

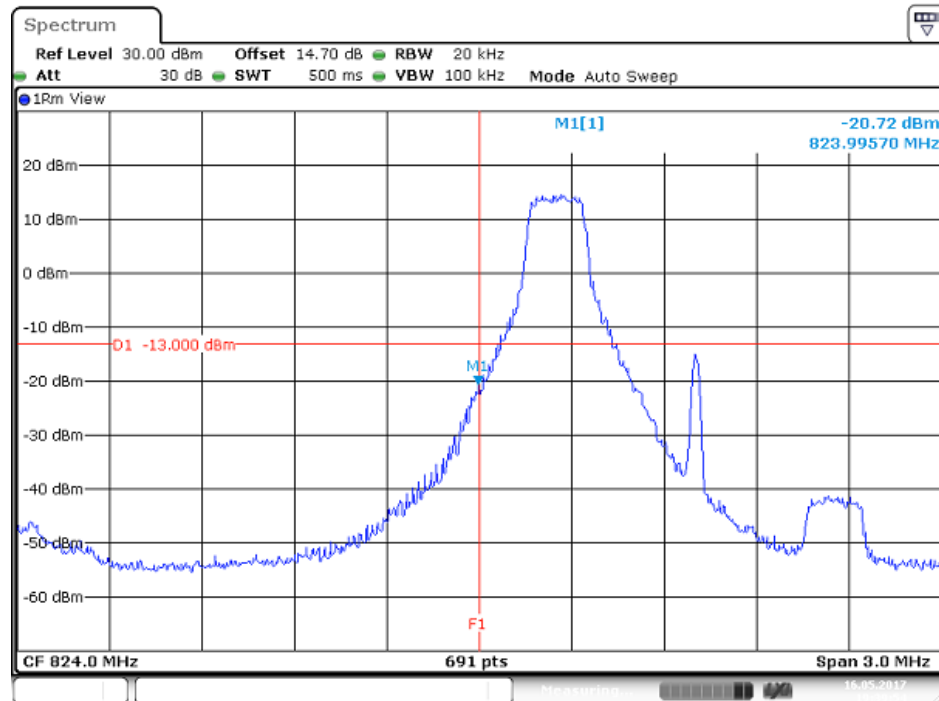
7.6 BAND EDGE MEASUREMENT

Limit

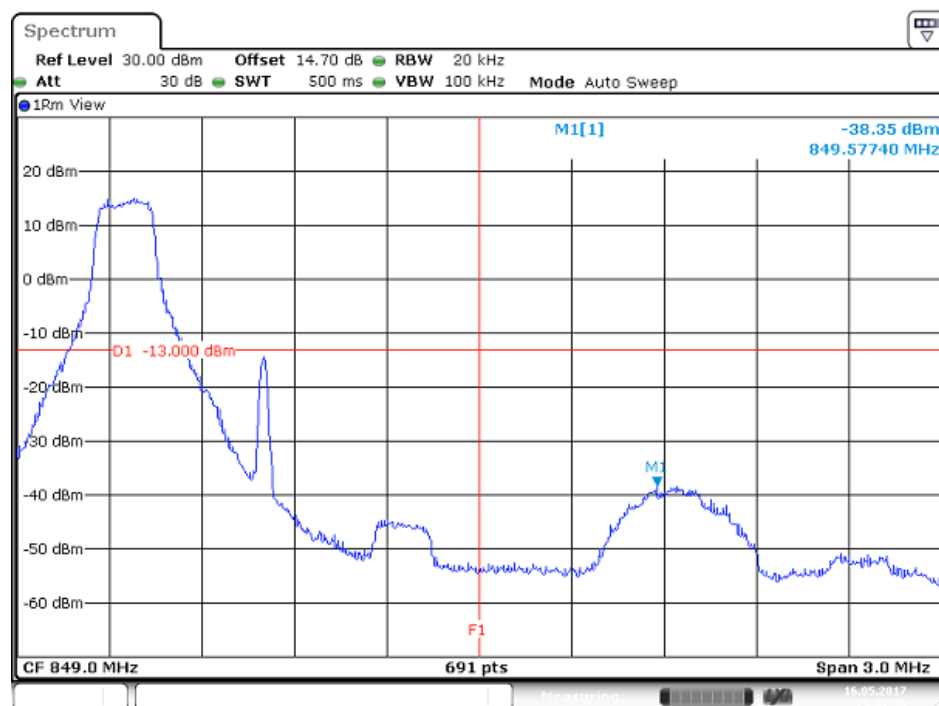
Emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm .

Test Procedures

1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
2. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 7.2 dB in the transmitted path track.
3. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz.
4. Record the max trace plot into the test report.

Test Results:**LTE Band 5****CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1 RB ALLOCATED****LOWER BAND EDGE**

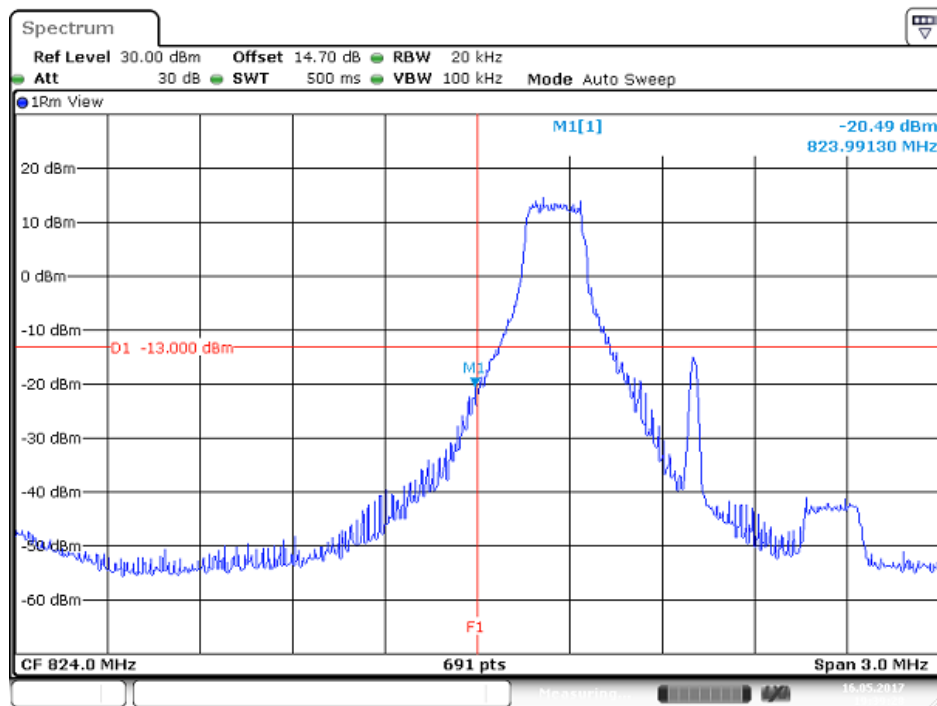
Date: 16 MAY 2017 19:29:55

HIGHER BAND EDGE

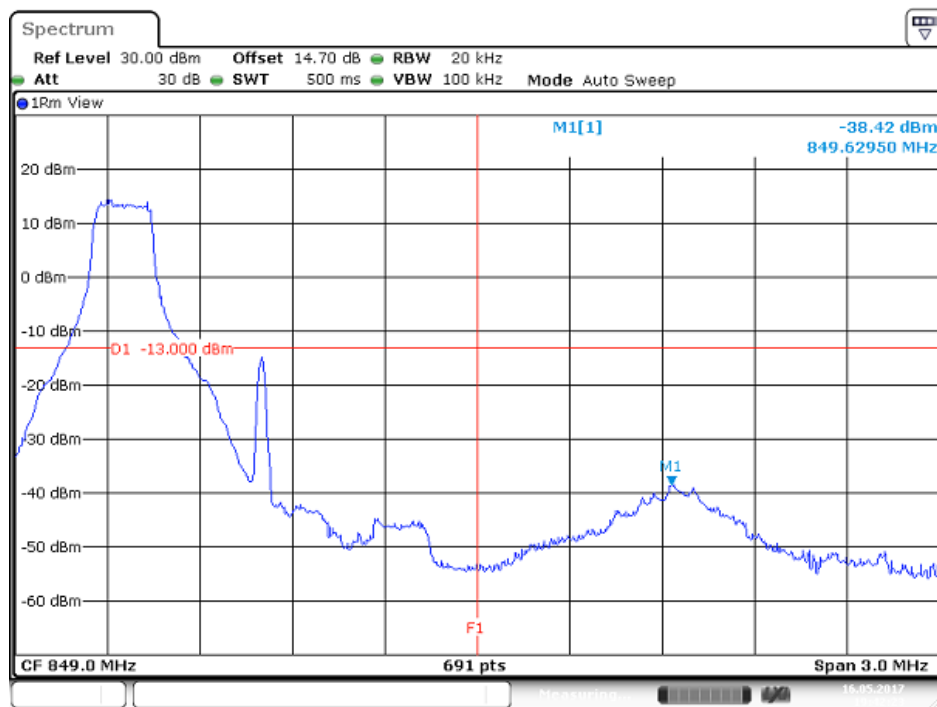
Date: 16 MAY 2017 19:41:38

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1 RB ALLOCATED

LOWER BAND EDGE

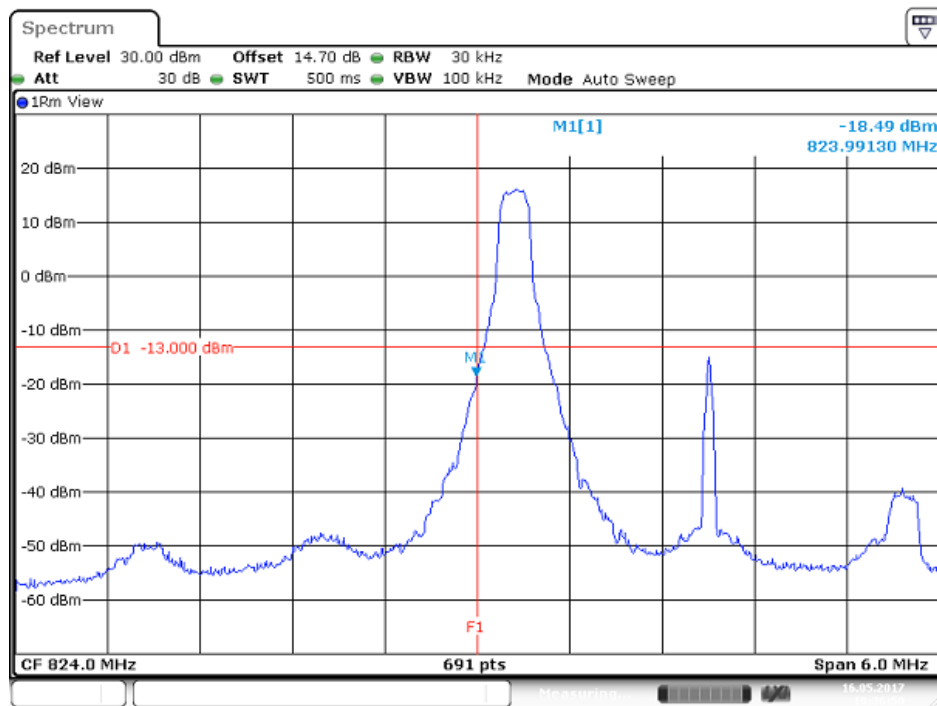


HIGHER BAND EDGE

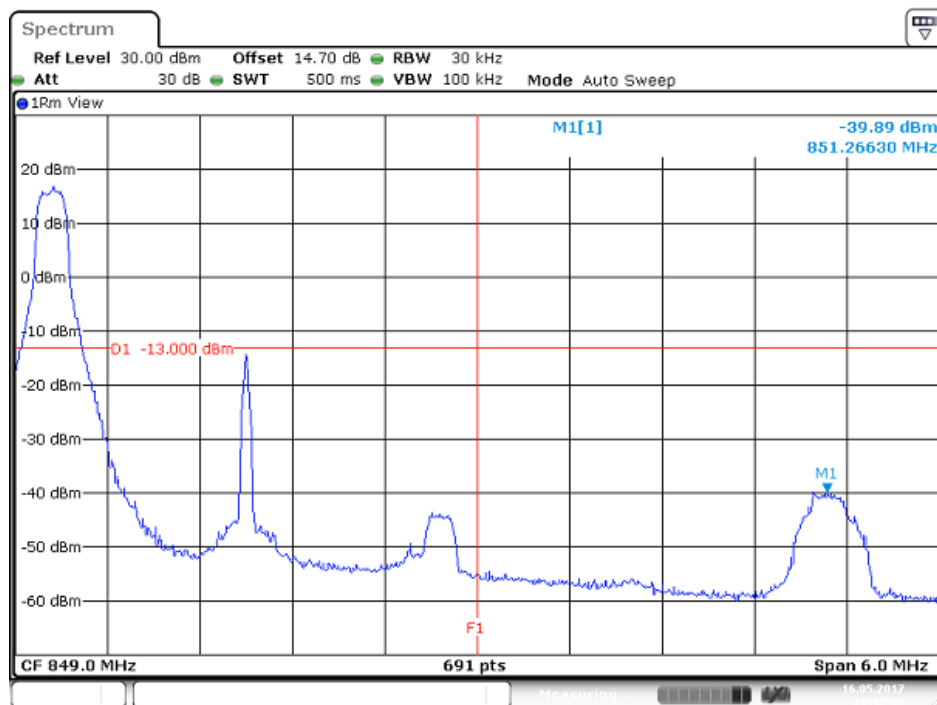


CHANNEL BANDWIDTH: 3MHz / QPSK / 1 RB ALLOCATED

LOWER BAND EDGE

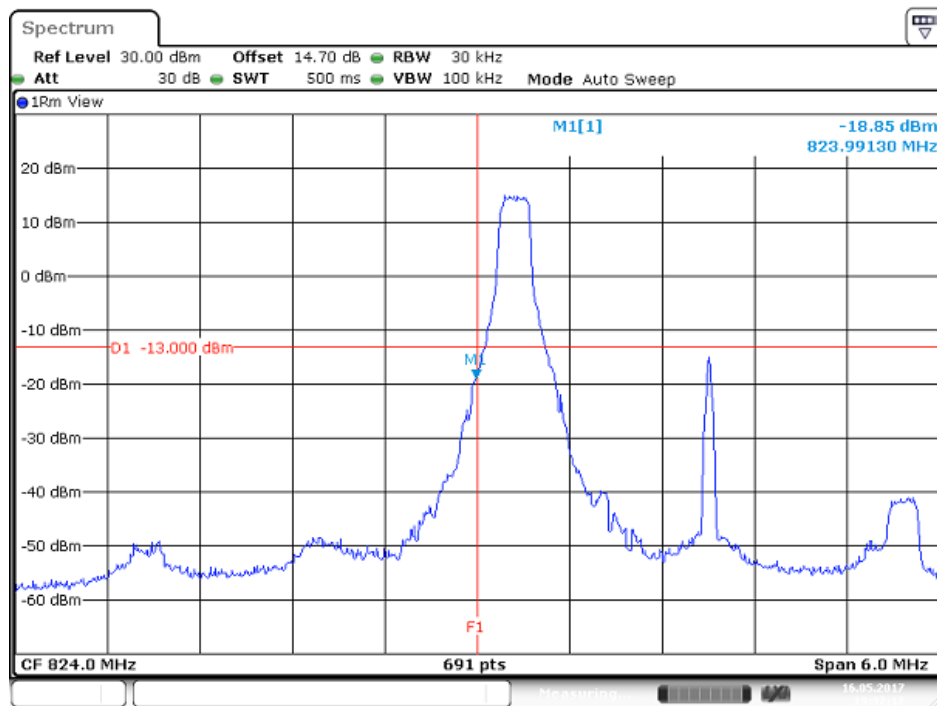


HIGHER BAND EDGE



CHANNEL BANDWIDTH: 3MHz / 16QAM / 1 RB ALLOCATED

LOWER BAND EDGE



Date: 16 MAY 2017 19:27:18

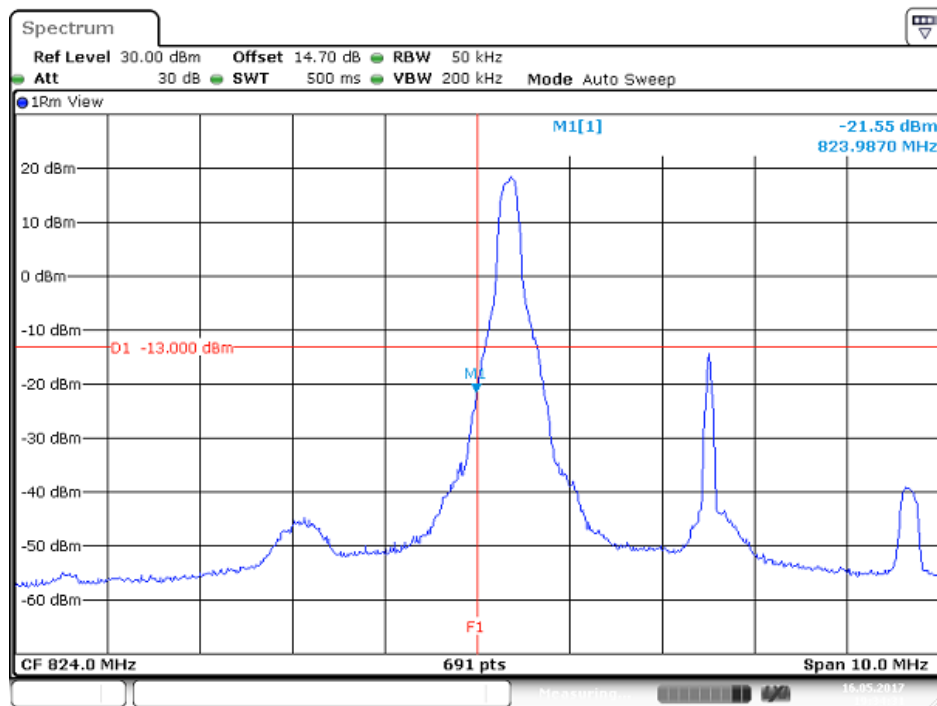
HIGHER BAND EDGE



Date: 16 MAY 2017 19:44:39

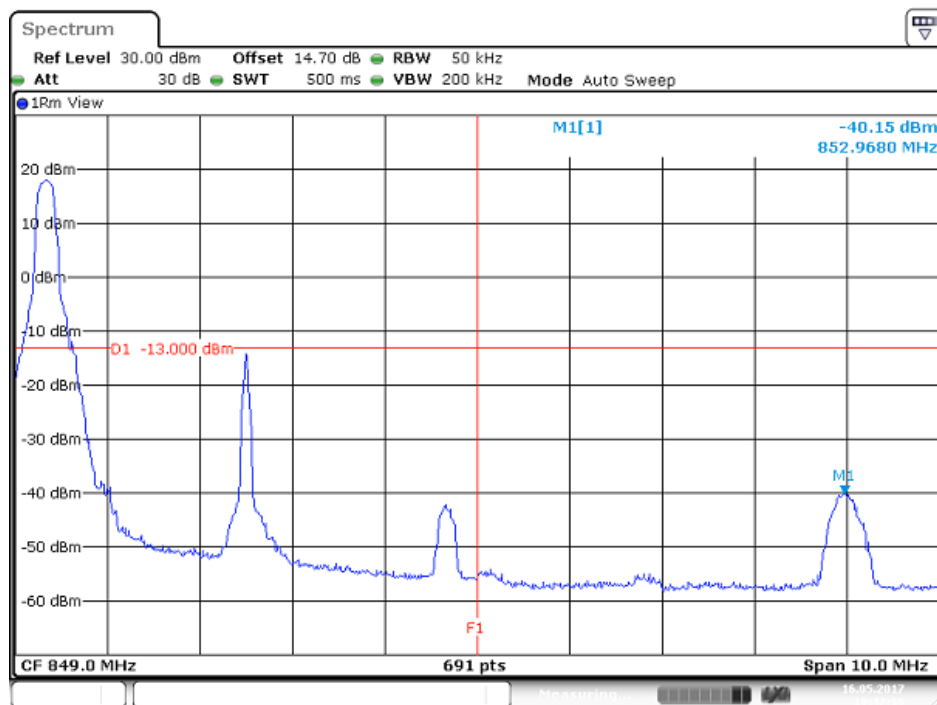
CHANNEL BANDWIDTH: 5MHz / QPSK / 1 RB ALLOCATED

