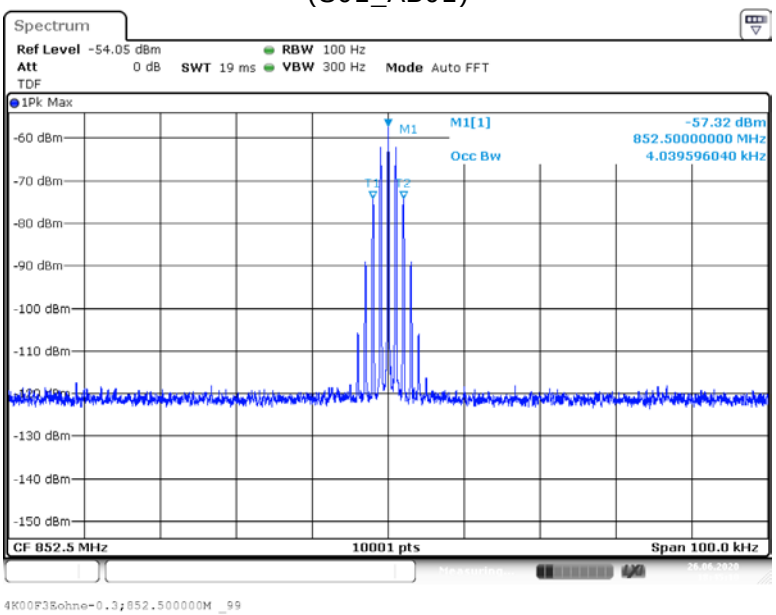
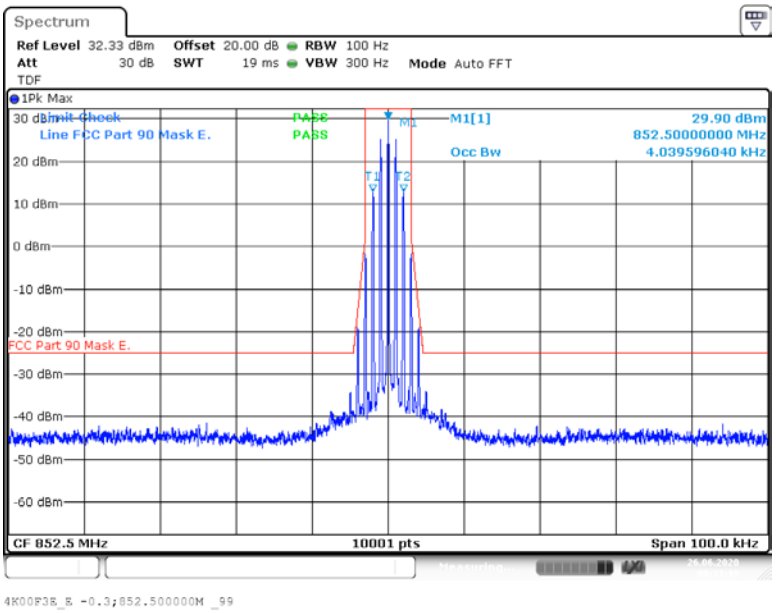
4.3.4.2FREQUENCY BAND = 851 MHZ – 854 MHZ

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 4K00F3E (S01_AB01)

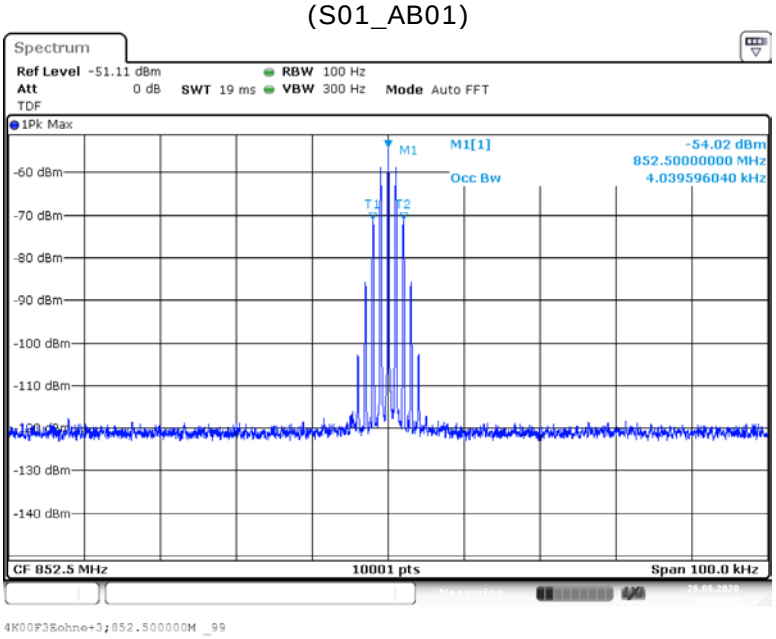


Input Signal

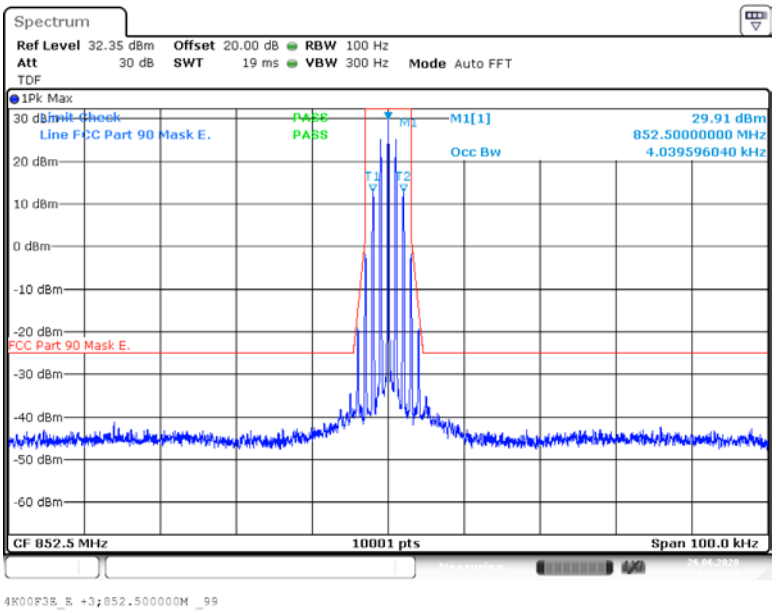


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 4K00F3E
(S01_AB01)

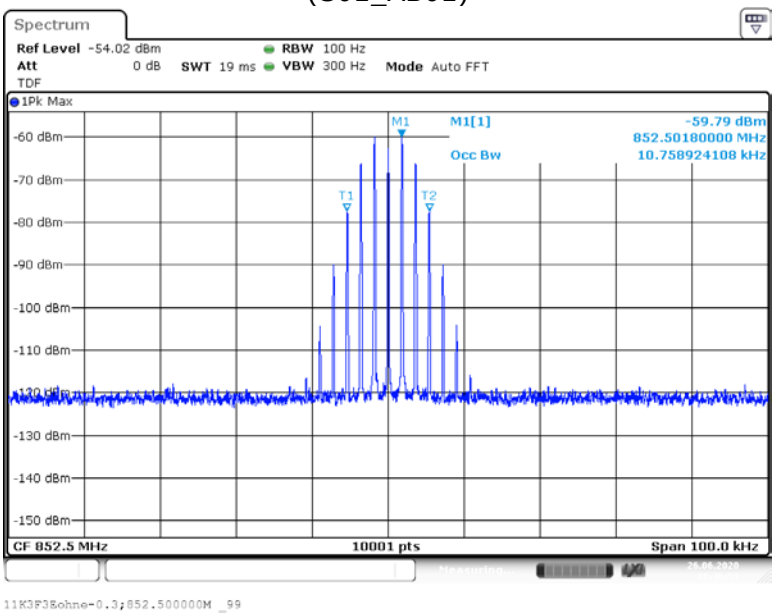


Input Signal

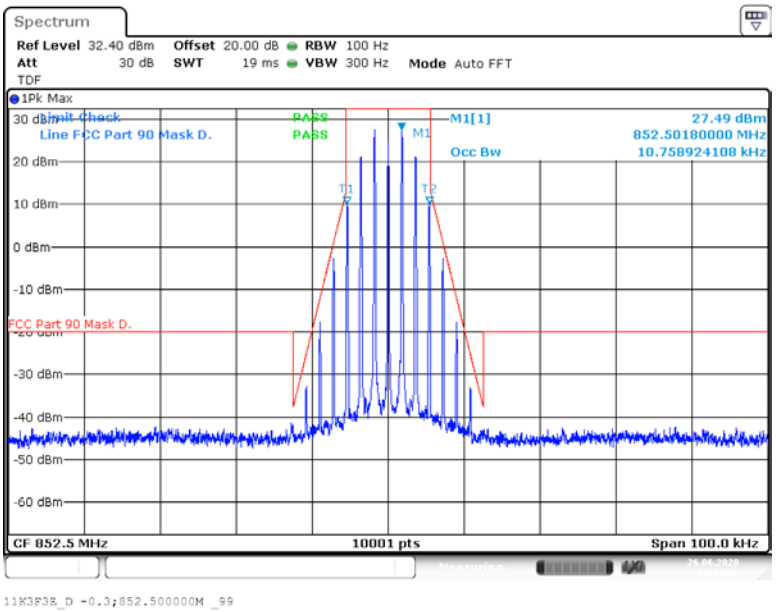


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 11K3F3E (S01_AB01)

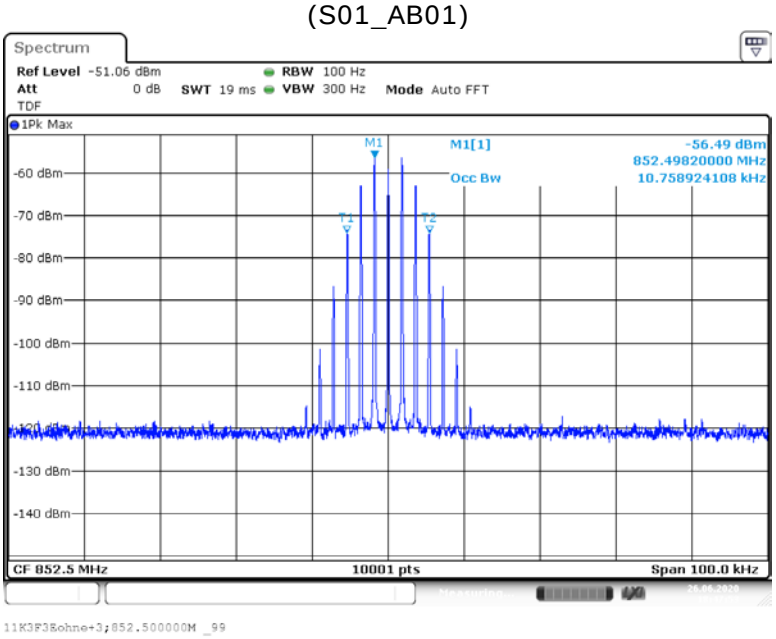


Input Signal

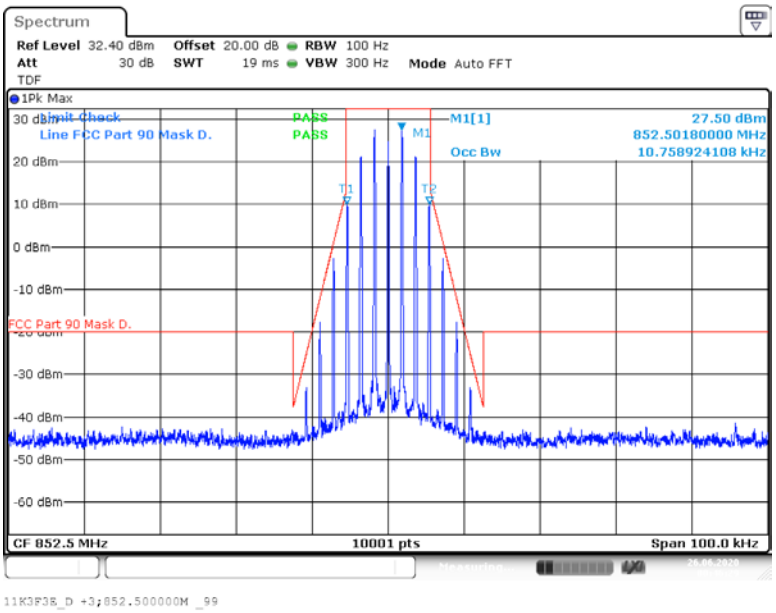


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 11K3F3E
(S01_AB01)

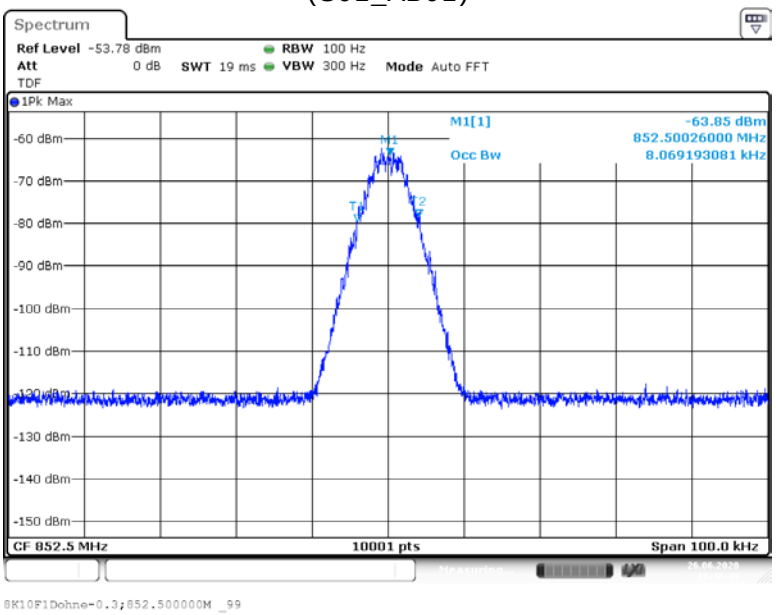


Input Signal

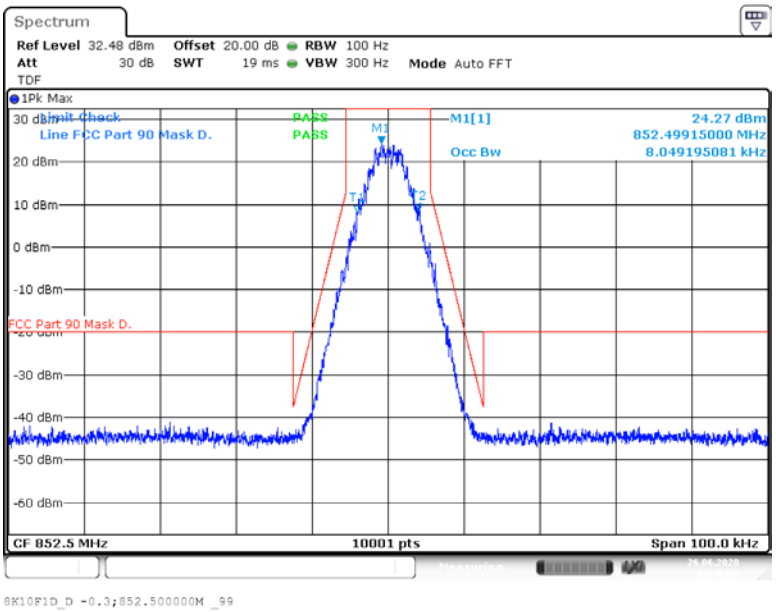


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 8K10F1D (S01_AB01)

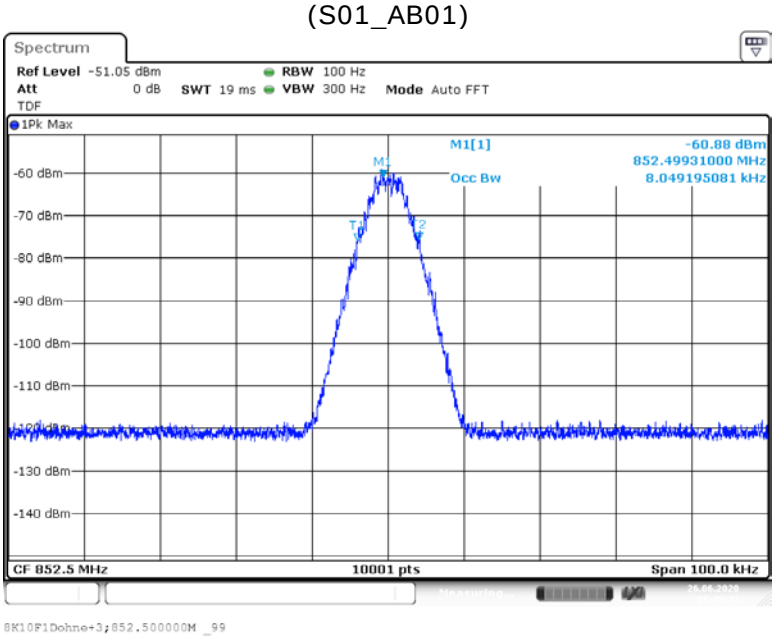


Input Signal

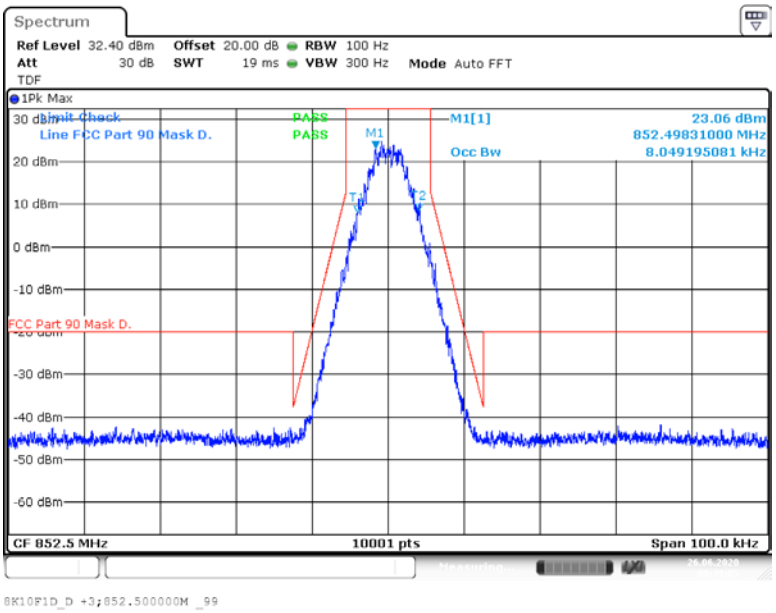


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 8K10F1D
(S01_AB01)

