

Annex 1: Measurement diagrams 23-1-0078001T004a-A1

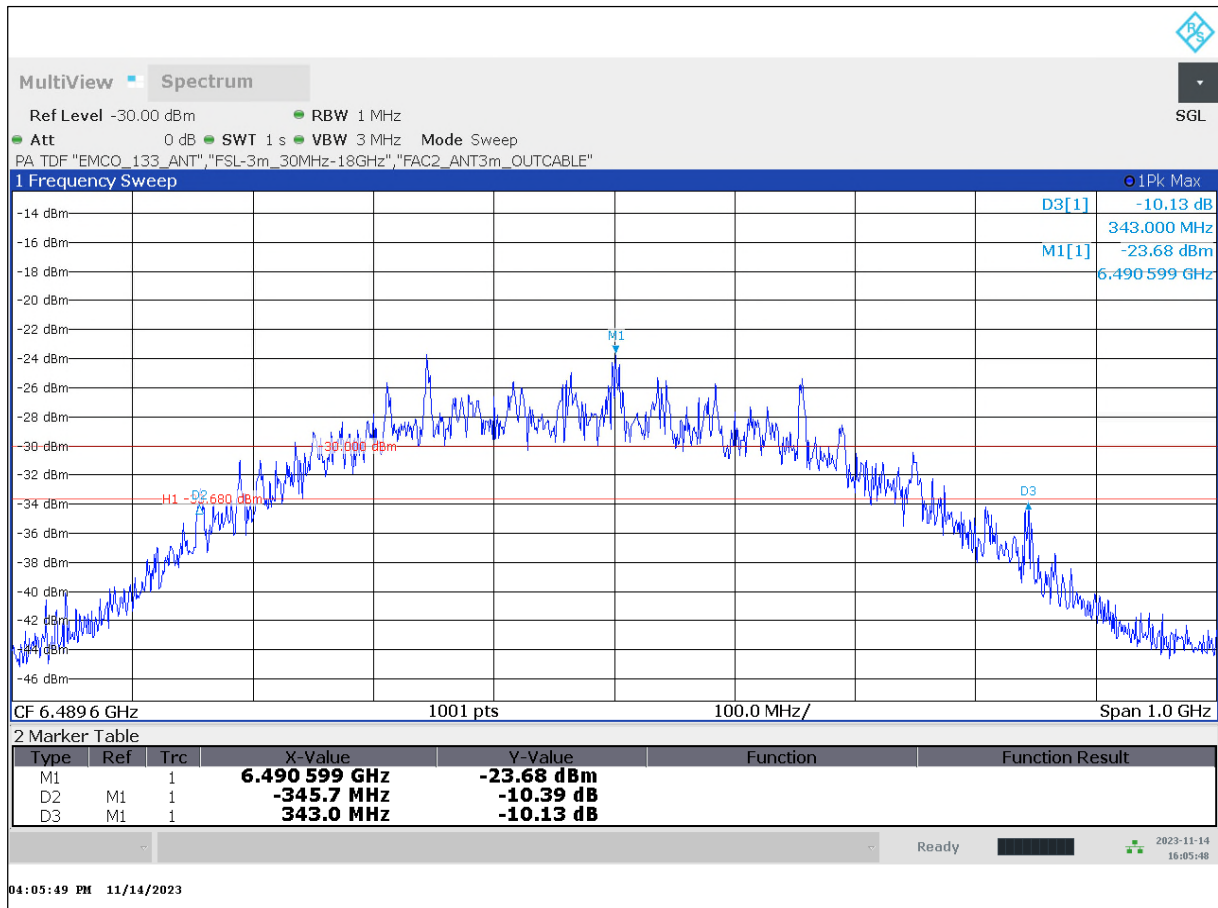
Number of pages:	39	Date of Report:	2023-Nov-28
Testing company:	cetecom advanced GmbH Untertuerkheimer Str. 6-10 66117 Saarbruecken GERMANY	Applicant:	Eliko Tehnoloogia Arenduskeskus OÜ
Product:	Positioning device		
Model:	ELIKO TAG		
FCC ID:	2AF2I-TAG	IC:	27124-TAG
Testing has been carried out in accordance with:	FCC Regulations Title 47 CFR, Chapter I, Subchapter A, Part 15 Subpart C Intentional Radiators § 15.207 Conducted limits Subpart F Ultra-Wideband Operation § 15.519 Technical requirements for hand held UWB systems § 15.521 Technical requirements applicable to all UWB devices ISED-Regulations Radio Standards Specifications RSS-Gen, Issue 5 General Requirements for Compliance of Radio Apparatus RSS-220, Issue 1 + Amendment 1 (July 2018) Devices Using Ultra-Wideband (UWB) Technology		

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1 Measurement diagrams

1.1 10dB bandwidth measurements

TID0143b__BW10dB_A192_E90_AntV



Measured bandwidth: 688.7 MHz

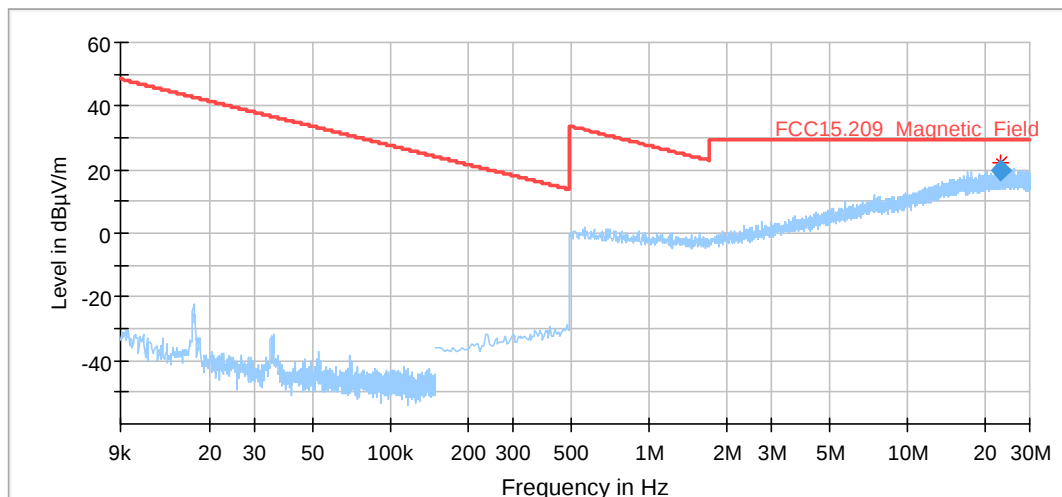
1.2 Emission measurements: 9kHz to 30MHz

TID0147a_MgFeld_TX_Ch5_EUT_standing

Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	Lor
Operating Mode:	UWB Channel no. 5
Power during tests:	full loaded batteries
Comment 1:	EUT standing
Comment 2:	
Environmental Conditions:	T=20.5deg, Humidity: 50.4%rH
EUT Setup:	Main EUT S02 + USB cable
Verdict:	Passed

Full Spectrum



Final Result

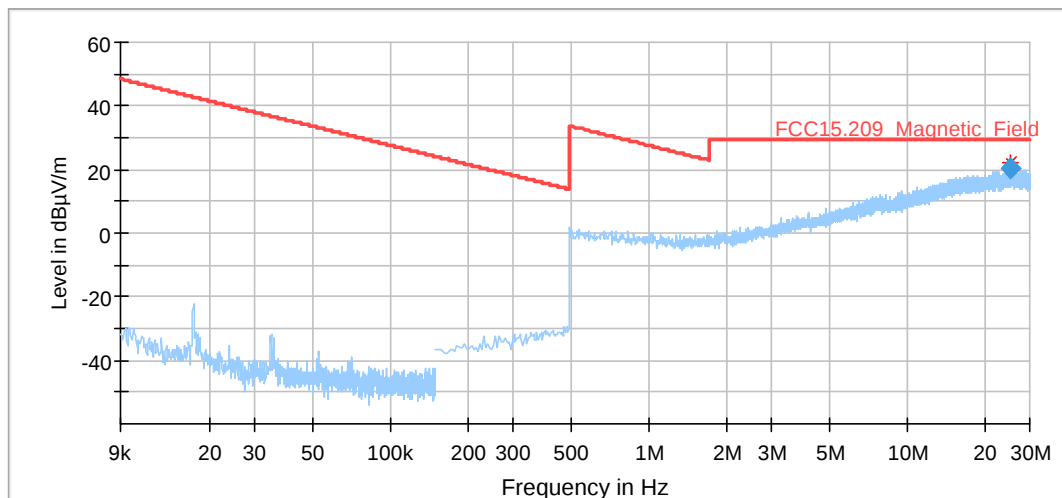
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
23.302000	20.07	29.54	9.47	9.000	V	200.0	1.8	11:23:35 - 15.11.2023

TID0147b_MgFeld_TX_Ch5_EUT_laying

Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.50.0
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	Lor
Operating Mode:	UWB Channel no. 5
Power during tests:	full loaded batteries
Comment 1:	EUT laying
Comment 2:	
Environmental Conditions:	T=20.5deg, Humidity: 50.4%rH
EUT Setup:	Main EUT S02 + USB cable
Verdict:	Passed

Full Spectrum

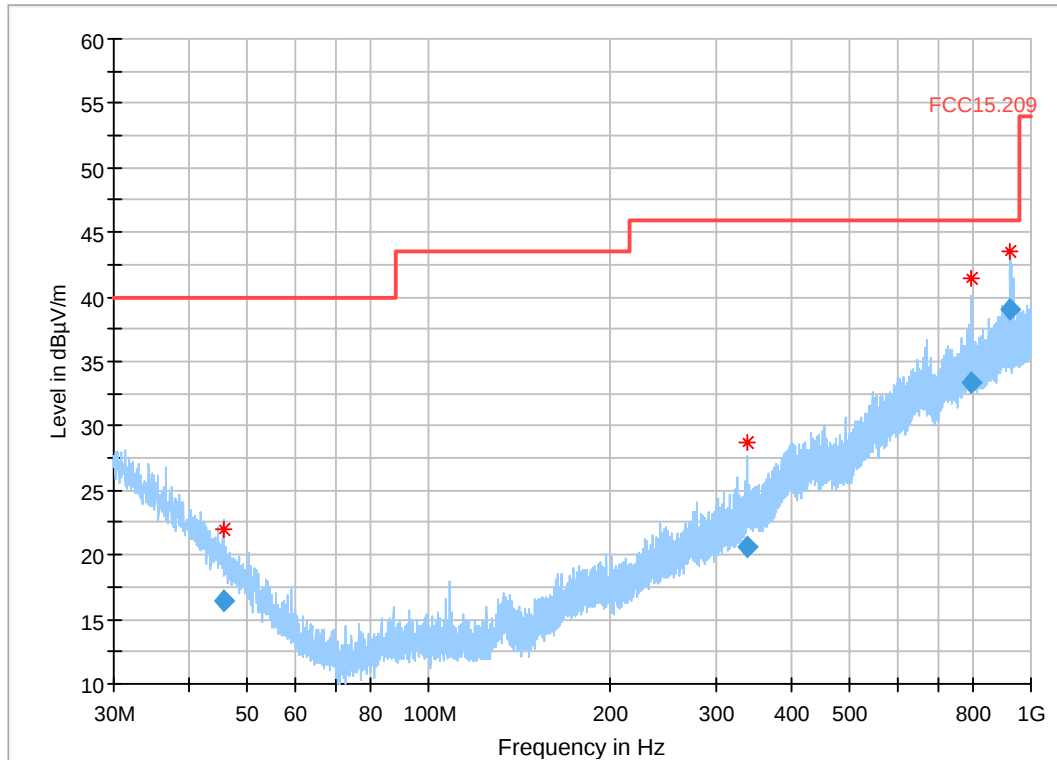


Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
25.418000	20.45	29.54	9.09	9.000	V	198.0	2.0	10:59:44 - 15.11.2023

1.3 Emission measurements: 30MHz to 1GHz

TID0146a_TX_Ch5_EUT_standing



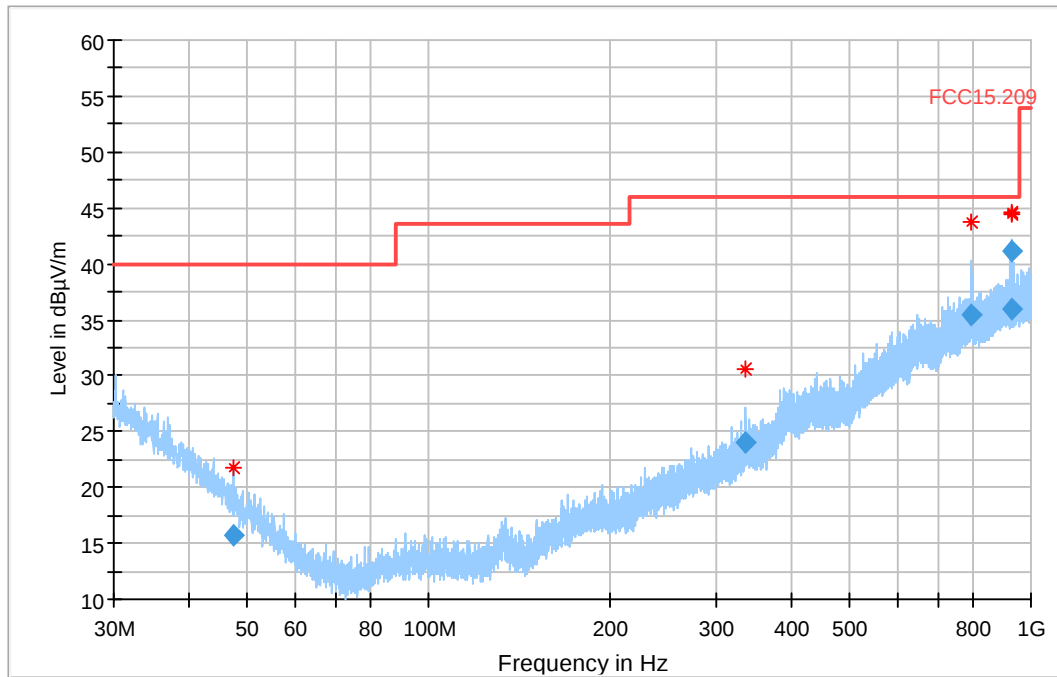
Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path (dB)	Preamp (dB)
45.590000	16.50	40.00	23.50	120.000	191.0	H	276.0	14.0	0.0	0.6
336.690000	20.64	46.00	25.36	120.000	259.0	H	17.0	16.6	0.0	1.9
794.510000	33.40	46.00	12.60	120.000	333.0	H	44.0	25.6	0.0	3.1
925.350000	39.02	46.00	6.98	120.000	310.0	H	328.0	27.0	0.0	3.4

(continuation of the "Final_Result" table from column 18 ...)

