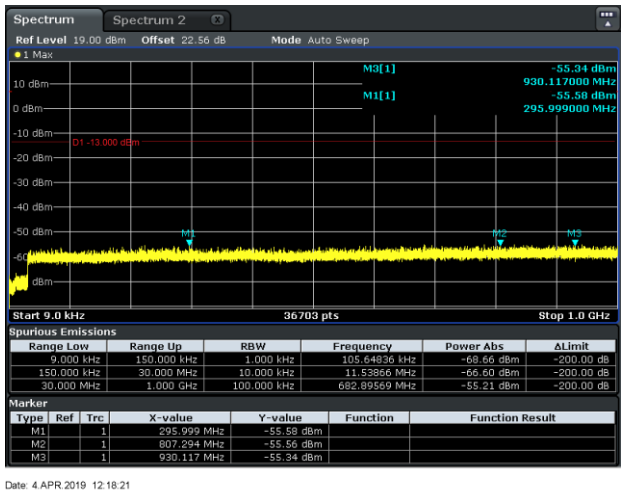



***Figure 8.2-21:*** *Conducted spurious emissions 9KHz to 1GHz, 2132.5MHz, 16QAM, 20MHz BW.*

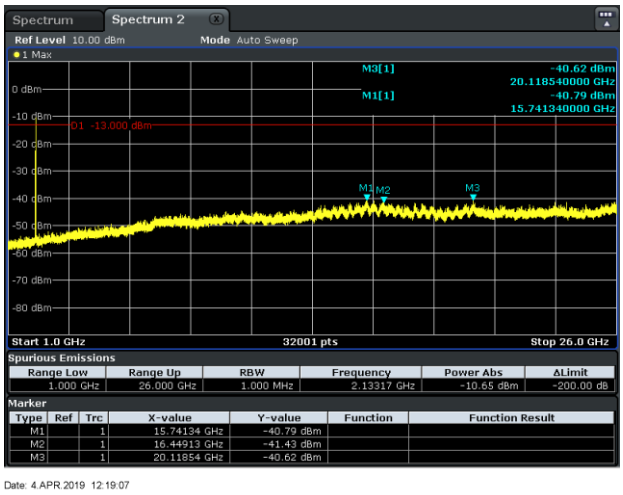



***Figure 8.2-22:*** *Conducted spurious emissions 1GHz to 26GHz, 2132.5MHz, 16QAM, 20MHz BW.*

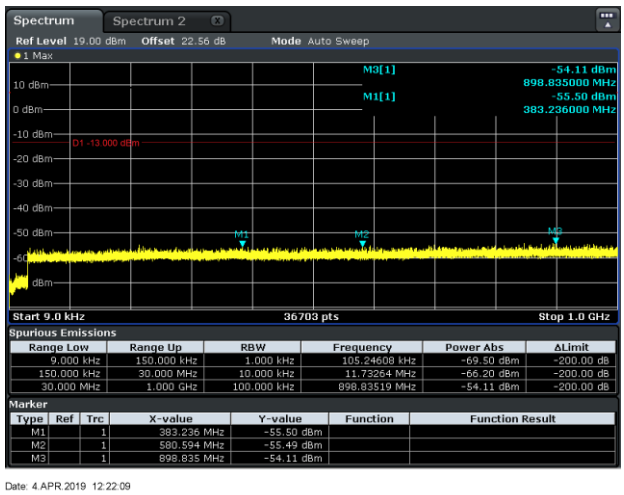



***Figure 8.2-23:*** *Conducted spurious emissions 9KHz to 1GHz, 2145MHz, 16QAM, 20MHz BW.*

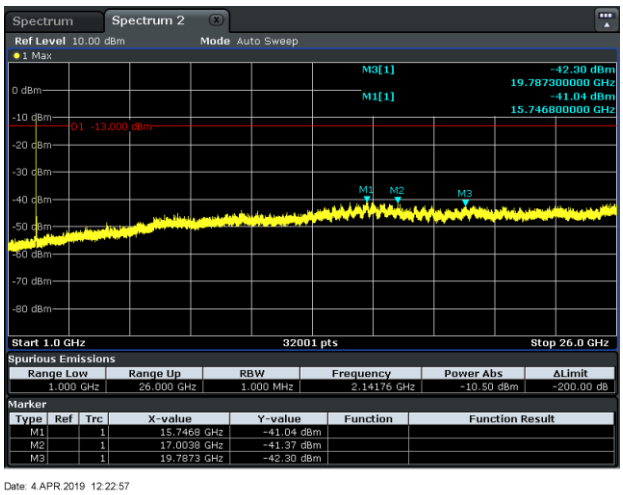



***Figure 8.2-24:*** *Conducted spurious emissions 1GHz to 26GHz, 2145MHz, 16QAM, 20MHz BW.*

## 8.3 Spurious emissions at RF antenna connector (Band 13)

### 8.3.1 Definitions and limits

FCC 27.53:
(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;
(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130 Issue 2
4.7 Transmitter unwanted emissions

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:
a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least: (i) 76 + 10 log10 p (watts), dB, for base and fixed equipment, and (ii) 65 + 10 log10 p (watts), dB, for mobile and portable equipment.
b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

### 8.3.2 Test summary

| | |
|---|---|
| Test date | April 4, 2019 |

### 8.3.3 Observations, settings and special notes

The spectrum was searched from 9kHz to the 26GHz.
All measurements were performed using RMS detector at Max Hold.
Antenna 2 – LTE Band 13, 16QAM, 5Mhz and 10MHz Bandwidth - Spurious Emissions
Not shown –Plots for Port 1 were essentially the same.
Offset: 20db attenuator + 0.41dB cable loss + 2.15dBi (<1GHz) antenna gain = 22.56dB

## 8.3.4 Test data

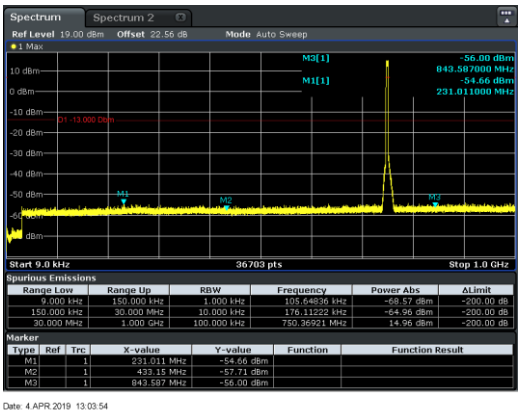



***Figure 8.3-1:*** *Conducted spurious emissions 9KHz to 1GHz, 748.5MHz, 16QAM, 5MHz BW.*

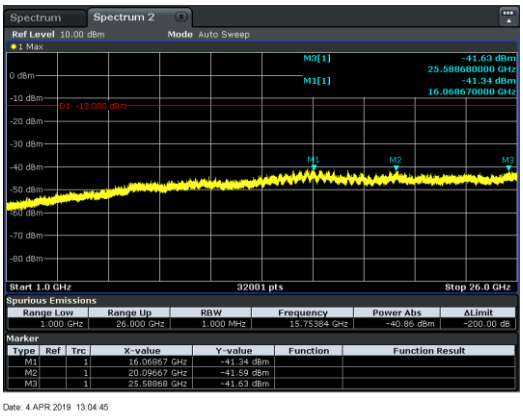



***Figure 8.3-2:*** *Conducted spurious emissions 1GHz to 26GHz, 748.5MHz, 16QAM, 5MHz BW.*

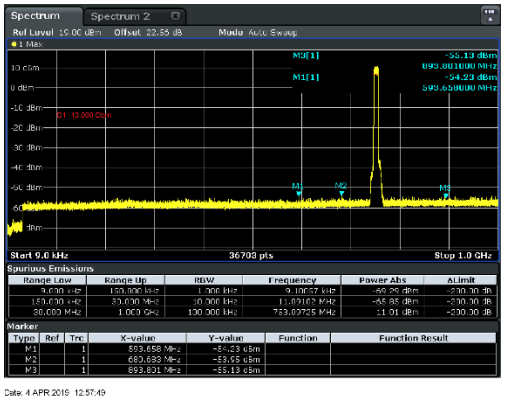



***Figure 8.3-33:*** *Conducted spurious emissions 9KHz to 1GHz, 751MHz, 16QAM, 5MHz BW.*

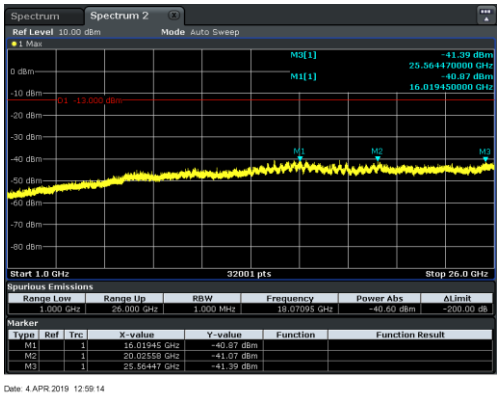



***Figure 8.3-34:*** *Conducted spurious emissions for 1GHz to 26GHz, 751MHz, 16QAM, 5MHz BW.*

***Figure 8.3-4: :***

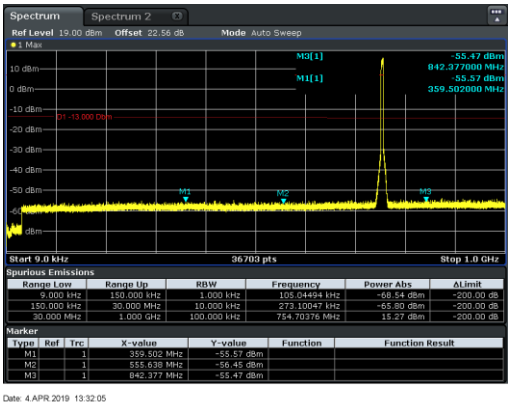



***Figure 8.3-35:*** *Conducted spurious emissions 9KHz to 1GHz, 753.5MHz, 16QAM, 5MHz BW.*

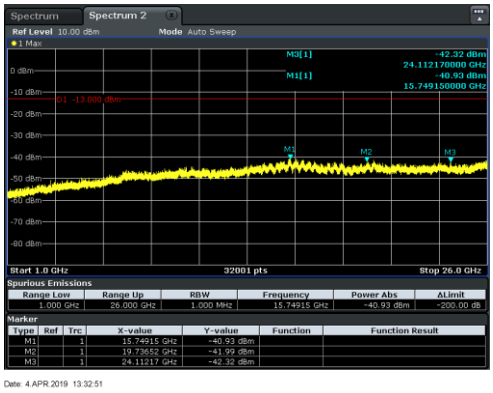



***Figure 8.3-36:*** *Conducted spurious emissions 1GHz to 26GHz, 753.5MHz, 16QAM, 5MHz BW.*

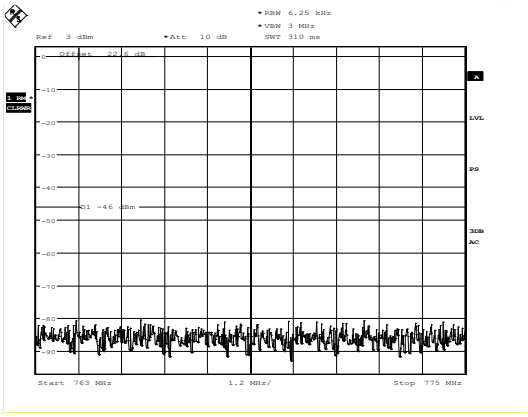



***Figure 8.32-37:*** *Conducted additional unwanted emissions limits 763-775MHz 6QAM, 5MHz BW.*

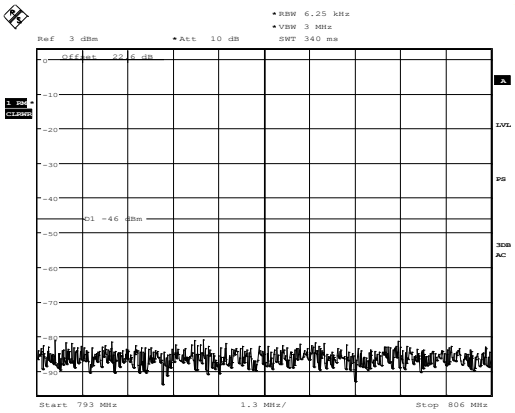



***Figure 8.3-38:*** *Conducted additional unwanted emissions limits 793-806MHz 6QAM, 5MHz BW.*

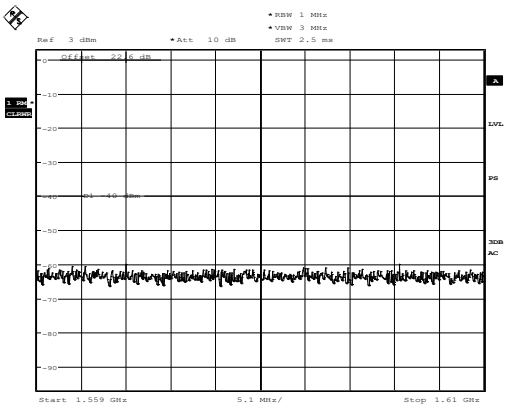



***Figure 8.3-39:*** *Conducted additional unwanted emissions limits 1559-1610MHz 6QAM, 5MHz BW.*

***Figure 8.3-5:*** *: Conducted spurious emissions for QPSK 5 MHz Mid channel at Port 1*

***Figure 8.3-6:*** *:*

*Table 8.3-1: Spurious Emissions at Band Edges – Port 2 – LTE Band 4*

| Frequency | Band Edge Measurement (dBm) | RBW (kHz) | Limit (dBm) |
|---|---|---|---|
| **Band 4** | | | |
| **Bandwidth 5MHz** | | | |
| **QPSK** | | | |
| 2112.5 | -29.54 | 50 | -13 |
| 2152.5 | -26.00 | 50 | -13 |
| **16QAM** | | | |
| 2112.5 | -31.08 | 50 | -13 |
| 2152.5 | -24.94 | 50 | -13 |
| **64QAM** | | | |
| 2112.5 | -29.97 | 50 | -13 |
| 2152.5 | -27.70 | 50 | -13 |
| | | | |
| **Bandwidth 10MHz** | | | |
| **QPSK** | | | |
| 2115 | -22.72 | 200 | -13 |
| 2150 | -21.54 | 200 | -13 |
| **16QAM** | | | |
| 2115 | -21.21 | 200 | -13 |
| 2150 | -2194 | 200 | -13 |
| **64QAM** | | | |
| 2115 | -26.09 | 200 | -13 |
| 2150 | -23.85 | 200 | -13 |
| | | | |
| **Bandwidth 15MHz** | | | |
| **QPSK** | | | |
| 2117.5 | -26.61 | 200 | -13 |
| 2147.5 | -31.70 | 200 | -13 |
| **16QAM** | | | |
| 2117.5 | -28.35 | 200 | -13 |
| 2147.5 | -28.49 | 200 | -13 |
| **64QAM** | | | |
| 2117.5 | -28.78 | 200 | -13 |
| 2147.5 | -27.65 | 200 | -13 |
| | | | |
| **Bandwidth 20MHz** | | | |
| **QPSK** | | | |
| 2120 | -30.45 | 200 | -13 |
| 2145 | -30.00 | 200 | -13 |
| **16QAM** | | | |
| 2120 | -30.79 | 200 | -13 |
| 2145 | -28.15 | 200 | -13 |
| **64QAM** | | | |
| 2120 | -29.16 | 200 | -13 |
| 2145 | -29.74 | 200 | -13 |
| | | | |

