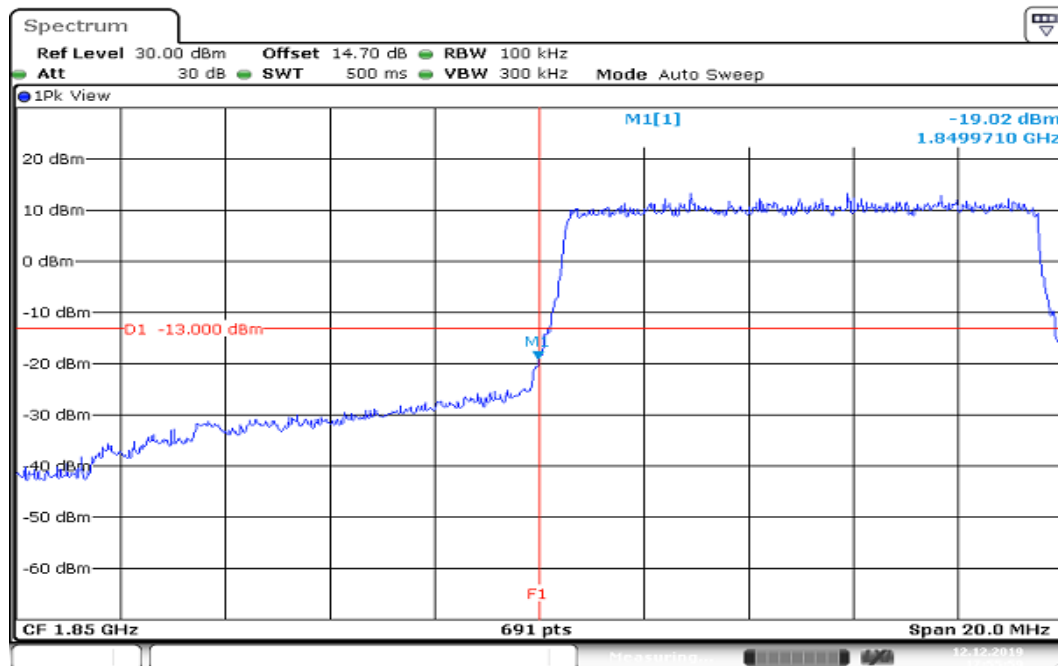
Date: 12.DEC.2019 17:42:19

HIGHER BAND EDGE

Date: 12.DEC.2019 17:49:42

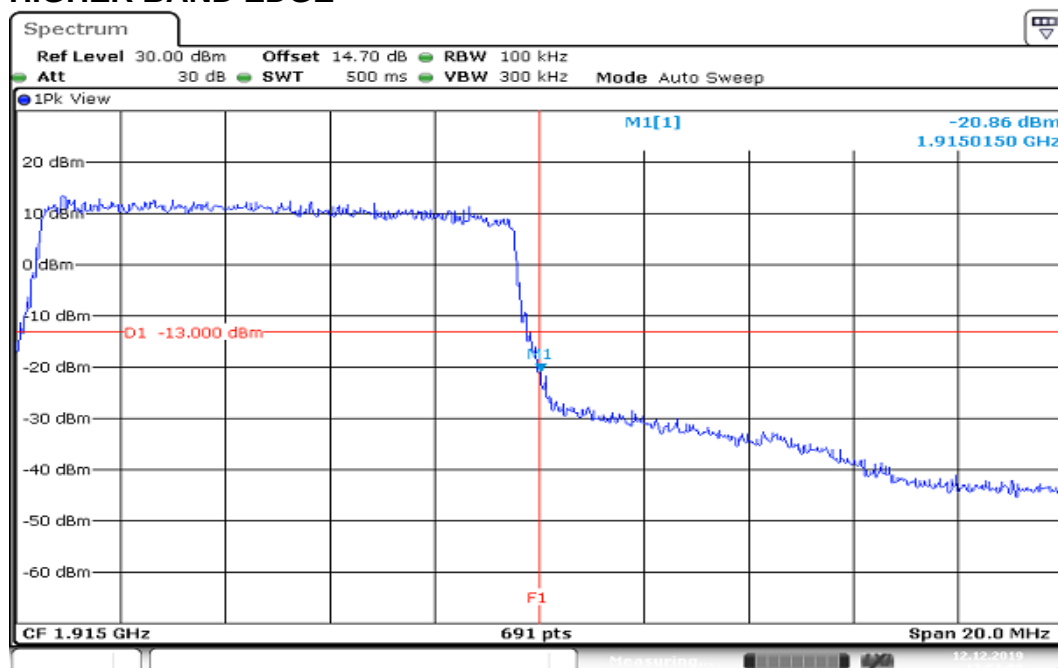
Report No.: T191105W01-RP9

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



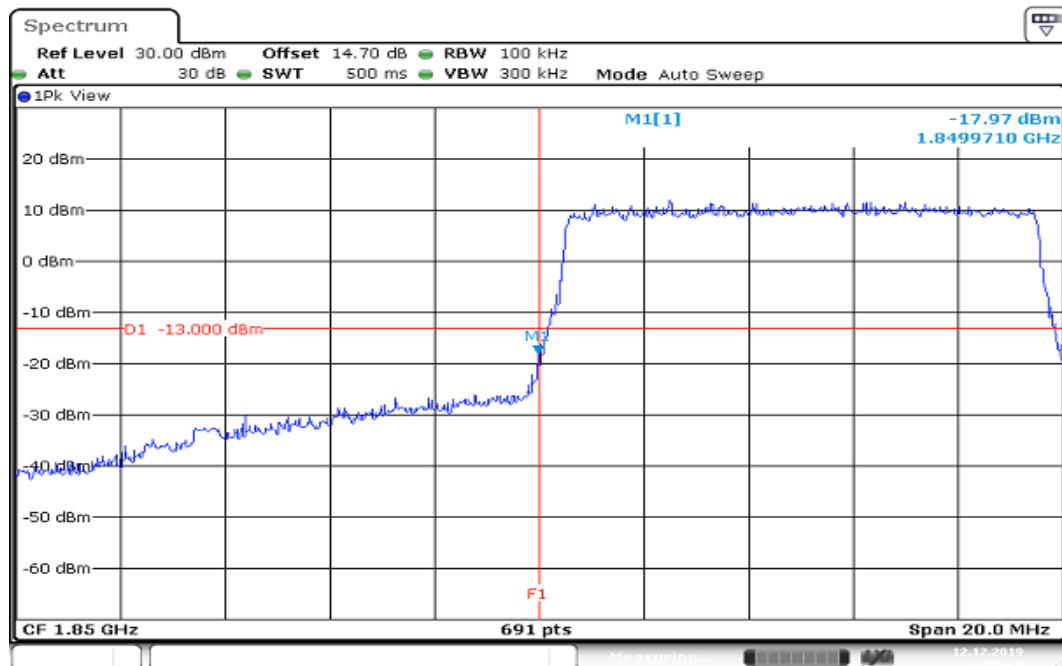
Date: 12.DEC.2019 17:56:00

HIGHER BAND EDGE



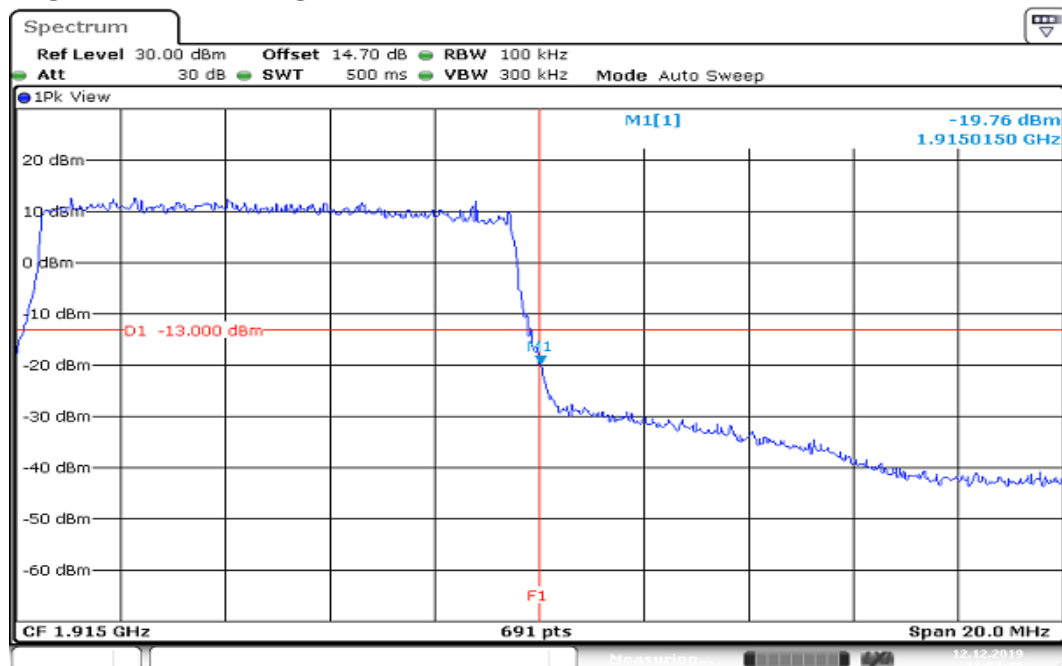
Date: 12.DEC.2019 17:51:01

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

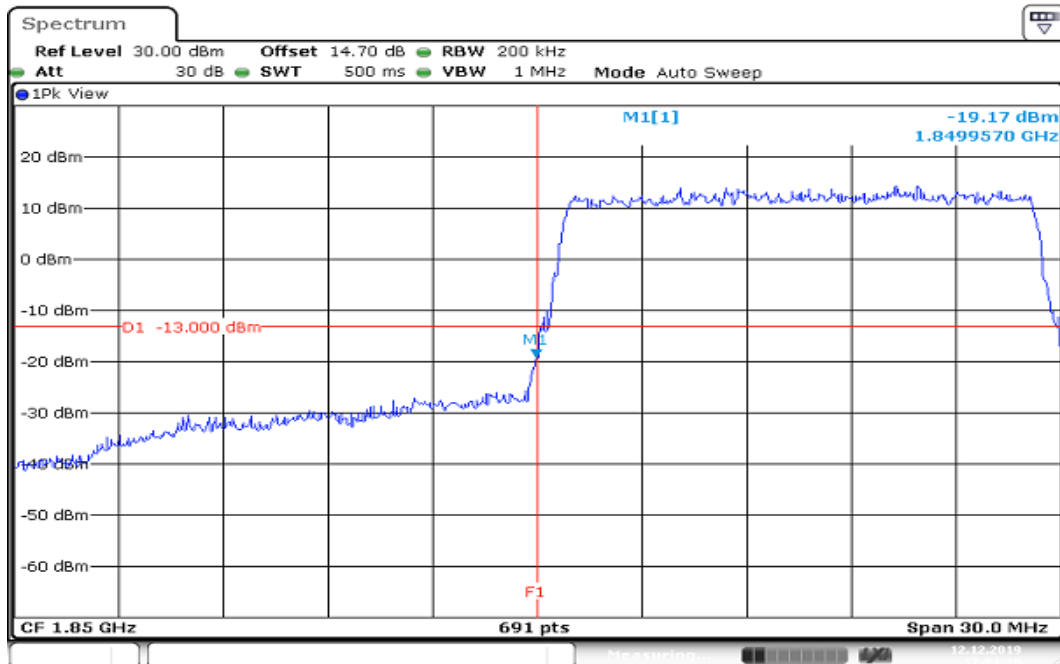


Date: 12.DEC.2019 17:55:26

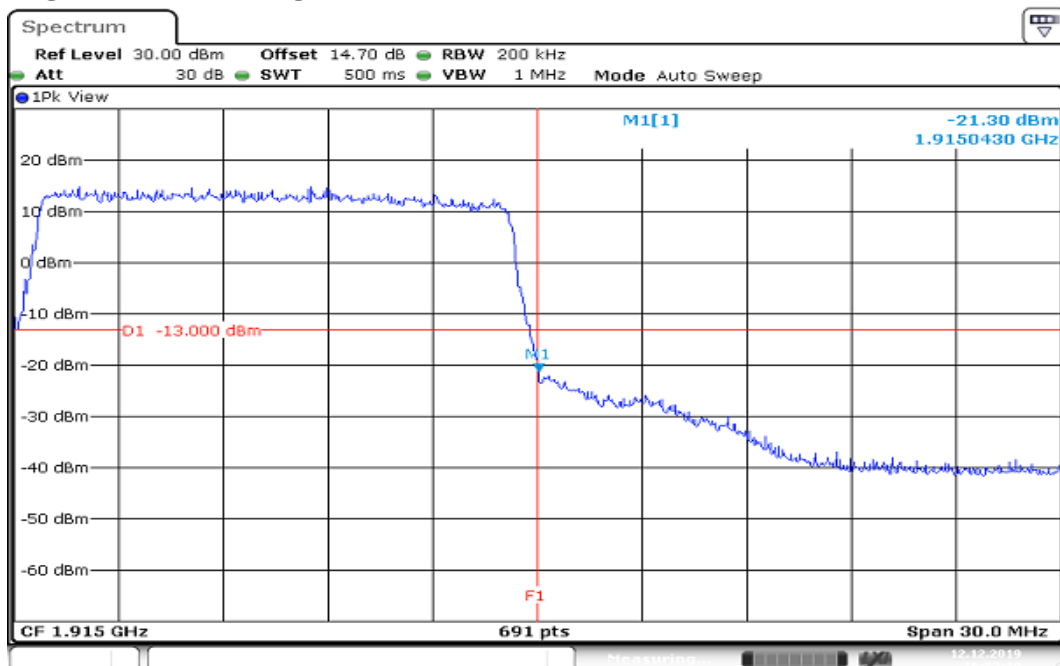
HIGHER BAND EDGE



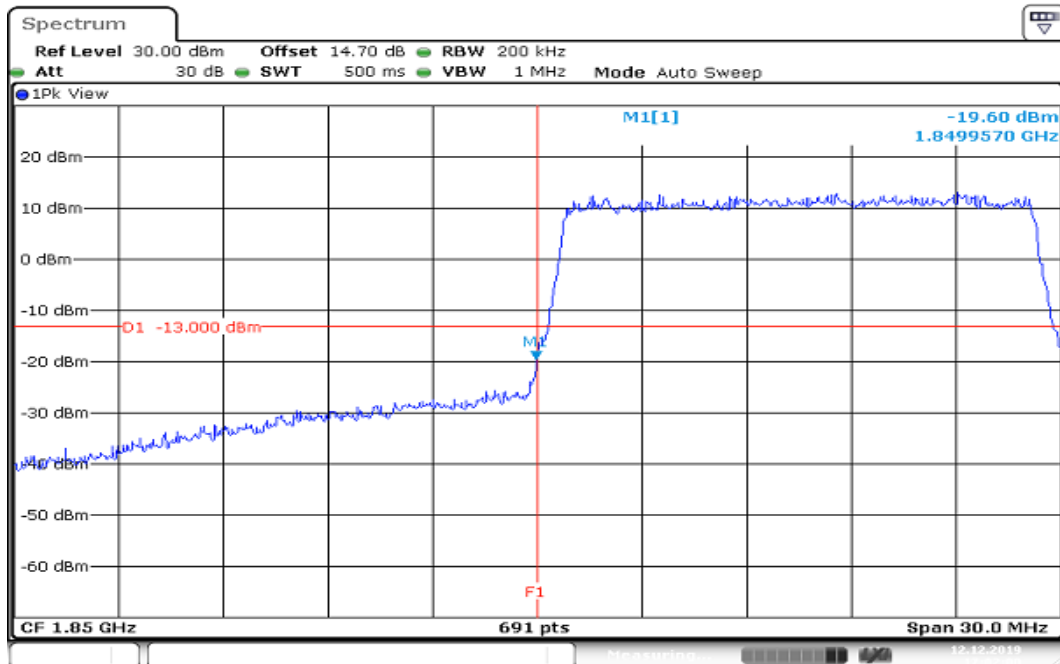
Date: 12.DEC.2019 17:51:48

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

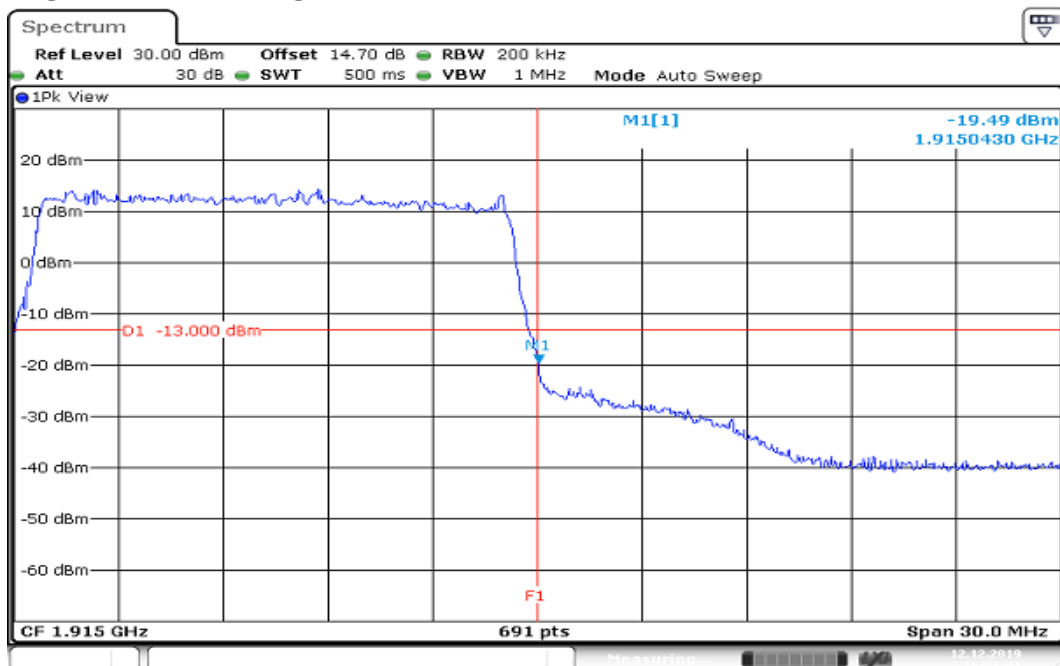
Date: 12.DEC.2019 17:01:29

HIGHER BAND EDGE

Date: 12.DEC.2019 16:52:19

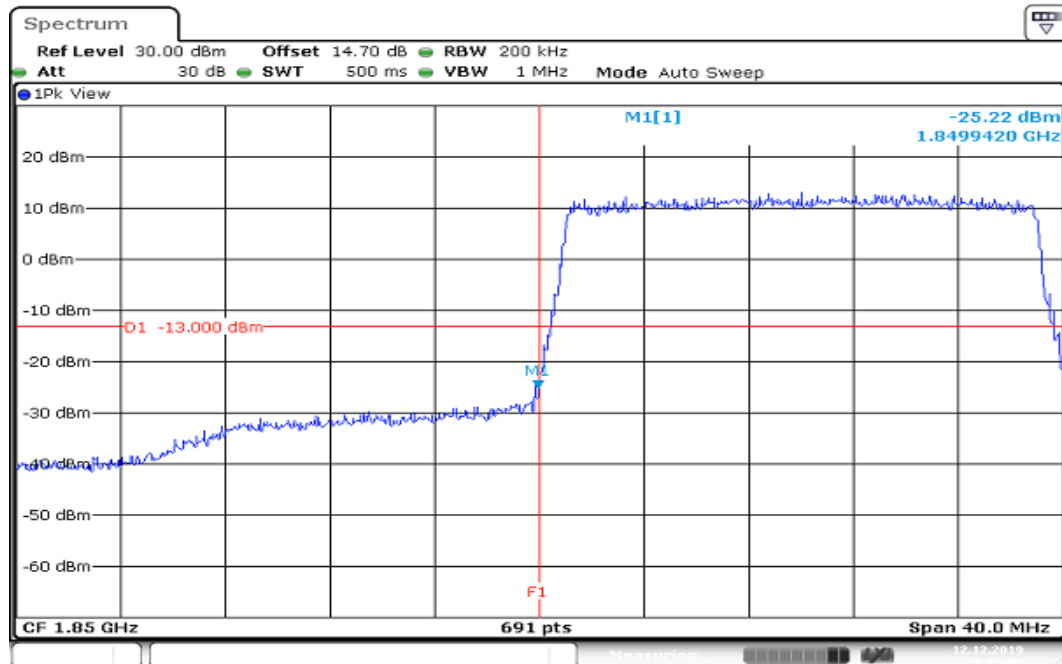