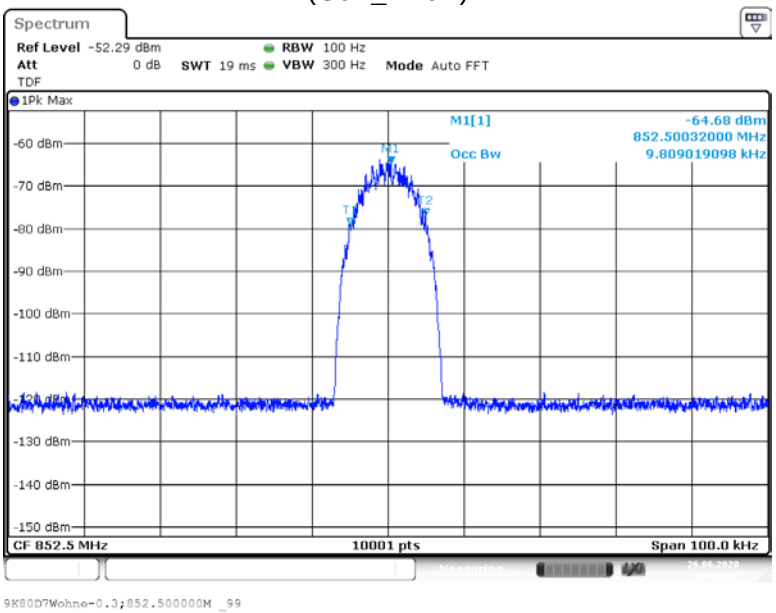


Input Signal

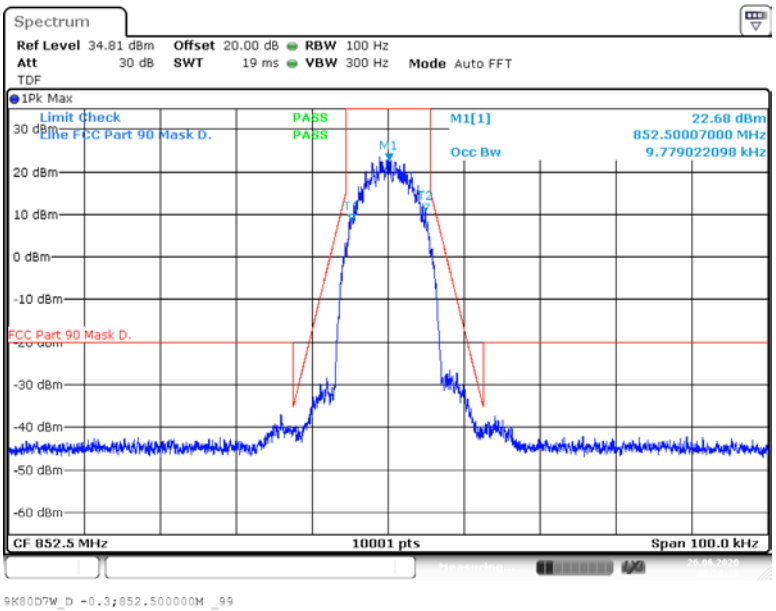


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 9K80D7W (S01_AB01)

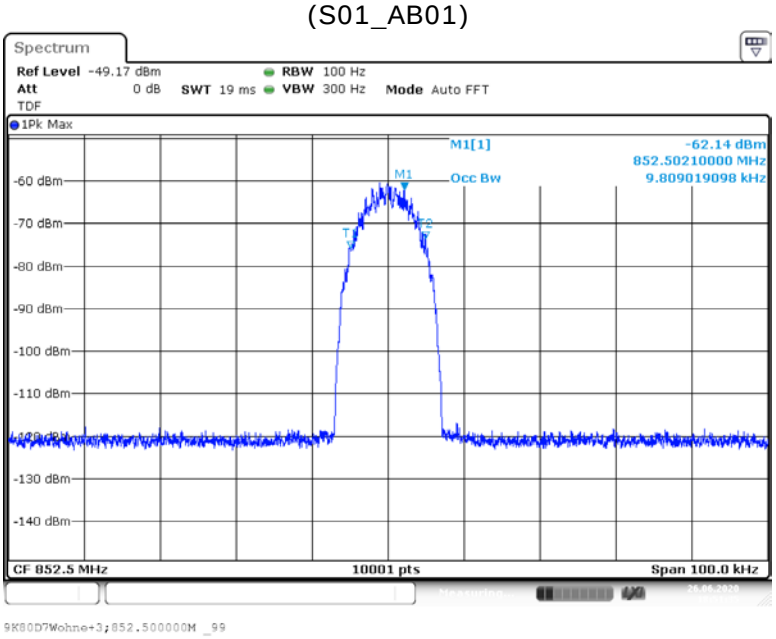


Input Signal

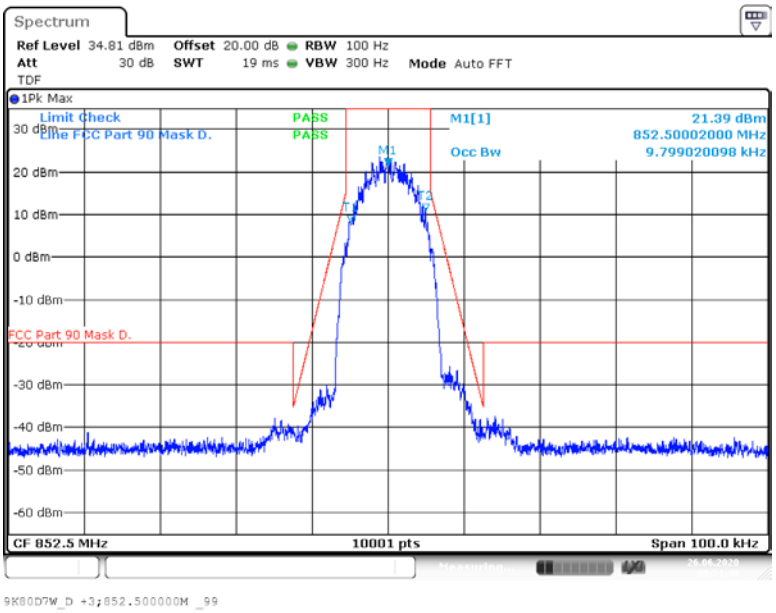


Output Signal

Frequency Band = 851 MHz – 854 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 9K80D7W
(S01_AB01)



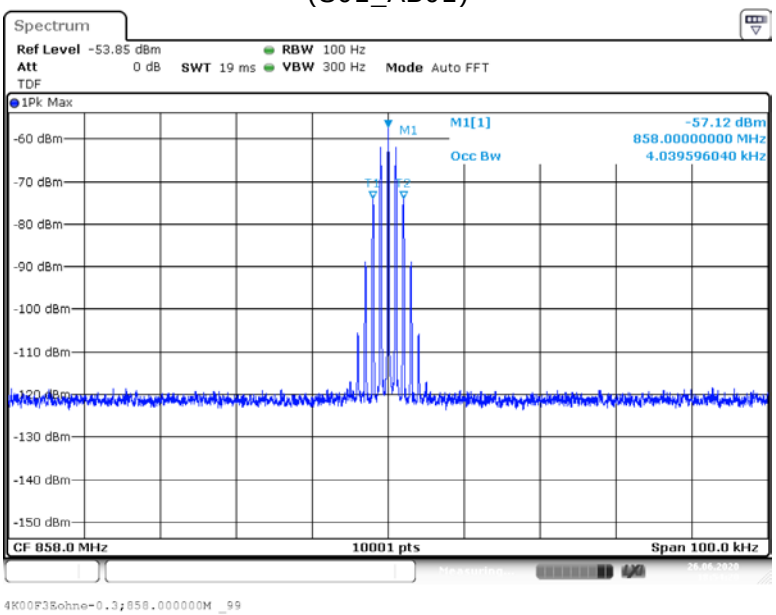
Input Signal



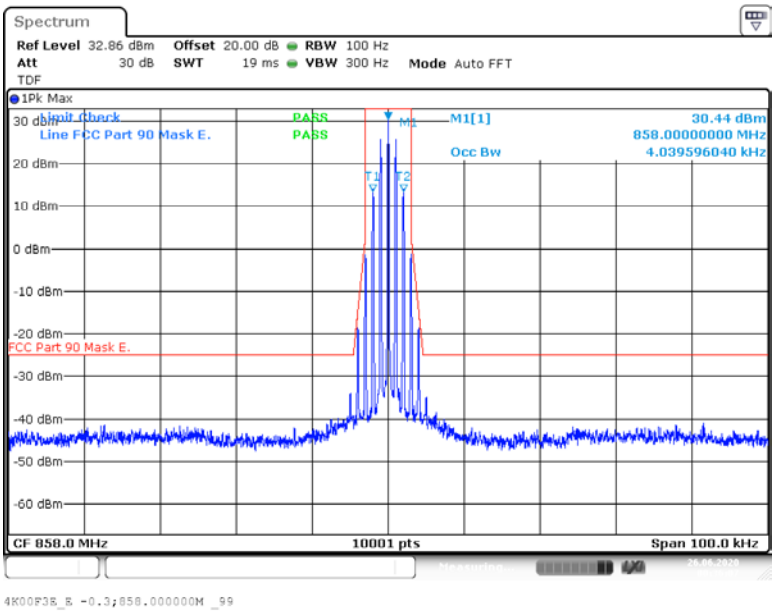
Output Signal

4.3.4.3FREQUENCY BAND = 854 MHZ – 862 MHZ

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 4K00F3E (S01_AB01)

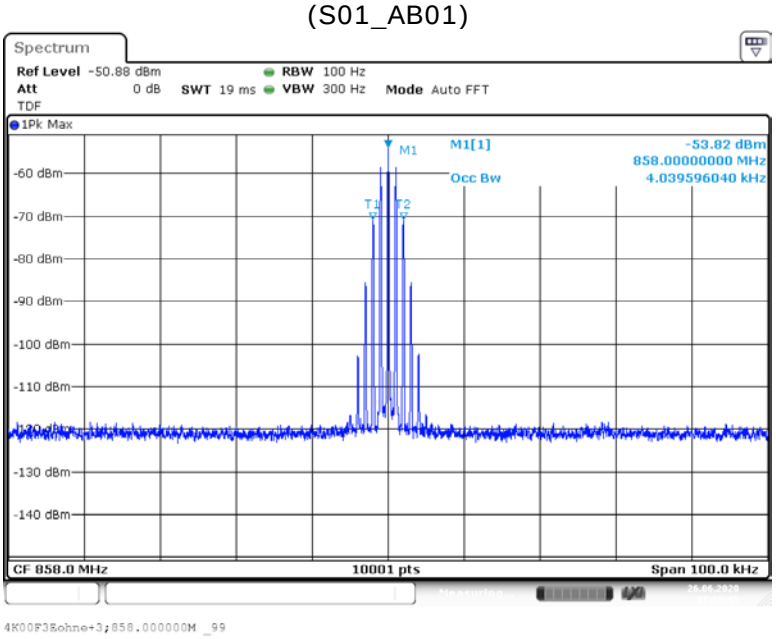


Input Signal

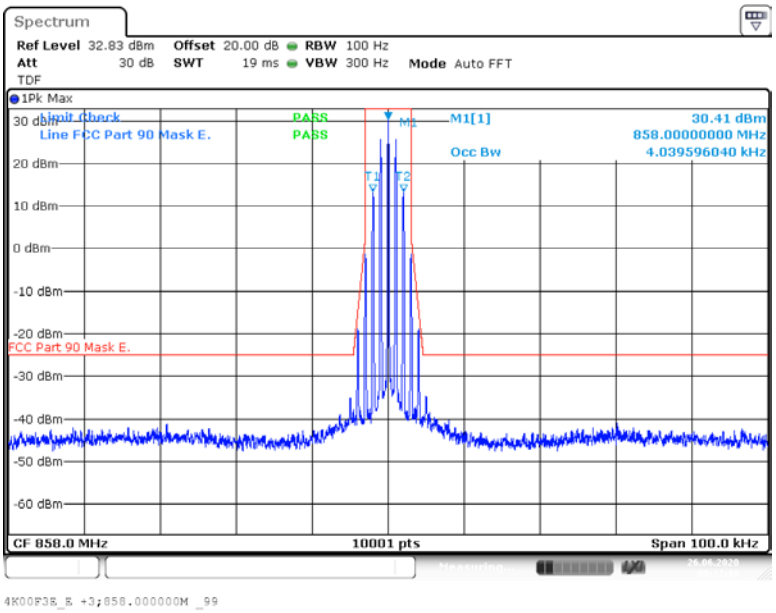


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 4K00F3E
(S01_AB01)

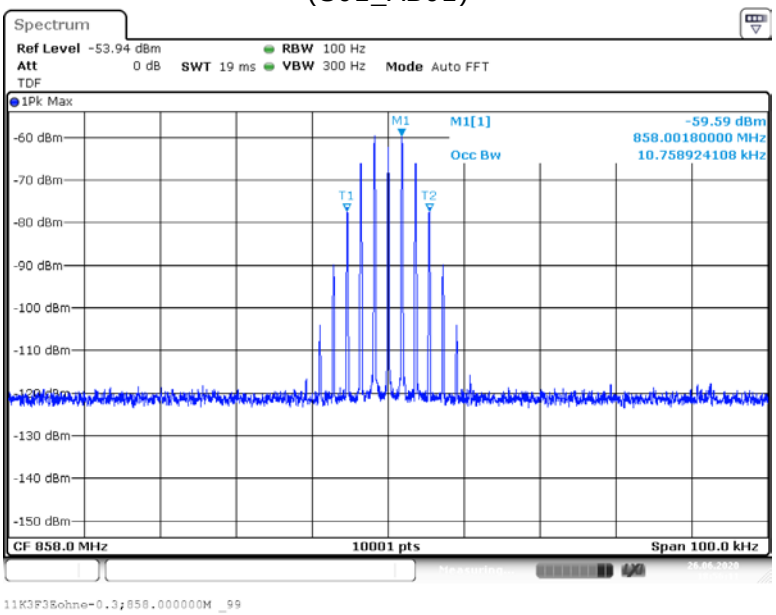


Input Signal

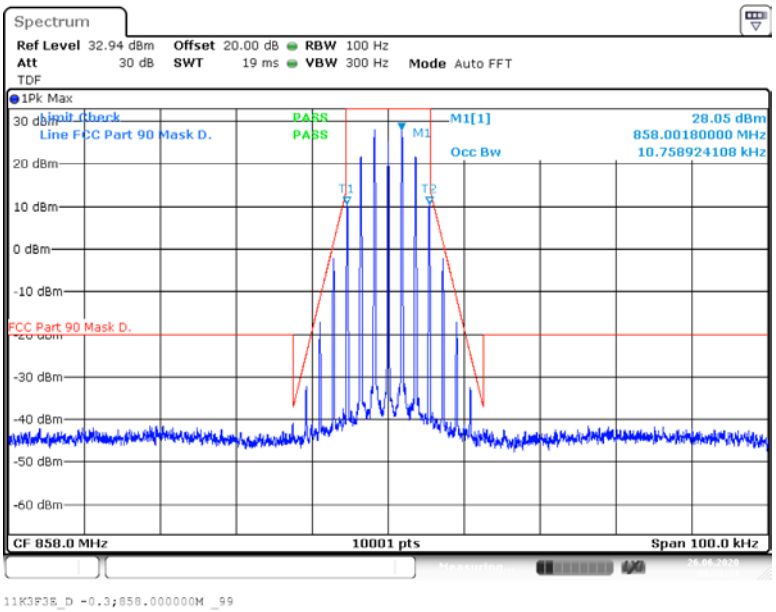


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 11K3F3E (S01_AB01)

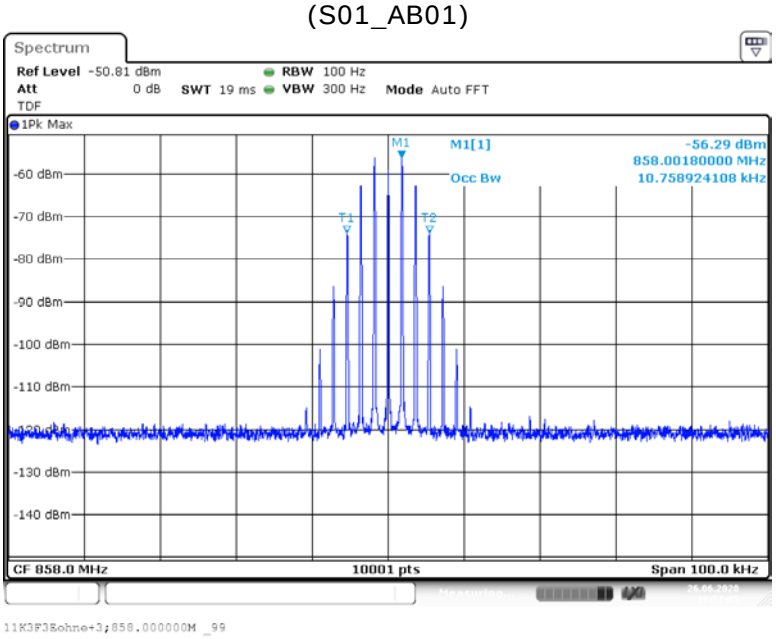


Input Signal

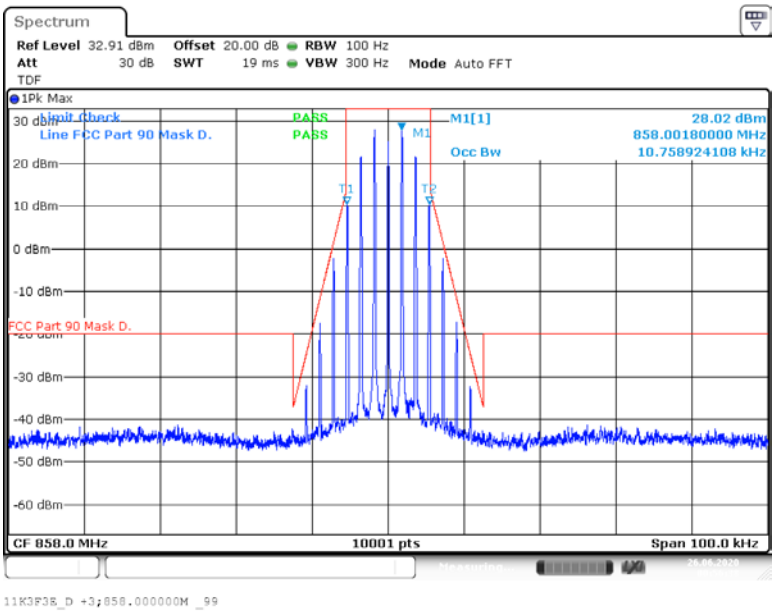


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 11K3F3E
(S01_AB01)