*Table 8.3-2: Spurious Emissions at band edges – Port 2 – LTE Band 13*

| Frequency | Band Edge Measurement (dBm) | RBW (kHz) | Limit (dBm) |
|---|---|---|---|
| **Band 13** | | | |
| **Bandwidth 5MHz** | | | |
| **QPSK** | | | |
| 748.5 | -31.95 | 30 | -13 |
| 753.5 | -31.86 | 30 | -13 |
| **16QAM** | | | |
| 748.5 | -31.81 | 30 | -13 |
| 753.5 | -27.51 | 30 | -13 |
| **64QAM** | | | |
| 748.5 | -29.07 | 30 | -13 |
| 753.5 | -33.98 | 30 | -13 |
| | | | |
| **Bandwidth 10MHz** | | | |
| **QPSK** | | | |
| 751 | -39.11 / -35.31 | 30 | -13 |
| **16QAM** | | | |
| 751 | -35.49 / -35.91 | 30 | -13 |
| **64QAM** | | | |
| 751 | -33.54 / -36.01 | 30 | -13 |

## ***Spurious Emissions at band edges – Port 2 – LTE Band 4***

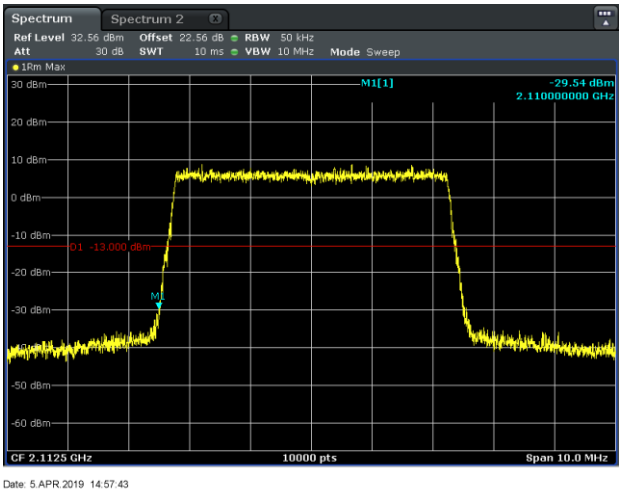



***Figure 8.3-7:*** *Conducted band edge for QPSK 212.5MHz, 5MHz Channel.*

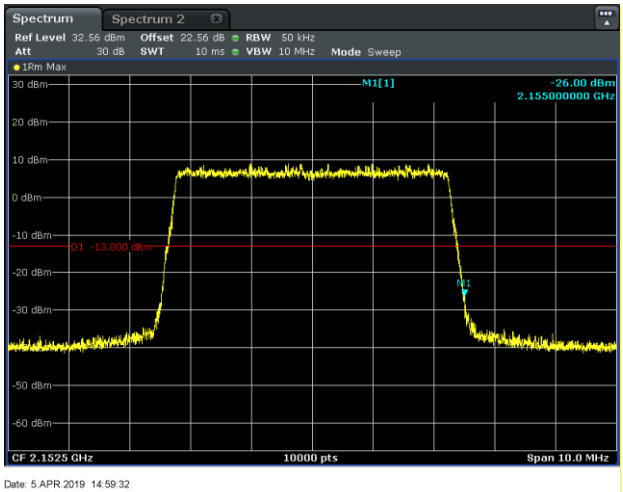



***Figure 8.3-8:*** *Conducted band edge for QPSK 2152.5MHz, 5MHz Channel.*

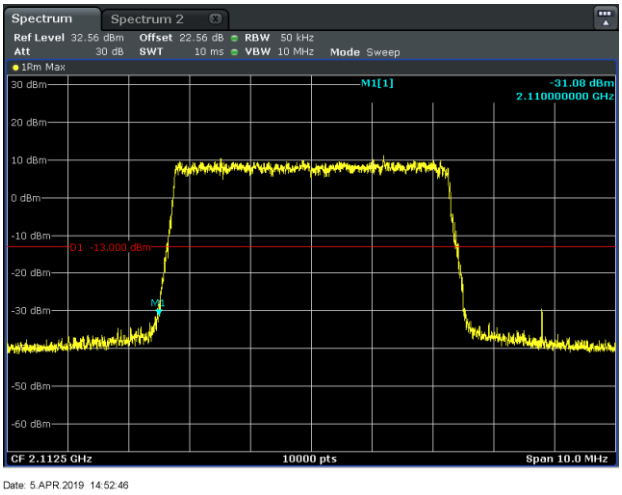



***Figure 8.3-39:*** *Conducted band edge for 16QAM 212.5MHz, 5MHz channel.*

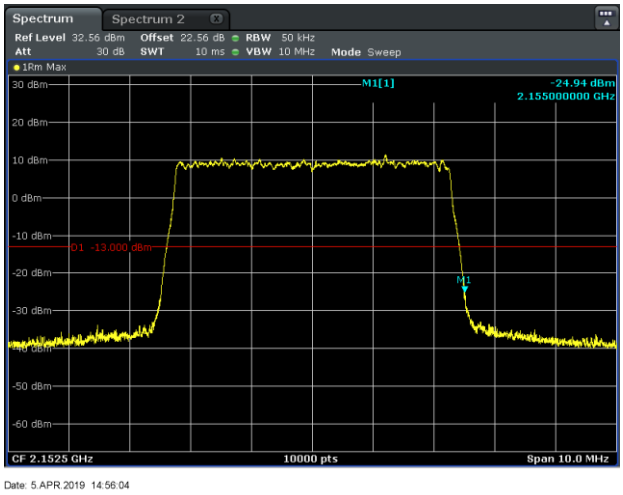



***Figure 8.3-40:*** *Conducted band edge for 16QAM 2152.5MHz, 5MHz channel.*

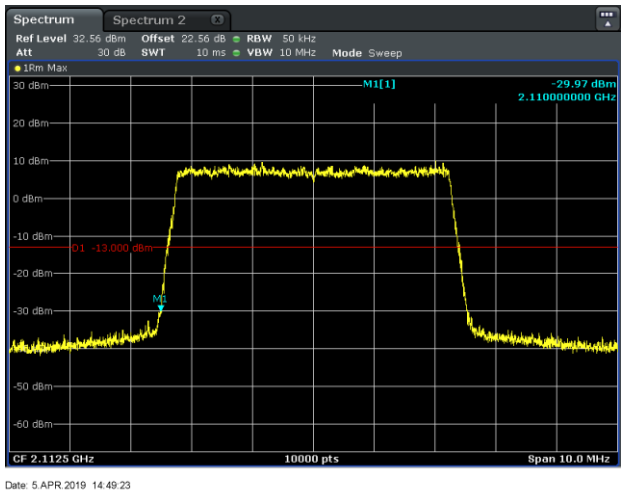



***Figure 8.3-41:*** *Conducted band edge for 64QAM 212.5MHz, 5MHz Channel.*

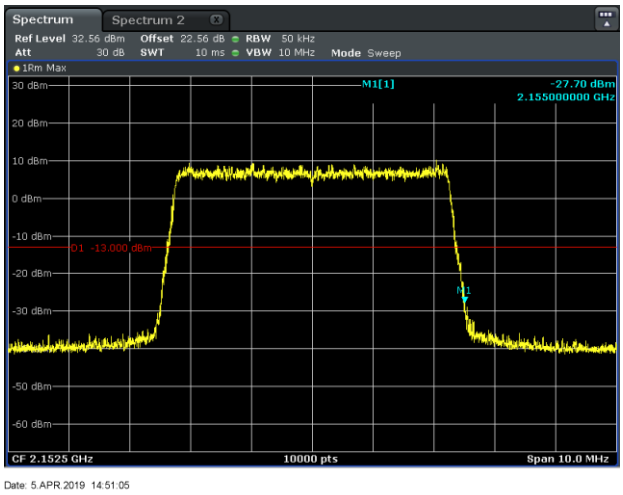



***Figure 8.3-42:*** *Conducted band edge for 64QAM 2152.5MHz, 5MHz channel.*

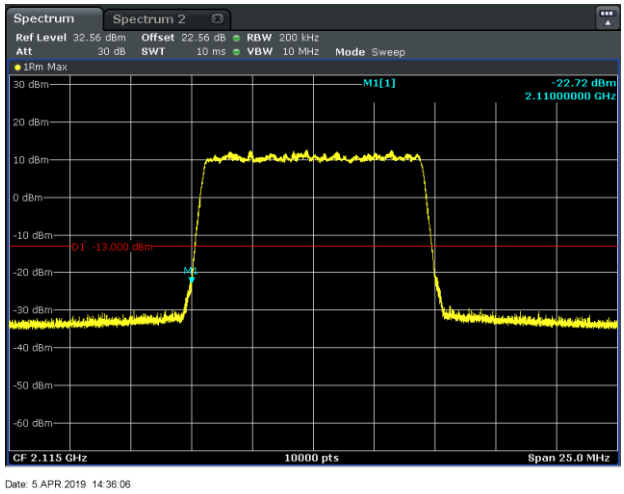



***Figure 8.3-43:*** *Conducted band edge for QPSK 2115 MHz, 10MHz channel*

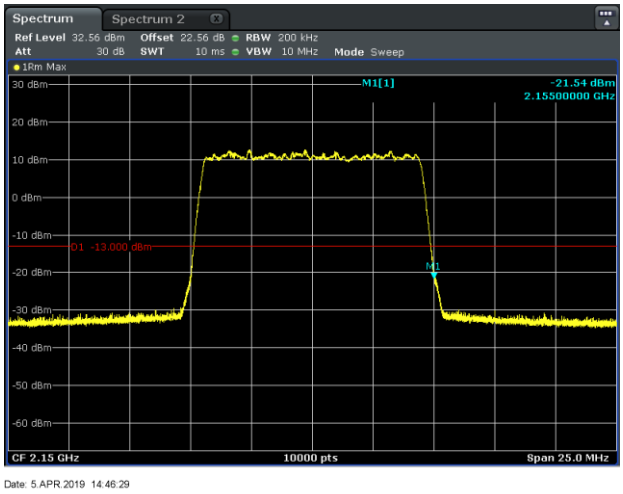



***Figure 8.3-44:*** *Conducted band edge for QPSK 2155 MHz, 10MHz channel - Port 1*

***Figure 8.3-1***

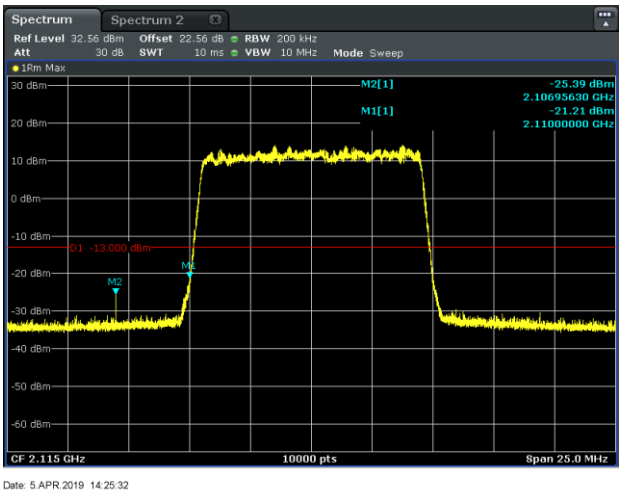



***Figure 8.3-45:*** *Conducted band edge for 16QAM 2115 MHz, 10MHz channel*

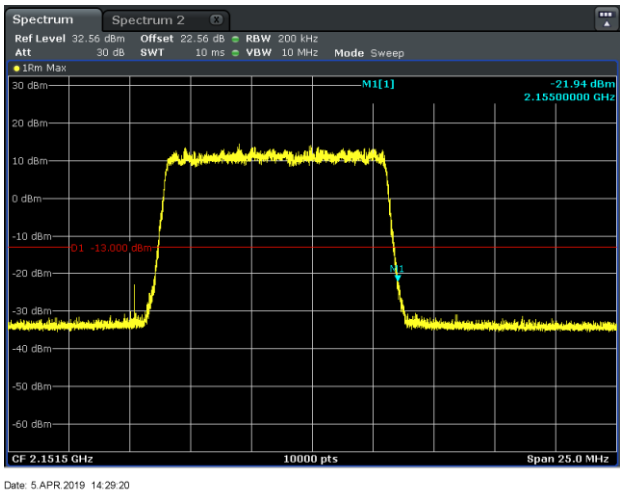



