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Test report

360804-2R1TRFWL

Date of issue: April 10, 2019

Applicant:

Siemens Canada Limited

Product:

Base Station

Model:

WIN7327

FCC ID:

WQE723702

Specifications:

- FCC 47 CFR Part 96

  Citizens Broadband Radio Service

Test location

Company name	Nemko Canada Inc.
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City	Ottawa
Province	Ontario
Postal code	K1V 1H2
Country	Canada
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Toll free	+1 800 563 6336
Website	www.nemko.com
Site number	FCC: CA2040 (3 m semi anechoic chamber)

Tested by	Andrey Adelberg, Senior Wireless/EMC Specialist
Reviewed by	Kevin Rose, Wireless/EMC Specialist
Date	April 10, 2019
Signature of reviewer	

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 Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of contents

Table of contents **3**

Section 1. Report summary **4**

1.1 Applicant and manufacturer 4

1.2 Test specifications 4

1.3 Test method 4

1.4 Statement of compliance 4

1.5 Exclusions 4

1.6 Test report revision history 4

Section 2. Summary of test results **5**

2.1 FCC Part 96 test results 5

Section 3. Equipment under test (EUT) details **6**

3.1 Sample information 6

3.2 EUT information 6

3.3 Technical information 6

3.4 Product description and theory of operation 7

3.5 EUT exercise details 7

3.6 EUT setup diagram 8

3.7 EUT sub assemblies 8

Section 4. Engineering considerations **9**

4.1 Modifications incorporated in the EUT 9

4.2 Technical judgment 9

4.3 Deviations from laboratory tests procedures 9

Section 5. Test conditions **10**

5.1 Atmospheric conditions 10

5.2 Power supply range 10

Section 6. Measurement uncertainty **11**

6.1 Uncertainty of measurement 11

Section 7. Test equipment **12**

7.1 Test equipment list 12

Section 8. Testing data **13**

8.1 FCC 96.41(b) Output power and PSD 13

8.2 FCC 96.41(g) The peak-to-average power ratio (PAPR) 16

8.3 FCC 96.41(e)(3) Emission bandwidth and occupied bandwidth 18

8.4 FCC 96.41(e)(1) 3.5 GHz emissions and interference limits 20

8.5 FCC 96.41(e)(2) Additional protection levels 27

8.6 FCC 2.1055 Frequency stability 39

Section 9. Block diagrams of test set-ups **40**

9.1 Radiated emissions set-up for frequencies below 1 GHz 40

9.2 Radiated emissions set-up for frequencies above 1 GHz 40

9.3 Conducted emissions set-up 41

Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Siemens Canada Limited
Address	300 Applewood Crescent
City	Concord
Province/State	ON
Postal/Zip code	L4K 5C7
Country	Canada

1.2 Test specifications

FCC 47 CFR Part 96	Citizens Broadband Radio Service

1.3 Test method

ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
940660 D01 Part 96 CBRS Eqpt v01	Certification and test procedures for citizens broadband radio service devices authorized under Part 96
662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

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

This test report covers only general requirements of Part 96. For SAS and functionality please refer to the WINNF test report.

1.6 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued
R1TRF	Category B testing only

Section 2. Summary of test results

2.1 FCC Part 96 test results

Part	Test description	Verdict
§96.41(e)(3)	Emission and occupied bandwidth	Pass
§96.41(b)	Power limits	Pass
§96.41(e)(1)	3.5 GHz Emissions and Interference Limits	Pass
§96.41(e)(2)	Additional protection levels	Pass
§96.41(g)	The peak-to-average power ratio (PAPR)	Pass
§2.1055	Frequency stability	Pass

Notes: None

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	October 1, 2018
Nemko sample ID number	1

3.2 EUT information

Product name	Base Station
Model	WIN7327
Serial number	43741218029
Revision number	REV:09 H/W:A3

3.3 Technical information

Frequency band	3550–3700 MHz
Frequency Min (MHz)	3552.5 (5 MHz channel); 3555 (10 MHz channel)
Frequency Max (MHz)	3697.5 (5 MHz channel); 3695 (10 MHz channel)
RF total power Max (W)	36.982 (5 MHz channel, Category B); 50.118 (10 MHz channel, Category B)
Maximum declared power per port	27 dBm ±1 dB
RF power density (W/MHz)	0.189 (5 MHz channel, Category B); 0.188 (10 MHz channel, Category B)
Field strength, Units @ distance	N/A
Measured BW (kHz) (99 %)	4660 (5 MHz channel); 9320 (10 MHz channel)
Measured BW (kHz) (26 dB)	5380 (5 MHz channel); 10400 (10 MHz channel)
Type of modulation	QPSK½ to 64QAM
Emission classification (F1D, G1D, D1D)	5M00W7D; 10M0W7D
Transmitter spurious, Units @ distance	52.12 dBµV/m at 1308.52 MHz @ 3 m
Power requirements	48 V_{DC} via PoE powered from 120 V_{AC} / 60 Hz
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

Type	Manufacturer	Model	Gain
Dual slant pol (for BS)	Wireless Edge	MT – 404067/ND	17 dBi
Sector Antenna	Maxrad	SP3338-18XP60	18 dBi
Sector Antenna	Kenbotong	KBT90DP17-3338AT0	17 dBi
Sector Panel Antenna	Tongyu	TDJ-333817D-90PTO	17 dBi
Omnidirectional Antenna	Wireless Edge	MT – 402009/N/A	8.5 dBi

3.4 Product description and theory of operation

The WIN7237 Pico WiMAX BST is a single sector station used to enhance outdoor and indoor WiMAX coverage and capacity. The unit is easily installable, powered by PoE and supports remote management. WIN7237 provides the full base station functionality necessary for serving a single sector. It supports up to 512 subscriber units and its light weight and small footprint allow it to be easily mounted by one person on poles, street lamps or walls.
The WIN7237 is a member of the WIN-MAX E family, a line of mobile WiMAX broadband wireless access systems based on the 802.16e mobile WiMAX standard. WIN-MAX E systems are designed for robustness and simplicity, offering feature-rich services with low deployment and operation costs, for unmatched operator competitiveness and fast ROI.
WIN7237 provides all the functionality necessary to communicate with fixed and mobile subscriber units according to the service criteria and customer Service Level Agreements (SLA). The end-to-end Quality of Service (QoS) ensures the same high quality WiMAX experience is delivered to customers outside or inside his/her home or small office.

Frequency range:	3550–3700 MHz
Average output power:	27 dBm ±1 dB max
Bandwith:	5 MHz, 7 MHz, 10 MHz
Antenna types:	
	- Sector Antenna: 17 dBi and 18 dBi
	- Omnidirectional: 8.5 dBi

The WIN7237 consists of the following modules:

- Base-Band board – including the WiMAX 16e MIMO Base-Band SoC (running the 16e MAC + PHY) plus the User Interface, GPS module for synchronization, DC/DC power supply and the analog front end that interface the RF module.
- RF board - Dual transmit & receive module that modulate the analog WiMAX signal input from the Base-Band modem to the high frequency RF output.
- Chassis

The WIN7237 uses time division duplexing (TDD) to transmit and receive on the same RF channel. This is a non-contention based method for providing an efficient and predictable two-way PTP or PMP cell deployment. The modulation technique specifies how the data is coded within the OFDMA carriers. The base station supports QPSK, 16 QAM, and 64 QAM modulations. The two transmitter chains are not correlated.

3.5 EUT exercise details

EUT was controlled via PuttY interface from the computer.

3.6 EUT setup diagram

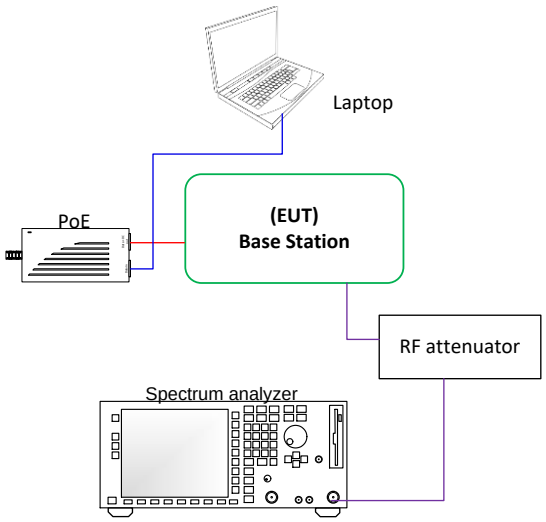

Figure 3.6-1: *Setup diagram*

3.7 EUT sub assemblies

Table 3.7-1: *EUT sub assemblies*

Description	Brand name	Model/Part number	Serial number
PoE	N/A	0334B5555 Black	L21450039379
Laptop	Dell	Latitude E6430	Nemko FA002851

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

None

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.

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

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Dec. 9/18
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	March 26/19
Spectrum analyzer	Rohde & Schwarz	FSU	FA001877	1 year	Oct 26/18
Preamp (1–18 GHz)	ETS-Lindgren	124334	FA002877	1 year	Nov. 14/18
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	Oct. 1/19
Horn antenna (1–18 GHz)	EMCO	3115	FA000649	1 year	Oct. 27/18
Horn antenna (18–26.5 GHz)	Electro-metrics	SH-50/60-1	FA000479	—	VOU
Horn antenna (26.5–40 GHz)	Electro-metrics	SH-50/60-2	FA000485	—	VOU
Pre-amplifier (18–26 GHz)	Narda	BBS-1826N612	FA001550	—	VOU
Pre-amplifier (26–40 GHz)	Narda	DBL-2640N610	FA001556	—	VOU
Temperature chamber	Espec	EPX-4H	FA002735	1 year	Sept. 12/19
Power meter	Agilent	N1911A	FA001946	1 year	Oct 11, 2019
Power sensor	Agilent	N1922A	FA001947	1 year	Aug 8, 2018

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

Section 8. Testing data

8.1 FCC 96.41(b) Output power and PSD

8.1.1 Definitions and limits

Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the following table:

Table 8.1-1: *Output power and PSD limits*

Device	Maximum EIRP, dBm/10 MHz	Maximum PSD, dBm/MHz
End User Device	23	N/A
Category A CBSD	30	20
Category B CBSD	47	37

8.1.2 Test summary

Test date	October 9, 2018

8.1.3 Observations, settings and special notes

Based on the maximum RF power listed in this report, considerations pertaining to the maximum allowed EIRP and antenna type should be considered for each installation. As per manufacturer declaration: EUT doesn't transmit more than one channel bandwidth simultaneously.
The test was performed using RMS detector of the spectrum analyzer with RBW of 1 MHz and VBW of 10 MHz and 10 MHz RBW and 30 MHz VBW.
Total transmission power measurement results (in dBm units), provided below in the first 4 tables, are for the information purposes only. These values don't have limit in the section §96.41, since all the limits in the standard are expressed in dBm/10 MHz or dBm/MHz units. The measurement was performed using RMS power meter.

8.1.4 Test data

Table 8.1-2: *Maximum total transmition power and EIRP for 5 MHz channel MIMO operation of CBRS Category B*

Frequency, MHz	Tx power at Ant 1, dBm	Tx power at Ant 2, dBm	Combined Tx power dBm	Antenna gain, dBi	EIRP, dBm
3552.5	24.29	24.29	27.30	18.00	45.30
3625.0	24.82	24.98	27.91	18.00	45.91
3697.5	24.17	24.81	27.51	18.00	45.51

Table 8.1-3: *Maximum total transmition power and EIRP for 10 MHz channel MIMO operation of CBRS Category B*

Frequency, MHz	Tx power at Ant 1, dBm	Tx power at Ant 2, dBm	Combined Tx power dBm	Antenna gain, dBi	EIRP, dBm
3555.0	26.89	26.17	29.55	8.50	38.05
3625.0	27.04	27.81	30.45	8.50	38.95
3695.0	28.41	26.84	30.71	8.50	39.21
3555.0	26.67	27.67	30.21	17.00	47.21
3625.0	26.75	27.16	29.97	17.00	46.97
3695.0	27.22	26.71	29.98	17.00	46.98
3555.0	25.05	25.79	28.45	18.00	46.45
3625.0	26.62	25.73	29.21	18.00	47.21
3695.0	26.21	25.76	29.00	18.00	47.00

Table 8.1-4: *EIRP in 10 MHz measurement result for 5 MHz MIMO operation of CBRS Category B*

Frequency, MHz	Modulation	Output power at Ant 1, dBm/10 MHz	Output power at Ant 2, dBm/10 MHz	Combined output power dBm/10 MHz	Antenna gain, dBi	EIRP, dBm/10 MHz	EIRP Limit, dBm/10 MHz	Margin, dB
3552.5	QPSK½	24.88	24.17	27.55	18.00	45.55	47.00	1.45
3625.0	QPSK½	24.92	24.38	27.67	18.00	45.67	47.00	1.33
3697.5	QPSK½	24.66	24.27	27.48	18.00	45.48	47.00	1.52
3552.5	64QAM	24.90	24.39	27.66	18.00	45.66	47.00	1.34
3625.0	64QAM	24.62	24.18	27.42	18.00	45.42	47.00	1.58
3697.5	64QAM	24.89	24.44	27.68	18.00	**45.68**	47.00	1.32

