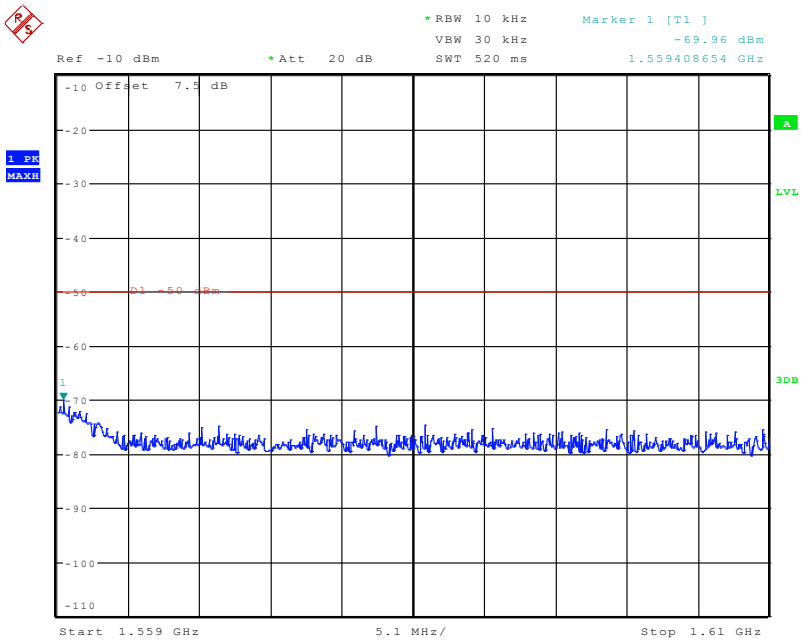
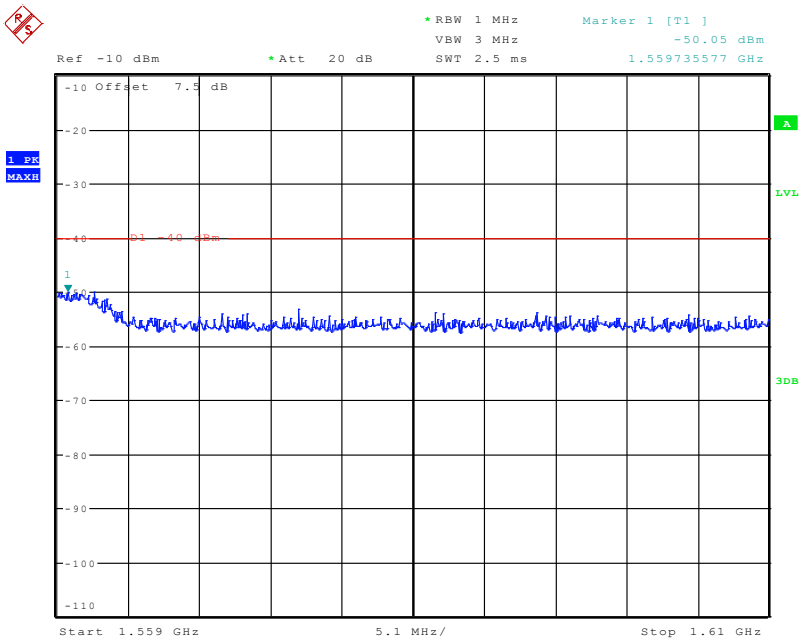
## 1559 MHz - 1610 MHz (5.0 MHz, Low channel, Narrow)



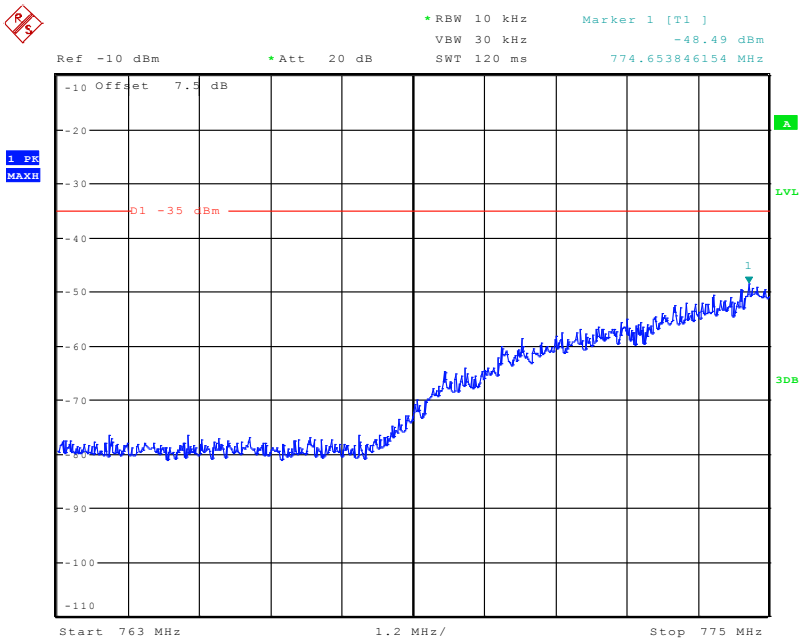

Date: 5.NOV.2020 13:25:08

## 1559 MHz - 1610 MHz (5.0 MHz, Low channel, Wide)



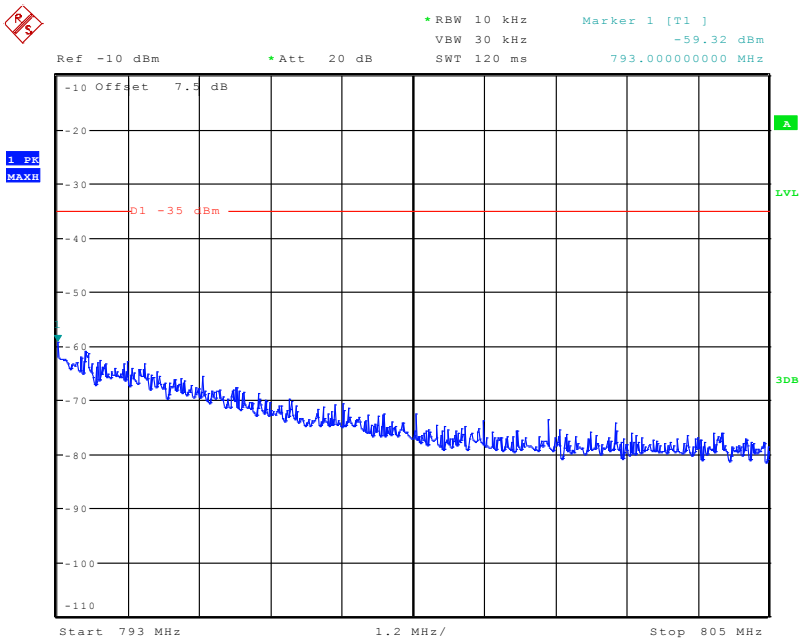

Date: 5.NOV.2020 13:25:29

## 763 MHz - 775 MHz (5.0 MHz, Middle channel)



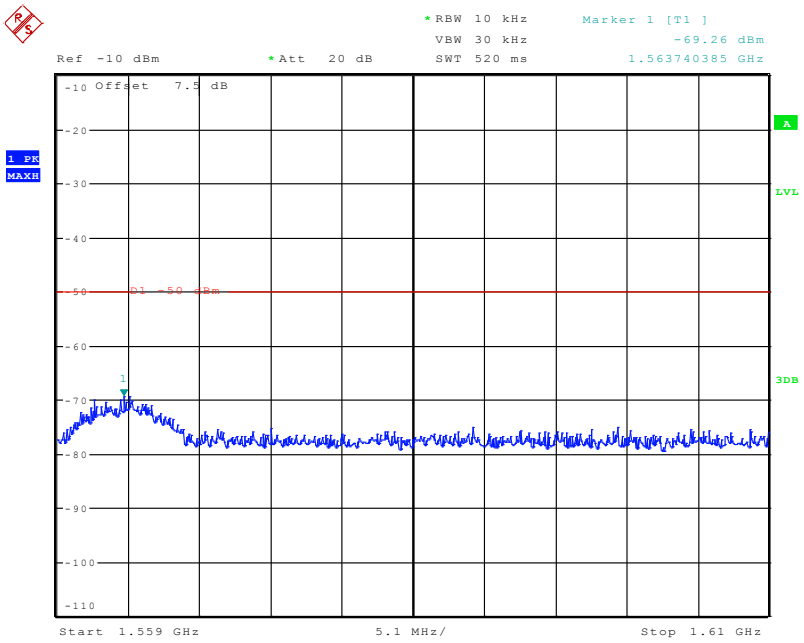

Date: 5.NOV.2020 13:19:57

## 793MHz – 805 MHz (5.0 MHz, Middle channel)



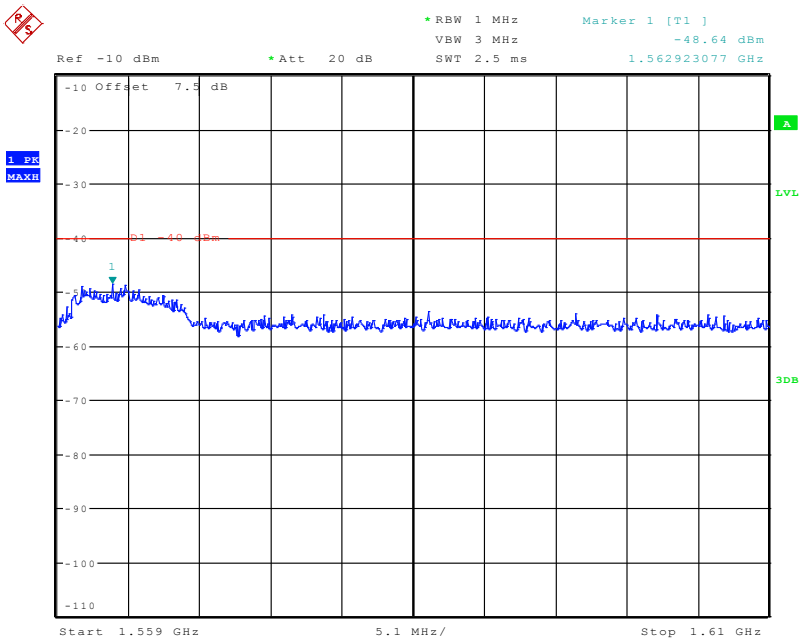

Date: 5.NOV.2020 13:21:31

## 1559 MHz - 1610 MHz (5.0 MHz, Middle channel, Narrow)



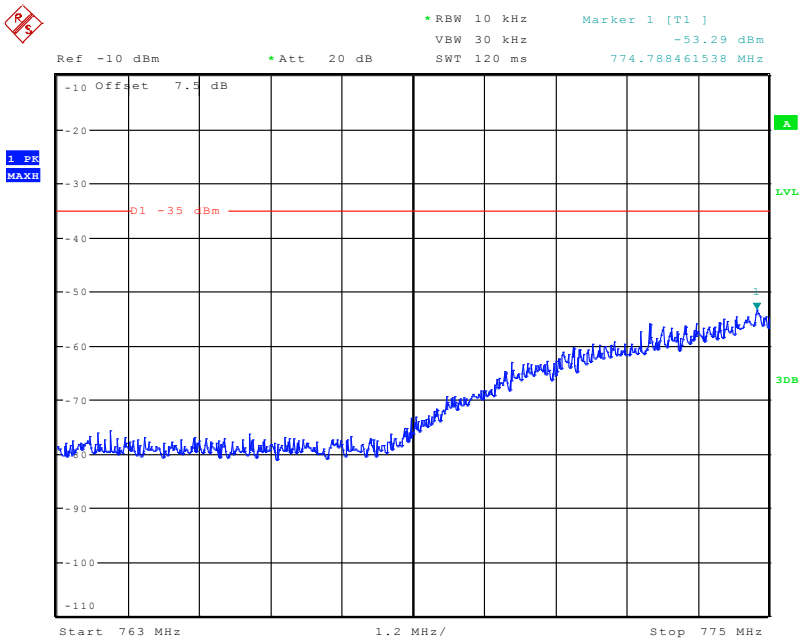

Date: 5.NOV.2020 13:24:49

## 1559 MHz - 1610 MHz (5.0 MHz, Middle channel, Wide)



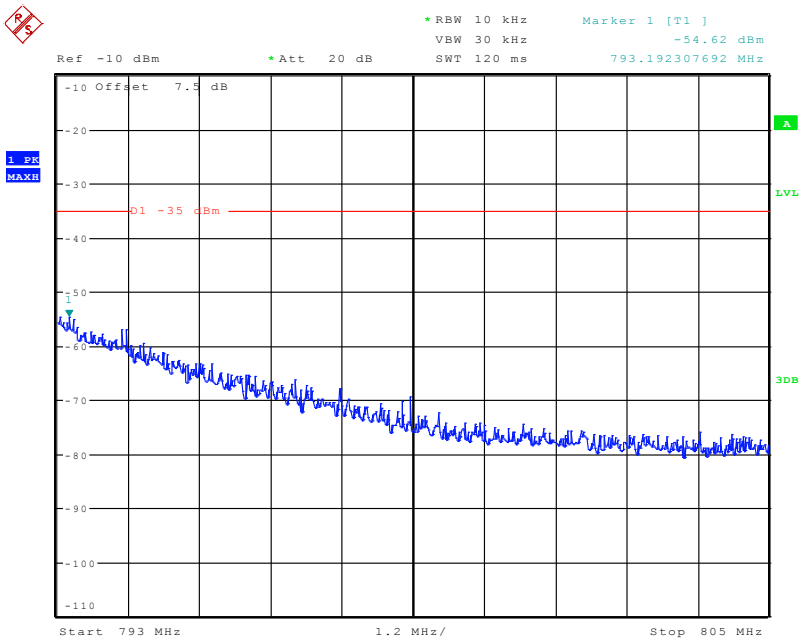

Date: 5.NOV.2020 13:24:27

## 763 MHz - 775 MHz (5.0 MHz, High channel)

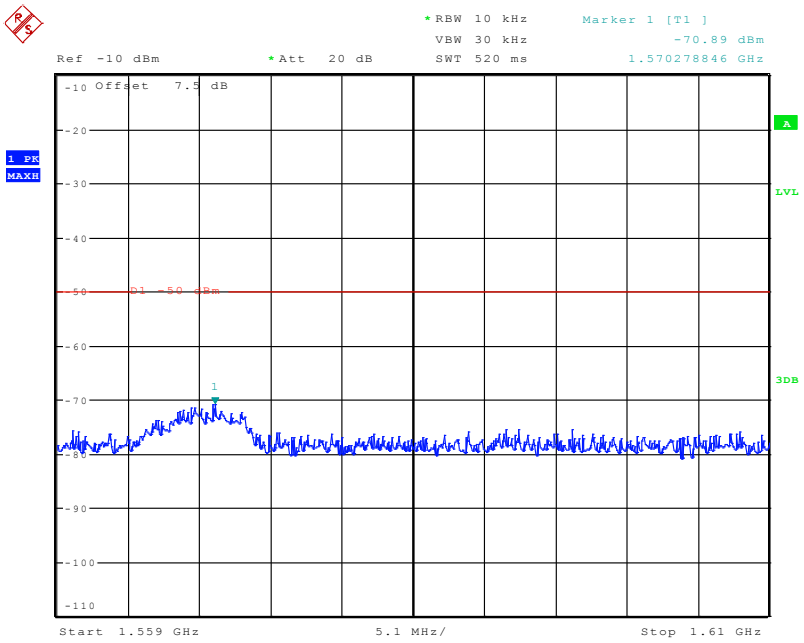



Date: 5.NOV.2020 13:20:21

## 793MHz – 805MHz (5.0 MHz, High channel)

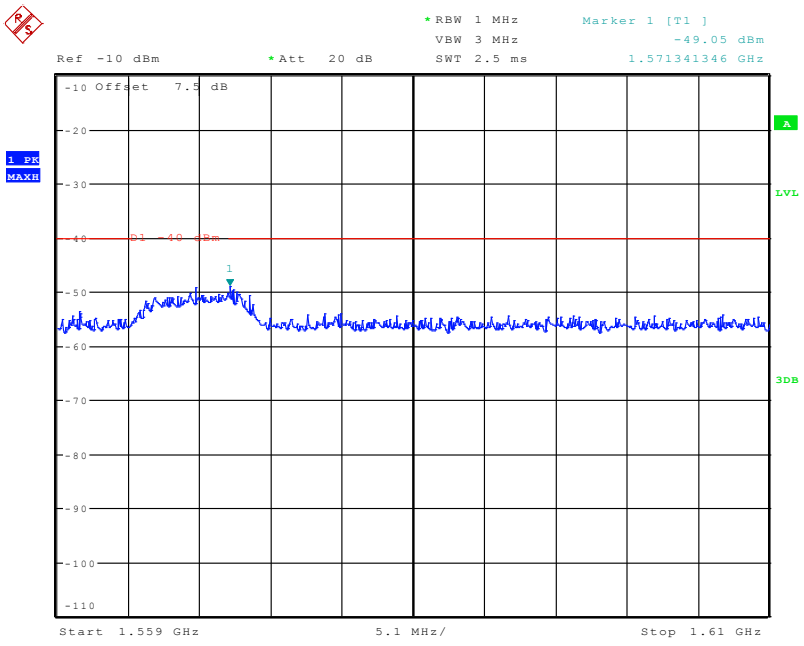


## 1559 MHz - 1610 MHz (5.0 MHz, High channel, Narrow)



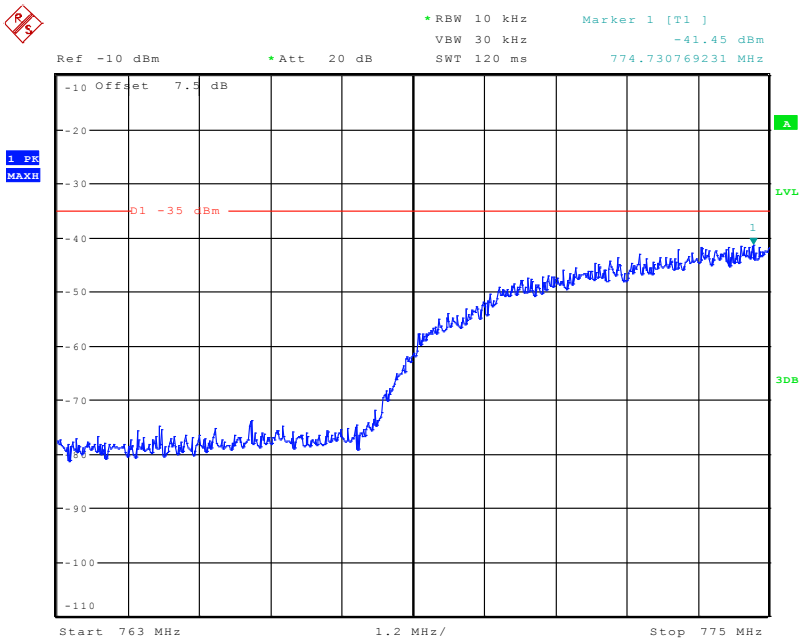

Date: 5.NOV.2020 13:26:11

## 1559 MHz - 1610 MHz (5.0 MHz, High channel, Wide)



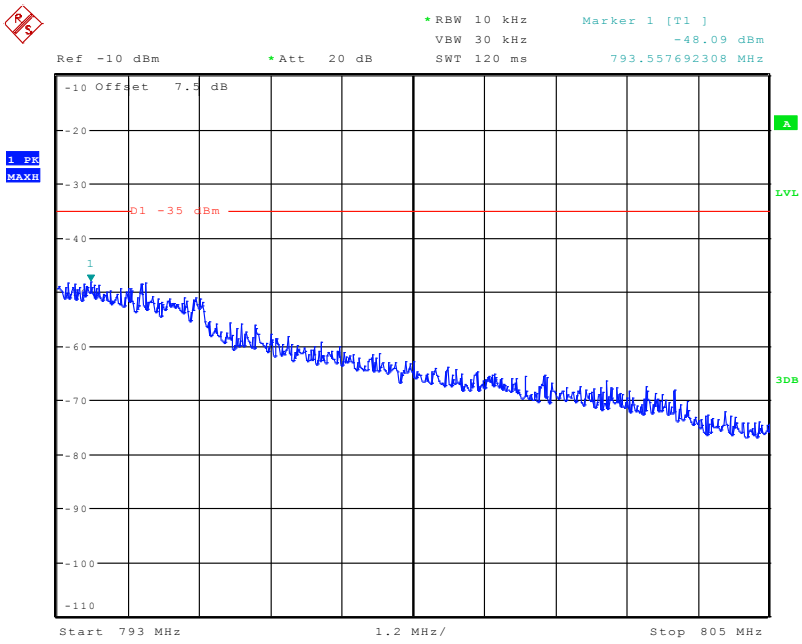

Date: 5.NOV.2020 13:25:52

## 763 MHz - 775 MHz (10.0 MHz, Middle channel)



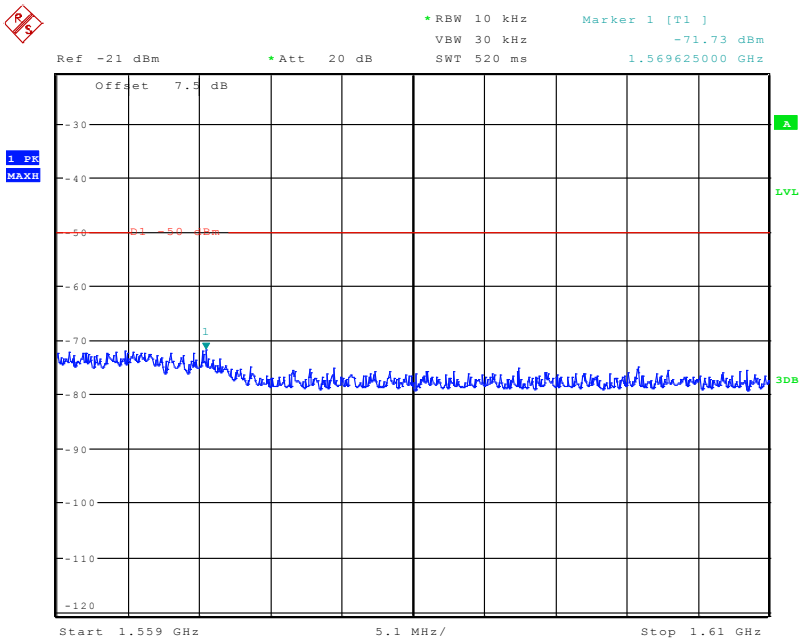

Date: 5.NOV.2020 13:22:11

## 793MHz – 805 MHz (10.0 MHz, Middle channel)



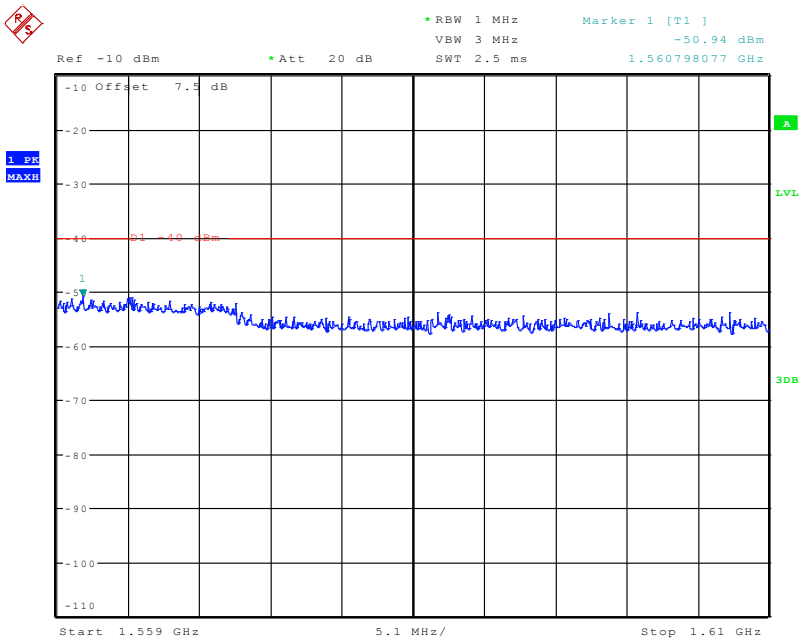

Date: 5.NOV.2020 13:21:54

## 1559 MHz - 1610 MHz (10.0 MHz, Middle channel, Narrow)




Date: 5.NOV.2020 13:23:27

## 1559 MHz - 1610 MHz (10.0 MHz, Middle channel, Wide)




Date: 5.NOV.2020 13:23:58

# FCC § 2.1053; § 22.917 (a);§ 24.238 (a); §27.53 SPURIOUS RADIATED EMISSIONS

## Applicable Standard

FCC § 2.1053, §22.917(a) and § 24.238(a) and § 27.53

## Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

## Test Data

### Environmental Conditions

| | |
|---|---|
| **Temperature:** | 29~30.5 ℃ |
| **Relative Humidity:** | 54~65 % |
| **ATM Pressure:** | 100.8~101.0 kPa |

*The testing was performed by Harris He on 2020-10-22 for below 1GHz and Alan He on 2020-10-19 for above 1GHz.*

*EUT operation mode: Transmitting (Worst case)*

**30 MHz ~ 10 GHz:**

**Cellular Band (Part 22H)**

| Frequency (MHz) | Receiver Reading (dBμV) | Turntable Angle Degree | Rx Antenna | | Substituted | | | Absolute Level (dBm) | FCC Part 22H | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (m) | Polar (H/V) | Level (dBm) | Cable Loss (dB) | Antenna Gain (dBd/dBi) | | Limit (dBm) | Margin (dB) |
| WCDMA Mode | | | | | | | | | | |
| Low channel | | | | | | | | | | |
| 956.3 | 37.38 | 256 | 1.3 | H | -63.2 | 1.37 | 0.0 | -64.57 | -13 | 51.57 |
| 956.3 | 38.43 | 45 | 1.3 | V | -60.9 | 1.37 | 0.0 | -62.27 | -13 | 49.27 |
| 1652.80 | 46.27 | 268 | 1.4 | H | -60.1 | 1.30 | 8.90 | -52.50 | -13 | 39.50 |
| 1652.80 | 45.18 | 56 | 2.4 | V | -60.6 | 1.30 | 8.90 | -53.00 | -13 | 40.00 |
| 2479.20 | 44.08 | 294 | 1.7 | H | -59.3 | 2.60 | 10.20 | -51.70 | -13 | 38.70 |
| 2479.20 | 44.24 | 341 | 1.3 | V | -58.5 | 2.60 | 10.20 | -50.90 | -13 | 37.90 |
| 3305.60 | 44.08 | 255 | 2.4 | H | -56.8 | 1.50 | 11.70 | -46.60 | -13 | 33.60 |
| 3305.60 | 43.67 | 321 | 1.2 | V | -57.3 | 1.50 | 11.70 | -47.10 | -13 | 34.10 |
| Middle channel | | | | | | | | | | |
| 957.4 | 37.63 | 284 | 2.0 | H | -63.0 | 1.37 | 0.0 | -64.37 | -13 | 51.37 |
| 957.4 | 38.52 | 38 | 2.3 | V | -60.8 | 1.37 | 0.0 | -62.17 | -13 | 49.17 |
| 1673.20 | 46.14 | 257 | 1.3 | H | -60.2 | 1.30 | 8.90 | -52.60 | -13 | 39.60 |
| 1673.20 | 45.84 | 272 | 1.3 | V | -59.9 | 1.30 | 8.90 | -52.30 | -13 | 39.30 |
| 2509.80 | 43.88 | 198 | 1.2 | H | -59.5 | 2.60 | 10.20 | -51.90 | -13 | 38.90 |
| 2509.80 | 43.97 | 31 | 2.2 | V | -58.8 | 2.60 | 10.20 | -51.20 | -13 | 38.20 |
| 3346.40 | 44.14 | 226 | 2.3 | H | -56.8 | 1.50 | 11.70 | -46.60 | -13 | 33.60 |
| 3346.40 | 43.77 | 46 | 2.4 | V | -57.2 | 1.50 | 11.70 | -47.00 | -13 | 34.00 |
| High channel | | | | | | | | | | |
| 961.7 | 37.39 | 173 | 1.8 | H | -63.2 | 1.37 | 0.0 | -64.57 | -13 | 51.57 |
| 961.7 | 38.46 | 5 | 1.8 | V | -60.9 | 1.37 | 0.0 | -62.27 | -13 | 49.27 |
| 1693.20 | 46.23 | 223 | 2.5 | H | -60.1 | 1.30 | 8.90 | -52.50 | -13 | 39.50 |
| 1693.20 | 45.91 | 295 | 1.2 | V | -59.8 | 1.30 | 8.90 | -52.20 | -13 | 39.20 |
| 2539.80 | 44.01 | 159 | 2.0 | H | -59.3 | 2.60 | 10.20 | -51.70 | -13 | 38.70 |
| 2539.80 | 43.86 | 171 | 1.9 | V | -58.9 | 2.60 | 10.20 | -51.30 | -13 | 38.30 |
| 3386.40 | 43.74 | 54 | 1.2 | H | -57.5 | 1.40 | 11.80 | -47.10 | -13 | 34.10 |
| 3386.40 | 43.82 | 238 | 1.1 | V | -57.2 | 1.40 | 11.80 | -46.80 | -13 | 33.80 |

**30 MHz ~ 20 GHz:**

**PCS Band (Part 24E)**

| Frequency (MHz) | Receiver Reading (dBμV) | Turntable Angle Degree | Rx Antenna | | Substituted | | | Absolute Level (dBm) | FCC Part 24E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (m) | Polar (H/V) | Level (dBm) | Cable Loss (dB) | Antenna Gain (dBd/dBi) | | Limit (dBm) | Margin (dB) |
| WCDMA Mode | | | | | | | | | | |
| Low channel | | | | | | | | | | |
| 958.6 | 37.47 | 352 | 1.4 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 958.6 | 38.63 | 215 | 2.5 | V | -60.7 | 1.37 | 0.0 | -62.07 | -13 | 49.07 |
| 3704.80 | 45.12 | 351 | 1.9 | H | -56.7 | 1.60 | 11.90 | -46.40 | -13 | 33.40 |
| 3704.80 | 44.33 | 87 | 1.5 | V | -56.9 | 1.60 | 11.90 | -46.60 | -13 | 33.60 |
| Middle channel | | | | | | | | | | |
| 968.7 | 37.54 | 243 | 1.3 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 968.7 | 38.26 | 120 | 1.8 | V | -61.1 | 1.37 | 0.0 | -62.47 | -13 | 49.47 |
| 3760.00 | 44.89 | 9 | 2.4 | H | -57.2 | 1.50 | 11.80 | -46.90 | -13 | 33.90 |
| 3760.00 | 44.41 | 40 | 2.0 | V | -57.2 | 1.50 | 11.80 | -46.90 | -13 | 33.90 |
| High channel | | | | | | | | | | |
| 947.7 | 37.49 | 304 | 1.2 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 947.7 | 38.54 | 174 | 2.2 | V | -60.8 | 1.37 | 0.0 | -62.17 | -13 | 49.17 |
| 3815.20 | 44.91 | 220 | 1.3 | H | -57.1 | 1.50 | 11.80 | -46.80 | -13 | 33.80 |
| 3815.20 | 44.22 | 239 | 1.4 | V | -57.4 | 1.50 | 11.80 | -47.10 | -13 | 34.10 |

