

Annex 1: Measurement diagrams 22-1-0131901T003a-C01-A1

Number of pages:	19	Date of Report:	2023-Mar-31
Testing company:	cetecom advanced GmbH Im Teelbruch 116 45219 Essen Germany Tel. + 49 (0) 20 54 / 95 19-0 Fax: + 49 (0) 20 54 / 95 19-150	Applicant:	BBC Bircher AG
Product: Model:	Wireless Transmission System XRF-TI		
FCC ID:	TBZ-XRFTI9	IC:	5904A-XRFTI9
Testing has been carried out in accordance with:	FCC Regulations Title 47 CFR, Chapter I, Subchapter A, Part 15 Subpart C Intentional Radiators § 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz ISED-Regulations Radio Standards Specification RSS-Gen, Issue 5 General Requirements for Compliance of Radio Apparatus RSS-247, Issue 2 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Device		

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1 Measurement diagrams

1.1 Radiated measurements

1.1.1 Radiated field strength emissions below 30 MHz

2.01a_RSE_standing

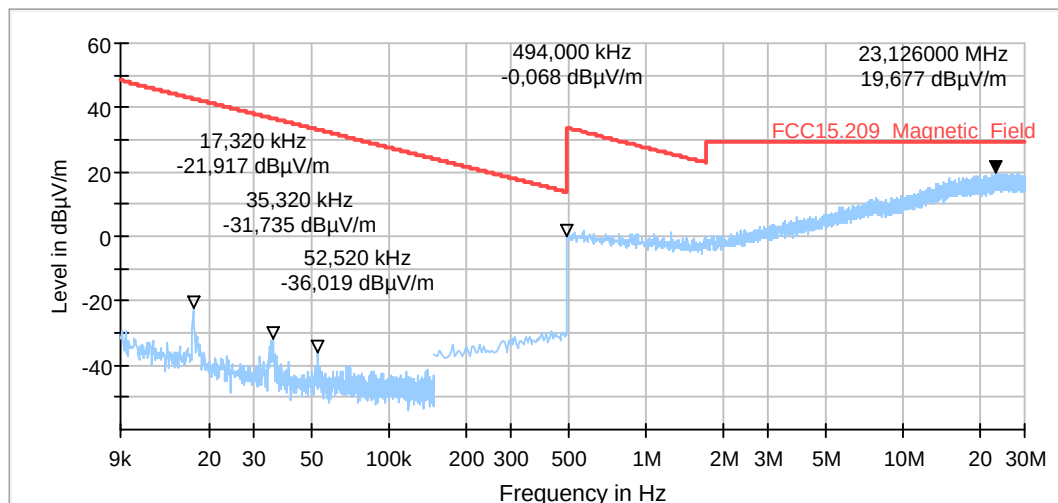
Common Information

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, §15.247 & RSS-247: Issue 2, RSS-Gen: Issue 5
Operator Name:	TFra
Operating Mode:	TX 921.5 MHz
Environmental Conditions:	Humidity : 40%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number	22-1-01319S24_C01
Power supply:	3.6 V DC
Comment:	

Full Spectrum



Remarks: emission in the range from ~17 kHz to ~52 kHz are cause by an electrical antenna mast inside the chamber.

EUT worst case orientation was determined to be the standing position due to higher output power see section

1.1.4 Radiated Band-Edge emissions

1.1.2 Radiated field strength emissions 30 MHz – 1 GHz

3.01a_RSE_standing

Common Information

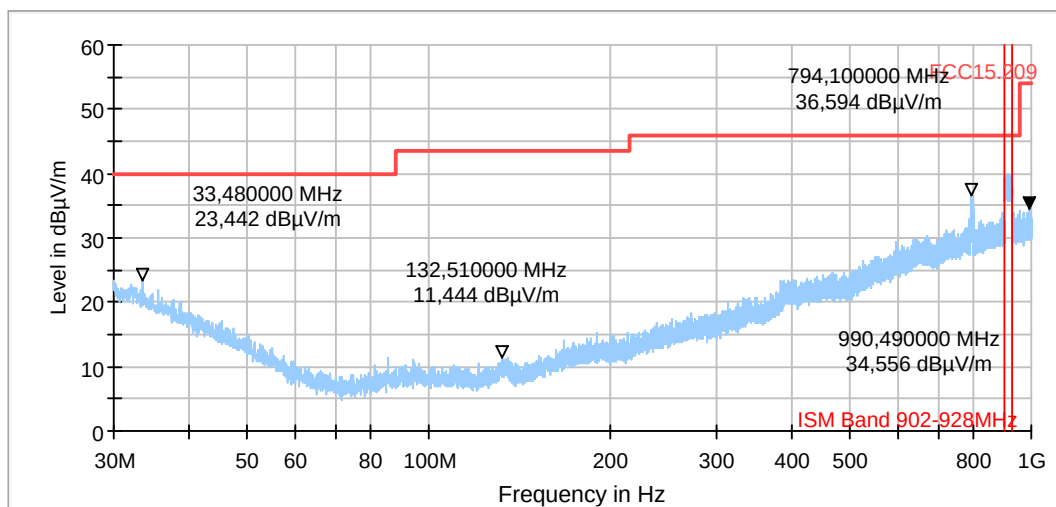
Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC §15.205 §15.209, §15.247 & RSS-247: Issue 2, RSS-Gen: Issue 5
Antenna polarisation:	horizontal/vertical
Filter:	Bandstop filter 902MHz - 928MHz
Operator Name:	TFra
Operating Mode:	TX 921.5 MHz
Environmental Conditions:	Humidity : 45%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number	22-1-01319S24_C01
Power supply:	3.6 V DC
Comment:	standing

