

Annex 1: Measurement diagrams
to
TEST REPORT
No.: 6-0520-14-1-7b

According to:
FCC Regulations
Part 15.207 / 15.209
Part 15.247

for

Leica Camera AG

Digital Camera Leica S (Typ 007)

FCC-ID: N5AS007

Laboratory Accreditation and Listings			
 DAkkS Deutsche Akkreditierungsstelle D-PL-12047-01-01	 FCC MRA US-EU 0003	 Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3	 Voluntary Controls for Electromagnetic Emissions Reg. No.: R-2666 C-2914, T-1967, G-301
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1. Measurement diagrams

1.1. Conducted EMI measurements on AC-mains port according 15.207

Diagram 1.01

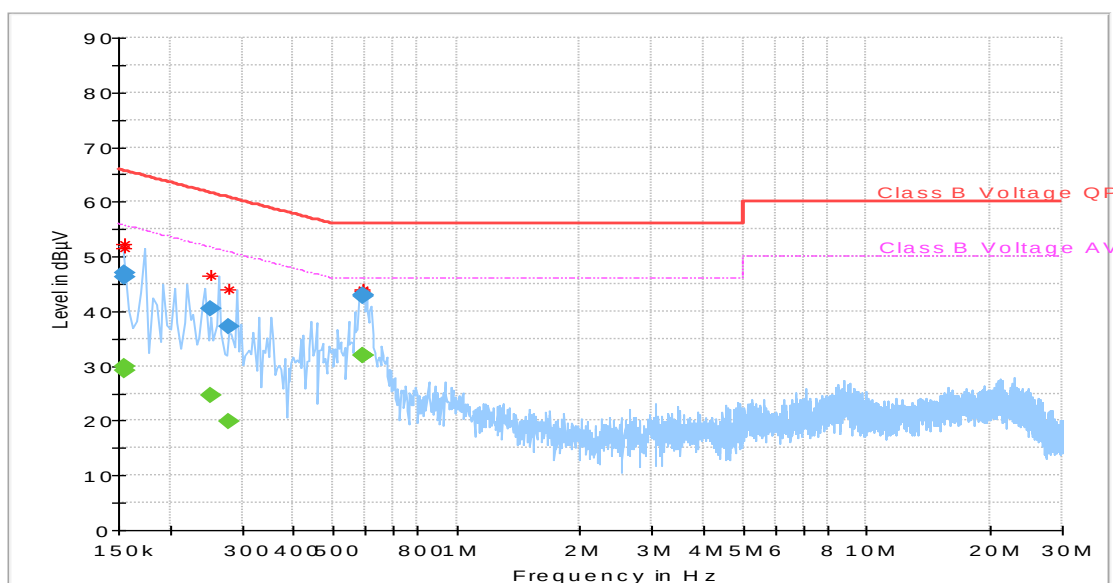
Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site & Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Specification:	FCC 15.207
Operating Mode:	WLAN
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions:	Humidity: 31%rH; Temperature: 22°C
Operator:	HLA
Comments:	b-mode, 5.5 Mbit

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	
Power Supply:	120V / 60Hz

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)
0.155000	---	29.07	55.73
0.155000	46.31	---	65.73
0.155938	---	29.86	55.68
0.155938	47.00	---	65.68
0.250781	40.50	---	61.73
0.250781	---	24.67	51.73
0.278125	---	19.97	50.87
0.278125	37.30	---	60.87
0.592188	---	32.05	46.00
0.592188	42.87	---	56.00
0.592813	42.85	---	56.00
0.592813	---	32.03	46.00

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)
0.155000	---	29.07	55.73
0.155000	46.31	---	65.73
0.155938	---	29.86	55.68
0.155938	47.00	---	65.68
0.250781	40.50	---	61.73
0.250781	---	24.67	51.73
0.278125	---	19.97	50.87
0.278125	37.30	---	60.87
0.592188	---	32.05	46.00
0.592188	42.87	---	56.00
0.592813	42.85	---	56.00
0.592813	---	32.03	46.00

Diagram 1.02

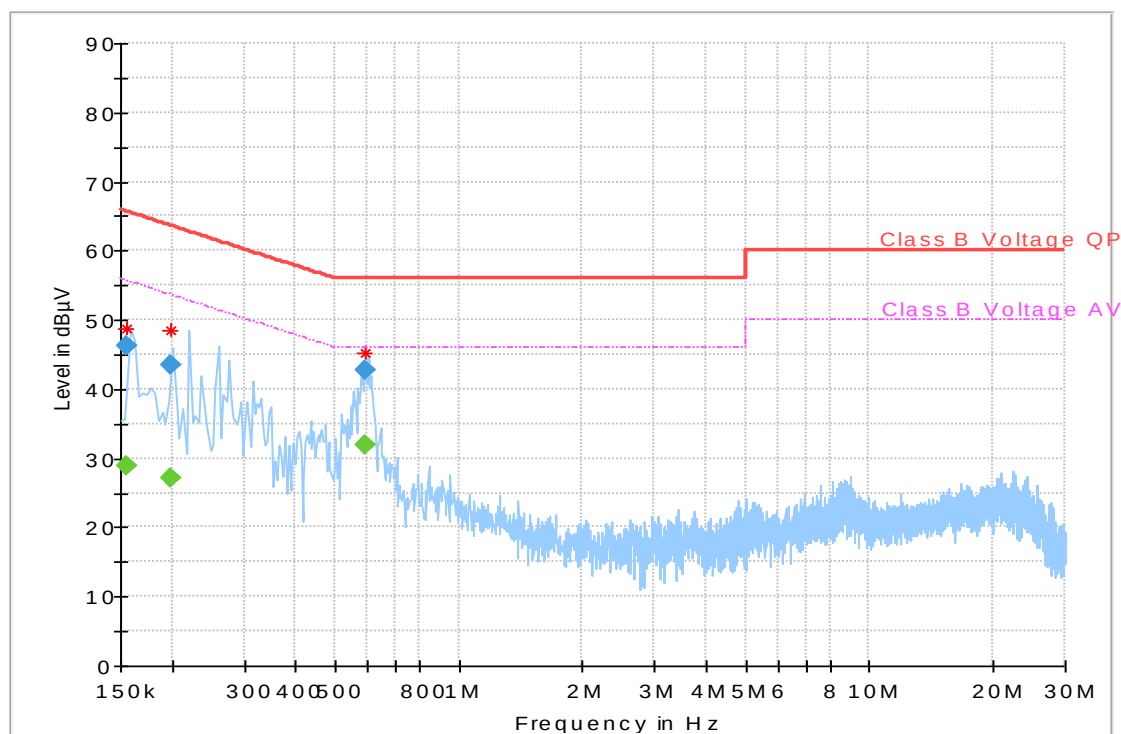
Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site & Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Specification:	FCC 15.207
Operating Mode:	WLAN
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions:	Humidity: 31%rH; Temperature: 22°C
Operator:	HLA
Comments:	g-mode, 6 Mbit

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	120V / 60Hz
Comments:	--

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)
0.155000	46.33	---	65.73
0.155000	---	28.93	55.73
0.197813	43.55	---	63.70
0.197813	---	27.03	53.70
0.591719	---	31.97	46.00
0.591719	42.77	---	56.00

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)
0.155000	46.33	---	65.73
0.155000	---	28.93	55.73
0.197813	43.55	---	63.70
0.197813	---	27.03	53.70
0.591719	---	31.97	46.00
0.591719	42.77	---	56.00

Diagram 1.03

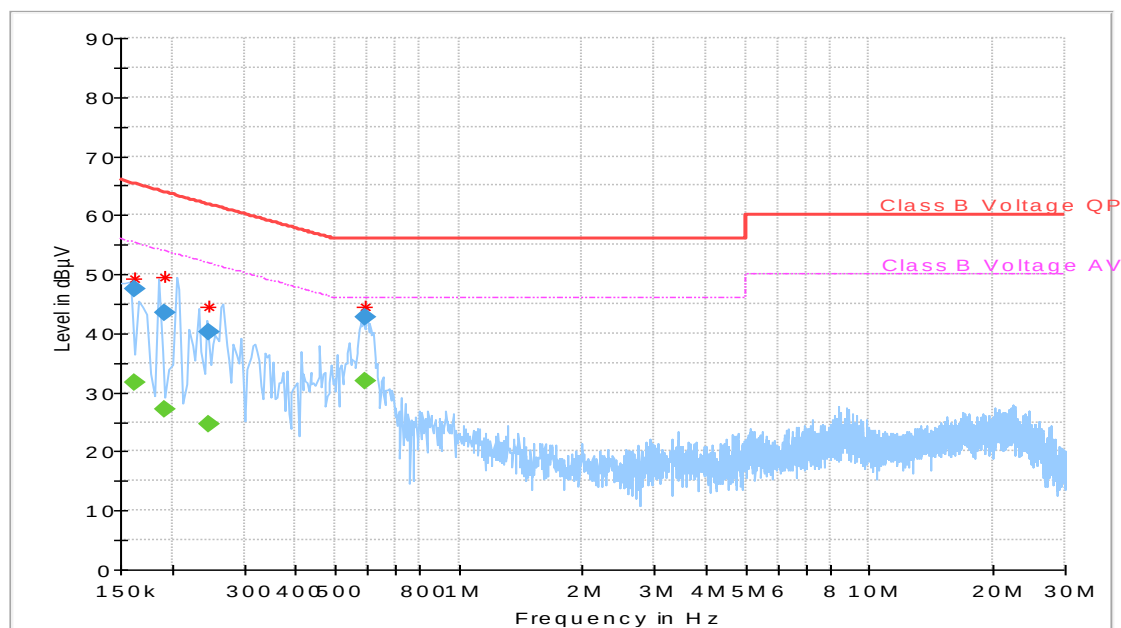
Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site & Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Specification:	FCC 15.207
Operating Mode:	WLAN
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions:	Humidity: 31%rH; Temperature: 22°C
Operator:	HLA
Comments:	n-mode, MCS0

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	120V / 60Hz
Comments:	--

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)
0.162656	47.49	---	65.33
0.162656	---	31.60	55.33
0.192188	43.38	---	63.94
0.192188	---	27.19	53.94
0.245781	40.34	---	61.90
0.245781	---	24.63	51.90
0.592813	42.65	---	56.00
0.592813	---	31.81	46.00

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)
0.162656	47.49	---	65.33
0.162656	---	31.60	55.33
0.192188	43.38	---	63.94
0.192188	---	27.19	53.94
0.245781	40.34	---	61.90
0.245781	---	24.63	51.90
0.592813	42.65	---	56.00
0.592813	---	31.81	46.00

1.2. Magnetic field measurements $f < 30\text{MHz}$

1.2.1. b-Mode Modulation

Diagram 2.01a_Ch1_b_Mode_1MBit

Common Information

Test Description:	Magnetic Fieldstrength Measurement related to 30/300 m distance
Test site and distance:	Semi Anechoic Room (SAR); CETECOM GmbH Essen
Version of Testsoftware:	EMC32 V8.51.0
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 Part 15.247(15.209)
Operator:	HLA
Operating conditions:	Ch1, bMode, 1MBit
Power During test:	full loaded battery
Remark:	Standing

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	
Power Supply:	120V / 60Hz

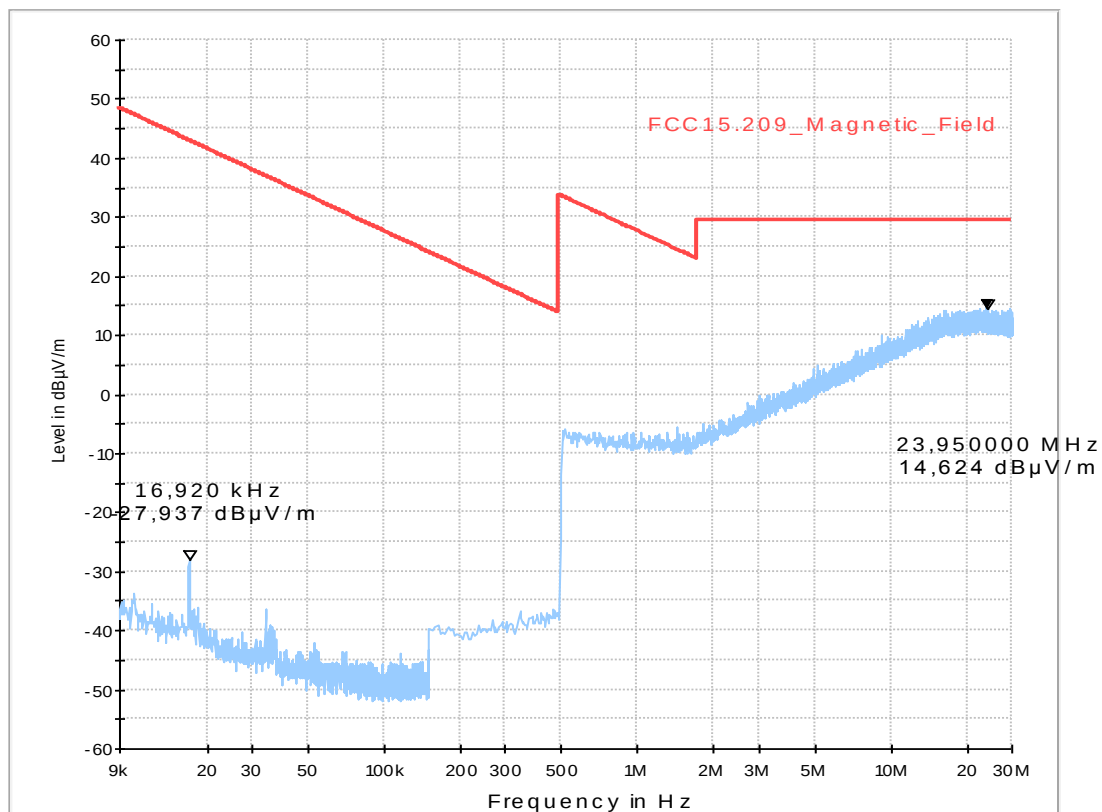


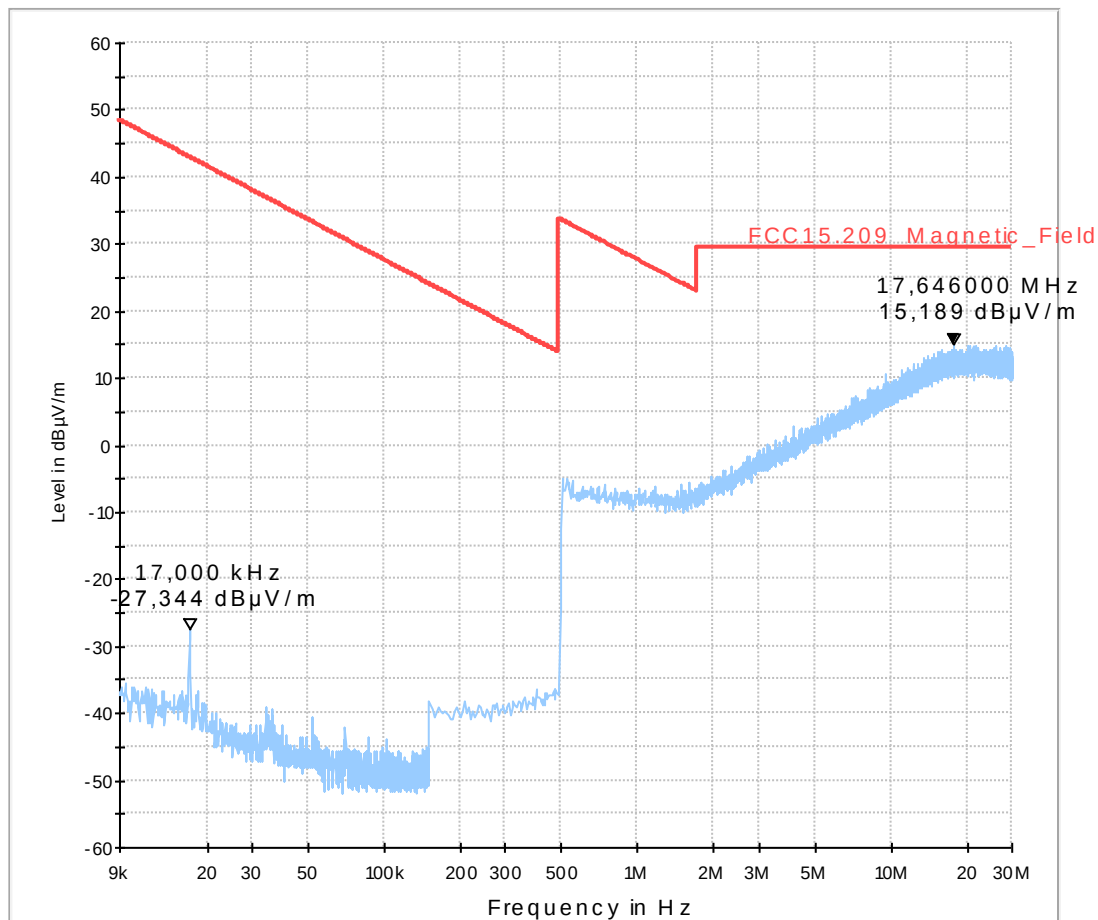
Diagram 2.01b_Ch1_b_Mode_1MBit

Common Information

Test Description:	Magnetic Fieldstrength Measurement related to 30/300 m distance
Operating Conditions:	Semi Anechoic Room (SAR); CETECOM GmbH Essen
Operator Name:	EMC32 V8.51.0
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 Part 15.247(15.209)
Operator:	HLA
Operating conditions:	Ch1, bMode, 1MBit
Power During test:	full loaded battery
Remark:	laying

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	
Power Supply:	full Battery



1.2.2. g-Mode Modulation

Diagram No. 2.02a_TX_Ch6_g-mode_54Mbit

Test description:	Date: 24.04.2015 Page 1 of 1
Test site and distance:	Magnetic Field Strength Measurement related to 30/300 m distance
Version of Testsoftware:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Distance correction:	EMC32 V8.51.0
Technical Data:	used accord. table, pls. see test report
Rec. antenna (pre-scan):	Please see page 2 for detailed data of measurement setup
Used filter:	height 1.00 m, parallel and 90° to EUT polarisation
Test specification:	bypass
	FCC Part 15.247(15.209)

Operator:	HLA
Operating conditions:	Ch6, g-Mode, 54MBit
Power during tests:	full loaded battery
Comment 1:	standing
Comment 2:	

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery

3

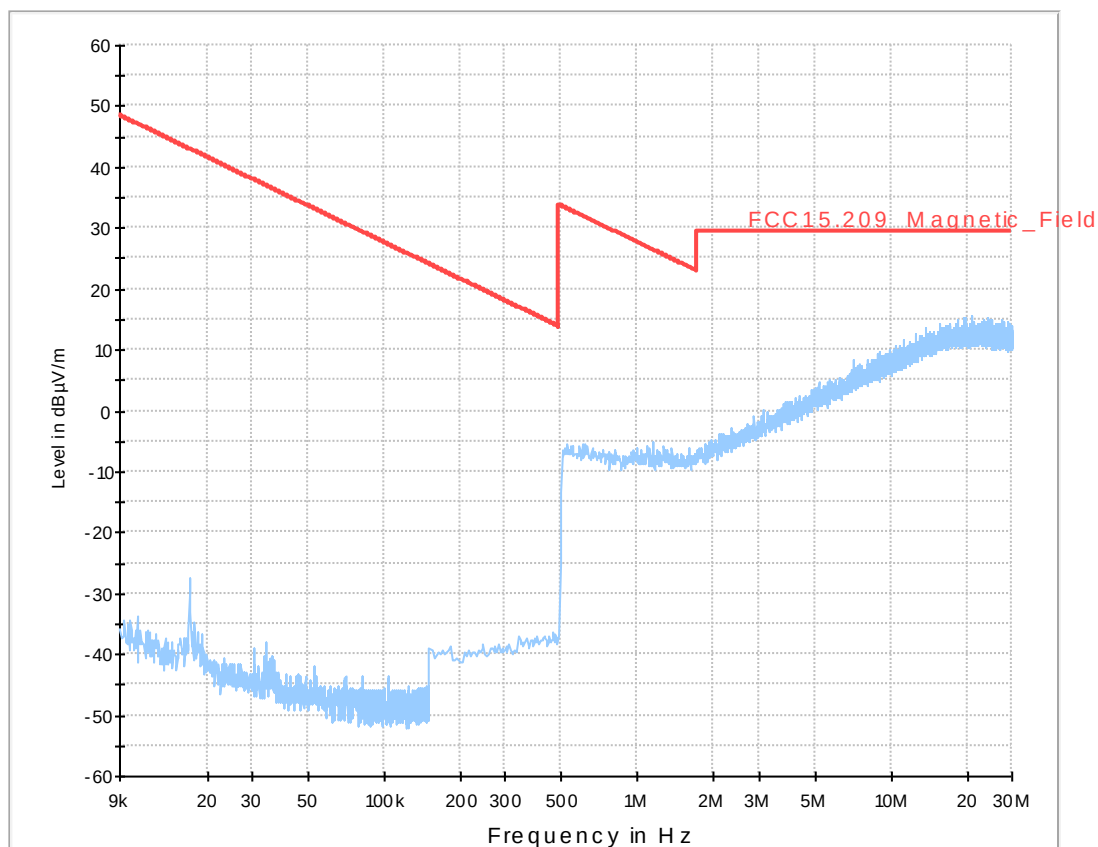


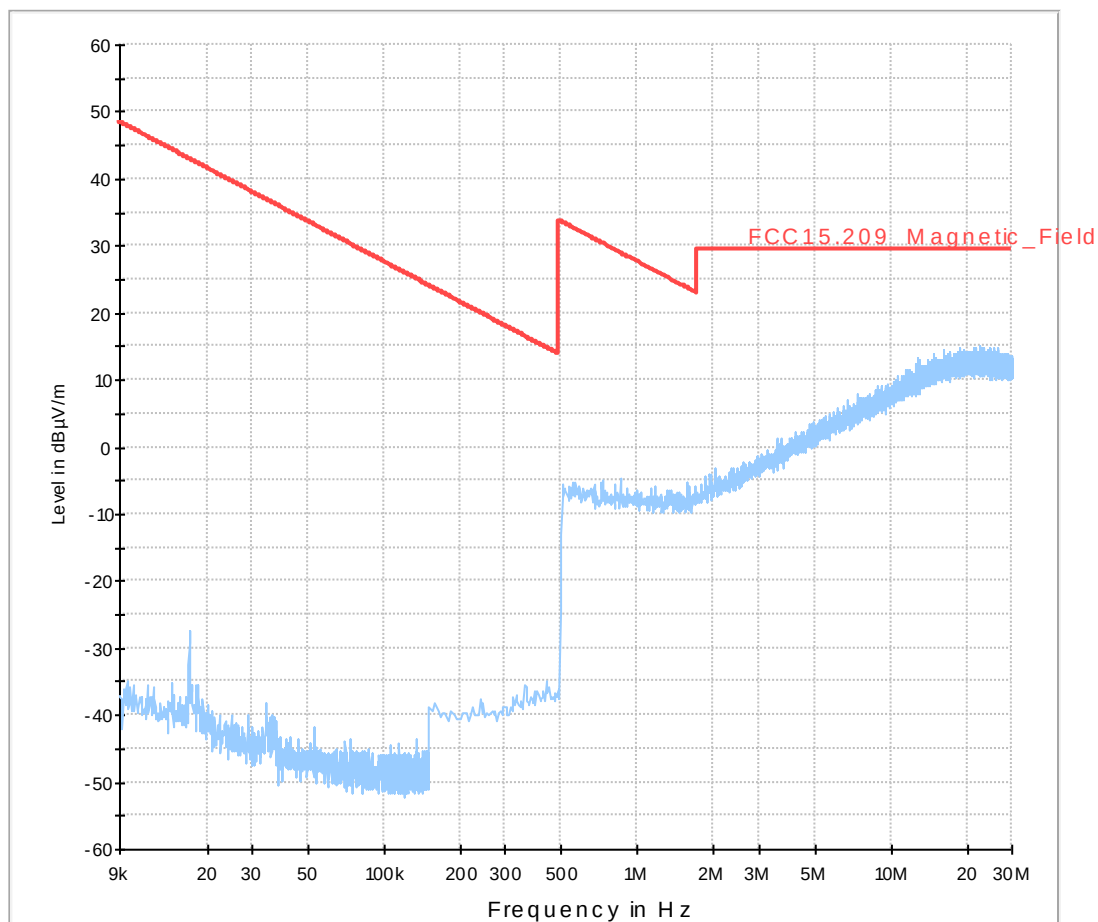
Diagram No. 2.02b_TX_Ch6_g-mode_54Mbit

Test Description:	Date: 24.04.2015 Page 1 of 1
Test site and distance:	Magnetic Field Strength Measurement related to 30/300 m distance
Version of Testsoftware:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Distance correction:	EMC32 V8.51.0
Technical Data:	used accord. table, pls. see test report
Rec. antenna (pre-scan):	Please see page 2 for detailed data of measurement setup
Used filter:	height 1.00 m, parallel and 90° to EUT polarisation
Test specification:	FCC Part 15.247(15.209)
Operator:	HLA
Operating conditions:	Ch6, g-Mode, 54MBit
Power during tests:	full loaded battery
Comment 1:	laying

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)

Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery



1.2.3. n-Mode Modulation**Diagram No. 2.03a_TX_Ch11_n-mode_MCS6**

Test description:	Date: 24.04.2015 Page 1 of 1
Test site and distance:	Magnetic Field Strength Measurement related to 30/300 m distance
Version of Testsoftware:	Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
Distance correction:	EMC32 V8.51.0
Technical Data:	used accord. table, pls. see test report
Rec. antenna (pre-scan):	Please see page 2 for detailed data of measurement setup
Used filter:	height 1.00 m, parallel and 90° to EUT polarisation
Test specification:	bypass
	FCC Part 15.247(15.209)
Operator:	HLA
Operating conditions:	Ch:11, n-mode, MCS6
Power during tests:	full loaded battery
Comment 1:	standing

