EMC TEST REPORT for Licensed Device

No. SH12020032-001

Applicant	: Aruba Networks, Inc. 1322 Crossman Ave., Sunnyvale CA 94089 USA
Manufacturer	: Aruba Networks, Inc. 1322 Crossman Ave., Sunnyvale CA 94089 USA
Product Name	: Wireless Mesh Router
Type/Model	: MSR4K43N3XXX (Where X=A to Z, Blank or Symbol for marketing purpose)

SUMMARY

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

47CFR Part 90 (2010): Private Land Mobile Radio Service

TIA/EIA-603-C (2004): Land Mobile FM or PM – Communications Equipment – Measurement and performance Standards

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

RSS-111 Issue 4 (January 2012): Broadband Public Safety Equipment Operating in the Band 4940-4990 MHz

Date of issue: Feb 16, 2012

Prepared by:

Wakeyou Wang (*Project Engineer*)

Reviewed by:

Daniel Zhao (*Reviewer*)

Description of Test Facility

Name: Intertek Testing Services Ltd. Shanghai ETL Semko
Address: Building No.86, 1198 Qinzhou Road(North), Shanghai 200233, P.R. China

FCC Registration Number: 236597
IC Assigned Code: 2042B-1

Name of contact: Steve Li
Tel: +86 21 64956565 ext. 214
Fax: +86 21 54262335 ext. 214

Content

1. General Information

1.1 Applicant Information

Applicant:		Aruba Networks, Inc. 1322 Crossman Ave., Sunnyvale CA 94089 USA
Name of contact:		Ivaylo Tankov
Tel:		408-754-3035
Fax:		408-227-4550
Manufacturer:		Aruba Networks, Inc. 1322 Crossman Ave., Sunnyvale CA 94089 USA
Sample received date	:	Feb 1, 2012
Sample Identification No	:	*0120201-13-001*
Date of test	:	Feb 1, 2012 ~ Feb 16, 2012

1.2 Identification of the EUT

Equipment:	Wireless Mesh Router
Type/model:	MSR4K43N3XXX(Where X=A to Z, Blank or Symbol for marketing purpose)
FCC ID:	Q9DMSR4000AC
IC:	4675A-MSR4000AC

1.3 Technical specification

Operation Frequency Band: 4950 - 4980MHz

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

Gain of Antenna: AP-ANT-2*2-5614 (14dBi)
AP-ANT-86 (9dBi)

Rating: 100-240Vac, 0.75A, 50-60Hz

Description of EUT: Here are a series of models. They are electrically identical except for different model names.
Among the EUT, there are four same RF cards, namely card 0, card 1, card 2 and card 3. Each card has two chains, namely Chain 0-1 and Chain 0-2.

Channel Bandwidth: 20MHz

Channel Description: Two channels, namely 4950MHz and 4980MHz

Port identification:

Port	Description	Type	Number
1	Console	USB2.0	1
3	RF connector	Female-N	8
4	Ethernet	RJ45	1

