

Annex 1: Measurement diagrams to
TEST REPORT
 No.: 18-1-0050701T04a

According to:

FCC Regulations

Part 15.205

Part 15.209

Part 15.407

ISED-Regulations

RSS-Gen, Issue 4, RSS-247, Issue 2

for

Datalogic S.r.l.

Joya Touch A6
A00AN04HLXHT0AN-NY0

FCC ID: U4GJTADG
ISED ID: 3862E-JTADG
HVIN JTAD GUN
HVIN JTAD HH

Laboratory Accreditation and Listings		
 Deutsche Akkreditierungsstelle D-PL-12047-01-01 Accredited EMC-Test Laboratory	 Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3	 Voluntary Controls for Electromagnetic Emissions Reg. No.: R-20013, C-20009, T-20006, G-20013
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Laboratory Accreditation and Listings		

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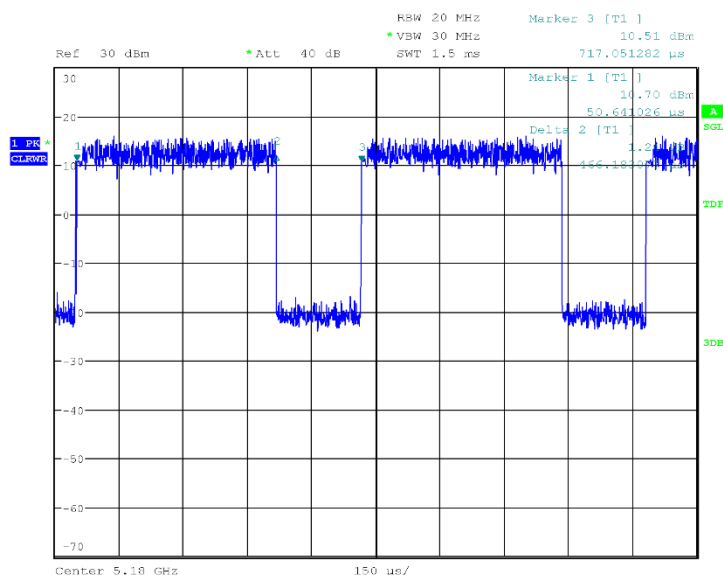
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1. Radiated Field Strength Measurements

1.1. Duty-Cycle measurements

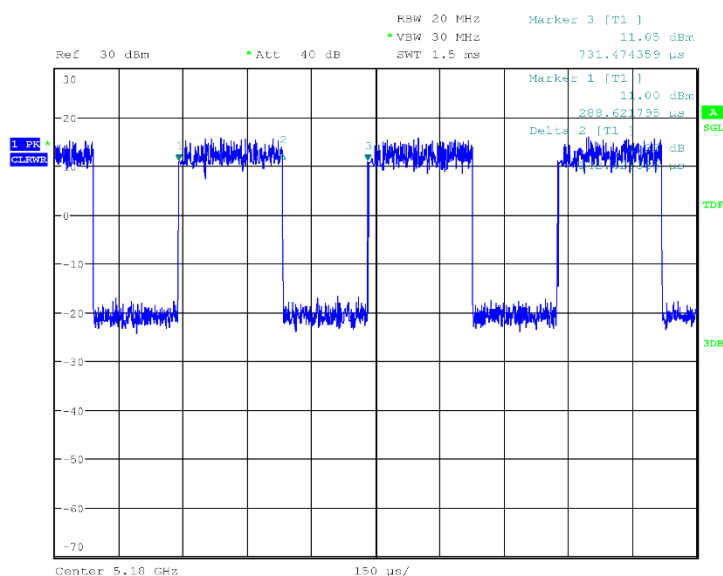
A correction factor will be applied to all AVERAGE values due non-continuous transmissions. This is valid for all AV-limits from 1GHz on.

Please see corresponding chapters in the main test report for corrected results and main duty-cycle calculations.



Date: 16.MAY.2018 16:51:55

Diagram 1: Duty-Cycle, channel 36, 18Mbit data rate



Date: 16.MAY.2018 16:53:08

Diagram 2: Duty-Cycle, channel 36, MCS4 modulation scheme

1.2. Power conducted measurement

Method PM-G b) used according KDB 789033D02 v01r03 with duty-cycle correction after raw measurement

1.2.1. a-Mode

Operational Bands:	U-NII 1			U-NII-2A			U-NII 2C			U-NII-3		
Frequency Range:	5150 - 5250 MHz			5250 - 5350 MHz			5470 - 5600 MHz 5650 - 5725 MHz			5725 - 5850 MHz		
Channel No. (Channel Frequency)	Channel 36 (5180MHz)	Channel 40 (5200MHz)	Channel 48 (5240MHz)	Channel 52 (5260MHz)	Channel 56 (5280MHz)	Channel 64 (5320MHz)	Channel 100 (5500MHz)	Channel 116 (5580MHz)	Channel 140 (5700MHz)	Channel 149 (5745MHz)	Channel 157 (5785MHz)	Channel 165 (5825MHz)
WLAN 5 GHz-a Mode B.W. 20 MHz Power Settings +12.5dBm												
Data Rate	Measured Conducted Power values (using RF Average Power Meter) + Including Duty-Cycle Correction factors											
6Mbps	12,10	12,00	12,34	12,12	11,79	11,44	10,27	9,26	10,00	11,82	11,80	11,13
9Mbps	11,87	11,88	12,31	12,12	11,43	9,78	10,17	9,10	9,82	11,68	11,64	11,09
12Mbps	12,09	12,01	11,10	12,14	12,00	11,58	10,28	9,17	9,87	11,68	11,68	11,10
18Mbps	12,12	12,04	11,15	12,17	11,87	11,67	10,35	9,22	9,98	11,80	11,63	11,16
24Mbps	12,09	11,98	12,41	12,17	11,96	11,57	10,30	9,27	10,01	11,81	11,88	11,21
36Mbps	11,84	11,67	12,10	11,97	11,60	11,22	10,05	9,13	9,86	11,66	11,70	11,07
48Mbps	11,44	11,35	11,79	11,58	11,33	10,92	9,56	8,67	9,50	11,34	11,39	10,38
54Mbps	10,60	10,48	10,88	10,65	10,40	10,01	8,32	7,63	8,57	10,51	10,56	9,94

1.2.2. n-Mode

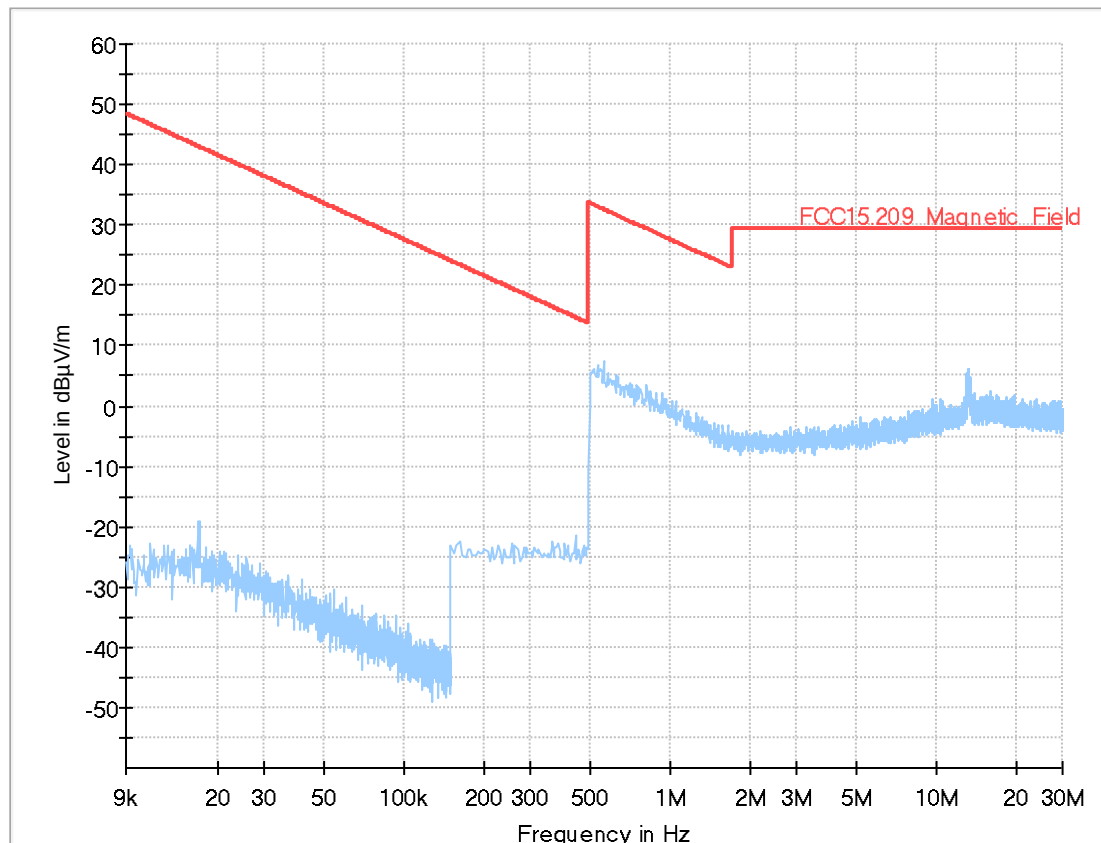
Operational Bands:	U-NII 1			U-NII-2A			U-NII 2C			U-NII-3		
Frequency Range:	5150 - 5250 MHz			5250 - 5350 MHz			5470 - 5600 MHz 5650 - 5725 MHz			5725 - 5850 MHz		
Channel No. (Channel Frequency)	Channel 36 (5180MHz)	Channel 40 (5200MHz)	Channel 48 (5240MHz)	Channel 52 (5260MHz)	Channel 56 (5280MHz)	Channel 64 (5320MHz)	Channel 100 (5500MHz)	Channel 116 (5580MHz)	Channel 140 (5700MHz)	Channel 149 (5745MHz)	Channel 157 (5785MHz)	Channel 165 (5825MHz)
WLAN 5 GHz-n Mode B.W. 20 MHz Power Settings +12.5dBm												
Data Rate	Measured Conducted Power values (using RF Average Power Meter) + Excluding Duty Cycle Correction factors											
MCS0 - 6.5Mbps	11,90	11,77	12,20	11,96	11,71	11,31	10,15	9,22	9,95	11,73	11,80	11,17
MCS1 - 13Mbps	11,95	11,88	12,37	12,21	11,92	11,29	10,13	9,27	9,96	11,99	11,92	11,15
MCS2 - 19.5Mbps	12,01	11,92	12,31	12,07	11,79	11,42	10,20	9,28	10,04	11,84	11,89	11,26
MCS3 - 26Mbps	11,97	11,87	12,30	12,04	11,80	11,19	10,19	9,26	10,03	10,22	12,00	11,26
MCS4 - 39Mbps	12,05	11,95	12,36	12,12	11,88	11,49	10,23	9,31	10,09	11,90	11,94	11,33
MCS5 - 52Mbps	11,61	11,52	11,95	11,71	11,46	11,04	9,64	8,78	9,63	11,48	11,54	10,90
MCS6 - 58.5Mbps	11,69	11,63	11,98	11,80	11,70	11,36	9,94	8,75	9,62	11,60	11,79	10,96
MCS7 - 65Mbps	8,74	8,64	9,09	8,85	8,59	8,10	6,21	5,70	6,73	8,90	8,30	8,50

1.3. Radiated Field Strength Emissions – 9 kHz to 30 MHz

2.01a_a-mode_18Mbps_ch36

Common Information

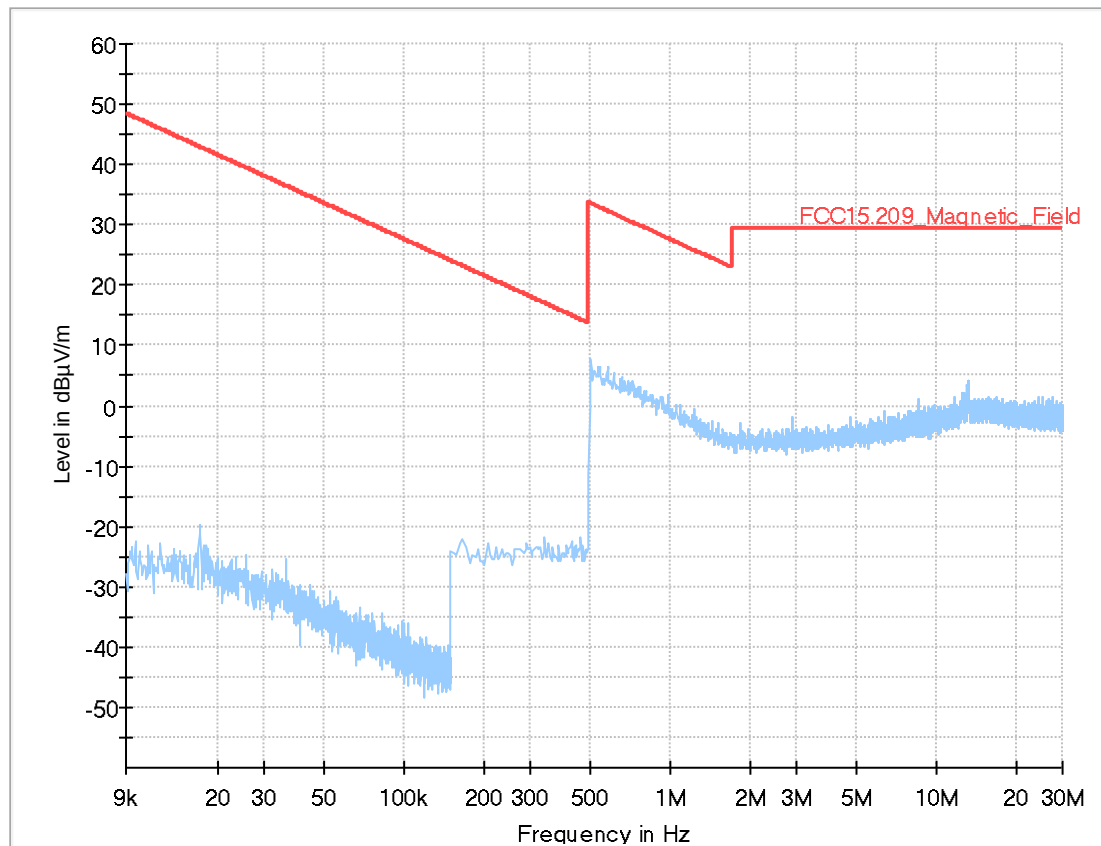
Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	a-mode 18Mbps ch036
Operating Conditions:	Humidity: 48%rH; Temperature: 20°C
Operator Name:	DLe
Comment:	EUT standing



2.01b_a-mode_18Mbps_ch36

Common Information

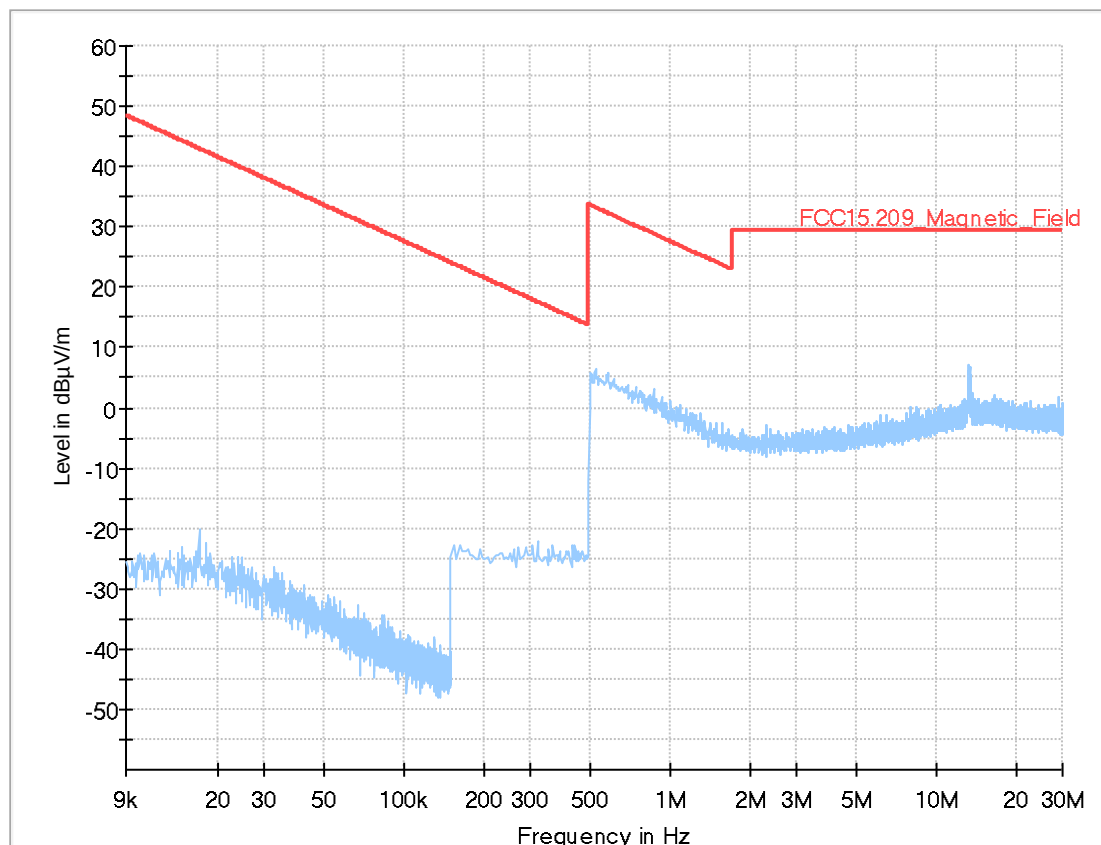
Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	a-mode 18Mbps ch036
Operating Conditions:	Humidity: 48%rH; Temperature: 20°C
Operator Name:	DLe
Comment:	EUT Laying



2.02a_n-mode_MCS4_ch48

Common Information

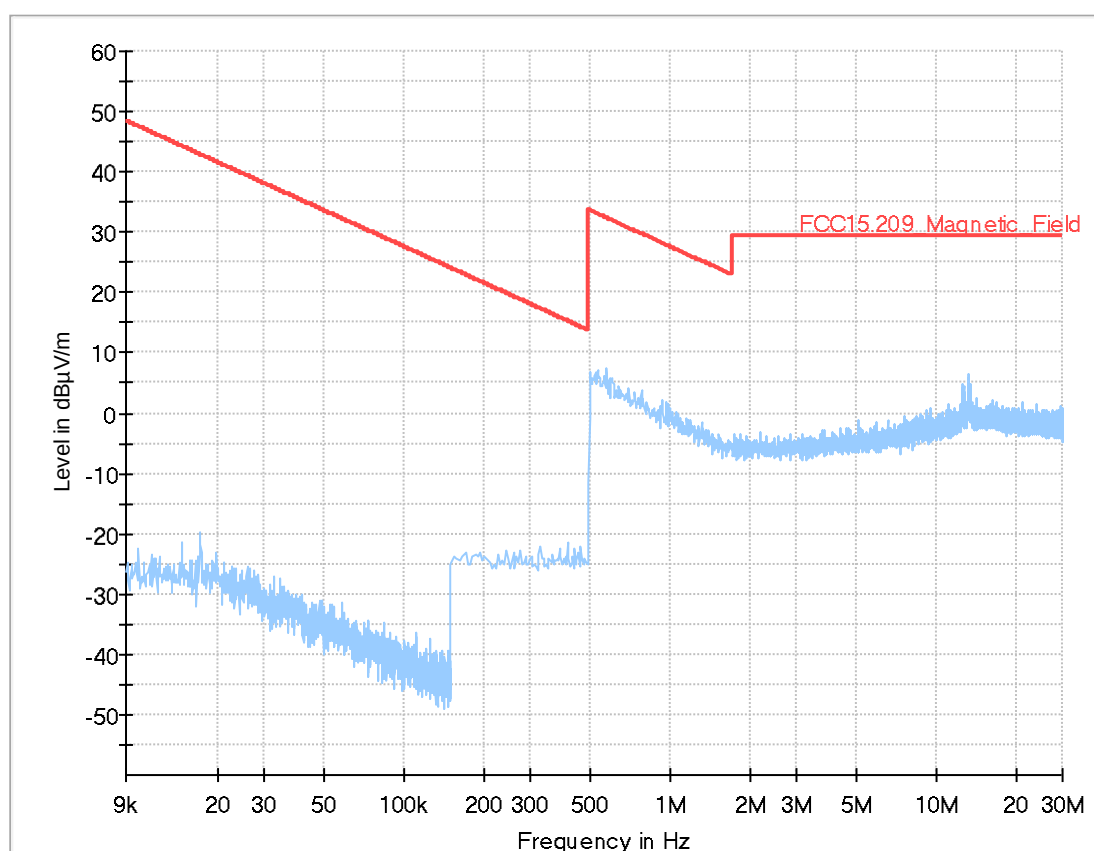
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Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	n-mode MCS4 ch048
Operating Conditions:	Humidity: 48%rH; Temperature: 20°C
Operator Name:	DLe
Comment:	EUT standing



2.03a_n-mode_MCS4_ch52

Common Information

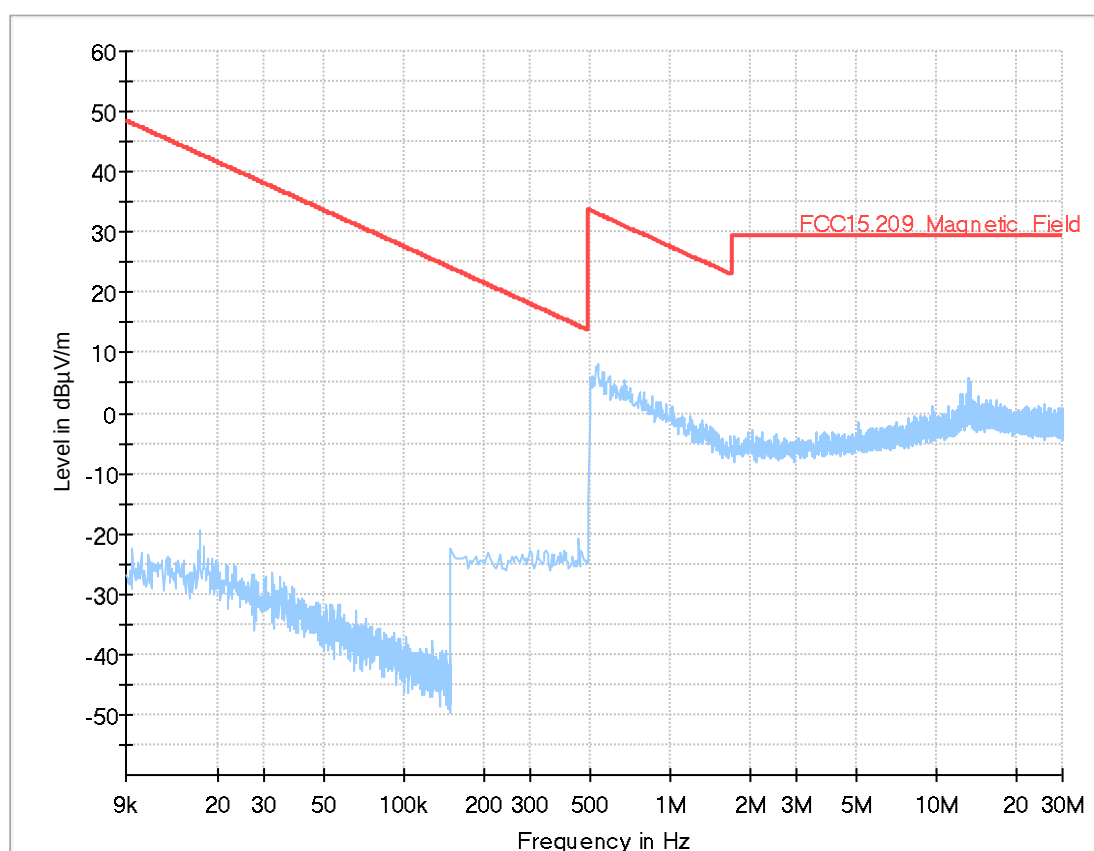
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Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	n-mode MCS4 ch052
Operating Conditions:	Humidity: 48%RH; Temperature: 20°C
Operator Name:	DLe
Comment:	EUT standing



2.04a_a-mode_18Mbps_ch64

Common Information

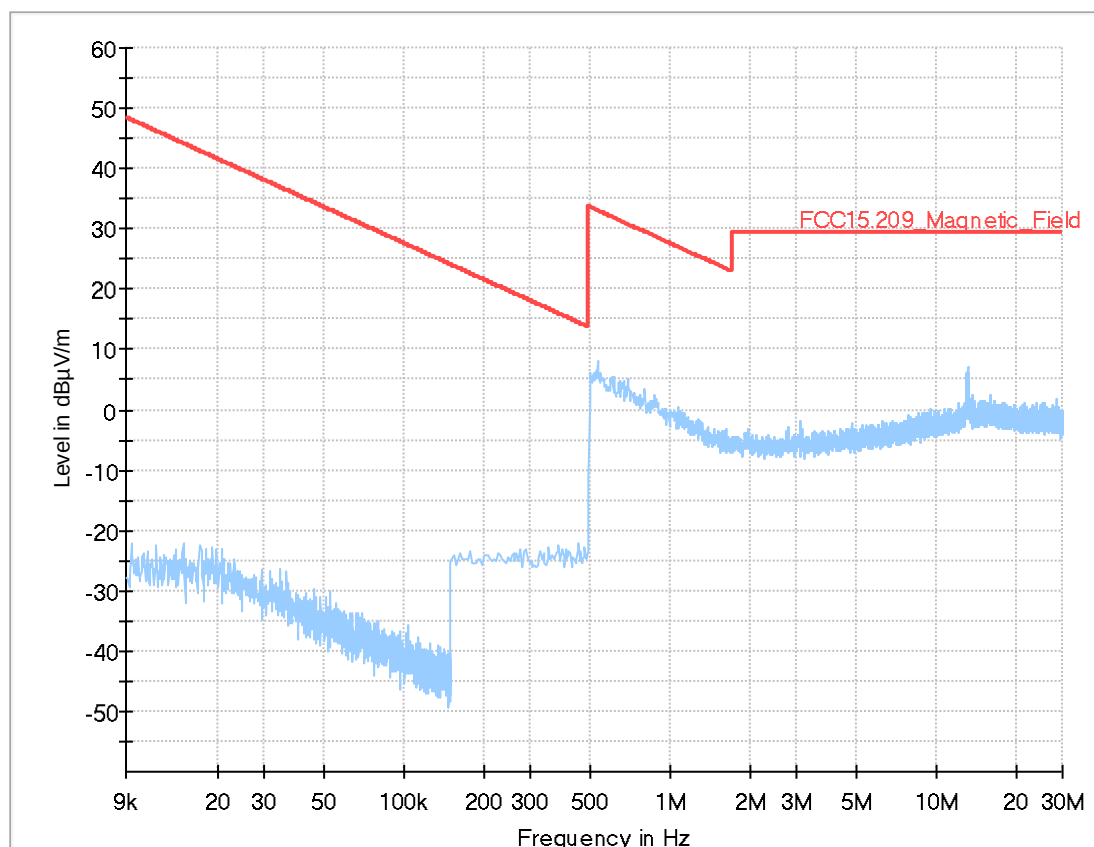
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Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	a-mode 18Mbps ch064
Operating Conditions:	Humidity: 48%RH; Temperature: 20°C
Operator Name:	Klv
Comment:	EUT standing