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery

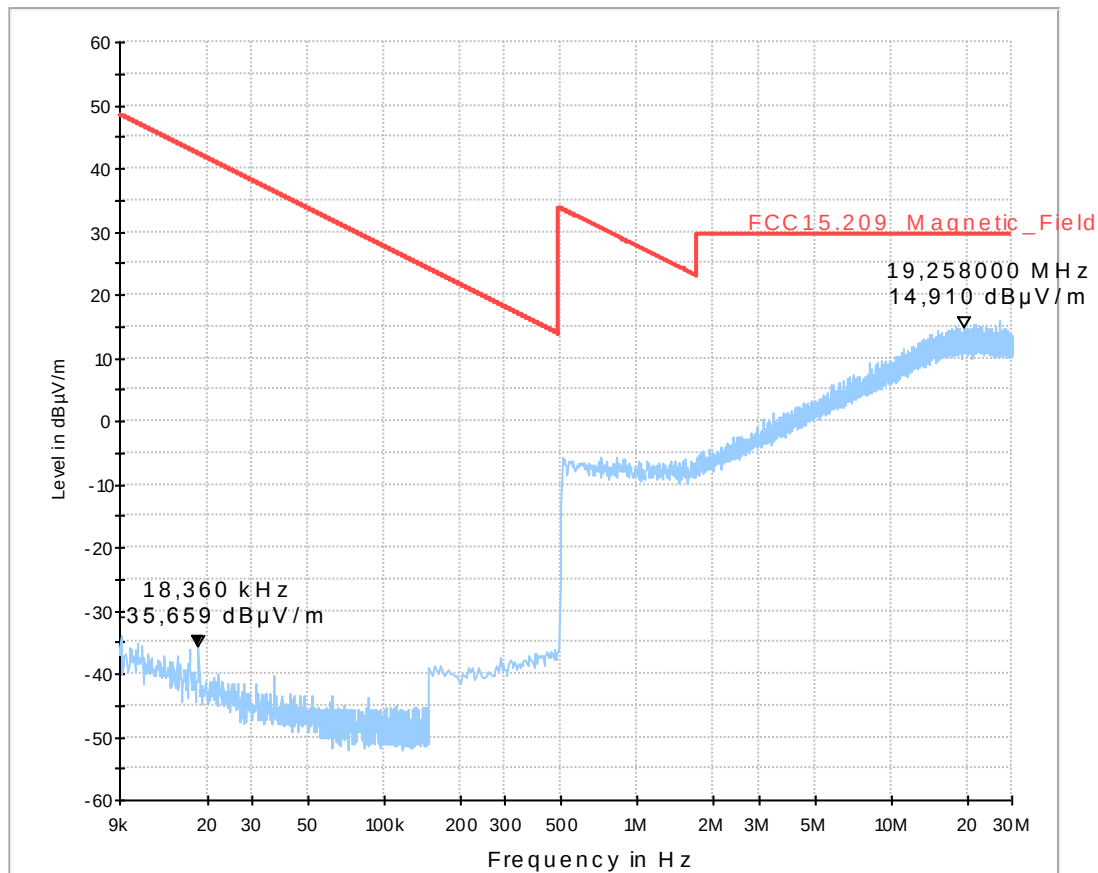
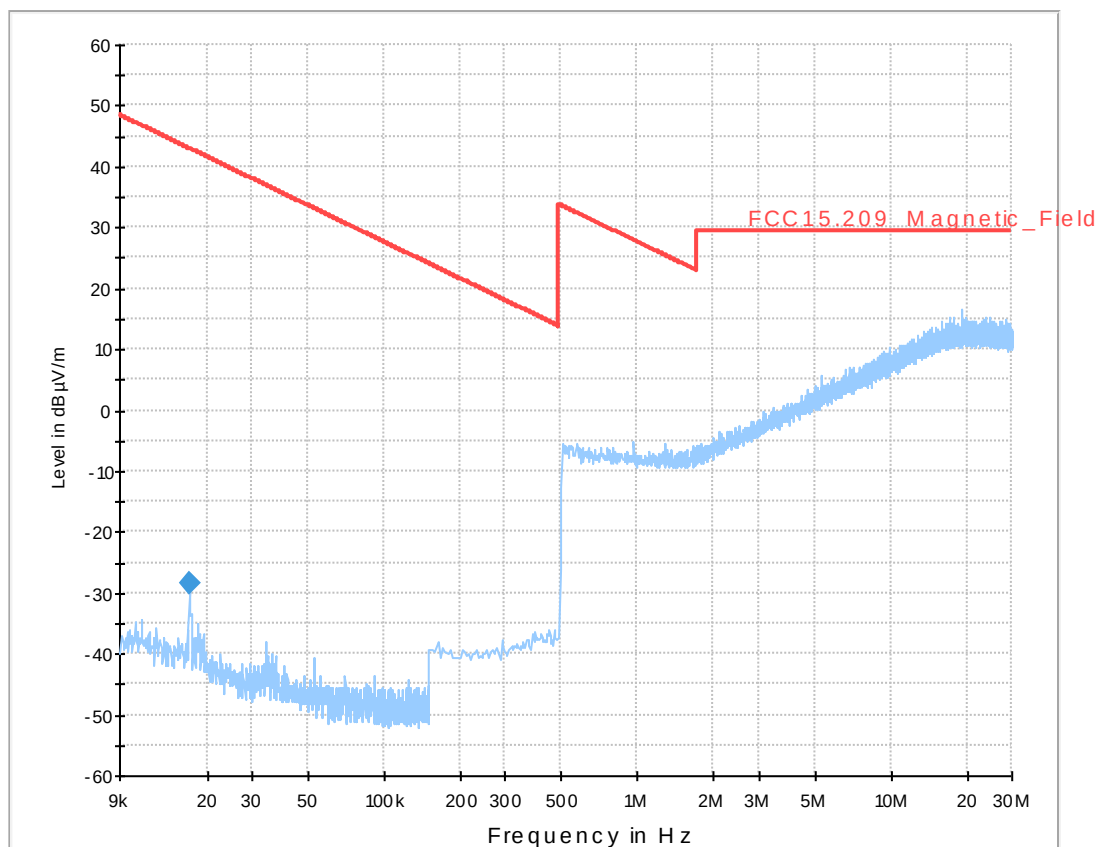


Diagram No. 2.03b_TX_Ch11_n-mode_MCS6

Date:	24.04.2015	Page 1 of 1
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 V8.51.0	
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 Part 15.247(15.209)	
Operator:	HLA	
Operating conditions:	Ch:11, n-Mode, MCS6	
Power during tests:	full loaded battery	
Comment 1:	laying	
Comment 2:		

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery



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

1.3.1. b-Mode Modulation

Diagram No. 3.01_TX_Ch1_b-mode_1Mbit

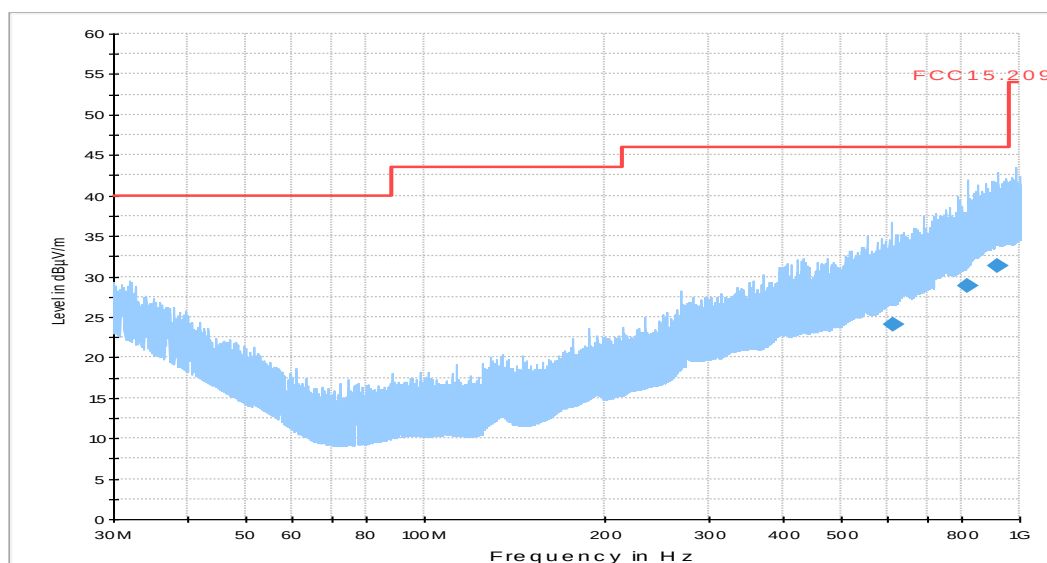
11.05.2015 Page 1 of 2
 Test description: Electric Field Strength Measurement
 Test site and distance: Ref.-Nr. 441 Semi Anechoic Room (SAR) with 3 m measurement distance
 Version of Testsoftware: EMC32 V8.51.0
 Distance correction: not used
 Used filter: not used
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.247/15.209

Operator: AHO
 Operating conditions: W-LAN, Channel 1, 1MBit, b-Mode
 Power during tests: full battery
 Comment 1: laying+ standing

EUT Information

Manufacturer: Leica Camera AG
 EuT: Digital Camera Leica S (Typ 007)
 Serial Number: P-108 (#RAD2)
 Connected Interfaces: --
 Power Supply: full Battery

01_FCC15.209_hor+vert_kipp



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Margin (dB)
611.280000	24.0	1000.0	120.000	116.0	H	232.0	0.0	22.4	22.00
817.480000	28.9	1000.0	120.000	282.0	H	270.0	90.0	25.6	17.10
919.970000	31.3	1000.0	120.000	332.0	V	185.0	0.0	27.1	14.70

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Limit (dBµV/m)
611.280000	46.00
817.480000	46.00
919.970000	46.00

1.3.2. g-Mode Modulation

Diagram No. 3.02_TX_Ch6_g-mode_54Mbit

11.05.2015 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 V8.51.0
 Distance correction: not used
 Used filter: not used
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.247/15.209

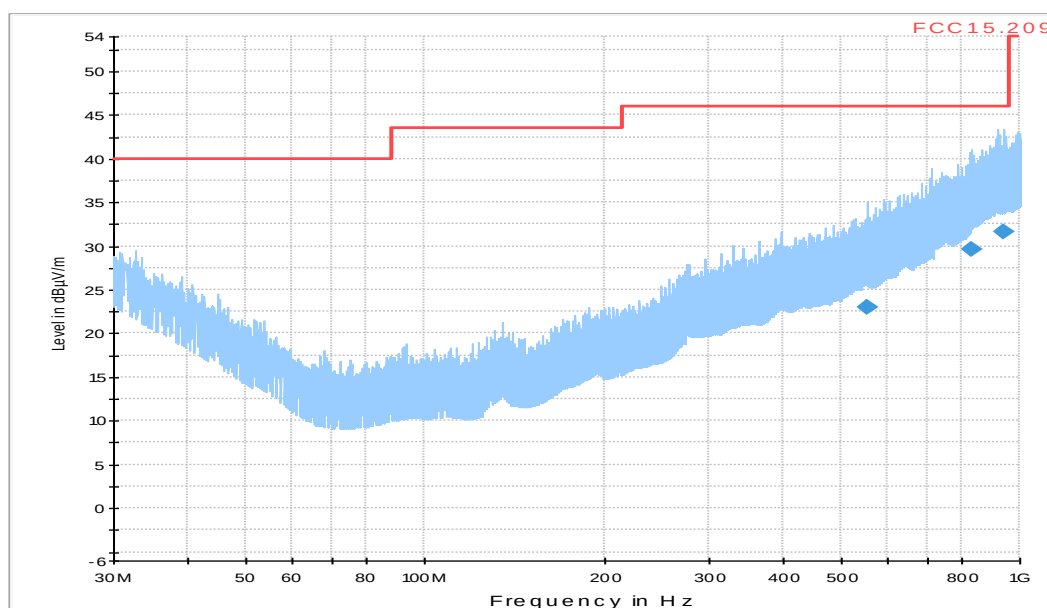
Operator: AHo
 Operating conditions: W-LAN, Channel 6, 54MBit, g-Mode
 Power during tests: full battery
 Comment 1: laying+ standing

EUT Information

Manufacturer: Leica Camera AG
 EuT: Digital Camera Leica S (Typ 007)

Serial Number: P-108 (#RAD2)
 Connected Interfaces: --
 Power Supply: full Battery

01_FCC15.209_hor+vert_kipp



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)	Correction (dB)	Margin (dB)
555.160000	23.1	1000.0	120.000	116.0	V	67.0	90.0	21.8	22.90
830.240000	29.7	1000.0	120.000	124.0	H	300.0	90.0	26.0	16.30
942.520000	31.6	1000.0	120.000	323.0	V	352.0	90.0	27.2	14.40

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Limit (dBµV/m)
555.160000	46.00
830.240000	46.00
942.520000	46.00

1.3.3. n-Mode Modulation

Diagram No. 3.03_TX_Ch11_n-mode_MCS6

11.05.2015 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 V8.51.0
 Distance correction: not used
 Used filter: not used
 Technical Data: please see page 2 for detailed data of measurement setup
 Test specification.: FCC 15.247/15.209

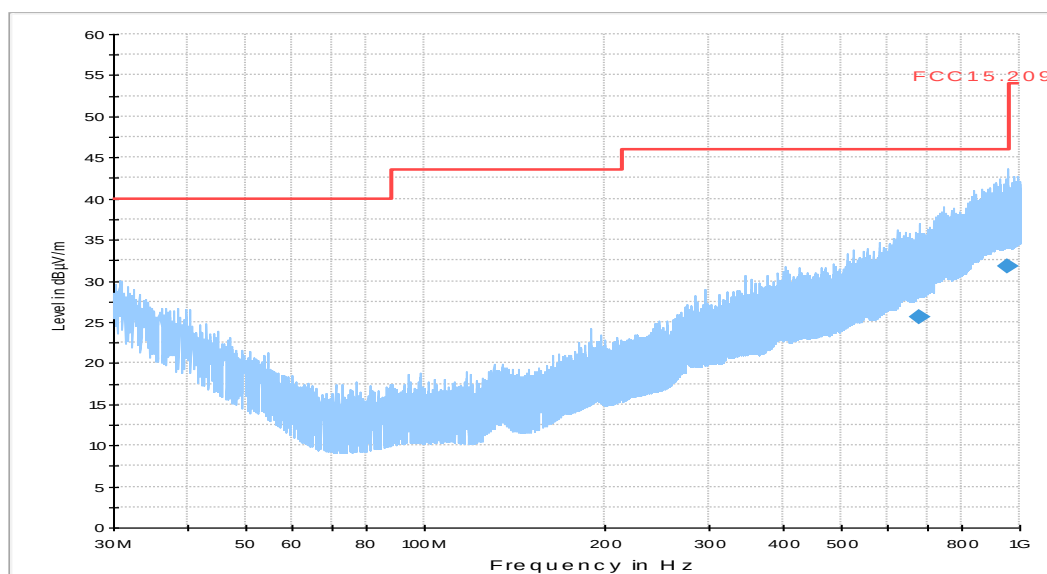
Operator: AHo
 Operating conditions: W-LAN, Channel 11, MCS6, n-Mode
 Power during tests: full battery
 Comment 1: laying+ standing

EUT Information

Manufacturer: Leica Camera AG
 EuT: Digital Camera Leica S (Typ 007)

Serial Number: P-108 (#RAD2)
 Connected Interfaces: --
 Power Supply: full Battery

01_FCC15.209_hor+vert_kipp



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)	Correction (dB)	Marginal (dB)
680.470000	25.6	1000.0	120.000	305.0	V	216.0	0.0	23.5	20.40
953.410000	31.8	1000.0	120.000	115.0	V	69.0	0.0	27.5	14.20

(continuation of the "Final Result 1" table from column 10 ...)

Frequency (MHz)	Limit (dBµV/m)
680.470000	46.00
953.410000	46.00

1.4. Field strength measurements $f < 18\text{GHz}$

1.4.1. b-Mode Modulation

Diagram No.: 4.04_TX_Ch1_b-Mode_1Mbit

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
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor/HLa
Comment:	Channel no. low=1, bMode, 1MBit

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery

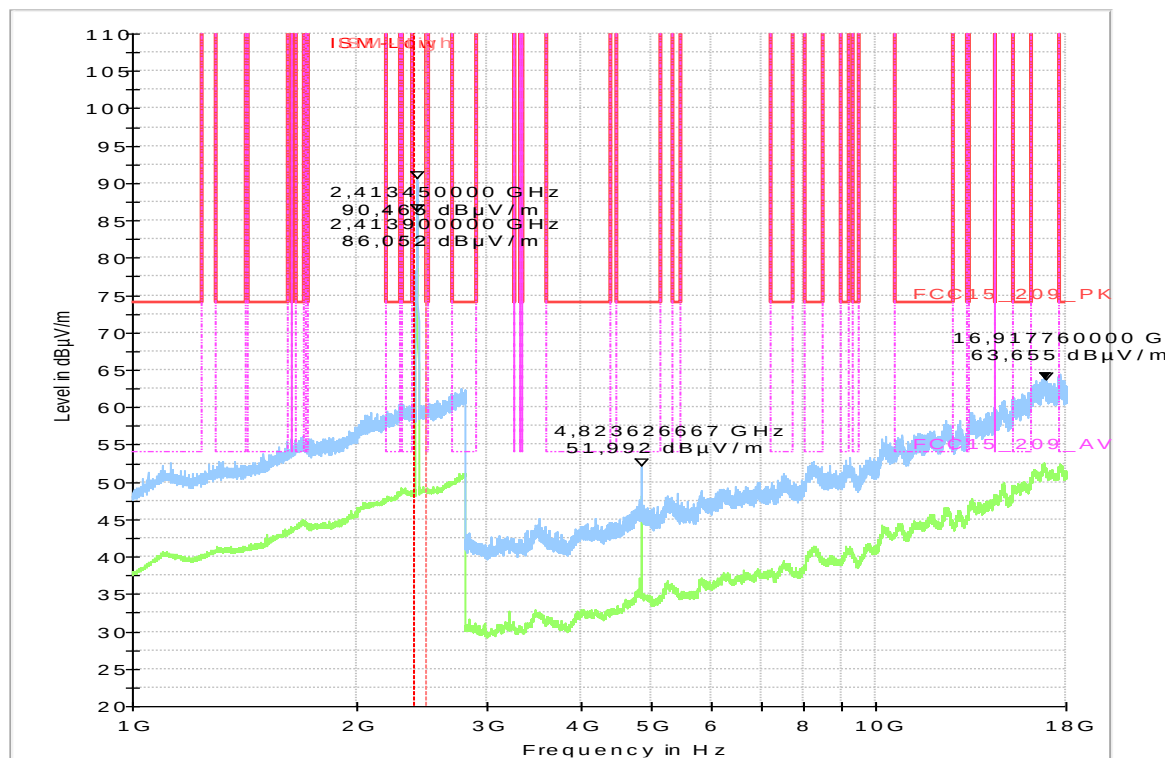
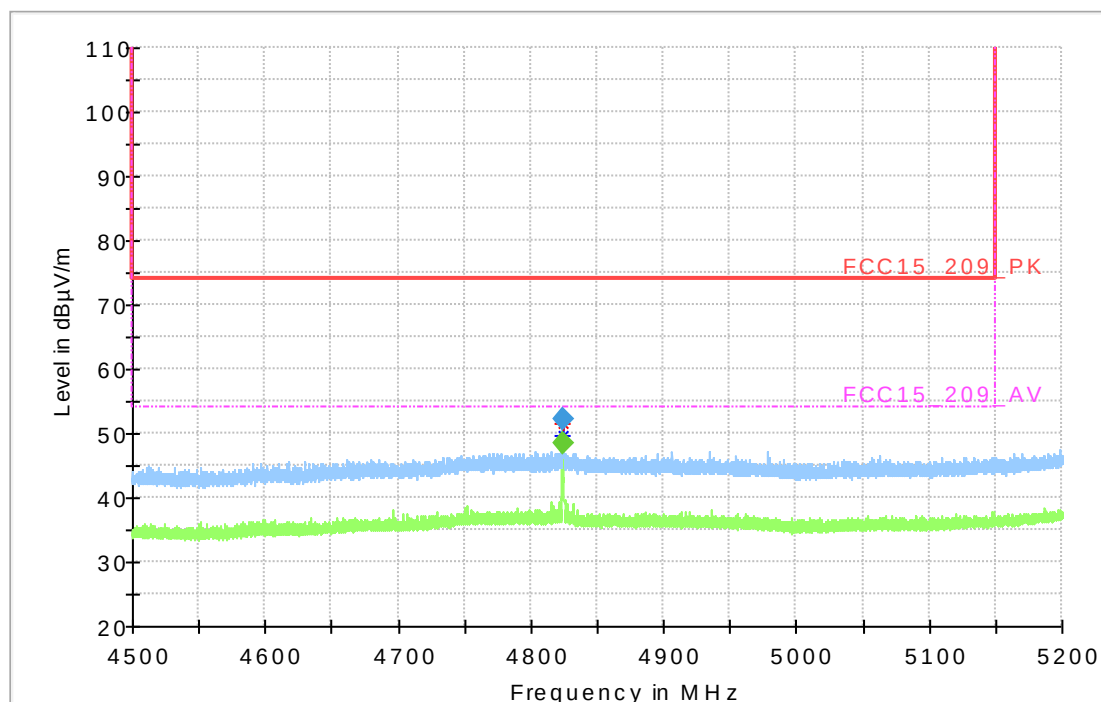


Diagram No.: 4.04a_TX_Ch1_b-Mode_1Mbit



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)
4823.985000	---	48.47	54.00	5.53	100.0	1000.000	155.0	V	34.0	0.0
4824.020000	52.26	---	74.00	21.74	100.0	1000.000	155.0	V	35.0	0.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Correction	Comment
4823.985000	4.8	11:43:52 - 08.05.2015
4824.020000	4.8	11:40:56 - 08.05.2015

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)
4823.985000	---	48.47	54.00	5.53	100.0	1000.000	155.0	V	34.0	0.0
4824.020000	52.26	---	74.00	21.74	100.0	1000.000	155.0	V	35.0	0.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Correction	Comment
4823.985000	4.8	11:43:52 - 08.05.2015
4824.020000	4.8	11:40:56 - 08.05.2015

1.4.2. g-Mode Modulation

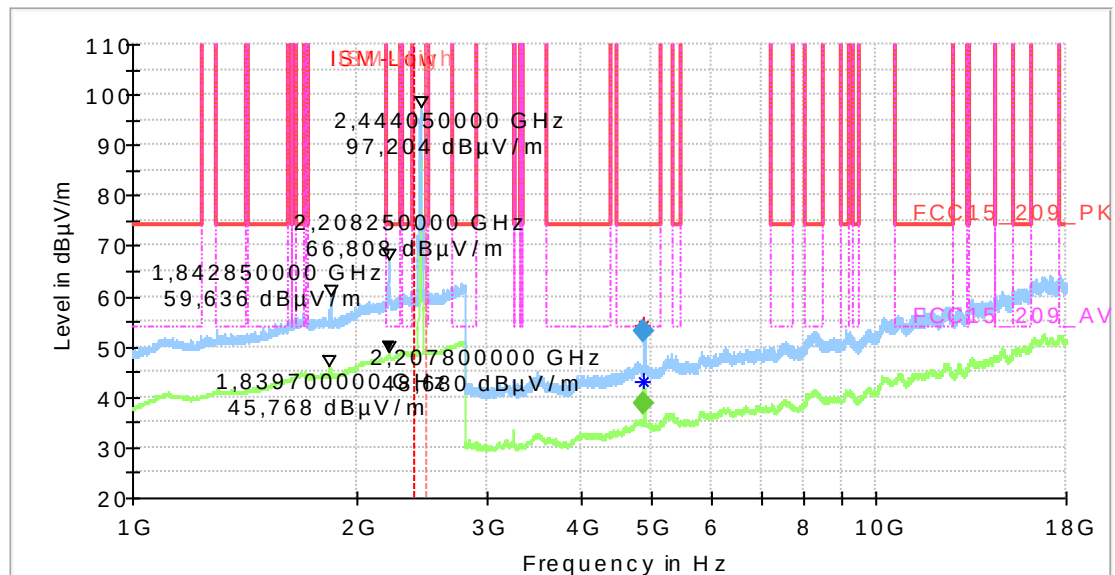
Diagram No.: 4.05a_TX_Ch6_g-Mode_54Mbit

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
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	HLA
Comment:	Channel no. mid=6, g-Mode, 54MBit

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery
Comments:	



Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)
4868.380000	53.24	---	74.00	20.76	100.0	1000.000	155.0	V	39.0	0.0
4870.846667	---	38.57	54.00	15.43	100.0	1000.000	155.0	V	38.0	0.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Correction
4868.380000	4.7
4870.846667	4.7

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)
4868.380000	53.24	---	74.00	20.76	100.0	1000.000	155.0	V	39.0	0.0
4870.846667	---	38.57	54.00	15.43	100.0	1000.000	155.0	V	38.0	0.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Correction
4868.380000	4.7
4870.846667	4.7

1.4.3. n-Mode Modulation

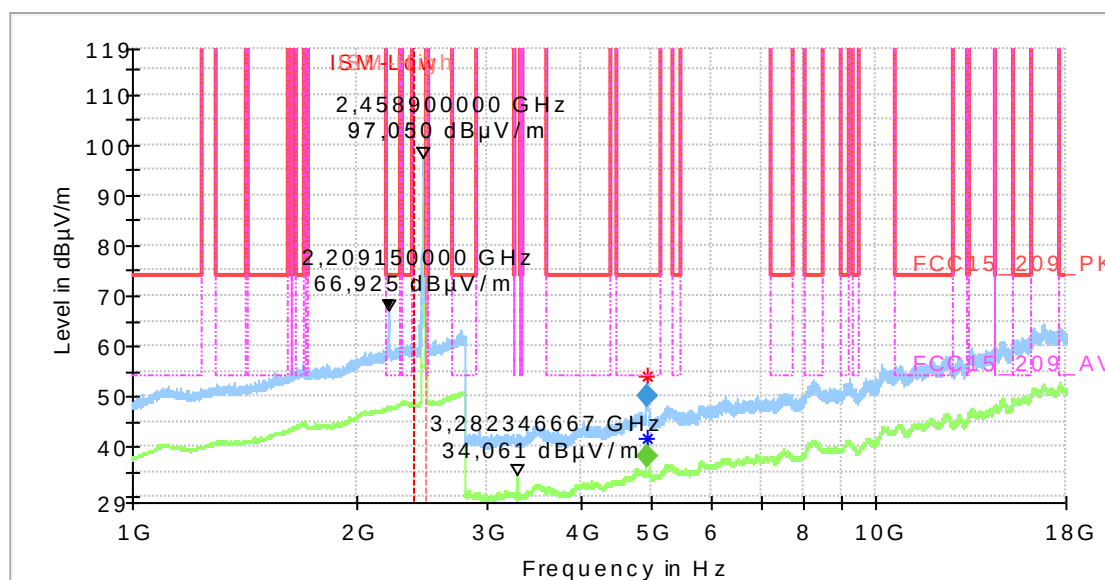
Diagram No.: 4.06a_TX_Ch11_n-Mode_MCS6

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
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. high=11

