Annex 1: Measurement diagrams
to
T E S T R E P O R T
18-1-0044501T05a-C1

A N N E X 1
MEASUREMENT DIAGRAMS

for

Leica Camera AG

Digital Camera Type No. 6847

FCC-ID: N5A6847
ISED: 11245A-6847

Laboratory Accreditation and Listings		
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-4452, C-20009, T-20006, G-20013
		MRA US-EU 0003
accredited according to DIN EN ISO/IEC 17025		

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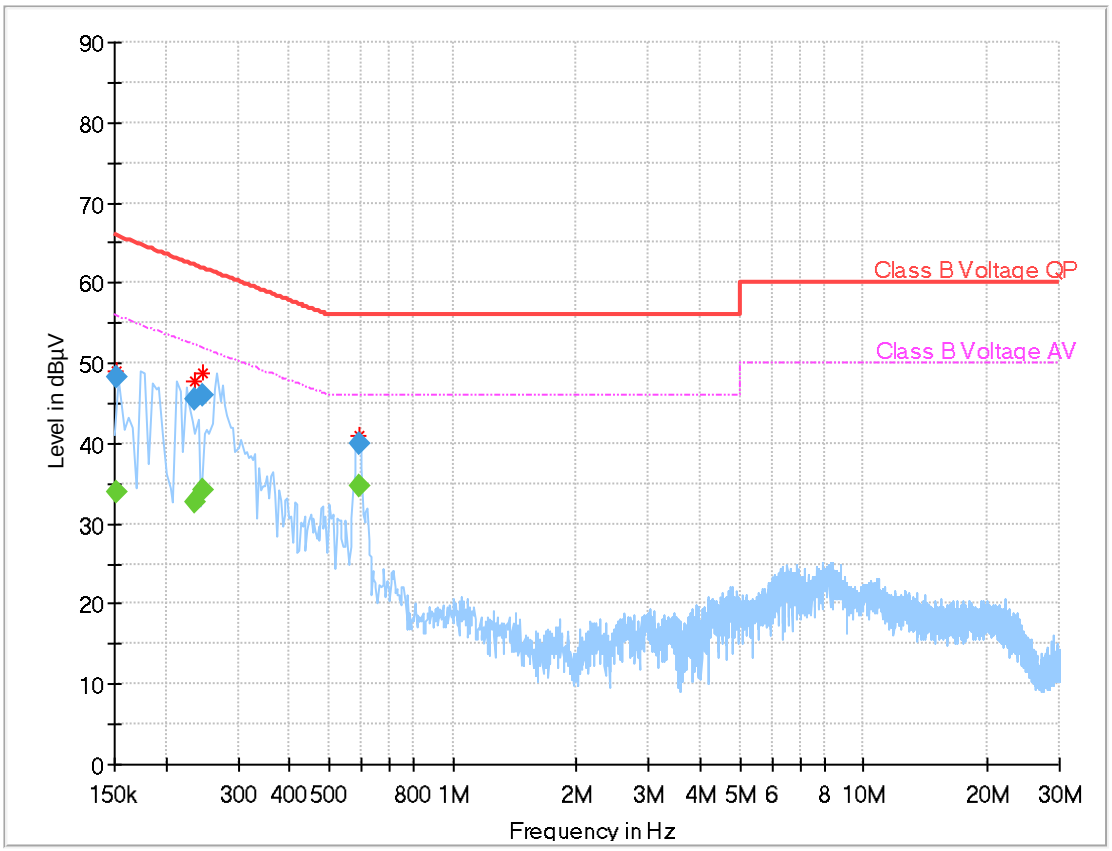
0.1. Conducted EMI measurements on AC-mains port according 15.207, class B

1.01_WLAN_Ch1_bMode

Common Information

Test Description:	Conducted Voltage Measurement
Test Site & Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Specification:	FCC 15.107, FCC 15.207
Operating Mode:	TX WLAN on, Channel 1, b-Mode
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions:	Temperature: 27.8°C
Operator:	Lor
Comments:	Camera P-021, FW: 0.18.28.5

Full Spectrum



Final_Result

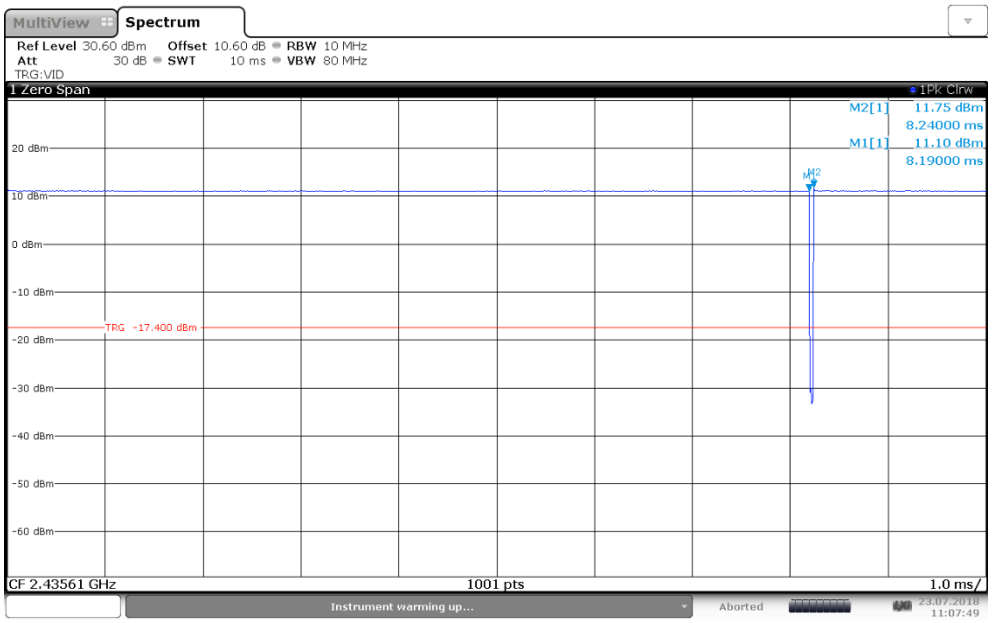
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)
0.150938	48.29	---	65.95
0.150938	---	33.97	55.95
0.235000	45.49	---	62.27
0.235000	---	32.77	52.27
0.244688	46.09	---	61.94
0.244688	---	34.13	51.94
0.591094	40.04	---	56.00
0.591094	---	34.76	46.00

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)
0.150938	48.29	---	65.95
0.150938	---	33.97	55.95
0.235000	45.49	---	62.27
0.235000	---	32.77	52.27
0.244688	46.09	---	61.94
0.244688	---	34.13	51.94
0.591094	40.04	---	56.00
0.591094	---	34.76	46.00

Final_Result

0.2. Duty-Cycle measurements, b-Mode

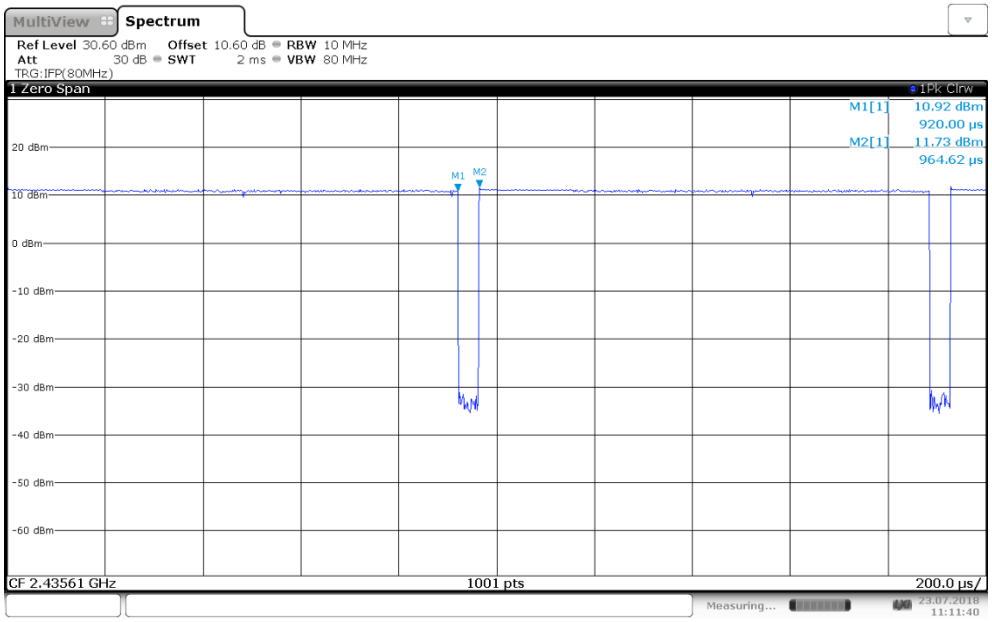
0.2.1. 1MBit



11:07:49 23.07.2018

Diagramm 1: Duty-Cycle 1MBit data rate

0.2.2. 11MBit



11:11:41 23.07.2018

Diagramm 2: Duty-Cycle 11MBit data rate

0.3. Duty-Cycle measurements, g-Mode

0.3.1. 6MBit

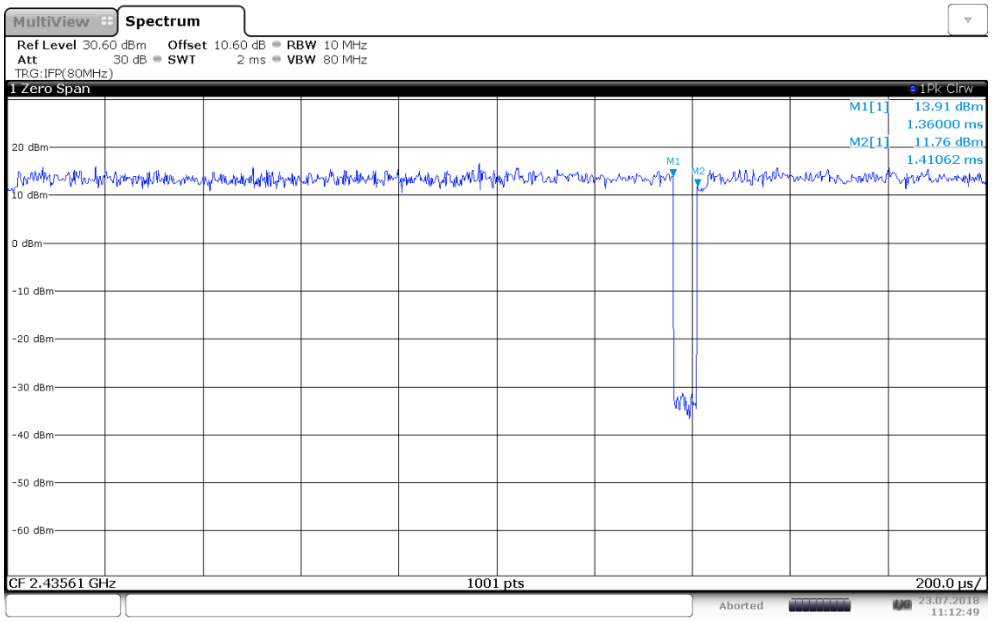


Diagramm 3: Duty-Cycle 6MBit data rate

0.3.2. 54MBit

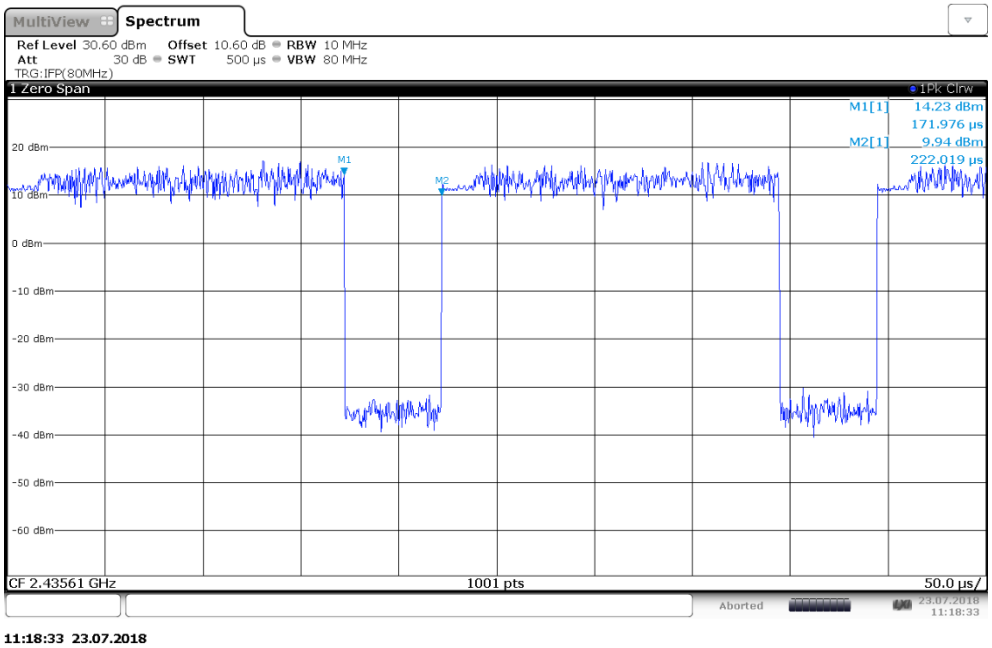


Diagramm 4: Duty-Cycle 54MBit data rate

0.4. Duty-Cycle measurements, n-Mode

0.4.1. MCS0

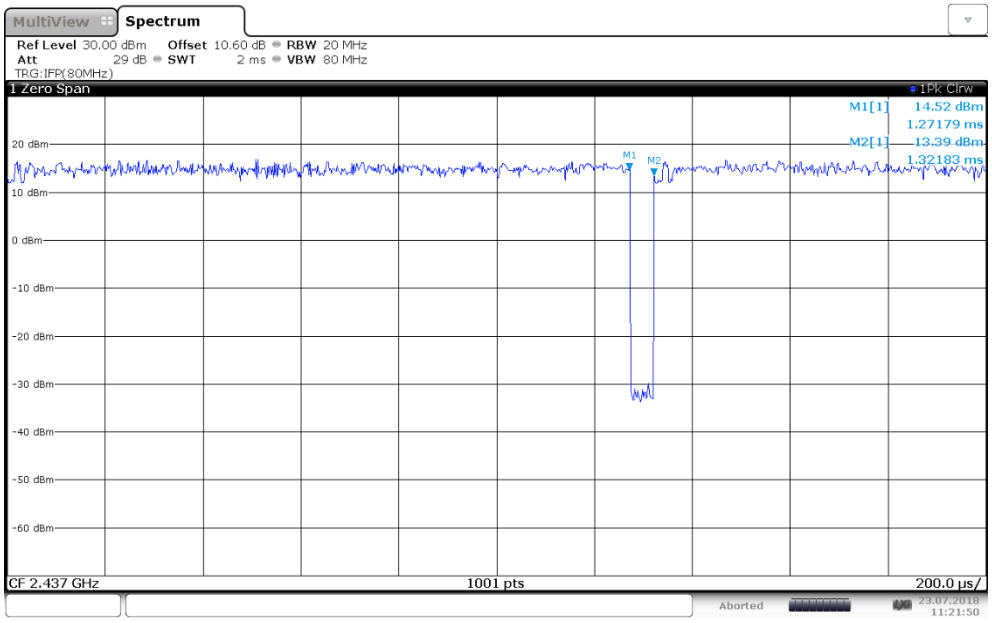


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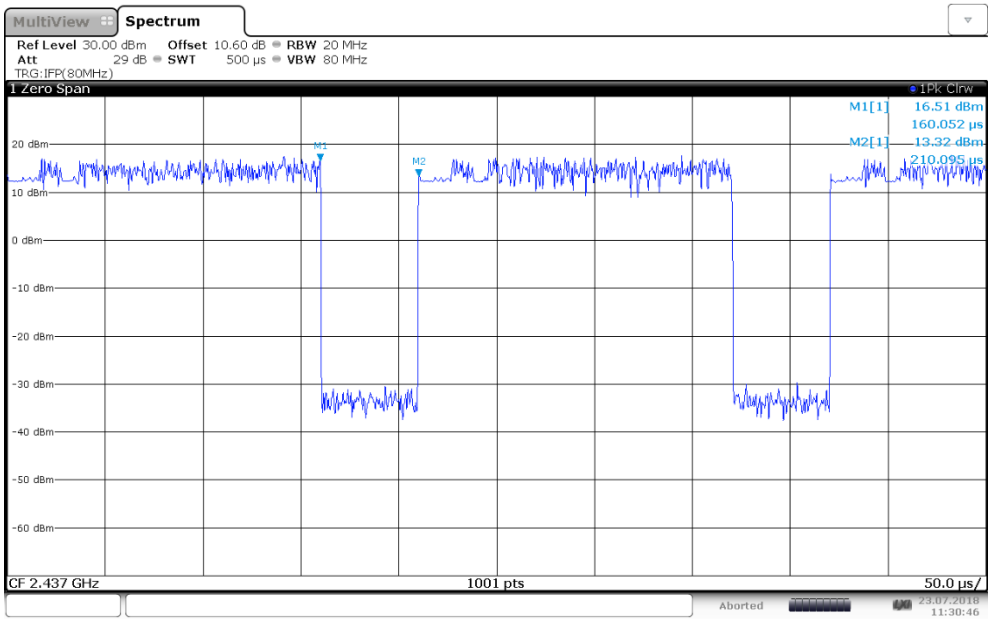
Diagramm 5: Duty-Cycle MCS7 data rate

0.4.2. MCS7



11:30:46 23.07.2018

Diagramm 6: Duty-Cycle MCS7 data rate

0.5. Magnetic field strength measurements in the range 9 kHz to 30 MHz

0.5.1. b-Mode Modulation

Diagram No. 2.01a_MgRSE_Ch1_1Mbit_bMode_set1_laying

Date: 28.06.2018 Page 1 of 3

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:	DLe
Operating Mode:	WLan CH 1 1Mbit Setup1
Operating conditions:	Humidity: 40% Temperature: 22°C
Power during tests:	120V AC
Comment 1:	Ohne Objektiv
Comment 2:	DUT laying

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
----------	----------
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-

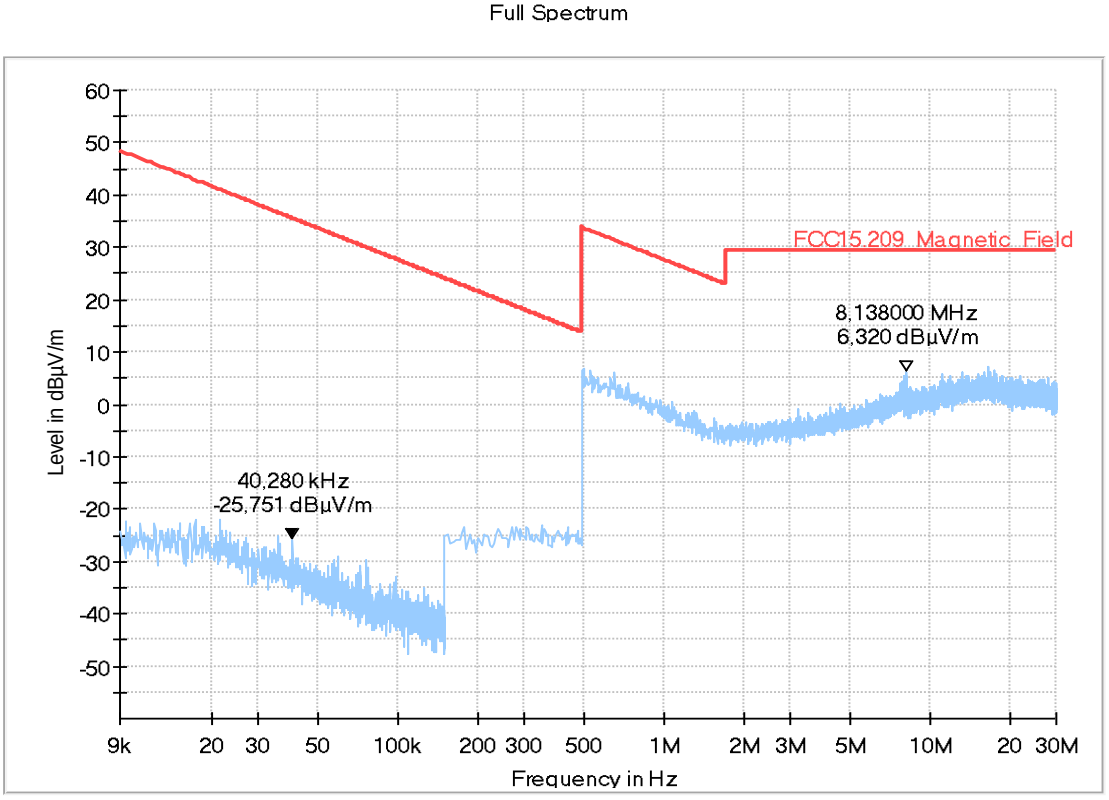


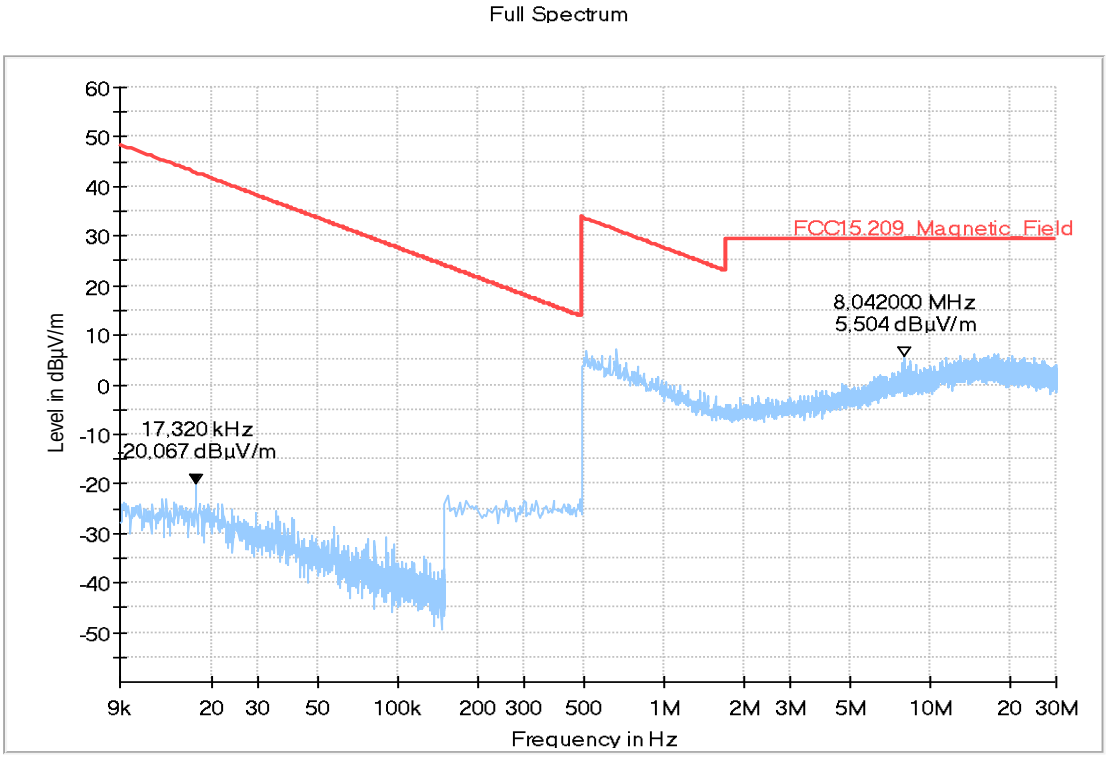
Diagram No. 2.01b_MgRSE_Ch1_1Mbit_bMode_set1_standing

Date: 28.06.2018 Page 1 of 3

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:	DLe
Operating Mode:	WLan CH 1 1Mbit Setup1
Operating conditions:	Humidity: 40% Temperature: 22°C
Power during tests:	120V AC
Comment 1:	Ohne Objektiv
Comment 2:	DUT standing

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



0.5.2. g-Mode Modulation

Diagram No. 2.02a_MgRSE_Ch6_54Mbit_gMode_set2_laying

Date: 28.06.2018 Page 1 of 3

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:	DLe
Operating Mode:	WLan CH 6 54Mbit Setup2
Operating conditions:	Humidity: 40% Temperature: 22°C
Power during tests:	120V AC
Comment 1:	Mit Objektiv
Comment 2:	DUT laying

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-

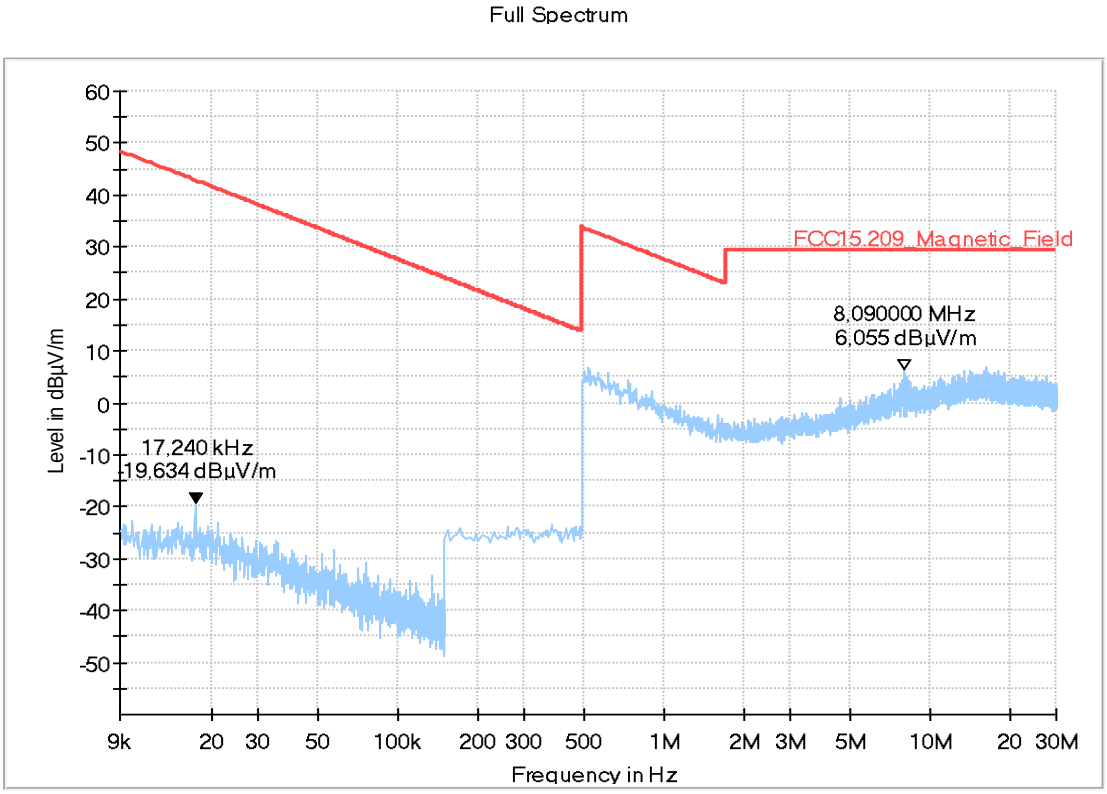


Diagram No. 2.02b_MgRSE_Ch6_54Mbit_gMode_set2_standing

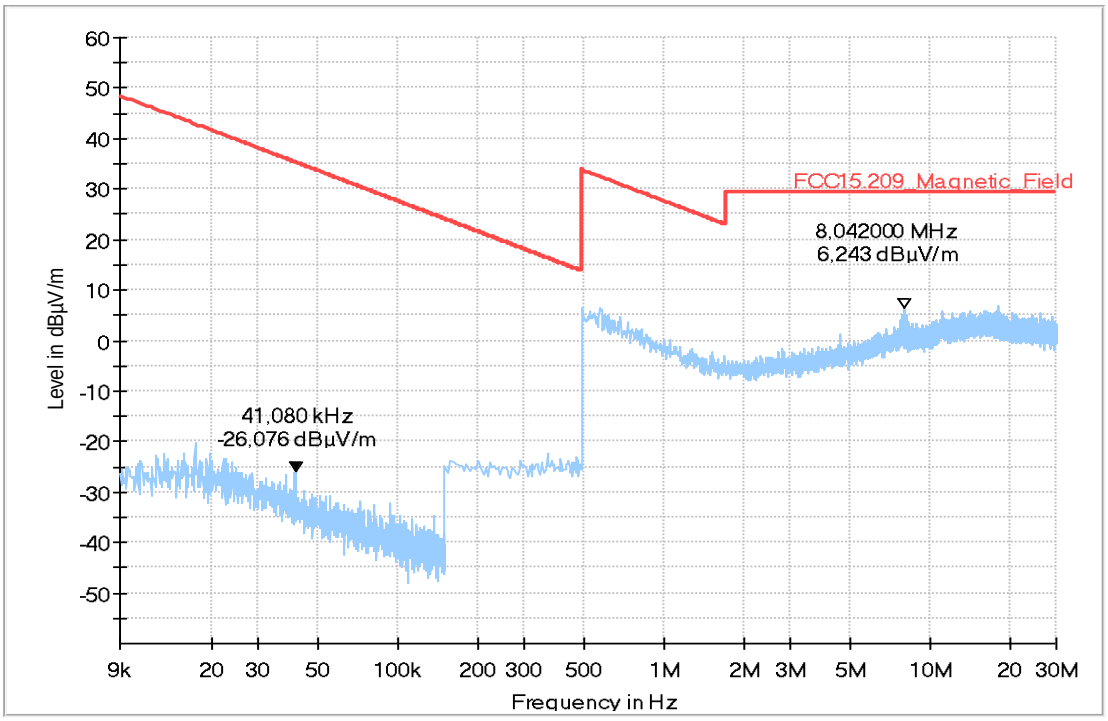
Date: 28.06.2018 Page 1 of 5

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:	DLe
Operating Mode:	WLan CH 6 54Mbit Setup2
Operating conditions:	Humidity: 40% Temperature: 22°C
Power during tests:	120V AC
Comment 1:	Mit Objektiv
Comment 2:	DUT standing

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-

Full Spectrum



0.5.3. n-Mode Modulation

Diagram No. 2.03a_MgRSE_Ch11_MCS7_nMode_set1_laying

Date: 28.06.2018 Page 1 of 3

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:	DLe
Operating Mode:	WLan CH 11 MCS7 Setup1
Operating conditions:	Humidity: 40% Temperature: 22°C
Power during tests:	120V AC
Comment 1:	Ohne Objektiv
Comment 2:	DUT laying