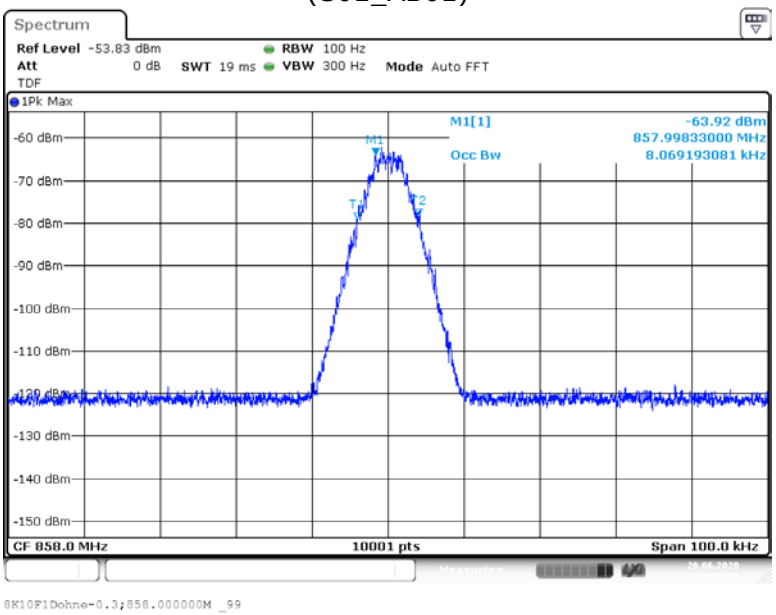


Input Signal

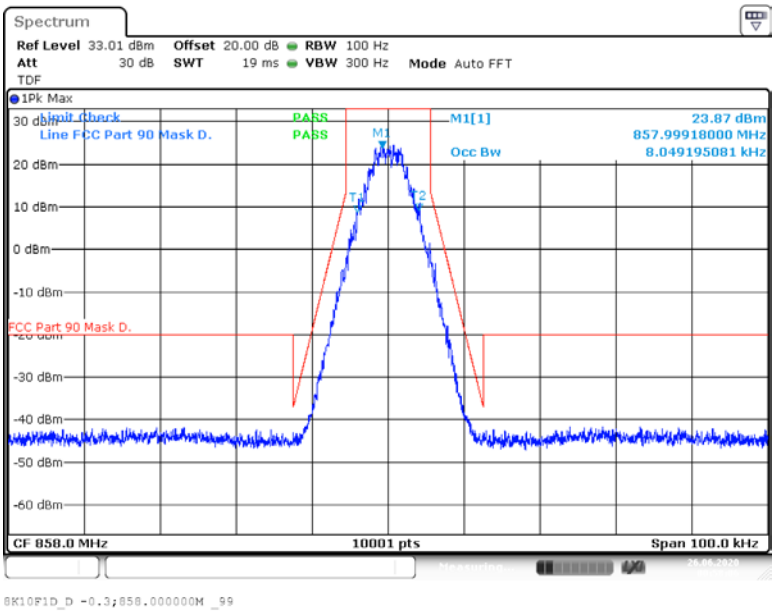


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 8K10F1D (S01_AB01)

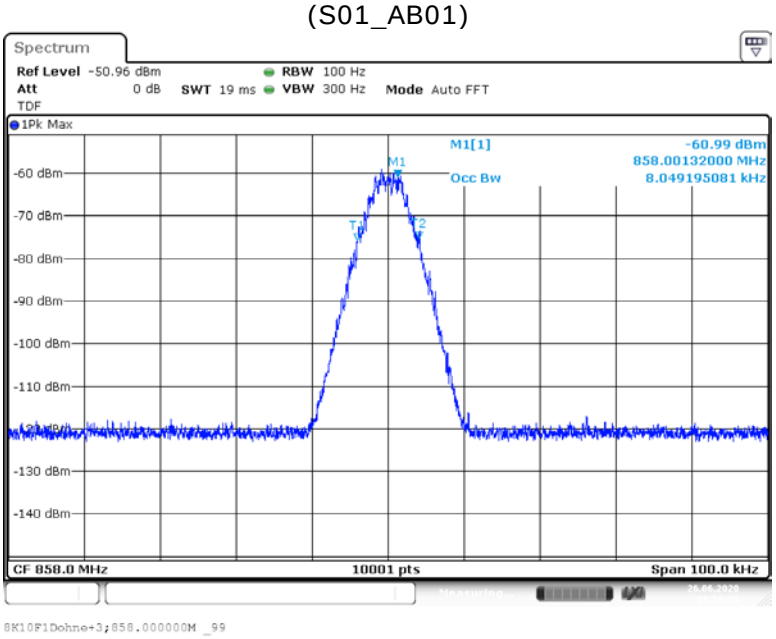


Input Signal

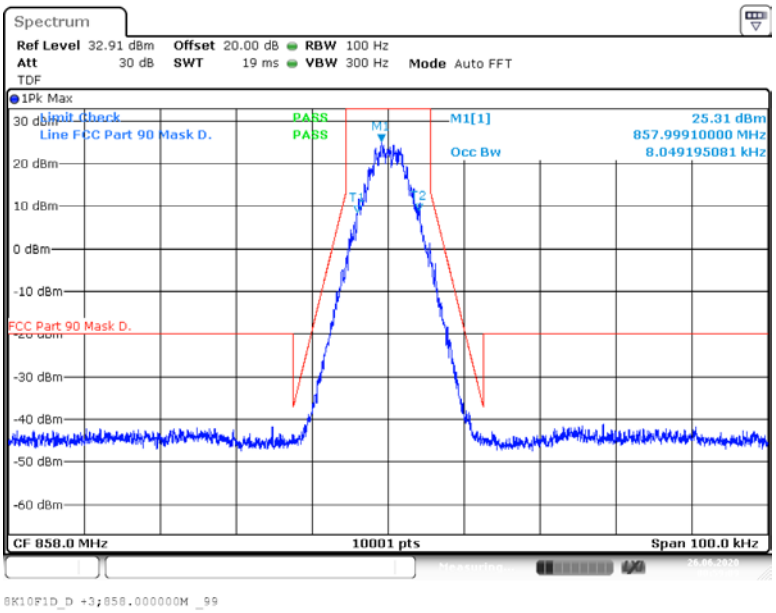


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 8K10F1D
(S01_AB01)

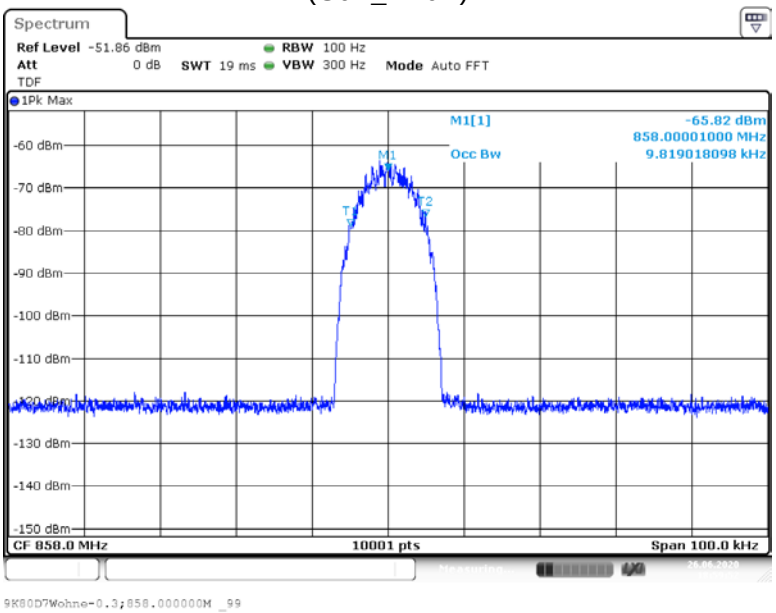


Input Signal

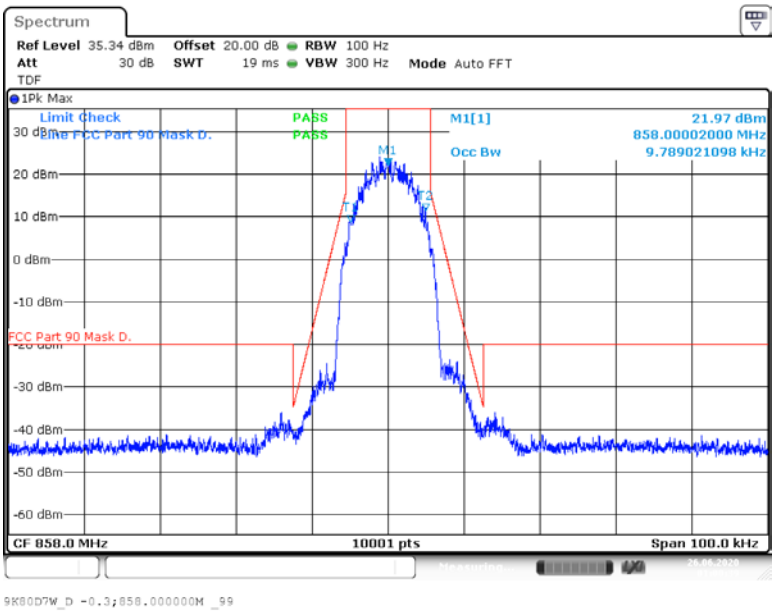


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 9K80D7W (S01_AB01)

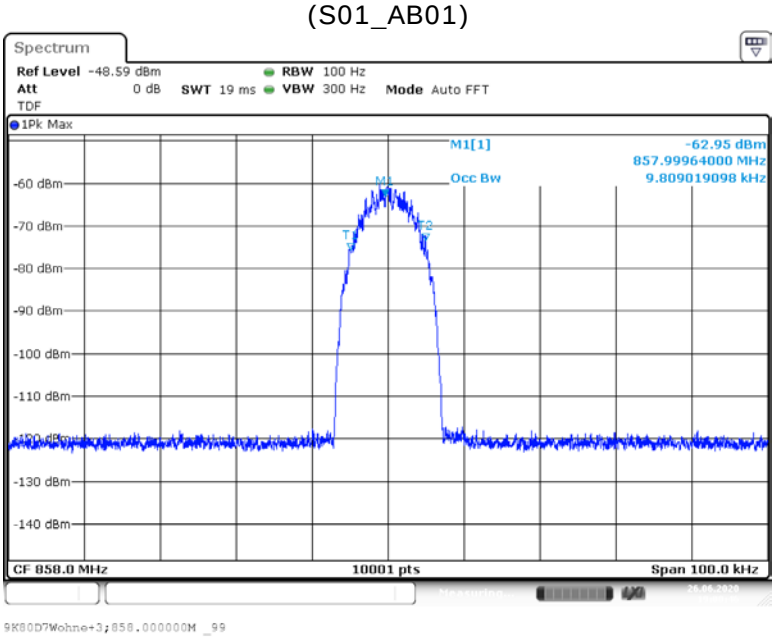


Input Signal

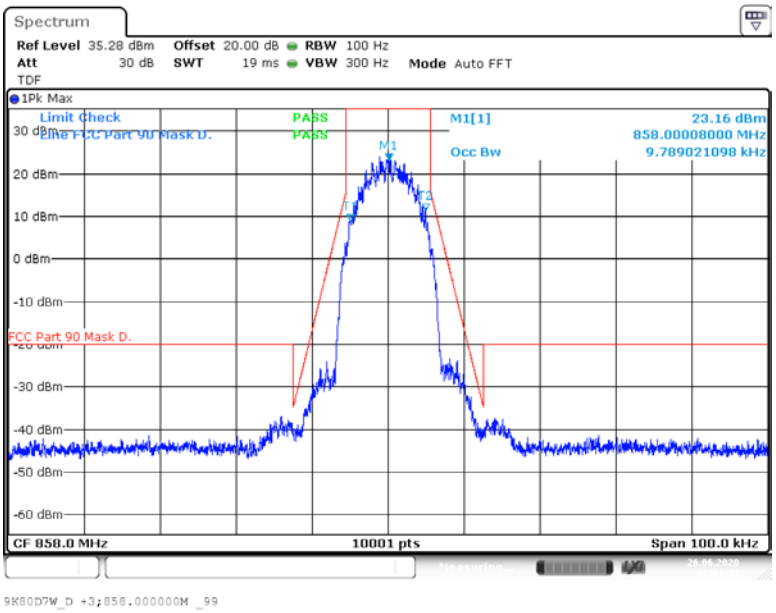


Output Signal

Frequency Band = 854 MHz – 862 MHz, Direction = RF downlink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 9K80D7W
(S01_AB01)



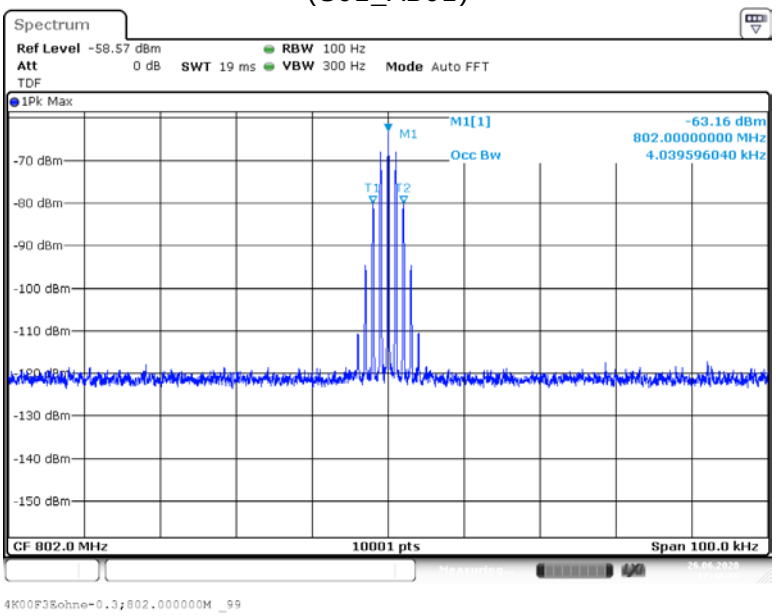
Input Signal



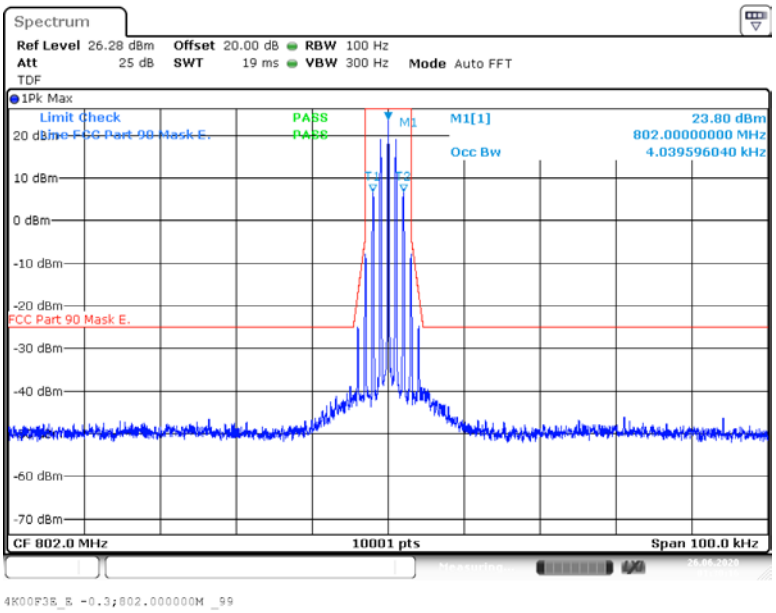
Output Signal

4.3.4.4FREQUENCY BAND = 799 MHZ – 805 MHZ

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 4K00F3E (S01_AB01)