EUT Information

Manufacturer:	Leica Camera AG
EuT:	Digital Camera Leica S (Typ 007)
Serial Number:	P-108 (#RAD2)
Connected Interfaces:	--
Power Supply:	full Battery
Comments:	--



Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)
4918.020000	---	38.31	54.00	15.69	100.0	1000.000	155.0	V	33.0	0.0
4925.233333	49.96	---	74.00	24.04	100.0	1000.000	155.0	H	144.0	0.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Correction	Comment
4918.020000	4.5	13:45:32 - 09.05.2015
4925.233333	4.4	13:42:16 - 09.05.2015

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Elevation (deg)
4918.020000	---	38.31	54.00	15.69	100.0	1000.000	155.0	V	33.0	0.0
4925.233333	49.96	---	74.00	24.04	100.0	1000.000	155.0	H	144.0	0.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Correction	Comment
4918.020000	4.5	13:45:32 - 09.05.2015
4925.233333	4.4	13:42:16 - 09.05.2015

1.5. Field strength measurements $18\text{GHz} < f < 25\text{GHz}$

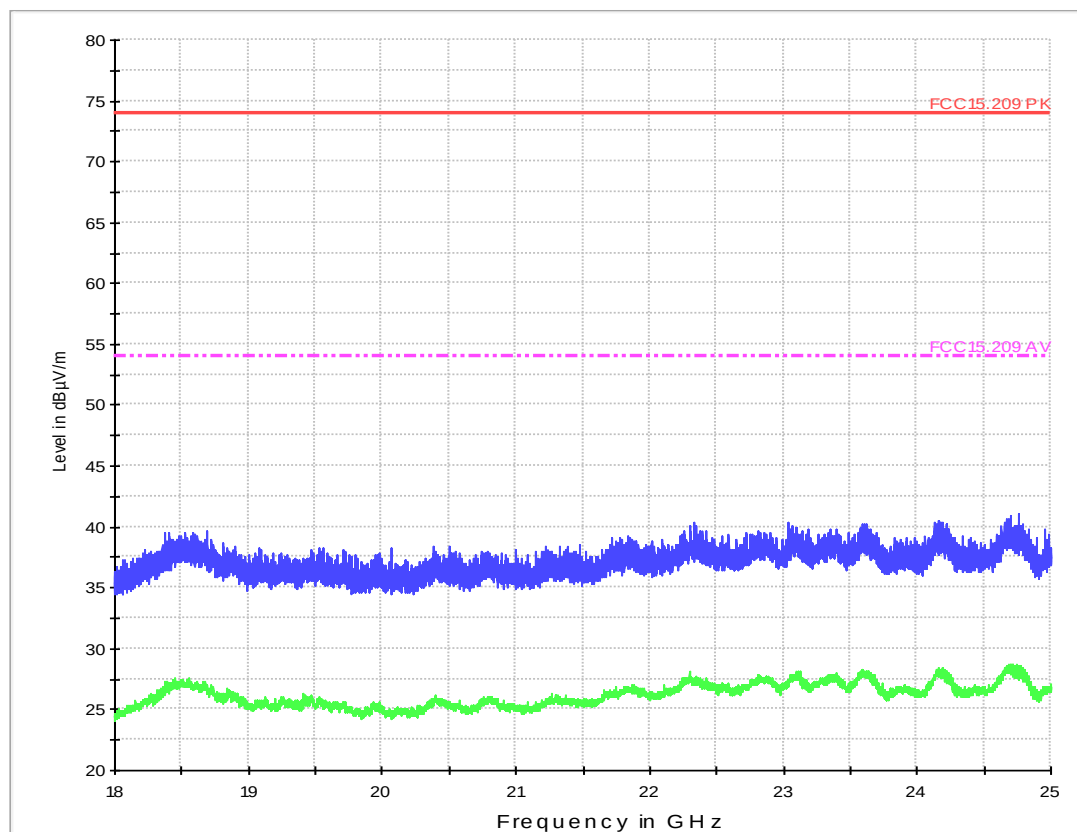
1.5.1. b-Mode Modulation

Diagram No.: 4.04b_TX_Ch1_bMode_1Mbits

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247, 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	TX mode continuous
Operator Name:	Aho
Comment:	Channel no. Low=1, 1 Mbits

EMI Scan_18_25GHz_Pre



Scan Setup: EMI Scan_18_25GHz_Pre [EMI radiated]

Hardware Setup:	HW05_ESU_18-40GHz_Preampl_Miteq_SN_1750117_dBuV_1m
Receiver:	[ESU 40]
Level Unit:	dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preampl
18 GHz - 25 GHz	400 kHz	PK+; AVG	1 MHz	0.0003 s	0 dB

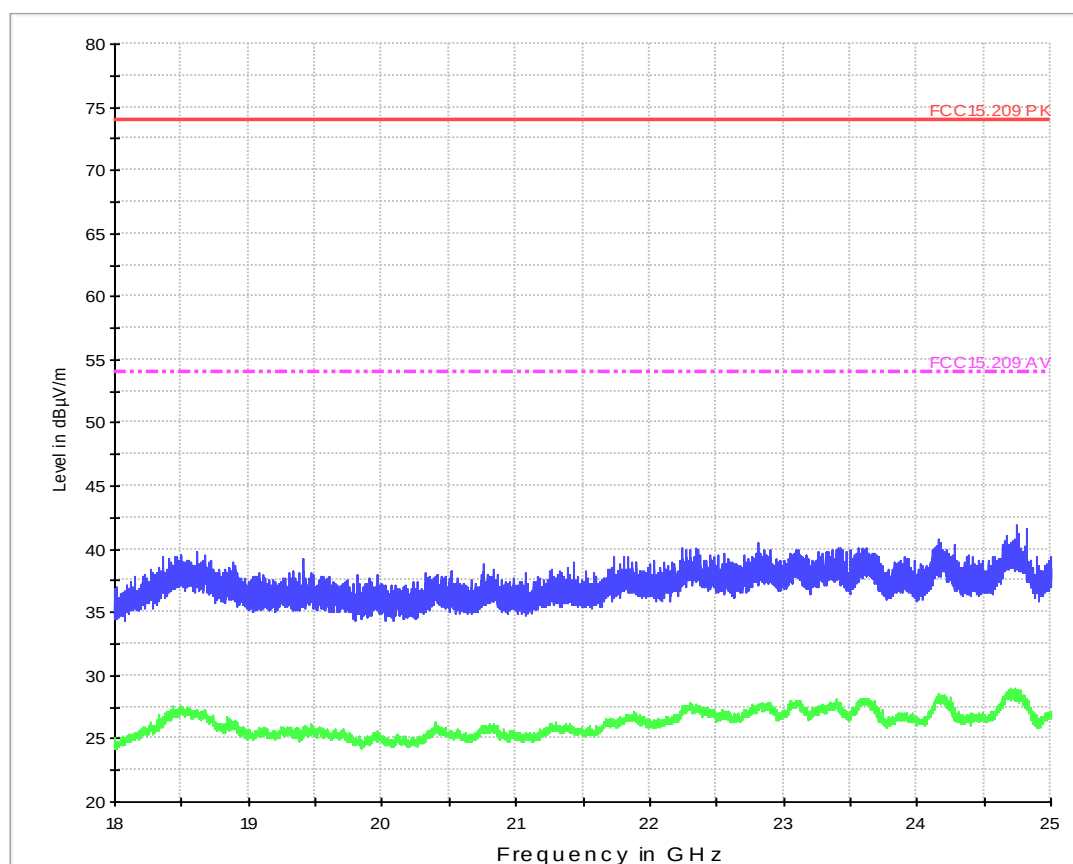
1.5.2. g-Mode Modulation

Diagram No.: 4.05b_TX_Ch6_gMode_MBits

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247, 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	TX mode continuous
Operator Name:	Aho
Comment:	Channel no. middle=6, 54 MBits

EMI Scan_18_25GHz_Pre



Scan Setup: EMI Scan_18_25GHz_Pre [EMI radiated]

Hardware Setup:	HW05_ESU_18-40GHz_Preampl_Miteq_SN_1750117_dBuV_1m
Receiver:	[ESU 40]
Level Unit:	dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preampl
18 GHz - 25 GHz	400 kHz	PK+; AVG	1 MHz	0.0003 s	0 dB

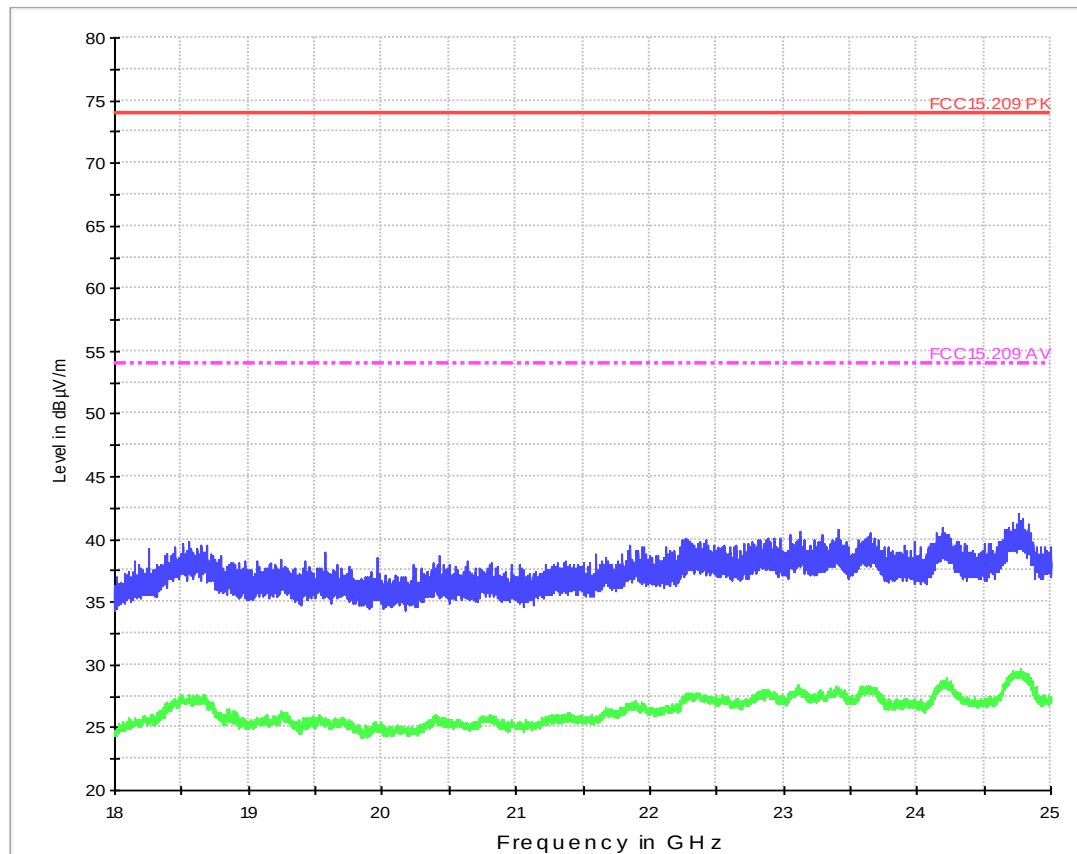
1.5.3. n-Mode Modulation

Diagram No.: 4.06b_CM_TX_Ch11_nMode_MCS6

Common Information

Test Description:	Radiated field strength emission in 1m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.247, 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Distance correction factor	3 to 1m: -10.5 dB applying to measurement results
SW-Version:	EMC32 V8.53.0
Operation mode:	TX mode continuous
Operator Name:	Aho
Comment:	Channel no. high=11, MCS6

EMI Scan_18_25GHz_Pre



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

1.6.1. Channel 1 (left band edge)

Diagram No.: 9.01b_BE_left_Ch1_b-Mode_1Mbit

Common Information

Test Description:	Radiated Band-Edge Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. low=1, b-Mode, 1MBit

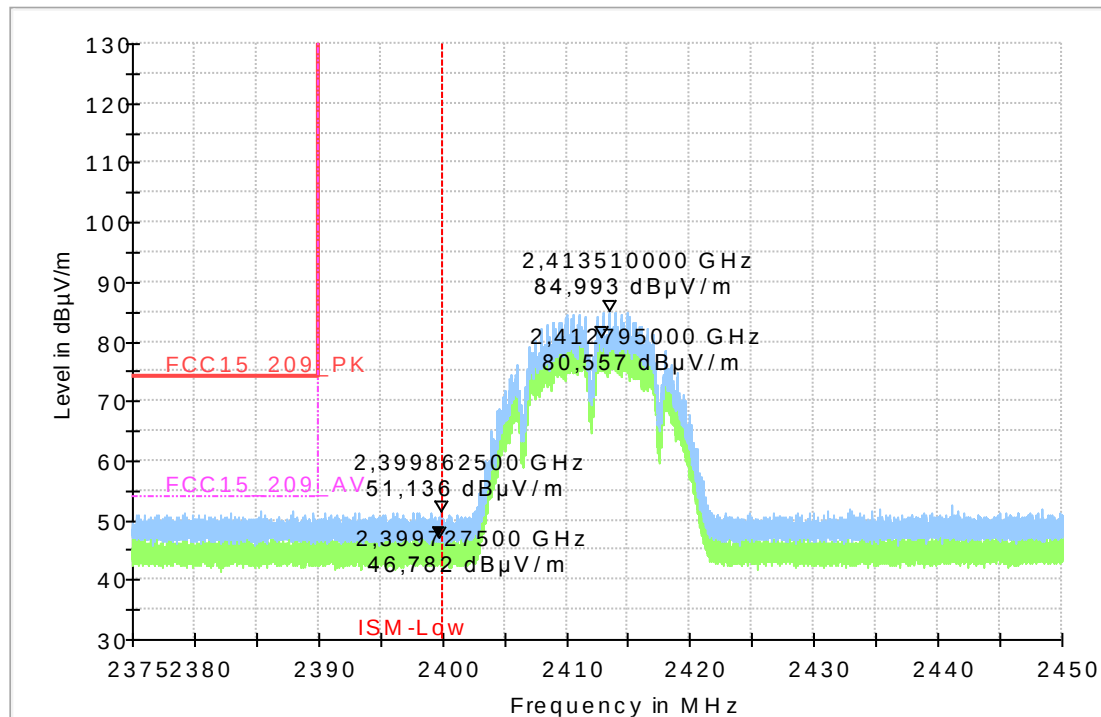


Diagram No.: 9.05_BE_left_Ch1_gMode_54Mbit

Common Information

Test Description:	Radiated Band-Edge Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. low=1, gMode, 54MBit

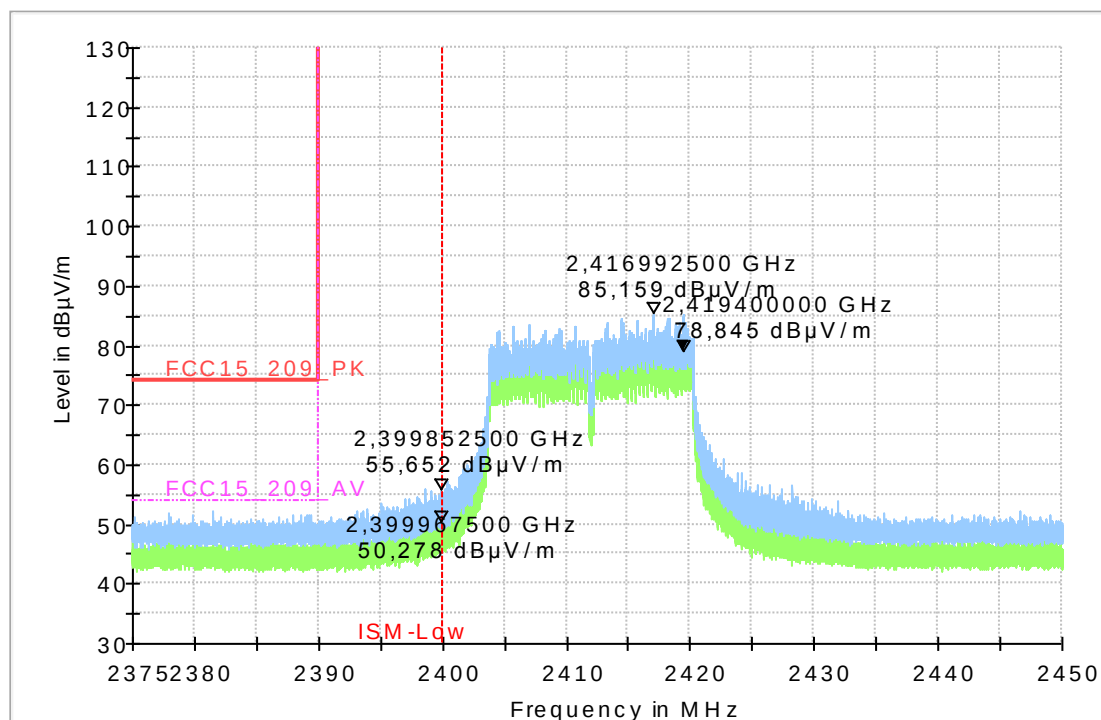
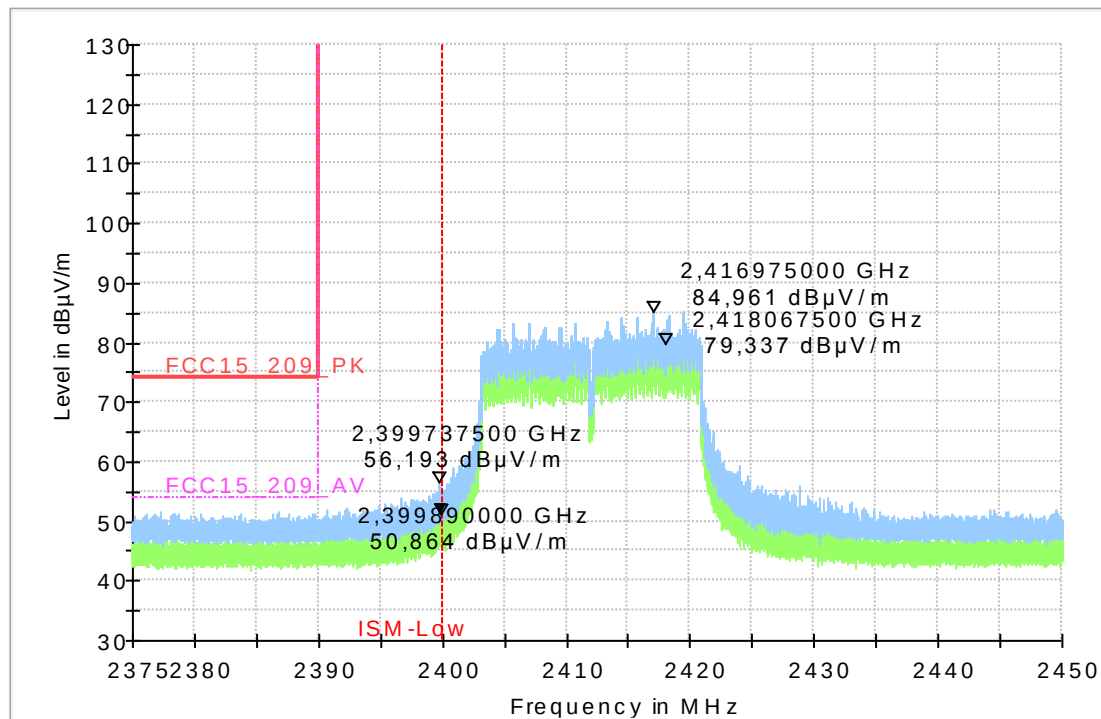


Diagram No.: 9.06_BE_left_Ch1_nMode_MCS6**Common Information**

Test Description:	Radiated Band-Edge Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. low=1, n-Mode, MCS6



1.6.2. Channel 11 (right band edge)

Diagram No.: 9.02b_BE_right_Ch11_n-Mode_MCS6_ReTest

Common Information

Test Description:	Radiated Band-Edge Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. high=11, n-Mode, MCS6

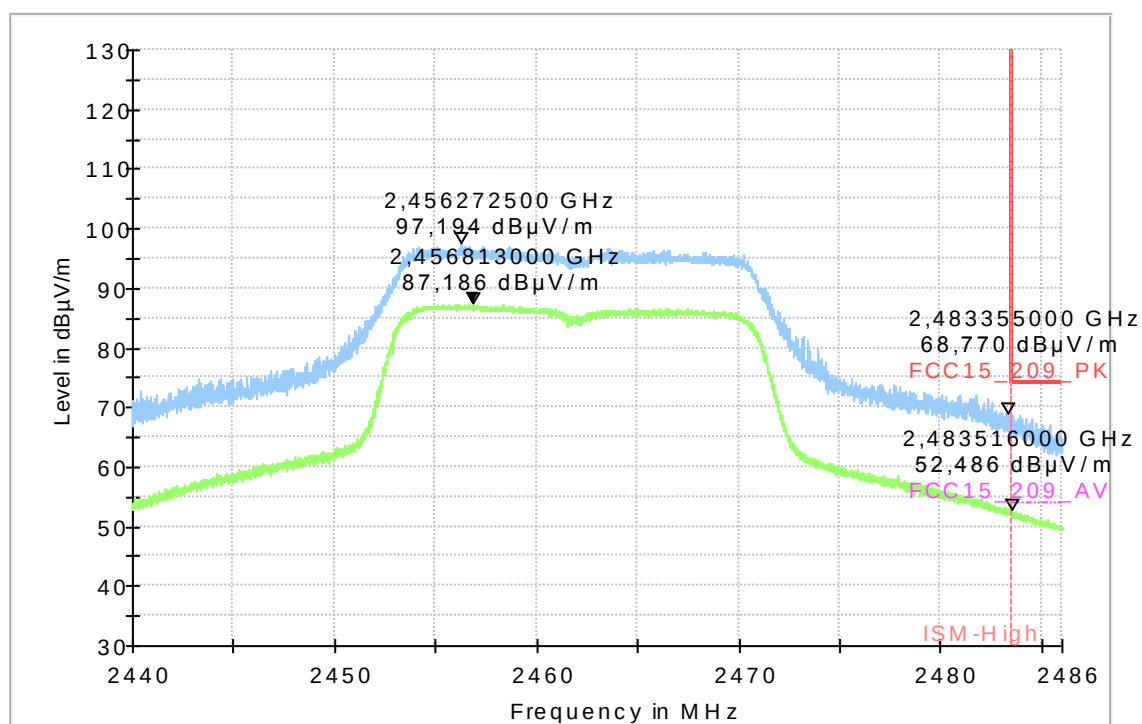


Diagram No.: 9.03_BE_right_Ch11_gMode_54Mbit**Common Information**

Test Description:	Radiated Band-Edge Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. high=11, gMode, 54MBit

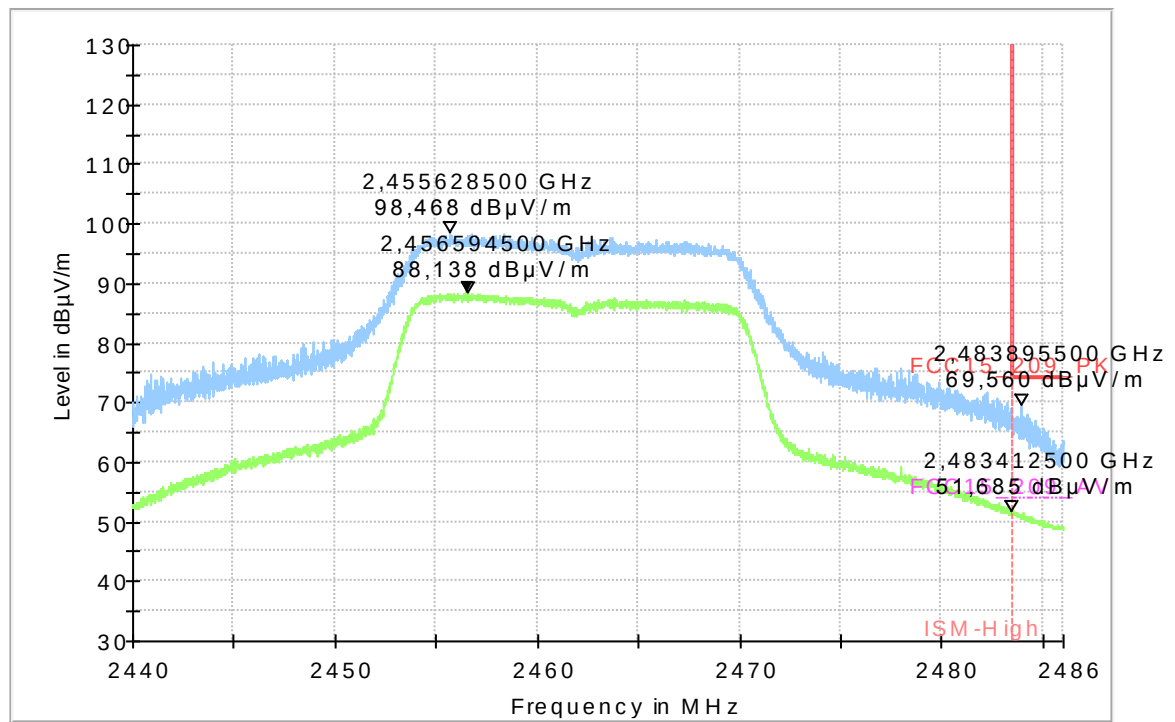
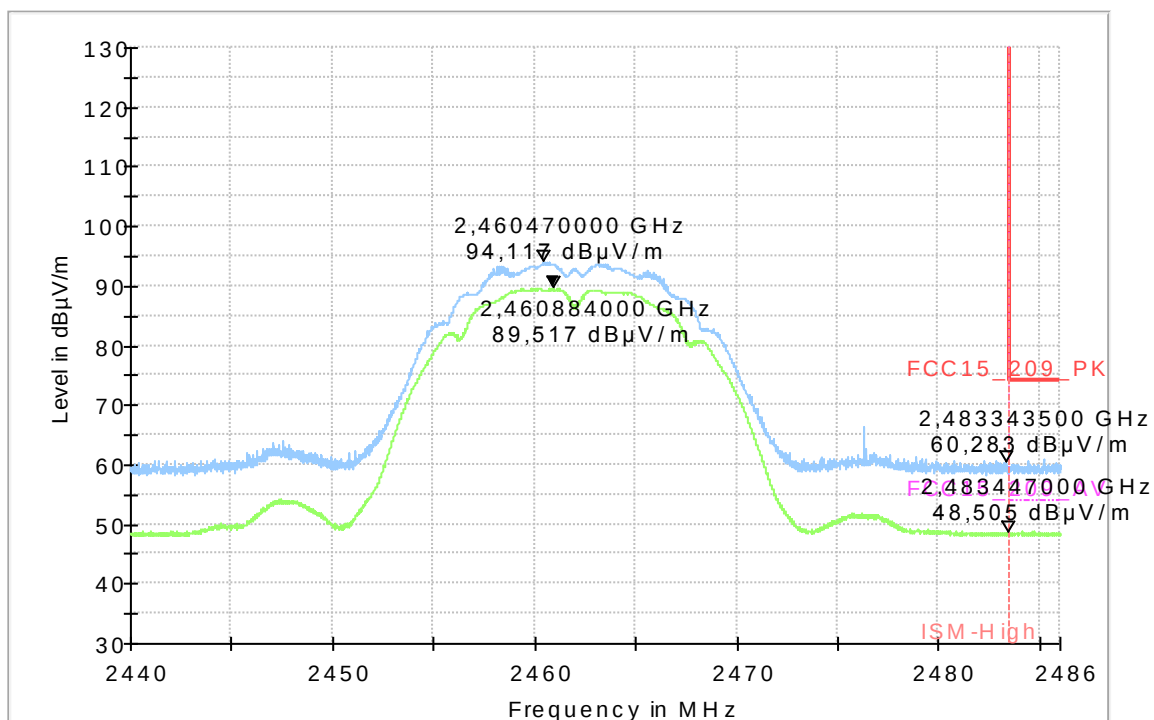