2.05a_a-mode_18Mbps_ch100

Common Information

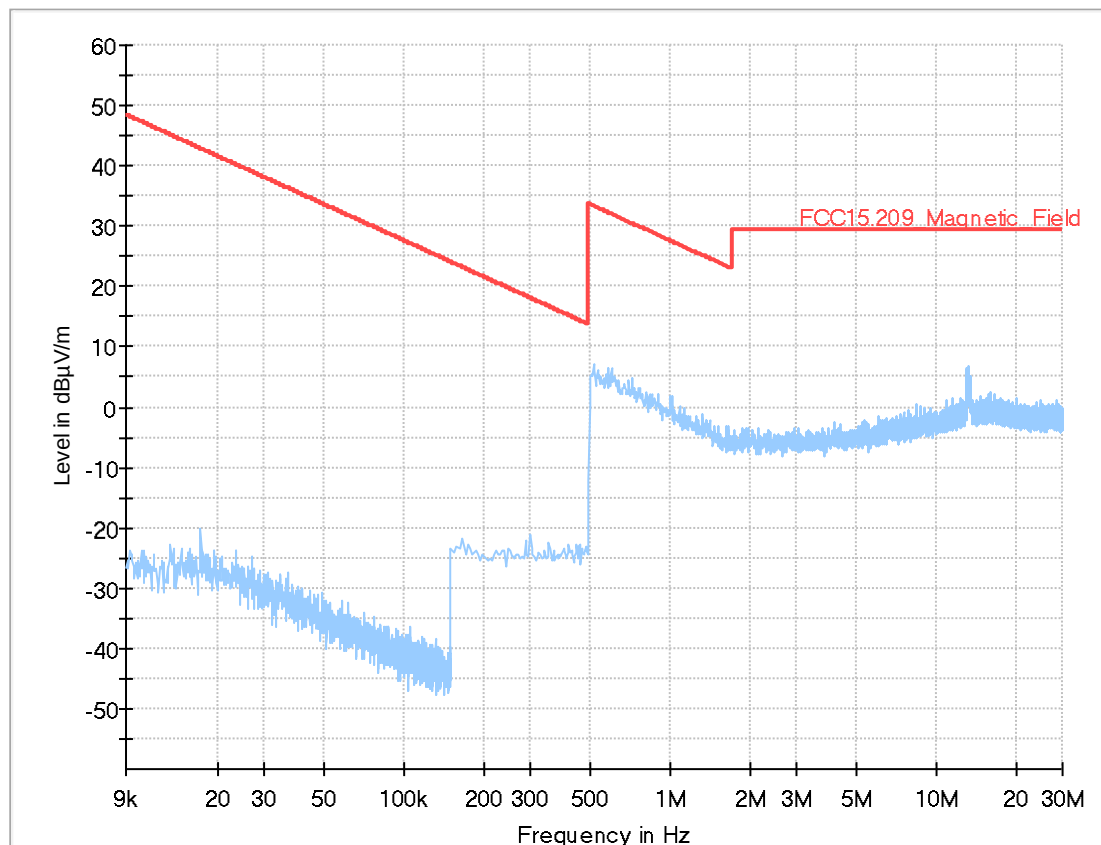
Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	a-mode 18Mbps ch100
Operating Conditions:	Humidity: 48%rH; Temperature: 20°C
Operator Name:	Klv
Comment:	EUT standing



2.06a_n-mode_MCS4_ch140

Common Information

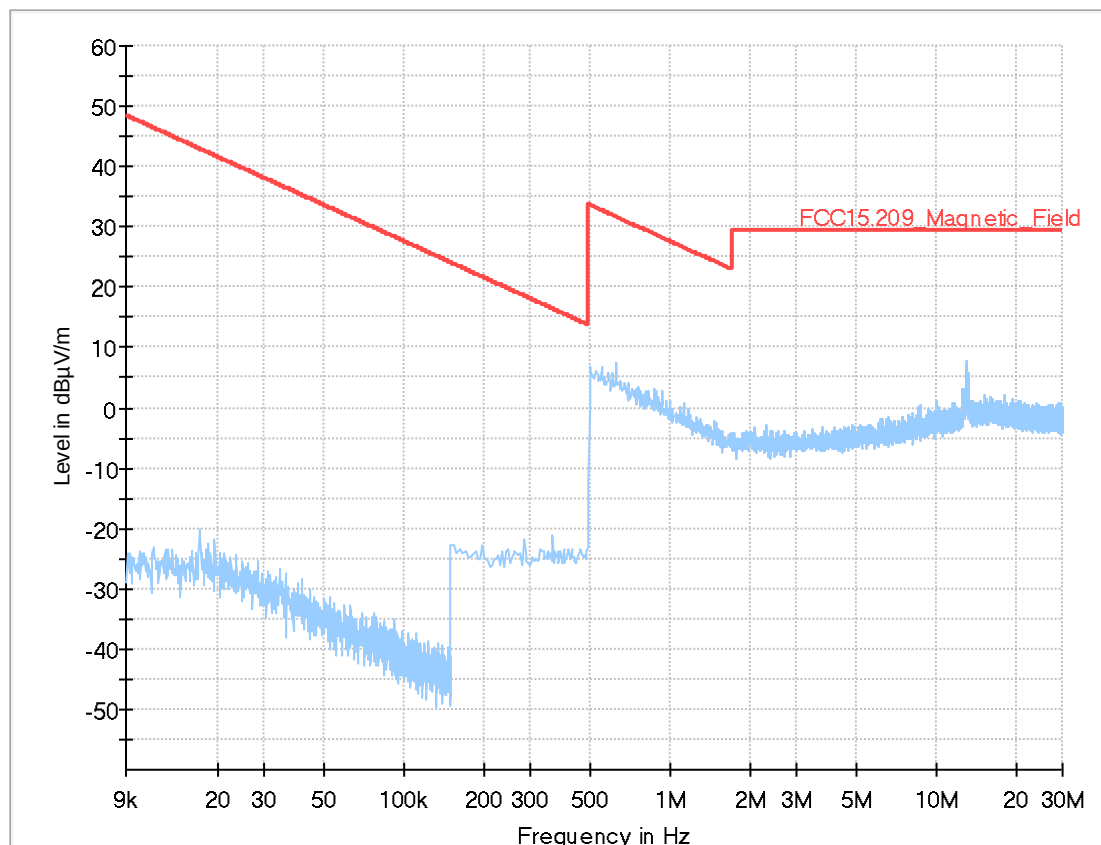
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Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	n-mode MCS4 ch140
Operating Conditions:	Humidity: 48%rH; Temperature: 20°C
Operator Name:	Klv
Comment:	EUT standing



2.07a_a-mode_18Mbps_ch149

Common Information

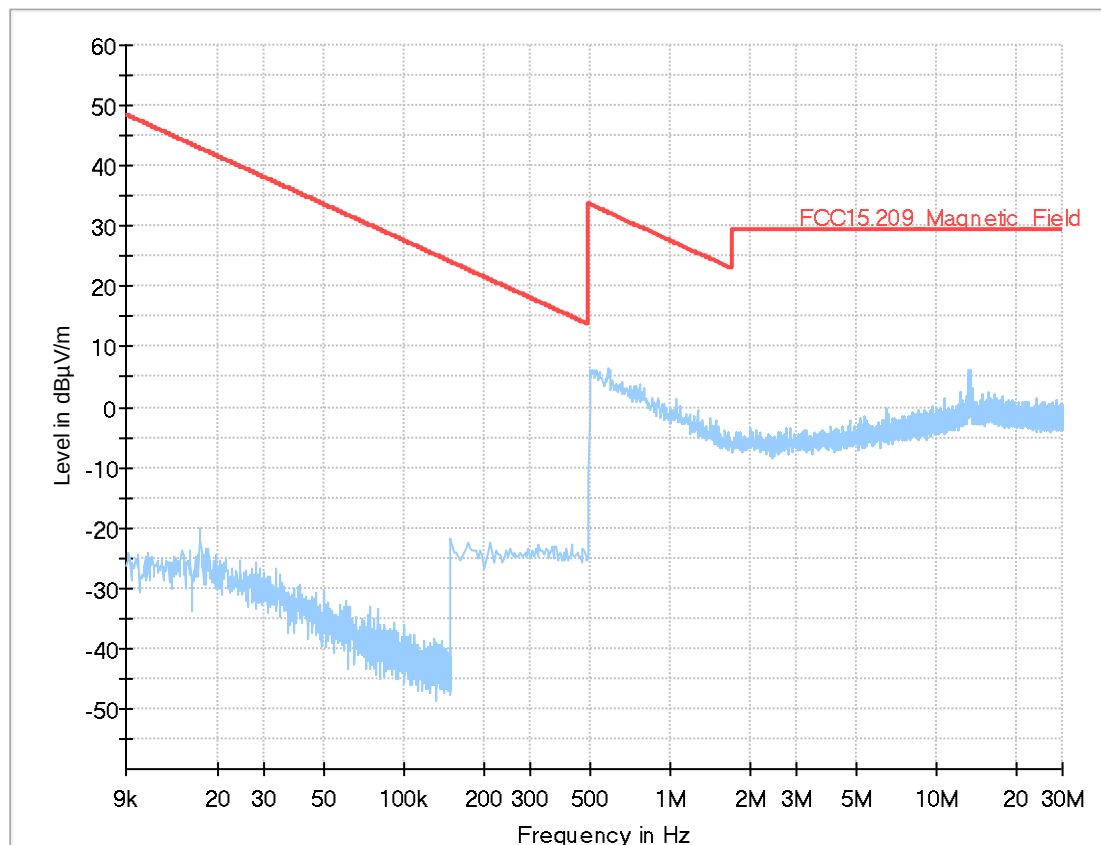
Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	a-mode 18Mbps ch149
Operating Conditions:	Humidity: 48%rH; Temperature: 20°C
Operator Name:	Klv
Comment:	EUT standing



2.08a_n-mode_MCS4_ch165

Common Information

Test Description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware	EMC32 V9.25.0
Distance Correction	used accord. table, pls. see test report
Technical Data	Please see page 2 for detailed data of measurement setup
Rec Antenna	height 1.00 m, parallel and 90° to EUT polarisation
Used Filter	bypass
Test Specification	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operating Mode	n-mode MCS4 ch165
Operating Conditions:	Humidity: 48%RH; Temperature: 20°C
Operator Name:	Klv
Comment:	EUT standing



1.4. Radiated Field Strength Emissions – 30 MHz to 1 GHz

Diagram No. 3.01a_a-mode_18Mbps_ch36

Test description:
Test site and distance:
Test specification.:

25.04.2018 Page 1 of 1
Electric Field Strength Measurement
Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)

Operator:
Operating conditions:
Comment 1:

Klv
a-mode | 18Mbps | ch036
EUT laying

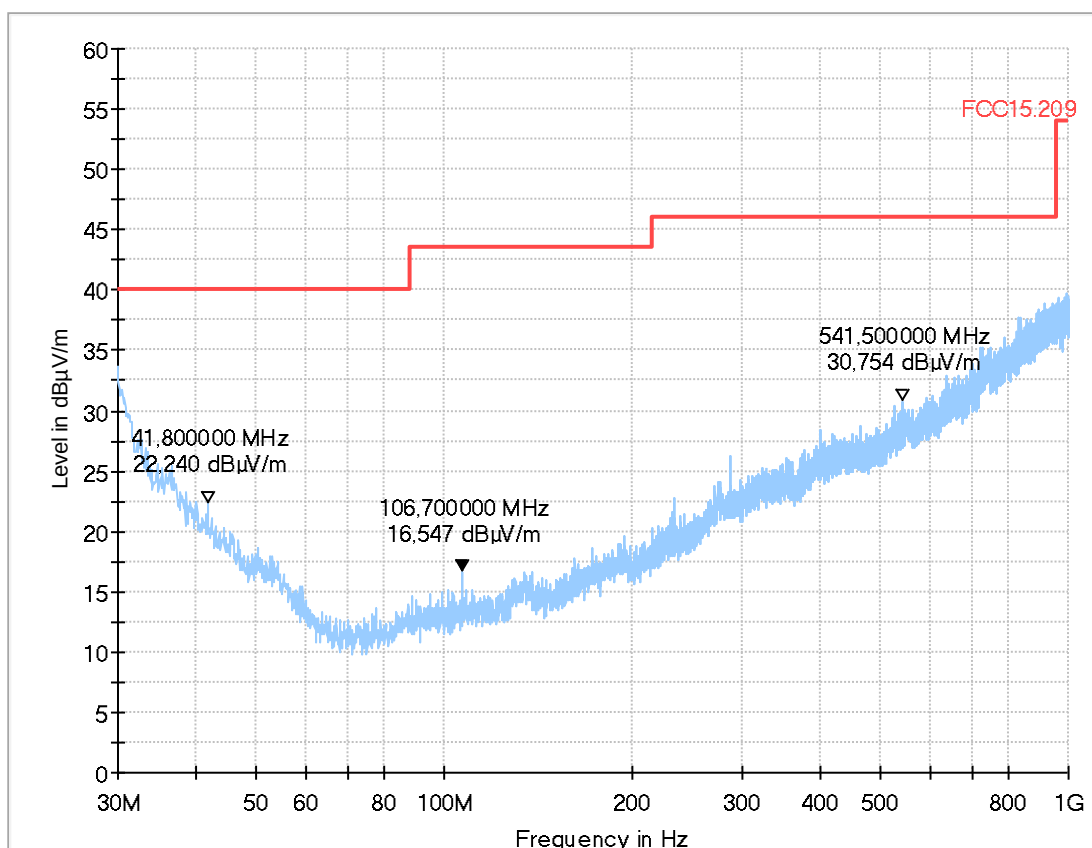


Diagram No. 3.01b_a-mode_18Mbps_ch36

Test description:	25.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	Klv
Operating conditions:	a-mode 18Mbps ch36
Comment 1:	EUT standing

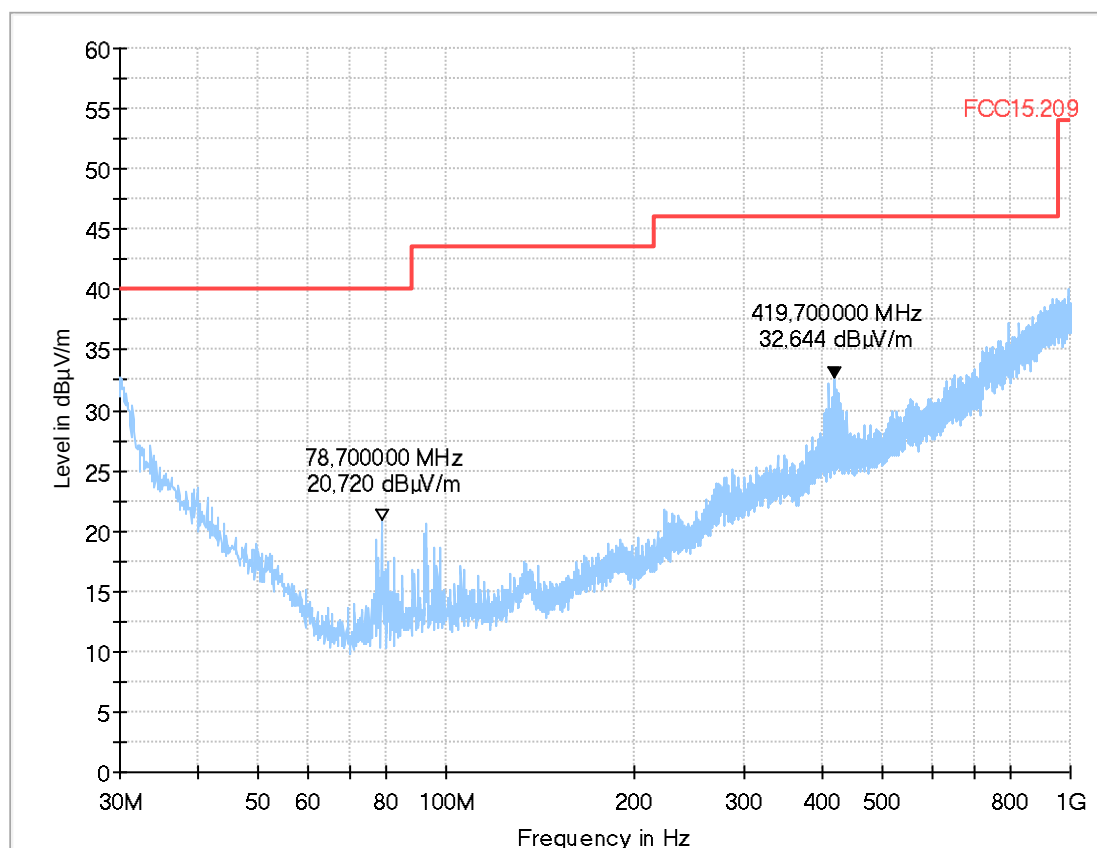


Diagram No. 3.02b_n-mode_MCS4_ch48

Test description:	25.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	Klv
Operating conditions:	n-mode MCS4 ch48
Comment 1:	EUT standing

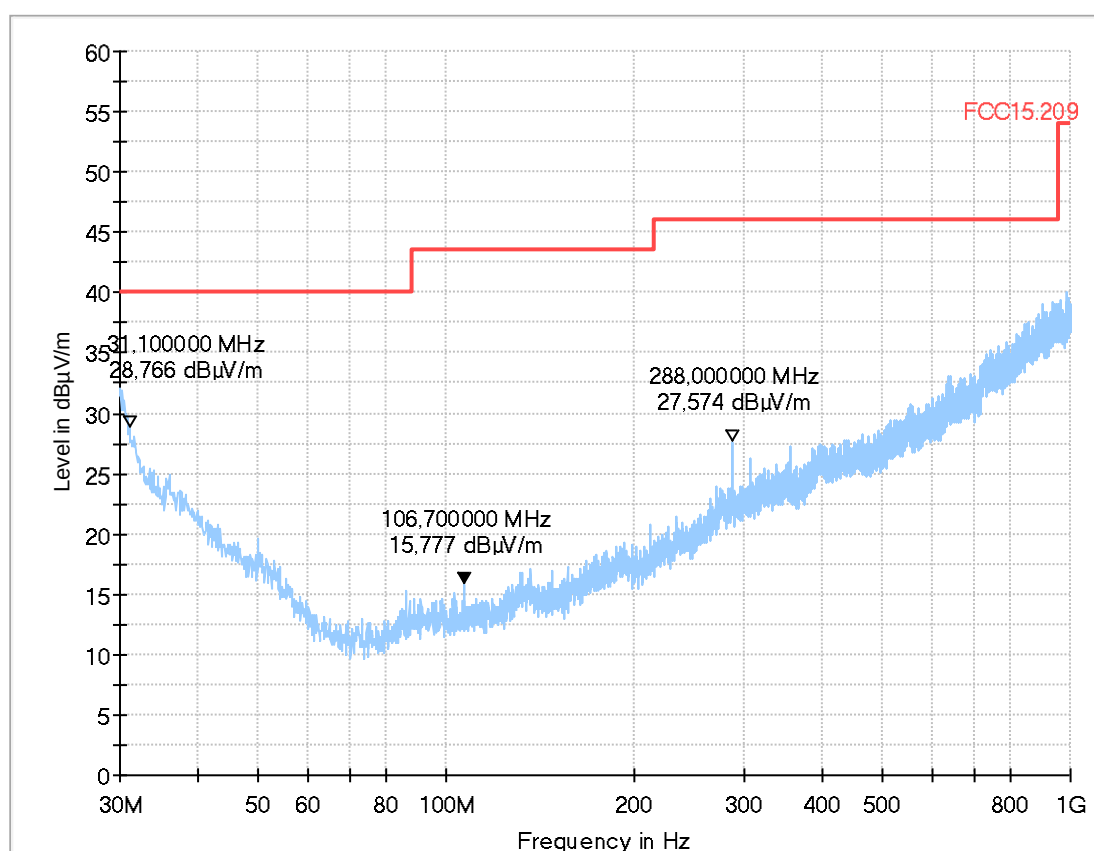


Diagram No. 3.03b_n-mode_MCS4_ch52

Test description:	25.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	Klv
Operating conditions:	n-mode MCS4 ch52
Comment 1:	EUT standing

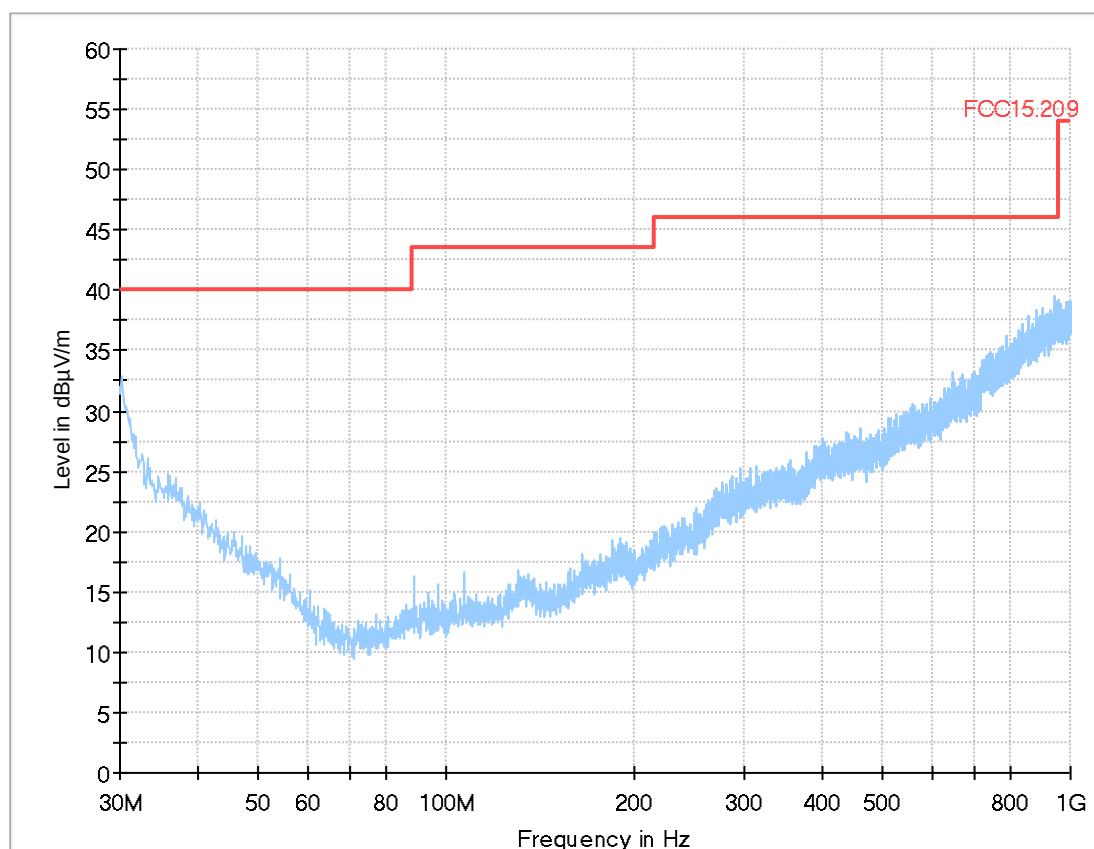


Diagram No. 3.04b_a-mode_18Mbps_ch64

Test description:	25.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	Klv
Operating conditions:	a-mode 18Mbps ch64
Comment 1:	EUT standing

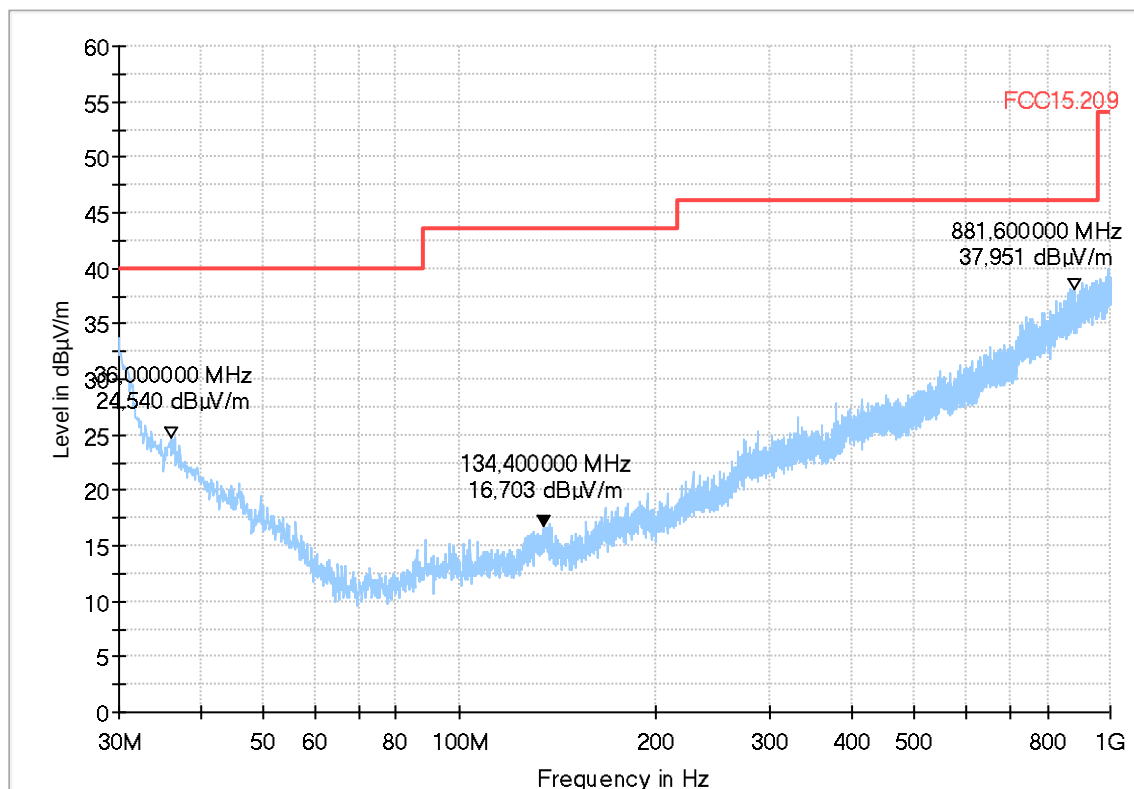


Diagram No. 3.05_a-mode_18Mbps_ch100

Test description:
Test site and distance:
Test specification.:

25.04.2018 Page 1 of 1
Electric Field Strength Measurement
Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)

Operator:
Operating conditions:
Comment 1:

Klv
a-mode | 18Mbps | ch100
EUT standing

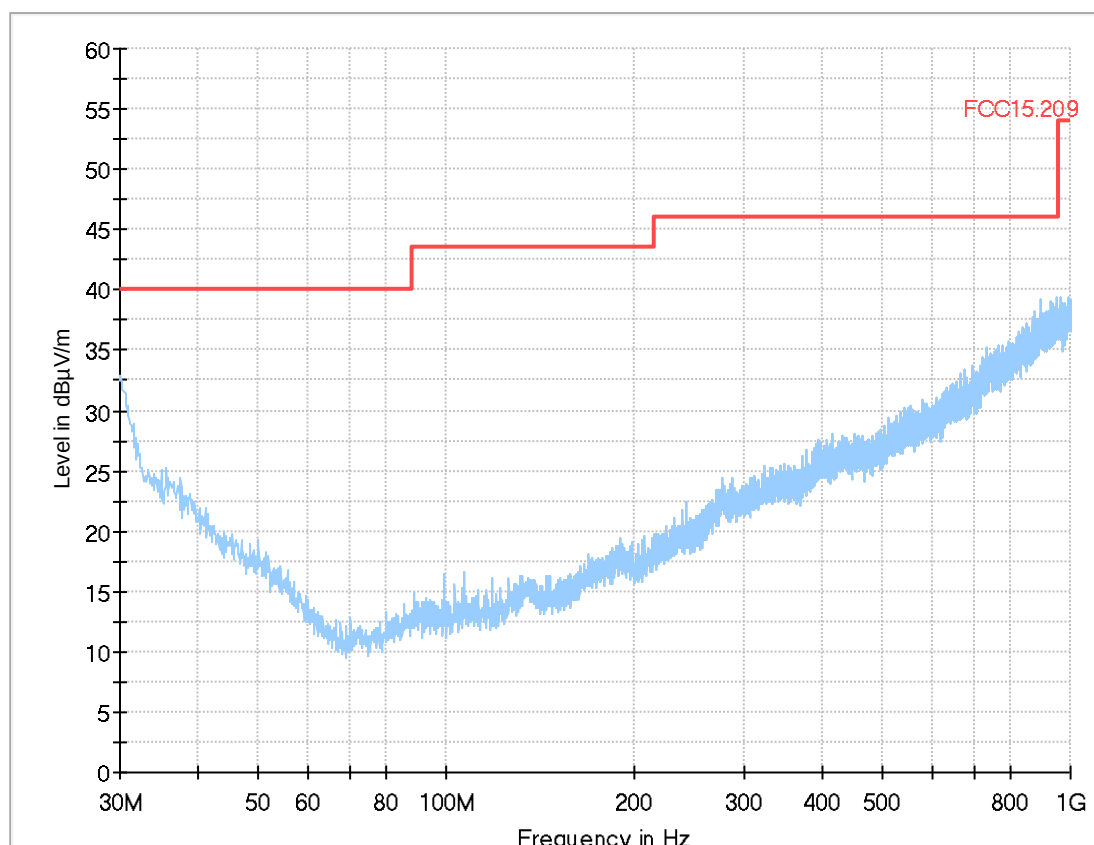


Diagram No. 3.06_n-mode_MCS4_ch140

Test description:	25.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	SLo
Operating conditions:	n-mode MCS4 ch140
Comment 1:	EUT standing