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-

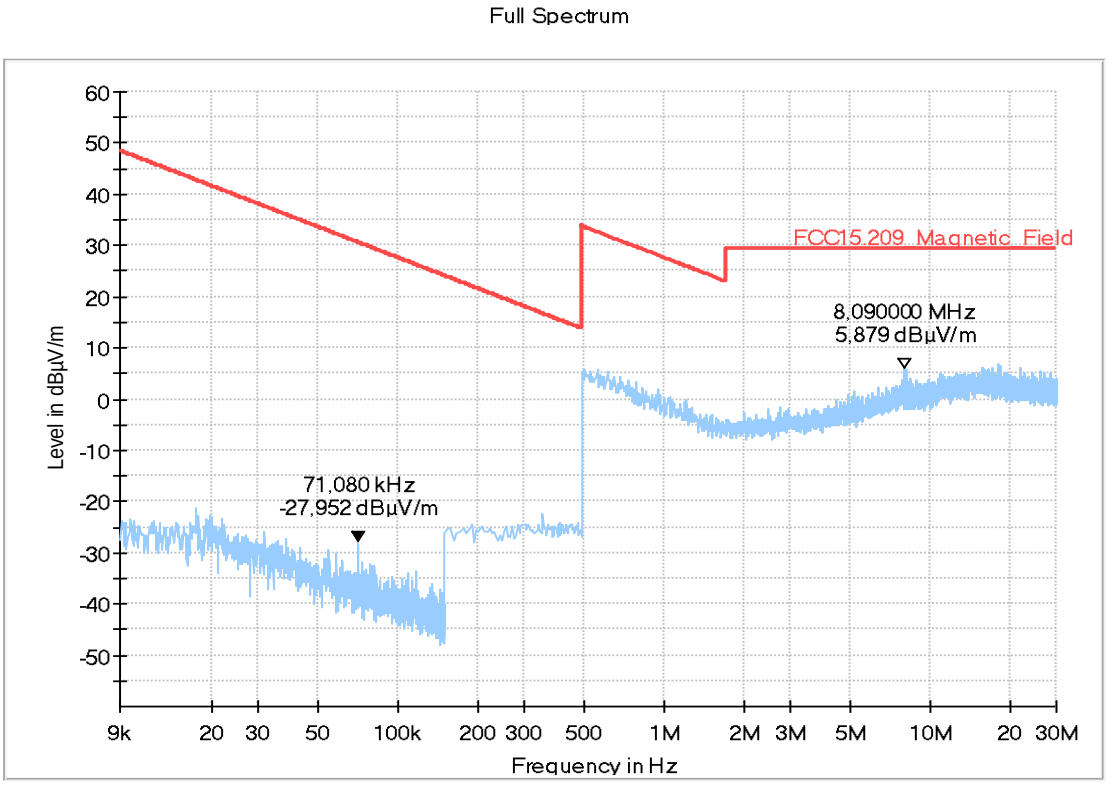


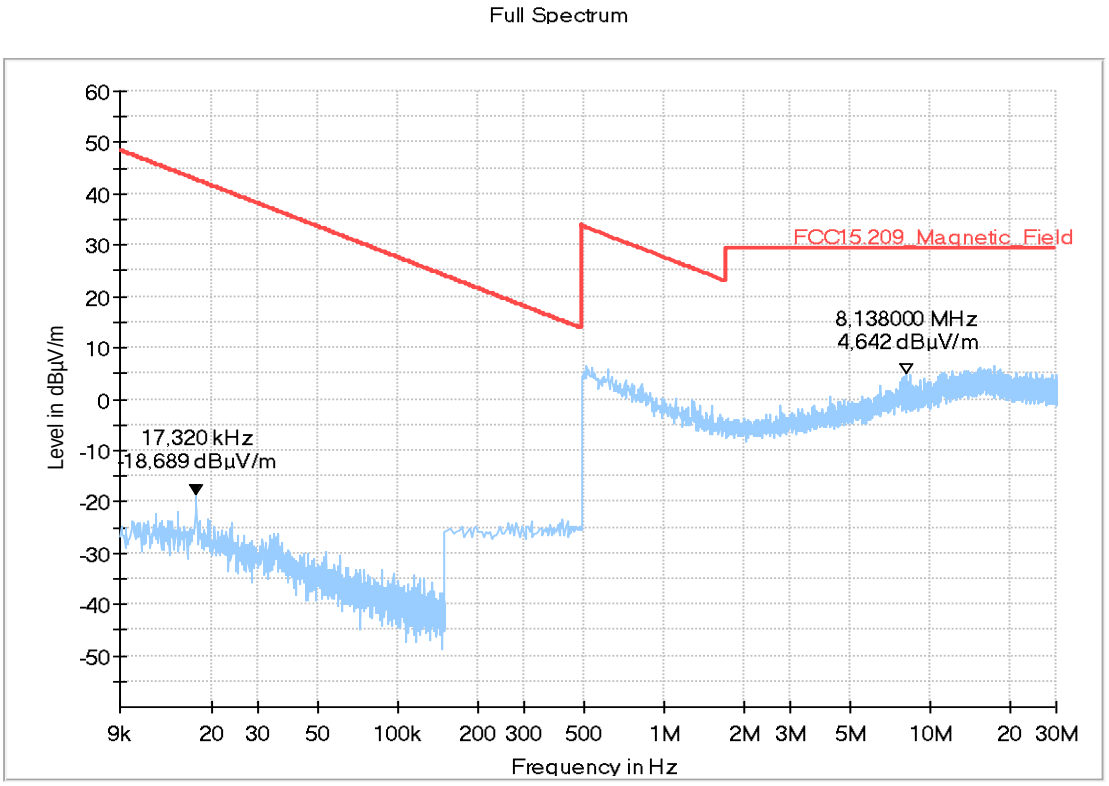
Diagram No. 2.03b_MgRSE_Ch11_MCS7_nMode_set1_standing

Date: 28.06.2018 Page 1 of 3

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:	DLe
Operating Mode:	WLan CH 11 MCS7 Setup1
Operating conditions:	Humidity: 40% Temperature: 22°C
Power during tests:	120V AC
Comment 1:	Ohne Objektiv
Comment 2:	DUT standing

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



0.6. Field strength measurements 30MHz < f < 1GHz

0.6.1. b-Mode Modulation

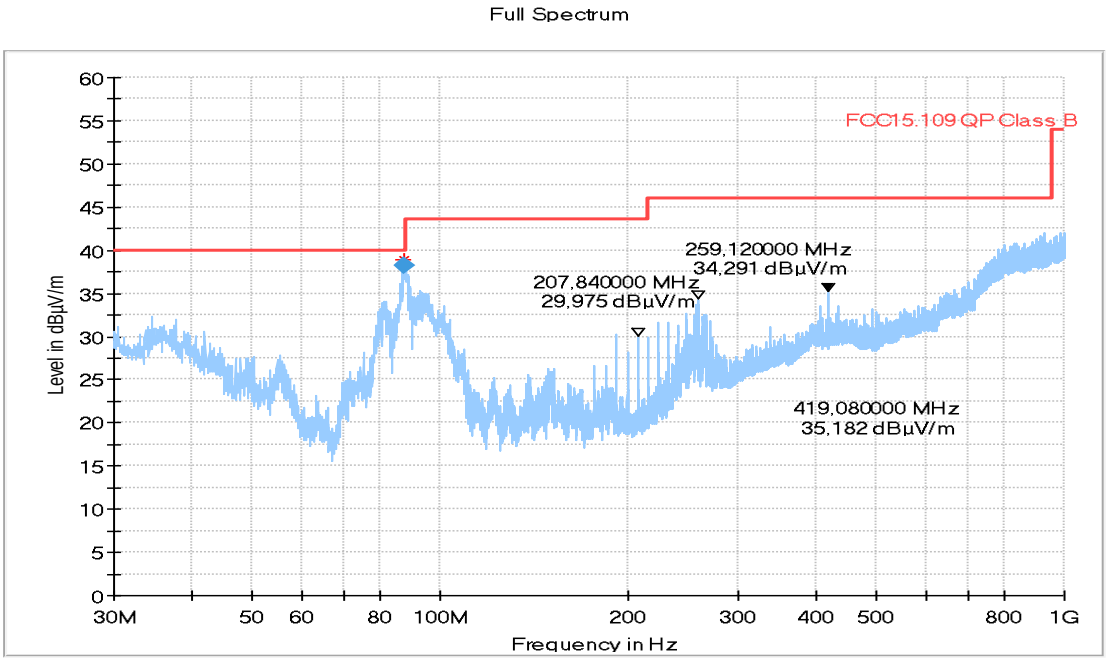
Diagram No. 3.01a_RSE_Ch1_1Mbit_bMode_set1_laying

28.06.2018 Page 1 of 2

Test description:	Electric Field Strength Measurement
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:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.109 Class B; RSS-Gen. Issue 4
Operator:	DLe
Operating mode	WLan Ch1 1Mbit setup1
Operating conditions:	Humidity: 48%rH; Temperature: 20°C
Power during tests:	120V AC
Comment 1:	ohne Objektiv
Comment2:	laying

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
----------	----------
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
87.48000	38.16	40.00	120.000	138.0	V	11.0	8.1

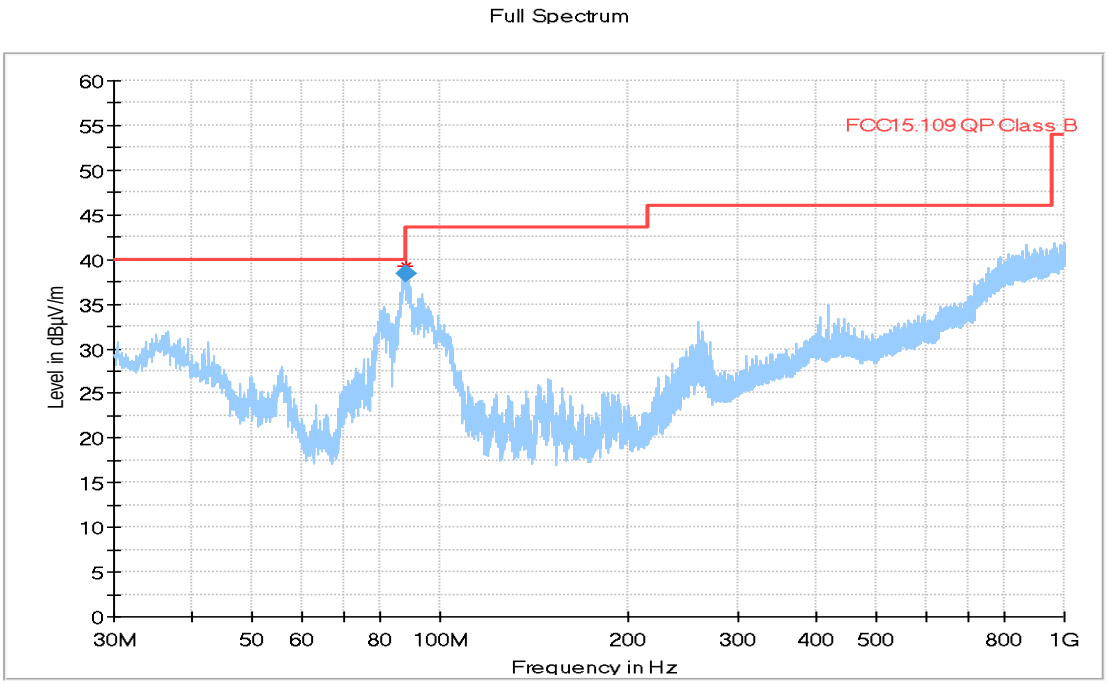
Diagram No. 3.01b_RSE_Ch1_1Mbit_bMode_set1_standing

28.06.2018 Page 1 of 2

Test description:	Electric Field Strength Measurement
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:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.109 Class B; RSS-Gen. Issue 4
Operator:	DLe
Operating mode	WLan Ch1 1Mbit setup1
Operating conditions:	Humidity: 48%rH; Temperature: 20°C
Power during tests:	120V AC
Comment 1:	ohne Objektiv
Comment2:	standing

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
87.90000	38.46	40.00	120.000	125.0	V	15.0	8.1

0.6.2. g-Mode Modulation

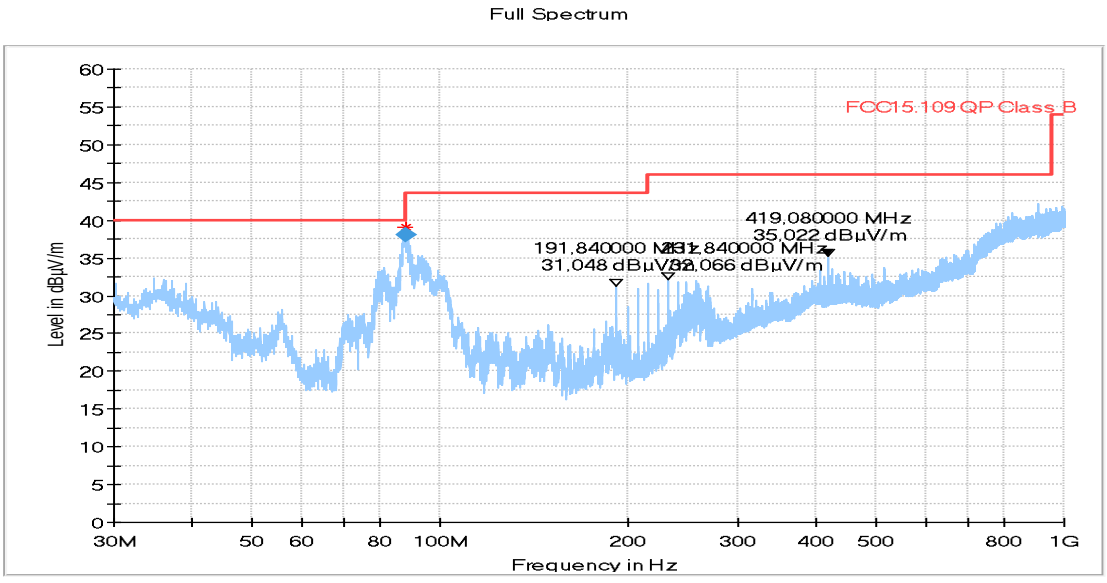
Diagram No. 3.02a_RSE_Ch6_54Mbit_gMode_set2_laying

28.06.2018 Page 1 of 2

Test description:	Electric Field Strength Measurement
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:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.109 Class B; RSS-Gen. Issue 4
Operator:	DLe
Operating mode	WLan Ch6 54Mbit setup2
Operating conditions:	Humidity: 48%rH; Temperature: 20°C
Power during tests:	120V AC
Comment 1:	mit Objektiv
Comment2:	laying

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
87.97000	38.03	40.00	120.000	121.0	V	10.0	8.1

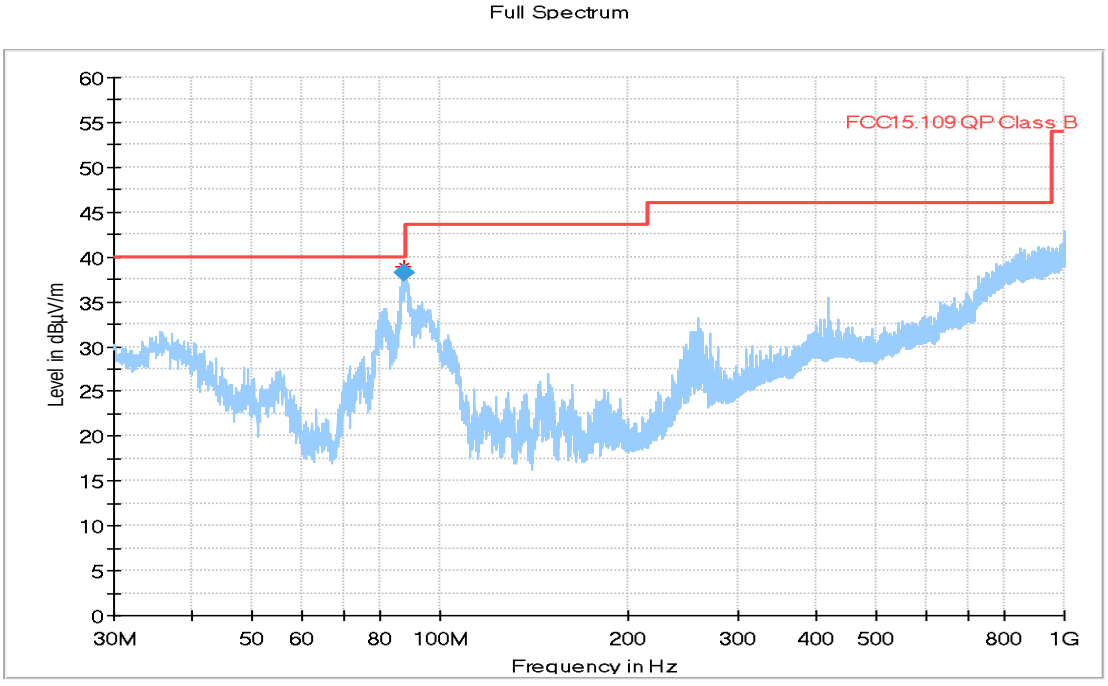
Diagram No. 3.02b_RSE_Ch6_54Mbit_gMode_set2_standing

28.06.2018 Page 1 of 2

Test description:	Electric Field Strength Measurement
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:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.109 Class B; RSS-Gen. Issue 4
Operator:	DLe
Operating mode	WLan Ch6 54Mbit setup2
Operating conditions:	Humidity: 48%rH; Temperature: 20°C
Power during tests:	120V AC
Comment 1:	mit Objektiv
Comment2:	standing

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
87.59000	38.17	40.00	120.000	105.0	V	15.0	8.1

0.6.3. n-Mode Modulation

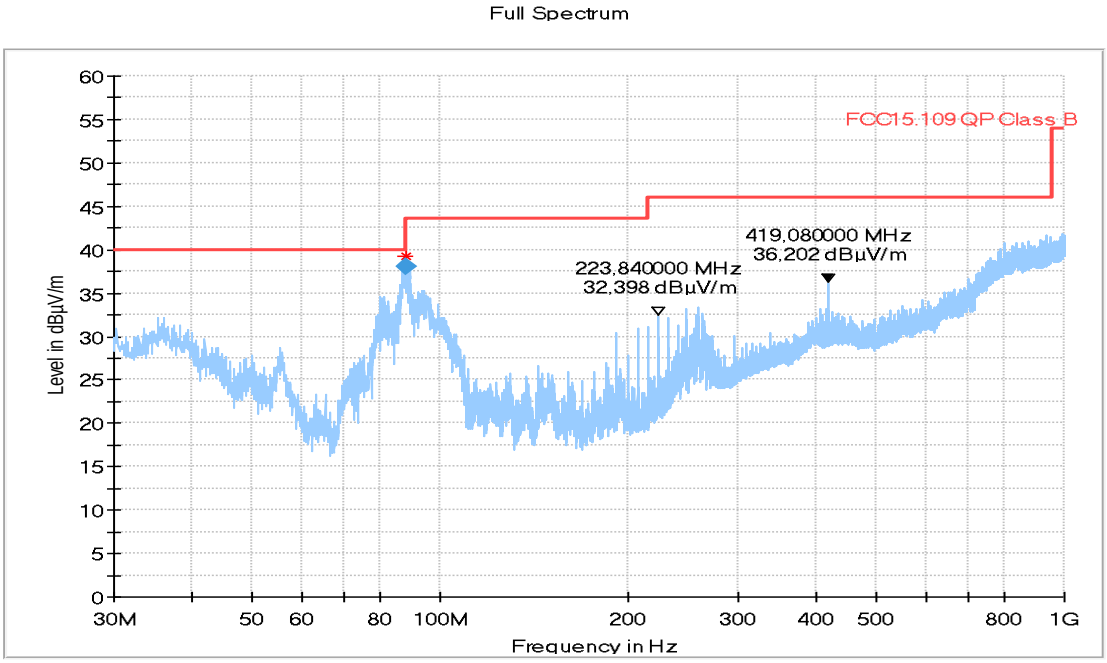
Diagram No. 3.03a_RSE_Ch11_MCS7_nMode_set1_laying

28.06.2018 Page 1 of 2

Test description:	Electric Field Strength Measurement
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:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.109 Class B; RSS-Gen. Issue 4
Operator:	DLe
Operating mode	WLan Ch11 MCS7 setup1
Operating conditions:	Humidity: 48%rH; Temperature: 20°C
Power during tests:	120V AC
Comment 1:	ohne Objektiv
Comment2:	laying

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
----------	----------
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
87.95000	38.11	40.00	120.000	110.0	V	7.0	8.1

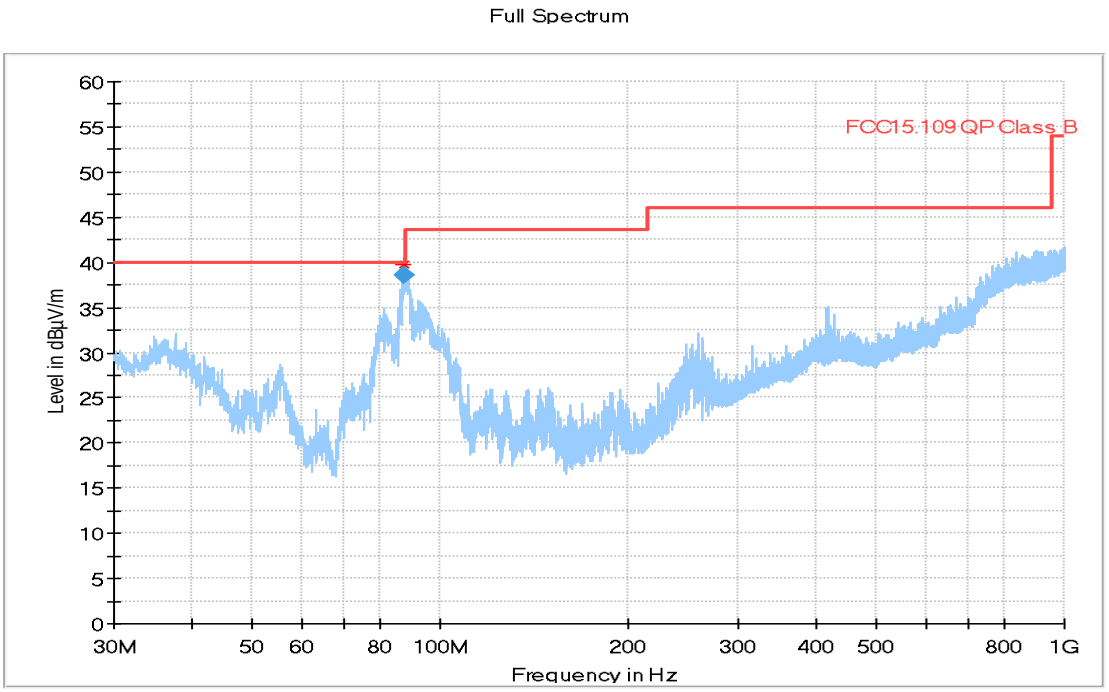
Diagram No. 3.03b_RSE_Ch11_MCS7_nMode_set1_standing

28.06.2018 Page 1 of 2

Test description:	Electric Field Strength Measurement
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:	not used
Used filter:	not used
Technical Data:	please see page 2 for detailed data of measurement setup
Test specification.:	FCC 15.109 Class B; RSS-Gen. Issue 4
Operator:	DLe
Operating mode	WLan Ch11 MCS7 setup1
Operating conditions:	Humidity: 48%rH; Temperature: 20°C
Power during tests:	120V AC
Comment 1:	ohne Objektiv
Comment2:	standing

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
87.77000	38.57	40.00	120.000	133.0	V	0.0	8.1

0.7. Field strength measurements 1GHz < f < 18GHz

0.7.1. b-Mode Modulation

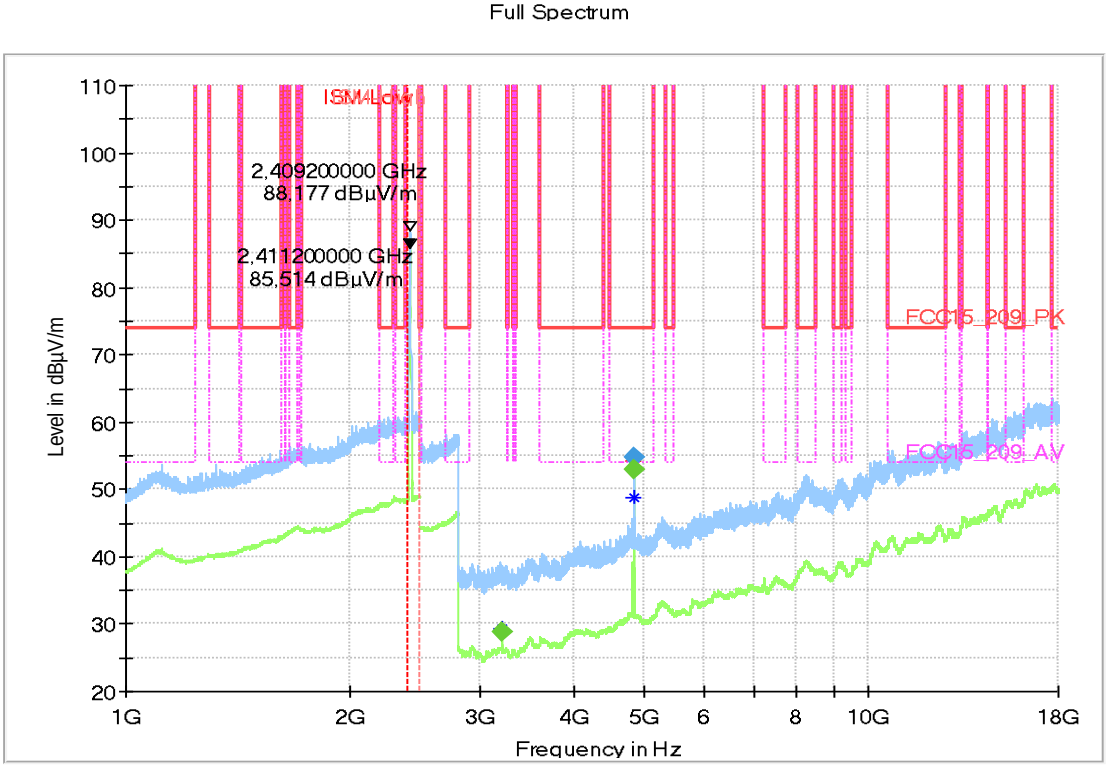
Diagram No.: 4.01a_RSE_Ch1_1Mbit_bMode_set1_laying

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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, CH:1 /1Mbit / b mode
Operating Conditions:	Humidity: 37%; Temperature: 22°
Operator Name:	HEI
Comment:	Ohne Objektiv

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



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)
3215.960000	---	28.93	150.00	121.07	100.0	1000.000	155.0	V	137.0
4823.960000	---	52.82	54.00	1.18	100.0	1000.000	155.0	V	193.0
4823.960000	54.79	---	74.00	19.21	100.0	1000.000	155.0	V	190.0

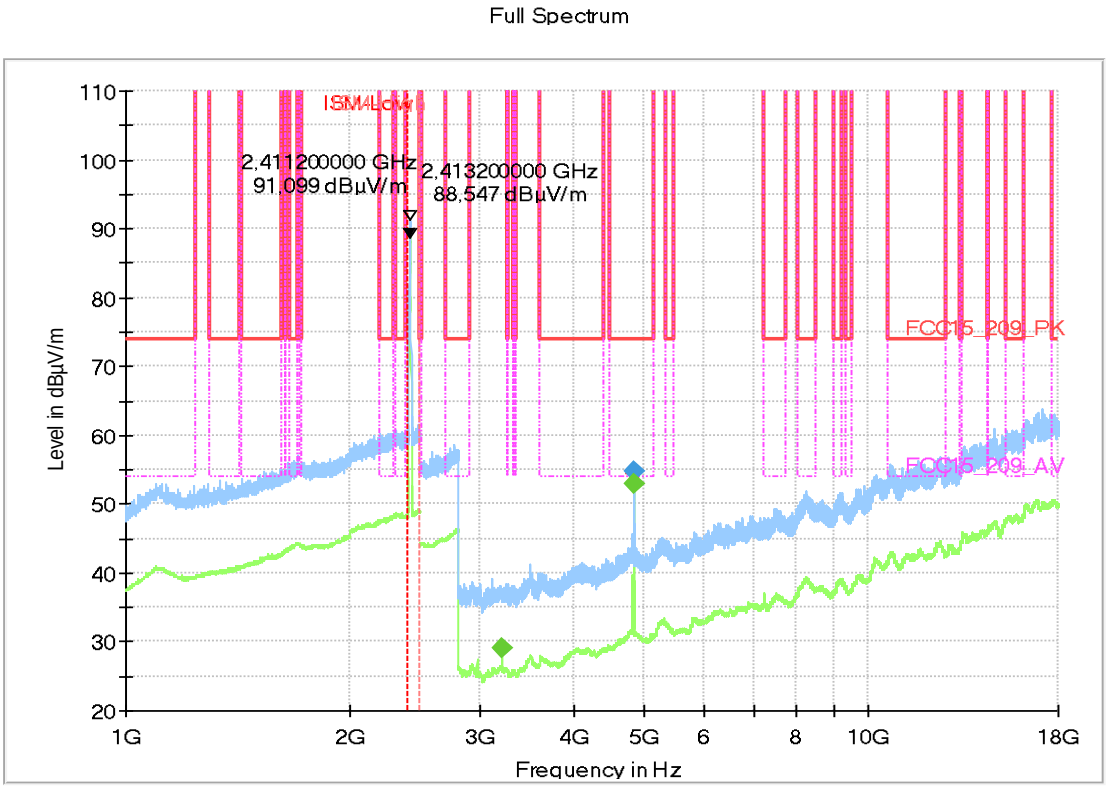
Diagram No.: 4.01b_RSE_Ch1_1Mbit_bMode_set1_standing

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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, CH:1 /1Mbit / b mode
Operating Conditions:	Humidity: 37%; Temperature: 22°
Operator Name:	HEI
Comment:	Ohne Objektiv

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



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)
3215.960000	---	29.09	150.00	120.91	100.0	1000.000	155.0	V	187.0
4823.960000	---	52.89	54.00	1.11	100.0	1000.000	155.0	V	185.0
4823.960000	54.85	---	74.00	19.15	100.0	1000.000	155.0	V	180.0

0.7.2. g-Mode Modulation

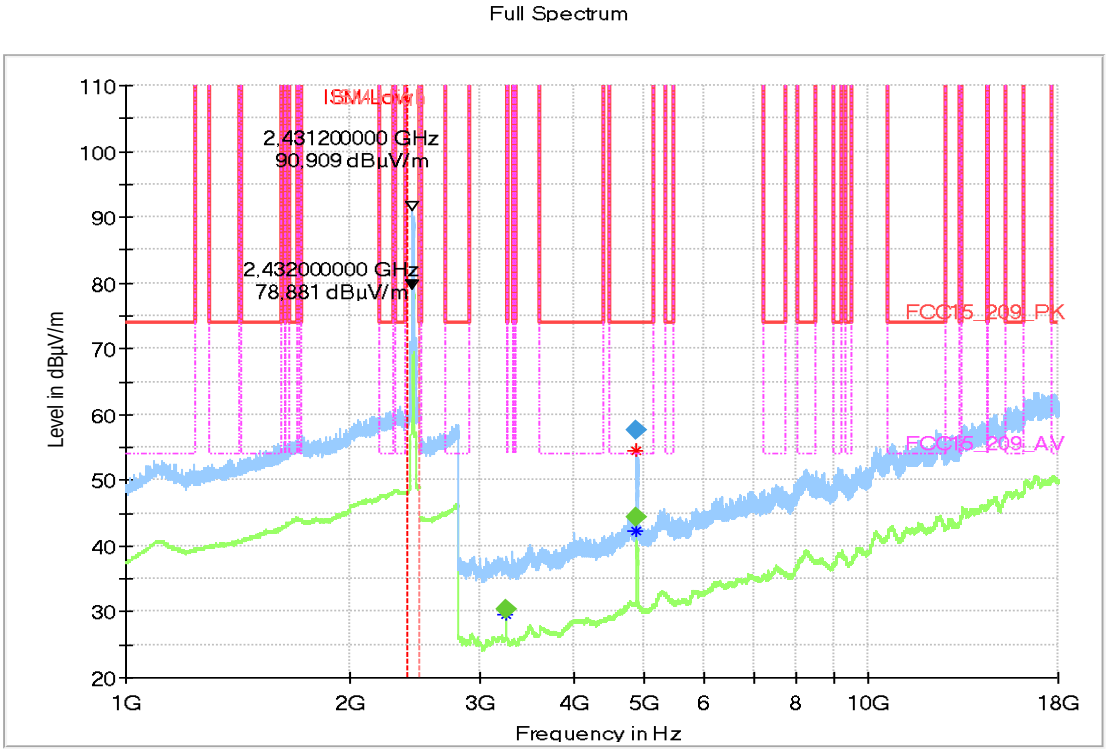
Diagram No.: 4.02a_RSE_Ch6_54Mbit_gMode_set2_laying

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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, CH:6/54Mbit / g mode
Operating Conditions:	Humidity: 37%; Temperature: 22°
Operator Name:	HEl
Comment:	mit Objektiv

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
----------	----------
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



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)
3249.320000	---	30.46	150.00	119.54	100.0	1000.000	155.0	V	152.0
4866.520000	57.65	---	74.00	16.35	100.0	1000.000	155.0	V	218.0
4872.720000	---	44.50	54.00	9.50	100.0	1000.000	155.0	V	219.0