**30 MHz ~ 20 GHz:**

**AWS Band**

| Frequency (MHz) | Receiver Reading (dBµV) | Turntable Angle Degree | Rx Antenna | | Substituted | | | Absolute Level (dBm) | FCC Part 27 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (m) | Polar (H/V) | Level (dBm) | Cable Loss (dB) | Antenna Gain (dBd/dBi) | | Limit (dBm) | Margin (dB) |
| WCDMA Mode | | | | | | | | | | |
| Low channel | | | | | | | | | | |
| 960.6 | 37.28 | 139 | 2.3 | H | -63.3 | 1.37 | 0.0 | -64.67 | -13 | 51.67 |
| 960.6 | 38.84 | 162 | 1.8 | V | -60.5 | 1.37 | 0.0 | -61.87 | -13 | 48.87 |
| 3424.80 | 44.38 | 232 | 1.1 | H | -56.4 | 1.40 | 11.80 | -46.00 | -13 | 33.00 |
| 3424.80 | 43.96 | 327 | 1.8 | V | -56.6 | 1.40 | 11.80 | -46.20 | -13 | 33.20 |
| Middle channel | | | | | | | | | | |
| 961.3 | 37.48 | 201 | 2.0 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 961.3 | 38.15 | 223 | 1.5 | V | -61.2 | 1.37 | 0.0 | -62.57 | -13 | 49.57 |
| 3465.20 | 44.75 | 236 | 1.6 | H | -56.0 | 1.50 | 12.00 | -45.50 | -13 | 32.50 |
| 3465.20 | 44.27 | 314 | 1.9 | V | -57.2 | 1.50 | 12.00 | -46.70 | -13 | 33.70 |
| High channel | | | | | | | | | | |
| 962.5 | 37.34 | 154 | 1.2 | H | -63.3 | 1.37 | 0.0 | -64.67 | -13 | 51.67 |
| 962.5 | 38.78 | 159 | 2.3 | V | -60.6 | 1.37 | 0.0 | -61.97 | -13 | 48.97 |
| 3505.20 | 44.61 | 299 | 1.4 | H | -56.1 | 1.50 | 12.00 | -45.60 | -13 | 32.60 |
| 3505.20 | 44.54 | 72 | 2.0 | V | -57.0 | 1.50 | 12.00 | -46.50 | -13 | 33.50 |

**LTE Band:** *(Pre-scan with all the bandwidth, and worse case as below)*

| Frequency | Receiver | Turntable | Rx Antenna | | Substituted | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| (MHz) | Reading (dBµV) | Angle Degree | Height (m) | Polar (H/V) | Level (dBm) | Cable Loss (dB) | Antenna Gain (dBd/dBi) | | | |
| Band 2 | | | | | | | | | | |
| Test frequency range:30 MHz ~ 20 GHz | | | | | | | | | | |
| 1.4 MHz, Low channel | | | | | | | | | | |
| 957.4 | 37.33 | 239 | 1.1 | H | -63.3 | 1.37 | 0.0 | -64.67 | -13 | 51.67 |
| 957.4 | 38.25 | 342 | 1.5 | V | -61.1 | 1.37 | 0.0 | -62.47 | -13 | 49.47 |
| 3701.40 | 44.16 | 191 | 1.2 | H | -57.6 | 1.60 | 11.90 | -47.30 | -13 | 34.30 |
| 3701.40 | 43.85 | 265 | 2.5 | V | -57.4 | 1.60 | 11.90 | -47.10 | -13 | 34.10 |
| 1.4 MHz, Middle channel | | | | | | | | | | |
| 959.6 | 37.62 | 129 | 1.7 | H | -63.0 | 1.37 | 0.0 | -64.37 | -13 | 51.37 |
| 959.6 | 38.45 | 98 | 1.7 | V | -60.9 | 1.37 | 0.0 | -62.27 | -13 | 49.27 |
| 3760.00 | 44.12 | 57 | 1.8 | H | -57.9 | 1.50 | 11.80 | -47.60 | -13 | 34.60 |
| 3760.00 | 43.67 | 246 | 1.6 | V | -57.9 | 1.50 | 11.80 | -47.60 | -13 | 34.60 |
| 1.4 MHz, High channel | | | | | | | | | | |
| 966.2 | 37.43 | 177 | 1.7 | H | -63.2 | 1.37 | 0.0 | -64.57 | -13 | 51.57 |
| 966.2 | 38.20 | 215 | 1.7 | V | -61.1 | 1.37 | 0.0 | -62.47 | -13 | 49.47 |
| 5727.90 | 51.34 | 283 | 1.4 | H | -48.5 | 1.60 | 12.10 | -38.00 | -13 | 25.00 |
| 5727.90 | 49.35 | 315 | 1.5 | V | -49.9 | 1.60 | 12.10 | -39.40 | -13 | 26.40 |
| Band 4 | | | | | | | | | | |
| Test frequency range:30 MHz ~ 20 GHz | | | | | | | | | | |
| 1.4 MHz, Low channel | | | | | | | | | | |
| 949.3 | 37.27 | 101 | 1.2 | H | -63.3 | 1.37 | 0.0 | -64.67 | -13 | 51.67 |
| 949.3 | 38.16 | 152 | 1.6 | V | -61.2 | 1.37 | 0.0 | -62.57 | -13 | 49.57 |
| 3421.40 | 44.04 | 255 | 1.7 | H | -56.8 | 1.40 | 11.80 | -46.40 | -13 | 33.40 |
| 3421.40 | 43.86 | 60 | 2.5 | V | -56.7 | 1.40 | 11.80 | -46.30 | -13 | 33.30 |
| 1.4 MHz, Middle channel | | | | | | | | | | |
| 961.7 | 37.52 | 46 | 1.4 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 961.7 | 38.36 | 136 | 2.5 | V | -61.0 | 1.37 | 0.0 | -62.37 | -13 | 49.37 |
| 3465.00 | 44.25 | 183 | 2.3 | H | -56.5 | 1.50 | 12.00 | -46.00 | -13 | 33.00 |
| 3465.00 | 44.08 | 336 | 2.4 | V | -57.4 | 1.50 | 12.00 | -46.90 | -13 | 33.90 |
| 1.4 MHz, High channel | | | | | | | | | | |
| 962.8 | 37.59 | 159 | 2.2 | H | -63.0 | 1.37 | 0.0 | -64.37 | -13 | 51.37 |
| 962.8 | 38.42 | 67 | 1.3 | V | -60.9 | 1.37 | 0.0 | -62.27 | -13 | 49.27 |
| 3508.60 | 44.38 | 81 | 1.1 | H | -56.4 | 1.50 | 12.00 | -45.90 | -13 | 32.90 |
| 3508.60 | 44.15 | 102 | 2.1 | V | -57.4 | 1.50 | 12.00 | -46.90 | -13 | 33.90 |

| Frequency | Receiver | Turntable | Rx Antenna | | Substituted | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| (MHz) | Reading (dBµV) | Angle Degree | Height (m) | Polar (H/V) | Level (dBm) | Cable Loss (dB) | Antenna Gain (dBd/dBi) | | | |
| Band 5 | | | | | | | | | | |
| Test frequency range: 30 MHz ~ 10 GHz | | | | | | | | | | |
| 1.4 MHz, Low channel | | | | | | | | | | |
| 952.1 | 37.41 | 15 | 2.1 | H | -63.2 | 1.37 | 0.0 | -64.57 | -13 | 51.57 |
| 952.1 | 38.36 | 225 | 1.3 | V | -61.0 | 1.37 | 0.0 | -62.37 | -13 | 49.37 |
| 1649.40 | 44.61 | 94 | 1.5 | H | -63.5 | 1.40 | 8.70 | -56.20 | -13 | 43.20 |
| 1649.40 | 44.28 | 346 | 2.0 | V | -63.6 | 1.40 | 8.70 | -56.30 | -13 | 43.30 |
| 1.4 MHz, Middle channel | | | | | | | | | | |
| 963.2 | 37.41 | 102 | 2.4 | H | -63.2 | 1.37 | 0.0 | -64.57 | -13 | 51.57 |
| 963.2 | 38.27 | 255 | 2.5 | V | -61.1 | 1.37 | 0.0 | -62.47 | -13 | 49.47 |
| 1673.00 | 44.35 | 183 | 1.1 | H | -62.0 | 1.30 | 8.90 | -54.40 | -13 | 41.40 |
| 1673.00 | 44.21 | 224 | 2.2 | V | -61.5 | 1.30 | 8.90 | -53.90 | -13 | 40.90 |
| 1.4 MHz, High channel | | | | | | | | | | |
| 965.0 | 37.74 | 264 | 2.1 | H | -62.9 | 1.37 | 0.0 | -64.27 | -13 | 51.27 |
| 965.0 | 38.66 | 96 | 2.1 | V | -60.7 | 1.37 | 0.0 | -62.07 | -13 | 49.07 |
| 1696.60 | 44.35 | 36 | 1.0 | H | -62.0 | 1.30 | 8.90 | -54.40 | -13 | 41.40 |
| 1696.60 | 44.12 | 28 | 2.3 | V | -61.6 | 1.30 | 8.90 | -54.00 | -13 | 41.00 |
| Band 12 | | | | | | | | | | |
| Test frequency range: 30 MHz ~ 10 GHz | | | | | | | | | | |
| 1.4 MHz, Low channel | | | | | | | | | | |
| 947.0 | 37.69 | 201 | 1.9 | H | -62.9 | 1.37 | 0.0 | -64.27 | -13 | 51.27 |
| 947.0 | 38.81 | 267 | 1.0 | V | -60.5 | 1.37 | 0.0 | -61.87 | -13 | 48.87 |
| 1399.40 | 43.95 | 11 | 2.0 | H | -64.2 | 1.60 | 7.90 | -57.90 | -13 | 44.90 |
| 1399.40 | 43.82 | 24 | 1.3 | V | -64.6 | 1.60 | 7.90 | -58.30 | -13 | 45.30 |
| 1.4 MHz, Middle channel | | | | | | | | | | |
| 965.3 | 37.48 | 201 | 2.0 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 965.3 | 38.15 | 223 | 1.5 | V | -61.2 | 1.37 | 0.0 | -62.57 | -13 | 49.57 |
| 1415.00 | 44.26 | 271 | 2.1 | H | -63.9 | 1.60 | 7.90 | -57.60 | -13 | 44.60 |
| 1415.00 | 43.85 | 33 | 1.1 | V | -64.6 | 1.60 | 7.90 | -58.30 | -13 | 45.30 |
| 1.4 MHz, High channel | | | | | | | | | | |
| 967.4 | 37.51 | 147 | 1.2 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 967.4 | 38.63 | 146 | 1.3 | V | -60.7 | 1.37 | 0.0 | -62.07 | -13 | 49.07 |
| 1430.60 | 44.11 | 232 | 1.1 | H | -64.1 | 1.60 | 7.90 | -57.80 | -13 | 44.80 |
| 1430.60 | 43.93 | 101 | 1.9 | V | -64.5 | 1.60 | 7.90 | -58.20 | -13 | 45.20 |

| Frequency | Receiver | Turntable | Rx Antenna | | Substituted | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| (MHz) | Reading (dBµV) | Angle Degree | Height (m) | Polar (H/V) | Level (dBm) | Cable Loss (dB) | Antenna Gain (dBd/dBi) | | | |
| Band 13 | | | | | | | | | | |
| Test frequency range: 30 MHz ~ 10 GHz | | | | | | | | | | |
| 5 MHz, Low channel | | | | | | | | | | |
| 964.9 | 37.62 | 113 | 2.2 | H | -63.0 | 1.37 | 0.0 | -64.37 | -13 | 51.37 |
| 964.9 | 38.13 | 287 | 1.7 | V | -61.2 | 1.37 | 0.0 | -62.57 | -13 | 49.57 |
| 1559.00 | 44.38 | 233 | 1.4 | H | -63.7 | 1.40 | 8.70 | -56.40 | -13 | 43.40 |
| 1559.00 | 44.12 | 252 | 1.4 | V | -63.7 | 1.40 | 8.70 | -56.40 | -13 | 43.40 |
| 5 MHz, Middle channel | | | | | | | | | | |
| 954.7 | 37.54 | 243 | 1.3 | H | -63.1 | 1.37 | 0.0 | -64.47 | -13 | 51.47 |
| 954.7 | 38.26 | 120 | 1.8 | V | -61.1 | 1.37 | 0.0 | -62.47 | -13 | 49.47 |
| 1564.00 | 44.12 | 126 | 1.4 | H | -64.0 | 1.40 | 8.70 | -56.70 | -13 | 43.70 |
| 1564.00 | 44.03 | 344 | 1.4 | V | -63.8 | 1.40 | 8.70 | -56.50 | -13 | 43.50 |
| 5 MHz, High channel | | | | | | | | | | |
| 951.3 | 37.37 | 273 | 1.8 | H | -63.2 | 1.37 | 0.0 | -64.57 | -13 | 51.57 |
| 951.3 | 38.44 | 319 | 1.8 | V | -60.9 | 1.37 | 0.0 | -62.27 | -13 | 49.27 |
| 1569.00 | 45.13 | 243 | 2.2 | H | -62.9 | 1.40 | 8.70 | -55.60 | -13 | 42.60 |
| 1569.00 | 44.52 | 211 | 1.9 | V | -63.3 | 1.40 | 8.70 | -56.00 | -13 | 43.00 |

**Note:**
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level
dBd is for the ERP, dBi is for EIRP.

# FCC § 22.917 (a);§ 24.238 (a); §27.53 (h)(m) - BAND EDGES

## Applicable Standard

According to § 22.917(a), the power of any emissions 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.

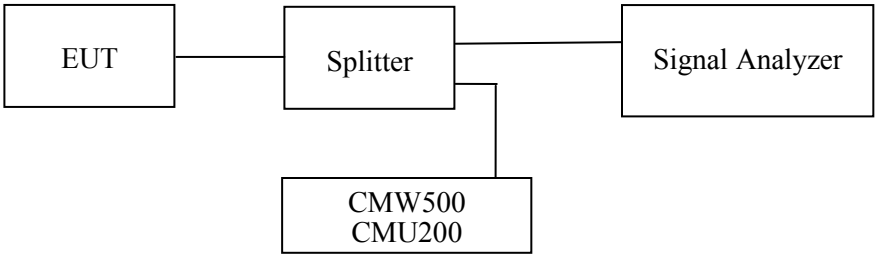
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to FCC §27.53 (h)(m), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

## Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency




## Test Data

### Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21~26.4℃ |
| **Relative Humidity:** | 42~68 % |
| **ATM Pressure:** | 100.3~101.2 kPa |

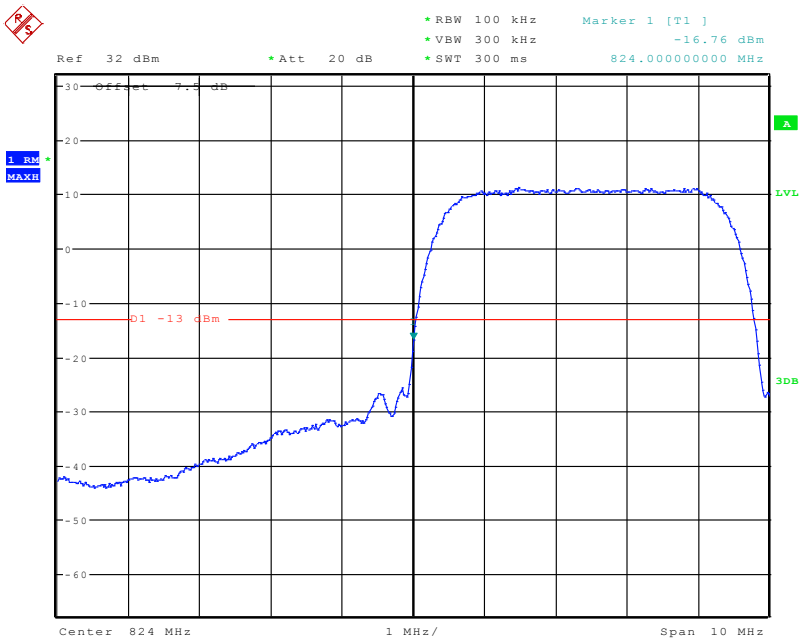
*The testing was performed by Alan He and Gavin Guo from 2020-03-09 to 2020-03-13.*