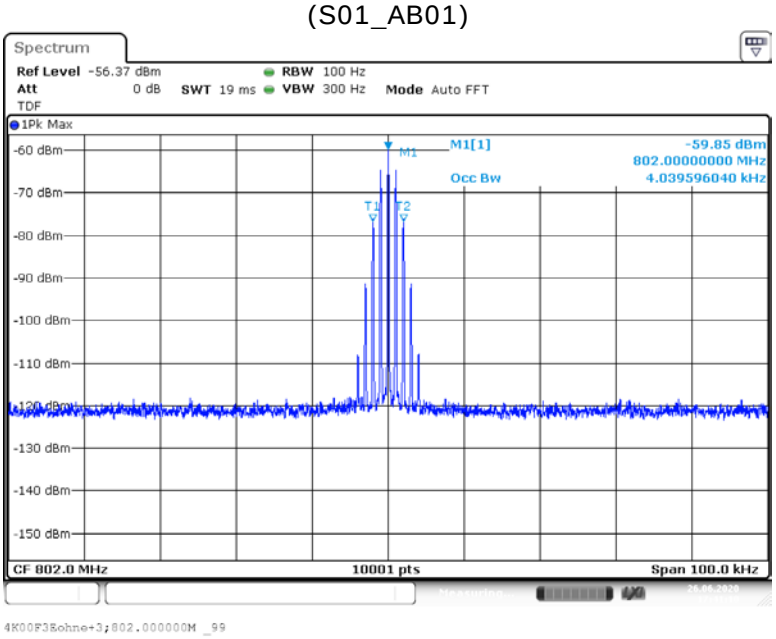


Input Signal

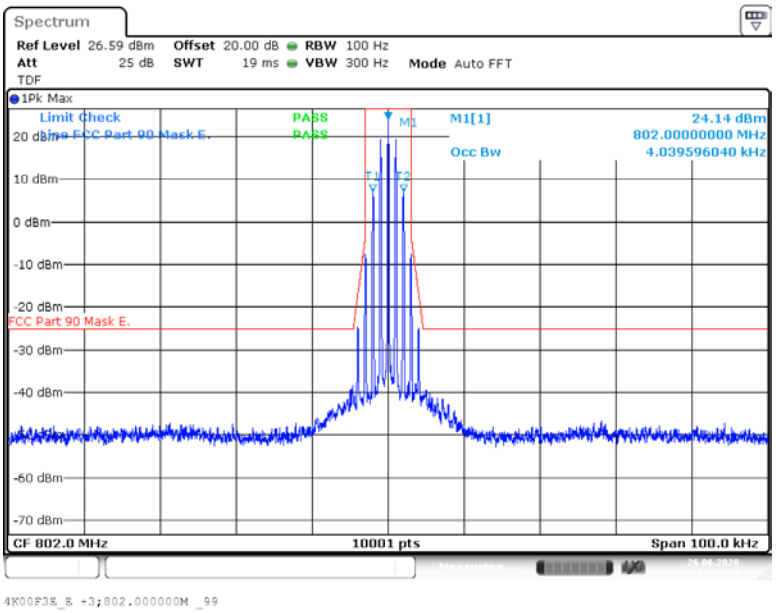


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 4K00F3E
(S01_AB01)

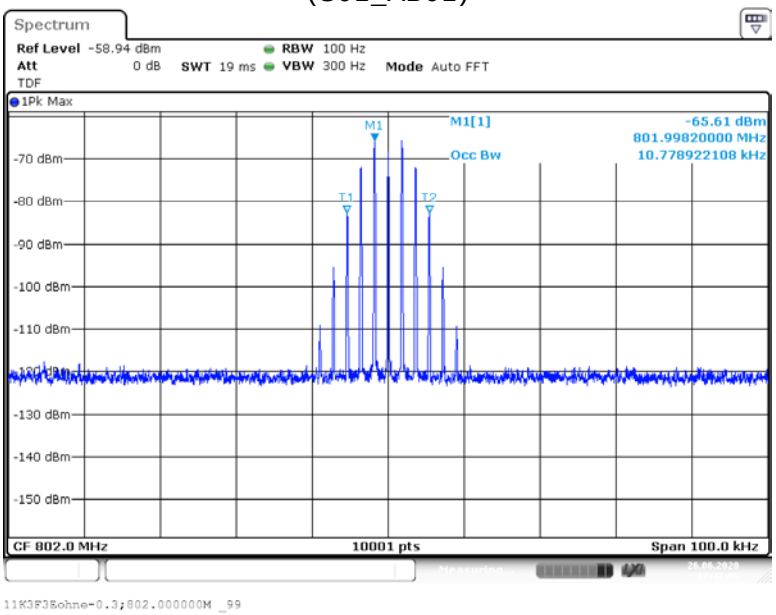


Input Signal

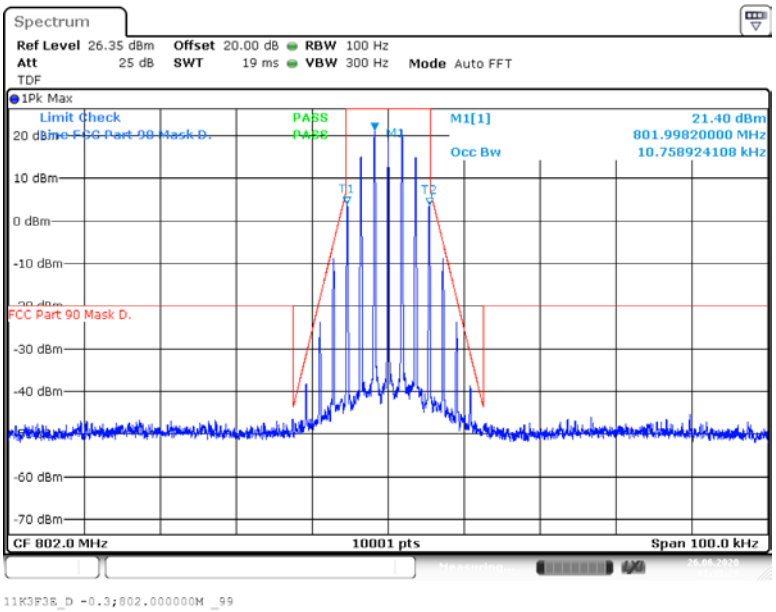


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink,
Input Power = 0.3 dB < AGC, at **fm** Signal Type = 11K3F3E
(S01_AB01)

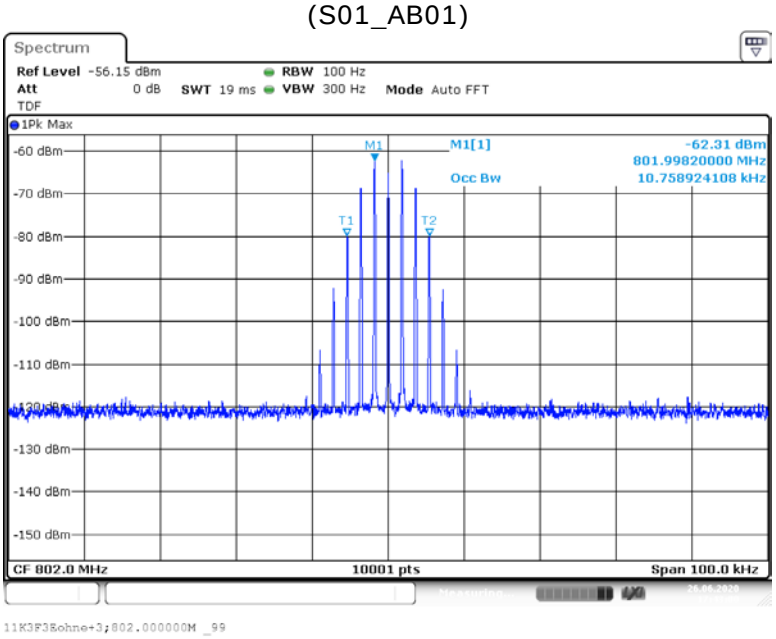


Input Signal

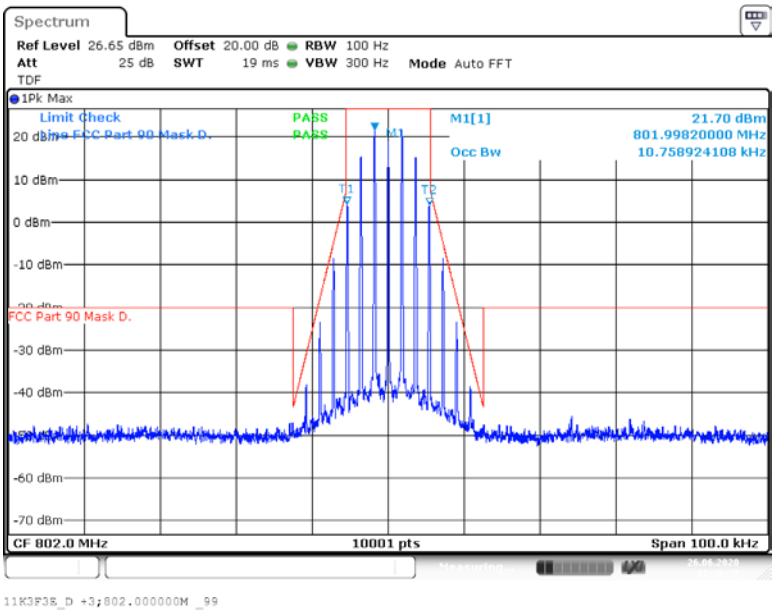


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 11K3F3E
(S01_AB01)

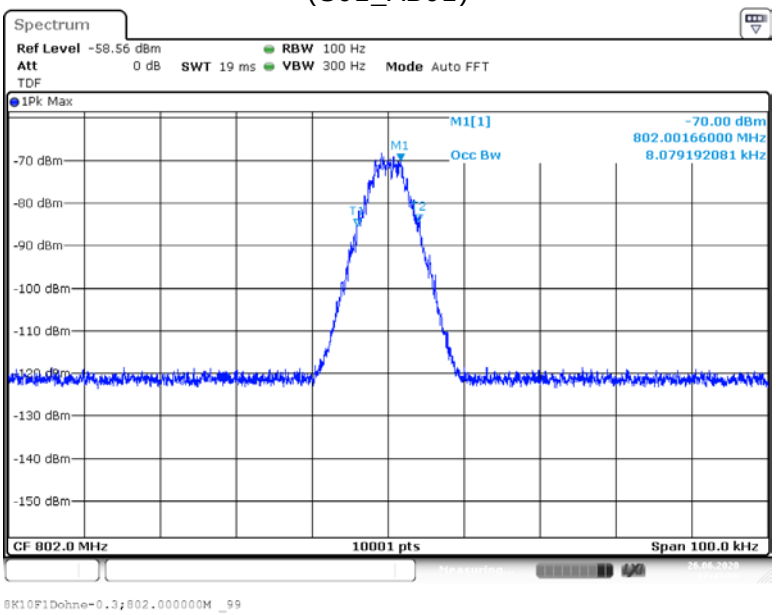


Input Signal

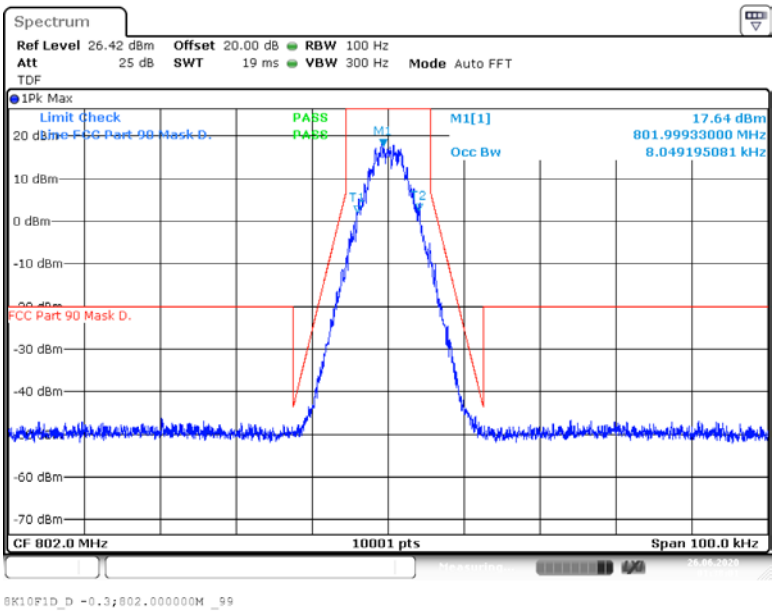


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 8K10F1D (S01_AB01)

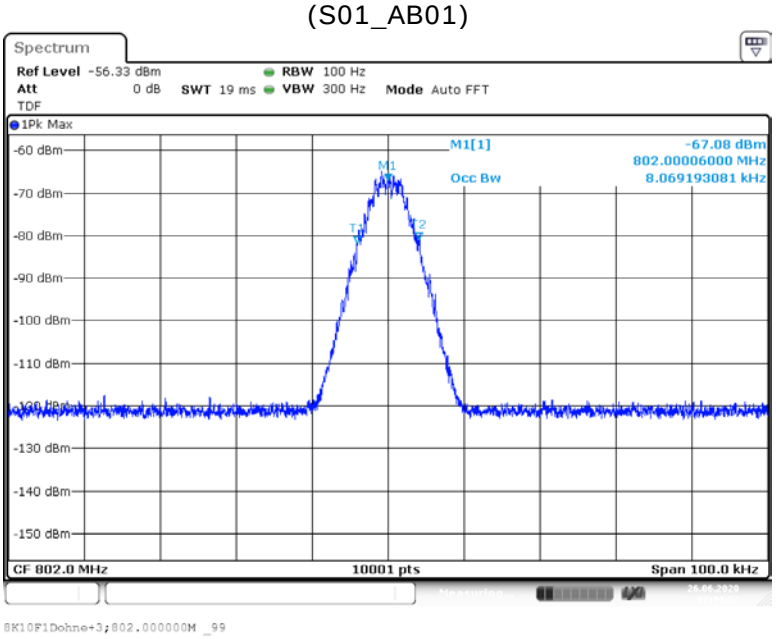


Input Signal

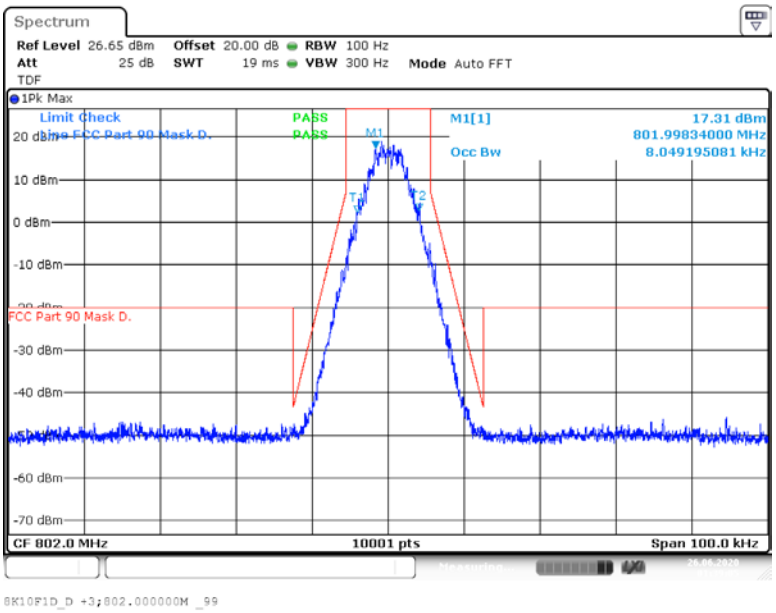


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 8K10F1D
(S01_AB01)

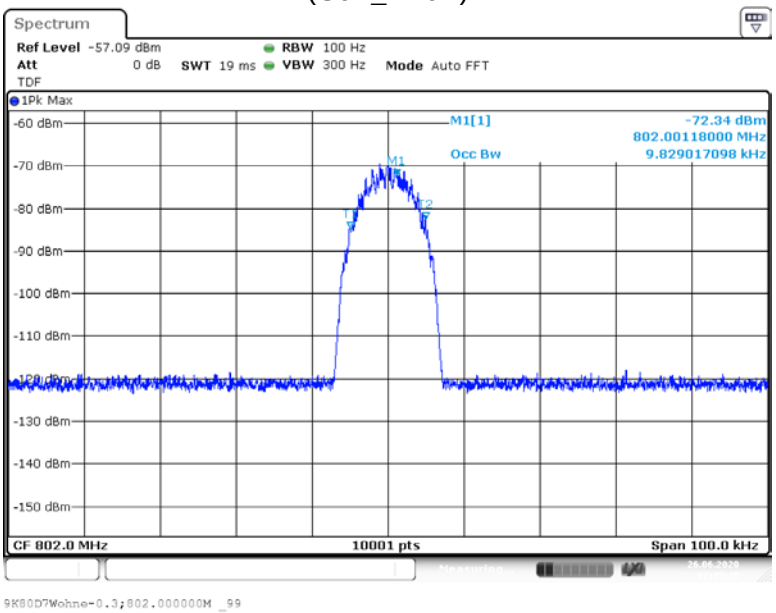


Input Signal

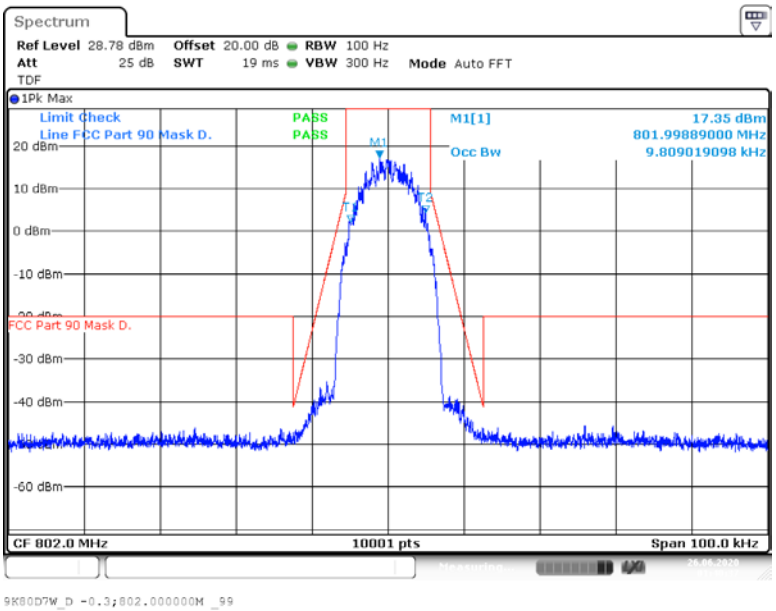


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 9K80D7W (S01_AB01)