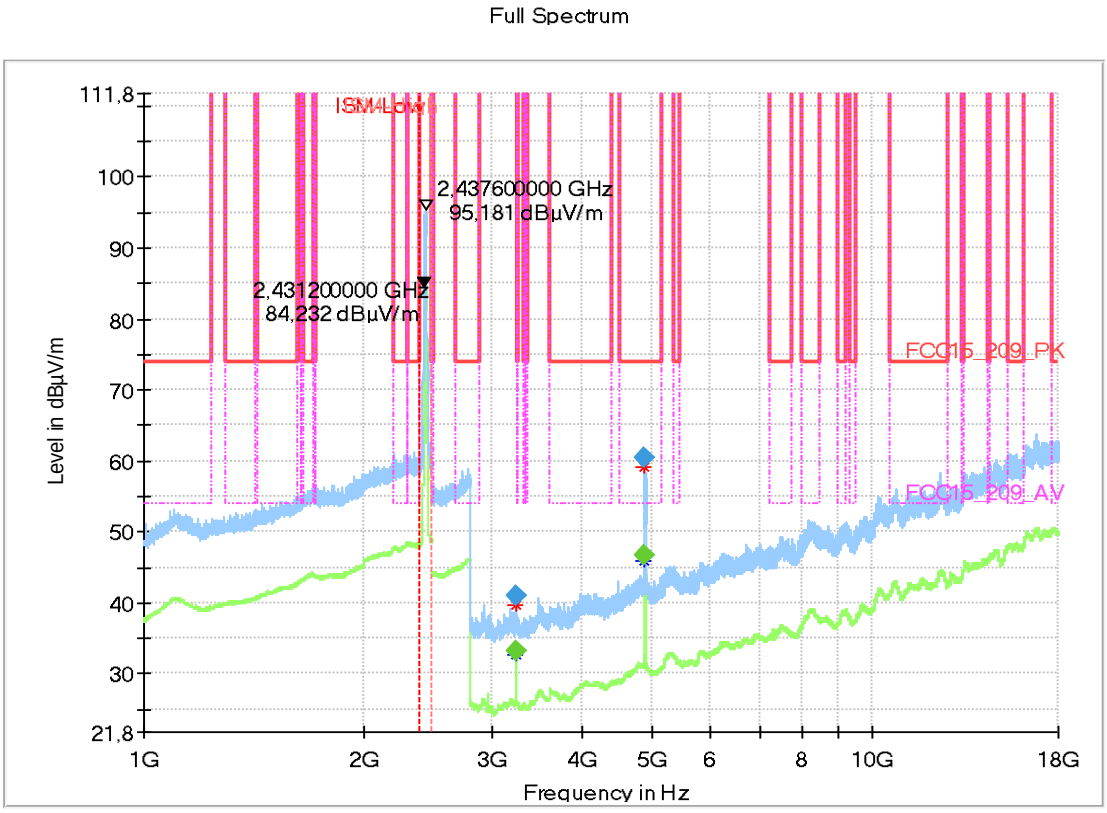
Diagram No.: 4.02b_RSE_Ch6_54Mbit_gMode_set2_standing

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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, CH:6/54Mbit / g mode
Operating Conditions:	Humidity: 37%; Temperature: 22°
Operator Name:	HEI
Comment:	mit Objektiv

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



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)
3249.320000	---	33.12	150.00	116.88	100.0	1000.000	155.0	H	139.0
3249.320000	40.93	---	150.00	109.07	100.0	1000.000	155.0	H	136.0
4869.200000	60.34	---	74.00	13.66	100.0	1000.000	155.0	H	188.0
4872.720000	---	46.62	54.00	7.38	100.0	1000.000	155.0	H	187.0

0.7.3. n-Mode Modulation

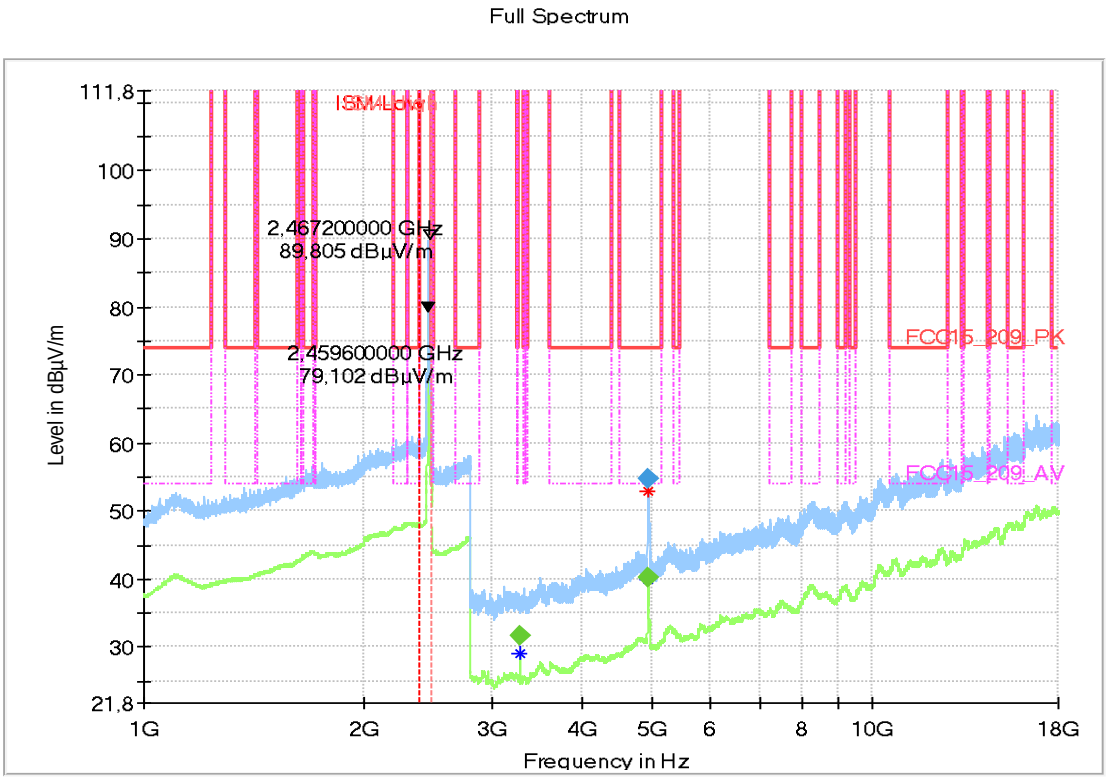
Diagram No.: 4.03a_RSE_Ch11_MCS7_nMode_set2_laying

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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, CH:11/MCS7 / n mode
Operating Conditions:	Humidity: 37%; Temperature: 22°
Operator Name:	HEl
Comment:	mit Objektiv

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
3282.640000	---	31.66	150.00	118.34	100.0	1000.000	155.0	V	152.0
4921.120000	54.80	---	74.00	19.20	100.0	1000.000	155.0	V	197.0
4922.720000	---	40.26	54.00	13.74	100.0	1000.000	155.0	H	223.0

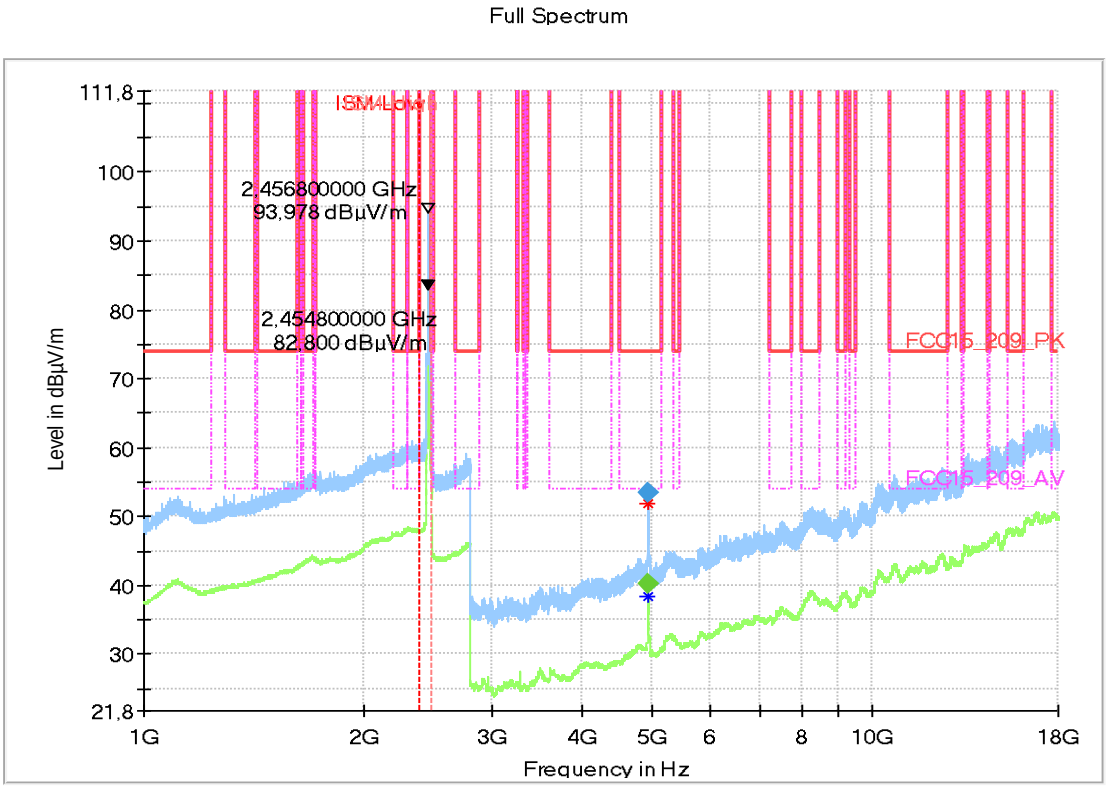
Diagram No.: 4.03b_RSE_Ch11_MCS7_nMode_set2_standing

Common Information

Test Description:	Band-Edge: Radiated Field Strength Emissions Emissions 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, CH:11/MCS7 / n mode
Operating Conditions:	Humidity: 37%; Temperature: 22°
Operator Name:	HEI
Comment:	mit Objektiv

EUT Information

Manufacturer:	Leica Camera AG-
Model:	-
Type:	-
---	---
EUT:	-
HW version:	Prototype-
SW version:	0.18.10.2-
SVN:	-
Config:	-
Serial number:	P-001
Connected Interfaces:	-
Power Supply:	-
Comments:	Sample Nr. 119-

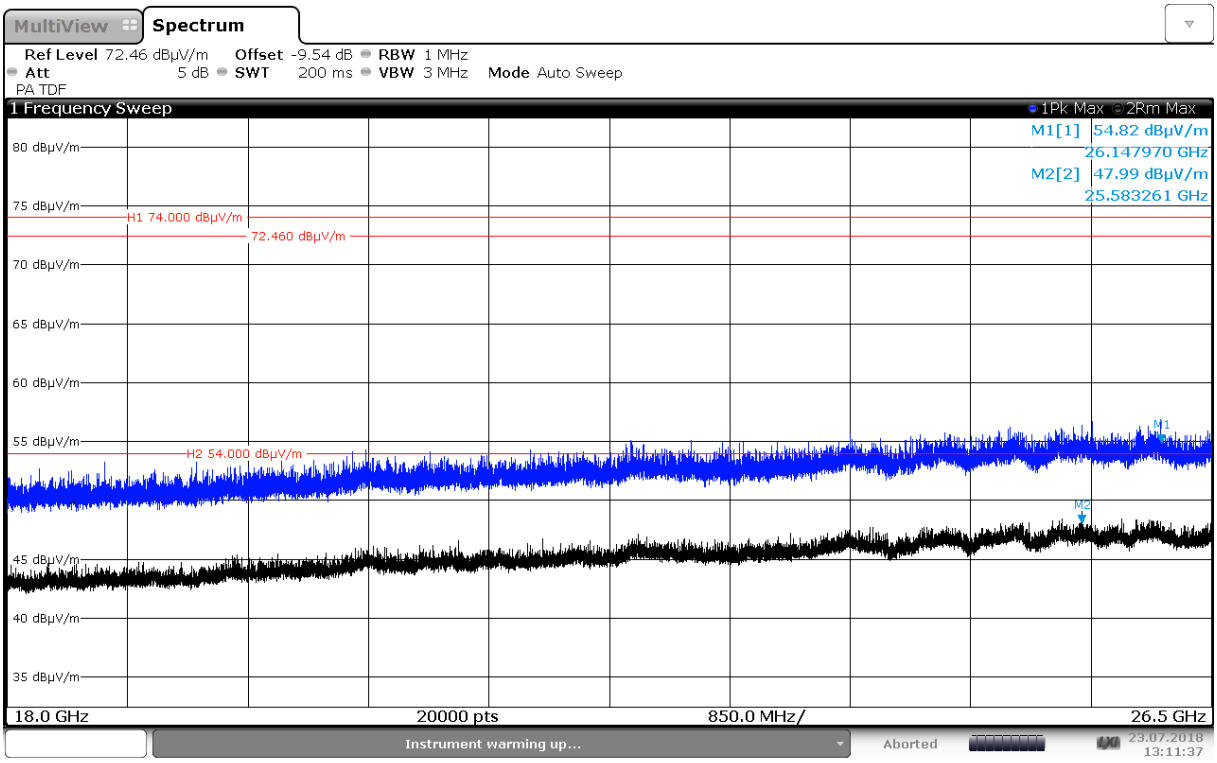


Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
4918.000000	53.43	---	74.00	20.57	100.0	1000.000	155.0	V	113.0
4925.200000	---	40.11	54.00	13.89	100.0	1000.000	155.0	V	114.0

0.8. Field strength measurements 18GHz < f < 26.5GHz

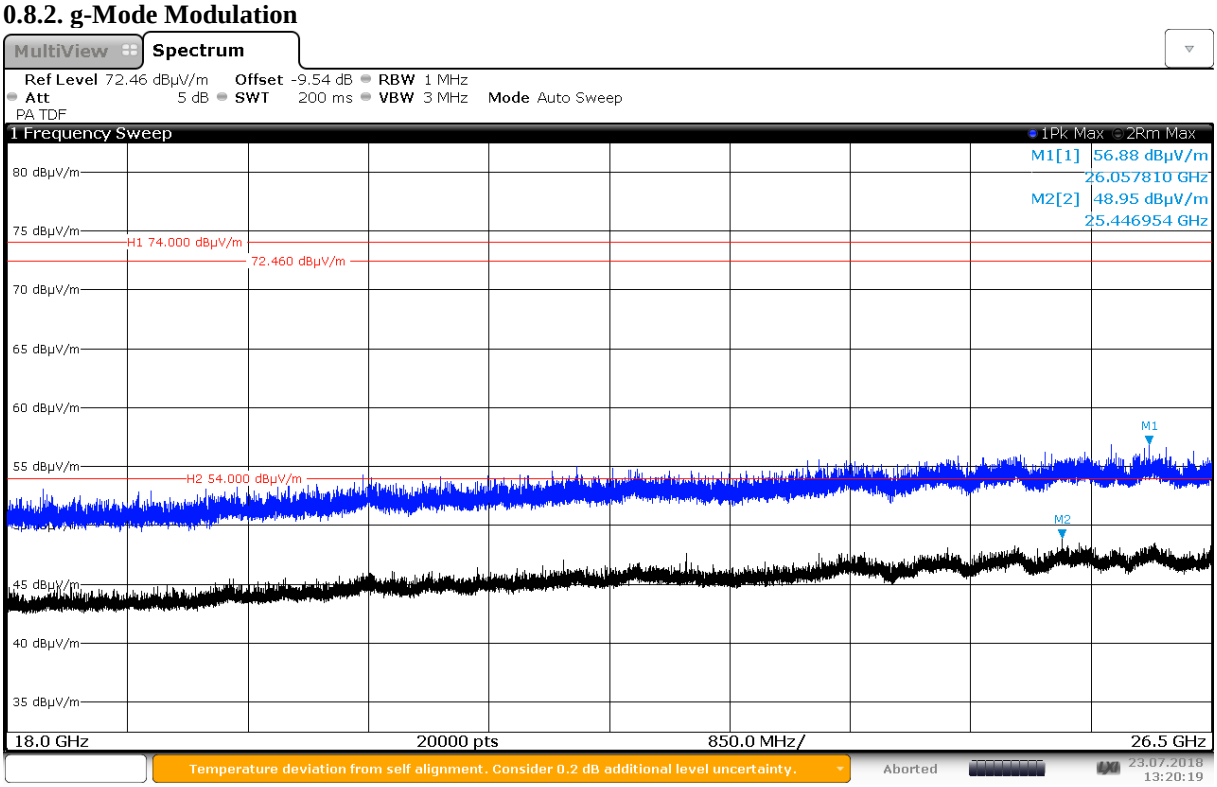
0.8.1. b-Mode Modulation



13:11:38 23.07.2018

Diagram No.: 8.101_RSE_bis26_5GHz_Ch1_1MBit_Setup2

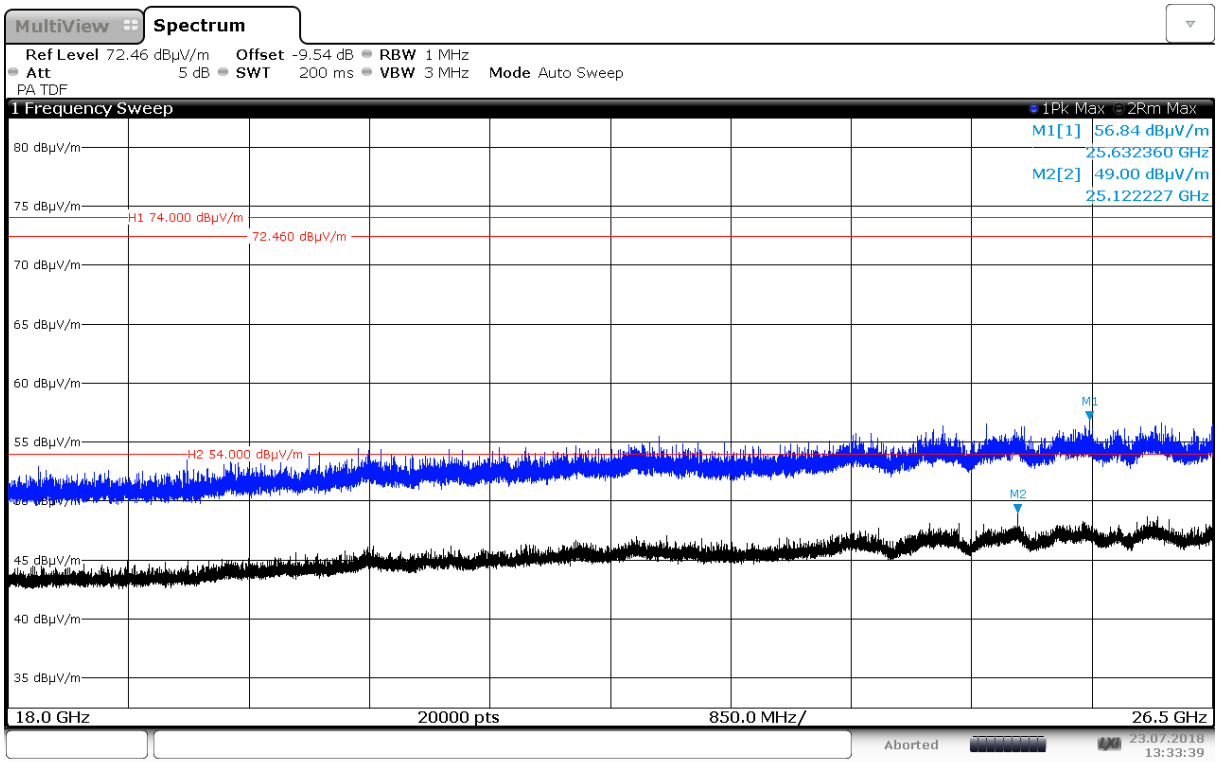
0.8.2. g-Mode Modulation



13:20:20 23.07.2018

Diagram No.: 8.102_RSE_bis_26_5GHz_Ch6_54MBit_Setup2

0.8.3. n-Mode Modulation



13:33:40 23.07.2018

Diagram No.: 8.103_RSE_bis_26_5GHz_Ch11_MCS7_Setup2

0.9.Radiated band-edge measurements accord. §15.209 & §15.205 (§15.247)

0.9.1. Channel 1, b-Mode (left band edge)

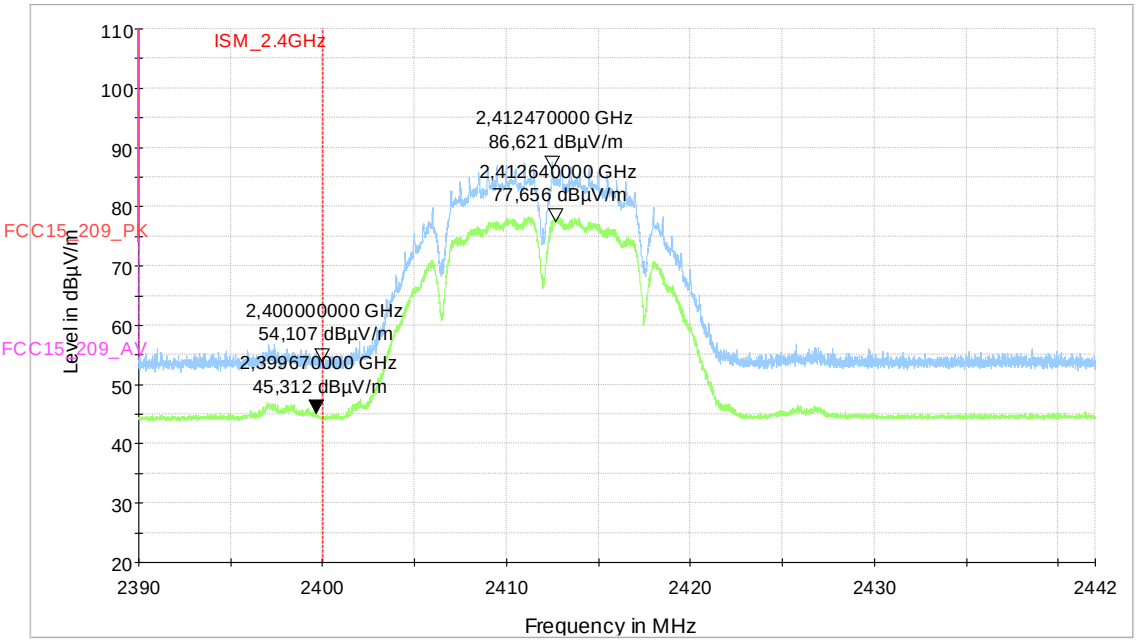


Diagram 7: 9.01a_BE_Low_Ch1_1Mbit_set1_standing

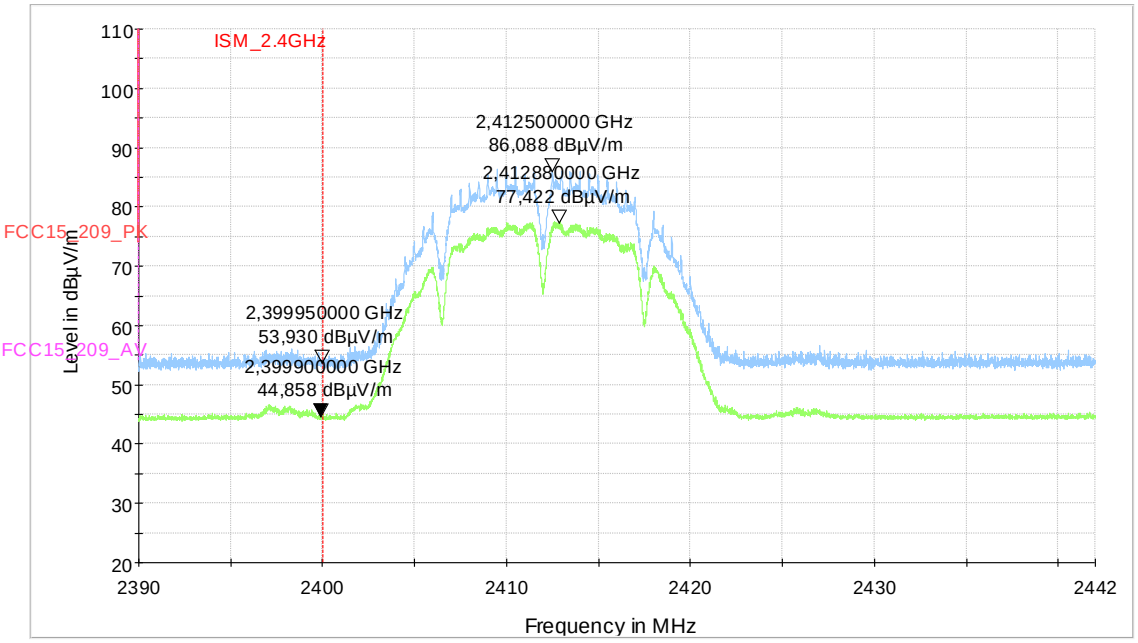


Diagram 8: 9.01b_BE_Low_Ch1_1Mbit_set1_laying

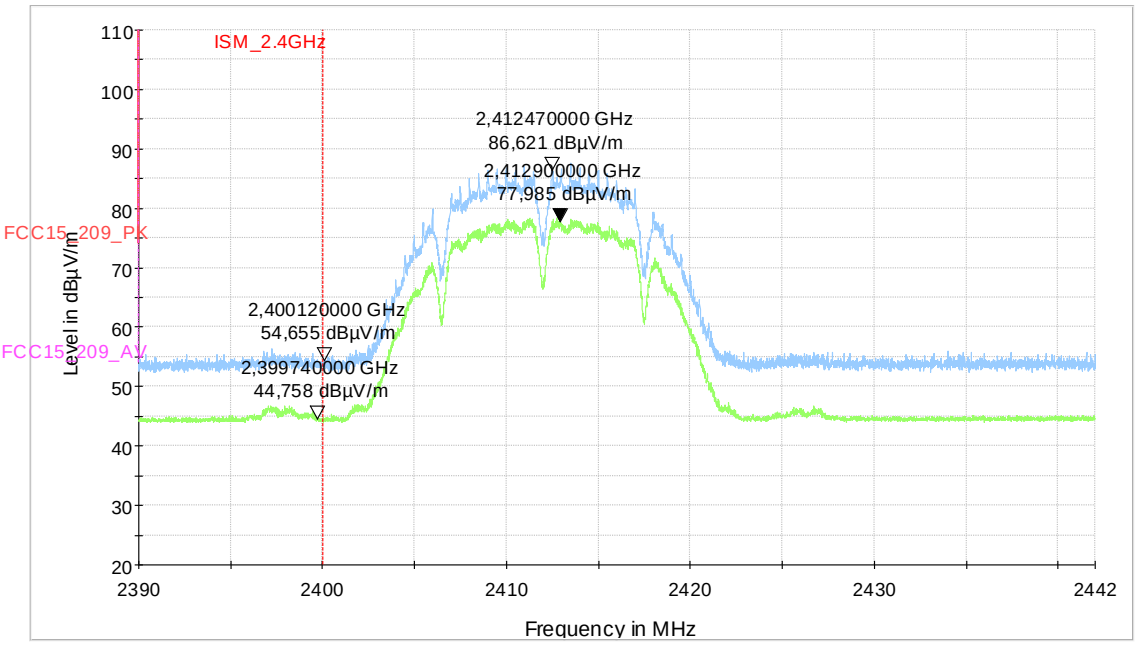


Diagram 9: 9.02a_BE_Low_Ch1_1Mbit_set2_standing

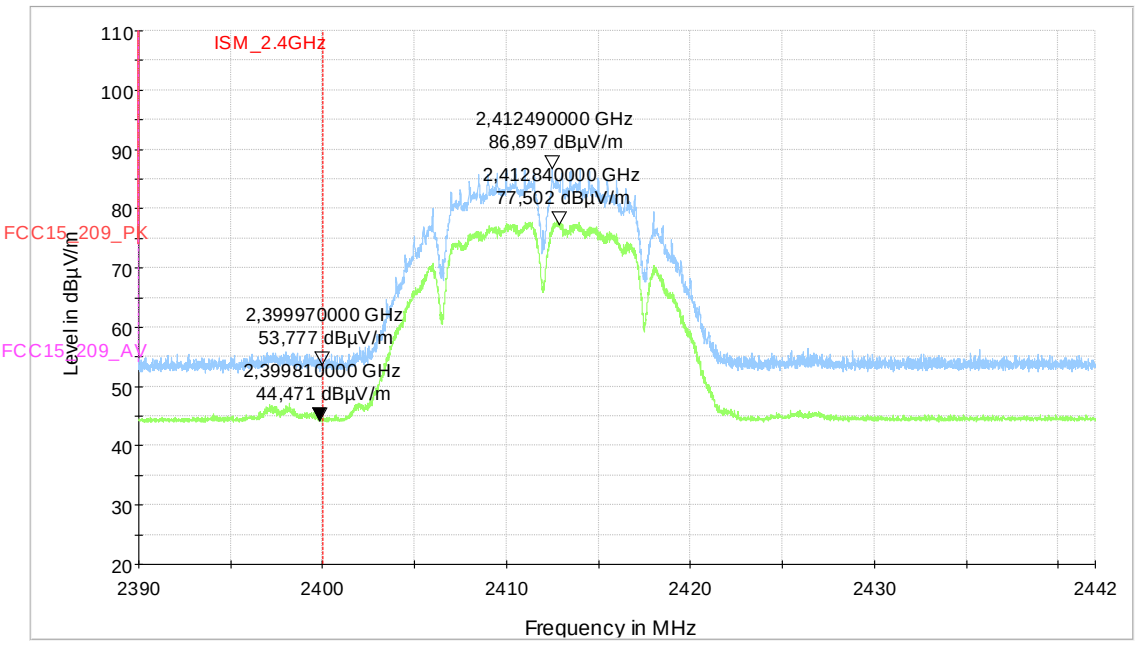
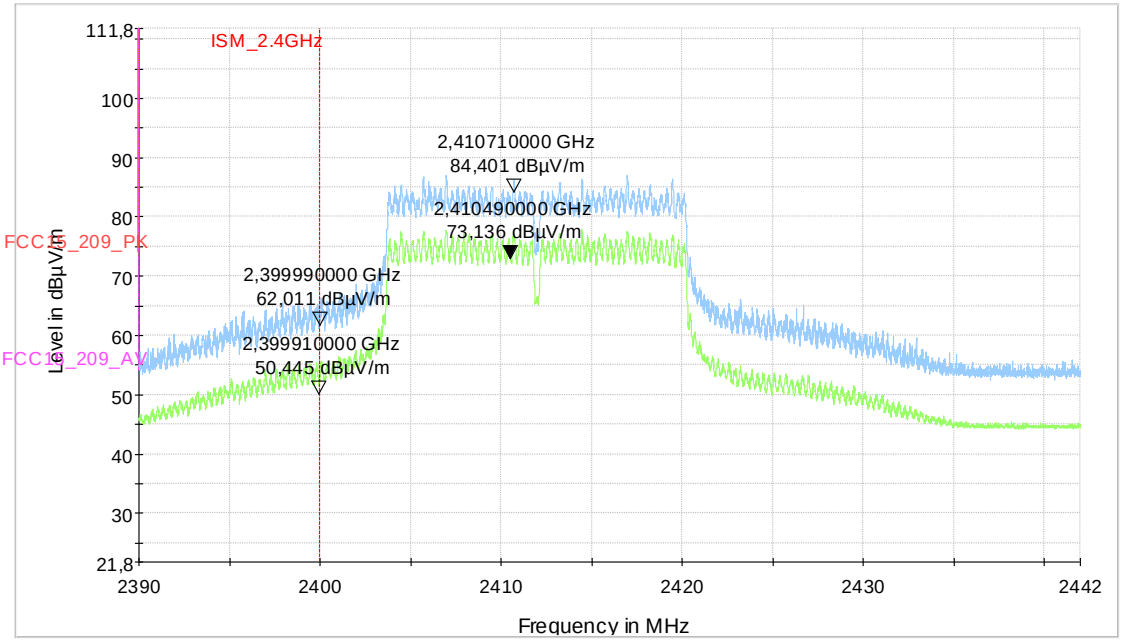
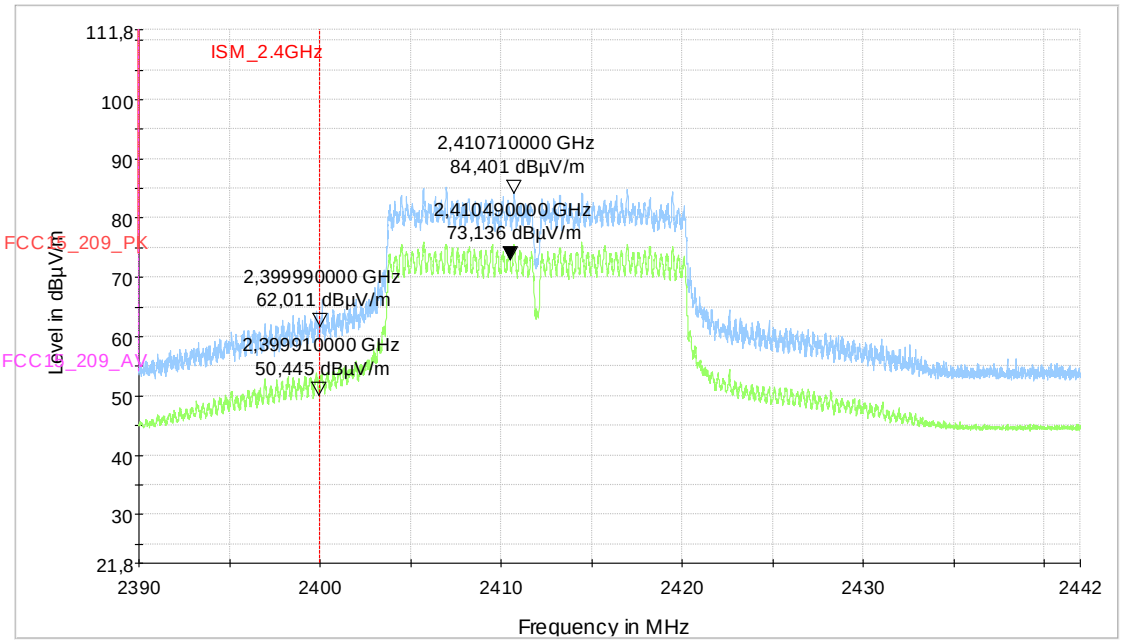