**CHANNEL BANDWIDTH: 15MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 17:02:00

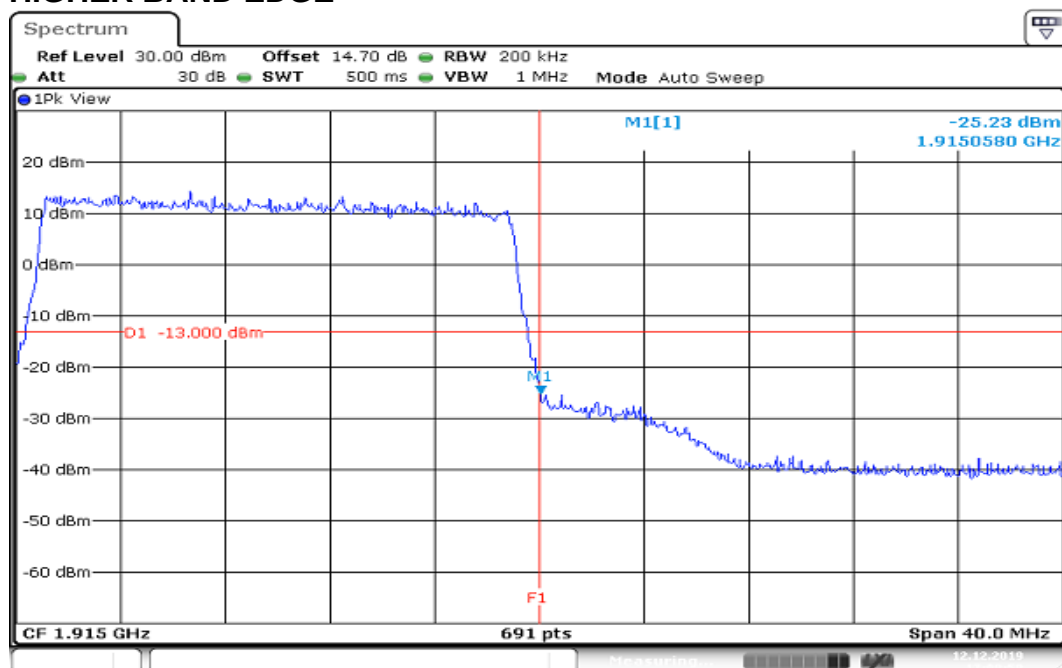
HIGHER BAND EDGE

Date: 12.DEC.2019 16:51:41

Report No.: T191105W01-RP9

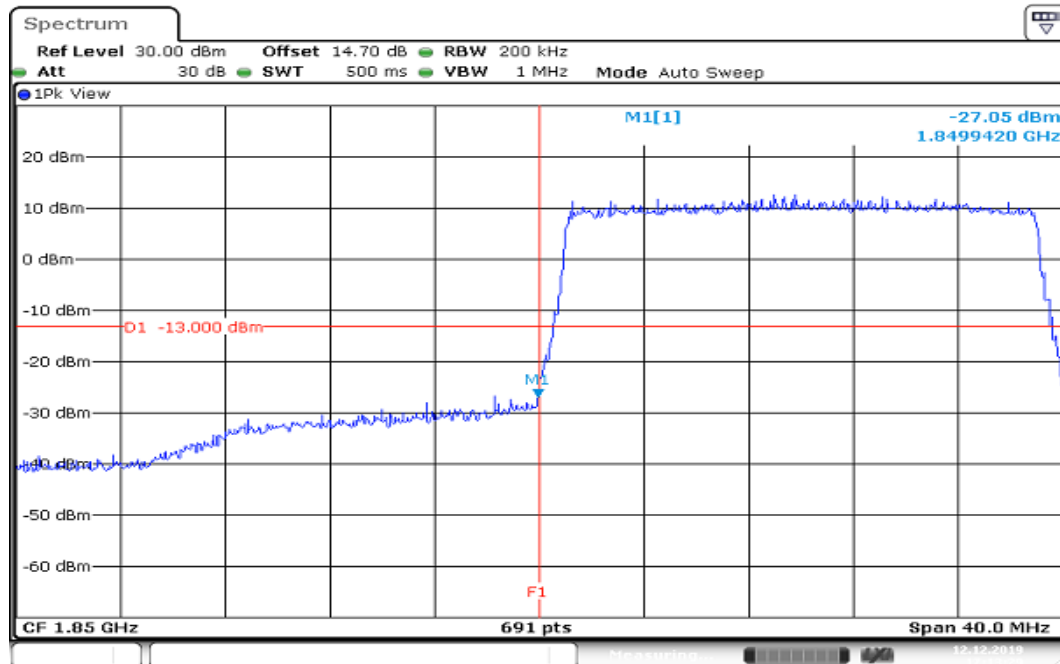
**CHANNEL BANDWIDTH: 20MHz / QPSK / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 17:13:06

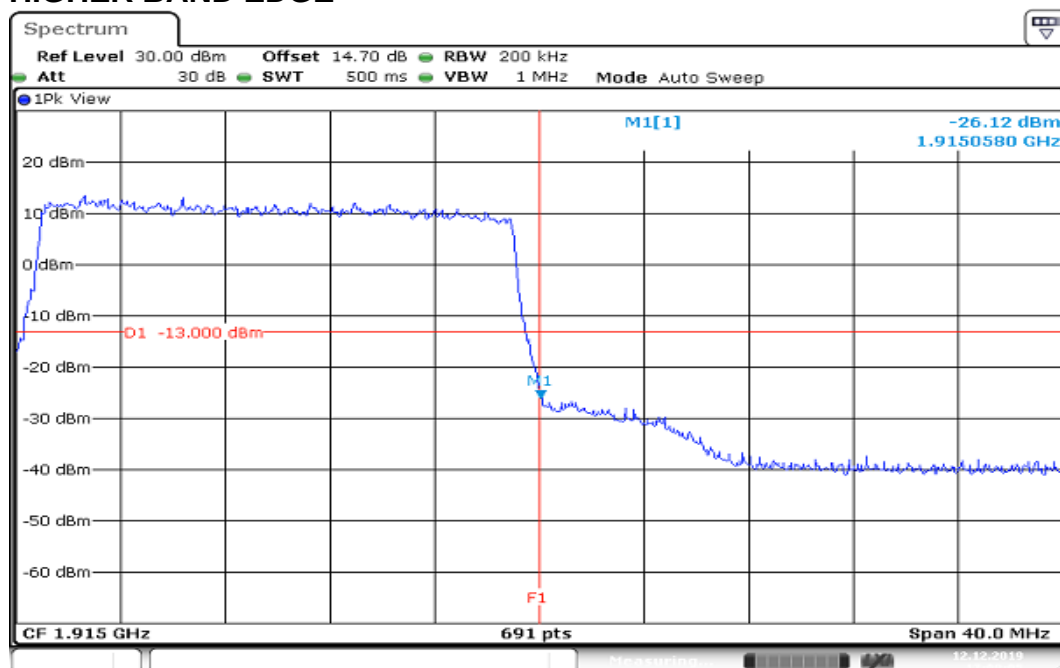
HIGHER BAND EDGE

Date: 12.DEC.2019 17:08:59

Report No.: T191105W01-RP9

**CHANNEL BANDWIDTH: 20MHz / 16QAM / 100% RB ALLOCATED
LOWER BAND EDGE**

Date: 12.DEC.2019 17:13:29

HIGHER BAND EDGE

Date: 12.DEC.2019 17:08:05

8.6 CONDUCTED SPURIOUS EMISSIONS

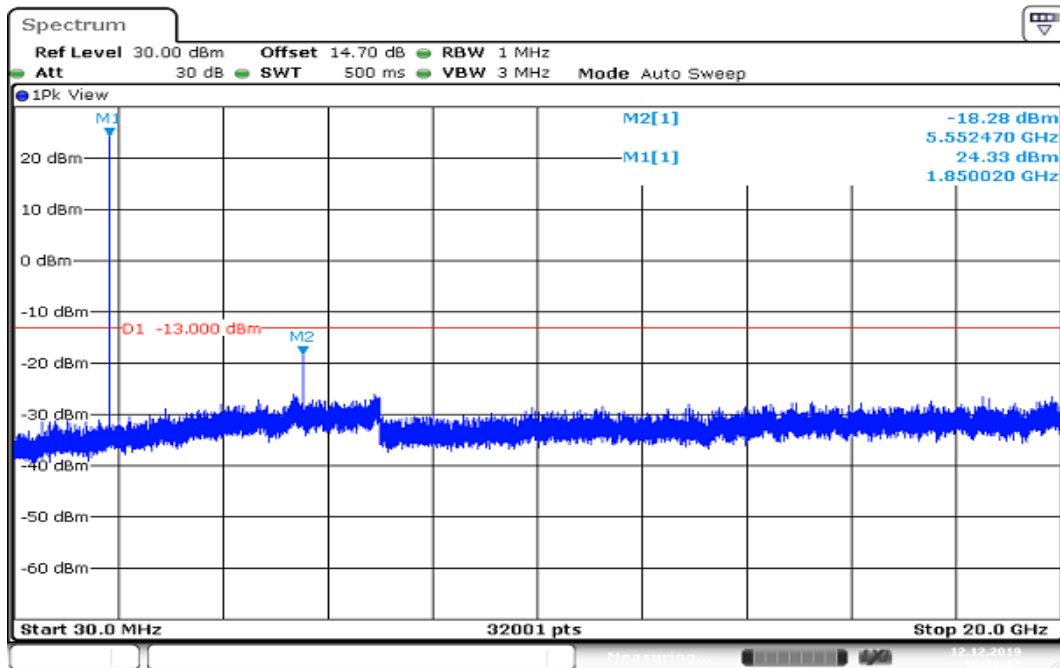
Limits

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

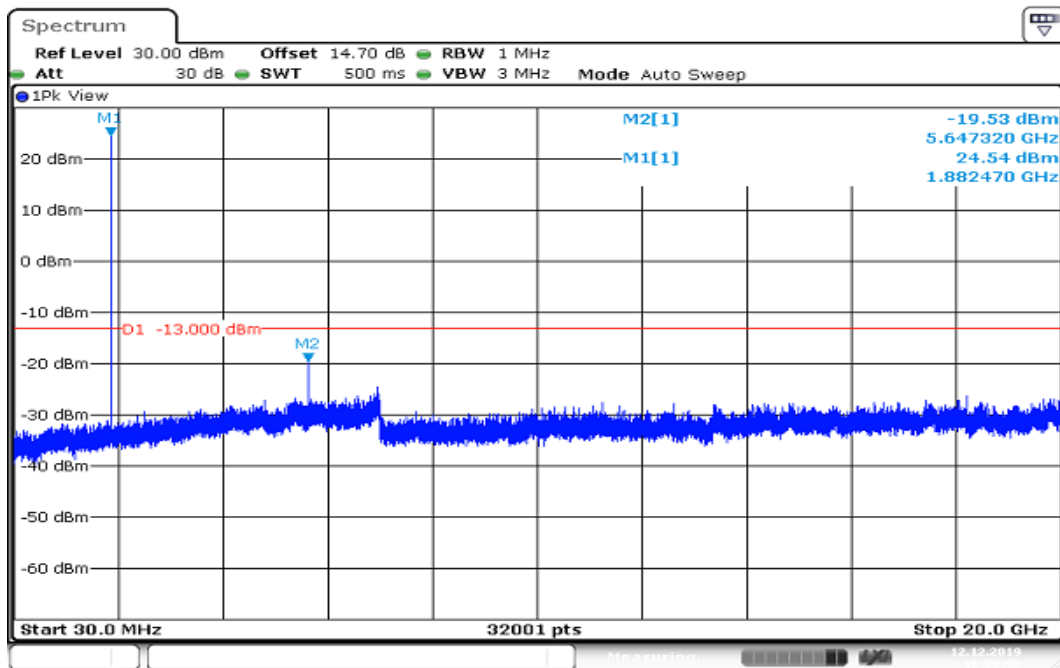
Test Procedures

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.