Table 8.1-5: *EIRP in 10 MHz measurement result for 10 MHz MIMO operation of CBRS Category B*

Frequency, MHz	Modulation	Output power at Ant 1, dBm/10 MHz	Output power at Ant 2, dBm/10 MHz	Combined output power dBm/10 MHz	Antenna gain, dBi	EIRP, dBm/10 MHz	EIRP Limit, dBm/10 MHz	Margin, dB
3555.0	QPSK½	26.89	27.08	30.00	8.50	38.50	47.00	8.50
3625.0	QPSK½	27.04	27.02	30.04	8.50	38.54	47.00	8.46
3695.0	QPSK½	27.50	27.05	30.29	8.50	38.79	47.00	8.21
3555.0	64QAM	26.59	26.84	29.73	8.50	38.23	47.00	8.77
3625.0	64QAM	26.72	26.72	29.73	8.50	38.23	47.00	8.77
3695.0	64QAM	27.30	26.83	30.08	8.50	38.58	47.00	8.42
3555.0	QPSK½	26.60	26.79	29.71	17.00	46.71	47.00	0.29
3625.0	QPSK½	26.75	26.73	29.75	17.00	46.75	47.00	0.25
3695.0	QPSK½	27.21	26.76	30.00	17.00	**47.00**	47.00	0.00
3555.0	64QAM	26.30	26.55	29.44	17.00	46.44	47.00	0.56
3625.0	64QAM	26.43	26.43	29.44	17.00	46.44	47.00	0.56
3695.0	64QAM	27.01	26.54	29.79	17.00	46.79	47.00	0.21
3555.0	QPSK½	25.60	25.79	28.71	18.00	46.71	47.00	0.29
3625.0	QPSK½	25.75	25.73	28.75	18.00	46.75	47.00	0.25
3695.0	QPSK½	26.21	25.76	29.00	18.00	**47.00**	47.00	0.00
3555.0	64QAM	25.30	25.55	28.44	18.00	46.44	47.00	0.56
3625.0	64QAM	25.43	25.43	28.44	18.00	46.44	47.00	0.56
3695.0	64QAM	26.01	25.54	28.79	18.00	46.79	47.00	0.21

Table 8.1-6: *PSD in 1 MHz measurement result for 5 MHz channel CBSD Category B*

Frequency, MHz	Modulation	PSD at Ant 1, dBm/MHz	PSD at Ant 2, dBm/MHz	Combined PSD, dBm/MHz	PSD Limit, dBm/MHz	Margin, dB
3552.5	QPSK½	19.97	19.24	22.63	37.00	14.37
3625.0	QPSK½	19.89	19.36	22.64	37.00	14.36
3697.5	QPSK½	19.83	19.41	22.64	37.00	14.36
3552.5	64QAM	19.98	19.54	**22.78**	37.00	14.22
3625.0	64QAM	19.81	19.38	22.61	37.00	14.39
3697.5	64QAM	19.77	19.35	22.58	37.00	14.42

Table 8.1-7: *PSD in 1 MHz measurement result for 10 MHz channel CBSD Category B*

Frequency, MHz	Modulation	PSD at Ant 1, dBm/MHz	PSD at Ant 2, dBm/MHz	Combined PSD, dBm/MHz	PSD Limit, dBm/MHz	Margin, dB
3555.0	QPSK½	19.06	19.44	22.26	37.00	14.74
3625.0	QPSK½	19.19	19.16	22.19	37.00	14.81
3695.0	QPSK½	19.97	19.49	**22.75**	37.00	14.25
3555.0	64QAM	19.02	19.22	22.13	37.00	14.87
3625.0	64QAM	19.41	19.48	22.46	37.00	14.54
3695.0	64QAM	19.72	19.31	22.53	37.00	14.47

Note: These PSD results correlate with power settings for 8.5 dBi antenna. For 17 dBi and 18 dBi, power settings are lower.

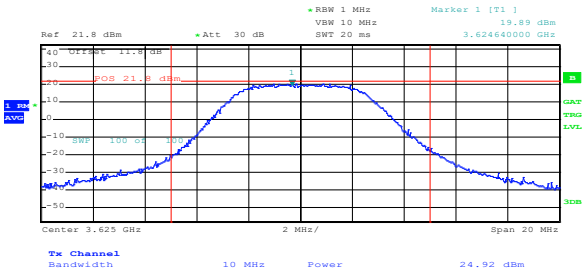

Figure 8.1-1: *Total power and power spectral density sample plot, 5 MHz channel*

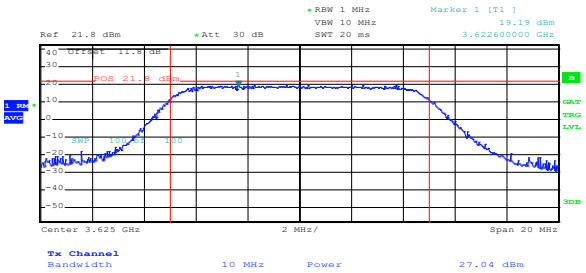

Figure 8.1-2: *Total power and power spectral density sample plot, 10 MHz channel*

8.2 FCC 96.41(g) The peak-to-average power ratio (PAPR)

8.2.1 Definitions and limits

The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

8.2.2 Test summary

Test date	October 12, 2018

8.2.3 Observations, settings and special notes

The test was performed using spectrum analyzer signal statistics' Complimentary Cumulative Distribution Function

8.2.4 Test data

Table 8.2-1: *PAPR measurement results*

Channel BW, MHz	Antenna port	Modulation	Frequency, MHz	CCDF at 0.1%, dB	Limit, dB	Margin, dB
5	1	QPSK½	3552.5	10.00	13.00	3.00
5	1	QPSK½	3625.0	10.06	13.00	2.94
5	1	QPSK½	3697.5	9.78	13.00	3.22
5	1	64QAM	3552.5	10.03	13.00	2.97
5	1	64QAM	3625.0	10.00	13.00	3.00
5	1	64QAM	3697.5	9.71	13.00	3.29
5	2	QPSK½	3552.5	9.90	13.00	3.10
5	2	QPSK½	3625.0	9.97	13.00	3.03
5	2	QPSK½	3697.5	9.78	13.00	3.22
5	2	64QAM	3552.5	9.90	13.00	3.10
5	2	64QAM	3625.0	9.84	13.00	3.16
5	2	64QAM	3697.5	9.84	13.00	3.16
10	1	QPSK½	3555.0	9.04	13.00	3.96
10	1	QPSK½	3625.0	9.01	13.00	3.99
10	1	QPSK½	3695.0	8.91	13.00	4.09
10	1	64QAM	3555.0	9.01	13.00	3.99
10	1	64QAM	3625.0	8.94	13.00	4.06
10	1	64QAM	3695.0	8.88	13.00	4.12
10	2	QPSK½	3555.0	9.10	13.00	3.90
10	2	QPSK½	3625.0	9.01	13.00	3.99
10	2	QPSK½	3695.0	8.91	13.00	4.09
10	2	64QAM	3555.0	9.04	13.00	3.96
10	2	64QAM	3625.0	9.84	13.00	3.16
10	2	64QAM	3695.0	9.04	13.00	3.96

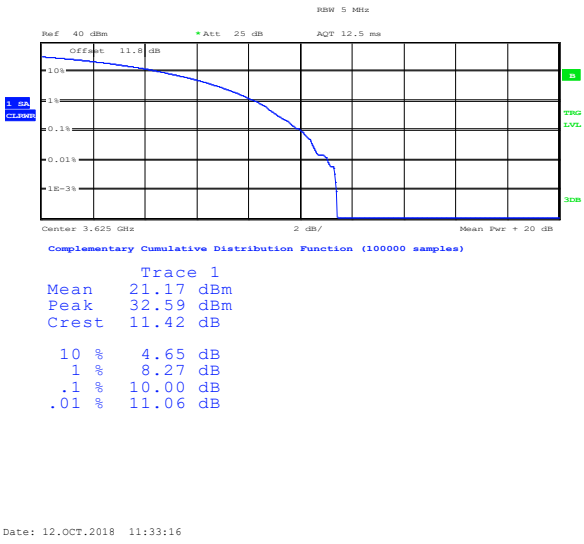

Figure 8.2-1: *CCDF sample plot, 5 MHz channel*

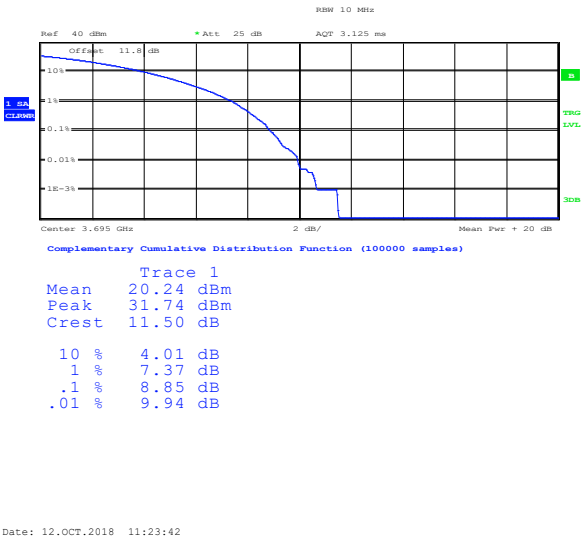

Figure 8.2-2: *CCDF sample plot, 10 MHz channel*

8.3 FCC 96.41(e)(3) Emission bandwidth and occupied bandwidth

8.3.1 Definitions and limits

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
FCC 2.1049 The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

8.3.2 Test summary

Test date	October 10, 2018

8.3.3 Observations, settings and special notes

Spectrum analyser settings for OBW measurements:

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

8.3.4 Test data

Table 8.3-1: *Occupied bandwidth measurement results for 5 MHz channel*

Frequency, MHz	Antenna port	Modulation	99% OBW, MHz	26 dB BW, MHz
3552.5	1	QPSK½	4.660	5.280
3625.0	1	QPSK½	4.660	5.260
3697.5	1	QPSK½	4.660	5.260
3552.5	1	64QAM	4.660	5.300
3625.0	1	64QAM	4.660	5.240
3697.5	1	64QAM	4.660	5.280
3552.5	2	QPSK½	4.660	5.280
3625.0	2	QPSK½	4.660	5.300
3697.5	2	QPSK½	4.660	5.260
3552.5	2	64QAM	4.660	5.260
3625.0	2	64QAM	4.660	5.320
3697.5	2	64QAM	4.660	5.380

Table 8.3-2: *Occupied bandwidth measurement results for 10 MHz channel*

Frequency, MHz	Antenna port	Modulation	99% OBW, MHz	26 dB BW, MHz
3555.0	1	QPSK½	9.280	10.280
3625.0	1	QPSK½	9.280	10.400
3695.0	1	QPSK½	9.280	10.240
3555.0	1	64QAM	9.280	10.240
3625.0	1	64QAM	9.280	10.200
3695.0	1	64QAM	9.240	10.200
3555.0	2	QPSK½	9.280	10.320
3625.0	2	QPSK½	9.280	10.360
3695.0	2	QPSK½	9.320	10.400
3555.0	2	64QAM	9.280	10.160
3625.0	2	64QAM	9.280	10.120
3695.0	2	64QAM	9.280	10.200

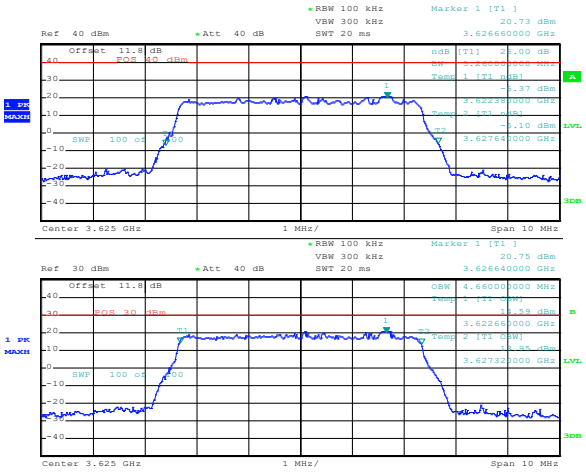

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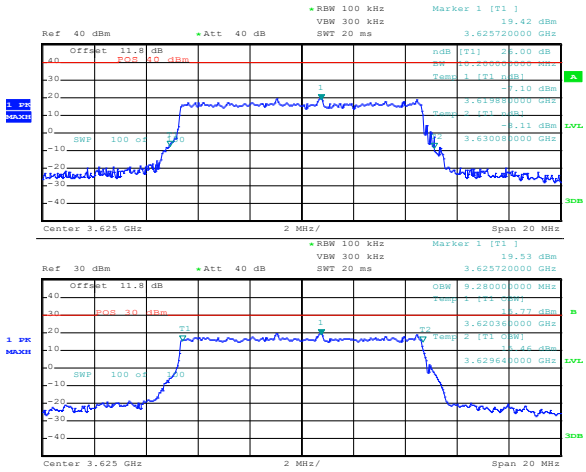
Figure 8.3-1: *Occupied bandwidth sample plot for 5 MHz channel*



