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Test report

FCC-15.247 and RSS-247 2016#309974

Date of issue: July 15, 2016

Applicant: Electronic Systems Technology, Inc.

Product: Wireless Modem (902-928 MHz, Wi-Fi)

Model: Horizon 900 Model# 216AD Model variant: N/A

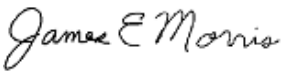
FCC ID: ENPHZN216AD IC Registration number: 2163A-216AD

Specifications:

- FCC 47 CFR Part 15 Subpart C, §15.247
  Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz
- RSS-247, Issue 1, May 2015
  Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Test location

Company name	Nemko USA, Inc.
Address	2210 Faraday Ave, Suite 150
City	Carlsbad
Province	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
Site number	FCC: US5058; IC: 2040B

Tested by	Feng You, Sr. Wireless Engineer
Reviewed by	James Morris, EMC and Wireless Divisions Manager
Review date	July 19, 2016
Reviewer signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

Copyright notification

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Electronic Systems Technology, Inc.
Address	415 N. Quay Street, Bldg. B-1
City	Kennewick
Province/State	WA
Postal/Zip code	99336
Country	U.S.A.

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.247	Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz
RSS-247, Issue 1	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.3 Test methods

ANSI C64.3-2014	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

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

None

1.6 Test report revision history

Revision #	Details of changes made to test report
1	Original report issued

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.207(a)	Conducted limits	Pass
§15.31(e)	Variation of power source	Pass[1]
§15.203	Antenna requirement	Pass[2]
§15.205	Restricted bands of operation	Pass

Notes: [1] Test performed with extreme of rated voltage 100-240V AC.

[2] The EUT uses a unique antenna coupling – R-TNC.

2.2 FCC Part 15 Subpart C, intentional radiators test results

Part	Test description	Verdict
§15.247(a)(1)	20 dB bandwidth of the hopping channel	Not applicable
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Pass
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band	Not applicable
§15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands	Pass
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	Not applicable
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	Not applicable
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Pass
§15.247(f)	Time of occupancy for hybrid systems	Not applicable

2.3 IC RSS-GEN, Issue 4, test results

Part	Test description	Verdict
7.1.2	Receiver radiated emission limits	Not applicable
7.1.3	Receiver conducted emission limits	Not applicable
8.8	Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus	Pass
8.10	Restricted Frequency Bands	Pass

Notes: [1] According to sections 5.2 and 5.3 of RSS-Gen, Issue 4 the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

2.4 IC RSS-247, Issue 1, test results

Part	Test description	Verdict
5.1	Frequency hopping systems (FHSs)	
5.1 (1)	Bandwidth of a frequency hopping channel	Not applicable
5.1 (2)	Minimum channel spacing for frequency hopping systems	Not applicable
5.1 (3)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.1 (4)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
5.1 (5)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
5.2	Digital modulation systems	
5.2 (1)	Minimum 6 dB bandwidth	Pass
5.2 (2)	Maximum power spectral density	Pass
5.3	Hybrid systems	
5.3 (1)	Digital modulation turned off	Not applicable
5.3 (2)	Frequency hopping turned off	Not applicable
5.4	Transmitter output power and e.i.r.p. requirements	
5.4 (1)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.4 (2)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
5.4 (3)	Frequency hopping systems operating in the 5725–5850 MHz	Not applicable
5.4 (4)	Systems employing digital modulation techniques	Pass
5.4 (5)	Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band	Not applicable
5.4 (6)	Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams	Not applicable
5.5	Unwanted Emissions	Pass

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	June 2, 2016
Nemko sample ID number	309974-1

3.2 EUT information

Product name	Wireless Modem (902-928 MHz, Wi-Fi)
Model	Horizon 900 Model# 216AD
Model variant	N/A
Serial number	Z-24263

3.3 Technical information

Applicant IC company number	2163A
IC UPN number	216AD
All used IC test site(s) Reg. number	2040B
RSS number and Issue number	RSS-247, Issue 1, May 2015
Frequency band	902-928 MHz
Frequency Min (MHz)	907
Frequency Max (MHz)	922
RF power Min (W), Conducted/ERP/EIRP	N/A
RF power Max (W), Conducted/ERP/EIRP	0.603 (Conducted)
Field strength, Units @ distance	N/A
Measured BW (kHz) (6 dB)	15847
Calculated BW (kHz), as per TRC-43	N/A
Type of modulation	DSSS/(BPSK, QPSK, CCK), OFDM/(BPSK, QPSK, QAM16, QAM64)
Emission classification (F1D, G1D, D1D)	G1D, W7D
Transmitter spurious, Units @ distance	60.31 dBµV/m @ 3m AVG, 65.27 dBµV/m @ 3m Peak
Power requirements	100-240V AC
Antenna information	7dBi Omni-Directional Antenna AA20Es900, 7dBi Yagi Antenna AA203Es900. Reverse TNC Connector. The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

3.4 Product description and theory of operation

EUT is 900MHz Wi-Fi modem.

3.5 EUT exercise details

EUT frequencies, modulation, bandwidth are set using client provided computer with test software.

EUT is set to output maximum power.

3.6 EUT setup diagram

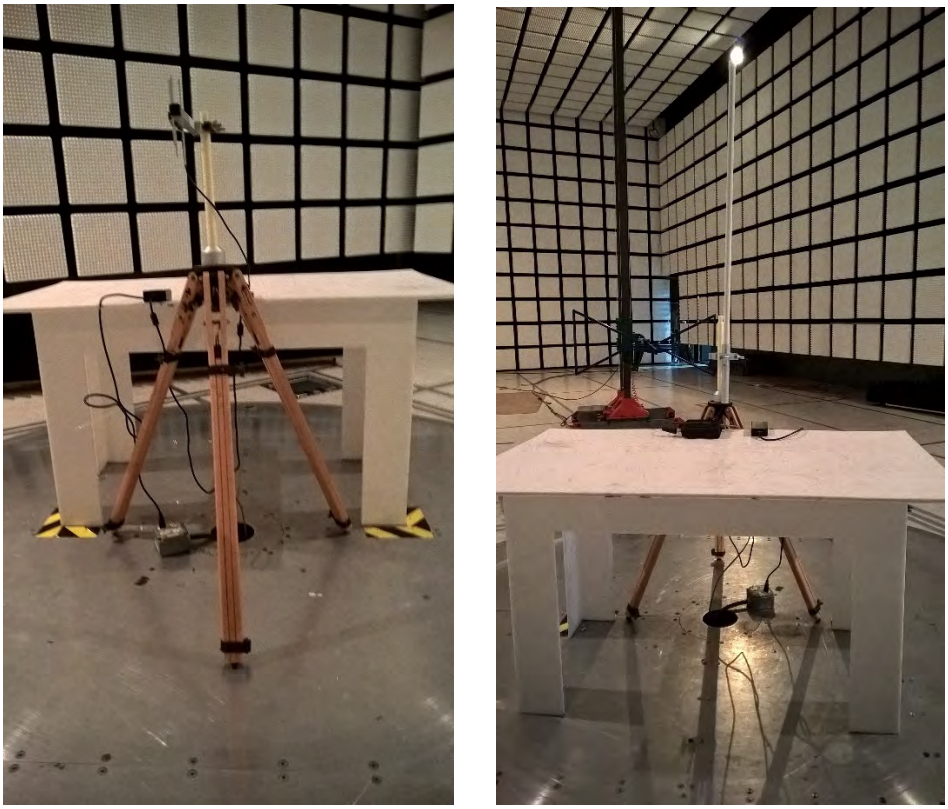


Figure 3.6-1: *Radiated Emissions Test Setup – below 1GHz*

Figure 3.6-2: *Radiated Emissions Test Setup – above 1GHz*

Figure 3.6-3: *AC Conducted Emissions Test Setup*

3.7 EUT sub assemblies

Table 3.7-1: *EUT sub assemblies*

Description	Brand name	Model/Part number	Serial number
Modem	EST	216AD	Z-24263
Omni-Directional Antenna	EST	AA20Es900	N/A
Yagi Antenna	EST	AA203Es900	N/A
Power Supply 12V DC	EST	AA179	N/A
Pole Mount Kit	EST	AA195PM	N/A

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

Test channels and test modes (modulation and bandwidth) were optimized according to ANSI 63.10 sec.5.6.2.

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

100-240V AC 50-60Hz

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Asset Tag	Description	Manufacturer	Model	Serial #	Next Cal
529	Antenna, DRWG	EMCO	3115	2505	01-Feb-2017
814	Multimeter	Fluke	111	78130063	02-Feb-2017
S1043	Variac (Variable Transformer) 3kVA, Input 110/220VAC @ 4.8/12A	Shanghai China	TDGC	N/A	NCR
E1019	Two Line V-Network	Rohde & Schwarz	ENV216	101045	15-June-2016
E1026	EMI Test Receiver 9kHz to 7GHz	Rohde & Schwarz	ESCI 7	100800	17-Mar-2017
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	02-Jul-2016
FA002713	EMI Receiver, 40GHz	Rohde & Schwarz	ESU40	1302.6005.40	28-Apr-2017
CCL001229	Spectrum Analyzer, 40GHz	Rohde & Schwarz	FSV40	1321.3008K40-101395-Zv	25-May-2017

Note: NCR - no calibration required, VOU - verify on use

Section 8. Test Data

8.1 FCC 15.247(a) (2) and RSS-247 5.2(1) Minimum 6 dB bandwidth

8.1.1 Definitions and limits

FCC 15.247:
(a) (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

IC RSS-247
5.2 (1) The minimum 6 dB bandwidth shall be 500 kHz.

8.1.2 Test summary

Test date	June 6, 2016	Temperature	23 °C
Test engineer	Feng You	Air pressure	1000 mbar
Verdict	Pass	Relative humidity	58 %

8.1.3 Observations, settings and special notes

Spectrum analyzer settings:

Resolution bandwidth	100 kHz
Video bandwidth	≥3 × RBW
Frequency span	1.5 x OBW
Detector mode	Peak
Trace mode	Max Hold

Per ANSI 63.10-2013 5.6.2.1

a) For each operating mode, if the measured channel bandwidth on the middle channel is at least 150% of the minimum permitted bandwidth, then it is not necessary to measure the bandwidth on the high and low channels.

8.1.4 Test data

Table 8.1-1: *6 dB bandwidth results with middle channel 912MHz*

Channel BW, MHz	Modulation	Data Rate	6dB bandwidth, kHz	Limit, kHz	Margin, kHz
5	DSSS/BPSK	1 Mbps	2373	500	1873
	DSSS/QPSK	2 Mbps	2547	500	2047
	DSSS/CCK	5.5 Mbps	2460	500	1960
	DSS/CCK	11 Mbps	2547	500	2047
	OFDM/BPSK	MCS0	2576	500	2076
	OFDM/QPSK	MCS1	2547	500	2047
	OFDM/QPSK	MCS2	2663	500	2163
	OFDM/QAM16	MCS3	2547	500	2047
	OFDM/QAM16	MCS4	4168	500	3668
	OFDM/QAM64	MCS5	4197	500	3697
	OFDM/QAM64	MCS6	4168	500	3668
	OFDM/QAM64	MCS7	4168	500	3668
10	DSSS/BPSK	1 Mbps	5123	500	4623
	DSSS/QPSK	2 Mbps	5123	500	4623
	DSSS/CCK	5.5 Mbps	4805	500	4305
	DSS/CCK	11 Mbps	4660	500	4160
	OFDM/BPSK	MCS0	5123	500	4623
	OFDM/QPSK	MCS1	5123	500	4623
	OFDM/QPSK	MCS2	4805	500	4305
	OFDM/QAM16	MCS3	4891	500	4391
	OFDM/QAM16	MCS4	8220	500	7720
	OFDM/QAM64	MCS5	8130	500	7630
	OFDM/QAM64	MCS6	8278	500	7778
	OFDM/QAM64	MCS7	8336	500	7836
20	DSSS/BPSK	1 Mbps	10116	500	9616
	DSSS/QPSK	2 Mbps	10116	500	9616
	DSSS/CCK	5.5 Mbps	9421	500	8921
	DSS/CCK	11 Mbps	9595	500	9095
	OFDM/BPSK	MCS0	15586	500	15086
	OFDM/QPSK	MCS1	15239	500	14739
	OFDM/QPSK	MCS2	15239	500	14739
	OFDM/QAM16	MCS3	15239	500	14739
	OFDM/QAM16	MCS4	15195	500	14695
	OFDM/QAM64	MCS5	15760	500	15260
	OFDM/QAM64	MCS6	15847	500	15347
	OFDM/QAM64	MCS7	15803	500	15303