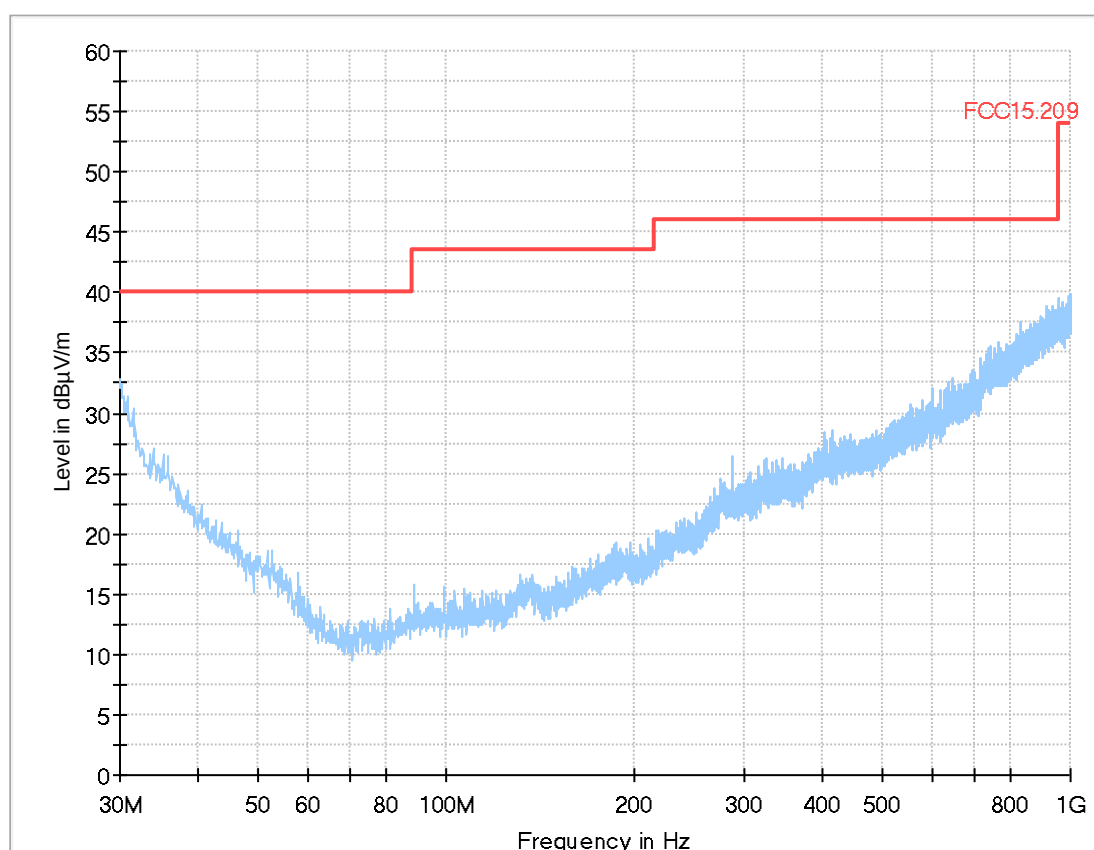


Diagram No. 3.07_a-mode_18Mbps_ch149

Test description:	26.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	SLo
Operating conditions:	a-mode 18Mbps ch149
Comment 1:	EUT standing

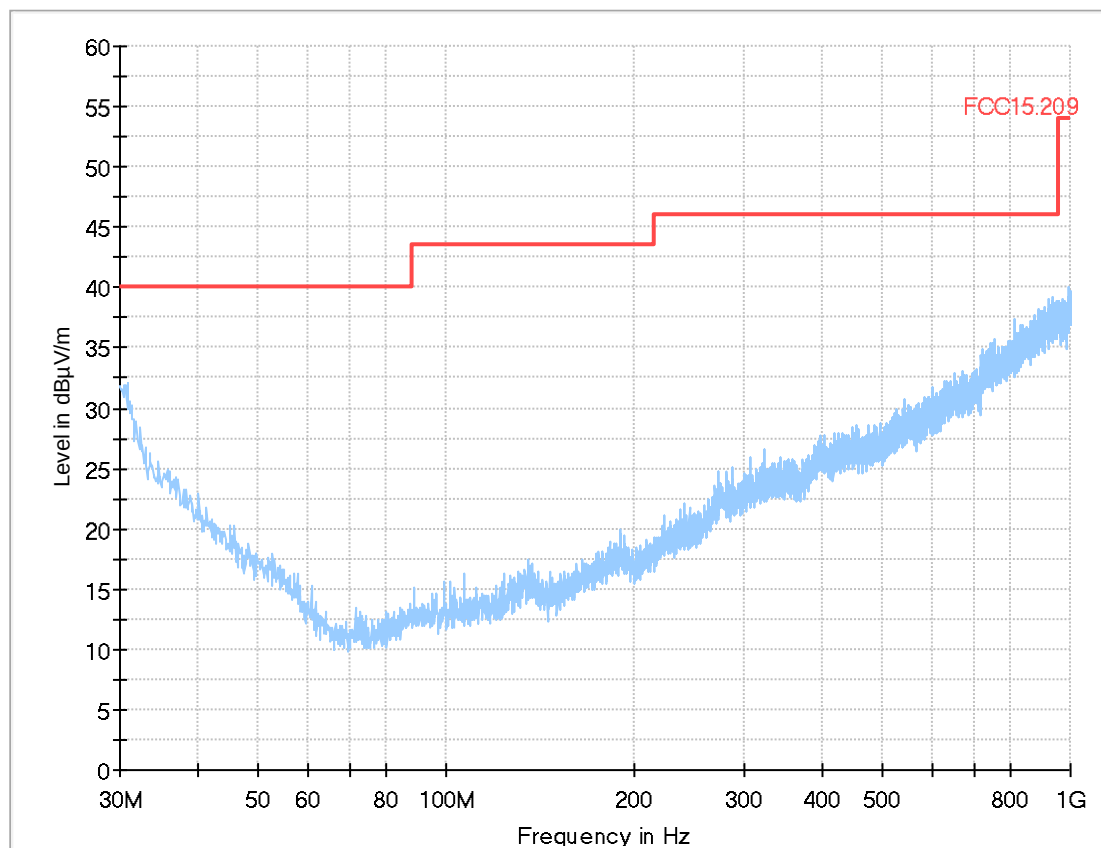
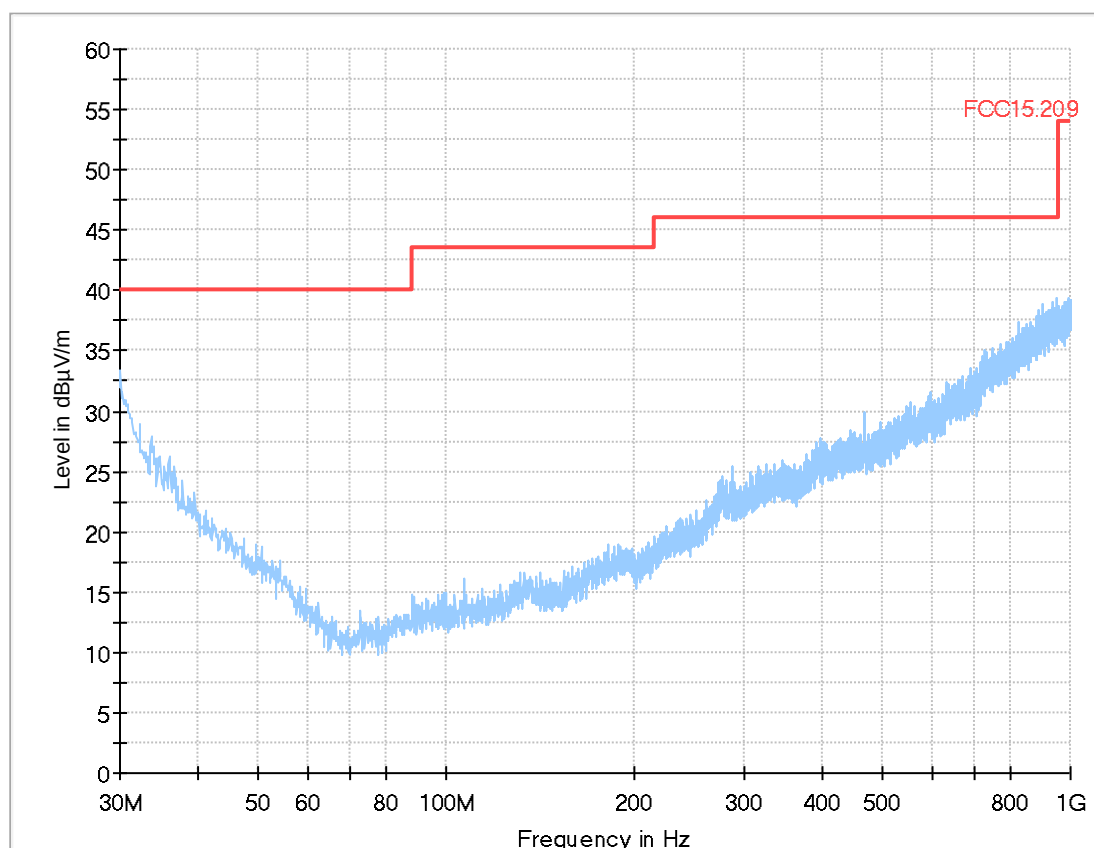


Diagram No. 3.06_n-mode_MCS4_ch165

Test description:	25.04.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Test specification.:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
	FCC - Testing Part 15.247 & RSS - 247 (WLAN2.4)
Operator:	SLo
Operating conditions:	n-mode MCS4 ch165
Comment 1:	EUT standing



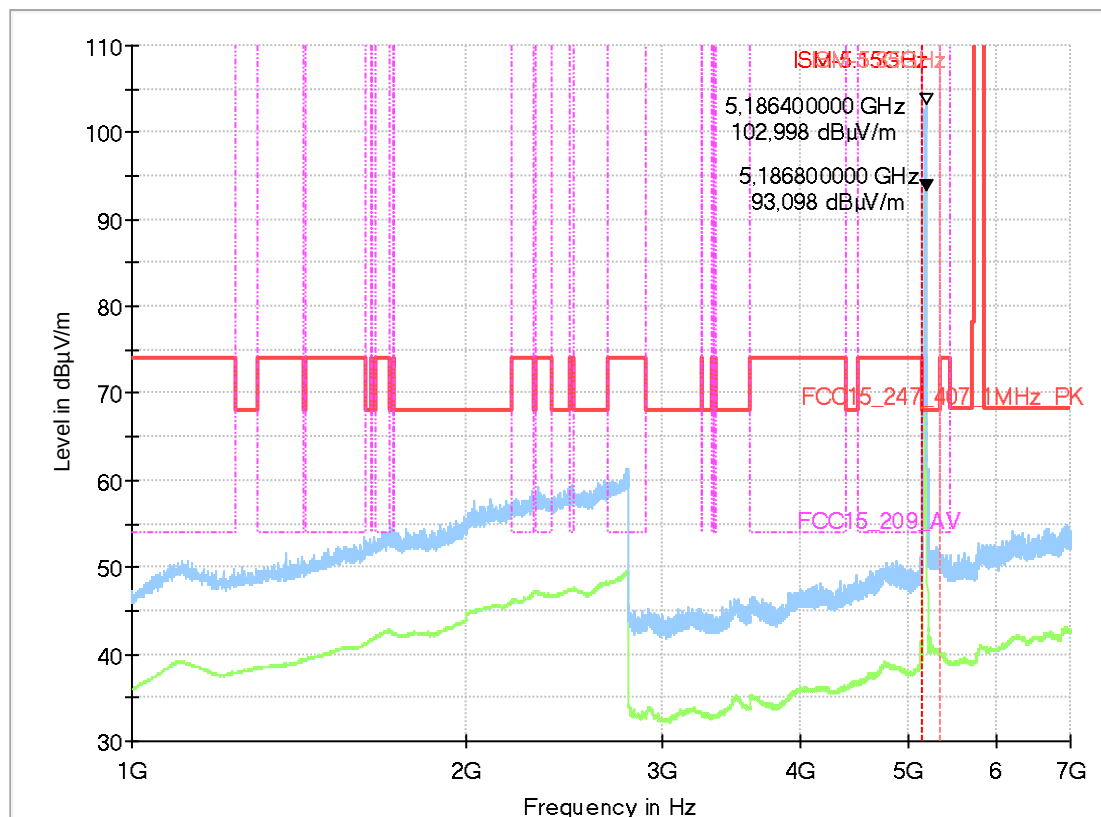
1.5. Radiated Field Strength Emissions – 1 GHz to 7 GHz

4.01a_a-mode_18Mbps_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous , a-mode ,CH: 36, Datarate:18Mbps , Power:12.5 .
Operator Name:	HEI

Full Spectrum

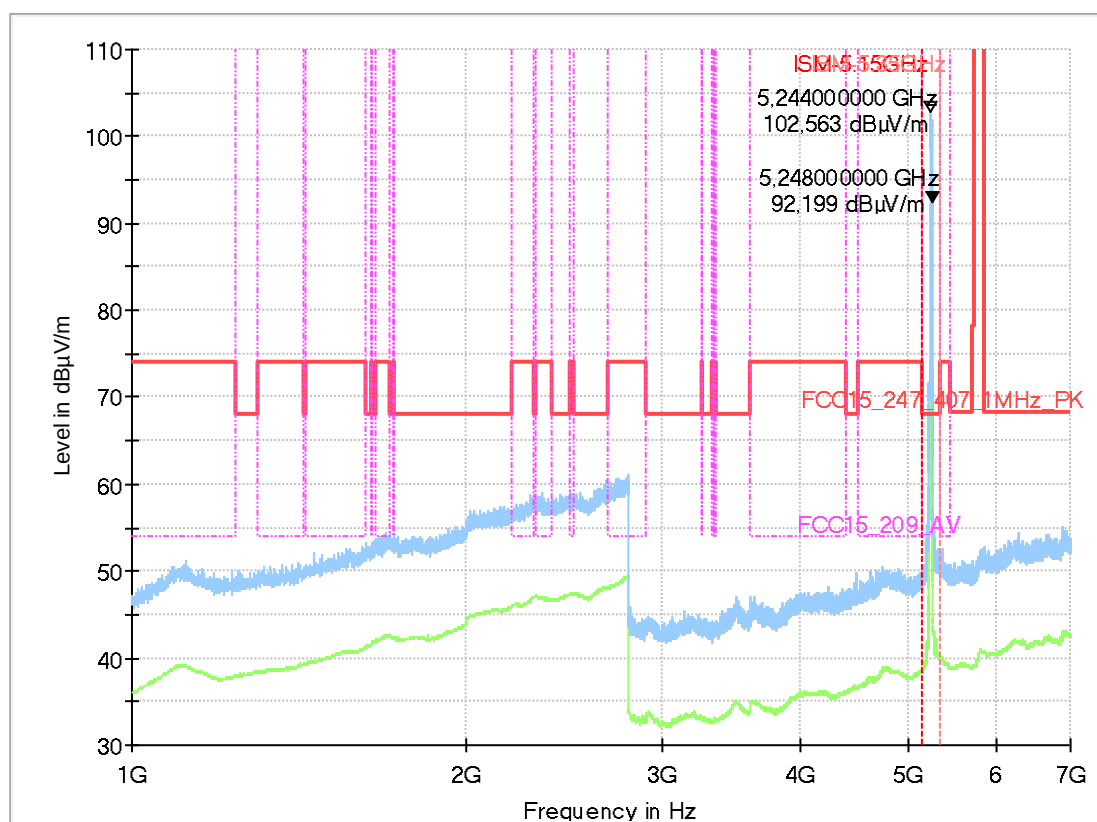


4.02a_n-mode_MCS4_ch48

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous,n-mode,CH:48 , Datarate :MCS4 , Power:12.5
Operator Name:	HEI

Full Spectrum

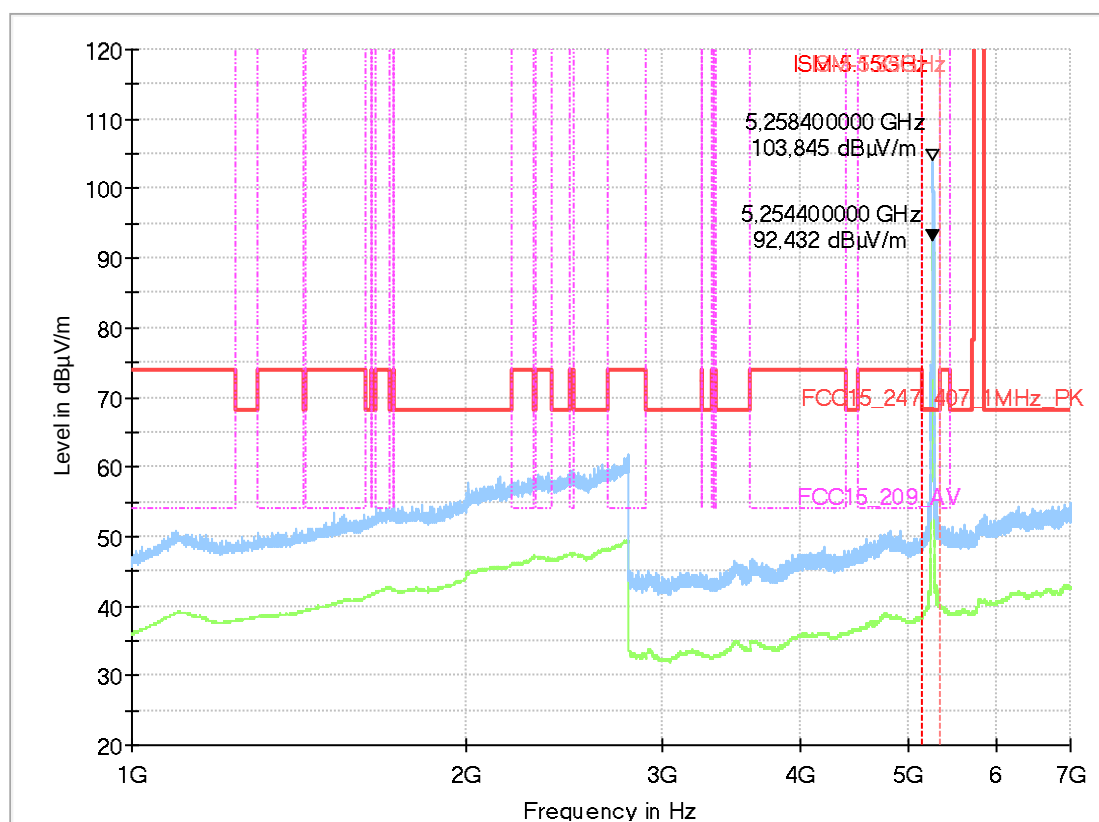


4.03a_n-mode_MCS4_ch52

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous, n-mode ,CH:52 , Datarate:MCS4 , Power:12.5.
Operator Name:	HEI

Full Spectrum

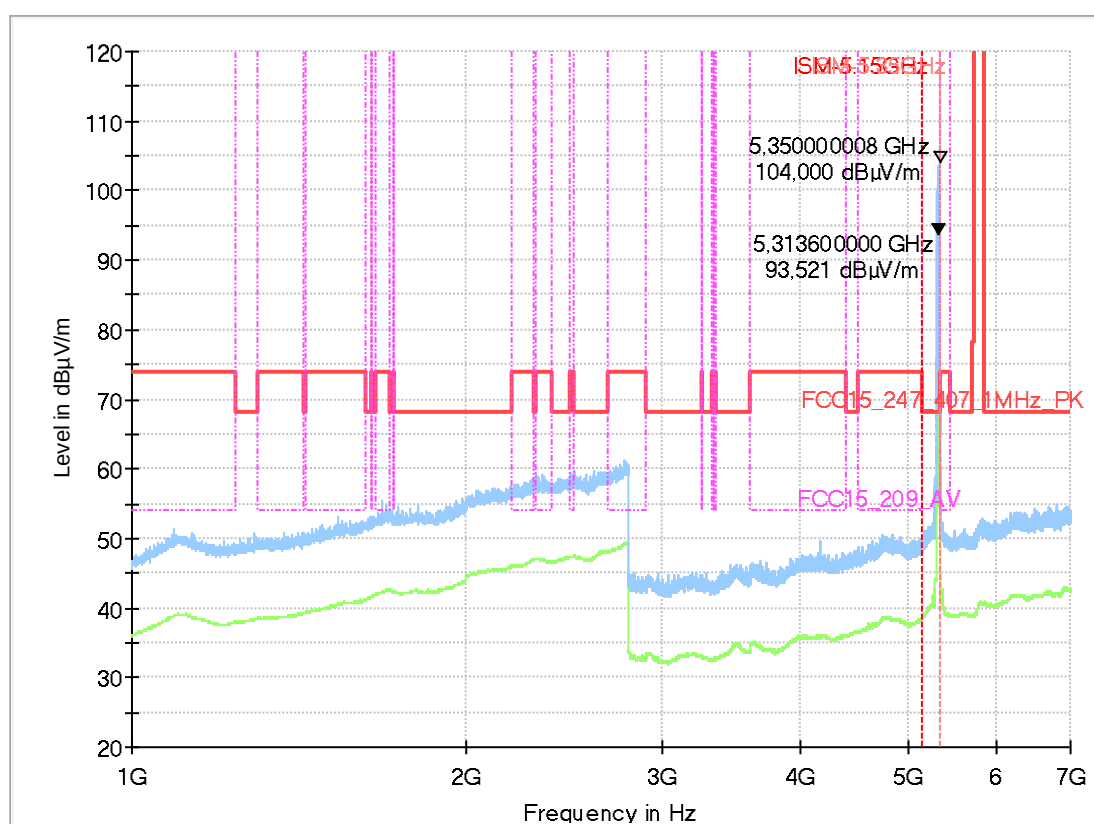


4.04a_a-mode_18Mbps_ch64

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous,a-mode ,CH:64 , Datarate:18, Power:12.5.
Operator Name:	HEI

Full Spectrum



4.05a_a-mode_18Mbps_ch100

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous, a-mode;CH:100, Datarate:18Mbps ,Power:12.5
Operator Name:	HEI

Full Spectrum

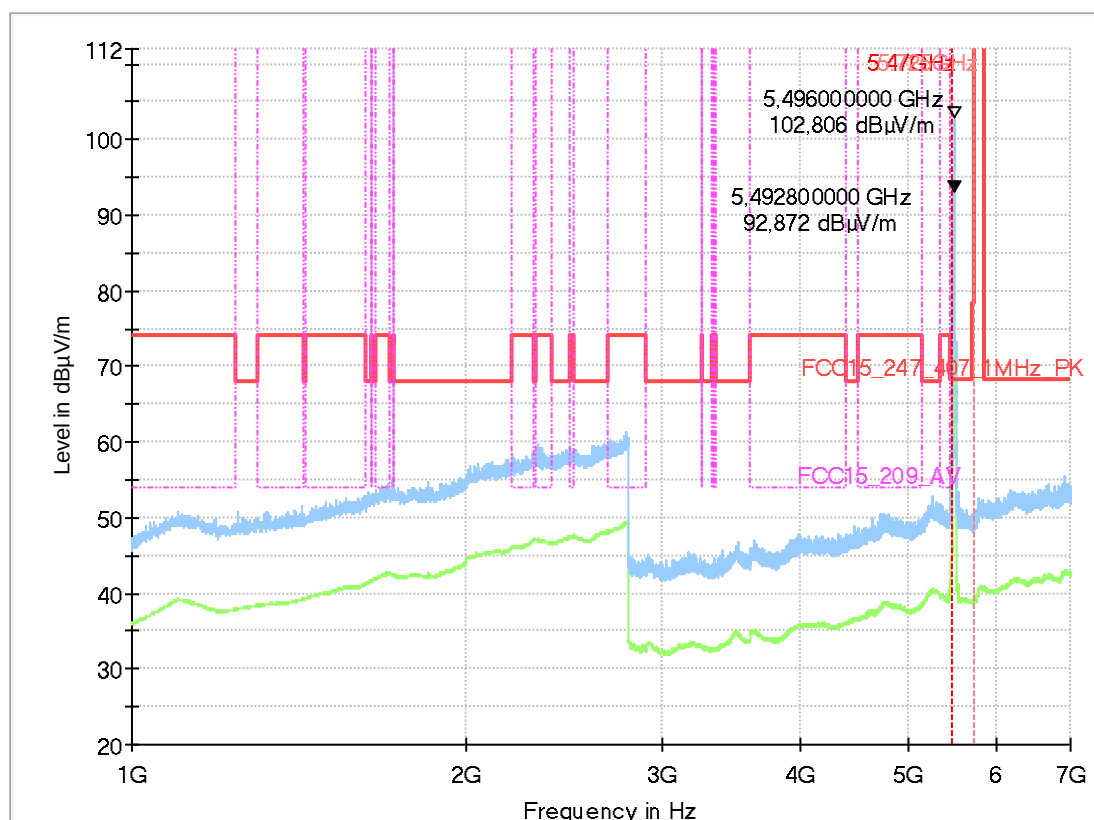
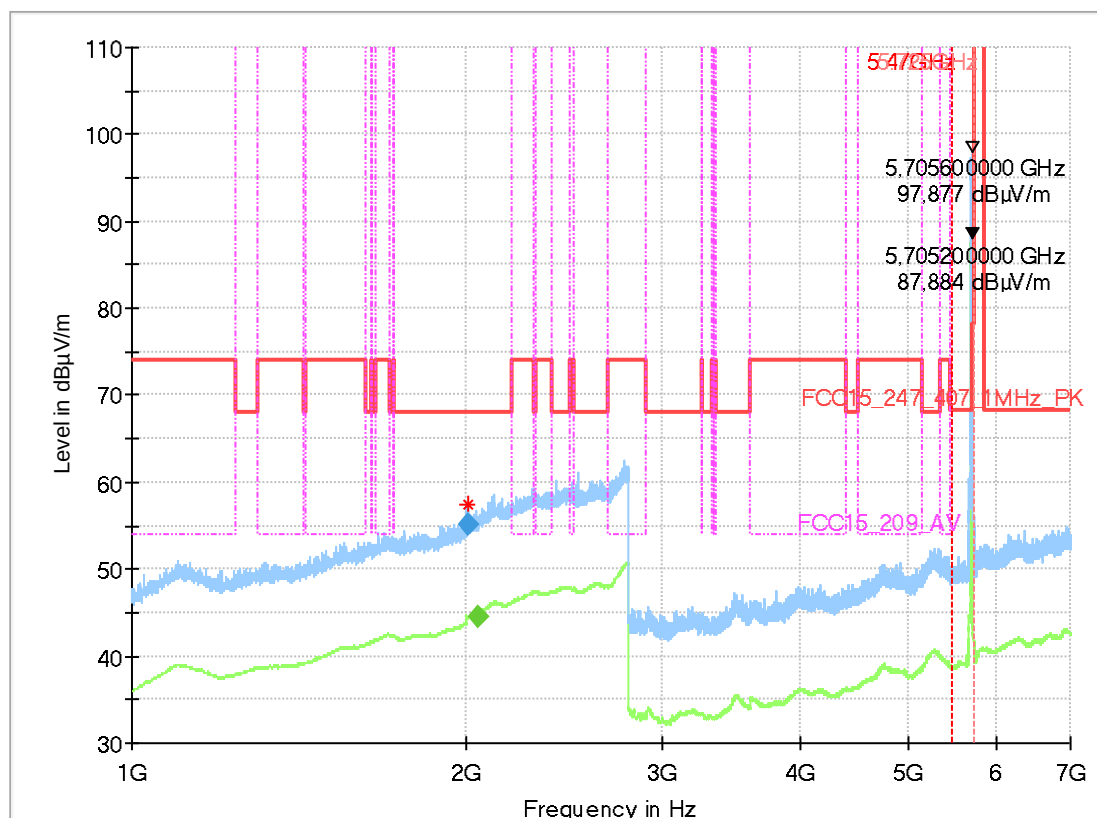


Diagram No.: 4.06b_n-mode_MCS4_ch140

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. low/middle/high

Full Spectrum



Final Result

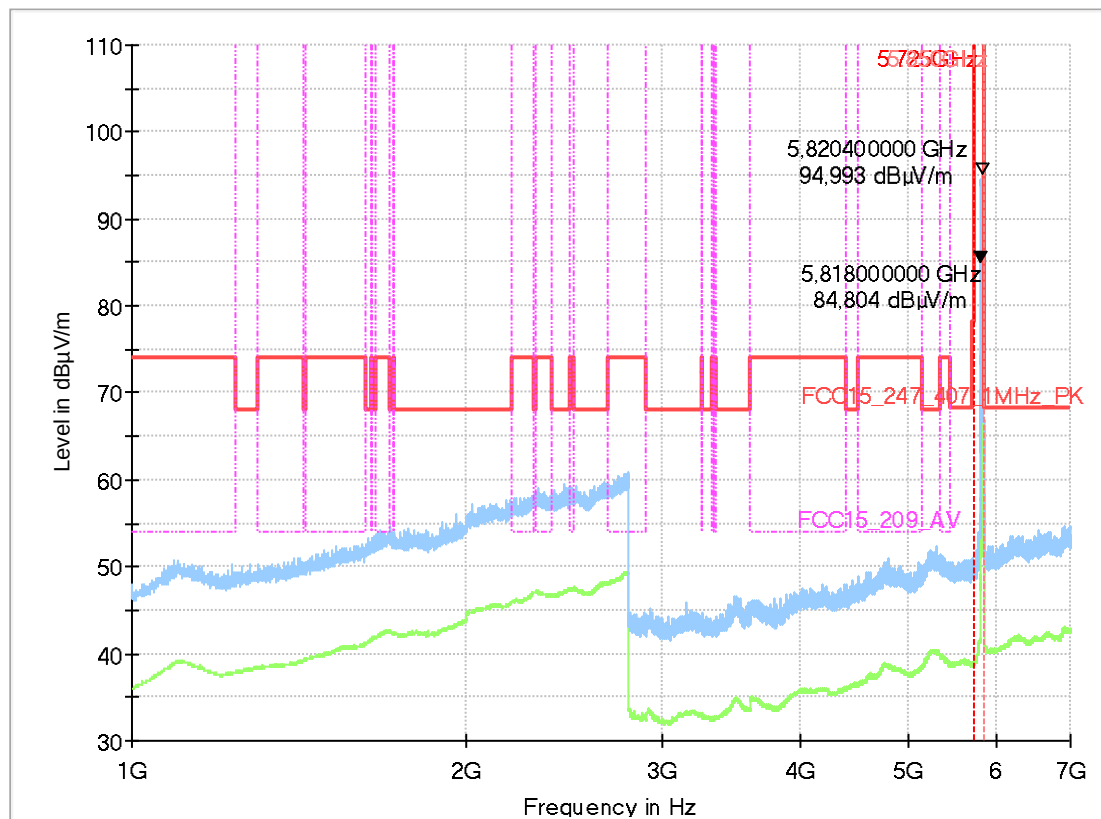
Frequency (MHz)	MaxPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
2004.900000	55.06	---	68.00	12.94	155.0	H	64.0	0.0	39.5
2050.800000	---	44.64	150.00	105.36	155.0	V	126.0	90.0	39.8