Frequency (MHz)	Trd Corr. (dB/m)	Raw Rec (dBμV)	Comment
45.590000	13.4	2.5	09:12:03 - 15.11.2023
336.690000	14.7	4.0	09:17:20 - 15.11.2023
794.510000	22.5	7.8	09:22:37 - 15.11.2023
925.350000	23.6	12.0	09:27:57 - 15.11.2023

TID0146b_TX_Ch5_EUT_laying



Final_Result

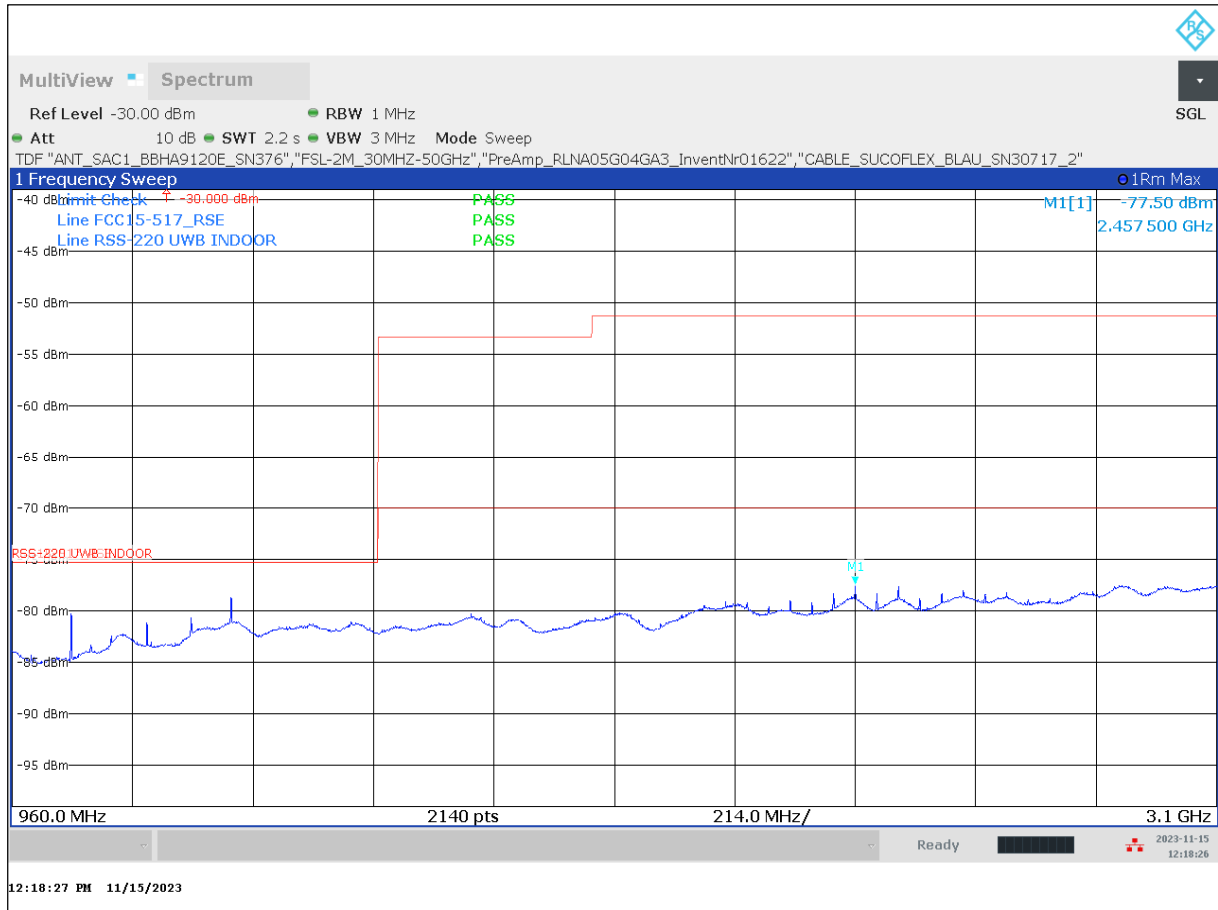
Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path (dB)	Preamp (dB)
47.270000	15.75	40.00	24.25	120.000	250.0	V	40.0	13.2	0.0	0.6
336.390000	23.96	46.00	22.04	120.000	112.0	H	261.0	16.6	0.0	1.9
794.310000	35.37	46.00	10.63	120.000	308.0	H	330.0	25.6	0.0	3.1
925.470000	41.18	46.00	4.82	120.000	292.0	H	282.0	27.0	0.0	3.4
926.750000	36.02	46.00	9.98	120.000	105.0	V	6.0	27.0	0.0	3.4

(continuation of the "Final_Result" table from column 18 ...)

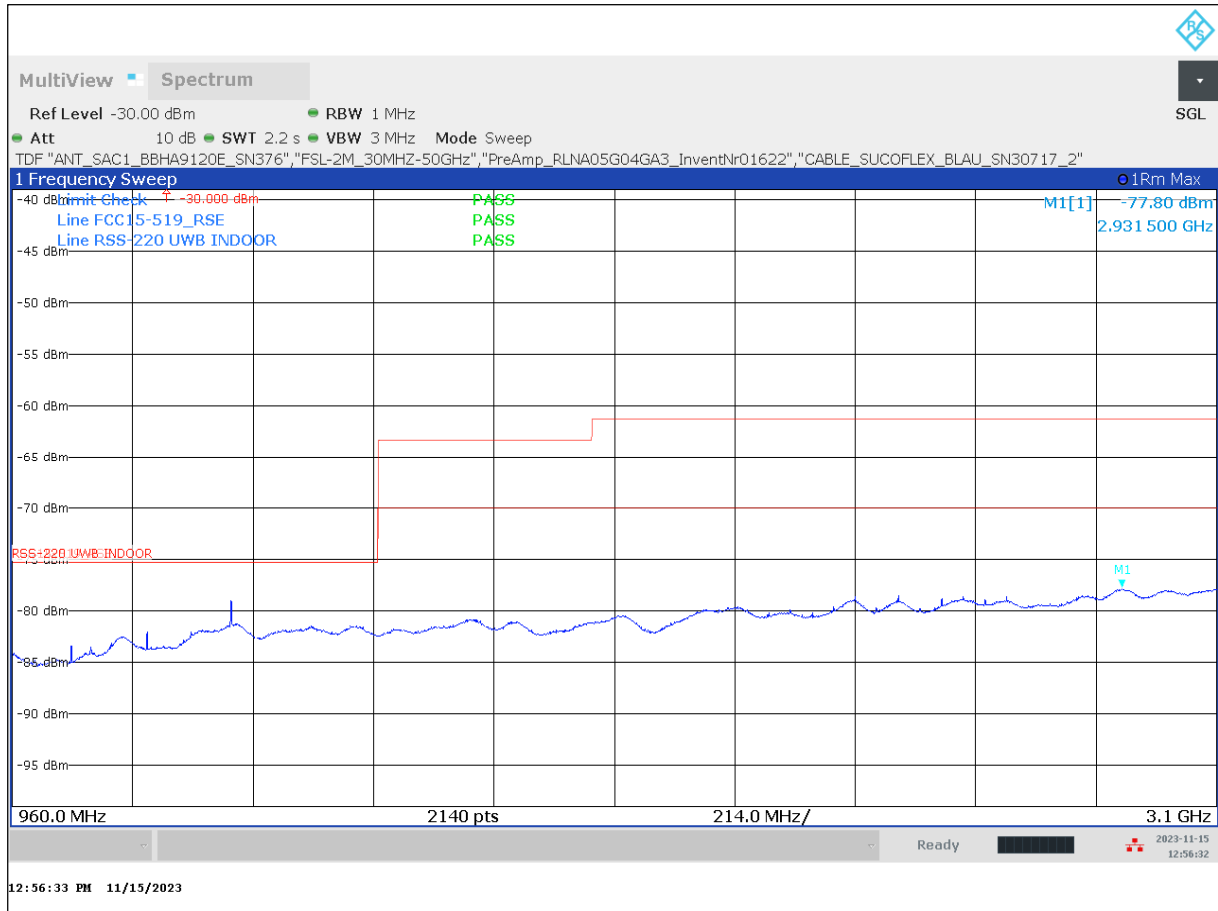
Frequency (MHz)	Trd Corr. (dB/m)	Raw Rec (dBμV)	Comment
47.270000	12.6	2.5	10:22:38 - 15.11.2023
336.390000	14.7	7.4	10:07:17 - 15.11.2023
794.310000	22.5	9.8	10:16:52 - 15.11.2023
925.470000	23.6	14.2	10:11:59 - 15.11.2023
926.750000	23.6	9.0	10:28:53 - 15.11.2023