Diagram No.: 9.04_BE_right_Ch11_bMode_1Mbit**Common Information**

Test Description:	Radiated Band-Edge Emissions in 3m distance
Test Site:	CETECOM GmbH Essen
Test Standard:	FCC 15.205&15.209 Intentional Radiator
Antenna polarisation:	horizontal/vertical
Operation mode:	TX, continuous
Operator Name:	Lor
Comment:	Channel no. high=11, b-Mode, 1MBit



1.7. Conducted RF-measurements on antenna port

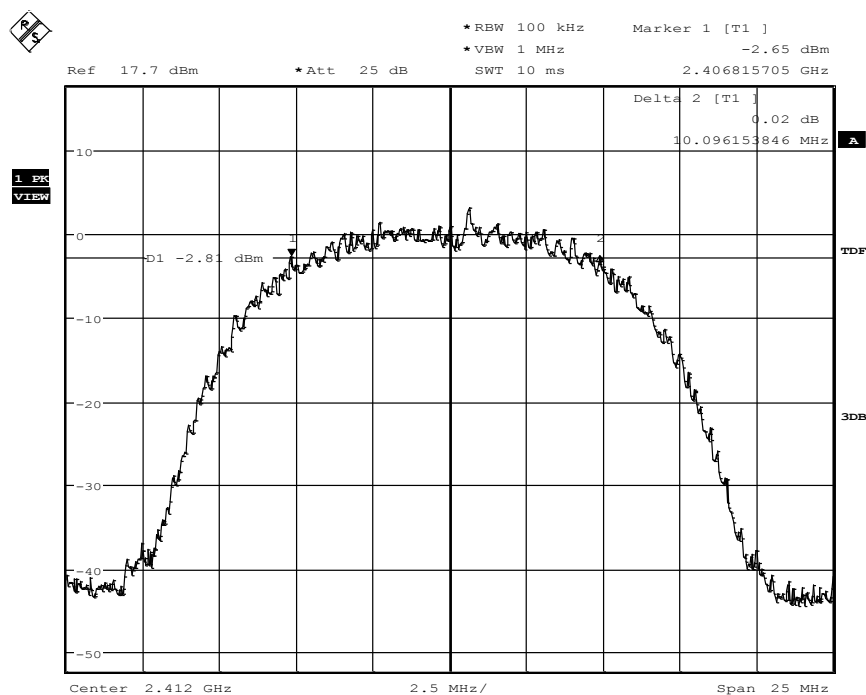
1.7.1. Conducted RF-power

b-mode		Power value (PK) [dBm]			Max-Value	Max.-Value among all modulations	
		Channel no.					
Data rate	Modulation	1	6	11			
1MBit	DBPSK	11,76	15,24	14,47	15,24	17,15	
2Mbit	DQPSK	11,70	15,19	14,38			
5.5Mbit	CCK/PBCC	11,65	15,19	14,44			
11MBit	ERP-PBCC	11,65	15,23	14,49			
g-Mode		Power value (PK) [dBm]			Max.-Value		
		Channel no.					
Data rate	Modulation	1,00	6,00	11,00			
6Mbit	BPSK	13,18	16,45	16,00	17,15		
9Mbit	BPSK	--	--	--			
12Mbit	QPSK	13,09	16,45	16,02			
18Mbit	QPSK	13,10	16,50	16,06			
24Mbit	16-QAM	13,19	16,60	16,13			
36Mbit	16-QAM	14,43	17,15	16,80			
48Mbit	64-QAM	14,48	17,02	16,65			
54MBit	64-QAM	14,39	16,98	16,67			
n-Mode HT20 (1 spatial stream: 1SS)		Power value (PK) [dBm]			Max.-Value		
		Channel no.					
Data rate	Modulation	1,00	6,00	11,00			
MCS0 -6.5Mbps	BPSK	13,15	16,48	15,86	16,98		
MCS1 - 13Mbps	QPSK	13,27	16,45	15,85			
MCS2 - 19.5Mbps	QPSK	13,27	16,50	15,92			
MCS3 - 26Mbps	QAM16	13,28	16,62	16,07			
MCS4 -39Mbps	QAM16	13,17	16,49	16,11			
MCS5 - 52MBps	QAM64	14,65	16,95	16,63			
MCS6 - 58.5MBps	QAM64	14,64	16,98	16,57			
MCS7 - 65MBps	QAM64	14,66	16,96	16,49			

1.8. 6-dB Bandwidth

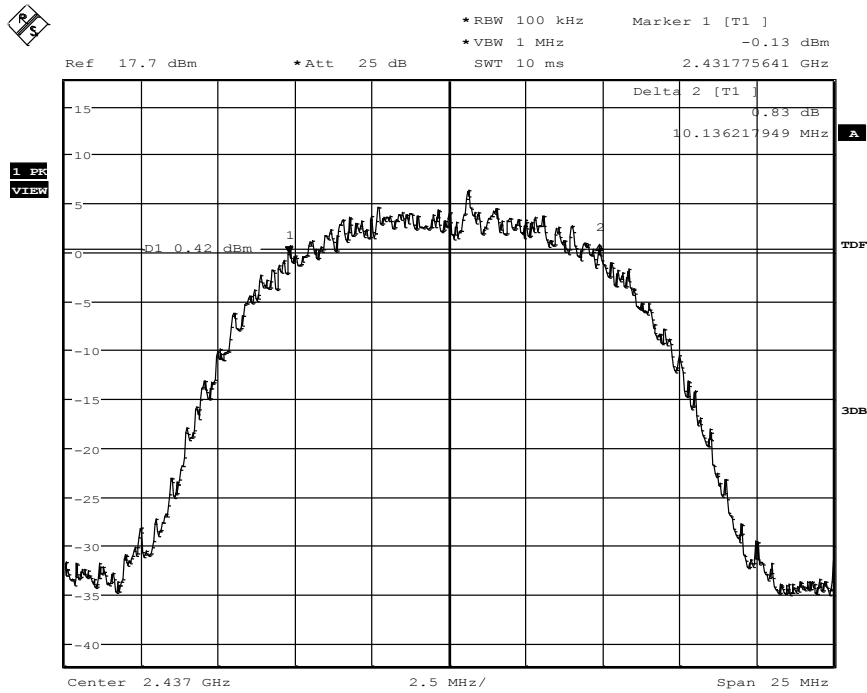
1.8.1. 6-dB Bandwidth (b-Mode)

b-mode		6dB-BW [MHz]			Max-Value
		Channel no.			
Data rate	Modulation	1	6	11	
1MBit	DBPSK	10,096153846	10,096153846	10,118585744	10,153846154
2Mbit	DQPSK	10,096153846	10,136217949	10,118589744	
5.5Mbit	CCK/PBCC	10,016025641	10,056085744	10,048076923	
11MBit	ERP-PBCC	10,096153846	10,136217949	10,153846154	

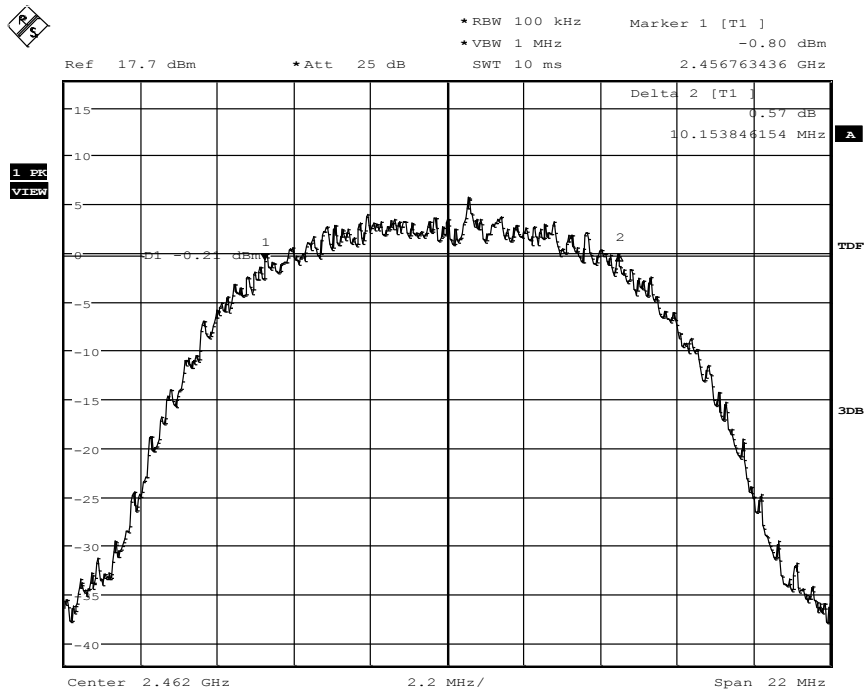


Date: 16.JUN.2015 10:22:08

Channel 1 - Worst-Case 6dB-Bandwidth



Date: 16.JUN.2015 10:43:59

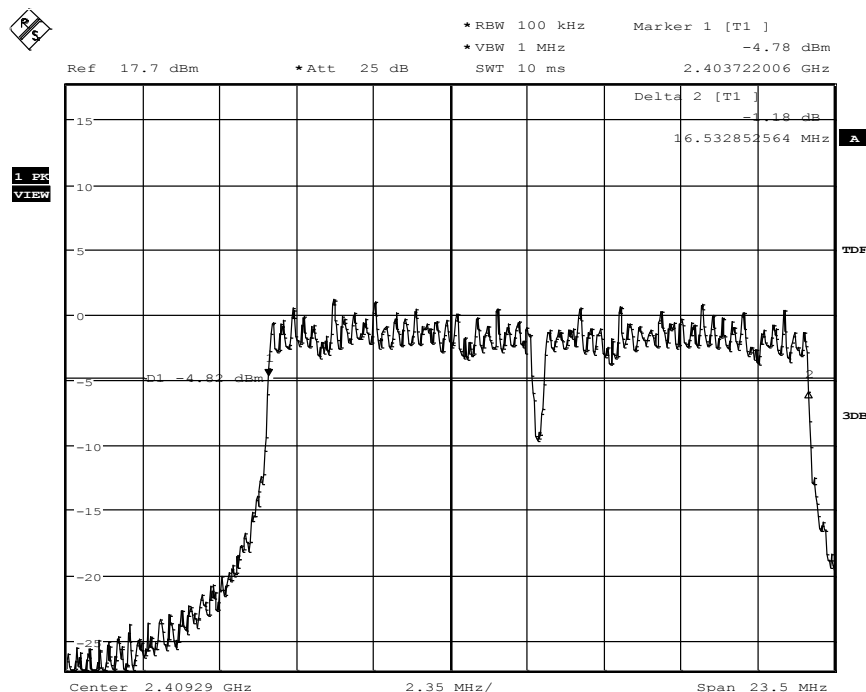
Channel 6 - Worst-Case 6dB-Bandwidth

Date: 16.JUN.2015 11:10:14

Channel 11 - Worst-Case 6dB-Bandwidth

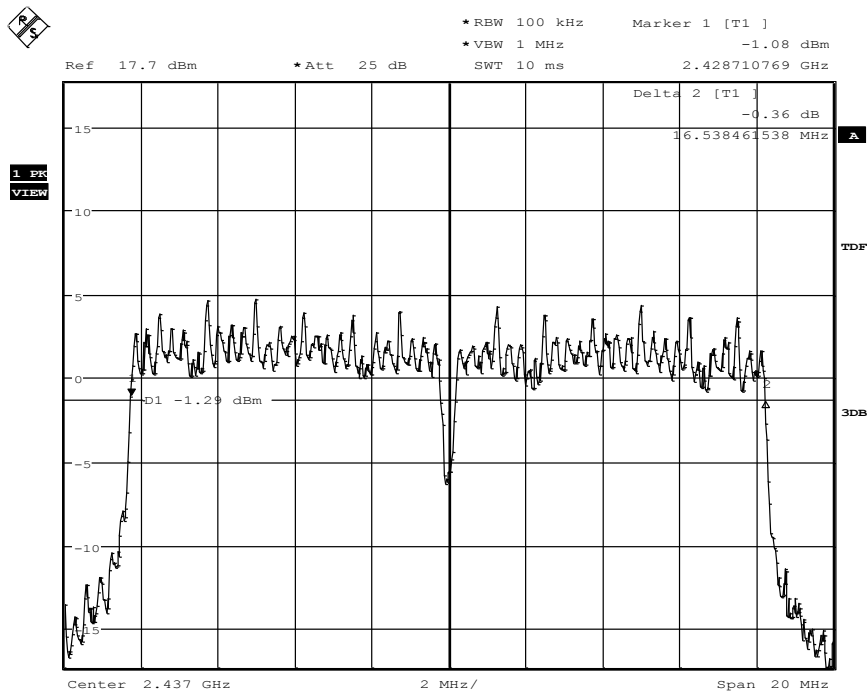
1.8.2. 6-dB Bandwidth (g-Mode)

g-Mode		6dB-BW [MHz]			Max-Value
		Channel no.			
Data rate	Modulation	1	6	11	
6Mbit	BPSK	16,356538462	16,346153846	16,346153846	16,538461538
9Mbit	BPSK	--	--	--	
12Mbit	QPSK	16,457532051	16,474358974	16,442307692	
18Mbit	QPSK	16,457532051	16,442307692	16,442307692	
24Mbit	QAM16	16,532852564	16,506410256	16,506410256	
36Mbit	QAM16	16,495192308	16,506410256	16,474358974	
48Mbit	QAM64	16,532852564	16,474358974	16,506410256	
54Mbit	QAM64	16,532852564	16,538461538	16,506410256	

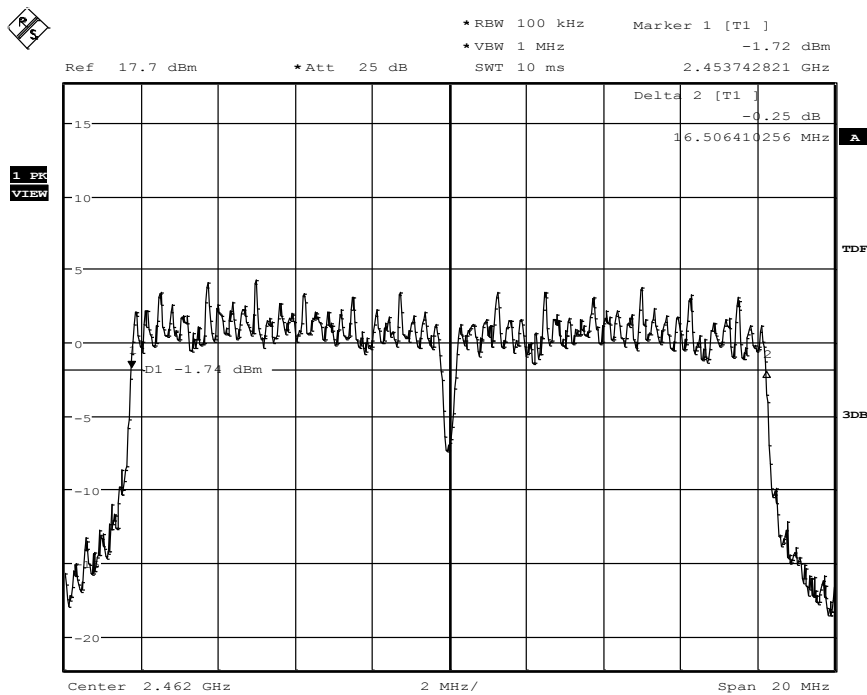


Date: 16.JUN.2015 11:46:20

Channel 1 - Worst-Case 6dB-Bandwidth



Date: 16.JUN.2015 12:15:15

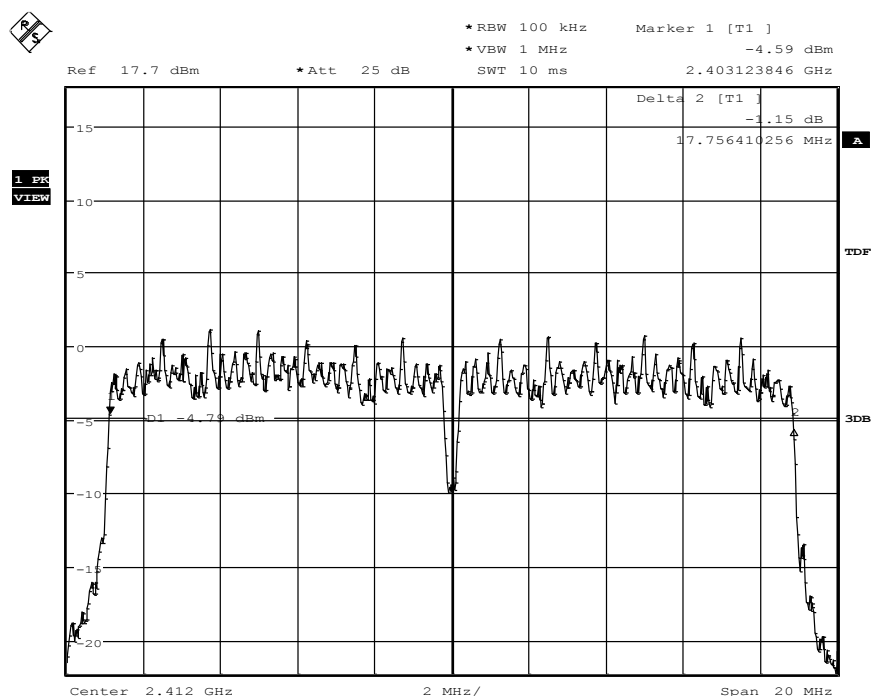
Channel 6 - Worst-Case 6dB-Bandwidth

Date: 16.JUN.2015 12:40:20

Channel 11 - Worst-Case 6dB-Bandwidth

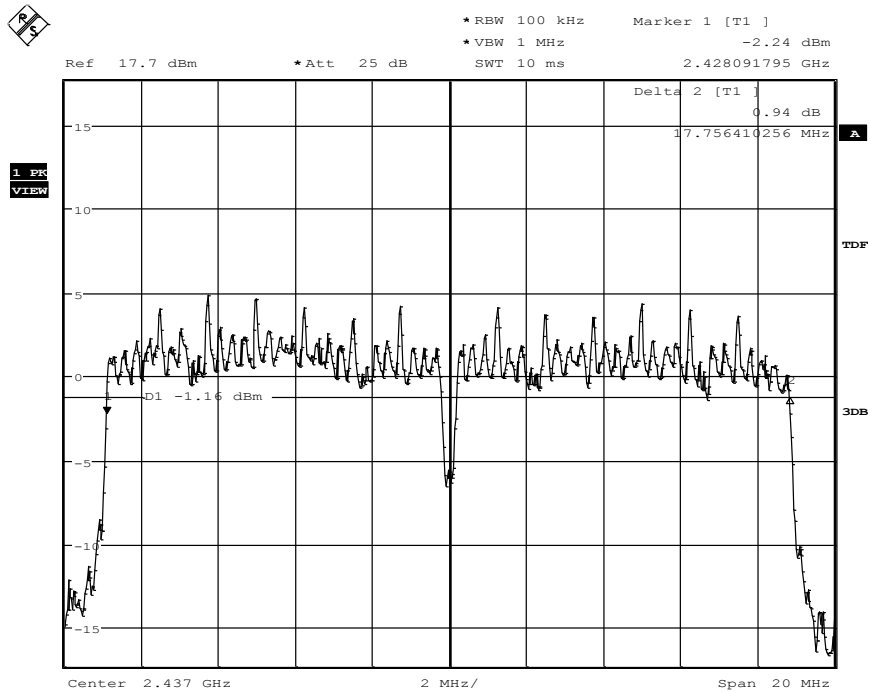
1.8.3. 6-dB Bandwidth (n-Mode)

n-Mode HT20 (1 spatial stream: 1SS)		6dB-BW [MHz]			Max-Value
		Channel no.			
Data rate	Modulation	1	6	11	
MCS0 - 6.5Mbps	BPSK	17,532051282	17,564102564	17,564102564	17,756410256
MCS1 - 13Mbps	QPSK	17,628205128	17,596153846	17,596153846	
MCS2 - 19.5Mbps	QPSK	17,660256410	17,628205128	17,596153846	
MCS3 - 26Mbps	QAM16	17,756410256	17,724358974	17,724358974	
MCS4 - 39Mbps	QAM16	17,724358974	17,724358974	17,724358974	
MCS5 - 52MBps	QAM64	17,756410256	17,756410256	17,724358974	
MCS6 - 58.5MBps	QAM64	17,756410256	17,756410256	17,724358974	
MCS7 - 65MBps	QAM64	17,756410256	17,756410256	17,756410256	

