

Annex 1: Measurement diagrams 21-1-0116002T01a-A1

Number of pages:	21	Date of Report:	2022-May-27
Testing company:	CETECOM GmbH Im Teelbruch 116 45219 Essen Germany Tel. + 49 (0) 20 54 / 95 19-0 Fax: + 49 (0) 20 54 / 95 19-150	Applicant:	Alois Kober GmbH
Product:	E&P levelsystem		
Model:	E&P levelsystem Touchpanel		
FCC ID:	2A5AD-4100938	IC:	N/A
Testing has been carried out in accordance with:	Title 47 CFR, Chapter I FCC Regulations, Subchapter A Part 15, Subpart C: §15.249 Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		

Table of Contents

1	Measurement diagrams.....	3
1.1	Radiated spurious emissions < 30 MHz	3
1.2	Radiated spurious emissions > 30 MHz	6
1.3	Radiated power & Band-Edge.....	9
1.4	Radiated spurious emissions > 1 GHz	15
1.5	Occupied Bandwidth 99%.....	18
1.6	Band-Edge with RBW 30	21

1 Measurement diagrams

1.1 Radiated spurious emissions < 30 MHz

Remark: emissions in the frequency range from ~17 kHz to ~52 kHz are external interference caused by an antenna mast inside the chamber.

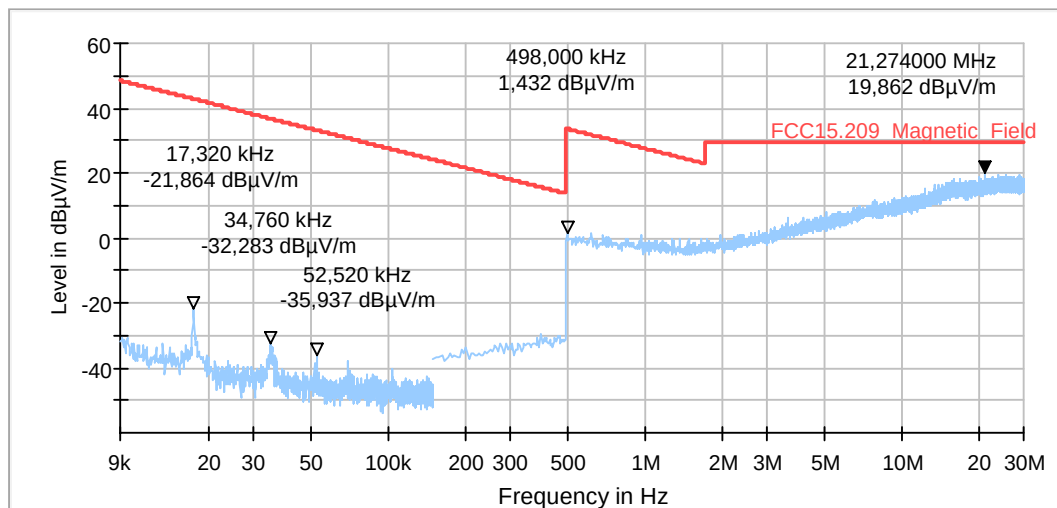
2.01_RSE_ChLow

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:	TFra
Operating Mode:	TX ChLow
Environmental Conditions:	Humidity : 41% rH; Temperature: 21 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
	Full Spectrum



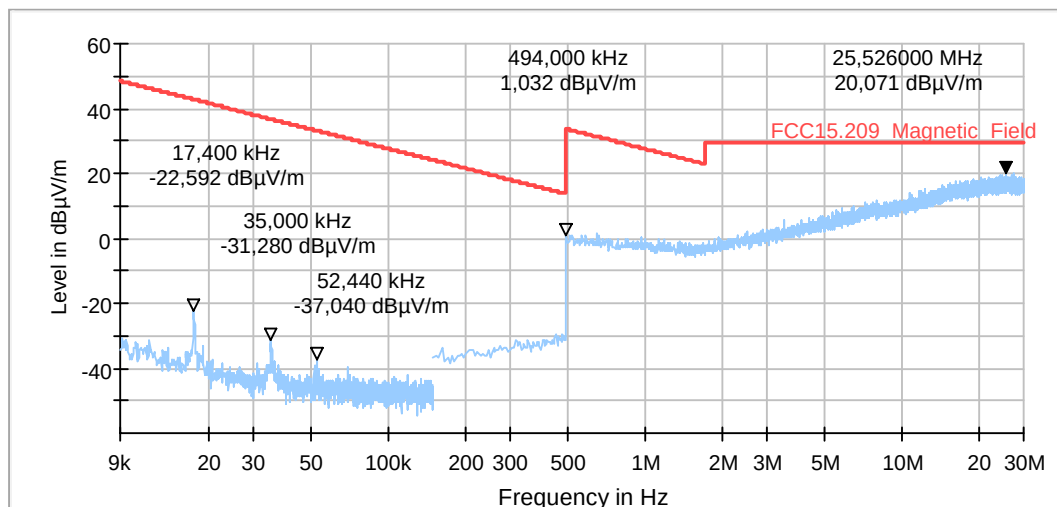
2.02_RSE_ChMid

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:	TFra
Operating Mode:	TX ChMid
Environmental Conditions:	Humidity : 41% rH; Temperature: 21 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
	Full Spectrum