Full Spectrum

Full Spectrum



3.01b_RSE_lying

Common Information

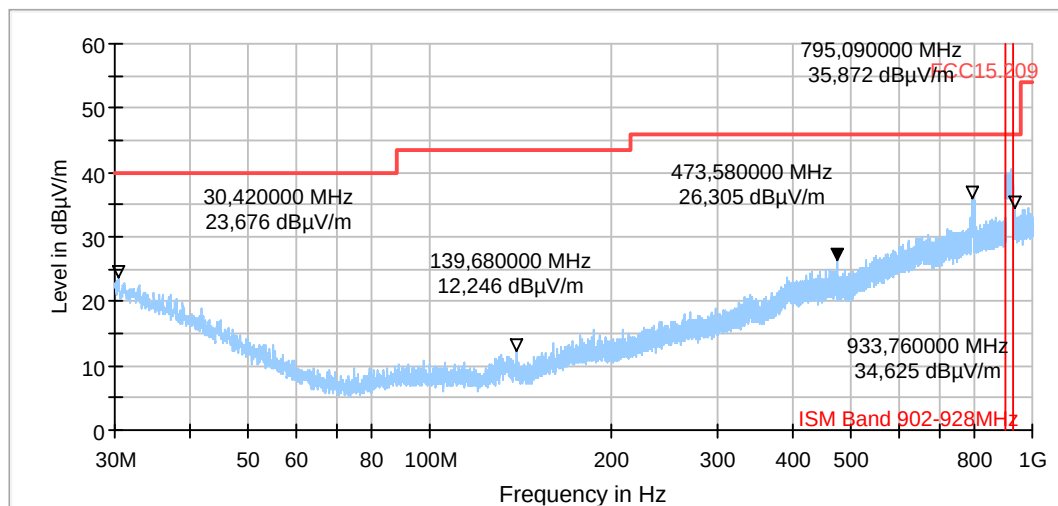
Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC §15.205 §15.209, §15.247 & RSS-247: Issue 2, RSS-Gen: Issue 5
Antenna polarisation:	horizontal/vertical
Filter:	Bandstop filter 902MHz - 928MHz
Operator Name:	TFra
Operating Mode:	TX 921.5 MHz
Environmental Conditions:	Humidity : 45%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number	22-1-01319S24_C01
Power supply:	3.6 V DC
Comment:	lying

Full Spectrum

Full Spectrum



1.1.3 Radiated field strength emissions above 1 GHz

4.01

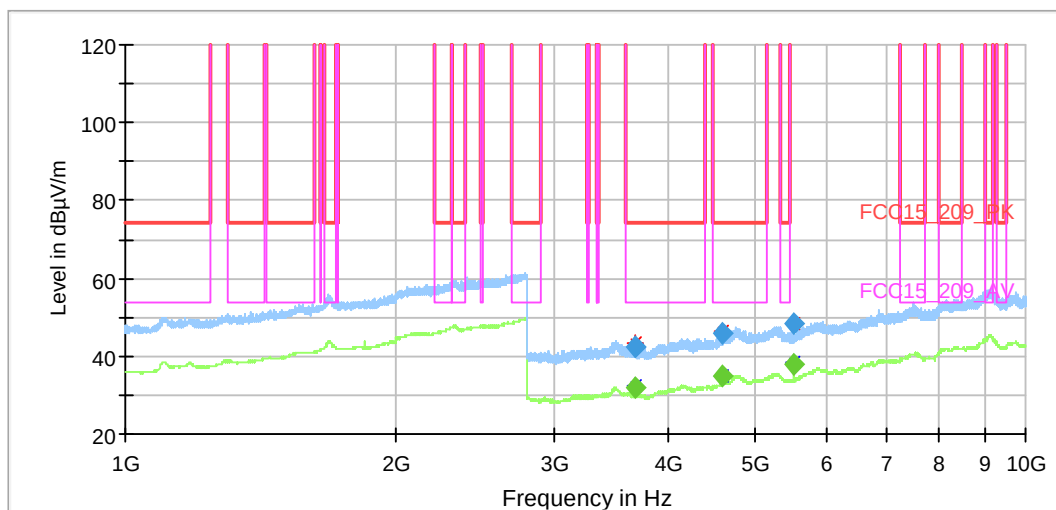
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC §15.205 §15.209, §15.247 & RSS-247: Issue 2, RSS-Gen: Issue 5
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra/LKnopp
Operating Mode:	TX 921.5 MHz
Environmental Conditions:	Humidity : 45%RH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number	22-1-01319S24_C01
Power supply:	3.6 V DC
Comment:	--

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Trd Corr. (dB/m)
3685.200000	---	32.09	54.00	21.91	100.0	1000.000	155.0	V	272.0	0.0	33
3686.800000	42.27	---	74.00	31.73	100.0	1000.000	155.0	V	92.0	0.0	33
4608.400000	---	34.69	54.00	19.31	100.0	1000.000	155.0	H	126.0	90.0	35
4608.400000	45.98	---	74.00	28.02	100.0	1000.000	155.0	H	128.0	90.0	35
5528.000000	---	37.95	150.00	112.05	100.0	1000.000	155.0	H	233.0	90.0	36
5528.000000	48.31	---	150.00	101.69	100.0	1000.000	155.0	H	133.0	90.0	36

1.1.4 Radiated Band-Edge emissions

9.01a_BE_standing

Common Information

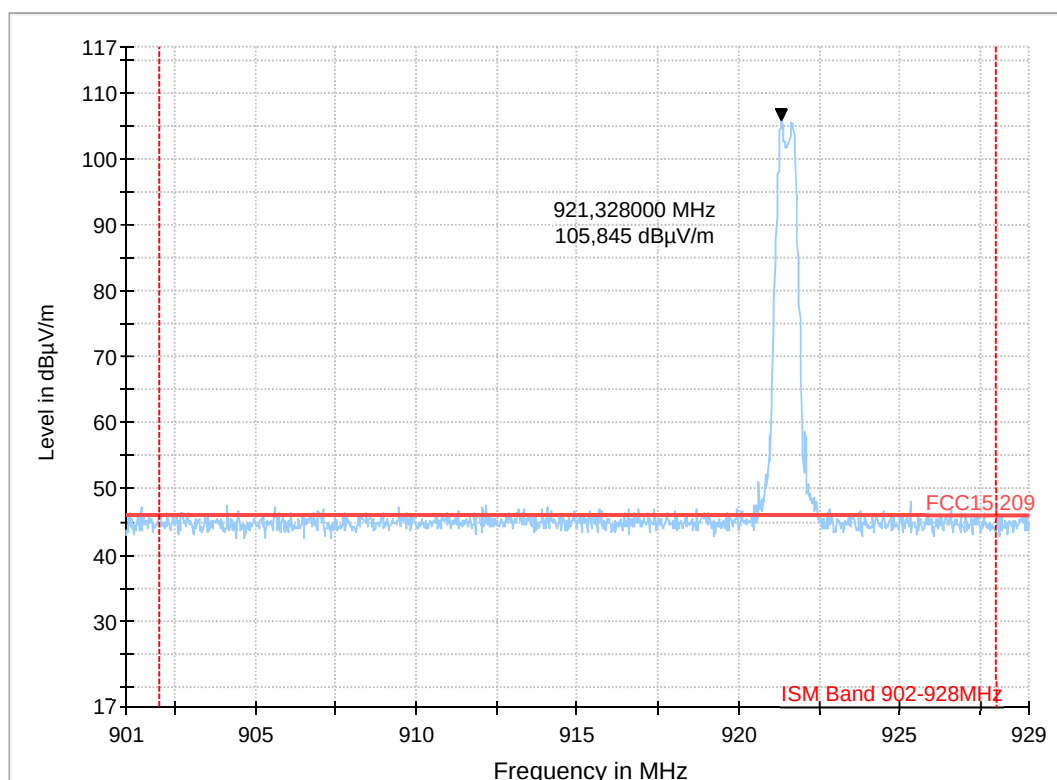
Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC §15.205 §15.209, §15.247 & RSS-247: Issue 2, RSS-Gen: Issue 5
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra
Operating Mode:	TX 921.5 MHz
Environmental Conditions:	Humidity : 45%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number	22-1-01319S24_C01
Power supply:	3.6 V DC
Comment:	--