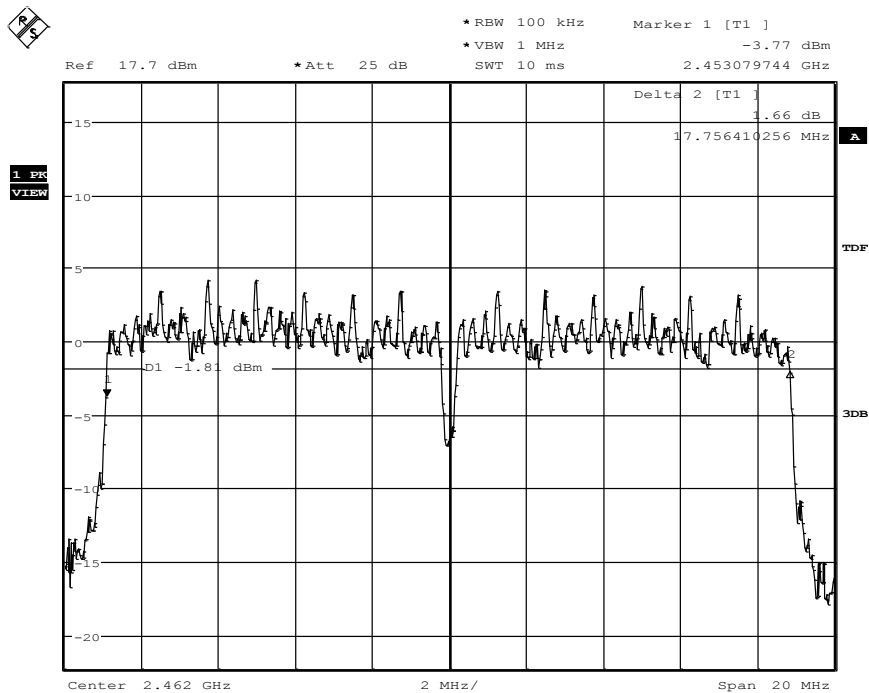


Date: 16.JUN.2015 13:52:02

Channel 1 - Worst-Case 6dB-Bandwidth



Date: 16.JUN.2015 14:32:58

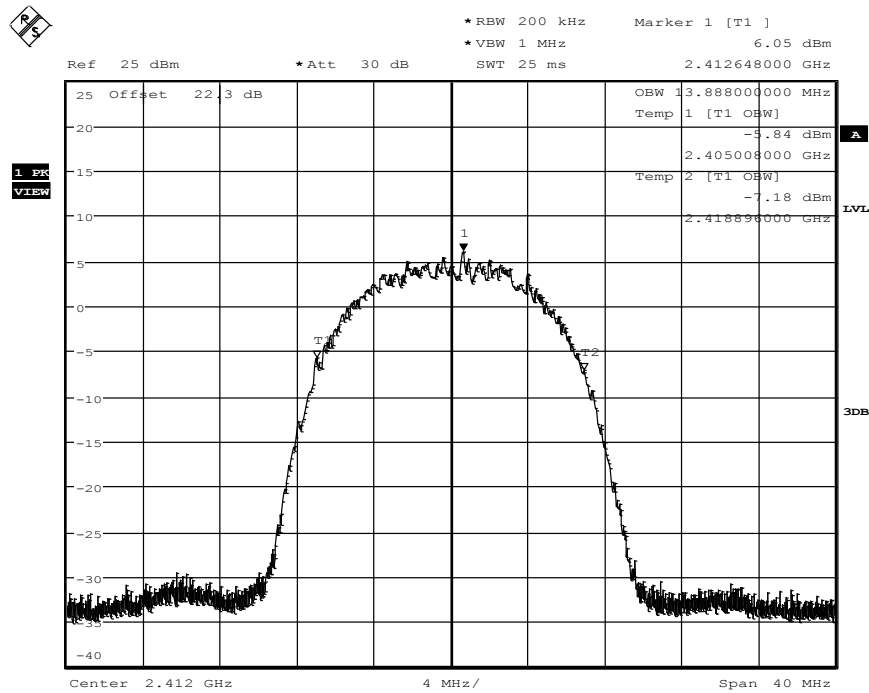
Channel 6 - Worst-Case 6dB-Bandwidth

Date: 16.JUN.2015 13:21:44

Channel 11 - Worst-Case 6dB-Bandwidth

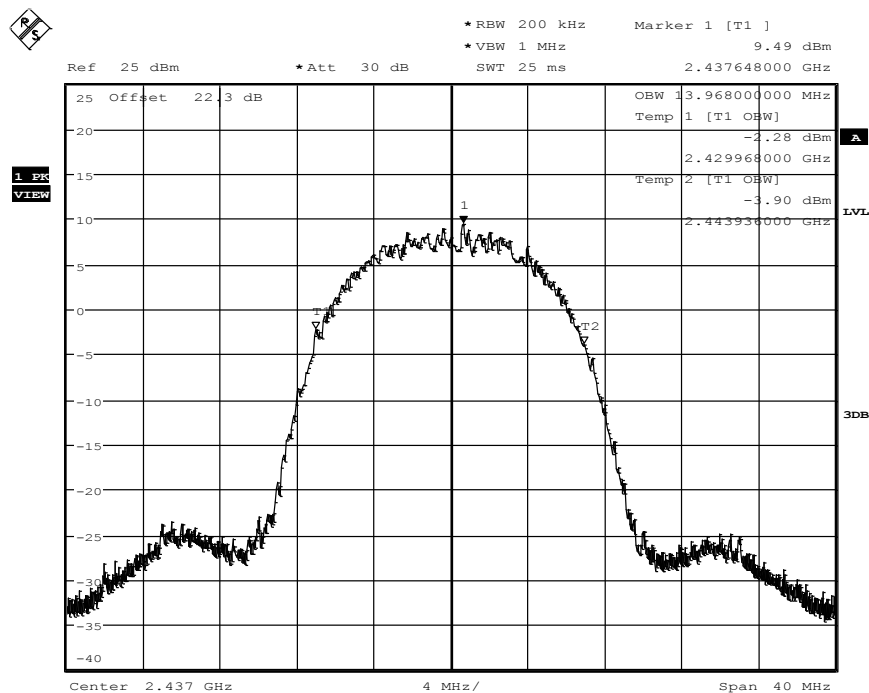
1.9. 99% Occupied Bandwidth

1.9.1. OBW - Bandwidth (b-Mode, 11MBit)



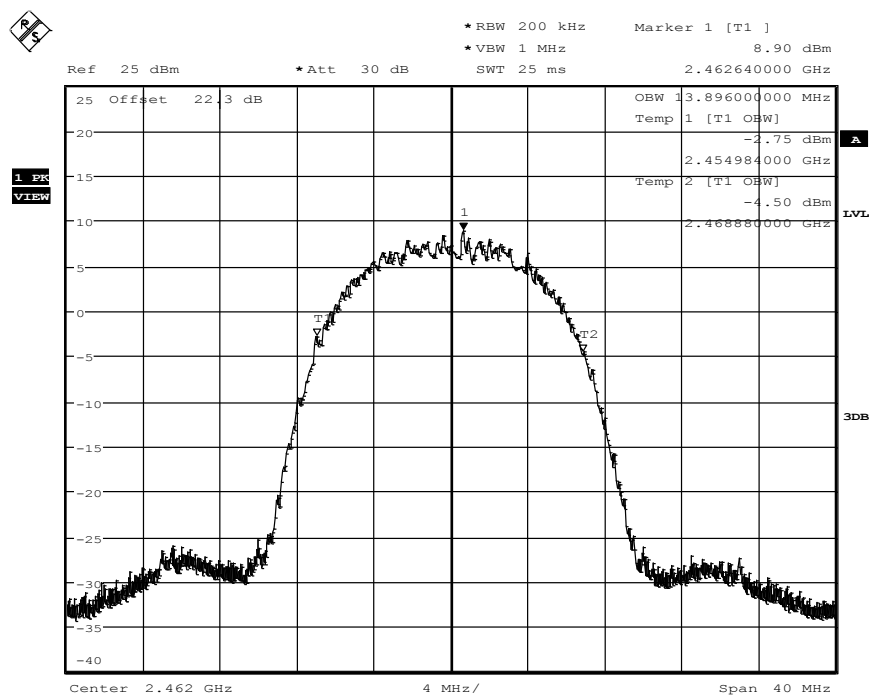
Date: 22.JUL.2015 11:01:02

Channel 1



Date: 22.JUL.2015 10:58:21

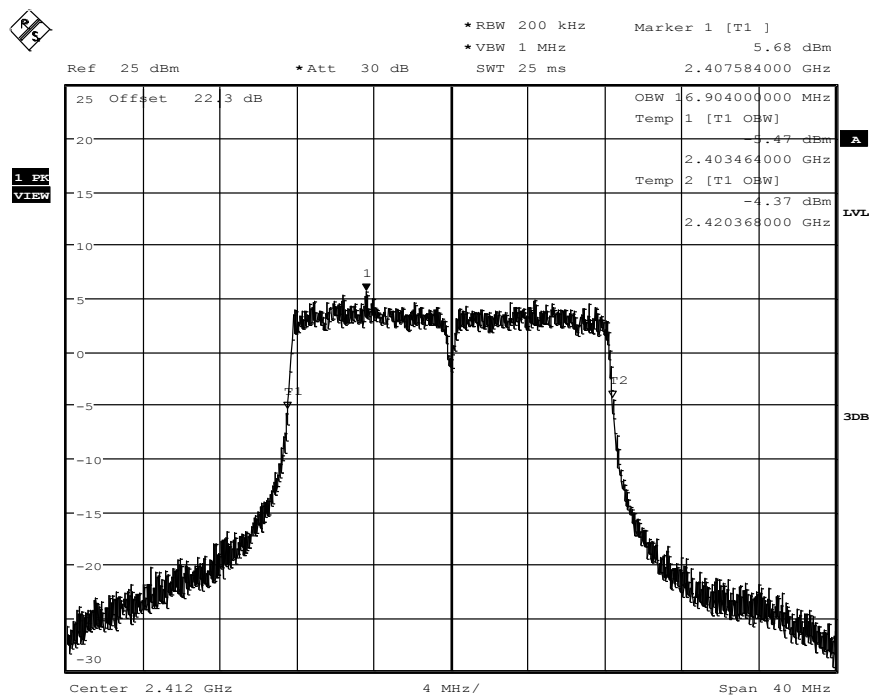
Channel 6



Date: 22.JUL.2015 10:53:37

Channel 11

1.9.2. OBW - Bandwidth (g-Mode, 54MBit)



Date: 22.JUL.2015 10:36:52

Channel 1

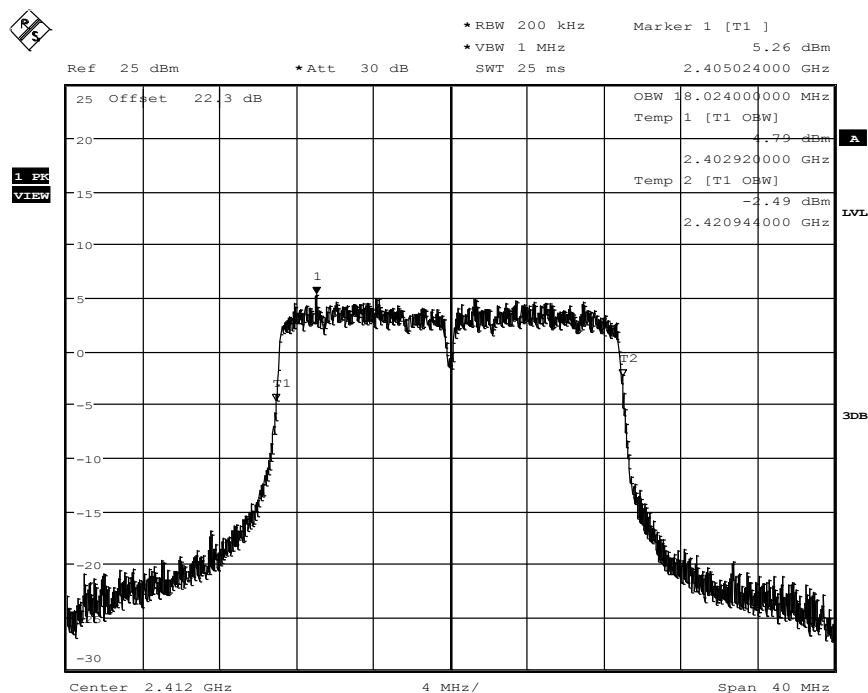


Channel 6



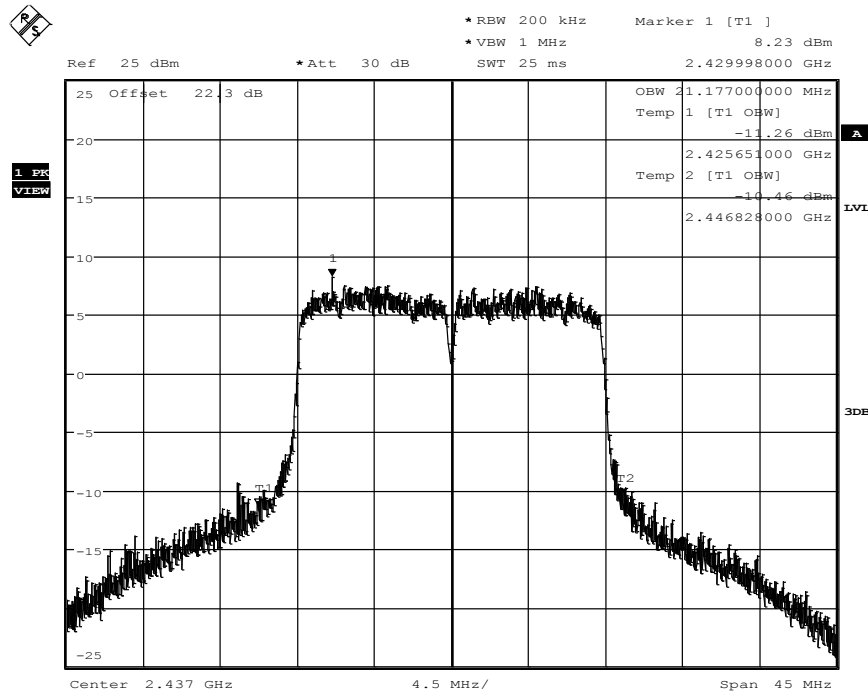
Channel 11

1.9.3. OBW - Bandwidth (n-Mode, MCS7)



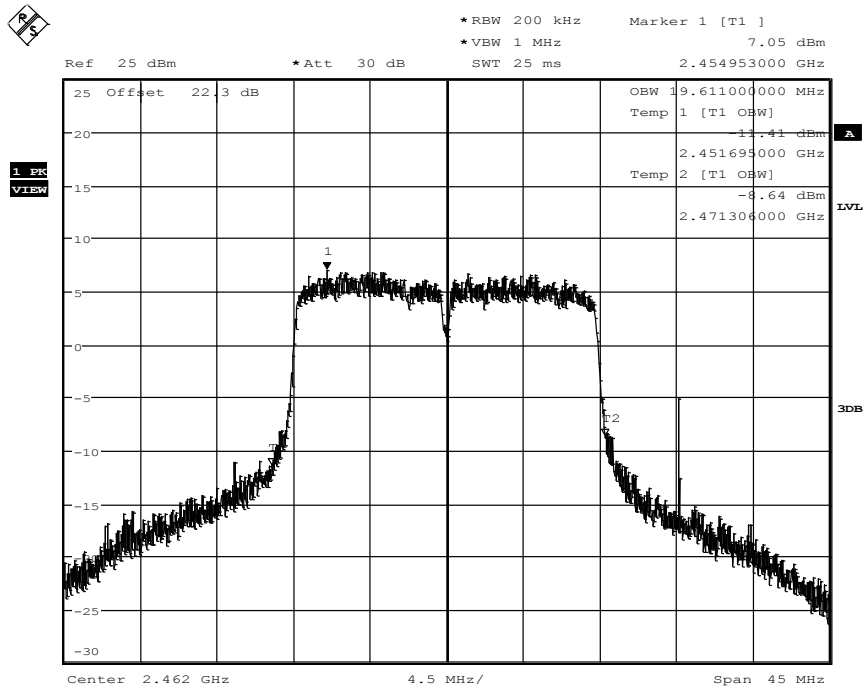
Date: 22.JUL.2015 10:18:05

Channel 1



Date: 22.JUL.2015 10:28:34

Channel 6



Date: 22.JUL.2015 10:33:13

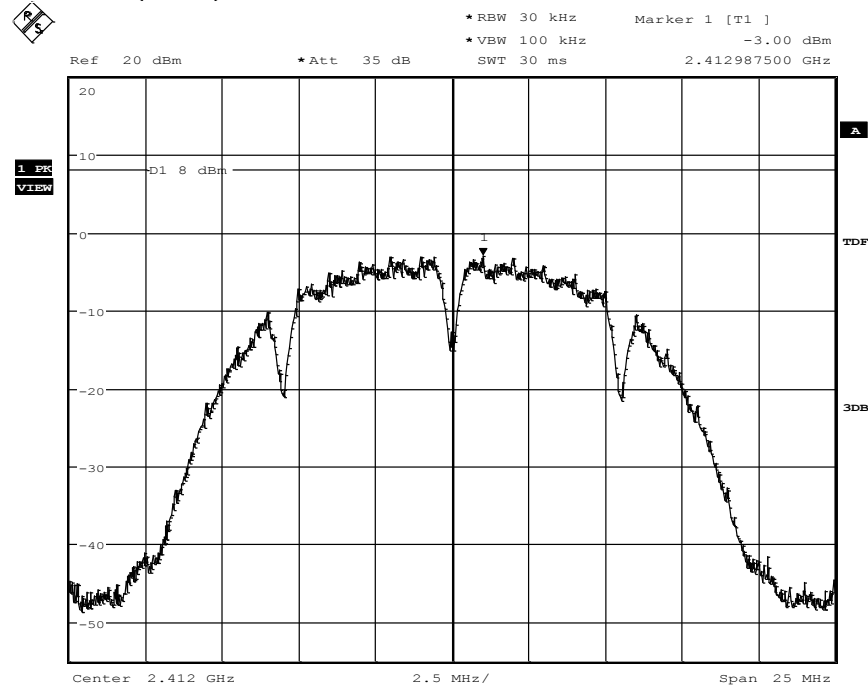
Channel 11

1.10. Power Spectral Density

Method §10.2

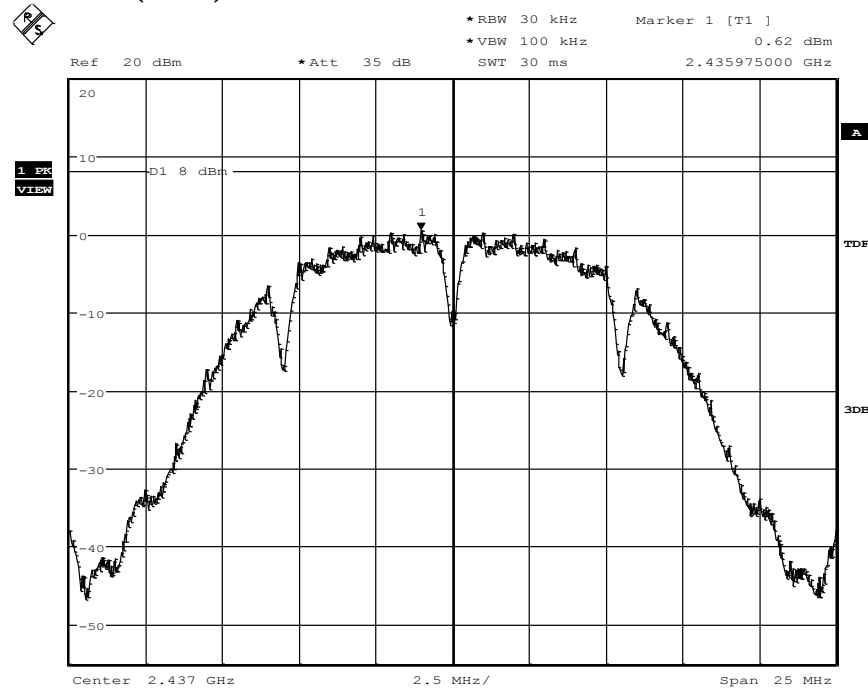
1.10.1. PSD (b-Mode)

Channel 1 (1Mbit)

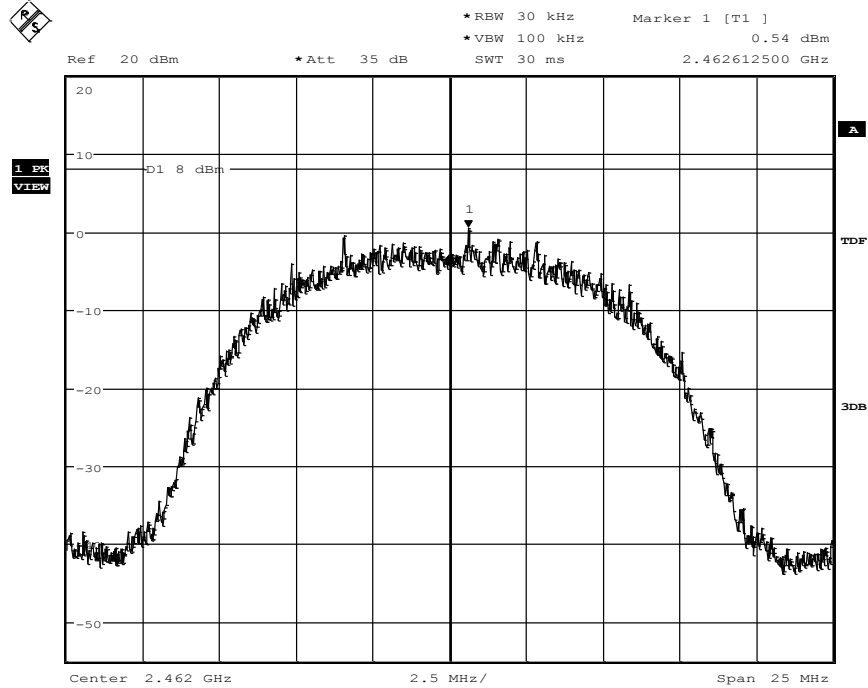


Date: 16.JUN.2015 15:16:36

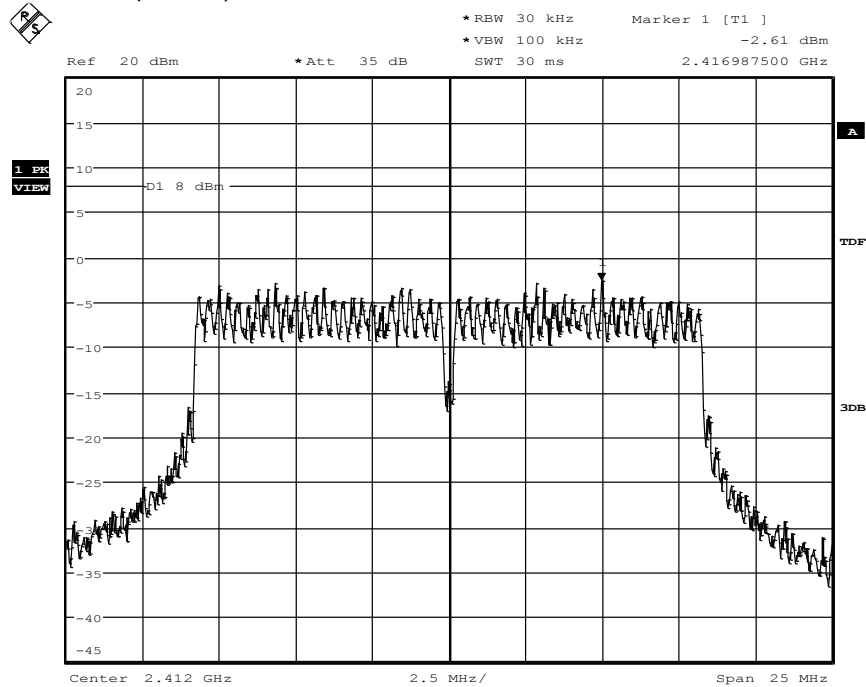
Channel 6 (1Mbit)



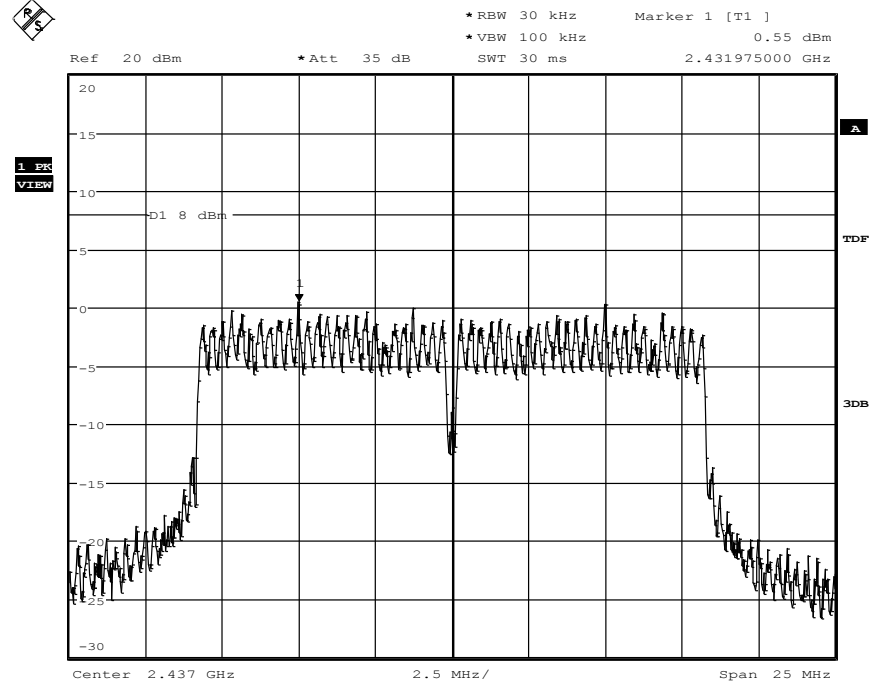
Date: 16.JUN.2015 15:21:08

Channel 11 (11Mbit)

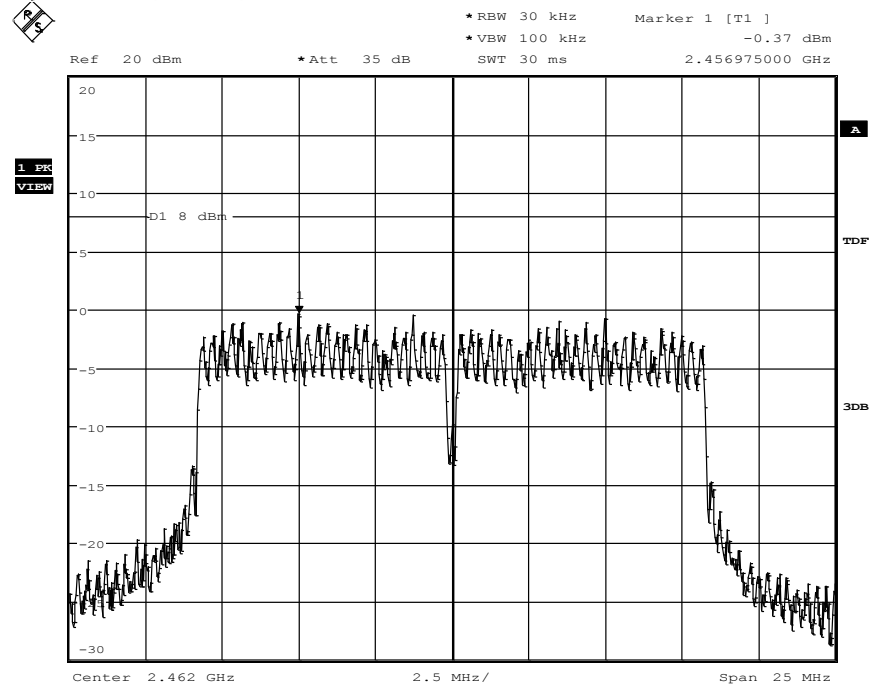
Date: 16.JUN.2015 15:29:37

1.10.2. PSD (g-Mode)**Channel 1 (48Mbit)**

Date: 16.JUN.2015 15:35:45

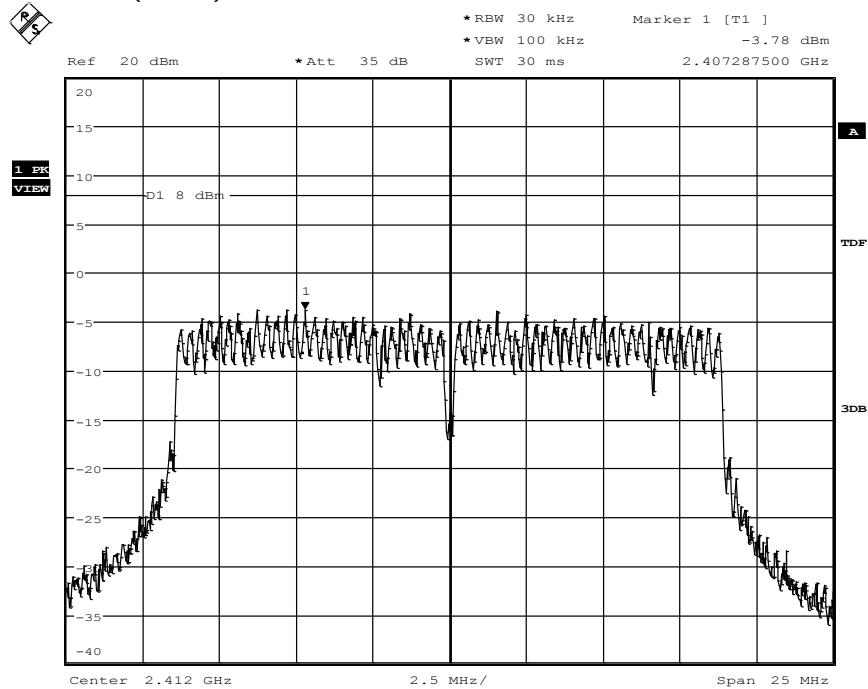
Channel 6 (36Mbit)