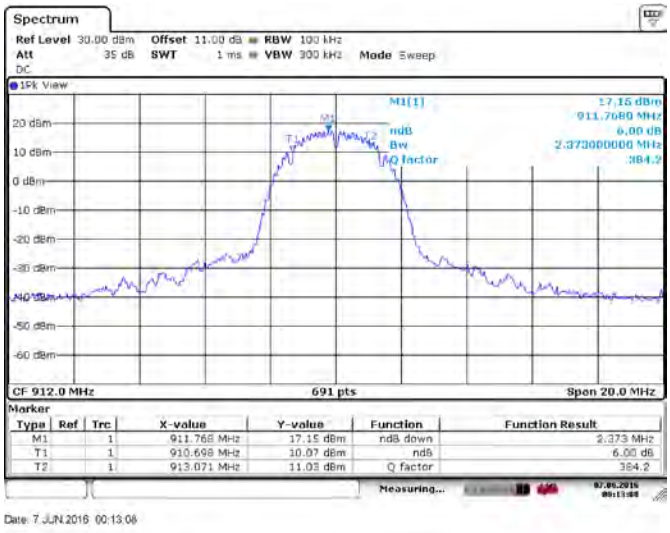


Figure 8.1-1: *6 dB bandwidth, 5MHz BW DSSS/BPSK 1 Mbps*

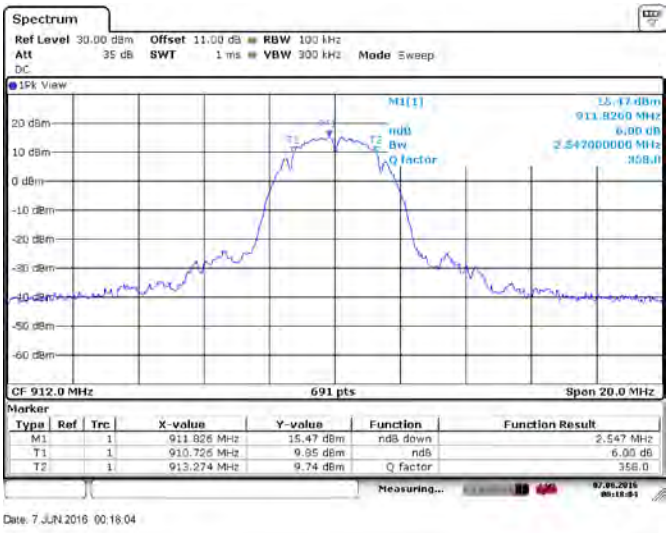


Figure 8.1-2: *6 dB bandwidth, 5MHz BW DSSS/QPSK 2 Mbps*

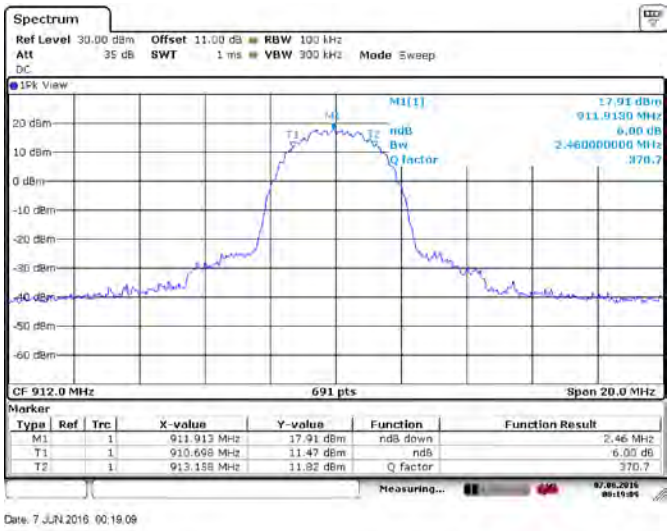


Figure 8.1-3: *6 dB bandwidth, 5MHz BW DSSS/CCK 5.5 Mbps*

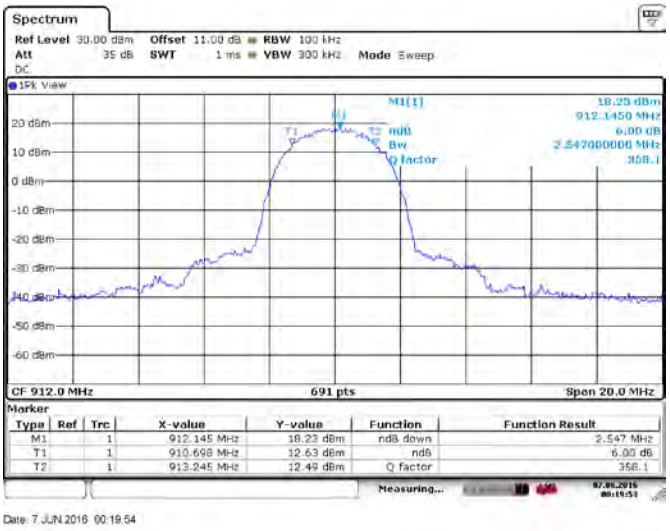


Figure 8.1-4: *6 dB bandwidth, 5MHz BW DSSS/CCK 11 Mbps*

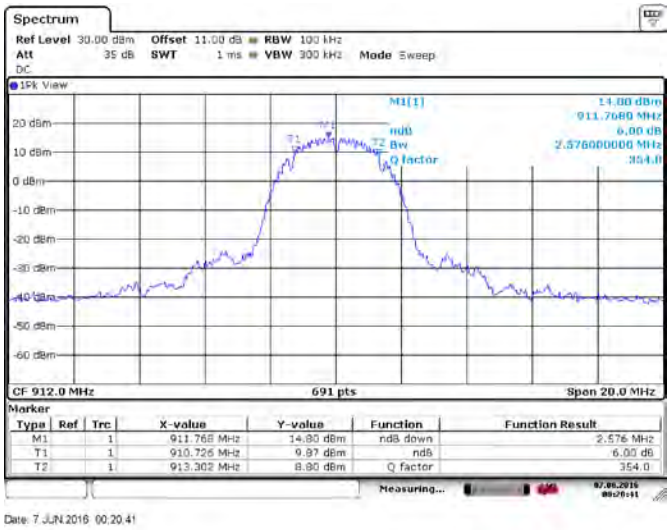


Figure 8.1-5: *6 dB bandwidth, 5MHz BW OFDM/BPSK MCS0*

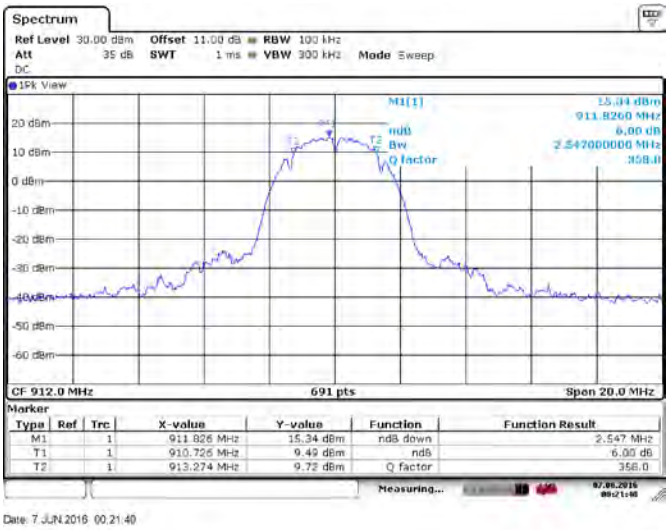


Figure 8.1-6: *6 dB bandwidth, 5MHz BW OFDM/QPSK MCS1*

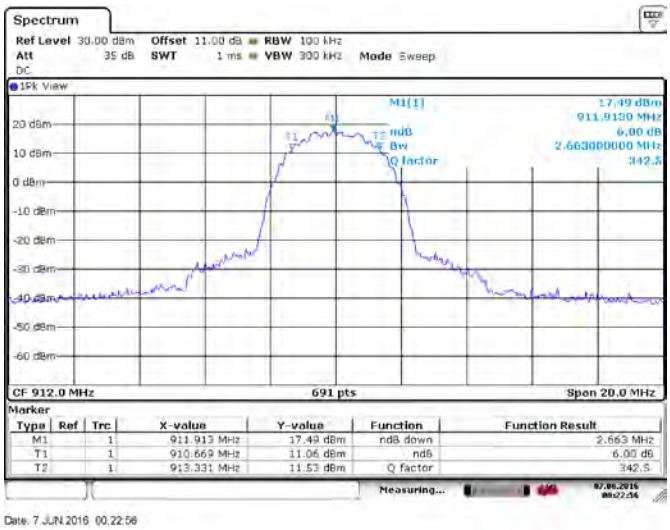


Figure 8.1-7: *6 dB bandwidth, 5MHz BW OFDM/QPSK MCS2*

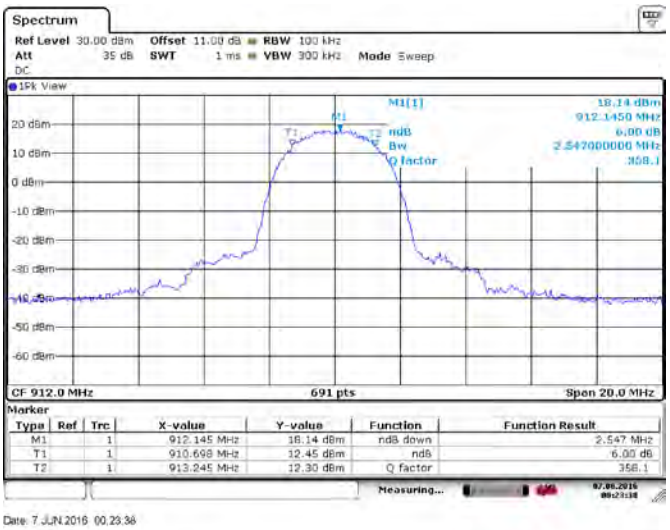


Figure 8.1-8: *6 dB bandwidth, 5MHz BW OFDM/QAM16 MCS3*

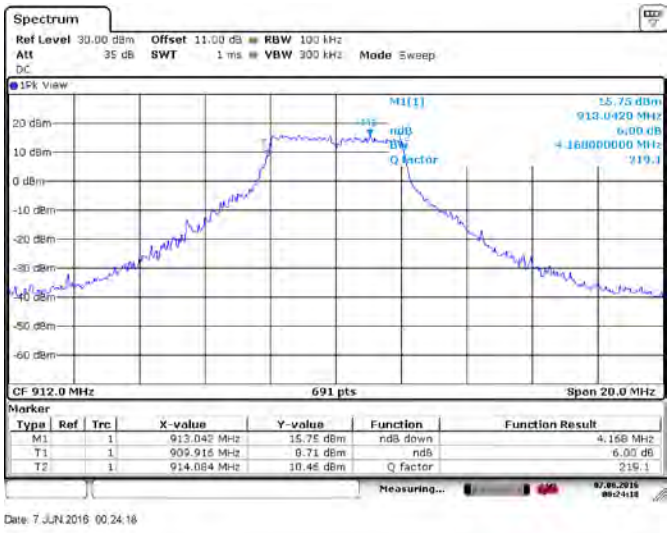


Figure 8.1-9: *6 dB bandwidth, 5MHz BW OFDM/QAM16 MCS4*

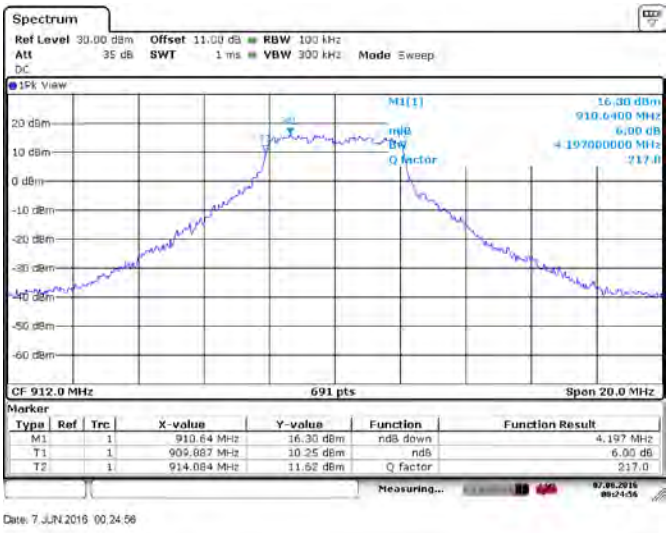


Figure 8.1-10: *6 dB bandwidth, 5MHz BW OFDM/QAM64 MCS5*

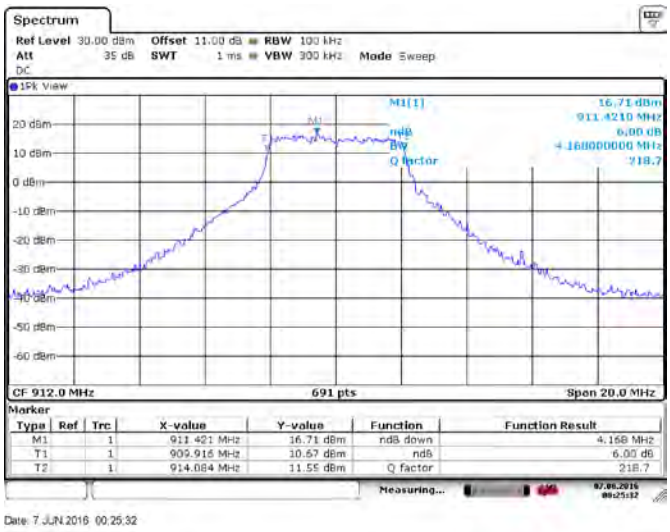


Figure 8.1-11: *6 dB bandwidth, 5MHz BW OFDM/QAM64 MCS6*

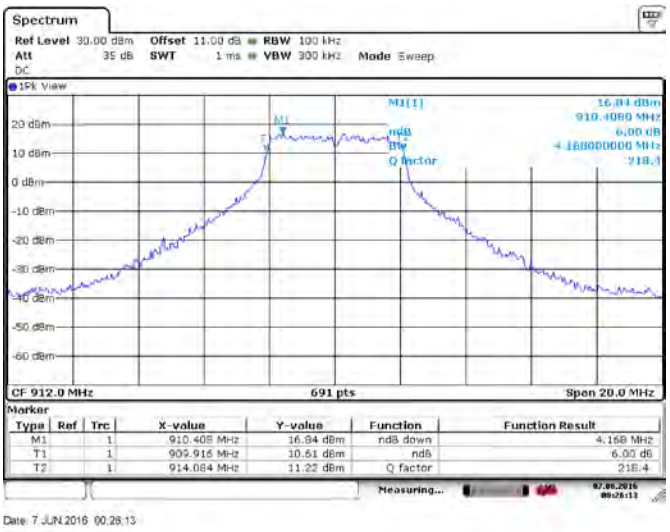


Figure 8.1-12: *6 dB bandwidth, 5MHz BW OFDM/QAM64 MCS7*

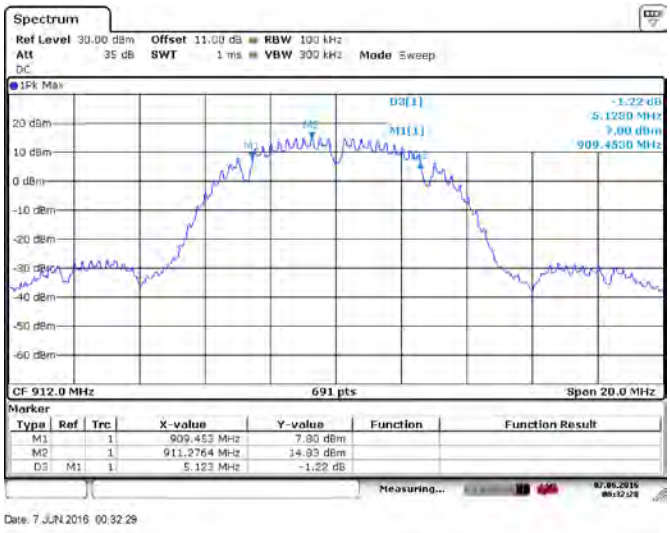


Figure 8.1-43: *6 dB bandwidth, 10MHz BW DSSS/BPSK 1 Mbps*

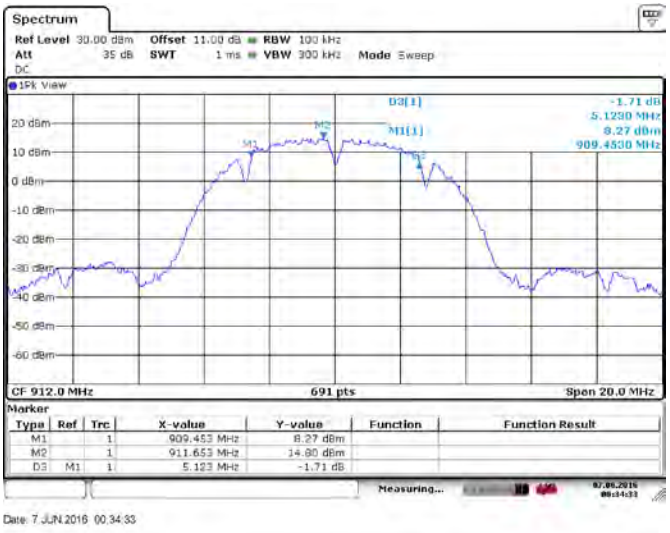


Figure 8.1-14: *6 dB bandwidth, 10MHz BW DSSS/QPSK 2 Mbps*

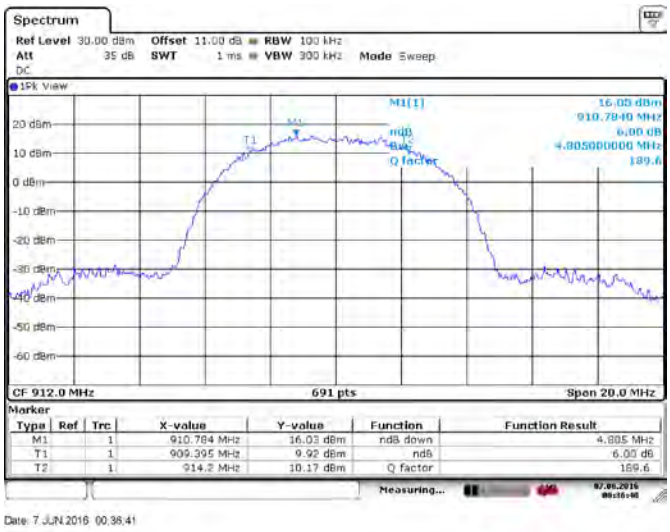


Figure 8.1-15: *6 dB bandwidth, 10MHz BW DSSS/CCK 5.5 Mbps*

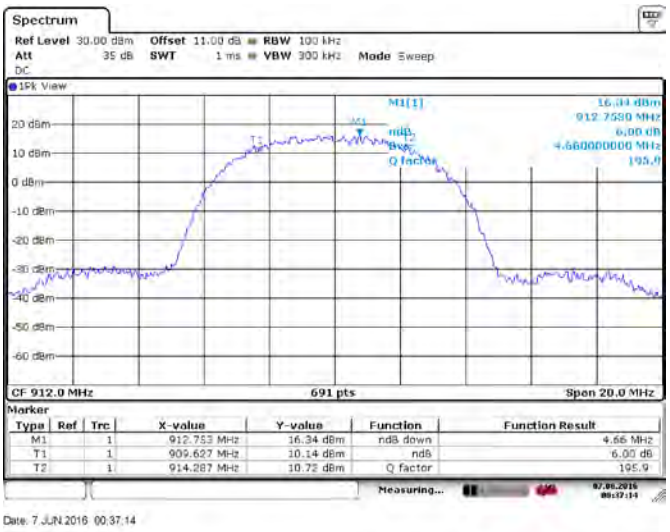


Figure 8.1-16: *6 dB bandwidth, 10MHz BW DSSS/CCK 11 Mbps*

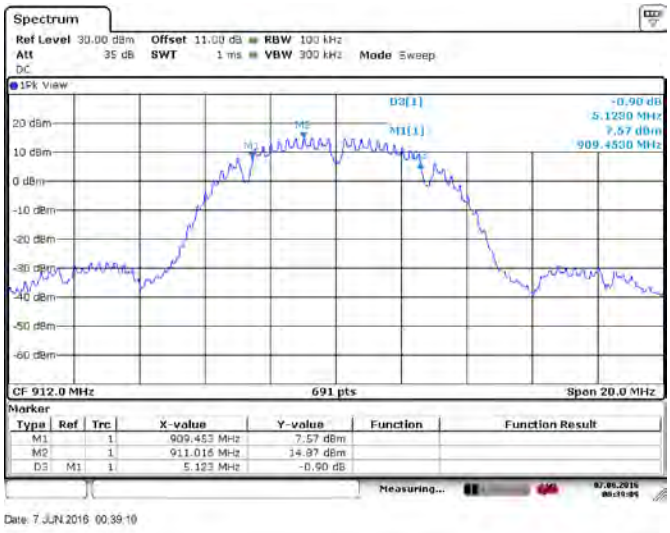


Figure 8.1-17: *6 dB bandwidth, 10MHz BW OFDM/BPSK MCS0*

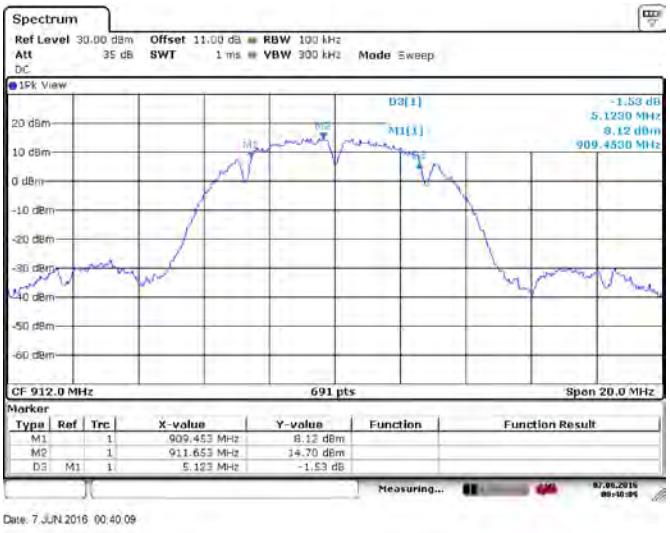


Figure 8.1-18: *6 dB bandwidth, 10MHz BW OFDM/QPSK MCS1*

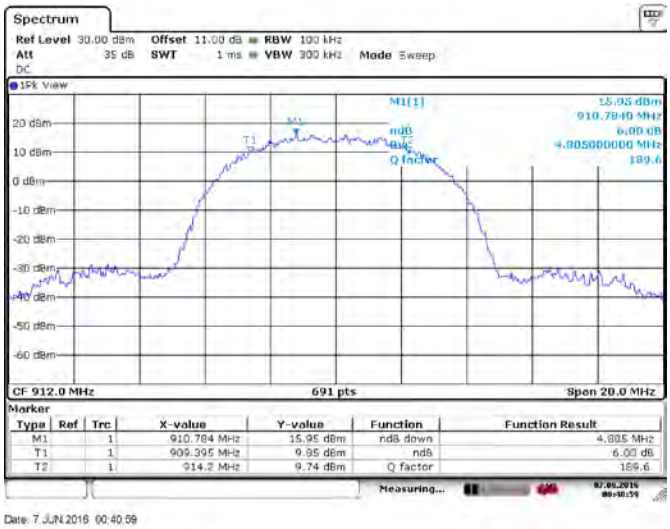


Figure 8.1-19: *6 dB bandwidth, 10MHz BW OFDM/QPSK MCS2*

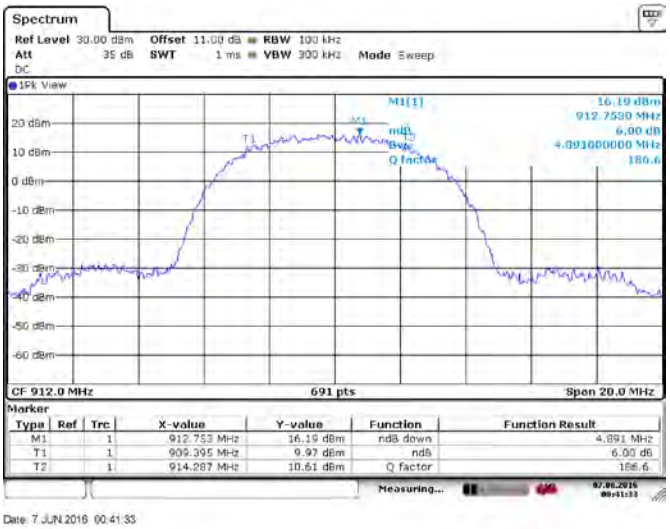


Figure 8.1-20: *6 dB bandwidth, 10MHz BW OFDM/QAM16 MCS3*

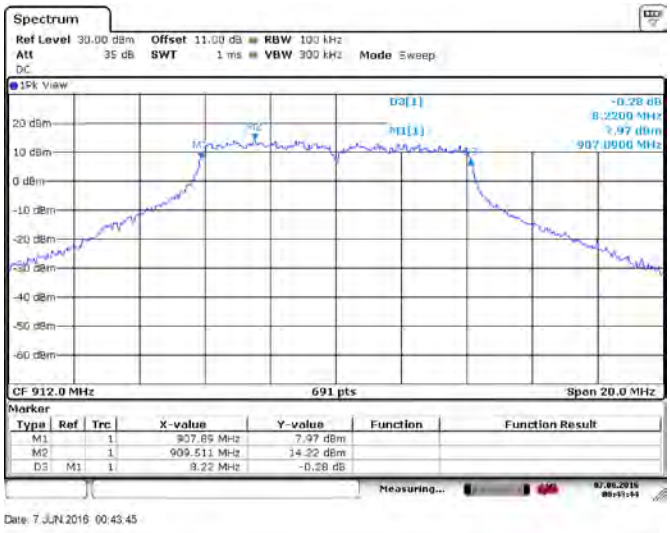


Figure 8.1-21: *6 dB bandwidth, 10MHz BW OFDM/QAM16 MCS4*

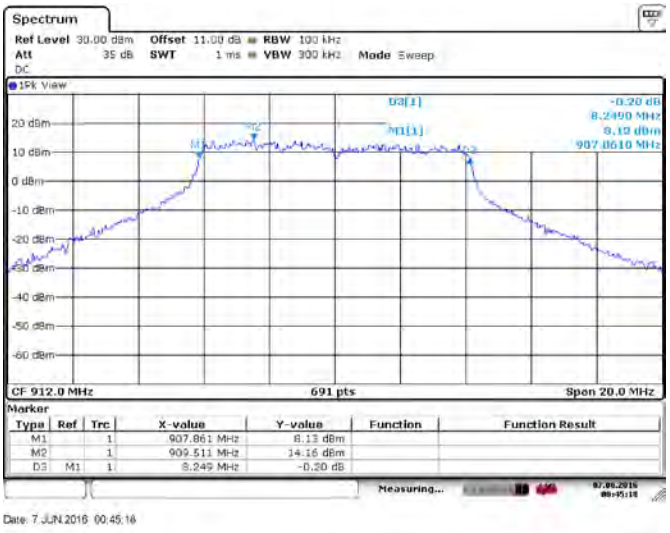