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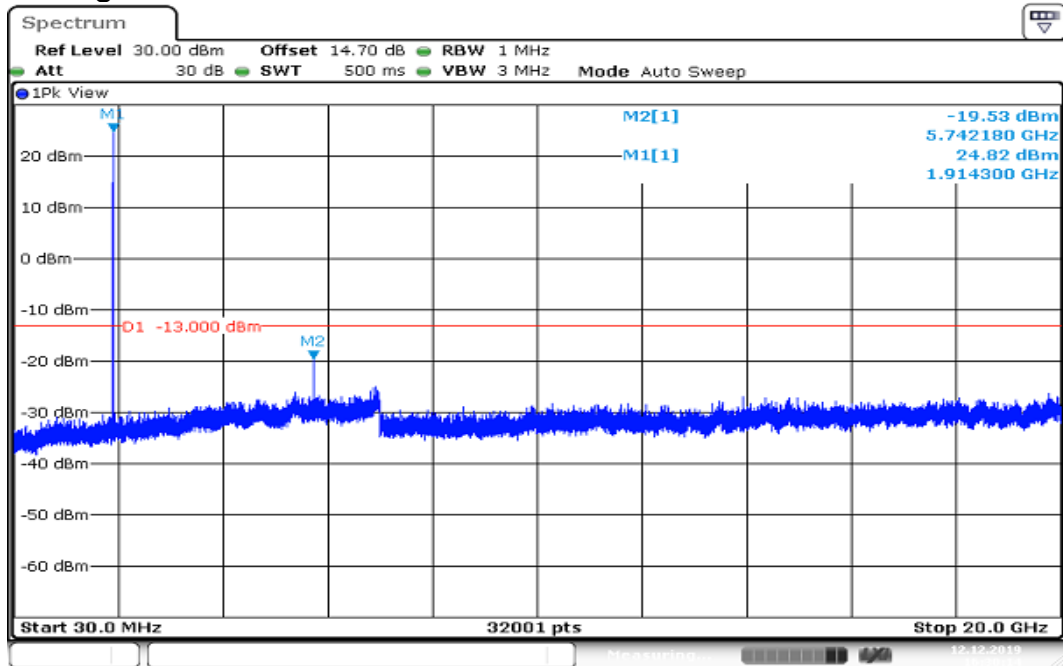
Test Results**LTE Band 25****CHANNEL BANDWIDTH: 1.4MHz / QPSK****CH Low**

Date: 12.DEC.2019 16:28:17

CH Mid

Date: 12.DEC.2019 16:28:58

CH High

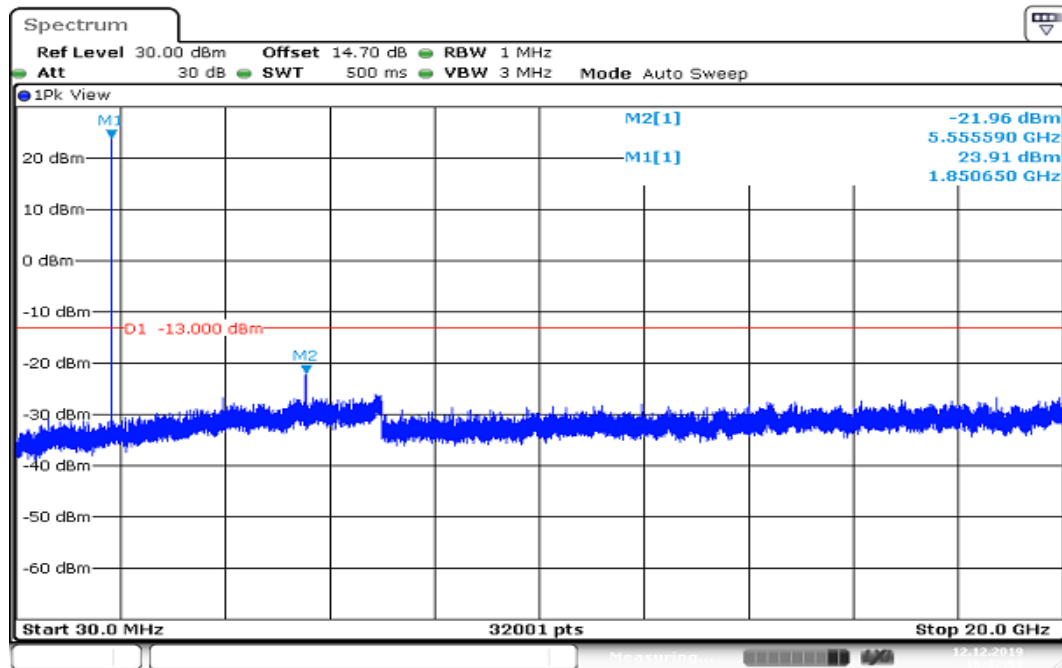


Date: 12.DEC.2019 16:30:14

Report No.: T191105W01-RP9

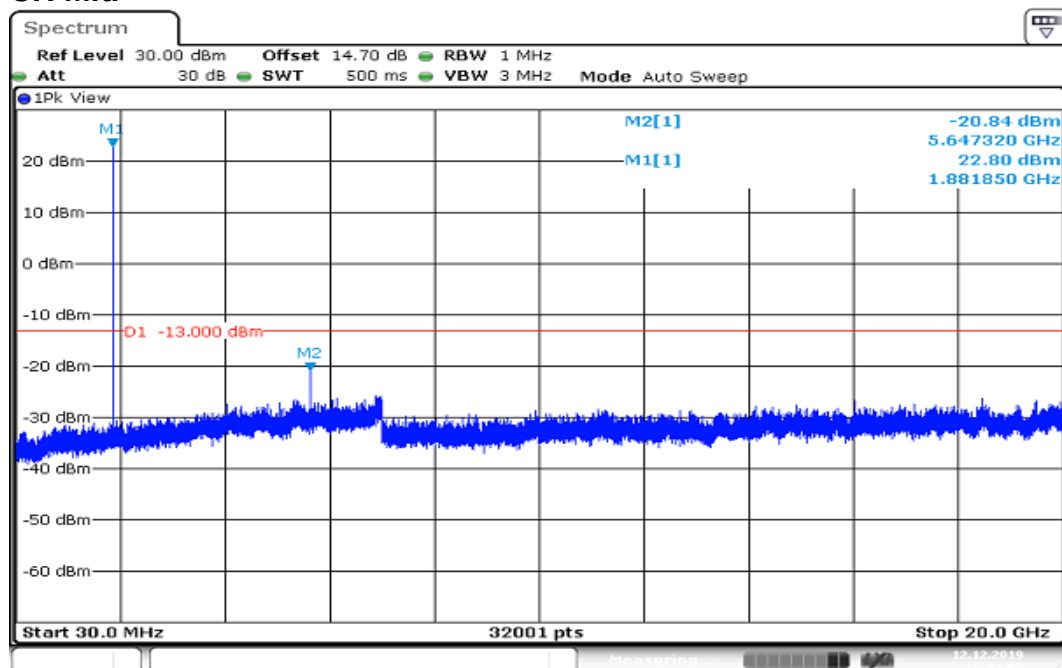
CHANNEL BANDWIDTH: 3MHz / QPSK

CH Low



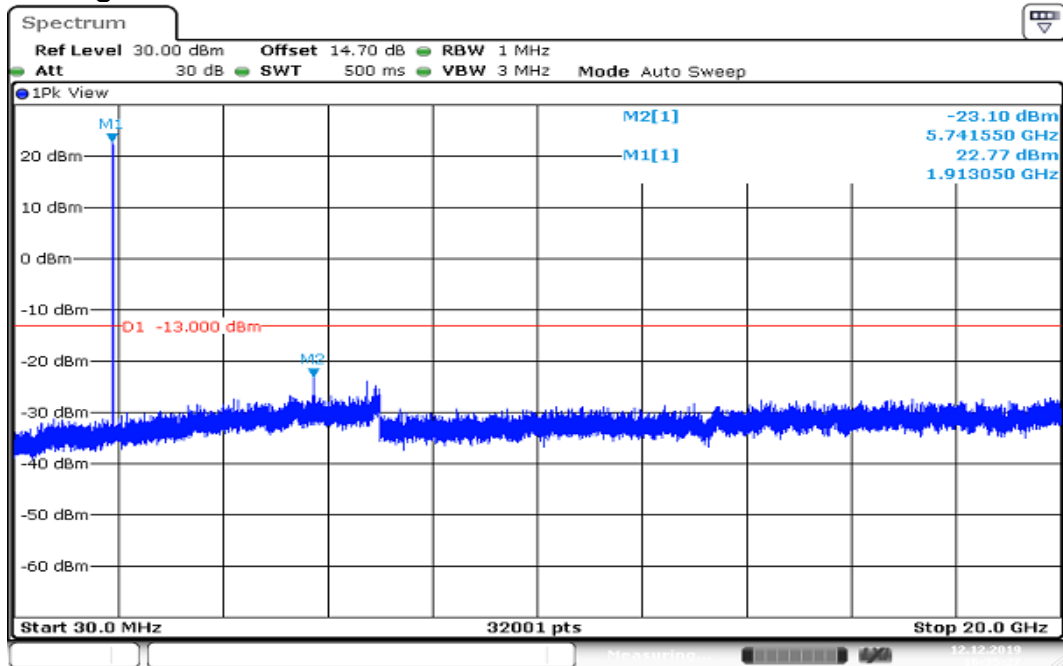
Date: 12.DEC.2019 16:32:59

CH Mid



Date: 12.DEC.2019 16:34:05

CH High

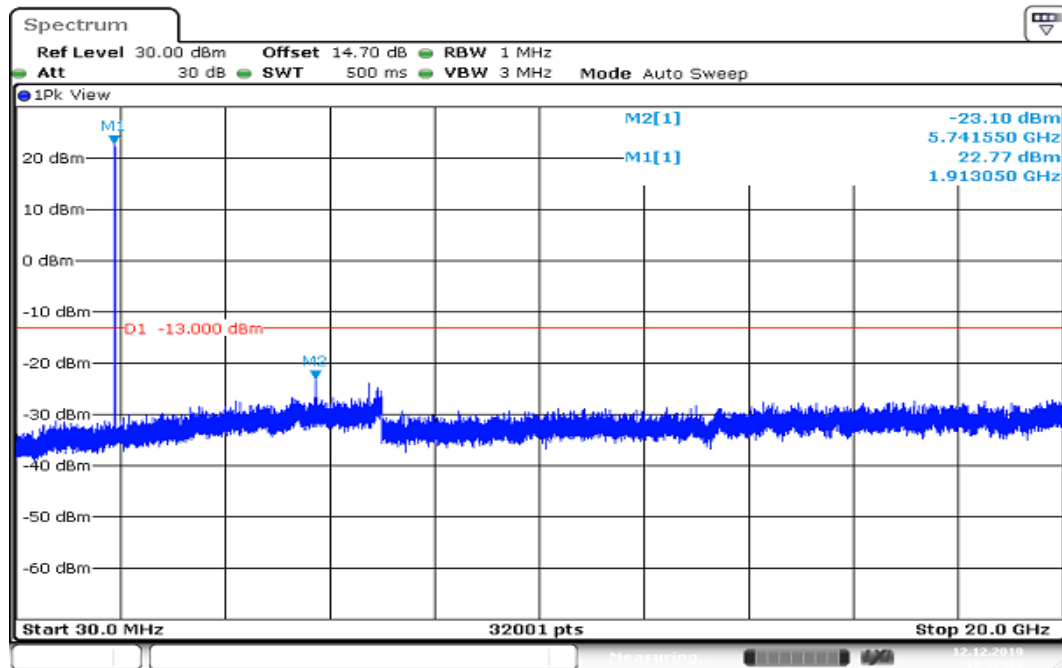


Date: 12.DEC.2019 16:35:27

Report No.: T191105W01-RP9

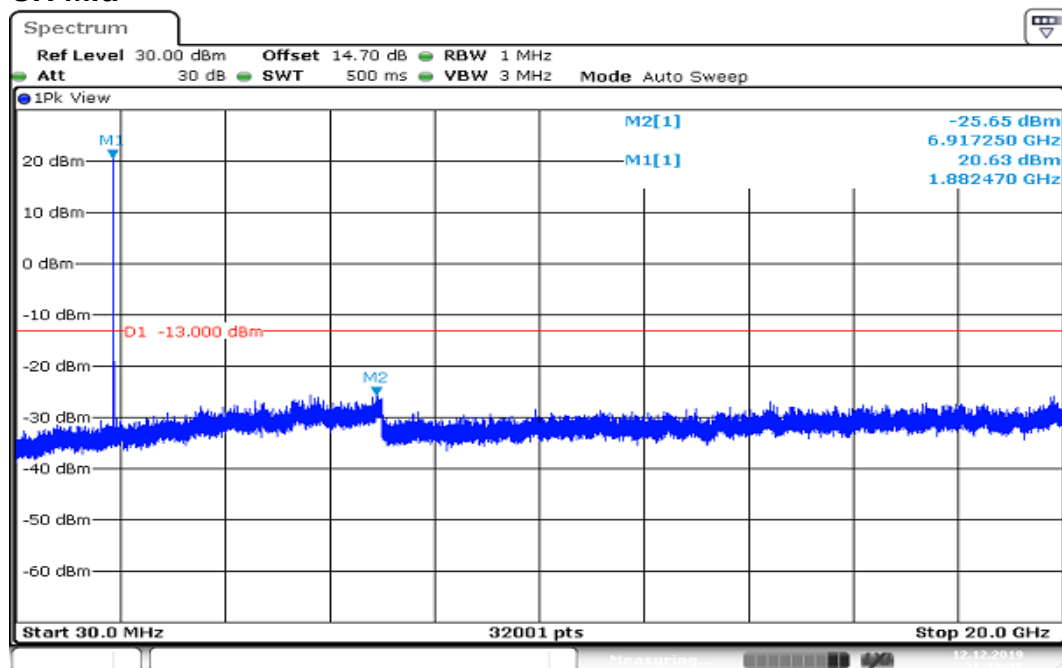
CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low