Date: 10.OCT.2018 14:58:31

Figure 8.3-2: *Occupied bandwidth sample plot for 10 MHz channel*

8.4 FCC 96.41(e)(1) 3.5 GHz emissions and interference limits

8.4.1 Definitions and limits

General protection levels. Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0–10 MHz above the upper SAS-assigned channel edge and within 0–10 MHz below the lower SAS-assigned channel edge. At all frequencies greater than 10 MHz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed −25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

8.4.2 Test summary

Test date	October 9, 2018

8.4.3 Observations, settings and special notes

This test was performed at the antenna ports and radiated with both antennas terminated with 50 Ohm load.
EUT was transmitting from both antenna connectors at the maximum power settings.
Only the worst emissions (conducted) results are shown in the test data below.
Spectrum analyser settings for measurements within 1 MHz from the SAS assigned channel edges:

Resolution bandwidth	30 kHz
Video bandwidth	300 kHz
Detector mode	RMS
Trace mode	Power averaging
Power integration	Over 50 kHz for 5 MHz channel; Over 100 kHz for 10 MHz channel

Spectrum analyser settings for measurements outside 1 MHz from the SAS assigned channel edges:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	RMS
Trace mode	Power averaging

8.4.4 Test data

Table 8.4-1: *Emission mask measurements for 5 MHz channel with QPSK½ modulation*

Antenna port	Channel	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit, dBm	Margin[1], dB
1	Low	0–1	3550.0	-21.10	-13.00	8.10
1	Low	0–1	3555.0	-22.35	-13.00	9.35
1	Low	1–10	3549.0	-25.24	-13.00	12.24
1	Low	1–10	3556.0	-25.16	-13.00	12.16
1	Low	>10	3540.0	-37.83	-25.00	12.83
1	Low	>10	3565.0	-38.97	-25.00	13.97
1	Mid	0–1	3622.5	-22.04	-13.00	9.04
1	Mid	0–1	3627.5	-21.96	-13.00	8.96
1	Mid	1–10	3621.5	-24.91	-13.00	11.91
1	Mid	1–10	3628.5	-25.84	-13.00	12.84
1	Mid	>10	3612.5	-39.06	-25.00	14.06
1	Mid	>10	3637.5	-39.71	-25.00	14.71
1	High	0–1	3695.0	-21.01	-13.00	8.01
1	High	0–1	3700.0	-21.13	-13.00	8.13
1	High	1–10	3694.0	-22.84	-13.00	9.84
1	High	1–10	3701.0	-24.44	-13.00	11.44
1	High	>10	3685.0	-38.27	-25.00	13.27
1	High	>10	3710.0	-39.06	-25.00	14.06
2	Low	0–1	3550.0	-23.58	-13.00	10.58
2	Low	0–1	3555.0	-23.03	-13.00	10.03
2	Low	1–10	3549.0	-30.70	-13.00	17.70
2	Low	1–10	3556.0	-27.74	-13.00	14.74
2	Low	>10	3540.0	-39.22	-25.00	14.22
2	Low	>10	3565.0	-39.33	-25.00	14.33
2	Mid	0–1	3622.5	-22.52	-13.00	9.52
2	Mid	0–1	3627.5	-22.47	-13.00	9.47
2	Mid	1–10	3621.5	-28.64	-13.00	15.64
2	Mid	1–10	3628.5	-29.24	-13.00	16.24
2	Mid	>10	3612.5	-39.25	-25.00	14.25
2	Mid	>10	3637.5	-40.00	-25.00	15.00
2	High	0–1	3695.0	-22.05	-13.00	9.05
2	High	0–1	3700.0	-22.25	-13.00	9.25
2	High	1–10	3694.0	-26.11	-13.00	13.11
2	High	1–10	3701.0	-27.76	-13.00	14.76
2	High	>10	3685.0	-38.90	-25.00	13.90
2	High	>10	3710.0	-39.49	-25.00	14.49

Note: [1]Margin of SISO operation. For MIMO 2×2 operation 3 dB should be subtracted from the margin in the table above.

Table 8.4-2: *Emission mask measurements for 5 MHz channel with 64QAM modulation*

Antenna port	Channel	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit, dBm	Margin[1], dB
1	Low	0–1	3550.0	-21.23	-13.00	8.23
1	Low	0–1	3555.0	-21.89	-13.00	8.89
1	Low	1–10	3549.0	-25.23	-13.00	12.23
1	Low	1–10	3556.0	-25.16	-13.00	12.16
1	Low	>10	3540.0	-38.87	-25.00	13.87
1	Low	>10	3565.0	-38.96	-25.00	13.96
1	Mid	0–1	3622.5	-22.09	-13.00	9.09
1	Mid	0–1	3627.5	-21.03	-13.00	8.03
1	Mid	1–10	3621.5	-25.49	-13.00	12.49
1	Mid	1–10	3628.5	-25.63	-13.00	12.63
1	Mid	>10	3612.5	-39.22	-25.00	14.22
1	Mid	>10	3637.5	-39.94	-25.00	14.94
1	High	0–1	3695.0	-20.69	-13.00	7.69
1	High	0–1	3700.0	-20.25	-13.00	7.25
1	High	1–10	3694.0	-23.30	-13.00	10.30
1	High	1–10	3701.0	-24.37	-13.00	11.37
1	High	>10	3685.0	-38.31	-25.00	13.31
1	High	>10	3710.0	-39.32	-25.00	14.32
2	Low	0–1	3550.0	-23.02	-13.00	10.02
2	Low	0–1	3555.0	-22.62	-13.00	9.62
2	Low	1–10	3549.0	-30.89	-13.00	17.89
2	Low	1–10	3556.0	-28.34	-13.00	15.34
2	Low	>10	3540.0	-39.27	-25.00	14.27
2	Low	>10	3565.0	-38.62	-25.00	13.62
2	Mid	0–1	3622.5	-22.60	-13.00	9.60
2	Mid	0–1	3627.5	-21.63	-13.00	8.63
2	Mid	1–10	3621.5	-29.36	-13.00	16.36
2	Mid	1–10	3628.5	-29.17	-13.00	16.17
2	Mid	>10	3612.5	-39.28	-25.00	14.28
2	Mid	>10	3637.5	-40.96	-25.00	15.96
2	High	0–1	3695.0	-21.78	-13.00	8.78
2	High	0–1	3700.0	-21.22	-13.00	8.22
2	High	1–10	3694.0	-26.53	-13.00	13.53
2	High	1–10	3701.0	-27.83	-13.00	14.83
2	High	>10	3685.0	-38.78	-25.00	13.78
2	High	>10	3710.0	-38.83	-25.00	13.83

Note: [1]Margin of SISO operation. For MIMO 2×2 operation 3 dB should be subtracted from the margin in the table above.

Table 8.4-3: *Emission mask measurements for 10 MHz channel with QPSK½ modulation*

Antenna port	Channel	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit, dBm	Margin[1], dB
1	Low	0–1	3550.0	-19.60	-13.00	6.60
1	Low	0–1	3560.0	-20.06	-13.00	7.06
1	Low	1–10	3549.0	-23.51	-13.00	10.51
1	Low	1–10	3561.0	-22.87	-13.00	9.87
1	Low	>10	3540.0	-29.40	-25.00	4.40
1	Low	>10	3570.0	-30.33	-25.00	5.33
1	Mid	0–1	3620.0	-21.07	-13.00	8.07
1	Mid	0–1	3630.0	-21.70	-13.00	8.70
1	Mid	1–10	3619.0	-21.78	-13.00	8.78
1	Mid	1–10	3631.0	-23.96	-13.00	10.96
1	Mid	>10	3610.0	-29.37	-25.00	4.37
1	Mid	>10	3640.0	-31.58	-25.00	6.58
1	High	0–1	3690.0	-19.53	-13.00	6.53
1	High	0–1	3700.0	-21.03	-13.00	8.03
1	High	1–10	3689.0	-18.39	-13.00	5.39
1	High	1–10	3701.0	-21.58	-13.00	8.58
1	High	>10	3680.0	-30.56	-25.00	5.56
1	High	>10	3710.0	-32.46	-25.00	7.46
2	Low	0–1	3550.0	-20.41	-13.00	7.41
2	Low	0–1	3560.0	-21.20	-13.00	8.20
2	Low	1–10	3549.0	-18.89	-13.00	5.89
2	Low	1–10	3561.0	-20.90	-13.00	7.90
2	Low	>10	3540.0	-31.29	-25.00	6.29
2	Low	>10	3570.0	-32.38	-25.00	7.38
2	Mid	0–1	3620.0	-23.78	-13.00	10.78
2	Mid	0–1	3630.0	-24.49	-13.00	11.49
2	Mid	1–10	3619.0	-19.23	-13.00	6.23
2	Mid	1–10	3631.0	-20.73	-13.00	7.73
2	Mid	>10	3610.0	-33.02	-25.00	8.02
2	Mid	>10	3640.0	-33.44	-25.00	8.44
2	High	0–1	3690.0	-20.13	-13.00	7.13
2	High	0–1	3700.0	-21.47	-13.00	8.47
2	High	1–10	3689.0	-18.55	-13.00	5.55
2	High	1–10	3701.0	-21.07	-13.00	8.07
2	High	>10	3680.0	-31.02	-25.00	6.02
2	High	>10	3710.0	-33.66	-25.00	8.66

Note: [1]Margin of SISO operation. For MIMO 2×2 operation 3 dB should be subtracted from the margin in the table above.

Table 8.4-4: *Emission mask measurements for 10 MHz channel with 64QAM modulation*

Antenna port	Channel	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit, dBm	Margin[1], dB
1	Low	0–1	3550.0	-22.56	-13.00	9.56
1	Low	0–1	3560.0	-23.23	-13.00	10.23
1	Low	1–10	3549.0	-24.79	-13.00	11.79
1	Low	1–10	3561.0	-23.82	-13.00	10.82
1	Low	>10	3540.0	-31.07	-25.00	6.07
1	Low	>10	3570.0	-31.63	-25.00	6.63
1	Mid	0–1	3620.0	-23.69	-13.00	10.69
1	Mid	0–1	3630.0	-24.13	-13.00	11.13
1	Mid	1–10	3619.0	-22.76	-13.00	9.76
1	Mid	1–10	3631.0	-25.07	-13.00	12.07
1	Mid	>10	3610.0	-31.79	-25.00	6.79
1	Mid	>10	3640.0	-34.42	-25.00	9.42
1	High	0–1	3690.0	-19.53	-13.00	6.53
1	High	0–1	3700.0	-21.03	-13.00	8.03
1	High	1–10	3689.0	-18.39	-13.00	5.39
1	High	1–10	3701.0	-21.58	-13.00	8.58
1	High	>10	3680.0	-30.56	-25.00	5.56
1	High	>10	3710.0	-32.46	-25.00	7.46
2	Low	0–1	3550.0	-23.58	-13.00	10.58
2	Low	0–1	3560.0	-24.39	-13.00	11.39
2	Low	1–10	3549.0	-20.89	-13.00	7.89
2	Low	1–10	3561.0	-22.83	-13.00	9.83
2	Low	>10	3540.0	-31.90	-25.00	6.90
2	Low	>10	3570.0	-32.58	-25.00	7.58
2	Mid	0–1	3620.0	-22.76	-13.00	9.76
2	Mid	0–1	3630.0	-23.52	-13.00	10.52
2	Mid	1–10	3619.0	-21.21	-13.00	8.21
2	Mid	1–10	3631.0	-22.66	-13.00	9.66
2	Mid	>10	3610.0	-33.75	-25.00	8.75
2	Mid	>10	3640.0	-33.93	-25.00	8.93
2	High	0–1	3690.0	-23.07	-13.00	10.07
2	High	0–1	3700.0	-23.49	-13.00	10.49
2	High	1–10	3689.0	-20.56	-13.00	7.56
2	High	1–10	3701.0	-23.00	-13.00	10.00
2	High	>10	3680.0	-32.64	-25.00	7.64
2	High	>10	3710.0	-34.23	-25.00	9.23

Note: [1]Margin of SISO operation. For MIMO 2×2 operation 3 dB should be subtracted from the margin in the table above.