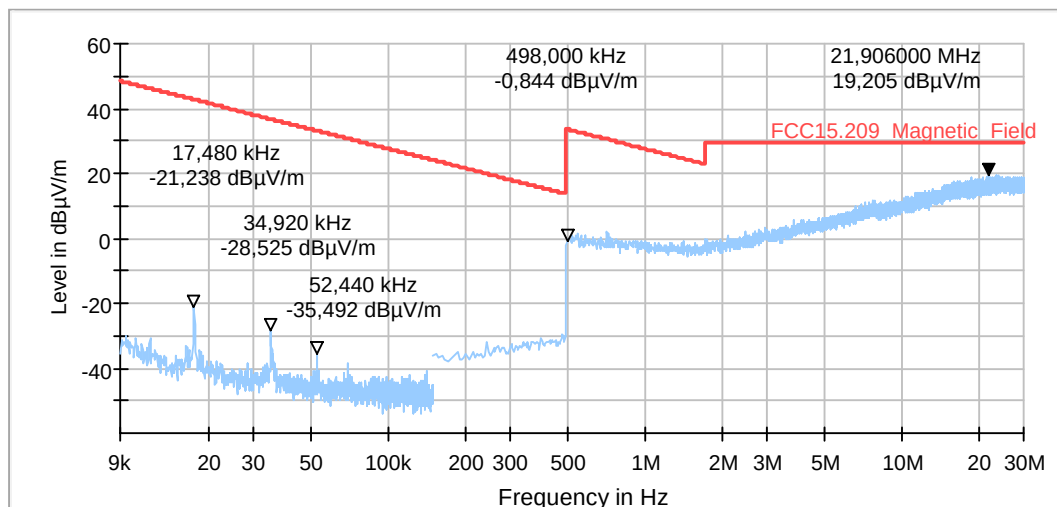
2.03_RSE_ChHigh

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:	TFra
Operating Mode:	TX ChHigh
Environmental Conditions:	Humidity : 41% rH; Temperature: 21 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
	Full Spectrum



1.2 Radiated spurious emissions > 30 MHz

Remark: emissions at 928 MHz and 933 MHz are caused due to external interference outside the chamber.

3.01b_RSE_ChLow

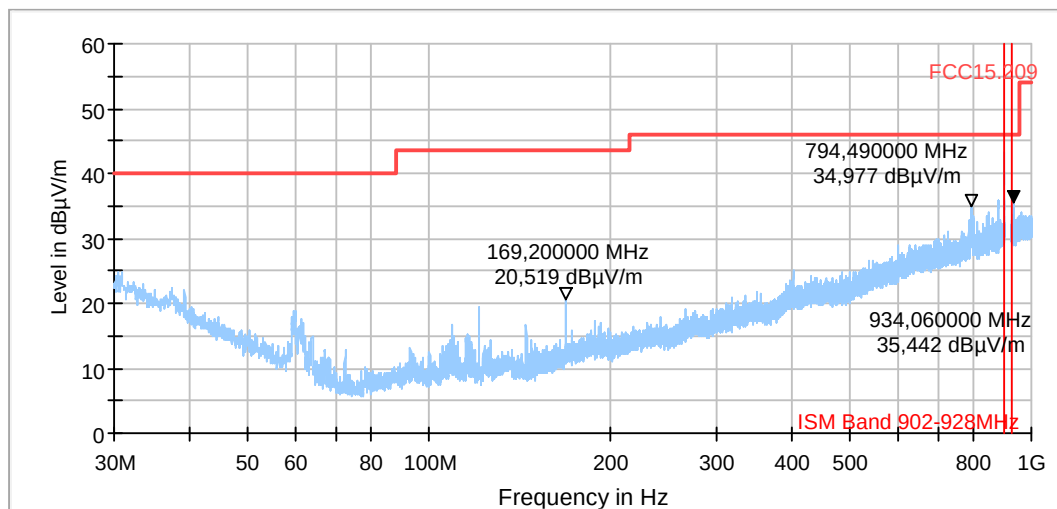
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX ChLow
Environmental Conditions:	Humidity : 40% rH; Temperature: 20 °C
Operator:	SSanthakum
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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Full Spectrum



3.02b_RSE_ChMid

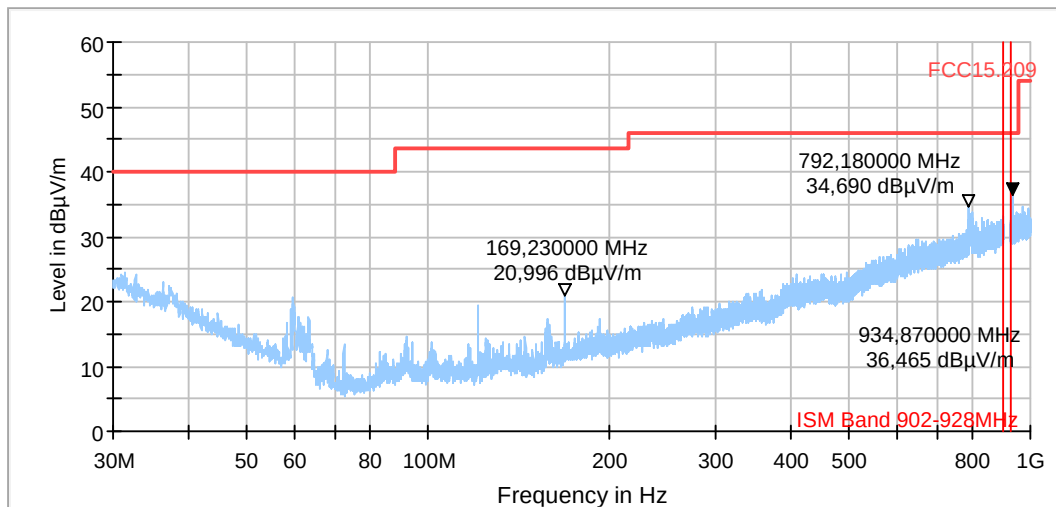
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX ChMid
Environmental Conditions::	Humidity : 40% rH; Temperature: 20 °C
Operator:	SSanthakum
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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Full Spectrum



