

Annex 1: Measurement diagrams 21-1-0178701T022a-C01-A1

Number of pages:	15	Date of Report:	2023-Apr-28
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:	Actia Nordic AB
Product: Model:	Telematic Device 104760201		
FCC ID:	2AGKK104760201	IC:	20839-104760201
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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Measurement diagrams

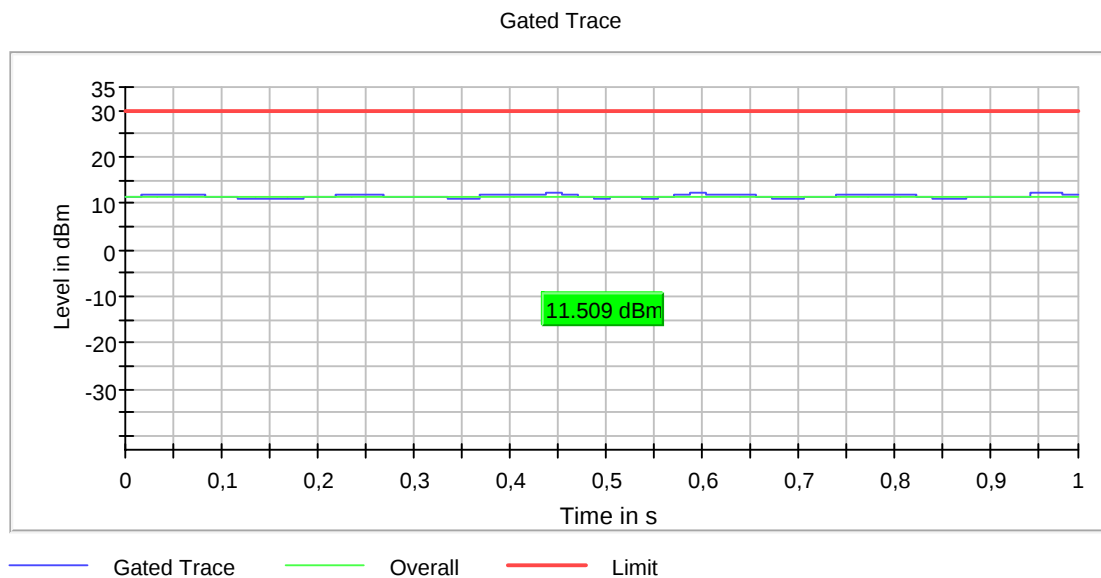
1 RF output power

RF output power (2412 MHz; b-mode [1MBps] (12 dBm); 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	DutyCycle (%)	Result
2412.000000	11.5	30.0	99.925	PASS



OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

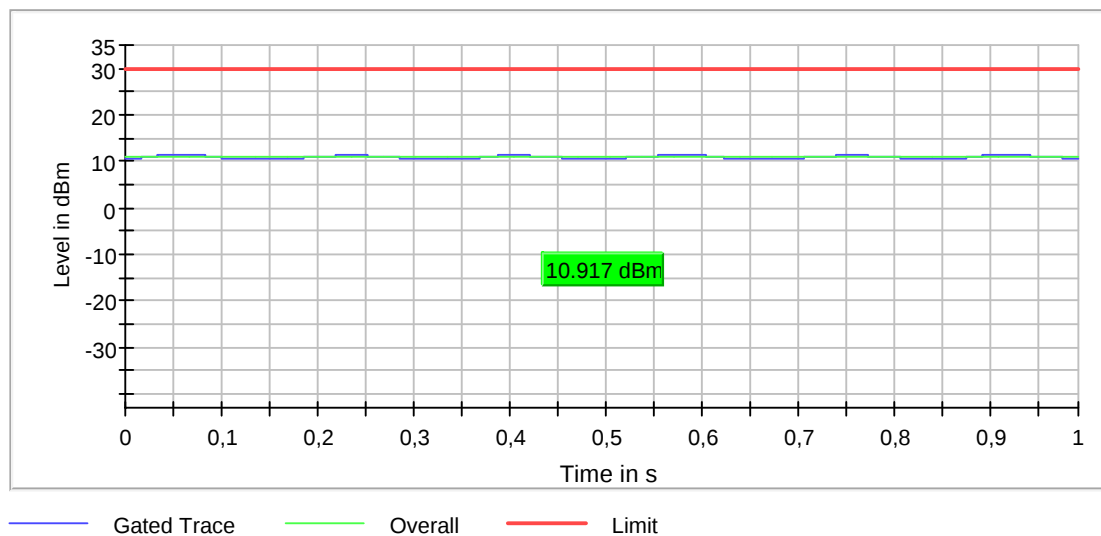
RF output power (2437 MHz; b-mode [1MBps] (12 dBm); 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	DutyCycle (%)	Result
2437.000000	10.9	30.0	99.925	PASS