LOWER BAND EDGE



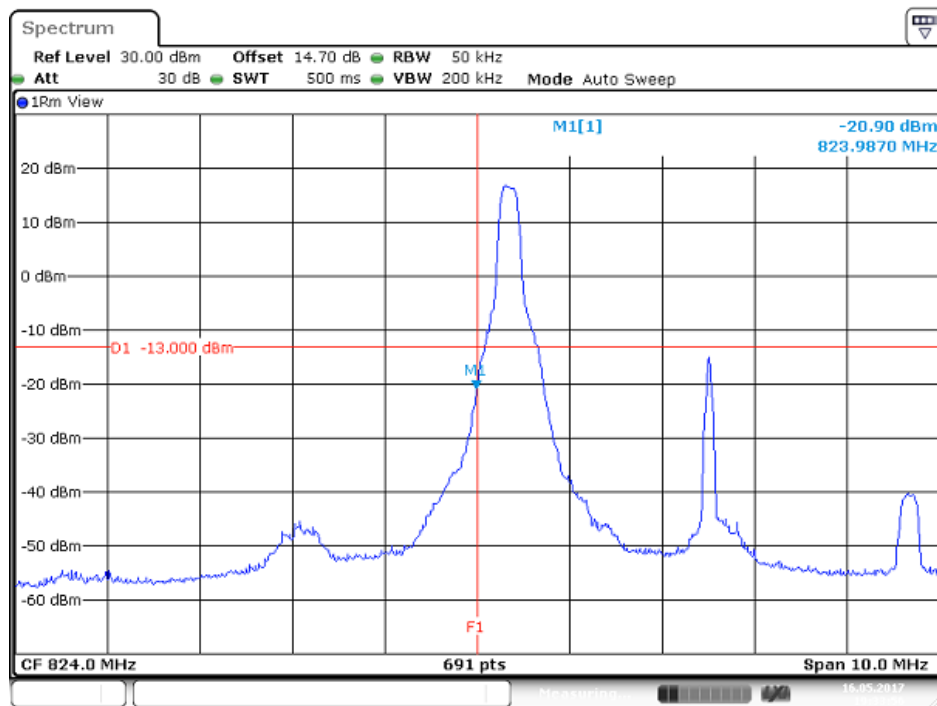
Date: 16 MAY 2017 19:24:31

HIGHER BAND EDGE

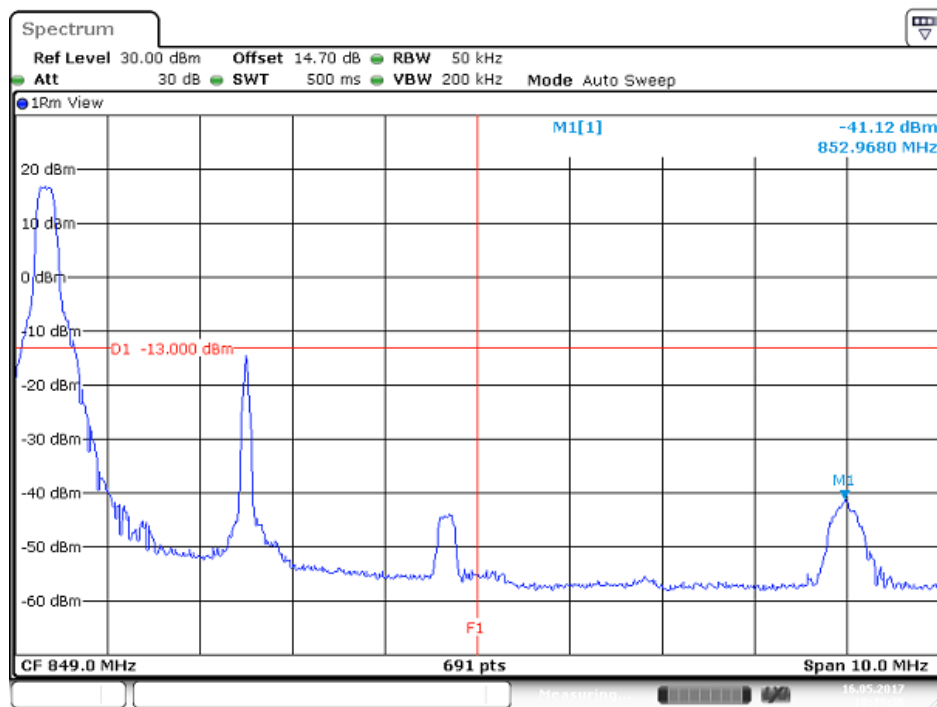


Date: 16 MAY 2017 19:47:17

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

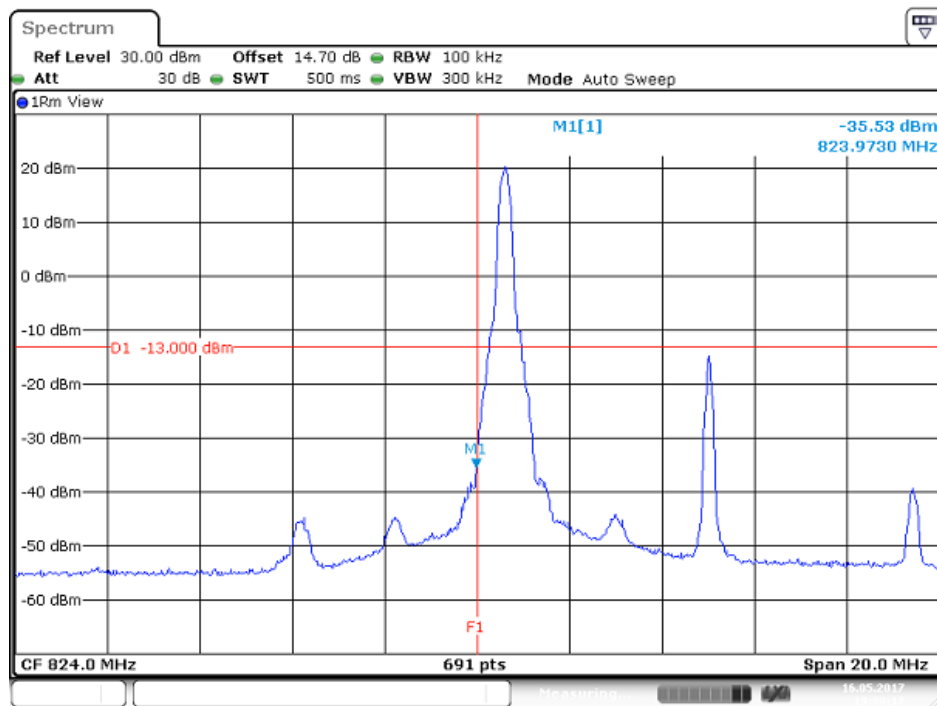


HIGHER BAND EDGE

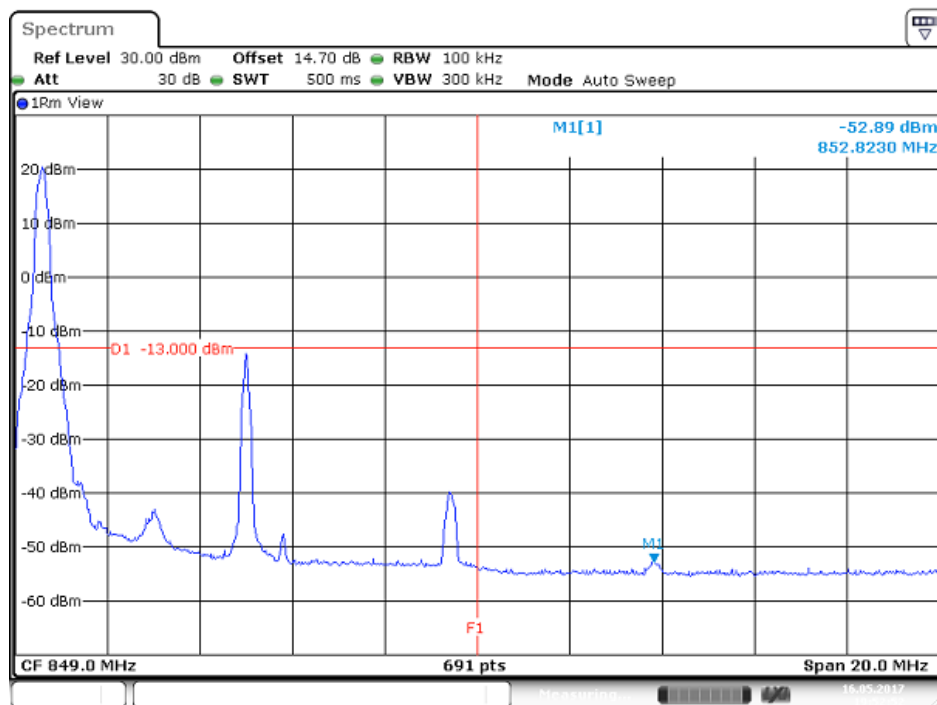


CHANNEL BANDWIDTH: 10MHz / QPSK / 1 RB ALLOCATED

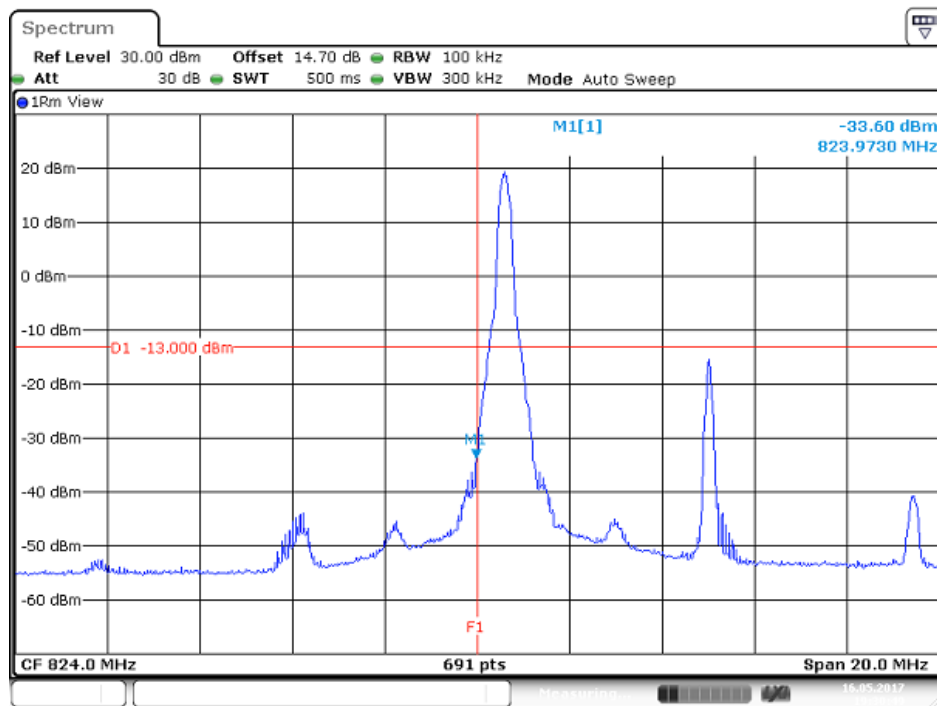
LOWER BAND EDGE



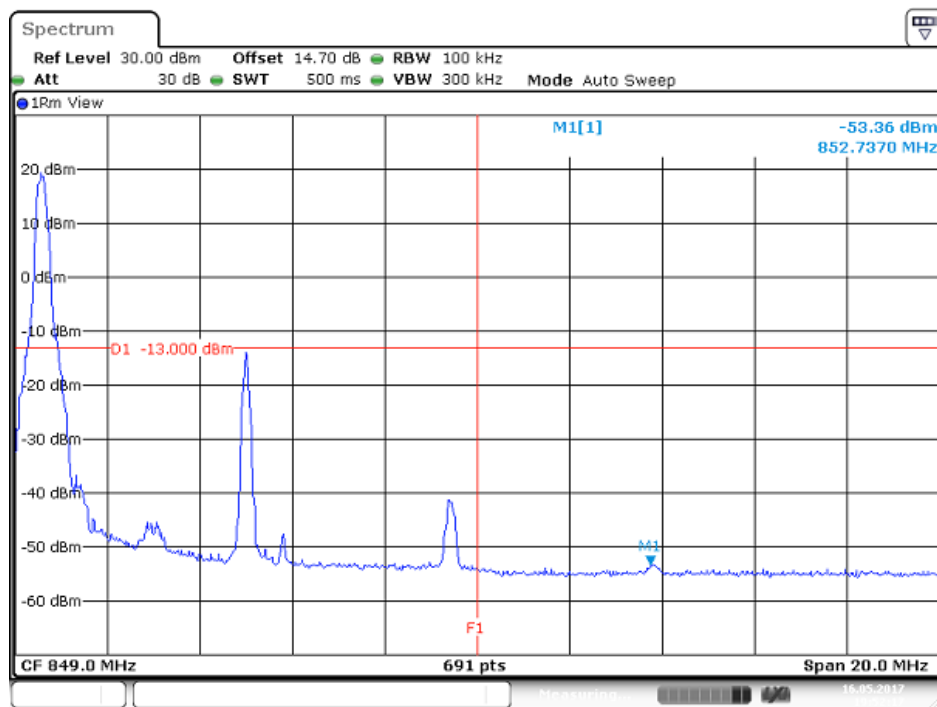
HIGHER BAND EDGE



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

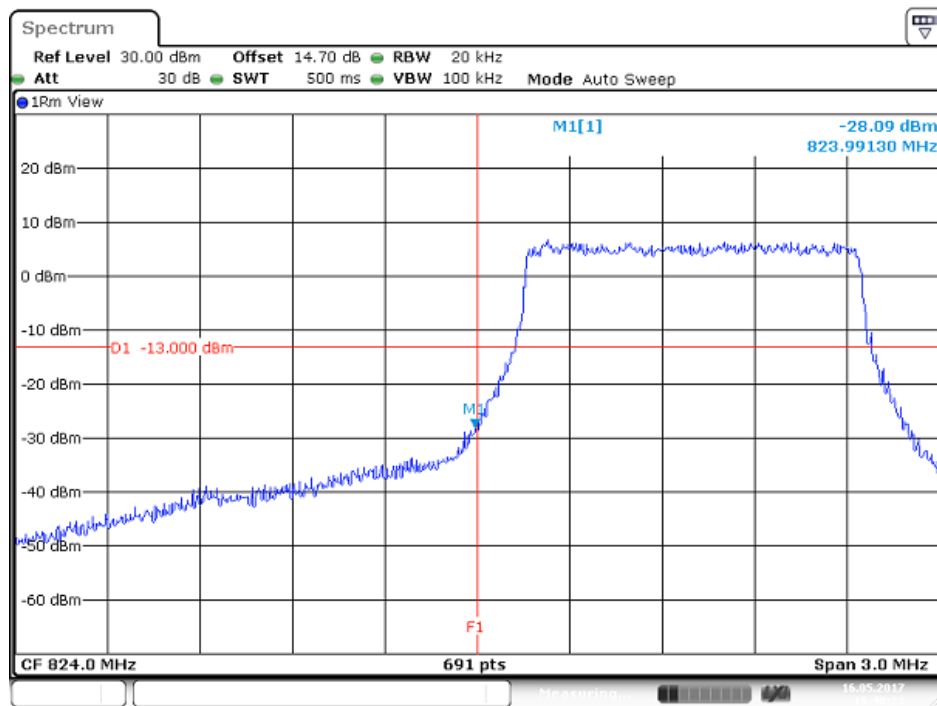


HIGHER BAND EDGE

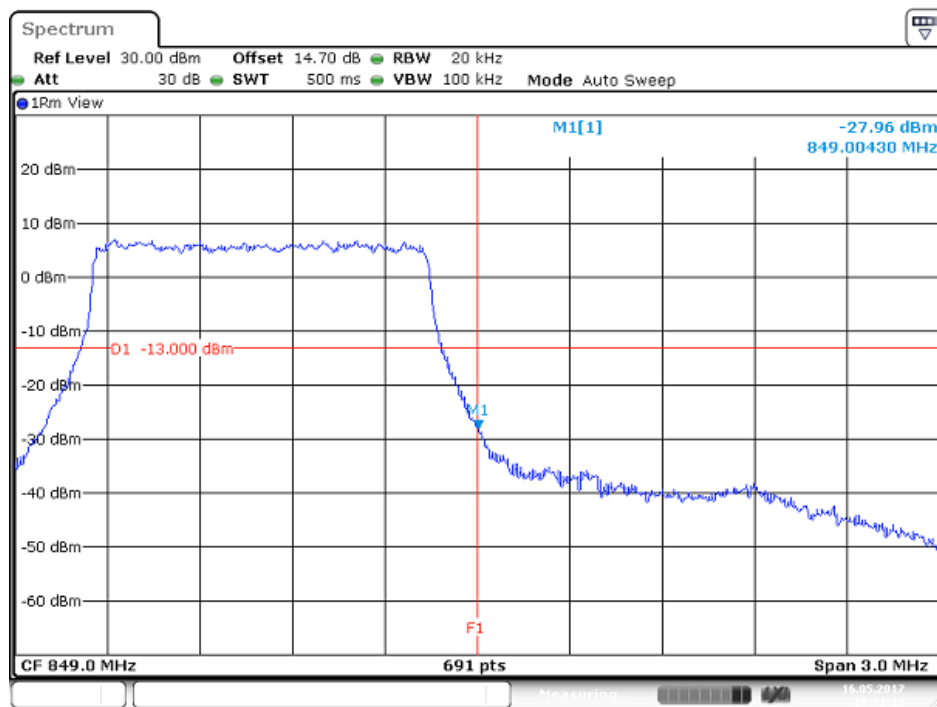


CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB ALLOCATED

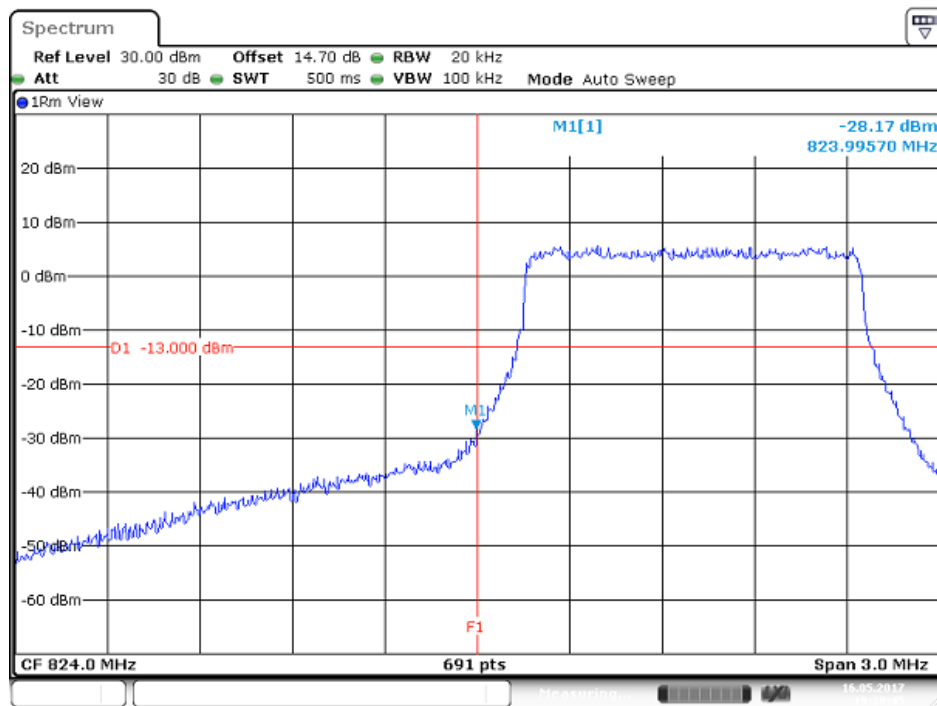
LOWER BAND EDGE



HIGHER BAND EDGE

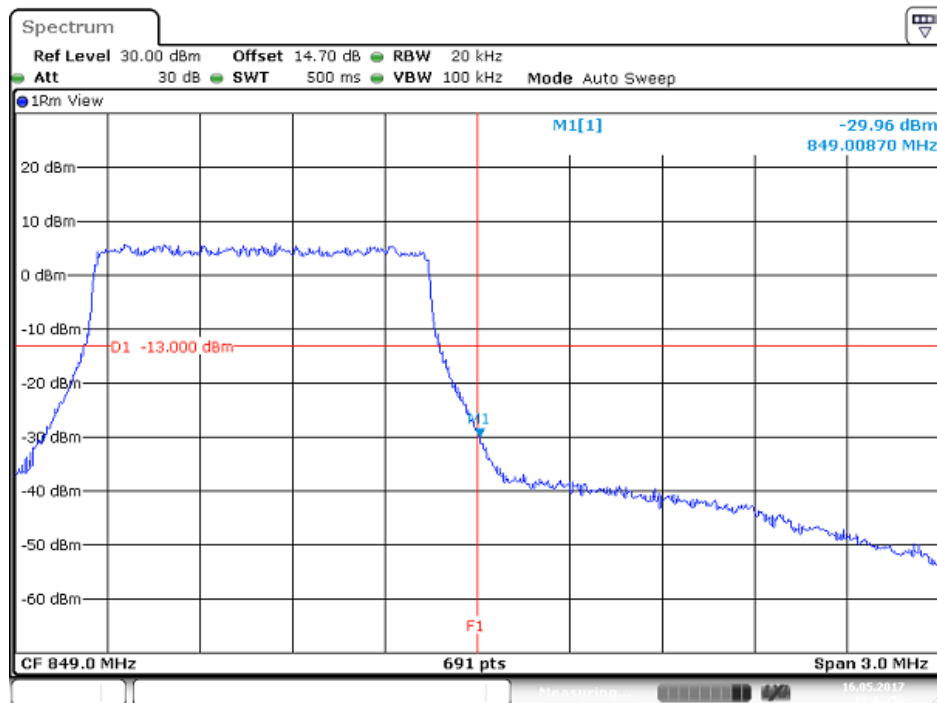


CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB ALLOCATED LOWER BAND EDGE



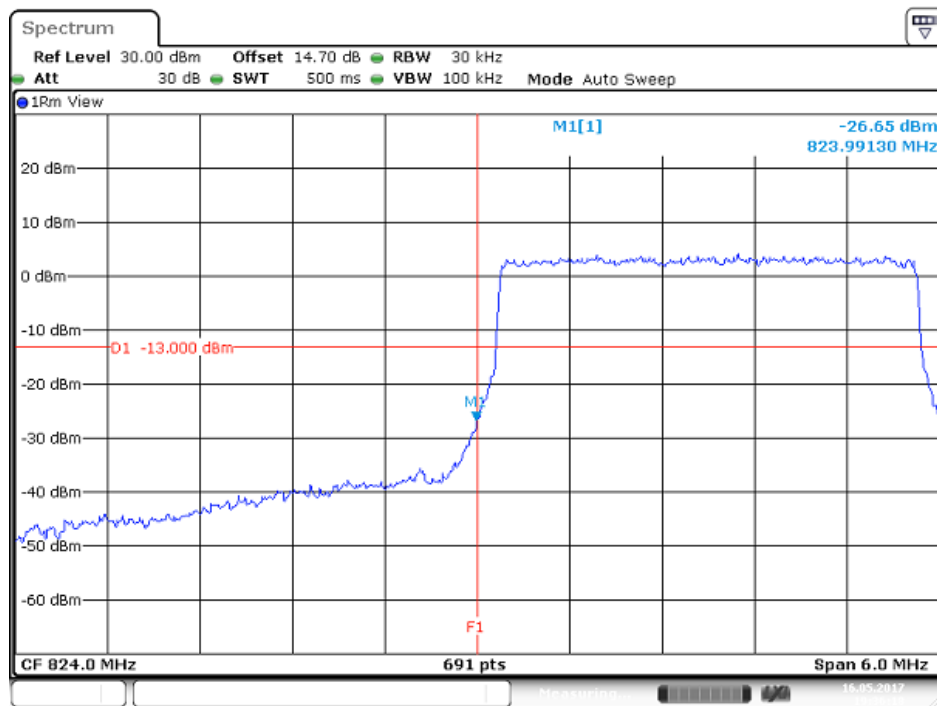
Date: 16 MAY 2017 19:28:46

HIGHER BAND EDGE

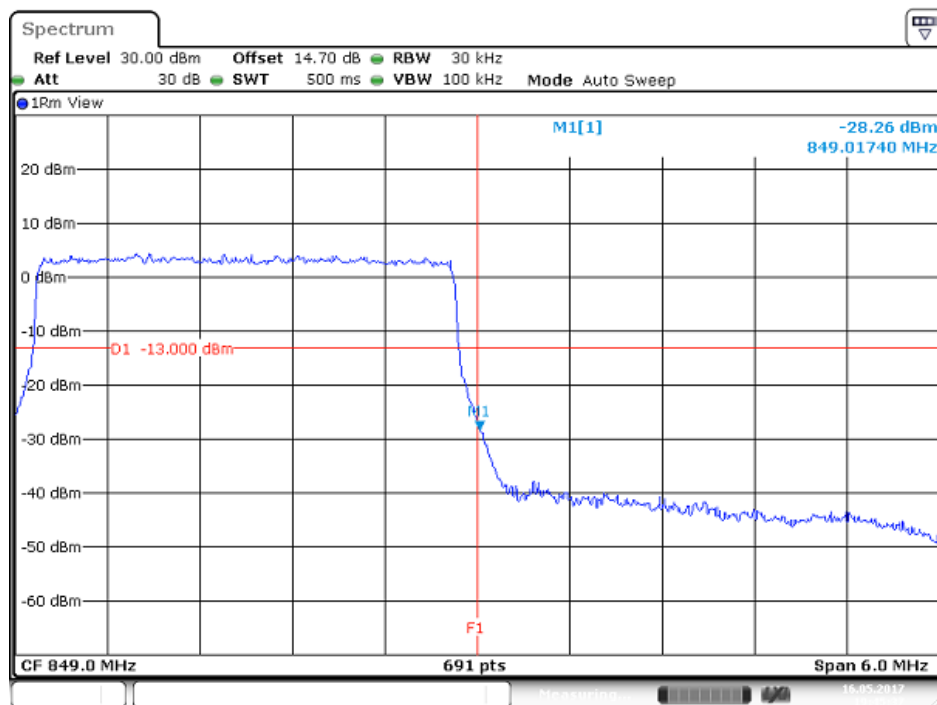


Date: 16 MAY 2017 19:42:50

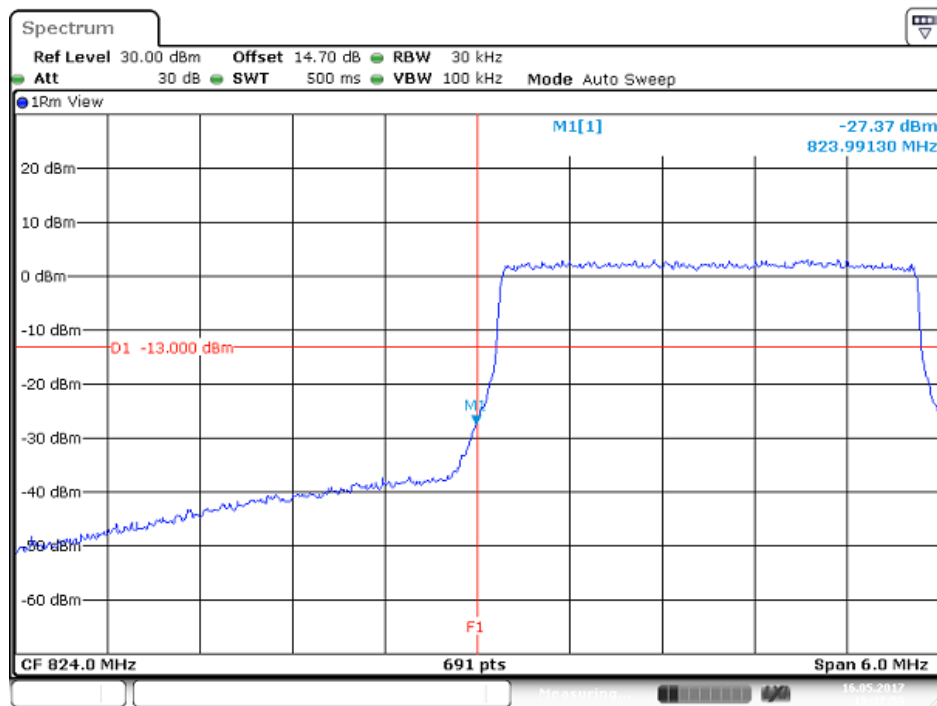
CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB ALLOCATED LOWER BAND EDGE



HIGHER BAND EDGE

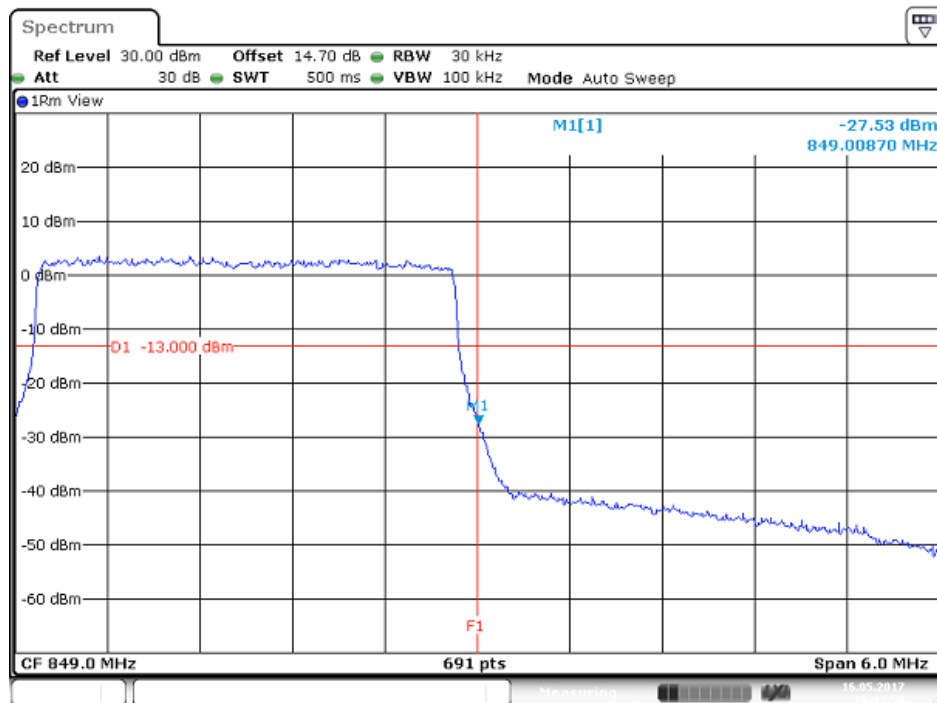


CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB ALLOCATED LOWER BAND EDGE



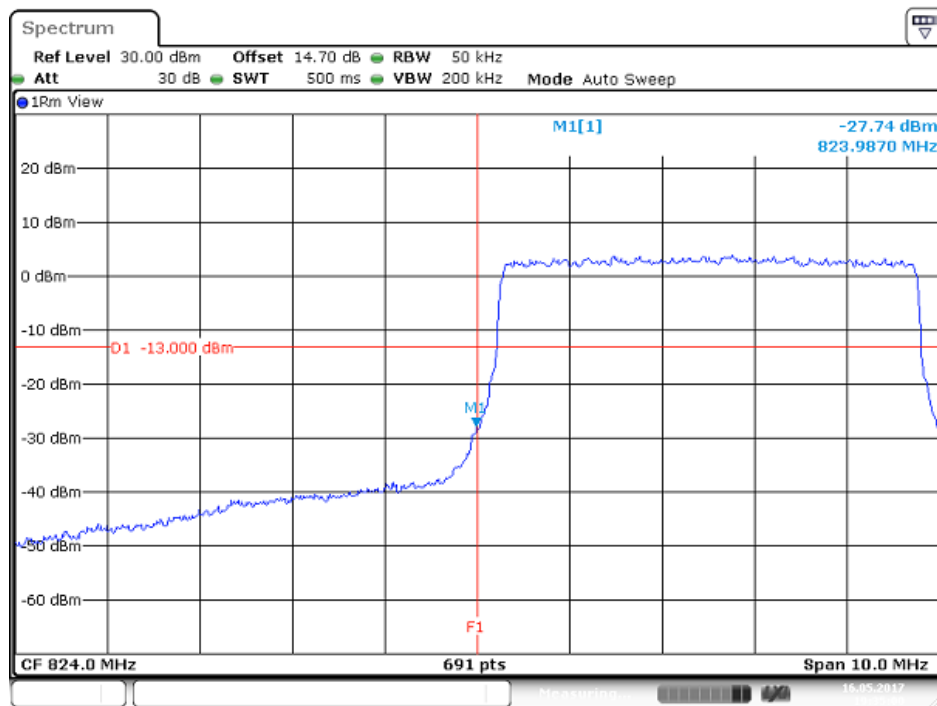
Date: 16 MAY 2017 19:27:50

HIGHER BAND EDGE

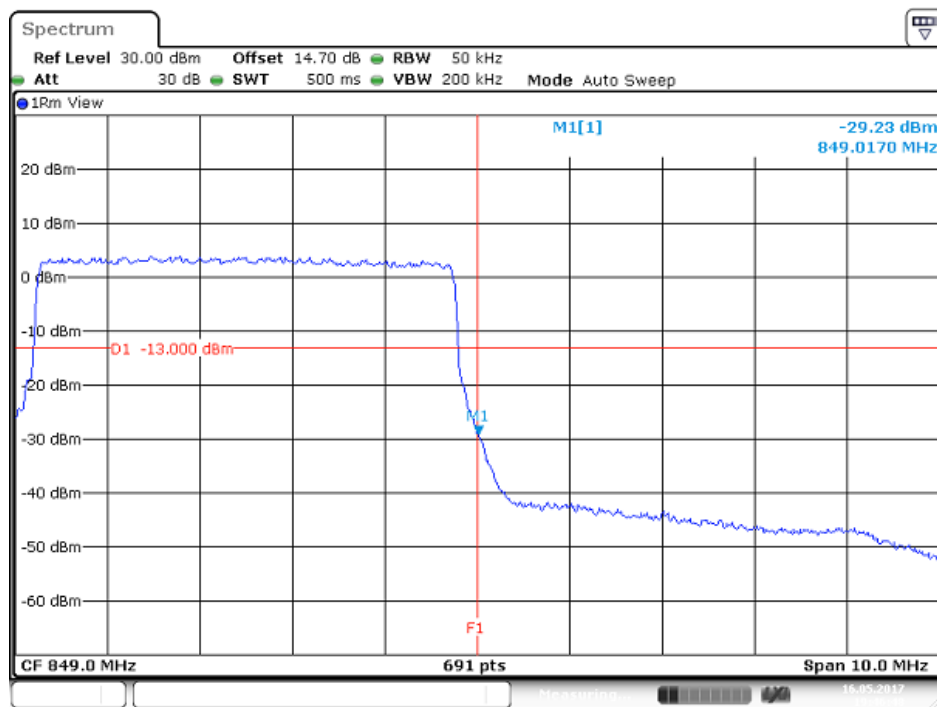


Date: 16 MAY 2017 19:43:51

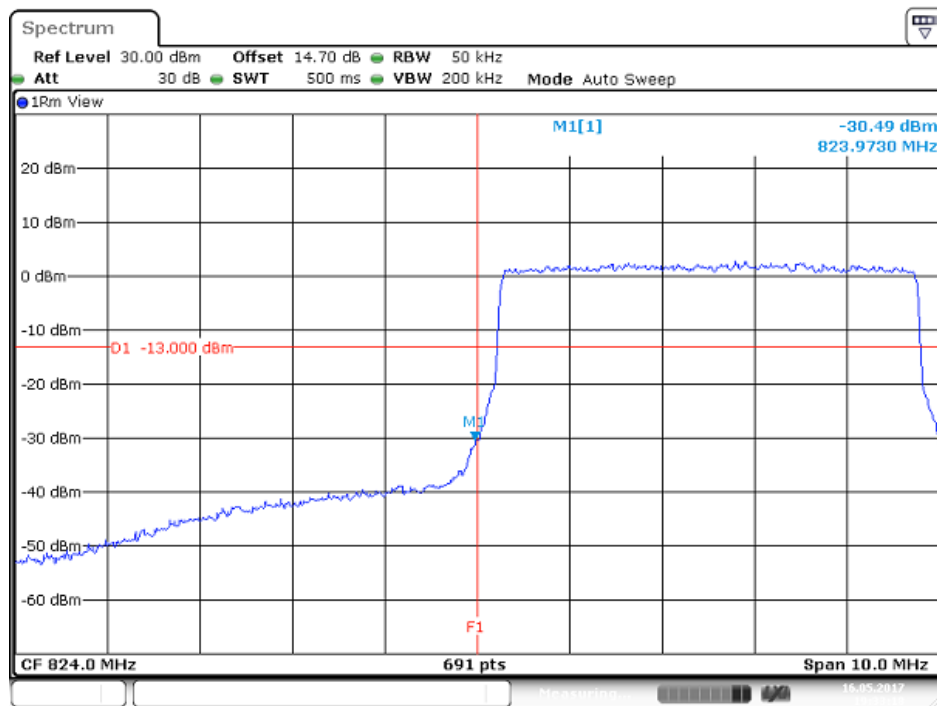
CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB ALLOCATED LOWER BAND EDGE



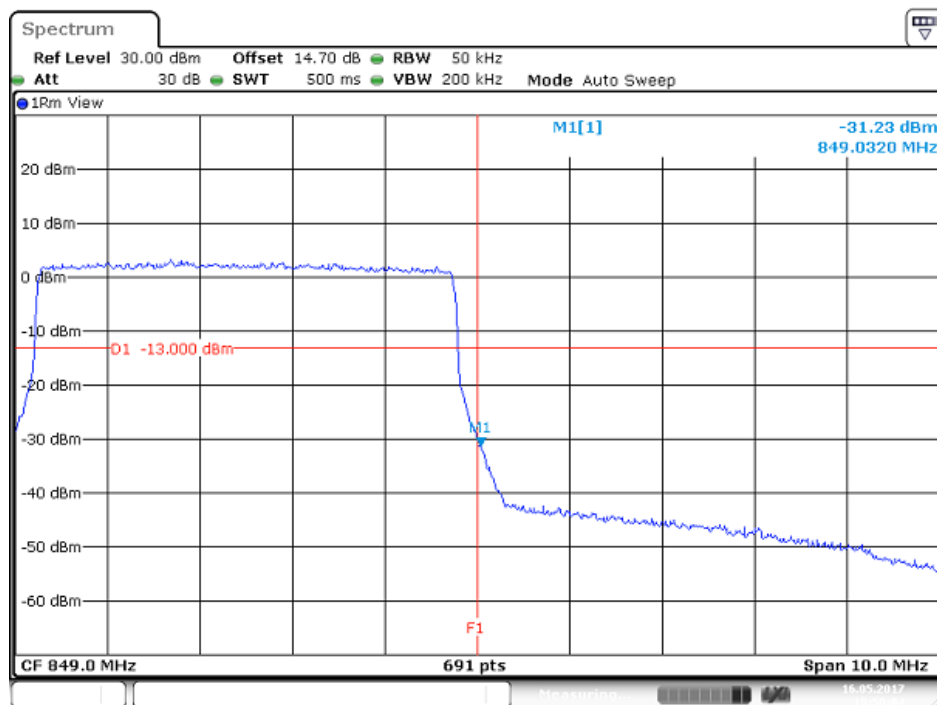
HIGHER BAND EDGE



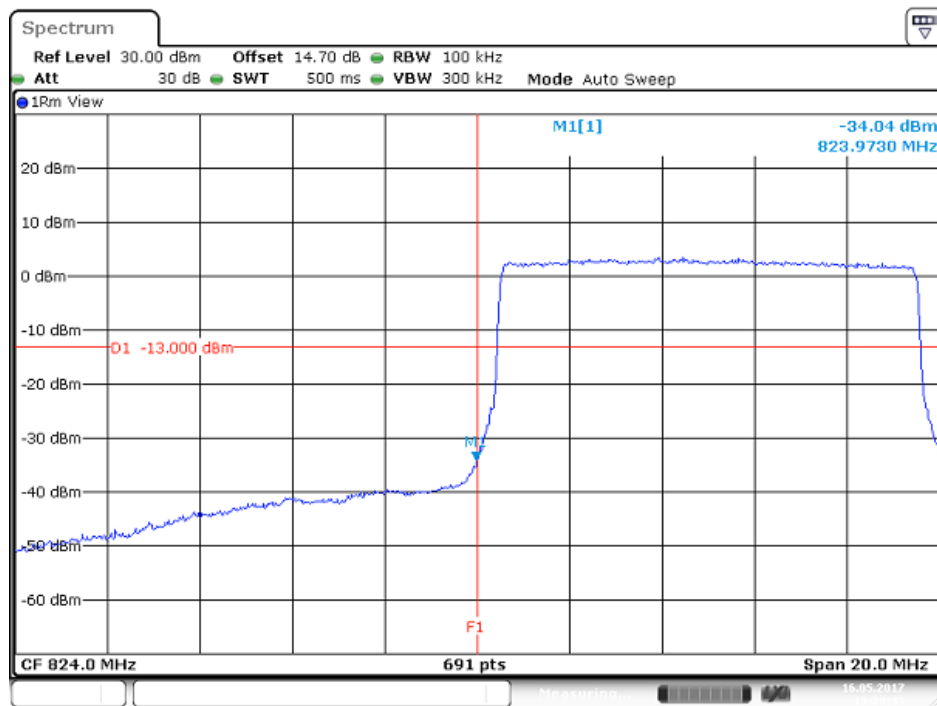
CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB ALLOCATED LOWER BAND EDGE



HIGHER BAND EDGE

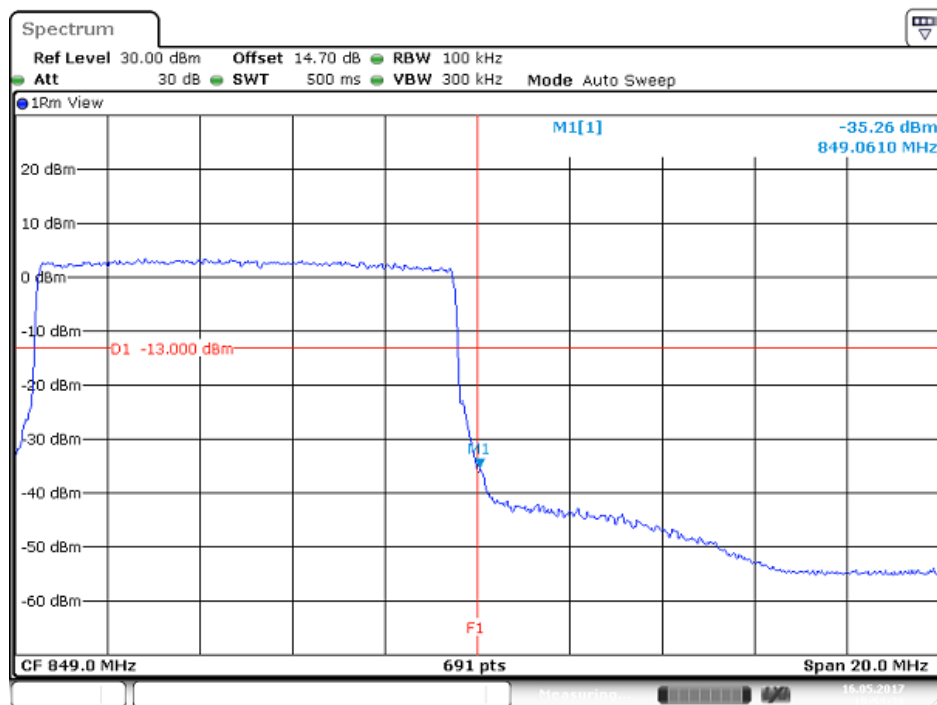


CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB ALLOCATED LOWER BAND EDGE



