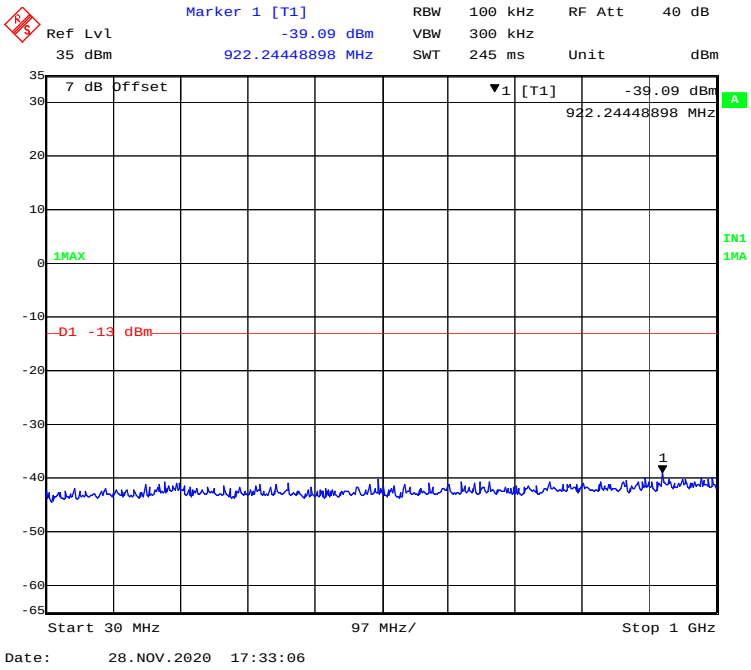
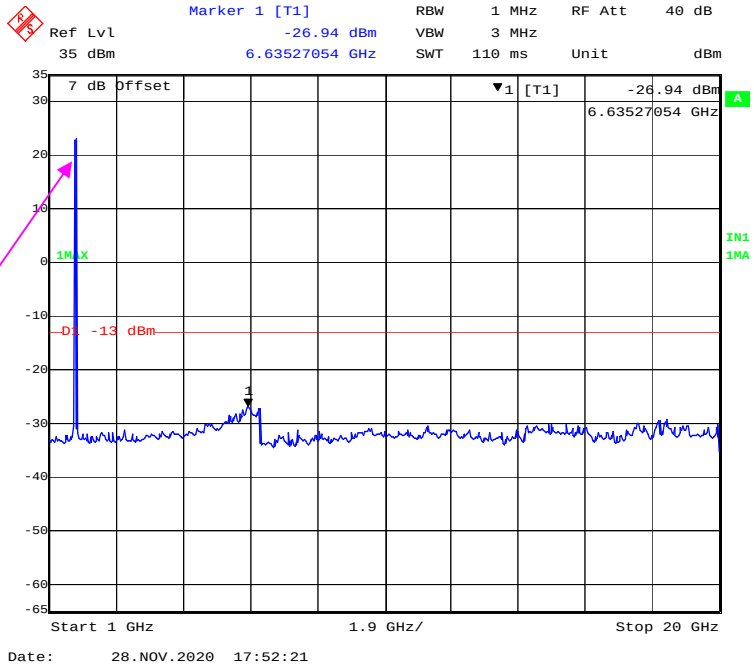
30 MHz - 1 GHz (10 MHz, 16-QAM, High Channel)

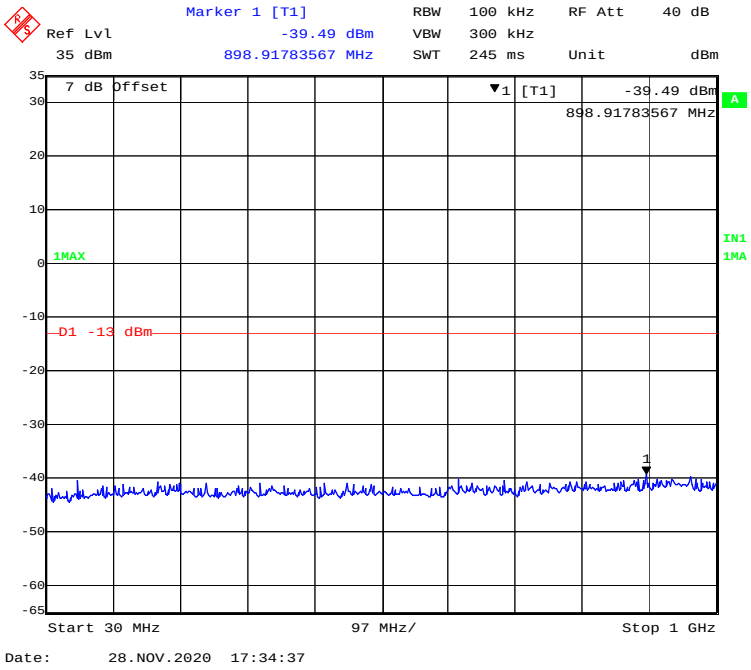


1 GHz – 20 GHz (10 MHz, 16-QAM, High Channel)

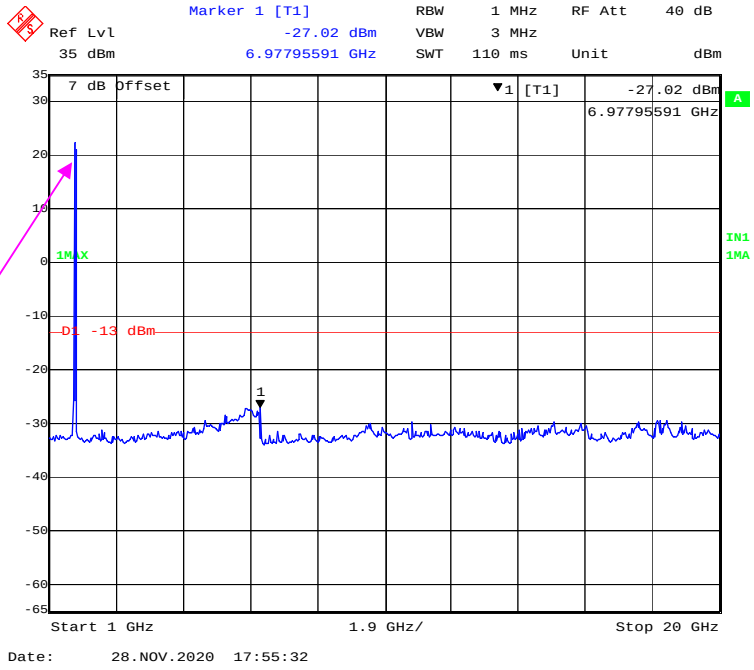


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, High Channel)

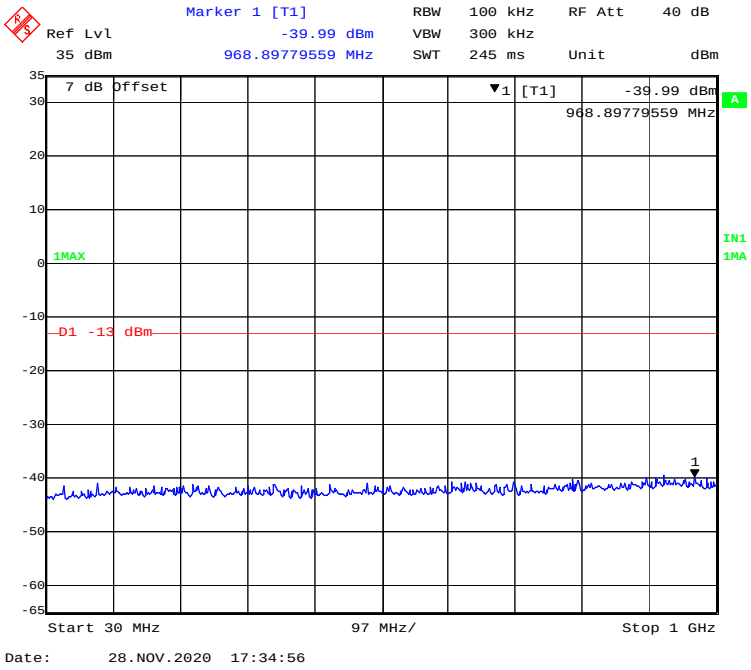


1 GHz – 20 GHz (15 MHz, QPSK, High Channel)

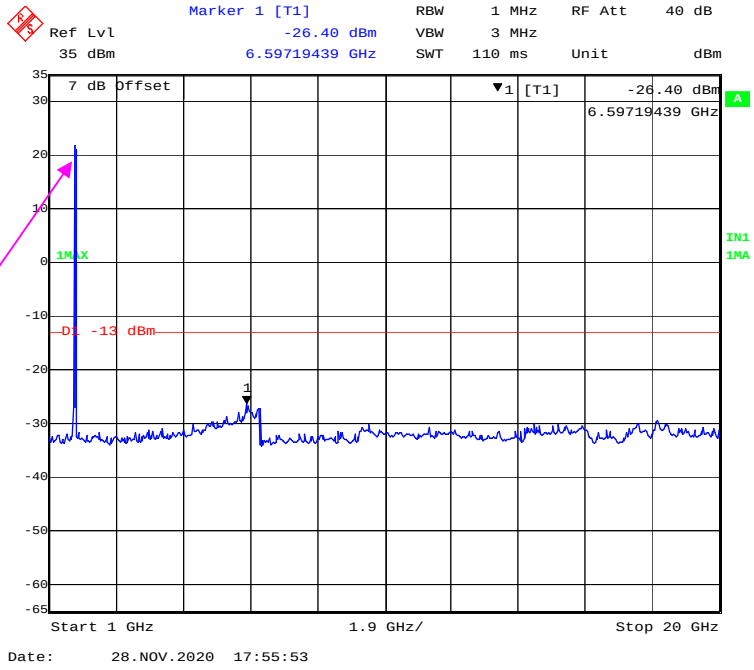


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, High Channel)

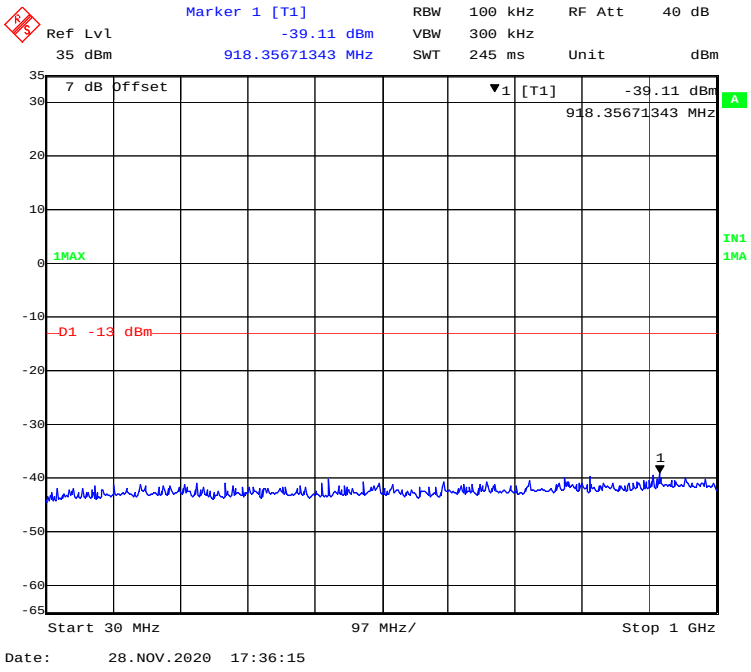


1 GHz – 20 GHz (15 MHz, 16-QAM, High Channel)

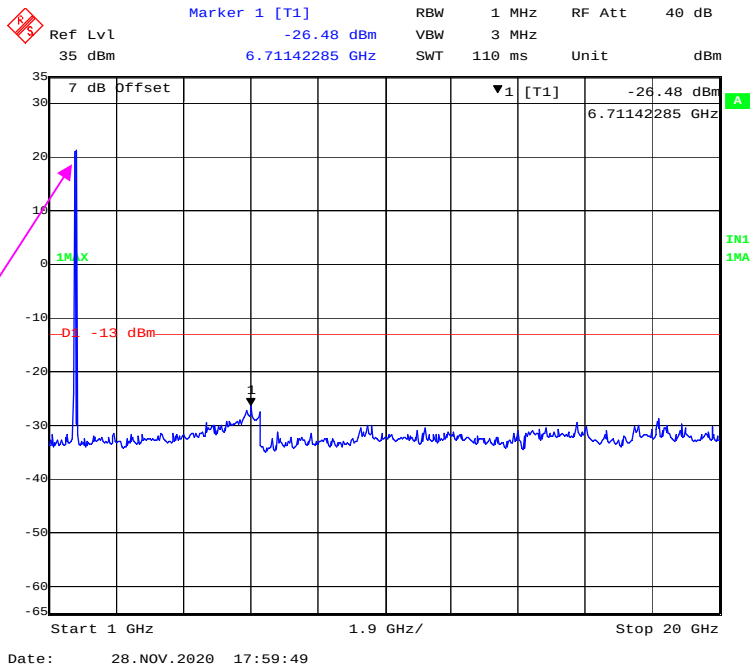


Fundamental

30 MHz - 1 GHz (20 MHz, QPSK, High Channel)

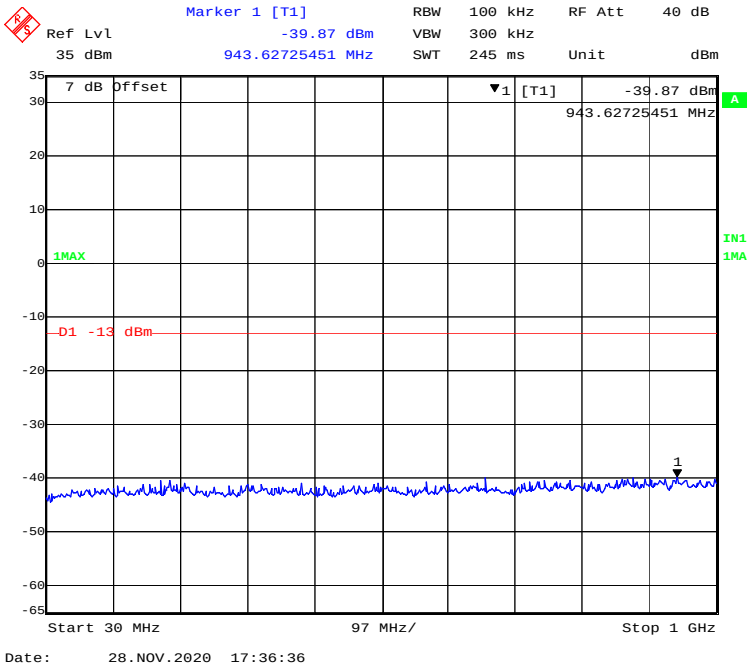


1 GHz – 20 GHz (20 MHz, QPSK, High Channel)

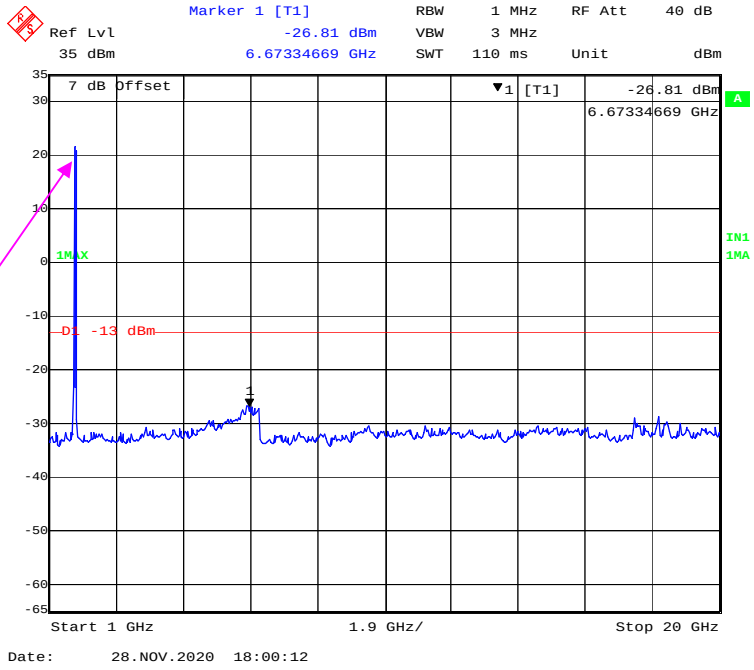


Fundamental

30 MHz - 1 GHz (20 MHz, 16-QAM, High Channel)



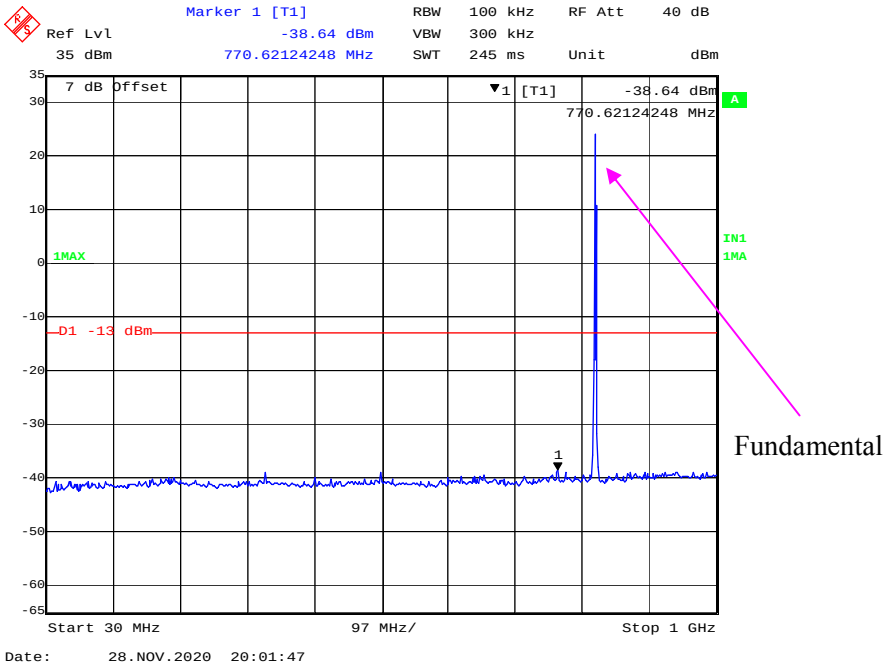
1 GHz – 20 GHz (20 MHz, 16-QAM, High Channel)



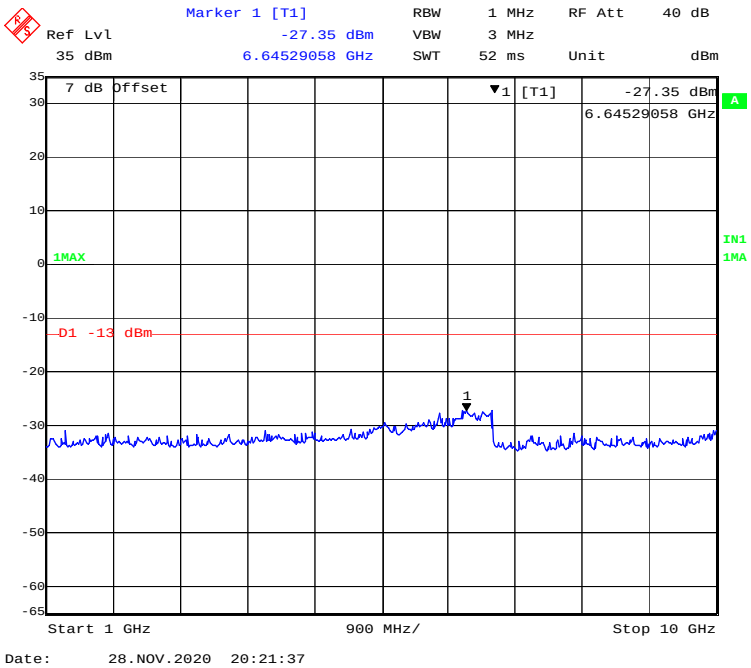
Fundamental

LTE Band 5:

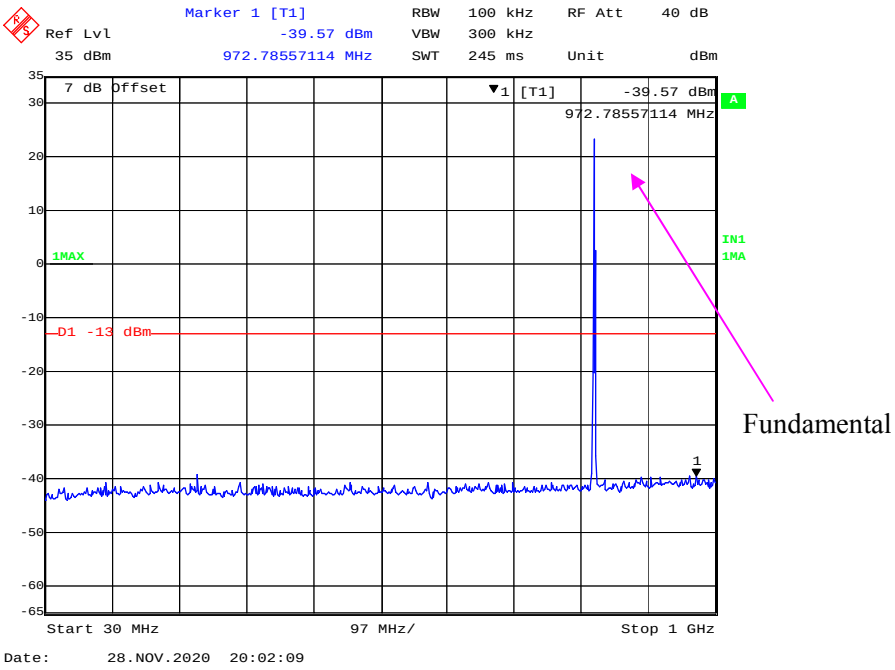
30 MHz – 1 GHz (QPSK, 1.4 MHz, Low Channel)



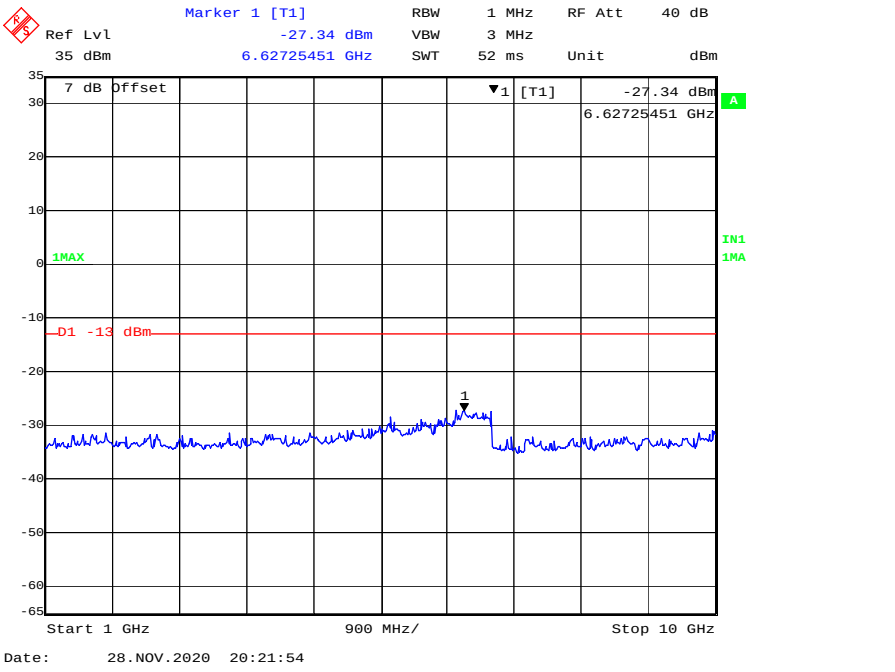
1 GHz – 10 GHz (QPSK, 1.4 MHz, Low Channel)



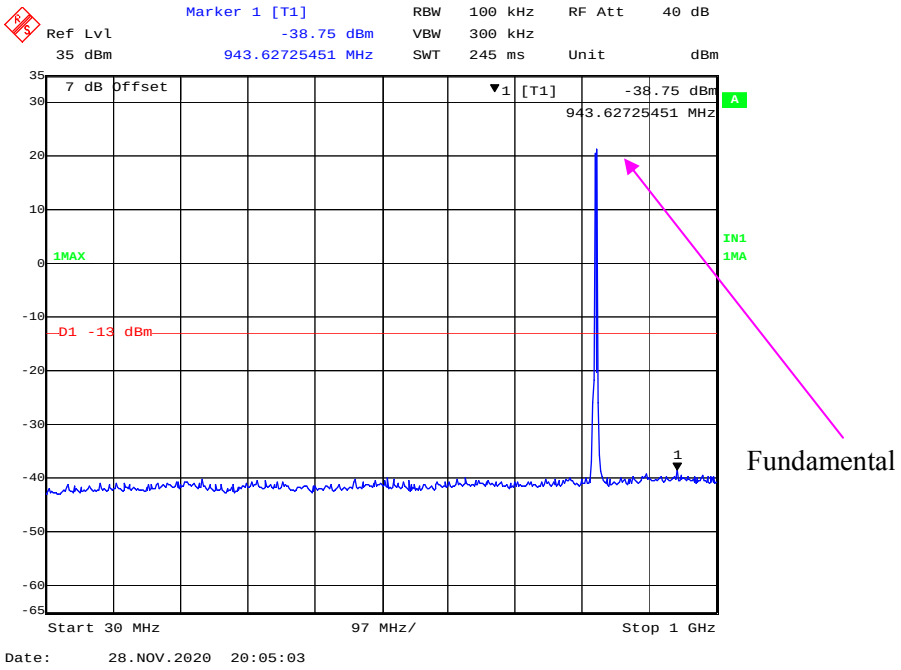
30 MHz – 1 GHz (16QAM, 1.4 MHz, Low Channel)



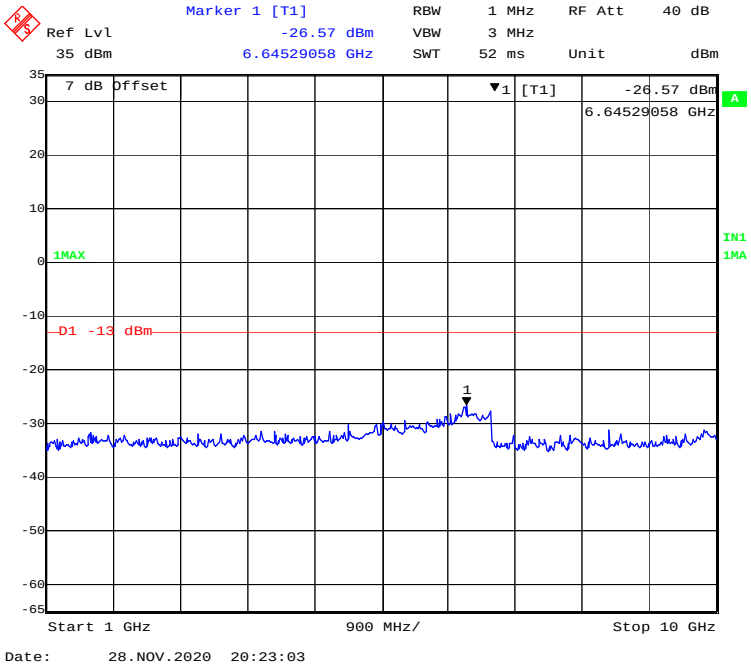
1 GHz – 10 GHz (16QAM, 1.4 MHz, Low Channel)



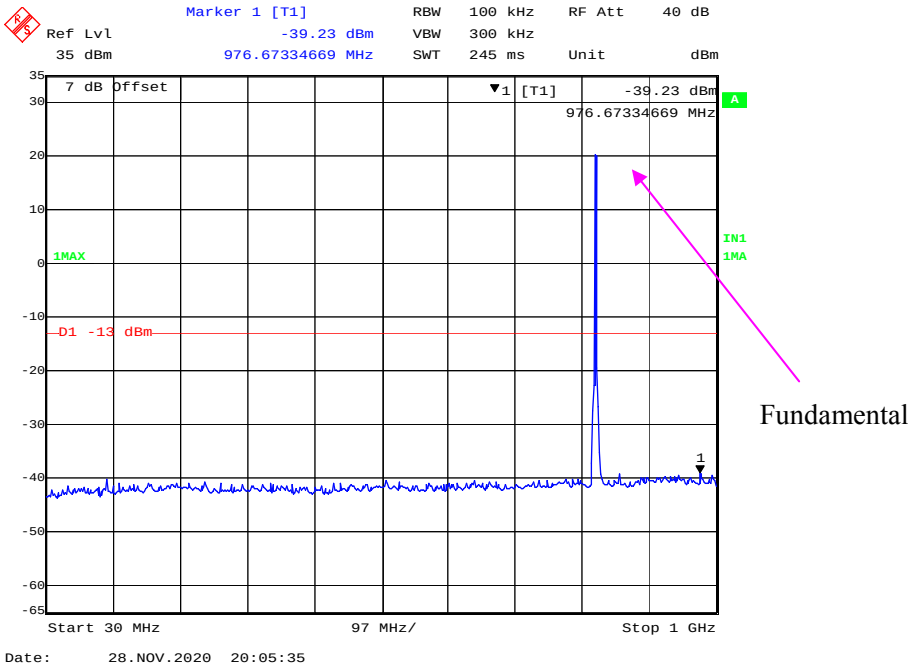
30 MHz – 1 GHz (QPSK, 3.0 MHz, Low Channel)



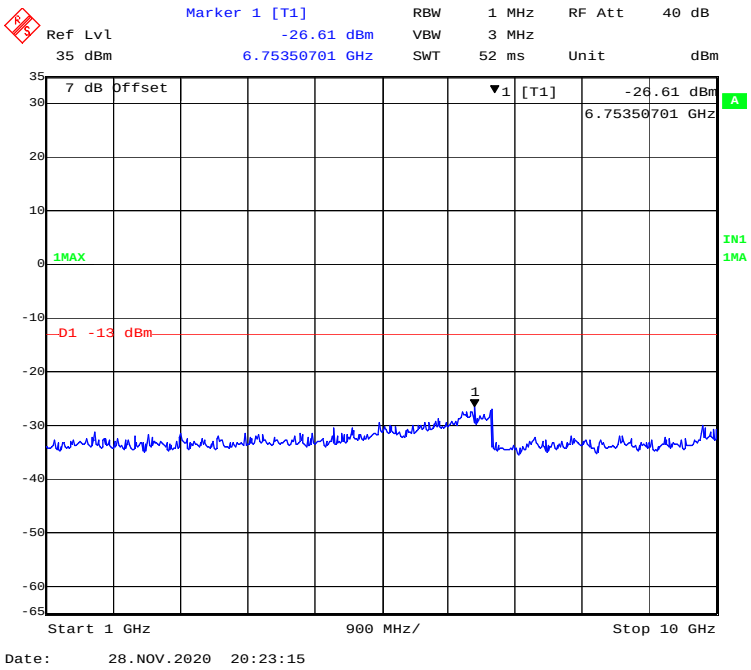
1 GHz – 10 GHz (QPSK, 3.0 MHz, Low Channel)



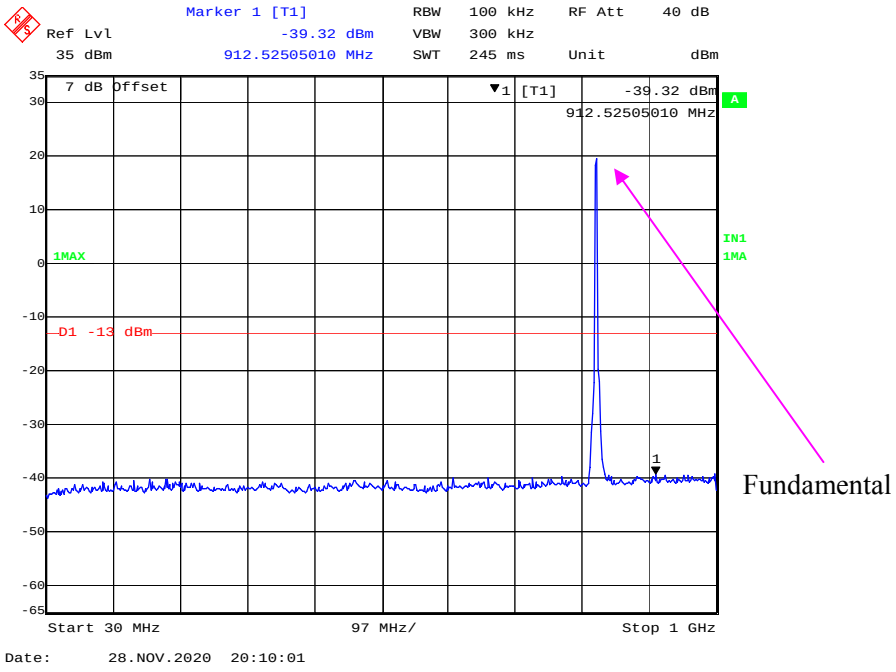
30 MHz – 1 GHz (16QAM, 3.0 MHz, Low Channel)



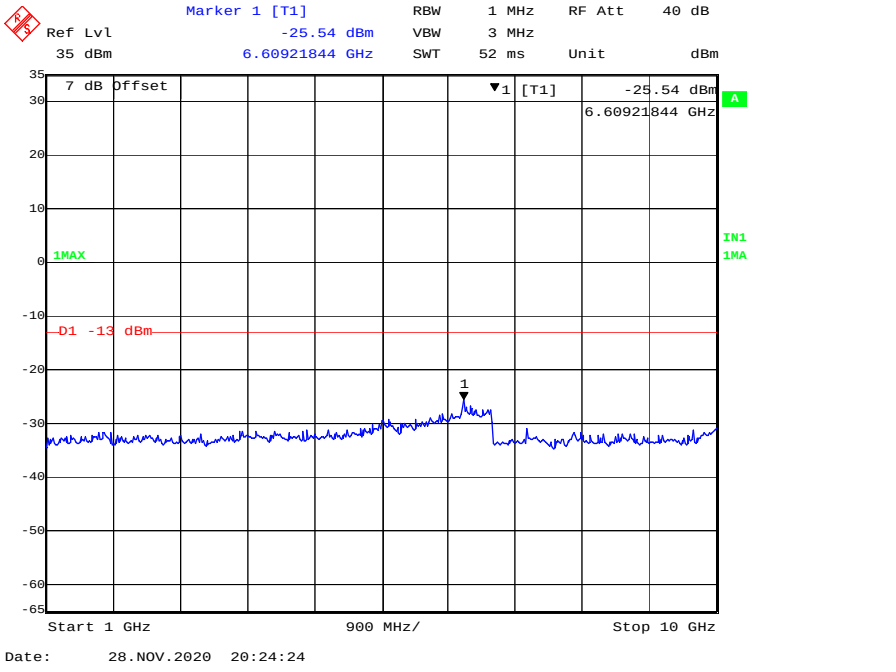
1 GHz – 10 GHz (16QAM, 3.0 MHz, Low Channel)



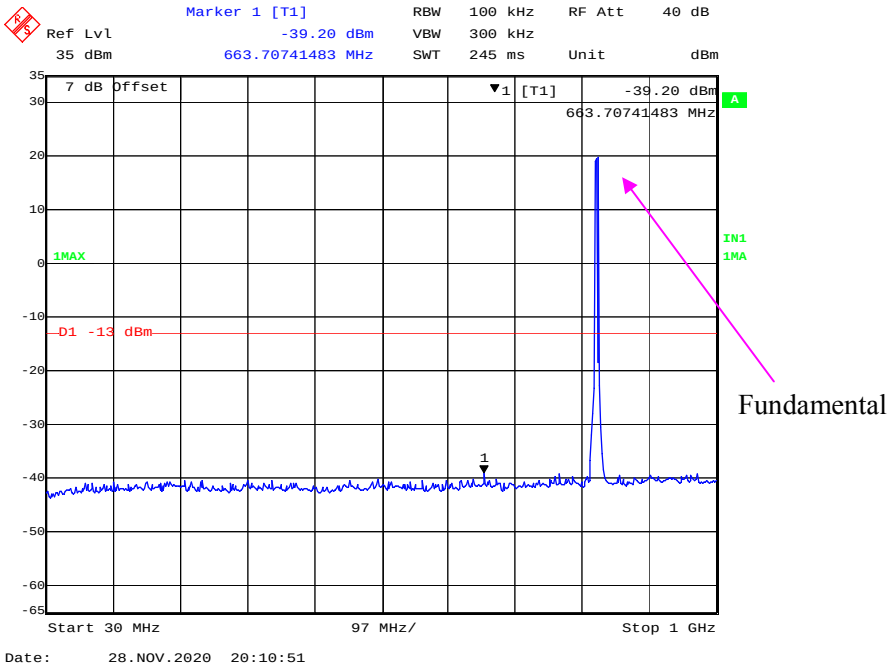
30 MHz – 1 GHz (QPSK, 5.0 MHz, Low Channel)



1 GHz – 10 GHz (QPSK, 5.0MHz, Low Channel)



30 MHz – 1 GHz (16QAM, 5.0 MHz, Low Channel)



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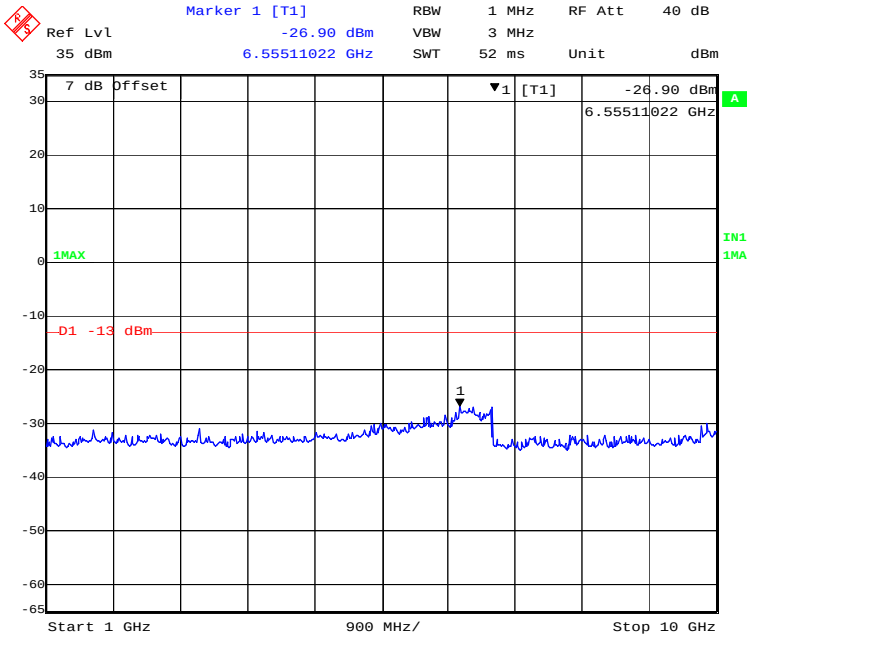
1 GHz – 10 GHz (16QAM, 5.0MHz, Low Channel)



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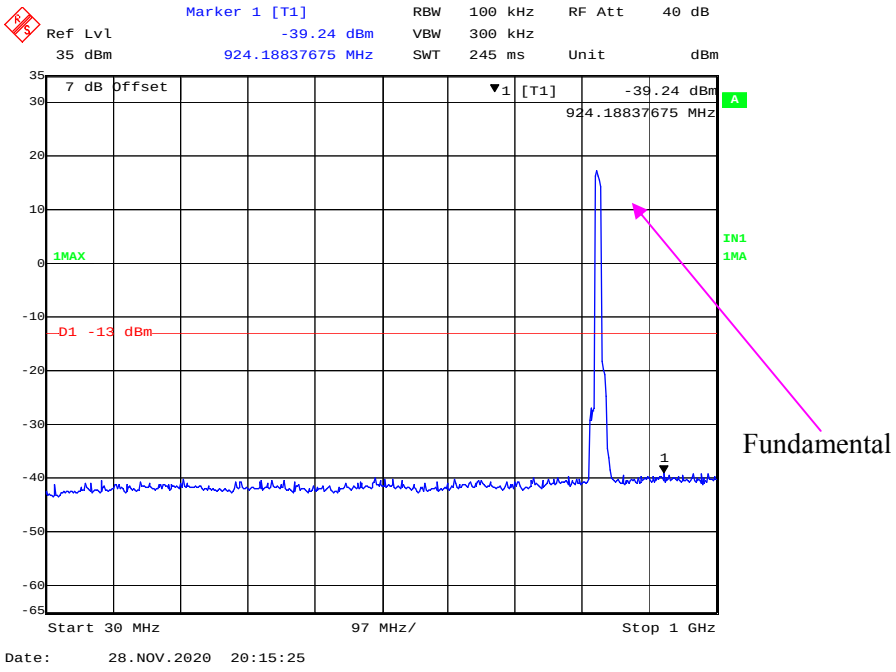
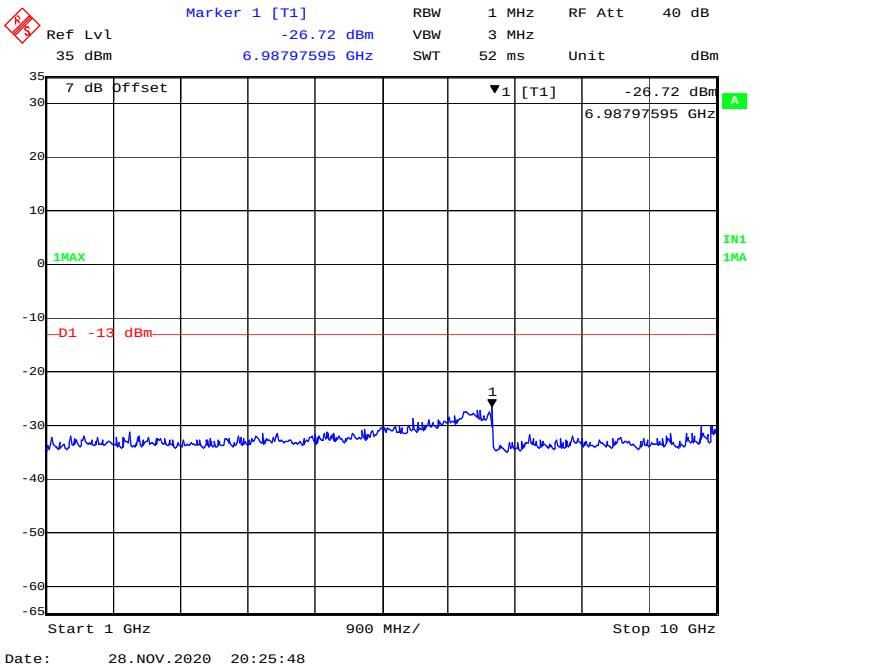
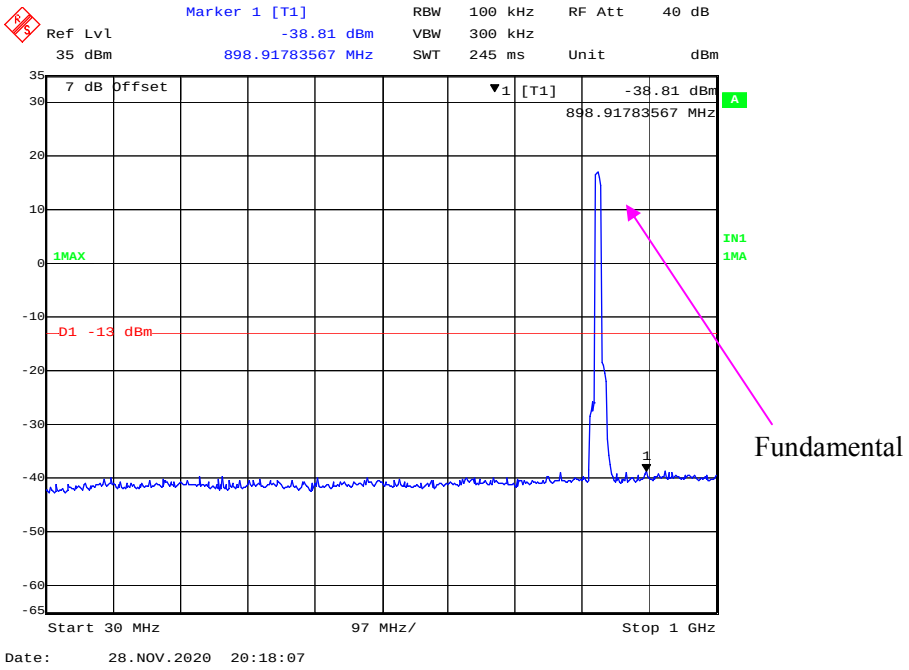
30 MHz – 1 GHz (QPSK, 10.0 MHz, Low Channel)



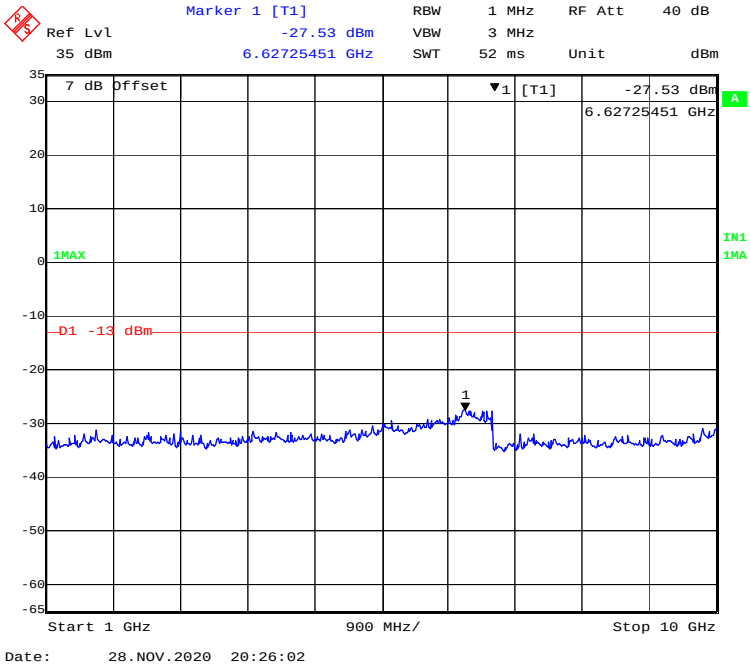
1 GHz – 10 GHz (QPSK, 10.0 MHz, Low Channel)



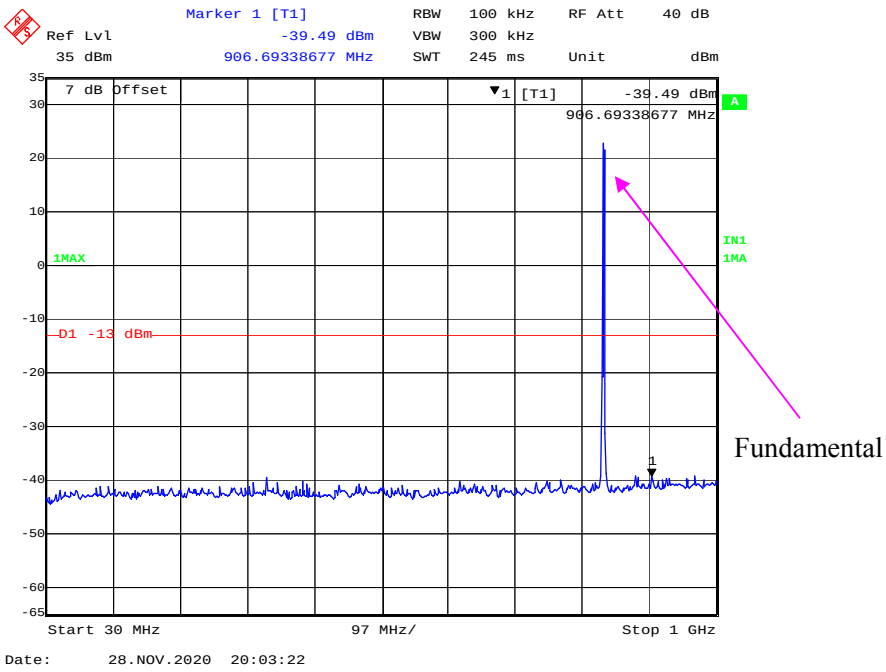
30 MHz – 1 GHz (16QAM, 10.0 MHz, Low Channel)



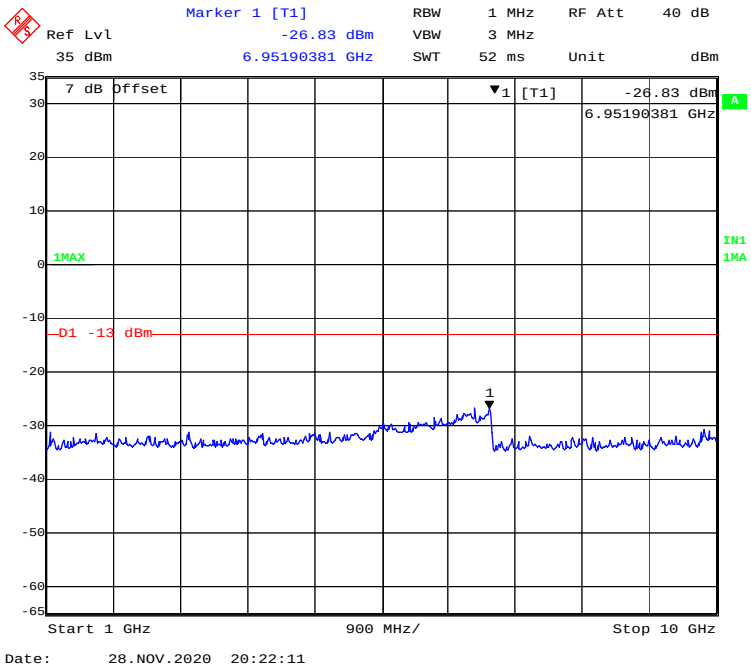
1 GHz – 10 GHz (16QAM, 10.0 MHz, Low Channel)



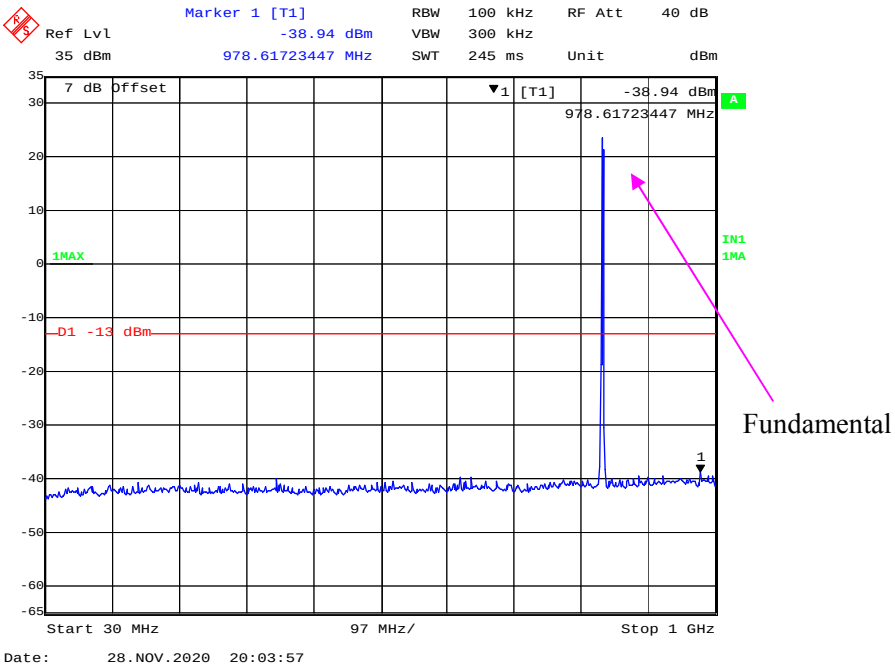
30 MHz – 1 GHz (QPSK, 1.4 MHz, Middle Channel)



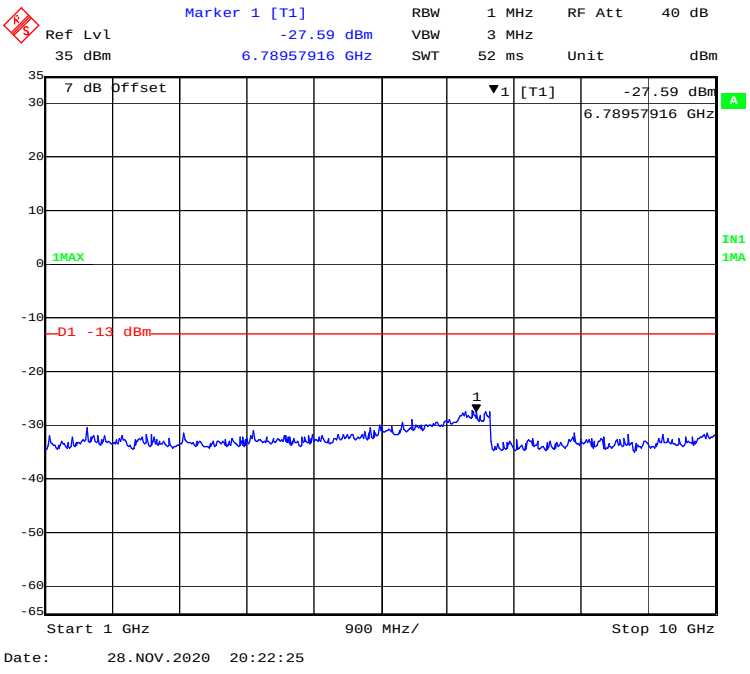
1 GHz – 10 GHz (QPSK, 1.4 MHz, Middle Channel)



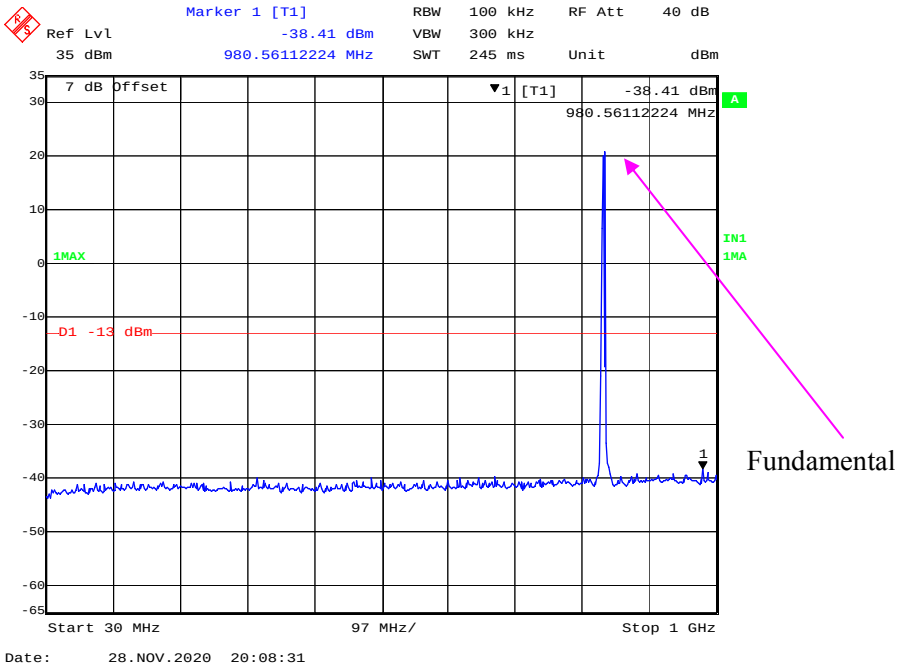
30 MHz – 1 GHz (16QAM, 1.4 MHz, Middle Channel)



1 GHz – 10 GHz (16QAM, 1.4 MHz, Middle Channel)



30 MHz – 1 GHz (QPSK, 3.0 MHz, Middle Channel)



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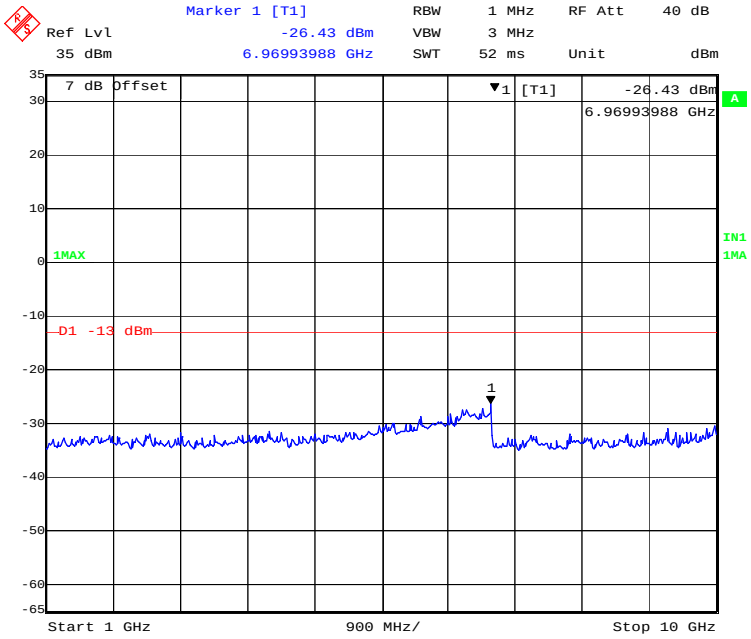
1 GHz – 10 GHz (QPSK, 3.0 MHz, Middle Channel)



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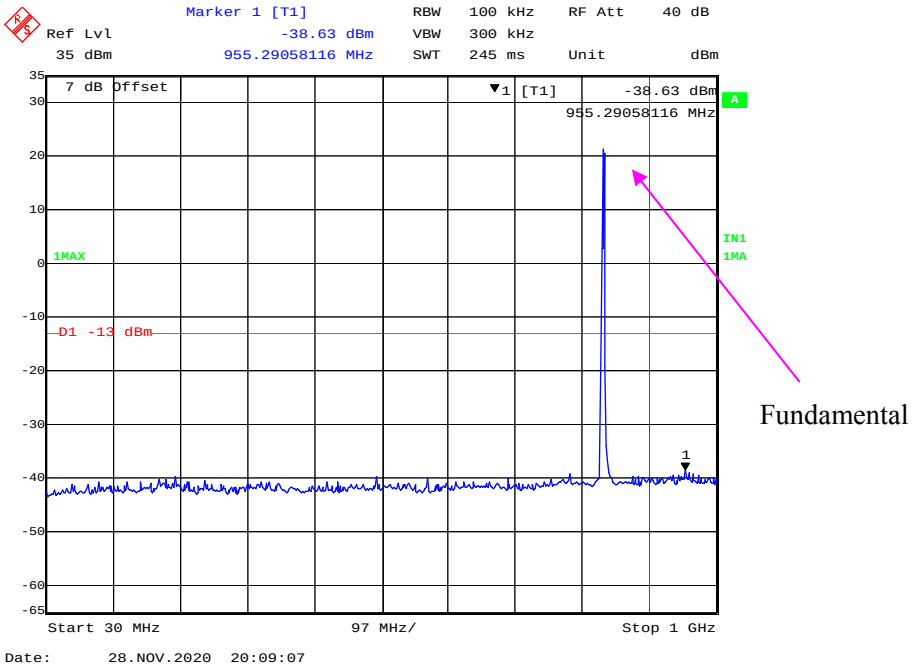
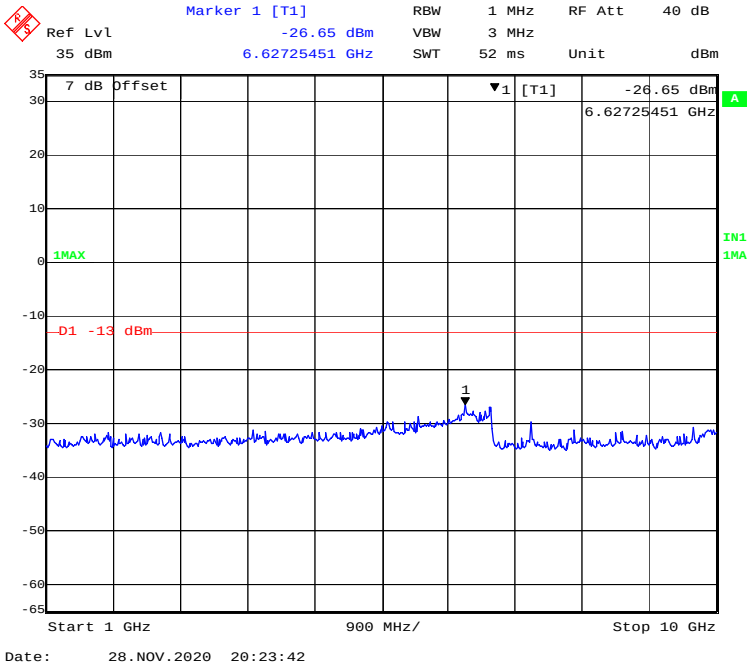
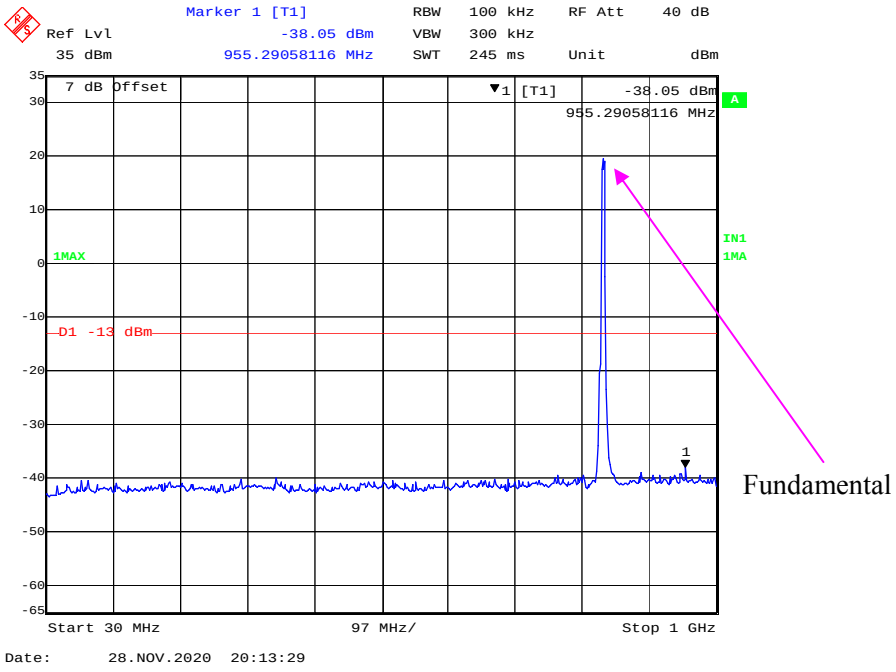
30 MHz – 1 GHz (16QAM, 3.0 MHz, Middle Channel)



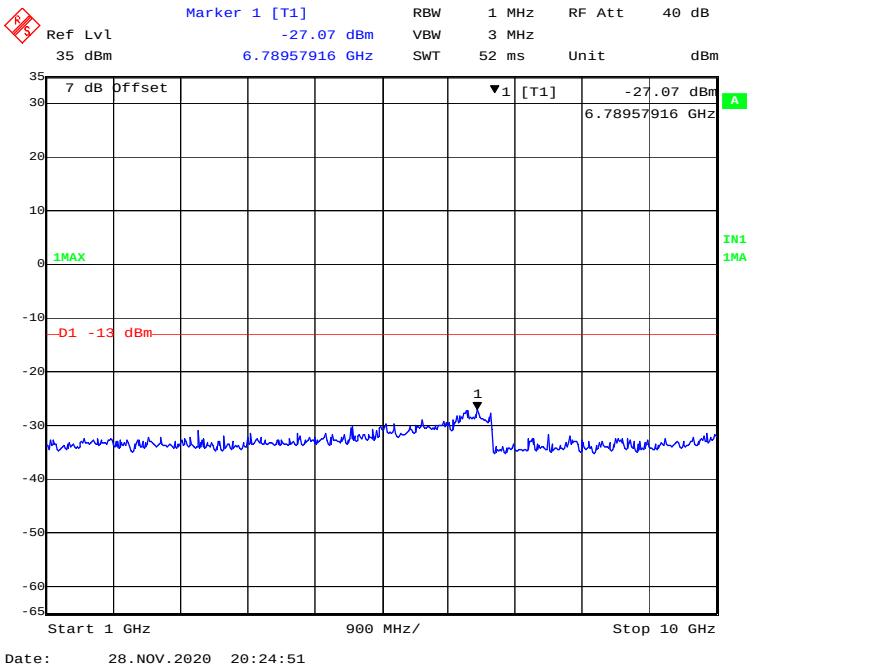
1 GHz – 10 GHz (16QAM, 3.0 MHz, Middle Channel)



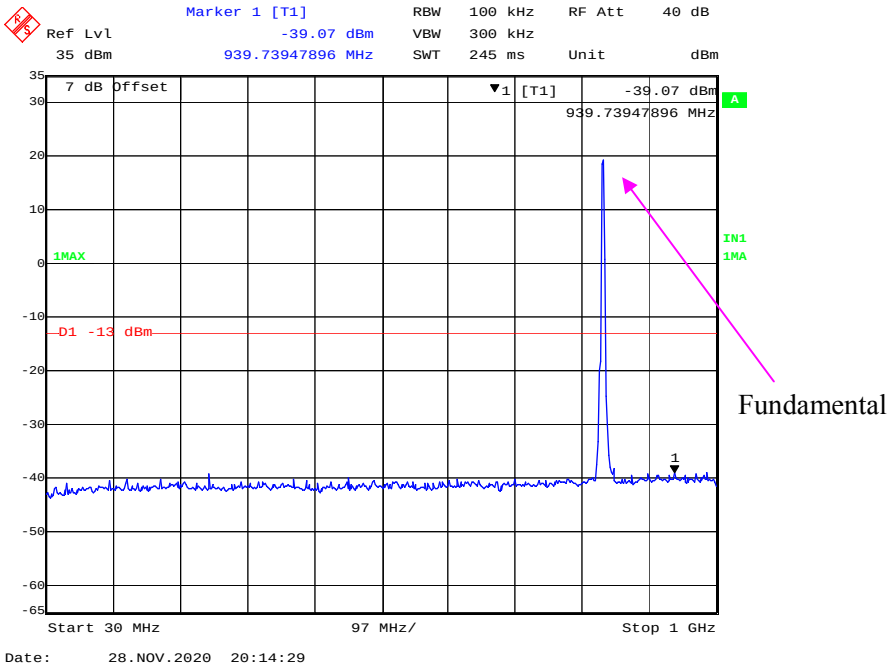
30 MHz – 1 GHz (QPSK, 5.0 MHz, Middle Channel)



1 GHz – 10 GHz (QPSK, 5.0MHz, Middle Channel)



30 MHz – 1 GHz (16QAM, 5.0 MHz, Middle Channel)



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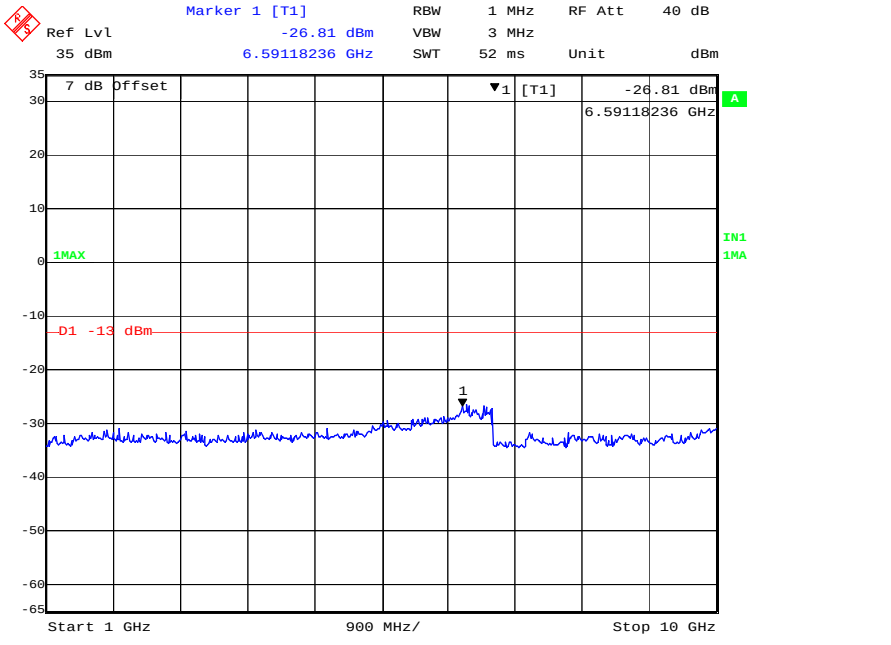
1 GHz – 10 GHz (16QAM, 5.0MHz, Middle Channel)



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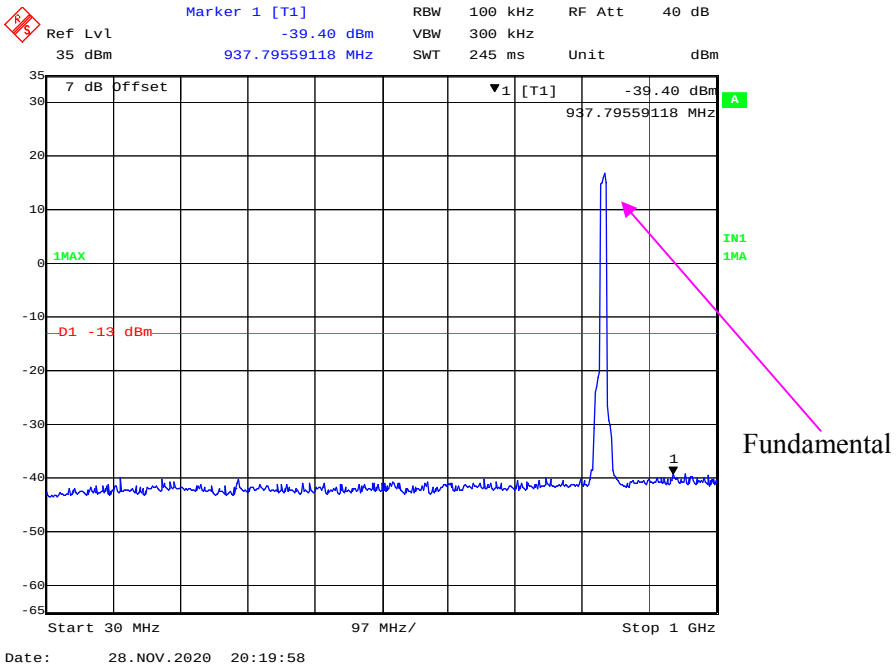
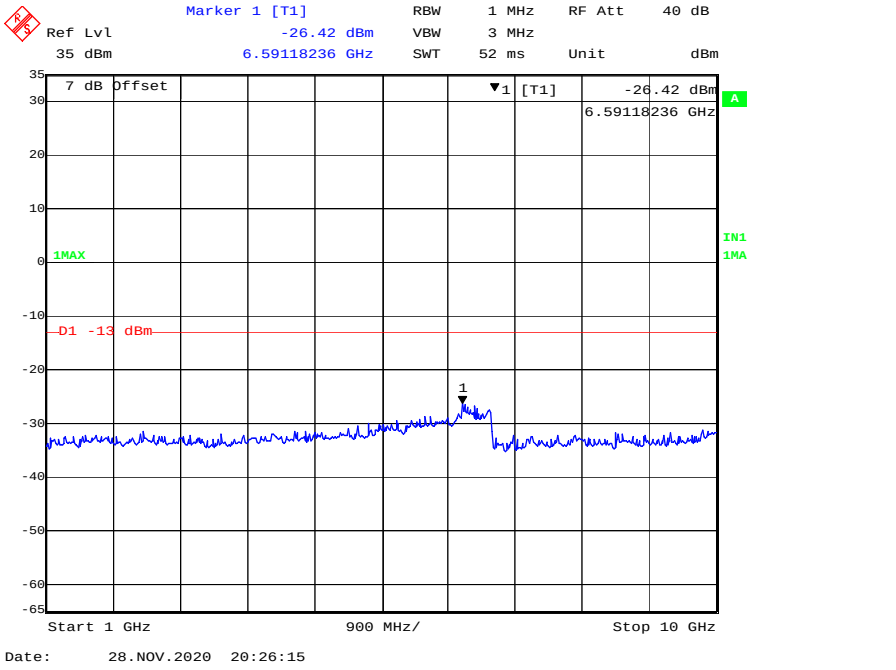
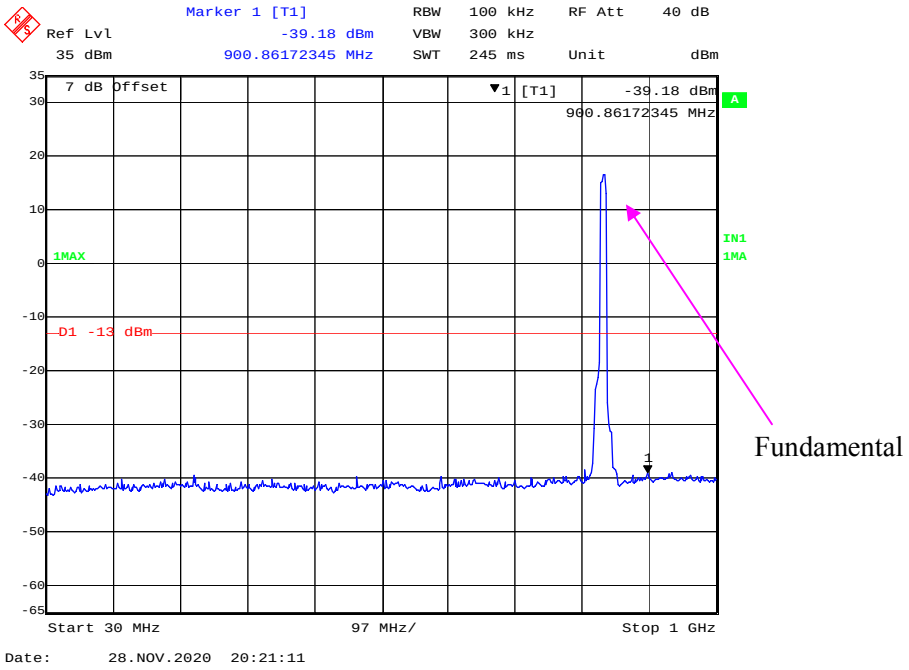
30 MHz – 1 GHz (QPSK, 10.0 MHz, Middle Channel)



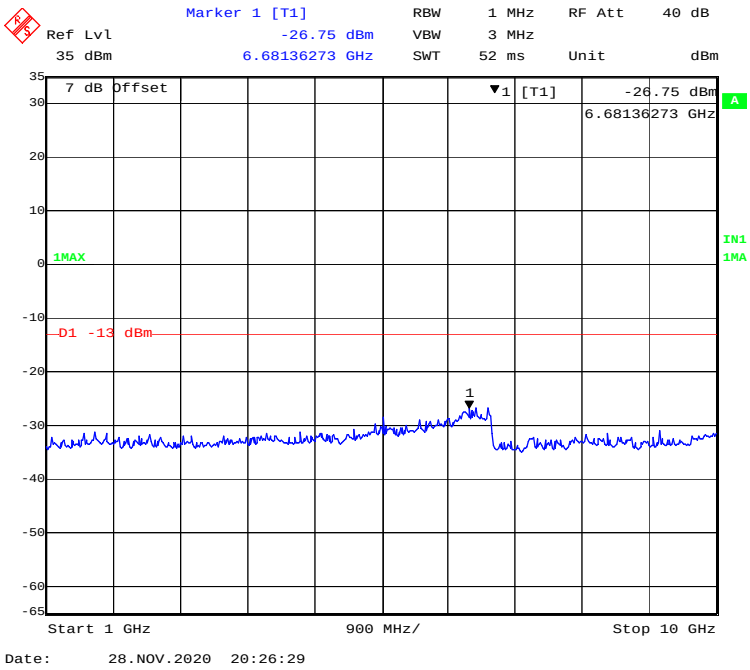
1 GHz – 10 GHz (QPSK, 10.0 MHz, Middle Channel)



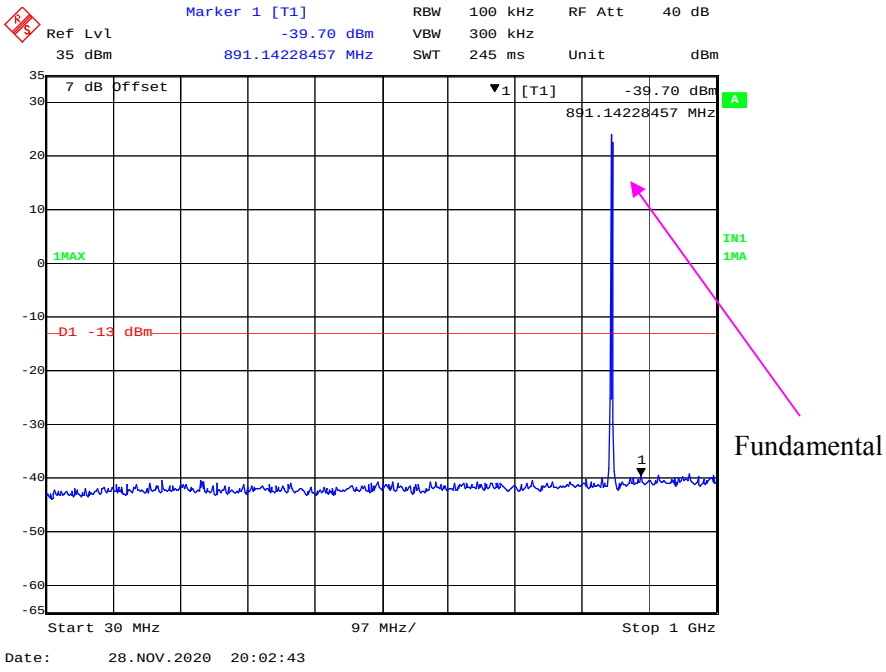
30 MHz – 1 GHz (16QAM, 10.0 MHz, Middle Channel)



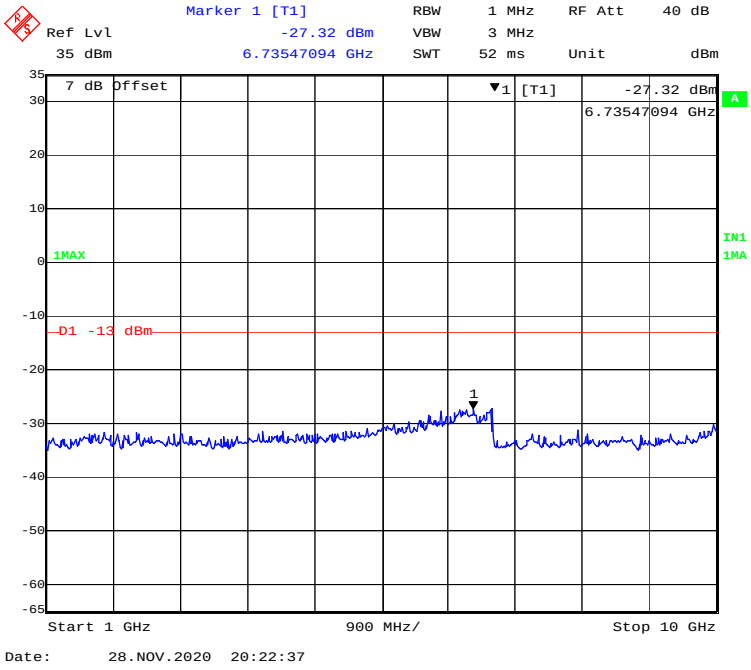
1 GHz – 10 GHz (16QAM, 10.0 MHz, Middle Channel)



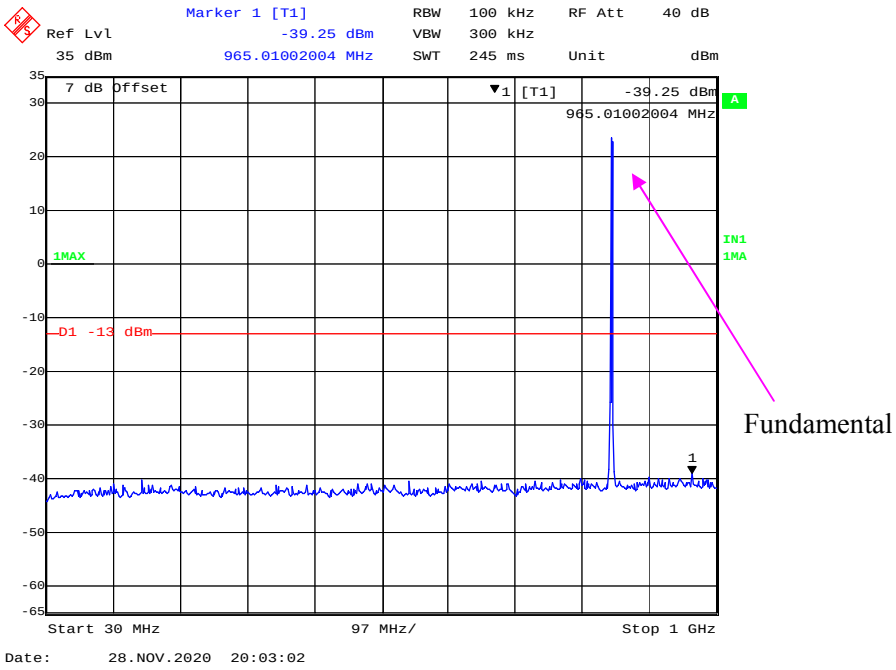
30 MHz – 1 GHz (QPSK, 1.4 MHz, High Channel)



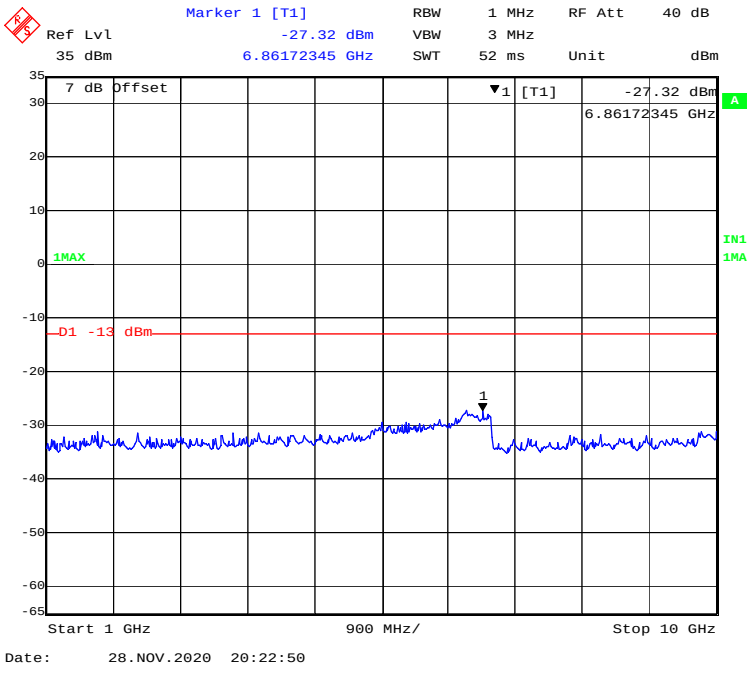
1 GHz – 10 GHz (QPSK, 1.4 MHz, High Channel)



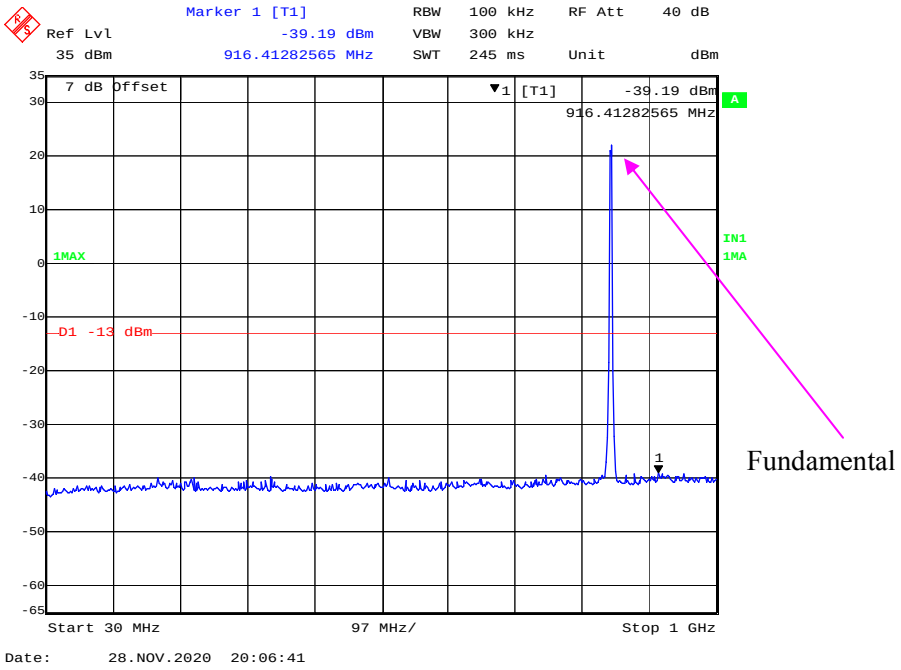
30 MHz – 1 GHz (16QAM, 1.4 MHz, High Channel)



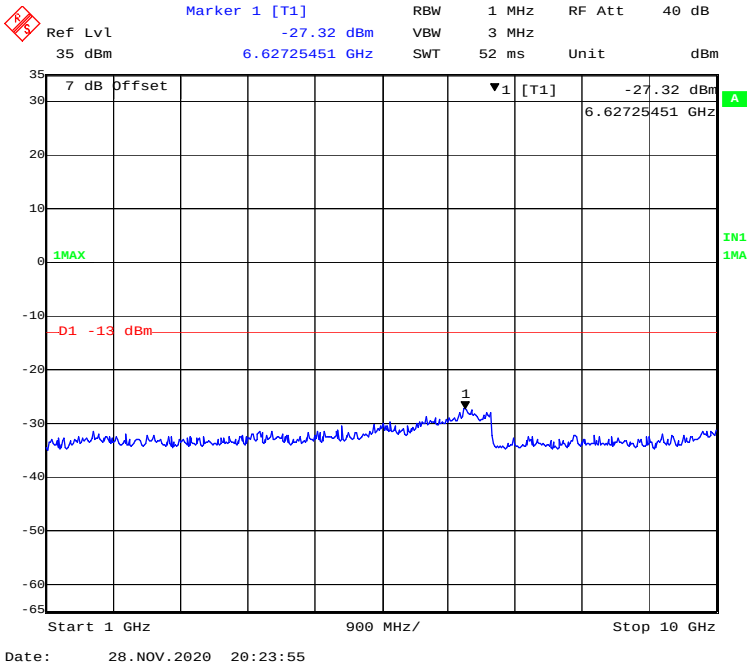
1 GHz – 10 GHz (16QAM, 1.4 MHz, High Channel)



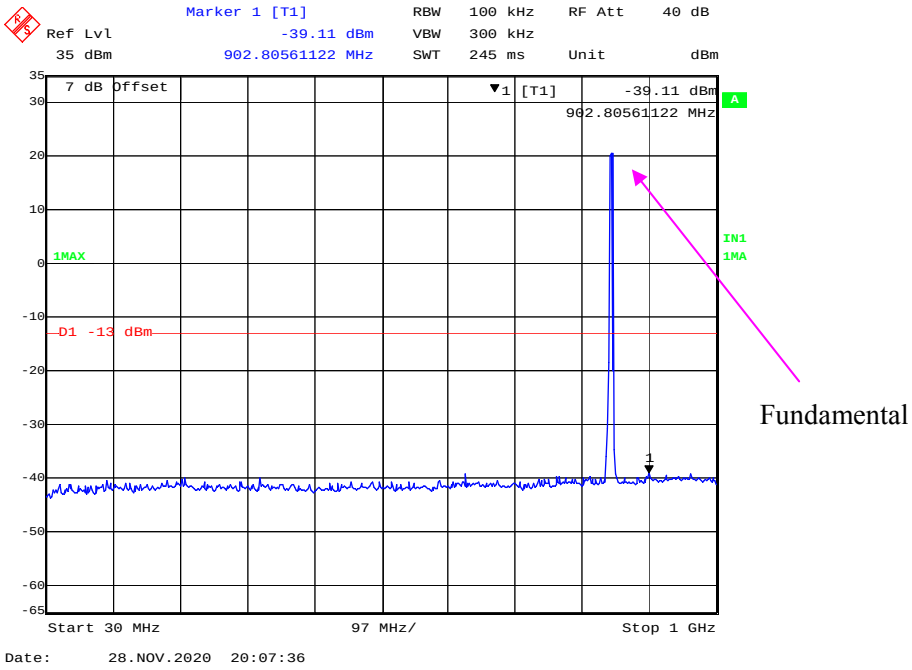
30 MHz – 1 GHz (QPSK, 3.0 MHz, High Channel)



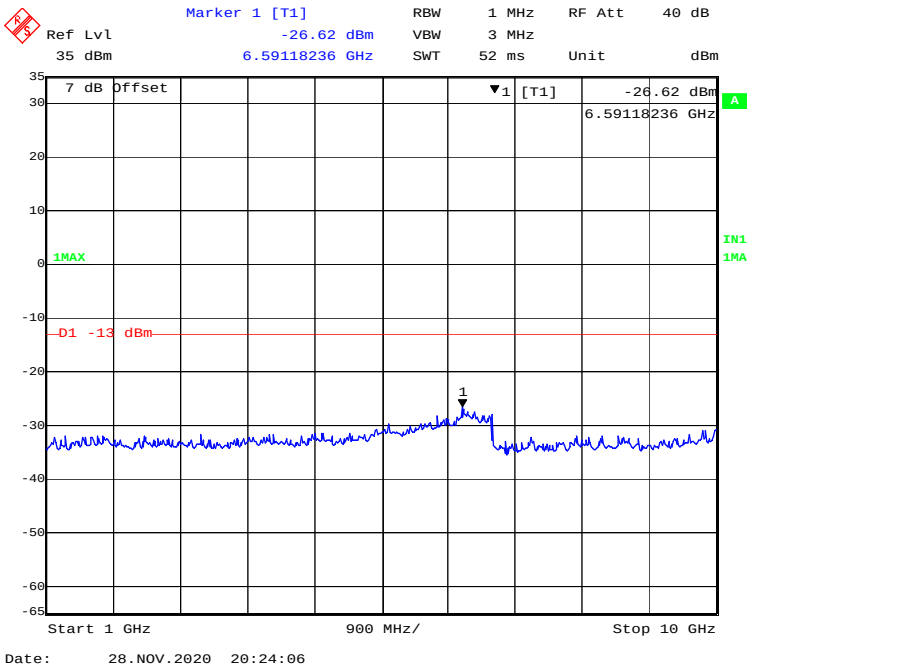
1 GHz – 10 GHz (QPSK, 3.0 MHz, High Channel)



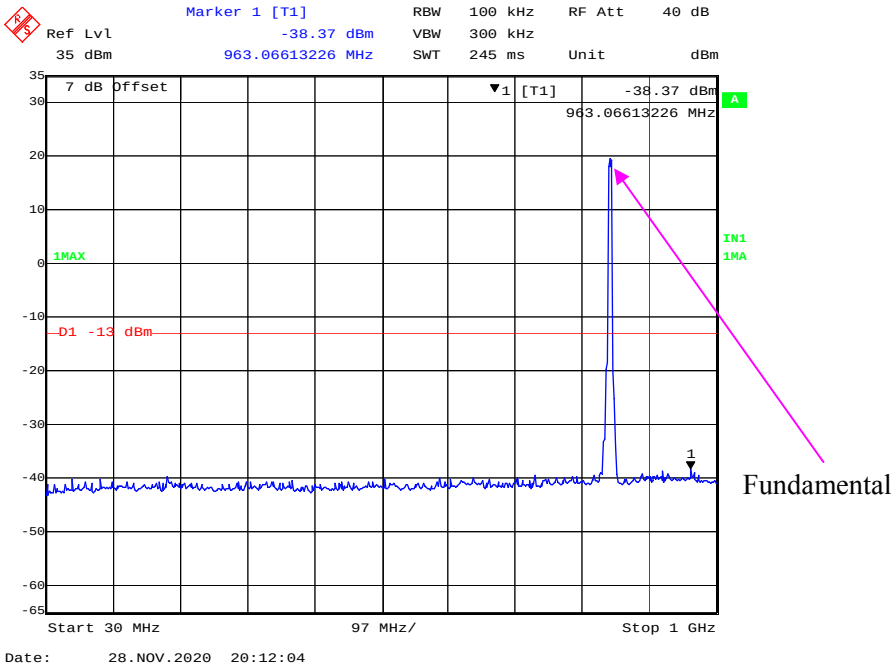
30 MHz – 1 GHz (16QAM, 3.0 MHz, High Channel)



1 GHz – 10 GHz (16QAM, 3.0 MHz, High Channel)



30 MHz – 1 GHz (QPSK, 5.0 MHz, High Channel)



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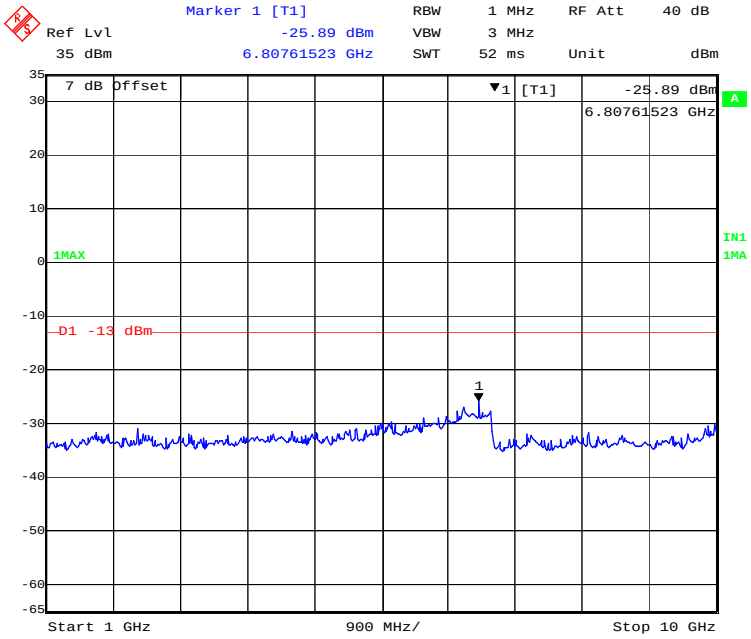
1 GHz – 10 GHz (QPSK, 5.0MHz, High Channel)



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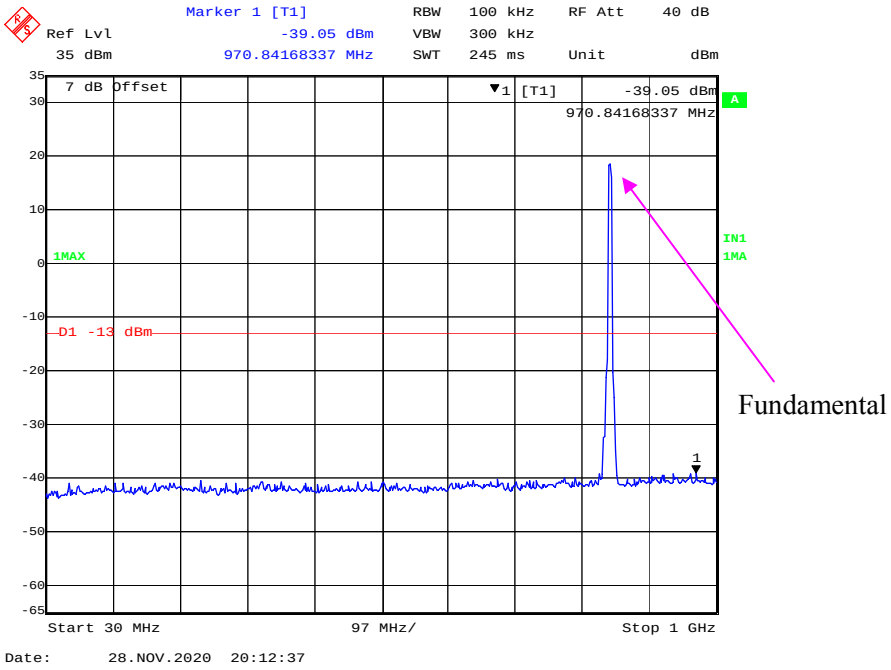
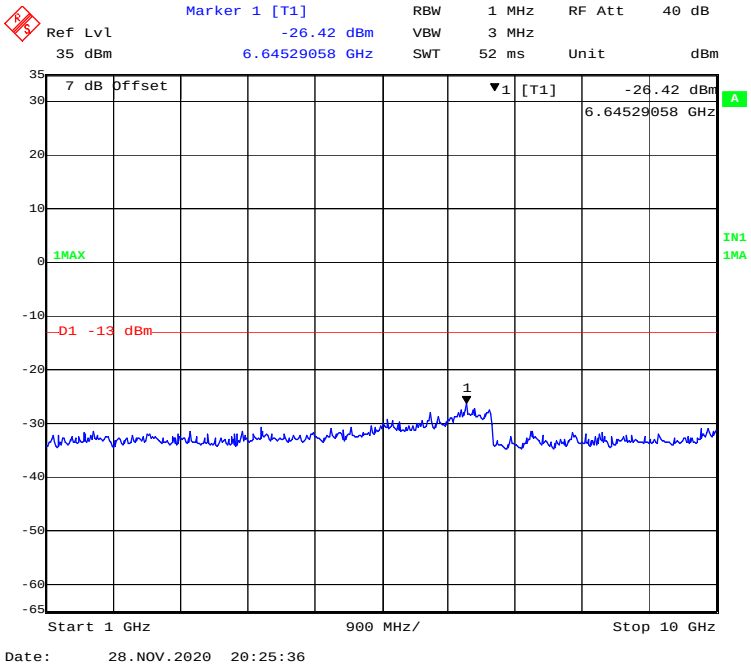
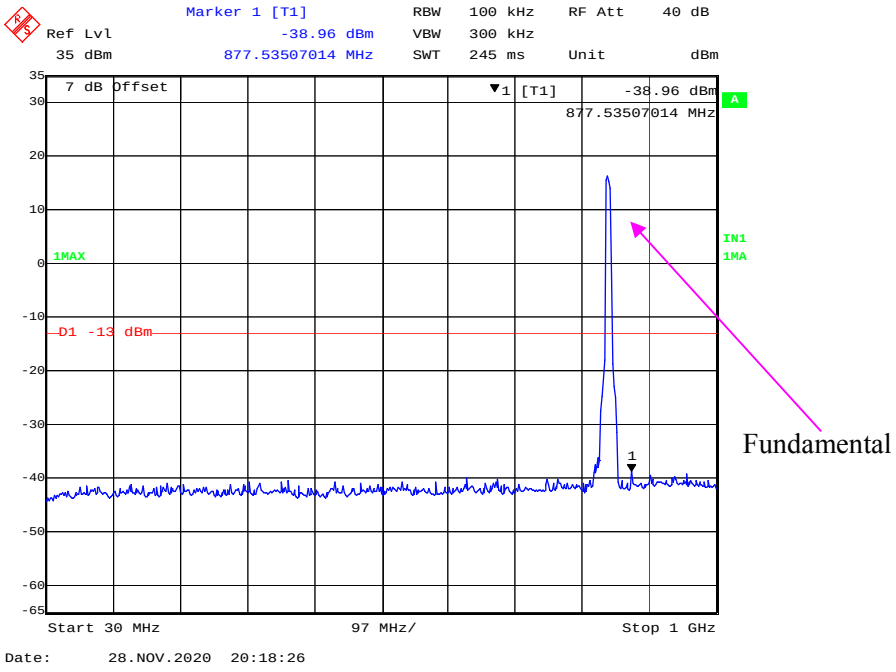
30 MHz – 1 GHz (16QAM, 5.0 MHz, High Channel)



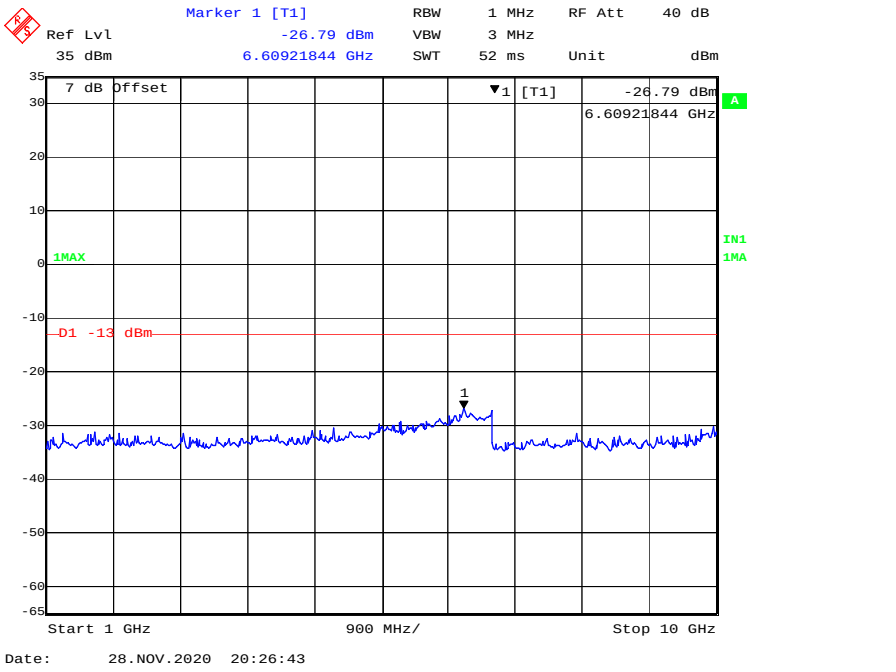
1 GHz – 10 GHz (16QAM, 5.0MHz, High Channel)



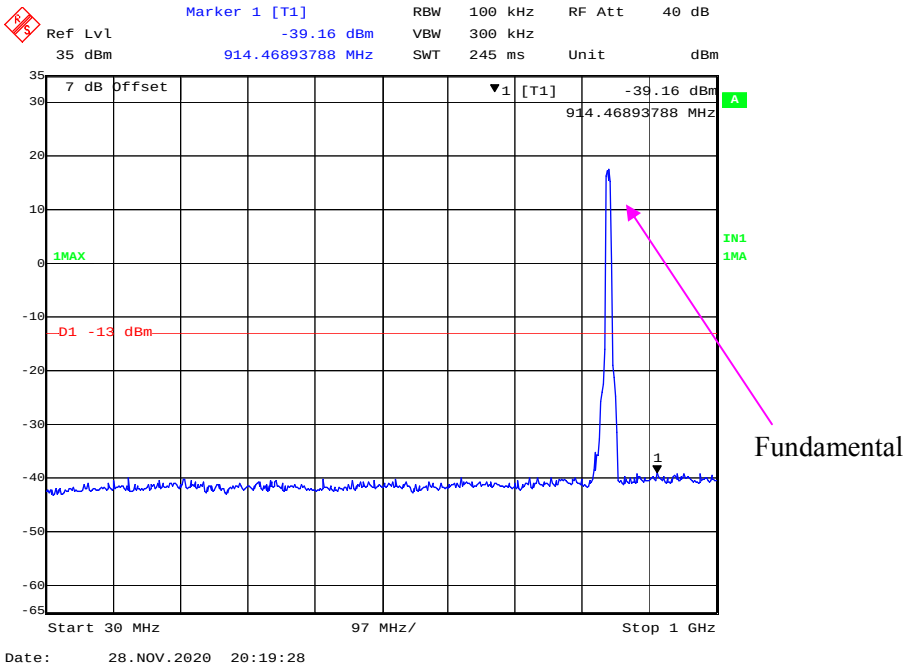
30 MHz – 1 GHz (QPSK, 10.0 MHz, High Channel)