Diagram 10: 9.02b_BE_Low_Ch1_1Mbit_set2_laying

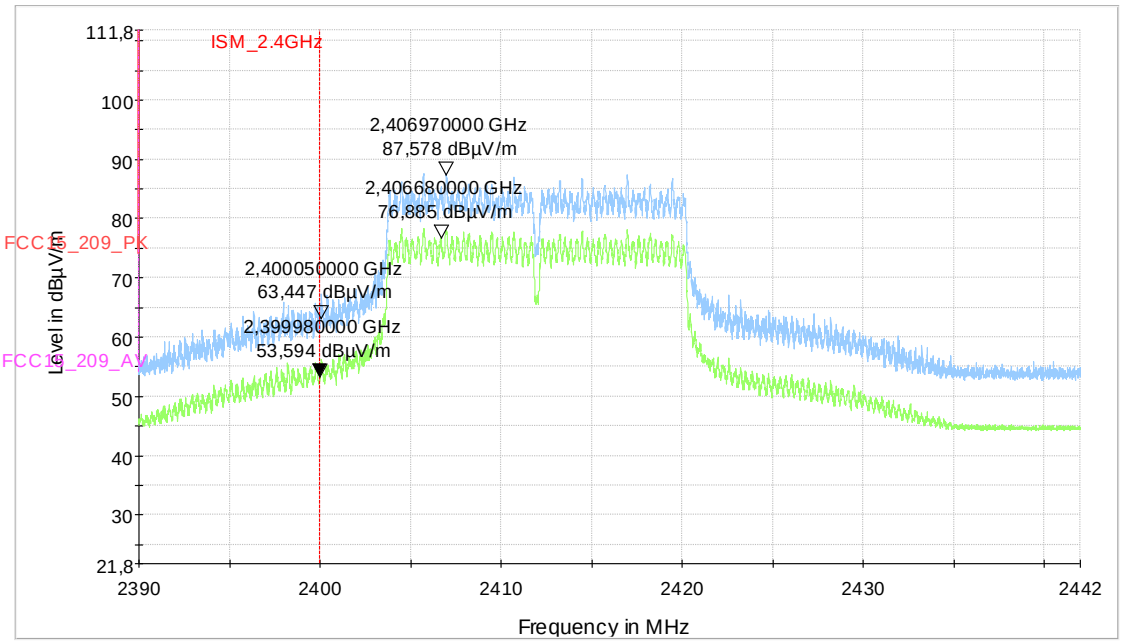
0.9.2. Channel 1, g-Mode (left band edge)



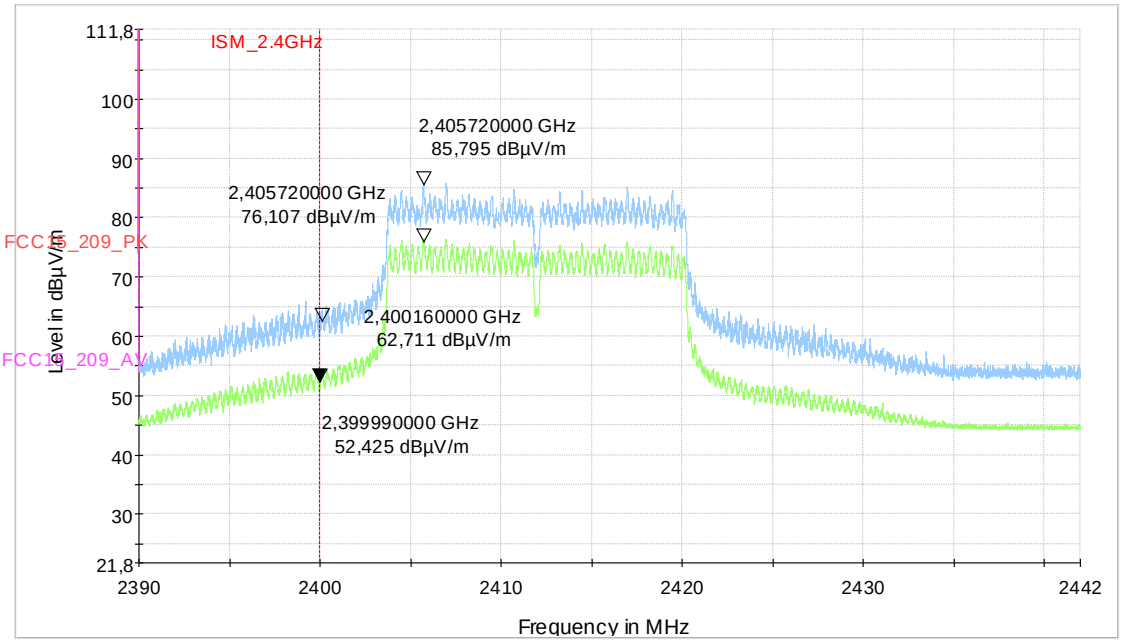
Photograph 11: 9.03a_BE_Low_Ch1_54Mbit_set1_standing



Photograph 12: 9.03b_BE_Low_Ch1_54Mbit_set1_laying

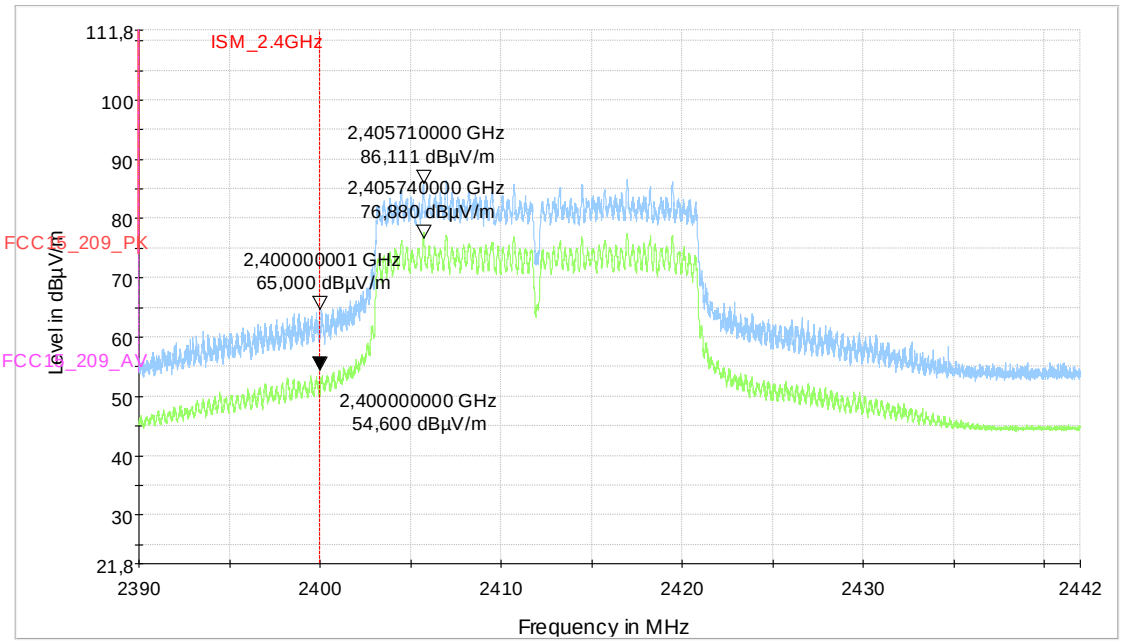


Photograph 13: 9.04a_BE_Low_Ch1_54Mbit_set2_standing

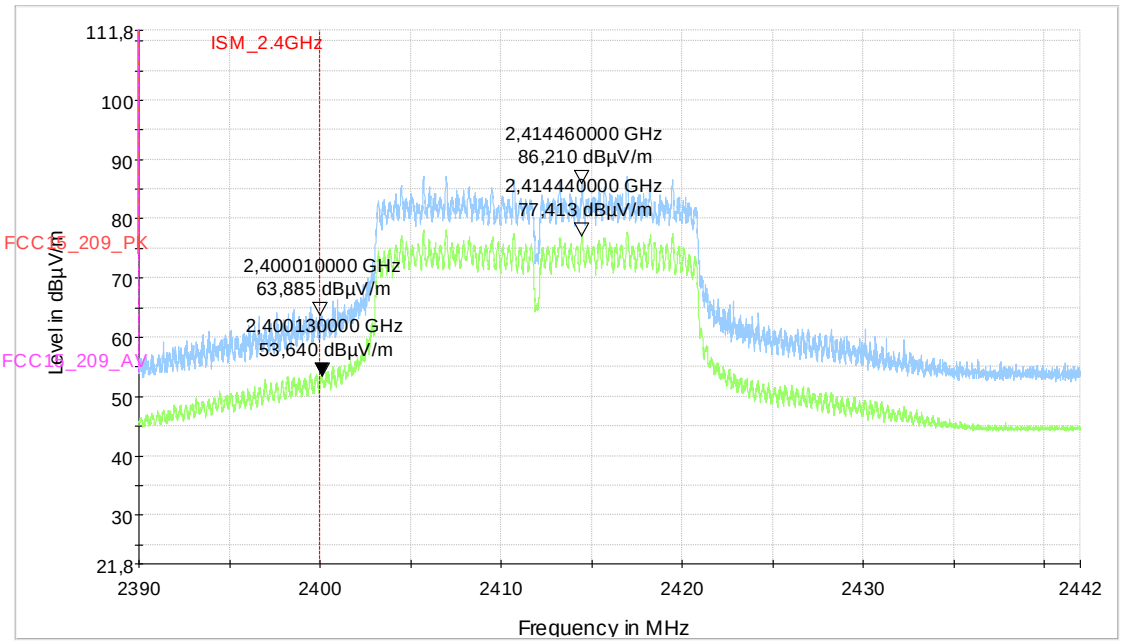


Photograph 14: 9.04b_BE_Low_Ch1_54Mbit_set2_laying

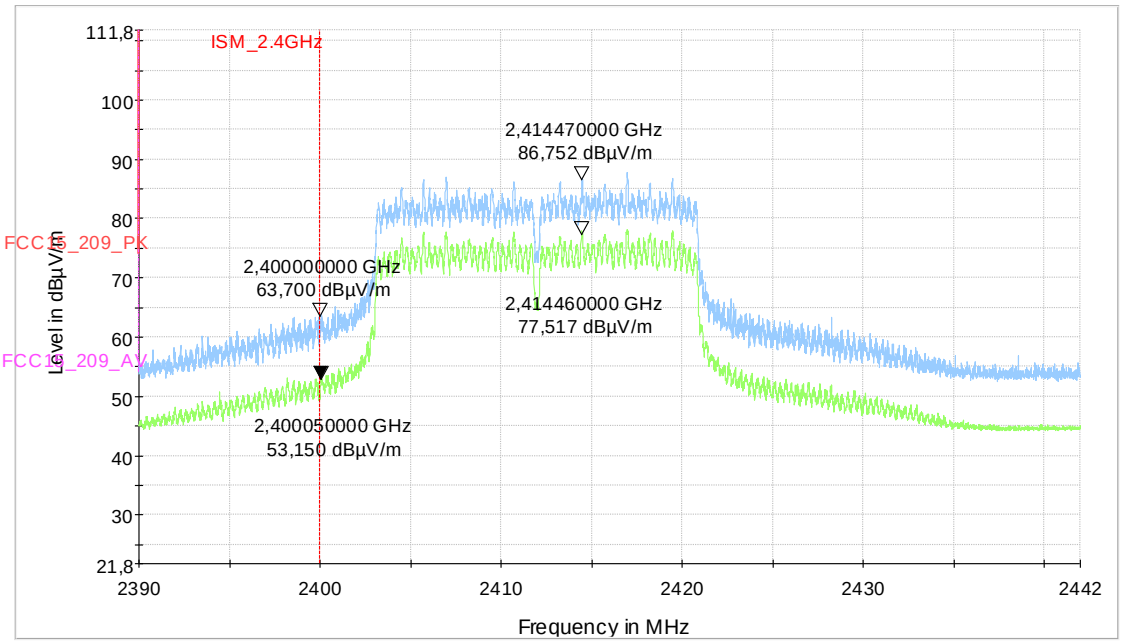
0.9.3. Channel 1, n-Mode (left band edge)



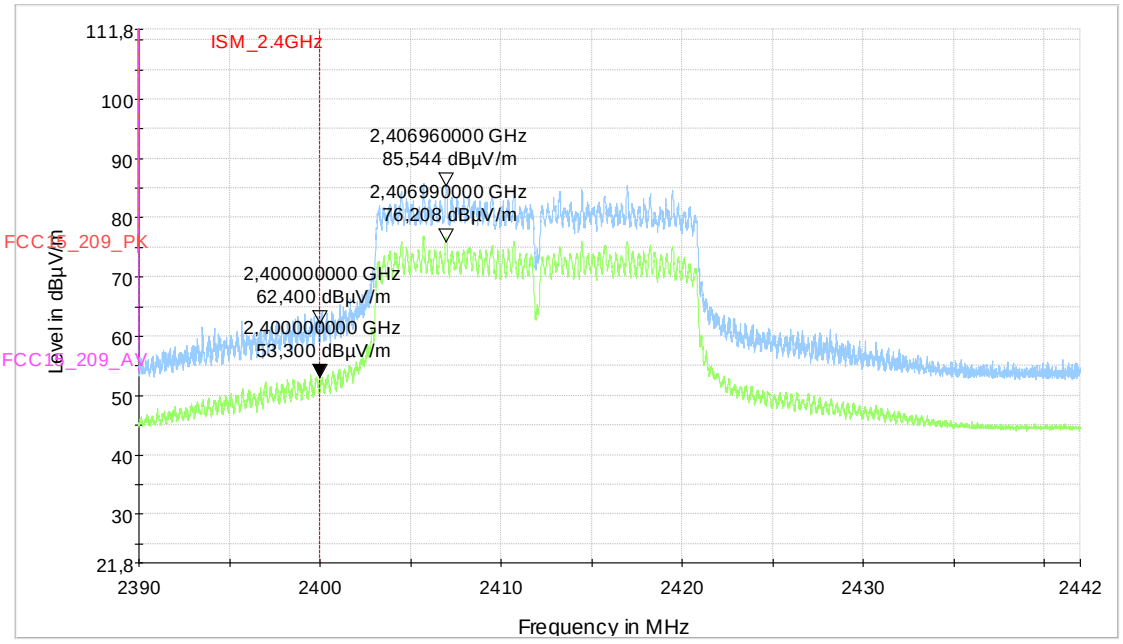
Photograph 15: 9.05a_BE_Low_Ch1_MCS7_set1_standing