1.4 Emission measurements: 960MHz to 3.1GHz

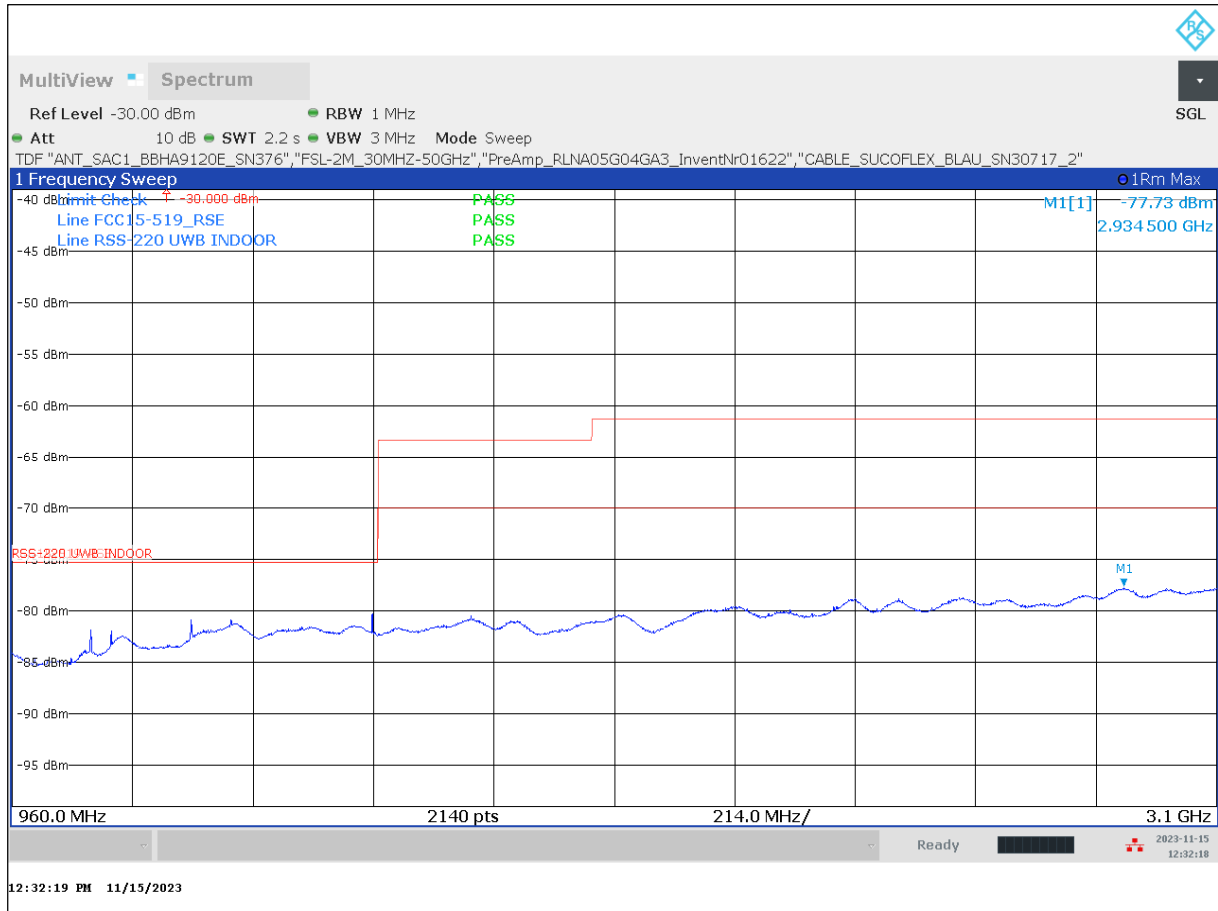
TID0139a_01_TX_RSE_EUT_standing_Anth



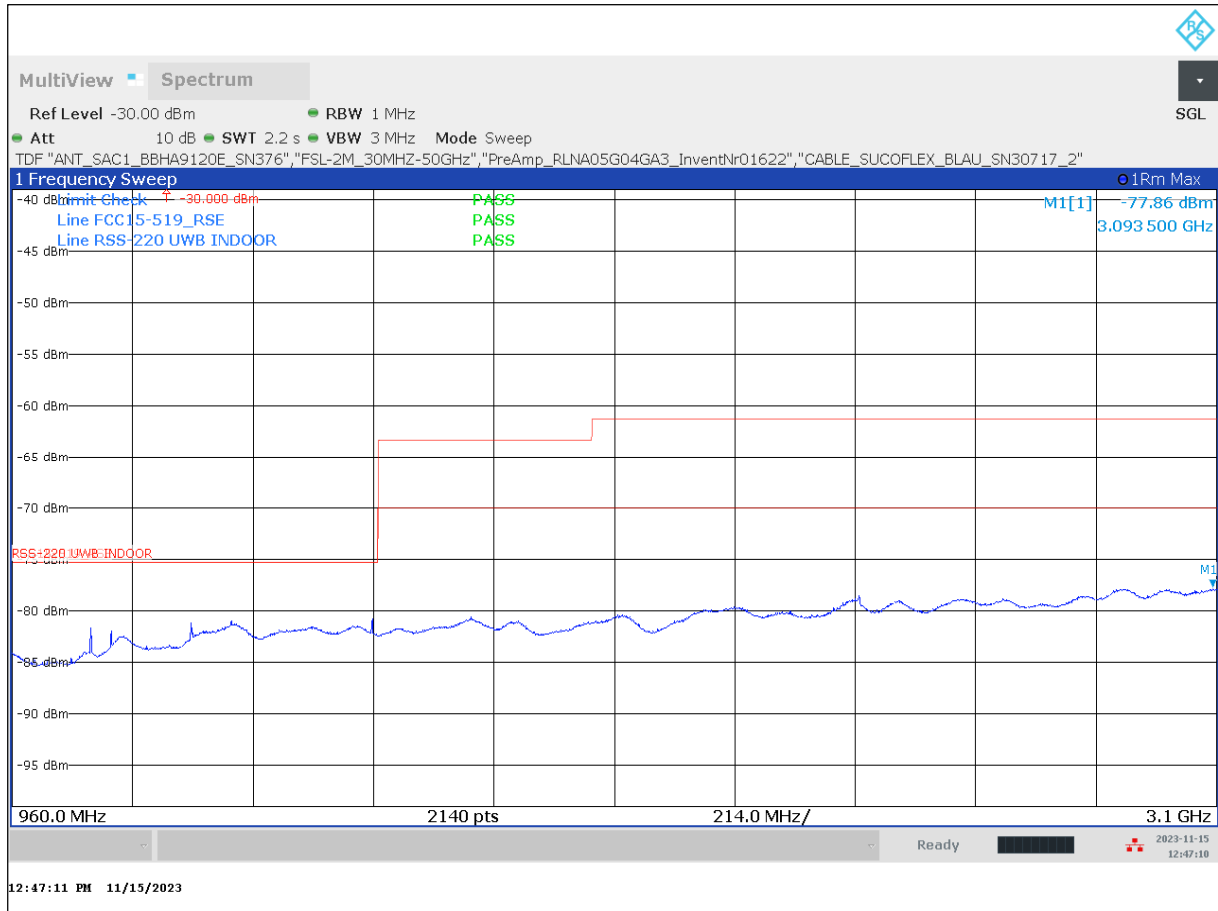
TID0139a_04__TX_RSE__EUT_laying__Anth



TID0139b_02__TX_RSE__EUT_standing__AntV

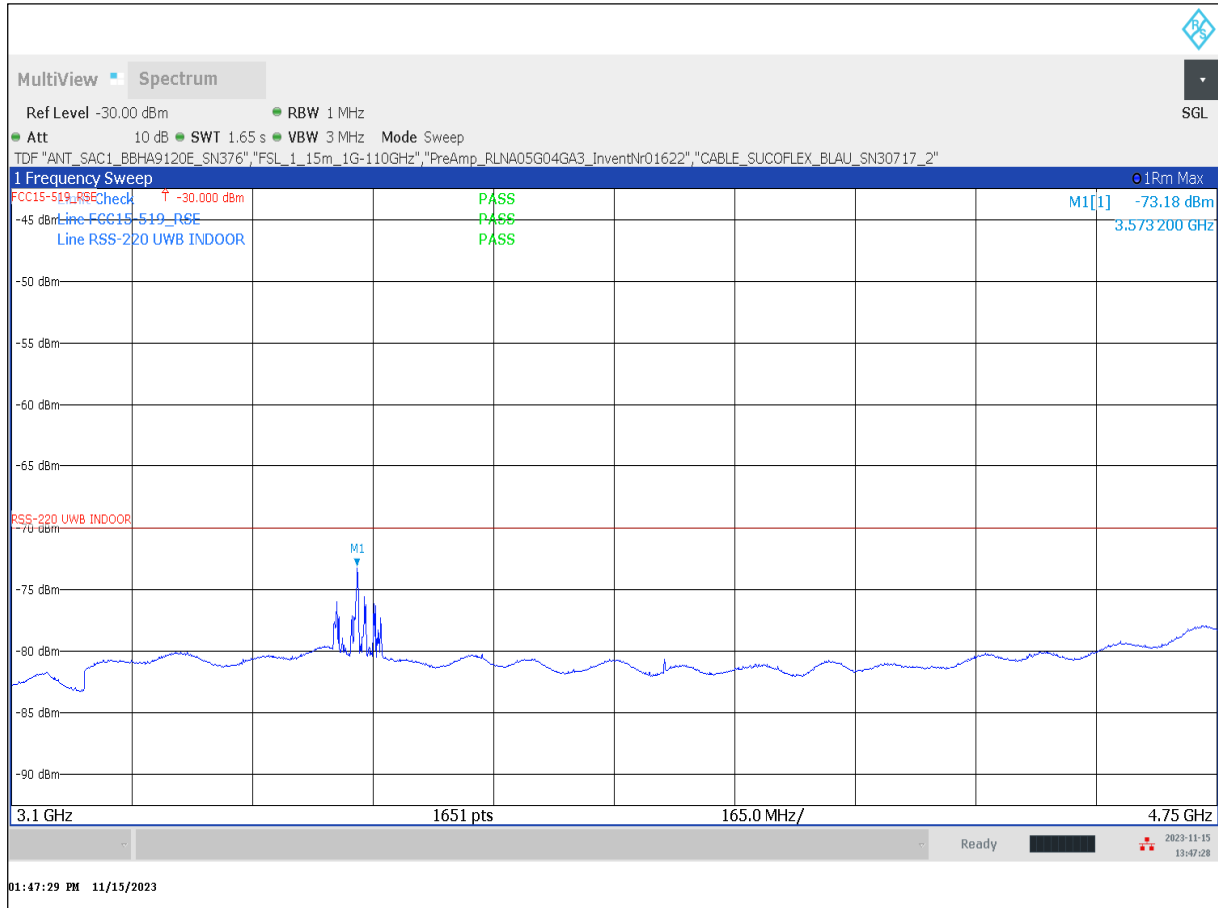


TID0139b_03__TX_RSE__EUT_laying__AntV



1.4.1 Emission measurements: 3.1GHz to 4.750MHz (RSS-220 limits)

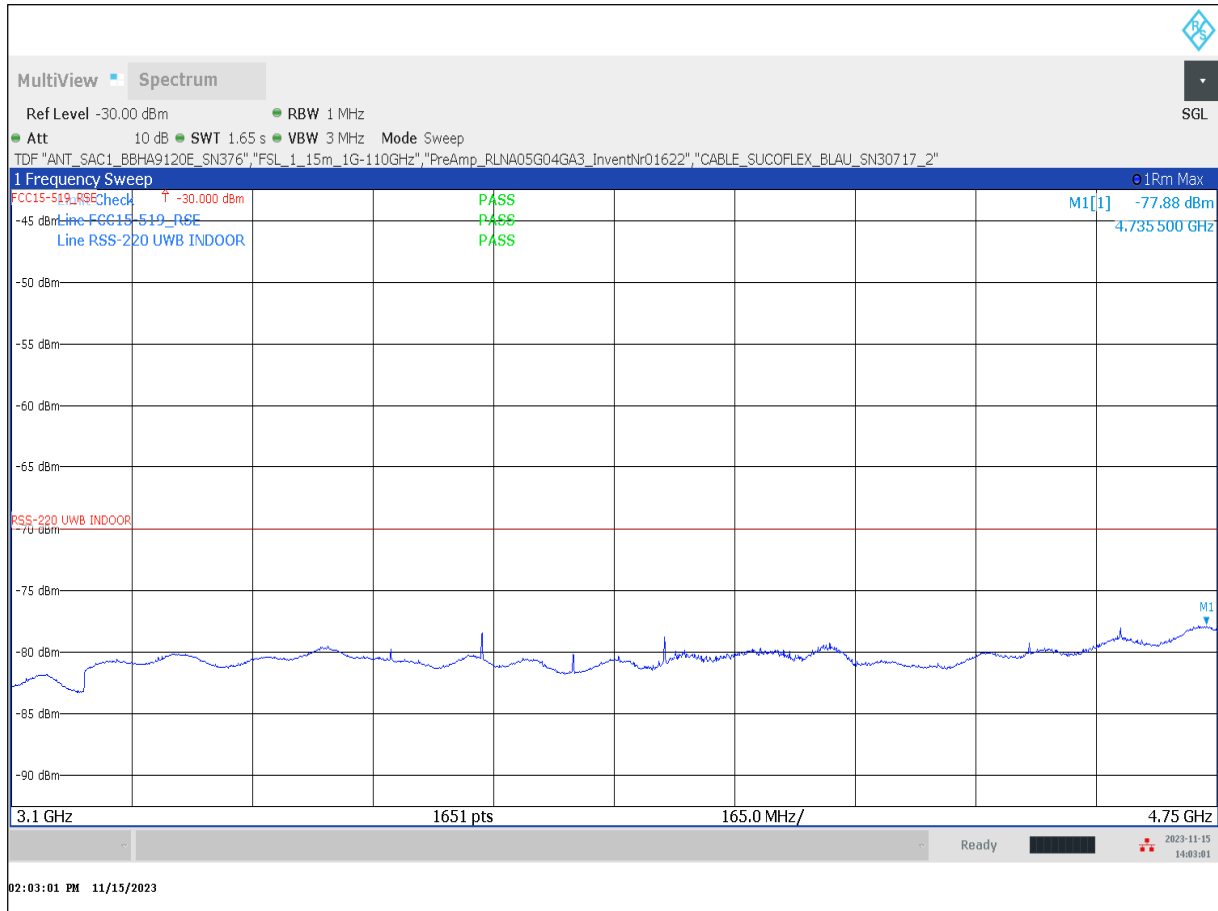
TID0148a_01__TX_RSE__EUT_standing__Anth