***Figure 8.3-46:*** *Conducted band edge for 16QAM 2150 MHz, 10 MHz channel - Port 1*

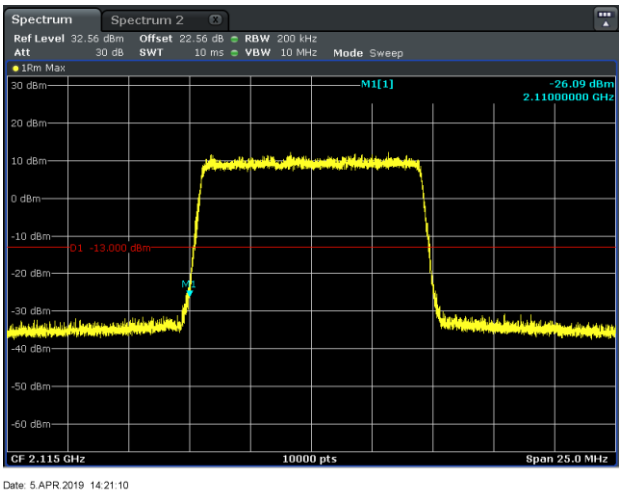



***Figure 8.3-47:*** *Conducted band edge for 64QAM 2115 MHz, 10MHz channel*

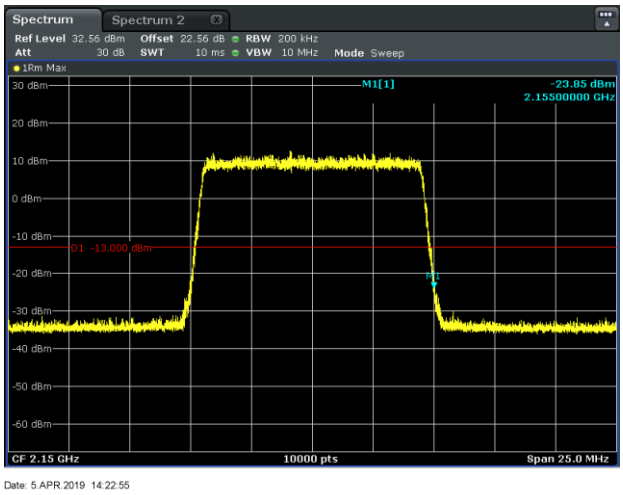



***Figure 8.3-48:*** *Conducted band edge for 64QAM 2150 MHz, 10MHz channel*

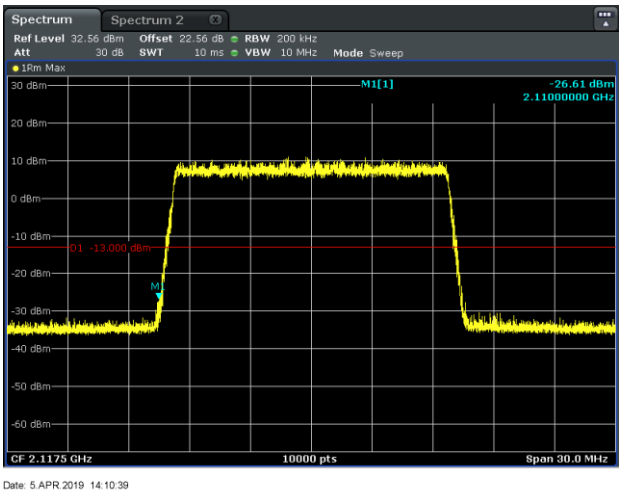



***Figure 8.3-49:*** *Conducted band edge for QPSK 2117.5 MHz, 15MHz channel*

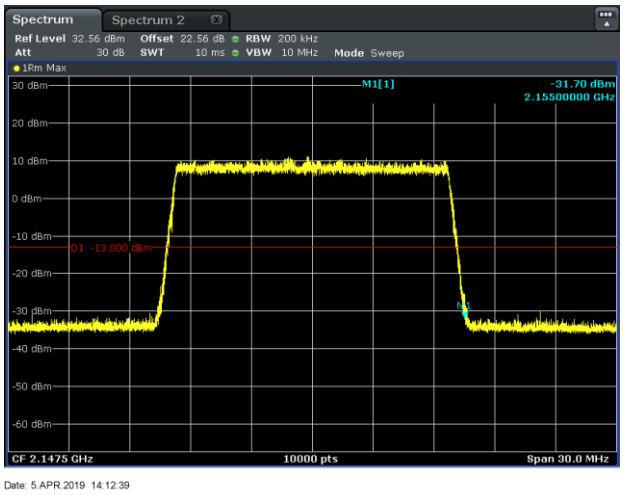



***Figure 8.3-50:*** *Conducted band edge for QPSK 2147.5 MHz, 15MHz channel*

***Figure 8.3-13:*** *MHz channel -*

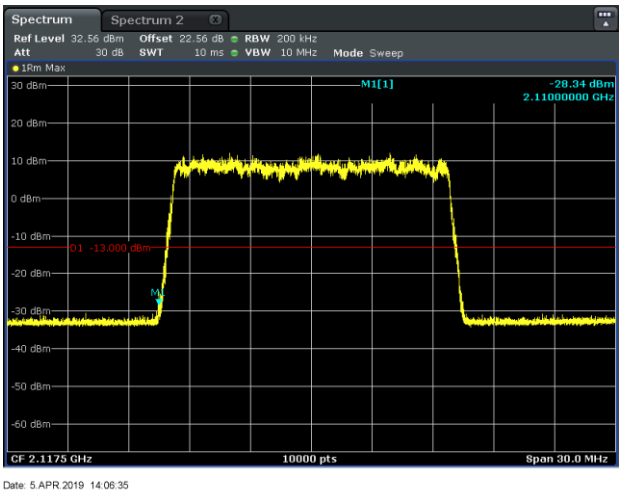



***Figure 8.3-51:*** *Conducted band edge for 16QAM 2117.5MHz,15MHz channel*

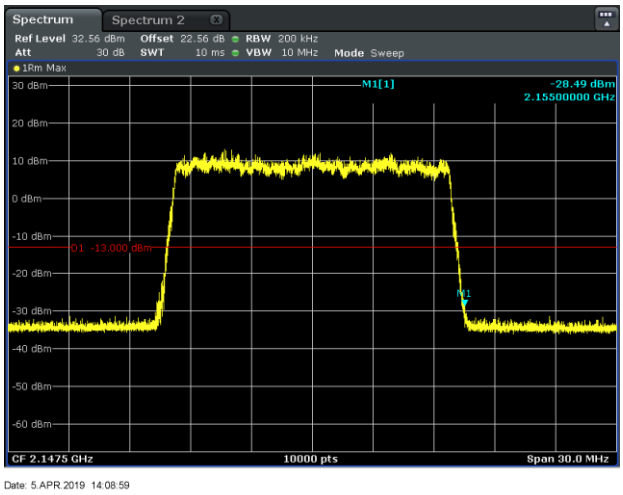



***Figure 8.3-52:*** *Conducted band edge for 16QAM 2147.5 MHz, 15MHz channel*

***Figure 8.3-15:*** *MHz channel -*

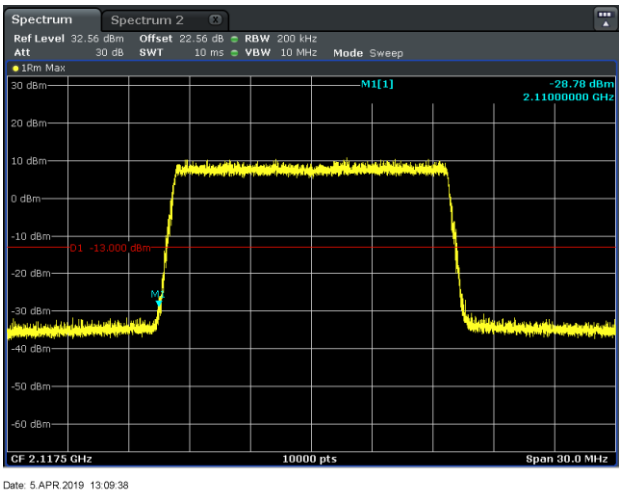



***Figure 8.3-53:*** *Conducted band edge for 64QAM 2117.5MHz,15MHz channel*

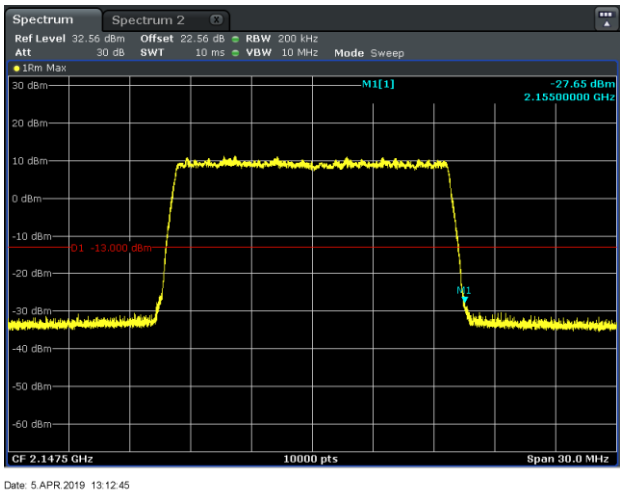



***Figure 8.3-54:*** *Conducted band edge for 64QAM 2147.5MHz,15MHz channel*

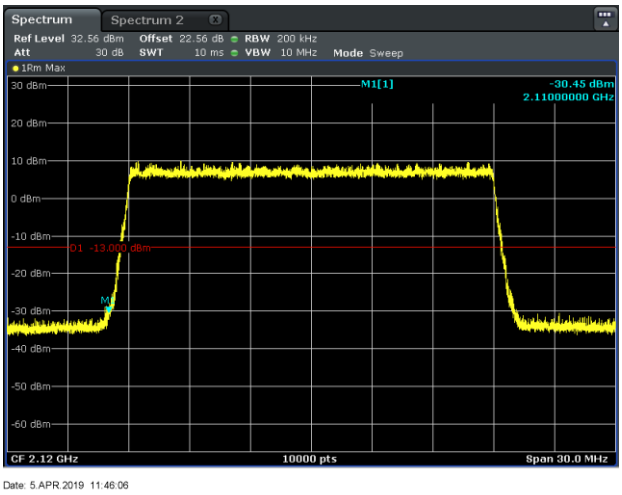



***Figure 8.3-55:*** *Conducted band edge for QPSK 2120MHz, 20MHz channel*

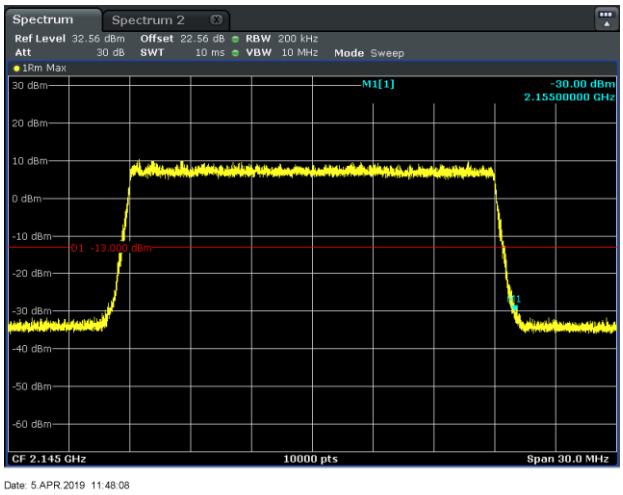



***Figure 8.3-56:*** *Conducted band edge for QPSK 2150MHz, 20MHz channel - Port 1*

***Figure 8.3-17:*** *MHz channel -*

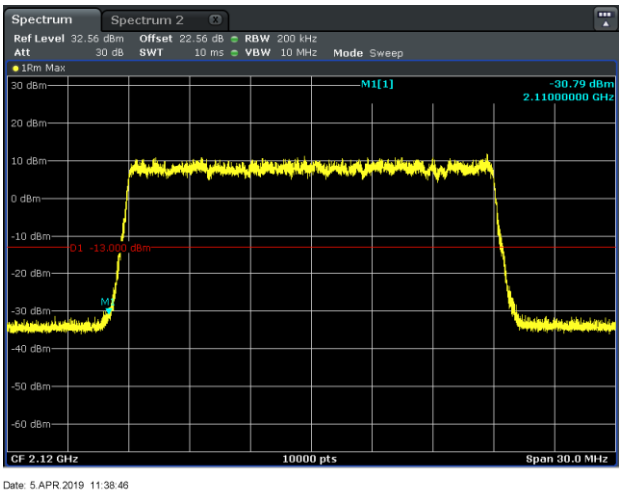



***Figure 8.3-57:*** *Conducted band edge for 16QAM 2120MHz, 20MHz channel*

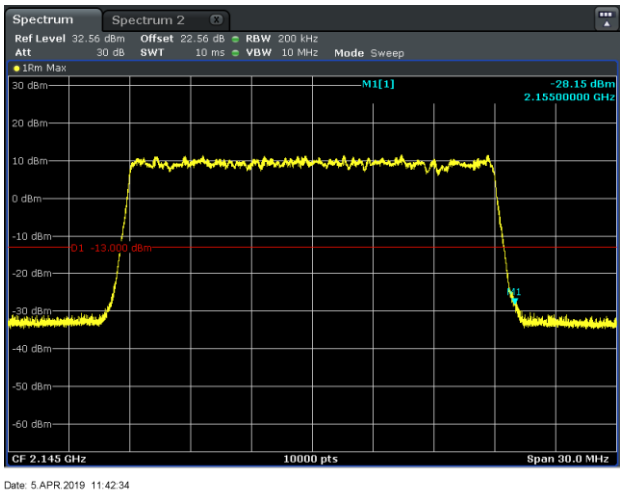



***Figure 8.3-58:*** *Conducted band edge for 16QAM 2145MHz, 20MHz channel*

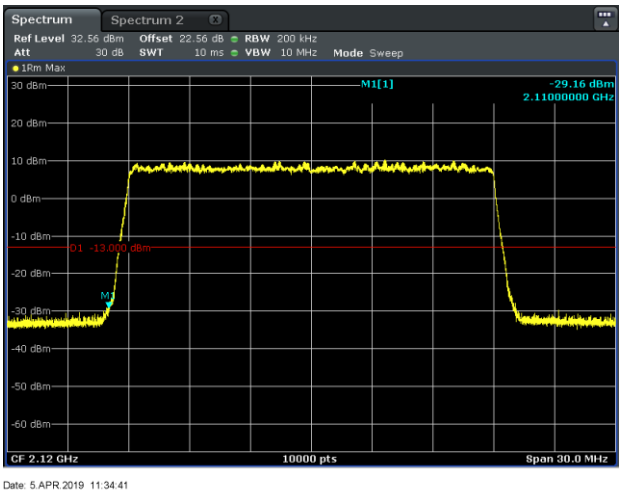



***Figure 8.3-59:*** *Conducted band edge for 64QAM 2120MHz, 20MHz channel*

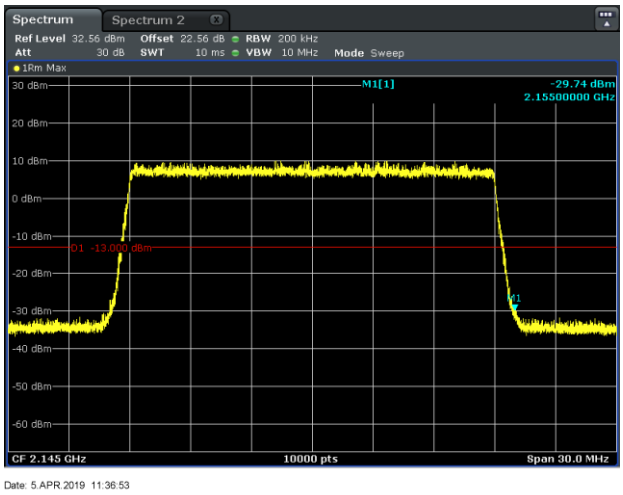



***Figure 8.3-60:*** *Conducted band edge for 64QAM 2145MHz, 20MHz channel*

## ***Spurious Emissions at band edges – Port 2 – LTE Band 13***

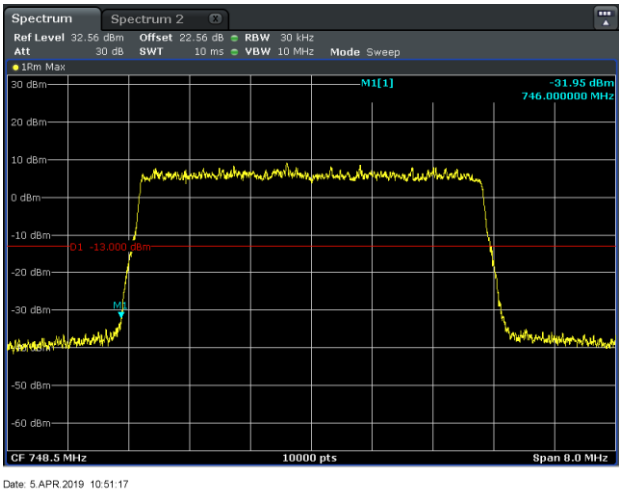