Full Spectrum

Full Spectrum



Remark: FCC 15.209 limit not applicable in the 902 MHz to 928 MHz range

9.01b_BE_lying

Common Information

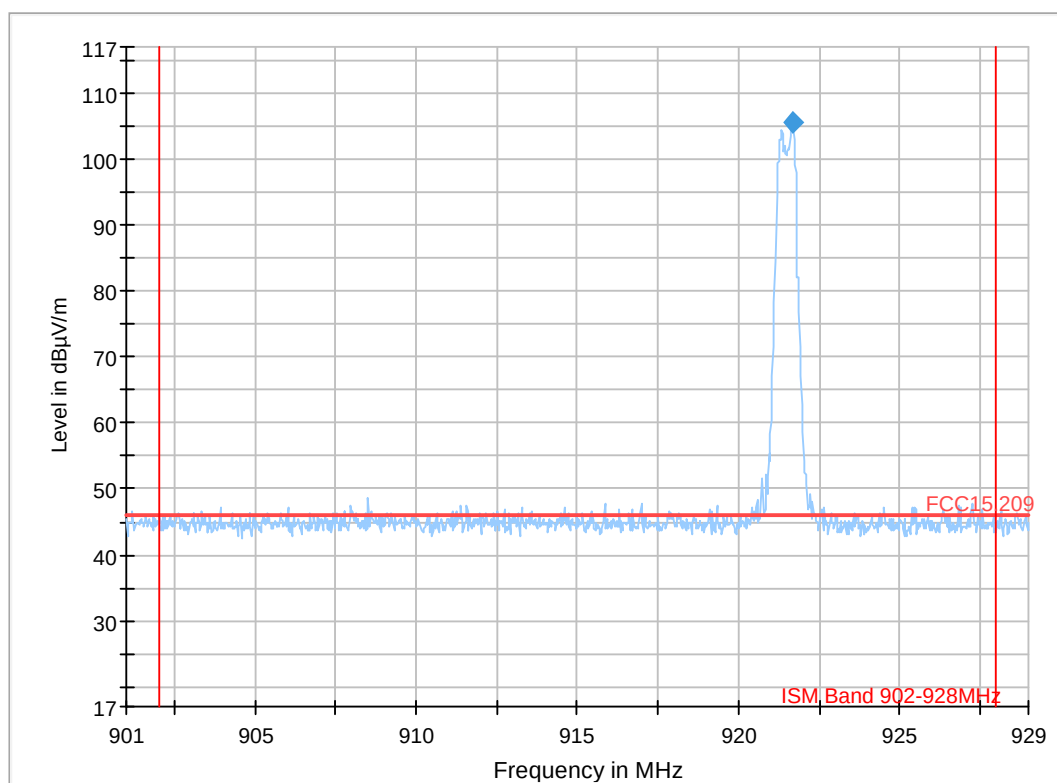
Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC §15.205 §15.209, §15.247 & RSS-247: Issue 2, RSS-Gen: Issue 5
Antenna polarisation:	horizontal/vertical
Operator Name:	TFra
Operating Mode:	TX 921.5 MHz
Environmental Conditions:	Humidity : 45%rH; Temperature: 20°C
Verdict:	Passed

EUT Information

PMT number	22-1-01319S24_C01
Power supply:	3.6 V DC
Comment:	--

Full Spectrum

Full Spectrum



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Trd Corr. (dB/m)
921.664000	105.65	46.00	100.000	105.0	H	315.0	23.7