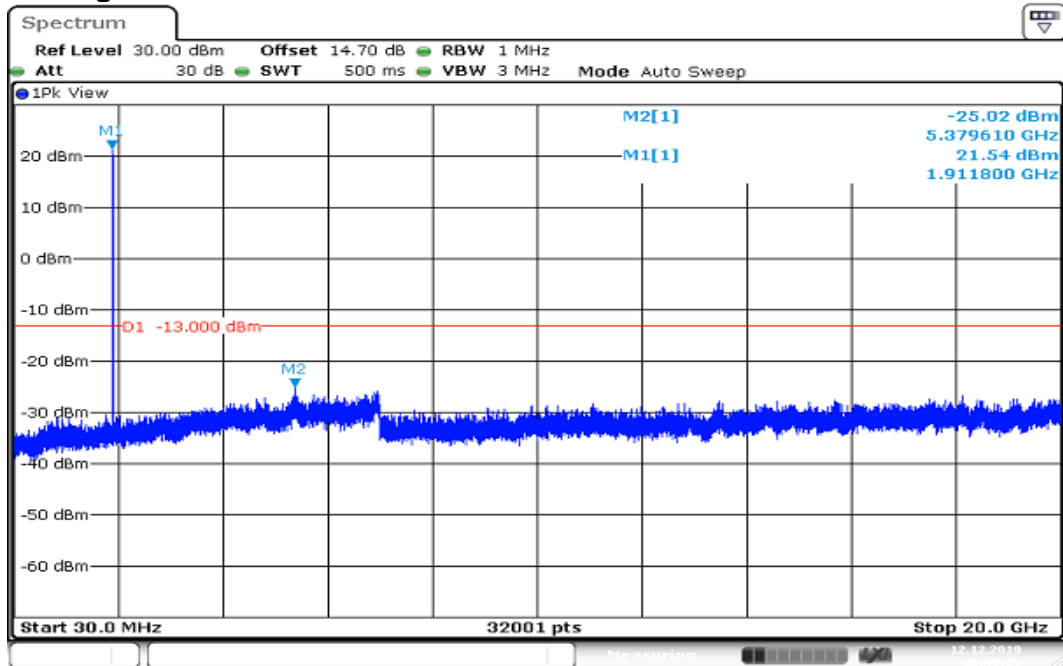
Date: 12.DEC.2019 16:37:10

CH Mid



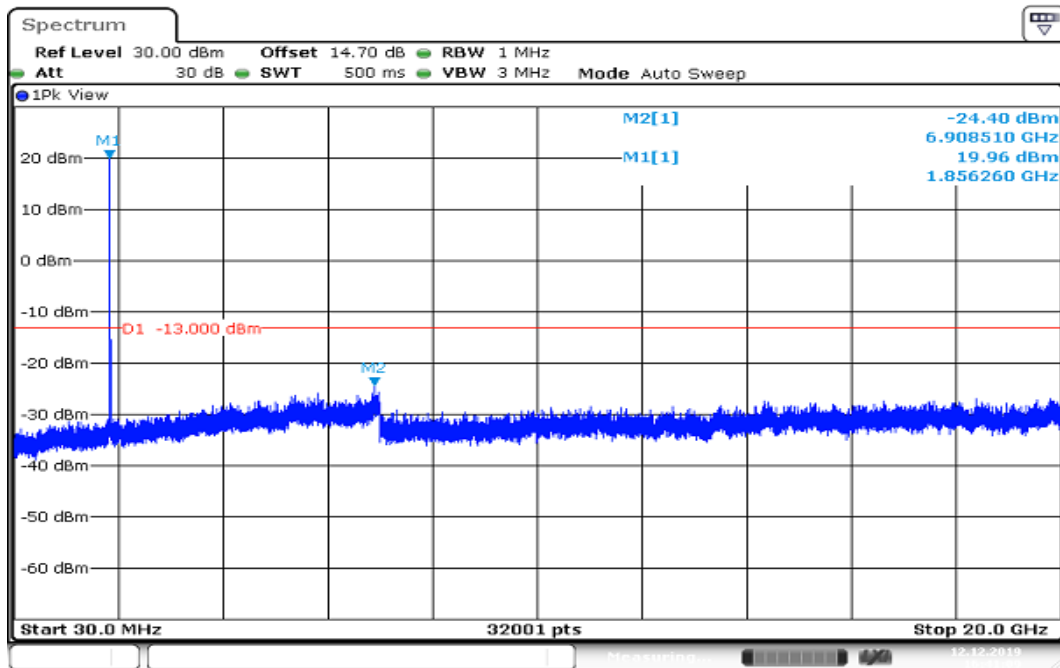
Date: 12.DEC.2019 16:38:48

CH High

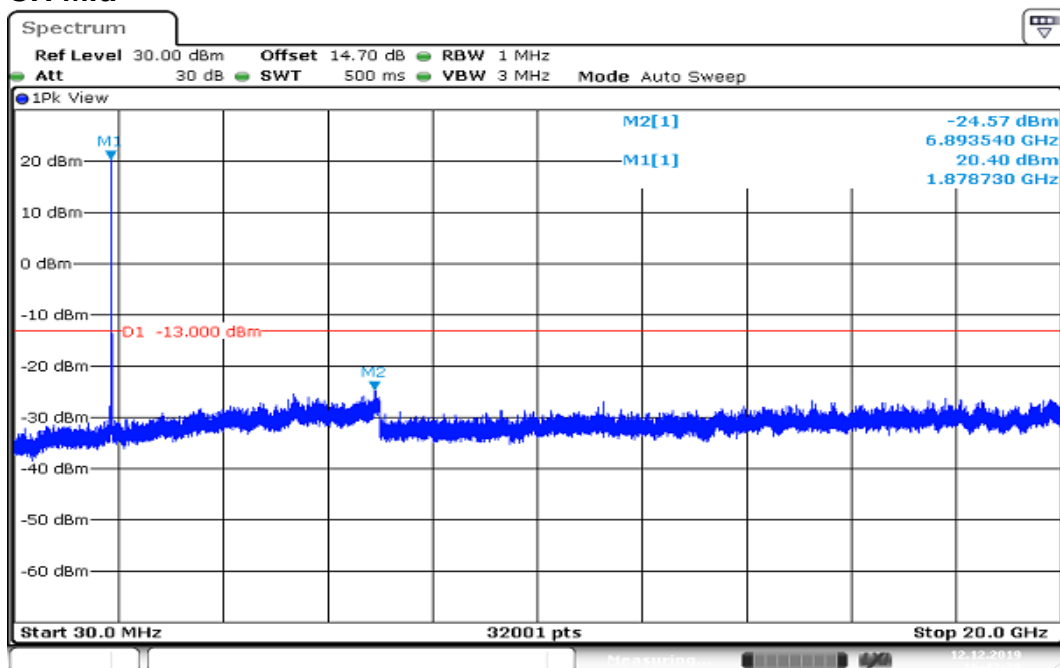


Date: 12.DEC.2019 16:40:30

Report No.: T191105W01-RP9

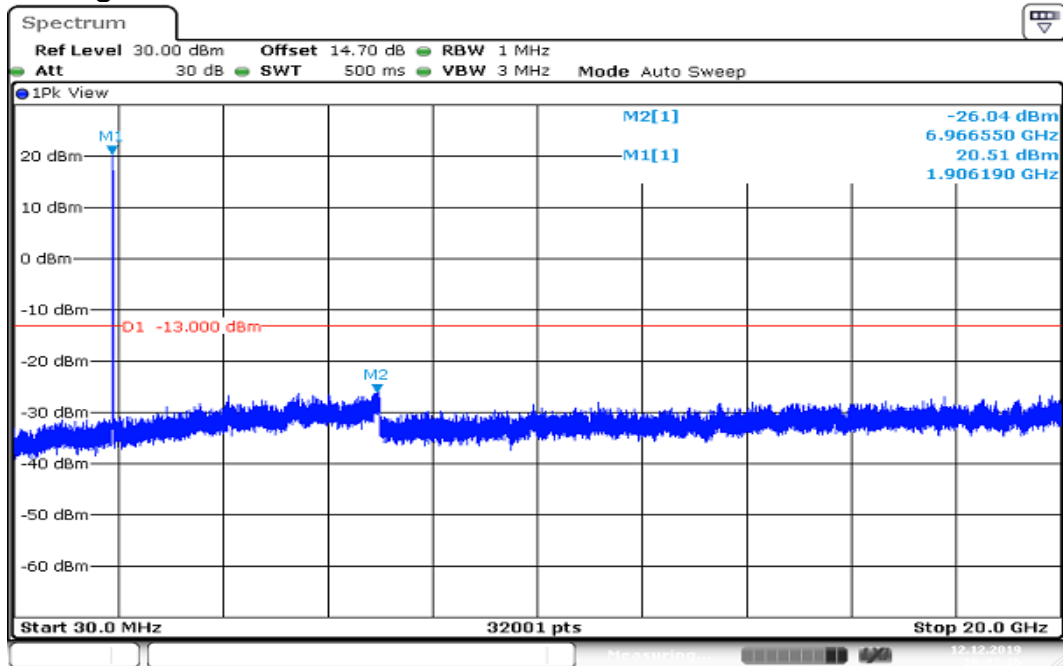
CHANNEL BANDWIDTH: 10MHz / QPSK**CH Low**