3.03b_RSE_ChHigh

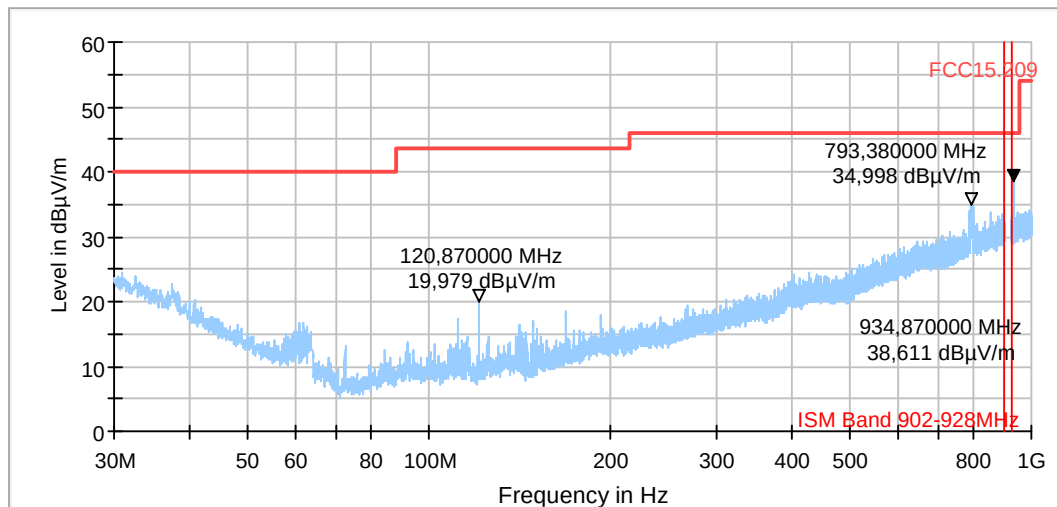
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX ChHigh
Environmental Conditions::	Humidity : 40% rH; Temperature: 20 °C
Operator:	SSanthakum
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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Full Spectrum



1.3 Radiated power & Band-Edge

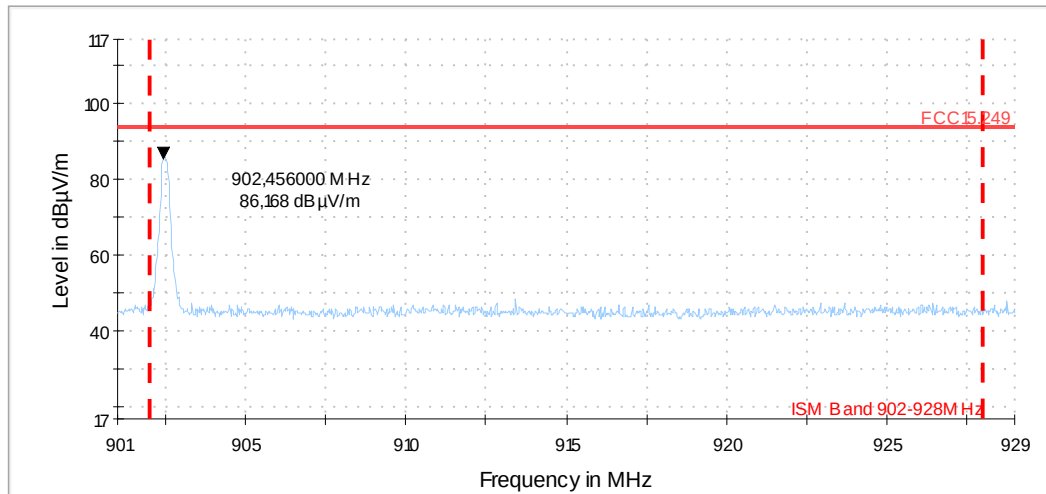
3.04a_PWR_ChLow_standing

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operation mode:	TX ChLow
Operator Name:	SSanthakum
Environmental Conditions:	Humidity : 40% rH; Temperature: 21 °C
Verdict:	Passed

