






Report No. 332888-03-002

FCC TEST REPORT / IC TEST REPORT

Product	KleerNet Transceiver Module	
Name and address of the applicant	AUDIVO GmbH Irrenloher Damm 30 92521 Schwarzenfeld GERMANY	
Name and address of the manufacturer	AUDIVO GmbH Irrenloher Damm 30 92521 Schwarzenfeld GERMANY	
Model	DWAM83-TB	
Rating	3.3Vdc	
Trademark	KleerNet	
Serial number	/	
Additional information	The tested device contains radio module operates in 5725 – 5875MHz band.	
Tested according to	FCC Part 15.207 and 15.209 Conducted limits / Radiated emission limits; general requirements Industry Canada RSS-GEN, Issue 5 General Requirements for Compliance of Radio Apparatus	
Report number	332888-03-002	
Tested in period	2018-03-07 - 2018-03-09	
Issue date	2018-08-01	
Name and address of the testing laboratory	<p>Nemko GmbH & Co. KG Reetzstraße 58 D-76327 Pfinztal</p> <p>Tel.: + 49 (0) 7240 – 63 - 0 Fax: + 49 (0) 7240 – 63 - 11</p>	<p> Bundesnetzagentur</p> <p>FCC No: 973501 IC OATS: 10921A-1</p> <p>BNetzA-CAB-17/21-17</p>
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Prepared by [Dipl.-Ing. M. Korny] </div> <div style="text-align: center;">  Approved by [Dipl.-Ing. P. Lukas] </div> </div>		

Template version: B

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CONTENTS

1	INFORMATION	3
1.1	Test Item.....	3
1.2	Normal test conditions	4
1.3	Test Engineer(s)	4
1.4	Description of modification for Modification Filing.....	4
1.5	Family List Rational	4
1.6	Antenna Requirement.....	4
1.7	Worst-Case Configuration and Mode.....	4
1.8	Comments	4
2	TEST REPORT SUMMARY	5
2.1	General.....	5
2.2	Test Summary	6
3	TEST RESULTS.....	7
3.1	Power Line Conducted Emissions	7
3.2	Spurious Emissions (Radiated)	10
4	Measurement Uncertainty.....	37
5	LIST OF TEST EQUIPMENT	38
6	BLOCK DIAGRAM.....	39
6.1	Power Line Conducted Emission	39
6.2	Test Site Radiated Emission.....	39

1 INFORMATION

1.1 Test Item

Name :	KleerNet Transceiver Module
Model/version :	DWAM83-TB
Serial number :	SMSC 2011
Hardware identity and/or version:	SMSC 2011
Software identity and/or version :	V1.31 (for Tx power test), V2.00 (product release)
Frequency Range :	5725 - 5850 MHz
Number of Channels :	3
Channel BW :	20 MHz
Type of Modulation :	DARR-83: QPSK (Digital modulation)
Maximum data rate :	22 Mbps
User Frequency Adjustment :	None
Type of Power Supply :	USB power 5Vdc
Antenna Connector :	No, Integral antenna
No of Antennas :	2
Antenna Diversity Supported :	Yes
Declared Antenna Gain :	Antenna A: 3dBi , Antenna B: 3dBi
Receiver category :	3

Description of Test Item

The DWAM83 module provides a wireless digital audio link between one central unit (CU), that is usually a transmitter, and one or more mobile units (MU), usually configured as receivers.

The digital audio link allows transportation of up to 4 audio streams. The streams can consist of any combination of up- and downstreams between CU and one or more MU. A CU can serve multiple MU simultaneously. All MUs have access to the same audio streams of the CU, to which they are paired to. On MU side it could be selected whether all or just a specific audio stream is presented on the digital audio outputs (SPDIF or I²S).

For applications using 1 Stereo stream audio data of up to 96kHz/24Bit is supported. For applications using 4 stereo streams sample rate is limited to 48kHz. Audio sample rate for wireless link is always using 48kHz or 96kHz. Other sample rates on input interfaces are converted by internal SRC.

1.2 Normal test conditions

Temperature: 20 - 26 °C
Relative humidity: 45 - 55 %
Normal test voltage: 5 V dc

The values are the limit registered during the test period.
The measurements were done with the EUT powered by 5Vdc. It was checked that power variations between 85% and 115% did not have any influence on the measurements.

1.3 Test Engineer(s)

Markus Korny

1.4 Description of modification for Modification Filing

Not applicable.

1.5 Family List Rational

Not Applicable.

1.6 Antenna Requirement

Is the antenna detachable?

☐ Yes ☒ No

If detachable, is the antenna connector non-standard?

☐ Yes ☐ No

Type of antenna connector: N/A

Ref. FCC §15.203

1.7 Worst-Case Configuration and Mode

Radiated Emissions was performed with the EUT set to transmit at the channel with the highest output power as worst-case scenario.

1.8 Comments

The output level is set to maximum in the software.

The radiated measurements are tested on three axes.

Test adapter with evaluation board.

All ports were populated during spurious emission measurements.

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC Part 15.207 and 15.209 and Industry Canada RSS-GEN, Issue 5

Tests were performed in accordance with ANSI C63.4-2014 and ANSI C63.10-2013.

Radiated tests were performed in a semi-anechoic shielded room ($f < 1$ GHz) and a fully-anechoic shielded room ($f > 1$ GHz) at a measuring distance of 3m and 1m.

A description of the test facility is on file with the FCC and Industry Canada.

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

☐ Family Listing



THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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2.2 Test Summary

Name of test	FCC Part 15 reference	RSS-GEN Issue 5 reference	Result
Supply Voltage Variations	15.31(e)	6.11 (RSS-GEN)	Complies
Power Line Conducted Emission	15.107(a) 15.207(a)	8.8 (RSS-GEN)	Complies ²
Spurious Emissions (Radiated)	15.109(a) 15.209(a)	6.13 (RSS-GEN) 8.9 (RSS-GEN)	Complies

² EUT is powered with DC

3 TEST RESULTS

3.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)/8.8

Test Performed By: Markus Korny

Date of Test: 2018-03-09

Measurement procedure: ANSI C63.4-2014 using 50 μ H/50 ohms LISN.

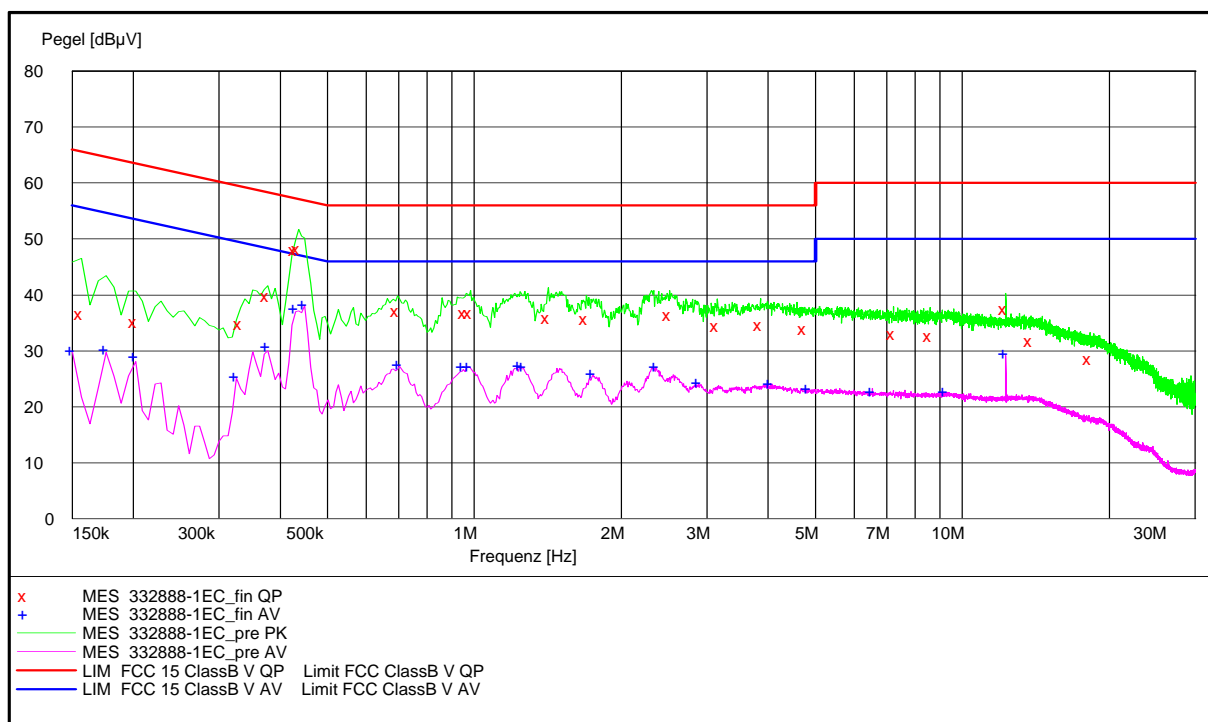
Test Results: Complies.

Measurement Data: See attached graph.

AC/DC adapter type: AQUIL STAR PRECISION, Model: ASUC31e-050100

Input voltage to AC/DC adapter: 115V/60Hz

Highest measured value (L1 and N):



Diagram

Final measurements QP with Quasi-Peak-Detector

Frequenz MHz	Pegel dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.156500	36.70	10.00	65.60	28.90	N	FLO
0.202000	35.20	10.00	63.50	28.40	N	FLO
0.332000	34.80	10.00	59.40	24.60	L1	FLO
0.377500	39.90	10.00	58.30	18.50	L1	FLO
0.429500	48.00	10.00	57.30	9.30	L1	FLO
0.436000	48.30	10.00	57.10	8.90	L1	FLO
0.696000	37.10	10.00	56.00	18.90	L1	FLO
0.956000	36.80	10.00	56.00	19.20	L1	FLO
0.982000	36.90	10.00	56.00	19.10	L1	FLO
1.417500	35.90	10.00	56.00	20.10	L1	FLO
1.697000	35.70	10.10	56.00	20.30	L1	FLO
2.516000	36.40	10.10	56.00	19.60	L1	FLO
3.146500	34.50	10.20	56.00	21.50	L1	FLO
3.861500	34.60	10.20	56.00	21.40	L1	FLO
4.758500	34.00	10.20	56.00	22.00	L1	FLO
7.228500	33.10	10.40	60.00	26.90	L1	FLO
8.593500	32.70	10.40	60.00	27.30	L1	FLO
12.285500	37.50	10.70	60.00	22.50	L1	FLO
13.845500	31.70	10.80	60.00	28.30	L1	FLO
18.298000	28.60	11.00	60.00	31.40	L1	FLO

Final measurements AV with Average-Detector

Frequenz MHz	Pegel dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	30.20	10.00	56.00	25.80	L1	FLO
0.176000	30.30	10.00	54.70	24.40	L1	FLO
0.202000	29.10	10.00	53.50	24.40	L1	FLO
0.325500	25.60	10.00	49.60	23.90	L1	FLO
0.377500	31.00	10.00	48.30	17.40	L1	FLO
0.429500	37.70	10.00	47.30	9.50	L1	FLO
0.449000	38.40	10.00	46.90	8.50	L1	FLO
0.702500	27.60	10.00	46.00	18.40	L1	FLO
0.949500	27.20	10.00	46.00	18.80	L1	FLO
0.975500	27.30	10.00	46.00	18.70	L1	FLO
1.242000	27.40	10.00	46.00	18.60	L1	FLO
1.261500	27.20	10.00	46.00	18.80	L1	FLO
1.749000	26.10	10.10	46.00	19.90	L1	FLO
2.360000	27.30	10.10	46.00	18.70	L1	FLO
2.880000	24.40	10.10	46.00	21.60	L1	FLO
4.043500	24.20	10.20	46.00	21.80	L1	FLO
4.843000	23.40	10.20	46.00	22.60	L1	FLO
6.546000	22.90	10.30	50.00	27.10	L1	FLO
9.237000	22.80	10.50	50.00	27.20	L1	FLO
12.285500	29.60	10.70	50.00	20.40	L1	FLO

3.2 Spurious Emissions (Radiated)

Para. No.: 15.209(a)/8.9

Test Performed By: Markus Korny	Date of Test: 2018-03-07 – 2018-03-08
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Test Results: Complies

Band-edge, @3m

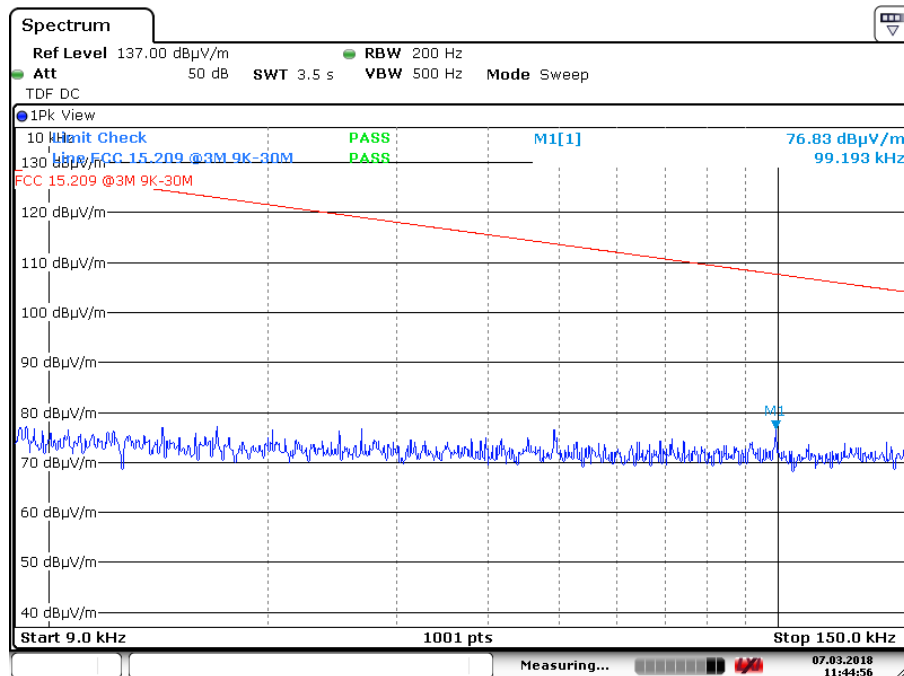
Frequency	Measured Field Strength @3m, dBμV/m	Detector	Limit dBμV/m	Margin dB
/	/	PK	74	/
	/	AV	54	/
/	/	PK	74	/
	/	AV	54	/
/	/	PK	74	/
	/	AV	54	/

Radiated emissions 10 kHz-30 MHz.

Measuring distance 3 m, measured with Peak detector.

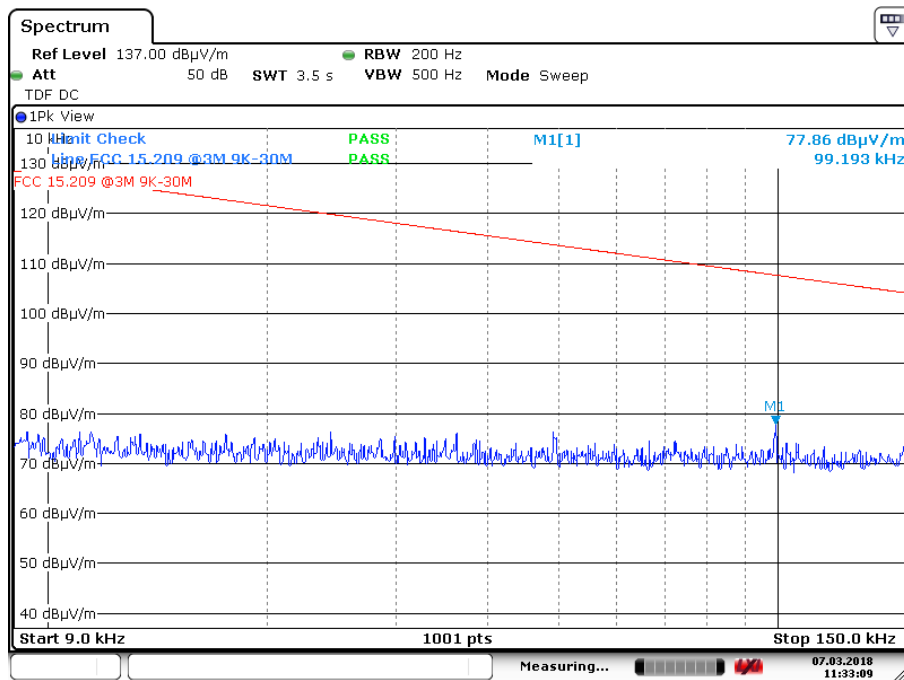
No spurious detected, see attached graph.

Limit is converted to 3 m using 40 dB/decade according to 15.31 (f) (2).