***Figure 8.3-61:*** *Conducted band edge for QPSK 748.5MHz, 5MHz channel*

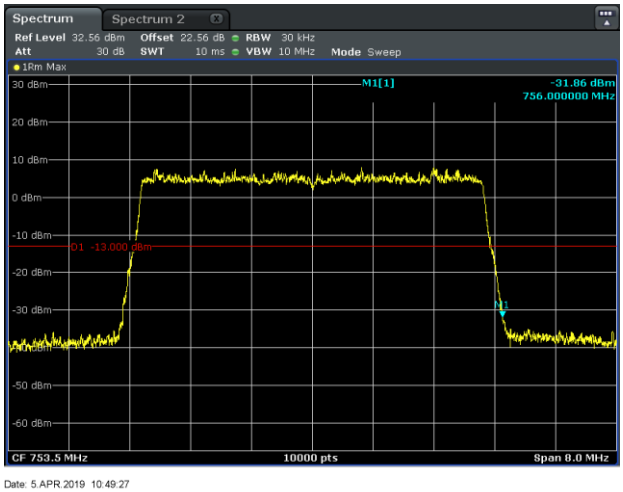



***Figure 8.3-62:*** *Conducted band edge for QPSK 753.5MHz, 5MHz channel*

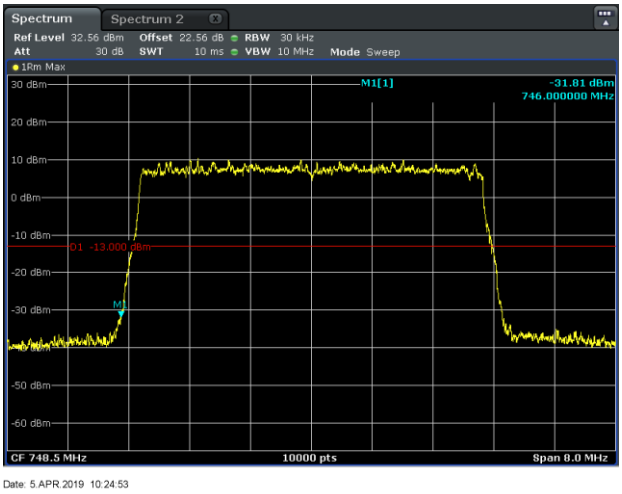



***Figure 8.3-61:*** *Conducted band edge for 16QAM 748.5MHz, 5MHz channel*

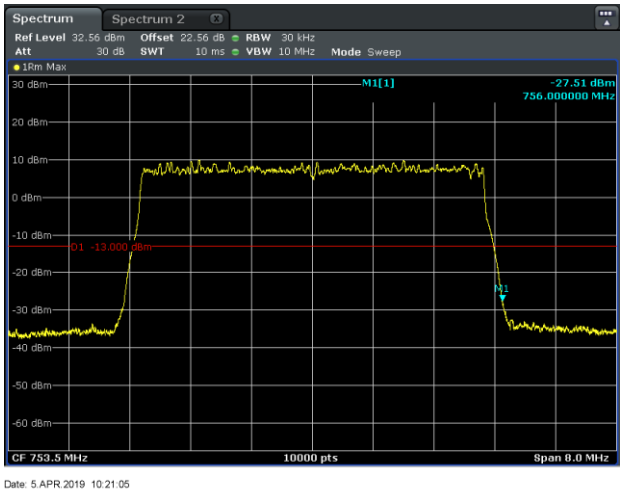
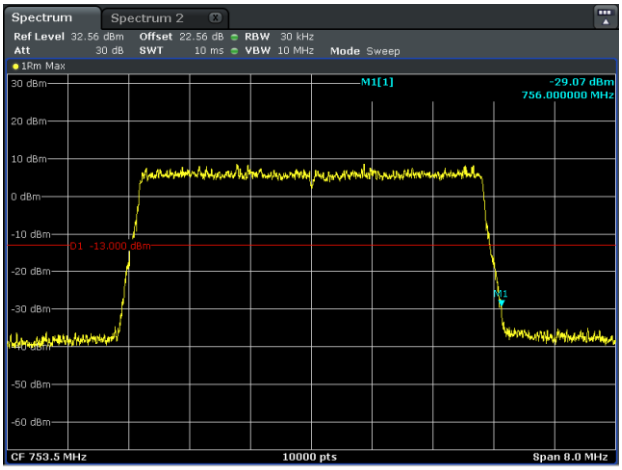
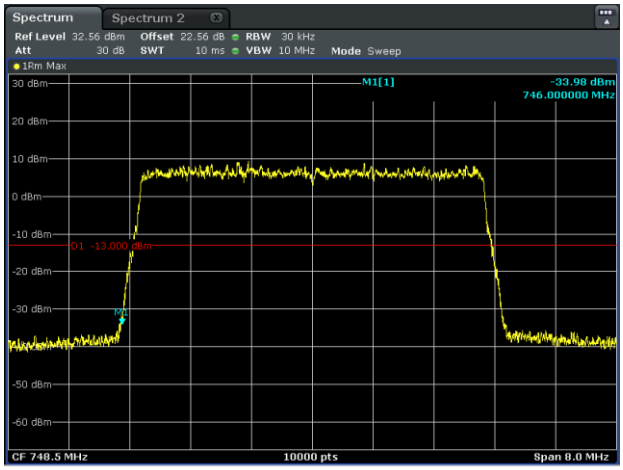



***Figure 8.3-62:*** *Conducted band edge for 16QAM 753.5MHz,5MHz channel*



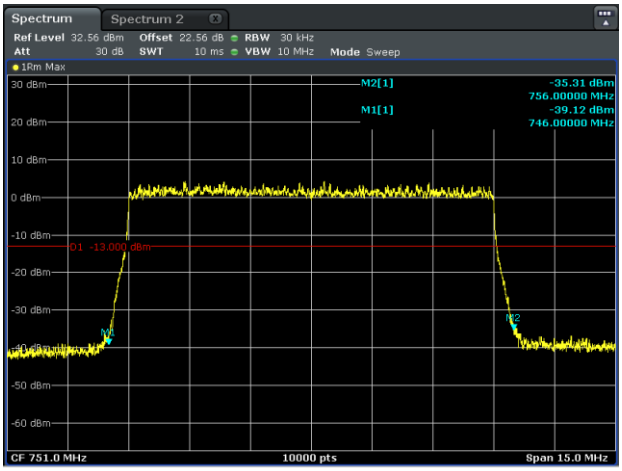

Date: 5.APR.2019 10:31:01

***Figure 8.3-61:*** *Conducted band edge for 64QAM 748.5MHz, 5MHz channel*



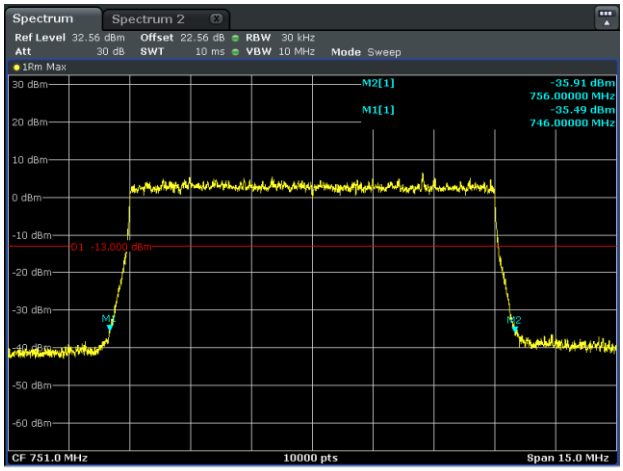

Date: 5.APR.2019 10:27:37

***Figure 8.3-62:*** *Conducted band edge for 64QAM 753.5MHz,5MHz channel*




Date: 5.APR.2019 11:28:06

***Figure 8.3-61:*** *Conducted band edge for QPSK 751MHz, 10MHz channel*




Date: 5.APR.2019 11:26:15

***Figure 8.3-62:*** *Conducted band edge for 16QAM 751MHz, 10MHz channel*

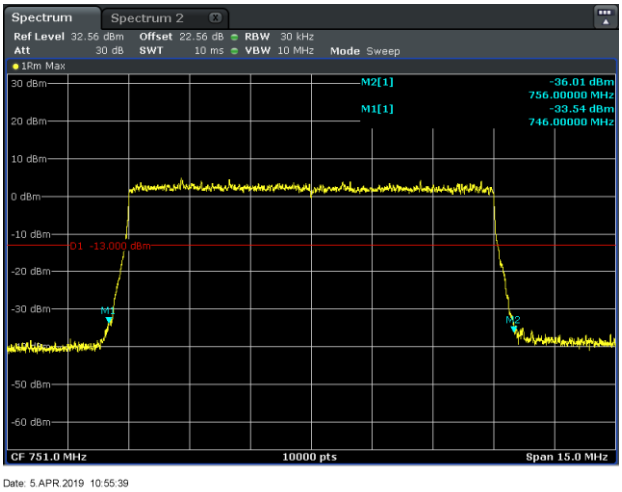



***Figure 8.3-61:*** *Conducted band edge for 64QAM 751MHz, 10MHz channel*

## 8.4 Radiated spurious emissions

### 8.4.1 Definitions and limits

FCC:

Part 27
(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(2) For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area.

### 8.4.2 Test summary

| | | | |
|---|---|---|---|
| Test date | April 11, 2019 | Temperature | 22 °C |
| Test engineer | Andres Martinez, Test Engineer. | Air pressure | 1000 mbar |
| Verdict | Pass | Relative humidity | 30 % |

### 8.4.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10th harmonic.
All measurements were performed using a peak detector.
RBW within 30–1000 MHz was 100 kHz and 1 MHz above 1 GHz. VBW was wider than RBW.
Testing was performed with all RF ports terminated with 50 Ohm load.
Tested Band 4, QPSK, 20MHz Bandwidth, 2120MHz.
Tested Band 13, 64QAM, 5MHz Bandwidth, 748.5MHz.