Figure 8.1-22: *6 dB bandwidth, 10MHz BW OFDM/QAM64 MCS5*

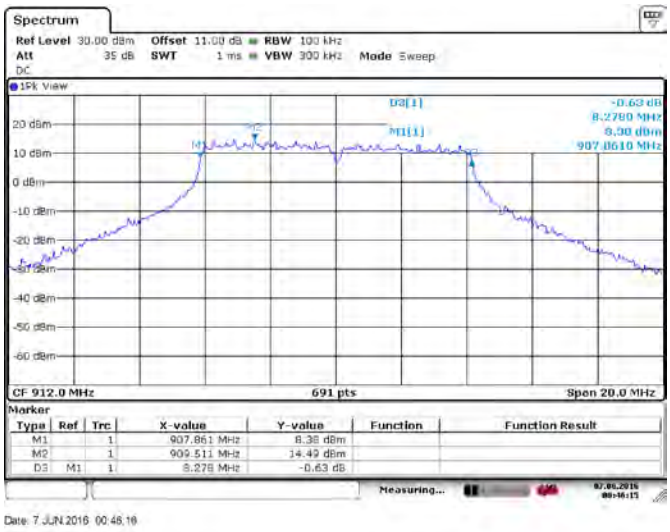


Figure 8.1-23: *6 dB bandwidth, 10MHz BW OFDM/QAM64 MCS6*

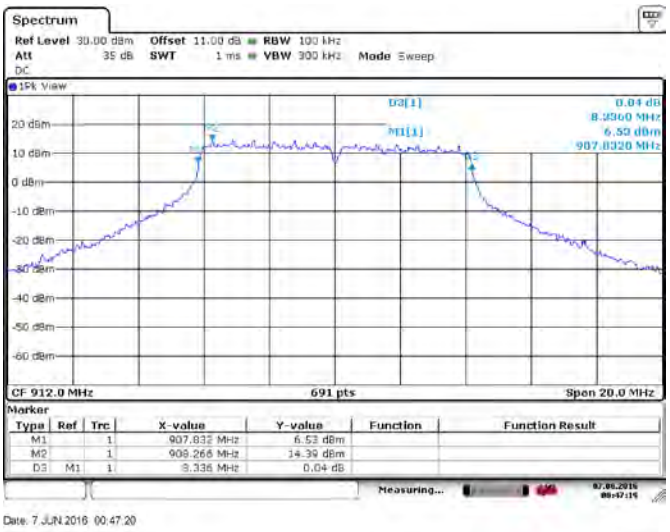


Figure 8.1-24: *6 dB bandwidth, 10MHz BW OFDM/QAM64 MCS7*

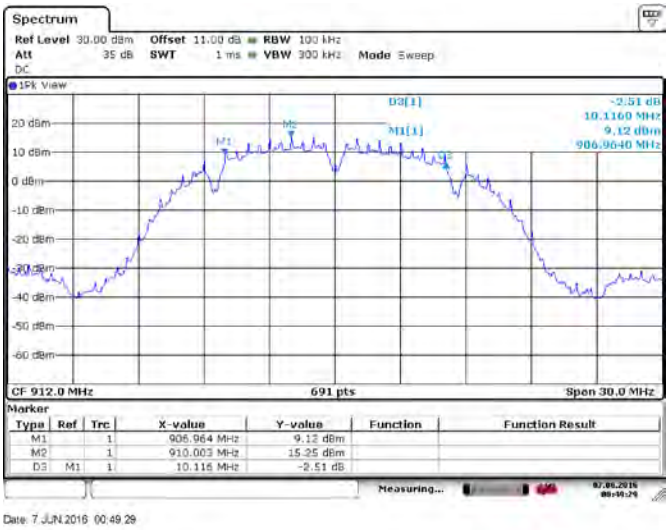


Figure 8.1-25: *6 dB bandwidth, 20MHz BW DSSS/BPSK 1 Mbps*

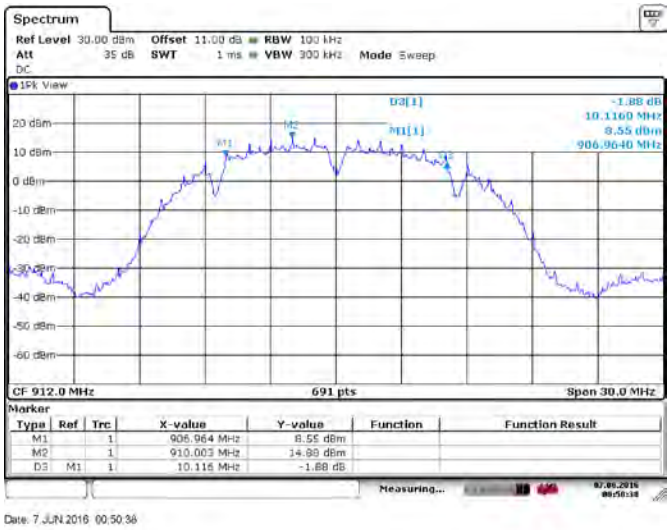


Figure 8.1-26: *6 dB bandwidth, 20MHz BW DSSS/QPSK 2 Mbps*

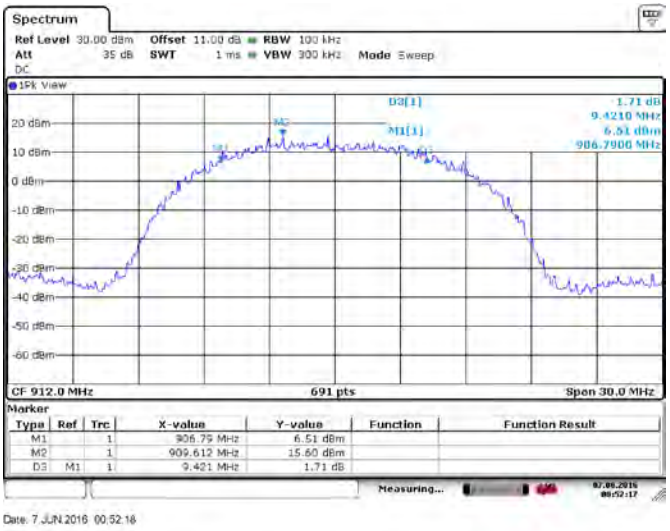


Figure 8.1-27: *6 dB bandwidth, 20MHz BW DSSS/CCK 5.5 Mbps*

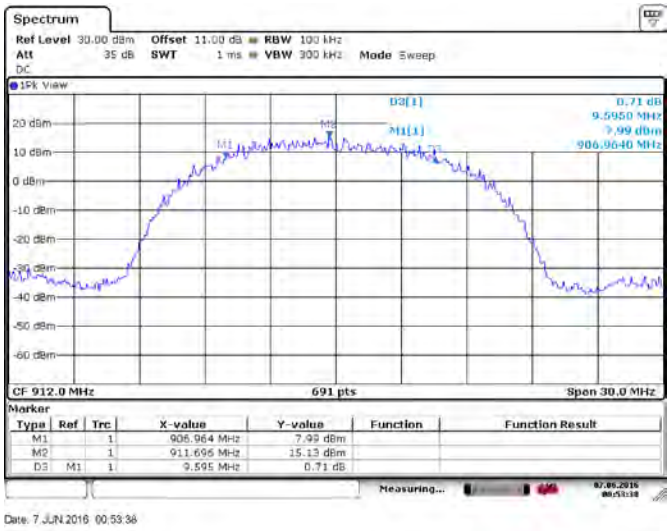


Figure 8.1-28: *6 dB bandwidth, 20MHz BW DSSS/CCK 11 Mbps*

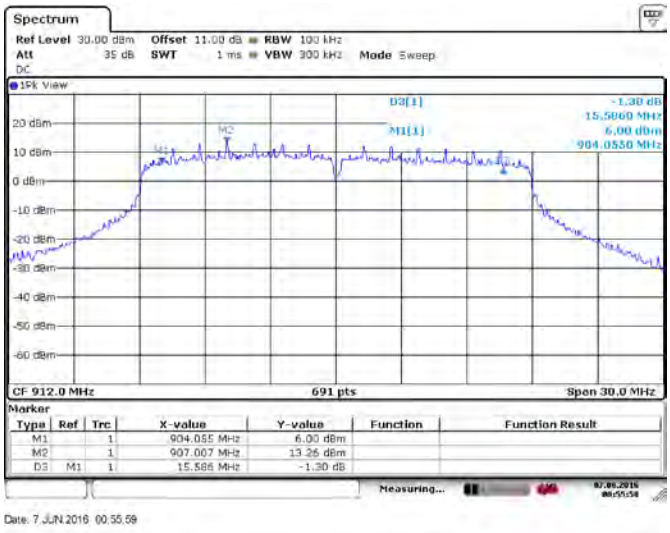


Figure 8.1-29: *6 dB bandwidth, 20MHz BW OFDM/BPSK MCS0*

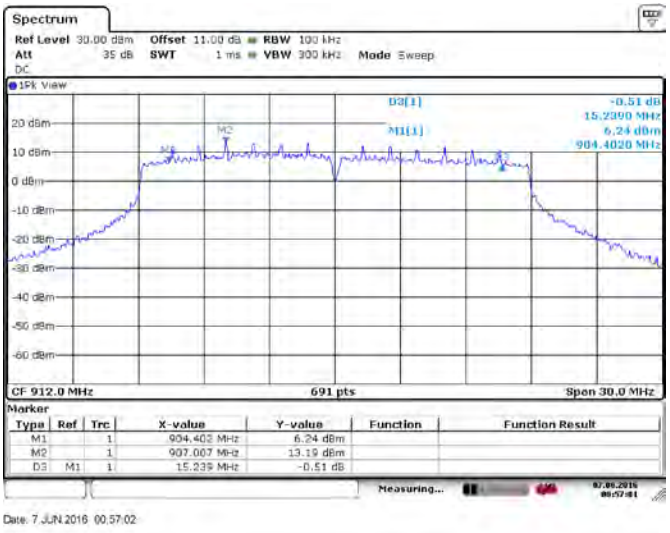


Figure 8.1-30: *6 dB bandwidth, 20MHz BW OFDM/QPSK MCS1*

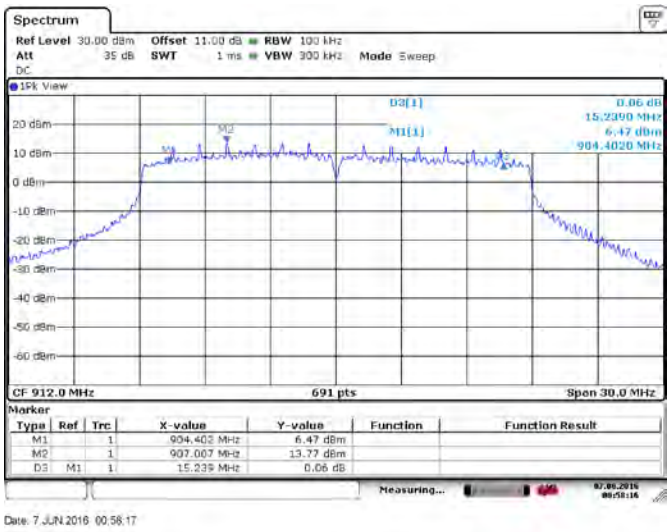


Figure 8.1-31: *6 dB bandwidth, 20MHz BW OFDM/QPSK MCS2*

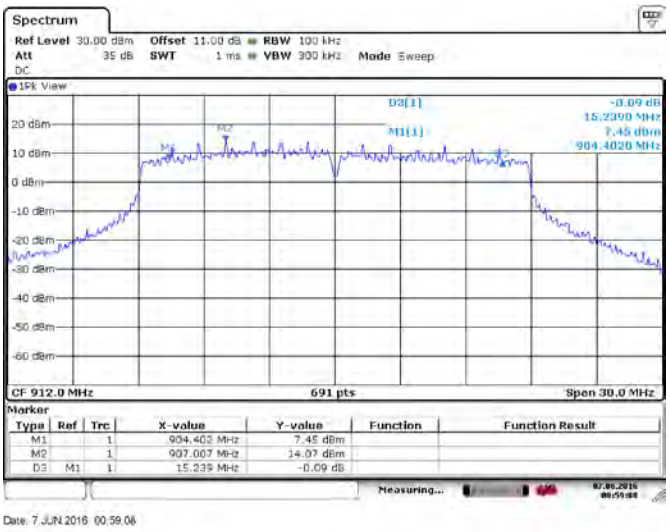


Figure 8.1-32: *6 dB bandwidth, 20MHz BW OFDM/QAM16 MCS3*

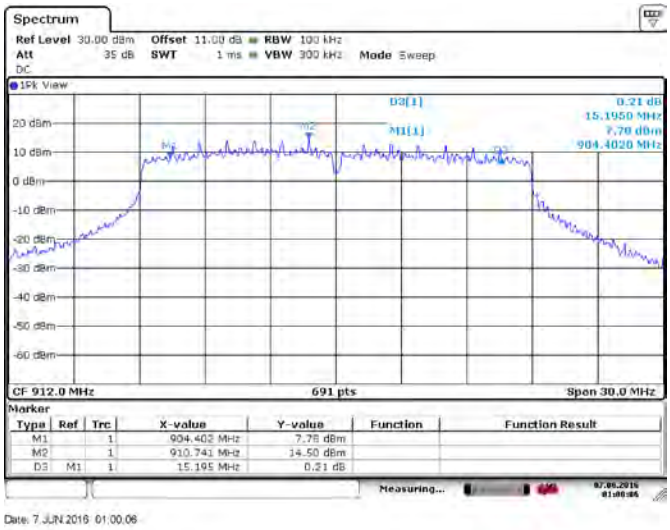


Figure 8.1-33: *6 dB bandwidth, 20MHz BW OFDM/QAM16 MCS4*

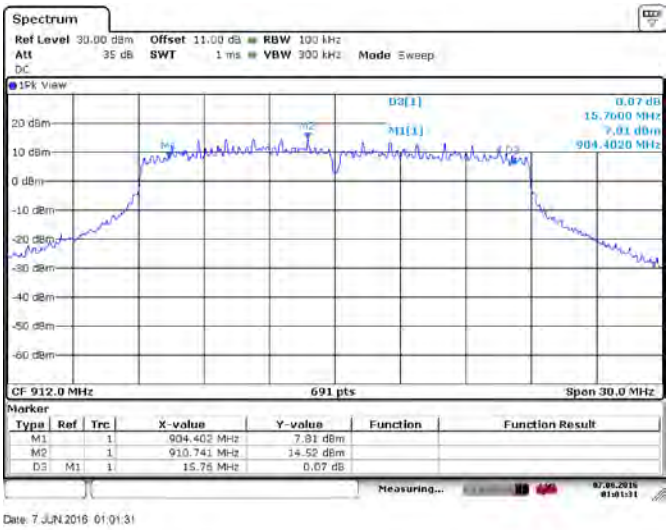


Figure 8.1-34: *6 dB bandwidth, 20MHz BW OFDM/QAM64 MCS5*

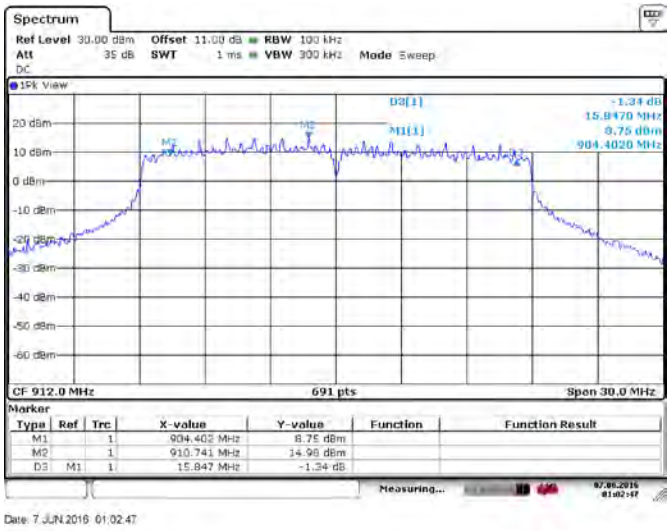


Figure 8.1-35: *6 dB bandwidth, 20MHz BW OFDM/QAM64 MCS6*

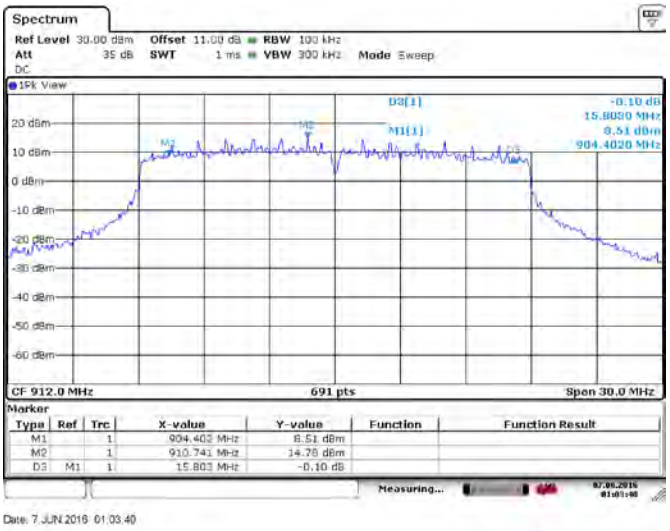


Figure 8.1-36: *6 dB bandwidth, 20MHz BW OFDM/QAM64 MCS7*

8.2 FCC 15.247(b) and RSS-247 5.4 (4) Transmitter output power and e.i.r.p. requirements

8.2.1 Definitions and limits

FCC:

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC:

5.4 Transmitter Output Power and Equivalent Isotropically Radiated Power (E.I.R.P.) Requirements

(4) For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

8.2.2 Test summary

Test date	June 2, 2016	Temperature	23 °C
Test engineer	Feng You	Air pressure	1002 mbar
Verdict	Pass	Relative humidity	64 %

8.2.3 Observations, settings and special notes

Peak Conducted Power Measured
Spectrum analyzer settings:

Resolution bandwidth	1MHz
Video bandwidth	3MHz
Channel Power bandwidth	25MHz
Frequency span	30MHz
Detector mode	Peak
Trace mode	Max Hold