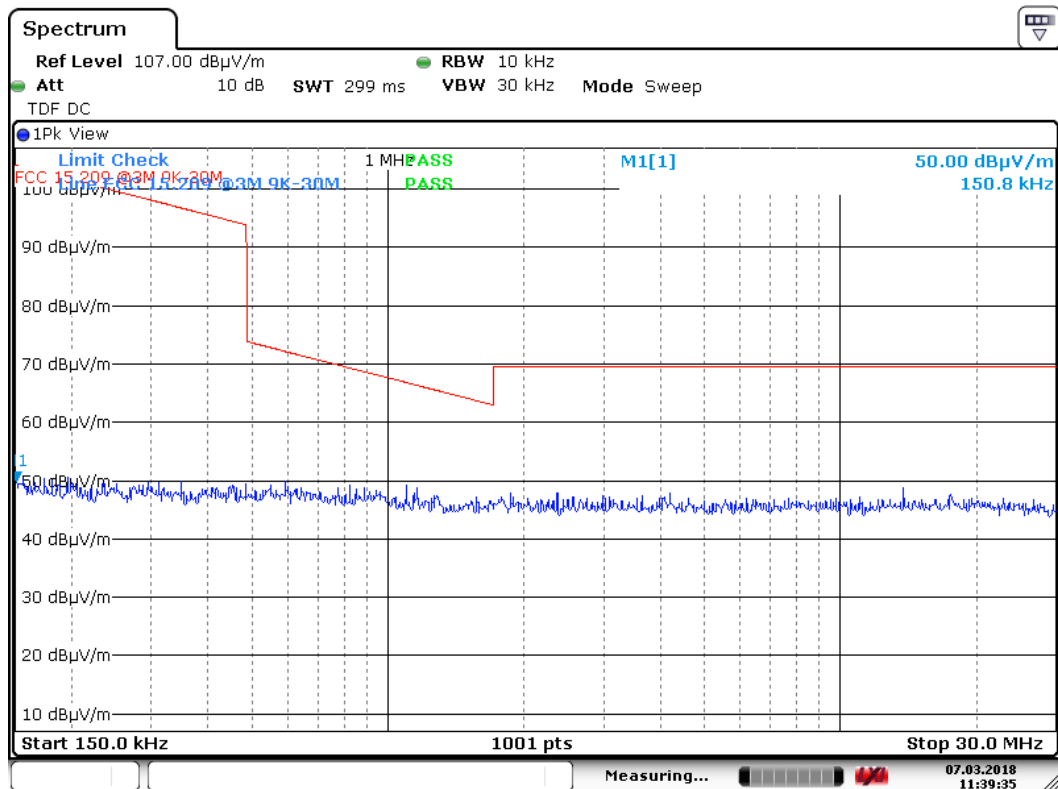
Date: 7.MAR.2018 11:44:56

Radiated Emissions, 9 kHz – 150 kHz @3m, all channels (port A)



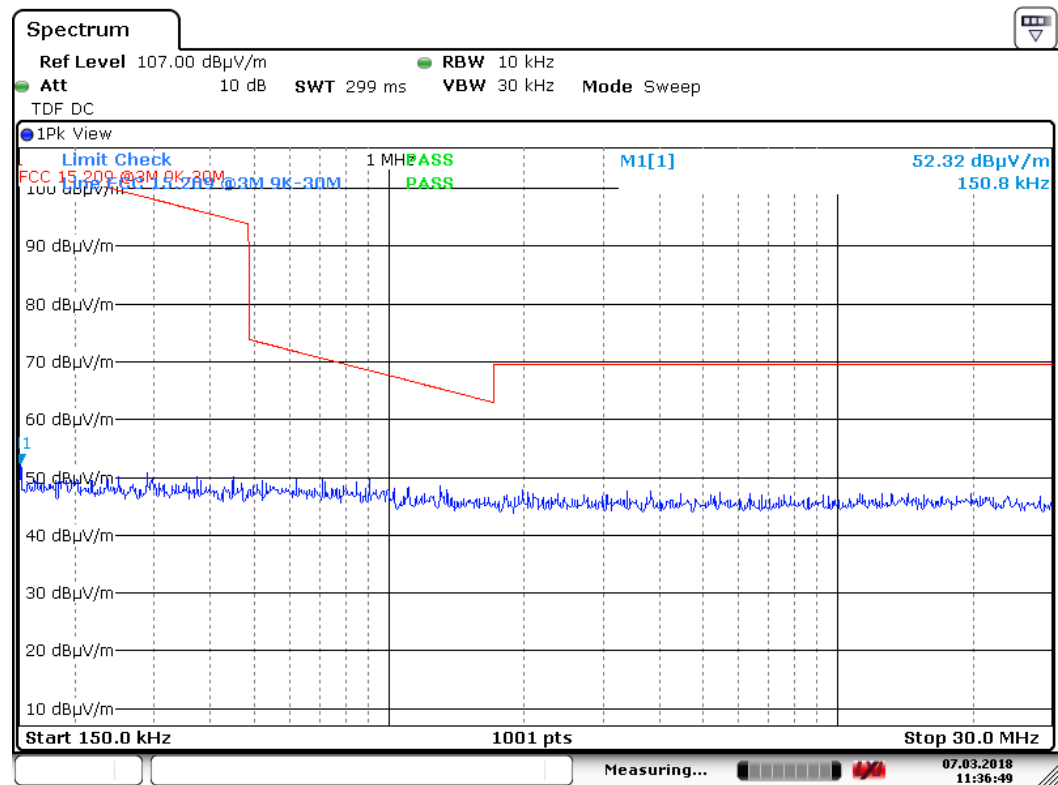
Date: 7.MAR.2018 11:33:09

Radiated Emissions, 9 kHz – 150 kHz @3m, all channels (port B)



Date: 7.MAR.2018 11:39:35

Radiated Emissions, 150 kHz - 30MHz @3m, all channels (port A)



Date: 7.MAR.2018 11:36:49

Radiated Emissions, 150 kHz - 30MHz @3m, all channels (port B)

Radiated emission 30 – 1000 MHz.

Detector: Quasi-Peak

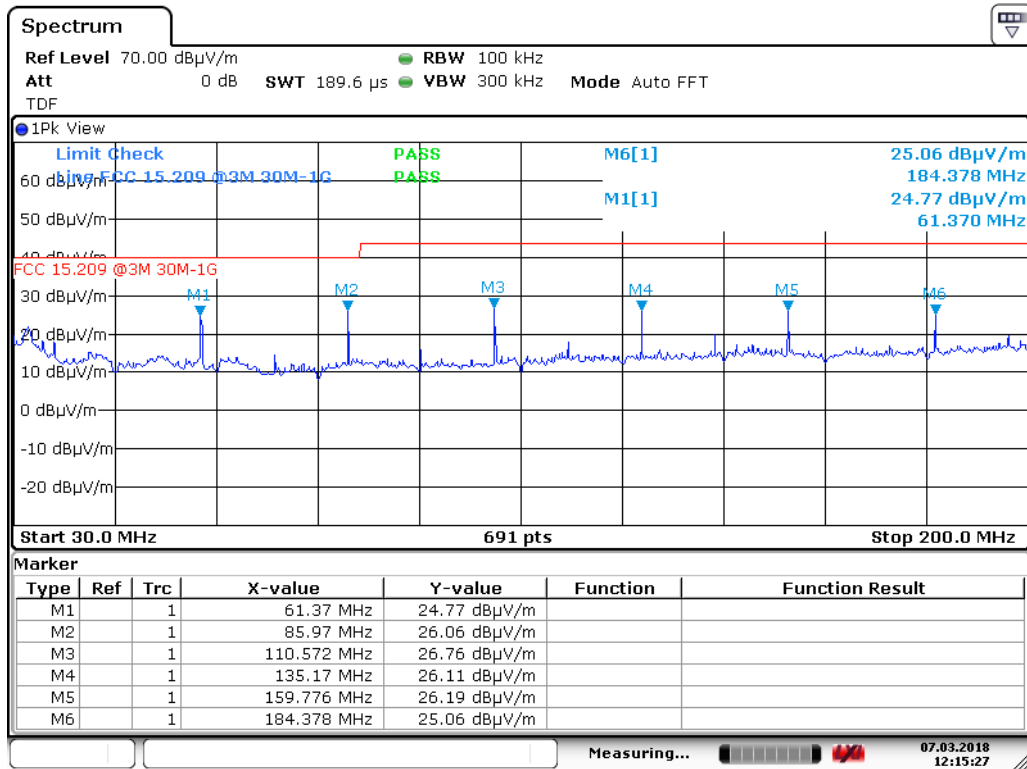
Measuring distance 3m .

Frequency	Operational condition	Detector	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz			dB μ V/m	metres	dB μ V/m	dB
36.77	TX on	PK	25.07	3	40.0	14.93
61.37	TX on	PK	30.78	3	40.0	9.22
85.97	TX on	PK	26.68	3	40.0	13.32
110.57	TX on	PK	27.00	3	43.5	16.5
135.17	TX on	PK	27.60	3	43.5	15.9
159.78	TX on	PK	31.49	3	43.5	12.01
184.38	TX on	PK	25.06	3	43.5	18.44
712.30	TX on	PK	36.93	3	46.0	9.07
725.00	TX on	PK	39.00	3	46.0	7.00
737.80	TX on	PK	36.66	3	46.0	9.34
/	TX on	PK	/	3	-	/

See attached graphs.

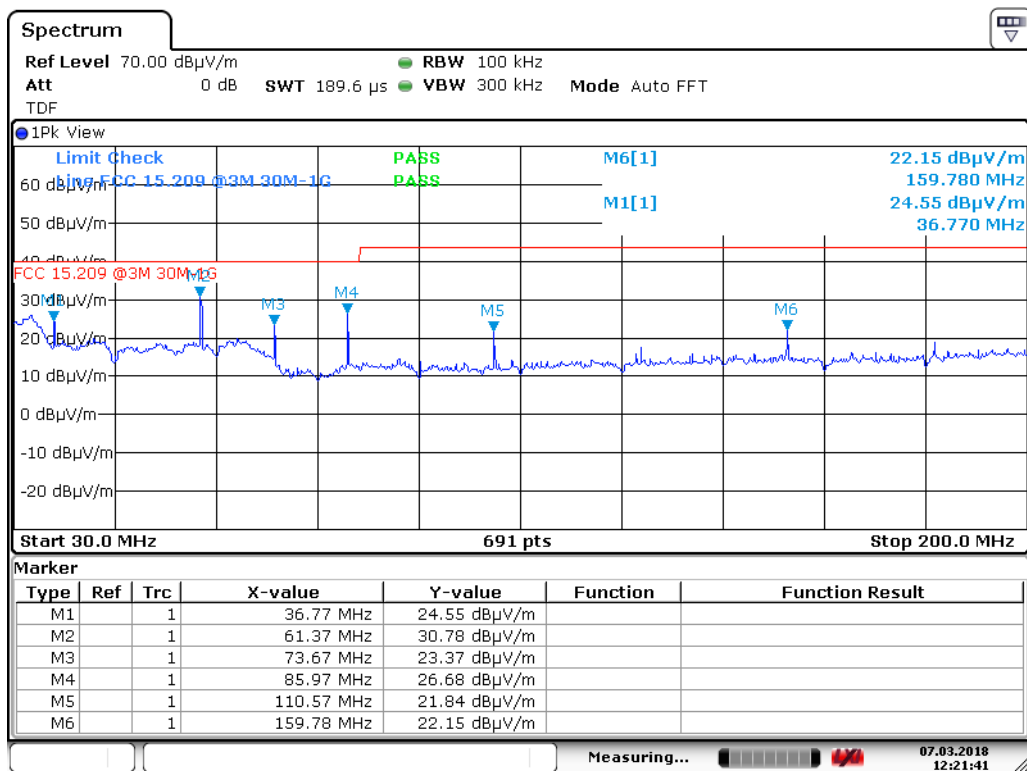
Requirements/Limit

FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency (MHz)	Quasi Peak (μV/m)	Quasi Peak (dBμV/m)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0



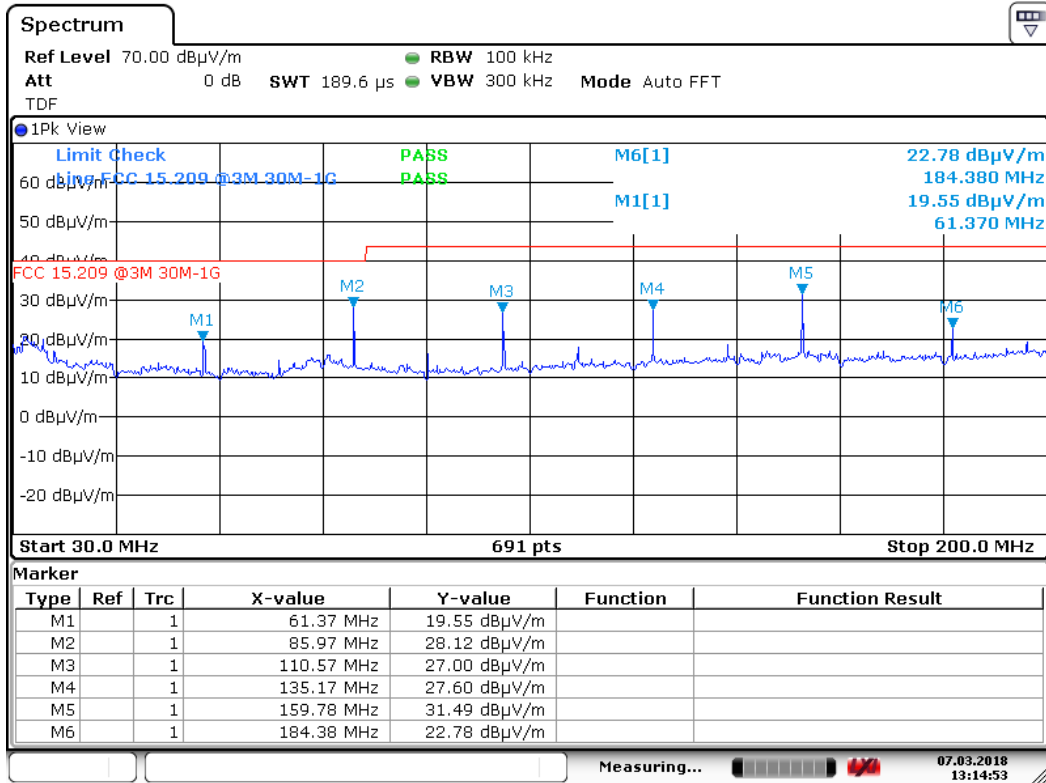
Date: 7.MAR.2018 12:15:26

Radiated Emissions, 30 – 200 MHz, HP, @3m, PK scan, all channels (port A)



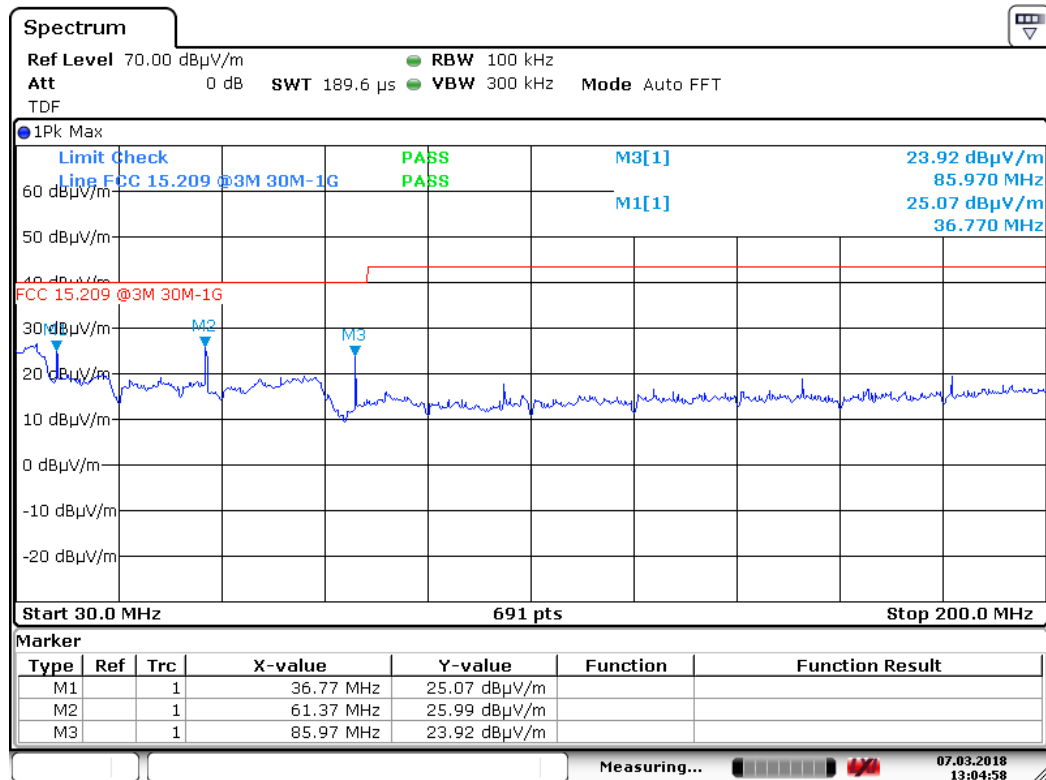
Date: 7.MAR.2018 12:21:41

Radiated Emissions, 30 – 200 MHz, VP, @3m, PK scan, all channels (port A)



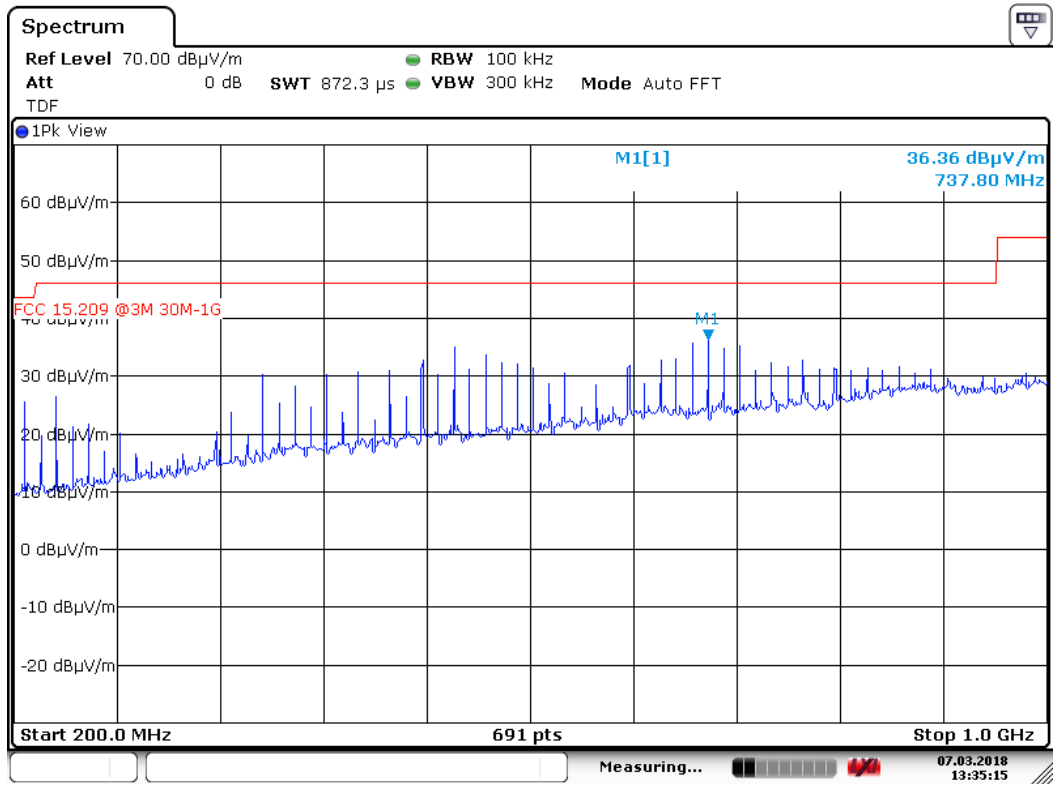
Date: 7.MAR.2018 13:14:53

Radiated Emissions, 30 – 200 MHz, HP, @3m, PK scan, all channels (port B)



