EMC TEST REPORT for Intentional Radiator (Wi-Fi Function)

No. 140300791SHA-001

Applicant	: Adtran, Inc. 901 Explorer Boulevard, Huntsville, Alabama, USA
Manufacturer	: Adtran, Inc. 901 Explorer Boulevard, Huntsville, Alabama, USA
Equipment	: GPON (Optional Network Terminal)
Type/Model	: TOTAL ACCESS 324RG
Trade Name	: ADTRAN

SUMMARY

The equipment complies with the requirements according to the following standard(s):

47CFR Part 15 (2013): Radio Frequency Devices

ANSI C63.4 (2003): 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

RSS-210 Issue 8 (December 2010): Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

RSS-Gen Issue 3 (December 2010): General Requirements and Information for the Certification of Radiocommunication Equipment

Date of issue: April 25, 2014

Prepared by:

Wakeyou Wang (*Project Engineer*)

Reviewed by:

Daniel Zhao (*Reviewer*)

Description of Test Facility

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IC Assigned Code: 2042B-1

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Content

SUMMARY 1
DESCRIPTION OF TEST FACILITY 2
1. GENERAL INFORMATION 4
1.1 Applicant Information 4
1.2 Identification of the EUT 4
1.3 Technical specification 5
1.4 Mode of operation during the test / Test peripherals used 5
2. TEST SPECIFICATION 6
2.1 Instrument list 6
2.2 Test Standard 6
2.3 Test Summary 7
2.4 Data rate VS power 8
3. MINIMUM 6DB BANDWIDTH 9
3.1 Limit 9
3.2 Test Configuration 9
3.3 Test Procedure and test setup 9
3.4 Test Protocol 10
4. MAXIMUM PEAK OUTPUT POWER 24
4.1 Test limit 24
4.2 Test Configuration 24
4.3 Test procedure and test setup 24
4.4 Test protocol 25
5. POWER SPECTRUM DENSITY 27
5.1 Test limit 27
5.2 Test Configuration 27
5.3 Test procedure and test setup 27
5.4 Test Protocol 28
6. RADIATED EMISSION 42
6.1 Test limit 42
6.2 Test Configuration 42
6.3 Test procedure and test setup 43
6.4 Test protocol 44
7. EMISSION OUTSIDE THE FREQUENCY BAND 49
7.1 Limit 49
7.2 Test Configuration 49
7.3 Test procedure and test setup 49
7.4 Test protocol 50
8. POWER LINE CONDUCTED EMISSION 84
8.1 Limit 84
8.2 Test configuration 84
8.3 Test procedure and test set up 85
8.4 Test protocol 86

1. General Information

1.1 Applicant Information

Applicant:		Adtran, Inc. 901 Explorer Boulevard, Huntsville, Alabama, USA
Name of contact:		Jeff Whitmire
Tel:		256-963-8000
Fax:		256-963-8250
Manufacturer:		Adtran, Inc. 901 Explorer Boulevard, Huntsville, Alabama, USA
Sample received date	:	March 12, 2014
Sample Identification No	:	*0140312-17-001*
Date of test	:	March 12, 2014 ~ April 5, 2014

1.2 Identification of the EUT

Equipment:	GPON (Optional Network Terminal)
Type/model:	TOTAL ACCESS 324RG
FCC ID:	HDC1287562G1
IC:	2250A-1287562G1

1.3 Technical specification

Frequency Range: 2412 - 2462MHz, 2422 - 2452MHz

Modulation:
DBPSK @1Mbps
DQPSK@2Mbp
CCK@5.5/11Mbps
BPSK@6/9 Mbps
QPSK@12/18Mbps
16-QAM@24Mbps
64-QAM@48/54Mbps and above

Gain of Antenna: Fixed antenna, 3.0dBi max, 2T2R MIMO

Rating: DC 12V, 1.5A powered by AC/DC adapter:

Manufactory	:	*DVE*
M/N	:	*DSA-20PFE-12 FUS 120150*
Input	:	*AC 100-240V~, 50/60Hz, 0.7A*
Output	:	*DC 12V, 1.5A*

Description of EUT: The EUT is Wi-Fi device supporting 802.11b/g/n20/n40 modes.

Channel Description: The channel spacing is 5MHz.

1.4 Mode of operation during the test / Test peripherals used

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

The lowest, middle and highest channel were tested as representatives.
For 802.11b/g/n HT20 ----- lowest, 2412MHz; middle, 2437MHz; highest, 2462MHz.
For 802.11n HT40 ----- lowest, 2422MHz; middle, 2437MHz; highest, 2452MHz.

Test Peripherals:
PC: HP ProBook 6450b

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESCS 30	R&S	EC 2107	2013-10-21	2014-10-20
Test Receiver	ESIB 26	R&S	EC 3045	2013-10-20	2014-10-19
A.M.N.	ESH2-Z5	R&S	EC 3119	2014-1-9	2015-1-8
A.M.N.	ENV 216	R&S	EC 3393	2013-8-9	2014-8-8
A.M.N.	ENV 216	R&S	EC 3394	2013-8-9	2014-8-8
A.M.N.	ENV4200	R&S	EC3558	2013-8-9	2014-8-8
Ultra-broadband antenna	HL 562	R&S	EC 3046-1	2013-5-16	2014-5-14
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2013-4-28	2015-4-27
Horn antenna	HF 906	R&S	EC 3049	2013-4-28	2015-4-27
Horn antenna	3117	ETS	EC 4792-1	2013-4-17	2014-4-16
Horn antenna	HAP18-26W		EC 4792-3	2013-4-10	2014-4-9
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2013-4-12	2014-4-11
Pre-amplifier	Tpa0118-40	R&S	EC 4792-2	2013-4-12	2014-4-11
Semi-anechoic chamber	-	Albatross project	EC 3048	2013-5-12	2014-5-11
Fully-anechoic chamber	-	Albatross project	EC 3047	2013-5-12	2014-5-11
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2014-1-8	2015-1-7
High Pass Filter	WHKX 2.8/18G-12SS	Wainwright	EC4297-2	2014-1-8	2015-1-7
High Pass Filter	WHKX 7.0/1.8G-8SS	Wainwright	EC4297-3	2014-1-8	2015-1-7
Band Reject Filter	WRCGV 2400/2483-2390/2493-35/10SS	Wainwright	EC4297-4	2014-1-8	2015-1-7
Power sensor / Power meter	N1911A/N1921A	Agilent	EC4318	2013-04-12	2014-04-11

2.2 Test Standard

47CFR Part 15 (2013)
ANSI C63.4 (2003)
RSS-210 Issue 8 (December 2010)
RSS-Gen Issue 3 (December 2010)

2.3 Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-210 Issue 8 Annex 8	Pass
Maximum peak output power	15.247(b)	RSS-210 Issue 8 Annex 8	Pass
Power spectrum density	15.247(e)	RSS-210 Issue 8 Annex 8	Pass
Radiated emission	15.205 & 15.209	RSS-210 Issue 8 Clause 2	Pass
Emission outside the frequency band	15.247(d)	RSS-210 Issue 8 Annex 8	Pass
Power line conducted emission	15.207	RSS-Gen Issue 3 Clause 7.2.4	Pass

2.4 Data rate VS power

The date rate with highest power level for each mode was chosen to perform test.

Mode	Data Rate (Mbps)	CH	Power (dBm)
802.11b	1	M	**17.34**
	2	M	17.26
	5.5	M	17.24
	11	M	17.32
802.11g	6	M	**17.14**
	9	M	16.89
	12	M	16.91
	18	M	16.97
	24	M	16.97
	36	M	17.03
	48	M	17.08
	54	M	17.12
802.11n HT20	MCS8	M	**16.61**
	MCS9	M	16.30
	MCS10	M	16.32
	MCS11	M	16.37
	MCS12	M	16.35
	MCS13	M	16.46
	MCS14	M	16.58
	MCS15	M	16.61
802.11n HT40	MCS8	M	**16.28**
	MCS9	M	15.94
	MCS10	M	15.96
	MCS11	M	16.05
	MCS12	M	16.06
	MCS13	M	16.09
	MCS14	M	16.21
	MCS15	M	16.25

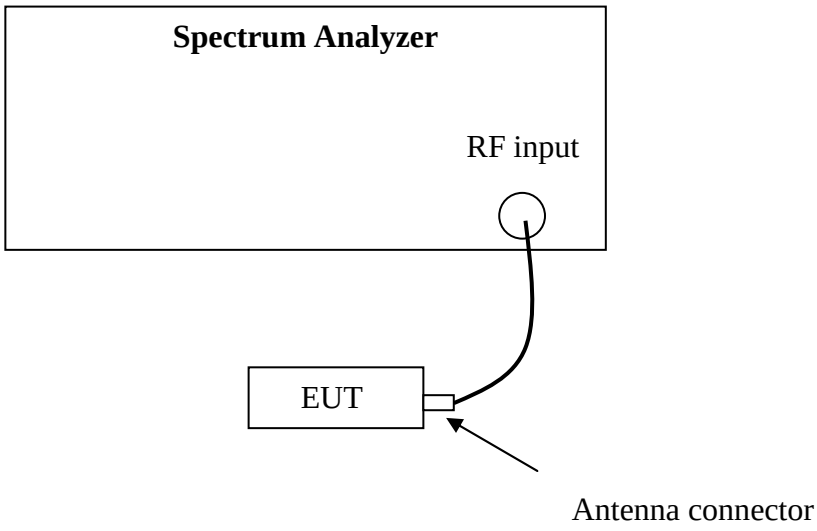
3. Minimum 6dB Bandwidth

Test result: PASS

3.1 Limit

For systems using digital modulation techniques that 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.

3.2 Test Configuration



3.3 Test Procedure and test setup

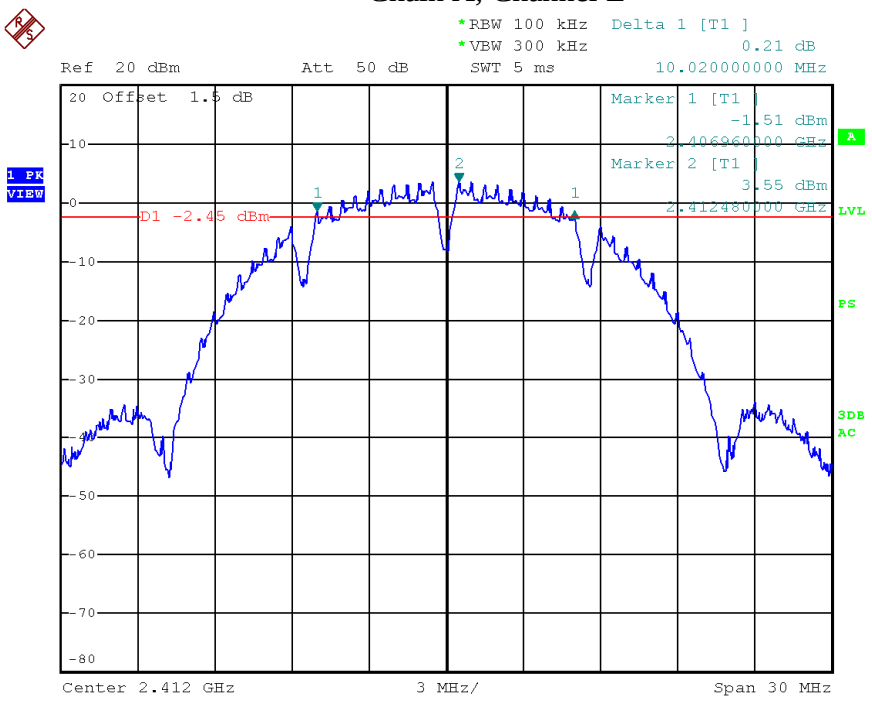
The minimum 6dB bandwidth per FCC §15.247(a)(2) is measured using the Spectrum Analyzer according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v03r01” for compliance to FCC 47CFR 15.247 requirements.

3.4 Test Protocol

Temperature : 25°C
Relative Humidity : 55%

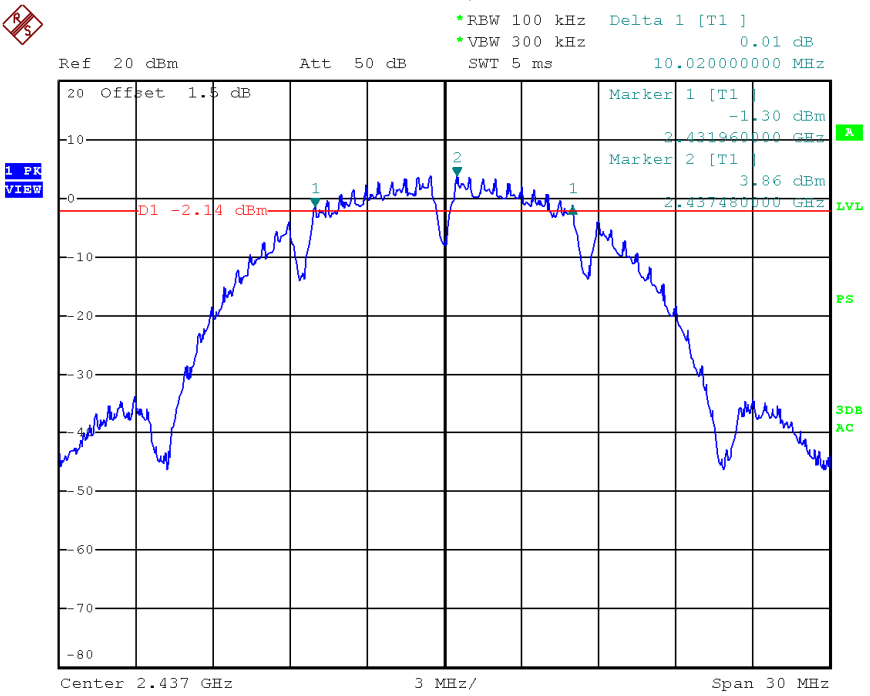
Mode	CH	Bandwidth (MHz)		Limit (MHz)
		Chain A	Chain B	
802.11b	L	10.02	10.02	⩾0.5
	M	10.02	10.02	
	H	10.08	10.02	

Chain A, Channel L



Date: 26.MAR.2014 10:26:06

Chain A, Channel M



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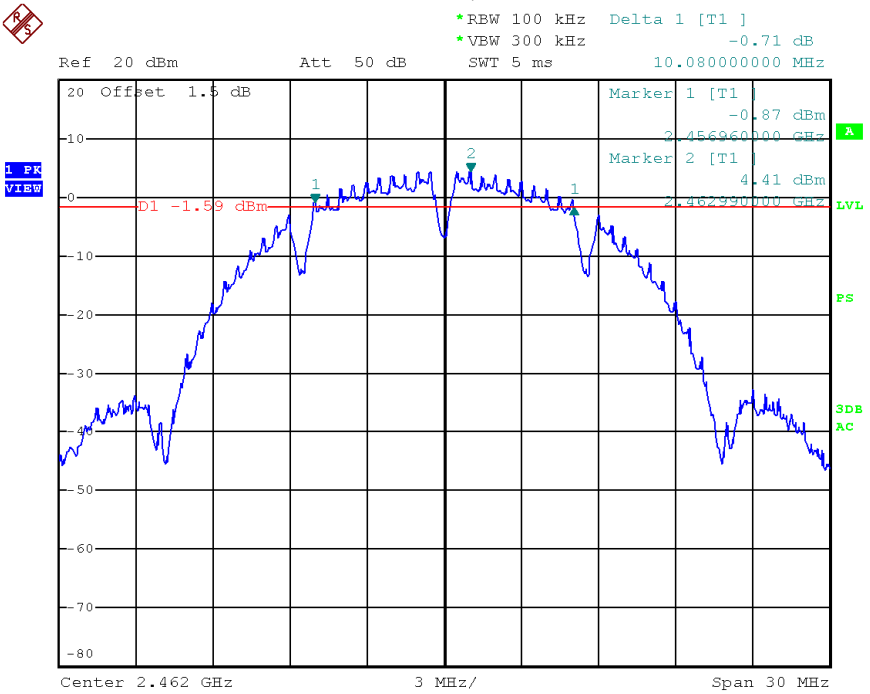
Chain A, Channel H



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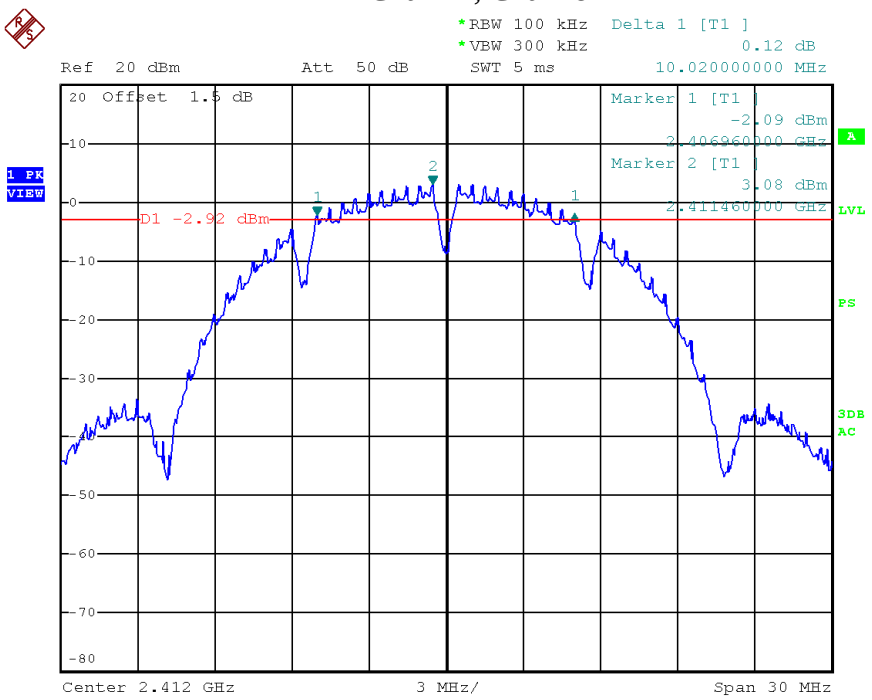
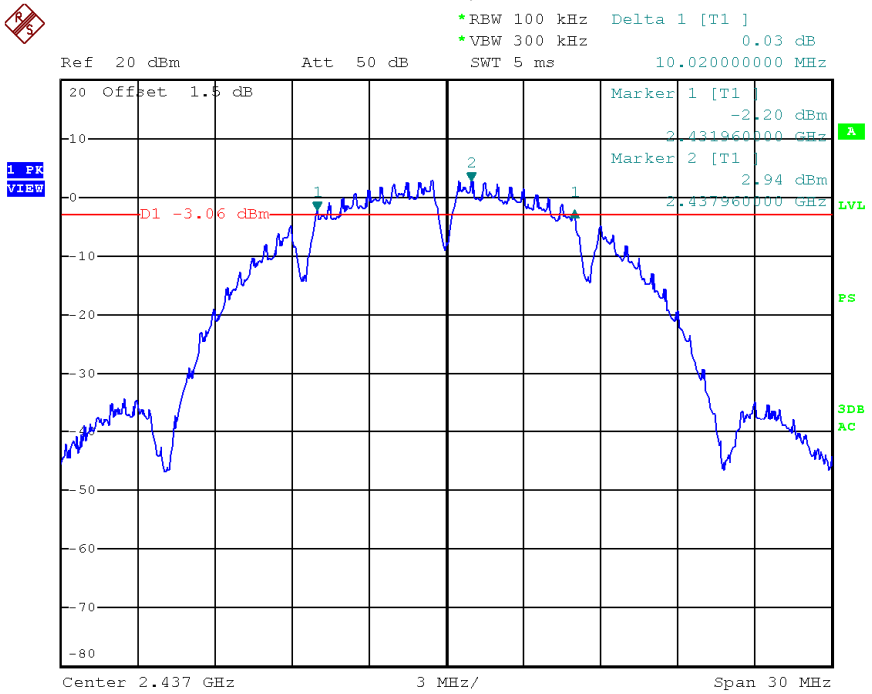
Chain B, Channel L



Date: 26.MAR.2014 15:15:47

Chain B, Channel M



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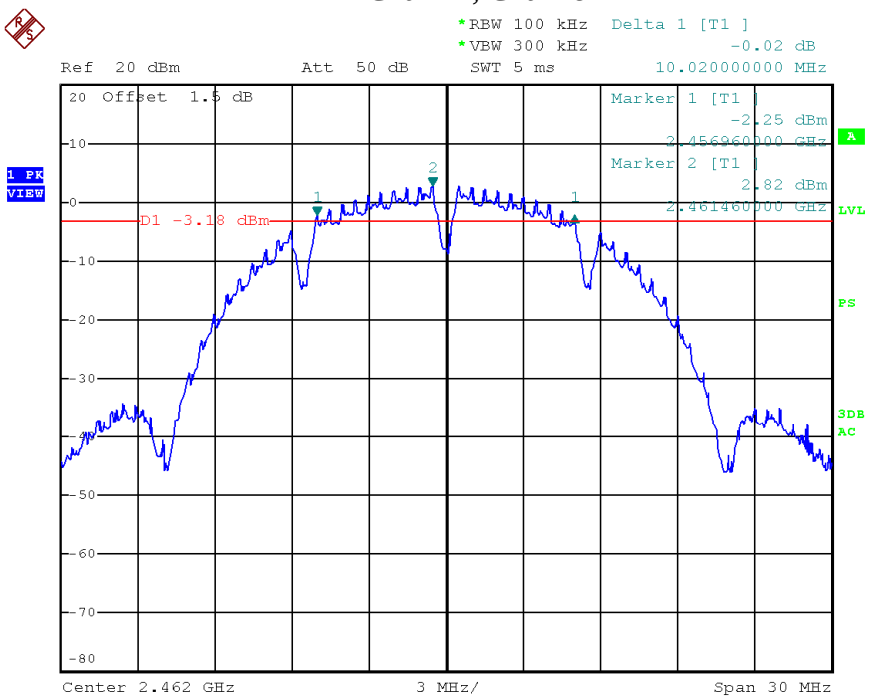
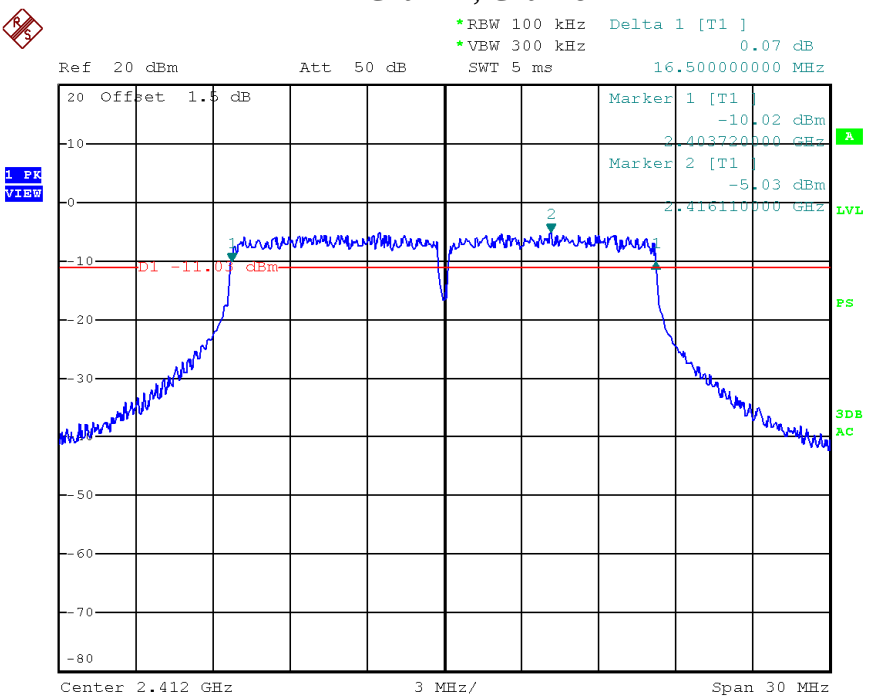
Chain B, Channel H



Date: 26.MAR.2014 15:17:29

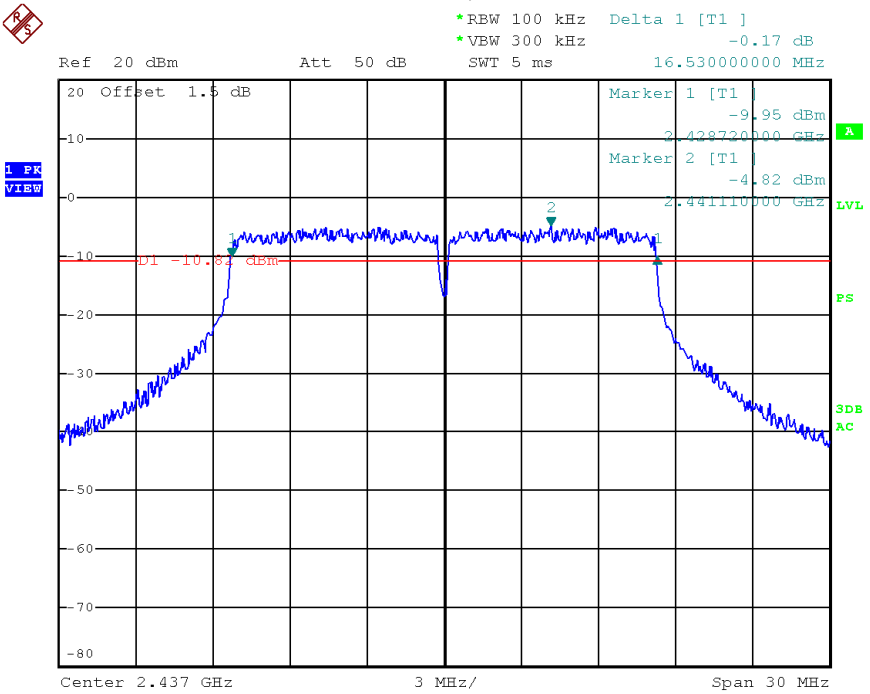
Mode	CH	Bandwidth (MHz)		Limit (MHz)
		Chain A	Chain B	
802.11g	L	16.50	16.50	≥0.5
	M	16.53	16.50	
	H	16.50	16.50	

Chain A, Channel L



Date: 26.MAR.2014 10:30:28

Chain A, Channel M



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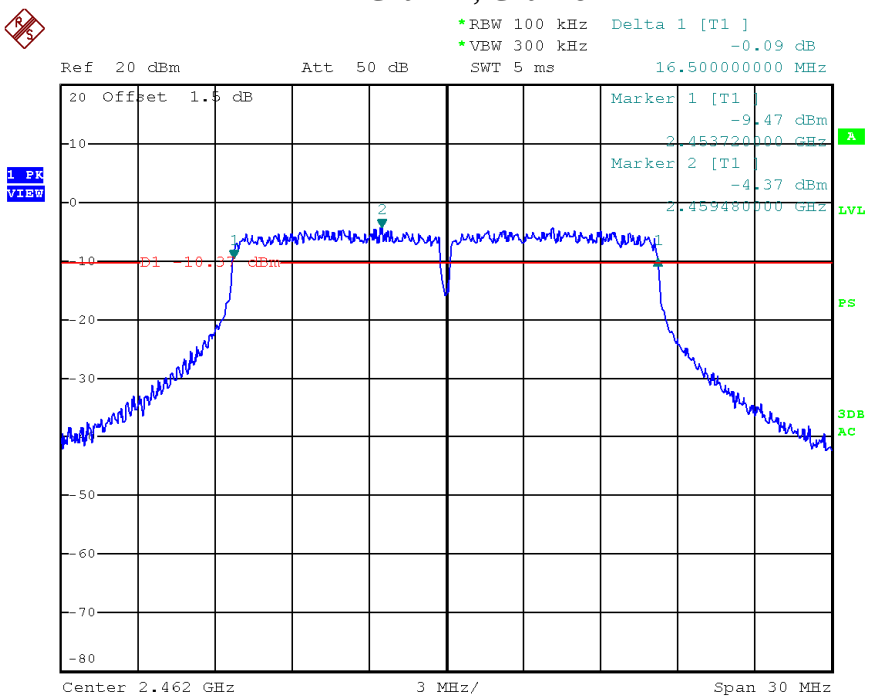
Chain A, Channel H



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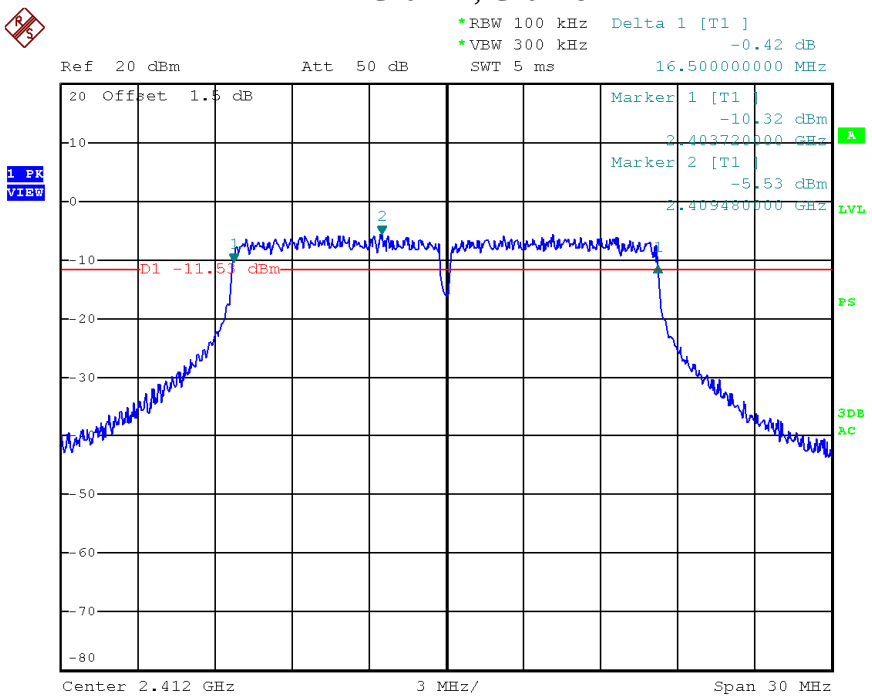
Chain B, Channel L