Gated Trace



OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

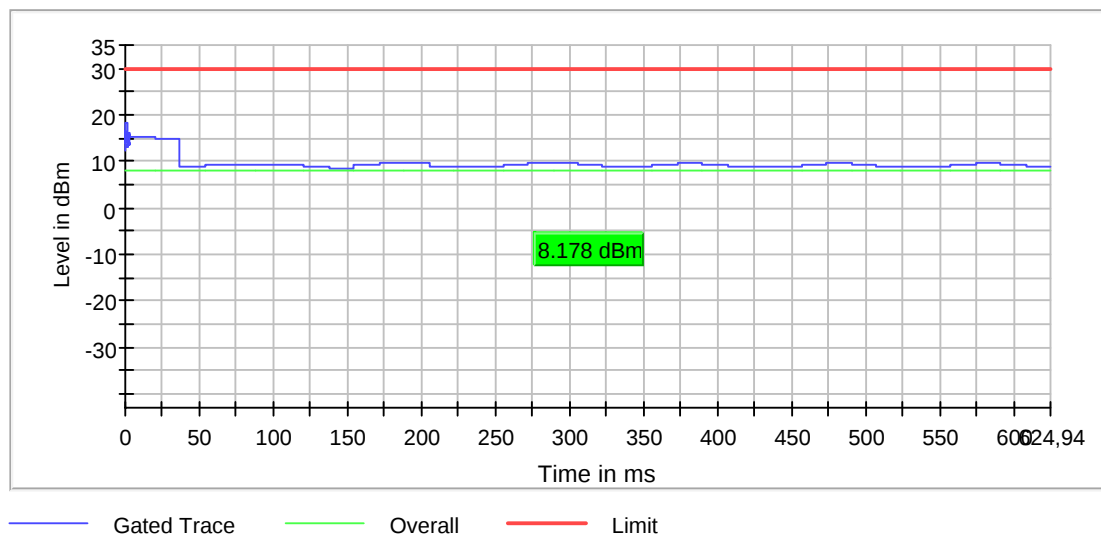
RF output power (2462 MHz; b-mode [1MBps] (12 dBm); 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	DutyCycle (%)	Result
2462.000000	8.2	30.0	93.618	PASS

Gated Trace



OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

2 Radiated field strength emissions below 30 MHz

2.01a_b-mode_1Mbps_ch01

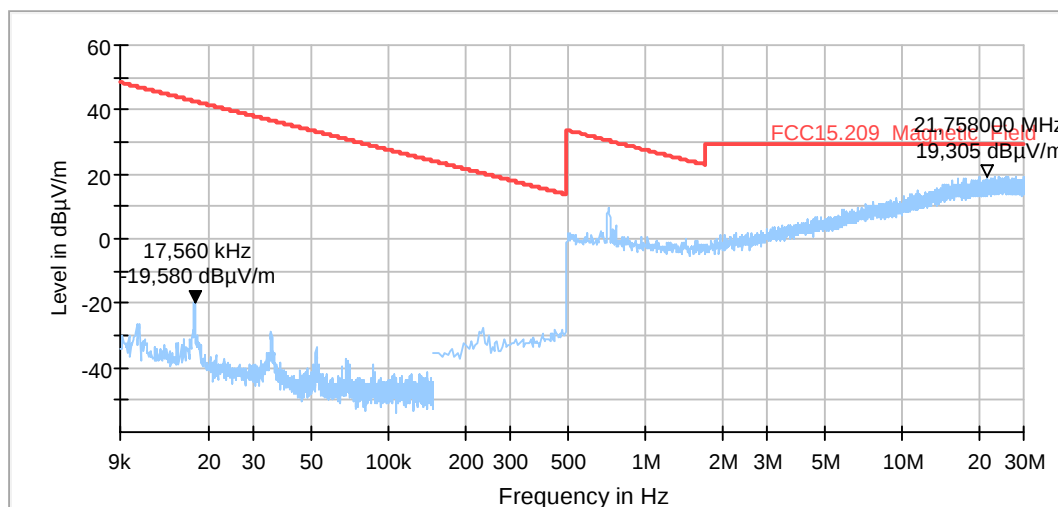
Common Information

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 4
Operator:	HLa
Operating Mode:	b-mode_1Mbps_ch01
EUT Setup:	3
Verdict:	Passed