Date: 16.JUN.2015 15:40:47

Channel 11 (36Mbit)

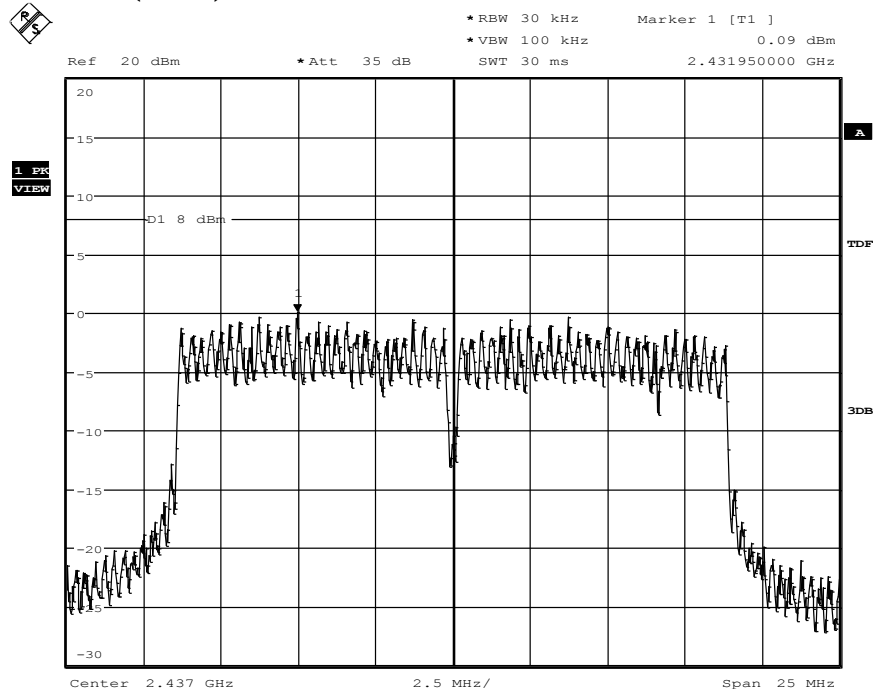
Date: 16.JUN.2015 15:44:14

1.10.3. PSD (n-Mode) Channel 1 (MCS7)



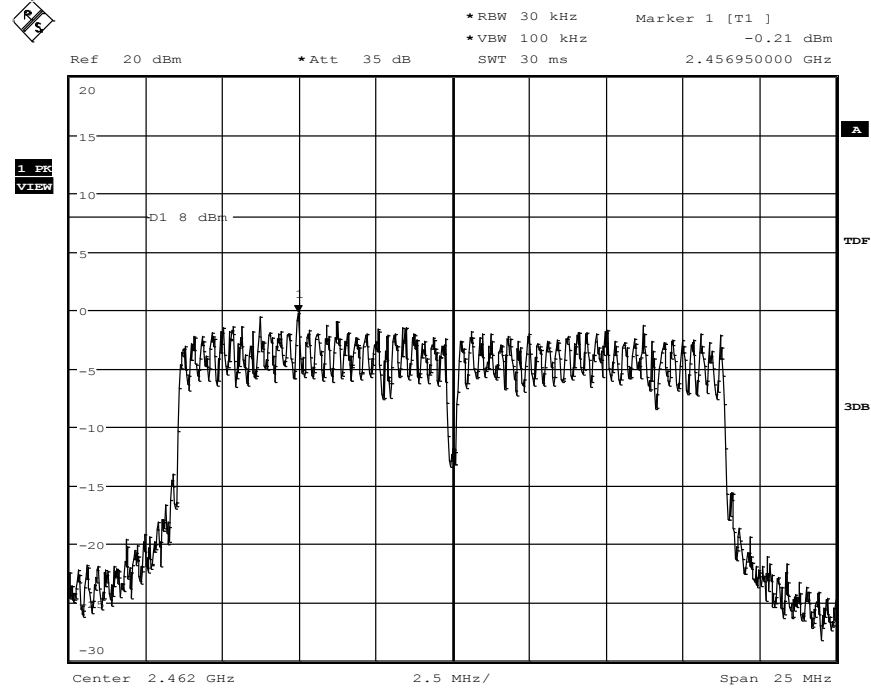
Date: 16.JUN.2015 15:47:33

Channel 6 (MCS6)



Date: 16.JUN.2015 15:51:27

Channel 11 (MCS5)

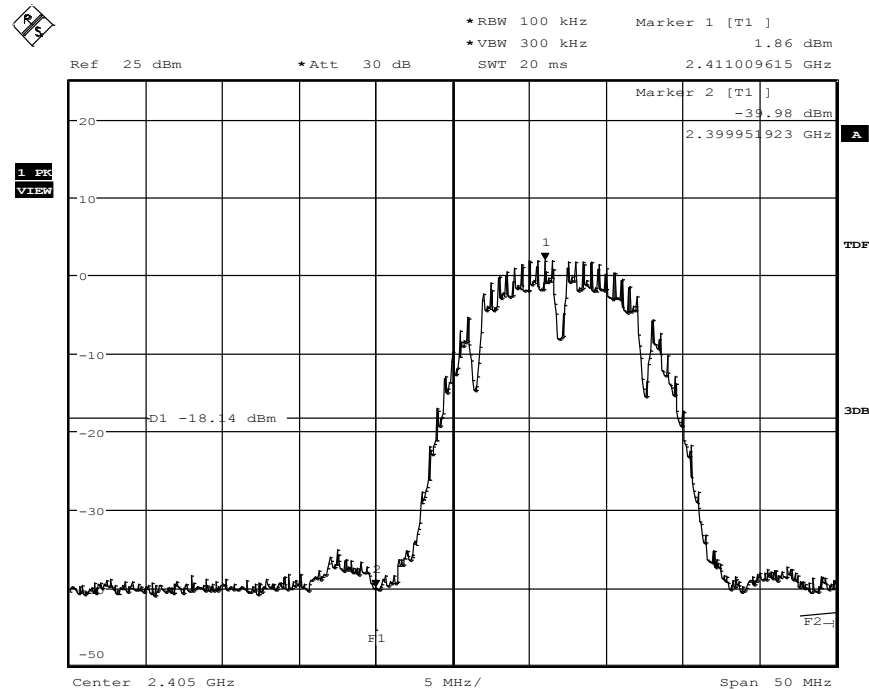


Date: 16.JUN.2015 15:56:53

1.11. 20dBc Emissions

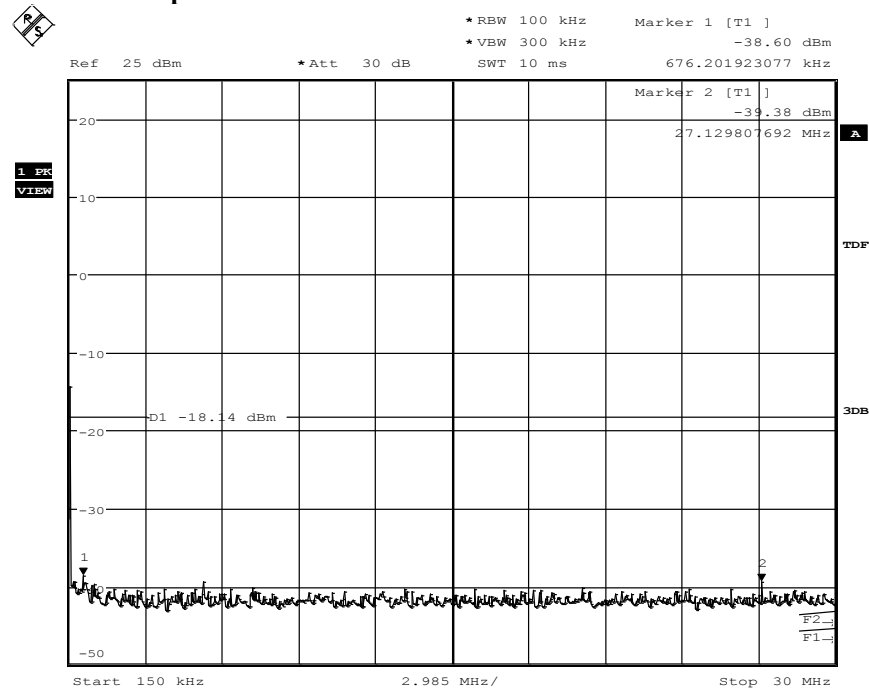
1.11.1. b-Mode Channel 1

1.11.1.1. Channel 1 Reference

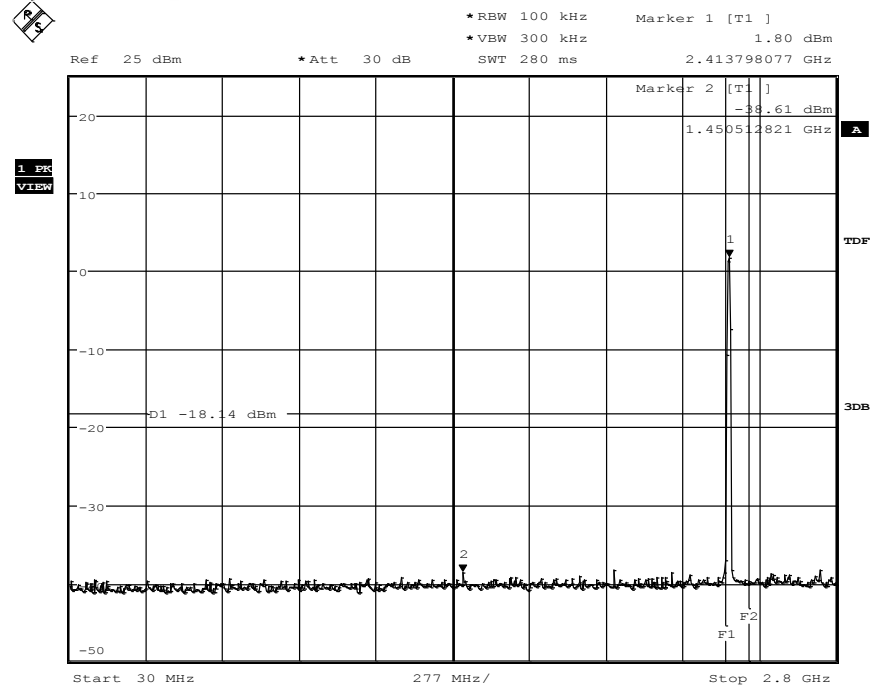


Date: 15.JUN.2015 14:08:55

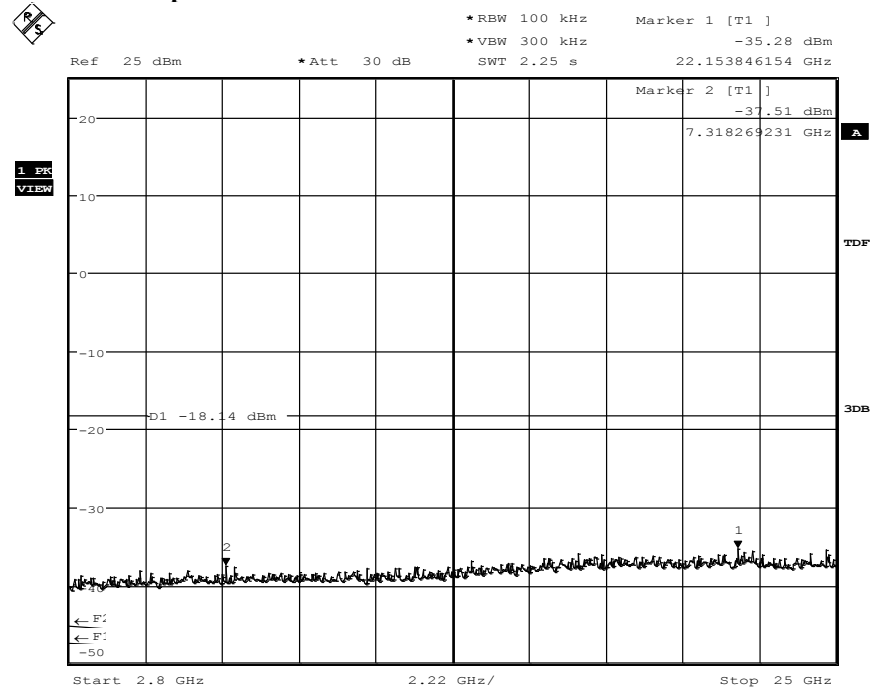
1.11.1.2. Sweep 1: 150kHz to 30MHz



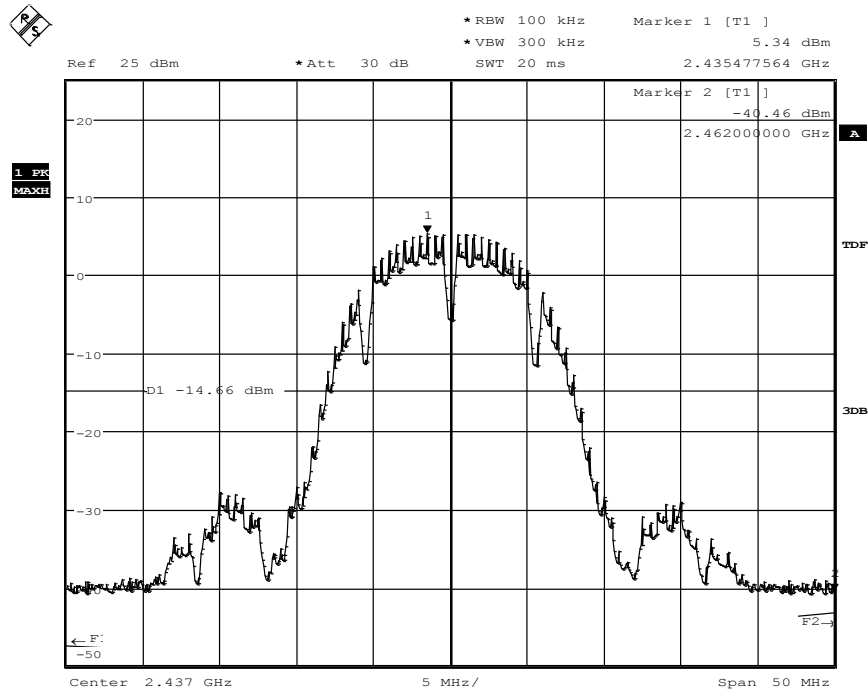
Date: 15.JUN.2015 14:13:56

1.11.1.3. Sweep 2: 30MHz to 2.8GHz

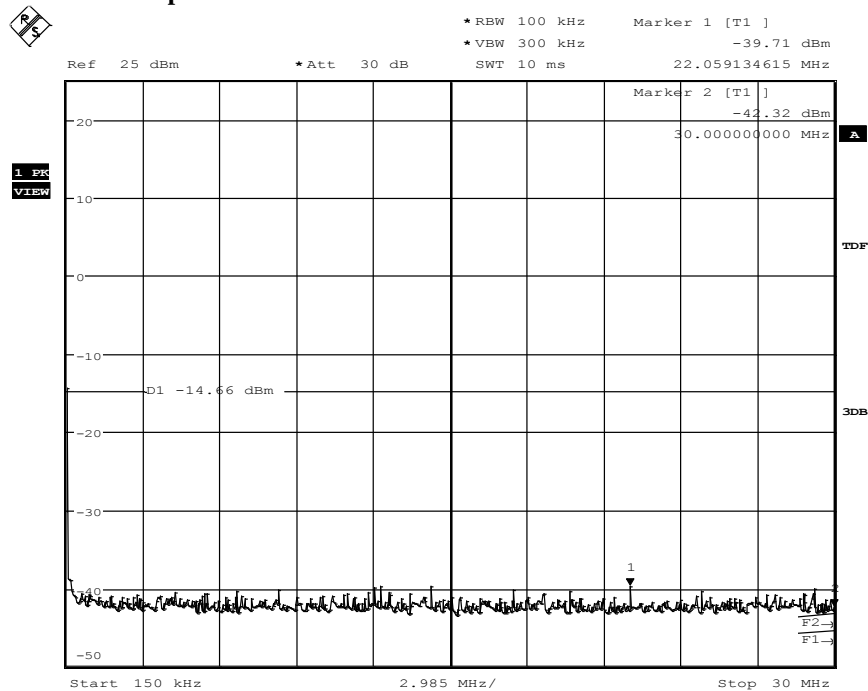
Date: 15.JUN.2015 14:20:20

1.11.1.4. Sweep 3: 2.8GHz to 25GHz

Date: 15.JUN.2015 14:24:55

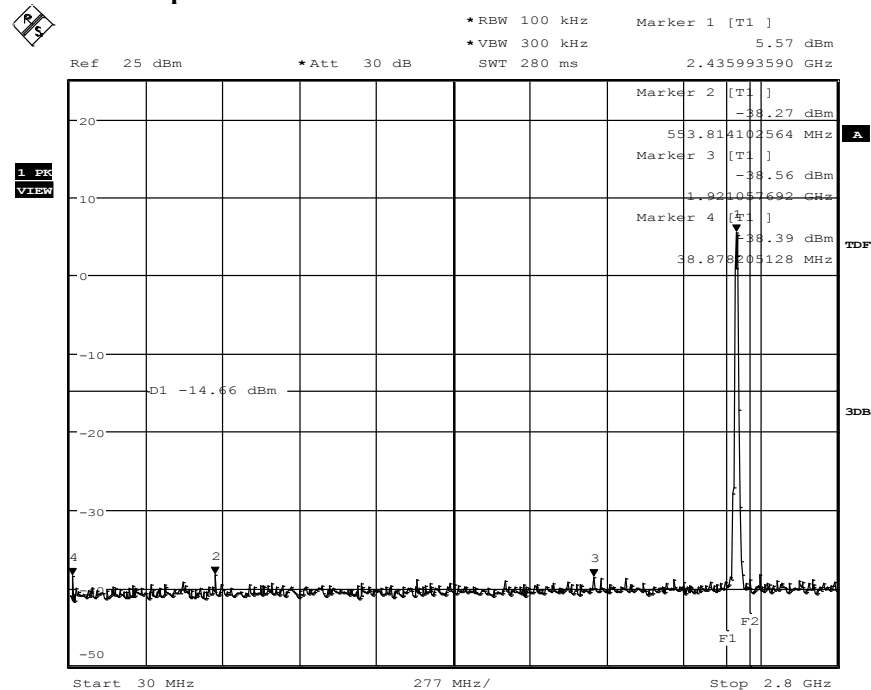
1.11.2. b-Mode Channel 6**1.11.2.1. Channel 6 Reference**

Date: 15.JUN.2015 14:29:10

1.11.2.2. Sweep 1: 150kHz to 30MHz

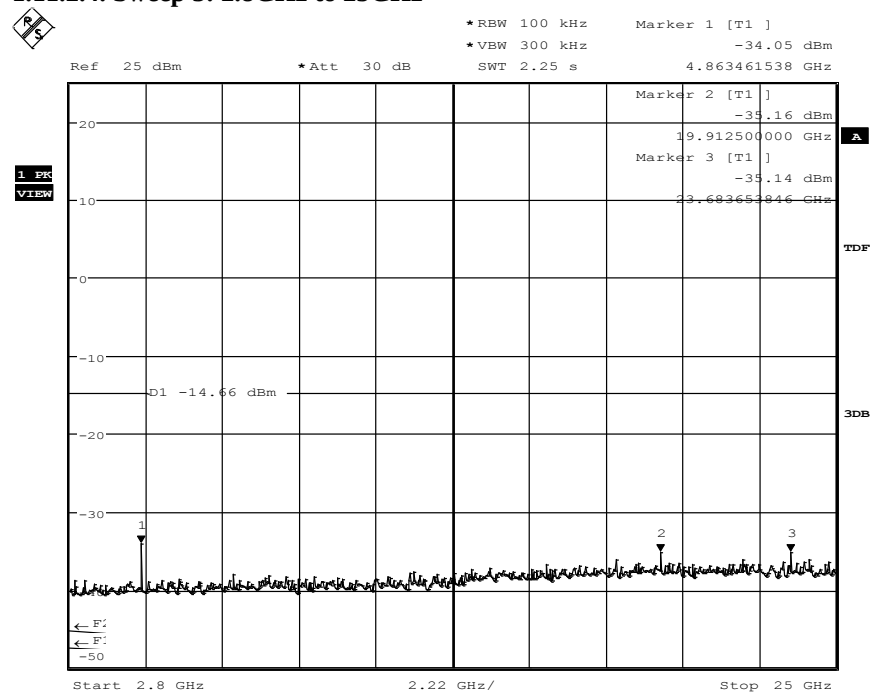
Date: 15.JUN.2015 14:31:56

1.11.2.3. Sweep 2: 30MHz to 2.8GHz

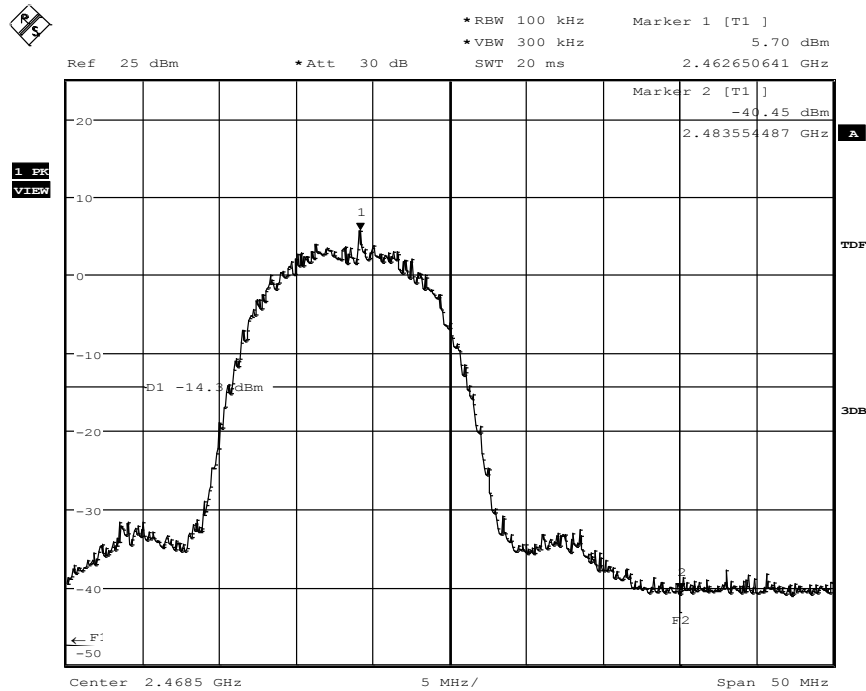


Date: 15.JUN.2015 14:37:17

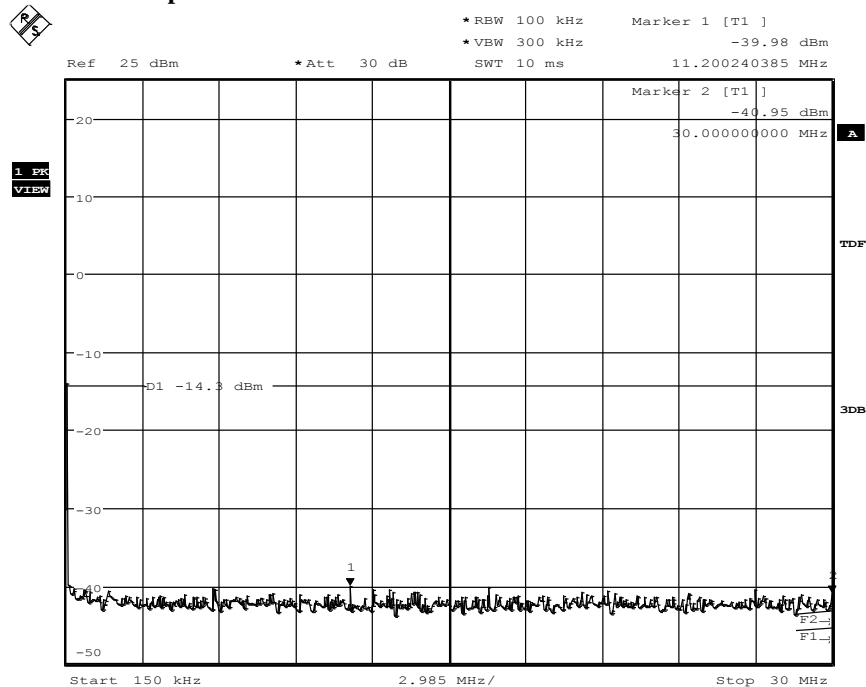
1.11.2.4. Sweep 3: 2.8GHz to 25GHz



Date: 15.JUN.2015 14:39:45

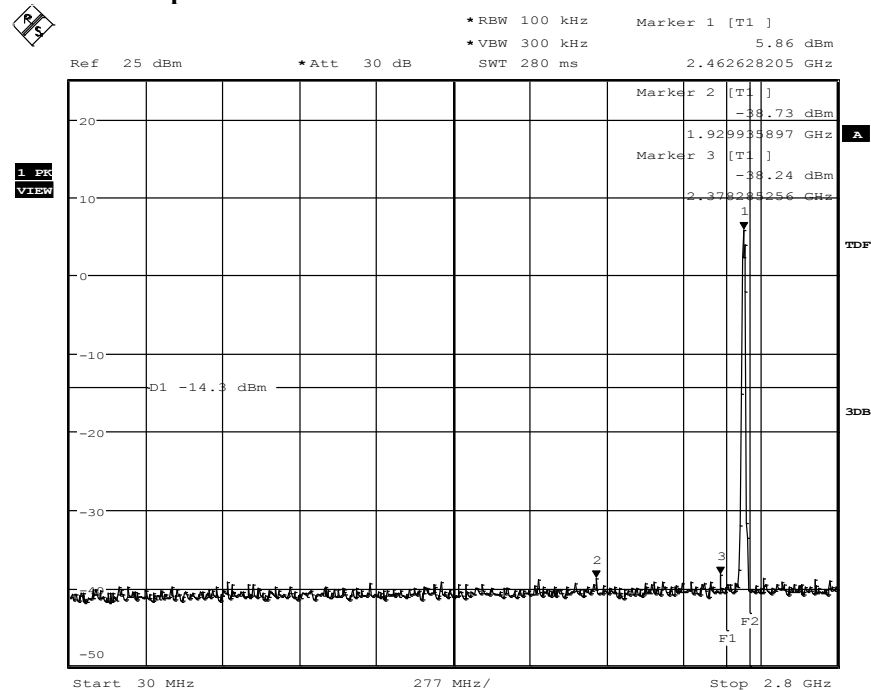
1.11.3. b-Mode Channel 11**1.11.3.1. Channel 11 Reference**