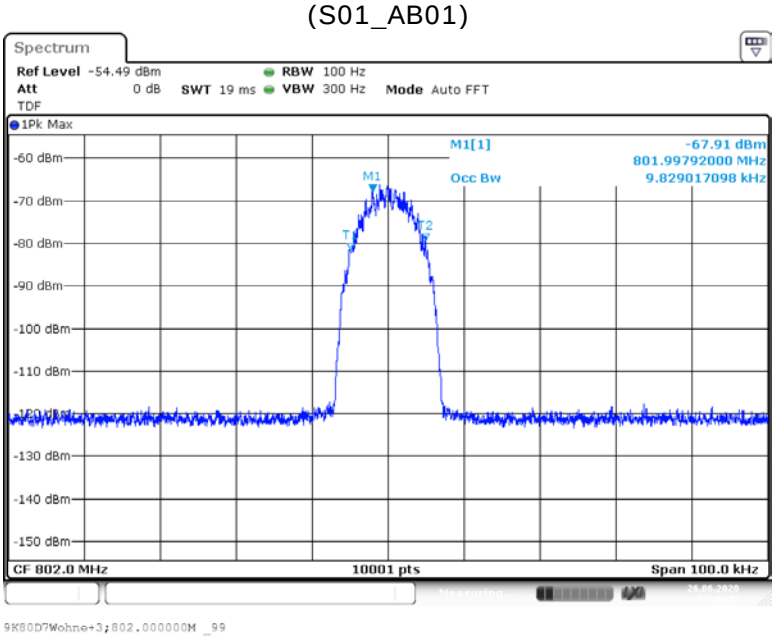


Input Signal

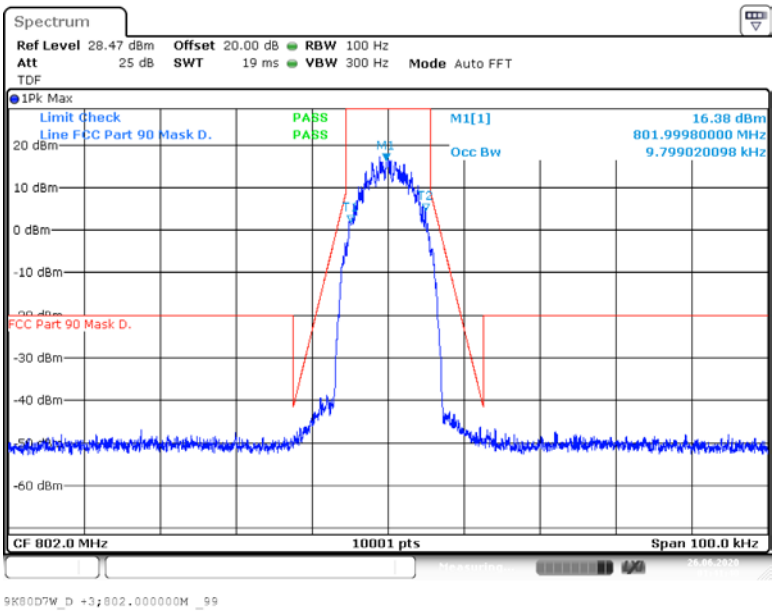


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 9K80D7W
(S01_AB01)

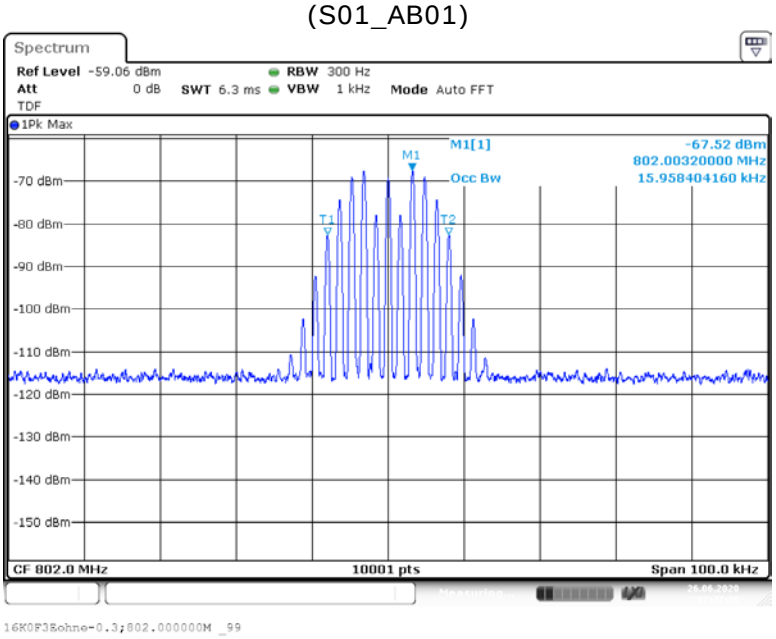


Input Signal

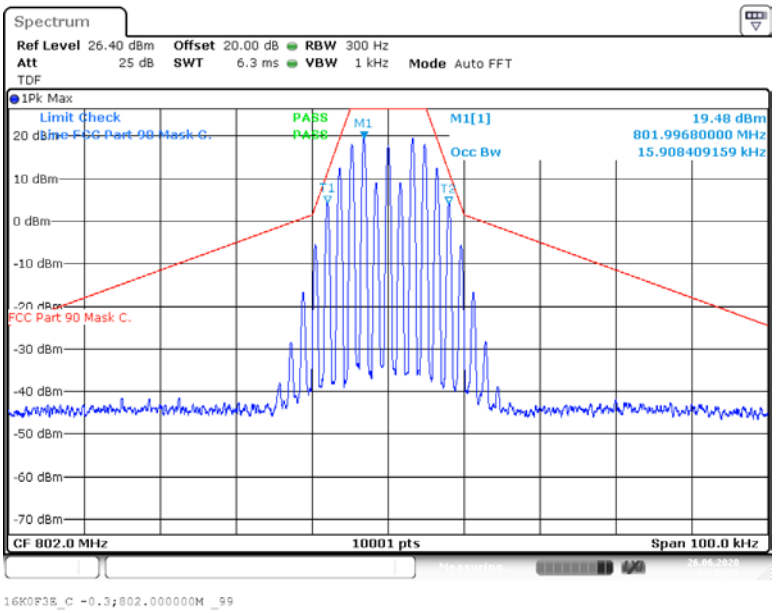


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink,
Input Power = 0.3 dB < AGC, at **fm** Signal Type = 16K0F3E
(S01_AB01)

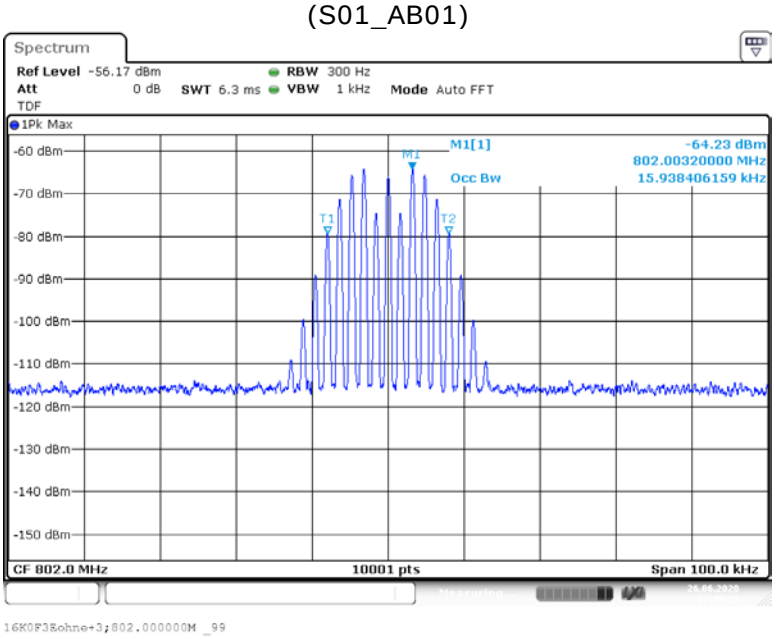


Input Signal

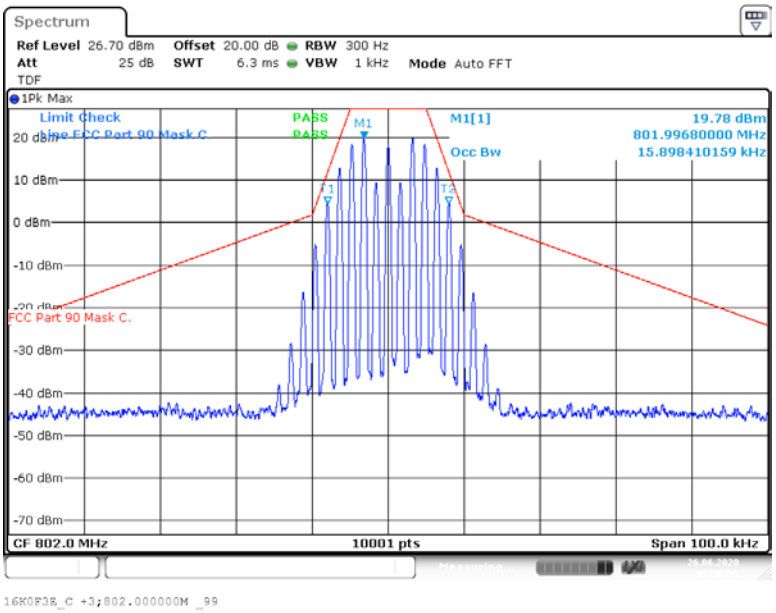


Output Signal

Frequency Band = 799 MHz – 805 MHz, Direction = RF uplink, Input Power = 3 dB > AGC, at **fm** Signal Type = 16K0F3E (S01_AB01)



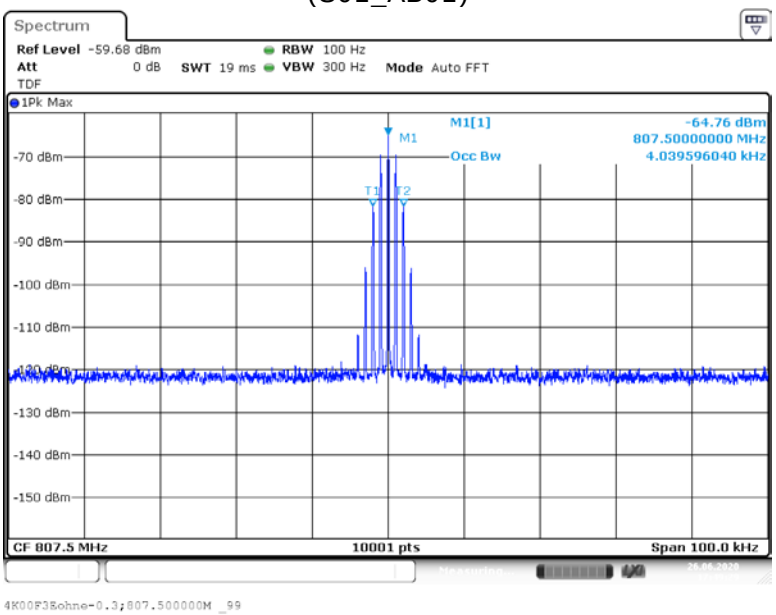
Input Signal



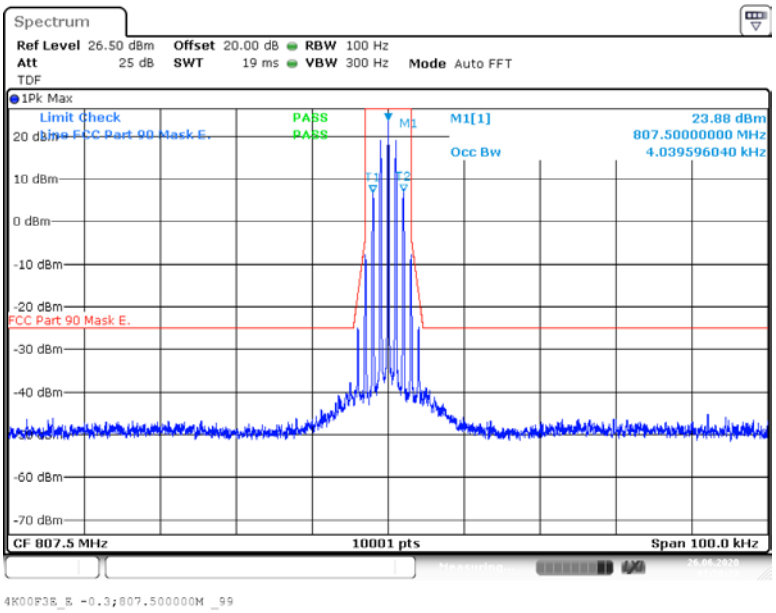
Output Signal

4.3.4.5FREQUENCY BAND = 806 MHZ – 809 MHZ

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 4K00F3E (S01_AB01)

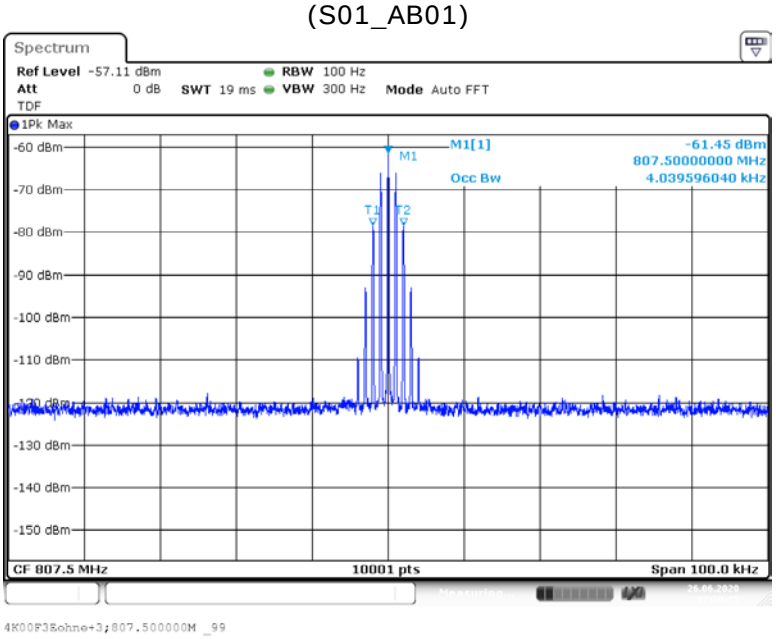


Input Signal

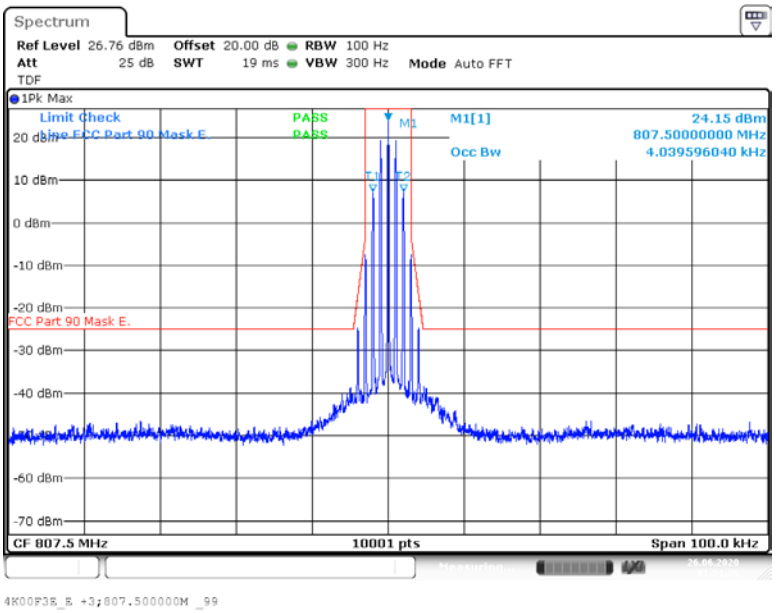


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 4K00F3E
(S01_AB01)

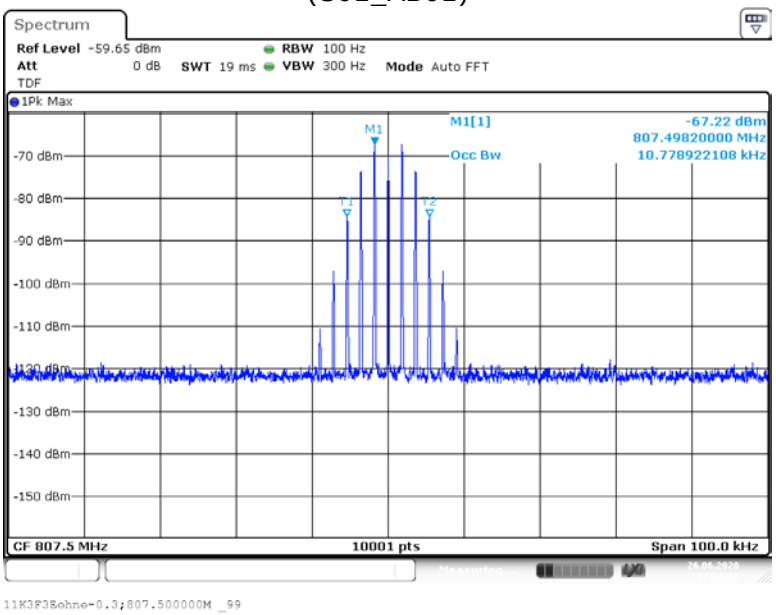


Input Signal

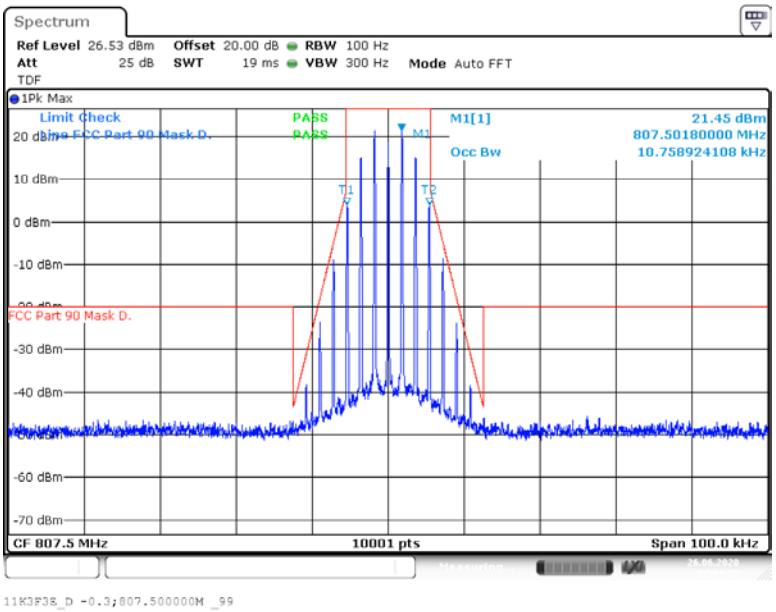


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink,
Input Power = 0.3 dB < AGC, at **fm** Signal Type = 11K3F3E
(S01_AB01)