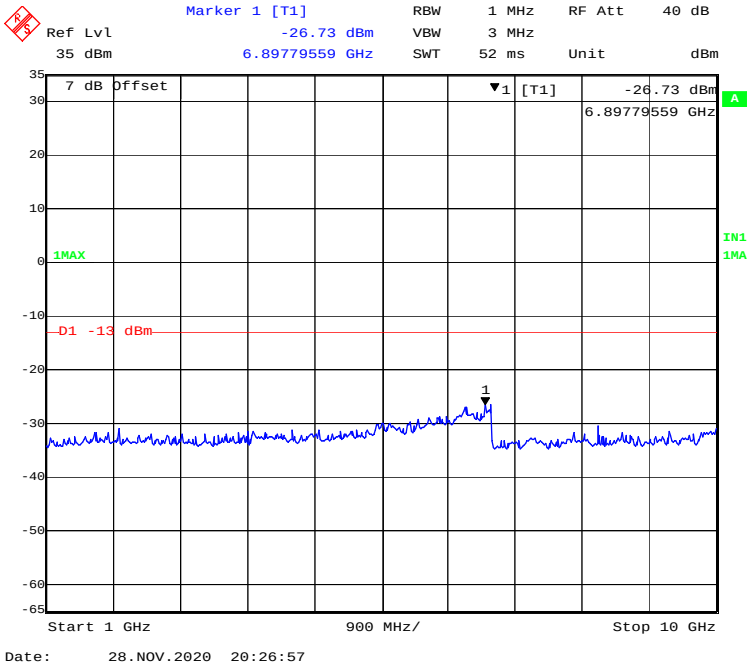
1 GHz – 10 GHz (QPSK, 10.0 MHz, High Channel)



30 MHz – 1 GHz (16QAM, 10.0 MHz, High Channel)

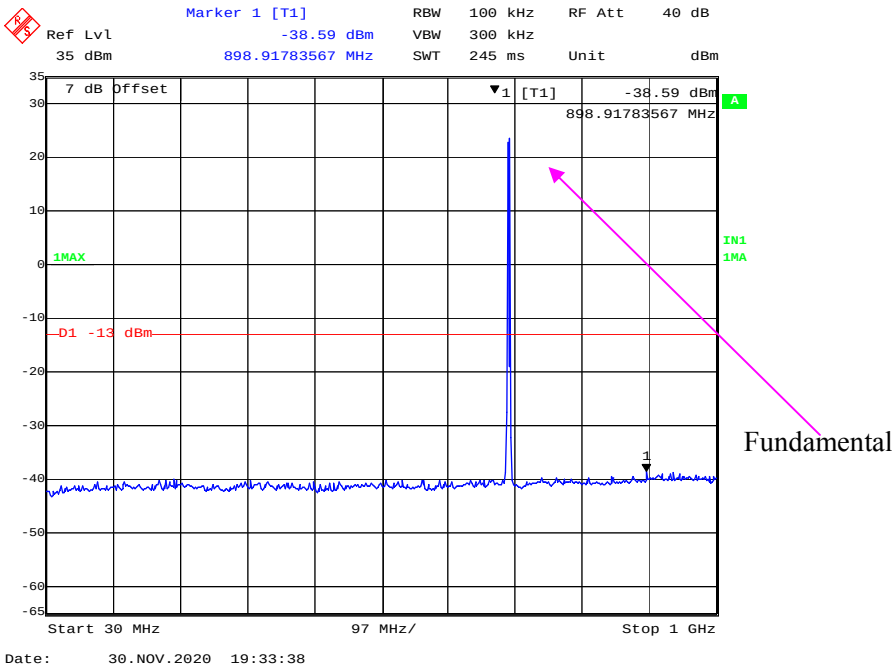


1 GHz – 10 GHz (16QAM, 10.0 MHz, High Channel)

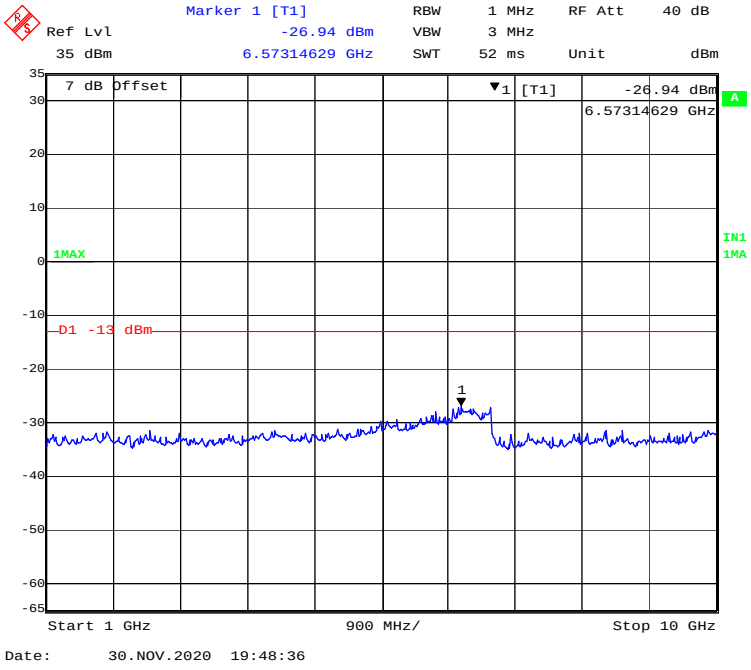


LTE Band 12:

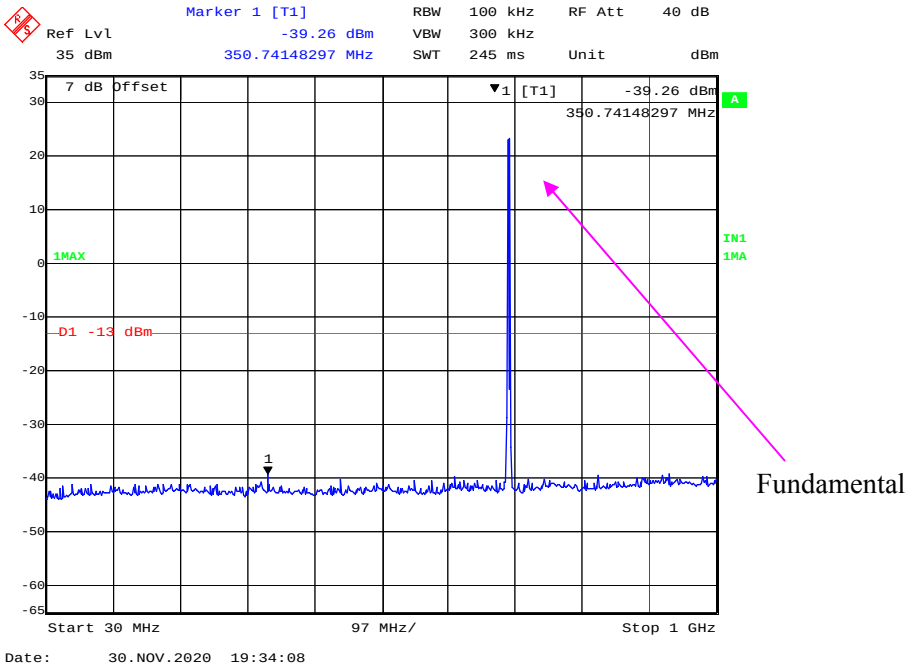
30 MHz - 1 GHz (1.4 MHz, QPSK, Low Channel)



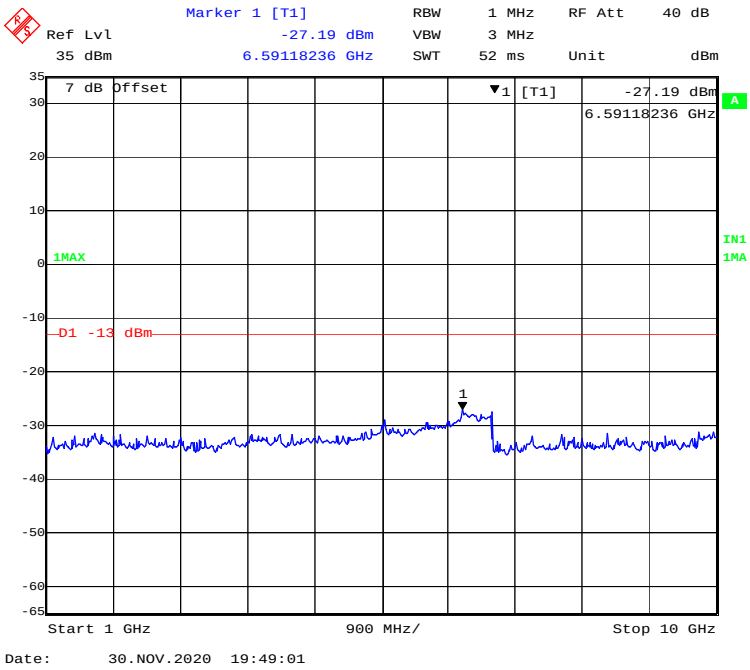
1 GHz – 10 GHz (1.4 MHz, QPSK, Low Channel)



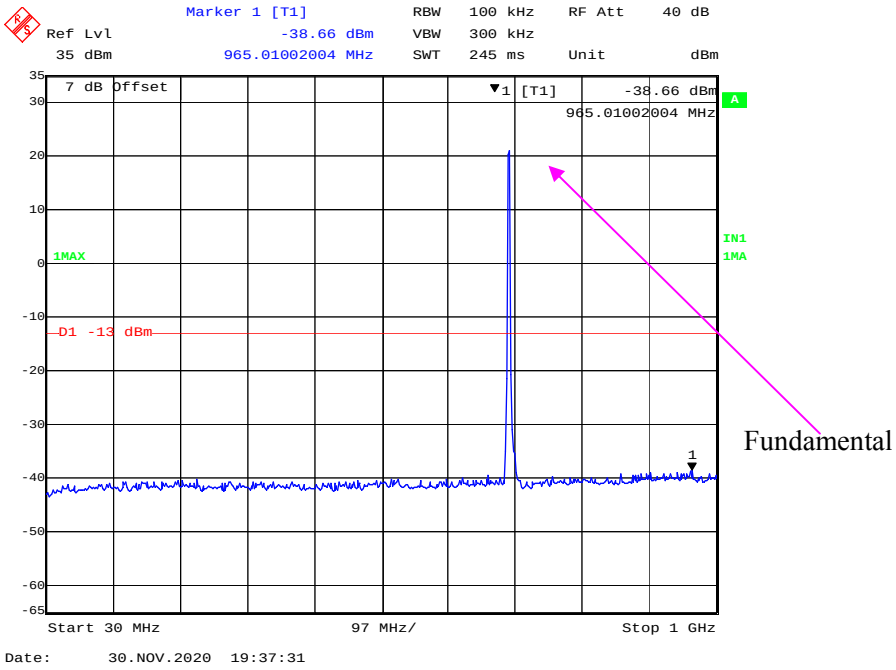
30 MHz - 1 GHz (1.4 MHz, 16-QAM, Low Channel)



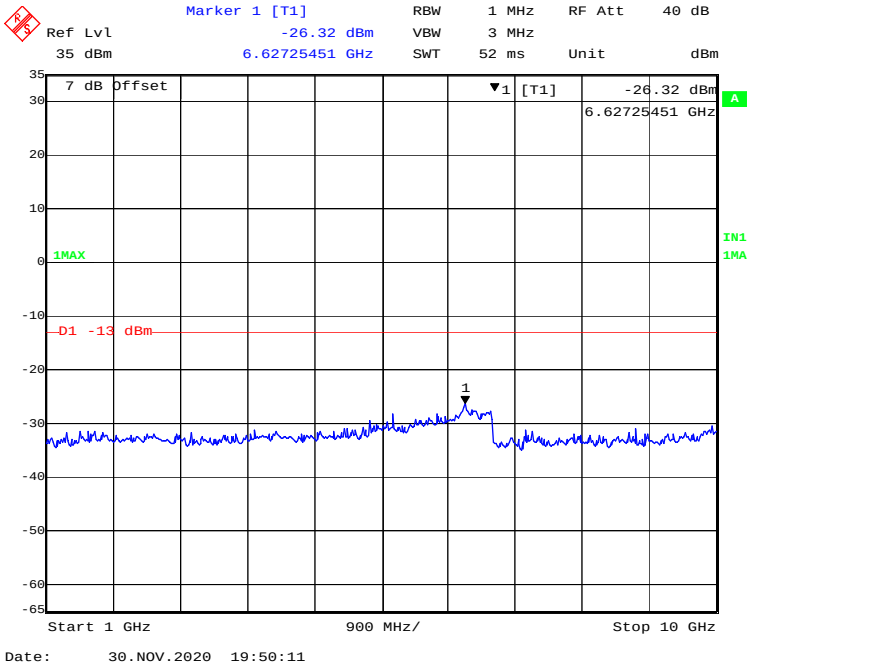
1 GHz – 10 GHz (1.4 MHz, 16-QAM, Low Channel)



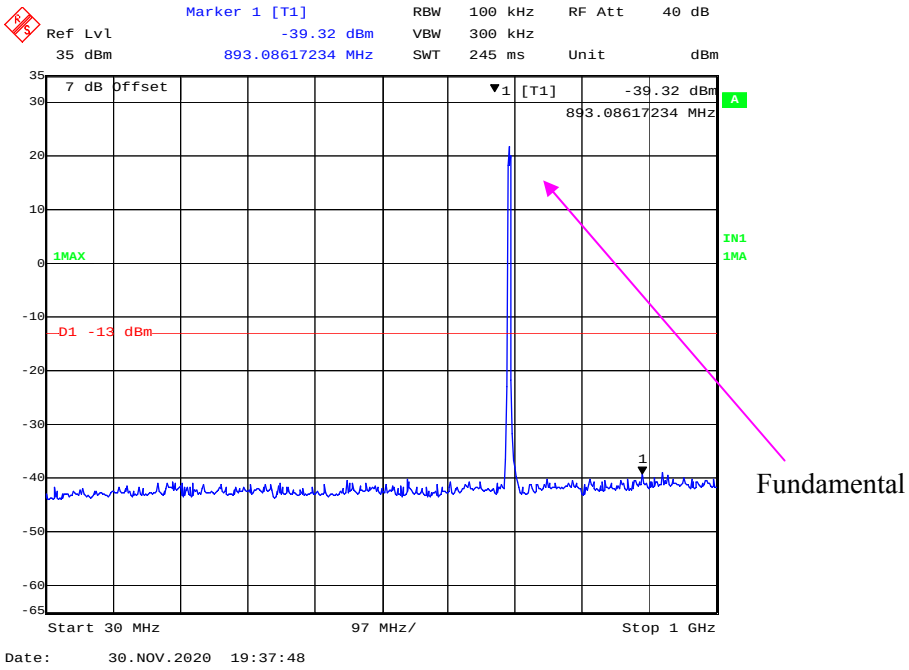
30 MHz - 1 GHz (3 MHz, QPSK, Low Channel)



1 GHz – 10 GHz (3 MHz, QPSK, Low Channel)



30 MHz - 1 GHz (3 MHz, 16-QAM, Low Channel)



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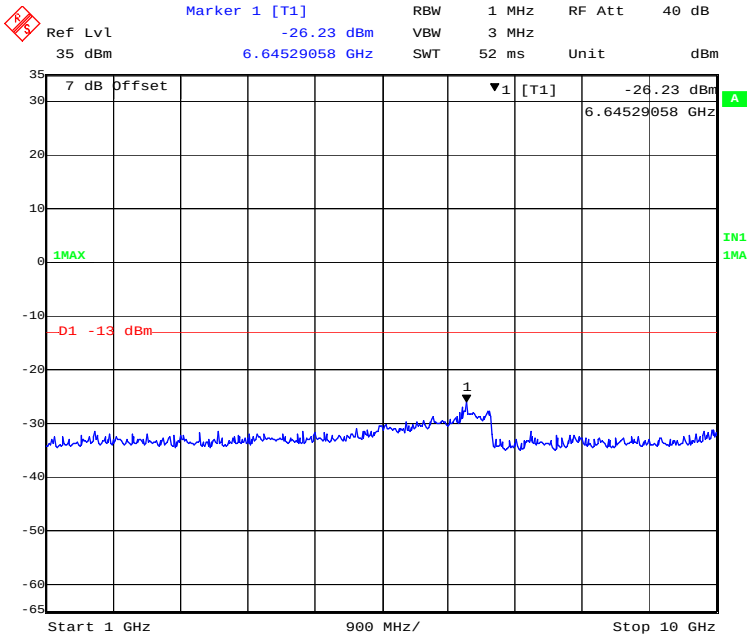
1 GHz – 10 GHz (3 MHz, 16-QAM, Low Channel)



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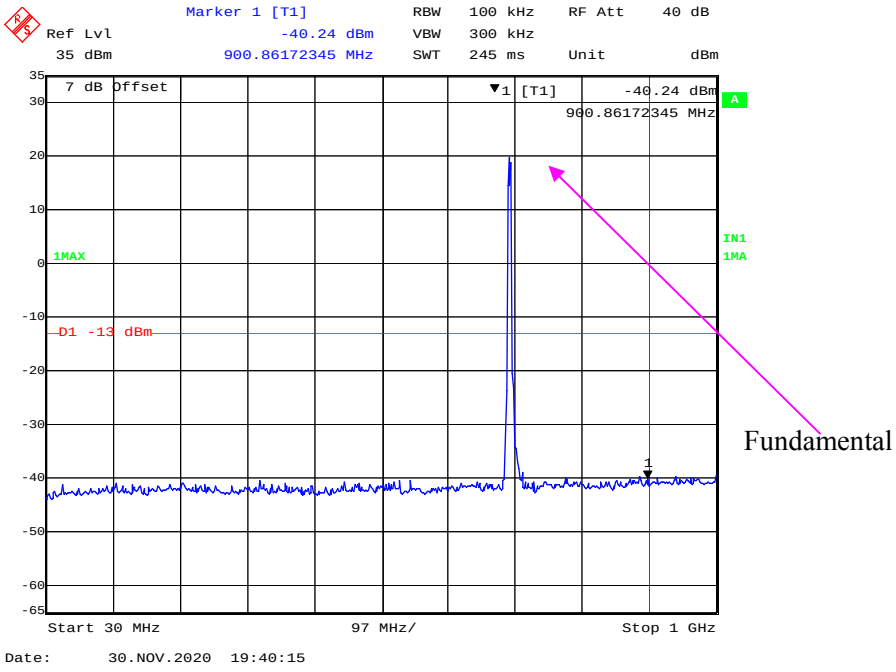
30 MHz - 1 GHz (5 MHz, QPSK, Low Channel)



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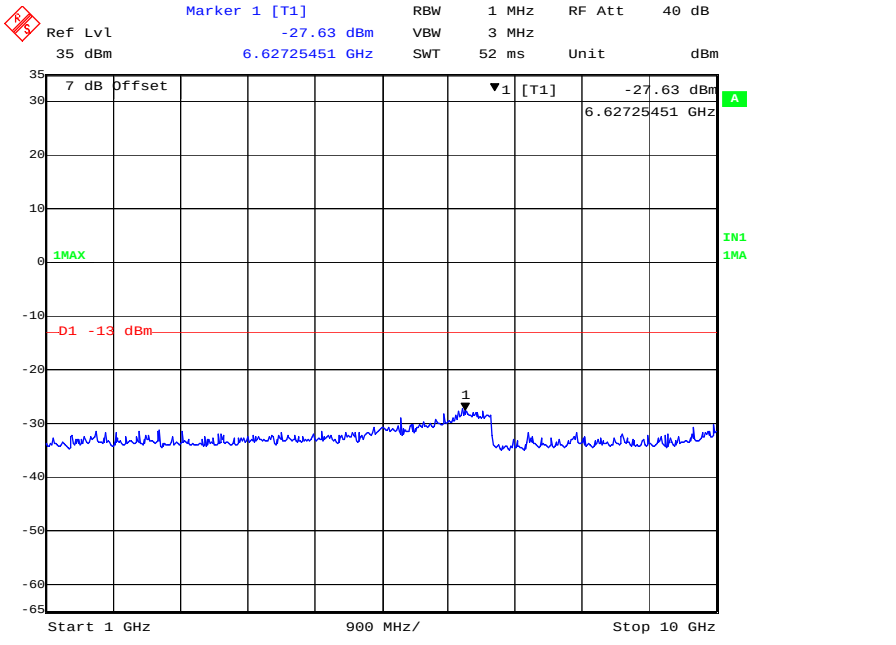
1 GHz – 10 GHz (5 MHz, QPSK, Low Channel)



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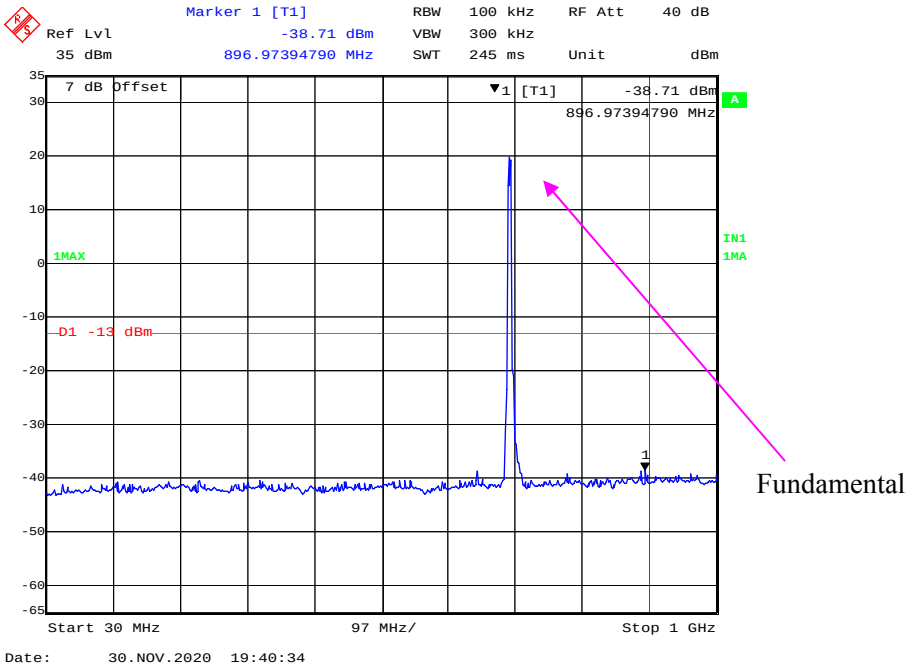
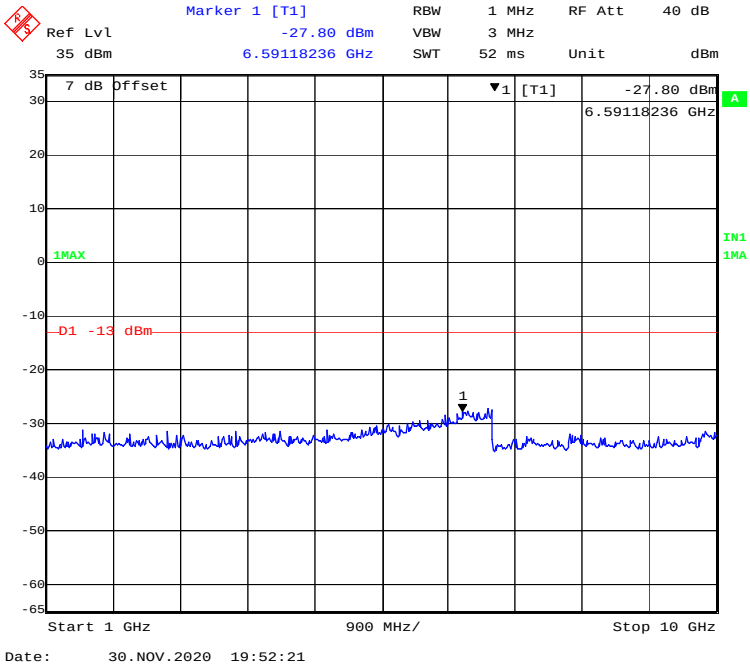
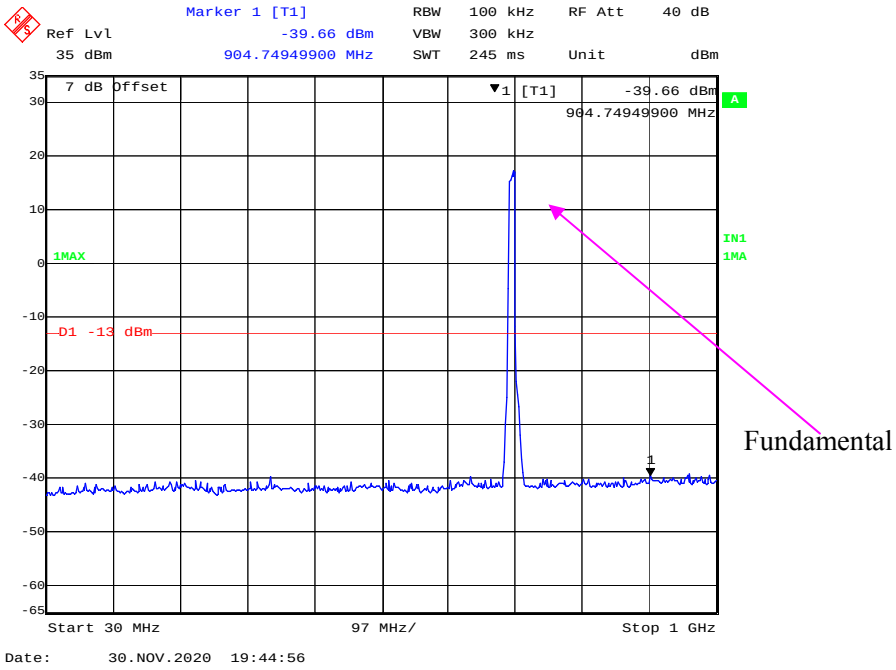
30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)



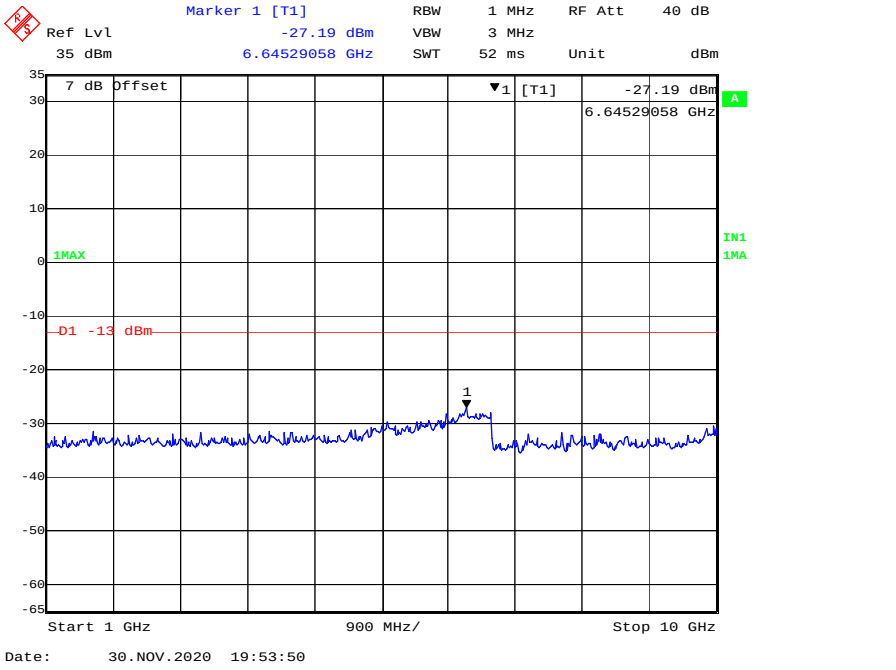
1 GHz – 10 GHz (5 MHz, 16-QAM, Low Channel)



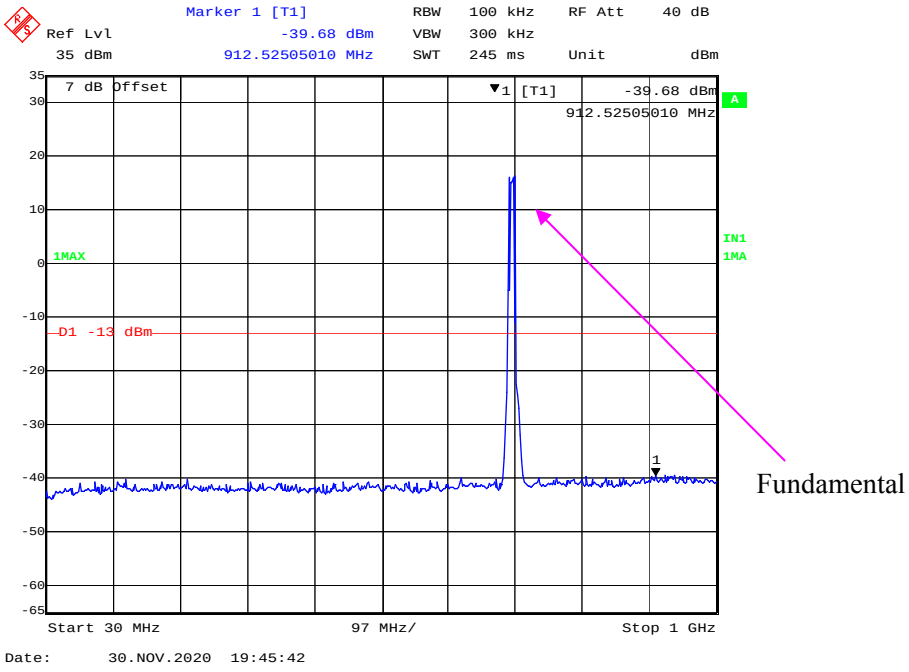
30 MHz - 1 GHz (10 MHz, QPSK, Low Channel)



1 GHz – 10 GHz (10 MHz, QPSK, Low Channel)



30 MHz - 1 GHz (10 MHz, 16-QAM, Low Channel)



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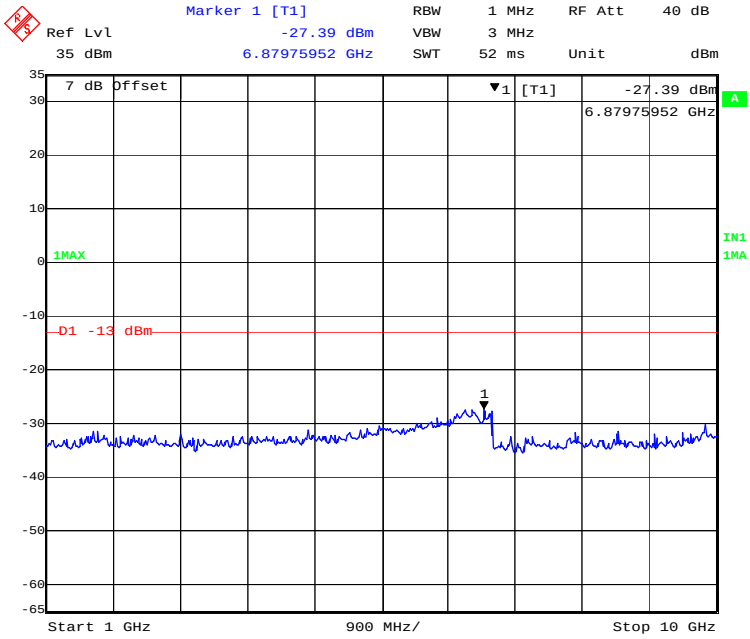
1 GHz – 10 GHz (10 MHz, 16-QAM, Low Channel)



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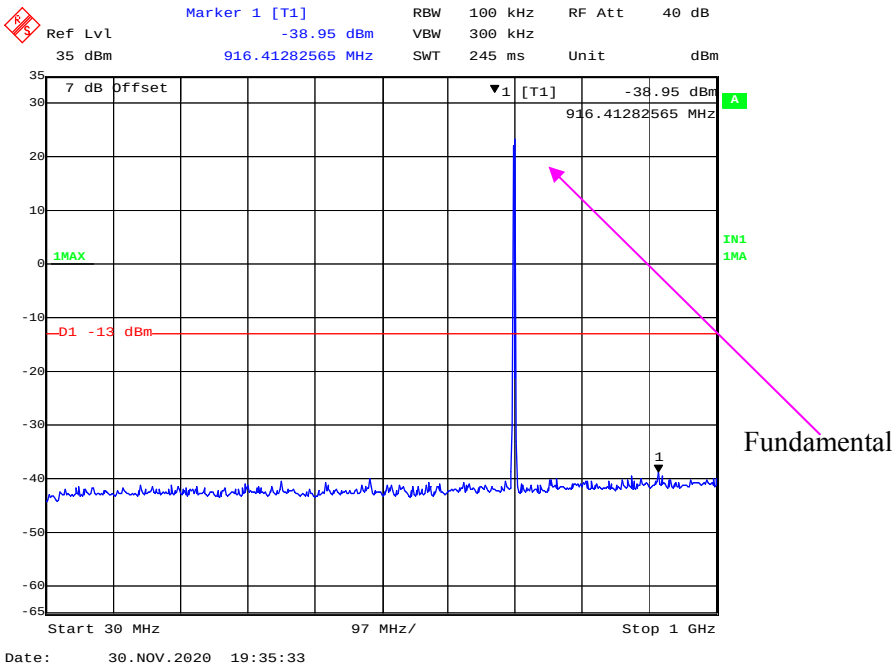
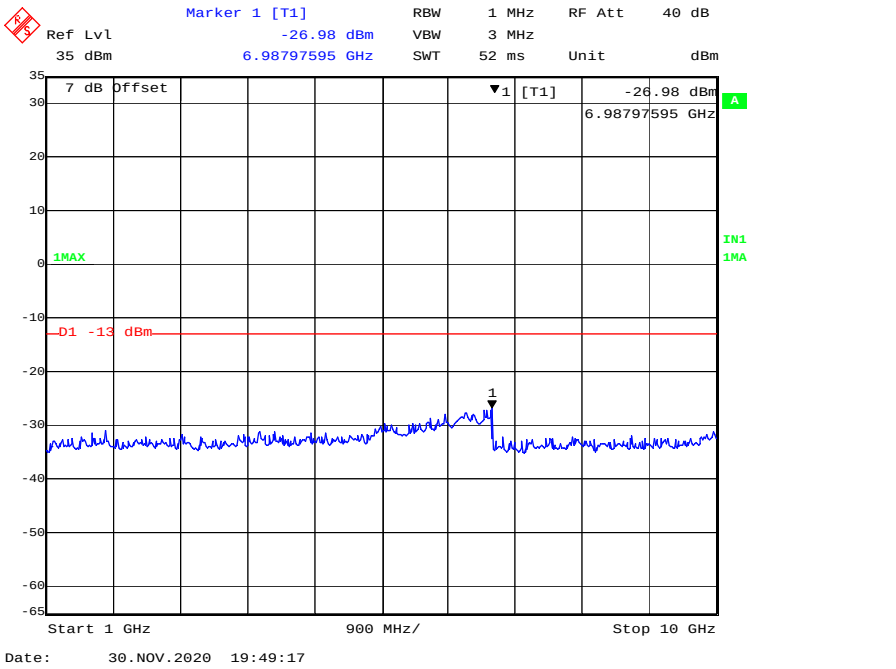
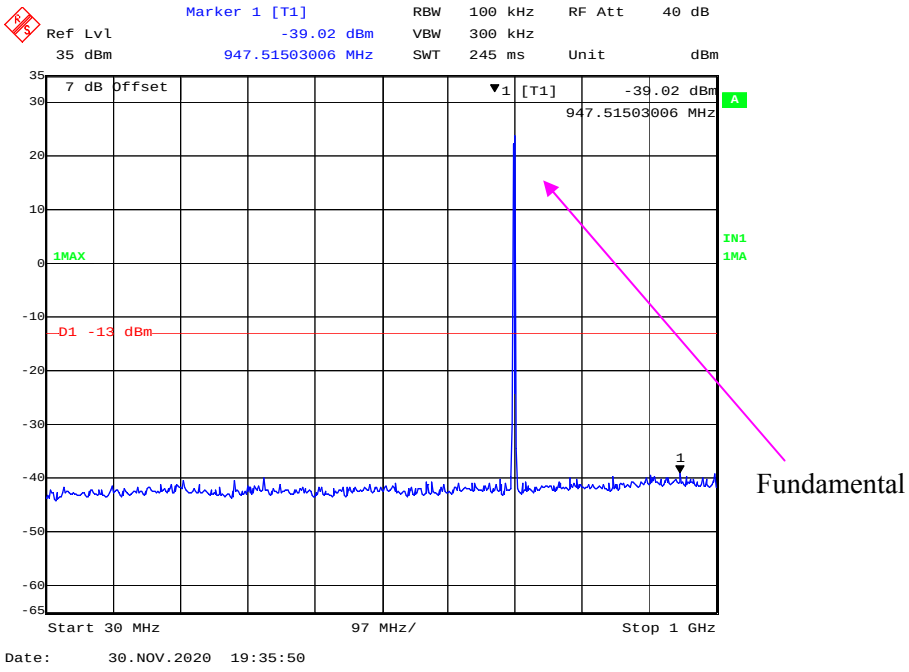
30 MHz - 1 GHz (1.4 MHz, QPSK, Middle Channel)



1 GHz – 10 GHz (1.4 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)



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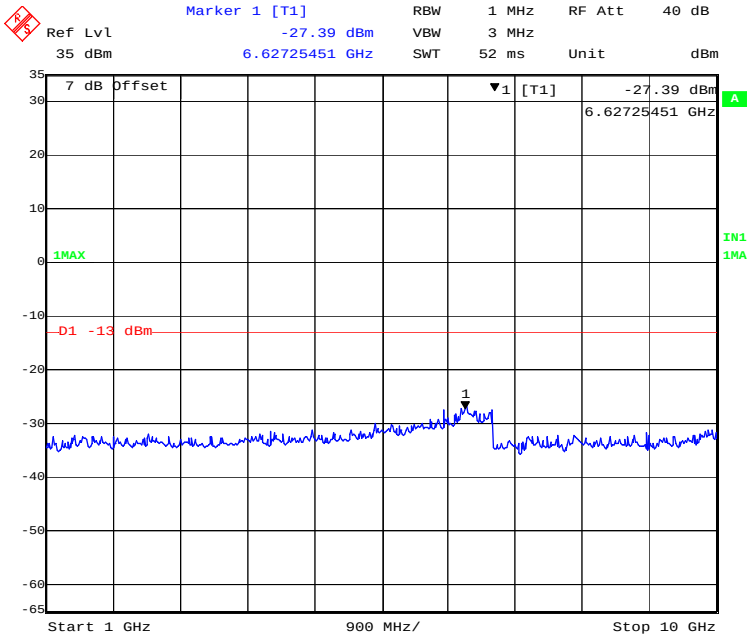
1 GHz – 10 GHz (1.4 MHz, 16-QAM, Middle Channel)



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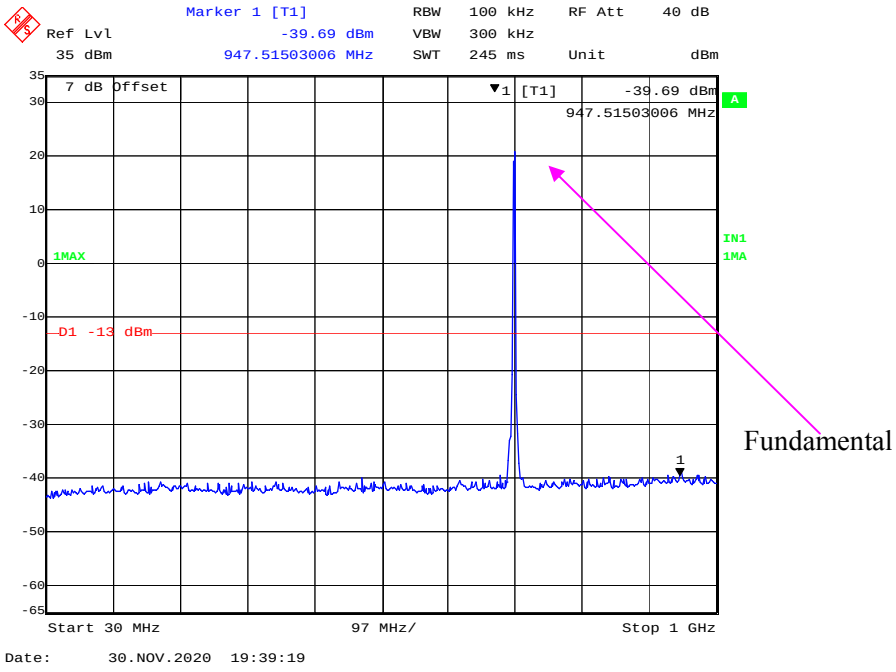
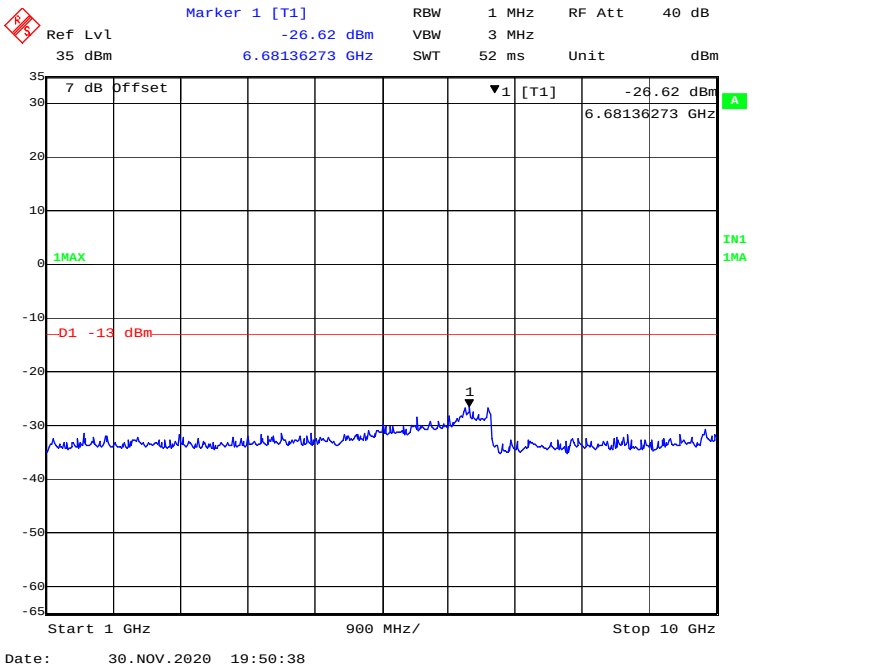
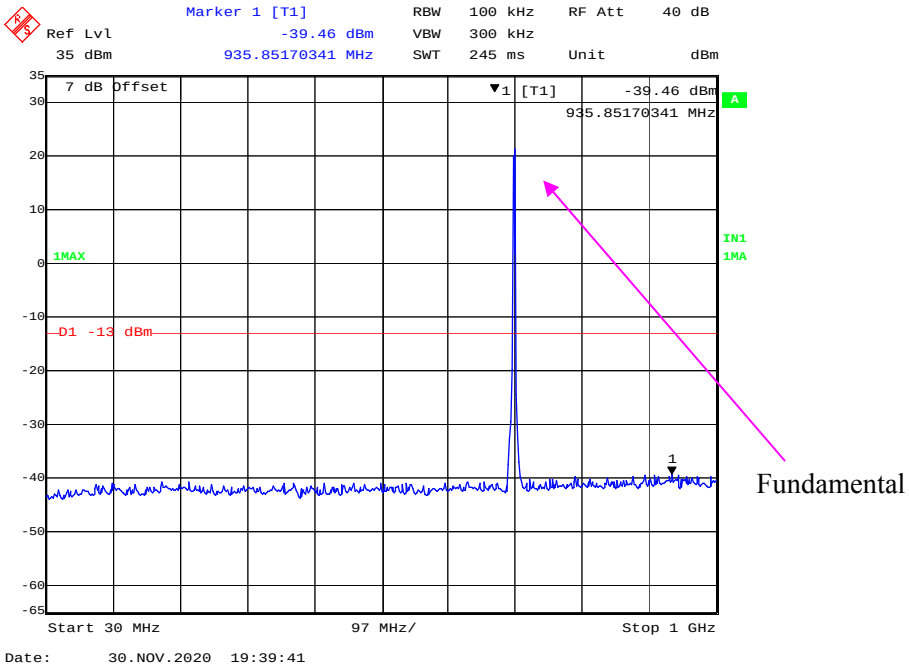
30 MHz - 1 GHz (3 MHz, QPSK, Middle Channel)



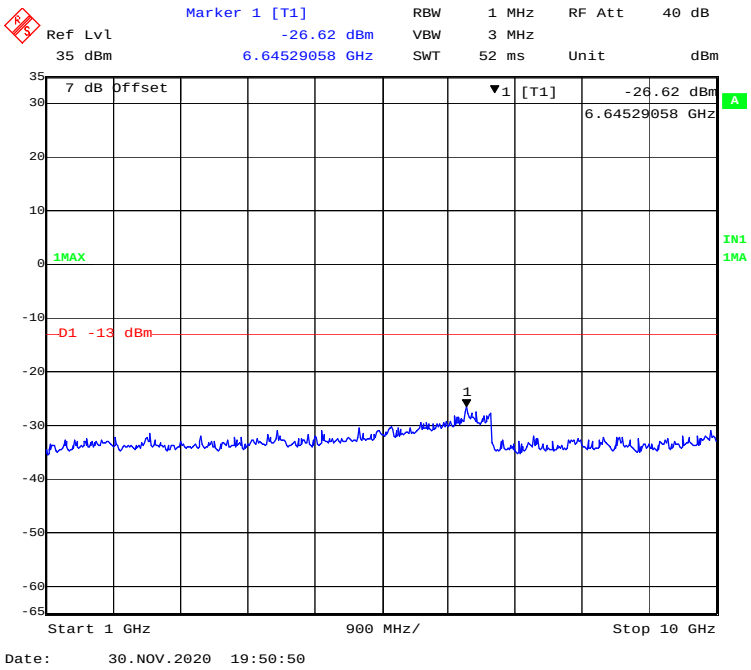
1 GHz – 10 GHz (3 MHz, QPSK, Middle Channel)



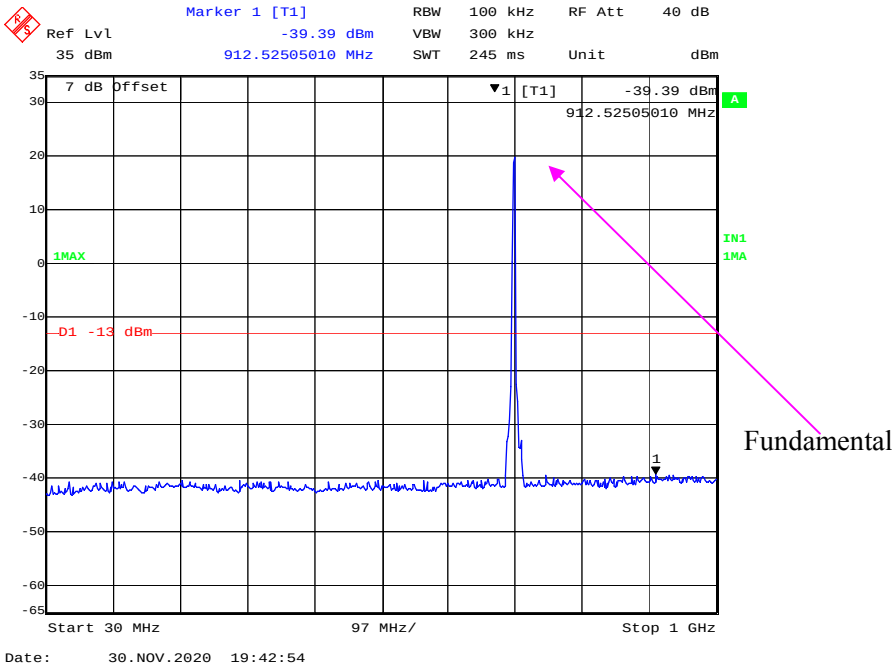
30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)



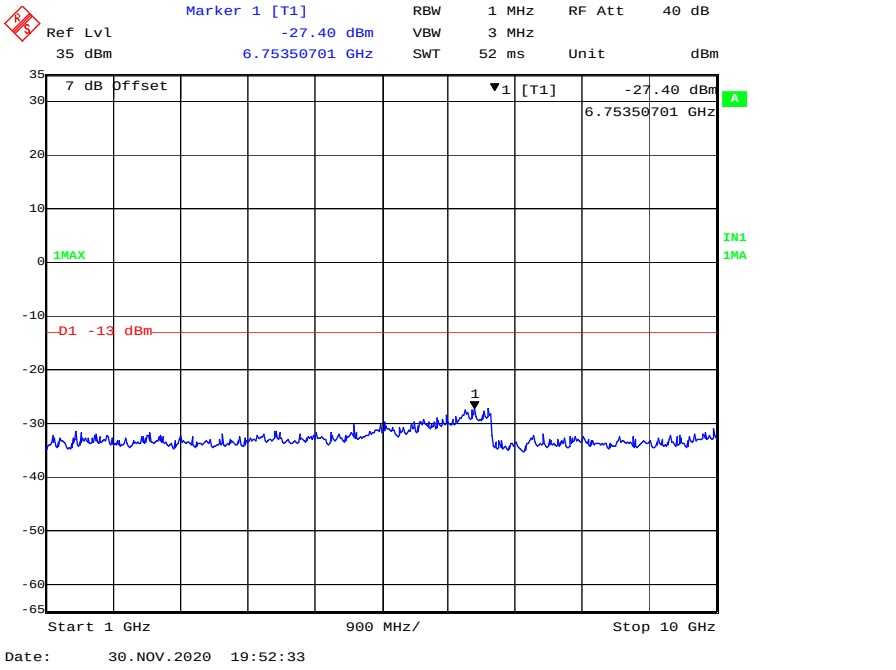
1 GHz – 10 GHz (3 MHz, 16-QAM, Middle Channel)



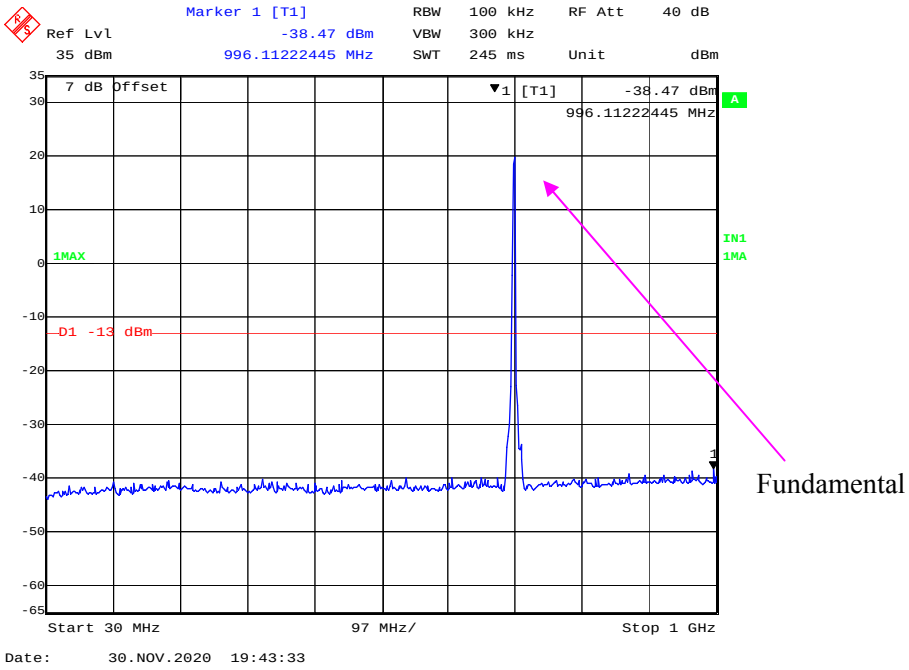
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



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1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)

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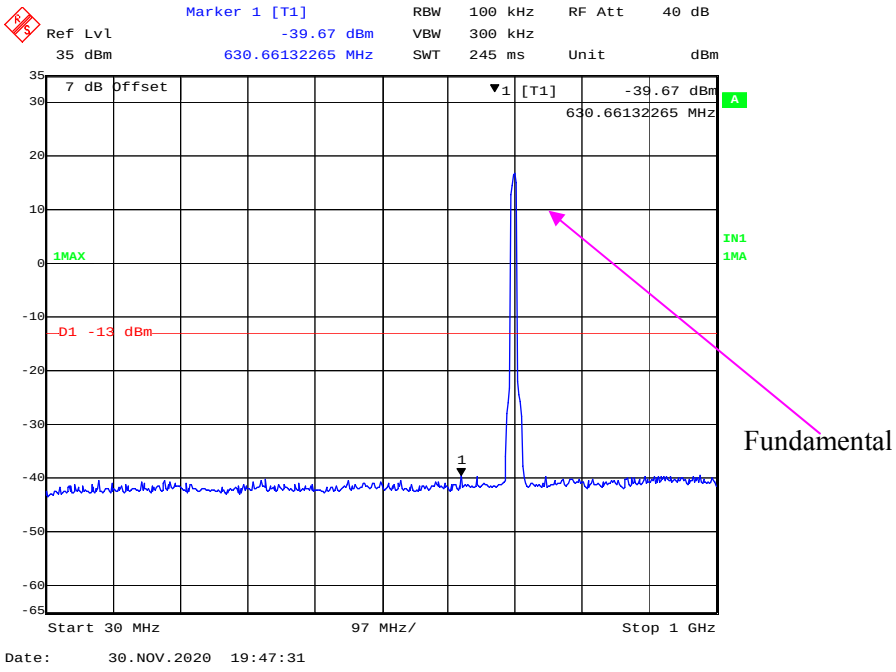
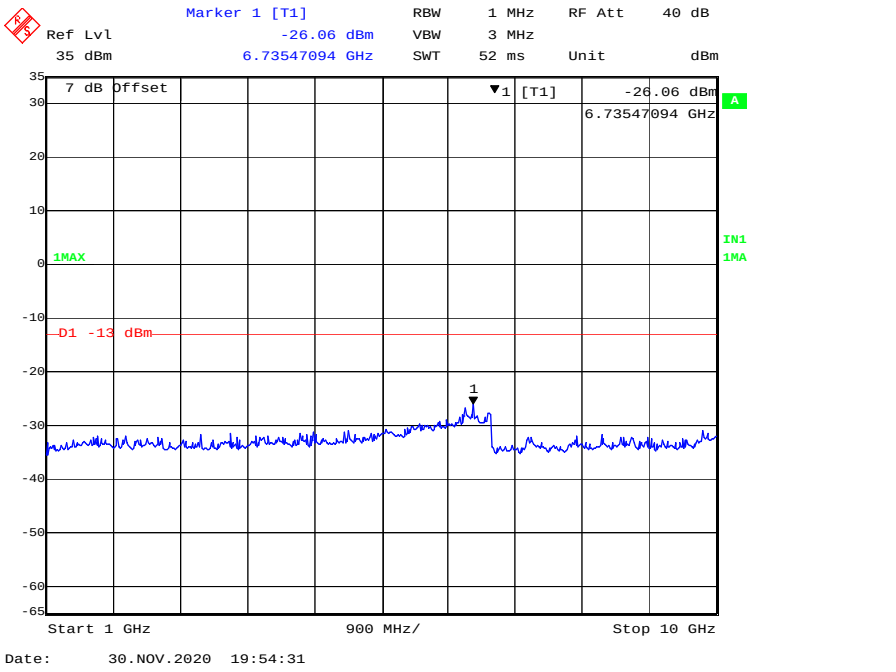
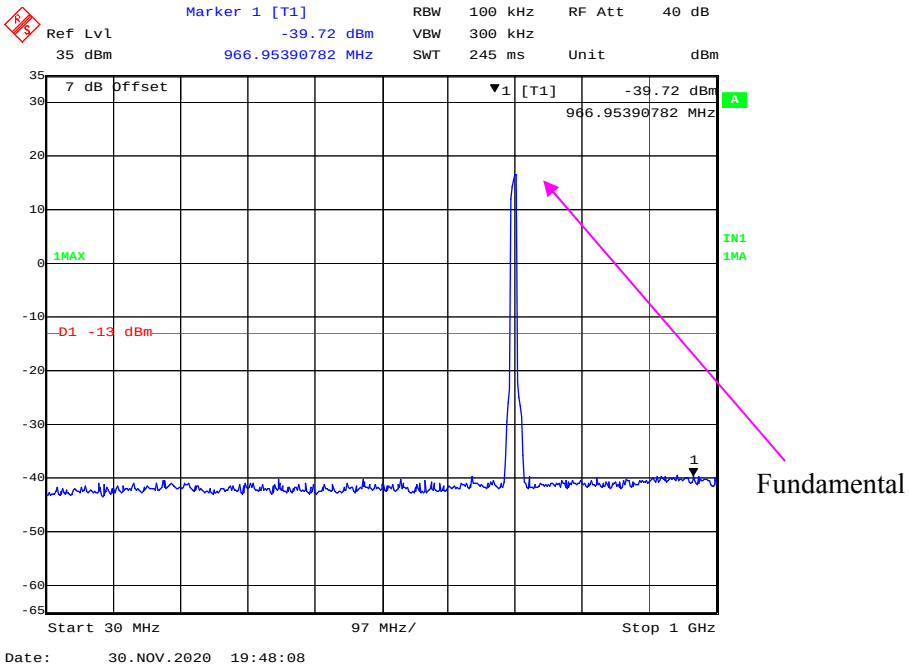
30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



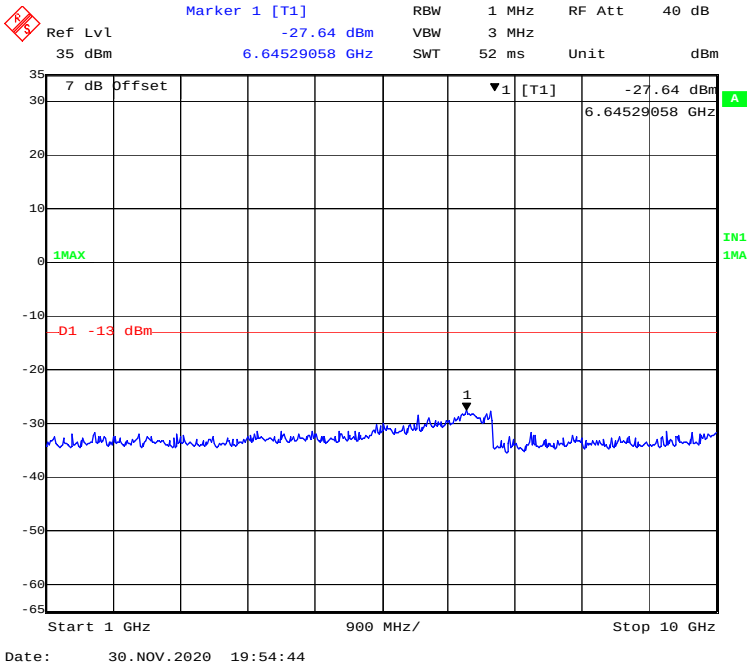
1 GHz – 10 GHz (10 MHz, QPSK, Middle Channel)



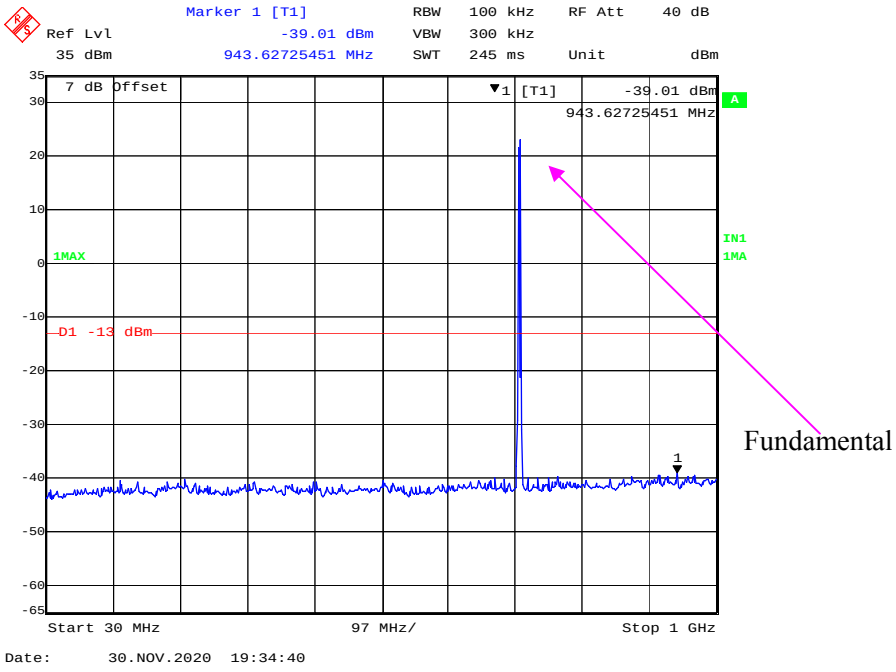
30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



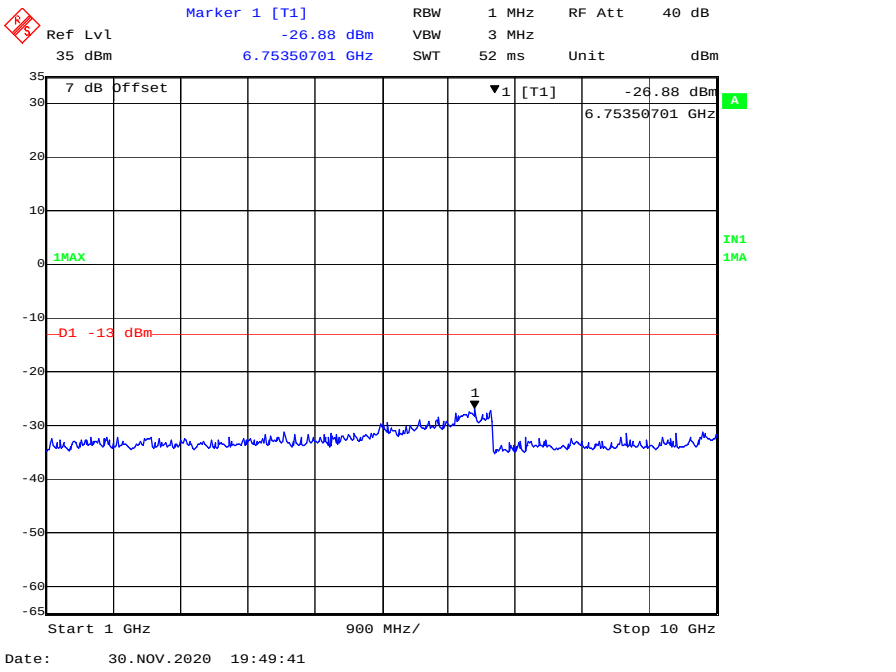
1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



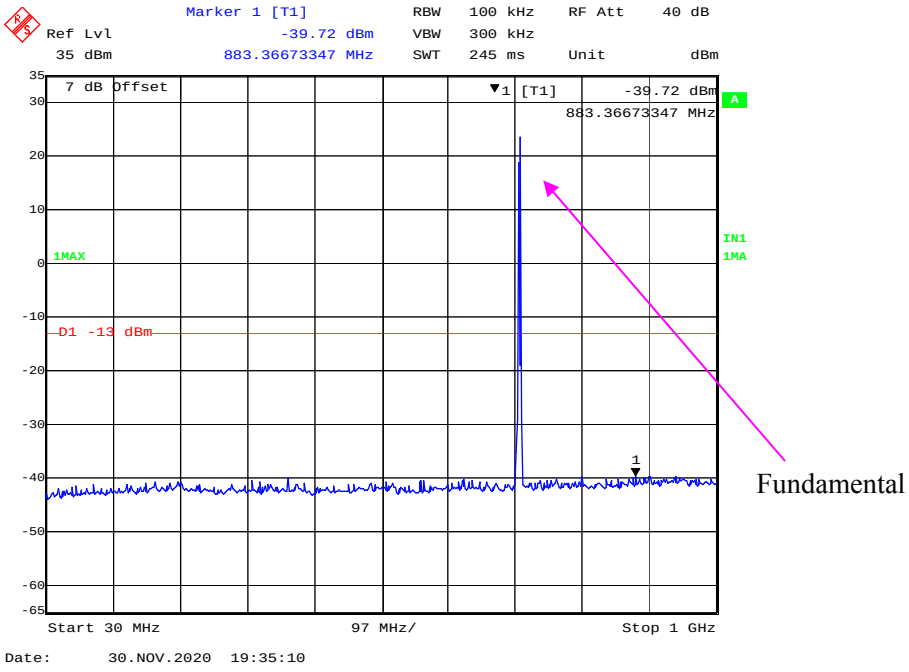
30 MHz - 1 GHz (1.4 MHz, QPSK, High Channel)



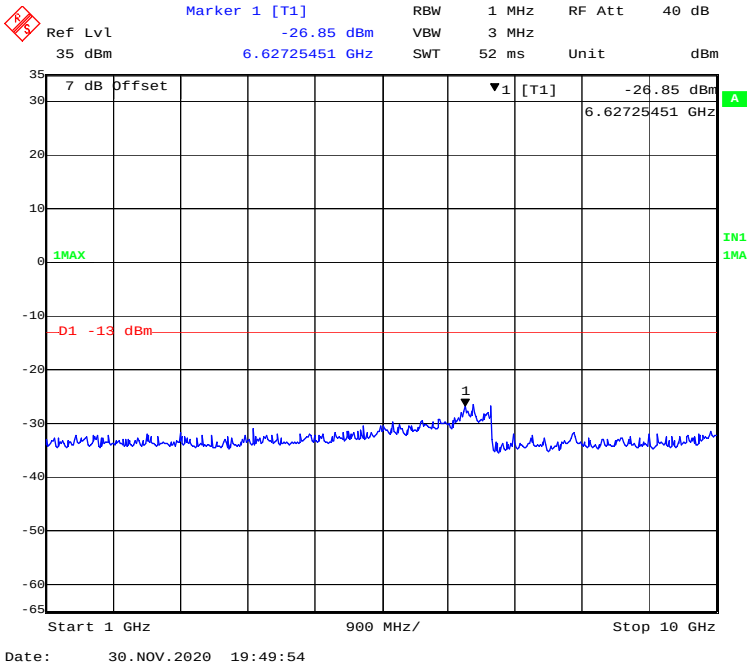
1 GHz – 10 GHz (1.4 MHz, QPSK, High Channel)



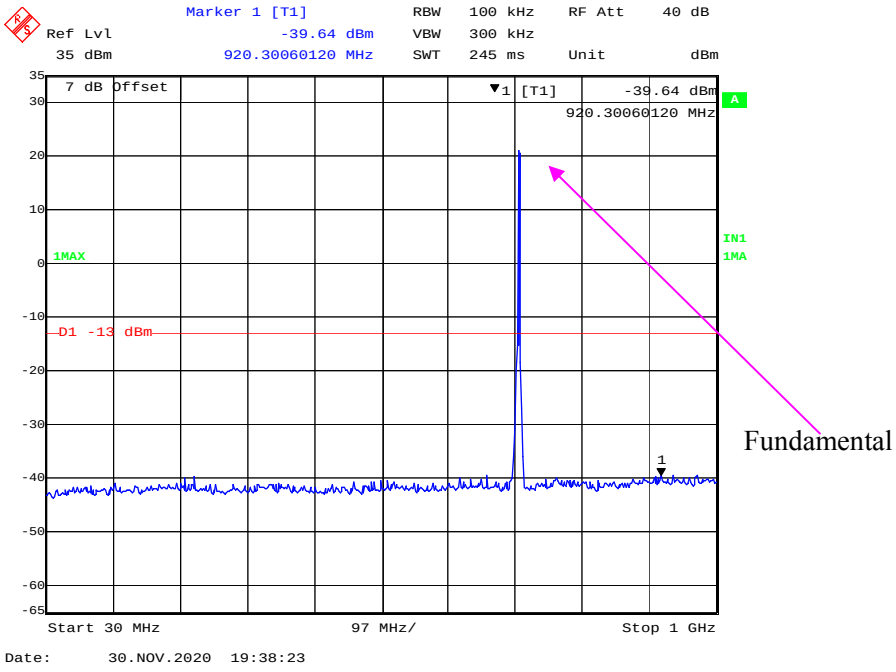
30 MHz - 1 GHz (1.4 MHz, 16-QAM, High Channel)



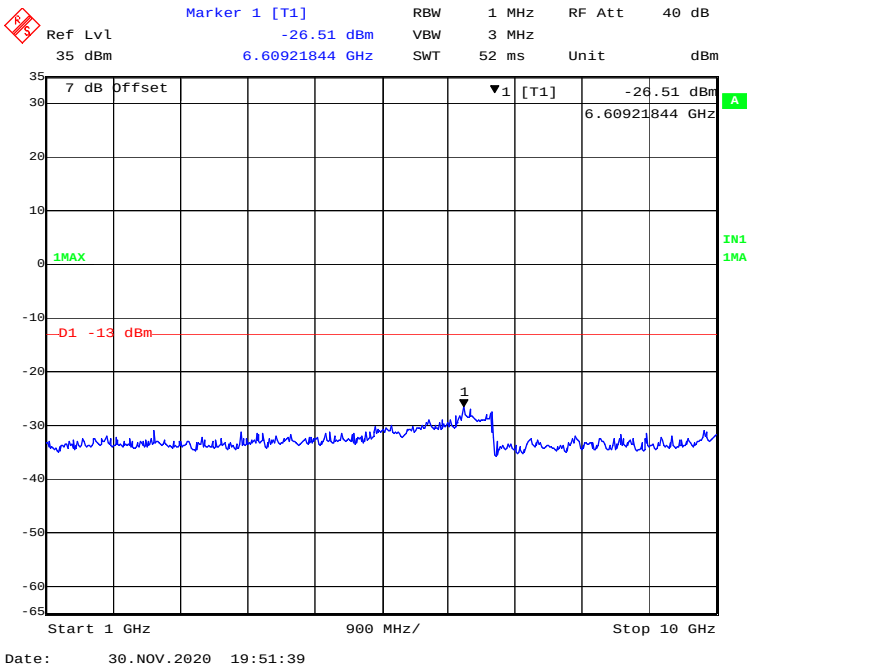
1 GHz – 10 GHz (1.4 MHz, 16-QAM, High Channel)



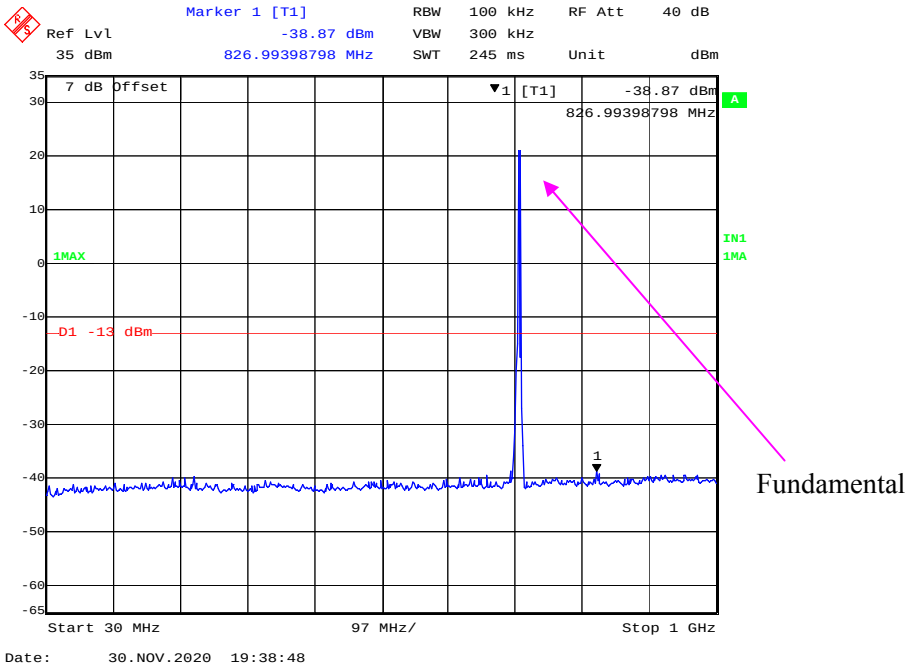
30 MHz - 1 GHz (3 MHz, QPSK, High Channel)



1 GHz – 10 GHz (3 MHz, QPSK, High Channel)



30 MHz - 1 GHz (3 MHz, 16-QAM, High Channel)



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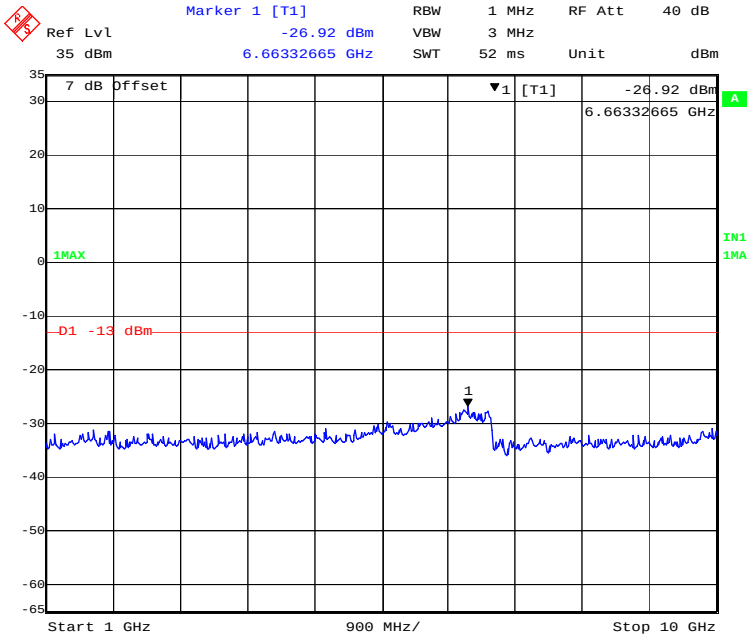
1 GHz – 10 GHz (3 MHz, 16-QAM, High Channel)



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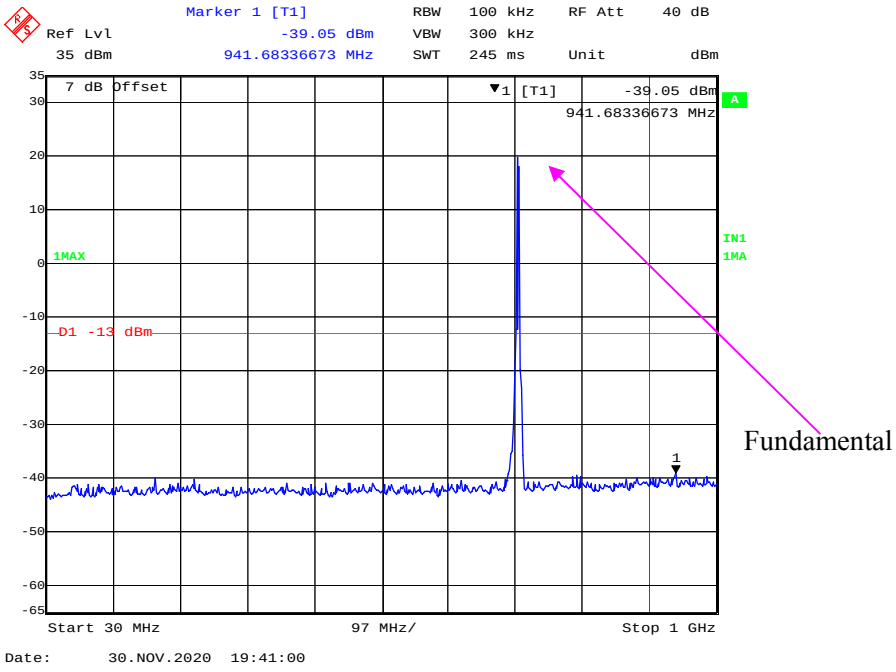
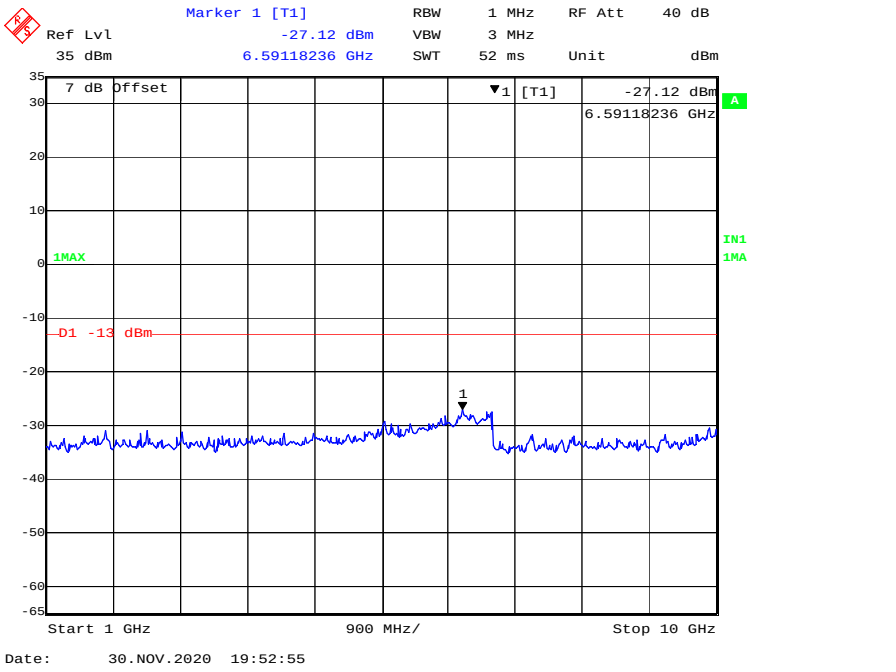
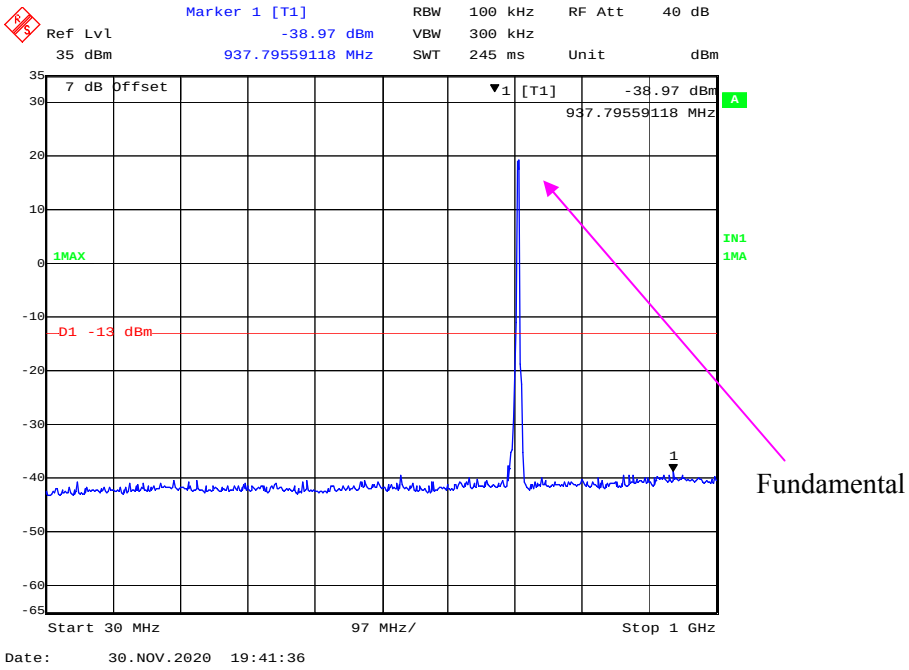
30 MHz - 1 GHz (5 MHz, QPSK, High Channel)



1 GHz – 10 GHz (5 MHz, QPSK, High Channel)



30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)



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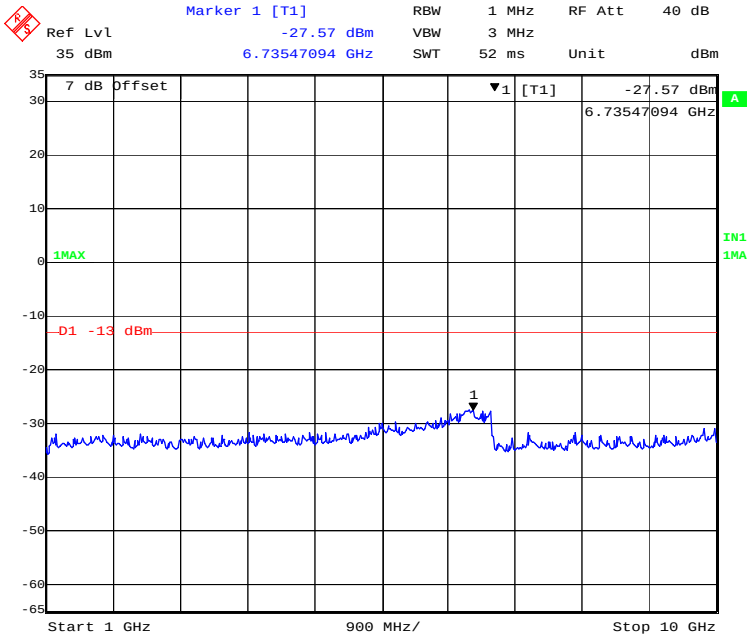
1 GHz – 10 GHz (5 MHz, 16-QAM, High Channel)



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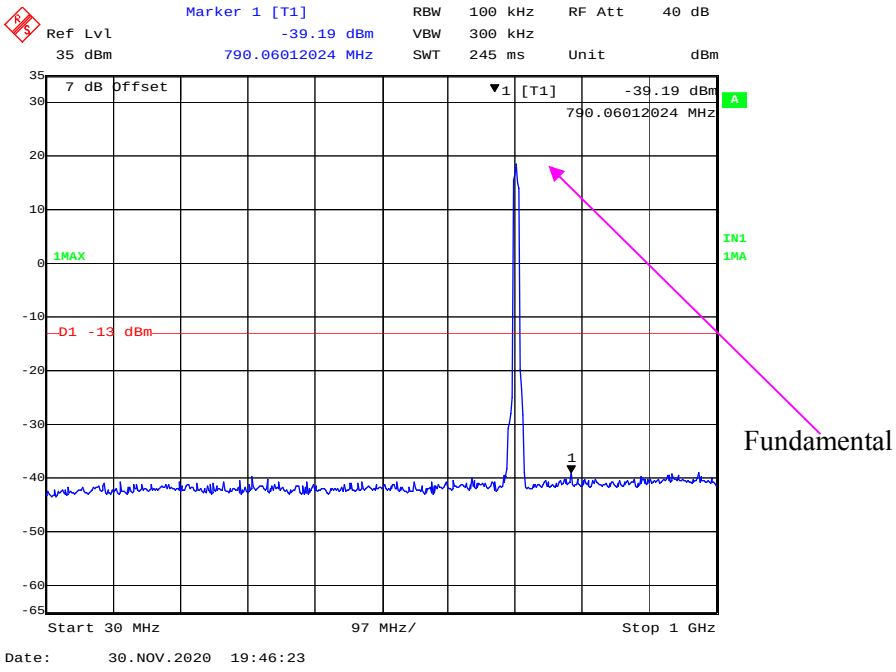
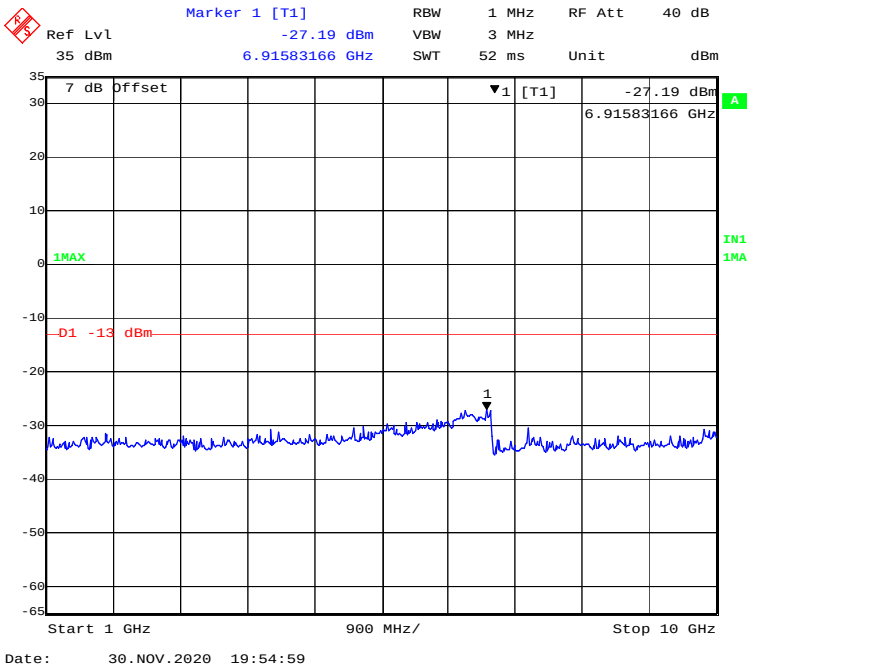
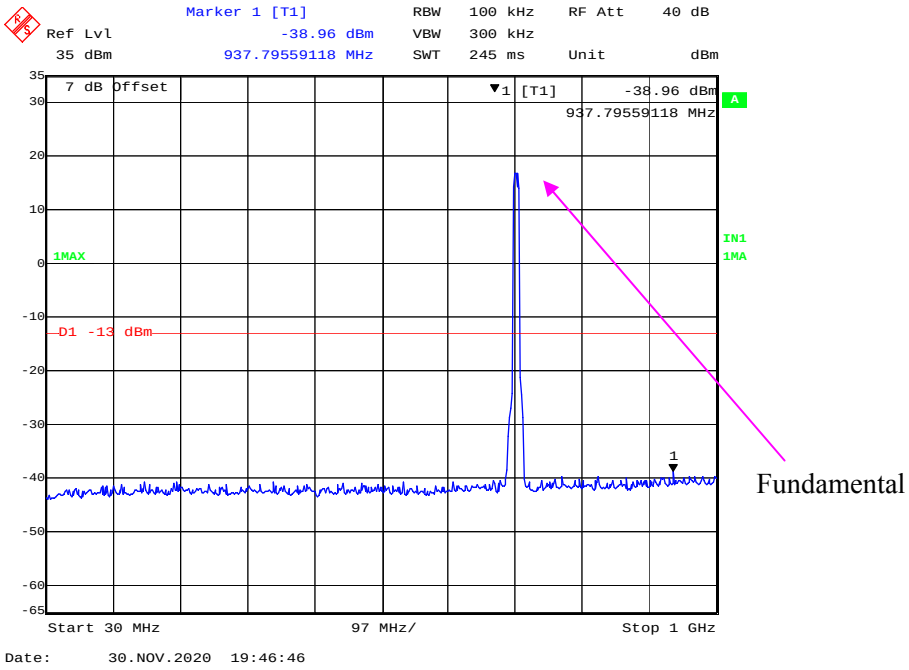
30 MHz - 1 GHz (10 MHz, QPSK, High Channel)



1 GHz – 10 GHz (10 MHz, QPSK, High Channel)



30 MHz - 1 GHz (10 MHz, 16-QAM, High Channel)



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1 GHz – 10 GHz (10 MHz, 16-QAM, High Channel)

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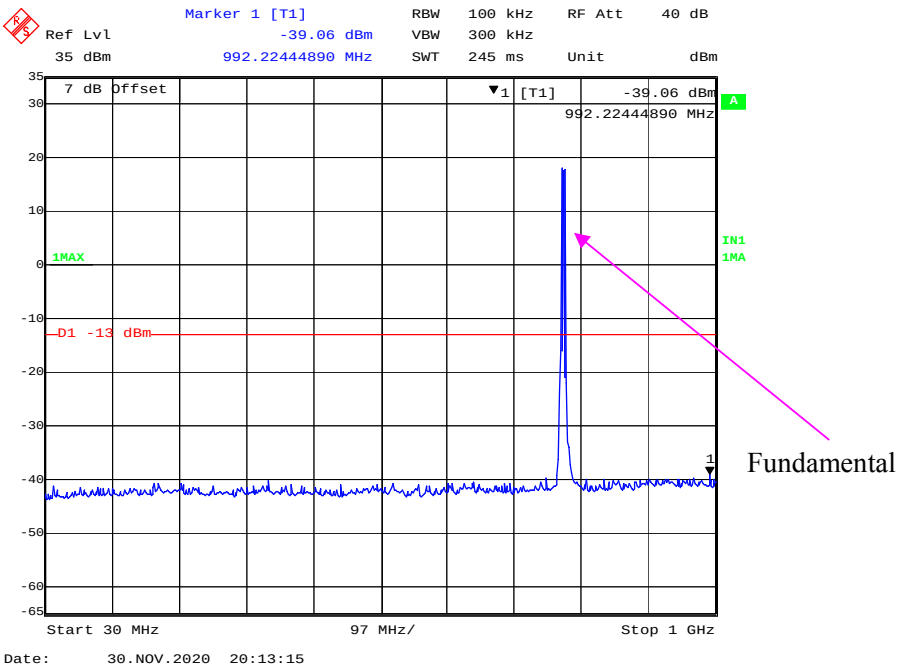
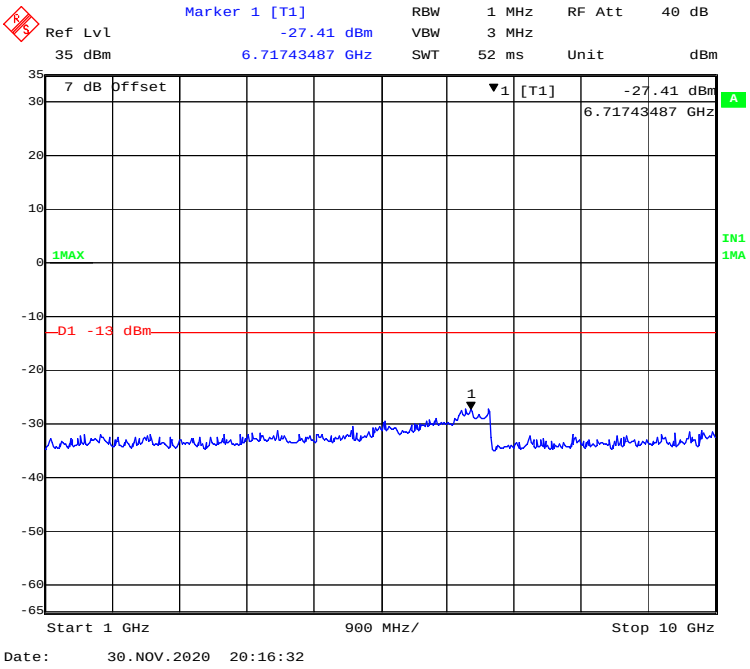
LTE Band 13:

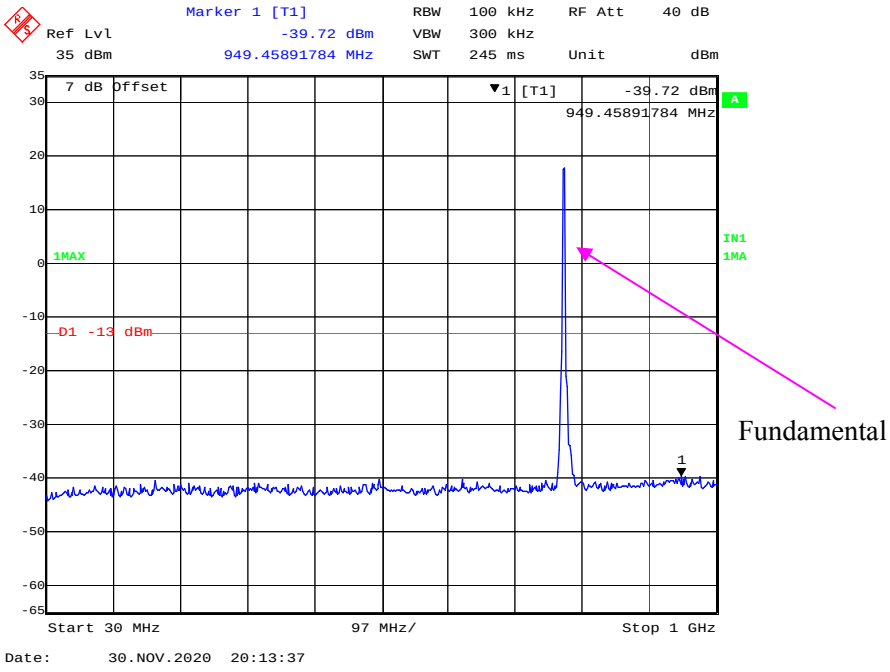
30 MHz - 1 GHz (5 MHz, QPSK, Low Channel)



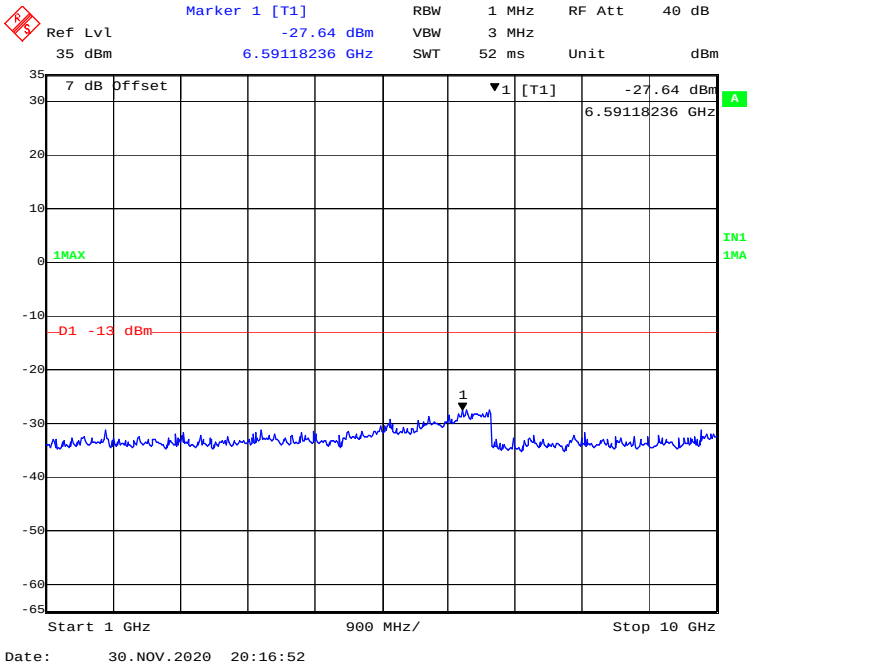
1 GHz – 10 GHz (5 MHz, QPSK, Low Channel)



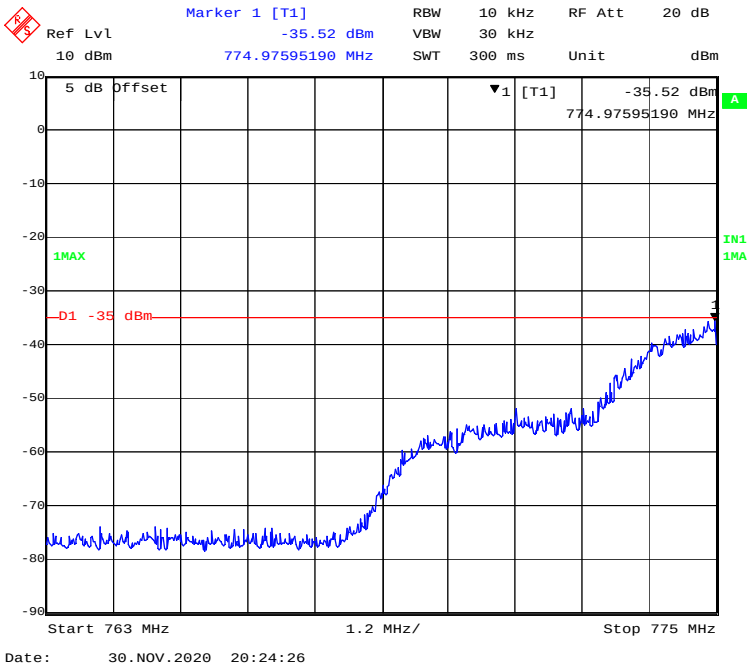
30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)



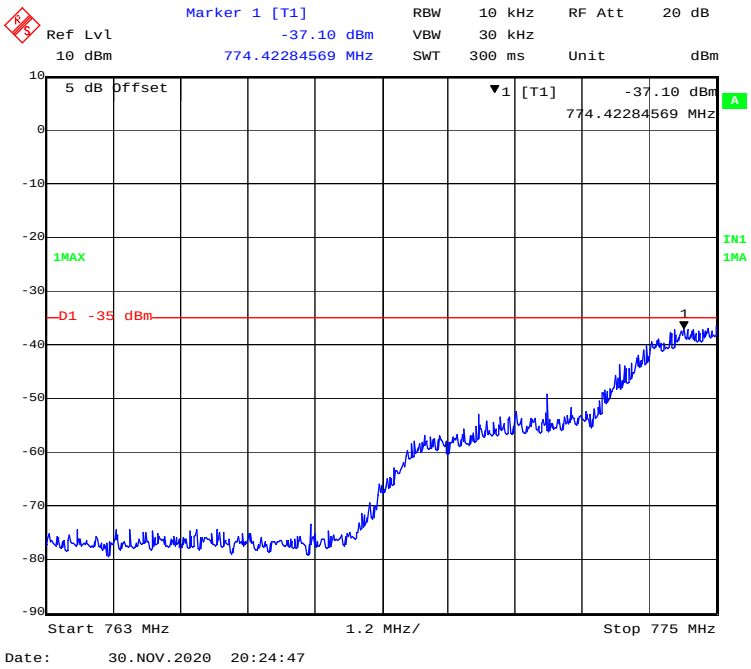
1 GHz – 10 GHz (5 MHz, 16-QAM, Low Channel)



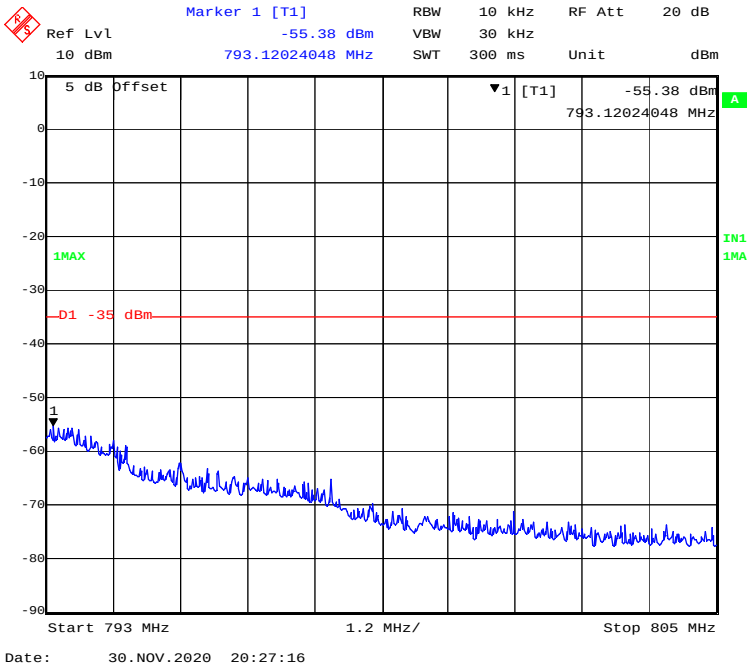
763 MHz - 775 MHz (5 MHz, QPSK, Low Channel)



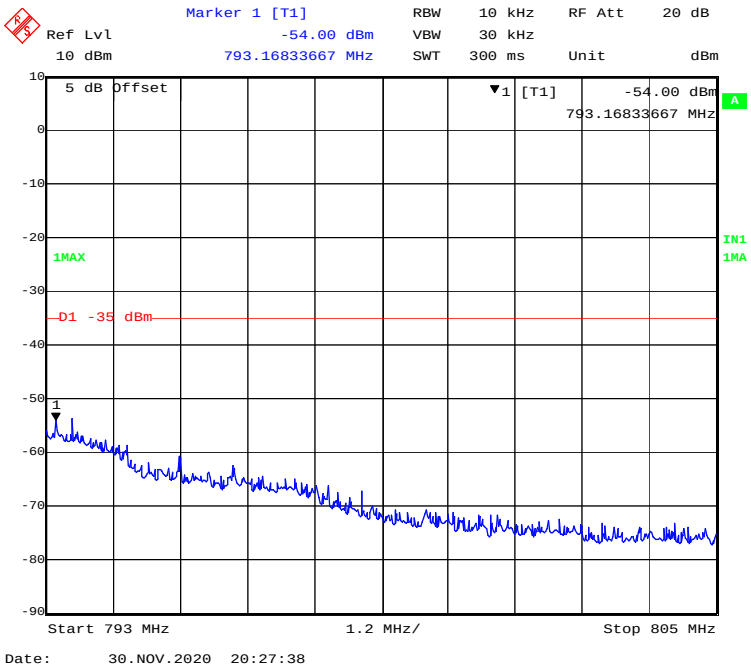
763 MHz - 775 MHz (5 MHz, 16-QAM, Low Channel)



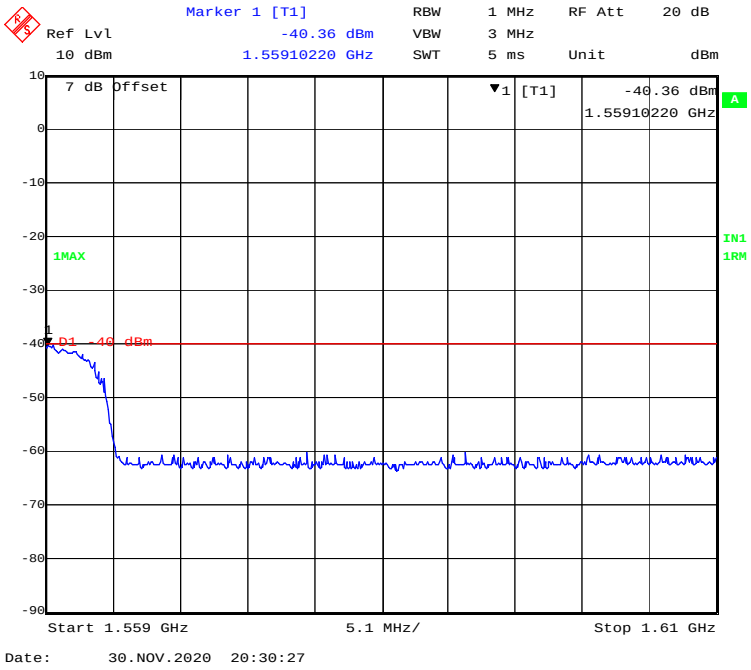
793 MHz - 805 MHz (5 MHz, QPSK, Low Channel)



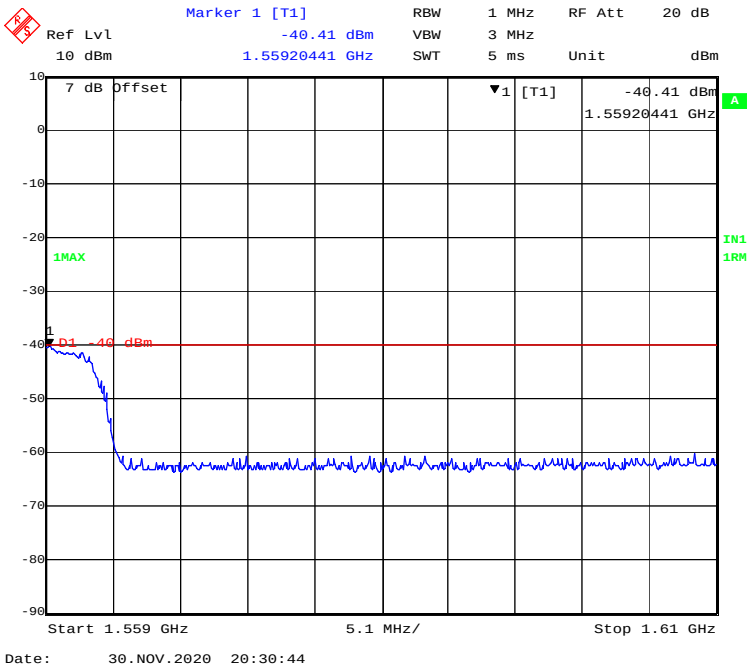
793 MHz - 805 MHz (5 MHz, 16-QAM, Low Channel)