### 8.4.4 Test data

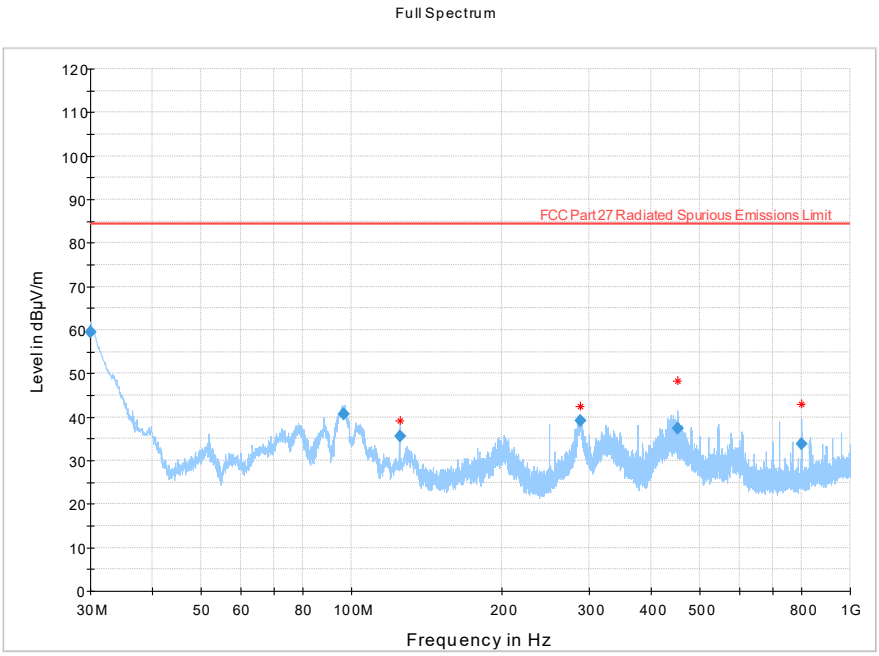



***Figure 8.4-1:*** *Radiated spurious emission below 1GHz, B4 at QPSK/ 2120MHz/20 MHz*

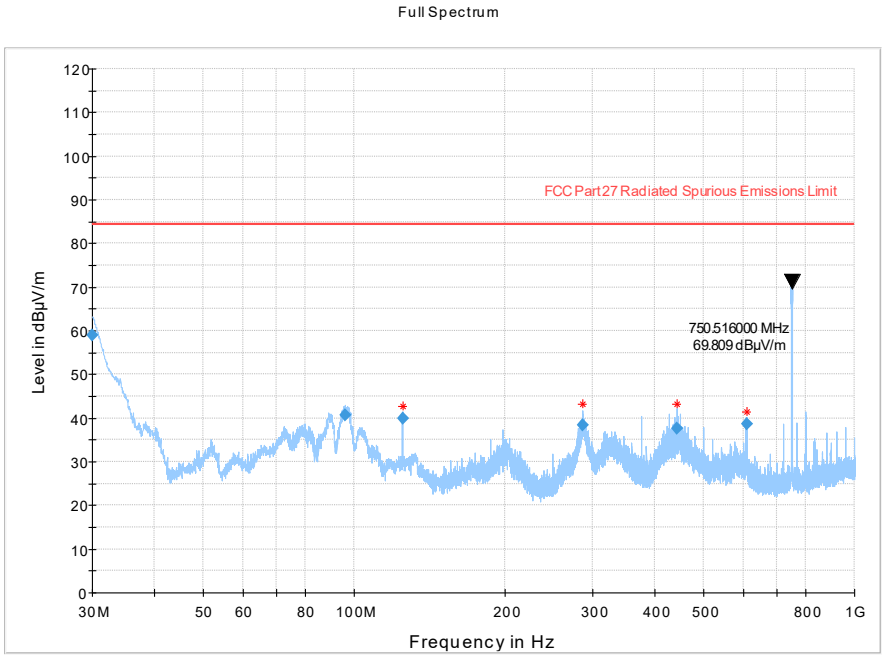



***Figure 8.4-2*** *Radiated spurious emission below 1GHz, B13 at 64QAM/ 748.5MHz/5MHz*

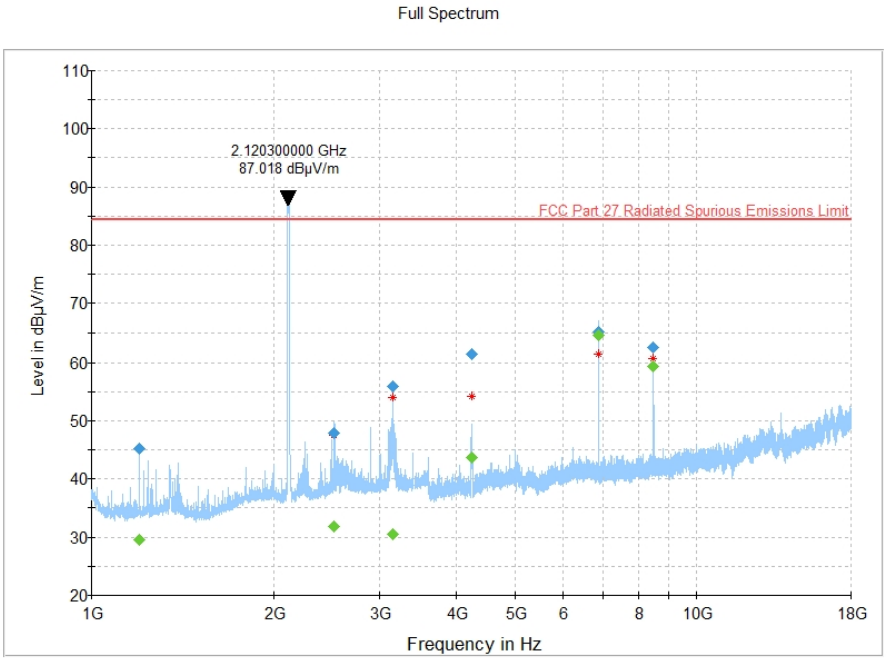



***Figure 8.4-3:*** *Radiated spurious emission 1GHz to 18GHz, B4 at QPSK/ 2120MHz/20 MHz*

***Note: Emission at 2120MHz is the transmitter not spurious***

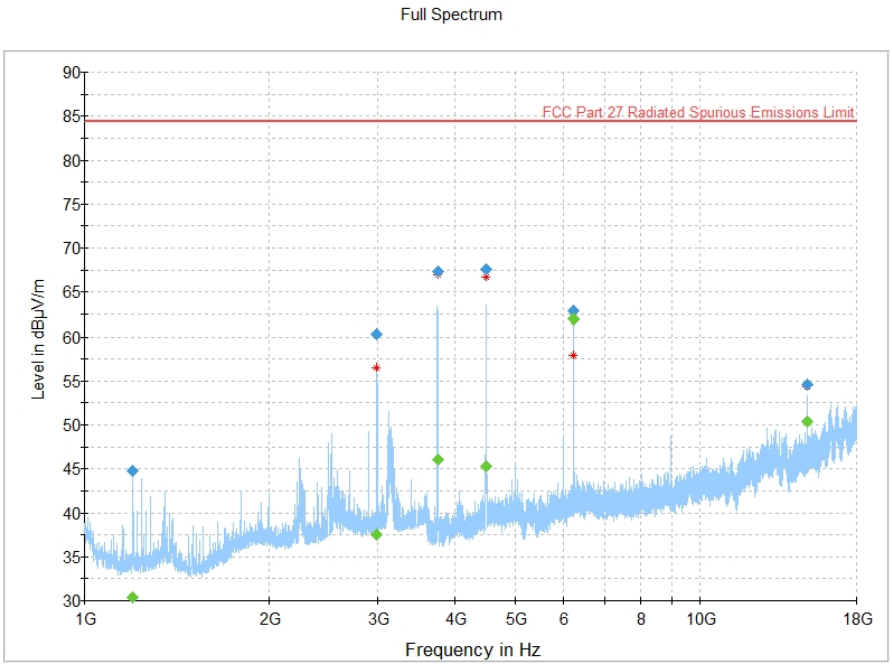



***Figure 8.4-4:*** *Radiated spurious emission 1GHz to 18GHz, B13 at 64QAM/ 748.5MHz/5MHz*

***Note: Emission at 2120MHz is the transmitter not spurious***

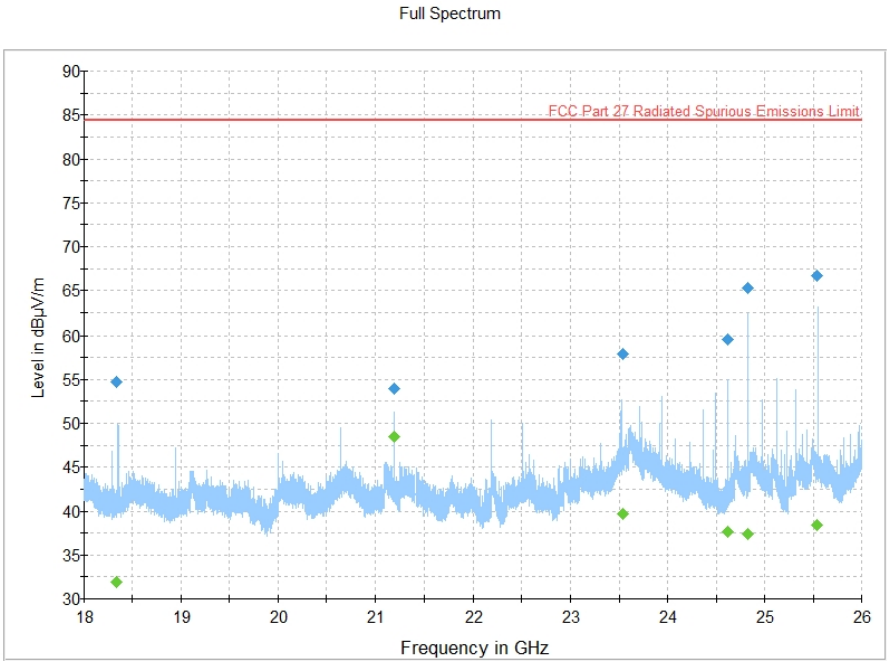



***Figure 8.4-5:*** *Radiated spurious emission 18 GHz to 26GHz, B4 at QPSK/ 2120MHz/20 MHz*

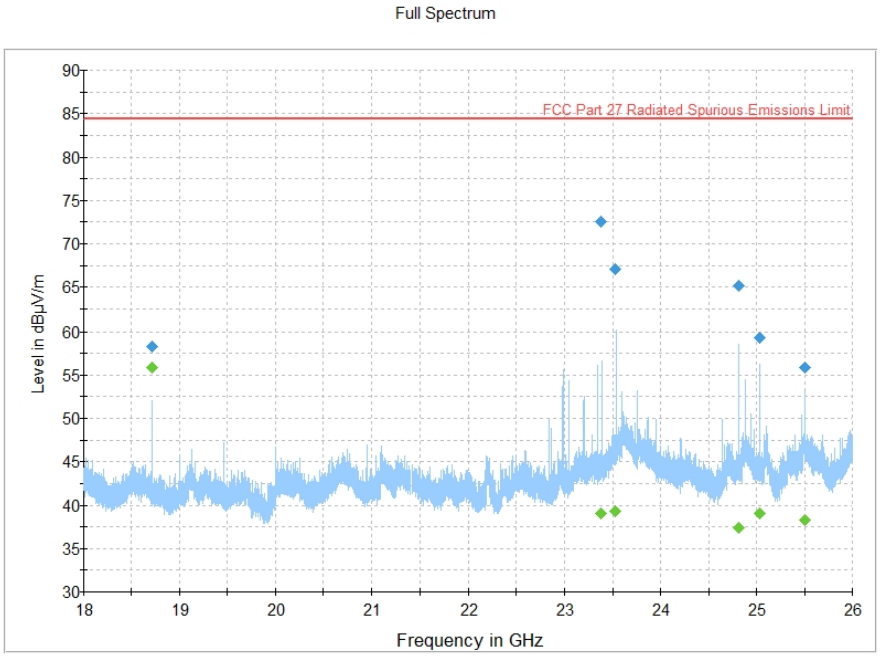



***Figure 8.4-6:*** *Radiated spurious emission 18GHz to 26GHz, B13 at 64QAM/ 748.5MHz/5MHz*

## 8.5 Frequency stability (Band 4, Band 13)

### 8.5.1 Definitions and limits

FCC:

The frequency stability shall be enough to ensure that the fundamental emissions stay within the authorized bands of operation.
Voltage Variation at 102Vac (85%), 120Vac (100%) and 138Vac (115%) shows the fundamental frequency stays within the authorized band of operation.

RSS-139 Issue 3
6.4 Frequency Stability
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS-130 Issue 2
4.5 Transmitter frequency stability
The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS Gen.

RSS-GEN Issue 5 Amend 1
With the transmitter installed in an environmental test chamber, the unmodulated carrier frequency and frequency stability shall be measured under the conditions specified below for licensed and licence-exempt devices, unless specified otherwise in the applicable RSS. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement.
For licensed devices, the following measurement conditions apply:

a. at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage
b. at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage

### 8.5.2 Test summary

| | |
|---|---|
| Test date | April 8, 2019 |

Passed – the EUT fundamental emissions stays within the band of operation during testing.

### 8.5.3 Observations, settings and special notes

Frequency Stability (Frequency= 2132.5MHz, Bandwidth= 5 MHz, QPSK modulation)
Voltage variation (+/- 15 % of 120 V, 60 HZ)
Temperature variation: (+50°C to -30°C)

The EUT frequency change was monitored by setting trace 1 on the spectrum analyzer to View. Then trace 2 was set to max hold. The plots below demonstrate that at each voltage and temperature setting no variation was noted. Therefore the fundamental emissions has remained with the band of operation.

Offset: 20db attenuator + 0.41dB cable loss + 2.15dBi antenna gain = 22.56dB

### 8.5.4 Test data

| Temperature | 102V | 120V | 138V |
|---|---|---|---|
| 50 | Pass | Pass | Pass |
| 40 | Pass | Pass | Pass |
| 30 | Pass | Pass | Pass |
| 20 | Pass | Pass | Pass |
| 10 | Pass | Pass | Pass |
| 0 | Pass | Pass | Pass |
| -10 | Pass | Pass | Pass |
| -20 | Pass | Pass | Pass |
| -30 | Pass | Pass | Pass |