Photograph 16: 9.05b_BE_Low_Ch1_MCS7_set1_laying



Photograph 17: 9.06a_BE_Low_Ch1_MCS7_set2_standing



Photograph 18: 9.06b_BE_Low_Ch1_MCS7_set2_laying

0.9.4. Channel 11, b-Mode (right band edge)

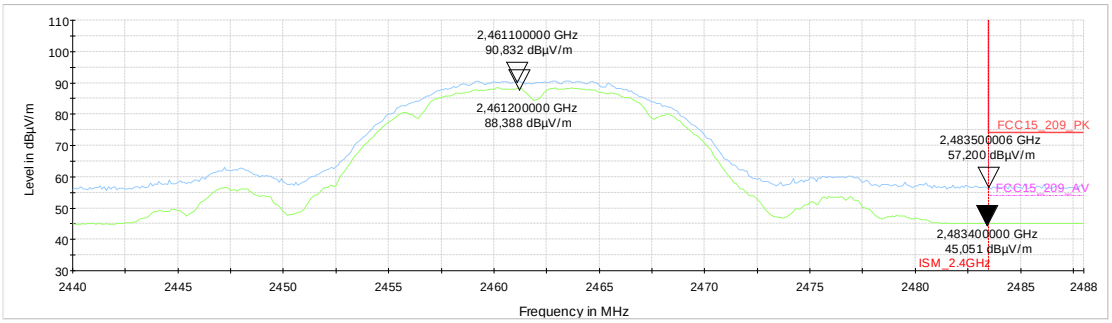


Diagram 19: 9.07a_BE_High_Ch11_1Mbit_set1_standing

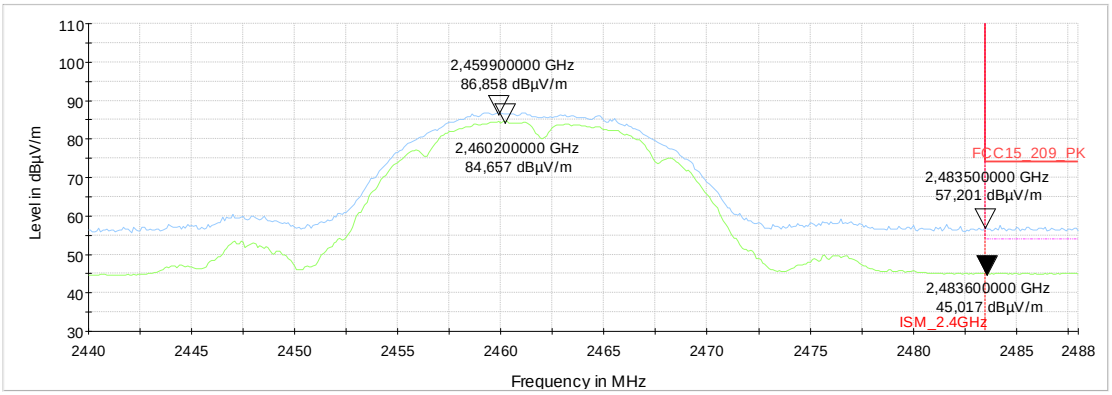


Diagram 20: 9.07b_BE_High_Ch11_1Mbit_set1_laying

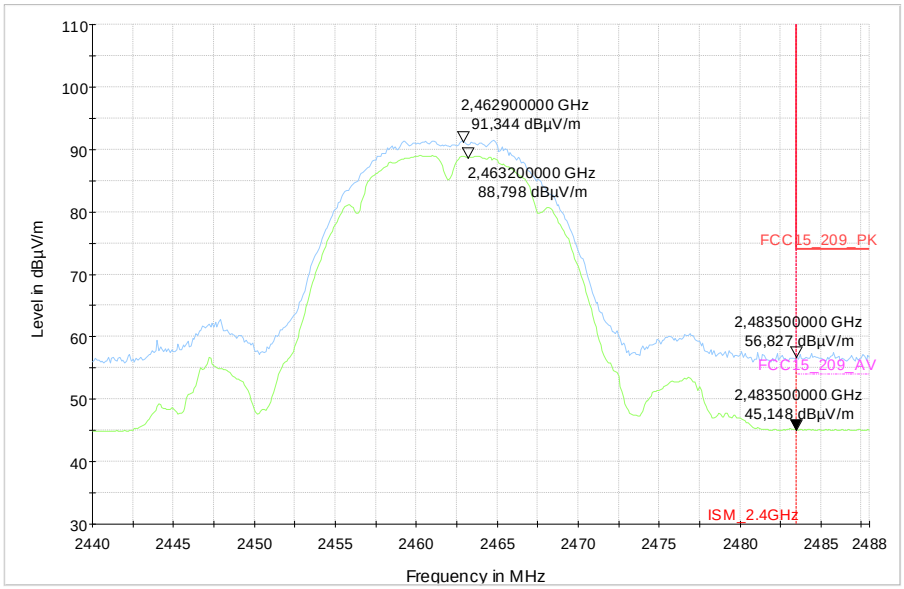


Diagram 21: 9.08a_BE_High_Ch11_1Mbit_set2_standing

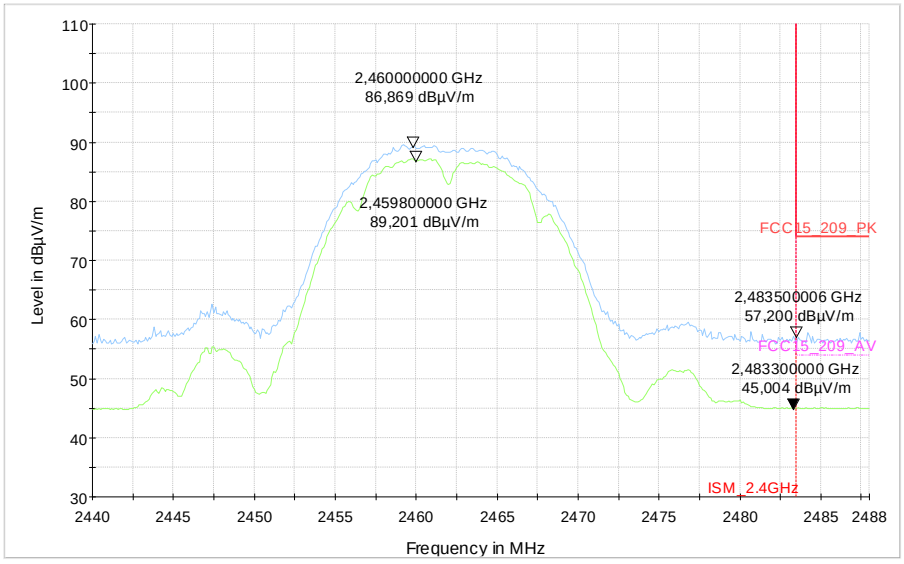


Diagram 22: 9.08b_BE_High_Ch11_1Mbit_set2_laying

0.9.5. Channel 11, g-Mode (right band edge)

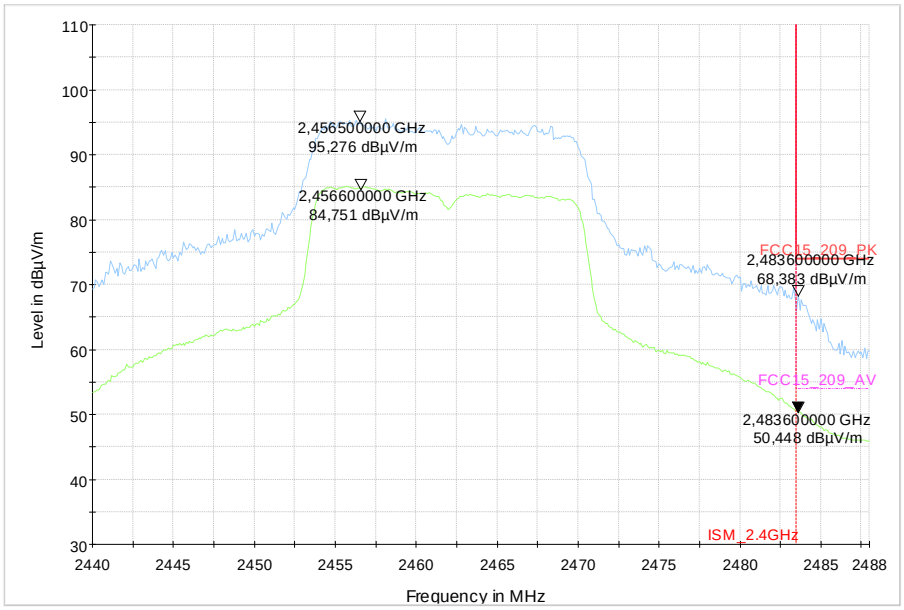


Diagram 23: 9.09a_BE_High_Ch11_54Mbit_set1_standing

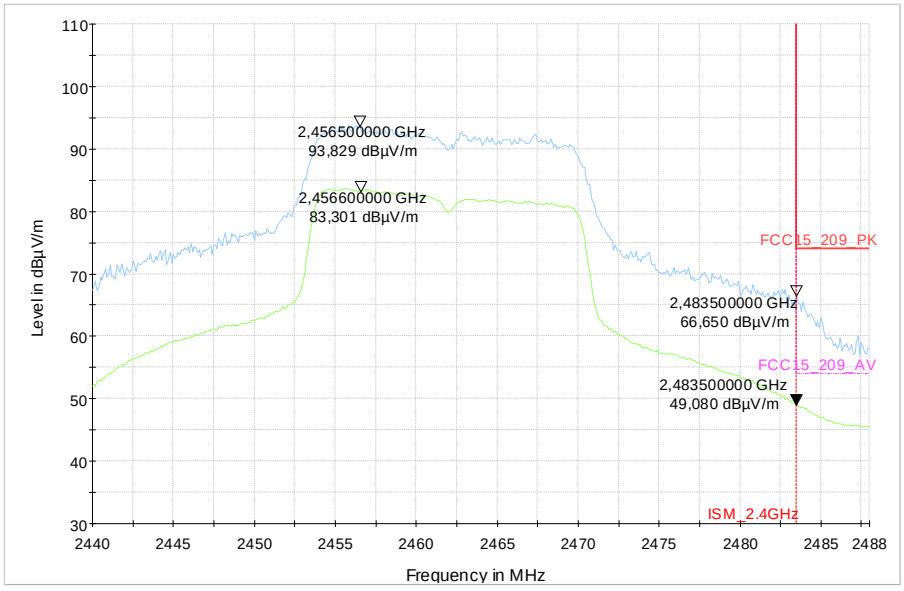


Diagram 24: 9.09b_BE_ High _Ch11_54Mbit_set1_laying

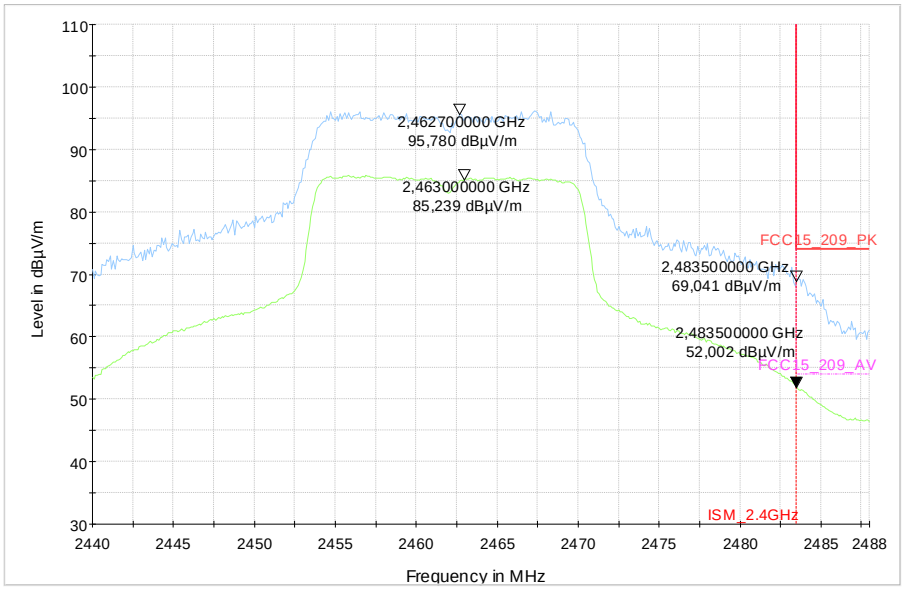


Diagram 25: 9.10a_BE_ High _Ch11_54Mbit_set2_standing

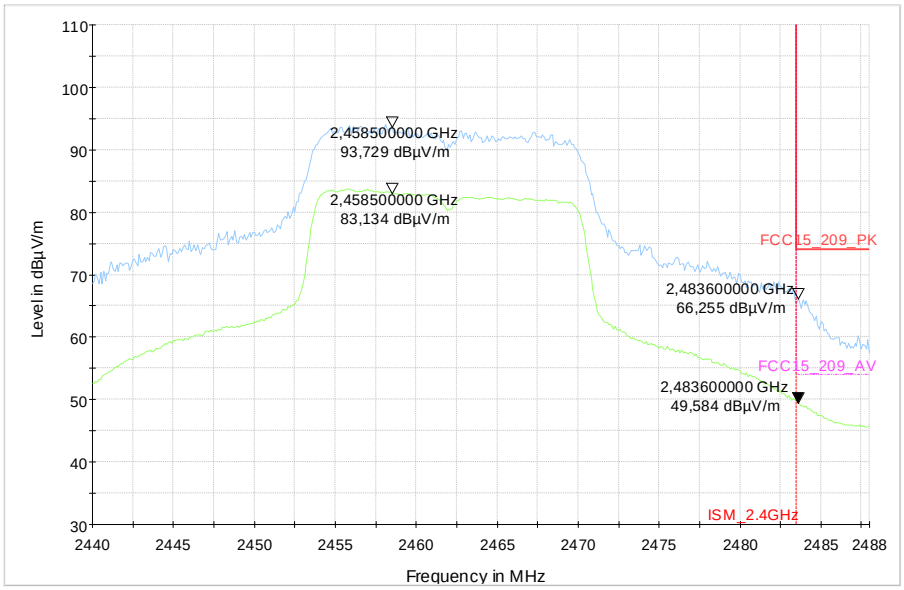


Diagram 26: 9.10b_BE_ High _Ch11_54Mbit_set2_laying

0.9.6. Channel 11, n-Mode (right band edge)

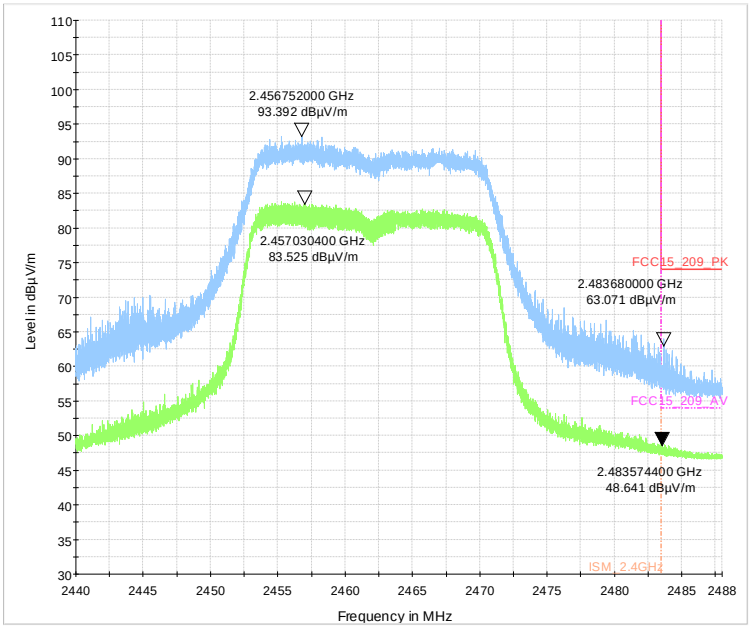


Diagram 27: 9.16a_BE_high_ch11_MCS7_set2_laying

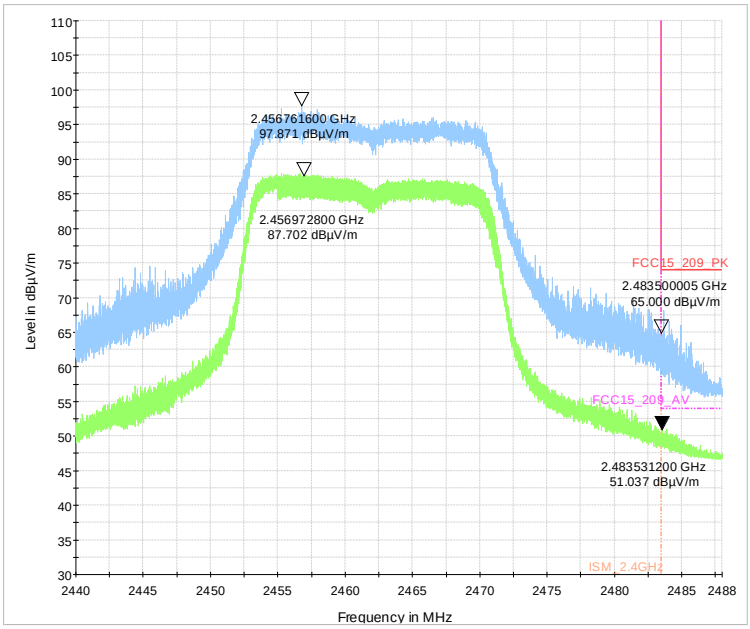


Diagram 28: 9.16a_BE_high_ch11_MCS7_set2_standing

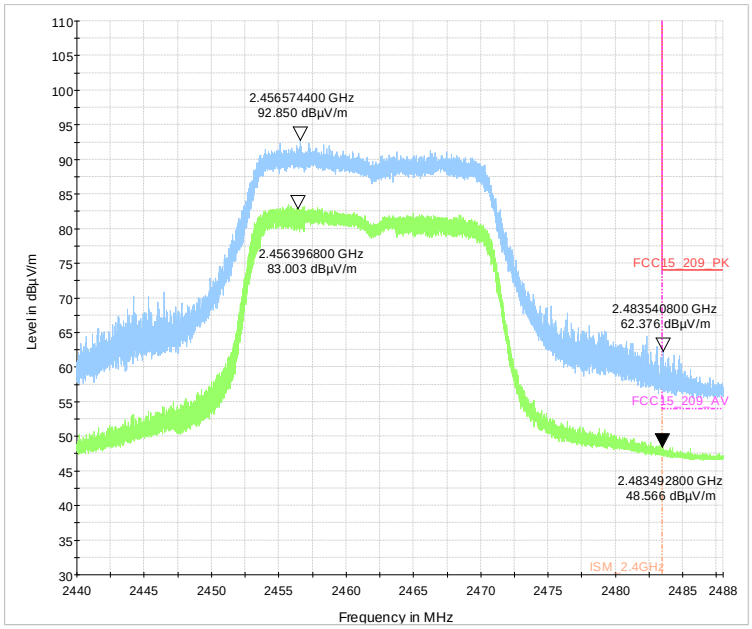


Diagram 29: 9.17b_BE_high_ch11_MCS7_set1_laying

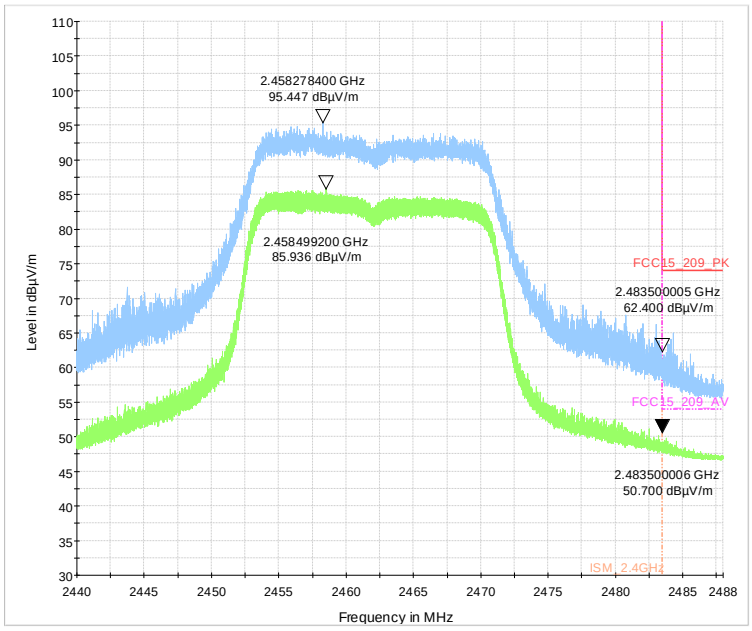


Diagram 30: 9.17b_BE_high_ch11_MCS7_set1_standing

0.10. Conducted RF-measurements on antenna port

0.10.1. Conducted RF-power (Average)

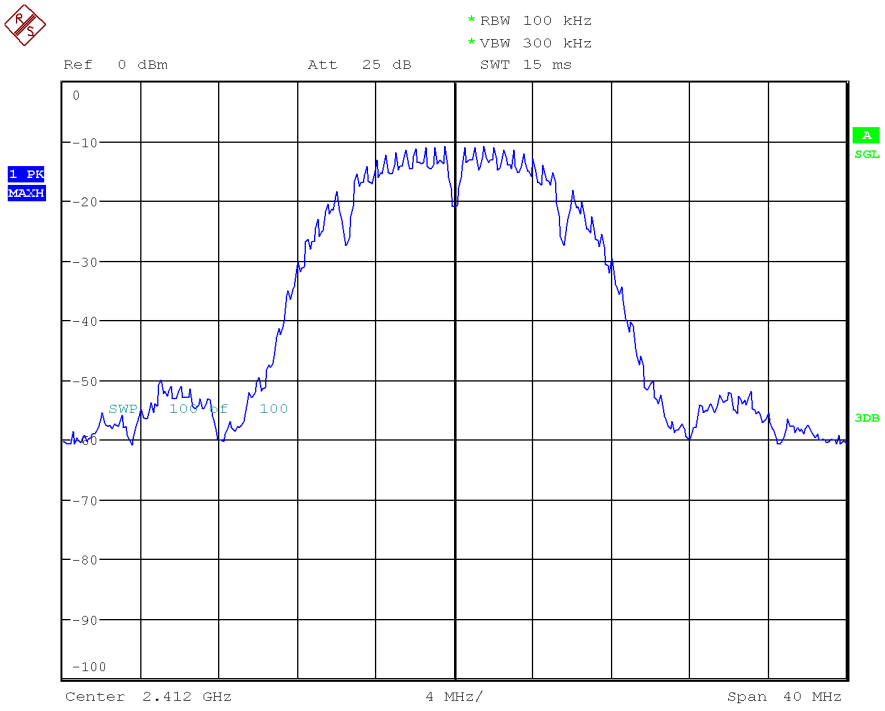
Duty-Cycle	b-mode		Channel no. / [dBm]			Max-Value / [dBm]
	Data rate	Modulation	1	6	11	
0,0264331	1MBit		8,85	9,28	9,08	9,28
0,0378754	2Mbit		8,82	9,21	9,07	
0,11443151	5.5Mbit		8,84	9,26	9,08	
0,20568435	11MBit		8,50	9,25	9,07	
	22MBit					

Duty-Cycle	g-Mode		Channel no. / [dBm]			Max-Value / [dBm]
	Data rate	Modulation	1	6	11	
0,15871129	6Mbit		8,77	9,46	9,62	10,55
--	9Mbit		--	--	--	
0,30322492	12Mbit		8,78	9,58	9,57	
0,44120131	18Mbit		8,82	9,57	9,51	
0,57123332	24Mbit		8,83	9,60	9,54	
0,81025676	36Mbit		9,54	10,27	10,40	
1,02509222	48Mbit		9,60	10,41	10,49	
1,10922299	54MBit		9,65	10,38	10,55	

Duty-Cycle	n-Mode HT20 (1 spatial stream: 1SS)		Channel no. / [dBm]			Max-Value / [dBm]
	Data rate	Modulation	1	6	11	
0,16760198	MCS0 -6.5Mbps	BPSK	8,77	9,46	9,50	10,61
0,31937671	MCS1 - 13Mbps	QPSK	8,80	9,45	9,49	
0,46008316	MCS2 - 19.5Mbps	QPSK	8,84	9,49	9,51	
0,59335818	MCS3 - 26Mbps	QAM16	8,91	9,58	9,62	
0,82505402	MCS4 -39Mbps	QAM16	9,05	9,68	9,74	
1,02353636	MCS5 - 52MBps	QAM64	9,63	10,38	10,55	
1,08670747	MCS6 - 58.5MBps	QAM64	9,62	10,42	10,61	
1,18154611	MCS7 - 65MBps	QAM64	9,60	10,42	10,50	

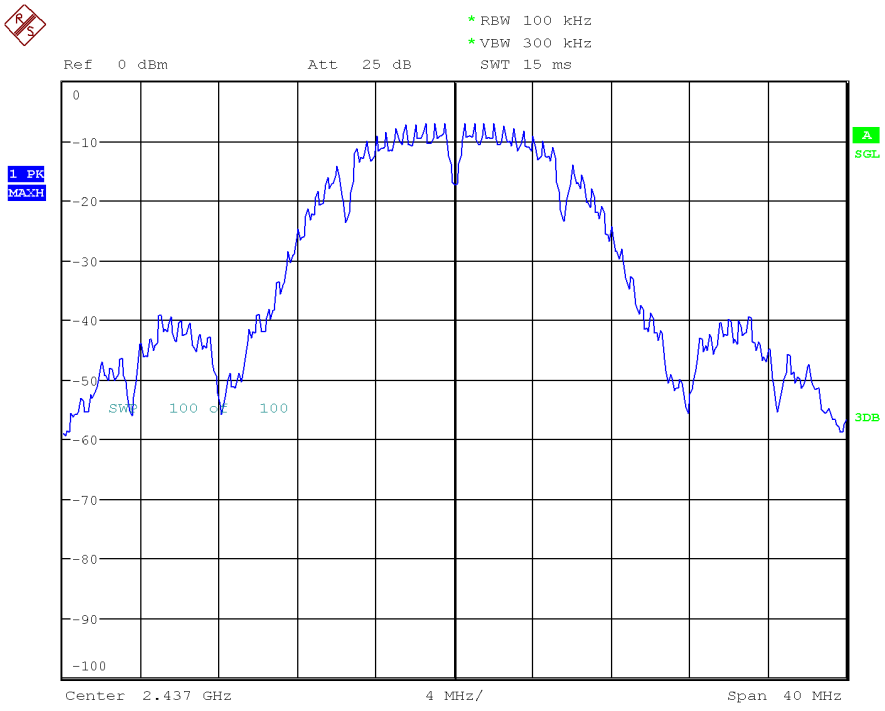
Remark: 9Mbit not supported modulation rate/scheme

0.10.2. 6-dB Bandwidth
0.10.3. 6-dB Bandwidth (b-Mode)



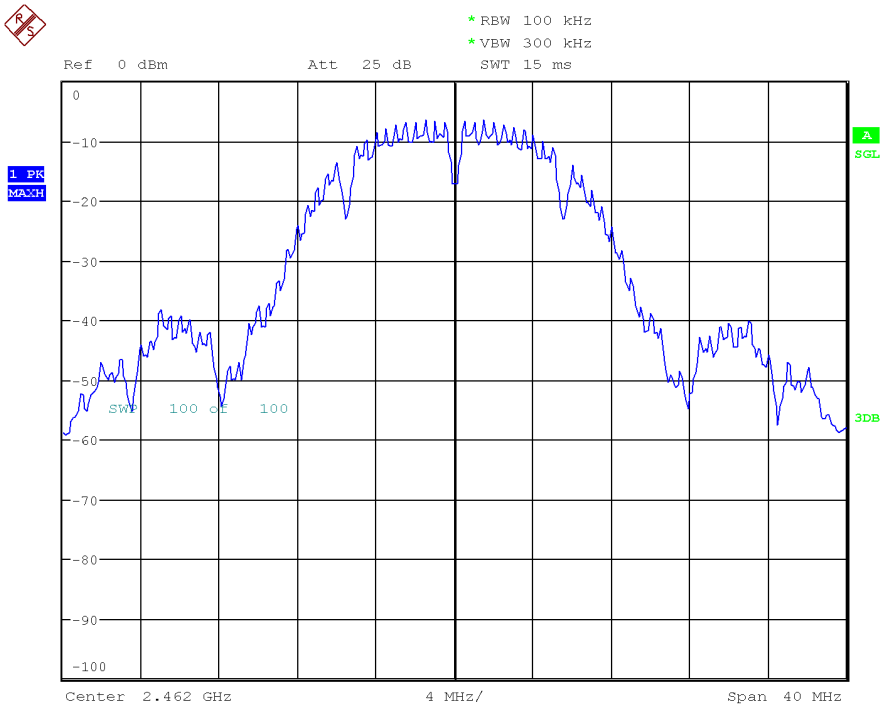
Date: 20.APR.2018 11:58:52

Channel 1 - 6dB-Bandwidth, b-Mode, 1Mbit



Date: 20.APR.2018 12:12:21

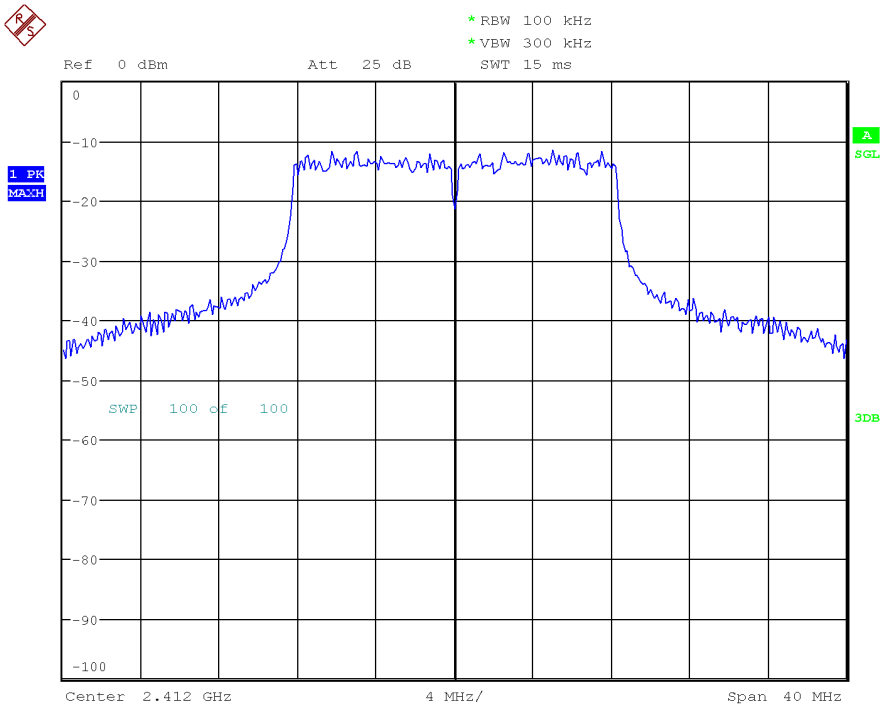
Channel 6 - 6dB-Bandwidth, b-Mode, 1MBit



Date: 20.APR.2018 13:08:23

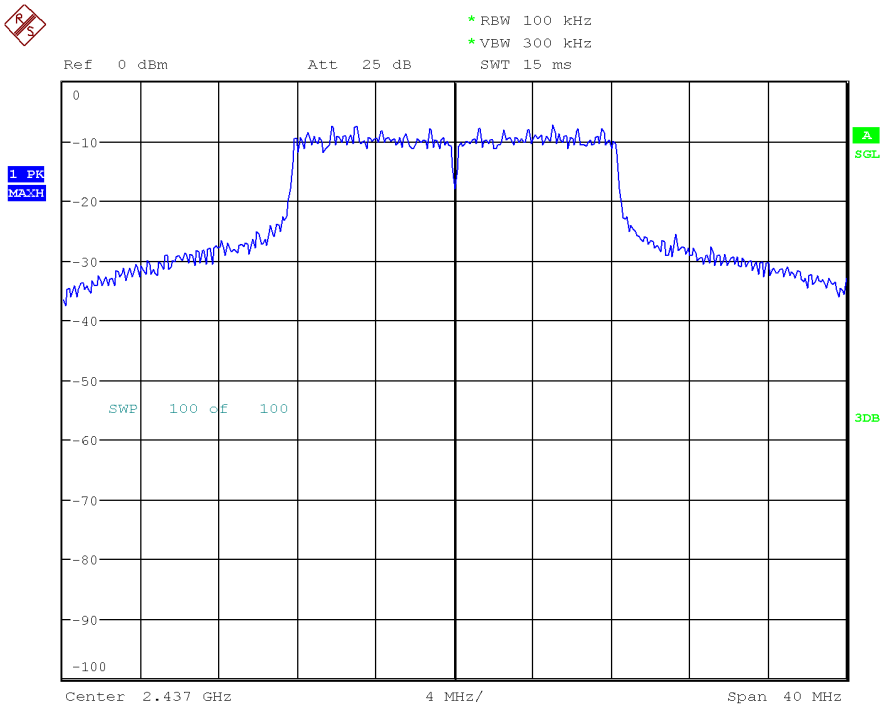
Channel 11 - 6dB-Bandwidth, b-Mode, 1MBit

0.10.4. 6-dB Bandwidth (g-Mode)



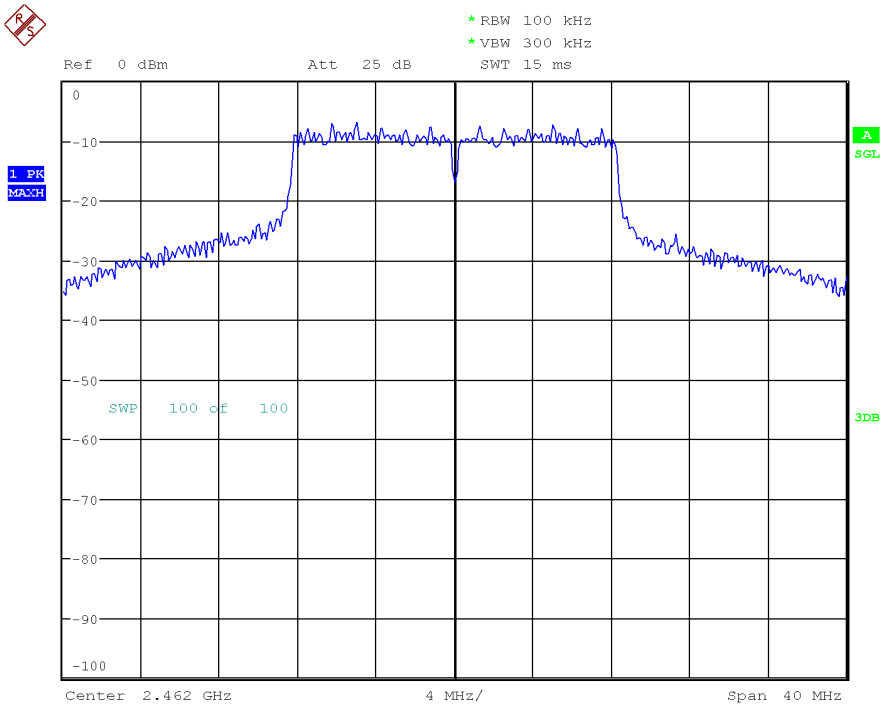
Date: 20.APR.2018 13:31:33

Channel 1 - 6dB-Bandwidth, g-Mode, 54MBit



Date: 20.APR.2018 13:50:25

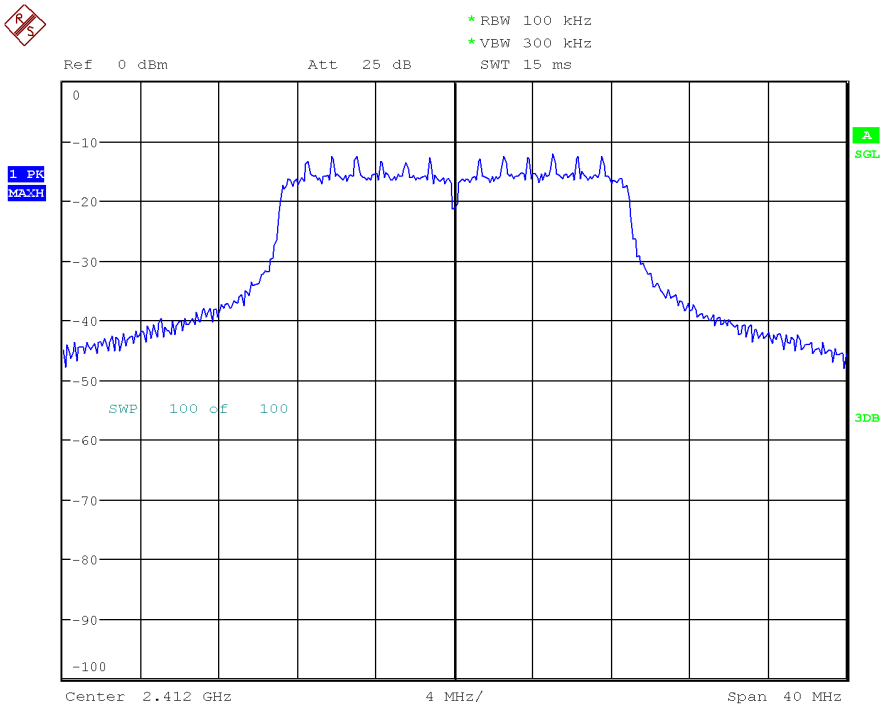
Channel 6 - 6dB-Bandwidth, g-Mode, 54MBit



Date: 20.APR.2018 14:07:22

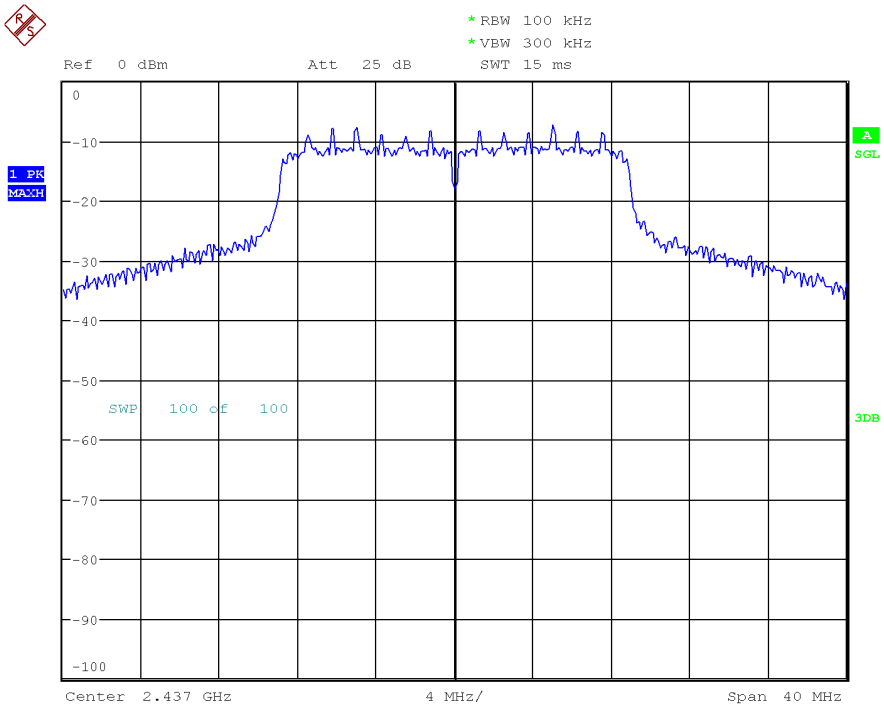
Channel 11 - 6dB-Bandwidth, g-Mode, 54MBit

0.10.5. 6-dB Bandwidth (n-Mode, MCS0)



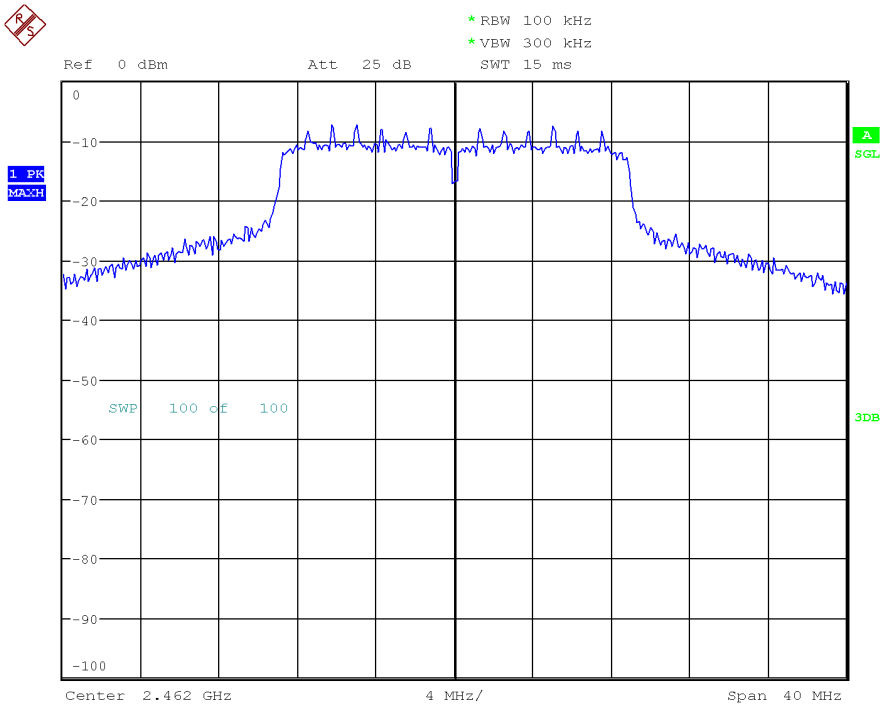
Date: 20.APR.2018 14:32:38

Channel 1 - 6dB-Bandwidth, MCS0



Date: 20.APR.2018 14:52:58

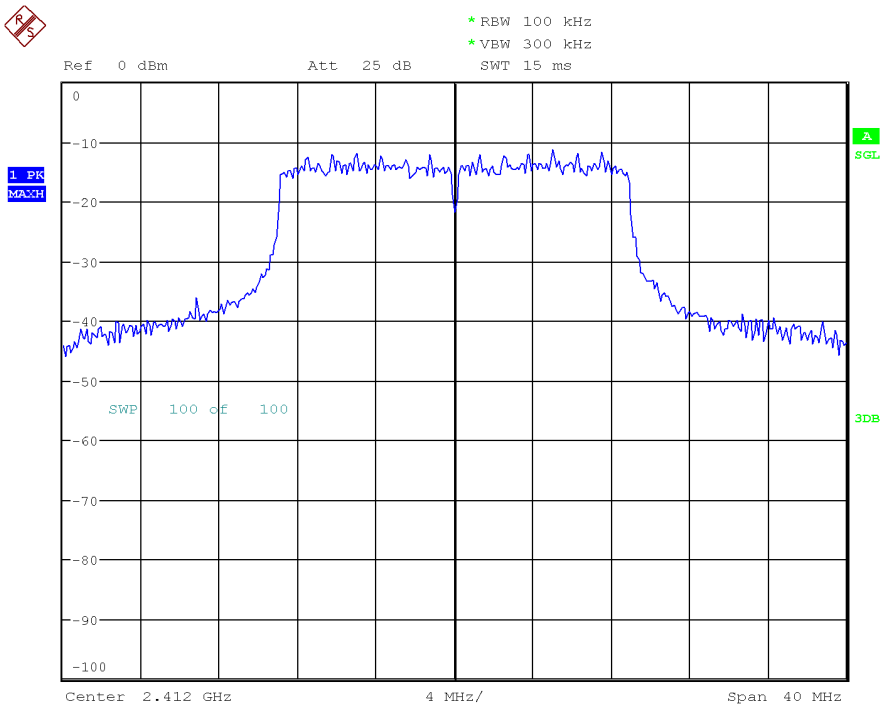
Channel 6 - 6dB-Bandwidth, MCS0



Date: 20.APR.2018 15:16:06

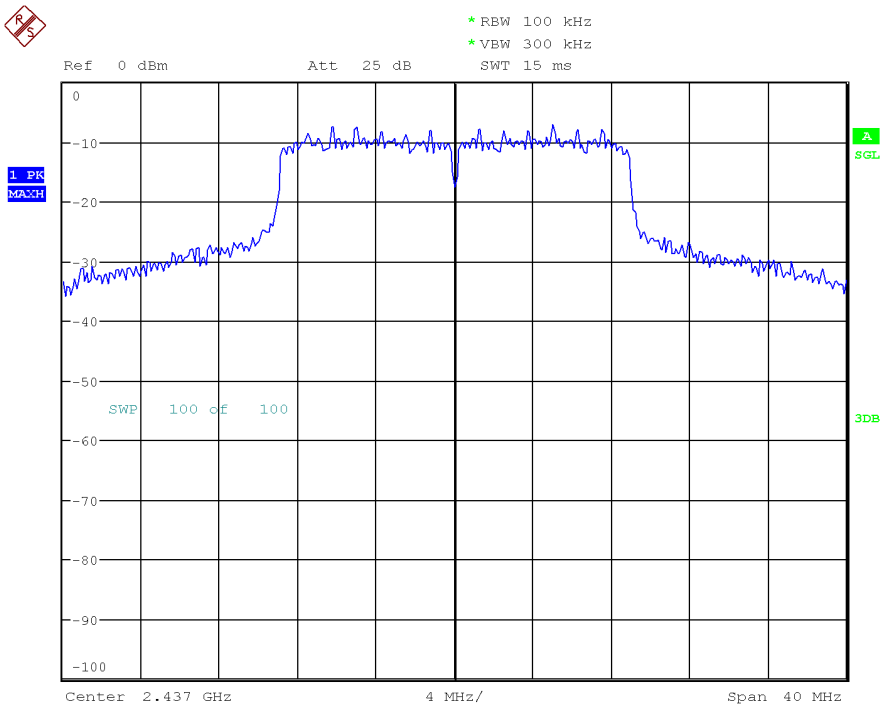
Channel 11 - 6dB-Bandwidth. MCS0

0.10.6. 6-dB Bandwidth (n-Mode, MCS7)