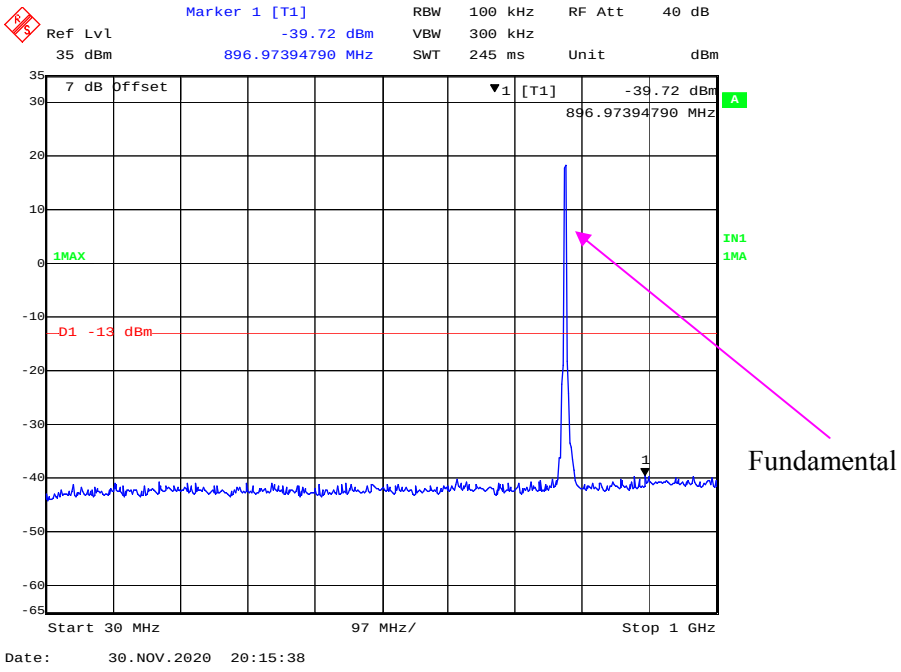
1559 MHz - 1610 MHz (5 MHz, QPSK, Low Channel)



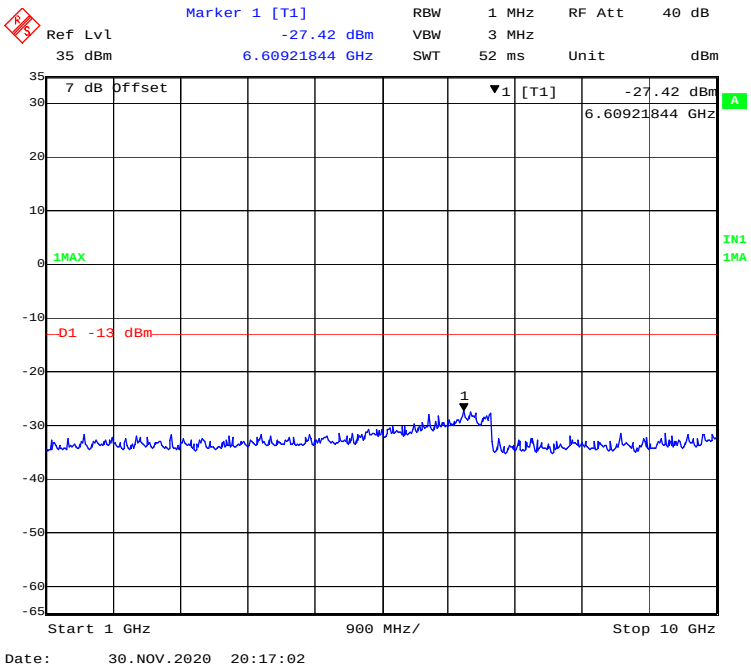
1559 MHz - 1610 MHz (5 MHz, 16-QAM, Low Channel)



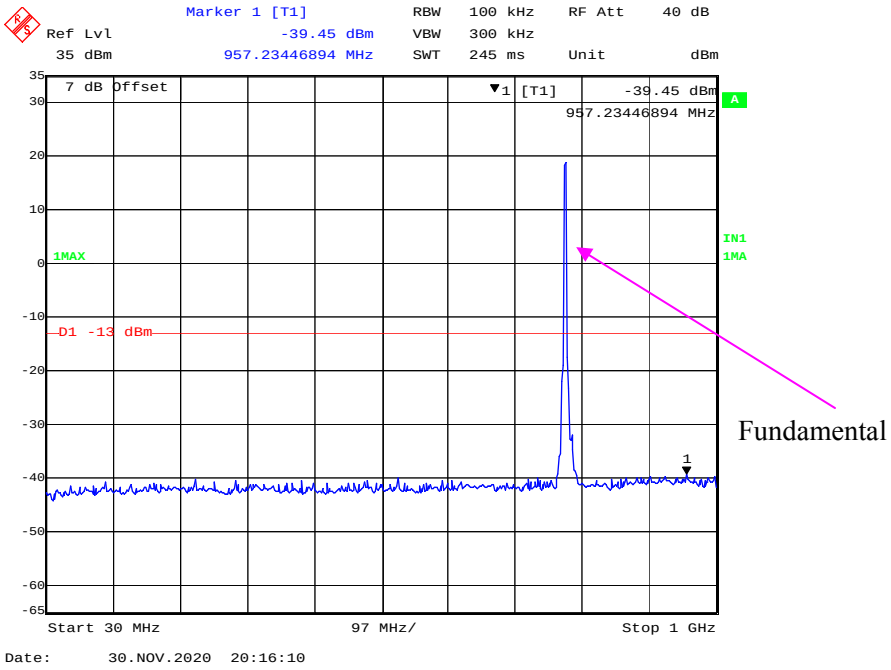
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



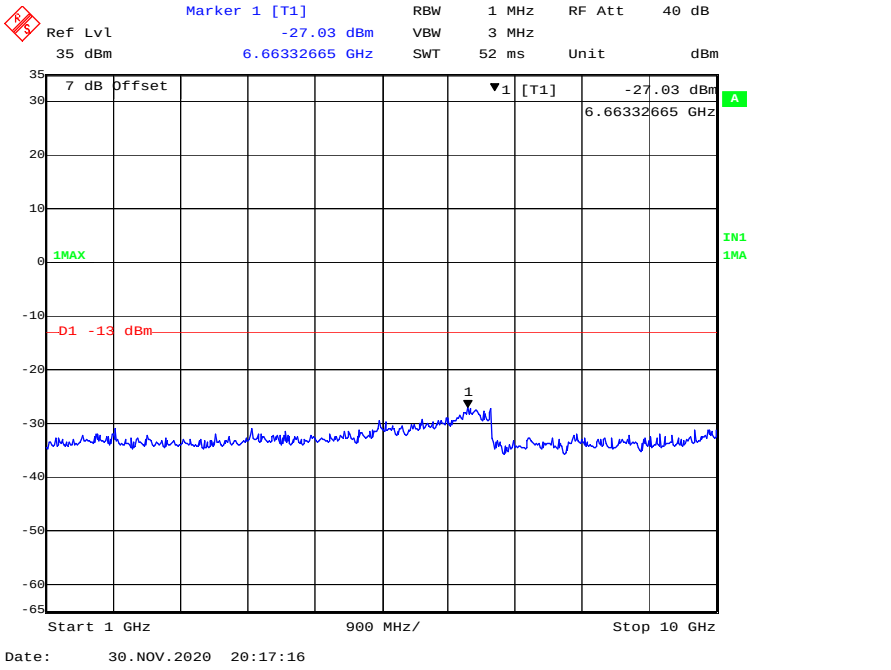
1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



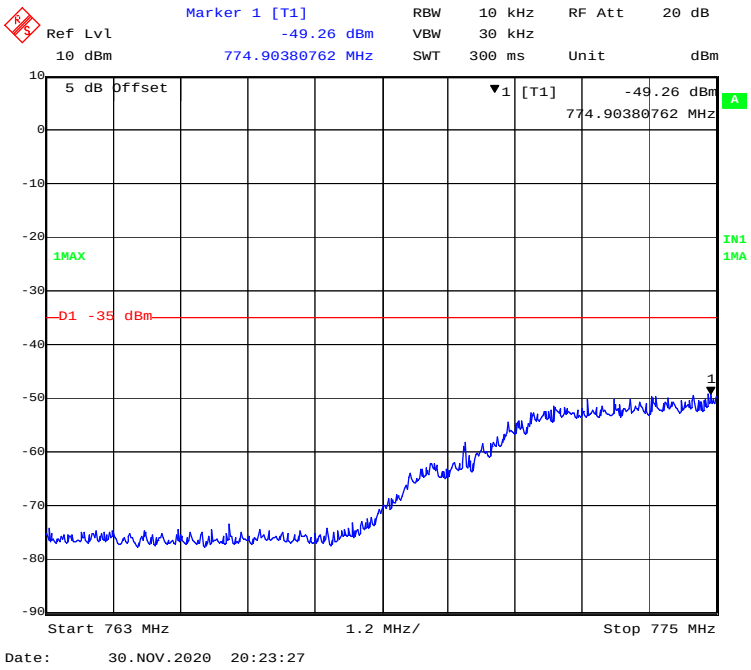
30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



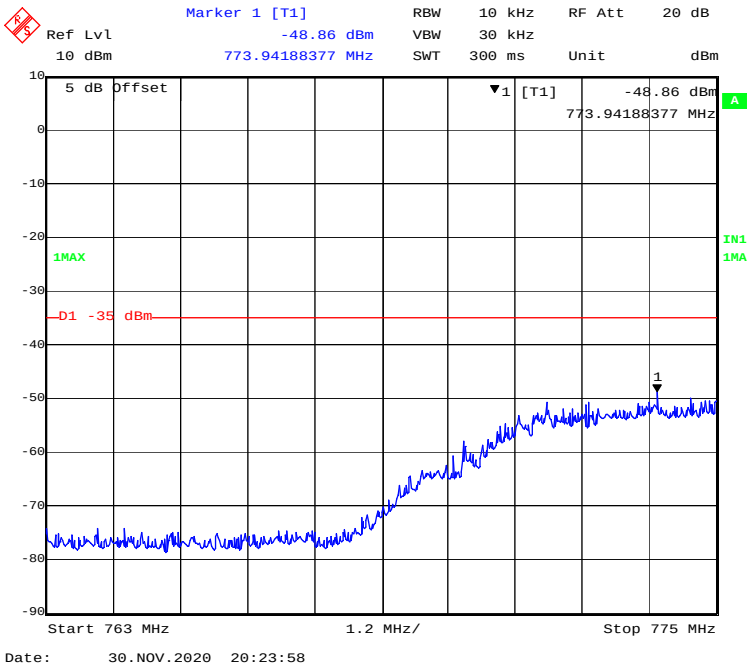
1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



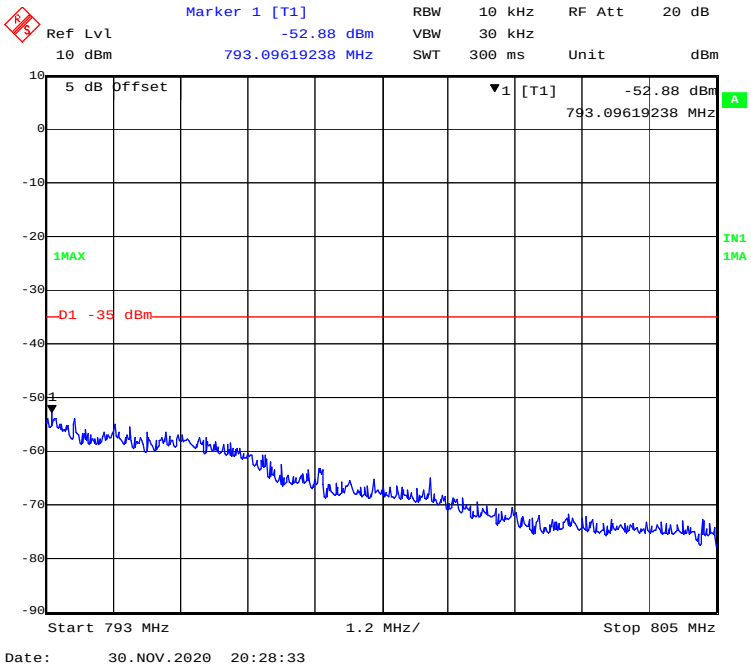
763 MHz - 775 MHz (5 MHz, QPSK, Middle Channel)



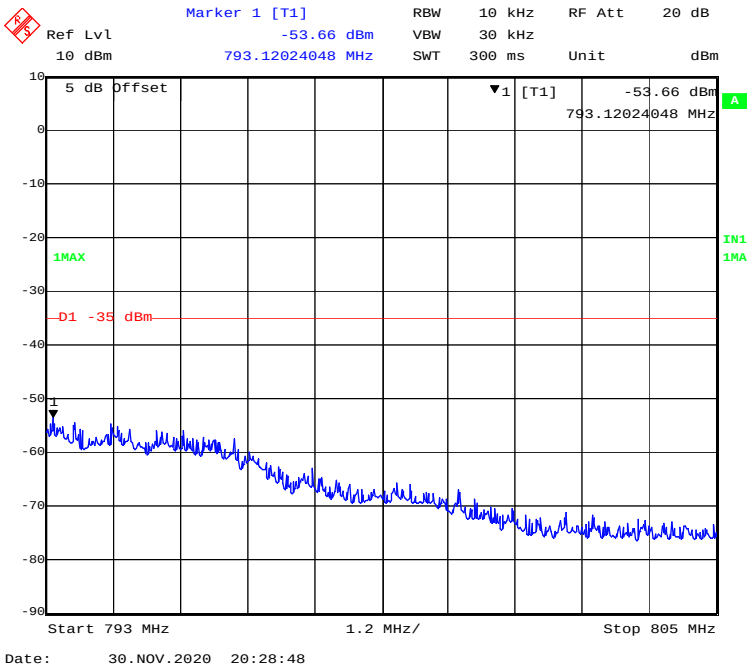
763 MHz - 775 MHz (5 MHz, 16-QAM, Middle Channel)



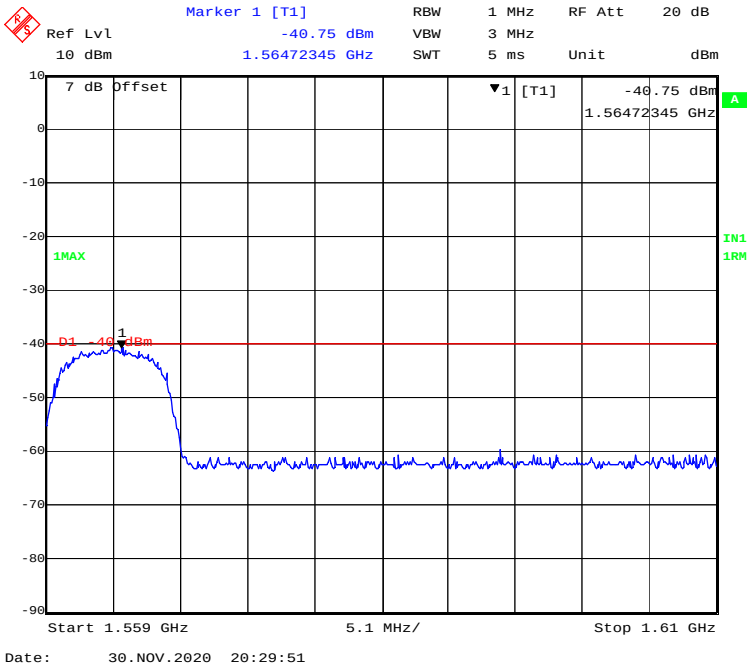
793 MHz - 805 MHz (5 MHz, QPSK, Middle Channel)



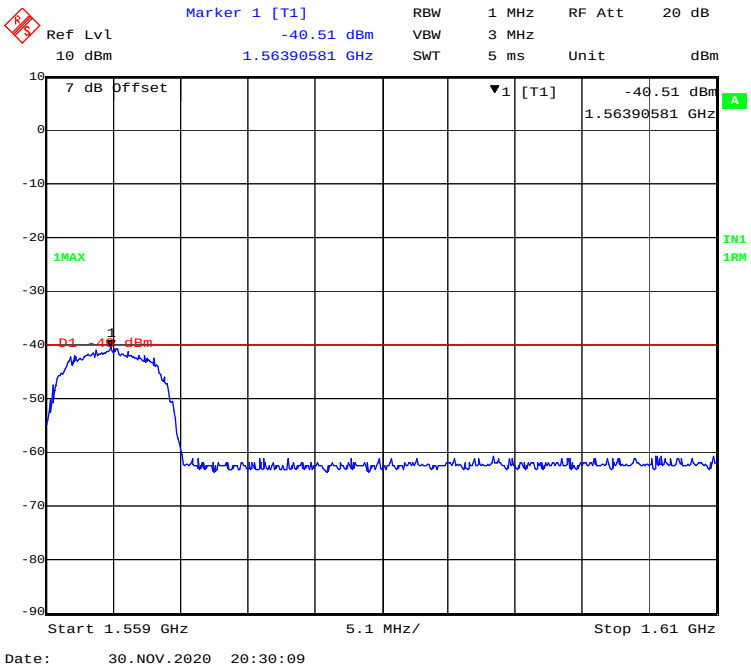
793 MHz - 805 MHz (5 MHz, 16-QAM, Middle Channel)



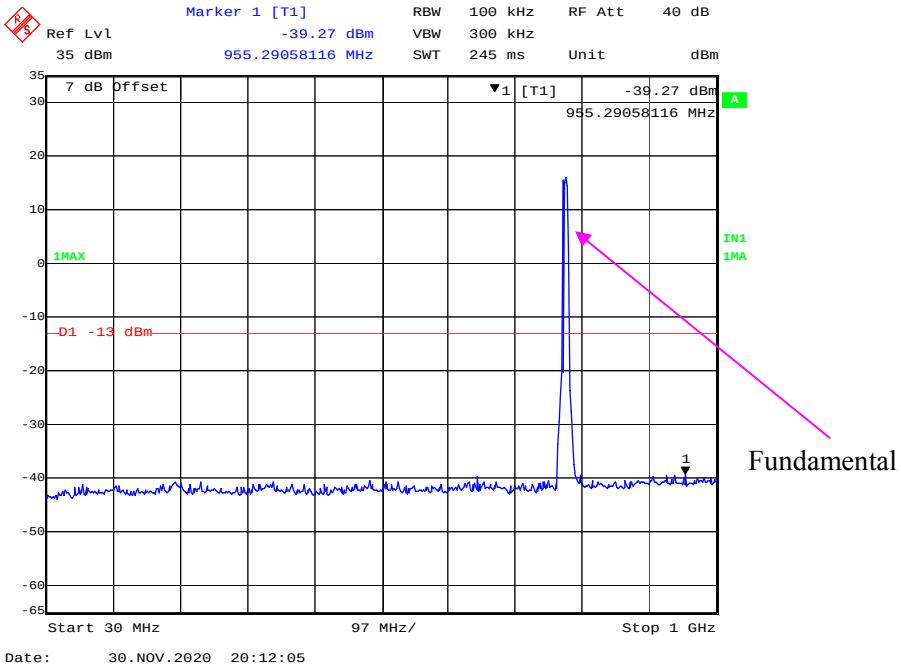
1559 MHz - 1610 MHz (5 MHz, QPSK, Middle Channel)



1559 MHz - 1610 MHz (5 MHz, 16-QAM, Middle Channel)



30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



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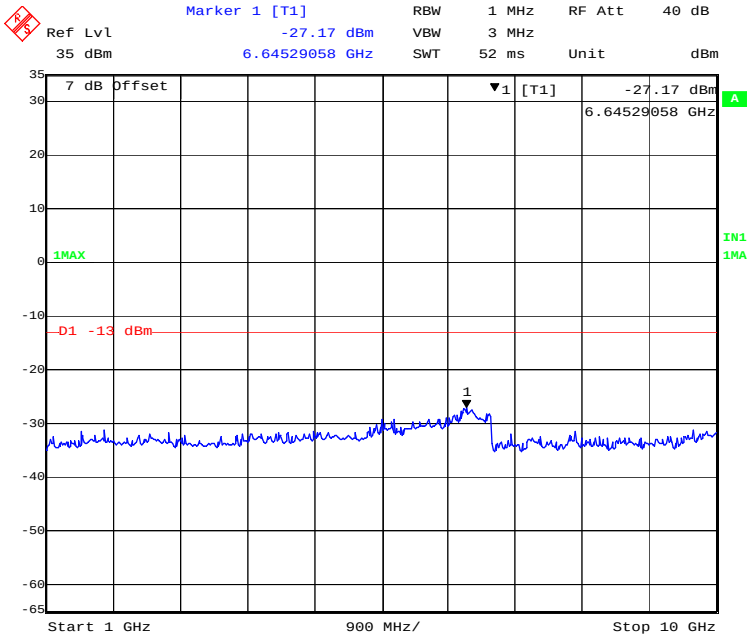
1 GHz – 10 GHz (10 MHz, QPSK, Middle Channel)



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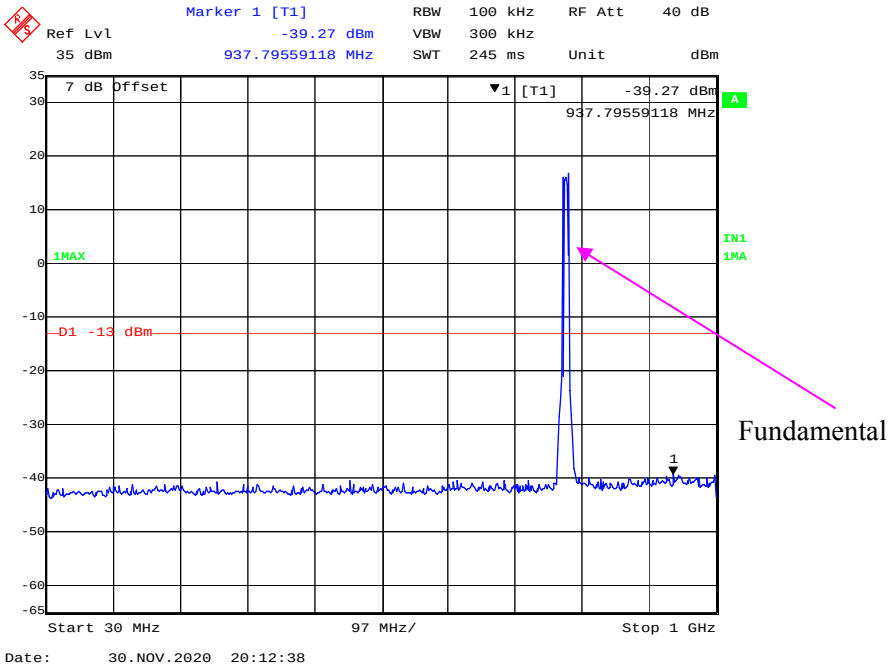
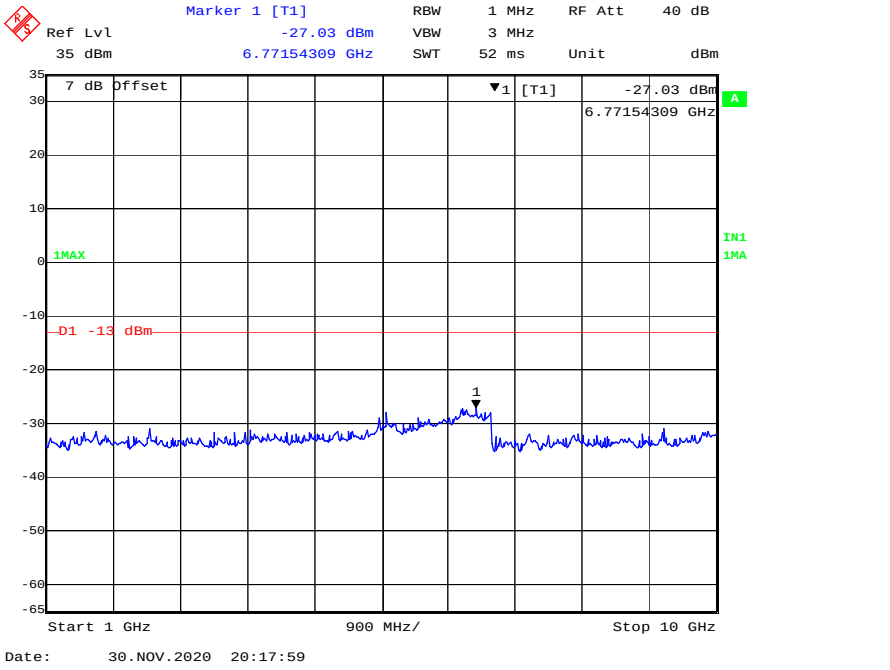
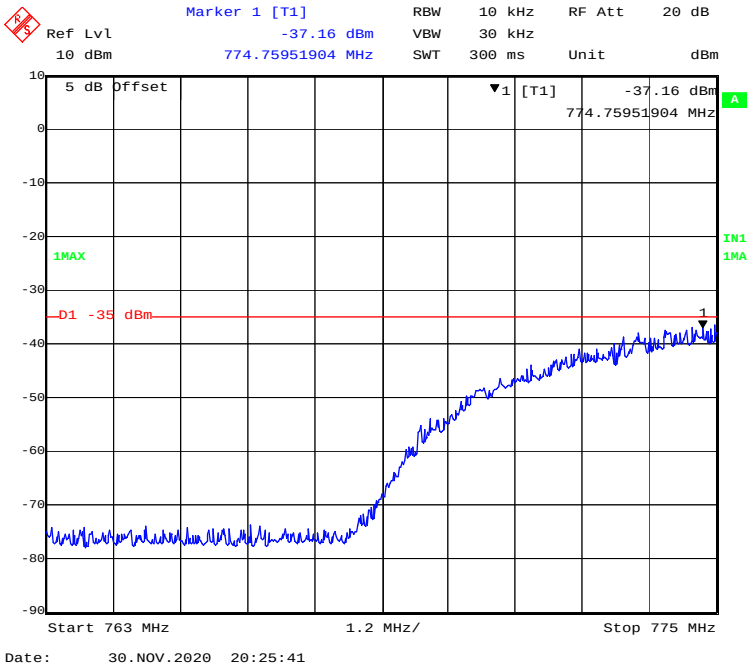
30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



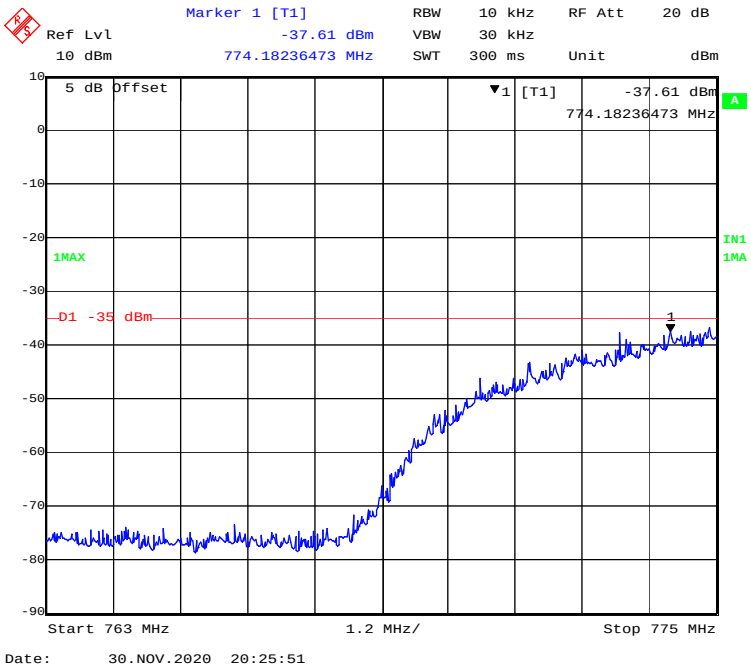
1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



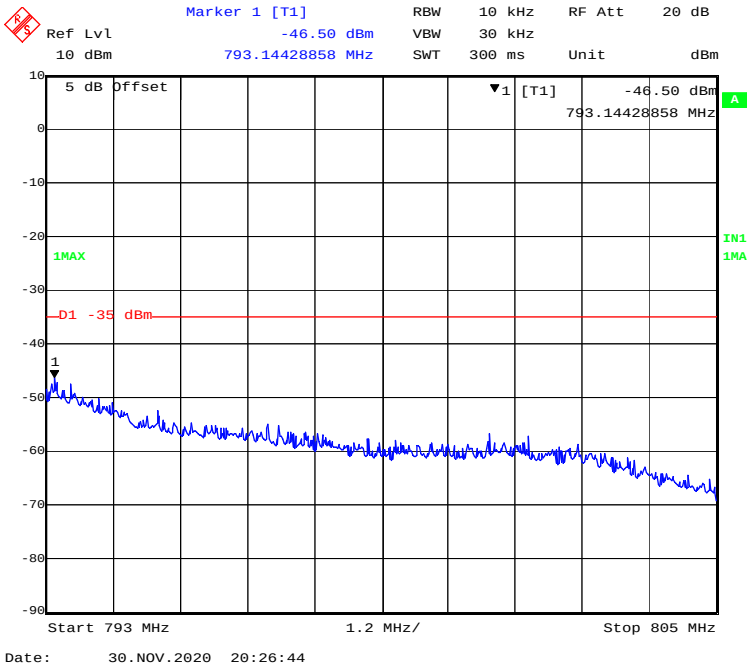
763 MHz - 775 MHz (10 MHz, QPSK, Middle Channel)



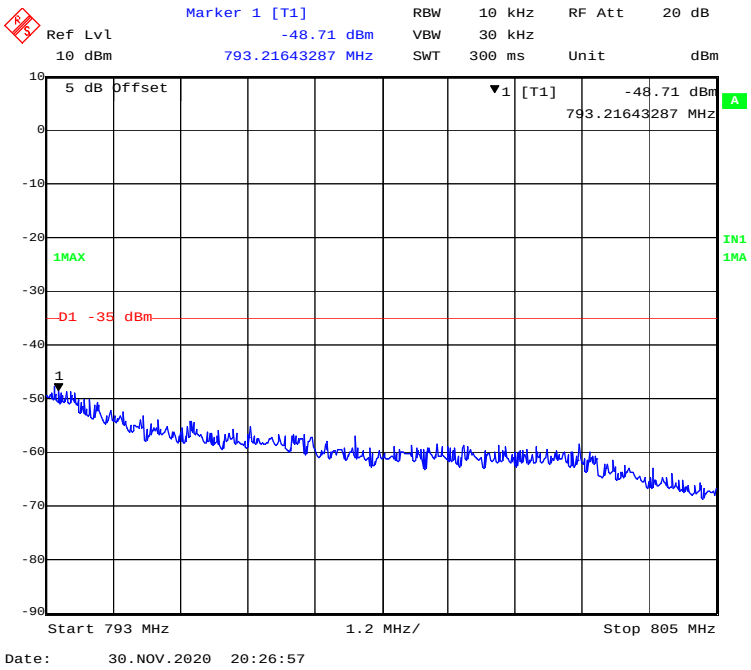
763 MHz - 775 MHz (10 MHz, 16-QAM, Middle Channel)



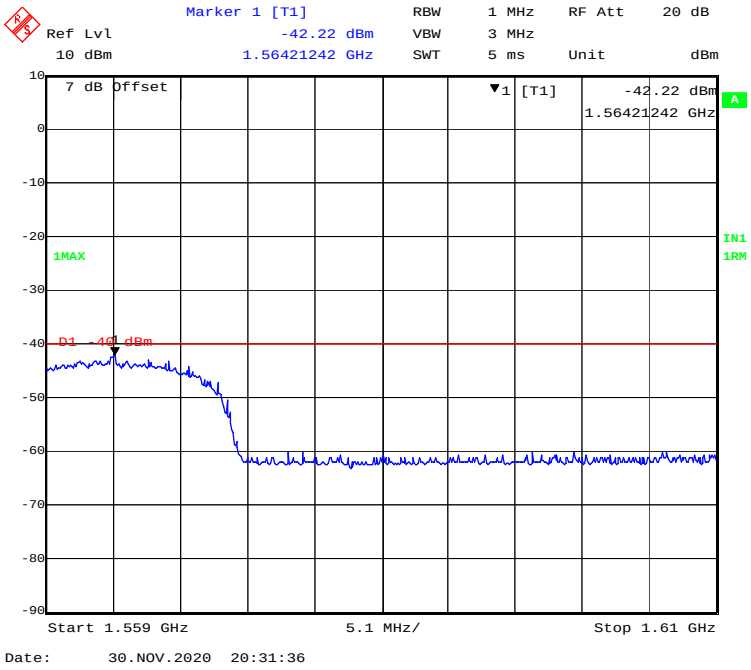
793 MHz - 805 MHz (10 MHz, QPSK, Middle Channel)



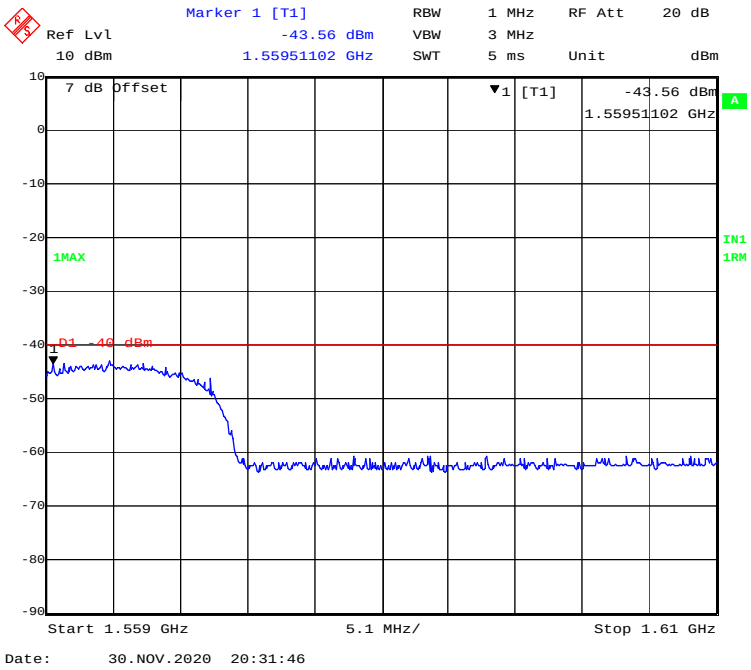
793 MHz - 805 MHz (10 MHz, 16-QAM, Middle Channel)



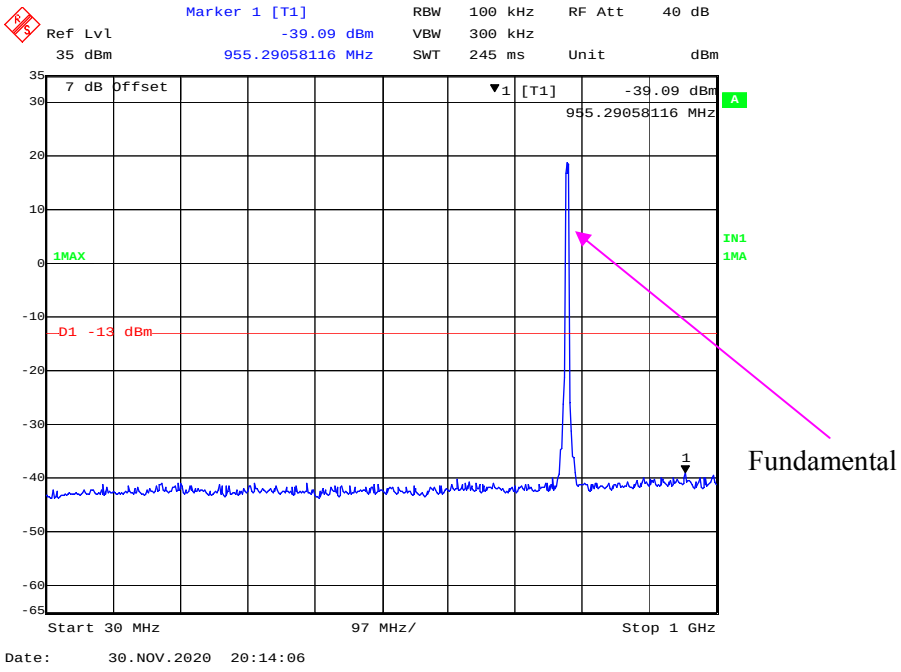
1559 MHz - 1610 MHz (10 MHz, QPSK, Middle Channel)



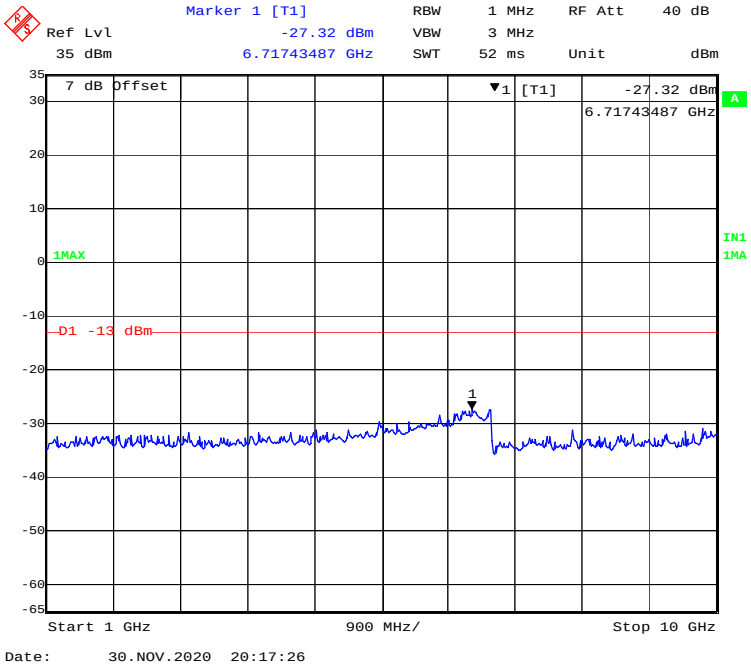
1559 MHz - 1610 MHz (10 MHz, 16-QAM, Middle Channel)



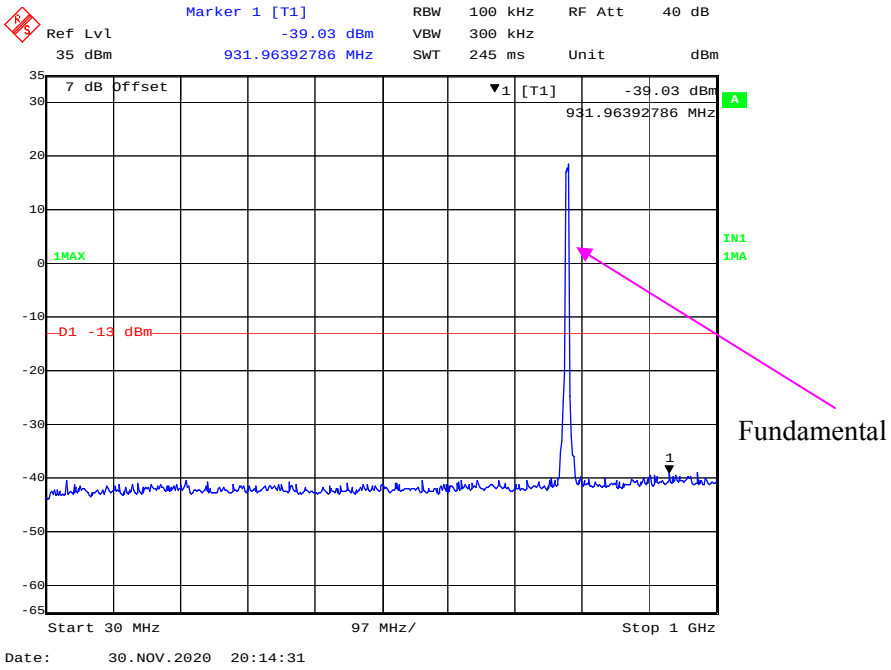
30 MHz - 1 GHz (5 MHz, QPSK, High Channel)



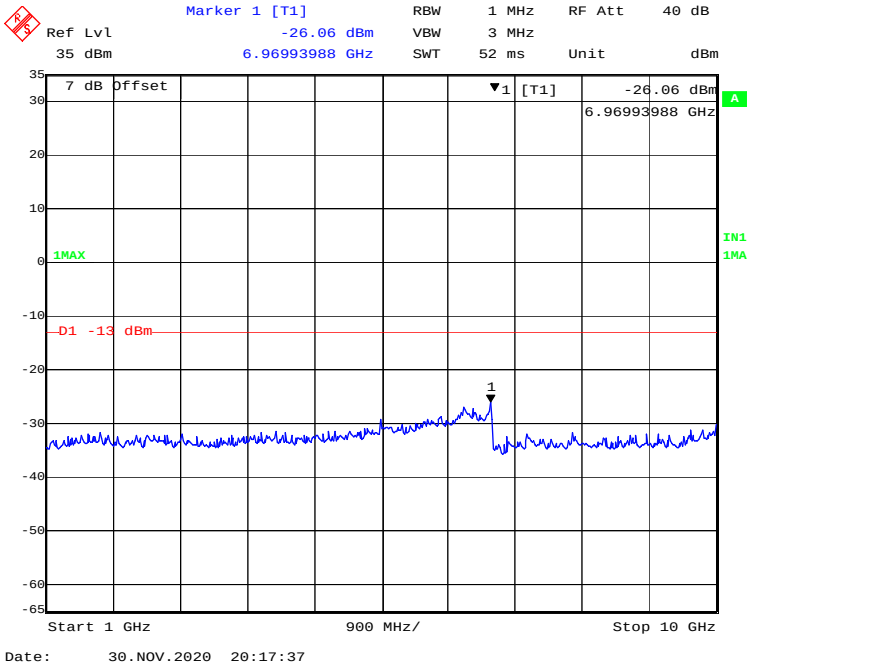
1 GHz – 10 GHz (5 MHz, QPSK, High Channel)



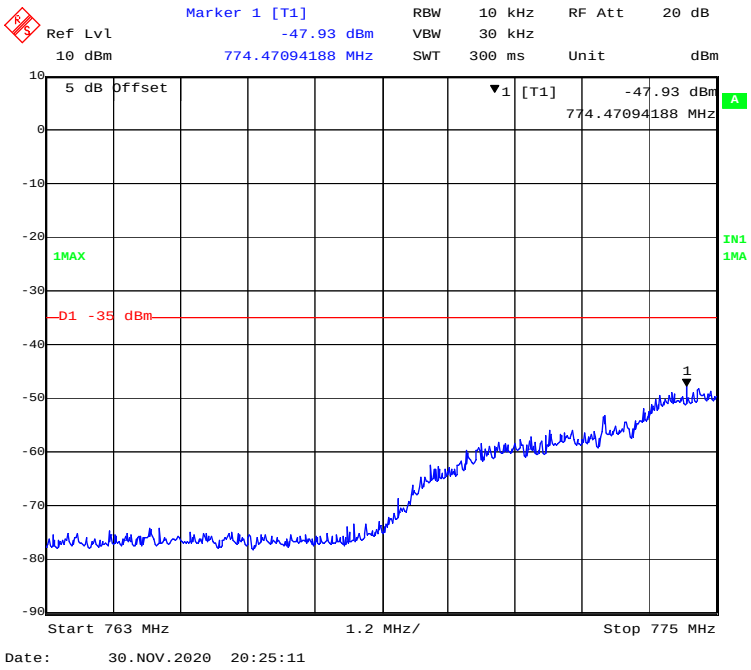
30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)



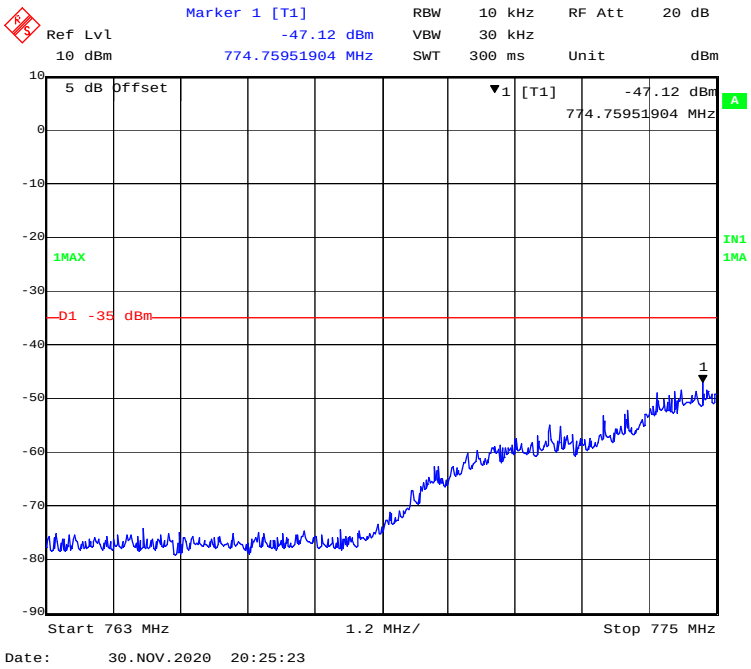
1 GHz – 10 GHz (5 MHz, 16-QAM, High Channel)



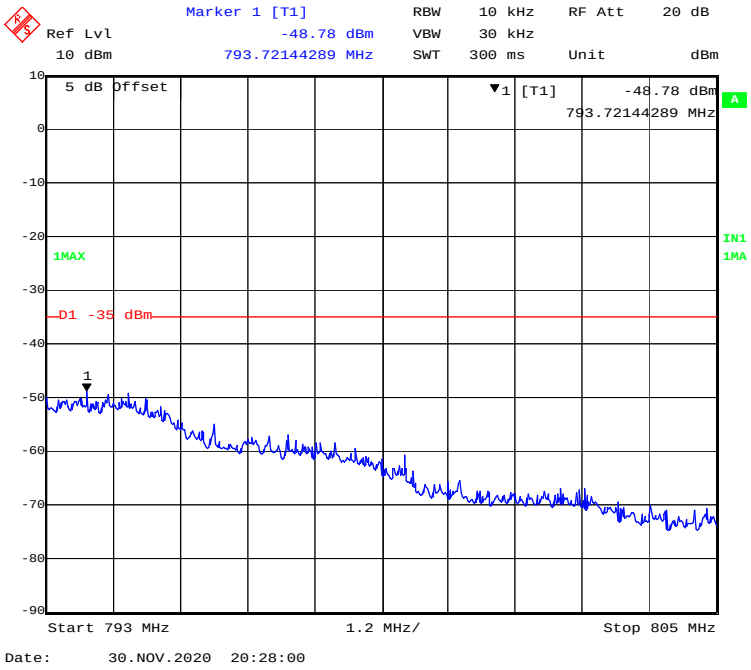
763 MHz - 775 MHz (5 MHz, QPSK, High Channel)



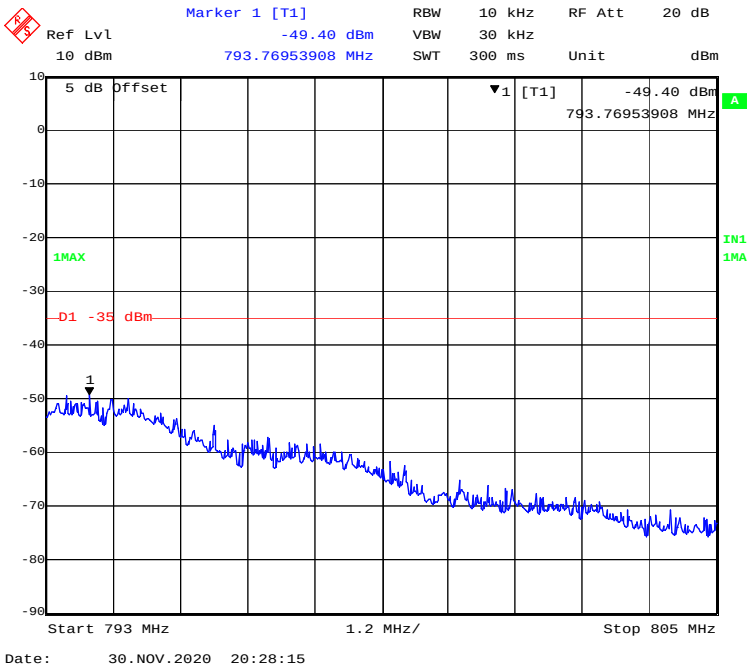
763 MHz - 775 MHz (5 MHz, 16-QAM, High Channel)



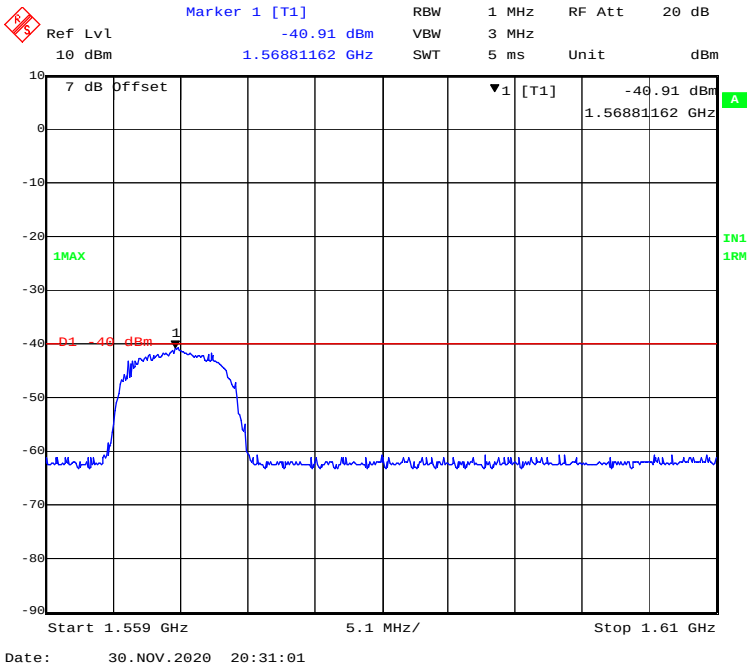
793 MHz - 805 MHz (5 MHz, QPSK, High Channel)



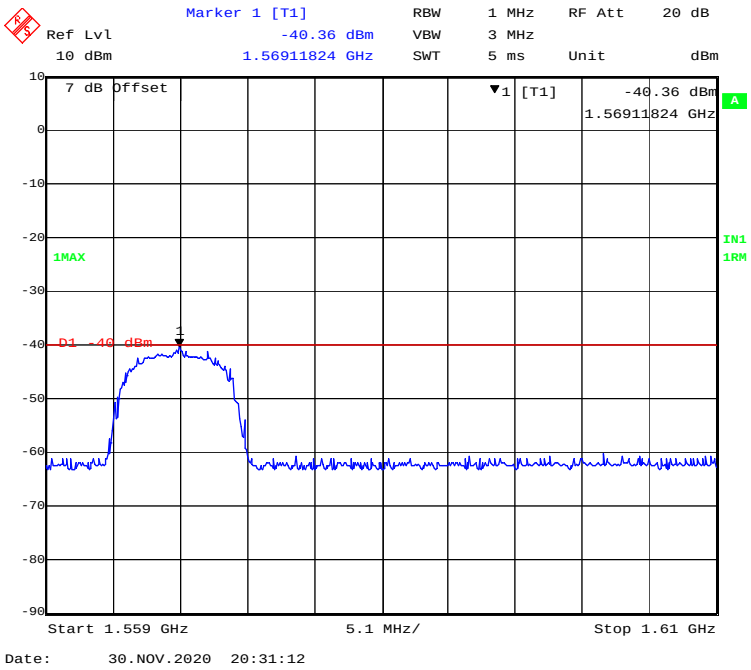
793 MHz - 805 MHz (5 MHz, 16-QAM, High Channel)



1559 MHz - 1610 MHz (5 MHz, QPSK, High Channel)

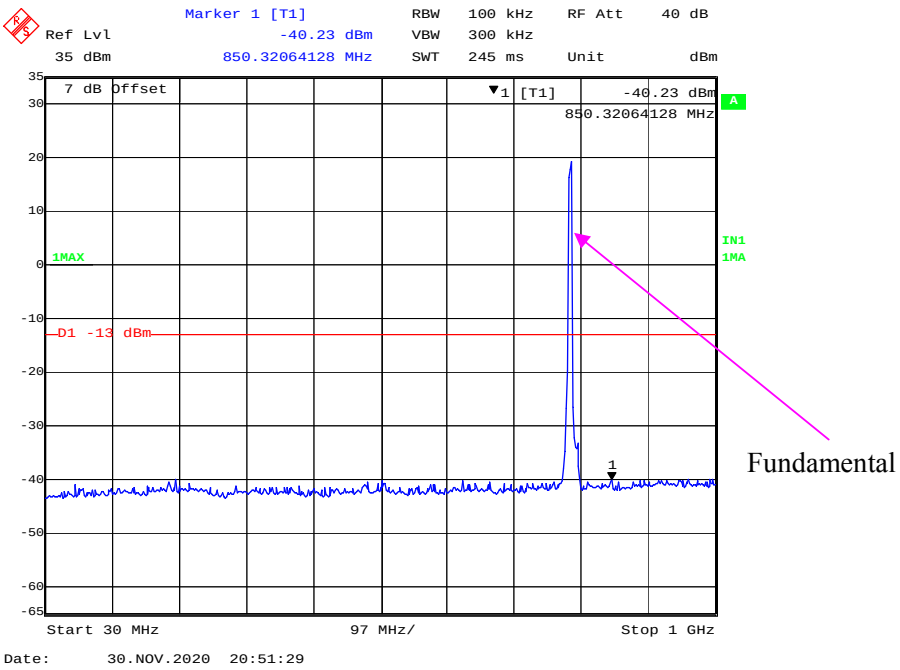


1559 MHz - 1610 MHz (5 MHz, 16-QAM, High Channel)

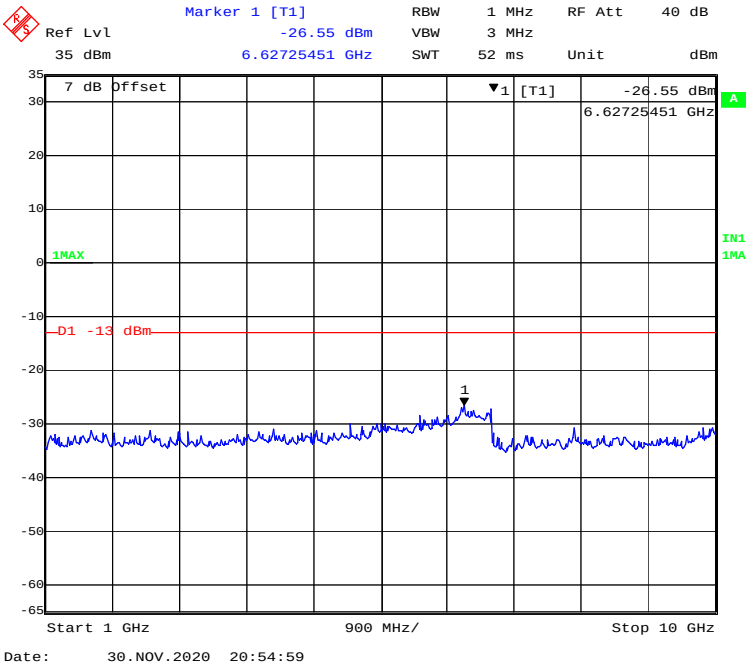


LTE Band 14:

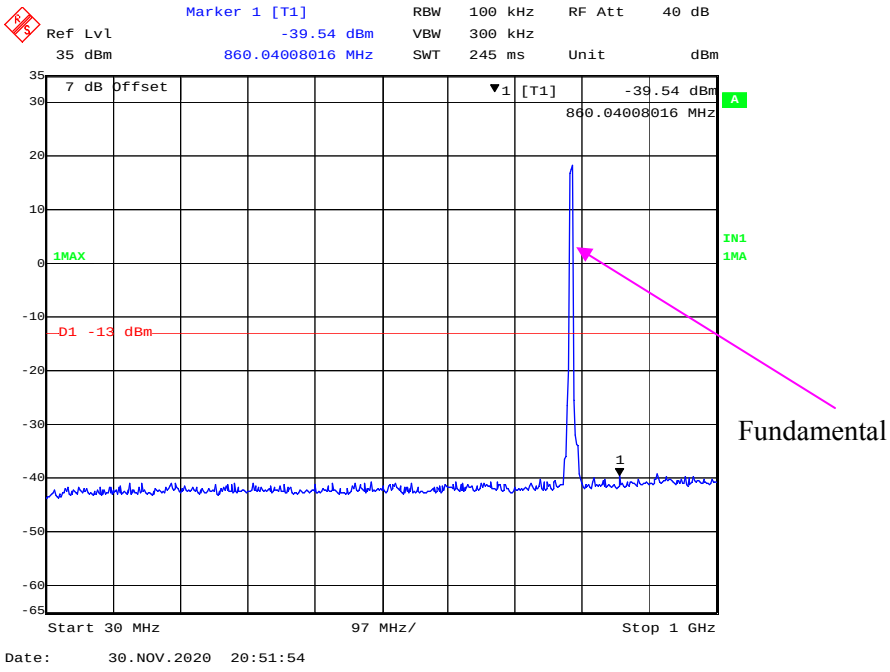
30 MHz - 1 GHz (5 MHz, QPSK, Low Channel)



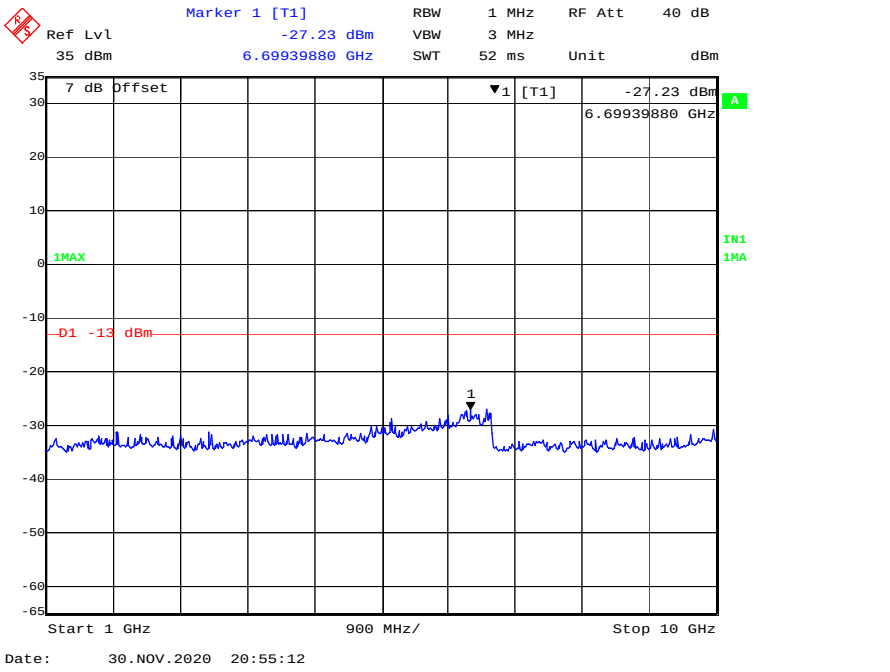
1 GHz – 10 GHz (5 MHz, QPSK, Low Channel)



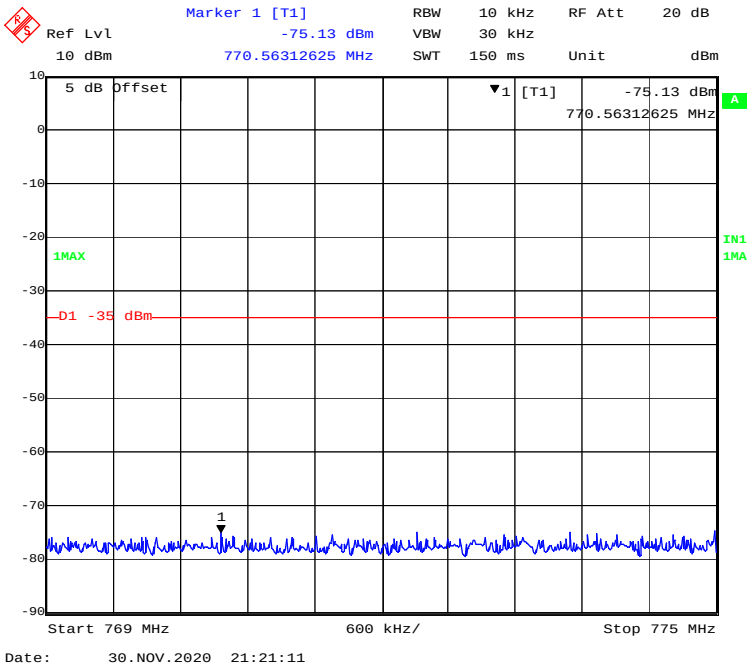
30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)



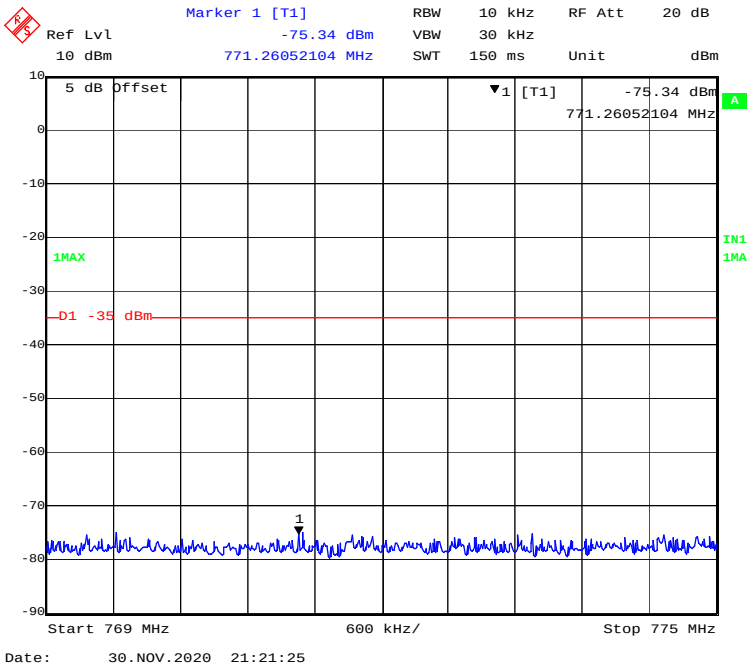
1 GHz – 10 GHz (5 MHz, 16-QAM, Low Channel)



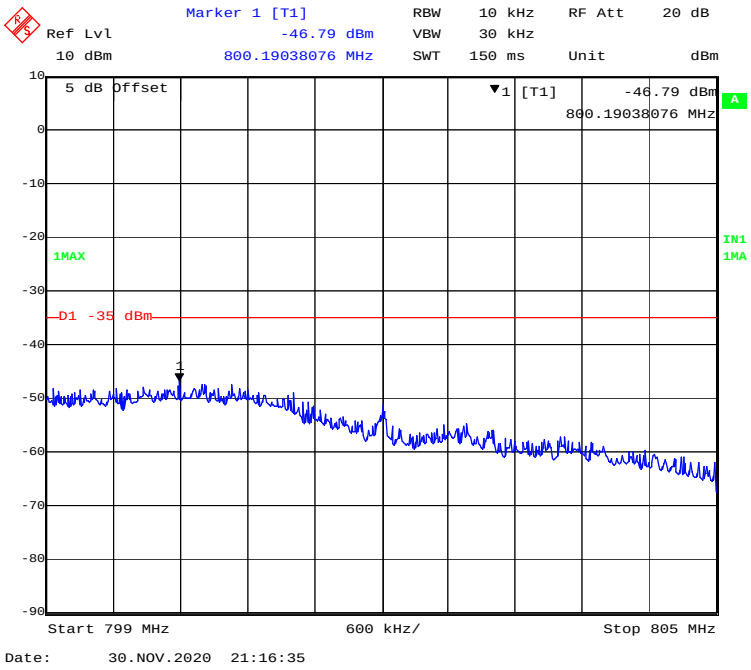
769 MHz - 775 MHz (5 MHz, QPSK, Low Channel)



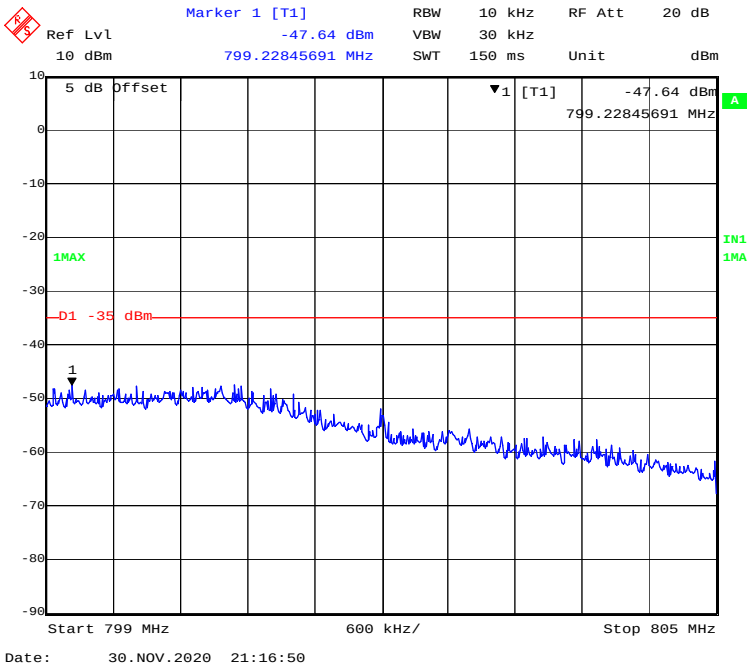
769 MHz - 775 MHz (5 MHz, 16-QAM, Low Channel)



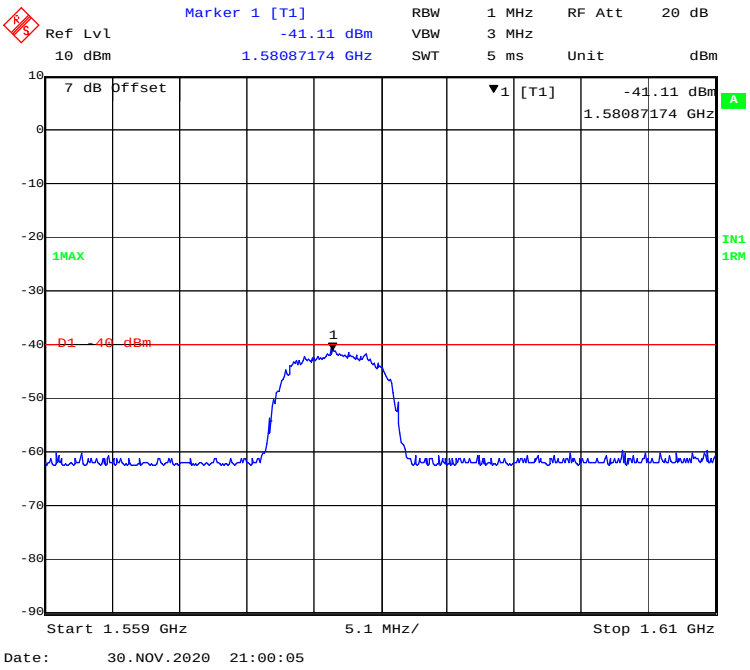
799 MHz - 805 MHz (5 MHz, QPSK, Low Channel)



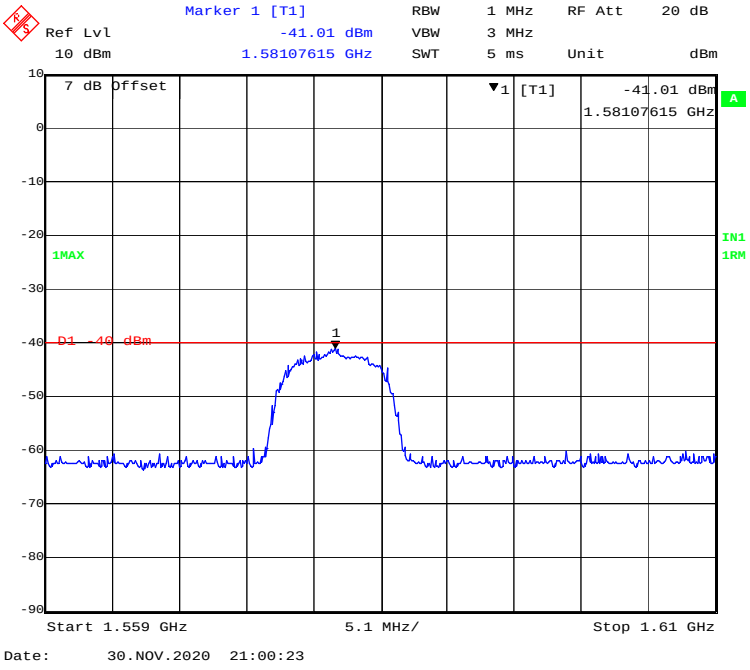
799 MHz - 805 MHz (5 MHz, 16-QAM, Low Channel)



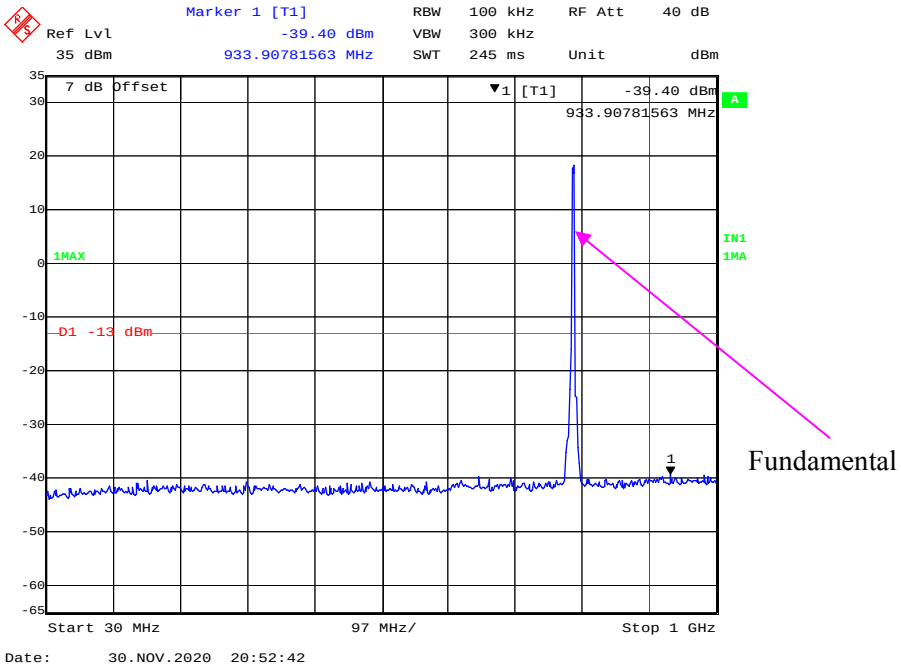
1559 MHz - 1610 MHz (5 MHz, QPSK, Low Channel)



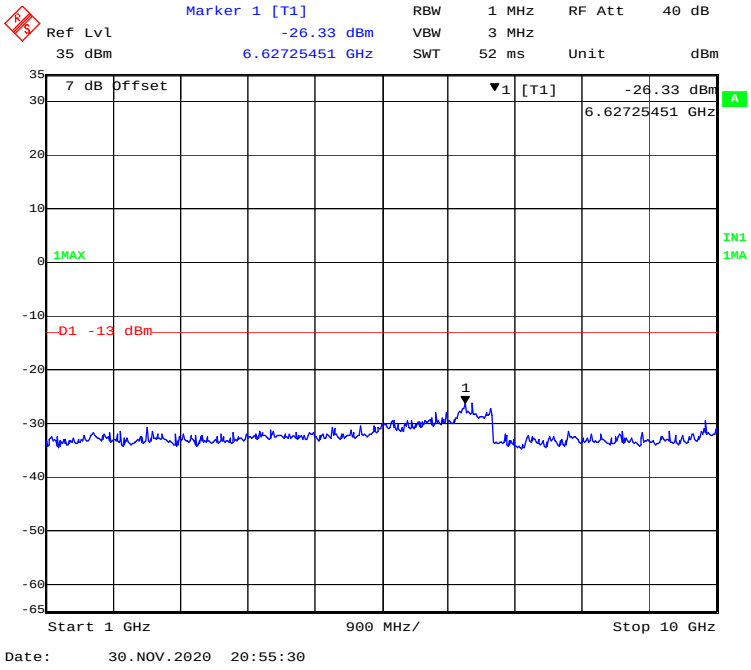
1559 MHz - 1610 MHz (5 MHz, 16-QAM, Low Channel)



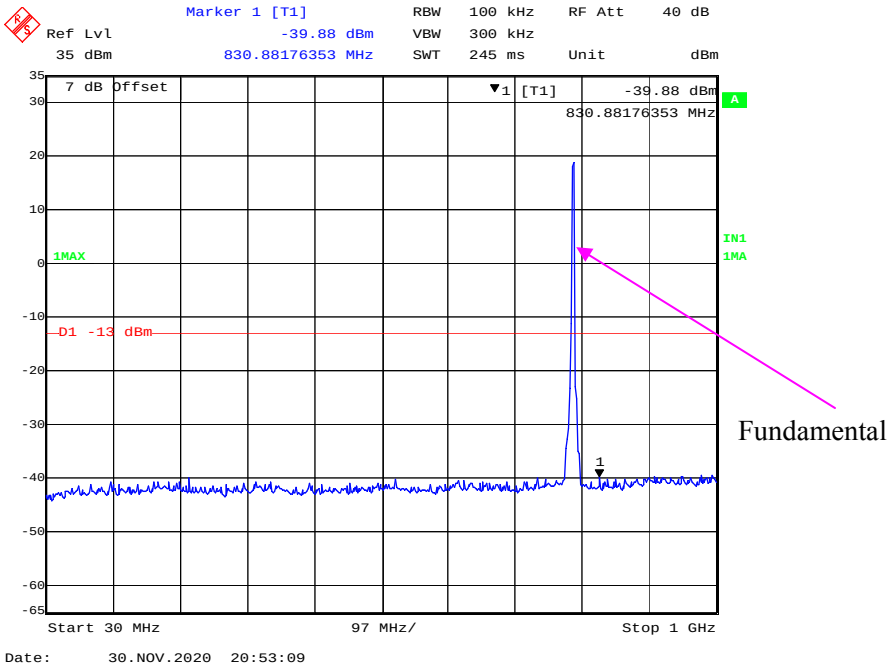
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



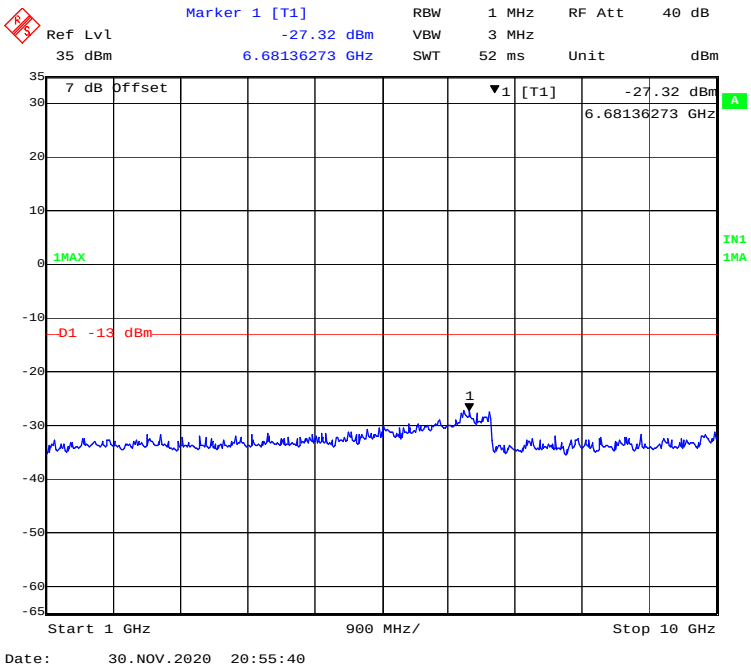
1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



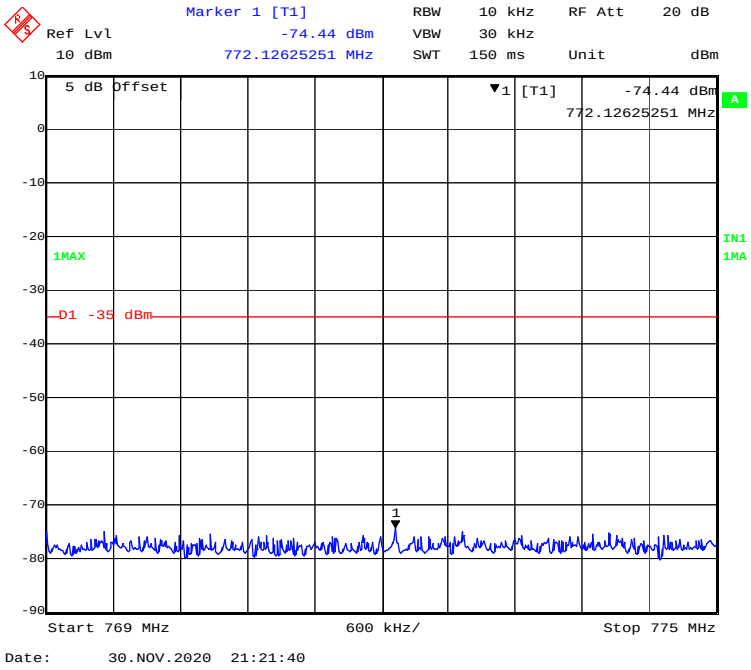
30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



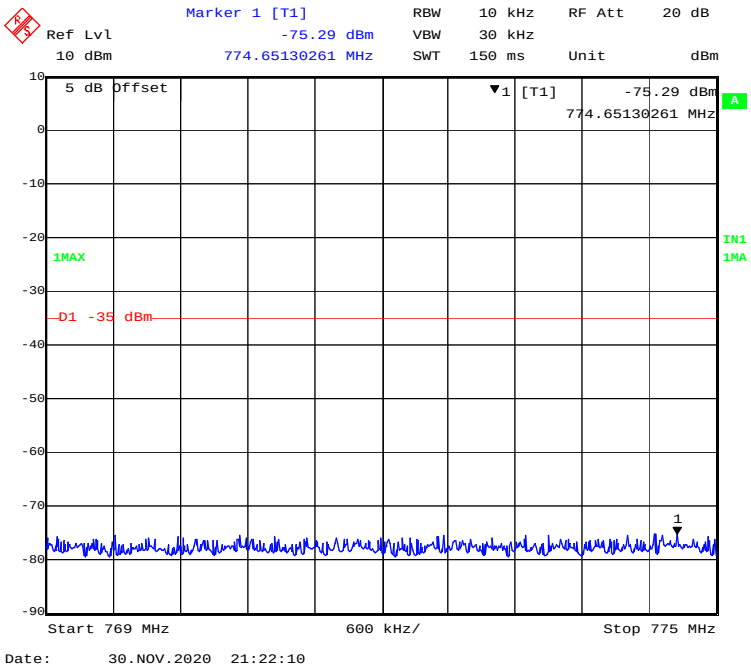
1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



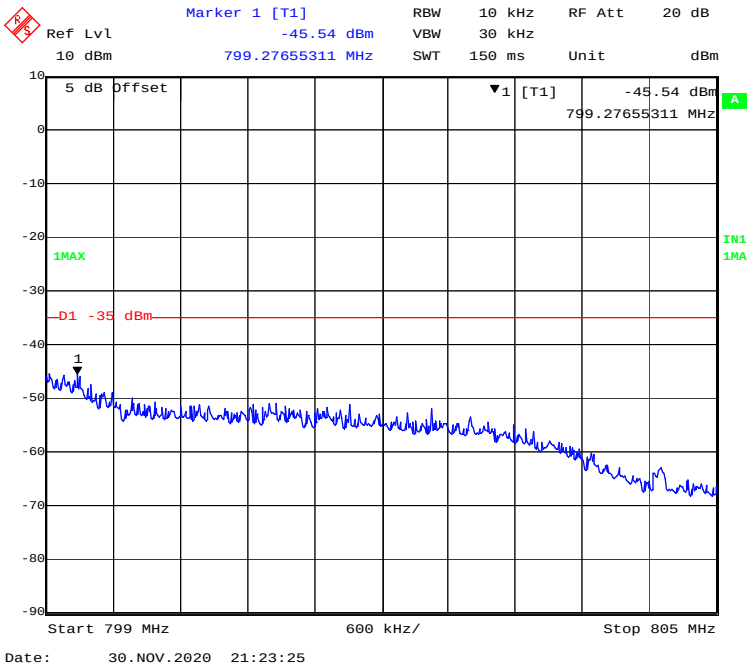
769 MHz - 775 MHz (5 MHz, QPSK, Middle Channel)



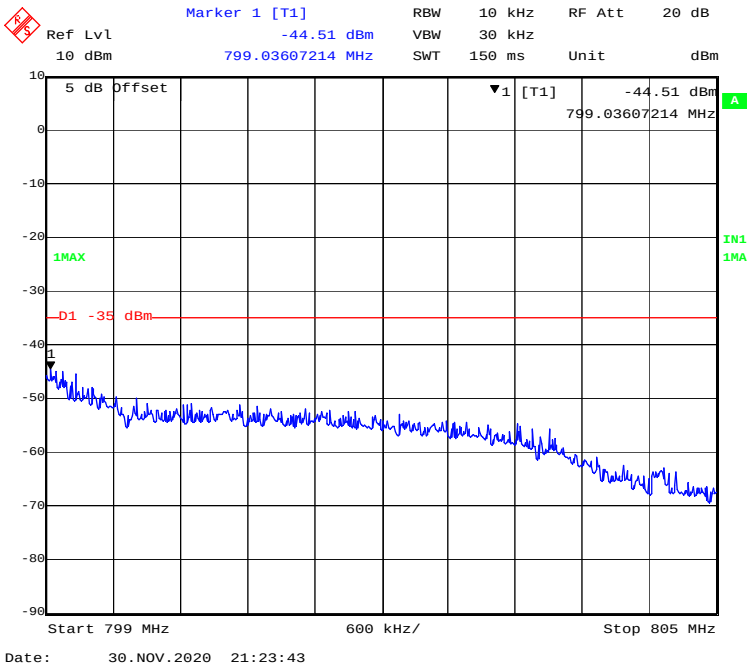
769 MHz - 775 MHz (5 MHz, 16-QAM, Middle Channel)



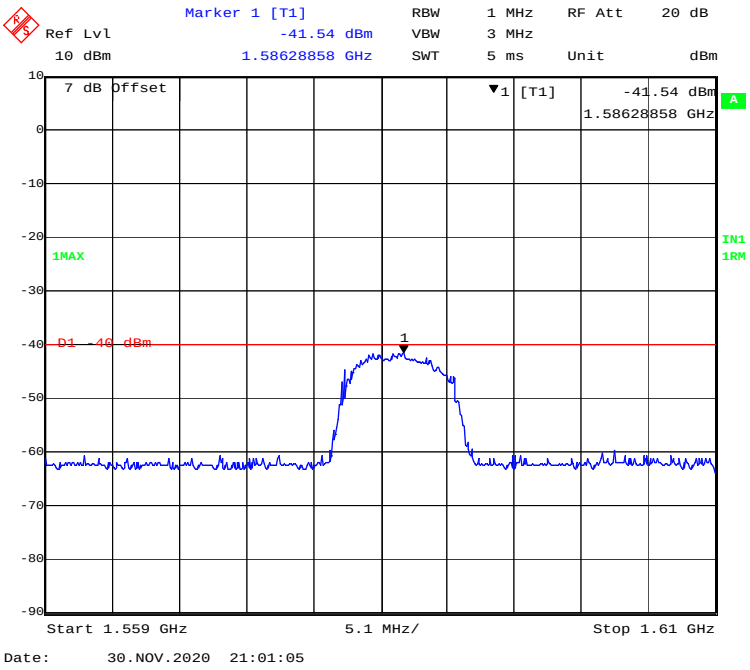
799 MHz - 805 MHz (5 MHz, QPSK, Middle Channel)



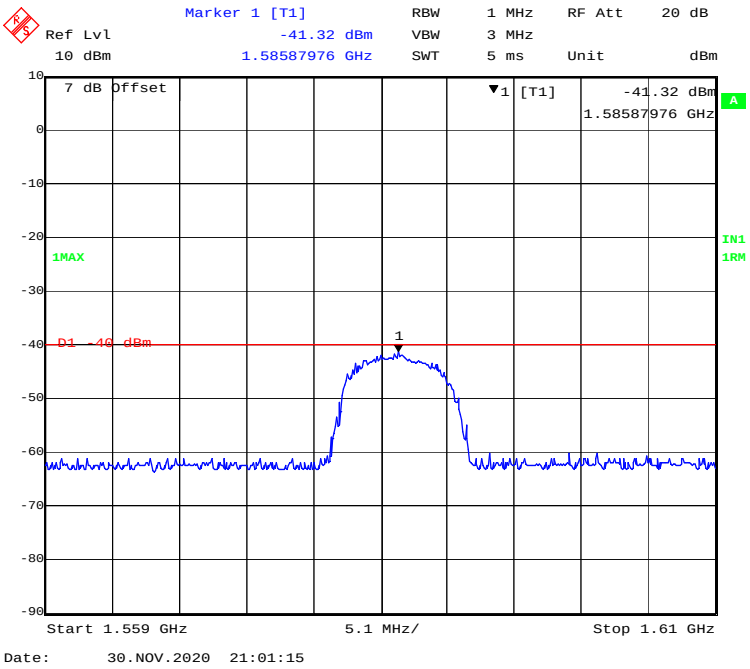
799 MHz - 805 MHz (5 MHz, 16-QAM, Middle Channel)



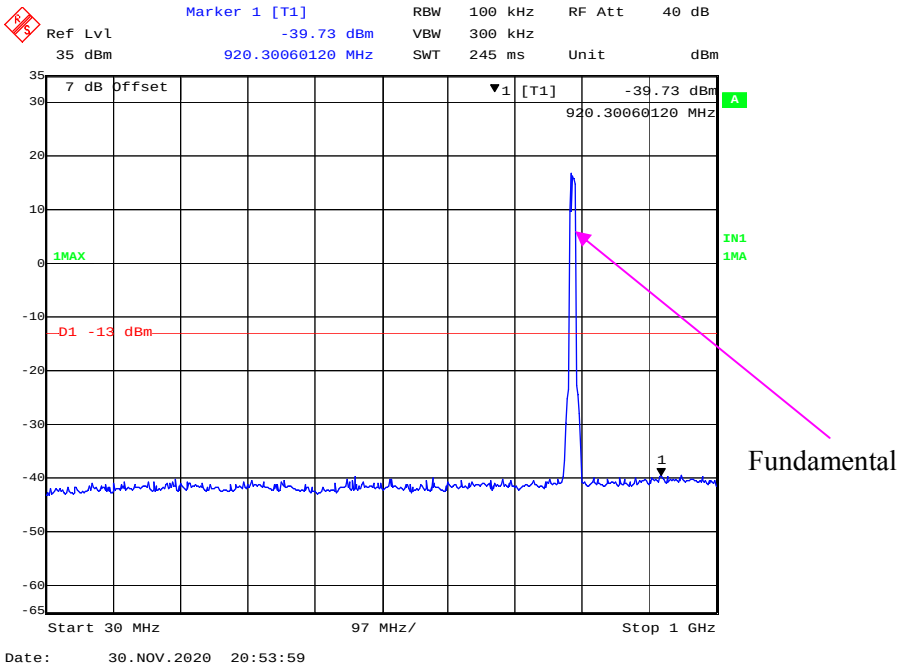
1559 MHz - 1610 MHz (5 MHz, QPSK, Middle Channel)



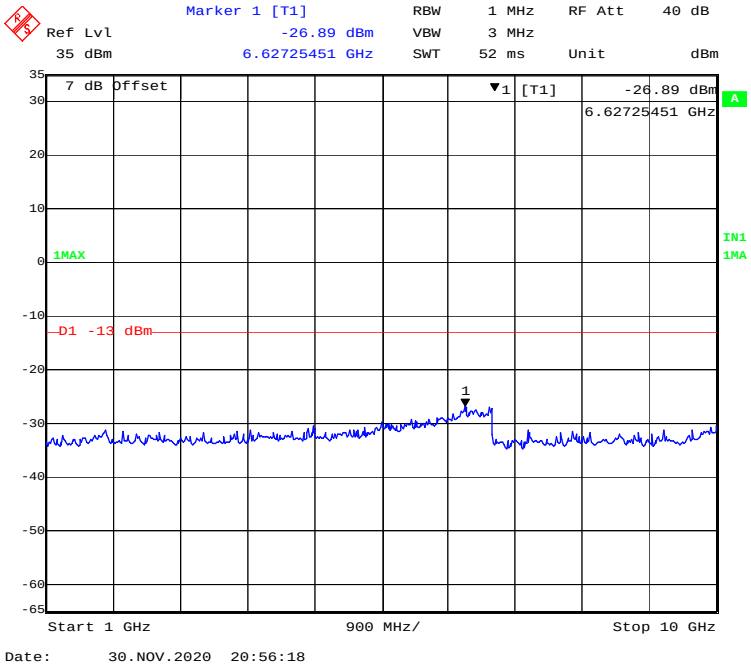
1559 MHz - 1610 MHz (5 MHz, 16-QAM, Middle Channel)



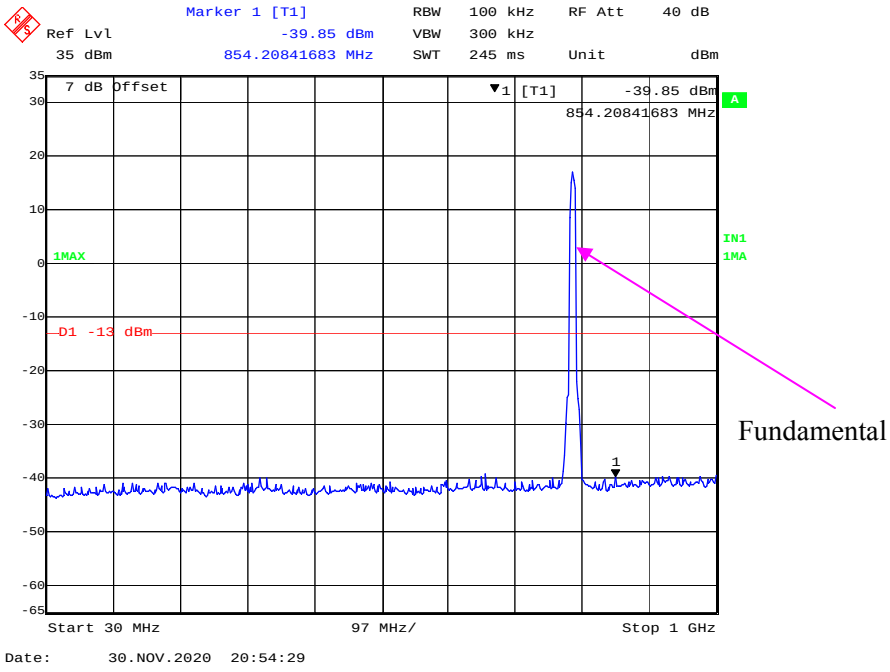
30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



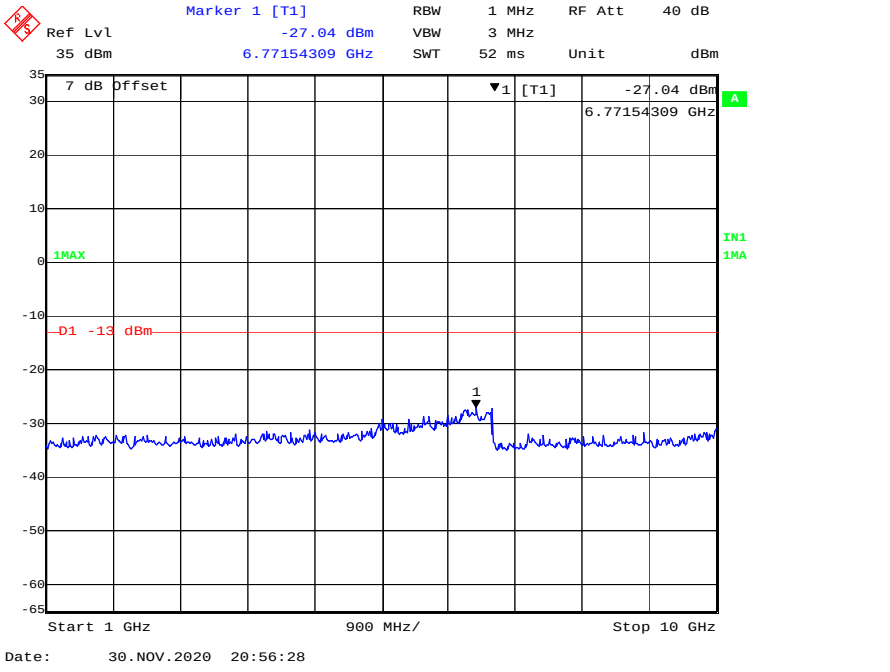
1 GHz – 10 GHz (10 MHz, QPSK, Middle Channel)



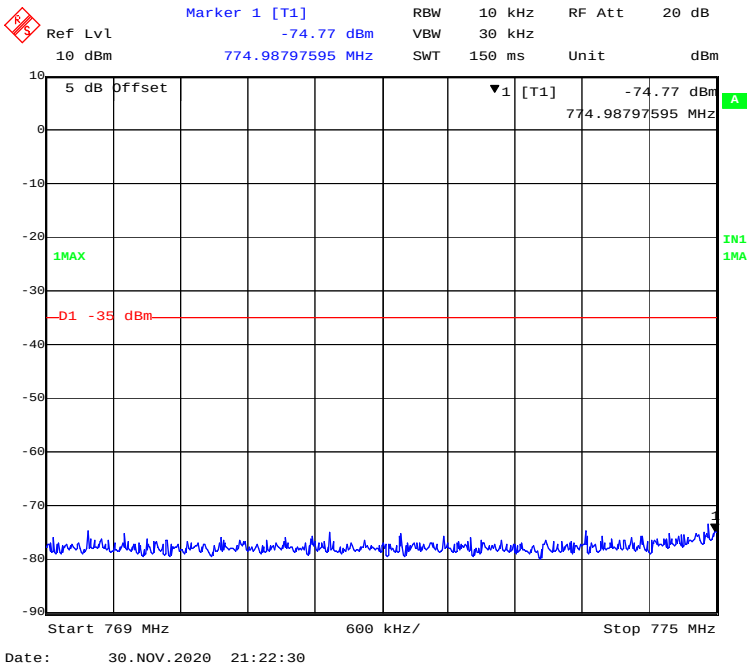
30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



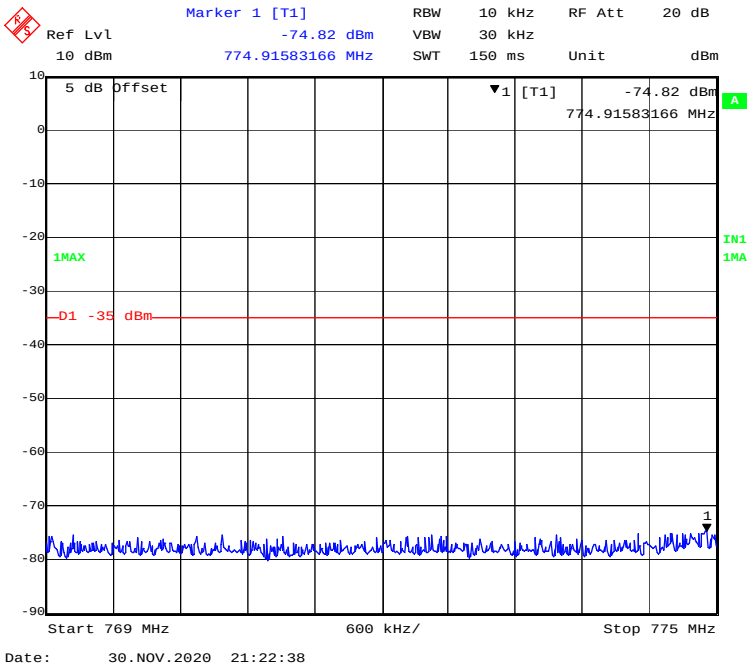
1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



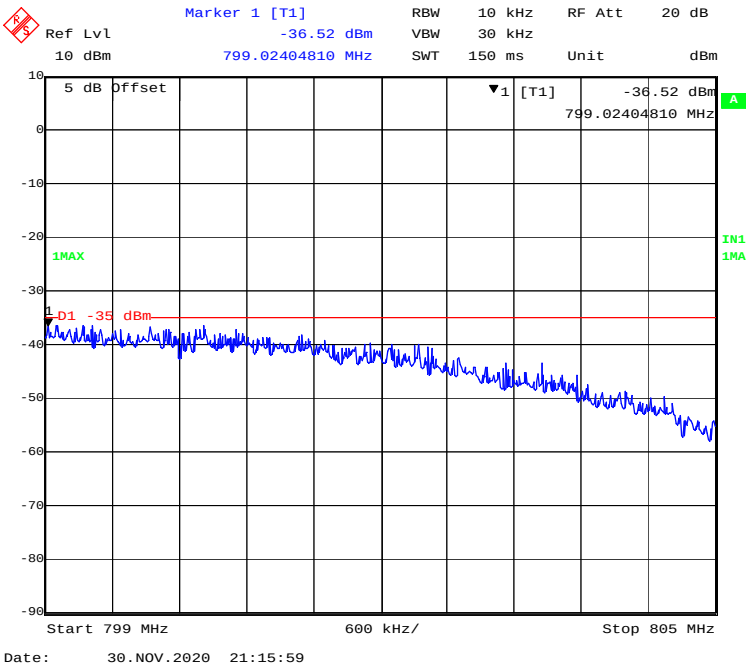
769 MHz - 775 MHz (10 MHz, QPSK, Middle Channel)



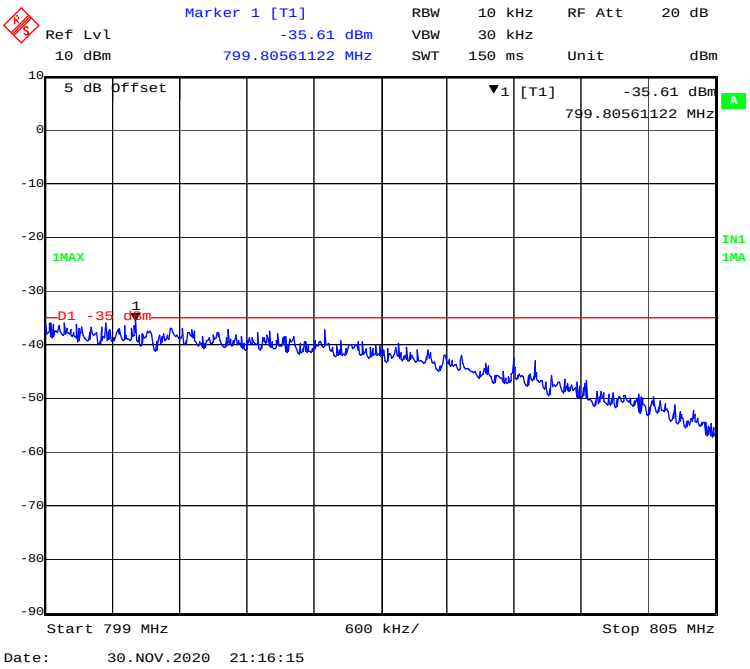
769 MHz - 775 MHz (10 MHz, 16-QAM, Middle Channel)



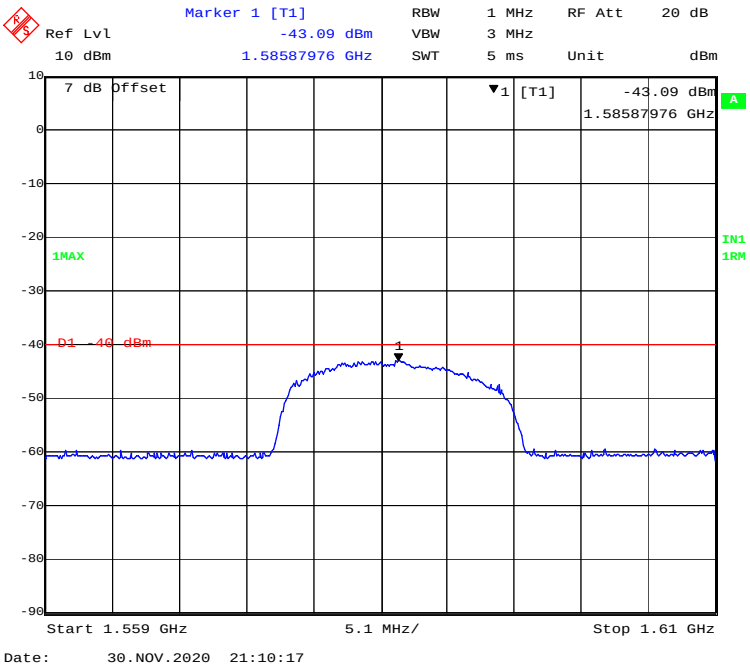
799 MHz - 805 MHz (10 MHz, QPSK, Middle Channel)



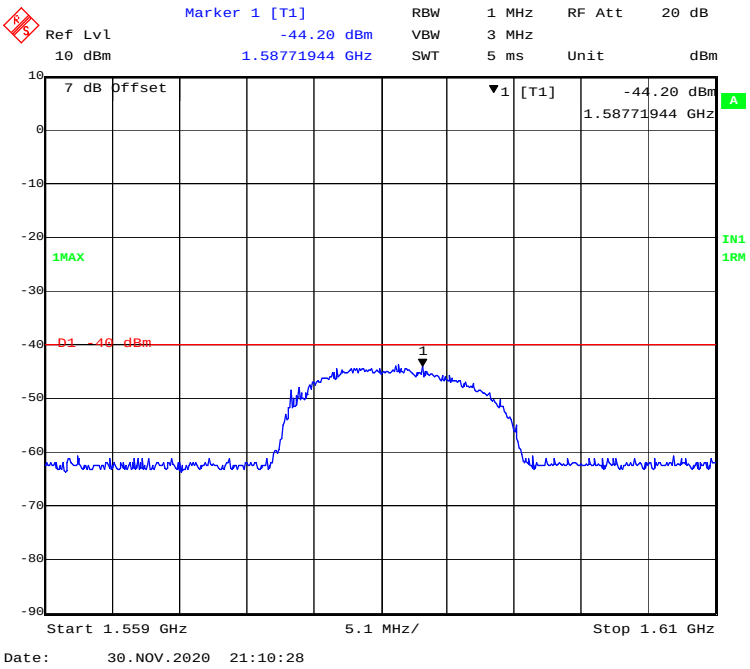
799 MHz - 805 MHz (10 MHz, 16-QAM, Middle Channel)