4.06a_n-mode_MCS4_ch165

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous , n-mode ,CH: 165, Datarate: MCS4 , Power:12.5 .
Operator Name:	HEI

Full Spectrum

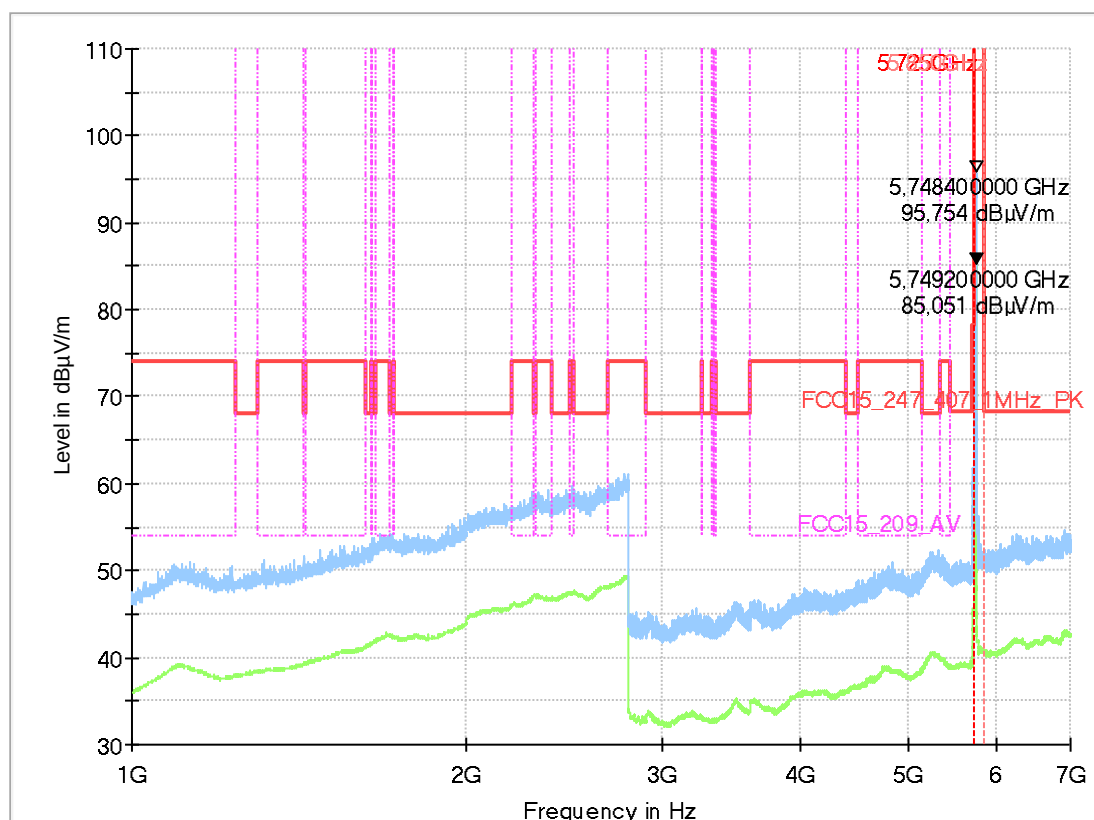


4.07a_a-mode_18Mbps_ch149

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous , a-mode ,CH: 149, Datarate:18 , Power:12.5 .
Operator Name:	HEI

Full Spectrum



1.6. Unwanted emissions Frequency-band 5150-5250MHz (RSS-247, Issue2, Chapter 6.2.1.2)

Requirement:

Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz.

1.6.1. Channel 48, MCS4 modulation scheme

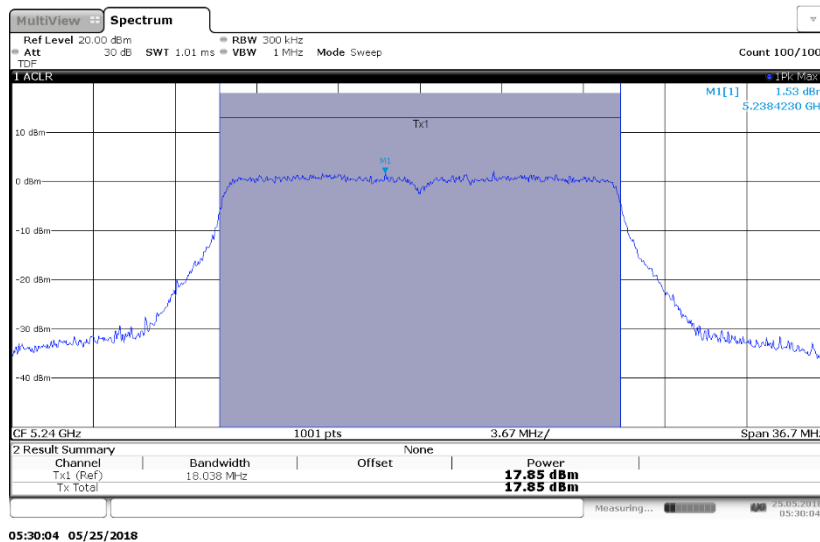
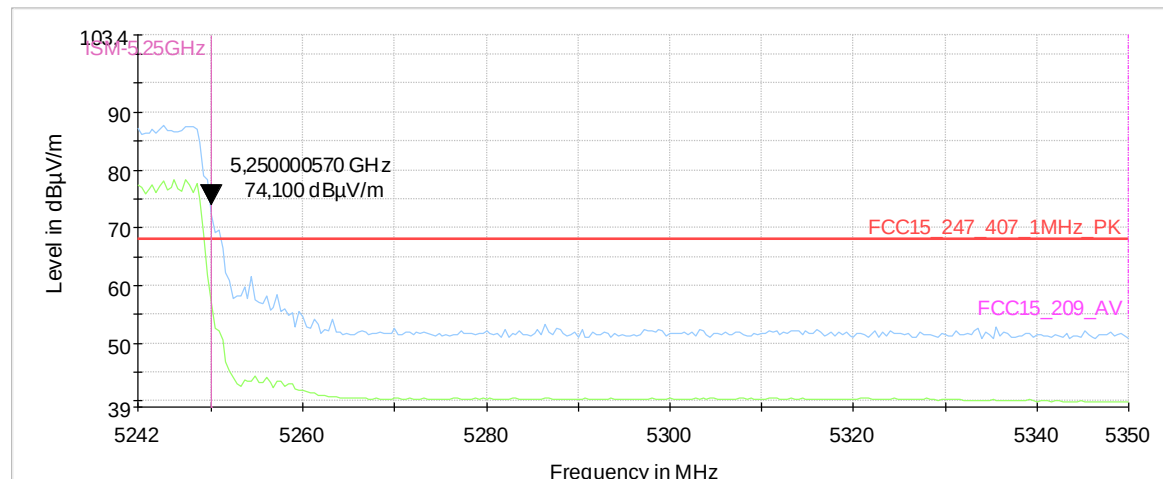


Diagram 3 - Channel power: 30.01_CH_Power_CH48_n-mode_MCS4

Band-Edge diagram:



Value at band-Edge: 74.10 dBμV/m

Value in dBm: 74.10 dBμV/m - 95.2 dB (correction for 3m measurement distance) = -21.1 dBm

Attenuation: Channel power – value at band-Edge: 17.85 dBm – (-21.1dBm) = 38.95 dB (=dBc)

Verdict: pass

1.6.2. Channel 48, 18Mbit modulation

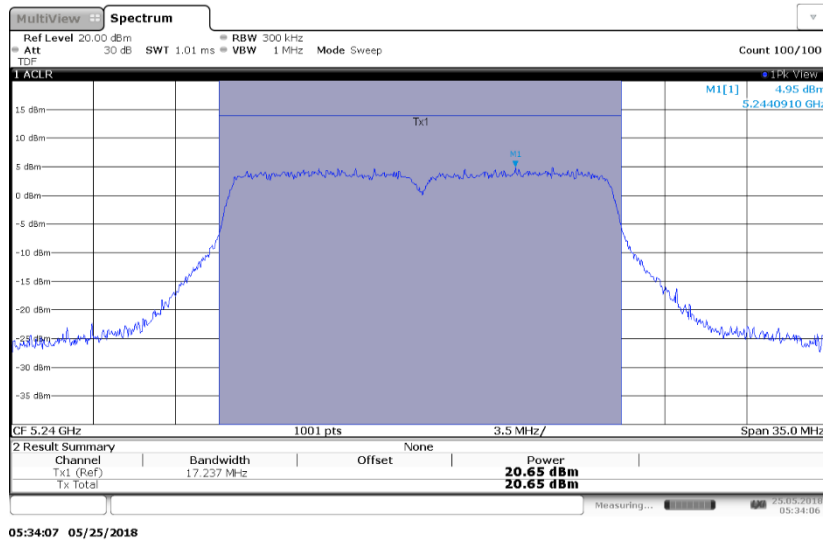
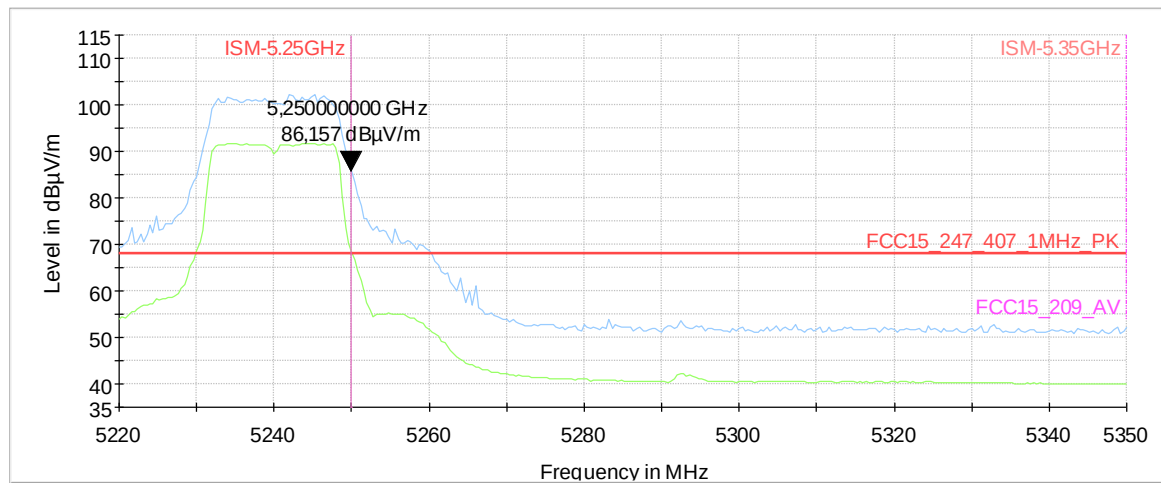


Diagram 4 – Channel power: 30.02_CH_Power_Ch48_a-mode_18Mbits

Band-Edge diagram:



Value at band-Edge: 86.15dBμV/m

Value in dBm: $86.15 \text{ dB}\mu\text{V/m} - 95.2 \text{ dB (correction for 3m measurement distance)} = -9.05 \text{ dBm}$

Attenuation: Channel power – value at band-Edge: $20.65\text{dBm} - (-9.05\text{dBm}) = 29.7 \text{ dB (=dBc)}$

Verdict: pass

1.7. Unwanted emissions Frequency-band 5250-5350MHz (RSS-247, Issue2, Chapter 6.2.2.2)

Requirement b of §6.2.2.2 applicable:

All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz

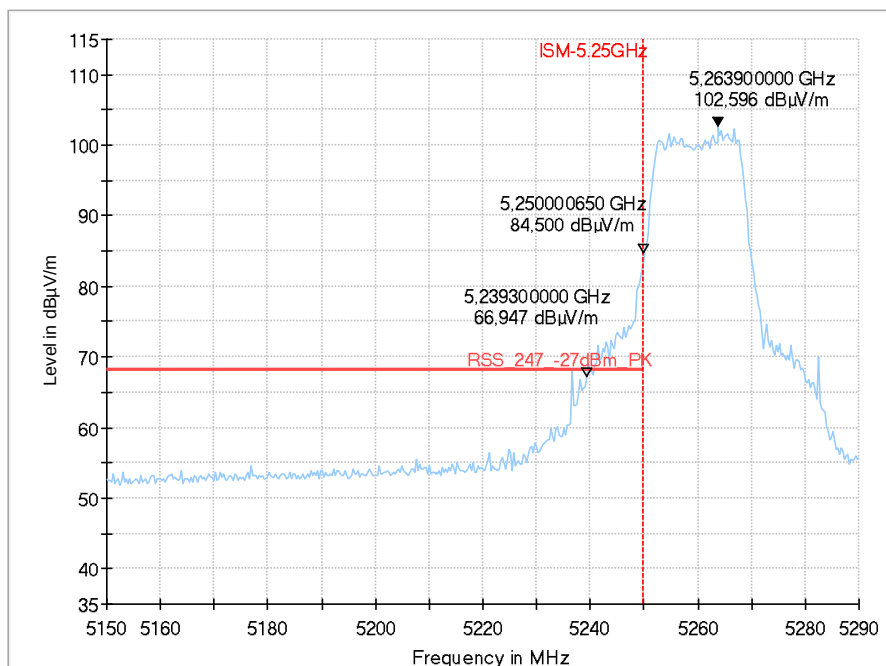
The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

Diagram No.: 9.03_BE_low_a-mode_18Mbps_ch052_step1

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. low/middle/high

Full Spectrum



Band-Edge peak value: 84.5dBµV/m@3m

Value in dBm: $84.5 \text{ dBµV/m} - 95.2 \text{ dB (correction measurement distance 3m)} = -10.7 \text{ dBm/MHz} < 10 \text{ dBm/MHz}$
(Limit for power density: §6.2.1.1)

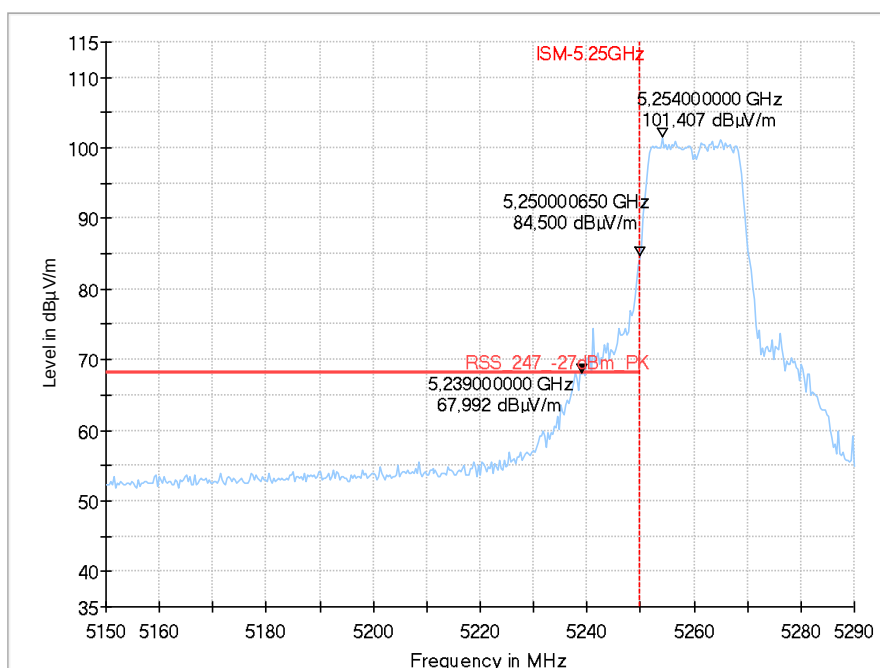
Device must be labelled: “for indoor use only”

Diagram No.: 9.11_BE_low_n-mode_MCS4_ch52_step1

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. low

Full Spectrum



Band-Edge peak value: 84.5dBμV/m@3m

Value in dBm: $84.5\text{dB}\mu\text{V/m} - 95.2\text{ dB (correction measurement distance 3m)} = -10.7\text{dBm/MHz} < 10\text{dBm/MHz}$
(Limit for power density: §6.2.1.1)

Device must be labelled: “for indoor use only”

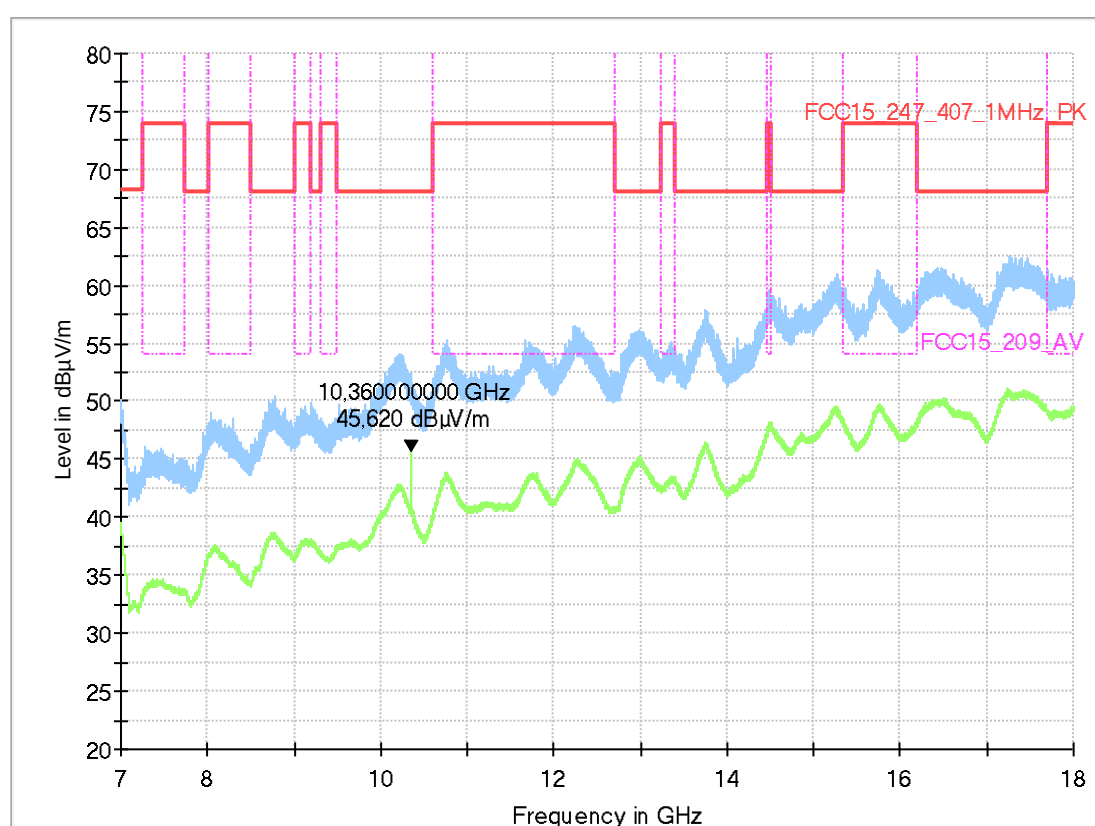
1.8. Radiated Field Strength Emissions – 7 GHz to 18 GHz

8.01b_a-mode_18Mbps_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	LKu/FKa
Comment:	S/N: G18D03796

Full Spectrum

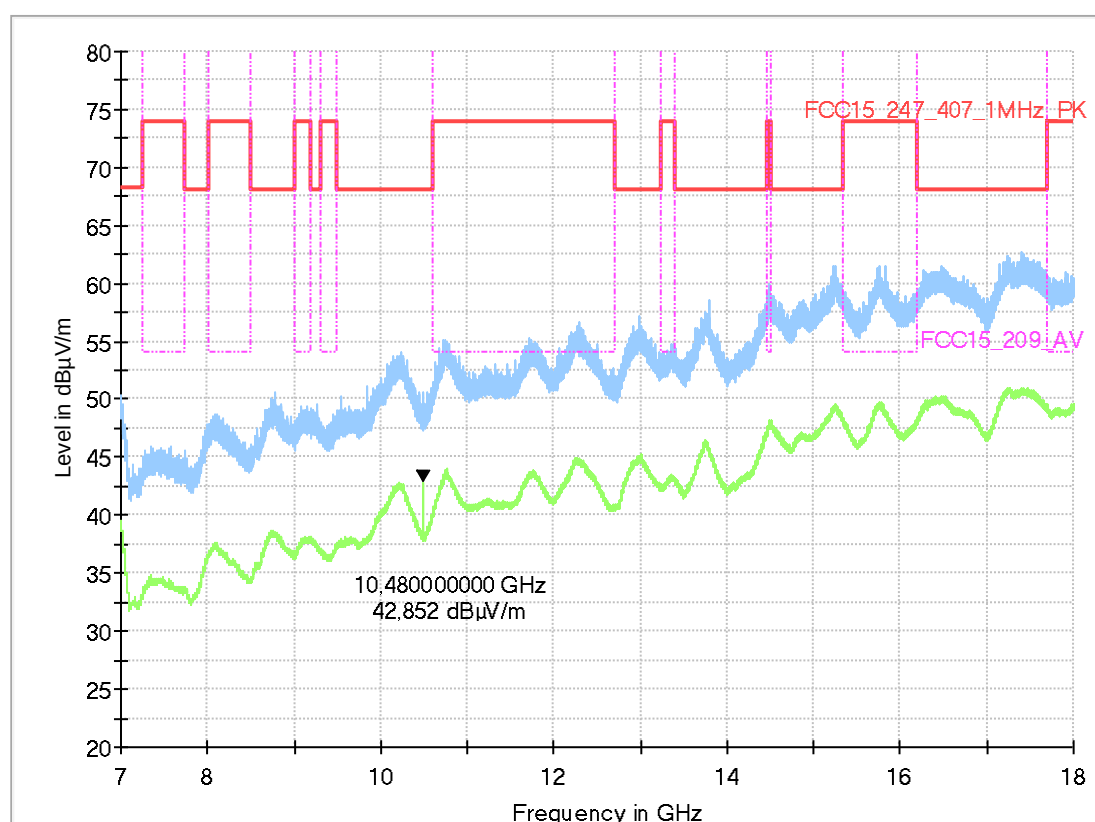


8.02b_n-mode_MCS4_ch48

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	LKu/FKa
Comment:	S/N: G18D03796

Full Spectrum

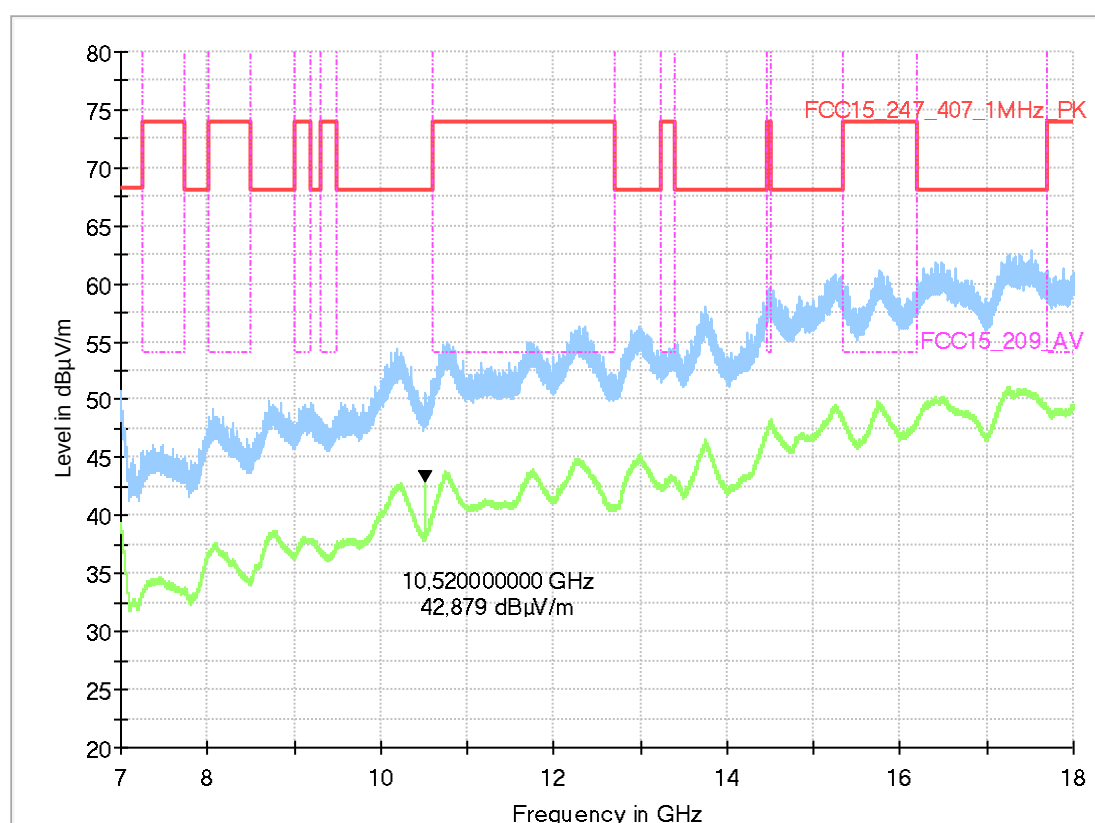


8.03b_n-mode_MCS4_ch052

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	LKu/FKa
Comment:	S/N: G18D03796

Full Spectrum

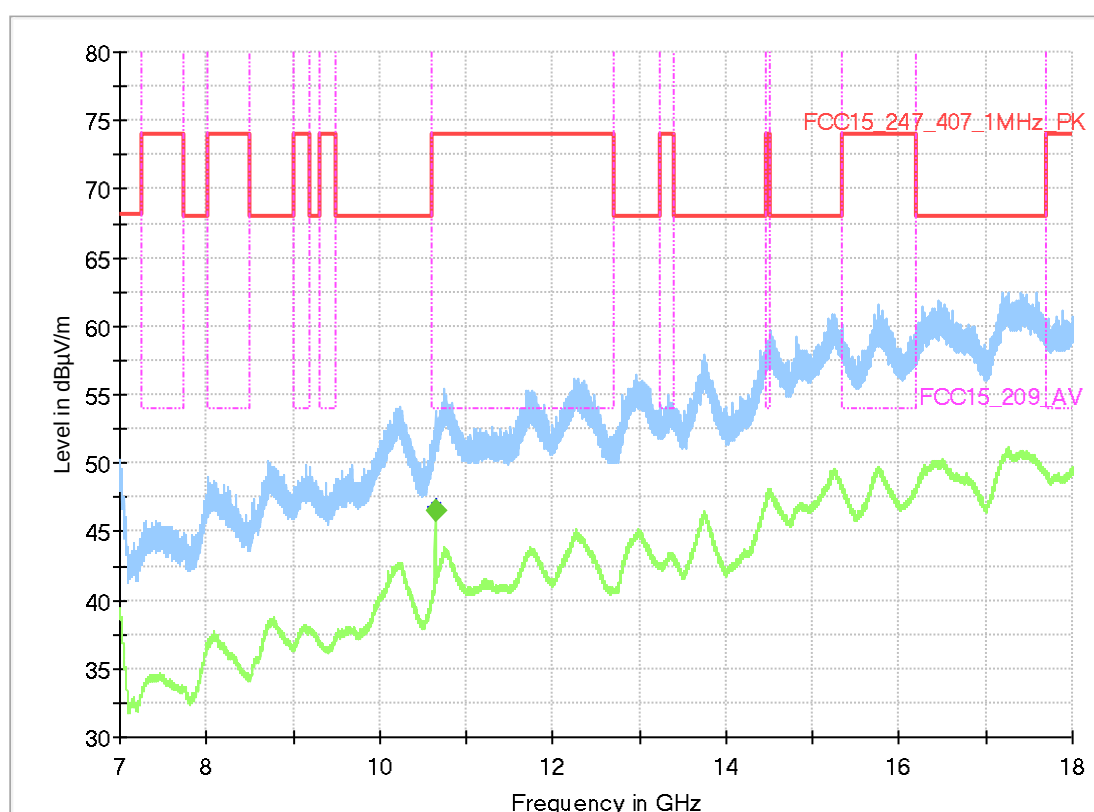


8.04b_a-mode_18Mbps_ch64

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	LKu/FKa
Comment:	S/N: G18D03796

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
10640.20	---	46.52	54.00	7.48	100.0	1000.000	155.0	V	151.0	90.0

(continuation of the "Final Result" table from column 16 ...)