Remark: FCC 15.209 limit not applicable in the 902 MHz to 928 MHz range

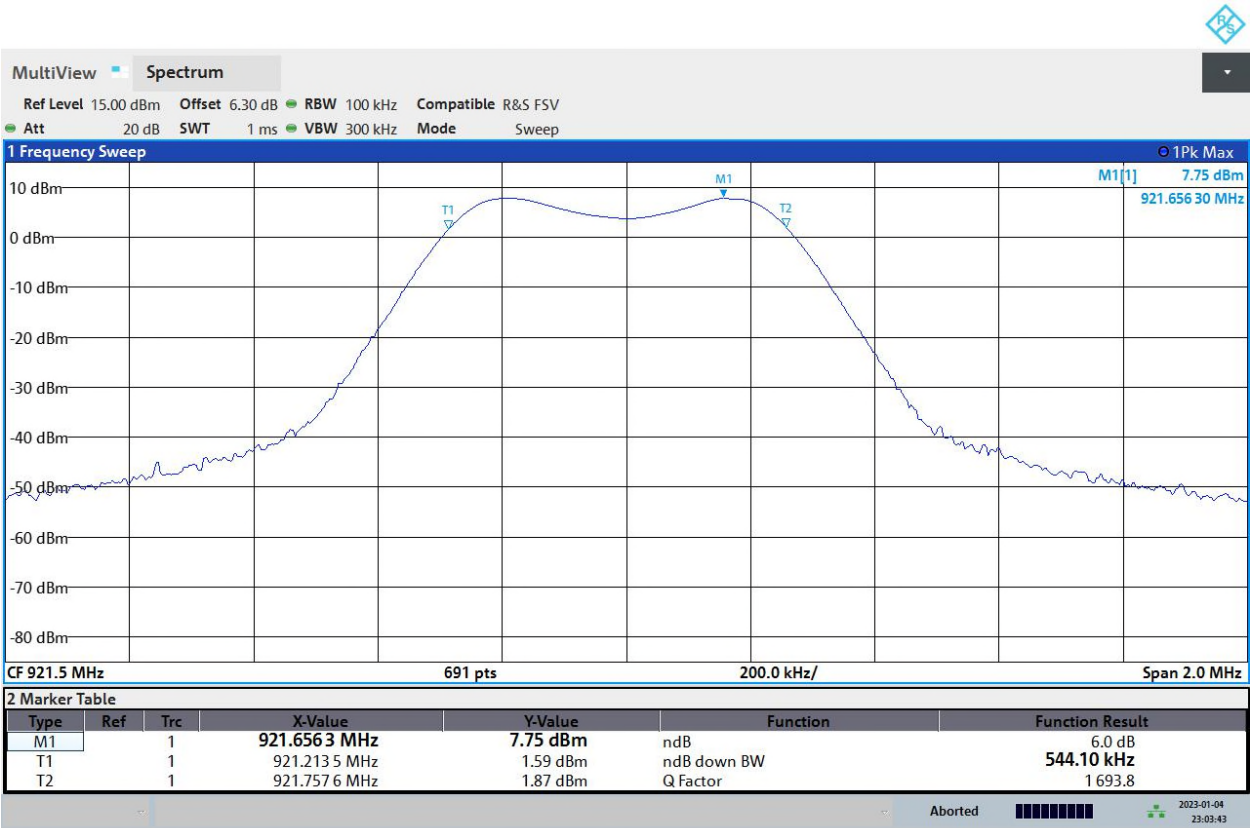
1.2 Conducted measurements

1.2.1 Duty-Cycle (for information)



Remark: duty-cycle measured over 1 second = 100%