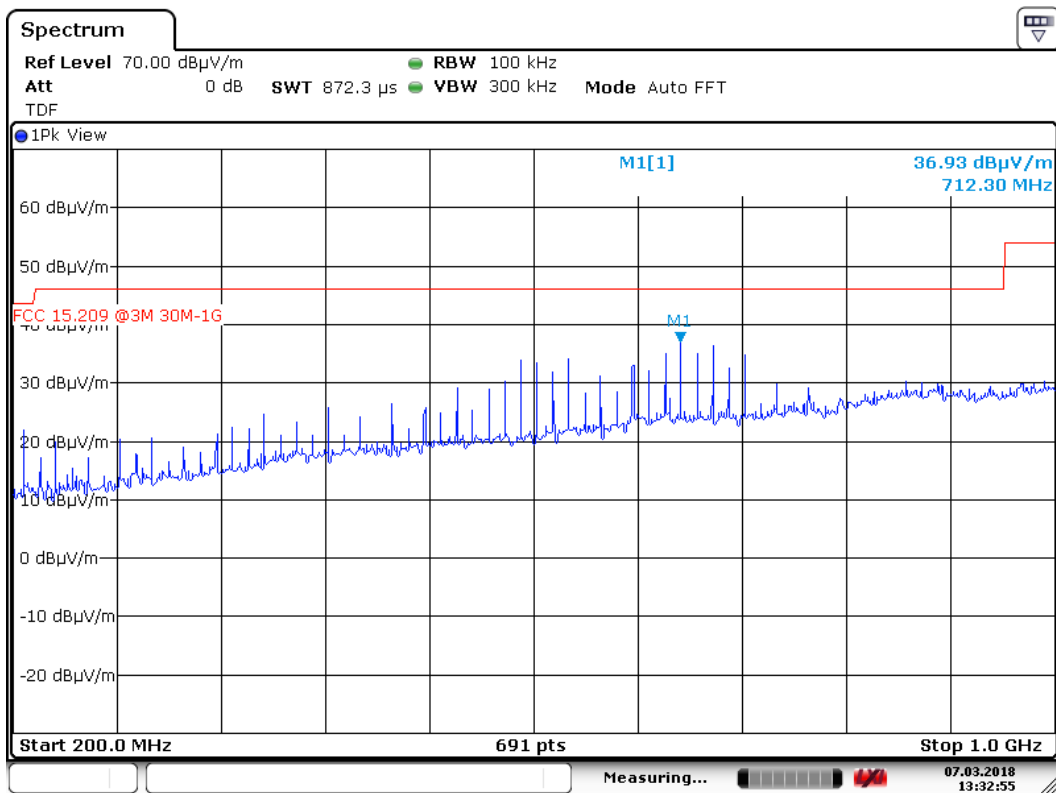
Date: 7.MAR.2018 13:04:58

Radiated Emissions, 30 – 200 MHz, VP, @3m, PK scan, all channels (port B)



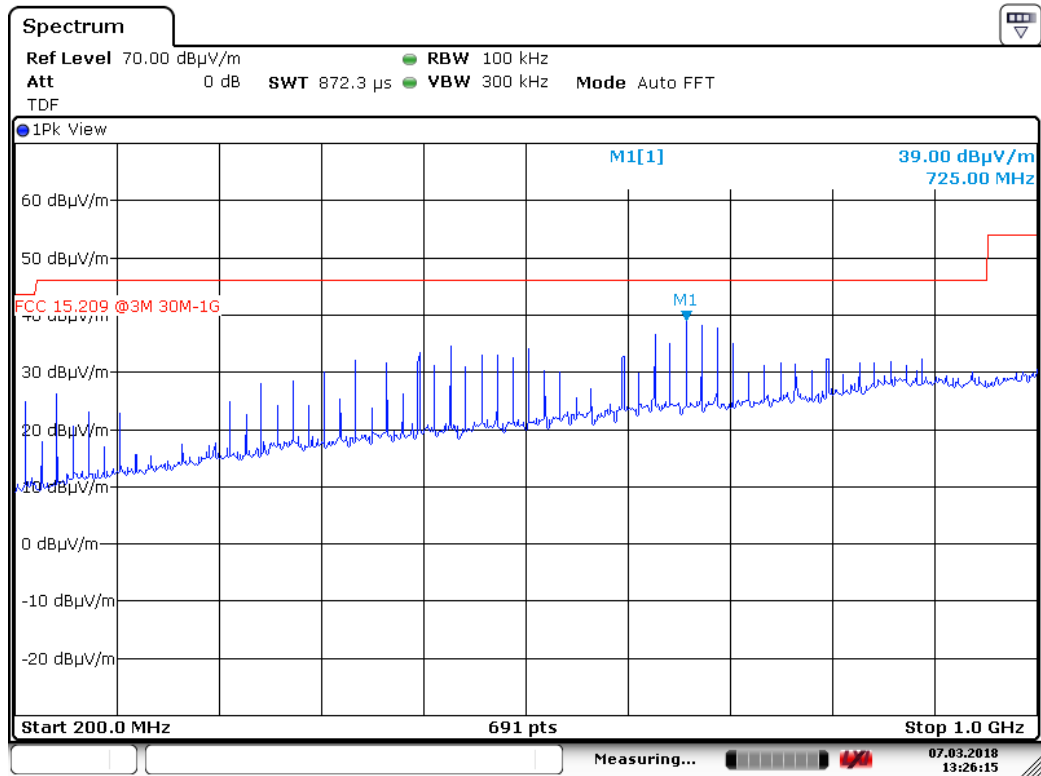
Date: 7.MAR.2018 13:35:15

Radiated Emissions, 200 - 1000 MHz, HP , @3m, PK scan, all channels (port A)



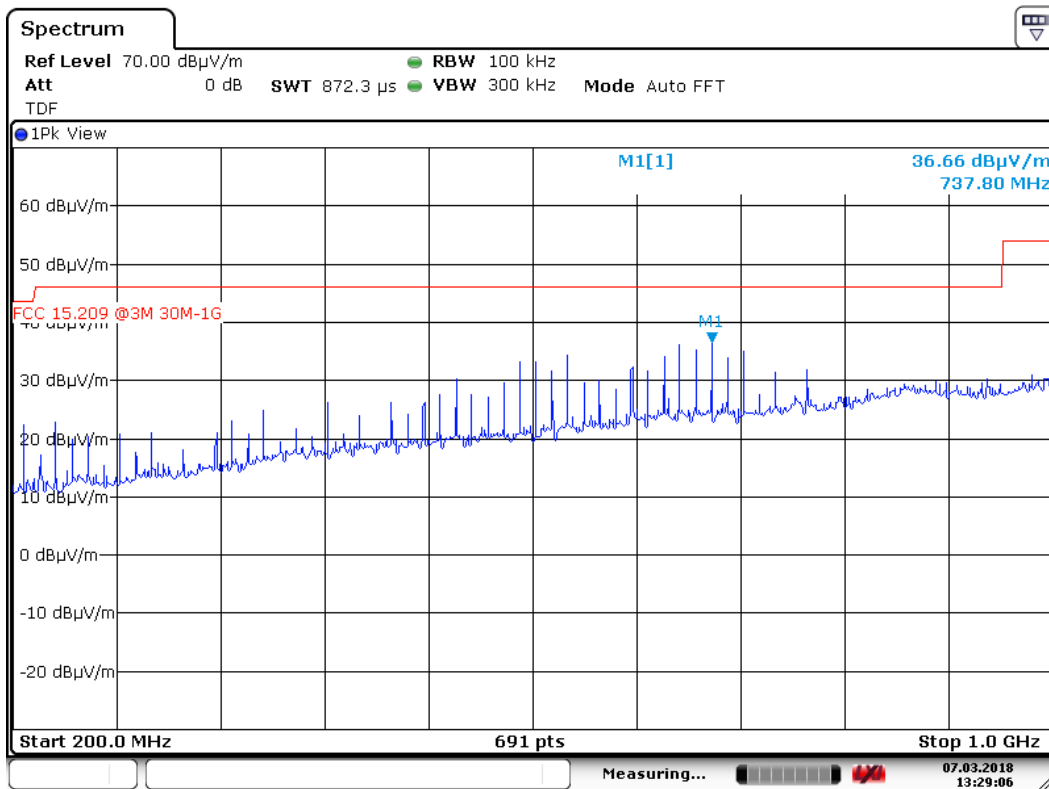
Date: 7.MAR.2018 13:32:55

Radiated Emissions, 200 - 1000 MHz, VP , @3m, PK scan, all channels (port A)



Date: 7.MAR.2018 13:26:15

Radiated Emissions, 200 - 1000 MHz, HP , @3m, PK scan, all channels (port B)



Date: 7.MAR.2018 13:29:06

Radiated Emissions, 200 - 1000 MHz, VP , @3m, PK scan, all channels (port B)

Radiated Emissions, 1-40 GHz

Measuring distance: 3m (1 – 8 GHz)
Measuring distance: 1m (8 – 18 GHz)
Measuring distance: 3m (18 – 40 GHz)

A pre-scan was performed above 18 GHz and no spurious emissions were detected.

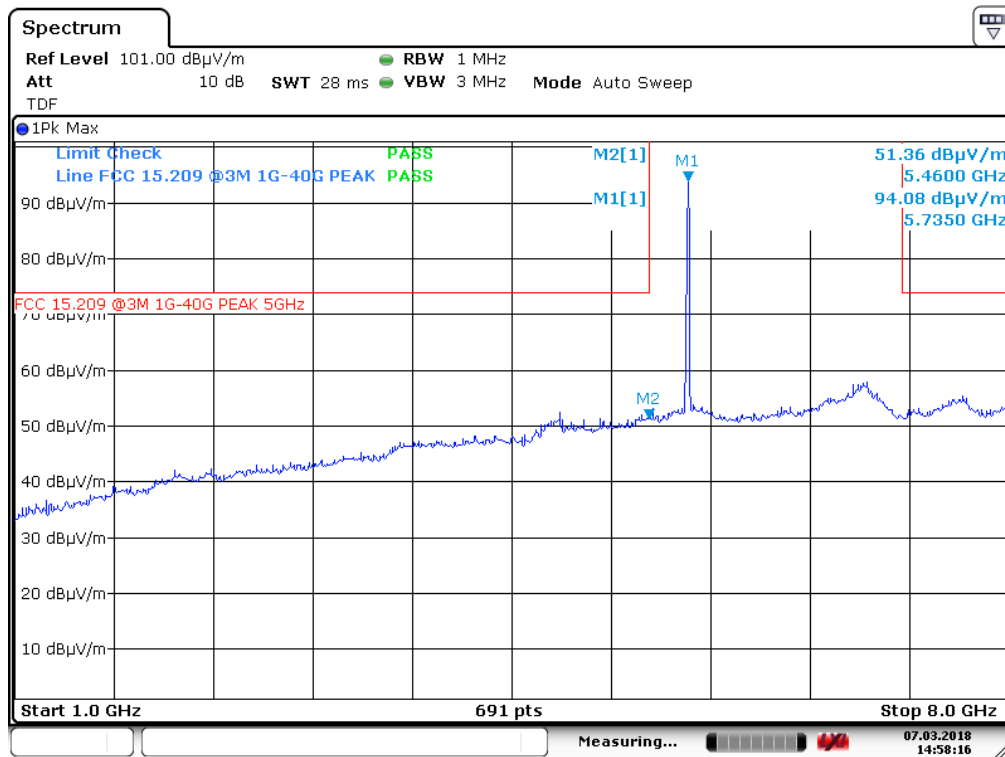
Peak Detector:

Frequency	RF channel	Dist. corr. factor	Field strength, Peak Detector	Duty cycle corr. factor	Limit	Margin
GHz	L,M,H	dB	dB μ V/m	dB	dB μ V/m	dB
17.8340	L,M,H	0	60.83	0	74	13.17
Other freqs	L,M,H	/	< 54	0	74	>20

Average Detector:

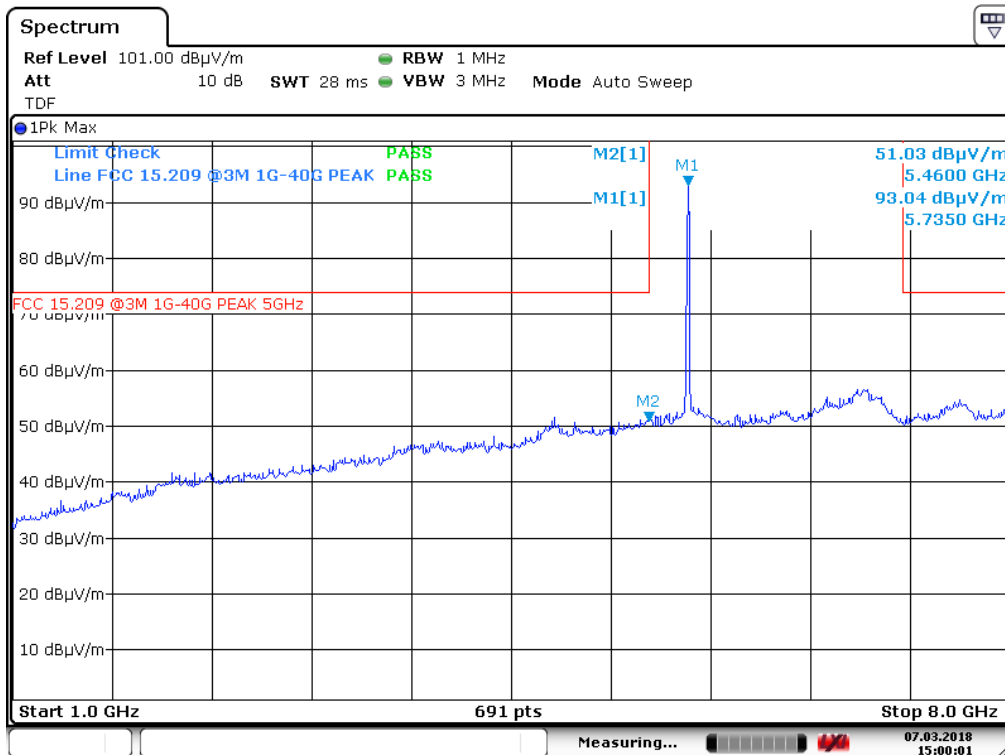
Frequency	RF channel	Dist. corr. factor	Field strength, Average Detector	Duty cycle corr. factor	Limit	Margin
GHz	L,M,H	dB	dB μ V/m	dB	dB μ V/m	dB
17.8340	L,M,H	0	49.85	0	54	4.15
Other freqs	L,M,H	/	/	0	54	/

Antenna factor, dist. corr. factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor".
See plots.



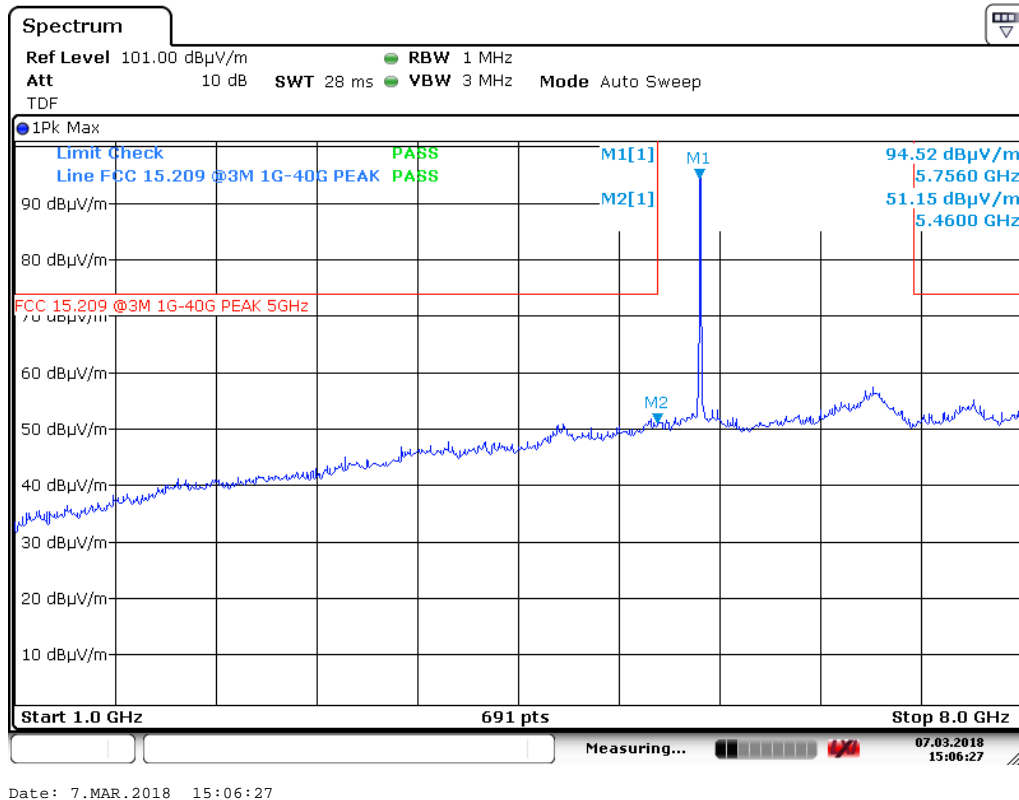
Date: 7.MAR.2018 14:58:16

Radiated Emissions, 5736 MHz (port A), 1 – 8 GHz, HP, @3m – Pre-scan

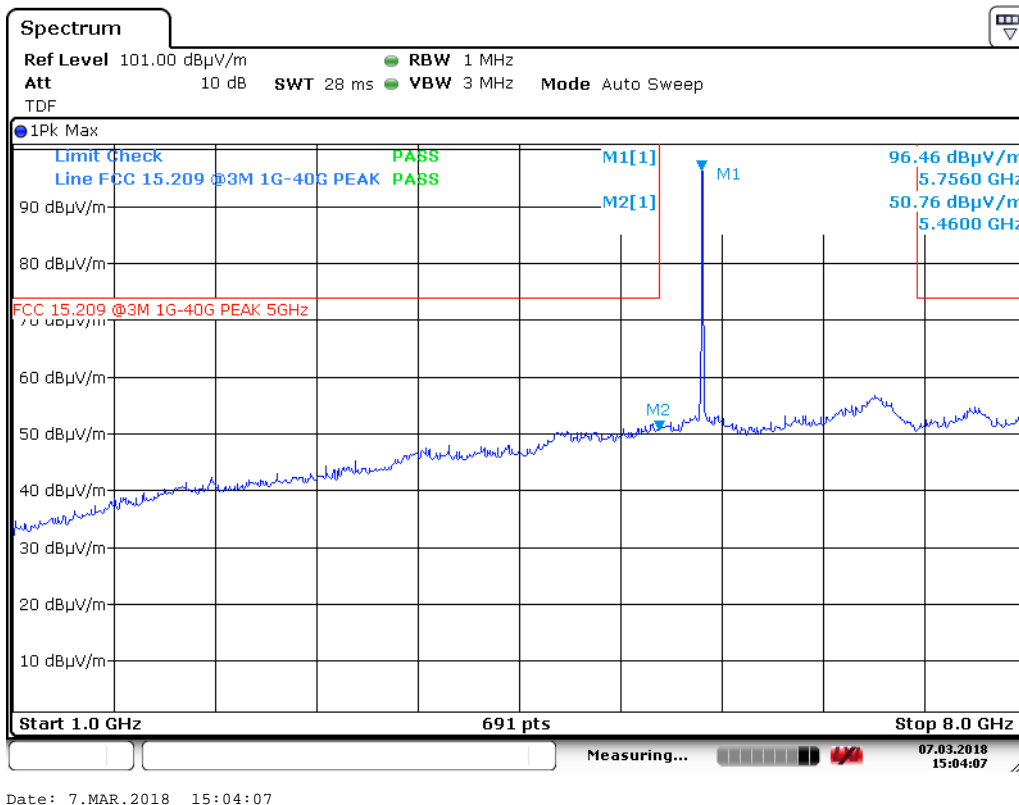


Date: 7.MAR.2018 15:00:01

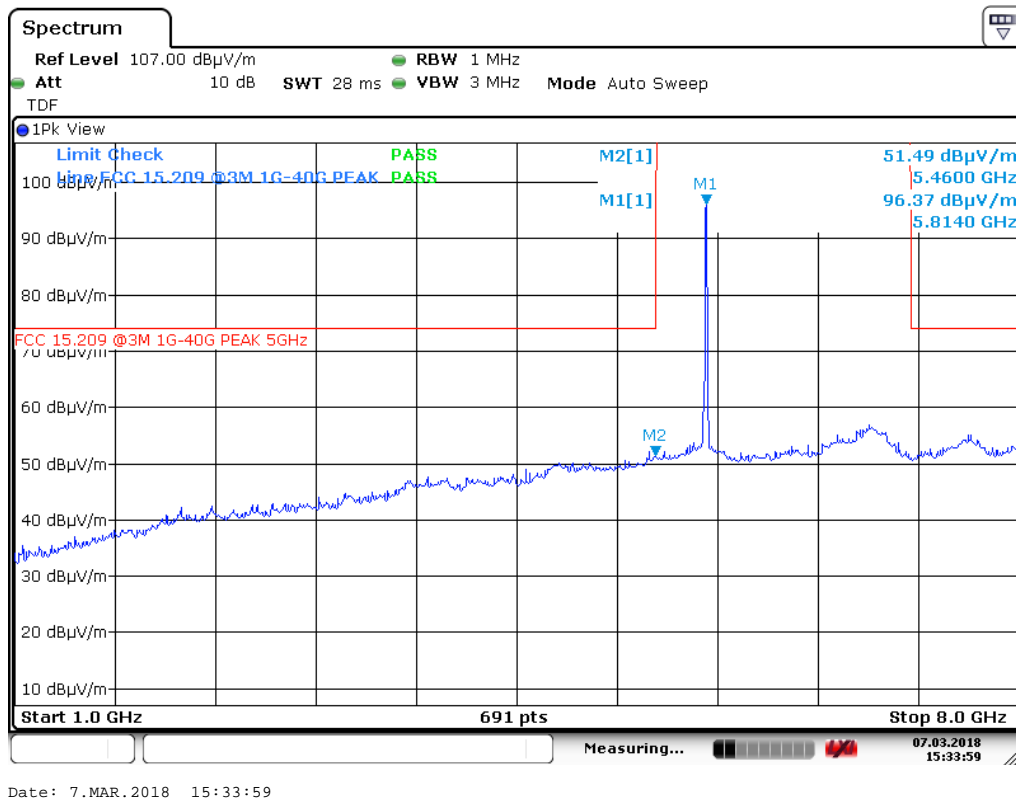
Radiated Emissions, 5736 MHz (port A), 1 – 8 GHz, VP, @3m – Pre-scan