Date: 12.DEC.2019 16:41:09

CH Mid

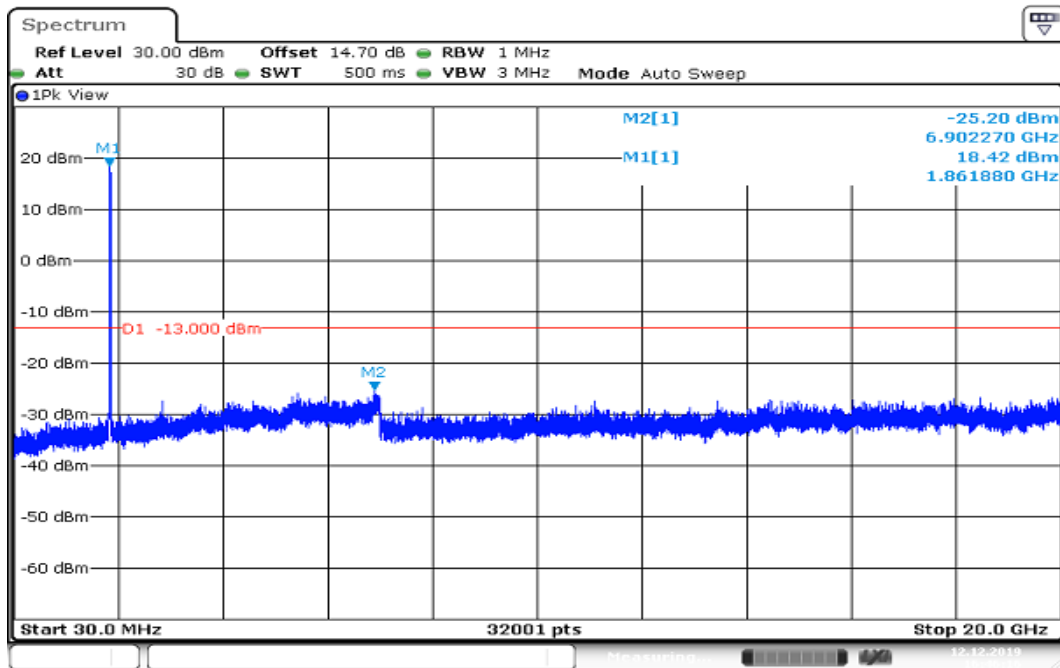
Date: 12.DEC.2019 16:42:38

CH High

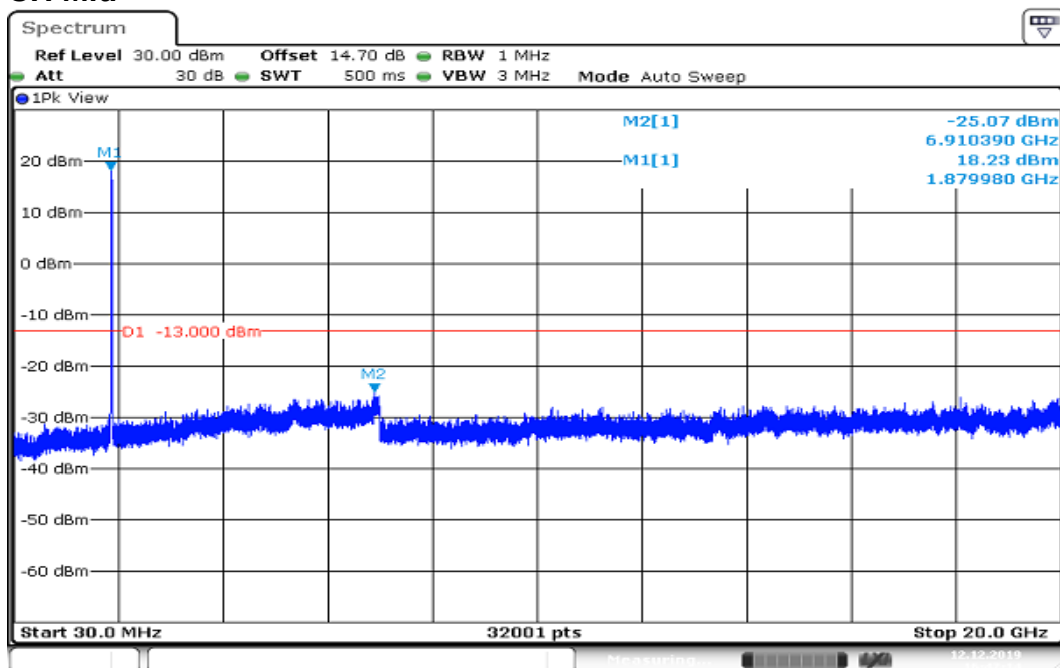


Date: 12.DEC.2019 16:43:16

Report No.: T191105W01-RP9

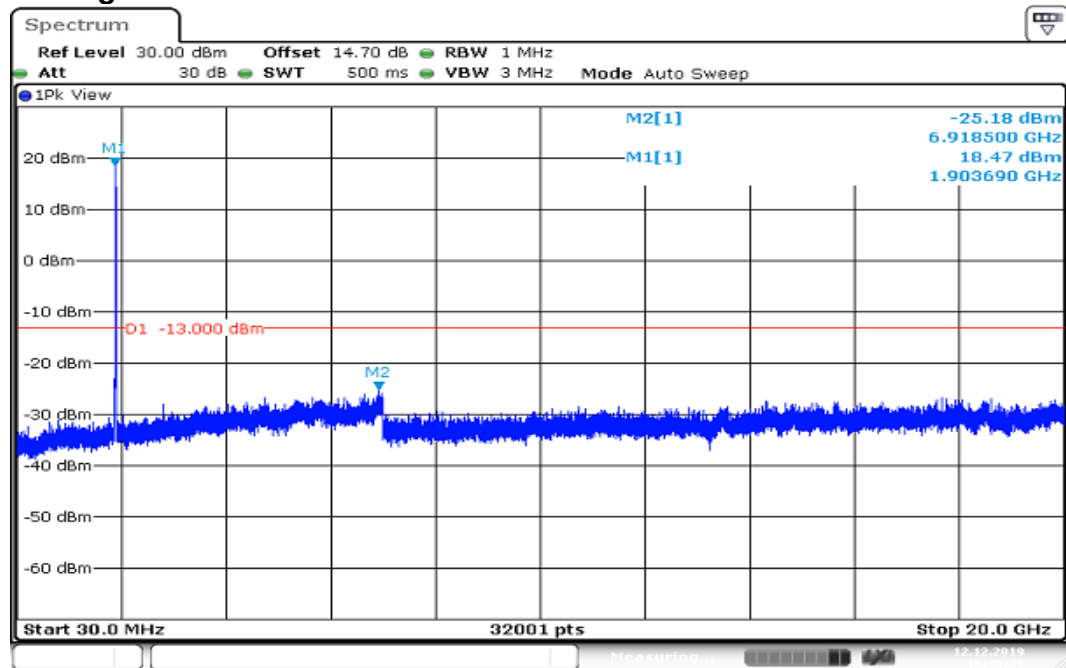
CHANNEL BANDWIDTH: 15MHz / QPSK
CH Low

Date: 12.DEC.2019 16:46:16

CH Mid

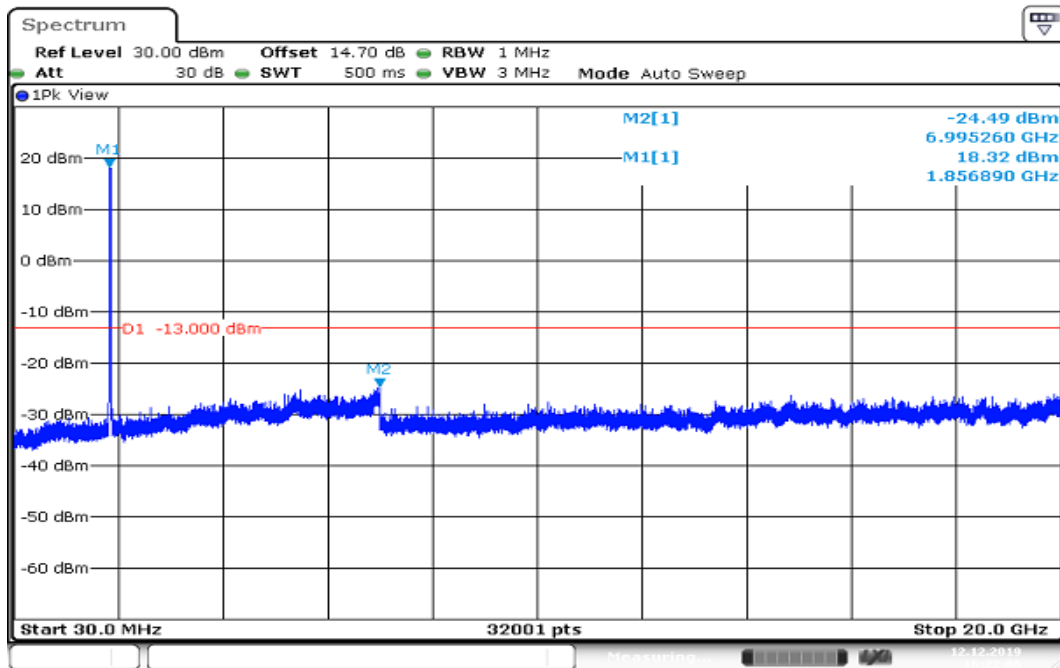
Date: 12.DEC.2019 16:47:14

CH High

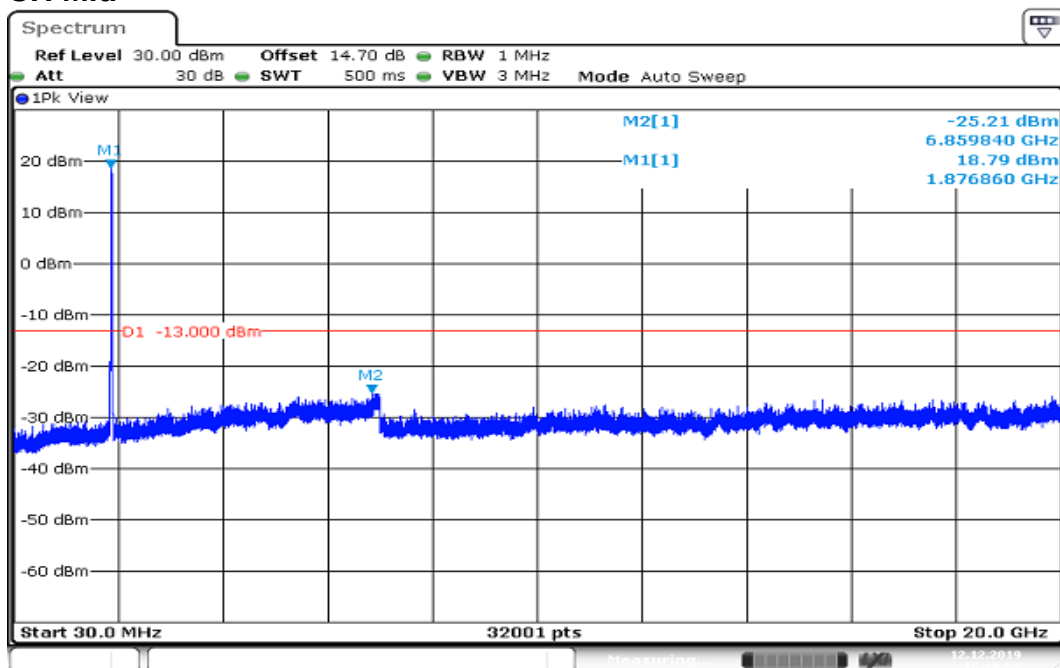


Date: 12.DEC.2019 16:48:31

Report No.: T191105W01-RP9

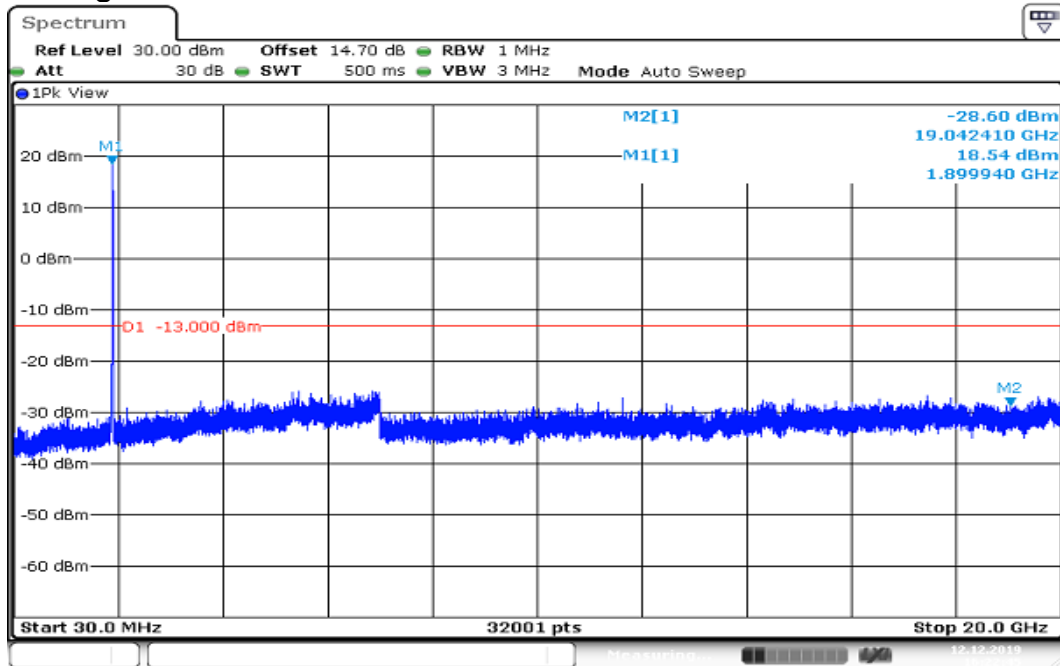
CHANNEL BANDWIDTH: 20MHz / QPSK
CH Low

Date: 12.DEC.2019 16:22:06

CH Mid

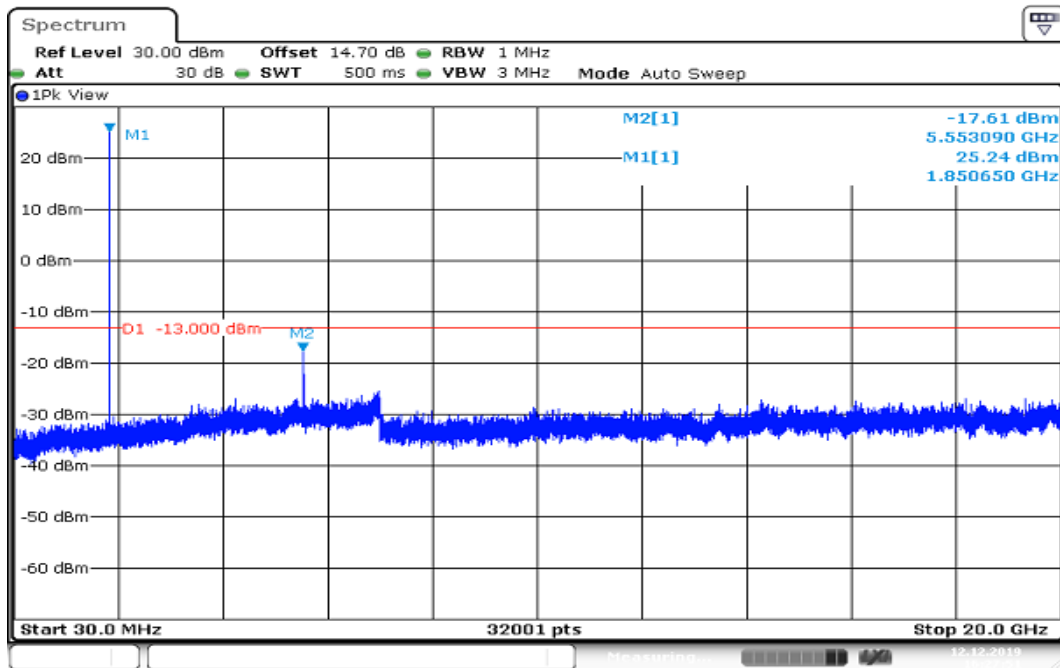
Date: 12.DEC.2019 16:18:57

CH High

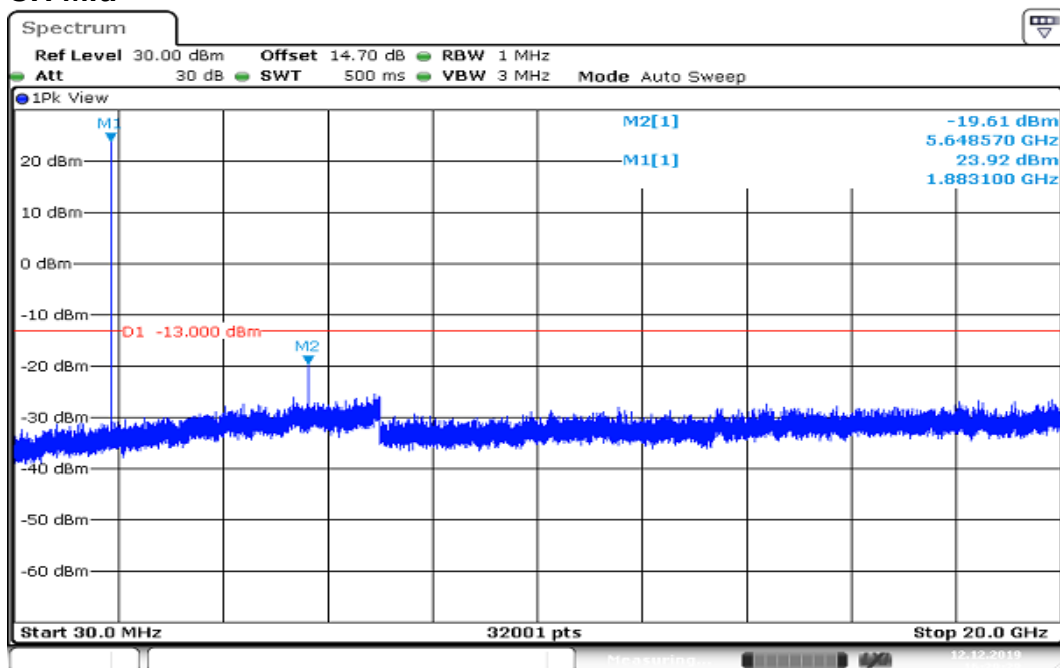


Date: 12.DEC.2019 16:22:46

Report No.: T191105W01-RP9

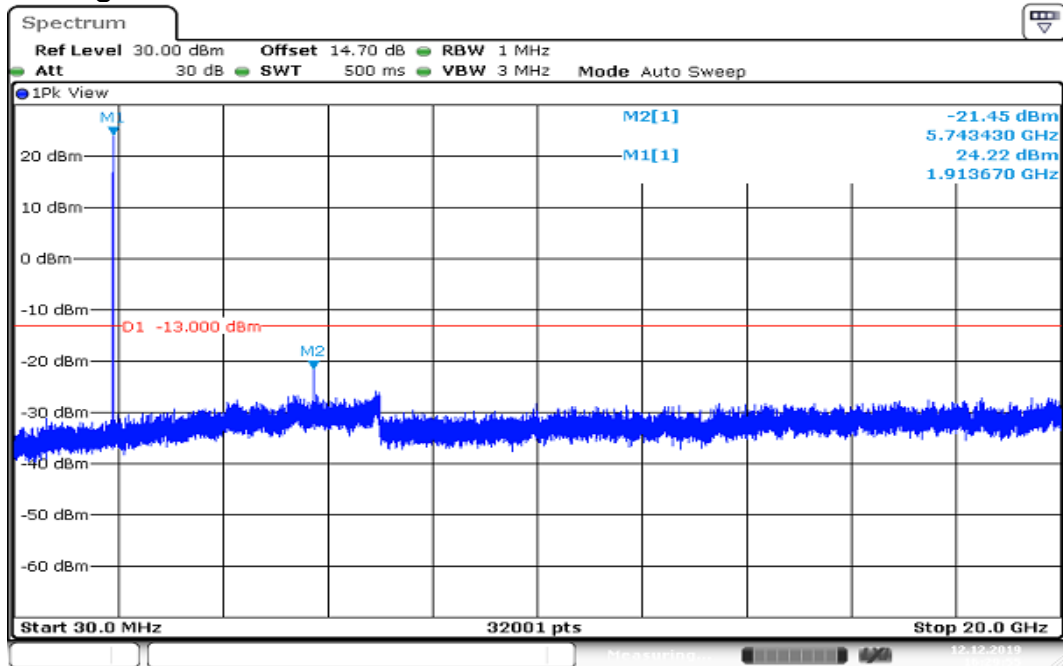
CHANNEL BANDWIDTH: 1.4MHz / 16QAM**CH Low**