EUT Information

PMT number: 21-1-01160S05_C01



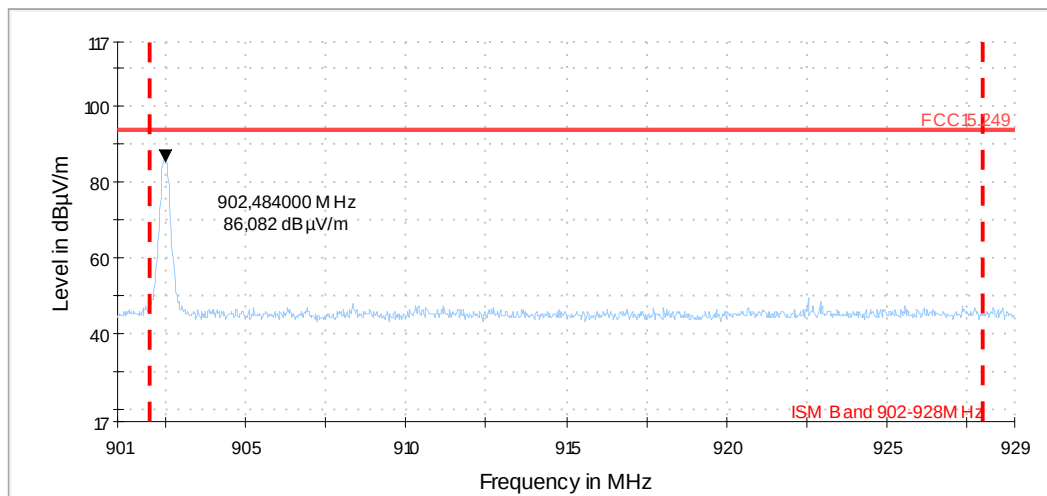
3.04b_PWR_ChLow_lying

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operation mode:	TX ChLow
Operator Name:	SSanthakum
Environmental Conditions:	Humidity : 40% rH; Temperature: 21 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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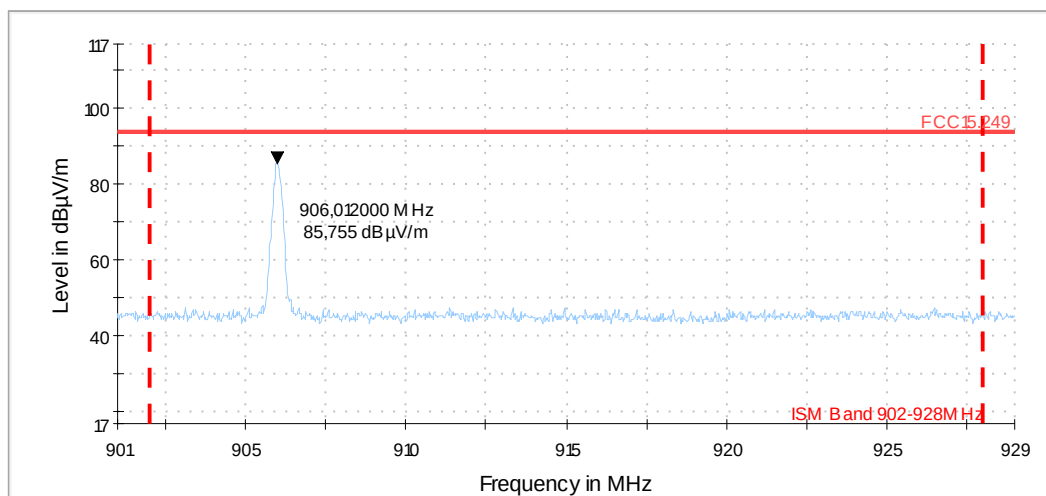
3.05a_PWR_ChMid_standing

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operation mode:	TX ChMid
Operator Name:	SSanthakum
Environmental Conditions:	Humidity : 40% rH; Temperature: 21 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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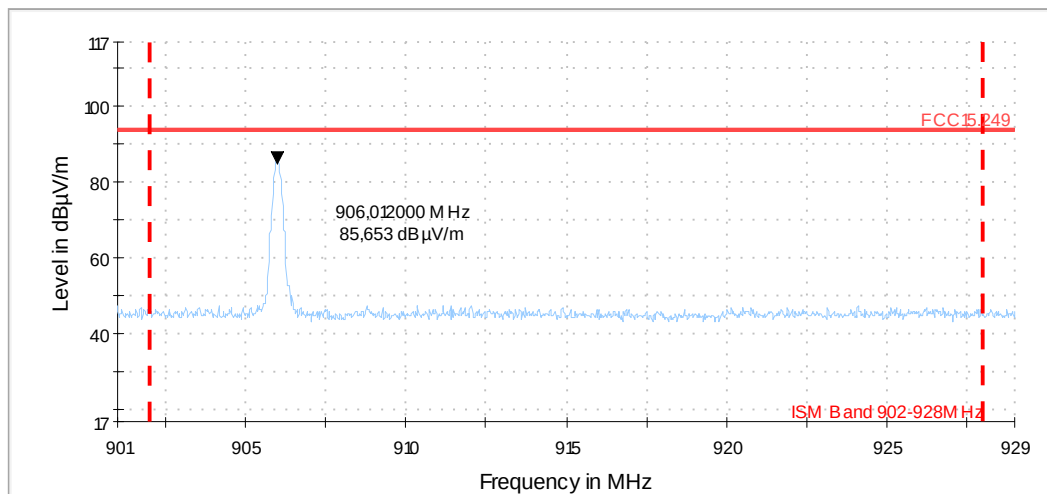
3.05b_PWR_ChMid_lying

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operation mode:	TX ChMid
Operator Name:	SSanthakum
Environmental Conditions:	Humidity : 40% rH; Temperature: 21 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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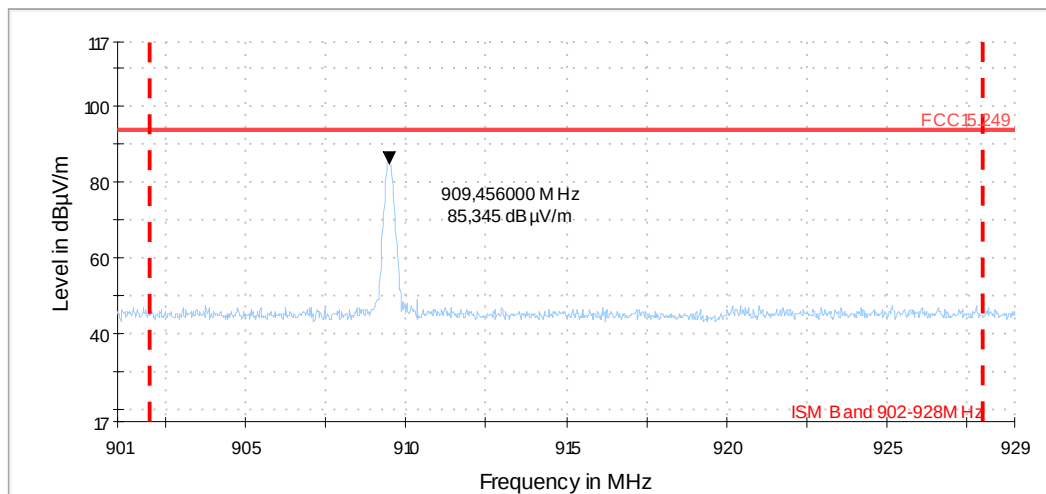
3.06a_PWR_ChHigh_standing