8.2.4 Test data

Table 8.2-1: *Output power measurements results – 907MHz*

Channel BW, MHz	Modulation	Data Rate	Conducted output power, dBm		Margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
			Measured	Limit					
5	DSSS/BPSK	1 Mbps	24.59	30	5.41	7	31.59	36	4.41
	DSSS/QPSK	2 Mbps	24.57	30	5.43	7	31.57	36	4.43
	DSSS/CCK	5.5 Mbps	24.74	30	5.26	7	31.74	36	4.26
	DSS/CCK	11 Mbps	24.83	30	5.17	7	31.83	36	4.17
	OFDM/BPSK	MCS0	24.62	30	5.38	7	31.62	36	4.38
	OFDM/QPSK	MCS1	24.8	30	5.2	7	31.8	36	4.2
	OFDM/QPSK	MCS2	24.6	30	5.4	7	31.6	36	4.4
	OFDM/QAM16	MCS3	24.7	30	5.3	7	31.7	36	4.3
	OFDM/QAM16	MCS4	24.81	30	5.19	7	31.81	36	4.19
	OFDM/QAM64	MCS5	24.93	30	5.07	7	31.93	36	4.07
	OFDM/QAM64	MCS6	25.04	30	4.96	7	32.04	36	3.96
	OFDM/QAM64	MCS7	25.22	30	4.78	7	32.22	36	3.78
10	DSSS/BPSK	1 Mbps	24.89	30	5.11	7	31.89	36	4.11
	DSSS/QPSK	2 Mbps	24.97	30	5.03	7	31.97	36	4.03
	DSSS/CCK	5.5 Mbps	25.2	30	4.8	7	32.2	36	3.8
	DSS/CCK	11 Mbps	25.39	30	4.61	7	32.39	36	3.61
	OFDM/BPSK	MCS0	24.52	30	5.48	7	31.52	36	4.48
	OFDM/QPSK	MCS1	24.65	30	5.35	7	31.65	36	4.35
	OFDM/QPSK	MCS2	25.02	30	4.98	7	32.02	36	3.98
	OFDM/QAM16	MCS3	25.12	30	4.88	7	32.12	36	3.88
	OFDM/QAM16	MCS4	25.04	30	4.96	7	32.04	36	3.96
	OFDM/QAM64	MCS5	25.2	30	4.8	7	32.2	36	3.8
	OFDM/QAM64	MCS6	25.31	30	4.69	7	32.31	36	3.69
	OFDM/QAM64	MCS7	25.39	30	4.61	7	32.39	36	3.61

Table 8.2-2: *Output power measurements results – 912MHz*

Channel BW, MHz	Modulation	Data Rate	Conducted output power, dBm		Margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
			Measured	Limit					
5	DSSS/BPSK	1 Mbps	24.04	30	5.96	7	31.04	36	4.96
	DSSS/QPSK	2 Mbps	23.99	30	6.01	7	30.99	36	5.01
	DSSS/CCK	5.5 Mbps	24.13	30	5.87	7	31.13	36	4.87
	DSS/CCK	11 Mbps	24.25	30	5.75	7	31.25	36	4.75
	OFDM/BPSK	MCS0	24.08	30	5.92	7	31.08	36	4.92
	OFDM/QPSK	MCS1	24	30	6	7	31	36	5
	OFDM/QPSK	MCS2	24.05	30	5.95	7	31.05	36	4.95
	OFDM/QAM16	MCS3	24.19	30	5.81	7	31.19	36	4.81
	OFDM/QAM16	MCS4	24.08	30	5.92	7	31.08	36	4.92
	OFDM/QAM64	MCS5	24.28	30	5.72	7	31.28	36	4.72
	OFDM/QAM64	MCS6	24.42	30	5.58	7	31.42	36	4.58
	OFDM/QAM64	MCS7	24.49	30	5.51	7	31.49	36	4.51
10	DSSS/BPSK	1 Mbps	24.03	30	5.97	7	31.03	36	4.97
	DSSS/QPSK	2 Mbps	24.12	30	5.88	7	31.12	36	4.88
	DSSS/CCK	5.5 Mbps	24.39	30	5.61	7	31.39	36	4.61
	DSS/CCK	11 Mbps	24.45	30	5.55	7	31.45	36	4.55
	OFDM/BPSK	MCS0	24.1	30	5.9	7	31.1	36	4.9
	OFDM/QPSK	MCS1	24.22	30	5.78	7	31.22	36	4.78
	OFDM/QPSK	MCS2	24.45	30	5.55	7	31.45	36	4.55
	OFDM/QAM16	MCS3	24.68	30	5.32	7	31.68	36	4.32
	OFDM/QAM16	MCS4	24.48	30	5.52	7	31.48	36	4.52
	OFDM/QAM64	MCS5	24.58	30	5.42	7	31.58	36	4.42
	OFDM/QAM64	MCS6	24.53	30	5.47	7	31.53	36	4.47
	OFDM/QAM64	MCS7	24.67	30	5.33	7	31.67	36	4.33
20	DSSS/BPSK	1 Mbps	23.72	30	6.28	7	30.72	36	5.28
	DSSS/QPSK	2 Mbps	23.79	30	6.21	7	30.79	36	5.21
	DSSS/CCK	5.5 Mbps	24.12	30	5.88	7	31.12	36	4.88
	DSS/CCK	11 Mbps	24.45	30	5.55	7	31.45	36	4.55
	OFDM/BPSK	MCS0	23.94	30	6.06	7	30.94	36	5.06
	OFDM/QPSK	MCS1	23.89	30	6.11	7	30.89	36	5.11
	OFDM/QPSK	MCS2	23.96	30	6.04	7	30.96	36	5.04
	OFDM/QAM16	MCS3	24.26	30	5.74	7	31.26	36	4.74
	OFDM/QAM16	MCS4	23.81	30	6.19	7	30.81	36	5.19
	OFDM/QAM64	MCS5	23.85	30	6.15	7	30.85	36	5.15
	OFDM/QAM64	MCS6	23.86	30	6.14	7	30.86	36	5.14
	OFDM/QAM64	MCS7	23.92	30	6.08	7	30.92	36	5.08

Table 8.2-3: *Output power measurements results – 917MHz*

Channel BW, MHz	Modulation	Data Rate	Conducted output power, dBm		Margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
			Measured	Limit					
20	DSSS/BPSK	1 Mbps	25.59	30	4.41	7	32.59	36	3.41
	DSSS/QPSK	2 Mbps	25.88	30	4.12	7	32.88	36	3.12
	DSSS/CCK	5.5 Mbps	26.22	30	3.78	7	33.22	36	2.78
	DSS/CCK	11 Mbps	26.31	30	3.69	7	33.31	36	2.69
	OFDM/BPSK	MCS0	27.19	30	2.81	7	34.19	36	1.81
	OFDM/QPSK	MCS1	26.95	30	3.05	7	33.95	36	2.05
	OFDM/QPSK	MCS2	26.97	30	3.03	7	33.97	36	2.03
	OFDM/QAM16	MCS3	27.61	30	2.39	7	34.61	36	1.39
	OFDM/QAM16	MCS4	26.19	30	3.81	7	33.19	36	2.81
	OFDM/QAM64	MCS5	26.44	30	3.56	7	33.44	36	2.56
	OFDM/QAM64	MCS6	26.21	30	3.79	7	33.21	36	2.79
	OFDM/QAM64	MCS7	26.36	30	3.64	7	33.36	36	2.64

Table 8.2-4: *Output power measurements results – 922MHz*

Channel BW, MHz	Modulation	Data Rate	Conducted output power, dBm		Margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
			Measured	Limit					
5	DSSS/BPSK	1 Mbps	24.63	30	5.37	7	31.63	36	4.37
	DSSS/QPSK	2 Mbps	24.47	30	5.53	7	31.47	36	4.53
	DSSS/CCK	5.5 Mbps	24.52	30	5.48	7	31.52	36	4.48
	DSS/CCK	11 Mbps	24.54	30	5.46	7	31.54	36	4.46
	OFDM/BPSK	MCS0	24.82	30	5.18	7	31.82	36	4.18
	OFDM/QPSK	MCS1	24.87	30	5.13	7	31.87	36	4.13
	OFDM/QPSK	MCS2	24.81	30	5.19	7	31.81	36	4.19
	OFDM/QAM16	MCS3	24.71	30	5.29	7	31.71	36	4.29
	OFDM/QAM16	MCS4	24.71	30	5.29	7	31.71	36	4.29
	OFDM/QAM64	MCS5	24.74	30	5.26	7	31.74	36	4.26
	OFDM/QAM64	MCS6	25.12	30	4.88	7	32.12	36	3.88
	OFDM/QAM64	MCS7	25.27	30	4.73	7	32.27	36	3.73
10	DSSS/BPSK	1 Mbps	25.18	30	4.82	7	32.18	36	3.82
	DSSS/QPSK	2 Mbps	24.64	30	5.36	7	31.64	36	4.36
	DSSS/CCK	5.5 Mbps	25.1	30	4.9	7	32.1	36	3.9
	DSS/CCK	11 Mbps	25.14	30	4.86	7	32.14	36	3.86
	OFDM/BPSK	MCS0	24.8	30	5.2	7	31.8	36	4.2
	OFDM/QPSK	MCS1	24.58	30	5.42	7	31.58	36	4.42
	OFDM/QPSK	MCS2	24.64	30	5.36	7	31.64	36	4.36
	OFDM/QAM16	MCS3	24.72	30	5.28	7	31.72	36	4.28
	OFDM/QAM16	MCS4	24.9	30	5.1	7	31.9	36	4.1
	OFDM/QAM64	MCS5	24.95	30	5.05	7	31.95	36	4.05
	OFDM/QAM64	MCS6	24.94	30	5.06	7	31.94	36	4.06
	OFDM/QAM64	MCS7	25.21	30	4.79	7	32.21	36	3.79

Table 8.2-5: *Output power measurements results – over voltage change (Worst case 917MHz CF, 20MHz BW, MCS3)*

Voltage	Modulation	Data Rate	Conducted output power, dBm		Margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
			Measured	Limit					
100V AC	OFDM/QAM16	MCS3	27.51	30	2.49	7	34.51	36	1.49
115V AC	OFDM/QAM16	MCS3	27.61	30	2.39	7	34.61	36	1.39
240V AC	OFDM/QAM16	MCS3	27.8	30	2.2	7	34.8	36	1.2

8.3 FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions

8.3.1 Definitions and limits

FCC:
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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §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)).

IC:
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

(a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 8.4-1 except for apparatus complying under RSS-287;
(b) Unwanted emissions that fall into restricted bands of Table 6 shall comply with the limits specified in RSS-Gen; and
(c) Unwanted emissions that do not fall within the restricted frequency bands of Table 8.4-1 shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

Table 8.3-1: *FCC §15.209 and RSS-Gen – Radiated emission limits*

Frequency, MHz	Field strength of emissions		Measurement distance, m
	µV/m	dBµV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test

Table 8.3-2: *IC restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677-5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8
8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Note: Certain frequency bands listed in Table 8.3-2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

Table 8.3-3: *FCC restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

8.3.2 Test summary

Test date	June 6, 2016	Temperature	23 °C
Test engineer	Feng You	Air pressure	1000 mbar
Verdict	Pass	Relative humidity	58 %

8.3.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10th harmonic.
EUT was set to transmit with 100 % duty cycle.

Spectrum analyzer settings for conducted spurious emissions measurements:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyzer settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyzer settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyzer settings for average radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	AVG
Trace mode:	Max Hold

Per ANSI 63.10-2013 5.6.2.2

a) Band edge requirements—Measurements on the mode with the widest bandwidth can be used to cover the same channel (center frequency) on modes with narrower bandwidth that have the same or lower output power for each modulation family (e.g., OFDM and direct sequence spread spectrum).

b) Spurious emissions—Measure the mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum).