1.2.2 Minimum Emission Bandwidth 6 dB



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Figure 1: D002_6dBBW

1.2.3 Occupied Channel Bandwidth 99%

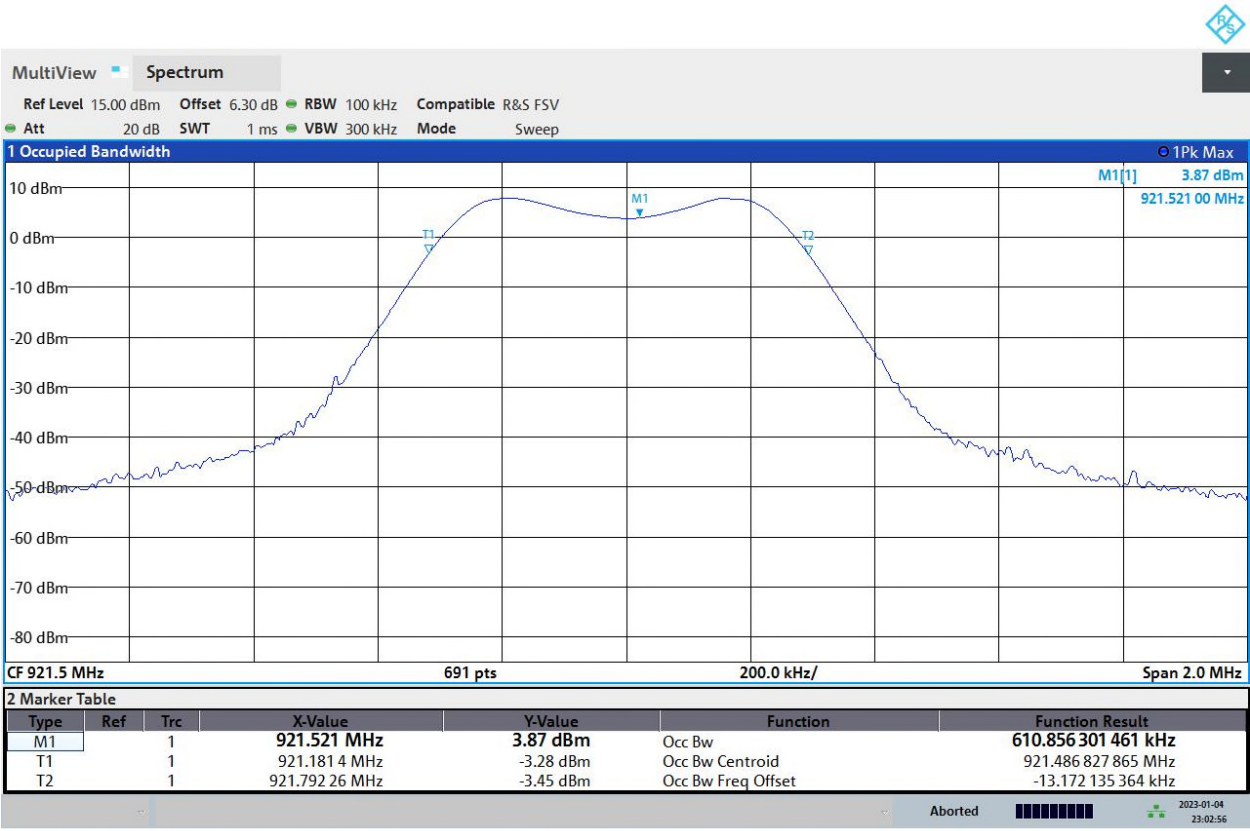


Figure 2: D001_99%OBW