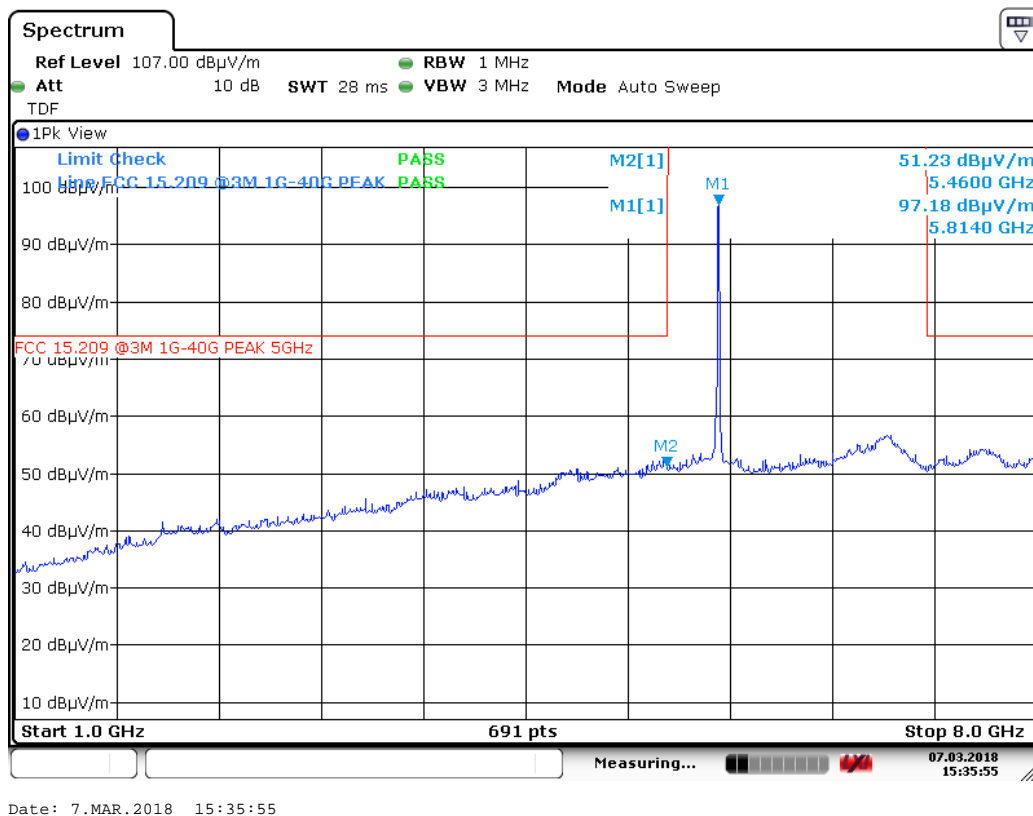
Radiated Emissions, 5762 MHz (port A), 1 – 8 GHz, HP, @3m – Pre-scan



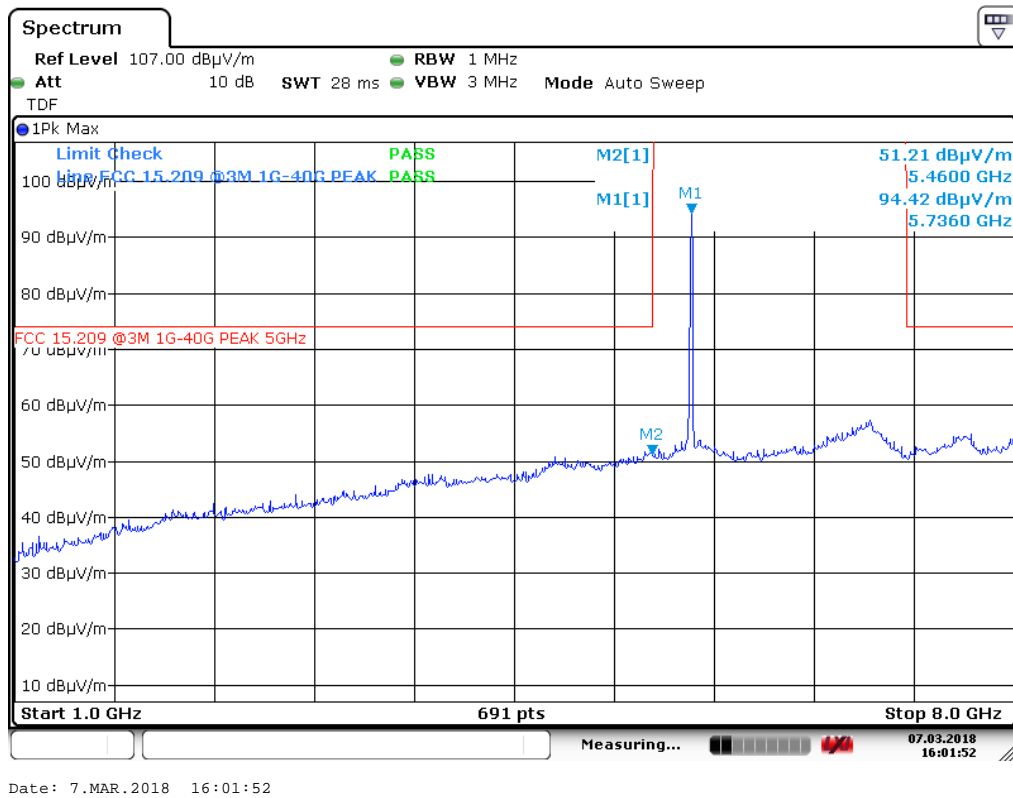
Radiated Emissions, 5762 MHz (port A), 1 – 8 GHz, VP, @3m – Pre-scan



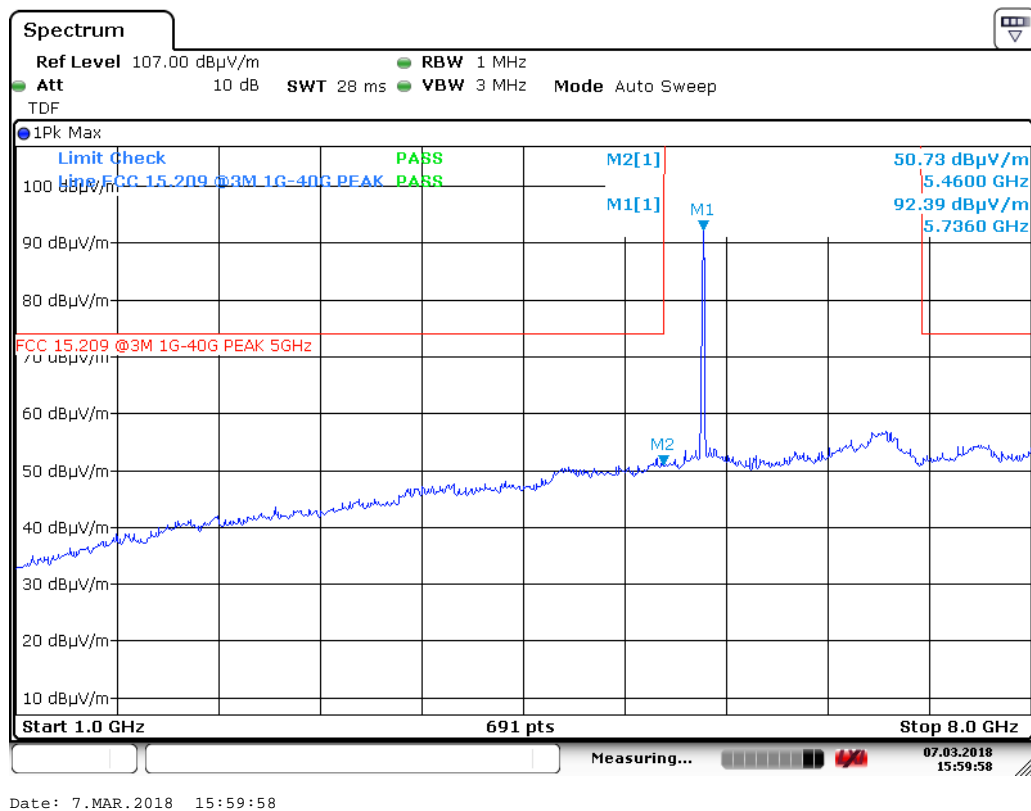
Radiated Emissions, 5814 MHz (port A), 1 – 8 GHz, HP, @3m – Pre-scan



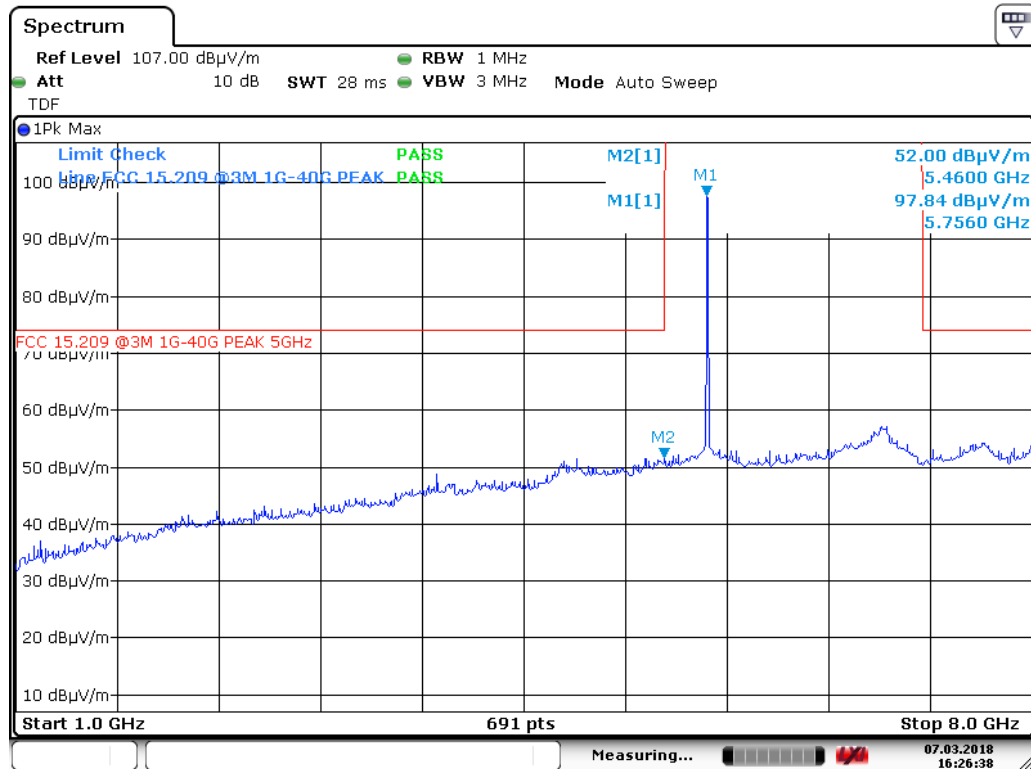
Radiated Emissions, 5814 MHz (port A), 1 – 8 GHz, VP, @3m – Pre-scan