8.3.4 Test data

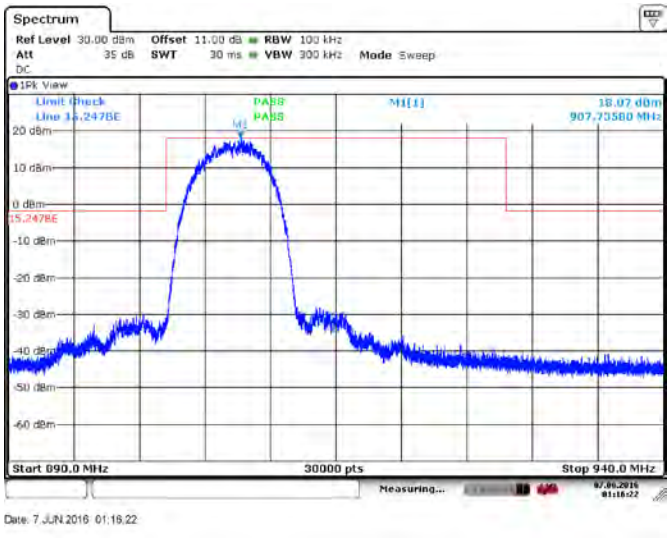


Figure 8.3-1: *Bandedge Measurement, 907MHz, 10MHz BW, DSSS/Mbps11*

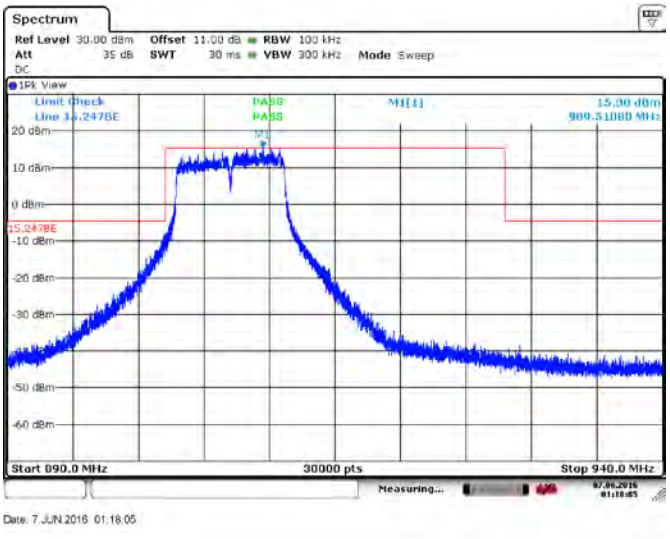


Figure 8.3-2: *Bandedge Measurement, 907MHz, 10MHz BW, OFDM/MCS7*

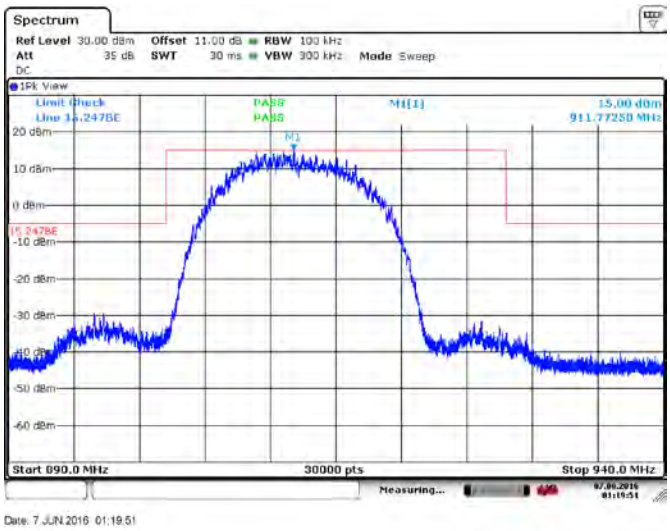


Figure 8.3-3: *Bandedge Measurement, 912MHz, 20MHz BW, DSSS/Mbps11*

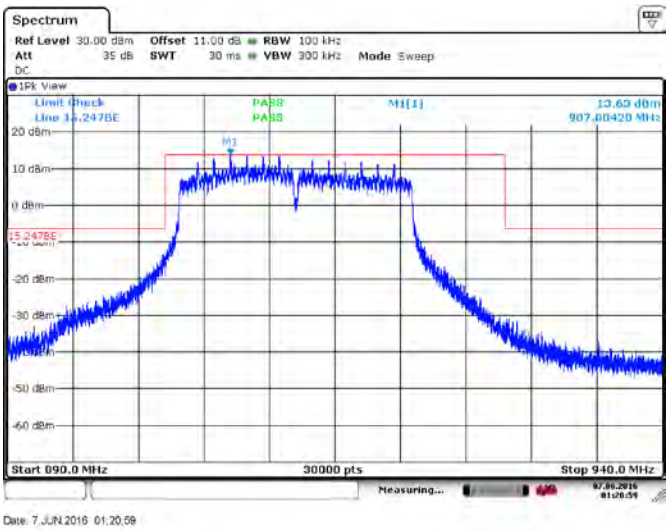


Figure 8.3-4: *Bandedge Measurement, 912MHz, 20MHz BW, OFDM/MCS3*

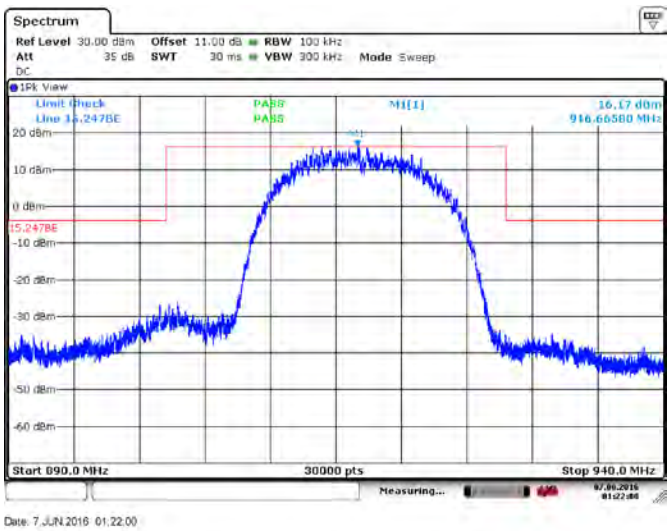


Figure 8.3-5: *Bandedge Measurement, 917MHz, 20MHz BW, DSSS/Mbps11*

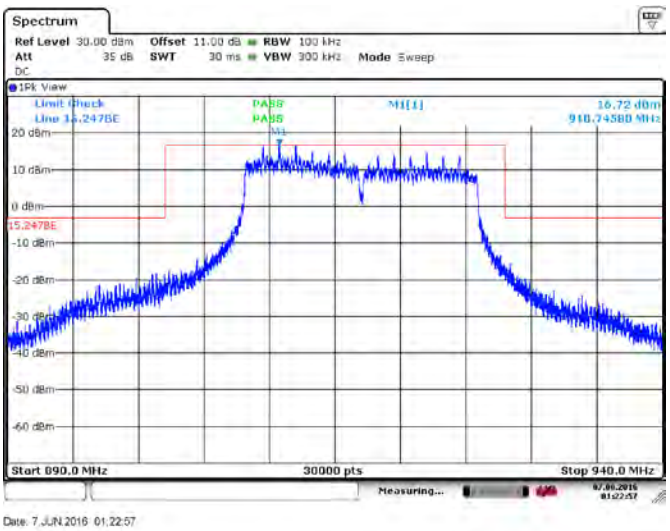


Figure 8.3-6: *Bandedge Measurement, 917MHz, 20MHz BW, OFDM/MCS3*

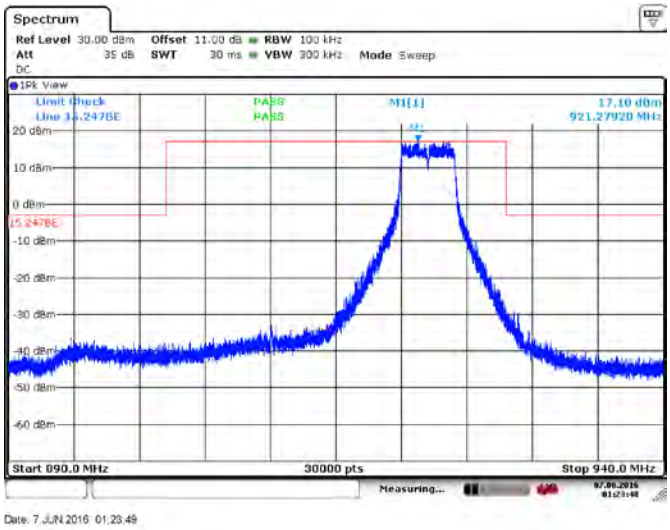


Figure 8.3-7: *Bandedge Measurement, 922MHz, 5MHz BW, OFDM/MCS7*

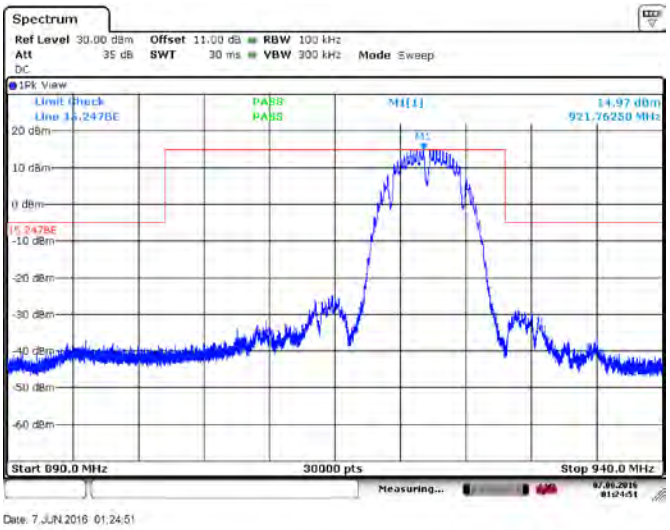


Figure 8.3-8: *Bandedge Measurement, 922MHz, 10MHz BW, DSSS/Mbps1*

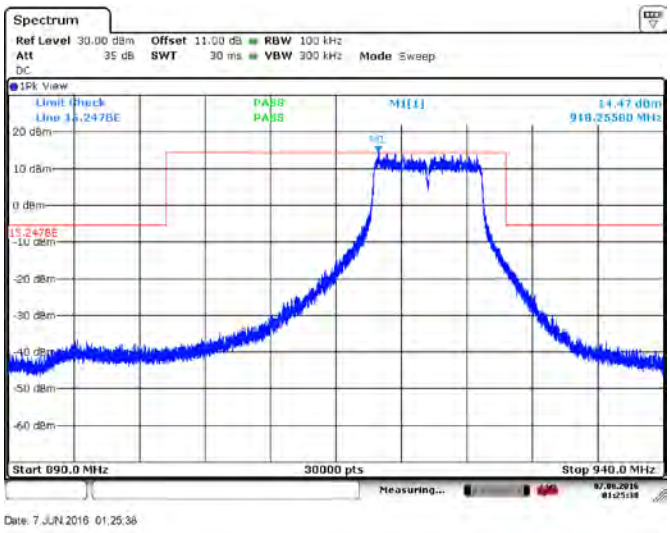


Figure 8.3-9: *Bandedge Measurement, 922MHz, 10MHz BW, OFDM/MCS7*

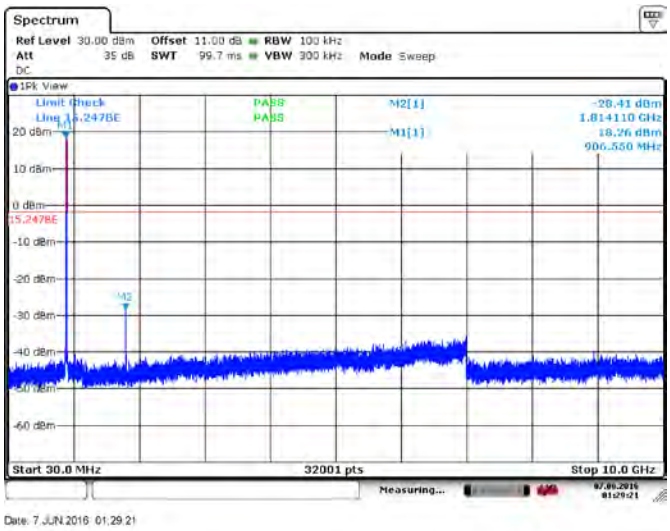


Figure 8.3-10: *Conducted spurious emissions, 907MHz, 5MHz BW, DSSS/Mbps11*

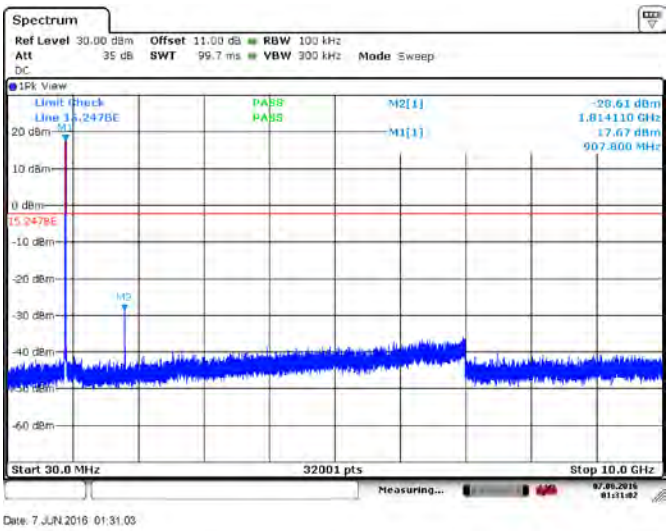


Figure 8.3-11: *Conducted spurious emissions, 907MHz, 10MHz BW, DSSS/Mbps11*

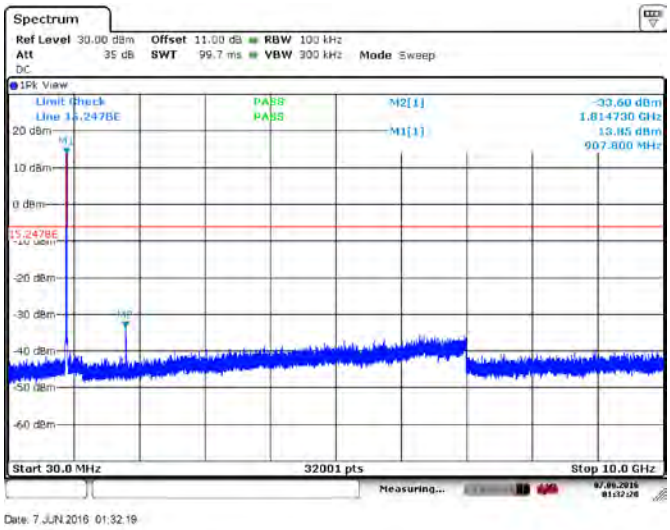


Figure 8.3-12: *Conducted spurious emissions, 907MHz, 10MHz BW, OFDM/MCS7*

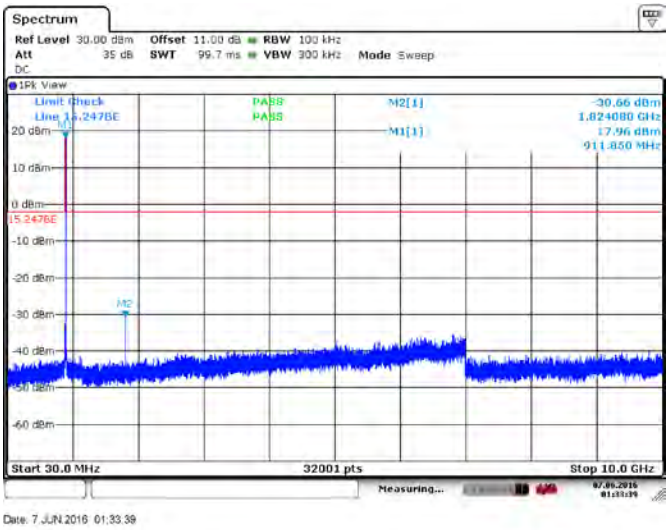


Figure 8.3-13: *Conducted spurious emissions, 912MHz, 5MHz BW, DSSS/Mbps11*

Peaks within 902-928MHz are transmitter fundamentals.

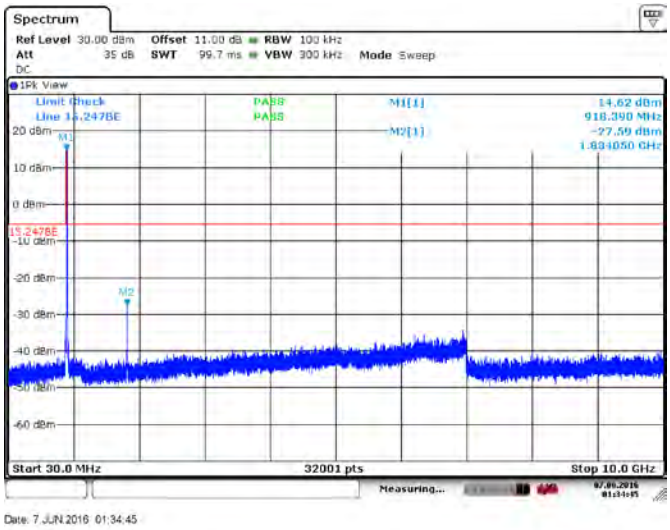


Figure 8.3-14: *Conducted spurious emissions, 917MHz, 20MHz BW, DSSS/Mbps11*

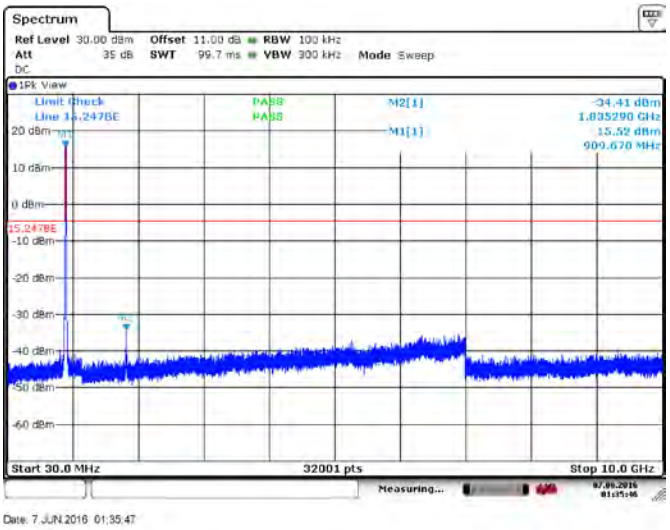


Figure 8.3-15: *Conducted spurious emissions, 917MHz, 20MHz BW, OFDM/MCS3*

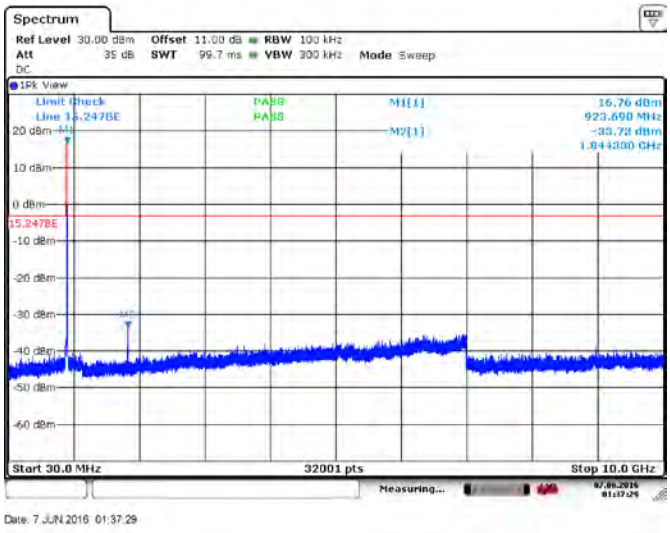


Figure 8.3-16: *Conducted spurious emissions, 922MHz, 5MHz BW, OFDM/MCS7*

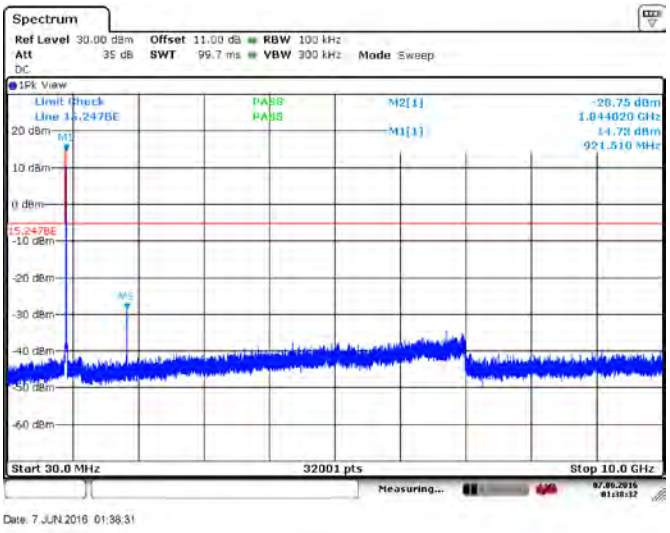


Figure 8.3-17: *Conducted spurious emissions, 922MHz, 10MHz BW, DSSS/Mbps1*

Peaks within 902-928MHz are transmitter fundamentals.

8.3.5 Test data – Radiated with Omni Directional Antenna

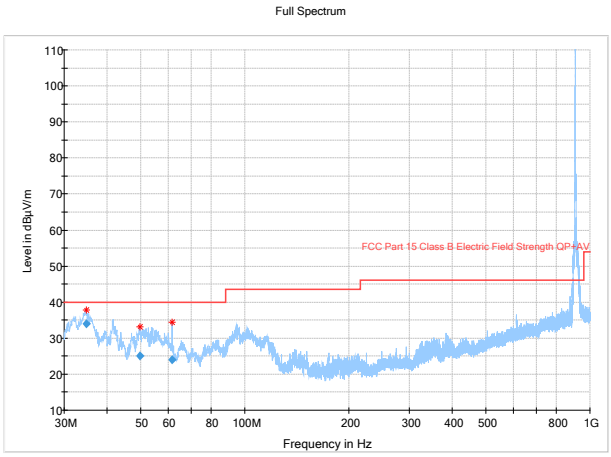


Figure 8.3-18: *Radiated spurious emissions, 907MHz, 5MHz BW, DSSS/Mbps11, 30-1000MHz*

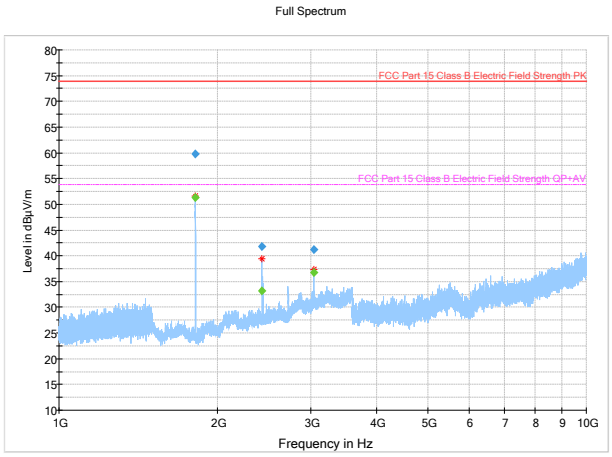


Figure 8.3-19: *Radiated spurious emissions, 907MHz, 5MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.706875	34.08	40.00	5.92	1000.0	120.000	105.6	V	175.0
49.703125	25.10	40.00	14.90	1000.0	120.000	142.2	V	43.0
61.626875	24.12	40.00	15.88	1000.0	120.000	133.3	V	348.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1814.050000	---	51.29	53.90	2.61	1000.0	1000.000	234.9	V	344.0
1814.050000	59.76	---	73.90	14.14	1000.0	1000.000	234.9	V	344.0
2426.925000	---	33.15	53.90	20.75	1000.0	1000.000	167.3	V	267.0
2426.925000	41.86	---	73.90	32.04	1000.0	1000.000	167.3	V	267.0
3040.175000	---	36.77	53.90	17.13	1000.0	1000.000	156.3	V	261.0
3040.175000	41.21	---	73.90	32.69	1000.0	1000.000	156.3	V	261.0

Peaks within 902-928MHz are transmitter fundamentals.

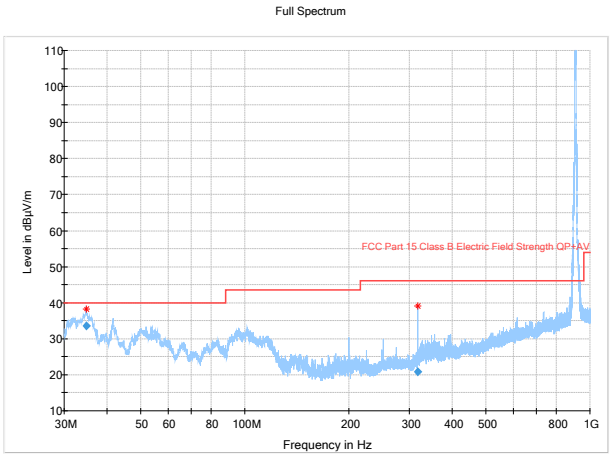


Figure 8.3-20: *Radiated spurious emissions, 907MHz, 10MHz BW, DSSS/Mbps11, 30-1000MHz*

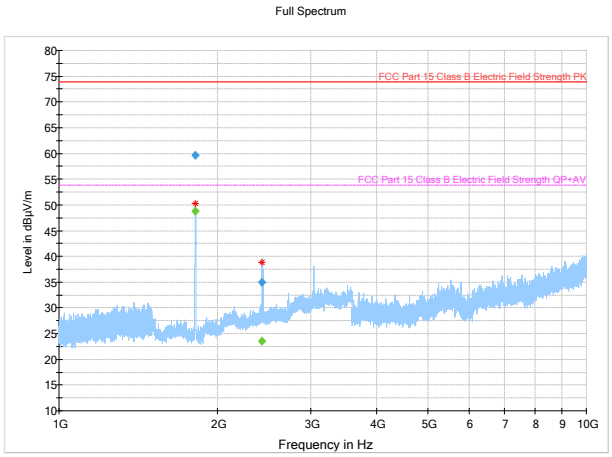


Figure 8.3-21: *Radiated spurious emissions, 907MHz, 10MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.527500	33.24	40.00	6.76	1000.0	120.000	103.9	V	152.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1814.050000	59.65	---	73.90	14.25	1000.0	1000.000	230.5	V	349.0
1814.050000	---	48.81	53.90	5.09	1000.0	1000.000	230.5	V	349.0
2425.750000	35.01	---	73.90	38.89	1000.0	1000.000	173.0	H	335.0
2425.750000	---	23.45	53.90	30.45	1000.0	1000.000	173.0	H	335.0

Peaks within 902-928MHz are transmitter fundamentals.