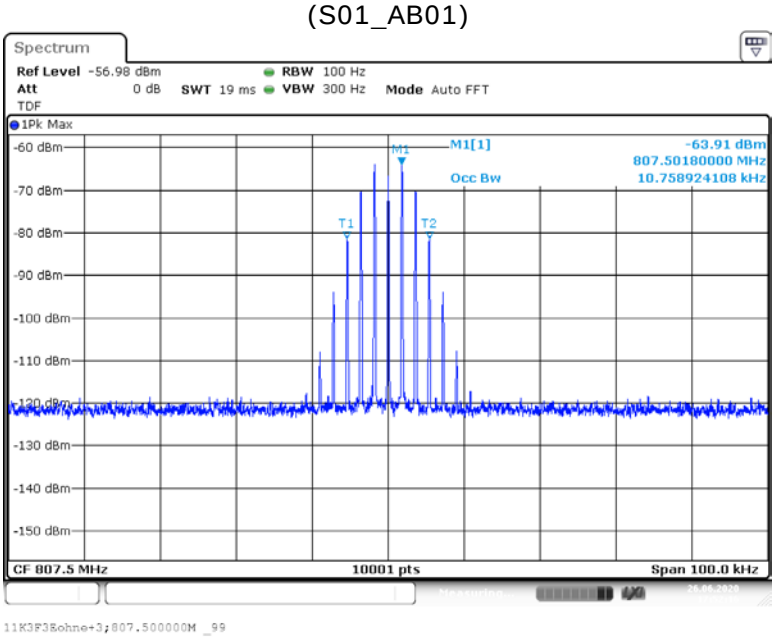


Input Signal

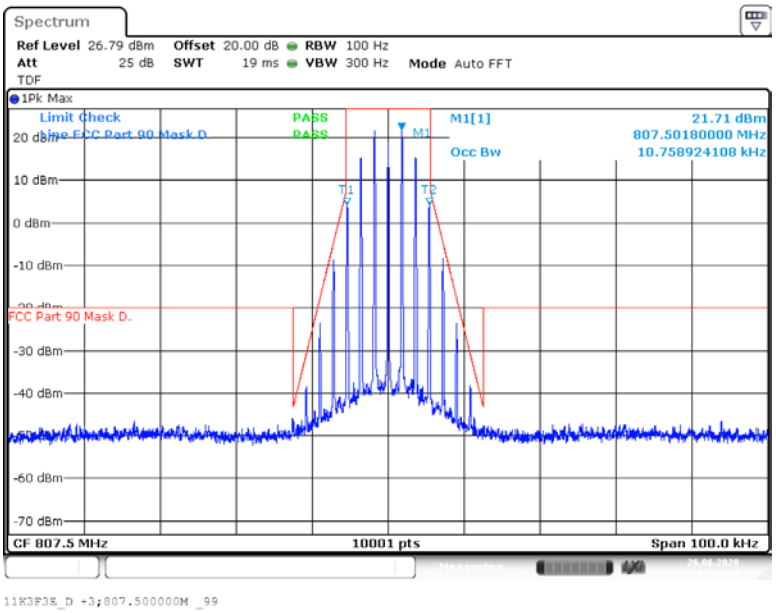


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 11K3F3E
(S01_AB01)

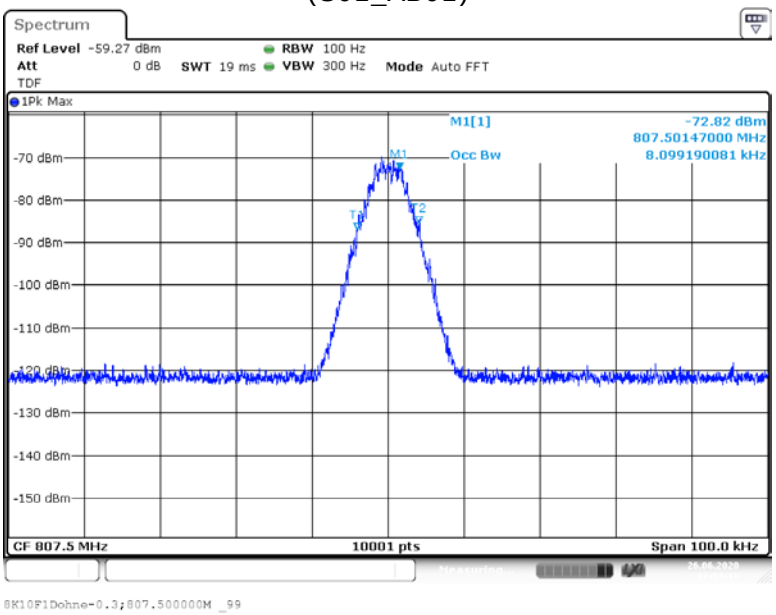


Input Signal

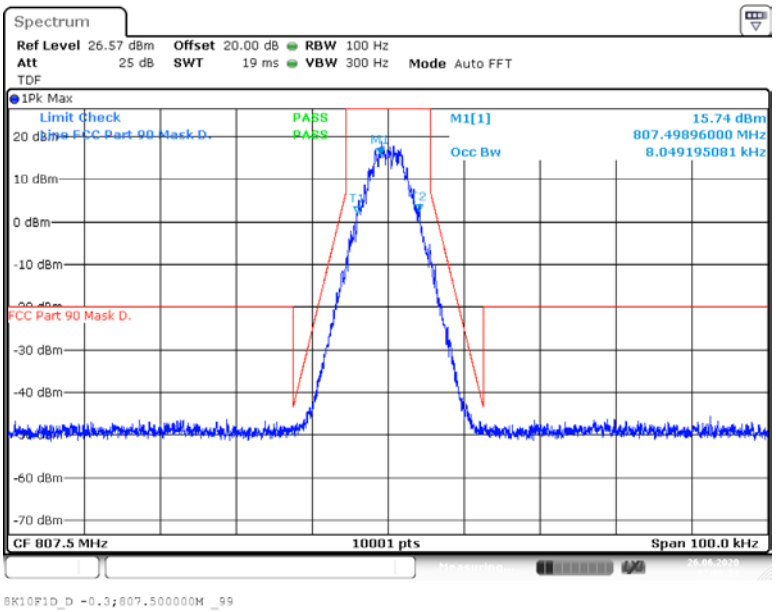


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 8K10F1D (S01_AB01)

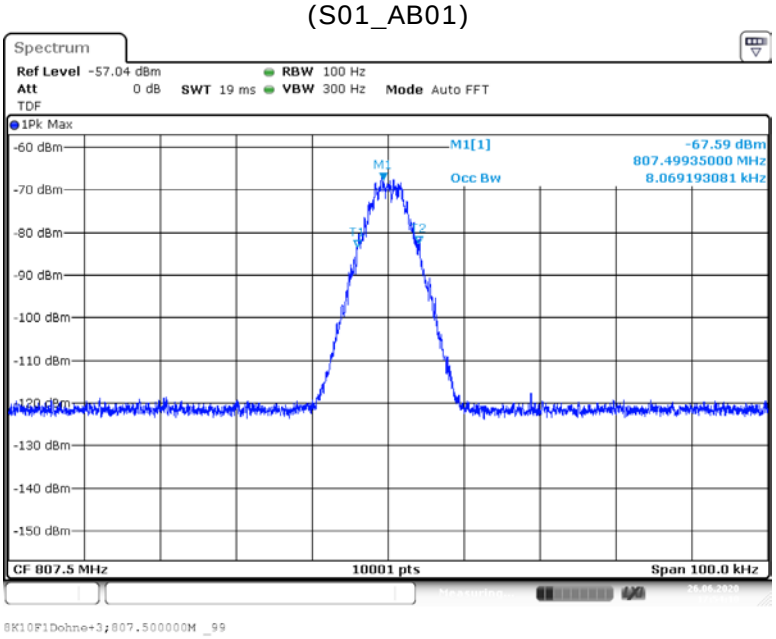


Input Signal

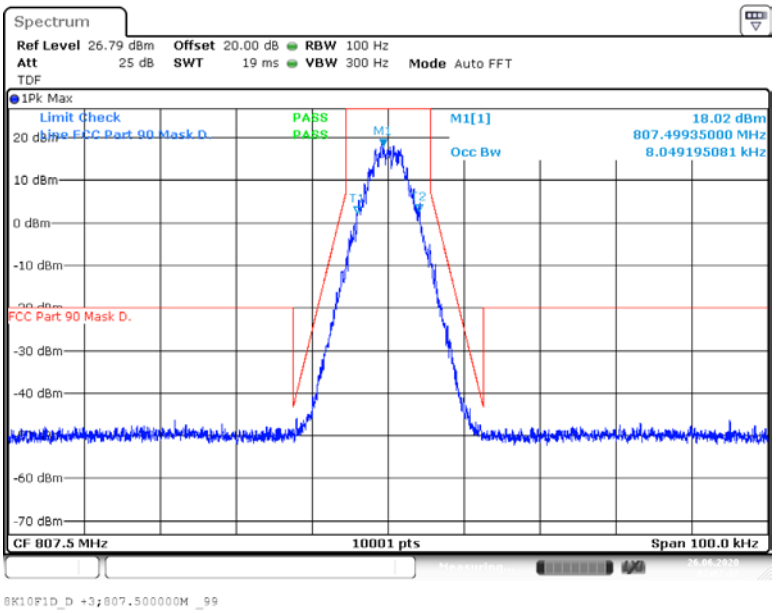


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 8K10F1D
(S01_AB01)

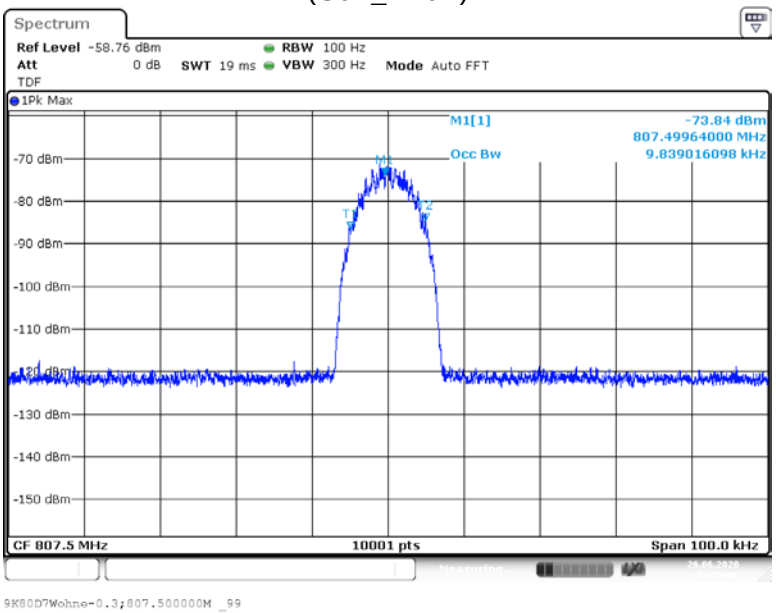


Input Signal

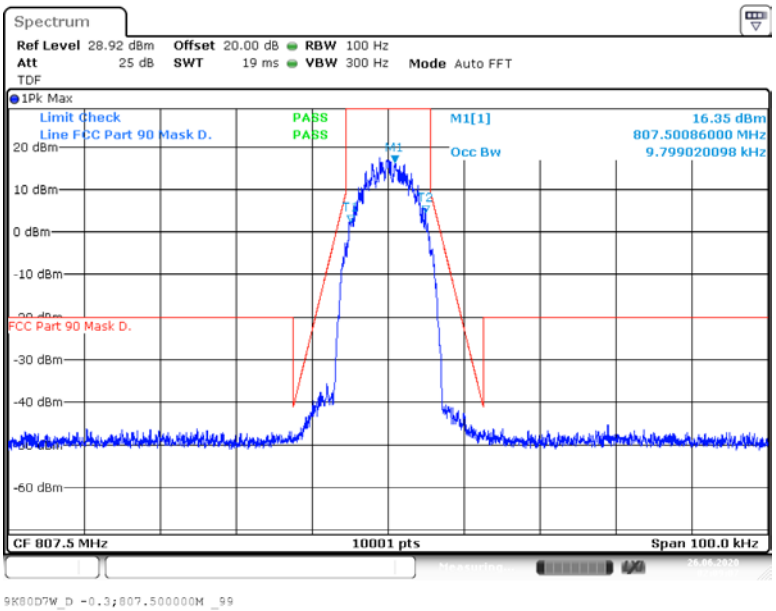


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 9K80D7W (S01_AB01)

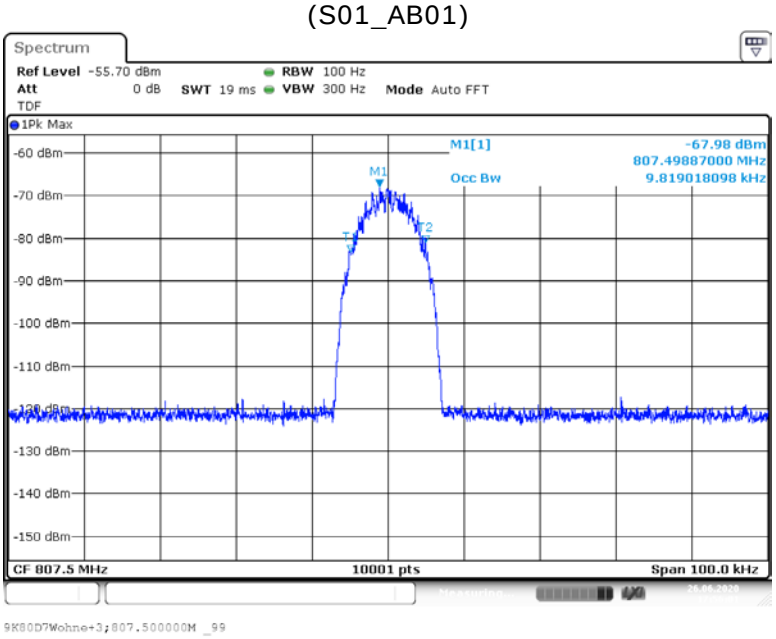


Input Signal

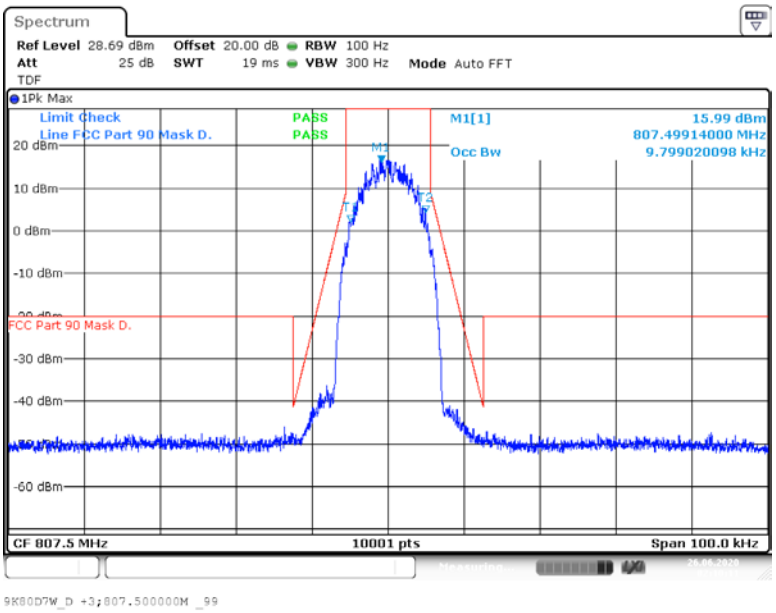


Output Signal

Frequency Band = 806 MHz – 809 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 9K80D7W
(S01_AB01)



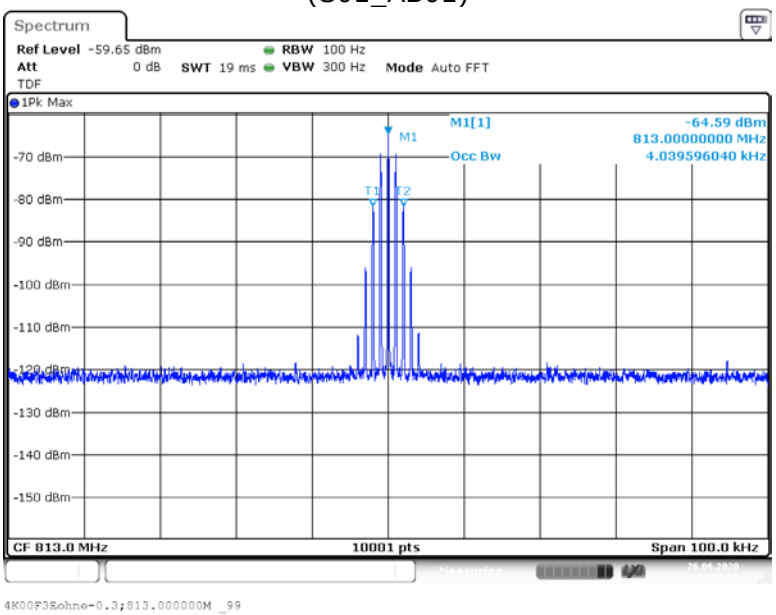
Input Signal



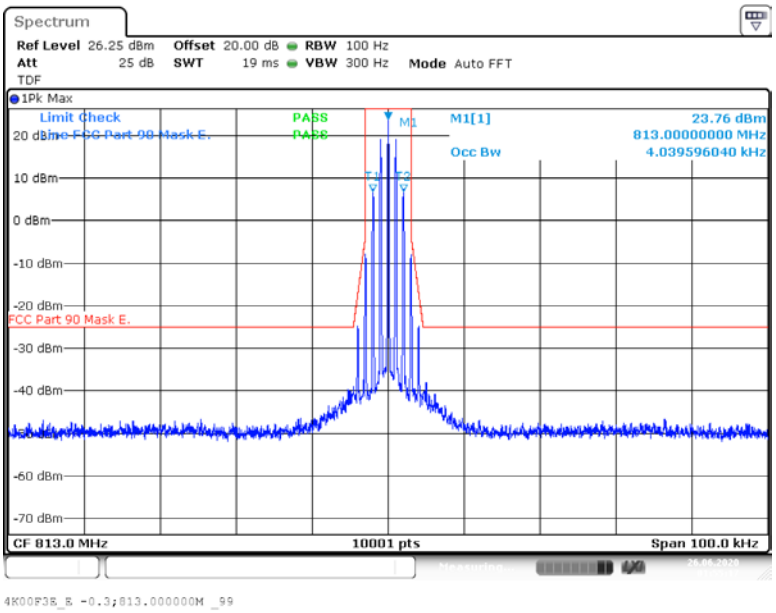
Output Signal

4.3.4.6FREQUENCY BAND = 809 MHZ – 817 MHZ

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 4K00F3E (S01_AB01)