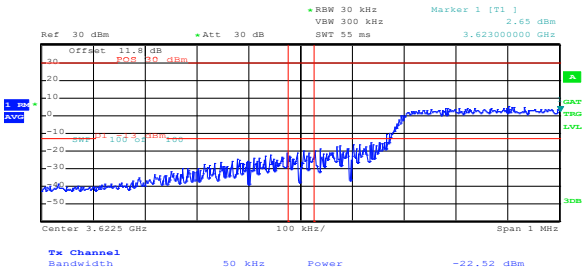


Figure 8.4-1: *Emission measurement within 0–1 MHz from the SAS assigned channel edge, sample plot for 5 MHz channel*

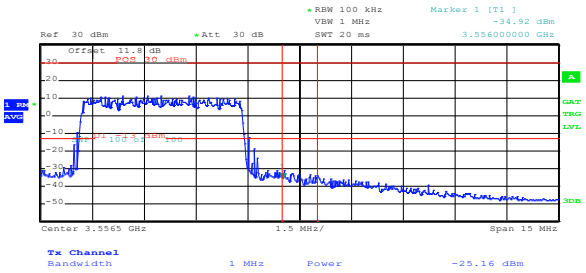


Figure 8.4-2: *Emission measurement within 1–10 MHz from the SAS assigned channel edge, sample plot for 5 MHz channel*

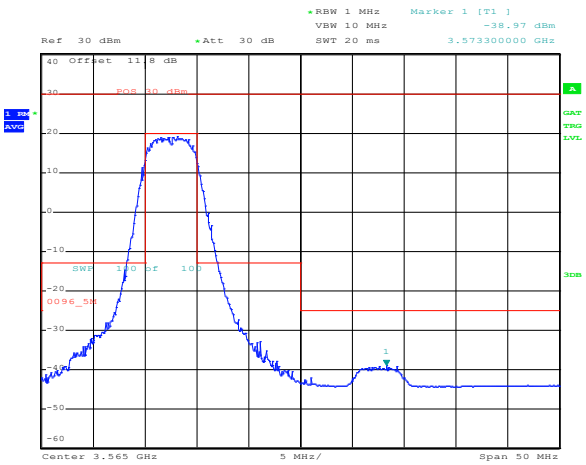


Figure 8.4-3: *Emission measurement more than 10 MHz from the SAS assigned channel edge, sample plot for 5 MHz channel*

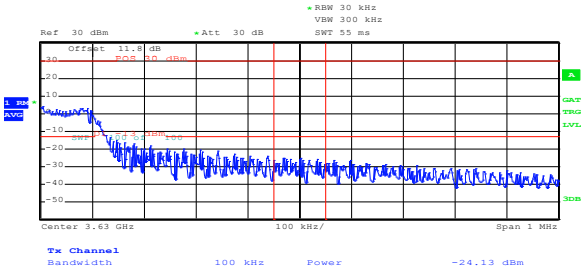


Figure 8.4-4: *Emission measurement within 0–1 MHz from the SAS assigned channel edge, sample plot for 10 MHz channel*

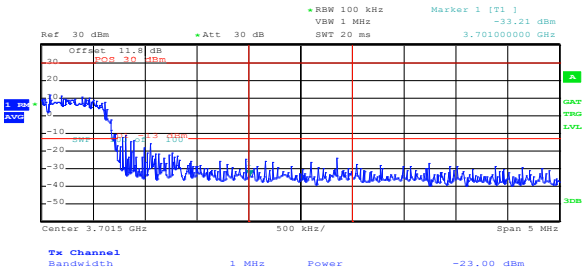


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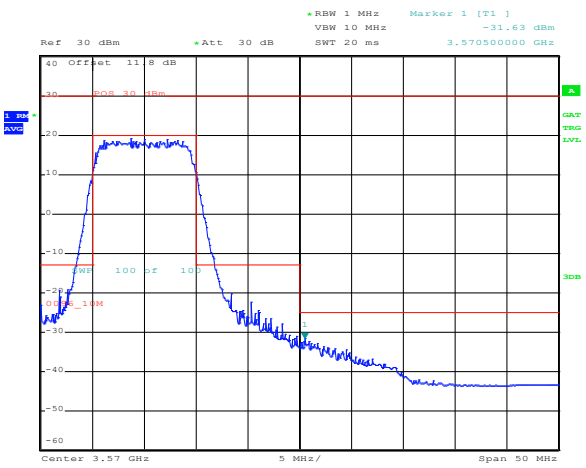
Figure 8.4-5: *Emission measurement within 1–10 MHz from the SAS assigned channel edge, sample plot for 10 MHz channel*



Date: 10.OCT.2018 09:50:26

Figure 8.4-6: *Emission measurement more than 10 MHz from the SAS assigned channel edge, sample plot for 10 MHz channel*

8.5 FCC 96.41(e)(2) Additional protection levels

8.5.1 Definitions and limits

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

8.5.2 Test summary

Test date	October 9, 2018

8.5.3 Observations, settings and special notes

The testing was performed conducted on each antenna port as well as radiated with both ports operating simultaeneously in MOIMO mode and terminated with 50 Ohm loads.Spurious emissions were tested from 30 MHz to the 10th harmonic. Only critical plots provided in test data below. Spectrum analyser settings:

Resolution bandwidth	100 kHz (radiated below 1 GHz) and 1 MHz (radiated above 1 GHz); 1 MHz (conducted)
Video bandwidth	3 × RBW
Detector and trace mode	RMS Power averaging (conducted), Peak Max-hold (radiated)

8.5.4 Test data

Table 8.5-1: *Additional emission measurements at 3530 and 3720 MHz*

Antenna port	Channel BW, MHz	Modulation	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit, dBm/MHz	Margin[1], dB
1	5	QPSK½	3530	-46.46	-40.00	6.46
1	5	QPSK½	3720	-48.62	-40.00	8.62
1	5	64QAM	3530	-46.28	-40.00	6.28
1	5	64QAM	3720	-48.36	-40.00	8.36
1	10	QPSK½	3530	-46.55	-40.00	6.55
1	10	QPSK½	3720	-44.05	-40.00	4.05
1	10	64QAM	3530	-46.58	-40.00	6.58
1	10	64QAM	3720	-45.36	-40.00	5.36
2	5	QPSK½	3530	-47.37	-40.00	7.37
2	5	QPSK½	3720	-46.30	-40.00	6.30
2	5	64QAM	3530	-47.31	-40.00	7.31
2	5	64QAM	3720	-46.23	-40.00	6.23
2	10	QPSK½	3530	-46.41	-40.00	6.41
2	10	QPSK½	3720	-43.44	-40.00	3.44
2	10	64QAM	3530	-46.45	-40.00	6.45
2	10	64QAM	3720	-43.46	-40.00	3.46

Note: [1]Margin of SISO operation. For MIMO 2×2 operation 3 dB should be subtracted from the margin in the table above.

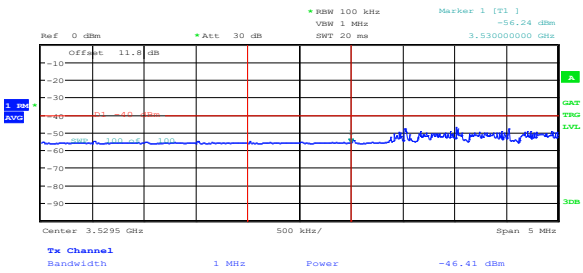


Figure 8.5-1: *Emission measurement at 3530 MHz sample plot*

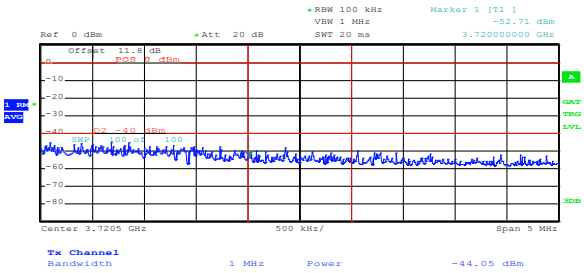


Figure 8.5-2: *Emission measurement at 3720 MHz sample plot*

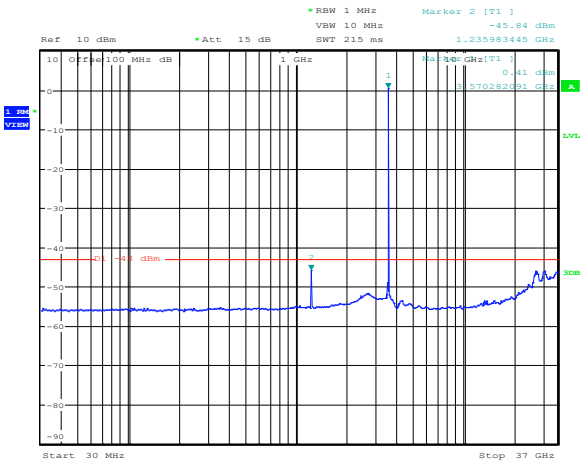


Figure 8.5-3: *Conducted spurious emissions for Antenna 1 with QPSK½ modulation on 5 MHz low channel*

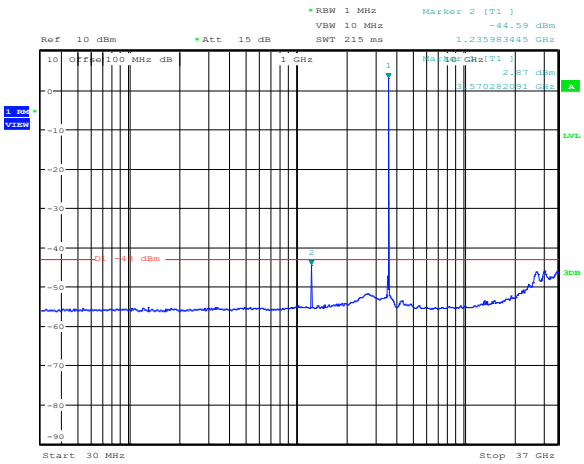


Figure 8.5-4: *Conducted spurious emissions for Antenna 1 with 64QAM modulation on 5 MHz low channel*

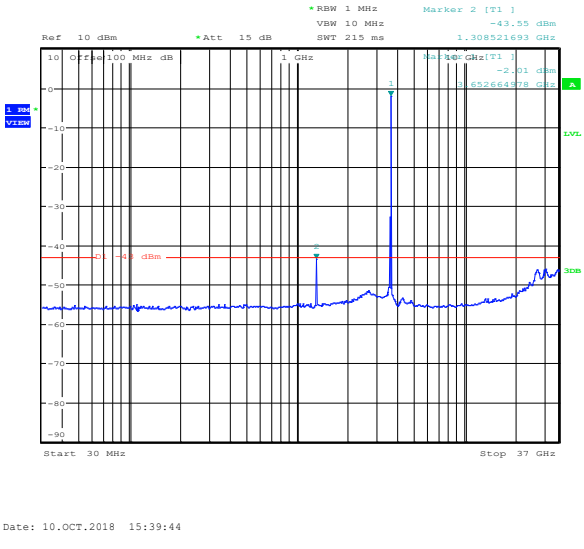


Figure 8.5-5: *Conducted spurious emissions for Antenna 1 with QPSK½ modulation on 5 MHz mid channel*

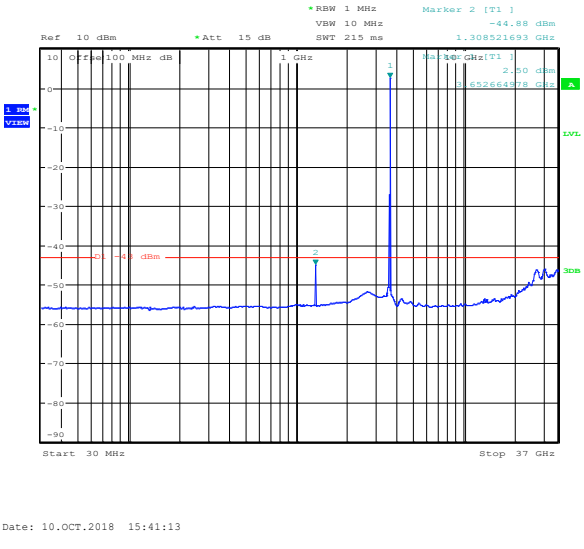


Figure 8.5-6: *Conducted spurious emissions for Antenna 1 with 64QAM modulation on 5 MHz mid channel*