**Table 8.5-1: Frequency error results**

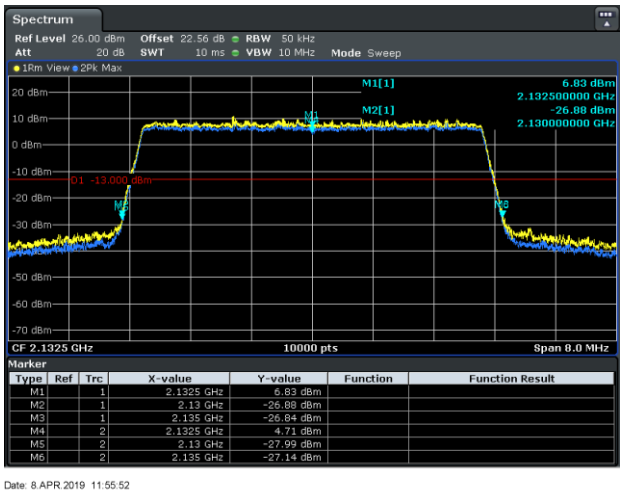



***Figure 8.5-61:*** *Frequency Stability, +50°C @ 102V*

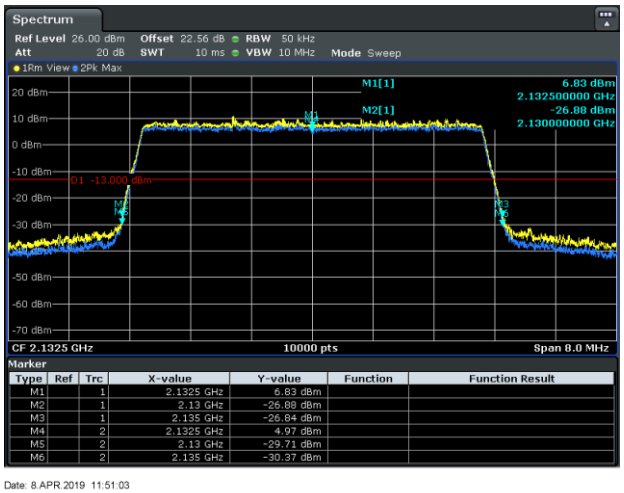



***Figure 8.5-62:*** *Frequency Stability, +50°C @ 120V*

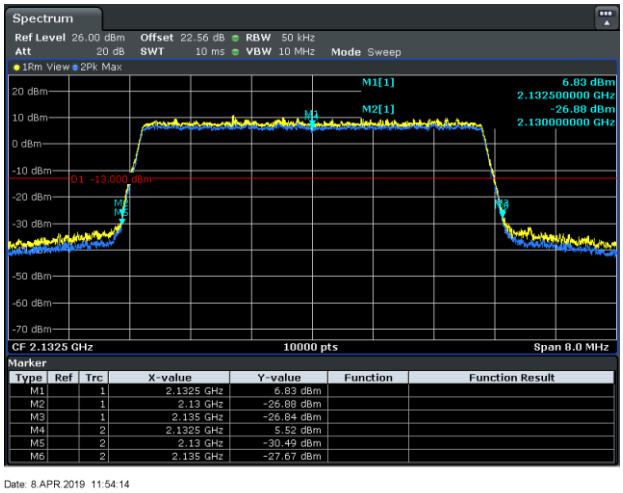



***Figure 8.5-61:*** *Frequency Stability, +50°C @ 138V*

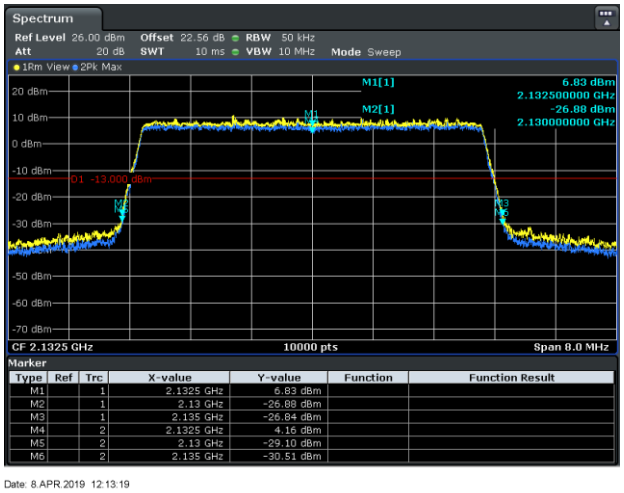



***Figure 8.5-62:*** *Frequency Stability, +40°C @ 102V*

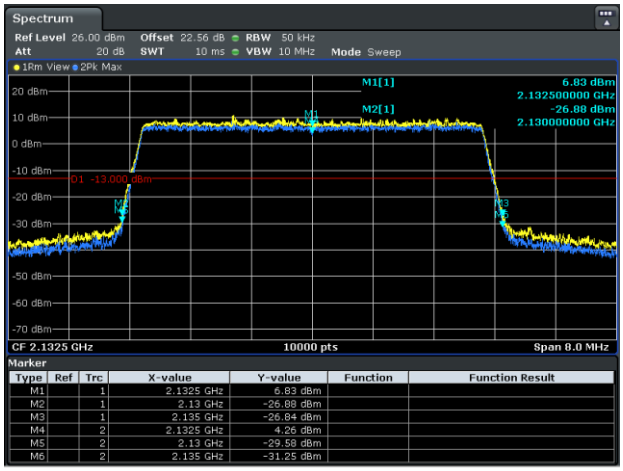



***Figure 8.5-61:*** *Frequency Stability, +40°C @ 120V*

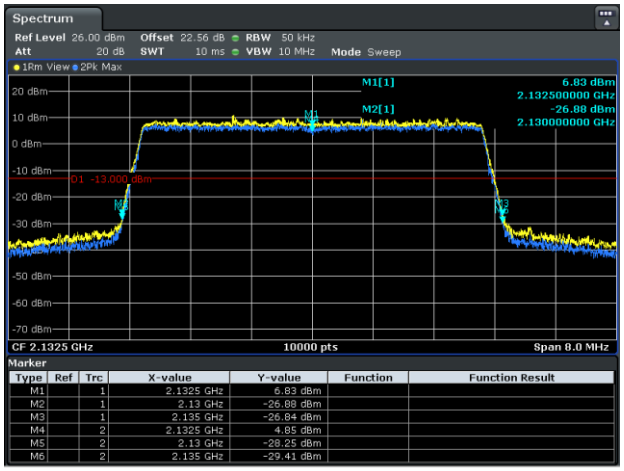



***Figure 8.5-62:*** *Frequency Stability, +40°C @ 138V*

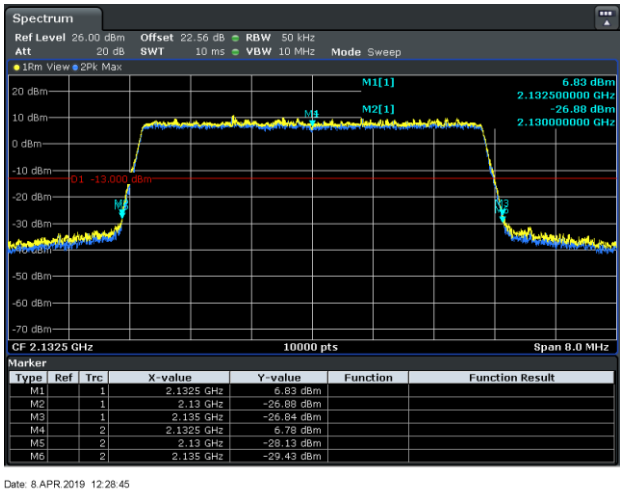



***Figure 8.5-61:*** *Frequency Stability, +30°C @ 102V*

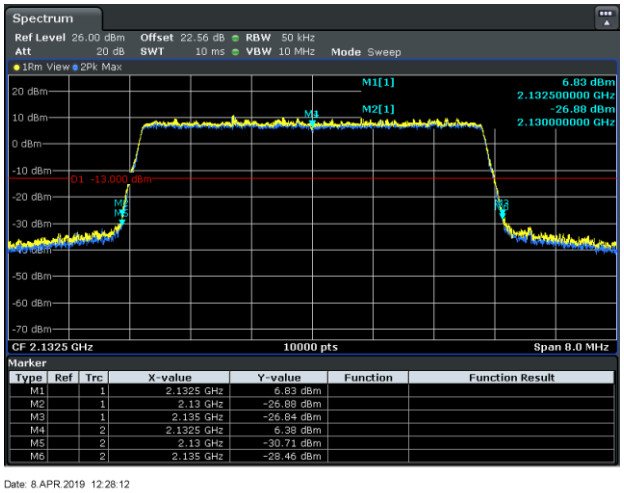



***Figure 8.5-62:*** *Frequency Stability, +30°C @ 120V*

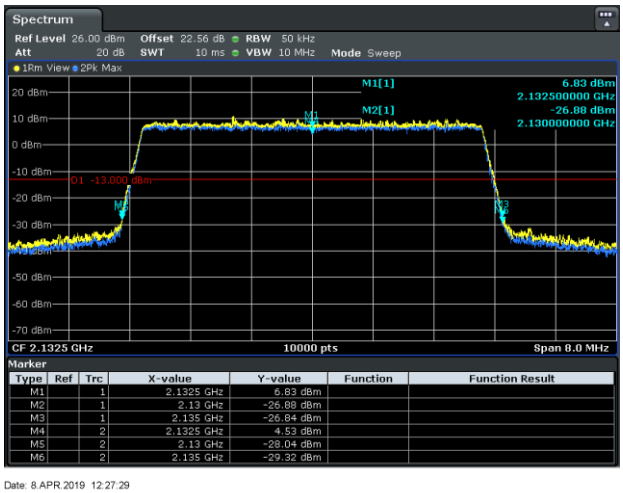



***Figure 8.5-61:*** *Frequency Stability, +30°C @ 138V*

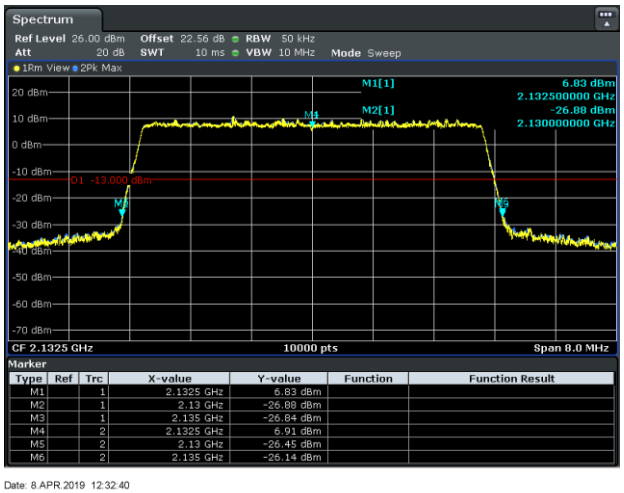
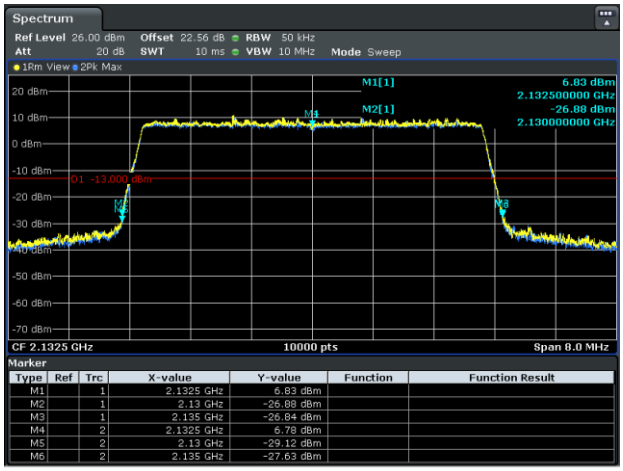
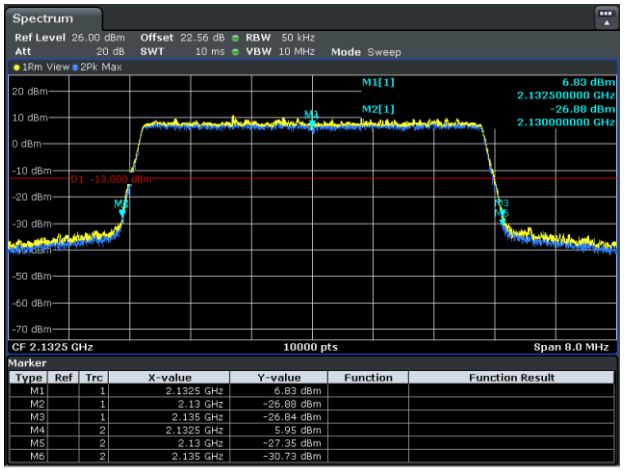