*EUT operation mode: Transmitting (Worst case)*

**Test Result: Pass**

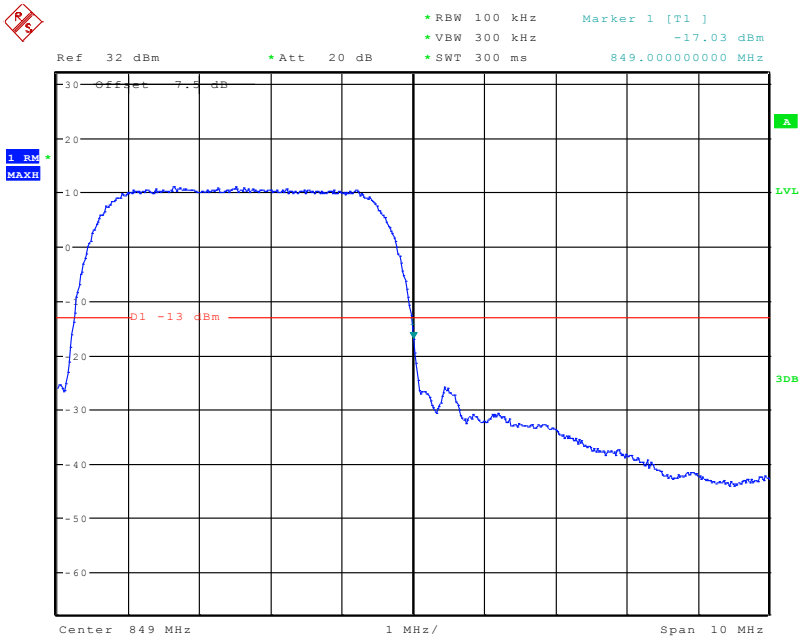
*Please refer to the following plots.*

## Cellular Band, Left Band Edge for WCDMA (BPSK) Mode



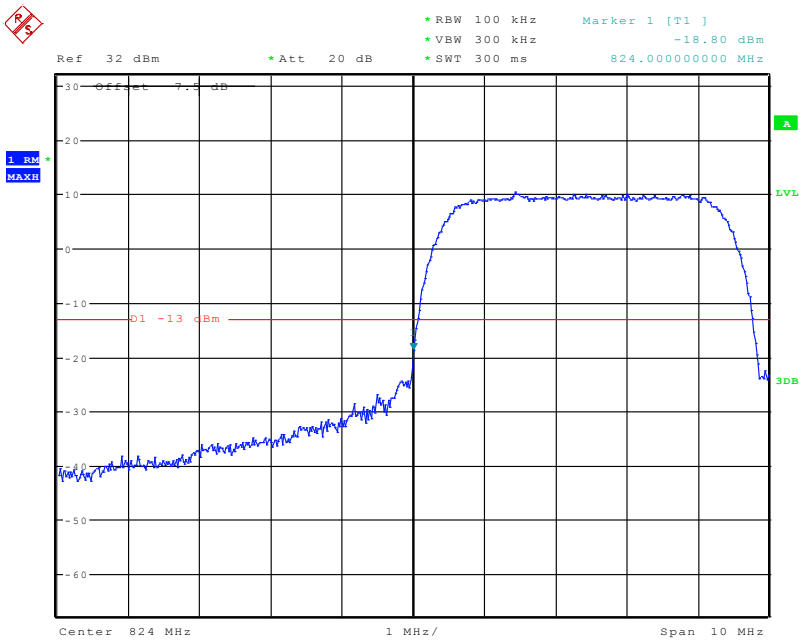

Date: 9.MAR.2020 10:36:08

## Cellular Band, Right Band Edge for WCDMA (BPSK) Mode



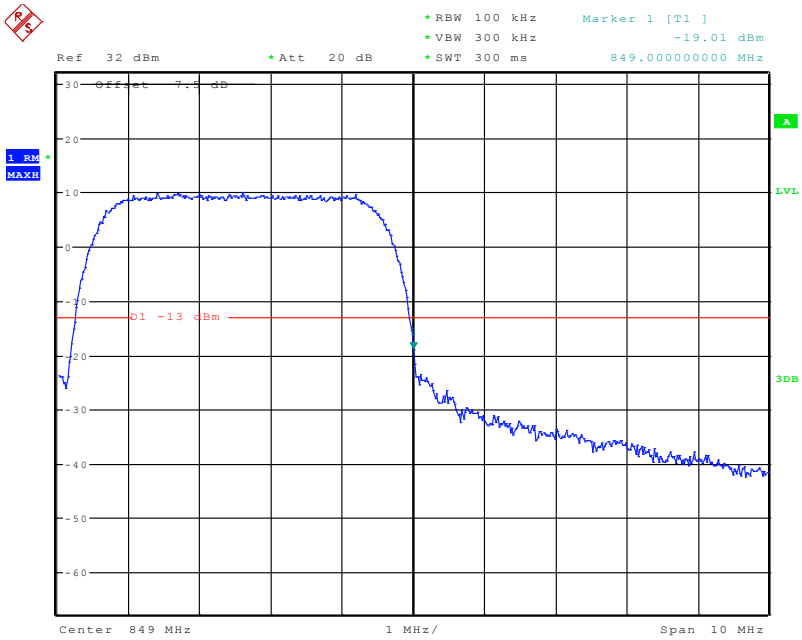

Date: 9.MAR.2020 10:37:21

## Cellular Band, Left Band Edge for HSDPA (16QAM) Mode



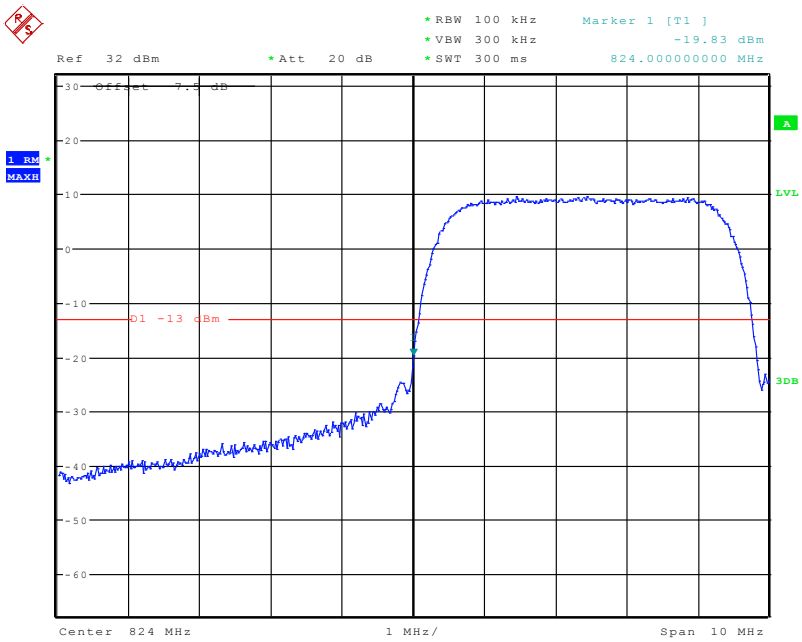

Date: 9.MAR.2020 10:39:05

## Cellular Band, Right Band Edge for HSDPA (16QAM) Mode



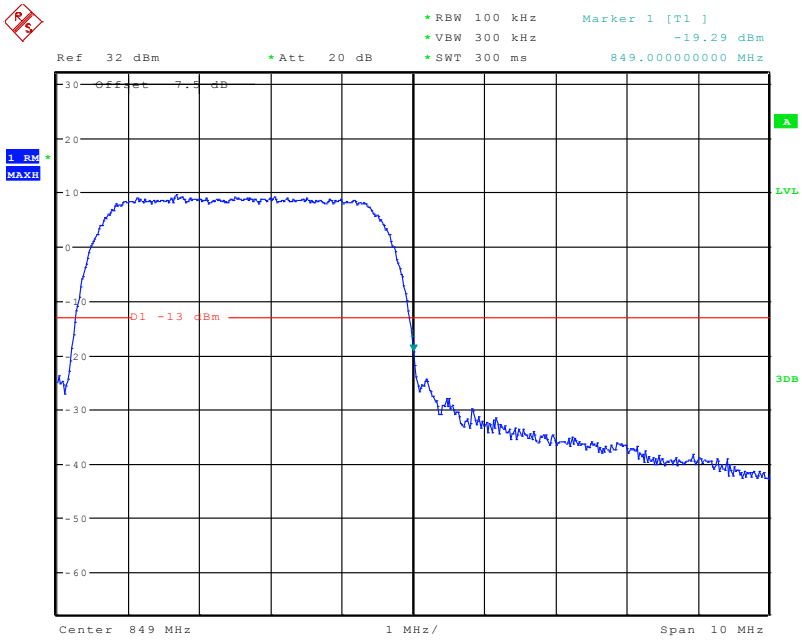

Date: 9.MAR.2020 10:39:32

## Cellular Band, Left Band Edge for HSUPA (BPSK) Mode



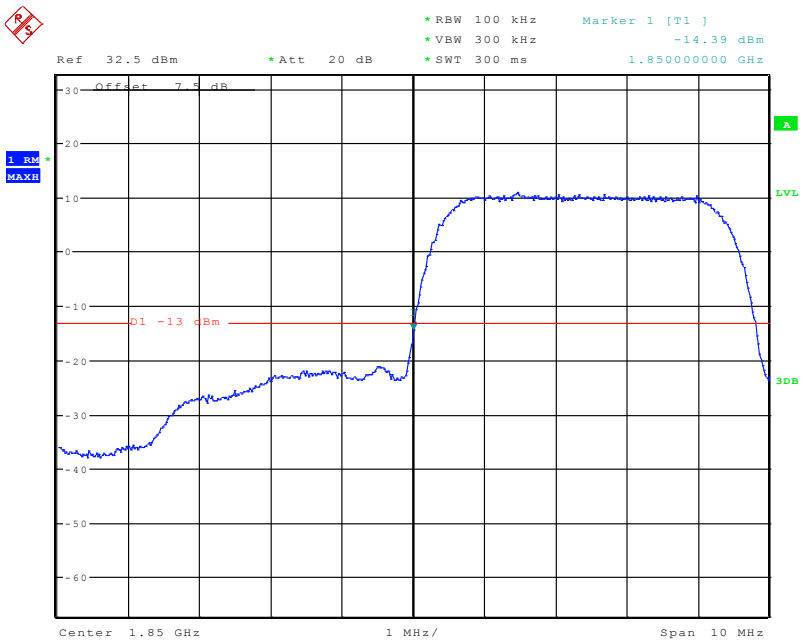

Date: 9.MAR.2020 10:38:30

## Cellular Band, Right Band Edge for HSUPA (BPSK) Mode



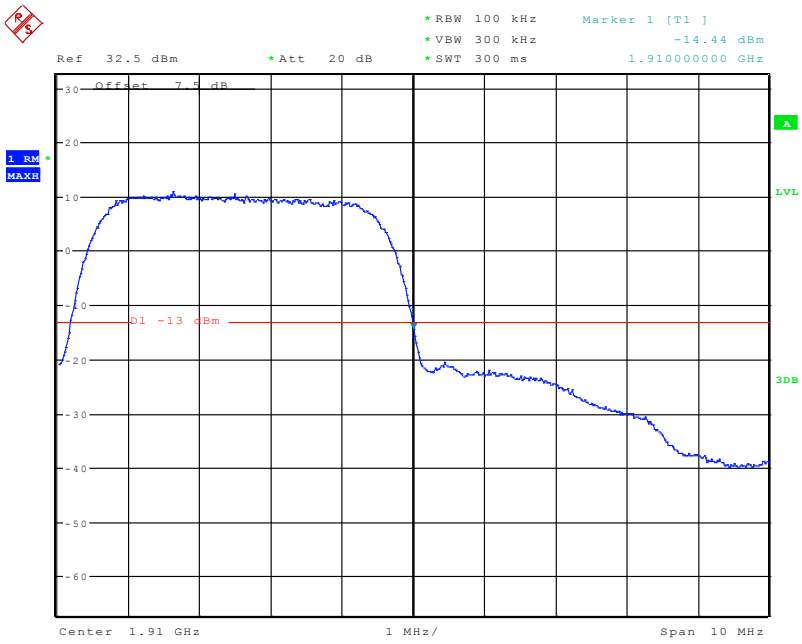

Date: 9.MAR.2020 10:37:58

## PCS Band, Left Band Edge for WCDMA (BPSK) Mode



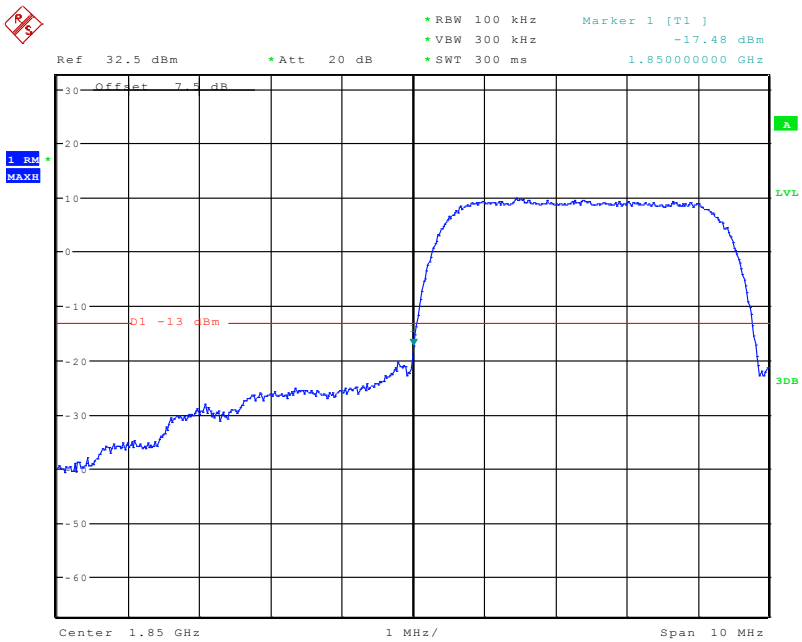

Date: 9.MAR.2020 11:23:50

## PCS Band, Right Band Edge for WCDMA (BPSK) Mode



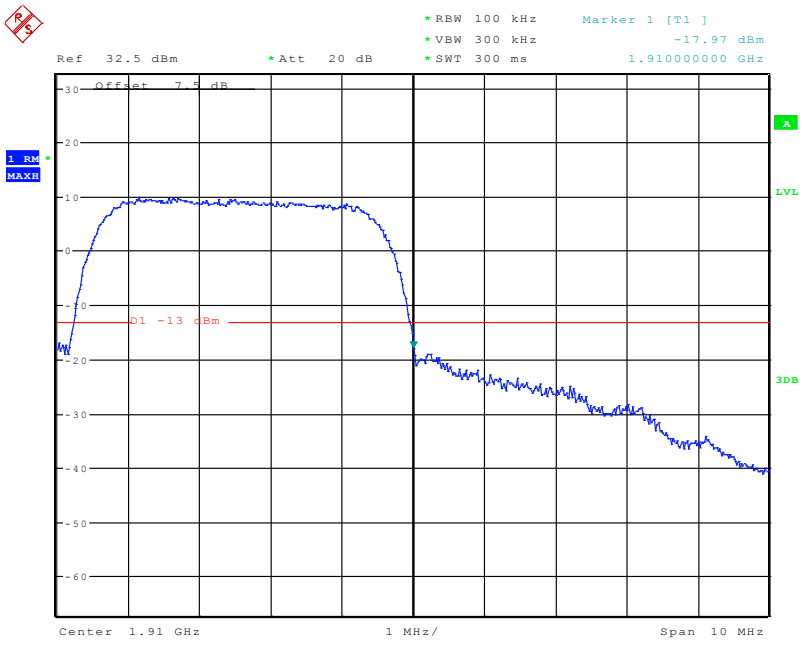

Date: 9.MAR.2020 11:28:01

## PCS Band, Left Band Edge for HSDPA (16QAM) Mode



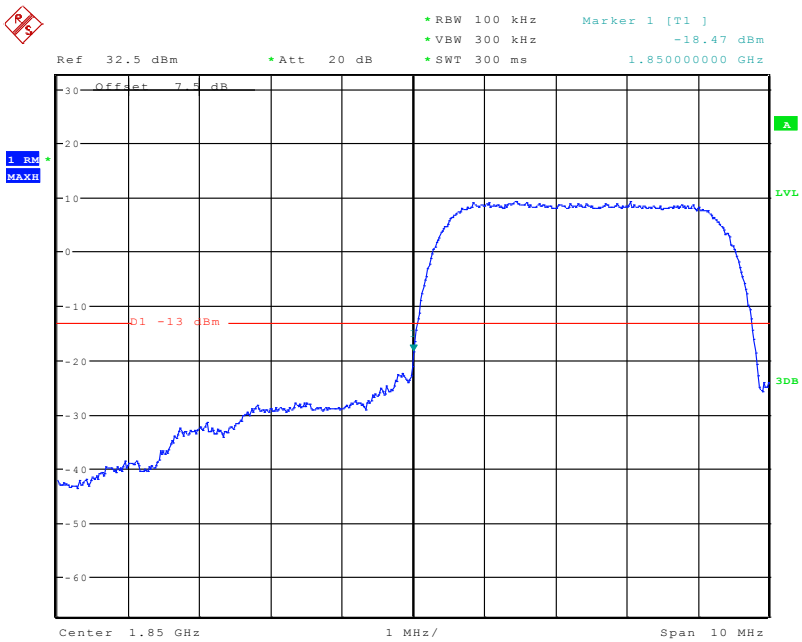

Date: 9.MAR.2020 11:24:30

## PCS Band, Right Band Edge for HSDPA (16QAM) Mode



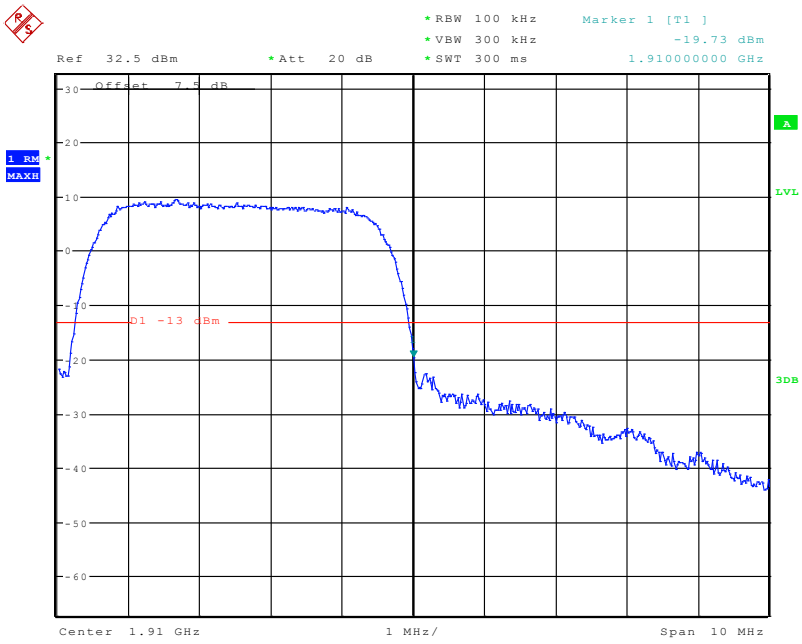

Date: 9.MAR.2020 11:26:55

## PCS Band, Left Band Edge for HSUPA (BPSK) Mode



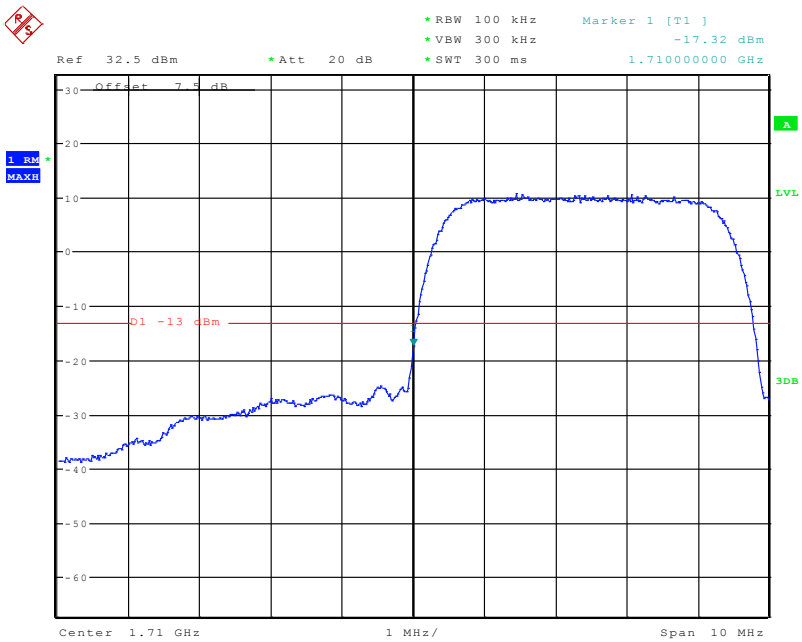

Date: 9.MAR.2020 11:23:17

## PCS Band, Right Band Edge for HSUPA (BPSK) Mode



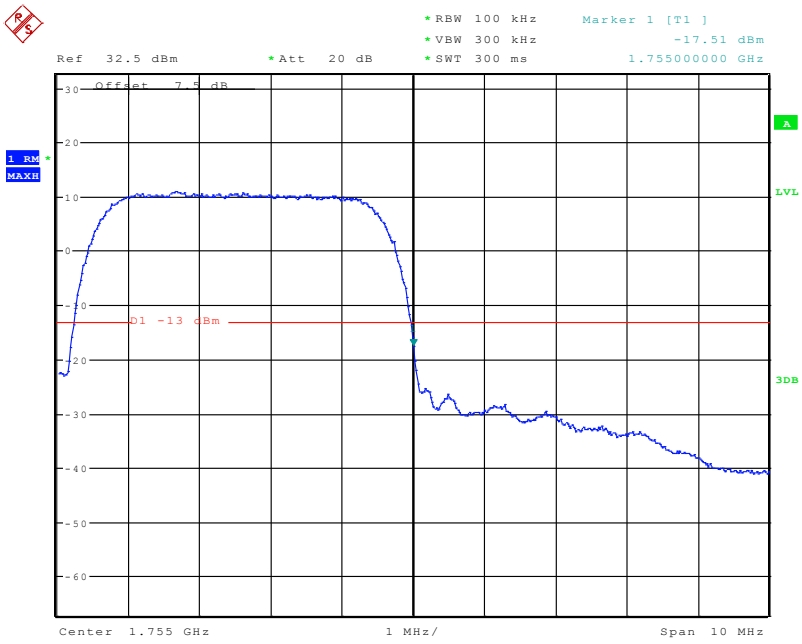

Date: 9.MAR.2020 11:27:31

## AWS Band, Left Band Edge for WCDMA (BPSK) Mode



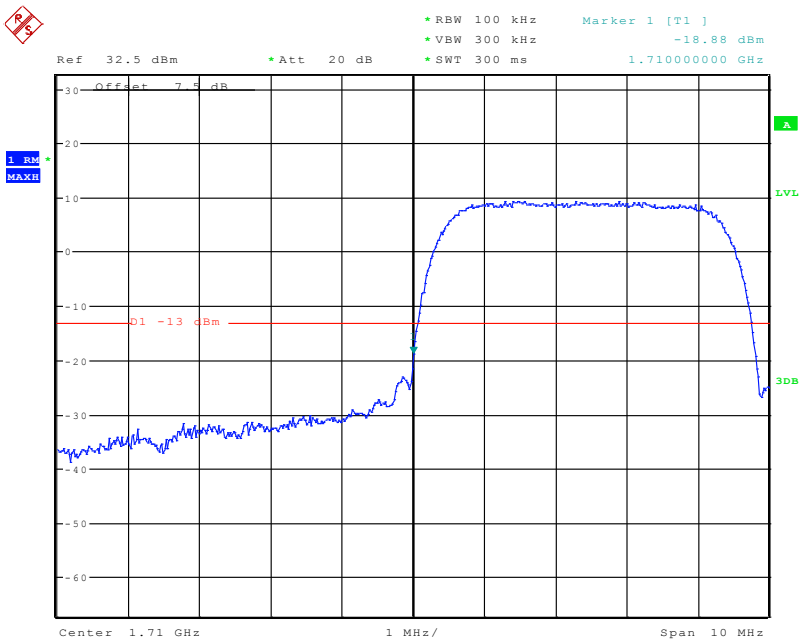

Date: 9.MAR.2020 11:08:53

## AWS Band, Right Band Edge for WCDMA (BPSK) Mode



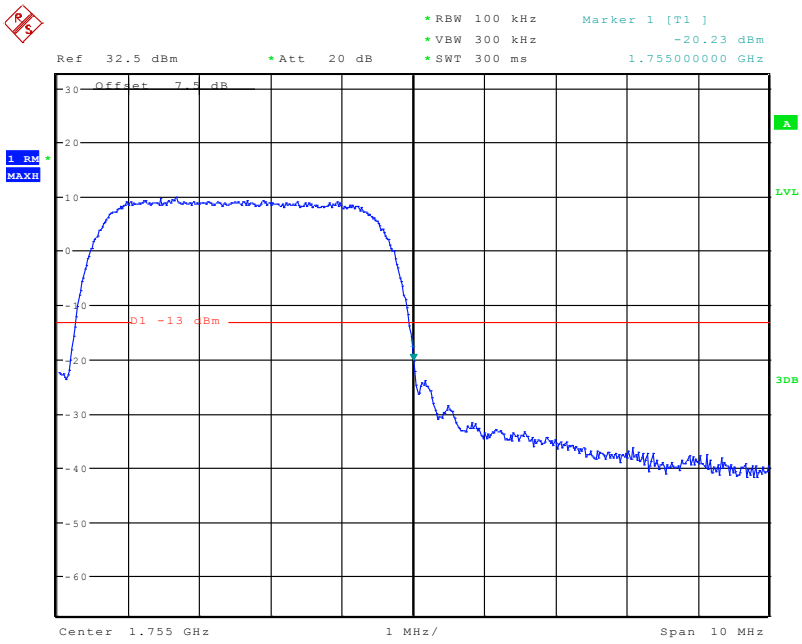

Date: 9.MAR.2020 11:09:32

## AWS Band, Left Band Edge for HSDPA (16QAM) Mode



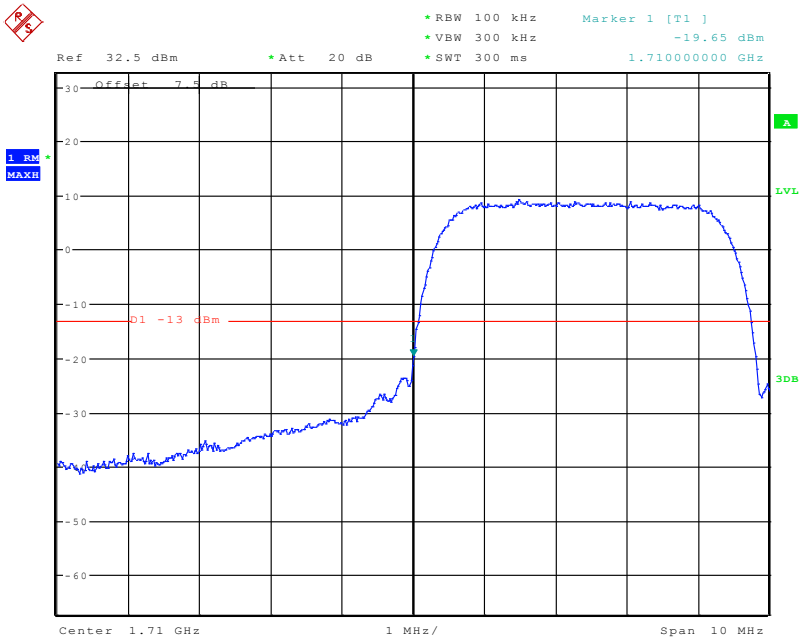

Date: 9.MAR.2020 11:08:21

## AWS Band, Right Band Edge for HSDPA (16QAM) Mode



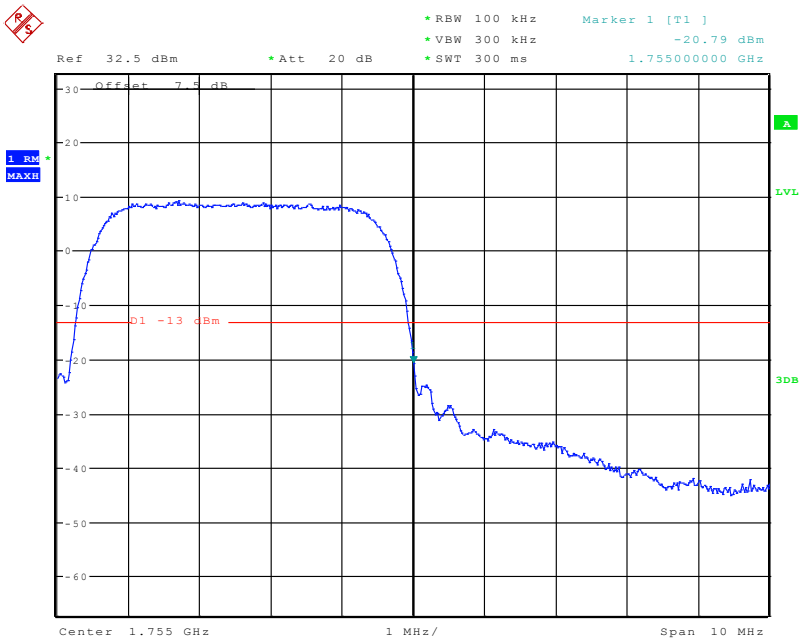

Date: 9.MAR.2020 11:07:51

## AWS Band, Left Band Edge for HSUPA (BPSK) Mode




Date: 9.MAR.2020 11:04:25

## AWS Band, Right Band Edge for HSUPA (BPSK) Mode

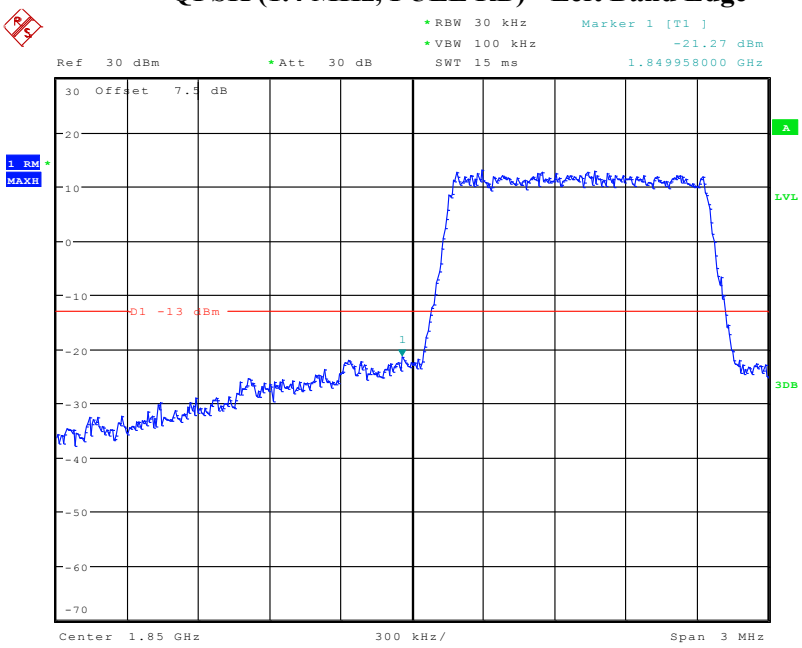



Date: 9.MAR.2020 11:05:25

**Band 2:**

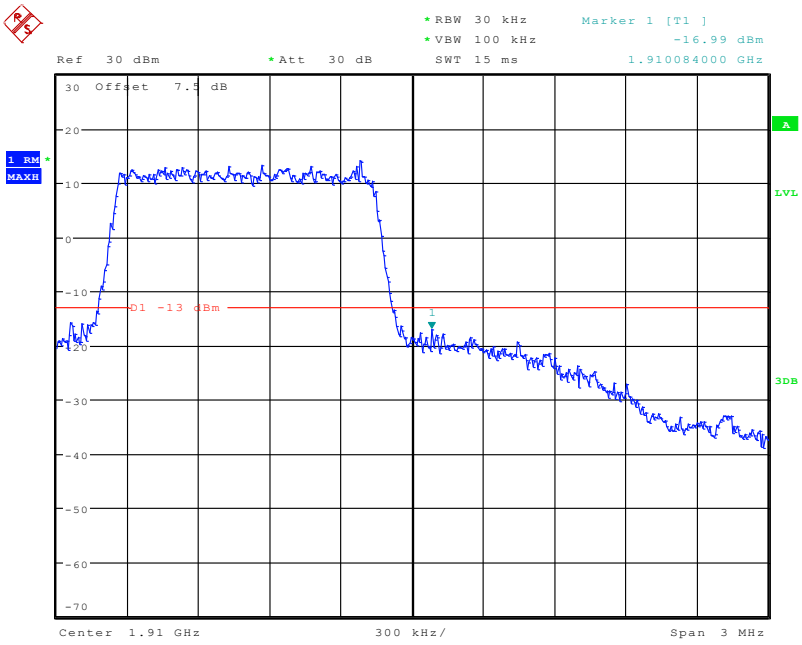
**Low channel**

**QPSK (1.4 MHz, FULL RB) - Left Band Edge**



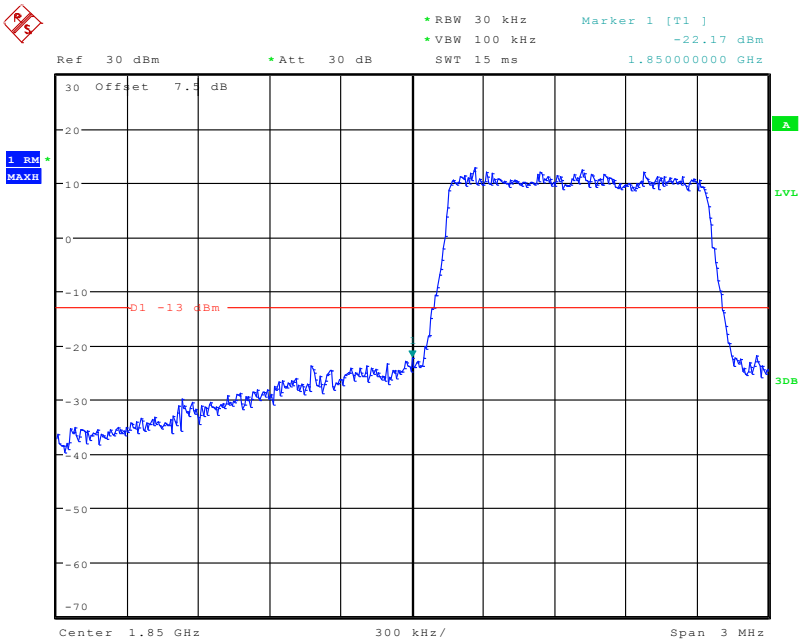

Date: 13.MAR.2020 10:26:13

**QPSK (1.4 MHz, FULL RB) - Right Band Edge**



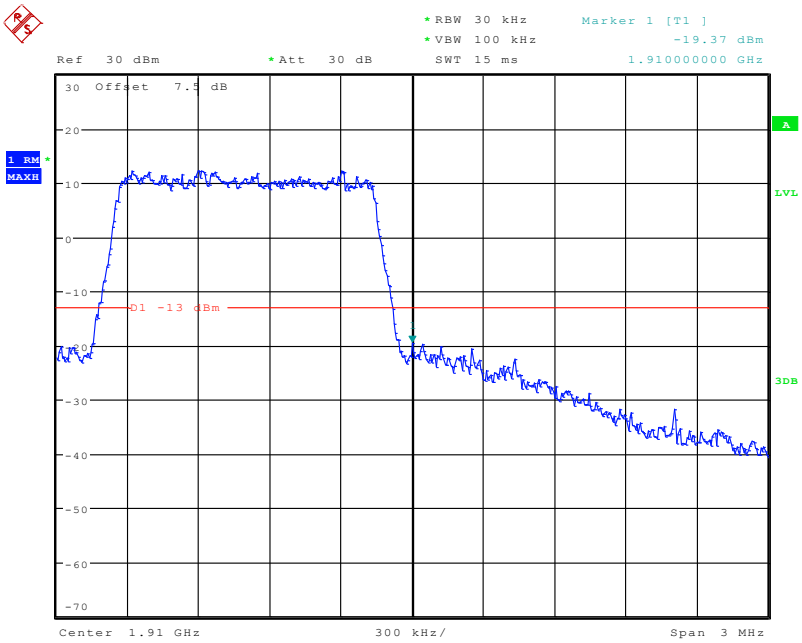