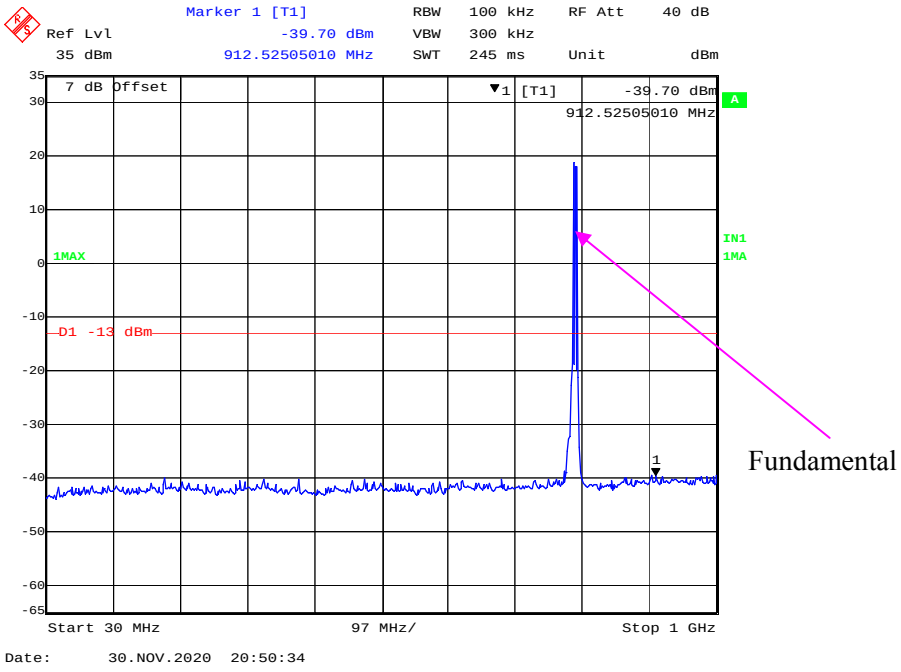
1559 MHz - 1610 MHz (10 MHz, QPSK, Middle Channel)



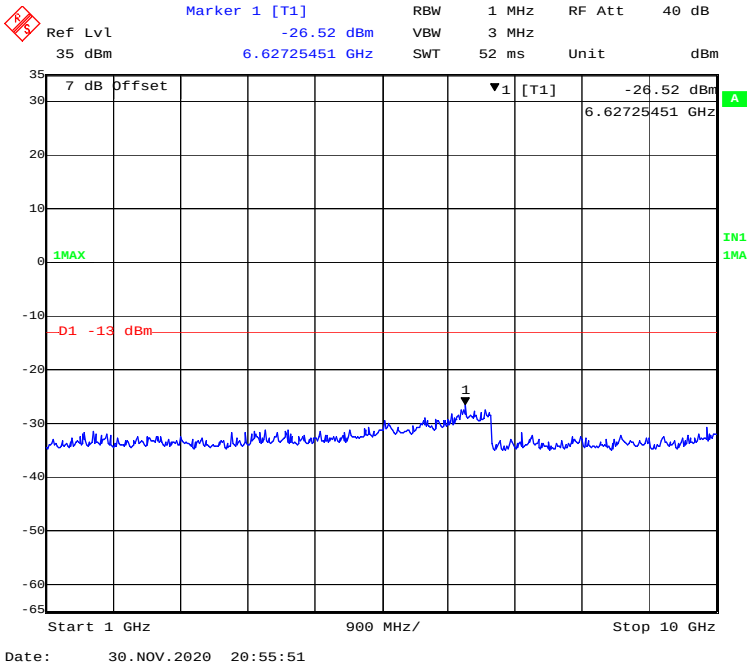
1559 MHz - 1610 MHz (10 MHz, 16-QAM, Middle Channel)



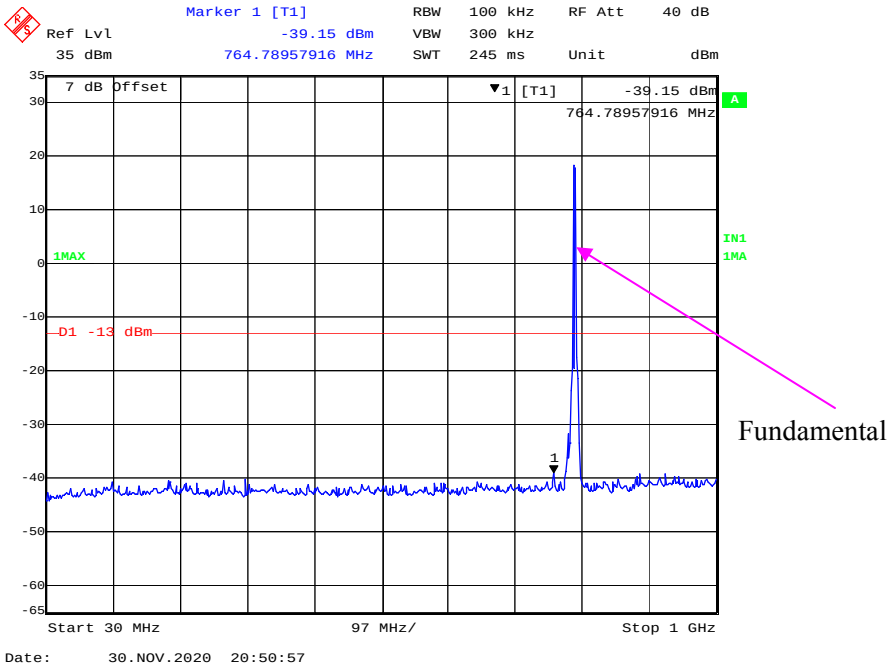
30 MHz - 1 GHz (5 MHz, QPSK, High Channel)



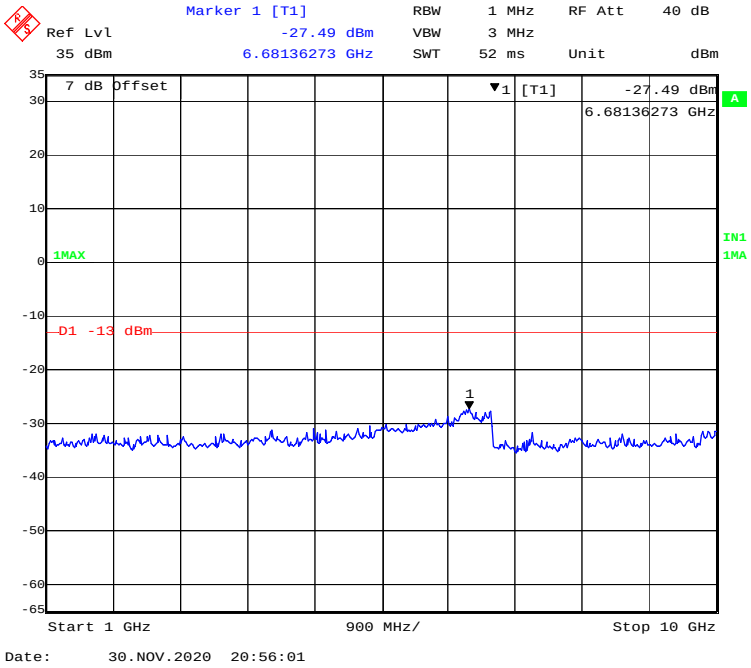
1 GHz – 10 GHz (5 MHz, QPSK, High Channel)



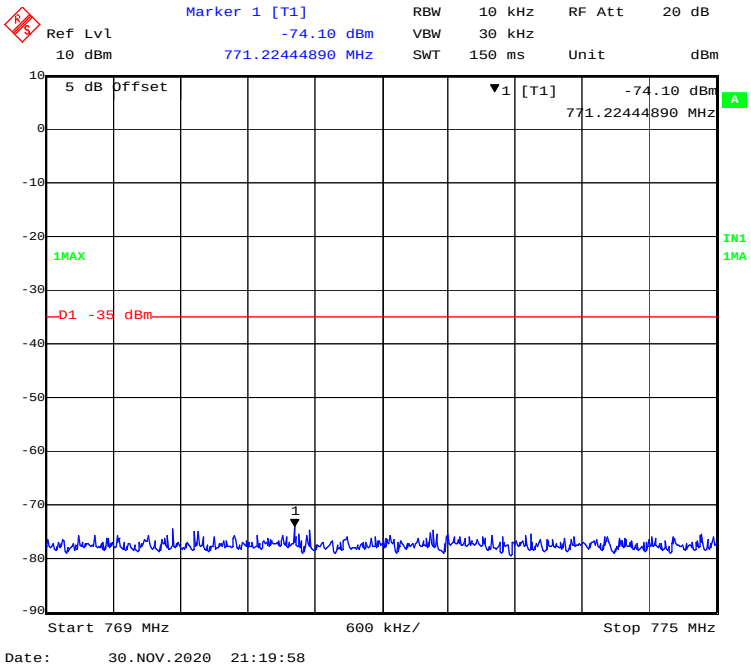
30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)



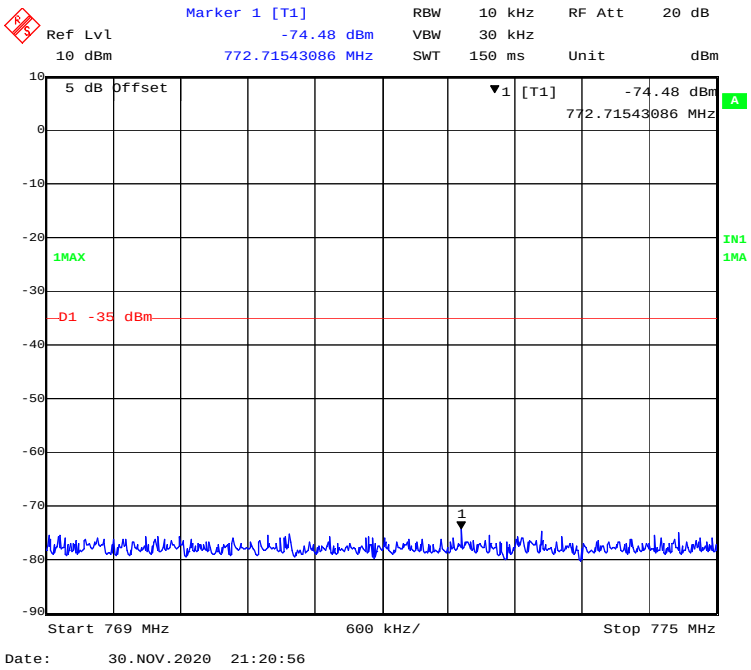
1 GHz – 10 GHz (5 MHz, 16-QAM, High Channel)



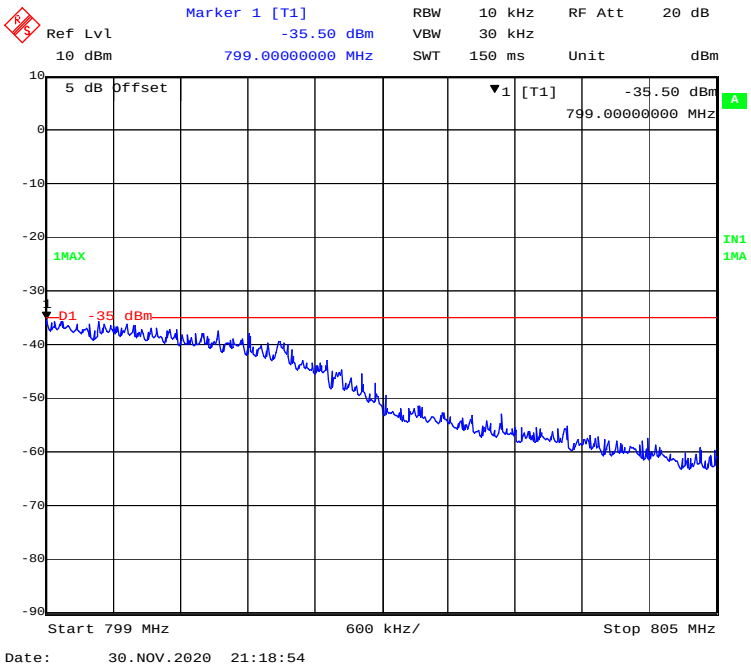
769 MHz - 775 MHz (5 MHz, QPSK, High Channel)



769 MHz - 775 MHz (5 MHz, 16-QAM, High Channel)

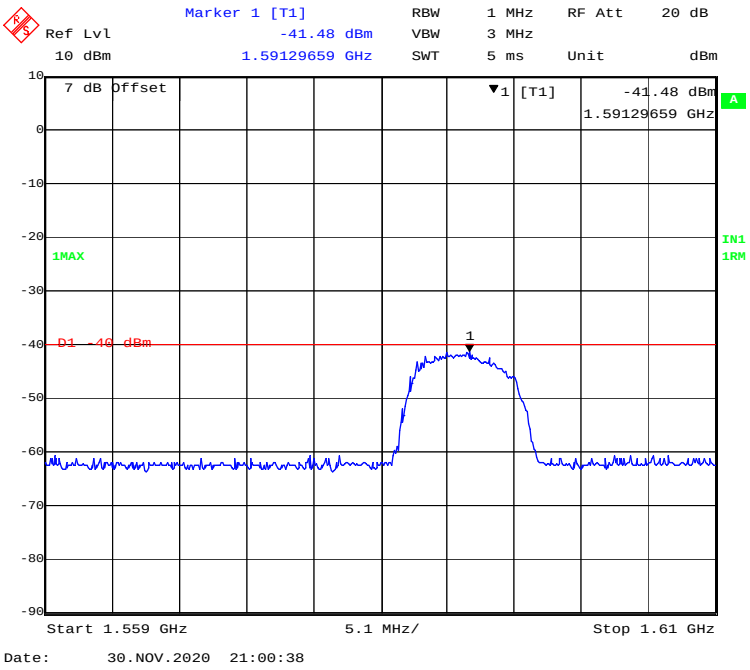


799 MHz - 805 MHz (5 MHz, QPSK, High Channel)

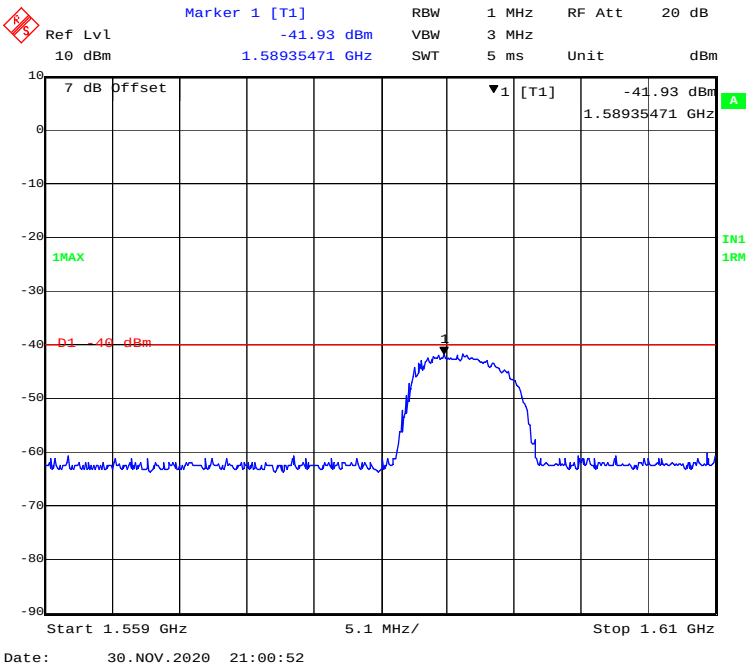


799 MHz - 805 MHz (5 MHz, 16-QAM, High Channel)

1559 MHz - 1610 MHz (5 MHz, QPSK, High Channel)

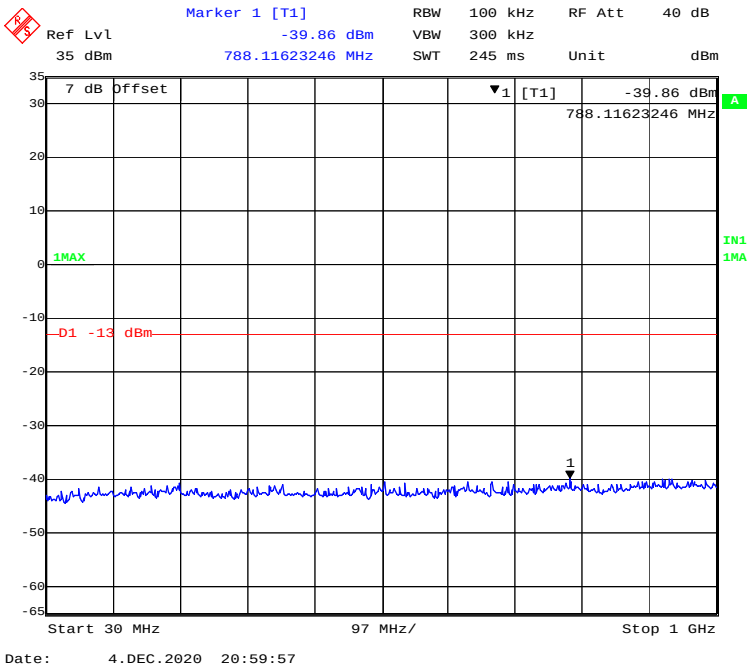


1559 MHz - 1610 MHz (5 MHz, 16-QAM, High Channel)

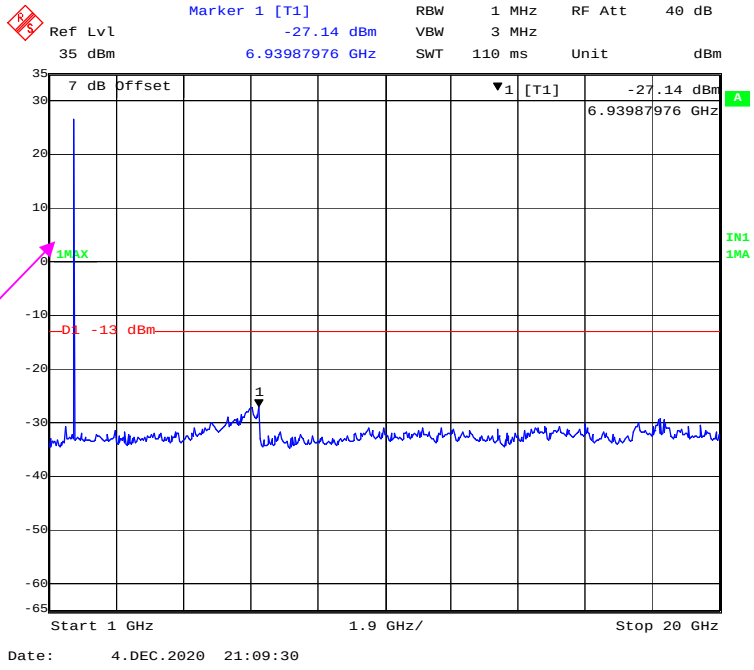


LTE Band 66:

30 MHz - 1 GHz (1.4 MHz, QPSK, Low Channel)

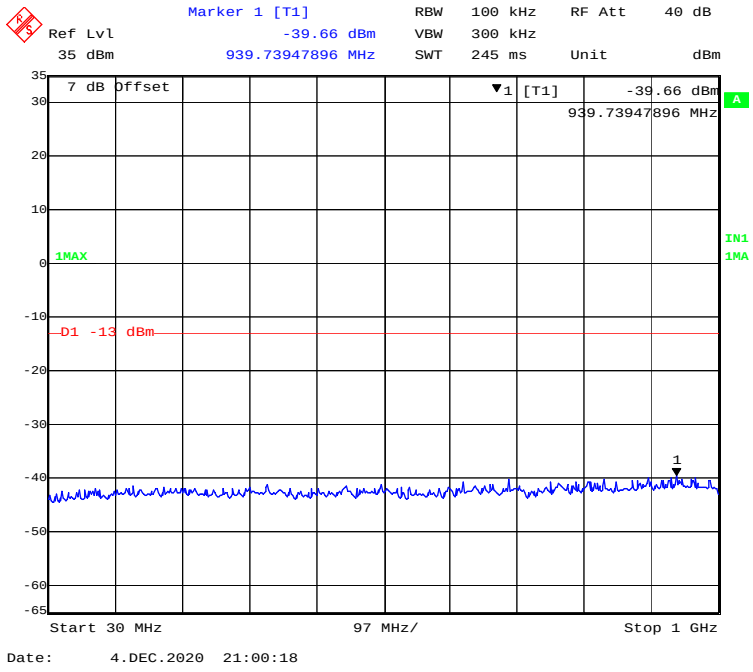


1 GHz – 20 GHz (1.4 MHz, QPSK, Low Channel)

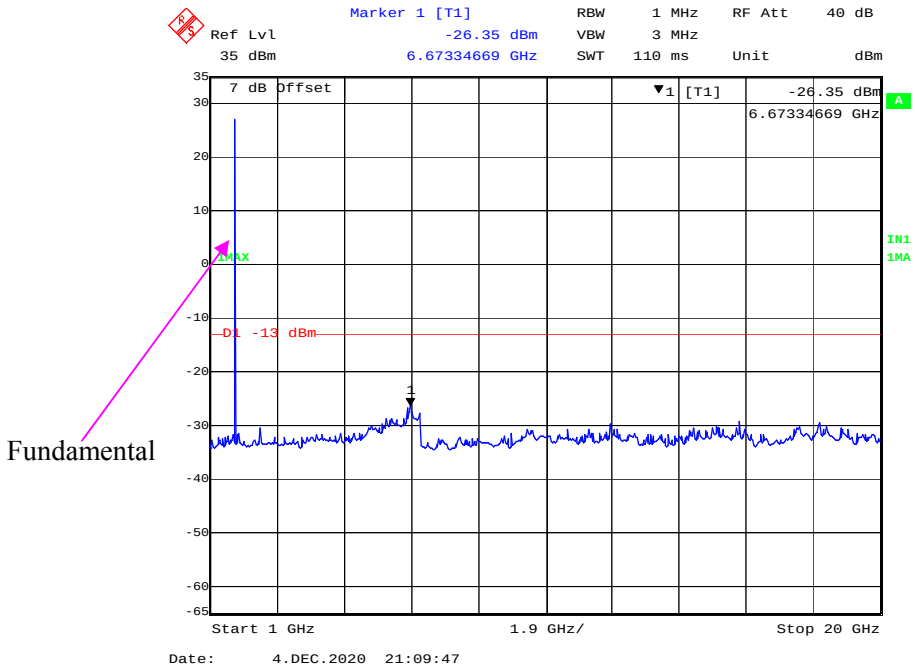


Fundamental

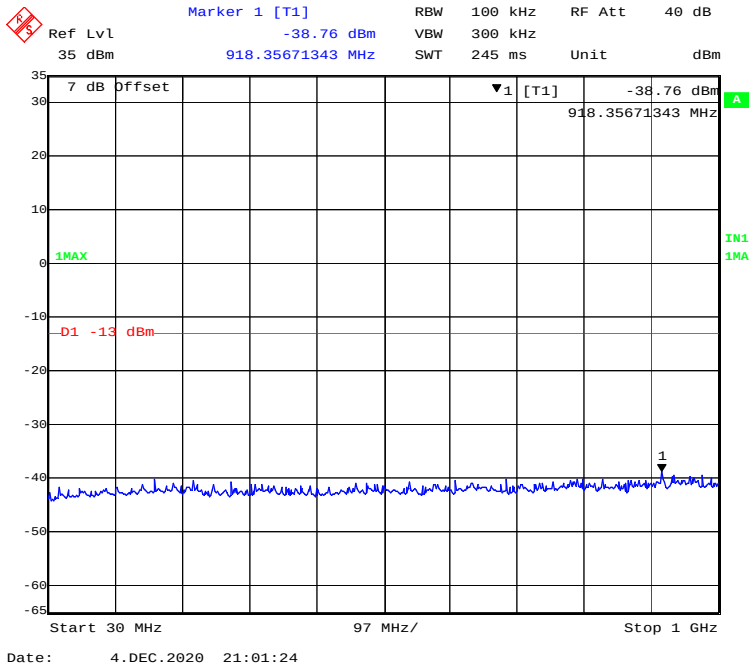
30 MHz - 1 GHz (1.4 MHz, 16-QAM, Low Channel)



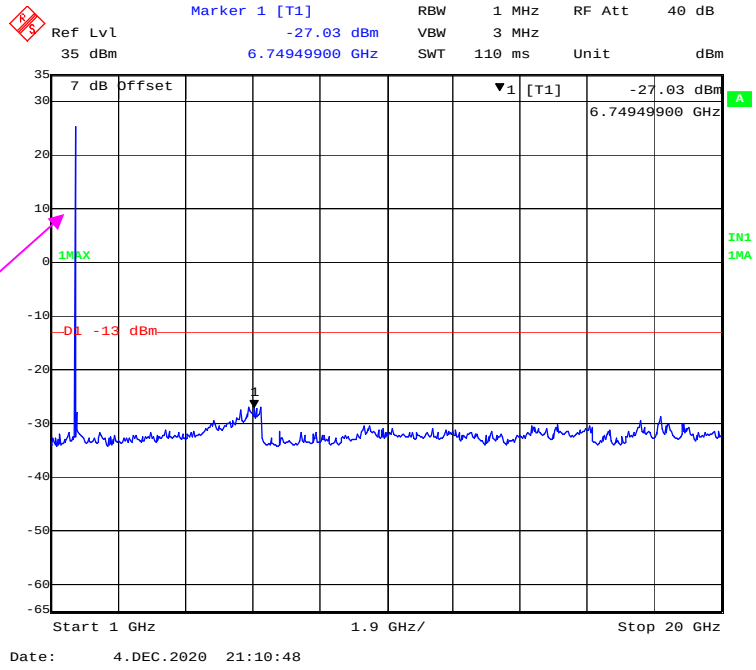
1 GHz – 20 GHz (1.4 MHz, 16-QAM, Low Channel)



30 MHz - 1 GHz (3 MHz, QPSK, Low Channel)

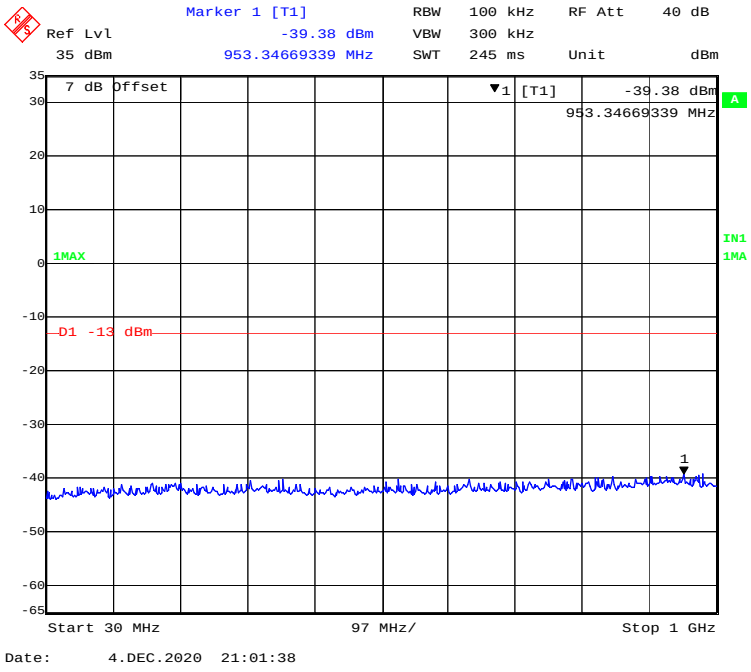


1 GHz – 20 GHz (3 MHz, QPSK, Low Channel)

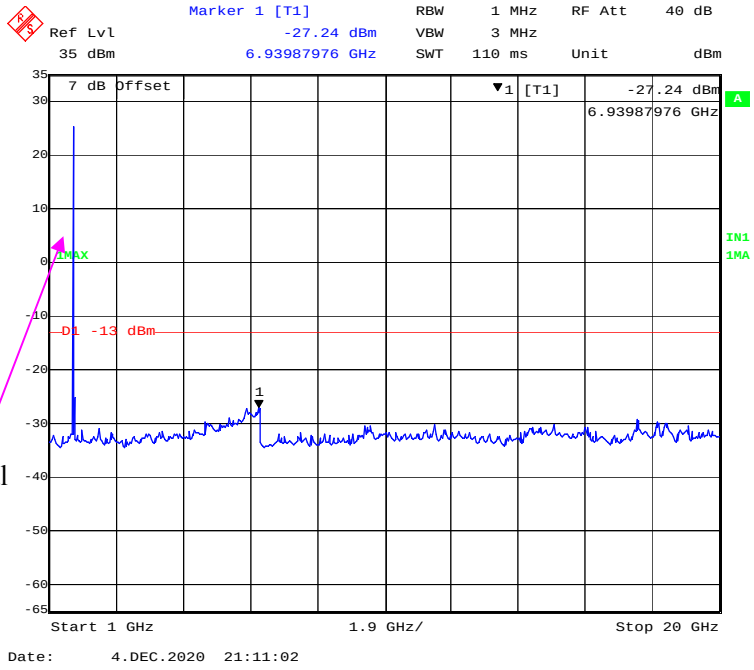


Fundamental

30 MHz - 1 GHz (3 MHz, 16-QAM, Low Channel)

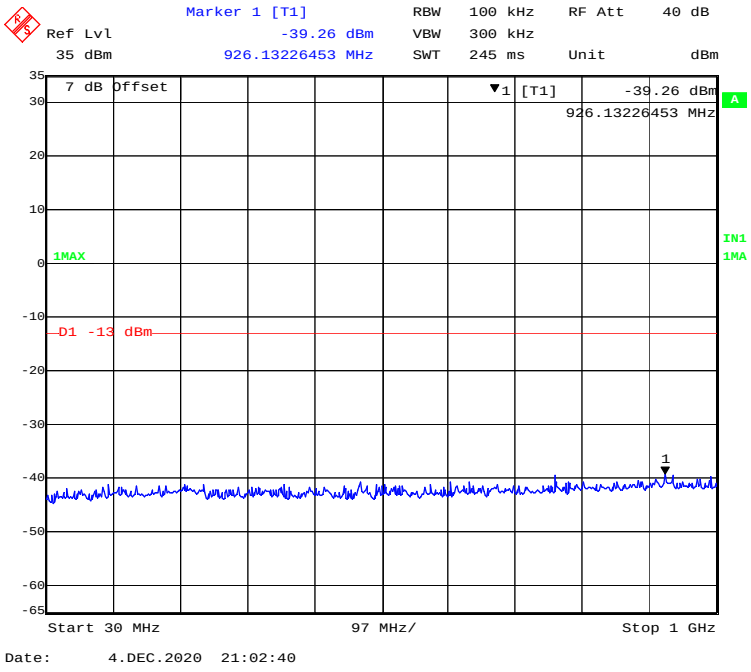


1 GHz – 20 GHz (3 MHz, 16-QAM, Low Channel)

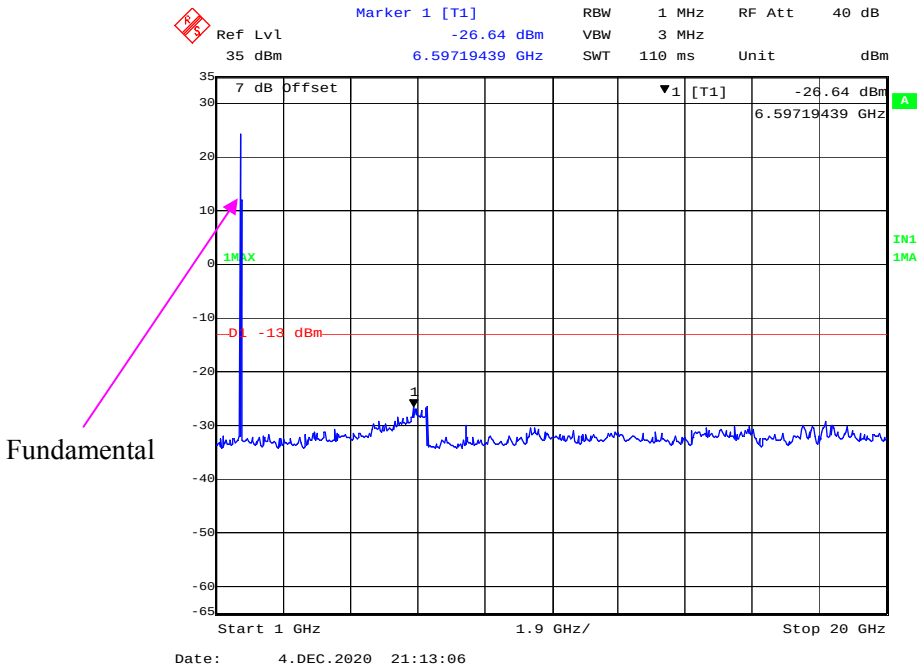


Fundamental

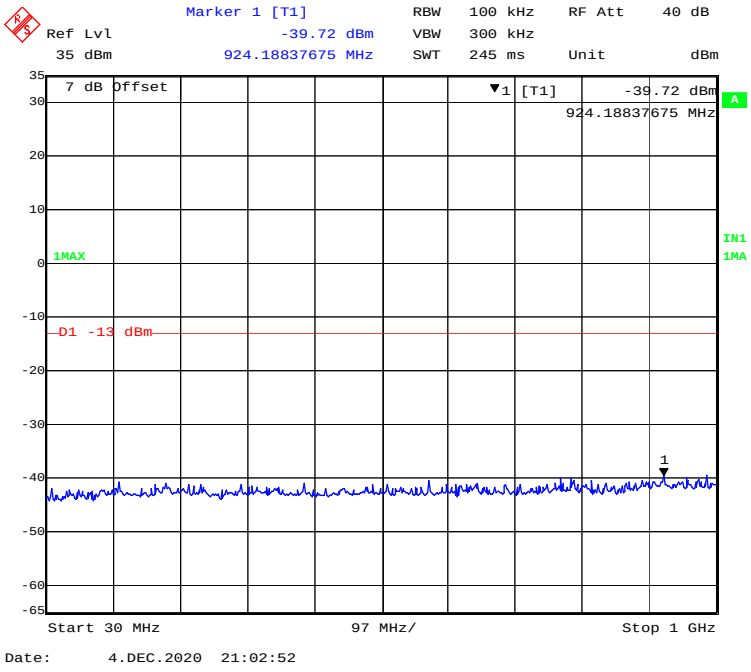
30 MHz - 1 GHz (5 MHz, QPSK, Low Channel)



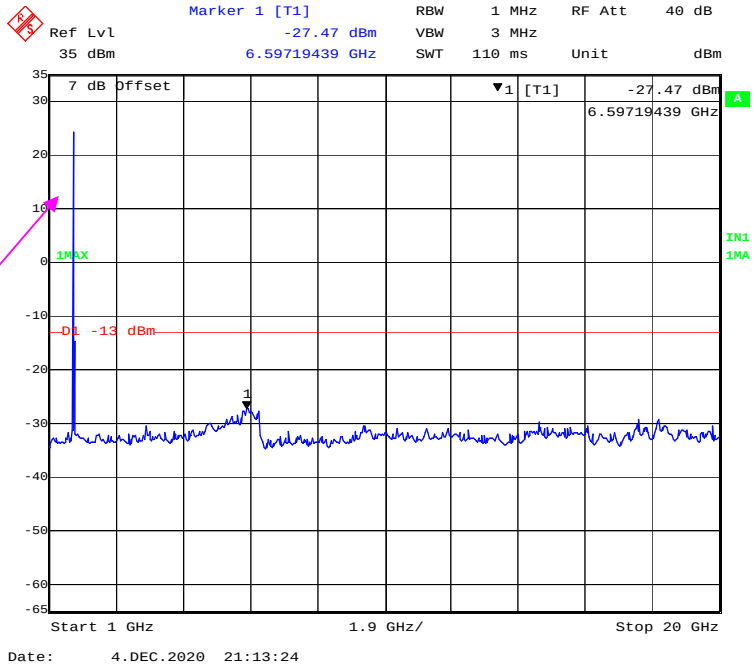
1 GHz – 20 GHz (5 MHz, QPSK, Low Channel)



30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)

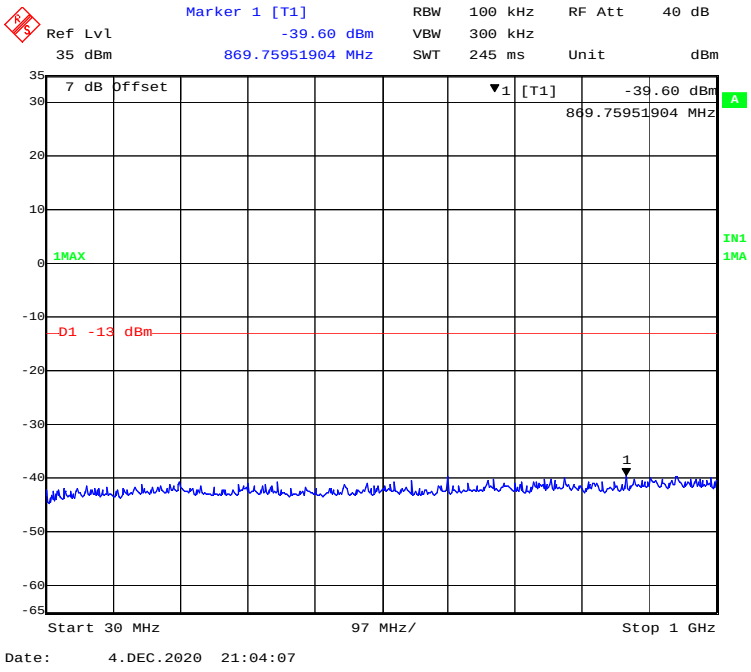


1 GHz – 20 GHz (5 MHz, 16-QAM, Low Channel)

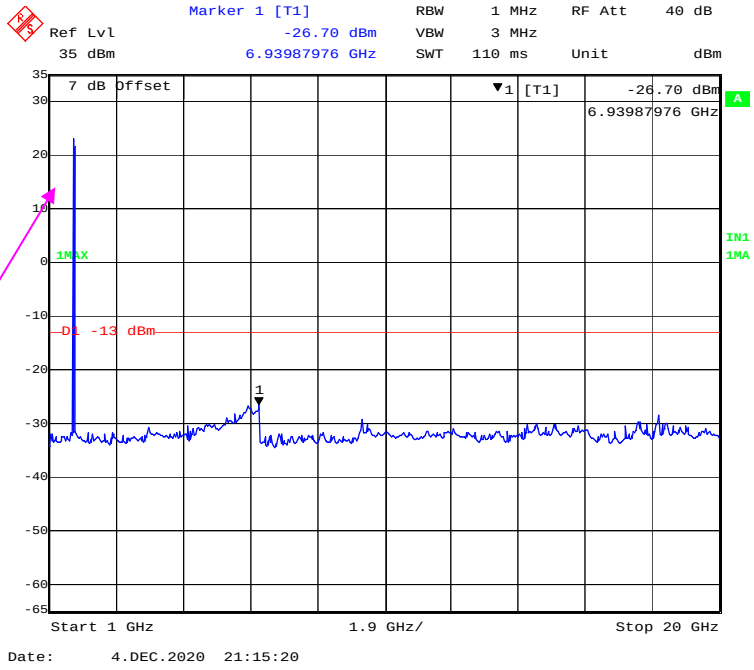


Fundamental

30 MHz - 1 GHz (10 MHz, QPSK, Low Channel)

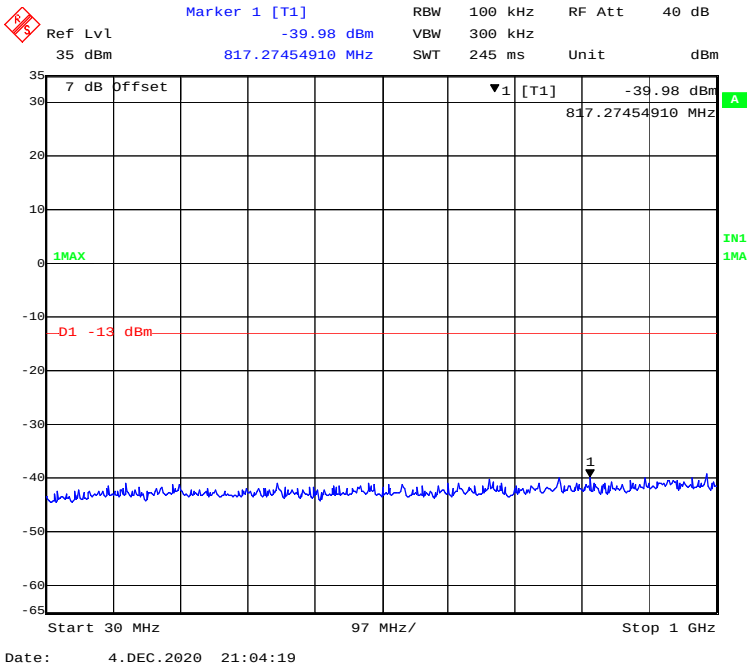


1 GHz – 20 GHz (10 MHz, QPSK, Low Channel)

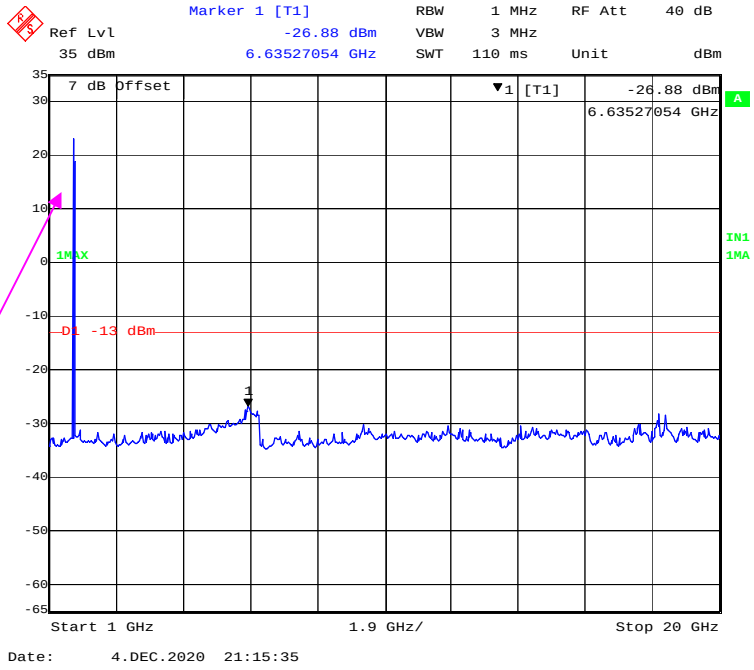


Fundamental

30 MHz - 1 GHz (10 MHz, 16-QAM, Low Channel)

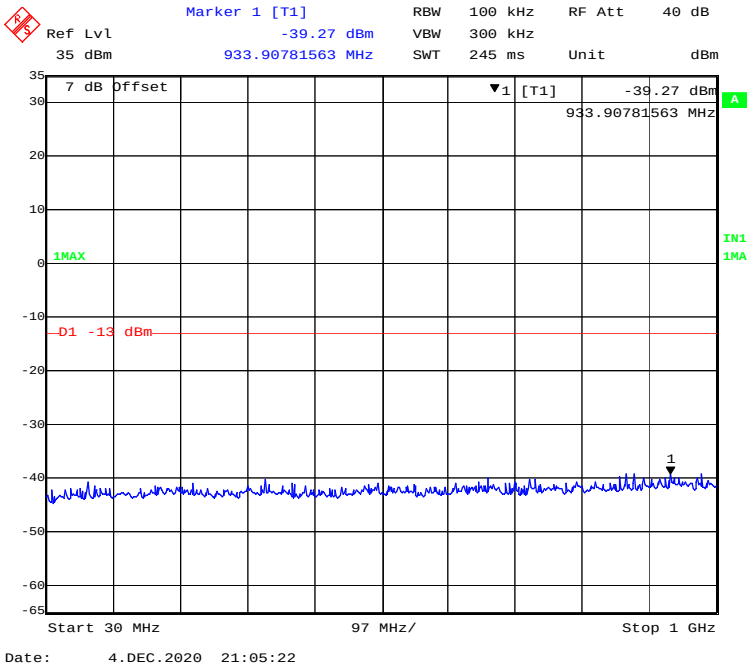


1 GHz – 20 GHz (10 MHz, 16-QAM, Low Channel)

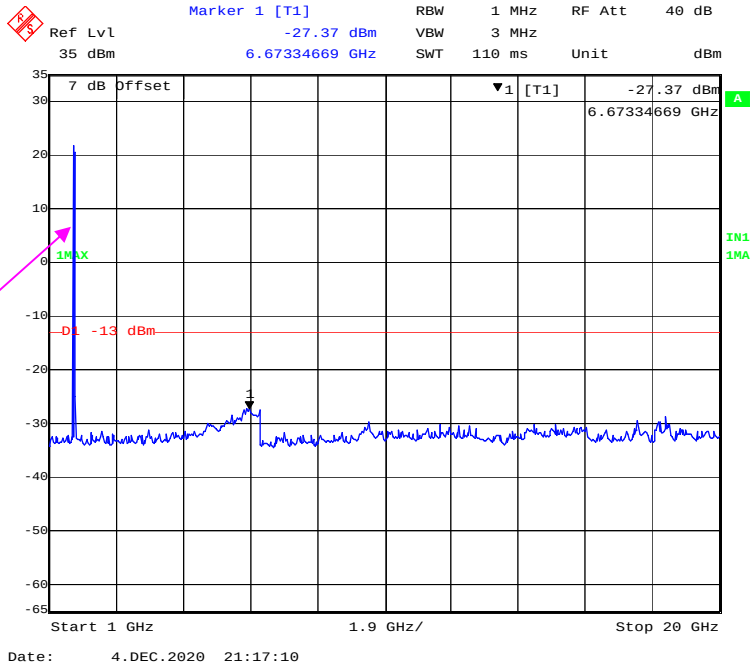


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, Low Channel)

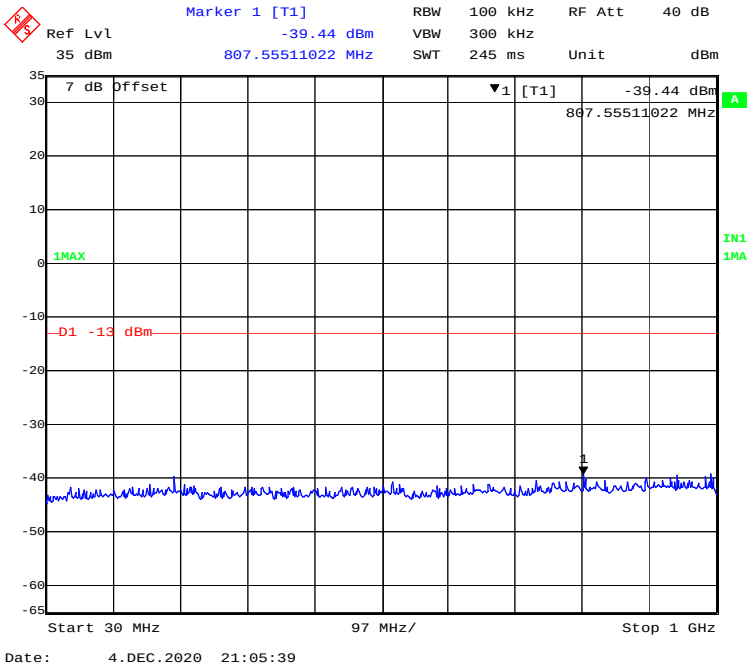


1 GHz – 20 GHz (15 MHz, QPSK, Low Channel)

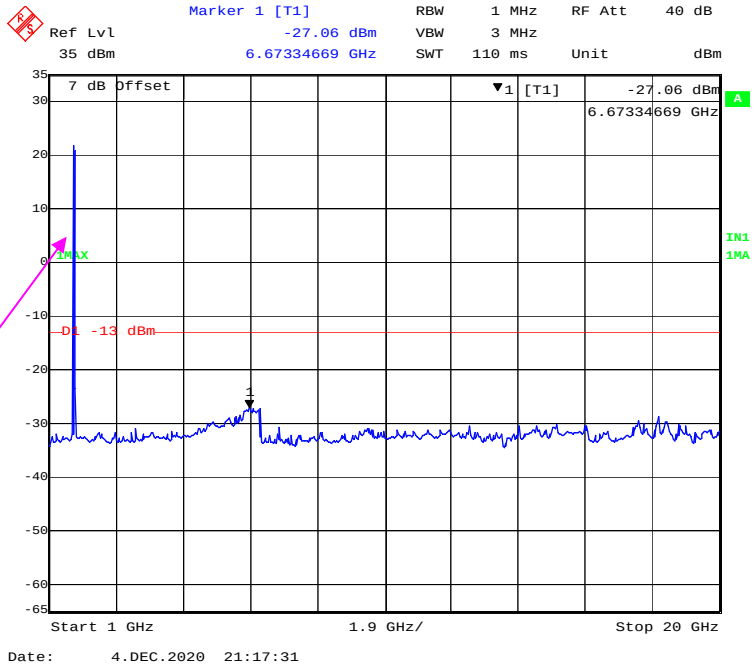


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, Low Channel)

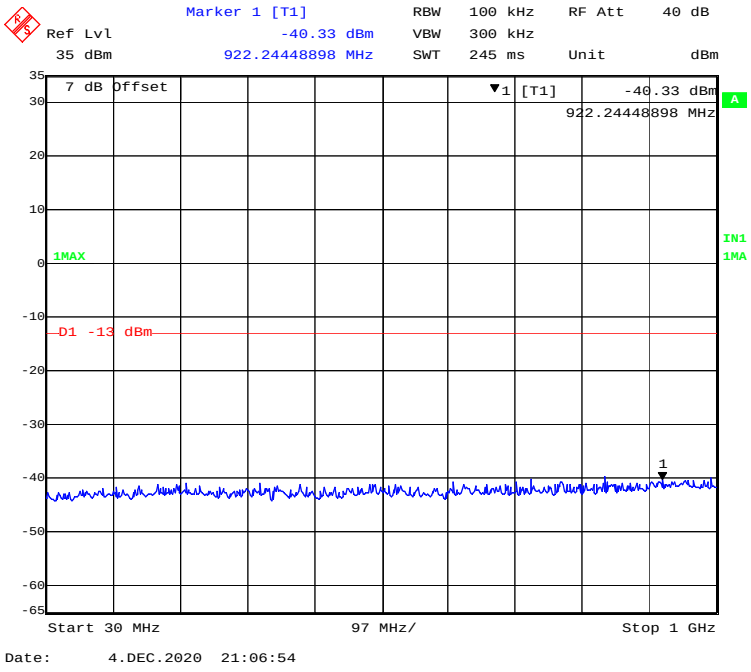


1 GHz – 20 GHz (15 MHz, 16-QAM, Low Channel)

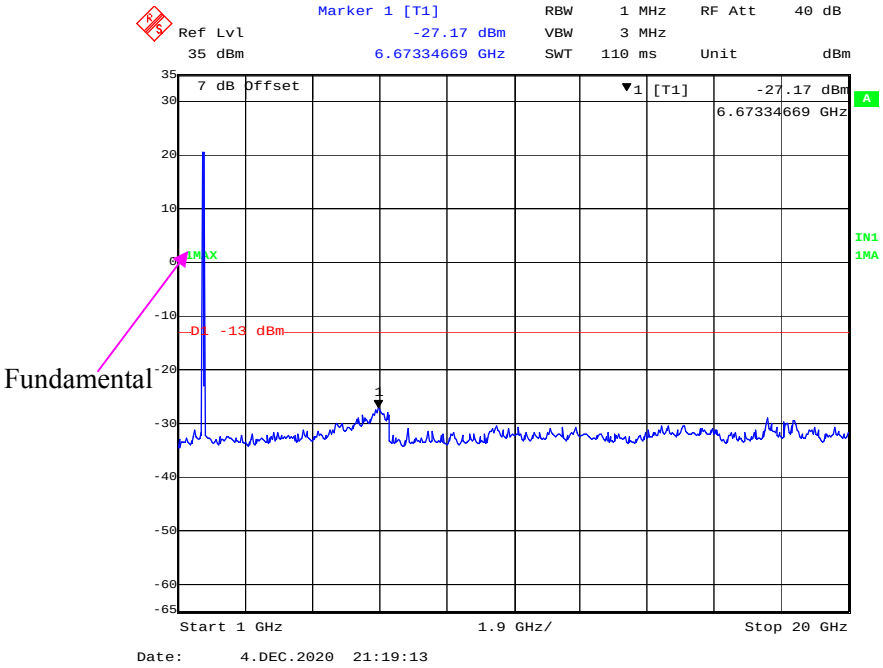


Fundamental

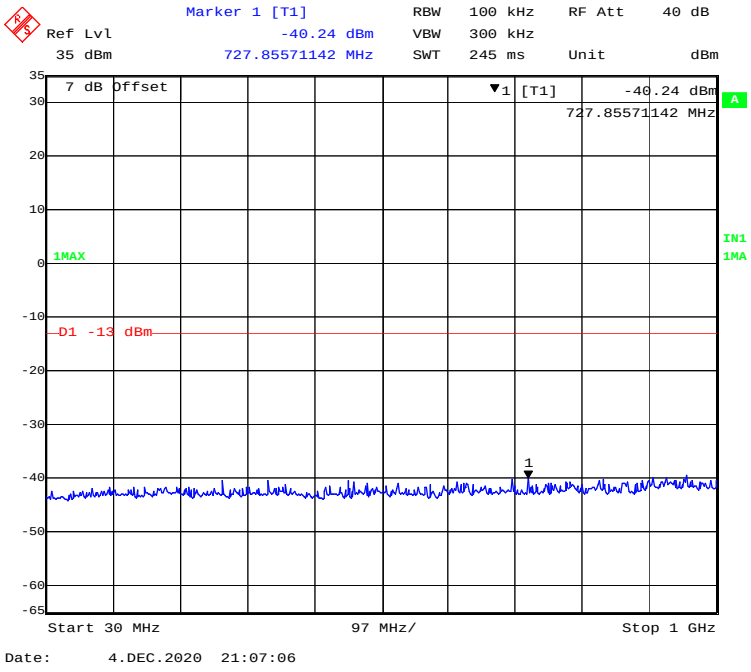
30 MHz - 1 GHz (20 MHz, QPSK, Low Channel)



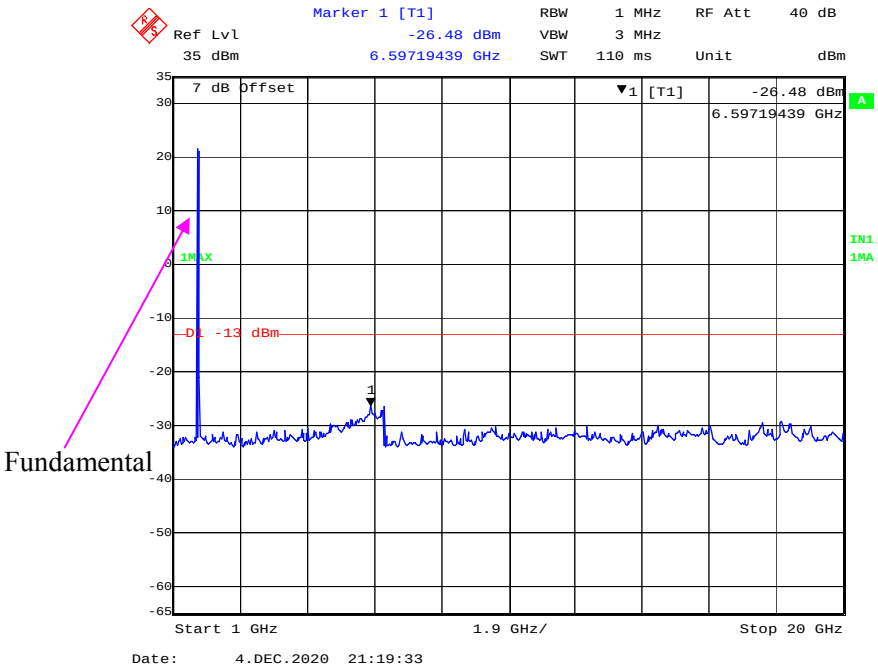
1 GHz – 20 GHz (20 MHz, QPSK, Low Channel)



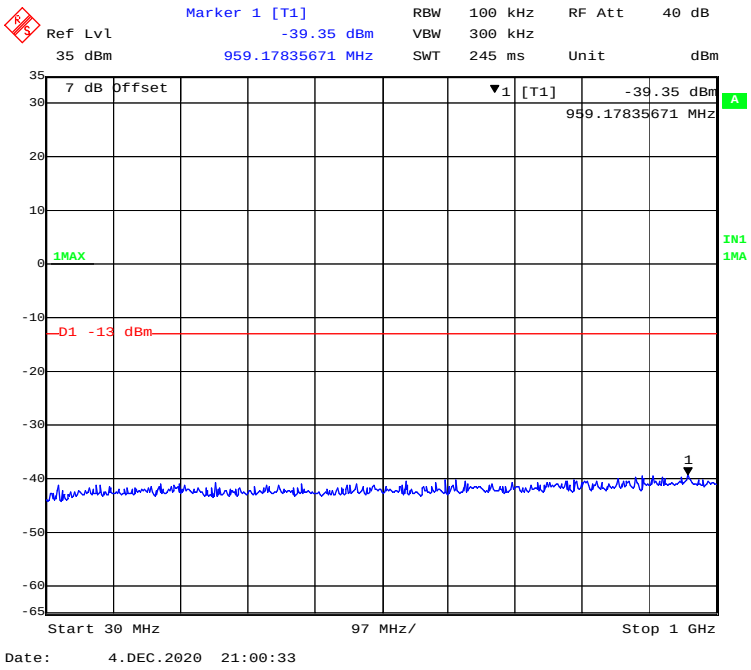
30 MHz - 1 GHz (20 MHz, 16-QAM, Low Channel)



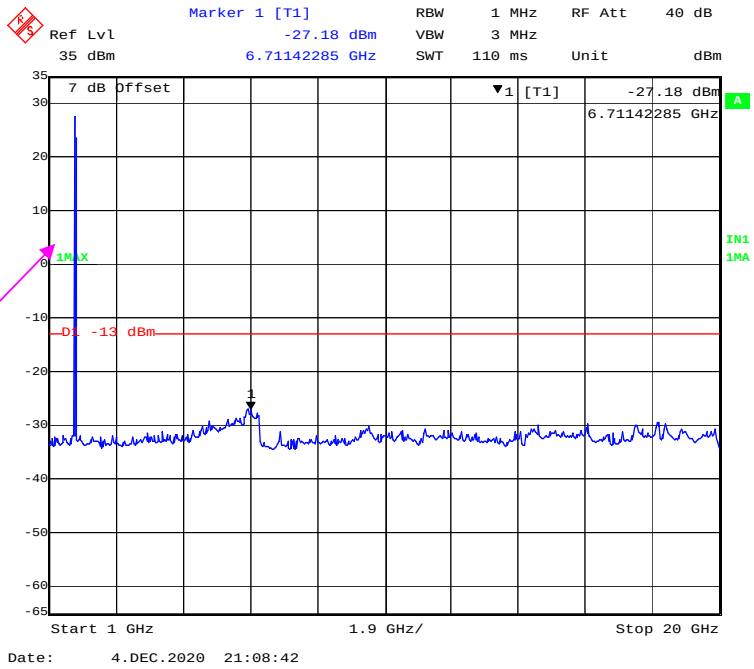
1 GHz – 20 GHz (20 MHz, 16-QAM, Low Channel)



30 MHz - 1 GHz (1.4 MHz, QPSK, Middle Channel)

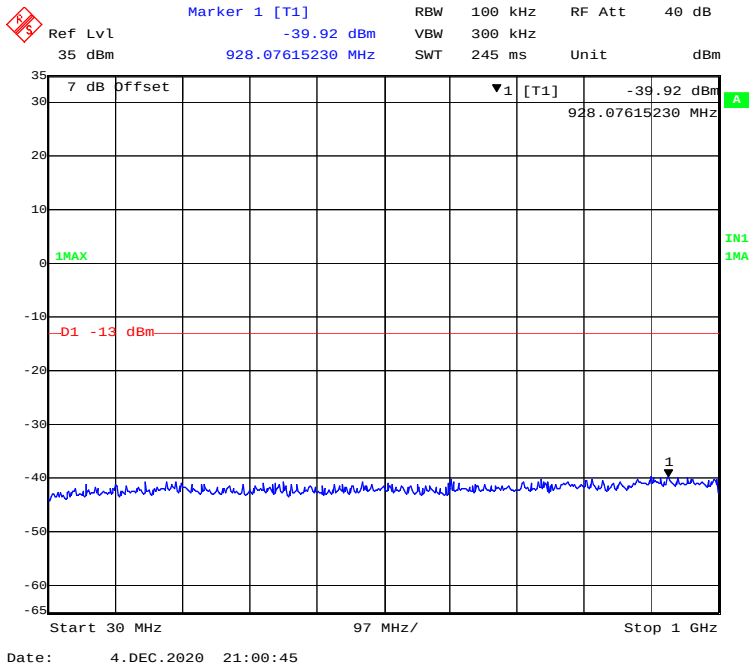


1 GHz – 20 GHz (1.4 MHz, QPSK, Middle Channel)

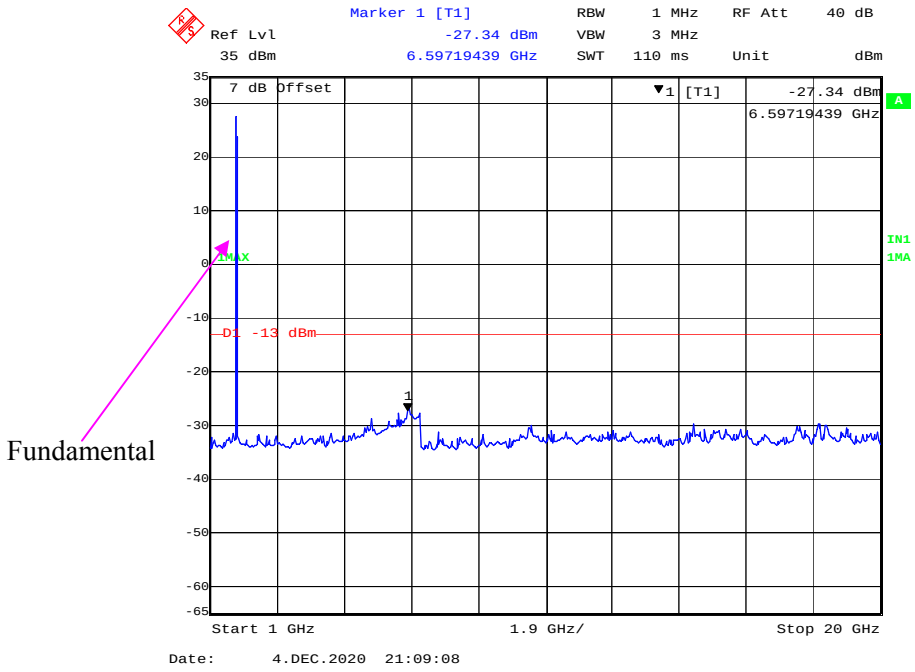


Fundamental

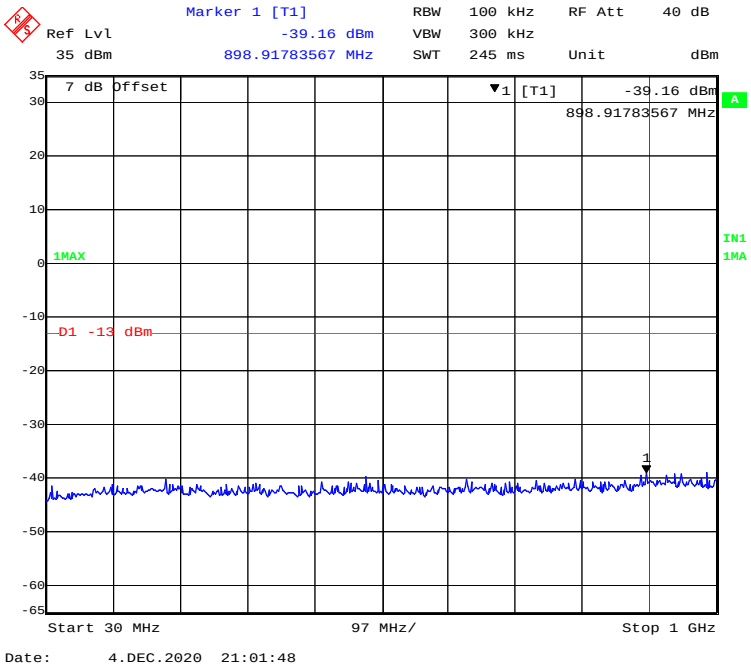
30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)



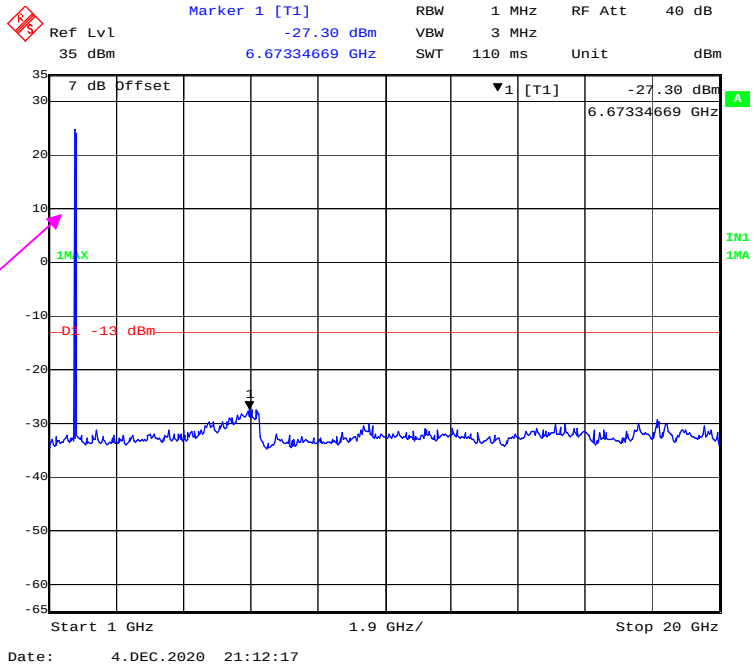
1 GHz – 20 GHz (1.4 MHz, 16-QAM, Middle Channel)



30 MHz - 1 GHz (3 MHz, QPSK, Middle Channel)

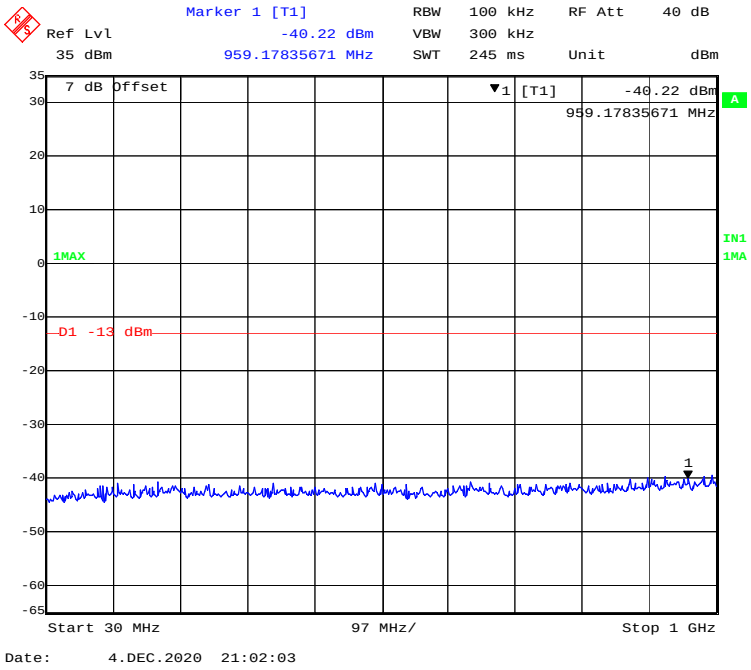


1 GHz – 20 GHz (3 MHz, QPSK, Middle Channel)

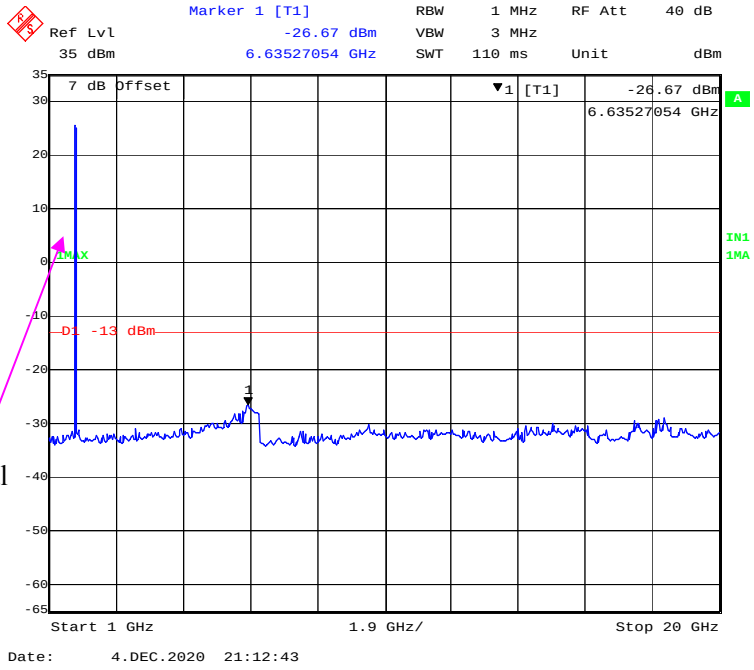


Fundamental

30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)

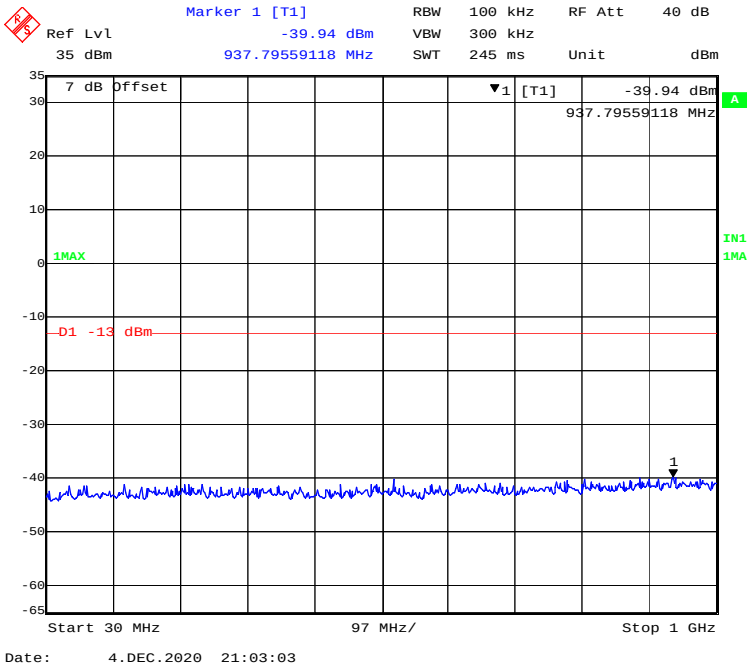


1 GHz – 20 GHz (3 MHz, 16-QAM, Middle Channel)

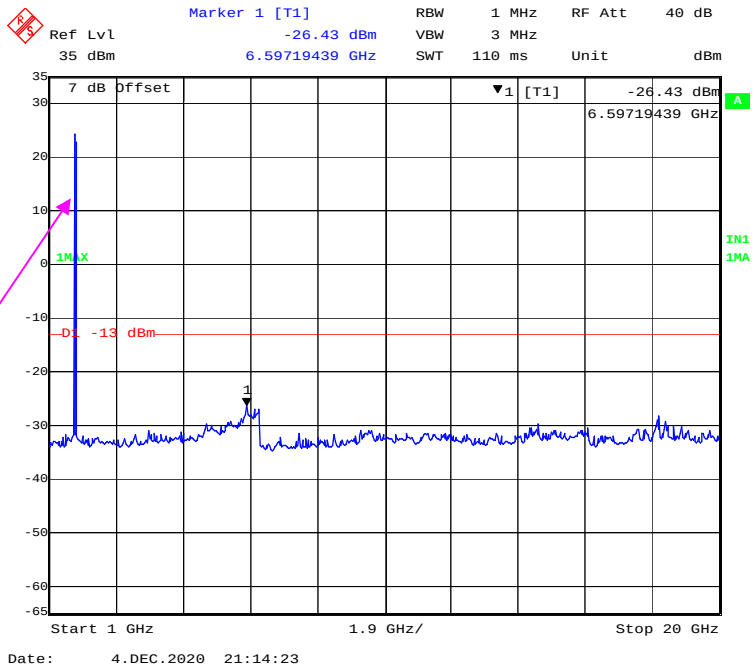


Fundamental

30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)

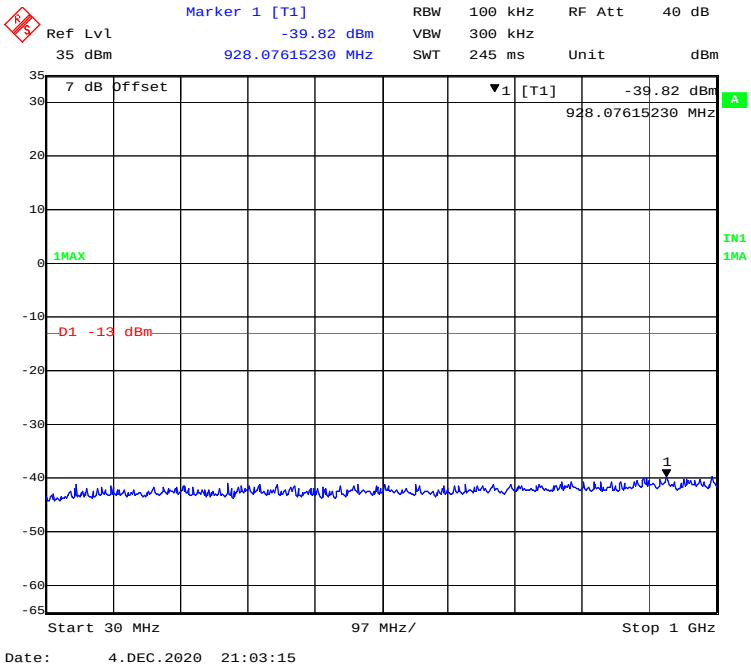


1 GHz – 20 GHz (5 MHz, QPSK, Middle Channel)

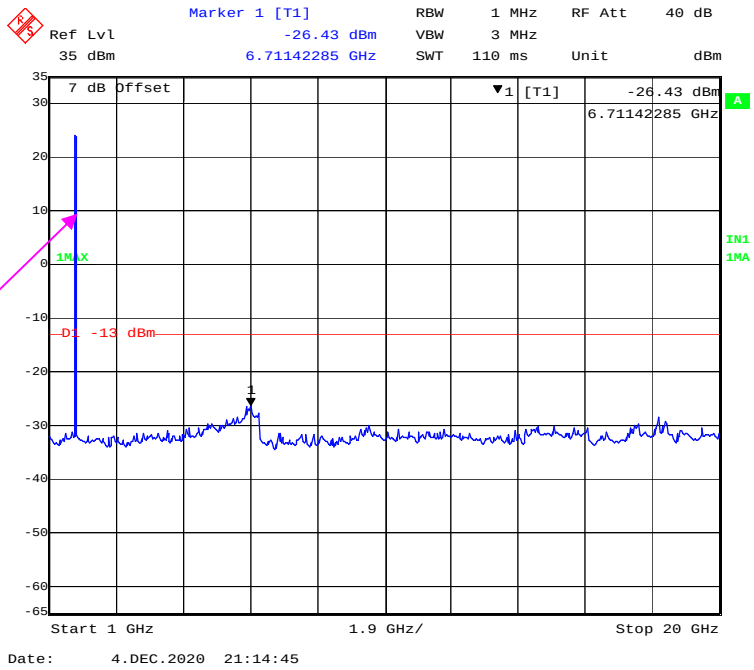


Fundamental

30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)

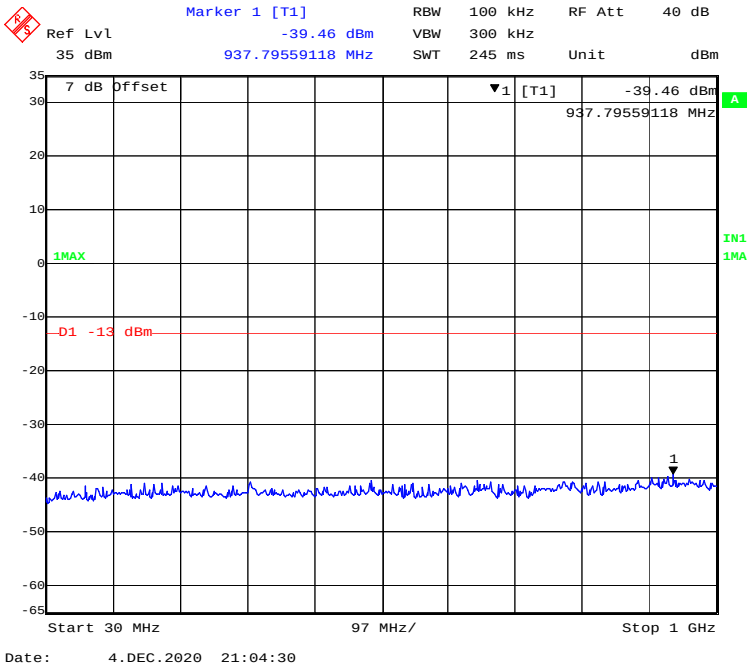


1 GHz – 20 GHz (5 MHz, 16-QAM, Middle Channel)

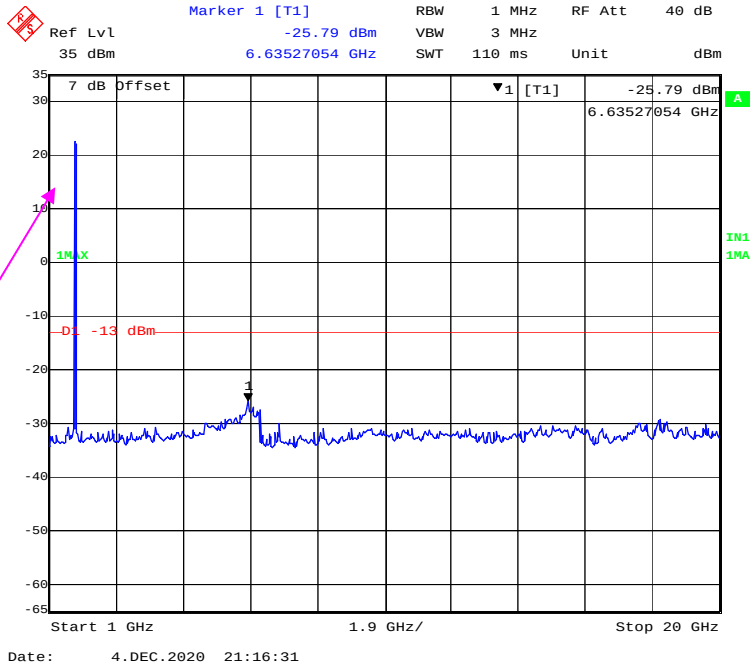


Fundamental

30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)

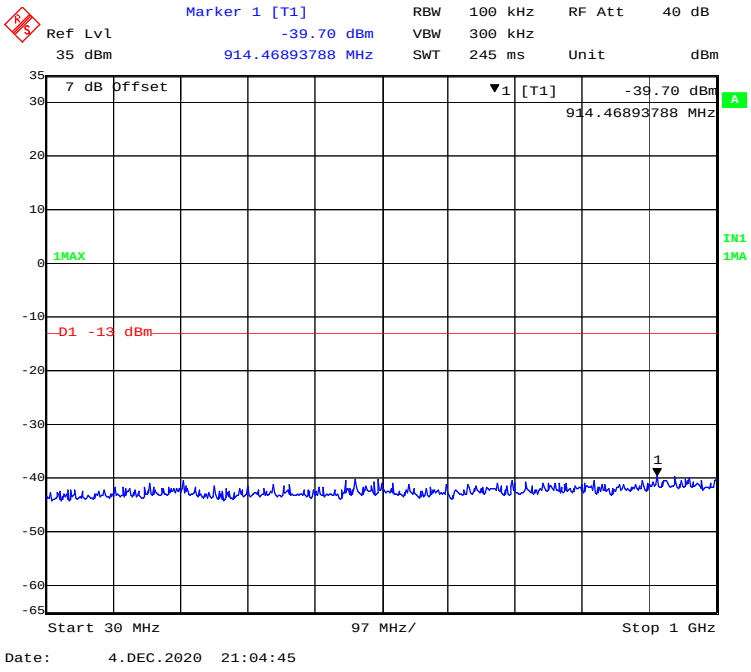


1 GHz – 20 GHz (10 MHz, QPSK, Middle Channel)

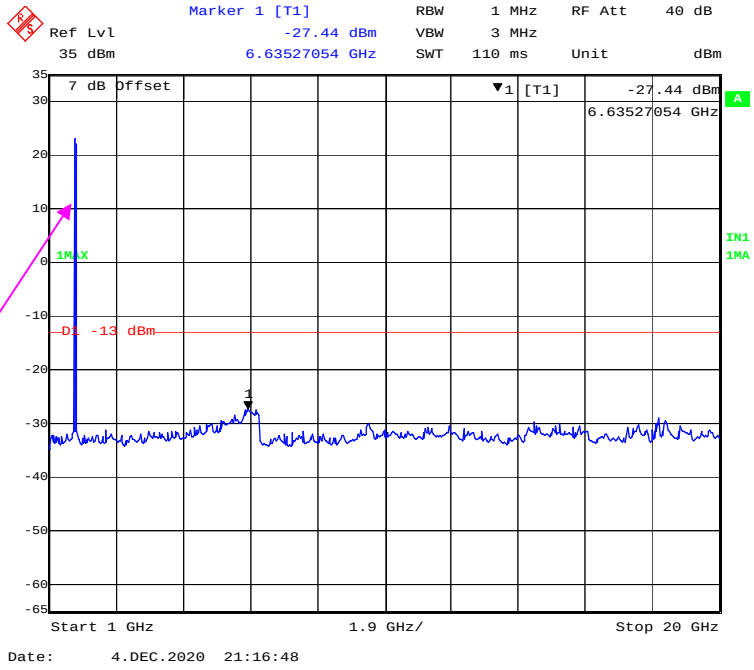


Fundamental

30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

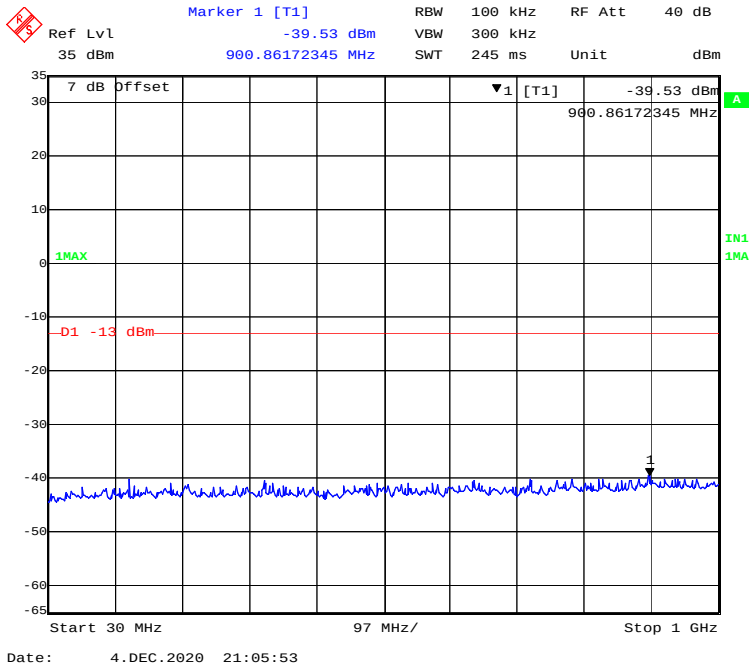


1 GHz – 20 GHz (10 MHz, 16-QAM, Middle Channel)

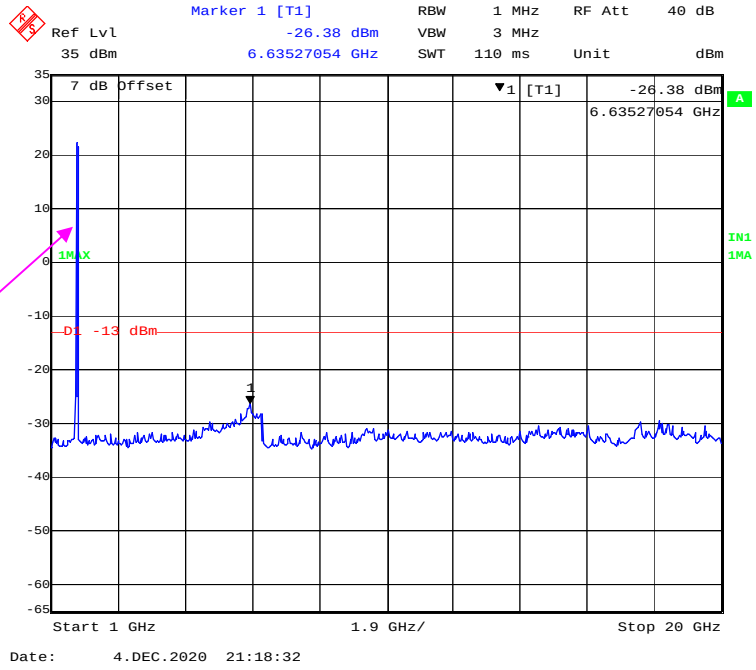


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, Middle Channel)

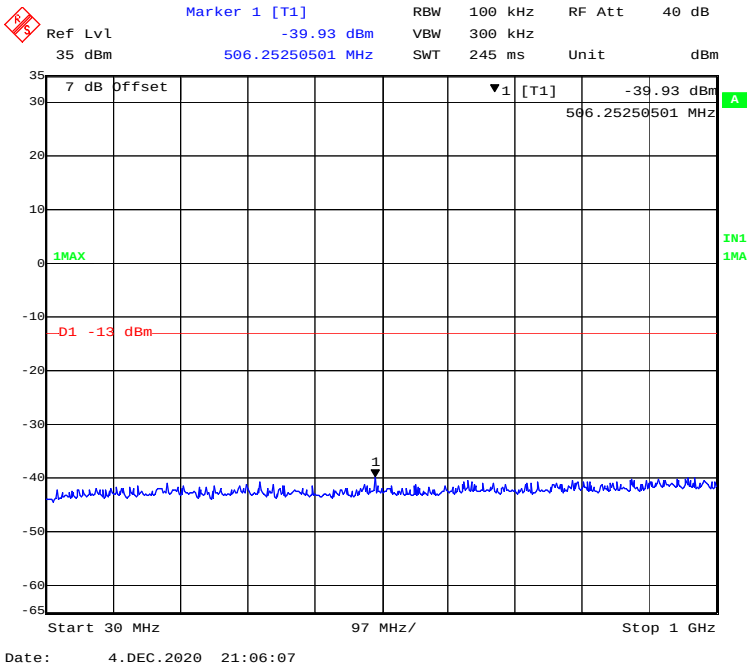


1 GHz – 20 GHz (15 MHz, QPSK, Middle Channel)

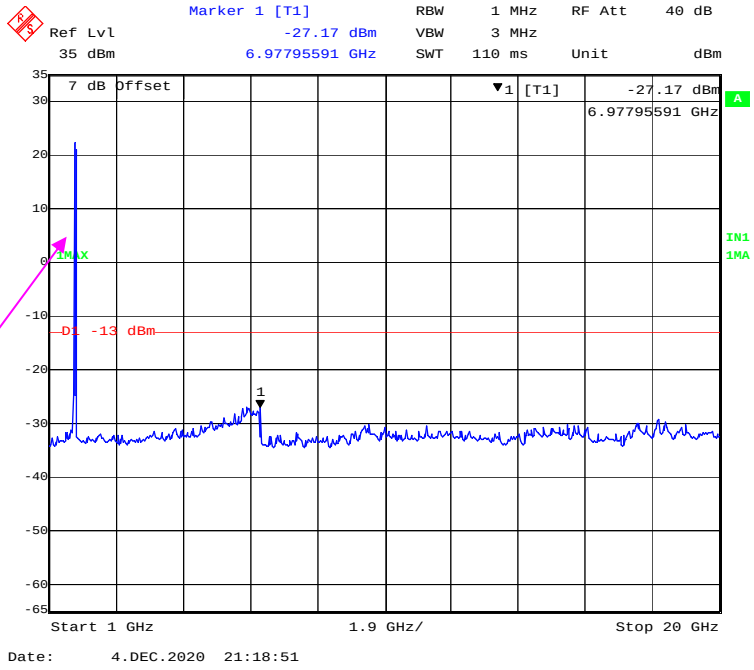


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, Middle Channel)

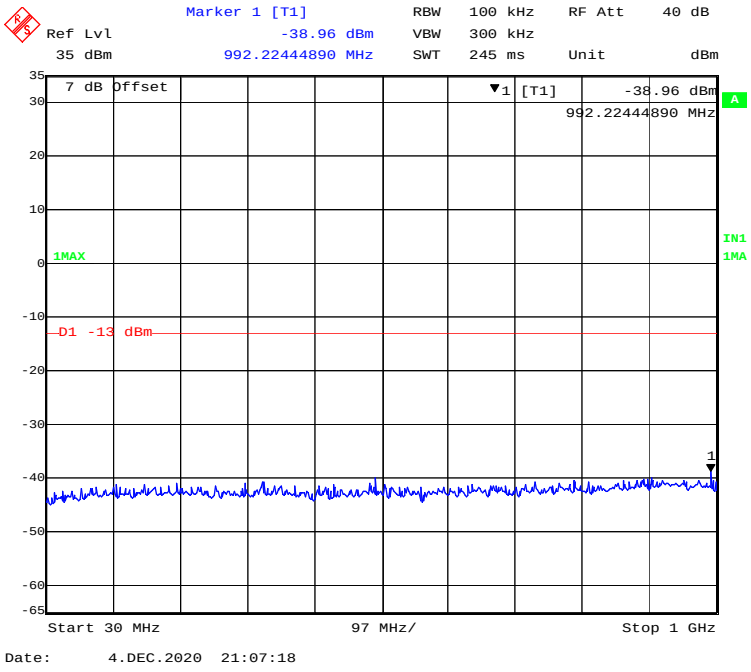


1 GHz – 20 GHz (15 MHz, 16-QAM, Middle Channel)

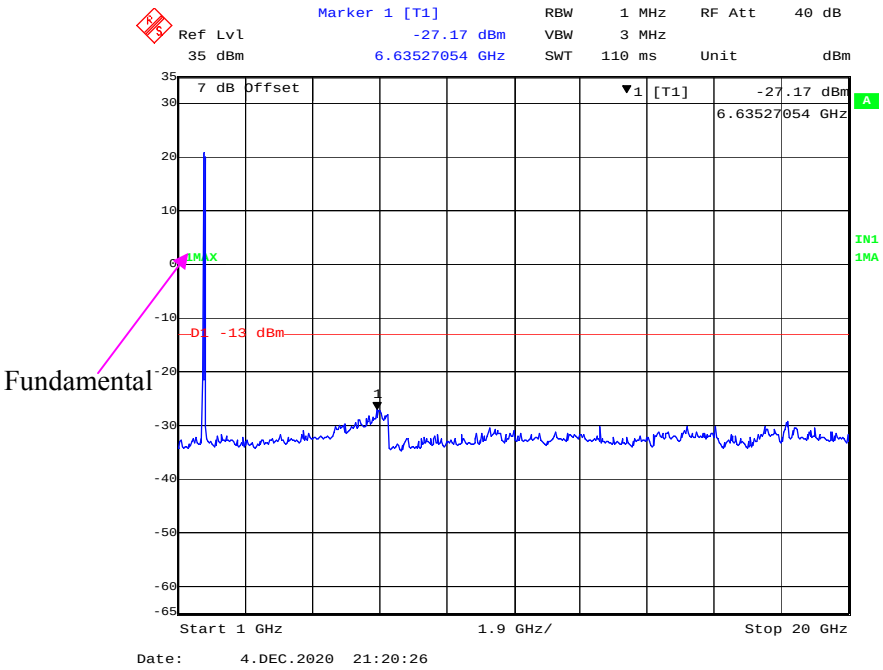


Fundamental

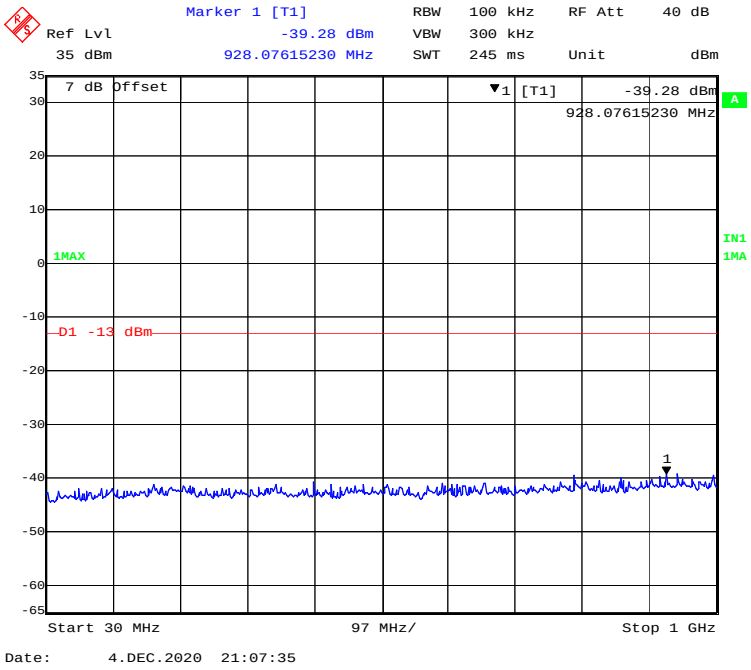
30 MHz - 1 GHz (20 MHz, QPSK, Middle Channel)



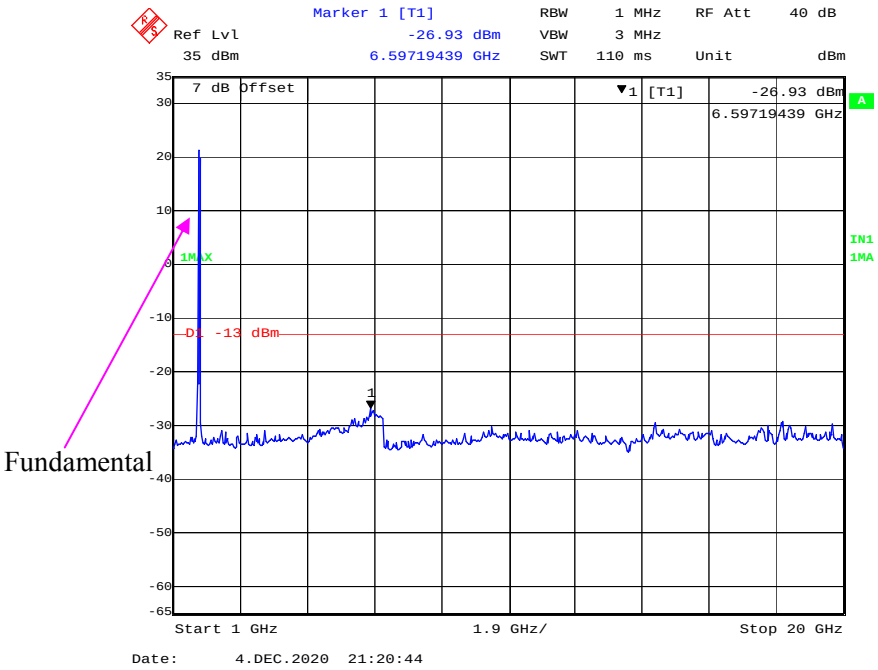
1 GHz – 20 GHz (20 MHz, QPSK, Middle Channel)



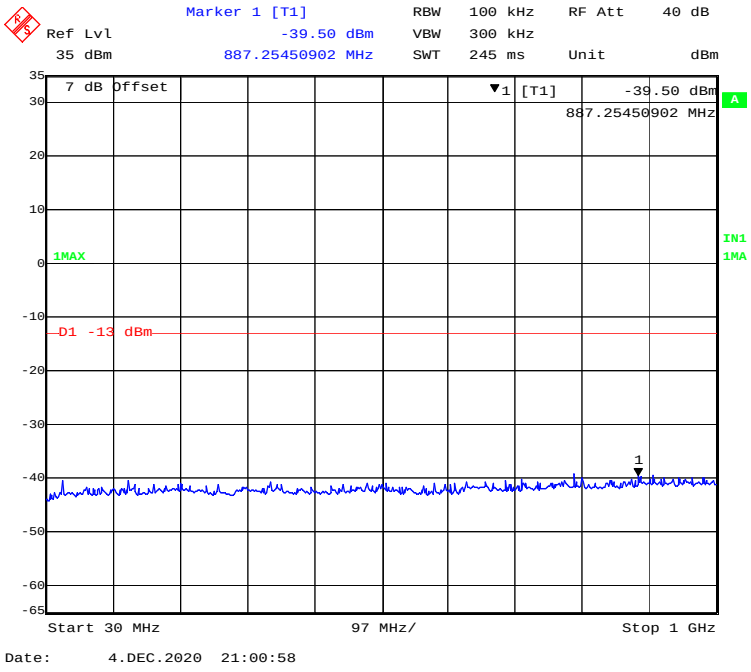
30 MHz - 1 GHz (20 MHz, 16-QAM, Middle Channel)



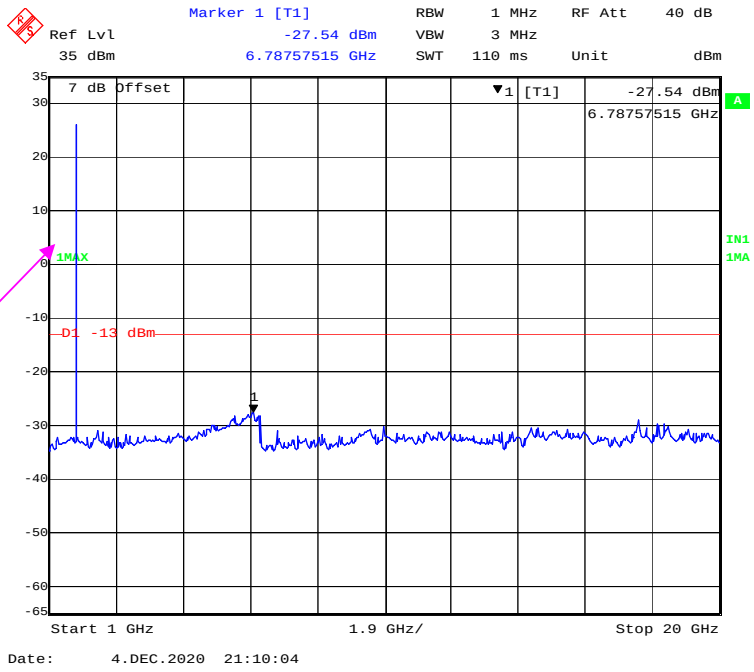
1 GHz – 20 GHz (20 MHz, 16-QAM, Middle Channel)



30 MHz - 1 GHz (1.4 MHz, QPSK, High Channel)

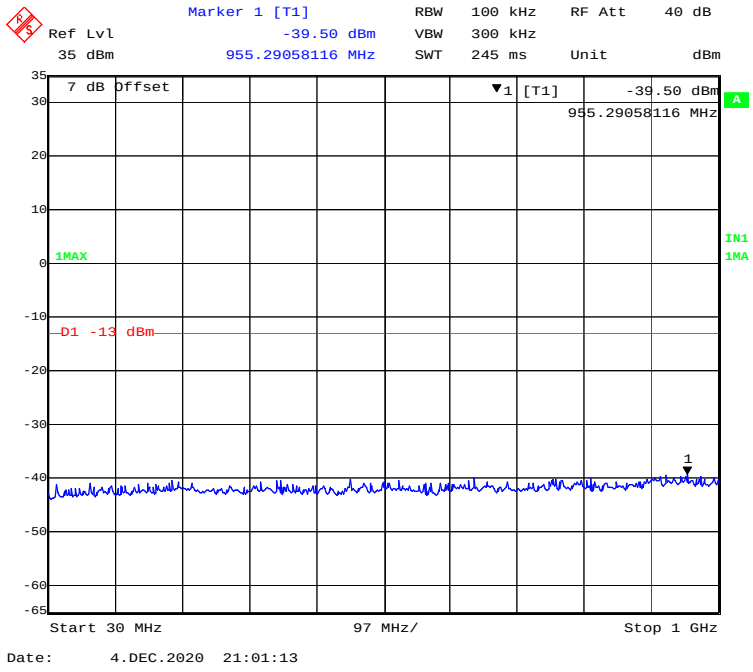


1 GHz – 20 GHz (1.4 MHz, QPSK, High Channel)

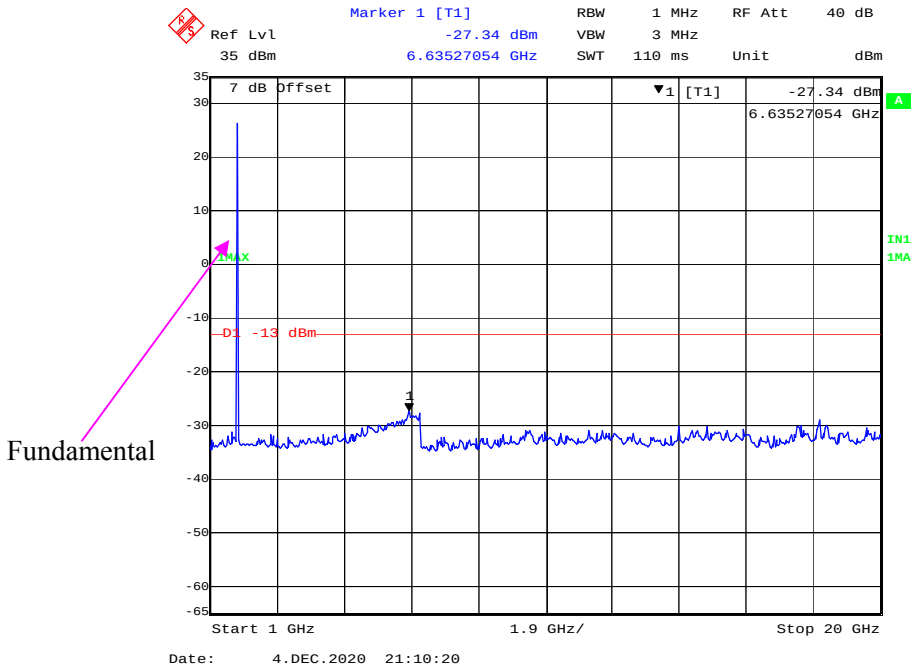


Fundamental

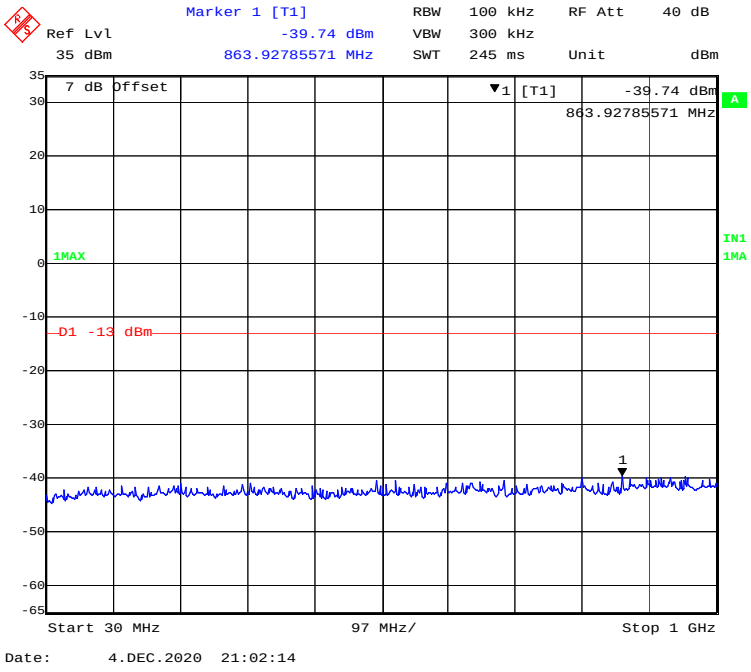
30 MHz - 1 GHz (1.4 MHz, 16-QAM, High Channel)