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operation mode:	TX ChHigh
Operator Name:	SSanthakum
Environmental Conditions:	Humidity : 40% rH; Temperature: 21 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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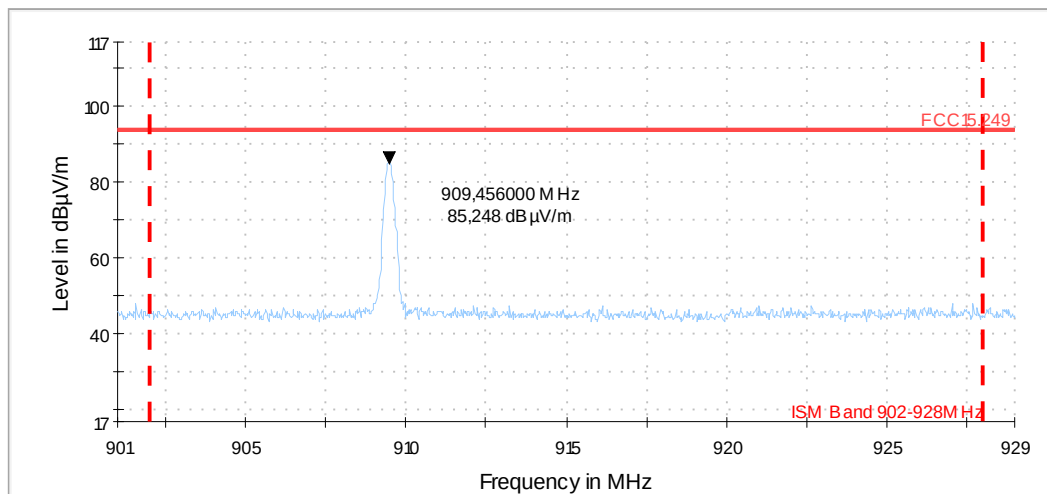
3.06b_PWR_ChHigh_lying

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 & RSS-247, Issue 2, RSS-Gen, Issue 5 (Intentional Radiator)
Antenna polarisation:	horizontal/vertical
Operation mode:	TX ChHigh
Operator Name:	SSanthakum
Environmental Conditions:	Humidity : 40% rH; Temperature: 21 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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1.4 Radiated spurious emissions > 1 GHz

4.01_RSE_Ch_Low

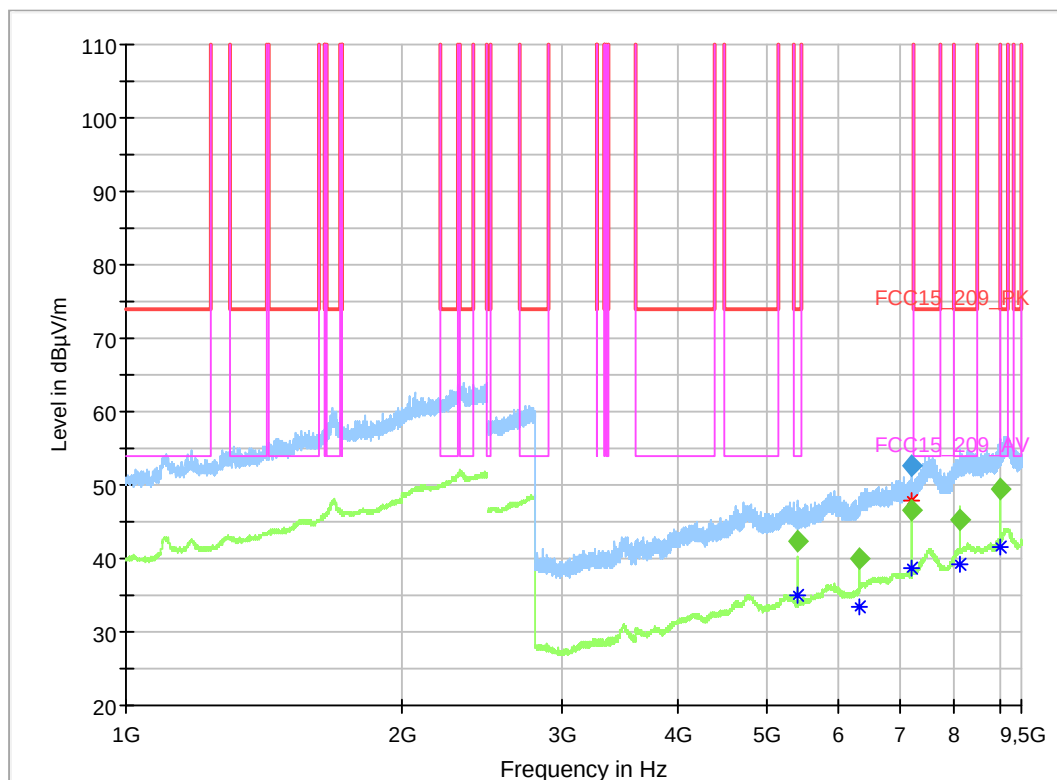
Common Information

Test Description: Radiated field strength emission in 3m distance
 Test Site: Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
 Test Standard: FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
 Antenna polarisation: horizontal/vertical
 Operating Mode: TX ChLow
 Operator: HEI
 Environmental Conditions: Humidity : 40% rH; Temperature: 18 °C
 Verdict: Passed

EUT Information

PMT number: 21-1-01160S05_C01

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)
5415.080000	---	42.24	54.00	11.76	100.0	1000.000	155.0	H	237.0	90.0
6317.360000	---	40.07	150.00	109.93	100.0	1000.000	155.0	H	174.0	90.0
7219.840000	52.75	---	150.00	97.25	100.0	1000.000	155.0	H	180.0	90.0
7219.840000	---	46.70	150.00	103.30	100.0	1000.000	155.0	H	184.0	90.0
8122.320000	---	45.14	54.00	8.86	100.0	1000.000	155.0	H	135.0	90.0
9025.080000	---	49.44	54.00	4.56	100.0	1000.000	155.0	V	162.0	90.0