Date: 13.MAR.2020 10:26:49

## 16-QAM (1.4 MHz, FULL RB) - Left Band Edge



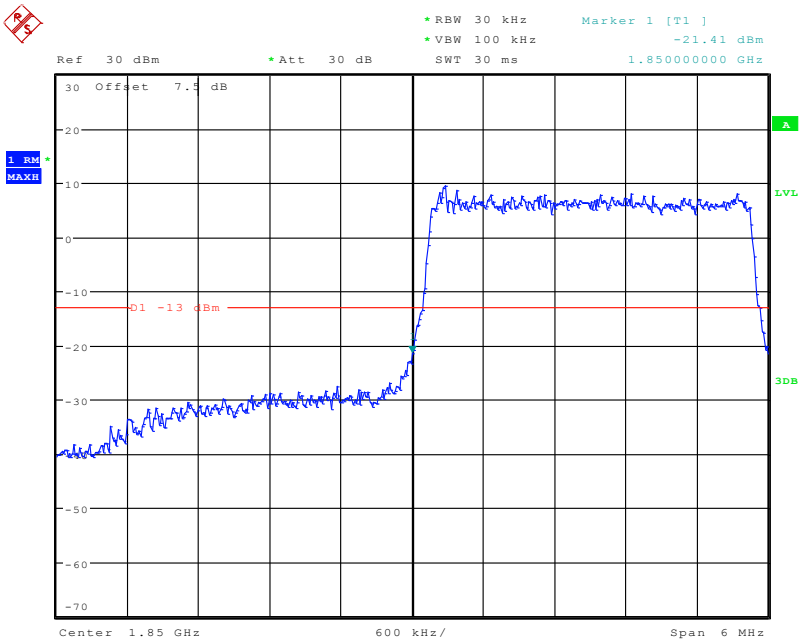

Date: 13.MAR.2020 10:26:29

## 16-QAM (1.4 MHz, FULL RB) - Right Band Edge



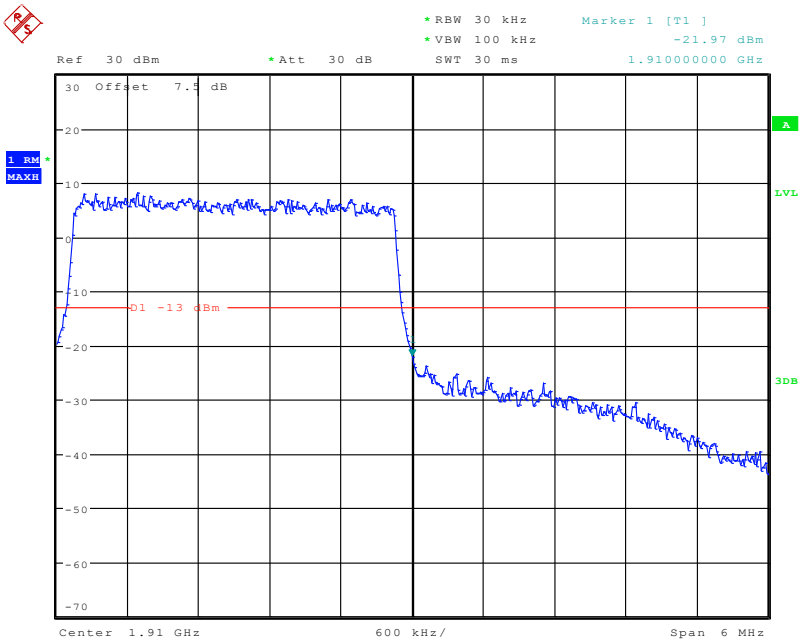

Date: 13.MAR.2020 10:27:11

## QPSK (3.0 MHz, FULL RB) - Left Band Edge



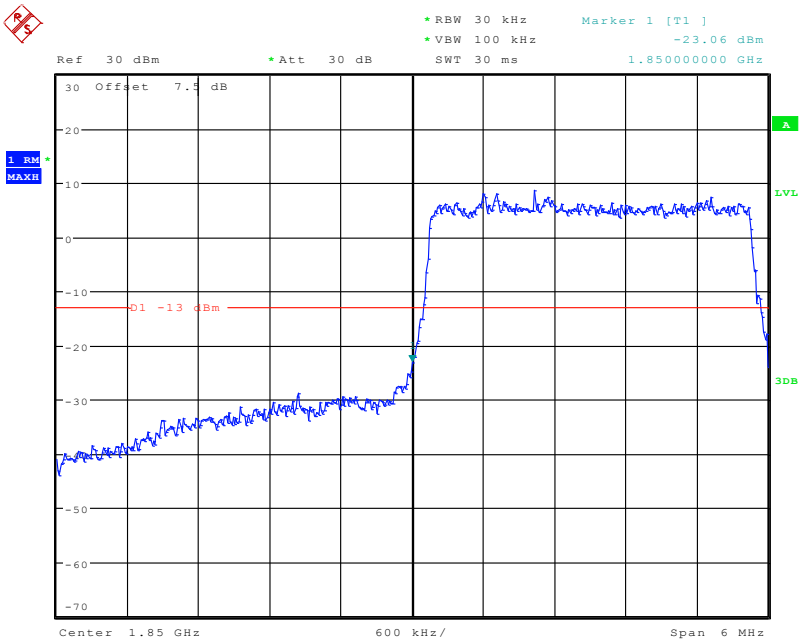

Date: 13.MAR.2020 10:27:30

## QPSK (3.0 MHz, FULL RB) - Right Band Edge



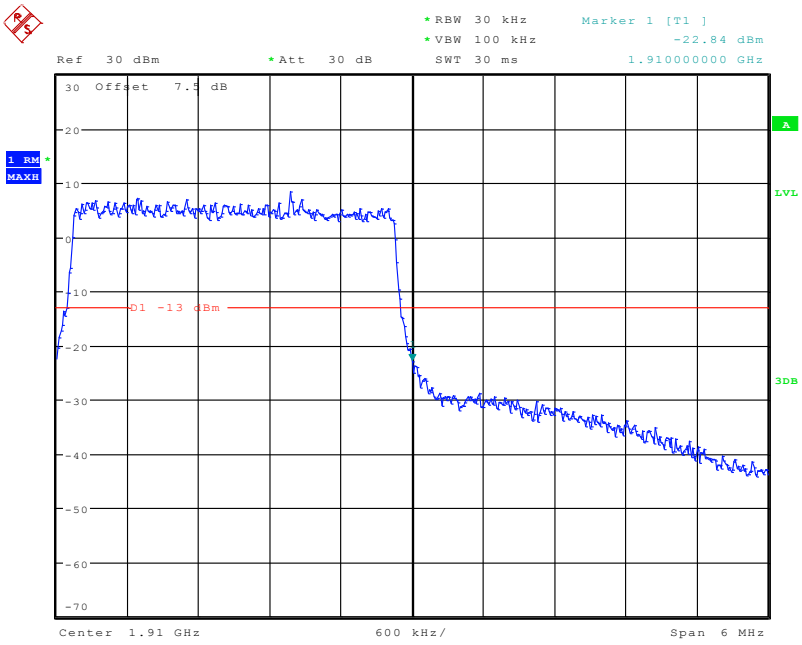

Date: 13.MAR.2020 10:28:05

## 16-QAM (3.0 MHz, FULL RB) - Left Band Edge



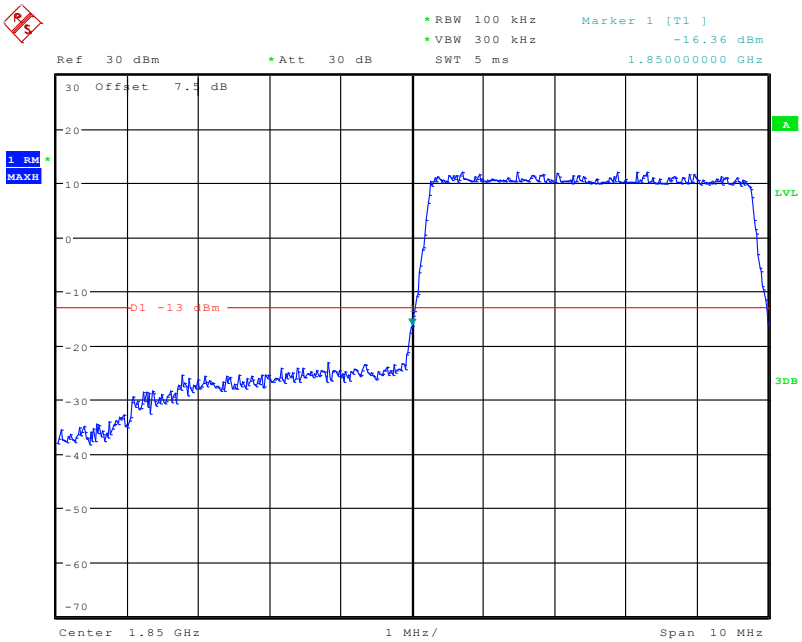

Date: 13.MAR.2020 10:27:49

## 16-QAM (3.0 MHz, FULL RB) - Right Band Edge



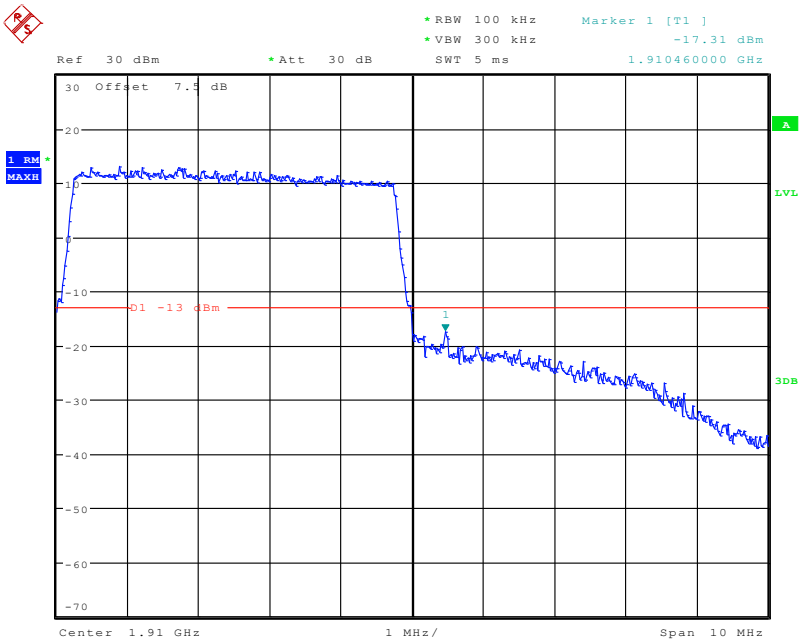

Date: 13.MAR.2020 10:28:20

## QPSK (5.0 MHz, FULL RB) - Left Band Edge



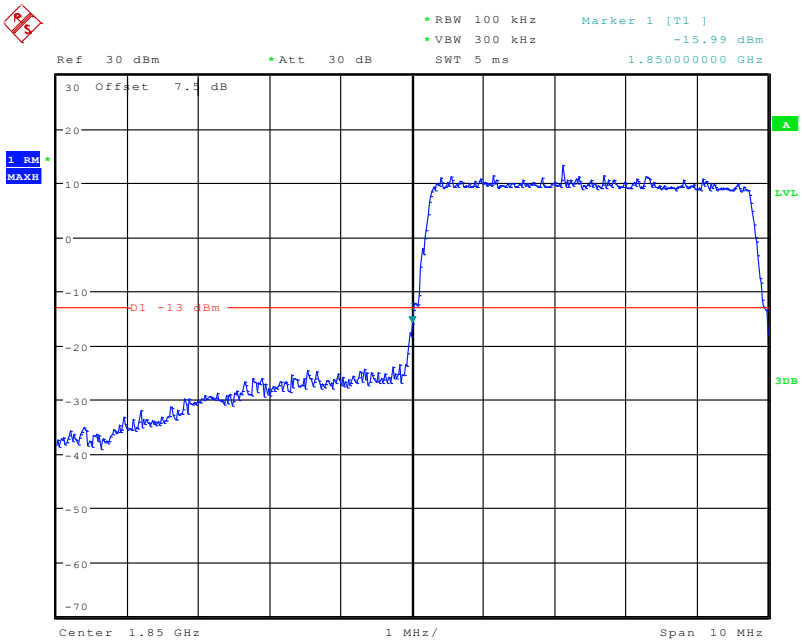

Date: 13.MAR.2020 10:28:40

## QPSK (5.0 MHz, FULL RB) - Right Band Edge



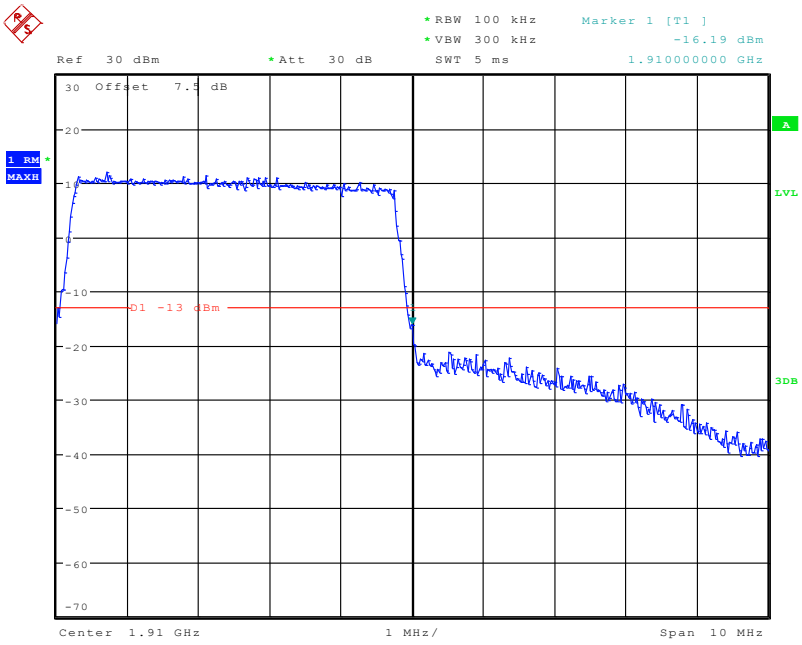

Date: 13.MAR.2020 10:29:15

## 16-QAM (5.0 MHz, FULL RB) - Left Band Edge



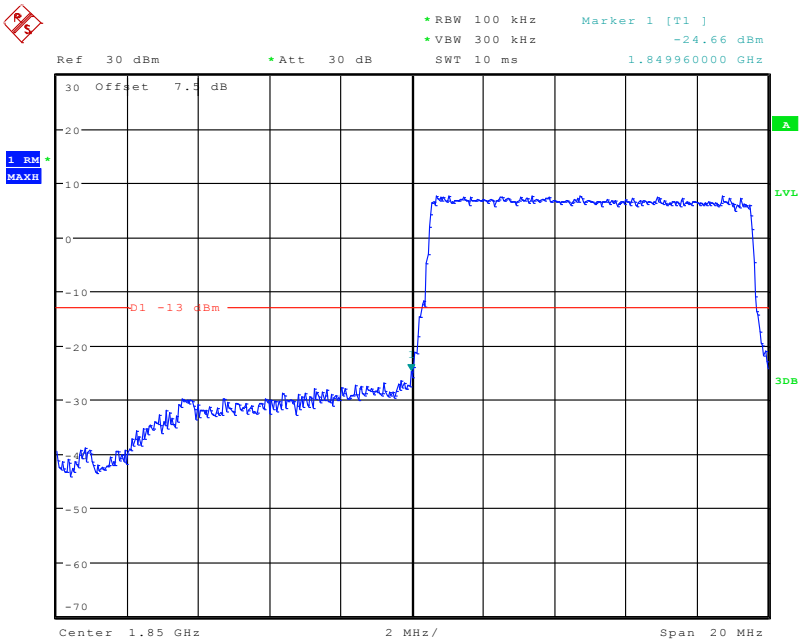

Date: 13.MAR.2020 10:28:56

## 16-QAM (5.0 MHz, FULL RB) - Right Band Edge



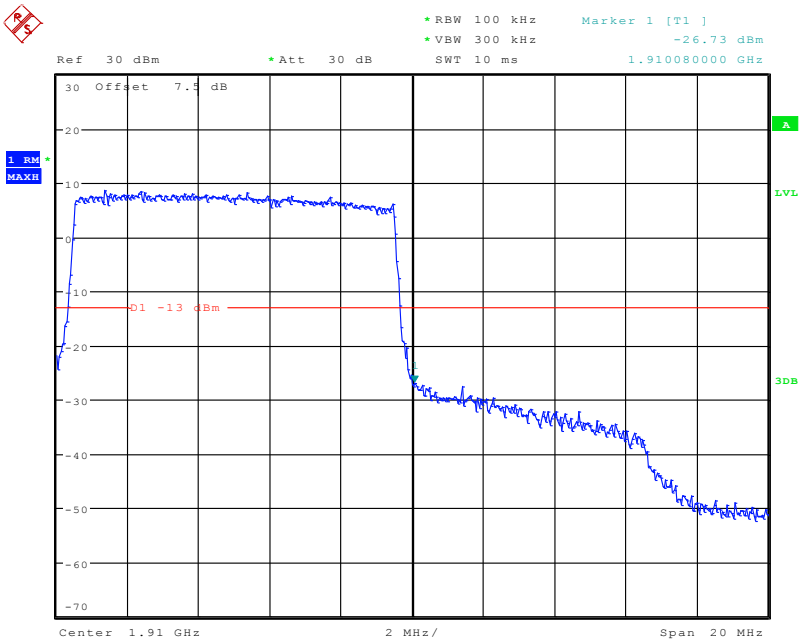

Date: 13.MAR.2020 10:29:30

## QPSK (10.0 MHz, FULL RB) - Left Band Edge



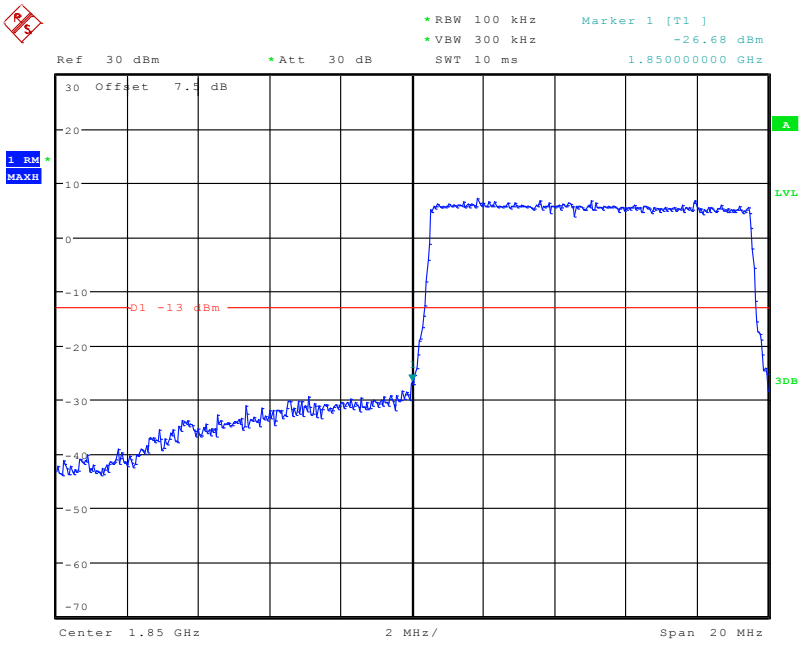

Date: 13.MAR.2020 10:29:54

## QPSK (10.0 MHz, FULL RB) - Right Band Edge



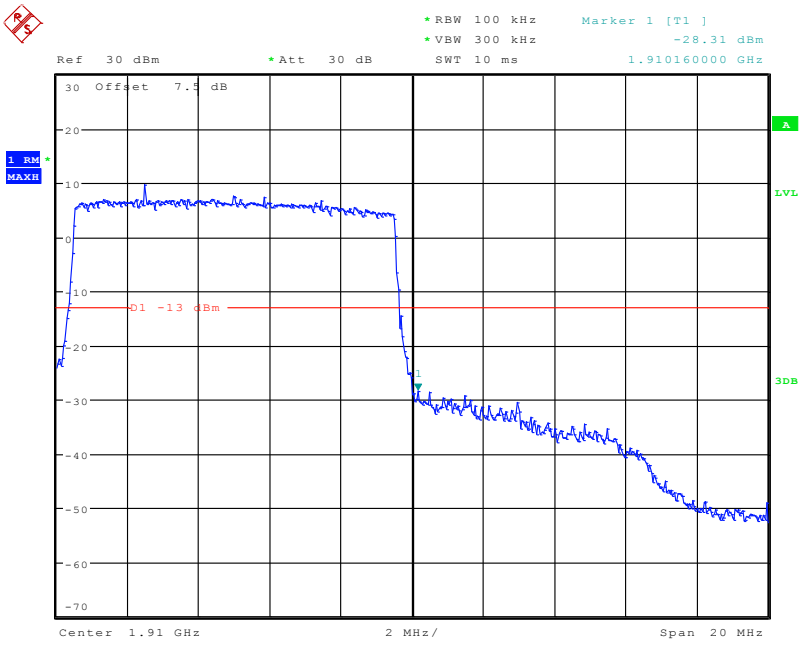

Date: 13.MAR.2020 10:30:28

## 16-QAM (10.0 MHz, FULL RB) - Left Band Edge



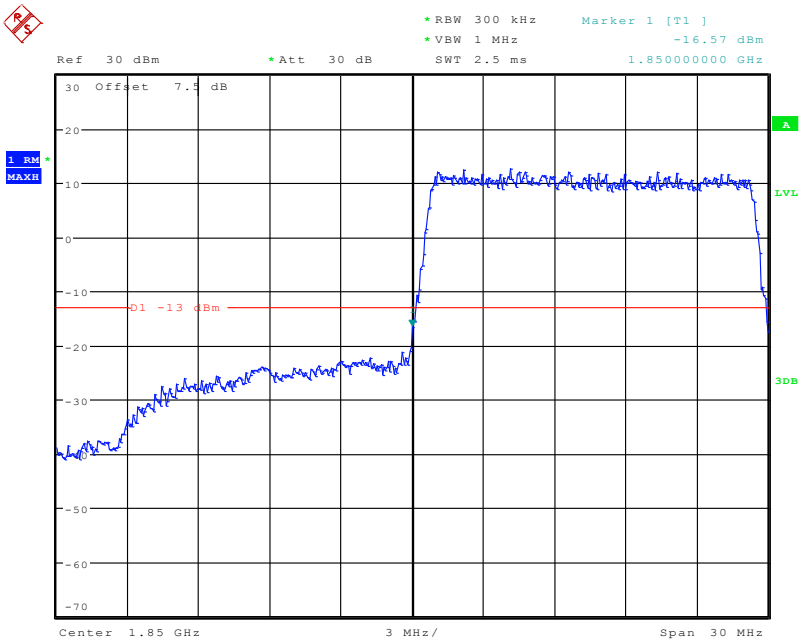

Date: 13.MAR.2020 10:30:11

## 16-QAM (10.0 MHz, FULL RB) - Right Band Edge



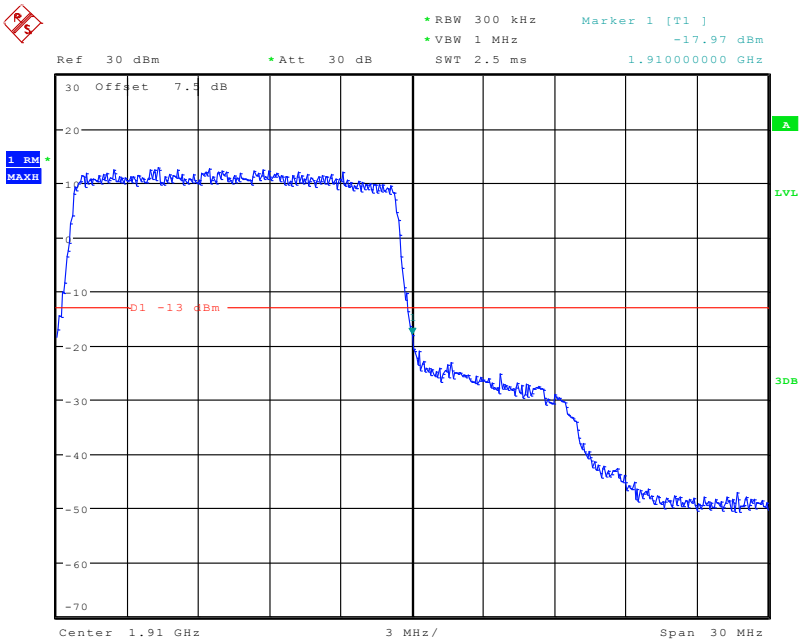

Date: 13.MAR.2020 10:30:45

## QPSK (15.0 MHz, FULL RB) - Left Band Edge



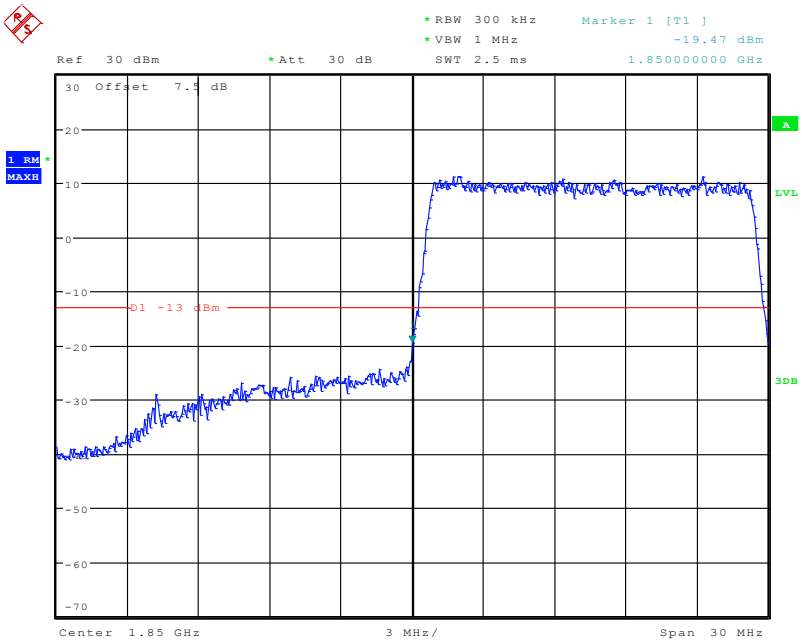

Date: 13.MAR.2020 10:31:08

## QPSK (15.0 MHz, FULL RB) - Right Band Edge



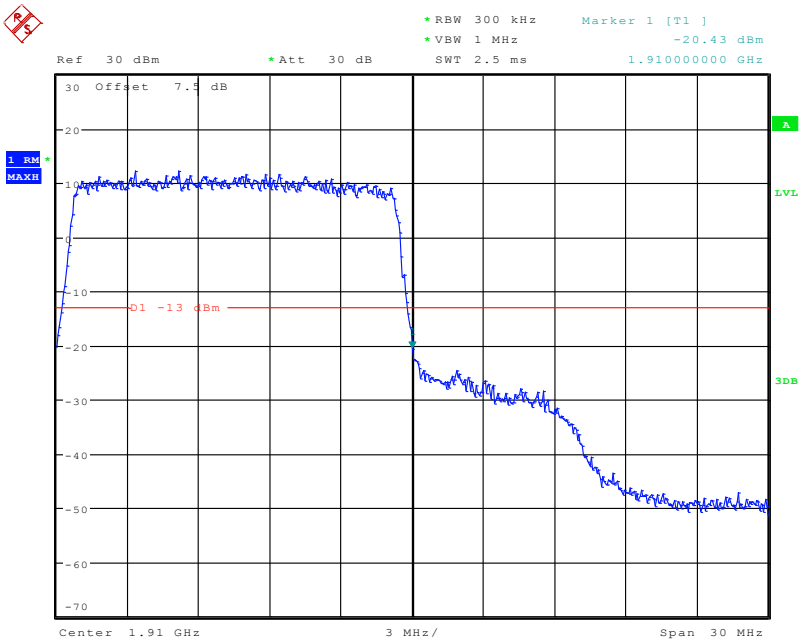

Date: 13.MAR.2020 10:31:47

## 16-QAM (15.0 MHz, FULL RB) - Left Band Edge



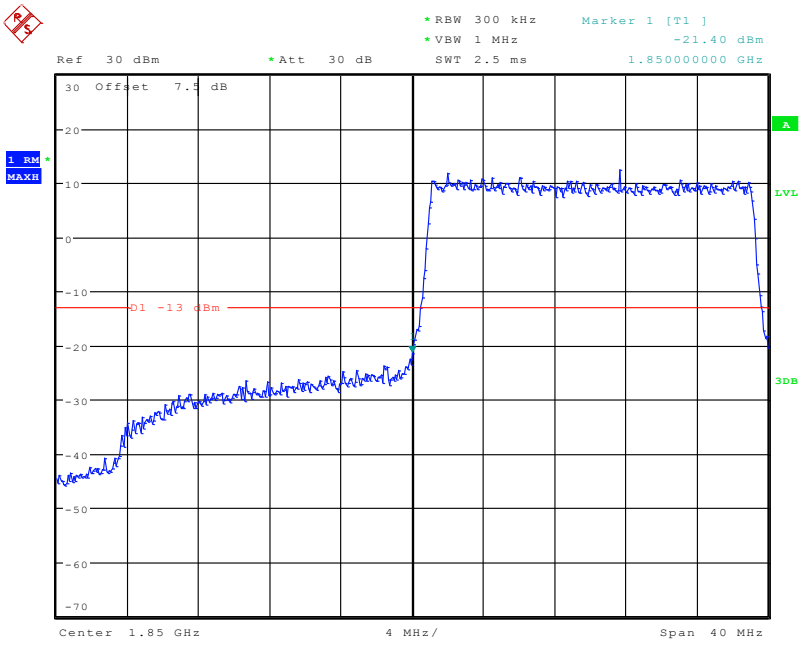

Date: 13.MAR.2020 10:31:27

## 16-QAM (15.0 MHz, FULL RB) - Right Band Edge



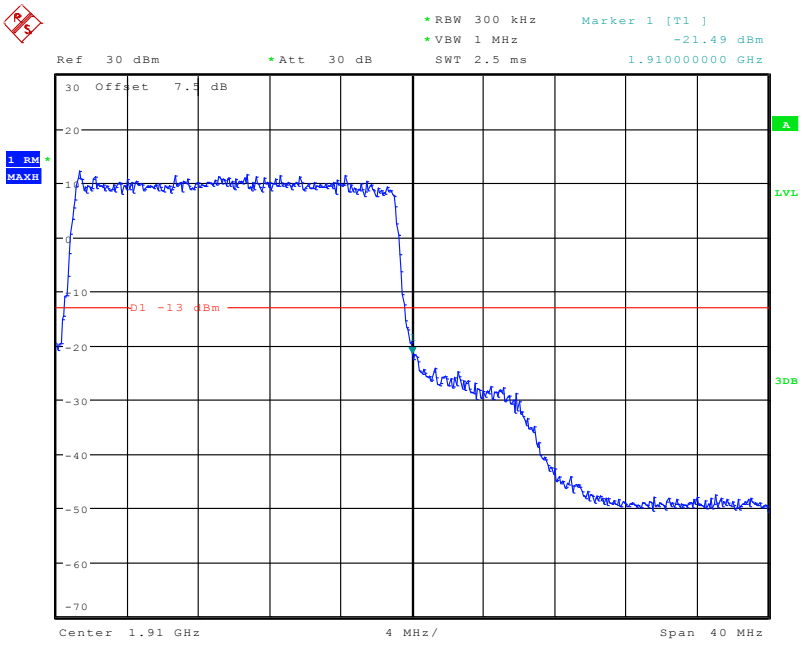

Date: 13.MAR.2020 10:32:05

## QPSK (20.0 MHz, FULL RB) - Left Band Edge



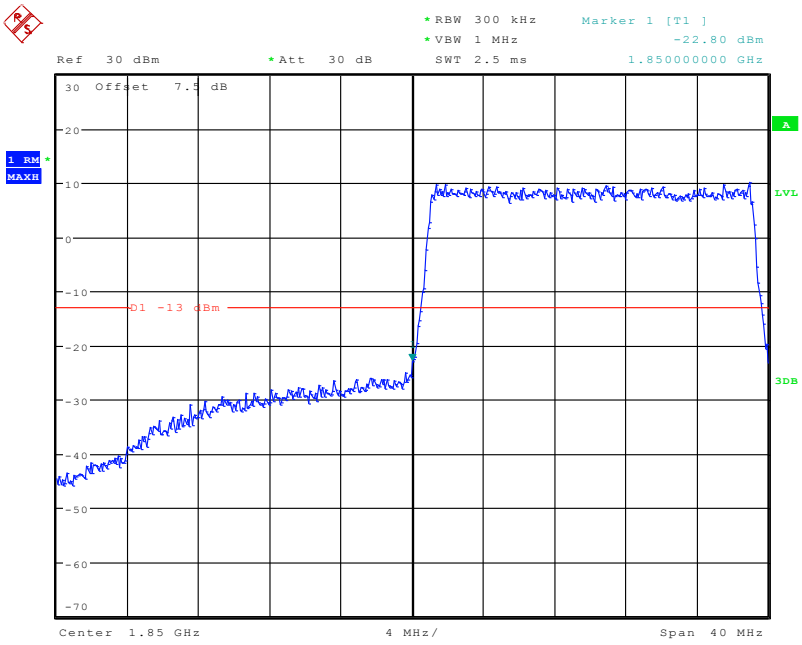

Date: 13.MAR.2020 10:32:32

## QPSK (20.0 MHz, FULL RB) - Right Band Edge



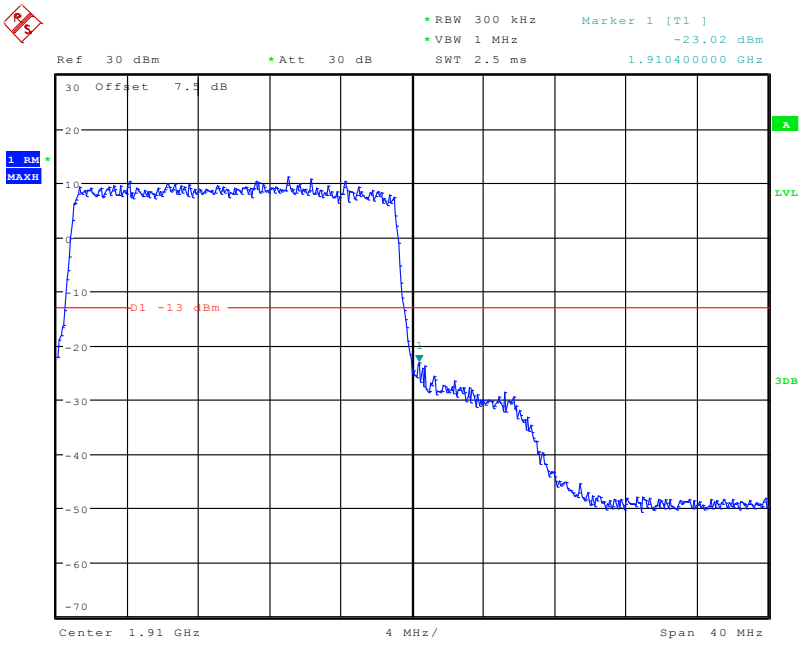

Date: 13.MAR.2020 10:33:10

## 16-QAM (20.0 MHz, FULL RB) - Left Band Edge




Date: 13.MAR.2020 10:32:51

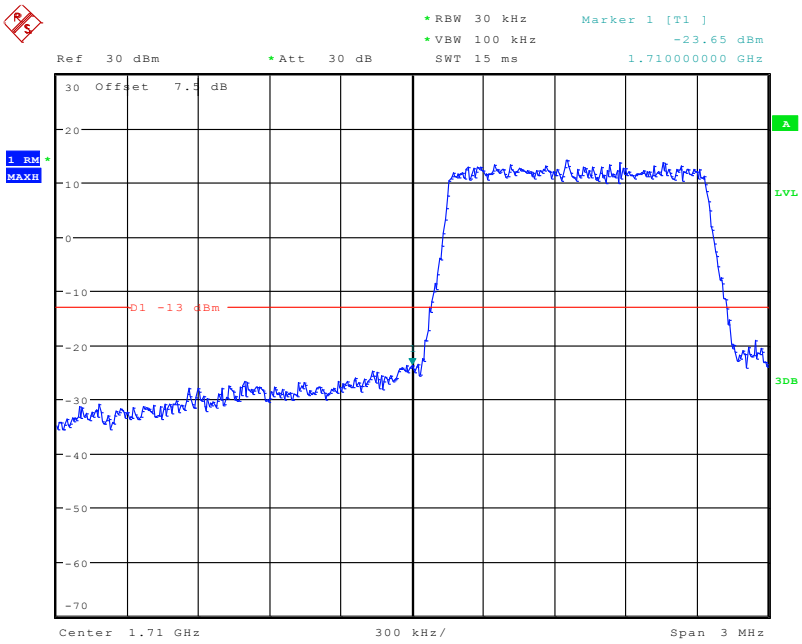
## 16-QAM (20.0 MHz, FULL RB) - Right Band Edge