Frequency (MHz)	Corr .	Comment
10640.200000	16.7	16:50:37 - 26.04.2018

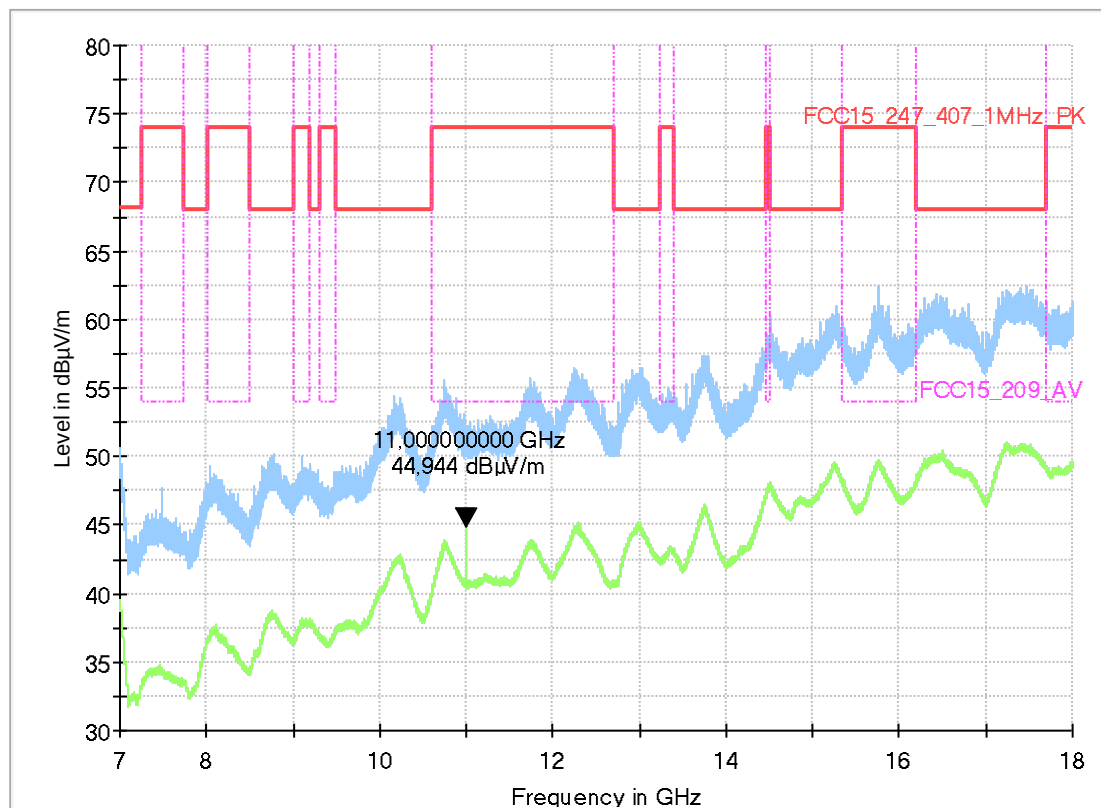
Value: 46.52 dBµV/m + Duty-Cycle correction 18Mbit (= 1,55 dB) = 48,07 dBµV/m

8.05b_a-mode_18Mbps_ch100

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	LKu/FKa
Comment:	S/N: G18D03796

Full Spectrum



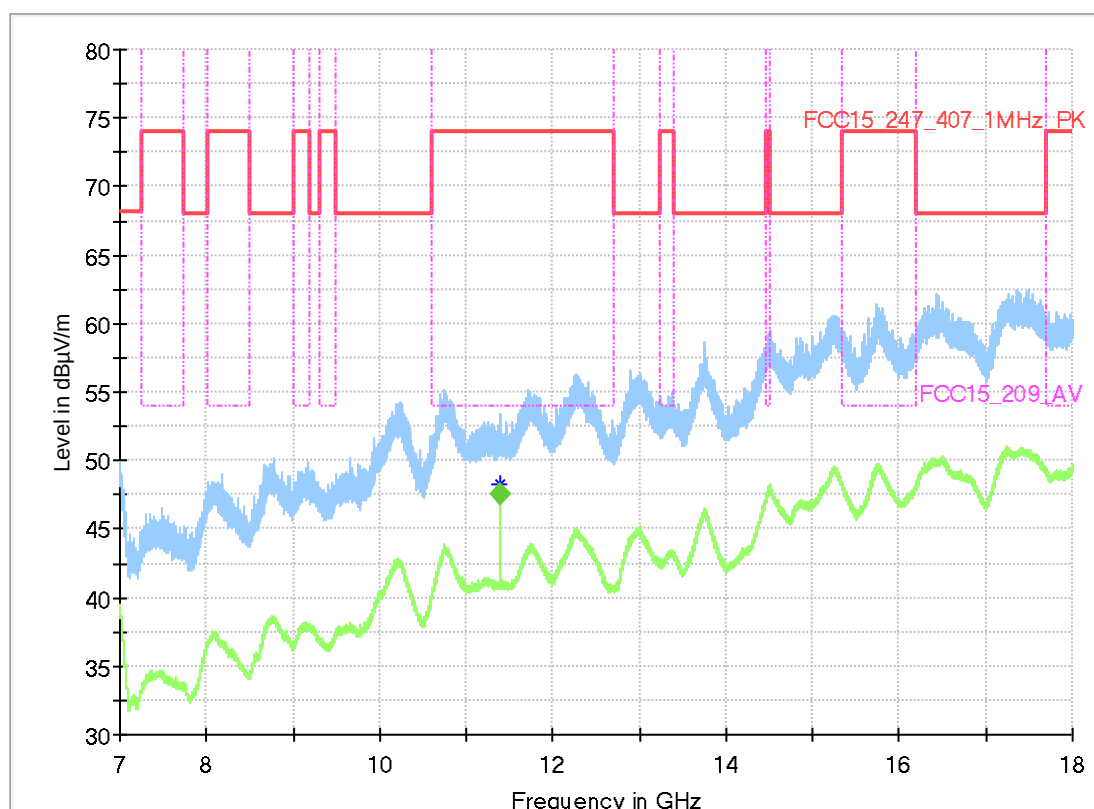
Value: 44.94 dBµV/m + Duty-Cycle correction 18Mbit (= 1,55 dB) = 46,49 dBµV/m

8.06b_n-mode_MCS4_ch140

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	SRa
Comment:	S/N: G18D03796

Full Spectrum



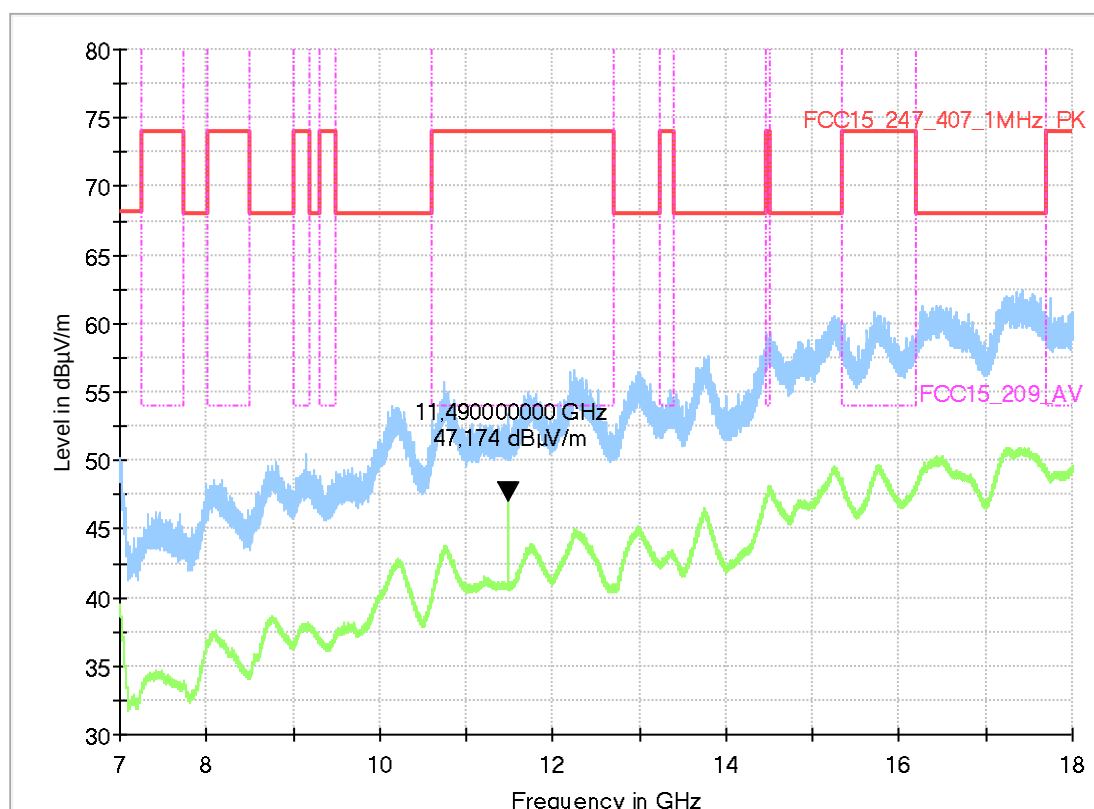
Value: 47.5 dBμV/m + Duty-Cycle correction MCS4 (= 2,62 dB) = 50.12 dBμV/m

8.07b_a-mode_18Mbps_ch149

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	SRa
Comment:	S/N: G18D03796

Full Spectrum



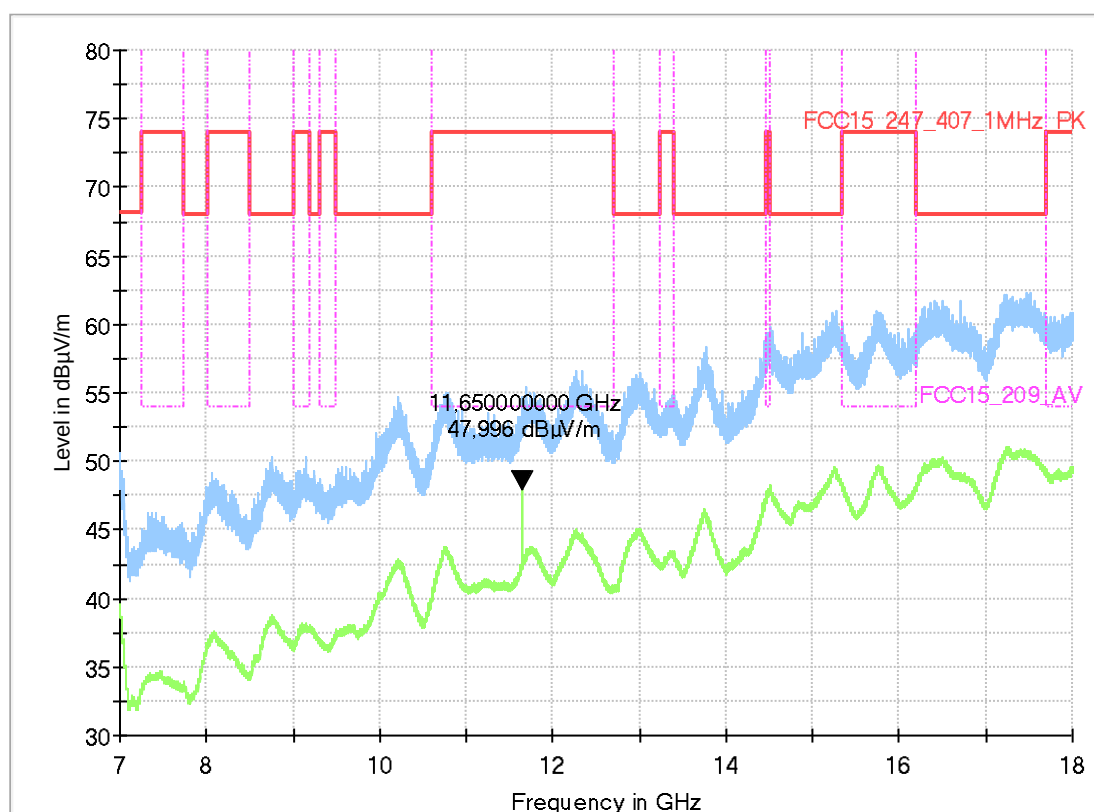
Value: 47.17 dBµV/m + Duty-Cycle correction 18Mbit (= 1,55 dB) = 48,72 dBµV/m

8.08b_n-mode_MCS4_ch165

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	SRa
Comment:	S/N: G18D03796

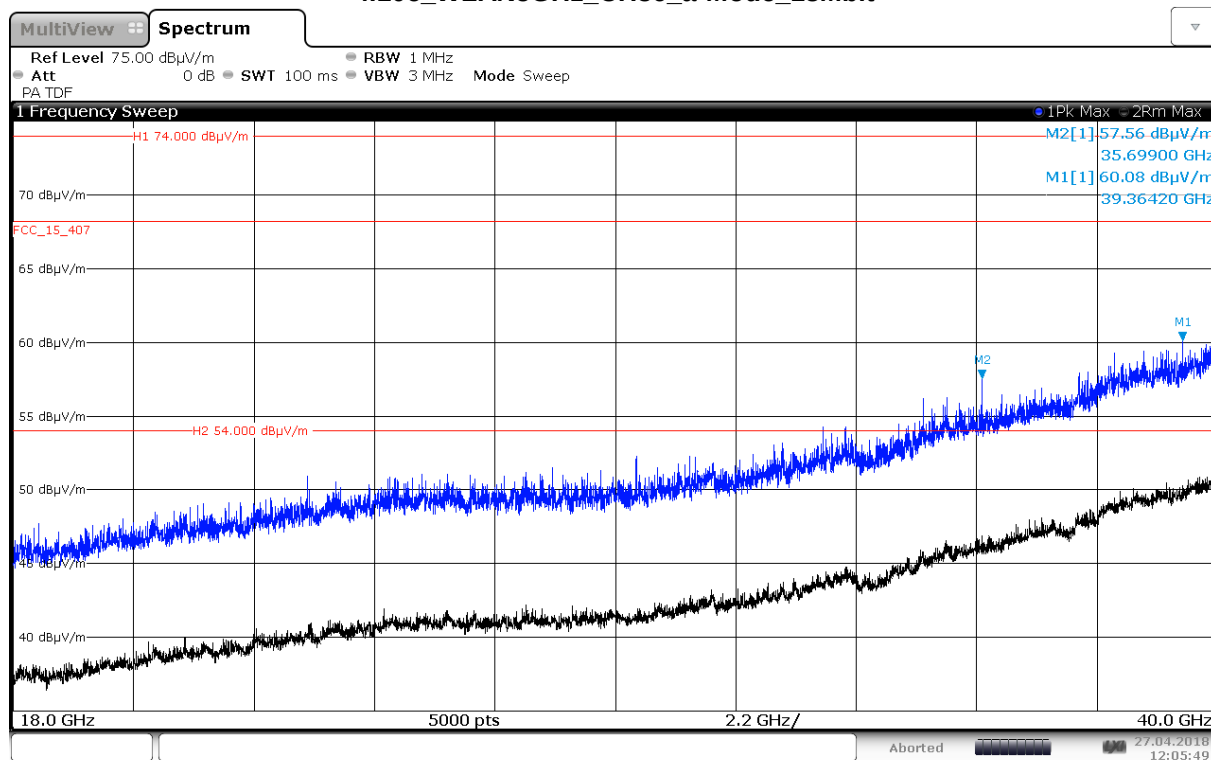
Full Spectrum



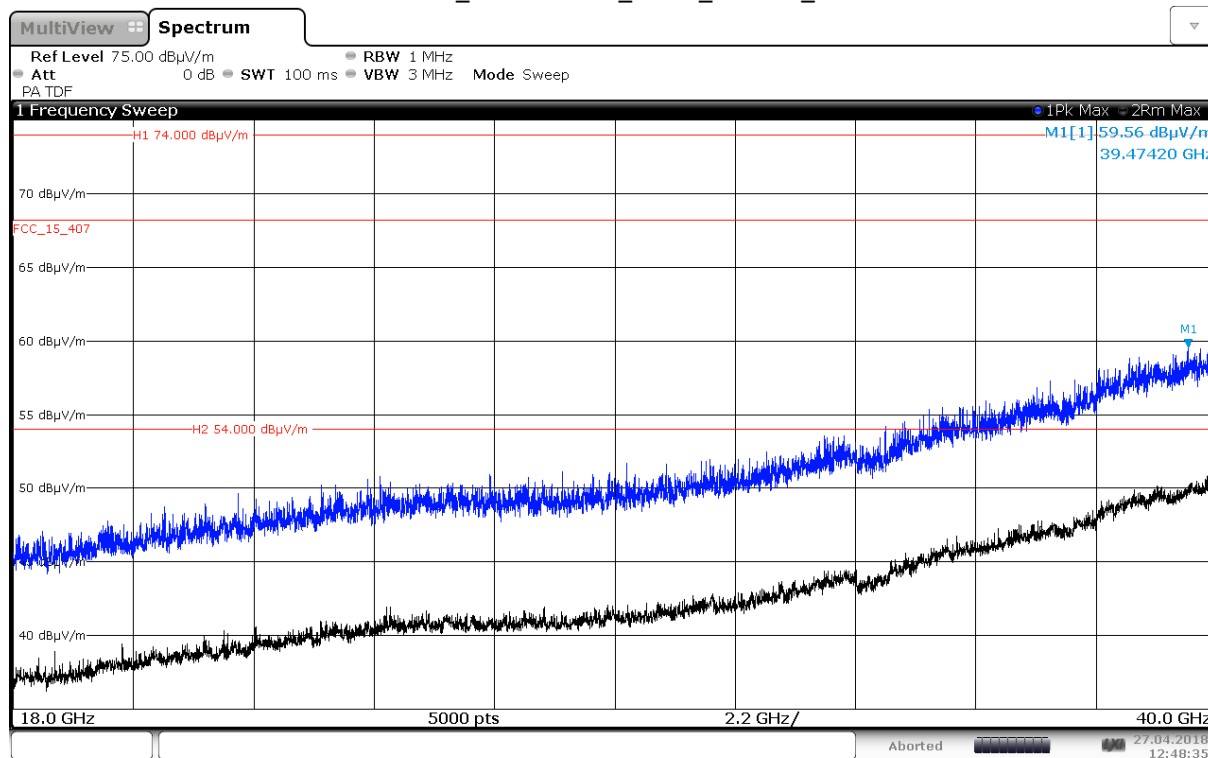
Value: 47.99 dBµV/m + Duty-Cycle correction MCS4 (= 2,62 dB) = 50.61 dBµV/m