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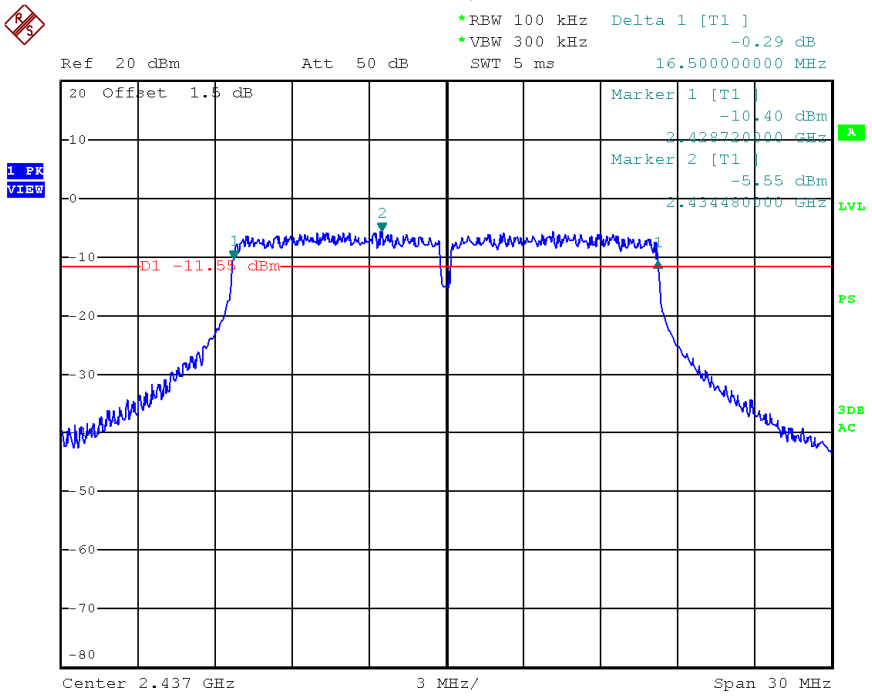
Chain B, Channel M



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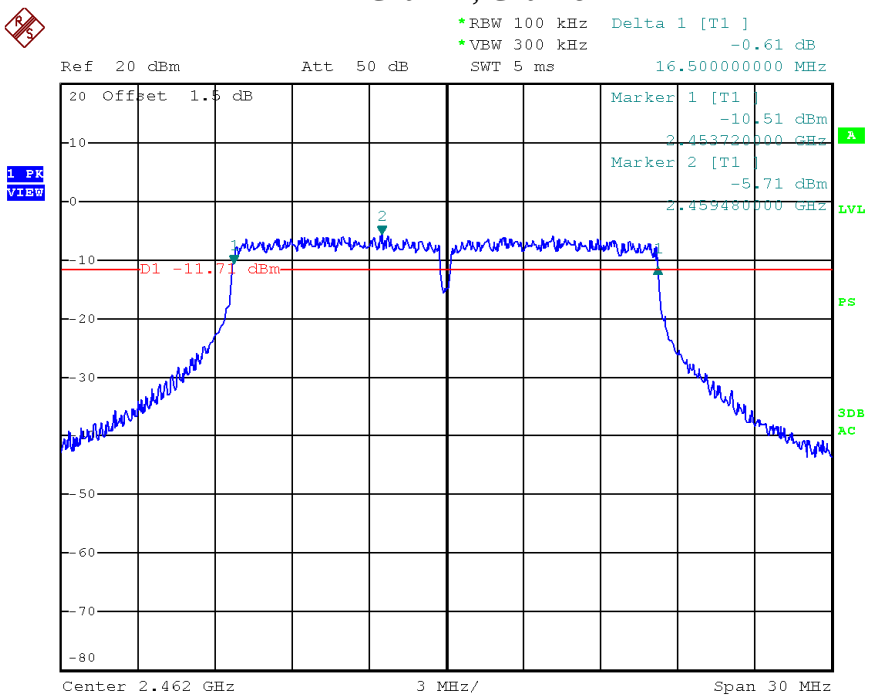
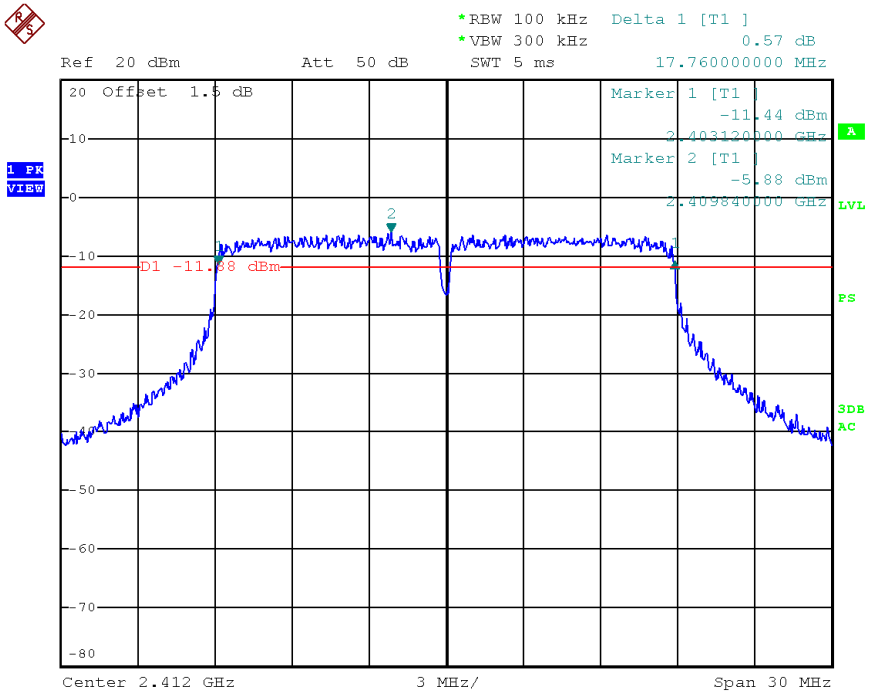
Chain B, Channel H



Date: 26.MAR.2014 15:18:18

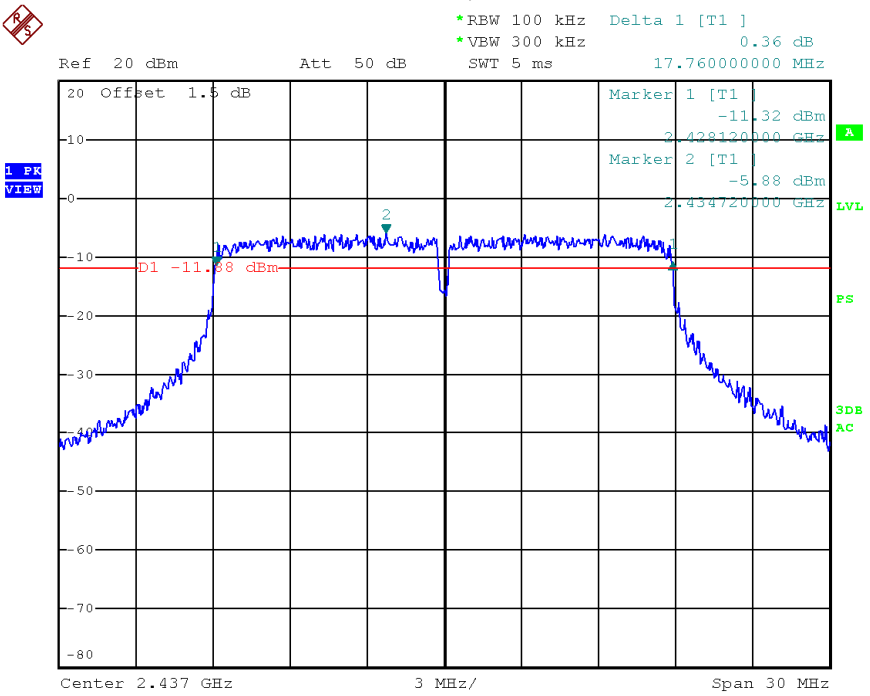
Mode	CH	Bandwidth (MHz)		Limit (MHz)
		Chain A	Chain B	
802.11n HT20	L	17.76	17.58	⩾0.5
	M	17.76	17.64	
	H	17.76	17.58	

Chain A, Channel L



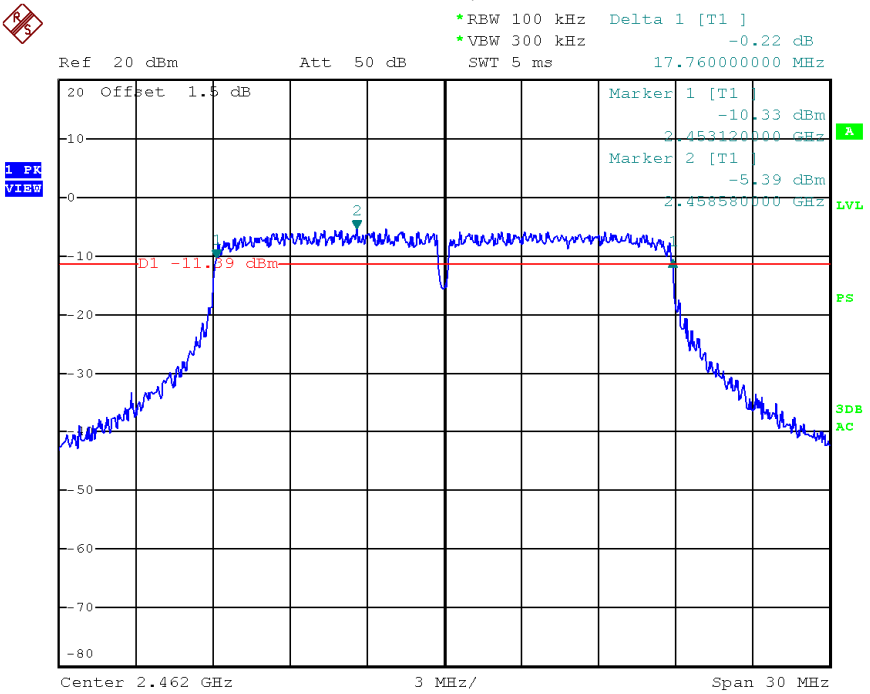
Date: 26.MAR.2014 10:36:50

Chain A, Channel M



Date: 26.MAR.2014 10:37:43

Chain A, Channel H



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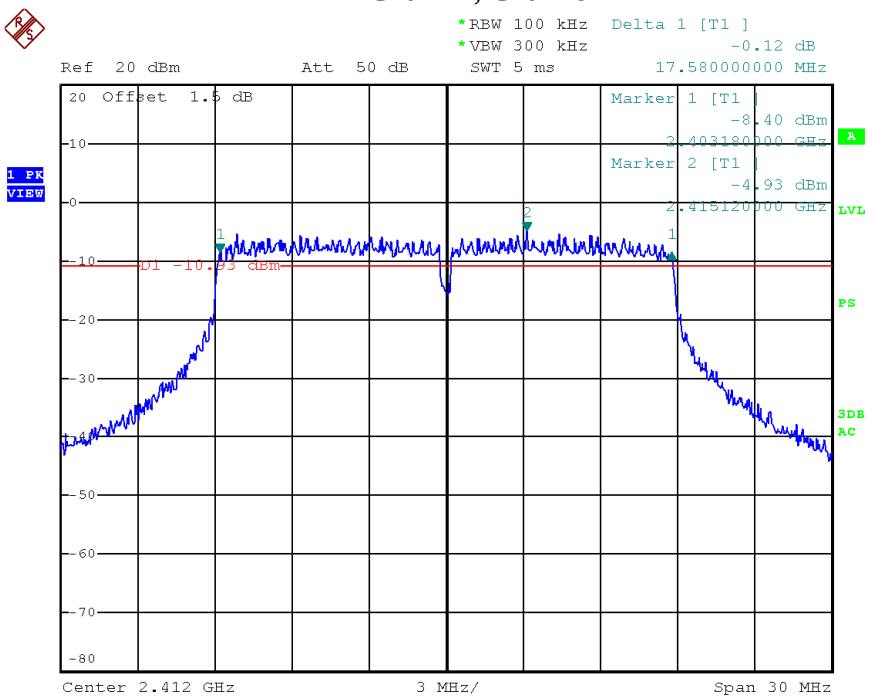
Chain B, Channel L



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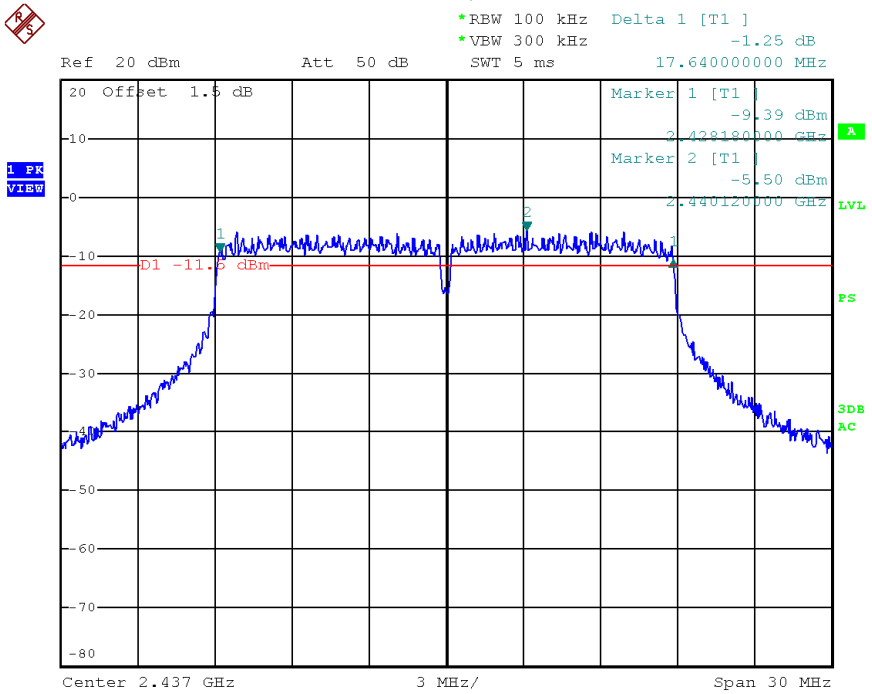
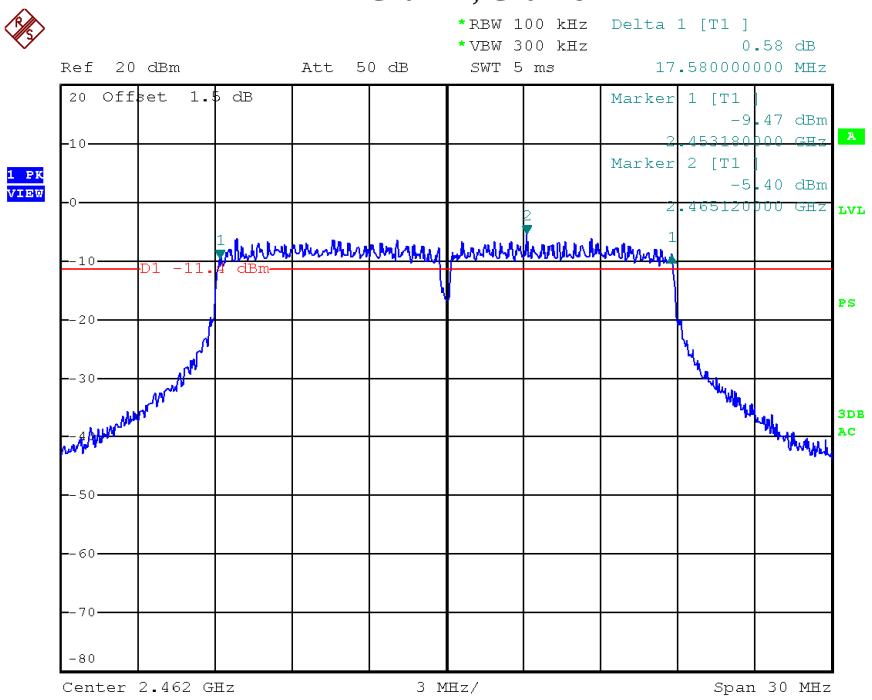
Chain B, Channel M



Date: 26.MAR.2014 15:21:33

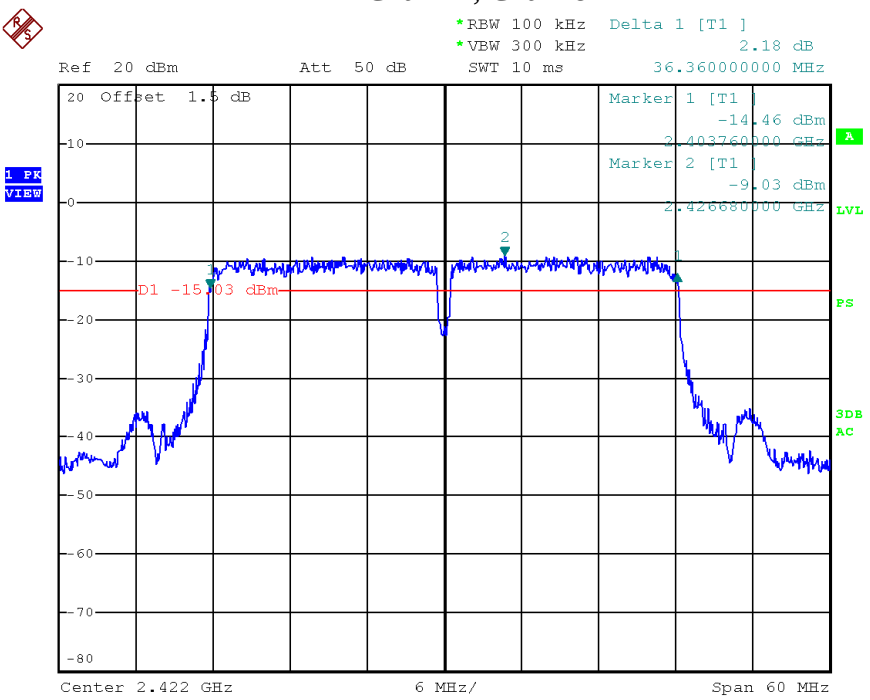
Chain B, Channel H



Date: 26.MAR.2014 15:22:11

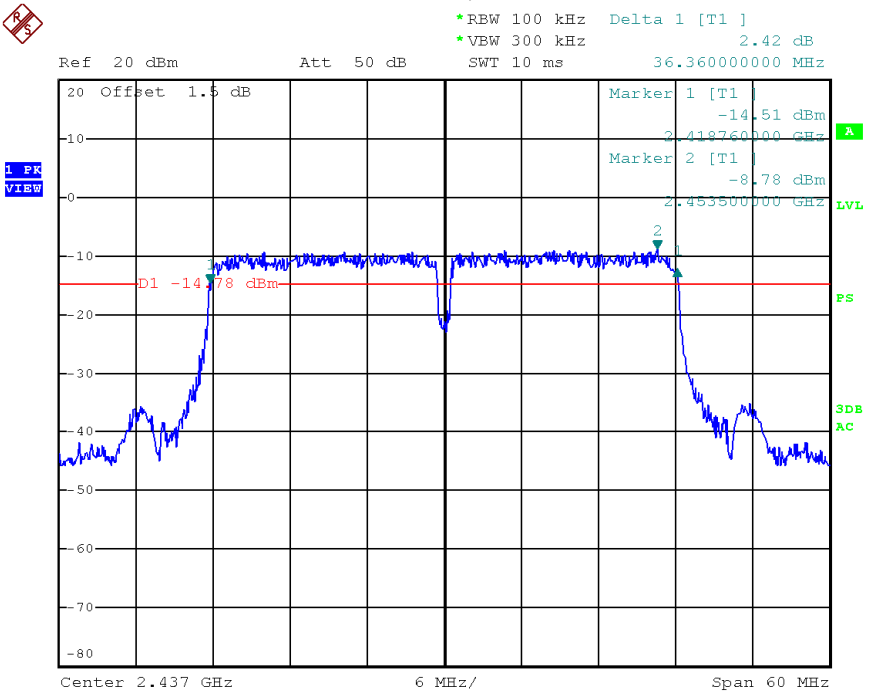
Mode	CH	Bandwidth (MHz)		Limit (MHz)
		Chain A	Chain B	
802.11n HT40	L	36.36	36.24	≥0.5
	M	36.36	36.26	
	H	36.24	36.38	

Chain A, Channel L



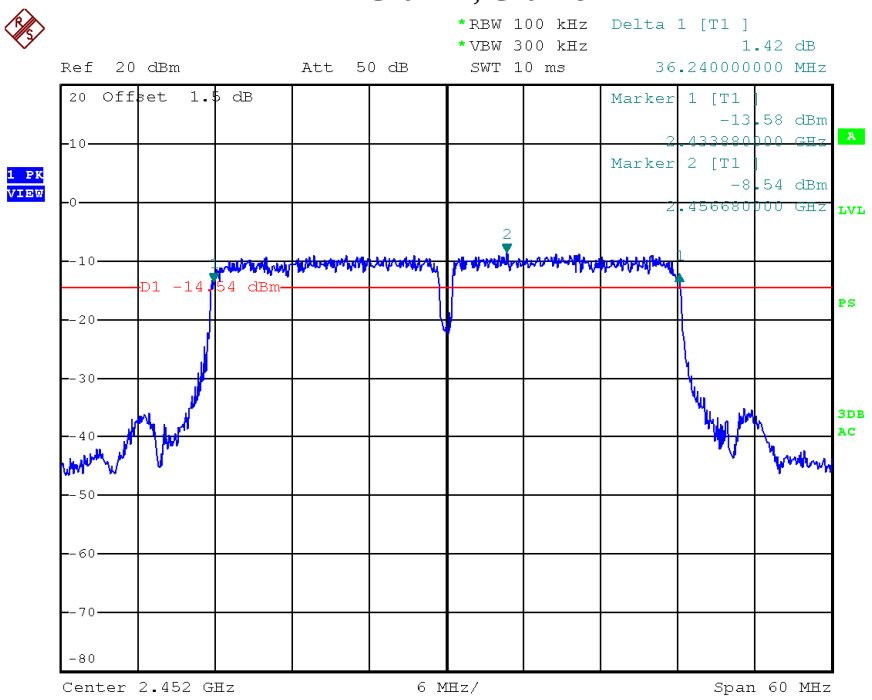
Date: 26.MAR.2014 10:39:58

Chain A, Channel M



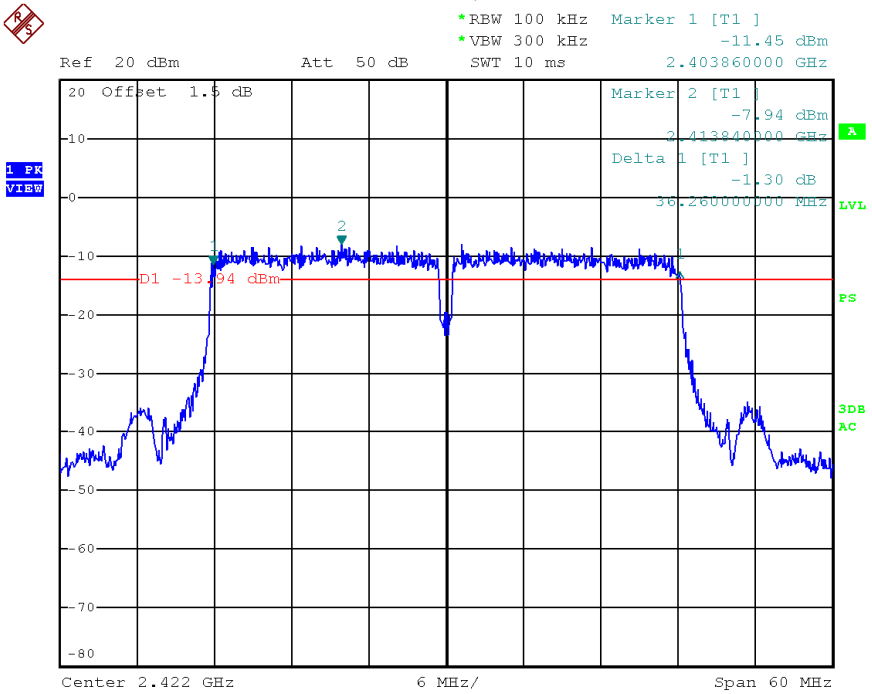
Date: 26.MAR.2014 10:40:54

Chain A, Channel H



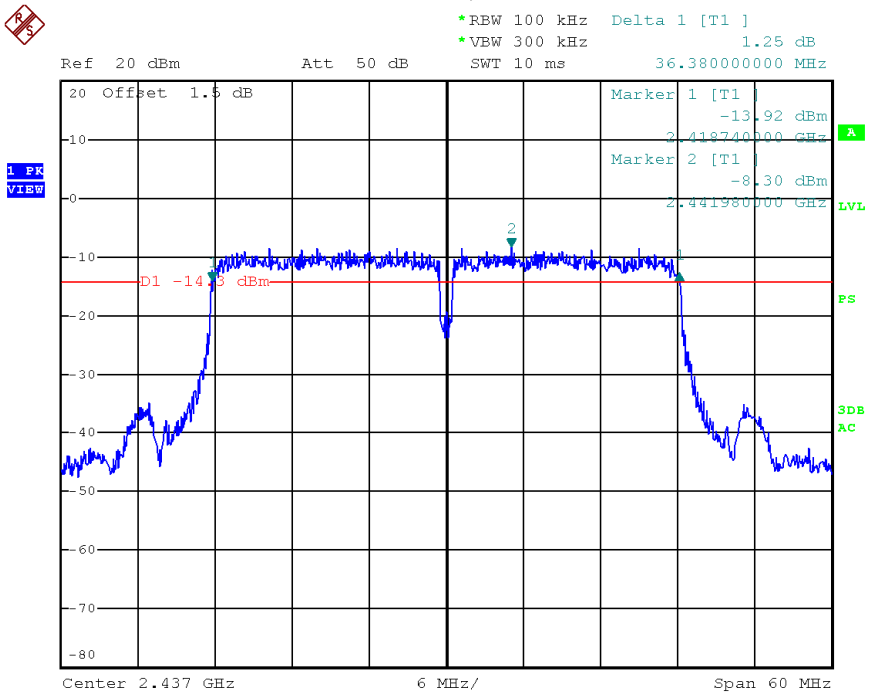
Date: 26.MAR.2014 10:41:43

Chain B, Channel L



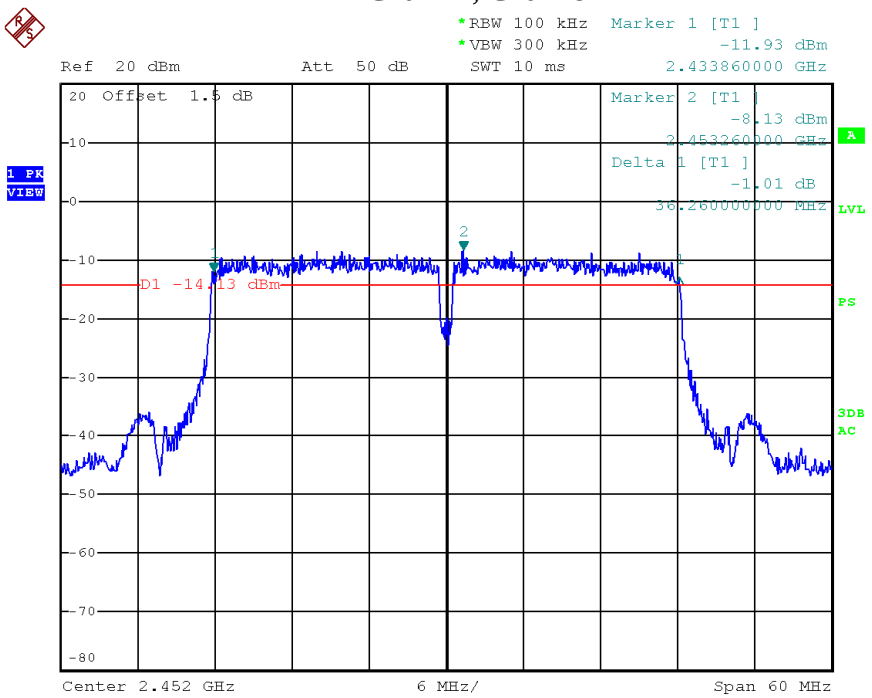
Date: 26.MAR.2014 15:24:55

Chain B, Channel M



Date: 26.MAR.2014 15:24:09

Chain B, Channel H



Date: 26.MAR.2014 15:23:13

4. Maximum peak output power

Test result: Pass

4.1 Test limit

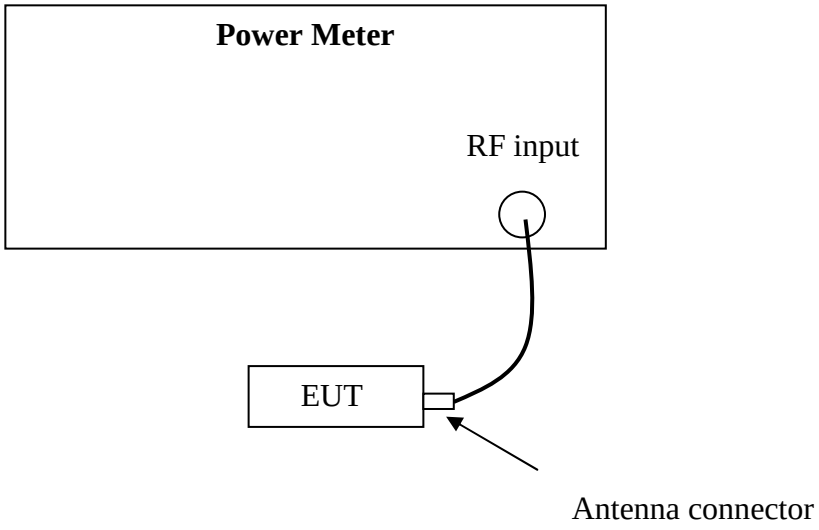
☐ For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt

☐ For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

☒ For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Test Configuration



4.3 Test procedure and test setup

The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v03r01” for compliance to FCC 47CFR 15.247 requirements (clause 9.1.3).