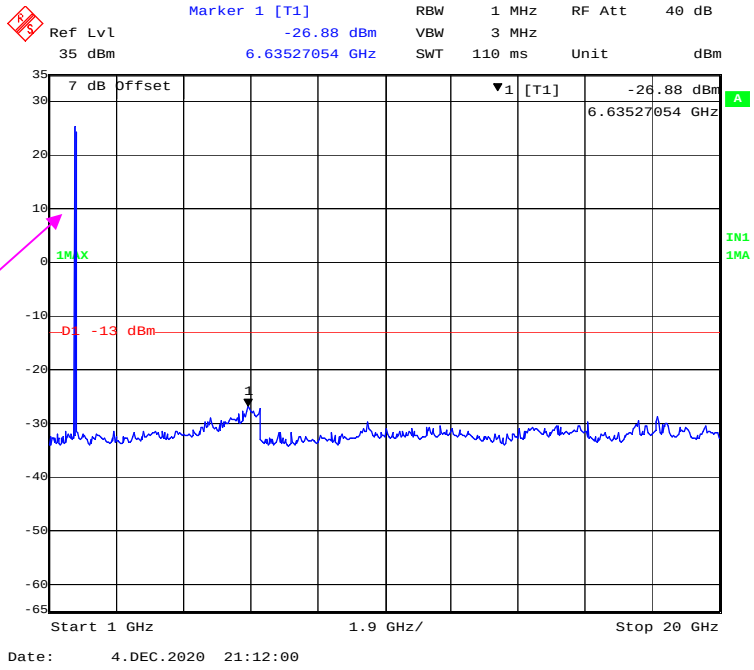
1 GHz – 20 GHz (1.4 MHz, 16-QAM, High Channel)



30 MHz - 1 GHz (3 MHz, QPSK, High Channel)

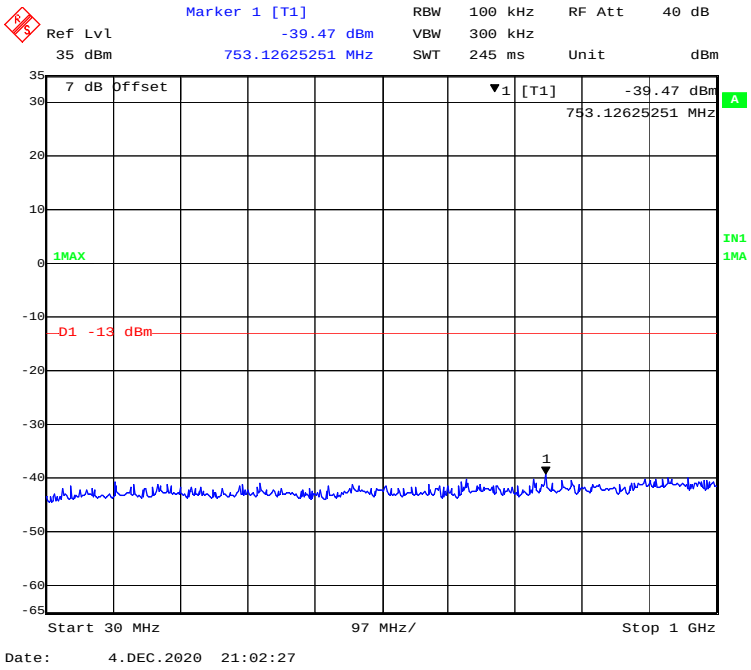


1 GHz – 20 GHz (3 MHz, QPSK, High Channel)

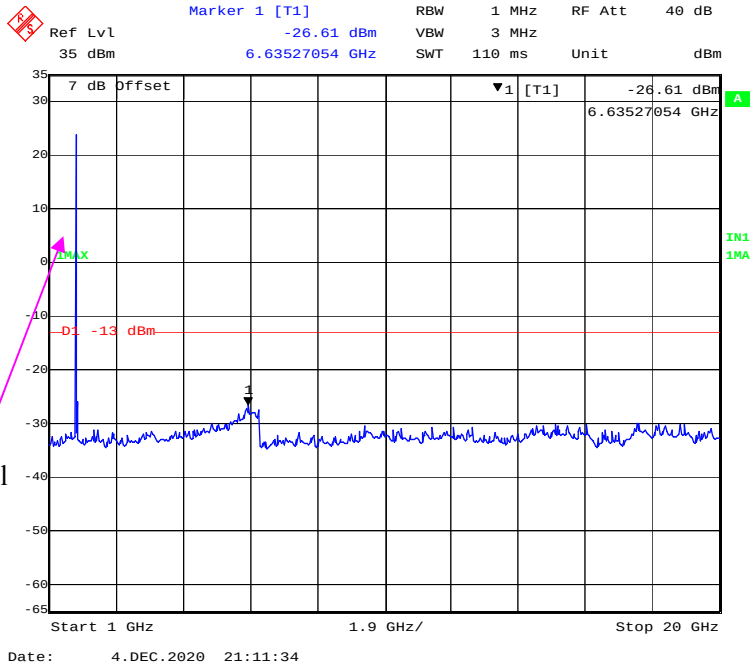


Fundamental

30 MHz - 1 GHz (3 MHz, 16-QAM, High Channel)

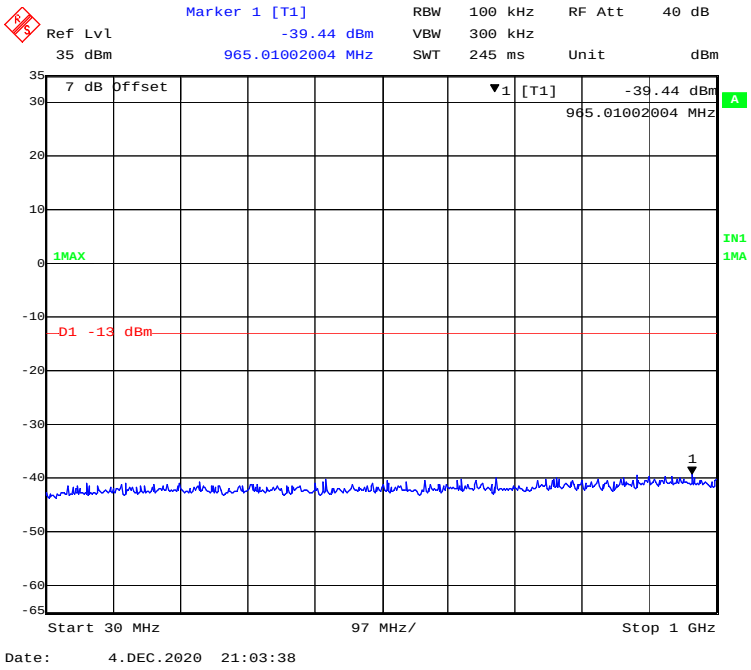


1 GHz – 20 GHz (3 MHz, 16-QAM, High Channel)

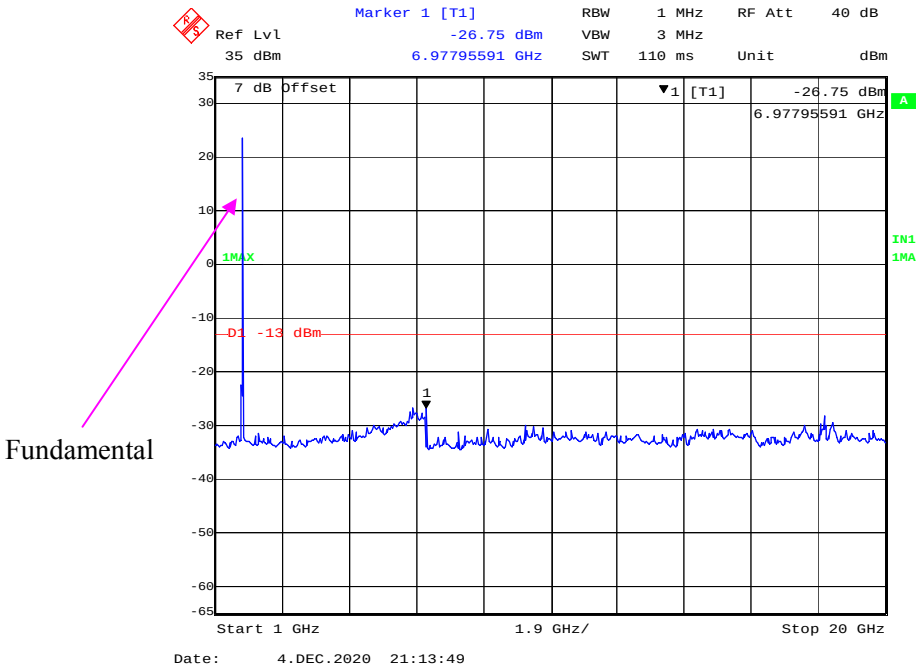


Fundamental

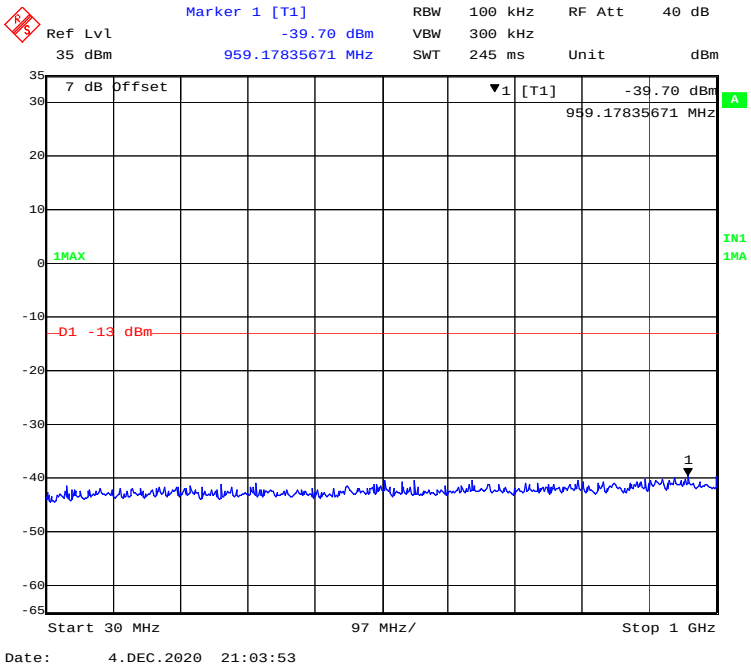
30 MHz - 1 GHz (5 MHz, QPSK, High Channel)



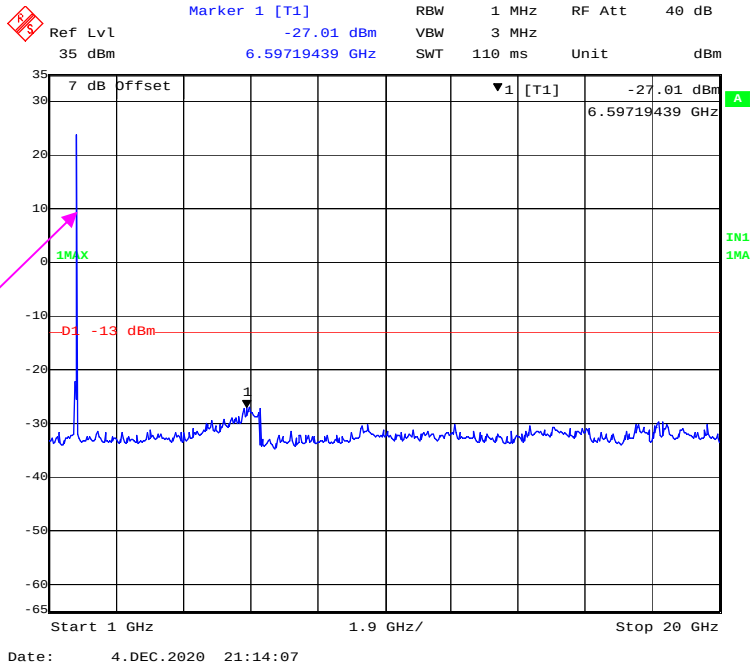
1 GHz – 20 GHz (5 MHz, QPSK, High Channel)



30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)

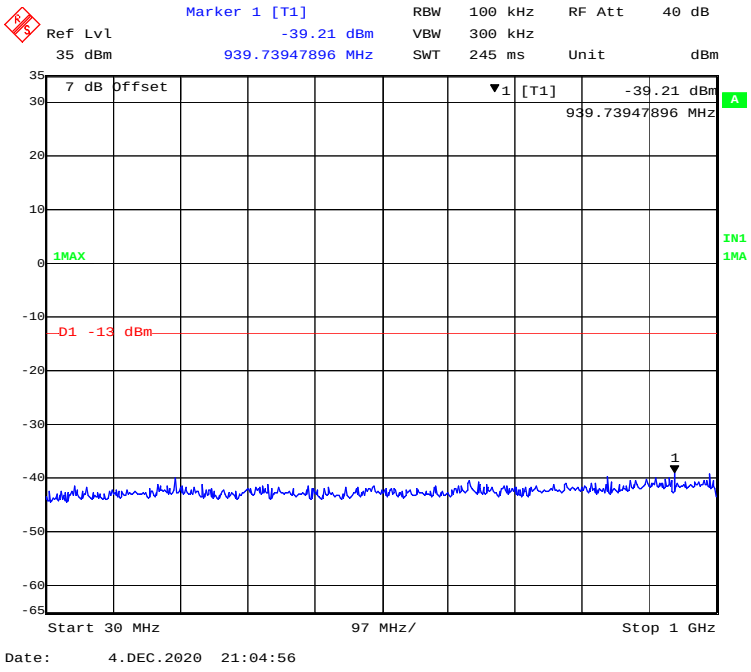


1 GHz – 20 GHz (5 MHz, 16-QAM, High Channel)

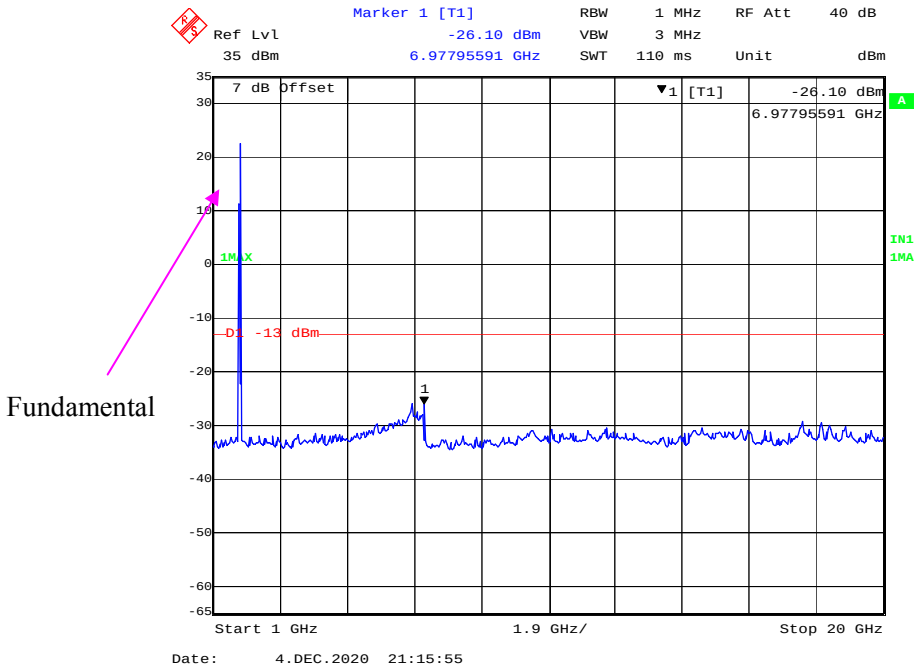


Fundamental

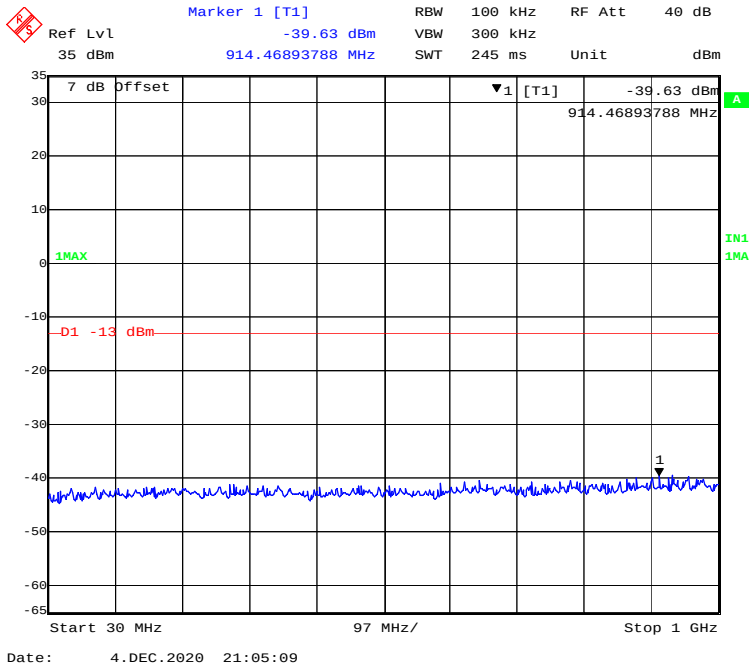
30 MHz - 1 GHz (10 MHz, QPSK, High Channel)



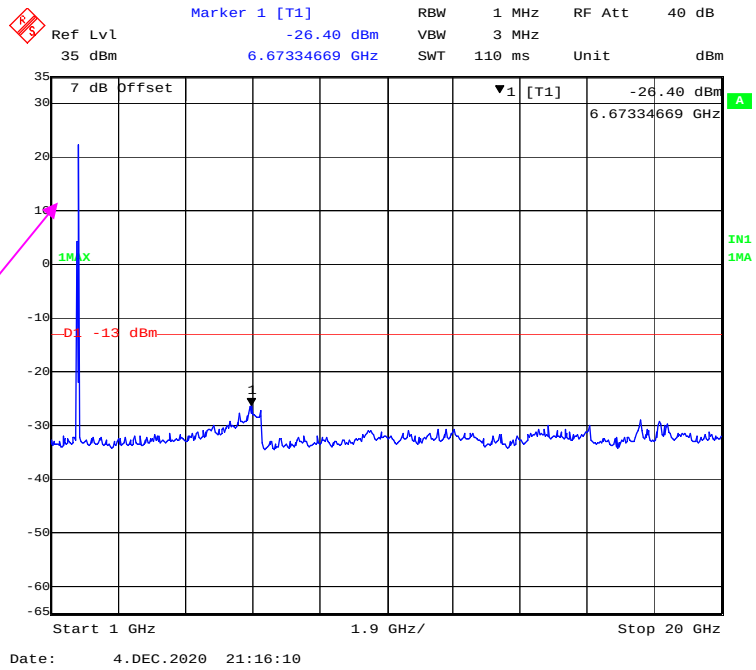
1 GHz – 20 GHz (10 MHz, QPSK, High Channel)



30 MHz - 1 GHz (10 MHz, 16-QAM, High Channel)

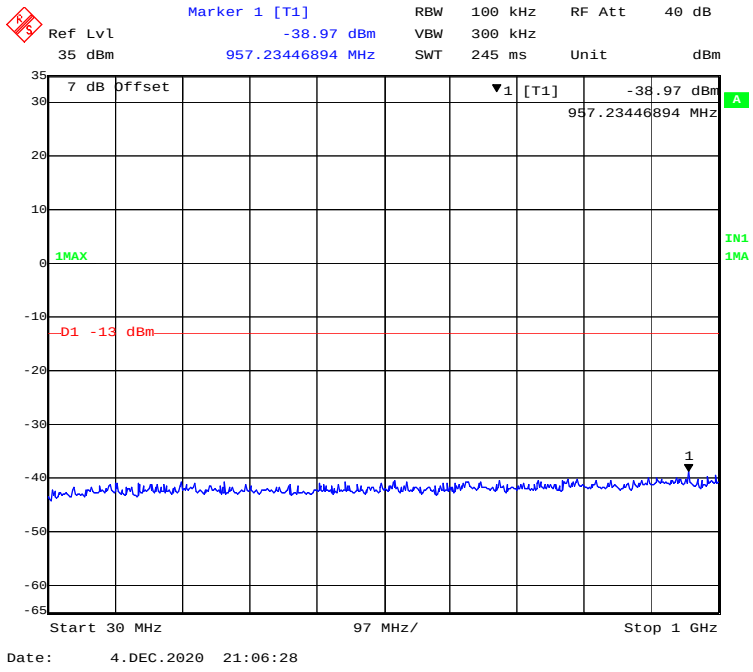


1 GHz – 20 GHz (10 MHz, 16-QAM, High Channel)

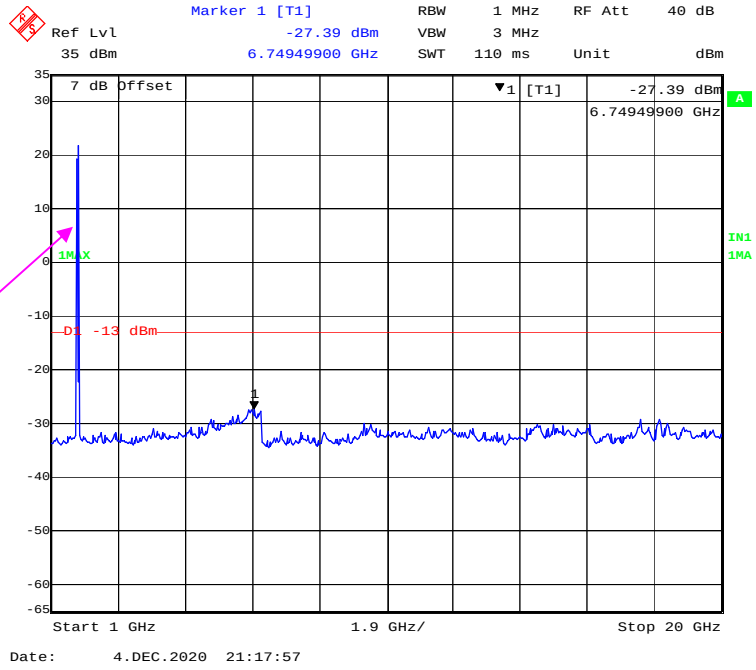


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, High Channel)

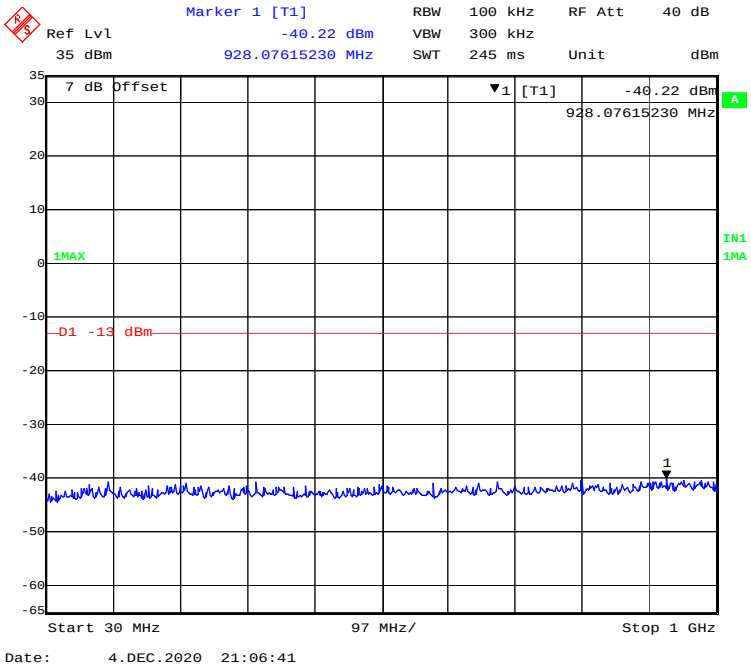


1 GHz – 20 GHz (15 MHz, QPSK, High Channel)

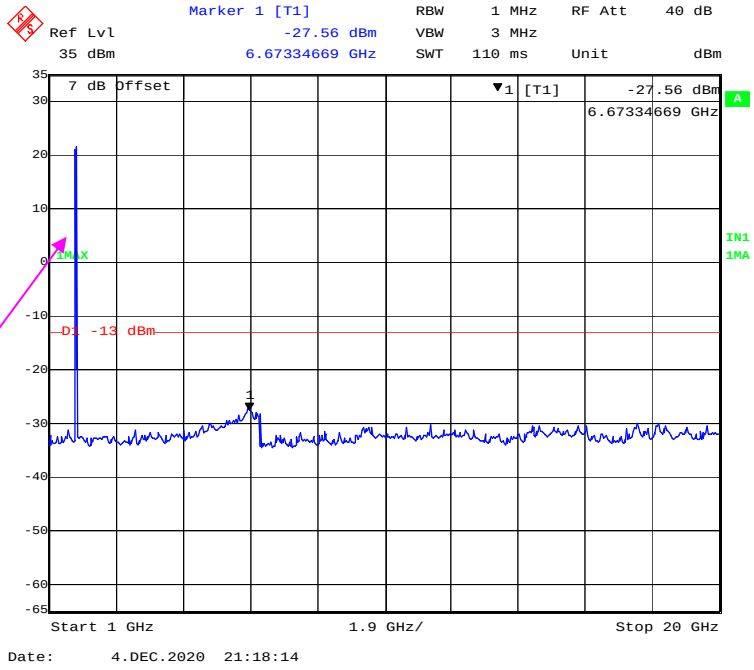


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, High Channel)

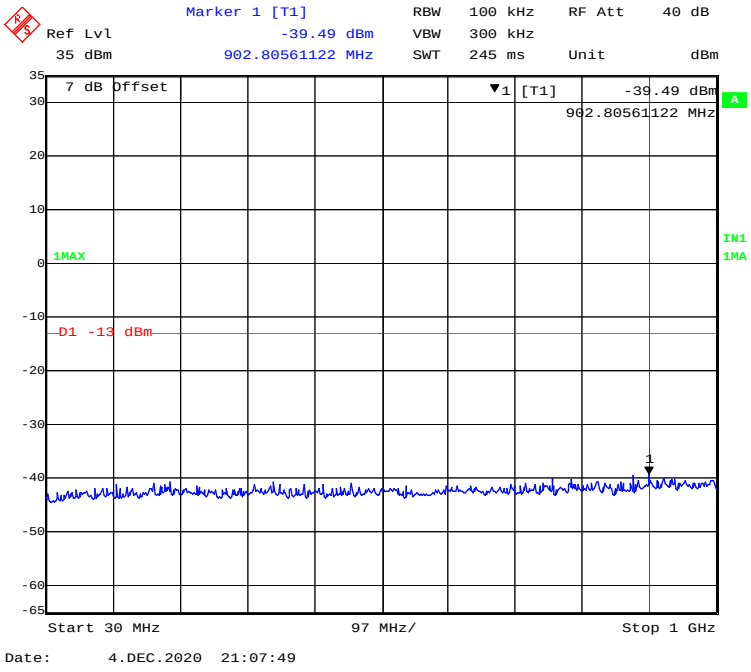


1 GHz – 20 GHz (15 MHz, 16-QAM, High Channel)

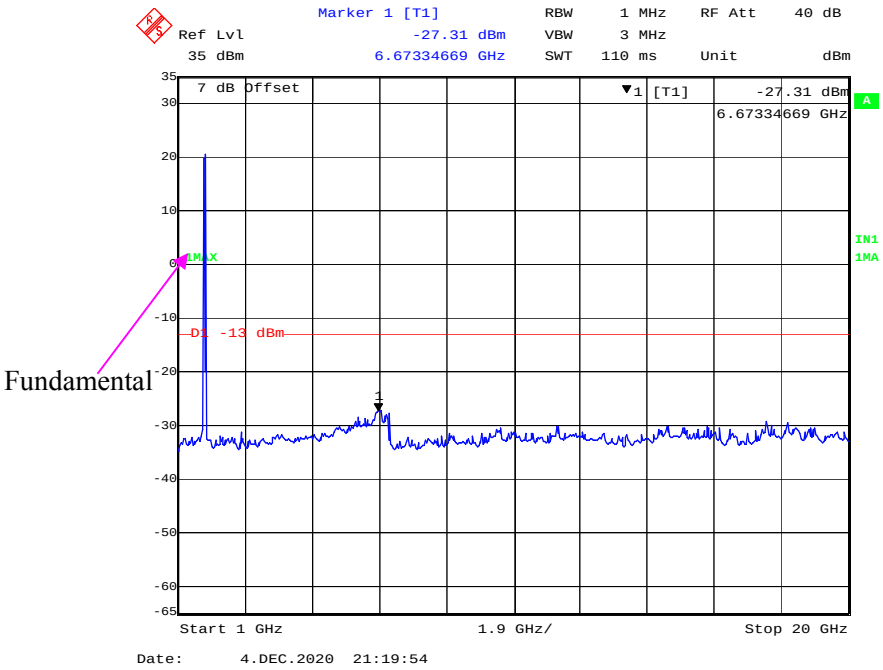


Fundamental

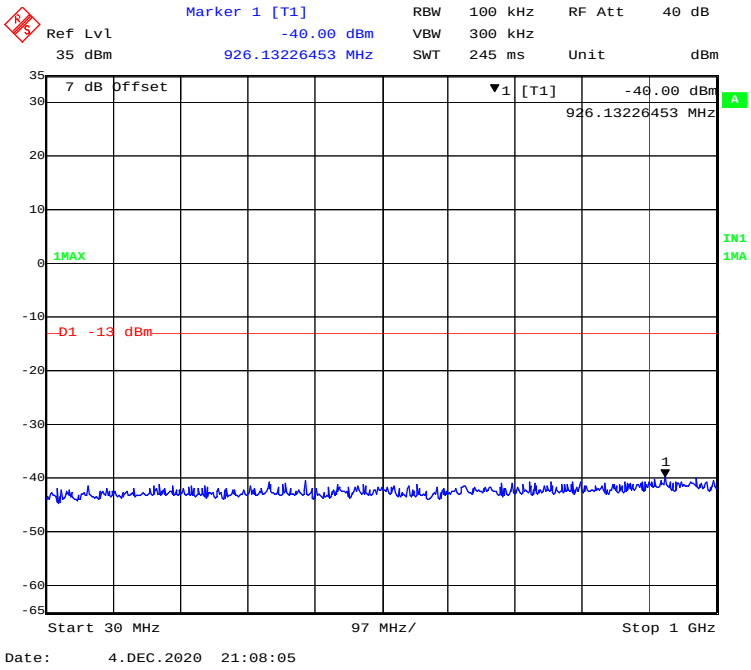
30 MHz - 1 GHz (20 MHz, QPSK, High Channel)



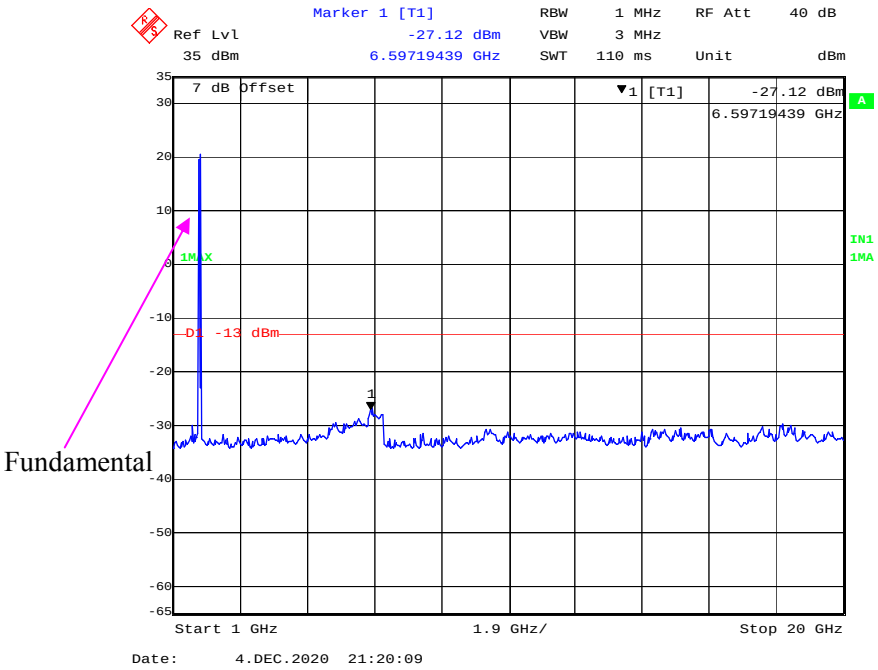
1 GHz – 20 GHz (20 MHz, QPSK, High Channel)



30 MHz - 1 GHz (20 MHz, 16-QAM, High Channel)

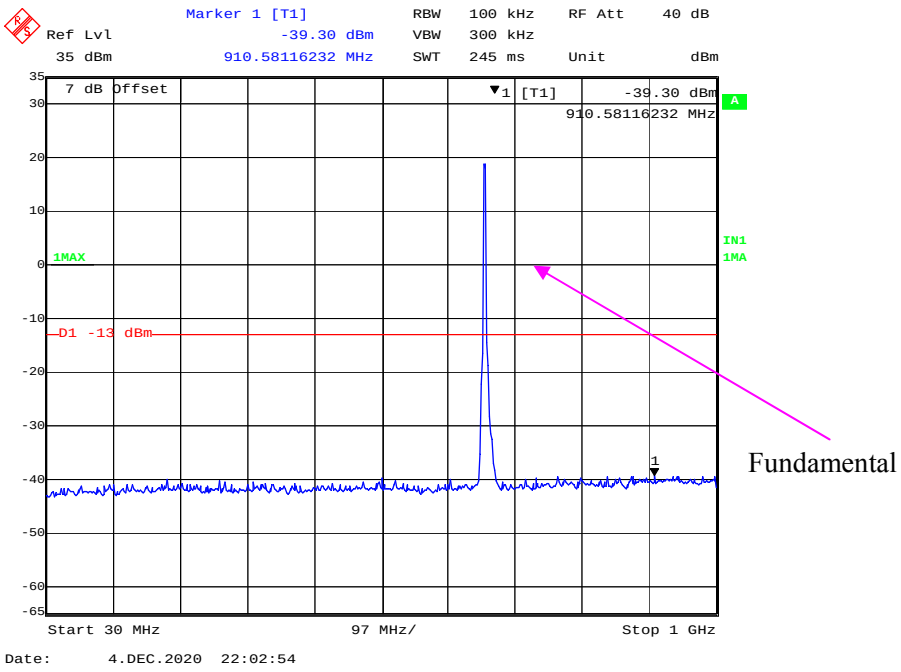


1 GHz – 20 GHz (20 MHz, 16-QAM, High Channel)

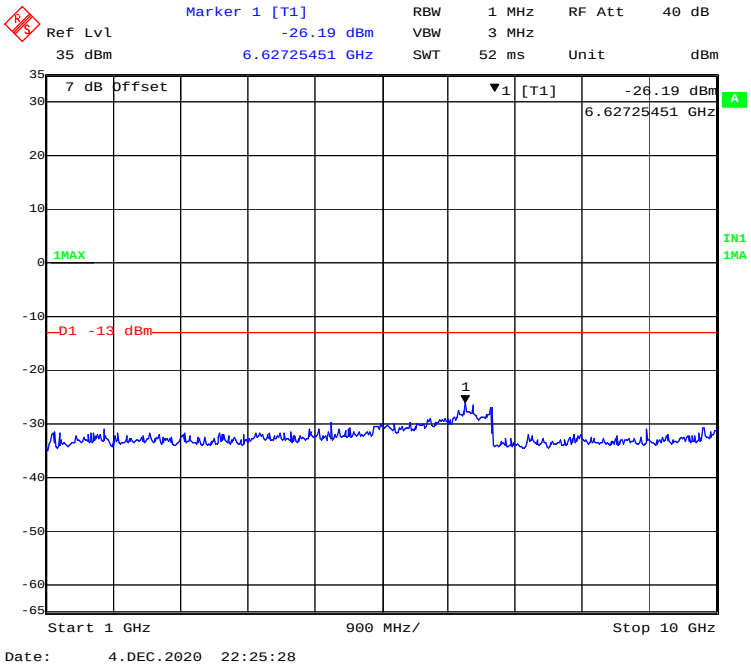


LTE Band 71:

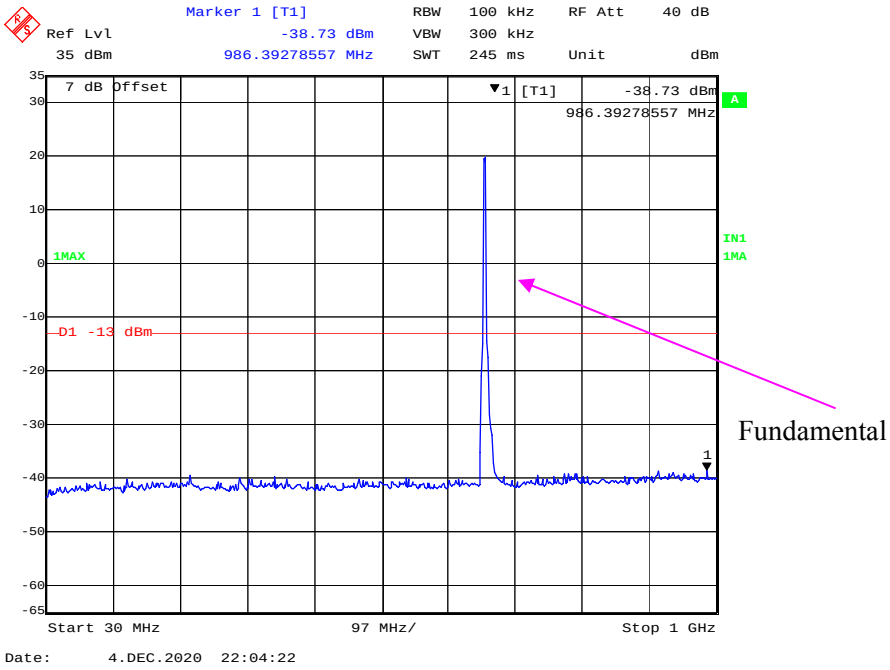
30 MHz - 1 GHz (5 MHz, QPSK, Low Channel)



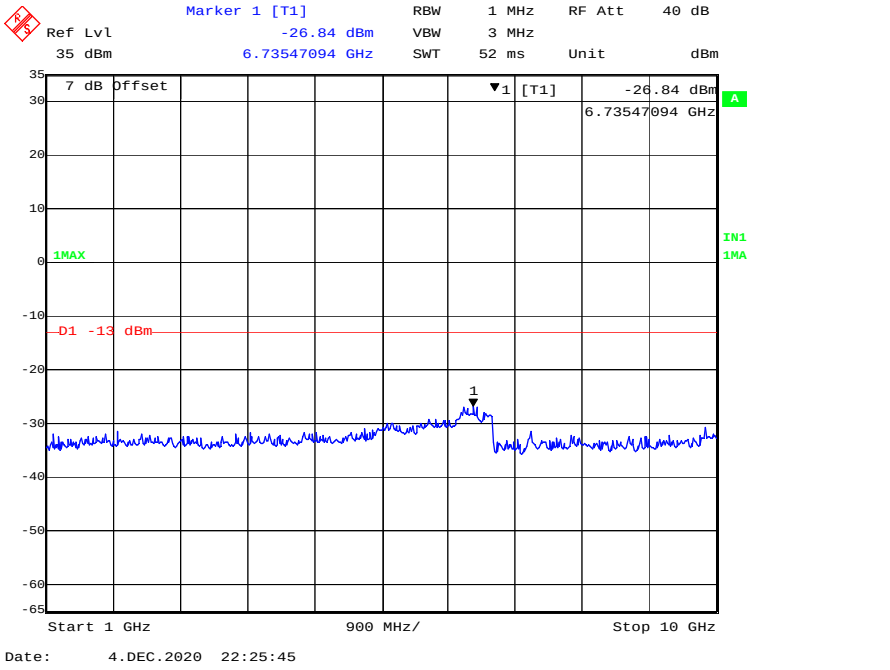
1 GHz – 10 GHz (5 MHz, QPSK, Low Channel)



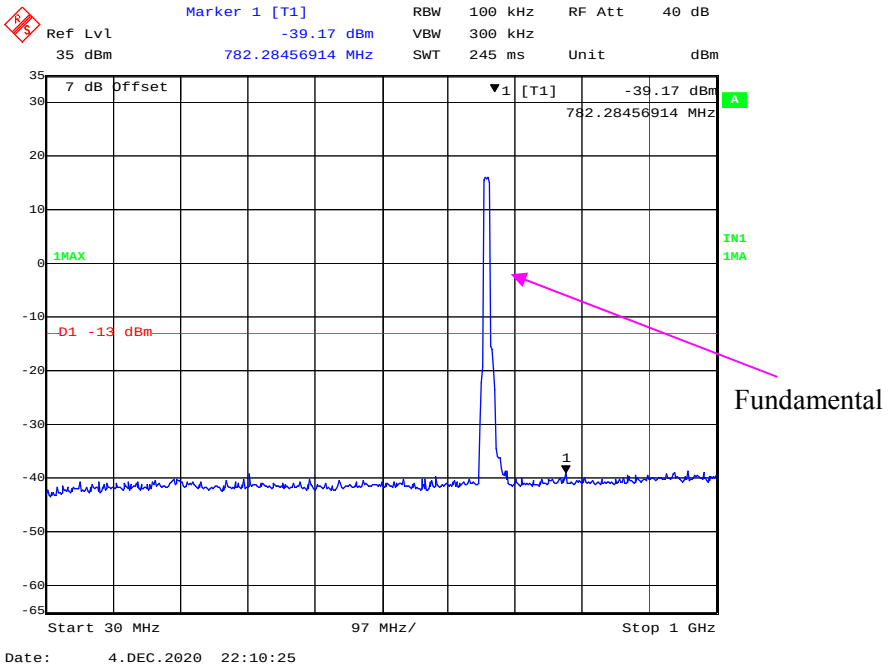
30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)



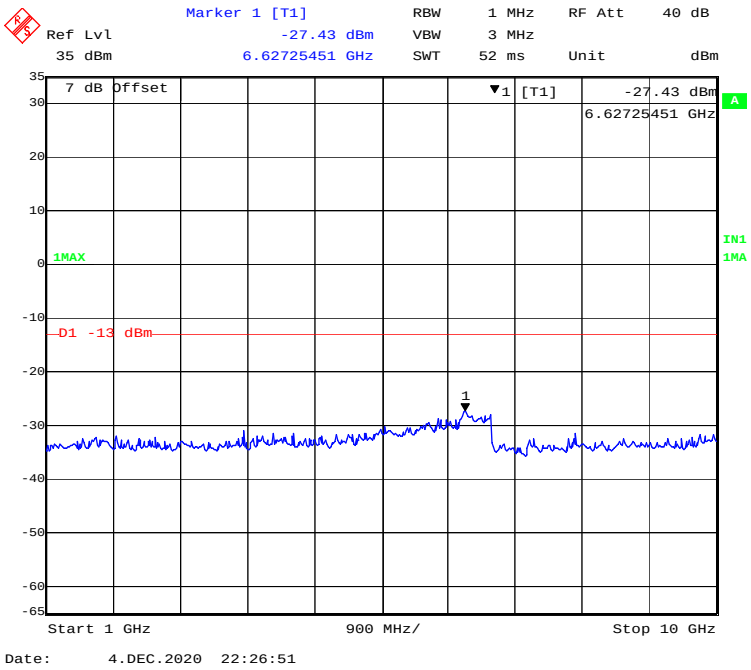
1 GHz – 10 GHz (5 MHz, 16-QAM, Low Channel)



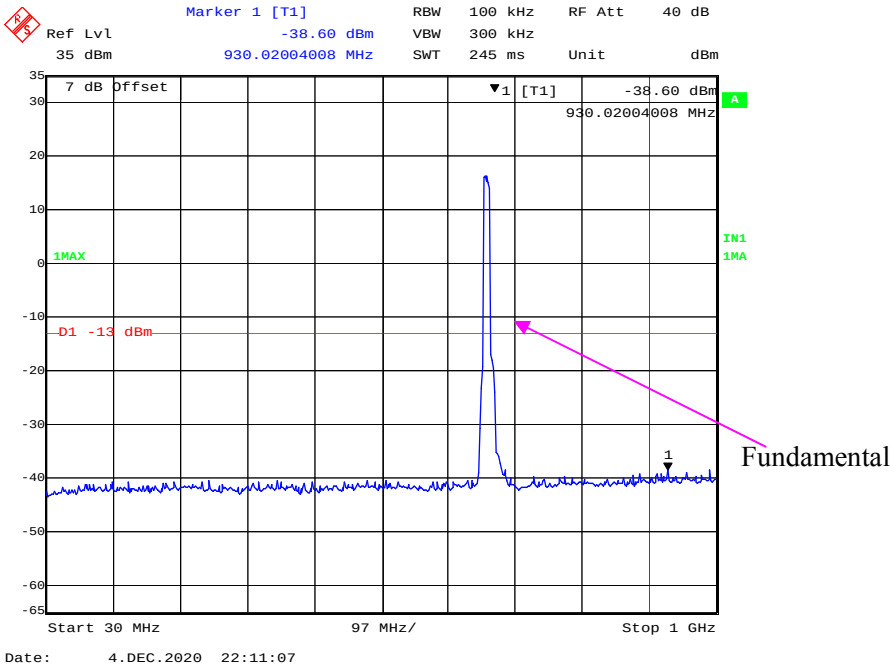
30 MHz - 1 GHz (10 MHz, QPSK, Low Channel)



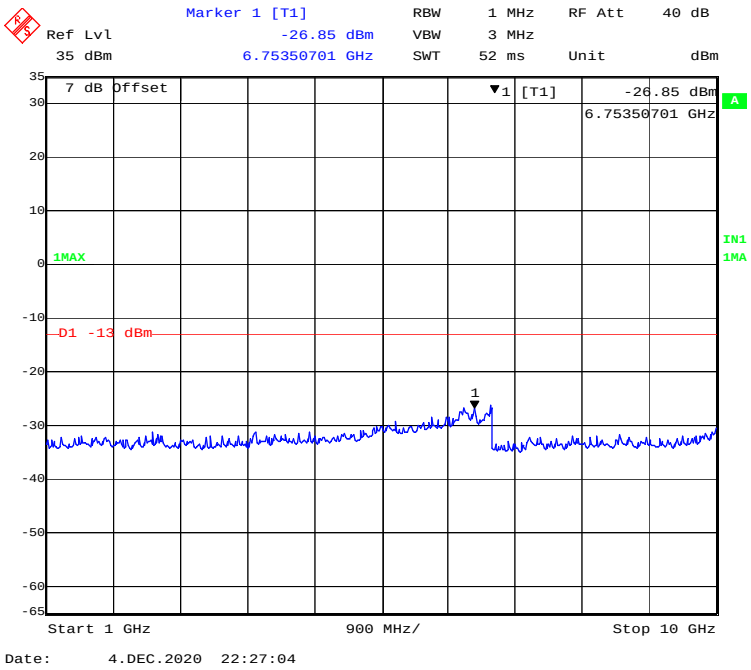
1 GHz – 10GHz (10MHz, QPSK, Low Channel)



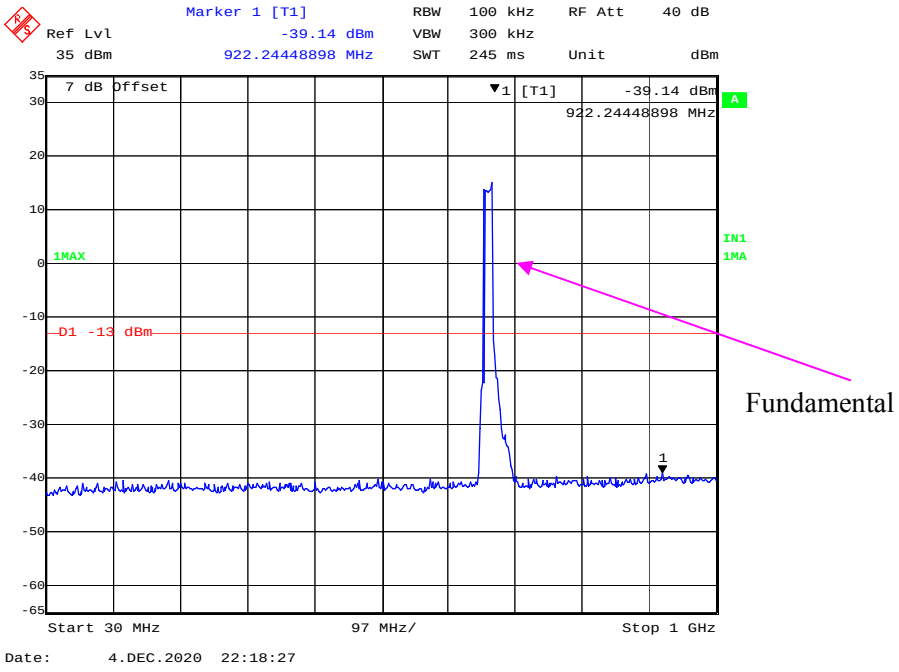
30 MHz - 1 GHz (10 MHz, 16-QAM, Low Channel)



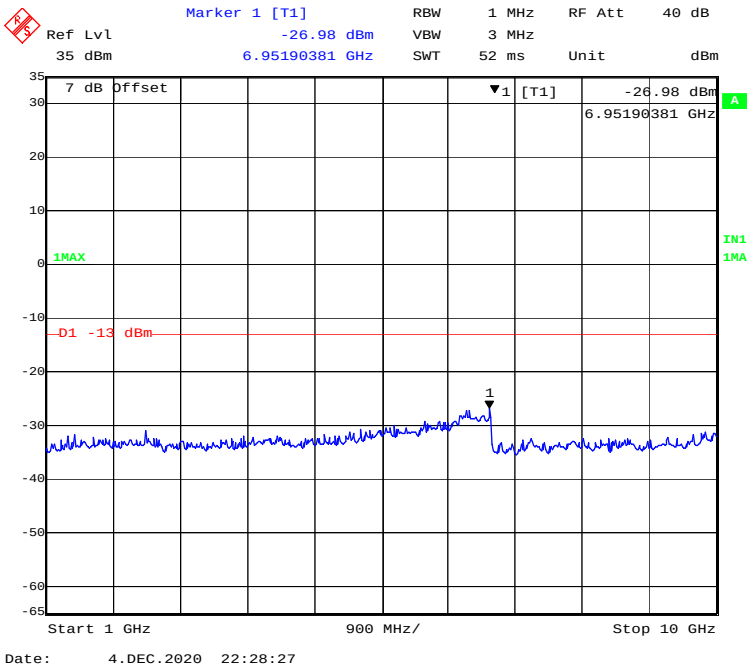
1 GHz – 10 GHz (10 MHz, 16-QAM, Low Channel)



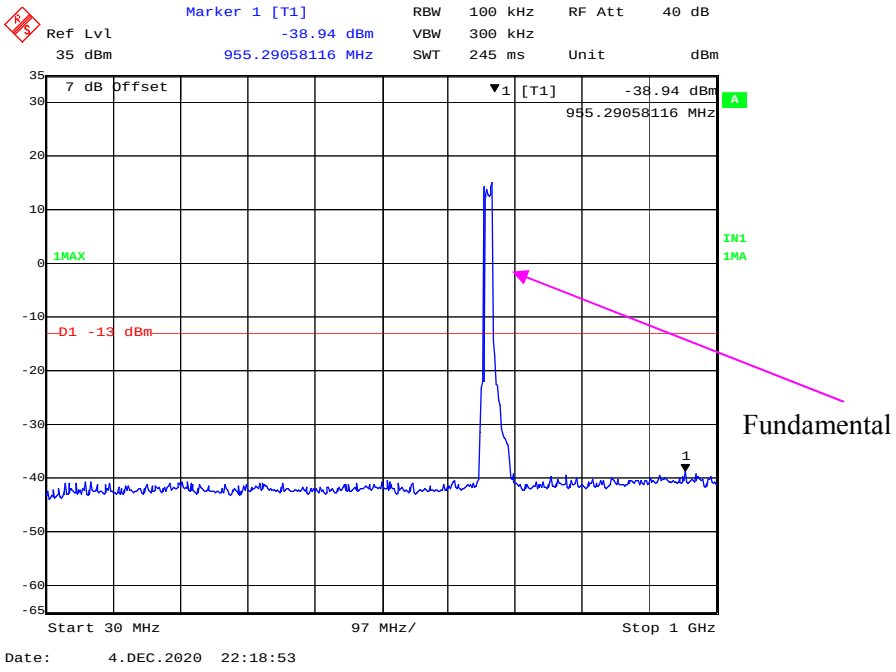
30 MHz - 1 GHz (15 MHz, QPSK, Low Channel)



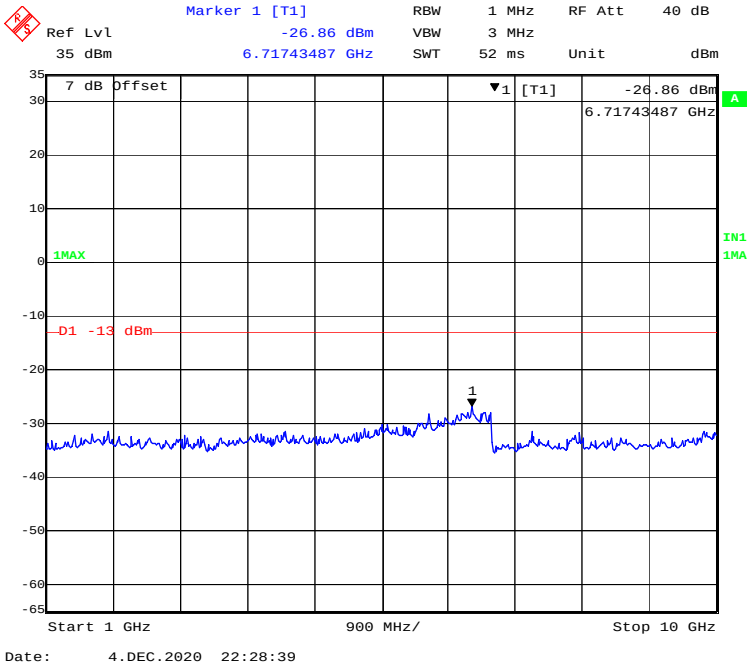
1 GHz – 10 GHz (15MHz, QPSK, Low Channel)



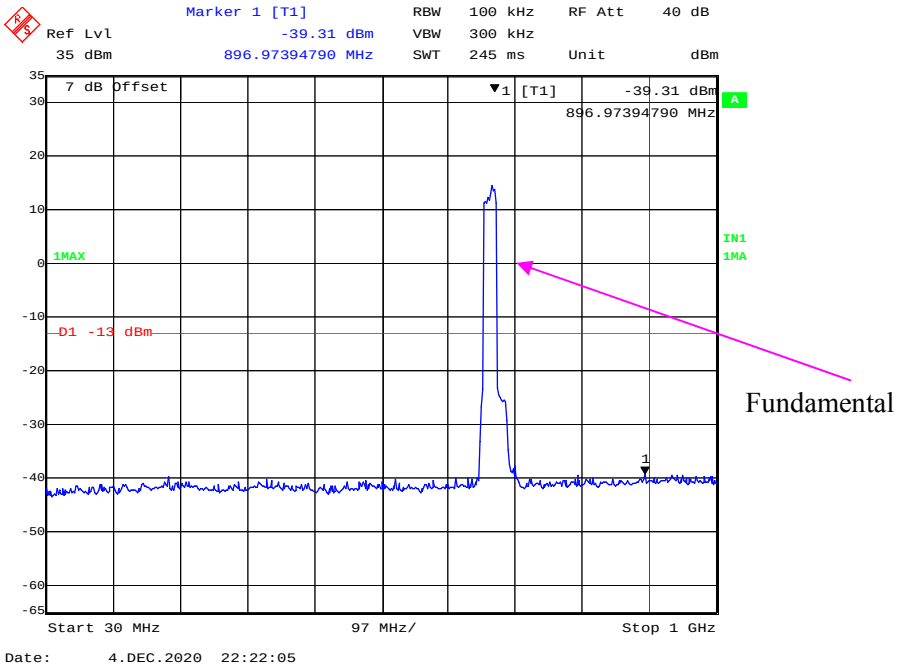
30 MHz - 1 GHz (15 MHz, 16-QAM, Low Channel)



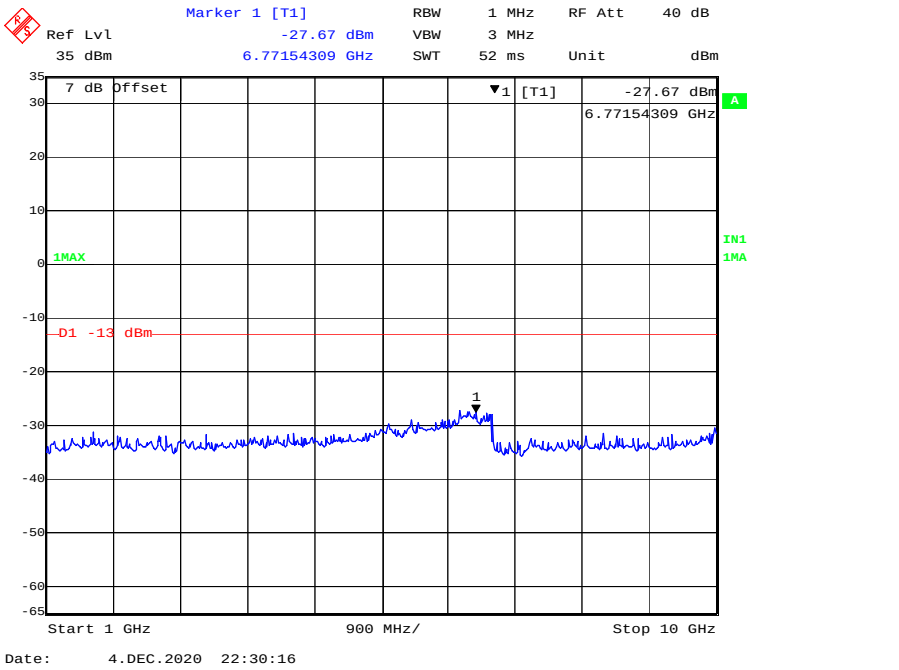
1 GHz – 10 GHz (15 MHz, 16-QAM, Low Channel)



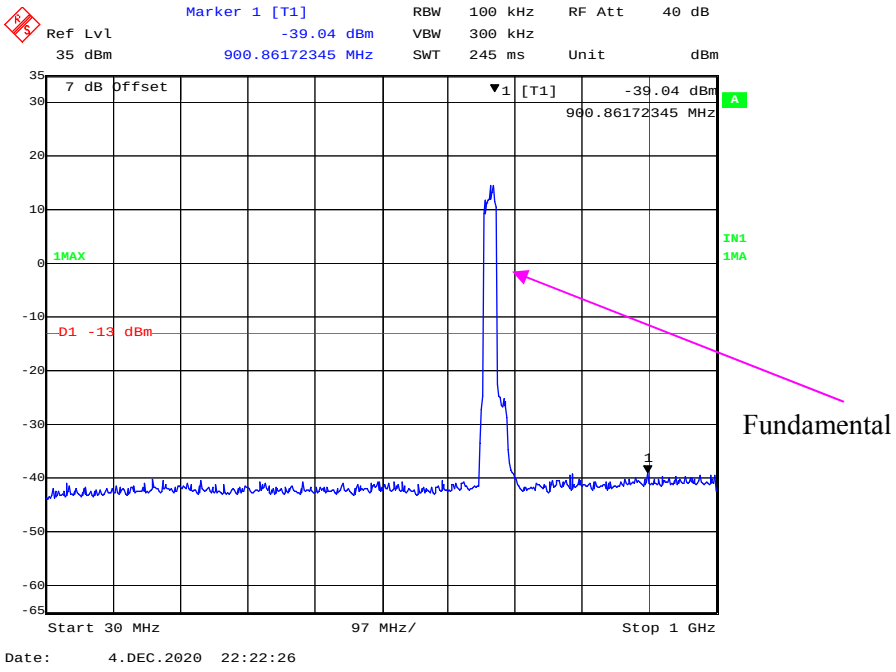
30 MHz - 1 GHz (20 MHz, QPSK, Low Channel)



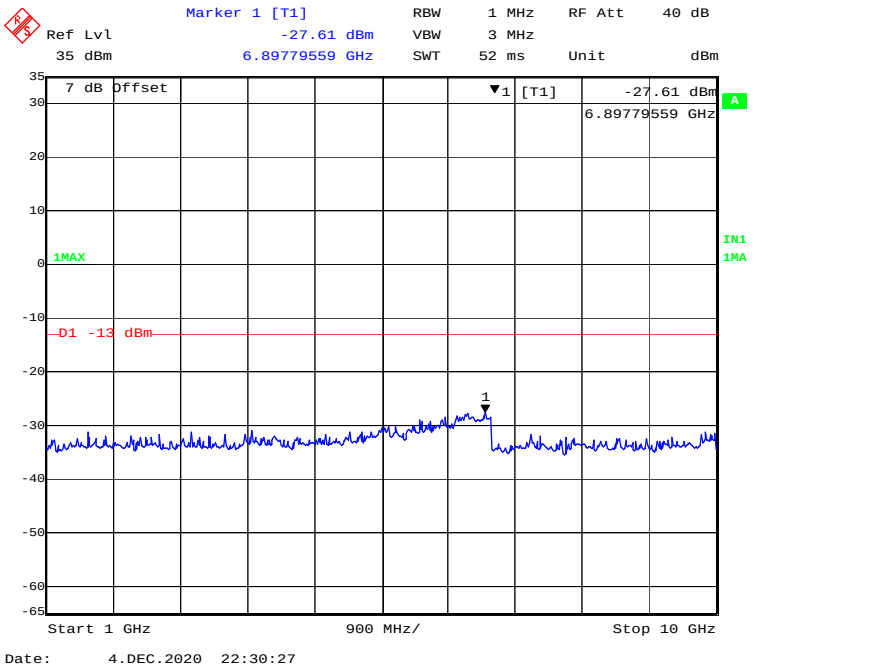
1 GHz – 10 GHz (20MHz, QPSK, Low Channel)



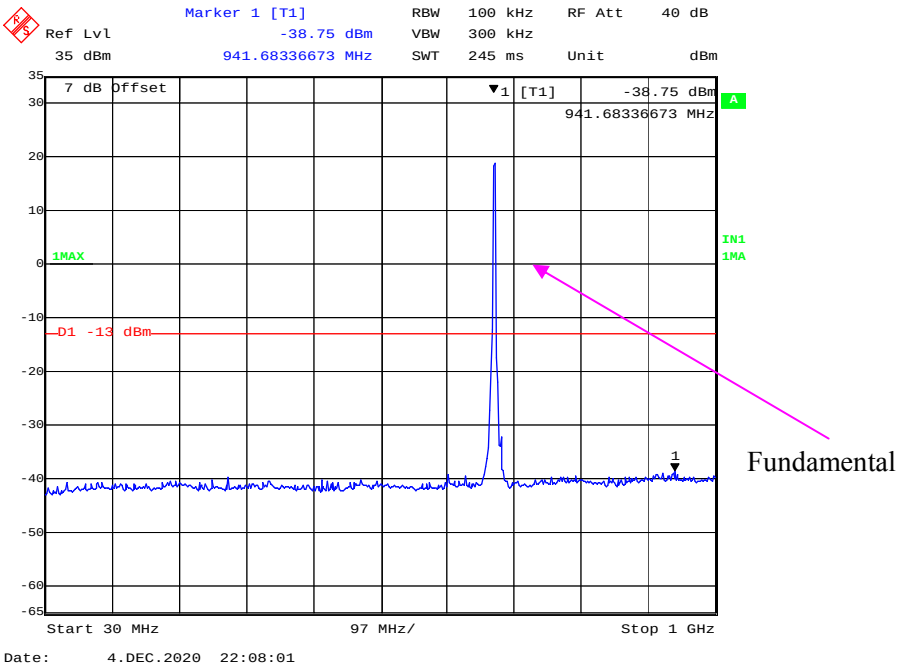
30 MHz - 1 GHz (20 MHz, 16-QAM, Low Channel)



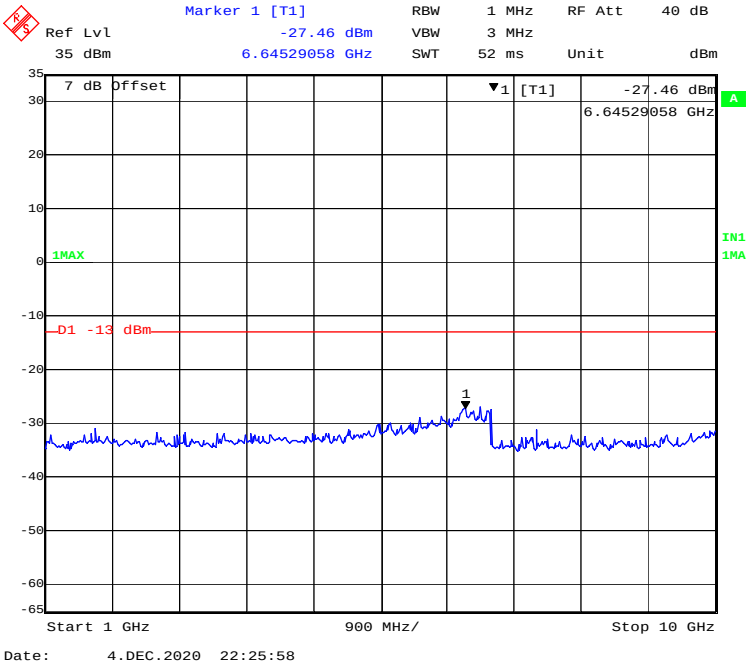
1 GHz – 10 GHz (20 MHz, 16-QAM, Low Channel)



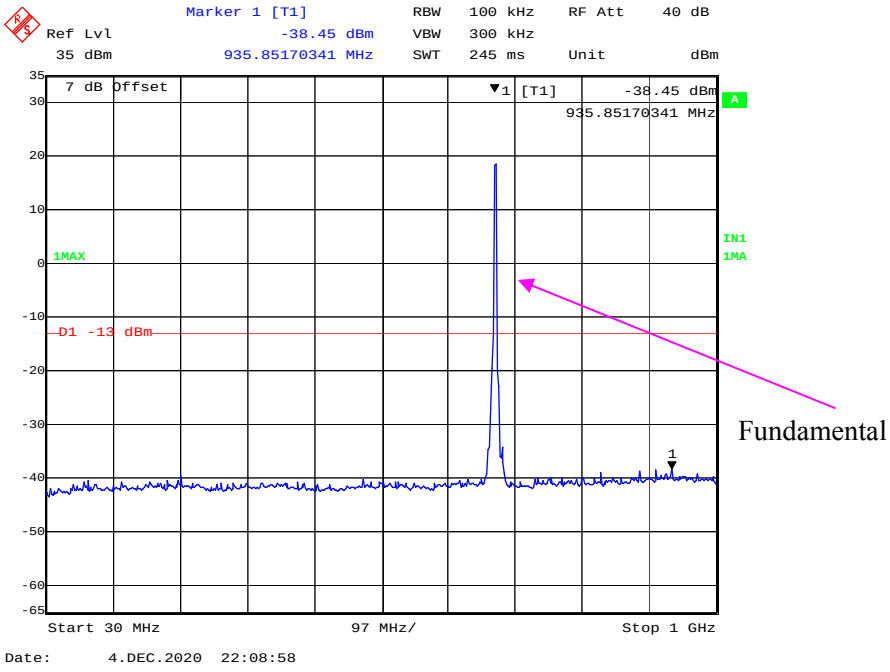
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



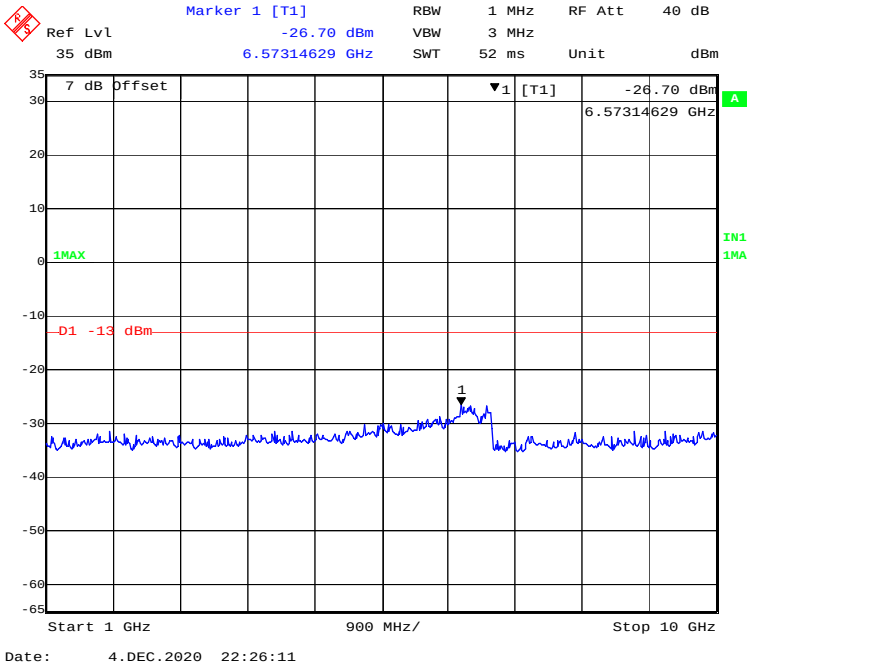
1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



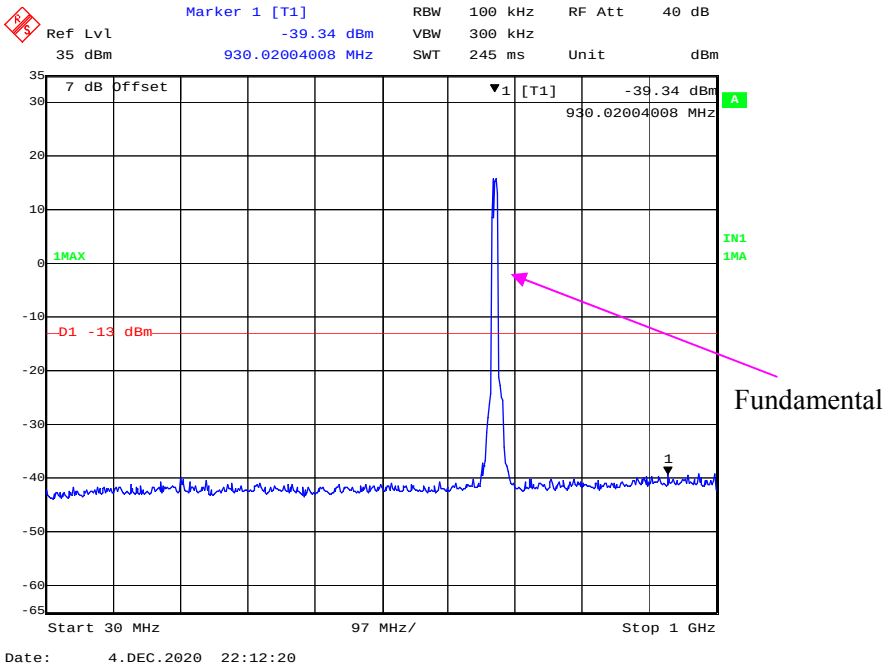
30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



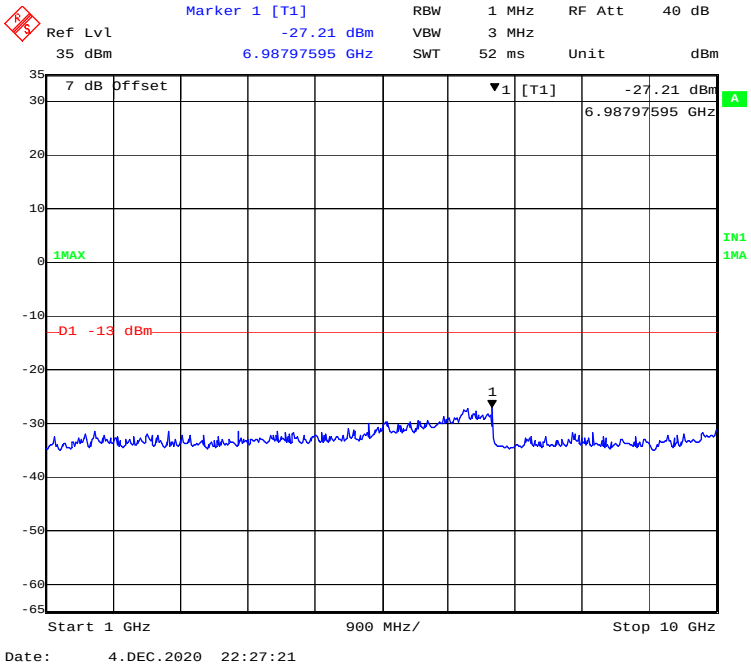
1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



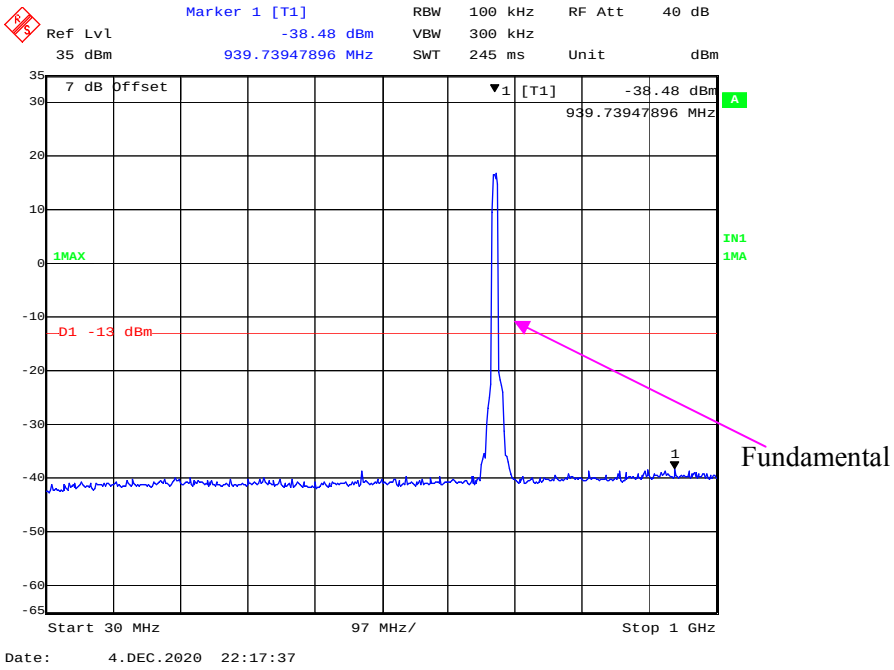
30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



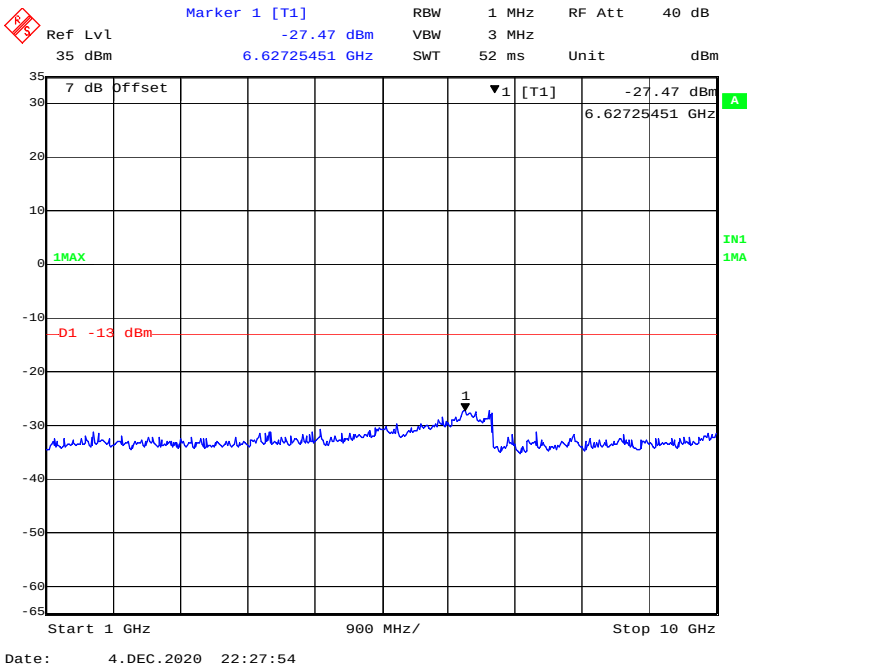
1 GHz – 10GHz (10MHz, QPSK, Middle Channel)



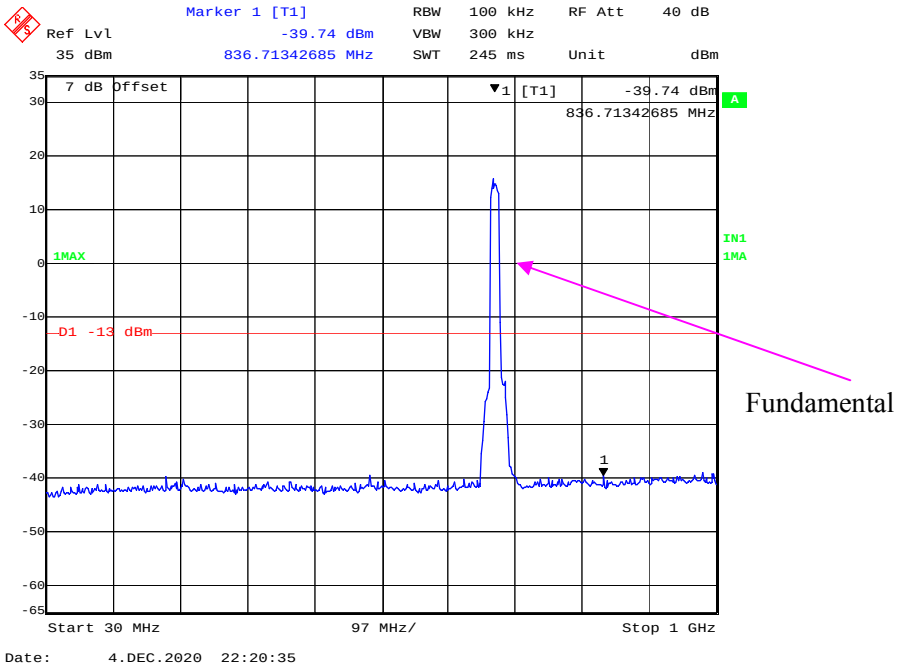
30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



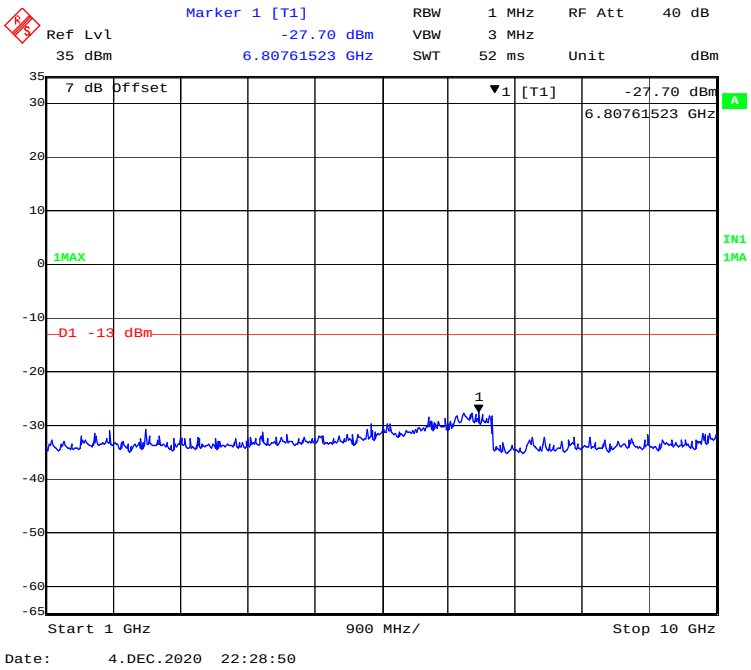
1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



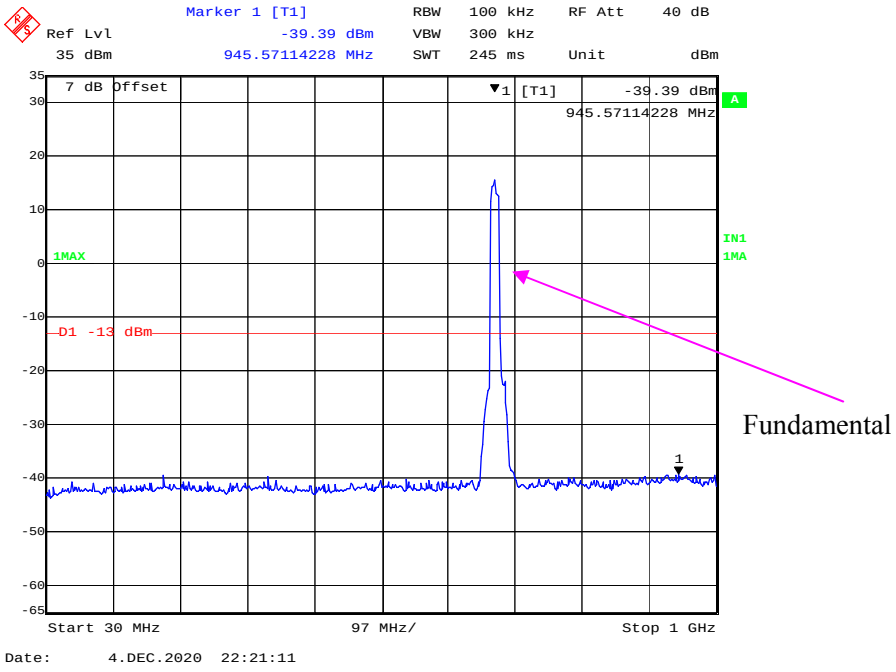
30 MHz - 1 GHz (15 MHz, QPSK, Middle Channel)



1 GHz – 10 GHz (15MHz, QPSK, Middle Channel)

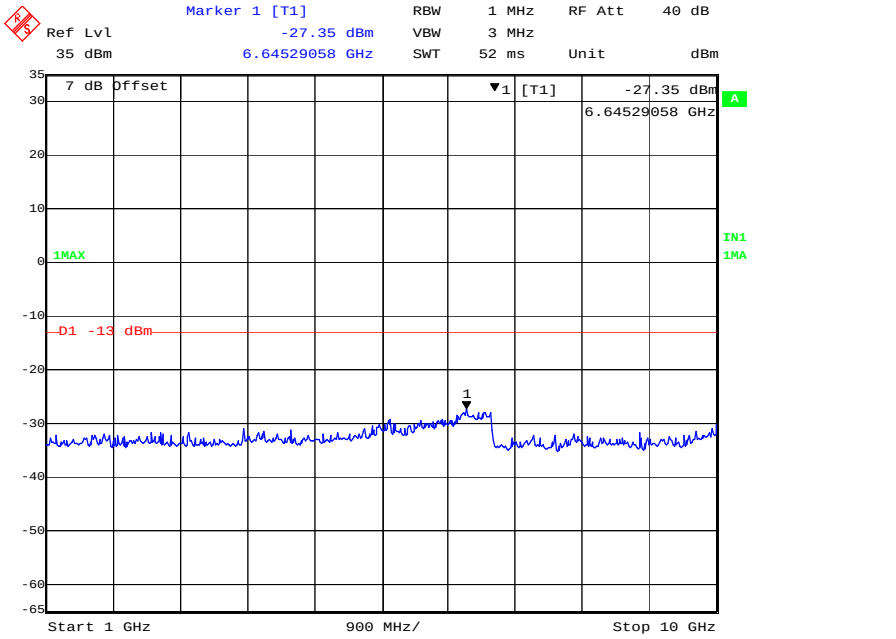


30 MHz - 1 GHz (15 MHz, 16-QAM, Middle Channel)



Date: 4.DEC.2020 22:21:11

1 GHz – 10 GHz (15 MHz, 16-QAM, Middle Channel)



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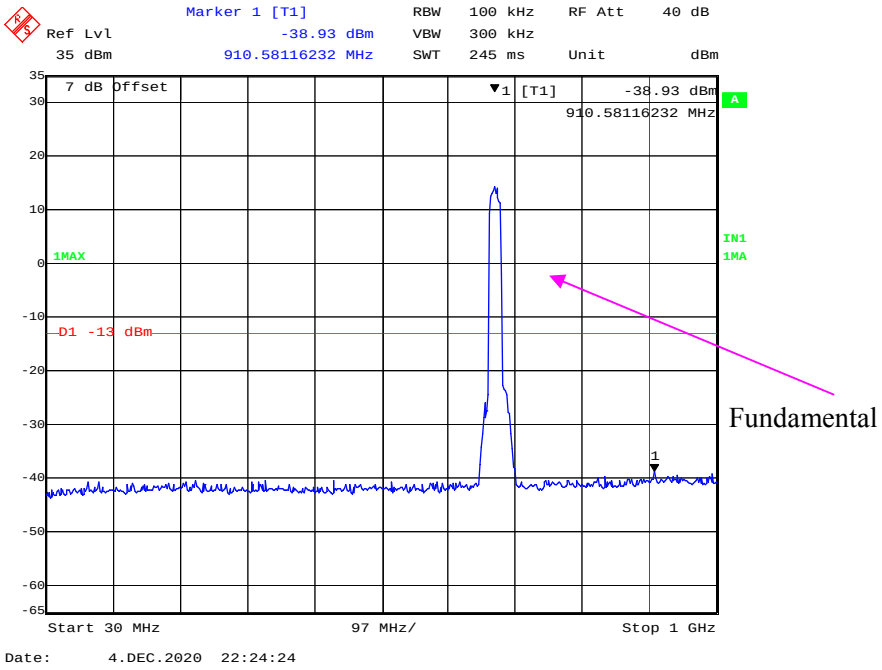
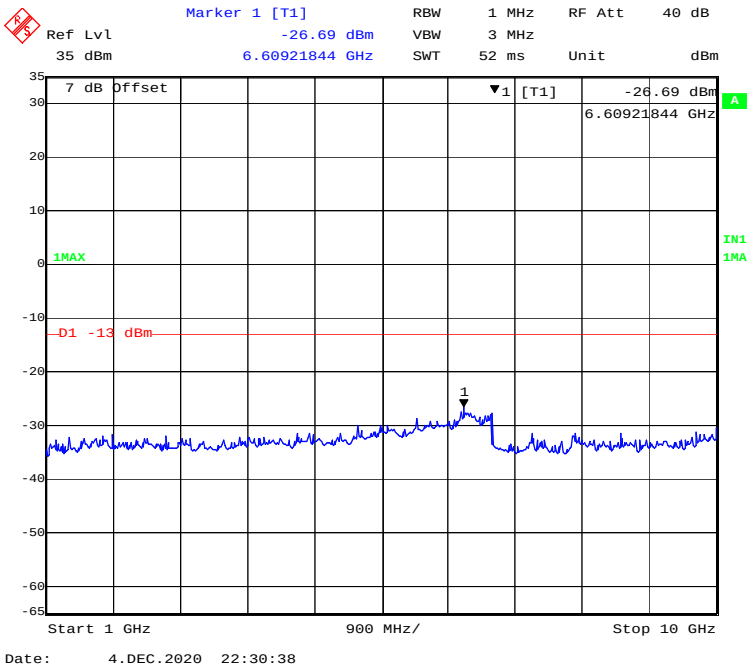
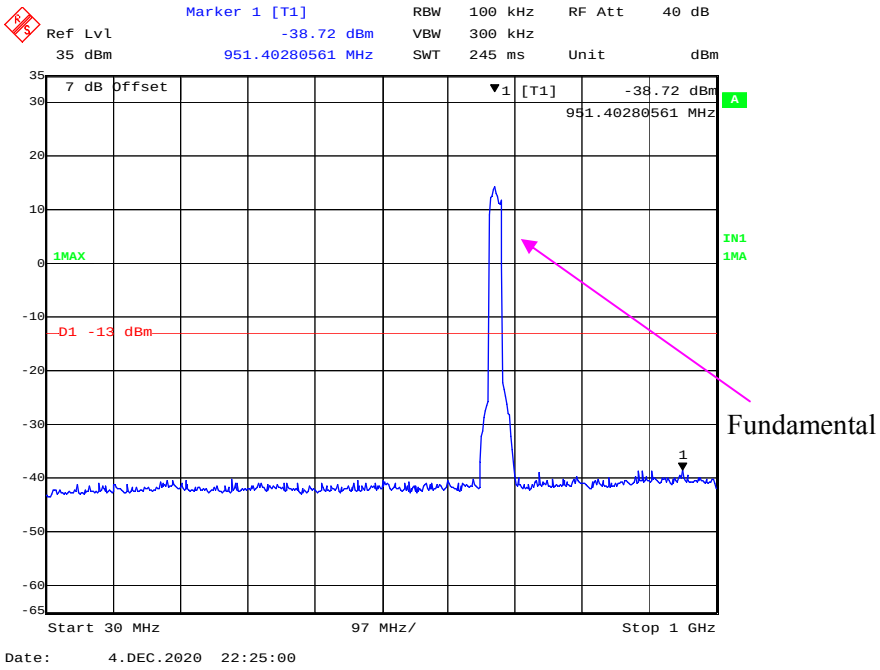
30 MHz - 1 GHz (20 MHz, QPSK, Middle Channel)



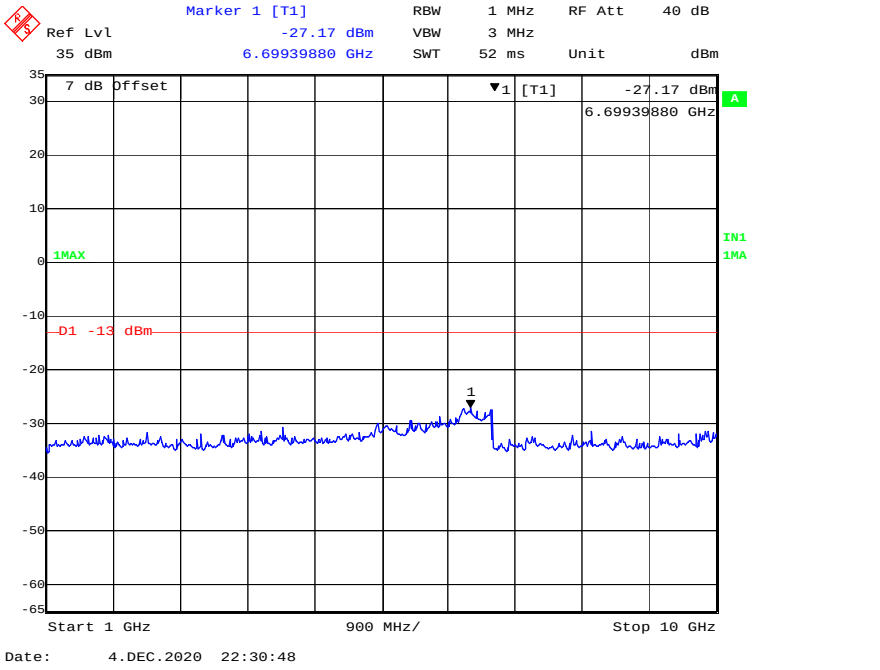
1 GHz – 10 GHz (20MHz, QPSK, Middle Channel)



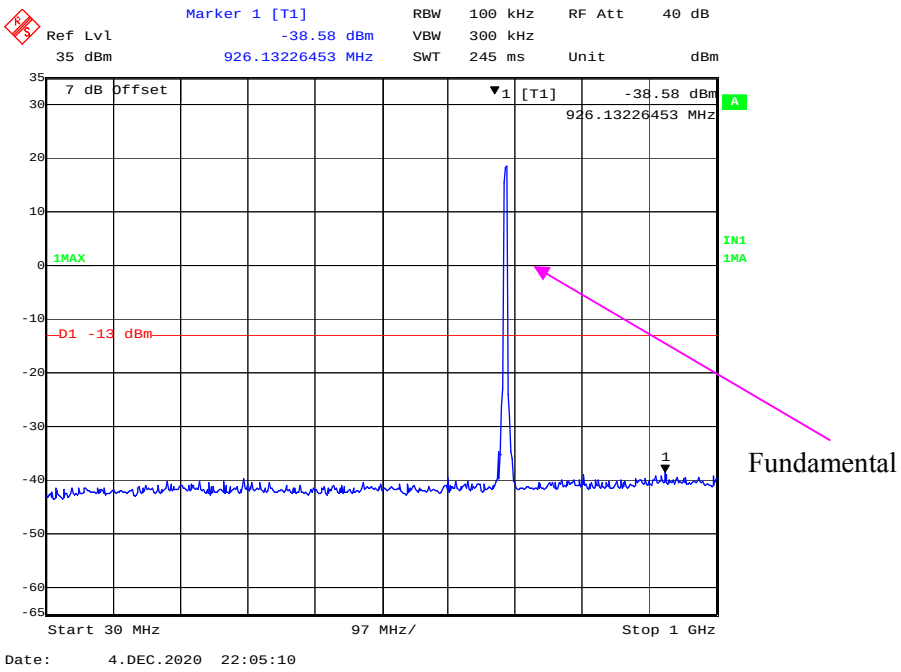
30 MHz - 1 GHz (20 MHz, 16-QAM, Middle Channel)



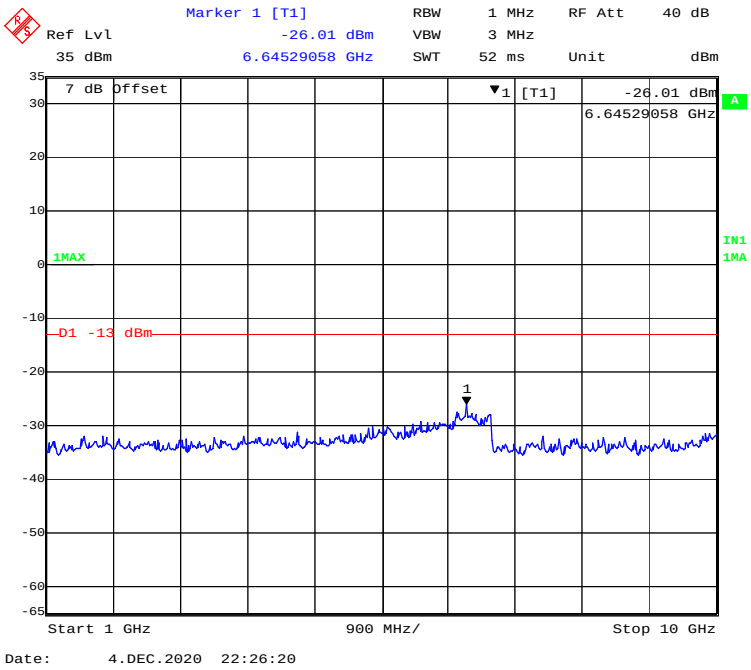
1 GHz – 10 GHz (20 MHz, 16-QAM, Middle Channel)



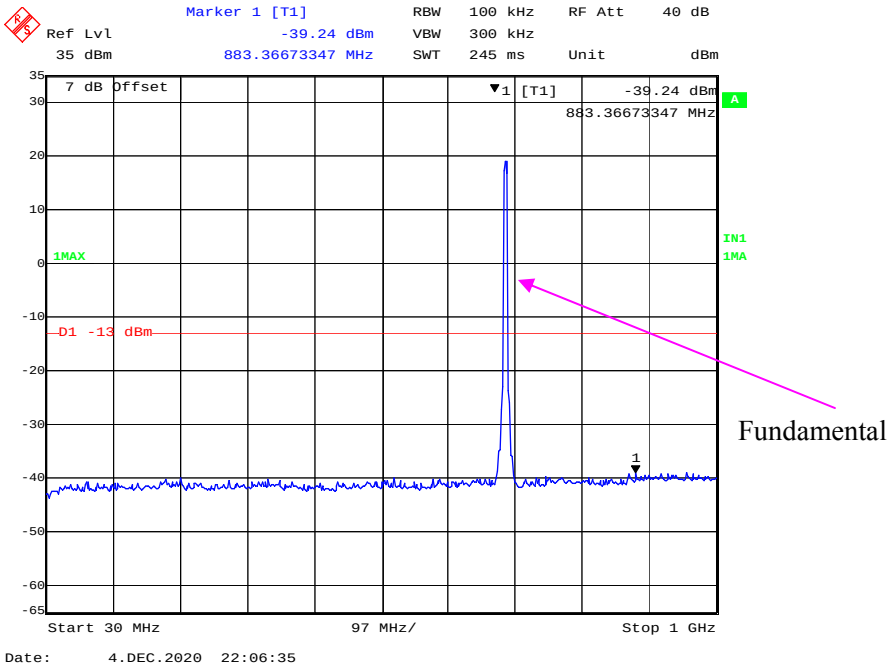
30 MHz - 1 GHz (5 MHz, QPSK, High Channel)



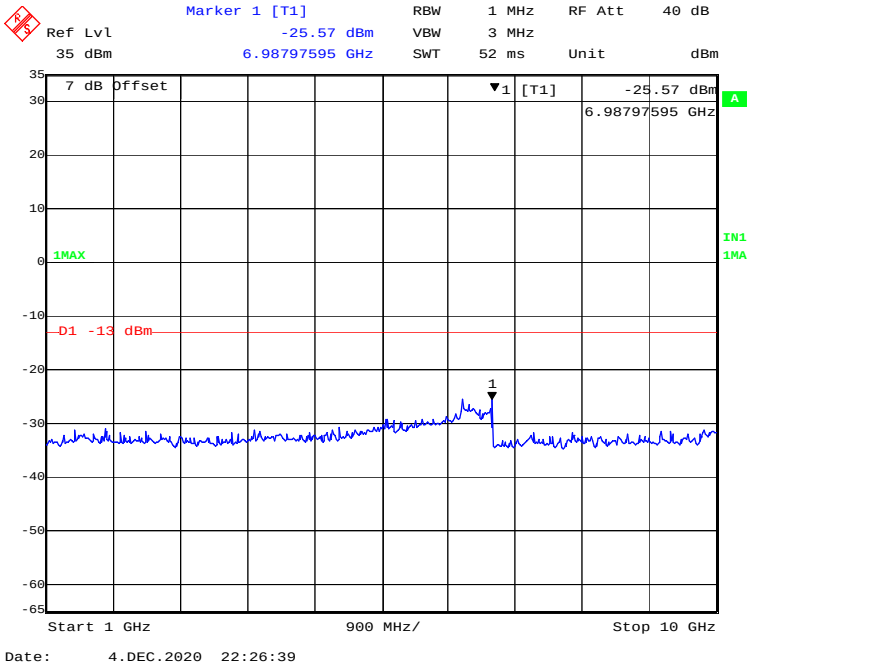
1 GHz – 10 GHz (5 MHz, QPSK, High Channel)



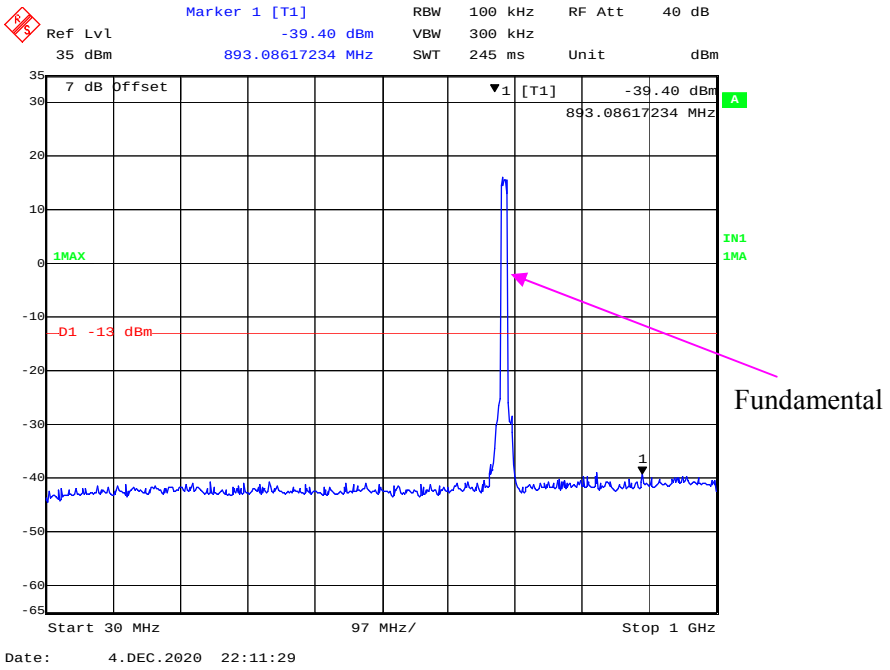
30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)



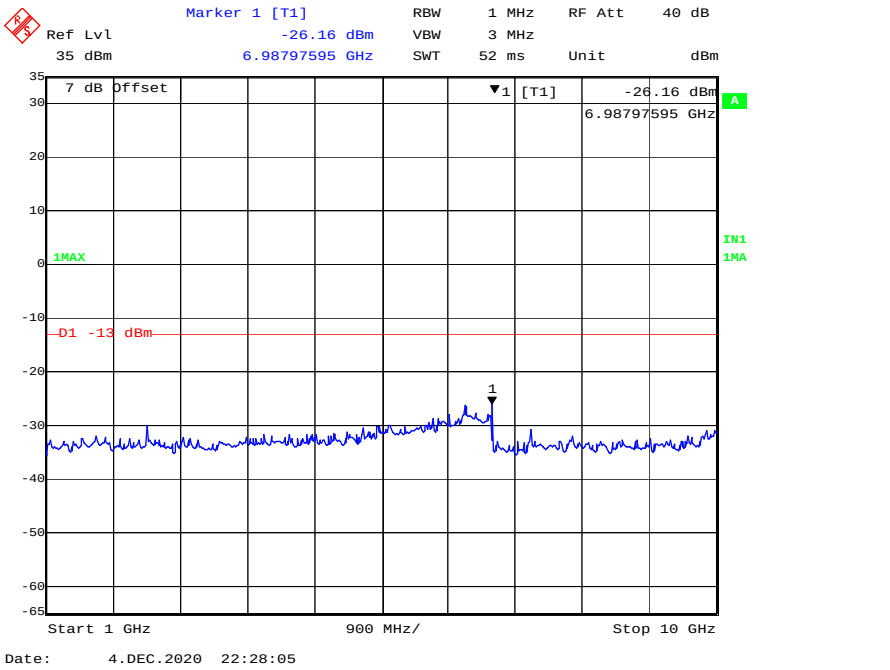
1 GHz – 10 GHz (5 MHz, 16-QAM, High Channel)