1.9. Radiated Field Strength Emissions – 18 GHz to 40 GHz

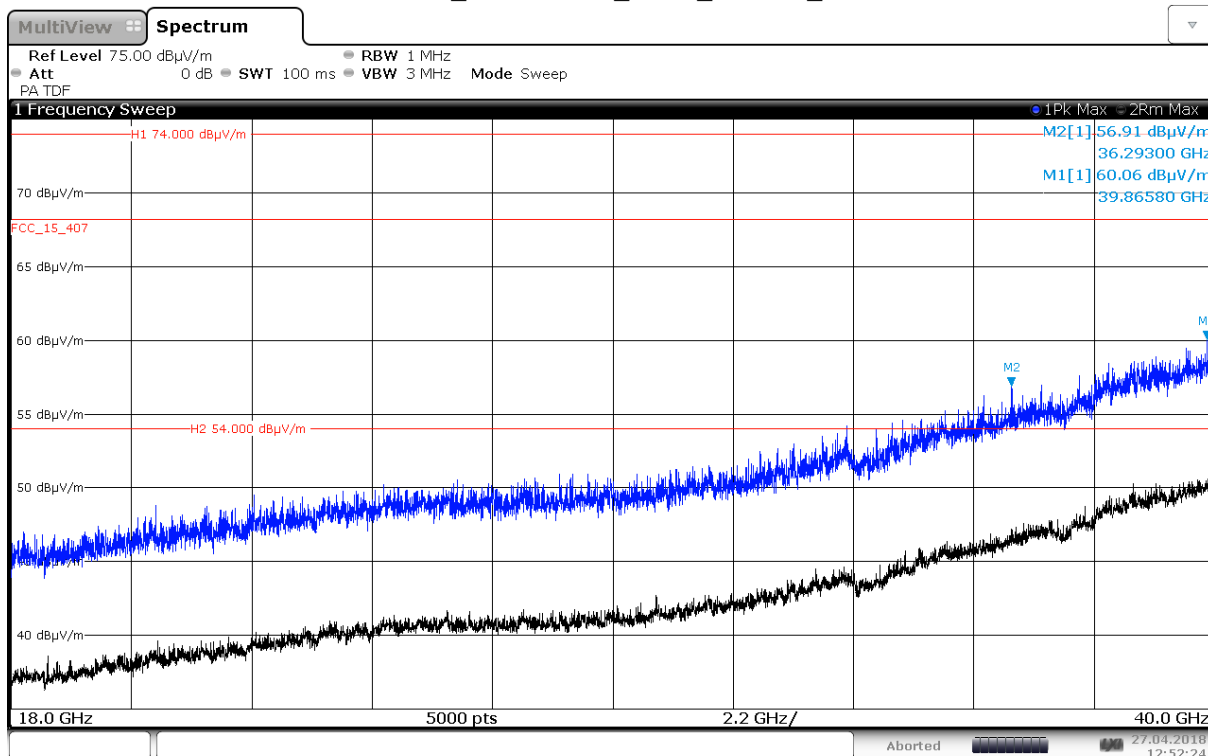
4.10c_WLAN5GHz_CH36_a-Mode_18Mbit



4.11c_WLAN5GHz_CH48_n-Mode_MCS4

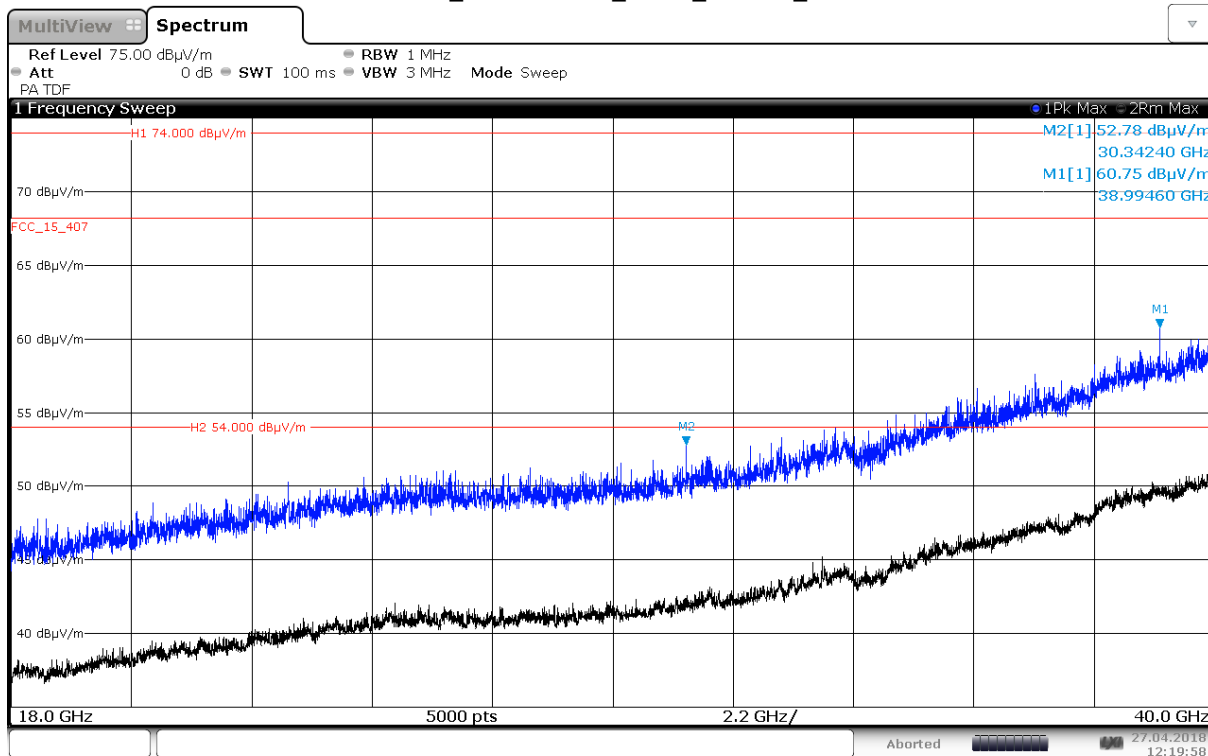


4.12c_WLAN5GHz_CH52_n-Mode_MCS4



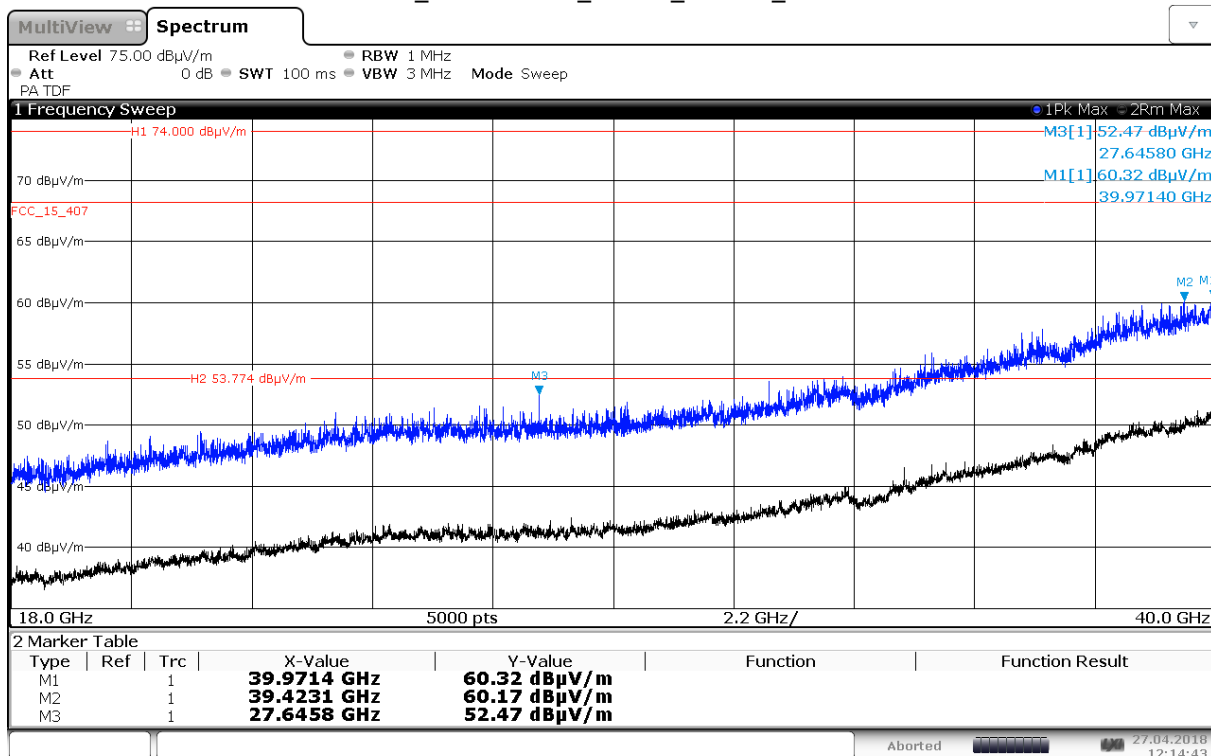
12:52:24 27.04.2018

4.13c_WLAN5GHz_CH64_a-Mode_18Mbit



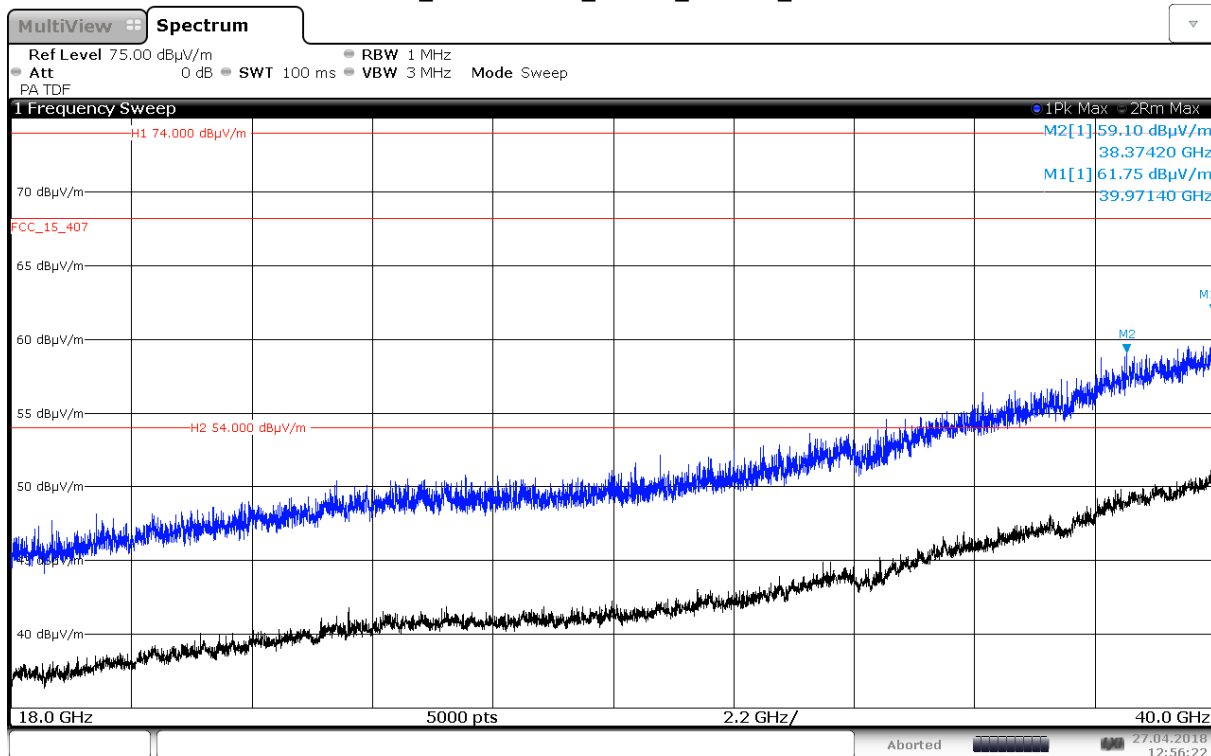
12:19:58 27.04.2018

4.14c_WLAN5GHz_CH100_a-Mode_18Mbit



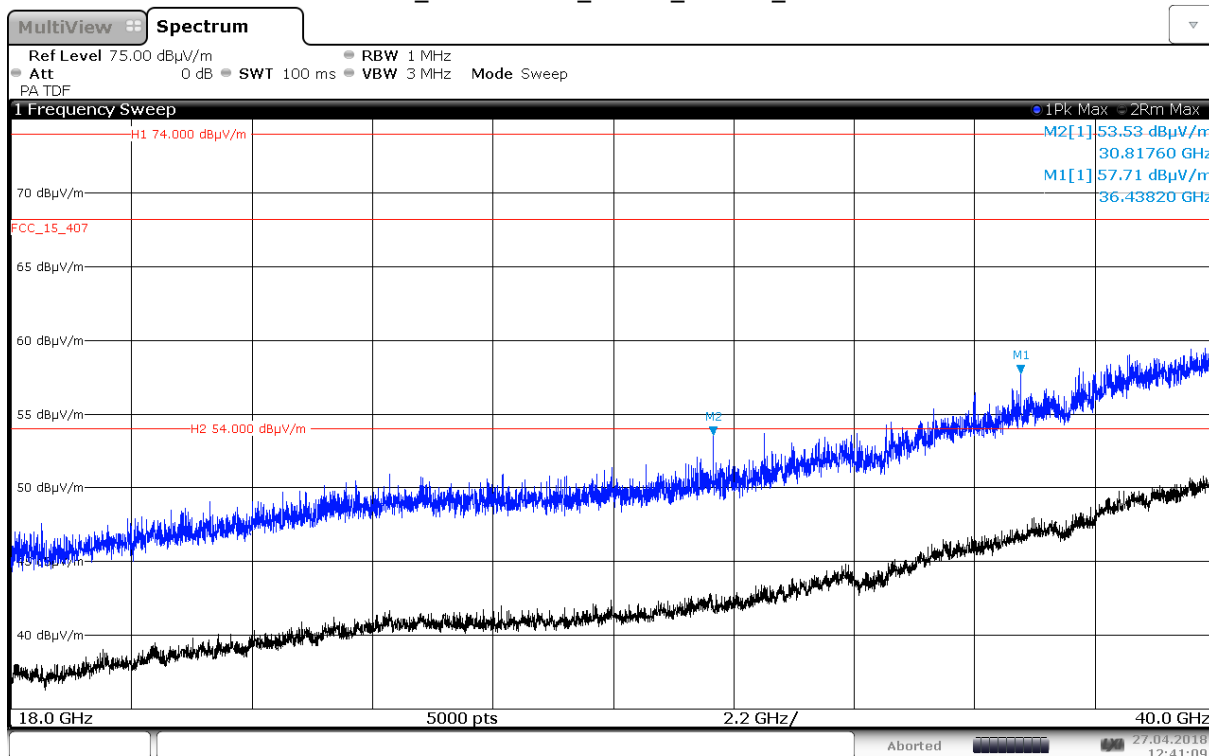
12:14:44 27.04.2018

4.15c_WLAN5GHz_CH140_n-Mode_MCS4



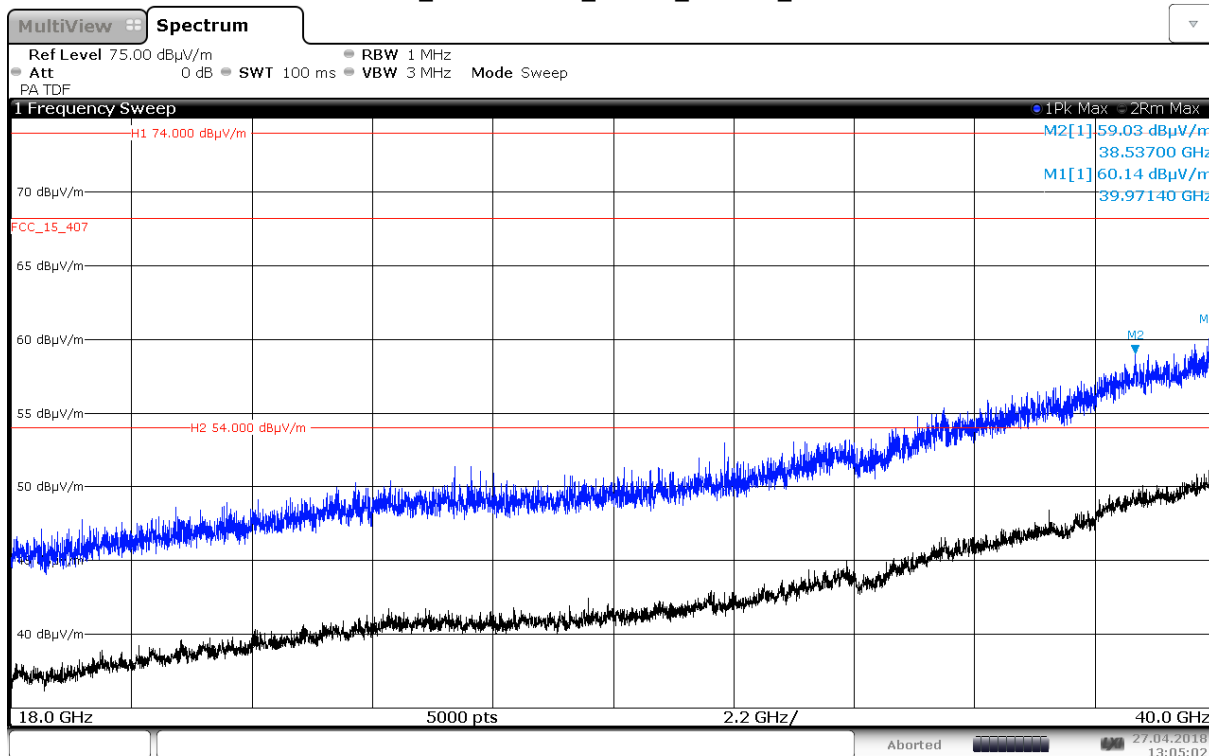
12:56:22 27.04.2018

4.16c_WLAN5GHz_CH149_a-Mode_18Mbit



12:41:10 27.04.2018

4.17c_WLAN5GHz_CH165_n-Mode_MCS4



13:05:03 27.04.2018

2. Radiated Band-Edge Measurements

9.01_BE_low_a-mode_18Mbps_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous,n-mode,a-mode 18Mbps ch36
Operator Name:	HEI

Full Spectrum

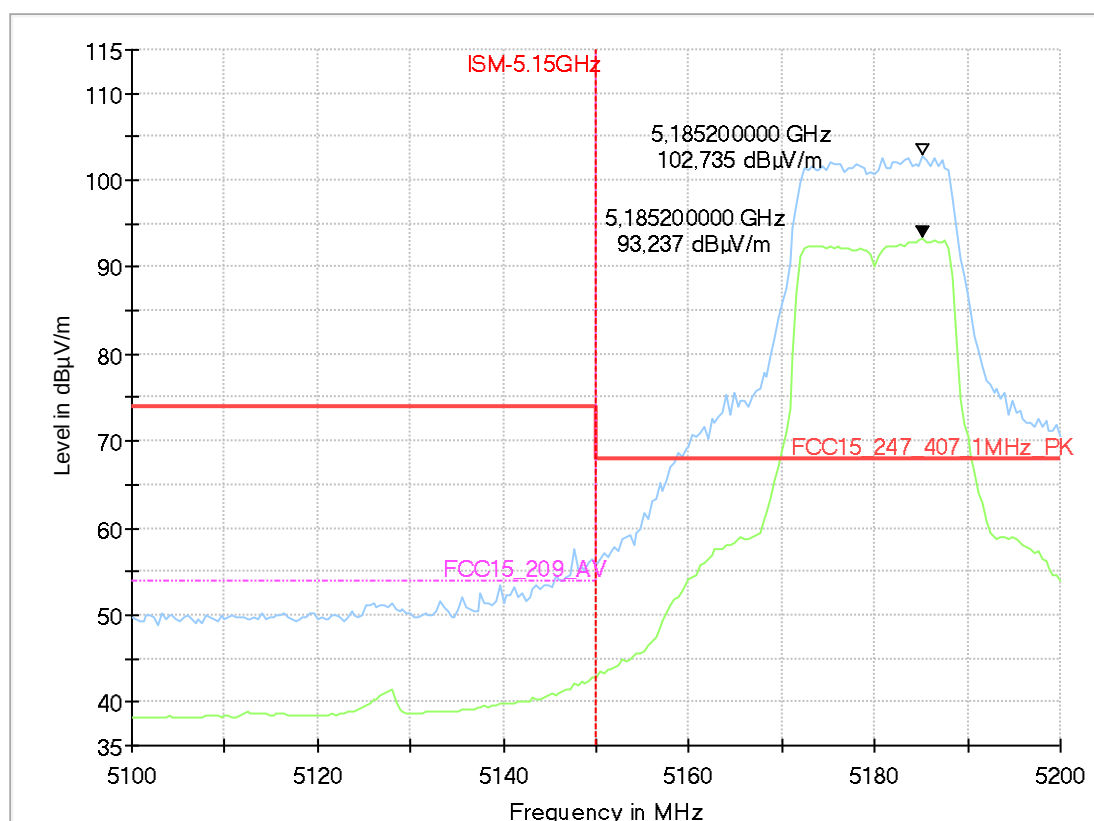


Diagram No.: 9.02_BE_high_a-mode_18Mbps_ch48

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum

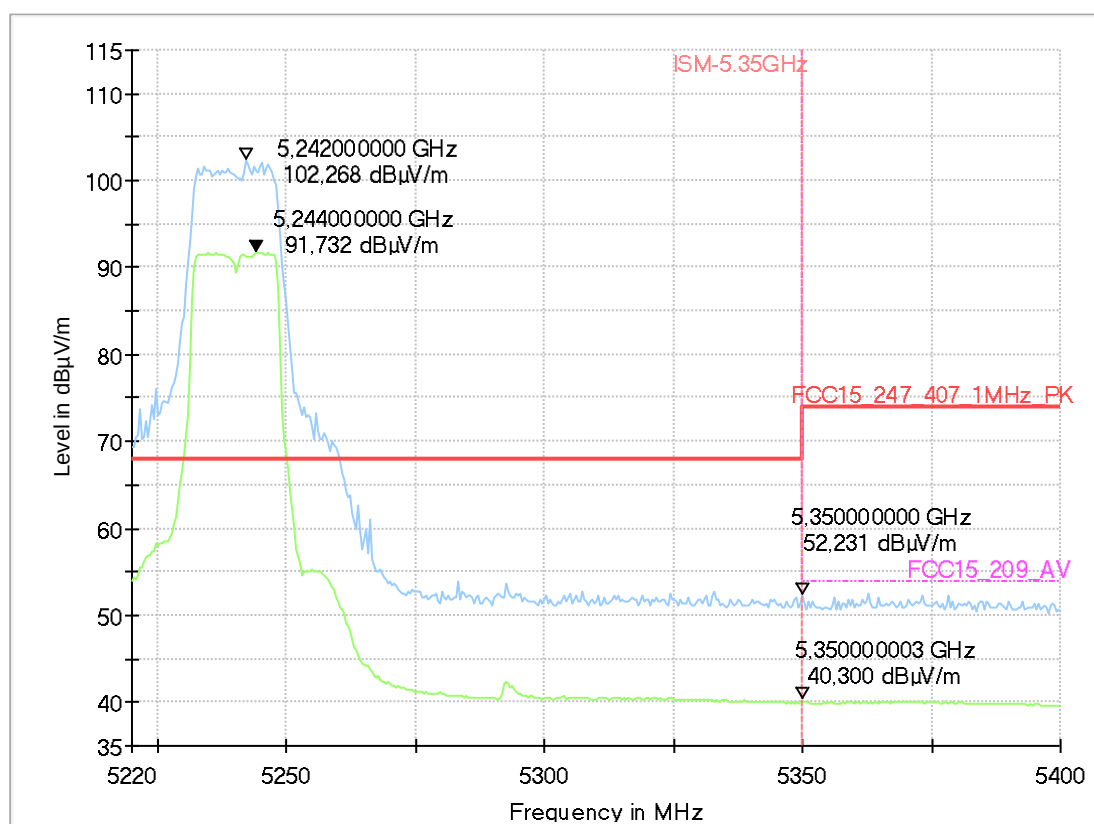
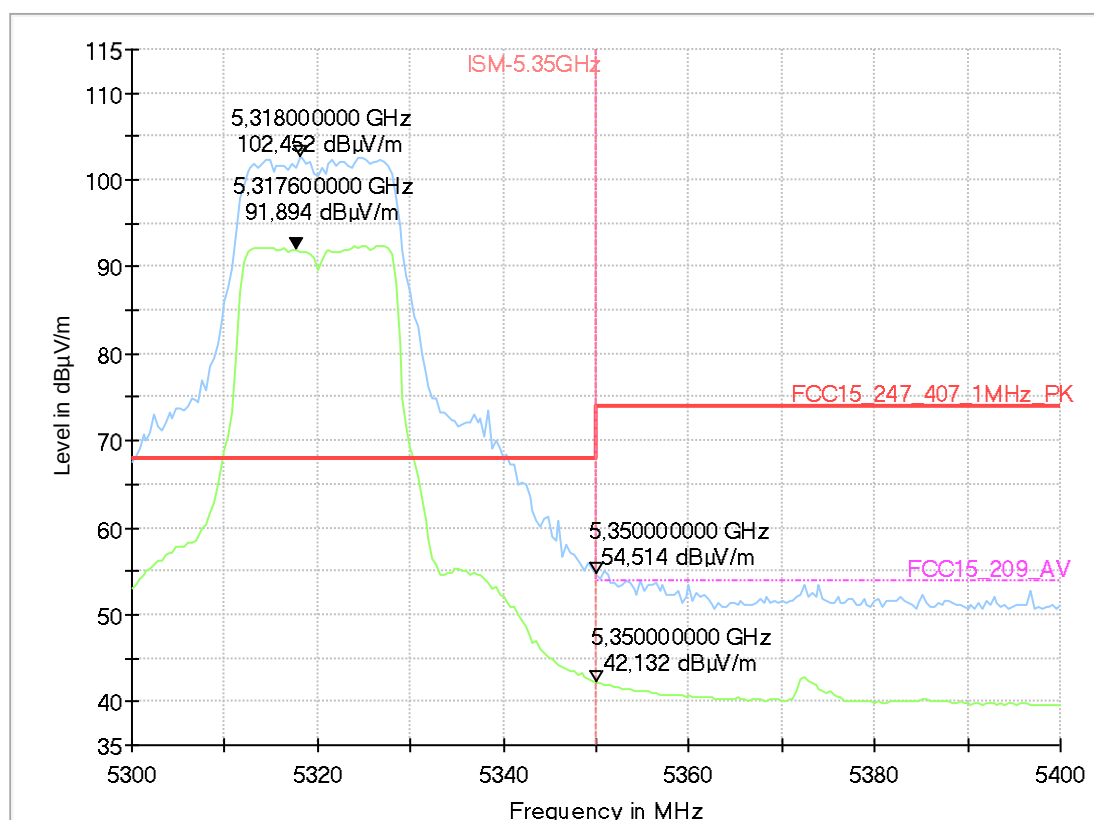


Diagram No.: 9.04_BE_high_a-mode_18Mbps_ch064

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum



9.05_BE_low_a-mode_18Mbps_ch100

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous,a-mode 18Mbps ch100
Operator Name:	HEI

Full Spectrum

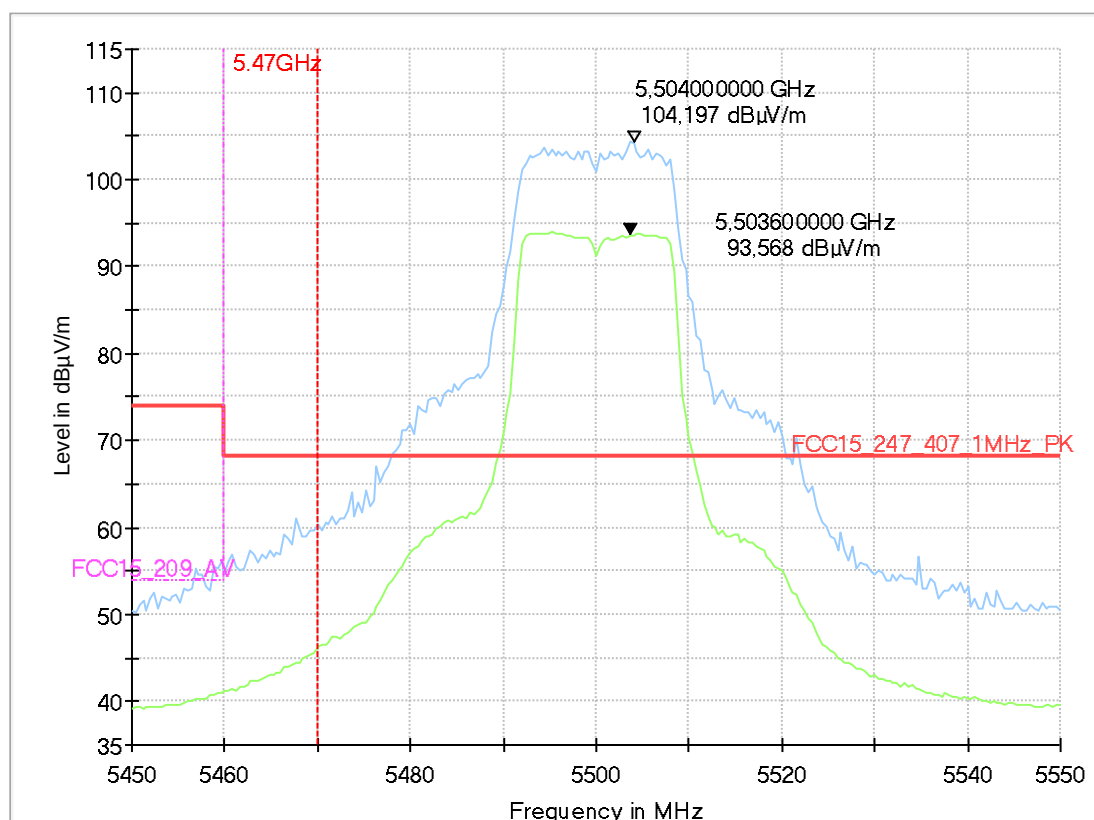


Diagram No.: 9.06_BE_high_a-mode_18Mbps_ch140

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum

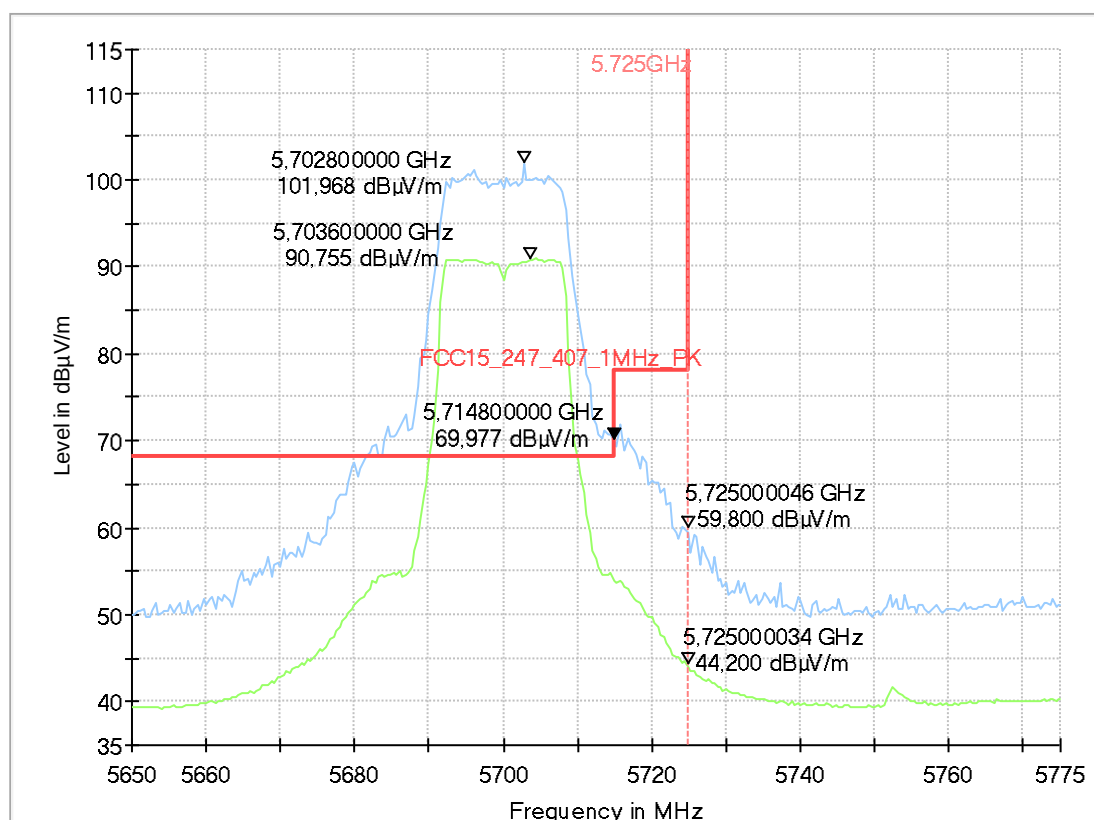


Diagram No.: 9.07_BE_low_a-mode_18Mbps_ch149

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. low

Full Spectrum

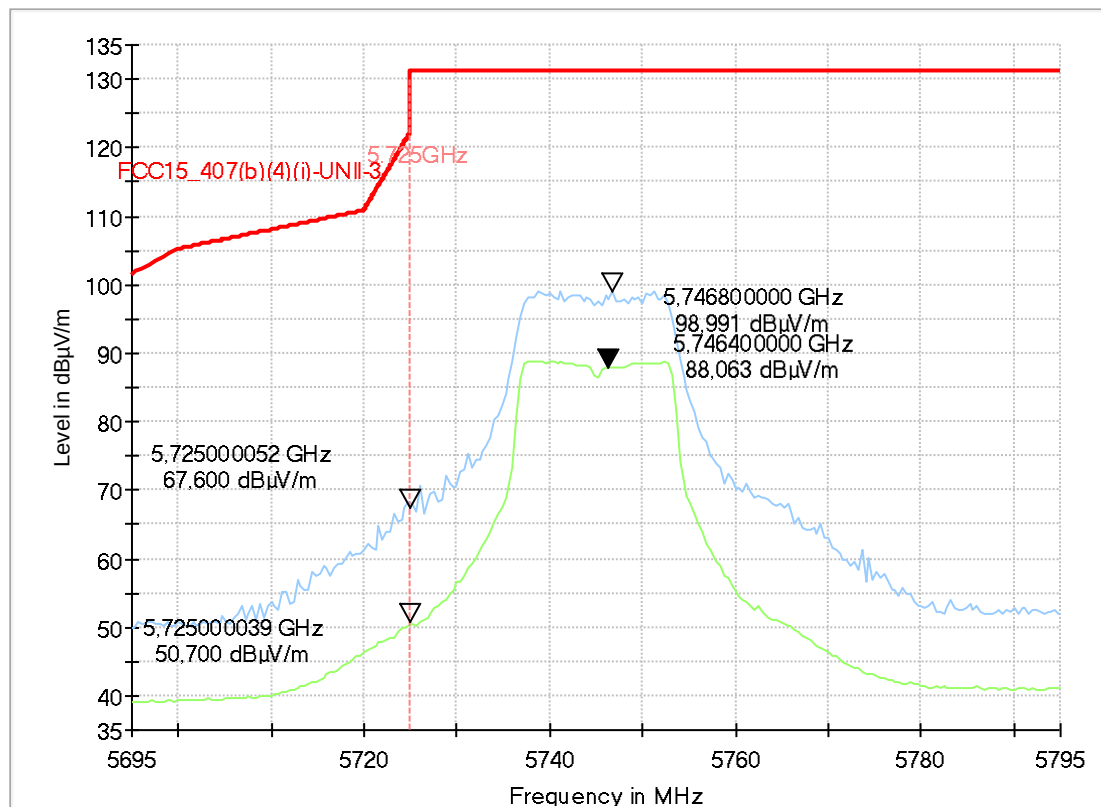


Diagram No.: 9.08_BE_high_a-mode_18Mbps_ch165

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum

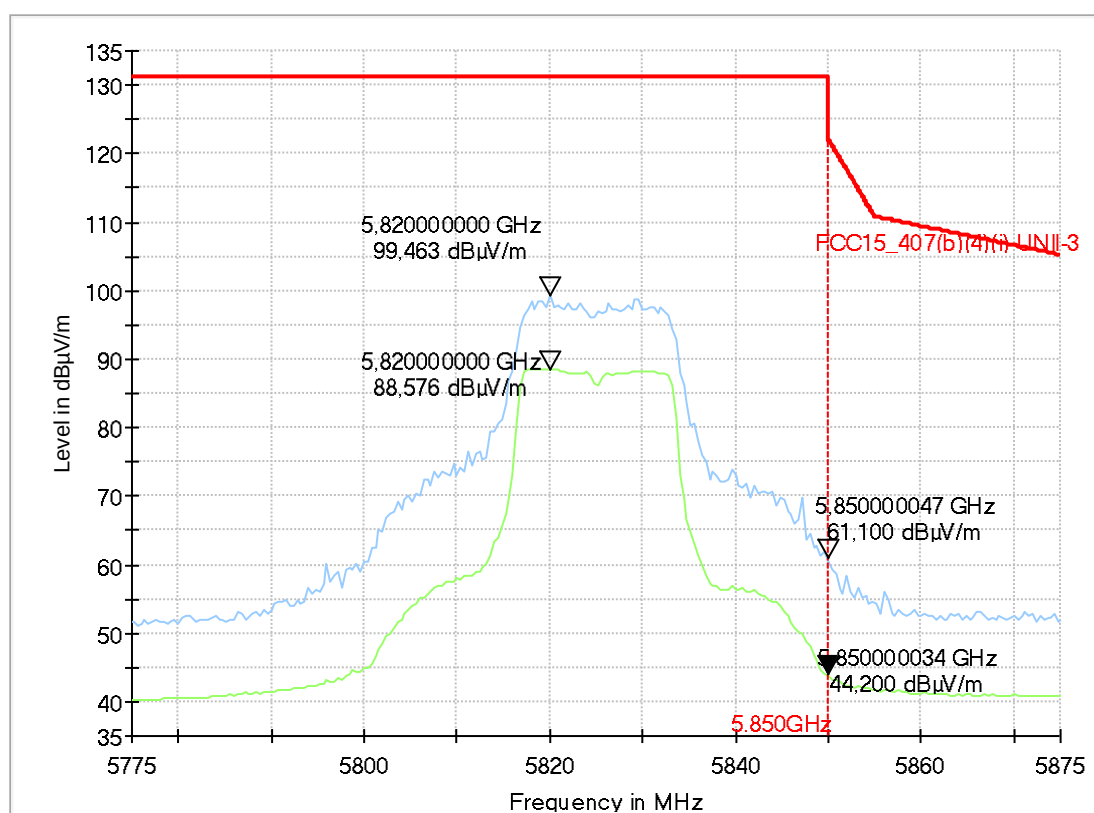


Diagram No.: 9.09_BE_low_n-mode_MCS4_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Humidity: 40%rH; Temperature: 20°C
Comment:	Channel no. low