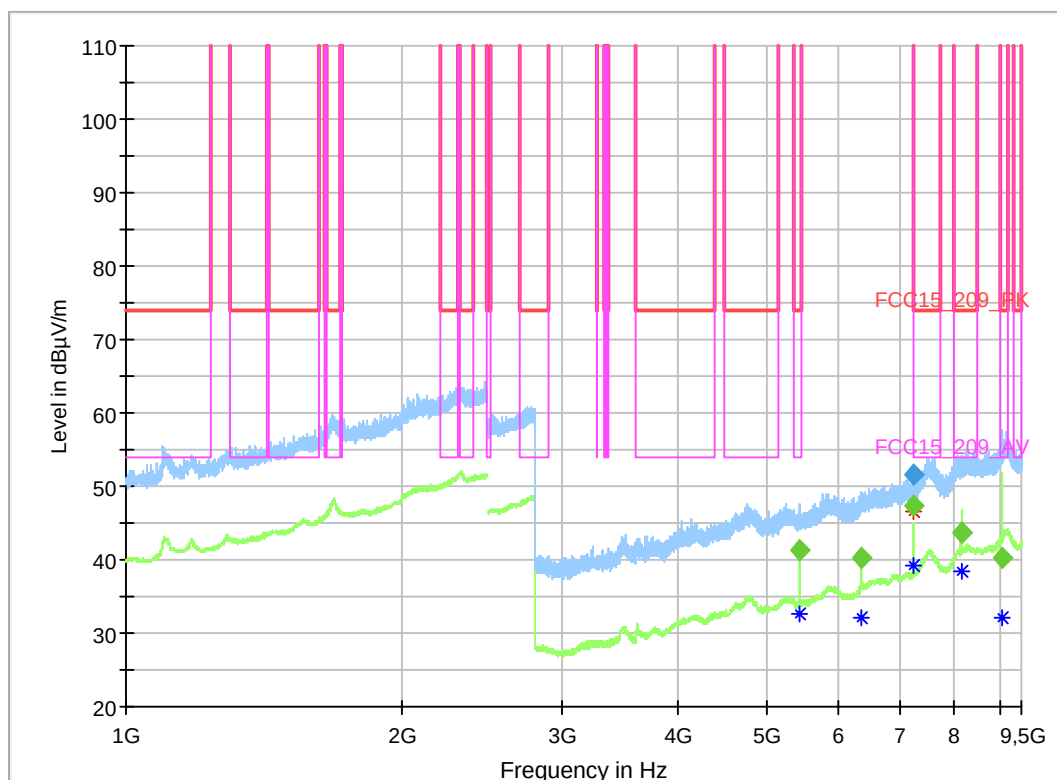
4.02_RSE_Ch_Mid

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX ChMid
Operator:	HEI
Environmental Conditions:	Humidity : 40% rH; Temperature: 19 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
	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)
5435.880000	---	41.28	54.00	12.72	100.0	1000.000	155.0	H	104.0	90.0
6342.000000	---	40.28	150.00	109.72	100.0	1000.000	155.0	H	184.0	90.0
7248.040000	---	47.25	150.00	102.75	100.0	1000.000	155.0	H	154.0	90.0
7248.040000	51.56	---	150.00	98.44	100.0	1000.000	155.0	V	23.0	0.0
8154.040000	---	43.70	54.00	10.30	100.0	1000.000	155.0	H	56.0	90.0
9059.920000	---	40.30	54.00	13.70	100.0	1000.000	155.0	V	185.0	90.0

4.03_RSE_Ch_High

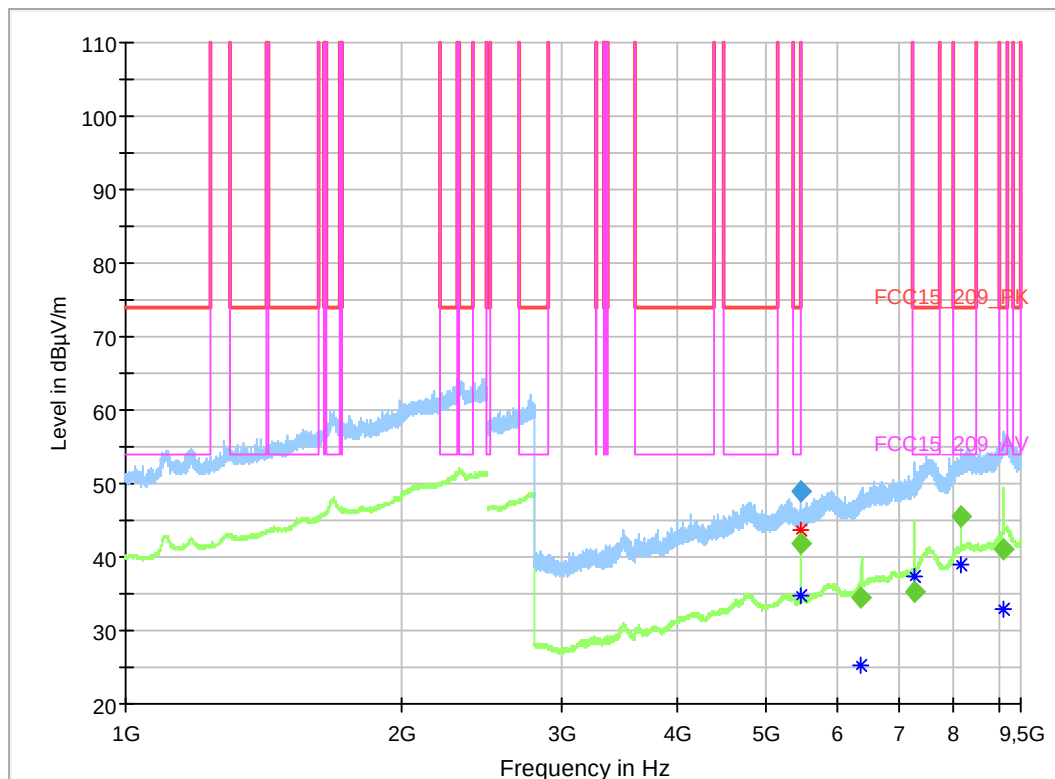
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	Fully Anechoic Chamber (FAC1) - EMC32 V10.60.20
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 5
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX ChHigh
Operator:	HEI
Environmental Conditions:	Humidity : 40% rH; Temperature: 19 °C
Verdict:	Passed

EUT Information

PMT number:	21-1-01160S05_C01
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Full Spectrum