4.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %

Mode	CH	Conducted Power (dBm)		Total Power (dBm)	Limit (dBm)
		Chain A	Chain B	Chain A + B	
802.11b	L	17.16	15.47	19.41	≤30
	M	17.34	15.25	19.43	
	H	17.92	15.09	19.74	

Mode	CH	Conducted Power (dBm)		Total Power (dBm)	Limit (dBm)
		Chain A	Chain B	Chain A + B	
802.11g	L	17.00	15.71	19.41	≤30
	M	17.14	15.39	19.36	
	H	17.59	15.12	19.54	

Mode	CH	Conducted Power (dBm)		Total Power (dBm)	Limit (dBm)
		Chain A	Chain B	Chain A + B	
802.11n HT20	L	16.68	15.78	19.26	≤30
	M	16.61	15.22	18.98	
	H	16.92	14.92	19.04	

Mode	CH	Conducted Power (dBm)		Total Power (dBm)	Limit (dBm)
		Chain A	Chain B	Chain A + B	
802.11n HT40	L	16.18	15.18	18.72	≤30
	M	16.28	15.02	18.71	
	H	16.52	14.80	18.75	

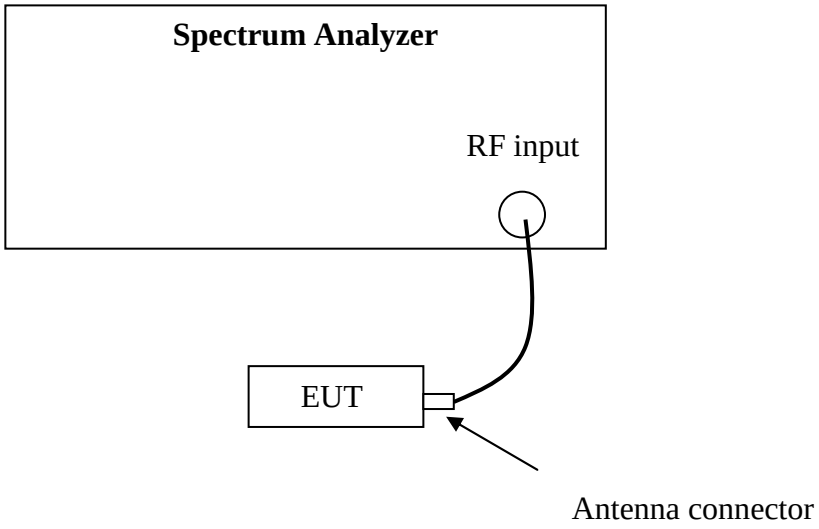
5. Power spectrum density

Test result: **Pass**

5.1 Test limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Configuration



5.3 Test procedure and test setup

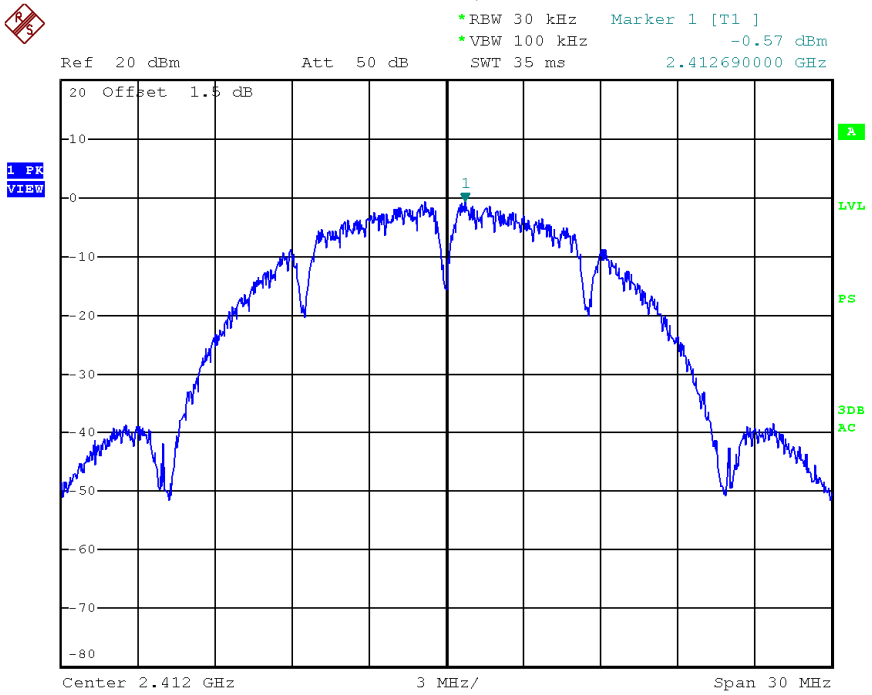
The power output per FCC §15.247(e) was tested according to DTS test procedure of "KDB558074 D01 DTS Meas Guidance v03r01" (clause 10.2) for compliance to FCC 47CFR 15.247 requirements.

5.4 Test Protocol

Temperature : 25 °C
Relative Humidity: 55 %

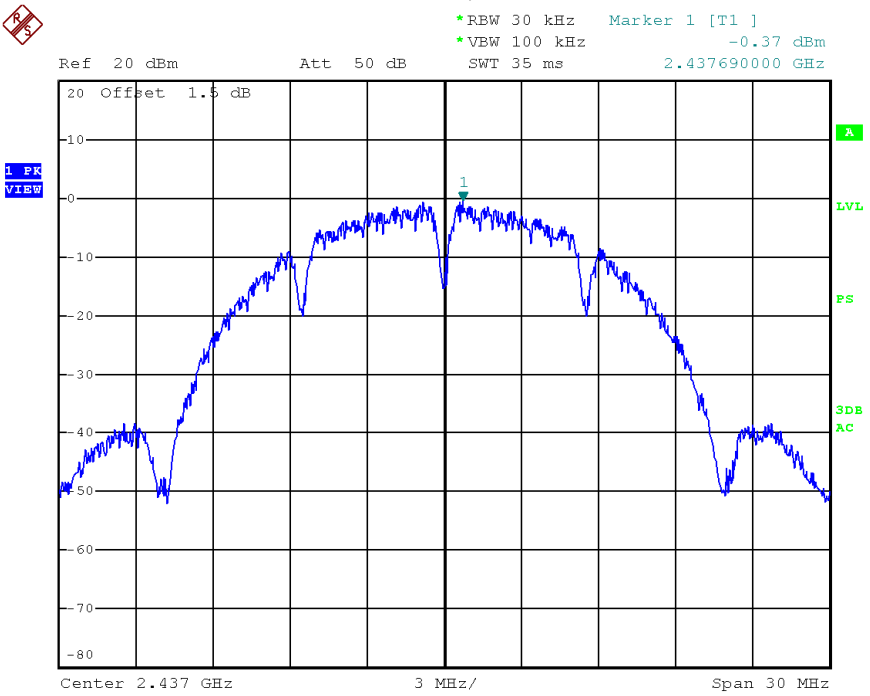
Mode	CH	Spectrum Density (dBm/30kHz)		Total Reading (dBm/30kHz)	Limit (dBm/3kHz)
		Chain A	Chain B	Chain A + B	
802.11b	L	-0.57	-1.80	1.87	≤8.00
	M	-0.37	-2.19	1.82	
	H	0.21	-2.32	2.14	

Chain A, Channel L



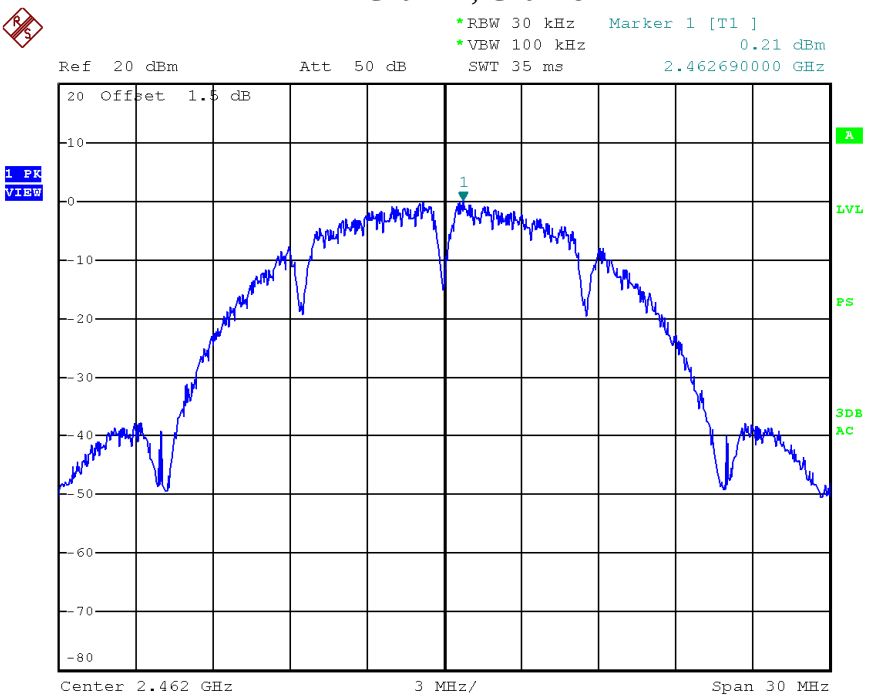
Date: 26.MAR.2014 14:56:02

Chain A, Channel M



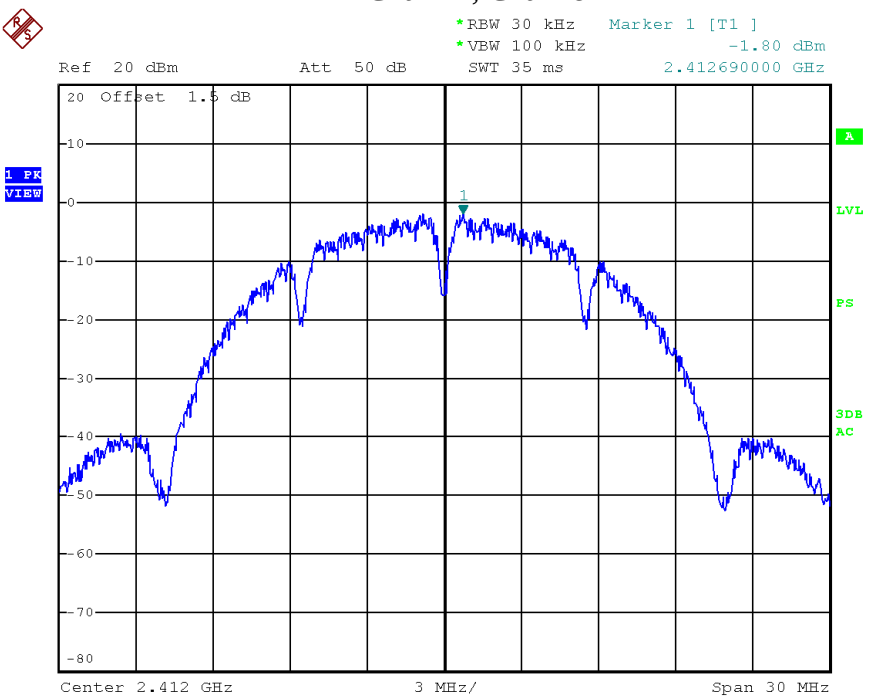
Date: 26.MAR.2014 14:56:34

Chain A, Channel H



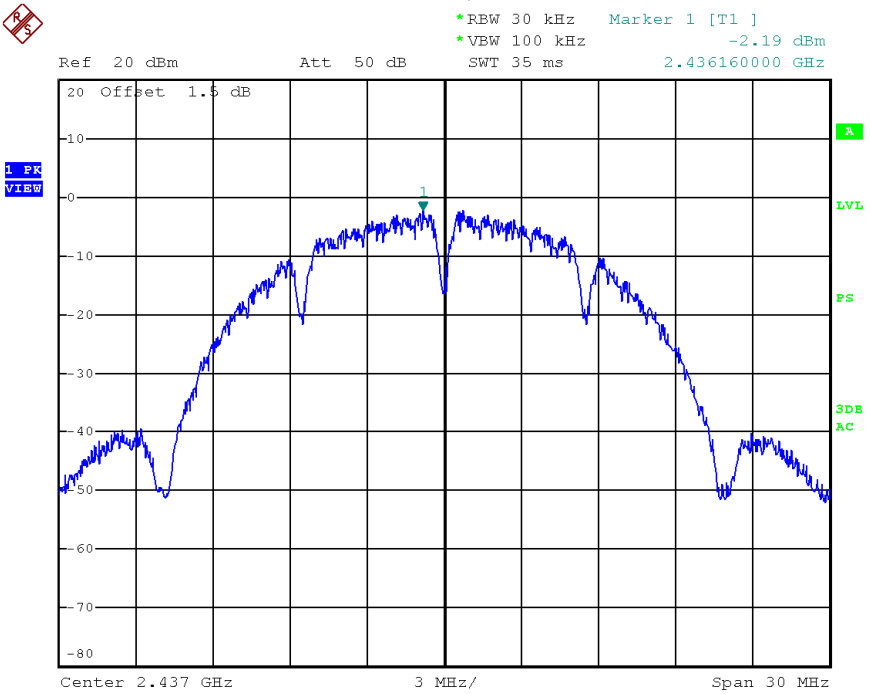
Date: 26.MAR.2014 14:57:07

Chain B, Channel L



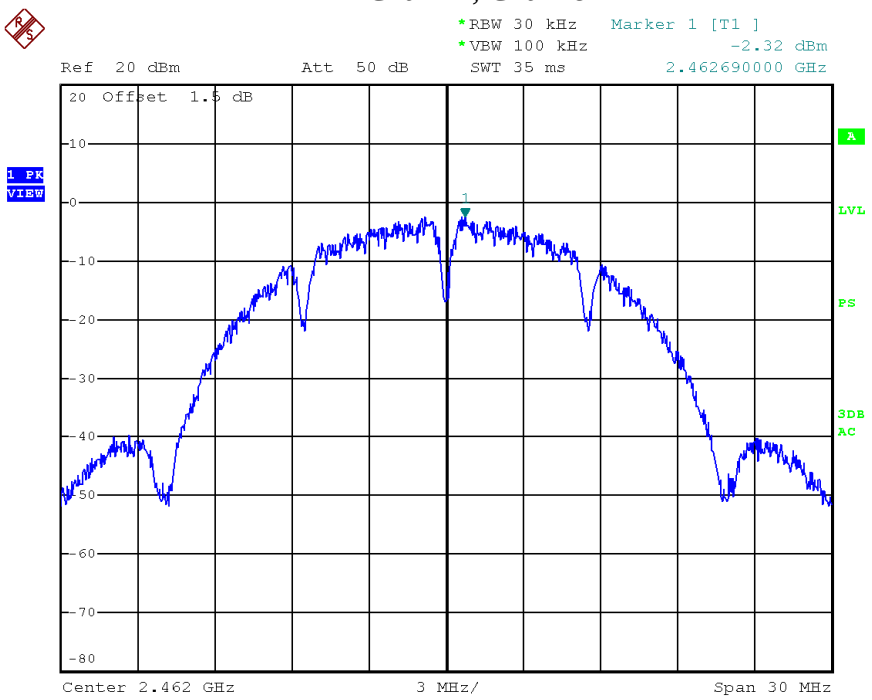
Date: 26.MAR.2014 15:44:16

Chain B, Channel M



Date: 26.MAR.2014 15:44:32

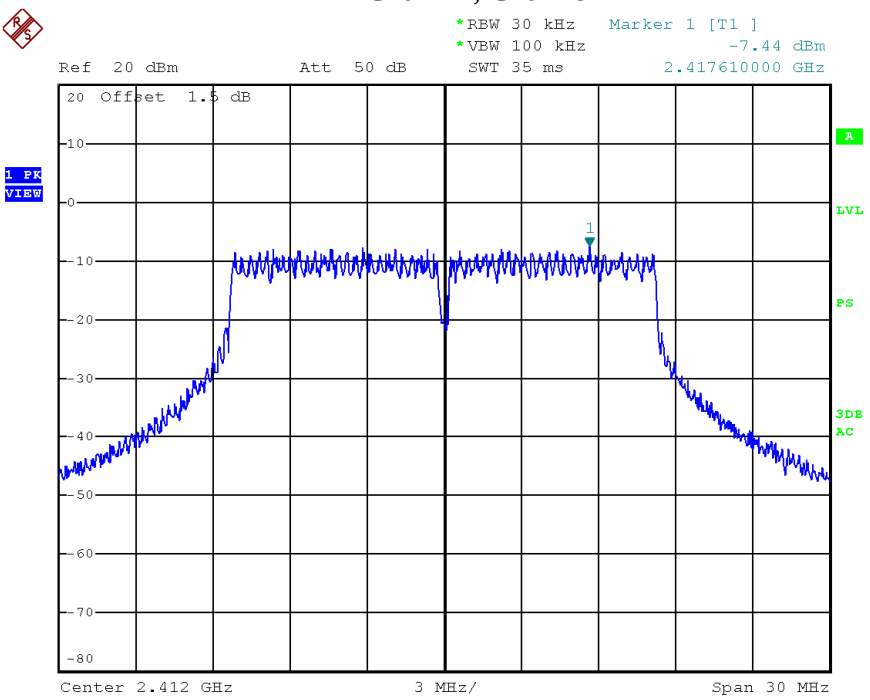
Chain B, Channel H



Date: 26.MAR.2014 15:44:46

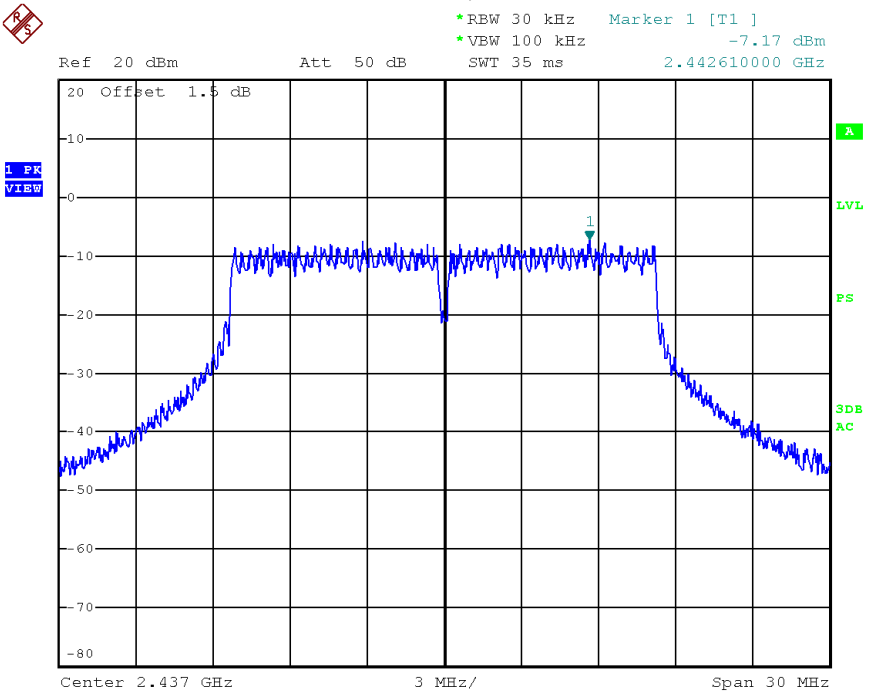
Mode	CH	Spectrum Density (dBm/30kHz)		Total Reading (dBm/30kHz)	Limit (dBm/3kHz)
		Chain A	Chain B	Chain A + B	
802.11g	L	-7.44	-8.46	-4.91	≤8.00
	M	-7.17	-8.87	-4.93	
	H	-6.79	-9.04	-4.76	

Chain A, Channel L



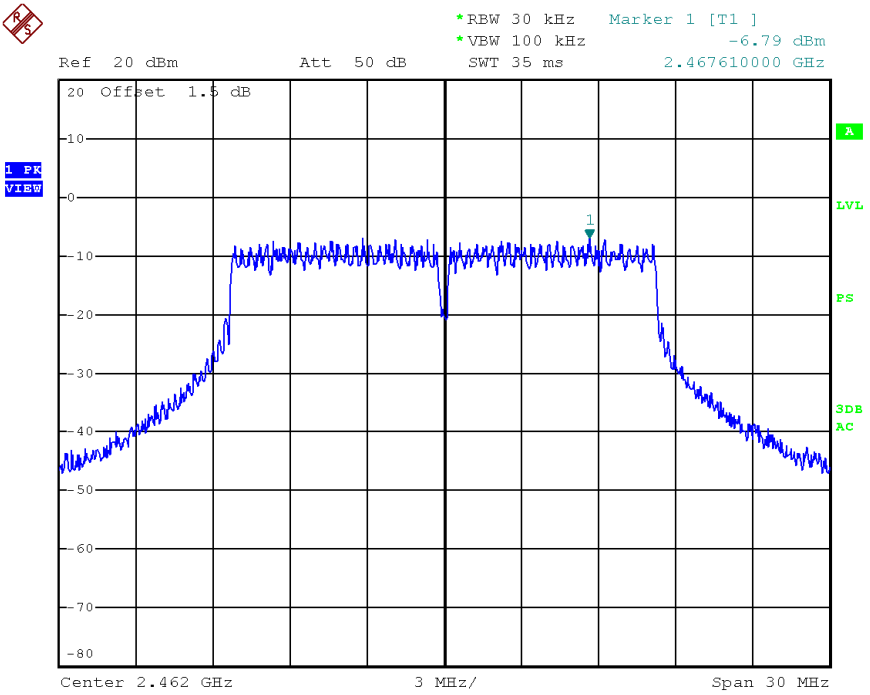
Date: 26.MAR.2014 14:58:27

Chain A, Channel M



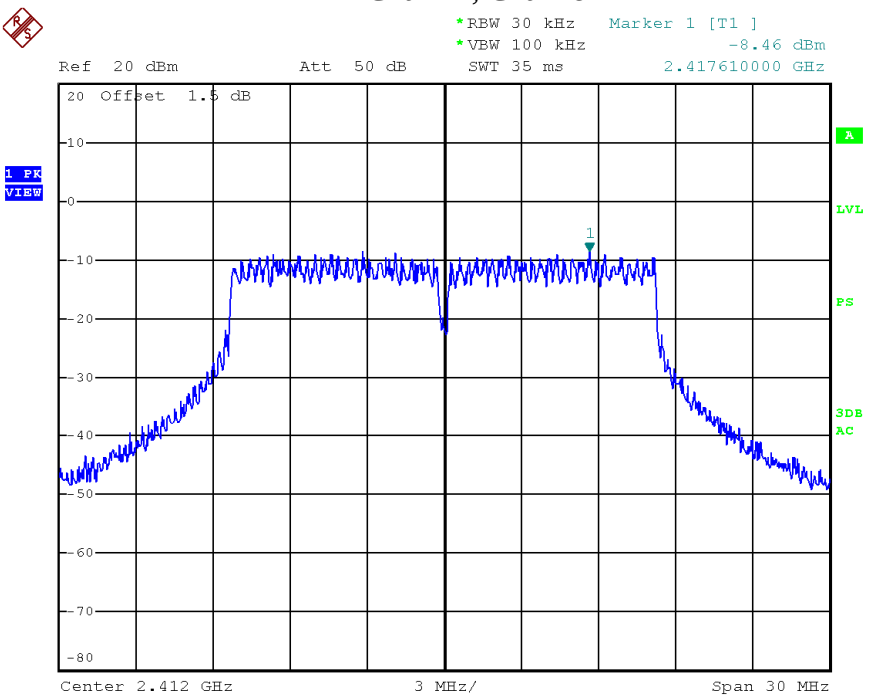
Date: 26.MAR.2014 14:58:10

Chain A, Channel H



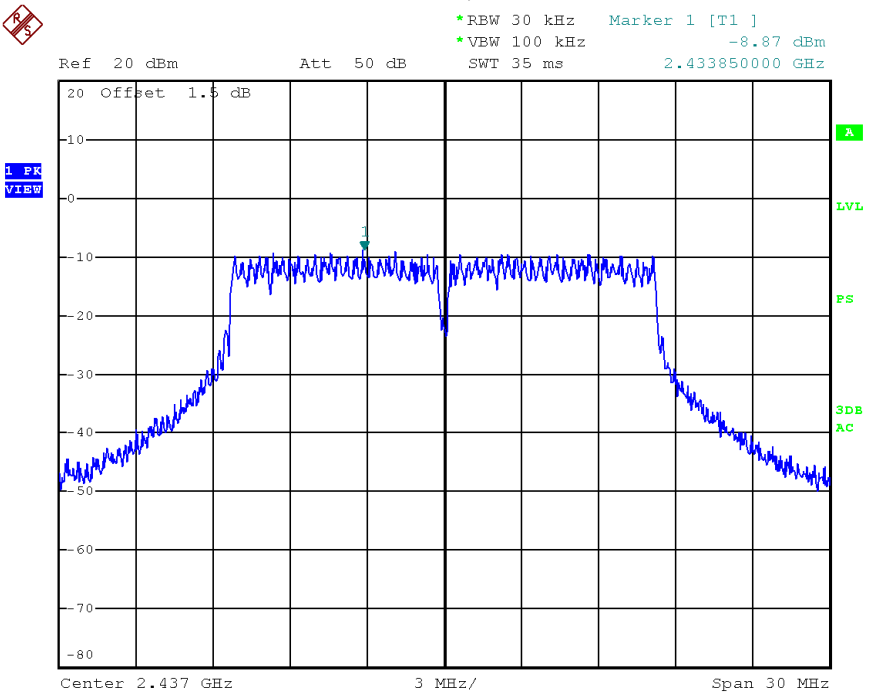
Date: 26.MAR.2014 14:57:49

Chain B, Channel L



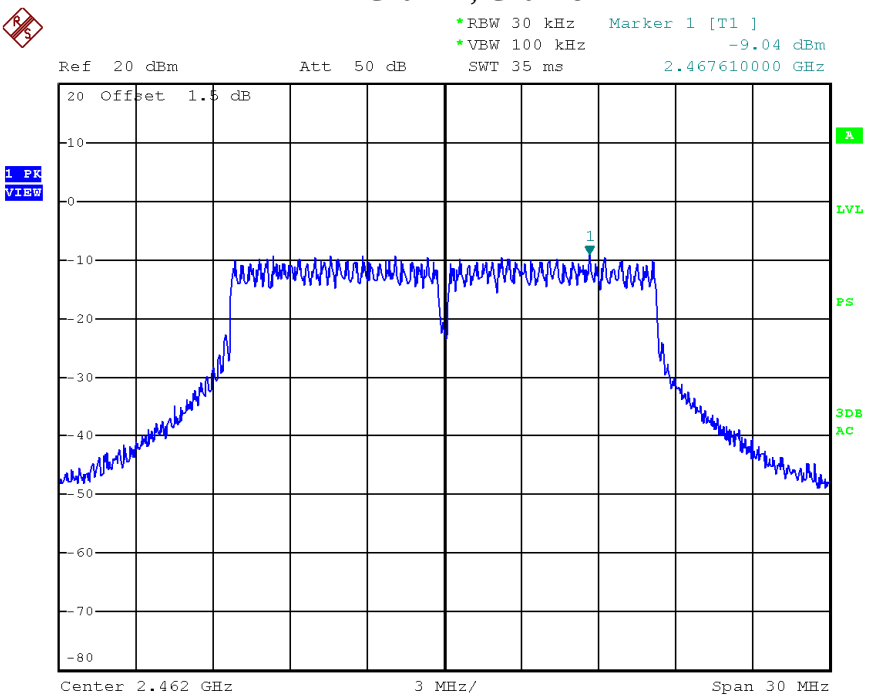
Date: 26.MAR.2014 15:45:37

Chain B, Channel M



Date: 26.MAR.2014 15:45:22

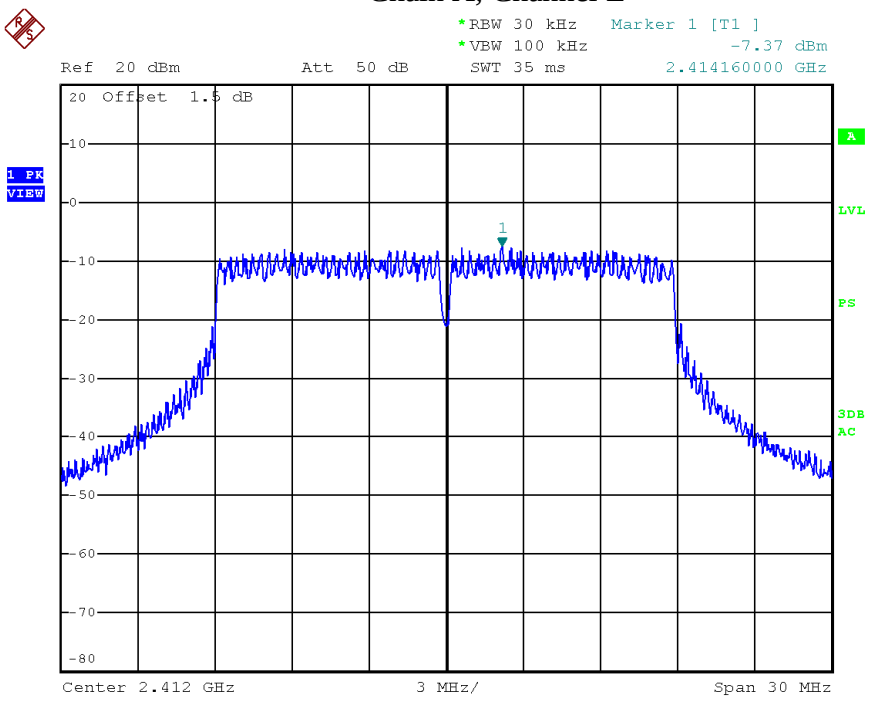
Chain B, Channel H



Date: 26.MAR.2014 15:45:05

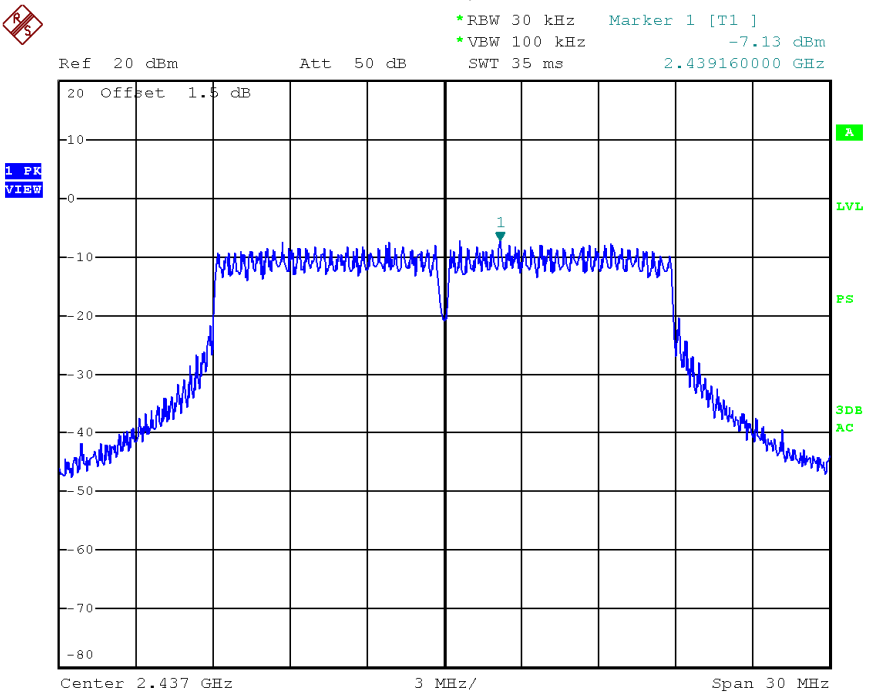
Mode	CH	Spectrum Density (dBm/30kHz)		Total Reading (dBm/30kHz)	Limit (dBm/3kHz)
		Chain A	Chain B	Chain A + B	
802.11n HT20	L	-7.37	-8.42	-4.85	≤8.00
	M	-7.13	-8.94	-4.93	
	H	-6.61	-9.28	-4.73	