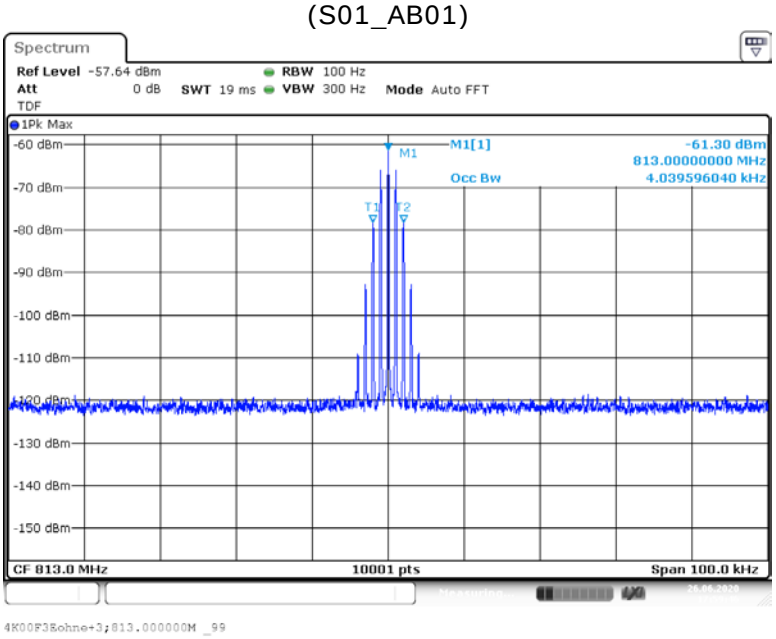


Input Signal

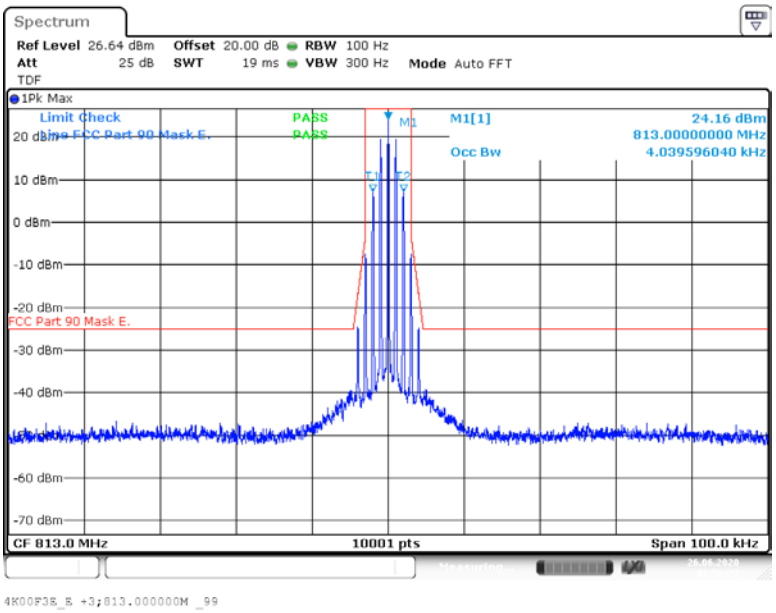


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 4K00F3E
(S01_AB01)

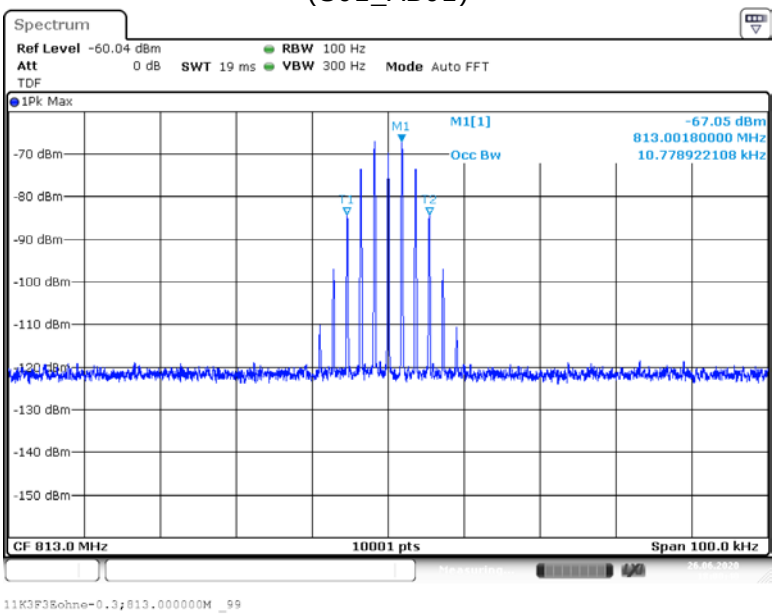


Input Signal

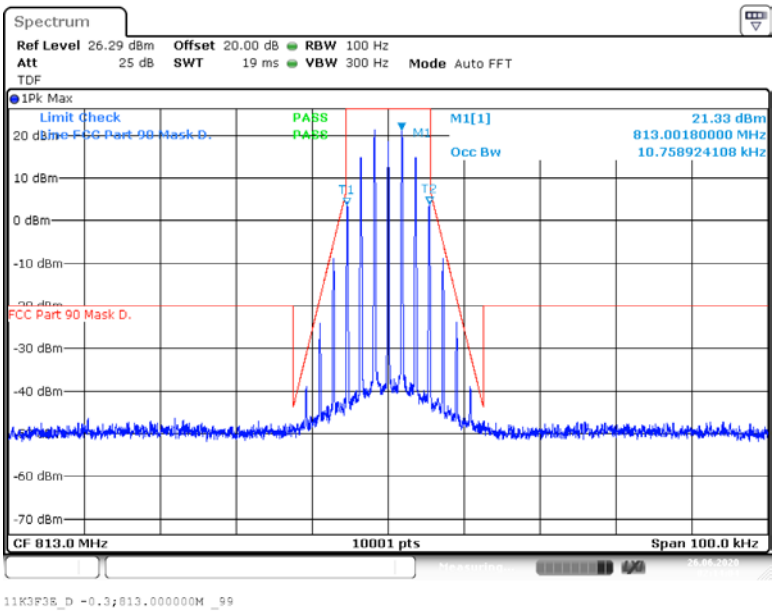


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 11K3F3E (S01_AB01)

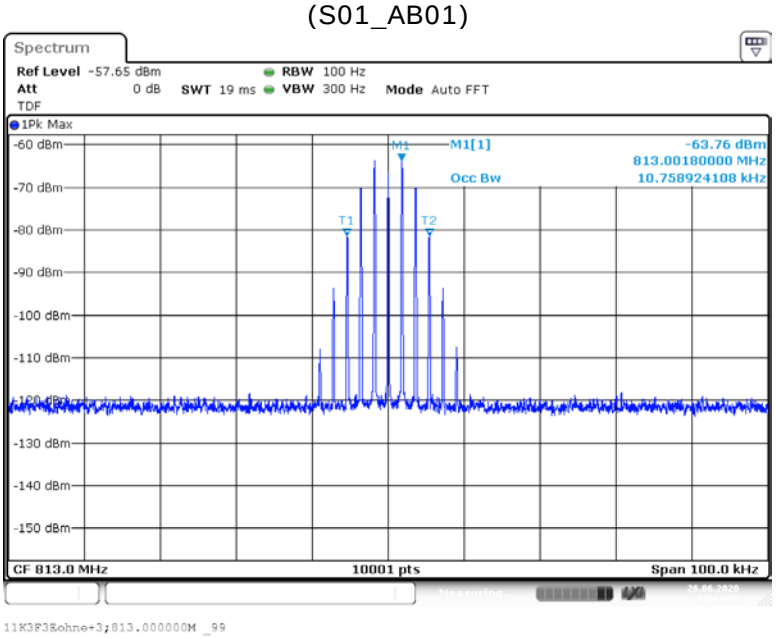


Input Signal

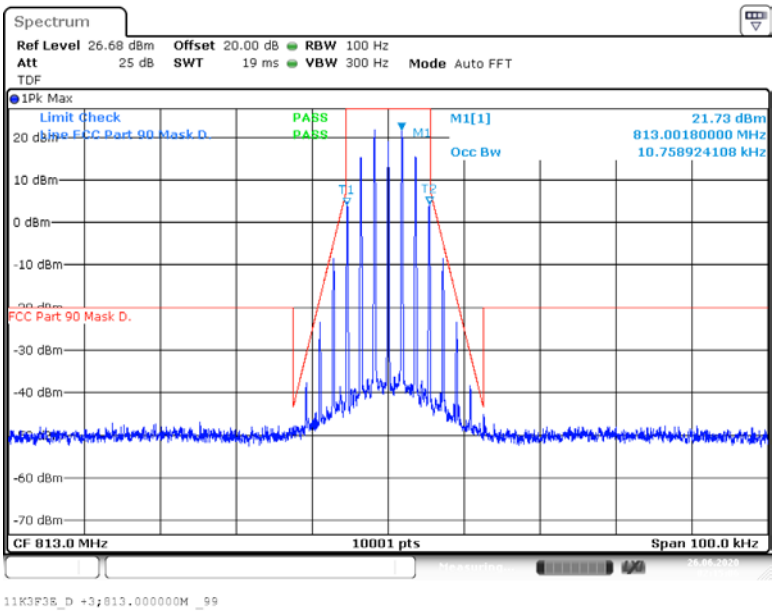


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink, Input Power = 3 dB > AGC, at **fm** Signal Type = 11K3F3E (S01_AB01)

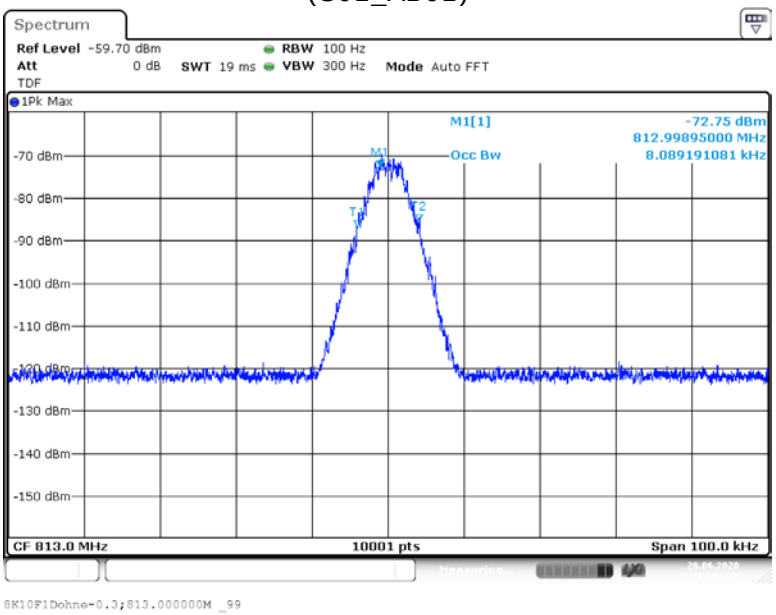


Input Signal

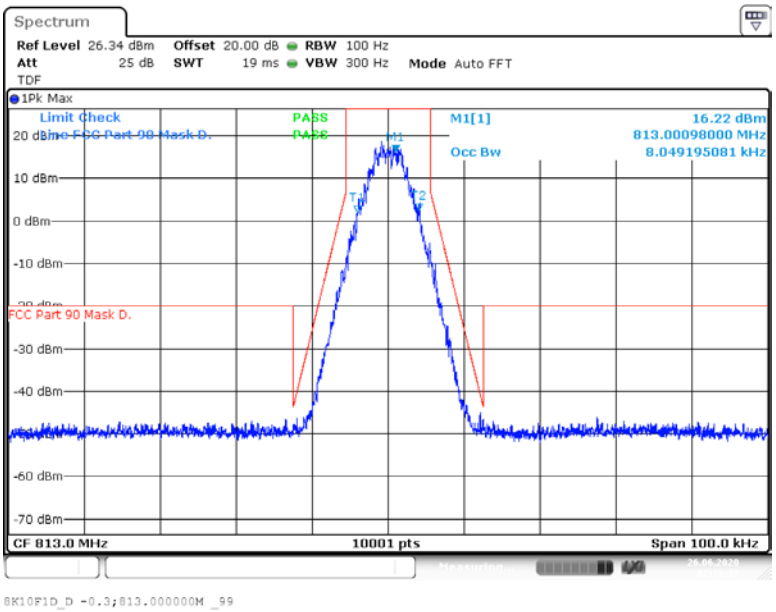


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 8K10F1D (S01_AB01)

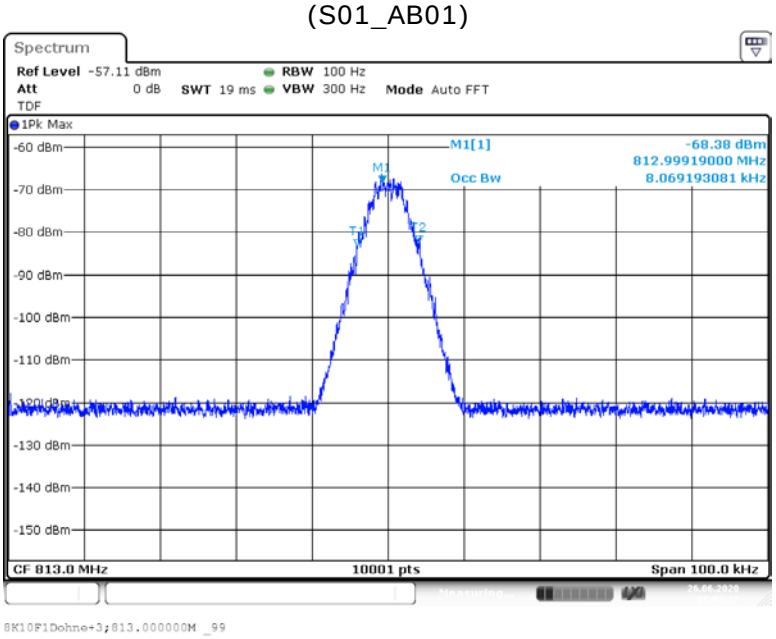


Input Signal

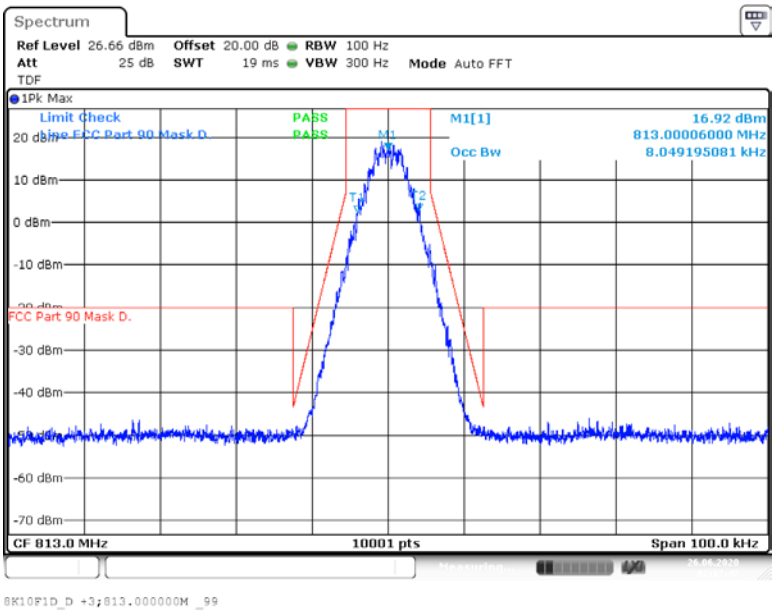


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 8K10F1D
(S01_AB01)

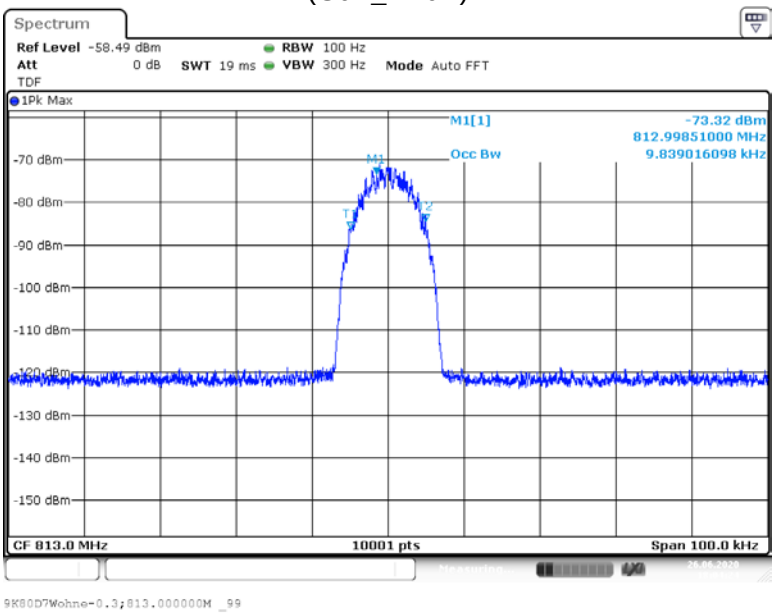


Input Signal

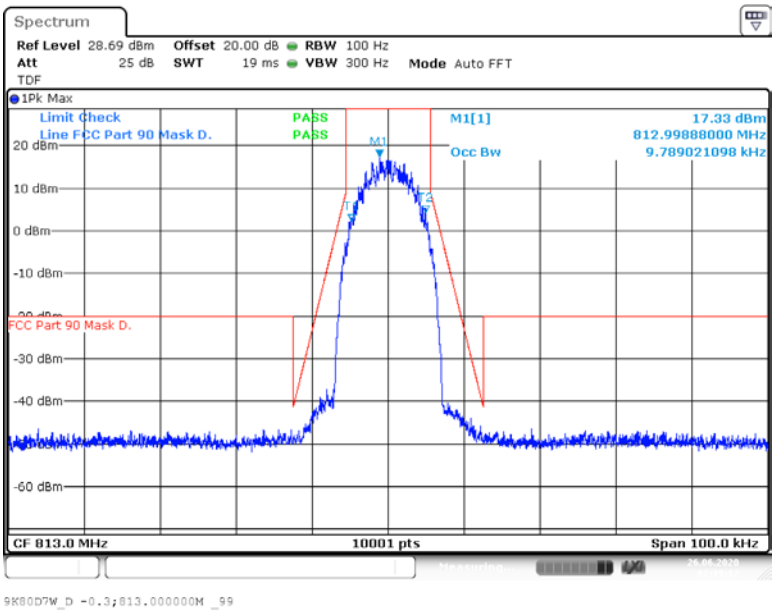


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink, Input Power = 0.3 dB < AGC, at **fm** Signal Type = 9K80D7W (S01_AB01)