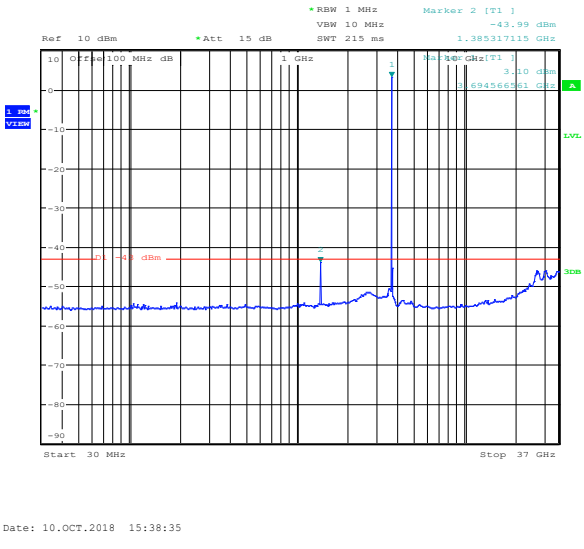


Figure 8.5-7: *Conducted spurious emissions for Antenna 1 with QPSK½ modulation on 5 MHz high channel*

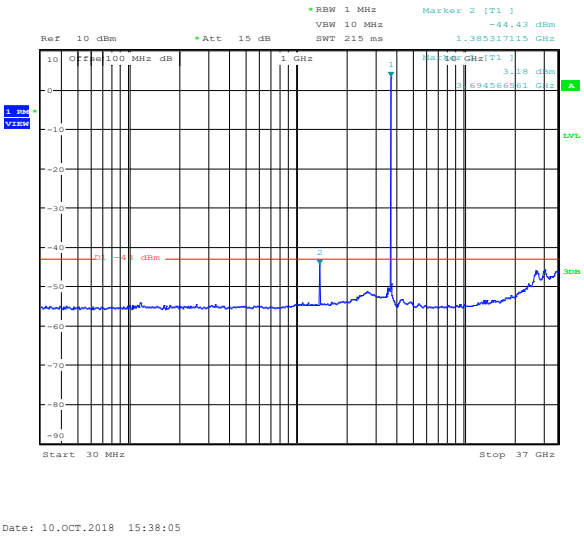


Figure 8.5-8: *Conducted spurious emissions for Antenna 1 with 64QAM modulation on 5 MHz high channel*

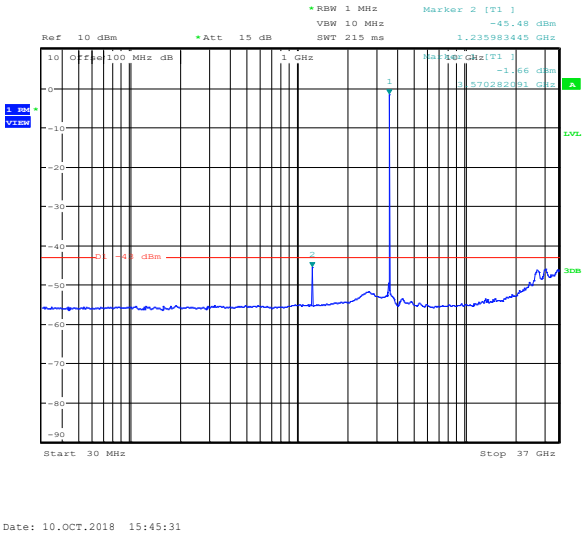


Figure 8.5-9: *Conducted spurious emissions for Antenna 2 with QPSK½ modulation on 5 MHz low channel*

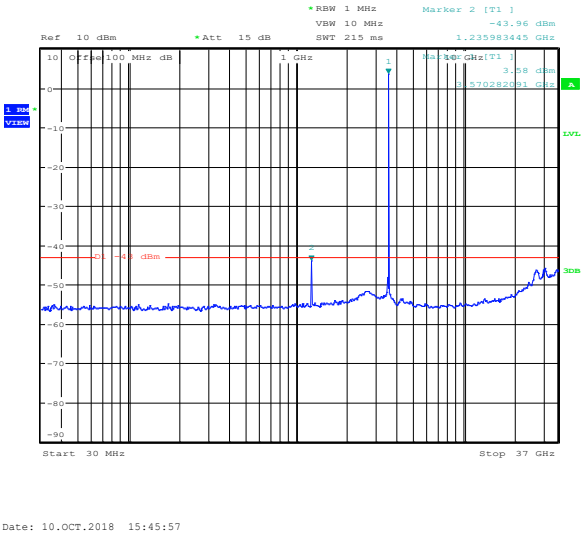


Figure 8.5-10: *Conducted spurious emissions for Antenna 2 with 64QAM modulation on 5 MHz low channel*

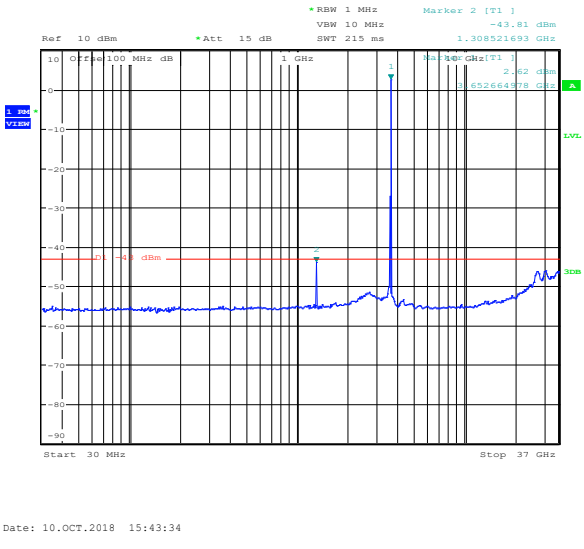


Figure 8.5-11: *Conducted spurious emissions for Antenna 2 with QPSK½ modulation on 5 MHz mid channel*

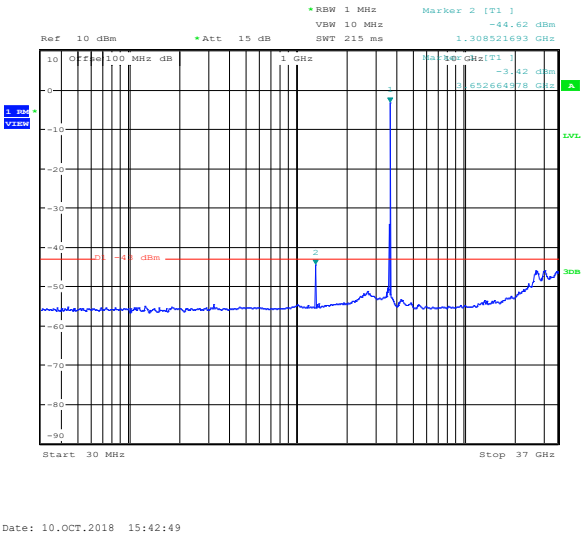


Figure 8.5-12: *Conducted spurious emissions for Antenna 2 with 64QAM modulation on 5 MHz mid channel*

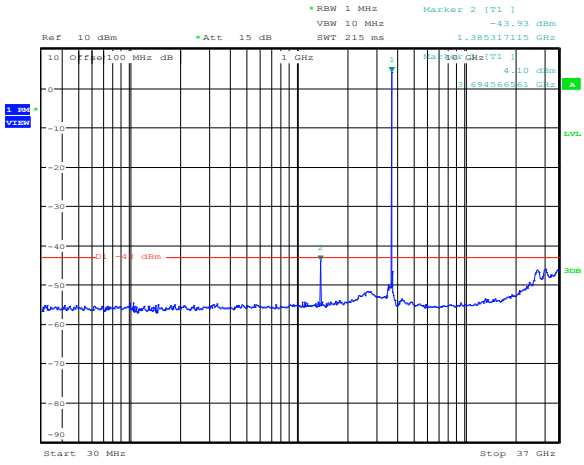


Figure 8.5-13: *Conducted spurious emissions for Antenna 2 with QPSK½ modulation on 5 MHz high channel*

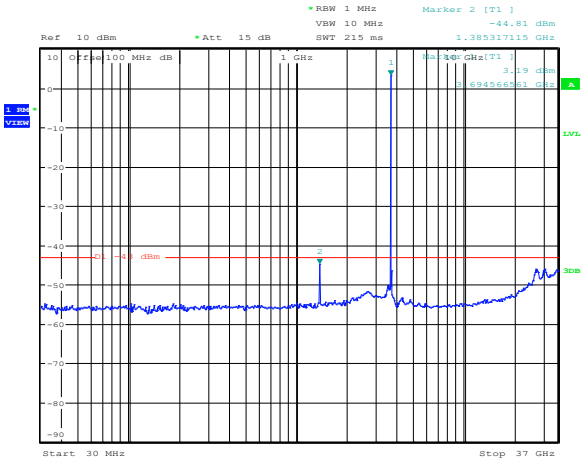


Figure 8.5-14: *Conducted spurious emissions for Antenna 2 with 64QAM modulation on 5 MHz high channel*

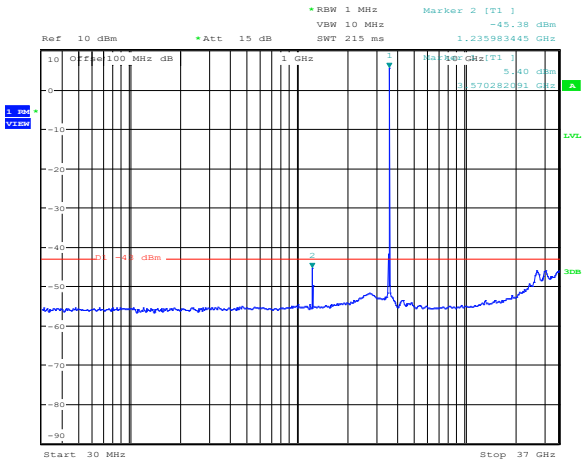


Figure 8.5-15: *Conducted spurious emissions for Antenna 1 with QPSK½ modulation on 10 MHz low channel*

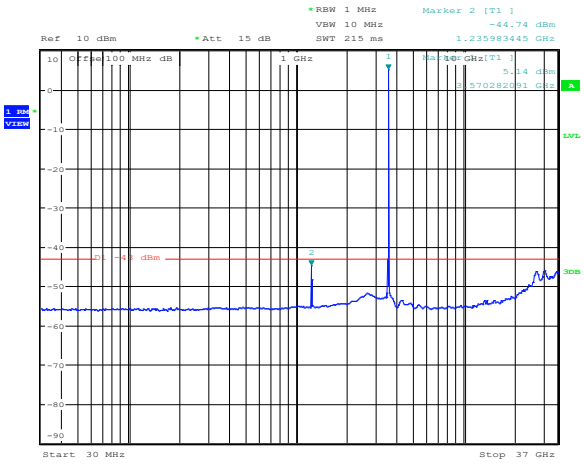


Figure 8.5-16: *Conducted spurious emissions for Antenna 1 with 64QAM modulation on 10 MHz low channel*

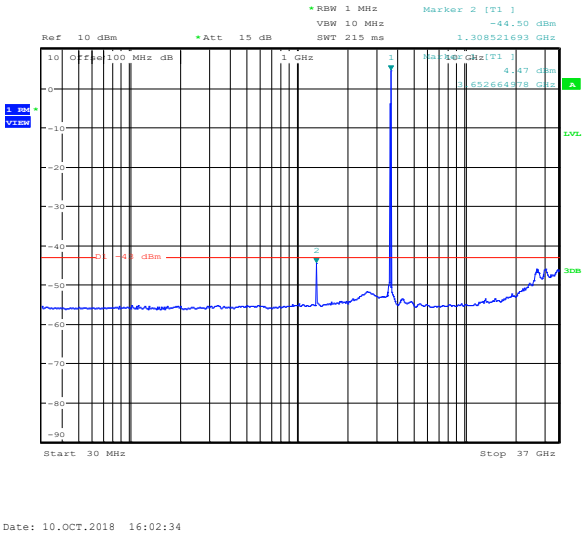


Figure 8.5-17: *Conducted spurious emissions for Antenna 1 with QPSK½ modulation on 10 MHz mid channel*

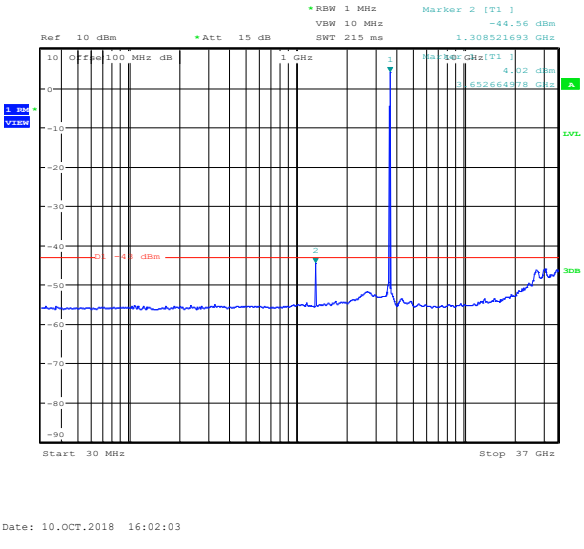


Figure 8.5-18: *Conducted spurious emissions for Antenna 1 with 64QAM modulation on 10 MHz mid channel*