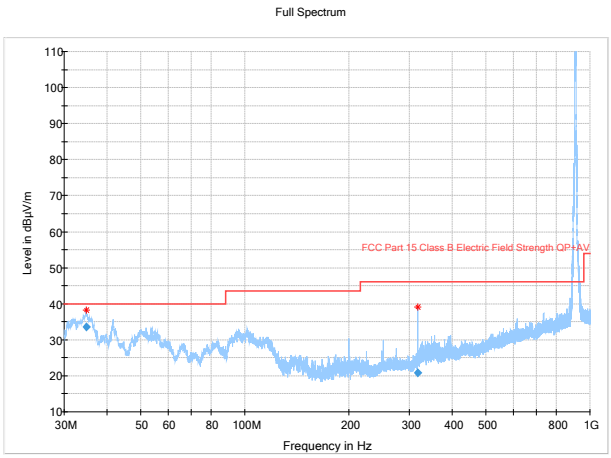


Figure 8.3-22: *Radiated spurious emissions, 907MHz, 10MHz BW, OFDM/MCS7, 30-1000MHz*

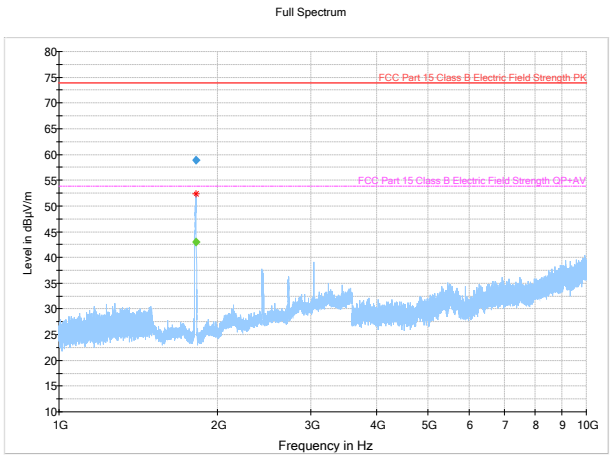


Figure 8.3-23: *Radiated spurious emissions, 907MHz, 10MHz BW, OFDM/MCS7, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.868125	33.62	40.00	6.38	1000.0	120.000	103.8	V	197.0
317.560000	20.73	46.00	25.27	1000.0	120.000	113.7	H	60.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1817.050000	---	42.92	53.90	10.98	1000.0	1000.000	229.8	V	223.0
1817.050000	58.97	---	73.90	14.93	1000.0	1000.000	229.8	V	223.0

Peaks within 902-928MHz are transmitter fundamentals.

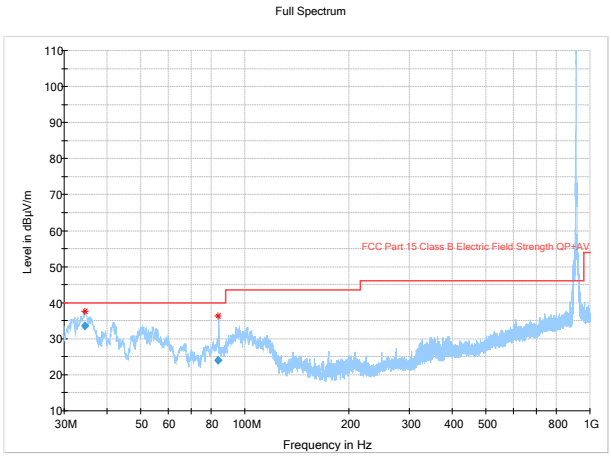


Figure 8.3-24: *Radiated spurious emissions, 912MHz, 5MHz BW, DSSS/Mbps11, 30-1000MHz*

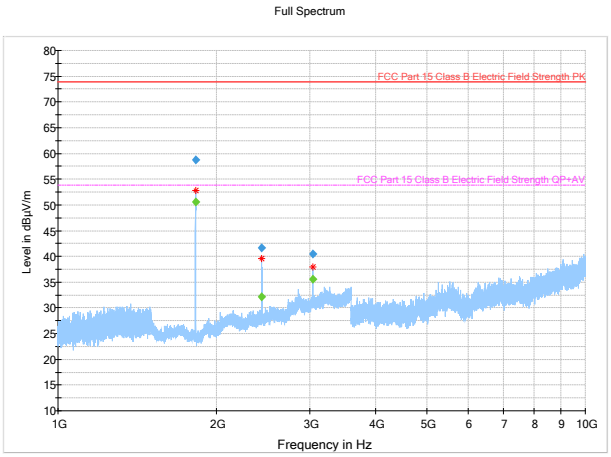


Figure 8.3-25: *Radiated spurious emissions, 912MHz, 5MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.367500	33.52	40.00	6.48	1000.0	120.000	121.0	V	187.0
83.760000	24.03	40.00	15.97	1000.0	120.000	283.2	V	185.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1823.850000	---	50.53	53.90	3.37	1000.0	1000.000	238.9	V	341.0
1823.850000	58.82	---	73.90	15.08	1000.0	1000.000	238.9	V	341.0
2431.600000	41.72	---	73.90	32.18	1000.0	1000.000	151.6	V	264.0
2431.600000	---	32.18	53.90	21.72	1000.0	1000.000	151.6	V	264.0
3040.175000	40.54	---	73.90	33.36	1000.0	1000.000	210.7	V	250.0
3040.175000	---	35.54	53.90	18.36	1000.0	1000.000	210.7	V	250.0

Peaks within 902-928MHz are transmitter fundamentals.

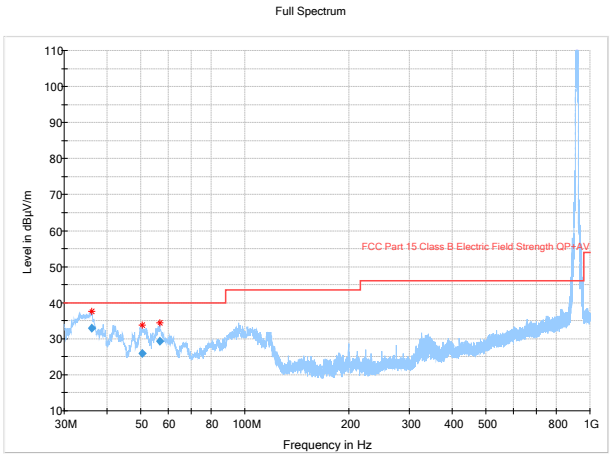


Figure 8.3-26: *Radiated spurious emissions, 917MHz, 20MHz BW, DSSS/Mbps11, 30-1000MHz*

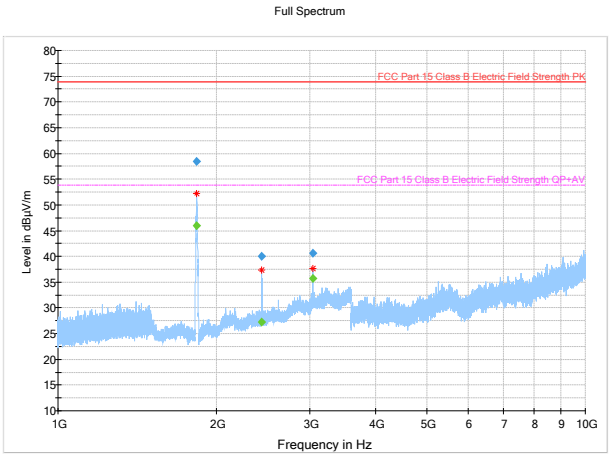


Figure 8.3-27: *Radiated spurious emissions, 917MHz, 20MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
36.061250	32.94	40.00	7.06	1000.0	120.000	116.3	V	132.0
50.491250	26.02	40.00	13.98	1000.0	120.000	174.4	V	54.0
56.796250	29.27	40.00	10.73	1000.0	120.000	119.7	V	48.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1834.025000	58.52	---	73.90	15.38	1000.0	1000.000	238.3	V	340.0
1834.025000	---	45.93	53.90	7.97	1000.0	1000.000	238.3	V	340.0
2433.775000	39.99	---	73.90	33.91	1000.0	1000.000	152.5	V	270.0
2433.775000	---	27.31	53.90	26.59	1000.0	1000.000	152.5	V	270.0
3040.175000	---	35.65	53.90	18.25	1000.0	1000.000	211.4	V	253.0
3040.175000	40.56	---	73.90	33.34	1000.0	1000.000	211.4	V	253.0

Peaks within 902-928MHz are transmitter fundamentals.

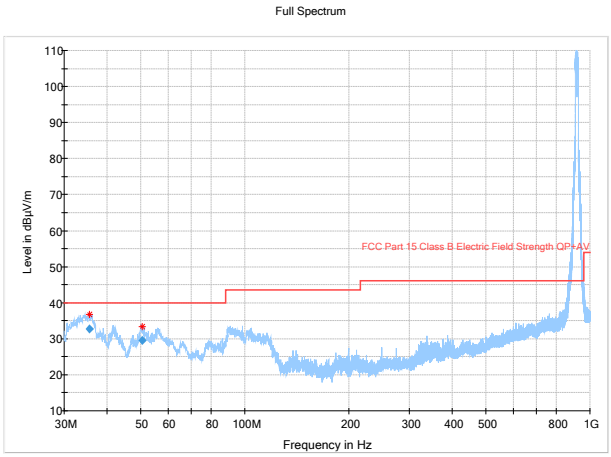


Figure 8.3-28: *Radiated spurious emissions, 917MHz, 20MHz BW, OFDM/MCS3, 30-1000MHz*

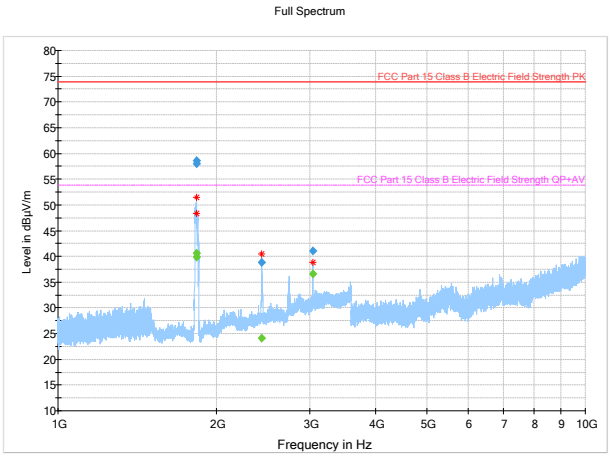


Figure 8.3-29: *Radiated spurious emissions, 917MHz, 20MHz BW, OFDM/MCS3, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
35.542500	32.75	40.00	7.25	1000.0	120.000	112.7	V	220.0
50.430625	29.59	40.00	10.41	1000.0	120.000	119.7	V	242.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1833.050000	58.64	---	73.90	15.26	1000.0	1000.000	238.4	V	333.0
1833.050000	---	40.61	53.90	13.29	1000.0	1000.000	238.4	V	333.0
1833.150000	57.96	---	73.90	15.94	1000.0	1000.000	244.8	V	300.0
1833.150000	---	39.82	53.90	14.08	1000.0	1000.000	244.8	V	300.0
2431.775000	38.84	---	73.90	35.06	1000.0	1000.000	170.3	V	270.0
2431.775000	---	24.08	53.90	29.82	1000.0	1000.000	170.3	V	270.0
3040.175000	41.04	---	73.90	32.86	1000.0	1000.000	144.7	V	261.0
3040.175000	---	36.66	53.90	17.24	1000.0	1000.000	144.7	V	261.0

Peaks within 902-928MHz are transmitter fundamentals.

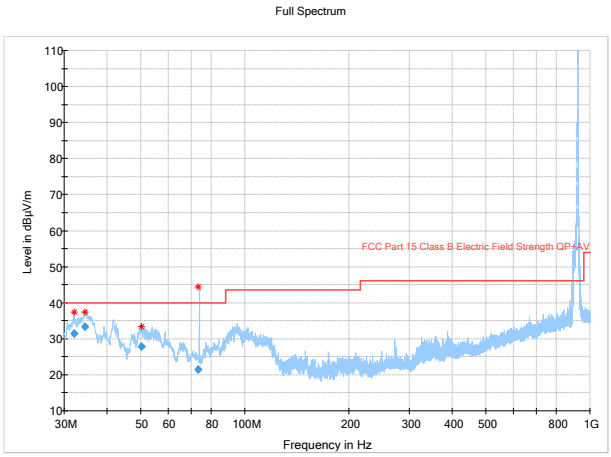


Figure 8.3-30: *Radiated spurious emissions, 922MHz, 5MHz BW, OFDM/MCS7, 30-1000MHz*

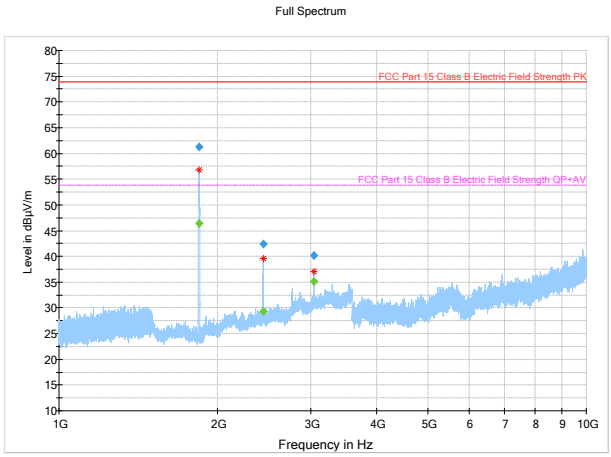


Figure 8.3-31: *Radiated spurious emissions, 922MHz, 5MHz BW, OFDM/MCS7, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
31.981250	31.52	40.00	8.48	1000.0	120.000	106.6	V	231.0
34.386875	33.34	40.00	6.66	1000.0	120.000	107.7	V	203.0
50.327500	27.80	40.00	12.20	1000.0	120.000	118.2	V	182.0
73.393125	21.47	40.00	18.53	1000.0	120.000	124.6	V	113.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1843.800000	---	46.42	53.90	7.48	1000.0	1000.000	239.4	V	305.0
1843.800000	61.20	---	73.90	12.70	1000.0	1000.000	239.4	V	305.0
2441.075000	42.33	---	73.90	31.57	1000.0	1000.000	103.9	V	257.0
2441.075000	---	29.37	53.90	24.53	1000.0	1000.000	103.9	V	257.0
3039.775000	40.16	---	73.90	33.74	1000.0	1000.000	147.5	V	251.0
3039.775000	---	35.05	53.90	18.85	1000.0	1000.000	147.5	V	251.0

Peaks within 902-928MHz are transmitter fundamentals.

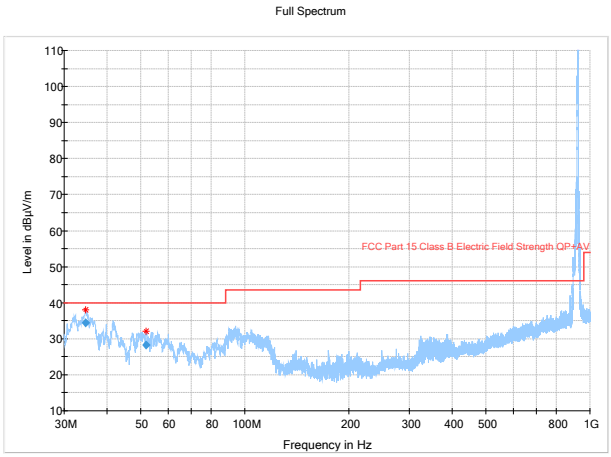


Figure 8.3-32: *Radiated spurious emissions, 922MHz, 10MHz BW, DSSS/Mbps1, 30-1000MHz*

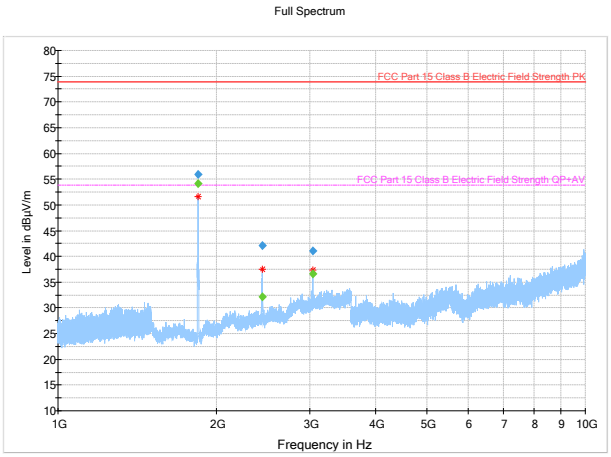


Figure 8.3-33: *Radiated spurious emissions, 922MHz, 10MHz BW, DSSS/Mbps1, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.626875	34.35	40.00	5.65	1000.0	120.000	110.3	V	188.0
51.823750	28.33	40.00	11.67	1000.0	120.000	132.6	V	315.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Note
1844.225000	---	54.07			1000.0	1000.000	241.7	V	312.0	Not in Restricted Band
1844.225000	55.99	---			1000.0	1000.000	241.7	V	312.0	Not in Restricted Band
2442.950000	42.17	---	73.90	31.73	1000.0	1000.000	132.4	V	263.0	
2442.950000	---	32.20	53.90	21.70	1000.0	1000.000	132.4	V	263.0	
3040.175000	41.09	---	73.90	32.81	1000.0	1000.000	148.9	V	263.0	
3040.175000	---	36.63	53.90	17.27	1000.0	1000.000	148.9	V	263.0	

Peaks within 902-928MHz are transmitter fundamentals.

8.3.6 Test data – Radiated with Yagi Directional Antenna

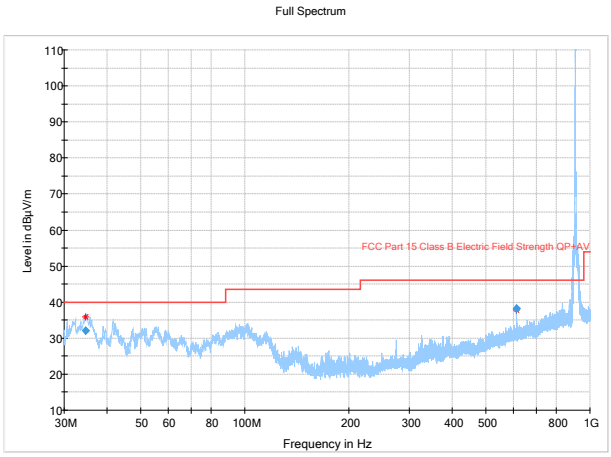


Figure 8.3-18: *Radiated spurious emissions, 907MHz, 5MHz BW, DSSS/Mbps11, 30-1000MHz*

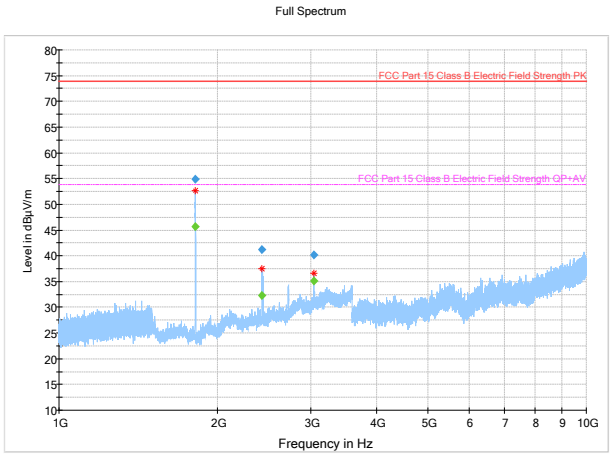


Figure 8.3-19: *Radiated spurious emissions, 907MHz, 5MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.567500	32.07	40.00	7.93	1000.0	120.000	104.3	V	190.0
612.741875	38.34	46.00	7.66	1000.0	120.000	117.0	V	200.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1814.050000	54.88	---	73.90	19.02	1000.0	1000.000	122.1	V	265.0
1814.050000	---	45.69	53.90	8.21	1000.0	1000.000	122.1	V	265.0
2426.900000	41.14	---	73.90	32.76	1000.0	1000.000	147.8	V	178.0
2426.900000	---	32.35	53.90	21.55	1000.0	1000.000	147.8	V	178.0
3039.775000	---	35.08	53.90	18.82	1000.0	1000.000	180.8	V	162.0
3039.775000	40.10	---	73.90	33.80	1000.0	1000.000	180.8	V	162.0

Peaks within 902-928MHz are transmitter fundamentals.