Date: 13.MAR.2020 10:33:29

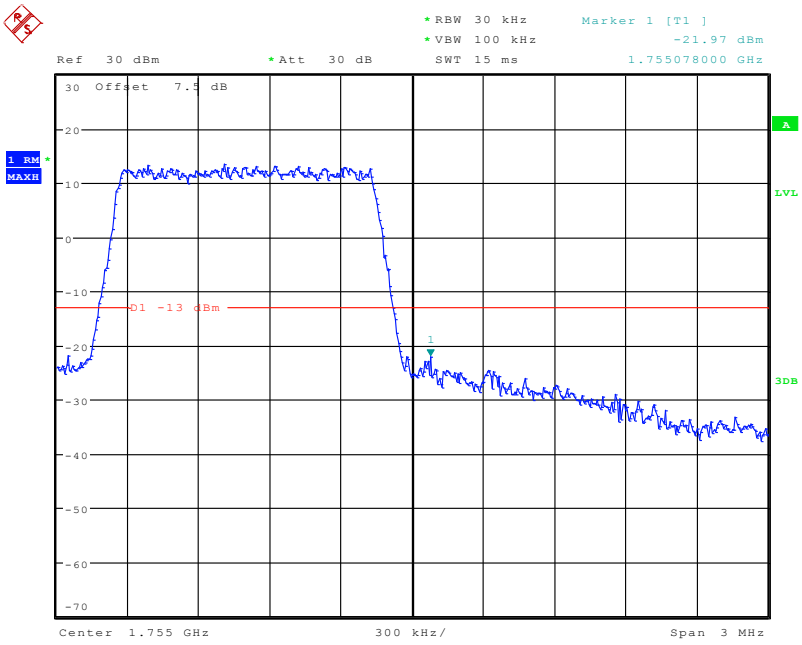
**Band 4:**

**QPSK (1.4 MHz, FULL RB) - Left Band Edge**



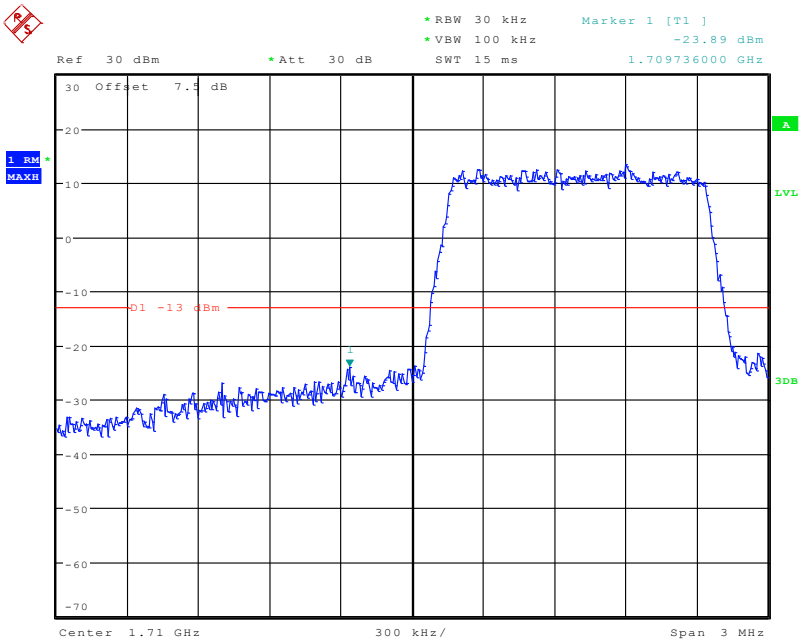

Date: 13.MAR.2020 10:33:54

**QPSK (1.4 MHz, FULL RB) - Right Band Edge**



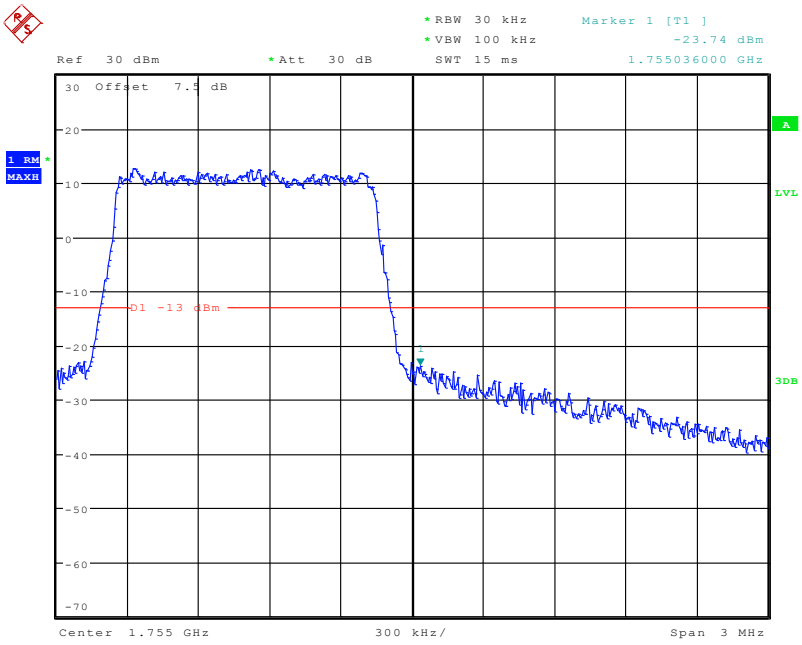

Date: 13.MAR.2020 10:34:32

## 16-QAM (1.4 MHz, FULL RB) - Left Band Edge



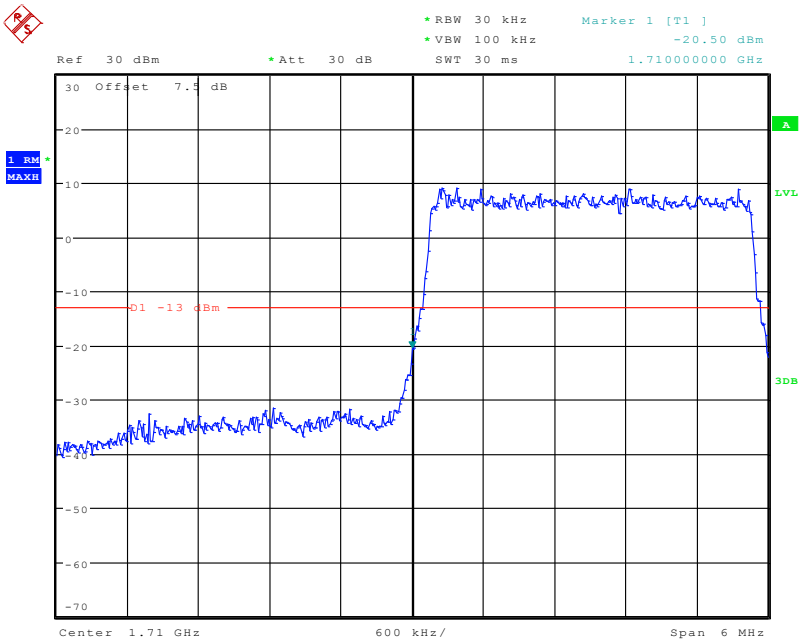

Date: 13.MAR.2020 10:34:13

## 16-QAM (1.4 MHz, FULL RB) - Right Band Edge



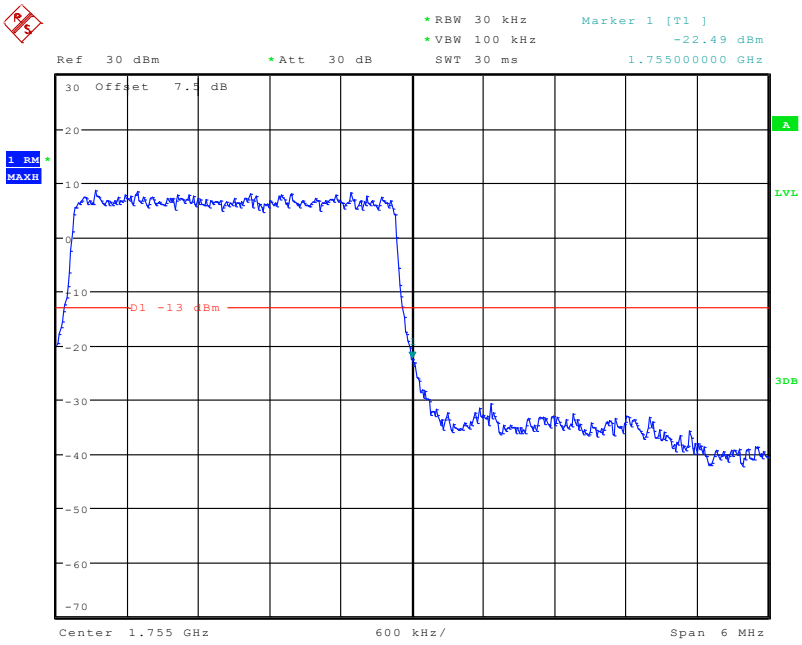

Date: 13.MAR.2020 10:34:47

## QPSK (3.0 MHz, FULL RB) - Left Band Edge



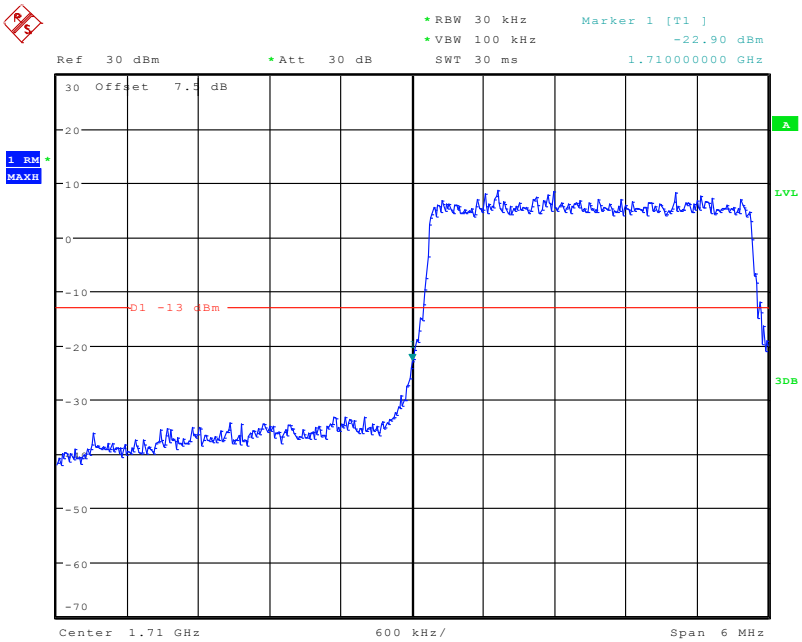

Date: 13.MAR.2020 10:35:07

## QPSK (3.0 MHz, FULL RB) - Right Band Edge



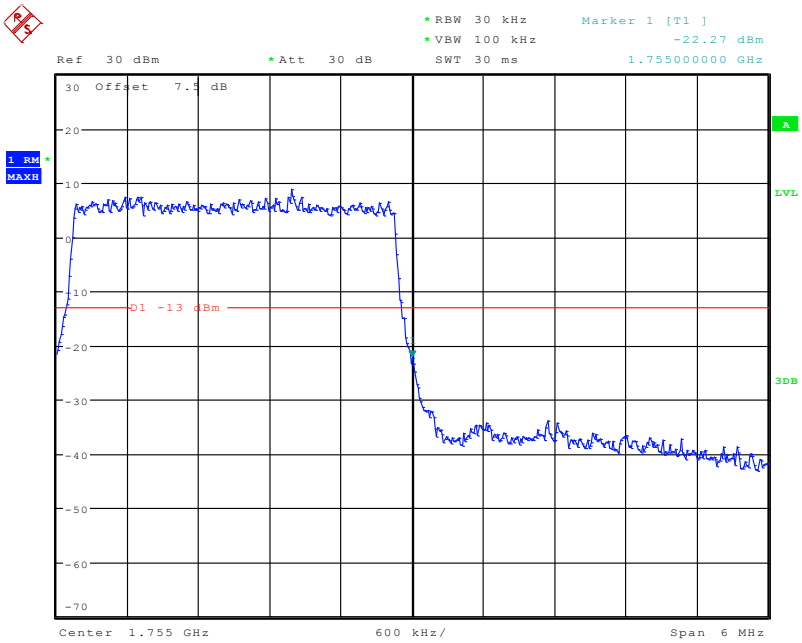

Date: 13.MAR.2020 10:35:39

## 16-QAM (3.0 MHz, FULL RB) - Left Band Edge



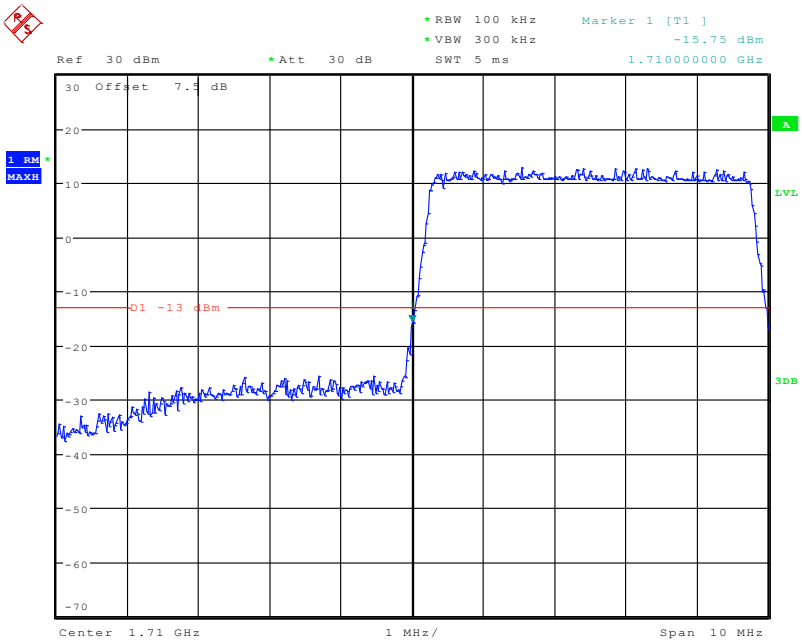

Date: 13.MAR.2020 10:35:22

## 16-QAM (3.0 MHz, FULL RB) - Right Band Edge



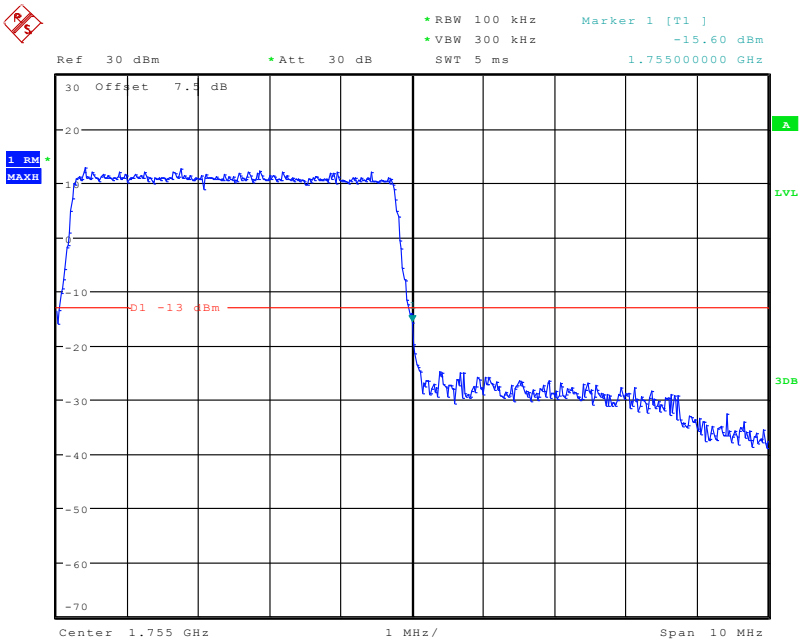

Date: 13.MAR.2020 10:35:54

## QPSK (5.0 MHz, FULL RB) - Left Band Edge



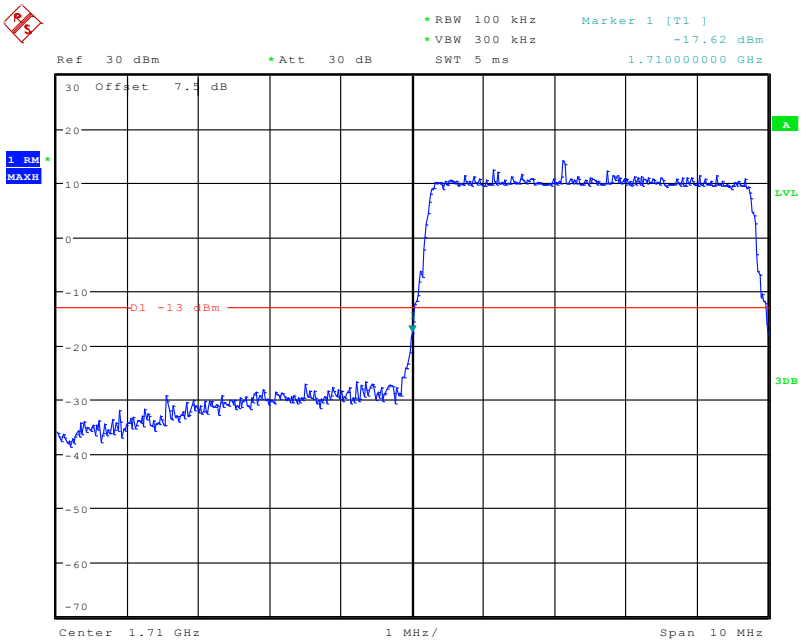

Date: 13.MAR.2020 10:36:17

## QPSK (5.0 MHz, FULL RB) - Right Band Edge



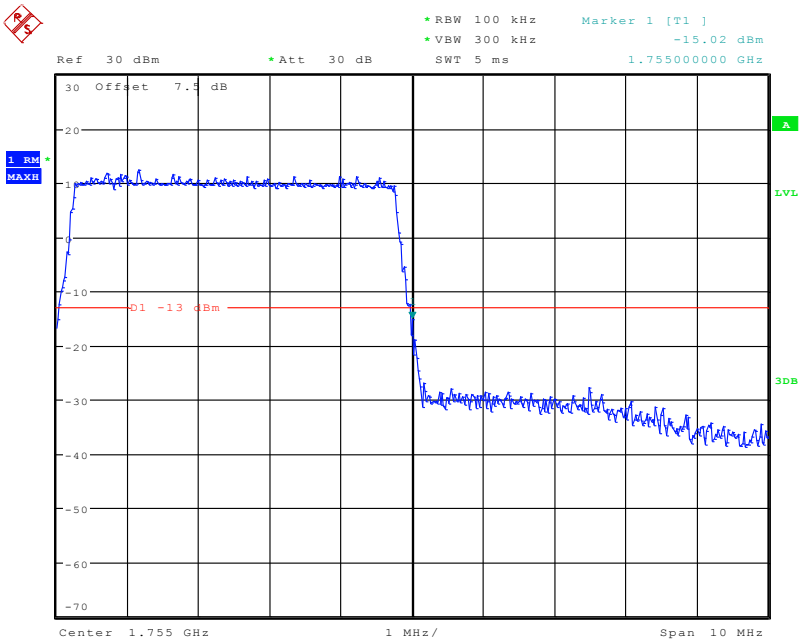

Date: 13.MAR.2020 10:36:52

## 16-QAM (5.0 MHz, FULL RB) - Left Band Edge



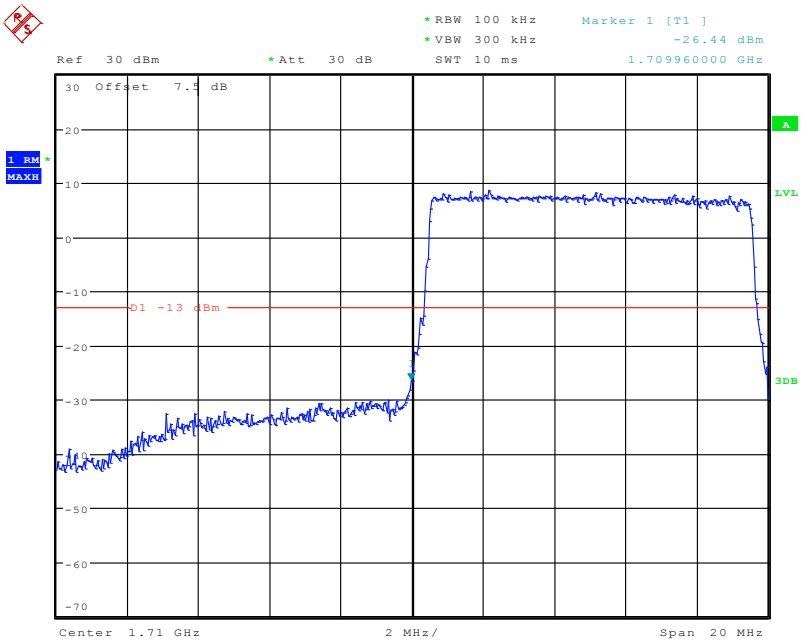

Date: 13.MAR.2020 10:36:36

## 16-QAM (5.0 MHz, FULL RB) - Right Band Edge



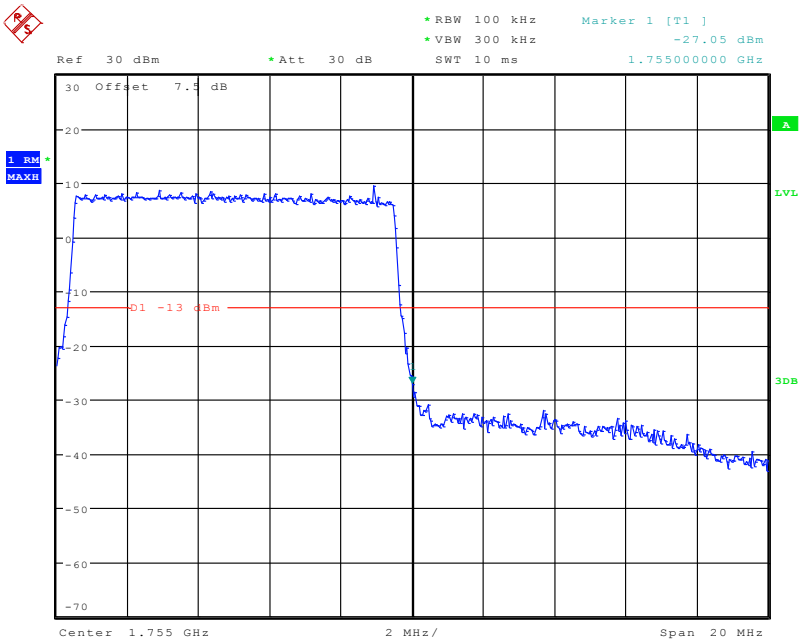

Date: 13.MAR.2020 10:37:07

## QPSK (10.0 MHz, FULL RB) - Left Band Edge



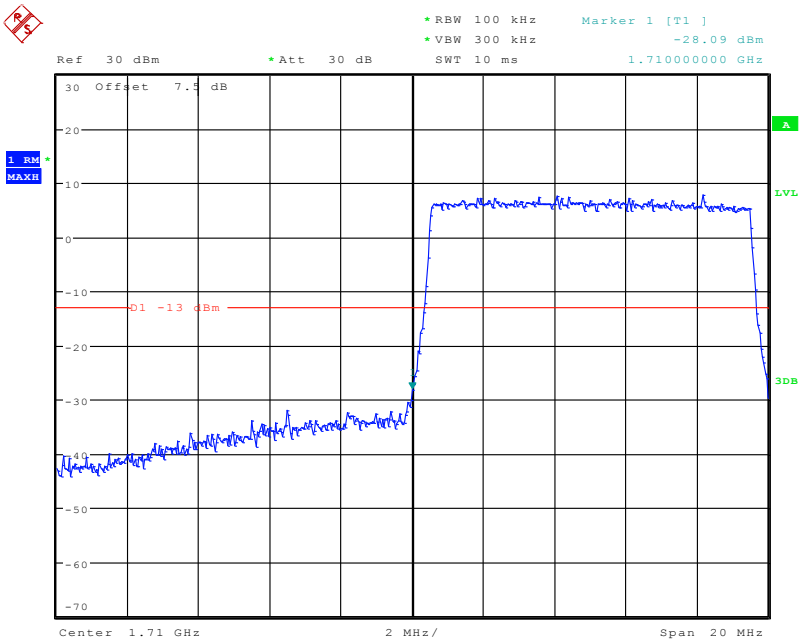

Date: 13.MAR.2020 10:37:29

## QPSK (10.0 MHz, FULL RB) - Right Band Edge



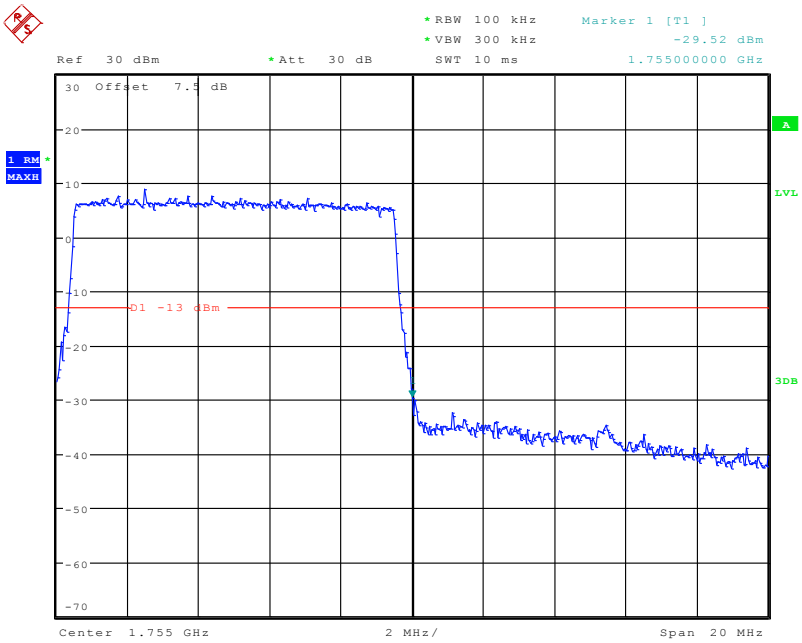

Date: 13.MAR.2020 10:38:03

## 16-QAM (10.0 MHz, FULL RB) - Left Band Edge



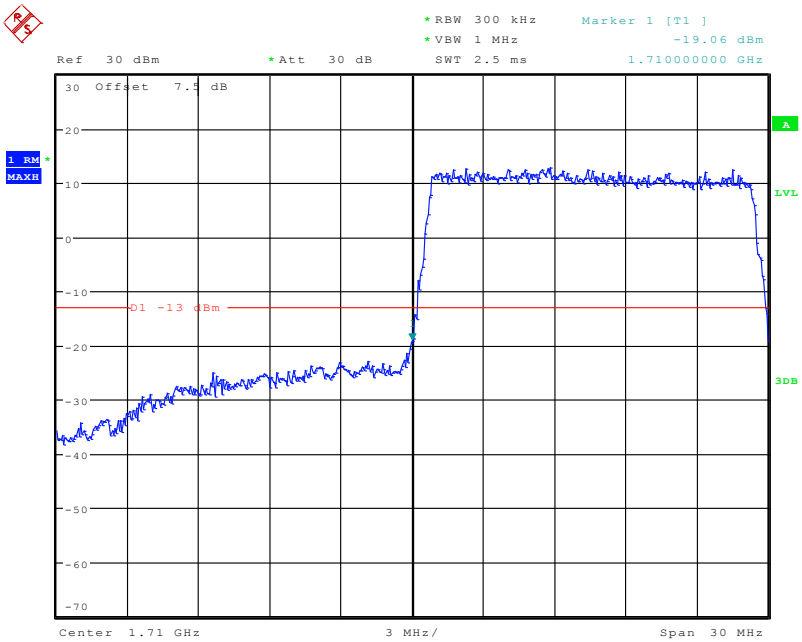

Date: 13.MAR.2020 10:37:45

## 16-QAM (10.0 MHz, FULL RB) - Right Band Edge



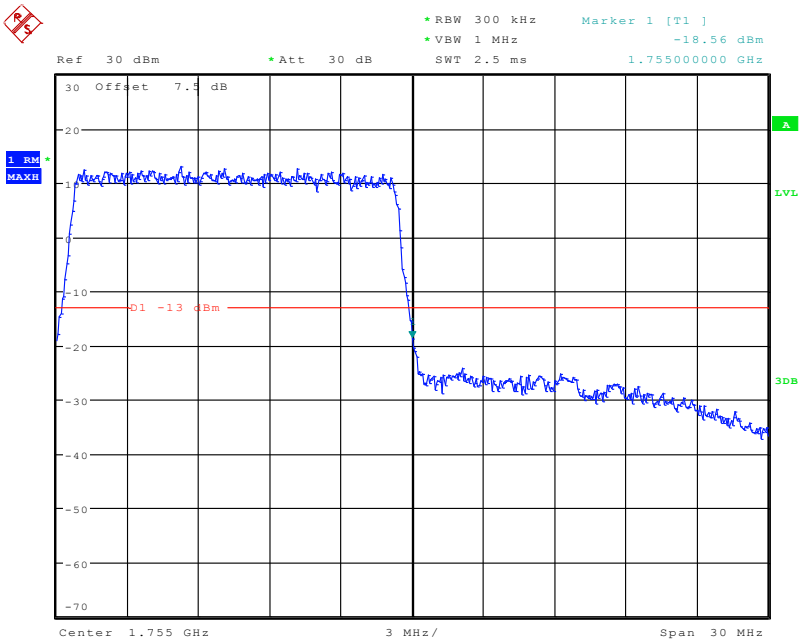

Date: 13.MAR.2020 10:38:19

## QPSK (15.0 MHz, FULL RB) - Left Band Edge



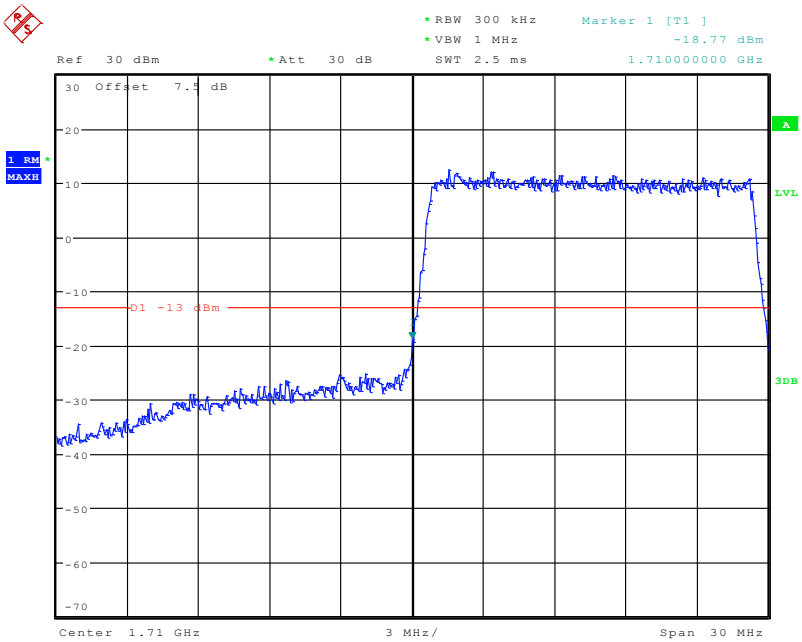

Date: 13.MAR.2020 10:38:43

## QPSK (15.0 MHz, FULL RB) - Right Band Edge



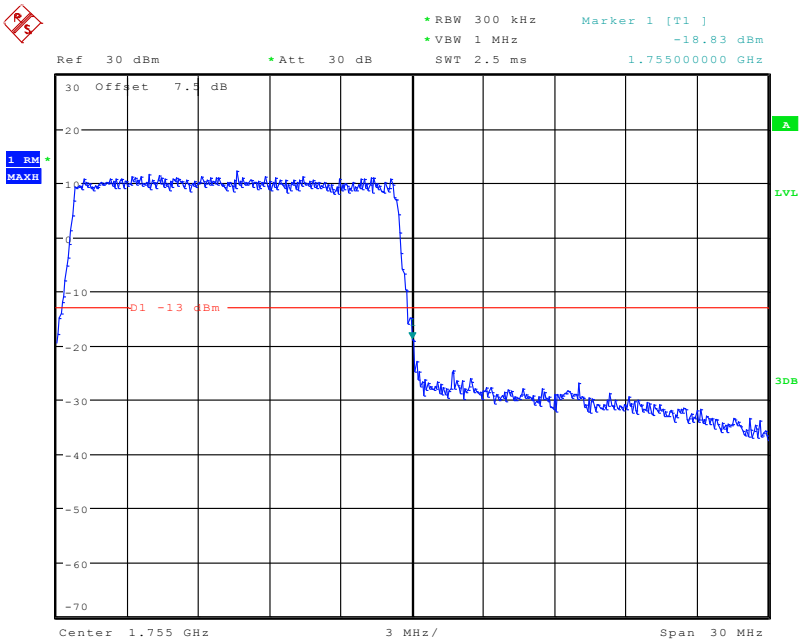

Date: 13.MAR.2020 10:39:21

## 16-QAM (15.0 MHz, FULL RB) - Left Band Edge



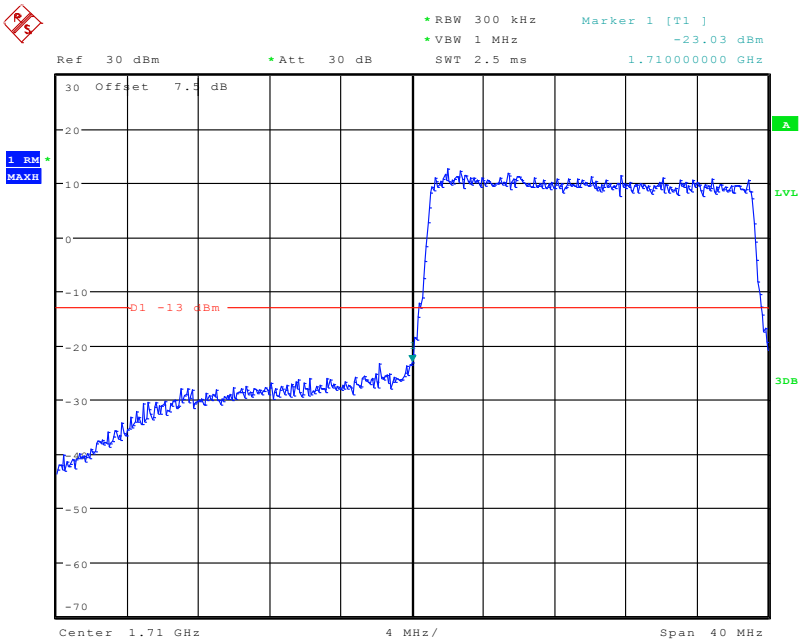

Date: 13.MAR.2020 10:39:02

## 16-QAM (15.0 MHz, FULL RB) - Right Band Edge



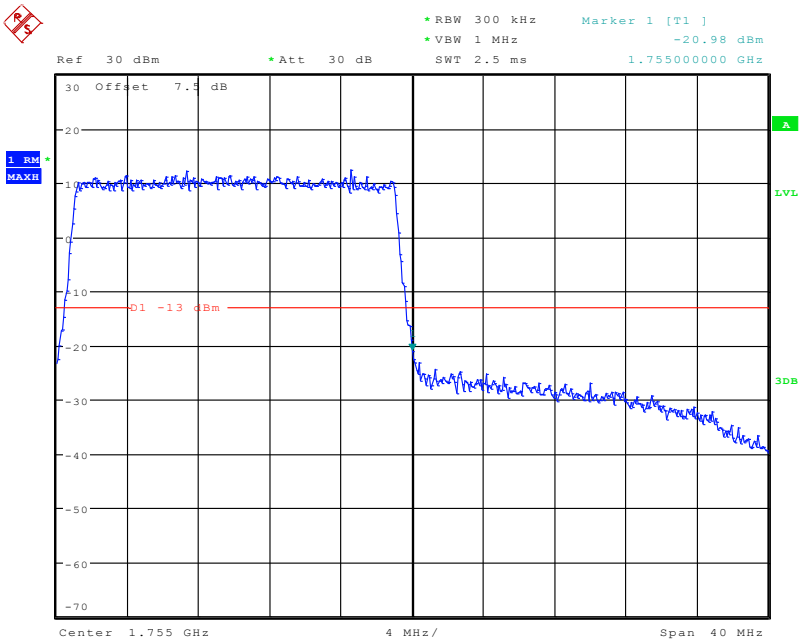

Date: 13.MAR.2020 10:39:40

## QPSK (20.0 MHz, FULL RB) - Left Band Edge



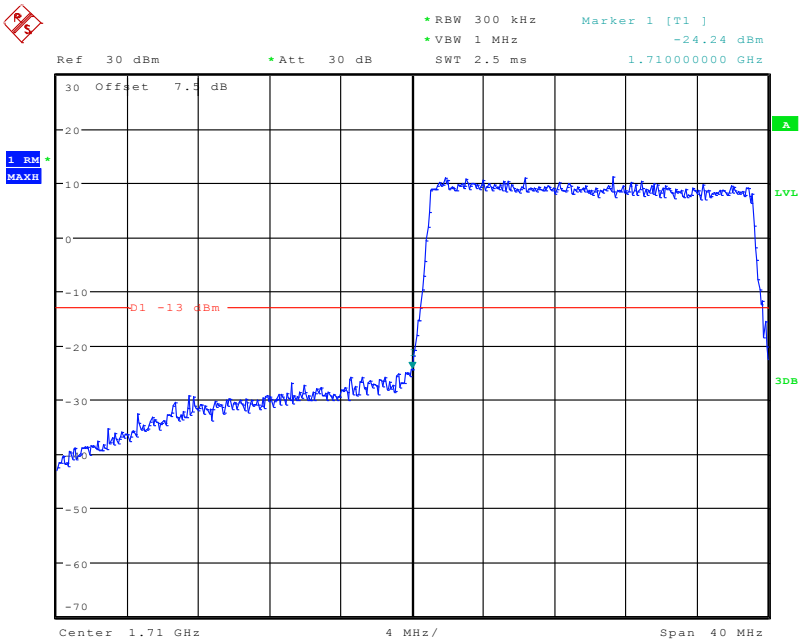

Date: 13.MAR.2020 10:40:04

## QPSK (20.0 MHz, FULL RB) - Right Band Edge



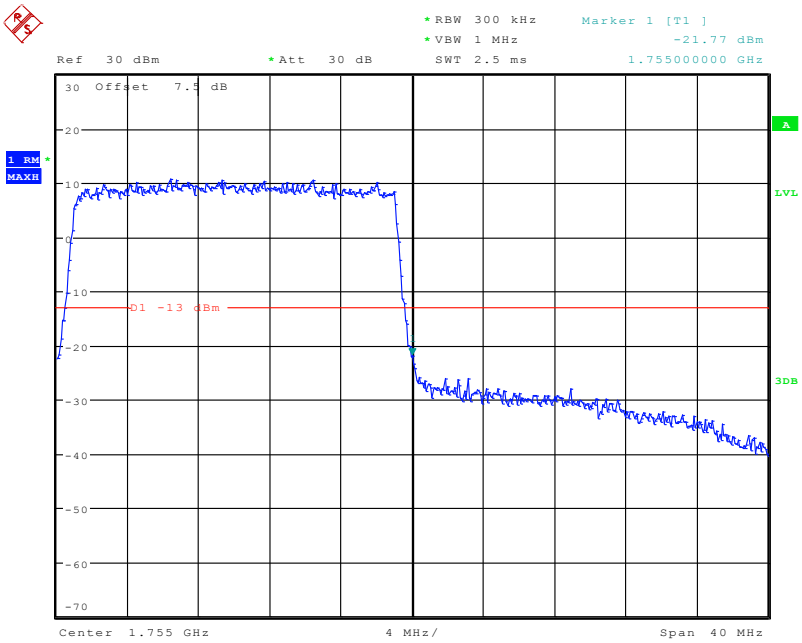

Date: 13.MAR.2020 10:40:49

## 16-QAM (20.0 MHz, FULL RB) - Left Band Edge




Date: 13.MAR.2020 10:40:26

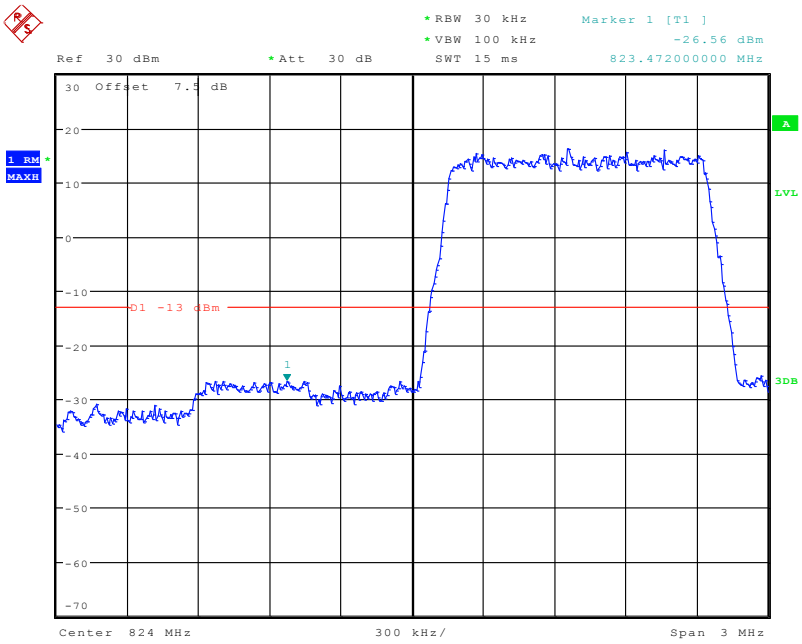
## 16-QAM (20.0 MHz, FULL RB) - Right Band Edge




