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CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-8494/14-01-07-A

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-00

Testing laboratory

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Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-00

Applicant

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Manufacturer

Neratec Solutions AG
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8608 Bubikon / SWITZERLAND

Test standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 247 Issue 1	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence - Exempt Local Area Network (LE-LAN) Devices

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	**WLAN module**
Model name:	**DT60M**
FCC ID:	**2AEJD-103678-DT60M**
IC:	**9301A-103678DT60M**
Frequency:	DTS band 2400 MHz to 2483.5 MHz
Technology tested:	WLAN (b-mode, g-mode, n-mode HT20, n-mode HT40)
Antenna:	External antennas
Power supply:	3.30 V DC by external power supply
Temperature range:	-30°C to +70°C

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:

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Radio Communications & EMC

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Radio Communications & EMC

1 Table of contents

2 General information

2.1 Notes and disclaimer

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This test report replaces the test report with the number 1-8494/14-01-07 and dated 2015-04-27

2.2 Application details

Date of receipt of order:	2014-09-16
Date of receipt of test item:	2015-01-26
Start of test:	2015-01-26
End of test:	2015-03-10
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	-/-	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 247 Issue 1	May 2015	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence - Exempt Local Area Network (LE-LAN) Devices

3.1 Measurement guidance

DTS : KDB 558074 D01	v03r03	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
KDB 662911 D01	V02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
ANSI C63.4-2014	-/-	American national standard for methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
ANSI C63.10-2013	-/-	American national standard of procedures for compliance testing of unlicensed wireless devices

4 Test environment

Temperature:	T_{nom}	+22 °C	during room temperature tests
	T_{max}	+70 °C	during high temperature tests
	T_{min}	-30 °C	during low temperature tests
Relative humidity content:		42 %	
Barometric pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	3.30 V	DC by external power supply
	V_{max}	3.60 V	
	V_{min}	3.15 V	

5 Test item

Kind of test item	:	WLAN module
Type identification	:	DT60M
PMN	:	DT60M
HVIN	:	DT60M
FVIN	:	6.4.4 RC1
HMN	:	-/-
S/N serial number	:	103678-A-03-000097, 103678-A-03-000098, 103678-A-03-000099
HW hardware status	:	V3
SW software status	:	6.4.4 RC1
Frequency band	:	DTS band 2400 MHz to 2483.5 MHz lowest frequency: 2412 MHz; highest frequency: 2462 MHz
Type of radio transmission **Use of frequency spectrum**	: :	DSSS, OFDM
Type of modulation	:	BPSK, QPSK, 16 – QAM, 64 – QAM
Number of channels	:	11 for 20 MHz channel bandwidth 1 for 40 MHz channel bandwidth
Antenna	:	External antennas
Power supply	:	3.30 V DC by external power supply
Temperature range	:	-30°C to +70°C

5.1 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup- and EUT-photos are included in test report: 1-8494/14-01-01_AnnexA
1-8494/14-01-01_AnnexB
1-8494/14-01-01_AnnexD

All available plots are included in this report. In some measurements no plot is available. The results are taken from the log file, which is made from the test system during the measurements.

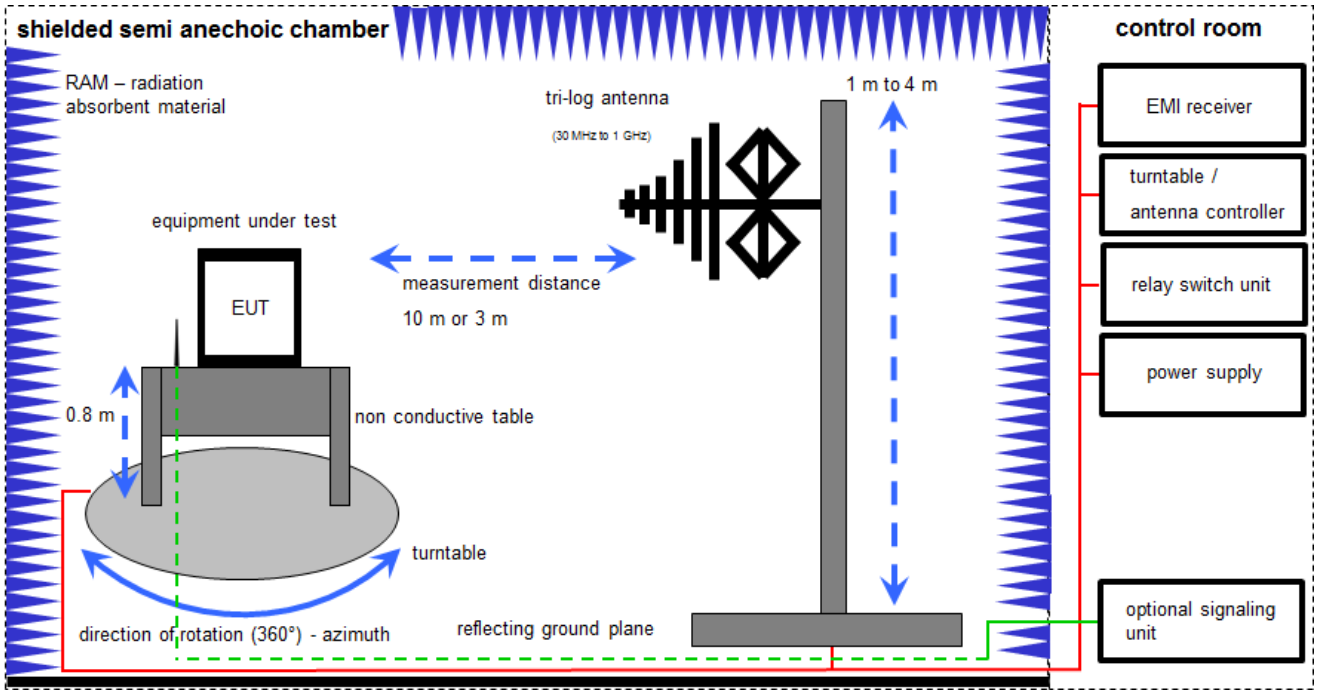
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.4. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.4 and ANSI C63.10.



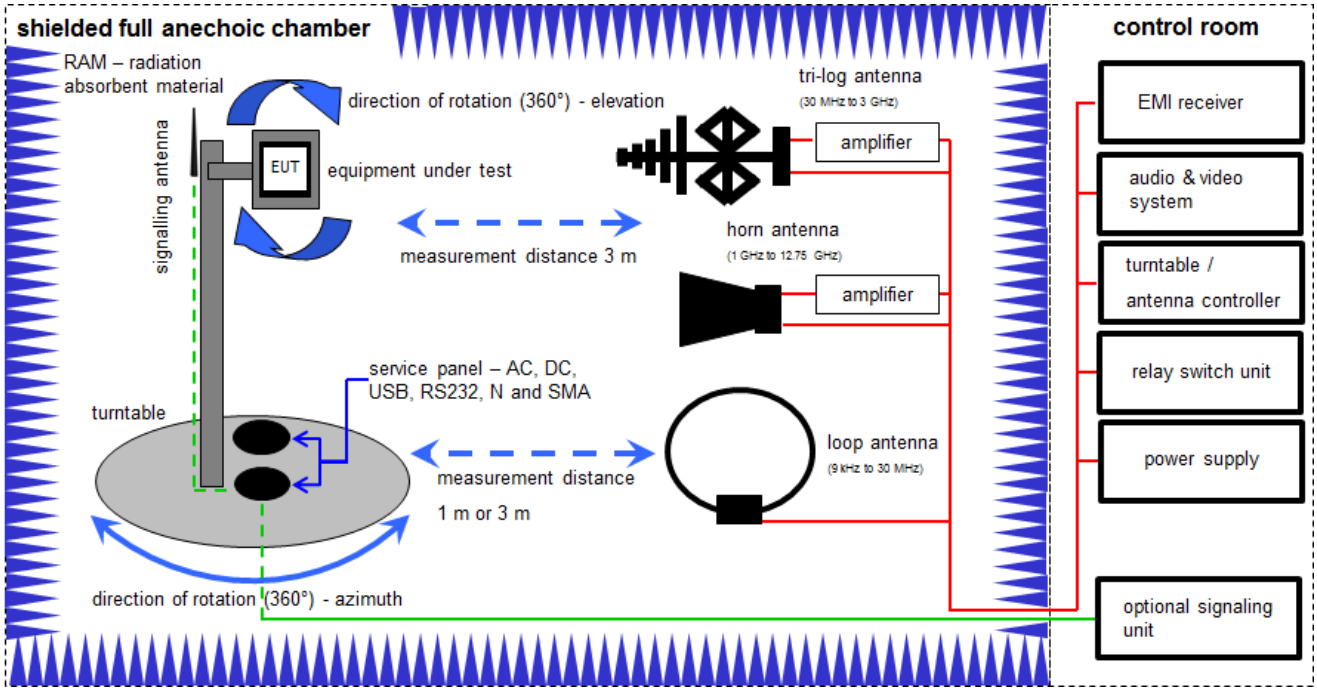
$SS = U_R + CL + AF$
(SS-signal strength; U_R-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

Example calculation:
SS [dBµV/m] = 12.35 [dBµV/m] + 1.90 [dB] + 16.80 [dBµV/m] = 31.05 [dBµV/m] (35.69 µV/m)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
2	A	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	26.01.2015	26.01.2016
3	A	Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745	izw	30.01.2014	30.01.2016
4	A	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw	29.01.2015	29.01.2017
5	A	Turntable Interface-Box	Model 105637	ETS-Lindgren	44583	300003747	izw	26.08.2014	26.08.2016
6	A	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	22.04.2014	22.04.2016

7.2 Radiated measurements chamber C



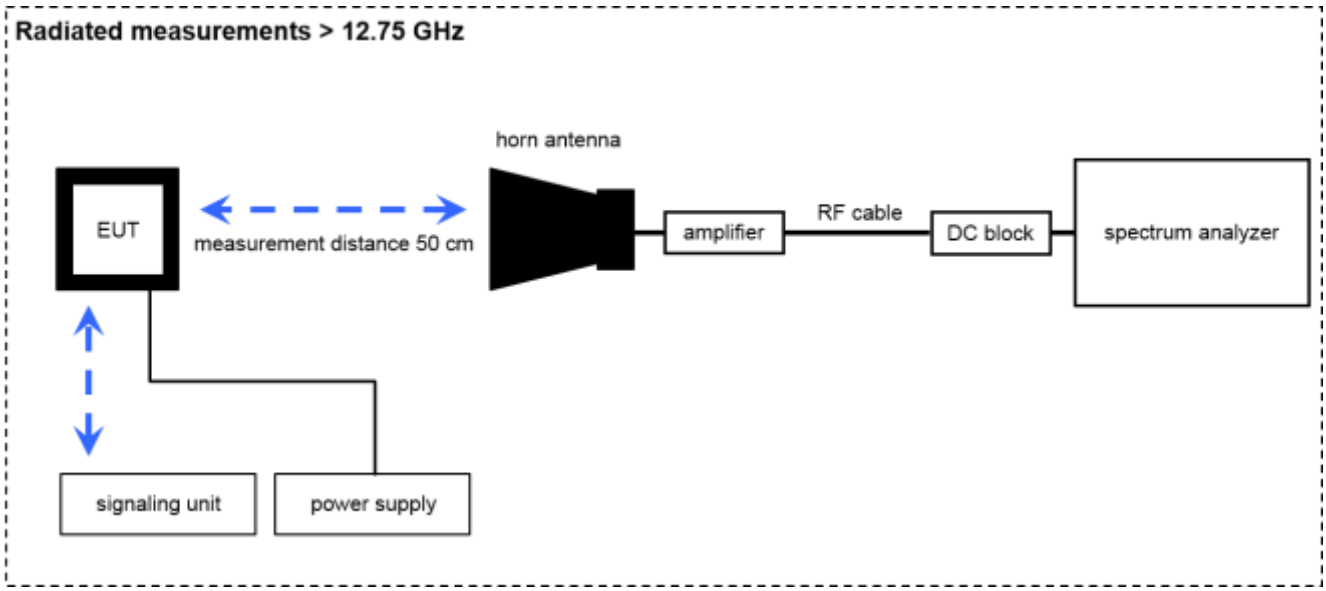
SS = U_R + CA + AF
(SS-signal strength; U_R-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

Example calculation:
SS [dBµV/m] = 40.0 [dBµV/m] + (-35.8) [dB] + 32.9 [dBµV/m] = 37.1 [dBµV/m] (71.61 µV/m)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A,C	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	9709-5290	300000212	k	23.07.2013	23.07.2015
2	A,B	EMI Test Receiver 20Hz- 26,5GHz	ESU26	R&S	100037	300003555	k	22.01.2015	22.01.2016
3	A,C	Highpass Filter	WHK1.1/15G-10SS	Wainwright	37	400000148	ne	22.04.2014	22.04.2017
4	A	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne	-/-	-/-
5	A	Band Reject Filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	26	300003792	ne	-/-	-/-
6	A	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	318	300003696	k	22.04.2014	22.04.2017
7	A,C	Broadband Amplifier 0.5-18 GHz	CBLU5184540	CERNEX	22050	300004482	ev	-/-	-/-
8	A	Broadband Amplifier	CBLU5135235	CERNEX	22011	300004492	ev	-/-	-/-
9	A,C	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000032	300004510	ne	-/-	-/-
10	A,B,C	Messrechner und Monitor	Intel Core i3 3220/3,3 GHz, Prozessor	Agilent Technologies	2V2403033A5421	300004591	ne	-/-	-/-
11	A,B,C	NEXIO EMV-Software	BAT EMC	EMCO	2V2403033A5421	300004682	ne	-/-	-/-
12	B	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	24.06.2015	24.06.2017

7.3 Radiated measurements 12.75 GHz to 26 GHz



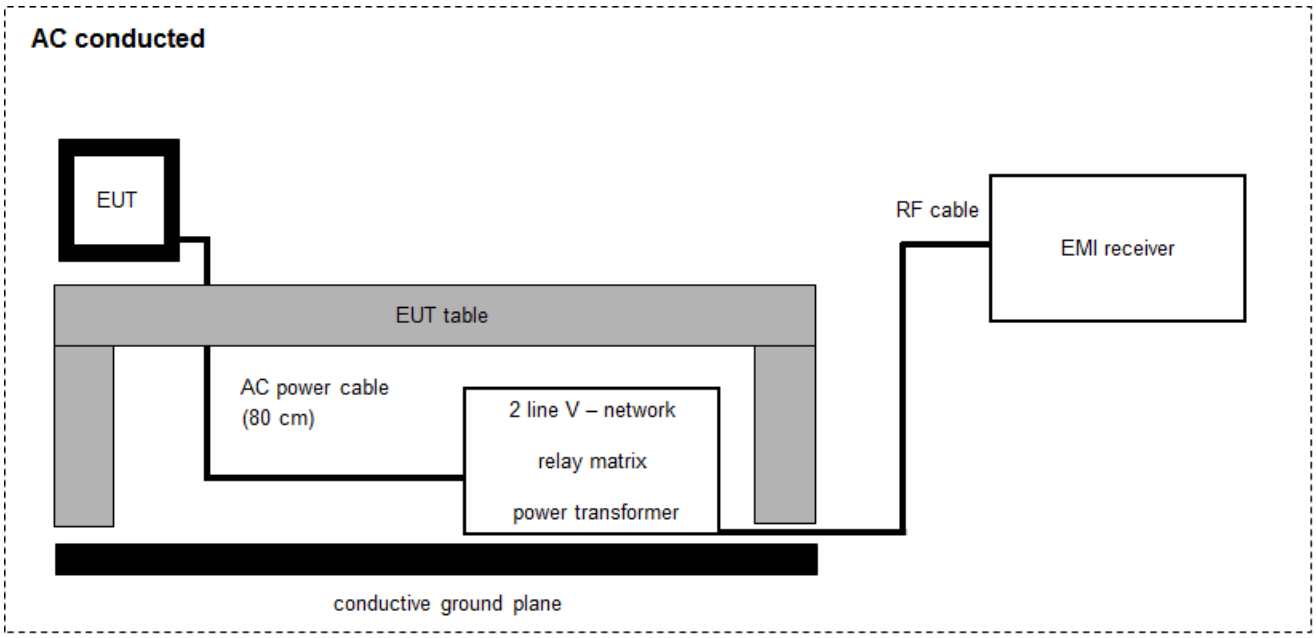
SS = U_R + CA + AF
(SS-signal strength; U_R-voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

Example calculation:
SS [dBµV/m] = 40.0 [dBµV/m] + (-60.1) [dB] + 36.74 [dBµV/m] = 16.64 [dBµV/m] (6.79 µV/m)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
2	A	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
3	A	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.01.2015	22.01.2016
4	A	Amplifier 2-40 GHz	JS32-02004000-57-5P	MITEQ	1777200	300004541	ev	-/-	-/-
5	A	RF-Cable	ST18/SMAm/SMAm/48	Huber & Suhner	Batch no. 600918	400001182	ev	-/-	-/-
6	A	RF-Cable	ST18/SMAm/SMm/48	Huber & Suhner	Batch no. 127377	400001183	ev	-/-	-/-
7	A	DC-Blocker 0.1-40 GHz	8141A	Inmet	Batch no. 127377	400001185	ev	-/-	-/-

7.4 AC conducted



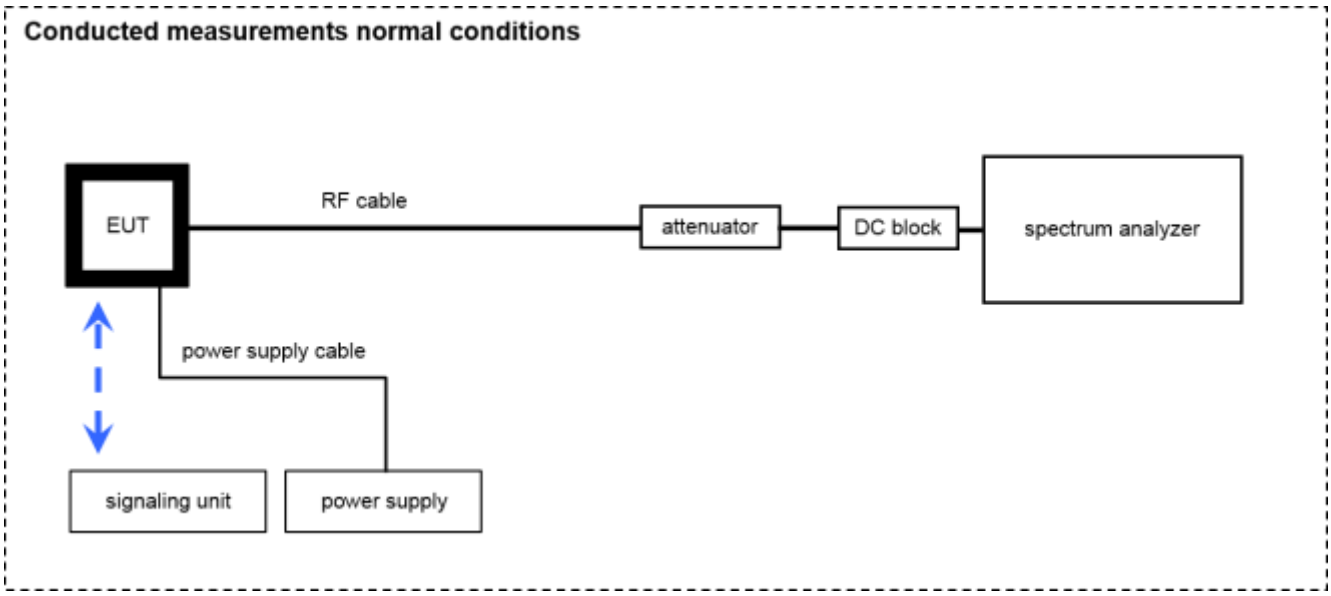
SS = UR + CF + VC
(SS-signal strength; UR-voltage at the receiver; CR-loss of the cable and filter; VC-correction factor of the ISN)

Example calculation:
SS [dBµV/m] = 37.62 [dBµV/m] + 9.90 [dB] + 0.23 [dB] = 47.75 [dBµV/m] (244.06 µV/m)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A,B	Netznachbildung	ESH3-Z5	R&S	892475/017	300002209	k	17.06.2014	17.06.2016
2	A,B	RF-Filter-section	85420E	HP	3427A00162	300002214	k	27.11.2006	-/-
3	A,B	EMI-Receiver	8542E	HP	3617A00170	300000568	k	28.01.2015	28.01.2016

7.5 Conducted measurements



OP = AV + CA
(OP-output power; AV-analyzer value; CA-loss signal path)

Example calculation:
OP [dBm] = 6.0 [dBm] + (11.7) [dB] = 17.7 [dBm] (58.88 mW)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.01.2015	22.01.2016
2	A	Amplifier 2-40 GHz	JS32-02004000-57-5P	MITEQ	1777200	300004541	ev	-/-	-/-
3	A	Power Supply 0-20V, 0-5A	6632B	Agilent Technologies	GB42110541	400000562	vlKl!	10.01.2013	10.01.2016
4	A	PC-WLAN Tester	Intel Core i3 3220/3,3 GHz, Prozessor	Agilent Technologies	2V2403033A4523	300004589	ne	-/-	-/-
5	A	Teststand	Teststand Custom Sequence Editor	National Instruments GmbH	2V2403033A4523	300004590	ne	-/-	-/-
6	A	RF-Cable	ST18/SMAm/SMAm/60	Huber & Suhner	Batch no. 606844	400001181	ev	-/-	-/-
7	A	DC-Blocker 0.1-40 GHz	8141A	Inmet	Batch no. 127377	400001185	ev	-/-	-/-
8	A	Coax Attenuator 10 dB 2W 0-40 GHz	MCL BW-K10-2W44+	Mini Circuits	Batch no. 127377	400001186	ev	-/-	-/-

8 Measurement uncertainty

Measurement uncertainty	
Test case	**Uncertainty**
Antenna gain	± 3 dB
Power spectral density	± 1.5 dB
DTS bandwidth	± 100 kHz (depends on the used RBW)
Occupied bandwidth	± 100 kHz (depends on the used RBW)
Maximum output power	± 1.5 dB
Detailed spurious emissions @ the band edge - conducted	± 1.5 dB
Band edge compliance radiated	± 3 dB
Spurious emissions conducted	± 3 dB
Spurious emissions radiated below 30 MHz	± 3 dB
Spurious emissions radiated 30 MHz to 1 GHz	± 3 dB
Spurious emissions radiated 1 GHz to 12.75 GHz	± 3.7 dB
Spurious emissions radiated above 12.75 GHz	± 4.5 dB
Spurious emissions conducted below 30 MHz (AC conducted)	± 2.6 dB

9 Sequence of testing

9.1 Sequence of testing 9 kHz to 30 MHz

Setup

- The equipment was set up to simulate a typical usage like descripted in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter (see ANSI C 63.4) – see each test details
- The EUT was set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1.5 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axces (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK (QPK / see ANSI C 63.4) detector
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

9.2 Sequence of testing 30 MHz to 1 GHz

Setup

- The equipment was set up to simulate a typical usage like descripted in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 10 or 3 meter (see ANSI C 63.4) – see each test details
- The EUT was set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions

Final measurement

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP (Quasi-Peak / see ANSI C 63.4) detector with an EMI receiver
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

9.3 Sequence of testing 1 GHz to 12.75 GHz

Setup

- The equipment was set up to simulate a typical usage like descripted in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter (see ANSI C 63.4) – see each test details
- The EUT was set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement

- The final measurement will be performed with minimum the six highest peaks according the requirements of the ANSI C63.4.
- According to the maximum found antenna polarisation and turntable position of the premeasurement the software maximizes the peaks by rotating the turntable position (0° to 360°). This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps). This procedure is repeated for both antenna polarisations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS (RMS / see ANSI C 63.4) detector
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

9.4 Sequence of testing above 12.75 GHz

Setup

- The equipment was set up to simulate a typical usage like descripted in the user manual or described by manufacturer.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 0.5 meter
- The EUT was set into operation.

Premeasurement

- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and RMS (RMS / see ANSI C 63.4) detector
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

10 Summary of measurement results

☐	No deviations from the technical specifications were ascertained
☐	There were deviations from the technical specifications ascertained
☒	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS - 247, Issue 1	see table below	2015-07-27	-/-

Test specification clause	Test case	Guideline	Temperature conditions	Power source voltages	Mode	C	NC	NA	NP	Remark
§15.247(b)(4) RSS - 247 / 5.4 (4)	Antenna gain	-/-	Nominal	Nominal	DSSS	☒	☐	☐	☐	-/-
§15.247(e) RSS - 247 / 5.2 (2)	Power spectral density	KDB 558074 DTS clause: 10.6	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.247(a)(2) RSS - 247 / 5.2 (1)	DTS bandwidth	KDB 558074 DTS clause: 8.1	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
RSS Gen clause 4.6.1	Occupied bandwidth	-/-	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.247(b)(3) RSS - 247 / 5.4 (4)	Maximum output power	KDB 558074 DTS clause: 9.2.2.5	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5	Detailed spurious emissions @ the band edge - conducted	-/-	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.205 RSS - 247 / 5.5 RSS - Gen	Band edge compliance radiated	KDB 558074 DTS clause: 13.3.2	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5	TX spurious emissions conducted	KDB 558074 DTS clause: 11.1 & 11.2 11.3	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.209(a) RSS-Gen	TX spurious emissions radiated below 30 MHz	-/-	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5 RSS-Gen	TX spurious emissions radiated 30 MHz to 1 GHz	-/-	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5 RSS-Gen	TX spurious emissions radiated above 1 GHz	-/-	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-
§15.109 RSS-Gen	RX spurious emissions radiated 30 MHz to 1 GHz	-/-	Nominal	Nominal	RX / idle	☒	☐	☐	☐	-/-
§15.109 RSS-Gen	RX spurious emissions radiated above 1 GHz	-/-	Nominal	Nominal	RX / idle	☒	☐	☐	☐	-/-
§15.107(a) §15.207	Conducted emissions < 30 MHz	-/-	Nominal	Nominal	DSSS OFDM	☒	☐	☐	☐	-/-

Note: NA = Not Applicable; NP = Not Performed; C = Compliant; NC = Not Compliant

11 Additional comments

Reference documents: Parrot_ANT_2_IPEX_On_Sensefly_dipol_dual_band_low_gain.pdf

Special test and configuration descriptions:

Power settings for SISO configuration parrot antenna (3dBi)

	Mode:			
Channel:	b	g	nHT-20	nHT-40
2412 MHz	-/-	8	8	-/-
2417 MHz	10	12	12	-/-
2437 MHz	10	15	14	9
2457 MHz	10	12	12	-/-
2462 MHz	8	8	8	-/-

Power settings for MIMO configuration parrot antenna (3dBi)

	Mode:			
Channel:	b	g	nHT-20	nHT-40
2412 MHz	-/-	-/-	-/-	-/-
2417 MHz	7	9	9	-/-
2437 MHz	7	15	14	6
2457 MHz	7	9	9	-/-
2462 MHz	-/-	-/-	-/-	-/-

Test mode: Special software is used.
EUT is transmitting pseudo random data by itself

Antenna configuration definition for the further test report:

ANT A1s = SISO with Parrot antenna @ antenna port 1
ANT A1m = MIMO with Parrot antenna @ antenna port 1
ANT A2m = MIMO with Parrot antenna @ antenna port 2

12 Measurement results

12.1 Antenna gain

EUT supports 2x2 MIMO over MMCS connectors.

Antenna type:	max. gain
Parrot_ANT_2_IPEX_On_Sensefly_dipol_dual_band_low_gain	3 dBi

Antenna gain value is declared by manufacturer.

12.2 Identify worst case data rate

Measurement:

All modes of the module will be measured with an average power meter to identify the maximum transmission power on mid channel. In the case that only one or two channels are available, only these will be measured.

In further tests only the identified worst case modulation scheme or bandwidth will be measured.
Additional the band edge compliance test will be performed in the lowest and highest modulation scheme.

Measurement parameters:

Spectrum Analyser: 3MHz RBW, 3MHz VBW, PP

Results:

Modulation	Modulation scheme / bandwidth
Frequency	2437 MHz
DSSS / b – mode	1 Mbit/s
OFDM / g – mode	6 Mbit/s
OFDM / n HT20 – mode	MCS0
OFDM / n HT40 – mode	MCS0

12.3 Duty Cycle

Description:

Measurement of the duty cyle in front of all power measurements to include a duty cycle corretion in the average power measurement.

Measurement:

Measurement parameter	
According to DTS clause 6.0 b	
Detector:	Peak
Sweep time:	4.7 ms
Resolution bandwidth:	10 MHz
Video bandwidth:	10 MHz
Span:	Zero Span
Trace-Mode:	Clear write
Sweep methode:	Single sweep
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Calculation:

Duty Cycle = T_{on} / T_{on+off}

Example: 448.188/492.01 = 0.9109

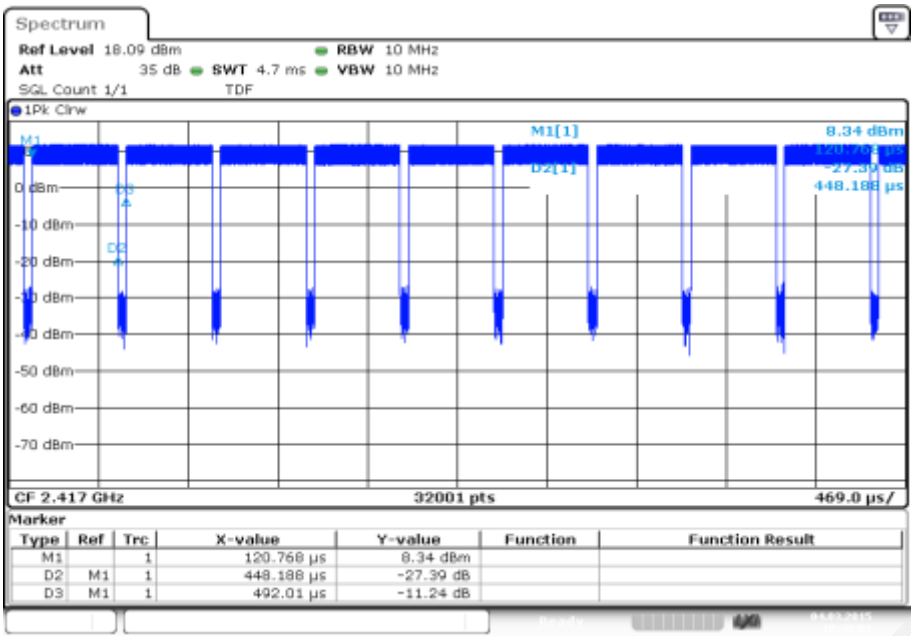
Duty Cycle correction factor = 10*log(Duty cycle)

Example: 10*log(0.9109) = -0.41 (Spectrum analyser offset 0.41 to correct the signal strength to 100%)

All values are calculated by CETECOM automated measurement system right before power measurement. See power measurement plots for duty cycle correction factor values.