Date: 12.DEC.2019 16:27:51

CH Mid

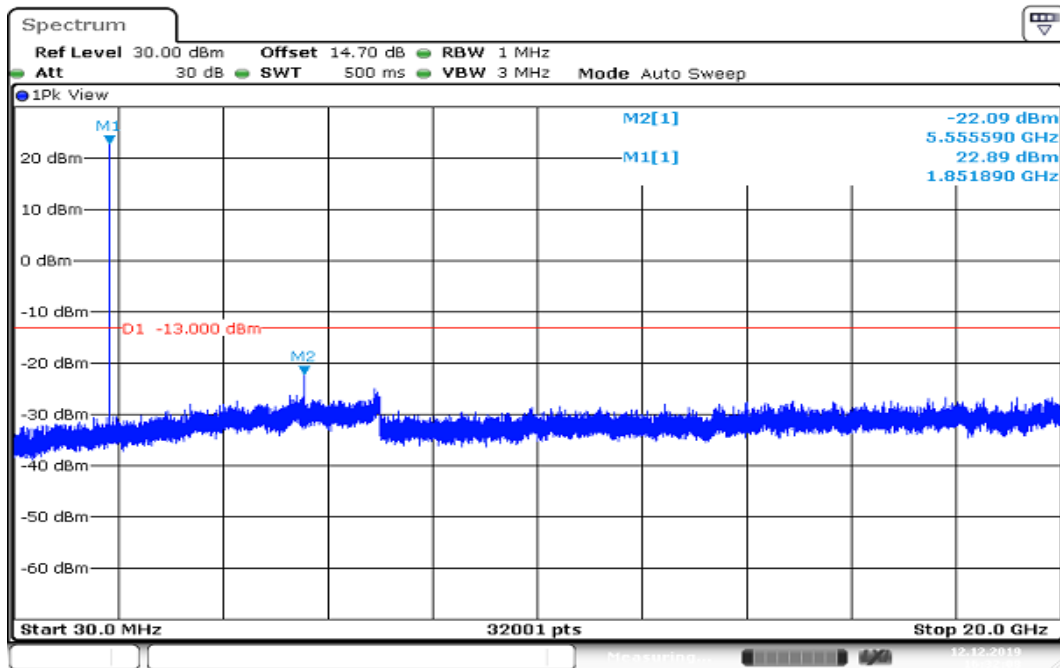
Date: 12.DEC.2019 16:29:29

CH High

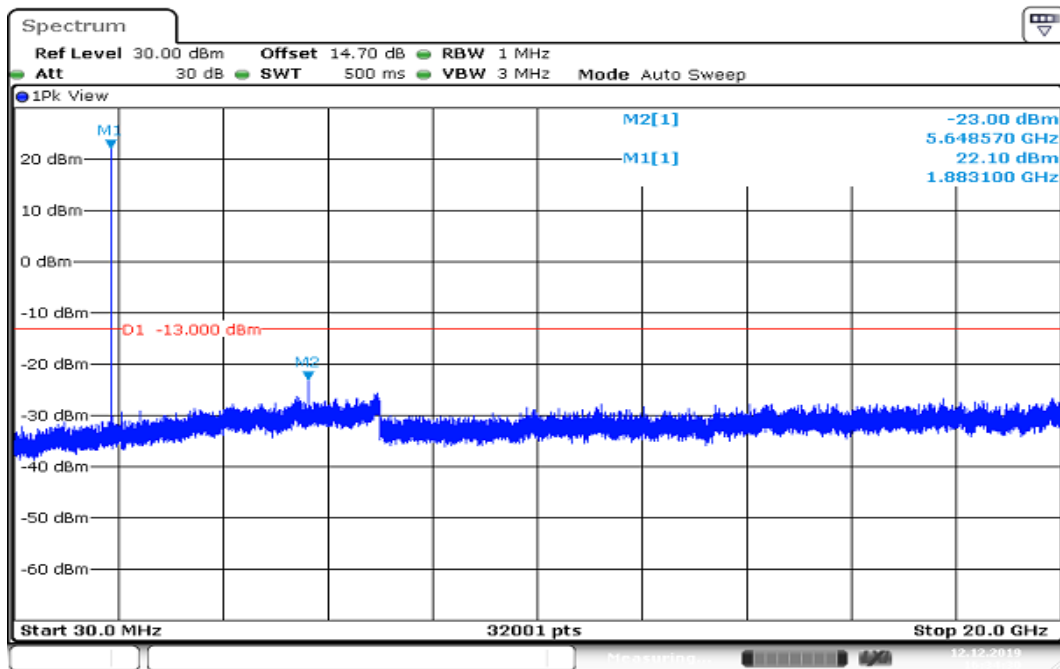


Date: 12.DEC.2019 16:29:55

Report No.: T191105W01-RP9

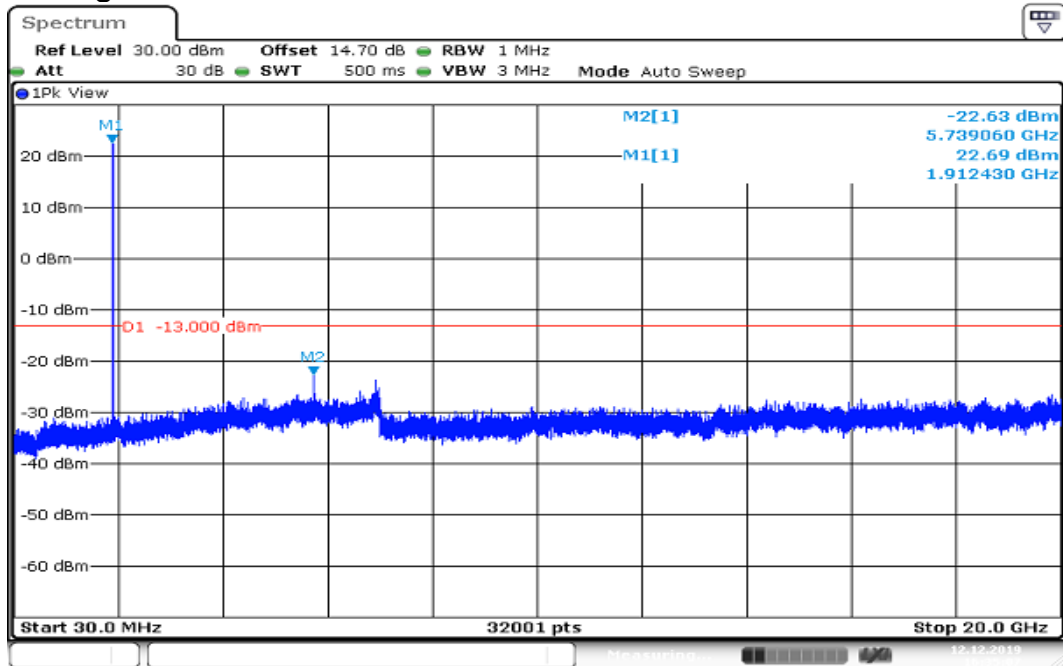
CHANNEL BANDWIDTH: 3MHz / 16QAM
CH Low

Date: 12.DEC.2019 16:32:08

CH Mid

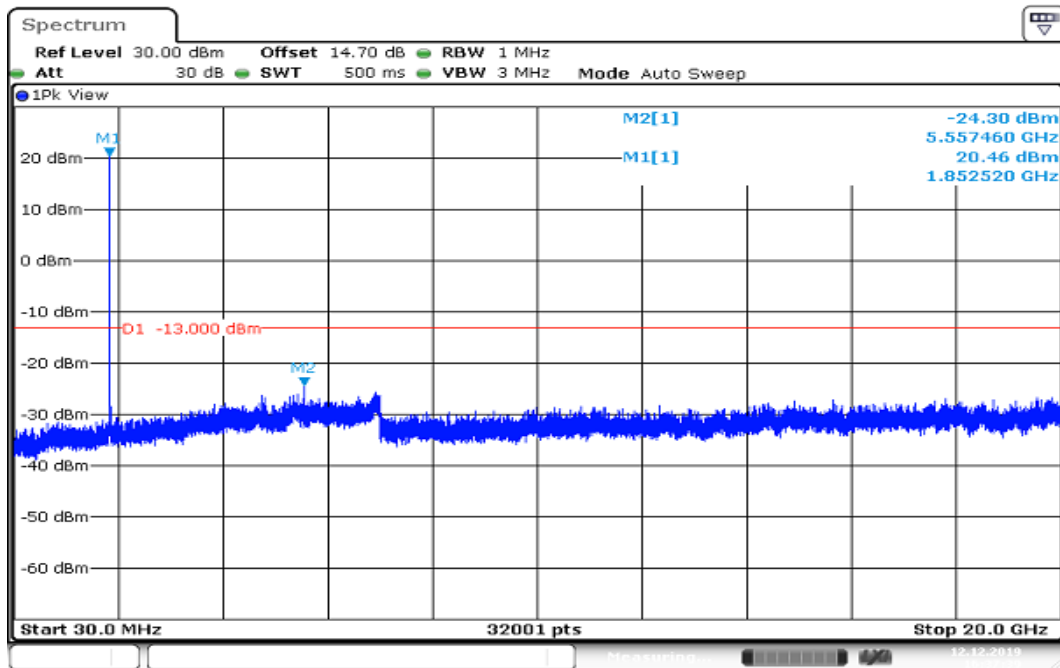
Date: 12.DEC.2019 16:34:30

CH High

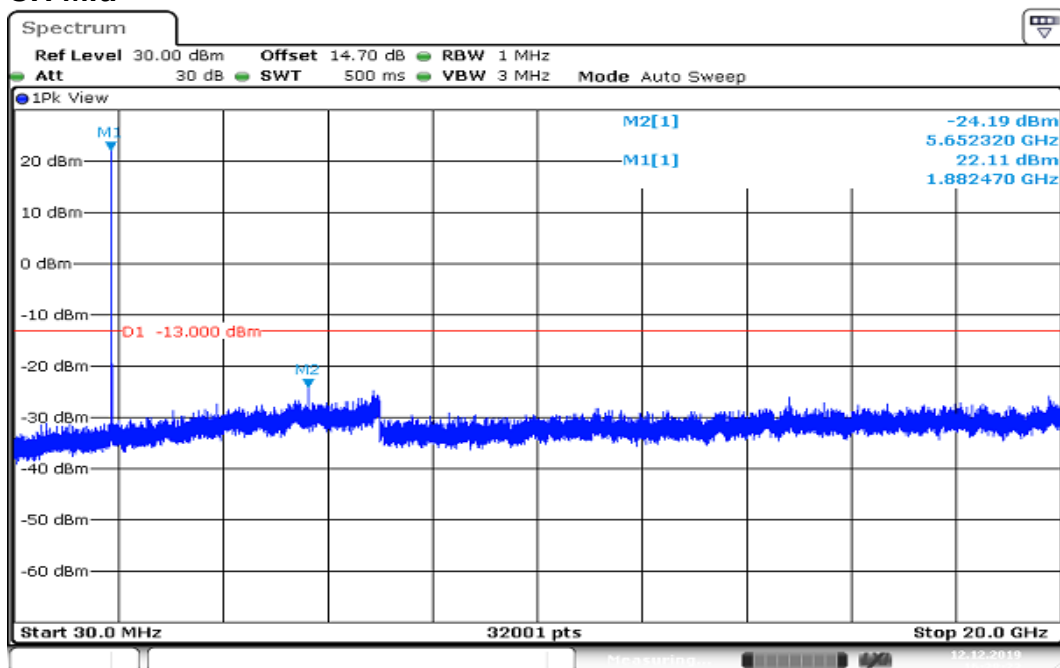


Date: 12.DEC.2019 16:35:07

Report No.: T191105W01-RP9

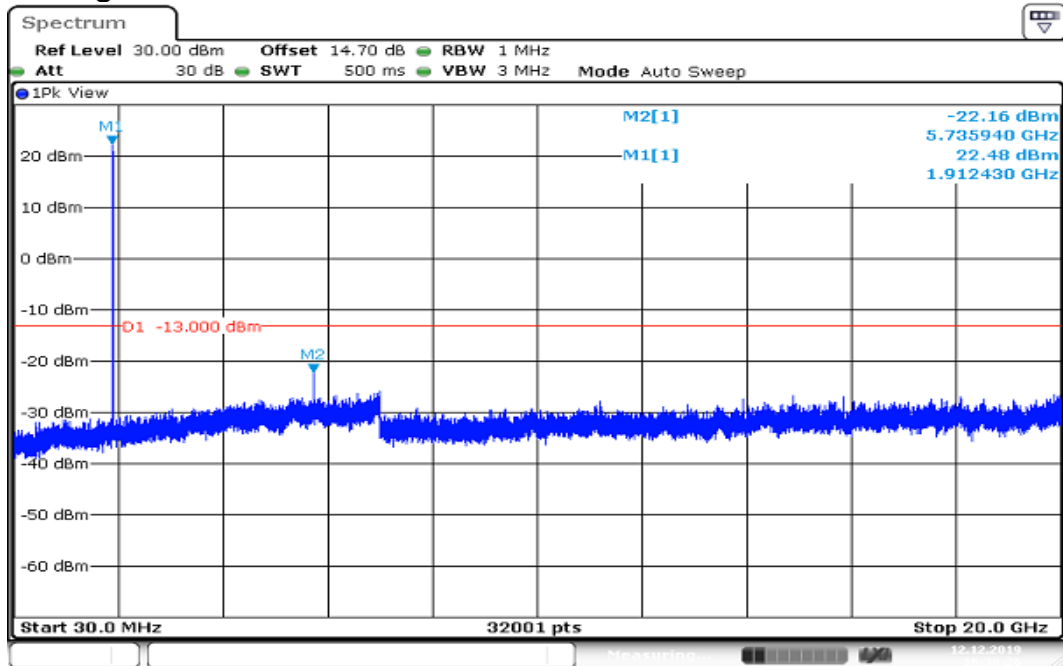
CHANNEL BANDWIDTH: 5MHz / 16QAM**CH Low**