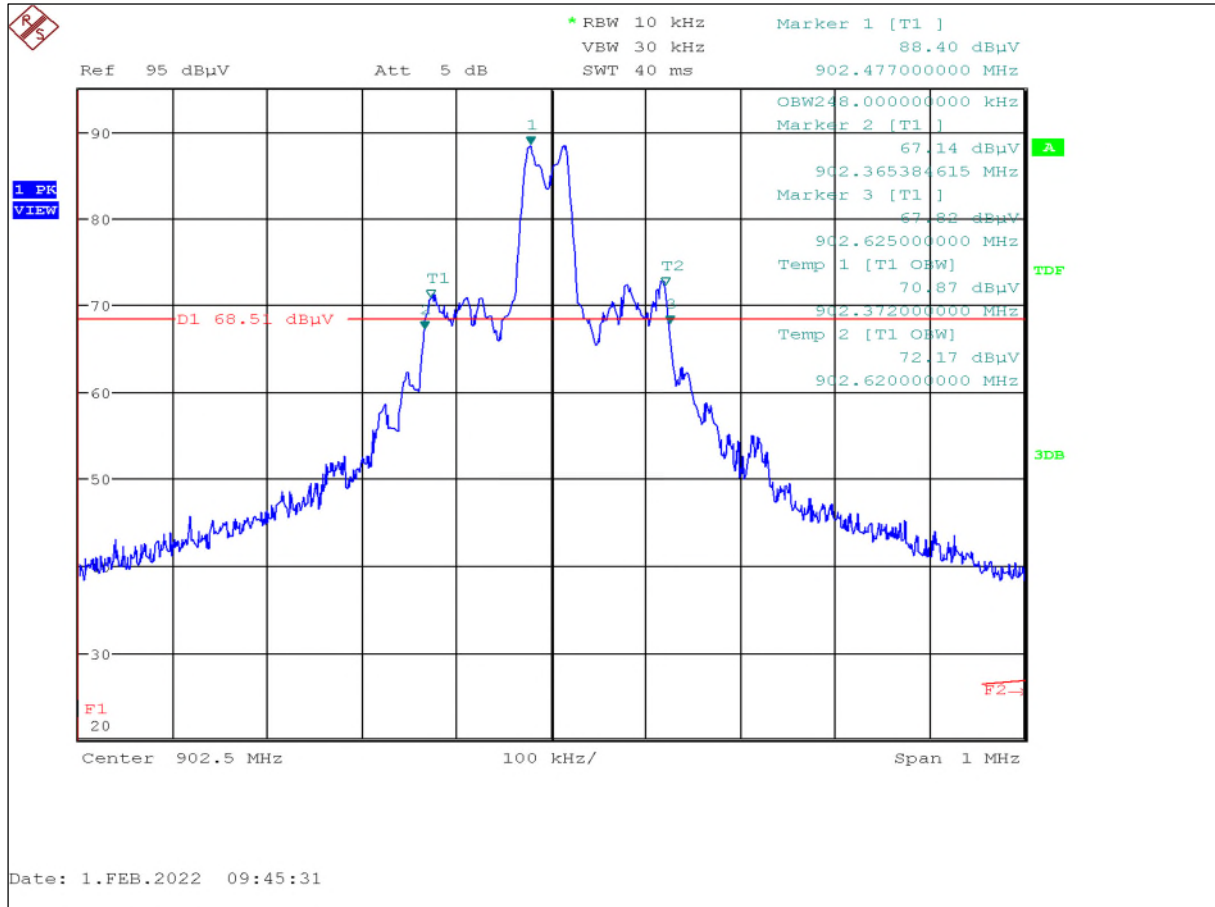


Final Result

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)
5456.840000	---	41.76	54.00	12.24	100.0	1000.000	155.0	H	271.0	90.0
5457.000000	49.03	---	74.00	24.97	100.0	1000.000	155.0	H	270.0	90.0
6365.400000	---	34.43	150.00	115.57	100.0	1000.000	155.0	V	199.0	90.0
7275.960000	---	35.28	54.00	18.72	100.0	1000.000	155.0	V	134.0	90.0
8185.440000	---	45.45	54.00	8.55	100.0	1000.000	155.0	H	229.0	90.0
9094.840000	---	40.98	54.00	13.02	100.0	1000.000	155.0	V	148.0	90.0

1.5 Occupied Bandwidth 99%

D001_01_99%OBW_20dB_ChLow



* RBW 10 kHz
 VBW 30 kHz
 SWT 40 ms

Marker 1 [T1]
 87.42 dBμV
 905.972000000 MHz

Ref 95 dBμV
 Att 5 dB

OBW2 22.000000000 kHz
 Marker 2 [T1]
 66.38 dBμV
 905.858974359 MHz
 Marker 3 [T1]
 64.78 dBμV
 906.121794872 MHz
 Temp 1 [T1 OBW]
 70.39 dBμV
 905.865000000 MHz
 Temp 2 [T1 OBW]
 69.96 dBμV
 906.117000000 MHz