EUT Information

PMT number	21-1-01787S53_C01
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Full Spectrum



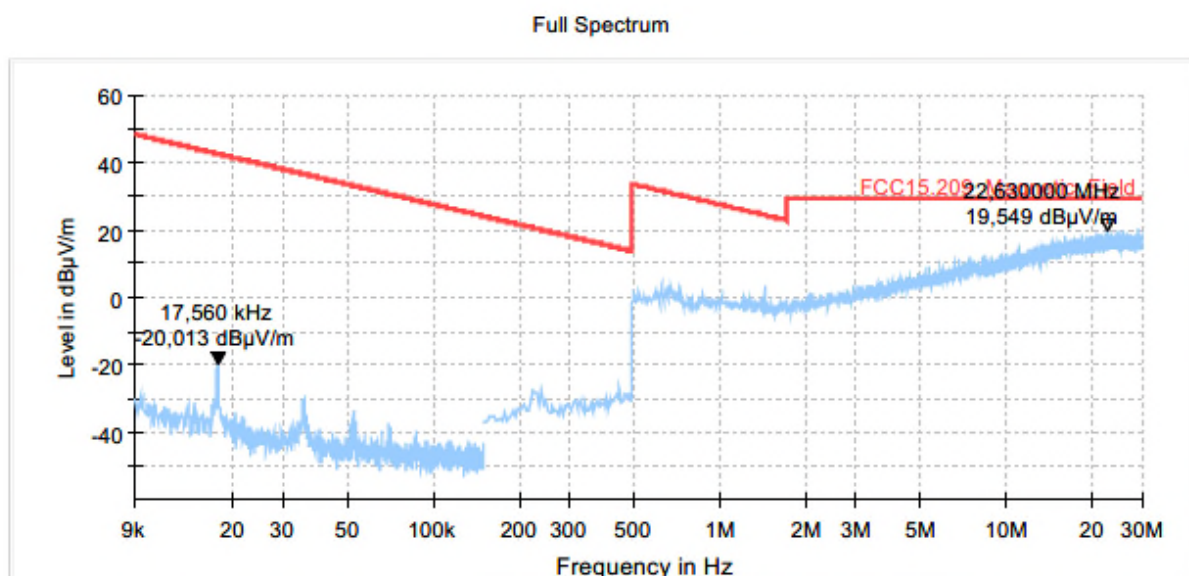
2.01b_b-mode_1Mbps_ch01

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 4
Operator:	HLa
Operating Mode:	b-mode_1Mbps_ch01
EUT Setup:	3
Verdict:	Passed

EUT Information

PMT number	21-1-01787S53_C01
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3 Radiated field strength emissions 30 MHz – 1 GHz