Date: 15.JUN.2015 14:45:18

1.11.3.2. Sweep 1: 150kHz to 30MHz

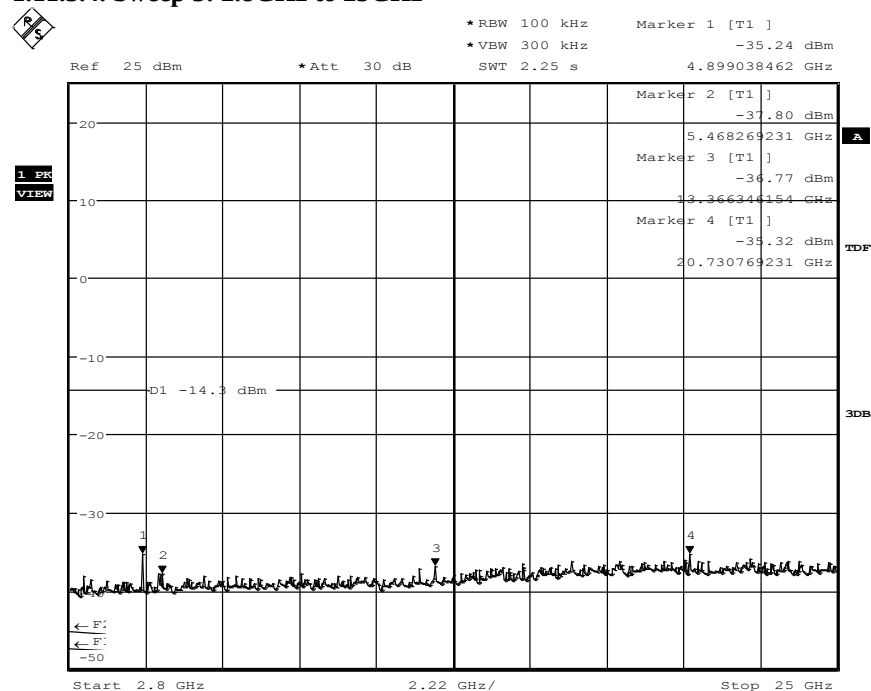
Date: 15.JUN.2015 14:47:27

1.11.3.3. Sweep 2: 30MHz to 2.8GHz

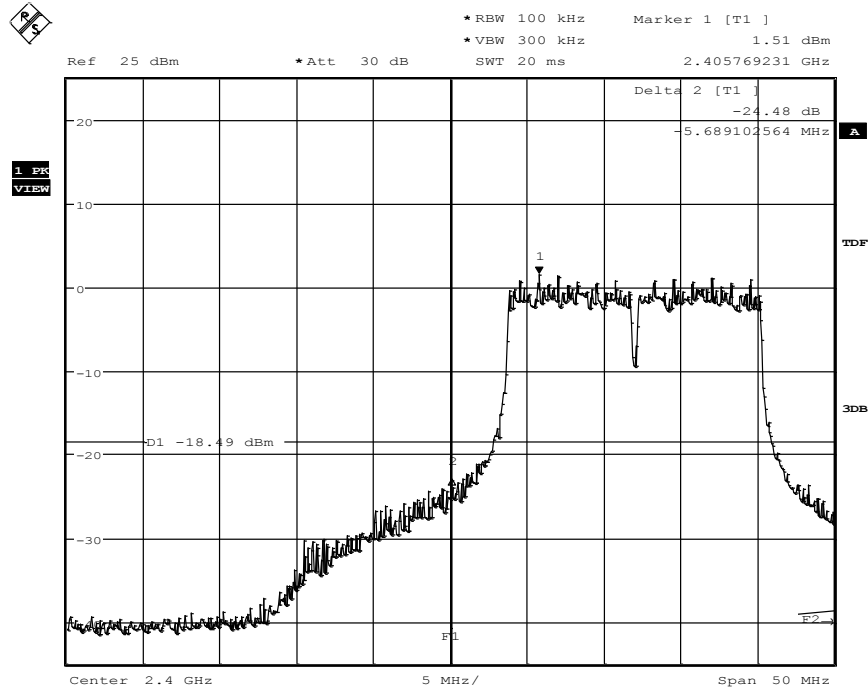


Date: 15.JUN.2015 14:50:10

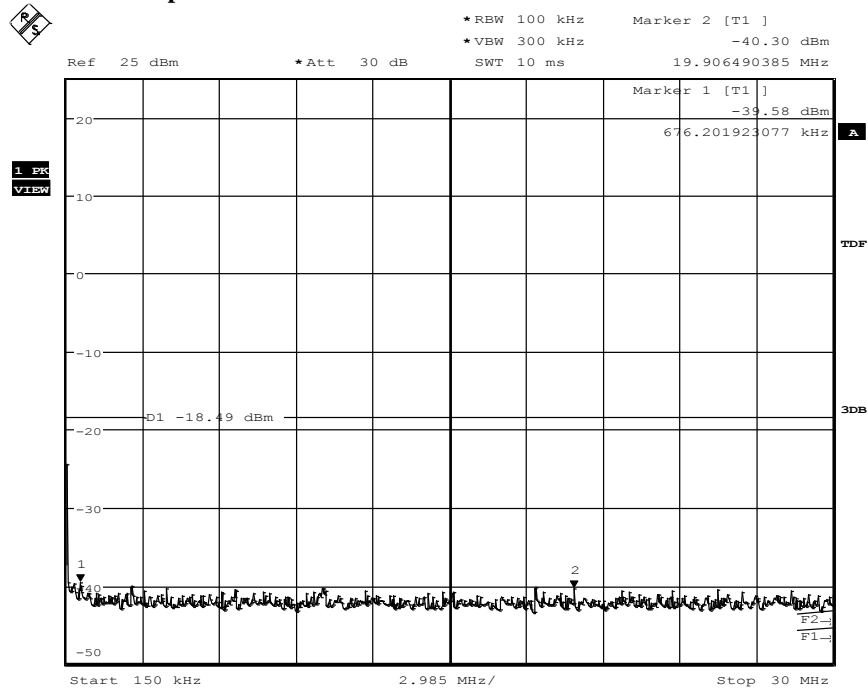
1.11.3.4. Sweep 3: 2.8GHz to 25GHz



Date: 15.JUN.2015 14:54:25

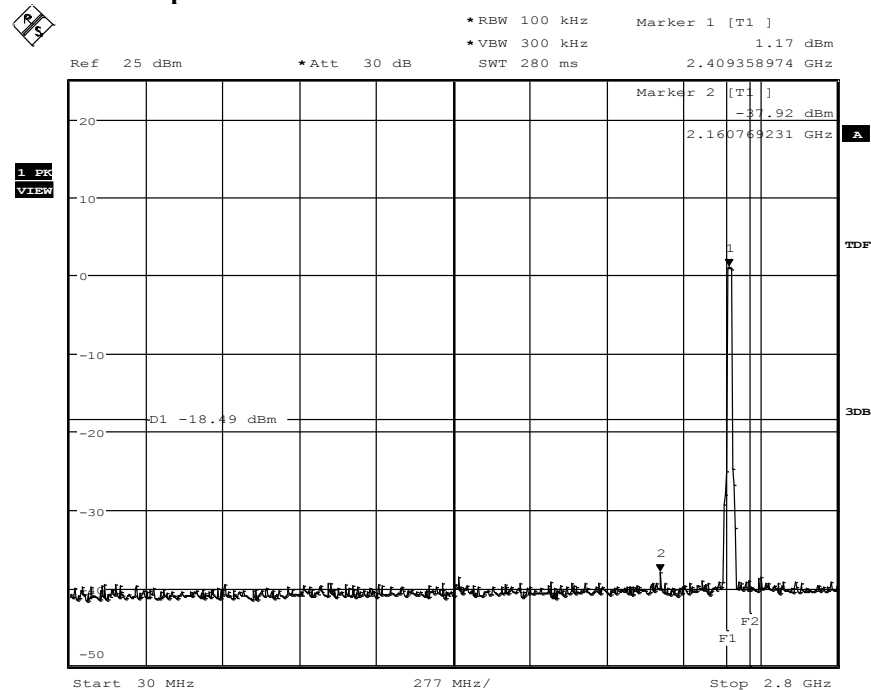
1.11.4. g-Mode Channel 1**1.11.4.1. Channel 1 Reference**

Date: 11.JUN.2015 10:07:58

1.11.4.2. Sweep 1: 150kHz to 30MHz

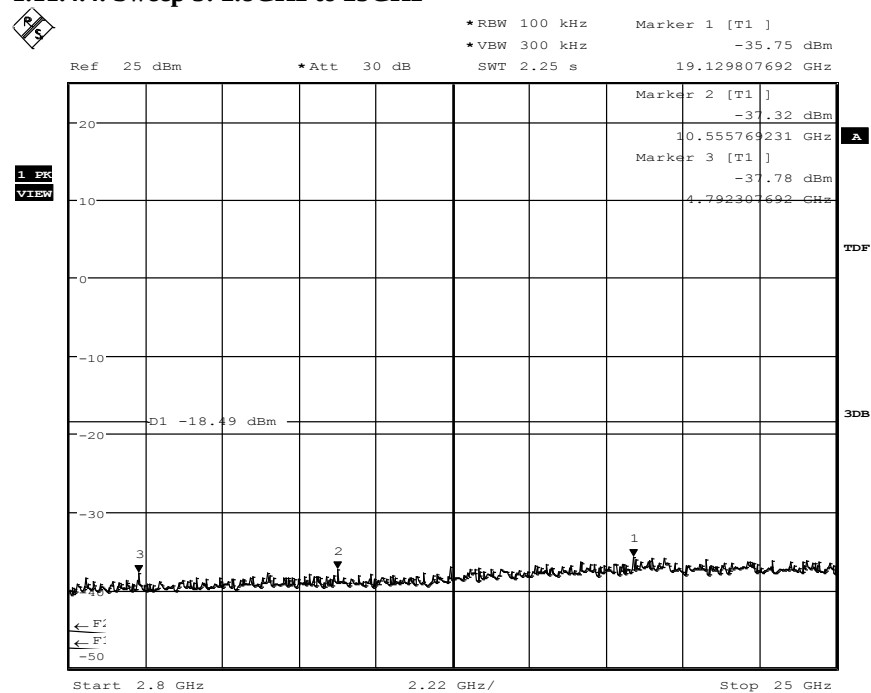
Date: 15.JUN.2015 12:14:10

1.11.4.3. Sweep 2: 30MHz to 2.8GHz

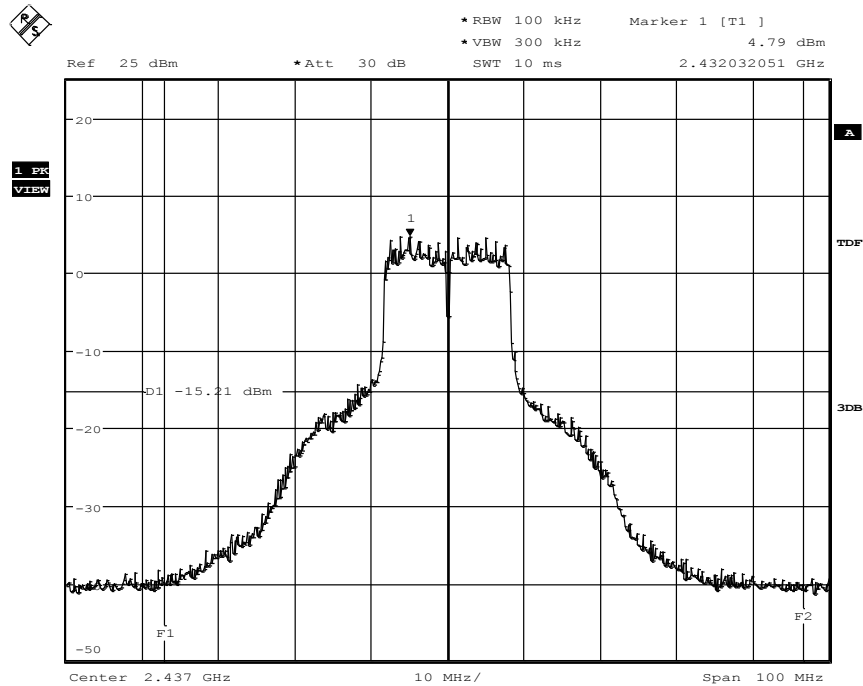


Date: 15.JUN.2015 12:17:57

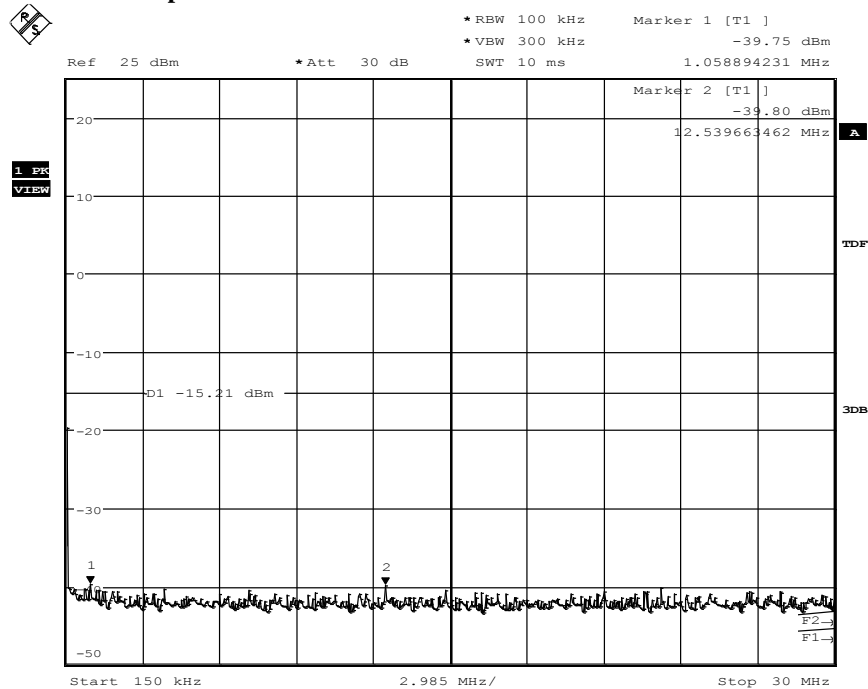
1.11.4.4. Sweep 3: 2.8GHz to 25GHz



Date: 15.JUN.2015 12:22:20

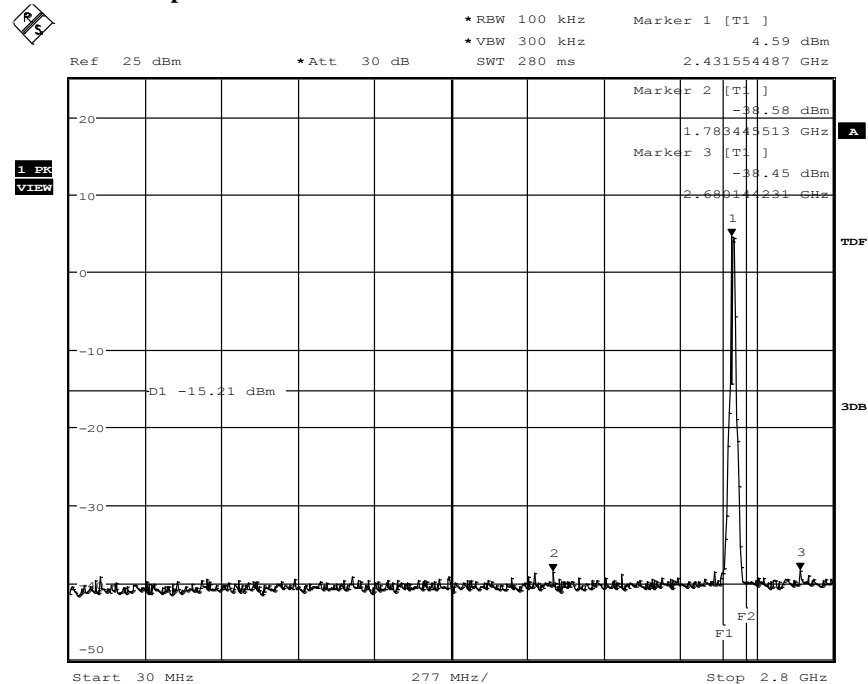
1.11.5. g-Mode Channel 6**1.11.5.1. Channel 6 Reference**