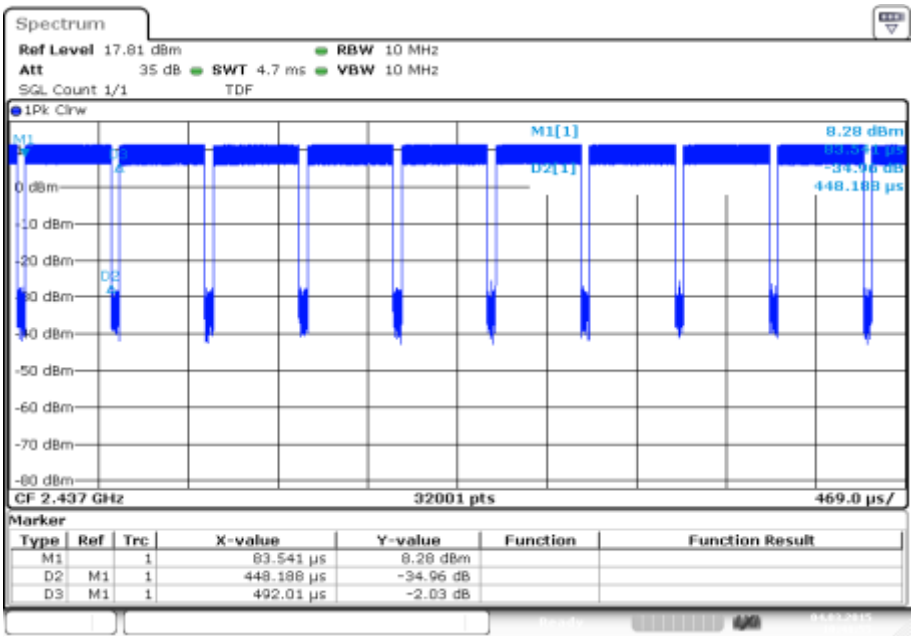
Plots: DSSS / b – mode

Plot 1: TX mode, A1s, 2417 MHz



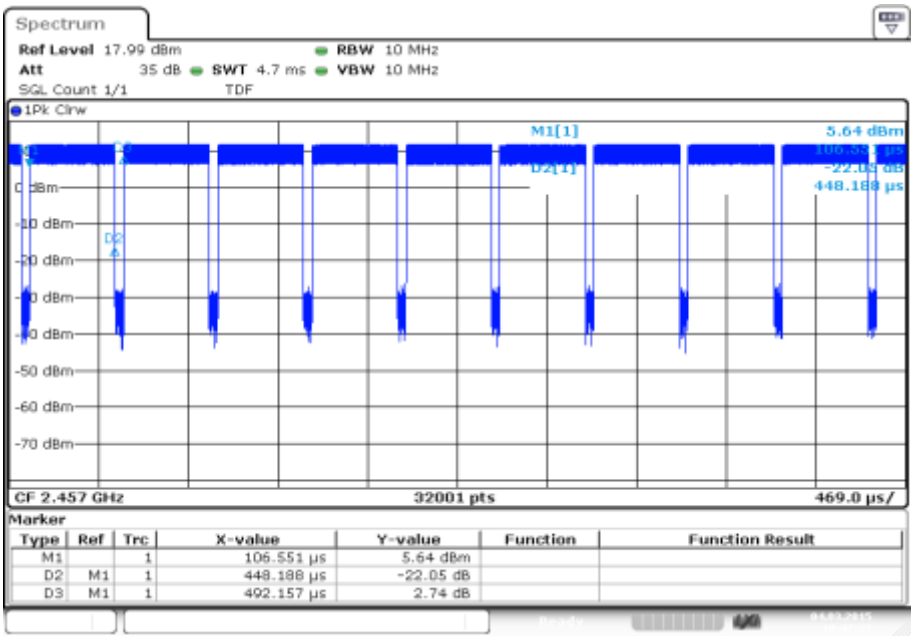
Date: 4.MAR.2015 10:30:02

Plot 2: TX mode, A1s, 2437 MHz



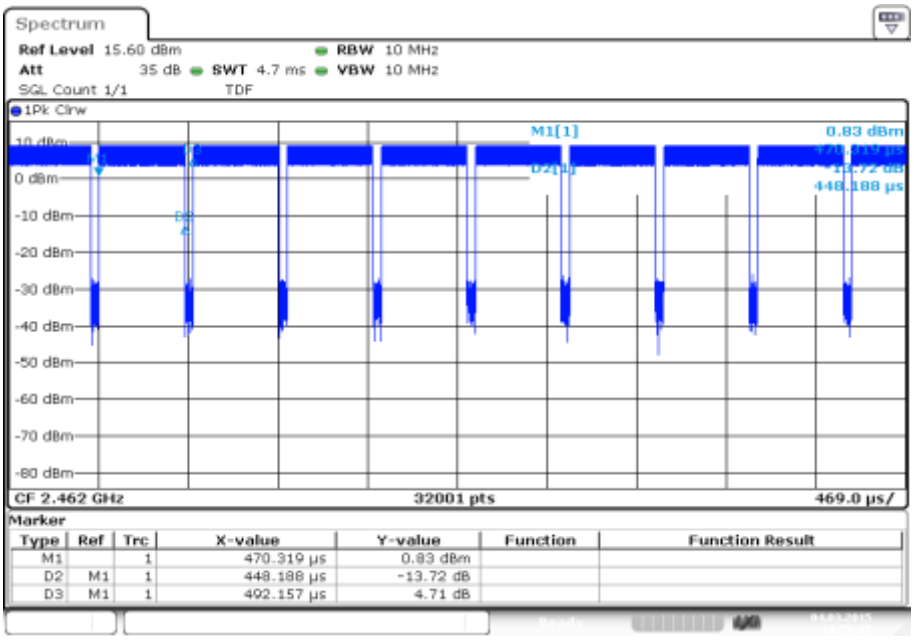
Date: 4.MAR.2015 10:41:55

Plot 3: TX mode, A1s, 2457 MHz



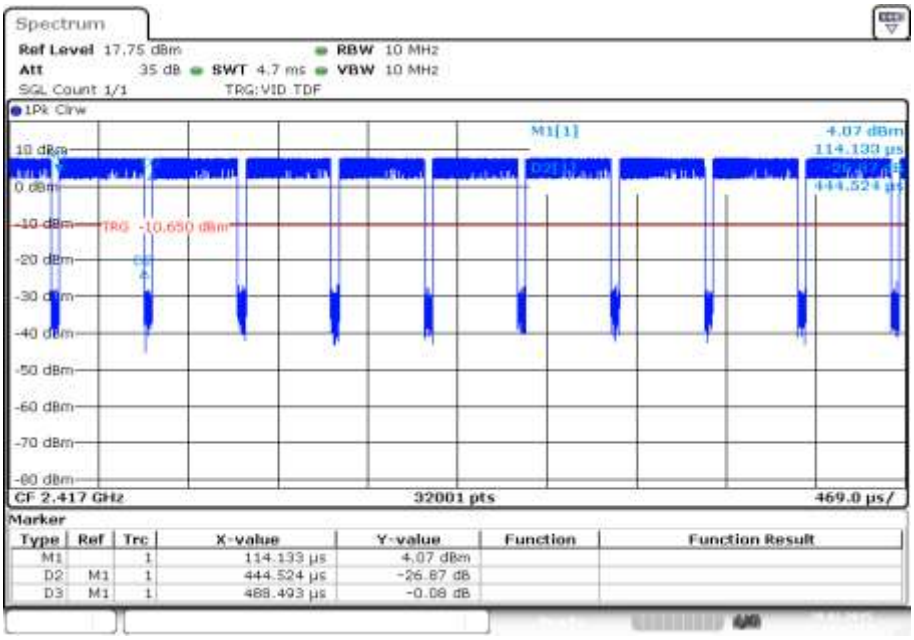
Date: 4.MAR.2015 10:47:35

Plot 4: TX mode, A1s, 2462 MHz



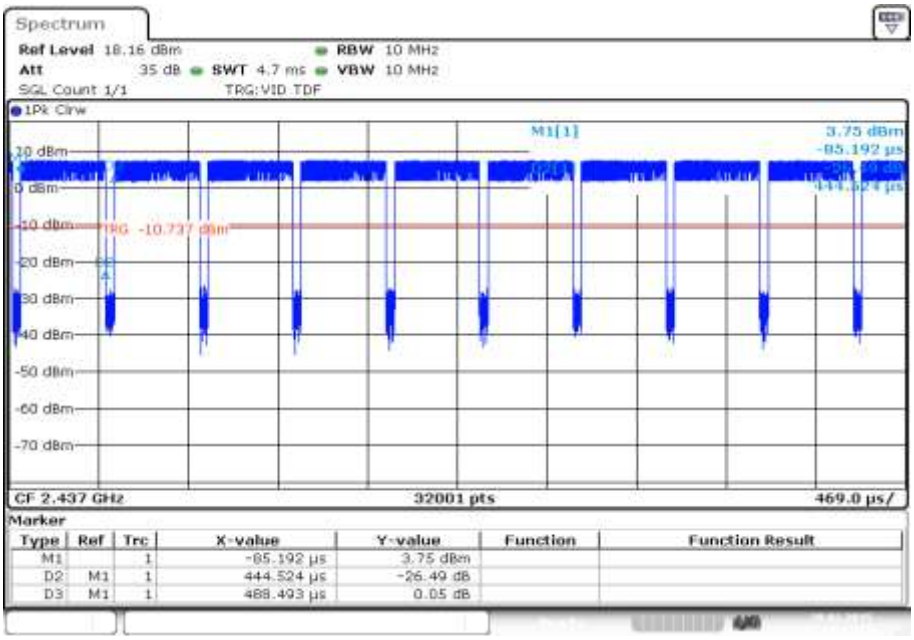
Date: 4.MAR.2015 10:59:15

Plot 5: TX mode, A1m, 2417 MHz



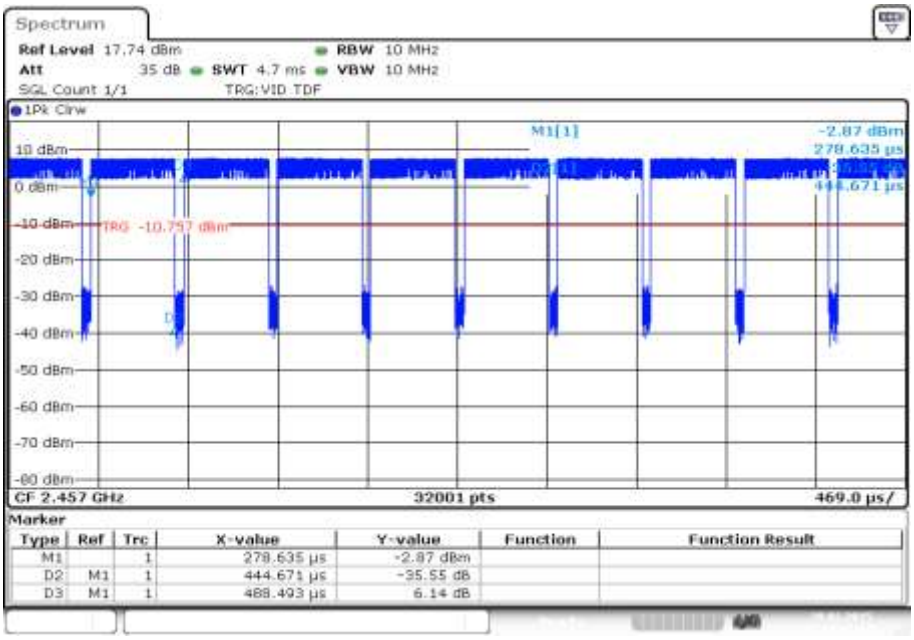
Date: 28.FEB.2015 14:02:33

Plot 6: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 14:15:27

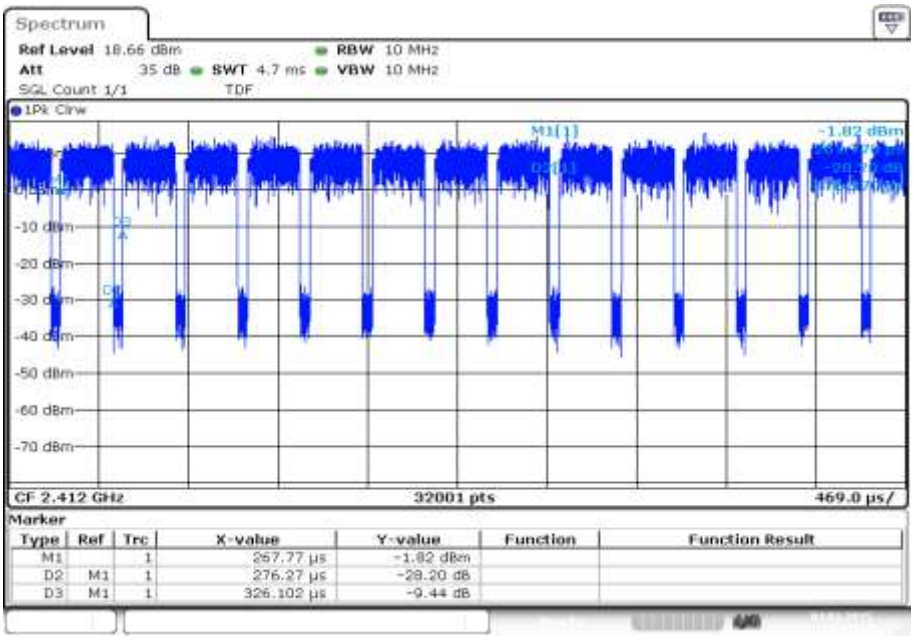
Plot 7: TX mode, A1m, 2457 MHz



Date: 28.FEB.2015 14:22:41

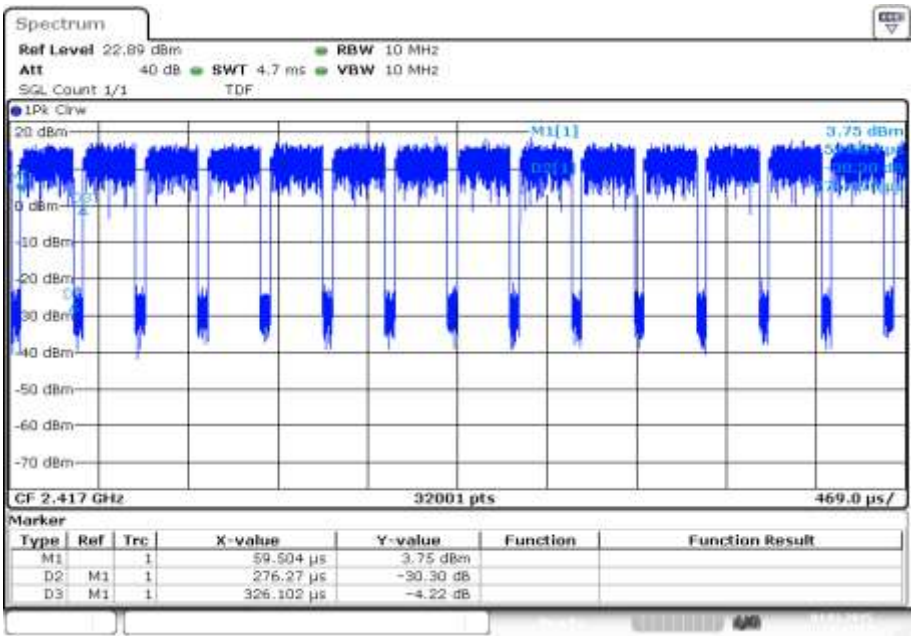
Plots: OFDM / g – mode

Plot 1: TX mode, A1s, 2412 MHz



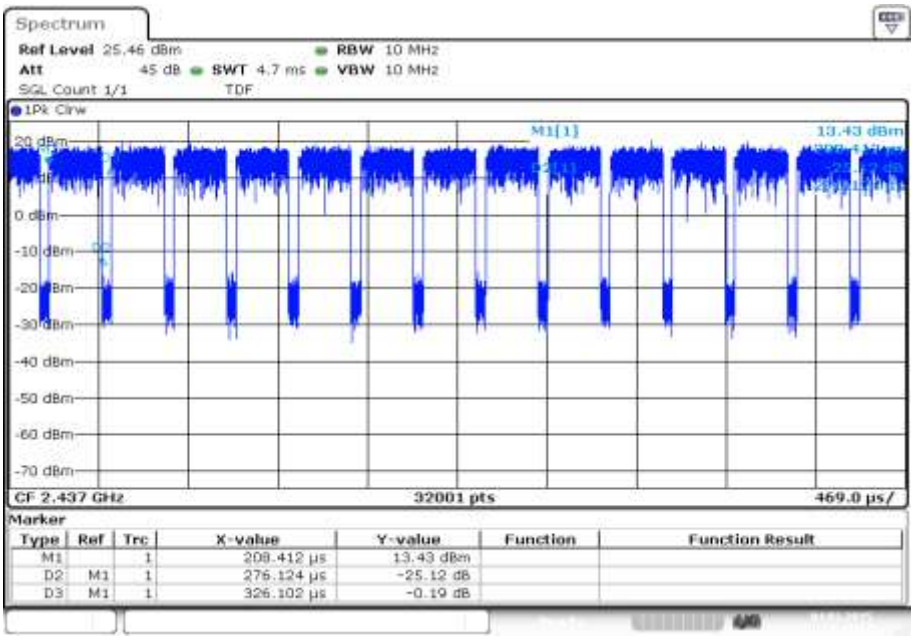
Date: 4.MAR.2015 11:05:32

Plot 2: TX mode, A1s, 2417 MHz



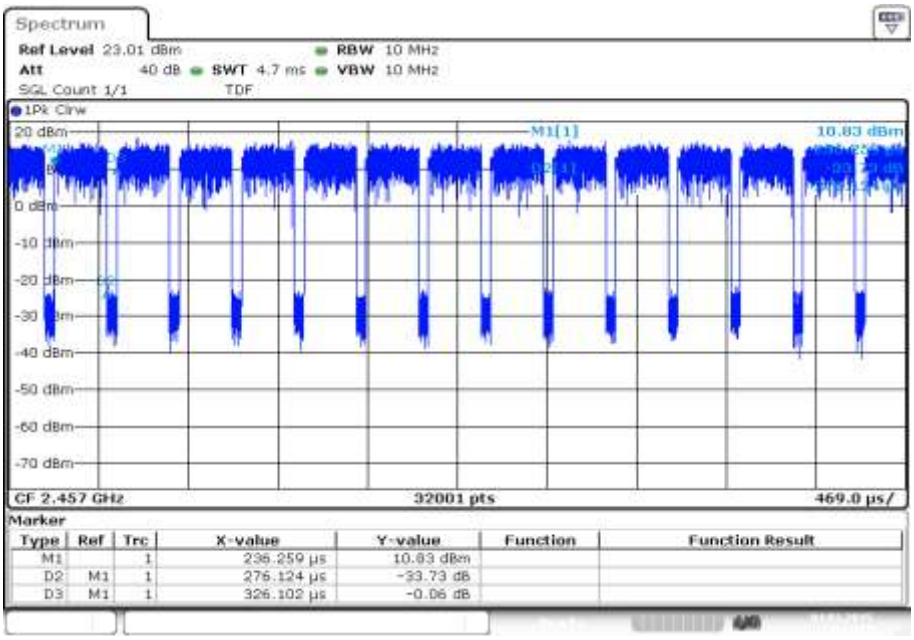
Date: 4.MAR.2015 11:12:27

Plot 3: TX mode, A1s, 2437 MHz



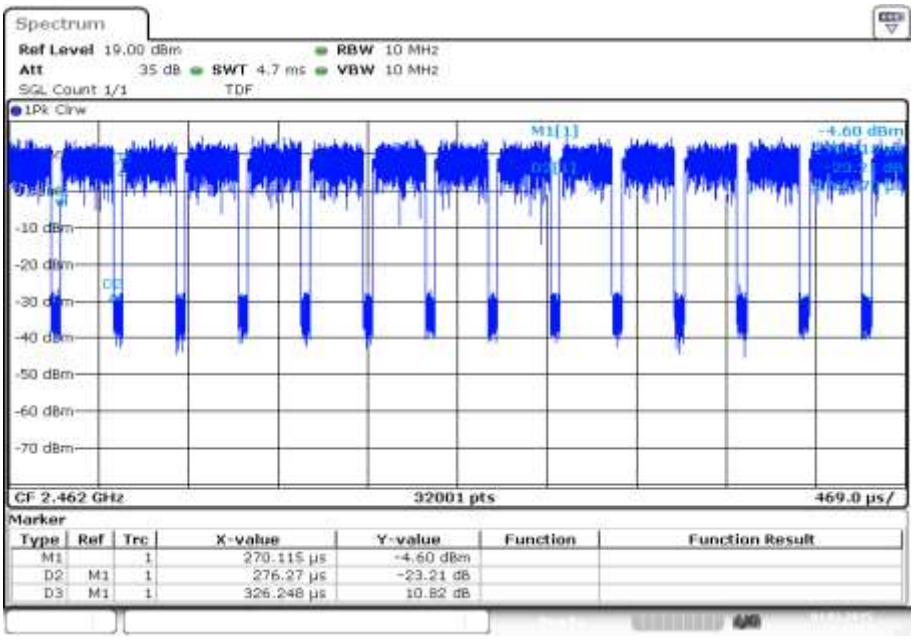
Date: 4.MAR.2015 11:19:12

Plot 4: TX mode, A1s, 2457 MHz



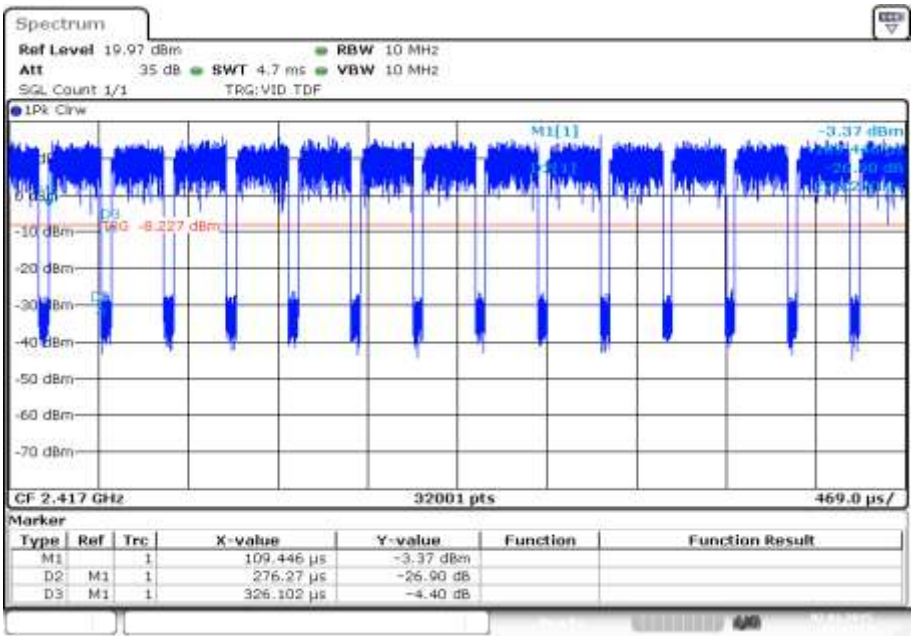
Date: 4.MAR.2015 11:26:30

Plot 5: TX mode, A1s, 2462 MHz



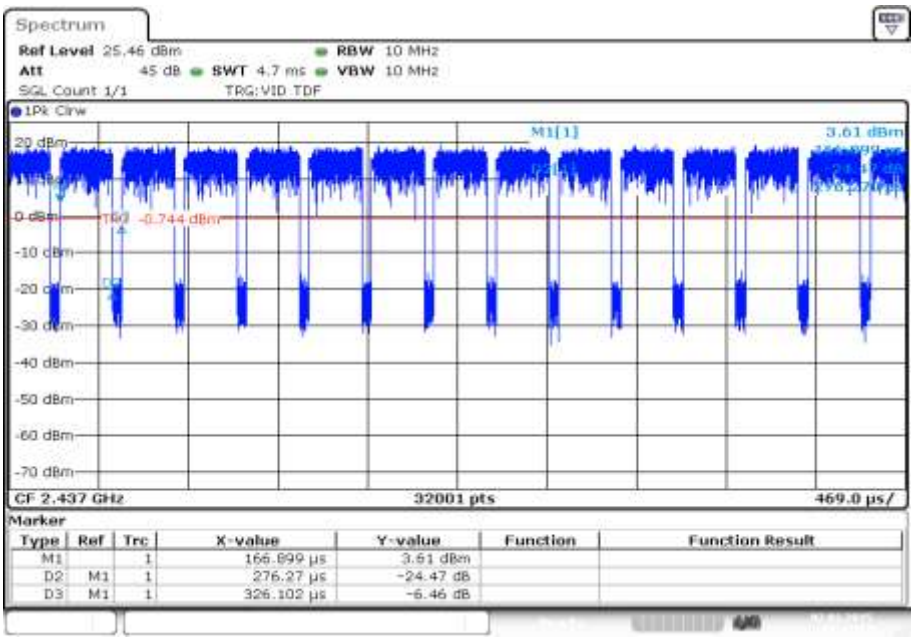
Date: 4.MAR.2015 11:33:53

Plot 6: TX mode, A1m, 2417 MHz



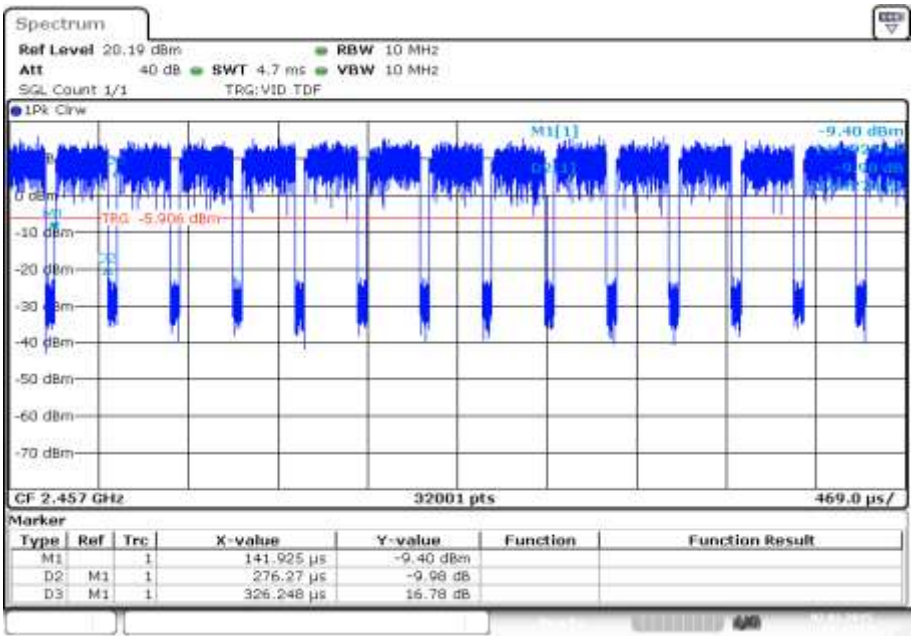
Date: 2.MAR.2015 08:05:49

Plot 7: TX mode, A1m, 2437 MHz



Date: 2.MAR.2015 08:12:32

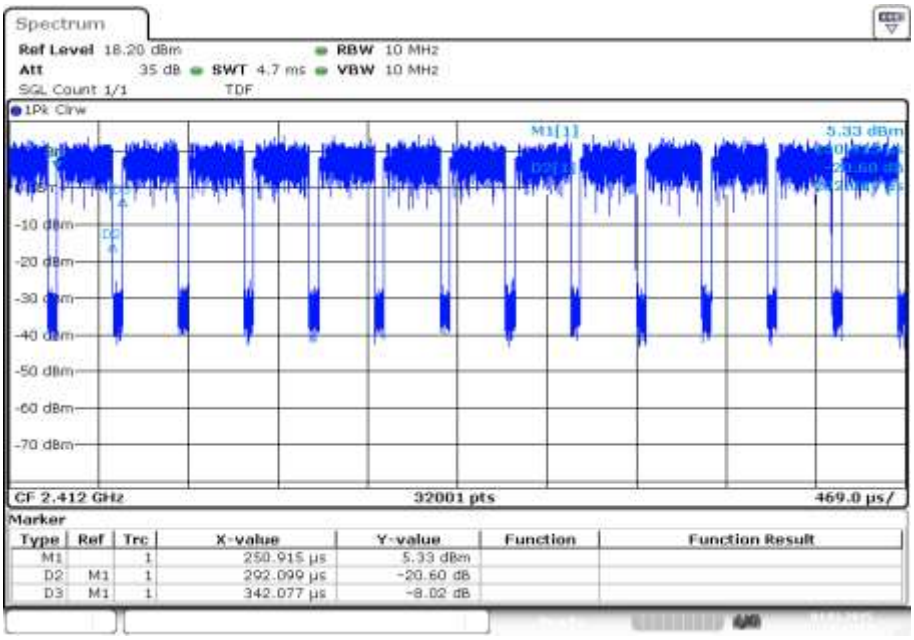
Plot 8: TX mode, A1m, 2457 MHz



Date: 2.MAR.2015 08:19:08

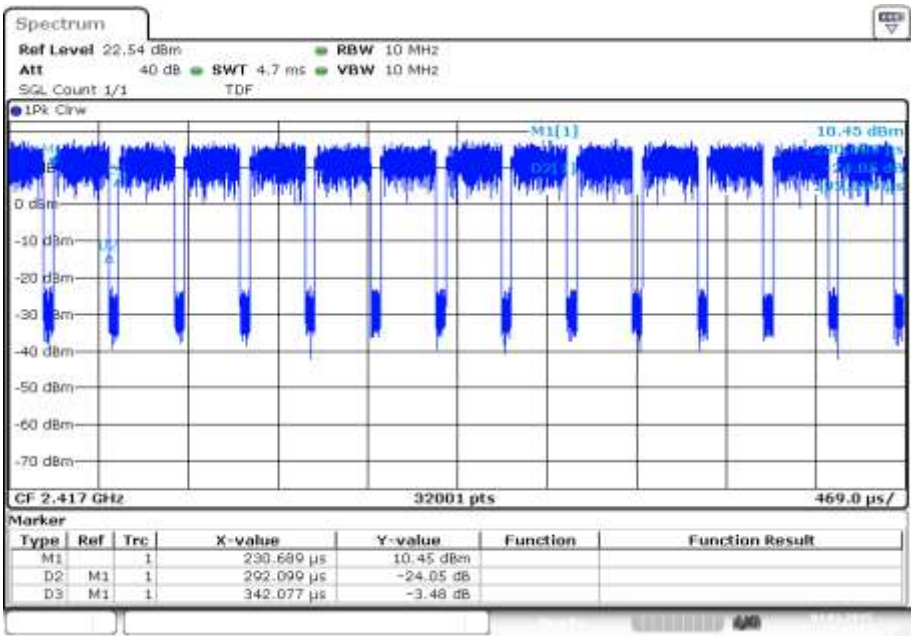
Plots: OFDM / n20 – mode

Plot 1: TX mode, A1s, 2412 MHz



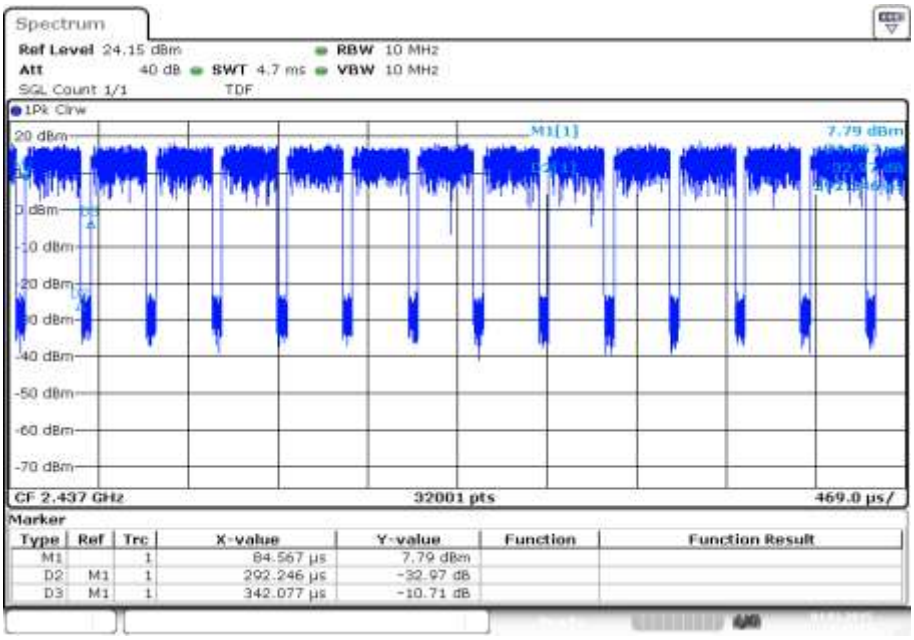
Date: 4.MAR.2015 11:41:33

Plot 2: TX mode, A1s, 2417 MHz



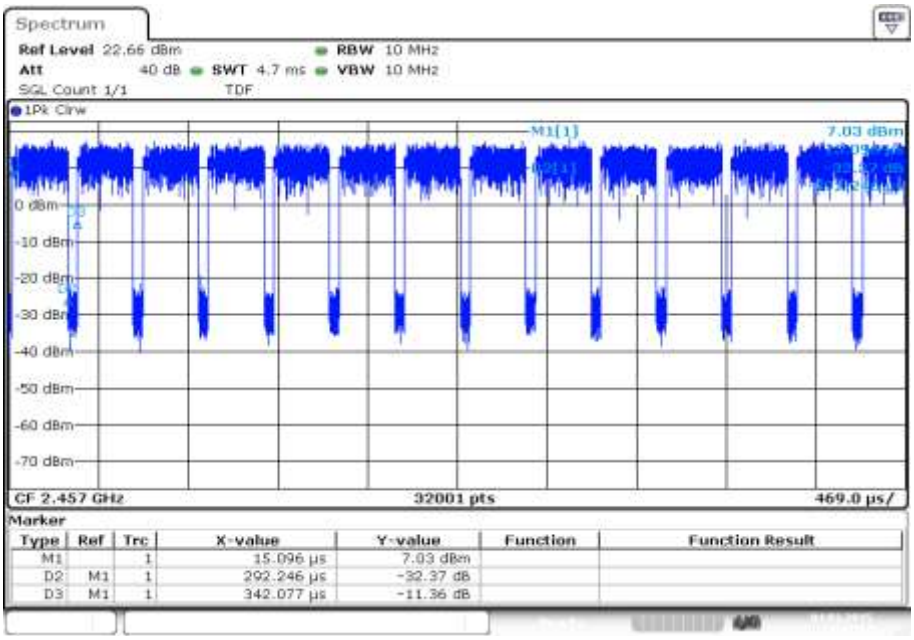
Date: 4.MAR.2015 11:51:15

Plot 3: TX mode, A1s, 2437 MHz



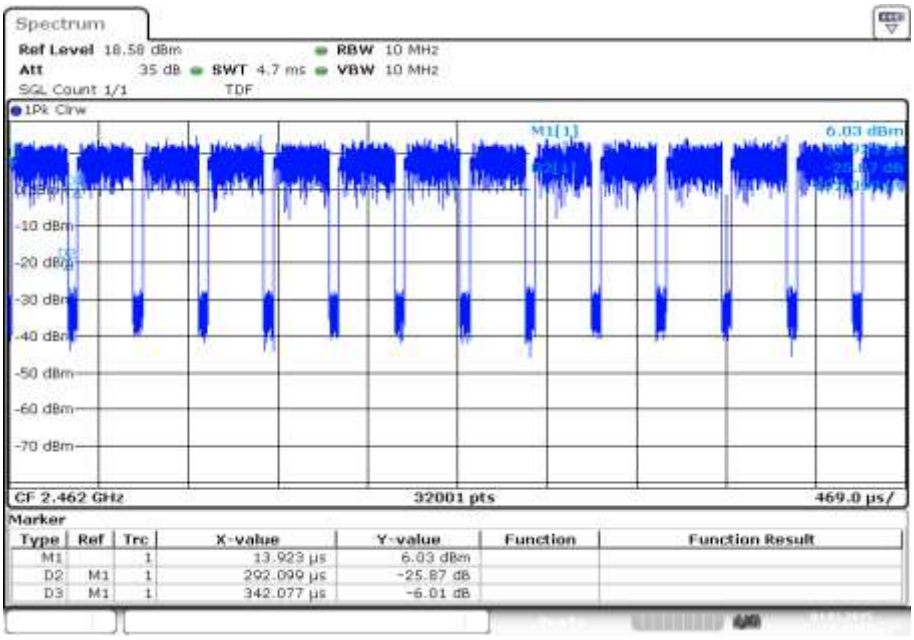
Date: 4.MAR.2015 11:58:07

Plot 4: TX mode, A1s, 2457 MHz



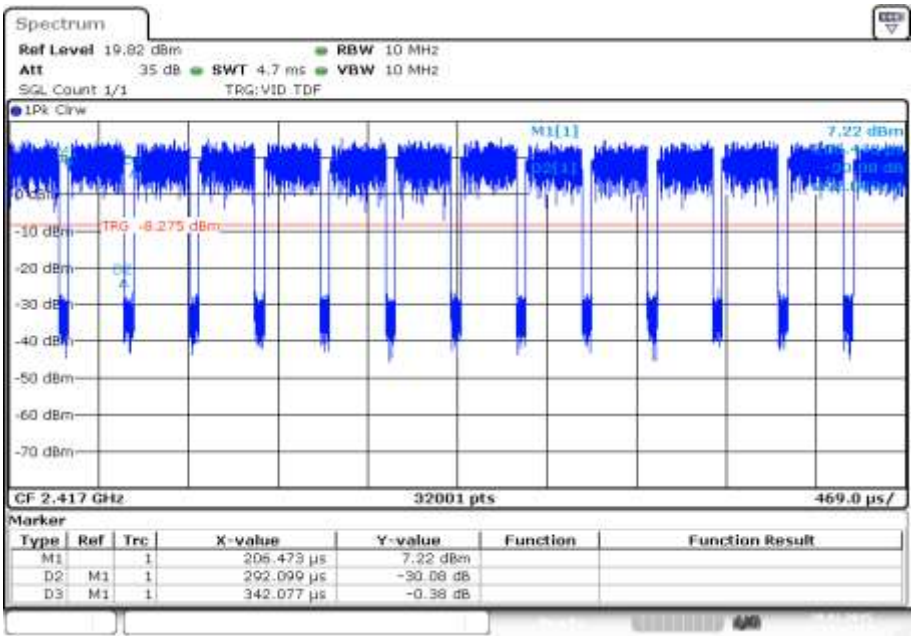
Date: 4.MAR.2015 12:06:53

Plot 5: TX mode, A1s, 2462 MHz



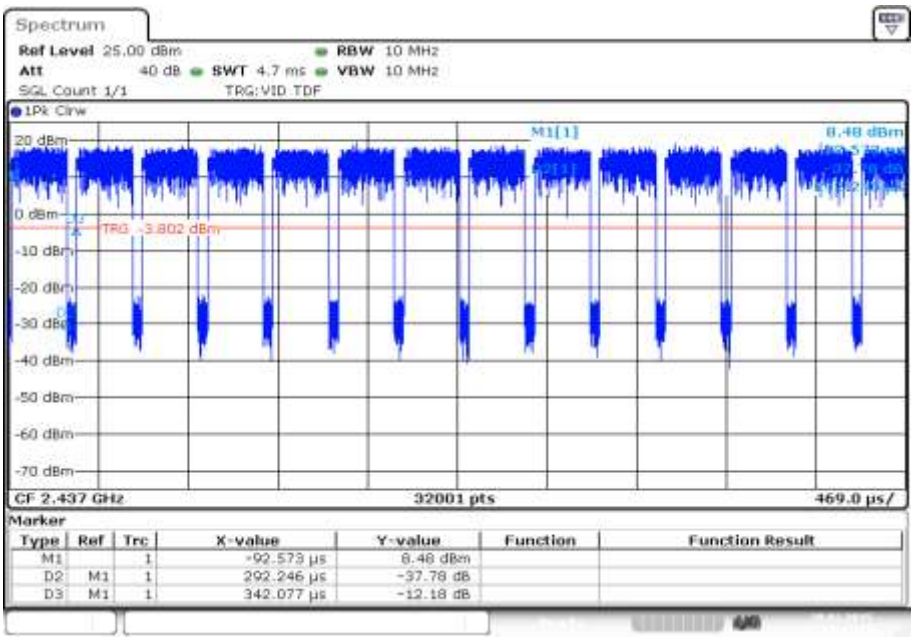
Date: 4.MAR.2015 12:16:31

Plot 6: TX mode, A1m, 2417 MHz



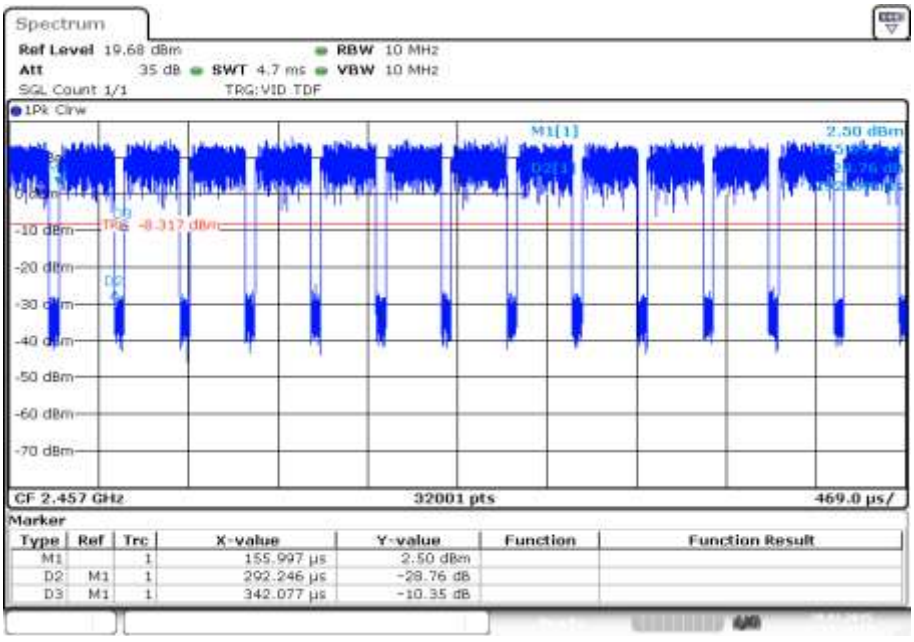
Date: 28.FEB.2015 15:05:38

Plot 7: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 15:13:17

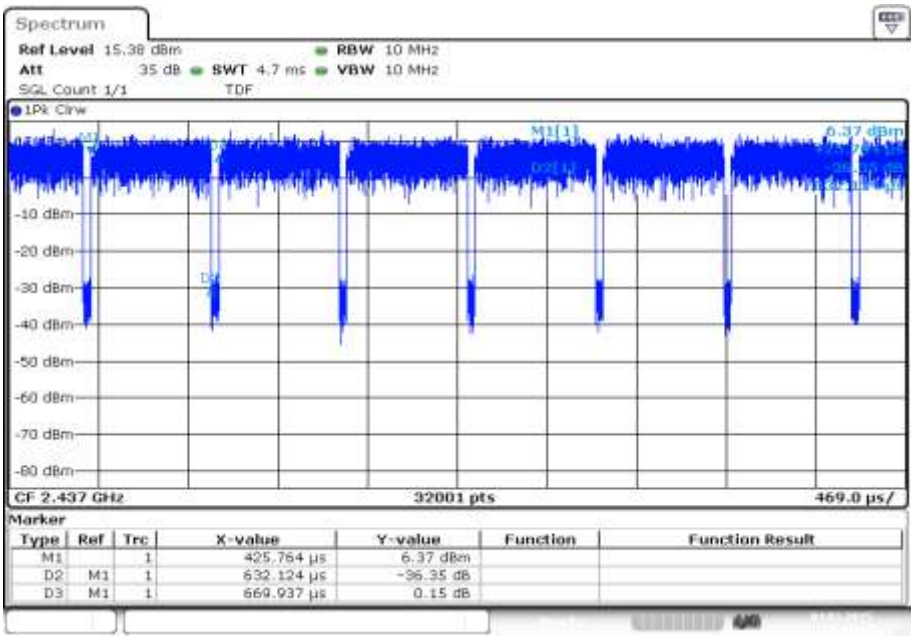
Plot 8: TX mode, A1m, 2457 MHz



Date: 28.FEB.2015 15:20:40

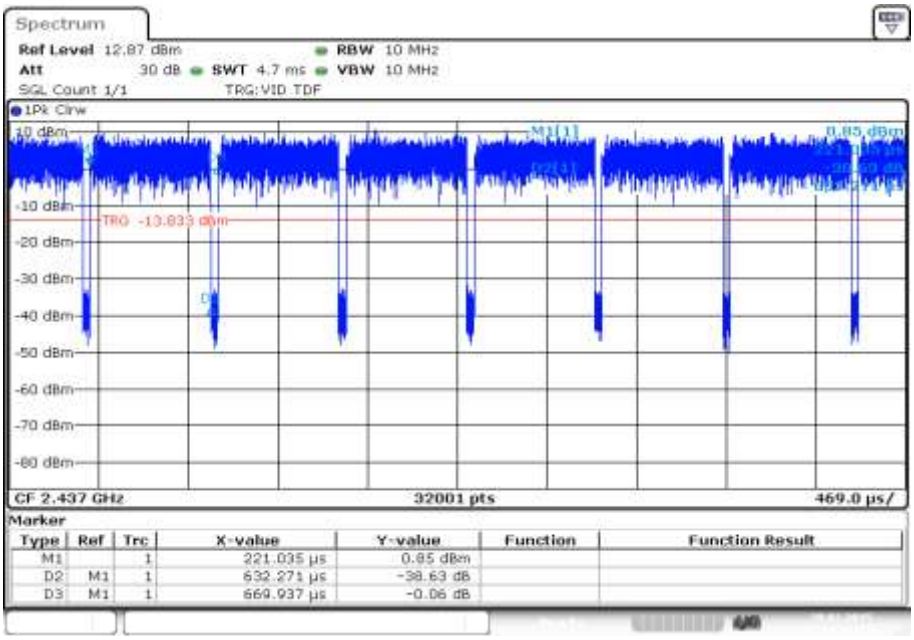
Plots: OFDM / n40 – mode

Plot 1: TX mode, A1s, 2437 MHz



Date: 4.MAR.2015 12:36:44

Plot 2: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 16:03:46

12.4 Maximum output power

Description:

Measurement of the maximum output power conducted and radiated. The measurements are performed using the data rate producing the highest conducted output power.

Measurement:

Measurement parameter	
According to DTS clause: 9.2.2.5	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 – 5 % of the OBW
Video bandwidth:	≥3x RBW
Span:	40 MHz
Integration bandwidth:	99 % power - bandwidth (OBW)
Trace-Mode:	Max hold (allow trace to fully stabilize)
Measurement function:	Channel power with OBW
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Limits:

FCC	IC
Maximum Output Power	
Conducted: 1.0 W – Antenna Gain max. 6 dBi	

Results: Output power incl. DC corr.

DSSS / b – mode	Maximum Output Power conducted [dBm]		
Frequency	ANT A1s	ANT A1m	ANT A2m
2412 MHz	NA	NA	NA
2417 MHz	9.82	5.64	6.11
2437 MHz	9.75	6.41	6.37
2457 MHz	9.88	5.69	6.17
2462 MHz	7.28	NA	NA
Maximum power	9.88	9.40	

Results: Output power incl. DC corr.

OFDM / g – mode	Maximum Output Power conducted [dBm]		
Frequency	ANT A1s	ANT A1m	ANT A2m
2412 MHz	7.64	NA	NA
2417 MHz	12.07	8.73	8.38
2427 MHz	NP	NP	NP
2437 MHz	14.85	14.74	14.64
2442 MHz	NP	NP	NP
2457 MHz	12.24	9.17	8.69
2462 MHz	8.03	NA	NA
Maximum power	14.85	17.70	

Results: Output power incl. DC corr.

OFDM / n – mode HT20	Maximum Output Power conducted [dBm]		
Frequency	ANT A1s	ANT A1m	ANT A2m
2412 MHz	7.53	NA	NA
2417 MHz	11.95	9.09	8.64
2427 MHz	NP	NP	NP
2437 MHz	13.61	14.38	13.55
2442 MHz	NP	NP	NP
2457 MHz	12.09	9.18	9.38
2462 MHz	7.92	NA	NA
Maximum power	13.61	17.00	

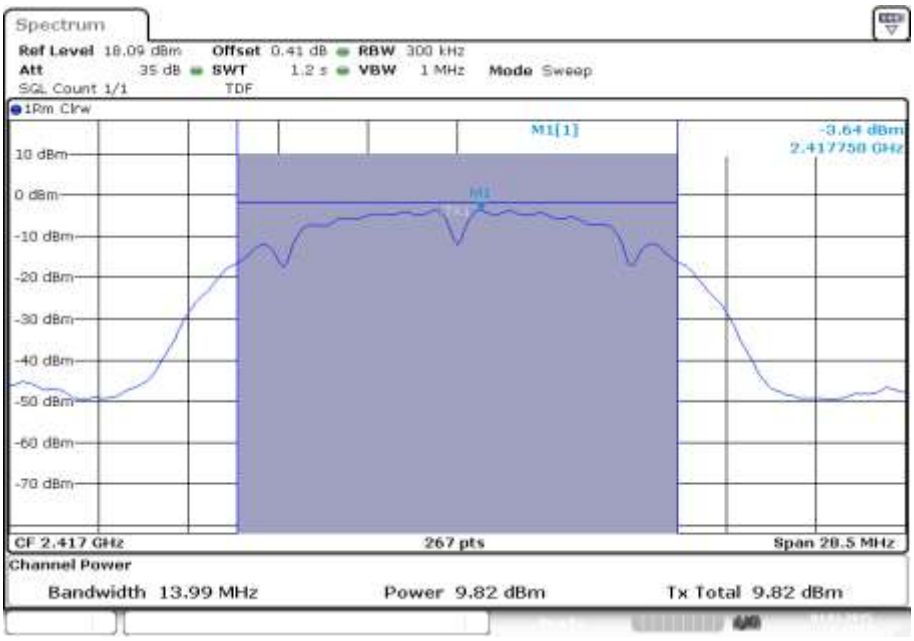
Results: Output power incl. DC corr.

OFDM / n – mode HT40	Maximum Output Power conducted [dBm]		
Frequency	ANT A1s	ANT A1m	ANT A2m
2437 MHz	9.37	6.64	6.27
Maximum power	9.37	9.47	