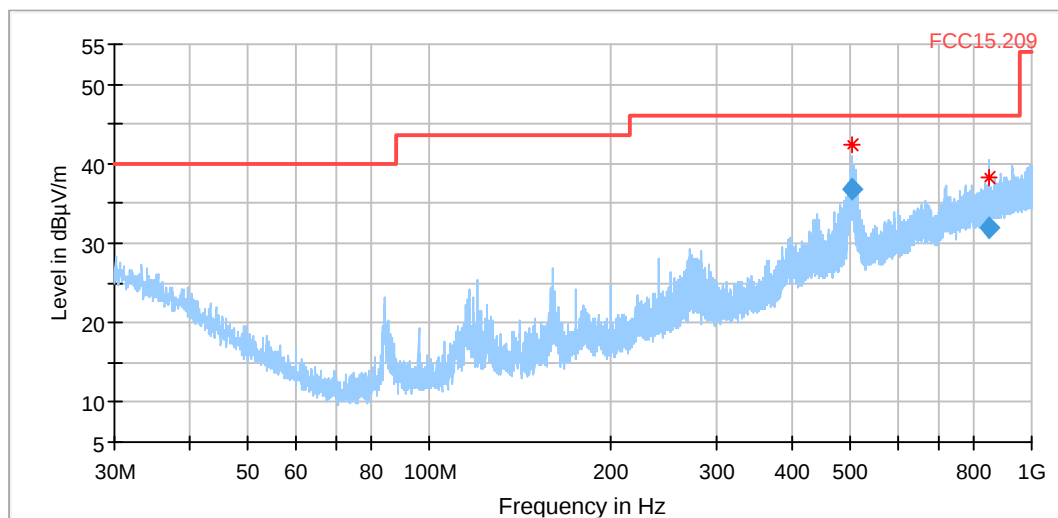
3.01a_b-mode_1Mbps_ch01

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 & RSS Gen. Issue 5
Antenna polarisation:	horizontal/vertical
Environmental Conditions:	Humidity : 48% rH; Temperature: 21 °C
Operator Name:	HLA
Operating Mode:	b-mode_1Mbps_ch01
EUT Setup:	2
Verdict:	Passed

EUT Information

PMT Sample number:	21-1-0178701S51_C01
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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)
504.250000	36.88	46.00	9.12	120.000	186.0	H	179.0	19.9	0.0	2.3
850.910000	31.97	46.00	14.03	120.000	164.0	H	232.0	26.6	0.0	3.3

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

Frequency (MHz)	Trd Corr. (dB/m)	Raw Rec (dBµV)	Comment
504.250000	17.5	17.0	17:51:25 - 30.11.2022
850.910000	23.3	5.4	17:46:16 - 30.11.2022

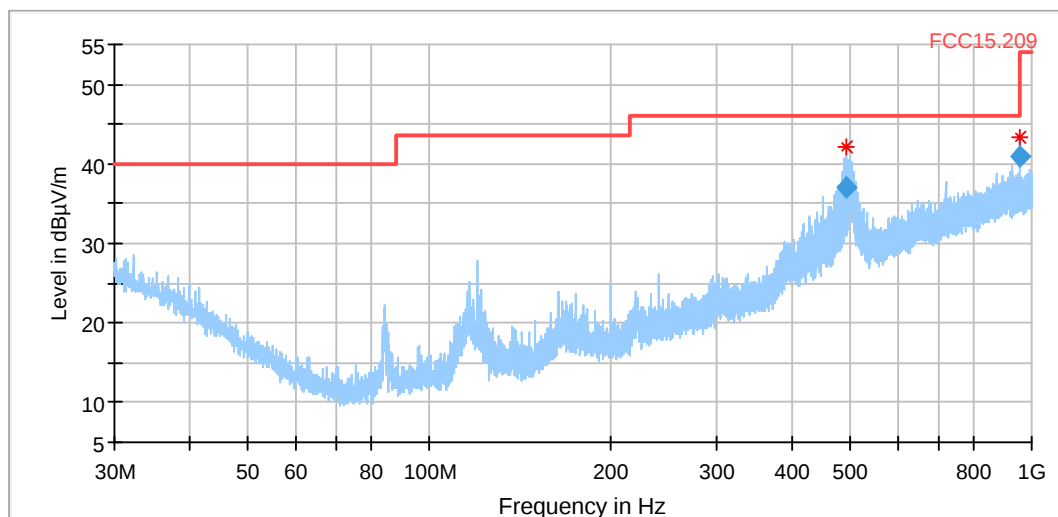
3.01b_b-mode_1Mbps_ch01

Common Information

Test Description: Radiated field strength emission in 3m distance
 Test Site: CETECOM GmbH Essen
 Test Standard: FCC 15.205&15.209 & RSS Gen. Issue 5
 Antenna polarisation: horizontal/vertical
 Environmental Conditions: Humidity : 48% rH; Temperature: 21 °C
 Operator Name: HLa
 Operating Mode: b-mode_1Mbps_ch01
 EUT Setup: 2
 Verdict: Passed

EUT Information

PMT Sample number: 21-1-0178701S51_C01



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)
492.350000	37.11	46.00	8.89	120.000	163.0	H	162.0	19.7	0.0	2.3
960.030000	41.04	54.00	12.96	120.000	109.0	V	148.0	27.6	0.0	3.6