***Figure 8.5-62:*** *Frequency Stability, +20°C @ 102V*



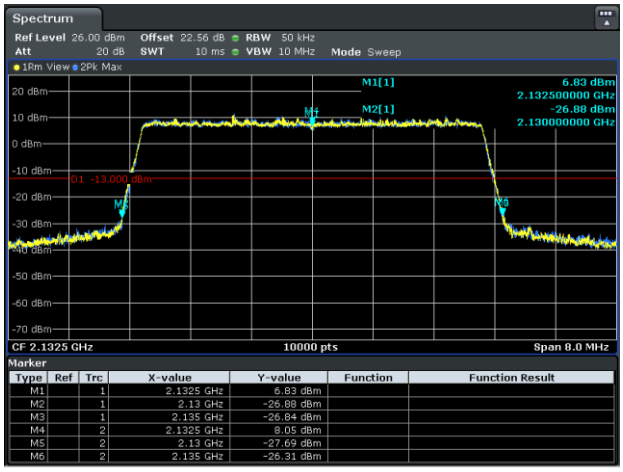

Date: 8.APR.2019 12:34:19

***Figure 8.5-61:*** *Frequency Stability, +20°C @ 120V*



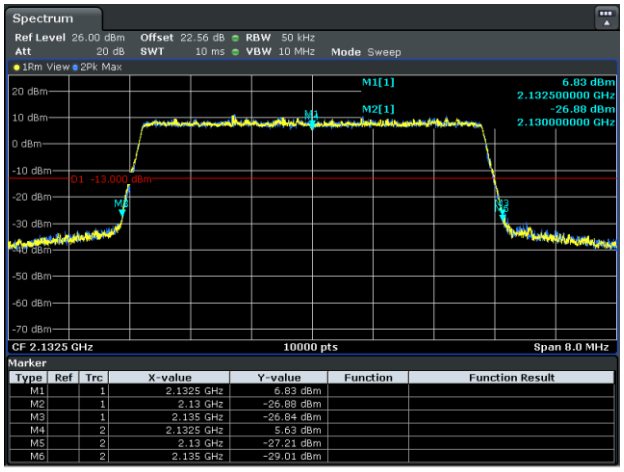

Date: 8.APR.2019 12:34:58

***Figure 8.5-62:*** *Frequency Stability, +20°C @ 138V*



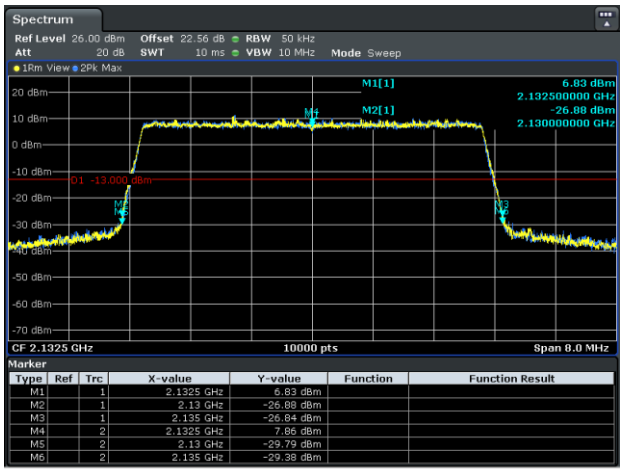

Date: 8.APR.2019 12:53:57

***Figure 8.5-61:*** *Frequency Stability, +10°C @ 102V*



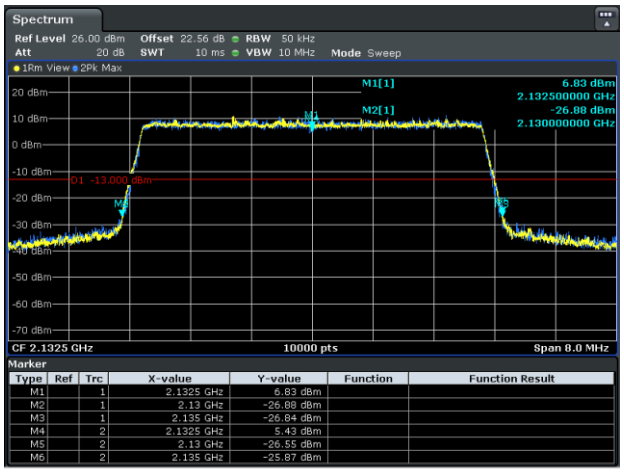

Date: 8.APR.2019 12:53:27

***Figure 8.5-62:*** *Frequency Stability, +10°C @ 120V*




Date: 8.APR.2019 12:52:56

***Figure 8.5-61:*** *Frequency Stability, +10°C @ 138V*




Date: 8.APR.2019 13:18:25

***Figure 8.5-62:*** *Frequency Stability, 0°C @ 102V*

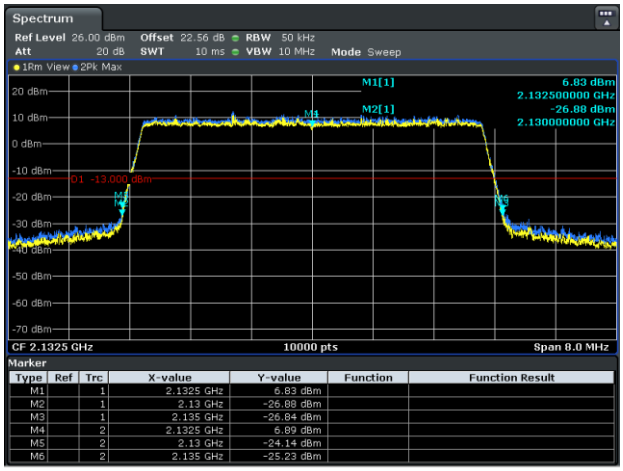



***Figure 8.5-61:*** *Frequency Stability, 0°C @ 120V*

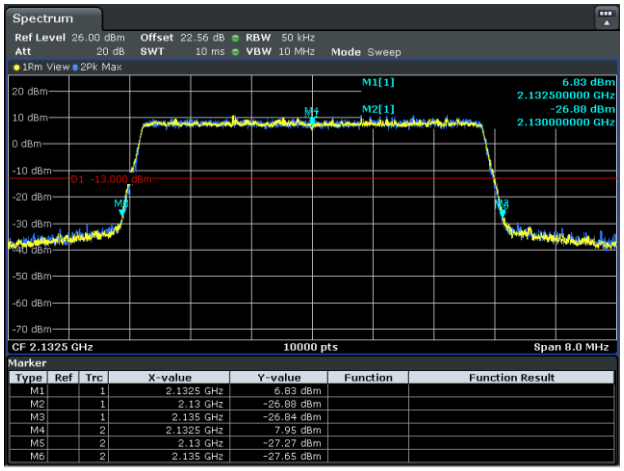



***Figure 8.5-62:*** *Frequency Stability, 0°C @ 138V*

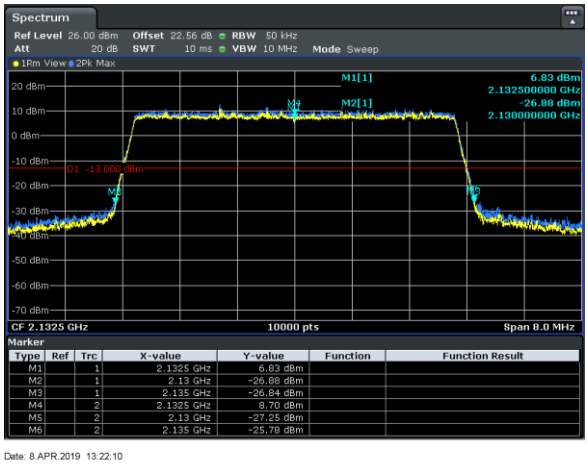



***Figure 8.5-61:*** *Frequency Stability, -10°C @ 102V*

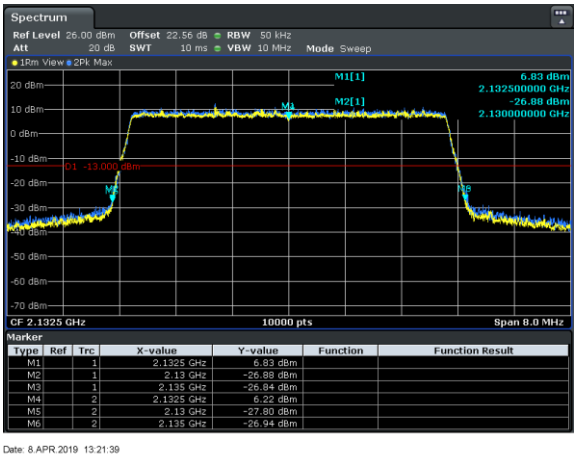



***Figure 8.5-62:*** *Frequency Stability, -10°C @ 120V*

***Figure 8.5-61:*** *Frequency Stability, -10°C @ 138V*

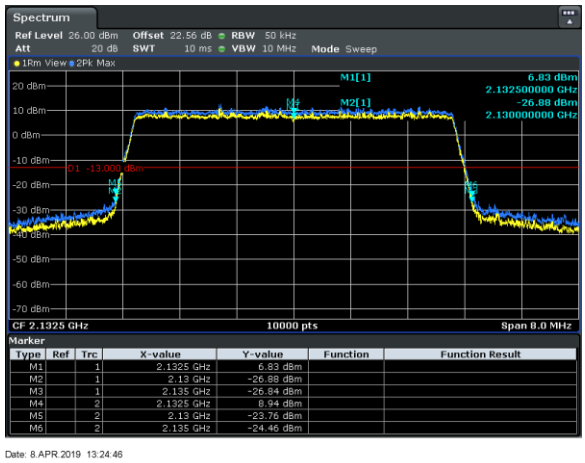



***Figure 8.5-62:*** *Frequency Stability, -20°C @ 102V*

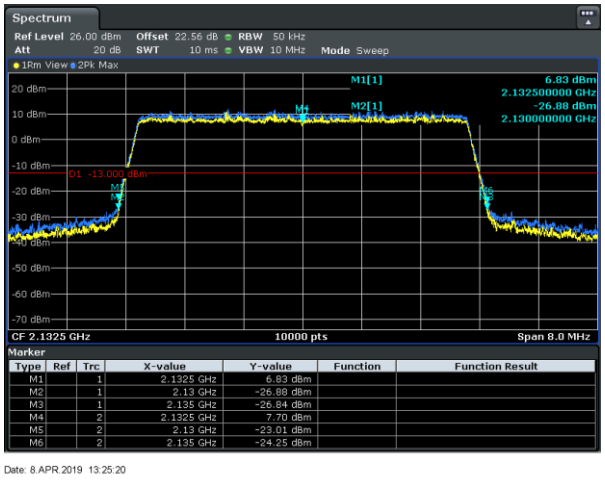



***Figure 8.5-61:*** *Frequency Stability, -20°C @ 120V*

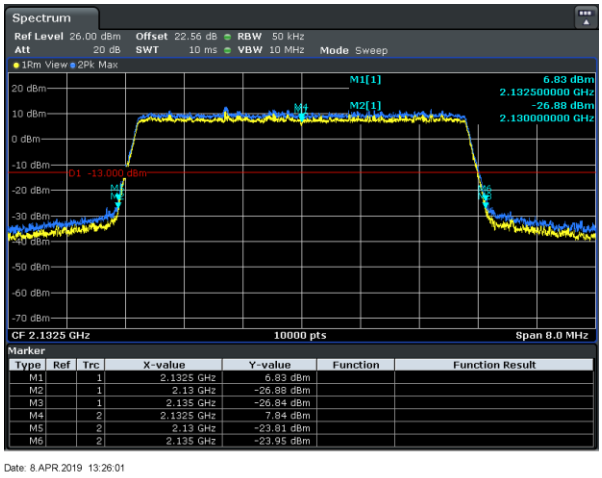



***Figure 8.5-62:*** *Frequency Stability, -20°C @ 138V*

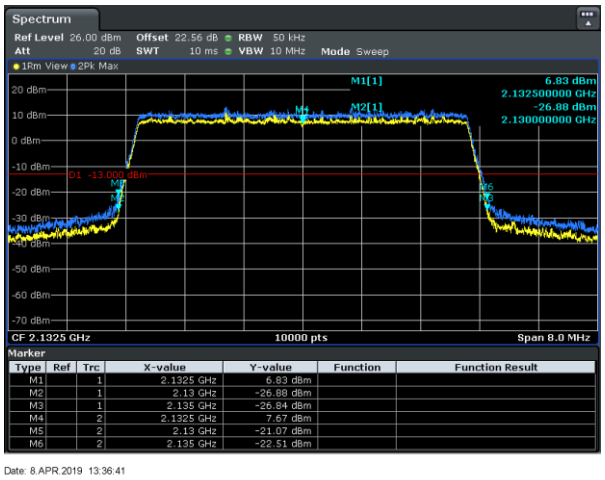



***Figure 8.5-61:*** *Frequency Stability, -30°C @ 102V*

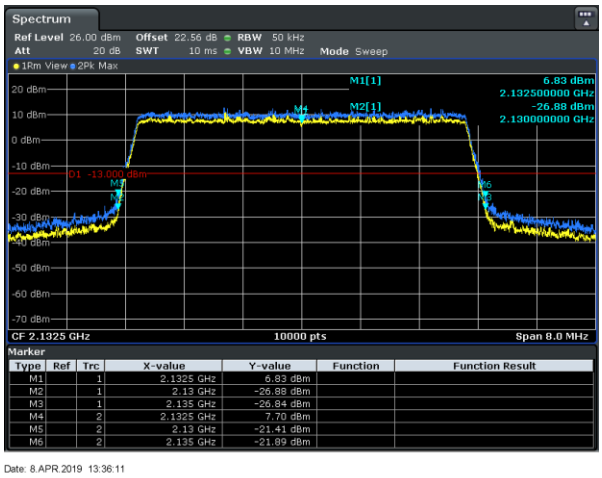



***Figure 8.5-62:*** *Frequency Stability, -30°C @ 120V*

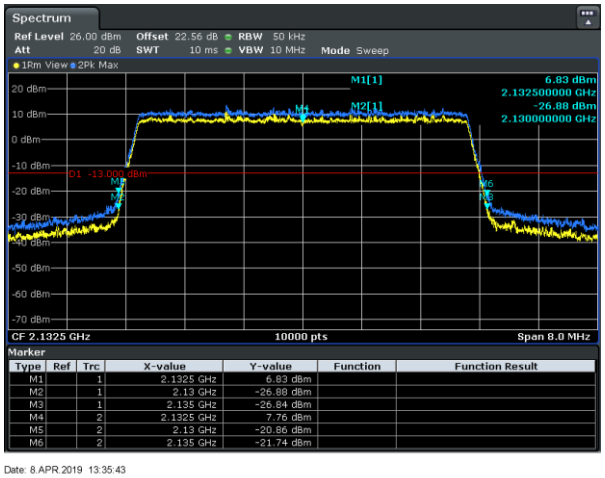



***Figure 8.5-61:*** *Frequency Stability, -30°C @ 138V*

## 8.6 Occupied bandwidth (Band 4, Band 13)

### 8.6.1 Definitions and limits

FCC:

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RSS:

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

### 8.6.2 Test summary

| | |
|---|---|
| Test date | April 3, 2019 |

Compliant

### 8.6.3 Observations, settings and special notes

Offset: 20db attenuator + 0.41dB cable loss + 2.15dBi antenna gain = 22.56dB

### 8.6.4 Test data

**Band 4**

| Declared Bandwidth = 5 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Bandwidth: 99 % | | | Bandwidth: 26 dB | | |
| **CF** | **QPSK** | **16QAM** | **64QAM** | **QPSK** | **16QAM** | **64QAM** |
| 2112.5 MHZ | 4.5570 | 4.5720 | 4.5803 | 4.9990 | 5.0055 | 5.0085 |
| 2132.5 MHZ | 4.5450 | 4.5600 | 4.5570 | 4.9875 | 4.9680 | 5.0835 |
| 2152.5 MHZ | 4.5510 | 4.5735 | 4.5495 | 4.9770 | 4.9845 | 5.0370 |

| Declared Bandwidth = 10 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Bandwidth: 99 % | | | Bandwidth: 26 dB | | |
| **CF** | **QPSK** | **16QAM** | **64QAM** | **QPSK** | **16QAM** | **64QAM** |
| 2115 MHz | 9.1606 | 9.2474 | 9.2040 | 10.2460 | 10.2460 | 10.2890 |
| 2132.5 MHz | 9.2040 | 9.2040 | 9.1606 | 10.2890 | 10.2890 | 10.2890 |
| 2150 MHz | 9.2040 | 9.2040 | 9.2040 | 10.2460 | 10.2030 | 10.2460 |

| Declared Bandwidth = 15 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Bandwidth: 99 % | | | Bandwidth: 26 dB | | |
| **CF** | **QPSK** | **16QAM** | **64QAM** | **QPSK** | **16QAM** | **64QAM** |
| 2117.5 MHz | 13.6758 | 13.6107 | 13.6758 | 14.9780 | 14.9780 | 15.0430 |
| 2132.5 MHZ | 13.6758 | 13.6107 | 13.6758 | 14.9780 | 14.9780 | 14.9780 |
| 2147.5 MHZ | 13.6758 | 13.6107 | 13.6260 | 14.8480 | 14.8480 | 14.9780 |

| Declared Bandwidth = 20 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Bandwidth: 99 % | | | Bandwidth: 26 dB | | |
| **CF** | **QPSK** | **16QAM** | **64QAM** | **QPSK** | **16QAM** | **64QAM** |
| 2120 MHz | 18.3212 | 18.4949 | 18.4081 | 20.5790 | 20.4920 | 20.4920 |
| 2132.5 MHz | 18.3212 | 18.4949 | 18.4081 | 20.4920 | 20.3180 | 20.4050 |
| 2145 MHz | 18.3212 | 18.4949 | 18.4081 | 20.4920 | 20.4050 | 20.4920 |

**Band 13**

| Declared Bandwidth = 5 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Bandwidth: 99 % | | | Bandwidth: 26 dB | | |
| **CF** | **QPSK** | **16QAM** | **64QAM** | **QPSK** | **16QAM** | **64QAM** |
| 748.5 MHz | 4.5405 | 4.5135 | 4.8450 | 4.9830 | 4.9275 | 5.6055 |
| 751 MHz | 4.5555 | 4.5585 | 4.5540 | 4.9650 | 4.9410 | 4.9800 |
| 753.5 MHz | 4.5615 | 4.5510 | 4.5480 | 4.9530 | 4.9395 | 5.0415 |

| Declared Bandwidth = 10 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Bandwidth: 99 % | | | Bandwidth: 26 dB | | |
| **CF** | **QPSK** | **16QAM** | **64QAM** | **QPSK** | **16QAM** | **64QAM** |
| 751 MHz | 9.1830 | 9.1710 | 9.1680 | 10.0470 | 10.0380 | 10.0800 |