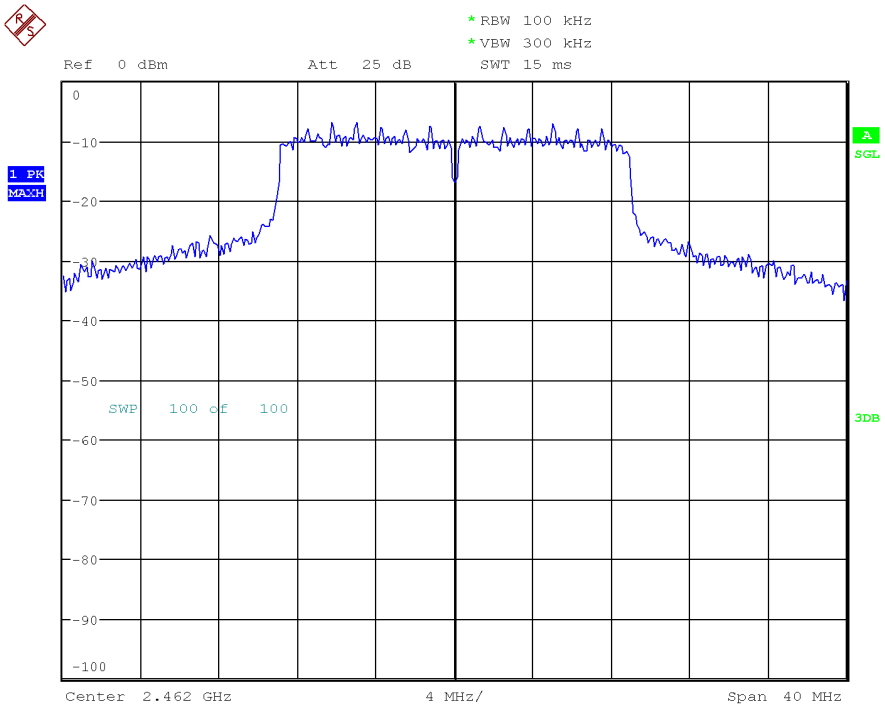
Date: 20.APR.2018 15:39:36

Channel 1 - 6dB-Bandwidth, MCS7



Date: 20.APR.2018 16:01:37

Channel 6 - 6dB-Bandwidth, MCS7

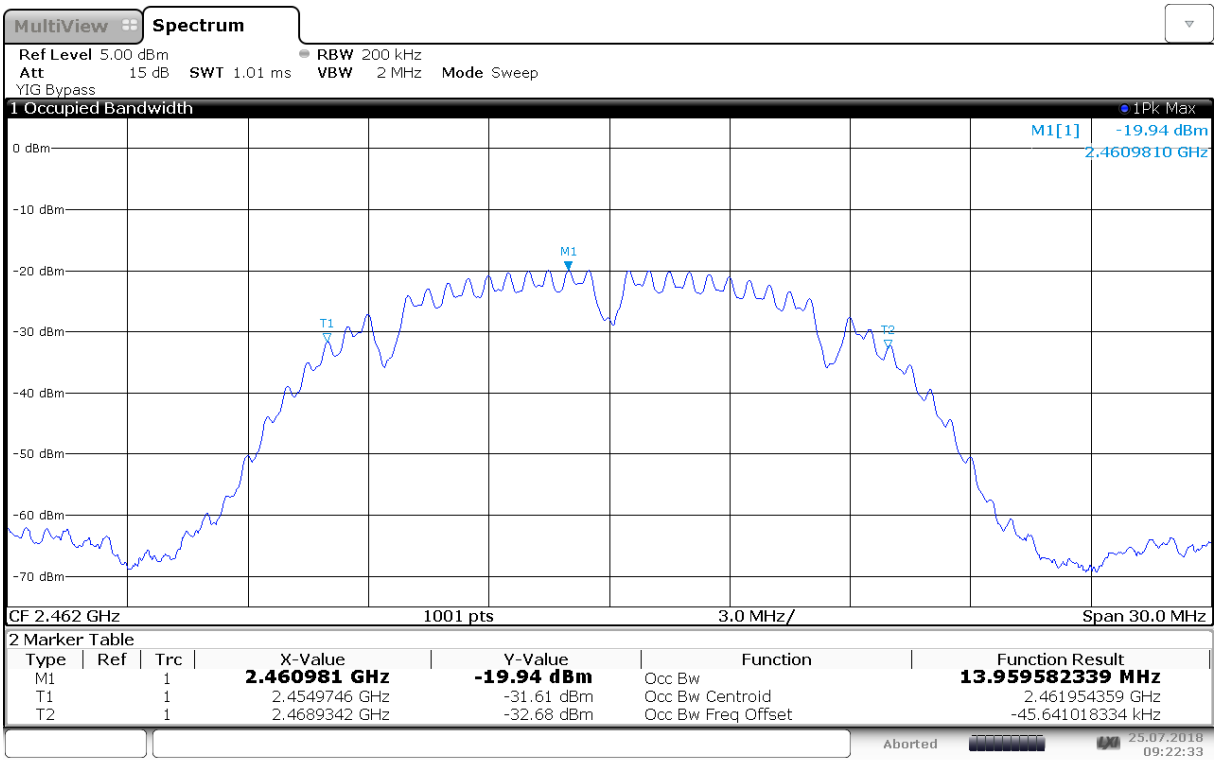


Date: 20.APR.2018 17:25:21

Channel 11 - 6dB-Bandwidth, MCS7

0.11. 99% Occupied Bandwidth

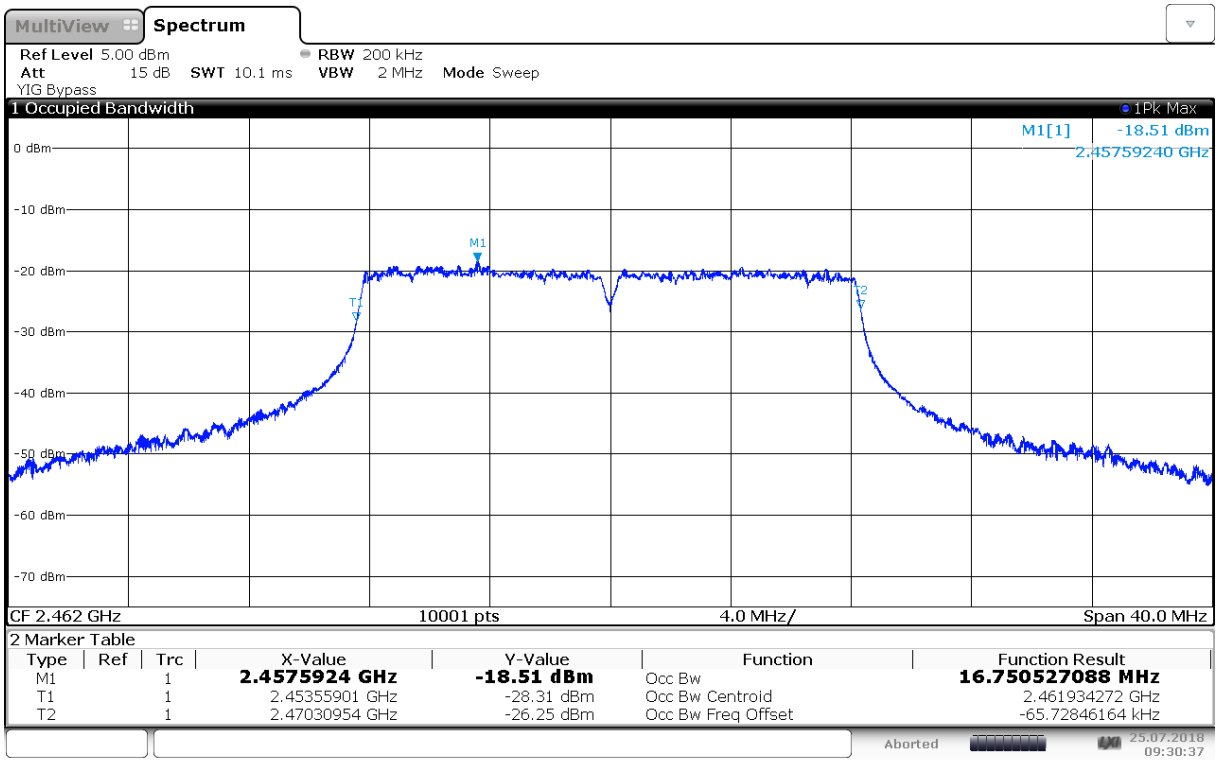
0.11.1. OBW - Bandwidth (b-Mode)



09:22:33 25.07.2018

Channel 11, 1 Mbit data rate

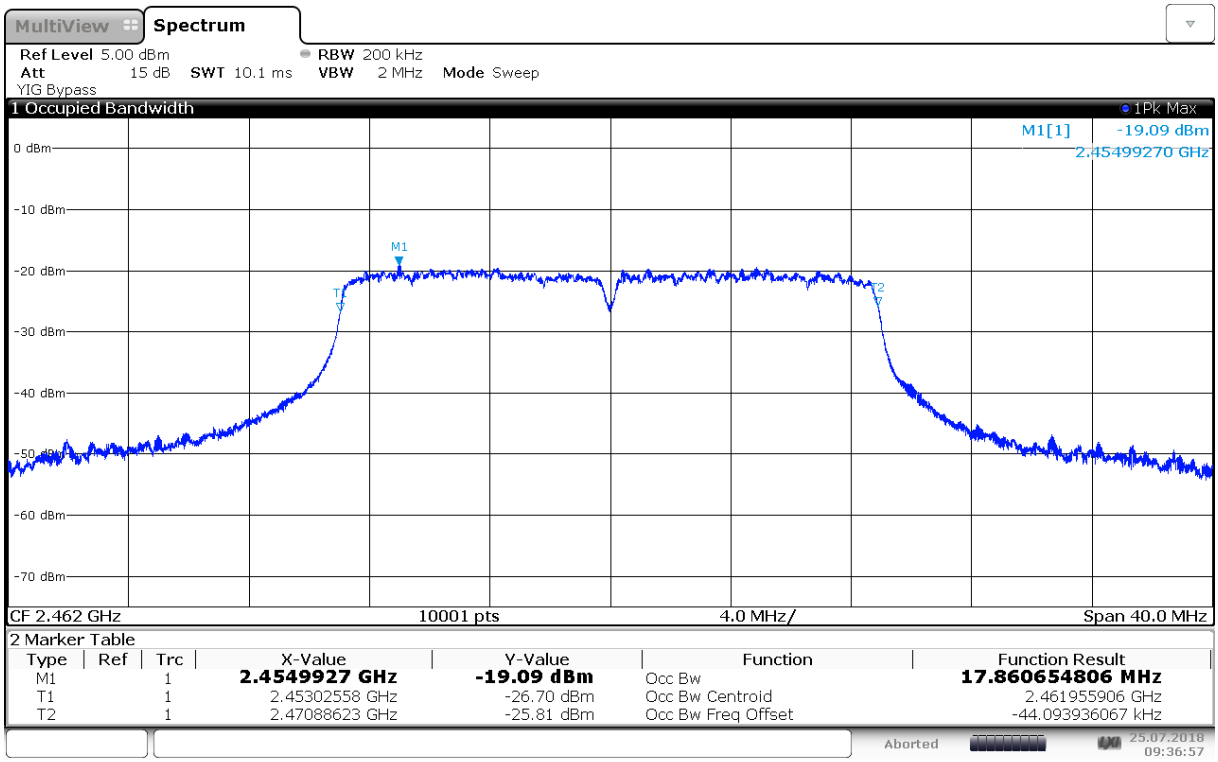
0.11.2. OBW - Bandwidth (g-Mode)



09:30:38 25.07.2018

Channel 11, 54Mbit data rate

0.11.3. OBW - Bandwidth (n-Mode)



09:36:57 25.07.2018

Channel 11, MCS7 modulation scheme

0.12. Power Spectral Density

0.12.1. Used equipment and settings on EUT

Frequencies		
WLAN CH 1 (2412 MHz)	WLAN CH 6 (2437 MHz)	WLAN CH 11 (2462 MHz)
Bandwidths		
20 MHz (20 MHz)		
Power		
1,000 dBm (11 dBm)		
Beamforming Gain		
1,000 dBm (11 dBm)	0 dB	
Gain Tables		
1,000 dBm (11 dBm)	Port 1: P099;	
DUT Settings		
No. of transmission chains	1	
Equipment Type	Other	
Digital Modulation	Yes	
Frequency Hopping	No	

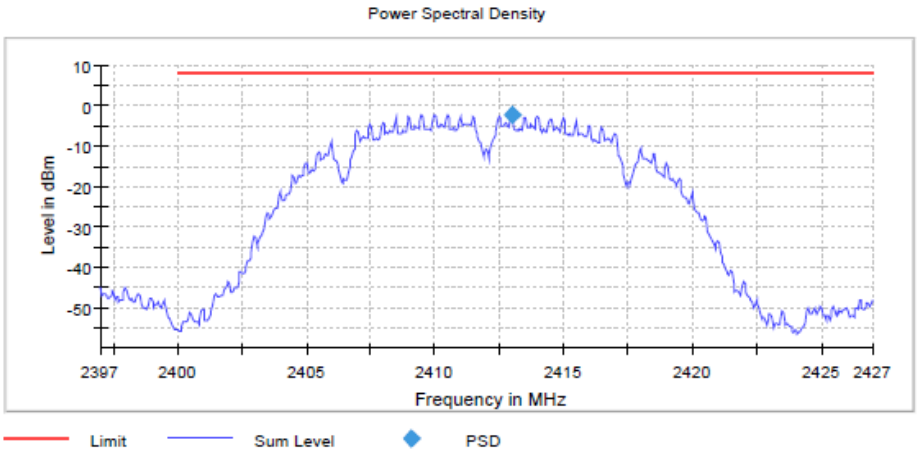
Hardware Setup: WMS Measurements\TS8997_8_Port

Spectrum Analyzer:	SA FSW 67 (SA FSW 67) @ VISA (ADR TCPIP::192.168.48.149::inst0::instr), SN 1312.8000K67/104023, FW 2.81
Vector Generator:	VG SMU200A (VG SMU200A) @ VISA (ADR TCPIP::192.168.48.148::inst0::instr), SN 103736, FW 3.1.18.24-03.20.286.21
Generator:	SMF100A (SMF100A) @ VISA (ADR TCPIP::192.168.48.146::inst0::instr), SN 102073, FW 3.20.390.24 / Drv:Rev 2.21.1, 02/2017, CVI 2015
OSP:	OSP-B157W (OSP-B157W) @ VISA (ADR TCPIP::192.168.48.157::inst0::instr), SN 1527.1144. /, FW 1.23.0.2

0.12.2. PSD (b-Mode, 1MBit)
Channel 1

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2412.975000	-2.159	8.0	PASS

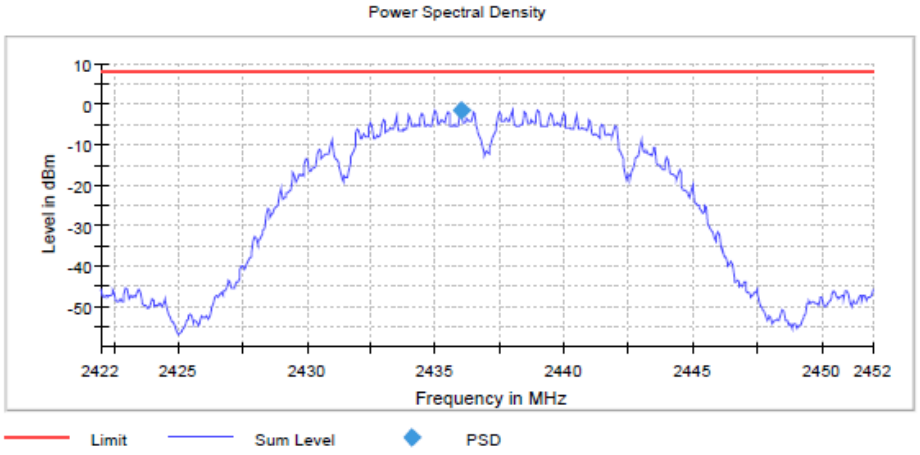


PSD Connector 1

Channel 6

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2435.975000	-1.359	8.0	PASS

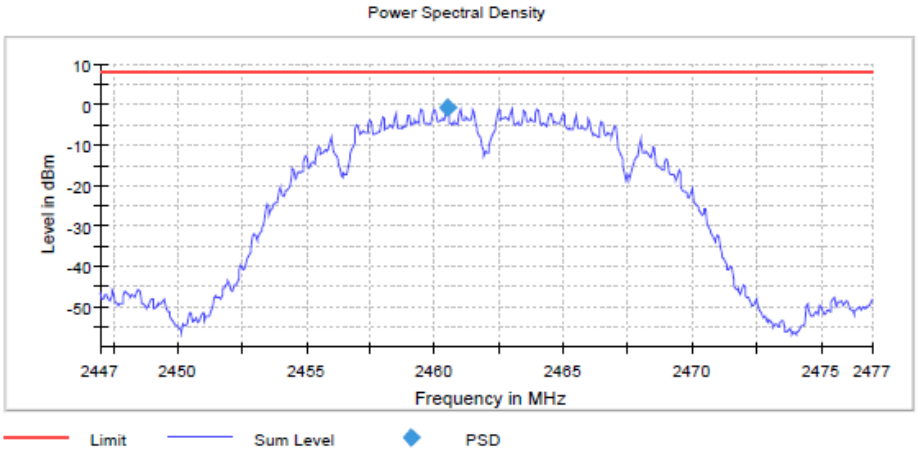


PSD Connector 1

Channel 11

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2460.475000	-0.942	8.0	PASS

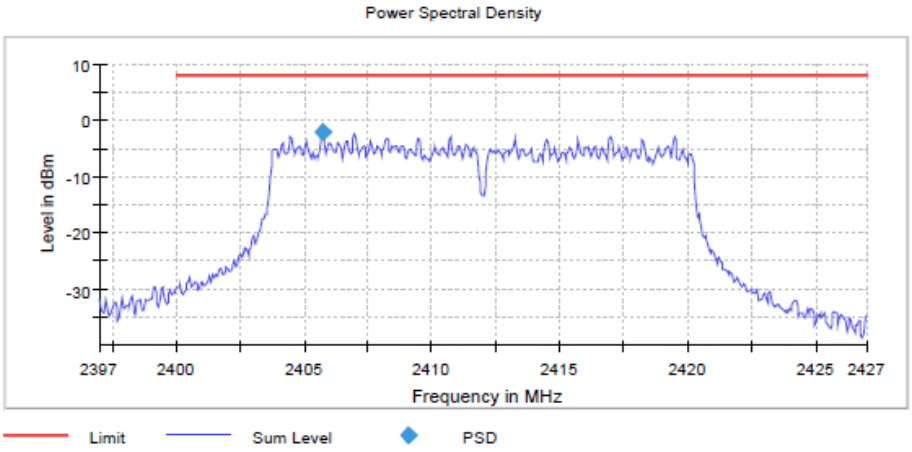


PSD Connector 1

0.12.3. PSD (g-Mode)
Channel 1

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2405.725000	-2.064	8.0	PASS

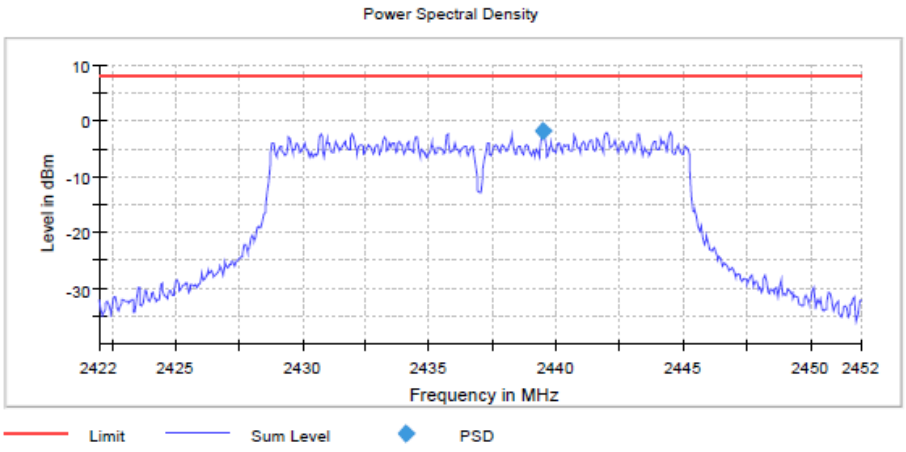


PSD Connector 1

Channel 6

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.475000	-1.827	8.0	PASS

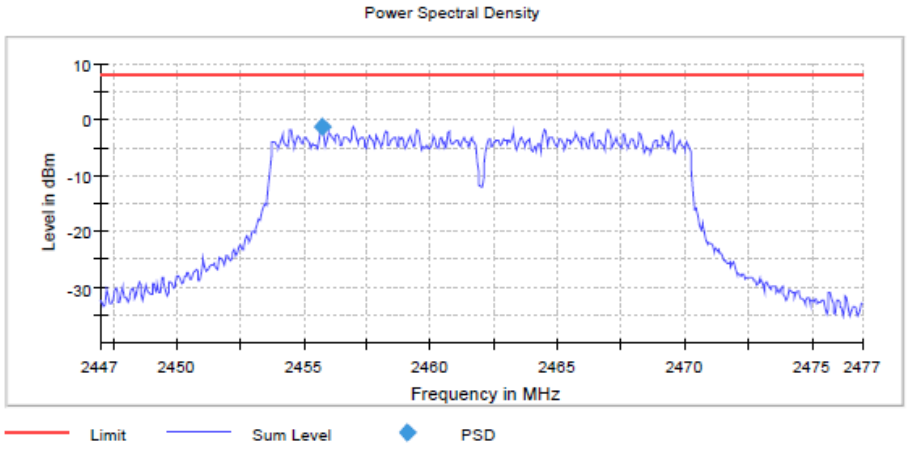


PSD Connector 1

Channel 11

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2455.725000	-1.170	8.0	PASS

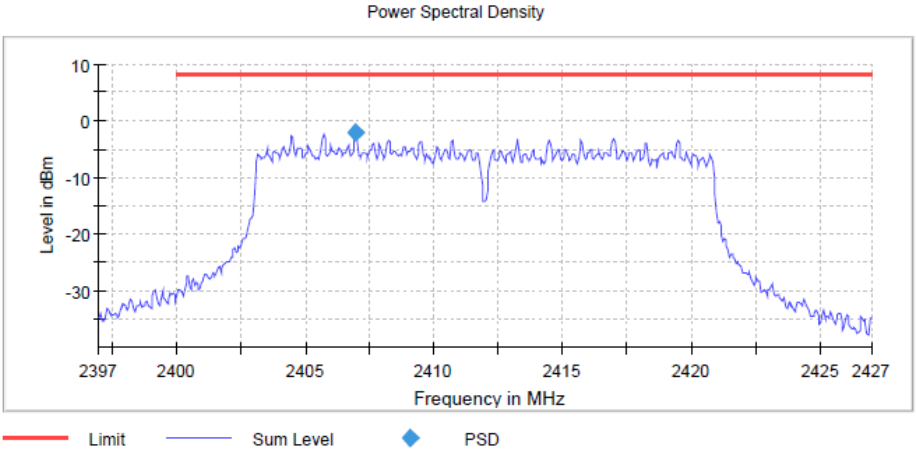


PSD Connector 1

0.12.4. PSD (n-Mode)
Channel 1

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2406.975000	-2.203	8.0	PASS

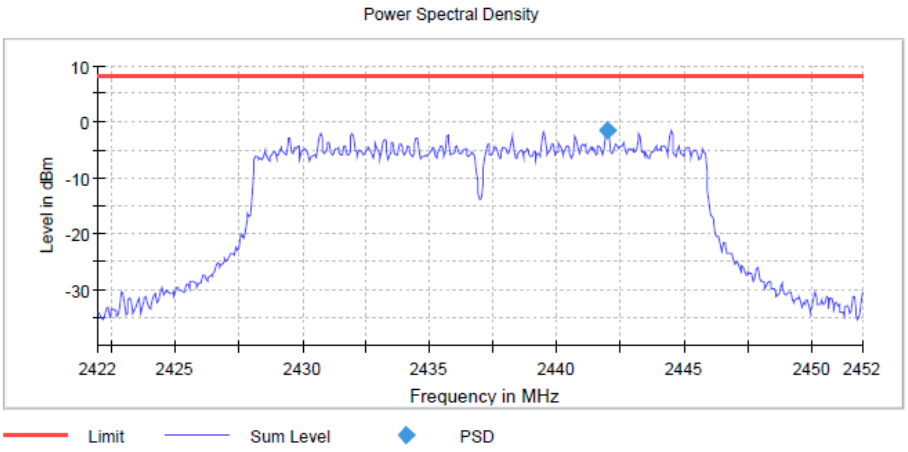


PSD Connector 1

Channel 6

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2441.975000	-1.574	8.0	PASS

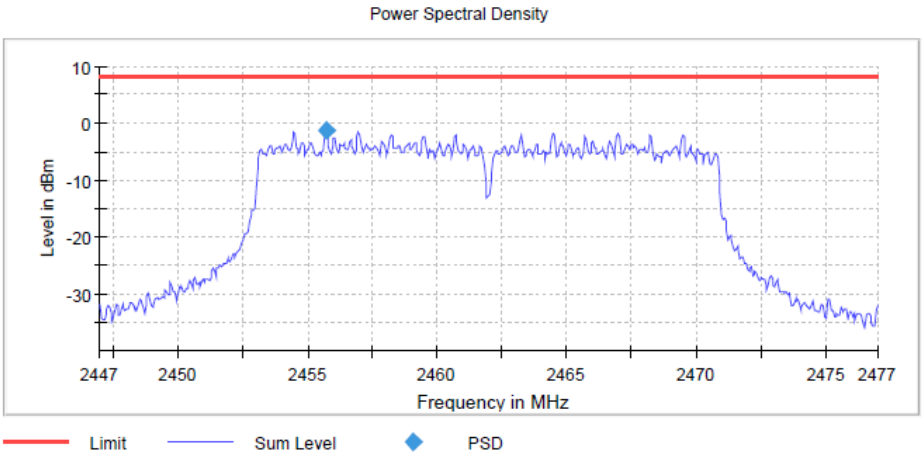


PSD Connector 1

Channel 11

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2455.725000	-1.289	8.0	PASS

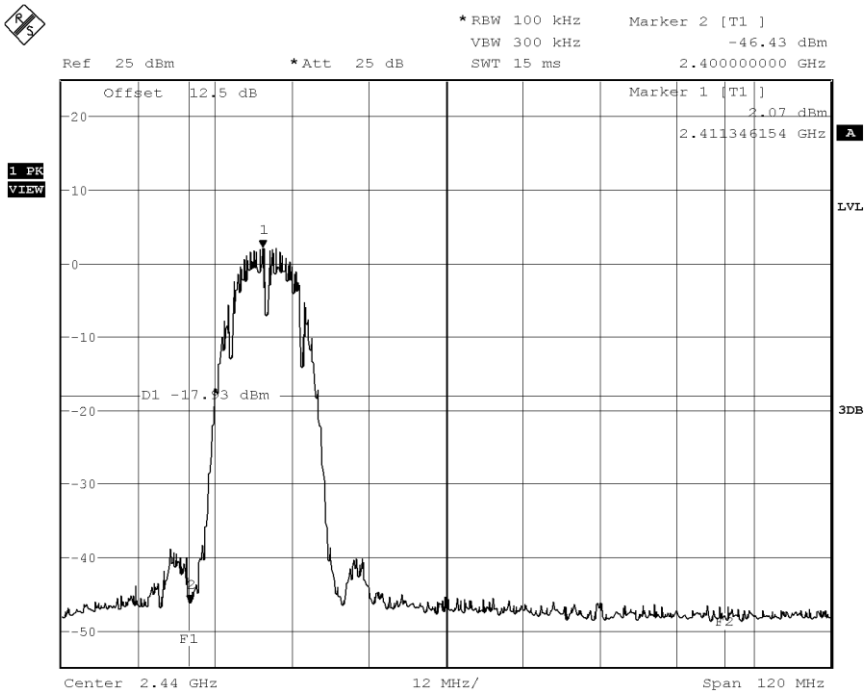


PSD Connector 1

0.13. 20dBc Emissions

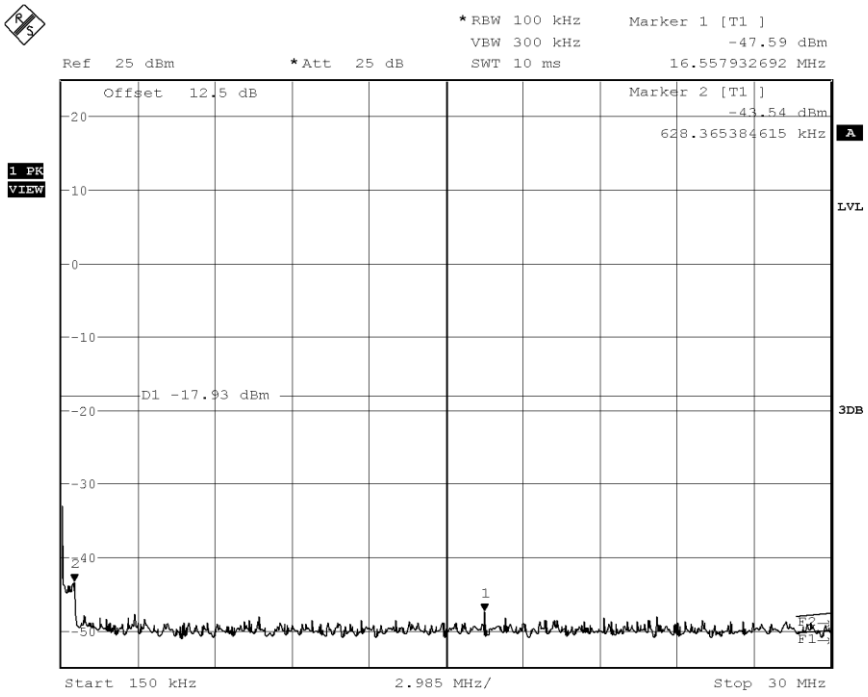
0.13.1. b-Mode, 1Mbit , Channel 1

0.13.1.1. Channel 1 Reference



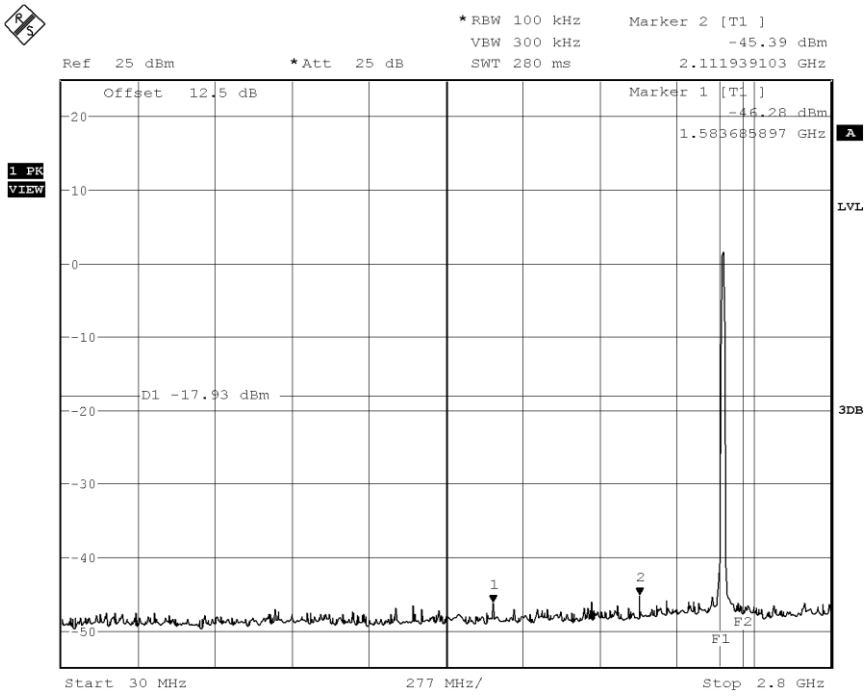
Date: 31.JUL.2018 14:39:43

0.13.1.2. Sweep 1: 150kHz to 30MHz



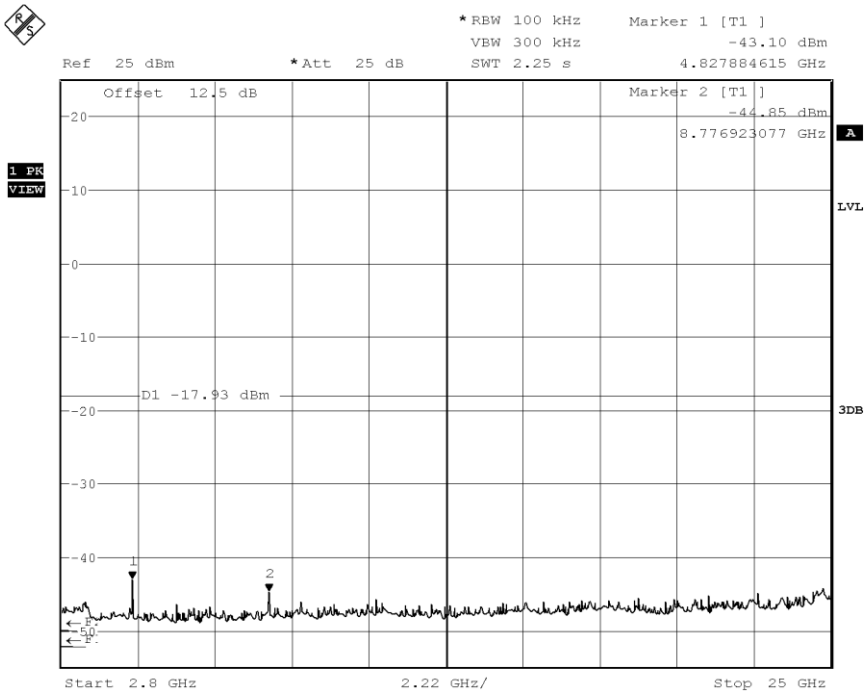
Date: 31.JUL.2018 14:43:49

0.13.1.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 14:47:08

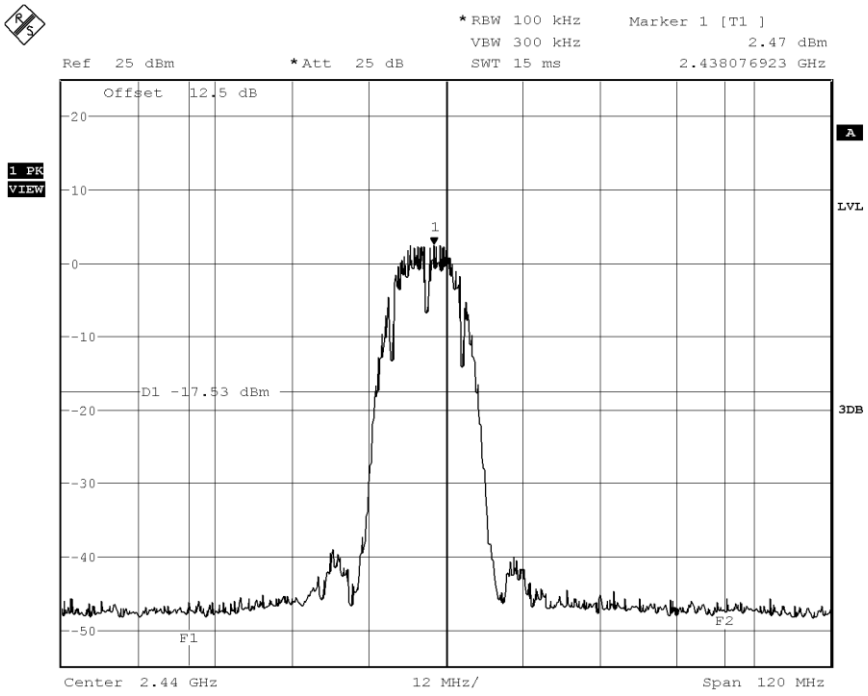
0.13.1.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 14:51:29