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

Frequency (MHz)	Trd Corr. (dB/m)	Raw Rec (dBµV)	Comment
492.350000	17.3	17.4	18:31:17 - 30.11.2022
960.030000	24.0	13.4	18:36:31 - 30.11.2022

4 Radiated field strength emissions above 1 GHz

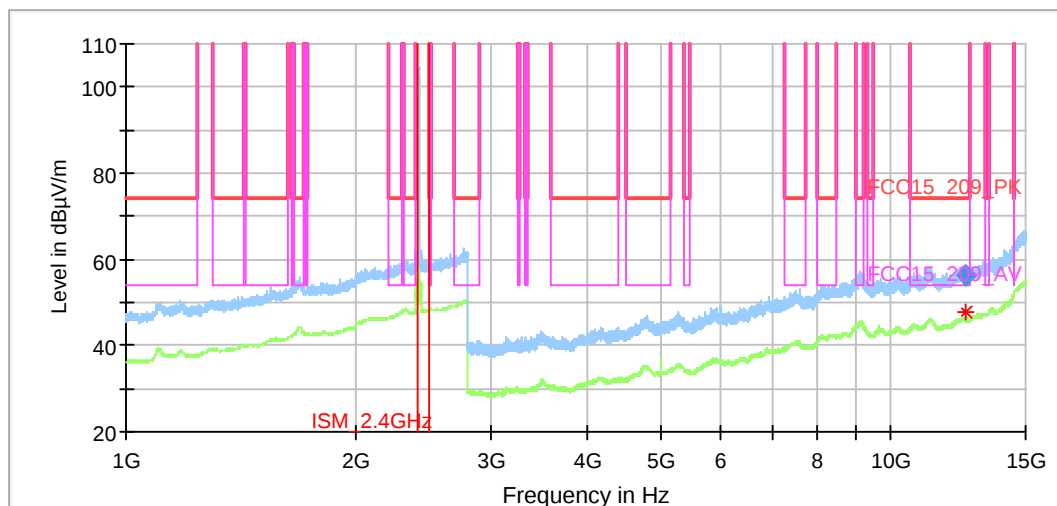
4.01_b-mode_1Mbps_ch01

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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 4
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX, continuous
Operator:	npe
Comment:	b-mode 1Mbps; ch01; 2412MHz
EUT Setup:	1
Environmental Conditions:	Humidity: 50% rH, Temperature: 20 °C
Verdict:	Passed

EUT Information

PMT Sample Nr.	21-1-01787S50_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)
12514.330000	56.47	---	74.00	17.53	100.0	1000.000	155.0	H	14.0	0.0