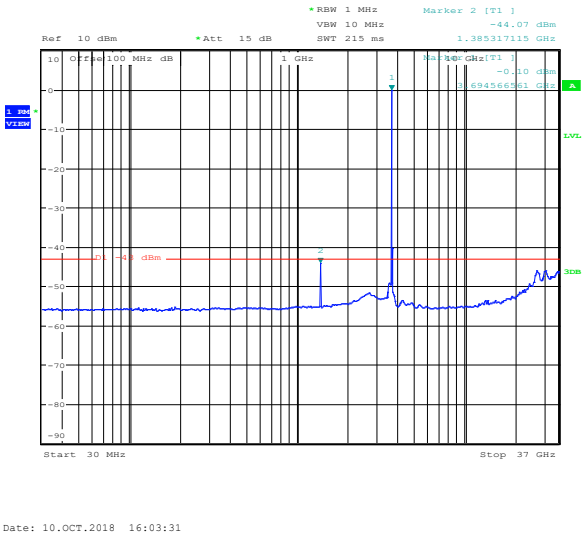


Figure 8.5-19: *Conducted spurious emissions for Antenna 1 with QPSK½ modulation on 10 MHz high channel*

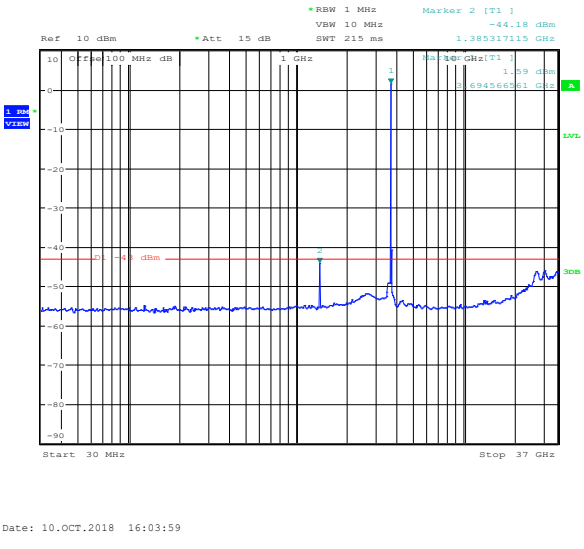


Figure 8.5-20: *Conducted spurious emissions for Antenna 1 with 64QAM modulation on 10 MHz high channel*

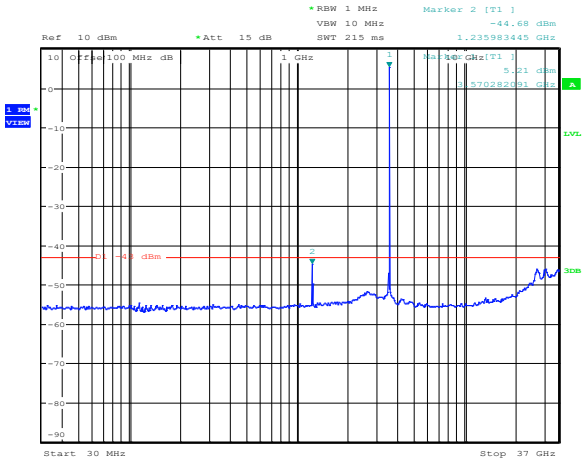


Figure 8.5-21: *Conducted spurious emissions for Antenna 2 with QPSK½ modulation on 10 MHz low channel*

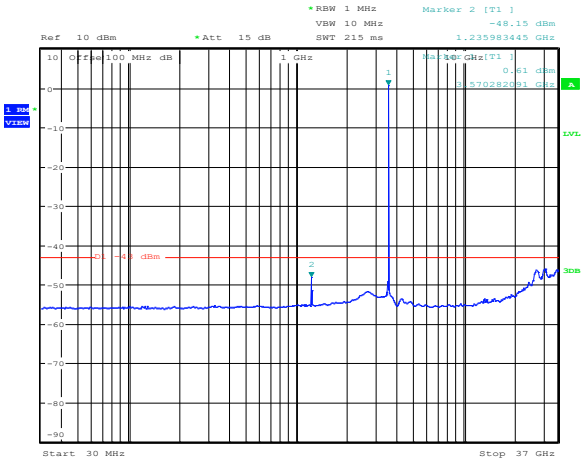


Figure 8.5-22: *Conducted spurious emissions for Antenna 2 with 64QAM modulation on 10 MHz low channel*

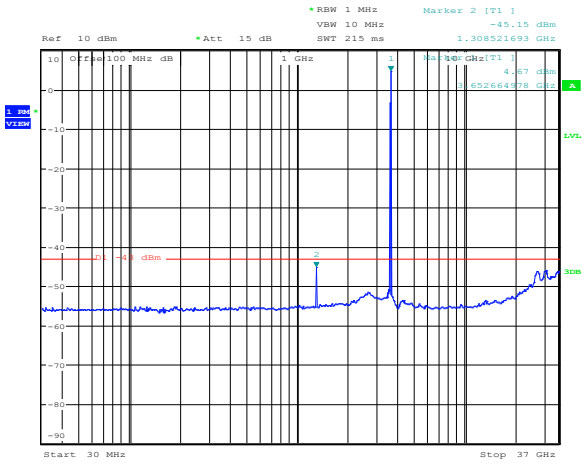


Figure 8.5-23: *Conducted spurious emissions for Antenna 2 with QPSK½ modulation on 10 MHz mid channel*

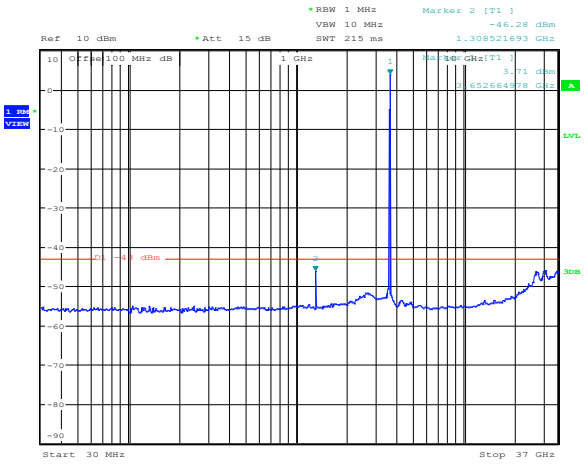


Figure 8.5-24: *Conducted spurious emissions for Antenna 2 with 64QAM modulation on 10 MHz mid channel*

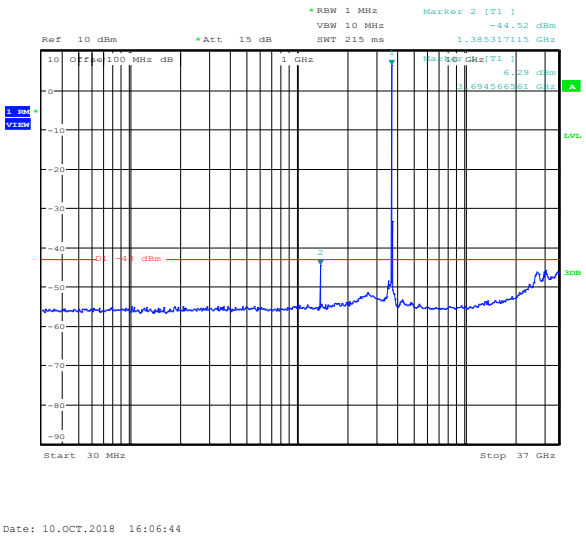


Figure 8.5-25: *Conducted spurious emissions for Antenna 2 with QPSK½ modulation on 10 MHz high channel*

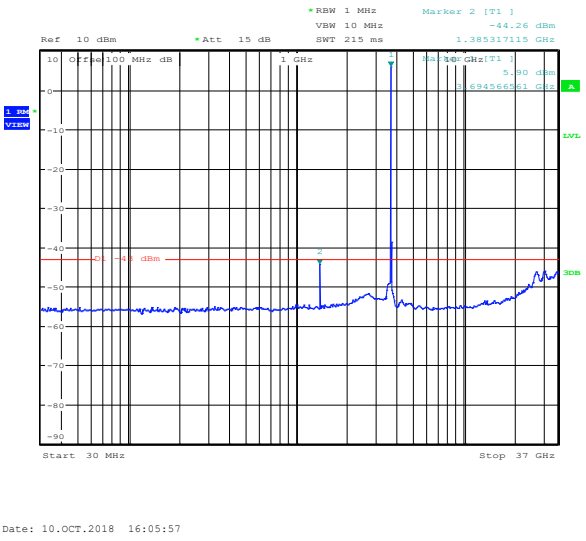


Figure 8.5-26: *Conducted spurious emissions for Antenna 2 with 64QAM modulation on 10 MHz high channel*

Table 8.5-2: *Conducted spurious emission measurement results*

Antenna port	Channel BW, MHz	Channel	Modulation	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit, dBm/MHz	Margin[1], dB
1	5	Low	QPSK½	1235.98	-45.14	-40.00	5.14
1	5	Mid	QPSK½	1308.52	-43.85	-40.00	3.85
1	5	High	QPSK½	1385.32	-43.29	-40.00	3.29
1	5	Low	64QAM	1235.98	-43.89	-40.00	3.89
1	5	Mid	64QAM	1308.52	-44.18	-40.00	4.18
1	5	High	64QAM	1385.32	-43.73	-40.00	3.73
1	10	Low	QPSK½	1235.98	-44.68	-40.00	4.68
1	10	Mid	QPSK½	1308.52	-43.80	-40.00	3.80
1	10	High	QPSK½	1385.32	-43.37	-40.00	3.37
1	10	Low	64QAM	1235.98	-44.04	-40.00	4.04
1	10	Mid	64QAM	1308.52	-43.86	-40.00	3.86
1	10	High	64QAM	1385.32	-43.48	-40.00	3.48
2	5	Low	QPSK½	1235.98	-44.78	-40.00	4.78
2	5	Mid	QPSK½	1308.52	-43.11	-40.00	3.11
2	5	High	QPSK½	1385.32	-43.23	-40.00	3.23
2	5	Low	64QAM	1235.98	-43.26	-40.00	3.26
2	5	Mid	64QAM	1308.52	-43.92	-40.00	3.92
2	5	High	64QAM	1385.32	-44.11	-40.00	4.11
2	10	Low	QPSK½	1235.98	-43.98	-40.00	3.98
2	10	Mid	QPSK½	1308.52	-44.45	-40.00	4.45
2	10	High	QPSK½	1385.32	-43.82	-40.00	3.82
2	10	Low	64QAM	1235.98	-47.45	-40.00	7.45
2	10	Mid	64QAM	1308.52	-45.58	-40.00	5.58
2	10	High	64QAM	1385.32	-43.56	-40.00	3.56

Note: [1]Margin of SISO operation. For MIMO 2×2 operation 3 dB should be subtracted from the margin in the table above.