Full Spectrum

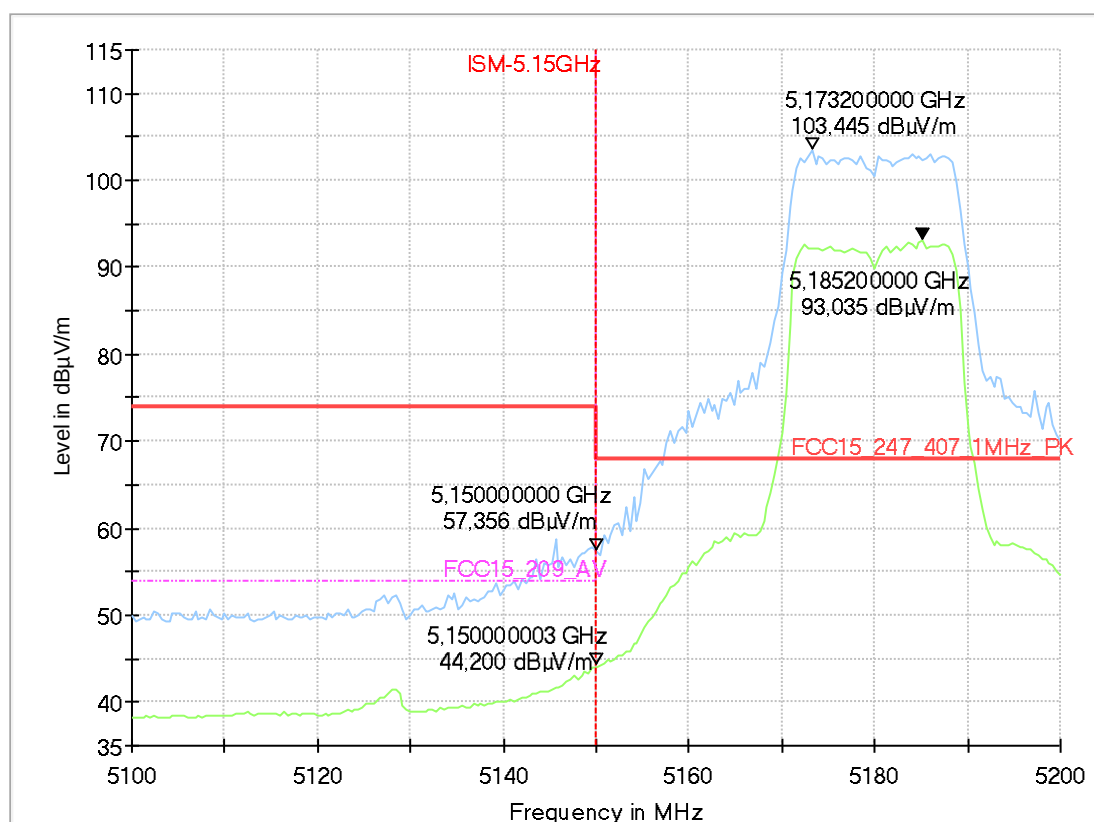


Diagram No.: 9.10_BE_high_n-mode_MCS4_ch48

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum

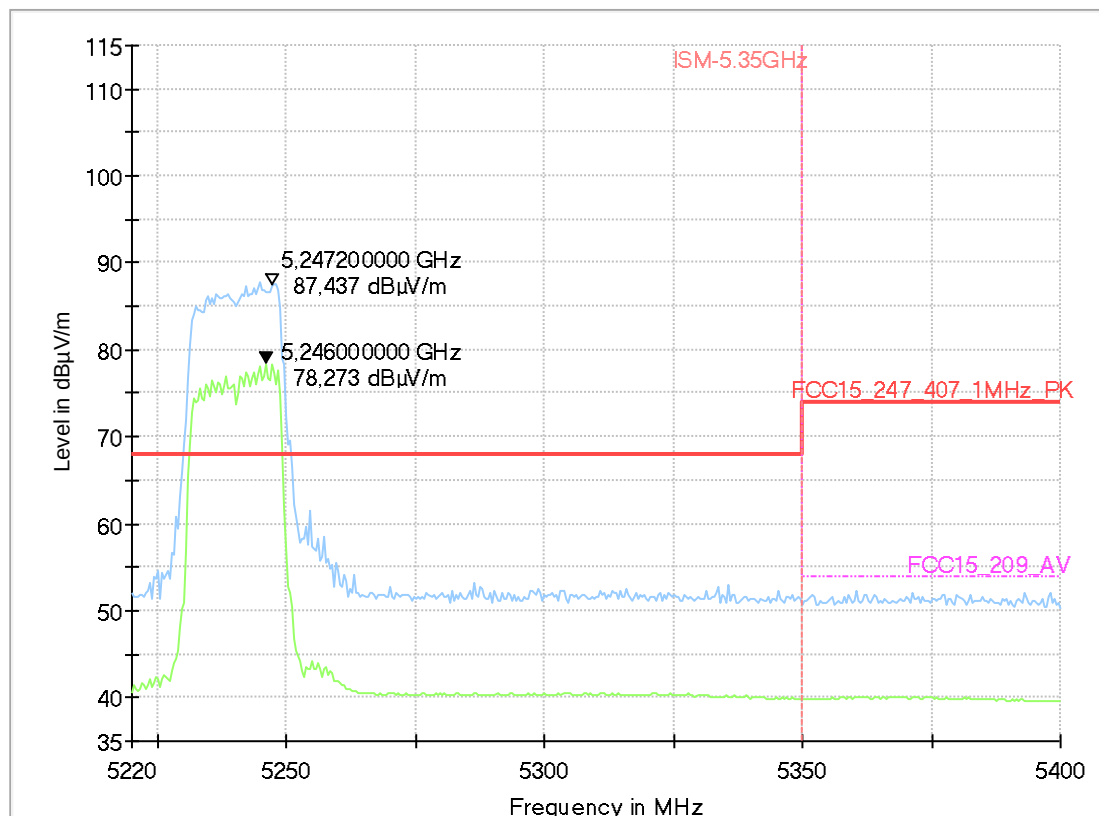


Diagram No.: 9.12_BE_high_n-mode_MCS4_ch64

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum

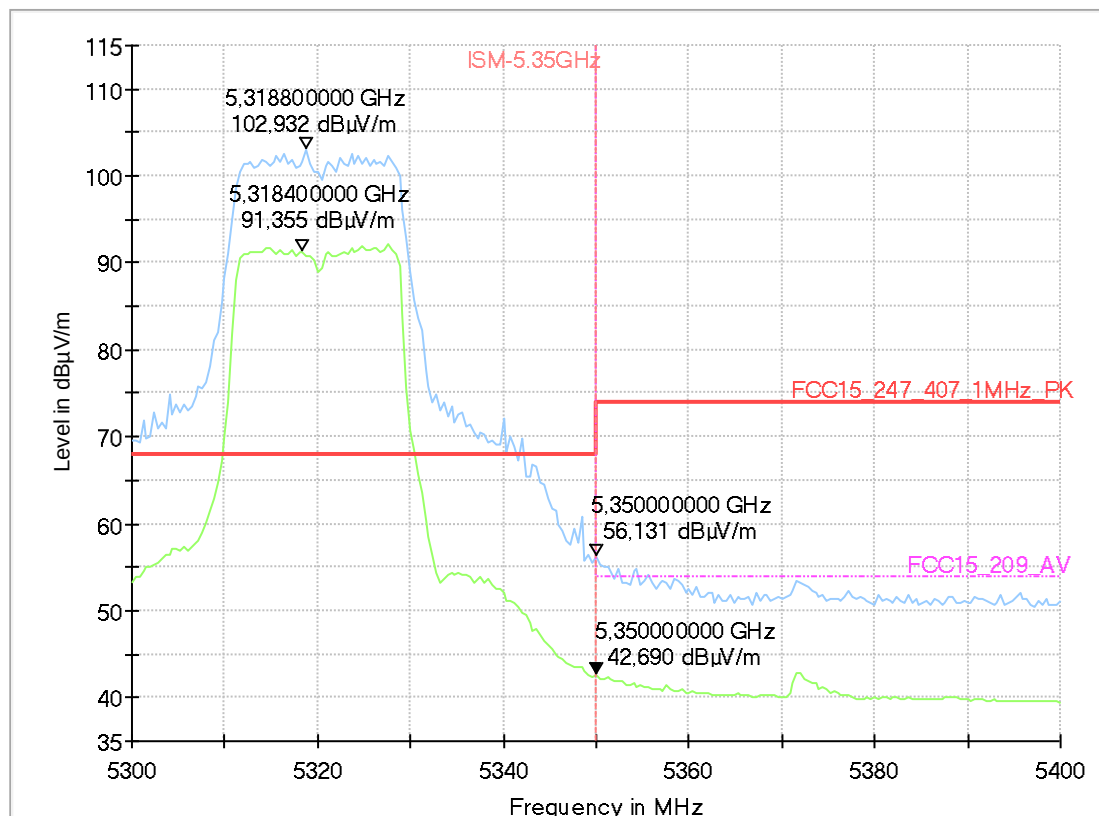


Diagram No.: 9.13_BE_low_n-mode_MCS4_ch100

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. low

Full Spectrum

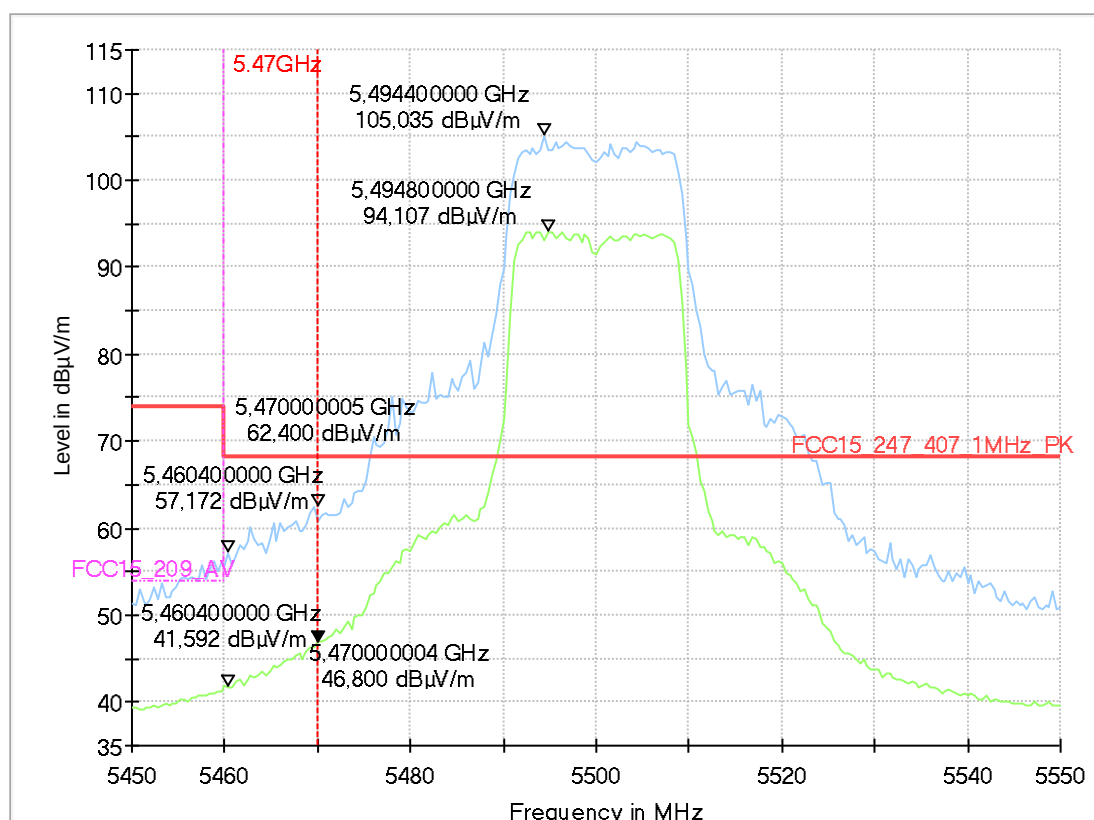


Diagram No.: 9.14_BE_high_n-mode_MCS4_ch140

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum

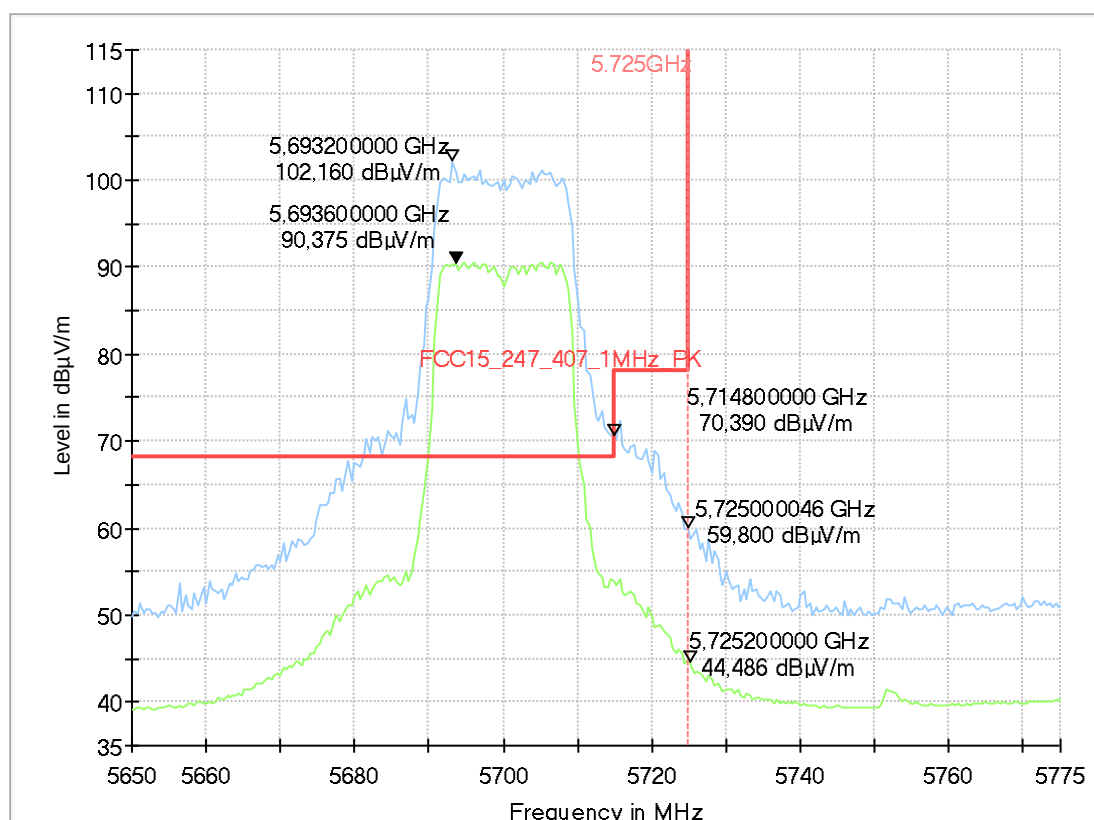


Diagram No.: 9.15_BE_low_n-mode_MCS4_ch149

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. low

Full Spectrum

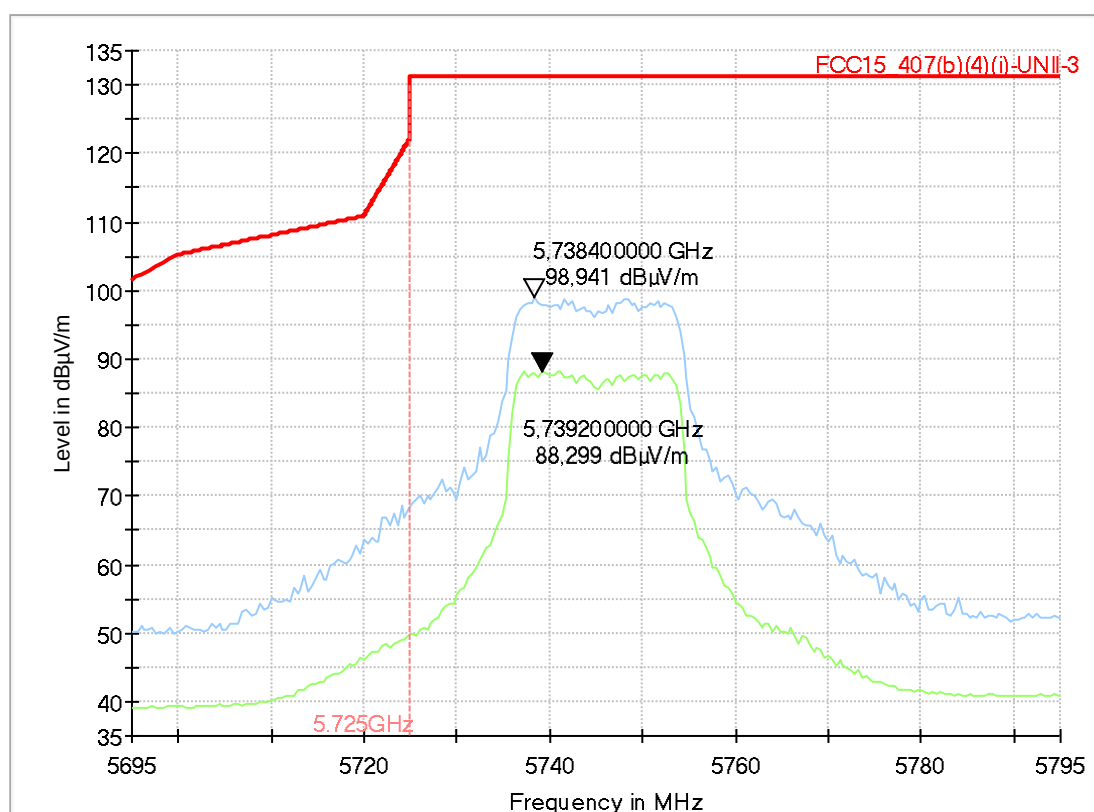
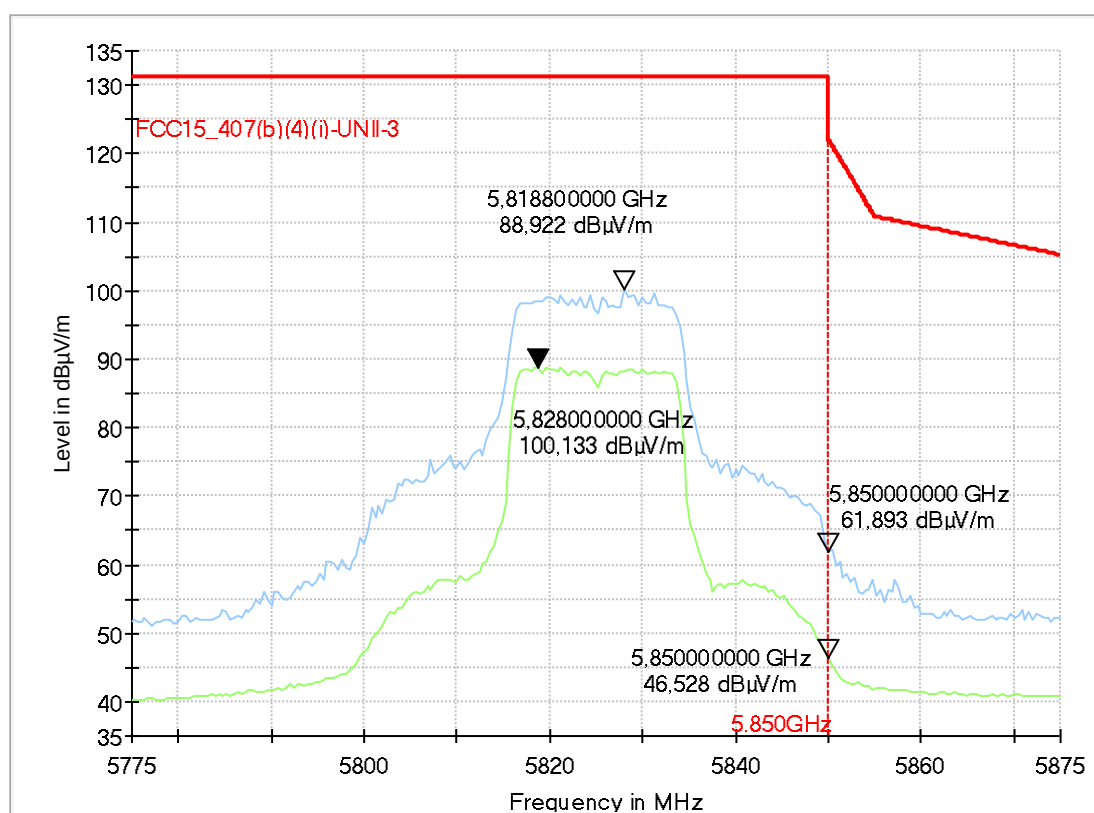


Diagram No.: 9.16_BE_high_n-mode_MCS4_ch165

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	TFra
Comment:	Channel no. high

Full Spectrum



3. Occupied bandwidth 99% (§15.407(h)(2) / RSS-247, Issue 2, Chapter 6.3)

Requirement for DFS capability:

If any part of an operating device's emission bandwidth falls in the bands 5250-5350 MHz, 5470-5600 MHz or 5650-5725 MHz, the device shall comply with requirements in the following sections.

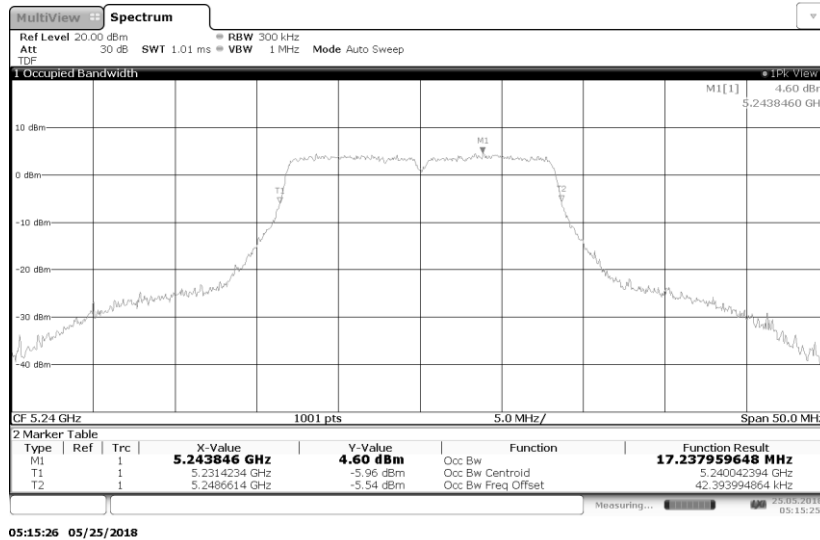


Diagram 5: 35.01_OBW_Ch48_A_Mode_18MBit

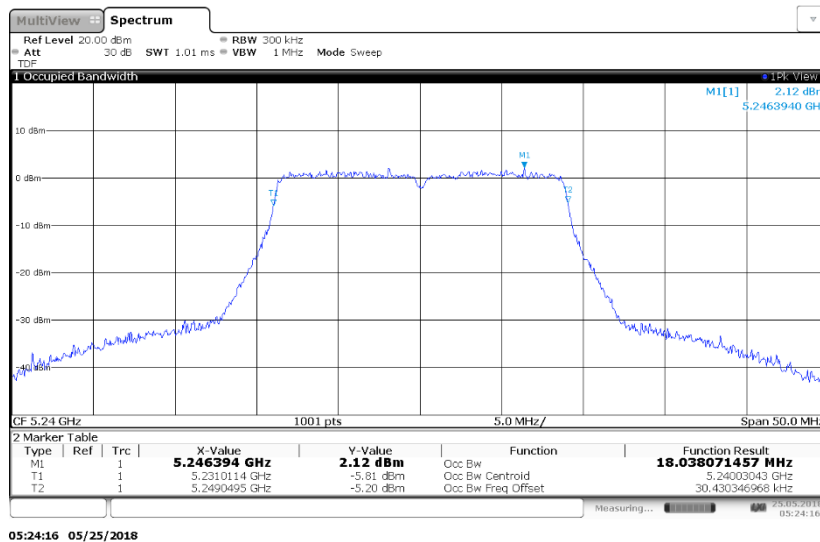


Diagram 6: 35.02_OBW_CH48_N_Mode_MCS4

Verdict: Point T1 and T2 (see screenshot) within assigned band from 5150-5250MHz -> no DFS requirement necessary for channel 48

4. Radiated Field Strength Measurements(Handheld Variant)

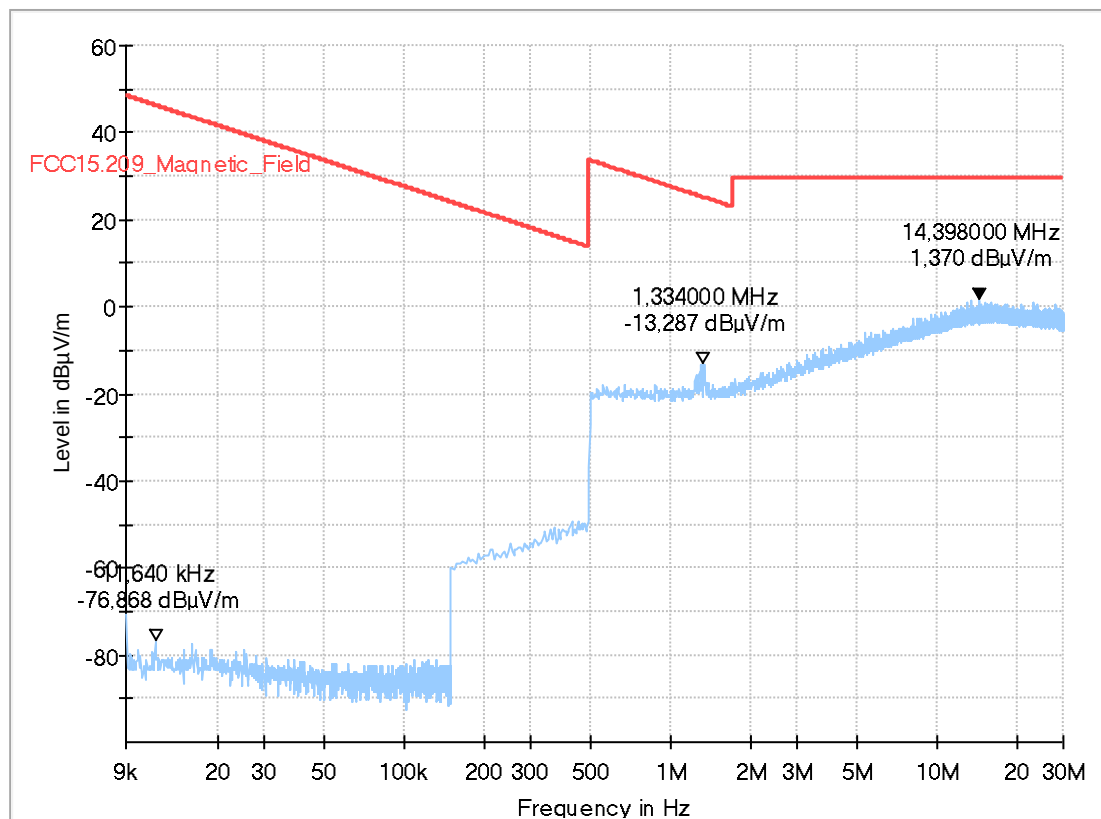
4.1. Radiated Field Strength Emissions – 9 kHz to 30 MHz

2.04_n-mode_MCS4_CH36

Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test site and distance:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Version of Testsoftware:	EMC32 V9.25.0
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 specification:	FCC 15.205 § 15.209; RSS-Gen: Issue 4
Operator:	TFR
Operating conditions:	worst case aus power WLAN 5GHz
Power during tests:	fully loaded batterie