Radiated Emissions, 5736 MHz (port B), 1 – 8 GHz, HP, @3m – Pre-scan

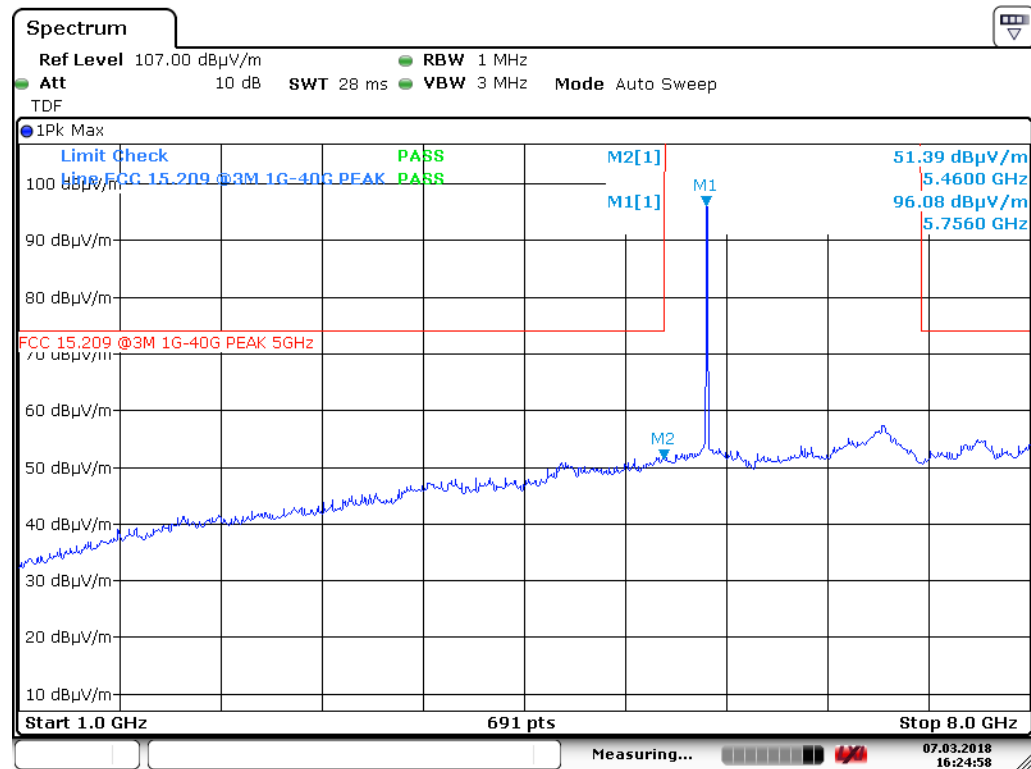


Radiated Emissions, 5736 MHz (port B), 1 – 8 GHz, VP, @3m – Pre-scan



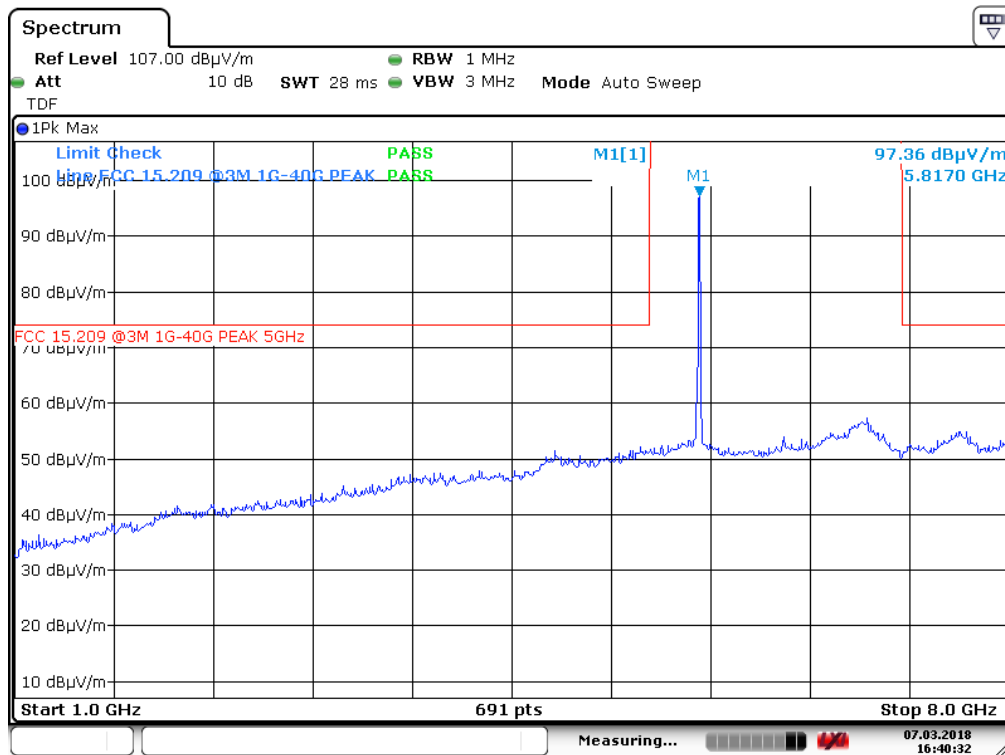
Date: 7.MAR.2018 16:26:38

Radiated Emissions, 5762 MHz (port B), 1 – 8 GHz, HP, @3m – Pre-scan



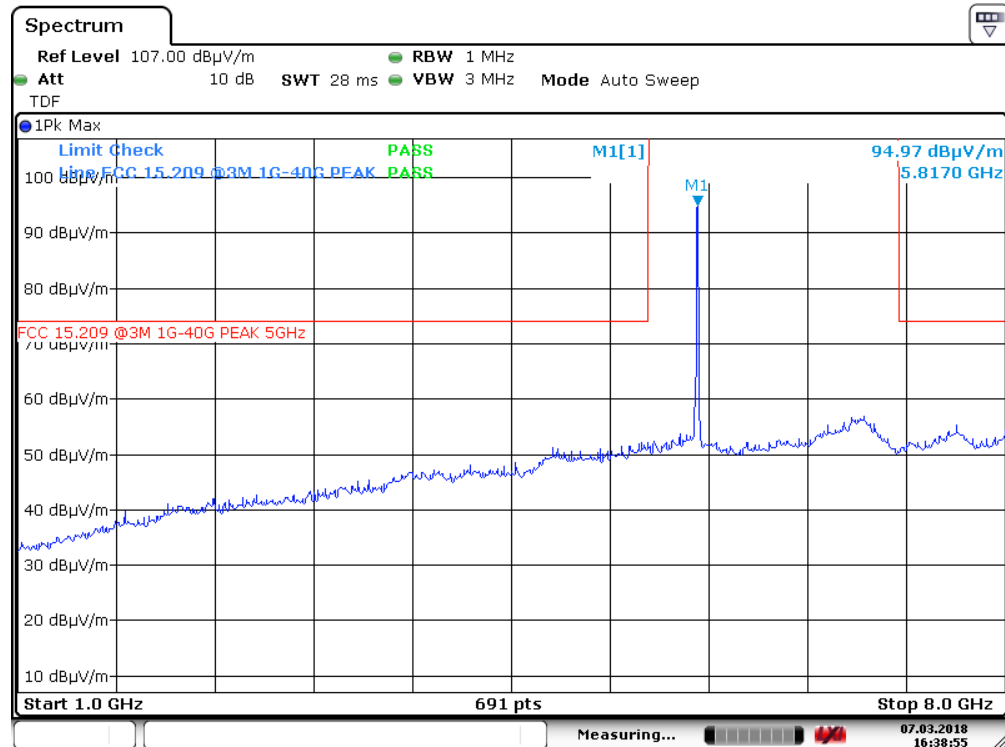
Date: 7.MAR.2018 16:24:58

Radiated Emissions, 5762 MHz (port B), 1 – 8 GHz, VP, @3m – Pre-scan



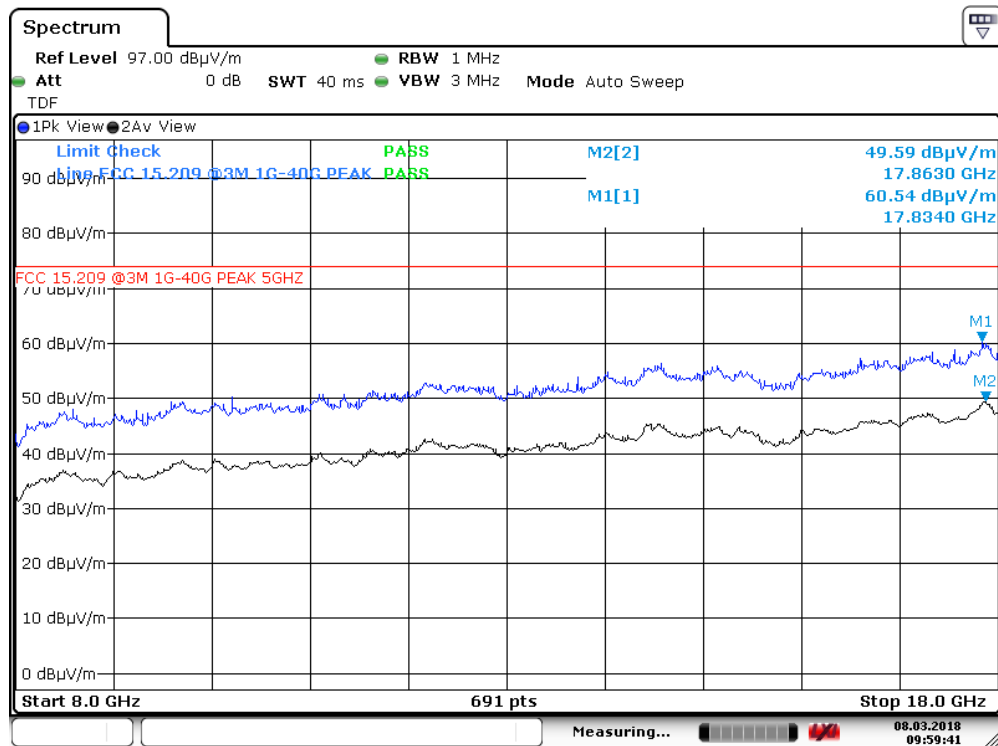
Date: 7.MAR.2018 16:40:32

Radiated Emissions, 5814 MHz (port B), 1 – 8 GHz, HP, @3m – Pre-scan



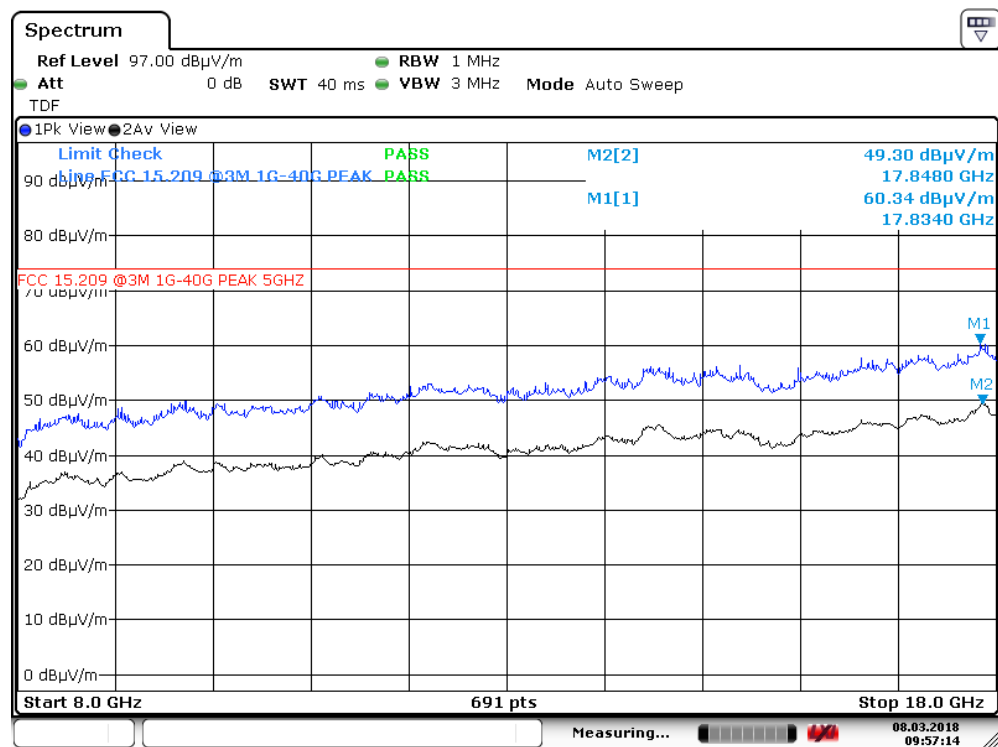
Date: 7.MAR.2018 16:38:55

Radiated Emissions, 5814 MHz (port B), 1 – 8 GHz, VP, @3m – Pre-scan



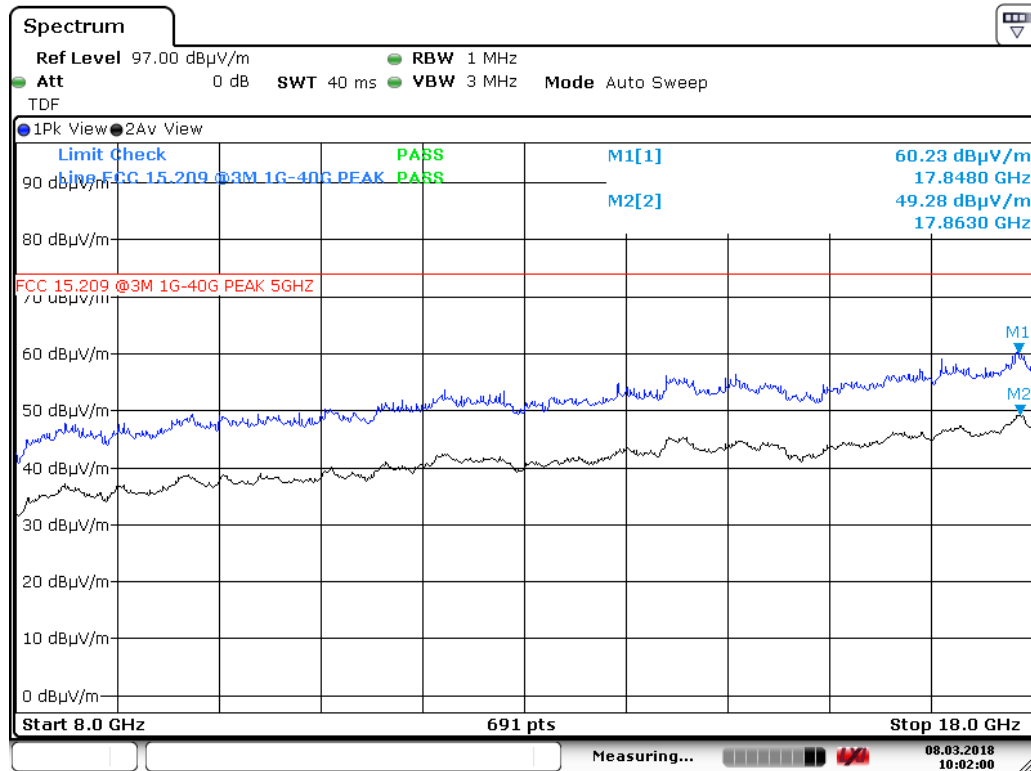
Date: 8.MAR.2018 09:59:42

Radiated Emissions, 5736 MHz (port A), 8 – 18 GHz, HP, @3m – Pre-scan



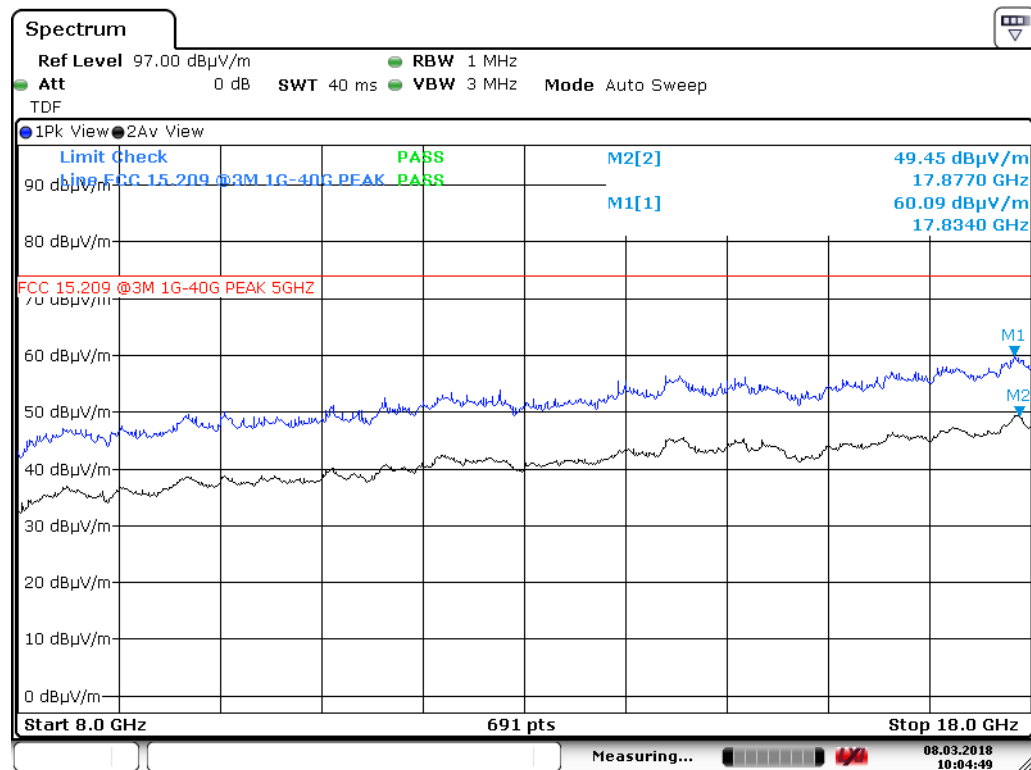
Date: 8.MAR.2018 09:57:15

Radiated Emissions, 5736 MHz (port A), 8 – 18 GHz, VP, @3m – Pre-scan