Date: 13.MAR.2020 10:41:07

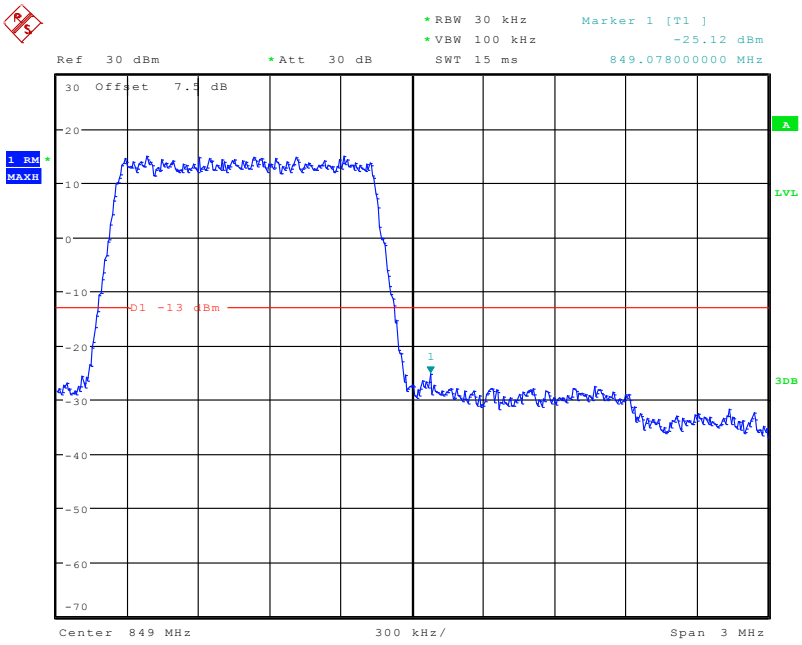
**Band 5:**

**QPSK (1.4 MHz, FULL RB) - Left Band Edge**



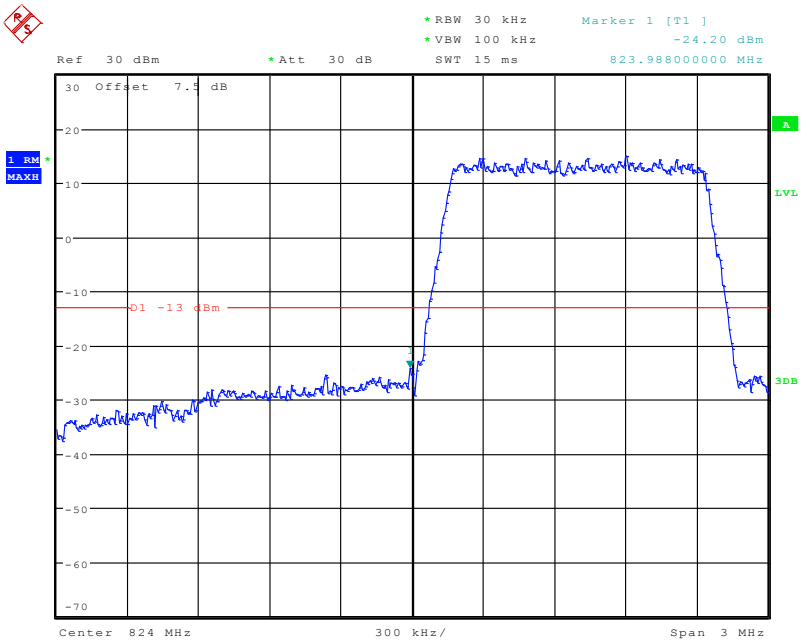

Date: 13.MAR.2020 10:41:31

**QPSK (1.4 MHz, FULL RB) - Right Band Edge**



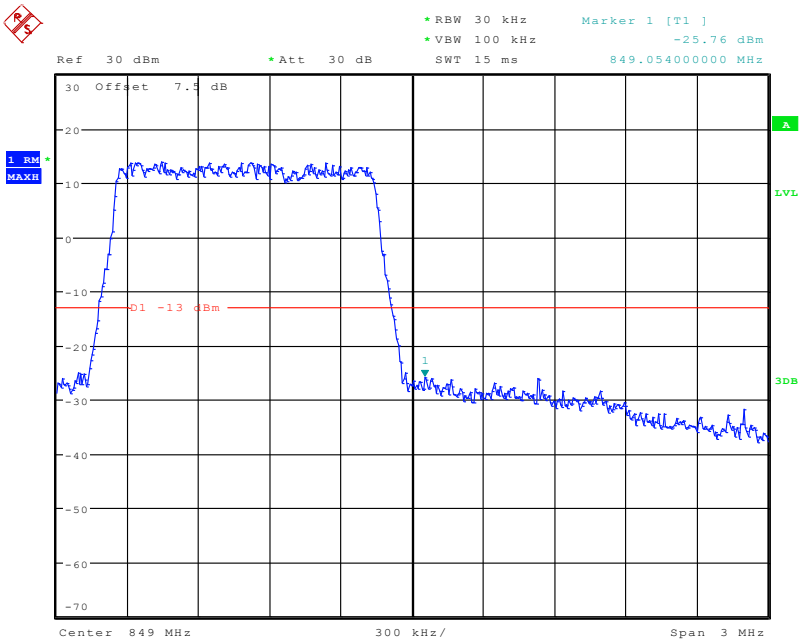

Date: 13.MAR.2020 10:42:03

## 16-QAM 1.4 MHz, FULL RB) - Left Band Edge



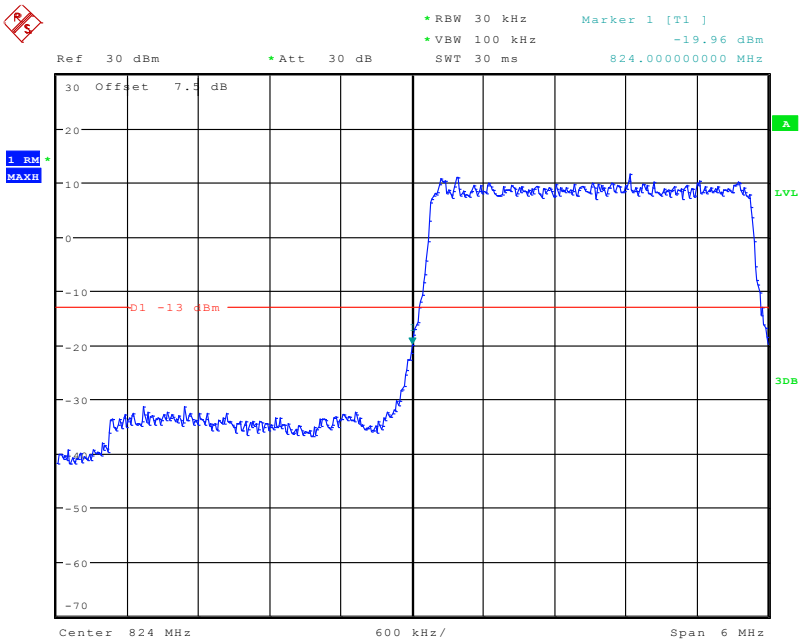

Date: 13.MAR.2020 10:41:47

## 16-QAM (1.4MHz, FULL RB) - Right Band Edge



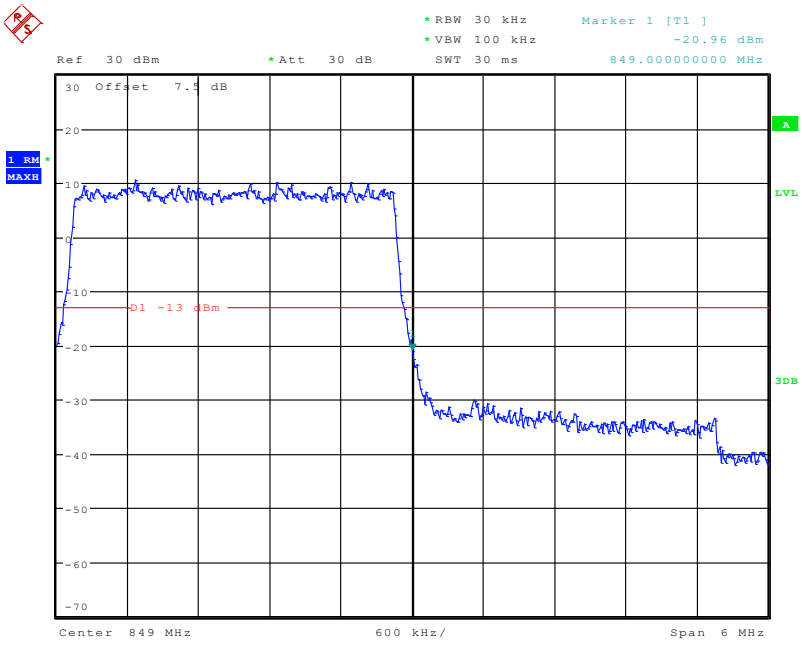

Date: 13.MAR.2020 10:42:18

## QPSK (3.0 MHz, FULL RB) - Left Band Edge



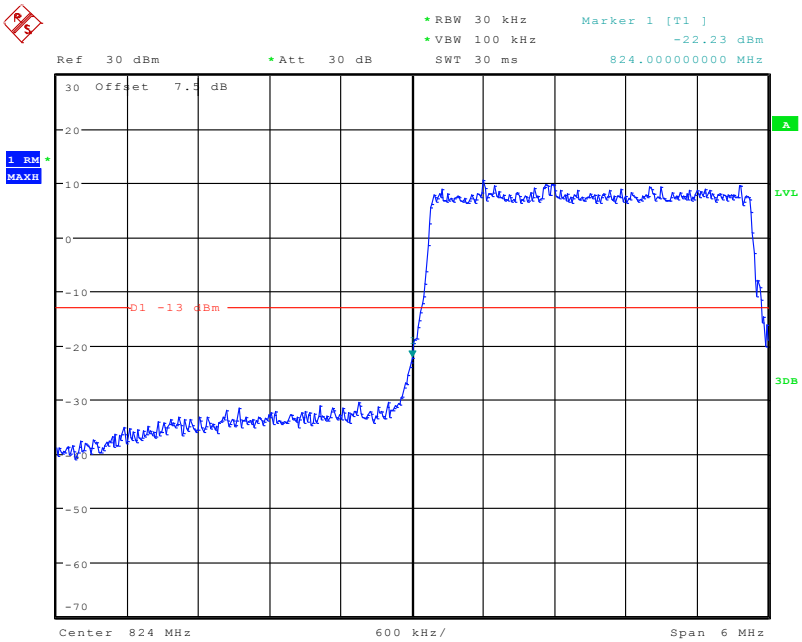

Date: 13.MAR.2020 10:42:38

## QPSK (3.0 MHz, FULL RB) - Right Band Edge



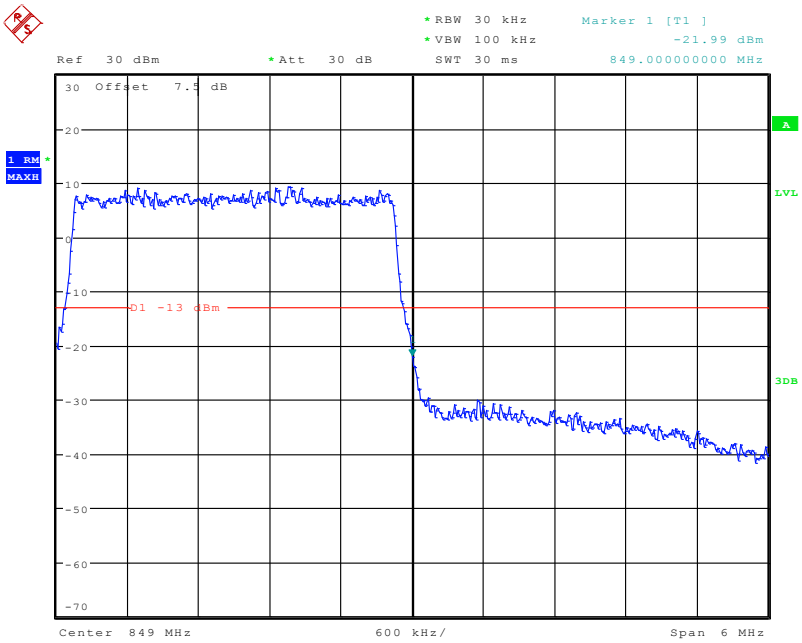

Date: 13.MAR.2020 10:43:10

## 16-QAM (3.0 MHz, FULL RB) - Left Band Edge



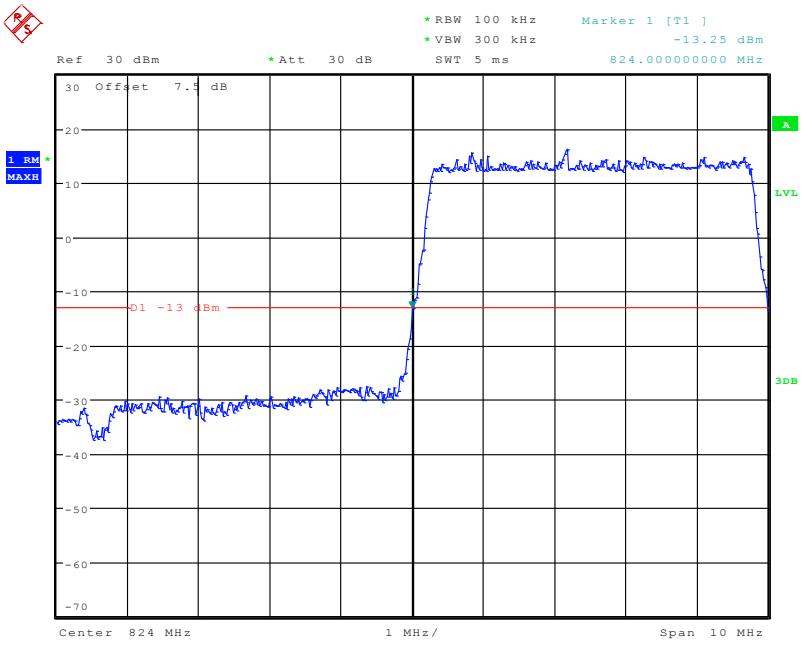

Date: 13.MAR.2020 10:42:54

## 16-QAM (3.0 MHz, FULL RB) - Right Band Edge



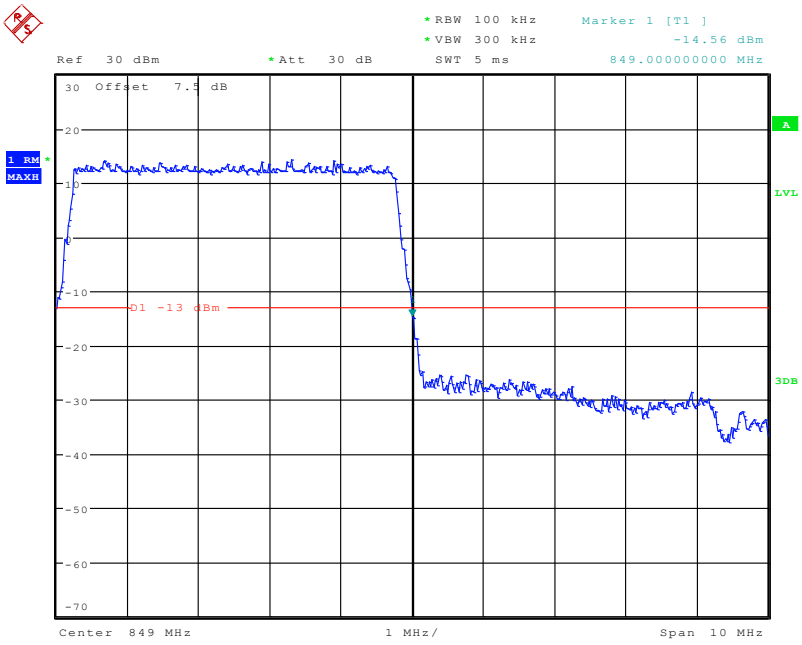

Date: 13.MAR.2020 10:43:25

## QPSK (5.0 MHz, FULL RB) - Left Band Edge



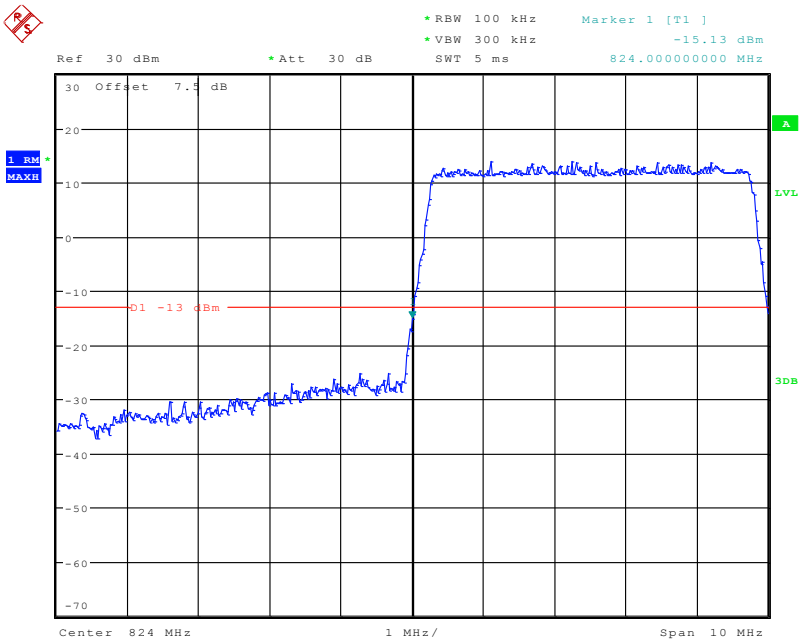

Date: 13.MAR.2020 10:56:16

## QPSK (5.0 MHz, FULL RB) - Right Band Edge



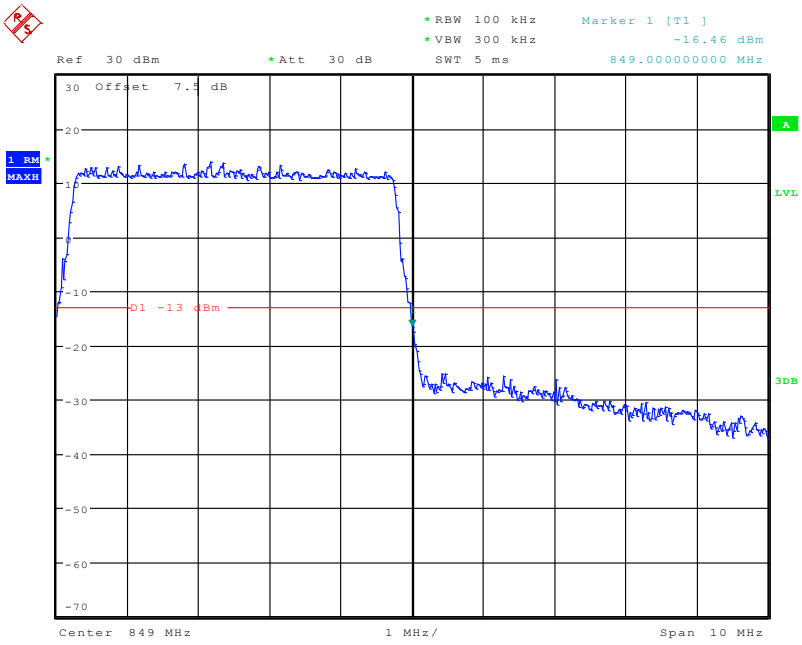

Date: 13.MAR.2020 10:56:47

## 16-QAM (5.0 MHz, FULL RB) - Left Band Edge



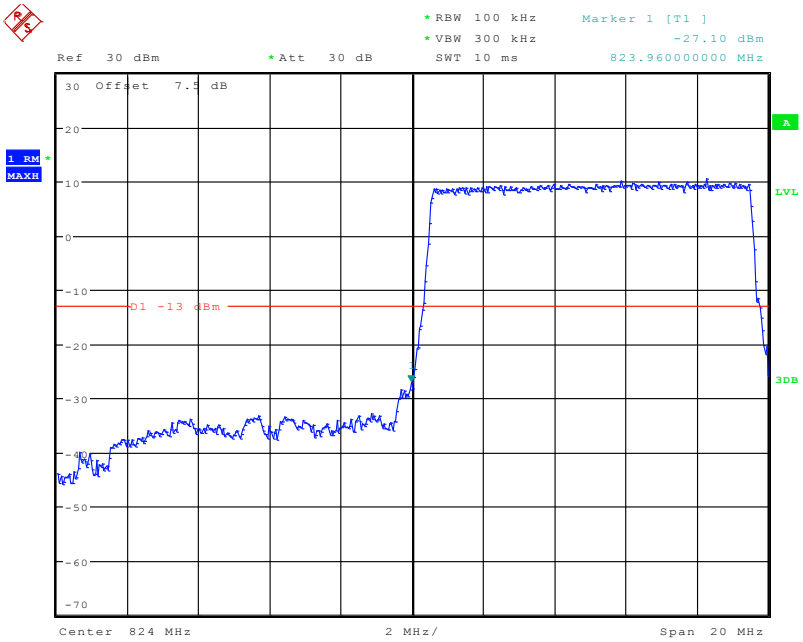

Date: 13.MAR.2020 10:56:31

## 16-QAM (5.0 MHz, FULL RB) - Right Band Edge



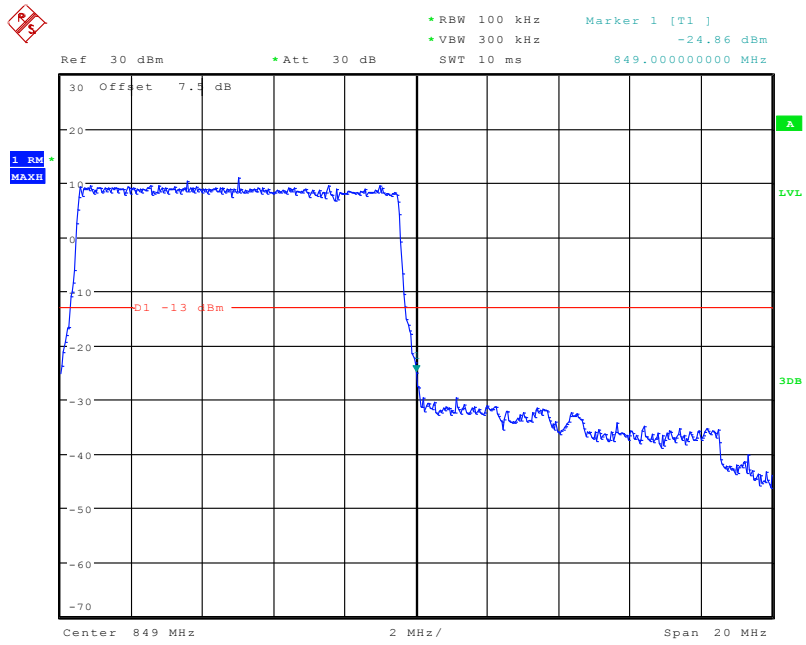

Date: 13.MAR.2020 10:57:03

## QPSK (10.0 MHz, FULL RB) - Left Band Edge



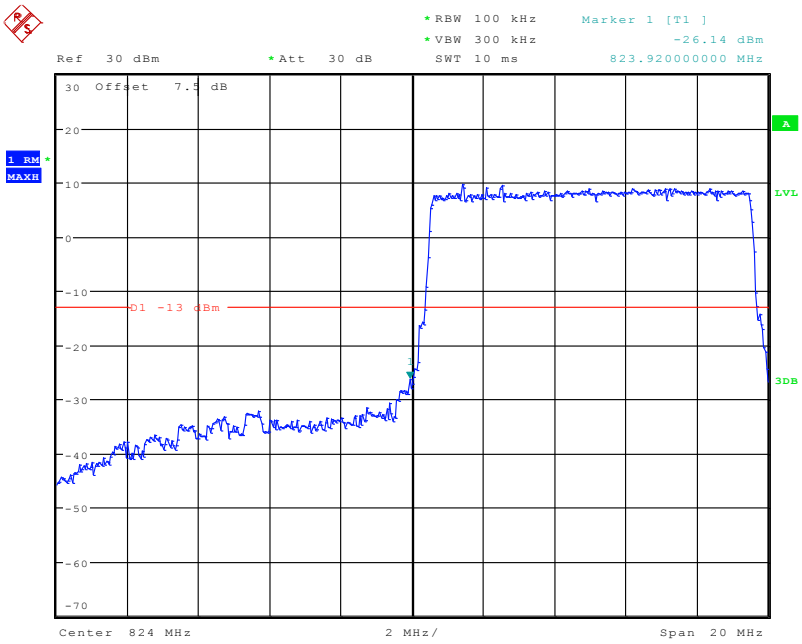

Date: 13.MAR.2020 10:59:42

## QPSK (10.0 MHz, FULL RB) - Right Band Edge



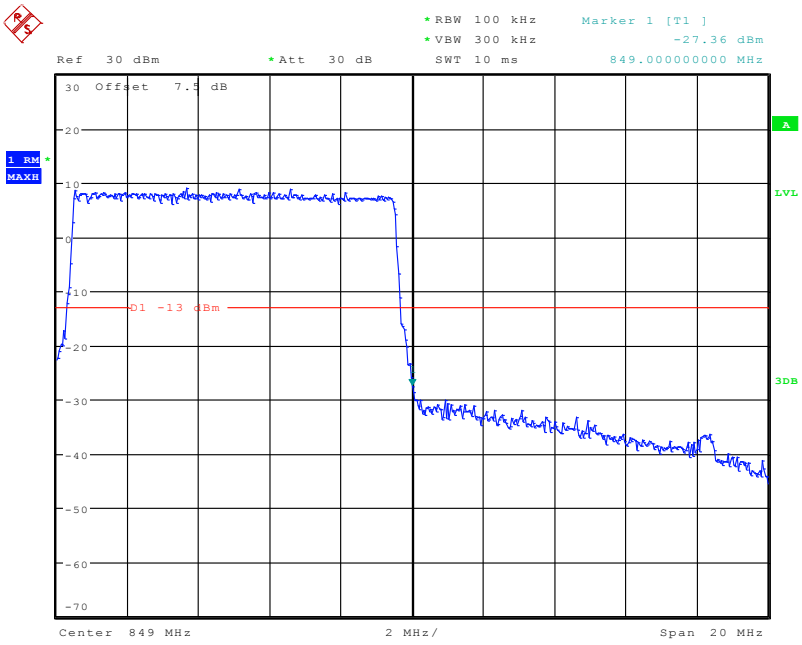

Date: 13.MAR.2020 11:00:16

## 16-QAM (10.0 MHz, FULL RB) - Left Band Edge




Date: 13.MAR.2020 10:59:59