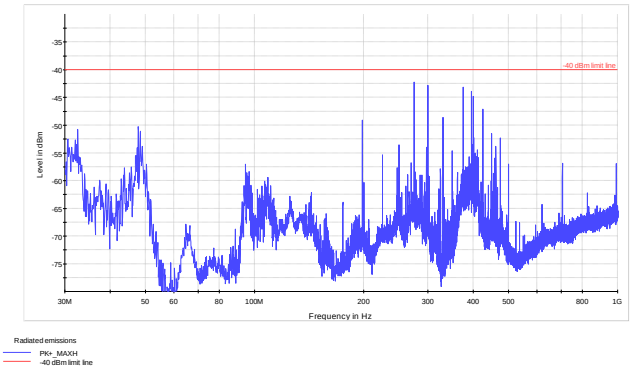


Figure 8.5-27: *Cabinet spurious emissions below 1 GHz 5 MHz low channel, antenna port 1*

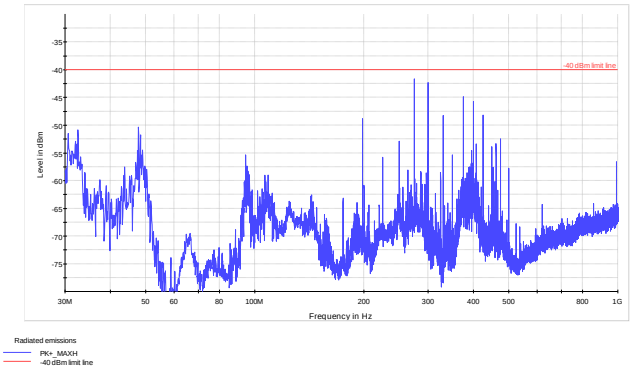


Figure 8.5-28: *Cabinet spurious emissions below 1 GHz 5 MHz low channel, antenna port 2*

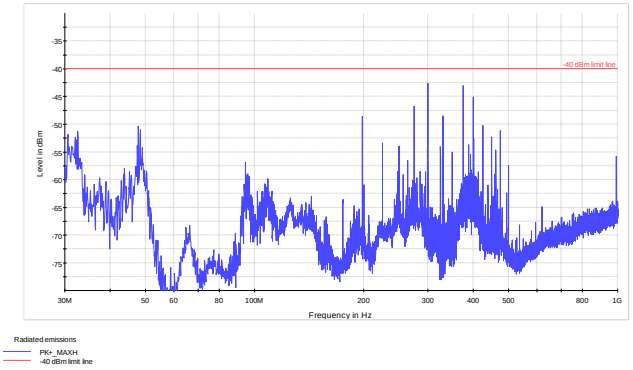


Figure 8.5-29: *Cabinet spurious emissions below 1 GHz 5 MHz mid channel, antenna port 1*

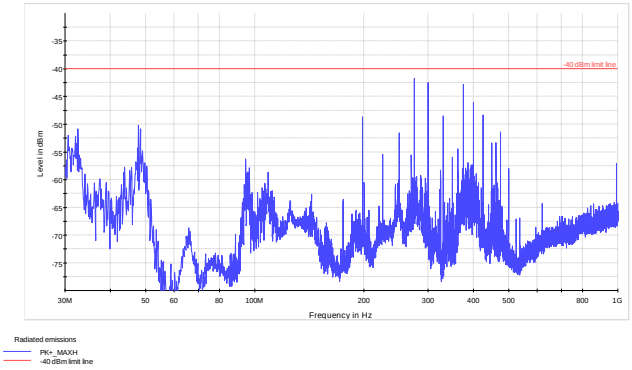


Figure 8.5-30: *Cabinet spurious emissions below 1 GHz 5 MHz mid channel, antenna port 2*

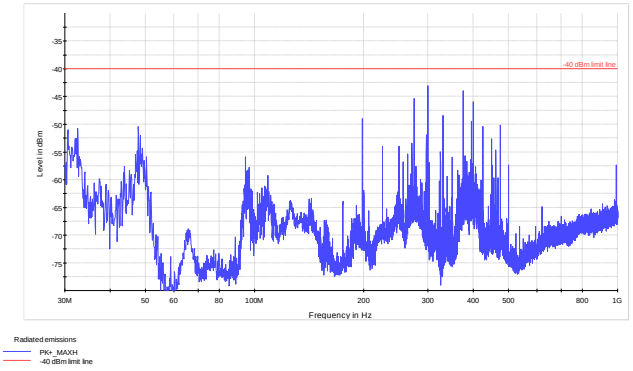


Figure 8.5-31: *Cabinet spurious emissions below 1 GHz 5 MHz high channel, antenna port 1*

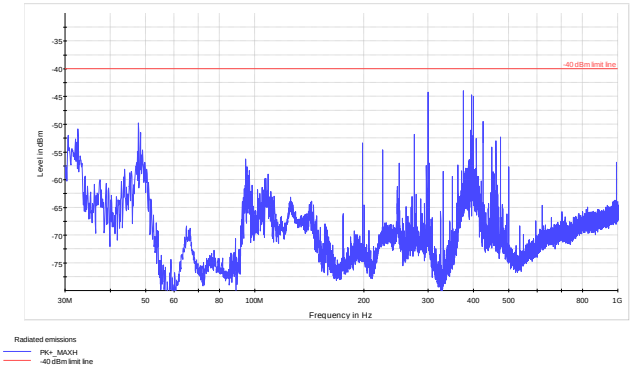


Figure 8.5-32: *Cabinet spurious emissions below 1 GHz 5 MHz high channel, antenna port 2*

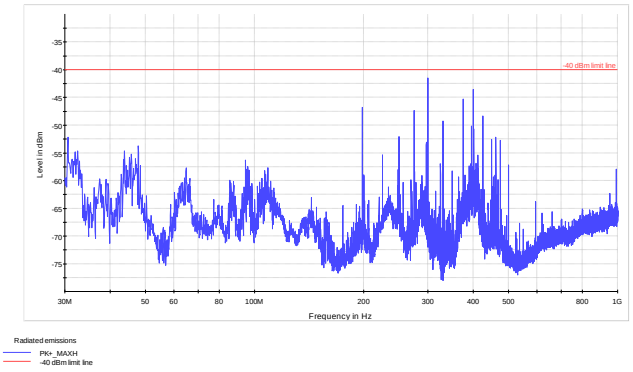


Figure 8.5-33: *Cabinet spurious emissions below 1 GHz 10 MHz low channel, antenna port 1*

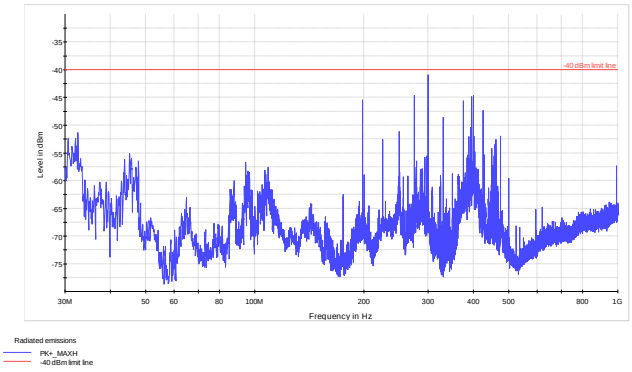


Figure 8.5-34: *Cabinet spurious emissions below 1 GHz 10 MHz low channel, antenna port 2*

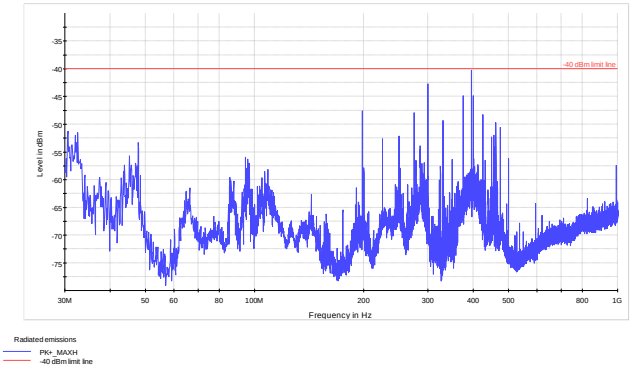


Figure 8.5-35: *Cabinet spurious emissions below 1 GHz 10 MHz mid channel, antenna port 1*

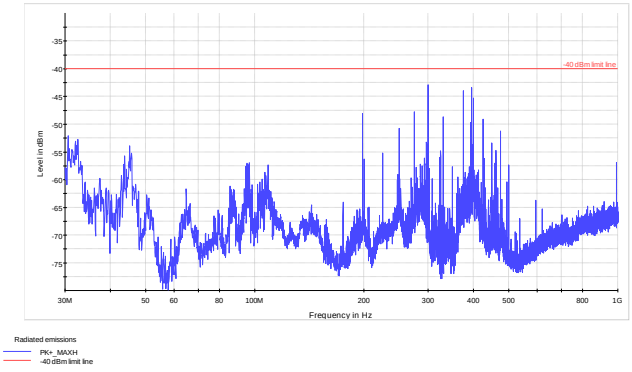


Figure 8.5-36: *Cabinet spurious emissions below 1 GHz 10 MHz mid channel, antenna port 2*

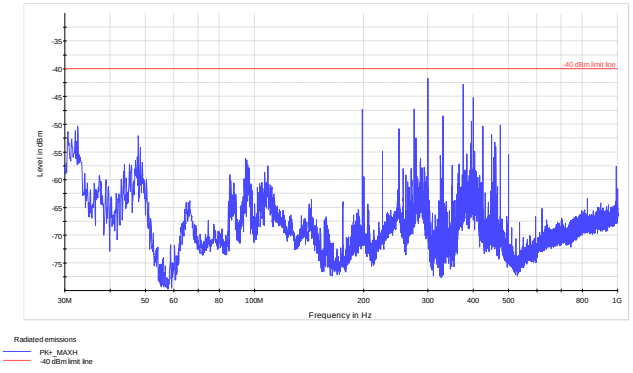


Figure 8.5-37: *Cabinet spurious emissions below 1 GHz 10 MHz high channel, antenna port 1*

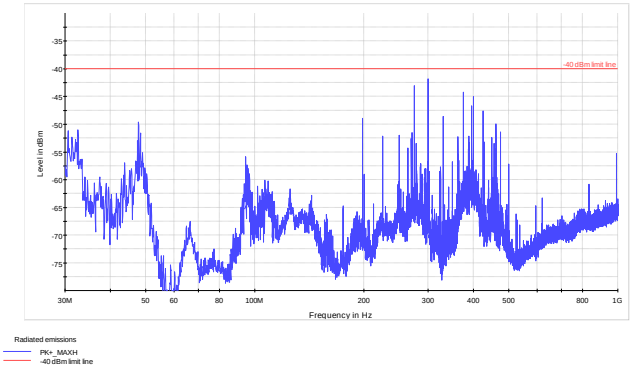


Figure 8.5-38: *Cabinet spurious emissions below 1 GHz 10 MHz high channel, antenna port 2*

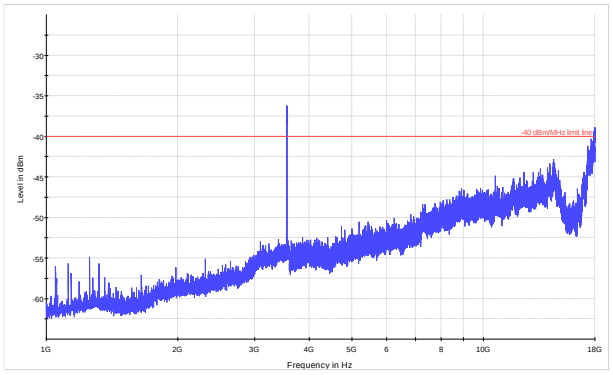


Figure 8.5-39: *Cabinet spurious emissions above 1 GHz 5 MHz low channel, antenna port 1*

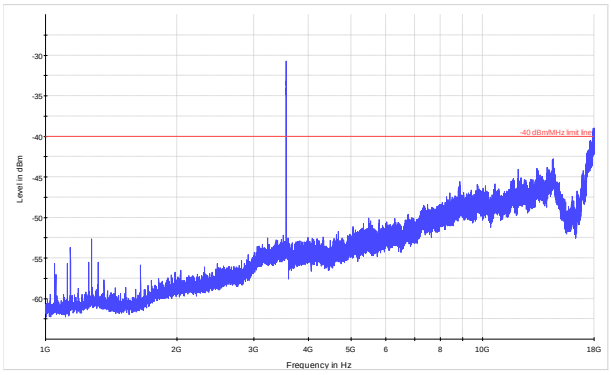


Figure 8.5-40: *Cabinet spurious emissions above 1 GHz 5 MHz low channel, antenna port 2*

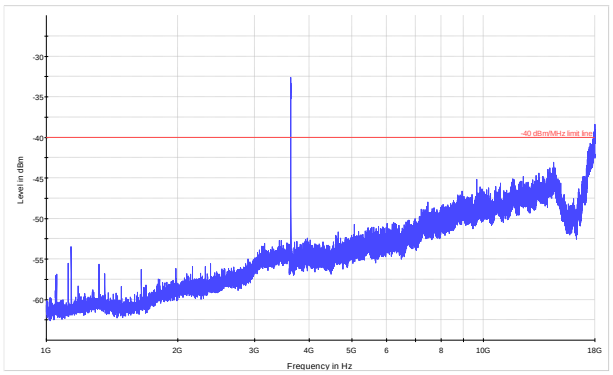


Figure 8.5-41: *Cabinet spurious emissions above 1 GHz 5 MHz mid channel, antenna port 1*

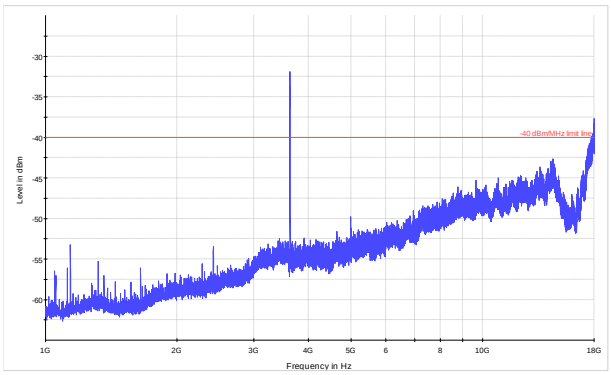


Figure 8.5-42: *Cabinet spurious emissions above 1 GHz 5 MHz mid channel, antenna port 2*

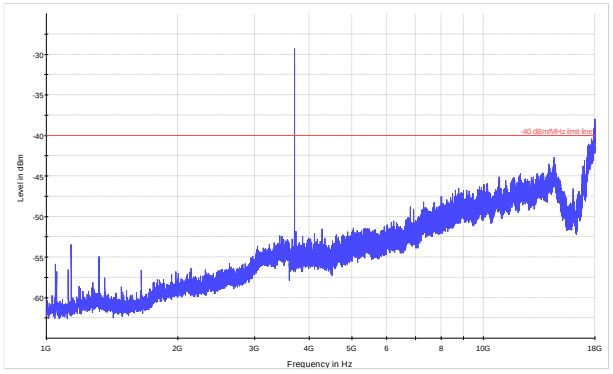


Figure 8.5-43: *Cabinet spurious emissions above 1 GHz 5 MHz high channel, antenna port 1*

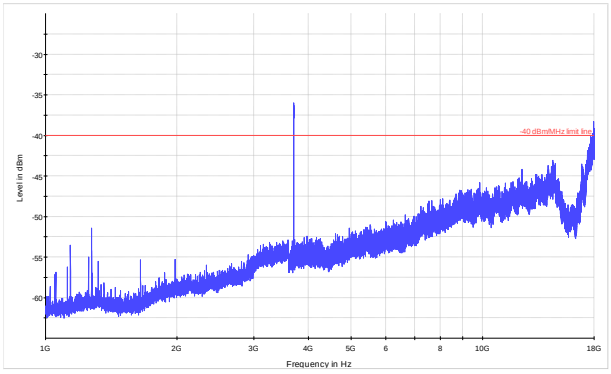


Figure 8.5-44: *Cabinet spurious emissions above 1 GHz 5 MHz high channel, antenna port 2*

On the plots above in the frequency range above 17.5 GHz the noise floor of the measuring equipment exceeded the limit. Further technical investigation led to conclusion that there are no spurious emissions and harmonics within this frequency range.