Date: 12.DEC.2019 16:37:39

CH Mid

Date: 12.DEC.2019 16:38:23

CH High

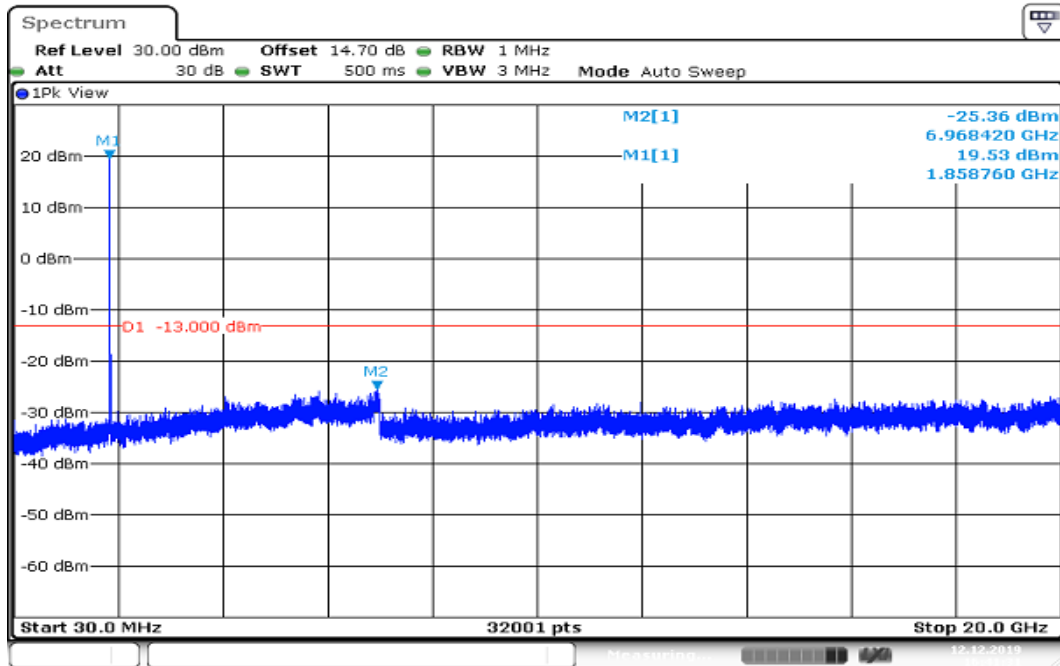


Date: 12.DEC.2019 16:39:27

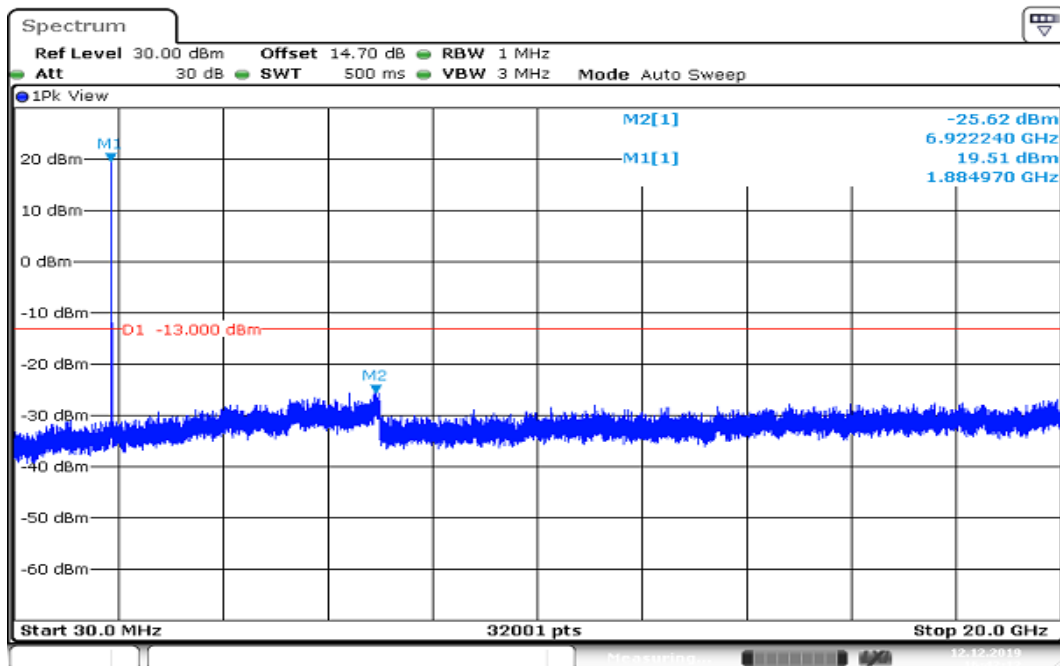
Report No.: T191105W01-RP9

CHANNEL BANDWIDTH: 10MHz / 16QAM

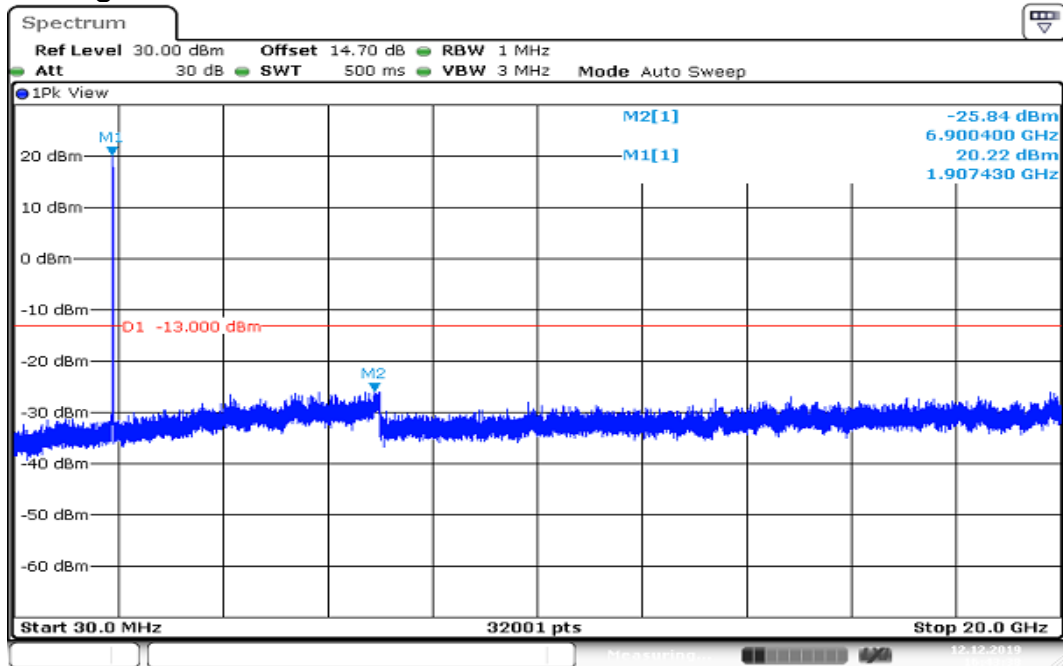
CH Low



CH Mid



CH High

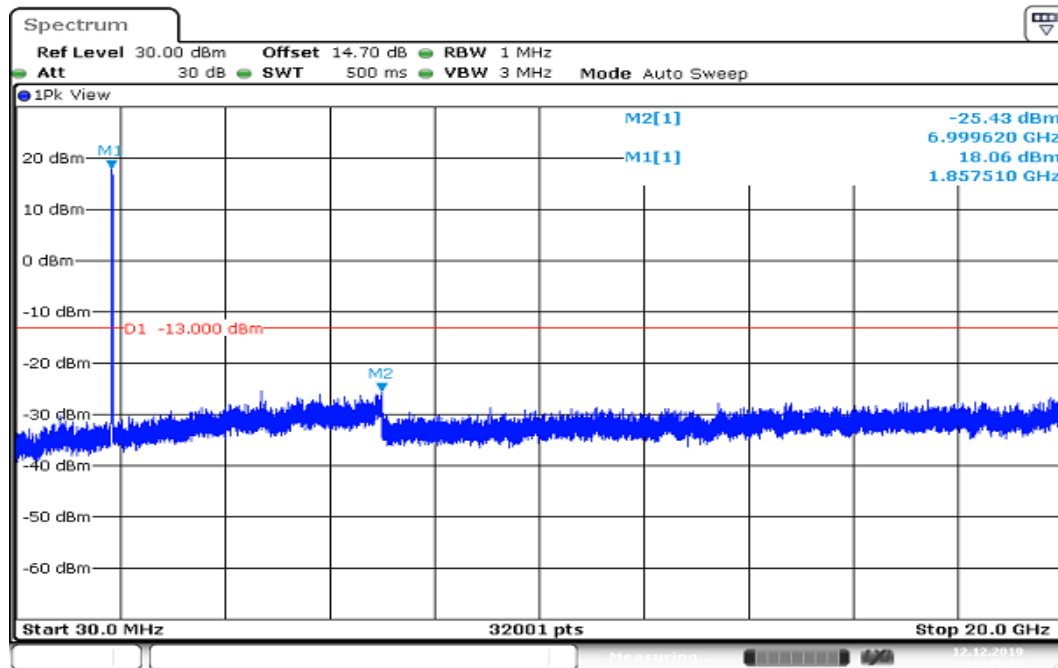


Date: 12.DEC.2019 16:43:38

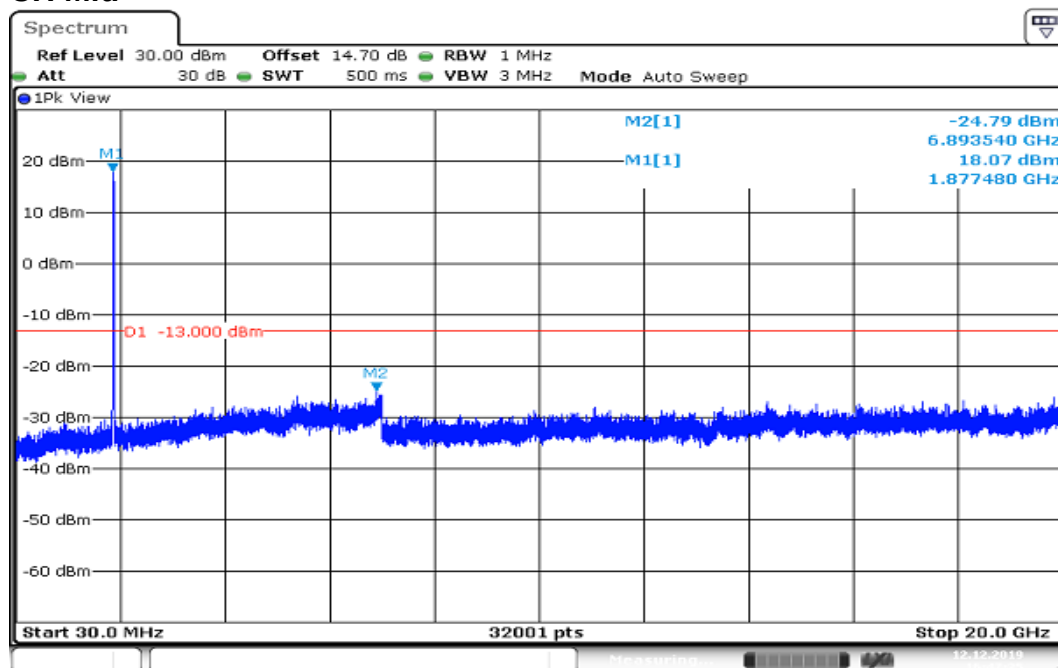
Report No.: T191105W01-RP9

CHANNEL BANDWIDTH: 15MHz / 16QAM

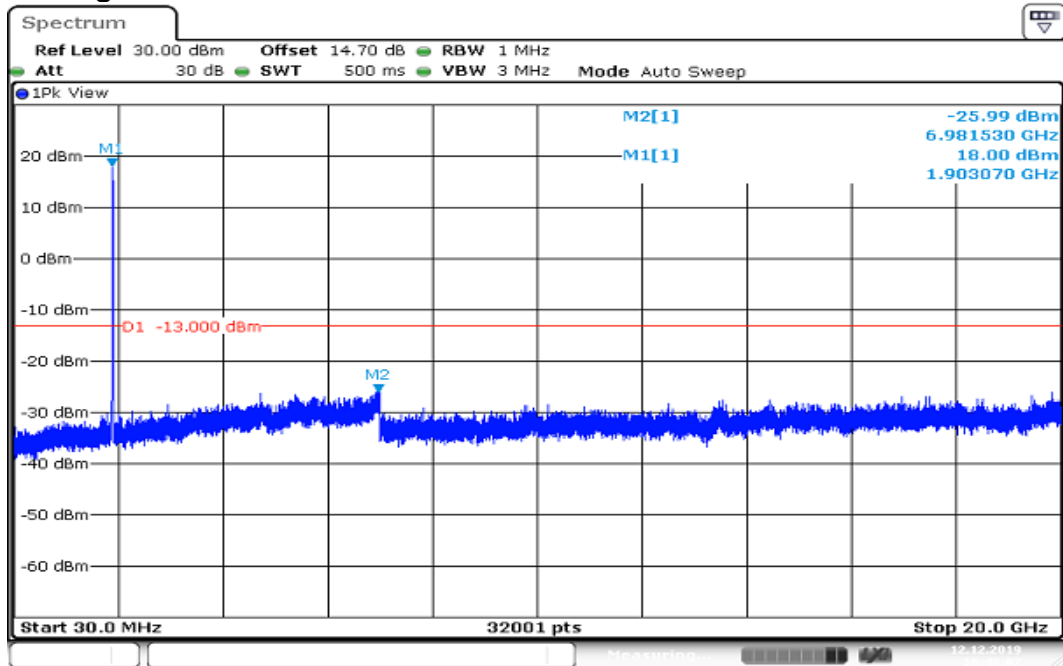
CH Low



CH Mid



CH High

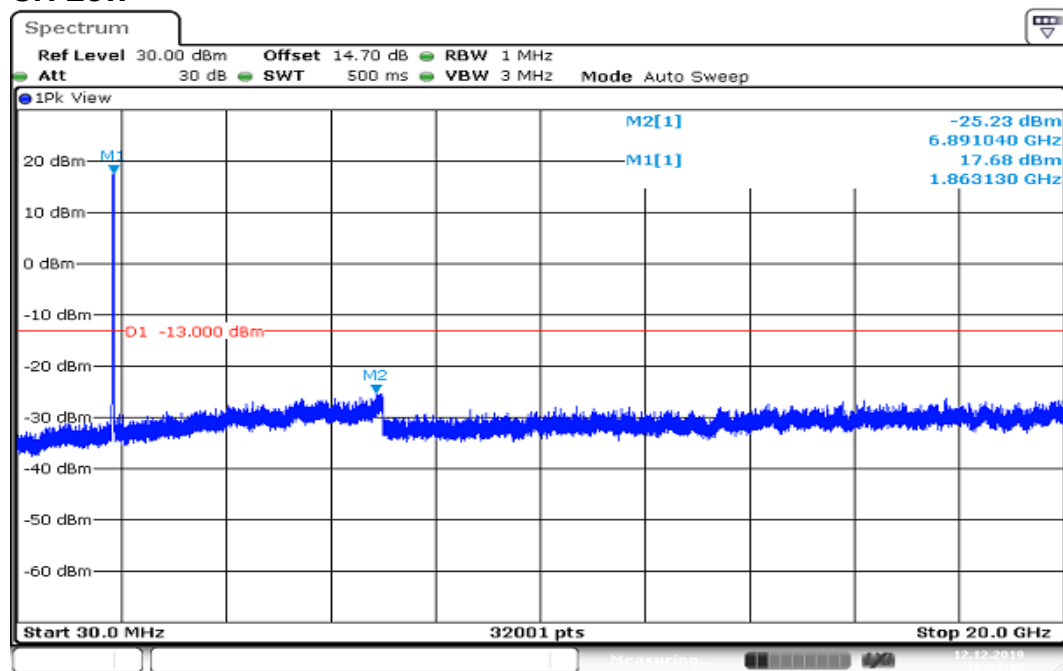


Date: 12.DEC.2019 16:48:08

Report No.: T191105W01-RP9

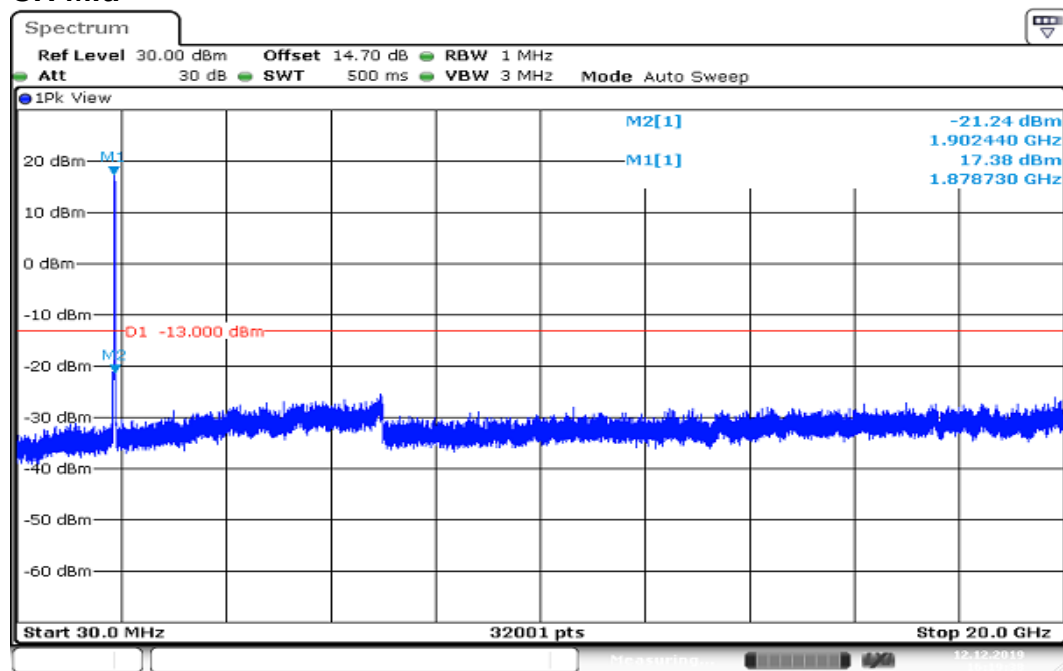
CHANNEL BANDWIDTH: 20MHz / 16QAM

CH Low



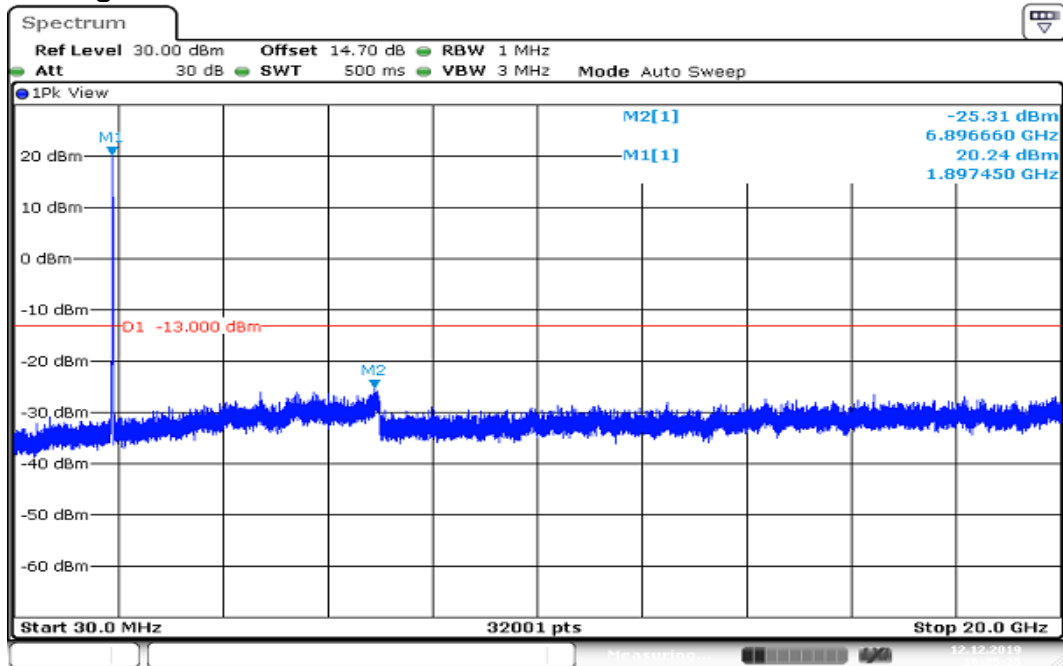
Date: 12.DEC.2019 16:21:10

CH Mid



Date: 12.DEC.2019 16:19:39

CH High



Date: 12.DEC.2019 16:25:26

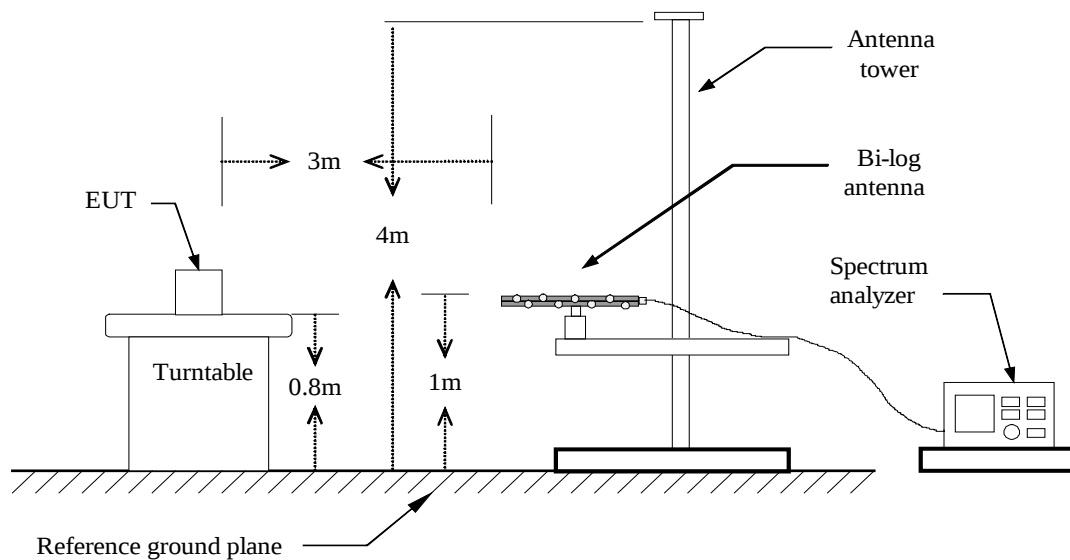
8.7 SPURIOUS RADIATION MEASUREMENT

LIMIT

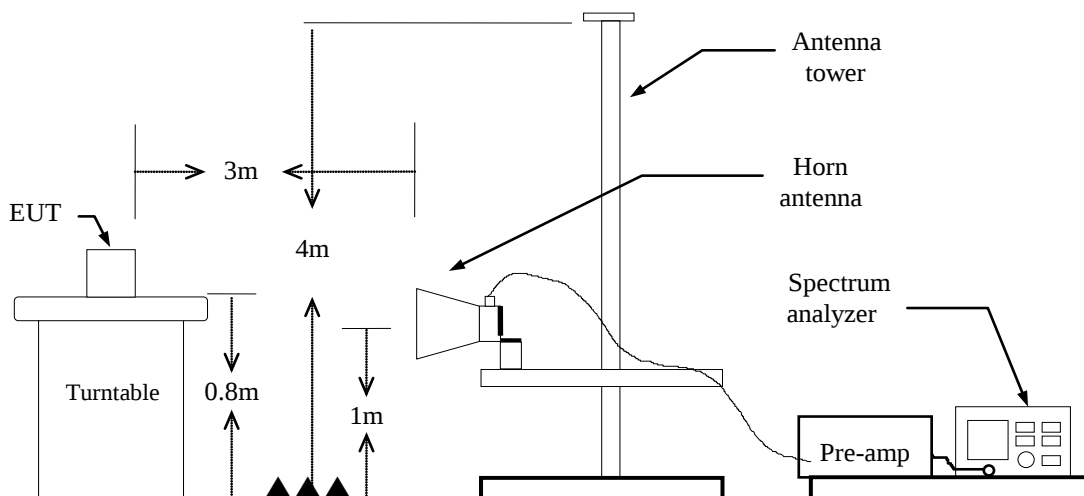
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

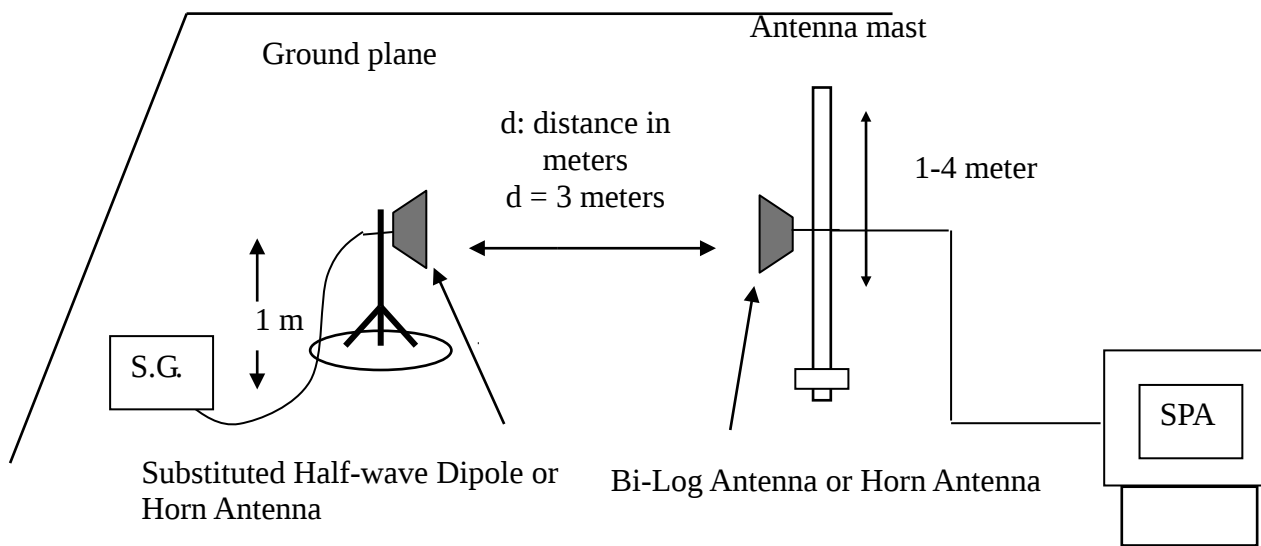
Test Configuration

Below 1 GHz



Above 1 GHz



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

1. According to KDB 971168 D01 and TIA-603-E,
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 25 / BW: 20MHz / QPSK / RB =1, RB Offset = 0****Operation Mode:** Tx / Low CH**Test Date:**