Verdict: complies

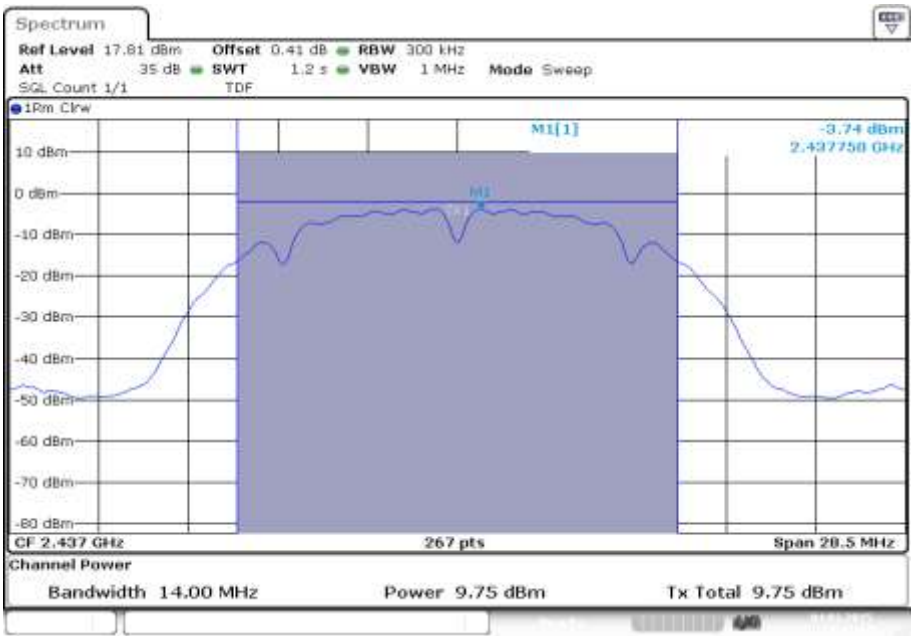
Plots: DSSS / b – mode

Plot 1: TX mode, A1s, 2417 MHz



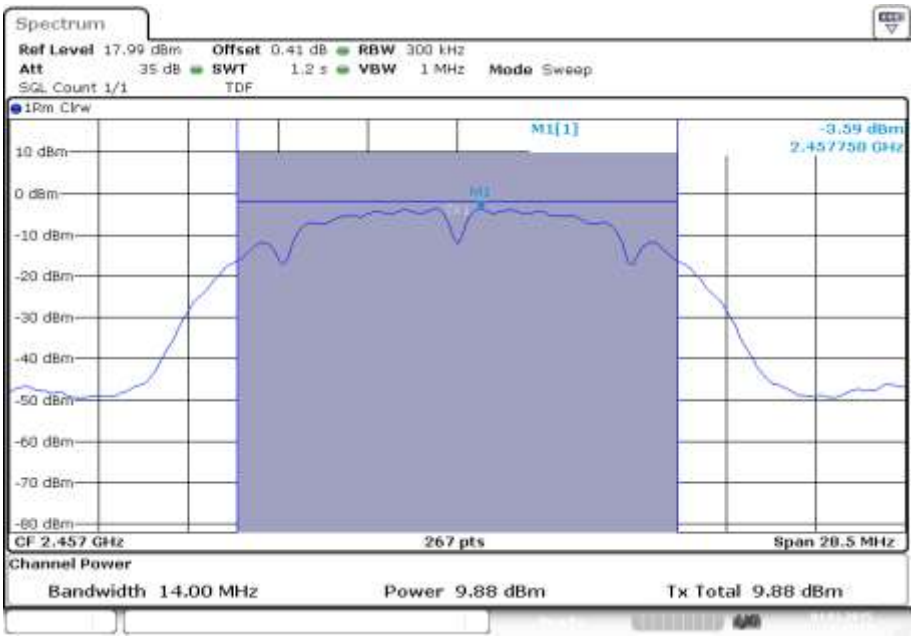
Date: 4.MAR.2015 10:30:57

Plot 2: TX mode, A1s, 2437 MHz



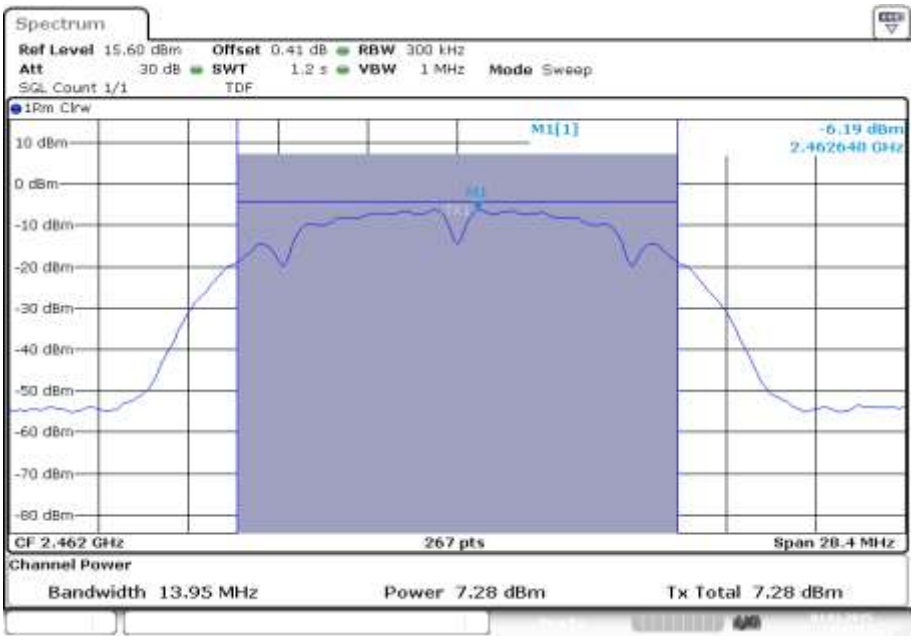
Date: 4.MAR.2015 10:42:48

Plot 3: TX mode, A1s, 2457 MHz



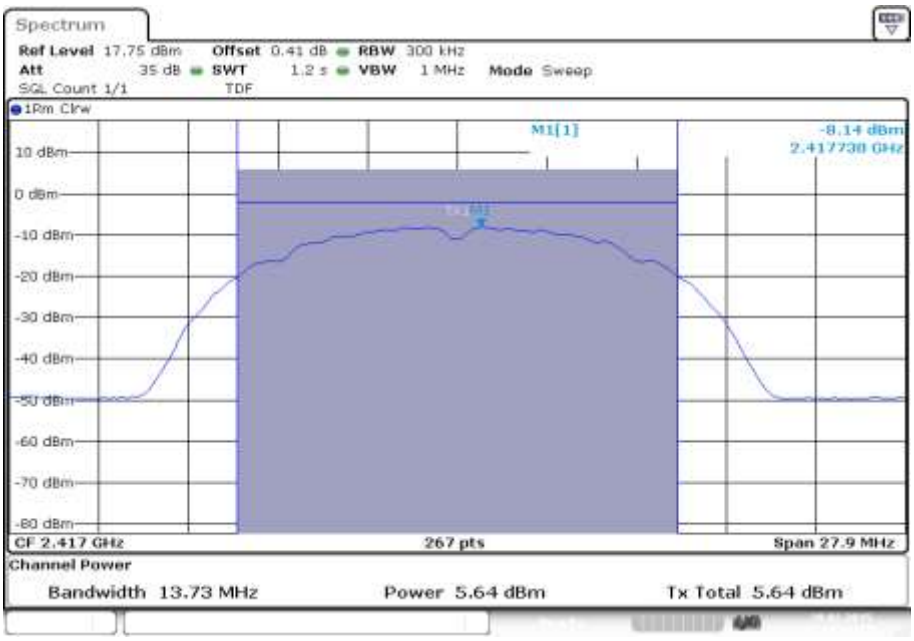
Date: 4.MAR.2015 10:48:30

Plot 4: TX mode, A1s, 2462 MHz



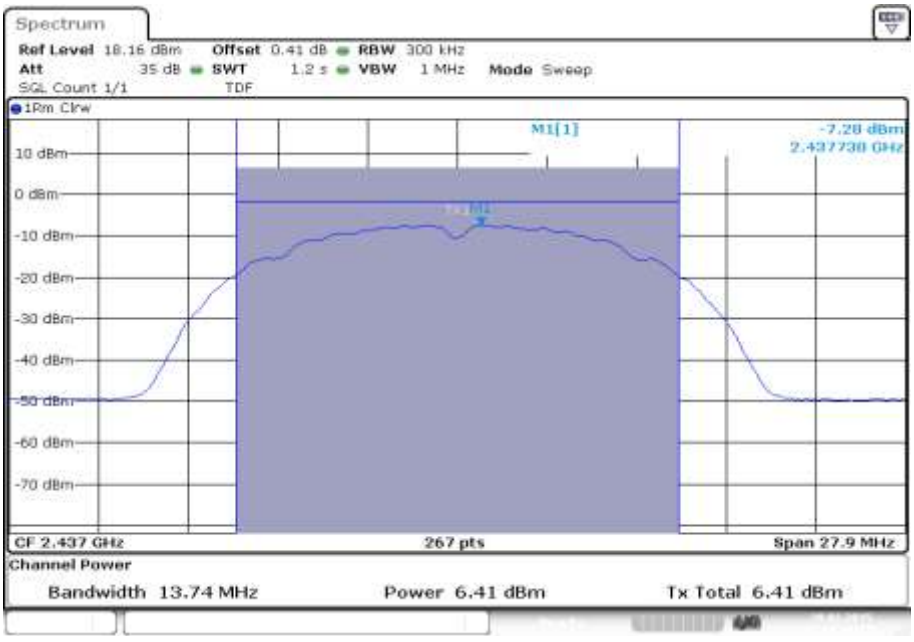
Date: 4.MAR.2015 11:00:11

Plot 5: TX mode, A1m, 2417 MHz



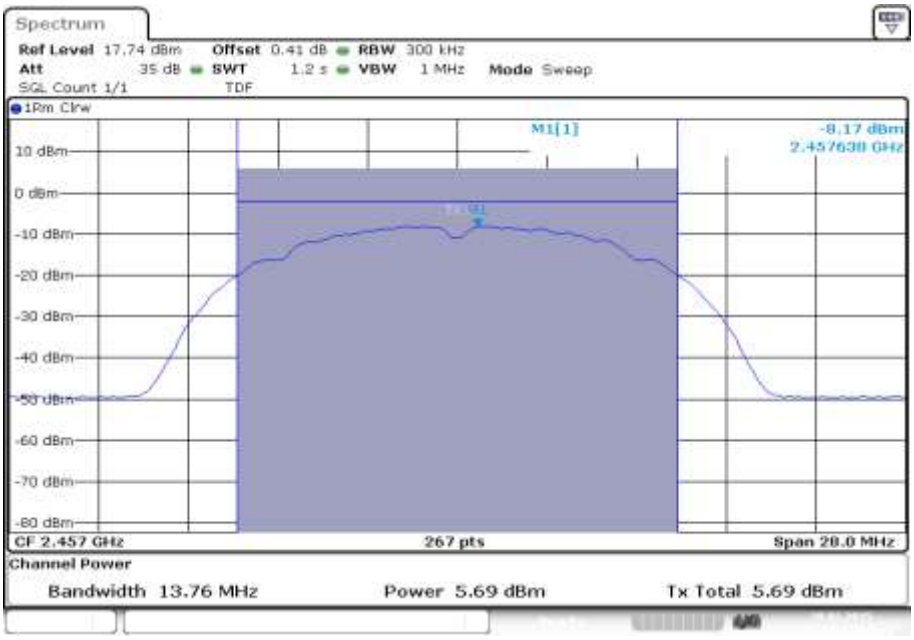
Date: 28.FEB.2015 14:03:29

Plot 6: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 14:16:19

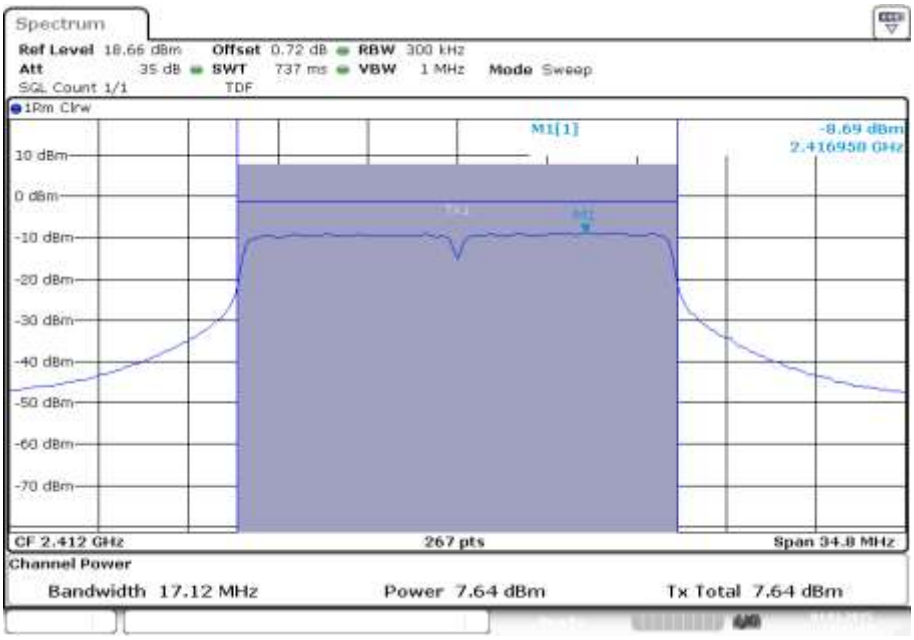
Plot 7: TX mode, A1m, 2457 MHz



Date: 28.FEB.2015 14:23:35

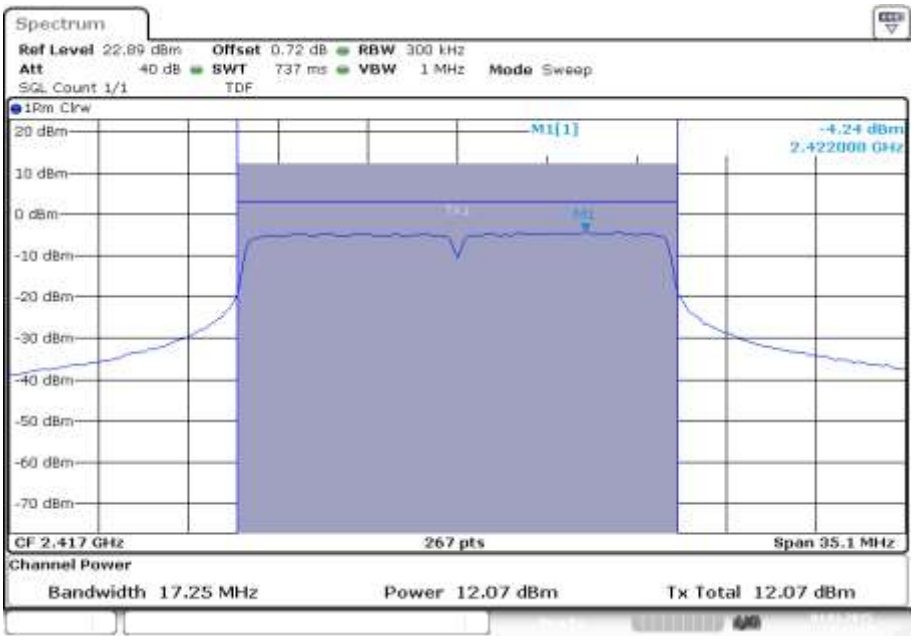
Plots: OFDM / g – mode

Plot 1: TX mode, A1s, 2412 MHz



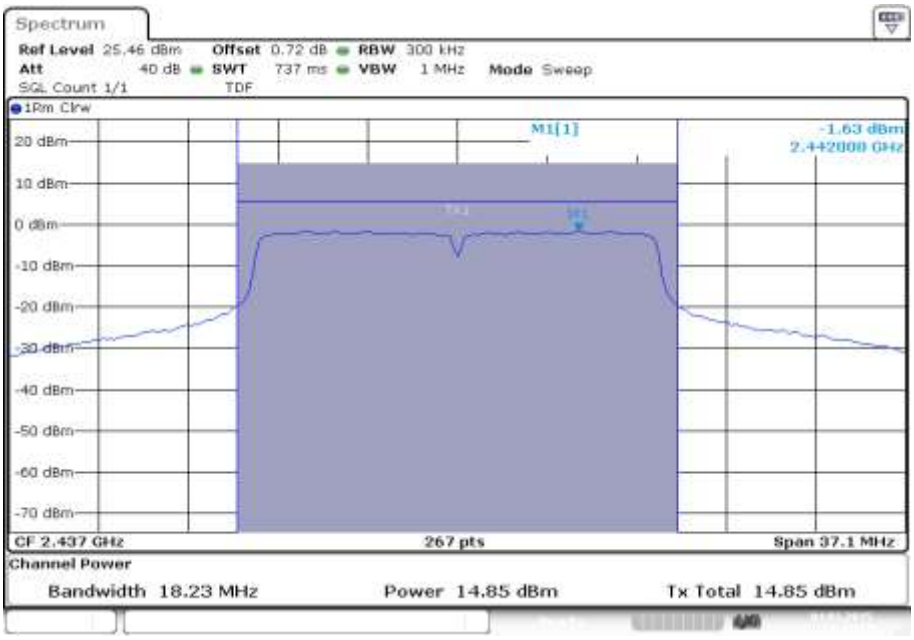
Date: 4.MAR.2015 11:06:48

Plot 2: TX mode, A1s, 2417 MHz



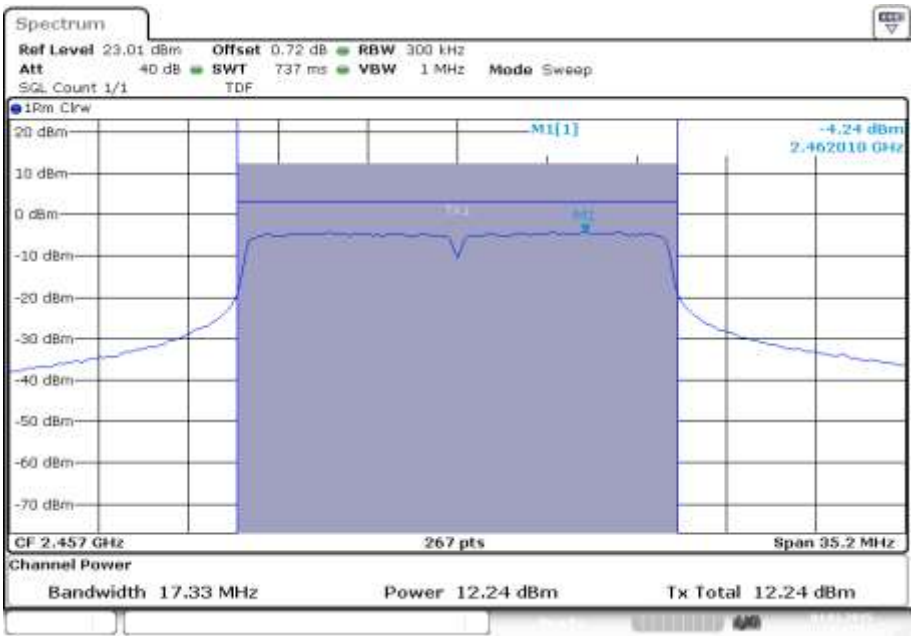
Date: 4.MAR.2015 11:13:48

Plot 3: TX mode, A1s, 2437 MHz



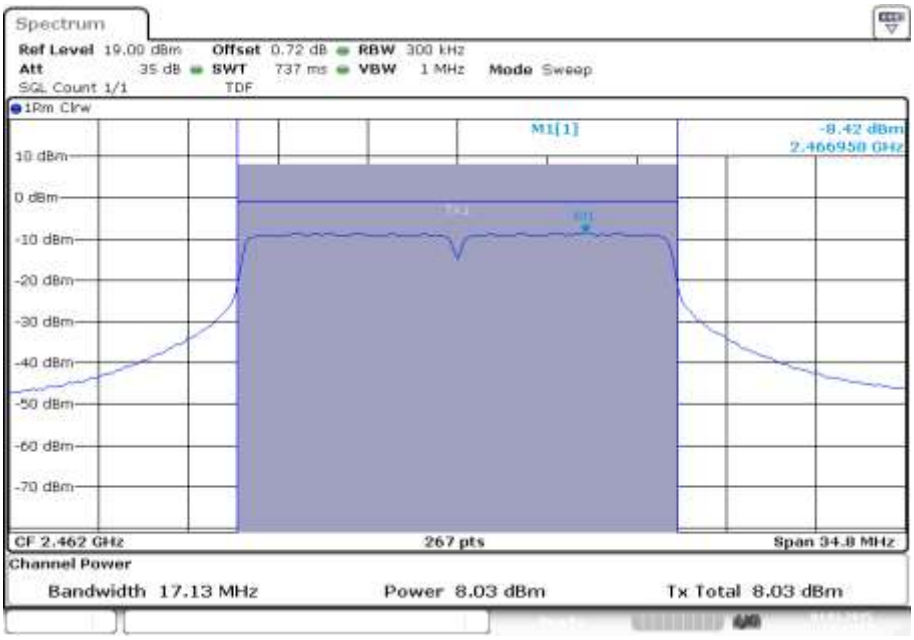
Date: 4.MAR.2015 11:20:30

Plot 4: TX mode, A1s, 2457 MHz



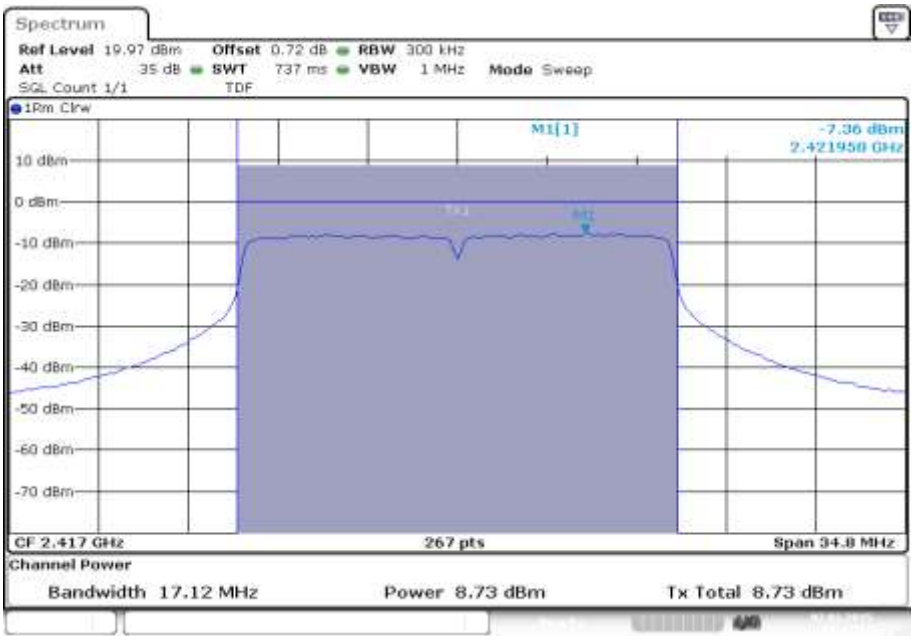
Date: 4.MAR.2015 11:27:51

Plot 5: TX mode, A1s, 2462 MHz



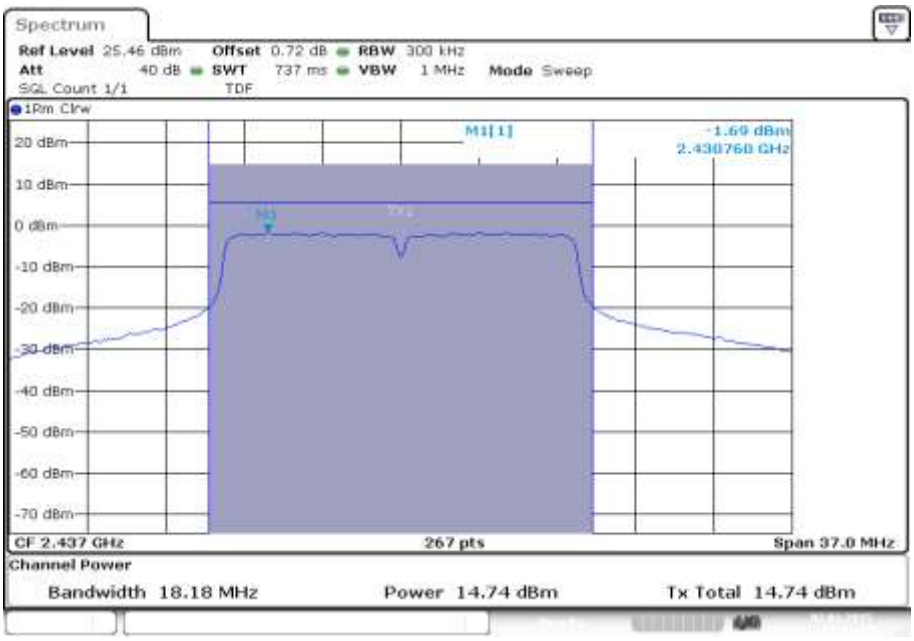
Date: 4.MAR.2015 11:35:17

Plot 6: TX mode, A1m, 2417 MHz



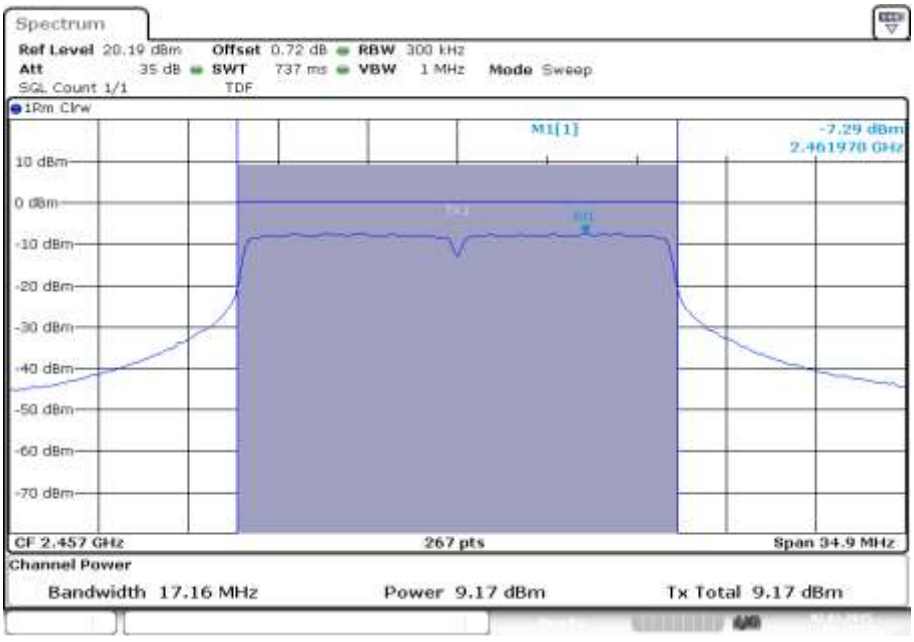
Date: 2.MAR.2015 08:07:10

Plot 7: TX mode, A1m, 2437 MHz



Date: 2.MAR.2015 08:13:49

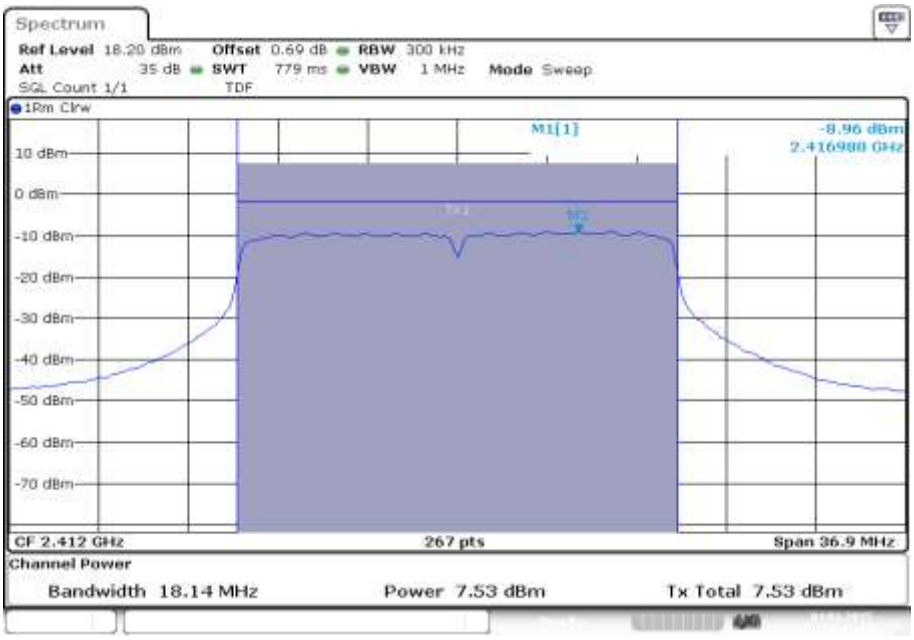
Plot 8: TX mode, A1m, 2457 MHz



Date: 2.MAR.2015 08:20:27

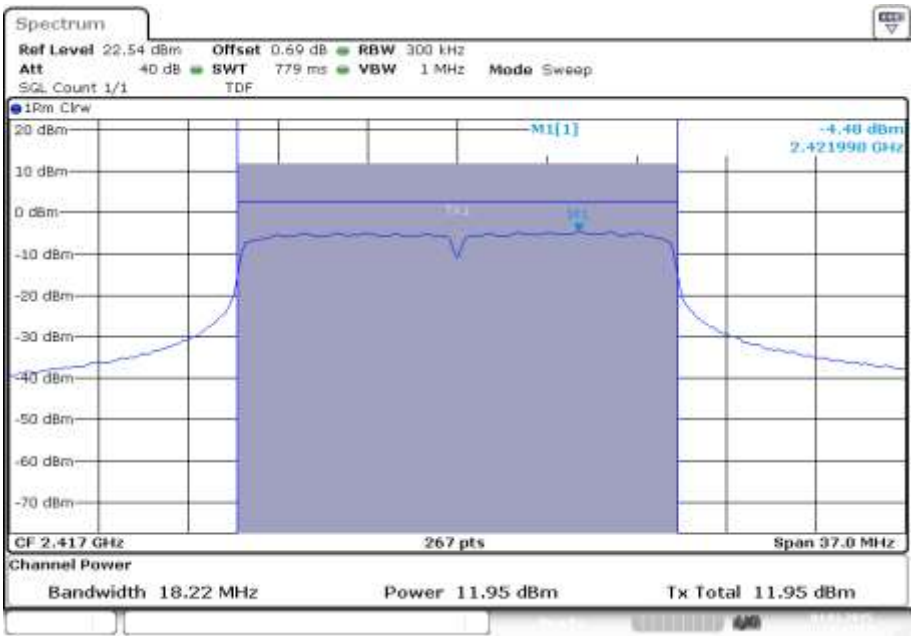
Plots: OFDM / n20 – mode

Plot 1: TX mode, A1s, 2412 MHz



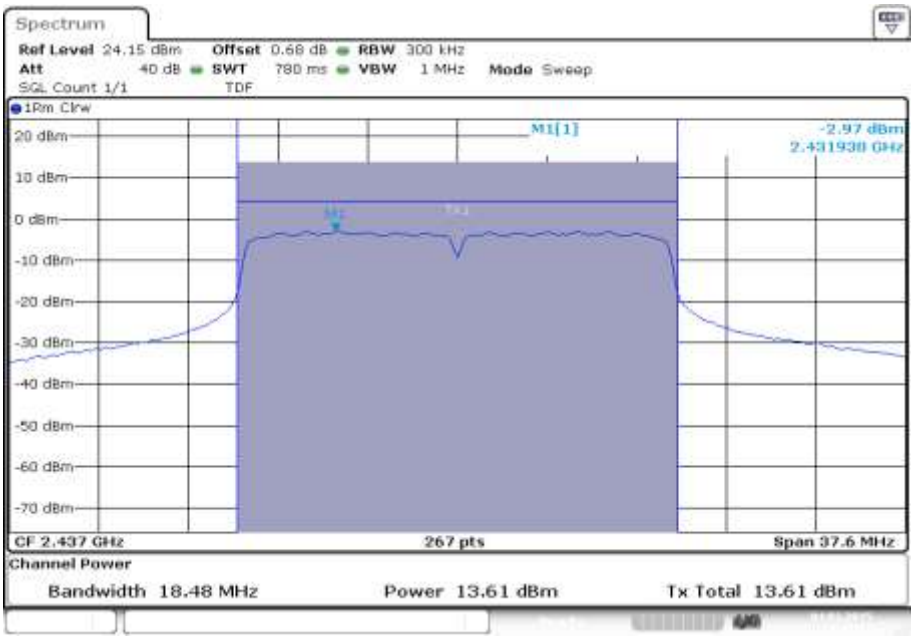
Date: 4.MAR.2015 11:42:46

Plot 2: TX mode, A1s, 2417 MHz



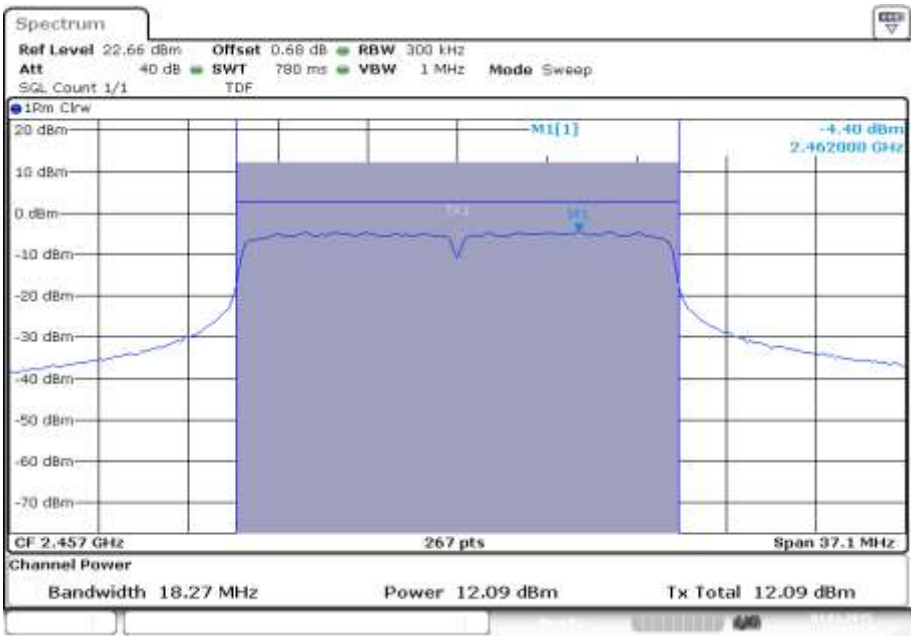
Date: 4.MAR.2015 11:52:33

Plot 3: TX mode, A1s, 2437 MHz



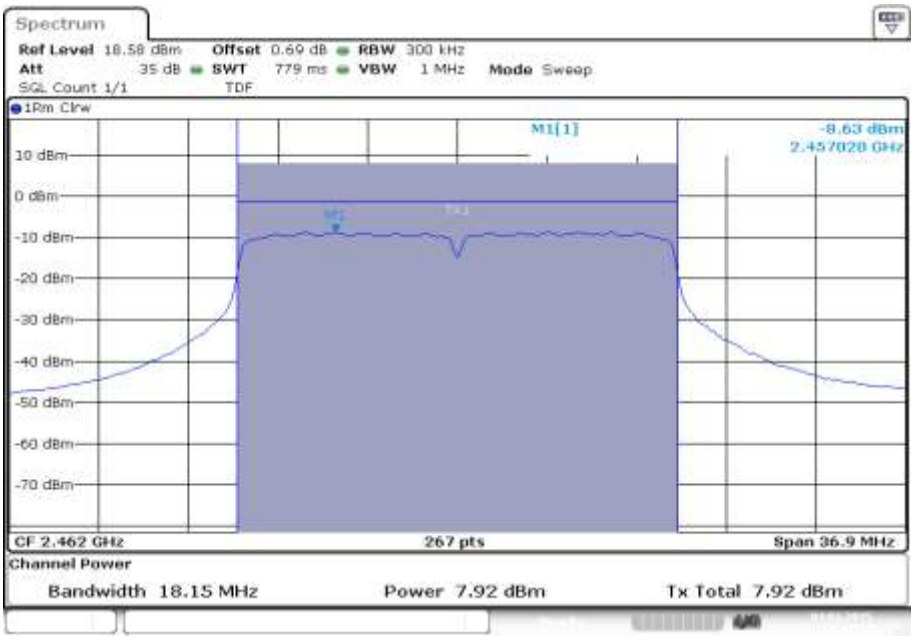
Date: 4.MAR.2015 11:59:22

Plot 4: TX mode, A1s, 2457 MHz



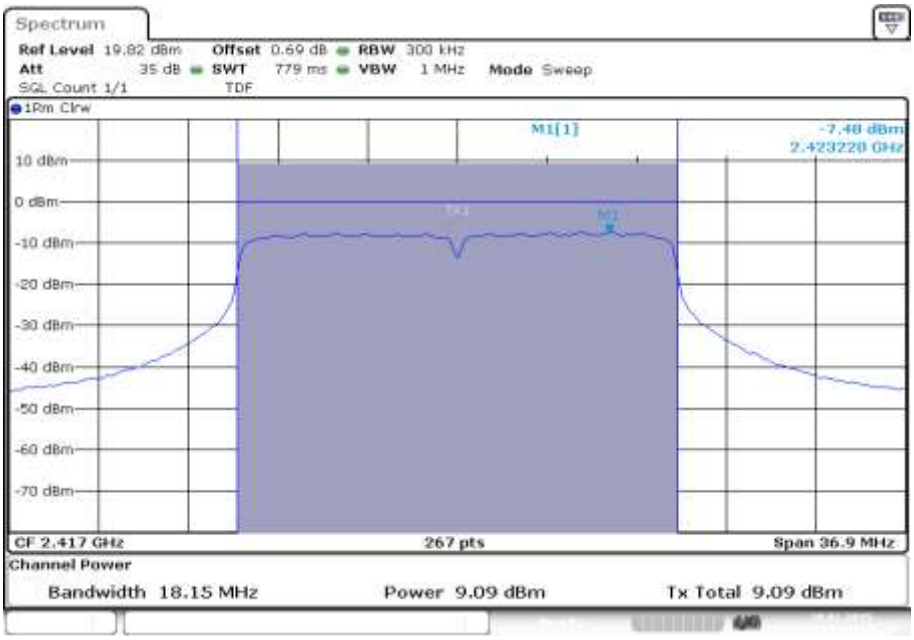
Date: 4.MAR.2015 12:08:10

Plot 5: TX mode, A1s, 2462 MHz



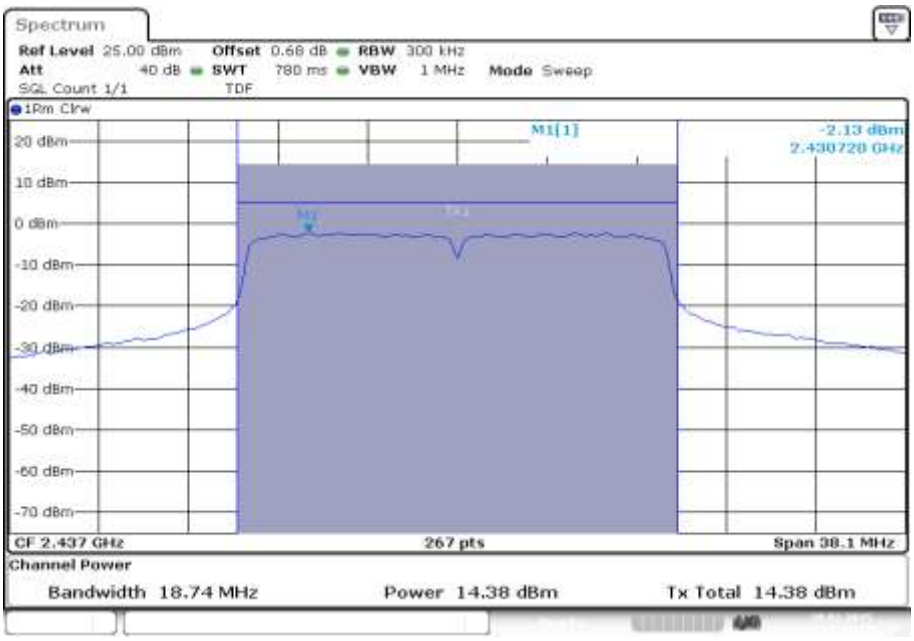
Date: 4.MAR.2015 12:17:52

Plot 6: TX mode, A1m, 2417 MHz



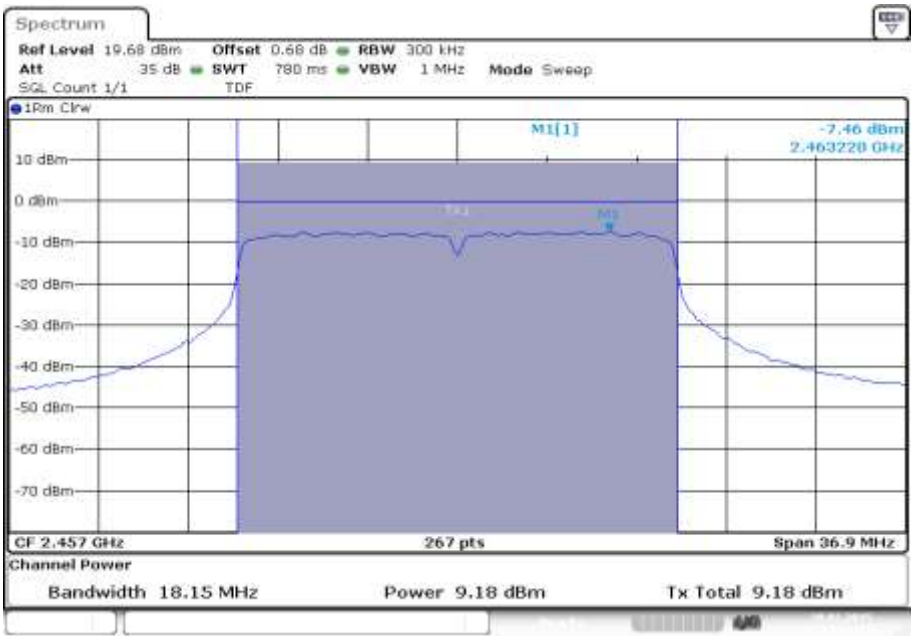
Date: 28.FEB.2015 15:06:54

Plot 7: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 15:14:30

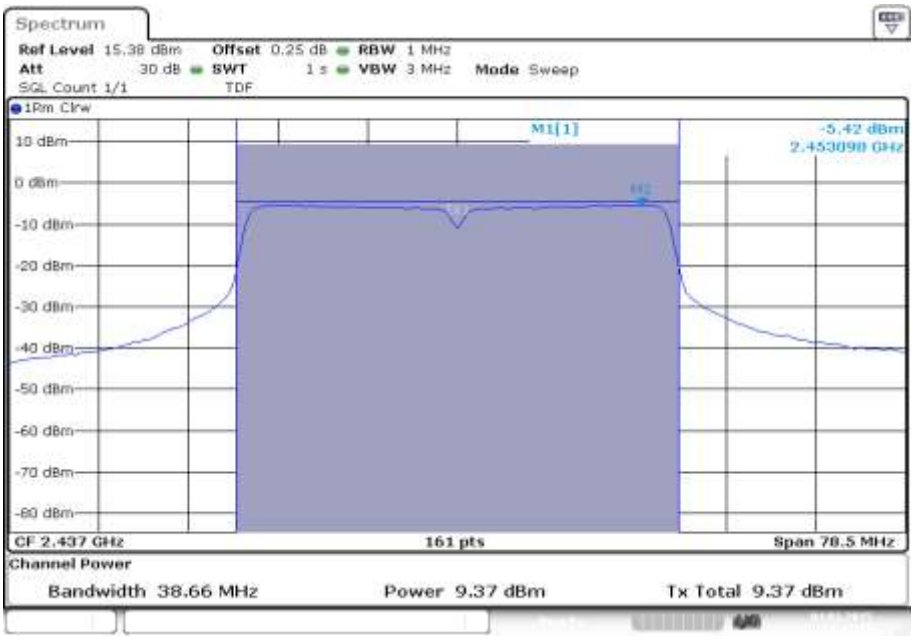
Plot 8: TX mode, A1m, 2457 MHz



Date: 28.FEB.2015 15:21:56

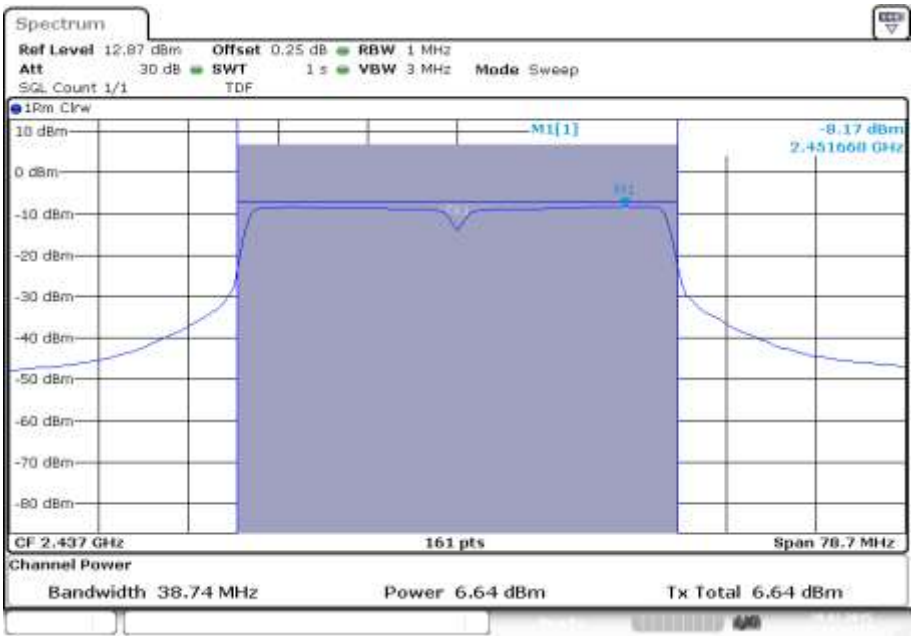
Plots: OFDM / n40 – mode

Plot 1: TX mode, A1s, 2437 MHz



Date: 4.MAR.2015 12:37:16

Plot 2: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 16:04:17

12.5 Power spectral density

Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated for both modulations at the lowest, middle and highest channel.

Measurement:

Measurement parameter	
According to DTS clause: 10.6	
Detector:	RMS
Sweep time:	~3s
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	40 MHz
Trace-Mode:	Max hold (allow trace to fully stabilize)
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Limits:

FCC	IC
Power Spectral Density	
8 dBm / 3kHz (conducted)	

Results: ANT A

Modulation / Frequency	Power Spectral density [dBm]					
	2412 MHz	2417 MHz	2437 MHz	2457 MHz	2462 MHz	Max. value or sum value
DSSS / b – mode ANT A1s	NA	-23.16	-23.25	-23.14	-25.71	-23.14
DSSS / b – mode ANT A1m	NA	-27.89	-27.21	-27.89	NA	-23.93
DSSS / b – mode ANT A2m	NA	-26.97	-26.68	-26.88	NA	
OFDM / g – mode ANT A1s	-27.16	-22.88	-19.93	-22.79	-27.10	-19.93
OFDM / g – mode ANT A1m	NA	-26.03	-20.30	-25.75	NA	-17.26
OFDM / g – mode ANT A2m	NA	-26.49	-20.24	-26.11	NA	
OFDM / n – mode ANT A1s	-27.70	-23.07	-21.49	-23.06	-27.03	-21.49
OFDM / n – mode ANT A1m	NA	-25.91	-20.61	-25.84	NA	-17.86
OFDM / n – mode ANT A2m	NA	-26.09	-21.14	-25.14	NA	
OFDM / n HT40 – mode ANT A1s	NA	NA	-29.18	NA	NA	-29.18
OFDM / n HT40 – mode ANT A1m	NA	NA	-31.97	NA	NA	-29.10
OFDM / n HT40 – mode ANT A2m	NA	NA	-32.25	NA	NA	

All values are calculated to 3kHz with the formula: 10*log(3000/100000)