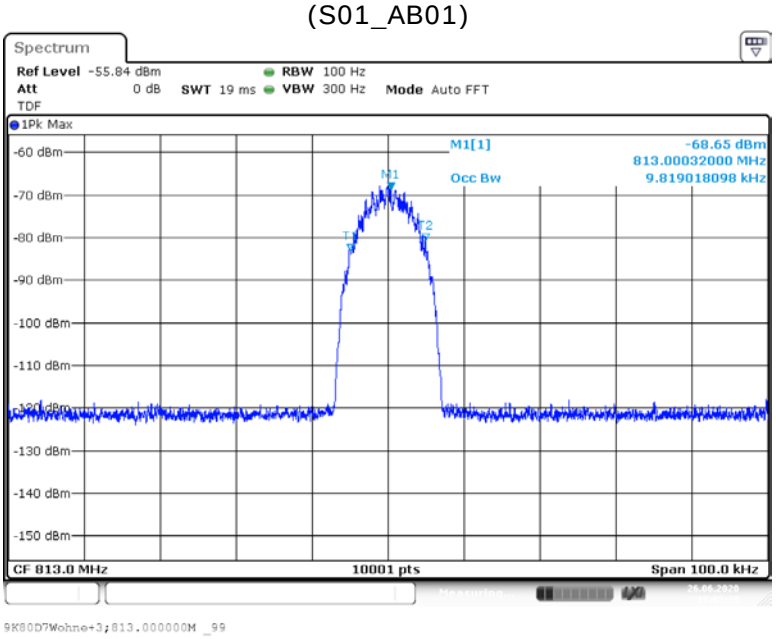


Input Signal

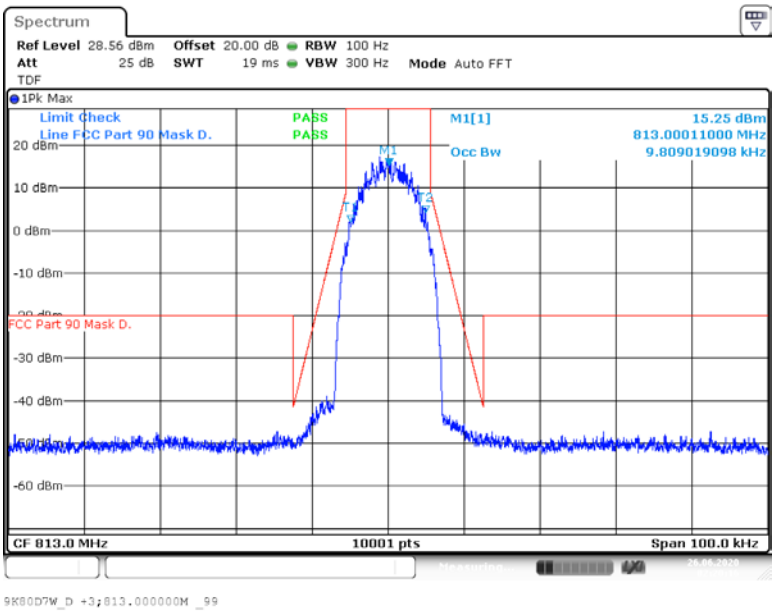


Output Signal

Frequency Band = 809 MHz – 817 MHz, Direction = RF uplink,
Input Power = 3 dB > AGC, at **fm** Signal Type = 9K80D7W
(S01_AB01)



Input Signal



Output Signal

4.3.5 TEST EQUIPMENT USED

FCC cond. Test Lab, BV Nbg

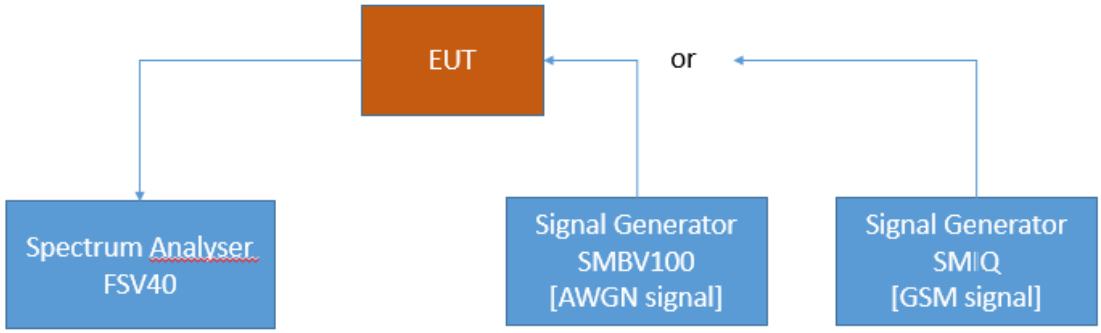
4.4 CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Standard FCC Part 2.1051, FCC Part 90: §90.219

The test was performed according to:
ANSI C63.26

4.4.1 TEST DESCRIPTION

The EUT was connected to the test setup according to the following diagram:



FCC Part 22/24/27/90 Industrial signal booster – Test Setup; Conducted Spurious Emissions

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyser settings can be directly found in the measurement diagrams.

4.4.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1051; Measurement required: Spurious emissions at antenna terminal:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§90.219 Use of signal boosters.

This section contains technical and operational rules allowing the use of signal boosters in the Private Land Mobile Radio Services (PLMRS). Rules for signal booster operation in the Commercial Mobile Radio Services under part 90 are found in §20.21 of this chapter.
.....

(e) *Device Specifications.* In addition to the general rules for equipment certification in §90.203(a)(2) and part 2, subpart J of this chapter, a signal booster must also meet the rules in this paragraph.

(3) Spurious emissions from a signal booster must not exceed −13 dBm within any 100 kHz measurement bandwidth.

4.4.3 TEST PROTOCOL

769 - 775 MHz, downlink							
Test Frequency	**Signal Type**	**Spurious Freq. [MHz]**	**Spurious Level [dBm]**	**Detector**	**RBW [kHz]**	**Limit [dBm]**	**Margin to Limit [dB]**
low	CW	760.178	-21.7	Peak	100	-13.0	8.7
low	CW	768.977	-33.3	Peak	1	-33.0	0.3
low	CW	851.746	-20.6	Peak	100	-13.0	7.6
mid	CW	763.201	-21.1	Peak	100	-13.0	8.1
mid	CW	768.945	-40.2	Peak	1	-33.0	7.2
mid	CW	857.827	-20.5	Peak	100	-13.0	7.5
high	CW	762.673	-21.0	Peak	100	-13.0	8.0
high	CW	775.022	-34.3	Peak	1	-33.0	1.3
high	CW	852.574	-20.5	Peak	100	-13.0	7.5

799 - 805 MHz, uplink							
Test Frequency	**Signal Type**	**Spurious Freq. [MHz]**	**Spurious Level [dBm]**	**Detector**	**RBW [kHz]**	**Limit [dBm]**	**Margin to Limit [dB]**
low	CW	798.972	-37.2	Peak	1	-33.0	4.2
low	CW	805.722	-29.8	Peak	10	-23.0	6.8
low	CW	822.451	-19.4	Peak	100	-13.0	6.4
mid	CW	798.951	-40.7	Peak	1	-33.0	7.7
mid	CW	805.778	-30.9	Peak	10	-23.0	7.9
mid	CW	816.835	-18.8	Peak	100	-13.0	5.8
high	CW	805.032	-37.3	Peak	1	-33.0	4.3
high	CW	805.799	-30.9	Peak	10	-23.0	7.9
high	CW	822.306	-19.2	Peak	100	-13.0	6.2

851 - 854 MHz, downlink

Test Frequency	Signal Type	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Limit [dBm]	Margin to Limit [dB]
low	CW	771.686	-19.4	Peak	100	-13.0	6.4
low	CW	850.993	-34.3	Peak	1	-33.0	1.3
low	CW	863.301	-19.8	Peak	100	-13.0	6.8
mid	CW	763.958	-20.4	Peak	100	-13.0	7.4
mid	CW	854.000	-40.1	Peak	1	-33.0	7.1
mid	CW	857.433	-21.1	Peak	100	-13.0	8.1
high	CW	772.562	-19.7	Peak	100	-13.0	6.7
high	CW	854.038	-33.1	Peak	1	-33.0	0.1
high	CW	867.881	-19.6	Peak	100	-13.0	6.6

806 - 809 MHz, uplink

Test Frequency	Signal Type	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Limit [dBm]	Margin to Limit [dB]
low	CW	805.977	-37.5	Peak	1	-33.0	4.5
low	CW	809.547	-29.2	Peak	10	-23.0	6.2
low	CW	820.487	-20.5	Peak	100	-13.0	7.5
mid	CW	805.771	-30.4	Peak	10	-23.0	7.4
mid	CW	809.080	-40.6	Peak	1	-33.0	7.6
mid	CW	820.189	-19.9	Peak	100	-13.0	6.9
high	CW	805.749	-30.0	Peak	10	-23.0	7.0
high	CW	809.026	-37.2	Peak	1	-33.0	4.2
high	CW	818.851	-19.3	Peak	100	-13.0	6.3

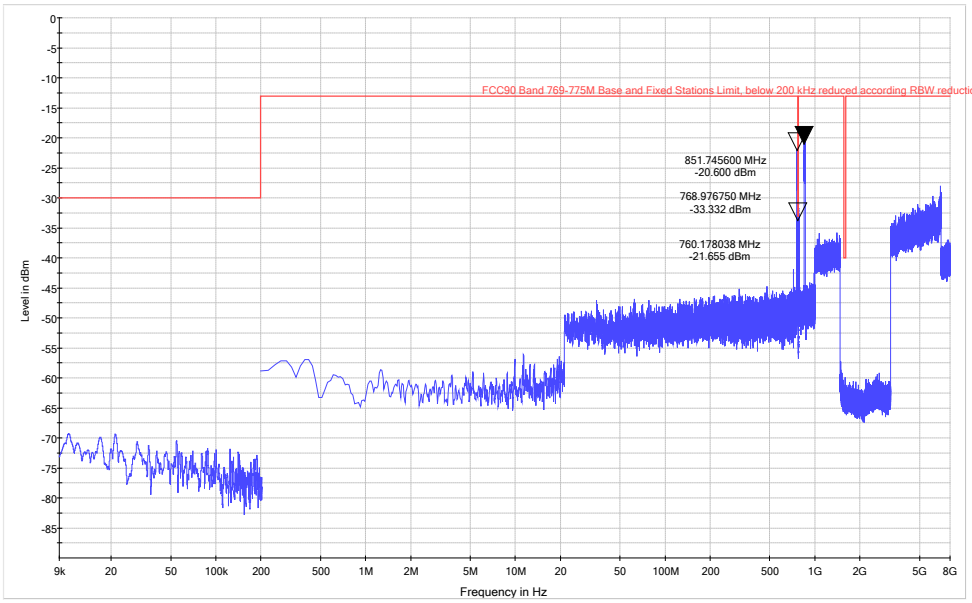
854 - 862 MHz, downlink							
Test Frequency	**Signal Type**	**Spurious Freq. [MHz]**	**Spurious Level [dBm]**	**Detector**	**RBW [kHz]**	**Limit [dBm]**	**Margin to Limit [dB]**
low	CW	766.148	-20.3	Peak	100	-13.0	7.3
low	CW	851.827	-20.0	Peak	100	-13.0	7.0
low	CW	853.970	-34.0	Peak	1	-33.0	1.0
mid	CW	765.375	-19.9	Peak	100	-13.0	6.9
mid	CW	862.003	-38.1	Peak	1	-33.0	5.1
mid	CW	865.665	-19.8	Peak	100	-13.0	6.8
high	CW	768.733	-19.8	Peak	100	-13.0	7.3
high	CW	862.000	-41.2	RMS	1	-33.0	8.2
high	CW	864.279	-20.2	Peak	100	-13.0	7.2

809 - 817 MHz, uplink							
Test Frequency	**Signal Type**	**Spurious Freq. [MHz]**	**Spurious Level [dBm]**	**Detector**	**RBW [kHz]**	**Limit [dBm]**	**Margin to Limit [dB]**
low	CW	809.000	-38.1	Peak	1	-33.0	5.1
low	CW	817.498	-28.7	Peak	10	-23.0	5.7
low	CW	820.290	-19.7	Peak	100	-13.0	6.7
mid	CW	817.078	-39.7	Peak	1	-33.0	6.7
mid	CW	818.000	-30.7	Peak	10	-23.0	7.7
mid	CW	820.253	-19.4	Peak	100	-13.0	6.4
high	CW	806.990	-19.3	Peak	100	-13.0	6.3
high	CW	817.031	-36.2	Peak	1	-33.0	3.2
high	CW	817.573	-29.2	Peak	10	-23.0	6.2

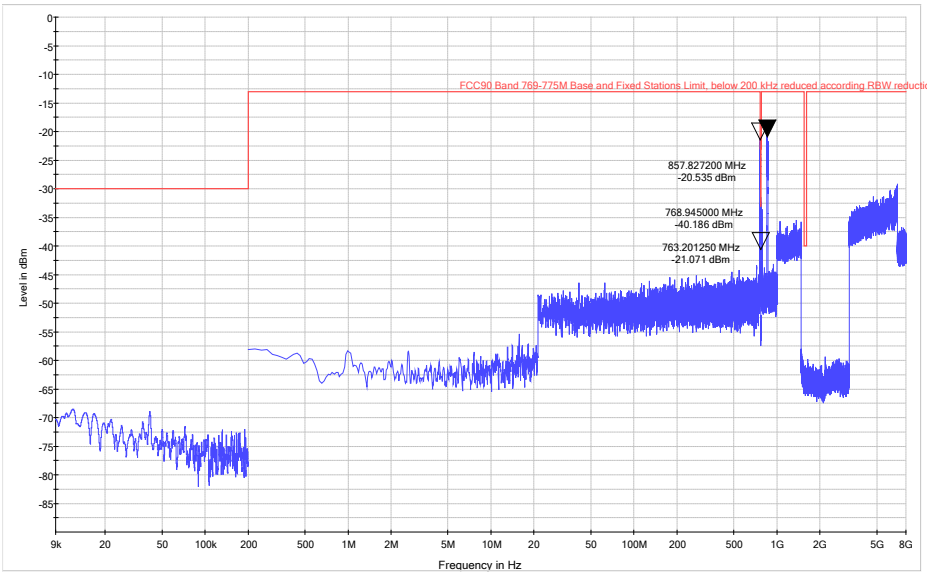
Remark: Please see next sub-clause for the measurement plot.
The peaks in the measurement plots are (input) wanted signal.
For comparison to limit of other standards the results include lower resolution bandwidth at lower limits.
Despite the lower measurement bandwidth, these limits are stricter than the -13 dBm at 100 kHz measurement bandwidth limit of the §90.219.

4.4.4 MEASUREMENT PLOTS

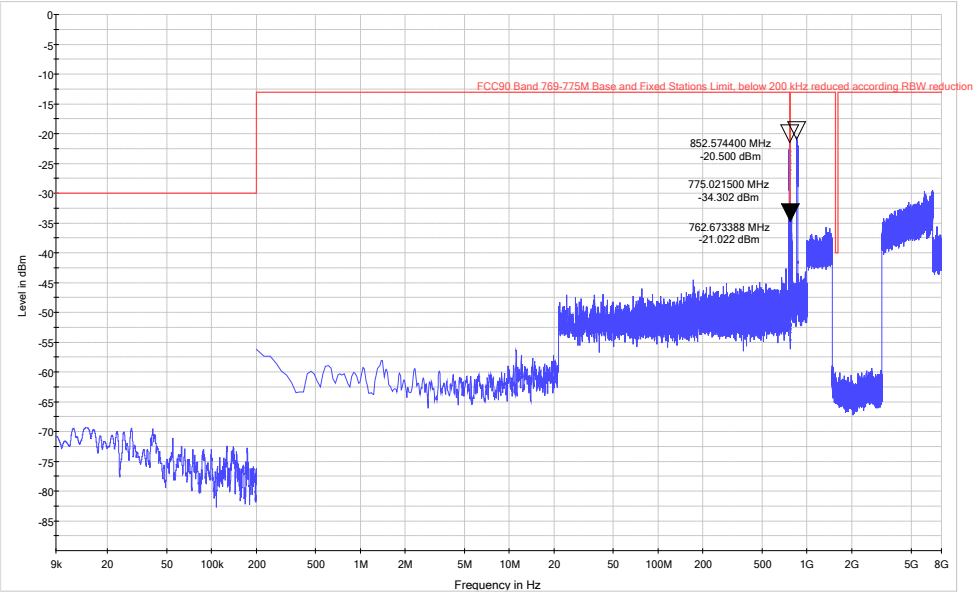
Frequency Band = Band 769 – 775 MHz, Test Frequency = low, Direction = RF downlink, Signal Type = CW
(S01_AA01)



Frequency Band = Band 769 – 775 MHz, Test Frequency = mid, Direction = RF downlink, Signal Type = CW
(S01_AA01)



Frequency Band = Band 769 – 775 MHz, Test Frequency = high, Direction = RF downlink, Signal Type = CW
(S01_AA01)



Frequency Band = Band 799 – 805 MHz, Test Frequency = low, Direction = RF uplink, Signal Type = CW
(S01_AA01)