Chain A, Channel L



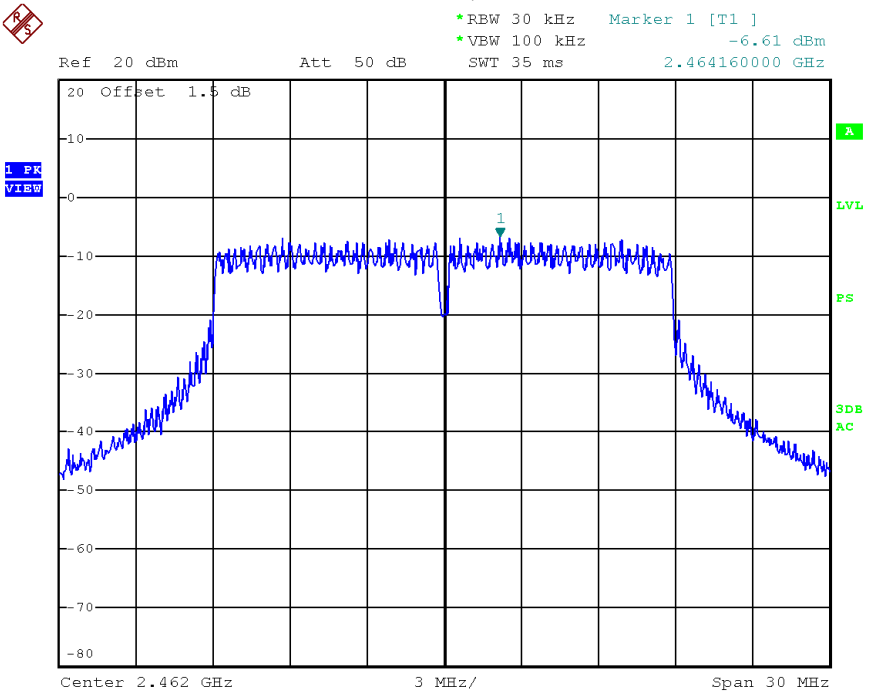
Date: 26.MAR.2014 14:58:55

Chain A, Channel M



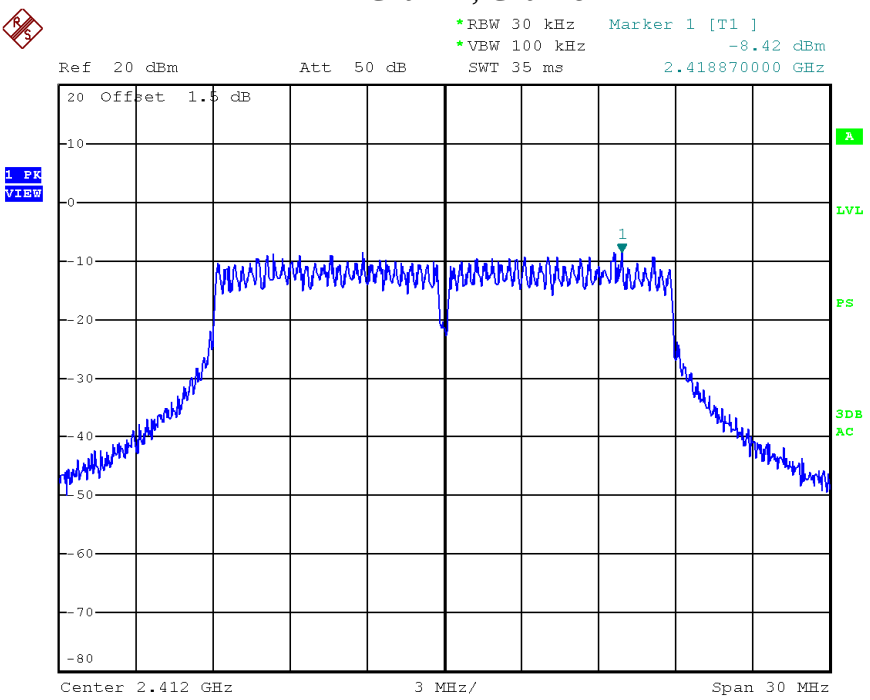
Date: 26.MAR.2014 14:59:14

Chain A, Channel H



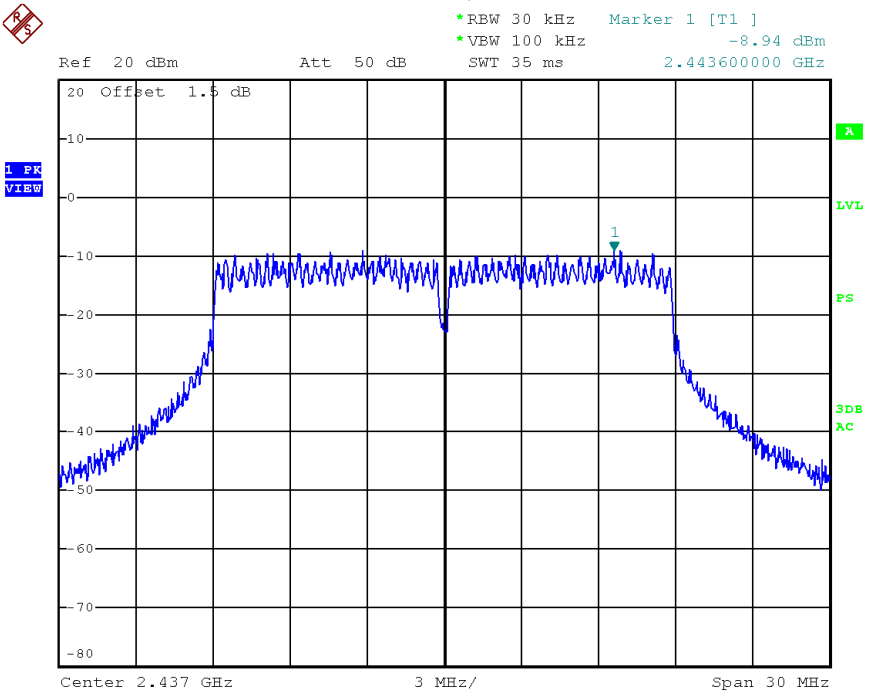
Date: 26.MAR.2014 14:59:29

Chain B, Channel L



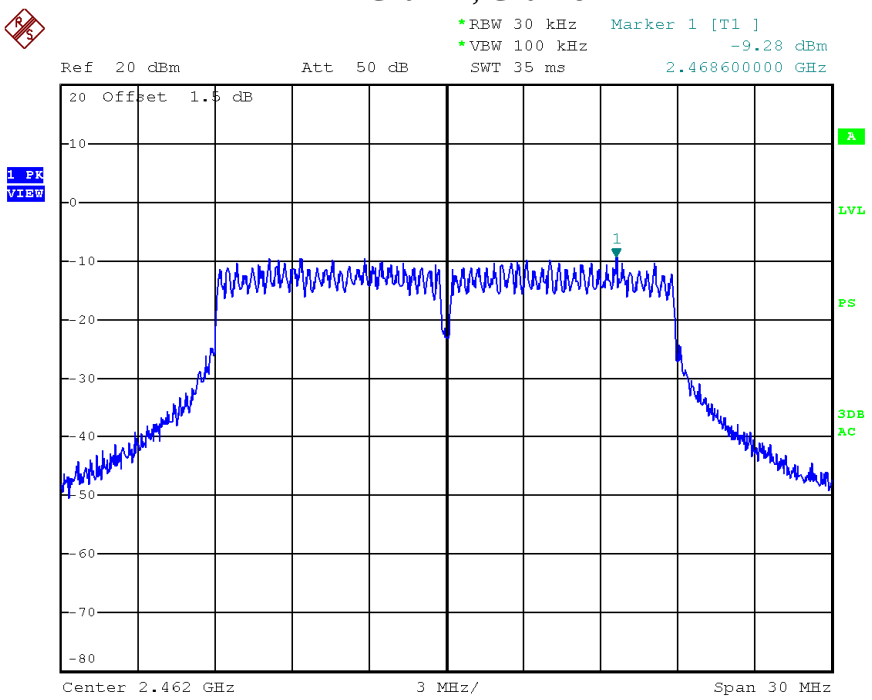
Date: 26.MAR.2014 15:46:03

Chain B, Channel M



Date: 26.MAR.2014 15:46:21

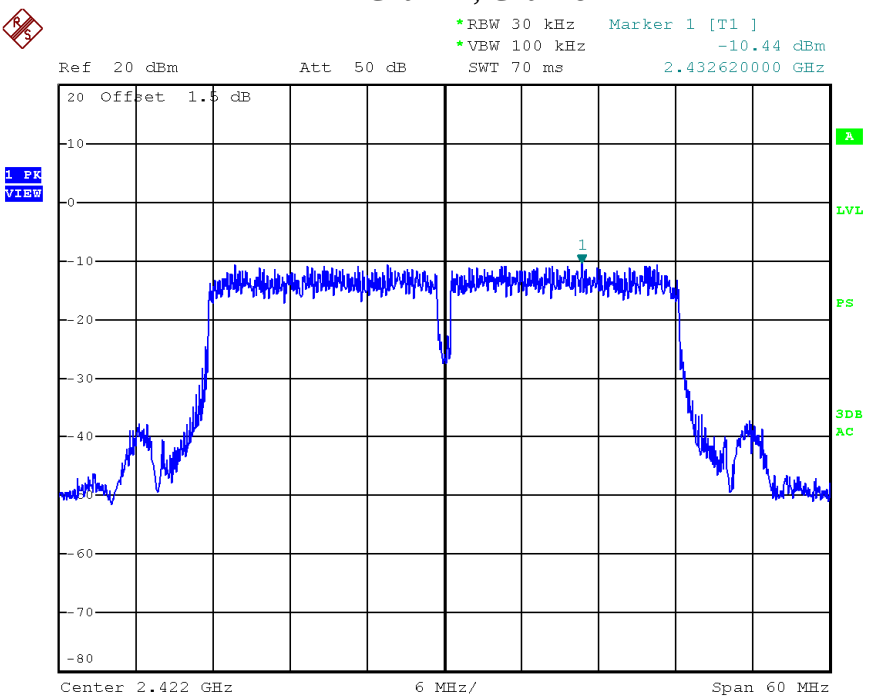
Chain B, Channel H



Date: 26.MAR.2014 15:46:35

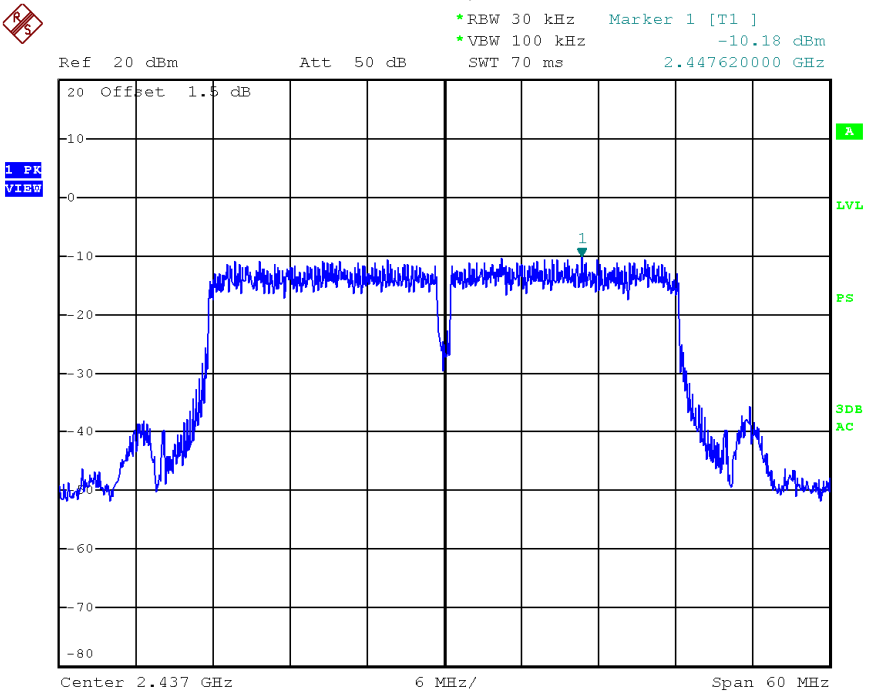
Mode	CH	Spectrum Density (dBm/30kHz)		Total Reading (dBm/30kHz)	Limit (dBm/3kHz)
		Chain A	Chain B	Chain A + B	
802.11n HT40	L	-10.44	-11.76	-8.04	≤8.00
	M	-10.18	-12.63	-8.22	
	H	-9.44	-12.58	-7.72	

Chain A, Channel L



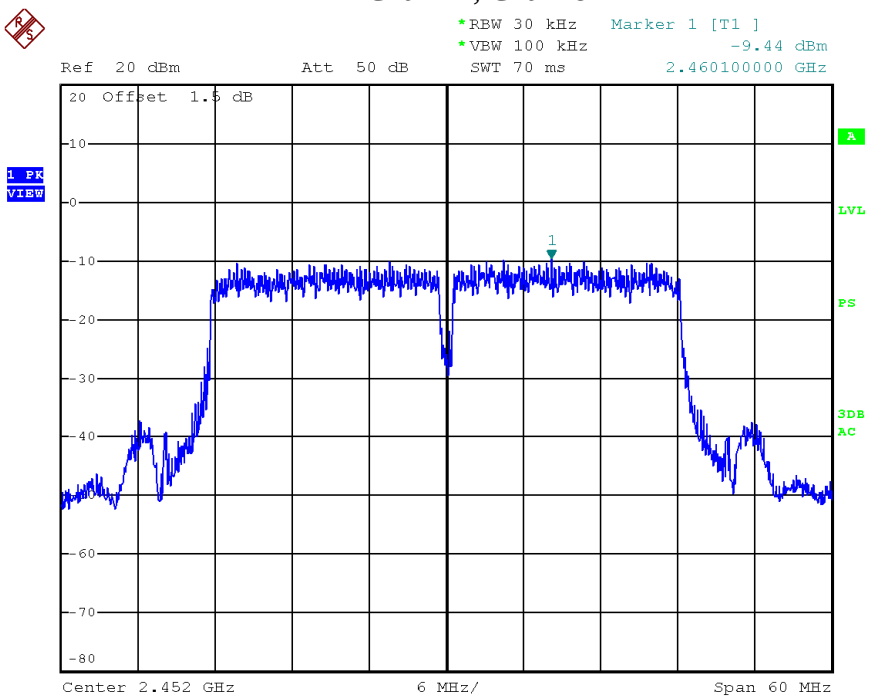
Date: 26.MAR.2014 15:00:04

Chain A, Channel M



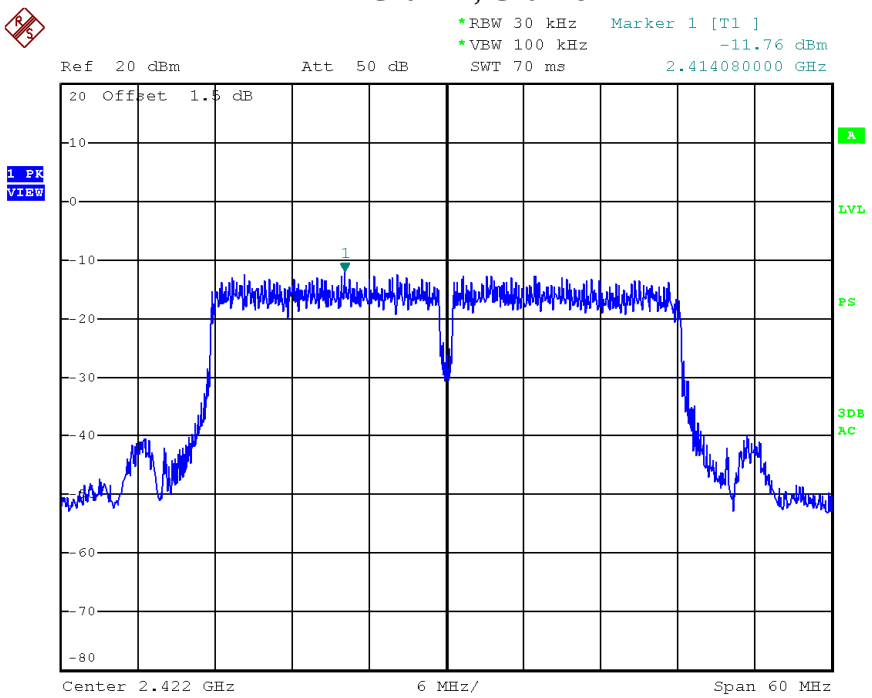
Date: 26.MAR.2014 15:00:23

Chain A, Channel H



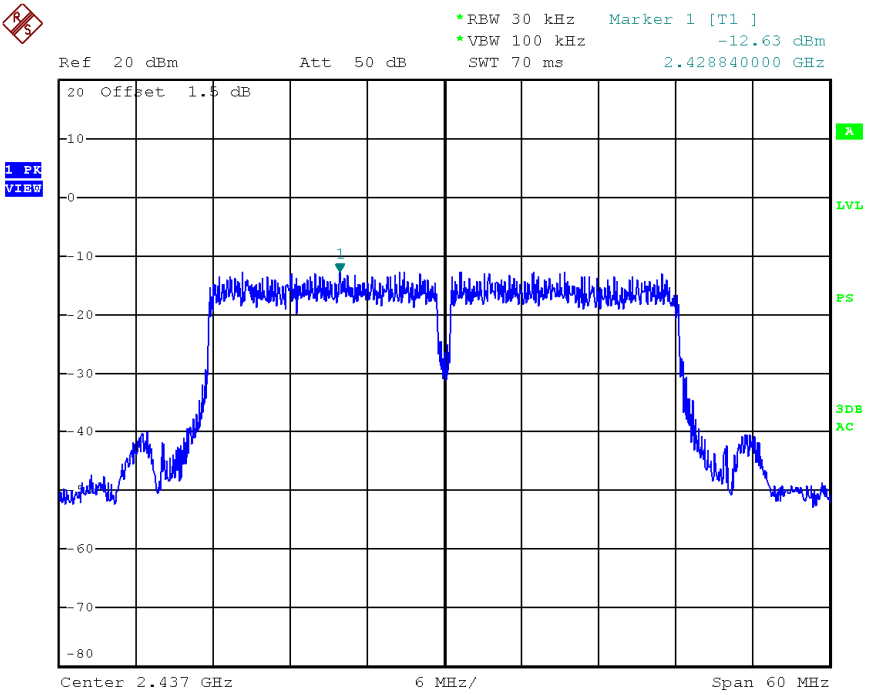
Date: 26.MAR.2014 15:00:39

Chain B, Channel L



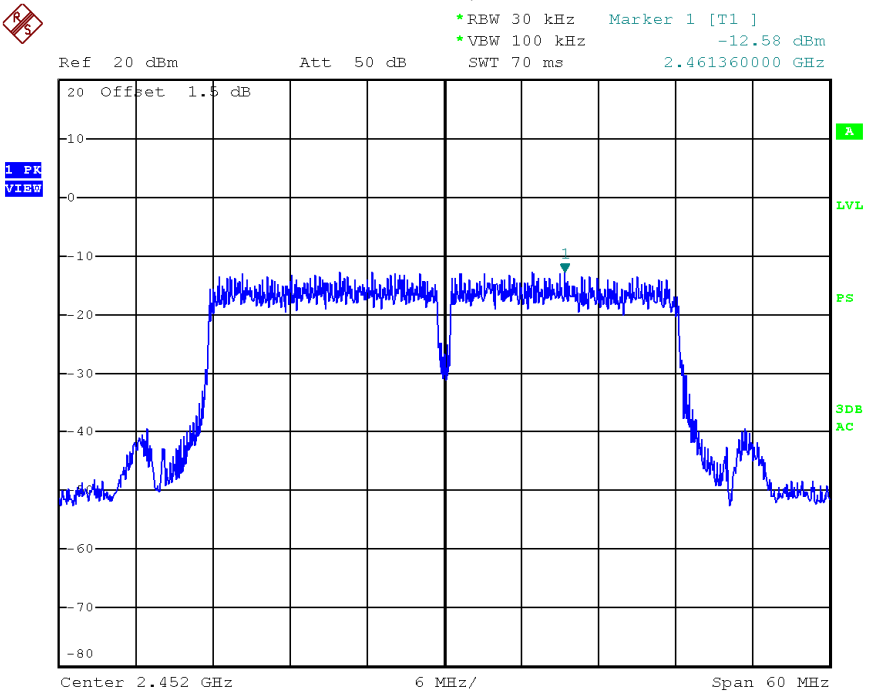
Date: 26.MAR.2014 15:48:29

Chain B, Channel M



Date: 26.MAR.2014 15:48:14

Chain B, Channel H



Date: 26.MAR.2014 15:47:57

6. Radiated emission

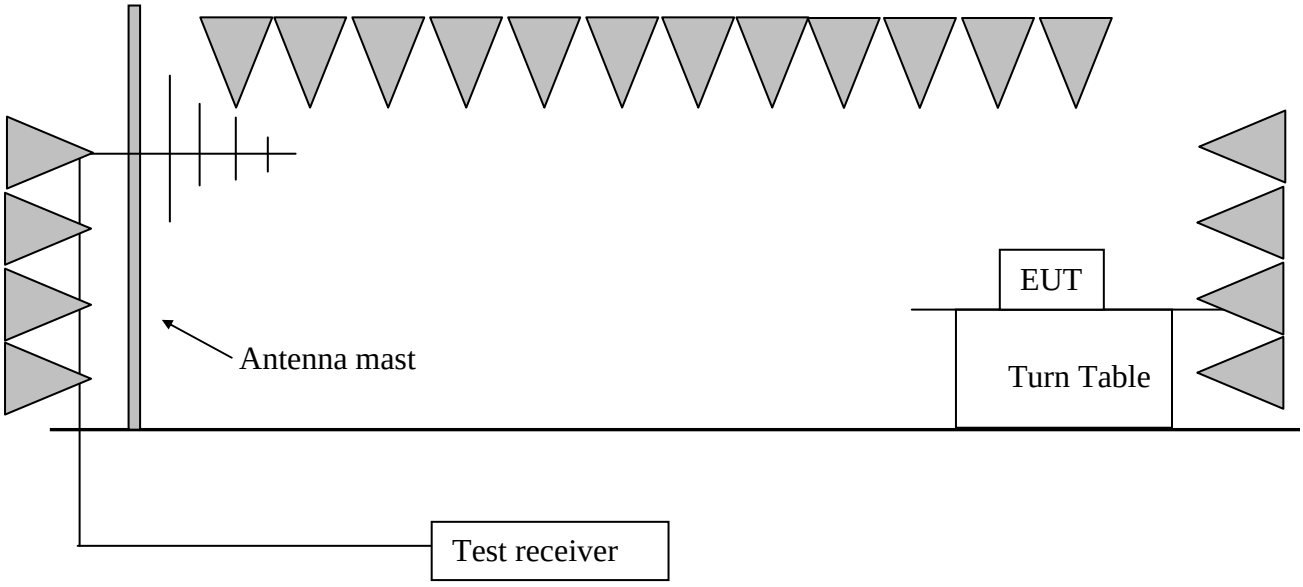
Test result: PASS

6.1 Test limit

The 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) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

6.2 Test Configuration



6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.
The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.
The EUT was tested according to DTS test procedure of KDB558074 D01 DTS “Meas Guidance v03r01” (clause 12.0) for compliance to FCC 47CFR 15.247 requirements.

6.4 Test protocol

Mode 802.11b

CH	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	V	2410.52	34.50	111.20	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2370.54	34.30	56.90	74.00	17.10	PK
	V	2371.63	34.30	37.20	54.00	16.80	AV
	V	4823.64	-3.50	47.00	54.00	7.00	PK
	V	7811.62	3.70	46.10	54.00	7.90	PK
M	V	2438.95	34.60	110.80	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	4873.60	-3.40	46.90	54.00	7.10	PK
	V	7823.60	3.80	45.40	54.00	8.60	PK
H	V	2463.07	34.70	110.20	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2483.61	34.70	57.30	74.00	16.70	PK
	V	2483.74	34.70	38.60	54.00	15.40	AV
	V	4921.84	-3.30	43.70	54.00	10.30	PK
	V	8106.21	4.10	45.60	54.00	8.40	PK

Mode 802.11g

CH	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	V	2407.85	34.50	107.10	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2390.00	34.30	56.10	74.00	17.90	PK
	V	2386.47	34.30	37.50	54.00	16.50	AV
	V	4825.17	-3.50	43.00	54.00	11.00	PK
	V	7839.67	3.80	46.50	54.00	7.50	PK
M	V	2440.91	34.60	106.50	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	4874.11	-3.40	44.80	54.00	9.20	PK
	V	7821.70	3.80	46.40	54.00	7.60	PK
H	V	2466.49	34.70	106.20	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2483.50	34.70	59.30	74.00	14.70	PK
	V	2483.59	34.70	40.60	54.00	13.40	AV
	V	4991.98	-3.20	44.00	54.00	10.00	PK
	V	8260.52	4.10	46.40	54.00	7.60	PK

Mode 802.11n HT20

CH	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	V	2413.95	34.50	109.50	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2390.00	34.30	56.90	74.00	17.10	PK
	V	2388.69	34.30	37.40	54.00	16.60	AV
	V	4823.64	-3.50	48.60	54.00	5.40	PK
	V	8765.53	4.40	47.90	54.00	6.10	PK
M	V	2440.68	34.60	109.20	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	4875.40	-3.40	47.30	54.00	6.70	PK
	V	7826.15	3.80	46.90	54.00	7.10	PK
H	V	2456.59	34.70	109.70	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2485.15	34.70	59.90	74.00	14.10	PK
	V	2484.66	34.70	40.80	54.00	13.20	AV
	V	4923.37	-3.30	46.50	54.00	7.50	PK
	V	7937.87	4.00	45.70	54.00	8.30	PK

Mode 802.11n HT40

CH	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	V	2425.75	34.50	105.60	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2388.06	34.30	59.00	74.00	15.00	PK
	V	2389.38	34.30	40.50	54.00	13.50	AV
	V	4837.68	-3.50	45.10	54.00	8.90	PK
	V	7909.81	3.90	46.30	54.00	7.70	PK
M	V	2438.95	34.60	105.80	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	4875.61	-3.40	44.80	54.00	9.20	PK
	V	7889.16	3.90	45.90	54.00	8.10	PK
H	V	2455.83	34.60	105.50	Fundamental	/	PK
	V	72.76	9.40	34.30	40.00	5.70	PK
	H	187.45	12.00	31.70	43.50	11.80	PK
	H	387.67	18.50	29.30	46.00	16.70	PK
	H	700.64	22.40	30.60	46.00	15.40	PK
	V	2483.53	34.70	60.30	74.00	13.70	PK
	V	2483.57	34.70	41.10	54.00	12.90	AV
	V	4991.98	-3.30	44.10	54.00	9.90	PK
	V	8470.94	4.00	46.10	54.00	7.90	PK

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = limit – Corrected Reading
4. If the PK reading is lower than AV limit, the AV testing is omitted.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin = 54 -10.20 = 43.80dBuV/m

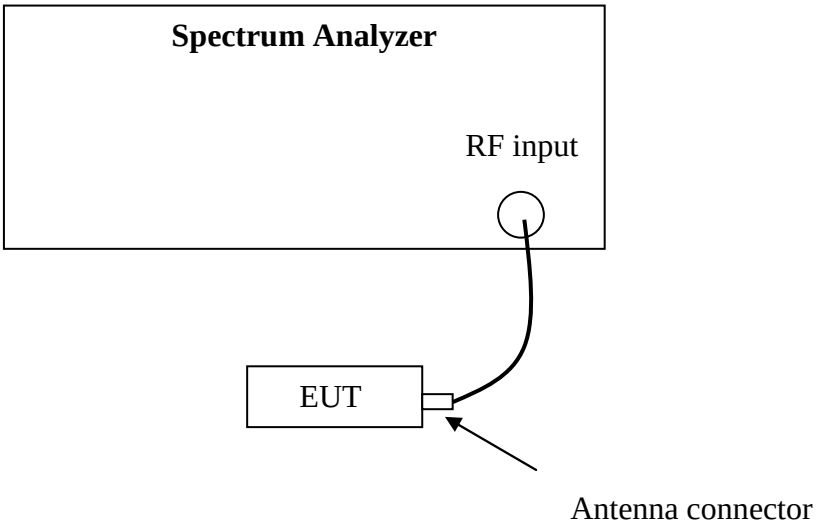
7. Emission outside the frequency Band

Test result: **PASS**

7.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

7.2 Test Configuration



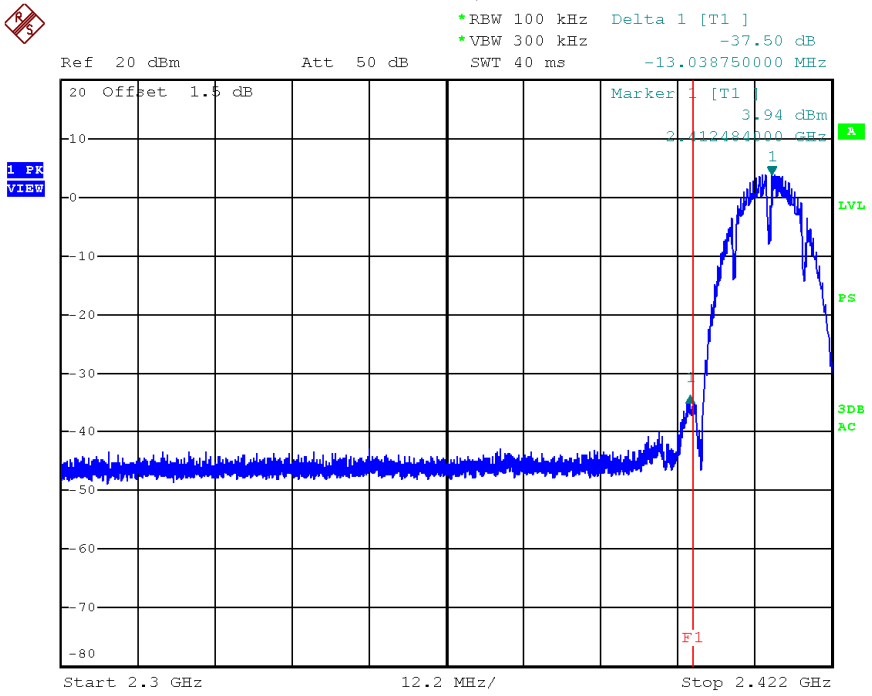
7.3 Test procedure and test setup

The Emission outside the frequency Band per FCC §15.247(d) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW.
The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v03r01” (clause 11.0) for compliance to FCC 47CFR 15.247 requirements.