Verdict: complies

Plots: DSSS / b – mode

Plot 1: TX mode, A1s, 2417 MHz

Date: 4.MAR.2015 10:31:02

Plot 2: TX mode, A1s, 2437 MHz

Date: 4.MAR.2015 10:42:53

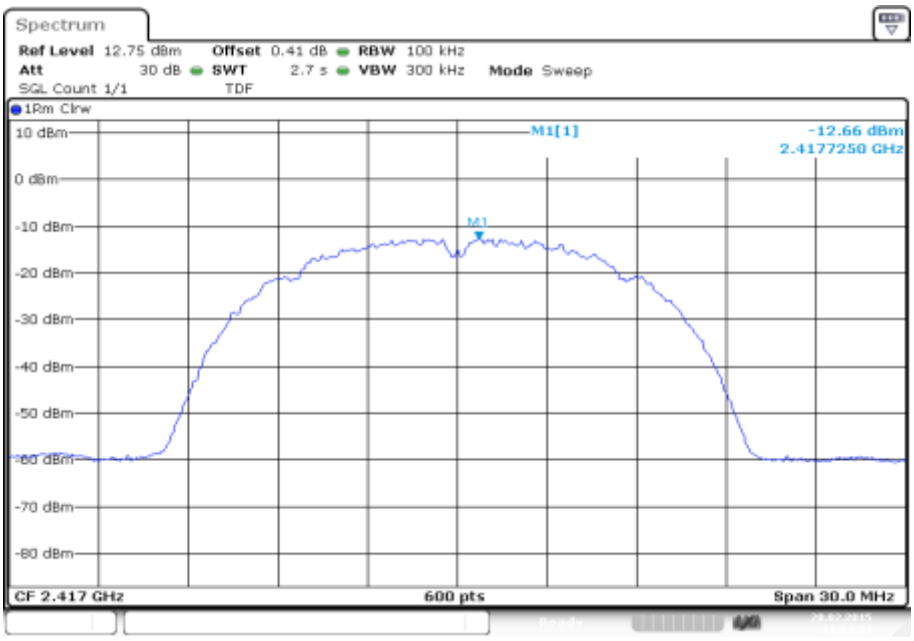
Plot 3: TX mode, A1s, 2457 MHz

Date: 4.MAR.2015 10:48:35

Plot 4: TX mode, A1s, 2462 MHz

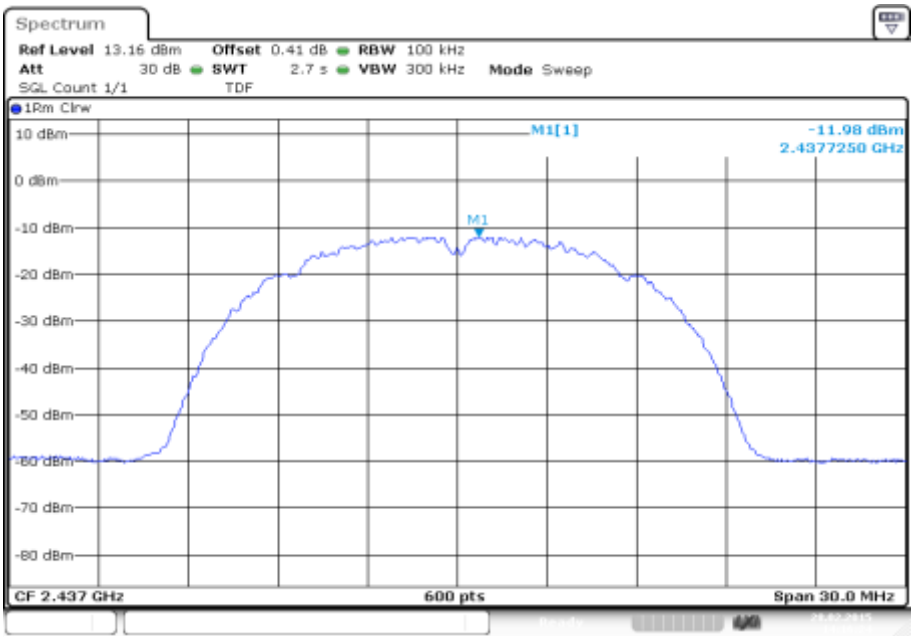
Date: 4.MAR.2015 11:00:16

Plot 5: TX mode, A1m, 2417 MHz



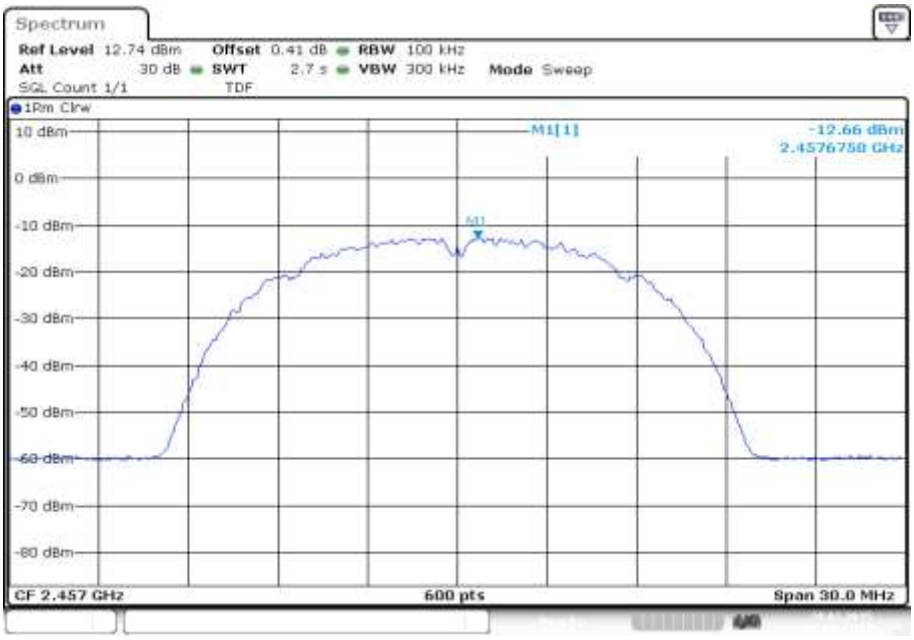
Date: 28.FEB.2015 14:03:34

Plot 5: TX mode, A1m, 2437 MHz



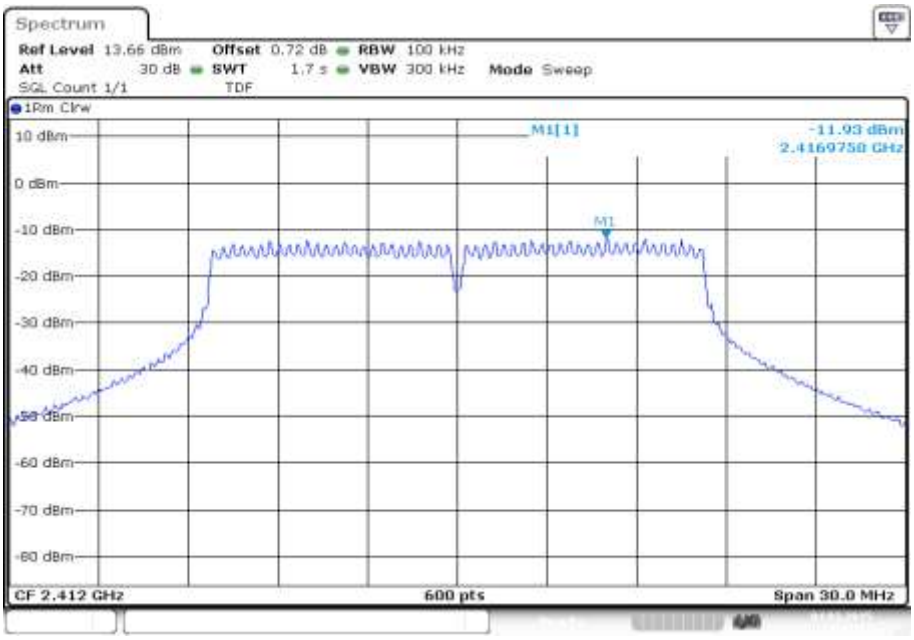
Date: 28.FEB.2015 14:16:24

Plot 6: TX mode, A1m, 2457 MHz



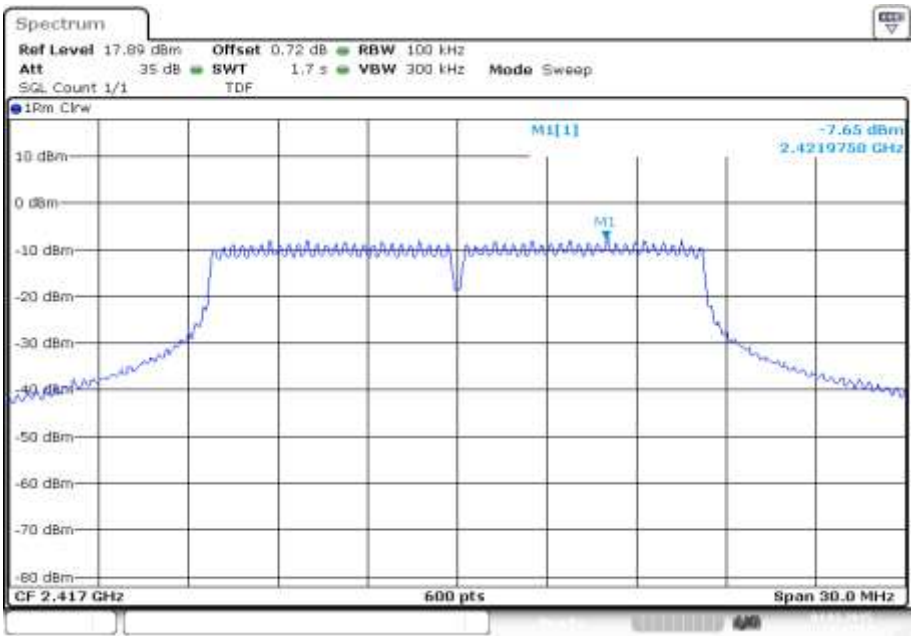
Plots: OFDM / g – mode

Plot 1: TX mode, A1s, 2412 MHz



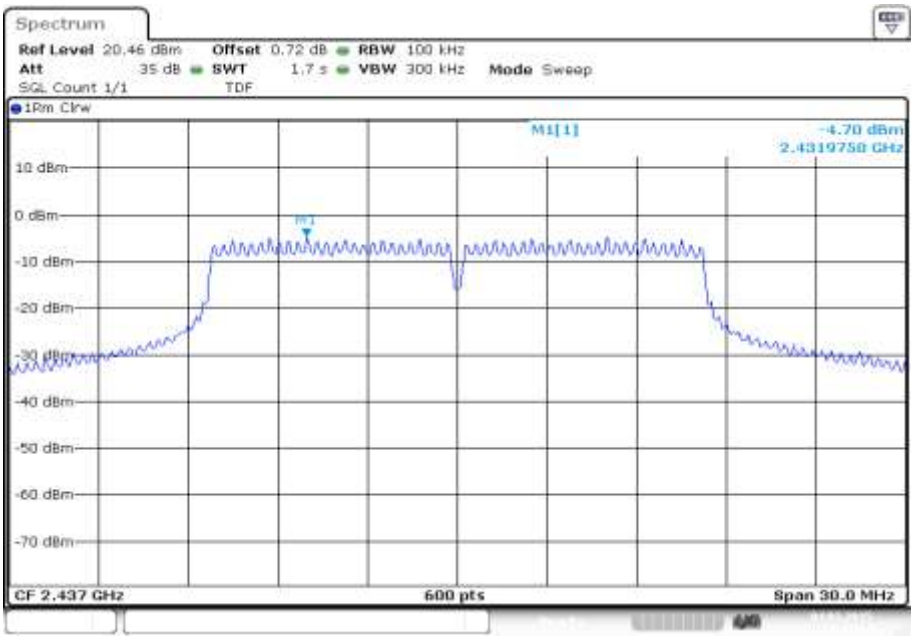
Date: 4.MAR.2015 11:06:52

Plot 2: TX mode, A1s, 2417 MHz



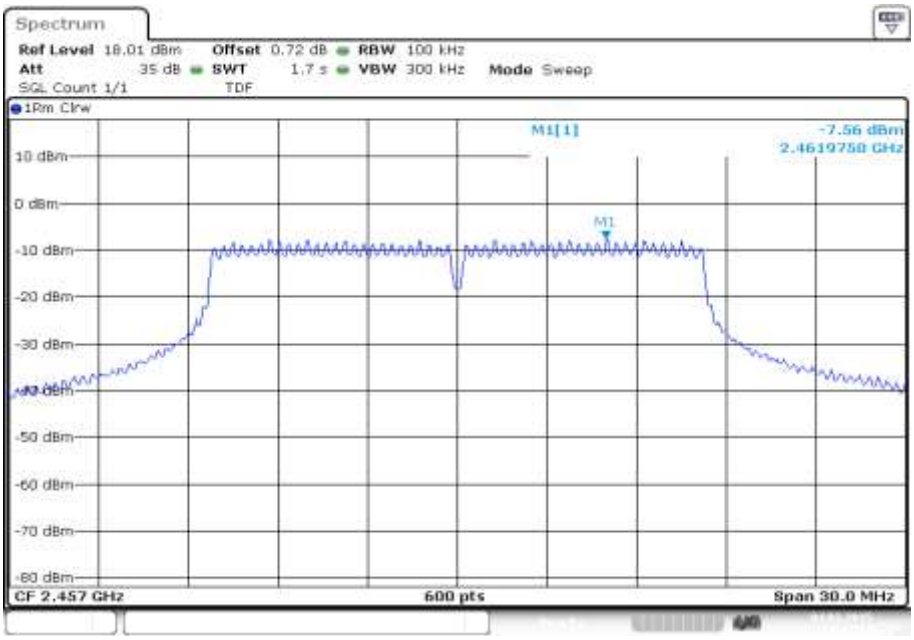
Date: 4.MAR.2015 11:13:52

Plot 3: TX mode, A1s, 2437 MHz



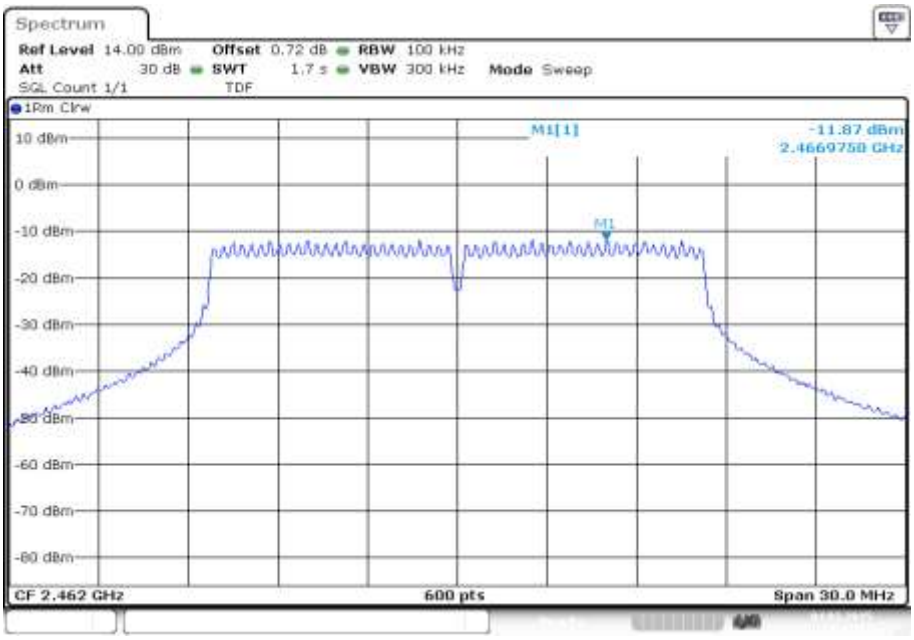
Date: 4.MAR.2015 11:20:34

Plot 4: TX mode, A1s, 2457 MHz



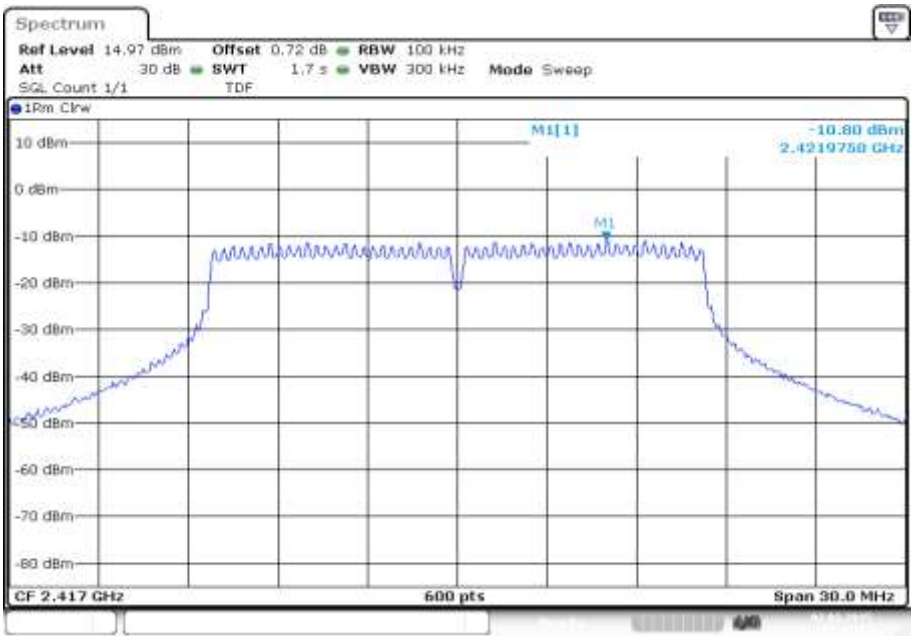
Date: 4.MAR.2015 11:27:55

Plot 5: TX mode, A1s, 2462 MHz



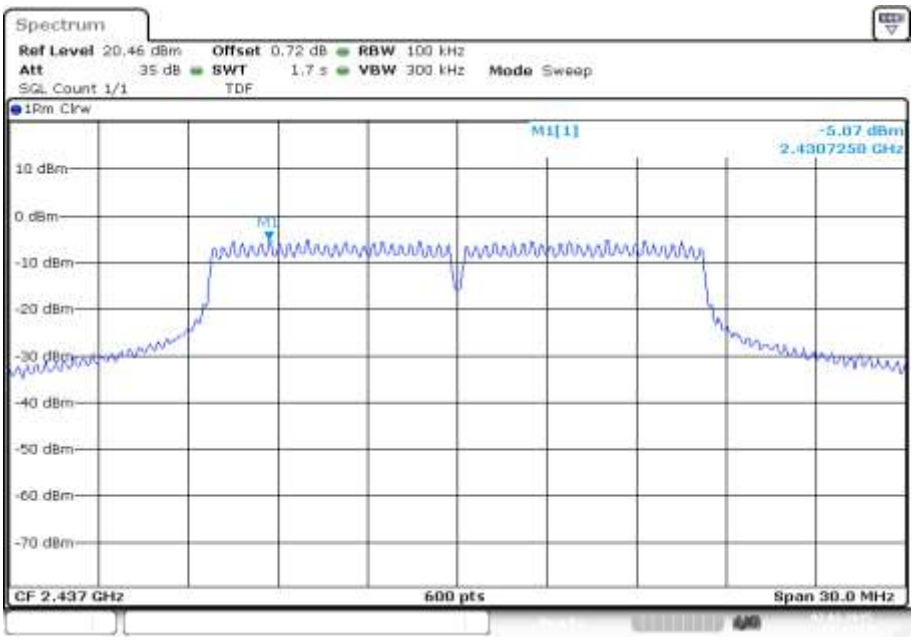
Date: 4.MAR.2015 11:35:21

Plot 6: TX mode, A1m, 2417 MHz



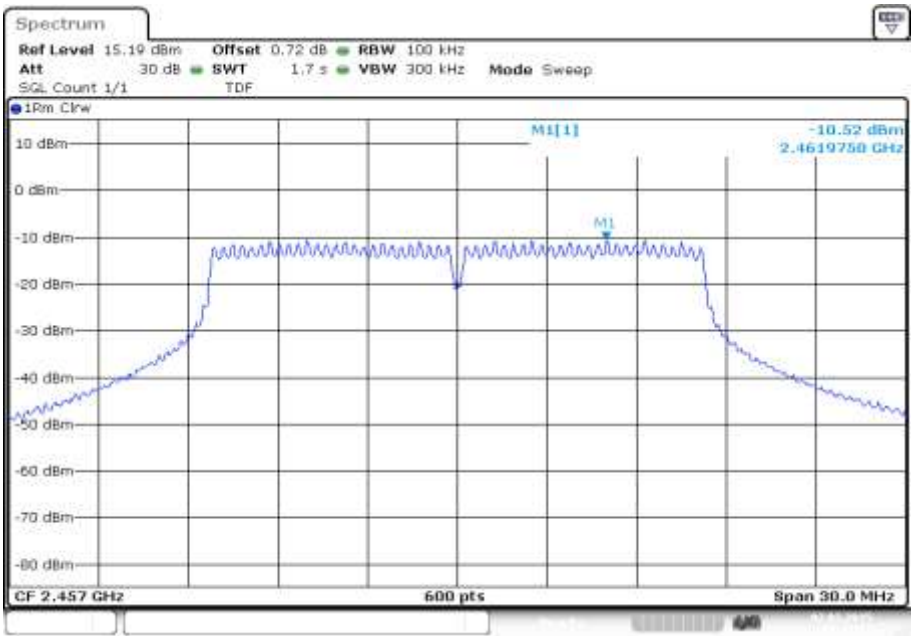
Date: 2.MAR.2015 08:07:15

Plot 7: TX mode, A1m, 2437 MHz



Date: 2.MAR.2015 08:13:53

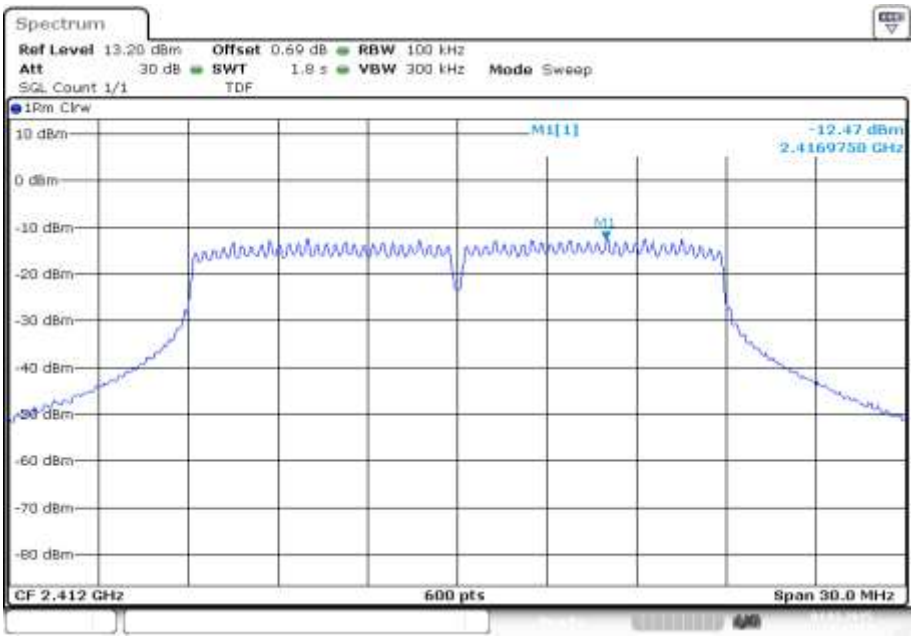
Plot 8: TX mode, A1m, 2457 MHz



Date: 2.MAR.2015 08:20:31

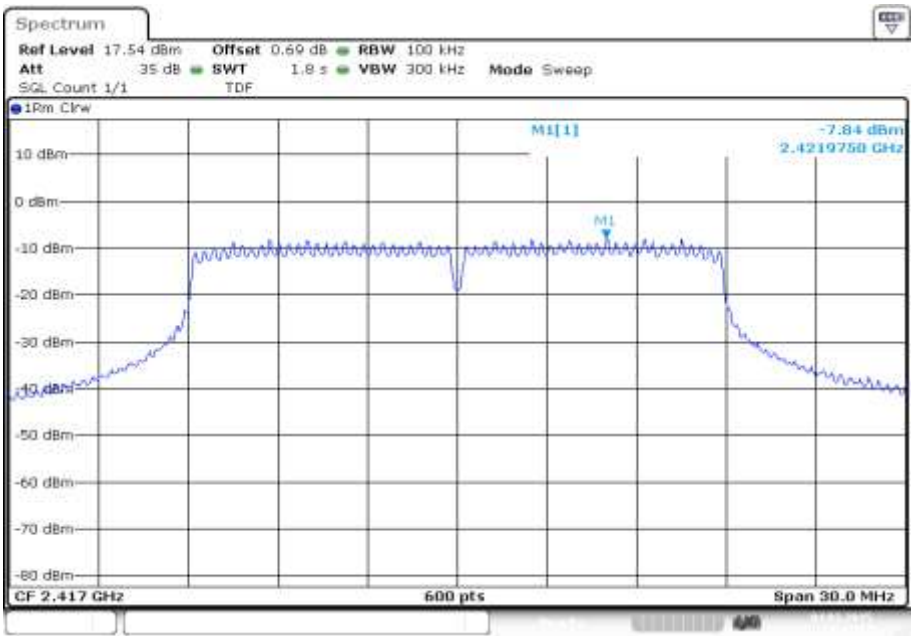
Plots: OFDM / nHT20 – mode

Plot 1: TX mode, A1s, 2412 MHz



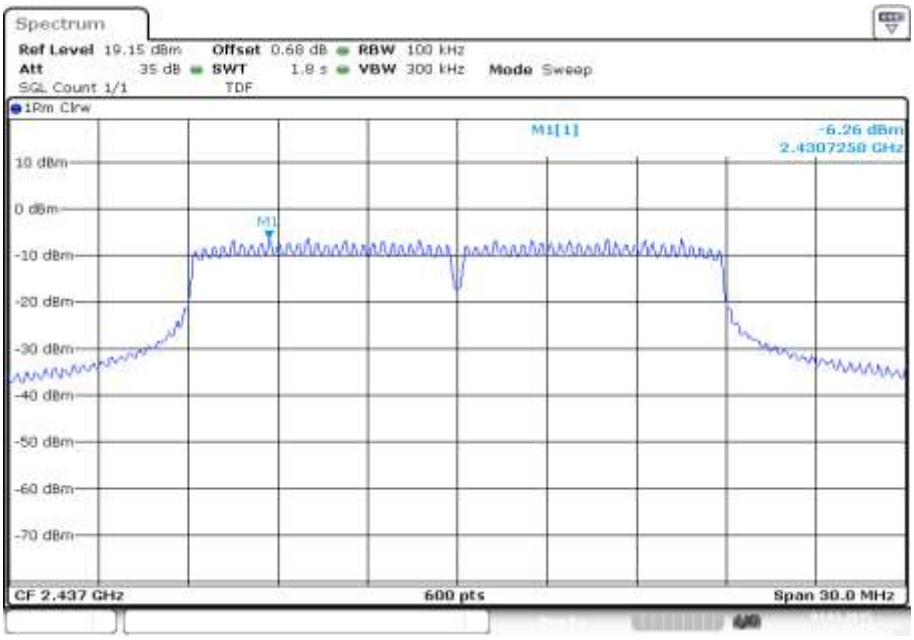
Date: 4.MAR.2015 11:42:50

Plot 2: TX mode, A1s, 2417 MHz



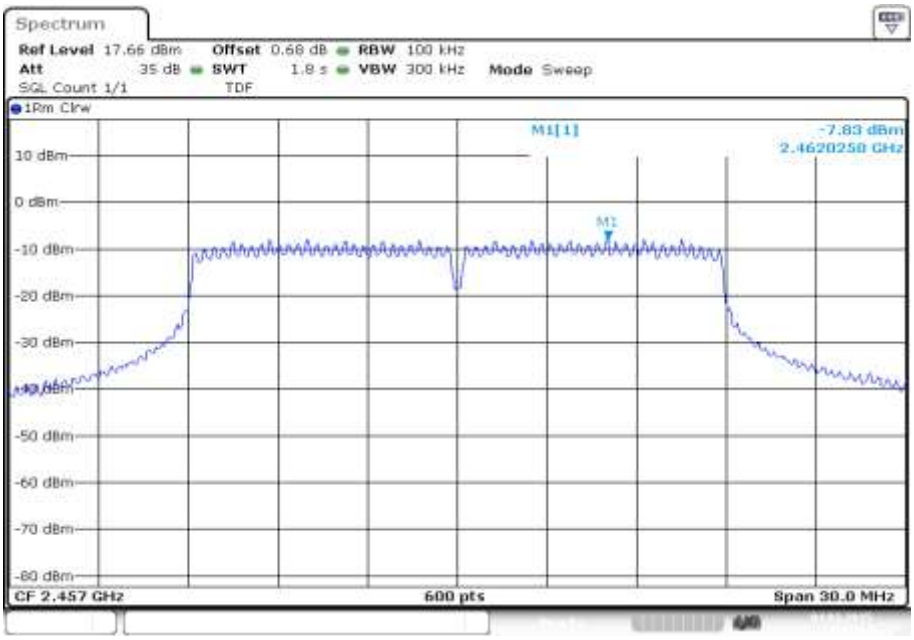
Date: 4.MAR.2015 11:52:37

Plot 3: TX mode, A1s, 2437 MHz



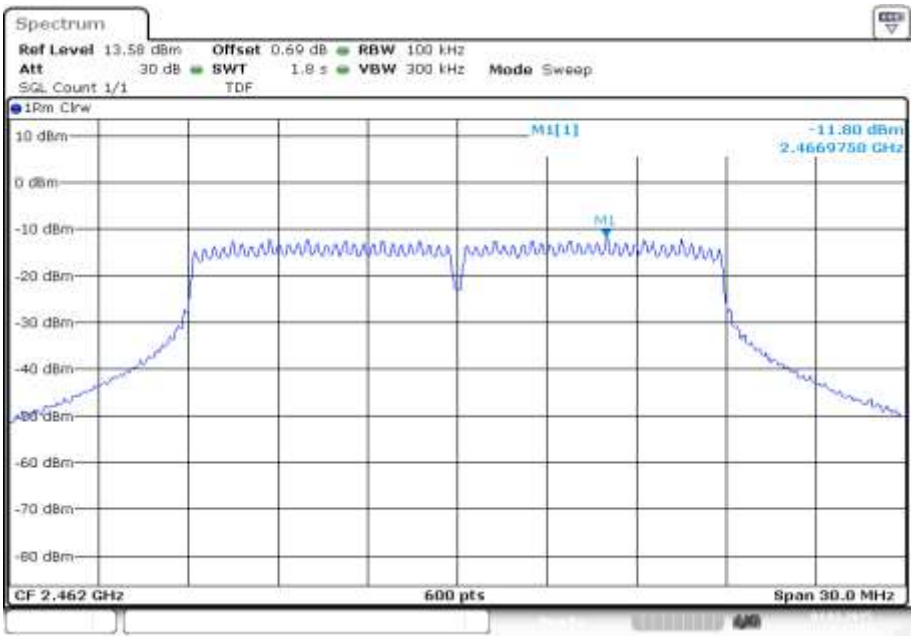
Date: 4.MAR.2015 11:59:26

Plot 4: TX mode, A1s, 2457 MHz



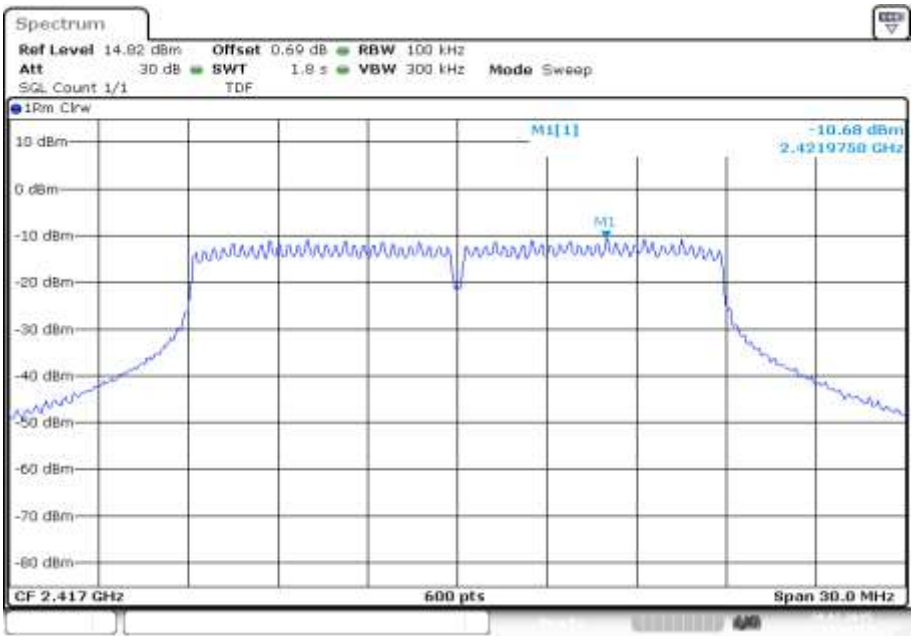
Date: 4.MAR.2015 12:08:14

Plot 5: TX mode, A1s, 2462 MHz



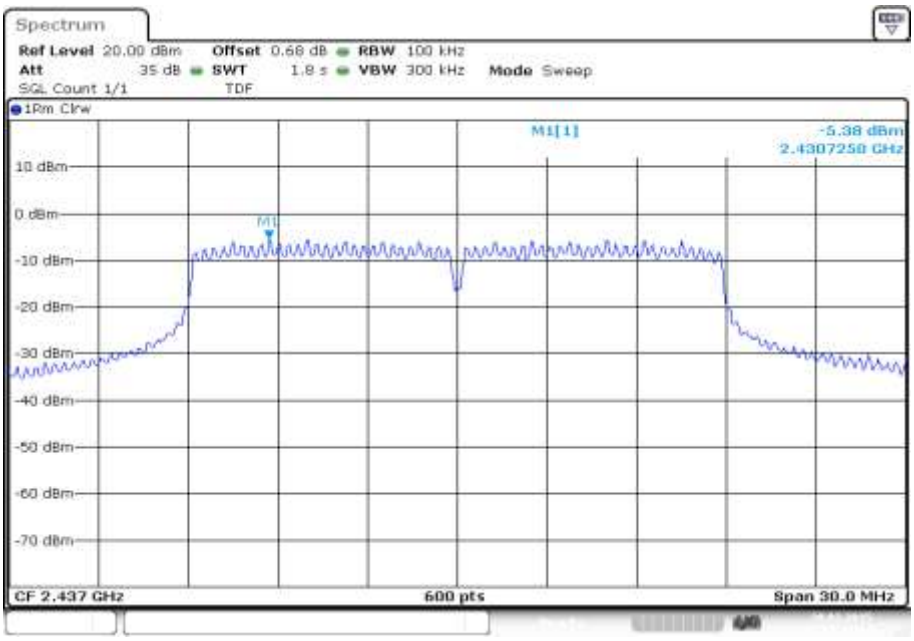
Date: 4.MAR.2015 12:17:56

Plot 6: TX mode, A1m, 2417 MHz



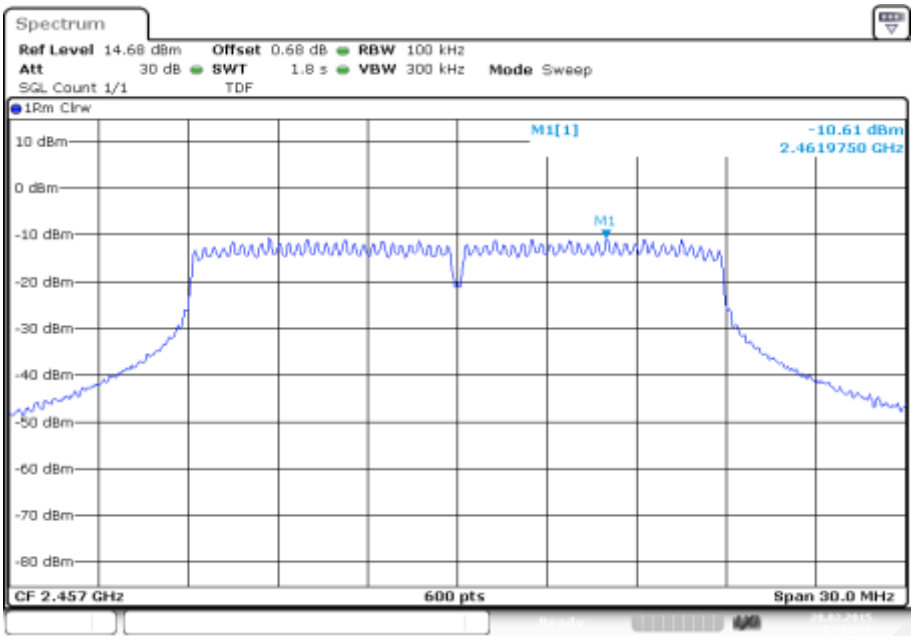
Date: 28.FEB.2015 15:06:58

Plot 5: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 15:14:34

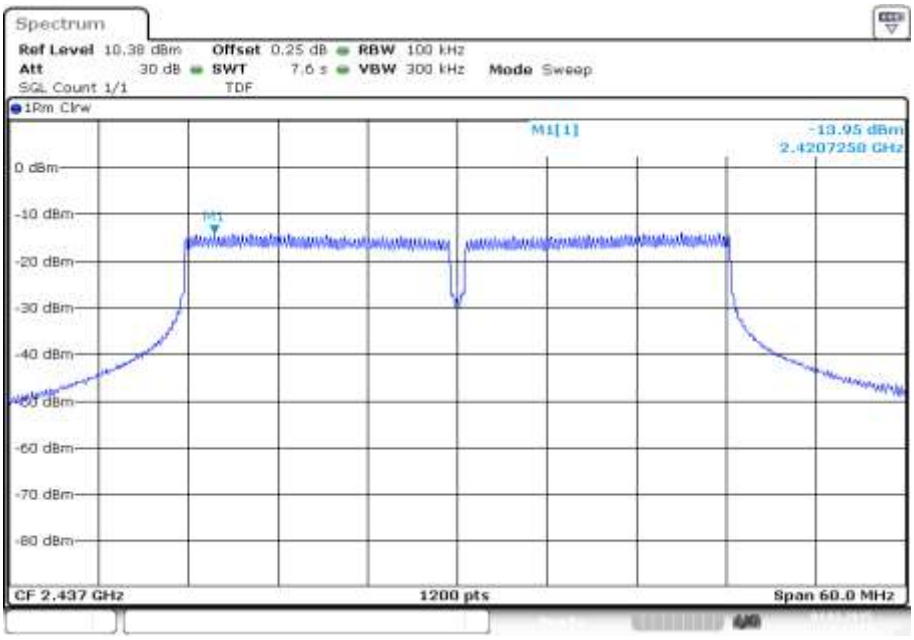
Plot 6: TX mode, A1m, 2457 MHz



Date: 28.FEB.2015 15:22:00

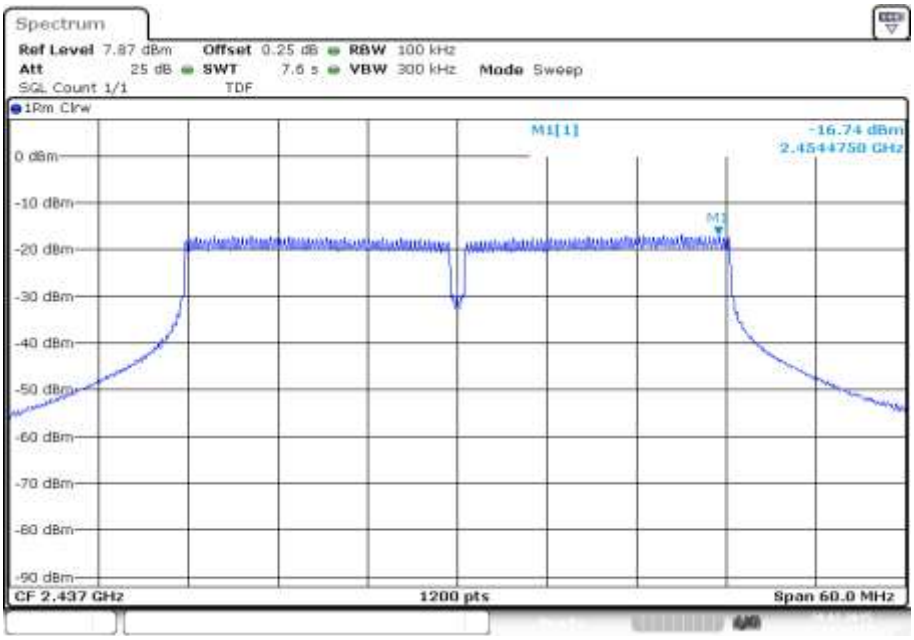
Plots: OFDM / nHT40 – mode

Plot 1: TX mode, A1s, 2437 MHz



Date: 4.MAR.2015 12:37:26

Plot 2: TX mode, A1m, 2437 MHz



Date: 28.FEB.2015 16:04:28

12.6 DTS bandwidth – 6 dB

Description:

Measurement of the 6 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
According to DTS clause: 8.1	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	40 MHz
Measurement procedure:	Measurement of the 75% bandwidth using the integration function of the analyzer
Trace-Mode:	Max hold (allow trace to stabilize)
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Limits:

FCC	IC
DTS Bandwidth – 6 dB	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

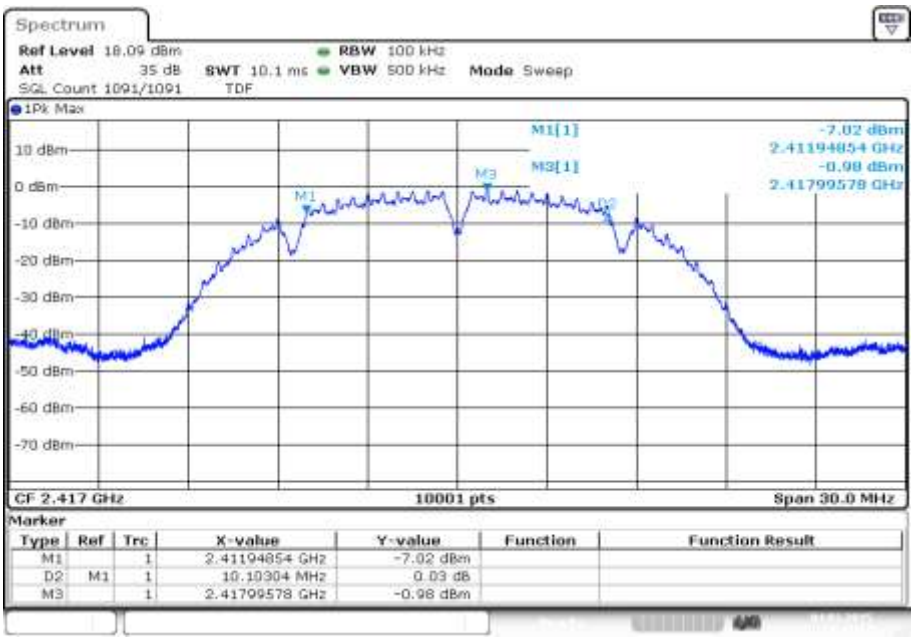
Results:

Frequency	6 dB bandwidth [kHz]		
	2417 MHz	2437 MHz	2462 MHz
DSSS / b – mode	10103	10106	10103
OFDM / g – mode	16336	16339	16333
OFDM / n HT20 – mode	17542	17569	17563
OFDM / n HT40 – mode	NA	36363	NA

Verdict: complies

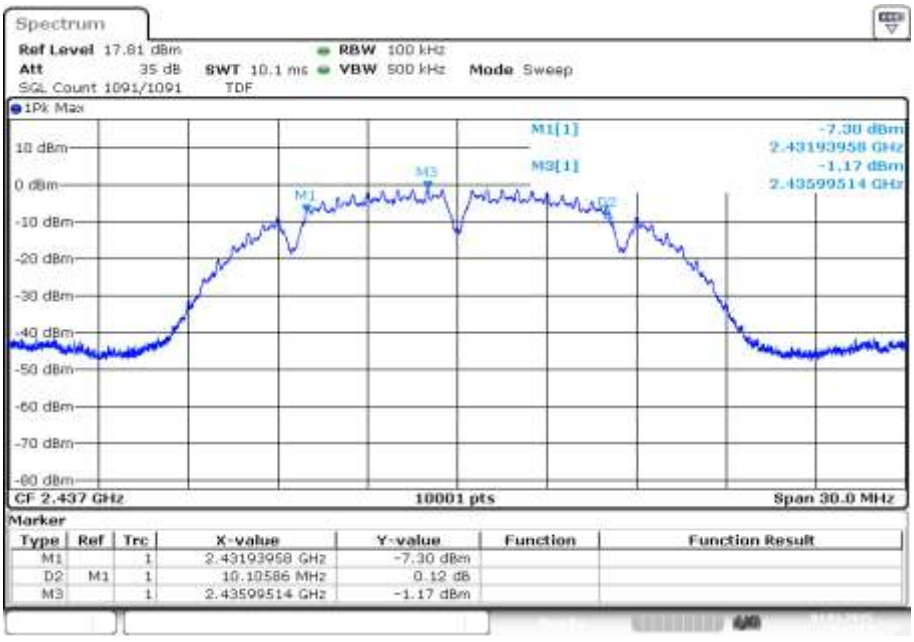
Plots: DSSS / b – mode

Plot 1: TX mode, 2417 MHz



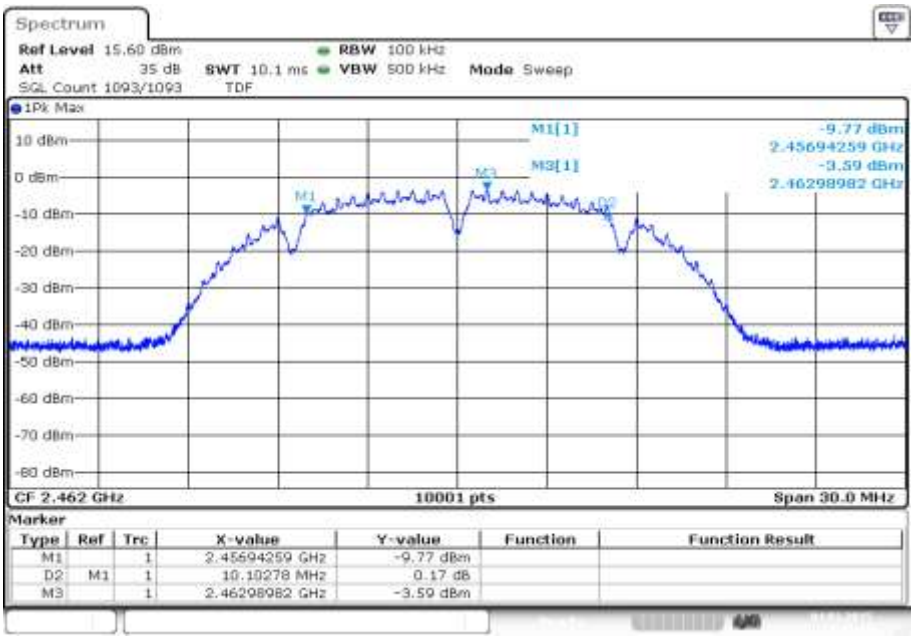
Date: 4.MAR.2015 10:30:32

Plot 2: TX mode, 2437 MHz



Date: 4.MAR.2015 10:42:23

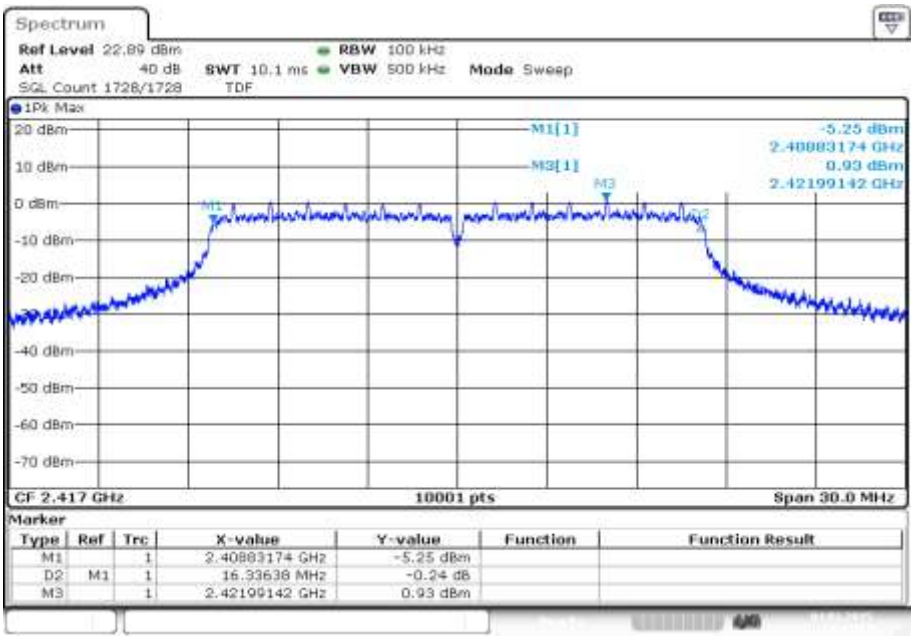
Plot 3: TX mode, 2462 MHz



Date: 4.MAR.2015 10:59:47

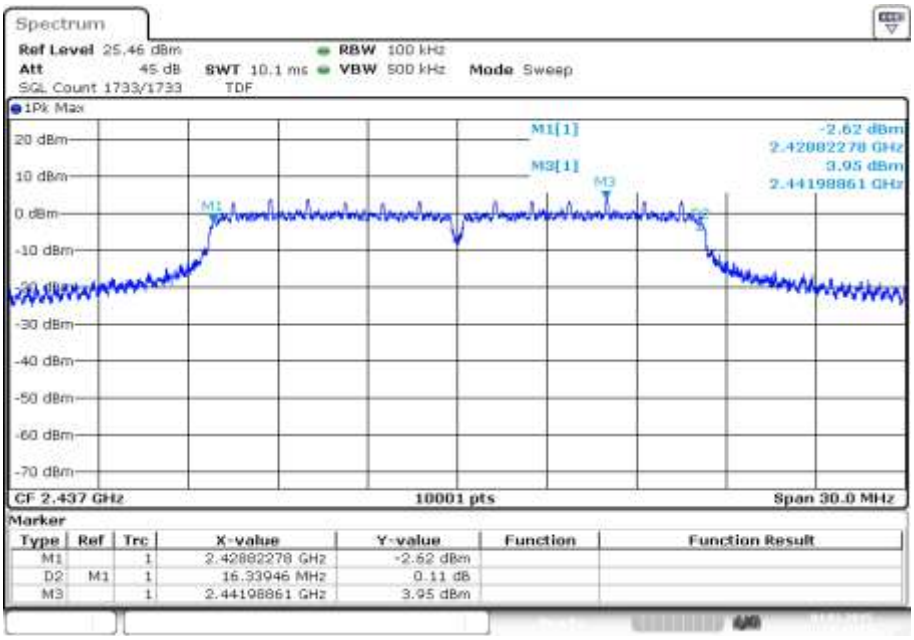
Plots: OFDM / g – mode

Plot 1: TX mode, 2417 MHz



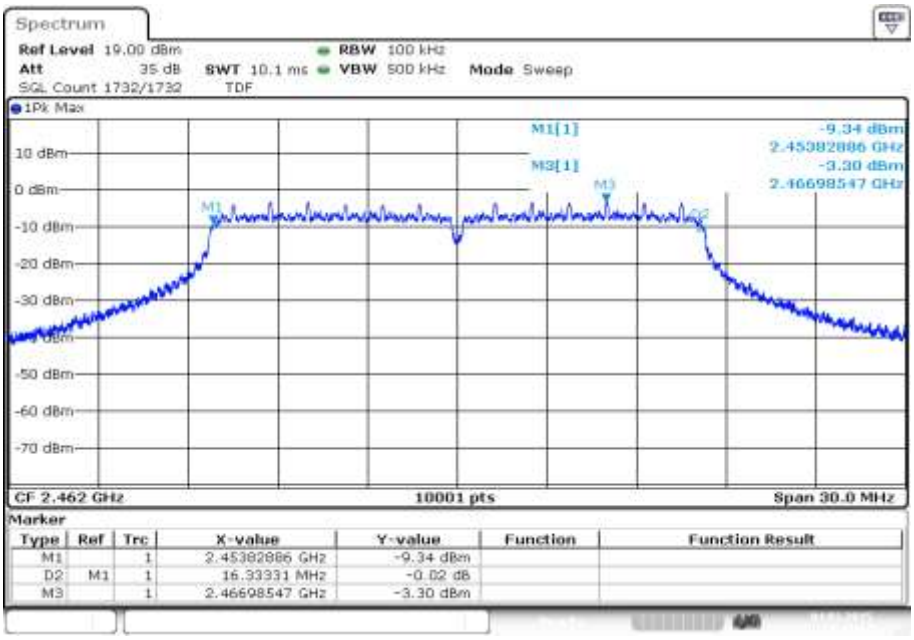
Date: 4.MAR.2015 11:13:13

Plot 2: TX mode, 2437 MHz



Date: 4.MAR.2015 11:19:55

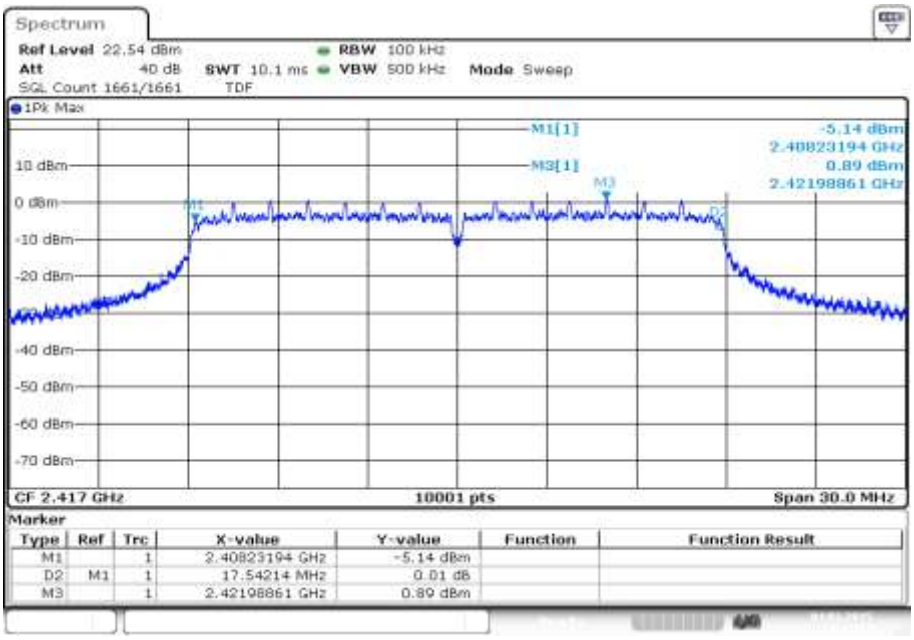
Plot 3: TX mode, 2462 MHz



Date: 4.MAR.2015 11:34:42

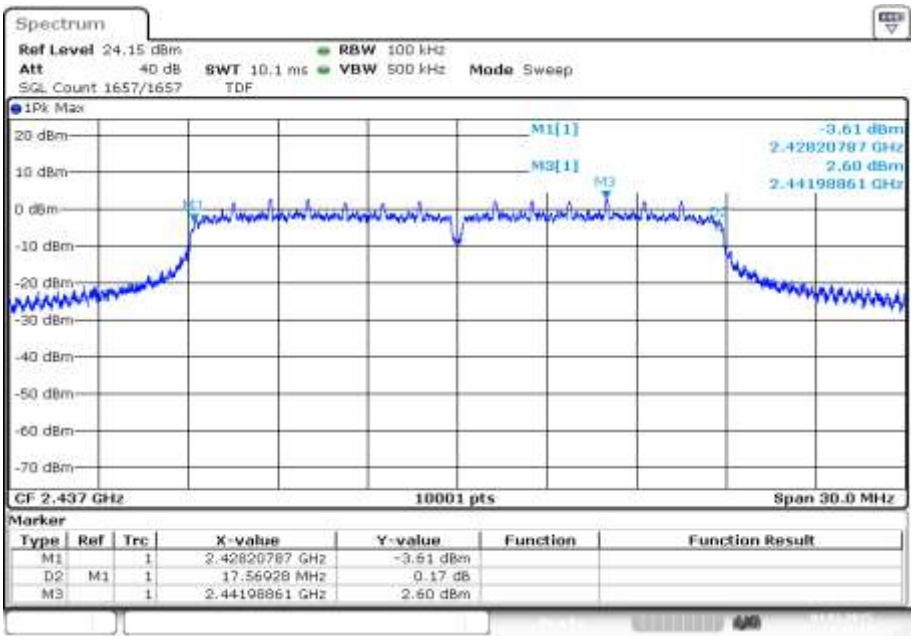
Plots: OFDM / nHT20 – mode

Plot 1: TX mode, 2417 MHz



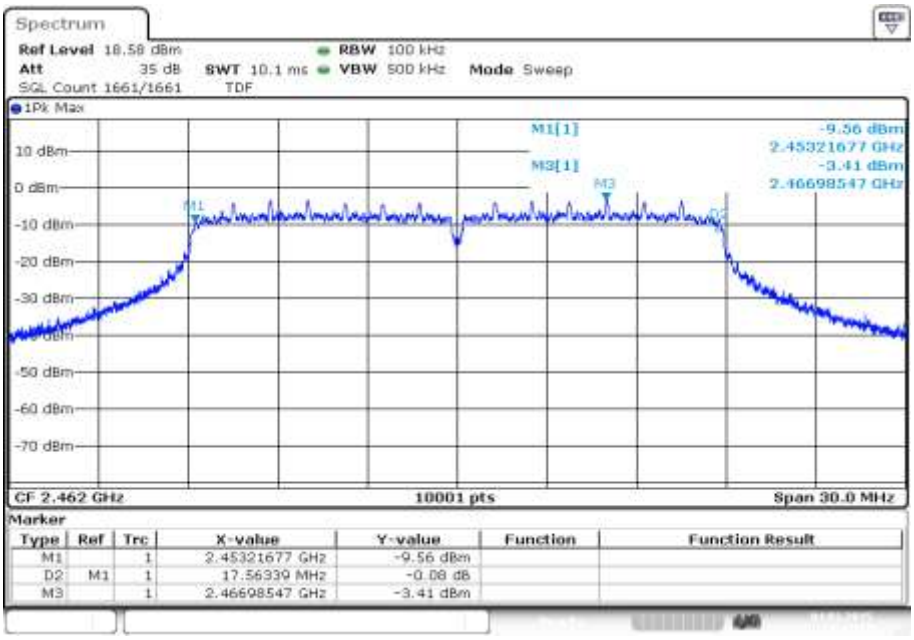
Date: 4.MAR.2015 11:51:59

Plot 2: TX mode, 2437 MHz



Date: 4.MAR.2015 11:58:48

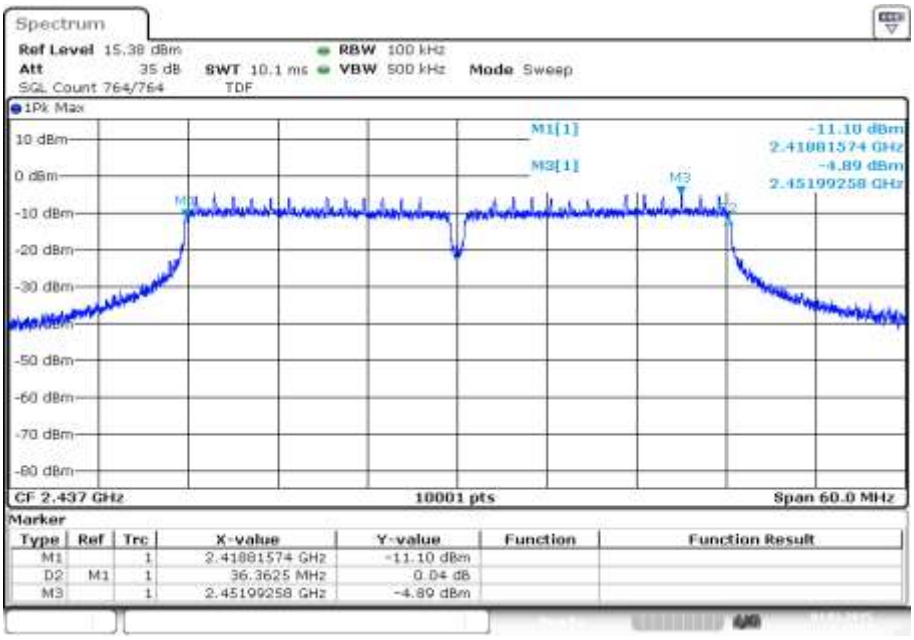
Plot 3: TX mode, 2462 MHz



Date: 4.MAR.2015 12:17:18

Plots: OFDM / nHT40 – mode

Plot 1: TX mode, 2437 MHz



Date: 4.MAR.2015 12:36:57

12.7 Occupied bandwidth – 99% emission bandwidth

Description:

Measurement of the 99% bandwidth of the modulated signal acc. RSS-GEN.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	40 MHz
Measurement procedure:	Measurement of the 99% bandwidth using the integration function of the analyzer
Trace-Mode:	Max hold (allow trace to stabilize)
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Usage:

-/-	IC
Occupied Bandwidth – 99% emission bandwidth	
OBW is necessary for Emission Designator	

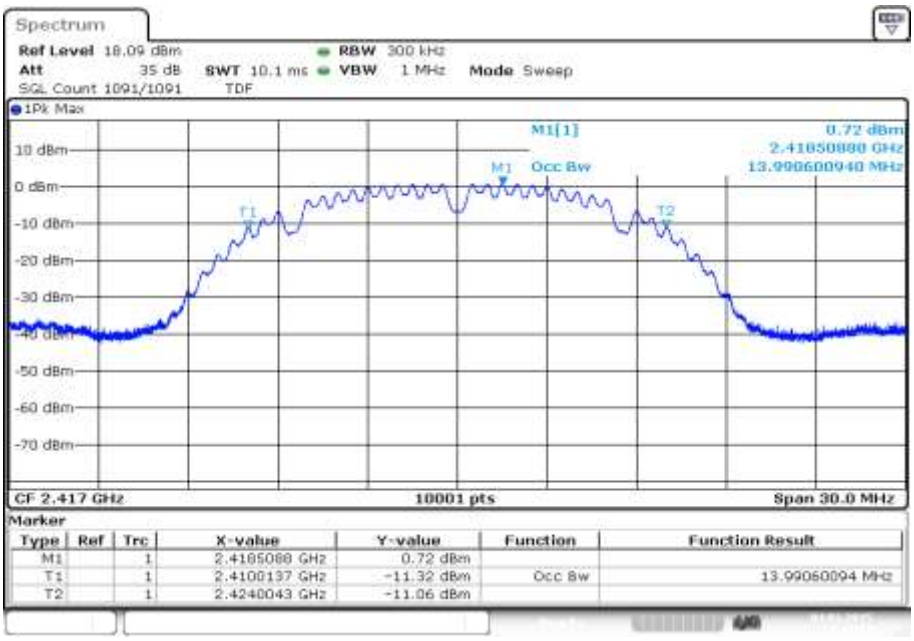
Results:

Modulation	99% bandwidth [kHz]		
Frequency	2417 MHz	2437 MHz	2462 MHz
DSSS / b – mode	13991	14000	13949
OFDM / g – mode	17251	18226	17134
OFDM / n HT20 – mode	18217	18484	18151
OFDM / n HT40 – mode	NA	38660	NA

Verdict: complies

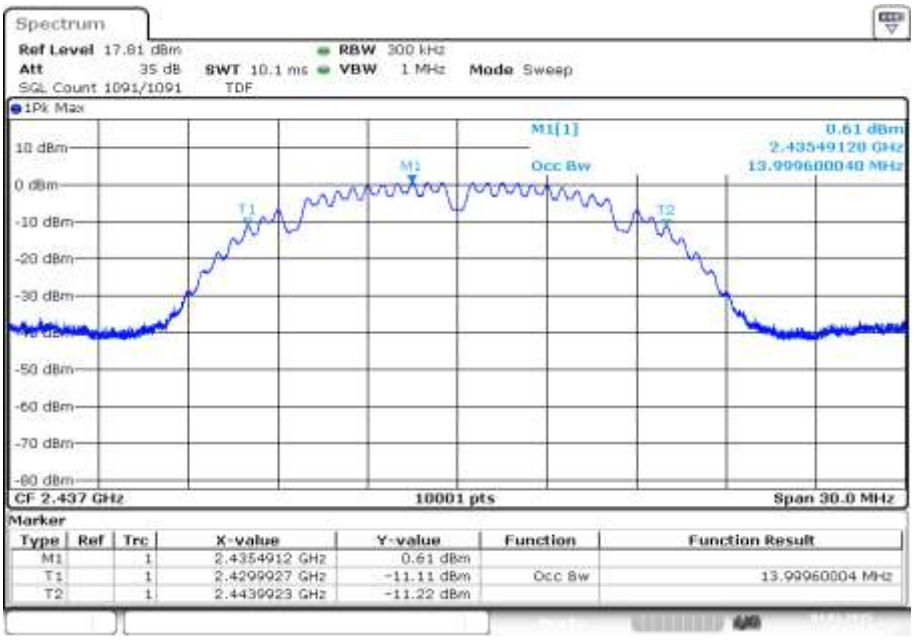
Plots: DSSS / b – mode

Plot 1: TX mode, lowest channel



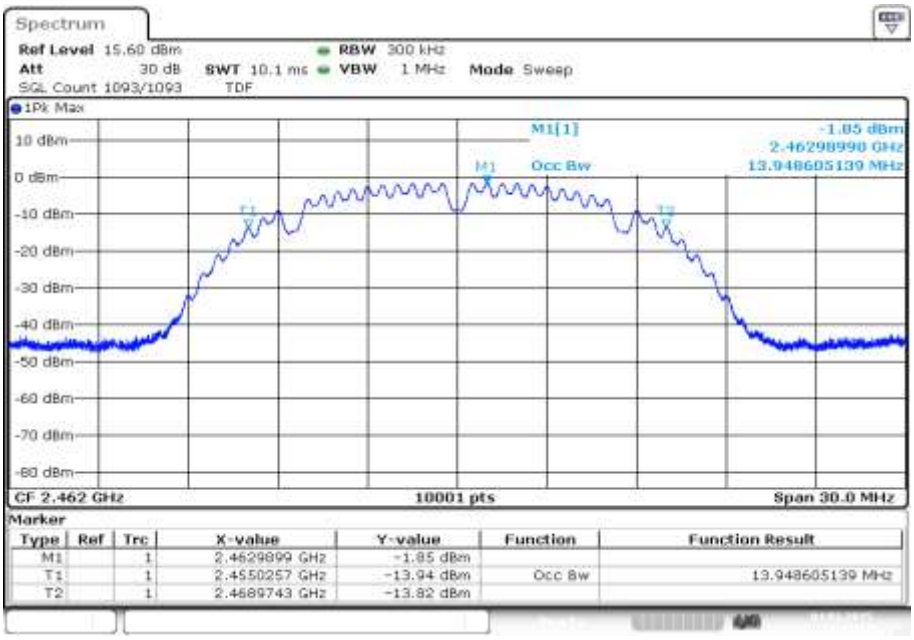
Date: 4.MAR.2015 10:30:53

Plot 2: TX mode, middle channel



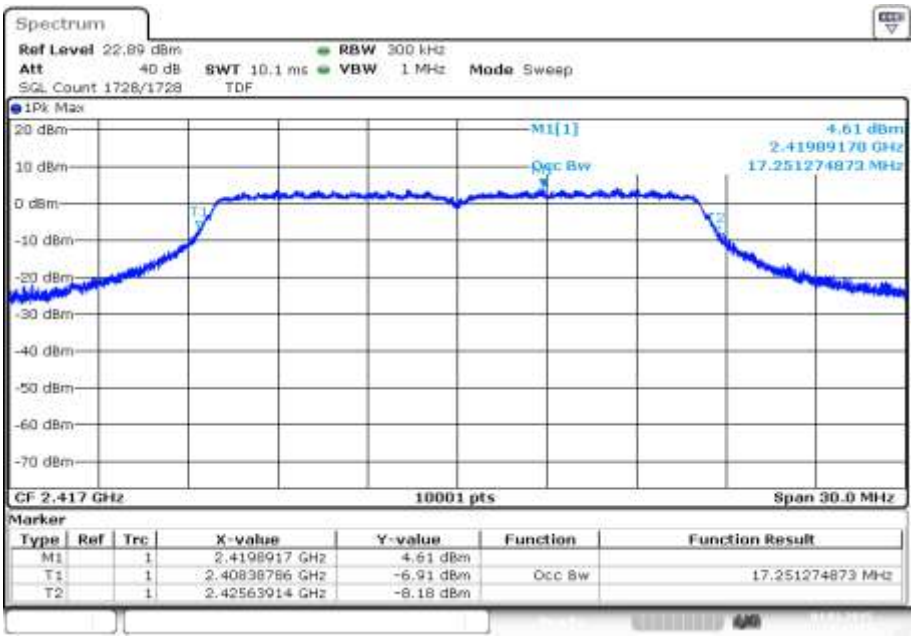
Date: 4.MAR.2015 10:42:44

Plot 3: TX mode, highest channel



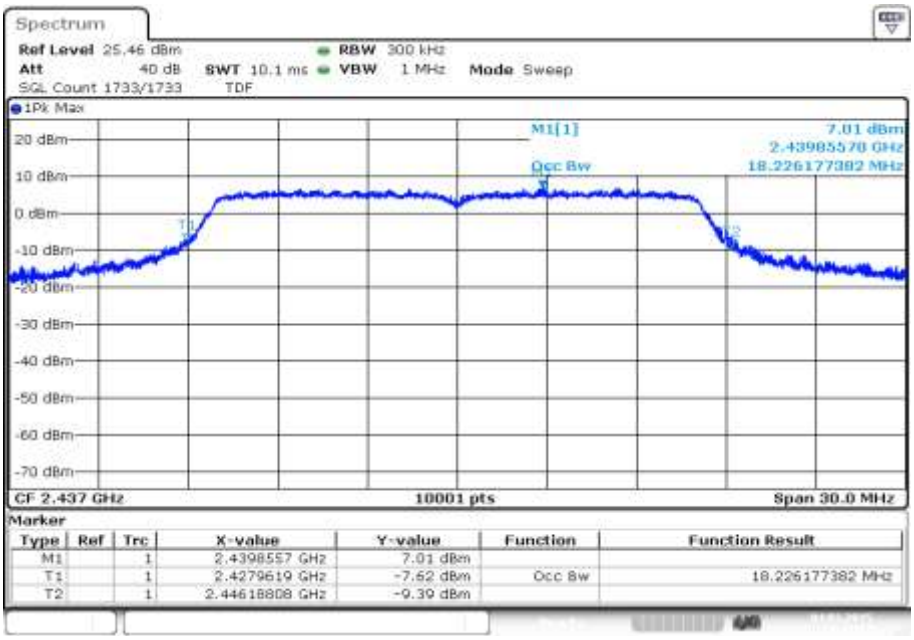
Plots: OFDM / g – mode

Plot 1: TX mode, lowest channel



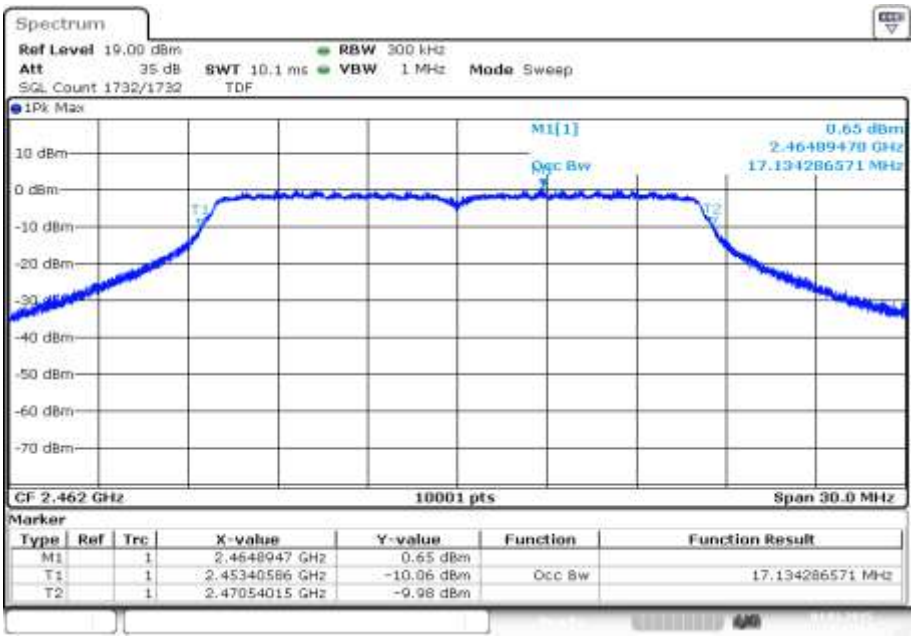
Date: 4.MAR.2015 11:13:45

Plot 2: TX mode, middle channel



Date: 4.MAR.2015 11:20:27

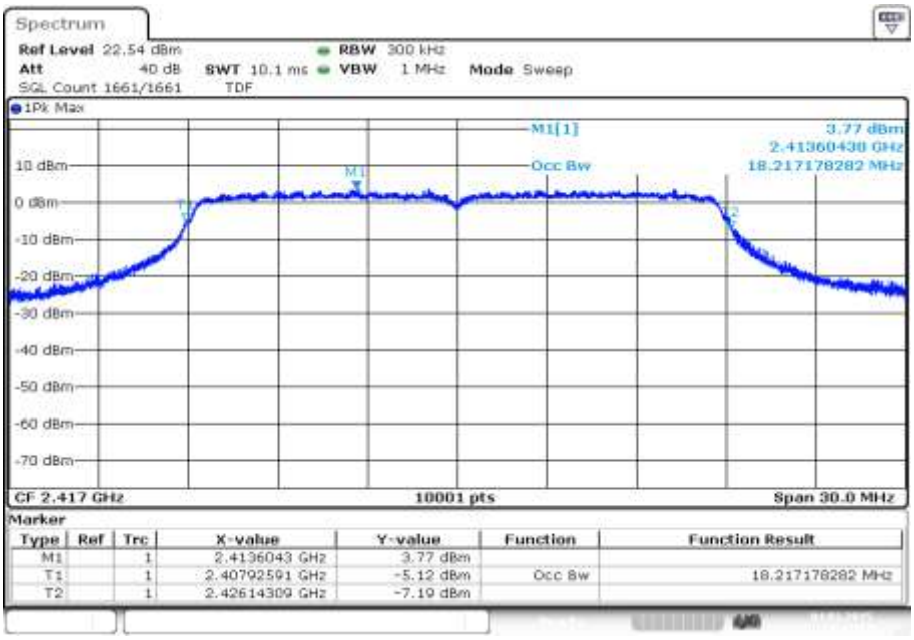
Plot 3: TX mode, highest channel



Date: 4.MAR.2015 11:35:14

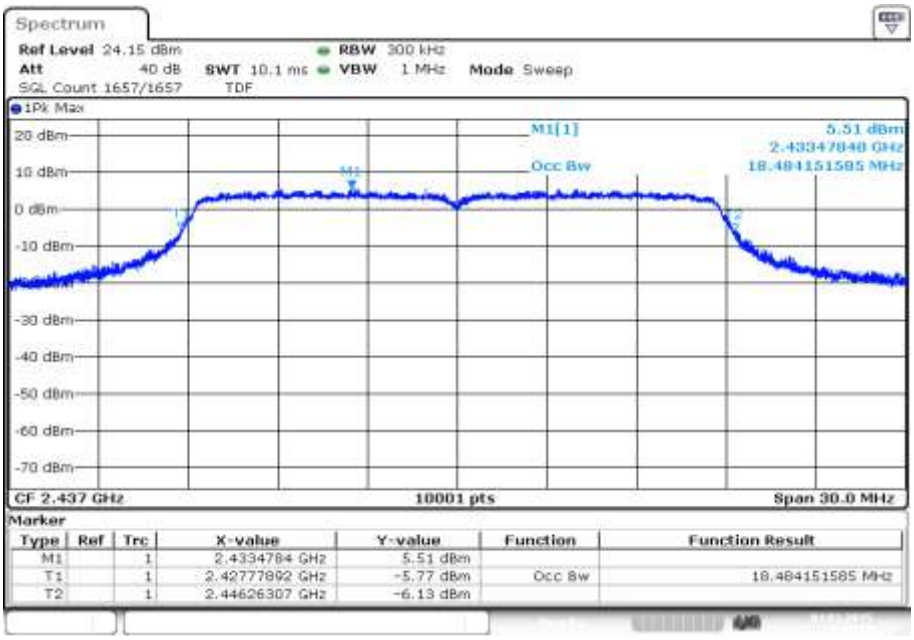
Plots: OFDM / n HT20 – mode

Plot 1: TX mode, lowest channel



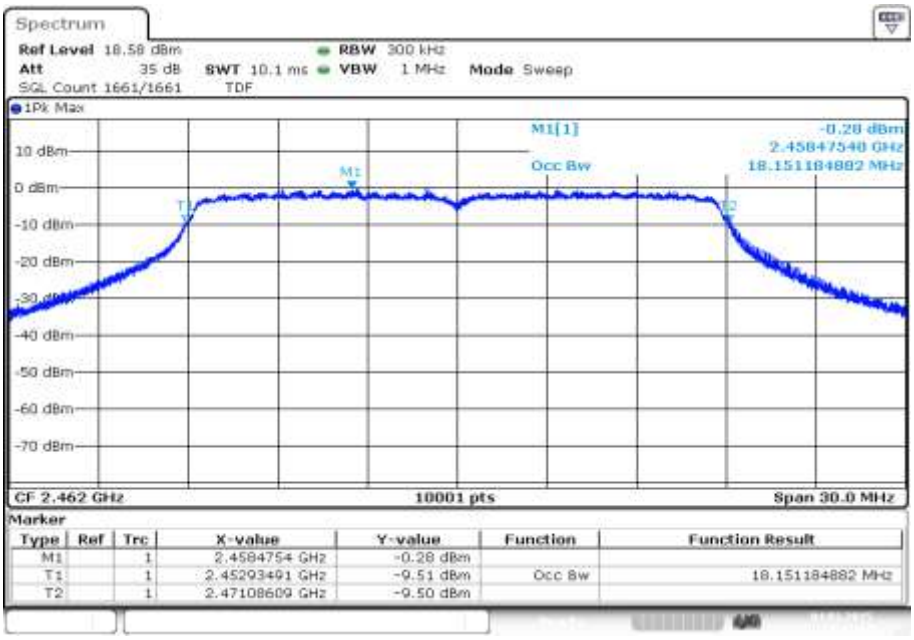
Date: 4.MAR.2015 11:52:30

Plot 2: TX mode, middle channel



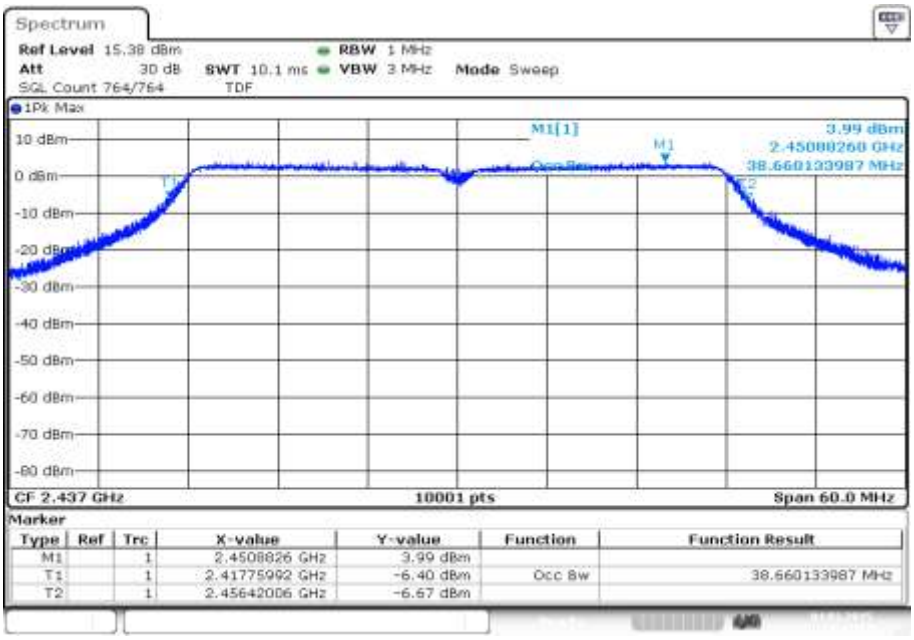
Date: 4.MAR.2015 11:59:19

Plot 3: TX mode, highest channel



Plots: OFDM / n HT40 – mode

Plot 1: TX mode, middle channel



Date: 4.MAR.2015 12:37:13

12.8 Detailed spurious emissions @ the band edge - conducted

Description:

Measurement of the conducted band edge compliance. EUT is measured at the lower and upper band edge in all modes.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	Lower Band Edge: 2300 – 2425 MHz Upper Band Edge: 2450 – 2550 MHz
Trace-Mode:	Max hold
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Limits:

FCC	IC
Band Edge Compliance Conducted	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.	

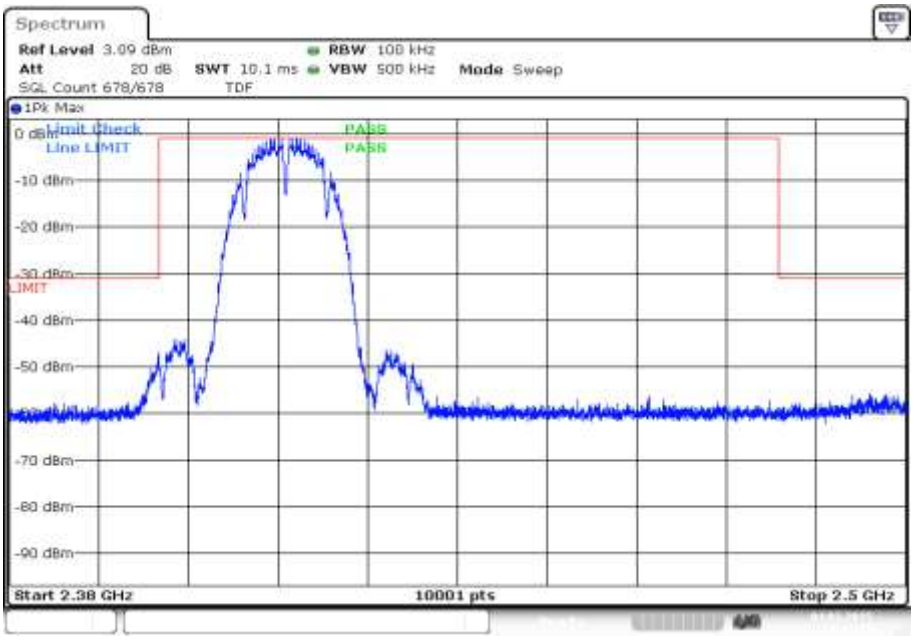
Results:

Scenario	Compliance Conducted [dB]			
Modulation	DSSS / b – mode	OFDM / g – mode	OFDM / n HT20 – mode	OFDM / n HT40 – mode
Lower Band Edge	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Upper Band Edge	> 30 dB	> 30 dB	> 30 dB	> 30 dB

Verdict: complies

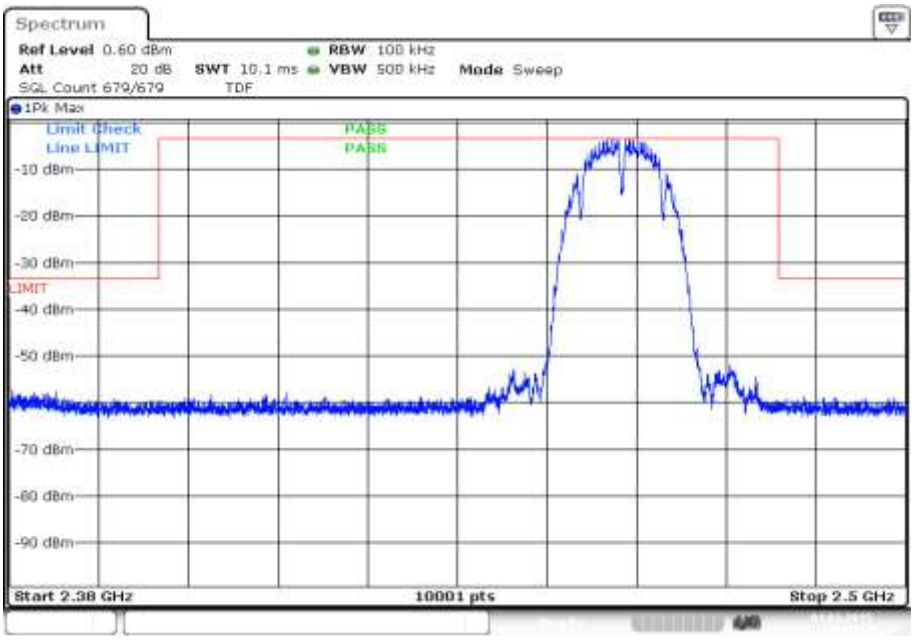
Plots: DSSS / b – mode

Plot 1: TX mode, lower band edge



Date: 4.MAR.2015 10:31:16

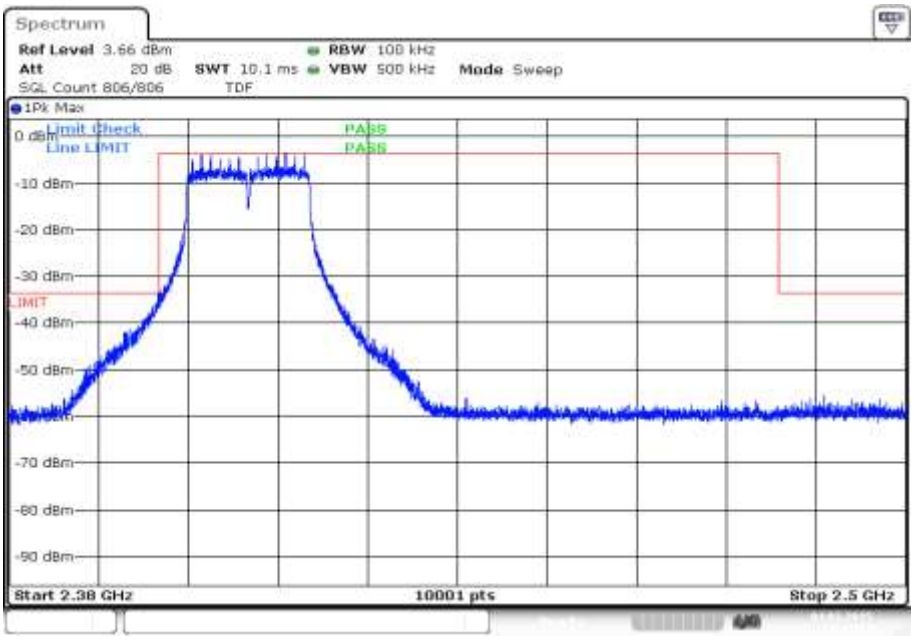
Plot 2: TX mode, upper band edge



Date: 4.MAR.2015 11:00:30

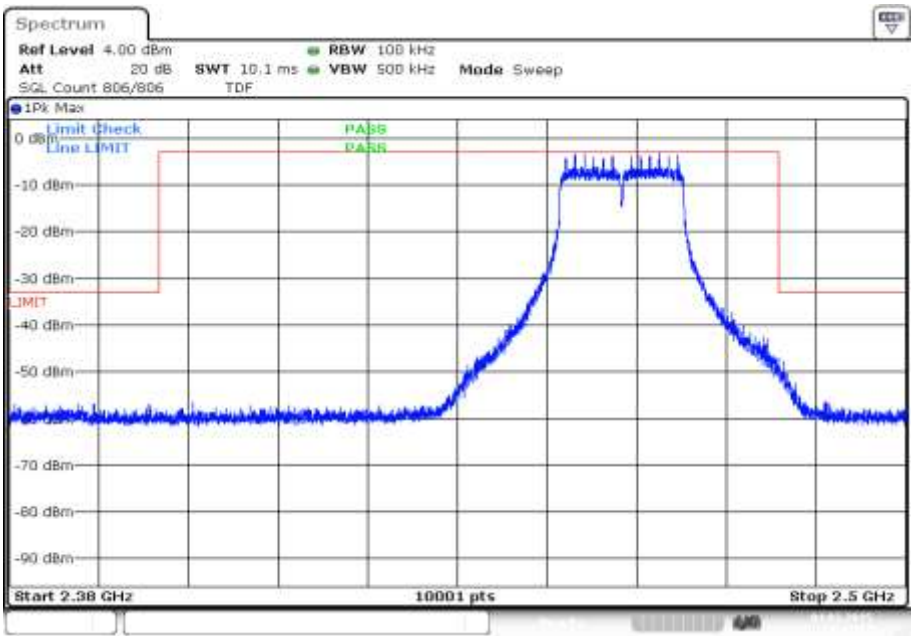
Plots: OFDM / g – mode

Plot 1: TX mode, lower band edge



Date: 4.MAR.2015 11:07:08

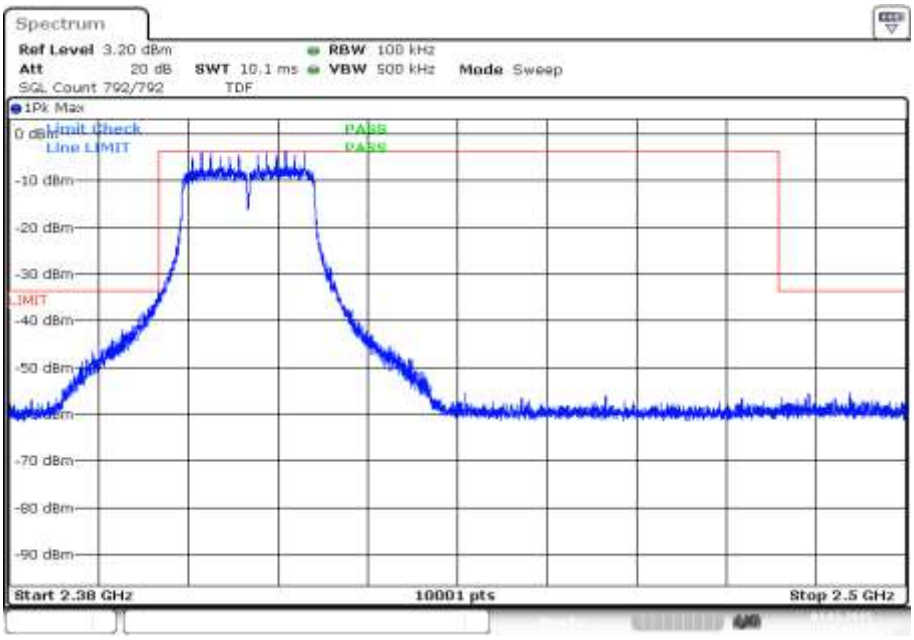
Plot 2: TX mode, upper band edge



Date: 4.MAR.2015 11:35:37

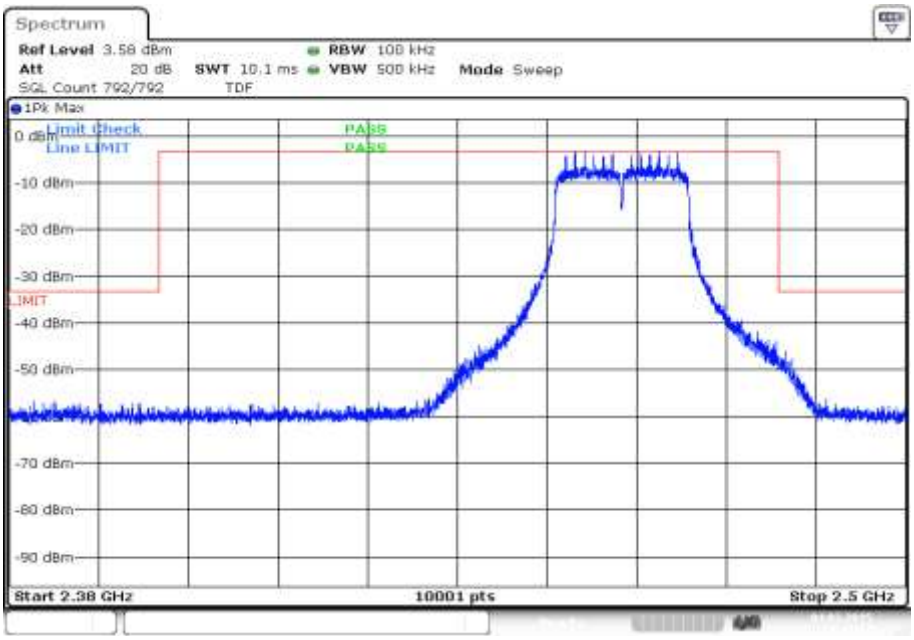
Plots: OFDM / n HT20 – mode

Plot 1: TX mode, lower band edge



Date: 4.MAR.2015 11:43:06

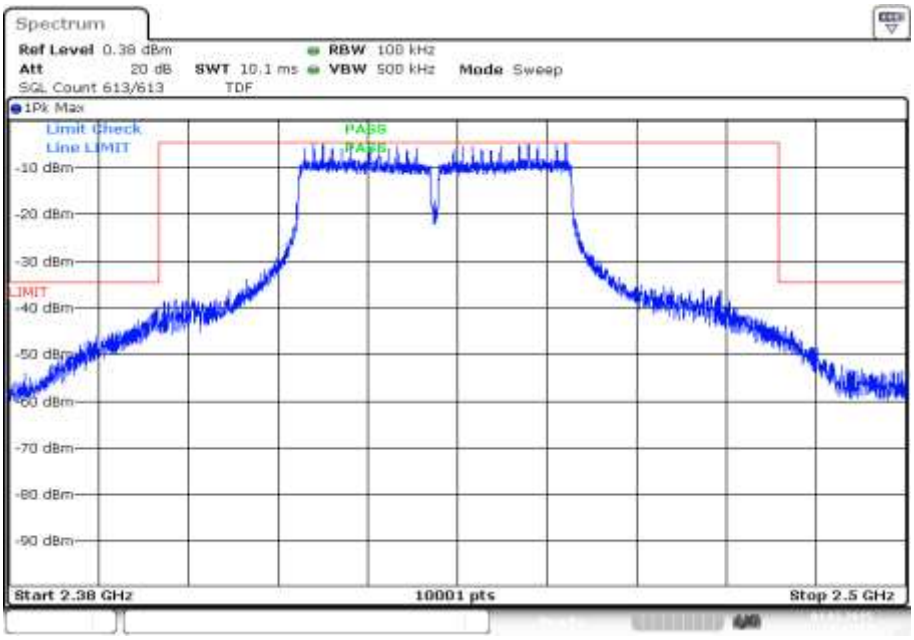
Plot 2: TX mode, upper band edge



Date: 4.MAR.2015 12:18:12

Plots: OFDM / n HT40 – mode

Plot 1: TX mode



Date: 4.MAR.2015 12:37:39

12.9 Band edge compliance radiated

Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to channel 1 for the lower restricted band and to channel 11 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3m.

Measurement:

Measurement parameter for peak measurements	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	See plot!
Trace-Mode:	Max Hold
Test setup:	See sub clause 7.2 - C
Measurement uncertainty	See sub clause 8

Measurement parameter for average measurements	
According to DTS clause: 13.3.2	
Detector:	RMS
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	2 MHz
Trace-Mode:	RMS Average over 101 sweeps
Test setup:	See sub clause 7.2 - C
Measurement uncertainty	See sub clause 8

Limits:

FCC	IC
Band Edge Compliance Radiated	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).	
74 dBµV/m Peak 54 dBµV/m AVG	

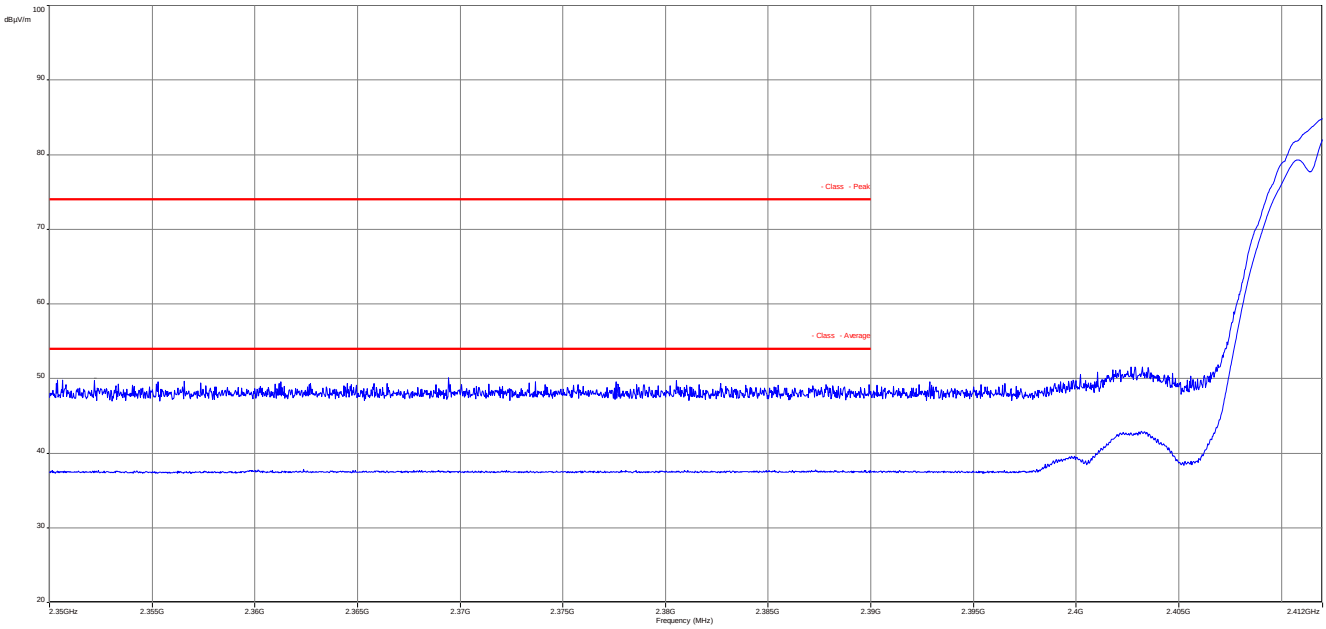
Results:

Scenario Modulation	Band Edge Compliance Conducted [dB]			
	DSSS / b – mode	OFDM / g – mode	OFDM / n HT20 – mode	OFDM / n HT40 – mode
Lower Band Edge	> 10 dB (Peak) > 10 dB (AVG)	> 10 dB (Peak) > 10 dB (AVG	> 10 dB (Peak) > 10 dB (AVG)	> 10 dB (Peak) > 10 dB (AVG)
Upper Band Edge	> 10 dB (Peak) > 10 dB (AVG)	> 10 dB (Peak) > 10 dB (AVG)	> 10 dB (Peak) > 10 dB (AVG)	> 10 dB (Peak) > 10 dB (AVG)