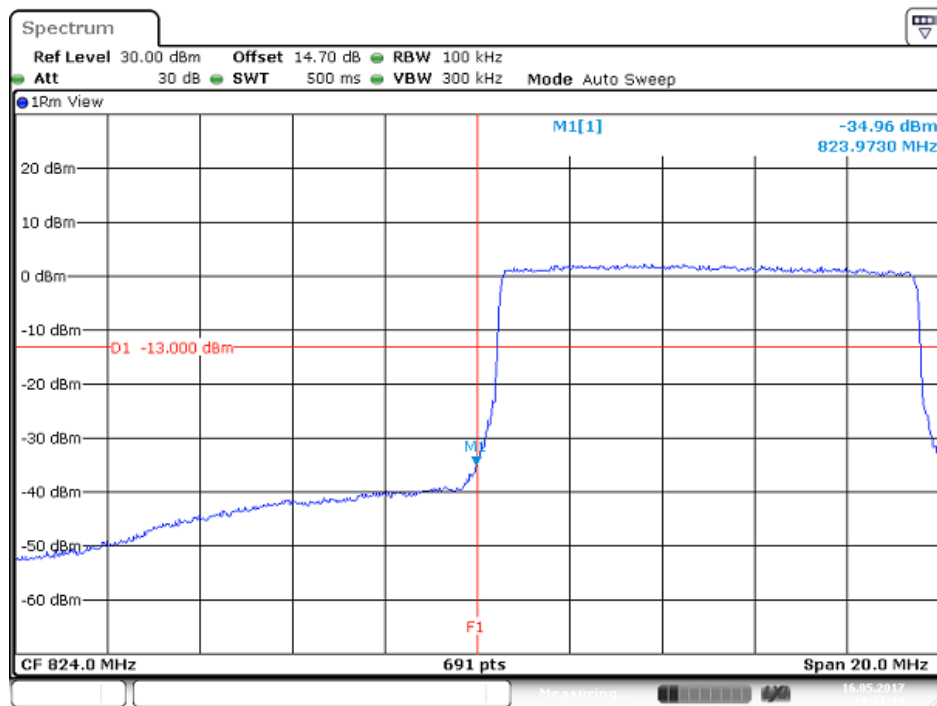
Date: 16 MAY 2017 19:29:43

HIGHER BAND EDGE



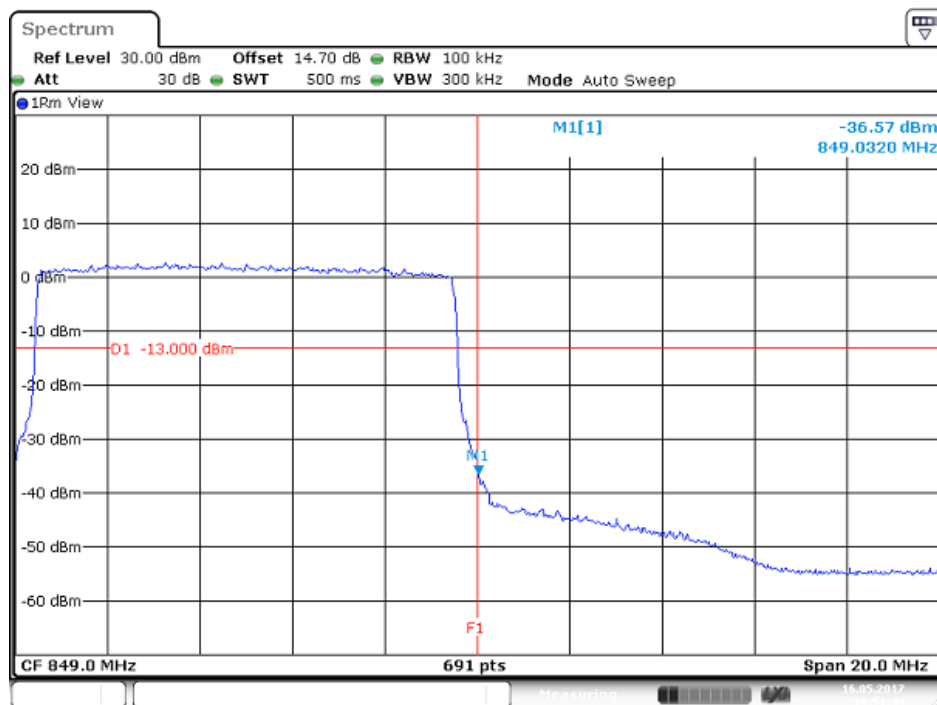
Date: 16 MAY 2017 19:53:38

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



Date: 16 MAY 2017 19:21:19

HIGHER BAND EDGE

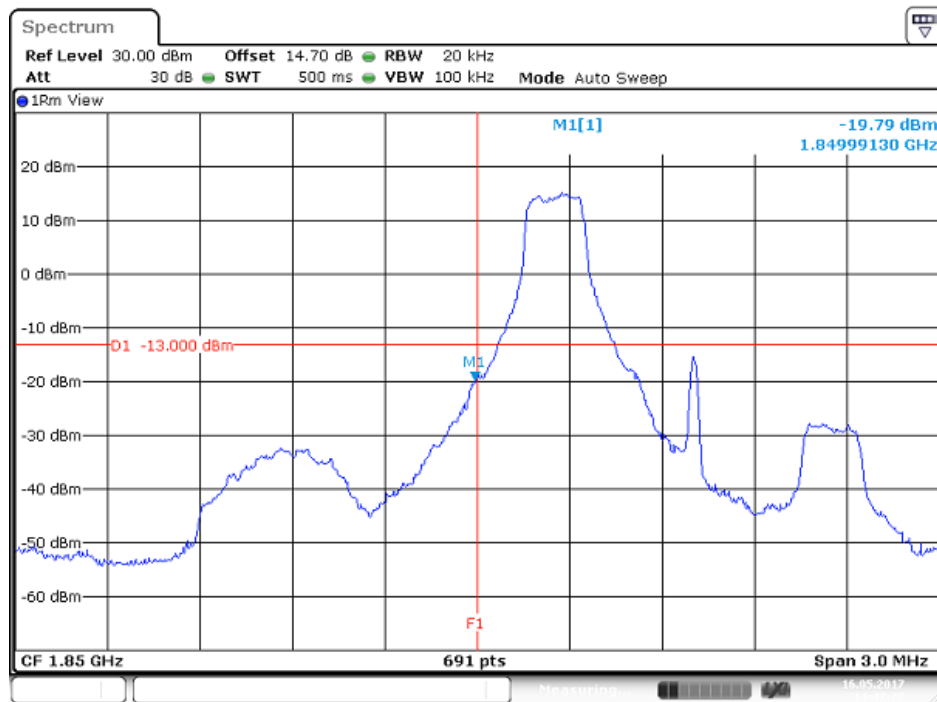


Date: 16 MAY 2017 19:51:44

LTE Band 2

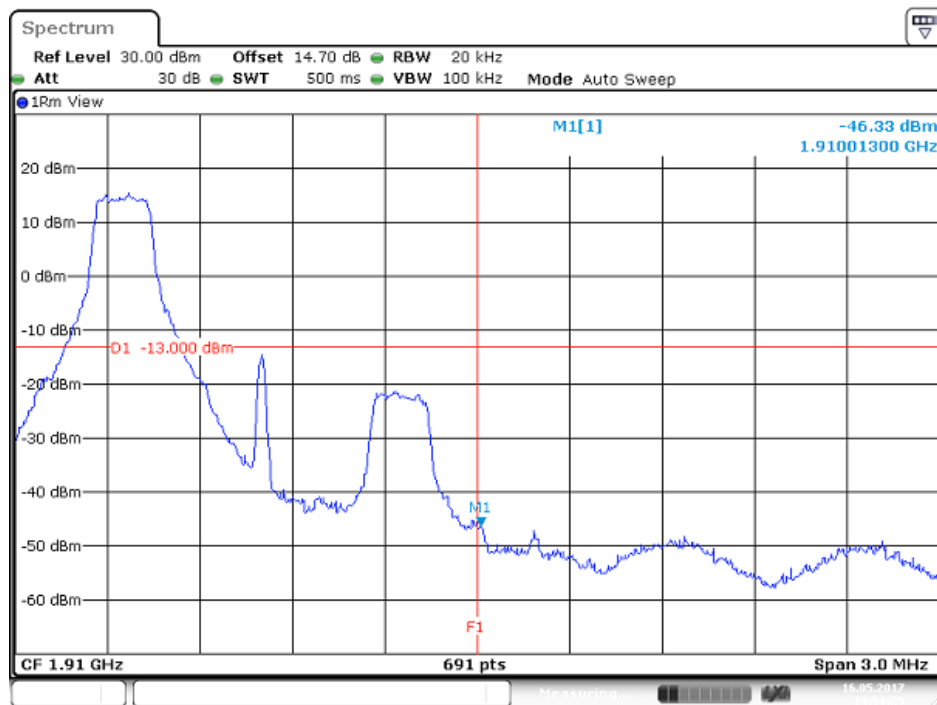
CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1 RB ALLOCATED