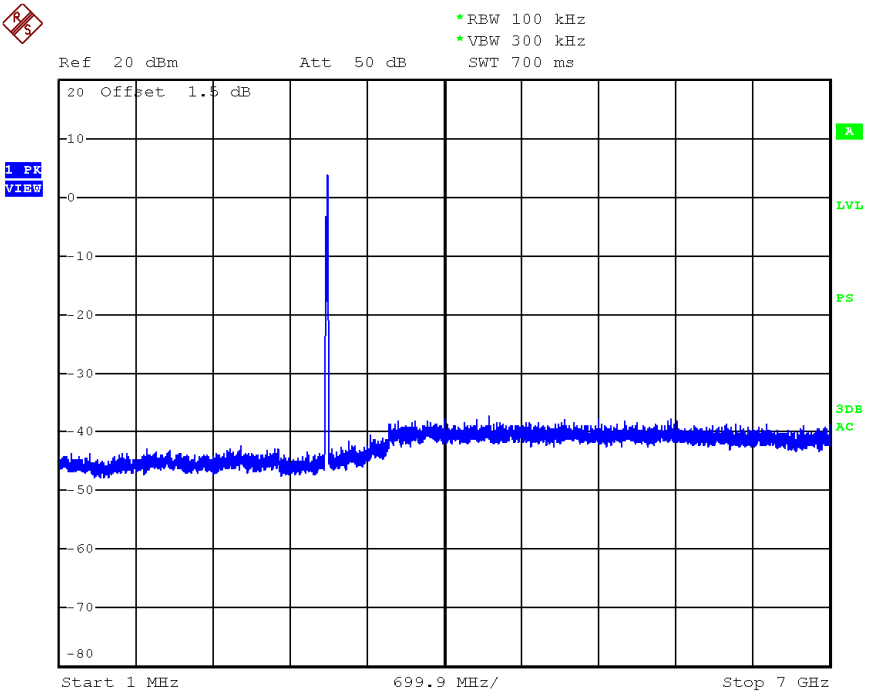
7.4 Test protocol

Mode	CH	Result		Limit (dB)
		Chain A	Chain B	
802.11b	L	Pass	Pass	≥20
	M	Pass	Pass	
	H	Pass	Pass	

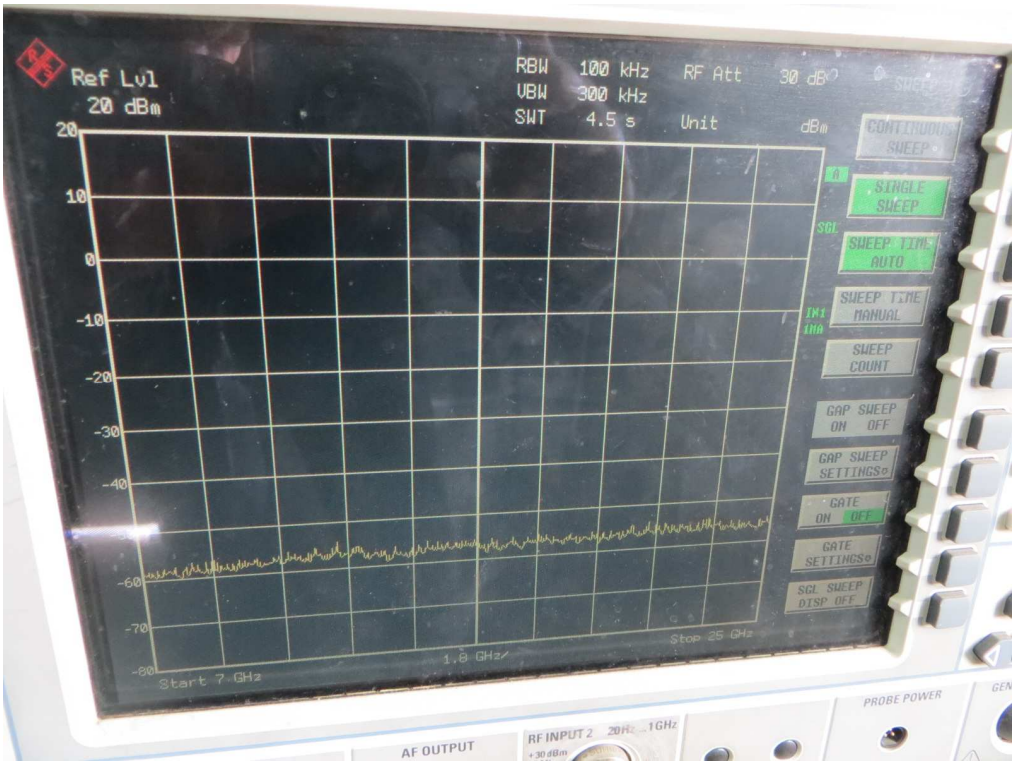
Chain A, Channel L



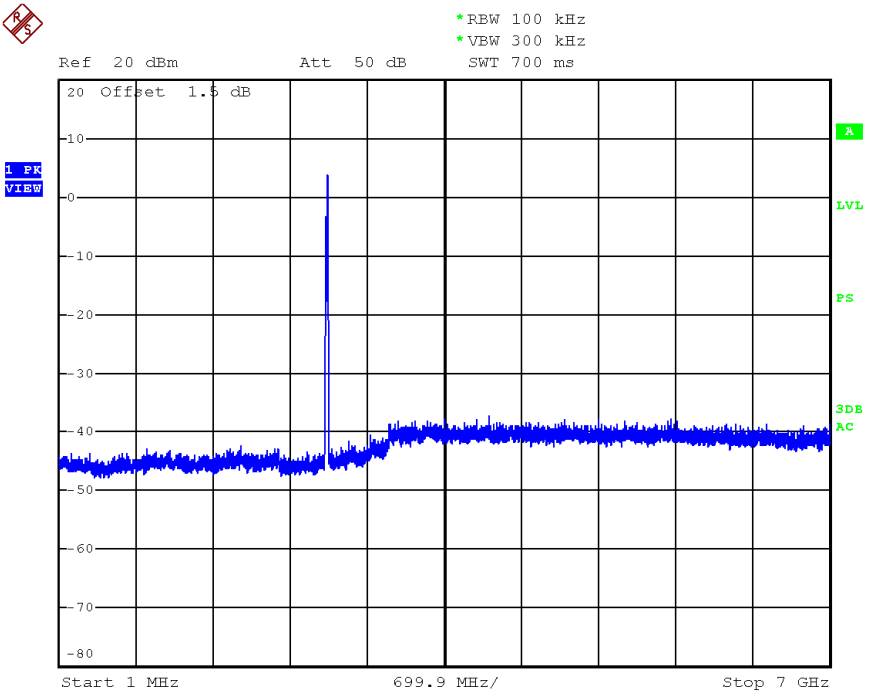
Date: 26.MAR.2014 10:51:23



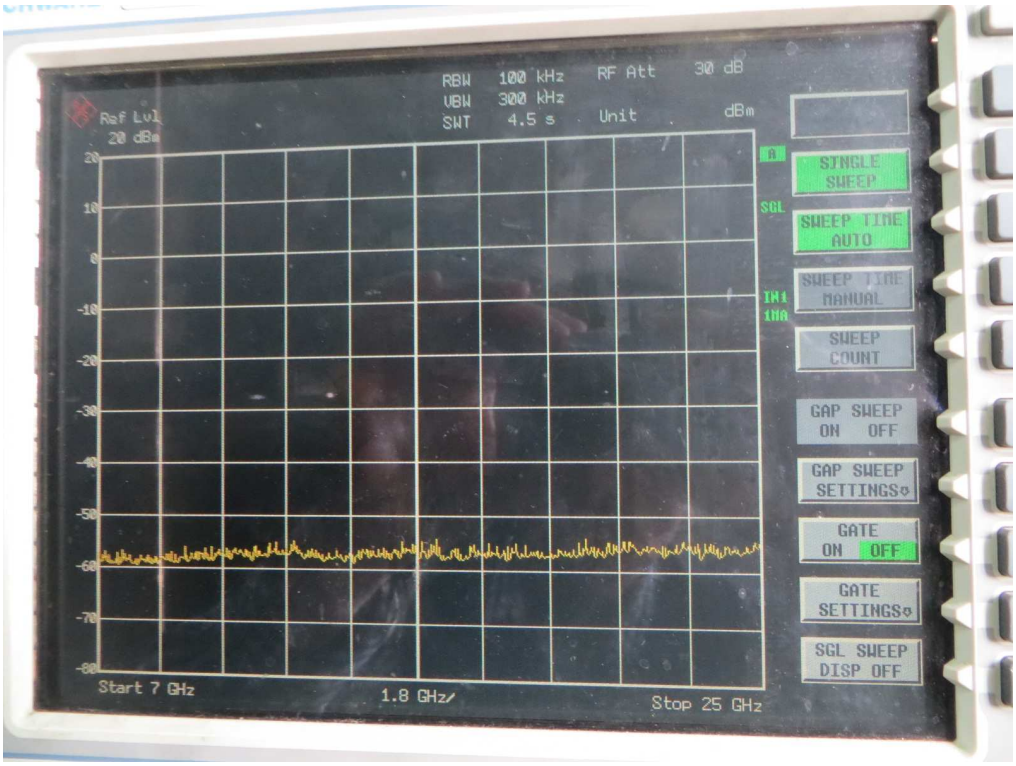
Date: 26.MAR.2014 10:54:10



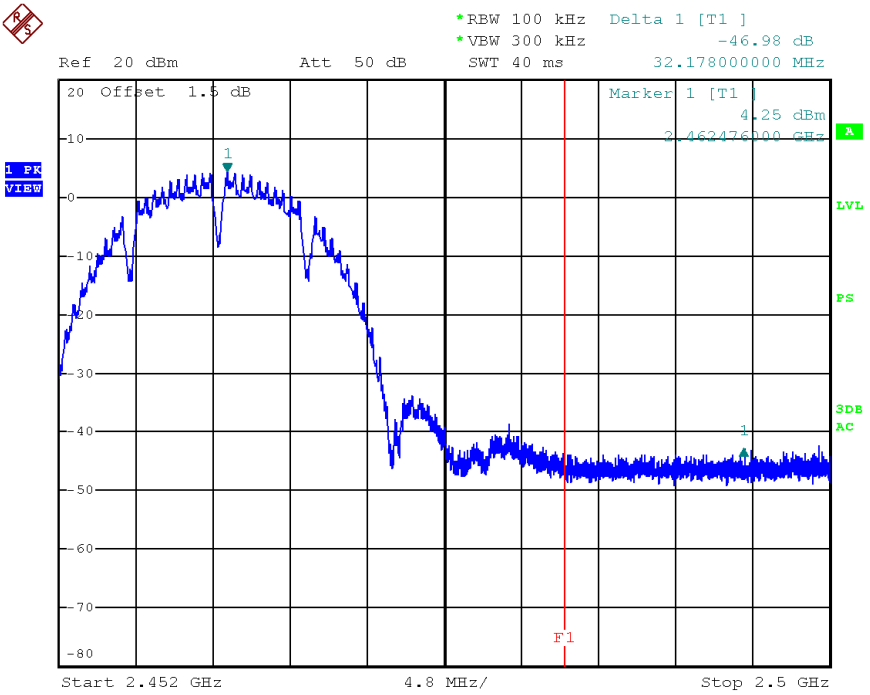
Chain A, Channel M



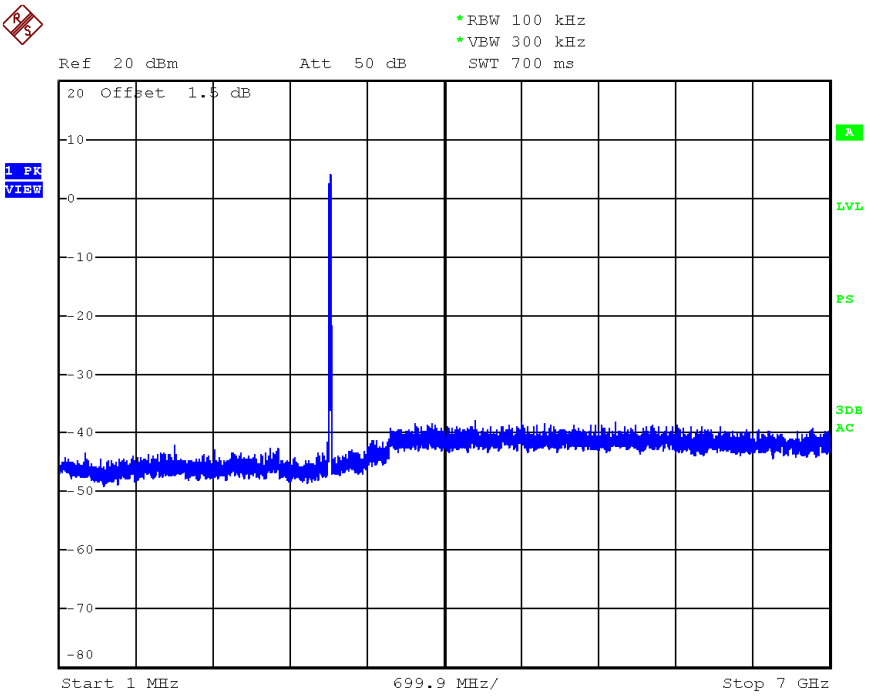
Date: 26.MAR.2014 10:54:10



Chain A, Channel H

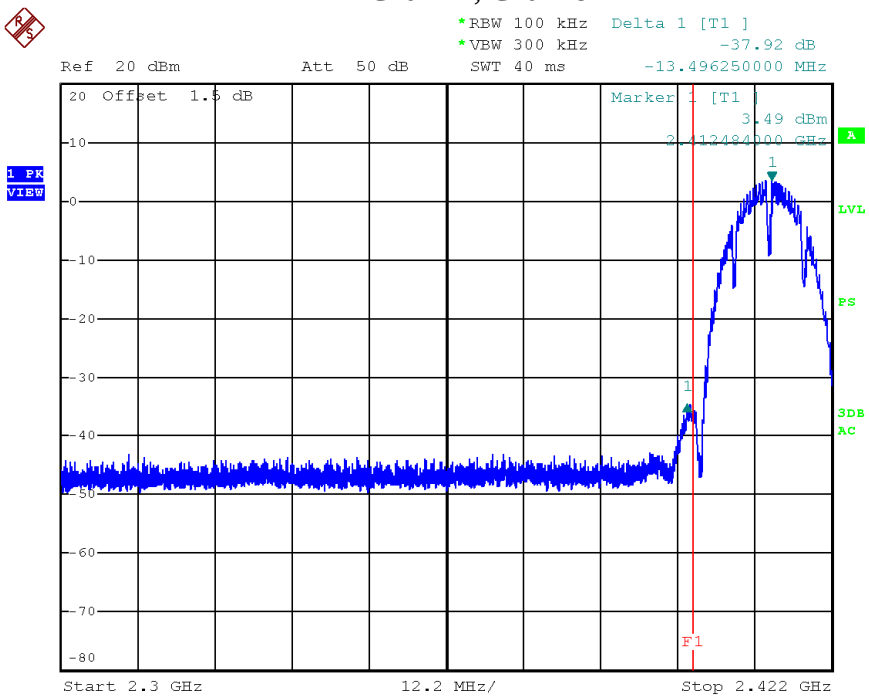


Date: 26.MAR.2014 11:14:03



Date: 26.MAR.2014 10:55:34

Chain B, Channel L



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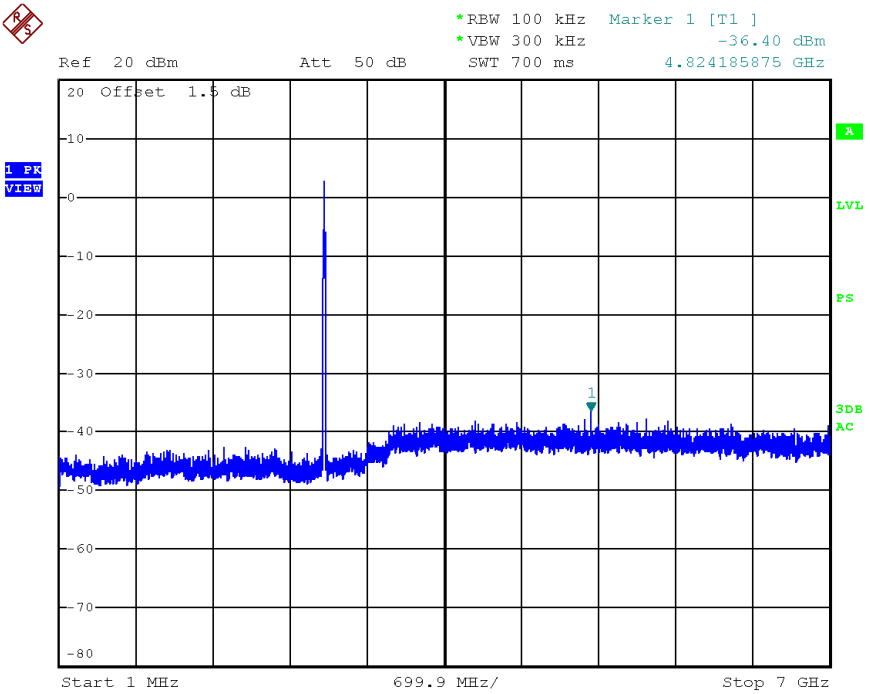
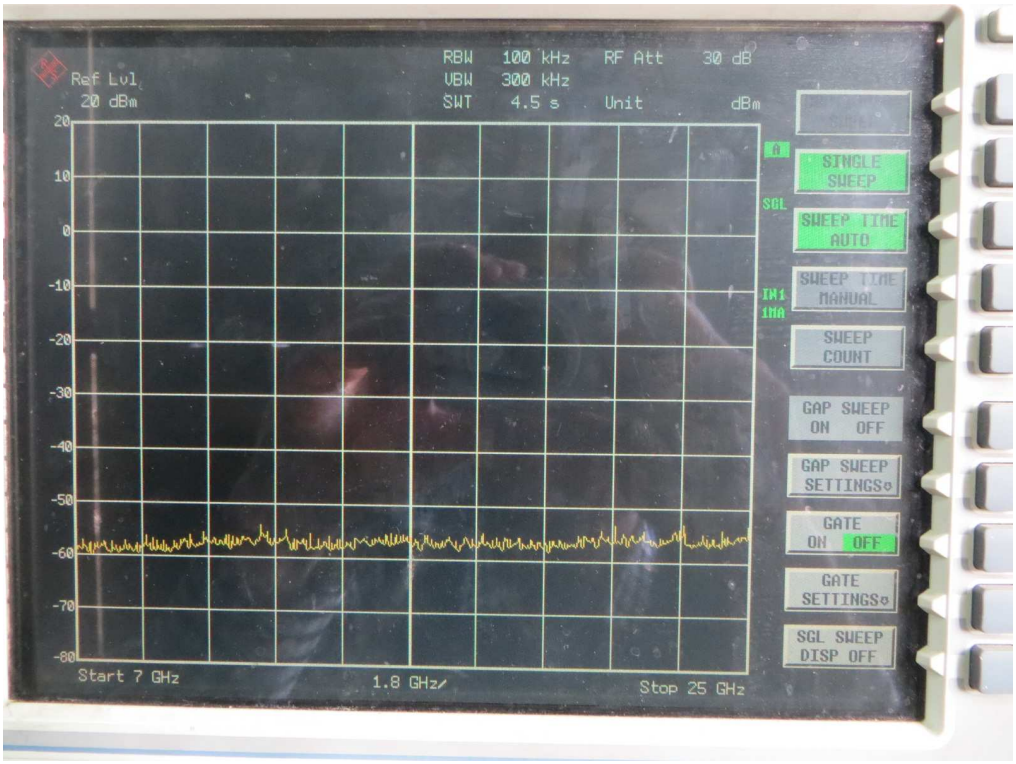
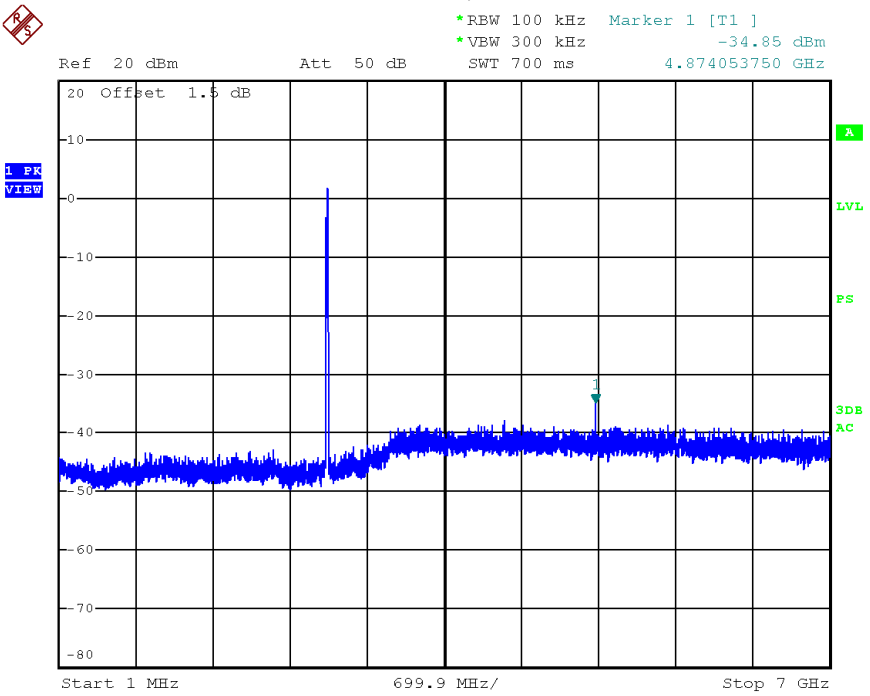


Date: 26.MAR.2014 15:28:07



Chain B, Channel M



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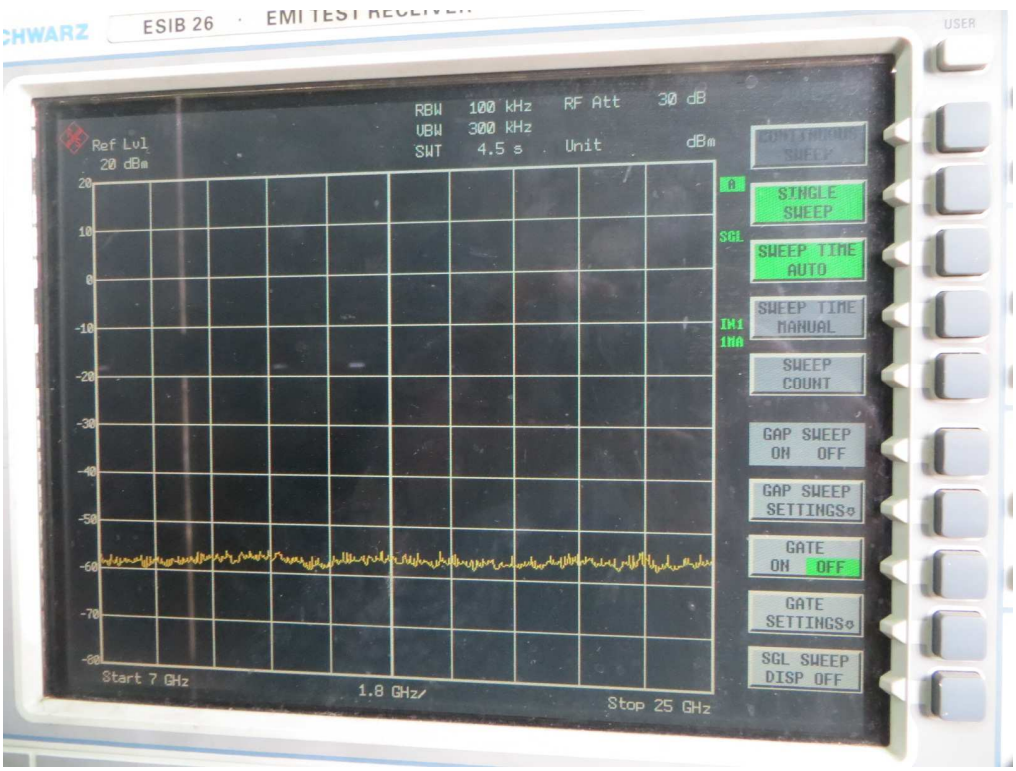
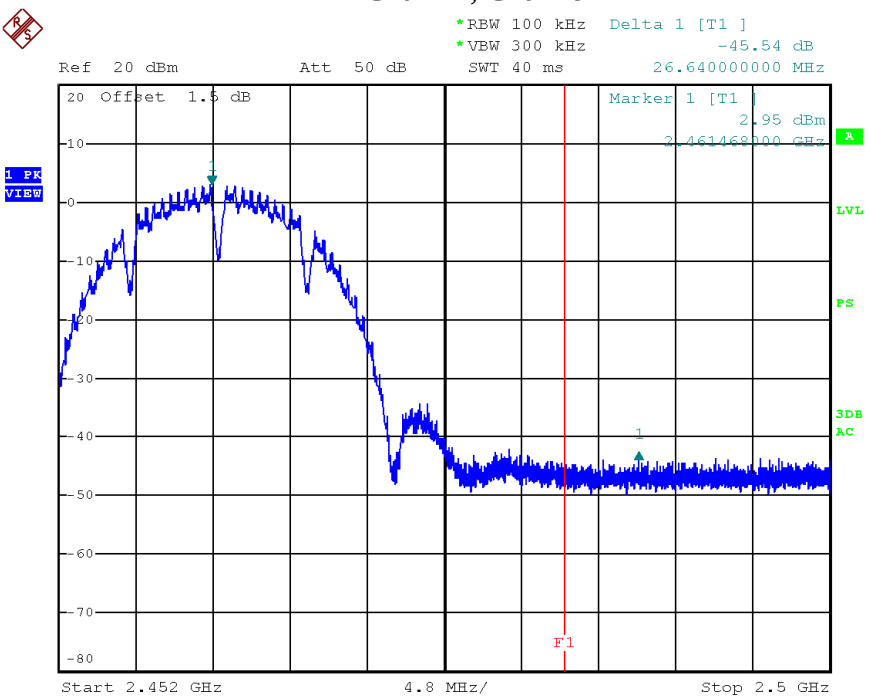
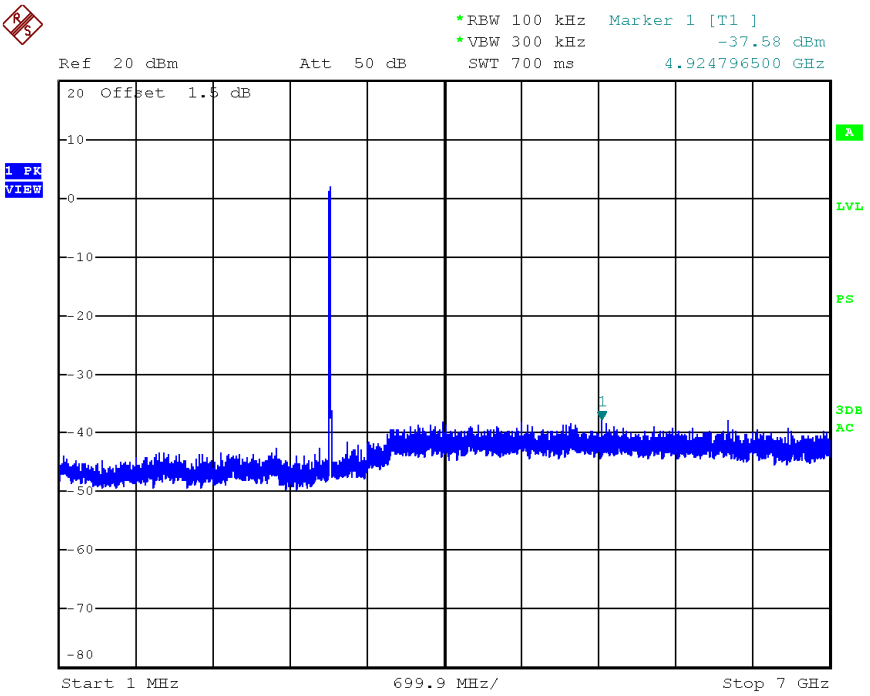


Chain B, Channel H



Date: 26.MAR.2014 15:29:53



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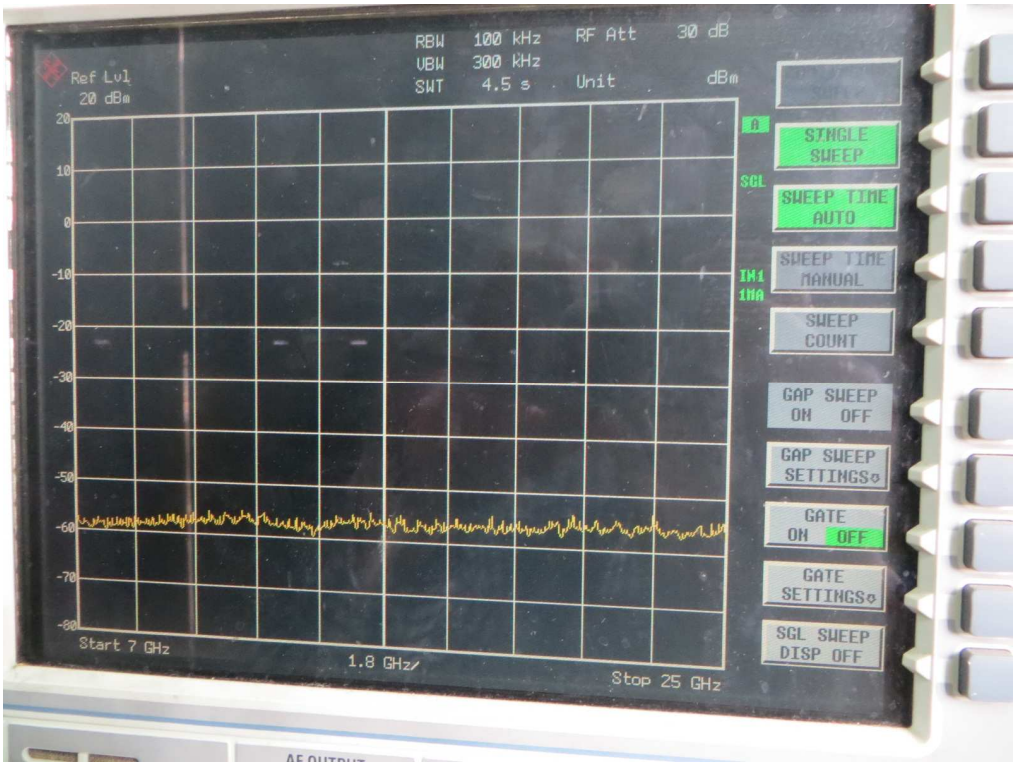
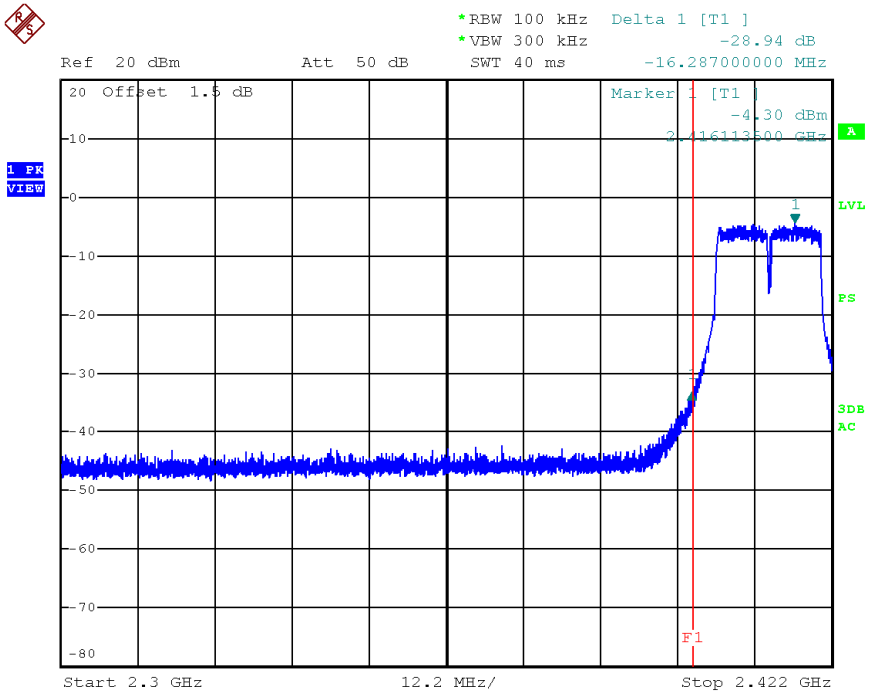