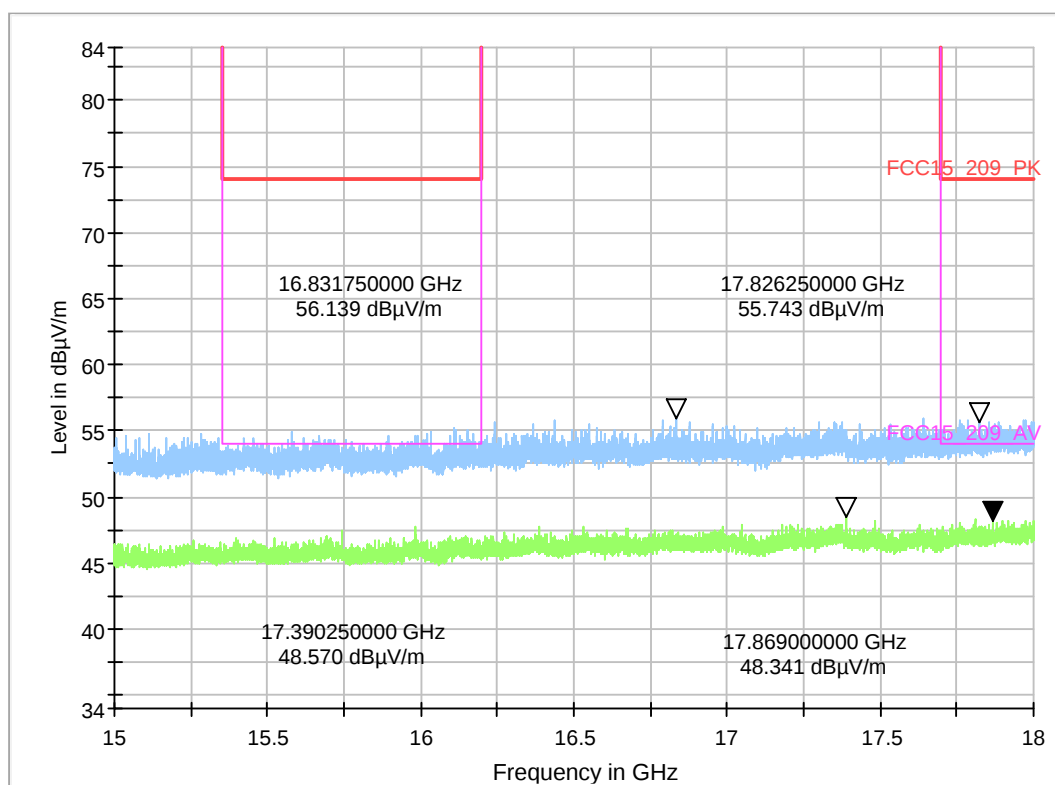
4.02_b-mode_1Mbps_ch01

Common Information

Test Description:	Radiated Field Strength Emission@3m distance
Test Site Location:	CETECOM GmbH Essen
Test Site:	Fully Anechoic Room (FAR2)
Test Standard:	FCC 15.247
Operating Mode:	1
Environmental Conditions:	Humidity: 33% rH; Temperature: 20 °C
SW-Version:	EMC32 V10.60.20
Operator:	TFra
EUT Setup:	4
Environmental Conditions:	Humidity: 33% rH; Temperature: 20 °C
Verdict:	Passed

EUT Information

PMT Sample Nr.	21-1-01787S54_C01
	Full Spectrum



4.03a_b-mode_1Mbps_ch01_lying

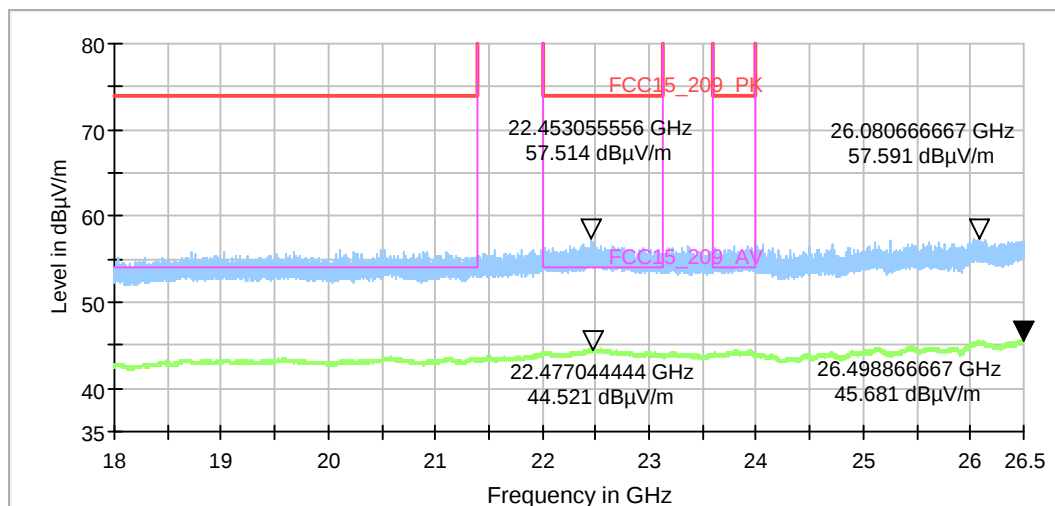
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator / RSS-247
Antenna polarisation:	horizontal/vertical
Operating Mode:	b-mode 2Mbps; ch01; 2412MHz
Operator:	TFra
Comment:	Channel no. low
Environmental Conditions:	Humidity: 33% rH; Temperature: 20 °C
EUT Setup:	4
Verdict:	Passed