1.2.4 Peak output power (Sweep)

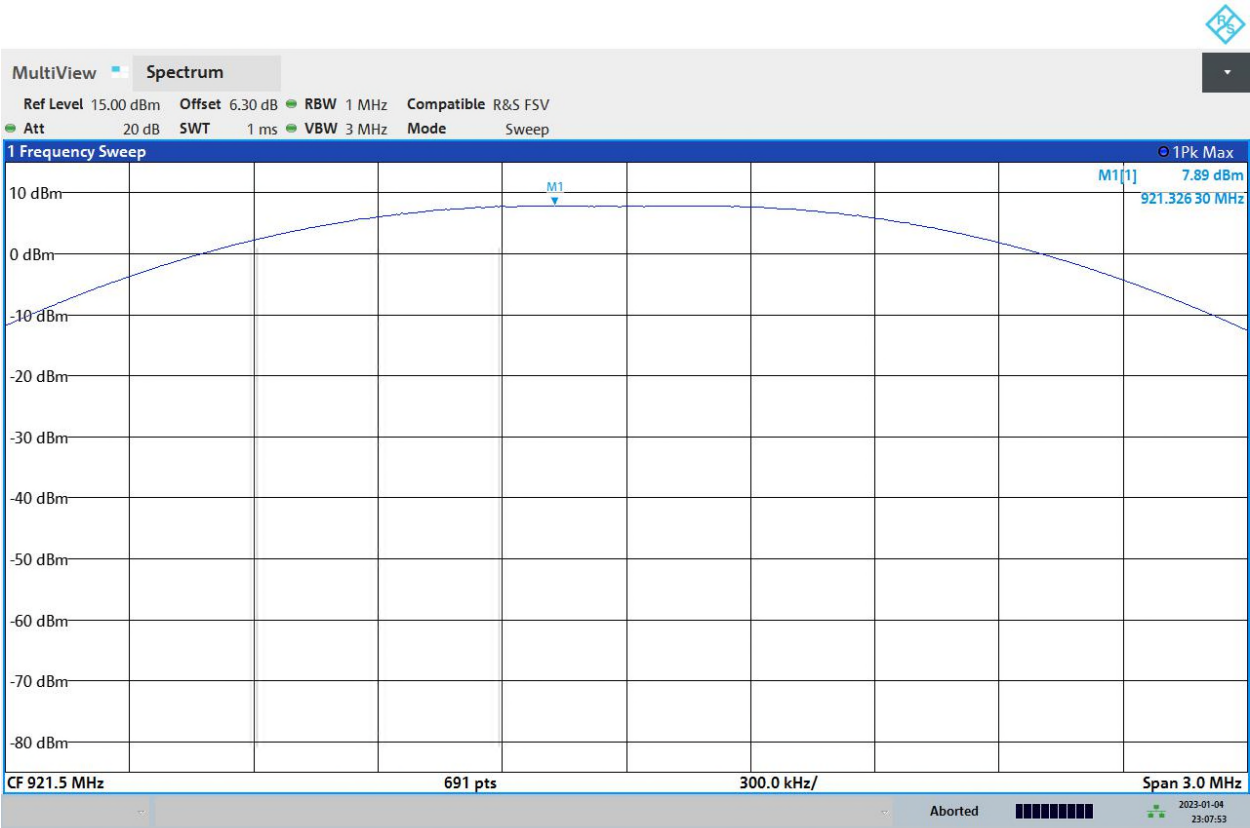


Figure 3: D003_PK-PWR

1.2.5 Power spectral density

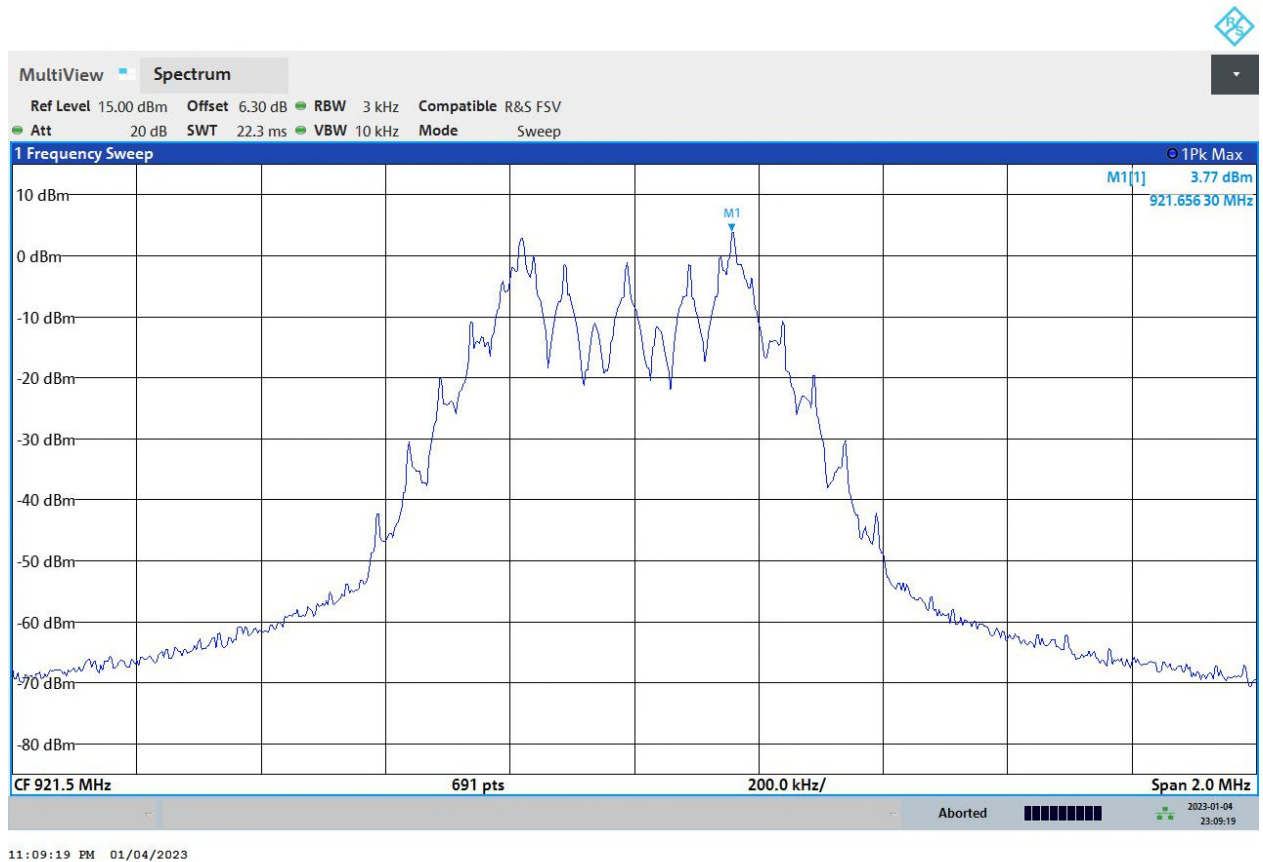


Figure 4: D004_PK-PSD