LOWER BAND EDGE



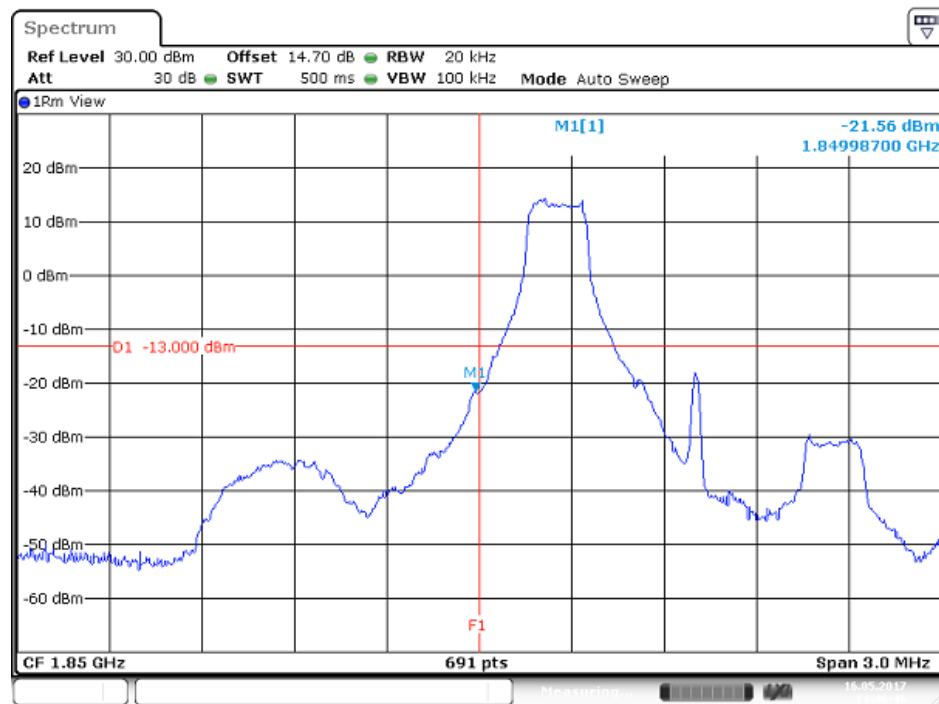
Date: 16 MAY 2017 14:47:27

HIGHER BAND EDGE



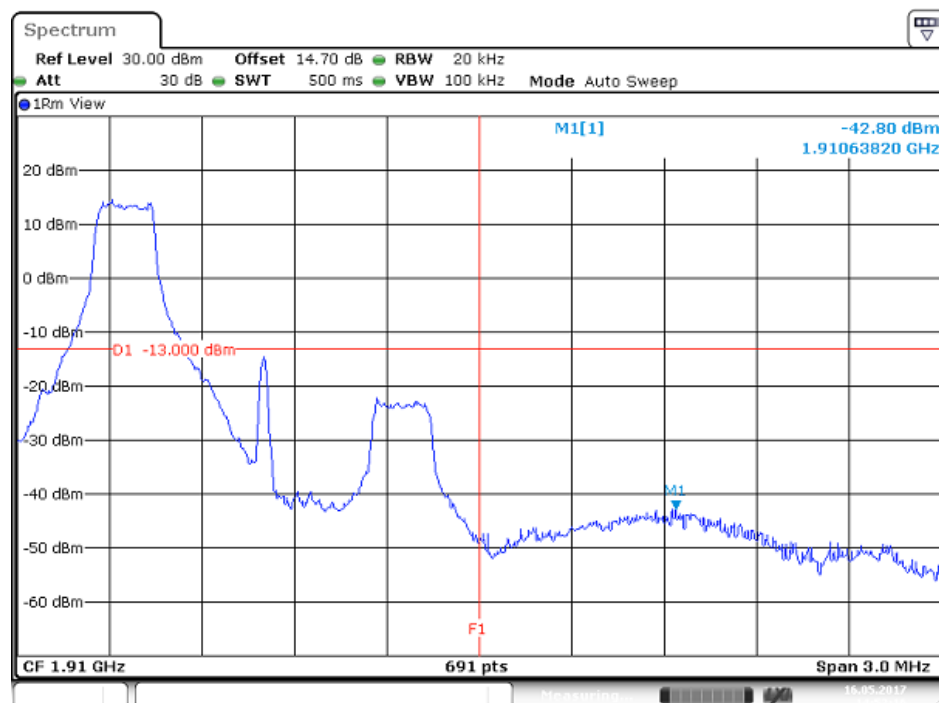
Date: 16 MAY 2017 14:51:26

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



Date: 16 MAY 2017 14:46:46

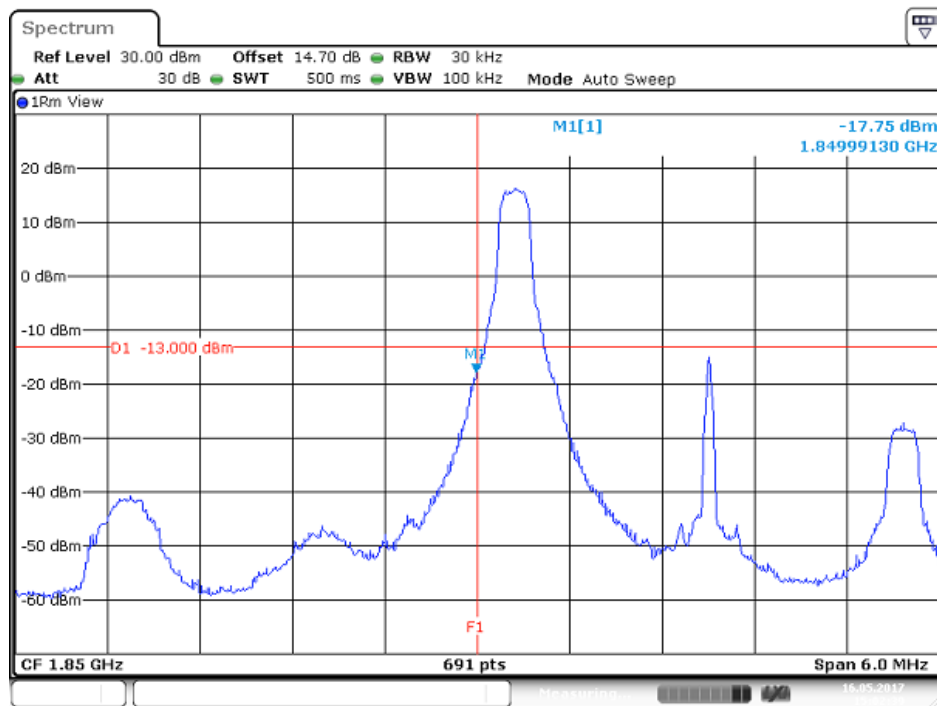
HIGHER BAND EDGE



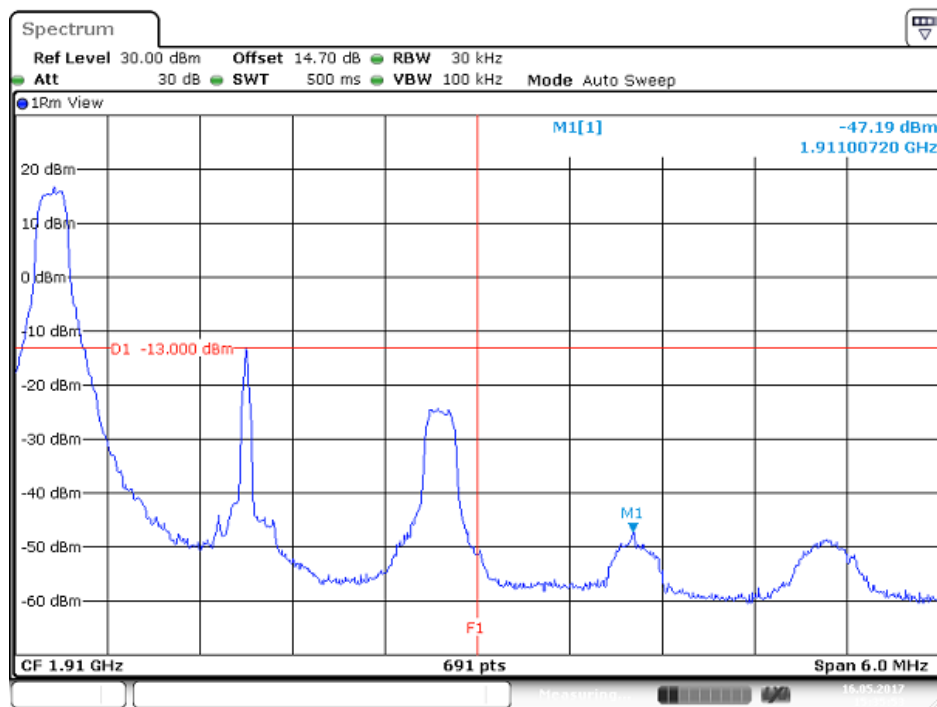
Date: 16 MAY 2017 14:52:16

CHANNEL BANDWIDTH: 3MHz / QPSK / 1 RB ALLOCATED

LOWER BAND EDGE

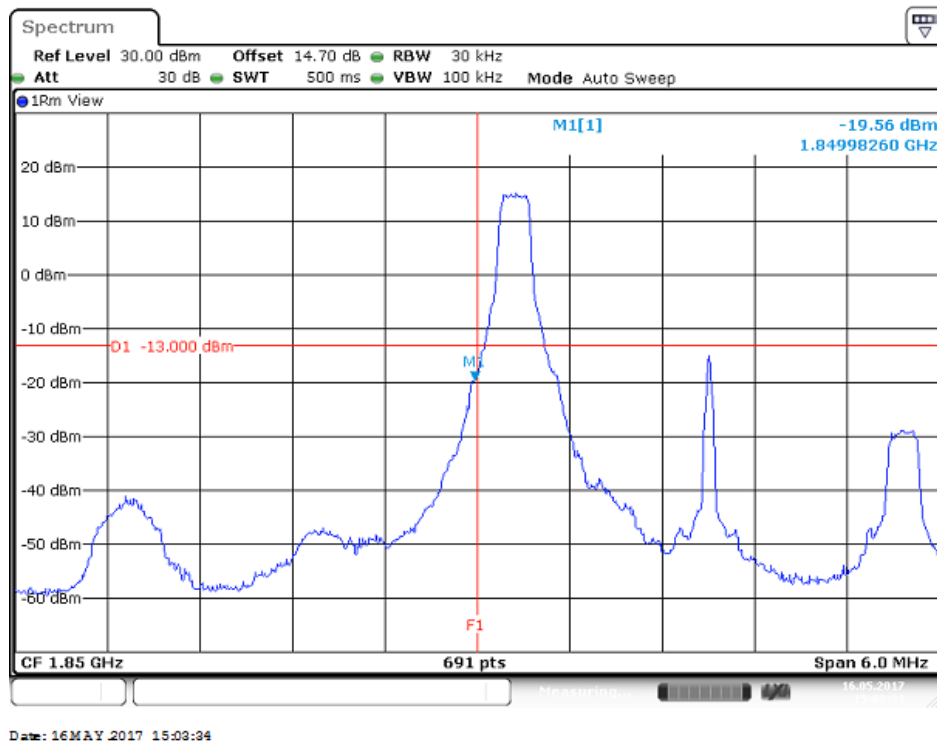


HIGHER BAND EDGE

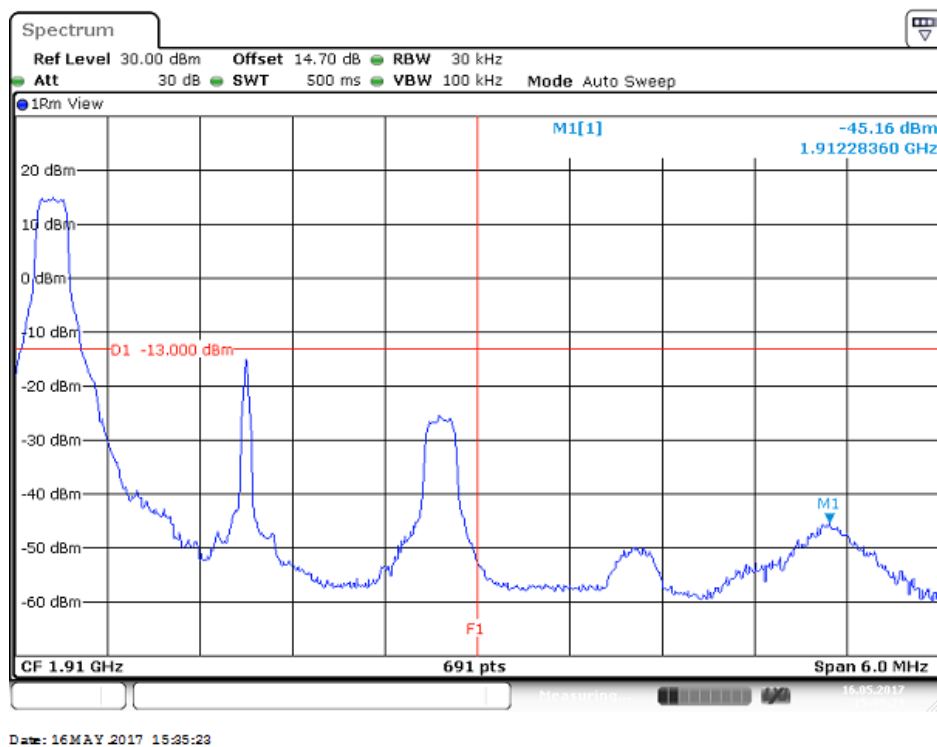


CHANNEL BANDWIDTH: 3MHz / 16QAM / 1 RB ALLOCATED

LOWER BAND EDGE

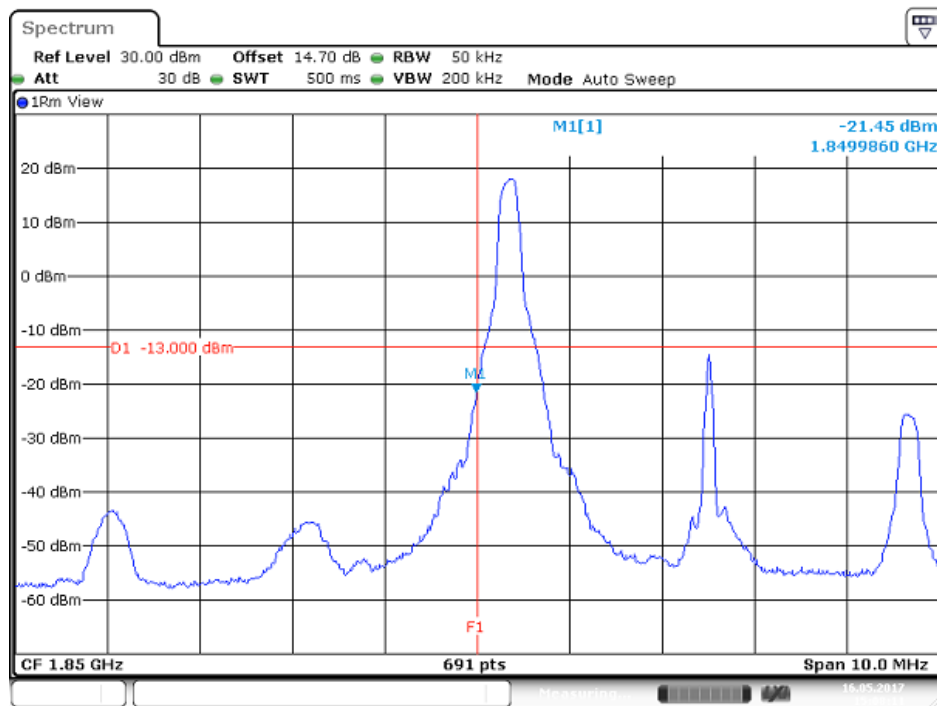


HIGHER BAND EDGE

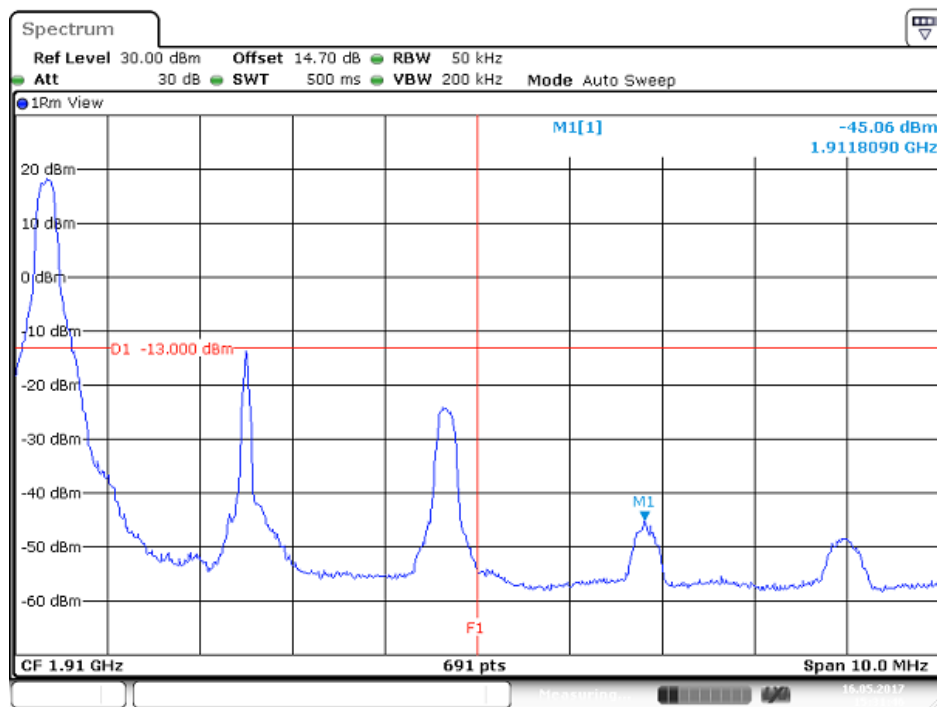


CHANNEL BANDWIDTH: 5MHz / QPSK / 1 RB ALLOCATED

LOWER BAND EDGE

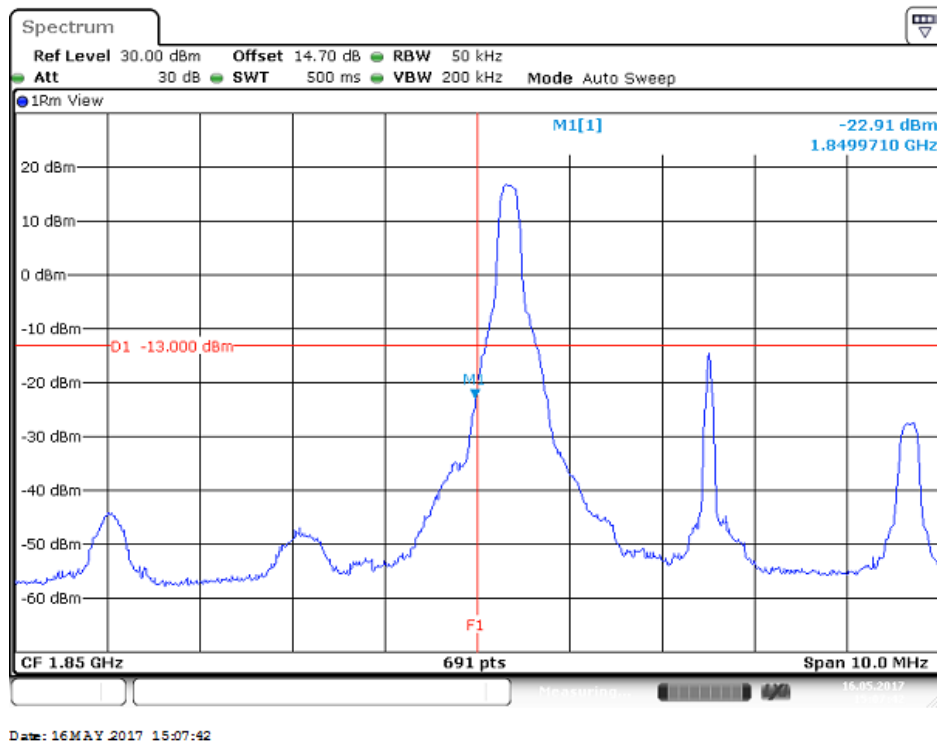


HIGHER BAND EDGE

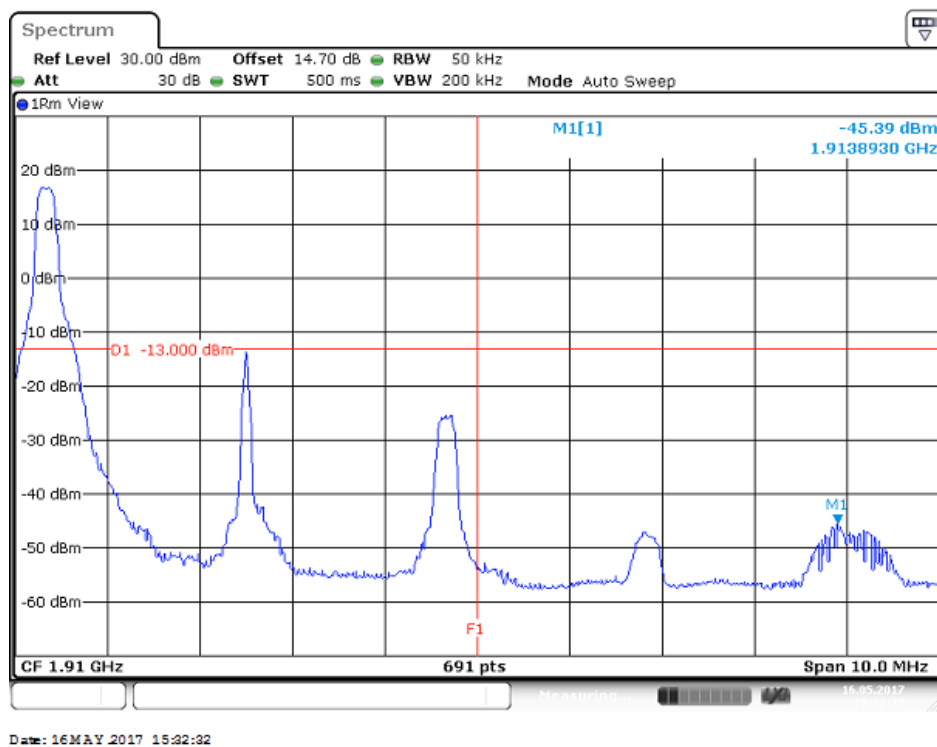


CHANNEL BANDWIDTH: 5MHz / 16QAM / 1 RB ALLOCATED

LOWER BAND EDGE

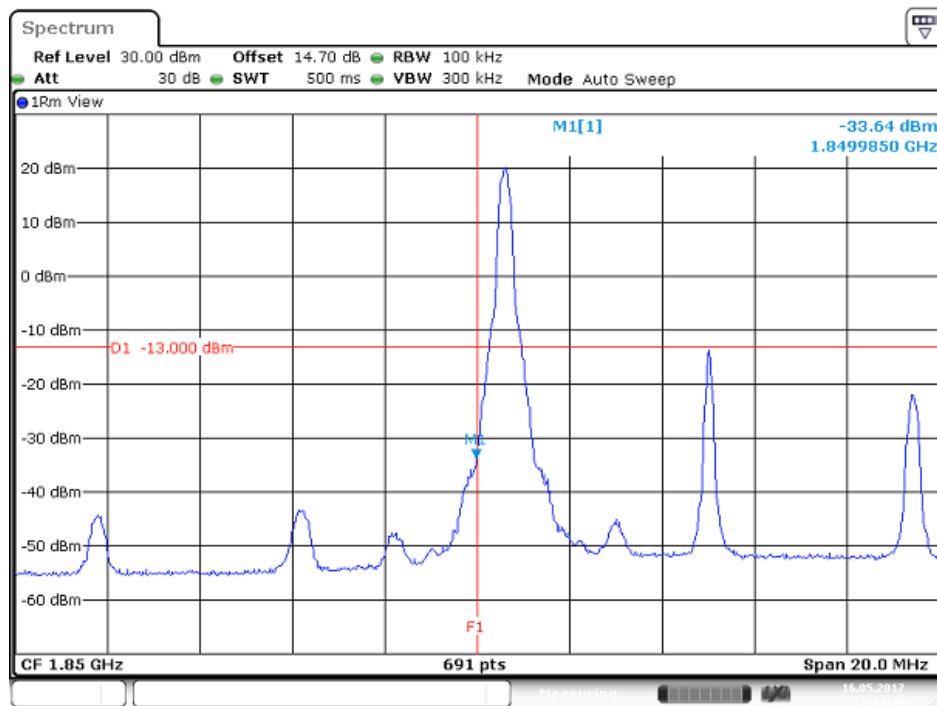


HIGHER BAND EDGE

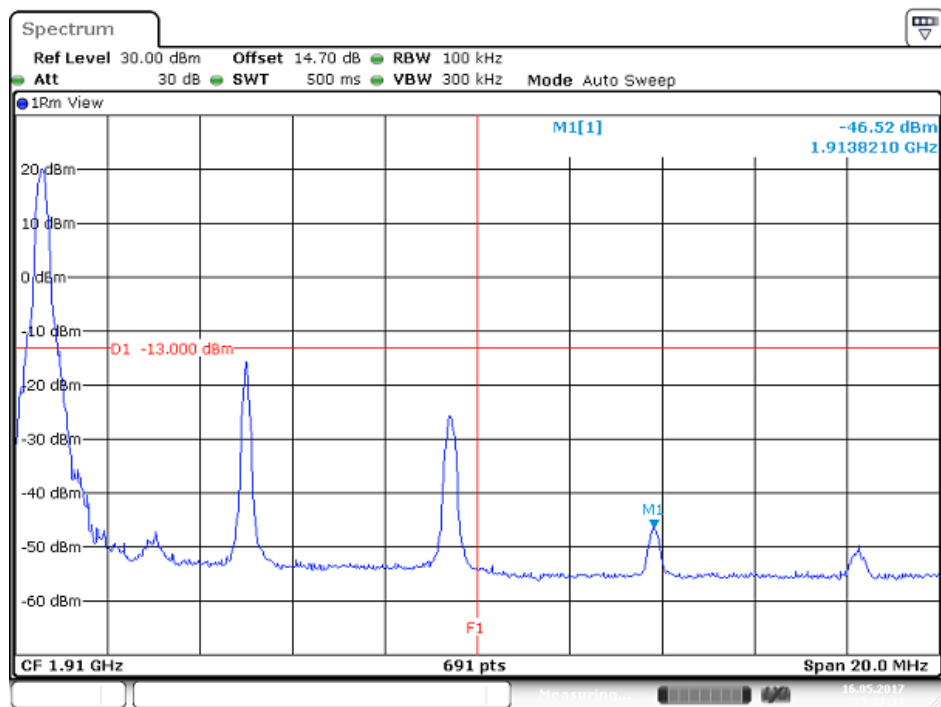


CHANNEL BANDWIDTH: 10MHz / QPSK / 1 RB ALLOCATED

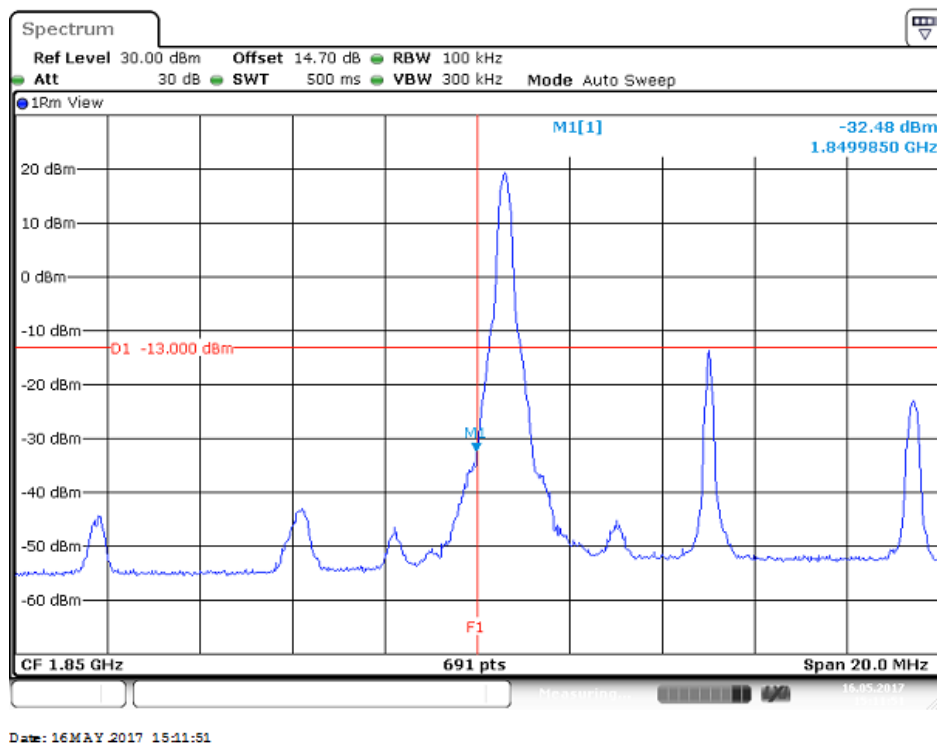
LOWER BAND EDGE



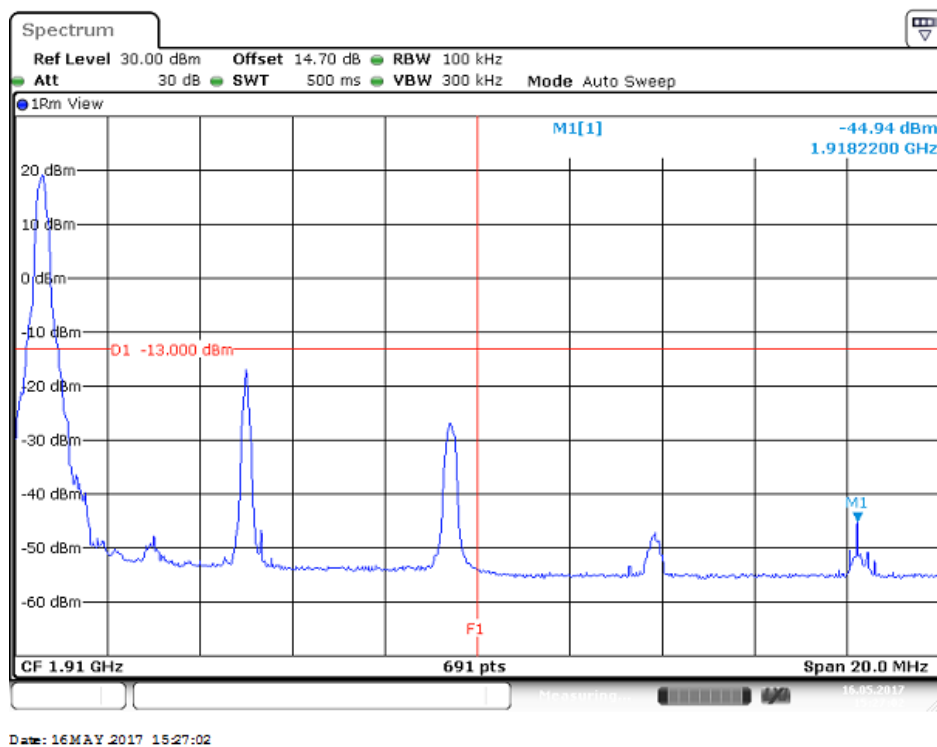
HIGHER BAND EDGE



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

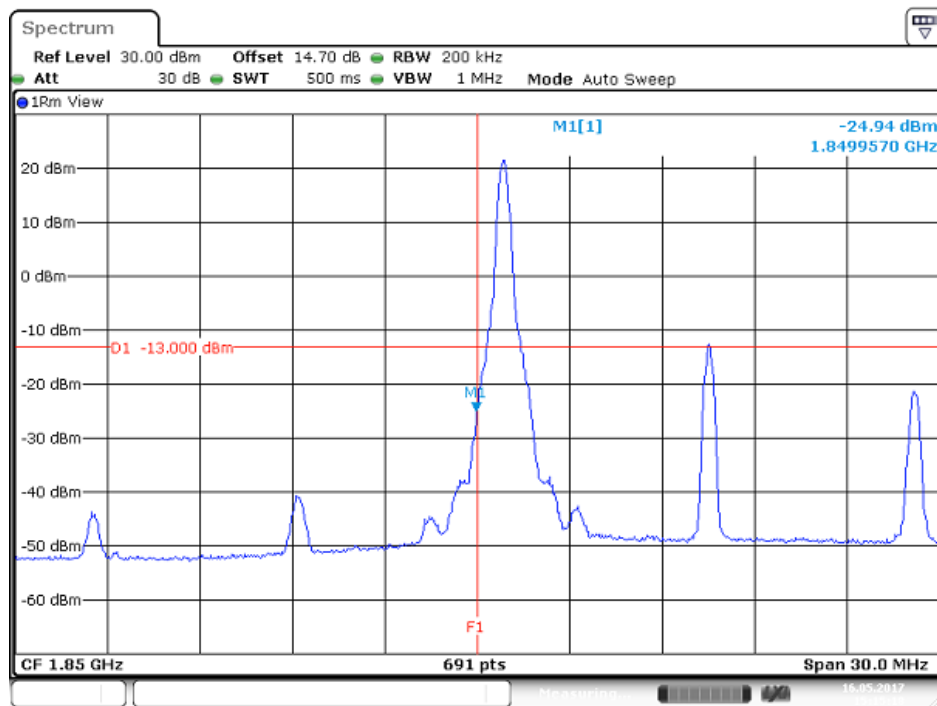


HIGHER BAND EDGE

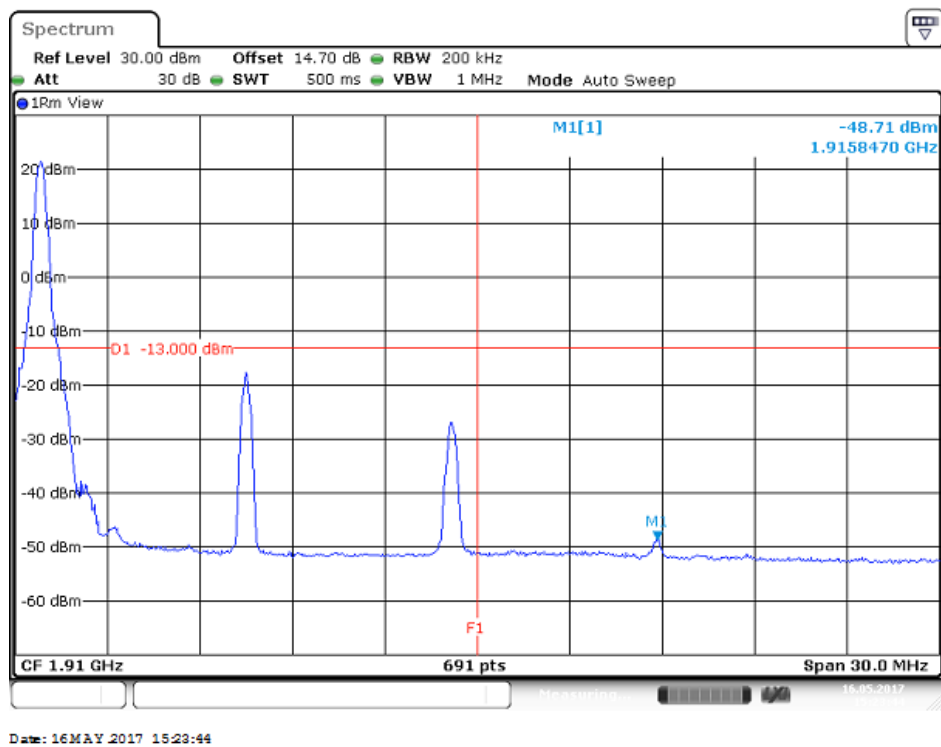


CHANNEL BANDWIDTH: 15MHz / QPSK / 1 RB ALLOCATED

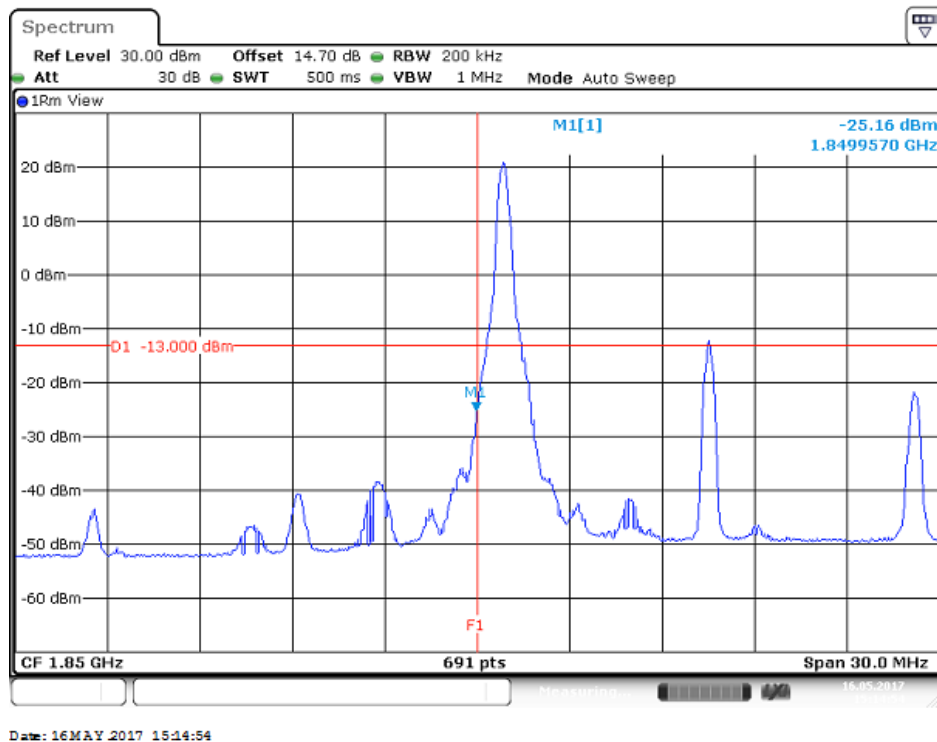
LOWER BAND EDGE



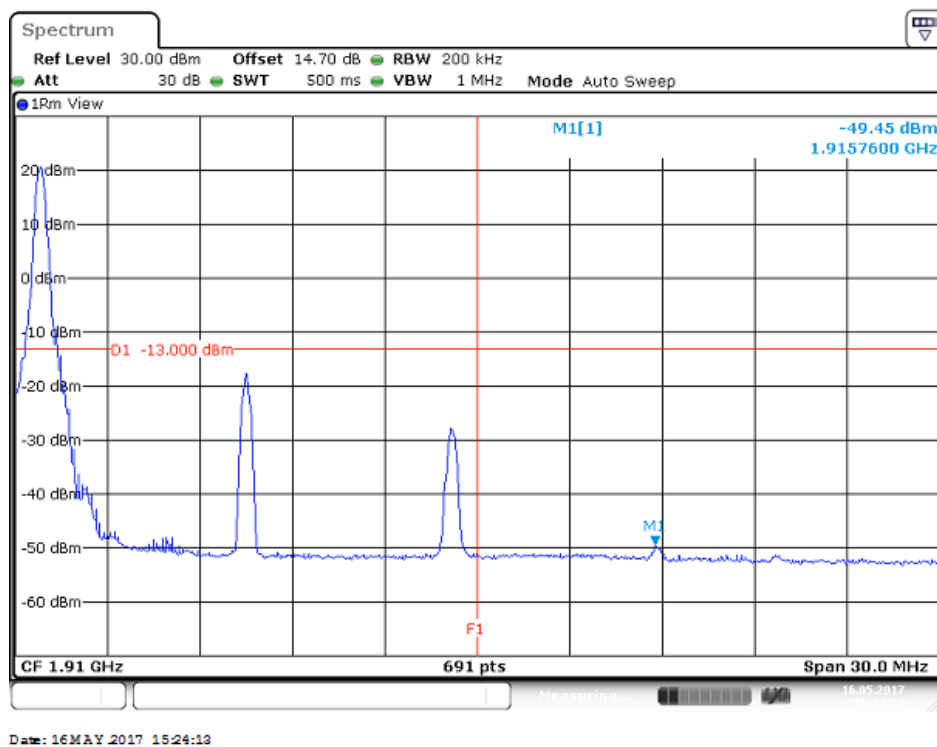
HIGHER BAND EDGE



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

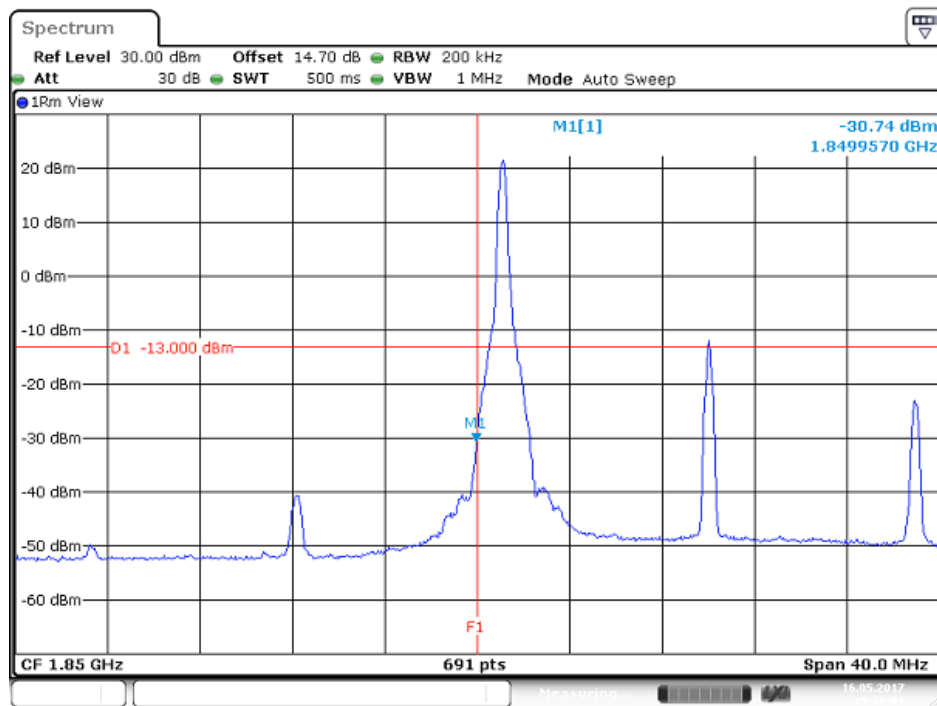


HIGHER BAND EDGE

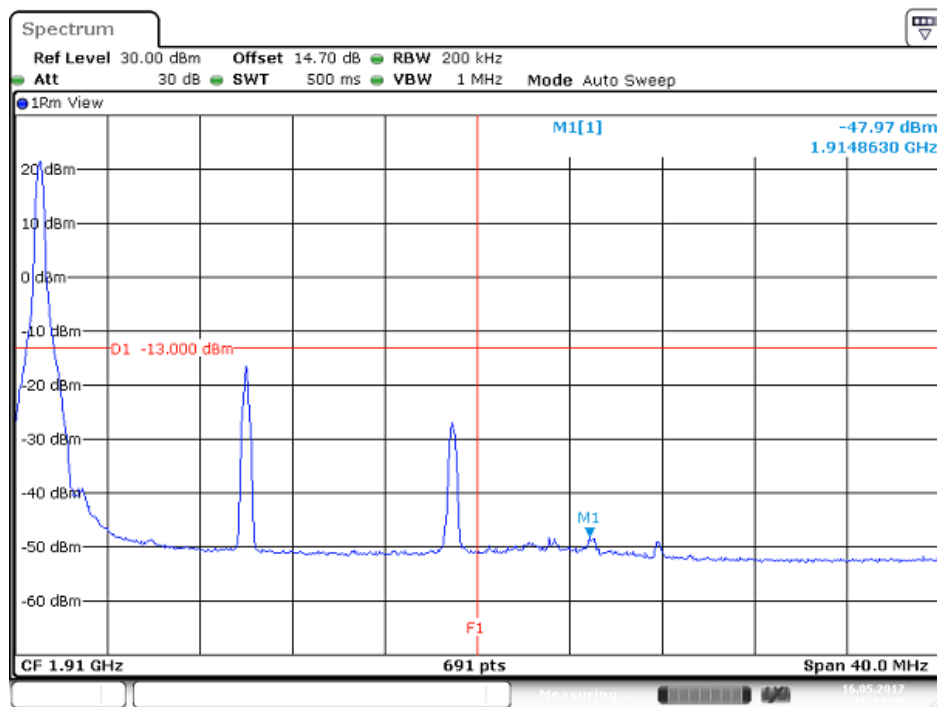


CHANNEL BANDWIDTH: 20MHz / QPSK / 1 RB ALLOCATED

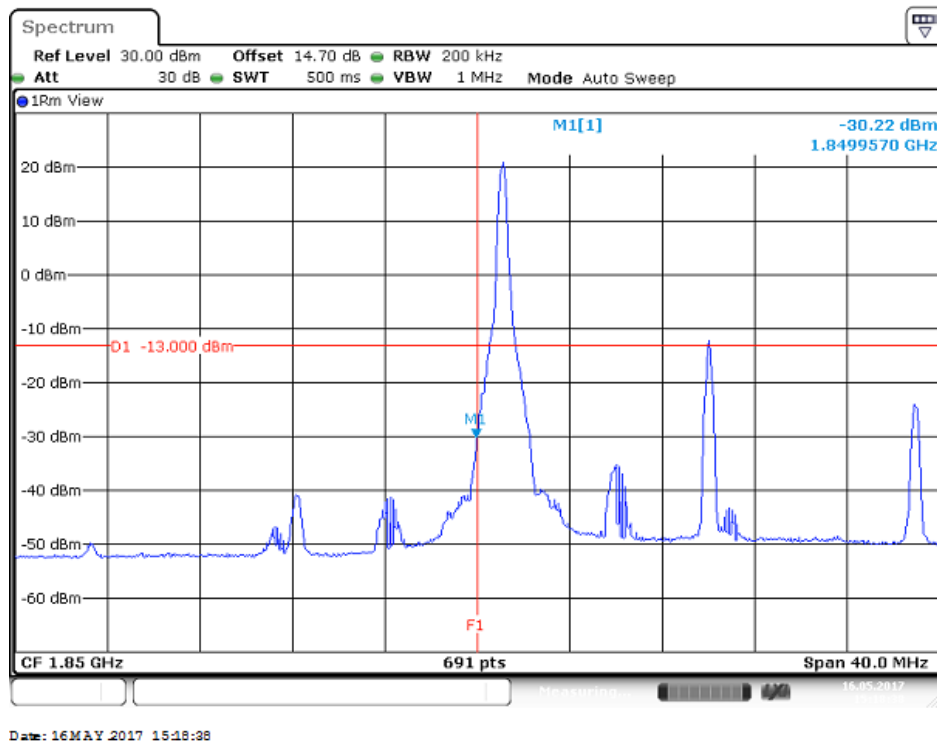
LOWER BAND EDGE



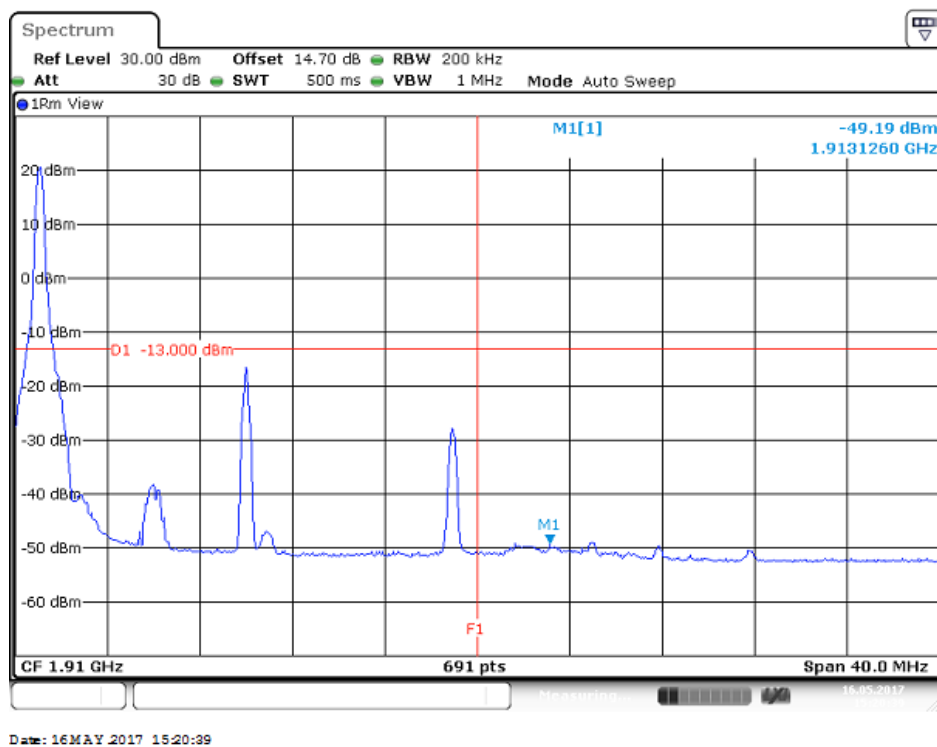
HIGHER BAND EDGE



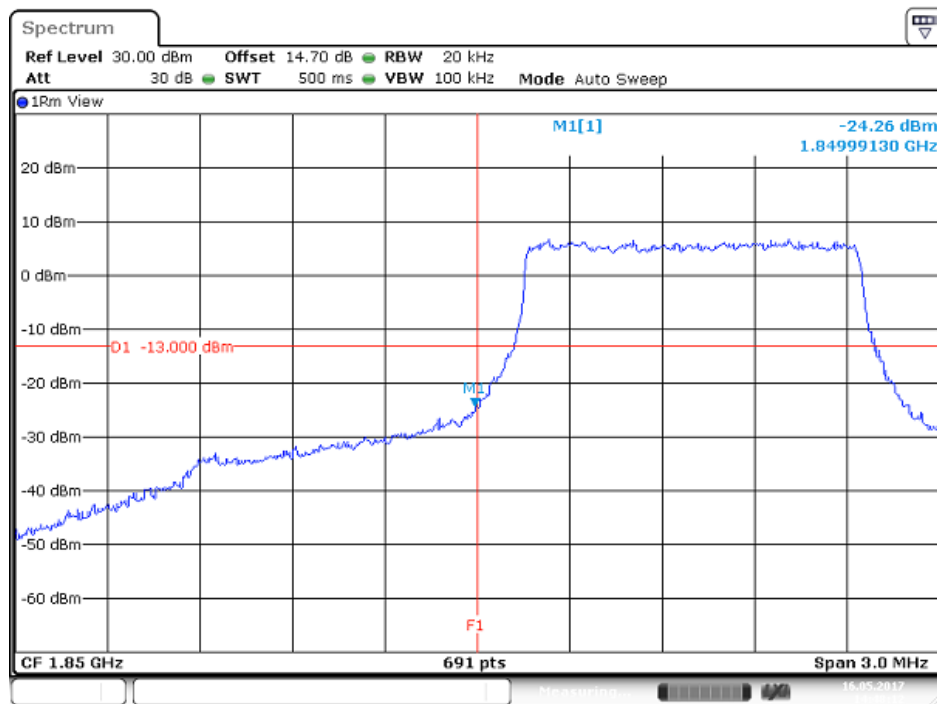
CHANNEL BANDWIDTH: 20MHz / 16QAM / 1 RB ALLOCATED LOWER BAND EDGE



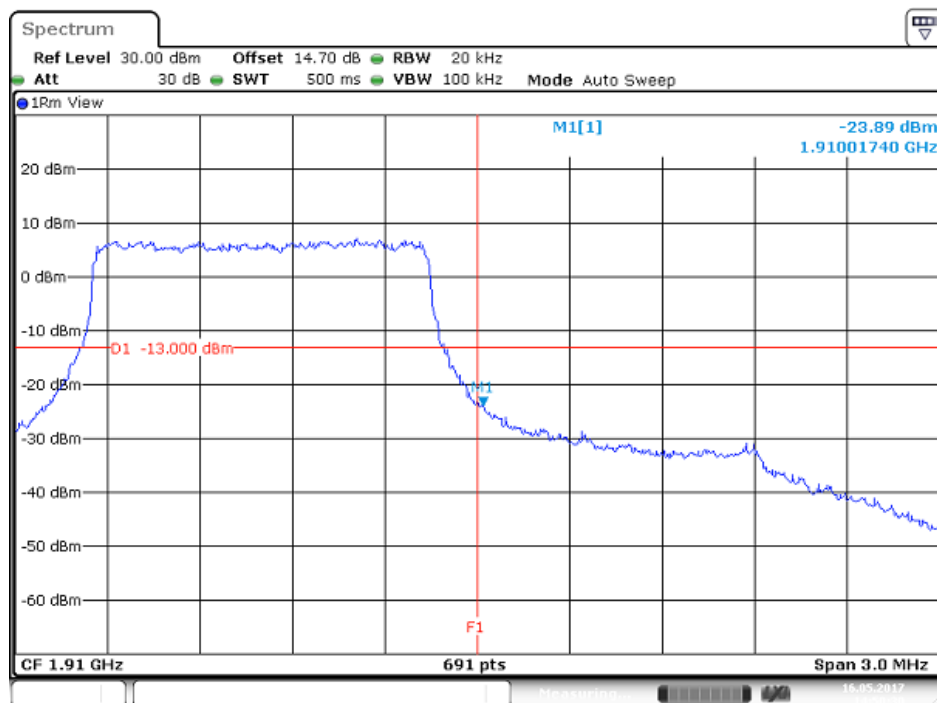
HIGHER BAND EDGE



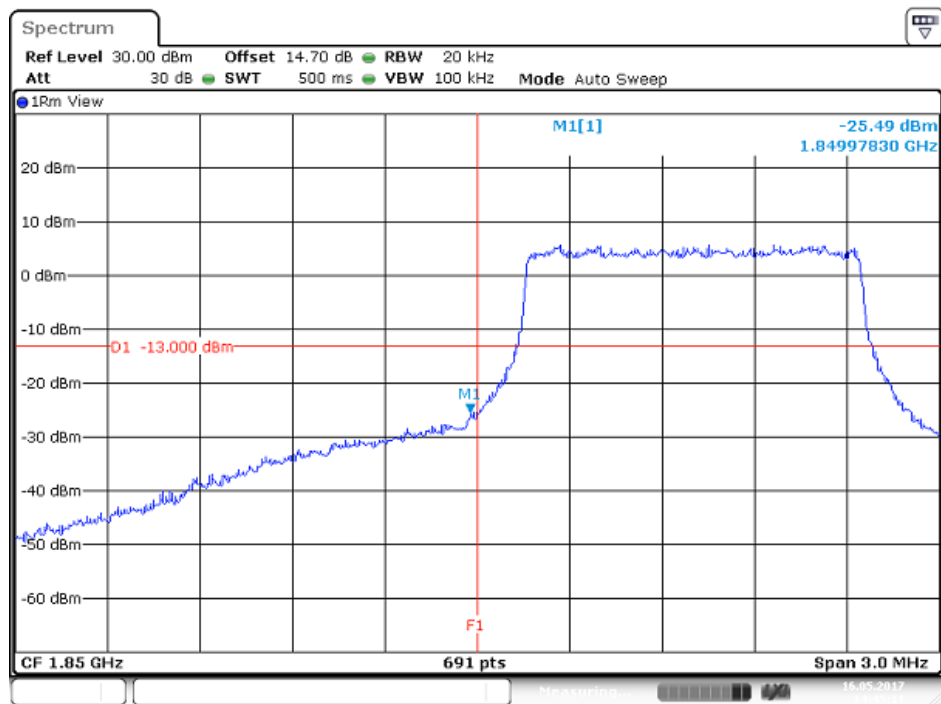
CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