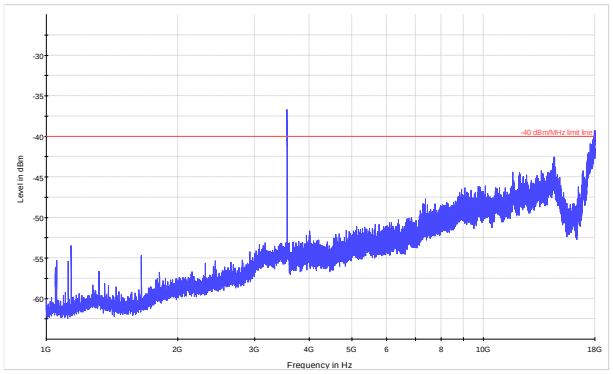


Figure 8.5-45: *Cabinet spurious emissions above 1 GHz 10 MHz low channel, antenna port 1*

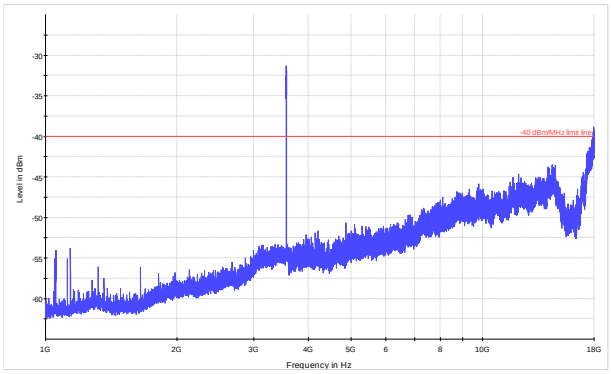


Figure 8.5-46: *Cabinet spurious emissions above 1 GHz 10 MHz low channel, antenna port 2*

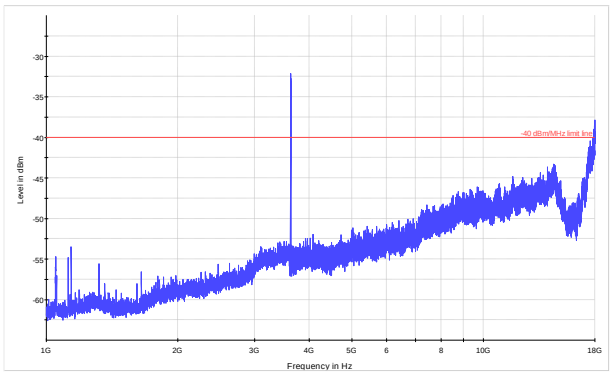


Figure 8.5-47: *Cabinet spurious emissions above 1 GHz 10 MHz mid channel, antenna port 1*

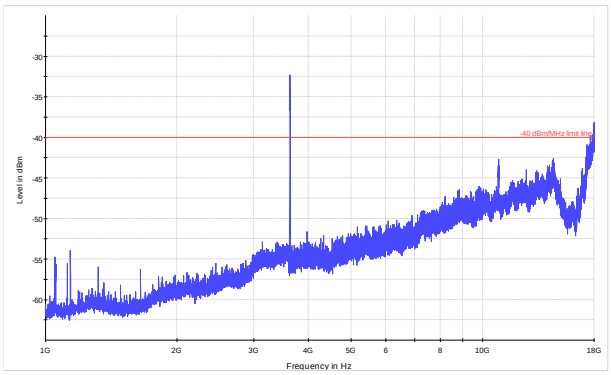


Figure 8.5-48: *Cabinet spurious emissions above 1 GHz 10 MHz mid channel, antenna port 2*

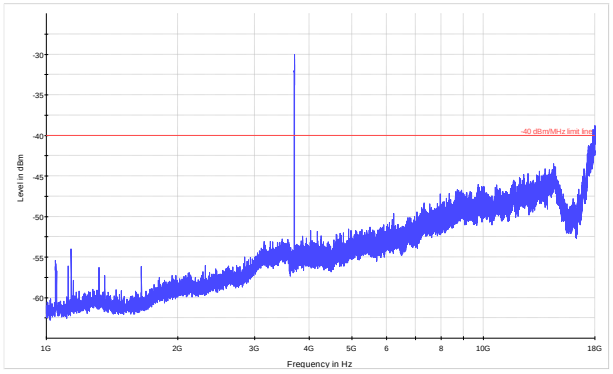


Figure 8.5-49: *Cabinet spurious emissions above 1 GHz 10 MHz high channel, antenna port 1*

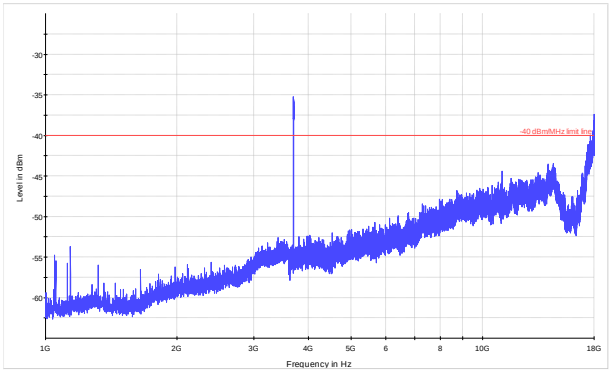


Figure 8.5-50: *Cabinet spurious emissions above 1 GHz 10 MHz high channel, antenna port 2*

On the plots above in the frequency range above 17.5 GHz the noise floor of the measuring equipment exceeded the limit. Further technical investigation led to conclusion that there are no spurious emissions and harmonics within this frequency range.

8.6 FCC 2.1055 Frequency stability

8.6.1 Definitions and limits

(a) The frequency stability shall be measured with variation of ambient temperature as follows:
(1) From −30°C to +50°C for all equipment except that specified in paragraphs (a)(2) and (3) of this section
(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° C through the range.
(d) The frequency stability shall be measured with variation of primary supply voltage as follows:
(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

8.6.2 Test summary

Test date:	October 13, 2018

8.6.3 Observations, settings and special notes

Spectrum analyser settings:

Resolution bandwidth	≥ 1 % of emission bandwidth
Video bandwidth	≥ 3 × RBW
Frequency span	Wider than emission bandwidth
Detector mode	Peak

8.6.4 Test data

Table 8.6-1: *Frequency drift measurement results*

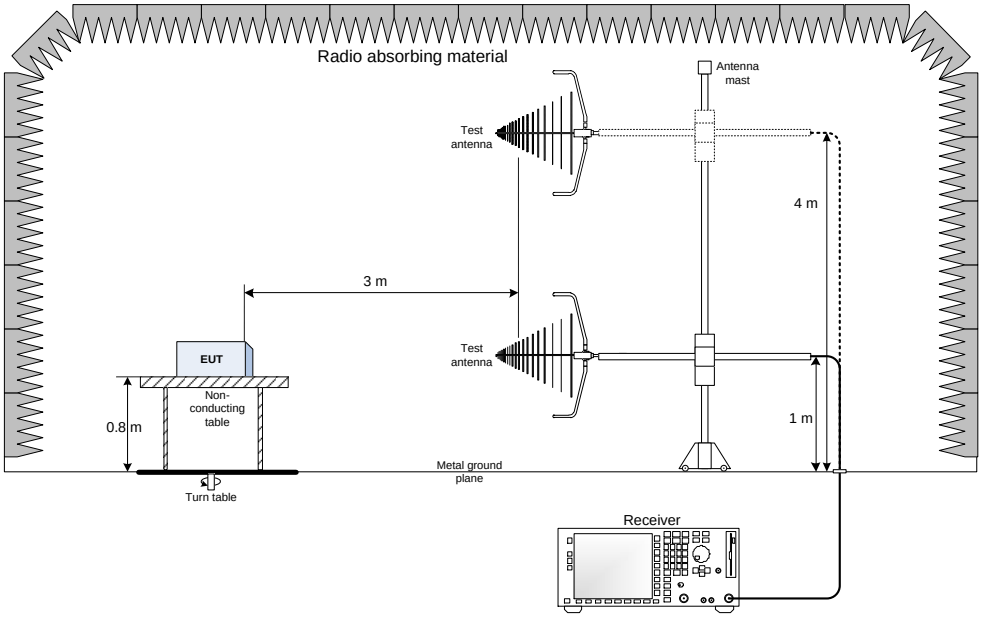
Test conditions	Frequency, Hz	Offset, ppm
+50 °C, Nominal	3624988411	-3.60
+40 °C, Nominal	3625021402	5.50
+30 °C, Nominal	3624987655	-3.81
+20 °C, +15 %	3624987053	-3.98
+20 °C, Nominal	3625001466	Reference
+20 °C, -15 %	3625011965	2.90
+10 °C, Nominal	3624992405	-2.50
0 °C, Nominal	3625001286	-0.05
−10 °C, Nominal	3625014367	3.56
−20 °C, Nominal	3624990063	-3.15
−30 °C, Nominal	3624975842	-7.07

Note: Offset was calculated as per the following formula:

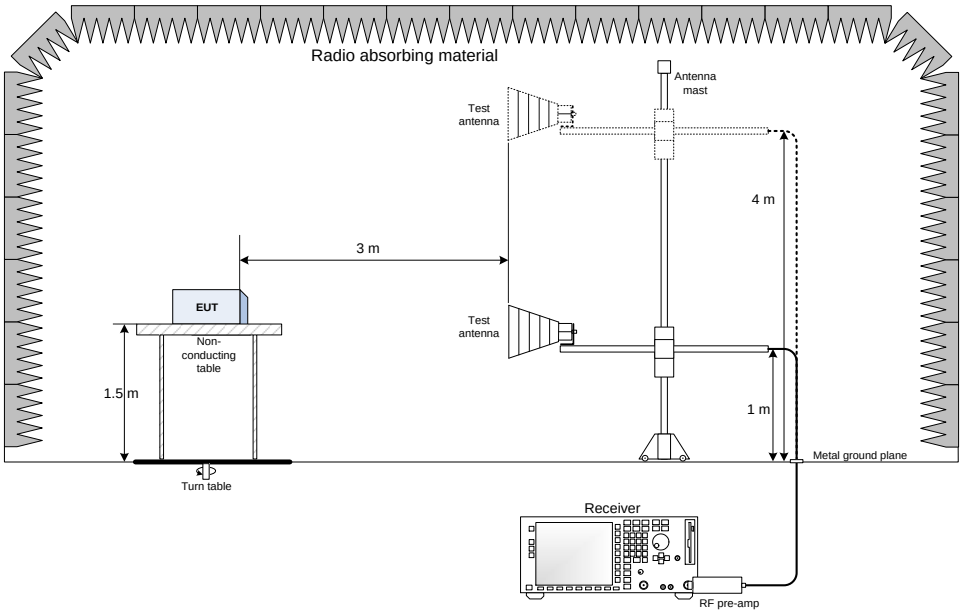
$$\frac{F_{Measured} - F_{reference}}{F_{reference}} \times 1 \cdot 10^{6}$$

Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up for frequencies below 1 GHz



9.2 Radiated emissions set-up for frequencies above 1 GHz



9.3 Conducted emissions set-up