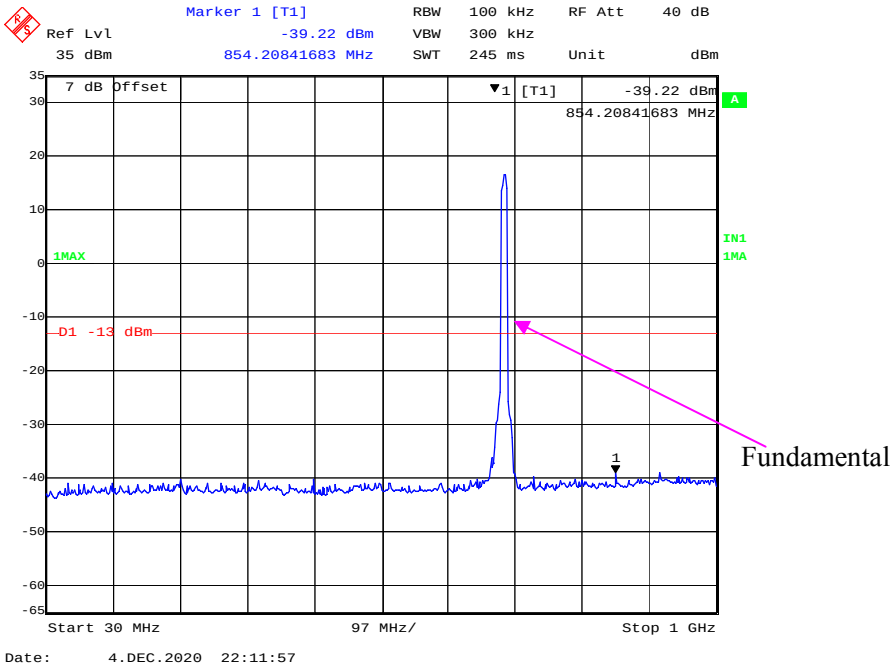
30 MHz - 1 GHz (10 MHz, QPSK, High Channel)



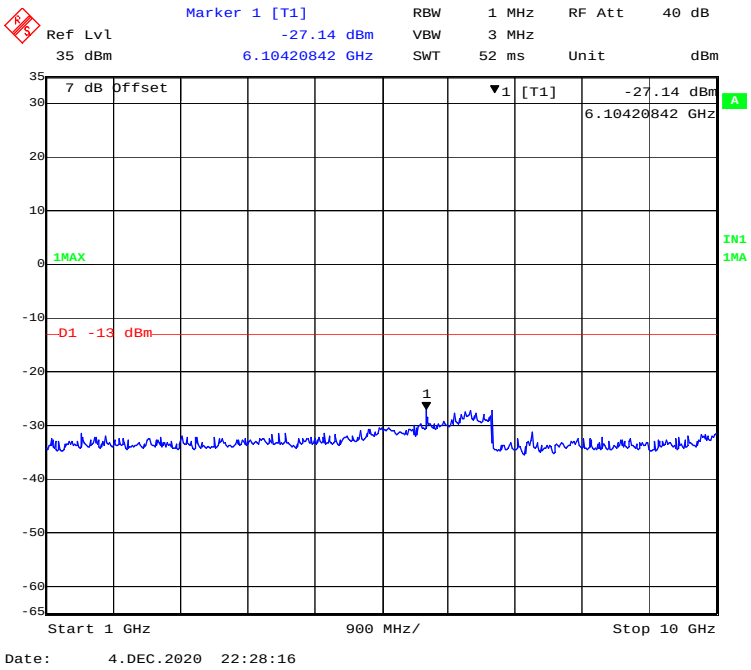
1 GHz – 10GHz (10MHz, QPSK, High Channel)



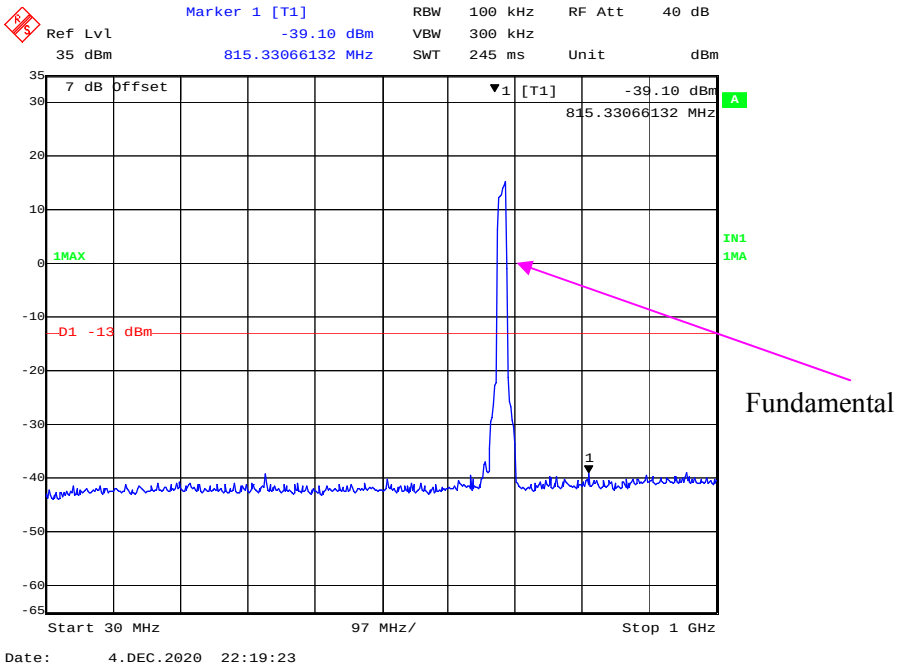
30 MHz - 1 GHz (10 MHz, 16-QAM, High Channel)



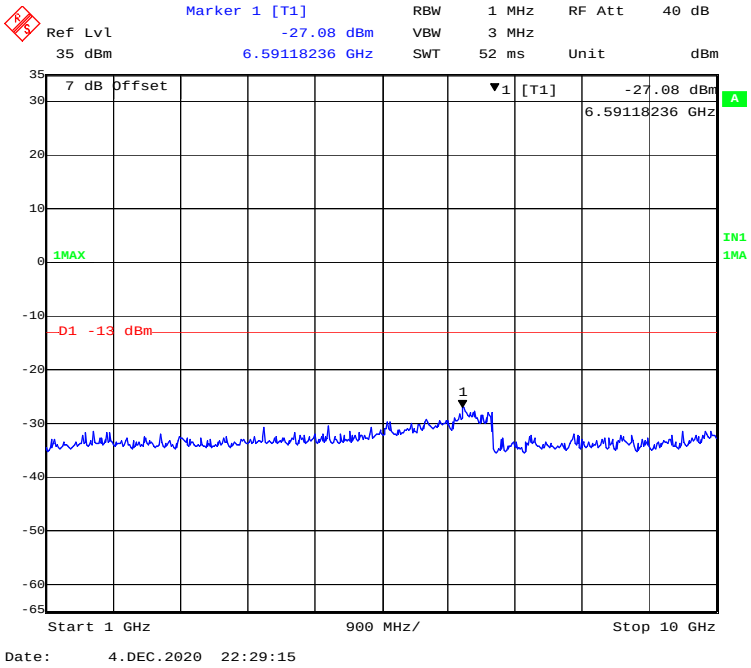
1 GHz – 10 GHz (10 MHz, 16-QAM, High Channel)



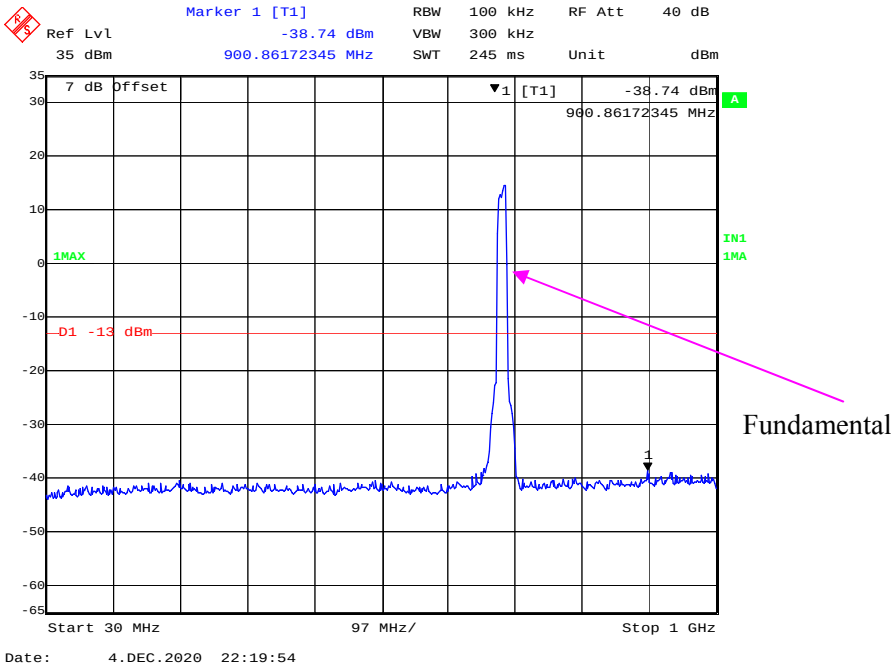
30 MHz - 1 GHz (15 MHz, QPSK, High Channel)



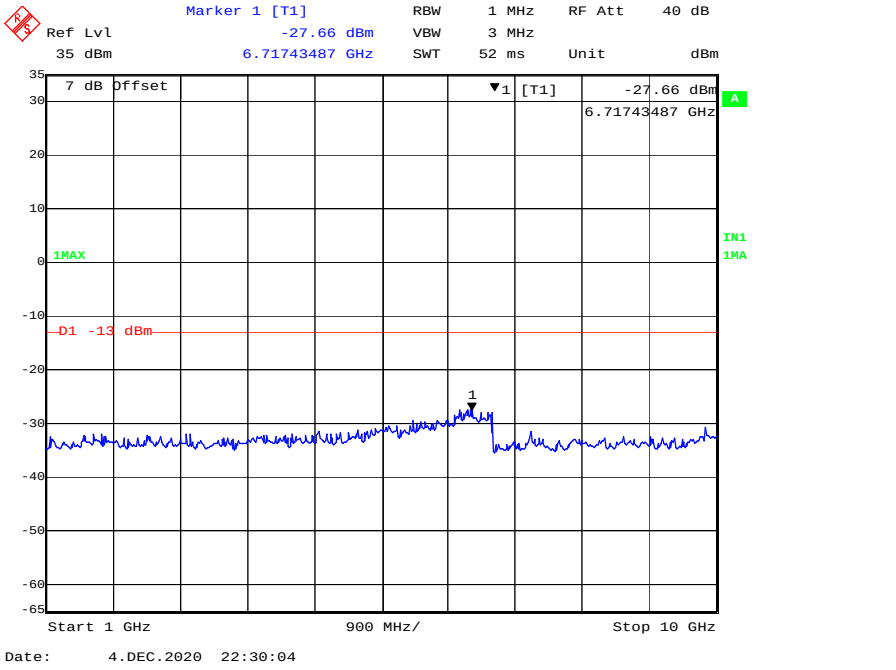
1 GHz – 10 GHz (15MHz, QPSK, High Channel)



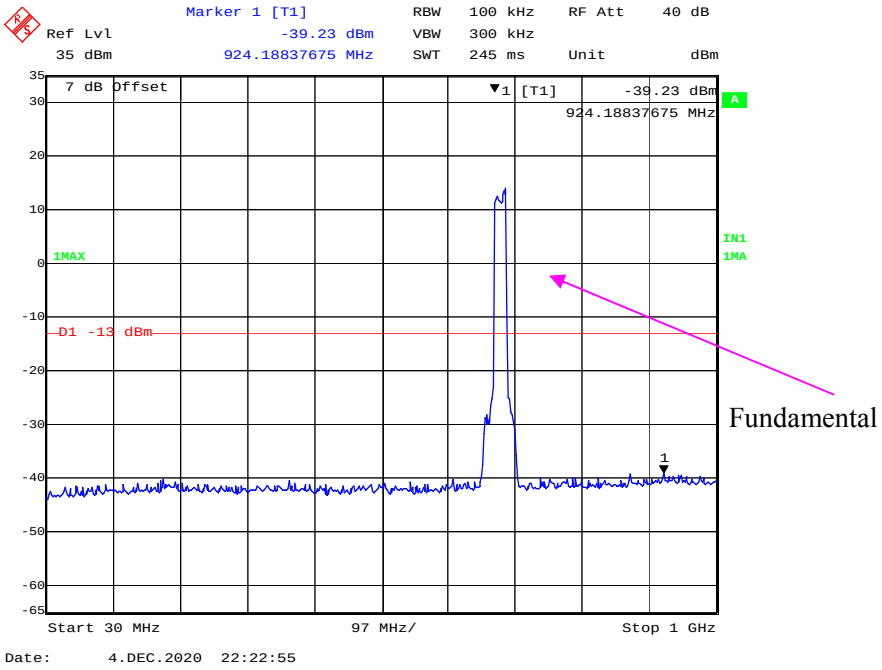
30 MHz - 1 GHz (15 MHz, 16-QAM, High Channel)



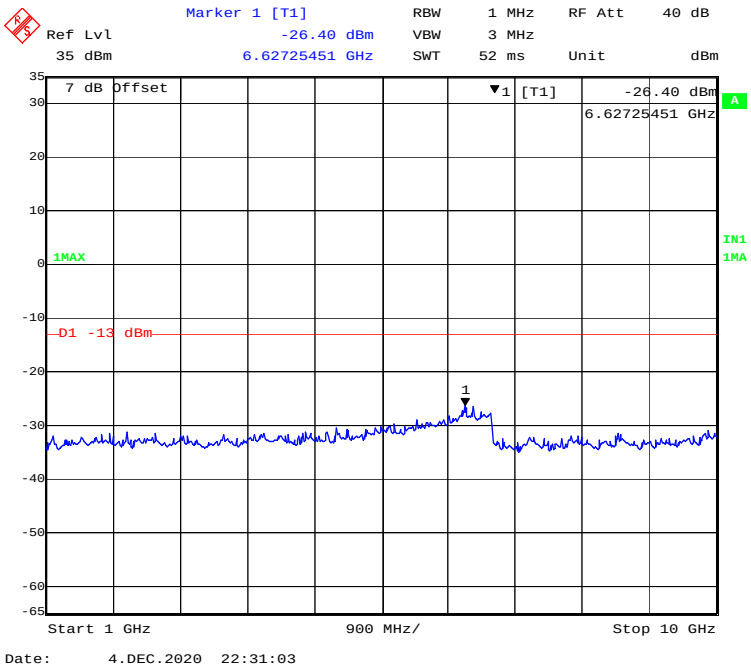
1 GHz – 10 GHz (15 MHz, 16-QAM, High Channel)



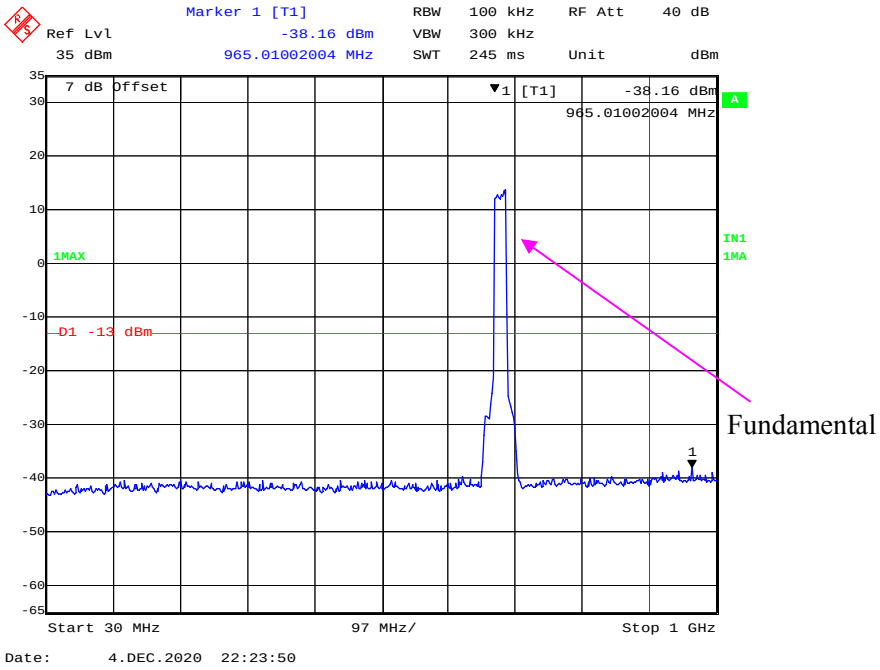
30 MHz - 1 GHz (20 MHz, QPSK, High Channel)



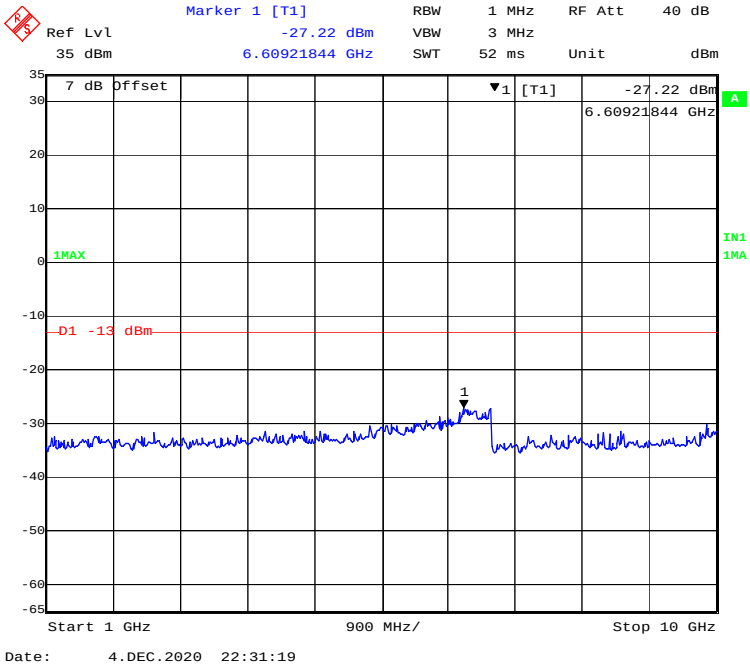
1 GHz – 10 GHz (20MHz, QPSK, High Channel)



30 MHz - 1 GHz (20 MHz, 16-QAM, High Channel)



1 GHz – 10 GHz (20 MHz, 16-QAM, High Channel)



FCC § 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (c) (g) (h); § 90.543 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917(a), § 24.238(a), §90.543 and § 27.53(h) (m)

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

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

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 (c) (g) (h), (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;

(2) On any frequency outside the 776-788 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.

(g)For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a 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, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

(h) AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

According to §90.543, for operations in the 758-768 MHz and the 788-798 MHz bands, 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 all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) 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.

(5) Compliance with the provisions of paragraph (e)(3) 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 30 kHz may be employed.

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 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.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23.2 ℃
Relative Humidity:	51 %
ATM Pressure:	101.3 kPa

The testing was performed by CK Huang on 2020-12-06.

Test mode: Transmitting (Pre-scan with low, middle and high channels, and the worse case data as below)

30 MHz ~ 10 GHz:

WCDMA Band V

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Low channel										
215.99	49.55	67	150	H	-54.73	0.43	-3.41	-58.57	-13	45.57
215.99	49.84	129	150	V	-54.44	0.48	-3.41	-58.33	-13	45.33
1652.80	46.05	129	100	H	-67.27	0.84	8.44	-59.67	-13	46.67
1652.80	46.67	256	100	V	-66.65	0.84	8.44	-59.05	-13	46.05

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
215.99	48.81	55	150	H	-55.47	0.43	-3.41	-59.31	-13	46.31
215.99	49.48	149	150	V	-54.80	0.48	-3.41	-58.69	-13	45.69
1673.20	45.80	8	100	H	-67.52	0.84	8.48	-59.88	-13	46.88
1673.20	46.29	279	100	V	-67.03	0.84	8.48	-59.39	-13	46.39

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, High channel										
215.99	50.40	175	150	H	-53.88	0.43	-3.41	-57.72	-13	44.72
215.99	50.42	100	150	V	-53.86	0.48	-3.41	-57.75	-13	44.75
1693.20	46.67	214	100	H	-66.36	0.84	8.51	-58.69	-13	45.69
1693.20	47.13	317	100	V	-65.90	0.84	8.51	-58.23	-13	45.23

30 MHz ~ 20 GHz:

WCDMA Band II

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Low channel										
215.87	49.94	264	150	H	-54.35	0.43	-3.41	-58.19	-13	45.19
215.87	50.38	214	150	V	-53.91	0.43	-3.41	-57.75	-13	44.75
3704.80	42.00	118	200	H	-64.96	0.95	9.78	-56.13	-13	43.13
3704.80	42.43	313	100	V	-64.53	0.95	9.78	-55.70	-13	42.70

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
215.87	49.61	40	150	H	-54.68	0.43	-3.41	-58.52	-13	45.52
215.87	50.24	273	150	V	-54.05	0.43	-3.41	-57.89	-13	44.89
3760.00	41.51	198	200	H	-65.27	0.95	9.74	-56.48	-13	43.48
3760.00	42.14	131	100	V	-64.64	0.95	9.74	-55.85	-13	42.85

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, High channel										
215.87	50.44	210	150	H	-53.85	0.43	-3.41	-57.69	-13	44.69
215.87	51.10	69	150	V	-53.19	0.43	-3.41	-57.03	-13	44.03
3815.20	41.73	244	200	H	-64.87	0.96	9.71	-56.12	-13	43.12
3815.20	42.26	44	100	V	-64.34	0.96	9.71	-55.59	-13	42.59

30 MHz ~ 20 GHz:

WCDMA Band IV

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Low channel										
216.61	51.16	224	150	H	-53.07	0.43	-3.39	-56.89	-13	43.89
216.61	51.56	264	150	V	-52.67	0.62	-3.39	-56.68	-13	43.68
3424.80	45.68	244	200	H	-62.22	0.93	9.83	-53.32	-13	40.32
3424.80	45.65	252	100	V	-62.25	0.93	9.83	-53.35	-13	40.35

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
216.61	50.27	194	150	H	-53.96	0.43	-3.39	-57.78	-13	44.78
216.61	50.65	233	150	V	-53.58	0.62	-3.39	-57.59	-13	44.59
3465.20	44.59	29	200	H	-63.16	0.93	9.87	-54.22	-13	41.22
3465.20	44.95	43	100	V	-62.80	0.93	9.87	-53.86	-13	40.86

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, High channel										
216.61	51.93	133	150	H	-52.30	0.43	-3.39	-56.12	-13	43.12
216.61	51.94	306	150	V	-52.29	0.62	-3.39	-56.30	-13	43.30
3505.20	45.78	166	200	H	-61.82	0.93	9.90	-52.85	-13	39.85
3505.20	46.11	206	100	V	-61.49	0.93	9.90	-52.52	-13	39.52

Note:
1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

Test mode: Transmitting (Pre-scan with all the bandwidth, and worse case as below)

30 MHz ~ 20 GHz:

LTE Band 2:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
219.63	51.67	277	100	H	-52.31	0.43	-3.28	-48.60	-13	35.60
219.63	51.45	298	200	V	-52.53	0.43	-3.28	-48.82	-13	35.82
3701.40	44.86	256	150	H	-62.10	0.95	9.78	-53.27	-13	40.27
3701.40	45.83	30	100	V	-61.13	0.95	9.78	-52.30	-13	39.30
16-QAM 1.4MHz Bandwidth Low Channel										
219.63	50.96	190	150	H	-53.02	0.43	-3.28	-49.31	-13	36.31
219.63	50.83	52	150	V	-53.15	0.43	-3.28	-49.44	-13	36.44
3701.40	46.65	42	200	H	-60.31	0.95	9.78	-51.48	-13	38.48
3701.40	45.53	31	200	V	-61.43	0.95	9.78	-52.60	-13	39.60

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
219.63	50.69	214	100	H	-53.29	0.43	-3.28	-49.58	-13	36.58
219.63	51.26	292	100	V	-52.72	0.43	-3.28	-49.01	-13	36.01
3760.00	44.71	250	150	H	-62.07	0.95	9.74	-53.28	-13	40.28
3760.00	45.65	74	100	V	-61.13	0.95	9.74	-52.34	-13	39.34
16-QAM 1.4MHz Bandwidth Middle Channel										
219.63	51.51	347	150	H	-52.47	0.43	-3.28	-48.76	-13	35.76
219.63	51.21	46	150	V	-52.77	0.43	-3.28	-49.06	-13	36.06
3760.00	44.82	211	200	H	-61.96	0.95	9.74	-53.17	-13	40.17
3760.00	46.29	95	200	V	-60.49	0.95	9.74	-51.70	-13	38.70

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
219.63	51.33	359	100	H	-52.65	0.43	-3.28	-48.94	-13	35.94
219.63	52.10	186	200	V	-51.88	0.43	-3.28	-48.17	-13	35.17
3818.60	44.61	355	150	H	-61.99	0.96	9.71	-53.24	-13	40.24
3818.60	46.28	9	100	V	-60.32	0.96	9.71	-51.57	-13	38.57
16-QAM 1.4MHz Bandwidth High Channel										
219.63	51.87	9	150	H	-52.11	0.43	-3.28	-48.40	-13	35.40
219.63	51.35	10	150	V	-52.63	0.43	-3.28	-48.92	-13	35.92
3818.60	46.88	355	200	H	-59.72	0.96	9.71	-50.97	-13	37.97
3818.60	45.74	240	200	V	-60.86	0.96	9.71	-52.11	-13	39.11

30 MHz ~ 20 GHz:

LTE Band 4:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
217.45	50.92	290	100	H	-53.24	0.43	-3.36	-49.45	-13	36.45
217.45	51.33	70	200	V	-52.83	0.43	-3.36	-49.04	-13	36.04
3421.40	42.56	209	150	H	-65.38	0.93	9.82	-56.49	-13	43.49
3421.40	42.34	190	100	V	-65.60	0.93	9.82	-56.71	-13	43.71
16-QAM 1.4MHz Bandwidth Low Channel										
217.45	51.32	64	150	H	-52.84	0.43	-3.36	-49.05	-13	36.05
217.45	50.38	61	150	V	-53.78	0.43	-3.36	-49.99	-13	36.99
3421.40	42.55	250	200	H	-65.39	0.93	9.82	-56.50	-13	43.50
3421.40	43.43	212	200	V	-64.51	0.93	9.82	-55.62	-13	42.62

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
217.45	50.35	252	100	H	-53.81	0.43	-3.36	-50.02	-13	37.02
217.45	50.87	340	200	V	-53.29	0.43	-3.36	-49.50	-13	36.50
3465.00	41.93	122	150	H	-65.82	0.93	9.87	-56.88	-13	43.88
3465.00	42.01	216	100	V	-65.74	0.93	9.87	-56.80	-13	43.80
16-QAM 1.4MHz Bandwidth Middle Channel										
217.45	51.15	112	150	H	-53.01	0.43	-3.36	-49.22	-13	36.22
217.45	50.51	202	150	V	-53.65	0.43	-3.36	-49.86	-13	36.86
3465.00	42.65	220	200	H	-65.10	0.93	9.87	-56.16	-13	43.16
3465.00	42.69	287	200	V	-65.06	0.93	9.87	-56.12	-13	43.12

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
217.45	50.85	128	100	H	-53.31	0.43	-3.36	-49.52	-13	36.52
217.45	51.04	208	200	V	-53.12	0.43	-3.36	-49.33	-13	36.33
3508.60	42.83	350	150	H	-64.74	0.93	9.90	-55.77	-13	42.77
3508.60	42.00	250	100	V	-65.57	0.93	9.90	-56.60	-13	43.60
16-QAM 1.4MHz Bandwidth High Channel										
217.45	51.81	155	150	H	-52.35	0.43	-3.36	-48.56	-13	35.56
217.45	51.77	99	150	V	-52.39	0.43	-3.36	-48.60	-13	35.60
3508.60	42.48	154	200	H	-65.09	0.93	9.90	-56.12	-13	43.12
3508.60	43.72	216	200	V	-63.85	0.93	9.90	-54.88	-13	41.88

30 MHz ~ 10 GHz:

LTE Band 5:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
237.94	50.23	259	100	H	-52.21	0.44	-2.66	-49.11	-13	36.11
237.94	50.54	56	200	V	-51.90	0.44	-2.66	-48.80	-13	35.80
1649.40	61.22	77	150	H	-52.12	0.84	8.44	-44.52	-13	31.52
1649.40	61.42	298	100	V	-51.92	0.84	8.44	-44.32	-13	31.32
16-QAM 1.4MHz Bandwidth Low Channel										
237.94	50.89	209	150	H	-51.55	0.44	-2.66	-48.45	-13	35.45
237.94	51.15	290	150	V	-51.29	0.44	-2.66	-48.19	-13	35.19
1649.40	62.32	167	200	H	-51.02	0.84	8.44	-43.42	-13	30.42
1649.40	62.18	262	200	V	-51.16	0.84	8.44	-43.56	-13	30.56

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
237.94	50.19	212	100	H	-52.25	0.44	-2.66	-49.15	-13	36.15
237.94	50.39	213	200	V	-52.05	0.44	-2.66	-48.95	-13	35.95
1673.00	60.35	102	150	H	-52.99	0.84	8.48	-45.35	-13	32.35
1673.00	60.45	63	100	V	-52.89	0.84	8.48	-45.25	-13	32.25
16-QAM 1.4MHz Bandwidth Middle Channel										
237.94	50.58	34	150	H	-51.86	0.44	-2.66	-48.76	-13	35.76
237.94	50.78	19	150	V	-51.66	0.44	-2.66	-48.56	-13	35.56
1673.00	61.26	5	200	H	-52.08	0.84	8.48	-44.44	-13	31.44
1673.00	60.84	45	200	V	-52.50	0.84	8.48	-44.86	-13	31.86

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
237.94	51.09	237	100	H	-51.35	0.44	-2.66	-48.25	-13	35.25
237.94	50.91	40	200	V	-51.53	0.44	-2.66	-48.43	-13	35.43
1696.60	61.38	206	150	H	-51.63	0.84	8.51	-43.96	-13	30.96
1696.60	61.87	97	100	V	-51.14	0.84	8.51	-43.47	-13	30.47
16-QAM 1.4MHz Bandwidth High Channel										
237.94	50.59	34	150	H	-51.85	0.44	-2.66	-48.75	-13	35.75
237.94	51.16	150	150	V	-51.28	0.44	-2.66	-48.18	-13	35.18
1696.60	62.41	171	200	H	-50.60	0.84	8.51	-42.93	-13	29.93
1696.60	62.05	288	200	V	-50.96	0.84	8.51	-43.29	-13	30.29

30 MHz ~ 10 GHz:

LTE Band 12:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
214.42	47.52	39	100	H	-56.90	0.43	-3.46	-53.01	-13	40.01
214.42	49.30	152	200	V	-55.12	0.43	-3.46	-51.23	-13	38.23
1399.40	50.19	277	150	H	-63.98	0.82	7.92	-56.88	-13	43.88
1399.40	51.32	62	100	V	-62.85	0.82	7.92	-55.75	-13	42.75
16-QAM 1.4MHz Bandwidth Middle Channel										
223.63	48.30	80	150	H	-55.34	0.43	-3.15	-51.76	-13	38.76
223.63	48.83	346	150	V	-54.81	0.43	-3.15	-51.23	-13	38.23
1399.40	51.32	80	200	H	-62.85	0.82	7.92	-55.75	-13	42.75
1399.40	50.96	323	200	V	-63.21	0.82	7.92	-56.11	-13	43.11

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
214.42	47.39	326	100	H	-57.03	0.43	-3.46	-53.14	-13	40.14
214.42	48.37	164	200	V	-56.05	0.43	-3.46	-52.16	-13	39.16
1415.00	49.21	326	150	H	-64.99	0.82	7.96	-57.85	-13	44.85
1415.00	50.01	172	100	V	-64.19	0.82	7.96	-57.05	-13	44.05
16-QAM 1.4MHz Bandwidth Middle Channel										
214.42	47.90	316	150	H	-56.52	0.43	-3.46	-52.63	-13	39.63
214.42	47.79	67	150	V	-56.63	0.43	-3.46	-52.74	-13	39.74
1415.00	49.48	351	200	H	-64.72	0.82	7.96	-57.58	-13	44.58
1415.00	50.61	76	200	V	-63.59	0.82	7.96	-56.45	-13	43.45

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
214.42	48.35	43	100	H	-56.07	0.43	-3.46	-52.18	-13	39.18
214.42	48.13	227	200	V	-56.29	0.43	-3.46	-52.40	-13	39.40
1430.60	49.97	150	150	H	-64.26	0.82	8.00	-57.08	-13	44.08
1430.60	51.00	38	100	V	-63.23	0.82	8.00	-56.05	-13	43.05
16-QAM 1.4MHz Bandwidth Middle Channel										
214.42	48.15	127	150	H	-56.27	0.43	-3.46	-52.38	-13	39.38
214.42	47.89	139	150	V	-56.53	0.43	-3.46	-52.64	-13	39.64
1430.60	51.24	190	200	H	-62.99	0.82	8.00	-55.81	-13	42.81
1430.60	50.27	94	200	V	-63.96	0.82	8.00	-56.78	-13	43.78

30 MHz ~ 10 GHz:

LTE Band 13:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Low Channel										
213.81	47.47	93	200	H	-57.00	0.43	-3.48	-53.09	-13	40.09
213.81	48.48	280	200	V	-55.99	0.43	-3.48	-52.08	-13	39.08
1559.00	45.04	65	100	H	-68.92	0.83	8.29	-61.46	-13	48.46
1559.00	45.07	46	150	V	-68.89	0.83	8.29	-61.43	-13	48.43
16-QAM 5MHz Bandwidth Low Channel										
213.81	48.31	147	100	H	-56.16	0.43	-3.48	-52.25	-13	39.25
213.81	48.72	99	150	V	-55.75	0.43	-3.48	-51.84	-13	38.84
1559.00	45.15	69	150	H	-68.81	0.83	8.29	-61.35	-13	48.35
1559.00	45.43	269	200	V	-68.53	0.83	8.29	-61.07	-13	48.07

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
213.81	47.37	123	200	H	-57.10	0.43	-3.48	-53.19	-13	40.19
213.81	47.47	274	200	V	-57.00	0.43	-3.48	-53.09	-13	40.09
1564.00	44.07	240	100	H	-69.86	0.83	8.30	-62.39	-13	49.39
1564.00	44.16	241	150	V	-69.77	0.83	8.30	-62.30	-13	49.30
16-QAM 5MHz Bandwidth Middle Channel										
213.81	47.59	121	100	H	-56.88	0.43	-3.48	-52.97	-13	39.97
213.81	47.69	63	150	V	-56.78	0.43	-3.48	-52.87	-13	39.87
1564.00	44.37	334	150	H	-69.56	0.83	8.30	-62.09	-13	49.09
1564.00	44.67	334	200	V	-69.26	0.83	8.30	-61.79	-13	48.79

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth High Channel										
213.81	47.95	128	200	H	-56.52	0.43	-3.48	-52.61	-13	39.61
213.81	47.77	189	200	V	-56.70	0.43	-3.48	-52.79	-13	39.79
1569.00	44.14	110	100	H	-69.75	0.83	8.31	-62.27	-13	49.27
1569.00	44.86	262	150	V	-69.03	0.83	8.31	-61.55	-13	48.55
16-QAM 5MHz Bandwidth High Channel										
213.81	48.10	329	100	H	-56.37	0.43	-3.48	-52.46	-13	39.46
213.81	47.61	16	150	V	-56.86	0.43	-3.48	-52.95	-13	39.95
1569.00	44.94	342	150	H	-68.95	0.83	8.31	-61.47	-13	48.47
1569.00	44.85	186	200	V	-69.04	0.83	8.31	-61.56	-13	48.56

30 MHz ~ 10 GHz:

LTE Band 14:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Low Channel										
260.16	51.45	82	100	H	-51.15	0.44	-2.23	-48.48	-13	35.48
260.16	52.33	149	200	V	-50.27	0.44	-2.23	-47.60	-13	34.60
1581.00	45.57	129	100	H	-68.24	0.83	8.33	-60.74	-40	20.74
1581.00	46.19	177	150	V	-67.62	0.83	8.33	-60.12	-40	20.12
16-QAM 5MHz Bandwidth Low Channel										
260.16	51.60	162	100	H	-51.00	0.44	-2.23	-48.33	-13	35.33
260.16	51.20	32	150	V	-51.40	0.44	-2.23	-48.73	-13	35.73
1581.00	46.69	66	100	H	-67.12	0.83	8.33	-59.62	-40	19.62
1581.00	45.90	147	200	V	-67.91	0.83	8.33	-60.41	-40	20.41

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
260.16	50.66	251	100	H	-51.94	0.44	-2.23	-49.27	-13	36.27
260.16	50.79	92	200	V	-51.81	0.44	-2.23	-49.14	-13	36.14
1586.00	44.66	24	100	H	-69.11	0.83	8.34	-61.60	-40	21.60
1586.00	44.72	202	150	V	-69.05	0.83	8.34	-61.54	-40	21.54
16-QAM 5MHz Bandwidth Middle Channel										
260.16	51.60	227	100	H	-51.00	0.44	-2.23	-48.33	-13	35.33
260.16	51.19	187	150	V	-51.41	0.44	-2.23	-48.74	-13	35.74
1586.00	45.09	138	100	H	-68.68	0.83	8.34	-61.17	-40	21.17
1586.00	44.96	14	200	V	-68.81	0.83	8.34	-61.30	-40	21.30

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth High Channel										
260.16	51.52	0	100	H	-51.08	0.44	-2.23	-48.41	-13	35.41
260.16	51.45	31	200	V	-51.15	0.44	-2.23	-48.48	-13	35.48
1591.00	44.78	260	100	H	-68.96	0.83	8.35	-61.44	-40	21.44
1591.00	45.48	192	150	V	-68.26	0.83	8.35	-60.74	-40	20.74
16-QAM 5MHz Bandwidth High Channel										
260.16	50.74	133	100	H	-51.86	0.44	-2.23	-49.19	-13	36.19
260.16	50.74	333	150	V	-51.86	0.44	-2.23	-49.19	-13	36.19
1591.00	45.67	171	100	H	-68.07	0.83	8.35	-60.55	-40	20.55
1591.00	45.67	95	200	V	-68.07	0.83	8.35	-60.55	-40	20.55

30 MHz ~ 20 GHz:

LTE Band 66:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
214.05	48.01	122	150	H	-56.44	0.43	-3.47	-52.54	-13	39.54
214.05	48.07	274	200	V	-56.38	0.43	-3.47	-52.48	-13	39.48
3421.40	41.18	123	100	H	-66.76	0.93	9.82	-57.87	-13	44.87
3421.40	40.98	183	100	V	-66.96	0.93	9.82	-58.07	-13	45.07
16-QAM 1.4MHz Bandwidth Low Channel										
214.05	48.64	296	200	H	-55.81	0.43	-3.47	-51.91	-13	38.91
214.05	47.75	327	150	V	-56.70	0.43	-3.47	-52.80	-13	39.80
3421.40	42.14	221	150	H	-65.80	0.93	9.82	-56.91	-13	43.91
3421.40	41.69	269	100	V	-66.25	0.93	9.82	-57.36	-13	44.36

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
214.05	47.05	293	150	H	-57.40	0.43	-3.47	-53.50	-13	40.50
214.05	47.10	161	200	V	-57.35	0.43	-3.47	-53.45	-13	40.45
3490.00	40.34	331	100	H	-67.30	0.93	9.89	-58.34	-13	45.34
3490.00	40.40	336	100	V	-67.24	0.93	9.89	-58.28	-13	45.28
16-QAM 1.4MHz Bandwidth Middle Channel										
214.05	47.99	111	200	H	-56.46	0.43	-3.47	-52.56	-13	39.56
214.05	47.83	316	150	V	-56.62	0.43	-3.47	-52.72	-13	39.72
3490.00	41.34	319	150	H	-66.30	0.93	9.89	-57.34	-13	44.34
3490.00	41.29	192	100	V	-66.35	0.93	9.89	-57.39	-13	44.39

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
214.05	47.09	253	150	H	-57.36	0.43	-3.47	-53.46	-13	40.46
214.05	47.34	174	200	V	-57.11	0.43	-3.47	-53.21	-13	40.21
3558.60	40.28	44	100	H	-67.14	0.93	9.87	-58.20	-13	45.20
3558.60	40.27	344	100	V	-67.15	0.93	9.87	-58.21	-13	45.21
16-QAM 1.4MHz Bandwidth High Channel										
214.05	47.57	68	200	H	-56.88	0.43	-3.47	-52.98	-13	39.98
214.05	47.23	260	150	V	-57.22	0.43	-3.47	-53.32	-13	40.32
3558.60	41.12	179	150	H	-66.30	0.93	9.87	-57.36	-13	44.36
3558.60	40.51	344	100	V	-66.91	0.93	9.87	-57.97	-13	44.97

30 MHz ~ 10 GHz:

LTE Band 71:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Low Channel										
218.66	50.38	56	150	H	-54.08	0.43	-3.32	-50.33	-13	37.33
218.66	51.41	293	200	V	-53.05	0.43	-3.32	-49.30	-13	36.30
1331.00	44.90	163	100	H	-69.13	0.81	7.71	-62.23	-13	49.23
1331.00	44.95	321	100	V	-69.08	0.81	7.71	-62.18	-13	49.18
16-QAM 5MHz Bandwidth Low Channel										
218.66	52.10	129	200	H	-52.36	0.43	-3.32	-48.61	-13	35.61
218.66	51.00	23	150	V	-53.46	0.43	-3.32	-49.71	-13	36.71
1331.00	46.10	308	150	H	-67.93	0.81	7.71	-61.03	-13	48.03
1331.00	45.27	22	100	V	-68.76	0.81	7.71	-61.86	-13	48.86

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
218.66	50.33	115	150	H	-54.13	0.43	-3.32	-50.38	-13	37.38
218.66	50.91	70	200	V	-53.55	0.43	-3.32	-49.80	-13	36.80
1361.00	43.86	64	100	H	-70.23	0.62	7.81	-63.04	-13	50.04
1361.00	44.67	168	100	V	-69.42	0.62	7.81	-62.23	-13	49.23
16-QAM 5MHz Bandwidth Middle Channel										
218.66	51.19	320	200	H	-53.27	0.43	-3.32	-49.52	-13	36.52
218.66	50.35	308	150	V	-54.11	0.43	-3.32	-50.36	-13	37.36
1361.00	44.10	146	150	H	-69.99	0.62	7.81	-62.80	-13	49.80
1361.00	44.72	296	100	V	-69.37	0.62	7.81	-62.18	-13	49.18

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth High Channel										
218.66	50.96	50	150	H	-53.50	0.43	-3.32	-49.75	-13	36.75
218.66	50.77	254	200	V	-53.69	0.43	-3.32	-49.94	-13	36.94
1391.00	44.08	300	100	H	-70.07	0.82	7.89	-63.00	-13	50.00
1391.00	44.87	153	100	V	-69.28	0.82	7.89	-62.21	-13	49.21
16-QAM 5MHz Bandwidth High Channel										
218.66	50.45	68	200	H	-54.01	0.43	-3.32	-50.26	-13	37.26
218.66	50.37	30	150	V	-54.09	0.43	-3.32	-50.34	-13	37.34
1391.00	45.12	83	150	H	-69.03	0.82	7.89	-61.96	-13	48.96
1391.00	44.63	40	100	V	-69.52	0.82	7.89	-62.45	-13	49.45

Note:
1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

FCC § 22.917 (a); § 24.238 (a); §27.53 (c) (g) (h); § 90.543 - BAND EDGES

Applicable Standards

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 (c) (g) (h), (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;

(2) On any frequency outside the 776-788 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.

(g)For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a 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, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

(h) AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

According to §90.543, for operations in the 758-768 MHz and the 788-798 MHz bands, 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 all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

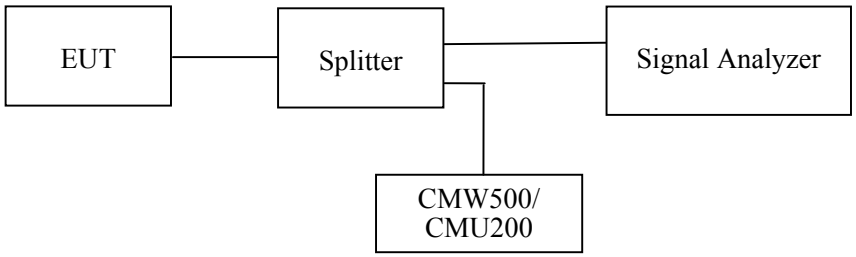
(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(5) Compliance with the provisions of paragraph (e)(3) 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 30 kHz may be employed.

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:	23.2-23.5 ℃
Relative Humidity:	51-53 %
ATM Pressure:	101.1-103.3 kPa

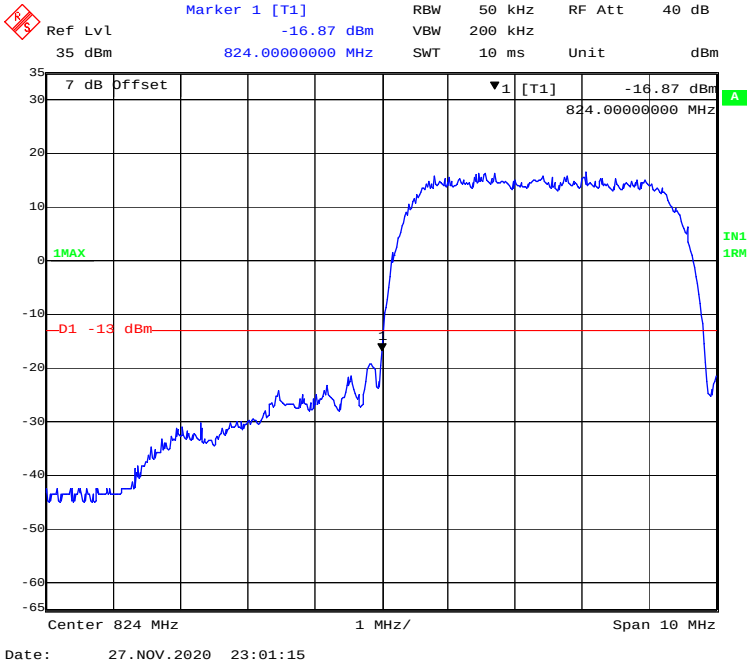
The testing was performed by CK Huang from 2020-11-27 to 2020-12-04.

EUT operation mode: Transmitting

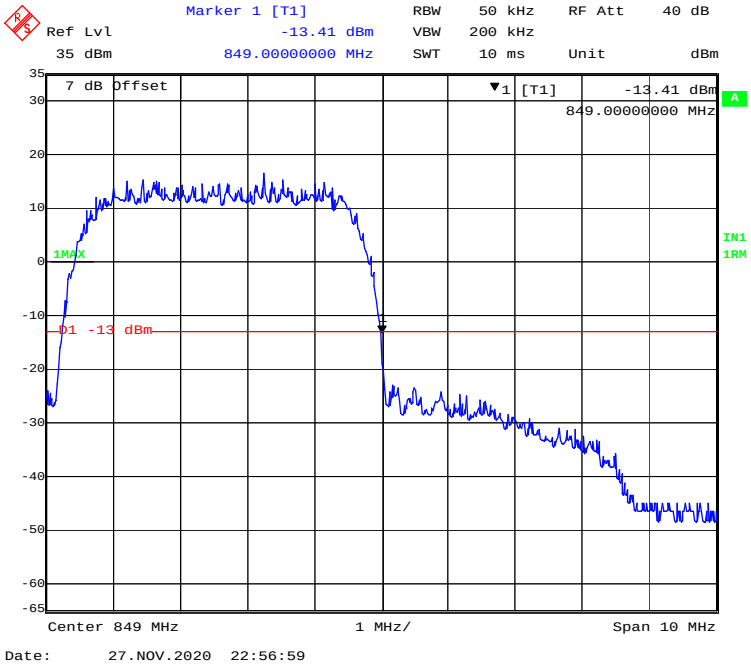
Test Result: Compliance.

WCDMA Band V

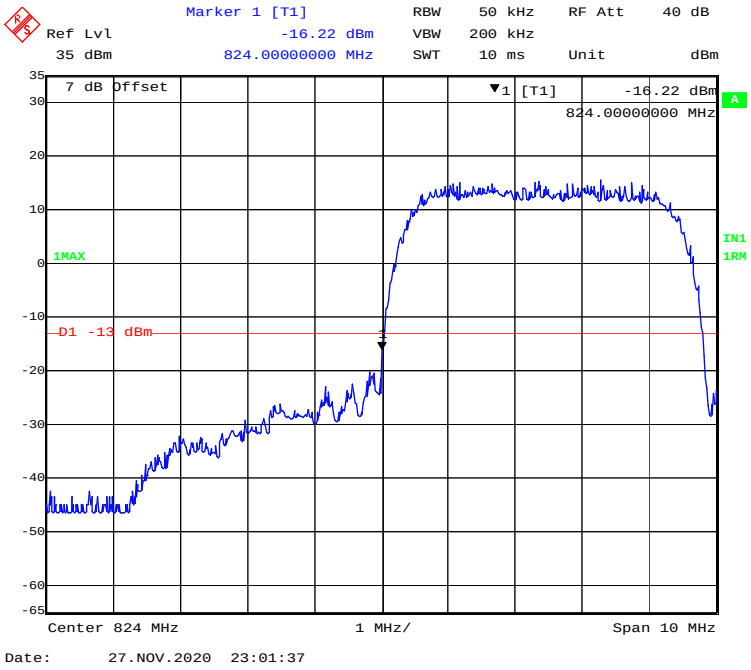
WCDMA (Rel 99) Mode, Left Band Edge



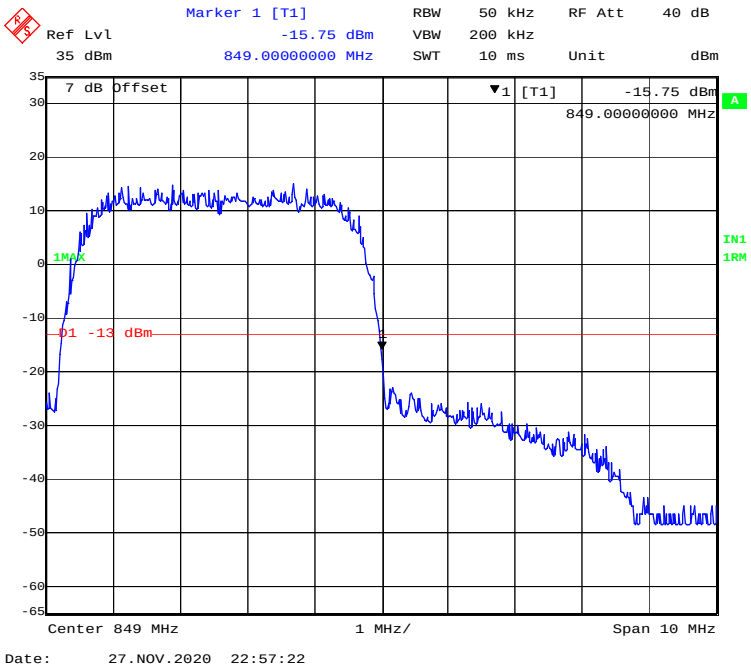
WCDMA (Rel 99) Mode, Right Band Edge



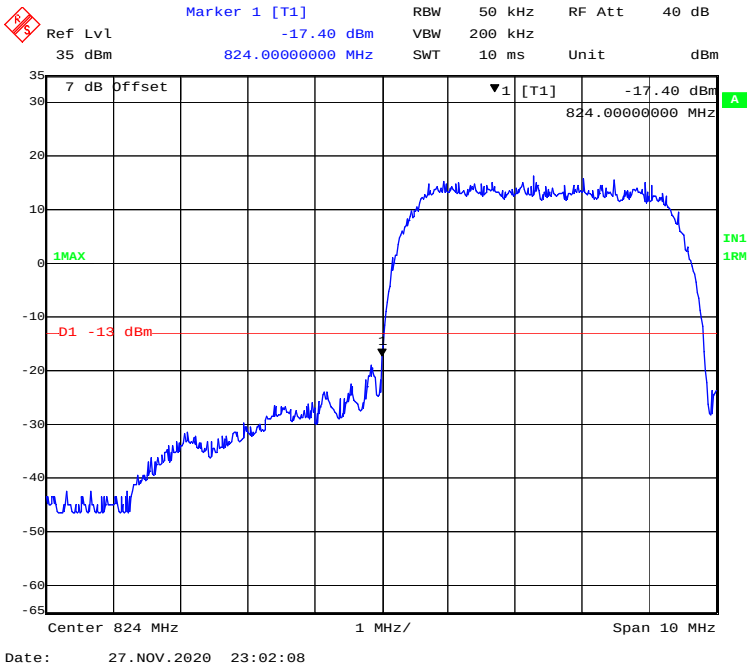
WCDMA (HSDPA) Mode, Left Band Edge



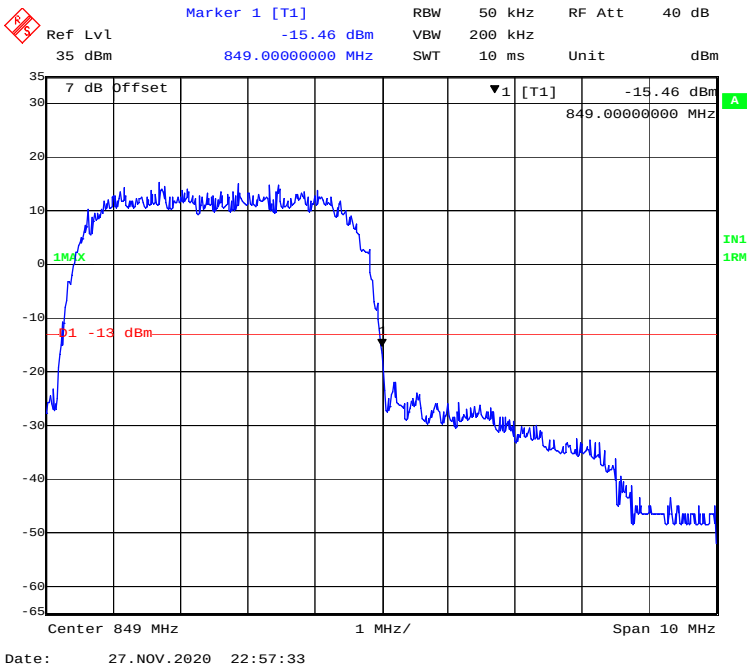
WCDMA (HSDPA) Mode, Right Band Edge



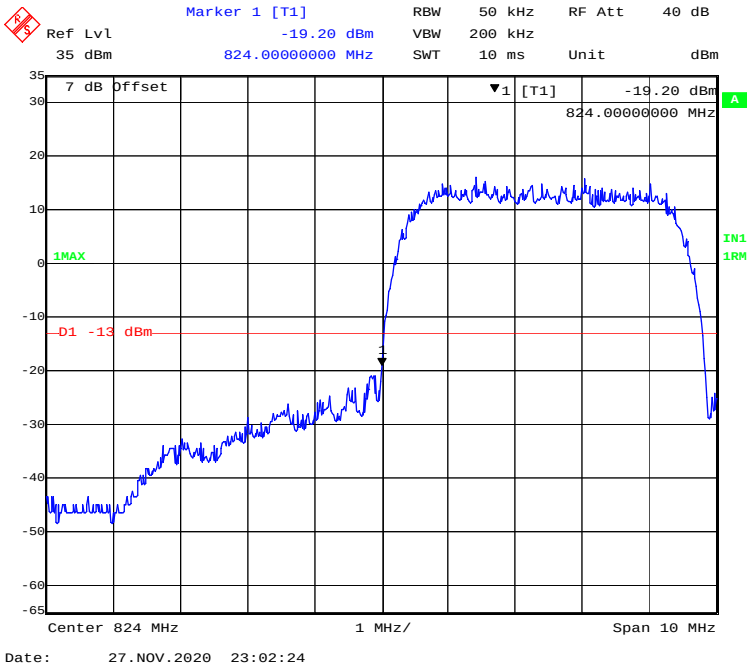
WCDMA (HSUPA) Mode, Left Band Edge



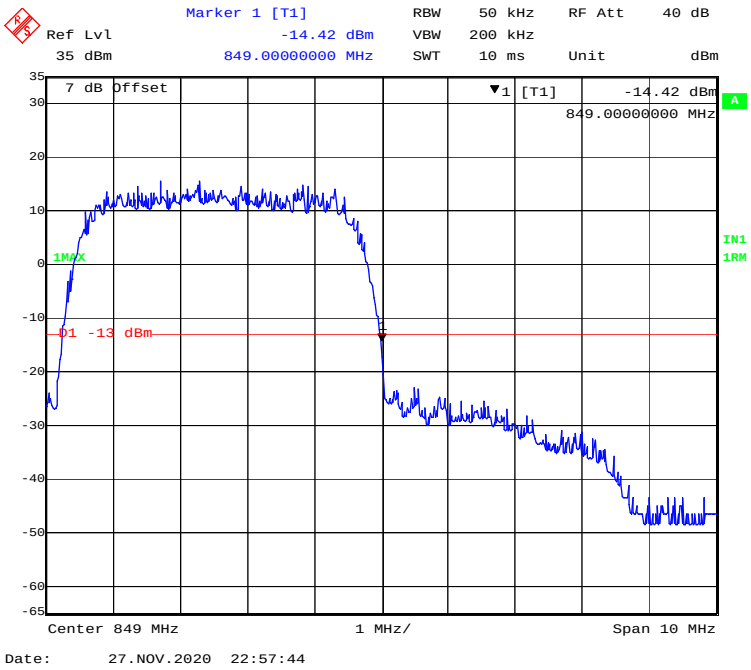
WCDMA (HSUPA) Mode, Right Band Edge



WCDMA (HSPA+) Mode, Left Band Edge

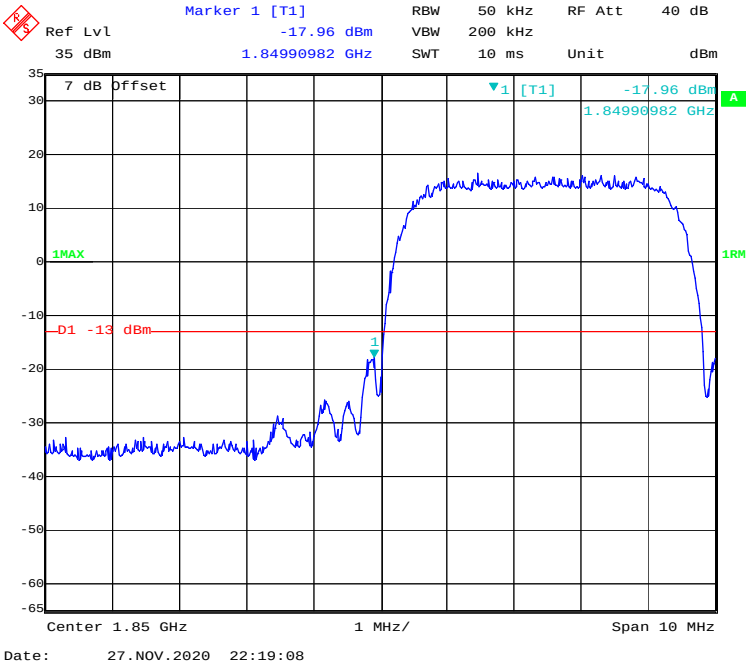


WCDMA (HSPA+) Mode, Right Band Edge

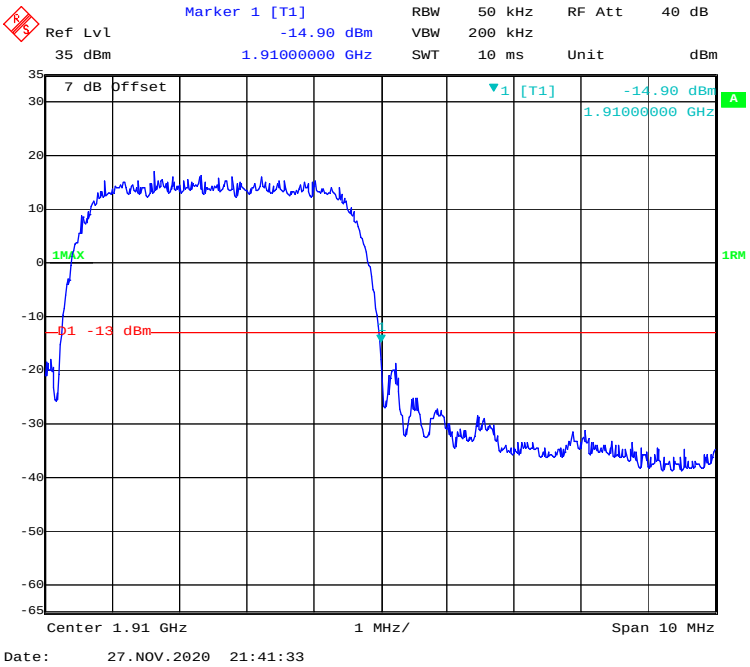


WCDMA Band II

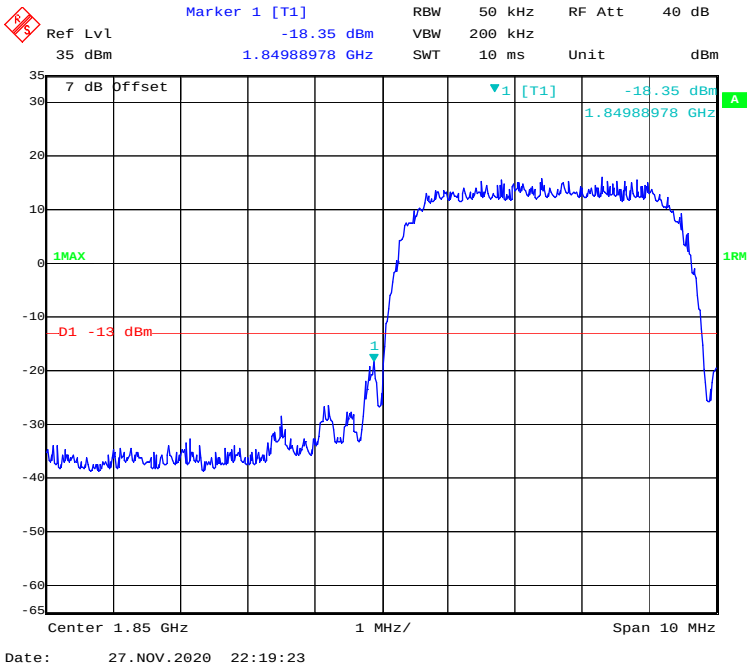
WCDMA (Rel99) Mode, Left Band Edge



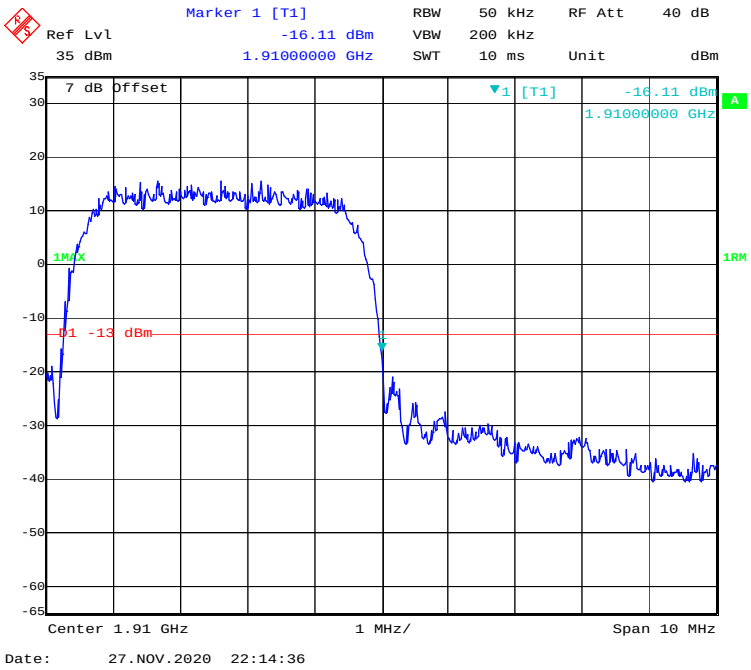
WCDMA (Rel99) Mode, Right Band Edge



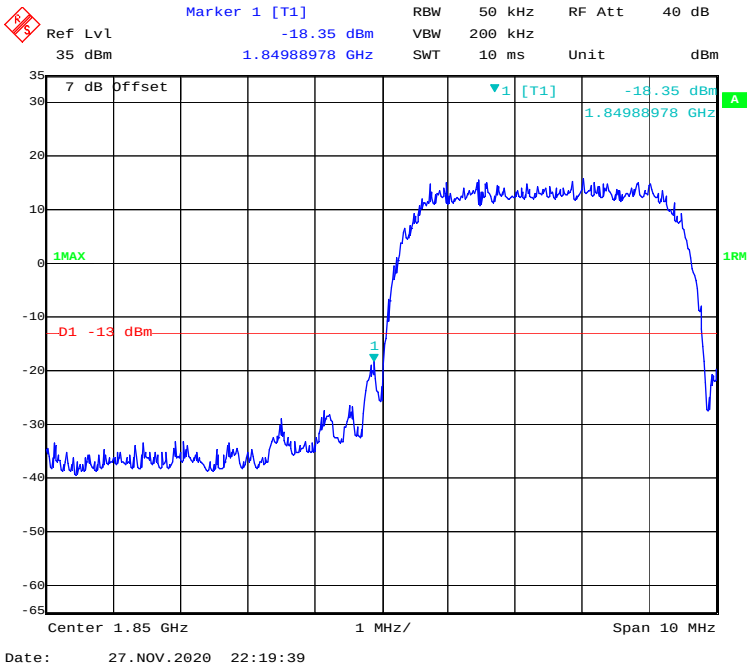
WCDMA (HSDPA) Mode, Left Band Edge



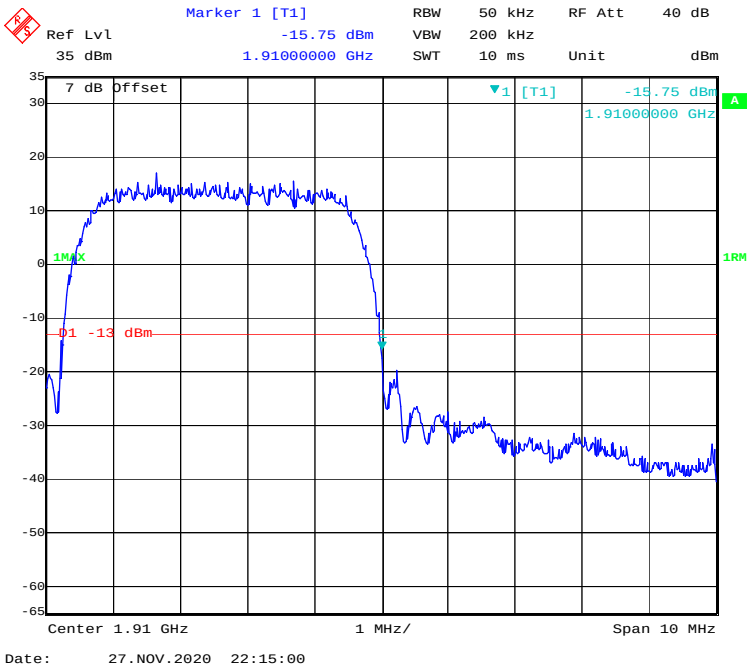
WCDMA (HSDPA) Mode, Right Band Edge



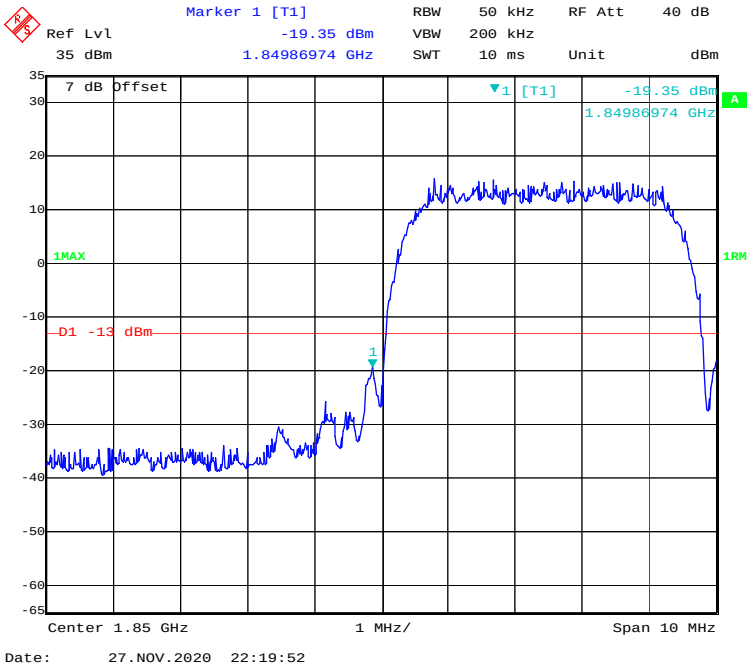
WCDMA (HSUPA) Mode, Left Band Edge



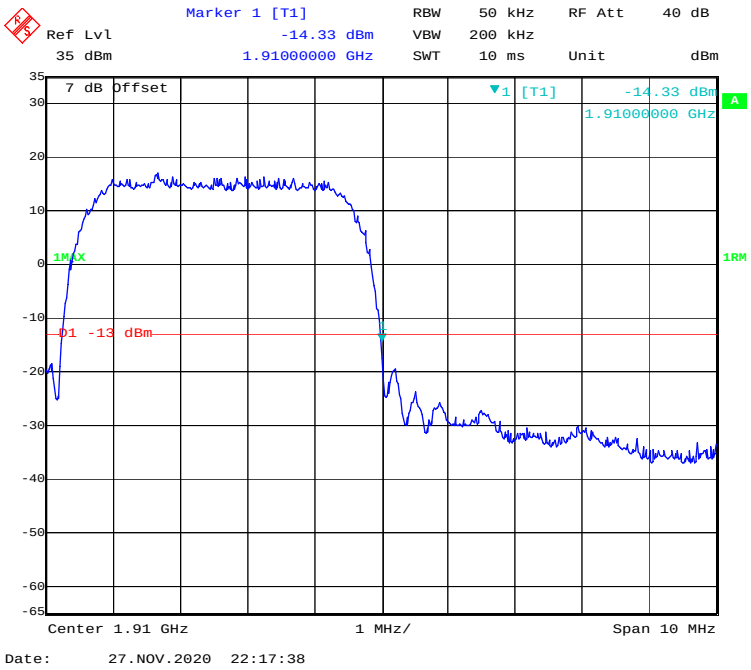
WCDMA (HSUPA) Mode, Right Band Edge



WCDMA (HSPA+) Mode, Left Band Edge

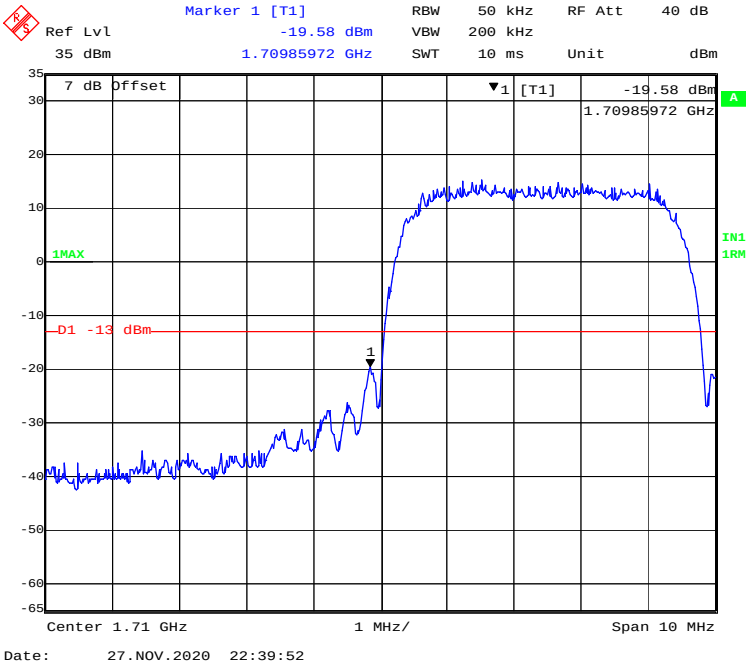


WCDMA (HSPA+) Mode, Right Band Edge

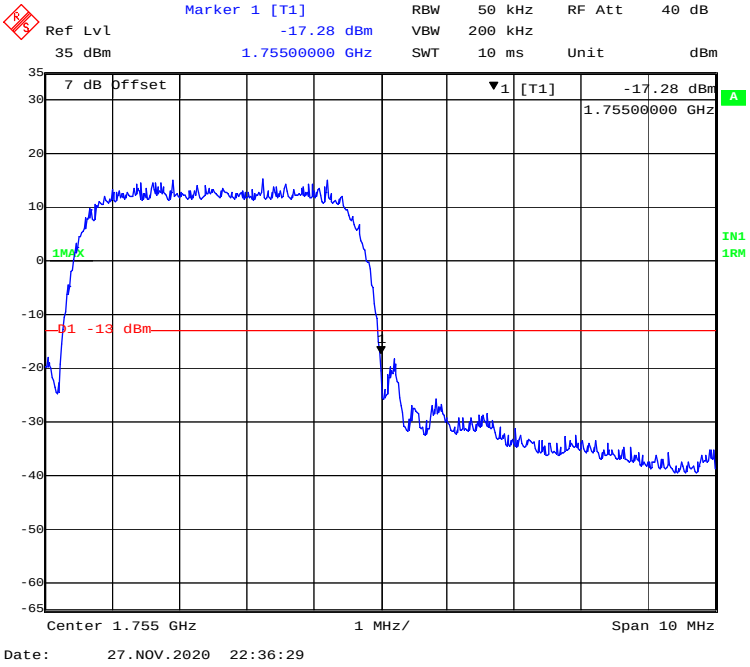


WCDMA Band IV

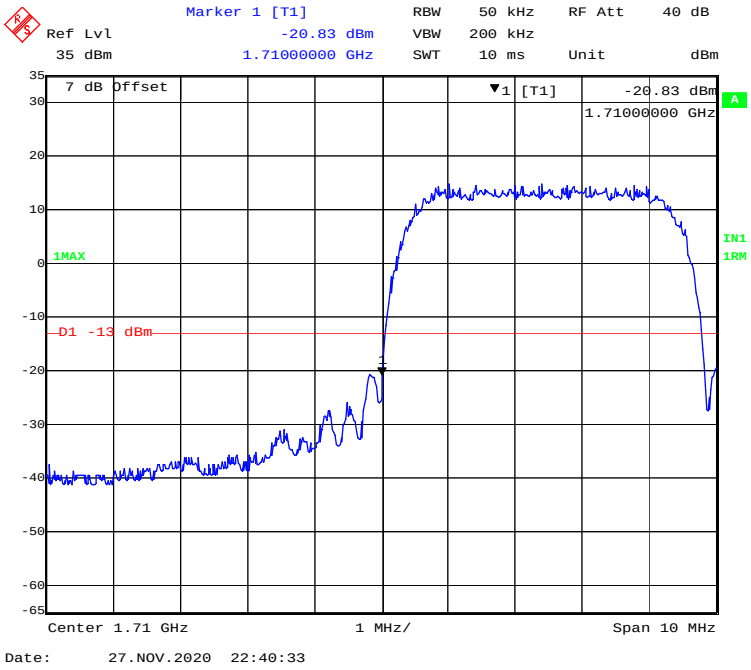
WCDMA (Rel99) Mode, Left Band Edge



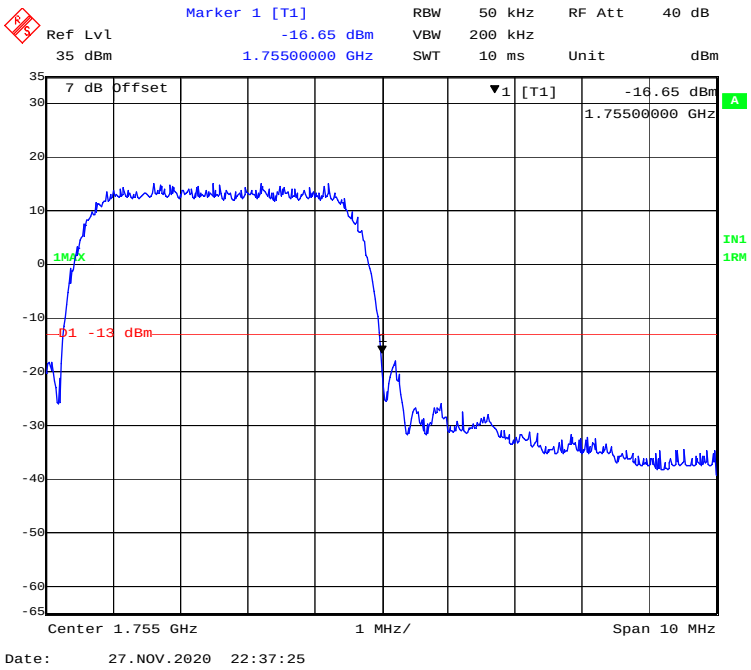
WCDMA (Rel99) Mode, Right Band Edge



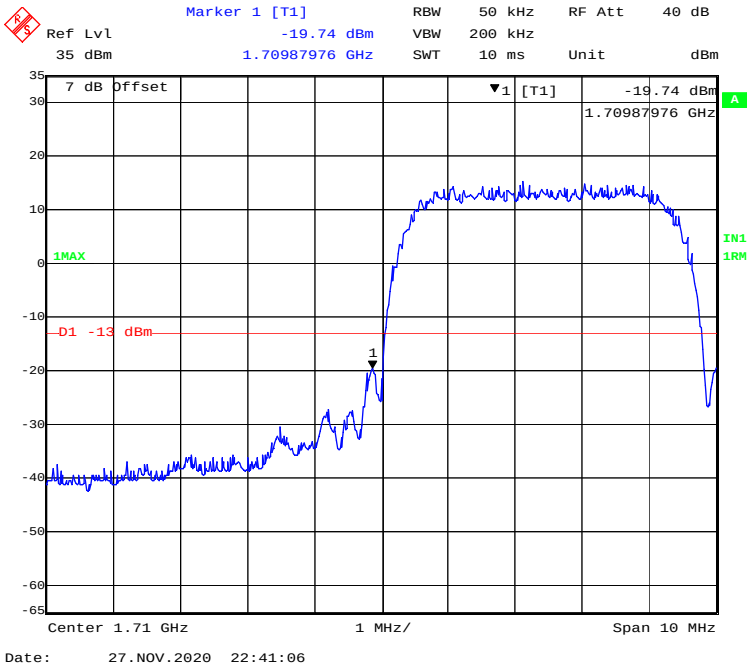
WCDMA (HSDPA) Mode, Left Band Edge



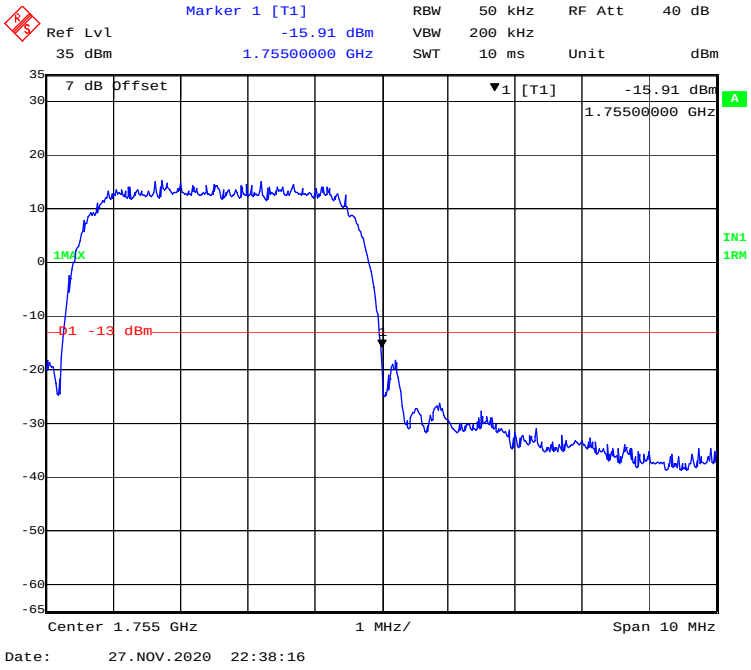
WCDMA (HSDPA) Mode, Right Band Edge



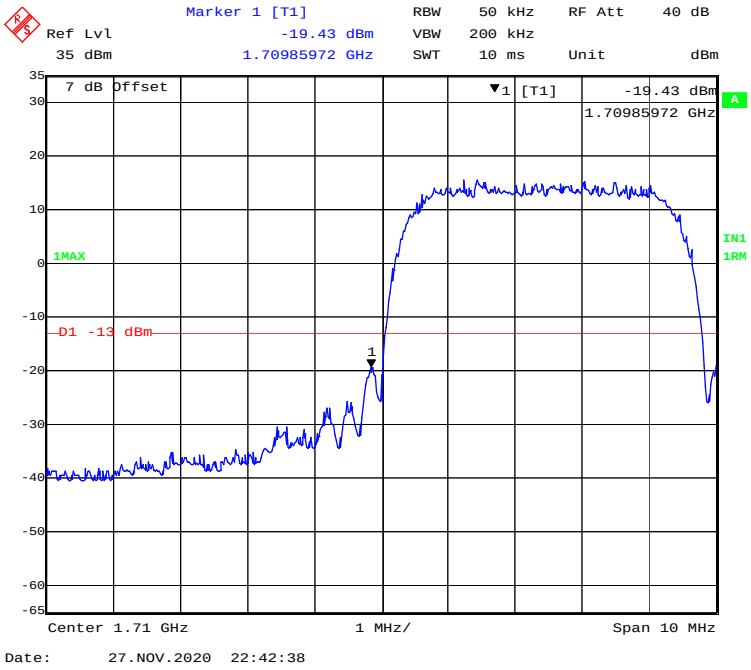
WCDMA (HSUPA) Mode, Left Band Edge



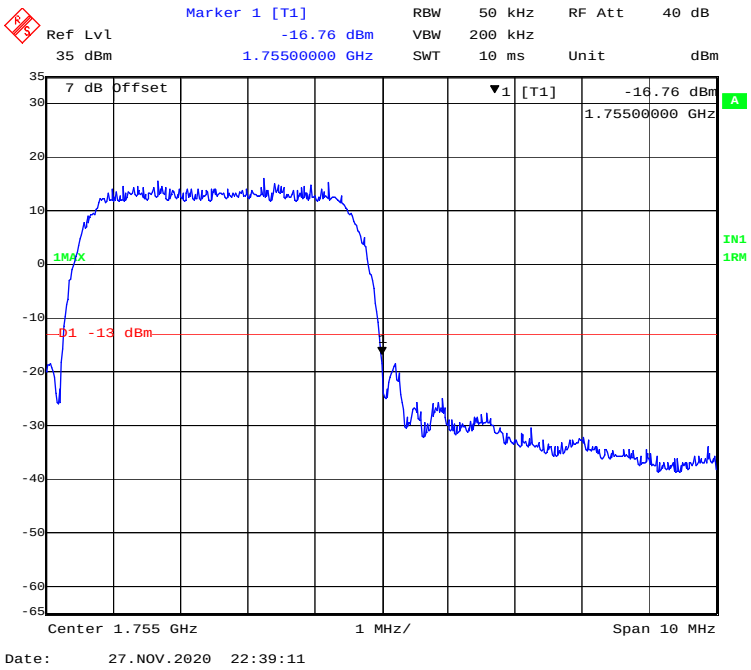
WCDMA (HSUPA) Mode, Right Band Edge



WCDMA (HSPA+) Mode, Left Band Edge

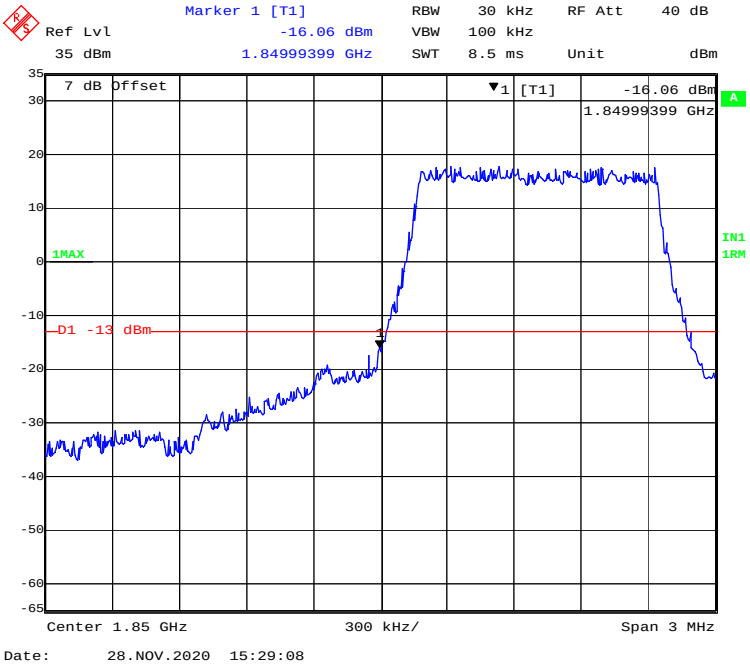


WCDMA (HSPA+) Mode, Right Band Edge

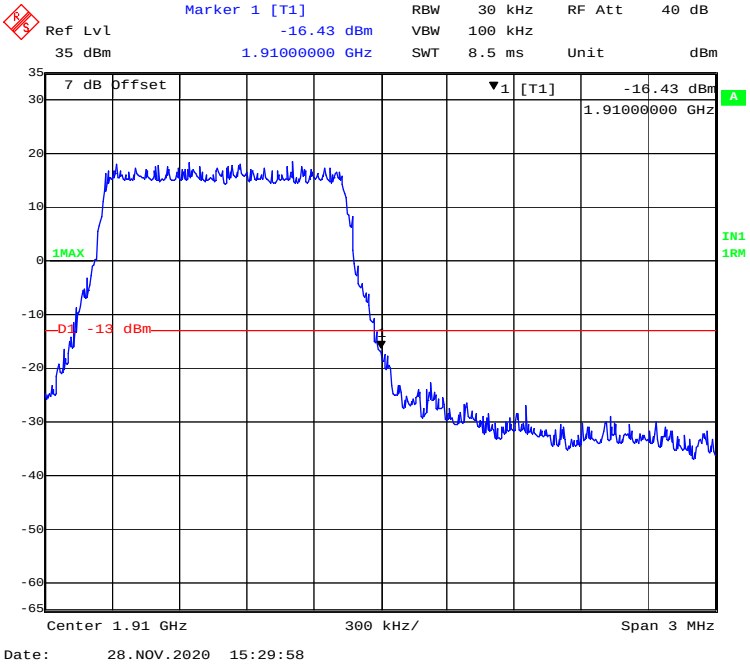


LTE Band 2:

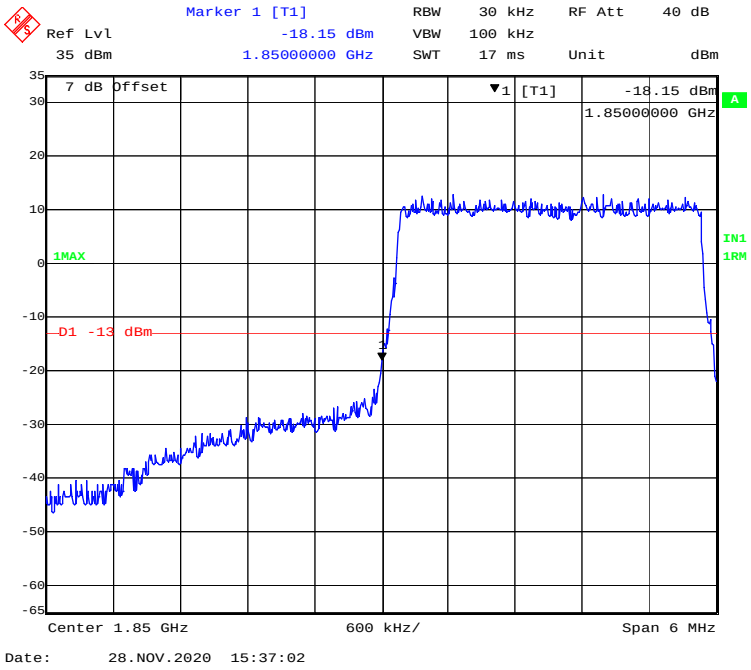
QPSK (1.4 MHz, FULL RB) - Left Band Edge



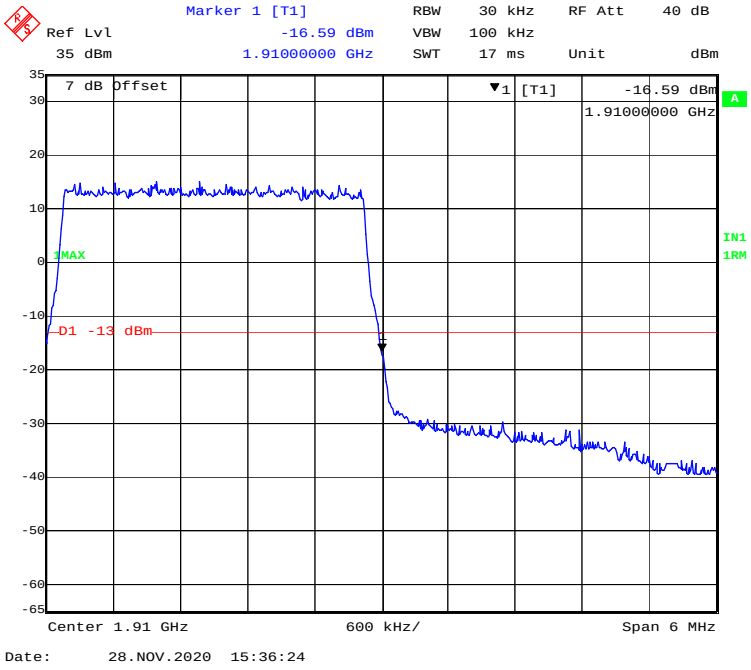
QPSK (1.4 MHz, FULL RB) - Right Band Edge



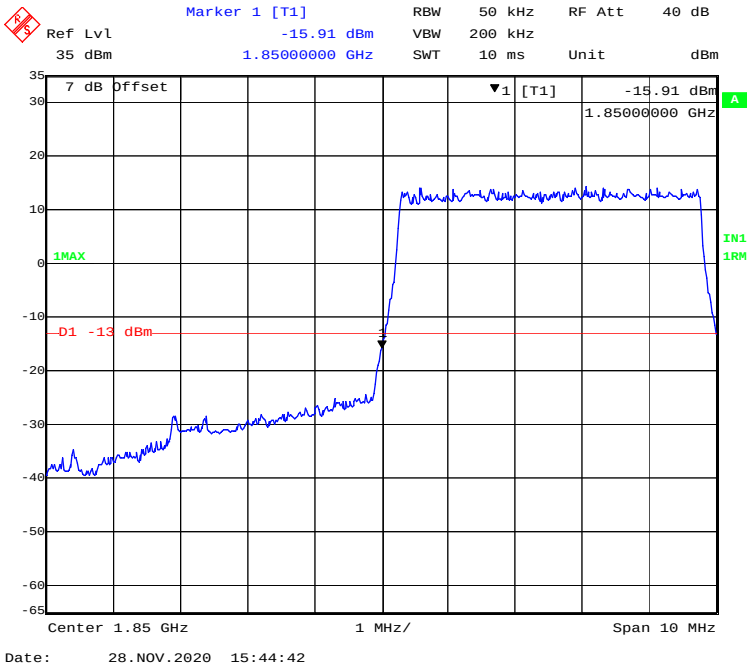
QPSK (3 MHz, FULL RB) - Left Band Edge



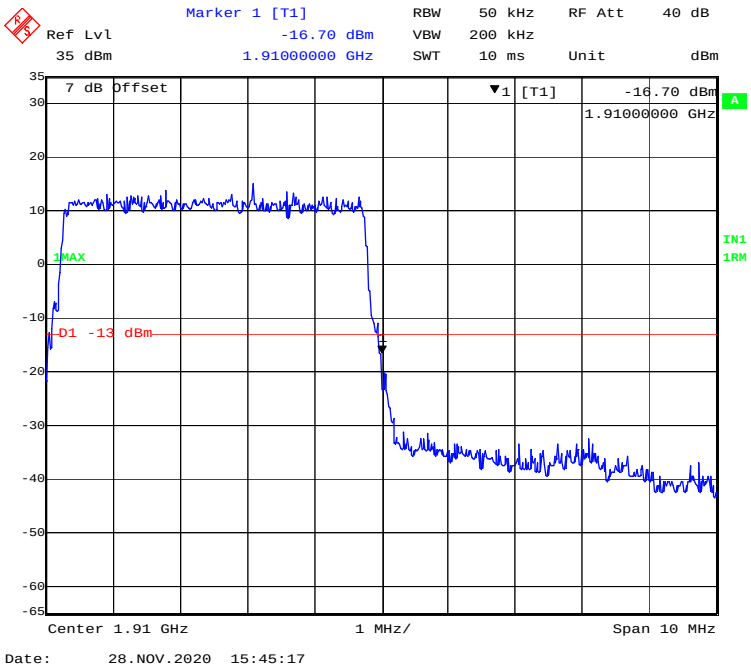
QPSK (3 MHz, FULL RB) - Right Band Edge



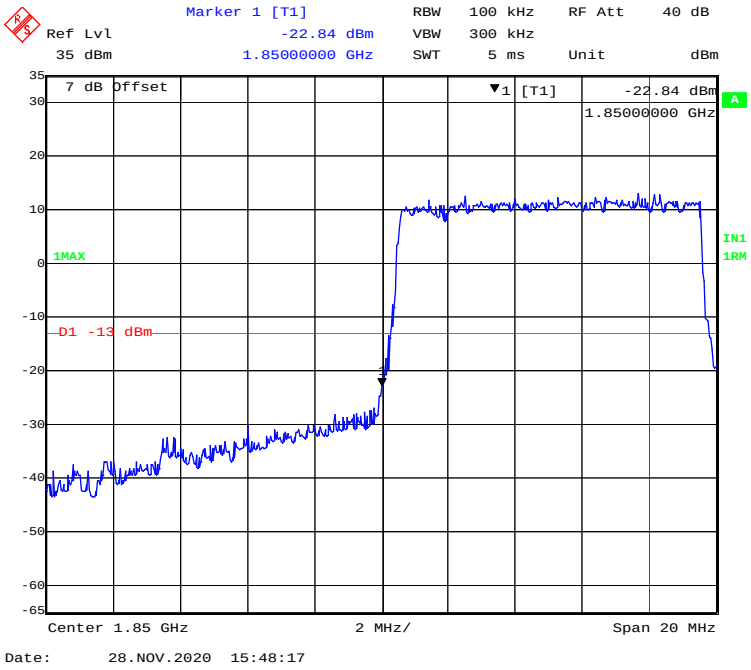
QPSK (5 MHz, FULL RB) - Left Band Edge



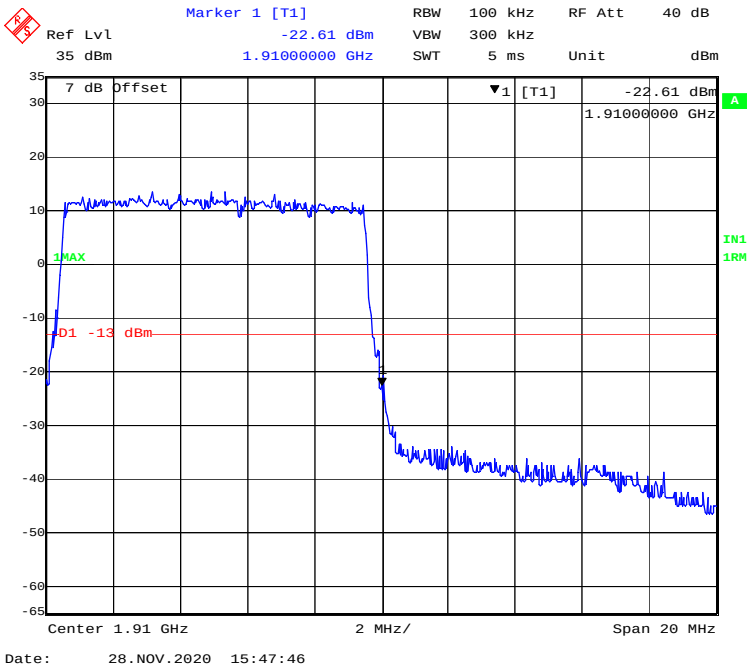
QPSK (5 MHz, FULL RB) - Right Band Edge



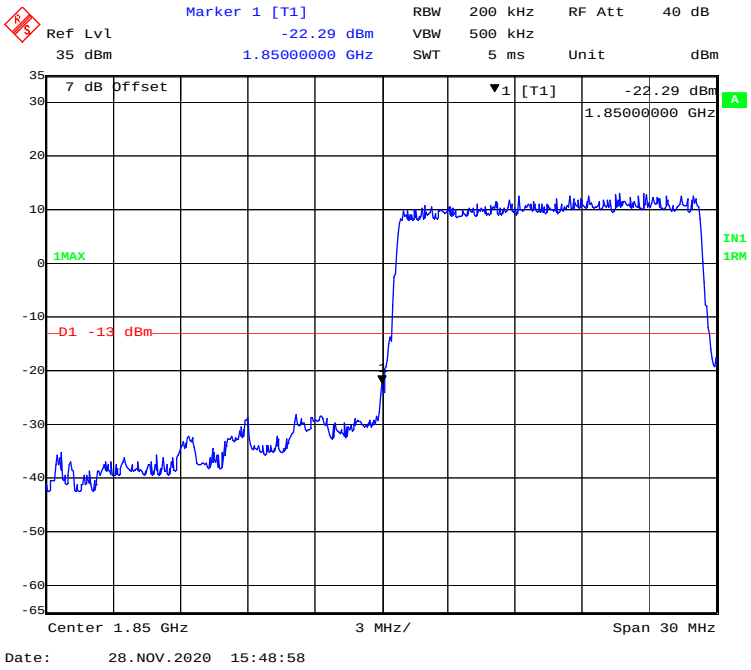
QPSK (10 MHz, FULL RB) - Left Band Edge



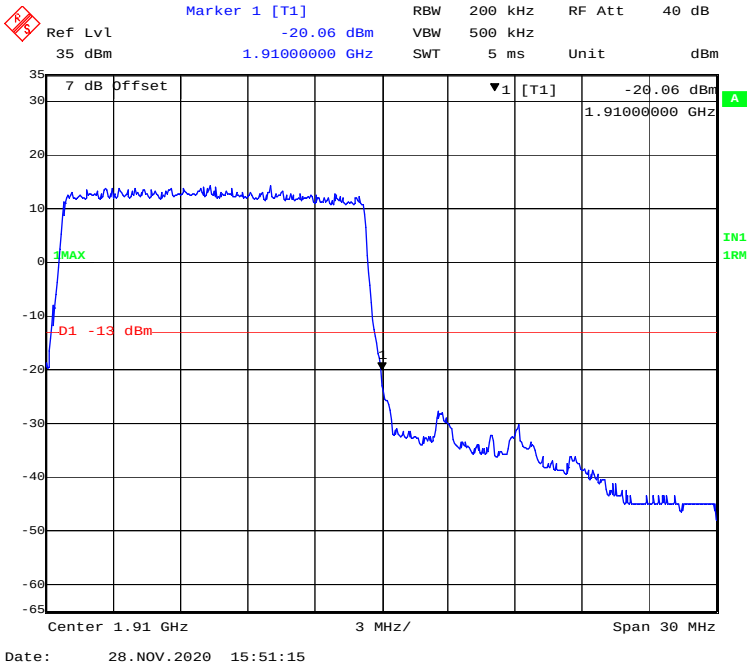
QPSK (10 MHz, FULL RB) - Right Band Edge



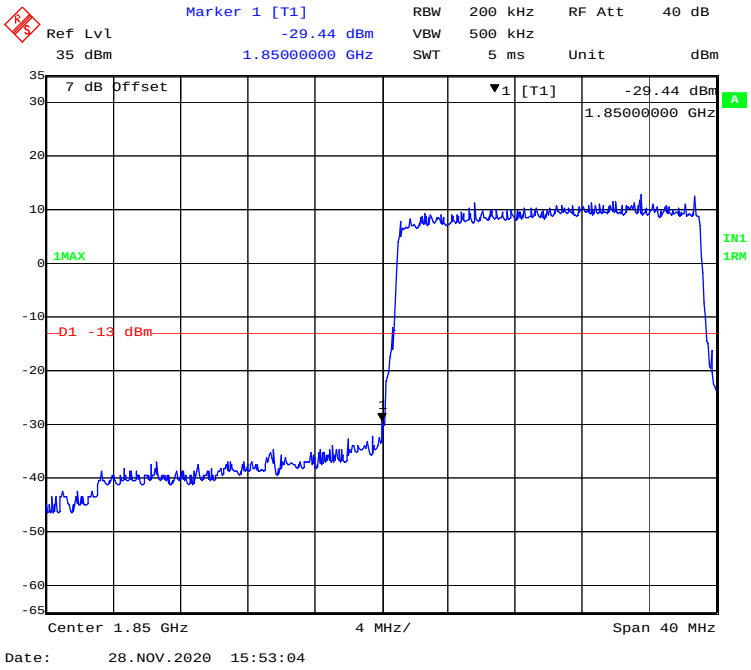
QPSK (15 MHz, FULL RB) - Left Band Edge



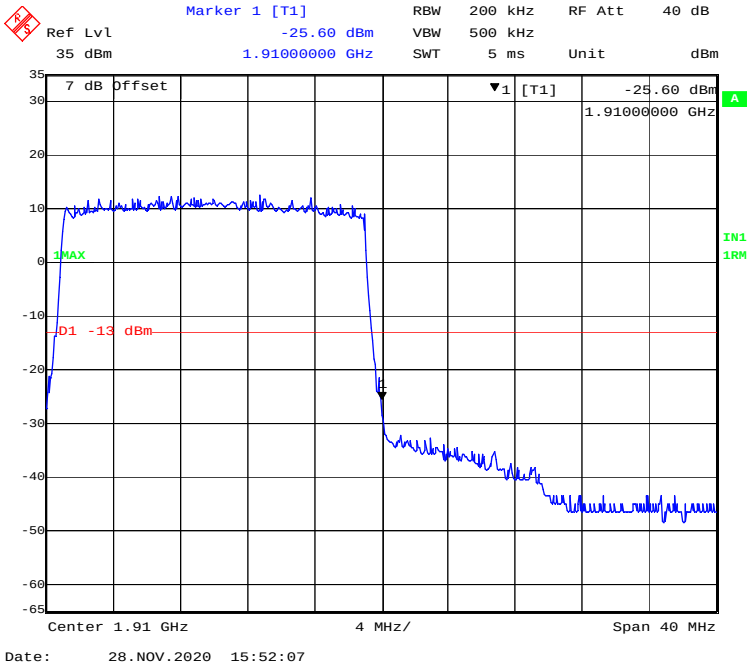
QPSK (15 MHz, FULL RB) - Right Band Edge