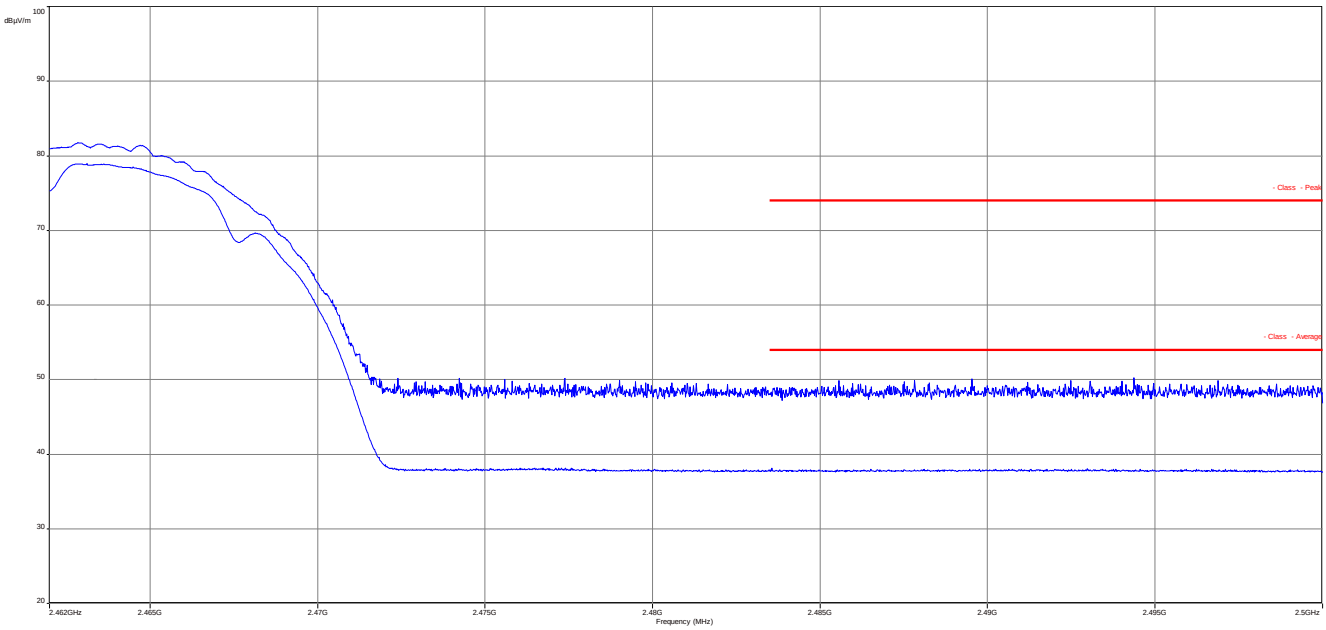
Verdict: **complies**

Plots: DSSS/ b – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization

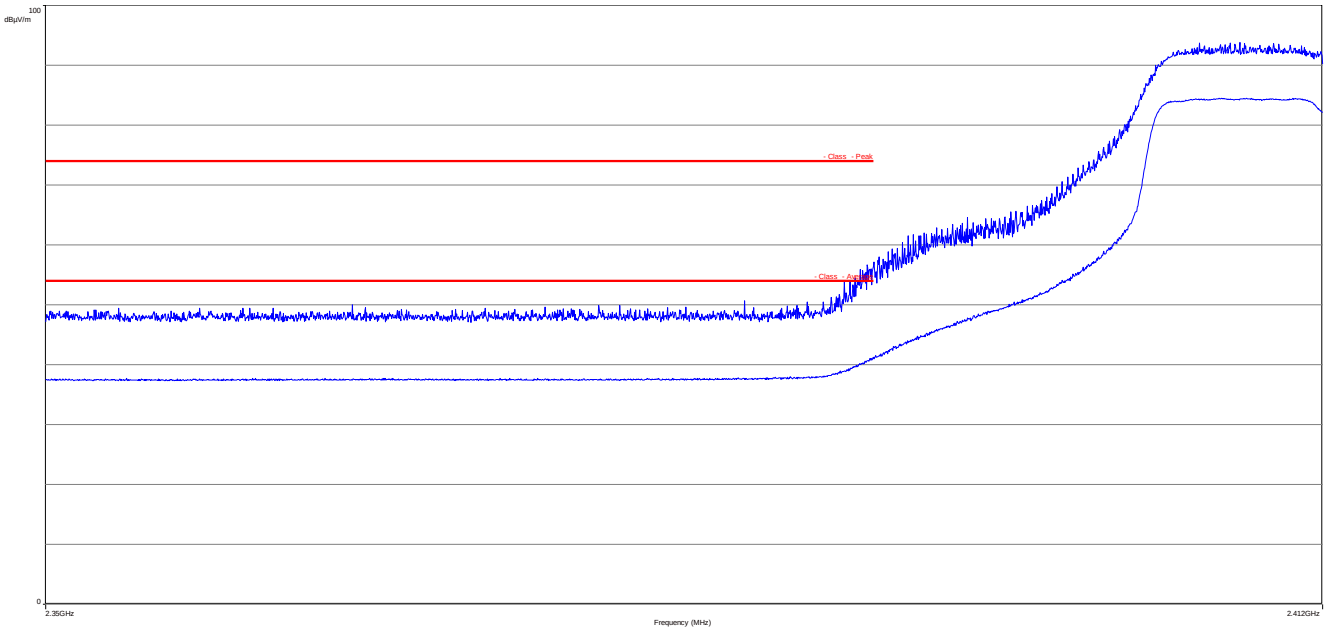


Plot 2: TX mode, upper band edge, vertical & horizontal polarization

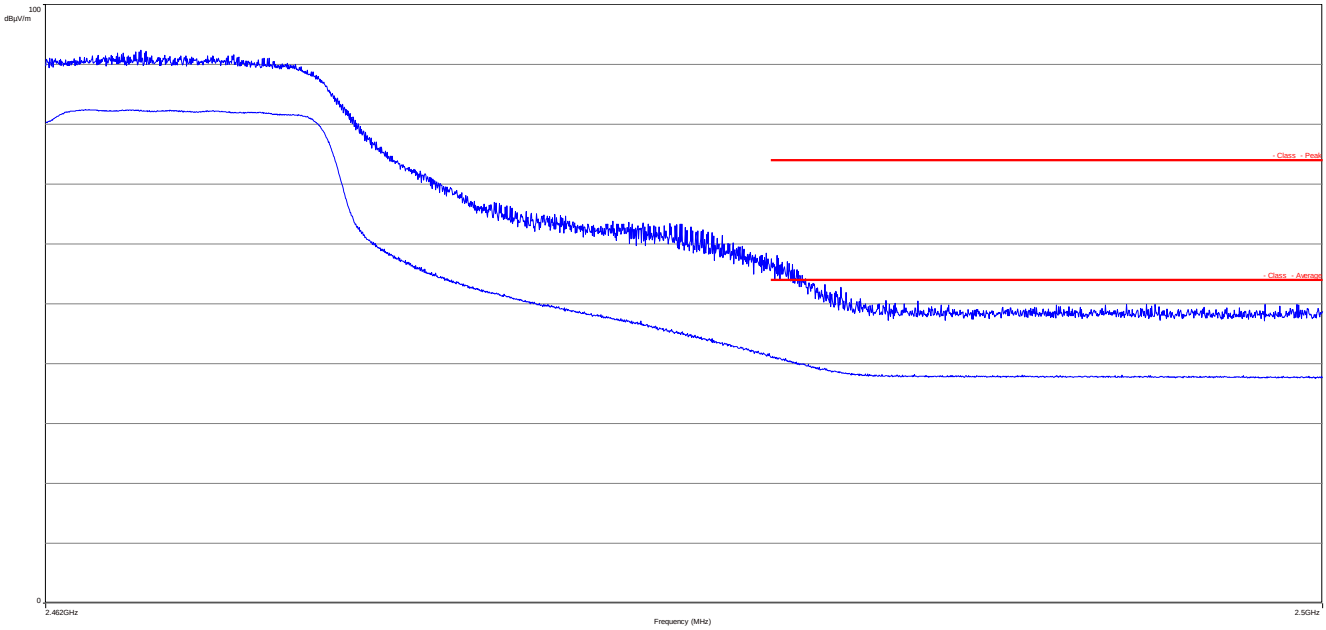


Plots: OFDM / g – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization

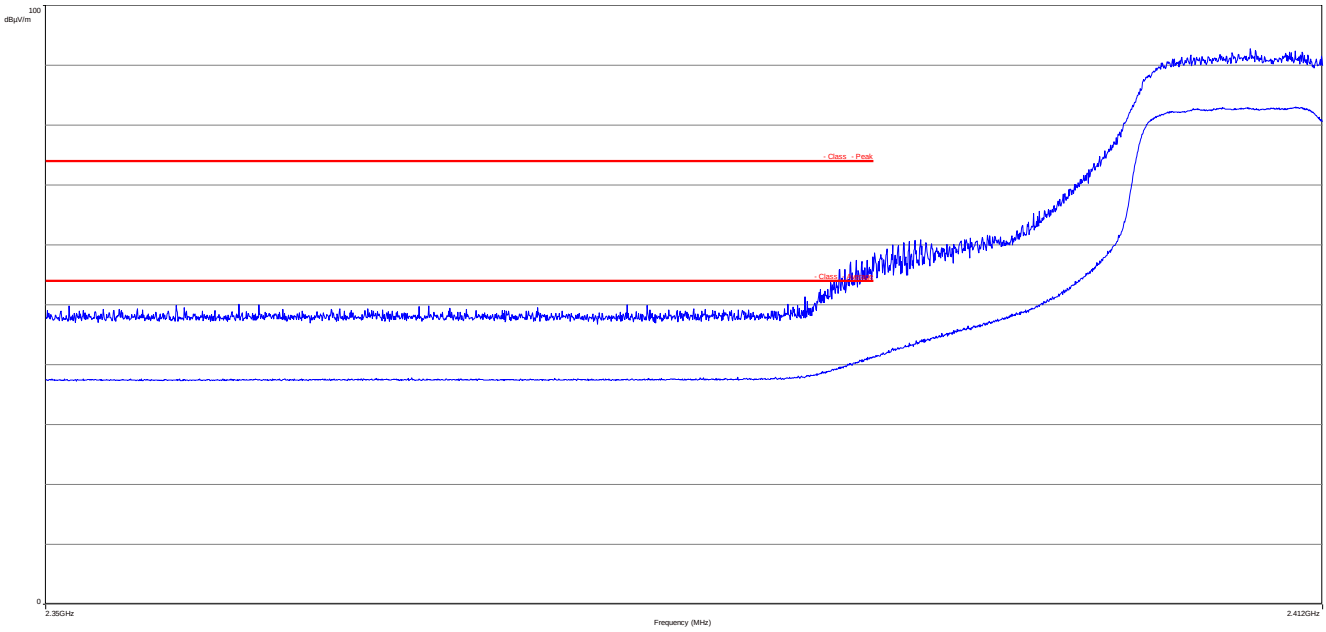


Plot 2: TX mode, upper band edge, vertical & horizontal polarization

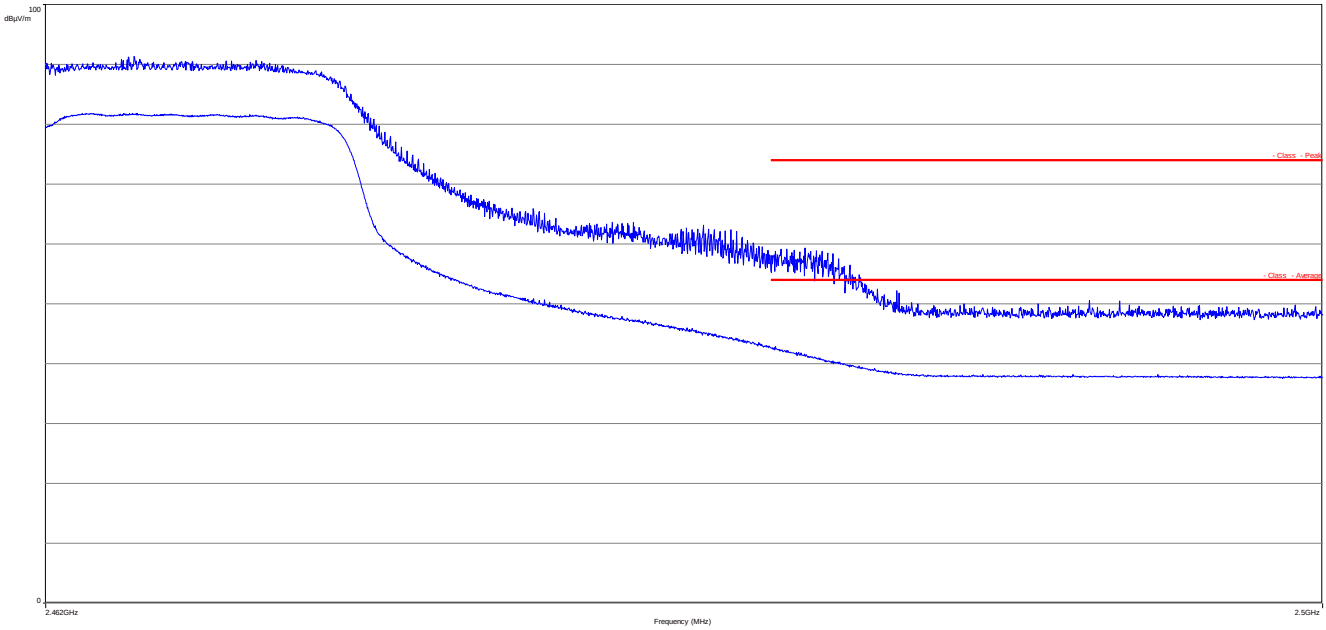


Plots: OFDM / n HT20 – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization

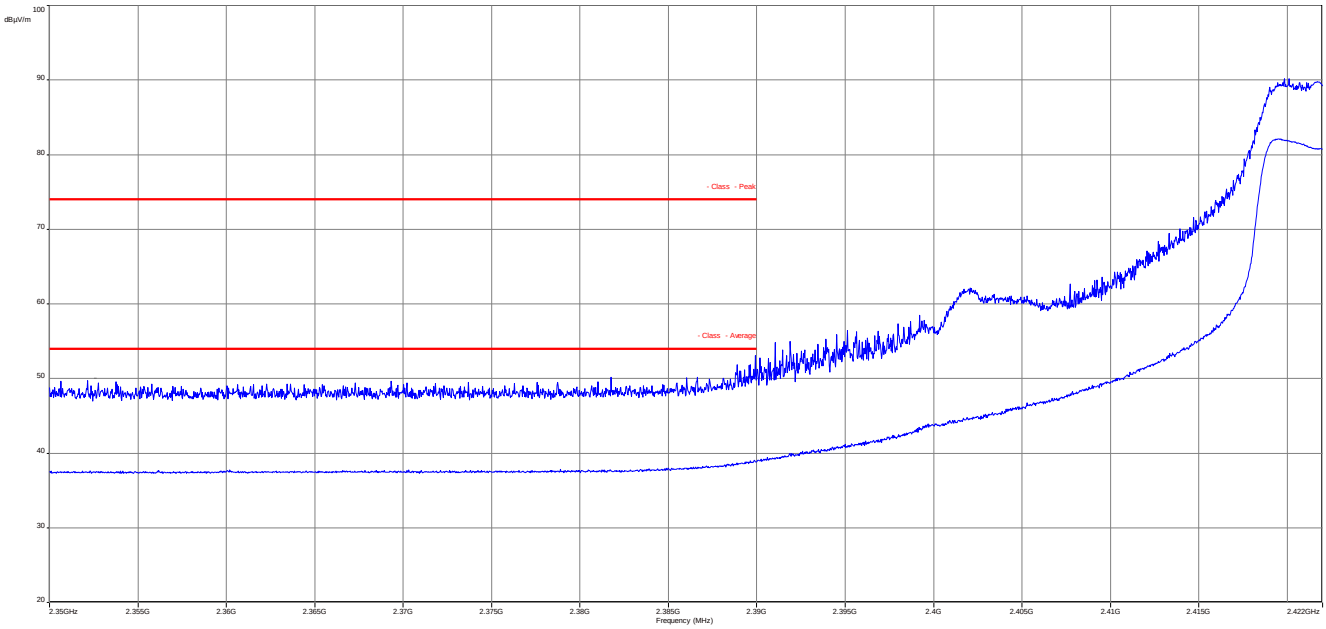


Plot 2: TX mode, upper band edge, vertical & horizontal polarization

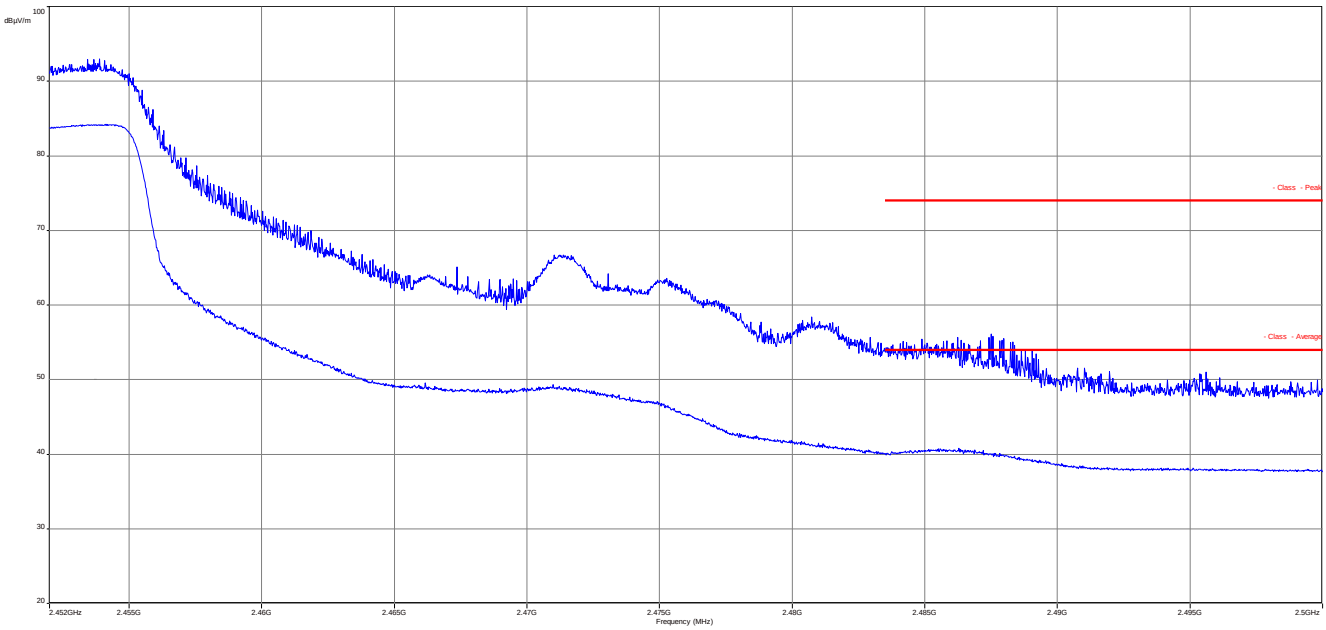


Plots: OFDM / n HT40 – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization



Plot 2: TX mode, upper band edge, vertical & horizontal polarization



12.10 Spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	9 kHz to 25 GHz
Trace-Mode:	Max Hold
Test setup:	See sub clause 7.5 - A
Measurement uncertainty	See sub clause 8

Limits:

FCC	IC
TX Spurious Emissions Conducted	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required	

Results: DSSS / b – mode

TX Spurious Emissions Conducted					
DSSS / b – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2417		-5.03	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
2437		-4.00	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
2462		-5.08	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies

Verdict: **complies**

Results: OFDM / g – mode

TX Spurious Emissions Conducted					
OFDM / g – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2417		-2.69	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
2437		3.78	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
2462		-2.54	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies

Verdict: **complies**

Results: OFDM / n HT20 – mode

TX Spurious Emissions Conducted					
OFDM / n HT20 – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2417		-2.50	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
2437		3.47	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
2462		-2.03	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies

Verdict: **complies**

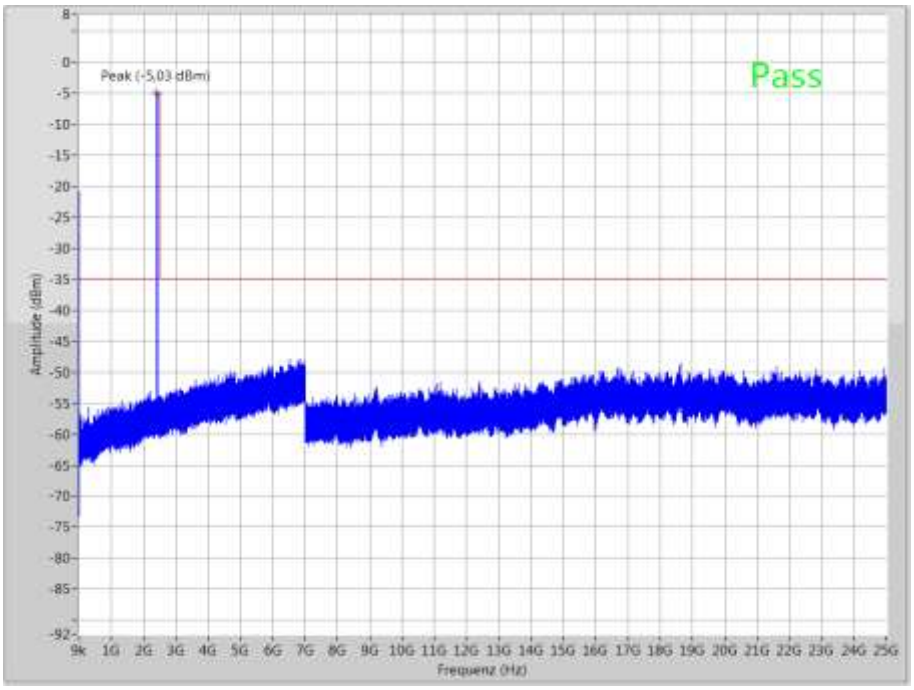
Results: OFDM / n HT40 – mode

TX Spurious Emissions Conducted					
OFDM / n HT20 – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2437		-7.82	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies

Verdict: **complies**

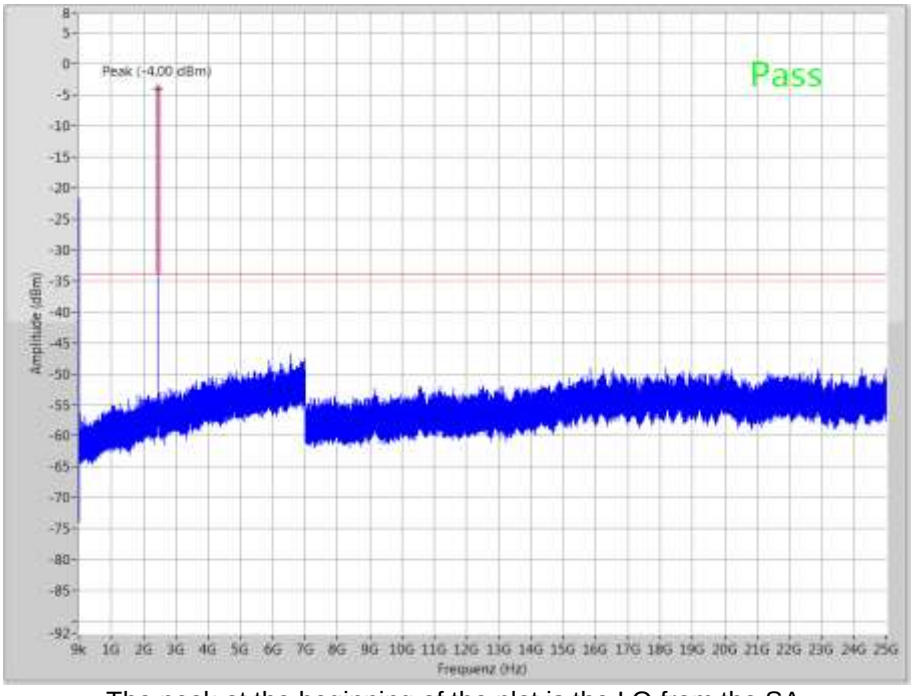
Plots: DSSS / b – mode

Plot 1: TX mode, lowest channel, up to 25 GHz



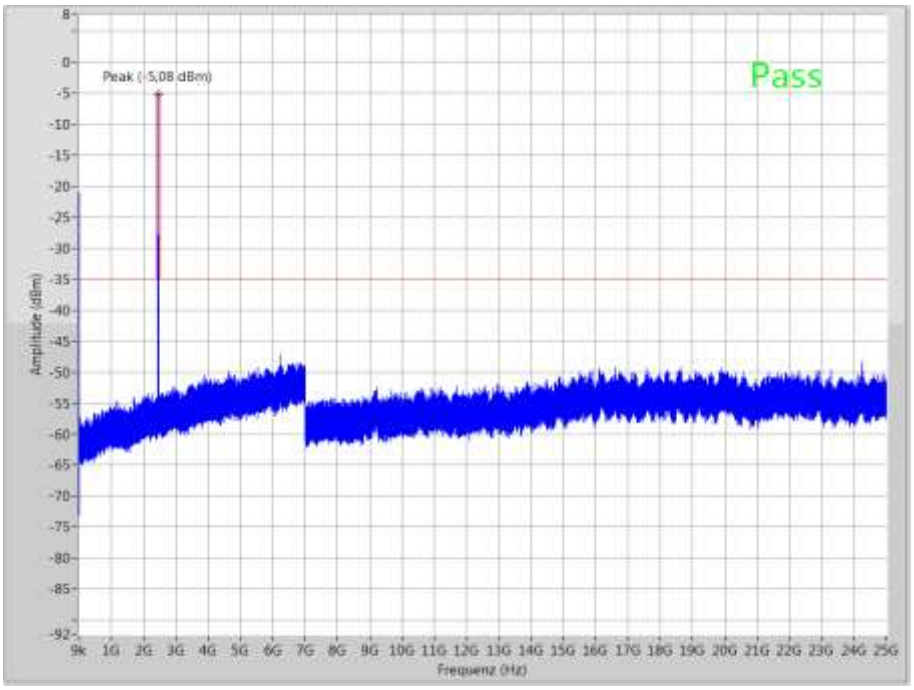
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

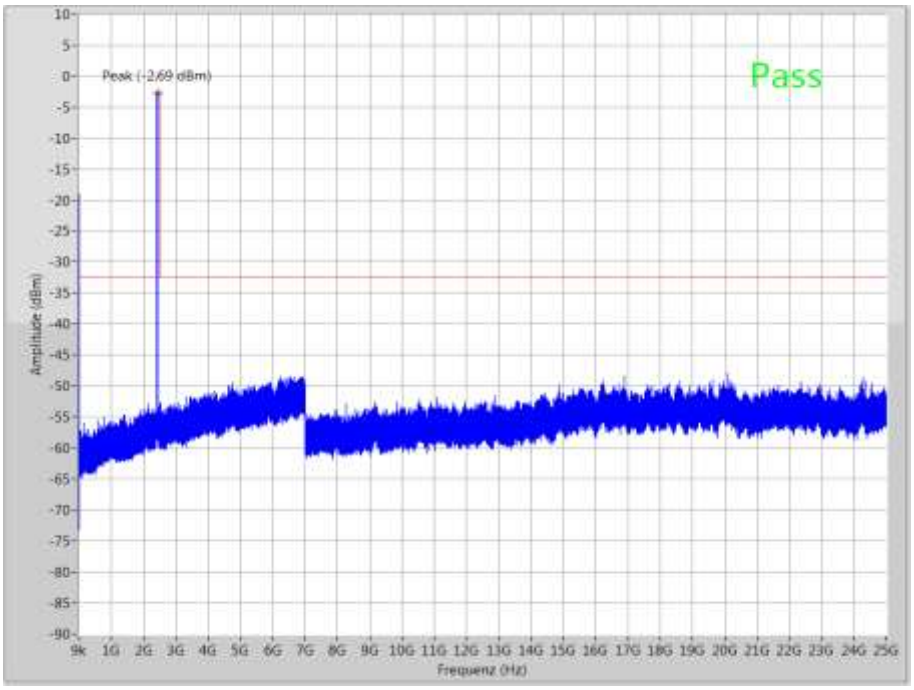
Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

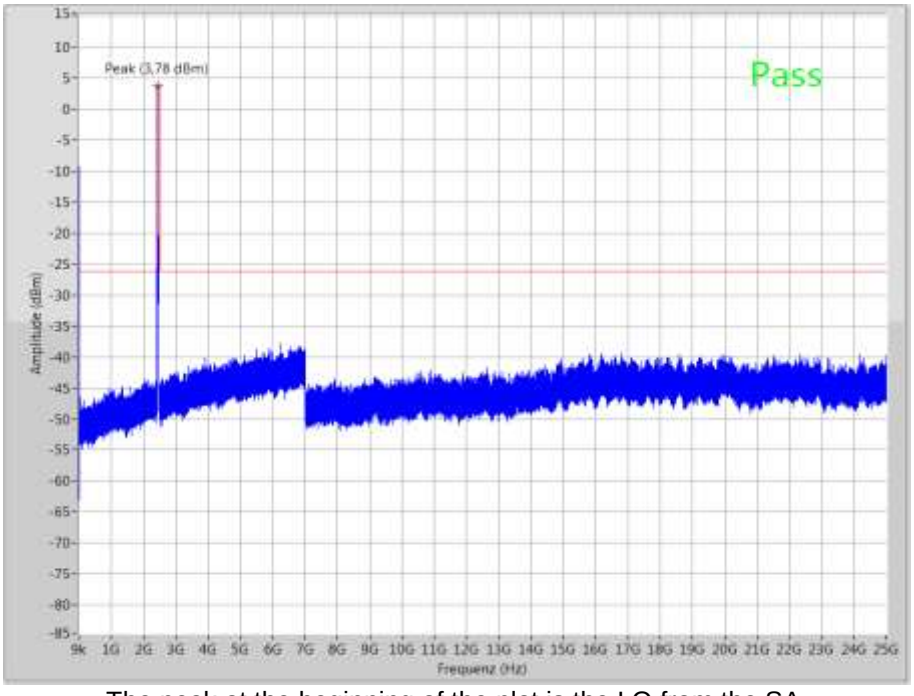
Plots: OFDM / g – mode

Plot 1: TX mode, lowest channel, up to 25 GHz



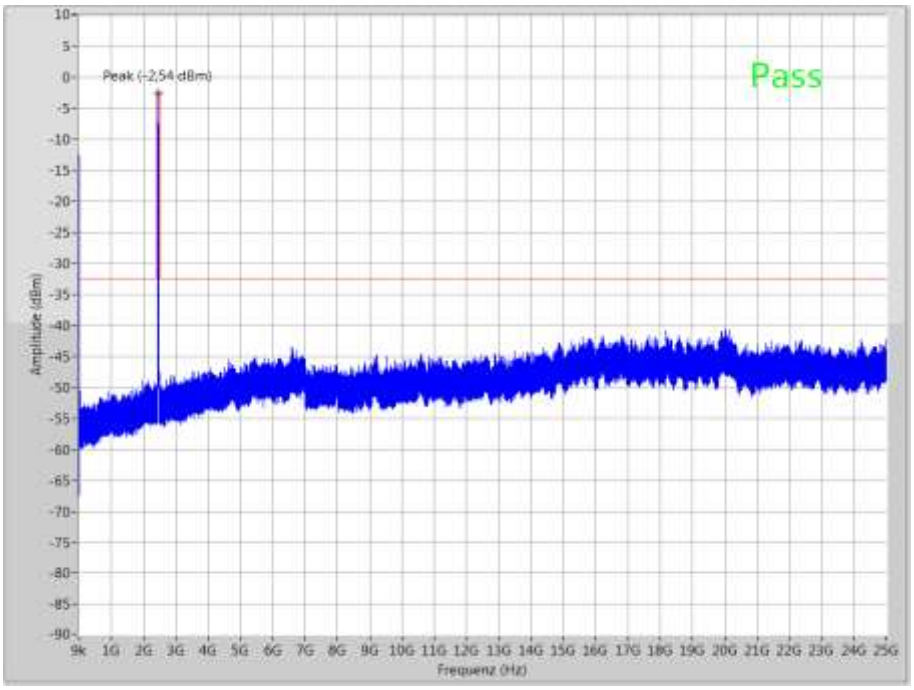
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

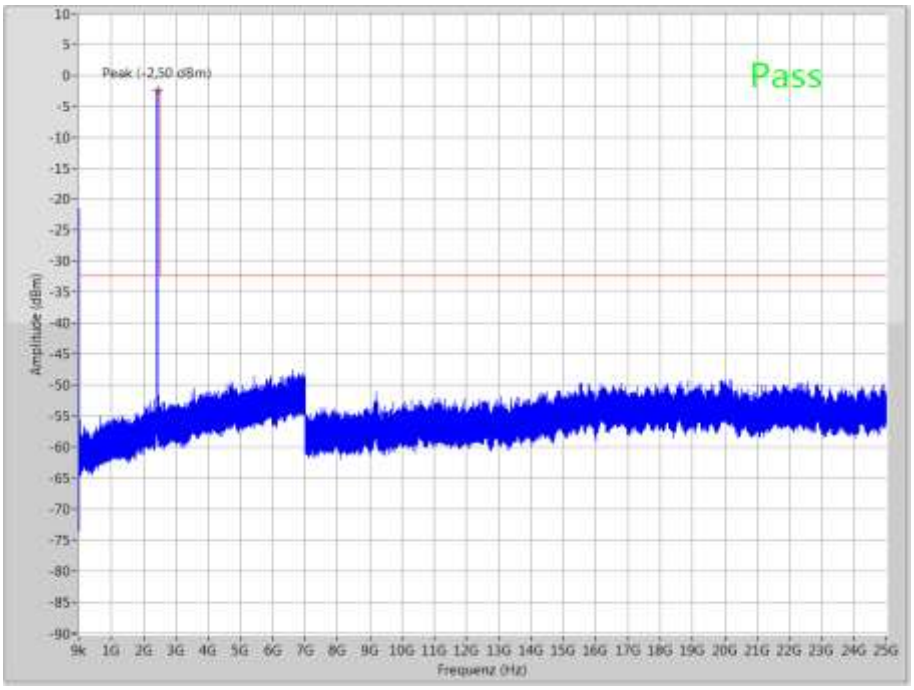
Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

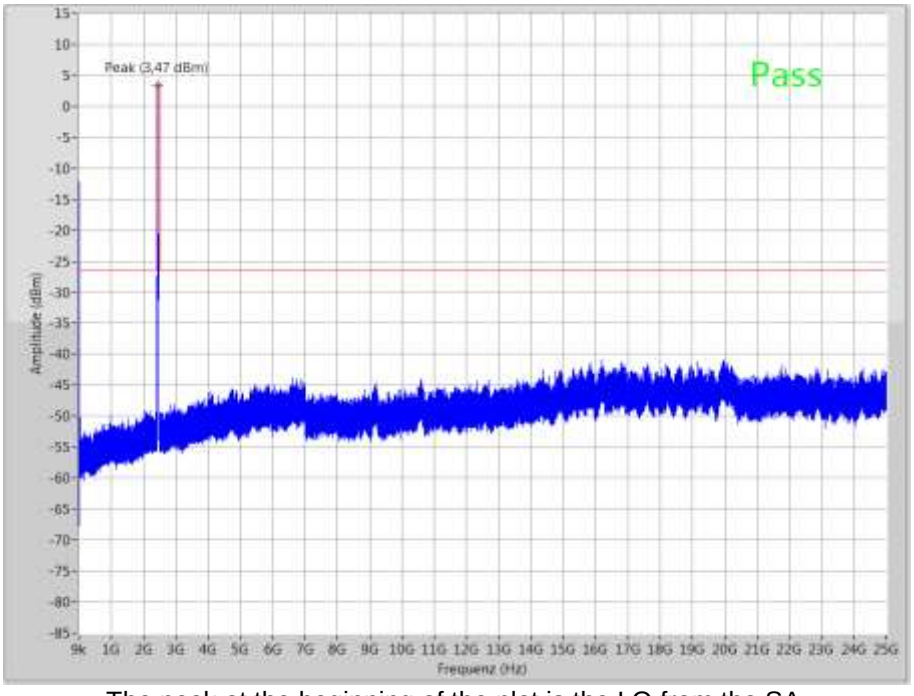
Plots: OFDM / n – mode HT20

Plot 1: TX mode, lowest channel, up to 25 GHz



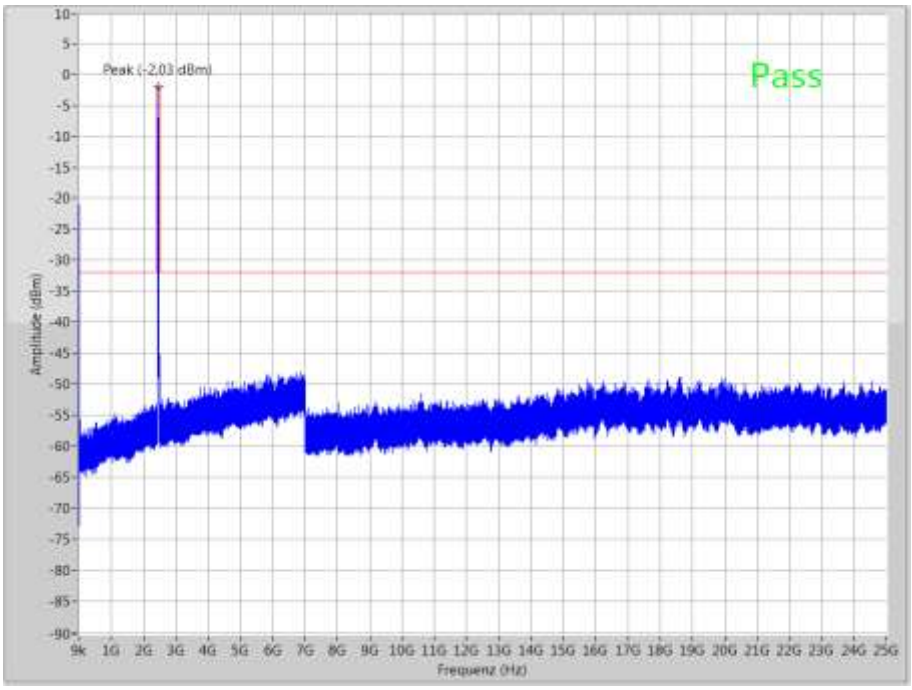
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

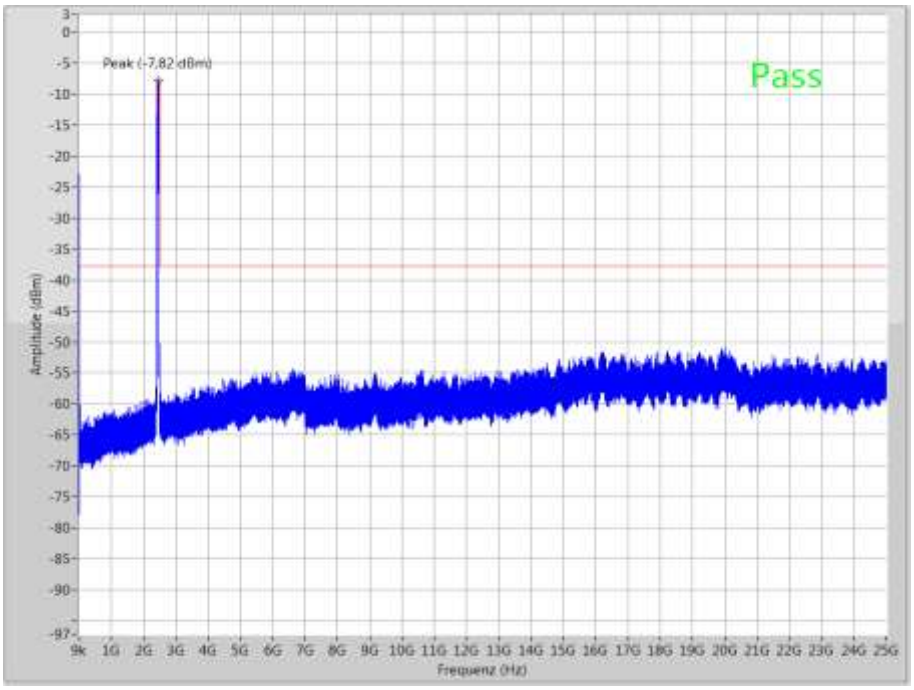
Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

Plots: OFDM / n – mode HT40

Plot 1: TX mode, mid channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

12.11 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW
Span:	30 MHz to 26 GHz
Trace-Mode:	Max Hold
Measured Modulation	☒ DSSS b – mode ☒ OFDM g – mode ☒ OFDM n – mode
Test setup:	See sub clause 7.1 – A See sub clause 7.2 – A See sub clause 7.3 – A
Measurement uncertainty	See sub clause 8

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

Limits:

FCC		IC
TX Spurious Emissions Radiated		
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results: DSSS / b – mode

TX Spurious Emissions Radiated [dBµV/m]								
DSSS / b – mode								
2417 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
All detected spurious are more than 6 dB below the limit			4874	PP	46	All detected spurious are more than 6 dB below the limit		

Results: OFDM / g – mode

TX Spurious Emissions Radiated [dBµV/m]								
DSSS / g – mode								
2417 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
All detected spurious are more than 6 dB below the limit			4876	PP	64.9	All detected spurious are more than 6 dB below the limit		
			4876	RMS	52.6			

Results: OFDM / n HT20 – mode

TX Spurious Emissions Radiated [dBµV/m]								
DSSS / n – mode								
2417 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
All detected spurious are more than 6 dB below the limit			4877	PP	62.3	All detected spurious are more than 6 dB below the limit		
			4877	RMS	50.0			

Results: OFDM / n HT40 – mode

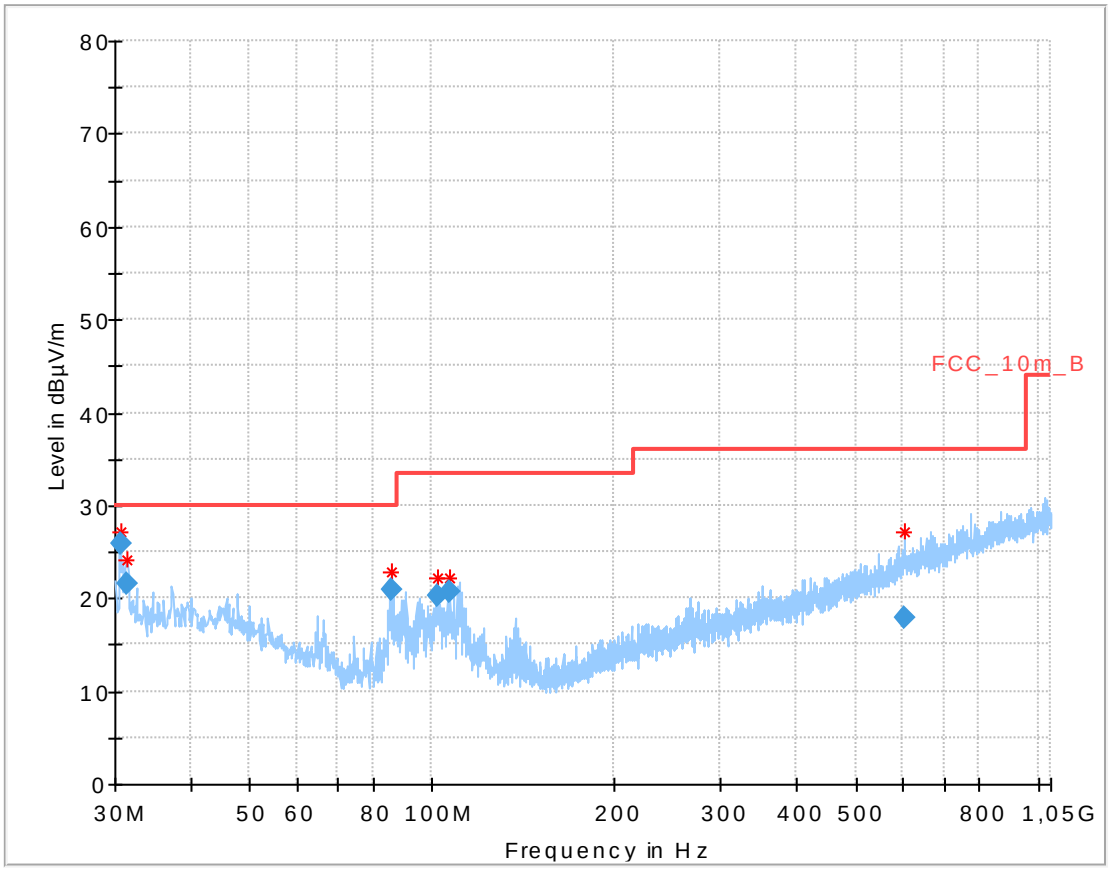
TX Spurious Emissions Radiated [dBµV/m]								
DSSS / n – mode								
2417 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
-/-			All detected spurious are more than 6 dB below the limit			-/-		

Verdict: **complies**

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

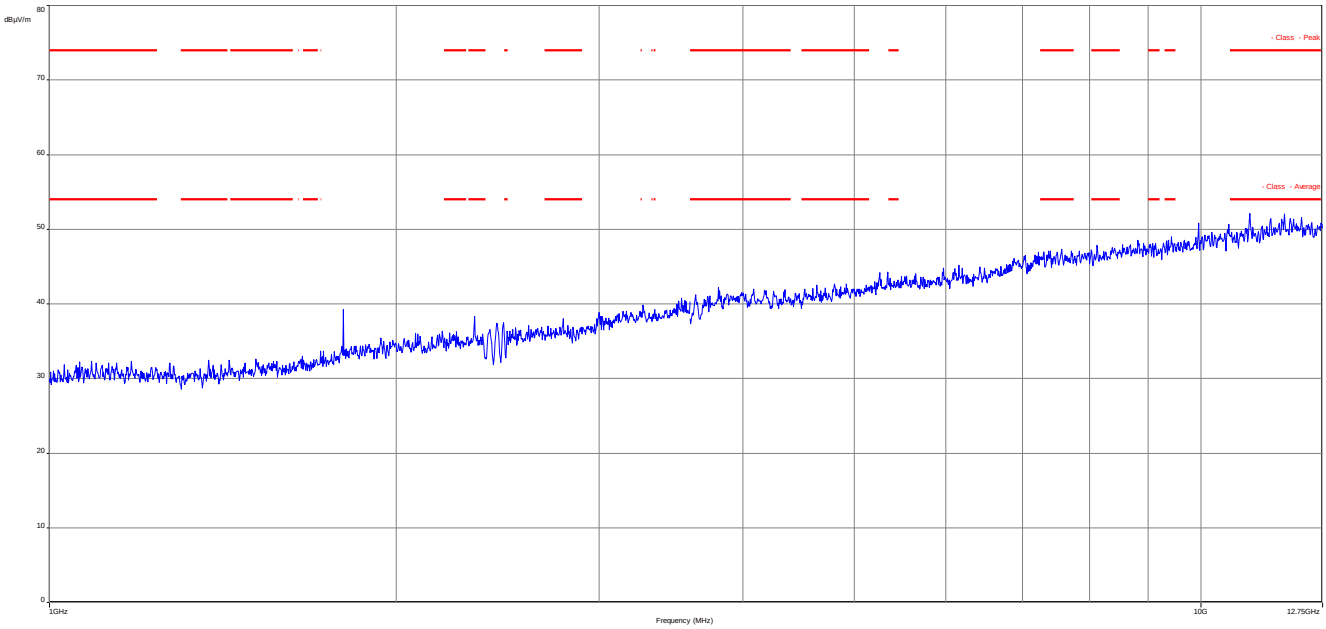
Plots: DSSS / b – mode

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization



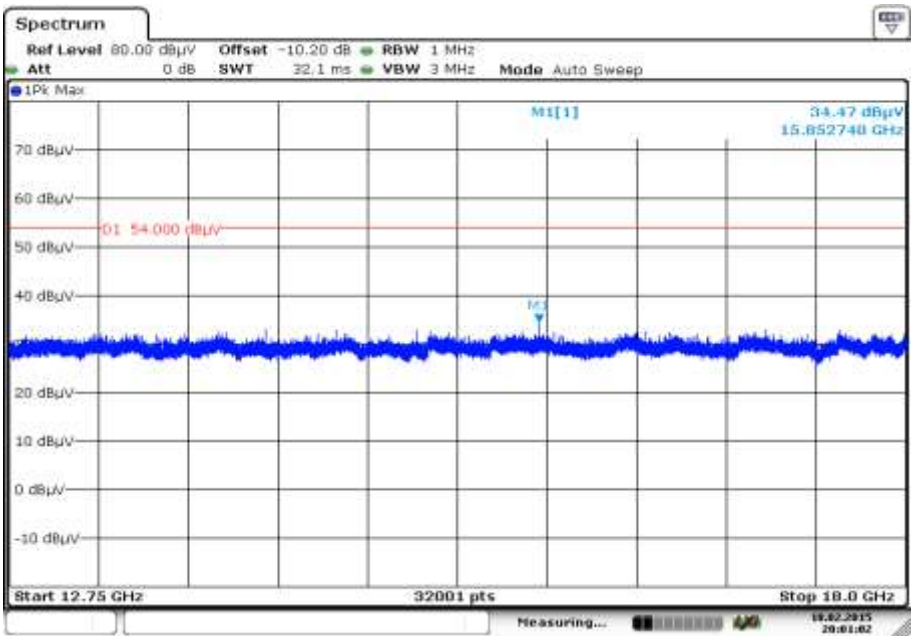
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.632700	25.83	30.00	4.17	1000.0	120.000	101.0	V	17	13.4
31.395900	21.51	30.00	8.49	1000.0	120.000	100.0	V	263	13.5
86.028300	20.89	30.00	9.11	1000.0	120.000	170.0	V	173	9.5
101.888550	20.23	33.50	13.27	1000.0	120.000	101.0	V	-7	12.0
106.675350	20.67	33.50	12.83	1000.0	120.000	170.0	V	-25	11.5
601.295400	17.80	36.00	18.20	1000.0	120.000	98.0	V	-6	20.7