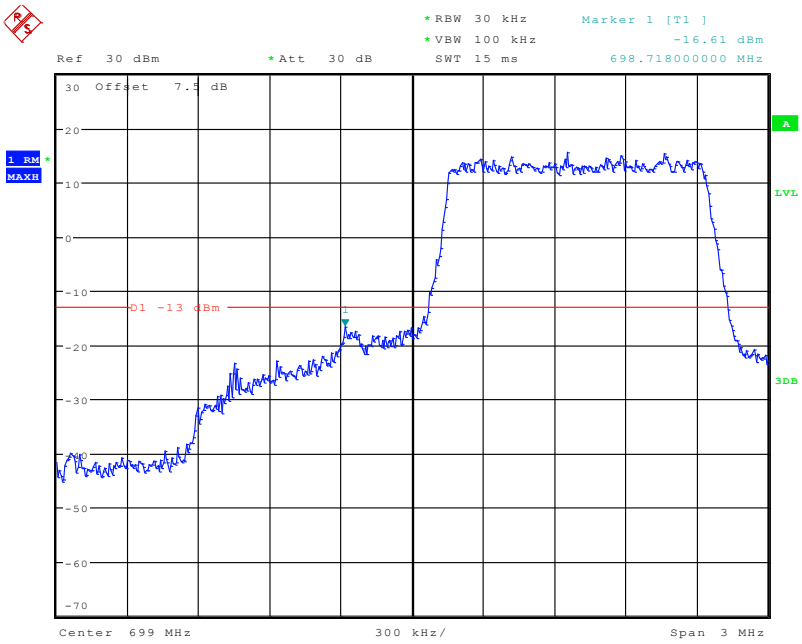
## 16-QAM (10.0 MHz, FULL RB) - Right Band Edge




Date: 13.MAR.2020 11:00:33

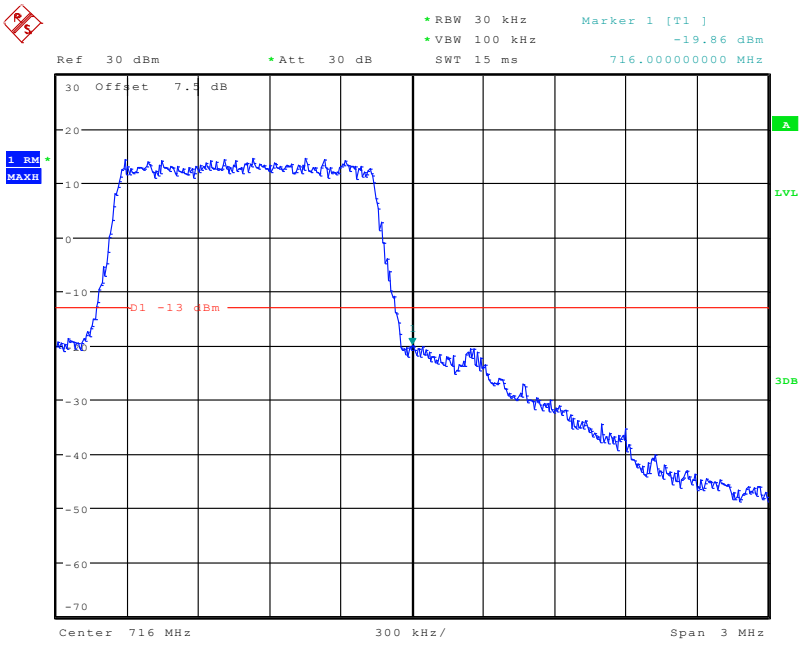
**Band 12:**

**QPSK (1.4 MHz, FULL RB) - Left Band Edge**



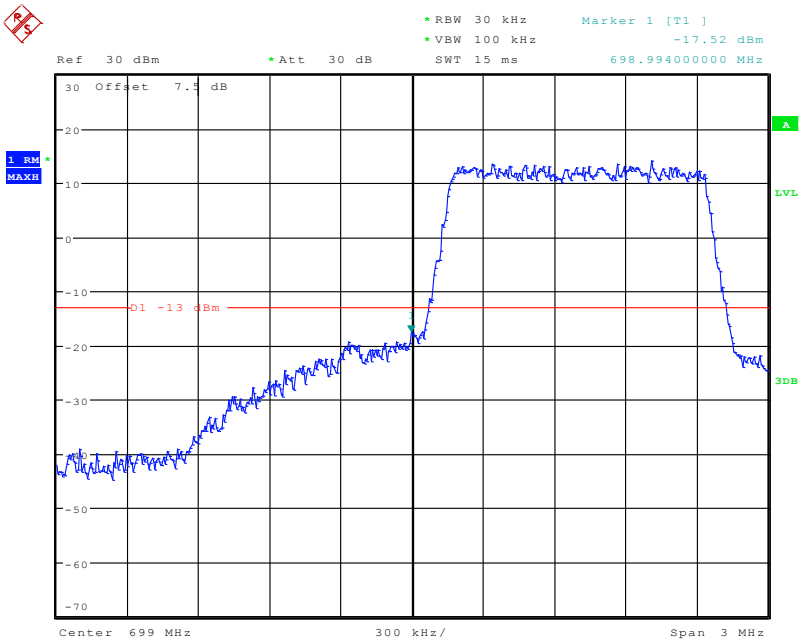

Date: 13.MAR.2020 11:00:58

**QPSK (1.4 MHz, FULL RB) - Right Band Edge**



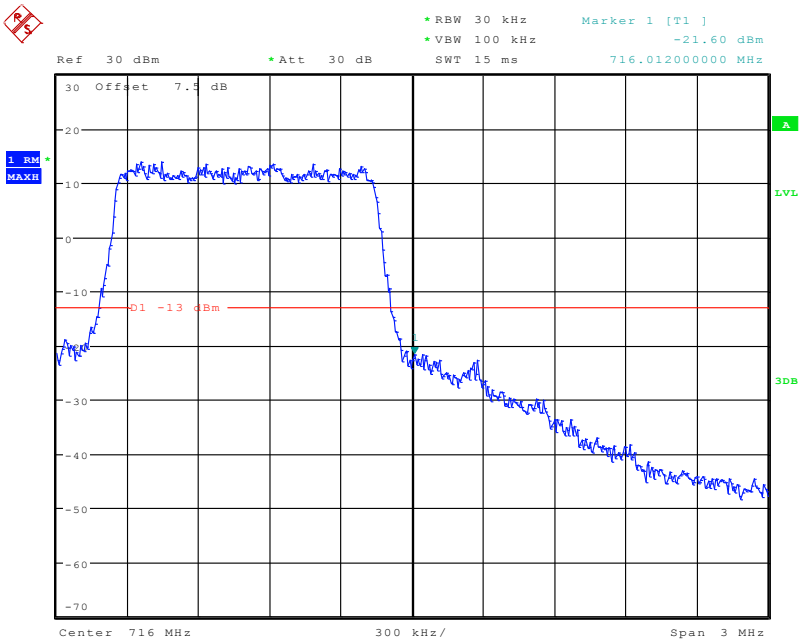

Date: 13.MAR.2020 11:01:30

## 16-QAM (1.4 MHz, FULL RB) - Left Band Edge



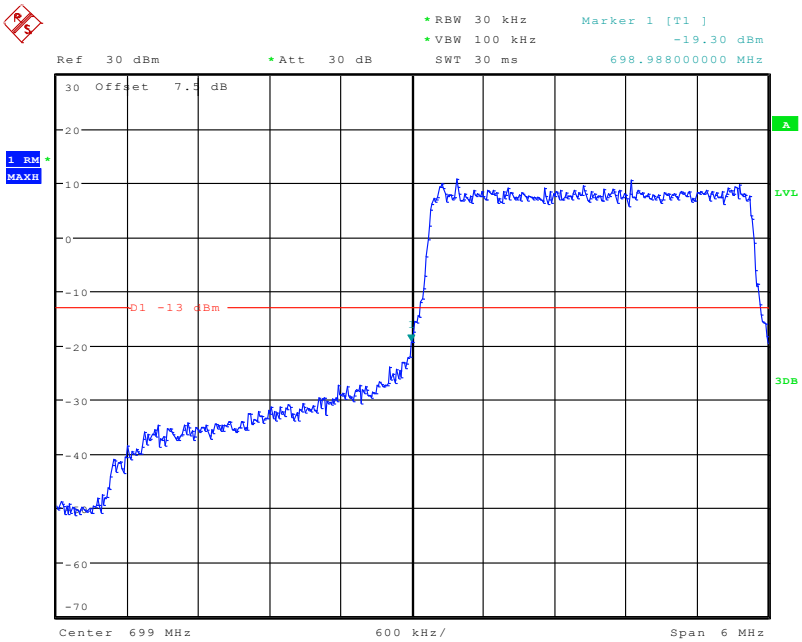

Date: 13.MAR.2020 11:01:14

## 16-QAM (1.4 MHz, FULL RB) - Right Band Edge



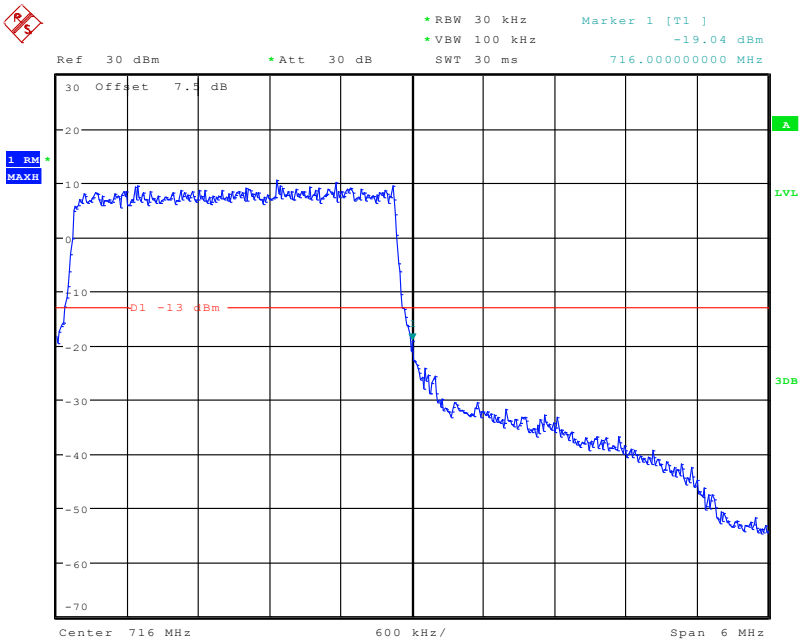

Date: 13.MAR.2020 11:01:45

## QPSK (3.0 MHz, FULL RB) - Left Band Edge



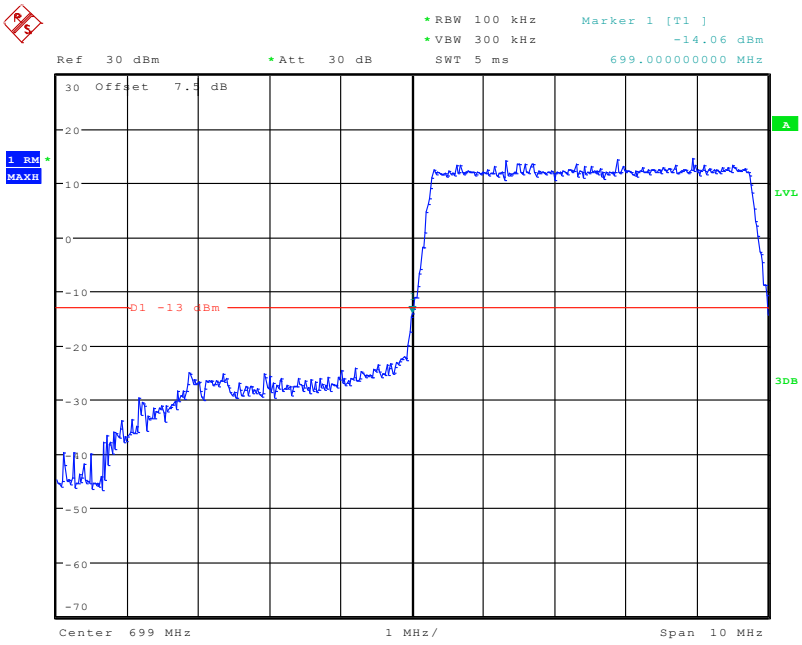

Date: 13.MAR.2020 11:02:05

## QPSK (3.0 MHz, FULL RB) - Right Band Edge



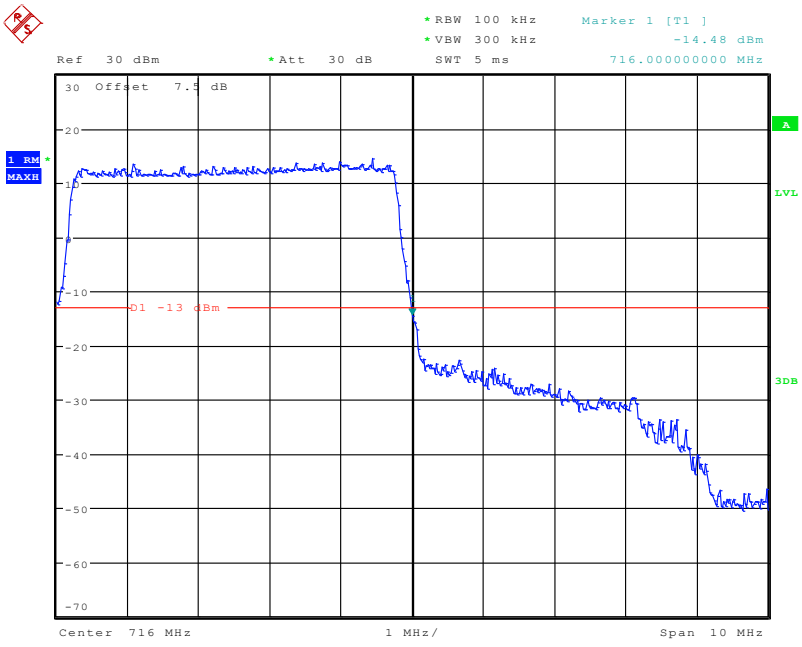

Date: 13.MAR.2020 11:02:37

## QPSK (5.0 MHz, FULL RB) - Left Band Edge



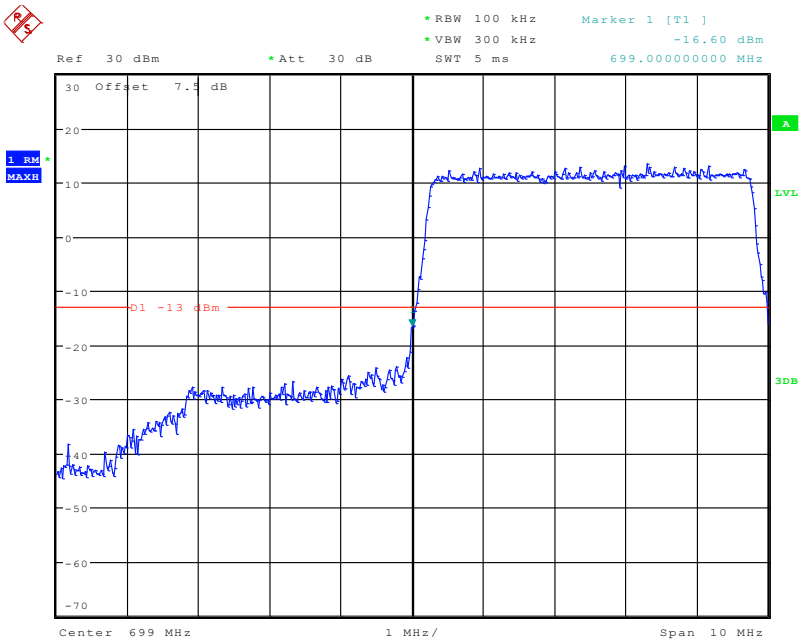

Date: 13.MAR.2020 11:03:15

## QPSK (5.0 MHz, FULL RB) - Right Band Edge



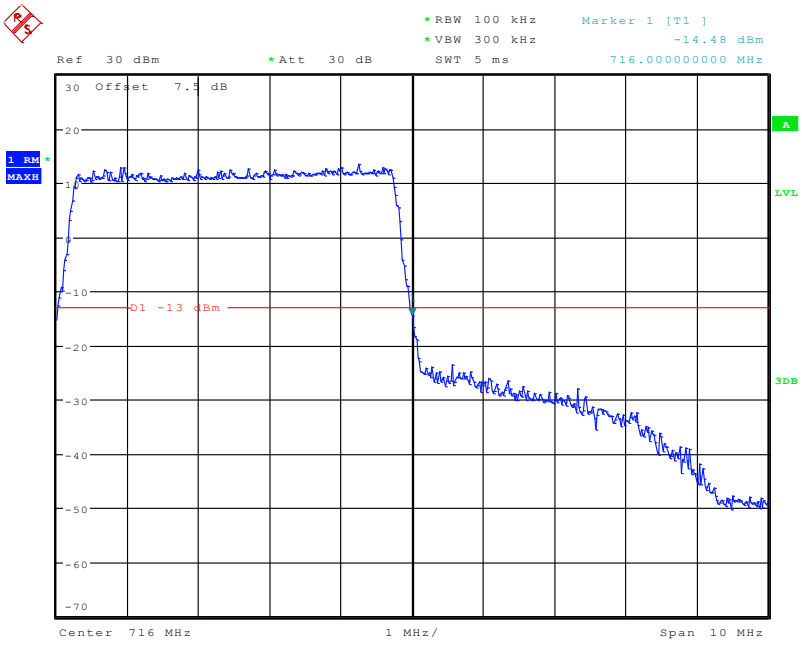

Date: 13.MAR.2020 11:03:47

## 16-QAM (5.0 MHz, FULL RB) - Left Band Edge



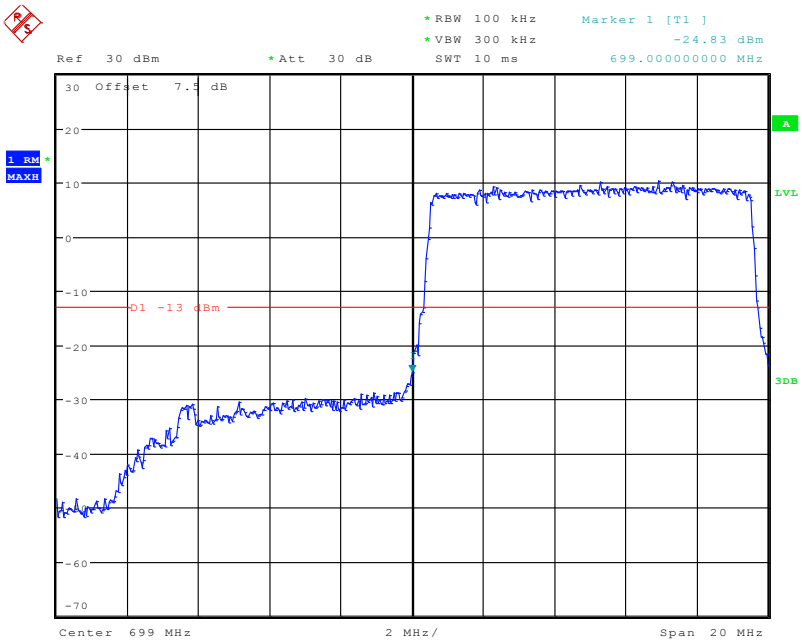

Date: 13.MAR.2020 11:03:31

## 16-QAM (5.0 MHz, FULL RB) - Right Band Edge



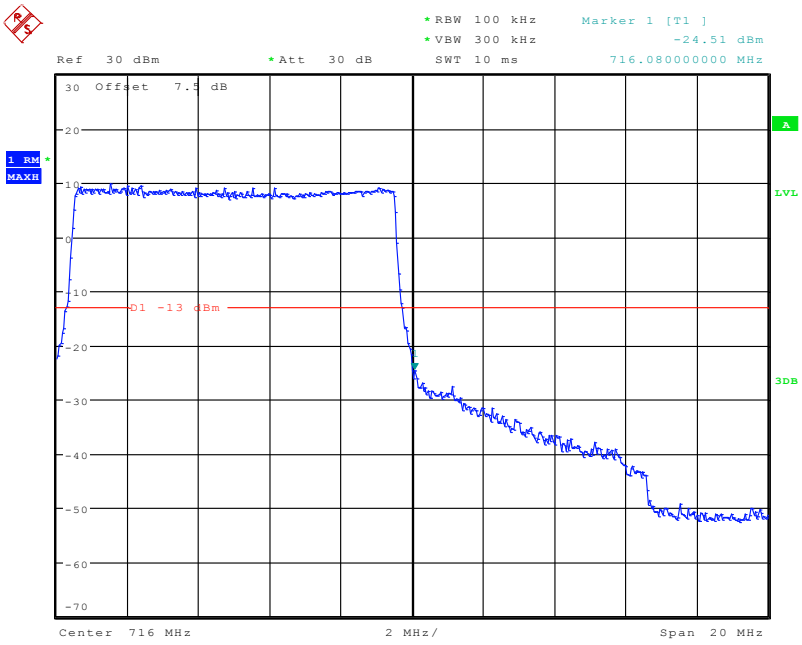

Date: 13.MAR.2020 11:04:03

## QPSK (10.0 MHz, FULL RB) - Left Band Edge



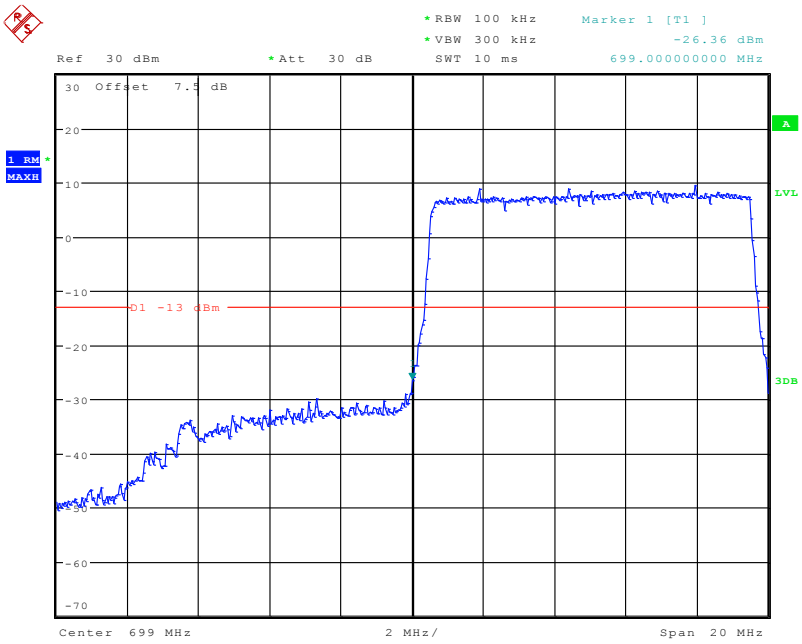

Date: 13.MAR.2020 11:04:24

## QPSK (10.0 MHz, FULL RB) - Right Band Edge



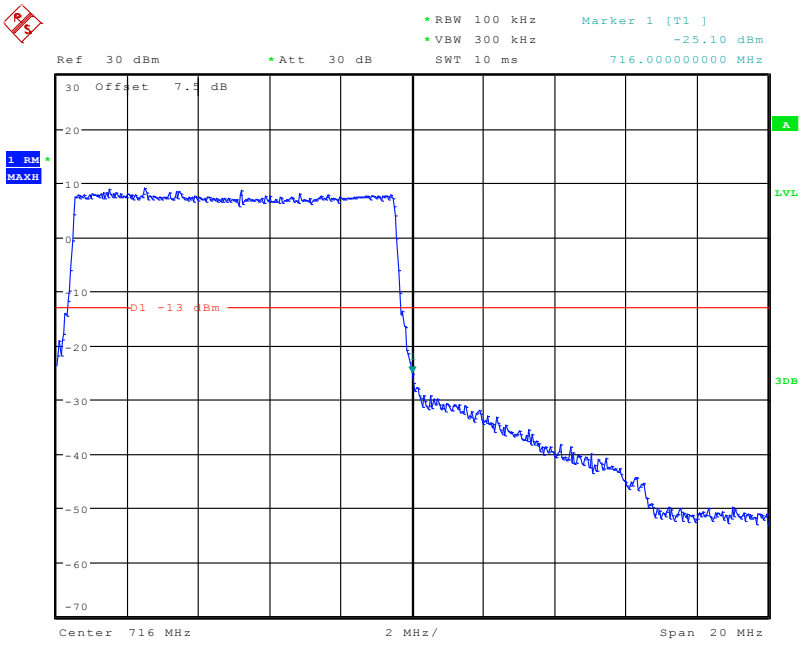

Date: 13.MAR.2020 11:04:58

## 16-QAM (10.0 MHz, FULL RB) - Left Band Edge




Date: 13.MAR.2020 11:04:41

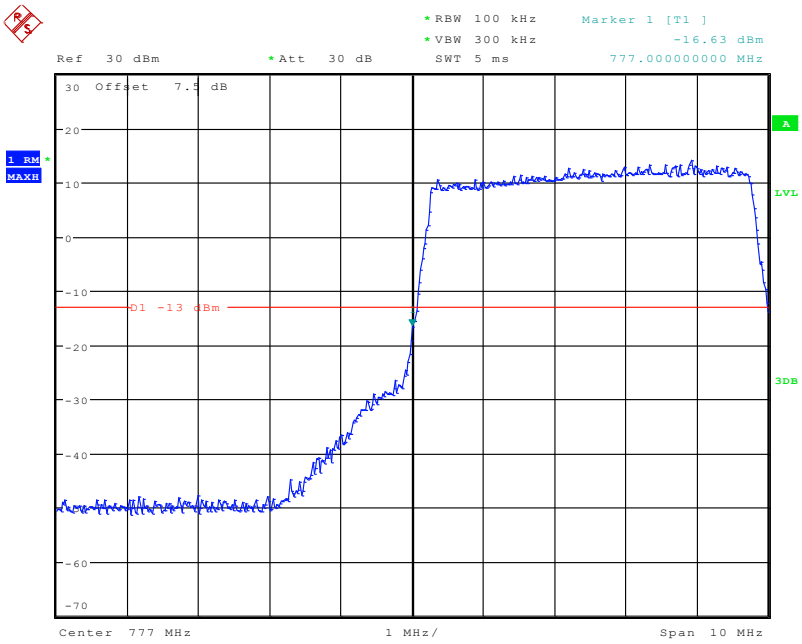
## 16-QAM (10.0 MHz, FULL RB) - Right Band Edge