1.2.6 Emissions in non-restricted frequency bands

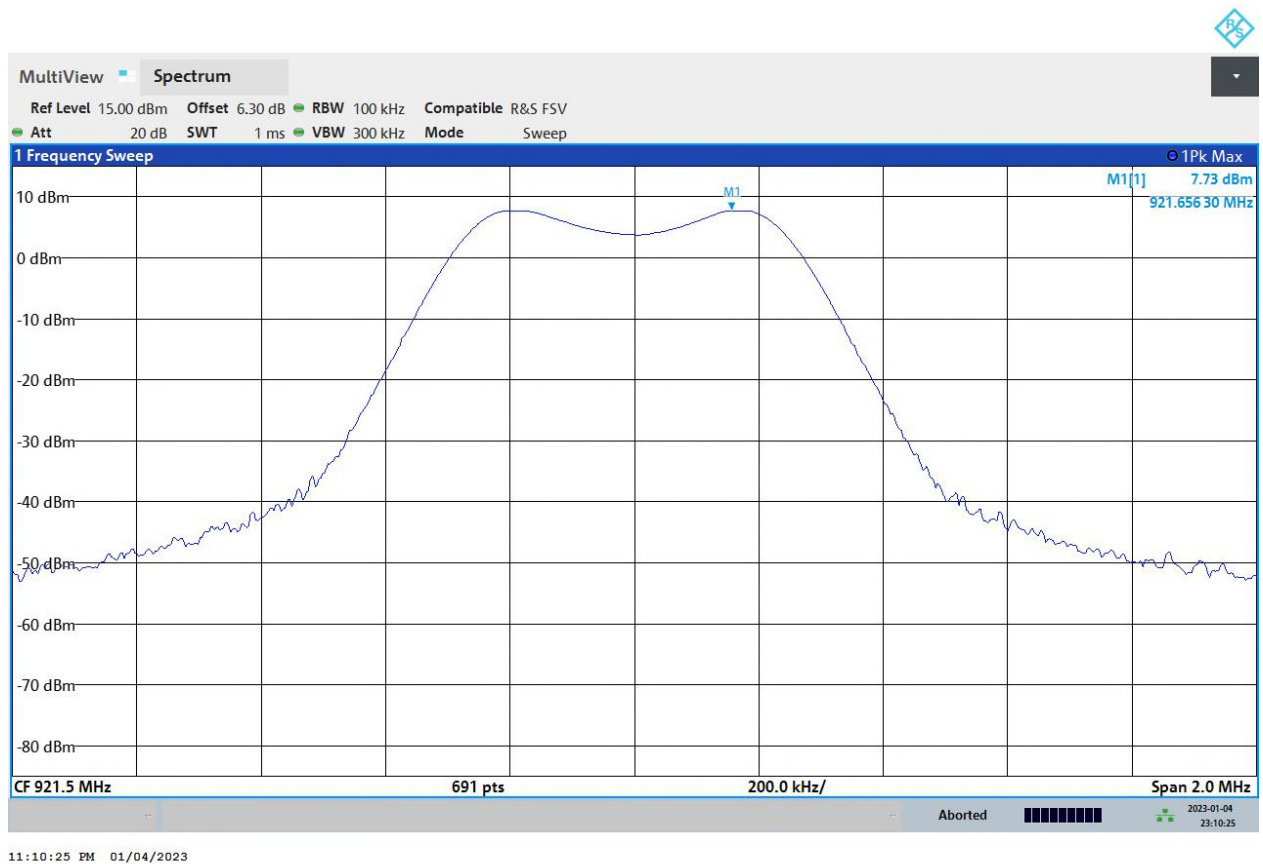


Figure 5: D005_01_sweep_ref

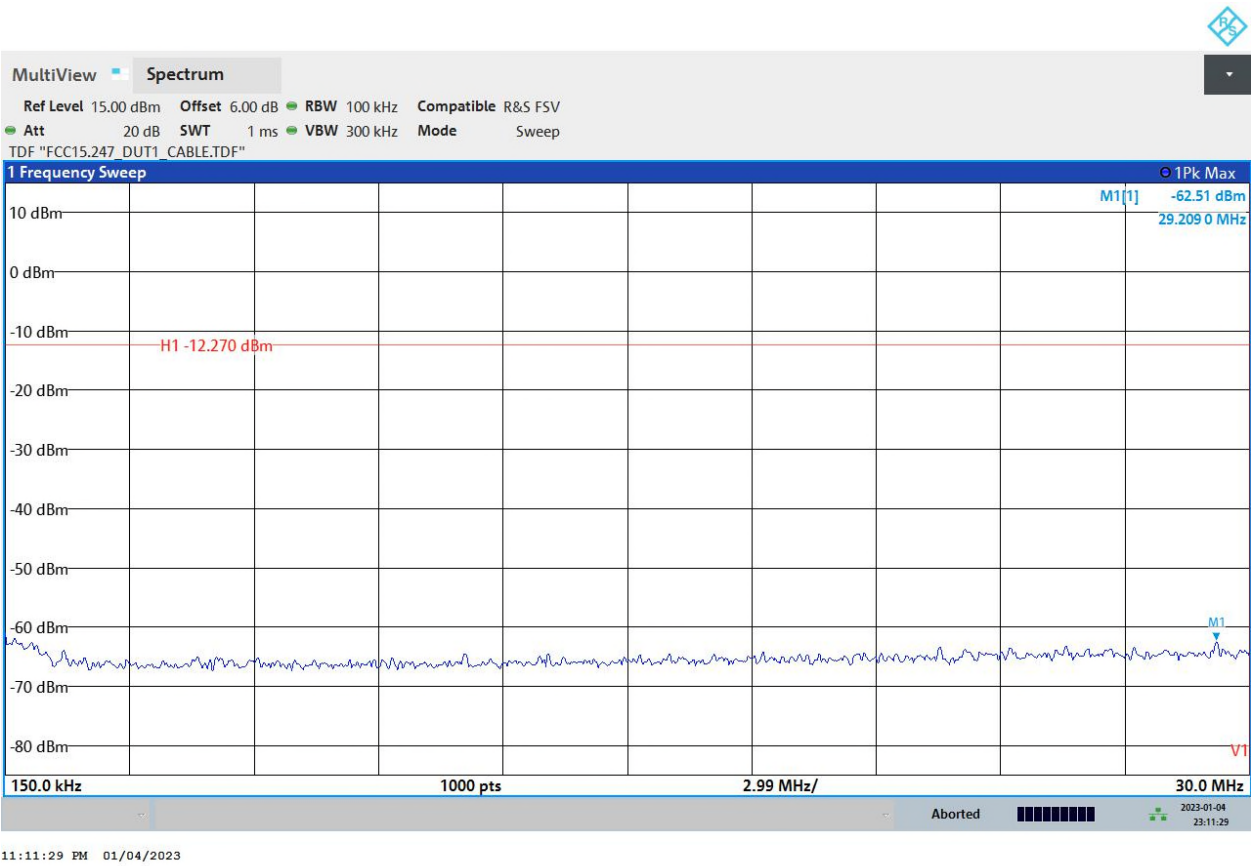
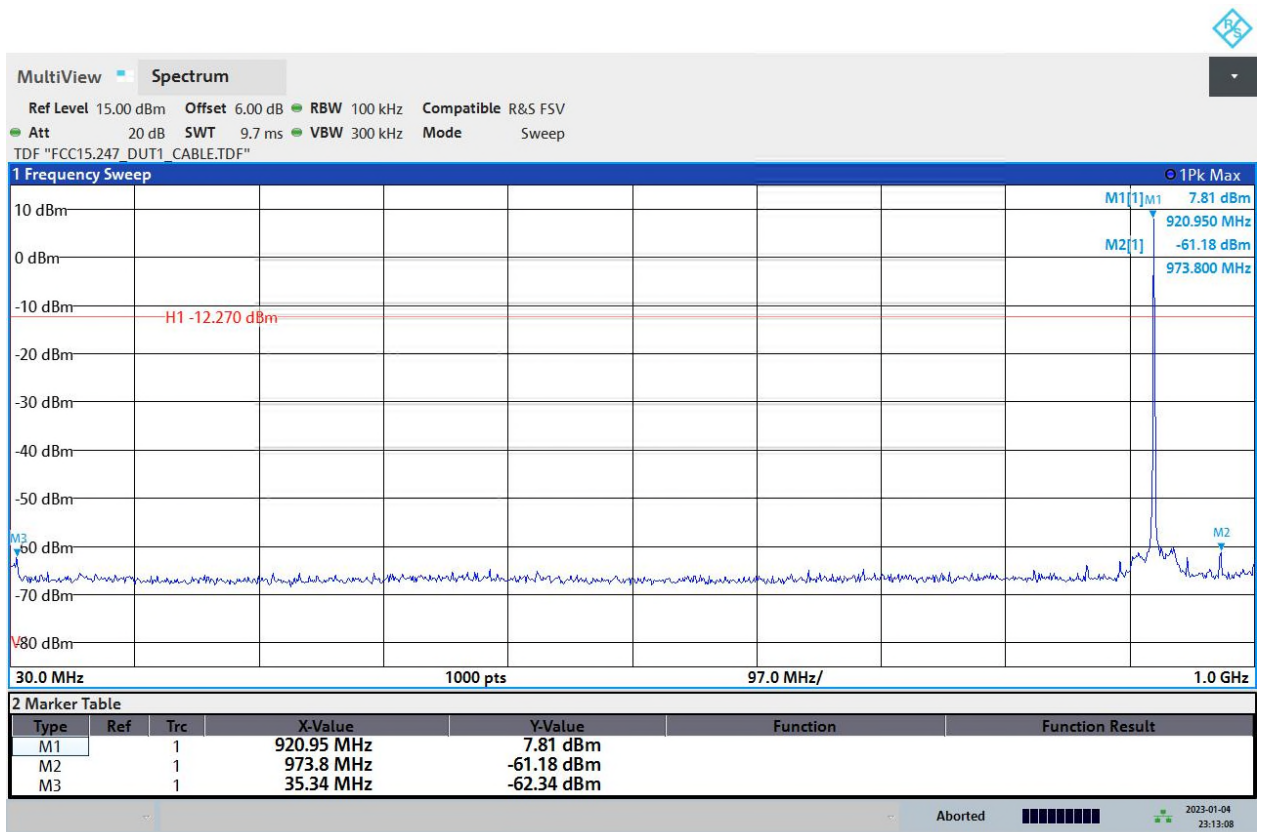
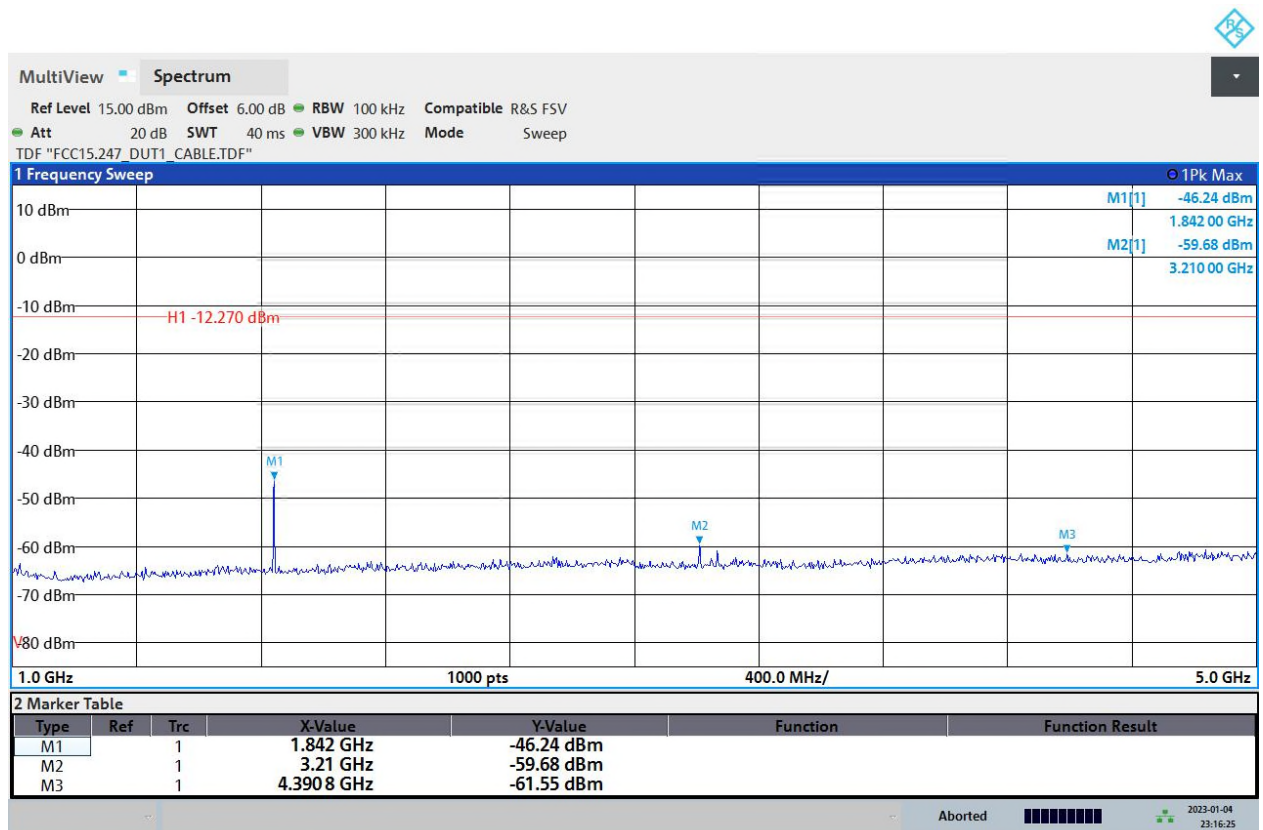