TID0148a_04__TX_RSE__EUT_laying__Anth



TID0148b_02__TX_RSE__EUT_standing__AntV

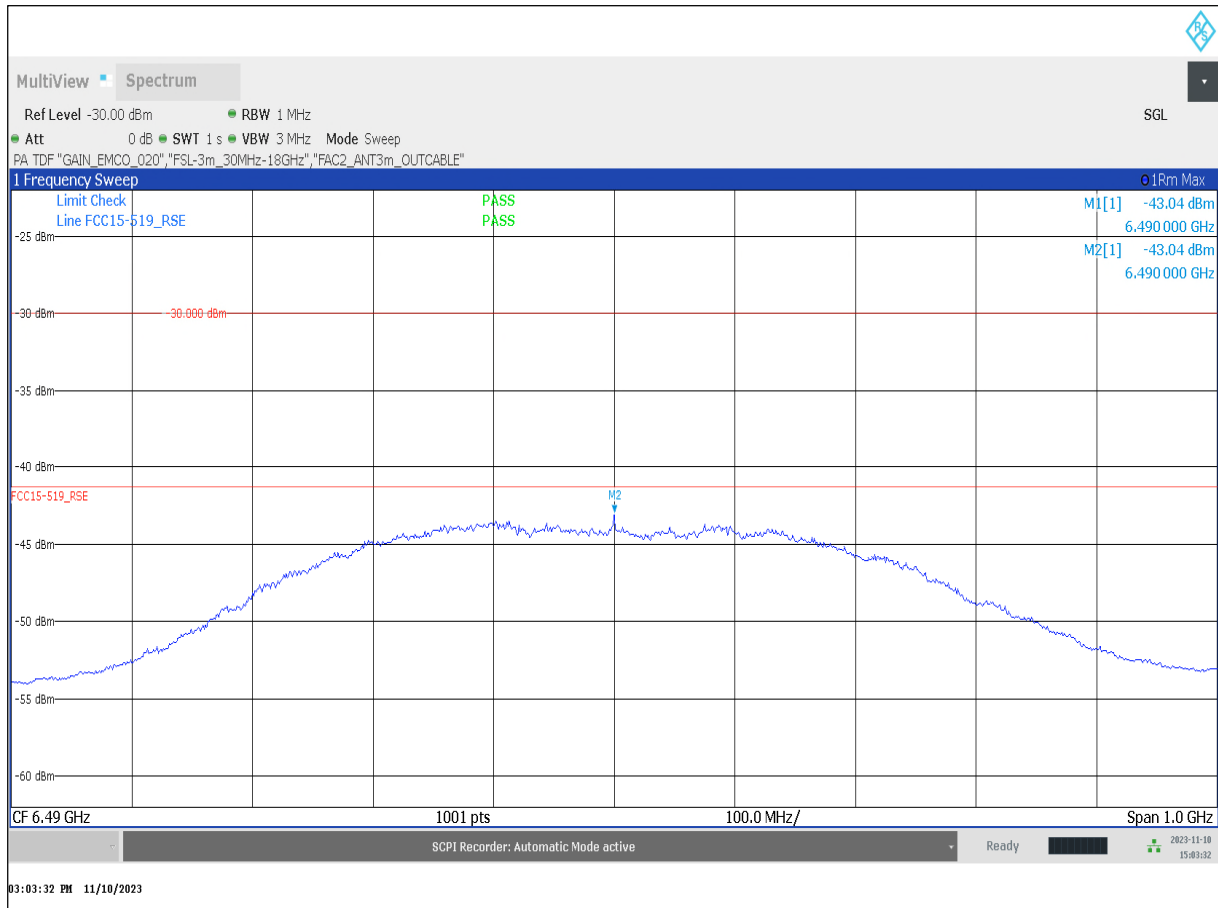


TID0148b_03__TX_RSE__EUT_laying__AntV

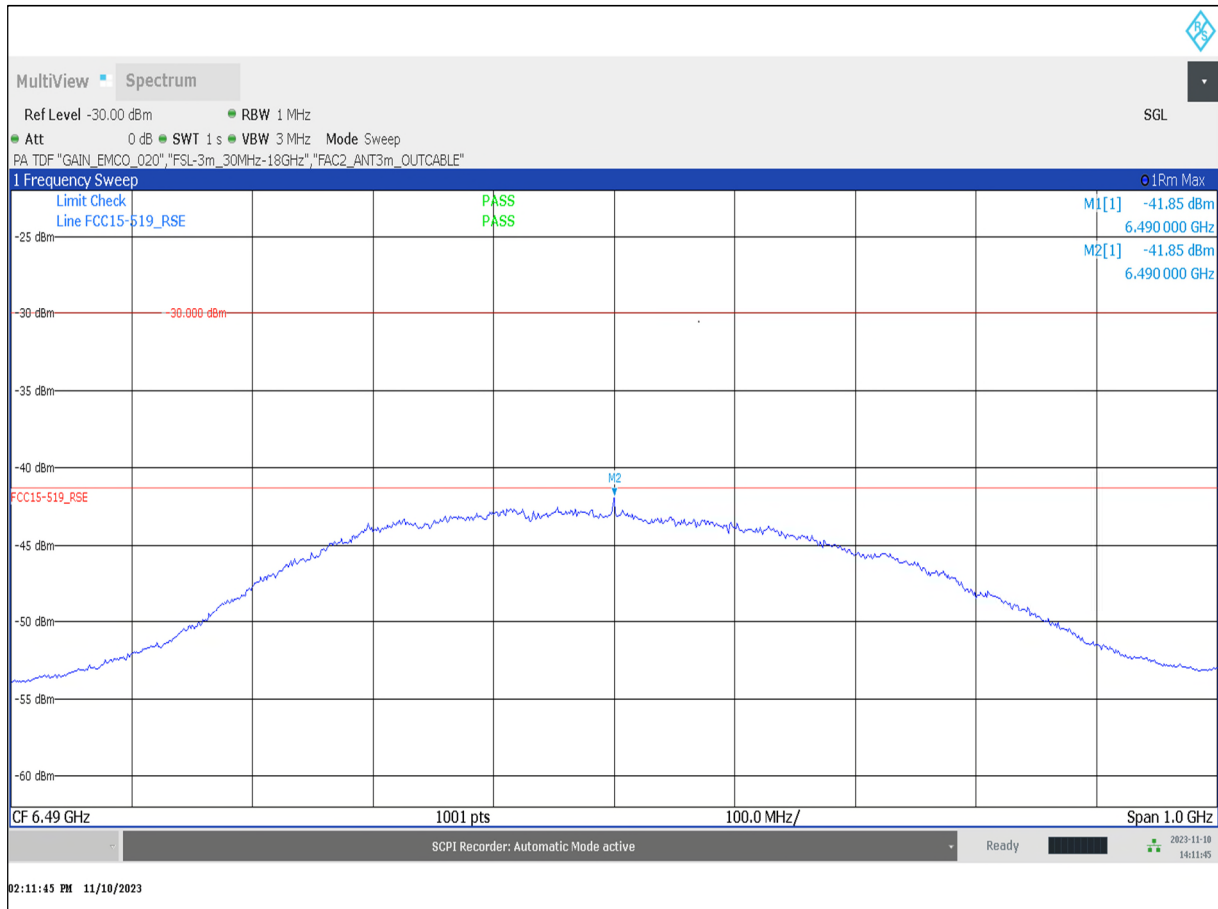


1.4.2 Emission measurements in range 3.1GHz to 10.6GHz

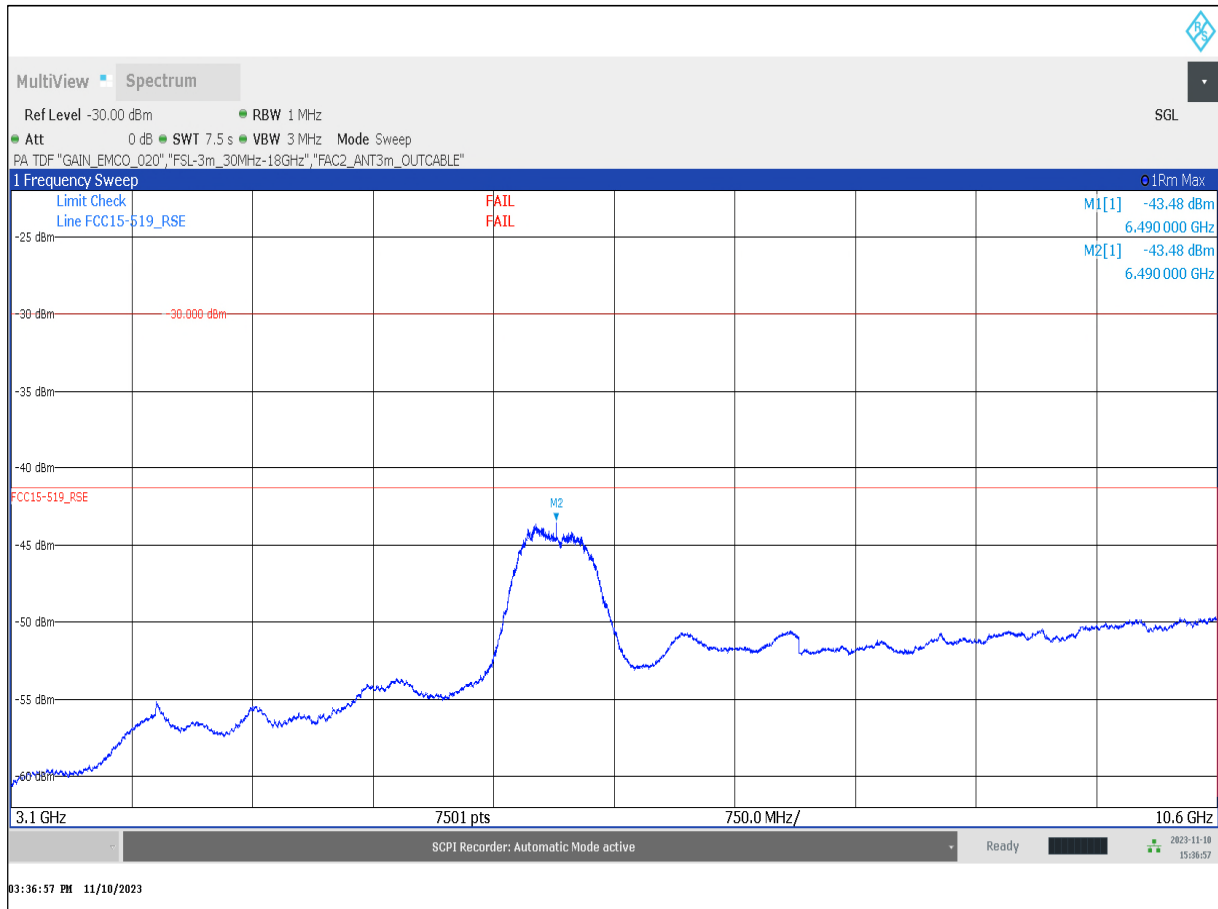
TID141a_RSE_S02_Ch5_PSD_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntH



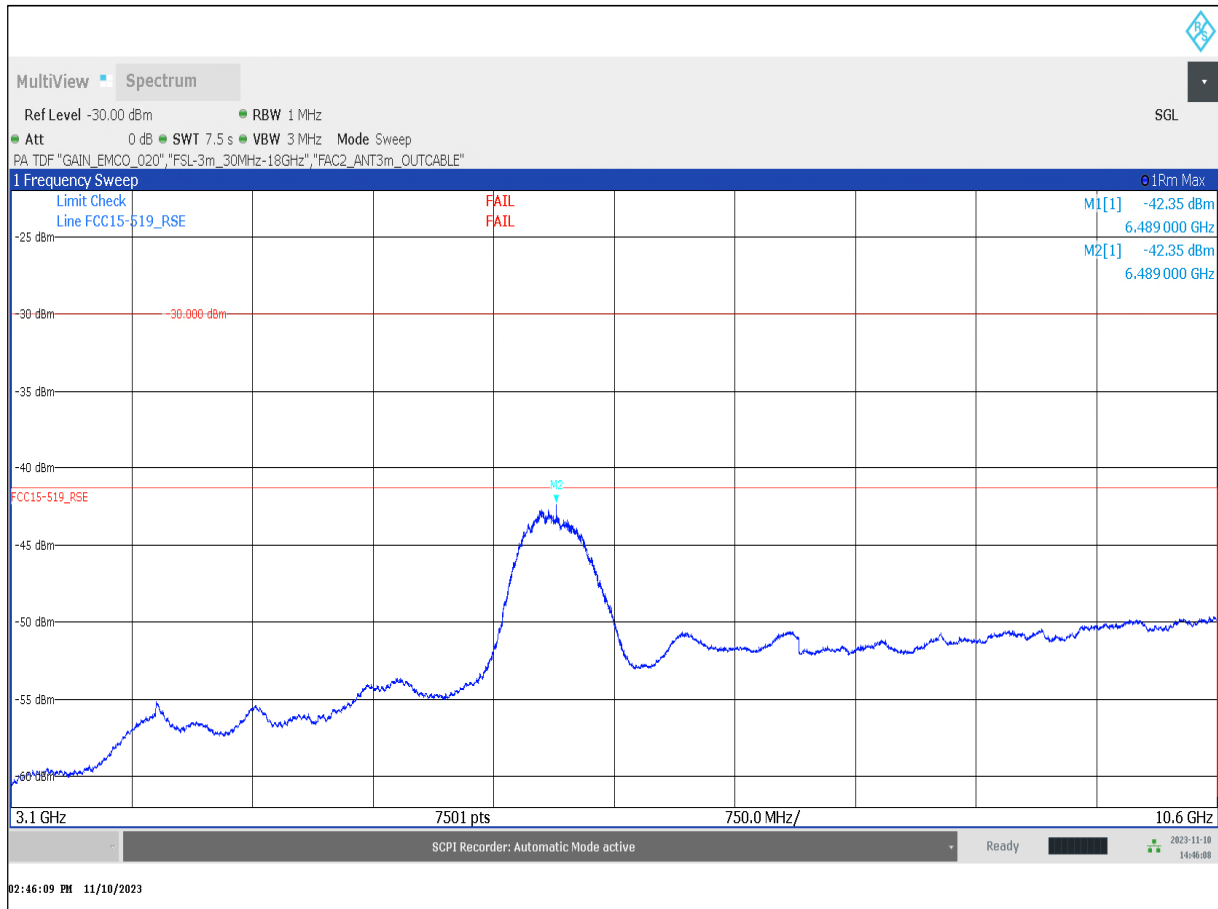
TID141b_RSE_S02_Ch5_PSD_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntV



TID142a_RSE_S02_Ch5_PSD_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntH



TID142b_RSE_S02_Ch5_PSD_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntV



1.4.3 Peak power measurements

TID143a_PK_PWR_S02_Ch5_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntH

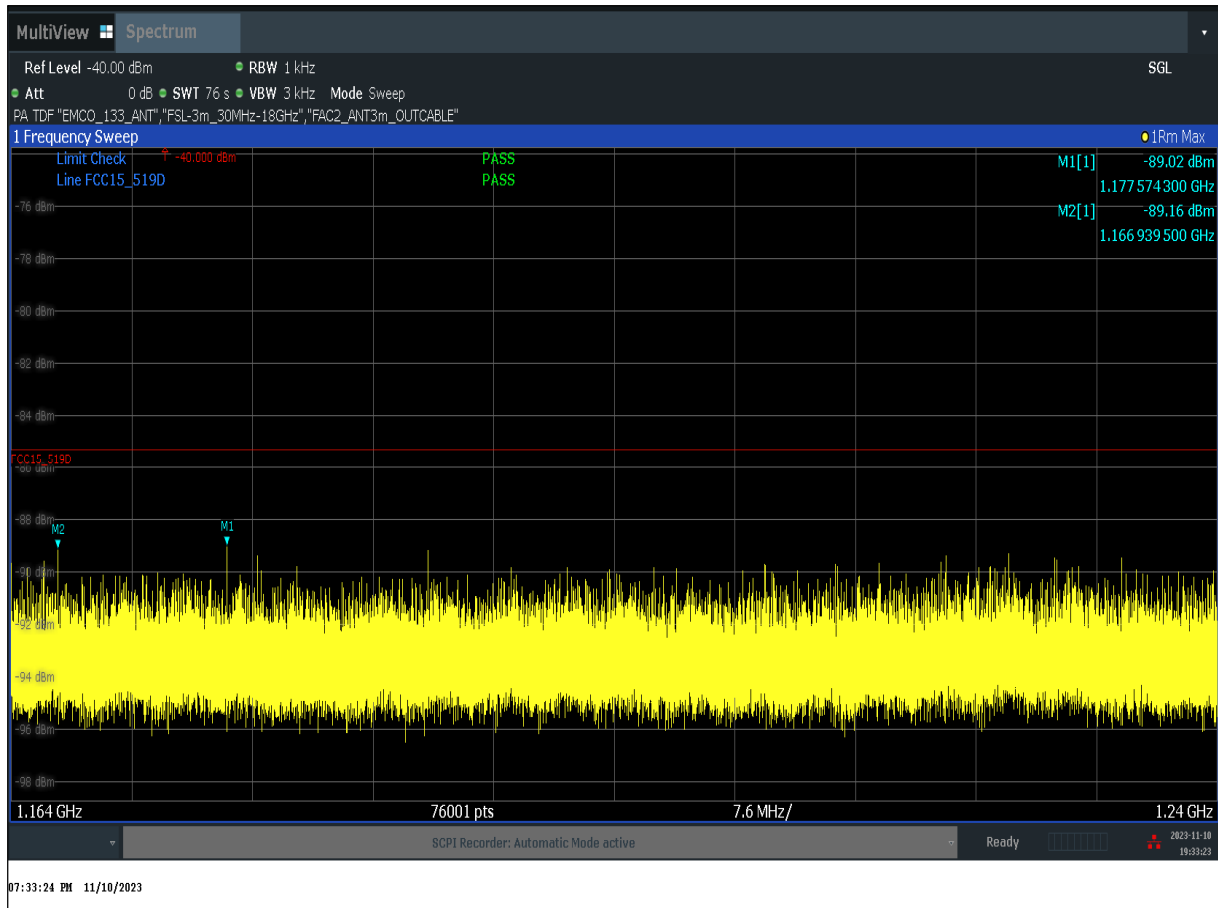


TID143b_PK_PWR_S02_Ch5_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntV

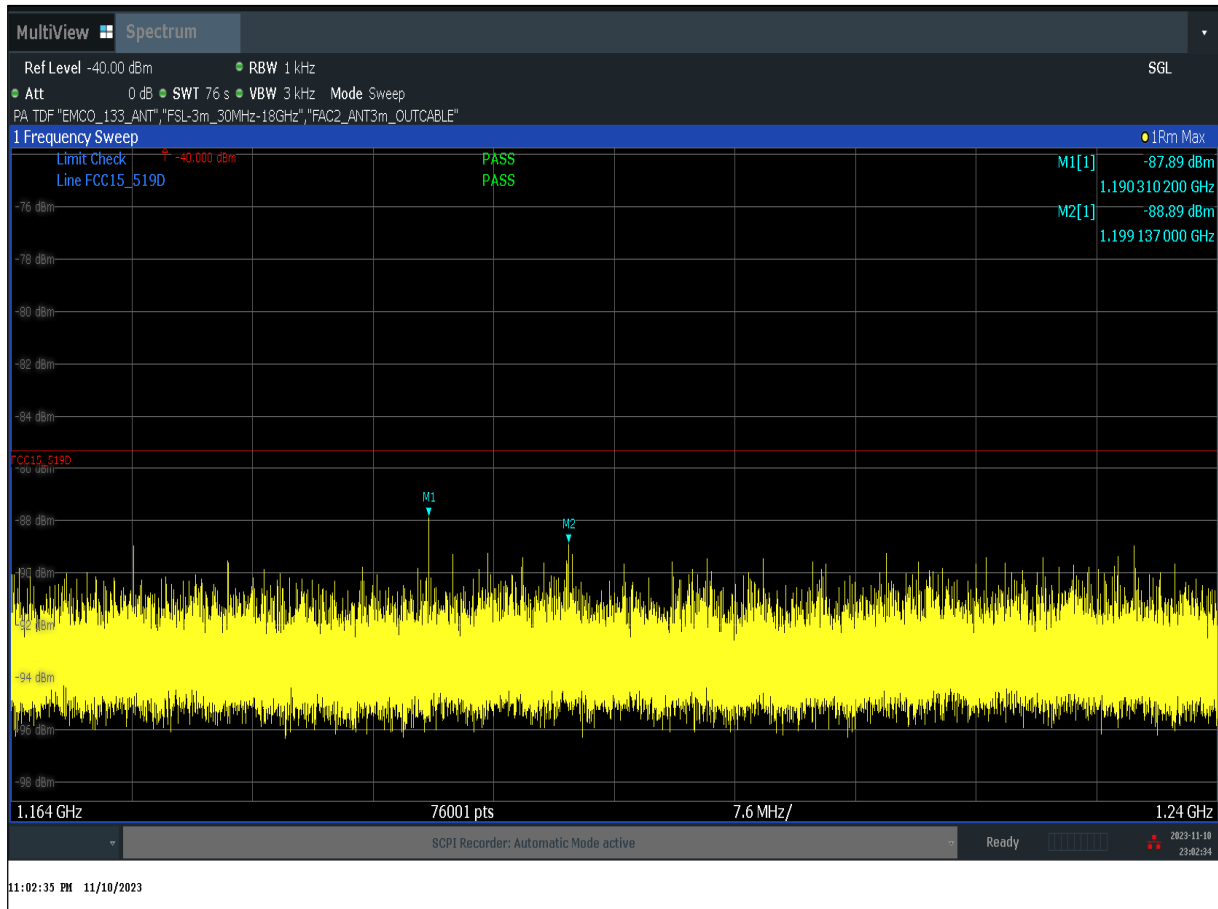


1.4.4 Emission in GPS1 range

TID144a_RSE_GPS1_S02_Ch5_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet5
6_AntH

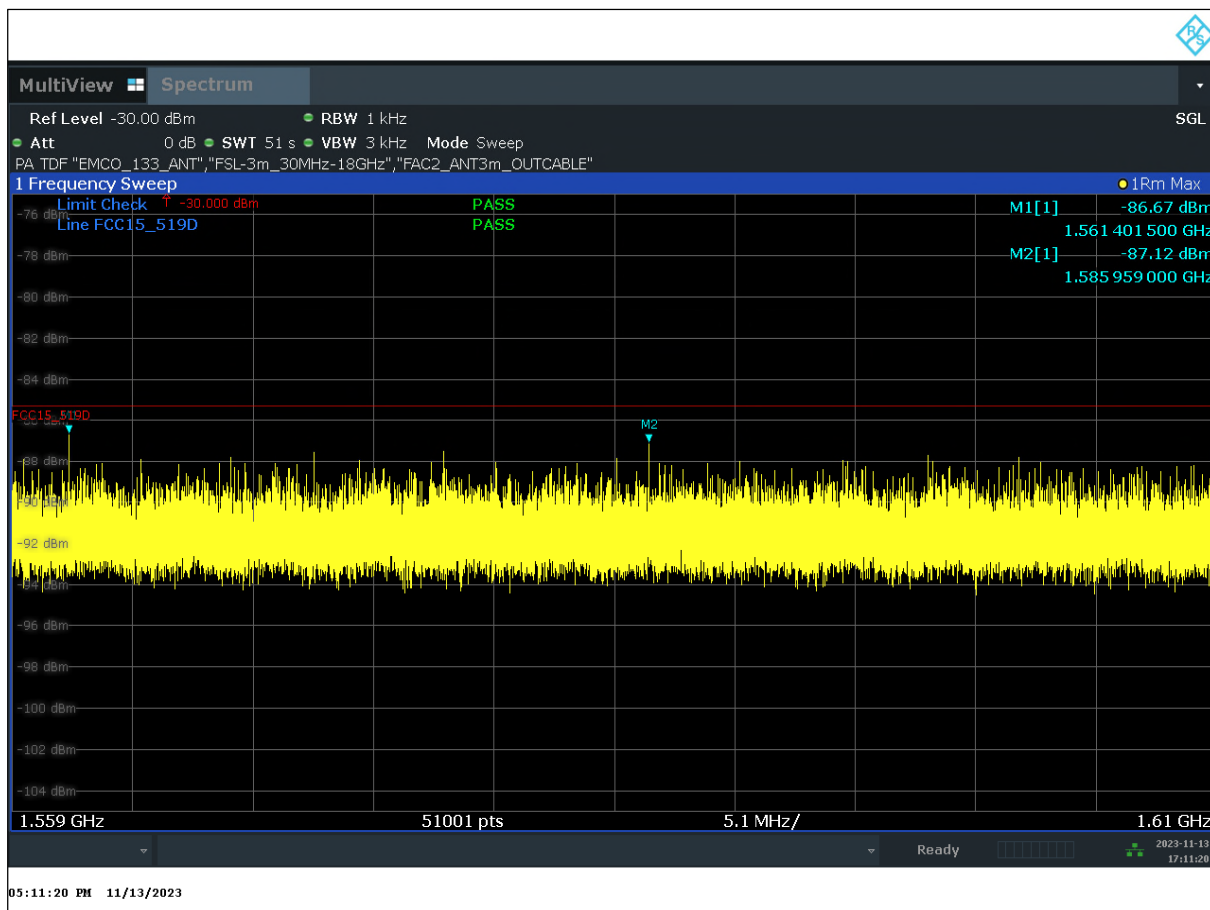


TID144b_RSE_GPS1_S02_Ch5_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet5 6_AntV

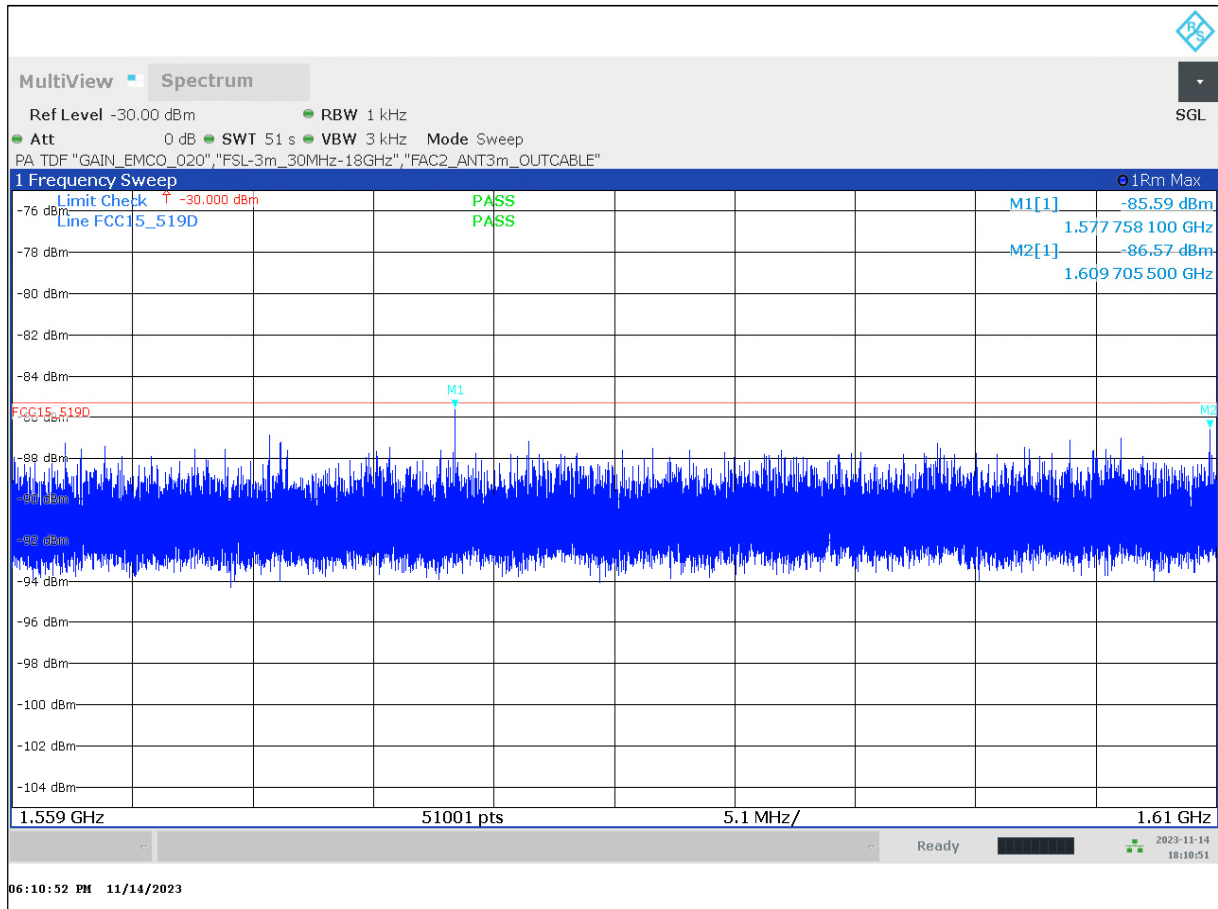


1.4.5 Emission in GPS2 range

TID145a_RSE_S02_Ch5_PSD_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntH



TID145b_GPS2_RSE_S02_Ch5_PSD_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet56_AntV