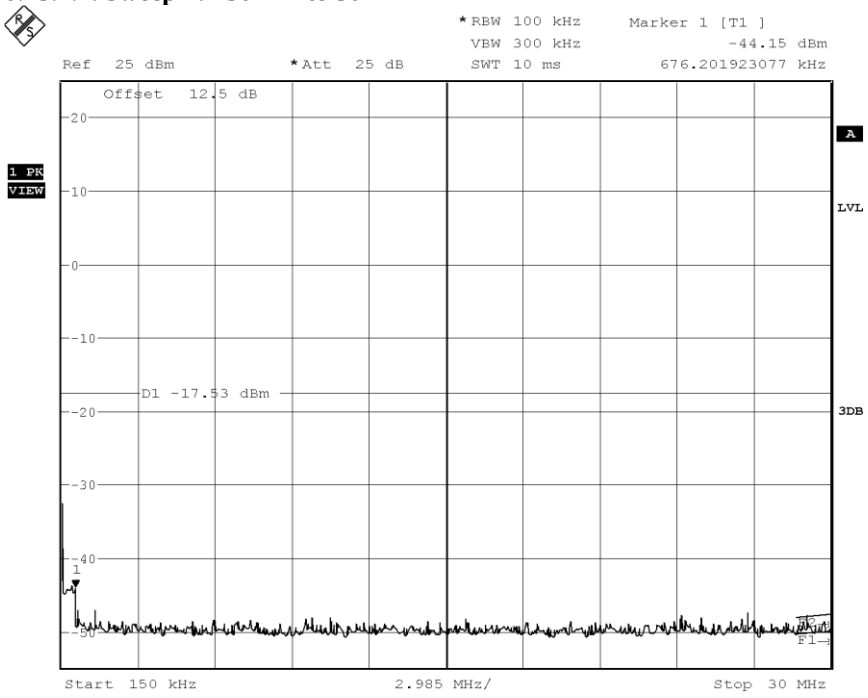
0.13.2. b-Mode, 1Mbit, Channel 6

0.13.2.1. Channel 6 Reference



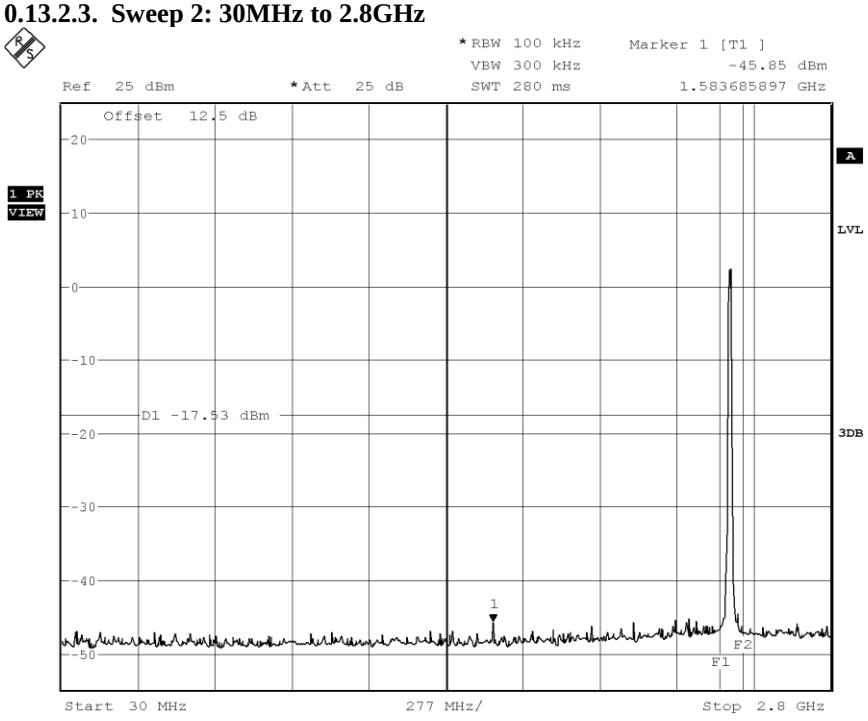
Date: 31.JUL.2018 14:55:20

0.13.2.2. Sweep 1: 150kHz to 30MHz



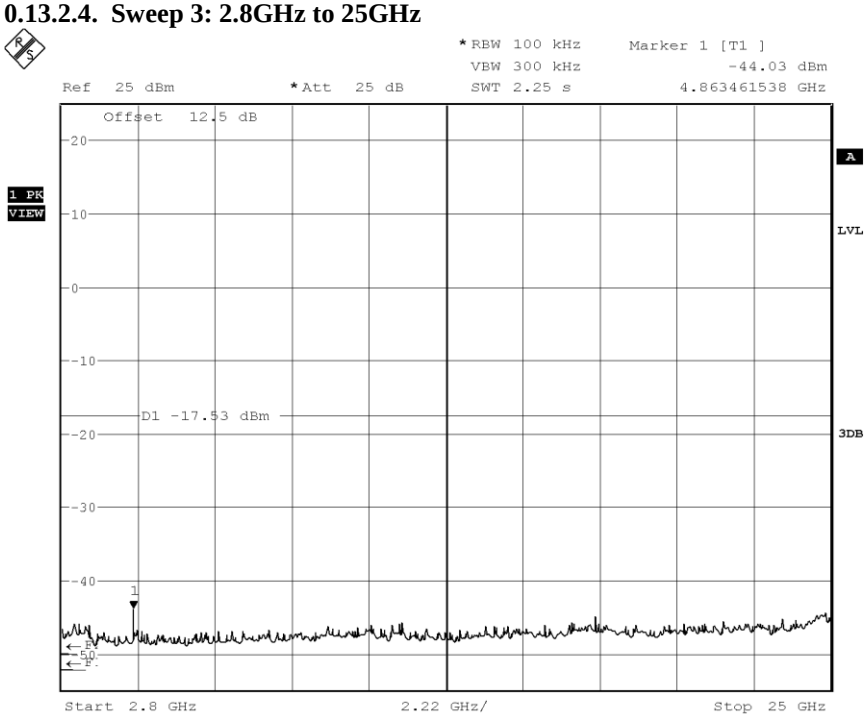
Date: 31.JUL.2018 14:59:06

0.13.2.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 15:04:11

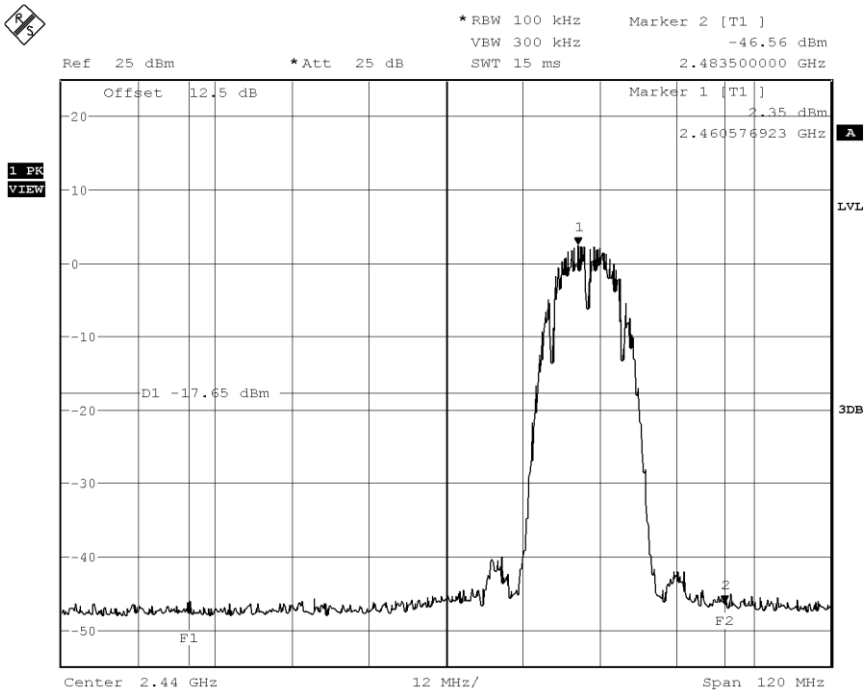
0.13.2.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 15:08:26

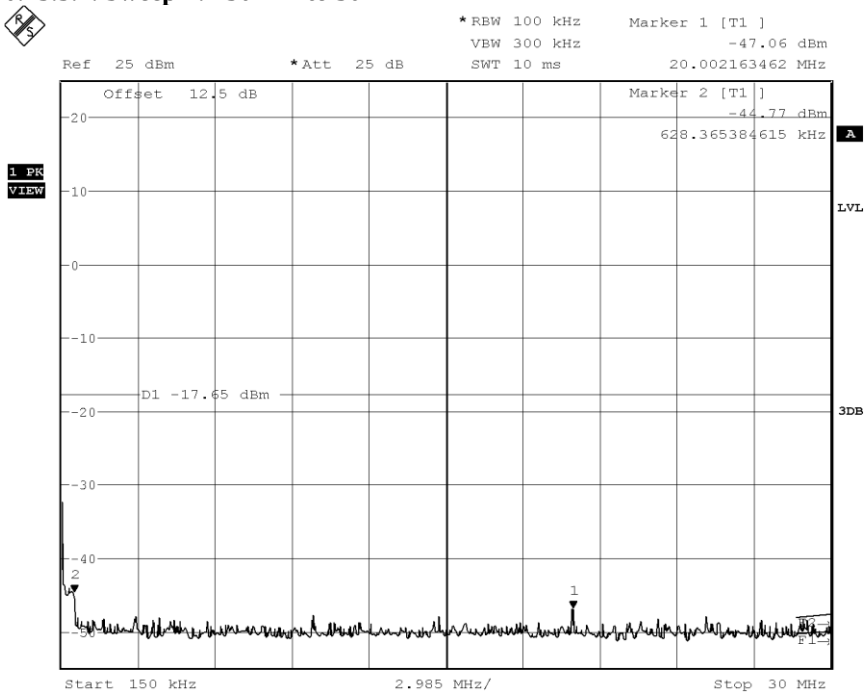
0.13.3. b-Mode, 1Mbit, Channel 11

0.13.3.1. Channel 11 Reference



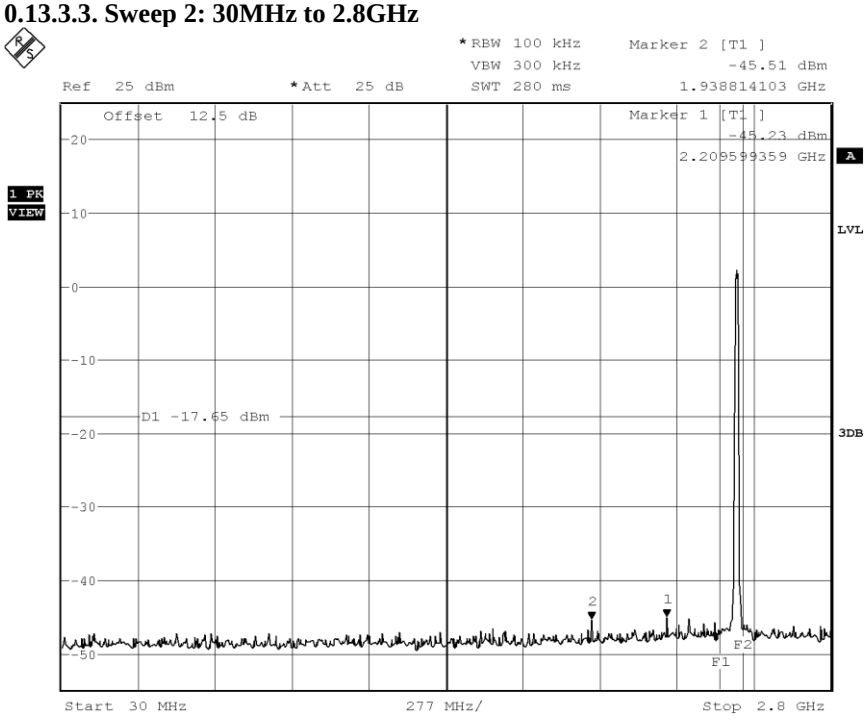
Date: 31.JUL.2018 15:19:29

0.13.3.2. Sweep 1: 150kHz to 30MHz



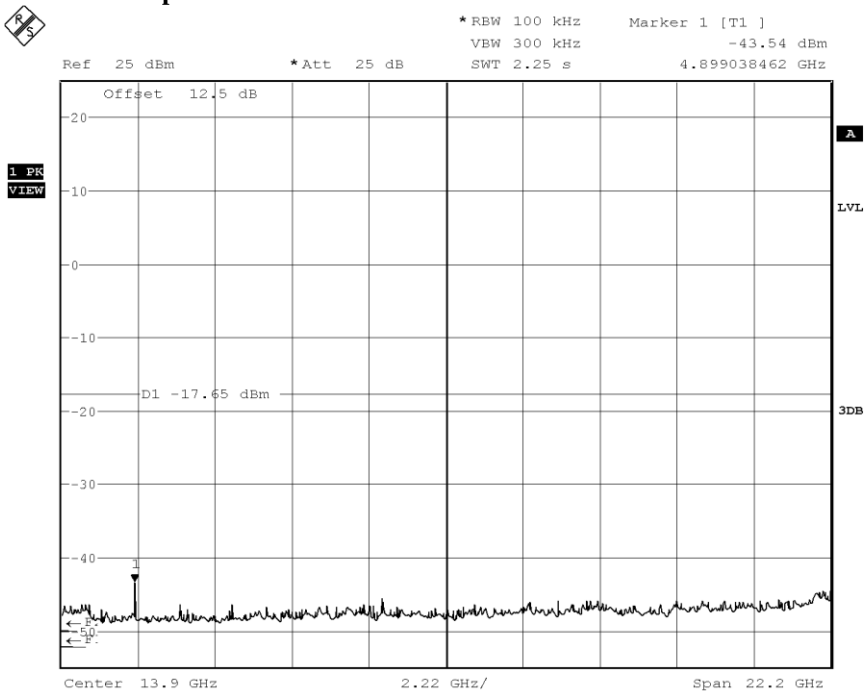
Date: 31.JUL.2018 15:22:02

0.13.3.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 15:26:29

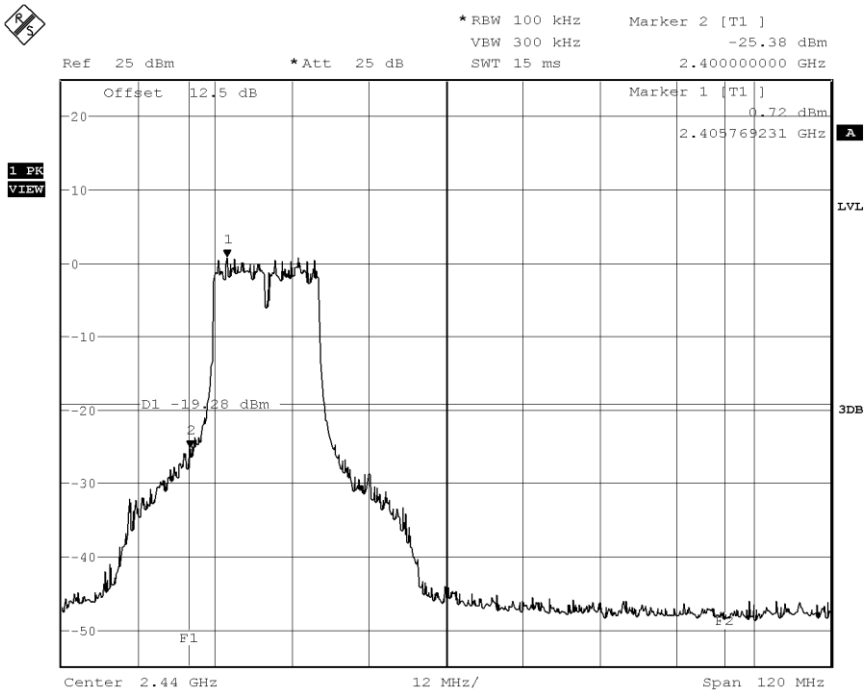
0.13.3.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 15:29:38

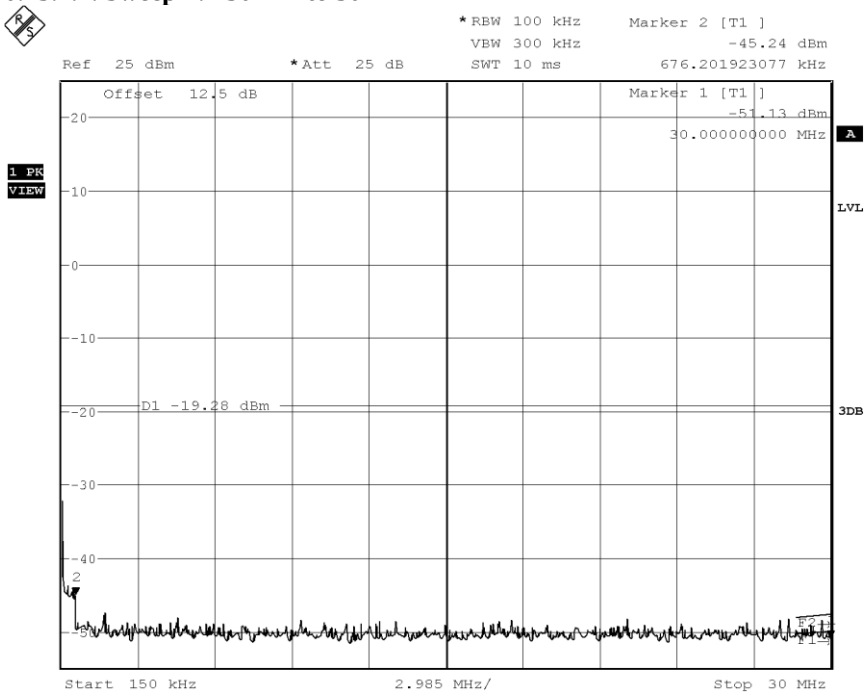
0.13.4. g-Mode, 54Mbit, Channel 1

0.13.4.1. Channel 1 Reference



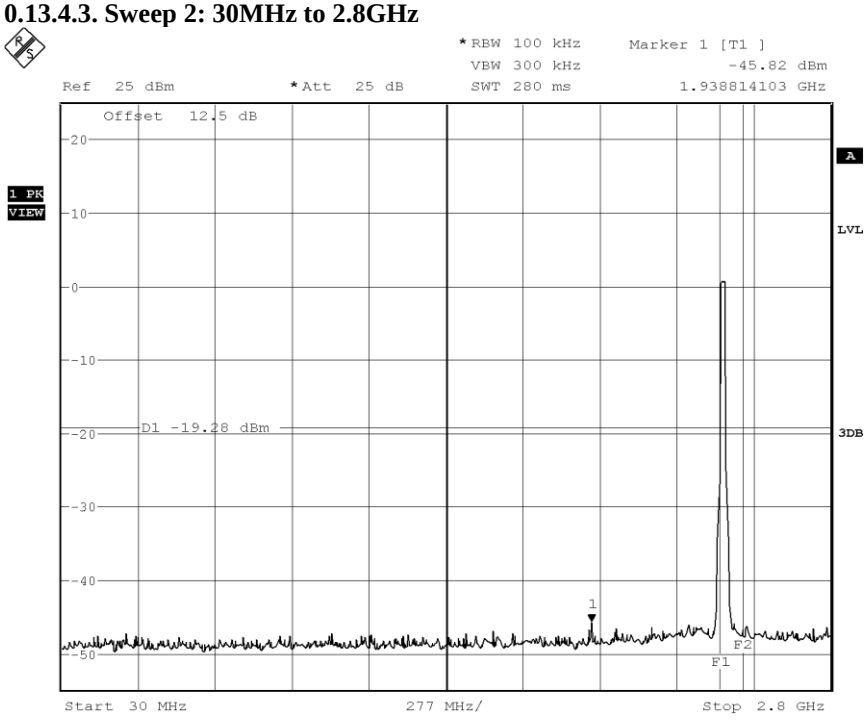
Date: 31.JUL.2018 11:10:52

0.13.4.2. Sweep 1: 150kHz to 30MHz



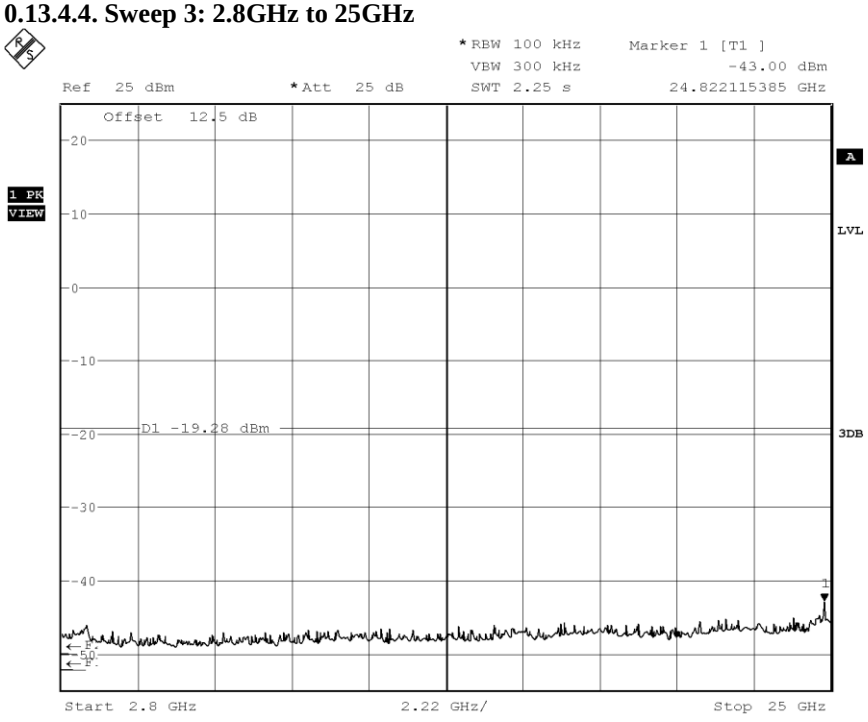
Date: 31.JUL.2018 11:13:25

0.13.4.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 11:15:46

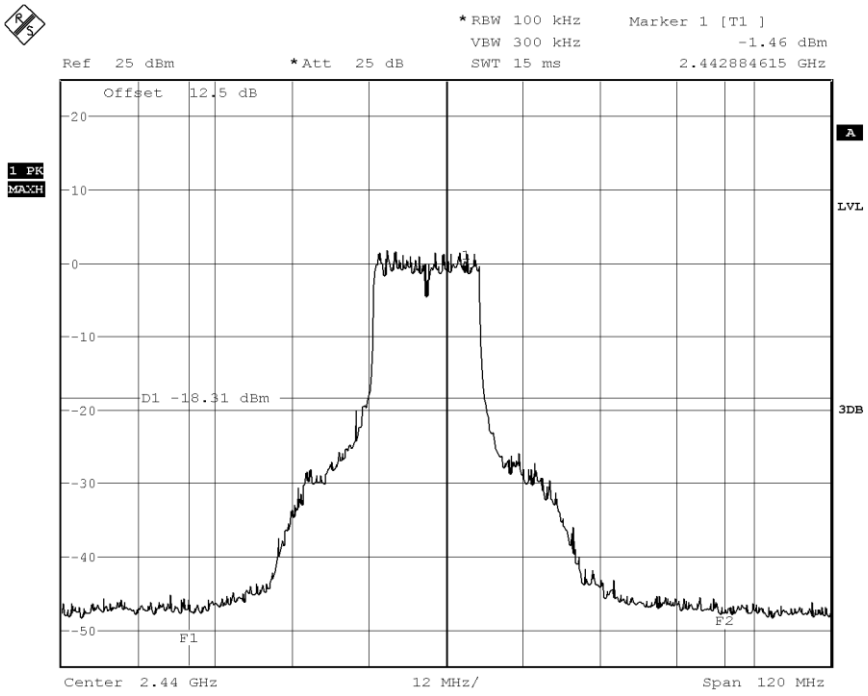
0.13.4.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 11:18:43

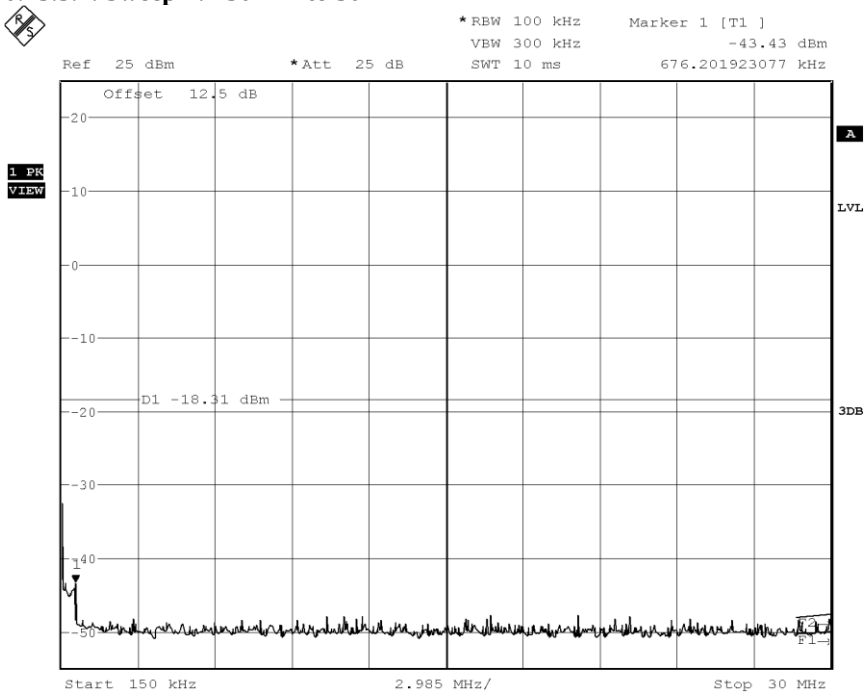
0.13.5. g-Mode, 48Mbit, Channel 6

0.13.5.1. Channel 6 Reference



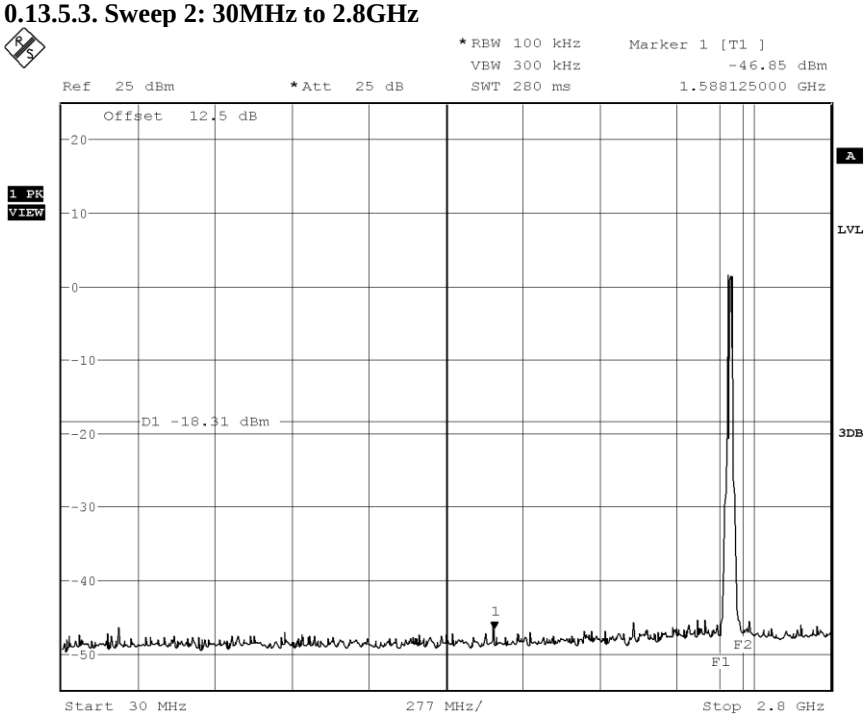
Date: 31.JUL.2018 11:22:22

0.13.5.2. Sweep 1: 150kHz to 30MHz



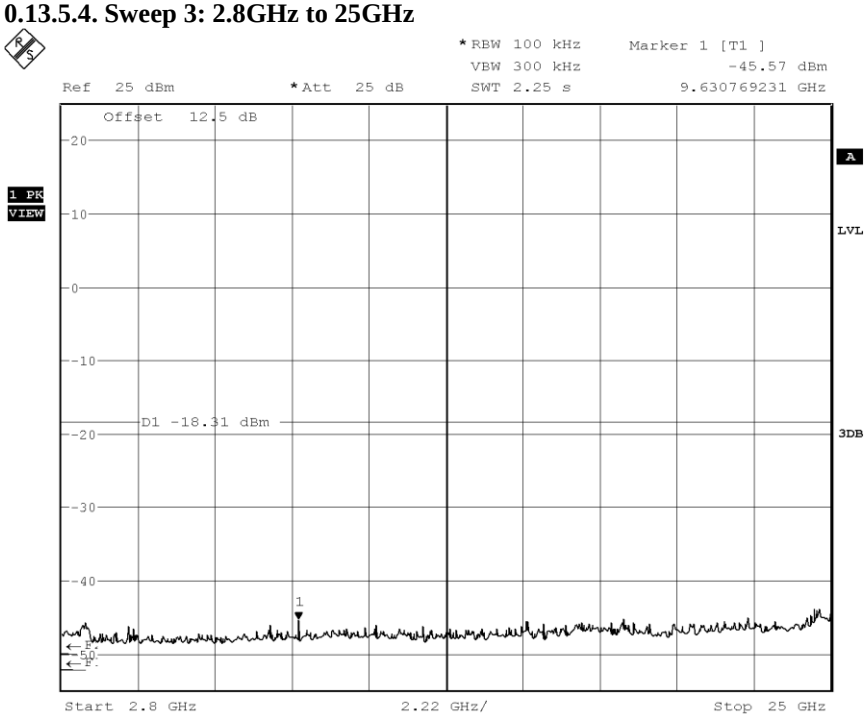
Date: 31.JUL.2018 11:25:33

0.13.5.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 11:28:47

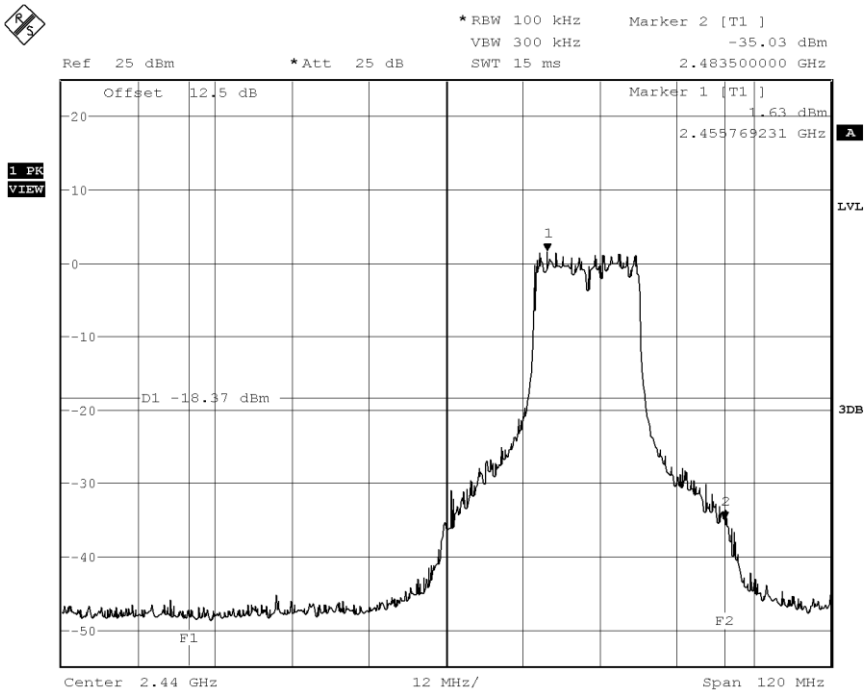
0.13.5.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 11:34:35