Mode	CH	Result		Limit (dB)
		Chain A	Chain B	
802.11g	L	Pass	Pass	≥20
	M	Pass	Pass	
	H	Pass	Pass	

Chain A, Channel L



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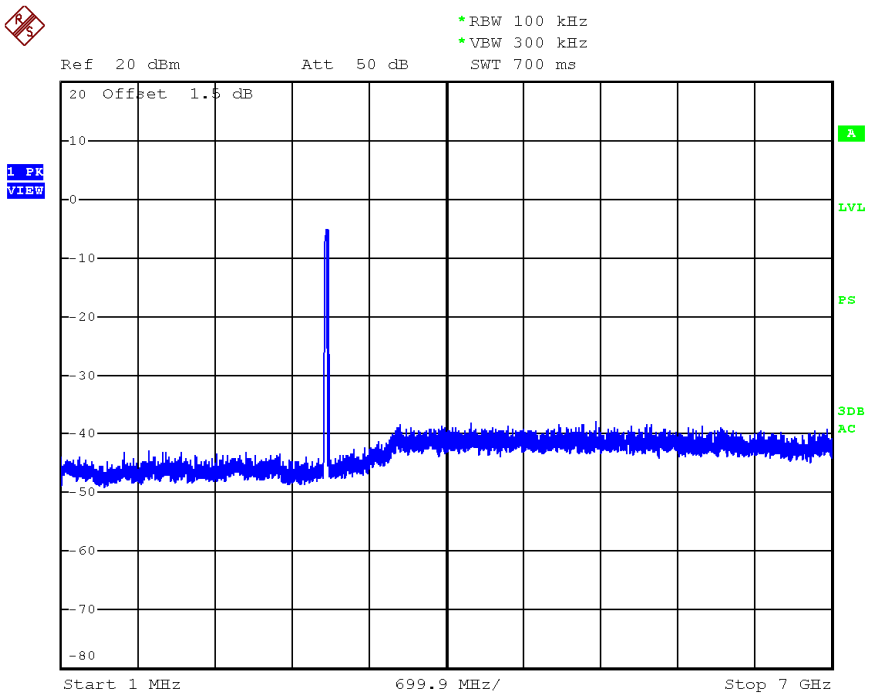

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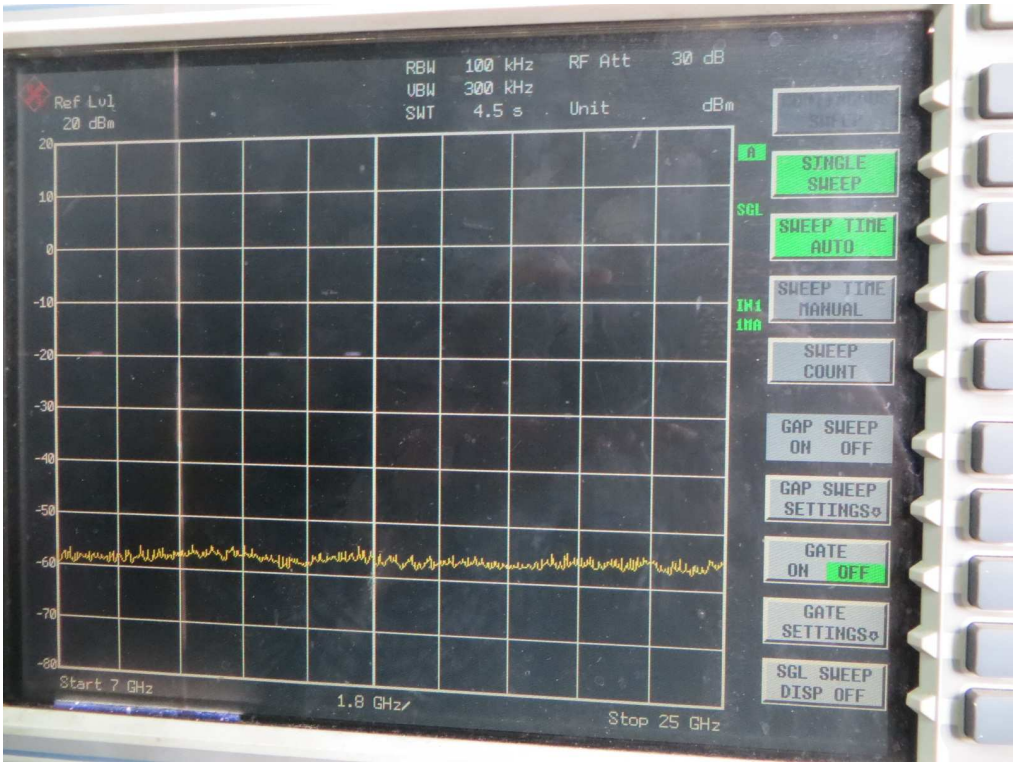
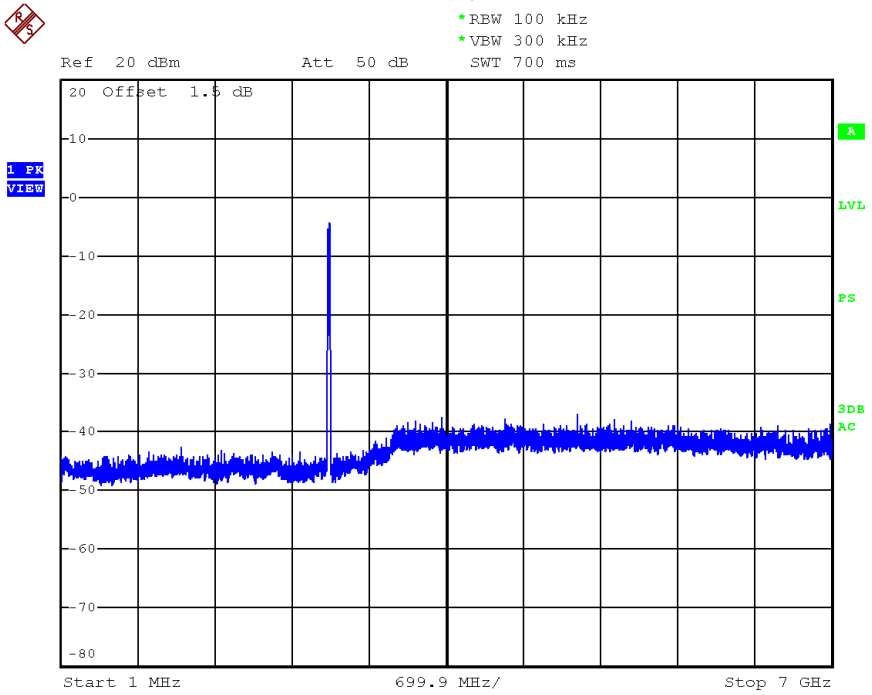


Chain A, Channel M



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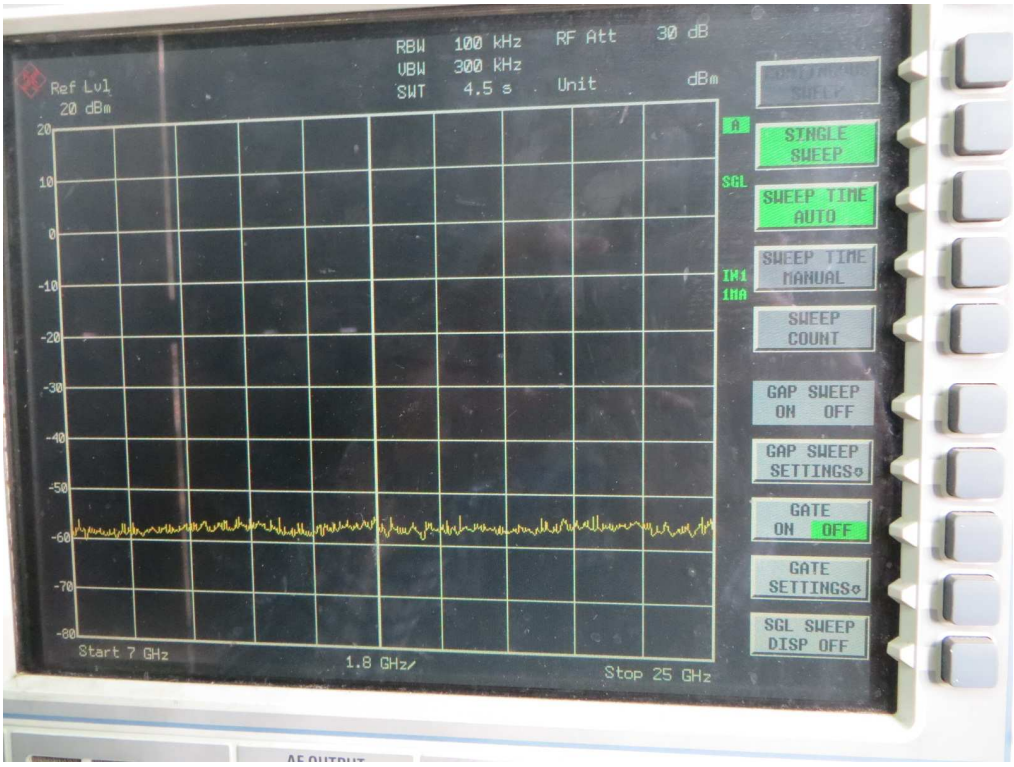
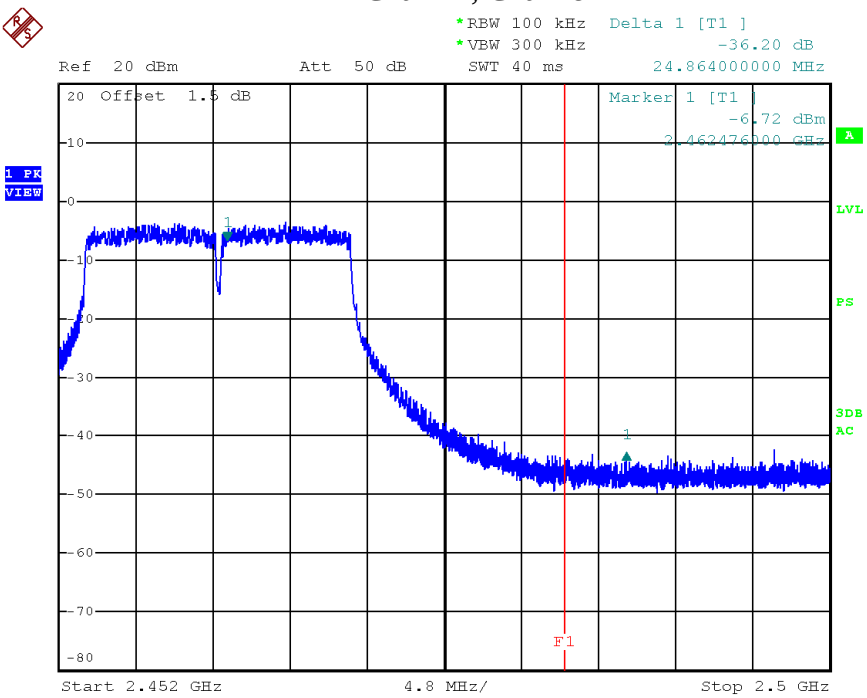


Chain A, Channel H



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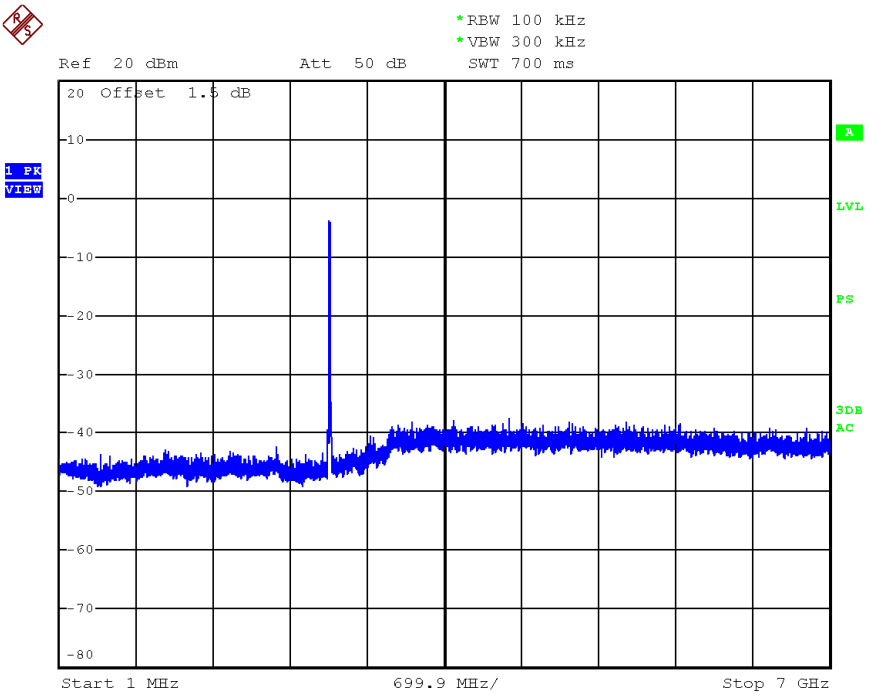
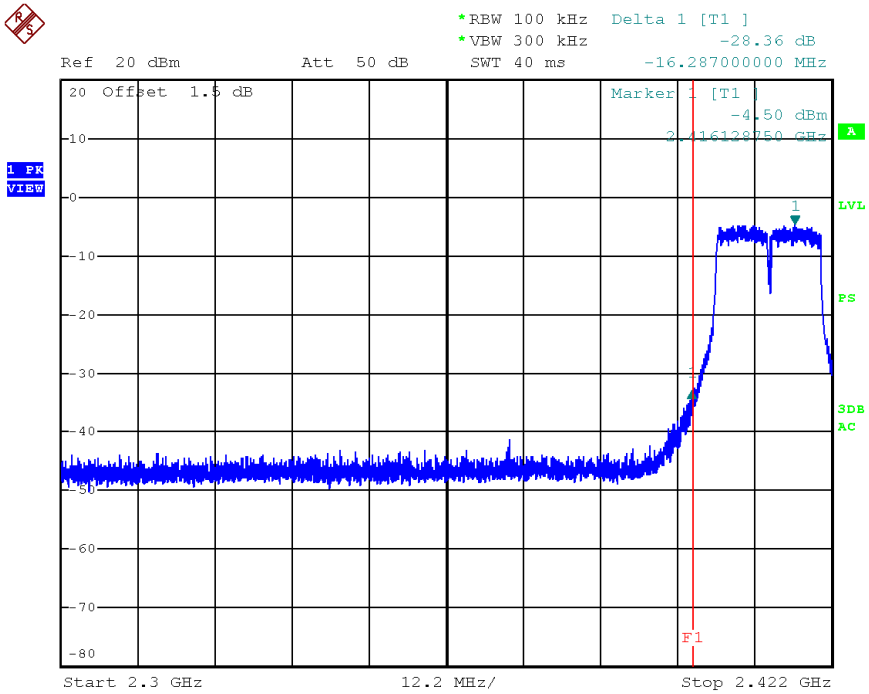


Date: 26.MAR.2014 13:45:32

Chain B, Channel L



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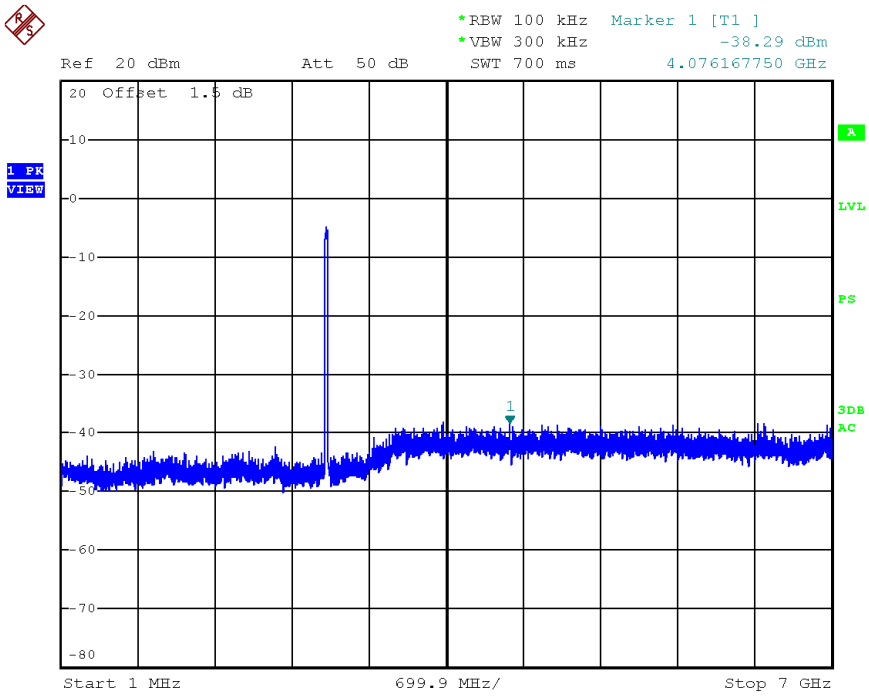

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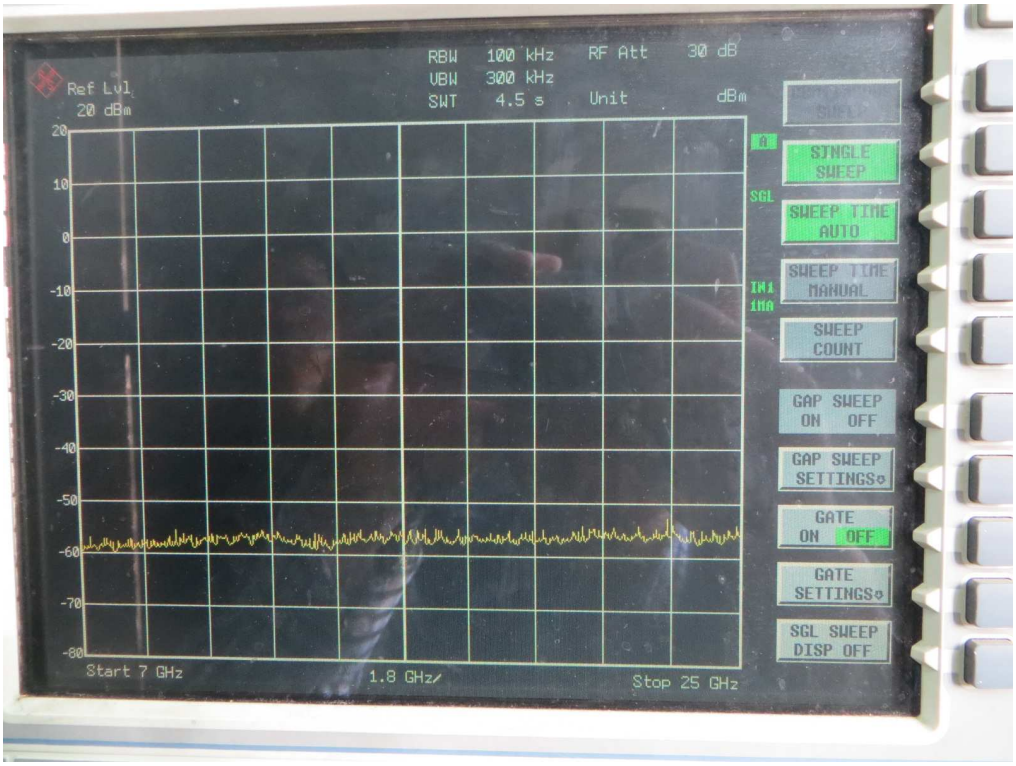
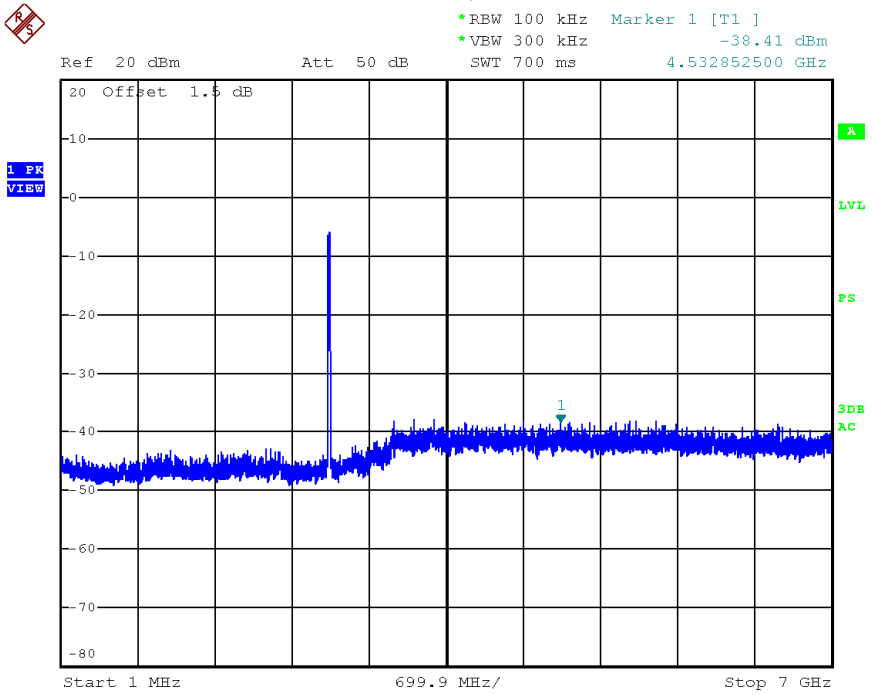
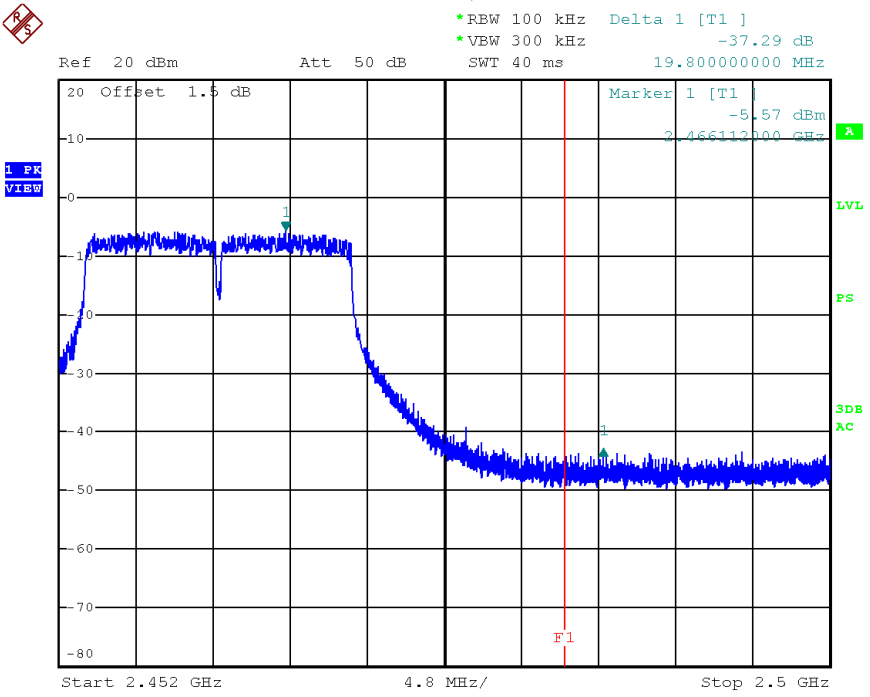


Chain B, Channel M



Date: 26.MAR.2014 15:31:58

Chain B, Channel H



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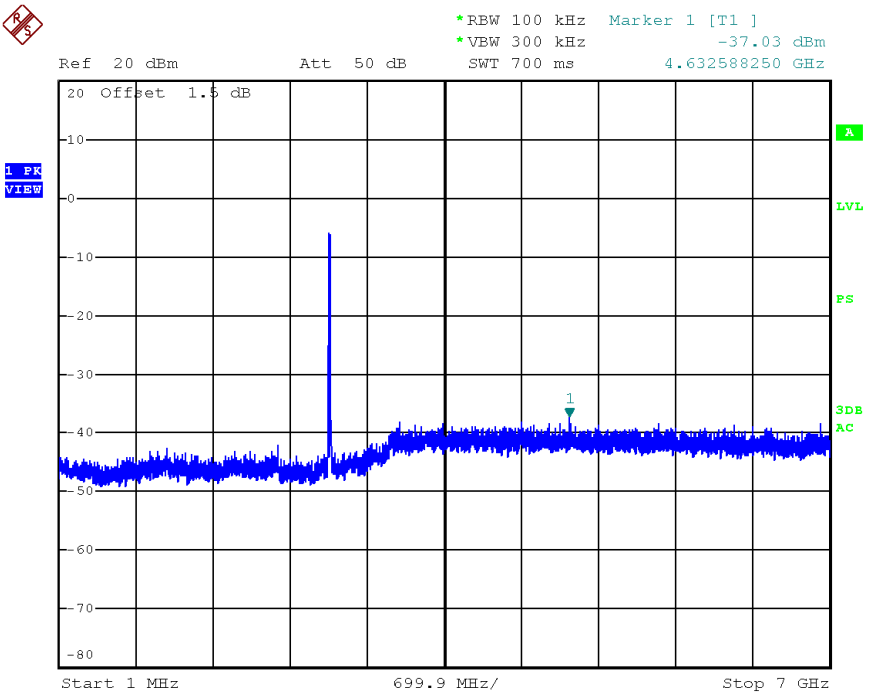
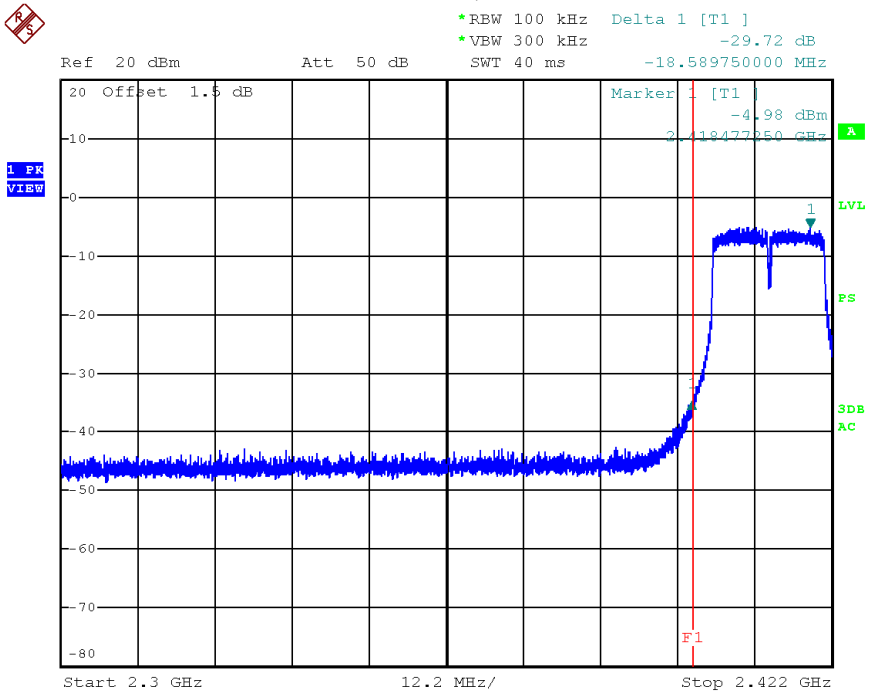


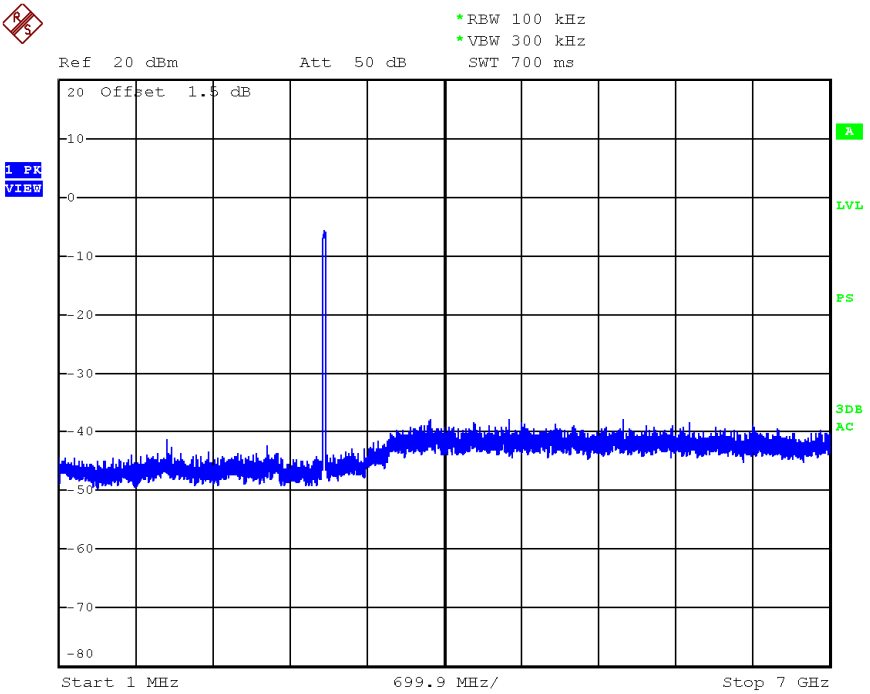
Date: 26.MAR.2014 15:31:20

Mode	CH	Result		Limit (dB)
		Chain A	Chain B	
802.11n HT20	L	Pass	Pass	≥20
	M	Pass	Pass	
	H	Pass	Pass	