HIGHER BAND EDGE

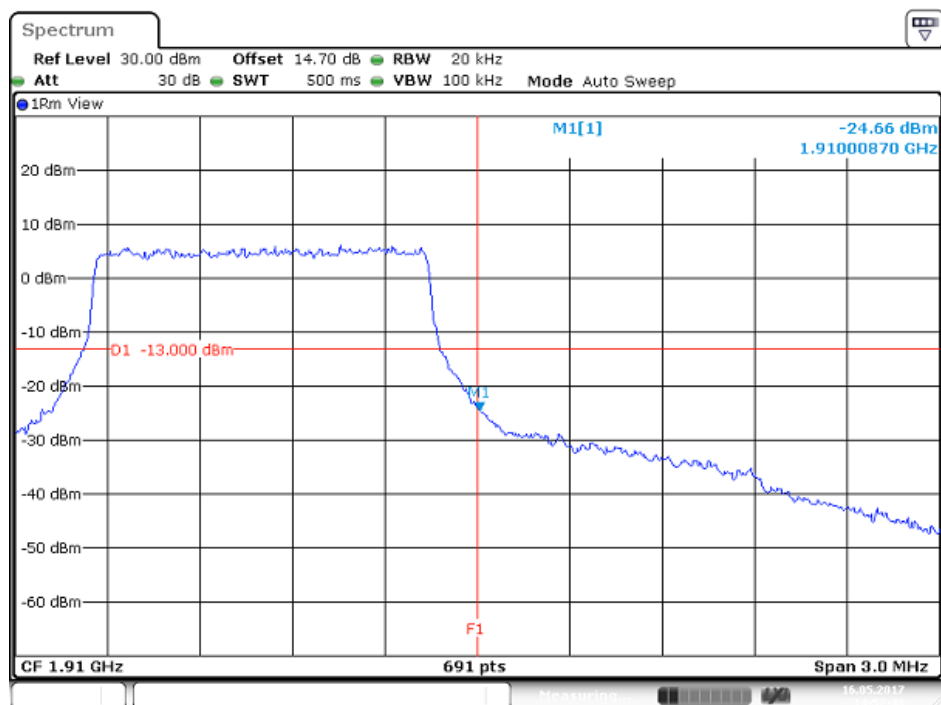


CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



Date: 16 MAY 2017 14:45:11

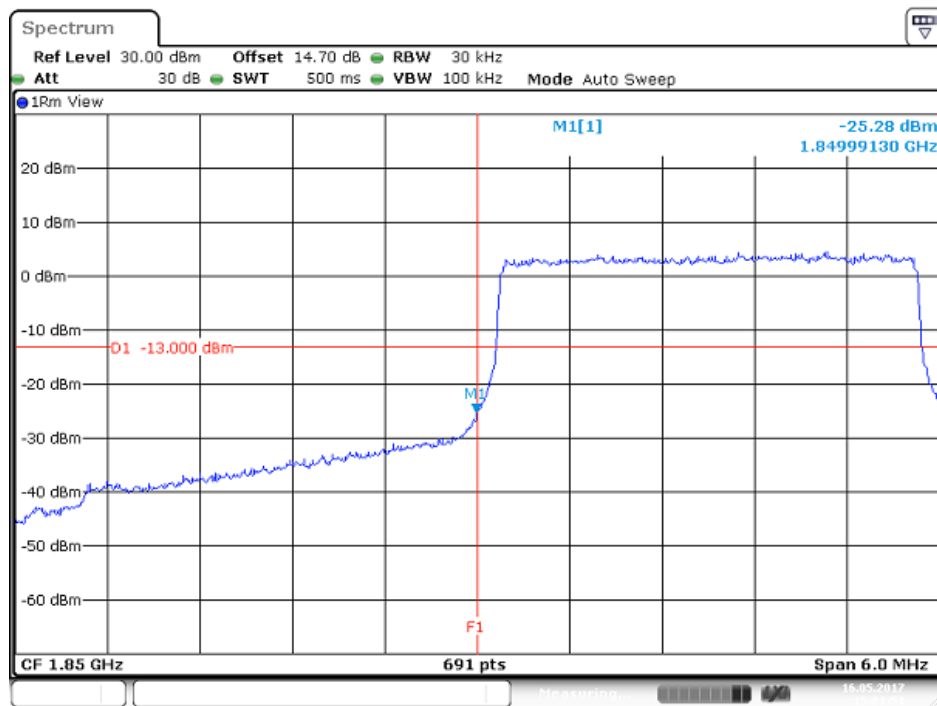
HIGHER BAND EDGE



Date: 16 MAY 2017 14:52:49

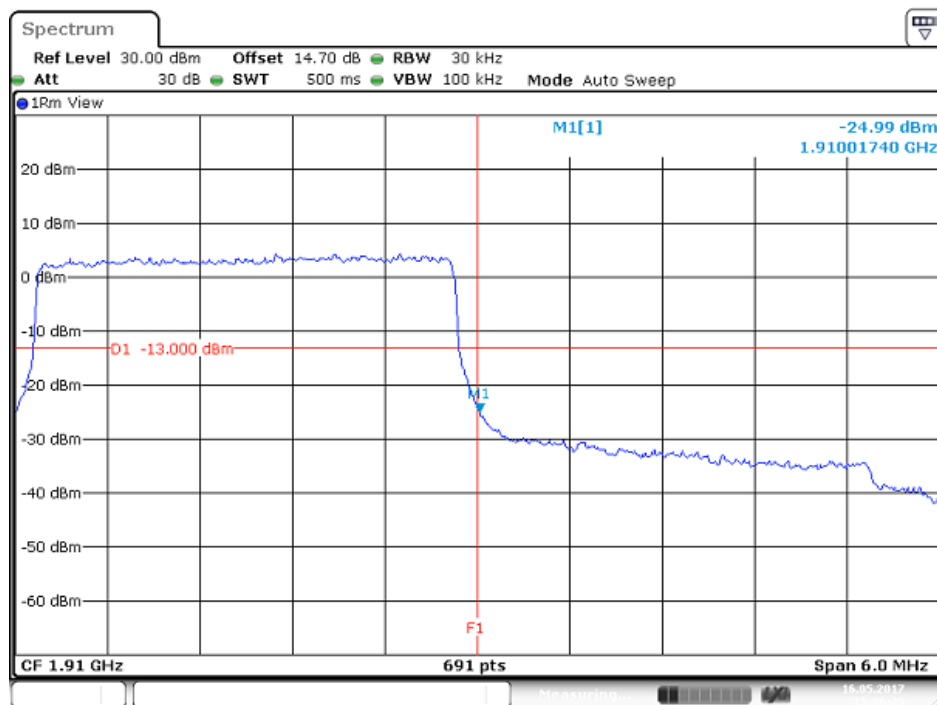
CHANNEL BANDWIDTH: 3MHz / QPSK / 100% RB ALLOCATED

LOWER BAND EDGE



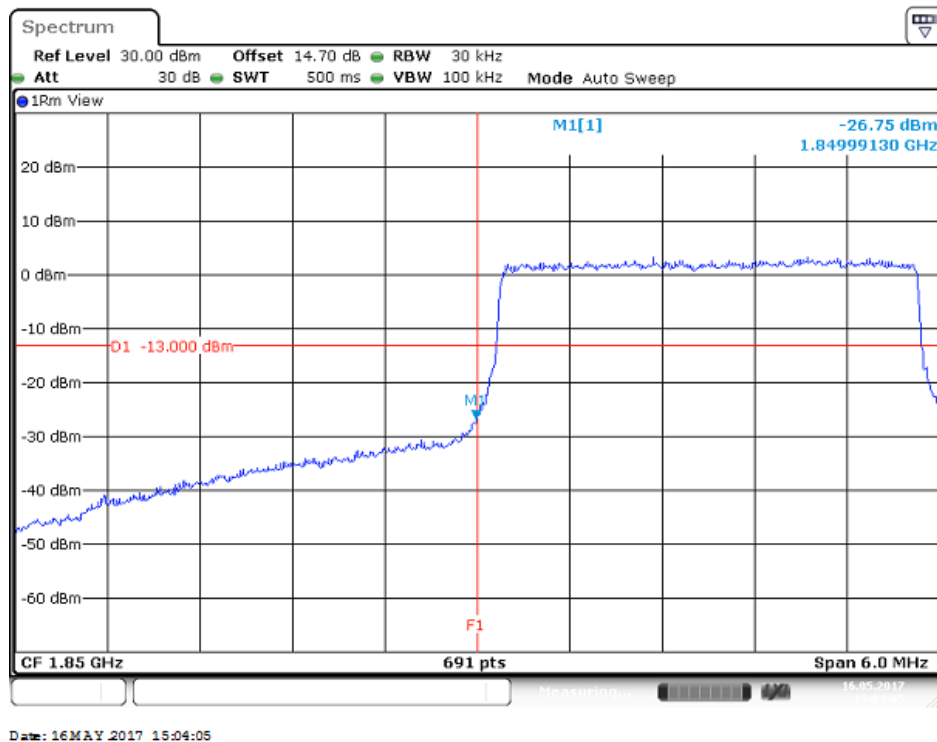
Date: 16 MAY 2017 15:01:51

HIGHER BAND EDGE

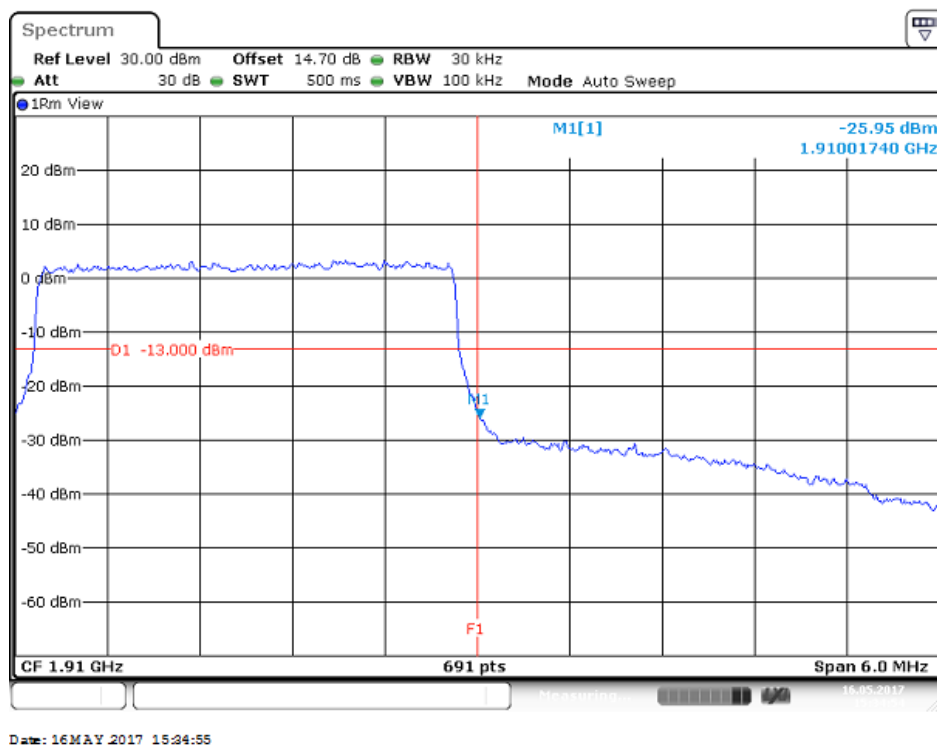


Date: 16 MAY 2017 15:26:26

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



HIGHER BAND EDGE



Spectrum

Ref Level 30.00 dBm Offset 14.70 dB RBW 50 kHz
 Att 30 dB SWT 500 ms VBW 200 kHz Mode Auto Sweep

1Rm View

M1[1] -26.45 dBm
 1.8499860 GHz

O1 -13.000 dBm

F1

CF 1.85 GHz 691 pts Span 10.0 MHz

Spectrum

Ref Level 30.00 dBm Offset 14.70 dB RBW 50 kHz
 Att 30 dB SWT 500 ms VBW 200 kHz Mode Auto Sweep

1Rm View

M1[1] -26.16 dBm
 1.9100430 GHz

O1 -13.000 dBm

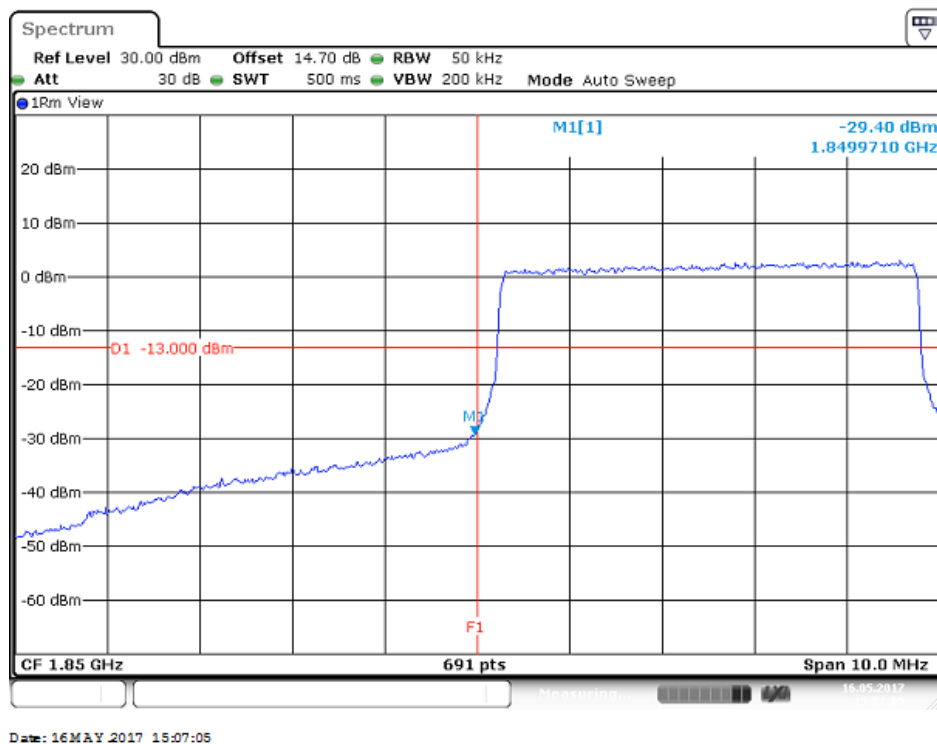
F1

CF 1.91 GHz 691 pts Span 10.0 MHz

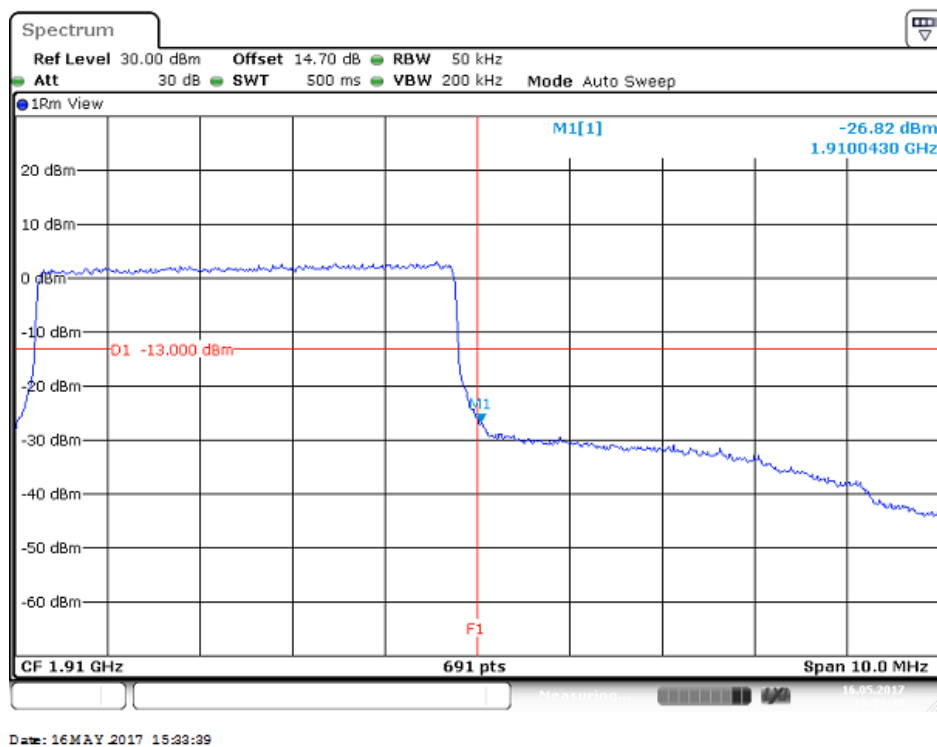
16.05.2017

Rev.00

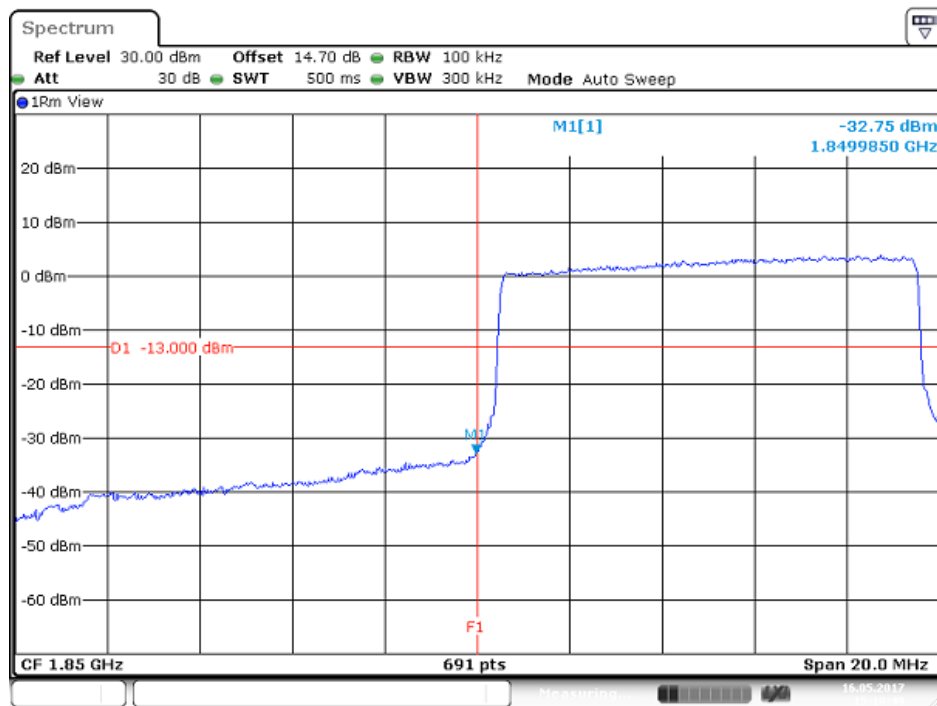
CHANNEL BANDWIDTH: 5MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



HIGHER BAND EDGE

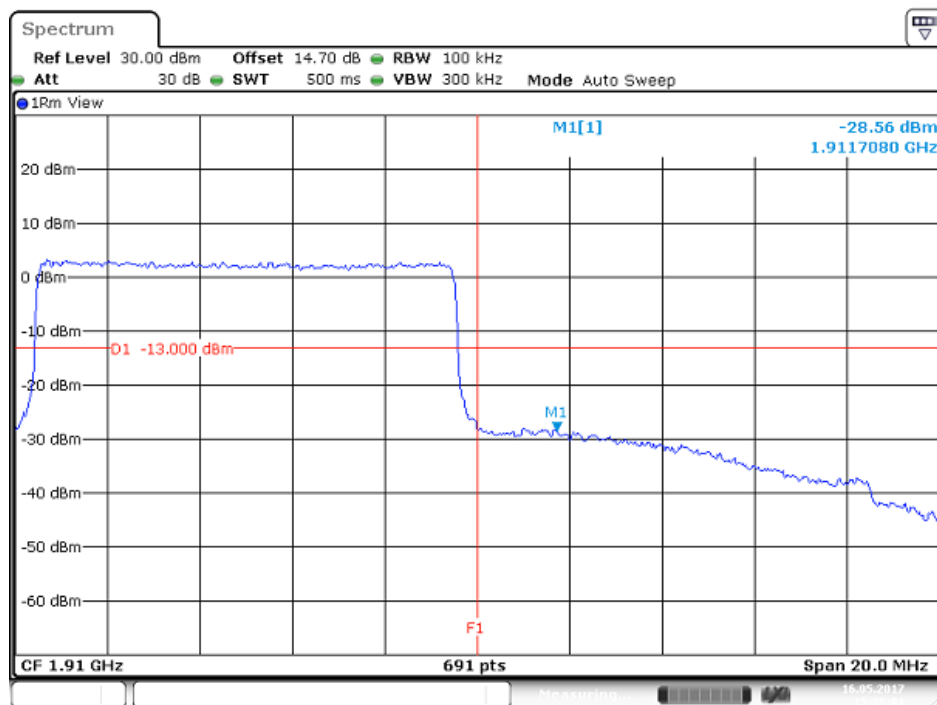


CHANNEL BANDWIDTH: 10MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



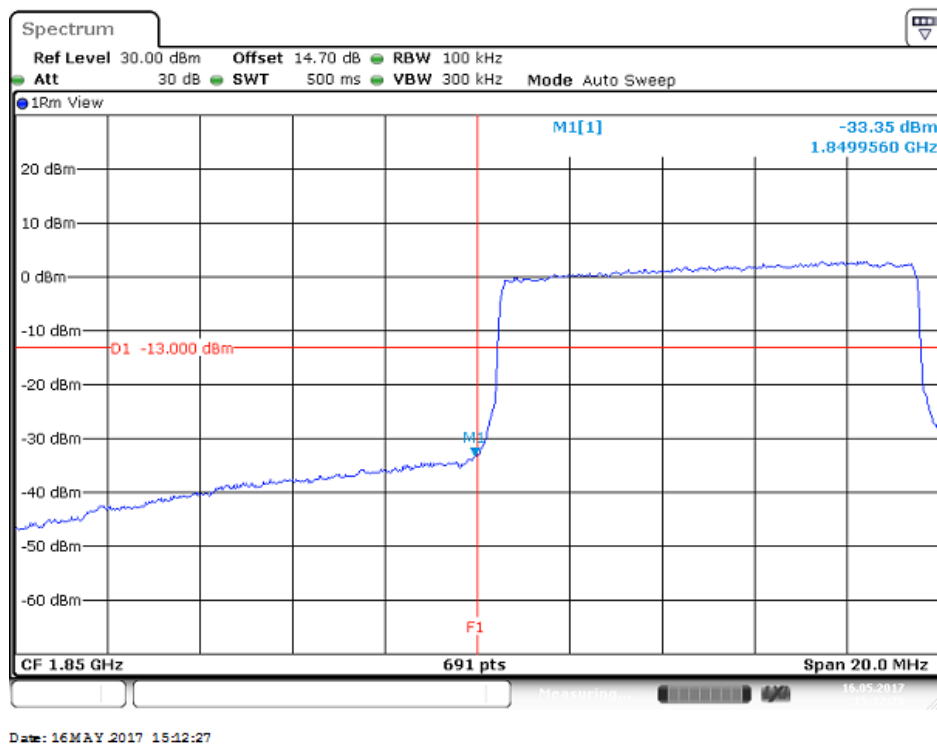
Date: 16 MAY 2017 15:10:50

HIGHER BAND EDGE

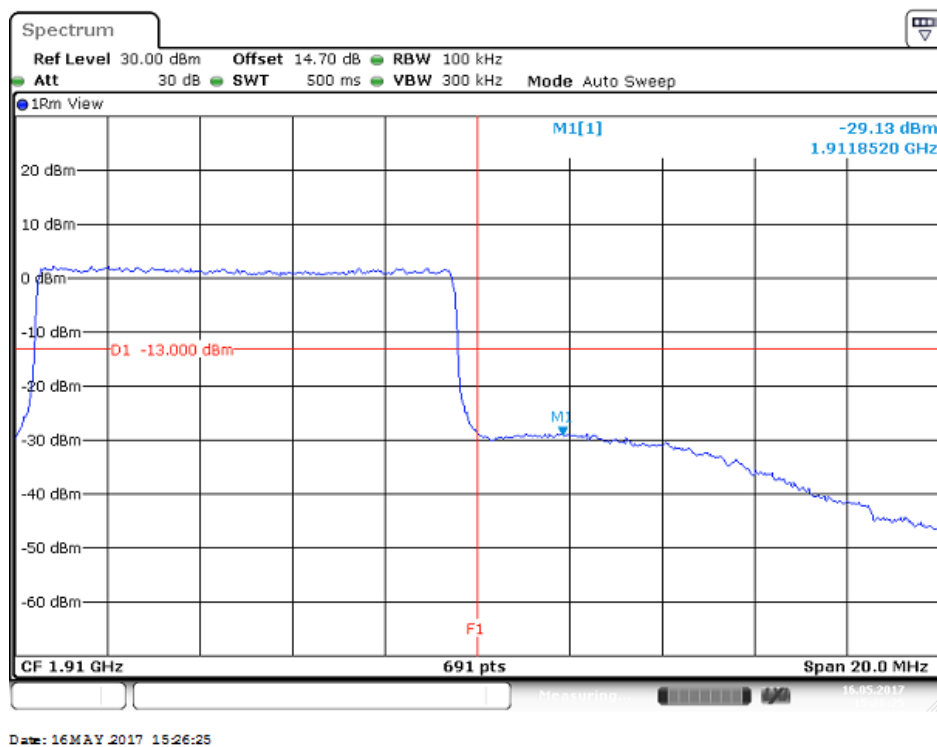


Date: 16 MAY 2017 15:28:01

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

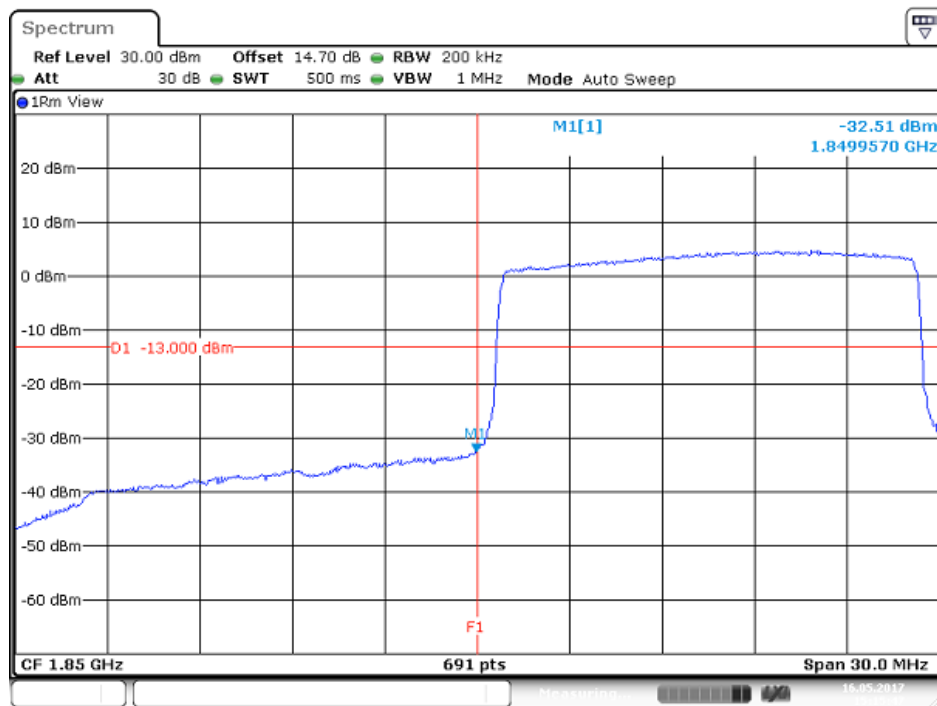


HIGHER BAND EDGE



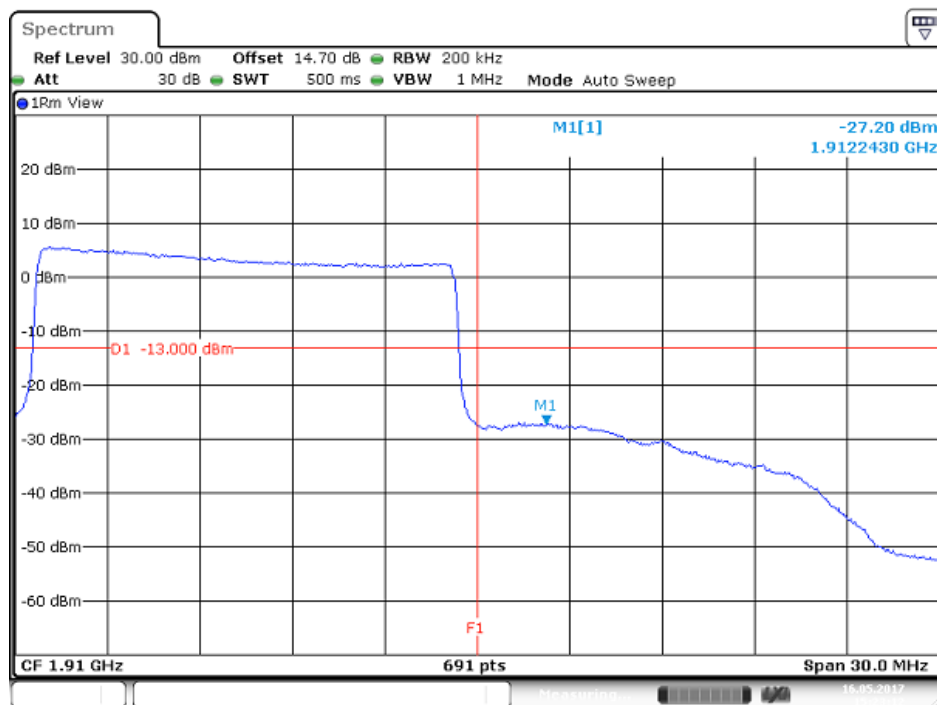
CHANNEL BANDWIDTH: 15MHz / QPSK / 100% RB ALLOCATED

LOWER BAND EDGE



Date: 16 MAY 2017 15:15:47

HIGHER BAND EDGE



Date: 16 MAY 2017 15:23:13

Spectrum

Ref Level 30.00 dBm Offset 14.70 dB RBW 200 kHz
 Att 30 dB SWT 500 ms VBW 1 MHz Mode Auto Sweep

1Rm View

M1[1] -32.83 dBm
 1.8499570 GHz

O1 -13.000 dBm

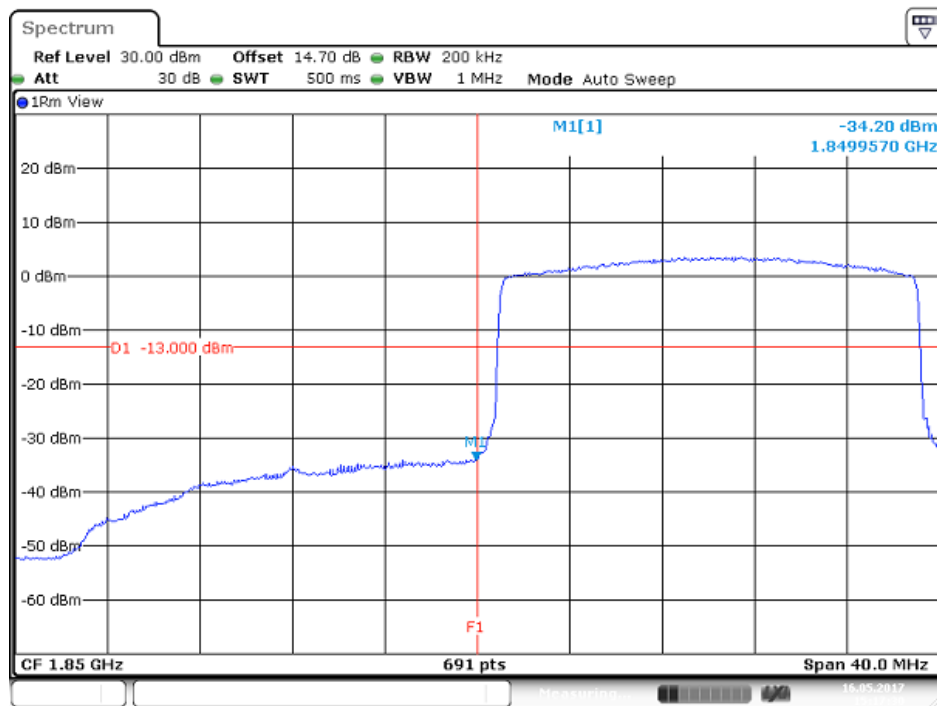
F1

CF 1.85 GHz 691 pts Span 30.0 MHz

Date: 16MAY 2017 15:14:18

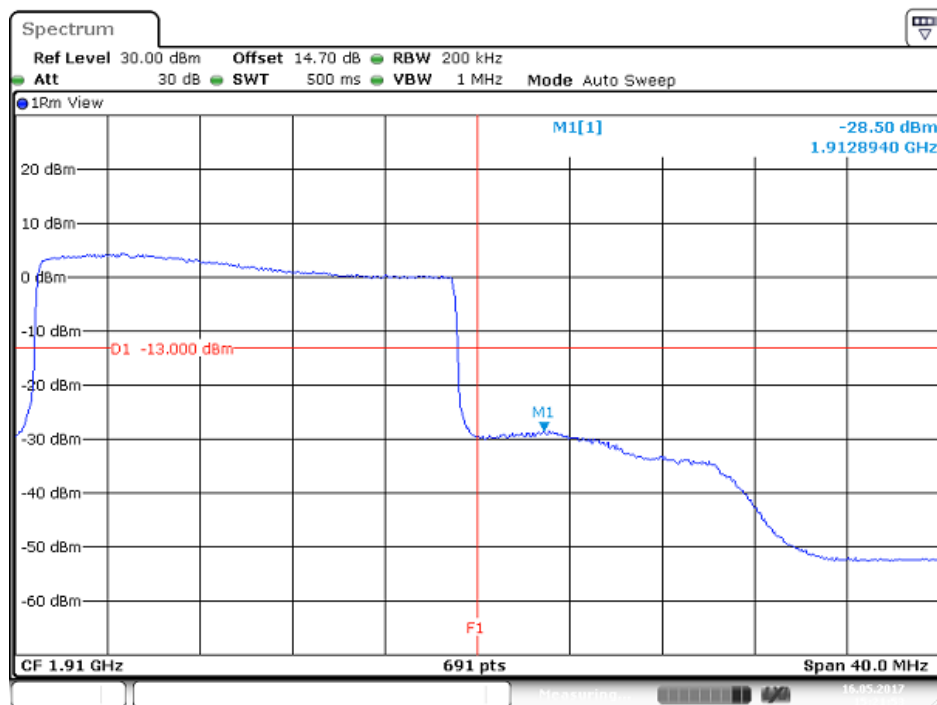
The screenshot displays a spectrum analyzer interface. The top panel shows settings: Ref Level 30.00 dBm, Att 30 dB, Offset 14.70 dB, RBW 200 kHz, Mode Auto Sweep, and Span 30.0 MHz. The main display area shows a blue trace representing the signal spectrum. A red horizontal line is drawn at -13.000 dBm, labeled 'O1'. A red vertical line is drawn at 1.9129810 GHz, labeled 'F1'. The signal level at this frequency is -28.14 dBm, labeled 'M1[1]'. The signal shows a sharp drop in power at the frequency marked by F1. The bottom panel shows the center frequency (CF) at 1.91 GHz, 691 points, and a span of 30.0 MHz. The date and time are 16 MAY 2017 15:24:45.