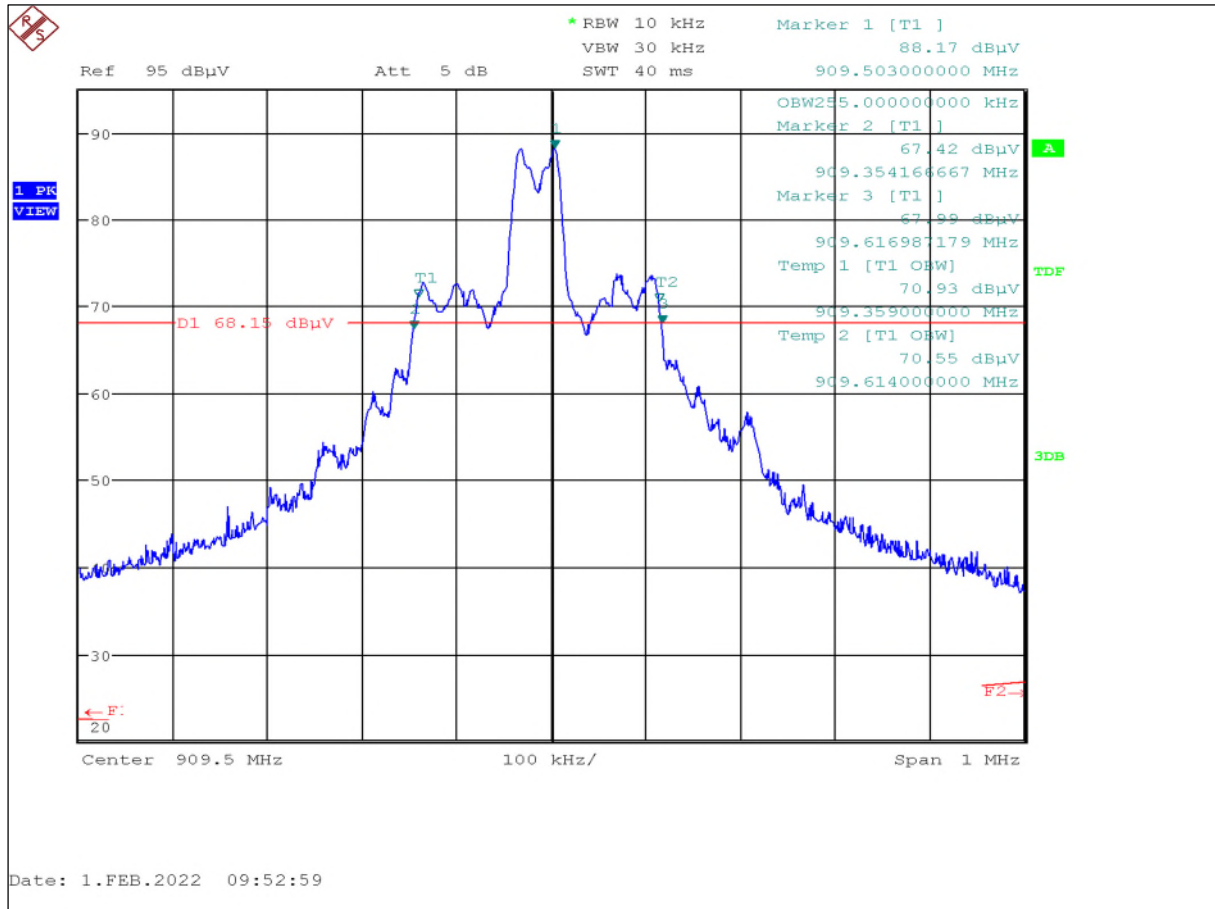
1 PK
 VIEW

D1 67.42 dBμV
 T1
 T2
 3dB
 F1
 F2

Center 906 MHz
 100 kHz/
 Span 1 MHz

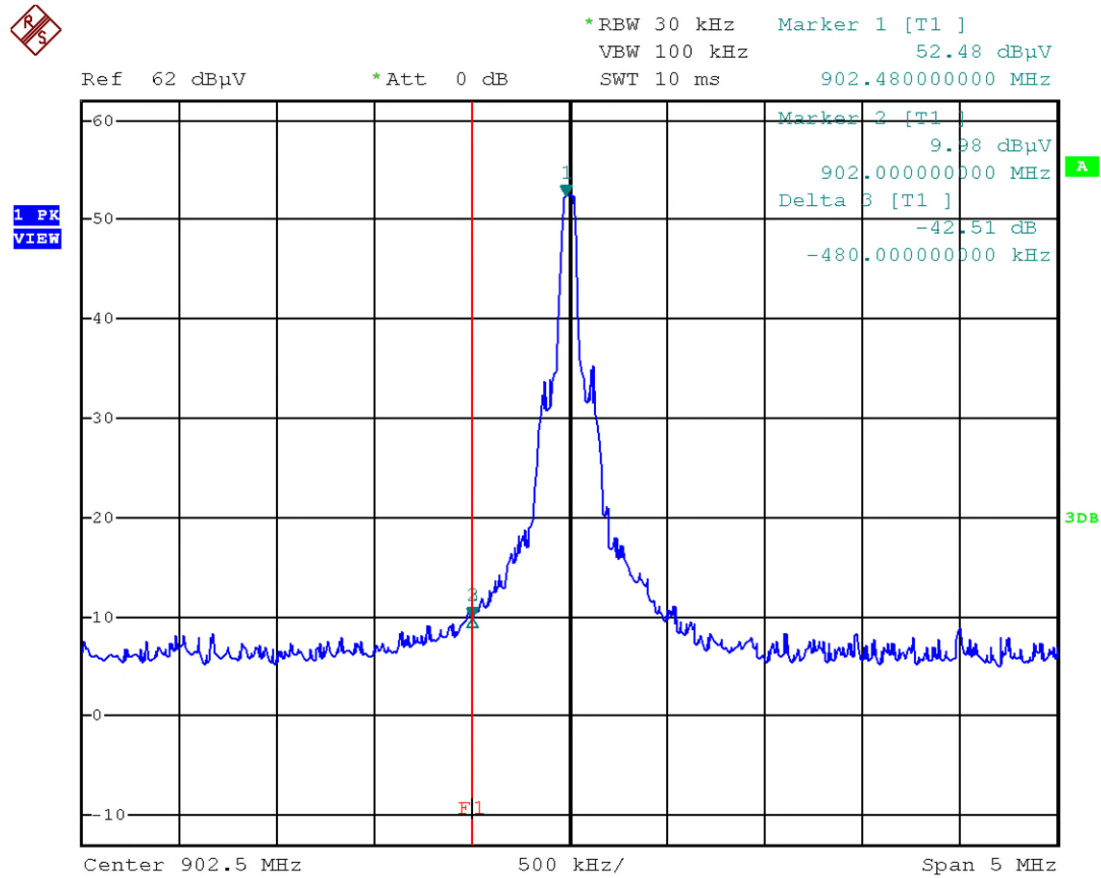
Date: 1.FEB.2022 09:55:22

D003_01_99%OBW_20dB_ChHigh



1.6 Band-Edge with RBW 30

D004_01_BE_ChLow



Date: 27.MAY.2022 15:44:18

End Of Annex 1