Full Spectrum



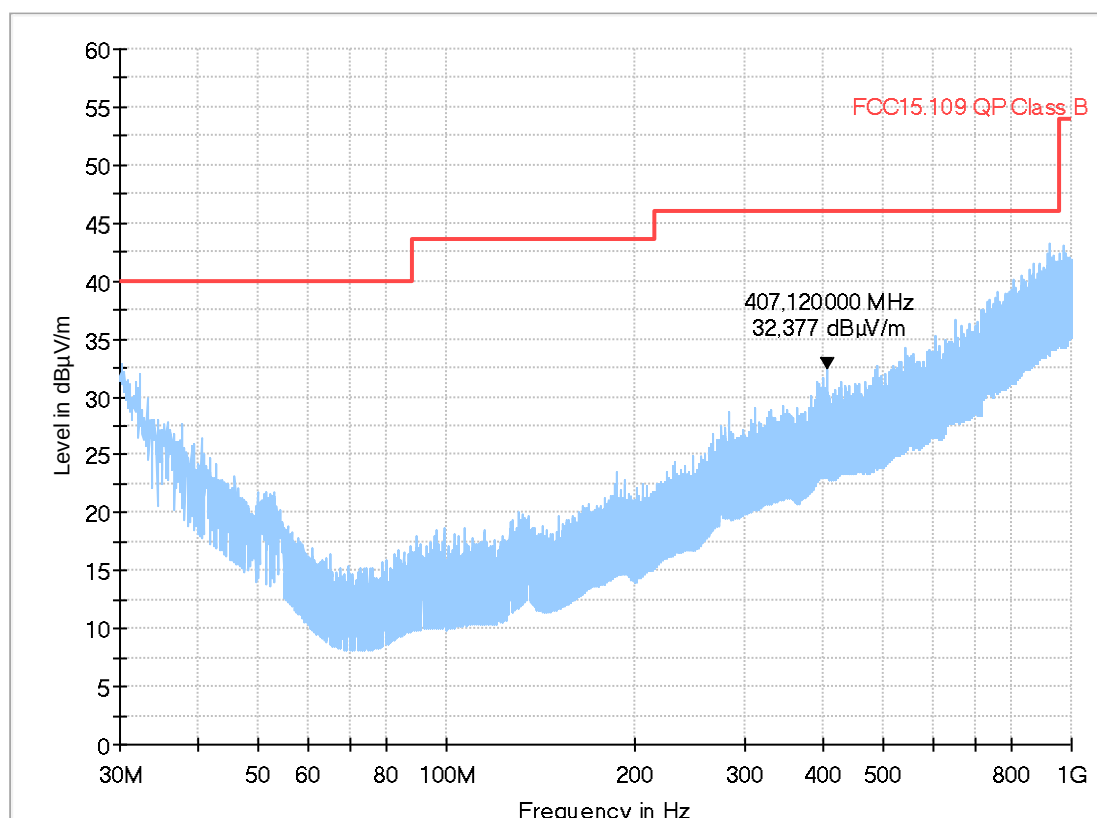
4.2. Radiated Field Strength Emissions – 30 MHz to 1 GHz

3.04_n-mode_MCS4_CH36

Test description:	01.05.2018 Page 1 of 1
Test site and distance:	Electric Field Strength Measurement
Version of Testsoftware:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Distance correction:	EMC32 V9.25.0
Used filter:	not used
Technical Data:	not used
Test specification.:	please see page 2 for detailed data of measurement setup
	FCC 15.109 Class B; RSS-Gen. Issue 4

Operator:	TFR
Operating conditions:	WLAN5GHz_n-mode_MCS4_ch36
Power during tests:	full battery

Full Spectrum

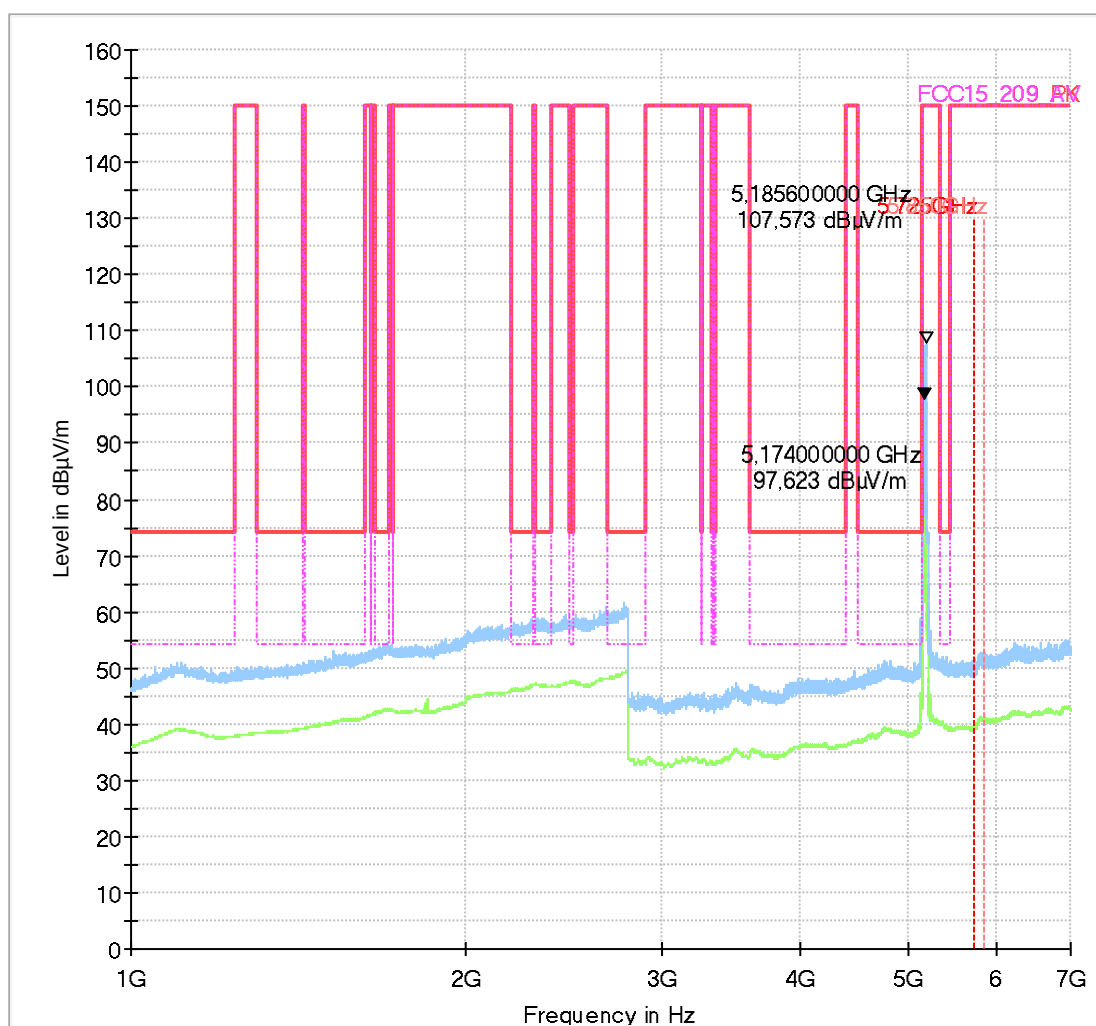


4.3. Radiated Field Strength Emissions – 1 GHz to 7 GHz

8.04a_n-mode_MCS4_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247&15.209 Intentional Radiator / RSS-Gen, Issue 4
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	SLo
Comment:	n-mode CH 36 MCS4



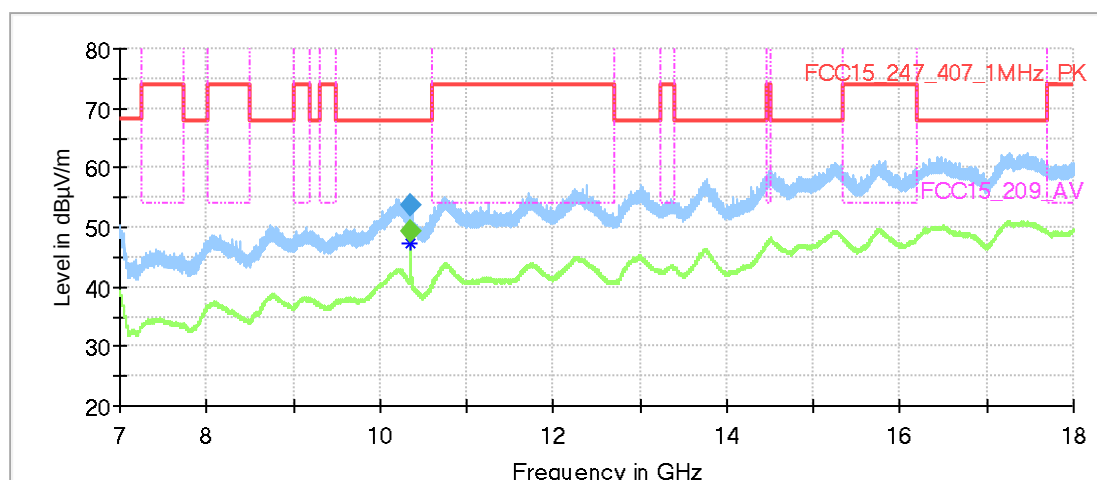
4.4. Radiated Field Strength Emissions – 7 GHz to 18 GHz

4.04b_n-mode_MCS4_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	LKu
Comment:	worst case aus power WLAN 5GHz / n-mode_MCS4_ch36

Full Spectrum



Final Result

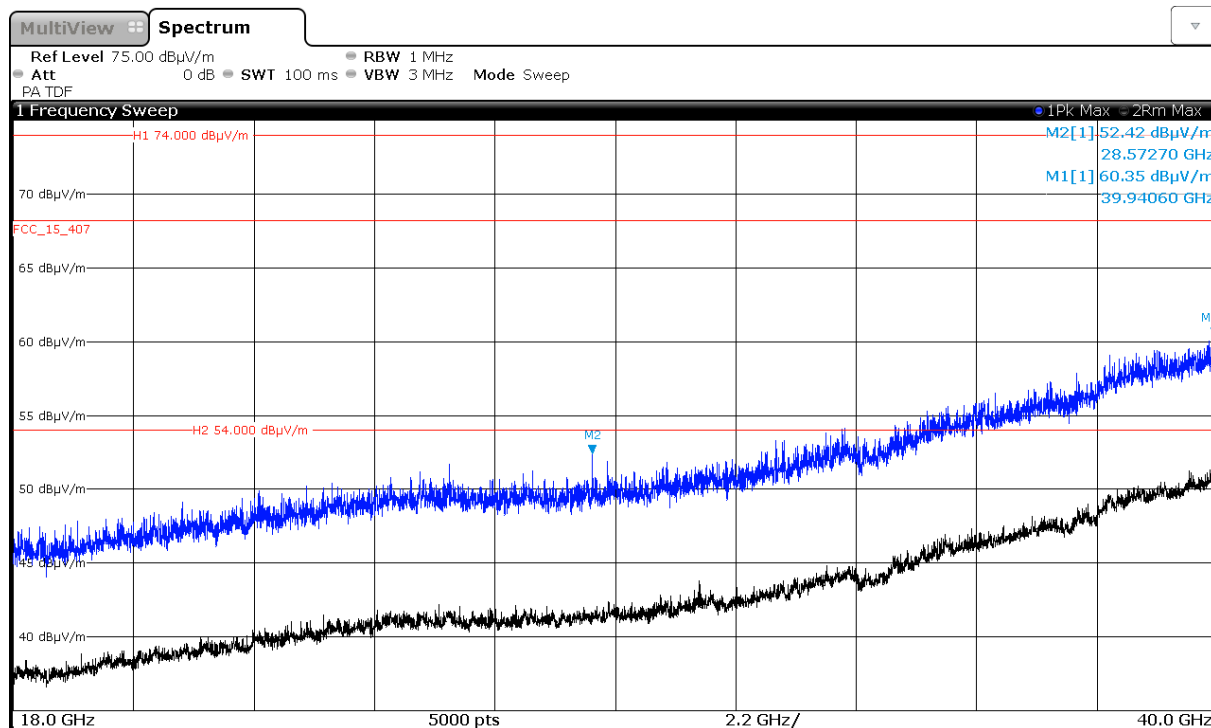
Frequency (MHz)	MaxPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
10359.800000	53.69	---	68.00	14.31	100.0	1000.000	155.0	H	58.0
10360.200000	---	49.30	150.00	100.70	100.0	1000.000	155.0	H	298.0

(continuation of the "Final_Result" table from column 15 ...)

Frequency (MHz)	Elevation (deg)	Correction (dB)	Comment
10359.800000	90.0	15.5	14:47:16 - 11.05.2018
10360.200000	90.0	15.5	14:49:38 - 11.05.2018

4.5. Radiated Field Strength Emissions – 18 GHz to 40 GHz

4.04c_n-mode_MCS4_ch36



4.6. Radiated Band-Edge Measurements

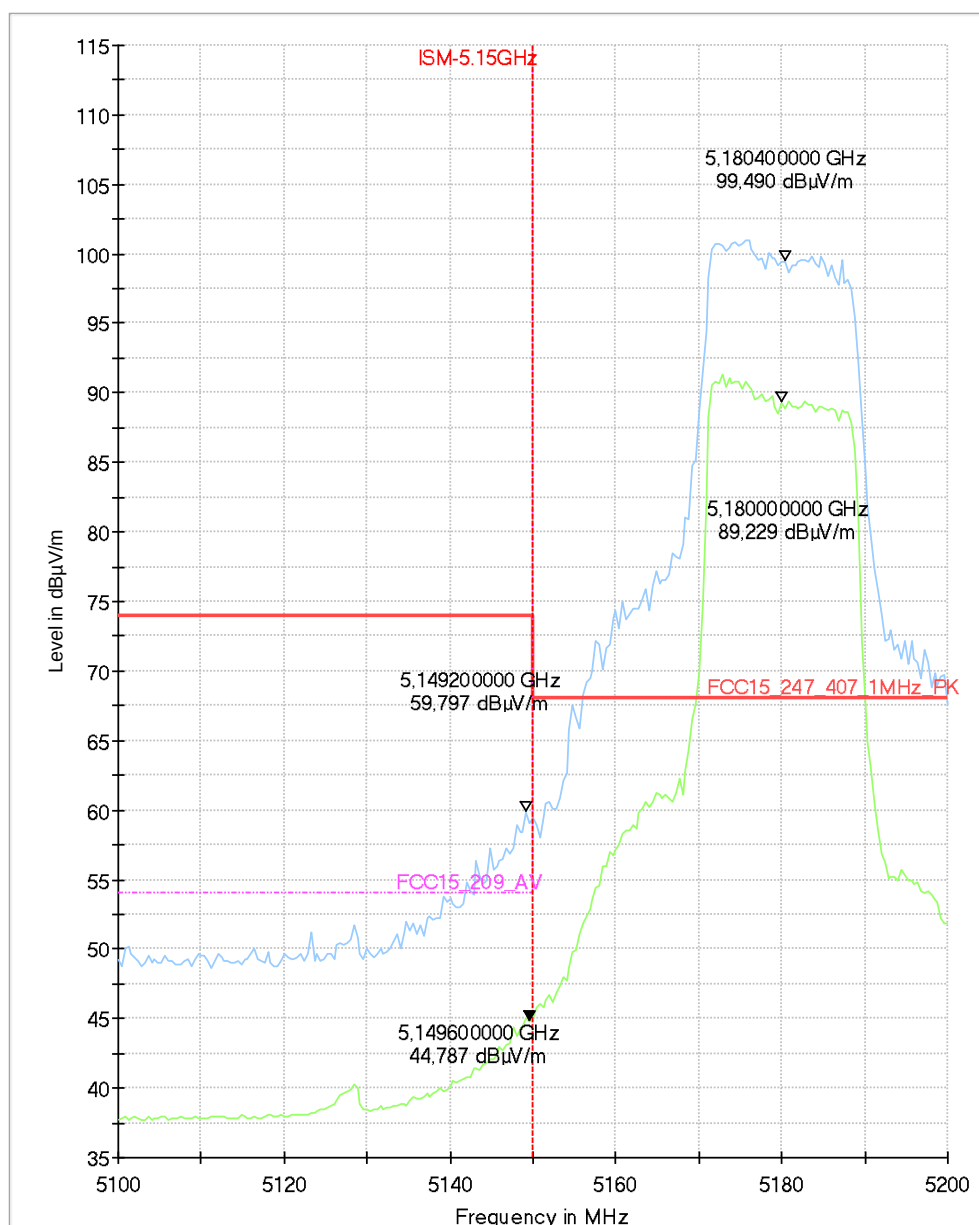
4.6.1. Channel 5180 MHz (U-NII-1:left band edge)

Diagram No.: 9.07_n-mode_MCS4_ch36

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. low/middle/high

Full Spectrum



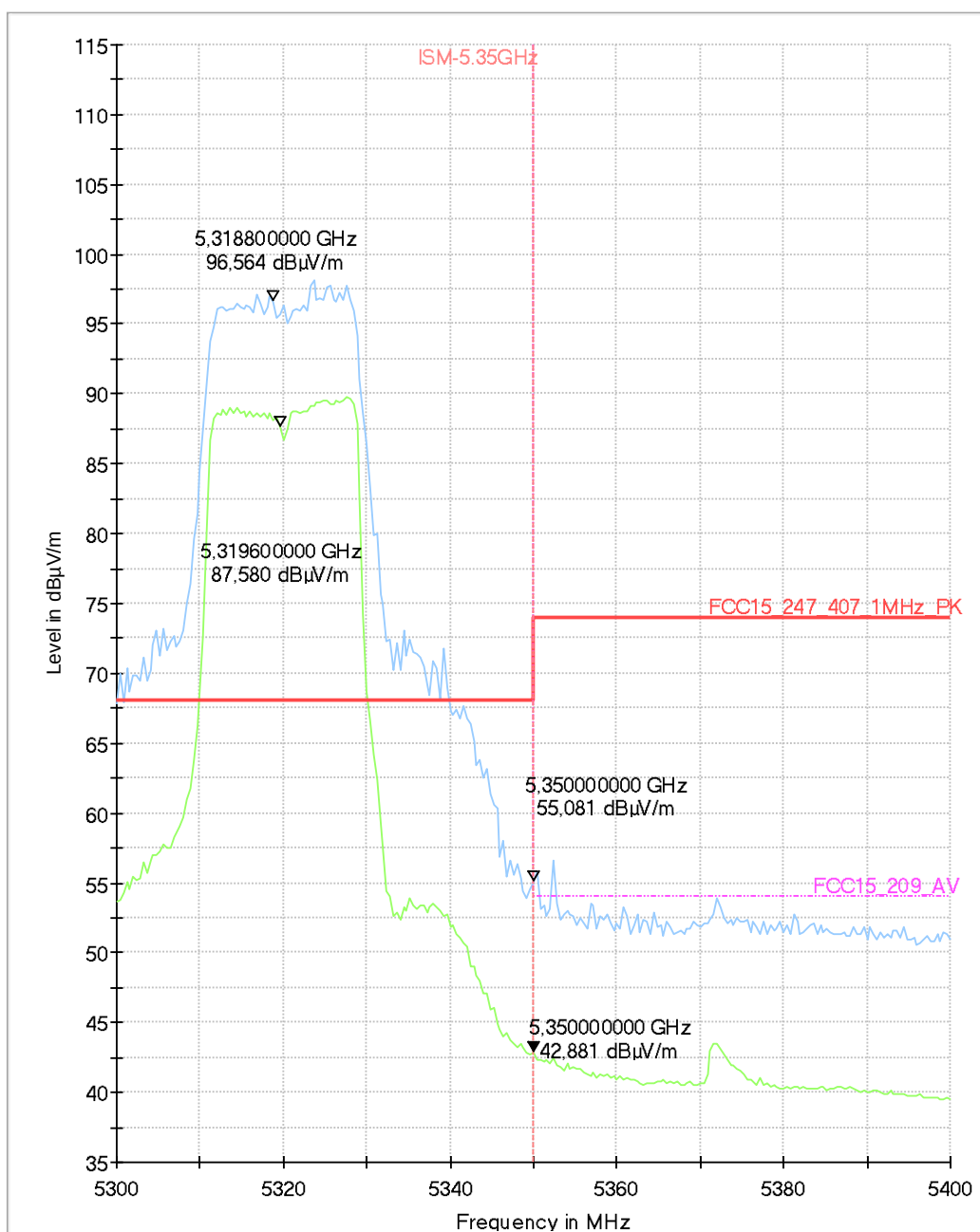
4.6.2. Channel 5320 MHz (U-NII-2A: right band edge)

Diagram No.: 9.08_n-mode_MCS4_ch64

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. 64

Full Spectrum



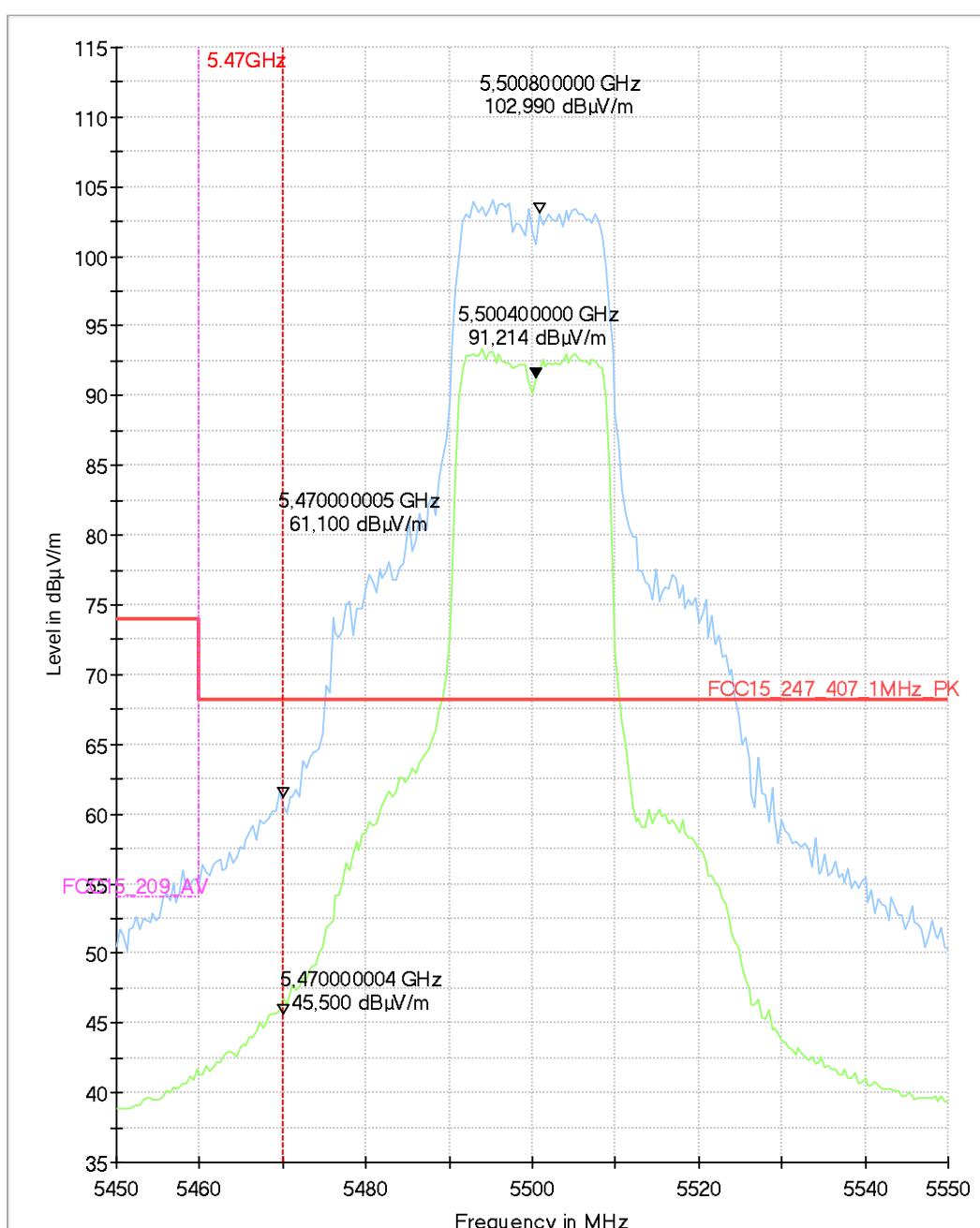
4.6.3. Channel 5500 MHz (U-NII-2C: left band edge)

Diagram No.: 9.09_n-mode_MCS4_ch100

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. 100

Full Spectrum

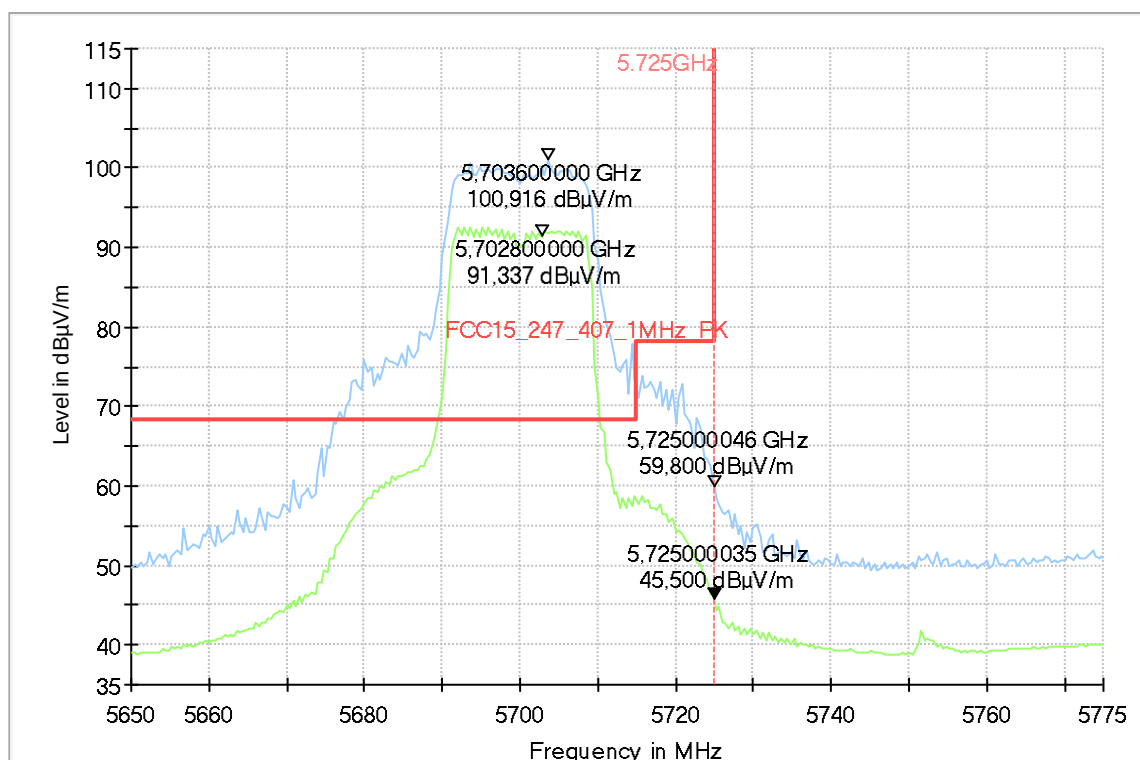


4.6.4. Channel 5700 MHz (U-NII-2C: right band edge)

Diagram No.: 9.10_n-mode_MCS4_ch140

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. 140

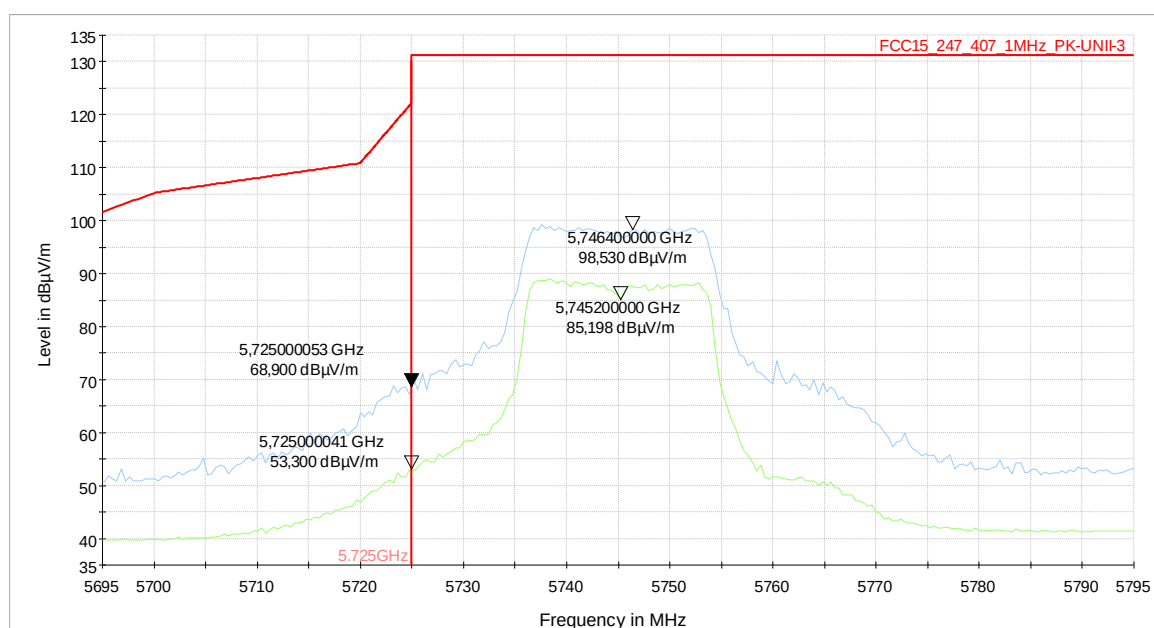


4.6.5. Channel 5745 MHz (U-NII-3: left band edge)

Diagram No.: 9.11_n-mode_MCS4_ch149

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. low149



4.6.6. Channel 5825 MHz (U-NII-3: right band edge)

Diagram No.: 9.12_n-mode_MCS4_ch165

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Software Version:	#Ver
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. high 165