Chain A, Channel L

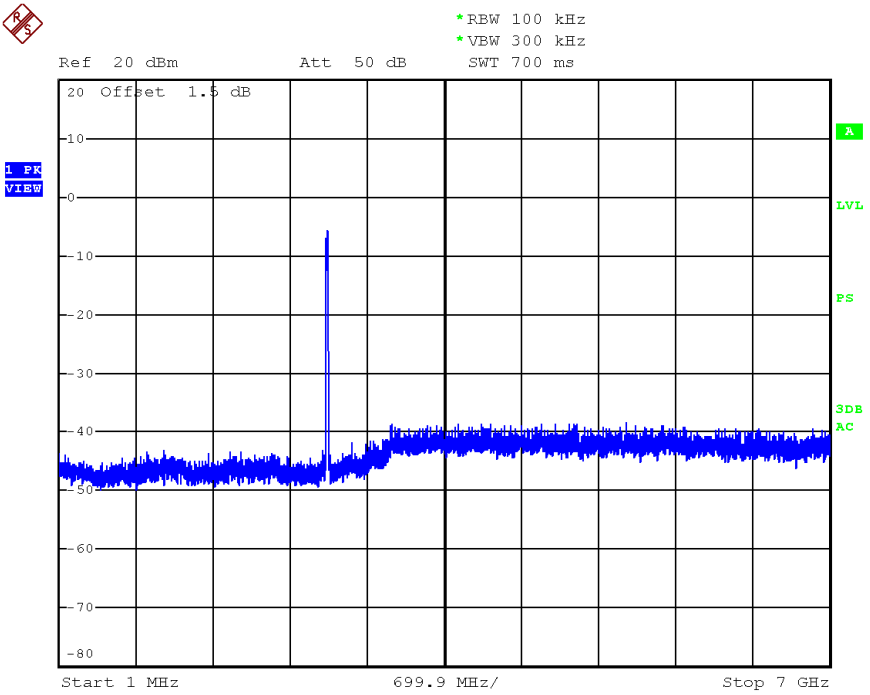


Date: 26.MAR.2014 13:49:36



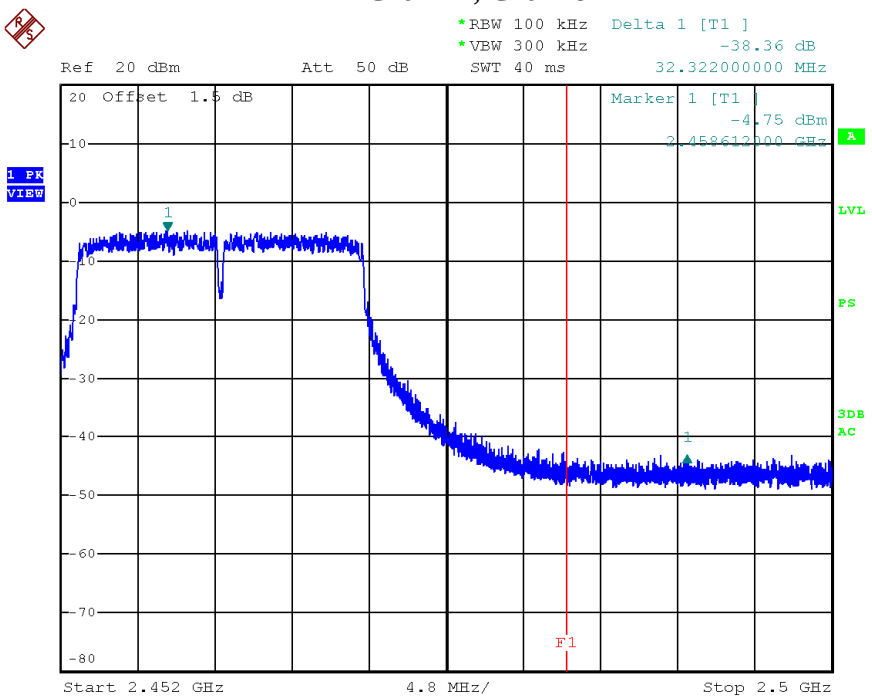
Date: 26.MAR.2014 13:50:14

Chain A, Channel M

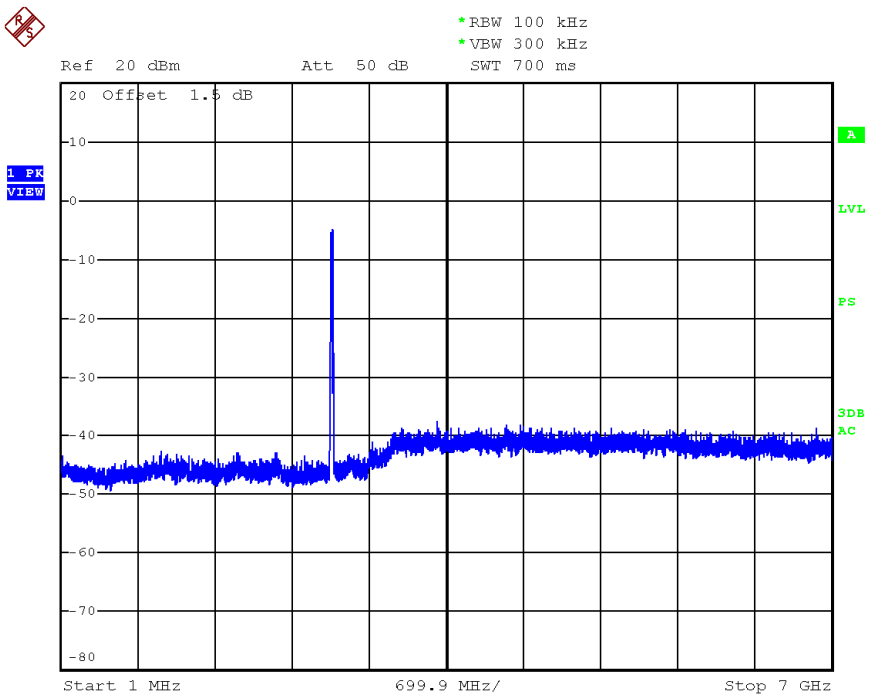


Date: 26.MAR.2014 13:50:38

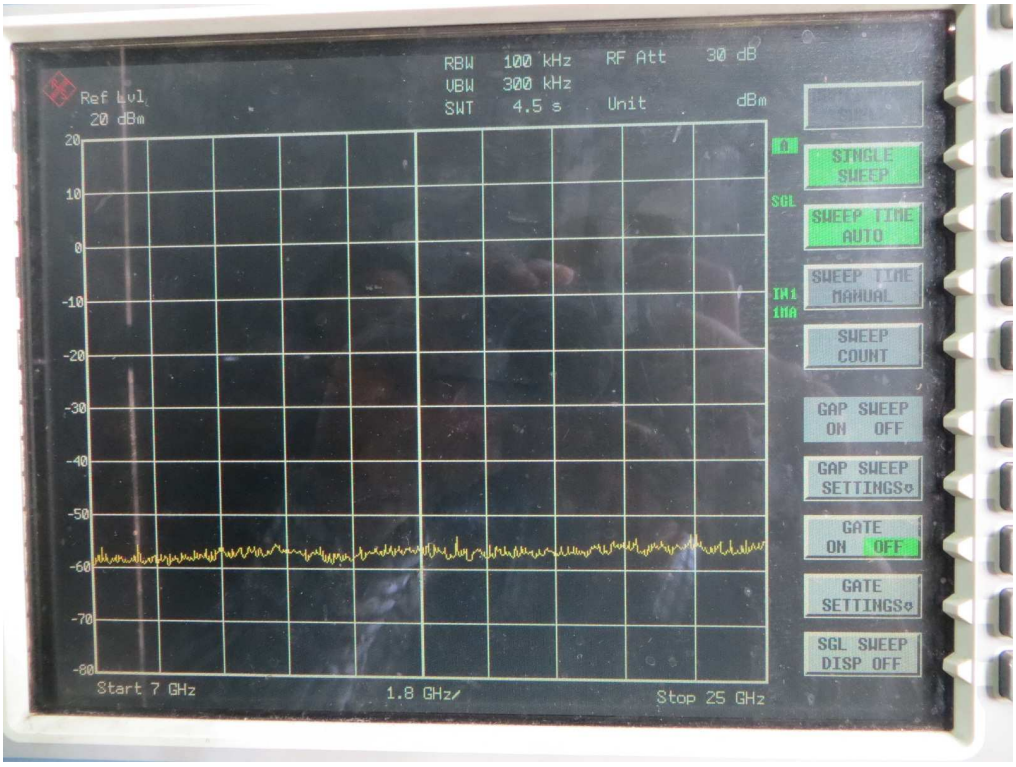
Chain A, Channel H



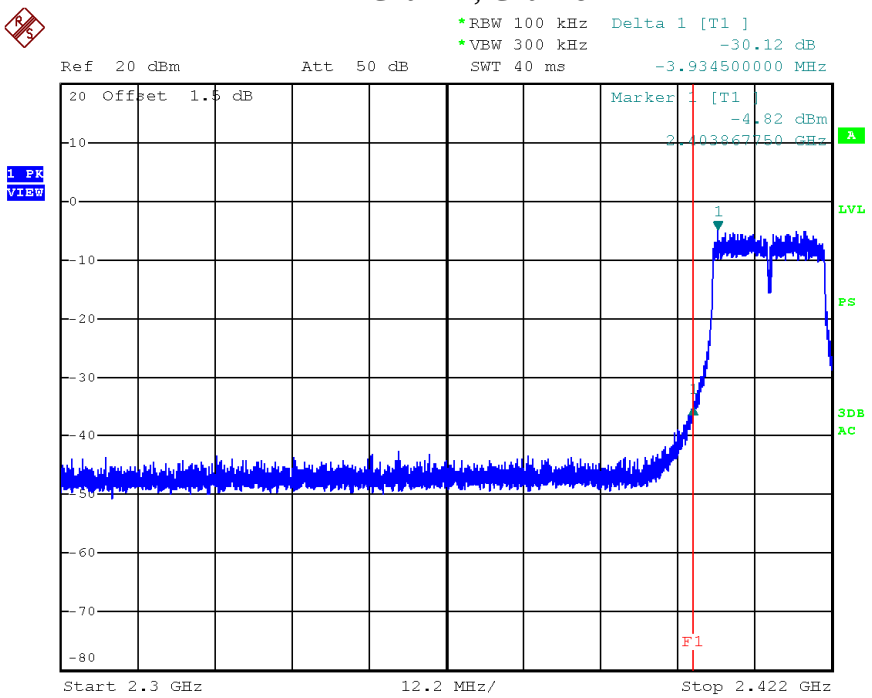
Date: 26.MAR.2014 13:51:58



Date: 26.MAR.2014 13:51:18



Chain B, Channel L



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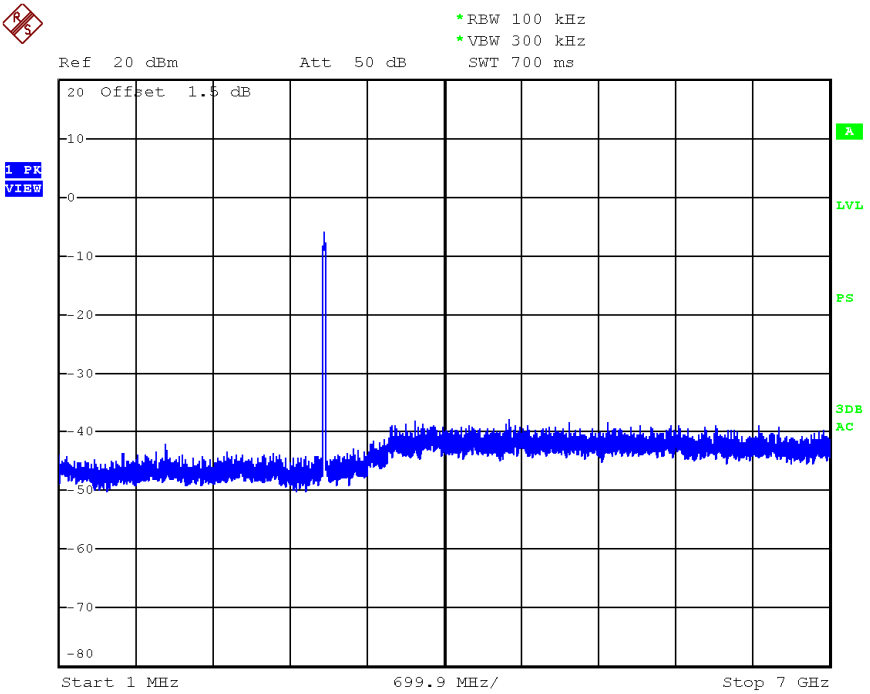

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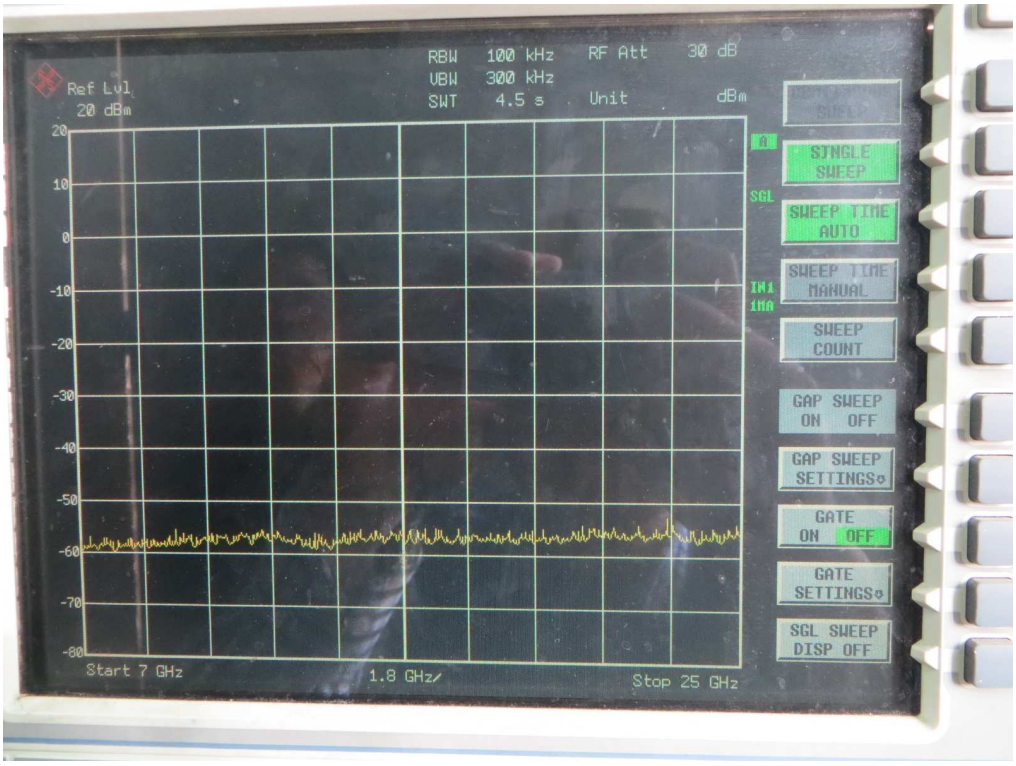
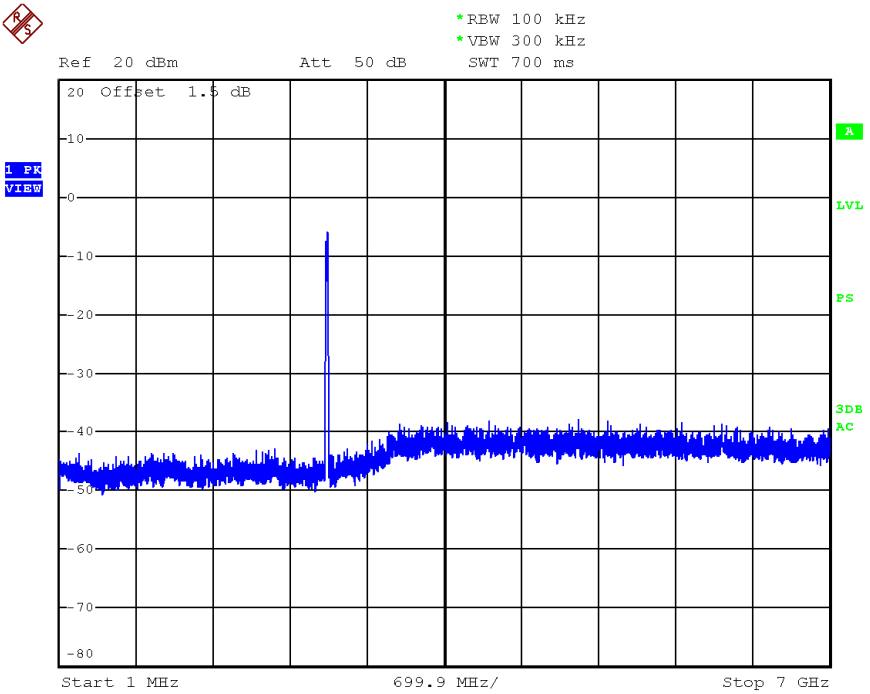
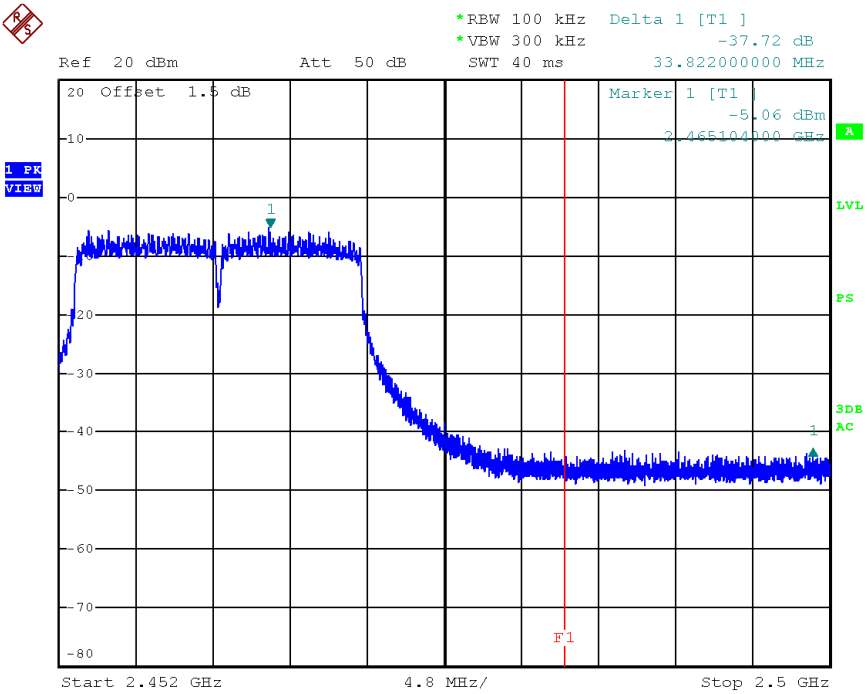


Chain B, Channel M



Date: 26.MAR.2014 15:36:02

Chain B, Channel H



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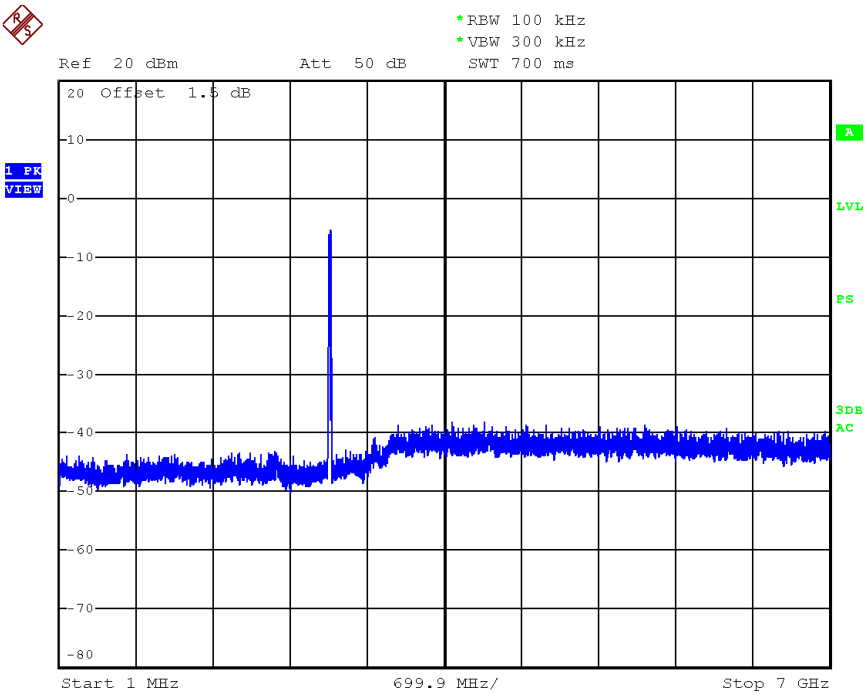

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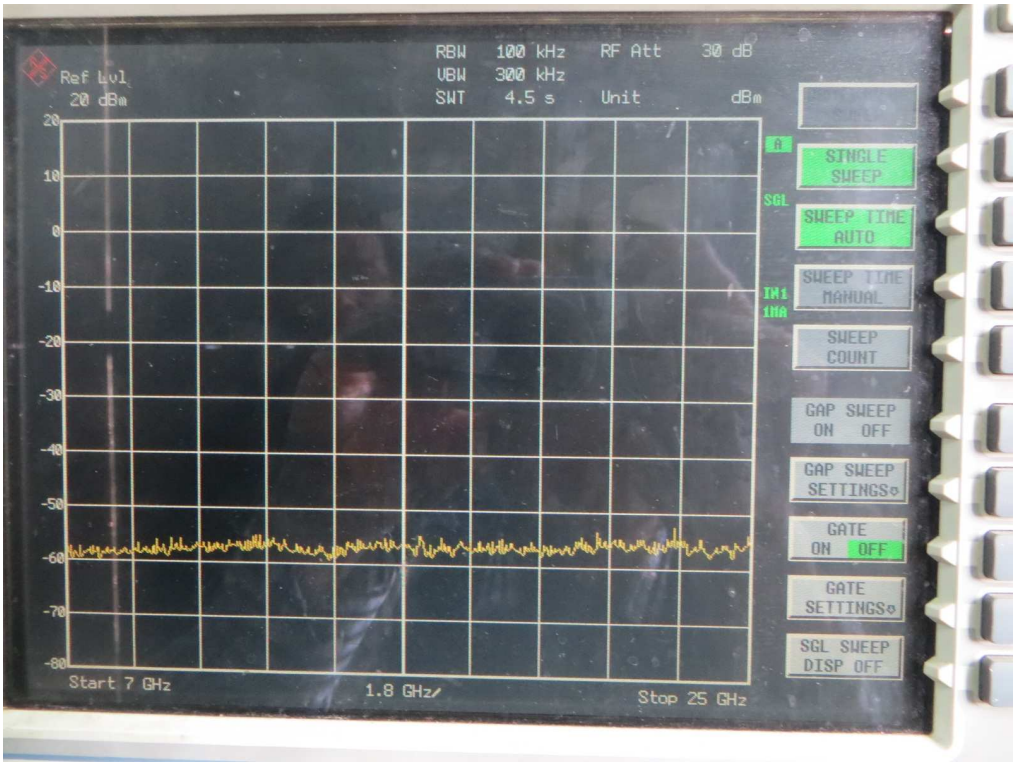
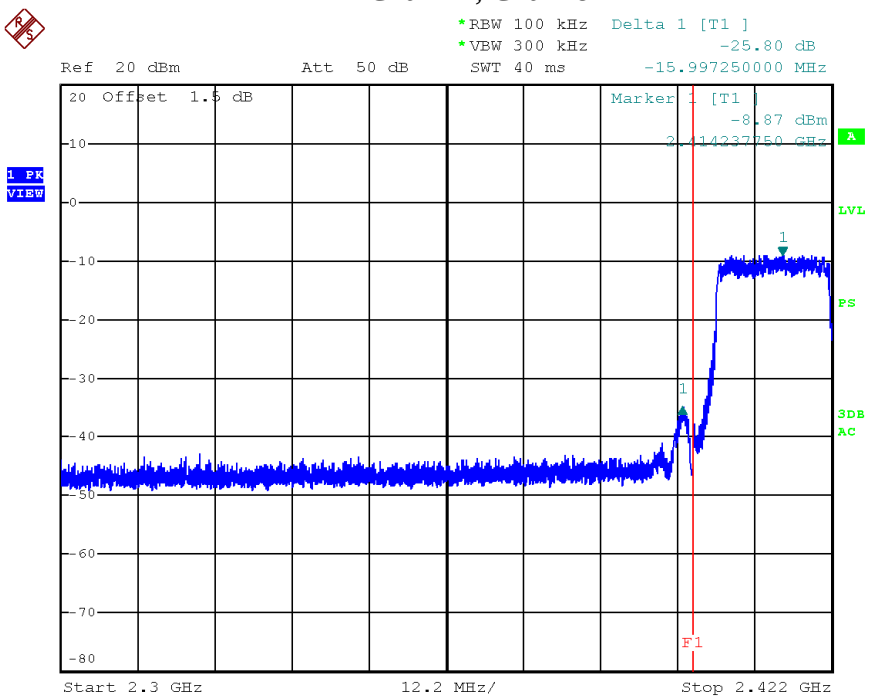
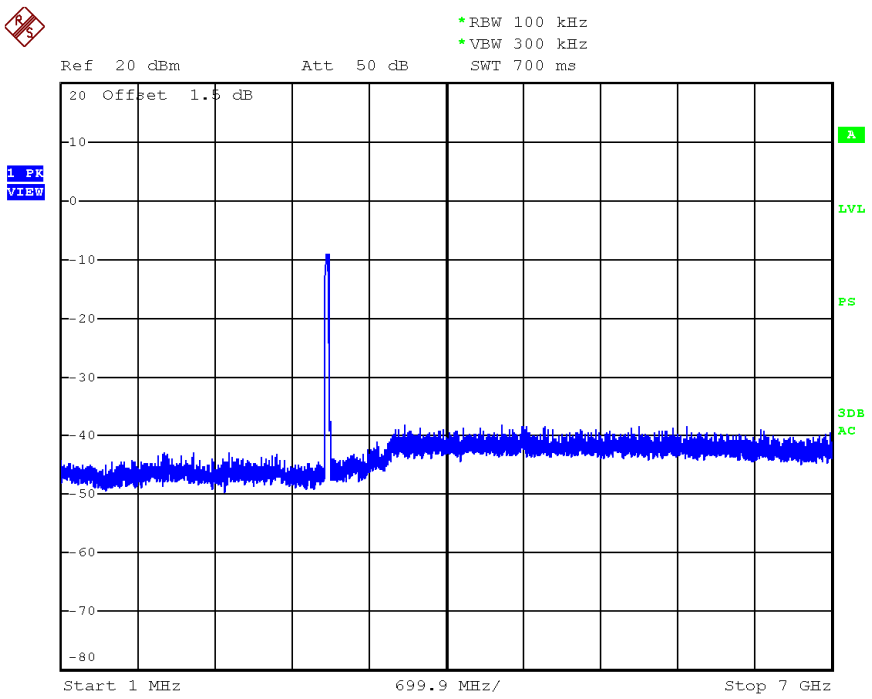


Mode	CH	Result		Limit (dB)
		Chain A	Chain B	
802.11n HT40	L	Pass	Pass	≥20
	M	Pass	Pass	
	H	Pass	Pass	

Chain A, Channel L

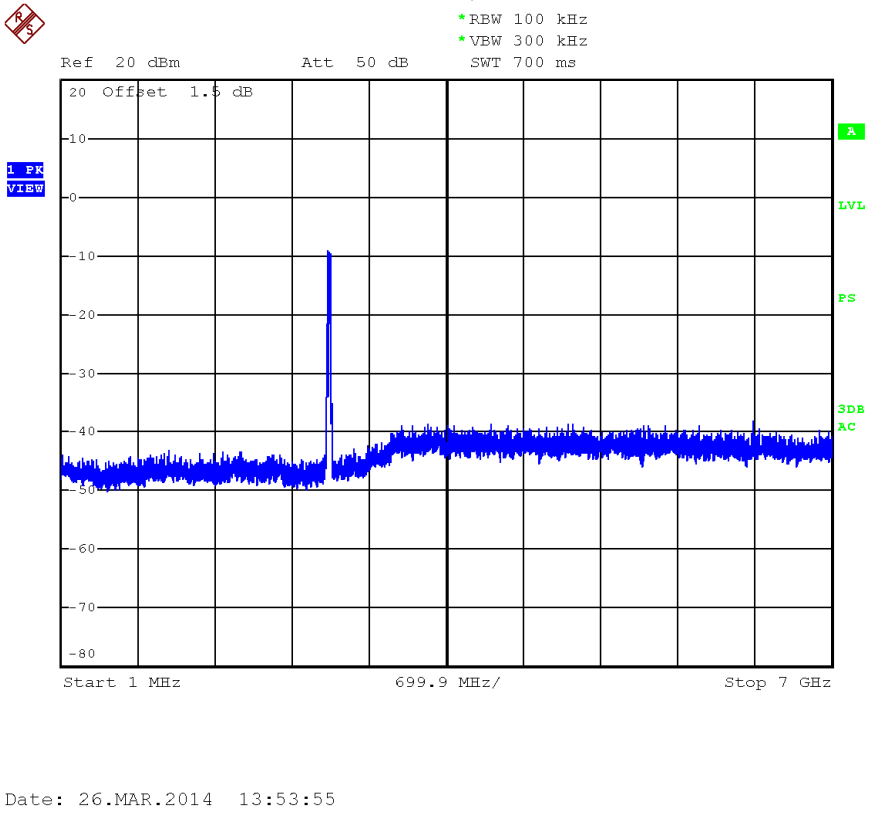


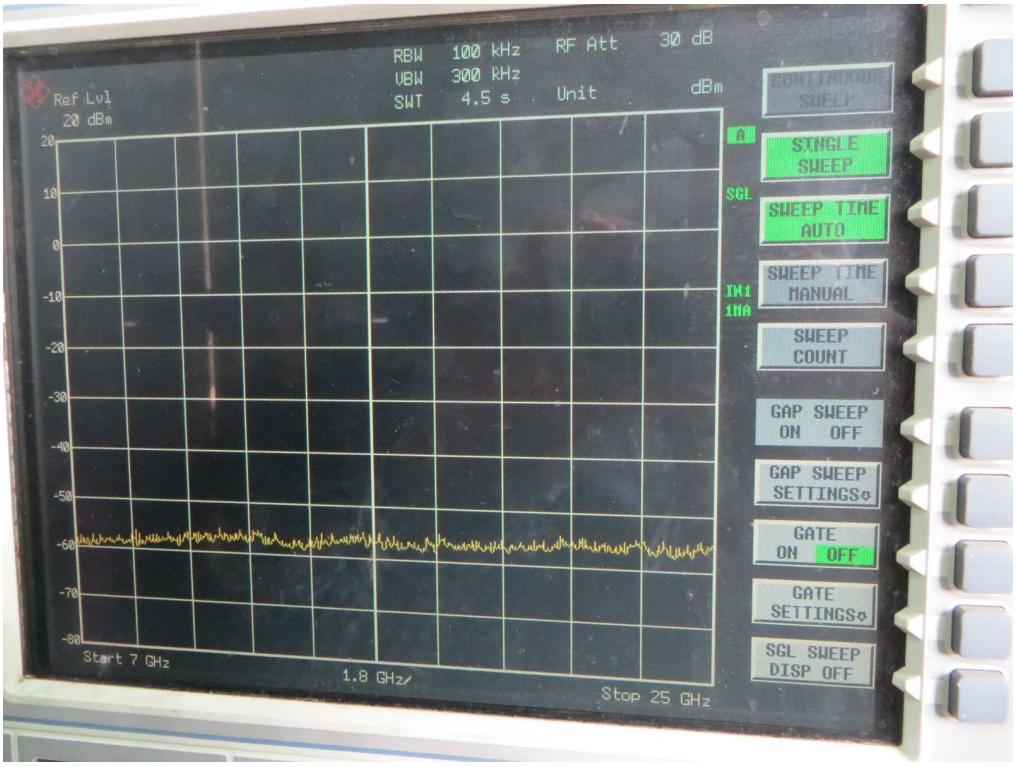
Date: 26.MAR.2014 13:55:10



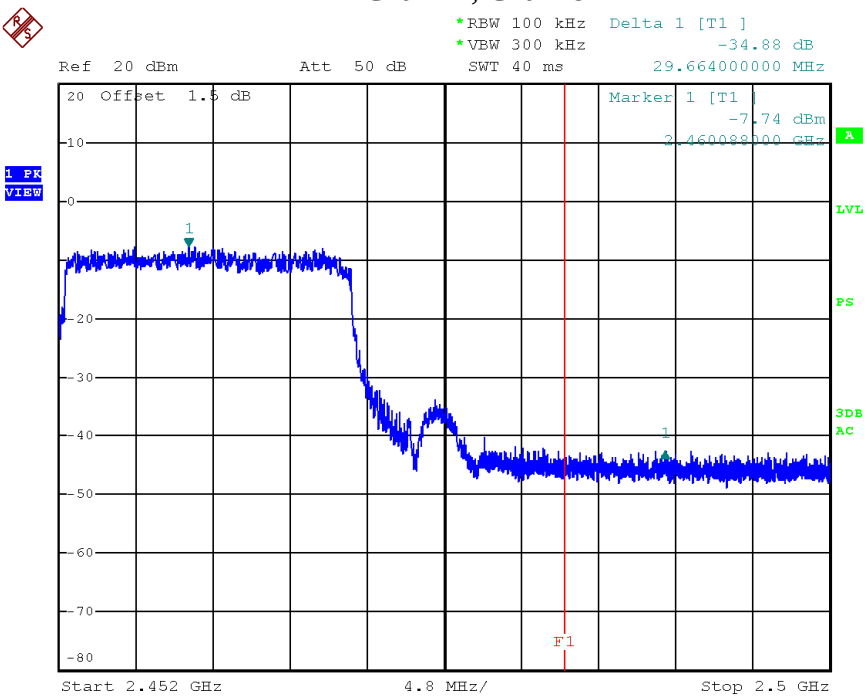
Date: 26.MAR.2014 13:54:29

Chain A, Channel M





Chain A, Channel H



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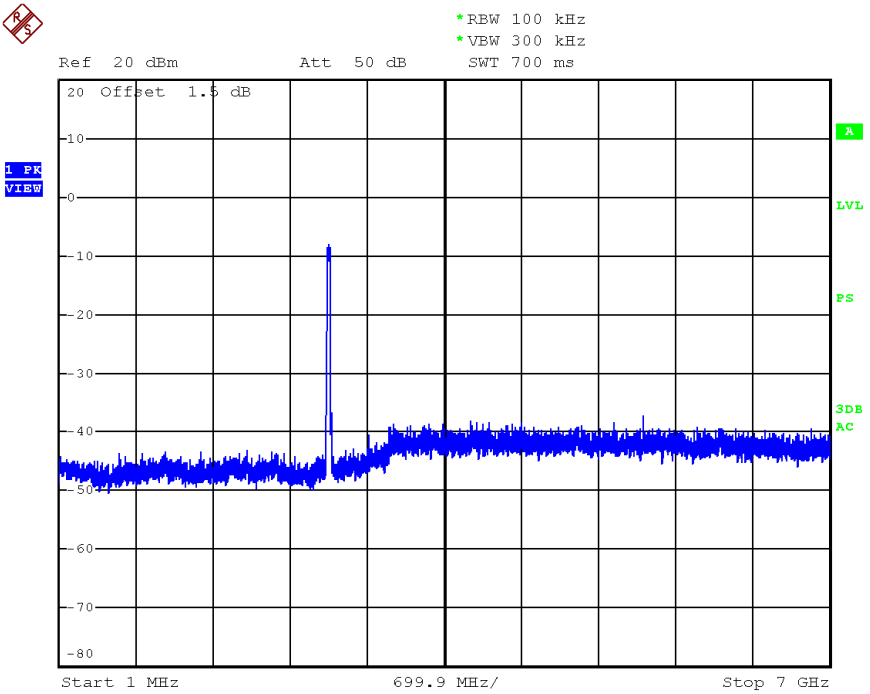