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



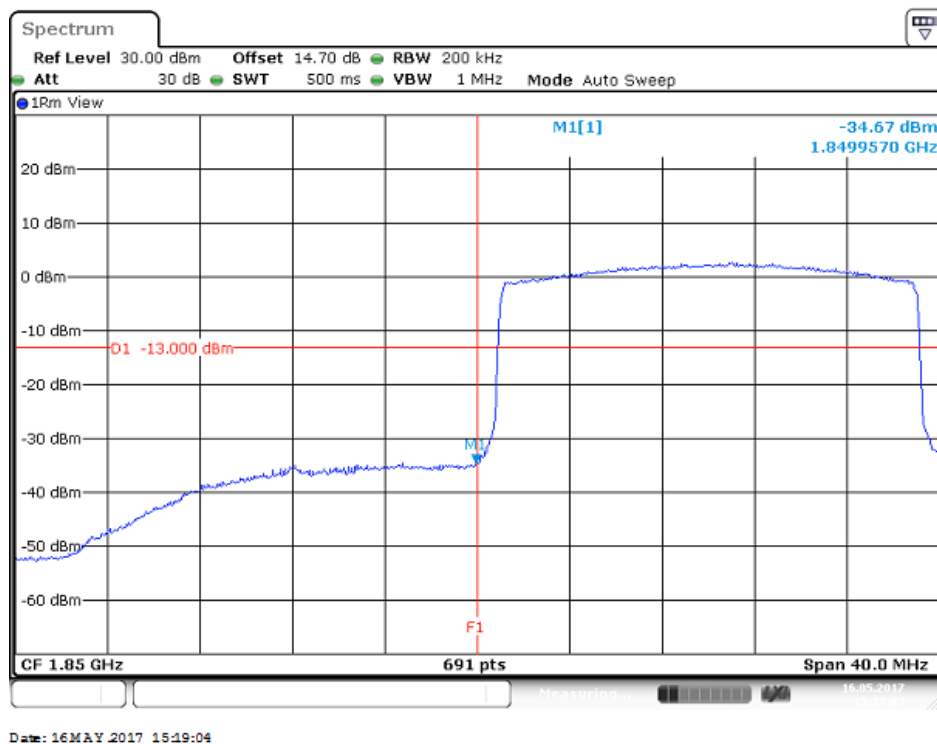
Date: 16 MAY 2017 15:17:30

HIGHER BAND EDGE

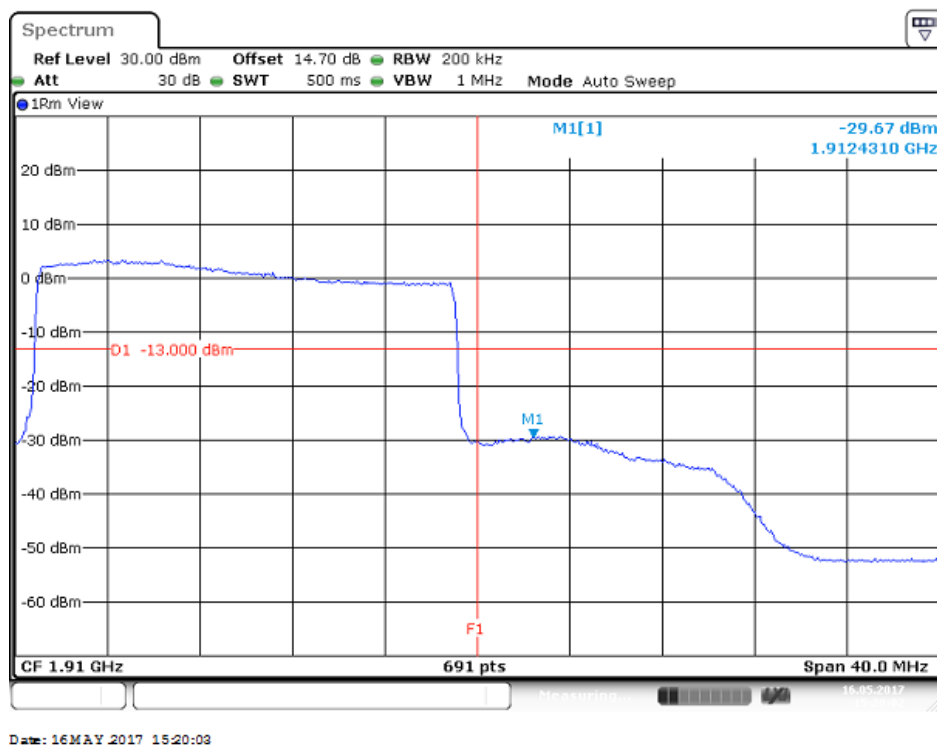


Date: 16 MAY 2017 15:21:54

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



HIGHER BAND EDGE



7.7 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

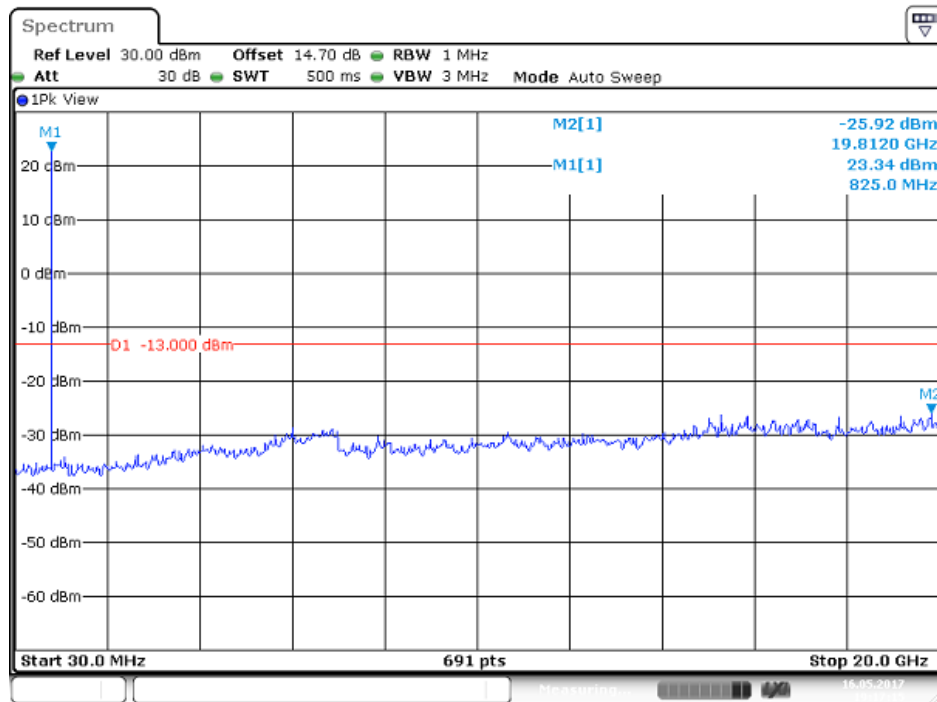
1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range.).
2. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. When the spectrum scanned from 30MHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.
4. When the spectrum scanned from 3GHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.

Test Results

LTE Band 5

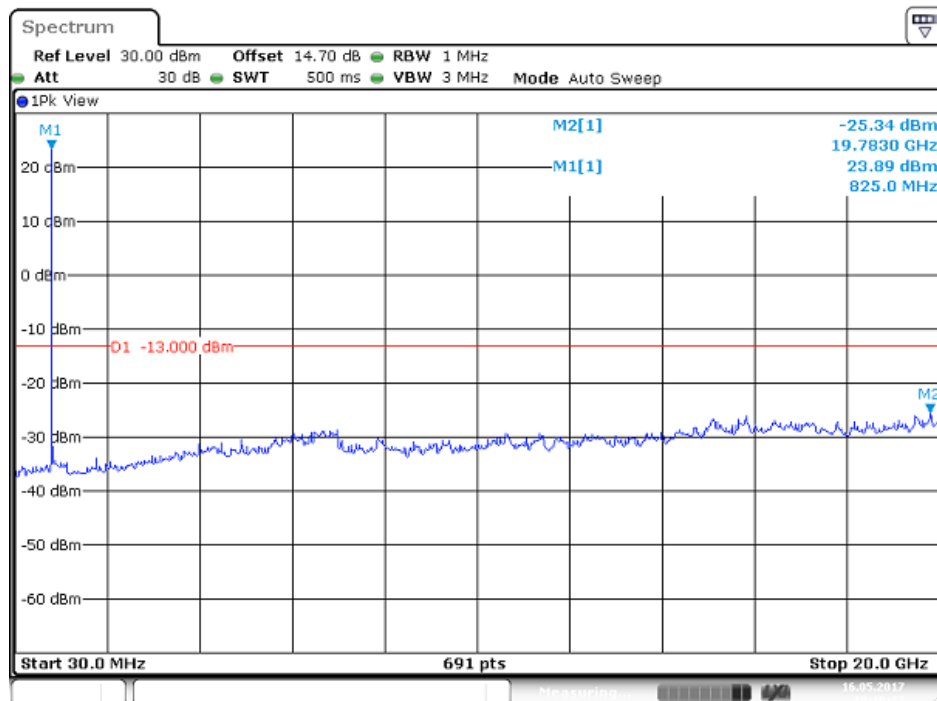
CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH Low



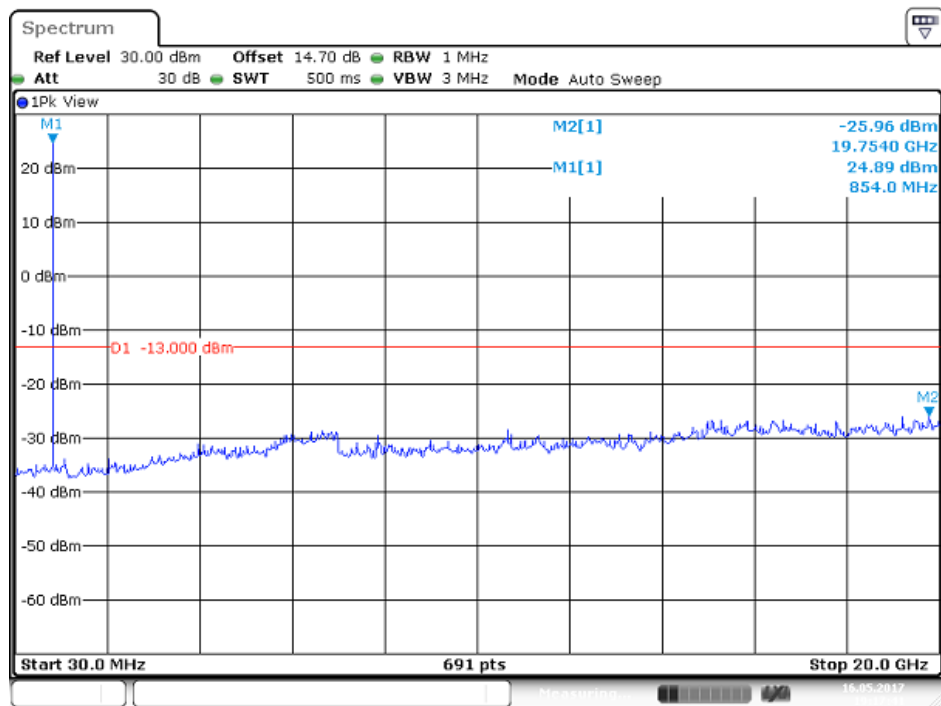
Date: 16 MAY 2017 19:17:16

CH Mid



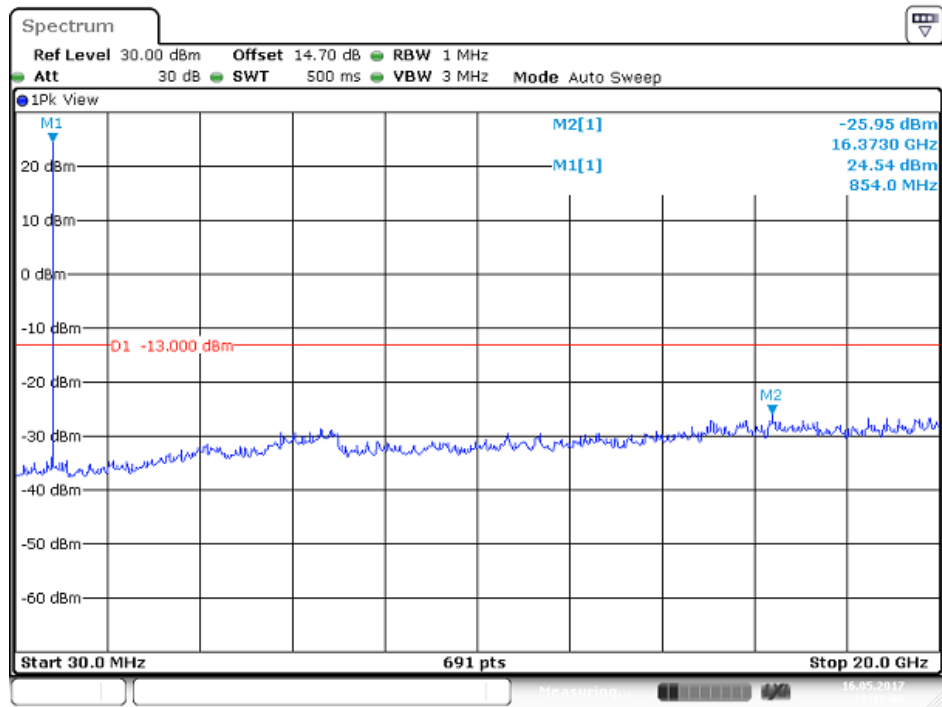
Date: 16 MAY 2017 19:16:13

CH High



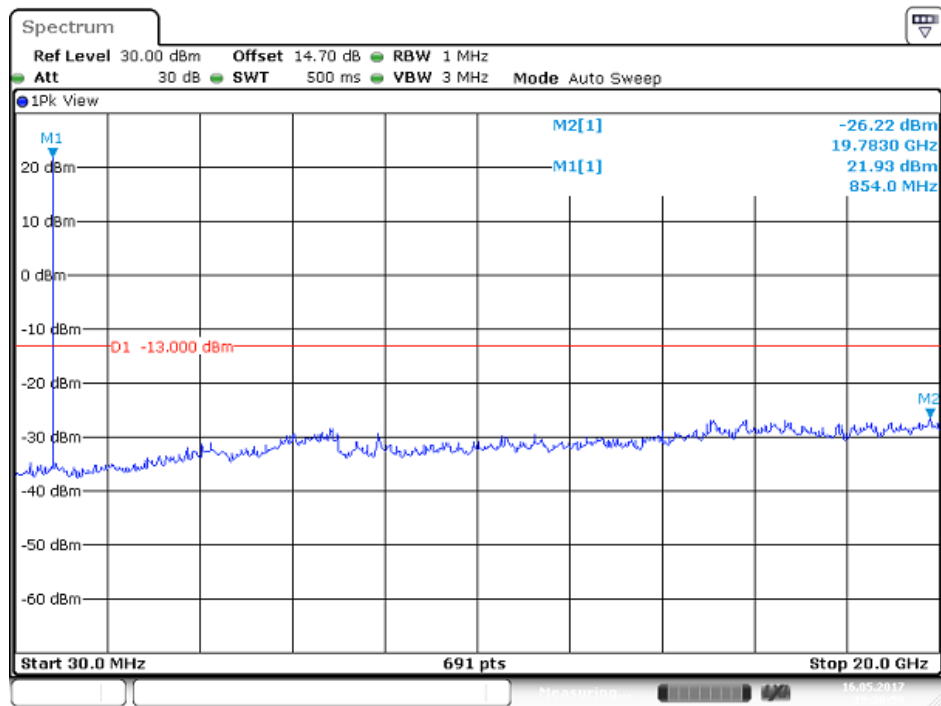
Date: 16 MAY 2017 19:17:41

CH High



Date: 16 MAY 2017 19:18:07

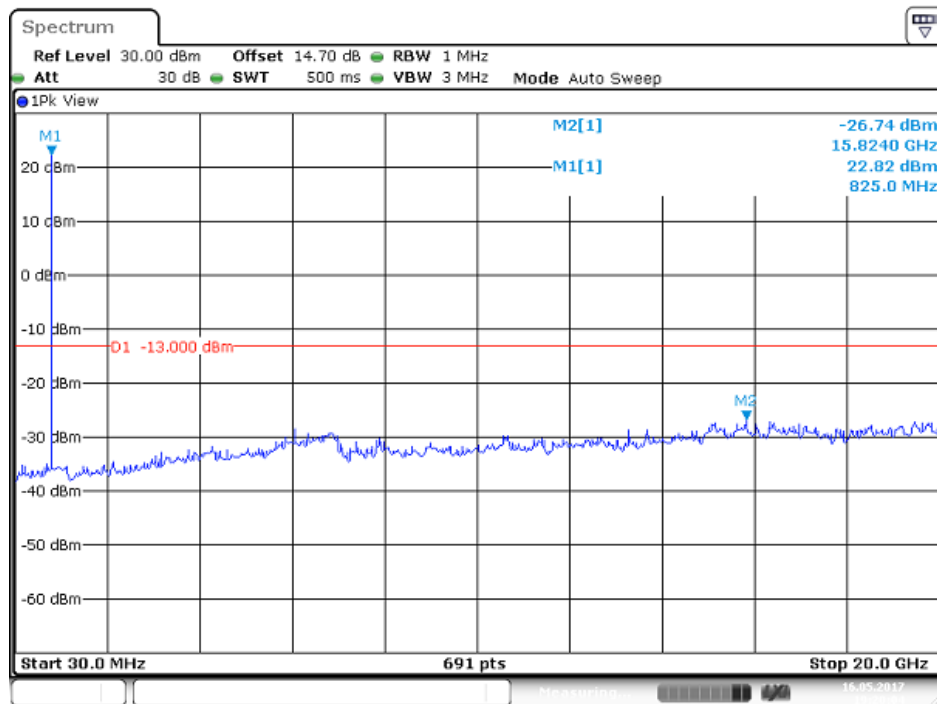
CH High



Date: 16 MAY 2017 19:20:58

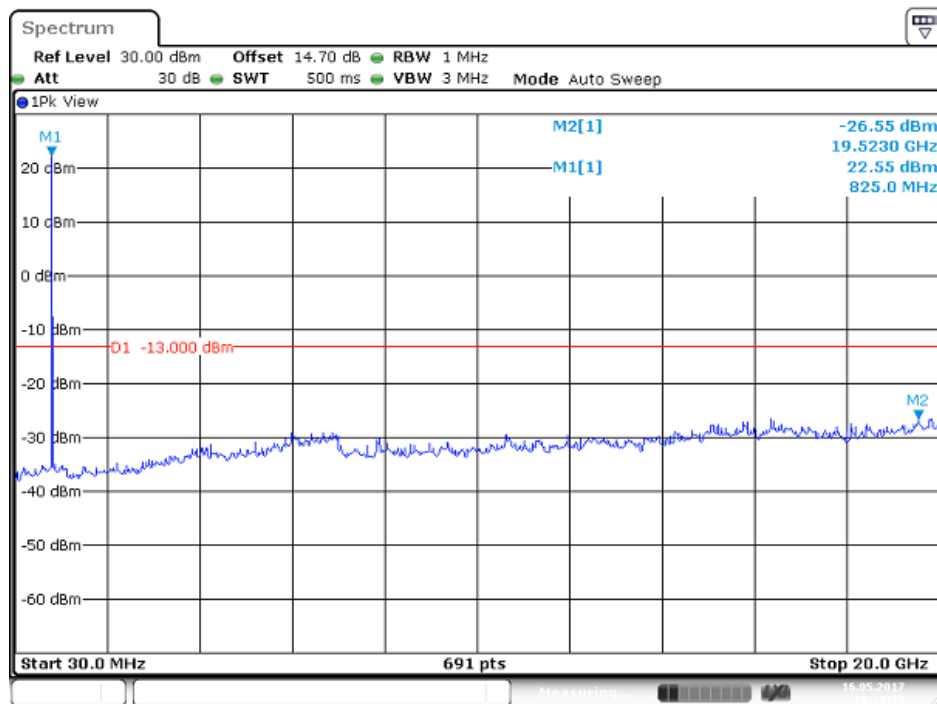
CHANNEL BANDWIDTH: 3MHz / 16QAM

CH Low



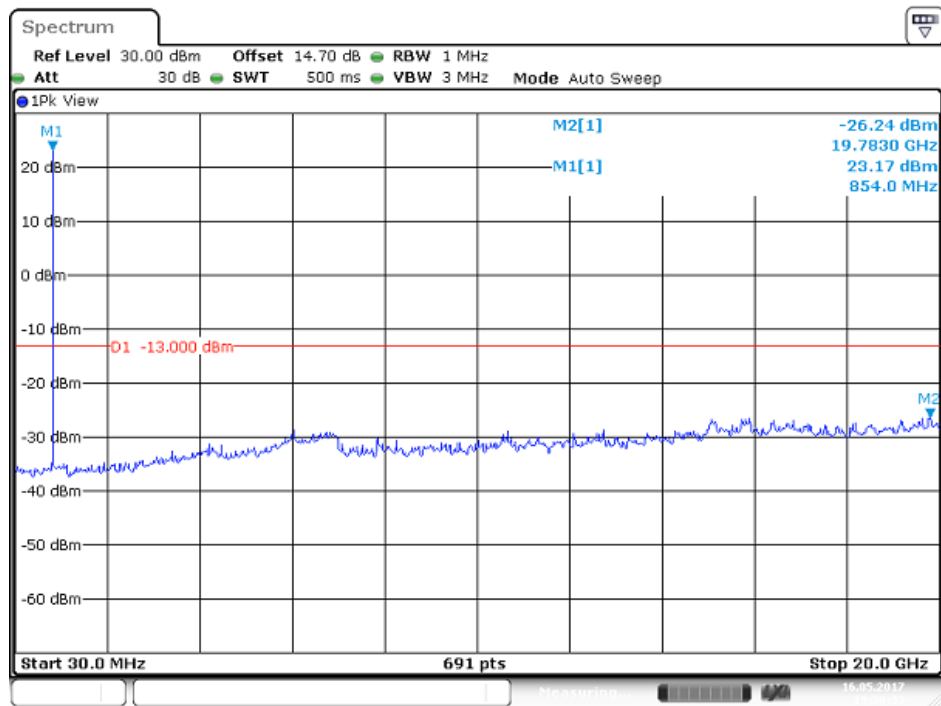
Date: 16 MAY 2017 19:20:05

CH Mid



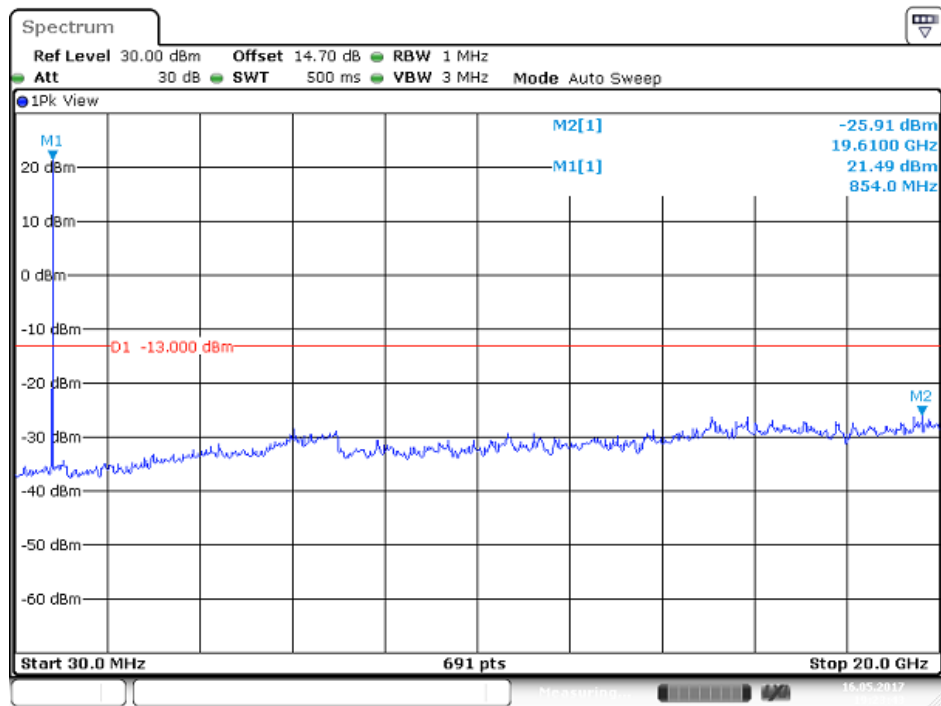
Date: 16 MAY 2017 19:19:40

CH High



Date: 16 MAY 2017 19:20:33

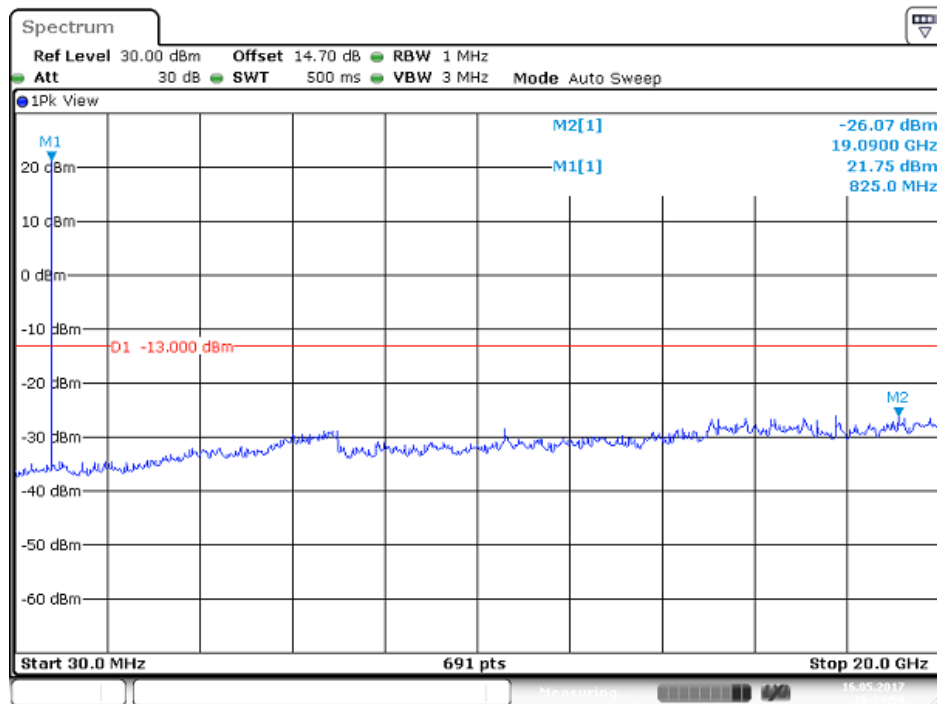
CH High



Date: 16 MAY 2017 19:23:43

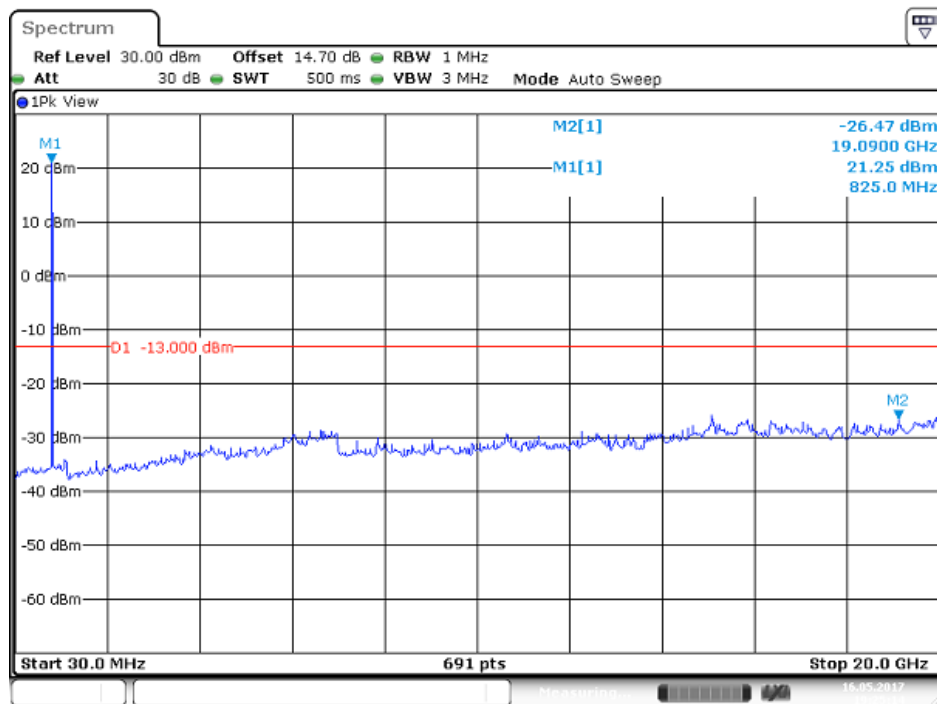
CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low