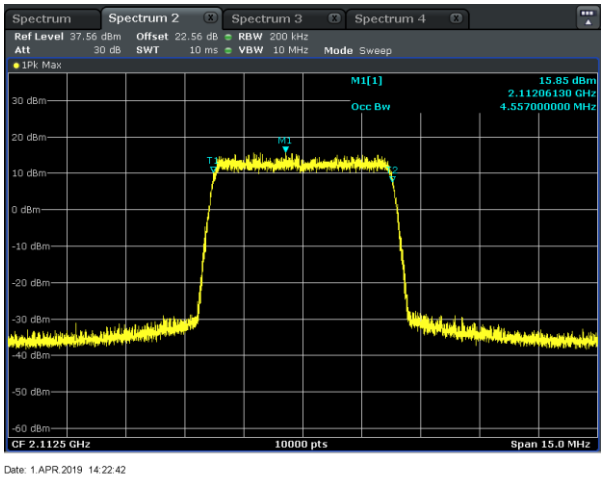



***Figure 8.6-61:*** *Occupied Bandwidth, 5MHz BW, QPSK, 2112.5MHz*

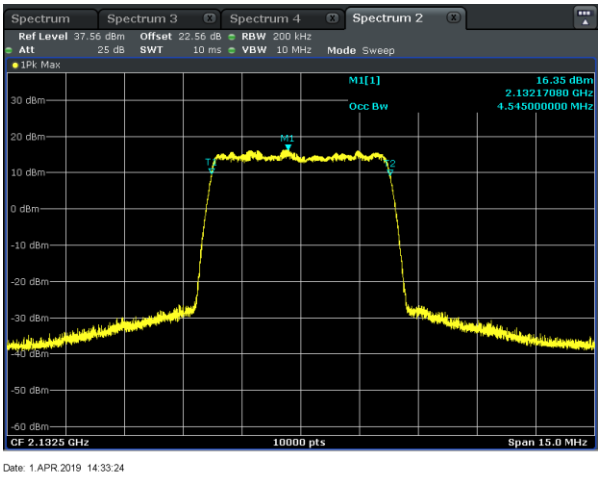



***Figure 8.6-62:*** *Occupied Bandwidth, 5MHz BW, QPSK, 2132.5MHz*

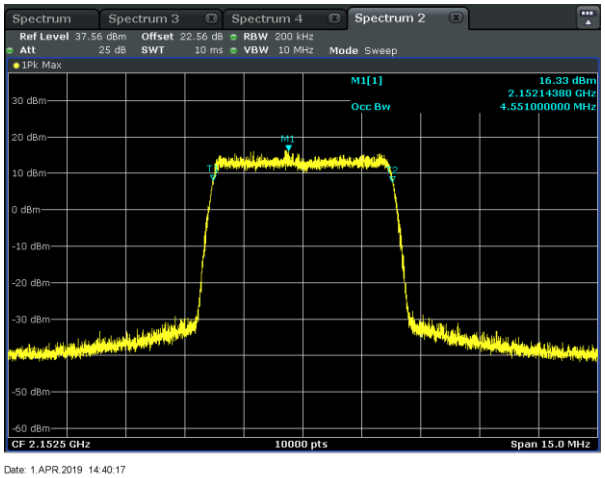



***Figure 8.6-61:*** *Occupied Bandwidth, 5MHz BW, QPSK, 2152.5MHz*

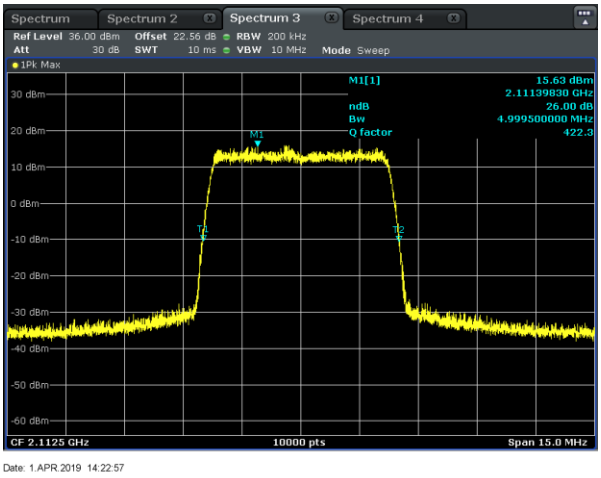



***Figure 8.6-62:*** *26dB, 5MHz BW, QPSK, 2112.5MHz*

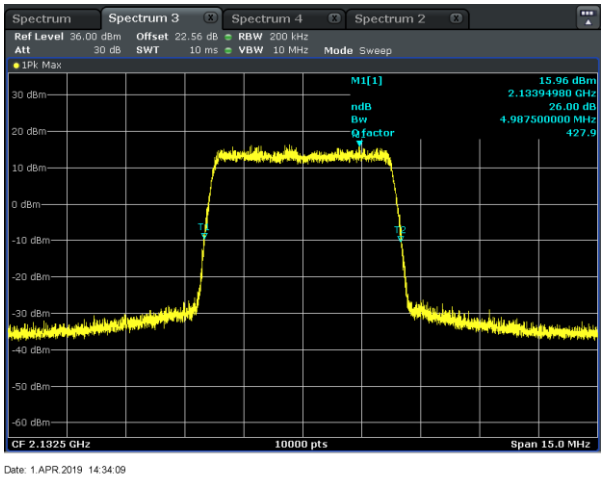



***Figure 8.6-61:*** *26dB, 5MHz BW, QPSK, 2132.5MHz*

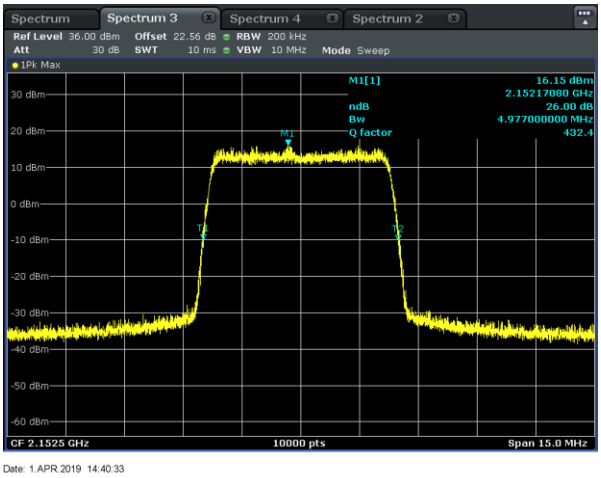



***Figure 8.6-62:*** *26dB, 5MHz BW, QPSK, 2152.5MHz*

## 8.7 Peak-to-average power ratio (Band 4, Band 13)

### 8.7.1 Definitions and limits

RSS 130 Issue 2:

The transmitter output power shall be measured in terms of average power. For base and fixed equipment, refer to SRSP-518 for power limits. The e.i.r.p. shall not exceed 50 watts for mobile equipment or for outdoor fixed subscriber equipment, nor shall it exceed 5 watts for portable equipment or for indoor fixed subscriber equipment. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

RSS 139 Issue 3:

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1710-1780 MHz shall not exceed one watt. Consult SRSP-513 for e.i.r.p. limits on fixed and base stations operating in the band 2110-2180 MHz. In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

### 8.7.2 Test summary

| | |
|---|---|
| Test date | April 3, 2019 |

Compliant

### 8.7.3 Observations, settings and special notes

None.

## 8.7.4 Test data

***Table 8.7-1: Peak-to-average power ratio – Port 2***

| Frequency | 0.01% PAPR (dB) |
|---|---|
| Band 4 | |
| **Bandwidth 5MHz** | |
| **QPSK** | |
| 2112.5 | 8.09 |
| 2132.5 | 8.06 |
| 2152.5 | 8.03 |
| **16QAM** | |
| 2112.5 | 8.03 |
| 2132.5 | 8.06 |
| 2152.5 | 8.00 |
| **64QAM** | |
| 2112.5 | 8.06 |
| 2132.5 | 8.12 |
| 2152.5 | 8.06 |
| | |
| **Bandwidth 10MHz** | |
| **QPSK** | |
| 2115 | 8.00 |
| 2132.5 | 7.97 |
| 2150 | 8.00 |
| **16QAM** | |
| 2115 | 7.97 |
| 2132.5 | 8.03 |
| 2150 | 8.03 |
| **64QAM** | |
| 2115 | 7.97 |
| 2132.5 | 8.03 |
| 2150 | 8.00 |
| | |
| **Bandwidth 15MHz** | |
| **QPSK** | |
| 2117.5 | 7.83 |
| 2132.5 | 7.86 |
| 2147.5 | 7.86 |
| **16QAM** | |
| 2117.5 | 8.14 |
| 2132.5 | 8.14 |
| 2147.5 | 8.09 |
| **64QAM** | |
| 2117.5 | 7.91 |
| 2132.5 | 7.88 |
| 2147.5 | 7.91 |
| | |
| **Bandwidth 20MHz** | |
| **QPSK** | |
| 2120 | 7.86 |
| 2132.5 | 7.86 |
| 2145 | 7.86 |
| **16QAM** | |
| 2120 | 7.80 |
| 2132.5 | 7.83 |
| 2145 | 7.83 |
| **64QAM** | |
| 2120 | 7.88 |
| 2132.5 | 7.91 |
| 2145 | 7.91 |
| | |

***Table 8.7-2: Peak-to-average power ratio – Port 2***

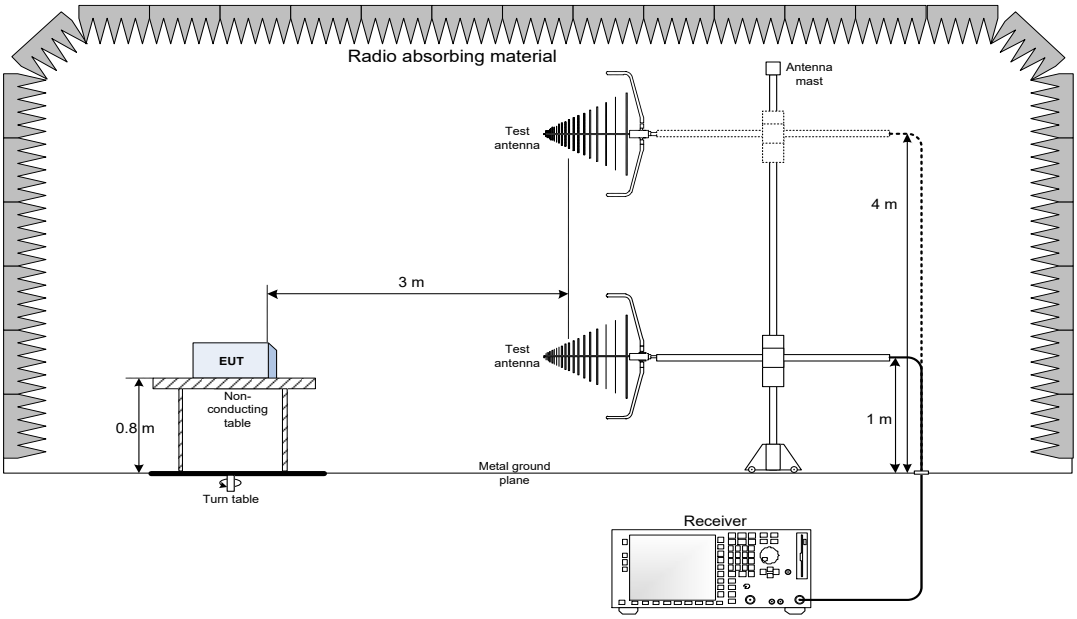
| Frequency | 0.01% PAPR (dB) |
|---|---|
| **Band 13** | |
| **Bandwidth 5MHz** | |
| **QPSK** | |
| 748.5 | 8.12 |
| 751 | 8.12 |
| 753.5 | 8.12 |
| **16QAM** | |
| 748.5 | 8.09 |
| 751 | 8.12 |
| 753.5 | 8.06 |
| **64QAM** | |
| 748.5 | 8.06 |
| 751 | 8.20 |
| 753.5 | 8.14 |
| **Bandwidth 10MHz** | |
| **QPSK** | |
| 751 | 8.14 |
| **16QAM** | |
| 751 | 8.14 |
| **64QAM** | |
| 751 | 8.14 |

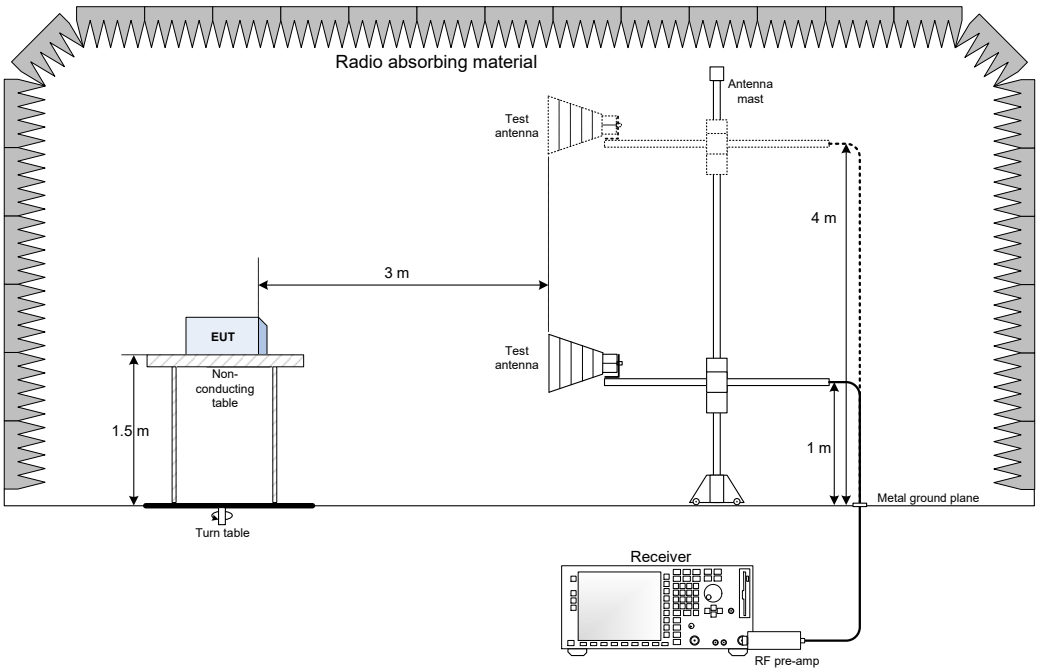
***Figure 8.7-1:*** *PAPR, Band 4, 5MHz BW, QPSK, 2112.5MHz*

***Figure 8.7-2:*** *PAPR, Band13, 5MHz BW, QPSK, 748.5MHz*

# **Section 9.** Block diagrams of test set-ups

## 9.1 Radiated emissions set-up for frequencies below 1 GHz




## 9.2 Radiated emissions set-up for frequencies above 1 GHz