Figure 6: D005_02_sweep_1



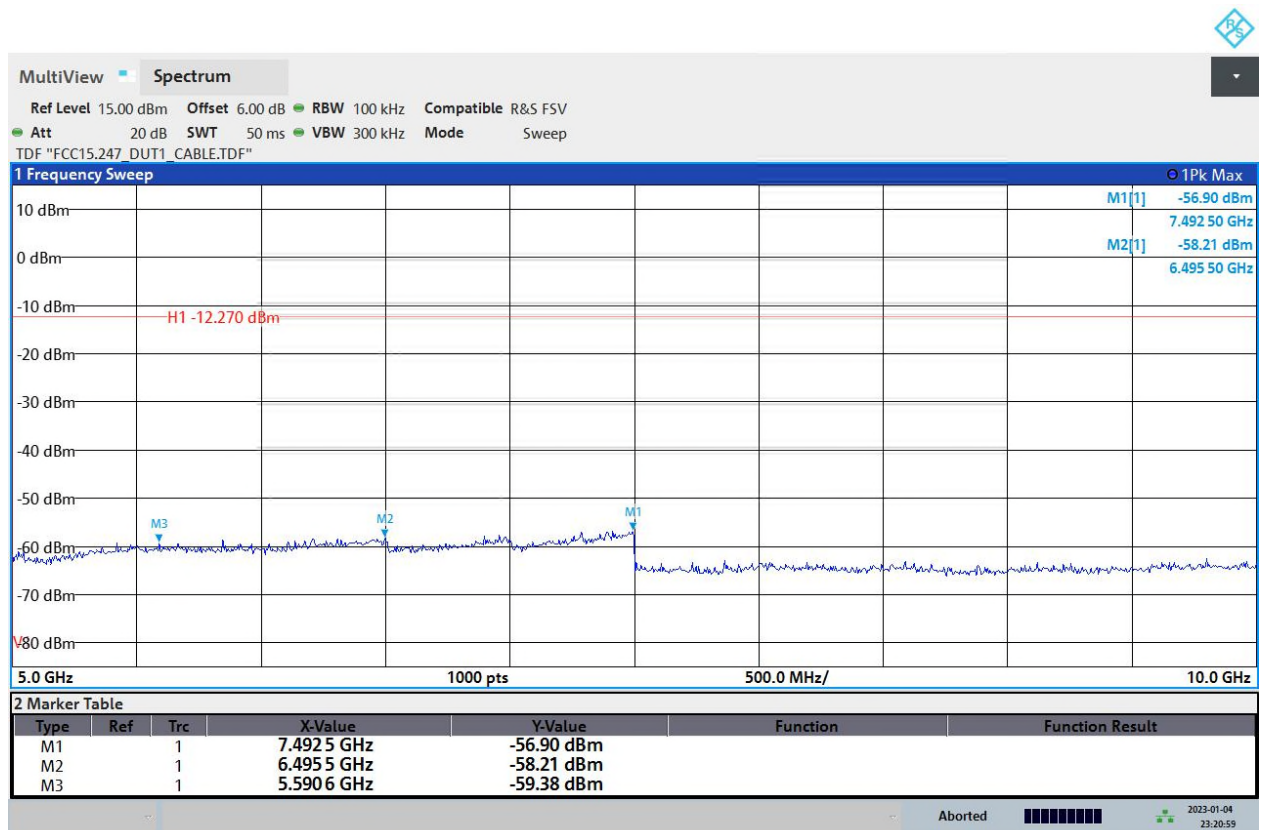
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Figure 7: D005_03_sweep_2



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Figure 8: D005_04_sweep_3



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Figure 9: D005_05_sweep_4

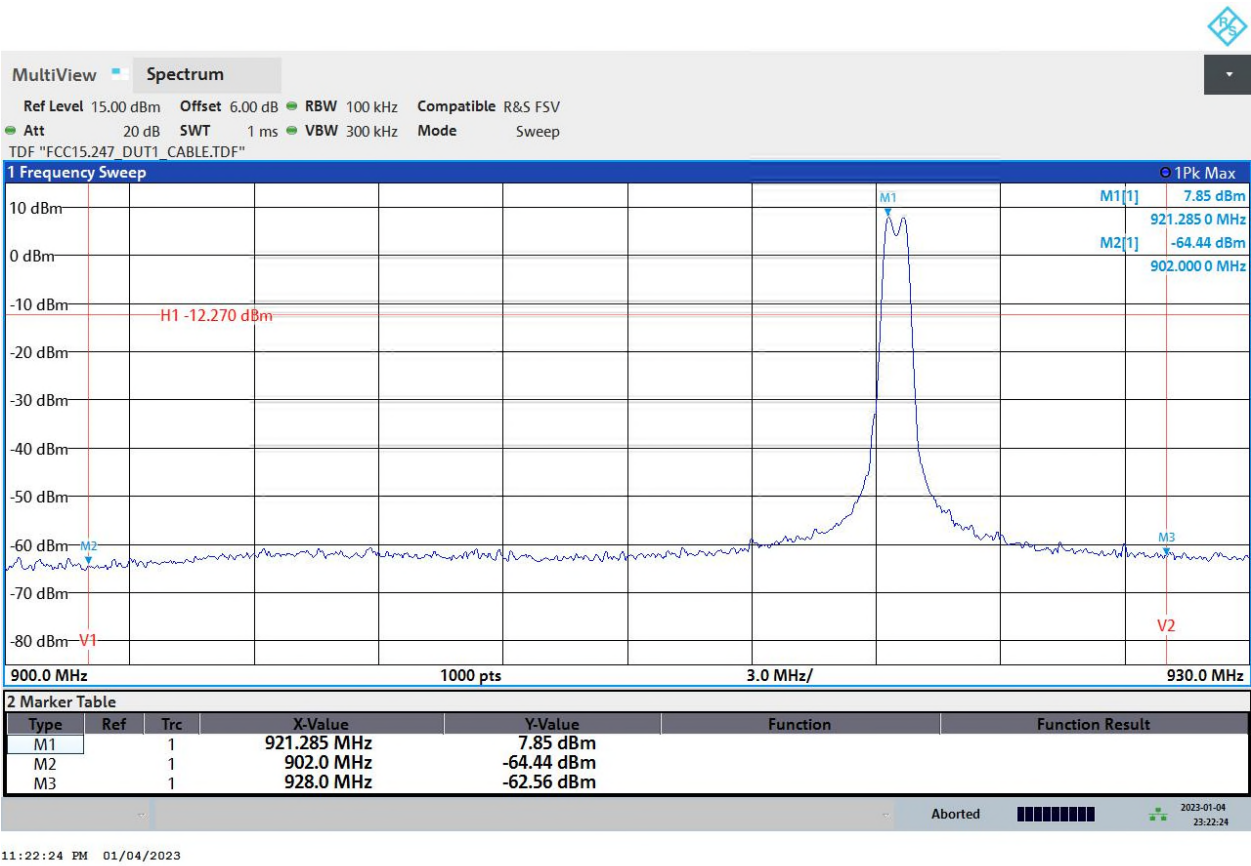


Figure 10: D005_06_BE

End Of Annex 1