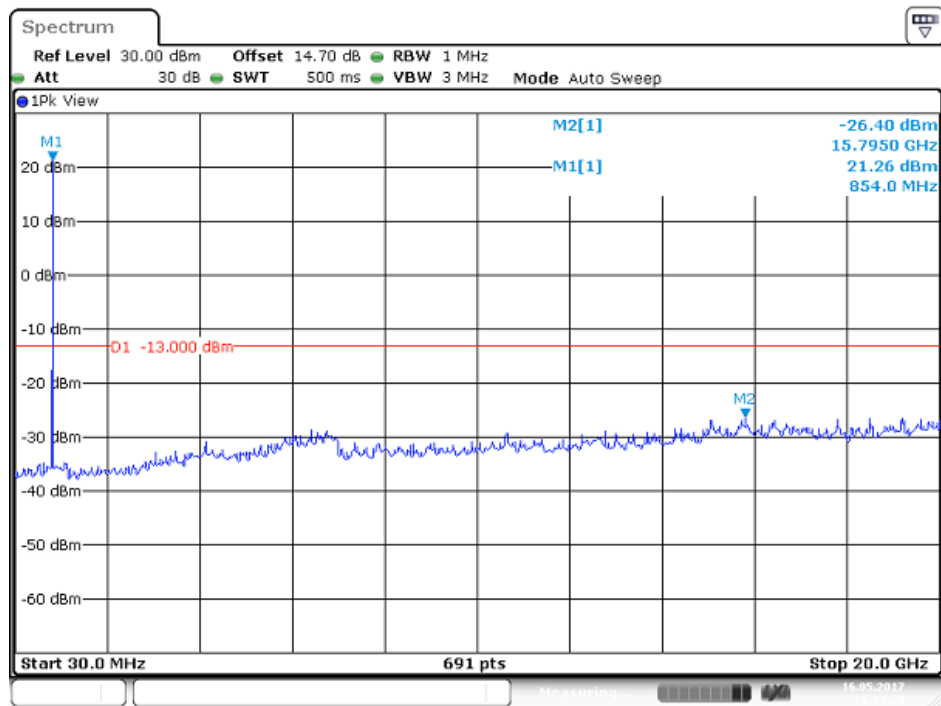
Date: 16 MAY 2017 19:24:50

CH Mid



Date: 16 MAY 2017 19:25:14

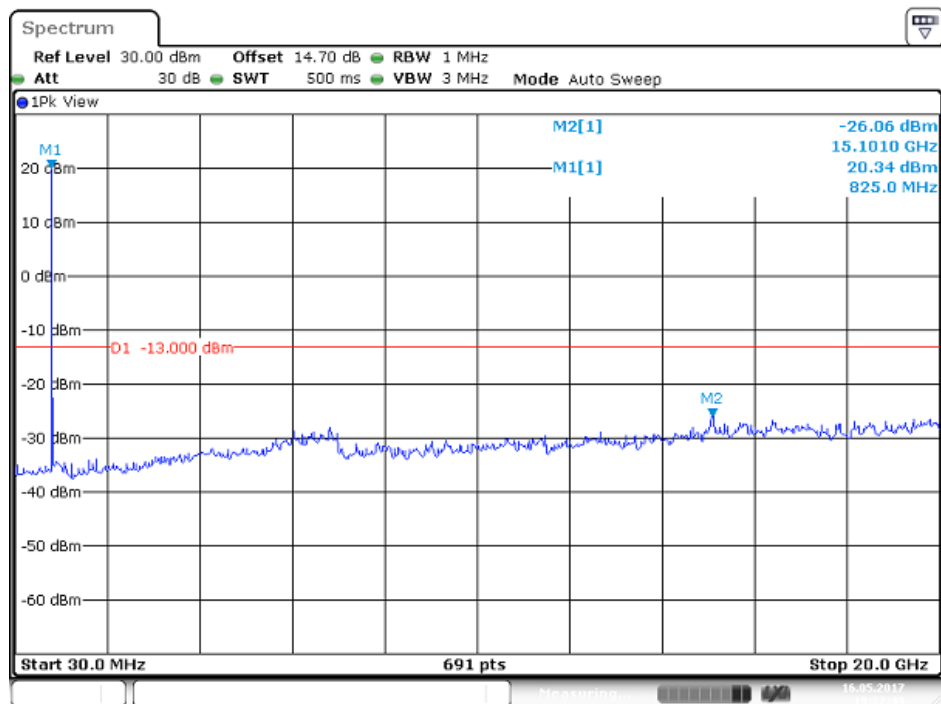
CH High



Date: 16 MAY 2017 19:24:20

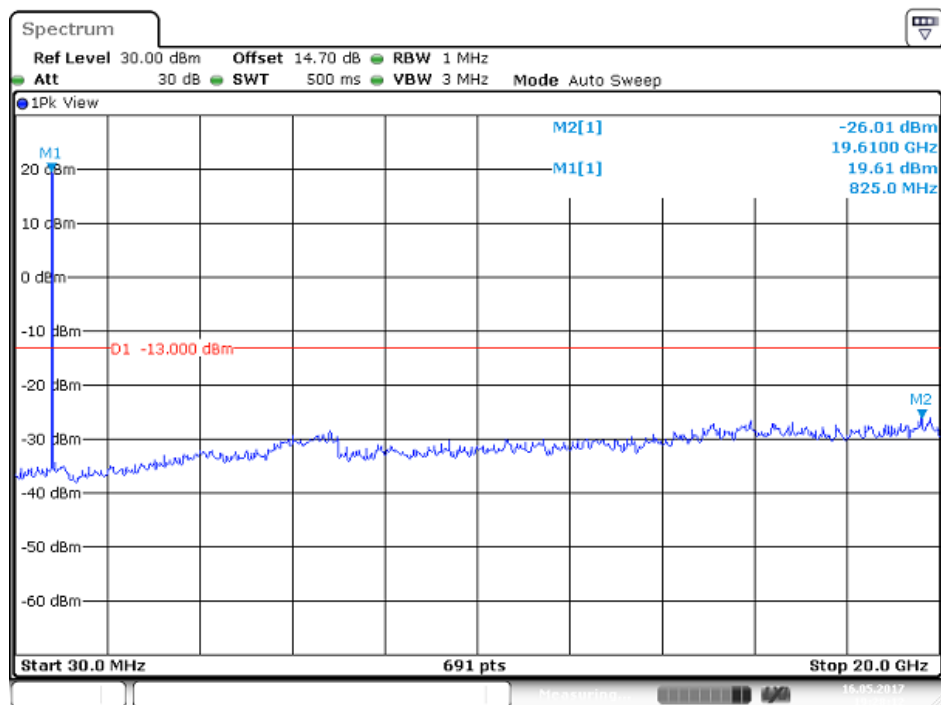
CHANNEL BANDWIDTH: 10MHz / QPSK

CH Low



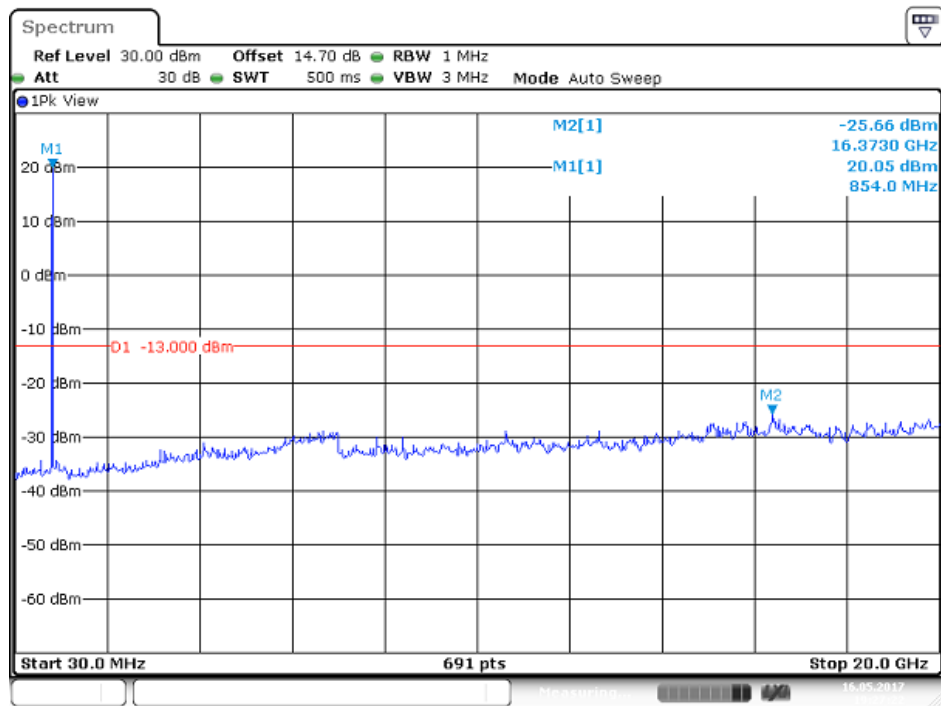
Date: 16 MAY 2017 19:27:49

CH Mid



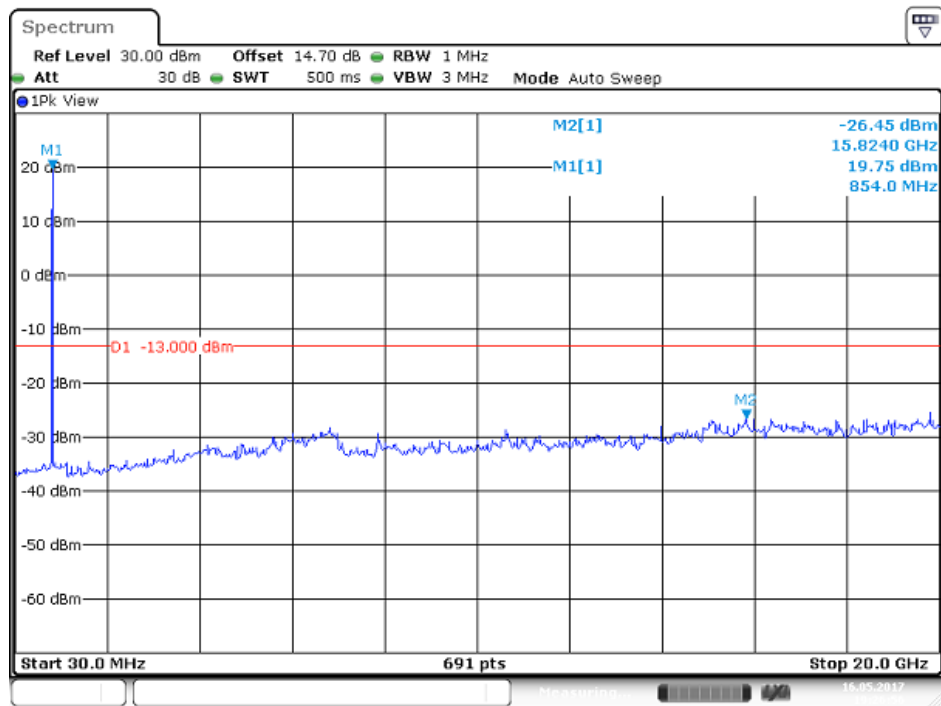
Date: 16 MAY 2017 19:28:13

CH High



Date: 16 MAY 2017 19:27:22

CH High

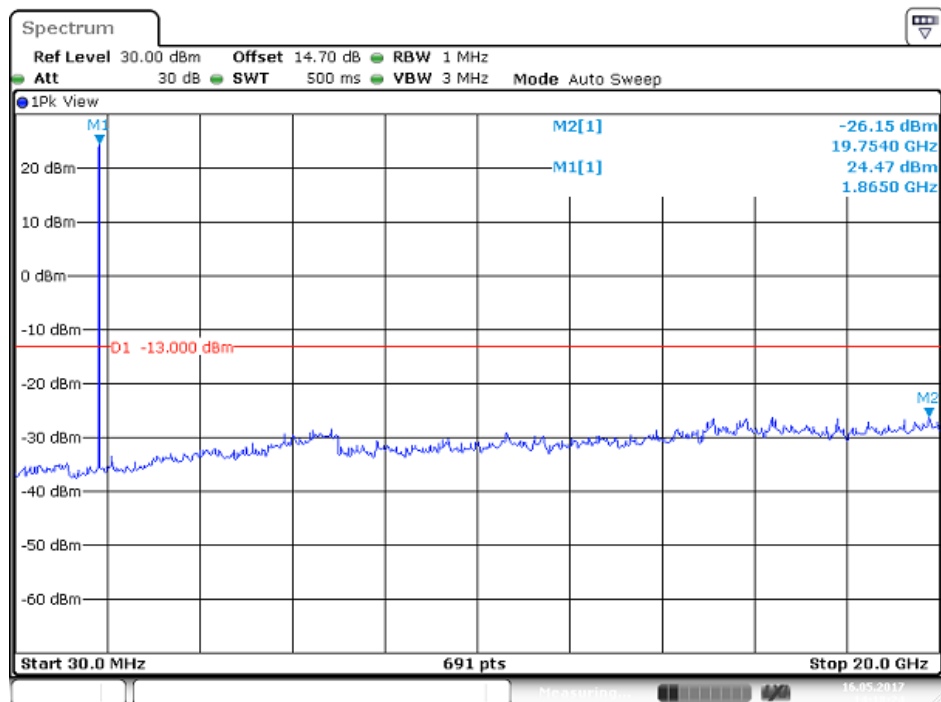


Date: 16 MAY 2017 19:26:57

LTE Band 2

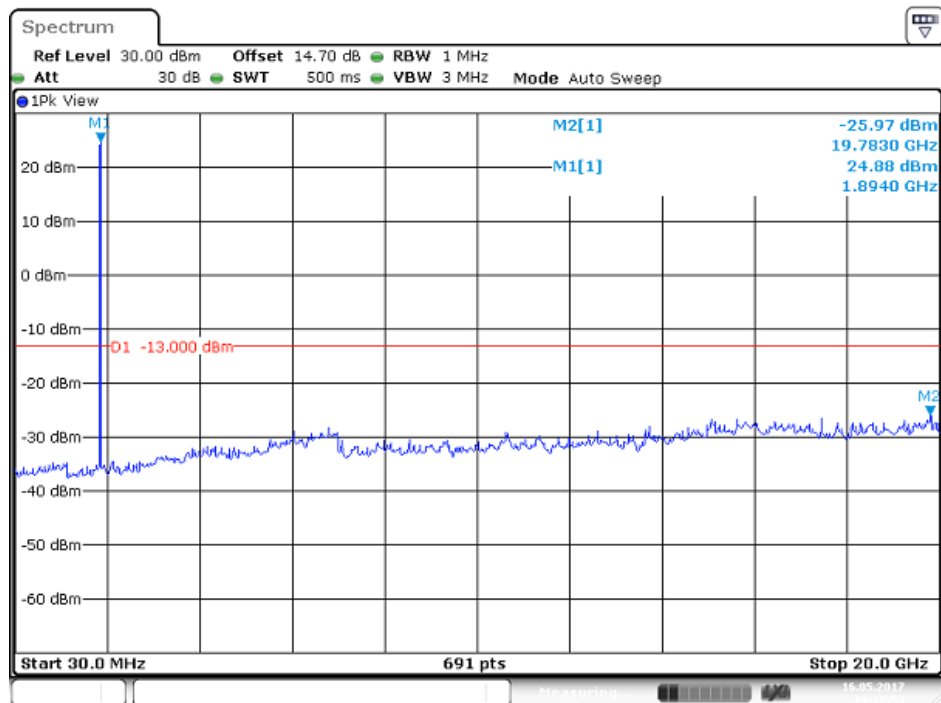
CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH Low



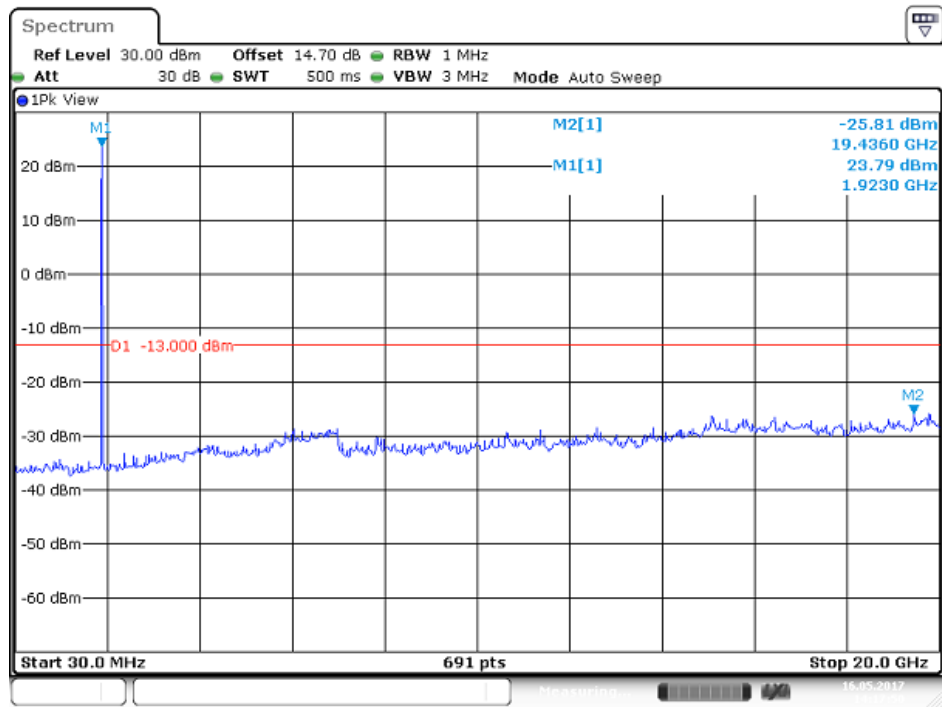
Date: 16 MAY 2017 14:18:24

CH Mid



Date: 16 MAY 2017 14:18:54

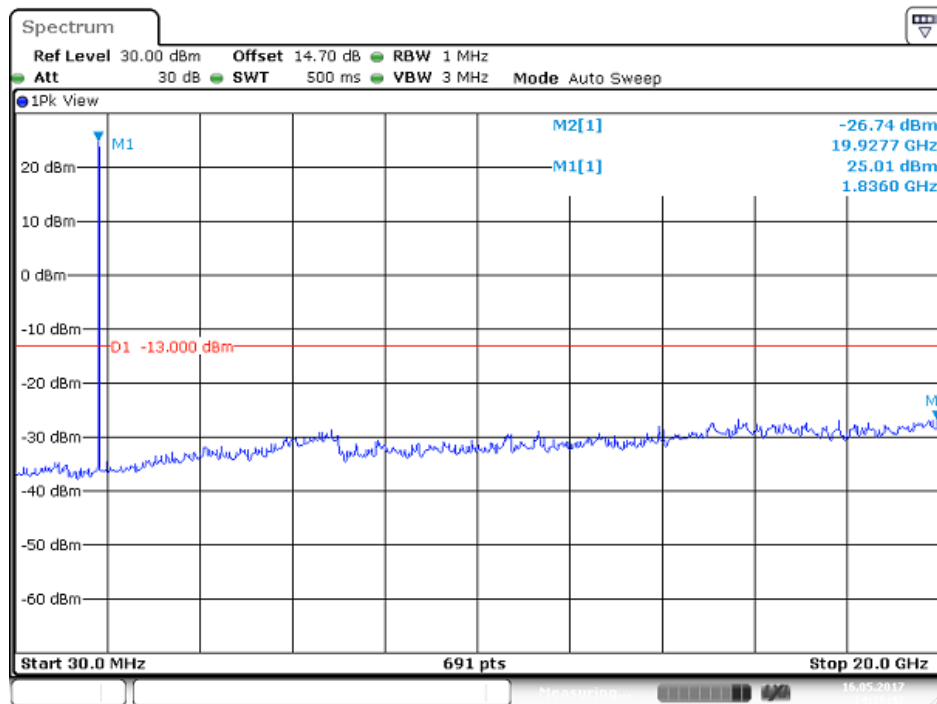
CH High



Date: 16 MAY 2017 14:17:50

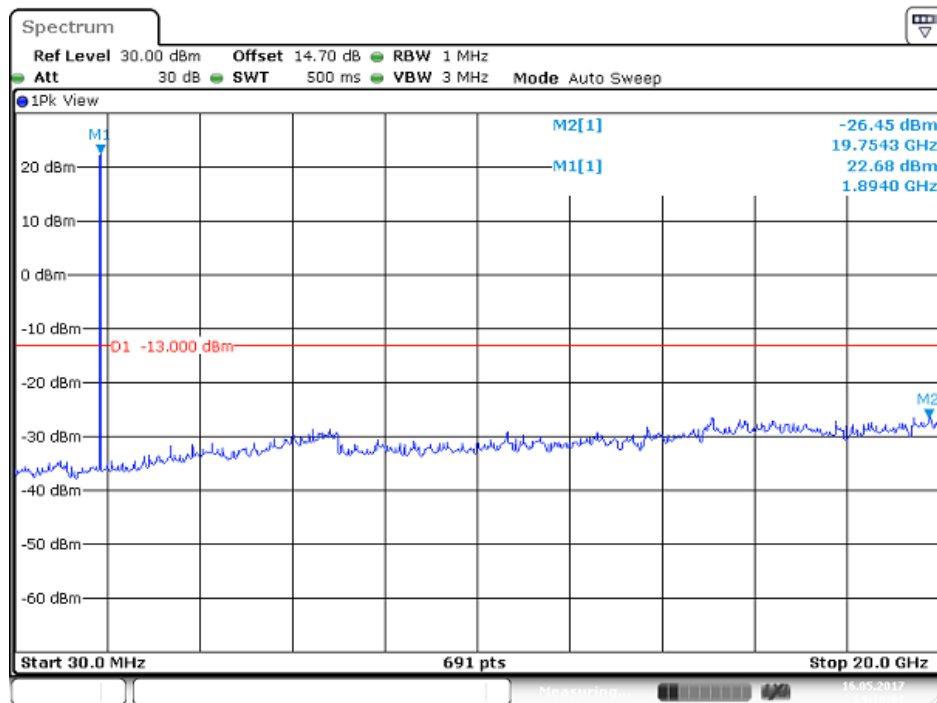
CHANNEL BANDWIDTH: 1.4MHz / 16QAM

CH Low



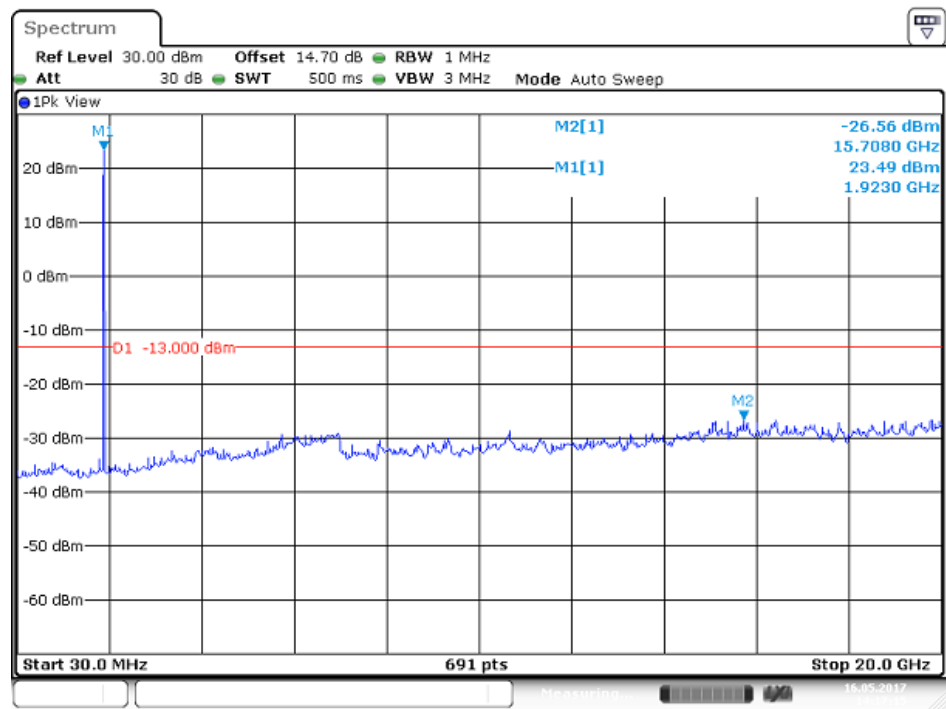
Date: 16 MAY 2017 14:16:43

CH Mid



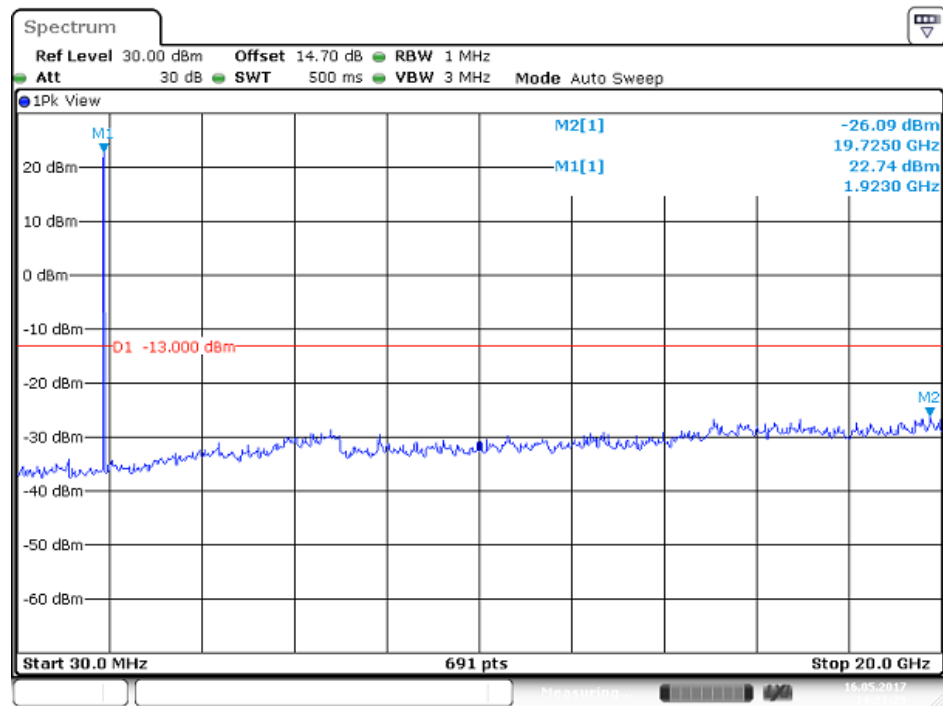
Date: 16 MAY 2017 14:16:01

CH High



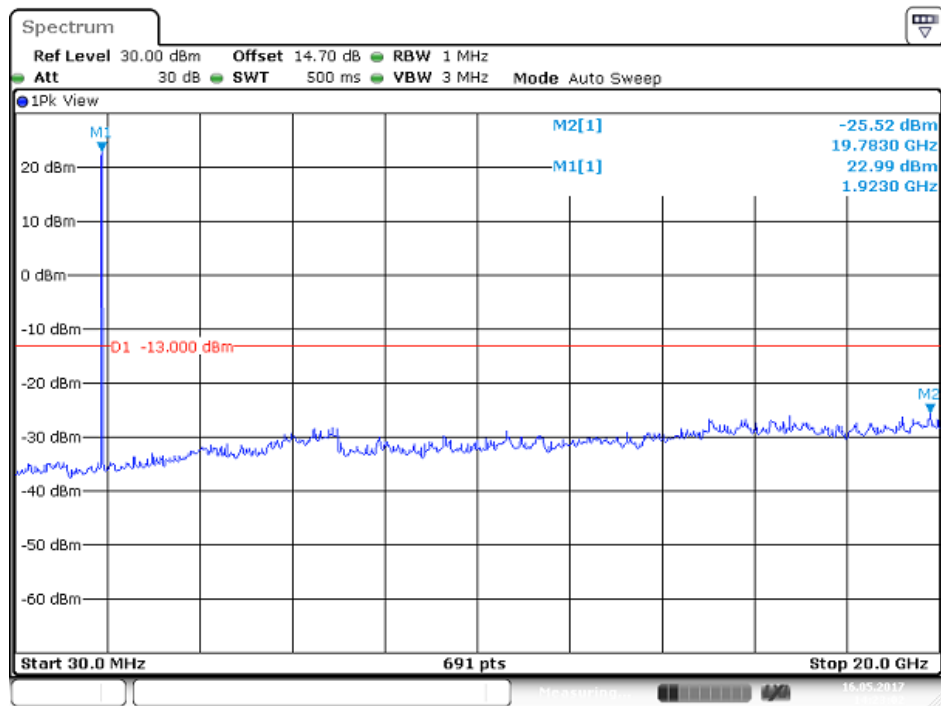
Date: 16 MAY 2017 14:17:16

CH High



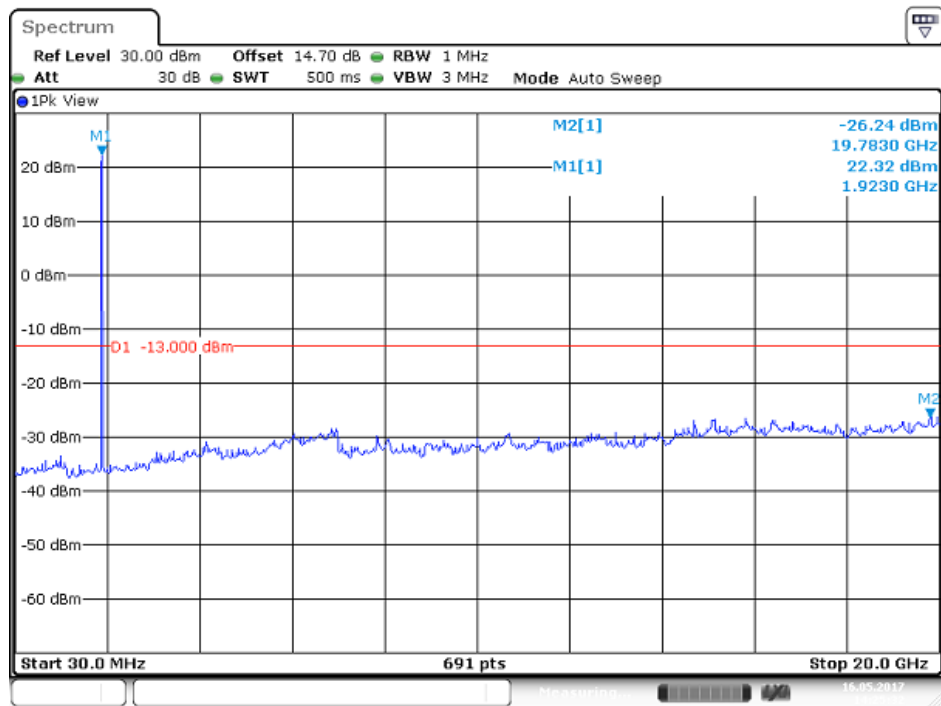
Date: 16MAY 2017 14:21:29

CH High



Date: 16 MAY 2017 14:23:02

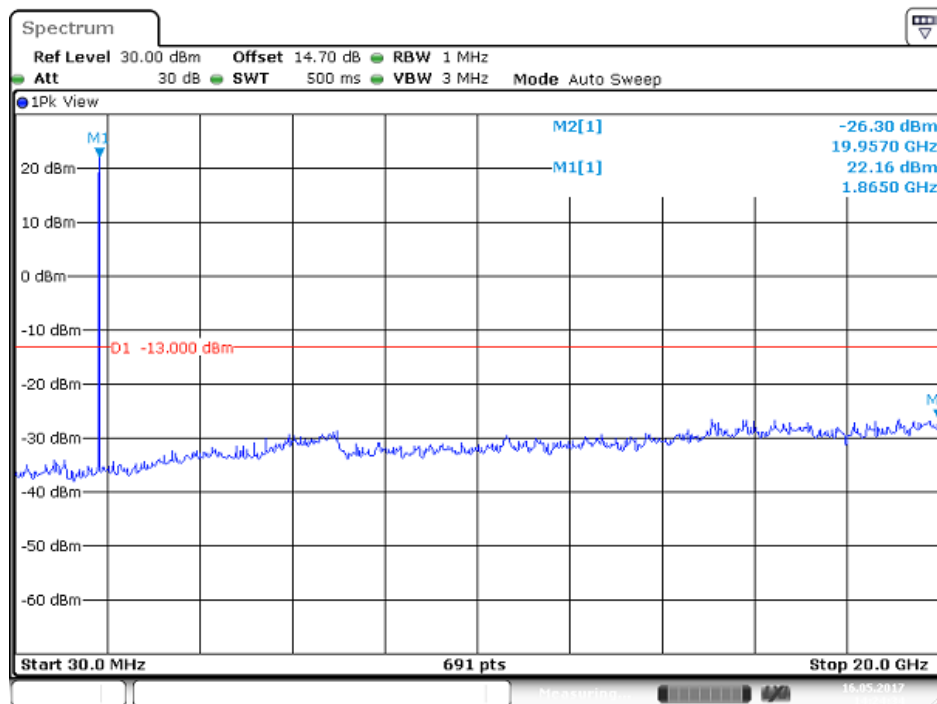
CH High



Date: 16 MAY 2017 14:25:32

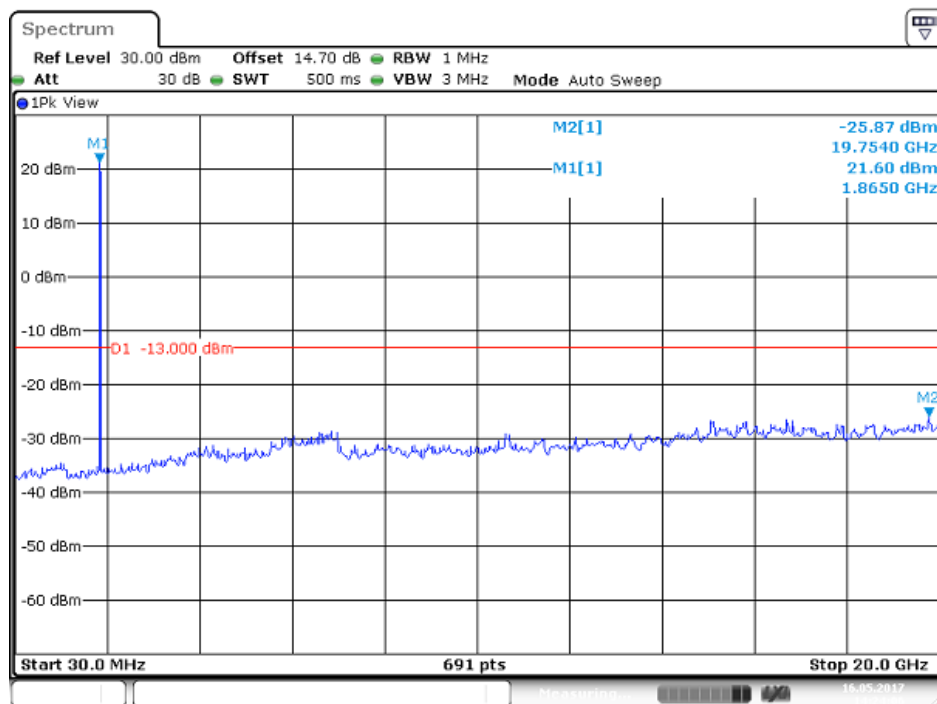
CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low