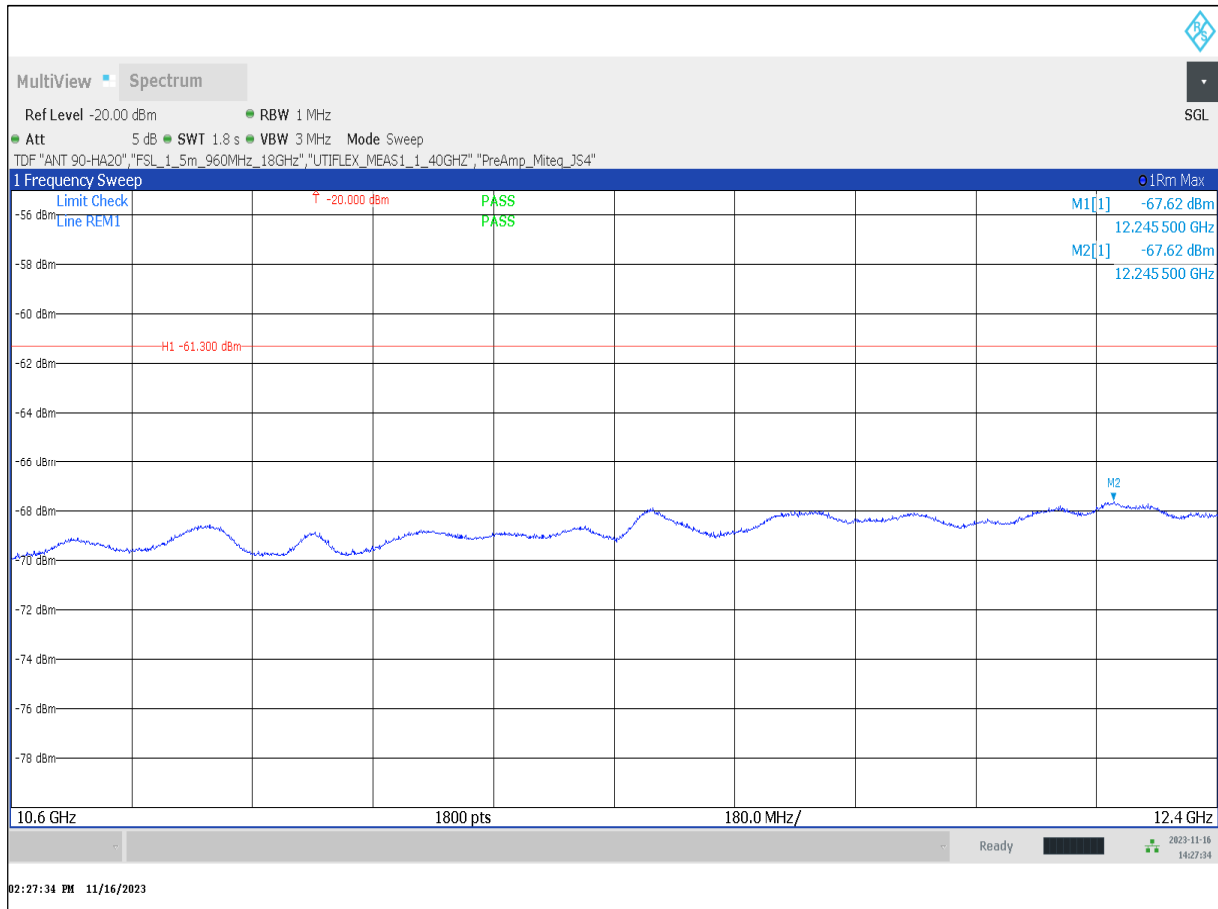


1.4.6 Emission measurements in range 10.6GHz to 12.4GHz

TID0149a_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet5
6_AntH

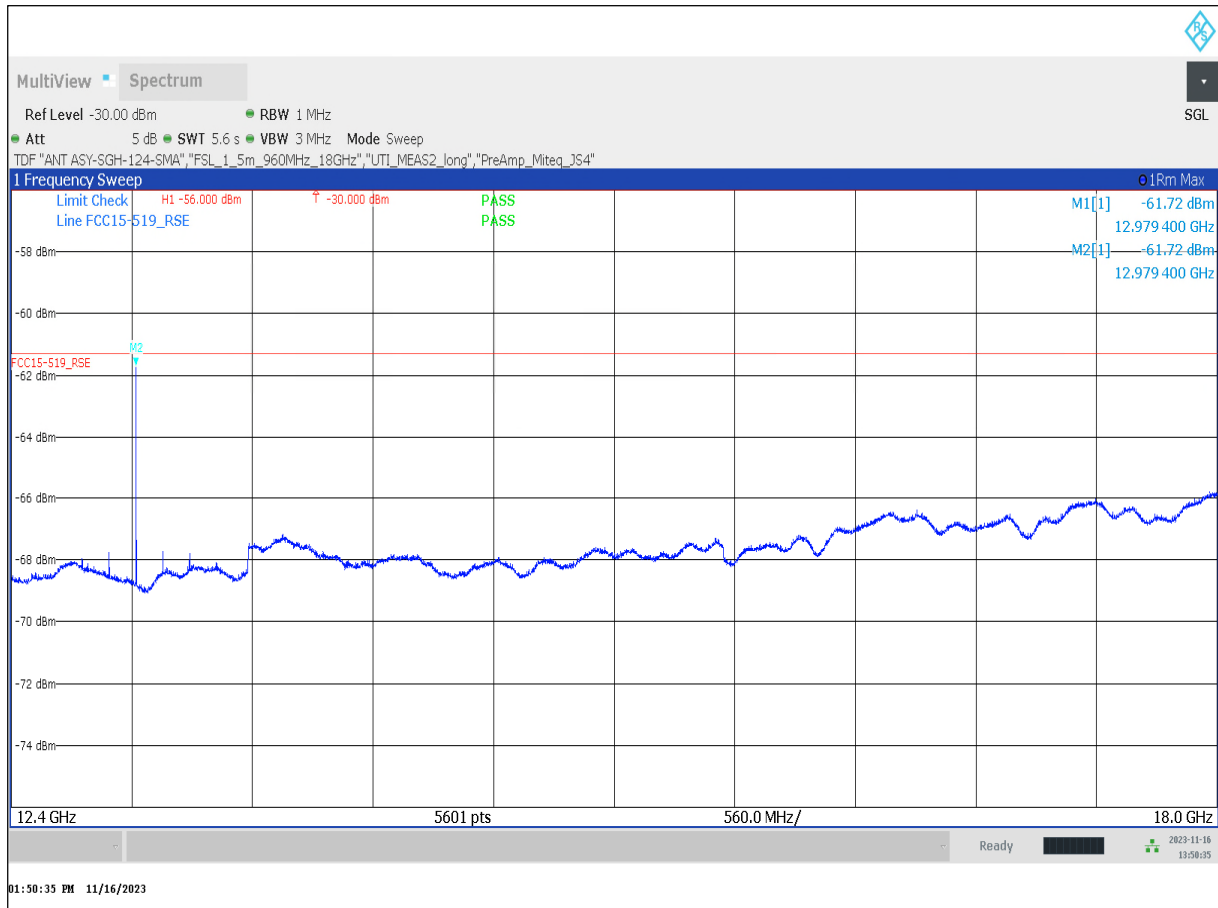


**TID0149b_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet
56_AntV**

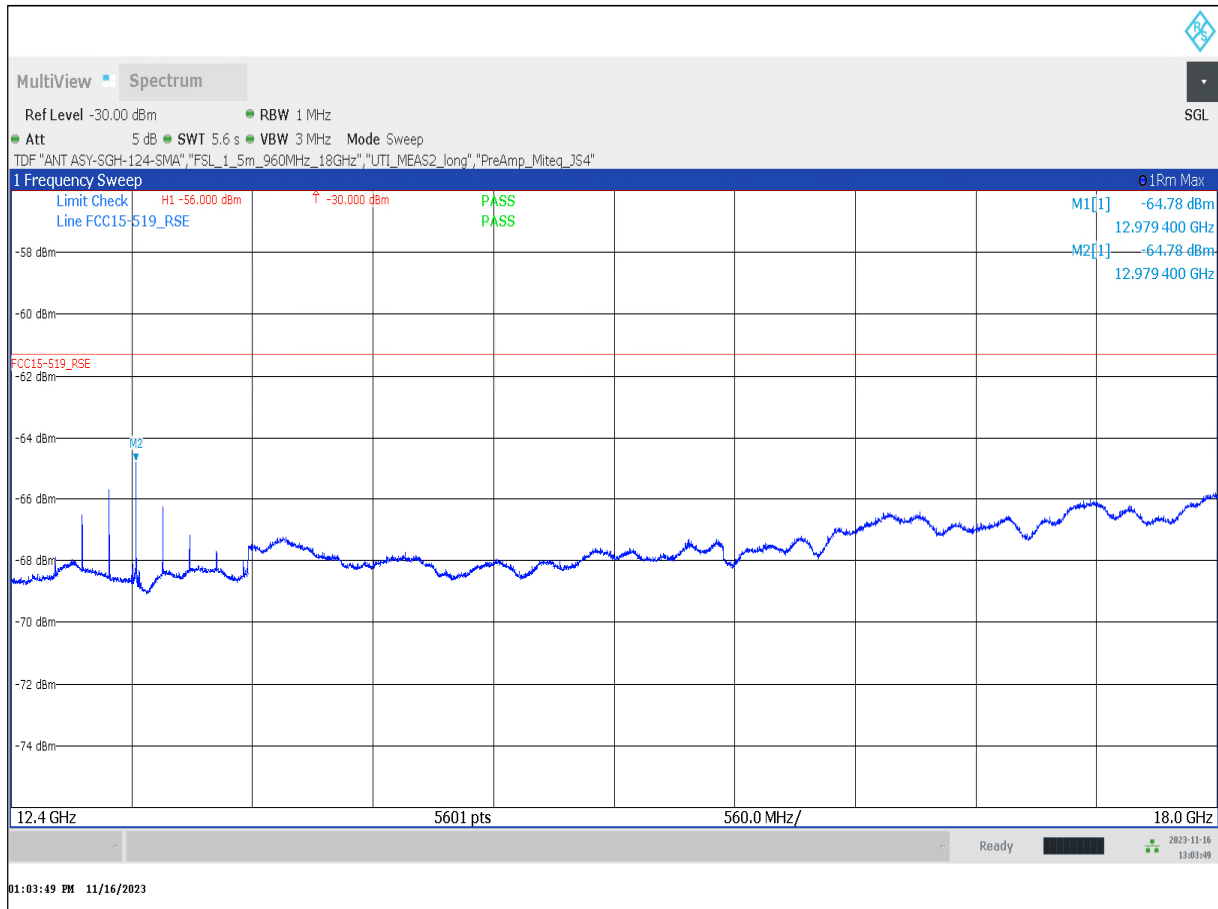


1.4.7 Emission measurements in range 12.4GHz to 18GHz

TID0150a_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet5_6_AntH

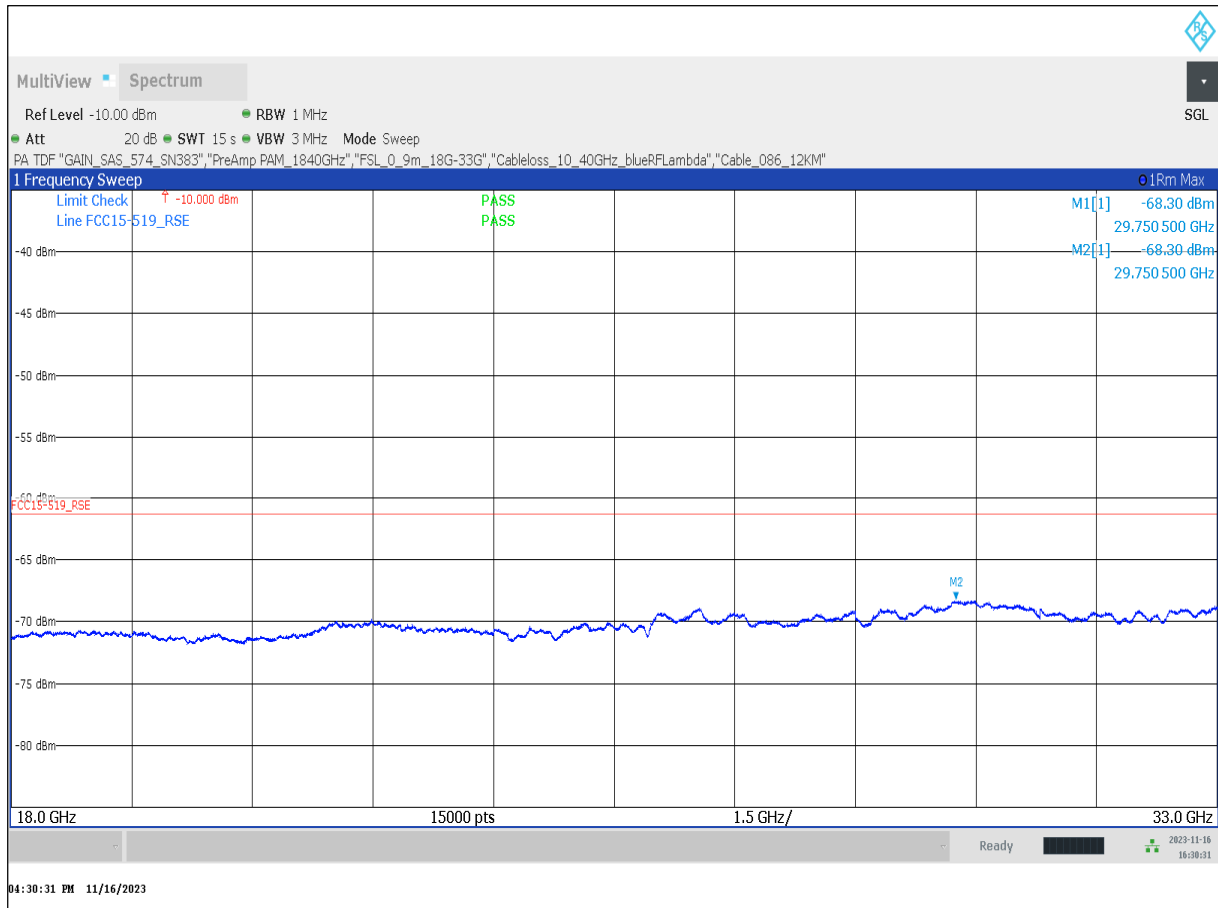


**TID0150b_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet
56_AntV**