EUT Information

PMT Sample Nr. 21-1-01787S54_C01

Full Spectrum



4.03b_b-mode_1Mbps_ch01_standing

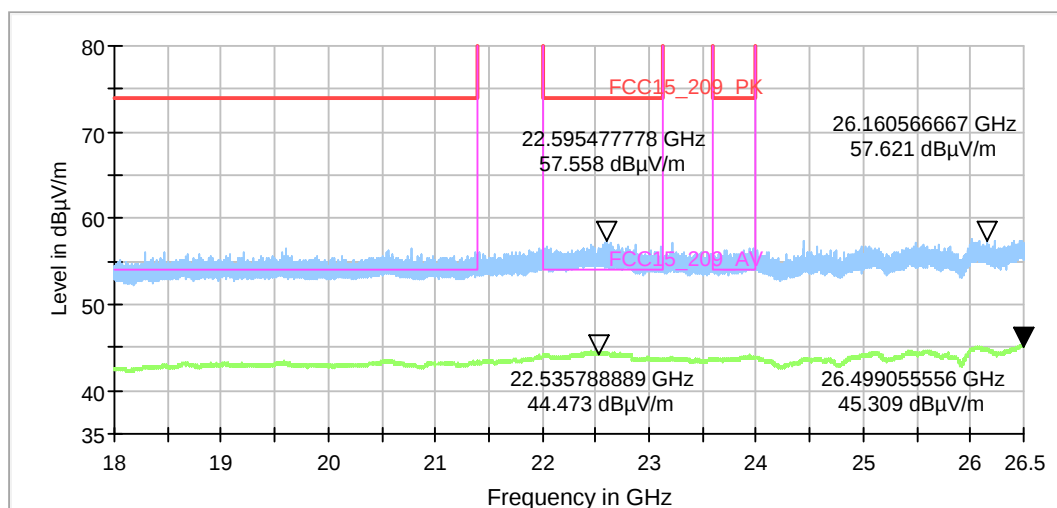
Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.407&15.209 Intentional Radiator / RSS-247
Antenna polarisation:	horizontal/vertical
Operating Mode:	b-mode 2Mbps; ch01; 2412MHz
Operator:	TFra
Comment:	Channel no. low/middle/high
Environmental Conditions:	Humidity: 33% rH; Temperature: 20 °C
EUT Setup:	4
Verdict:	Passed

EUT Information

PMT Sample Nr.	21-1-01787S54_C01
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Full Spectrum