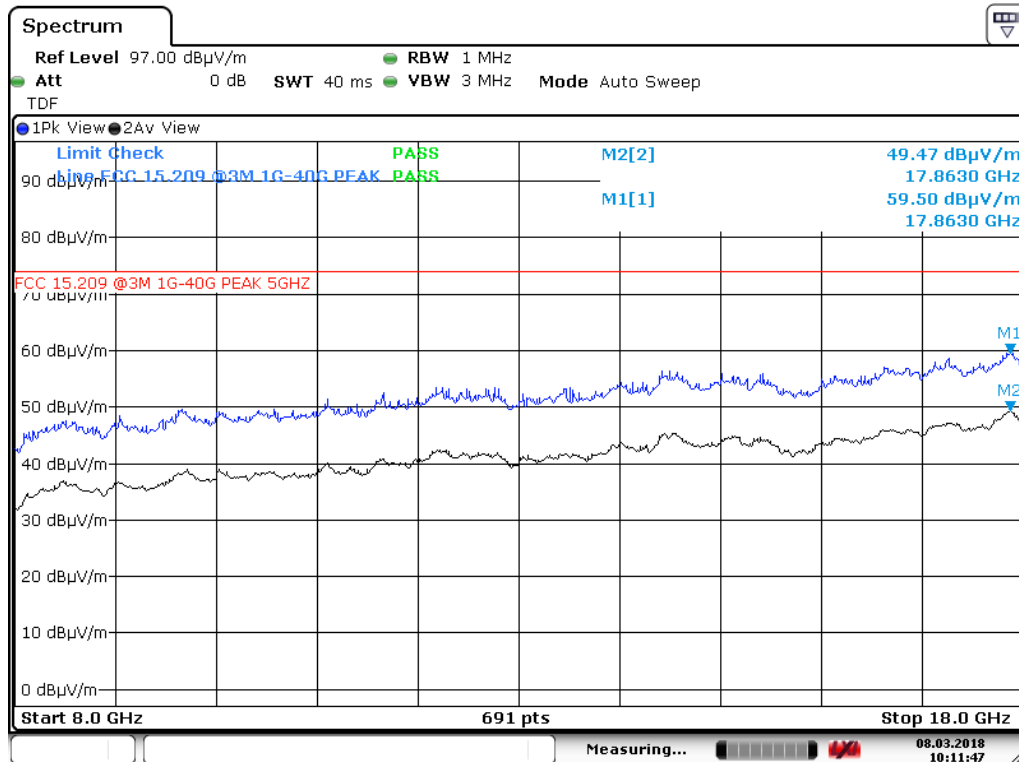
Date: 8.MAR.2018 10:02:01

Radiated Emissions, 5762 MHz (port A), 8 – 18 GHz, HP, @3m – Pre-scan



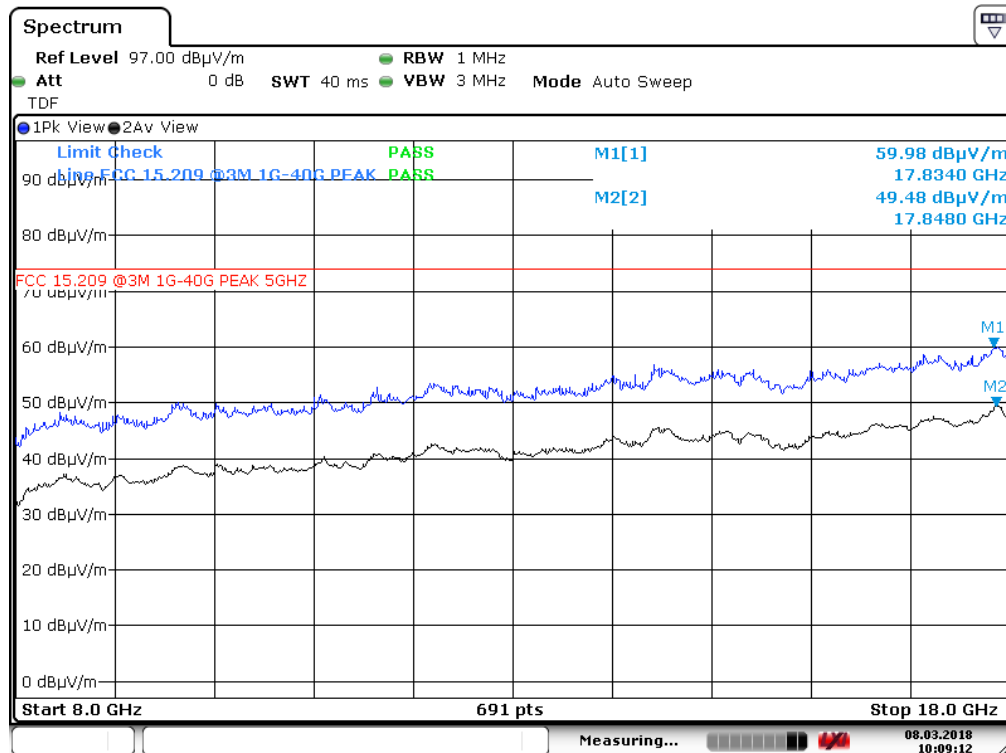
Date: 8.MAR.2018 10:04:49

Radiated Emissions, 5762 MHz (port A), 8 – 18 GHz, VP, @3m – Pre-scan



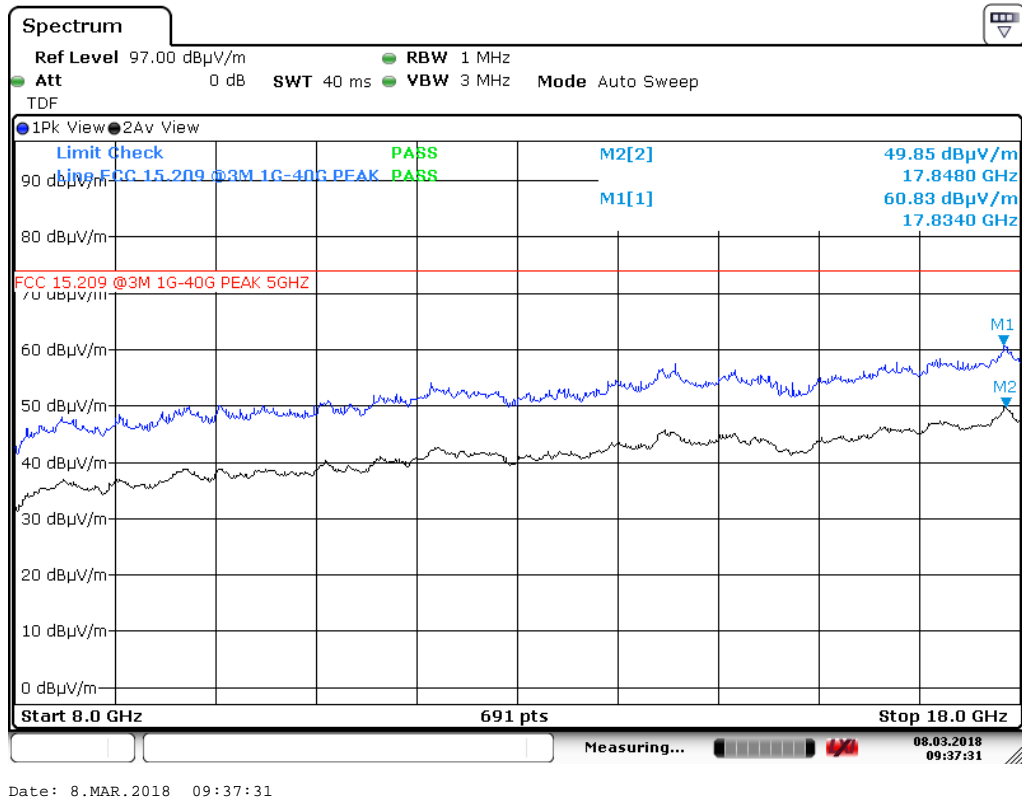
Date: 8.MAR.2018 10:11:48

Radiated Emissions, 5814 MHz (port A), 8 – 18 GHz, HP, @3m – Pre-scan

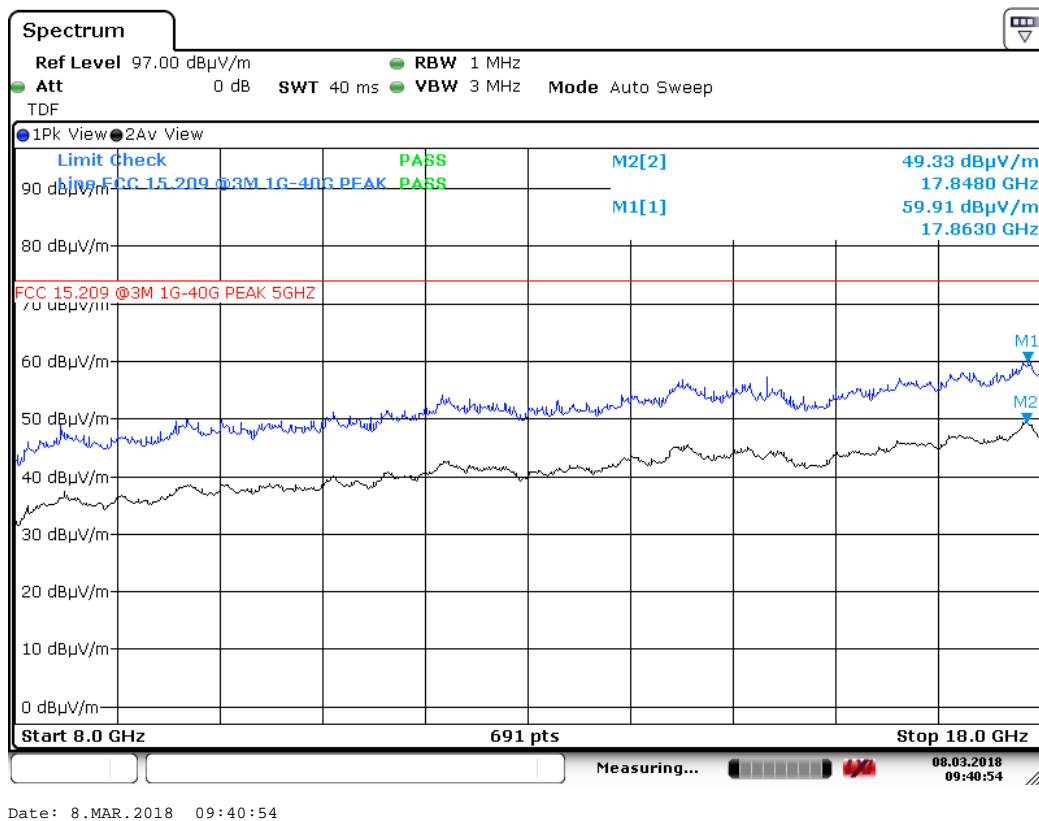


Date: 8.MAR.2018 10:09:13

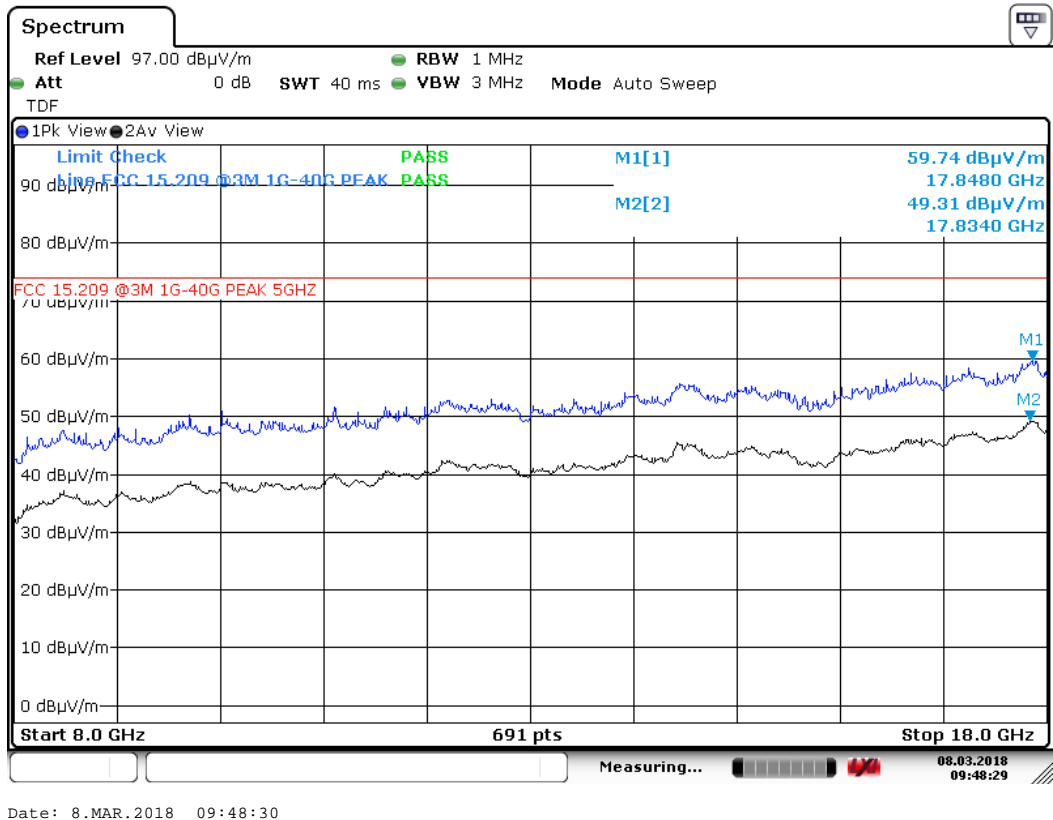
Radiated Emissions, 5814 MHz (port A), 8 – 18 GHz, VP, @3m – Pre-scan



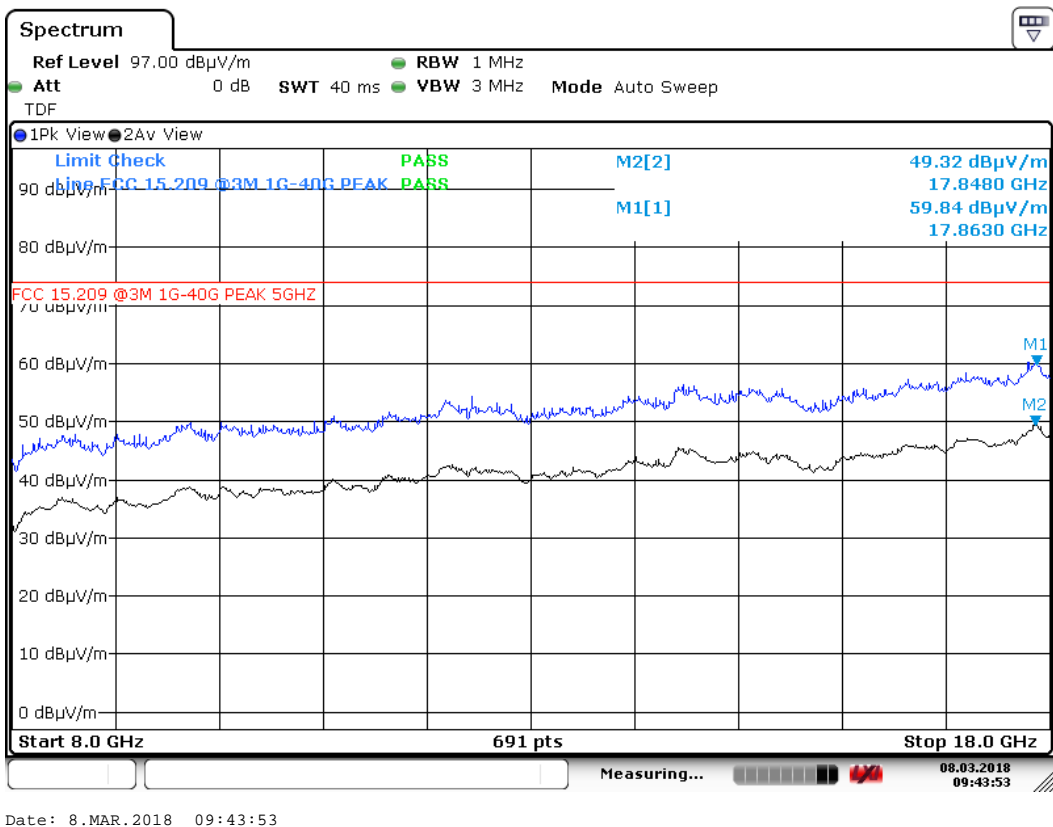
Radiated Emissions, 5736 MHz (port B), 8 – 18 GHz, HP, @3m – Pre-scan



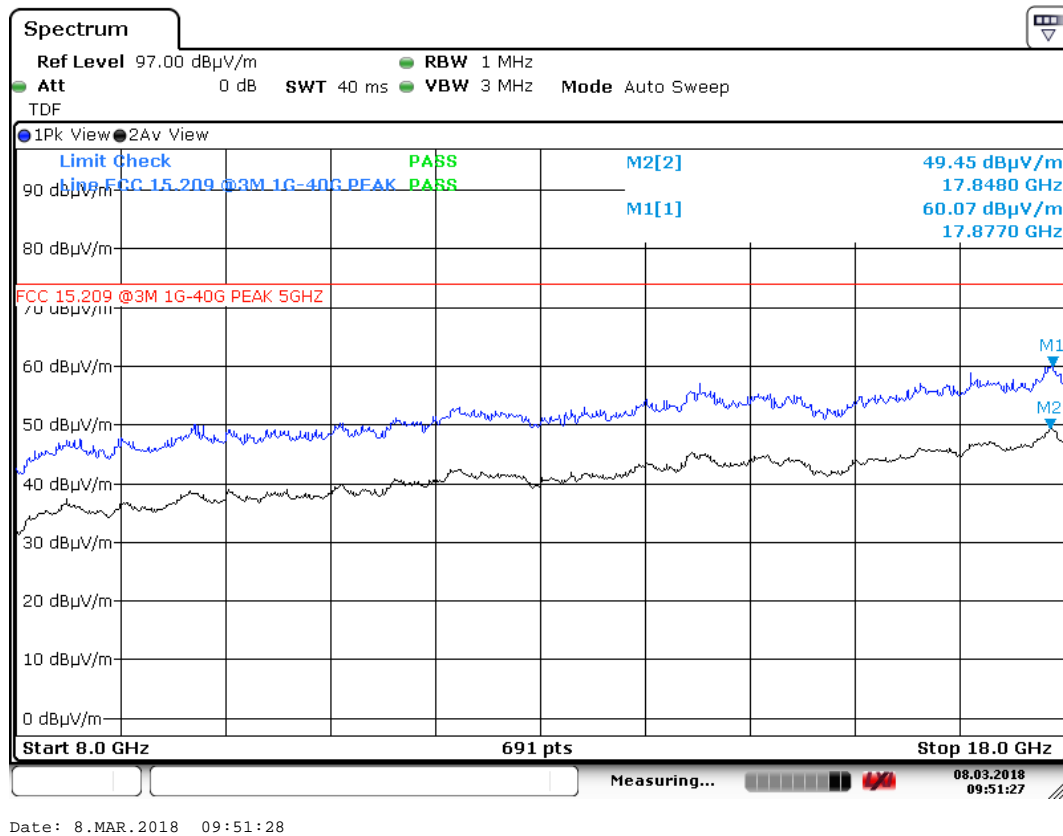
Radiated Emissions, 5736 MHz (port B), 8 – 18 GHz, VP, @3m – Pre-scan



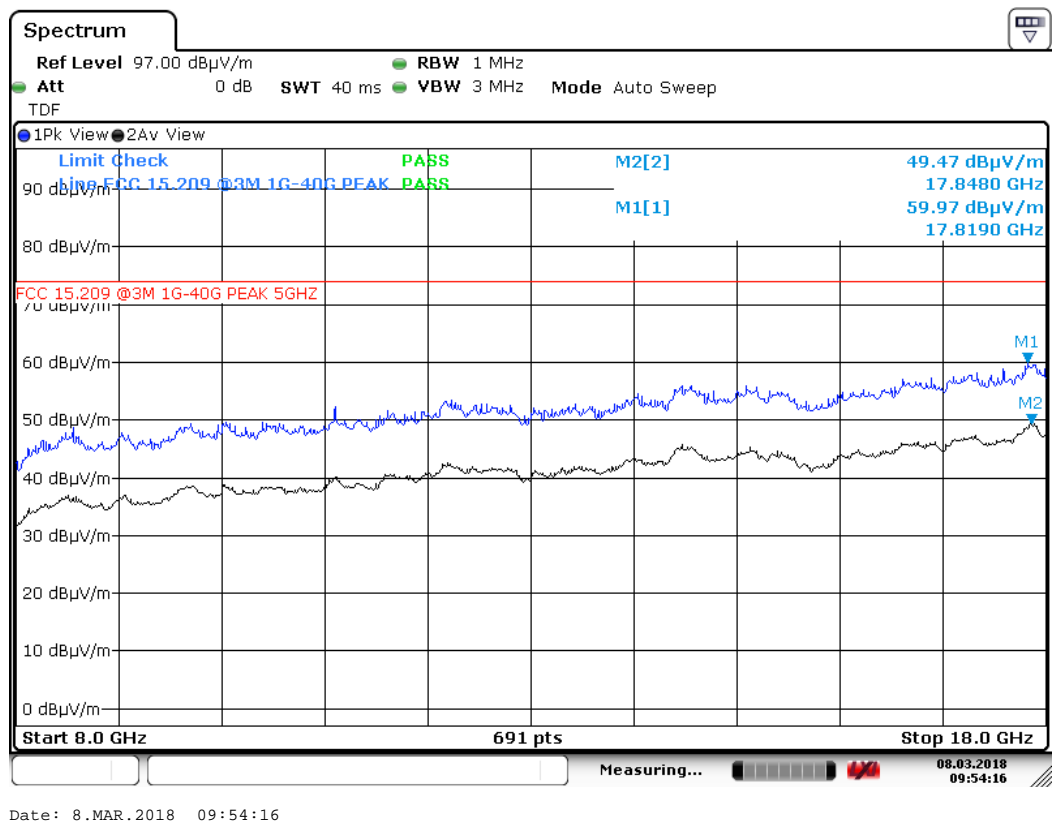
Radiated Emissions, 5762 MHz (port B), 8 – 18 GHz, HP, @3m – Pre-scan



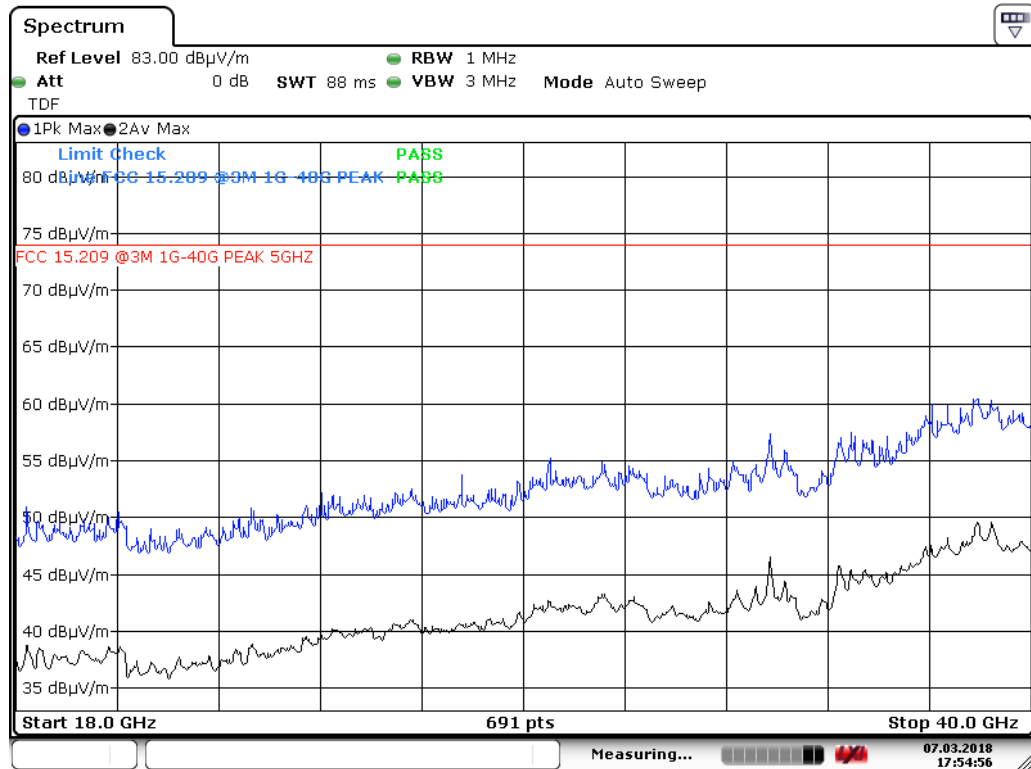
Radiated Emissions, 5762 MHz (port B), 8 – 18 GHz, VP, @3m – Pre-scan