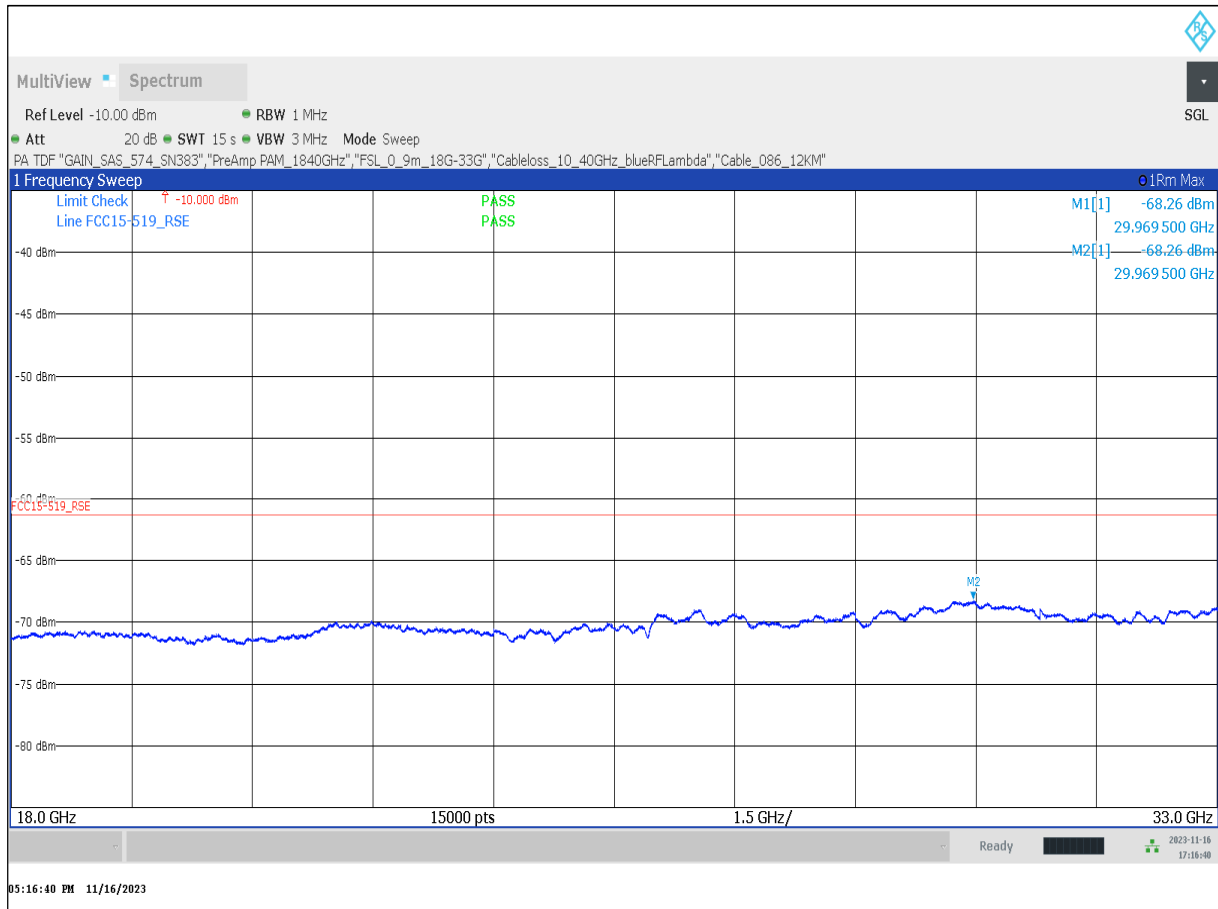


1.4.8 Emission measurements in range 18GHz to 33GHz

TID0151a_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet5_6_AntH

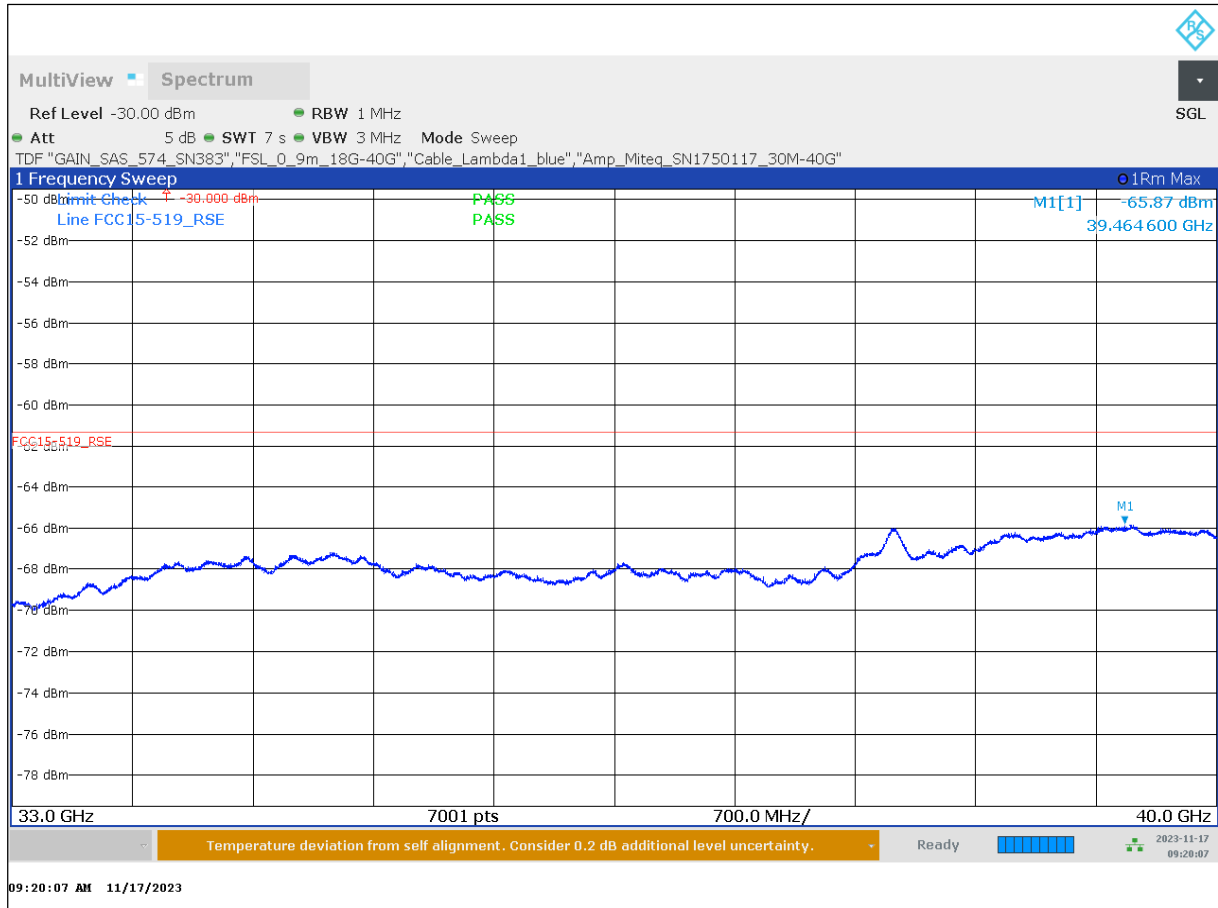


**TID0151b_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet
56_AntV**

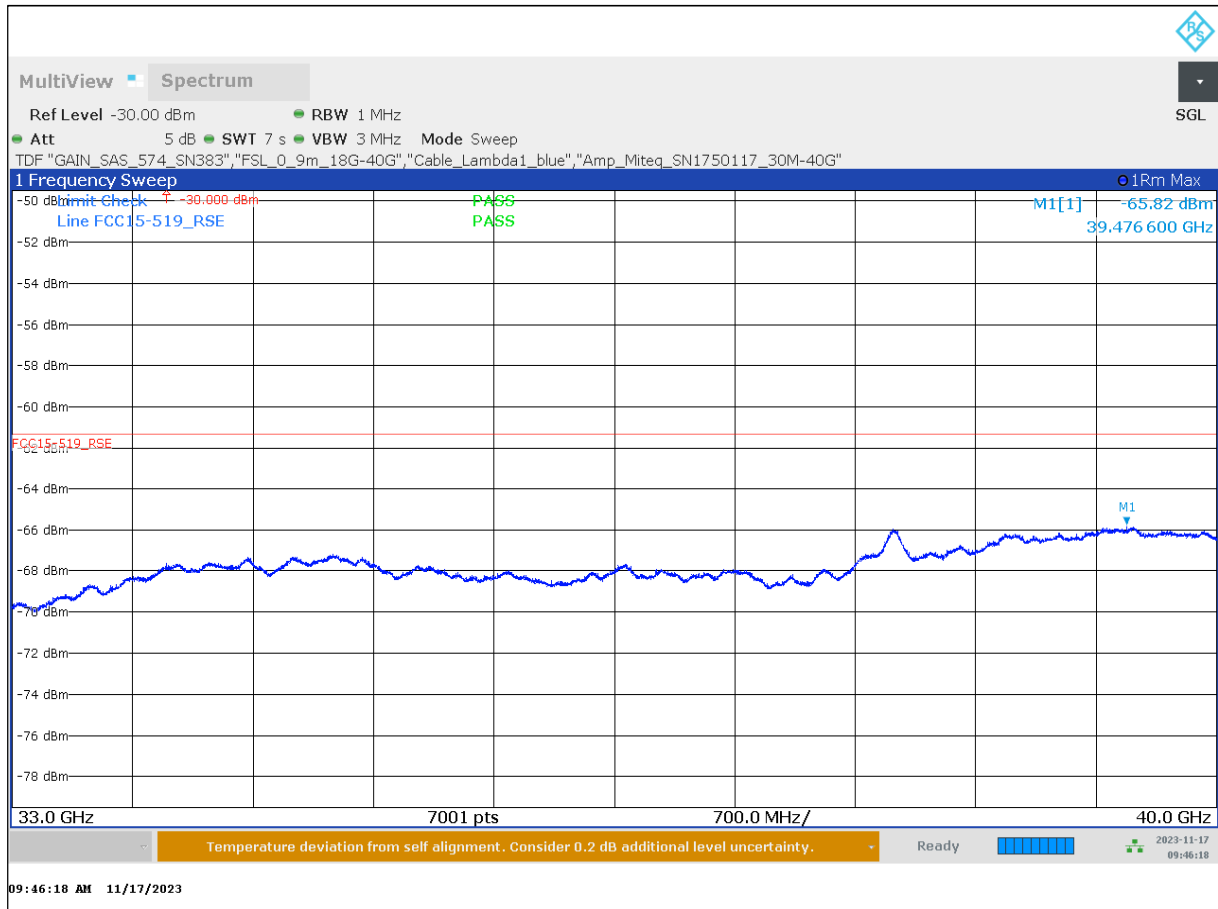


1.4.9 Emission measurements in range 33GHz to 40GHz

TID0152a_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet5
6_AntH

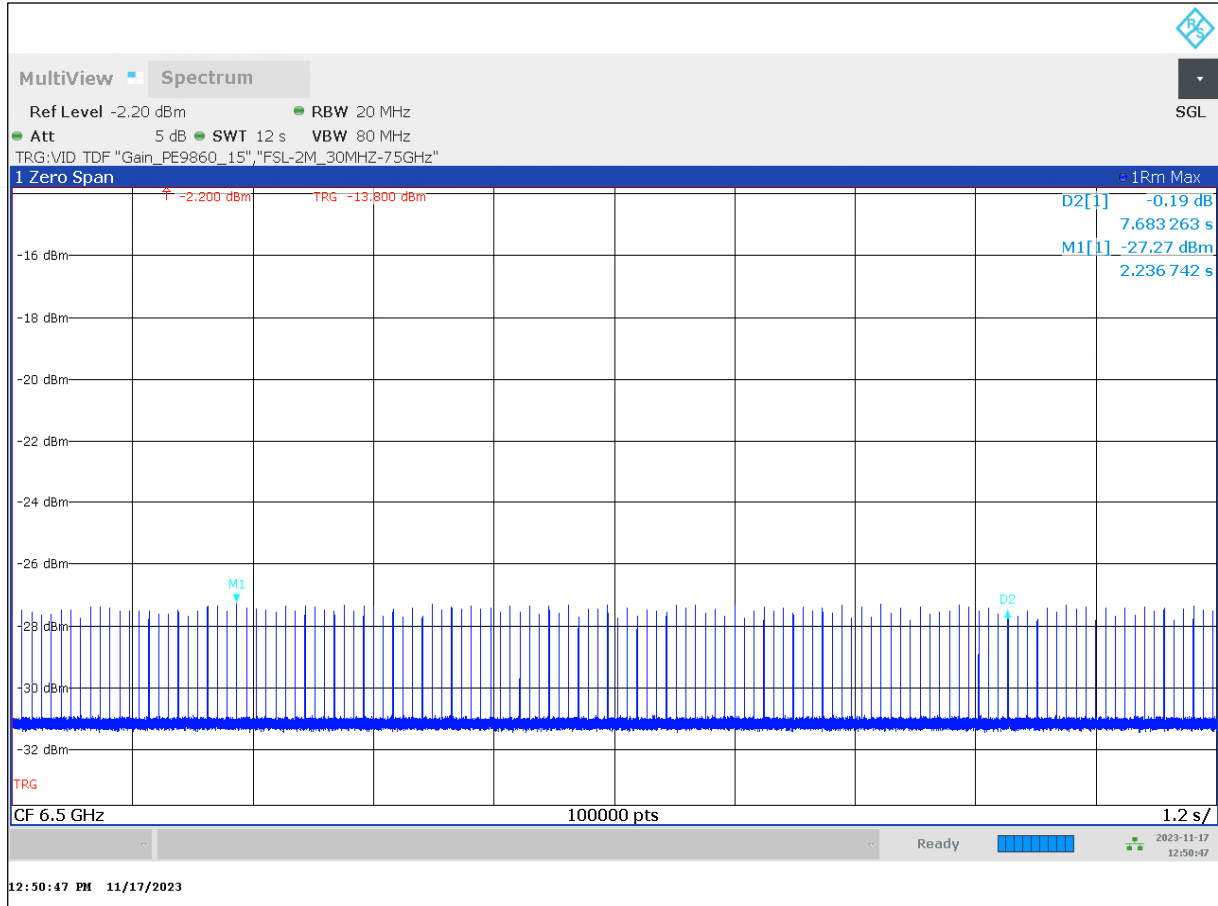


TID0152b_RSE_S02_Ch5_PWR_0x12121212_DataRate_6_8MBit_PRF64MHz_128Sym_Packet 56_AntV