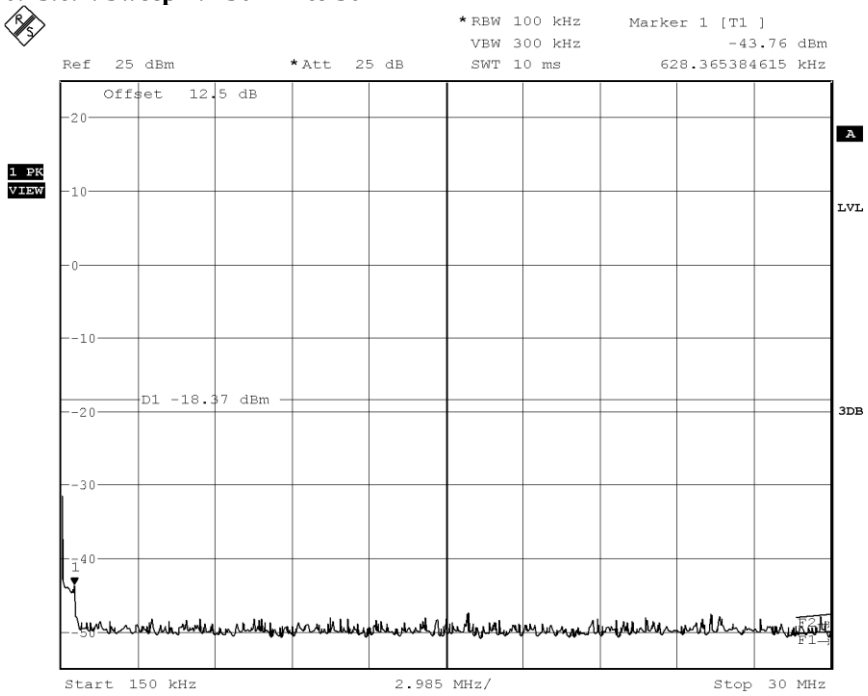
0.13.6. g-Mode, 54Mbit, Channel 11

0.13.6.1. Channel 11 Reference



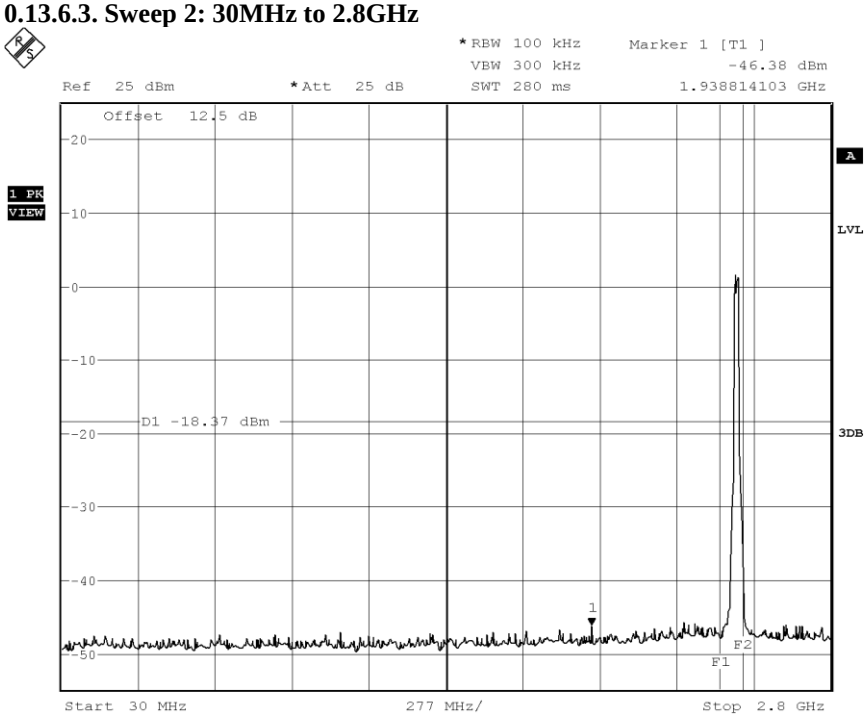
Date: 31.JUL.2018 11:37:28

0.13.6.2. Sweep 1: 150kHz to 30MHz



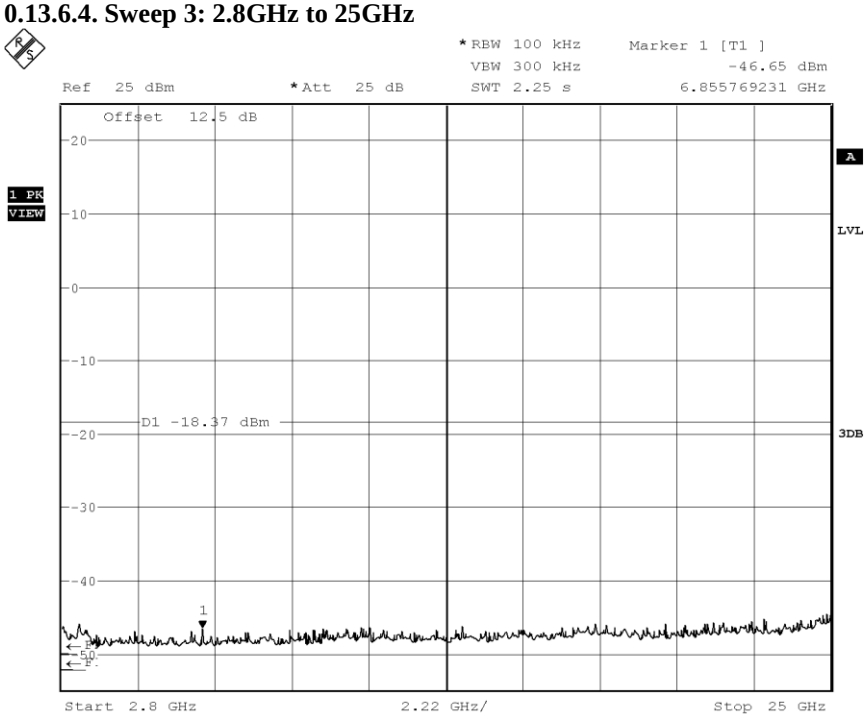
Date: 31.JUL.2018 11:41:30

0.13.6.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 11:47:38

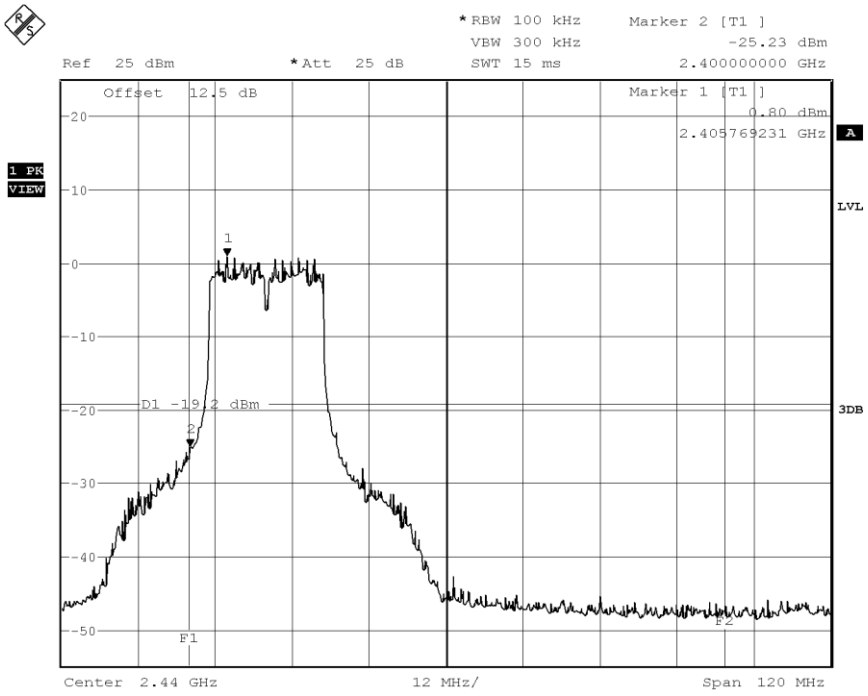
0.13.6.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 11:50:38

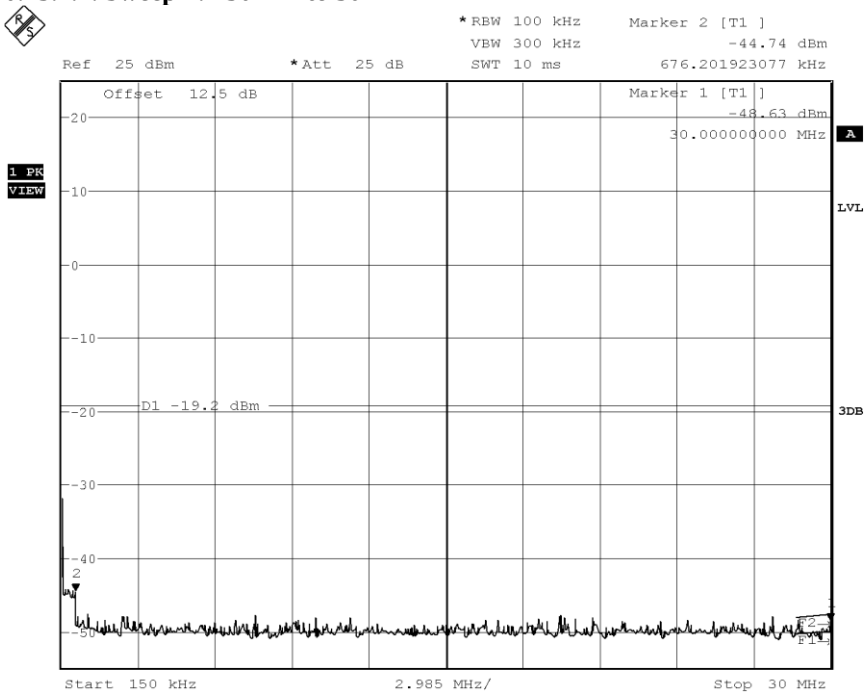
0.13.7. n-Mode, MCS5, Channel 1

0.13.7.1. Channel 1 Reference



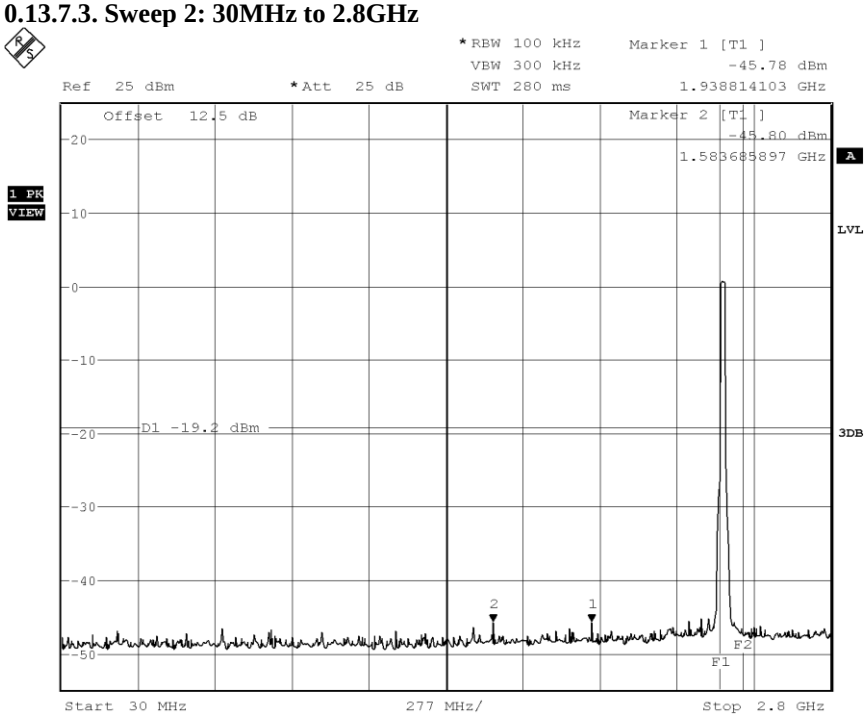
Date: 31.JUL.2018 11:54:57

0.13.7.2. Sweep 1: 150kHz to 30MHz



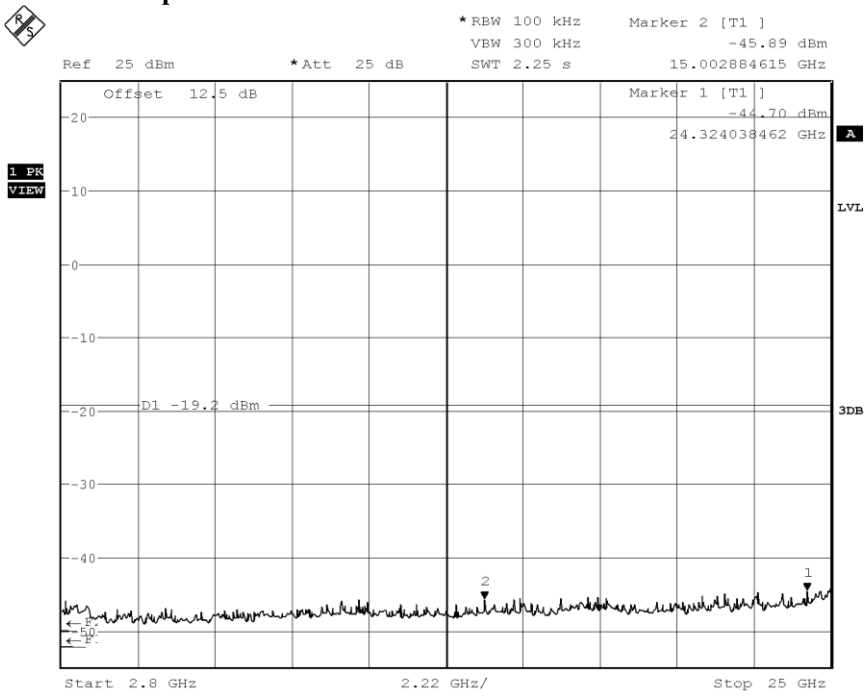
Date: 31.JUL.2018 11:57:52

0.13.7.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 12:01:34

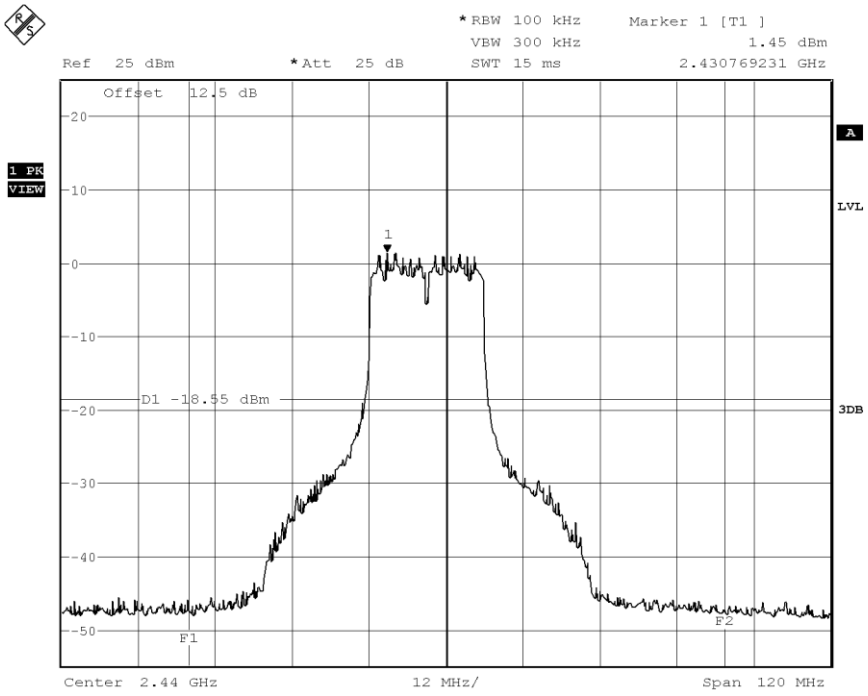
0.13.7.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 12:05:53

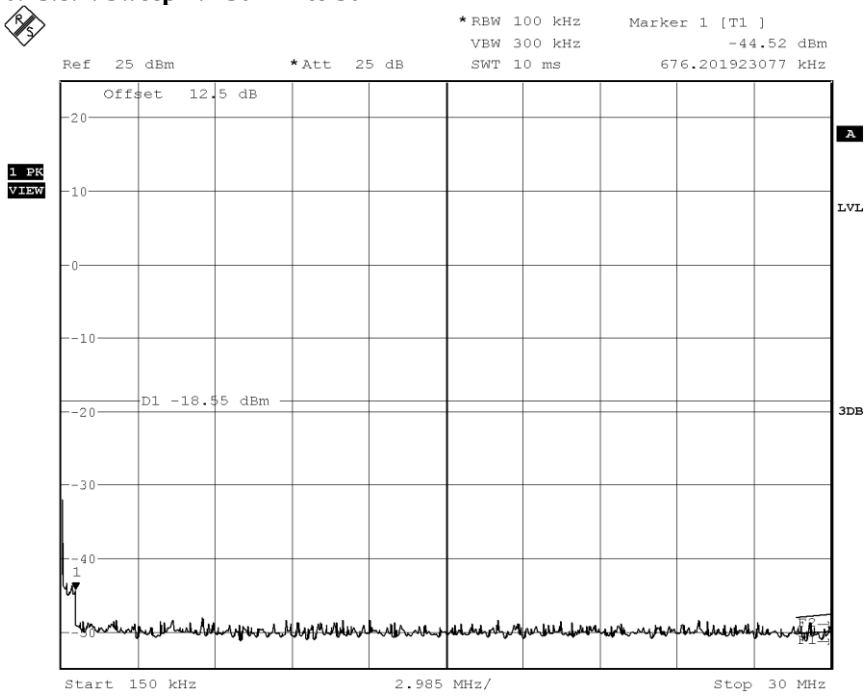
0.13.8. n-Mode, MCS6, Channel 6

0.13.8.1. Channel 6 Reference



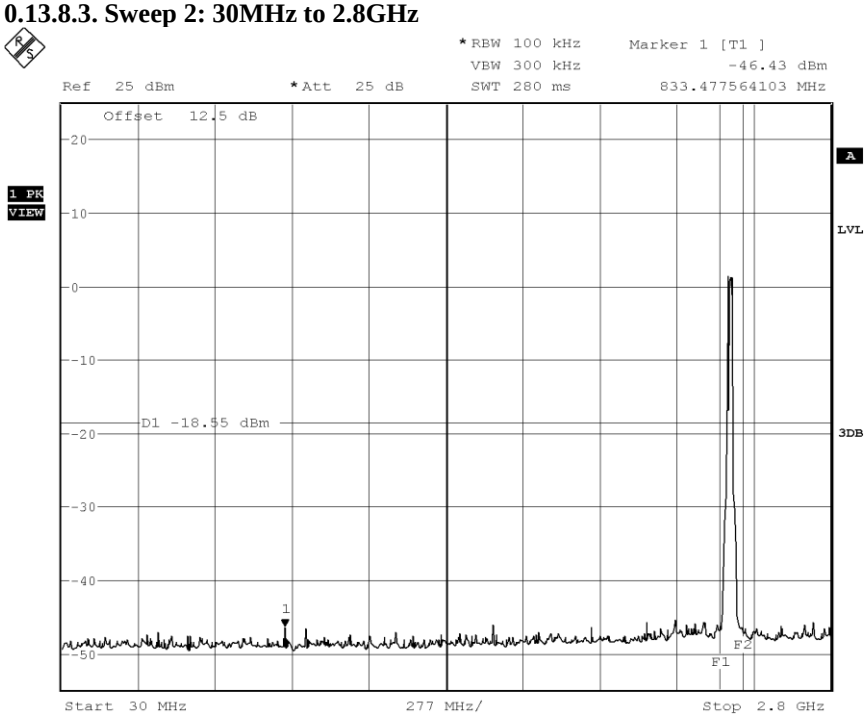
Date: 31.JUL.2018 12:09:31

0.13.8.2. Sweep 1: 150kHz to 30MHz



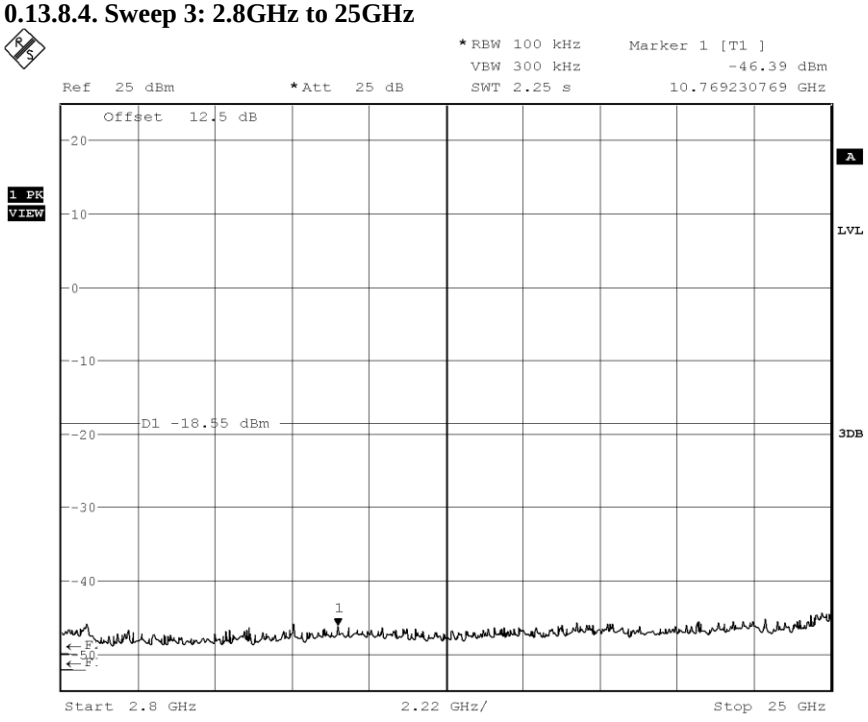
Date: 31.JUL.2018 12:11:57

0.13.8.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 12:14:52

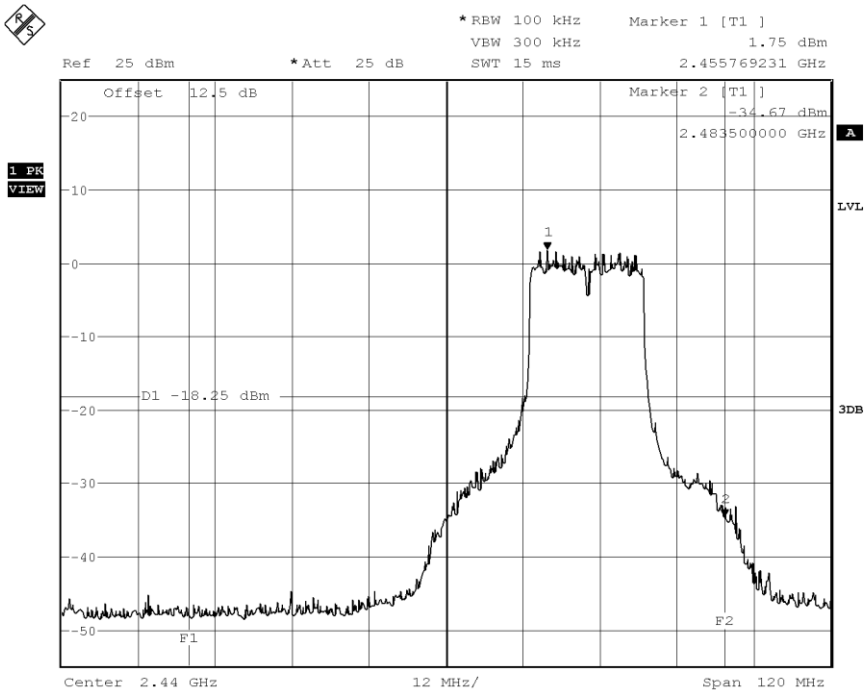
0.13.8.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 12:19:51

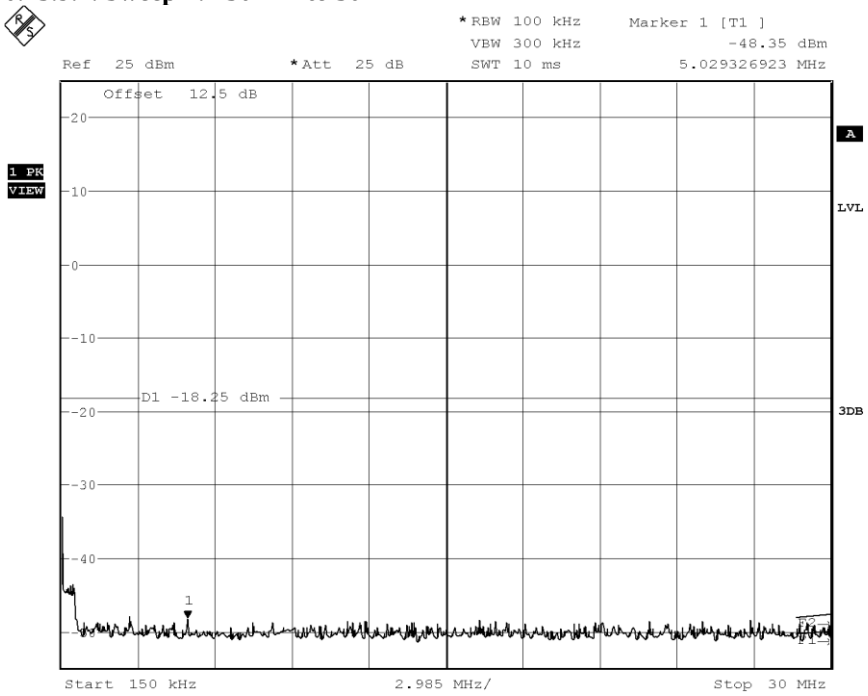
0.13.9. n-Mode, MCS6, Channel 11

0.13.9.1. Channel 11 Reference



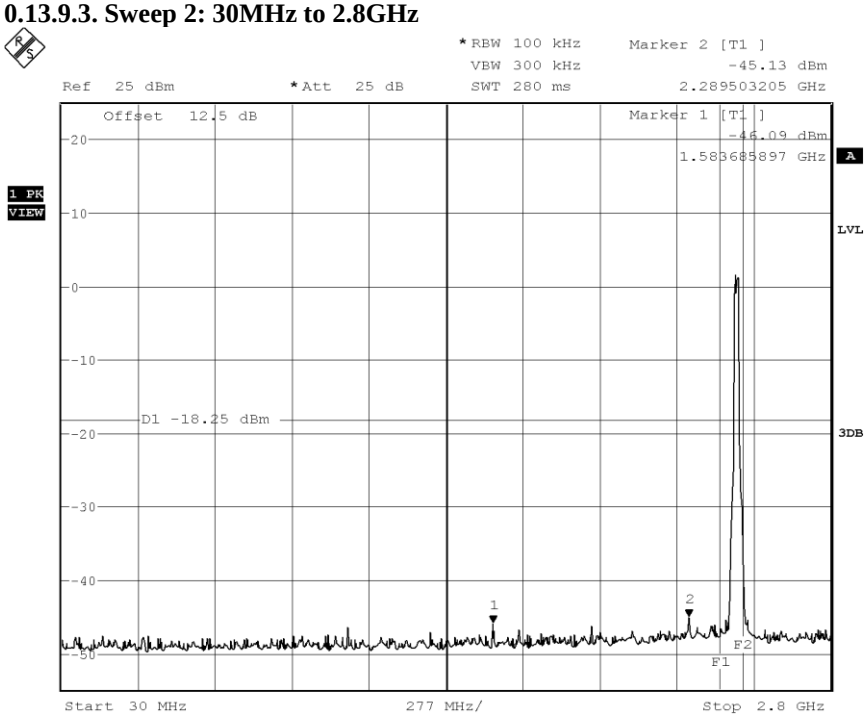
Date: 31.JUL.2018 12:23:02

0.13.9.2. Sweep 1: 150kHz to 30MHz



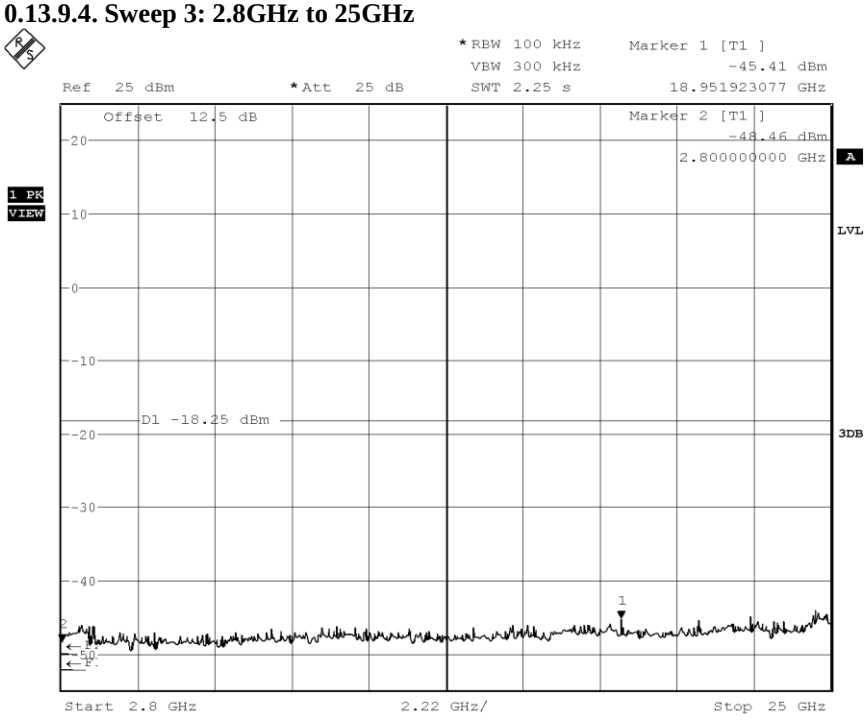
Date: 31.JUL.2018 12:30:33

0.13.9.3. Sweep 2: 30MHz to 2.8GHz



Date: 31.JUL.2018 12:28:44

0.13.9.4. Sweep 3: 2.8GHz to 25GHz



Date: 31.JUL.2018 12:26:29