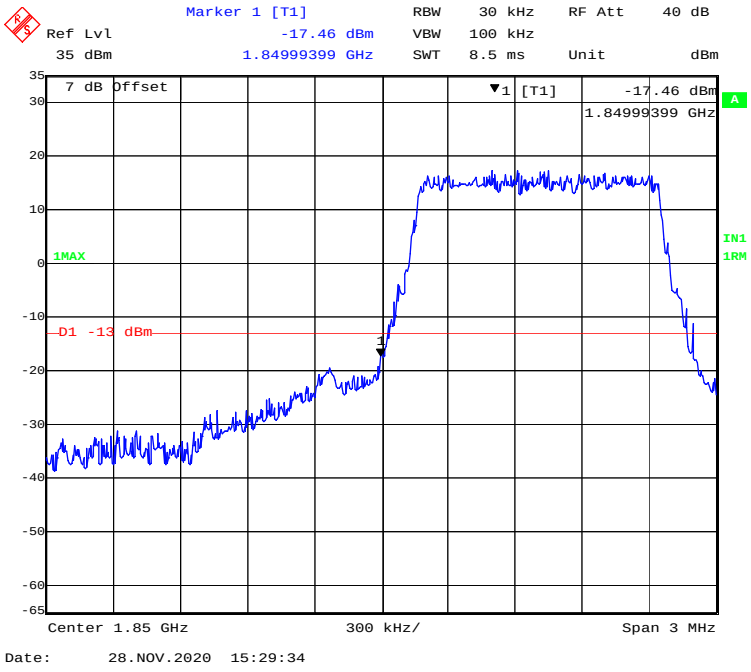
QPSK (20 MHz, FULL RB) - Left Band Edge



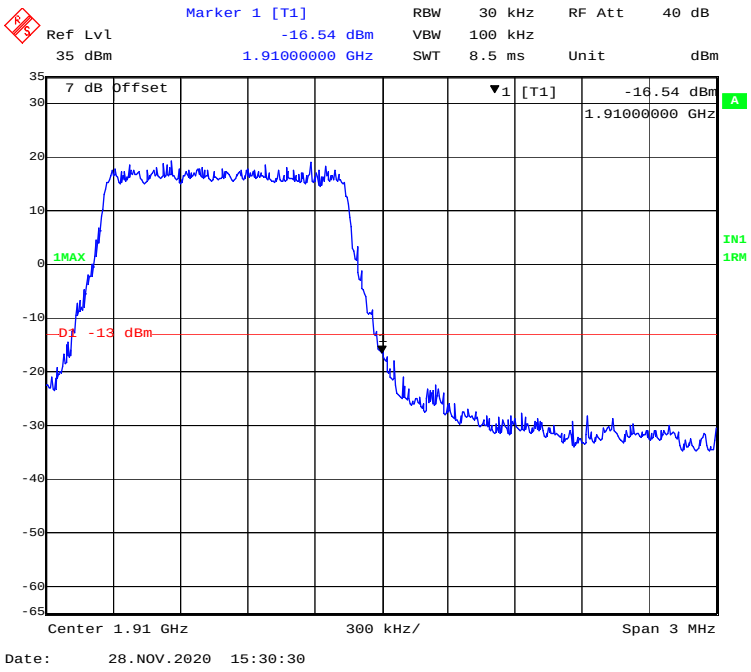
QPSK (20 MHz, FULL RB) - Right Band Edge



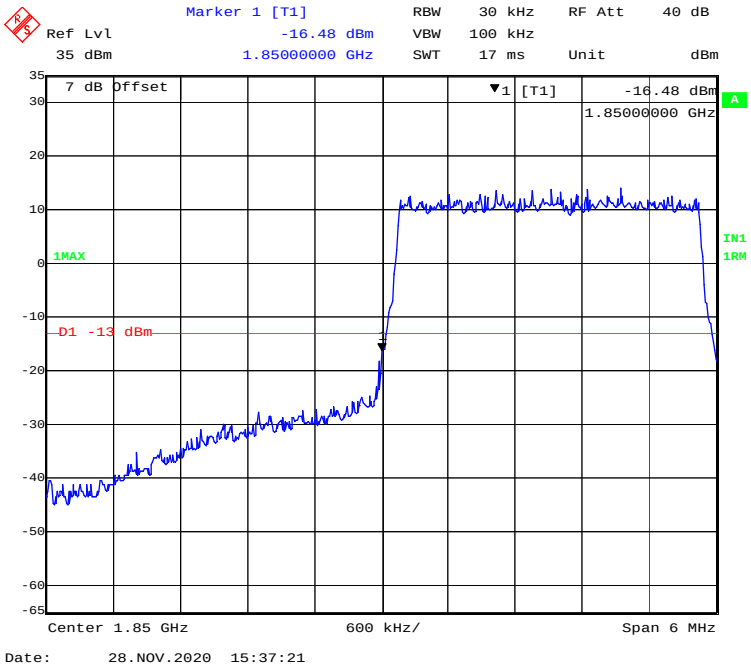
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



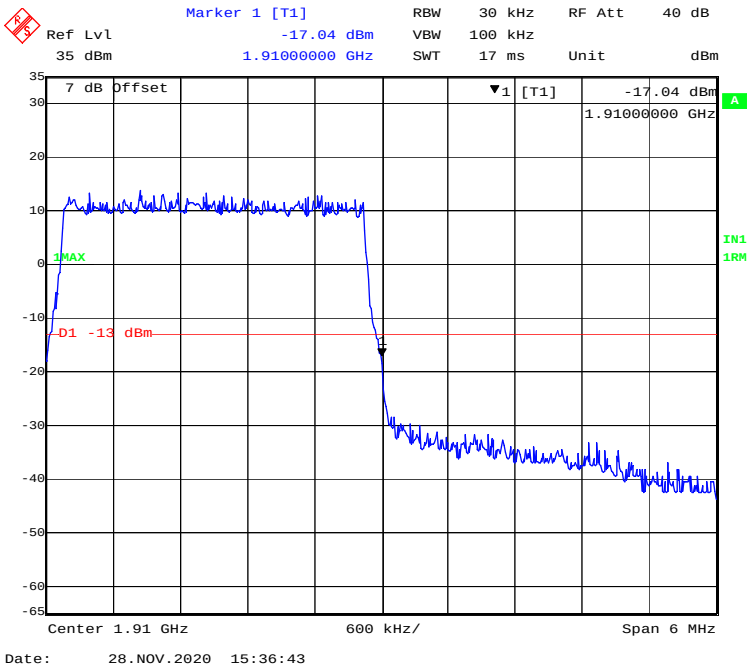
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



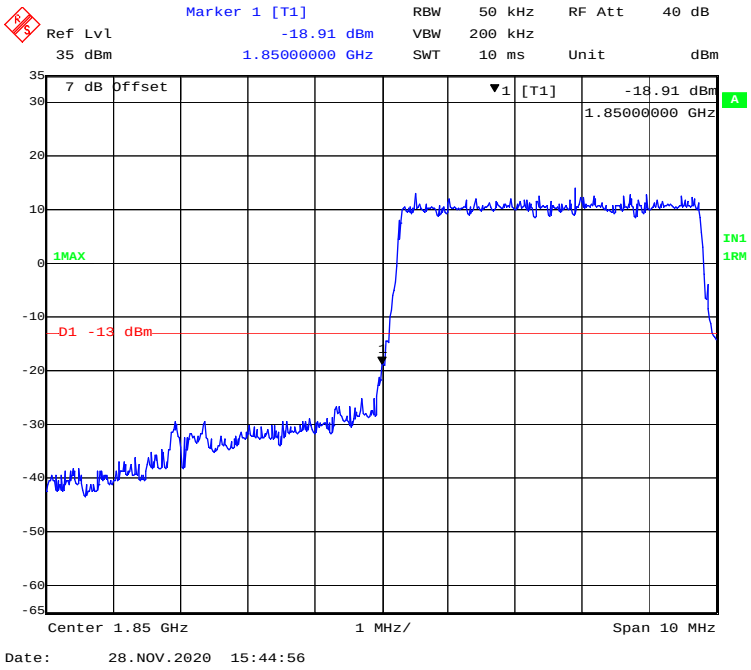
16-QAM (3 MHz, FULL RB) - Left Band Edge



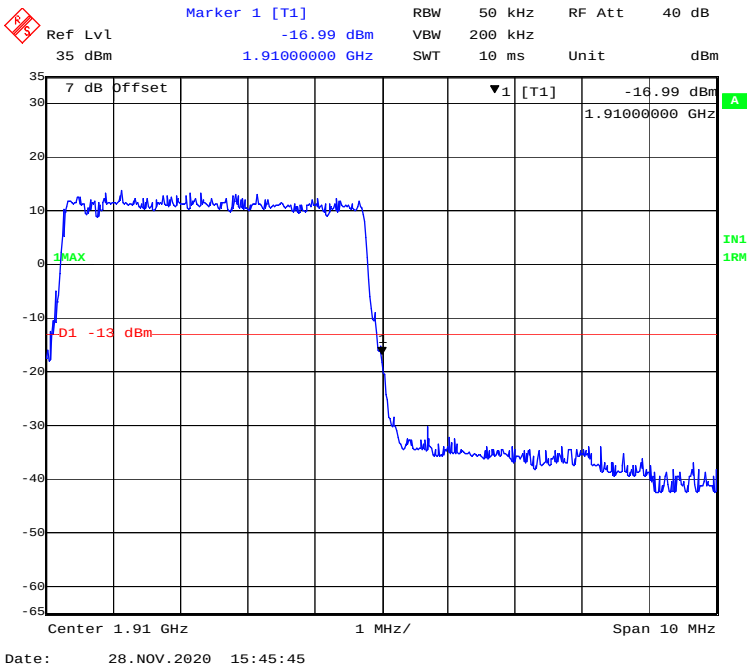
16-QAM (3 MHz, FULL RB) - Right Band Edge



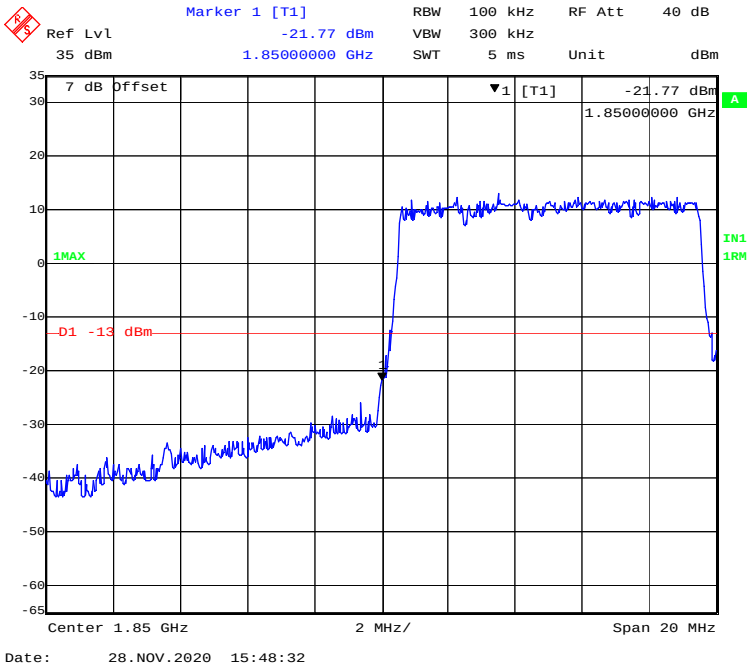
16-QAM (5 MHz, FULL RB) - Left Band Edge



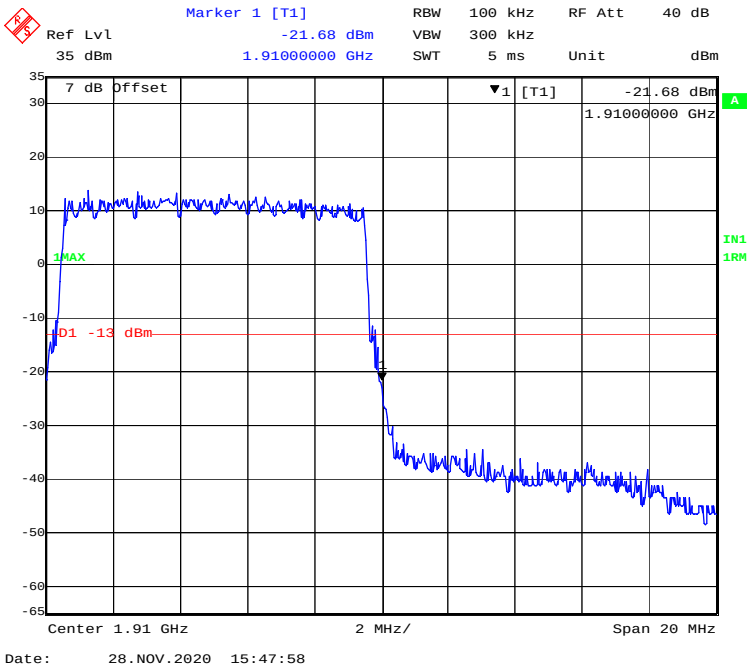
16-QAM (5 MHz, FULL RB) - Right Band Edge



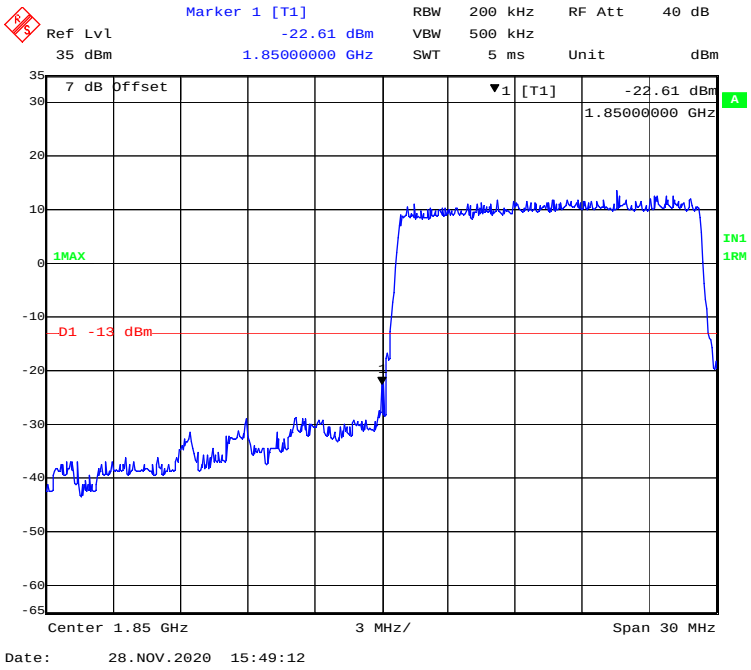
16-QAM (10 MHz, FULL RB) - Left Band Edge



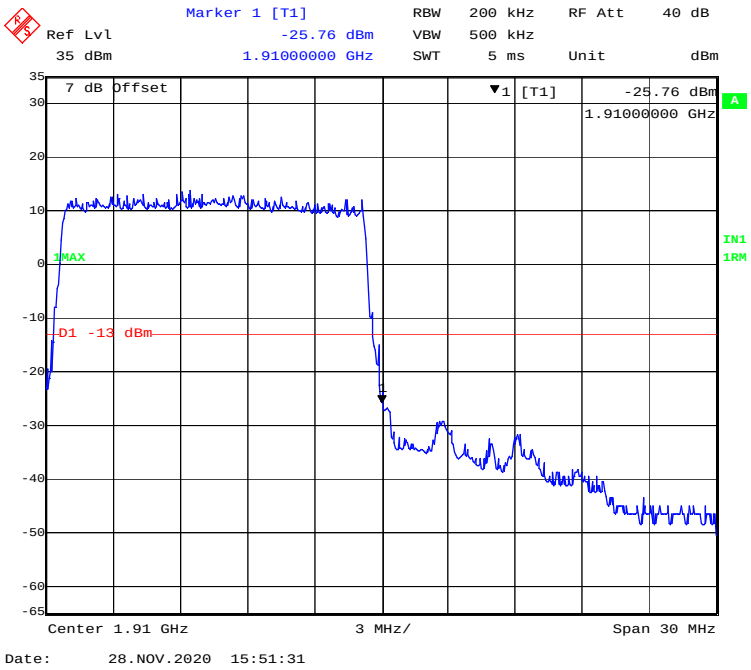
16-QAM (10 MHz, FULL RB) - Right Band Edge



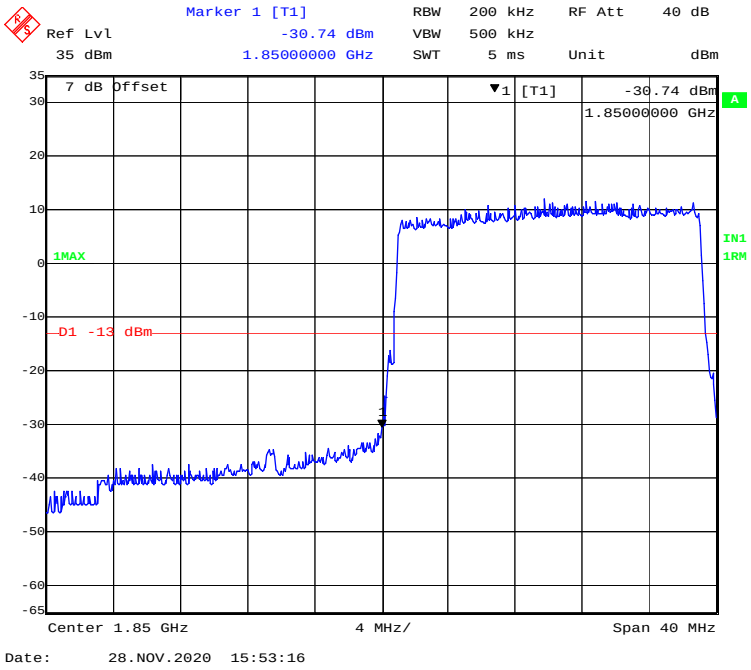
16-QAM (15 MHz, FULL RB) - Left Band Edge



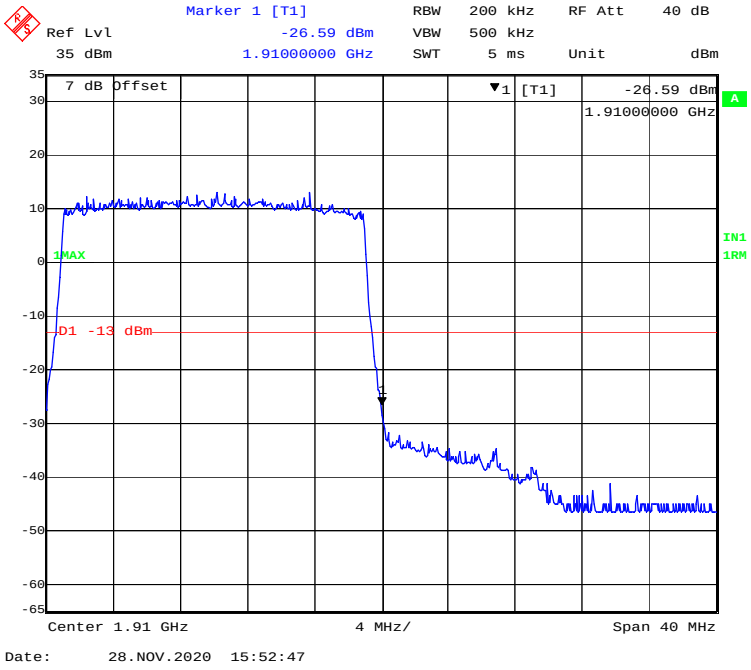
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

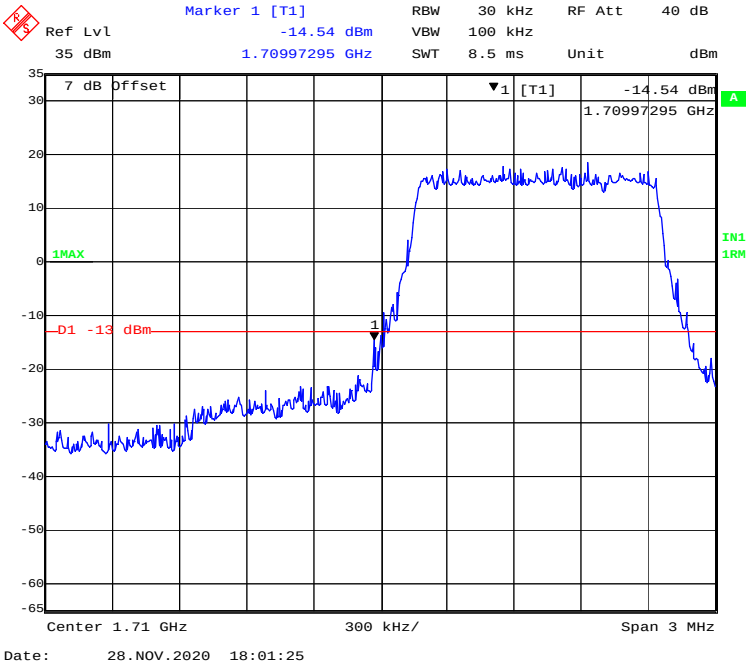


16-QAM (20 MHz, FULL RB) - Right Band Edge



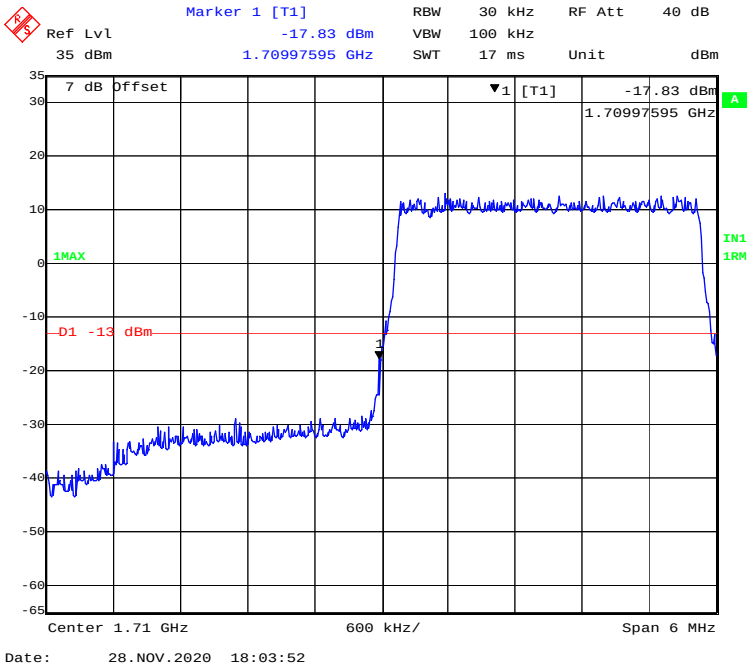
LTE Band 4:

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

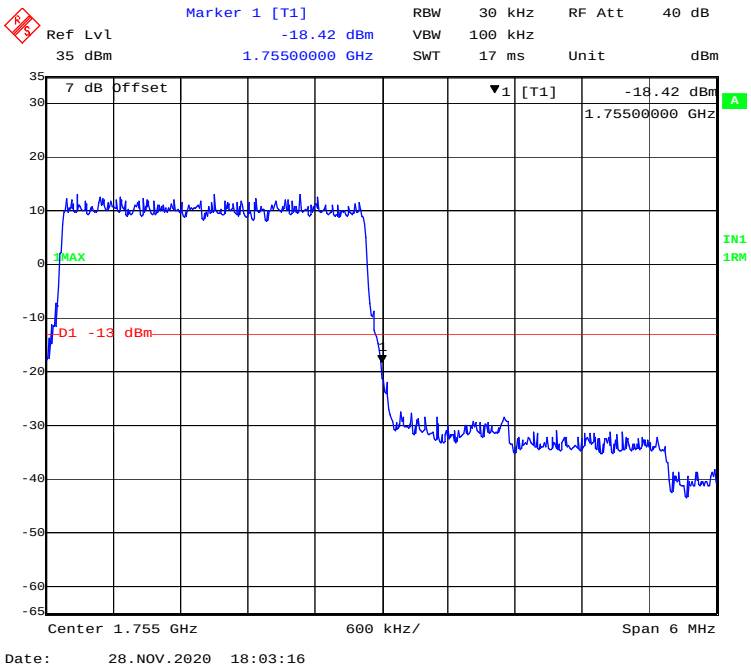


QPSK (1.4 MHz, FULL RB) - Right Band Edge

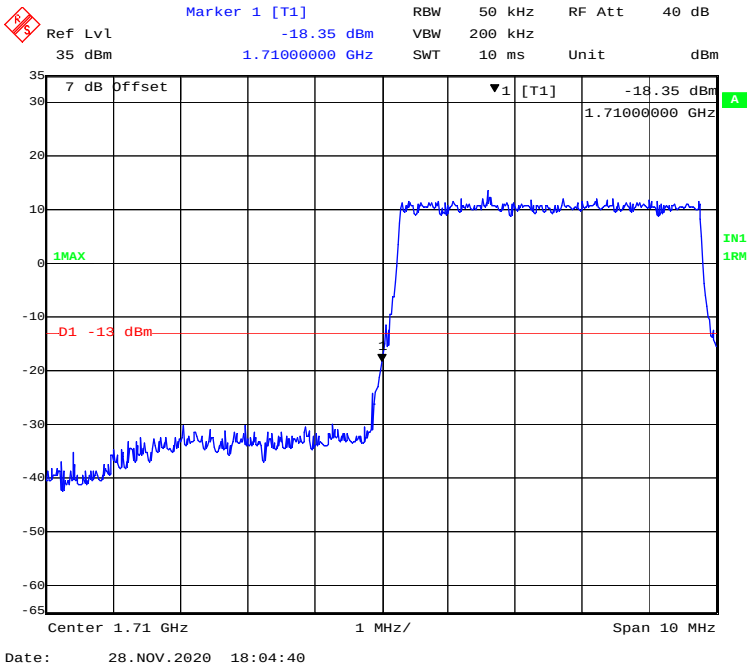
QPSK (3 MHz, FULL RB) - Left Band Edge



QPSK (3 MHz, FULL RB) - Right Band Edge

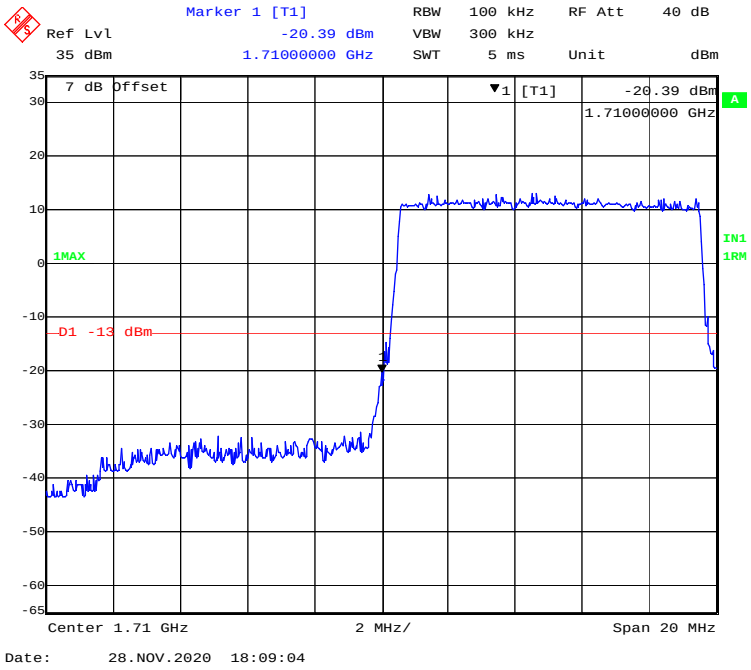


QPSK (5 MHz, FULL RB) - Left Band Edge

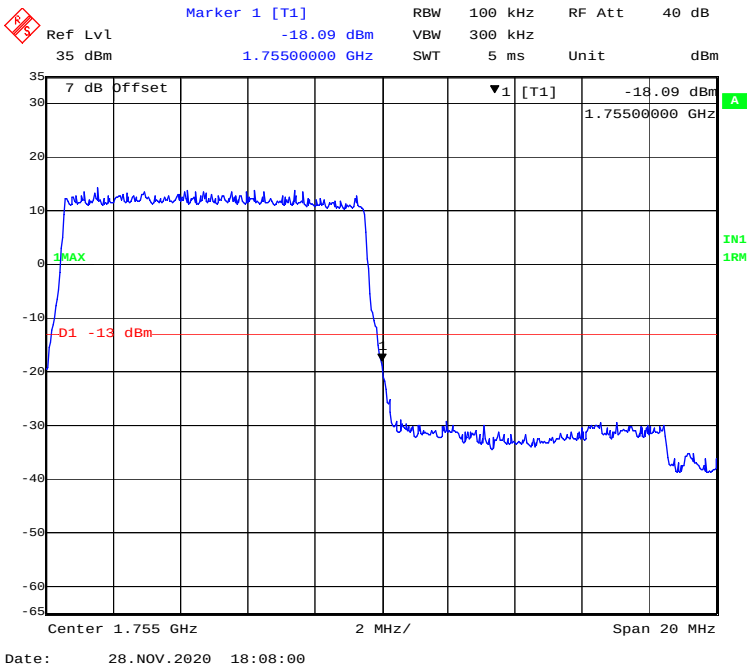


QPSK (5 MHz, FULL RB) - Right Band Edge

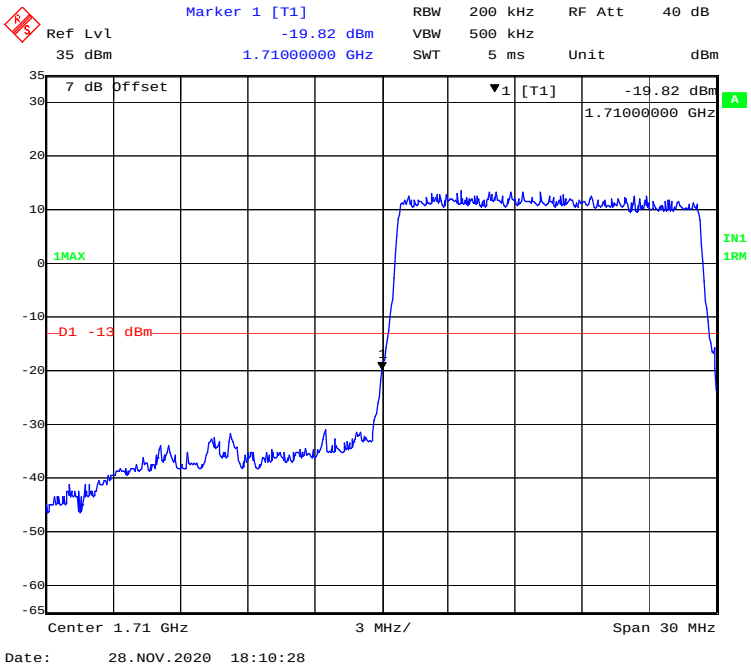
QPSK (10 MHz, FULL RB) - Left Band Edge



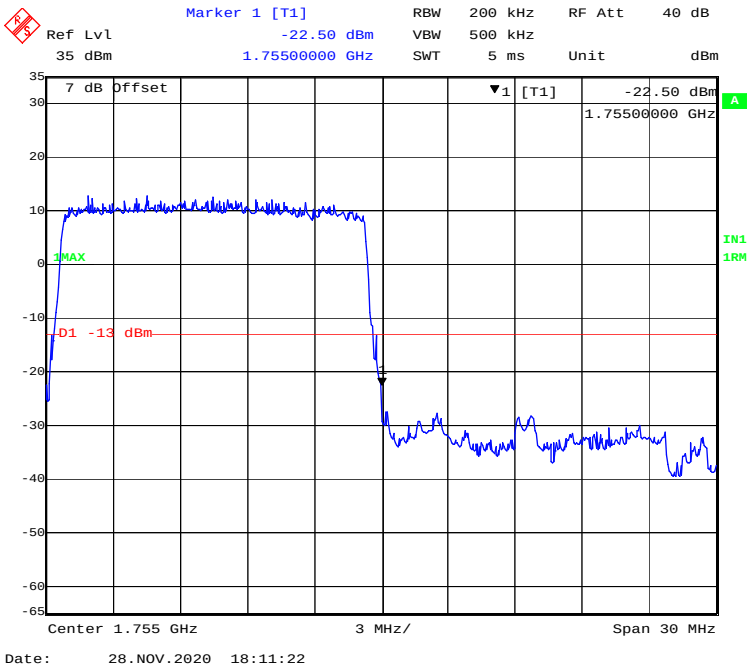
QPSK (10 MHz, FULL RB) - Right Band Edge



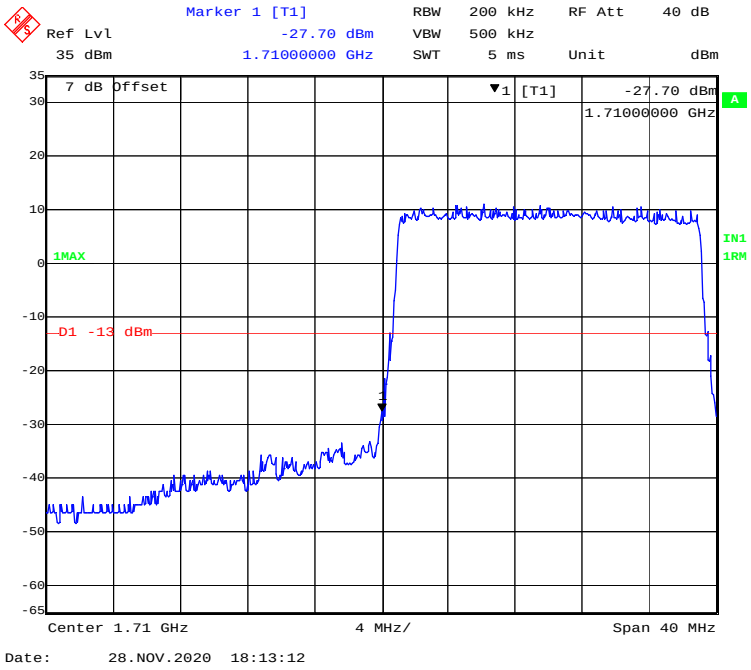
QPSK (15 MHz, FULL RB) - Left Band Edge



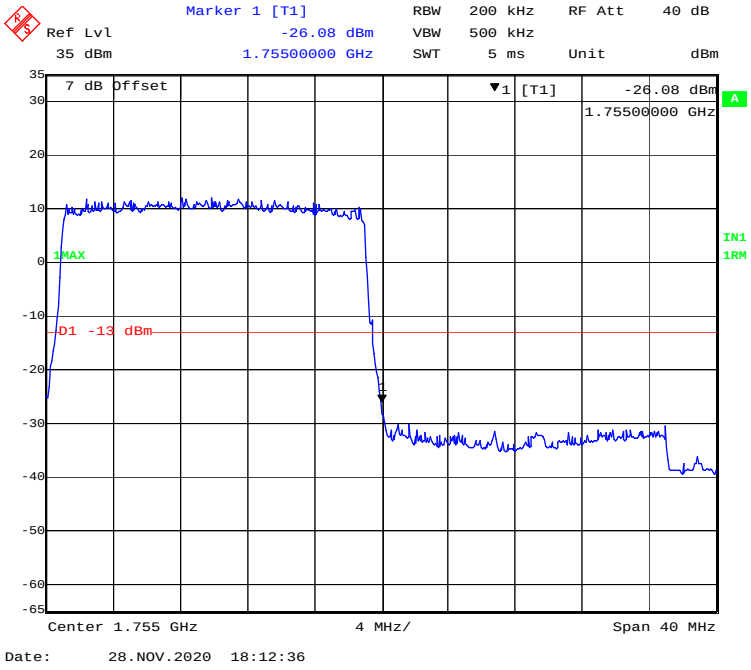
QPSK (15 MHz, FULL RB) - Right Band Edge



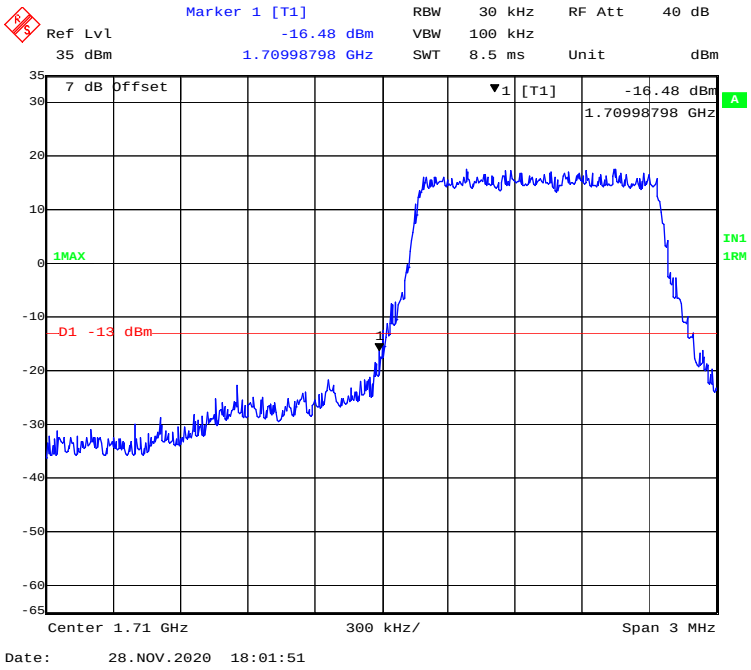
QPSK (20 MHz, FULL RB) - Left Band Edge



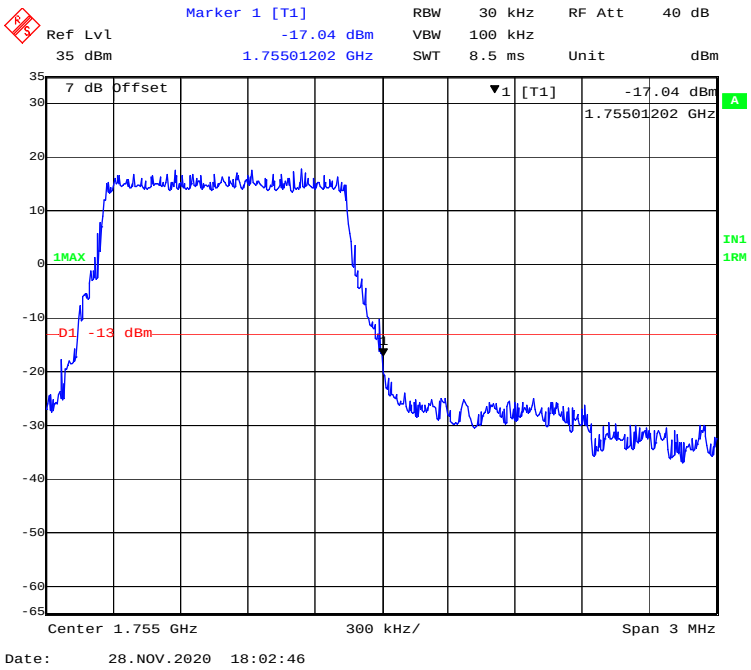
QPSK (20 MHz, FULL RB) - Right Band Edge



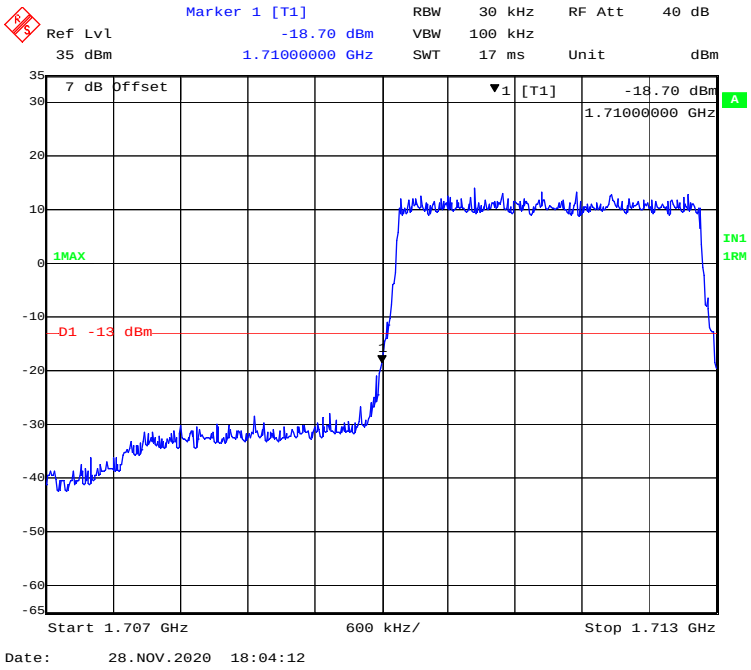
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



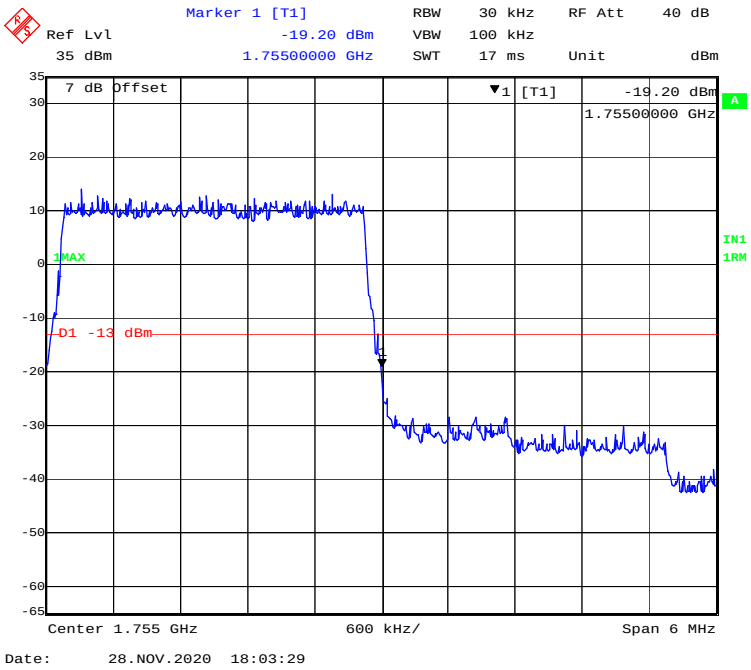
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



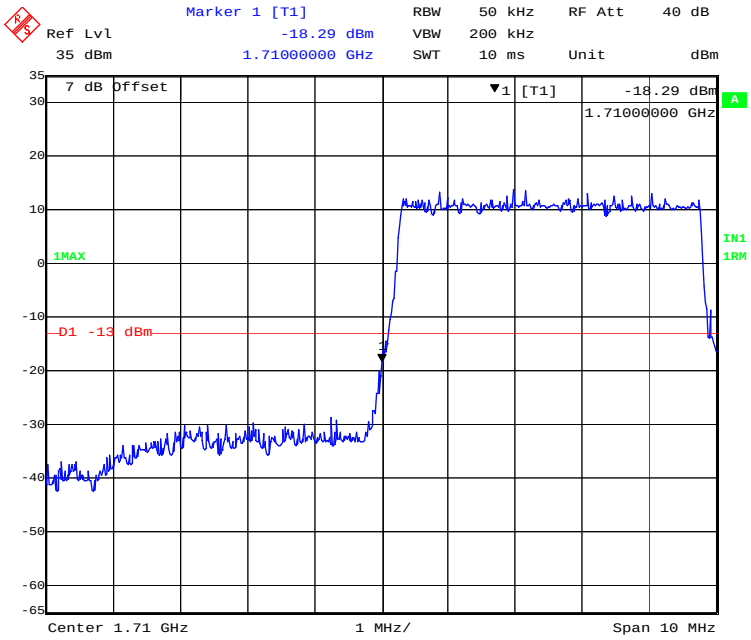
16-QAM (3 MHz, FULL RB) - Left Band Edge



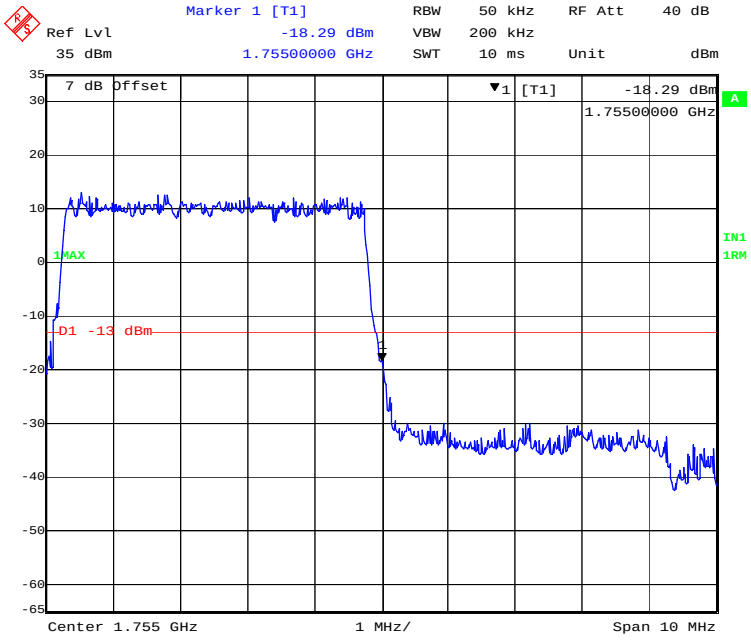
16-QAM (3 MHz, FULL RB) - Right Band Edge



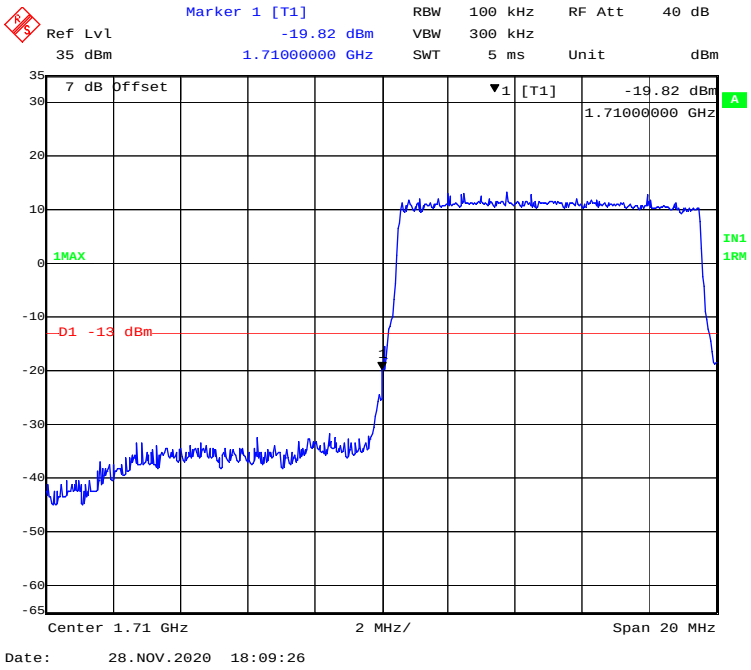
16-QAM (5 MHz, FULL RB) - Left Band Edge



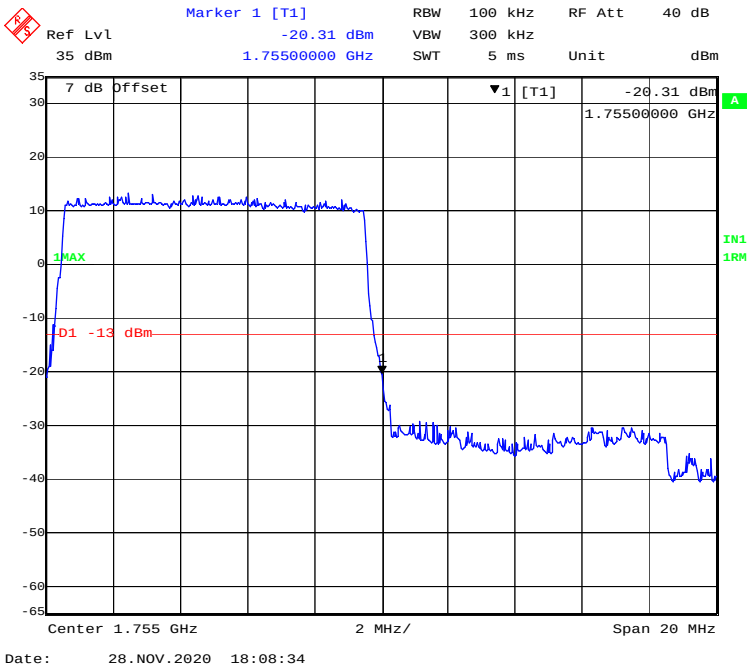
16-QAM (5 MHz, FULL RB) - Right Band Edge



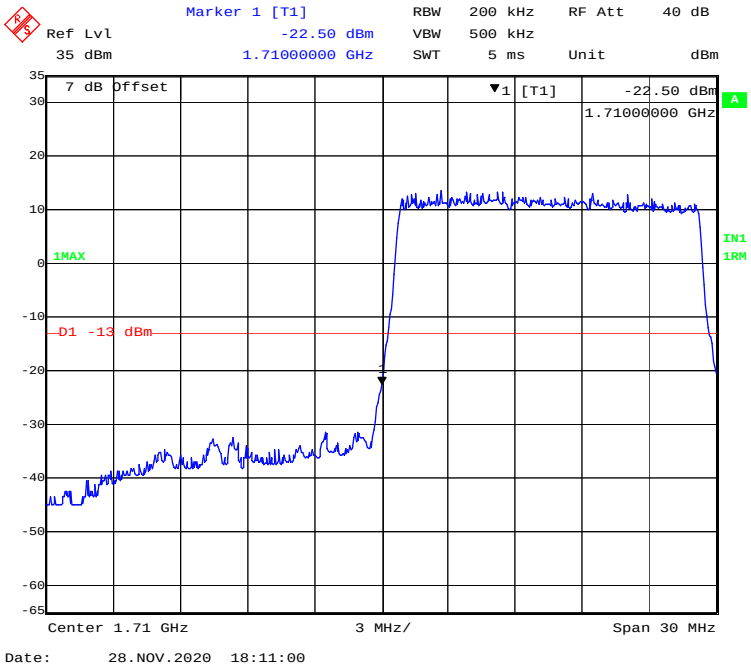
16-QAM (10 MHz, FULL RB) - Left Band Edge



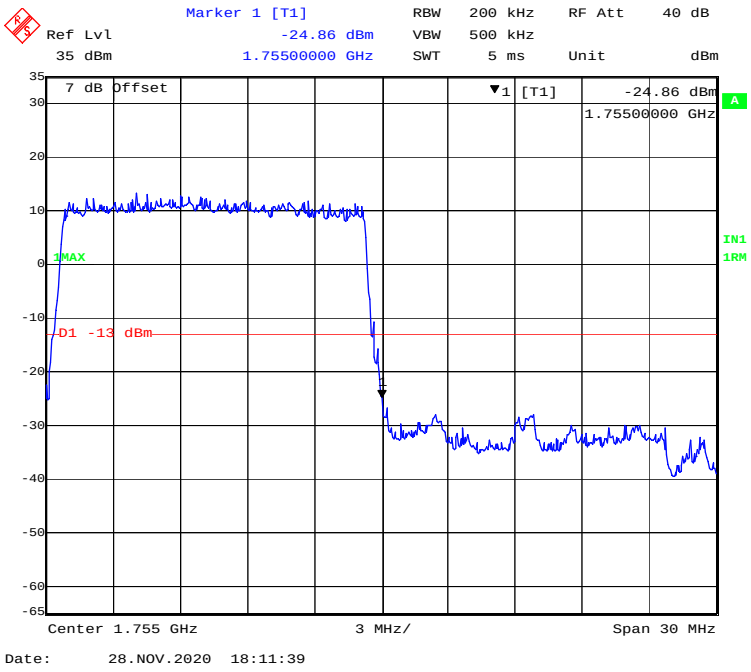
16-QAM (10 MHz, FULL RB) - Right Band Edge



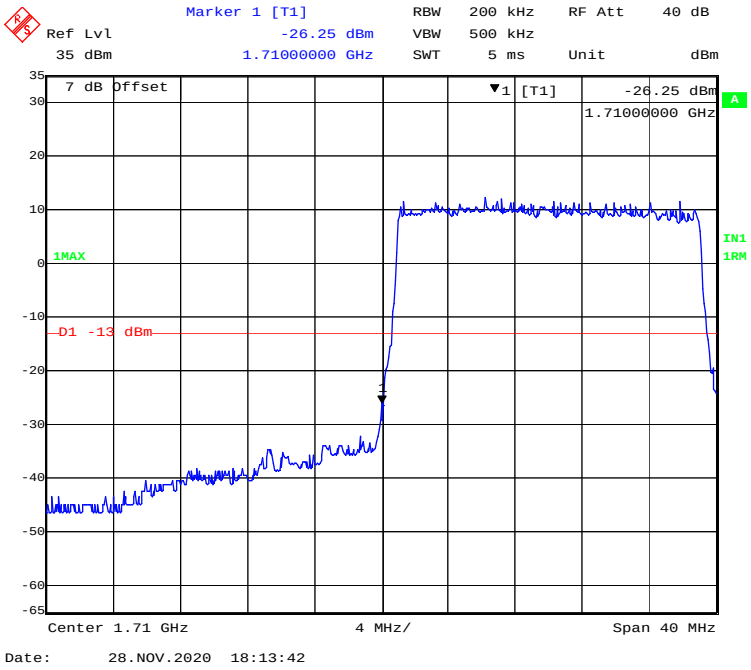
16-QAM (15 MHz, FULL RB) - Left Band Edge



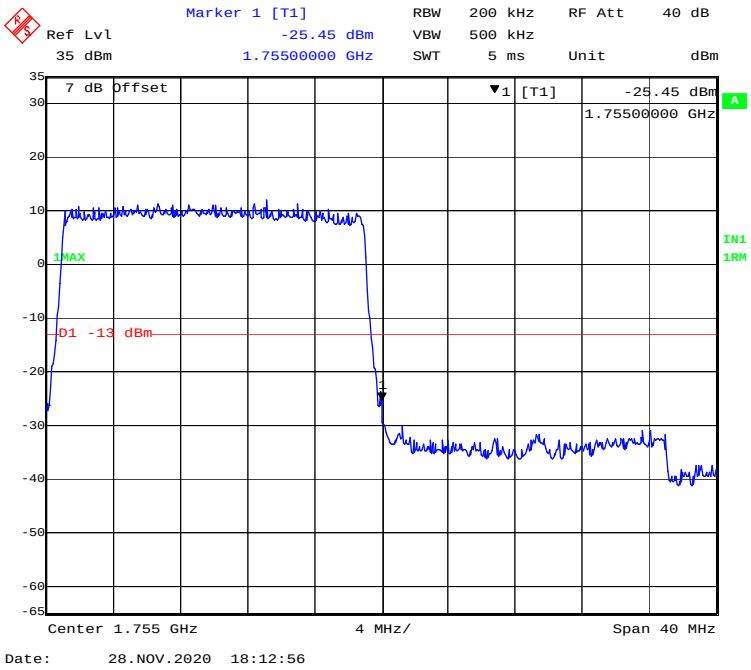
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

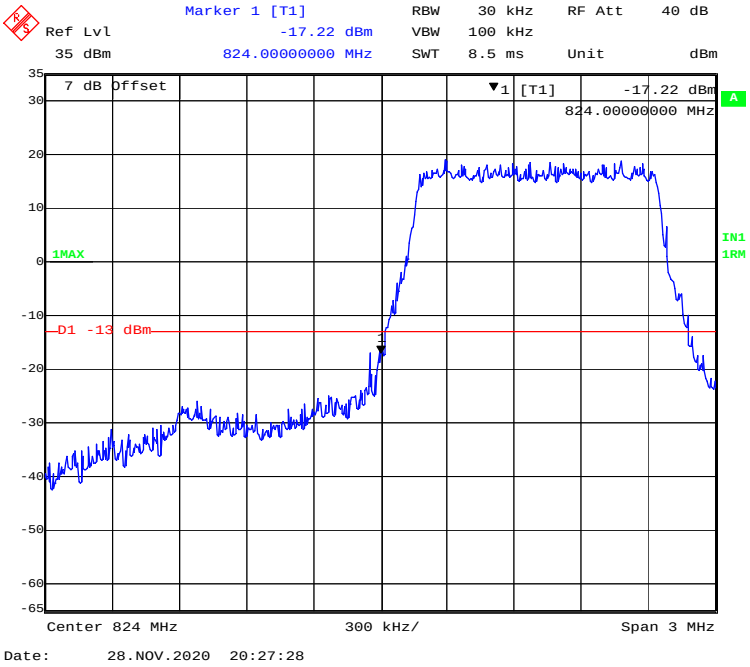


16-QAM (20 MHz, FULL RB) - Right Band Edge

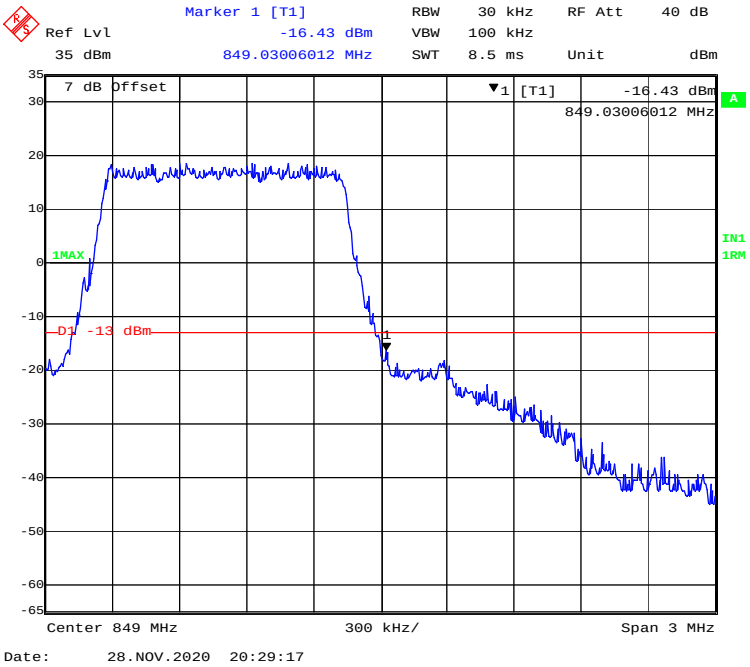


LTE Band 5:

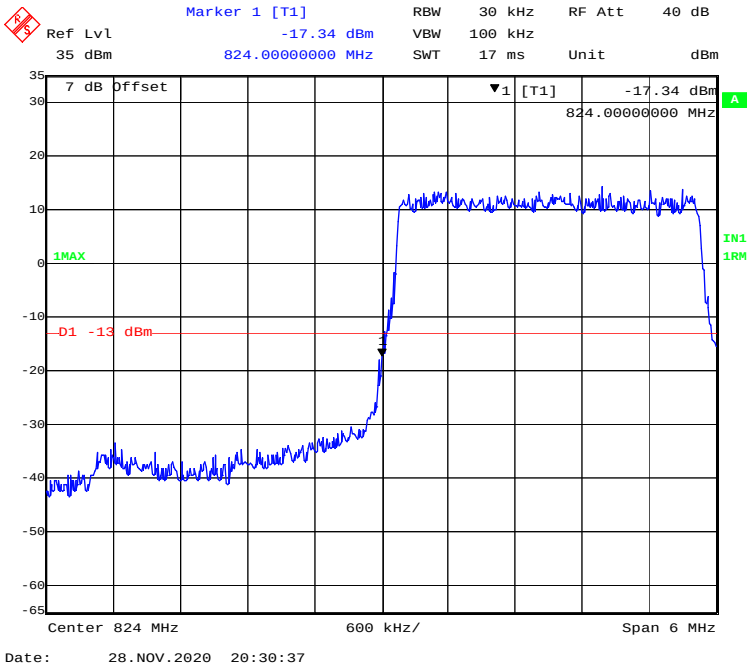
QPSK (1.4 MHz, FULL RB) - Left Band Edge



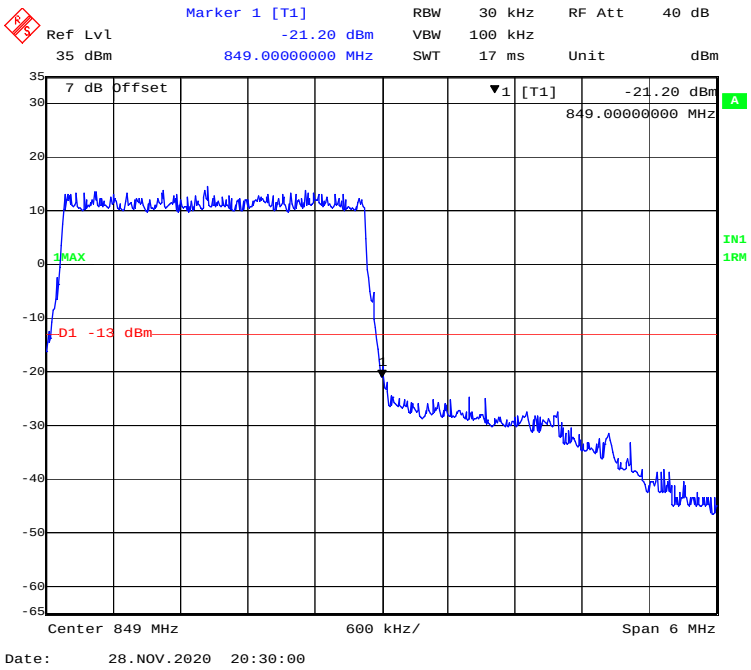
QPSK (1.4 MHz, FULL RB) - Right Band Edge



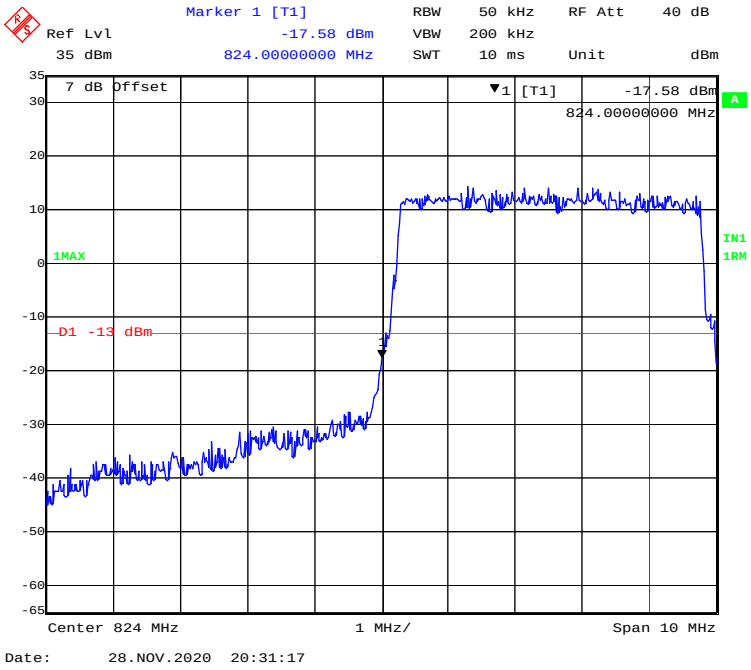
QPSK (3.0 MHz, FULL RB) - Left Band Edge



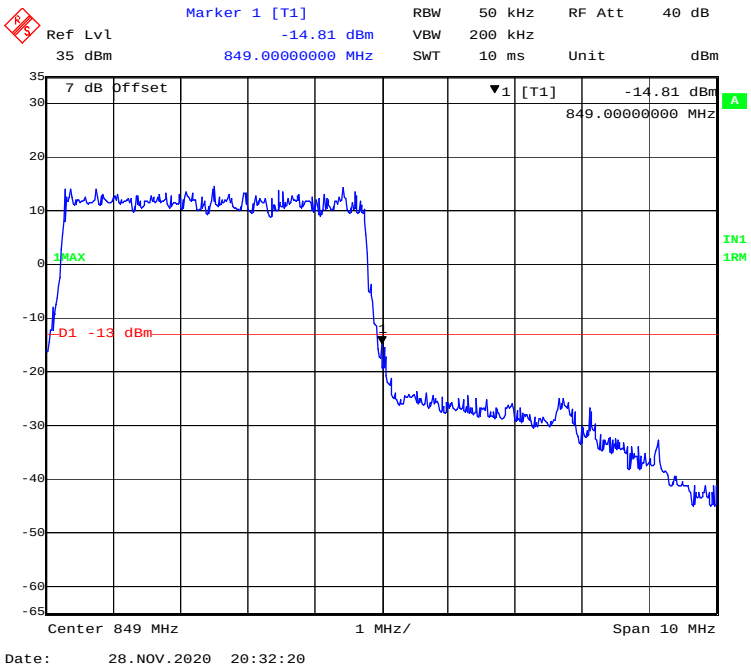
QPSK (3.0 MHz, FULL RB) - Right Band Edge



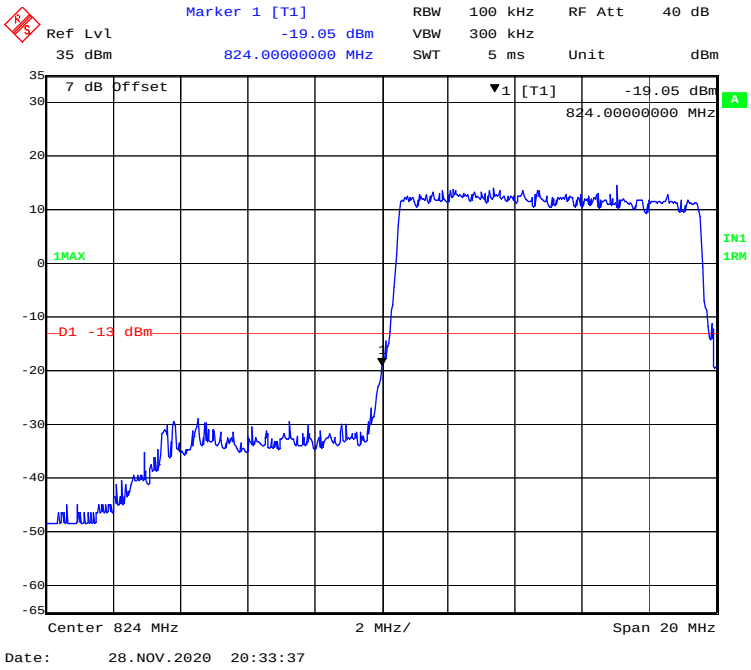
QPSK (5.0 MHz, FULL RB) - Left Band Edge



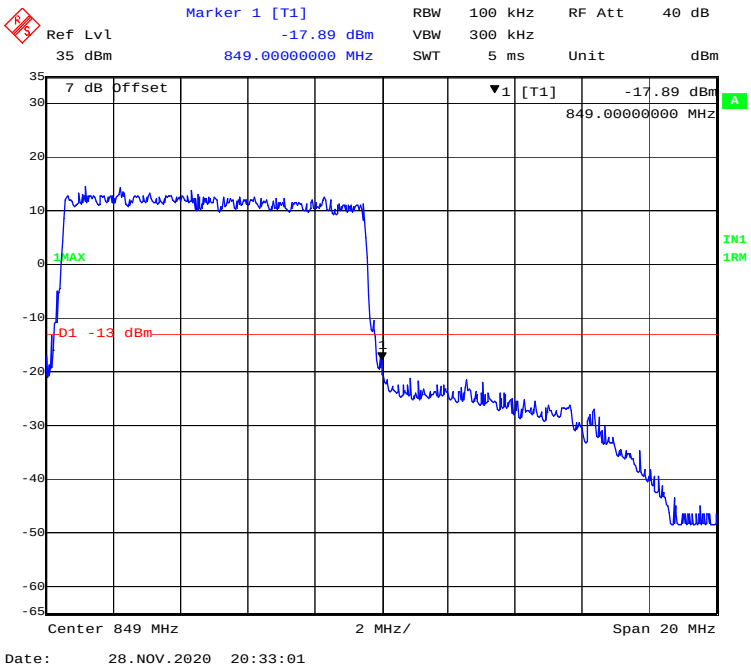
QPSK (5.0 MHz, FULL RB) - Right Band Edge



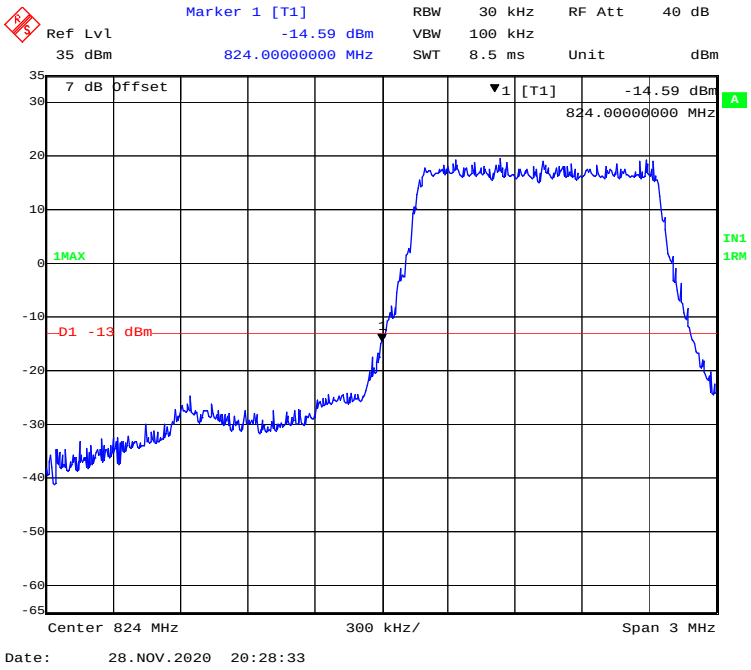
QPSK (10.0 MHz, FULL RB) - Left Band Edge



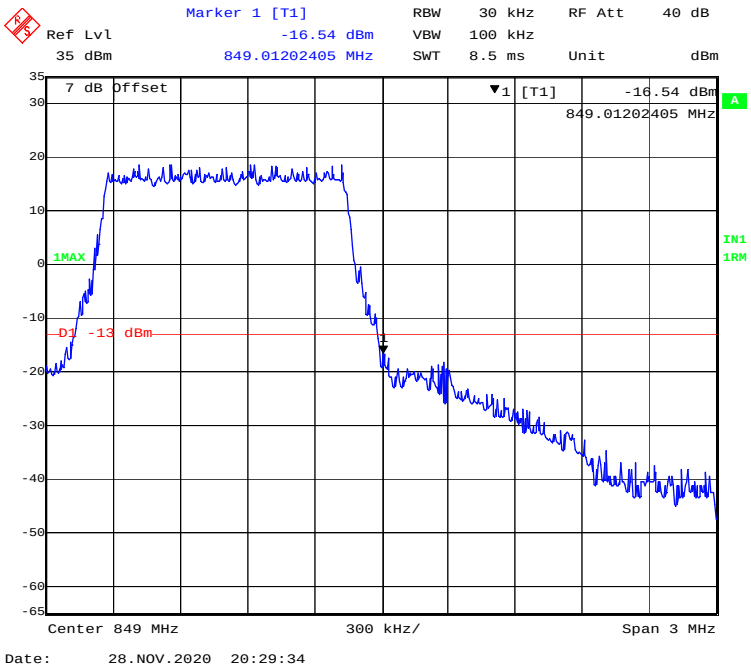
QPSK (10.0 MHz, FULL RB) - Right Band Edge



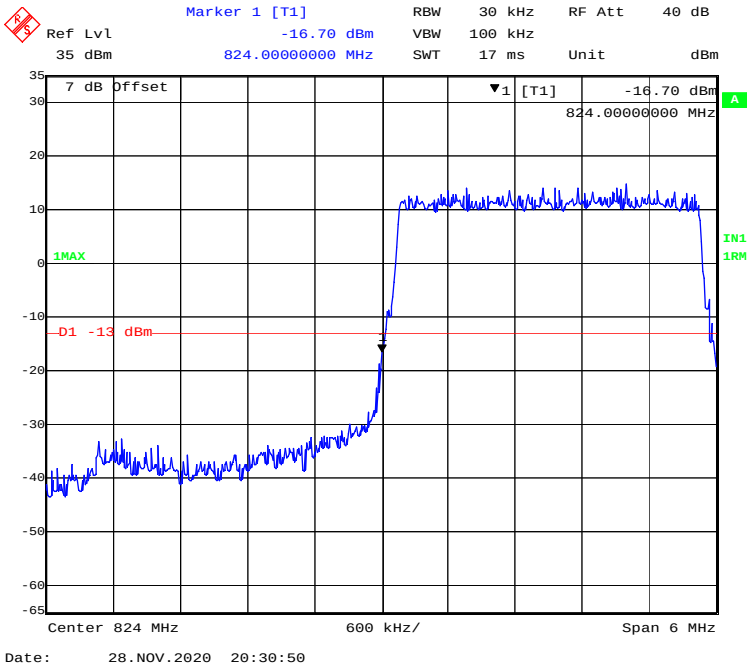
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



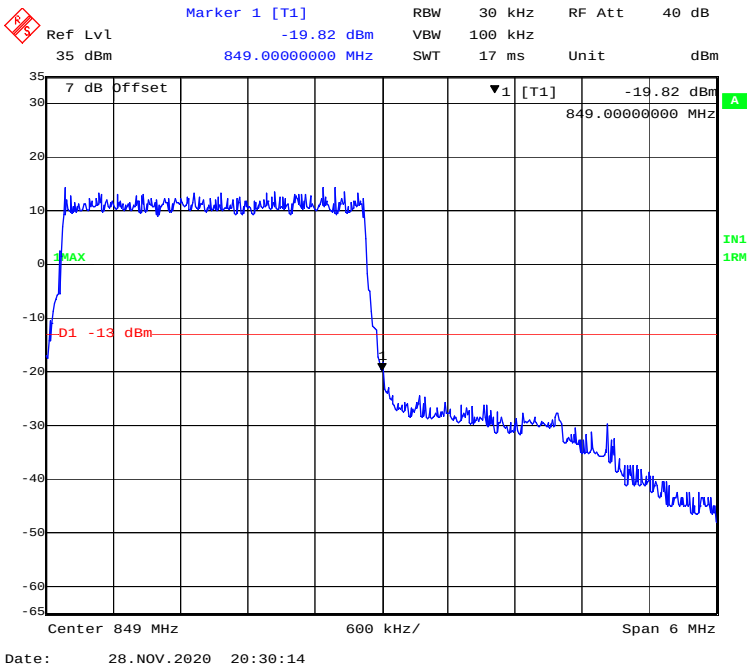
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



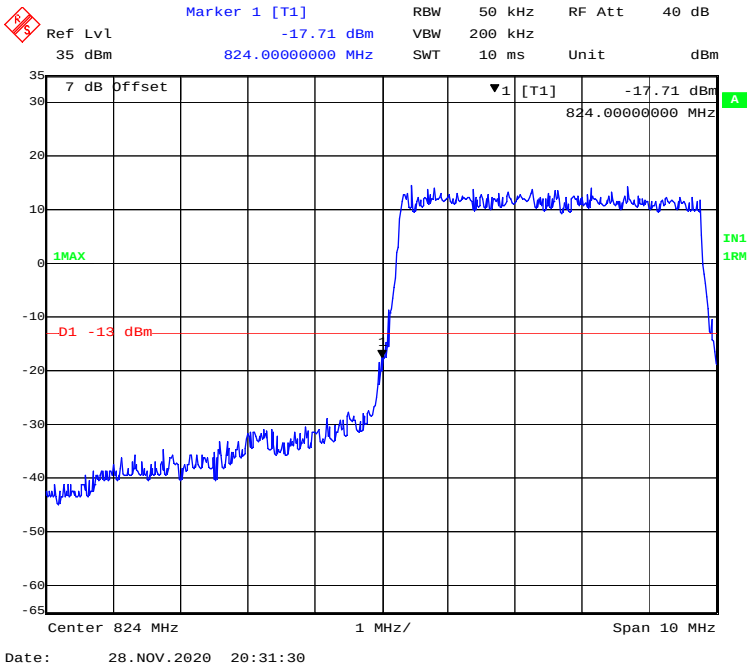
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



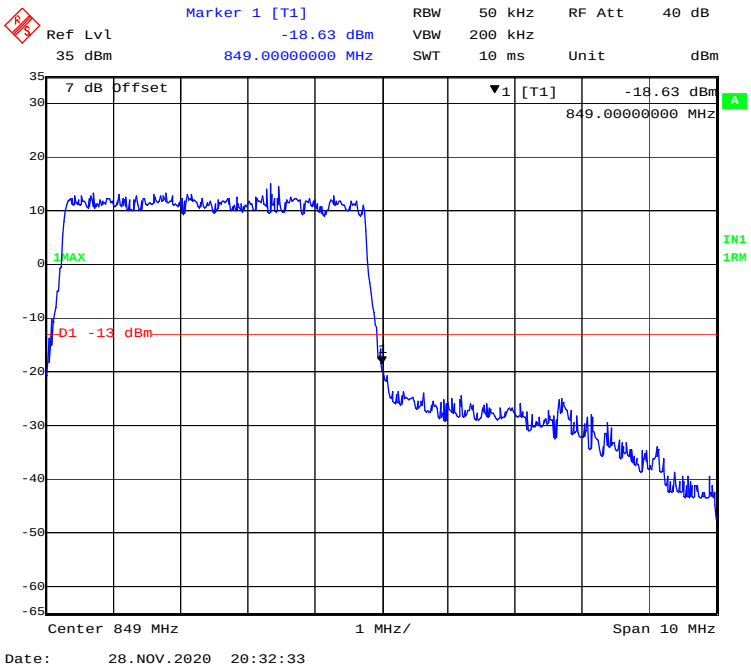
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



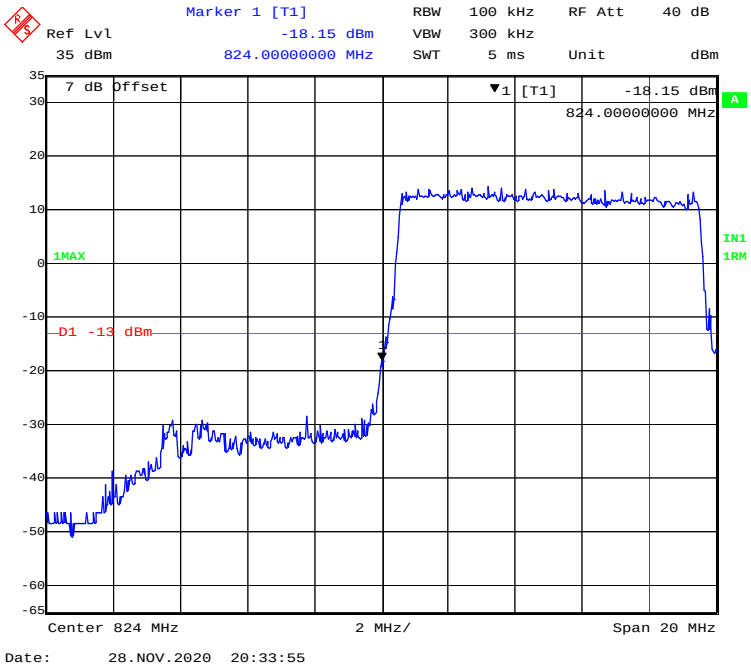
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



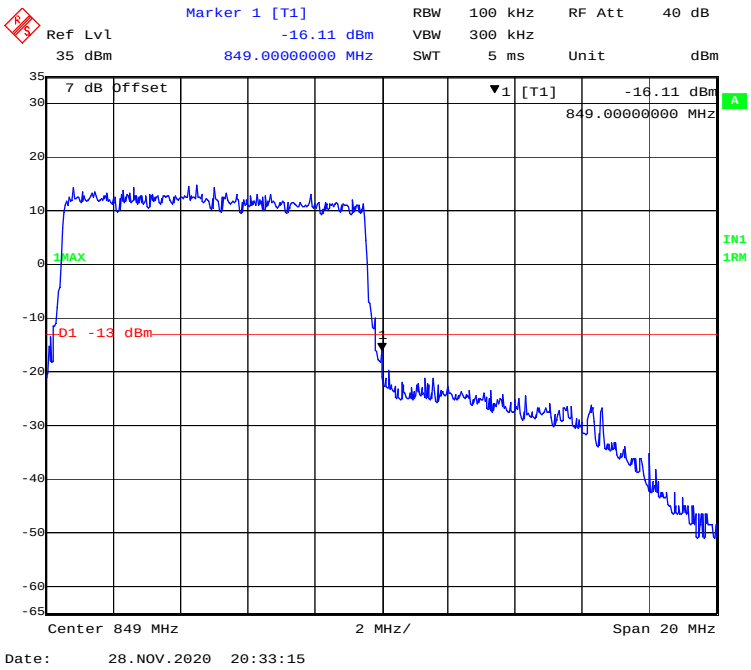
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



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

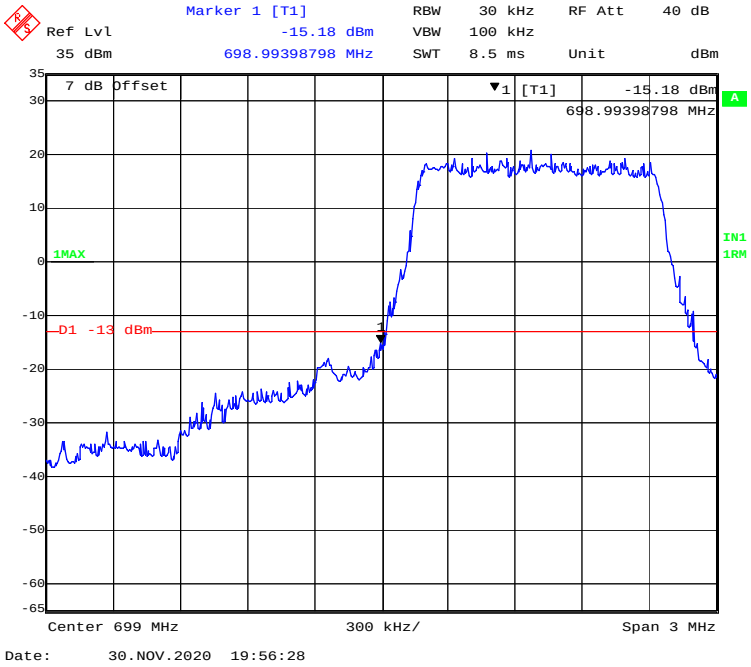


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

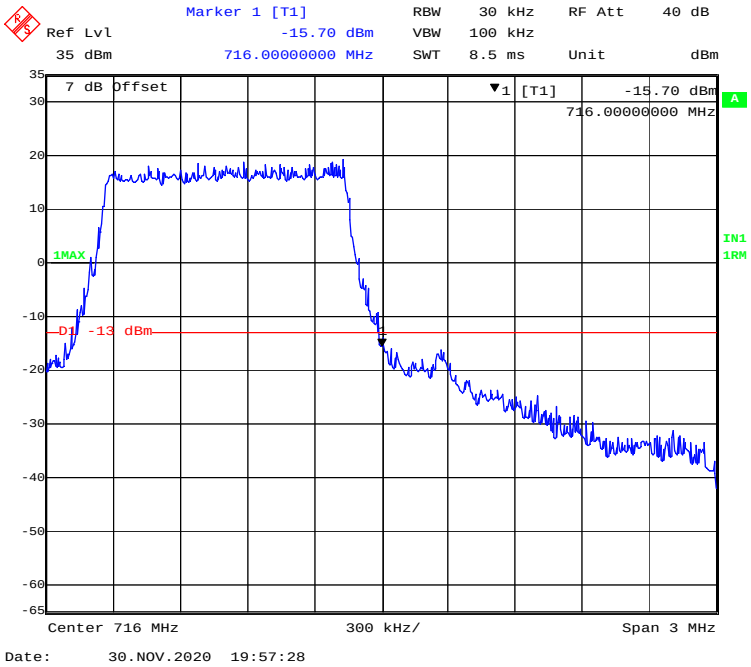


LTE Band 12:

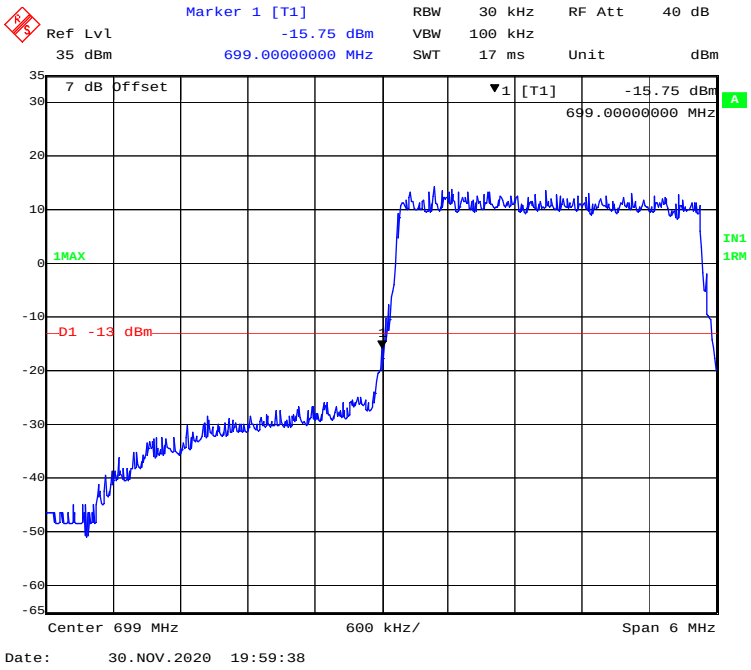
QPSK (1.4 MHz, FULL RB) - Left Band Edge



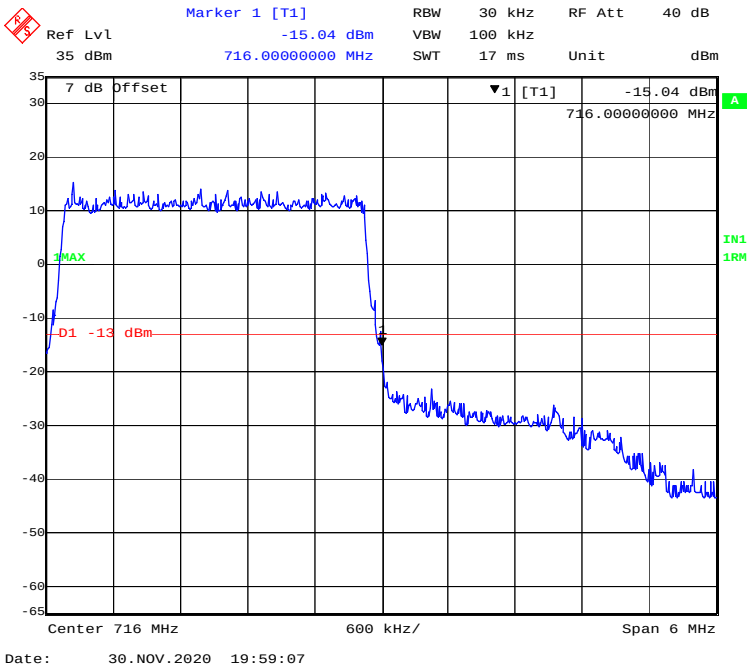
QPSK (1.4 MHz, FULL RB) - Right Band Edge



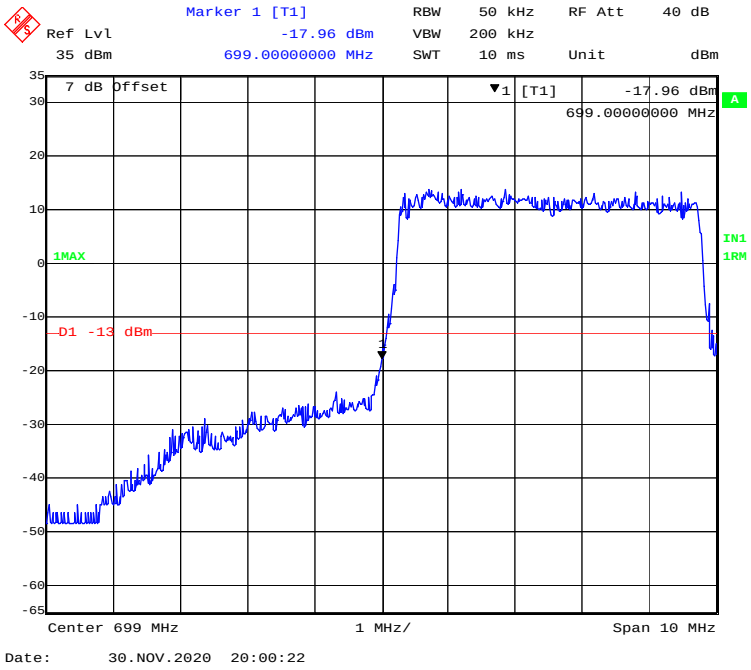
QPSK (3 MHz, FULL RB) - Left Band Edge



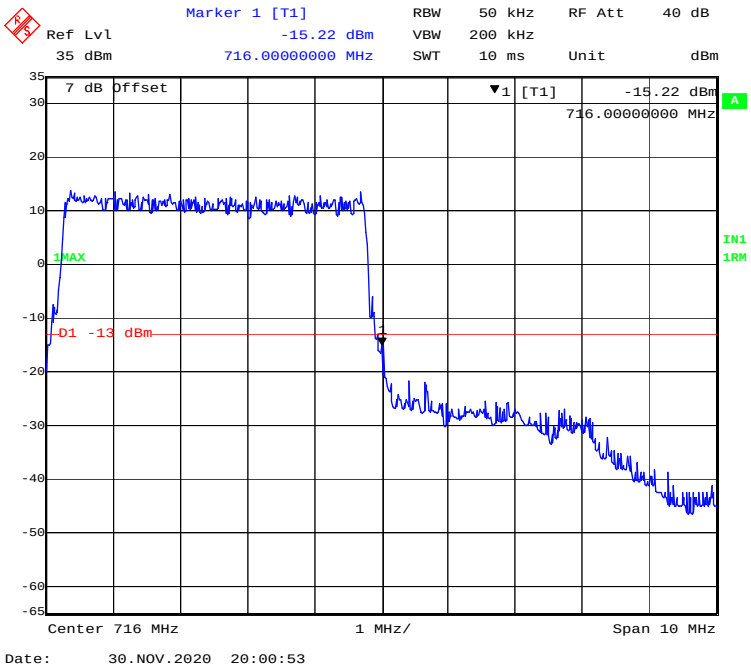
QPSK (3 MHz, FULL RB) - Right Band Edge



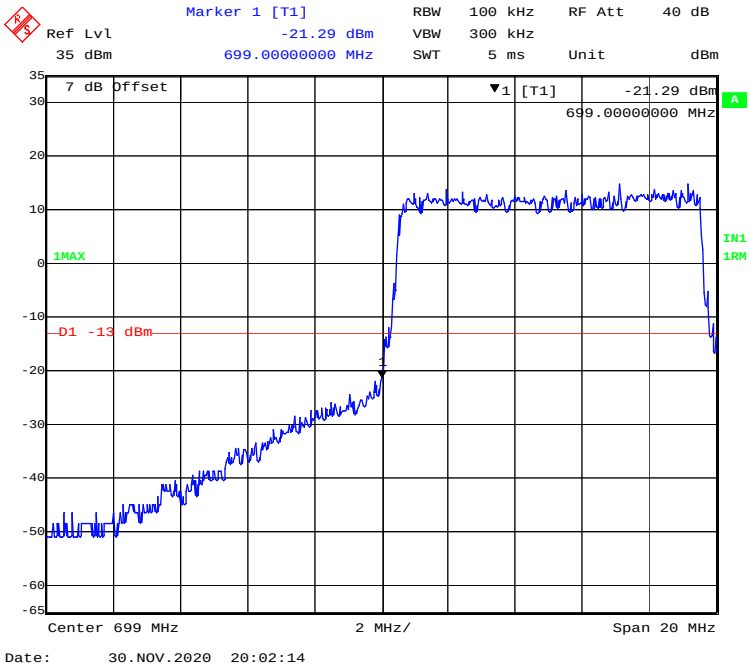
QPSK (5 MHz, FULL RB) - Left Band Edge



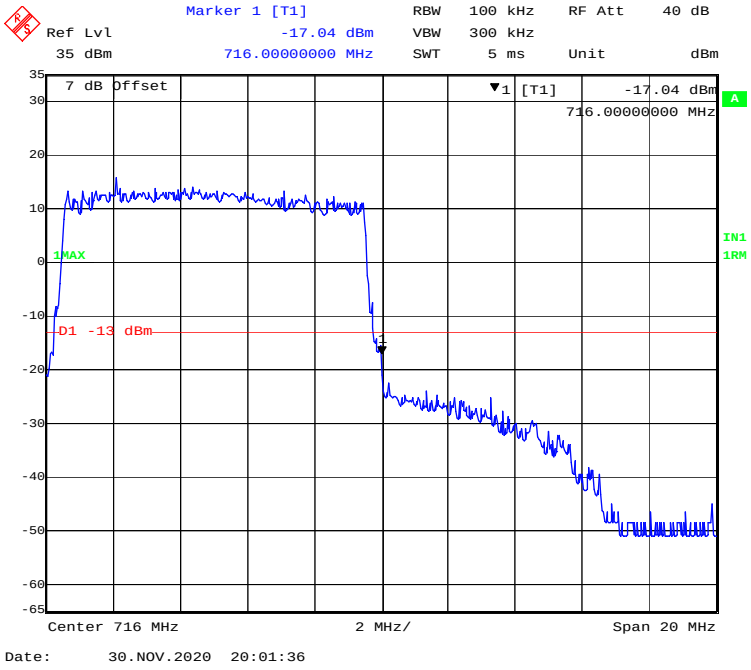
QPSK (5 MHz, FULL RB) - Right Band Edge



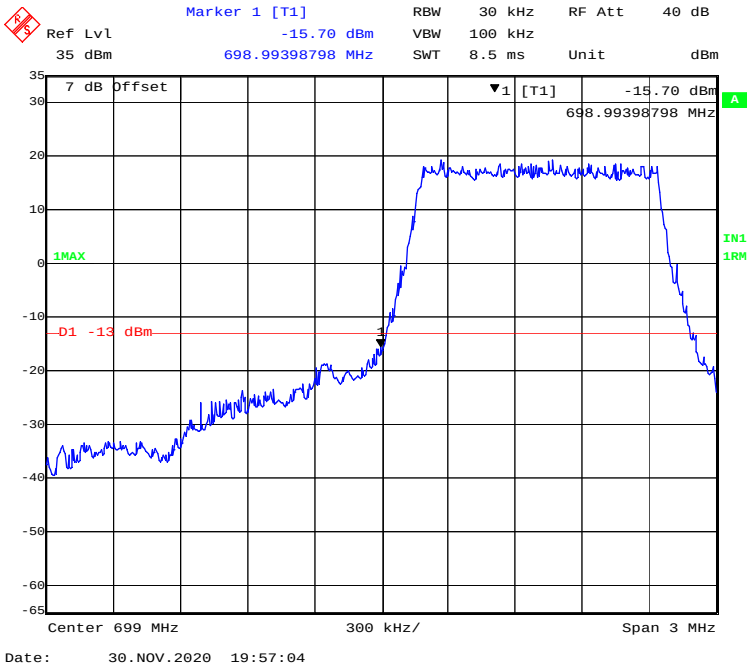
QPSK (10 MHz, FULL RB) - Left Band Edge



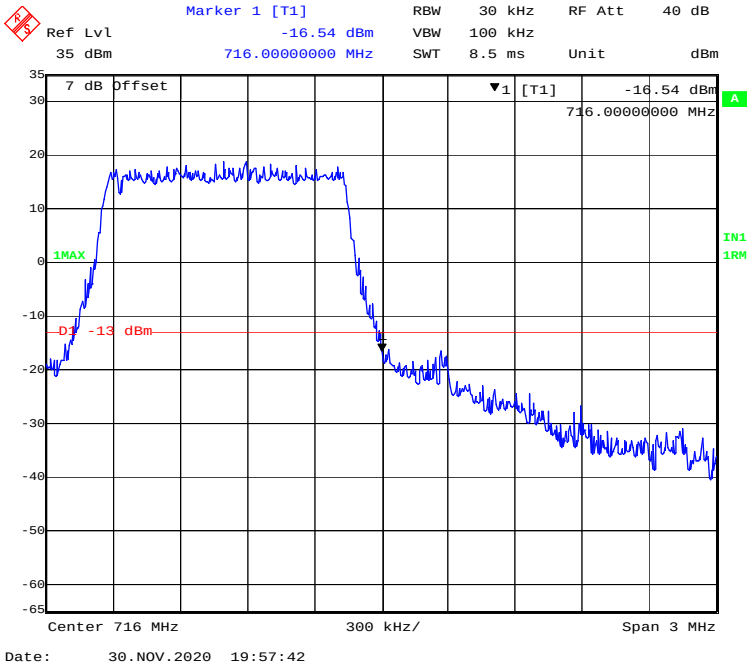
QPSK (10 MHz, FULL RB) - Right Band Edge



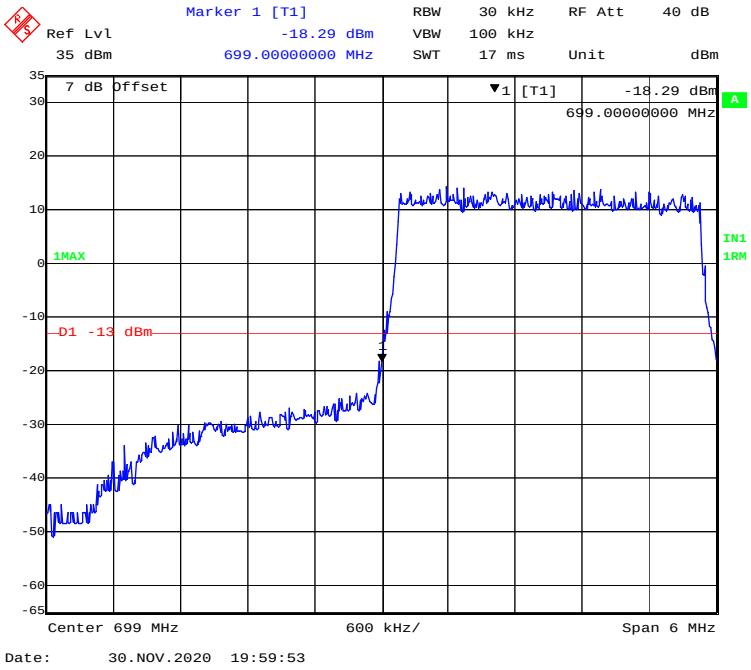
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



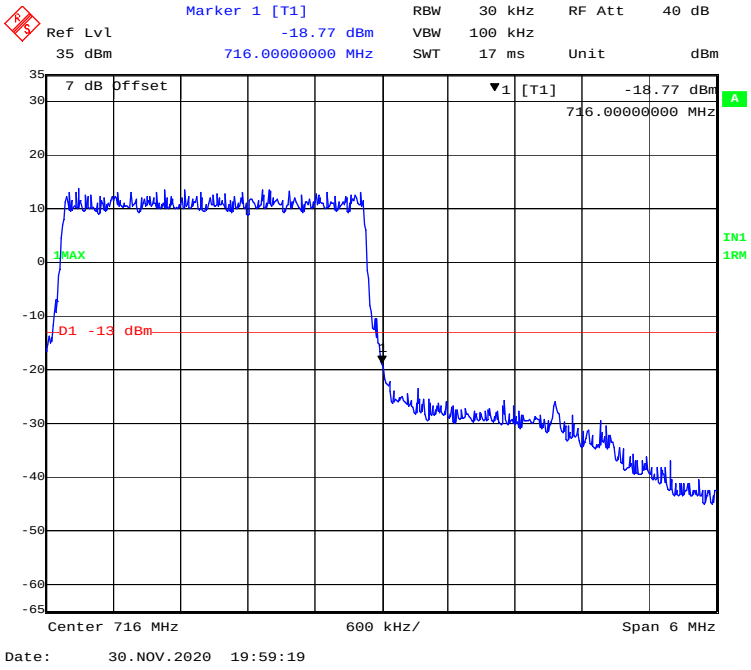
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



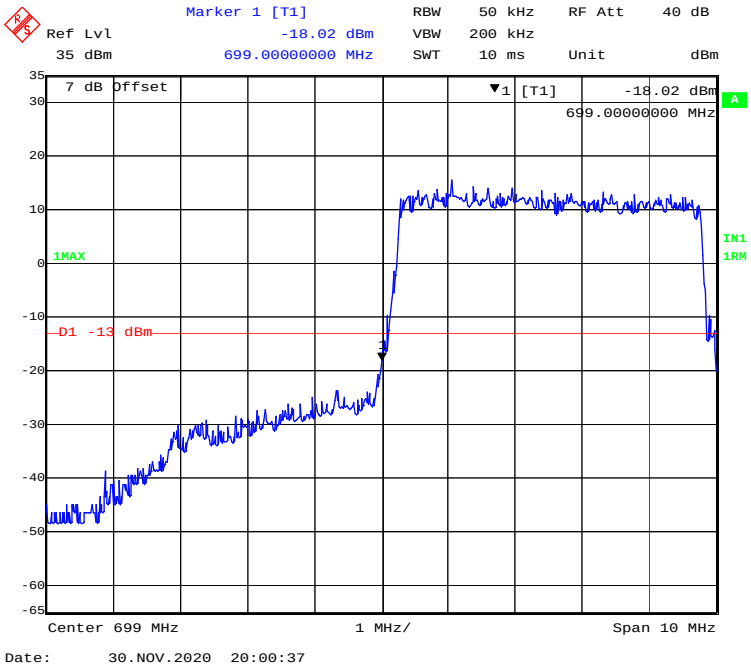
16-QAM (3 MHz, FULL RB) - Left Band Edge



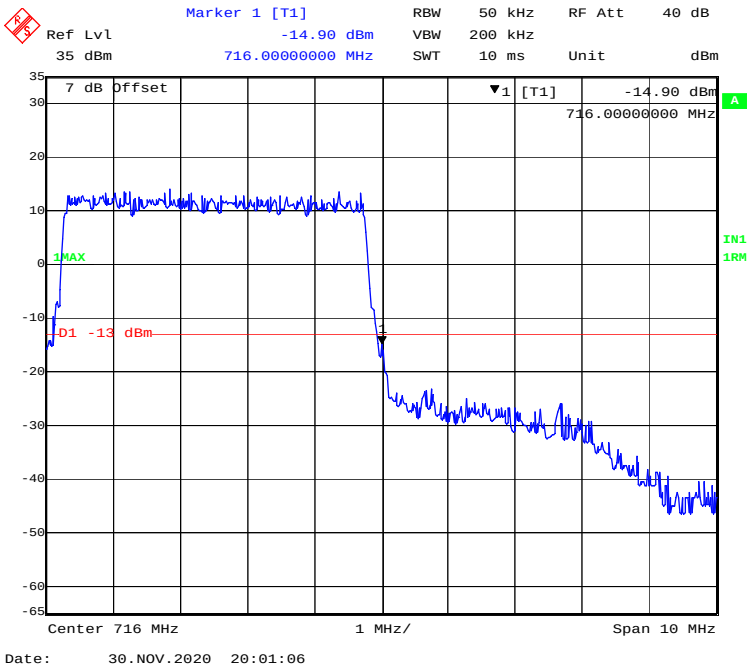
16-QAM (3 MHz, FULL RB) - Right Band Edge



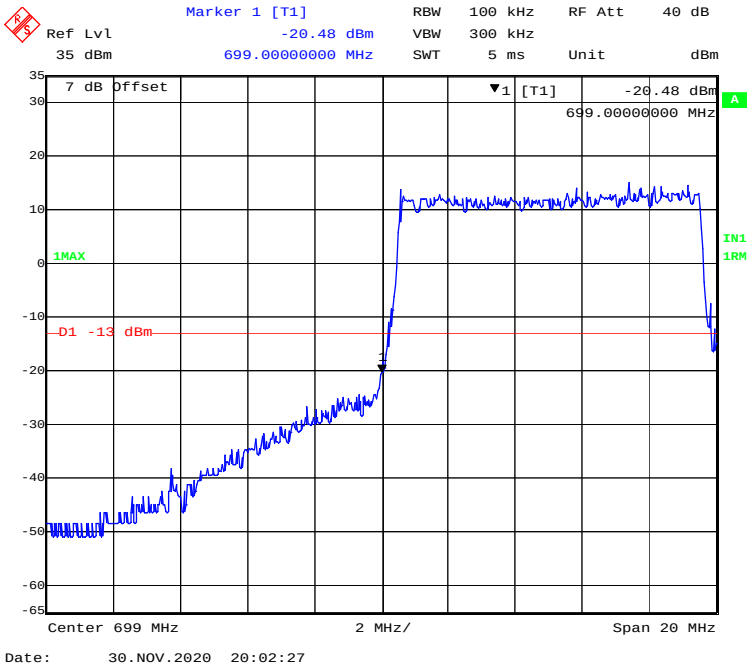
16-QAM (5 MHz, FULL RB) - Left Band Edge