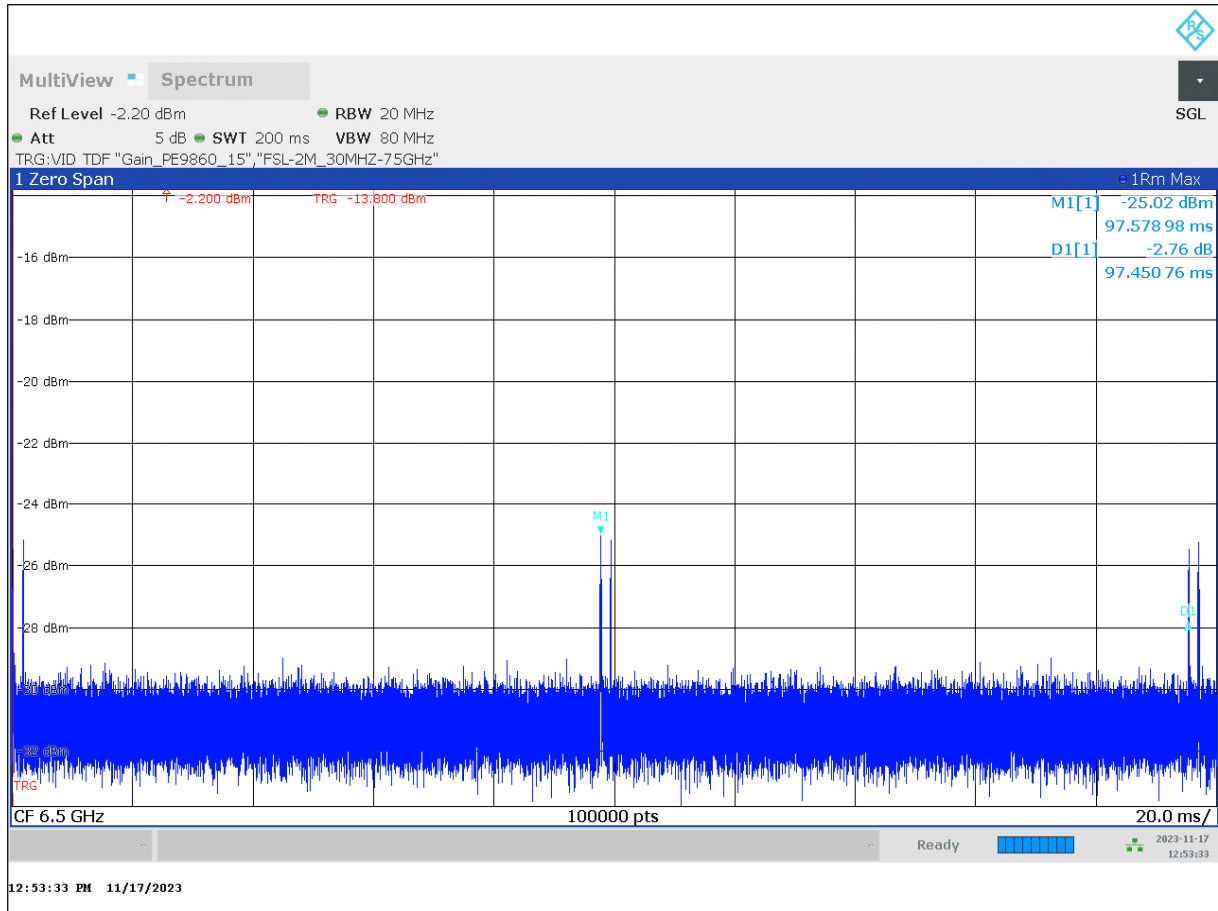
1.5 Timing measurements

TID0153_01_Tag_Timing_ConsecutiveCommunication_to_Anchor_over 12sec



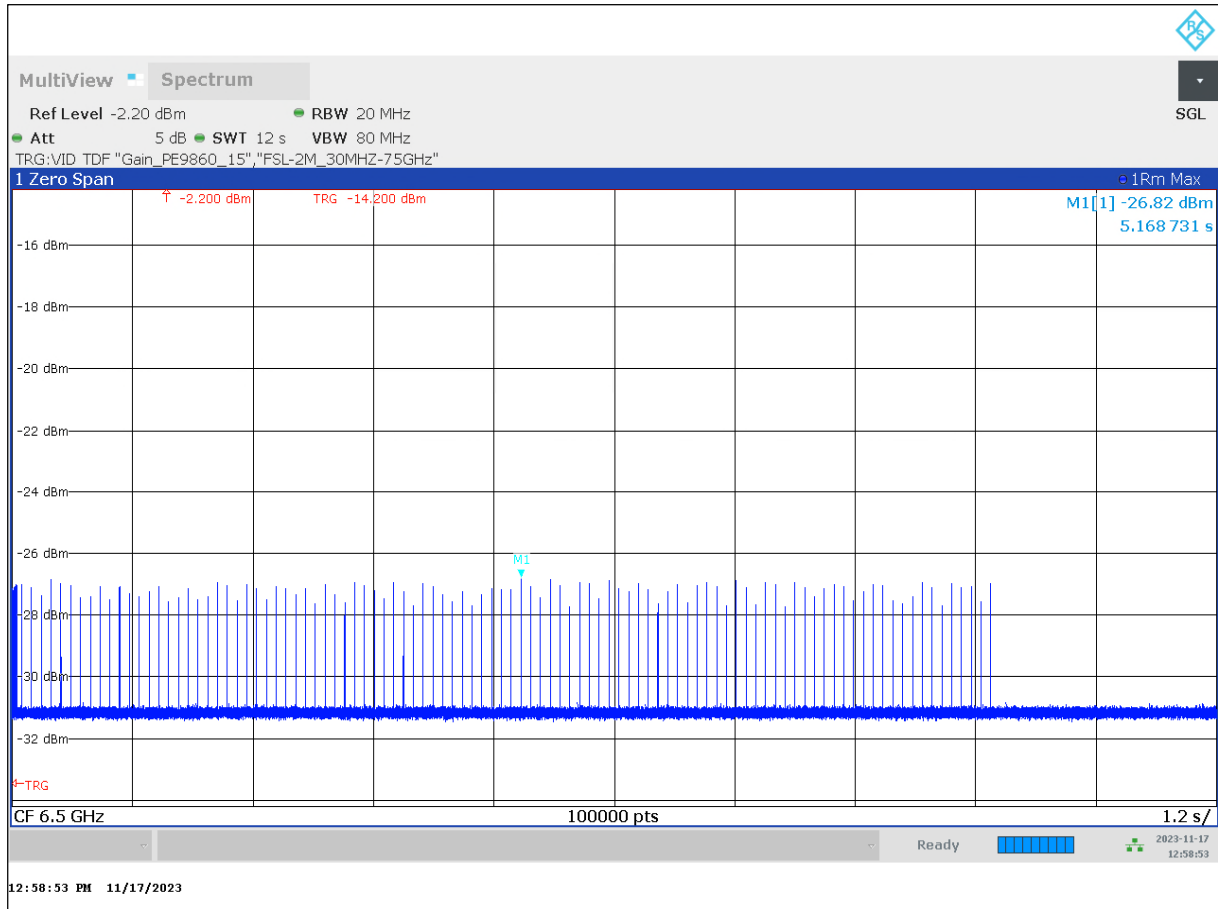
Communication view over 12seconds intervall.

TID0153_02_Tag_Timing_ConsecutiveCommunication_to_Anchor_over 20msec



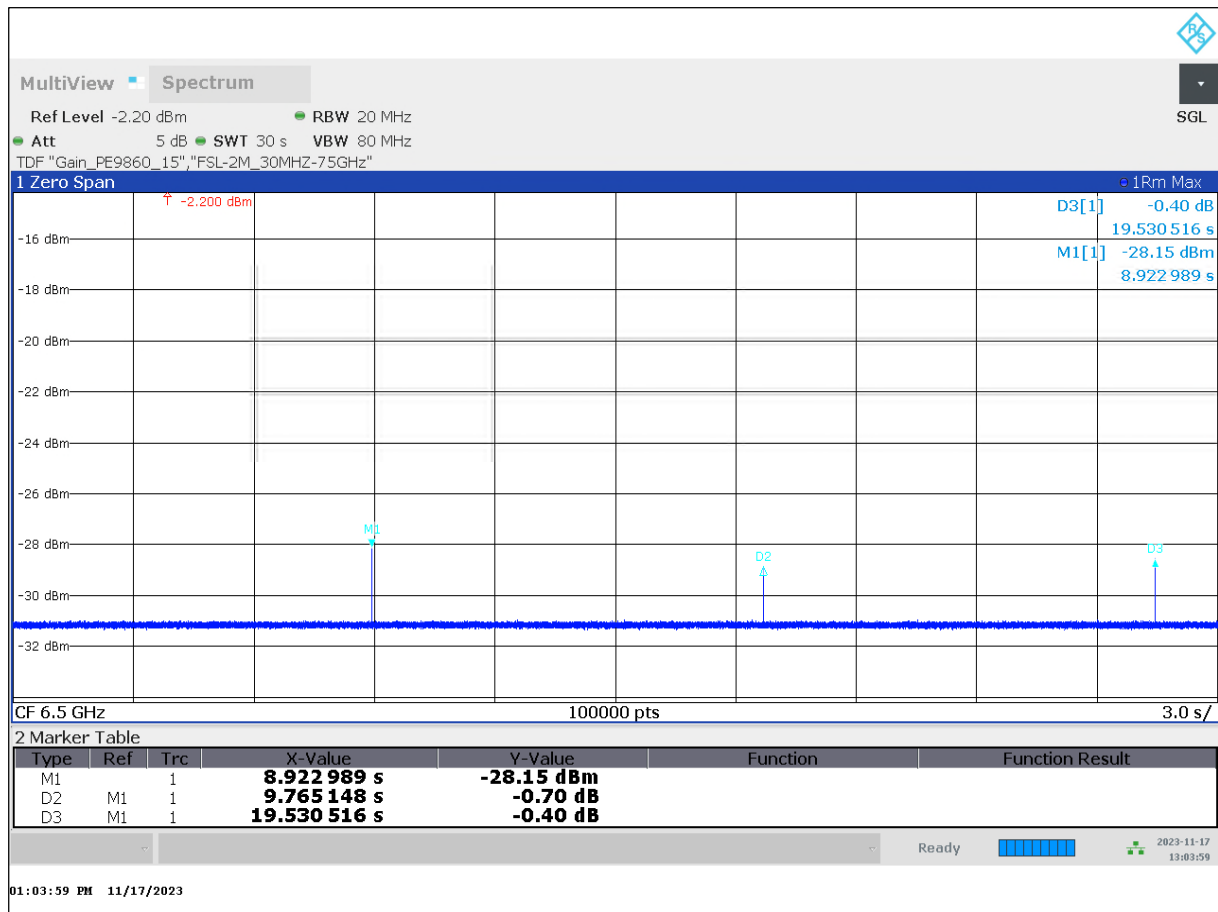
Communication view over 20mseconds intervall. Cycle time around 97.45ms.

TID0153_03_Tag_Timing_Communication_stop_12sec



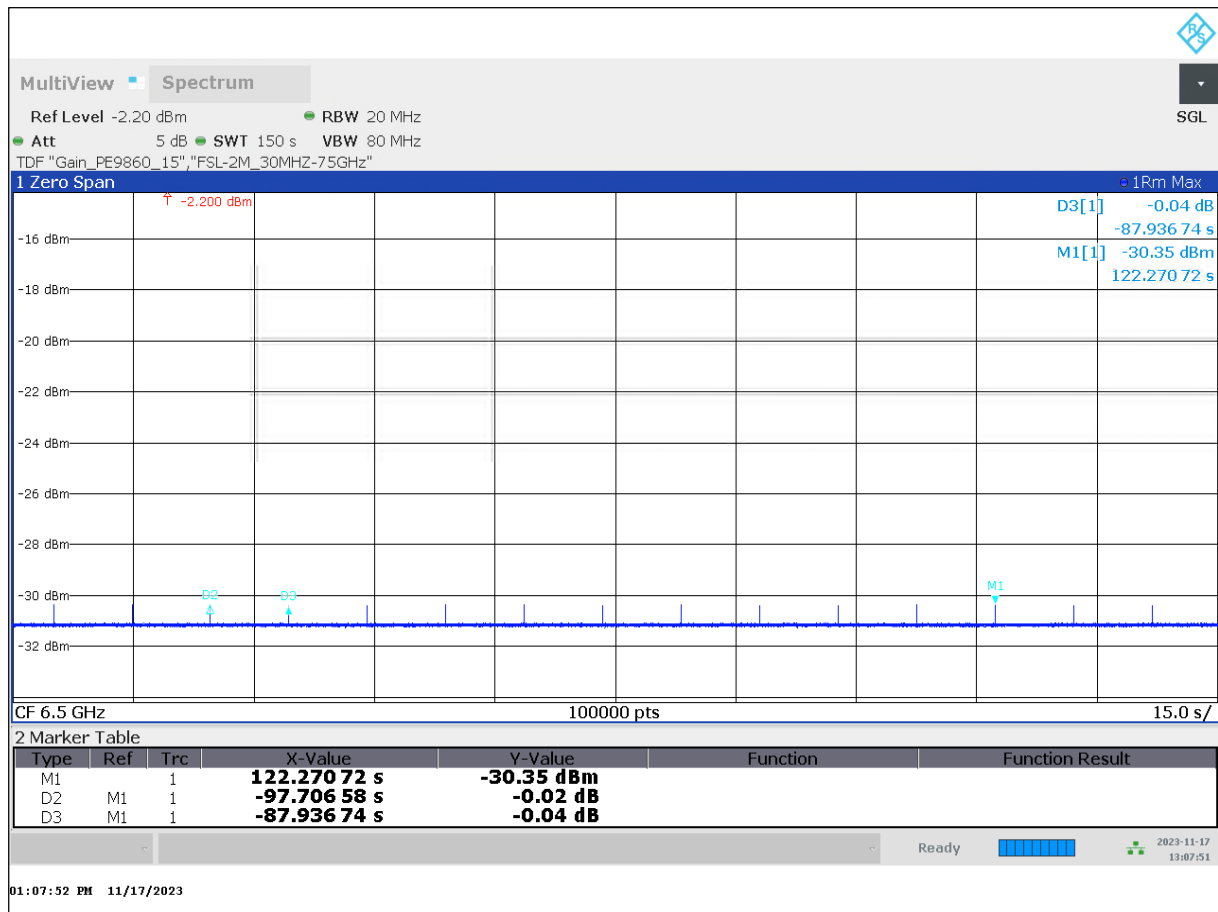
Last communication: 9.8499774997819447009 seconds
(Raw processing of file)

TID0153_04_Tag_Timing_Communication_stop_30sec



Overview long shot view, pings at cycle time of 9.76seconds.

TID0153_05_Tag_Timing_Communication_stop_150sec



Overview long shot view

End Of Annex 1