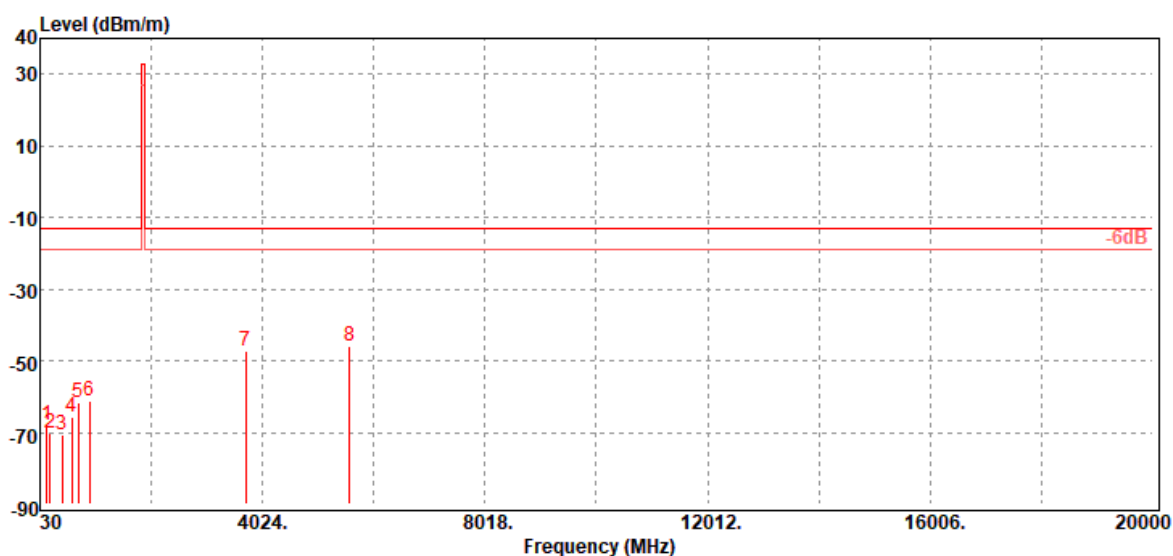
December 18, 2019

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)
158.04	-68.09	-60.66	-6.40	-1.03	-13.00	-55.09	V
209.45	-70.10	-66.73	-2.18	-1.19	-13.00	-57.10	V
424.79	-70.61	-67	-1.90	-1.71	-13.00	-57.61	V
605.21	-65.80	-62.72	-1.00	-2.08	-13.00	-52.80	V
721.61	-61.75	-58.09	-1.40	-2.26	-13.00	-48.75	V
919.49	-61.22	-57.35	-1.30	-2.57	-13.00	-48.22	V
3720.00	-47.20	-53.93	12.46	-5.73	-13.00	-34.20	V
5580.00	-45.74	-51.77	13.14	-7.11	-13.00	-32.74	V



Report No.: T191105W01-RP9

Operation Mode: Tx / Low CH

Test Date:

December 18, 2019

Temperature: 18.6°C

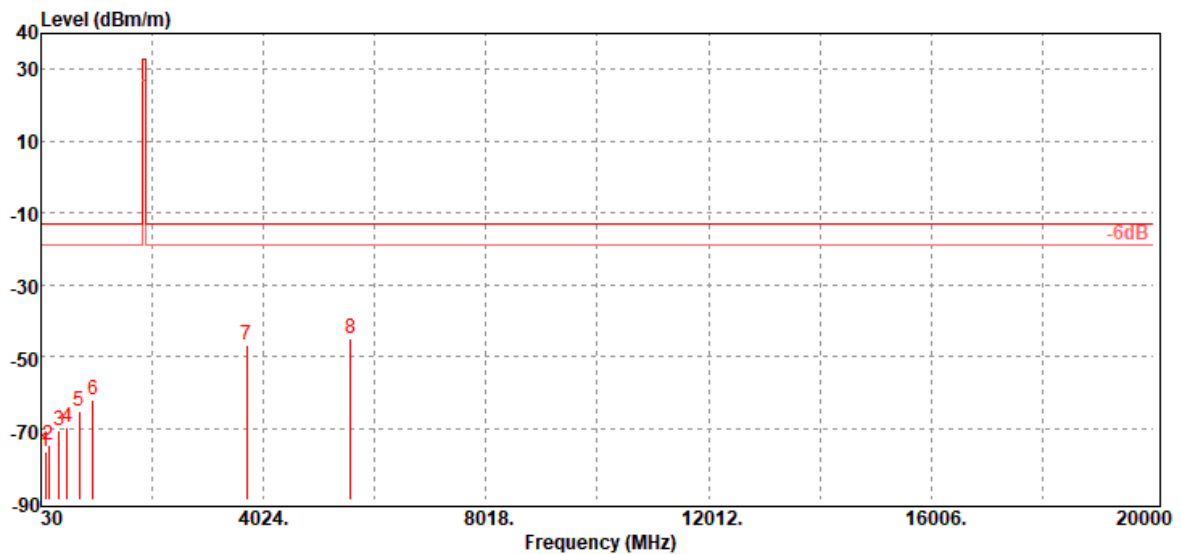
Tested by:

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)
102.75	-76.58	-66.87	-8.88	-0.83	-13.00	-63.58	H
170.65	-74.77	-68.37	-5.33	-1.07	-13.00	-61.77	H
353.01	-70.58	-67.59	-1.44	-1.55	-13.00	-57.58	H
497.54	-69.76	-65.9	-2.00	-1.86	-13.00	-56.76	H
721.61	-65.06	-61.4	-1.40	-2.26	-13.00	-52.06	H
968.96	-62.31	-58.37	-1.30	-2.64	-13.00	-49.31	H
3720.00	-47.03	-53.76	12.46	-5.73	-13.00	-34.03	H
5580.00	-44.94	-50.97	13.14	-7.11	-13.00	-31.94	H

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

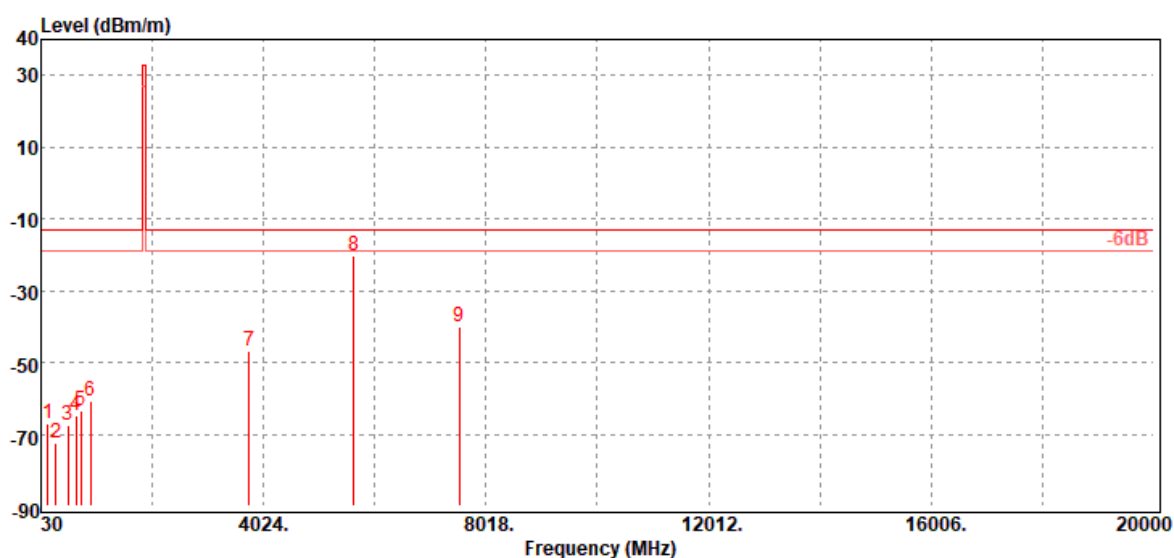
Tested by:

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)
150.28	-66.90	-58.79	-7.10	-1.01	-13.00	-53.90	V
294.81	-72.41	-68.89	-2.10	-1.42	-13.00	-59.41	V
508.21	-67.29	-63.63	-1.77	-1.89	-13.00	-54.29	V
660.50	-64.75	-61.17	-1.41	-2.17	-13.00	-51.75	V
747.80	-63.43	-59.72	-1.40	-2.31	-13.00	-50.43	V
919.49	-60.75	-56.88	-1.30	-2.57	-13.00	-47.75	V
3765.00	-46.80	-53.47	12.43	-5.76	-13.00	-33.80	V
5647.50	-20.21	-26.36	13.29	-7.14	-13.00	-7.21	V
7530.00	-39.98	-42.73	10.86	-8.11	-13.00	-26.98	V

Report No.: T191105W01-RP9

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

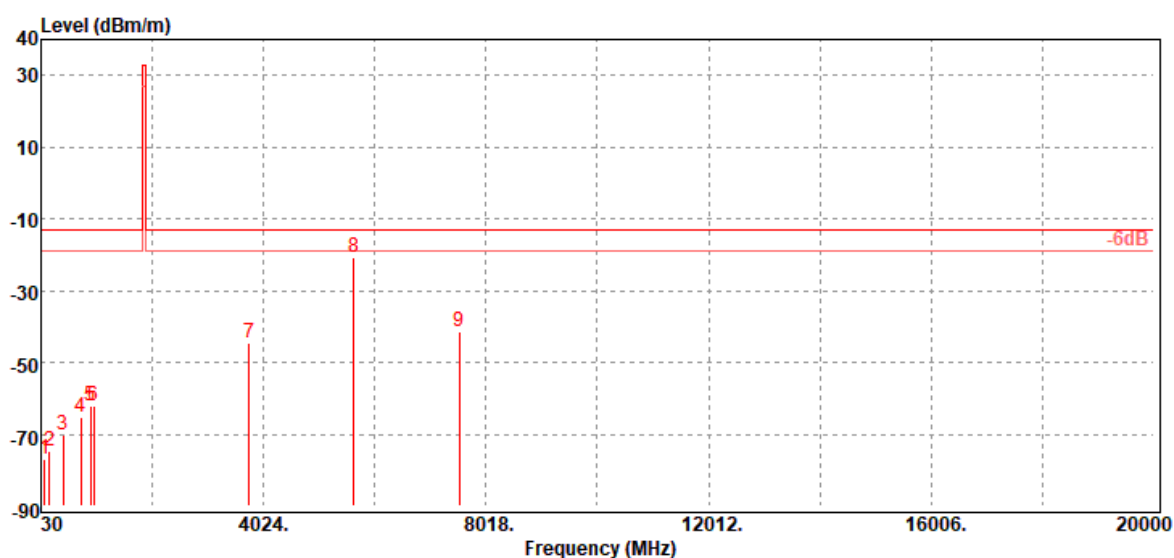
Tested by:

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)
94.99	-76.87	-68.77	-7.30	-0.80	-13.00	-63.87	H
180.35	-74.51	-69.05	-4.36	-1.10	-13.00	-61.51	H
425.76	-70.04	-66.43	-1.90	-1.71	-13.00	-57.04	H
745.86	-65.07	-61.37	-1.40	-2.30	-13.00	-52.07	H
922.40	-62.31	-58.43	-1.30	-2.58	-13.00	-49.31	H
973.81	-62.29	-58.27	-1.38	-2.64	-13.00	-49.29	H
3765.00	-44.75	-51.42	12.43	-5.76	-13.00	-31.75	H
5647.50	-20.80	-26.95	13.29	-7.14	-13.00	-7.80	H
7530.00	-41.63	-44.38	10.86	-8.11	-13.00	-28.63	H

Operation Mode: Tx / High CH

Test Date:

December 18, 2019

Temperature: 18.6°C

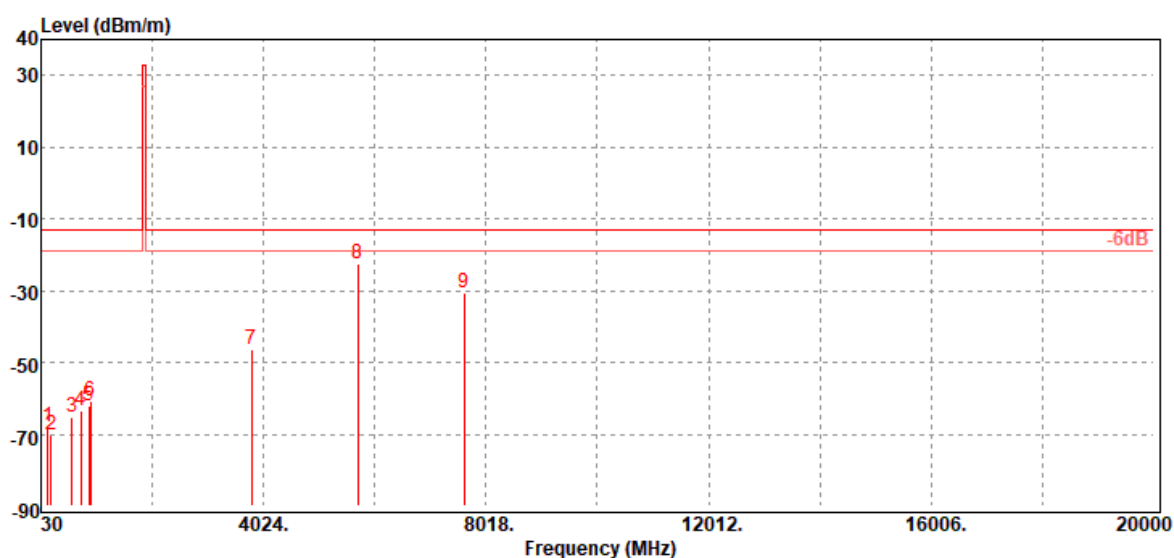
Tested by:

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)
148.34	-67.88	-59.61	-7.27	-1.00	-13.00	-54.88	V
207.51	-70.43	-66.8	-2.45	-1.18	-13.00	-57.43	V
589.69	-65.17	-62.11	-1.01	-2.05	-13.00	-52.17	V
747.80	-63.40	-59.69	-1.40	-2.31	-13.00	-50.40	V
891.36	-62.13	-58.37	-1.23	-2.53	-13.00	-49.13	V
920.46	-60.69	-56.81	-1.30	-2.58	-13.00	-47.69	V
3810.00	-46.49	-53.17	12.48	-5.80	-13.00	-33.49	V
5715.00	-22.39	-28.31	13.10	-7.18	-13.00	-9.39	V
7620.00	-30.57	-33.6	11.20	-8.17	-13.00	-17.57	V

Operation Mode: Tx / High CH

Test Date:

December 18, 2019

Temperature: 18.6°C

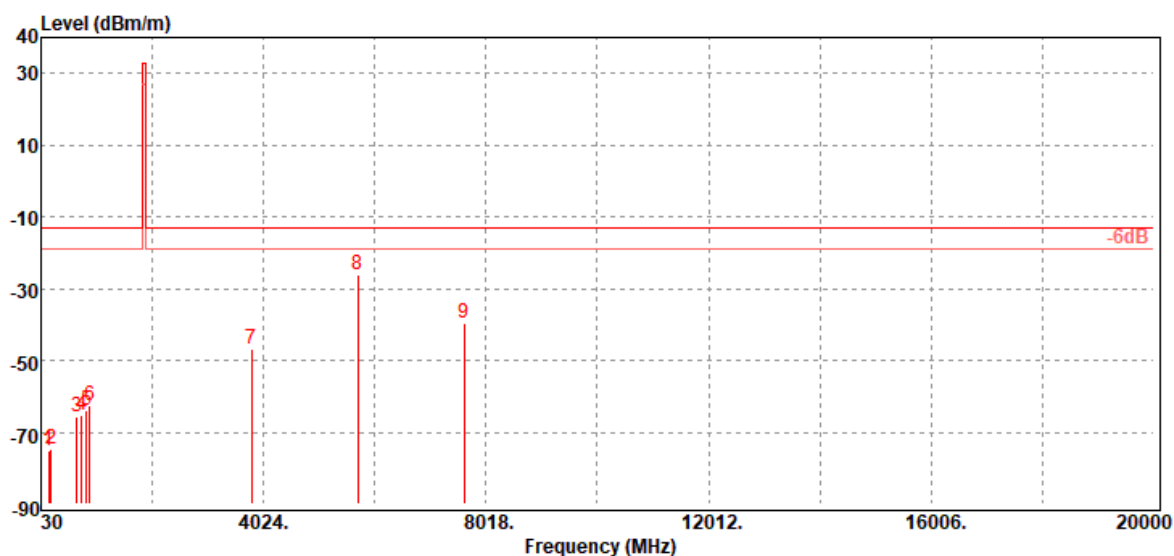
Tested by:

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)
167.74	-75.35	-68.74	-5.55	-1.06	-13.00	-62.35	H
209.45	-74.59	-71.22	-2.18	-1.19	-13.00	-61.59	H
675.05	-65.66	-62.17	-1.30	-2.19	-13.00	-52.66	H
759.44	-65.23	-61.51	-1.40	-2.32	-13.00	-52.23	H
846.74	-63.80	-59.98	-1.37	-2.45	-13.00	-50.80	H
903.00	-62.43	-58.62	-1.26	-2.55	-13.00	-49.43	H
3810.00	-46.72	-53.4	12.48	-5.80	-13.00	-33.72	H
5715.00	-25.95	-31.87	13.10	-7.18	-13.00	-12.95	H
7620.00	-39.74	-42.77	11.20	-8.17	-13.00	-26.74	H

- End of Test Report -