Date: 15.JUN.2015 12:26:04

1.11.5.2. Sweep 1: 150kHz to 30MHz

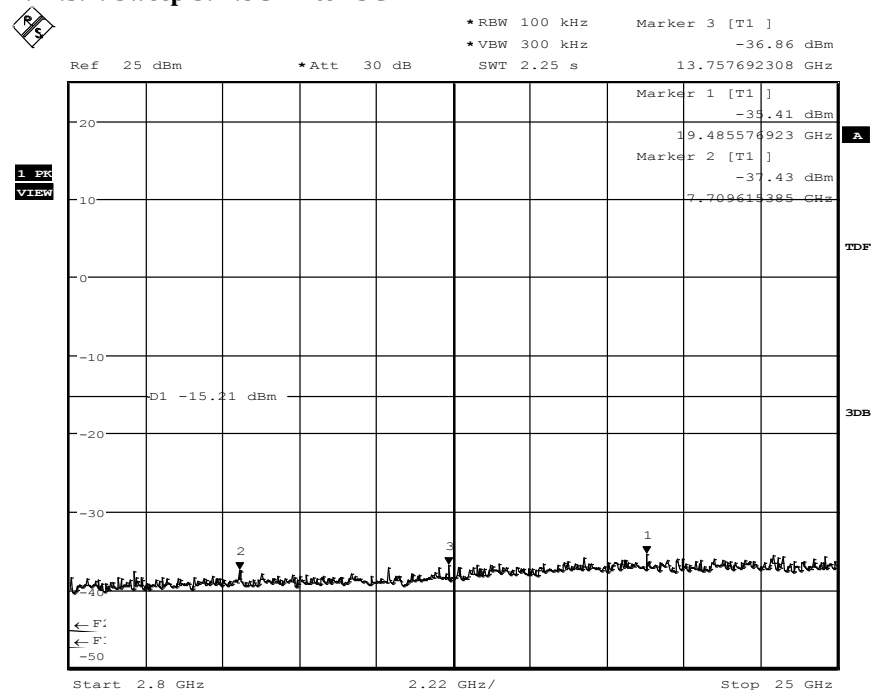
Date: 15.JUN.2015 12:29:10

1.11.5.3. Sweep 2: 30MHz to 2.8GHz

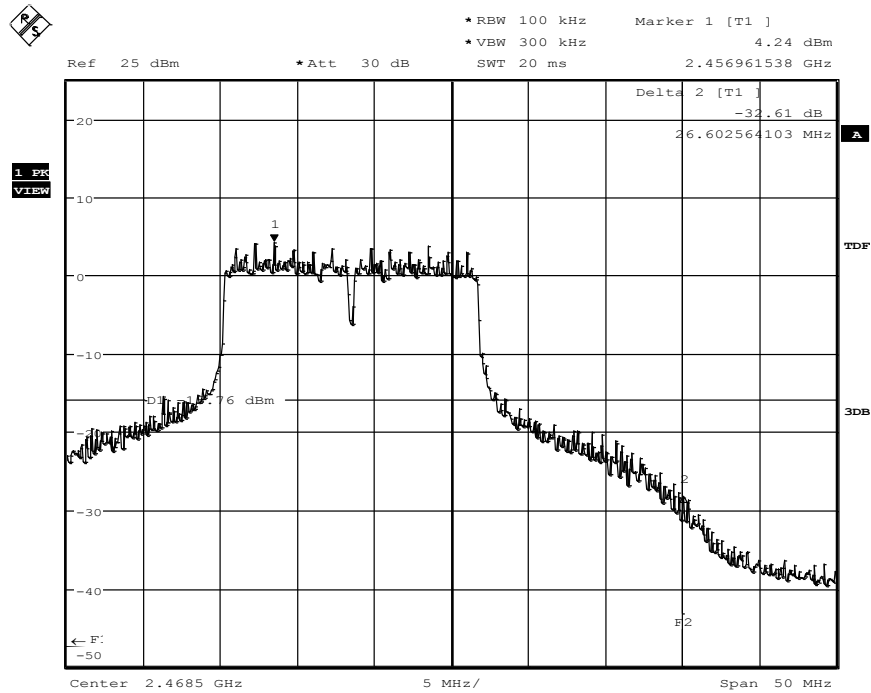


Date: 15.JUN.2015 12:33:20

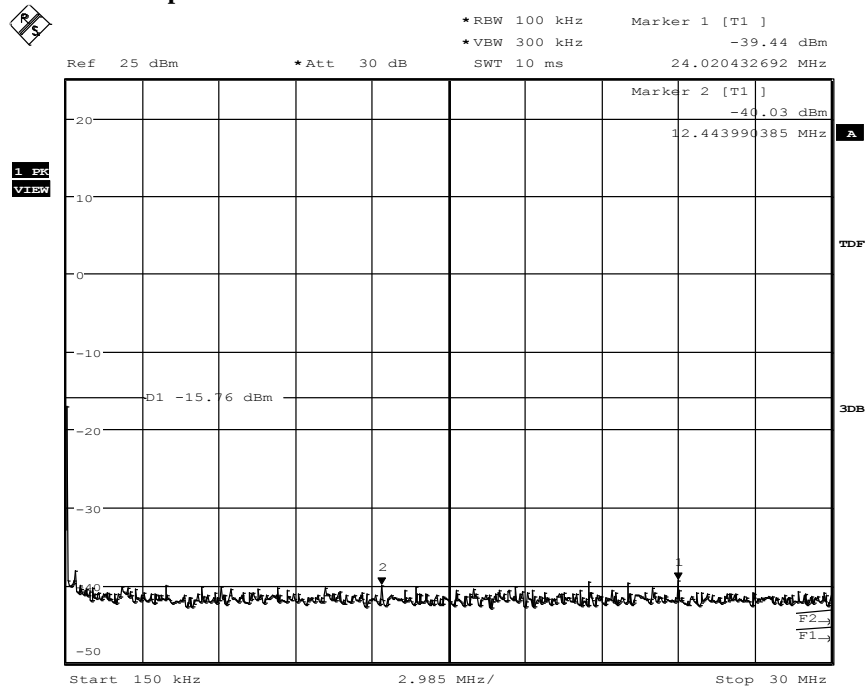
1.11.5.4. Sweep 3: 2.8GHz to 25GHz



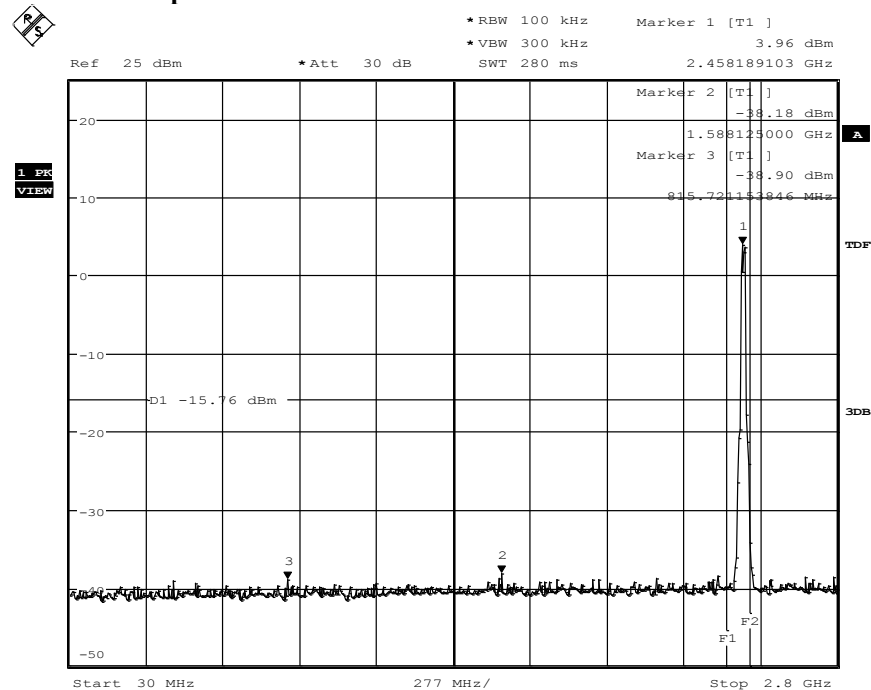
Date: 15.JUN.2015 12:41:02

1.11.6. g-Mode Channel 11**1.11.6.1. Channel 11 Reference**

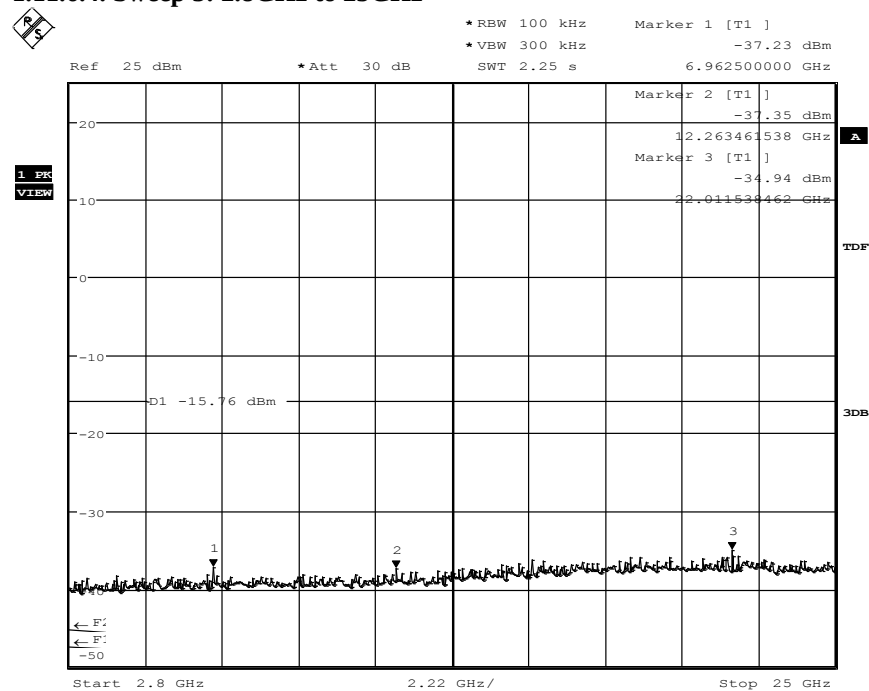
Date: 15.JUN.2015 12:46:34

1.11.6.2. Sweep 1: 150kHz to 30MHz

Date: 15.JUN.2015 12:51:35

1.11.6.3. Sweep 2: 30MHz to 2.8GHz

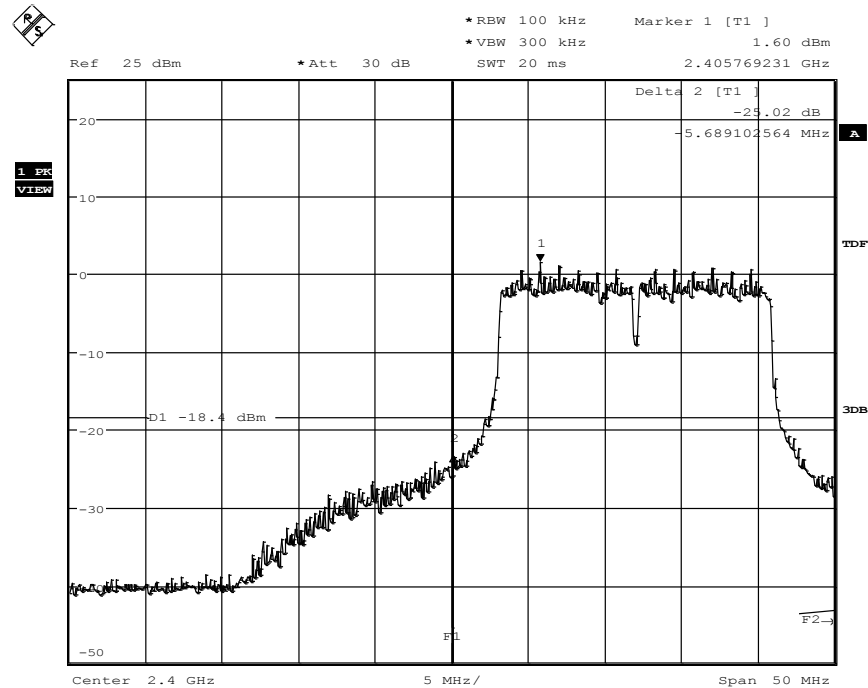
Date: 15.JUN.2015 12:56:33

1.11.6.4. Sweep 3: 2.8GHz to 25GHz

Date: 15.JUN.2015 13:00:32

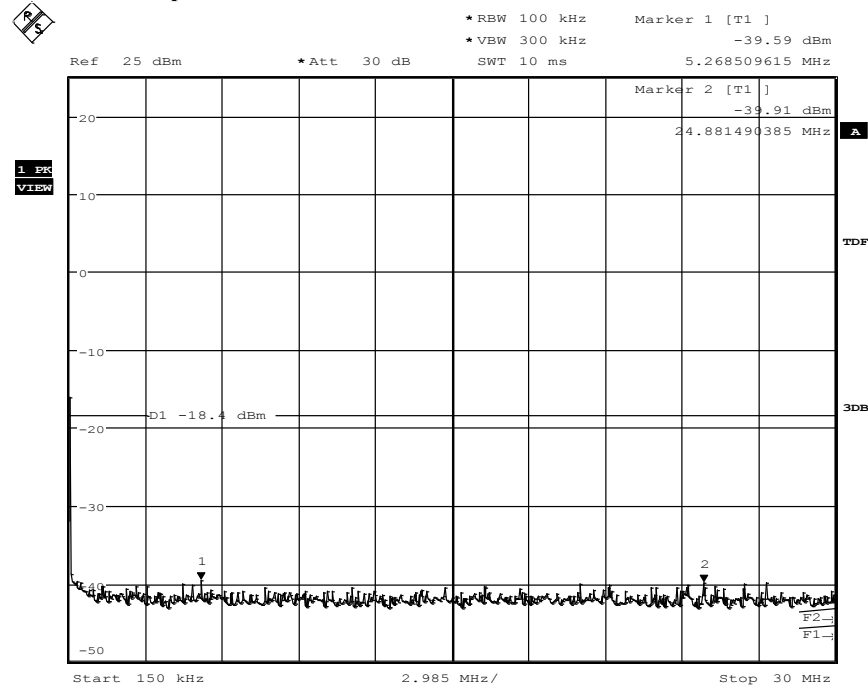
1.11.7. n-Mode Channel 1

1.11.7.1. Channel 1 Reference



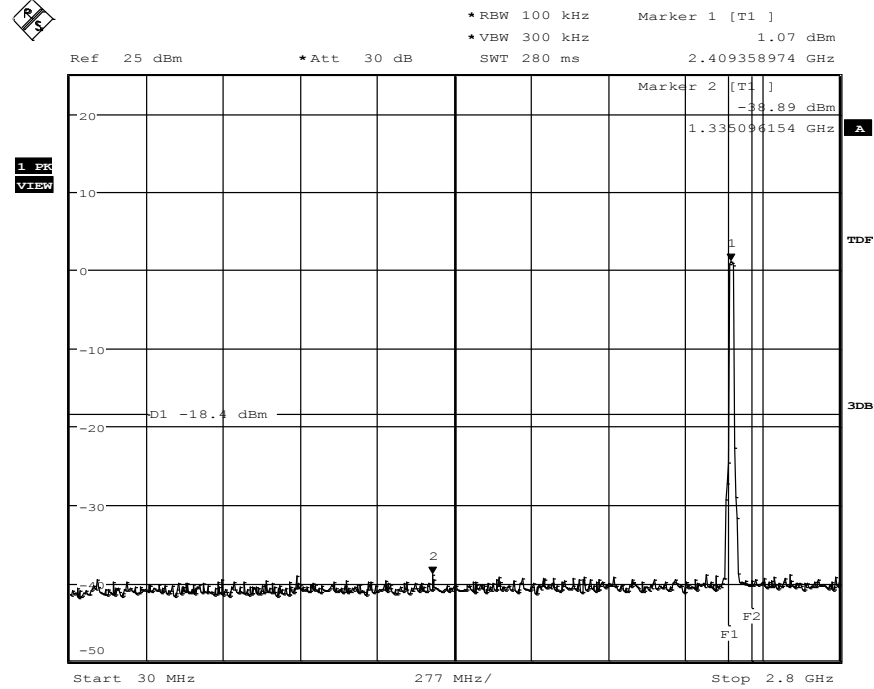
Date: 15.JUN.2015 13:08:36

1.11.7.2. Sweep 1: 150kHz to 30MHz



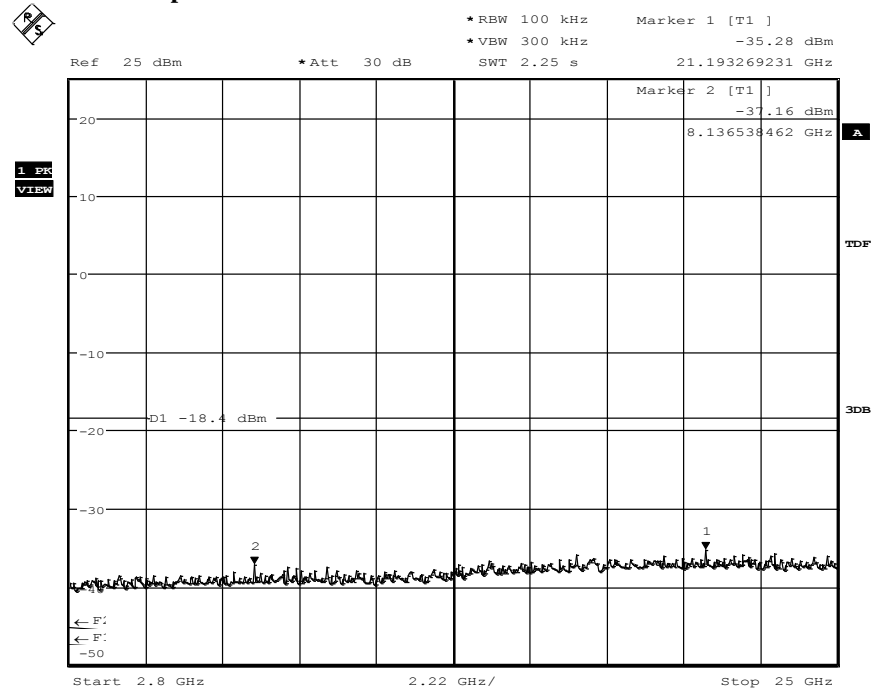
Date: 15.JUN.2015 13:12:22

1.11.7.3. Sweep 2: 30MHz to 2.8GHz

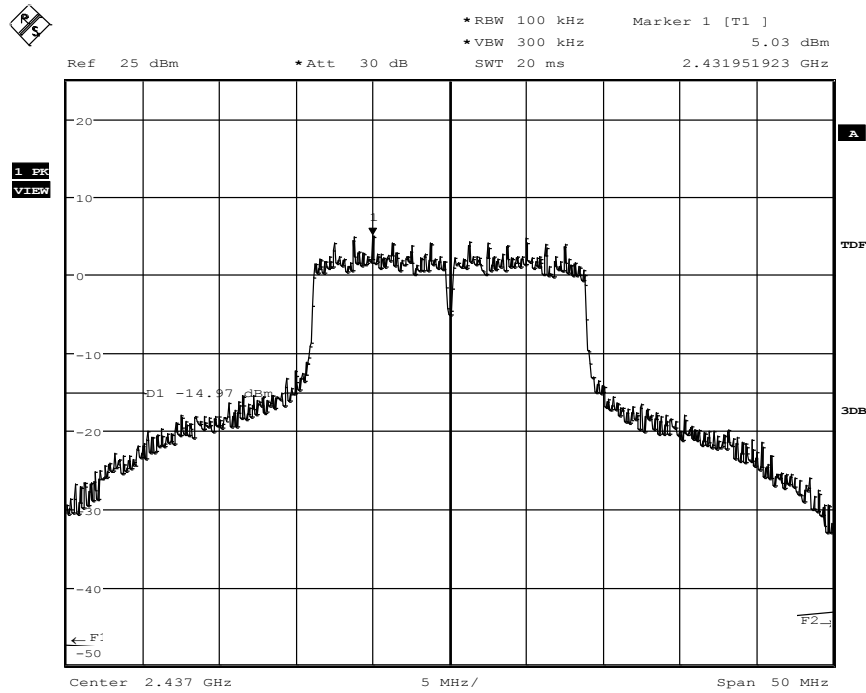


Date: 15.JUN.2015 13:15:46

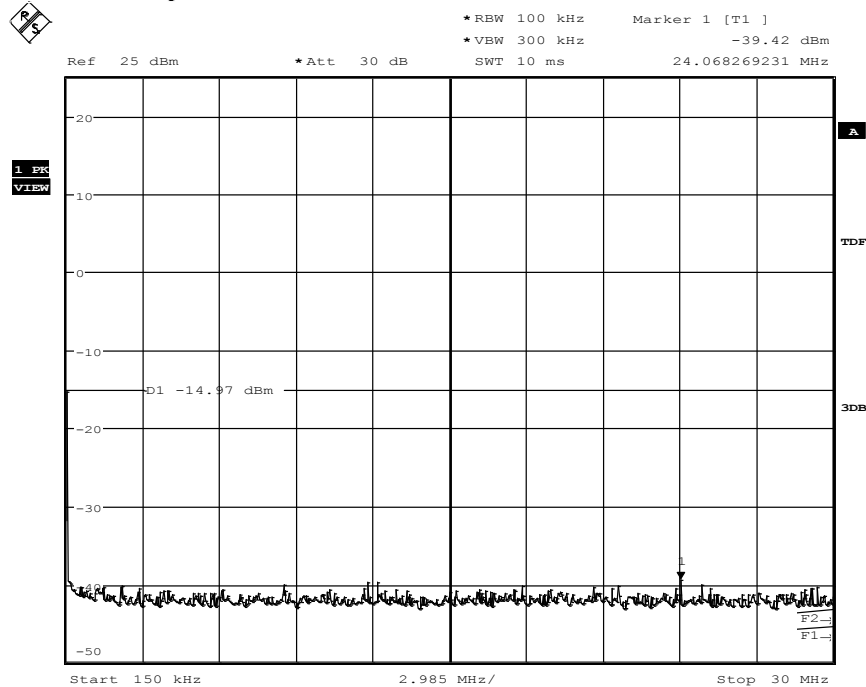
1.11.7.4. Sweep 3: 2.8GHz to 25GHz



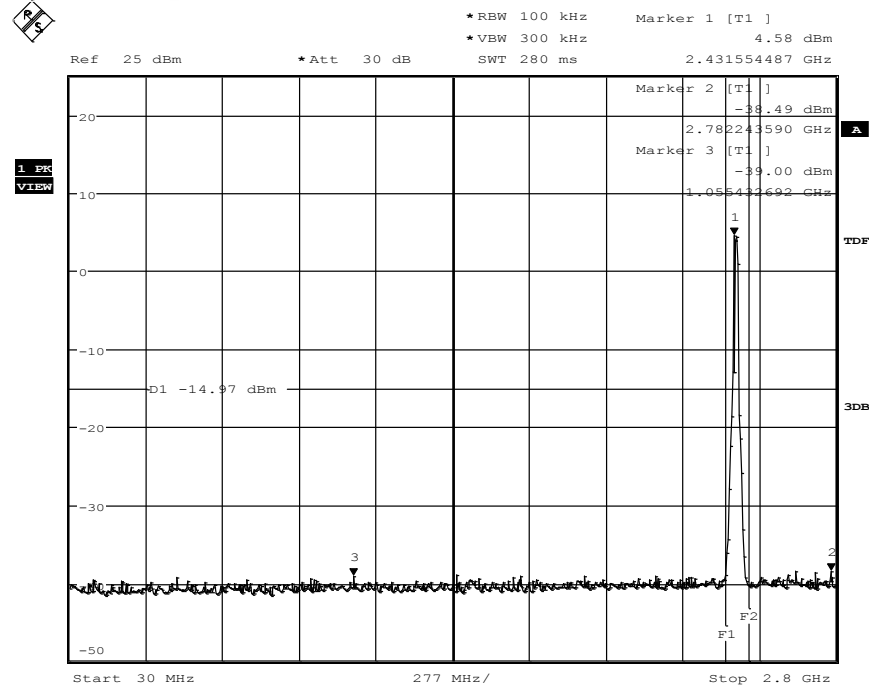
Date: 15.JUN.2015 13:20:56

1.11.8. n-Mode Channel 6**1.11.8.1. Channel 6 Reference**

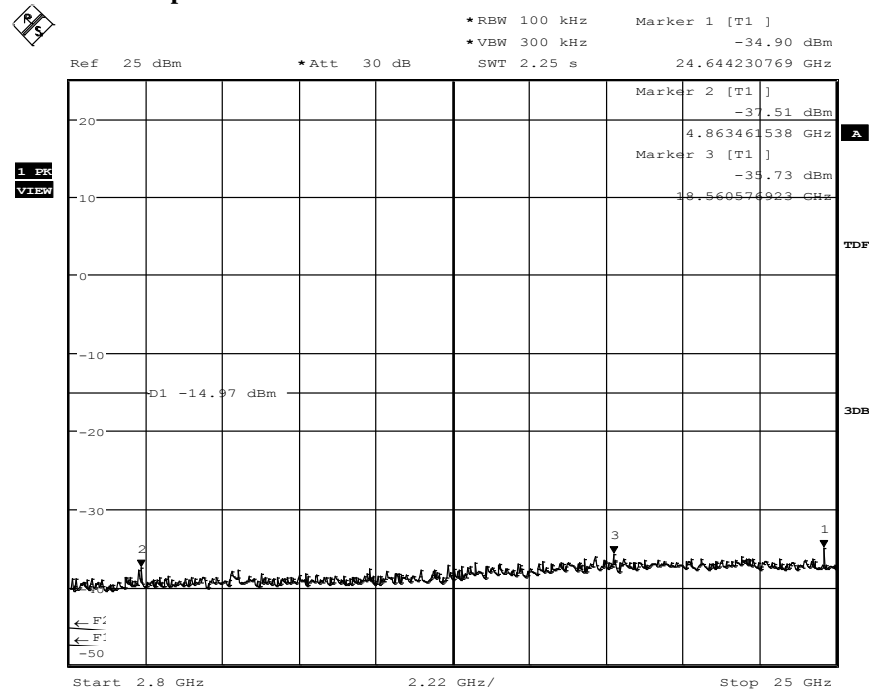
Date: 15.JUN.2015 13:24:54

1.11.8.2. Sweep 1: 150kHz to 30MHz

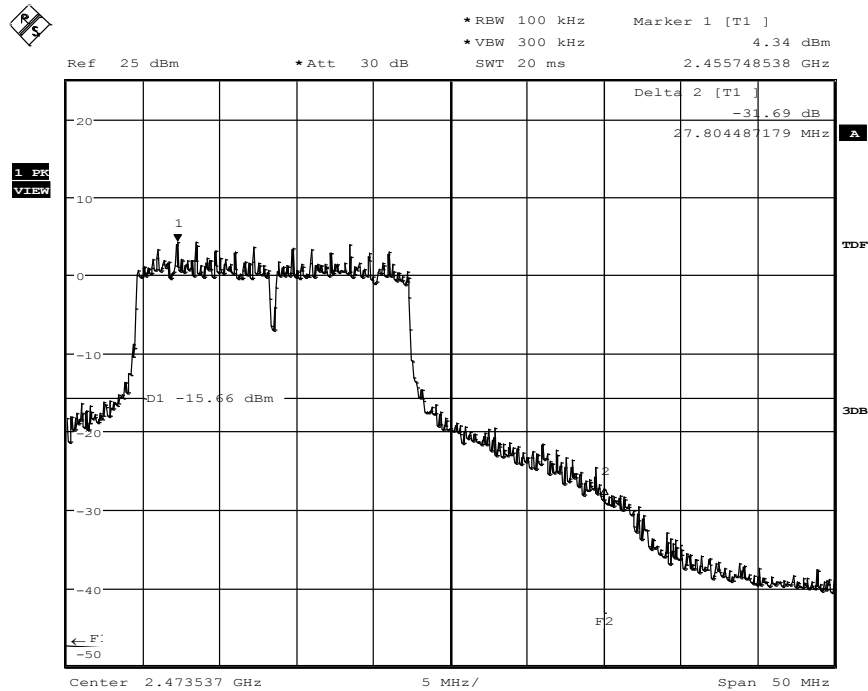
Date: 15.JUN.2015 13:29:04

1.11.8.3. Sweep 2: 30MHz to 2.8GHz

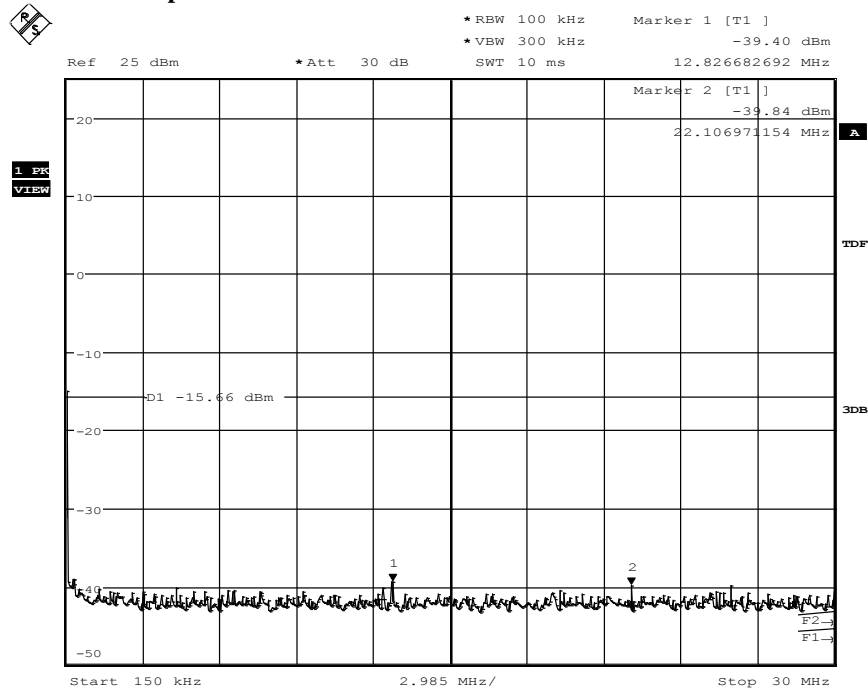
Date: 15.JUN.2015 13:33:29

1.11.8.4. Sweep 3: 2.8GHz to 25GHz

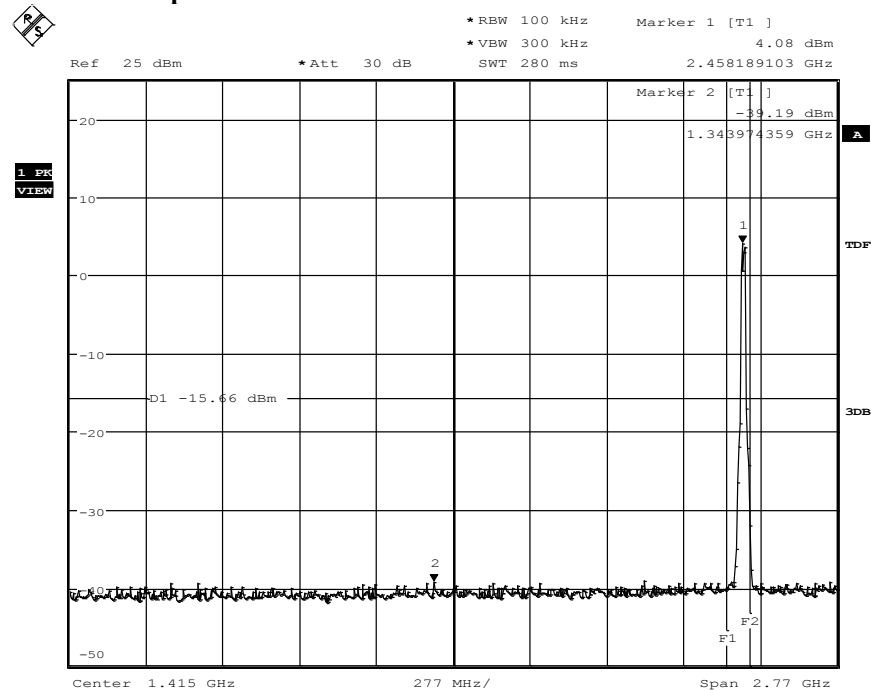
Date: 15.JUN.2015 13:37:50

1.11.9. n-Mode Channel 11**1.11.9.1. Channel 11 Reference**

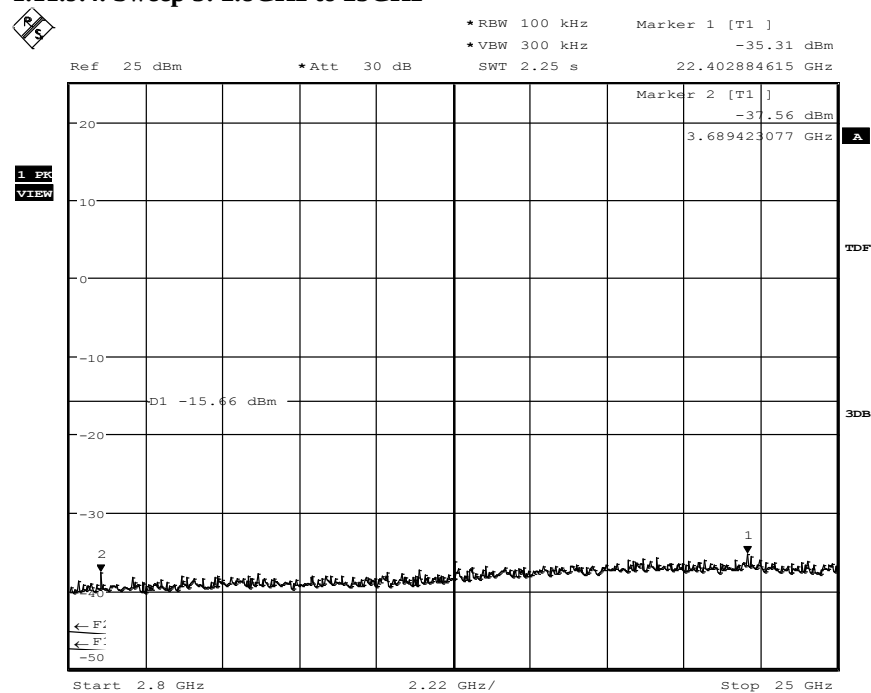
Date: 15.JUN.2015 13:49:51

1.11.9.2. Sweep 1: 150kHz to 30MHz

Date: 15.JUN.2015 13:53:09

1.11.9.3. Sweep 2: 30MHz to 2.8GHz

Date: 15.JUN.2015 13:56:02

1.11.9.4. Sweep 3: 2.8GHz to 25GHz

Date: 15.JUN.2015 14:01:57