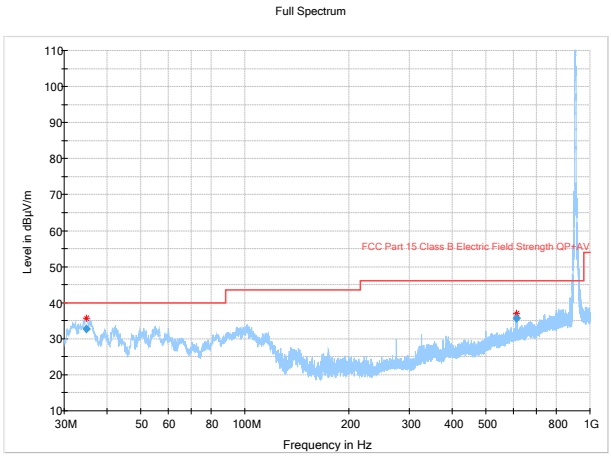


Figure 8.3-20: *Radiated spurious emissions, 907MHz, 10MHz BW, DSSS/Mbps11, 30-1000MHz*

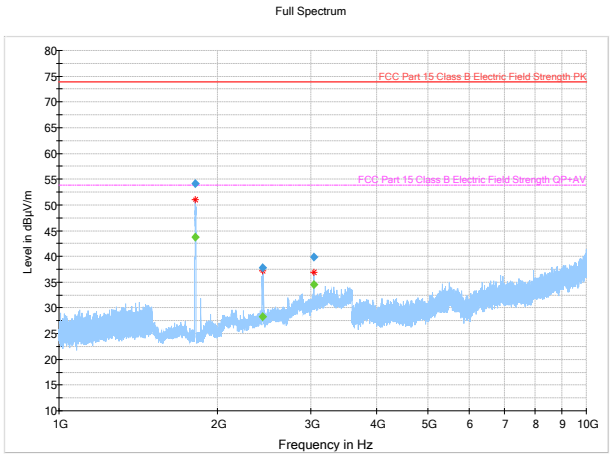


Figure 8.3-21: *Radiated spurious emissions, 907MHz, 10MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.728750	32.67	40.00	7.33	1000.0	120.000	104.3	V	111.0
612.277500	35.74	46.00	10.26	1000.0	120.000	224.8	V	335.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1814.050000	---	43.79	53.90	10.11	1000.0	1000.000	111.7	V	263.0
1814.050000	54.16	---	73.90	19.74	1000.0	1000.000	111.7	V	263.0
2428.600000	---	28.29	53.90	25.61	1000.0	1000.000	154.7	V	182.0
2428.600000	37.74	---	73.90	36.16	1000.0	1000.000	154.7	V	182.0
3039.800000	---	34.55	53.90	19.35	1000.0	1000.000	214.2	V	159.0
3039.800000	39.85	---	73.90	34.05	1000.0	1000.000	214.2	V	159.0

Peaks within 902-928MHz are transmitter fundamentals.

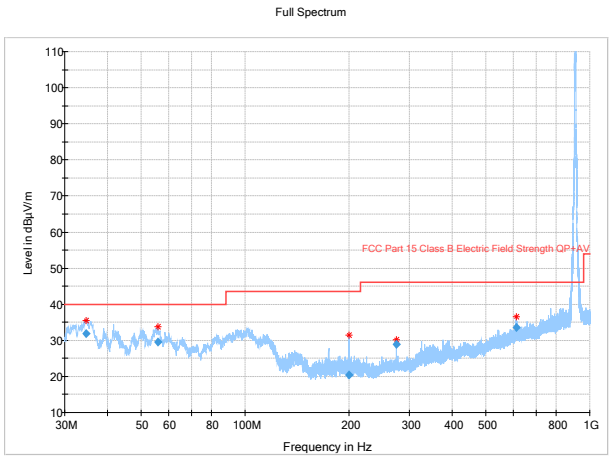


Figure 8.3-22: *Radiated spurious emissions, 907MHz, 10MHz BW, OFDM/MCS7, 30-1000MHz*

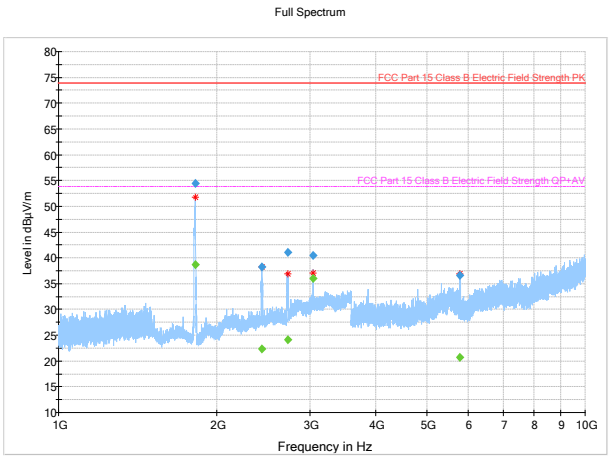


Figure 8.3-23: *Radiated spurious emissions, 907MHz, 10MHz BW, OFDM/MCS7, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.626875	31.84	40.00	8.16	1000.0	120.000	112.0	V	202.0
55.867500	29.52	40.00	10.48	1000.0	120.000	104.3	V	349.0
199.992500	20.34	43.50	23.16	1000.0	120.000	253.1	H	104.0
275.025625	28.83	46.00	17.17	1000.0	120.000	100.0	H	260.0
611.883750	33.50	46.00	12.50	1000.0	120.000	117.9	V	198.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1818.025000	54.38	---	73.90	19.52	1000.0	1000.000	117.3	V	266.0
1818.025000	---	38.66	53.90	15.24	1000.0	1000.000	117.3	V	266.0
2435.000000	---	22.32	53.90	31.58	1000.0	1000.000	100.0	H	290.0
2435.000000	38.31	---	73.90	35.59	1000.0	1000.000	100.0	H	290.0
2726.125000	41.11	---	73.90	32.79	1000.0	1000.000	109.8	V	150.0
2726.125000	---	24.06	53.90	29.84	1000.0	1000.000	109.8	V	150.0
3039.800000	40.49	---	73.90	33.41	1000.0	1000.000	176.3	V	162.0
3039.800000	---	35.97	53.90	17.93	1000.0	1000.000	176.3	V	162.0
5779.500000	36.54	---	73.90	37.36	1000.0	1000.000	166.6	V	39.0
5779.500000	---	20.65	53.90	33.25	1000.0	1000.000	166.6	V	39.0

Peaks within 902-928MHz are transmitter fundamentals.

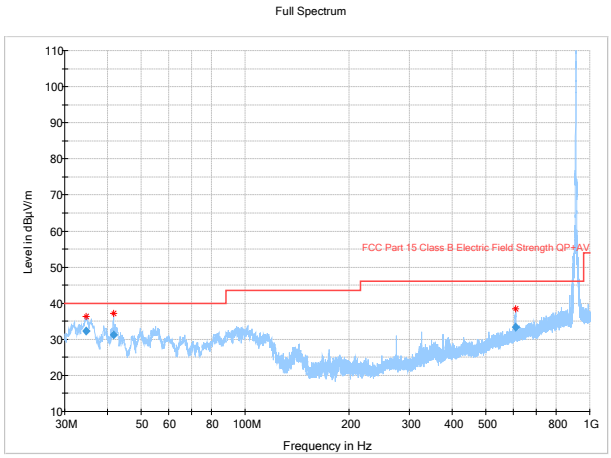


Figure 8.3-24: *Radiated spurious emissions, 912MHz, 5MHz BW, DSSS/Mbps11, 30-1000MHz*

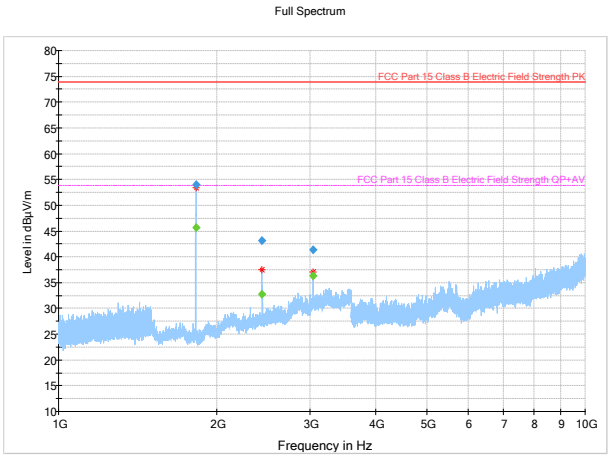


Figure 8.3-25: *Radiated spurious emissions, 912MHz, 5MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.590625	32.39	40.00	7.61	1000.0	120.000	100.0	V	152.0
41.619375	31.20	40.00	8.80	1000.0	120.000	120.8	V	76.0
609.065625	33.31	46.00	12.69	1000.0	120.000	115.3	V	216.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1823.850000	---	45.67	53.90	8.23	1000.0	1000.000	114.5	V	269.0
1823.850000	54.02	---	73.90	19.88	1000.0	1000.000	114.5	V	269.0
2432.050000	---	32.71	53.90	21.19	1000.0	1000.000	127.5	V	172.0
2432.050000	43.16	---	73.90	30.74	1000.0	1000.000	127.5	V	172.0
3040.175000	---	36.26	53.90	17.64	1000.0	1000.000	171.6	V	163.0
3040.175000	41.39	---	73.90	32.51	1000.0	1000.000	171.6	V	163.0

Peaks within 902-928MHz are transmitter fundamentals.

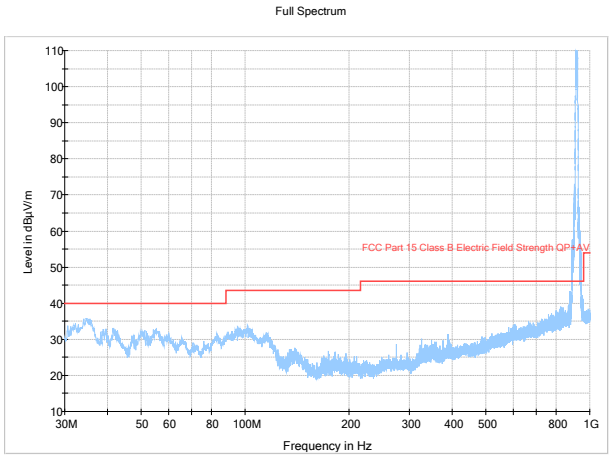


Figure 8.3-26: *Radiated spurious emissions, 917MHz, 20MHz BW, DSSS/Mbps11, 30-1000MHz*

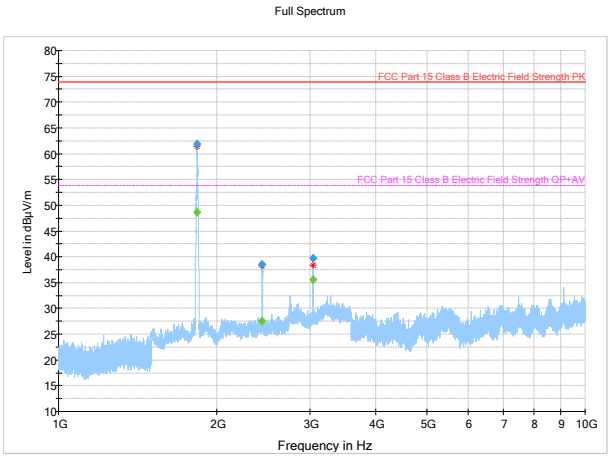


Figure 8.3-27: *Radiated spurious emissions, 917MHz, 20MHz BW, DSSS/Mbps11, 1-10GHz*

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1834.050000	---	48.69	53.90	5.21	1000.0	1000.000	100.0	V	91.0
1834.050000	61.88	---	73.90	12.02	1000.0	1000.000	100.0	V	91.0
2435.975000	---	27.56	53.90	26.34	1000.0	1000.000	164.2	V	173.0
2435.975000	38.58	---	73.90	35.32	1000.0	1000.000	164.2	V	173.0
3040.175000	---	35.52	53.90	18.38	1000.0	1000.000	215.8	V	176.0
3040.175000	39.69	---	73.90	34.21	1000.0	1000.000	215.8	V	176.0

Peaks within 902-928MHz are transmitter fundamentals.

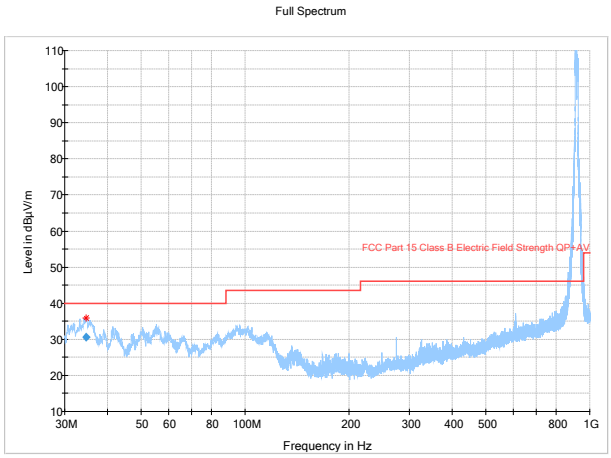


Figure 8.3-28: *Radiated spurious emissions, 917MHz, 20MHz BW, OFDM/MCS3, 30-1000MHz*

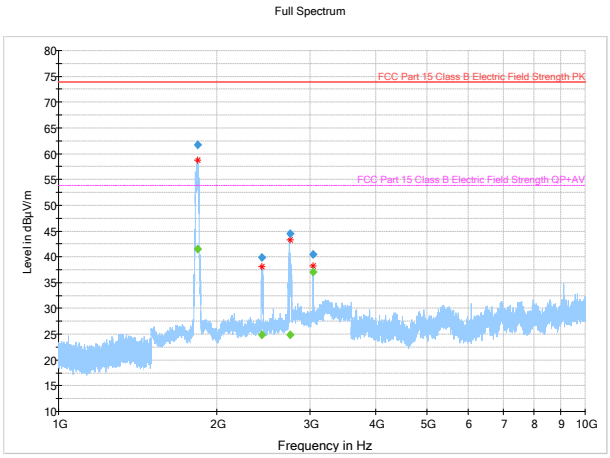


Figure 8.3-29: *Radiated spurious emissions, 917MHz, 20MHz BW, OFDM/MCS3, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.522500	30.52	40.00	9.48	1000.0	120.000	120.1	V	350.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1837.400000	---	41.51	53.90	12.39	1000.0	1000.000	121.6	V	95.0
1837.400000	61.74	---	73.90	12.16	1000.0	1000.000	121.6	V	95.0
2434.225000	---	24.82	53.90	29.08	1000.0	1000.000	152.5	V	184.0
2434.225000	39.84	---	73.90	34.06	1000.0	1000.000	152.5	V	184.0
2748.400000	---	24.83	53.90	29.07	1000.0	1000.000	161.1	V	184.0
2748.400000	44.47	---	73.90	29.43	1000.0	1000.000	161.1	V	184.0
3040.175000	---	36.99	53.90	16.91	1000.0	1000.000	166.7	V	176.0
3040.175000	40.46	---	73.90	33.44	1000.0	1000.000	166.7	V	176.0

Peaks within 902-928MHz are transmitter fundamentals.

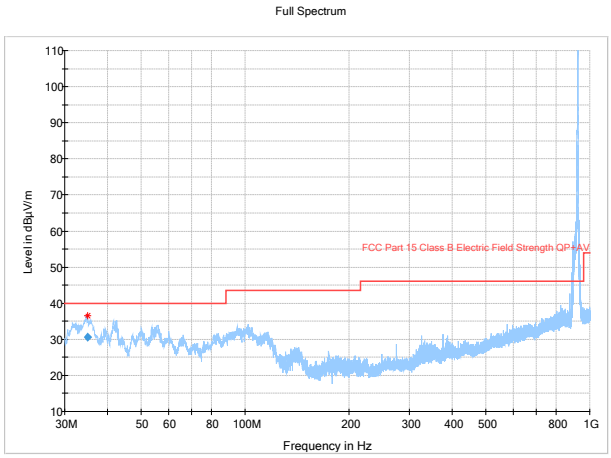


Figure 8.3-30: *Radiated spurious emissions, 922MHz, 5MHz BW, OFDM/MCS7, 30-1000MHz*

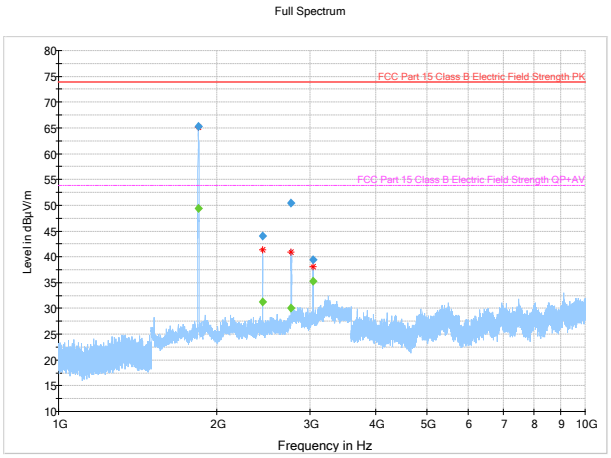


Figure 8.3-31: *Radiated spurious emissions, 922MHz, 5MHz BW, OFDM/MCS7, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
35.007500	30.64	40.00	9.36	1000.0	120.000	104.3	V	52.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
1846.175000	---	49.42	53.90	4.48	1000.0	1000.000	140.0	V	91.0
1846.175000	65.27	---	73.90	8.63	1000.0	1000.000	140.0	V	91.0
2440.525000	---	31.27	53.90	22.63	1000.0	1000.000	135.0	V	171.0
2440.525000	44.09	---	73.90	29.81	1000.0	1000.000	135.0	V	171.0
2765.475000	---	30.08	53.90	23.82	1000.0	1000.000	100.0	V	151.0
2765.475000	50.38	---	73.90	23.52	1000.0	1000.000	100.0	V	151.0
3040.175000	---	35.26	53.90	18.64	1000.0	1000.000	215.4	V	167.0
3040.175000	39.44	---	73.90	34.46	1000.0	1000.000	215.4	V	167.0

Peaks within 902-928MHz are transmitter fundamentals.