Radiated Emissions, 5814 MHz (port B), 8 – 18 GHz, HP, @3m – Pre-scan

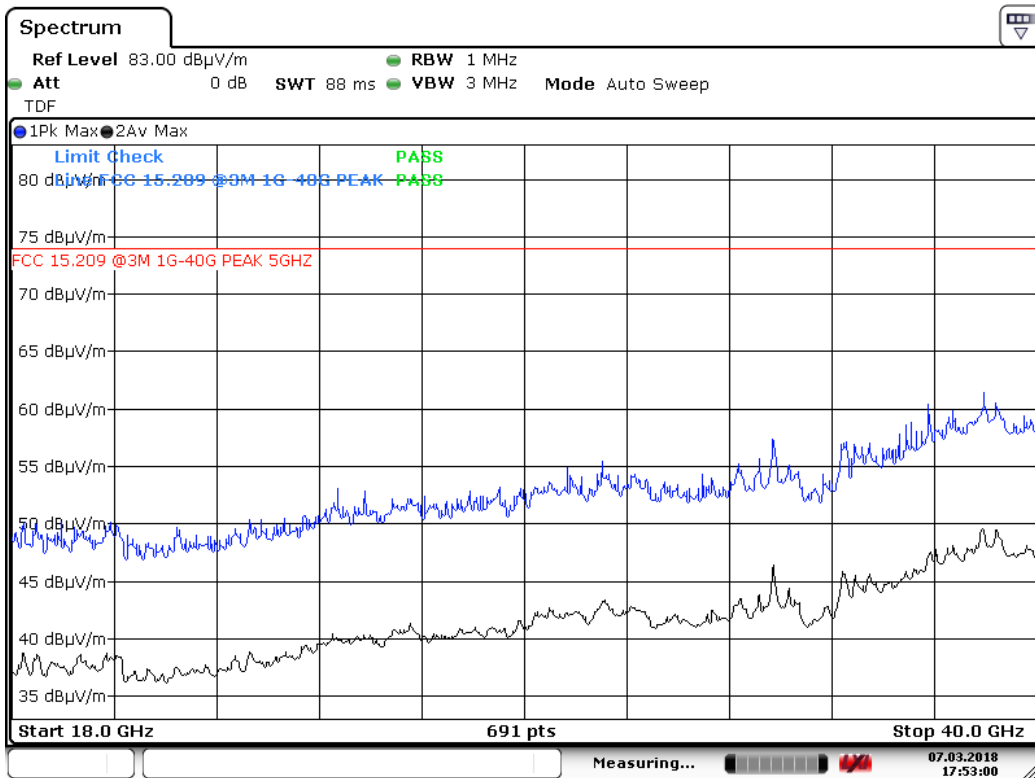


Radiated Emissions, 5814 MHz (port B), 8 – 18 GHz, VP, @3m – Pre-scan



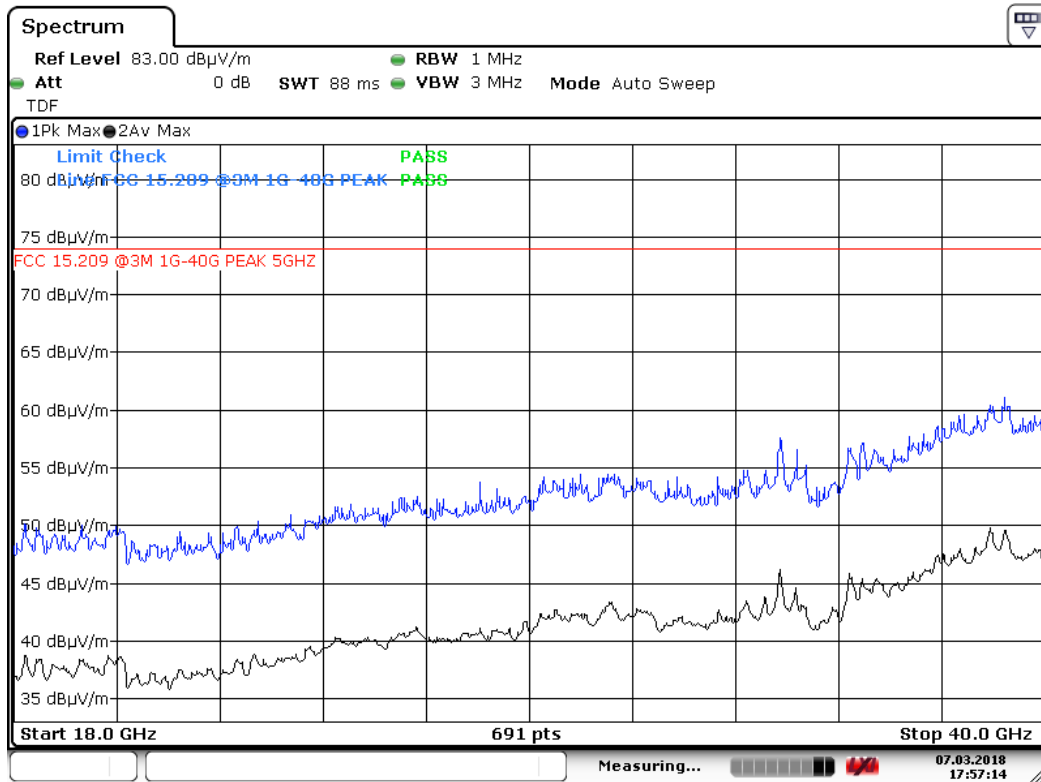
Date: 7.MAR.2018 17:54:56

Radiated Emissions, 5736 MHz (port A), 18 – 40 GHz, HP, @3m – Pre-scan



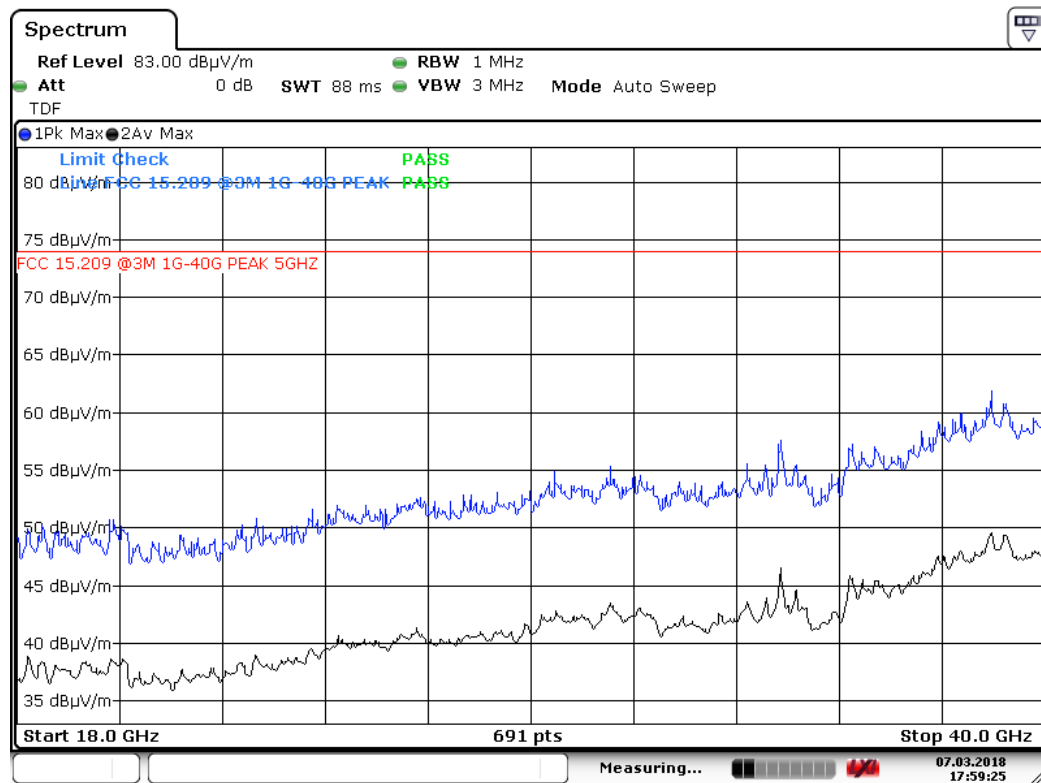
Date: 7.MAR.2018 17:53:00

Radiated Emissions, 5736 MHz (port A), 18 – 40 GHz, HP, @3m – Pre-scan



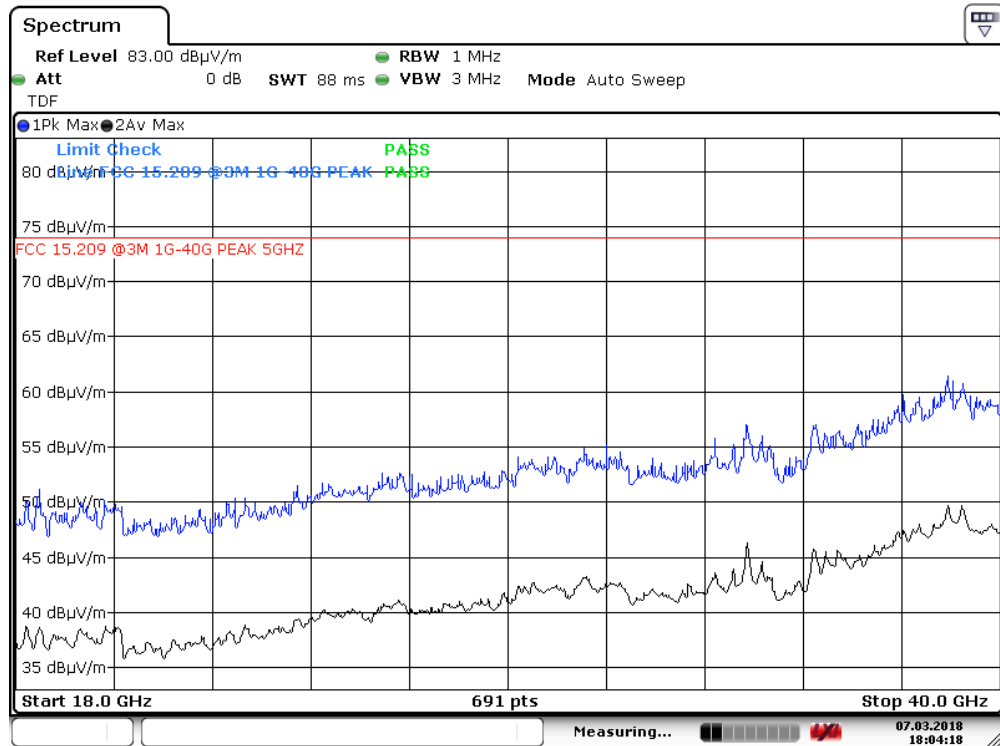
Date: 7.MAR.2018 17:57:14

Radiated Emissions, 5762 MHz (port A), 18 – 40 GHz, HP, @3m – Pre-scan



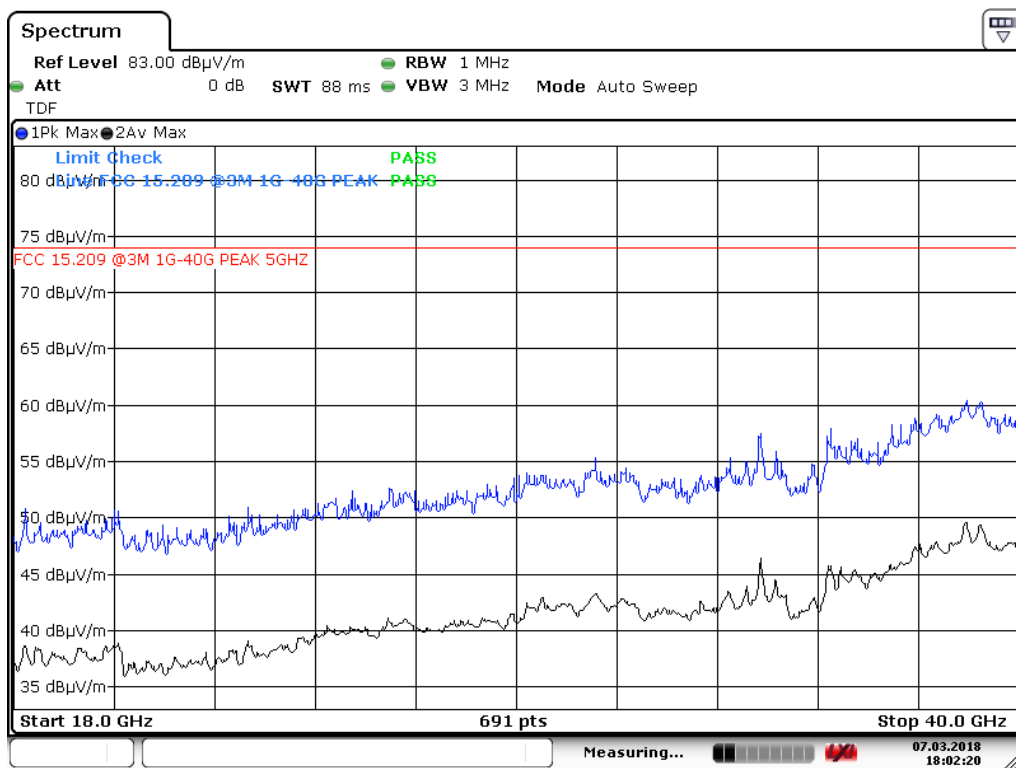
Date: 7.MAR.2018 17:59:25

Radiated Emissions, 5762 MHz (port A), 18 – 40 GHz, VP, @3m – Pre-scan



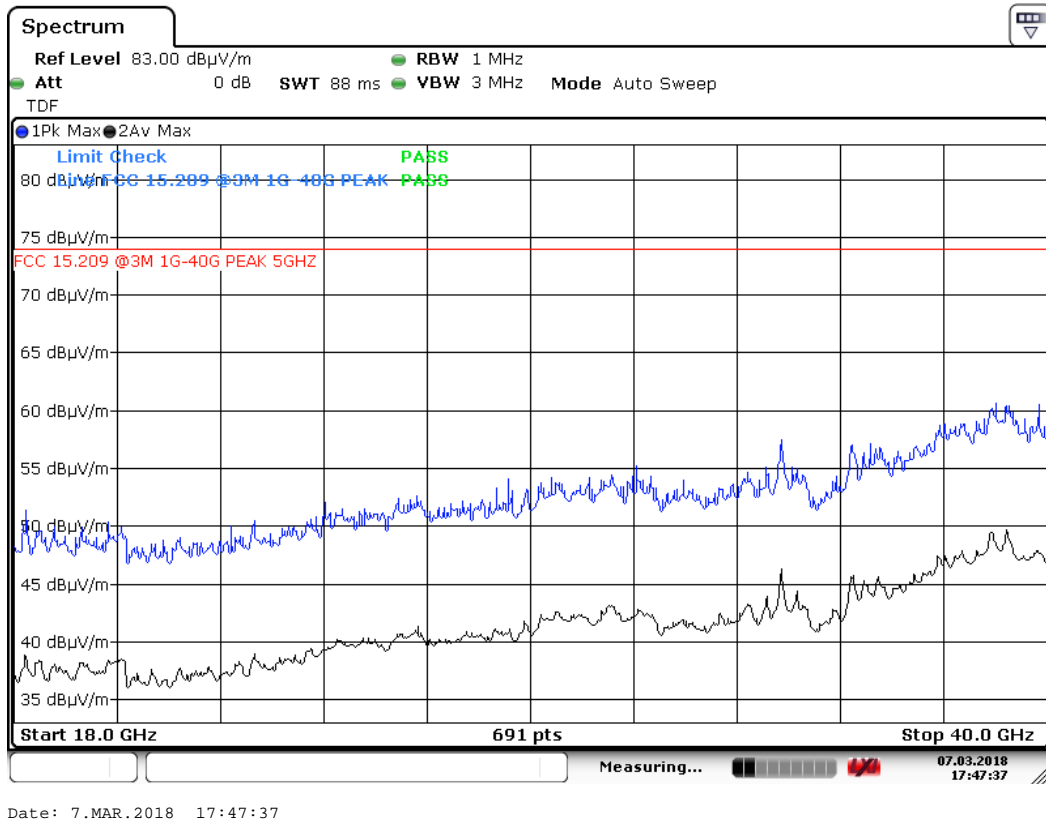
Date: 7.MAR.2018 18:04:18

Radiated Emissions, 5814 MHz (port A), 18 – 40 GHz, HP, @3m – Pre-scan

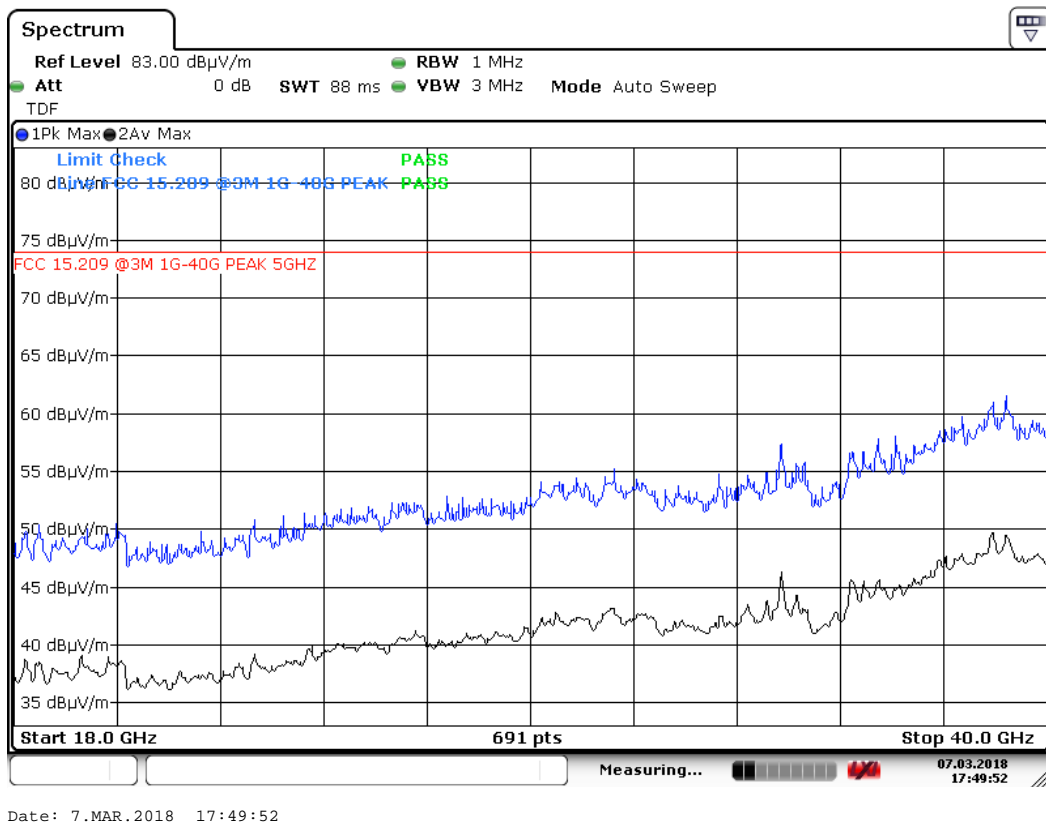


Date: 7.MAR.2018 18:02:20

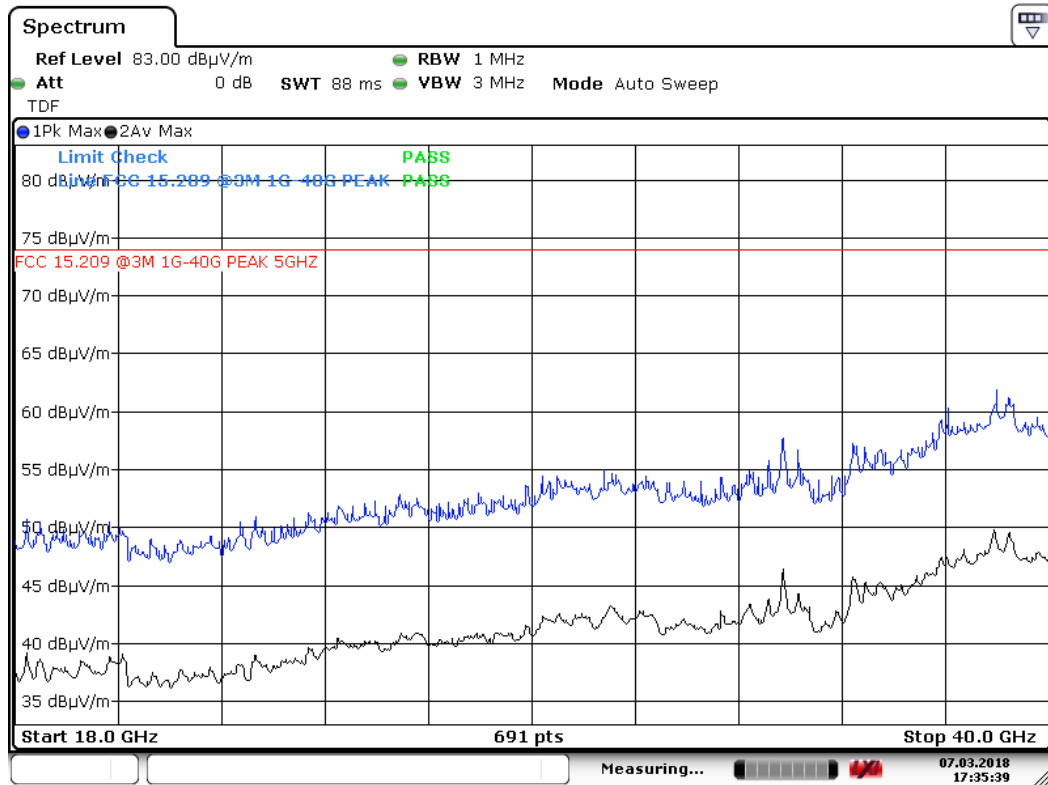
Radiated Emissions, 5814 MHz (port A), 18 – 40 GHz, VP, @3m – Pre-scan