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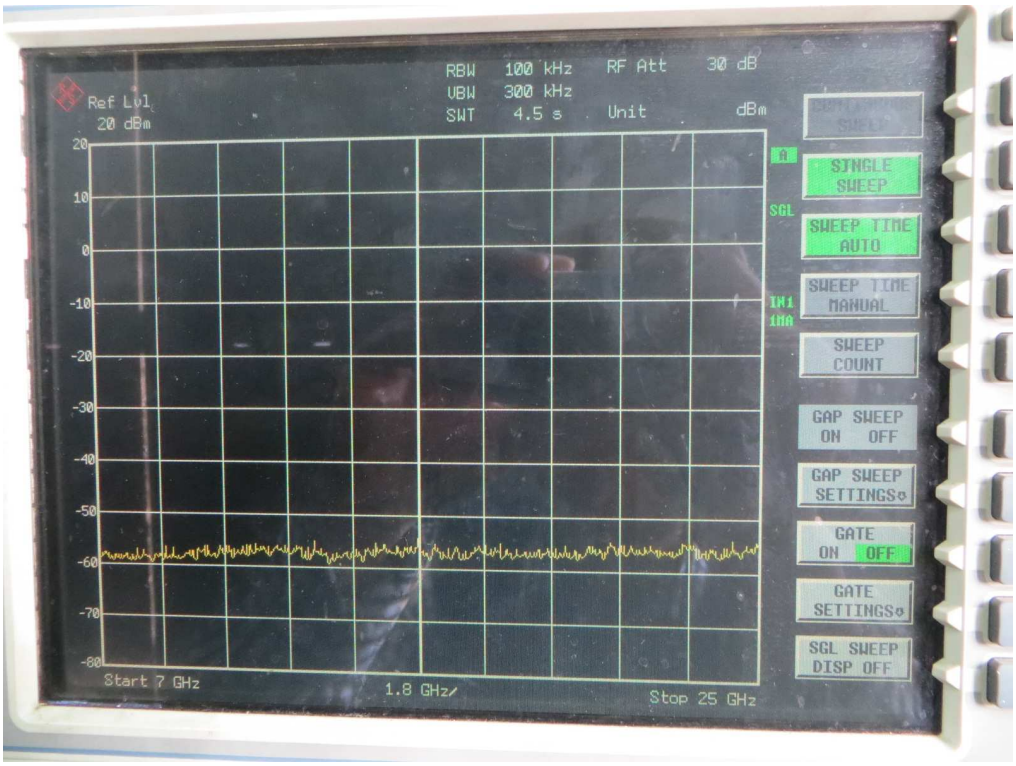
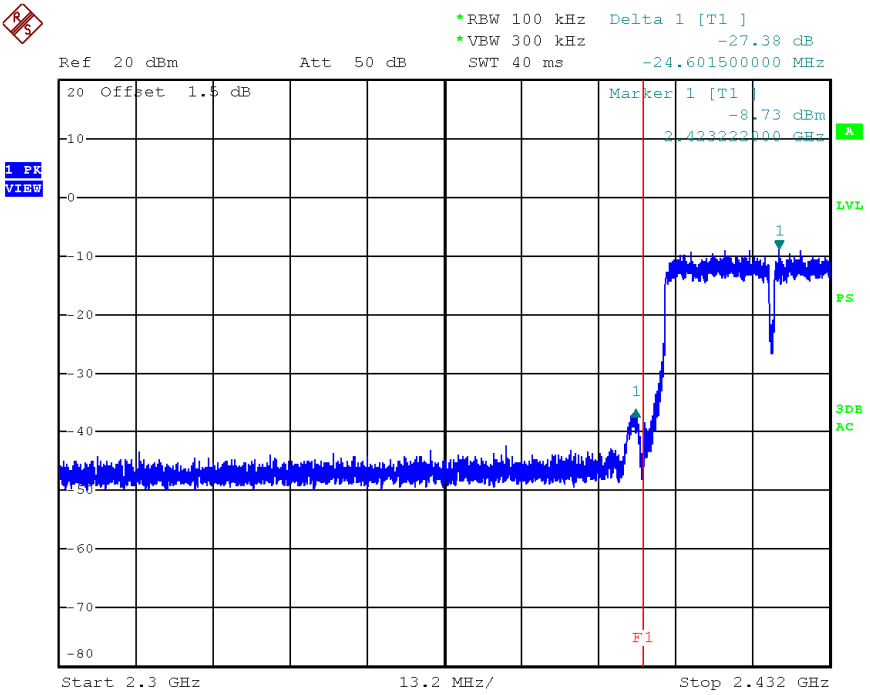


Chain B, Channel L



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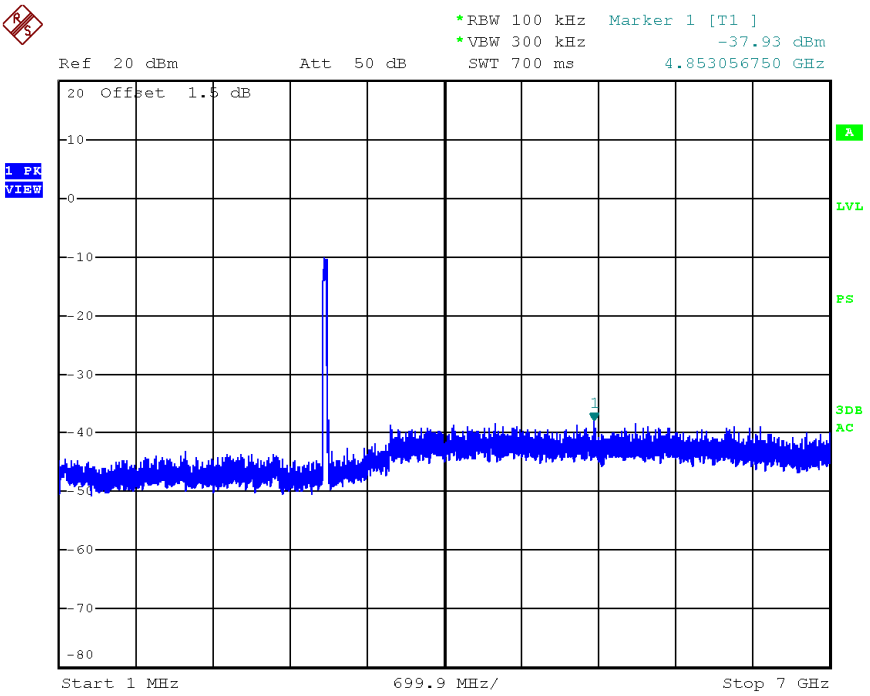

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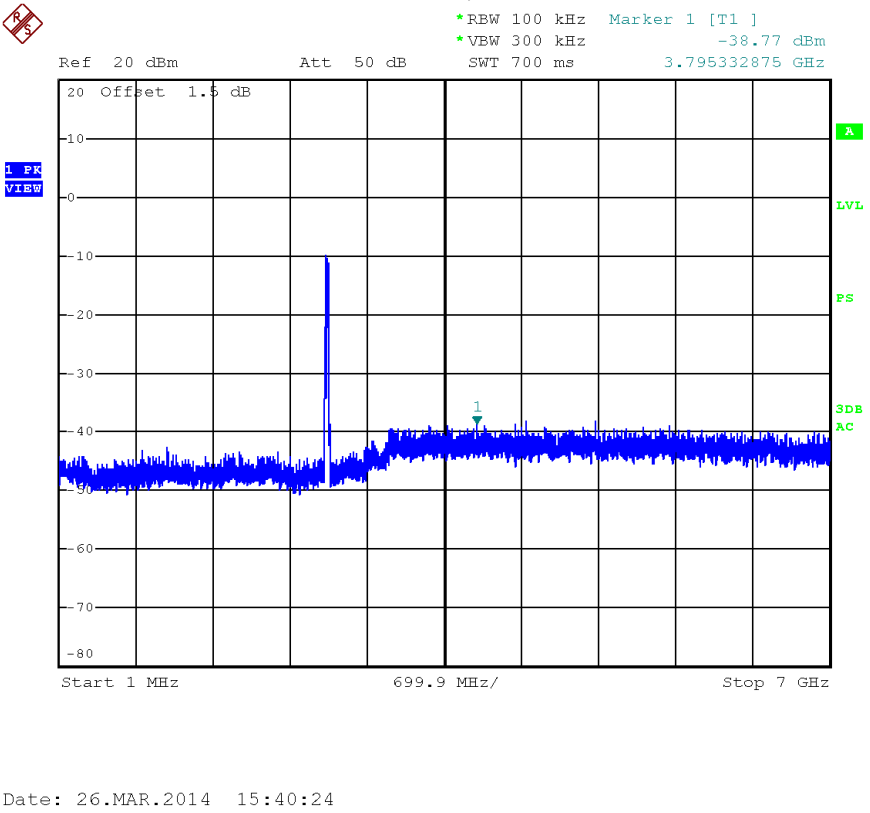
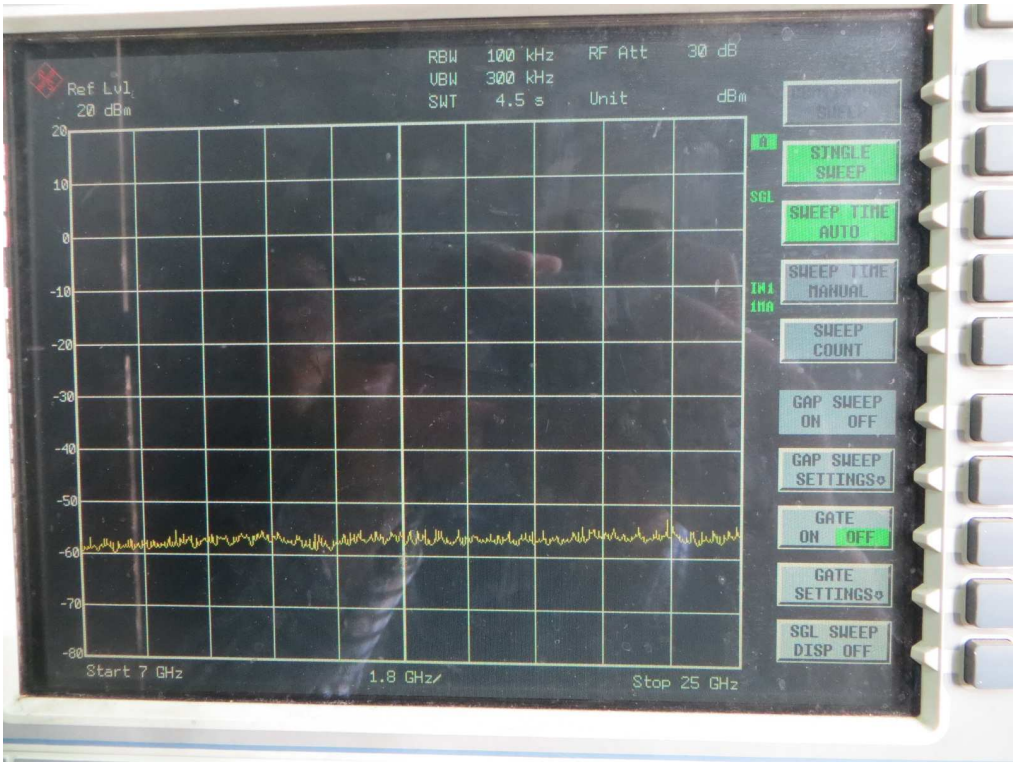
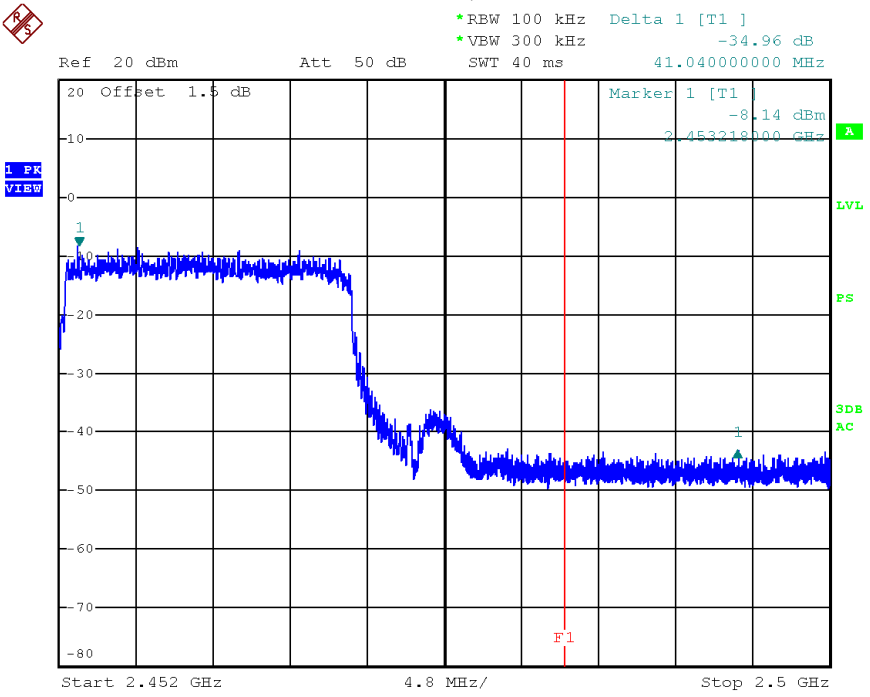
Chain B, Channel M





Chain B, Channel H



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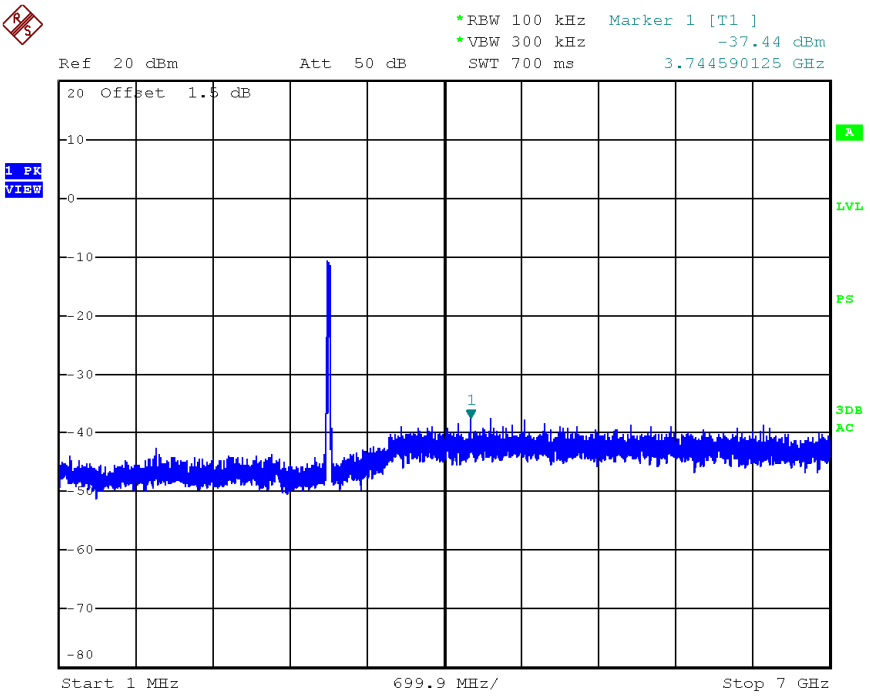

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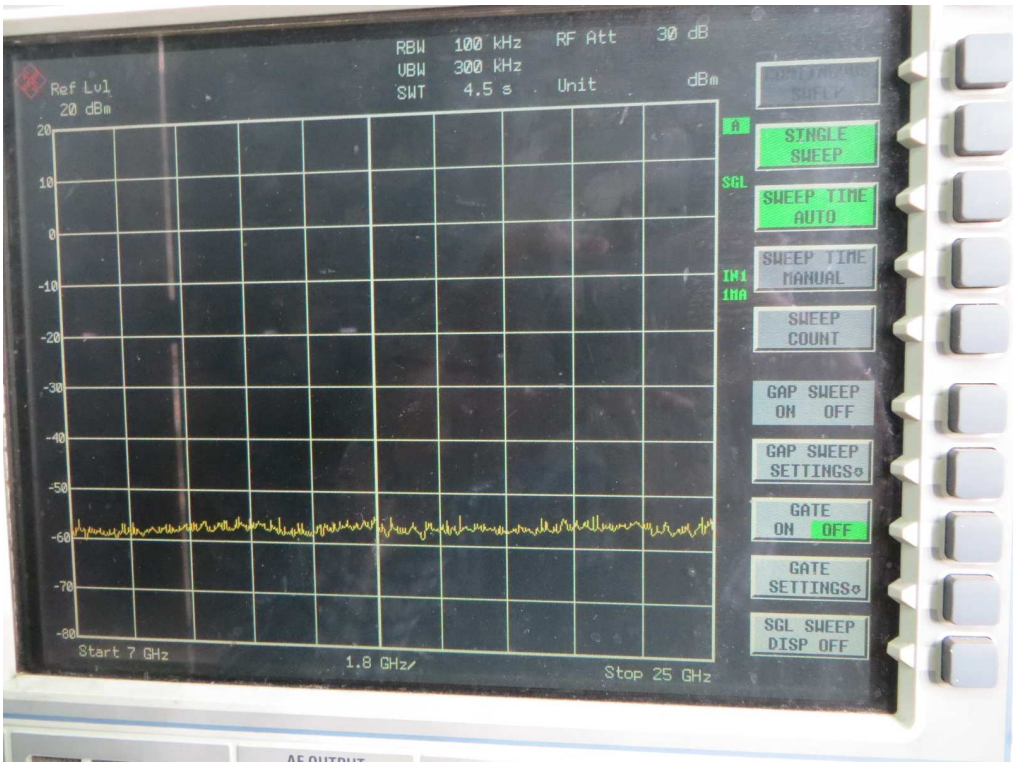


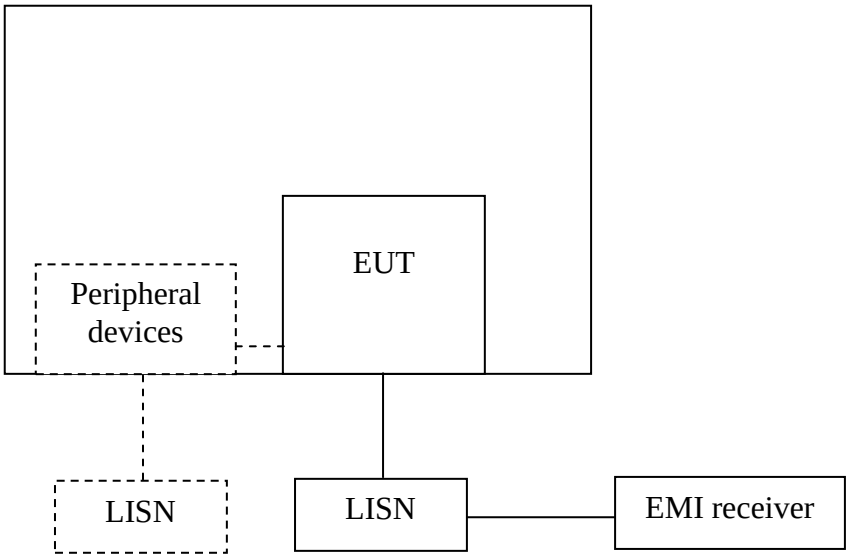
8. Power line conducted emission

Test result: **Pass**

8.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

8.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

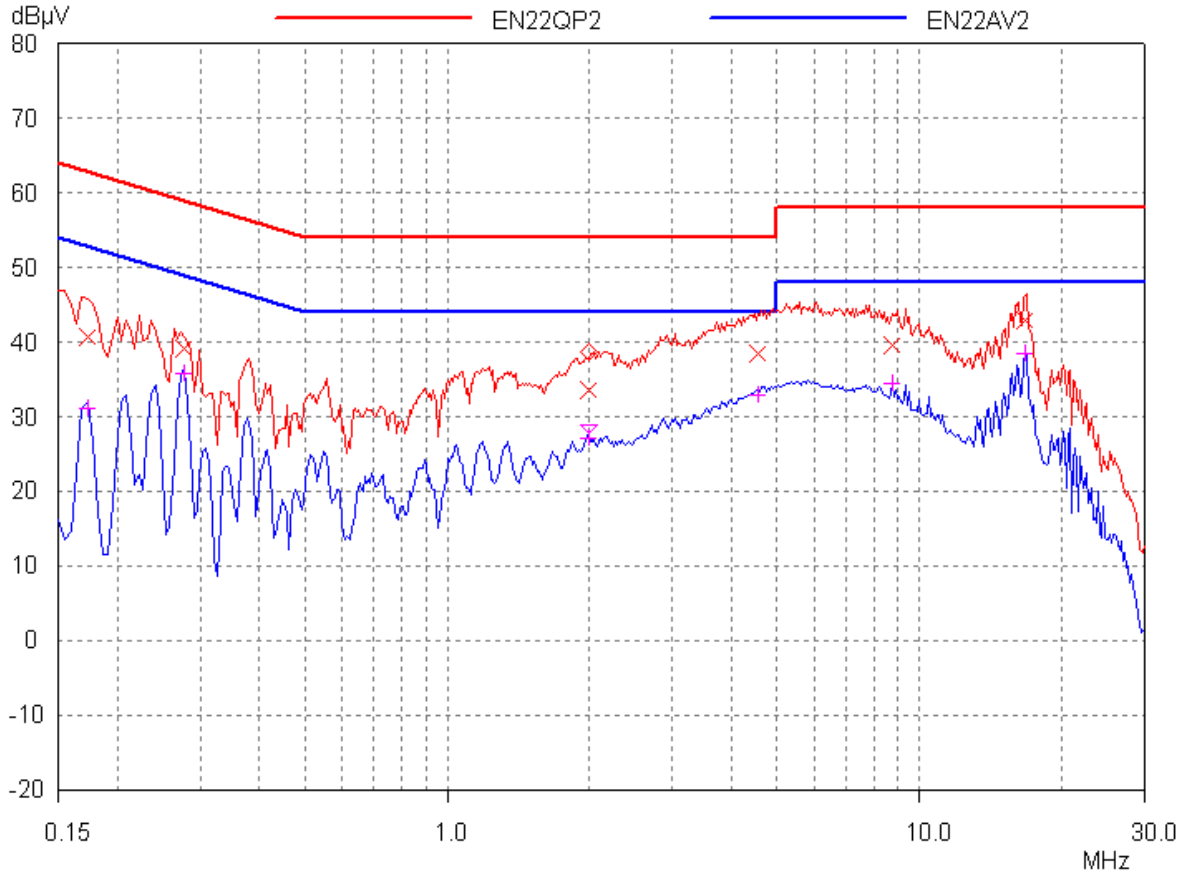
☐ For floor standing equipment, wooden support is 0.1m height rack.

8.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50Ω/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω/50uH coupling impedance with 50Ω termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.
The bandwidth of the test receiver is set at 9 kHz.

8.4 Test protocol

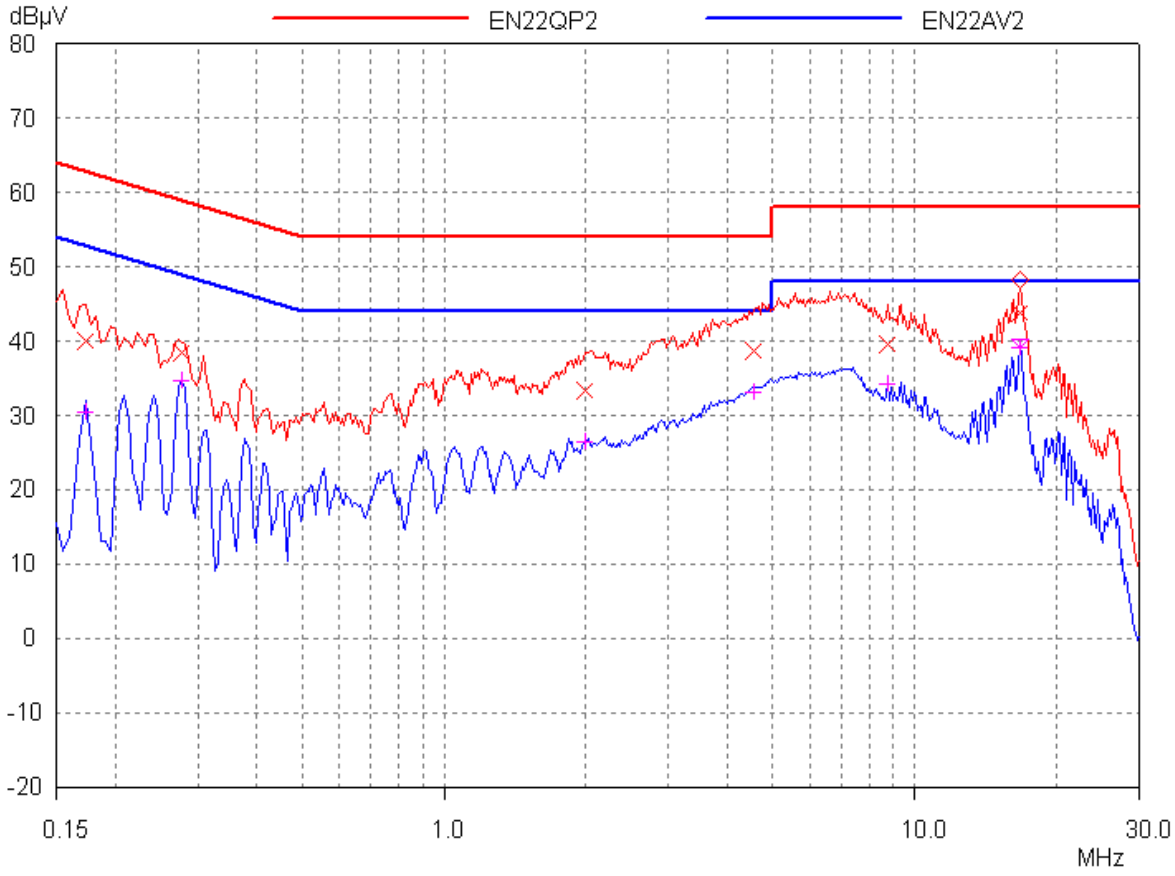
Line L



Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.17	3.00	40.61	31.15	64.84	54.84	24.23	23.69
0.28	3.00	39.09	35.85	60.94	50.94	21.85	15.09
2.00	3.00	33.64	27.07	56.00	46.00	22.36	18.93
4.52	3.00	38.41	32.87	56.00	46.00	17.59	13.13
8.74	3.00	39.52	34.49	60.00	50.00	20.48	15.51
16.66	3.00	42.98	38.51	60.00	50.00	17.02	11.49

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).
2. Margin (dB) = Limit - Corrected Reading.

Line N



Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.17	3.00	40.11	30.43	64.84	54.84	24.73	24.41
0.28	3.00	38.36	34.73	60.94	50.94	22.58	16.21
2.00	3.00	33.36	26.47	56.00	46.00	22.64	19.53
4.52	3.00	38.63	33.21	56.00	46.00	17.37	12.79
8.74	3.00	39.58	34.32	60.00	50.00	20.42	15.68
16.66	3.00	43.74	39.10	60.00	50.00	16.26	10.90

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).
2. Margin (dB) = Limit - Corrected Reading.