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



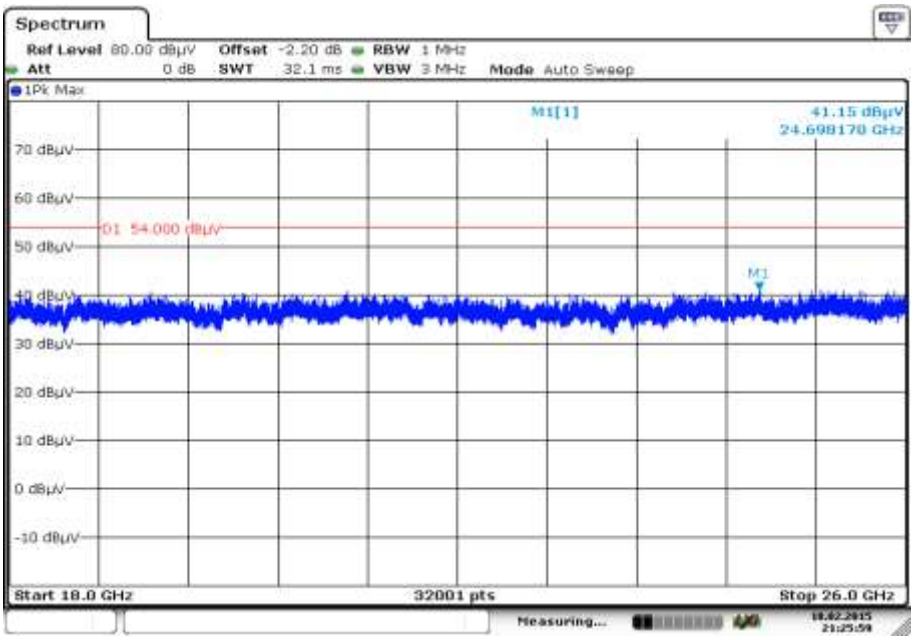
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



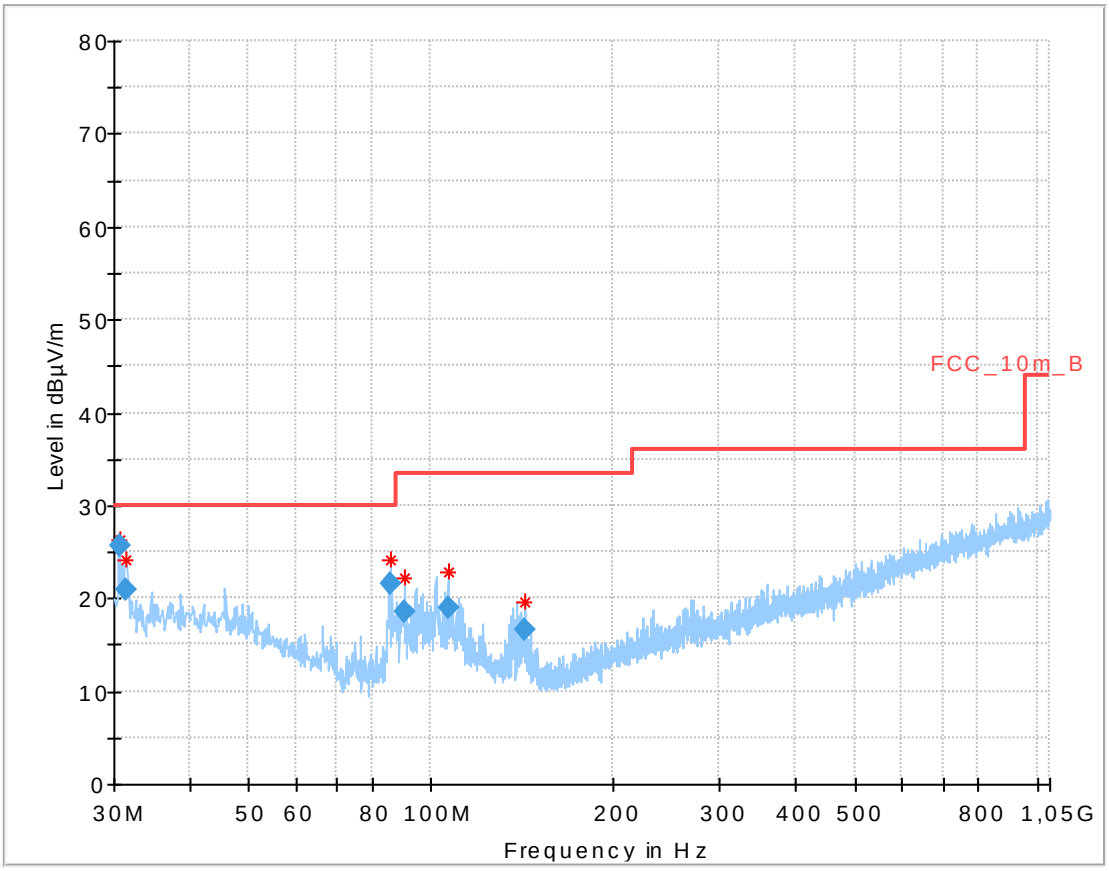
Date: 18.FEB.2015 20:01:03

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



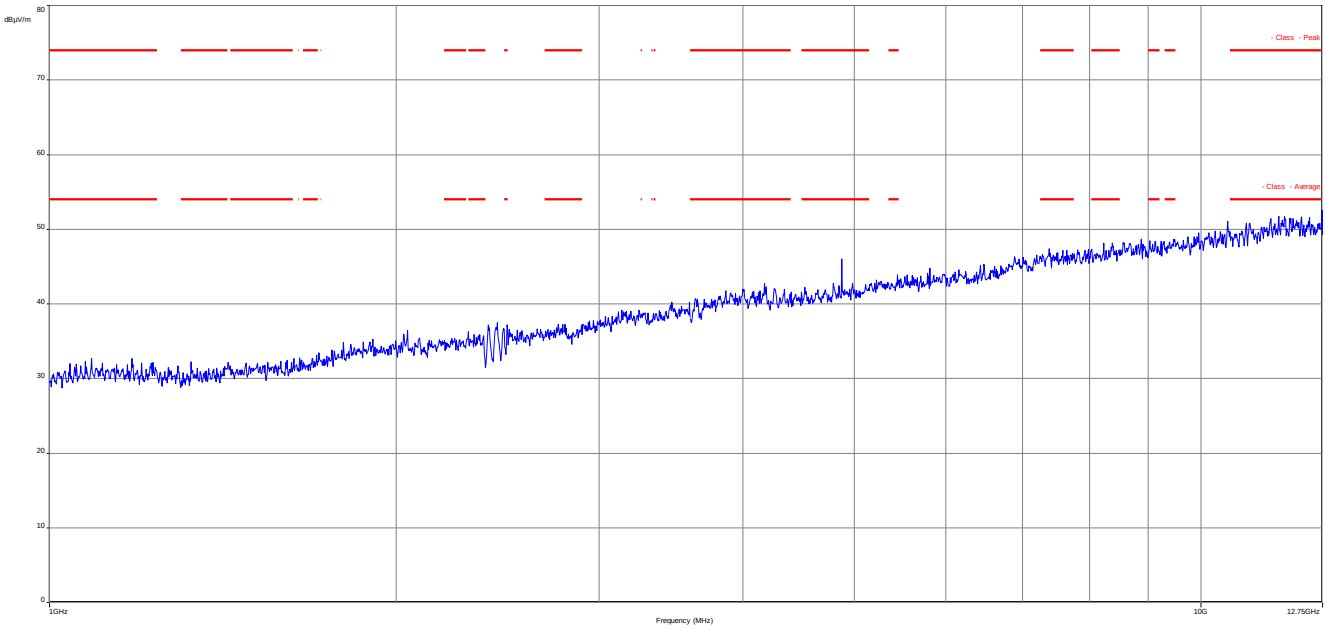
Date: 18.FEB.2015 21:25:59

Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization



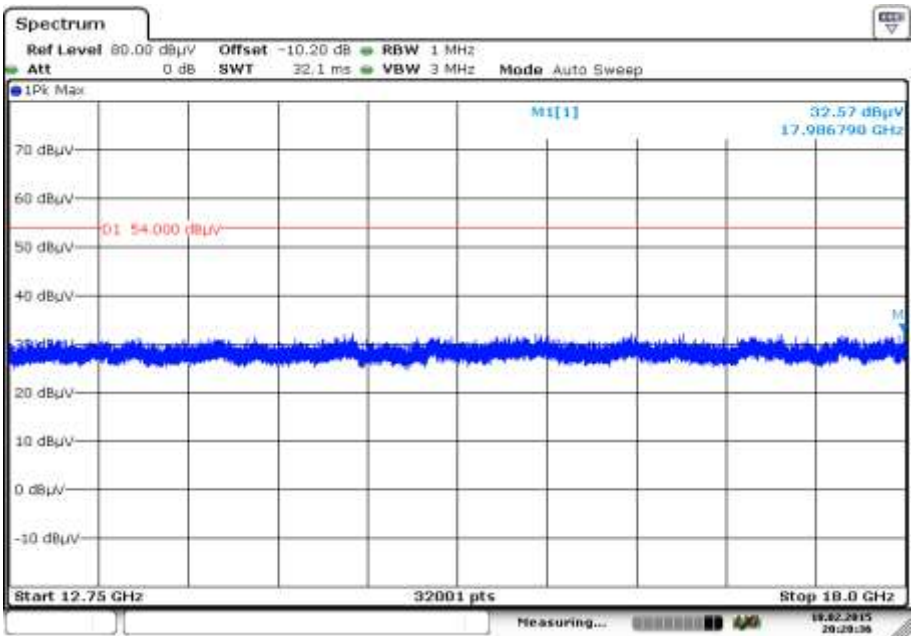
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.616882	25.74	30.00	4.26	1000.0	120.000	101.0	V	84	13.4
31.448850	20.95	30.00	9.05	1000.0	120.000	101.0	V	263	13.5
86.049450	21.61	30.00	8.39	1000.0	120.000	101.0	V	65	9.5
90.349950	18.51	33.50	14.99	1000.0	120.000	100.0	V	-25	10.5
106.707150	18.87	33.50	14.63	1000.0	120.000	98.0	V	263	11.5
143.294250	16.64	33.50	16.86	1000.0	120.000	170.0	V	287	8.8

Plot 6: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



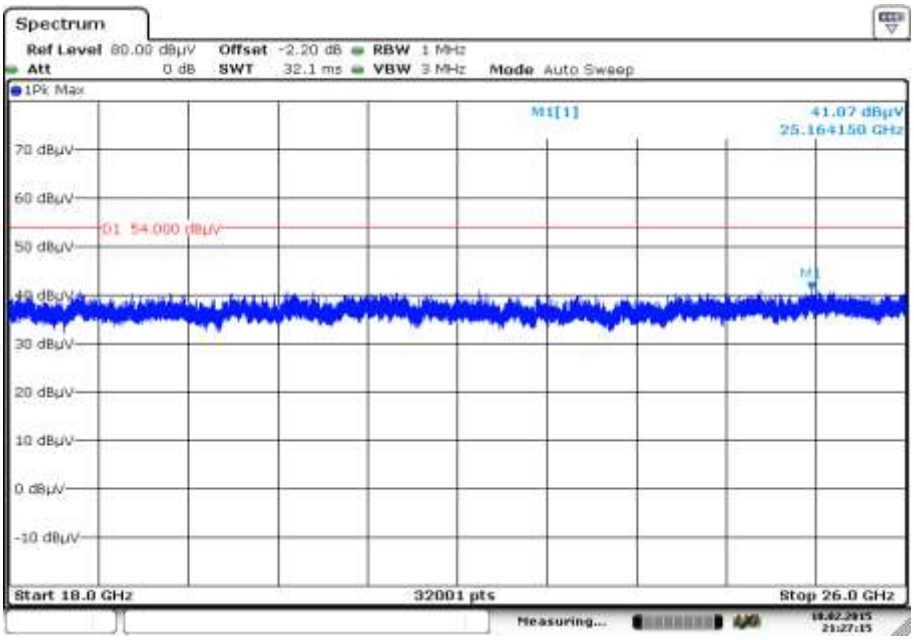
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



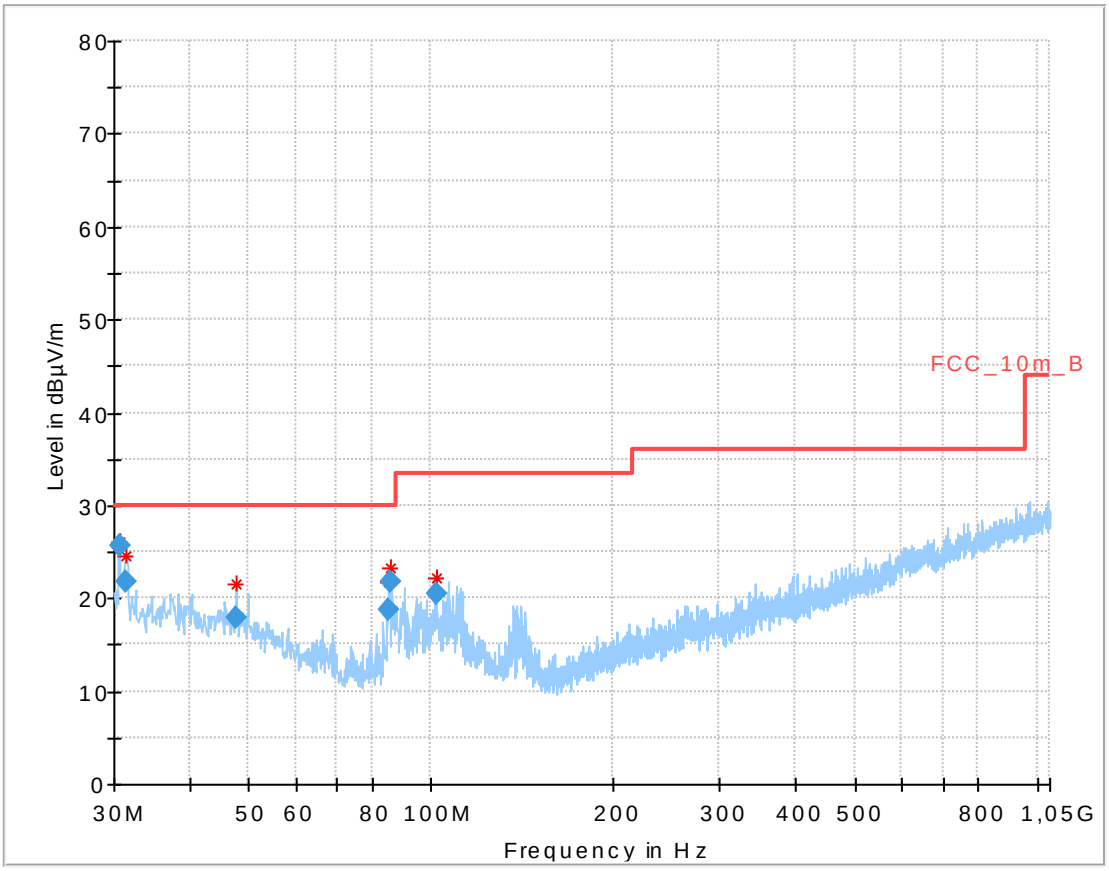
Date: 18.FEB.2015 20:28:36

Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



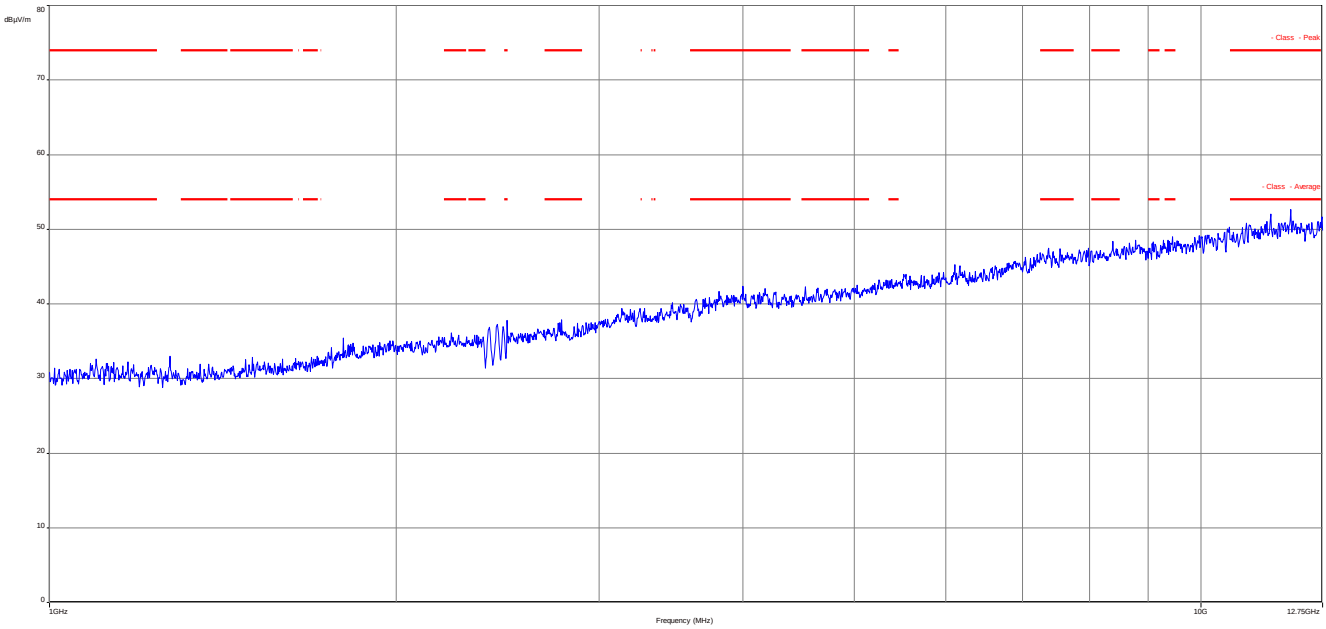
Date: 18.FEB.2015 21:27:15

Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization



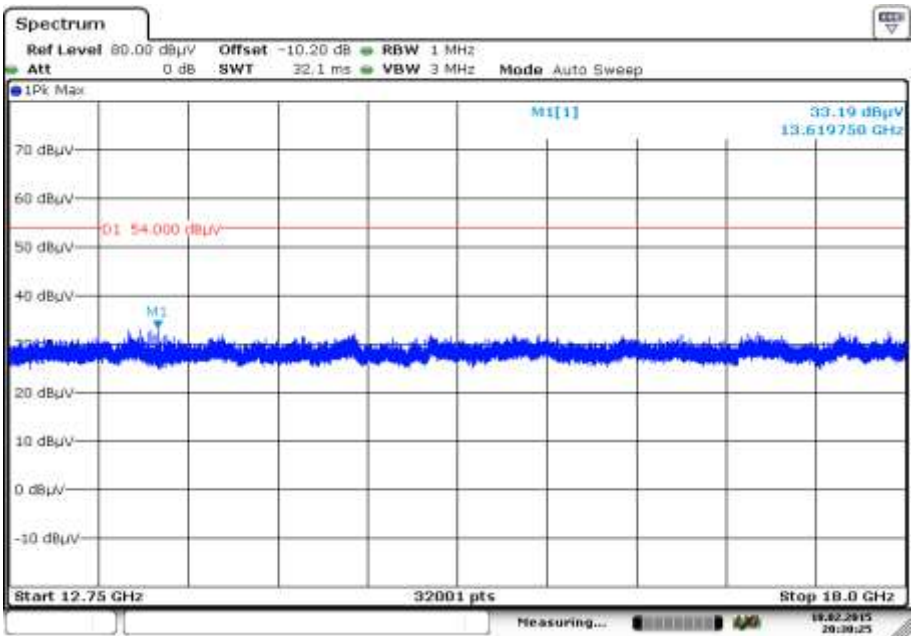
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.639499	25.67	30.00	4.33	1000.0	120.000	101.0	V	155	13.4
31.441500	21.78	30.00	8.22	1000.0	120.000	101.0	V	-6	13.5
47.777400	17.85	30.00	12.15	1000.0	120.000	98.0	V	65	13.2
85.454250	18.84	30.00	11.16	1000.0	120.000	170.0	V	115	9.4
86.056500	21.68	30.00	8.32	1000.0	120.000	170.0	V	155	9.5
101.880000	20.40	33.50	13.10	1000.0	120.000	98.0	V	-6	12.0

Plot 10: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



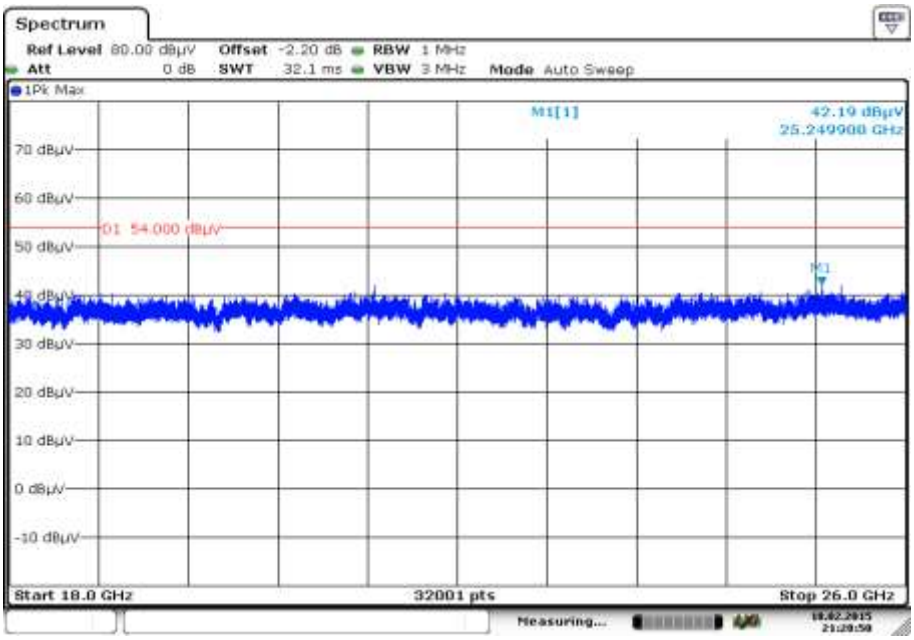
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



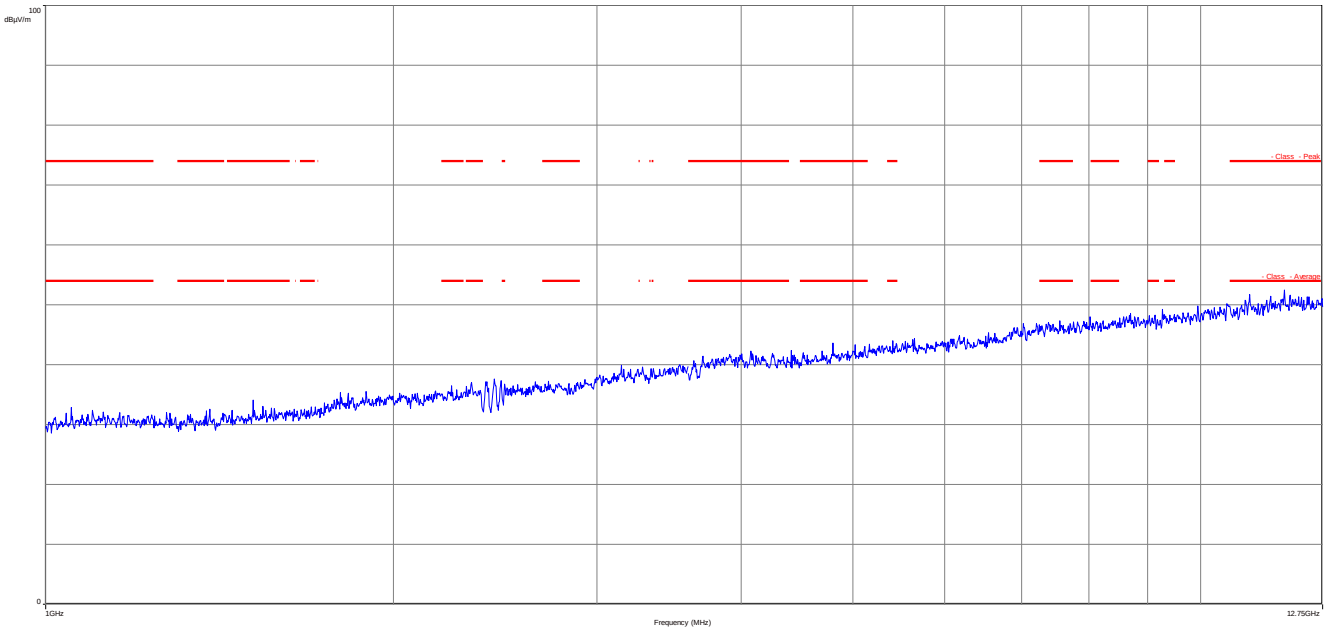
Date: 18.FEB.2015 20:30:26

Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



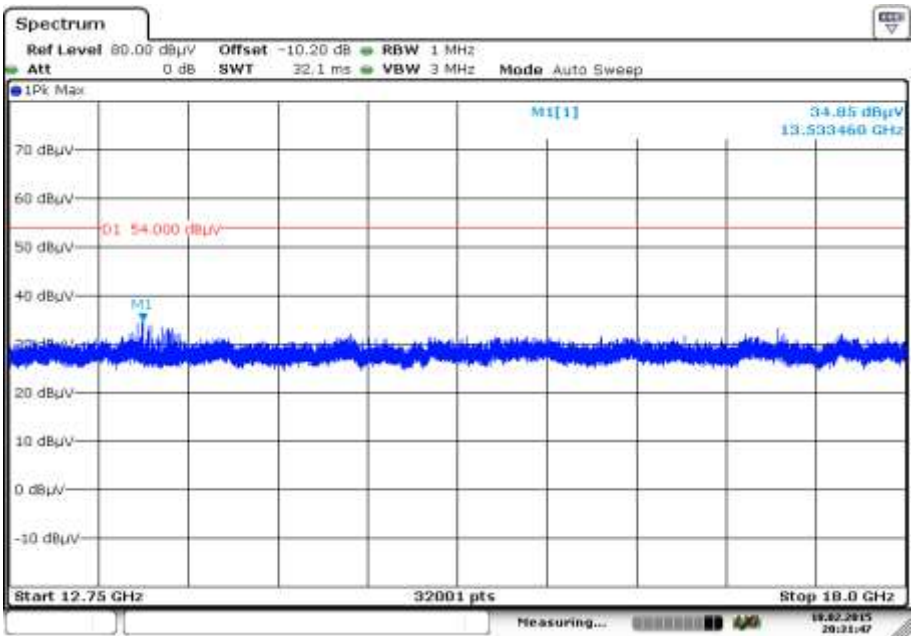
Plots: OFDM / g – mode

Plot 1: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



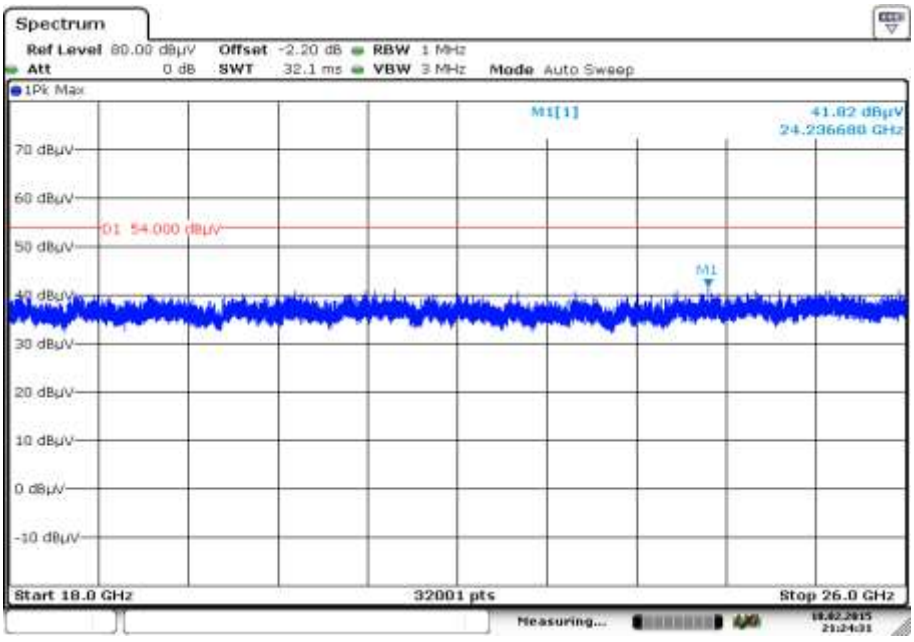
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

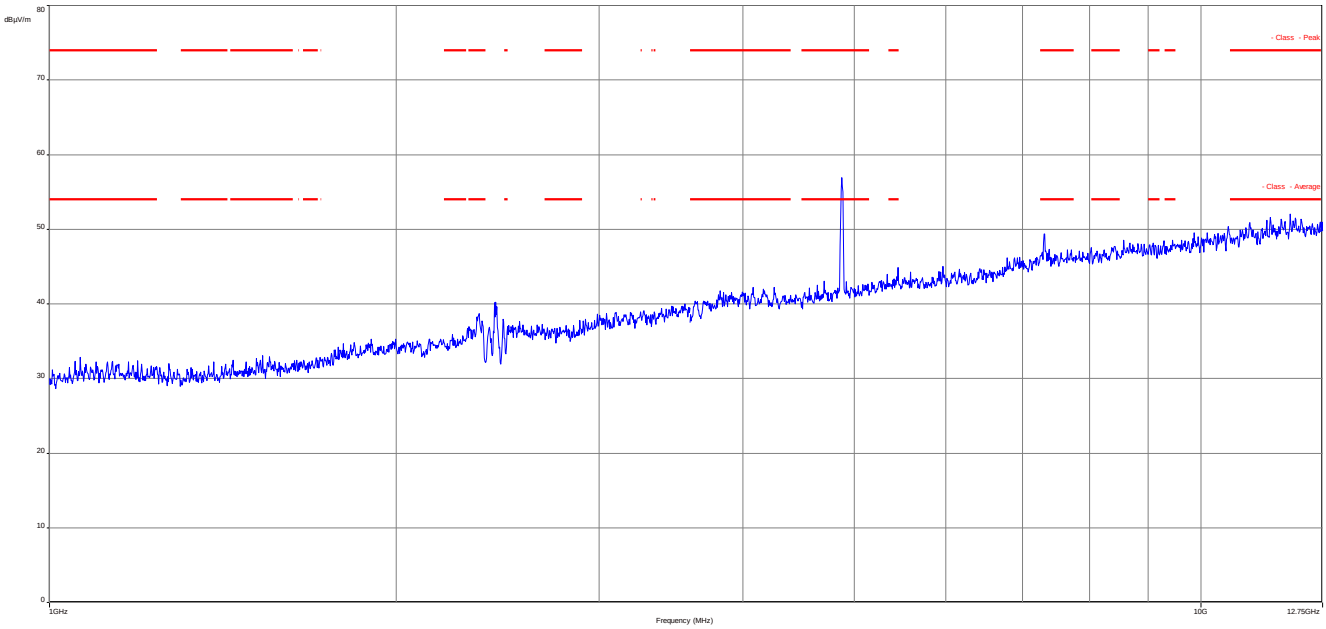


Date: 18.FEB.2015 20:31:48

Plot 3: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

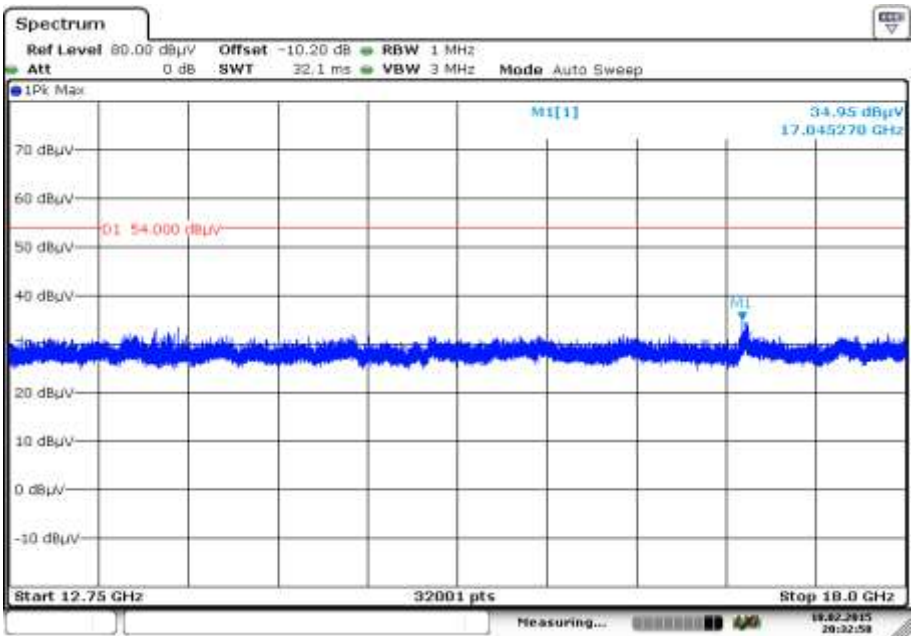


Plot 4: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



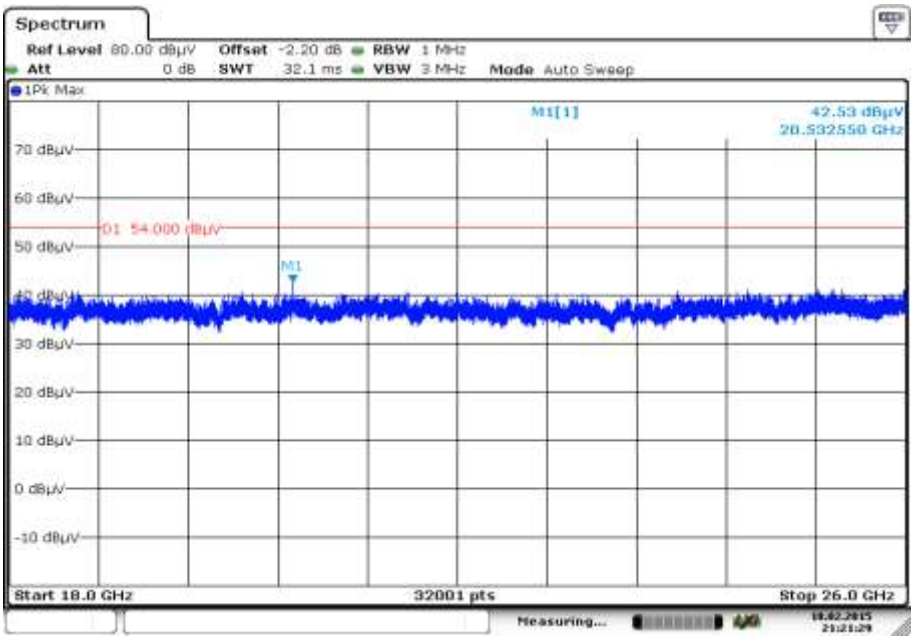
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 5: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



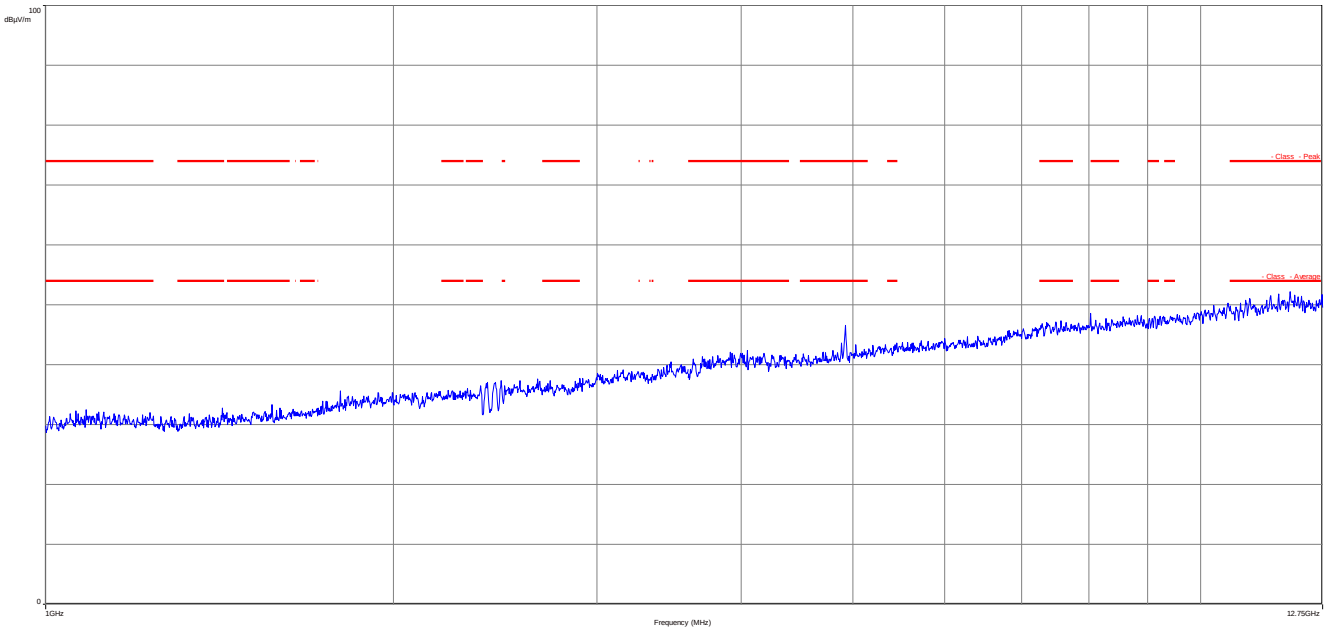
Date: 18.FEB.2015 20:32:58

Plot 6: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



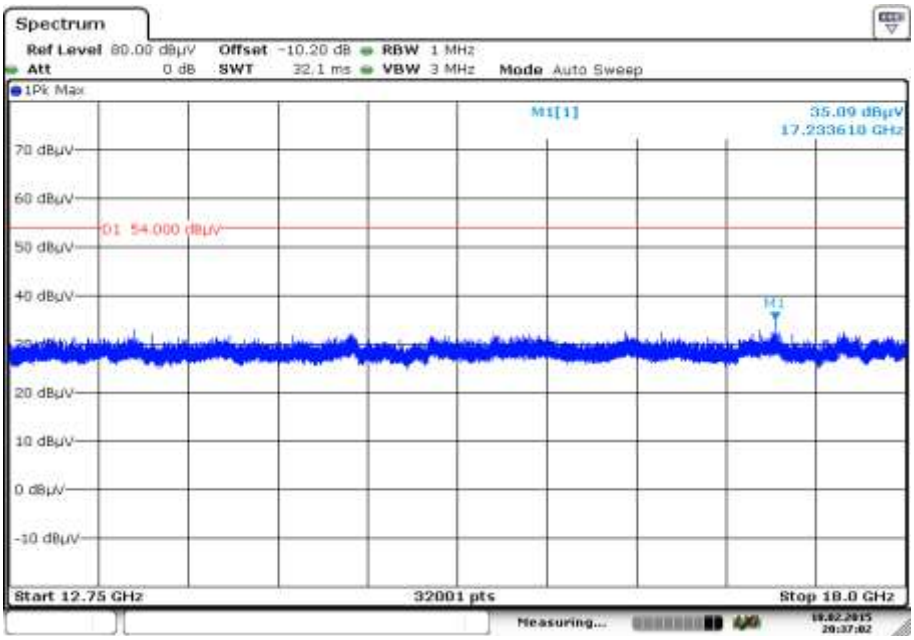
Date: 18.FEB.2015 21:21:30

Plot 7: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



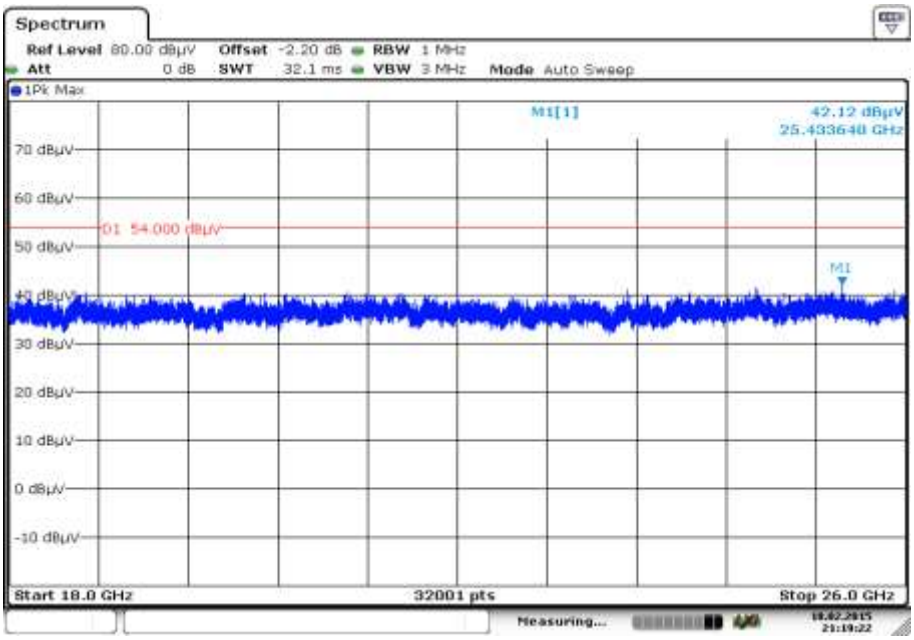
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 8: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 20:37:03

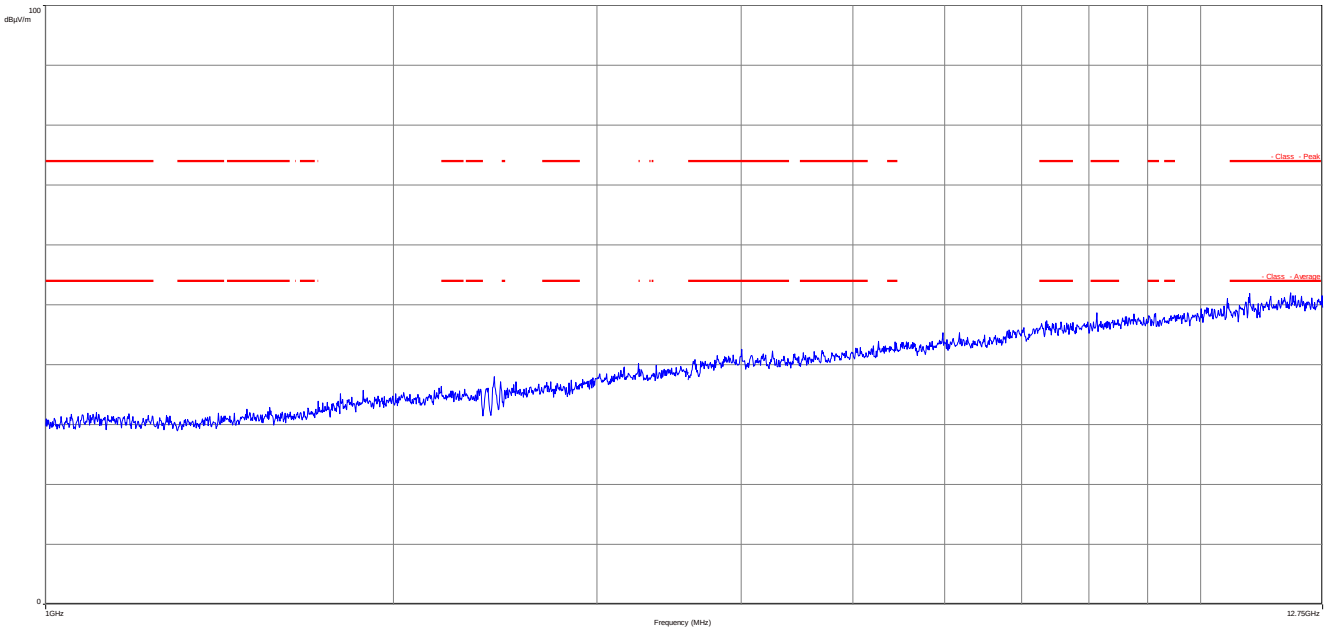
Plot 9: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 21:19:22

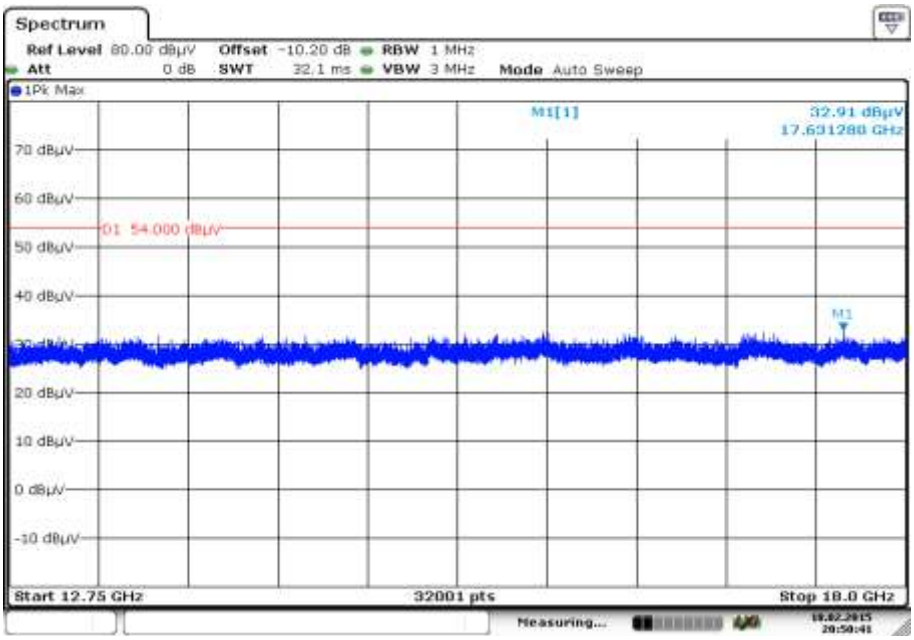
Plots: OFDM / n – mode HT20

Plot 1: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



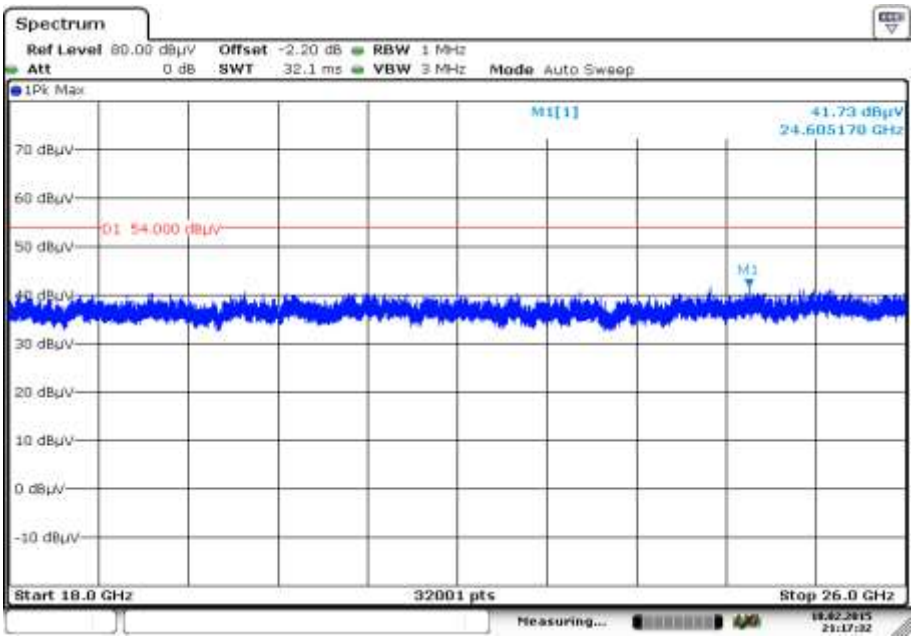
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