Date: 13.MAR.2020 11:05:15

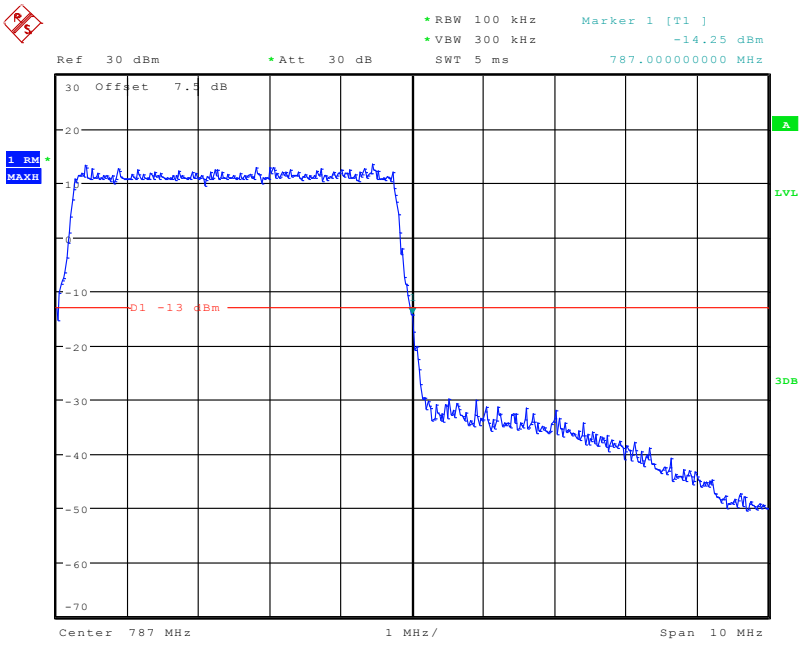
**Band 13:**

**QPSK (5.0 MHz, FULL RB) - Left Band Edge**



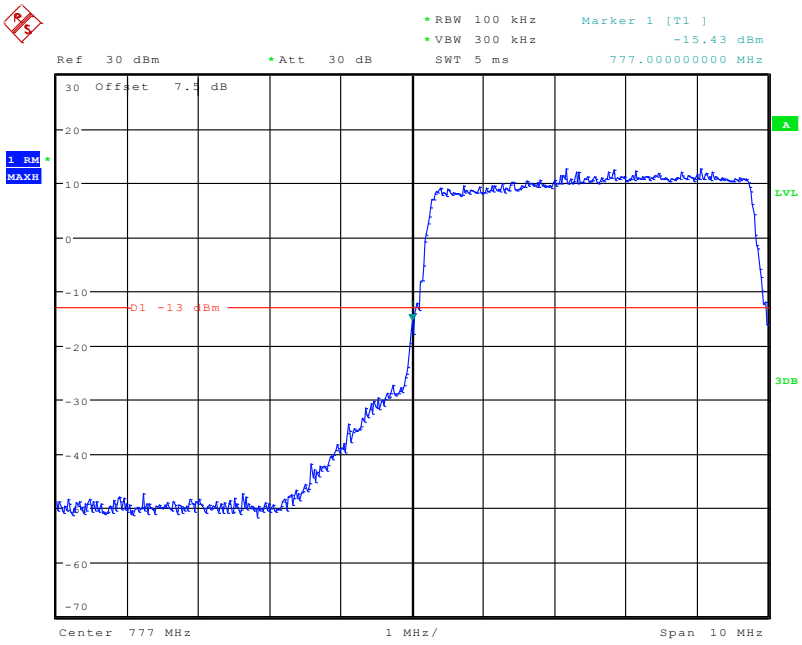

Date: 13.MAR.2020 11:05:42

**QPSK (5.0 MHz, FULL RB) - Right Band Edge**



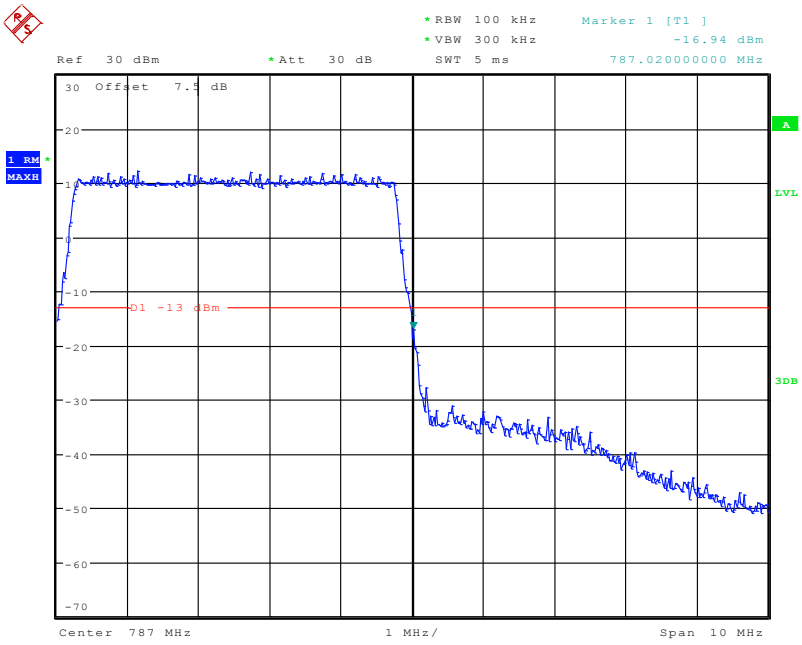

Date: 13.MAR.2020 11:06:17

## 16-QAM (5.0 MHz, FULL RB) - Left Band Edge



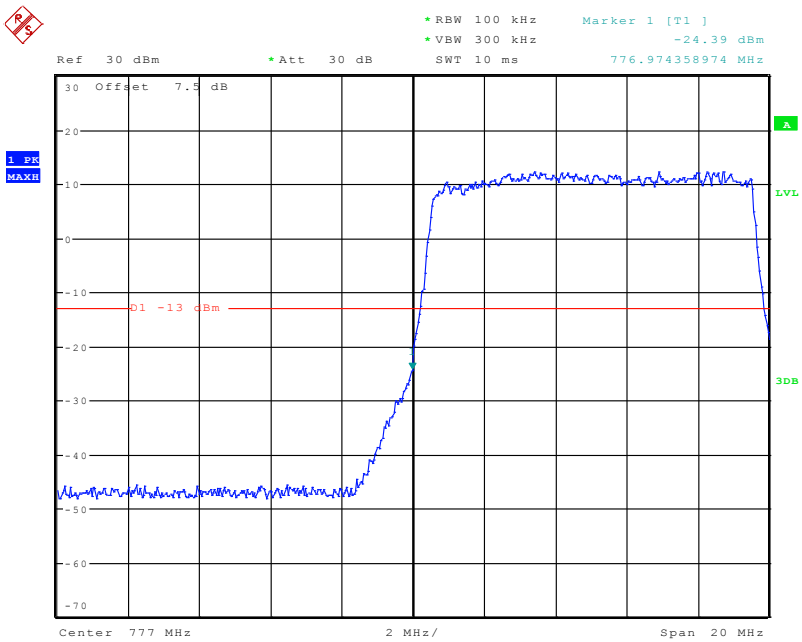

Date: 13.MAR.2020 11:05:58

## 16-QAM (5.0 MHz, FULL RB) - Right Band Edge



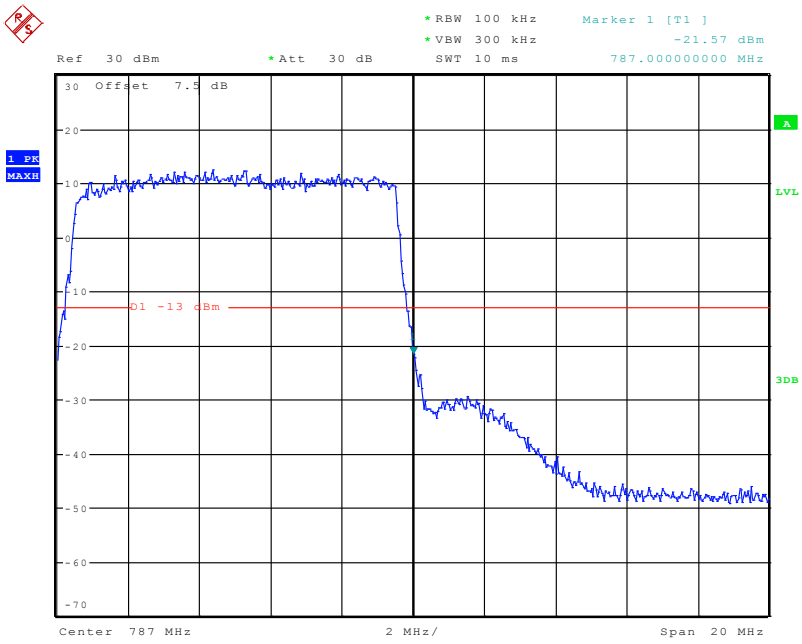

Date: 13.MAR.2020 11:06:33

## QPSK (10.0 MHz, FULL RB) - Left Band Edge



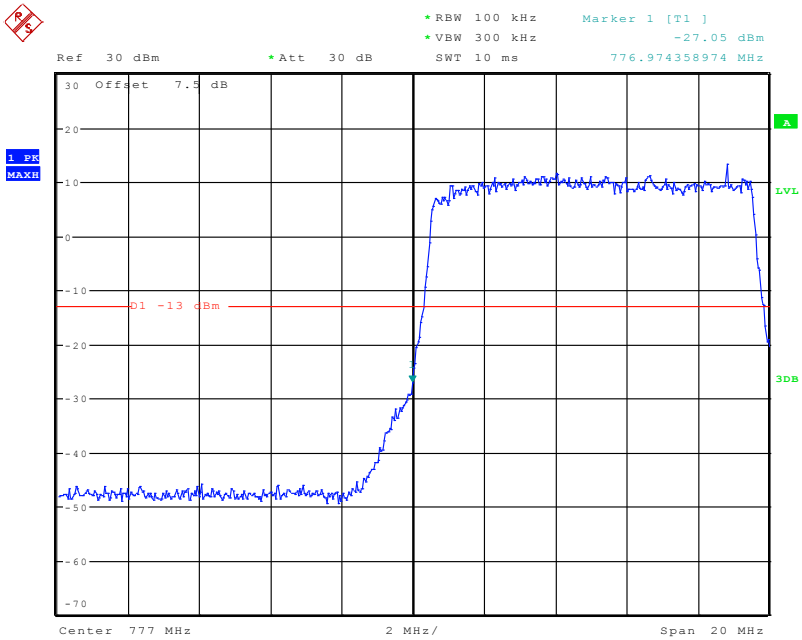

Date: 13.MAR.2020 11:14:38

## QPSK (10.0 MHz, FULL RB) - Right Band Edge



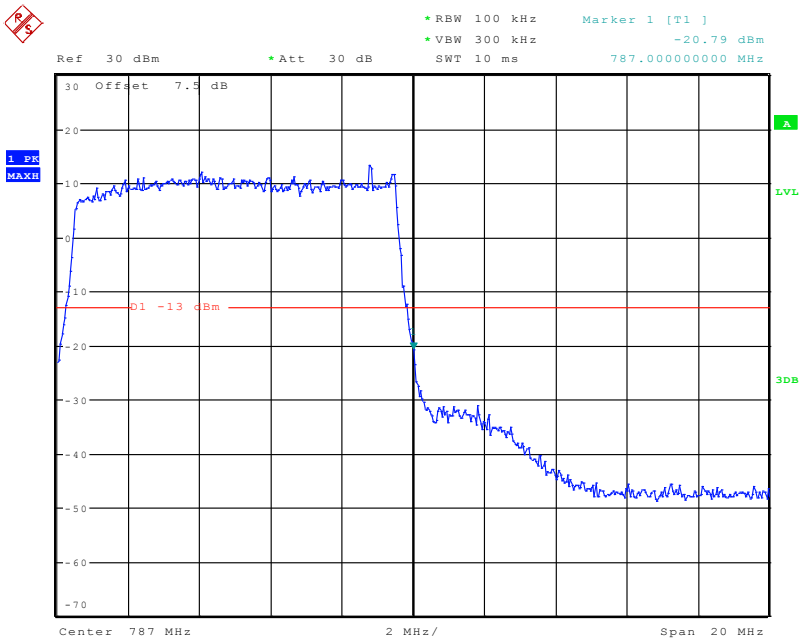

Date: 13.MAR.2020 11:16:29

## 16-QAM (10.0 MHz, FULL RB) - Left Band Edge




Date: 13.MAR.2020 11:15:34

## 16-QAM (10.0 MHz, FULL RB) - Right Band Edge




Date: 13.MAR.2020 11:16:04

# FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY

## Applicable Standard

FCC § 2.1055, §22.355, §24.235 and & §2 7.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

| Frequency Range (MHz) | Base, fixed (ppm) | Mobile ≤ 3 watts (ppm) | Mobile > 3 watts (ppm) |
|---|---|---|---|
| 25 to 50 | 20.0 | 20.0 | 50.0 |
| 50 to 450 | 5.0 | 5.0 | 50.0 |
| 450 to 512 | 2.5 | 5.0 | 5.0 |
| 821 to 896 | 1.5 | 2.5 | 2.5 |
| 928 to 929. | 5.0 | N/A | N/A |
| 929 to 960. | 1.5 | N/A | N/A |
| 2110 to 2220 | 10.0 | N/A | N/A |

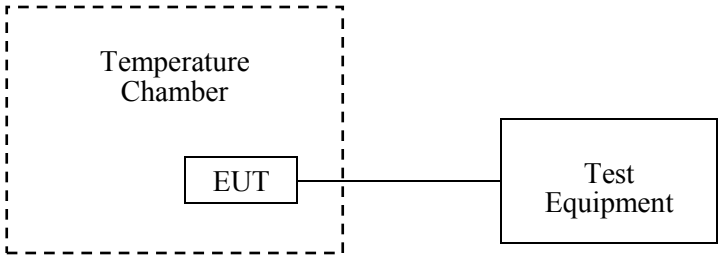
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

## Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



## Test Data

### Environmental Conditions

| | |
|---|---|
| **Temperature:** | 23.3~24.2 ℃ |
| **Relative Humidity:** | 42~66 % |
| **ATM Pressure:** | 100.3~101.2kPa |

*The testing was performed by Alan He and Gavin Guo from 2020-03-09 to 2020-03-13.*
*EUT operation mode: Transmitting*

**Test Result: Pass**

*Please refer to the following tables.*

**Cellular Band (Part 22H)**

**WCDMA Mode**

| Middle channel, $f_o$=836.6MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **Frequency Error (Hz)** | **Frequency Error (ppm)** | **Limit (ppm)** |
| -30 | 13.6 | -9 | -0.010758 | 2.5 |
| -20 | | 3 | 0.003586 | 2.5 |
| -10 | | -1 | -0.001195 | 2.5 |
| 0 | | 1 | 0.001195 | 2.5 |
| 10 | | 0 | 0.000000 | 2.5 |
| 20 | | -5 | -5.005977 | 2.5 |
| 30 | | -4 | -0.004781 | 2.5 |
| 40 | | 1 | 0.001195 | 2.5 |
| 50 | | 5 | 0.005977 | 2.5 |
| 20 | 11.6 | -1 | 0.001195 | 2.5 |
| | 15.6 | -6 | -0.007172 | 2.5 |

## PCS Band (Part 24E)

### WCDMA Mode

| Middle channel, $f_o$=1880.0 MHz | | | | |
|---|---|---|---|---|
| Temperature (℃) | Voltage ($V_{DC}$) | Frequency Error (Hz) | Frequency Error (ppm) | Result |
| -30 | 13.6 | 4 | 0.0021 | Pass |
| -20 | | 13 | 0.0069 | Pass |
| -10 | | 8 | 0.0043 | Pass |
| 0 | | 7 | 0.0037 | Pass |
| 10 | | 5 | 0.0027 | Pass |
| 20 | | 7 | 0.0037 | Pass |
| 30 | | 13 | 0.0069 | Pass |
| 40 | | 5 | 0.0027 | Pass |
| 50 | | 0 | 0.0000 | Pass |
| 20 | 11.6 | -2 | -0.0011 | Pass |
| | 15.6 | 3 | 0.0016 | Pass |

## AWS Band (Part 27)

| Temperature (℃) | Voltage ($V_{DC}$) | $F_L$ (MHz) | $F_H$ (MHz) | $F_L$ Limit (MHz) | $F_H$ Limit (MHz) |
|---|---|---|---|---|---|
| -30 | 13.6 | 1710.0672 | 1754.9306 | 1710 | 1755 |
| -20 | | 1710.0641 | 1754.9278 | 1710 | 1755 |
| -10 | | 1710.0633 | 1754.9296 | 1710 | 1755 |
| 0 | | 1710.0661 | 1754.9309 | 1710 | 1755 |
| 10 | | 1710.0658 | 1754.9289 | 1710 | 1755 |
| 20 | | 1710.0707 | 1754.9282 | 1710 | 1755 |
| 30 | | 1710.0685 | 1754.9321 | 1710 | 1755 |
| 40 | | 1710.0630 | 1754.9276 | 1710 | 1755 |
| 50 | | 1710.0659 | 1754.9299 | 1710 | 1755 |
| 20 | 11.6 | 1710.0633 | 1754.9291 | 1710 | 1755 |
| | 15.6 | 1710.0700 | 1754.9318 | 1710 | 1755 |

**LTE:**
**QPSK:**

**Band 2:**

| 10.0 MHz Middle channel, $f_o$ =1880MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **Frequency Error (Hz)** | **Frequency Error (ppm)** | **Result** |
| -30 | 13.6 | -2.50 | -0.0013 | Pass |
| -20 | | -9.97 | -0.0053 | Pass |
| -10 | | -6.13 | -0.0033 | Pass |
| 0 | | 6.17 | 0.0033 | Pass |
| 10 | | 7.92 | 0.0042 | Pass |
| 20 | | 6.46 | 0.0034 | Pass |
| 30 | | -6.52 | -0.0035 | Pass |
| 40 | | 7.18 | 0.0038 | Pass |
| 50 | | -9.69 | -0.0052 | Pass |
| 20 | 11.6 | -8.17 | -0.0043 | Pass |
| | 15.6 | -7.05 | -0.0038 | Pass |

**Band 4:**

| 10MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **$F_L$ (MHz)** | **$F_H$ (MHz)** | **$F_L$ Limit (MHz)** | **$F_H$ Limit (MHz)** |
| -30 | 13.6 | 1710.0762 | 1754.9316 | 1710 | 1755 |
| -20 | | 1710.0547 | 1754.9365 | 1710 | 1755 |
| -10 | | 1710.0741 | 1754.9415 | 1710 | 1755 |
| 0 | | 1710.0709 | 1754.9394 | 1710 | 1755 |
| 10 | | 1710.0696 | 1754.9339 | 1710 | 1755 |
| 20 | | 1710.0621 | 1754.9443 | 1710 | 1755 |
| 30 | | 1710.0584 | 1754.9396 | 1710 | 1755 |
| 40 | | 1710.0537 | 1754.9321 | 1710 | 1755 |
| 50 | | 1710.0663 | 1754.9374 | 1710 | 1755 |
| 20 | 11.6 | 1710.0619 | 1754.9312 | 1710 | 1755 |
| | 15.6 | 1710.0505 | 1754.9471 | 1710 | 1755 |

**Band 5:**

| 10.0 MHz Middle channel, $f_o$ =836.6MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **Frequency Error (Hz)** | **Frequency Error (ppm)** | **Limit (ppm)** |
| -30 | 13.6 | -0.27 | -0.0003 | 2.5 |
| -20 | | -6.97 | -0.0083 | 2.5 |
| -10 | | -5.50 | -0.0066 | 2.5 |
| 0 | | 6.06 | 0.0072 | 2.5 |
| 10 | | 9.80 | 0.0117 | 2.5 |
| 20 | | 5.03 | 0.006 | 2.5 |
| 30 | | -6.62 | -0.0079 | 2.5 |
| 40 | | -8.73 | -0.0104 | 2.5 |
| 50 | | -7.05 | -0.0084 | 2.5 |
| 20 | 11.6 | 8.99 | 0.0107 | 2.5 |
| | 15.6 | -7.17 | -0.0086 | 2.5 |

**Band 12:**

| 10 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **$F_L$ (MHz)** | **$F_H$ (MHz)** | **$F_L$ Limit (MHz)** | **$F_H$ Limit (MHz)** |
| -30 | 13.6 | 699.0663 | 715.9616 | 699 | 716 |
| -20 | | 699.0682 | 715.9594 | 699 | 716 |
| -10 | | 699.0510 | 715.9530 | 699 | 716 |
| 0 | | 699.0371 | 715.9577 | 699 | 716 |
| 10 | | 699.0460 | 715.9629 | 699 | 716 |
| 20 | | 699.0385 | 715.9702 | 699 | 716 |
| 30 | | 699.0631 | 715.9672 | 699 | 716 |
| 40 | | 699.0520 | 715.9482 | 699 | 716 |
| 50 | | 699.0575 | 715.9551 | 699 | 716 |
| 20 | 11.6 | 699.0748 | 715.9632 | 699 | 716 |
| | 15.6 | 699.0344 | 715.9618 | 699 | 716 |

**Band 13：**

| 10 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **$F_L$ (MHz)** | **$F_H$ (MHz)** | **$F_L$ Limit (MHz)** | **$F_H$ Limit (MHz)** |
| -30 | 13.6 | 777.0393 | 786.9604 | 777 | 787 |
| -20 | | 777.0250 | 786.9489 | 777 | 787 |
| -10 | | 777.0331 | 786.9647 | 777 | 787 |
| 0 | | 777.0390 | 786.9727 | 777 | 787 |
| 10 | | 777.0470 | 786.9526 | 777 | 787 |
| 20 | | 777.0328 | 786.9495 | 777 | 787 |
| 30 | | 777.0456 | 786.9506 | 777 | 787 |
| 40 | | 777.0233 | 786.9423 | 777 | 787 |
| 50 | | 777.0319 | 786.9555 | 777 | 787 |
| 20 | 11.6 | 777.0261 | 786.9322 | 777 | 787 |
| | 15.6 | 777.0251 | 786.9426 | 777 | 787 |

**16QAM:**

**Band 2:**

| 10.0 MHz Middle channel, $f_o$=1880MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **Frequency Error (Hz)** | **Frequency Error (ppm)** | **Result** |
| -30 | 13.6 | -3.98 | -0.0021 | Pass |
| -20 | | -6.68 | -0.0036 | Pass |
| -10 | | 9.77 | 0.0052 | Pass |
| 0 | | -7.62 | -0.0041 | Pass |
| 10 | | -9.91 | -0.0053 | Pass |
| 20 | | -9.82 | -0.0052 | Pass |
| 30 | | -6.68 | -0.0036 | Pass |
| 40 | | -8.85 | -0.0047 | Pass |
| 50 | | 5.67 | 0.003 | Pass |
| 20 | 11.6 | 6.05 | 0.0032 | Pass |
| | 15.6 | 7.52 | 0.004 | Pass |

**Band 4:**

| 10 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **$F_L$ (MHz)** | **$F_H$ (MHz)** | **$F_L$ Limit (MHz)** | **$F_H$ Limit (MHz)** |
| -30 | 13.6 | 1710.0675 | 1754.9384 | 1710 | 1755 |
| -20 | | 1710.0344 | 1754.9421 | 1710 | 1755 |
| -10 | | 1710.0731 | 1754.9358 | 1710 | 1755 |
| 0 | | 1710.0694 | 1754.9451 | 1710 | 1755 |
| 10 | | 1710.0635 | 1754.9312 | 1710 | 1755 |
| 20 | | 1710.0547 | 1754.9335 | 1710 | 1755 |
| 30 | | 1710.0605 | 1754.9362 | 1710 | 1755 |
| 40 | | 1710.0572 | 1754.9482 | 1710 | 1755 |
| 50 | | 1710.0574 | 1754.9309 | 1710 | 1755 |
| 20 | 11.6 | 1710.0605 | 1754.9419 | 1710 | 1755 |
| | 15.6 | 1710.0895 | 1754.9391 | 1710 | 1755 |

**Band 5:**

| 10.0 MHz Middle channel, $f_o$ =836.6MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **Frequency Error (Hz)** | **Frequency Error (ppm)** | **Limit (ppm)** |
| -30 | 13.6 | -1.53 | -0.0018 | 2.5 |
| -20 | | 8.10 | 0.0097 | 2.5 |
| -10 | | -8.59 | -0.0103 | 2.5 |
| 0 | | 9.33 | 0.0112 | 2.5 |
| 10 | | -6.94 | -0.0083 | 2.5 |
| 20 | | 7.54 | 0.009 | 2.5 |
| 30 | | 6.43 | 0.0077 | 2.5 |
| 40 | | -6.17 | -0.0074 | 2.5 |
| 50 | | -6.44 | -0.0077 | 2.5 |
| 20 | 11.6 | 6.34 | 0.0076 | 2.5 |
| | 15.6 | -6.89 | -0.0082 | 2.5 |

**Band 12:**

| 10 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **$F_L$ (MHz)** | **$F_H$ (MHz)** | **$F_L$ Limit (MHz)** | **$F_H$ Limit (MHz)** |
| -30 | 13.6 | 699.0479 | 715.9478 | 699 | 716 |
| -20 | | 699.0278 | 715.9549 | 699 | 716 |
| -10 | | 699.0695 | 715.9430 | 699 | 716 |
| 0 | | 699.0502 | 715.9303 | 699 | 716 |
| 10 | | 699.0328 | 715.9651 | 699 | 716 |
| 20 | | 699.0433 | 715.9490 | 699 | 716 |
| 30 | | 699.0461 | 715.9518 | 699 | 716 |
| 40 | | 699.0374 | 715.9761 | 699 | 716 |
| 50 | | 699.0435 | 715.9562 | 699 | 716 |
| 20 | 11.6 | 699.0670 | 715.9642 | 699 | 716 |
| | 15.6 | 699.0443 | 715.9362 | 699 | 716 |

**Band 13:**

| 10 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Temperature (℃)** | **Voltage ($V_{DC}$)** | **$F_L$ (MHz)** | **$F_H$ (MHz)** | **$F_L$ Limit (MHz)** | **$F_H$ Limit (MHz)** |
| -30 | 13.6 | 777.0315 | 786.9718 | 777 | 787 |
| -20 | | 777.0162 | 786.9617 | 777 | 787 |
| -10 | | 777.0470 | 786.9597 | 777 | 787 |
| 0 | | 777.0238 | 786.9675 | 777 | 787 |
| 10 | | 777.0449 | 786.9387 | 777 | 787 |
| 20 | | 777.0313 | 786.9699 | 777 | 787 |
| 30 | | 777.0319 | 786.9417 | 777 | 787 |
| 40 | | 777.0403 | 786.9452 | 777 | 787 |
| 50 | | 777.0125 | 786.9615 | 777 | 787 |
| 20 | 11.6 | 777.0305 | 786.9505 | 777 | 787 |
| | 15.6 | 777.0451 | 786.9590 | 777 | 787 |

******* END OF REPORT *******