Radiated Emissions, 5736 MHz (port B), 18 – 40 GHz, HP, @3m – Pre-scan

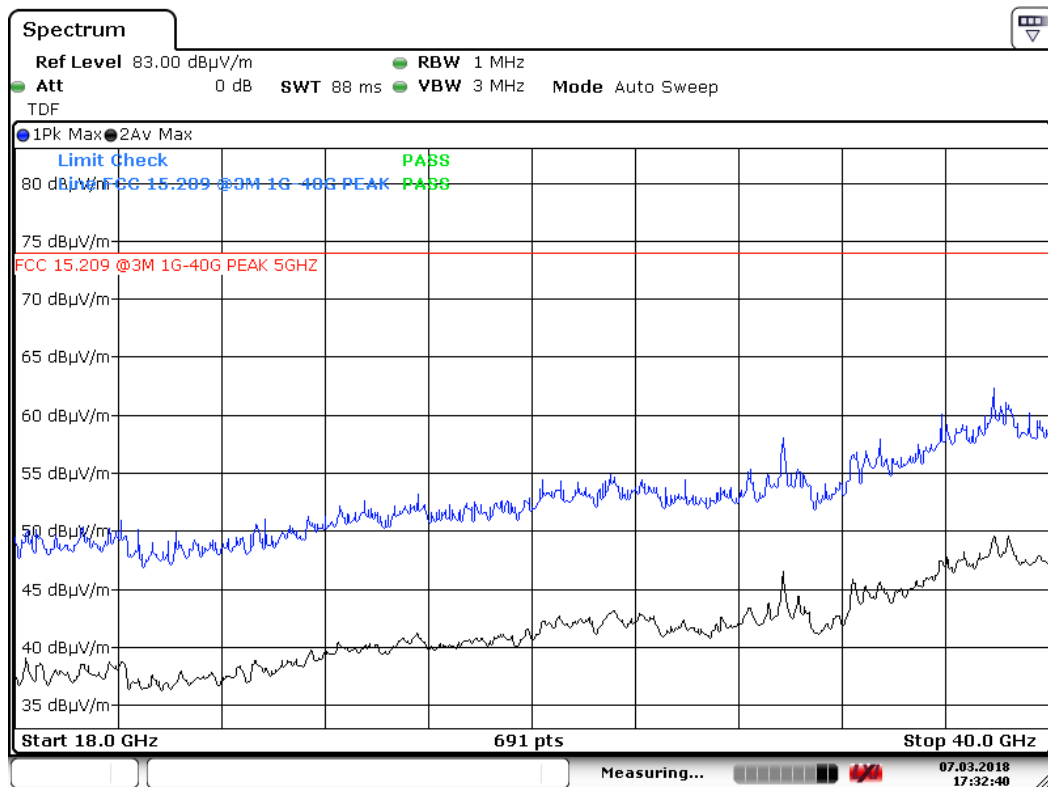


Radiated Emissions, 5736 MHz (port B), 18 – 40 GHz, VP, @3m – Pre-scan



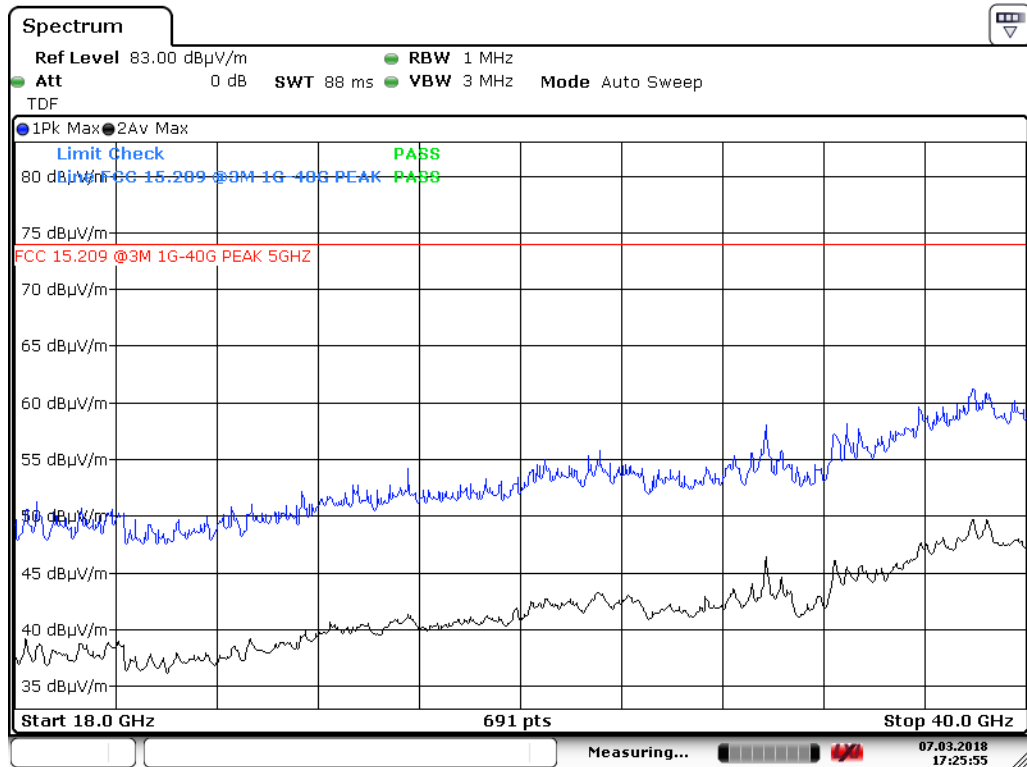
Date: 7.MAR.2018 17:35:39

Radiated Emissions, 5762 MHz (port B), 18 – 40 GHz, HP, @3m – Pre-scan



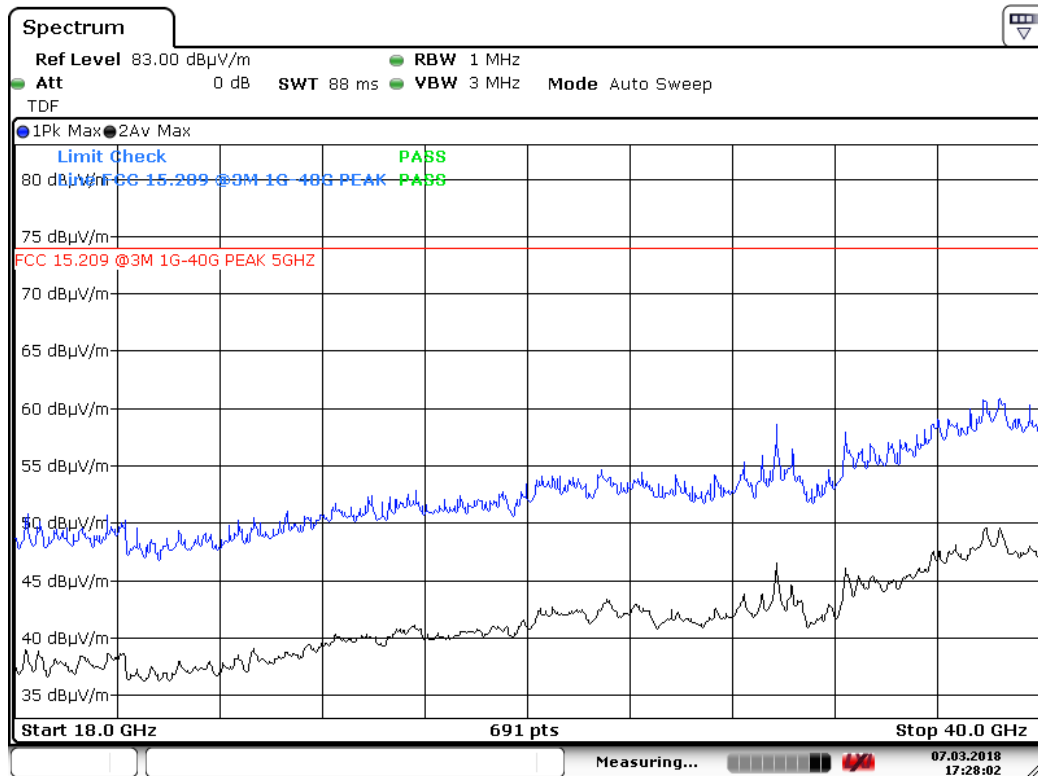
Date: 7.MAR.2018 17:32:40

Radiated Emissions, 5762 MHz (port B), 18 – 40 GHz, VP, @3m – Pre-scan



Date: 7.MAR.2018 17:25:55

Radiated Emissions, 5814 MHz (port B), 18 – 40 GHz, HP, @3m – Pre-scan



Date: 7.MAR.2018 17:28:02

Radiated Emissions, 5814 MHz (port B), 18 – 40 GHz, VP, @3m – Pre-scan

4 Measurement Uncertainty

Measurement Uncertainty Values		
Test Item		Uncertainty
Output Power		±0.8 dB
Power Spectral Density		±0.8 dB
Out of Band Emissions, Conducted	< 3.6 GHz	±0.8 dB
	> 3.6 GHz	±1.2 dB
Spurious Emissions, Radiated	< 200 MHz	±4.77 dB
	200 MHz - 1 GHz	±5.02 dB
	1 GHz – 18 GHz	±4.94 dB
	> 18 GHz	±5.91 dB
Emission Bandwidth		±4 %
Power Line Conducted Emissions		±3.58 %
Spectrum Mask Measurements	Frequency	±5 %
	Amplitude	±1.0 dB
Frequency Error		±0.6 ppm
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

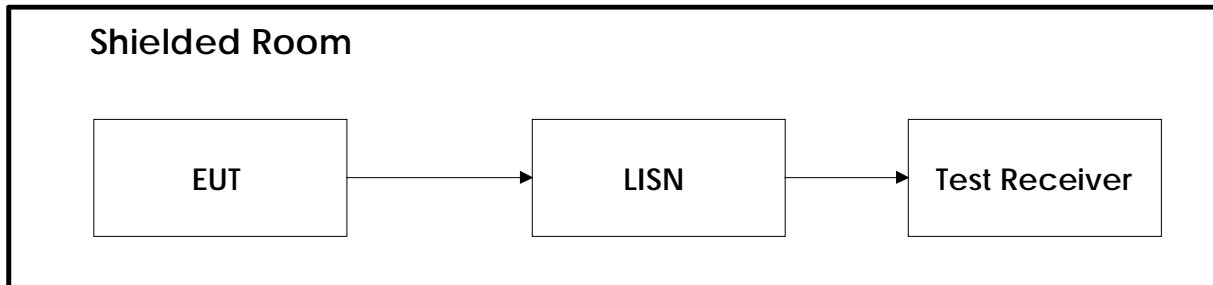
5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

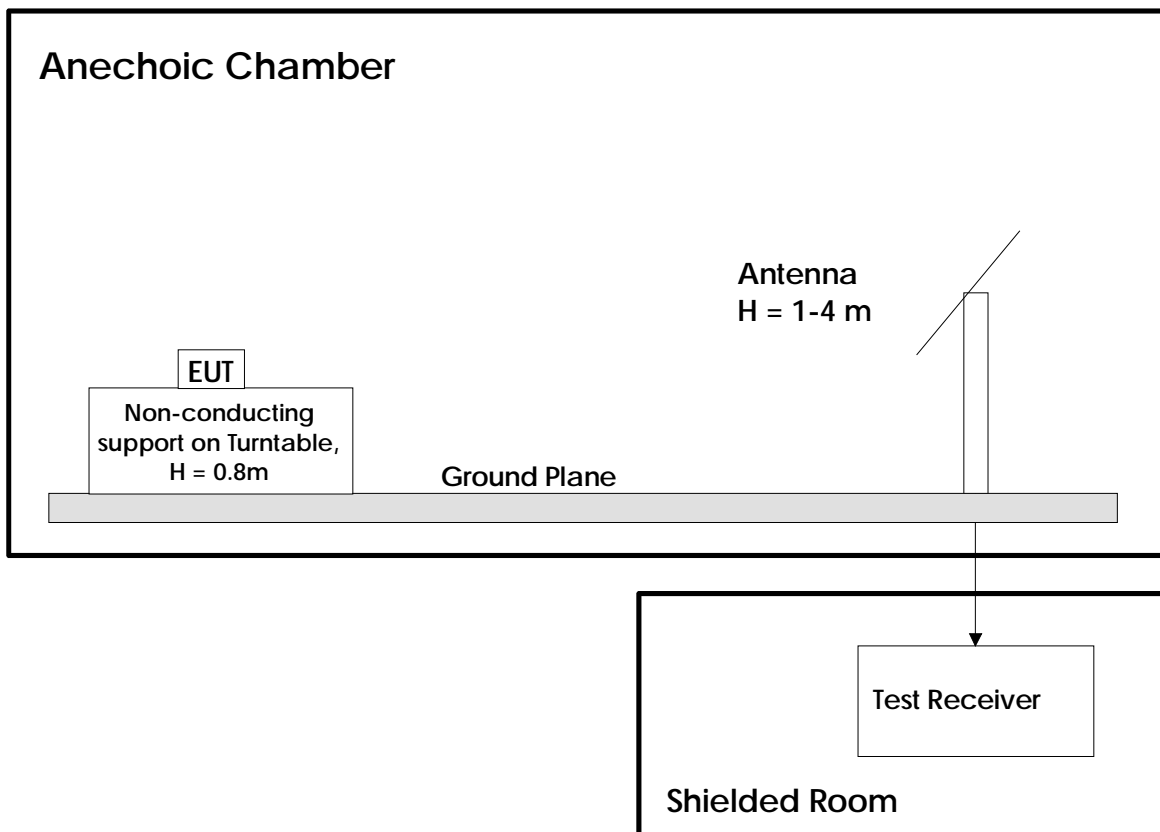
Ref No	Instrument/ ancillary	Manufacturer	Type of instrument/ ancillary	Cal. Date	Cal. Due
1-0039	Loop antenna	Rohde & Schwarz	HFH2-Z2	2017-09	2018-09
1-0040	Biconical antenna	Rohde & Schwarz	HK116	2015-08	2018-08
1-0055	LopPer antenna	Rohde & Schwarz	HL223	2015-08	2018-08
1-0080	Turntable	H. Deisel	DS 420	--	--
1-0256	Horn antenna	Schwarzbeck Mess-Elektronik	BBHA 9120	--	--
1-0361	Semi anechoic chamber	Reinhold & Mahla	3m	2017-06	2020-06
1-0364	Antenna cable 2	Kabelwerk Eupen	RF/Cord CMS / RG 214-N/7	2016-09	2019-09
1-0604	EMI test receiver	Rohde & Schwarz	ESU8	2017-09	2018-09
1-0611	Signal analyzer	Rohde & Schwarz	FSV 40	2017-09	2018-09
1-0614	Log.-per. antenna	Schwarzbeck Mess-Elektronik	STLP 9148 Stacked Log.-Per. Antenne	2016-11	2019-11
1-0615	Pre amplifier	Schwarzbeck Mess-Elektronik	BBV-9718 Broadband Preamplifier	2017-09	2018-09
1-0619	Coaxial cable (to SAC)	Huber+Suhner	SF106/2x11N-651/2m	2016-09	2019-09
1-0620	Antenna cable 3	Huber+Suhner	SF106/2x11N-651/3m	2016-09	2019-09
1-0771	Broadband Horn antenna	Schwarzbeck Mess-Elektronik	SHF-EHF Horn, 15-40GHz	2015-02	2018-03
1-0781	Pre amplifier	Schwarzbeck Mess-Elektronik	BBV 9721	2017-09	2018-09
1-0782	Antenna cable	Huber & Suhner	FB142A	2015-07	2018-07
1-0789	High Pass Filter	Mini Circuits	VHF-1320+ 1700-3800 MHz	2016-09	2019-09
1-0790	High Pass Filter	Mini Circuits	VHF-3100+ 3400-9900MHz	2016-09	2019-09
1-0791	High Pass Filter	Mini Circuits	VHF-740+ 900-2200MHz	2016-09	2019-09
1-0870	10 dB Attenuator	Mini Circuits	BW-N10W5+	2016-09	2019-09
1-0924	Cable 1m	---	SMA	2016-09	2019-09
1-0925	Cable 1m	---	SMA	2016-09	2019-09
1-0926	Cable 1m	Harbour Industries	SMA	2016-09	2019-09
1-0927	Cable 1m	Harbour Industries	SMA	2016-09	2019-09
1-0966	RF power meter	DARE	RPR3006W	2017-07	2018-07

6 BLOCK DIAGRAM

6.1 Power Line Conducted Emission



6.2 Test Site Radiated Emission



Measurements at 1GHz and above were performed with turntable height 1.5m and with the ground plane covered by absorbers.

Revision history

Version	Date	Comment	Sign
02	2018-08-01	FCC Part 15.247 and RSS-247 removed.	mk
01	2018-03-14	Additional calculation for TX power.	mk
00	2018-03-09	First version	mk