5 Radiated Band-Edge emissions

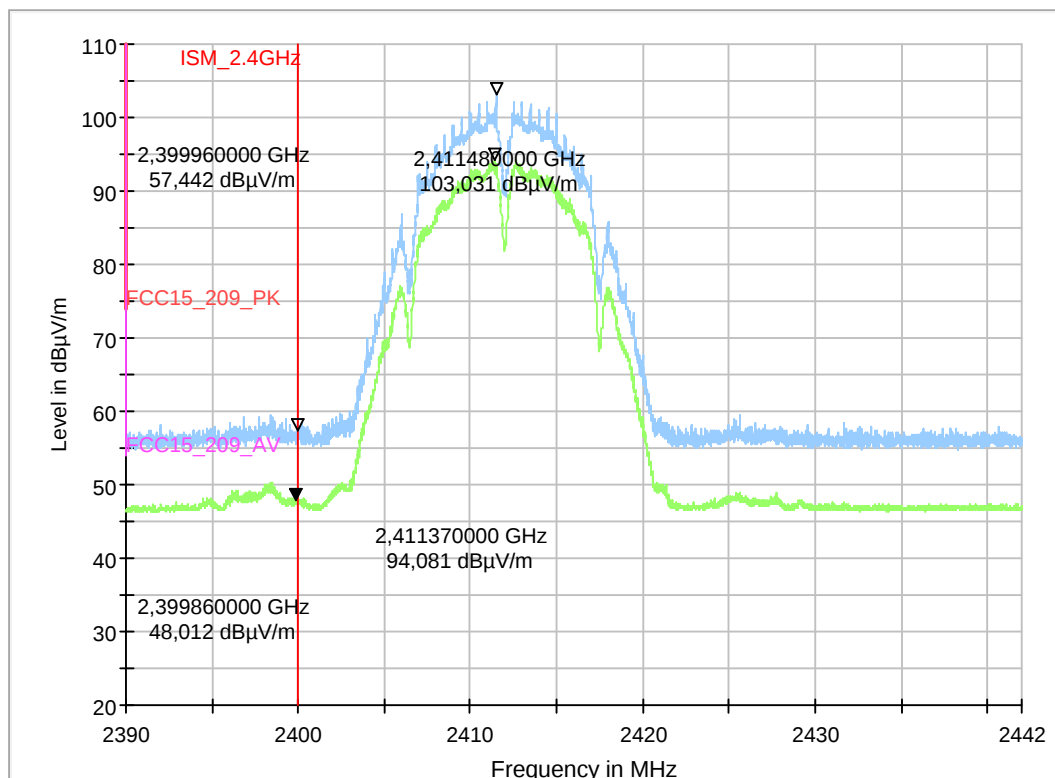
9.01_b-mode_1Mbps_ch01

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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 4
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX, continuous
Operator:	npe
Comment:	b-mode 2Mbps; ch01; 2412MHz
Environmental Conditions:	Humidity: 50% rH, Temperature: 20 °C
EUT Setup:	1
Verdict:	Passed

EUT Information

PMT Sample Nr.	21-1-01787S50_C01
	Full Spectrum



9.02_b-mode_1Mbps_ch11

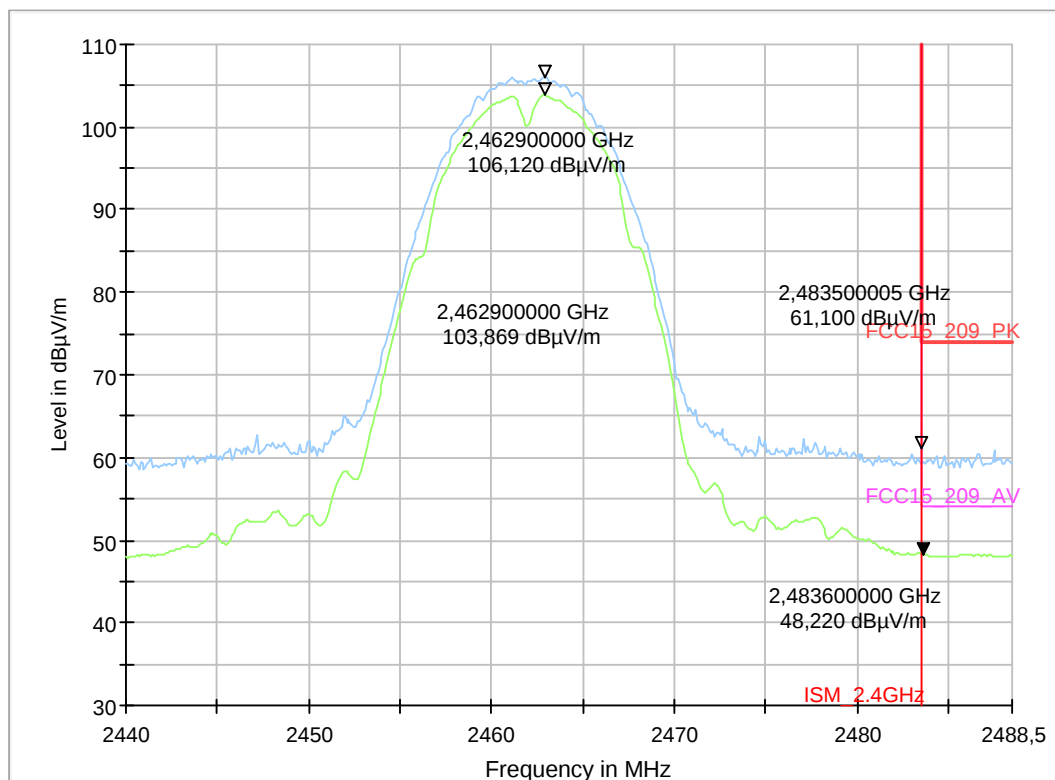
Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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 4
Antenna polarisation:	horizontal/vertical
Operating Mode:	TX, continuous
Operator:	npe
Comment:	b-mode 1Mbps; ch01; 2462MHz
EUT Setup:	1
Environmental Conditions:	Humidity: 50% rH, Temperature: 20 °C
Verdict:	Passed

EUT Information

PMT Sample Nr. 21-1-01787S50_C01

Full Spectrum



End Of Annex 1