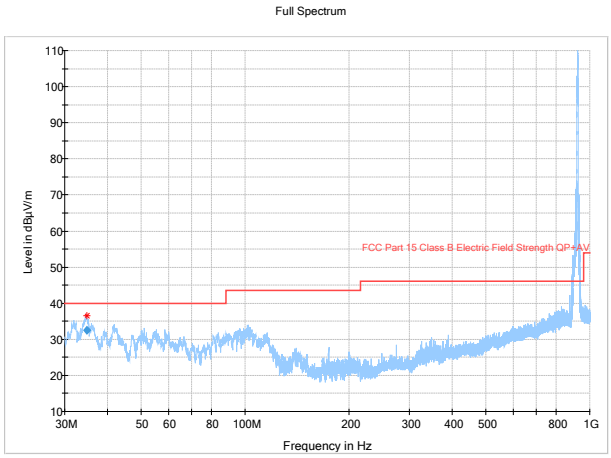


Figure 8.3-32: *Radiated spurious emissions, 922MHz, 10MHz BW, DSSS/Mbps1, 30-1000MHz*

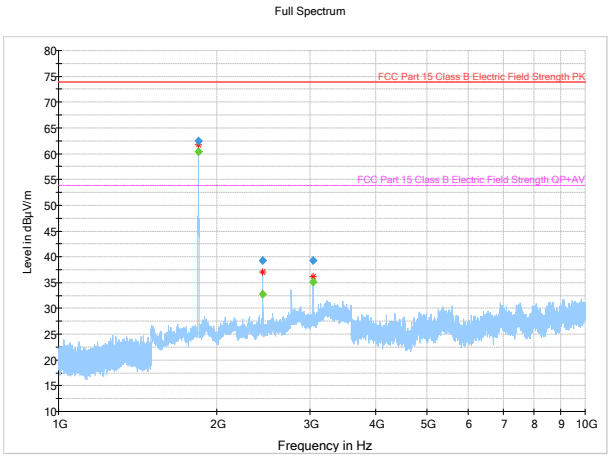


Figure 8.3-33: *Radiated spurious emissions, 922MHz, 10MHz BW, DSSS/Mbps1, 1-10GHz*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
34.708125	32.51	40.00	7.49	1000.0	120.000	103.9	V	140.0

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Note
1844.225000	---	60.31			1000.0	1000.000	125.0	V	80.0	Not in Restricted Band
1844.225000	62.44	---			1000.0	1000.000	125.0	V	80.0	Not in Restricted Band
2443.050000	---	32.71	53.90	21.19	1000.0	1000.000	136.7	V	172.0	
2443.050000	39.35	---	73.90	34.55	1000.0	1000.000	136.7	V	172.0	
3040.175000	---	35.04	53.90	18.86	1000.0	1000.000	214.6	V	168.0	
3040.175000	39.32	---	73.90	34.58	1000.0	1000.000	214.6	V	168.0	

Peaks within 902-928MHz are transmitter fundamentals.

8.4 FCC 15.247(e) and RSS-247 5.2(2) Power Spectrum Density

8.4.1 Definitions and limits

FCC and IC:
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

8.4.2 Test summary

Test date	June 2, 2016	Temperature	23 °C
Test engineer	Feng You	Air pressure	1002 mbar
Verdict	Pass	Relative humidity	64 %

8.4.3 Observations, settings and special notes

3kHz RBW

Per ANSI 63.10-2013 5.6.2.2

c) In-band PSD—Measurements on the mode with the narrowest bandwidth can be used to cover all modes within the same modulation family of an equal or lower output power provided the result is less than 50% of the limit.

8.4.4 Test data

Table 8.4-1: *Power Spectrum Density*

Frequency, MHz	Channel Bandwidth, MHz	Modulation	Data Rate, Mbps	Conducted PSD@3kHz, dBm		Margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
				Measured	Limit					
907	5	DSS/CCK	11	4.66	8	3.34	7	11.66	14	2.34
907	5	OFDM/QAM64	MCS7	4	8	4	7	11	14	3
907	10	DSS/CCK	11	2.54	8	5.46	7	9.54	14	4.46
907	10	OFDM/QAM64	MCS7	0.95	8	7.05	7	7.95	14	6.05
912	5	DSS/CCK	11	4.56	8	3.44	7	11.56	14	2.44
912	5	OFDM/QAM64	MCS7	2.65	8	5.35	7	9.65	14	4.35
912	10	DSS/CCK	11	2.08	8	5.92	7	9.08	14	4.92
912	10	OFDM/QAM64	MCS7	0.1	8	7.9	7	7.1	14	6.9
912	20	DSS/CCK	11	1.55	8	6.45	7	8.55	14	5.45
912	20	OFDM/QAM16	MCS3	-2.16	8	10.16	7	4.84	14	9.16
917	20	DSS/CCK	11	1.65	8	6.35	7	8.65	14	5.35
917	20	OFDM/QAM16	MCS3	-0.22	8	8.22	7	6.78	14	7.22
922	5	DSS/BPSK	1	1.76	8	6.24	7	8.76	14	5.24
922	5	OFDM/QAM64	MCS7	3.84	8	4.16	7	10.84	14	3.16
922	10	DSS/BPSK	1	1.44	8	6.56	7	8.44	14	5.56
922	10	OFDM/QAM64	MCS7	1.03	8	6.97	7	8.03	14	5.97

8.5 FCC 15.207(a) AC power line conducted emissions limits

8.5.1 Definitions and limits

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

The conducted emissions shall be measured with a 50 Ω/50 µH line impedance stabilization network (LISN).

Table 8.6-1: *Conducted emissions limit*

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

Note: * - Decreases with the logarithm of the frequency.

8.5.2 Test summary

Test date	June 6, 2016	Temperature	23 °C
Test engineer	Feng You	Air pressure	1000 mbar
Verdict	Pass	Relative humidity	58 %

8.5.3 Observations, settings and special notes

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

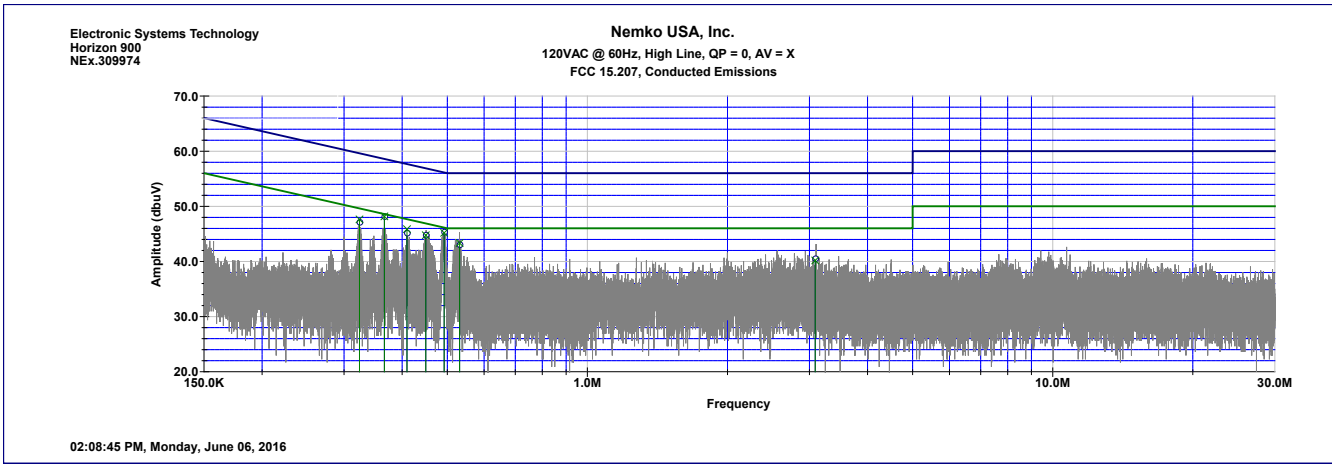
A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Highest output power mode (917MHz, 20MHz BW, OFDM/MCS3) was select.

Test receiver settings:

Frequency span	150 kHz to 30 MHz
Detector mode	Peak and Average (preview mode); Quasi-Peak (final measurements)
Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Trace mode	Max Hold
Measurement time	1000 ms

8.5.4 Test data

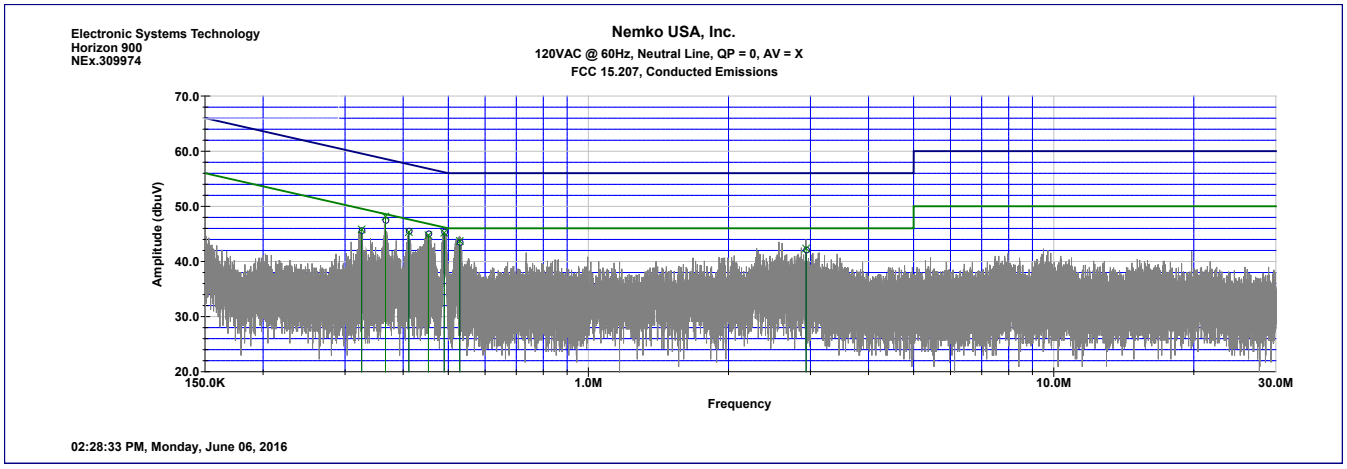


Plot 8.6-1: *Conducted emissions on phase line*

Table 8.5-2: *Quasi-Peak and Average conducted emissions results on phase line*

Frequency kHz	QP Rdng (dBµV)	Avg Rdng (dBµV)	QP Limit (dBµV)	Avg Limit (dBµV)	QP Margin (dB)	Avg Margin (dB)
323.82	47.2	47.6	61	49.6	13.8	2
366.26	48.2	48.2	59.8	48.6	11.6	0.4
409.6	45.2	45.8	58.6	47.7	13.4	1.9
449.55	44.8	44.7	57.4	46.9	12.6	2.2
492.3	45.4	45.2	56.2	46.1	10.8	0.9
531.35	43.1	43.3	56	46	12.9	2.7
3087.94	40.6	40.2	56	46	15.4	5.8

8.5.4 Test data, continued



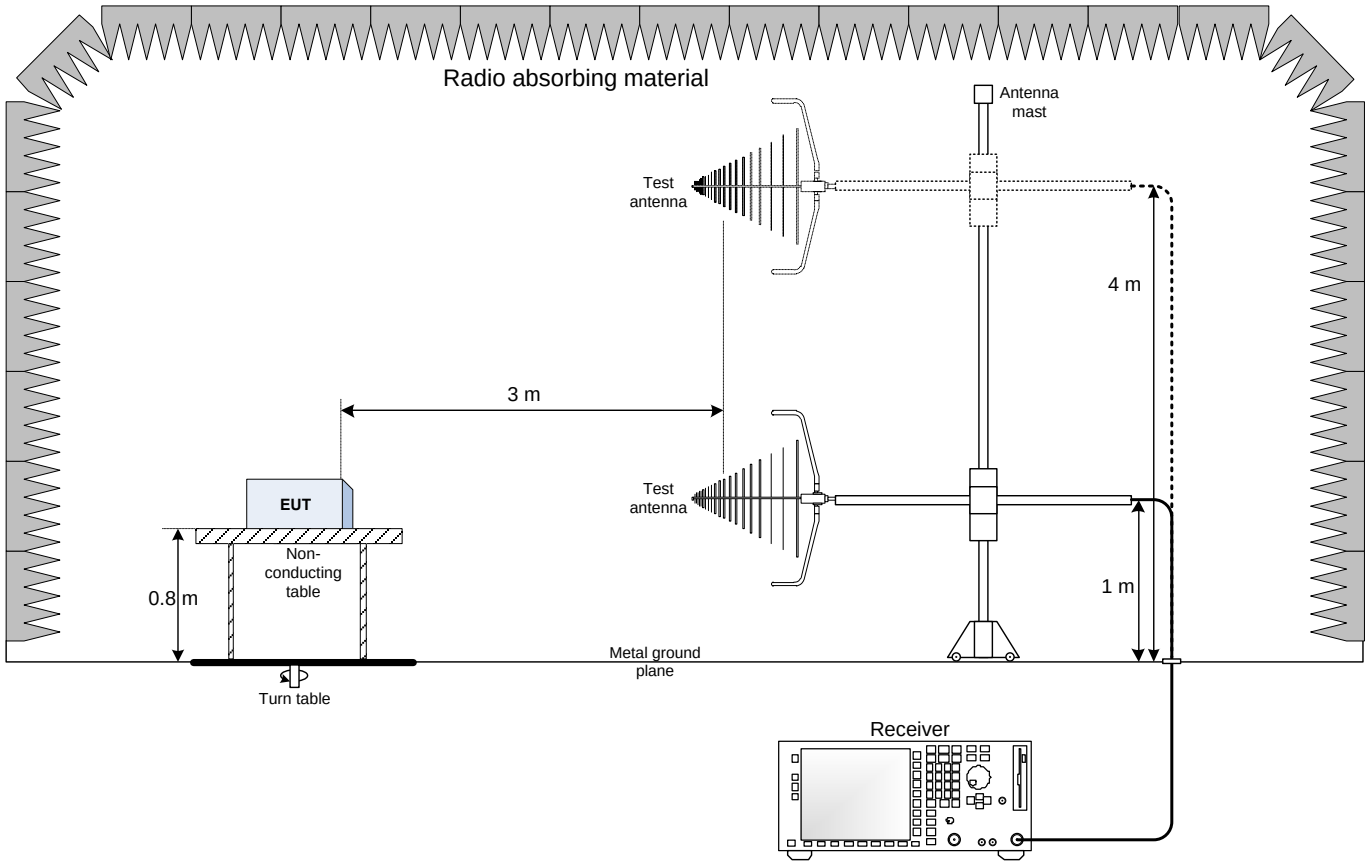
Plot 8.6-2: *Conducted emissions on neutral line*

Table 8.6-3: *Quasi-Peak and Average conducted emissions results on neutral line*

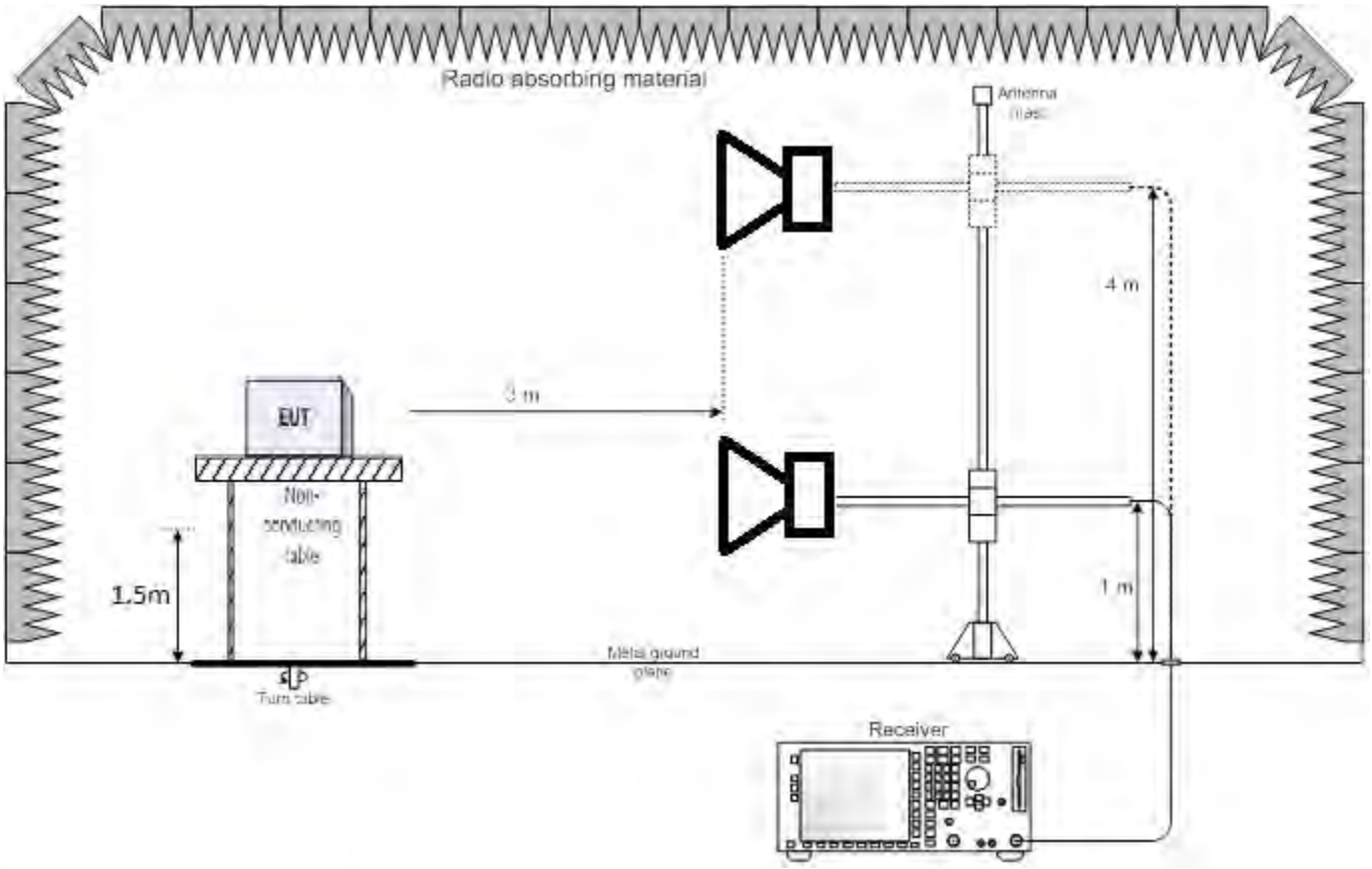
Frequency kHz	QP Rdng (dBµV)	Avg Rdng (dBµV)	QP Limit (dBµV)	Avg Limit (dBµV)	QP Margin (dB)	Avg Margin (dB)
325.76	45.7	45.8	61	49.6	15.3	3.8
366.5	47.5	48.1	59.8	48.6	12.3	0.5
411.35	45.6	45.3	58.5	47.6	12.9	2.3
453.17	45.1	44.7	57.3	46.8	12.2	2.1
490.14	45.4	45.2	56.3	46.2	10.9	1
529.29	43.5	43.7	56	46	12.5	2.3
2937.46	42.1	42.3	56	46	13.9	3.7

Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up – Below 1GHz



9.2 Radiated emissions set-up – Above 1GHz



9.3 Conducted emissions set-up