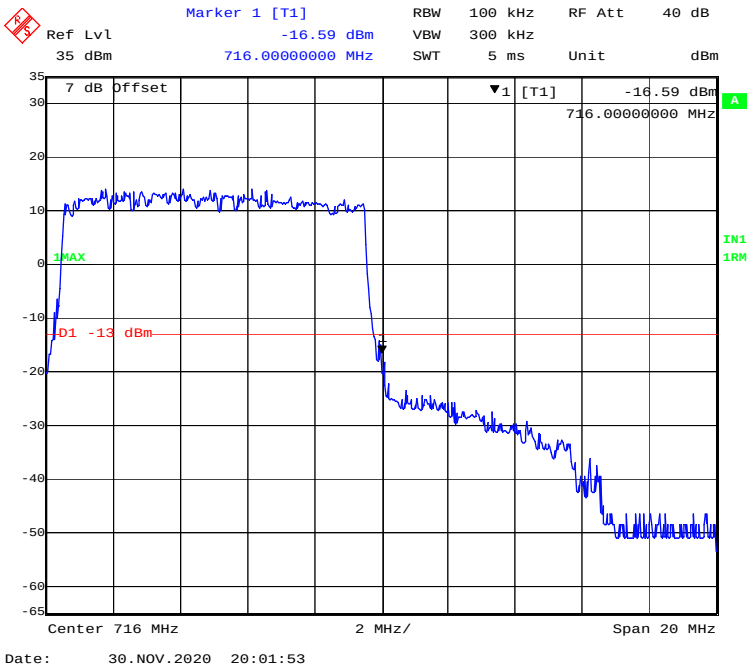
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge

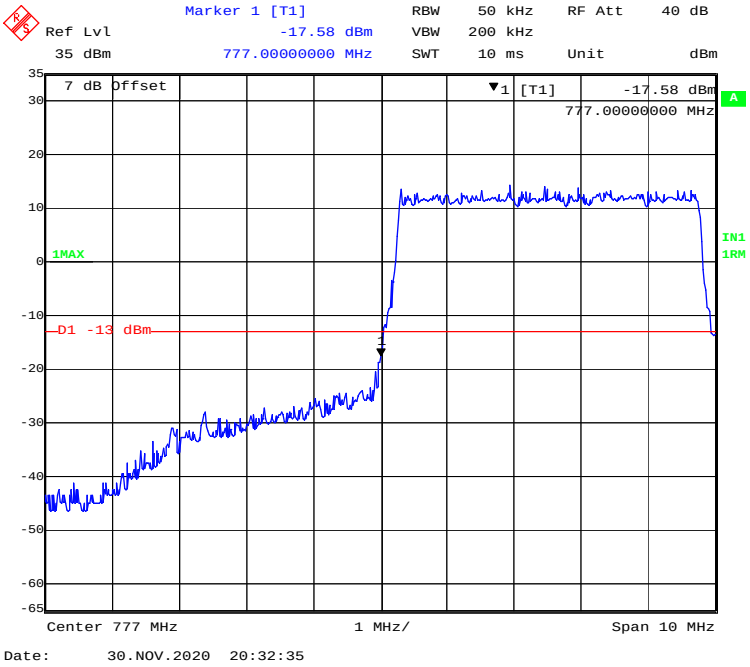


16-QAM (10 MHz, FULL RB) - Right Band Edge

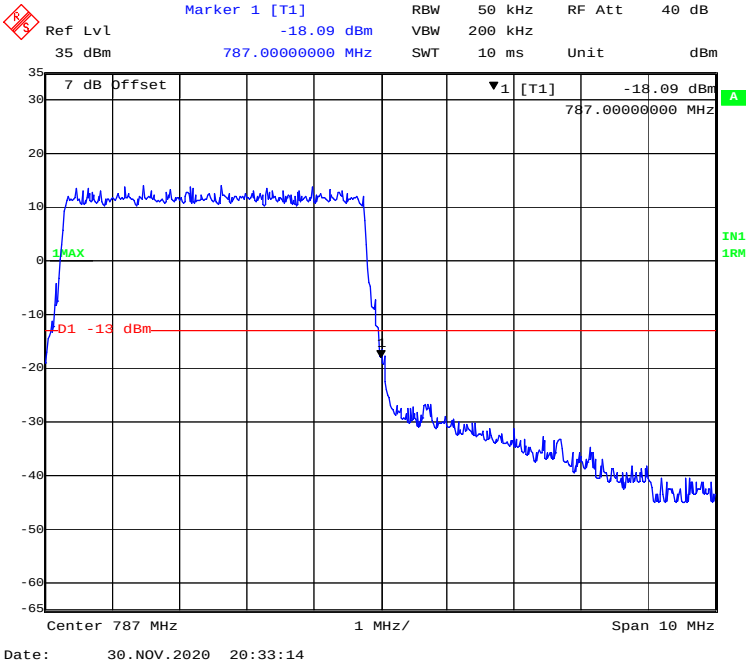


LTE Band 13:

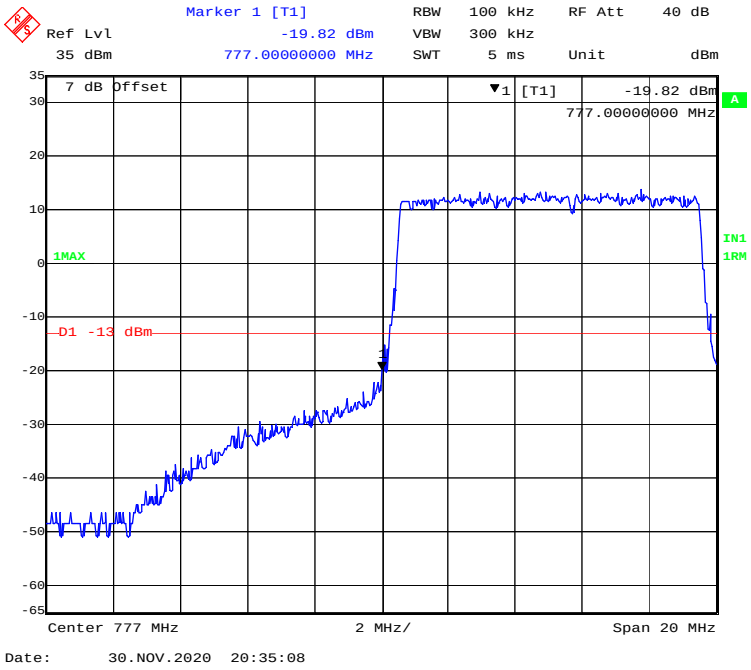
QPSK (5 MHz, FULL RB) - Left Band Edge



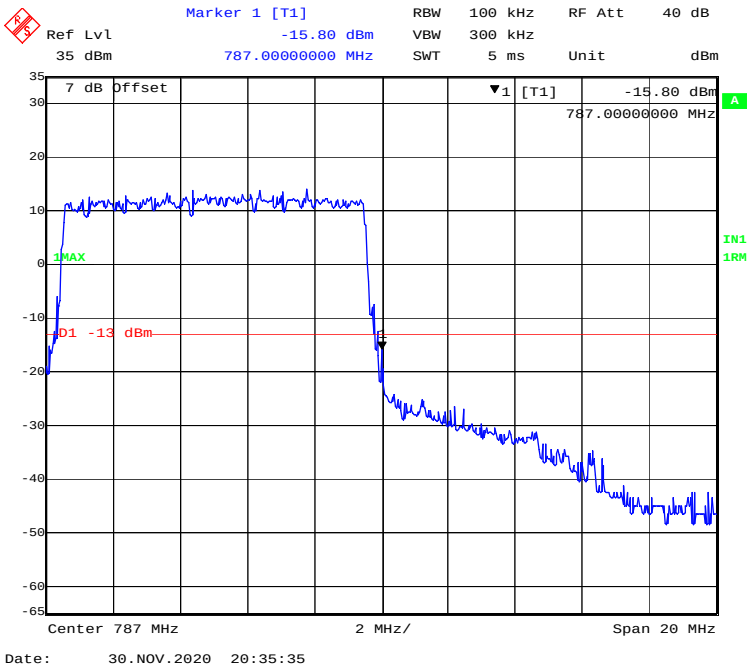
QPSK (5 MHz, FULL RB) - Right Band Edge



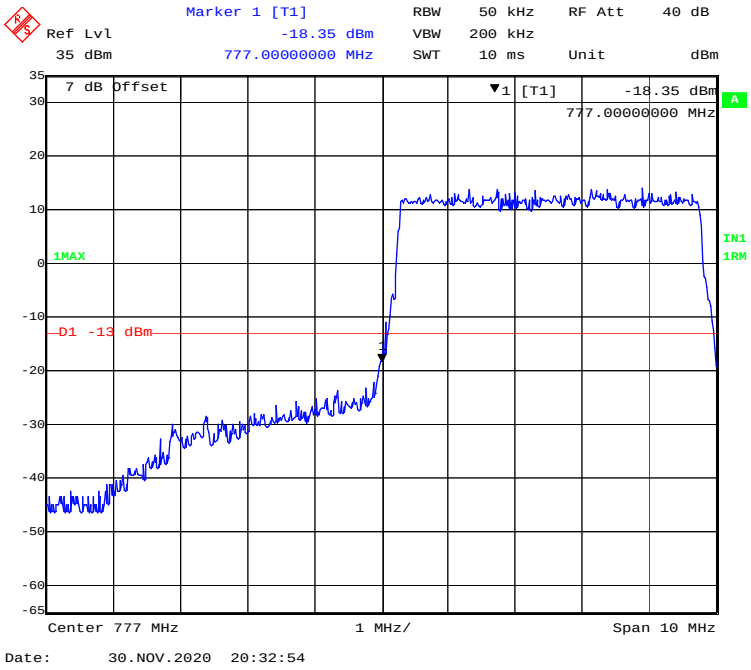
QPSK (10 MHz, FULL RB) - Left Band Edge



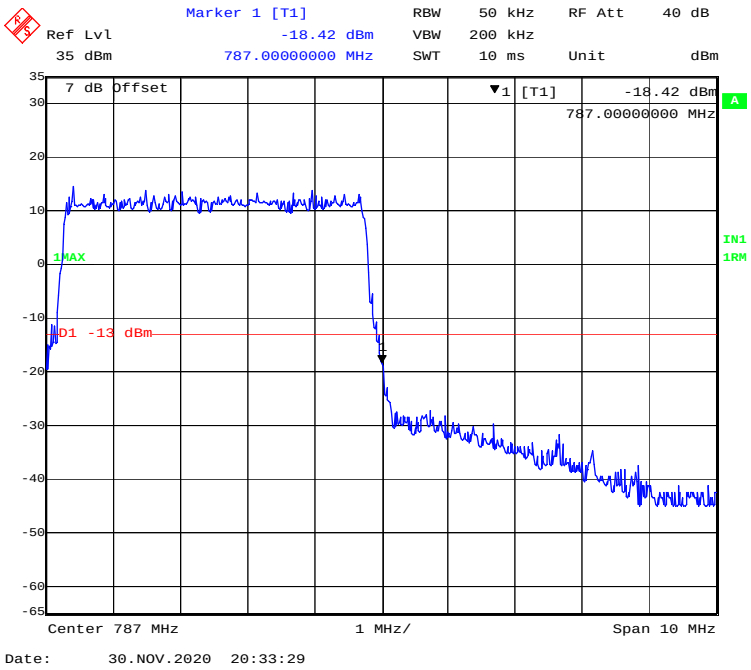
QPSK (10 MHz, FULL RB) - Right Band Edge



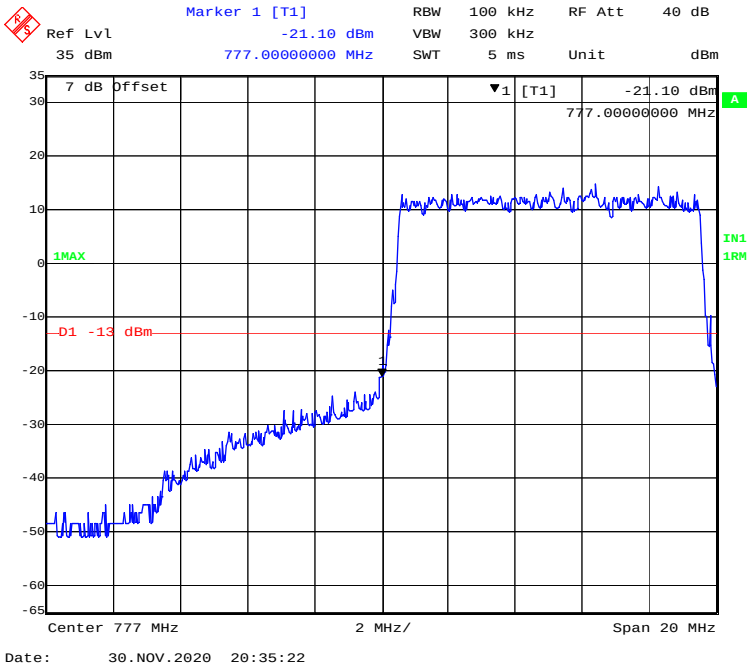
16-QAM (5 MHz, FULL RB) - Left Band Edge



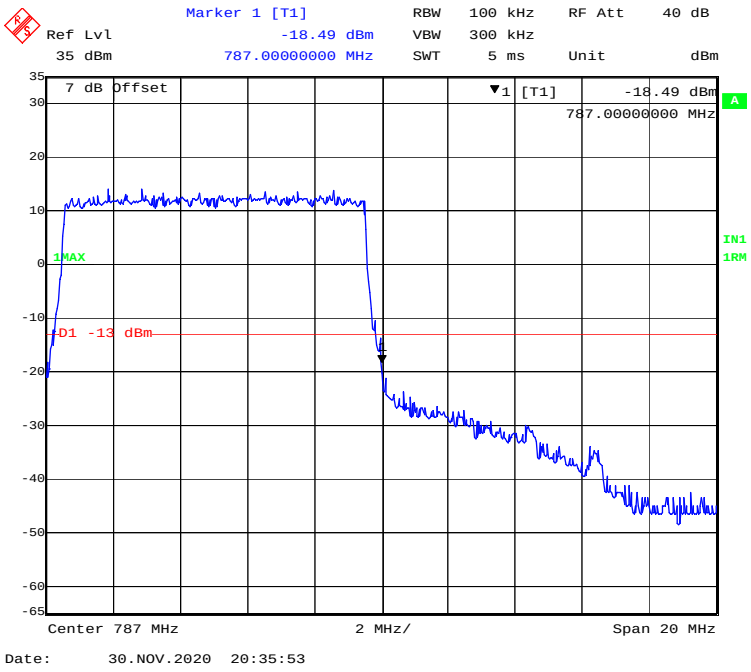
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge

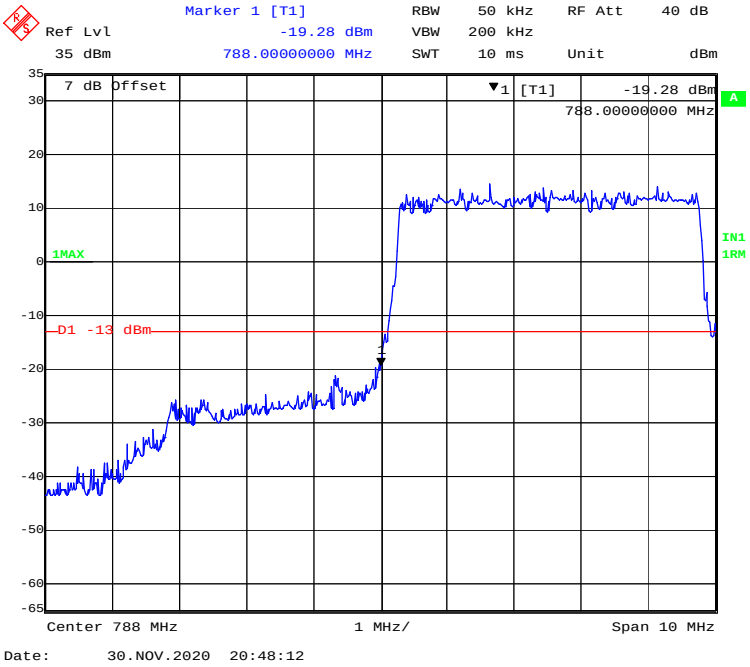


16-QAM (10 MHz, FULL RB) - Right Band Edge

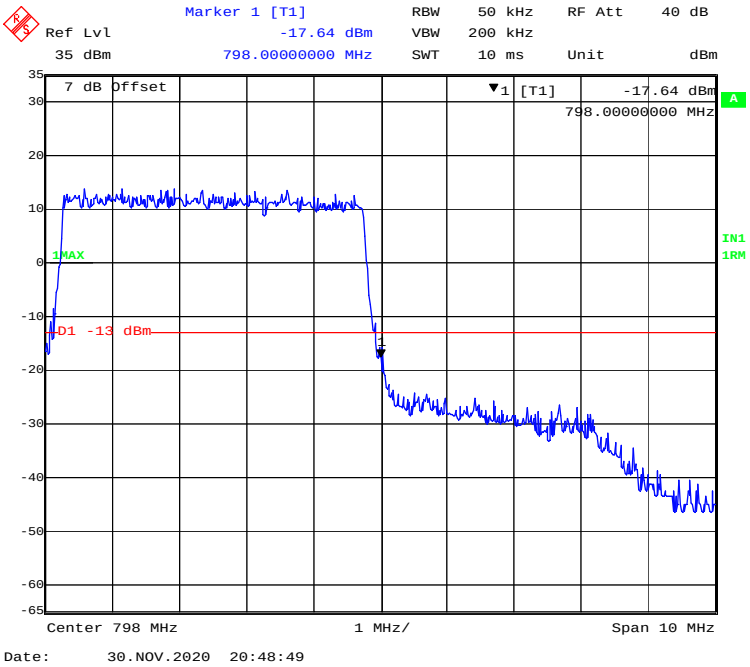


LTE Band 14:

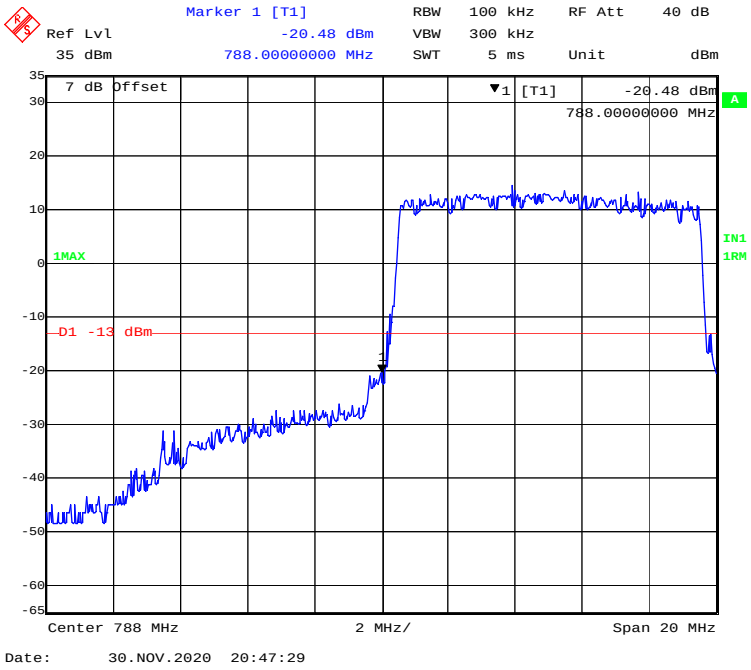
QPSK (5 MHz, FULL RB) - Left Band Edge



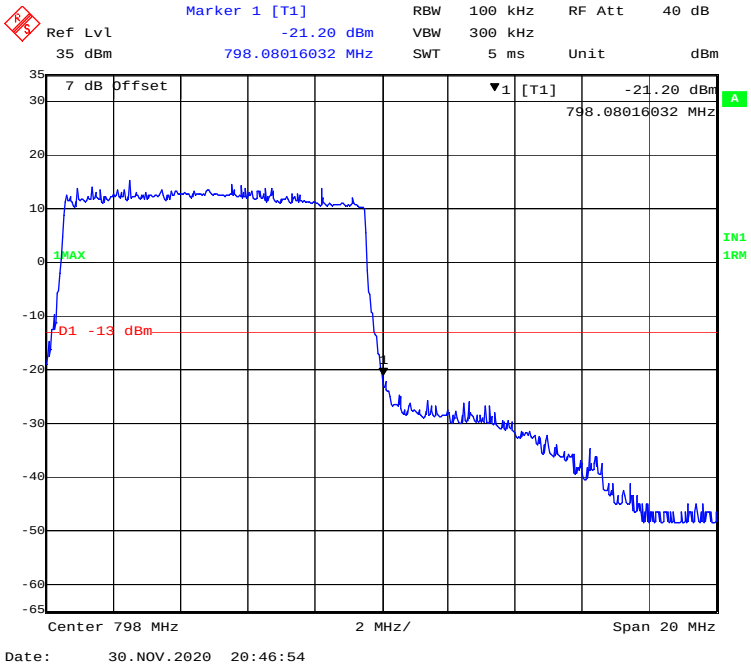
QPSK (5 MHz, FULL RB) - Right Band Edge



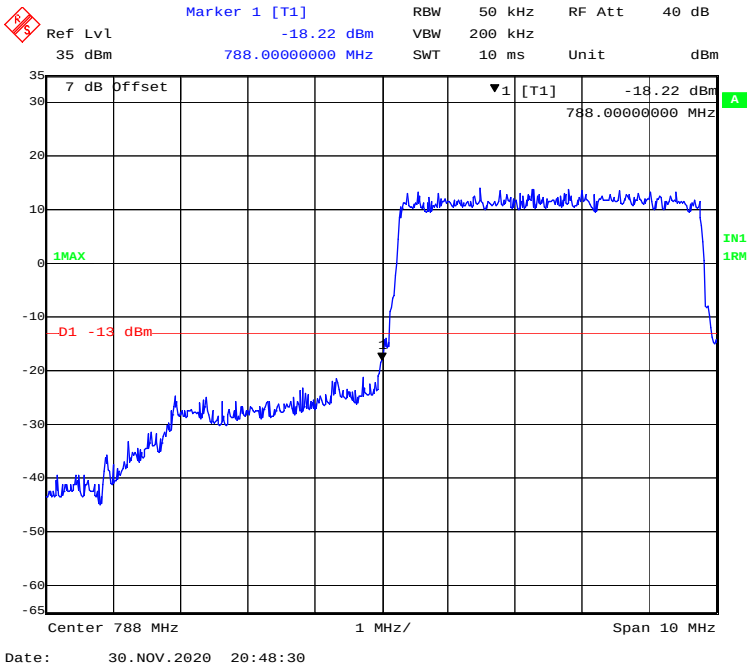
QPSK (10 MHz, FULL RB) - Left Band Edge



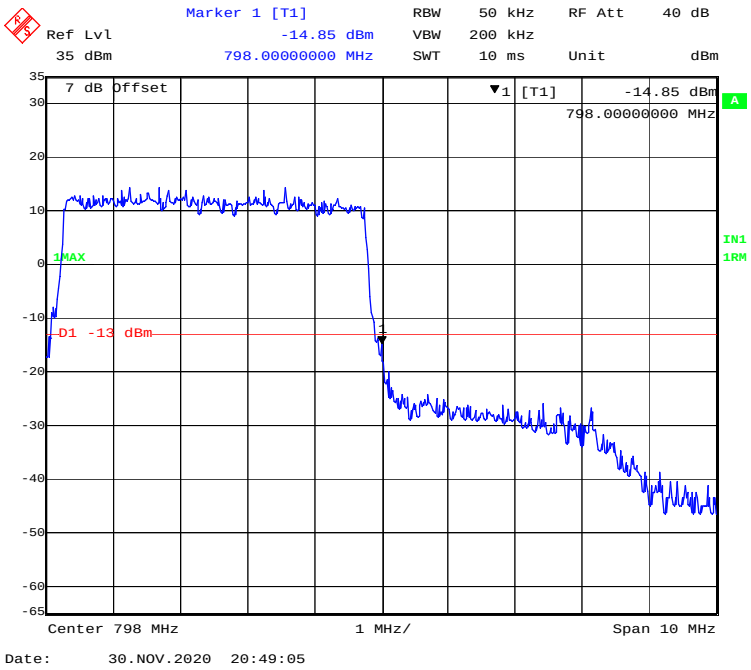
QPSK (10 MHz, FULL RB) - Right Band Edge



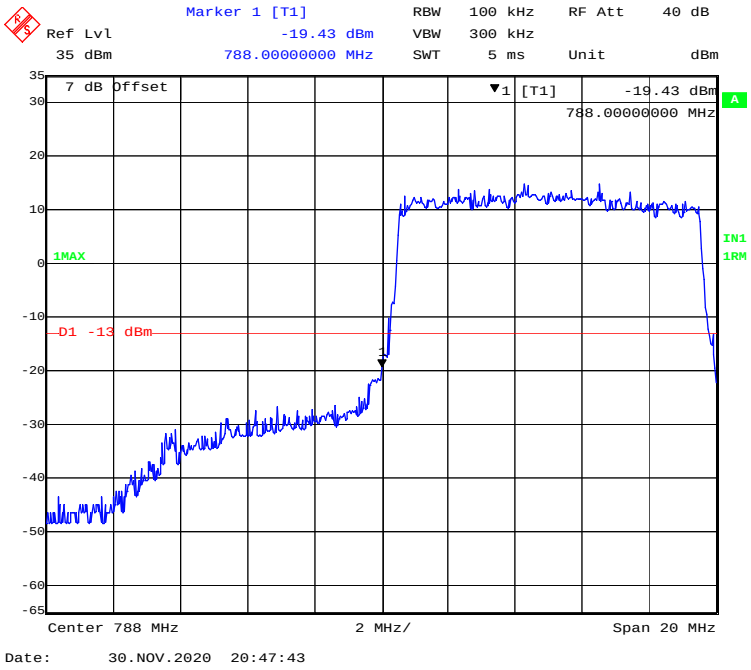
16-QAM (5 MHz, FULL RB) - Left Band Edge



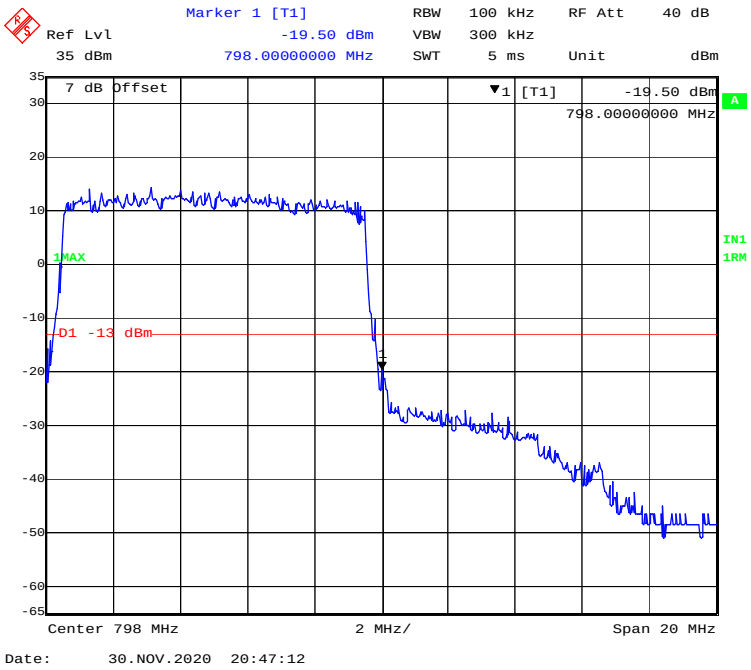
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge

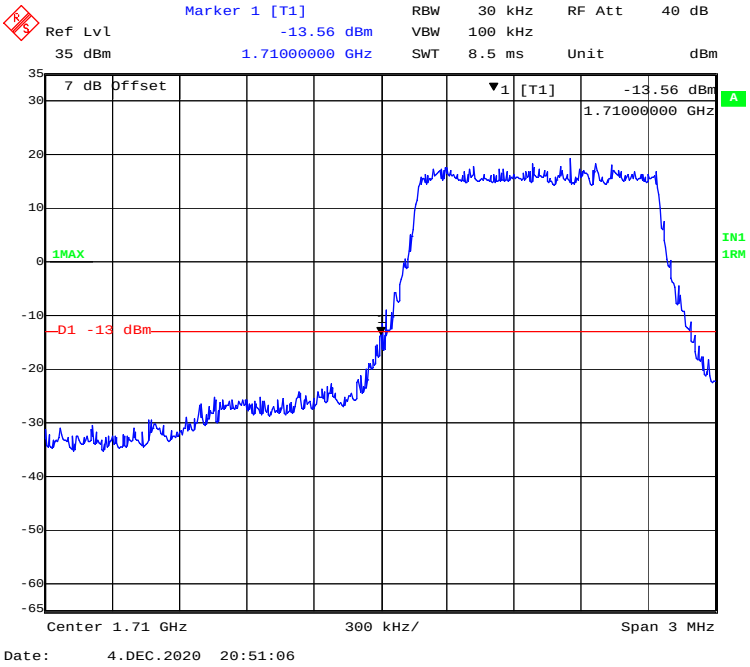


16-QAM (10 MHz, FULL RB) - Right Band Edge

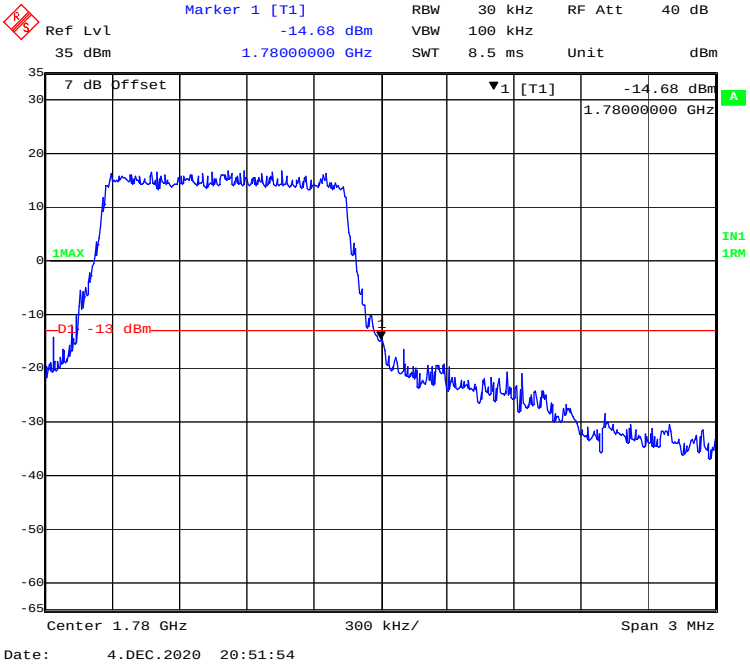


LTE Band 66:

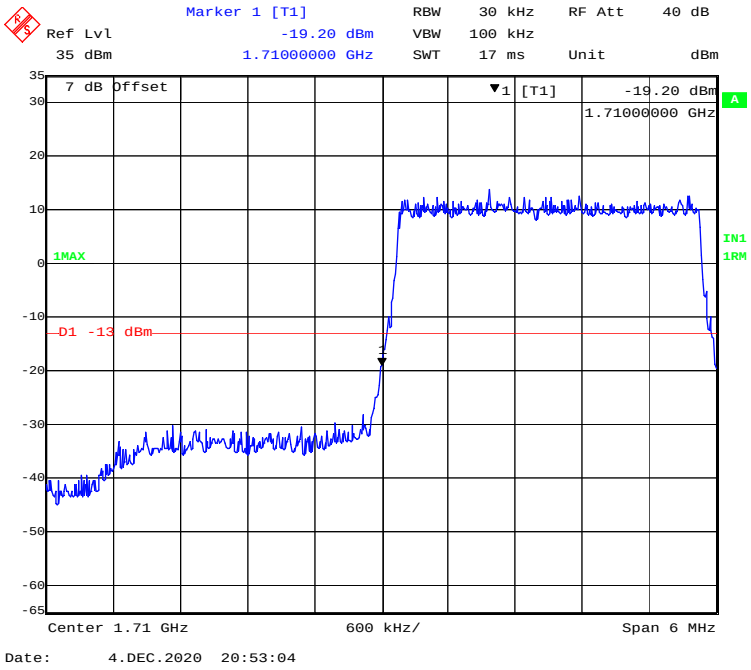
QPSK (1.4 MHz, FULL RB) - Left Band Edge



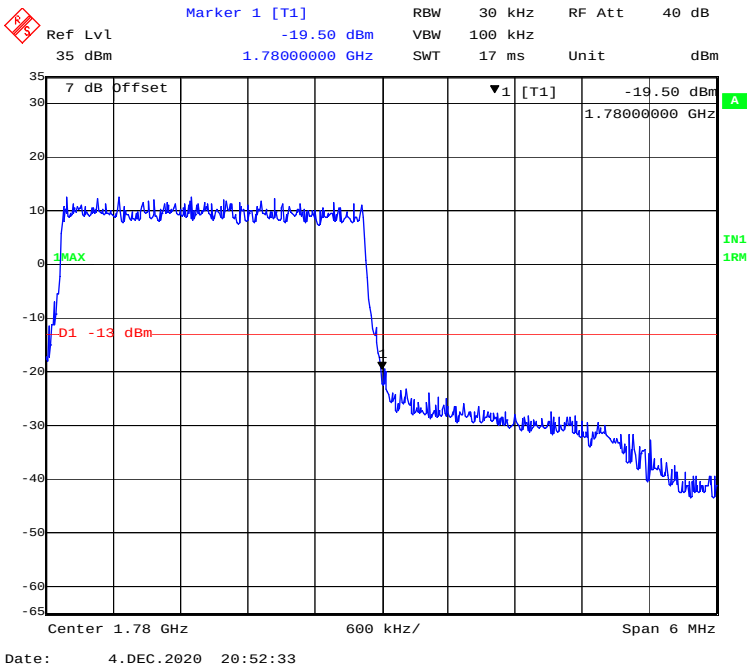
QPSK (1.4 MHz, FULL RB) - Right Band Edge



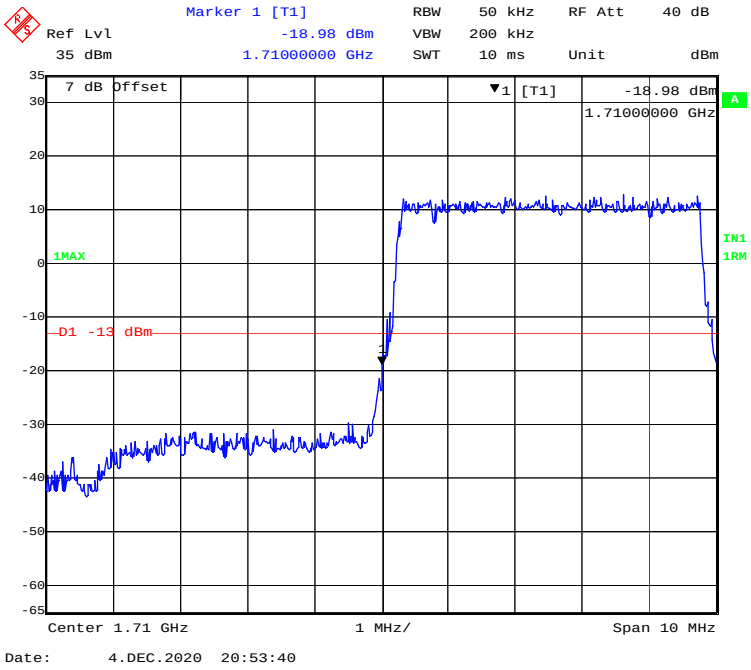
QPSK (3 MHz, FULL RB) - Left Band Edge



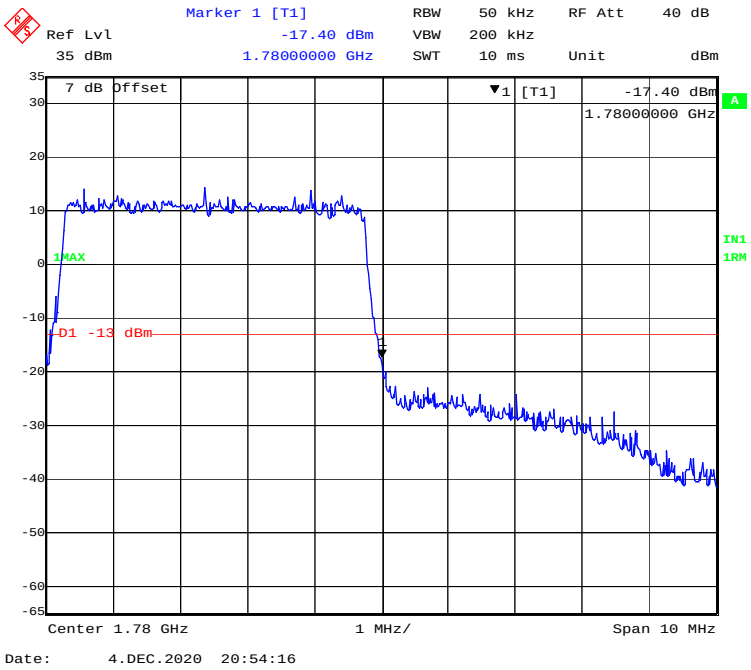
QPSK (3 MHz, FULL RB) - Right Band Edge



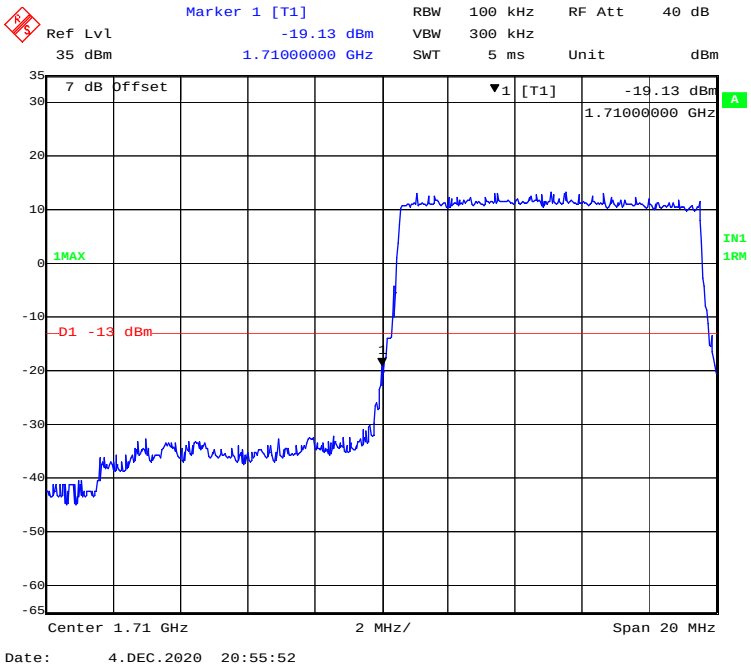
QPSK (5 MHz, FULL RB) - Left Band Edge



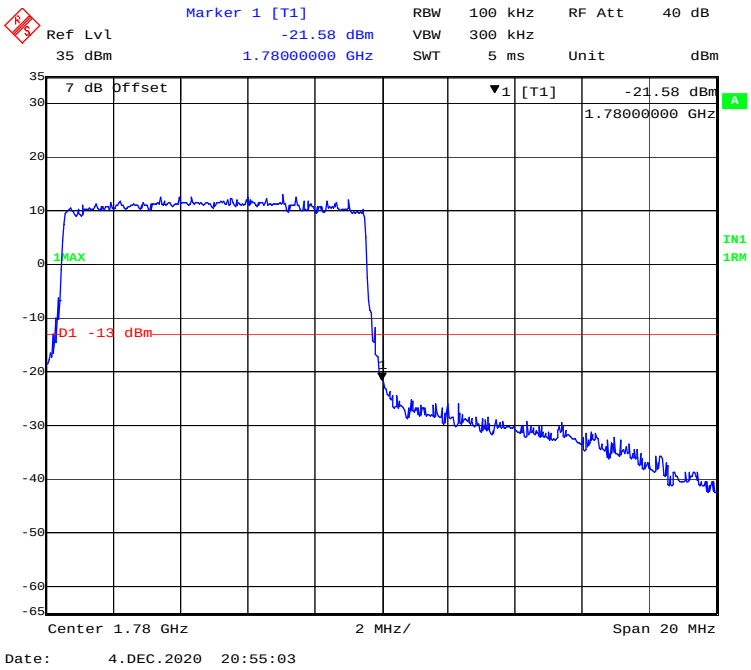
QPSK (5 MHz, FULL RB) - Right Band Edge



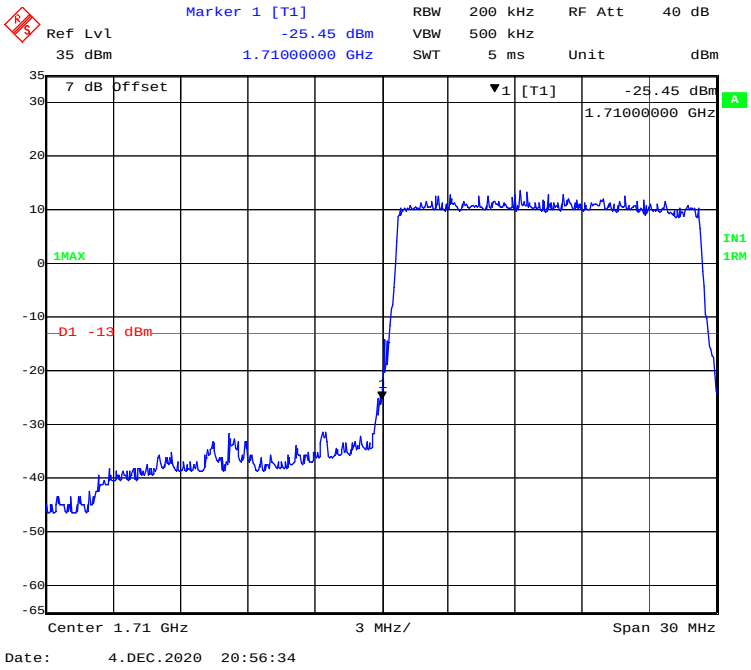
QPSK (10 MHz, FULL RB) - Left Band Edge



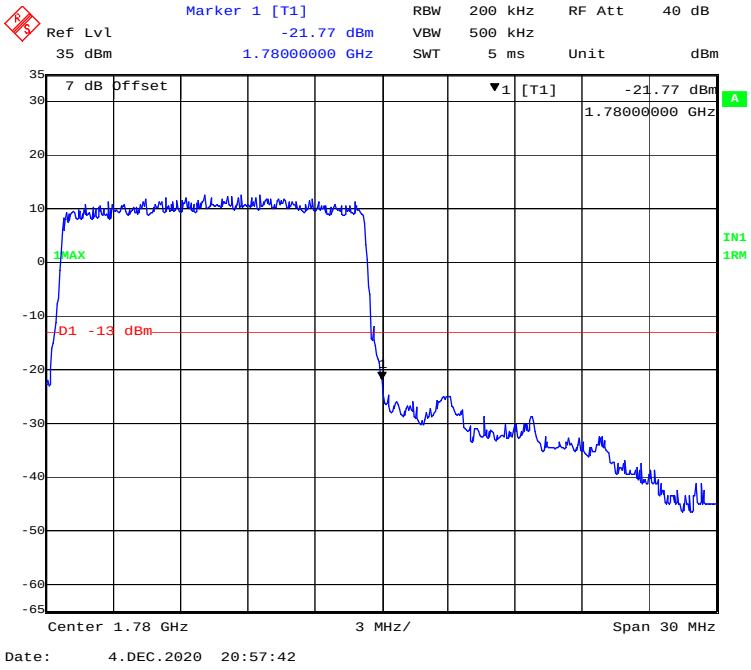
QPSK (10 MHz, FULL RB) - Right Band Edge



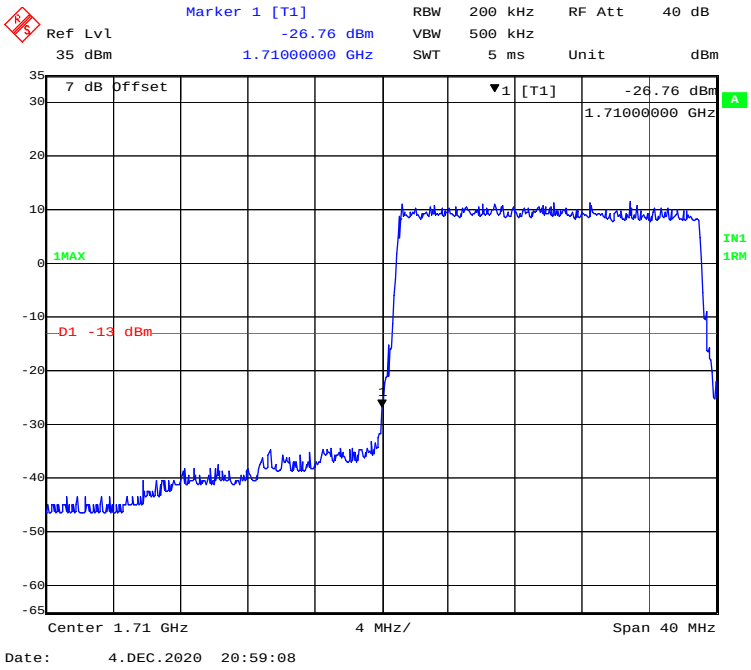
QPSK (15 MHz, FULL RB) - Left Band Edge



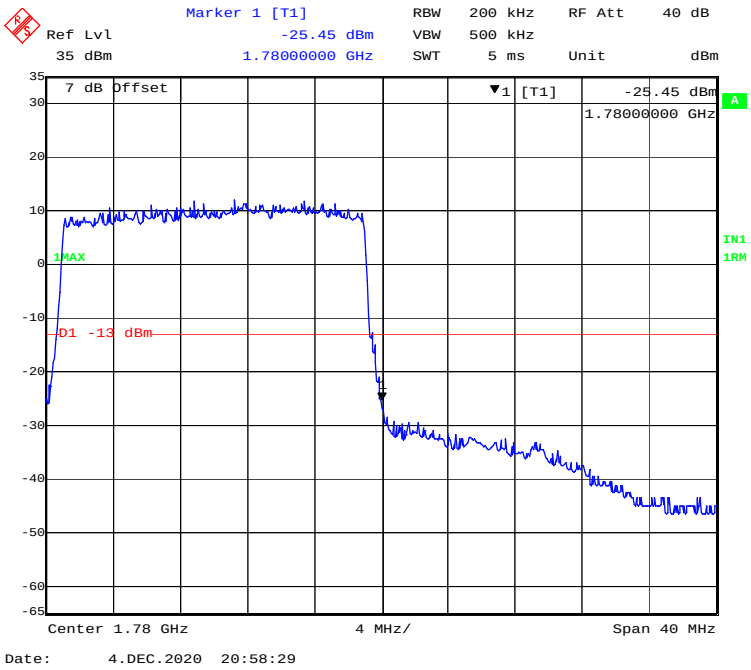
QPSK (15 MHz, FULL RB) - Right Band Edge



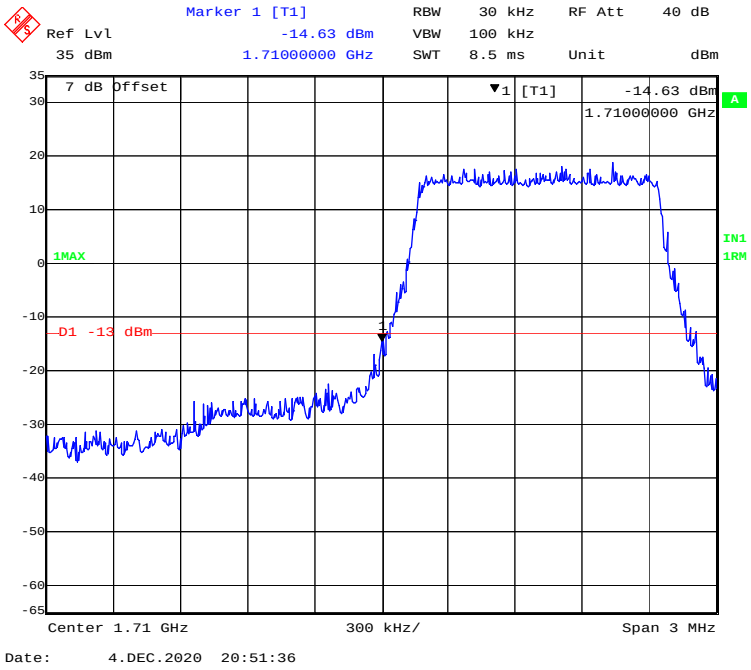
QPSK (20 MHz, FULL RB) - Left Band Edge



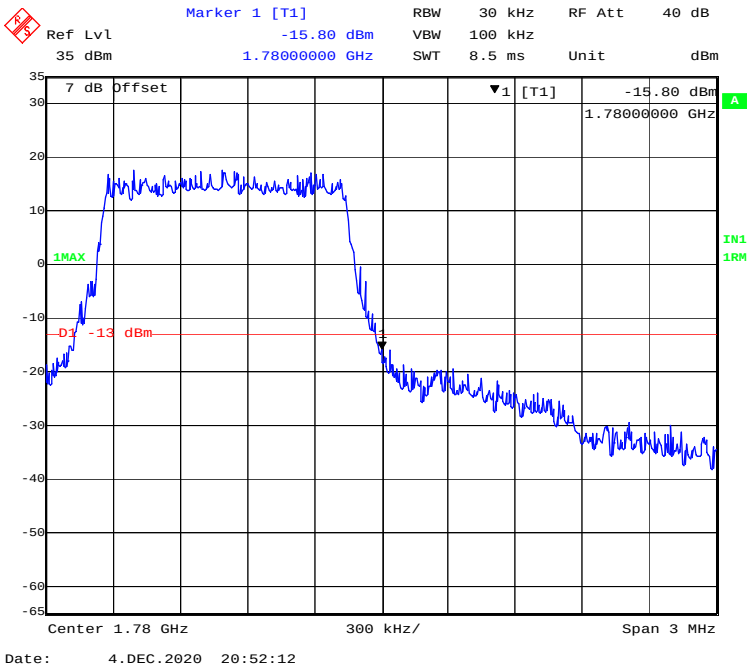
QPSK (20 MHz, FULL RB) - Right Band Edge



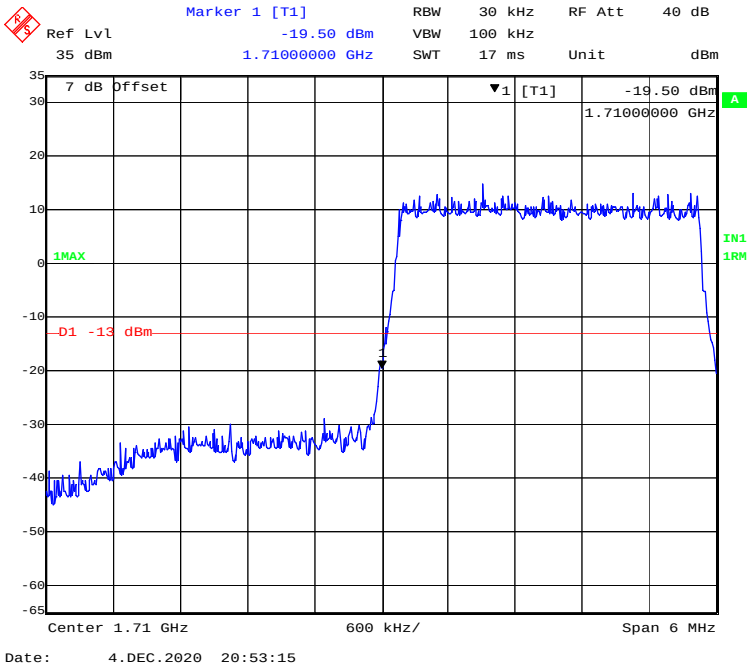
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



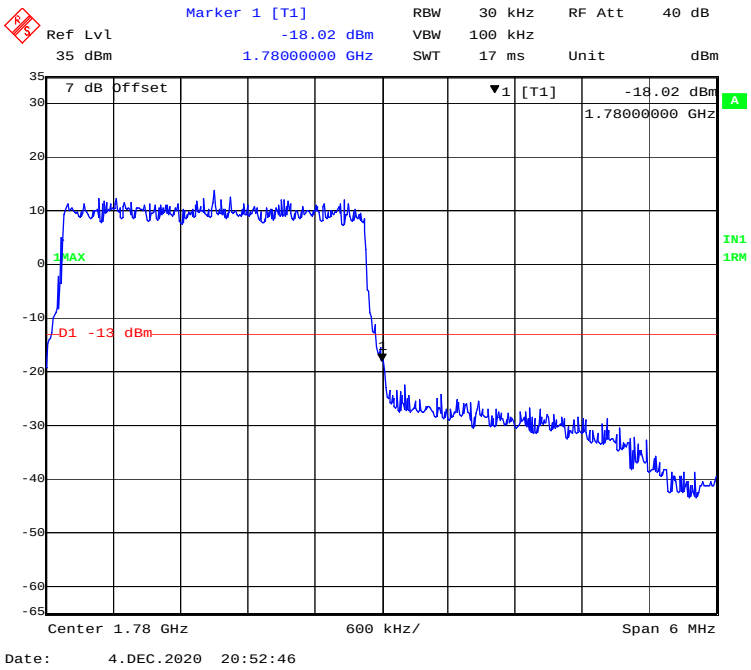
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



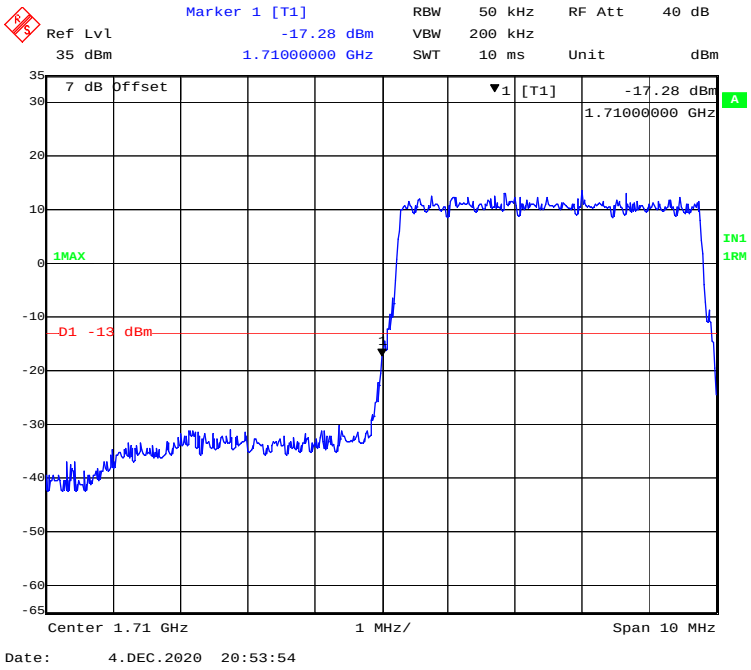
16-QAM (3 MHz, FULL RB) - Left Band Edge



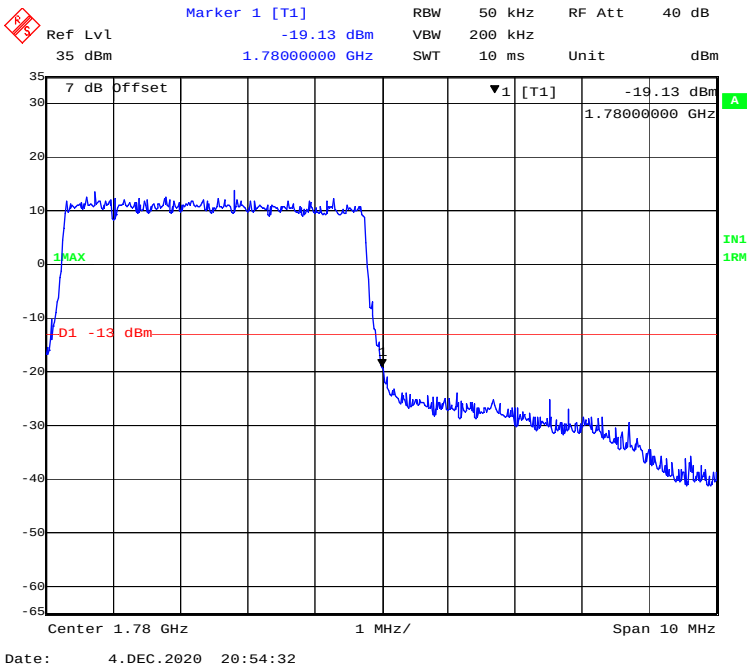
16-QAM (3 MHz, FULL RB) - Right Band Edge



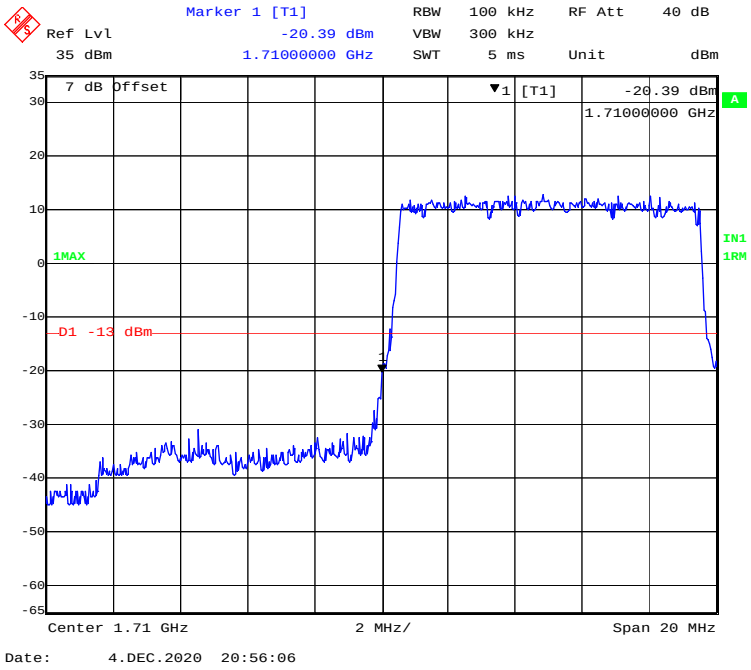
16-QAM (5 MHz, FULL RB) - Left Band Edge



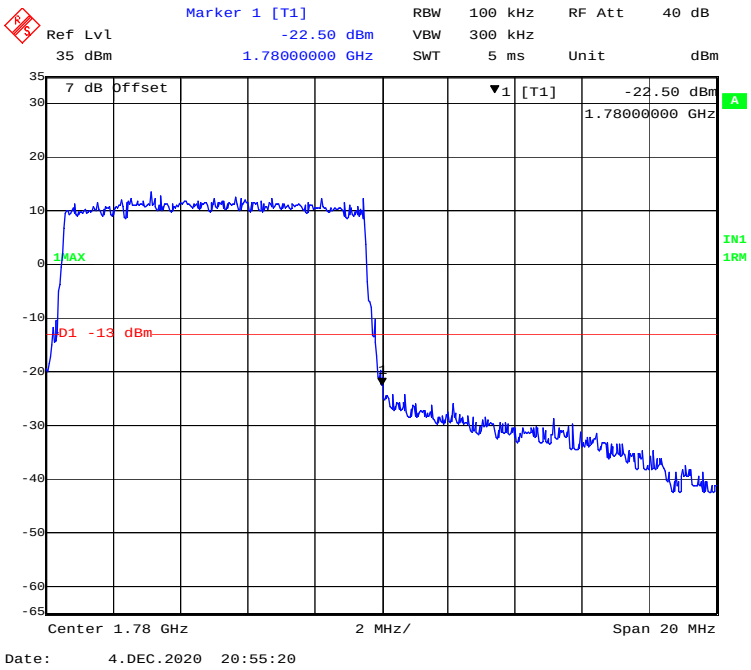
16-QAM (5 MHz, FULL RB) - Right Band Edge



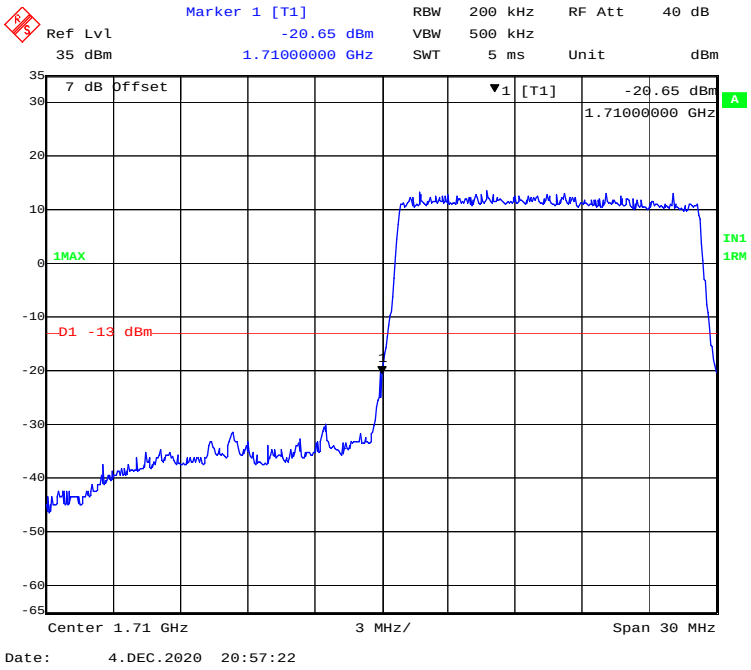
16-QAM (10 MHz, FULL RB) - Left Band Edge



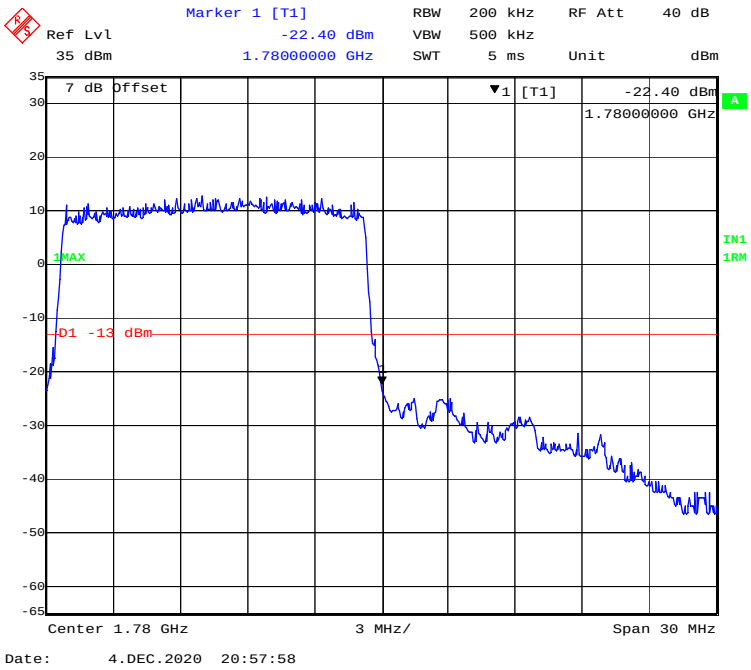
16-QAM (10 MHz, FULL RB) - Right Band Edge



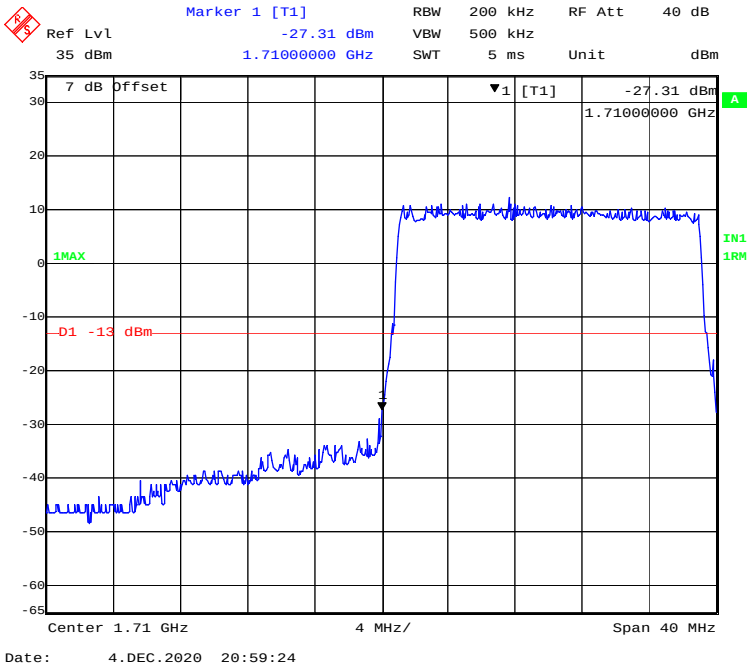
16-QAM (15 MHz, FULL RB) - Left Band Edge



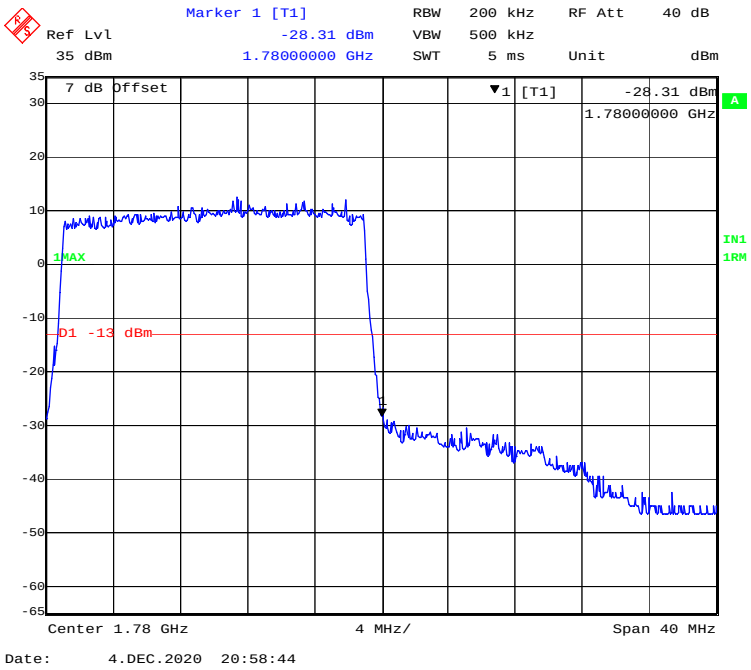
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

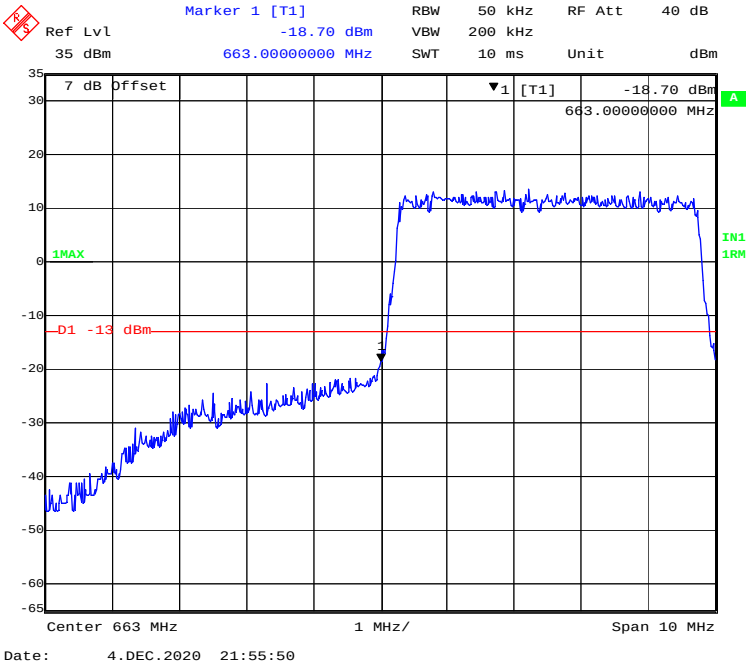


16-QAM (20 MHz, FULL RB) - Right Band Edge

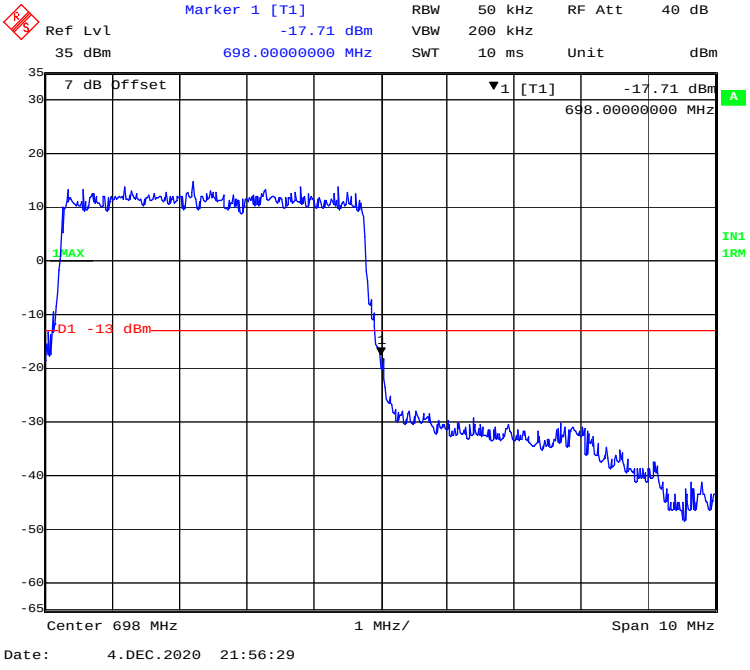


LTE Band 71:

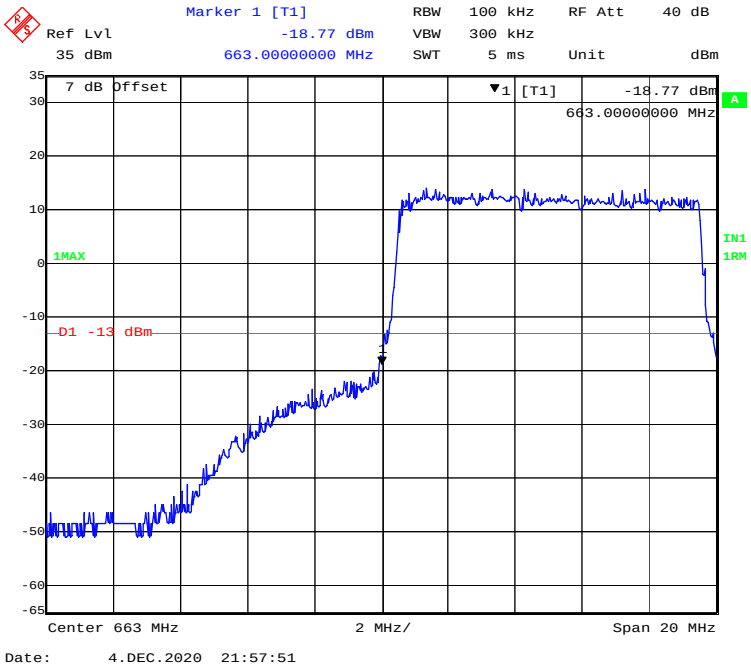
QPSK (5 MHz, FULL RB) - Left Band Edge



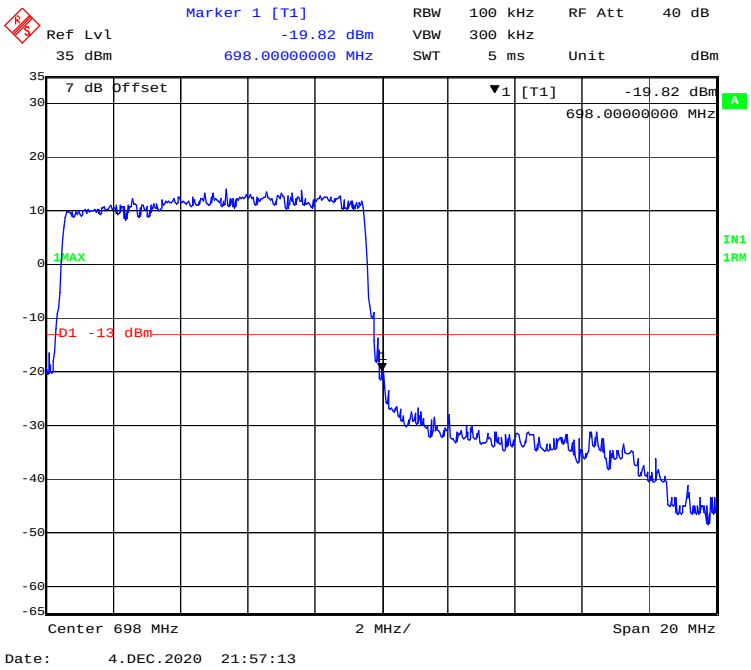
QPSK (5 MHz, FULL RB) - Right Band Edge



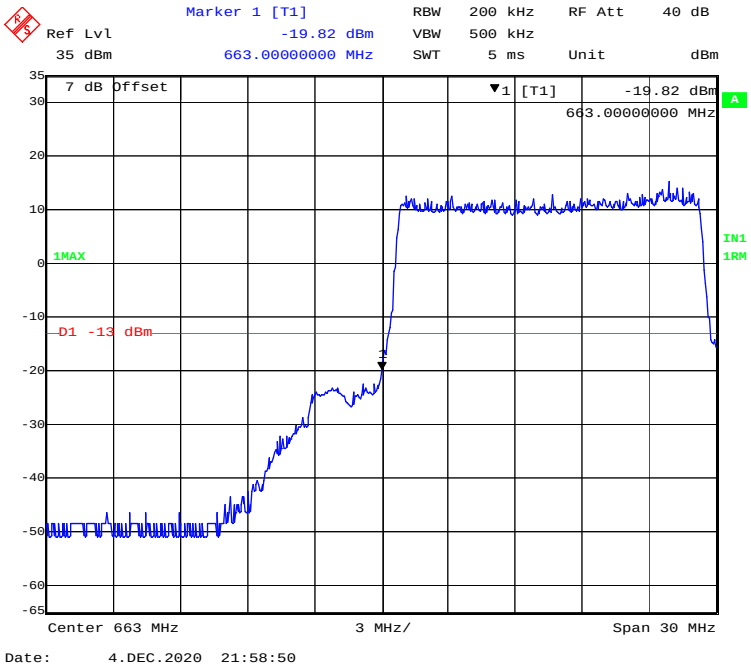
QPSK (10 MHz, FULL RB) - Left Band Edge



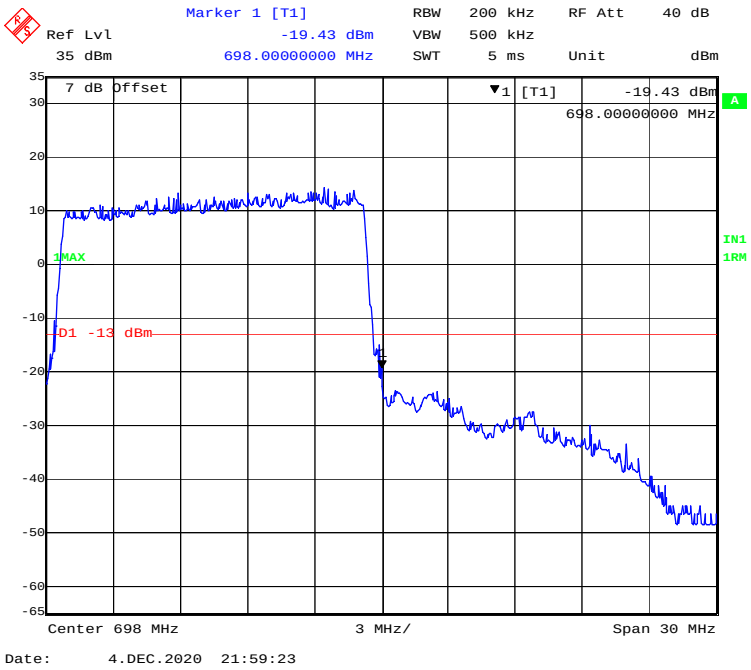
QPSK (10 MHz, FULL RB) - Right Band Edge



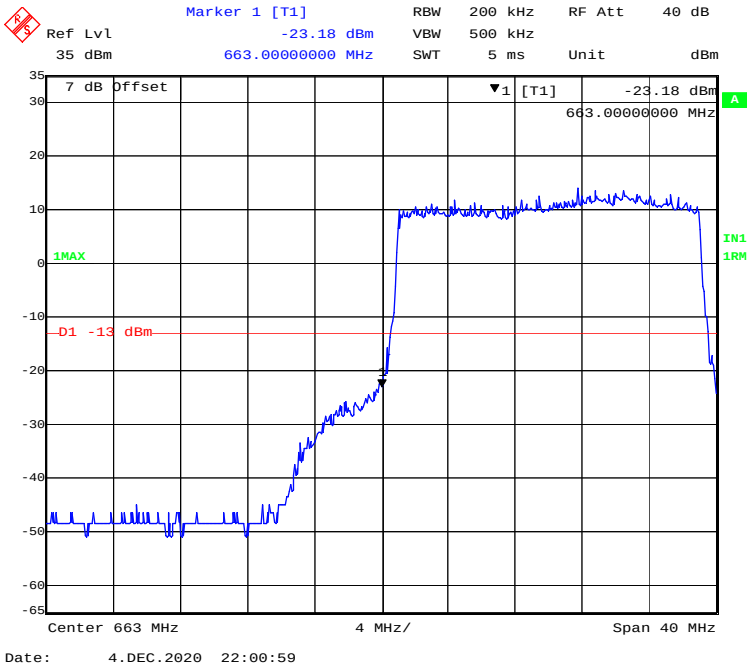
QPSK (15 MHz, FULL RB) - Left Band Edge



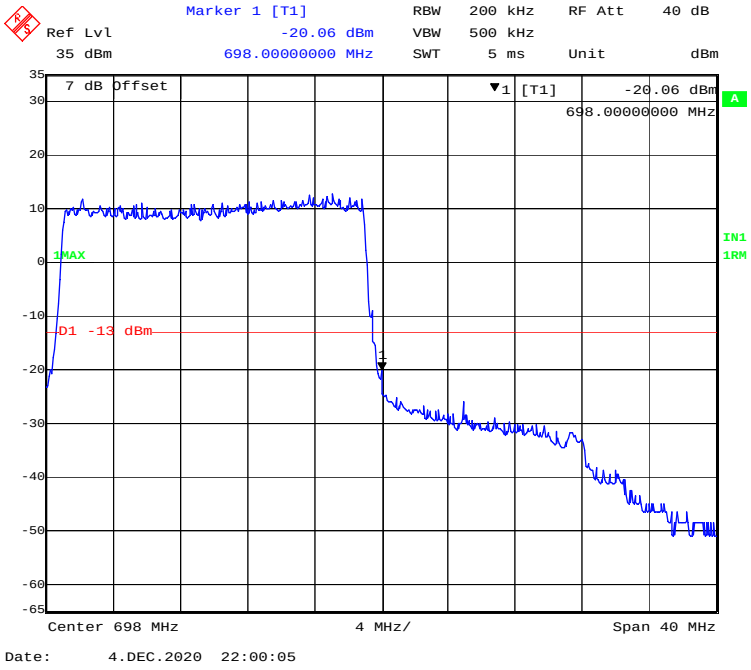
QPSK (15 MHz, FULL RB) - Right Band Edge



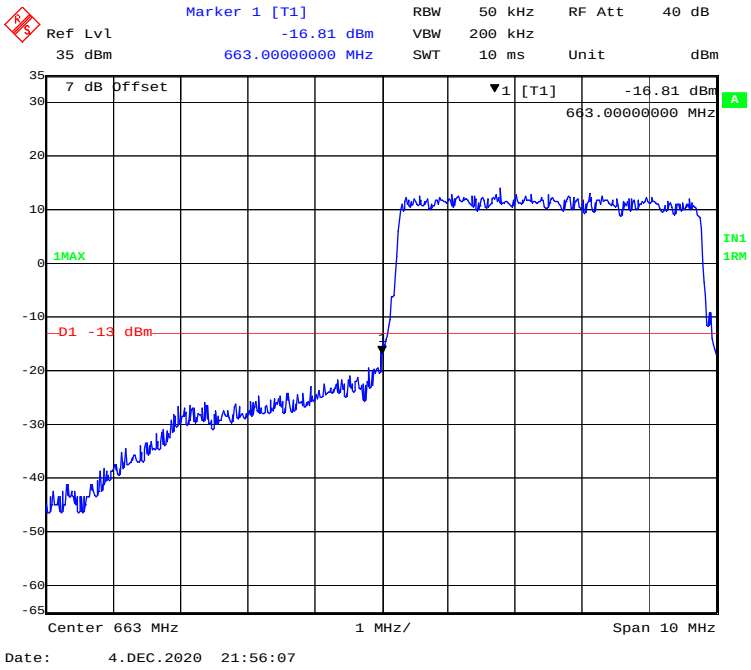
QPSK (20 MHz, FULL RB) - Left Band Edge



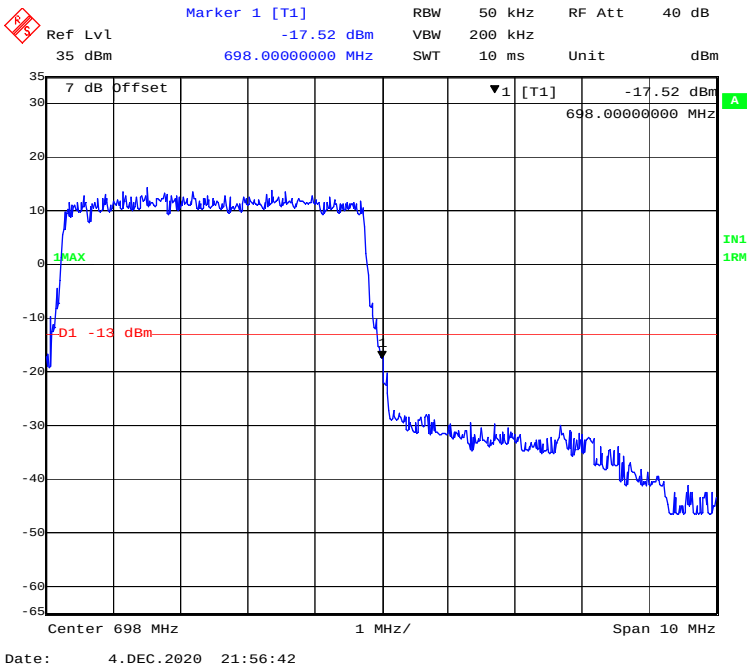
QPSK (20 MHz, FULL RB) - Right Band Edge



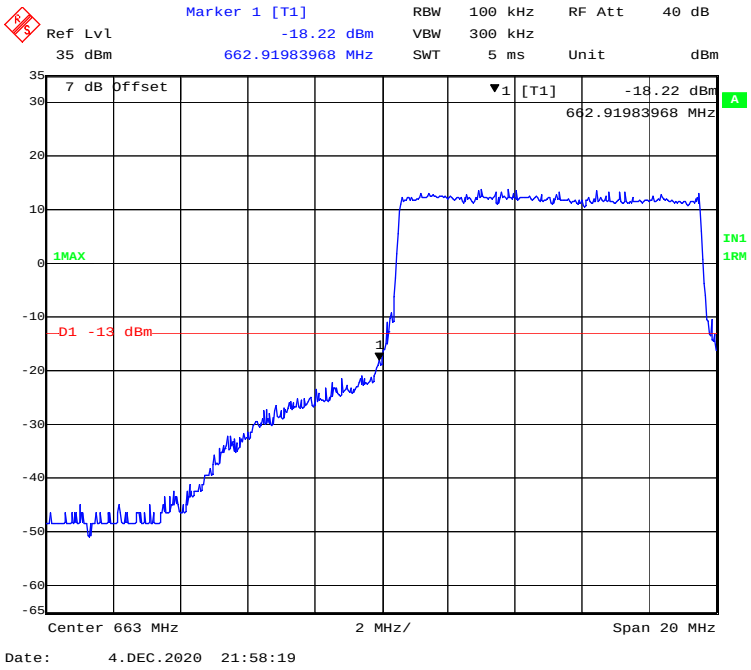
16-QAM (5 MHz, FULL RB) - Left Band Edge



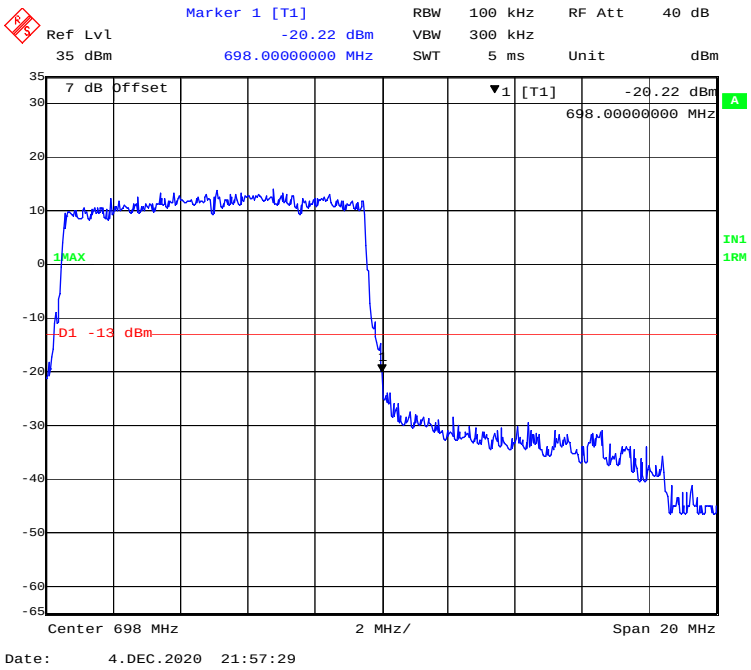
16-QAM (5 MHz, FULL RB) - Right Band Edge



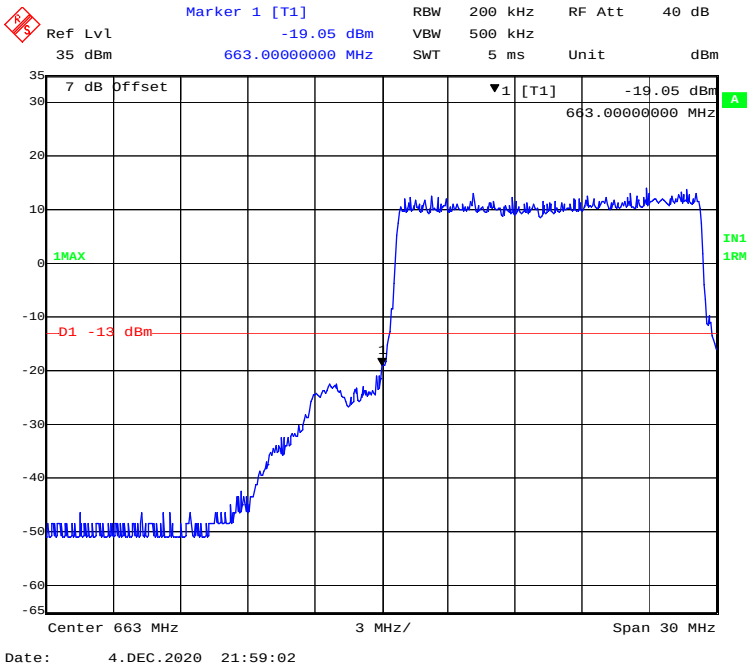
16-QAM (10 MHz, FULL RB) - Left Band Edge



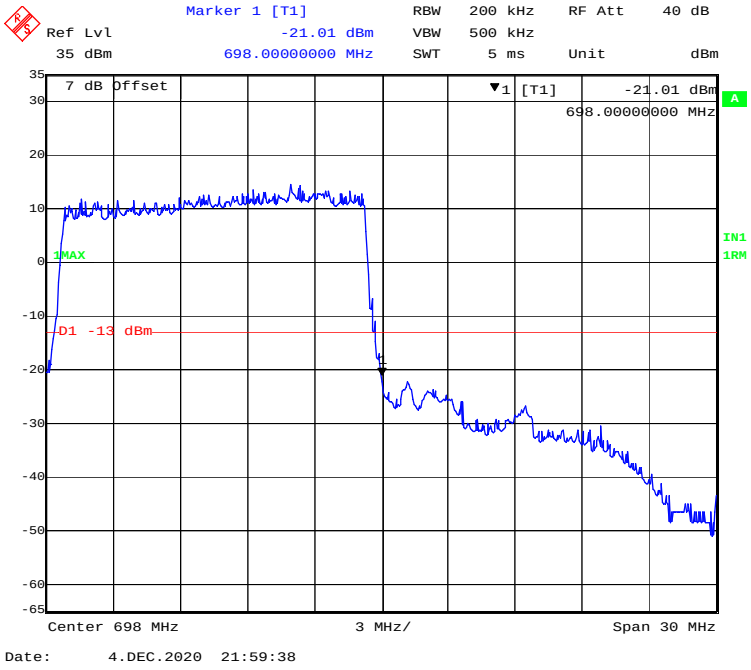
16-QAM (10 MHz, FULL RB) - Right Band Edge



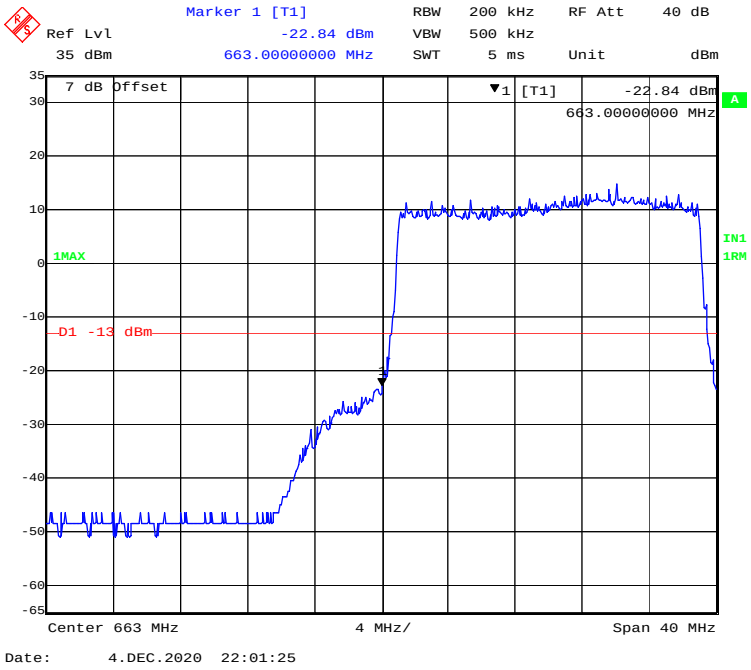
16-QAM (15 MHz, FULL RB) - Left Band Edge



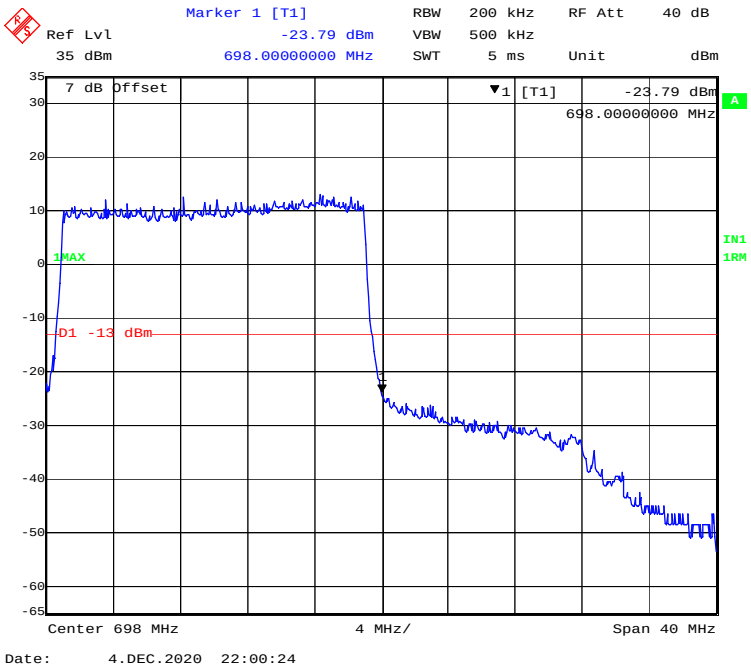
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge



16-QAM (20 MHz, FULL RB) - Right Band Edge



FCC § 2.1055; § 22.355; § 24.235; §27.54, § 90.213 - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055, §22.355, §24.235, § 90.213 and §27.54.

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

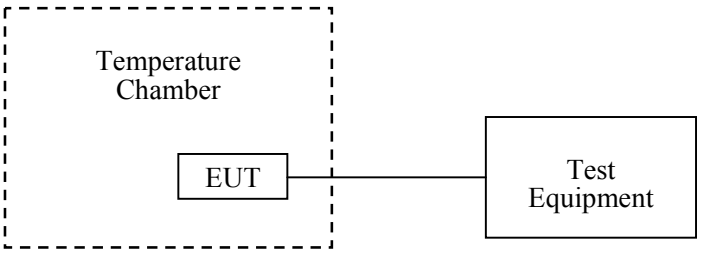
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	23.2℃
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

The testing was performed by CK Huang on 2020-12-06.

EUT operation mode: Transmitting

Test Result: Compliance.

WCDMA Band V:

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	24	20	0.023906	2.5
-20		14	0.014344	2.5
-10		16	0.011953	2.5
0		12	0.014344	2.5
10		10	0.011953	2.5
20		15	0.017930	2.5
30		13	0.015539	2.5
40		6	0.007172	2.5
50		15	0.017930	2.5
20	V min.= 12	9	0.010758	2.5
20	V max.= 36	16	0.019125	2.5

WCDMA Band II:

WCDMA Mode, Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	24	14	0.007447	Pass
-20		10	0.005319	Pass
-10		11	0.005851	Pass
0		15	0.007979	Pass
10		7	0.003723	Pass
20		14	0.007447	Pass
30		18	0.009574	Pass
40		18	0.009574	Pass
50		20	0.010638	Pass
20	V min.= 12	14	0.007447	Pass
20	V max.= 36	15	0.007979	Pass

WCDMA Band IV:

WCDMA Mode, Low Channel & High Channel					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	24	1710.4162	1754.6477	1710	1755
-20		1710.4077	1754.9464	1710	1755
-10		1710.3957	1754.7818	1710	1755
0		1710.4633	1754.6196	1710	1755
10		1710.4282	1754.6140	1710	1755
20		1710.4545	1754.6734	1710	1755
30		1710.4314	1754.7272	1710	1755
40		1710.3700	1754.9272	1710	1755
50		1710.4122	1754.6468	1710	1755
20	V min.= 12	1710.3895	1754.7249	1710	1755
20	V max.= 36	1710.3661	1754.9196	1710	1755

LTE Band 2:

Middle Channel, f_o=1880.0 MHz (QPSK) /Channel Bandwidth:20MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	24	16	0.0191	Pass
-20		10	0.0120	Pass
-10		9	0.0108	Pass
0		13	0.0155	Pass
10		13	0.0155	Pass
20		20	0.0239	Pass
30		15	0.0179	Pass
40		11	0.0132	Pass
50		13	0.0155	Pass
20	V min.= 12	8	0.0096	Pass
20	V max.= 36	18	0.0215	Pass

Middle Channel, f_o=1880.0 MHz (16-QAM) /Channel Bandwidth:20MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	24	15	0.0179	Pass
-20		13	0.0155	Pass
-10		7	0.0084	Pass
0		17	0.0203	Pass
10		9	0.0108	Pass
20		13	0.0155	Pass
30		9	0.0108	Pass
40		11	0.0132	Pass
50		13	0.0155	Pass
20	V min.= 12	20	0.0239	Pass
20	V max.= 36	15	0.0179	Pass

LTE Band 4:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	1710.0462	1754.9691	1710	1755
-20		1710.0406	1754.9696	1710	1755
-10		1710.0425	1754.9669	1710	1755
0		1710.0477	1754.9686	1710	1755
10		1710.0425	1754.9639	1710	1755
20		1710.0472	1754.9677	1710	1755
30		1710.0423	1754.9648	1710	1755
40		1710.0438	1754.9673	1710	1755
50		1710.0478	1754.9681	1710	1755
20	V min.= 12	1710.0401	1754.9644	1710	1755
20	V max.= 36	1710.0481	1754.9686	1710	1755

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	1710.0413	1754.9606	1710	1755
-20		1710.0408	1754.9699	1710	1755
-10		1710.0460	1754.9610	1710	1755
0		1710.0444	1754.9604	1710	1755
10		1710.0474	1754.9691	1710	1755
20		1710.0495	1754.9677	1710	1755
30		1710.0422	1754.9684	1710	1755
40		1710.0454	1754.9655	1710	1755
50		1710.0486	1754.9678	1710	1755
20	V min.= 12	1710.0452	1754.9681	1710	1755
20	V max.= 36	1710.0404	1754.9625	1710	1755

LTE Band 5:

Middle Channel, f_o = 836.5 MHz (QPSK)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	24	19	0.0227	2.5
-20		13	0.0155	2.5
-10		7	0.0084	2.5
0		10	0.0120	2.5
10		11	0.0132	2.5
20		17	0.0203	2.5
30		12	0.0143	2.5
40		15	0.0179	2.5
50		14	0.0167	2.5
20	V min.= 12	15	0.0179	2.5
20	V max.= 36	7	0.0084	2.5

Middle Channel, f_o = 836.5 MHz (16-QAM)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	24	10	0.0120	2.5
-20		16	0.0191	2.5
-10		10	0.0120	2.5
0		12	0.0143	2.5
10		6	0.0072	2.5
20		13	0.0155	2.5
30		11	0.0132	2.5
40		17	0.0203	2.5
50		20	0.0239	2.5
20	V min.= 12	15	0.0179	2.5
20	V max.= 36	16	0.0191	2.5

LTE Band 12:

Low Channel & High Channel (QPSK) /Channel Bandwidth:10MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	699.9523	715.9468	699	716
-20		699.9577	715.9407	699	716
-10		699.9564	715.9482	699	716
0		699.9580	715.9475	699	716
10		699.9554	715.9451	699	716
20		699.9538	715.9426	699	716
30		699.9515	715.9482	699	716
40		699.9563	715.9472	699	716
50		699.9554	715.9448	699	716
20	V min.= 12	699.9539	715.9468	699	716
20	V max.= 36	699.9537	715.9461	699	716

Low Channel & High Channel (16-QAM) /Channel Bandwidth:10MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	699.9515	715.9476	699	716
-20		699.9574	715.9470	699	716
-10		699.9514	715.9498	699	716
0		699.9591	715.9458	699	716
10		699.9536	715.9413	699	716
20		699.9515	715.9461	699	716
30		699.9559	715.9495	699	716
40		699.9517	715.9400	699	716
50		699.9595	715.9432	699	716
20	V min.= 12	699.9551	715.9489	699	716
20	V max.= 36	699.9598	715.9433	699	716

LTE Band 13:

Low Channel & High Channel (QPSK) /Channel Bandwidth:5MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	777.9575	786.9488	777	787
-20		777.9518	786.9479	777	787
-10		777.9549	786.9484	777	787
0		777.9526	786.9405	777	787
10		777.9578	786.9487	777	787
20		777.9571	786.9487	777	787
30		777.9512	786.9479	777	787
40		777.9533	786.9418	777	787
50		777.9528	786.9432	777	787
20	V min.= 12	777.9547	786.9475	777	787
20	V max.= 36	777.9512	786.9440	777	787

Low Channel & High Channel (16-QAM) /Channel Bandwidth:5MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	777.9569	786.9445	777	787
-20		777.9570	786.9414	777	787
-10		777.9503	786.9408	777	787
0		777.9570	786.9423	777	787
10		777.9556	786.9486	777	787
20		777.9524	786.9446	777	787
30		777.9522	786.9439	777	787
40		777.9563	786.9470	777	787
50		777.9514	786.9410	777	787
20	V min.= 12	777.9586	786.9405	777	787
20	V max.= 36	777.9589	786.9453	777	787

LTE Band 14:

Middle Channel, f_o=793.0 MHz (QPSK) /Channel Bandwidth:10MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	24	14	0.0177	2.5
-20		16	0.0202	2.5
-10		20	0.0252	2.5
0		15	0.0189	2.5
10		10	0.0126	2.5
20		8	0.0101	2.5
30		12	0.0151	2.5
40		12	0.0151	2.5
50		15	0.0189	2.5
20	V min.= 12	8	0.0101	2.5
20	V max.= 36	11	0.0139	2.5

Middle Channel, f_o=793.0 MHz (16-QAM) /Channel Bandwidth:10MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	24	20	0.0252	2.5
-20		20	0.0252	2.5
-10		10	0.0126	2.5
0		13	0.0164	2.5
10		15	0.0189	2.5
20		18	0.0227	2.5
30		15	0.0189	2.5
40		16	0.0202	2.5
50		15	0.0189	2.5
20	V min.= 12	17	0.0214	2.5
20	V max.= 36	14	0.0177	2.5

LTE Band 66:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	1710.9537	1779.9508	1710	1780
-20		1710.9536	1779.9541	1710	1780
-10		1710.9521	1779.9518	1710	1780
0		1710.9529	1779.9575	1710	1780
10		1710.9506	1779.9562	1710	1780
20		1710.9538	1779.9554	1710	1780
30		1710.9544	1779.9536	1710	1780
40		1710.9597	1779.9573	1710	1780
50		1710.9576	1779.9513	1710	1780
20	V min.= 12	1710.9597	1779.9513	1710	1780
20	V max.= 36	1710.9544	1779.9557	1710	1780

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	24	1710.9557	1779.9517	1710	1780
-20		1710.9562	1779.9583	1710	1780
-10		1710.9565	1779.9594	1710	1780
0		1710.9516	1779.959	1710	1780
10		1710.9529	1779.9512	1710	1780
20		1710.9513	1779.9596	1710	1780
30		1710.9563	1779.9583	1710	1780
40		1710.9531	1779.9588	1710	1780
50		1710.9538	1779.9552	1710	1780
20	V min.= 12	1710.9519	1779.9534	1710	1780
20	V max.= 36	1710.9558	1779.9536	1710	1780

LTE Band 71:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	24	663.9576	697.9502	663	698
-20		663.9554	697.9513	663	698
-10		663.9566	697.9583	663	698
0		663.9502	697.9501	663	698
10		663.9546	697.9556	663	698
20		663.9560	697.9575	663	698
30		663.9529	697.9564	663	698
40		663.9591	697.9595	663	698
50		663.9577	697.9600	663	698
20	V min.= 12	663.9556	697.9569	663	698
20	V max.= 36	663.9525	697.9504	663	698

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	24	663.9517	697.9531	663	698
-20		663.9547	697.9538	663	698
-10		663.9513	697.9595	663	698
0		663.9599	697.9572	663	698
10		663.9578	697.9515	663	698
20		663.9600	697.9509	663	698
30		663.9541	697.9591	663	698
40		663.9553	697.9509	663	698
50		663.9576	697.9583	663	698
20	V min.= 12	663.9593	697.9545	663	698
20	V max.= 36	663.9535	697.9544	663	698

Declarations

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2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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