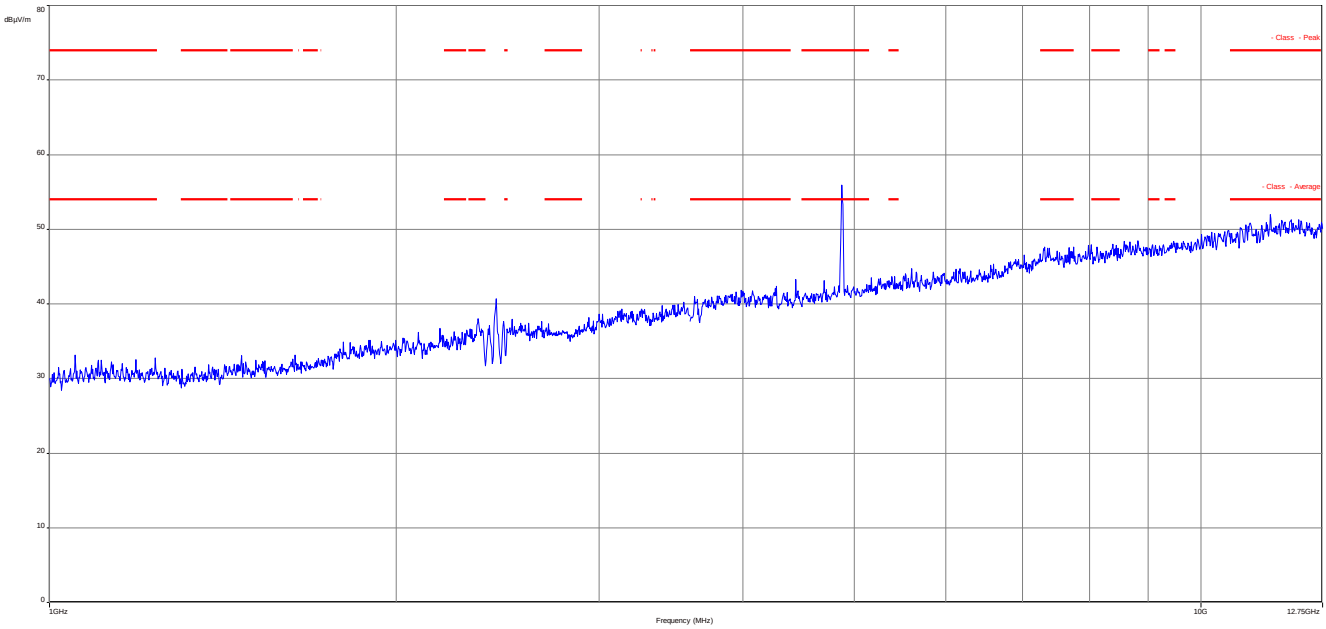
Date: 18.FEB.2015 20:50:42

Plot 3: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



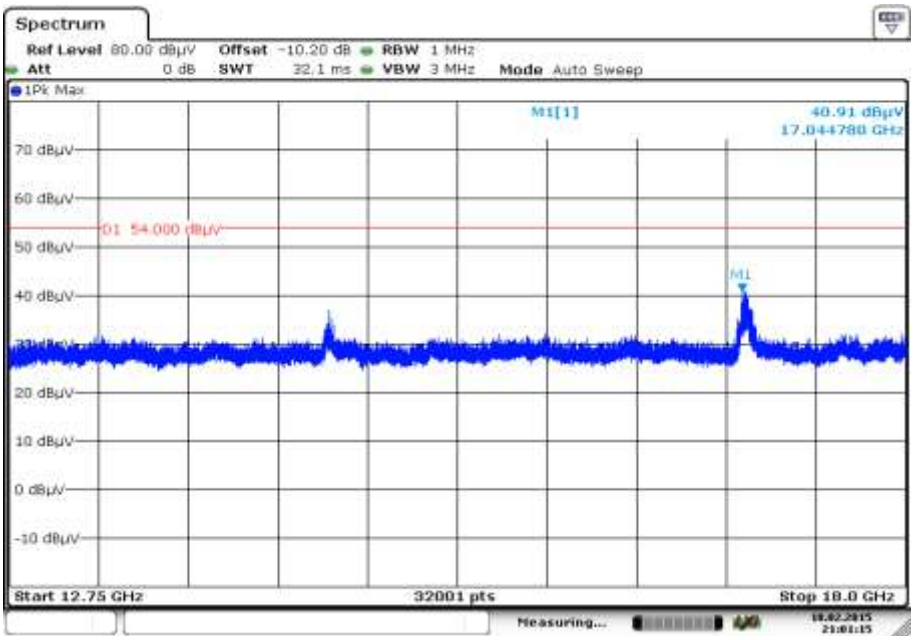
Date: 18.FEB.2015 21:17:32

Plot 4: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



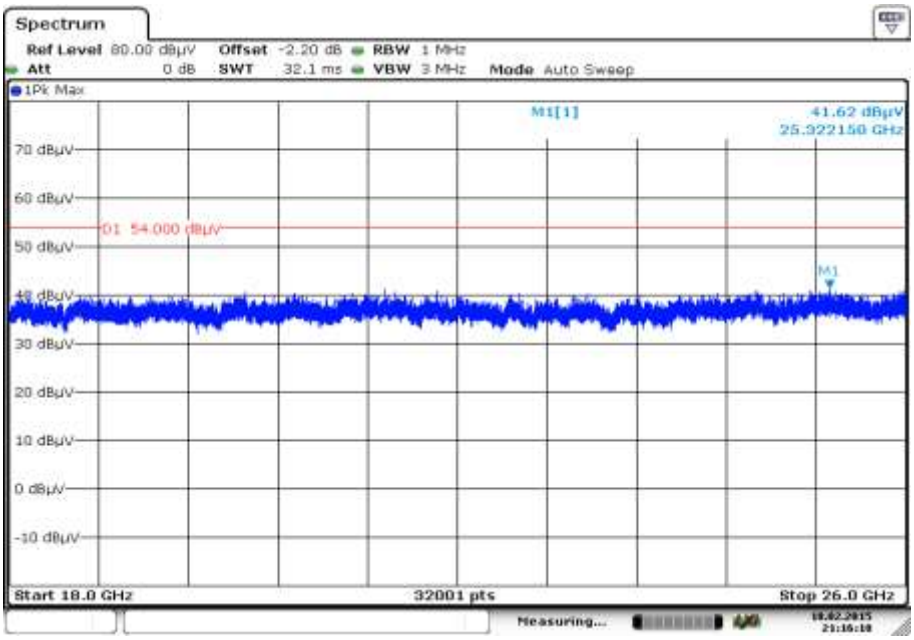
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 5: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



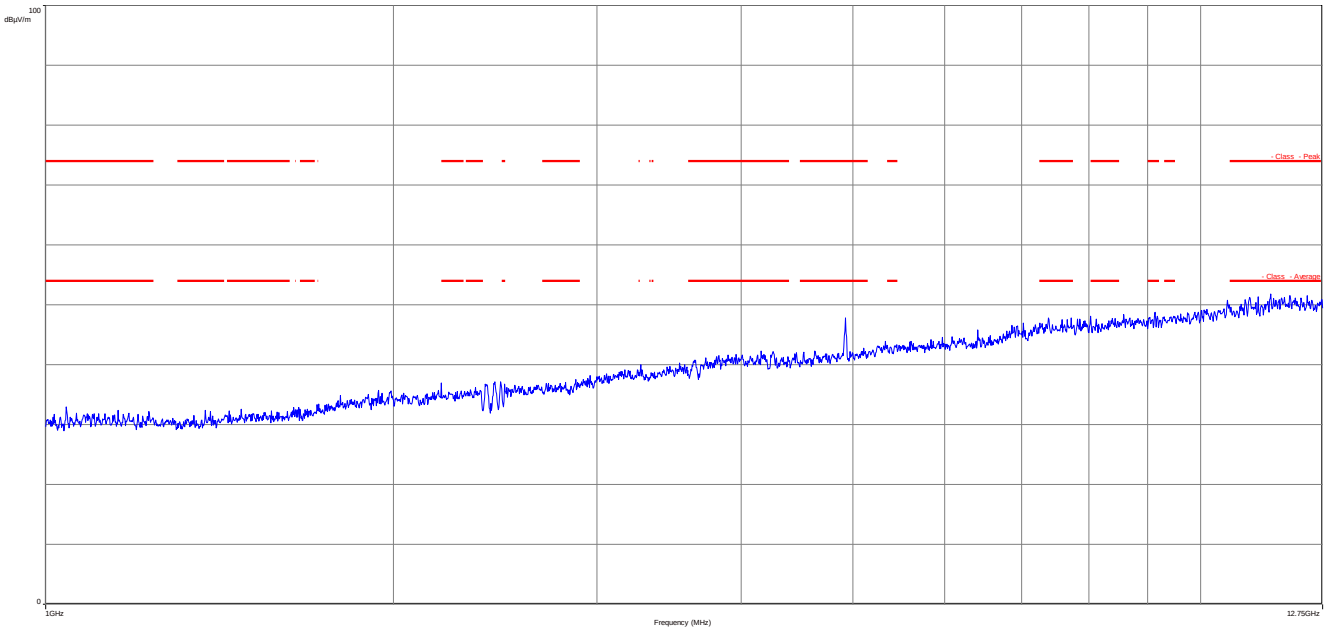
Date: 18.FEB.2015 21:01:15

Plot 6: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



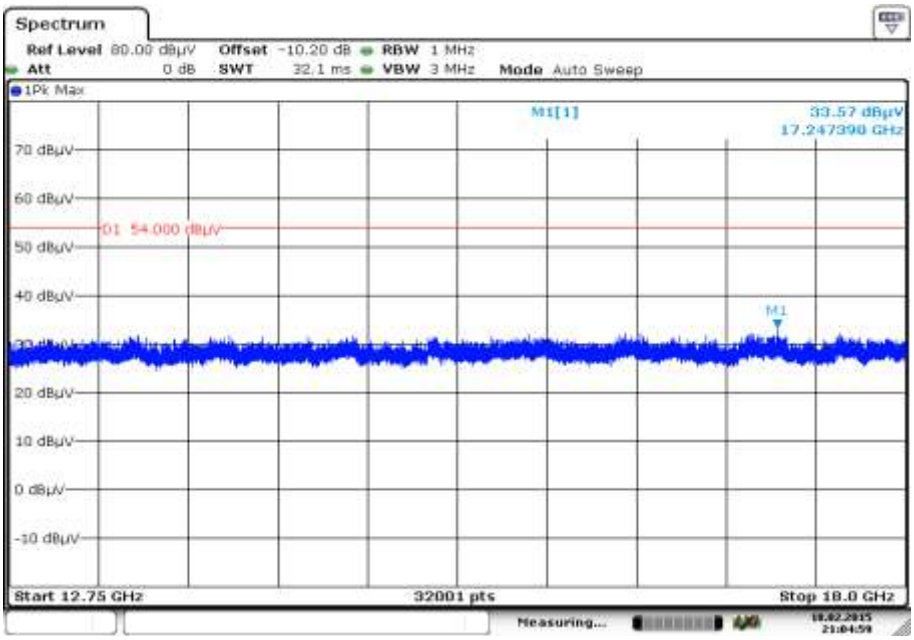
Date: 18.FEB.2015 21:16:18

Plot 7: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



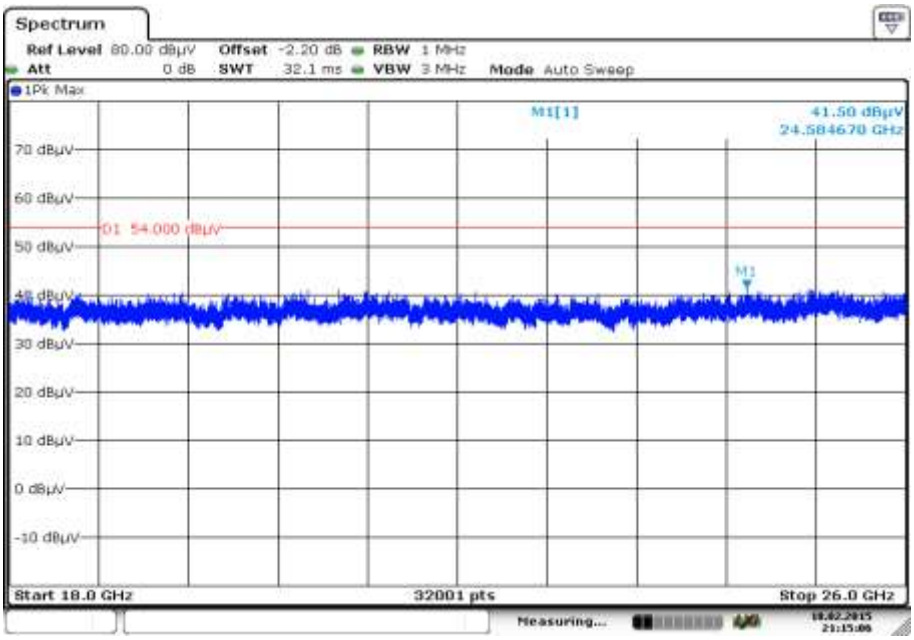
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 8: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 21:04:59

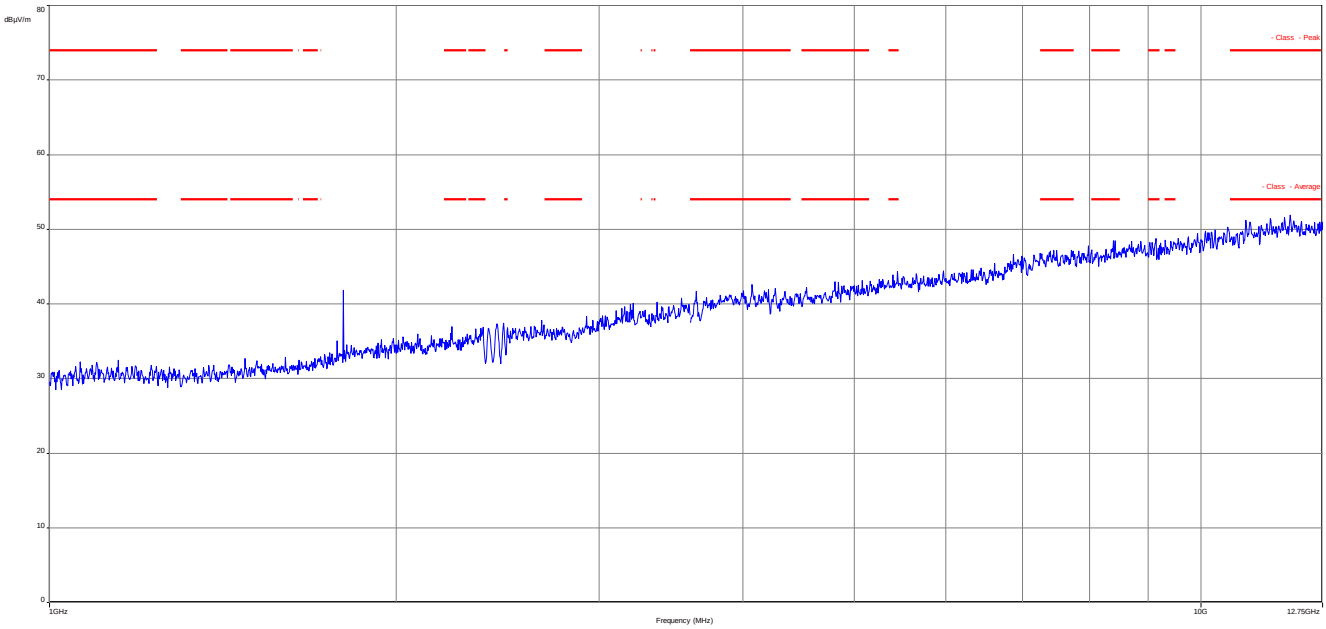
Plot 9: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 21:15:06

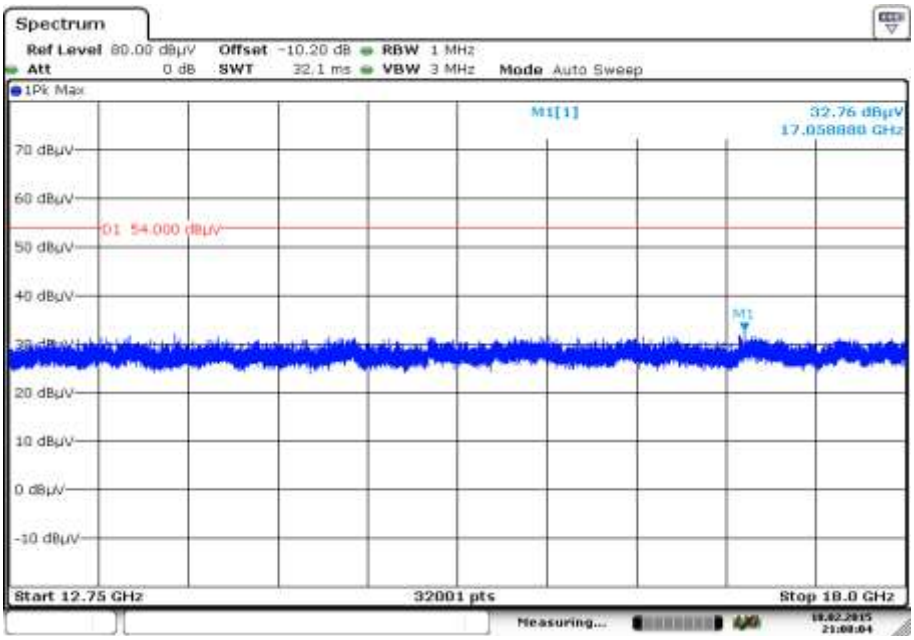
Plots: OFDM / n – mode HT40

Plot 1: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



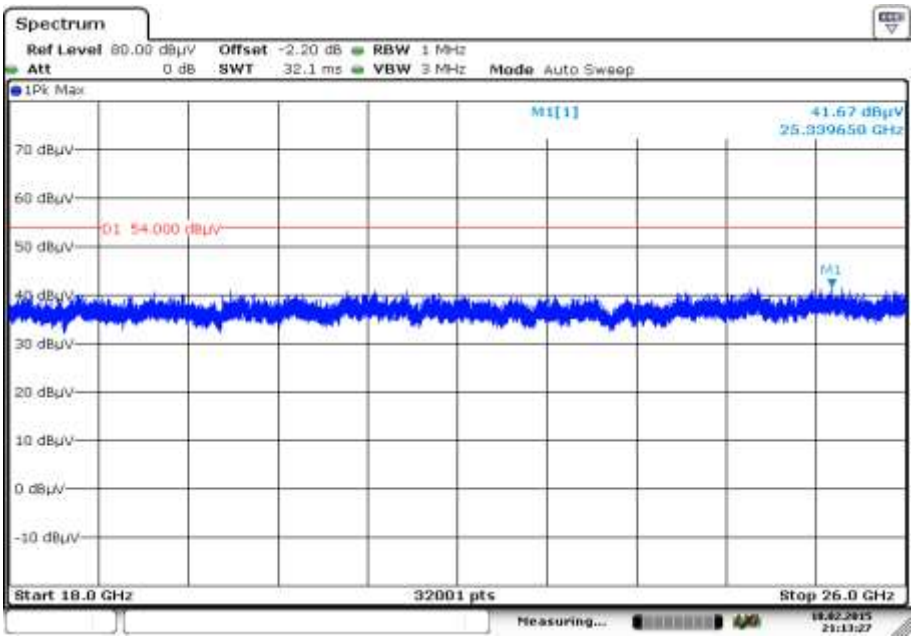
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 21:08:04

Plot 3: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



12.12 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode. The results are valid for both modes.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW
Span:	30 MHz to 26 GHz
Trace mode:	Max Hold
Test setup:	See sub clause 7.1 – A See sub clause 7.2 – A See sub clause 7.3 – A
Measurement uncertainty	See sub clause 8

Limits:

FCC		IC
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

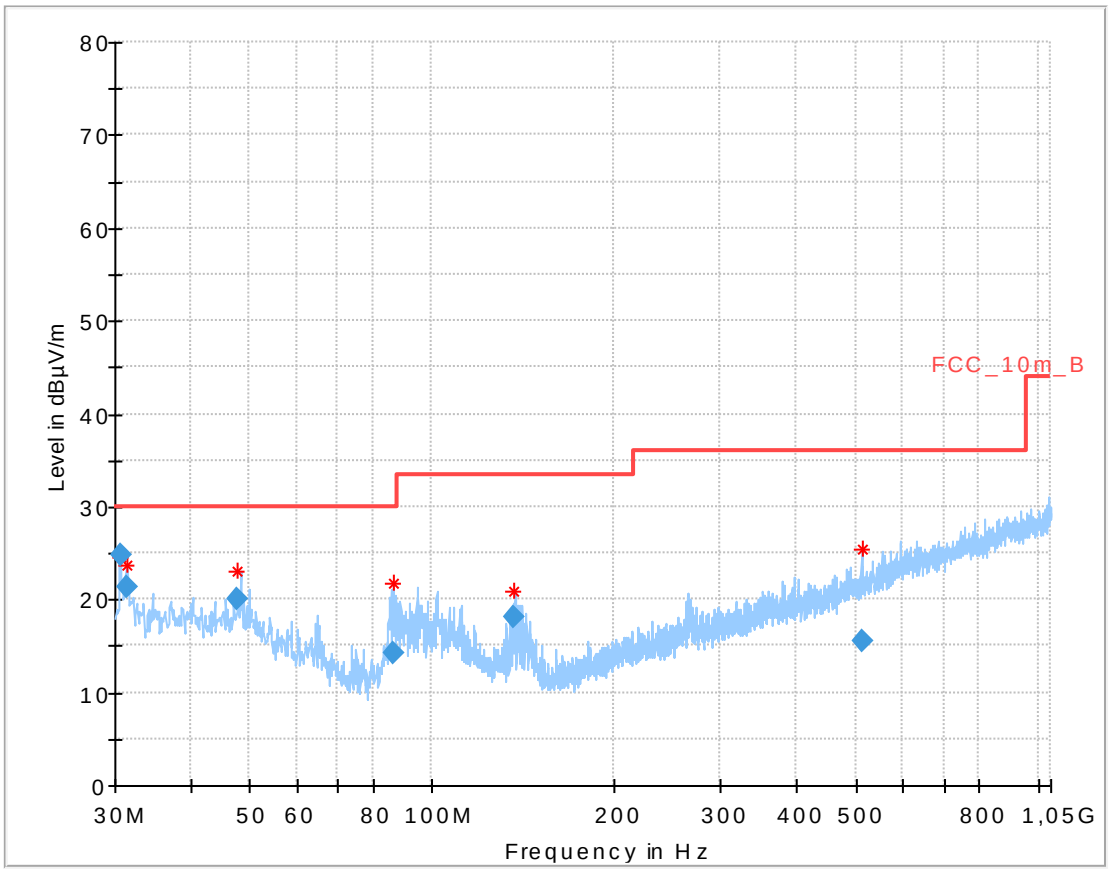
Results:

RX Spurious Emissions Radiated [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
No spurious emissions above 1 GHz detected.		

Verdict: complies

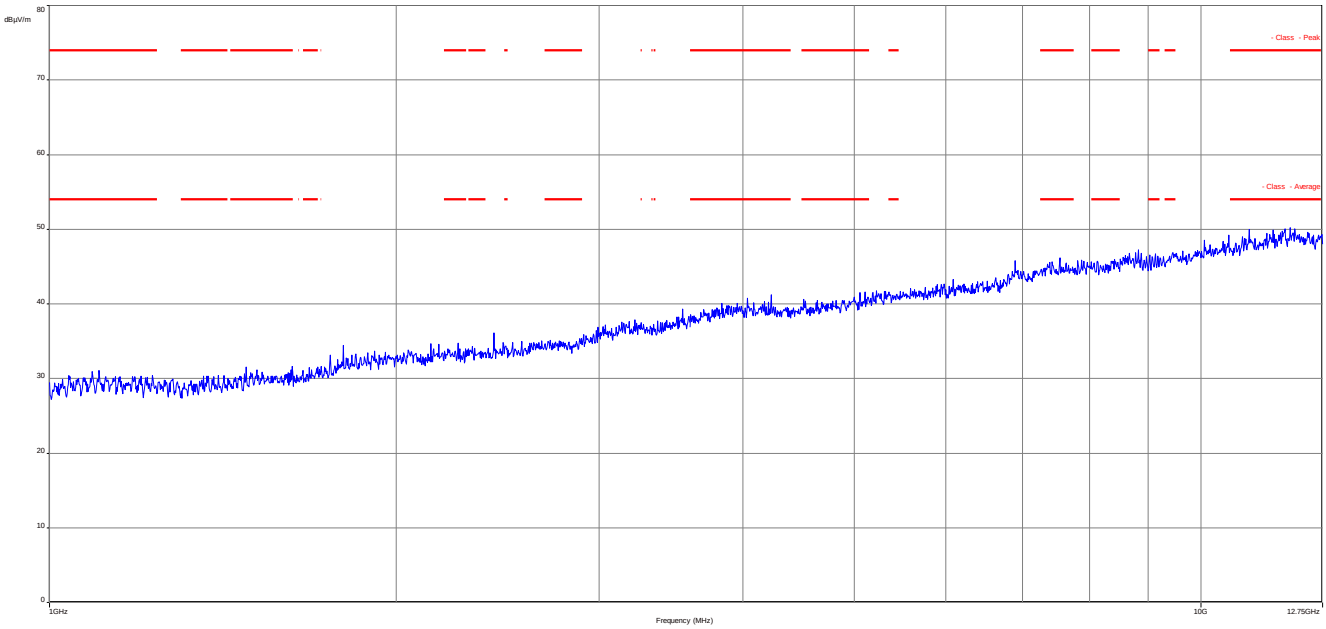
Plots: RX / Idle – mode

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

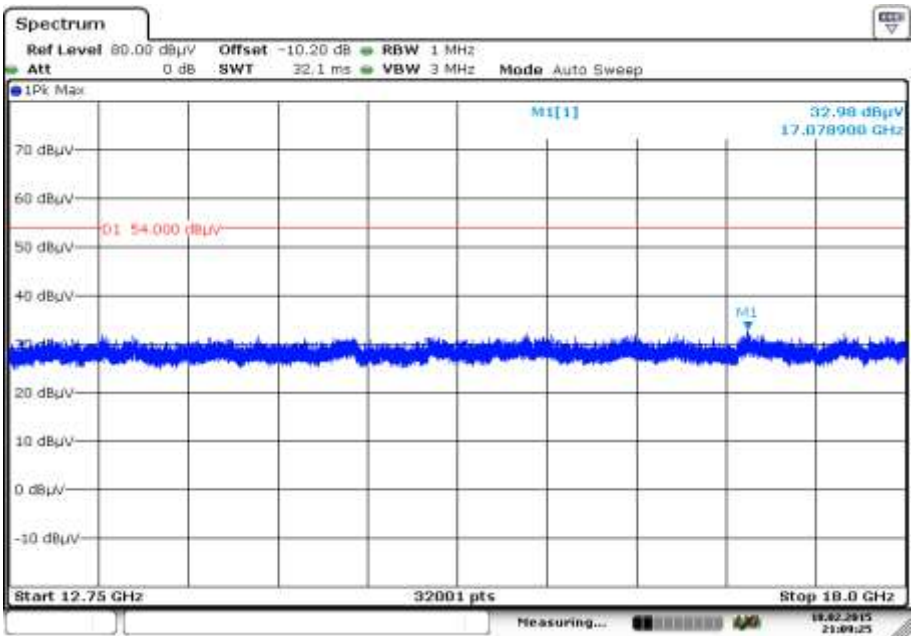


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.625346	24.80	30.00	5.20	1000.0	120.000	101.0	V	-24	13.4
31.402650	21.40	30.00	8.60	1000.0	120.000	101.0	V	-6	13.5
47.812650	19.97	30.00	10.03	1000.0	120.000	98.0	V	-6	13.2
86.117550	14.22	30.00	15.78	1000.0	120.000	170.0	V	-25	9.6
136.930200	18.12	33.50	15.38	1000.0	120.000	170.0	V	288	8.9
511.473000	15.61	36.00	20.39	1000.0	120.000	170.0	H	25	18.8

Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization

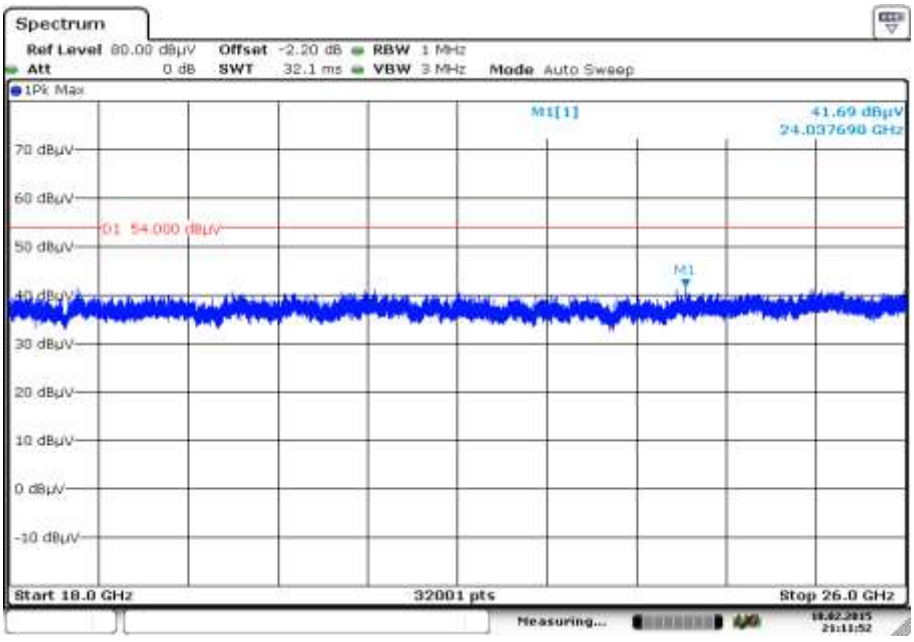


Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 21:09:26

Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 18.FEB.2015 21:11:53

12.13 Spurious emissions radiated below 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is representative for all channels and modes. If peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold
Test setup:	See sub clause 7.2 - B
Measurement uncertainty	See sub clause 8

Limits:

FCC		IC
TX Spurious Emissions Radiated < 30 MHz		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

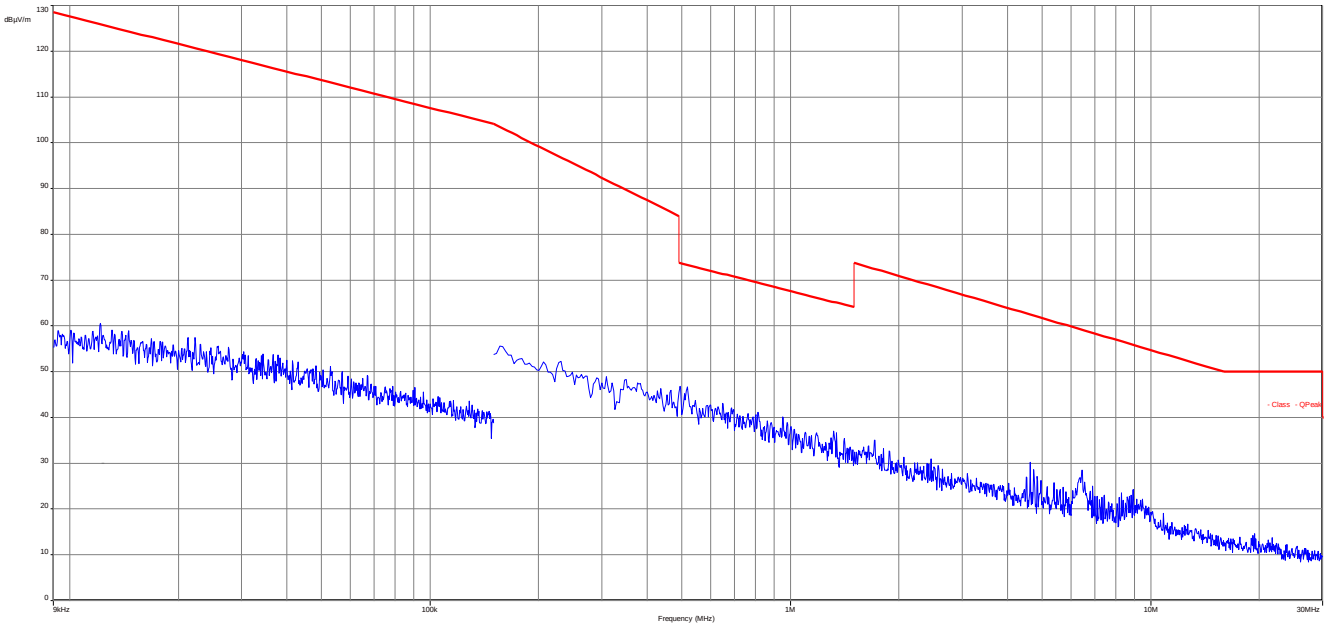
Results:

TX Spurious Emissions Radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No peaks detected.		

Verdict: complies

Plots: TX mode

Plot 1: 9 kHz to 30 MHz



12.14 Spurious emissions conducted below 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is repeated for DSSS and OFDM modulation. If peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold
Test setup:	See sub clause 7.4 – A (TX/RX)
Measurement uncertainty	See sub clause 8

Limits:

FCC		IC
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBµV/m)	Average (dBµV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

*Decreases with the logarithm of the frequency

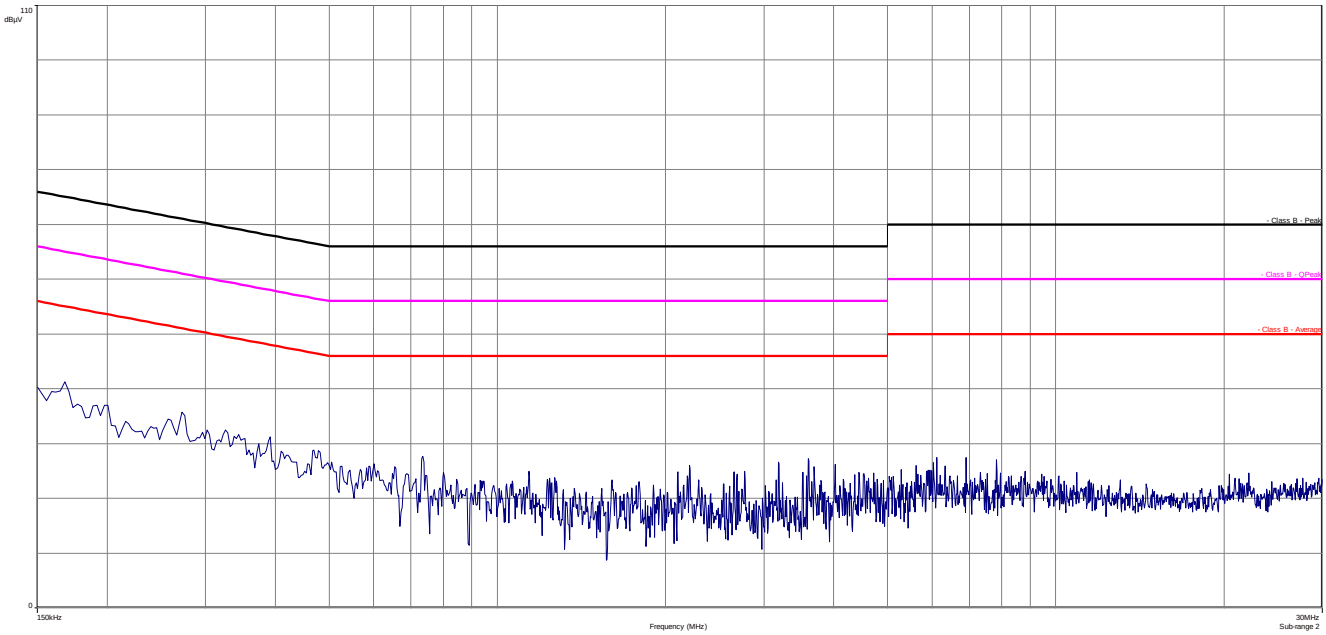
Results:

TX Spurious Emissions Conducted < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No peaks detected.		

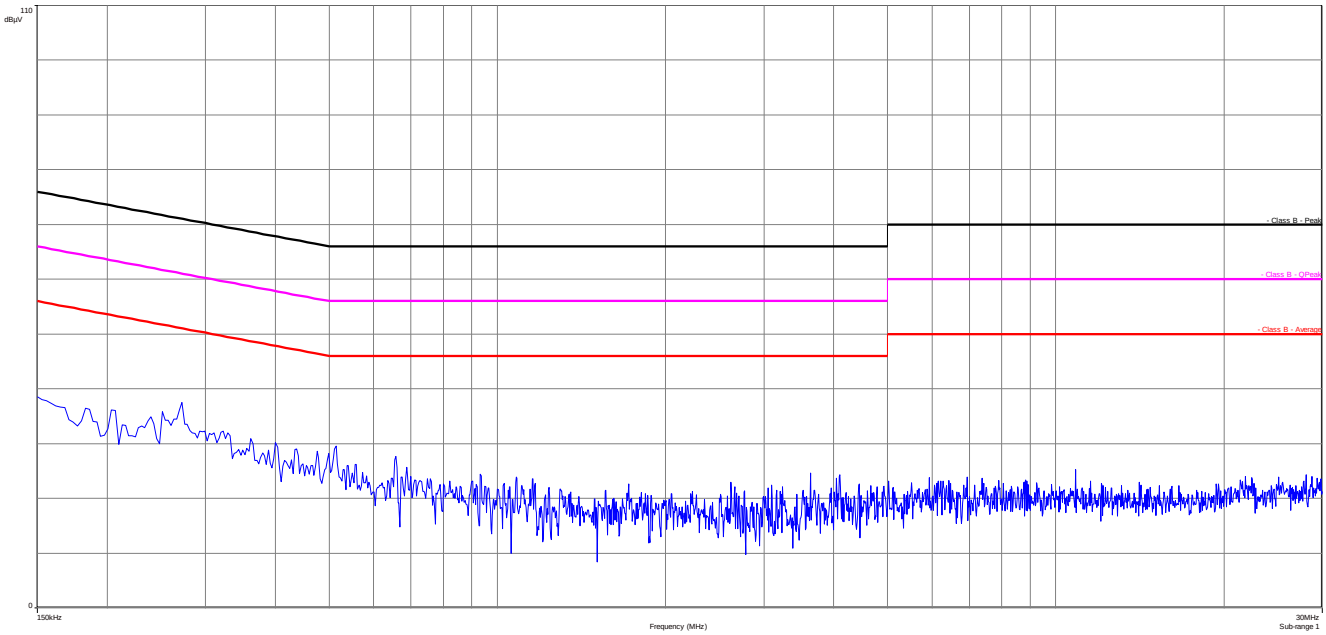
Verdict: complies

Plots:

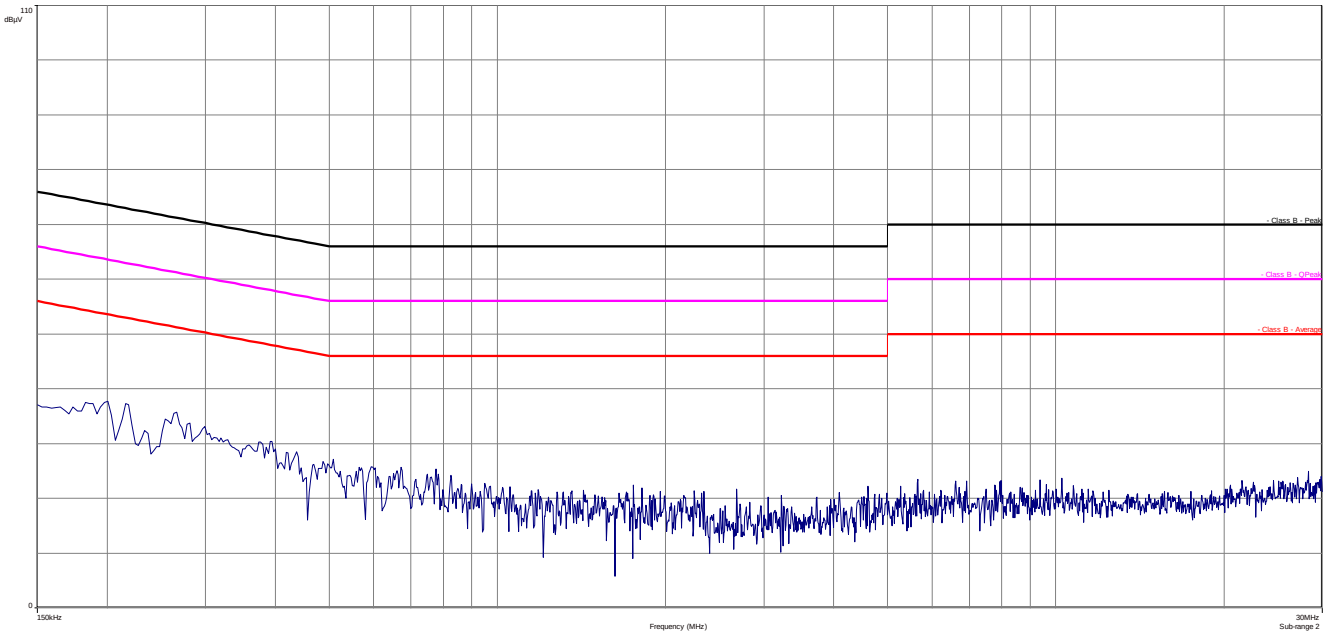
Plot 1: TX mode, 150 kHz to 30 MHz, phase line



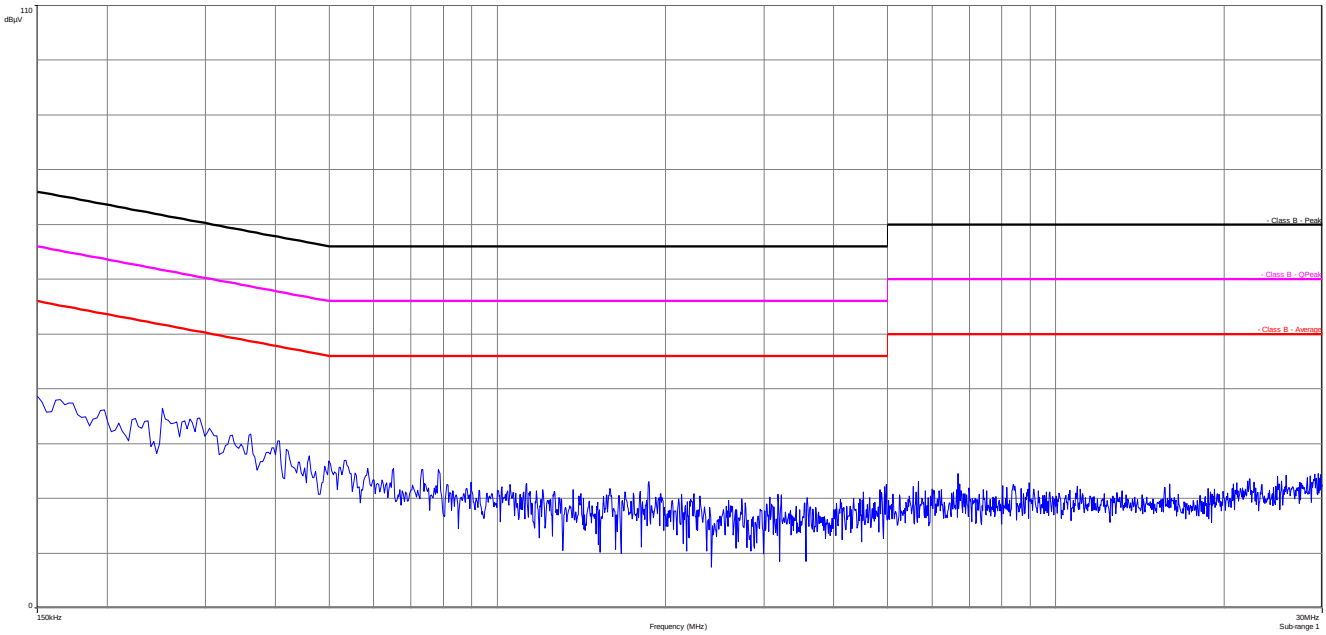
Plot 2: TX mode, 150 kHz to 30 MHz, neutral line



Plot 3: RX / Idle – mode, 150 kHz to 30 MHz, phase line



Plot 4: RX / Idle – mode, 150 kHz to 30 MHz, neutral line



13 Observations

No observations except those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2015-04-27
A	editorial changes	2015-07-27

Annex B Further information

Glossary

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software

Annex C Accreditation Certificate

Front side of certificate

Deutsche Akkreditierungsstelle GmbH

Akkreditierung

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

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Smart Card Terminals
Bluetooth
Wi-Fi Services

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Note:

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