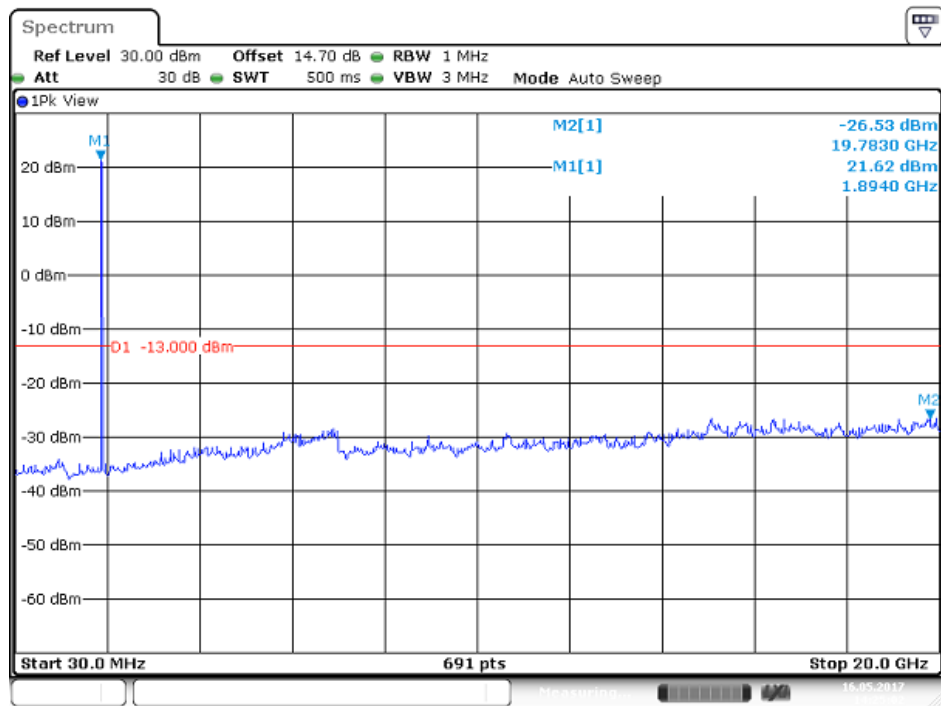
Date: 16 MAY 2017 14:24:34

CH Mid



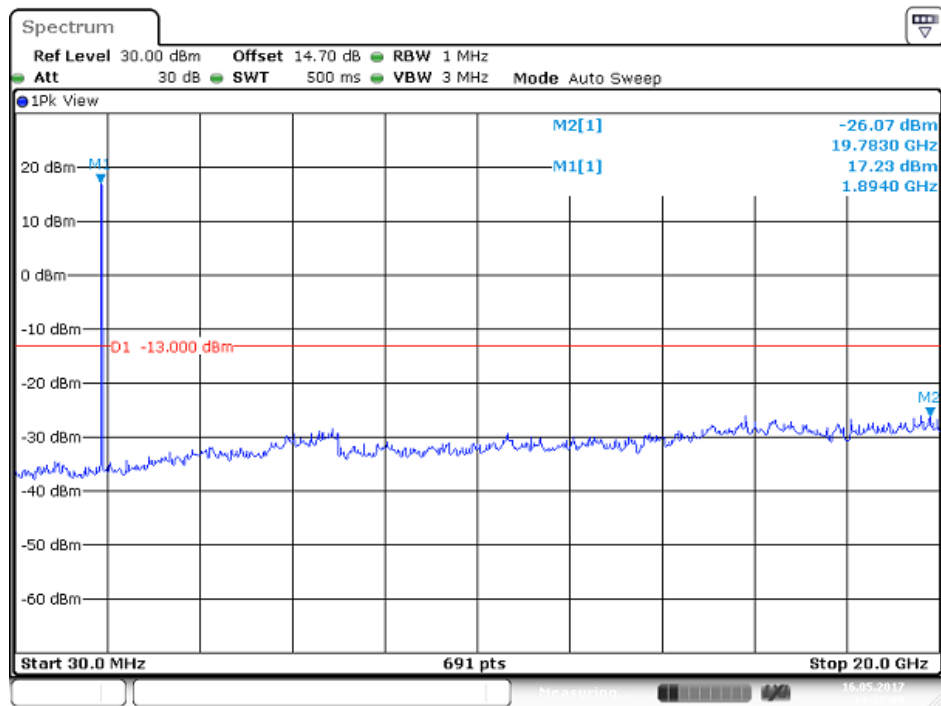
Date: 16 MAY 2017 14:24:06

CH High



Date: 16 MAY 2017 14:25:02

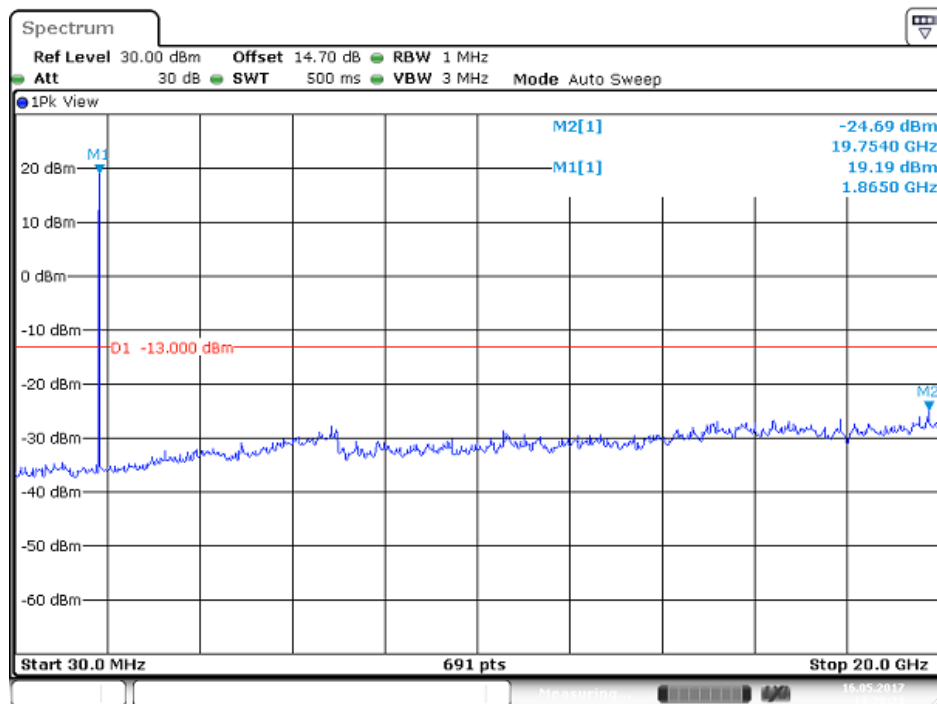
CH High



Date: 16 MAY 2017 14:28:00

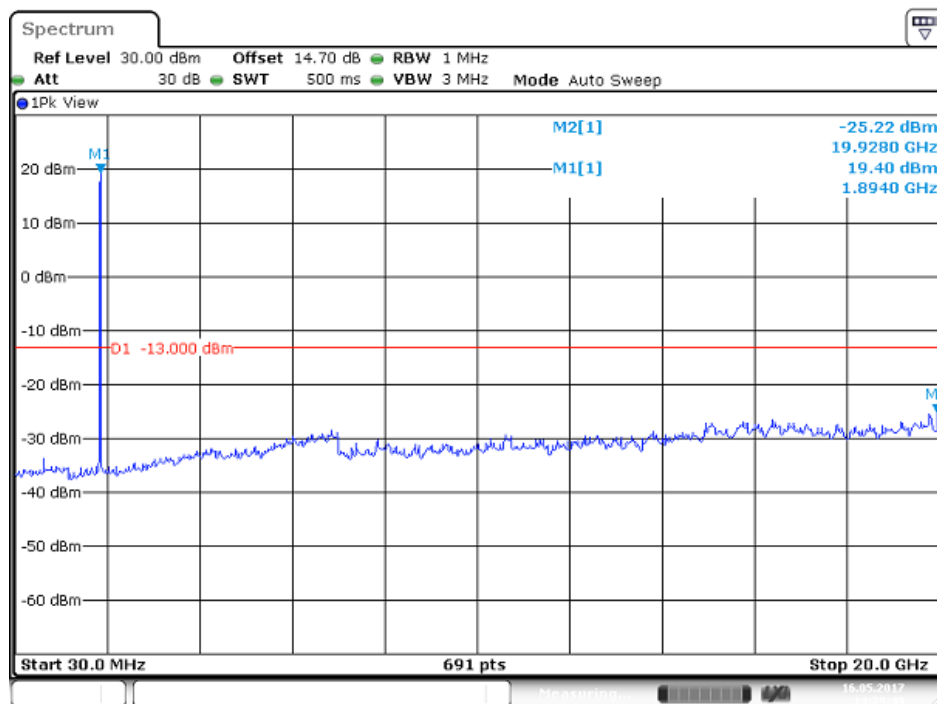
CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low



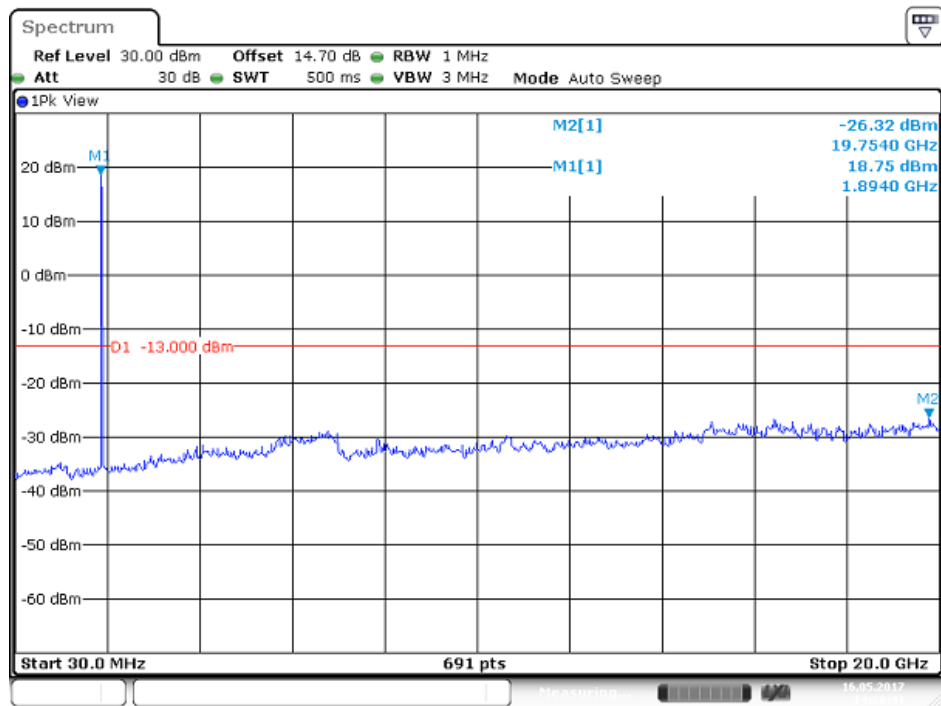
Date: 16 MAY 2017 14:29:21

CH Mid



Date: 16 MAY 2017 14:29:49

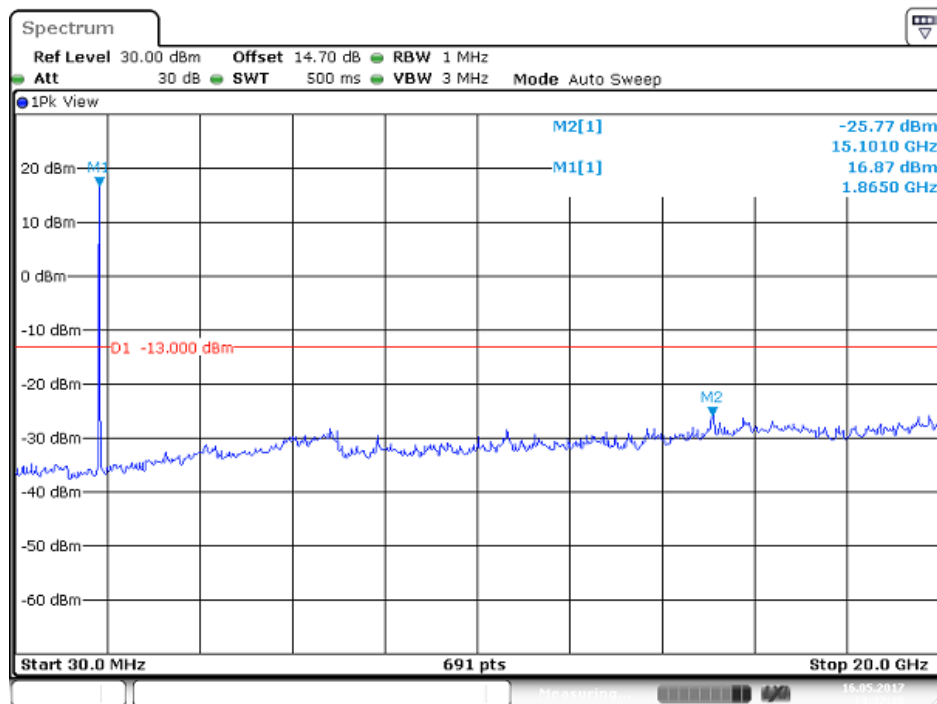
CH High



Date: 16 MAY 2017 14:28:41

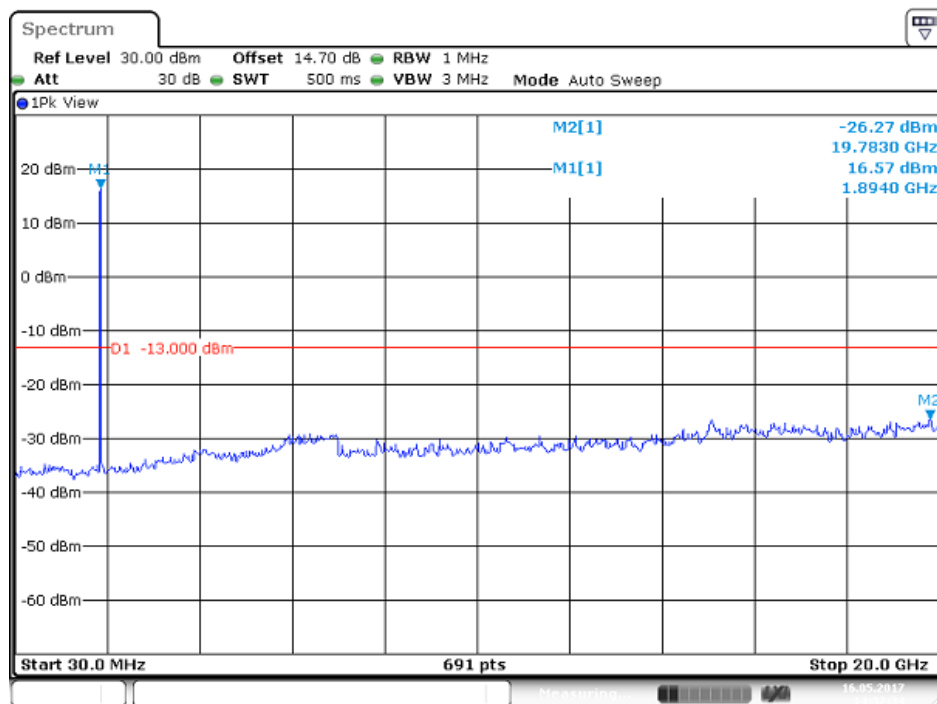
CHANNEL BANDWIDTH: 15MHz / QPSK

CH Low



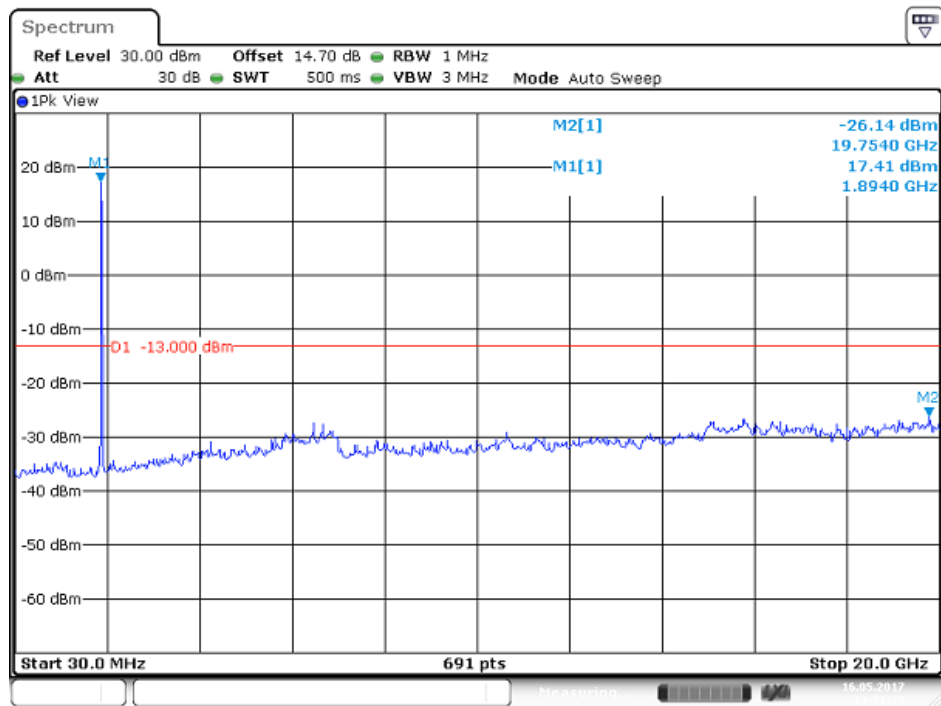
Date: 16 MAY 2017 14:22:10

CH Mid



Date: 16 MAY 2017 14:22:35

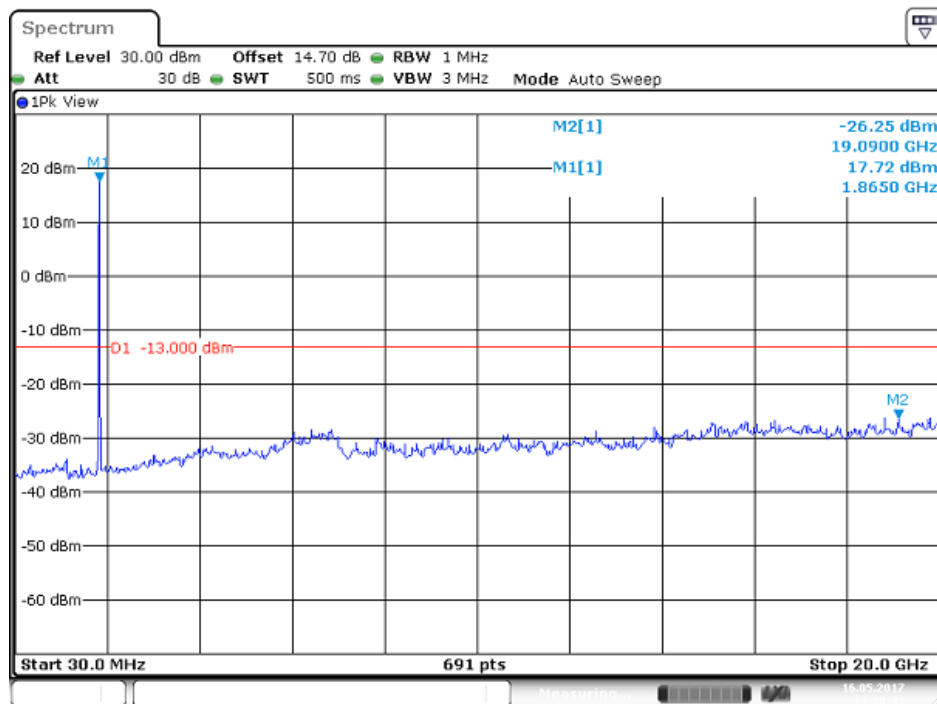
CH High



Date: 16 MAY 2017 14:21:33

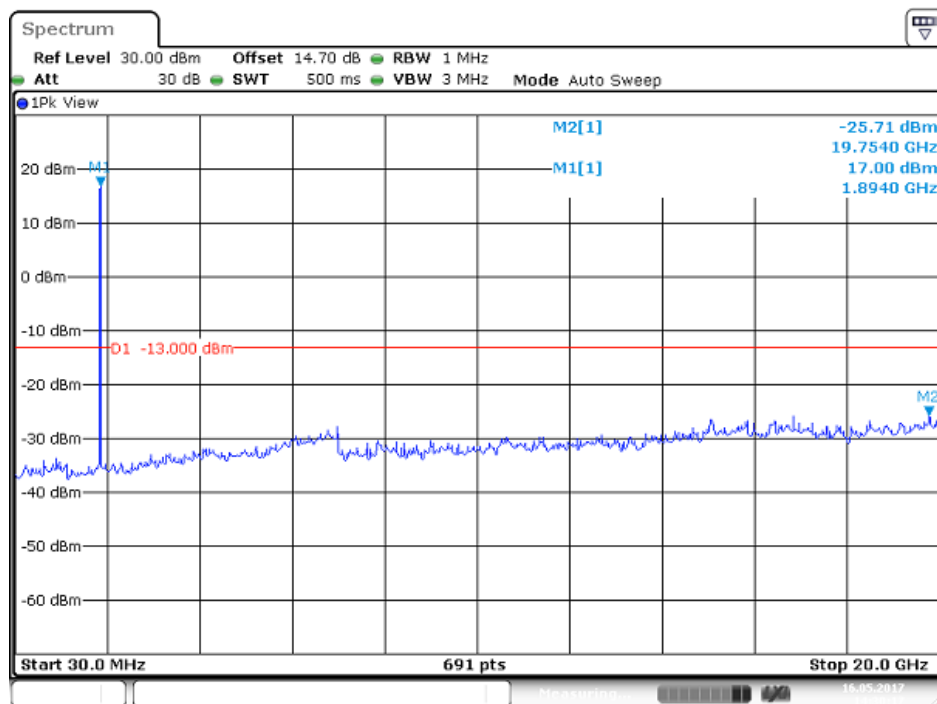
CHANNEL BANDWIDTH: 15MHz / 16QAM

CH Low



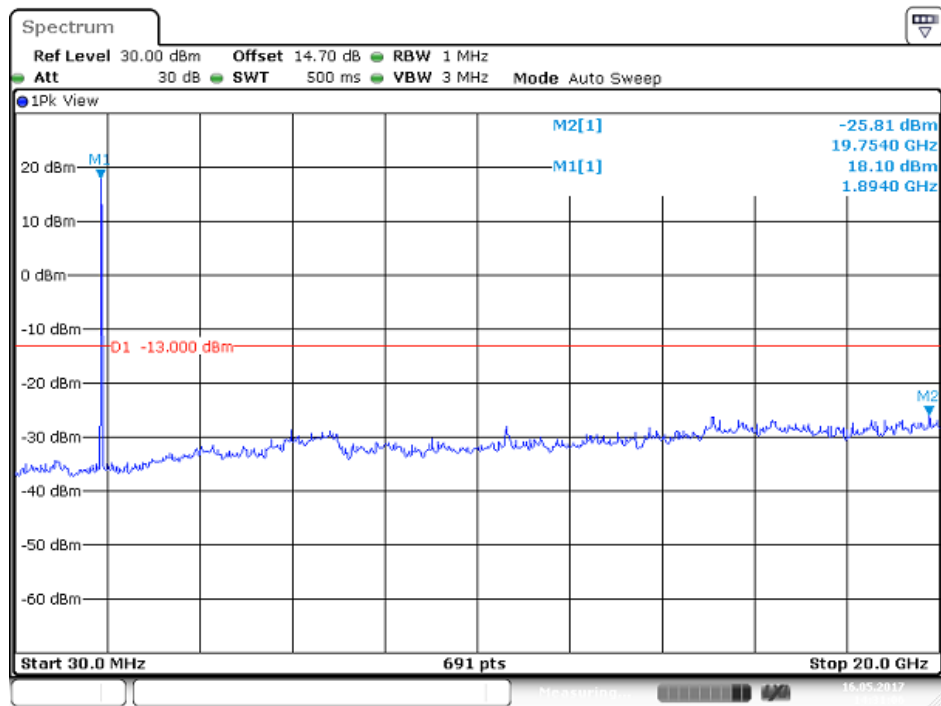
Date: 16 MAY 2017 14:20:43

CH Mid



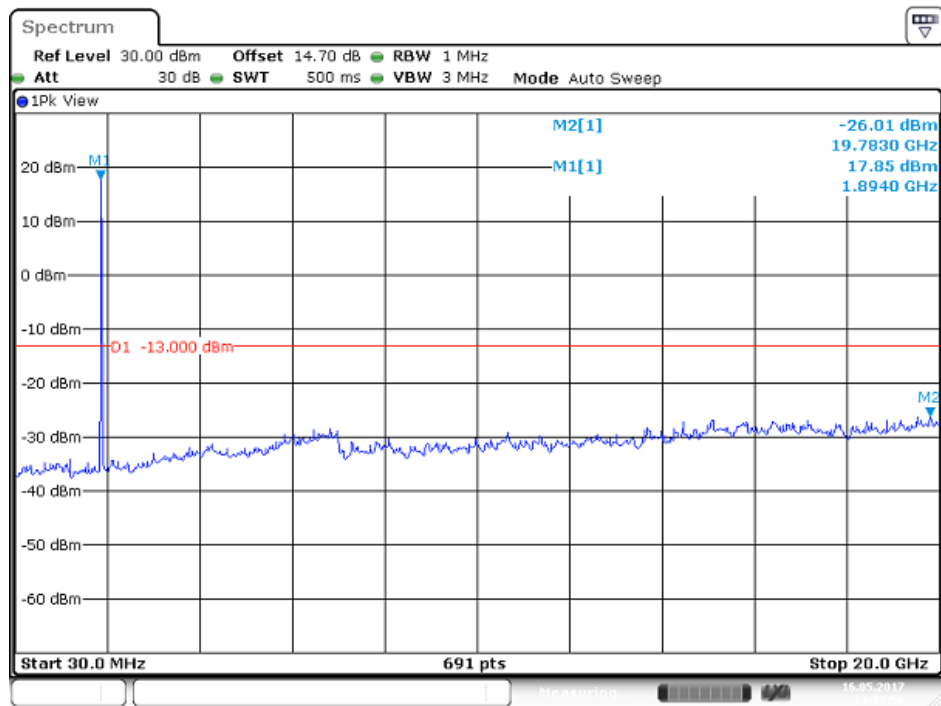
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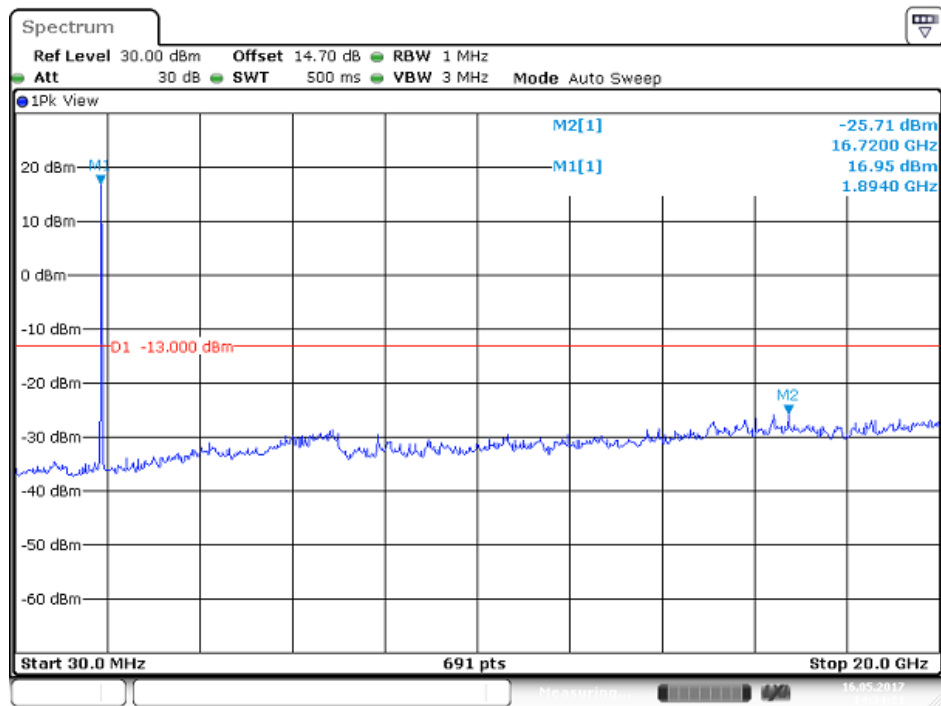
Date: 16 MAY 2017 14:21:07

CH High



Date: 16 MAY 2017 14:23:56

CH High



Date: 16MAY 2017 14:24:21