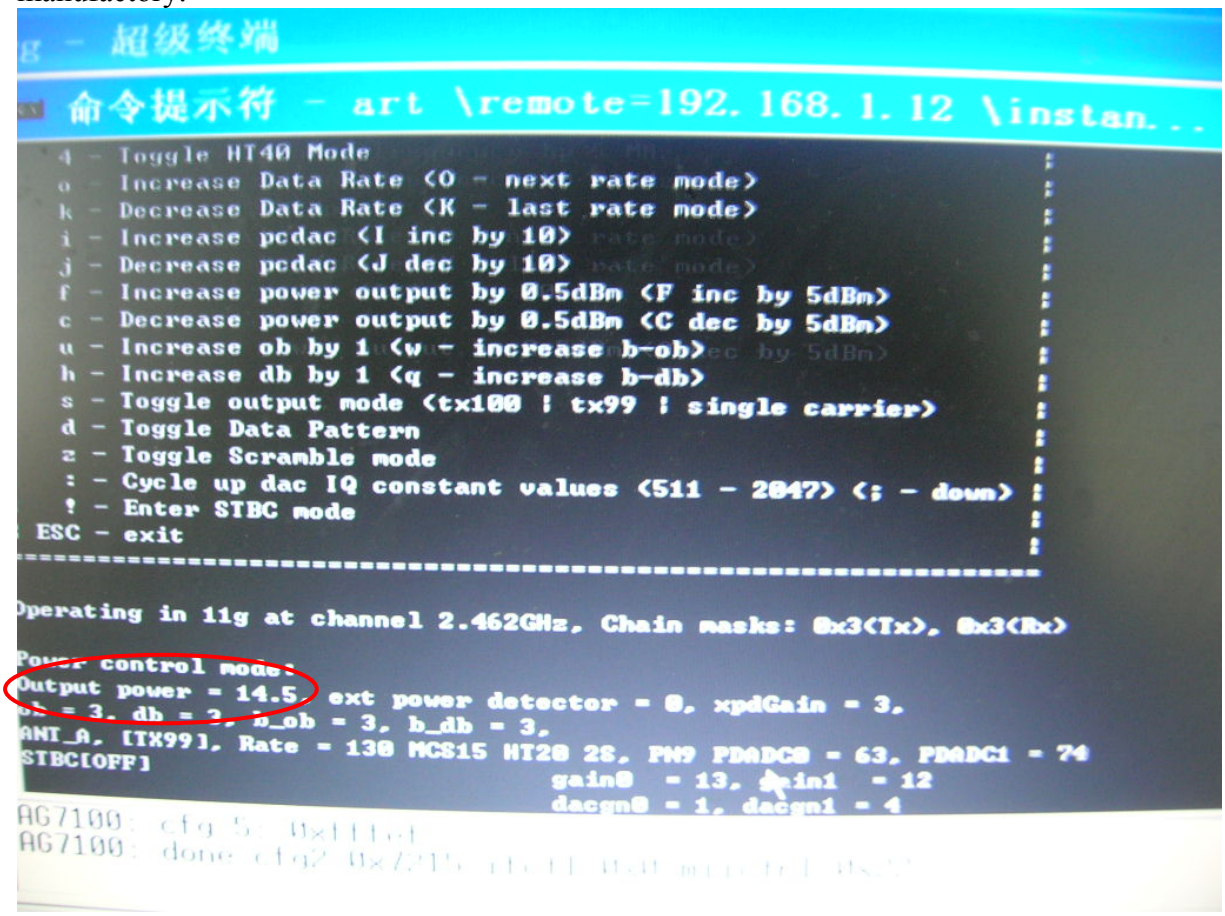
Dimension: 30cm * 30cm *13cm

Declared Temperature range: -30°C ~ 55°C

Declared **average** output power: 14.5dBm for dual chain; 11.5dBm for single chain

1.4 Mode of operation during the test / Test peripherals used

The EUT was set up as its normal use. While testing transmitting mode of EUT, the internal modulation was used.
During test, the power level was set as “14.5” indicated in software offered by the manufactory.



Test peripherals used:

Item No	Description	Band and Model	S/No
1	Laptop computer	FUJITSU SIMENS, LIFEBOOK	NA

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESIB 26	R&S	EC 3045	2011-10-21	2012-10-20
Semi-anechoic chamber	-	Albatross project	EC 3048	2011-5-21	2012-5-20
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2011-5-16	2013-5-15
Horn antenna	HF 906	R&S	EC 3049	2011-5-13	2013-5-12
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2011-4-12	2012-4-11
Test Receiver	ESCS 30	R&S	EC 2107	2011-10-21	2012-10-20
A.M.N.	ESH2-Z5	R&S	EC 3119	2012-1-9	2013-1-8
A.M.N.	ESH3-Z5	R&S	EC 2109	2012-1-10	2013-1-9
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2012-2-8	2013-2-7
High Pass Filter	WHKX 2.8/18G-12SS	Wainwright	EC4297-2	2012-2-8	2013-2-7
High Pass Filter	WHKX 7.0/1.8G-8SS	Wainwright	EC4297-3	2012-2-8	2013-2-7
Band Reject Filter	WRCGV 2400/2483-2390/2493-35/10SS	Wainwright	EC4297-4	2012-2-8	2013-2-7
Test Receiver	FSV40	R&S	/	2011-10-21	2012-10-20
Temperature and Humidity Chamber	GL-04AGP	GZ-ESPEC	EC2149	2011-9-1	2012-8-30
Preamplifier	AP-025C	Quietek	QT-AP003	2011-11-25	2012-11-24
Preamplifier	AP-180C	Quietek	CHM-0602013	2011-11-25	2012-11-24
Broad-Band Horn Antenna	BBHA9120D	Schwarzbeck	496	2011-11-25	2012-11-24
Broad-Band Horn Antenna	BBHA9170	Schwarzbeck	294	2011-11-25	2012-11-24

2.2 Test Standard

47CFR Part 90 (2010)
TIA/EIA-603-C (2004)
RSS-Gen Issue 3 (December 2010)
RSS-111 Issue 4 (January 2012)

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
Carrier Output Power	90.1215	RSS-111 Clause 5.3	Pass
Occupied Bandwidth	90.1213	RSS-111 Clause 5.3	Pass
Conducted Unwanted Emissions	90.210 (L)	RSS-111 Clause 5.4	Pass
Peak Excursion	90.1215	/	Pass
Power density	90.1215	RSS-111 Clause 5.3	Pass
Radiated Unwanted Emissions (Out of Band)	90.210 (L)	RSS-111 Clause 5.4	Pass
Transmitter Frequency Stability (Temperature Variation)	90.213	RSS-111 Clause 5.2	Pass
Transmitter Frequency Stability (Voltage Variation)	90.213	RSS-111 Clause 5.2	Pass
Transmitter Transient Frequency Behaviour	90.214	/	NA

2.4 RF cards VS Power

Mode	Chain	CH	Output Power (dBm)
802.11a	0-1	L	**11.59**
	0-2	L	**11.43**
	1-1	L	11.41
	1-2	L	11.40
	2-1	L	11.24
	2-2	L	11.31
	3-1	L	11.29
	3-2	L	11.38
802.11n, HT20	0-1	L	**11.53**
	0-2	L	**11.50**
	1-1	L	11.47
	1-2	L	11.45
	2-1	L	11.33
	2-2	L	11.36
	3-1	L	11.41
	3-2	L	11.44

Based on the test data above, in this report, the card 0 with the highest output power is chosen to perform all tests.

2.5 Data rate VS power

Mode	Data Rate	CH	Level at Chain 0-1 (dBm)
802.11a	MCS0	M	10.03
	MCS1	M	10.92
	MCS2	M	10.96
	MCS3	M	10.85
	MCS4	M	11.25
	MCS5	M	11.28
	MCS6	M	11.30
	MCS7	M	**11.59**
802.11n, HT20	MCS0	M	10.77
	MCS1	M	10.73
	MCS2	M	10.79
	MCS3	M	11.15
	MCS4	M	11.25
	MCS5	M	11.31
	MCS6	M	11.62
	MCS7	M	**11.53**

Based on the test data above, in this report, the highest speed is applied for all tests in every mode.

3. Transmitter Carrier Output Power

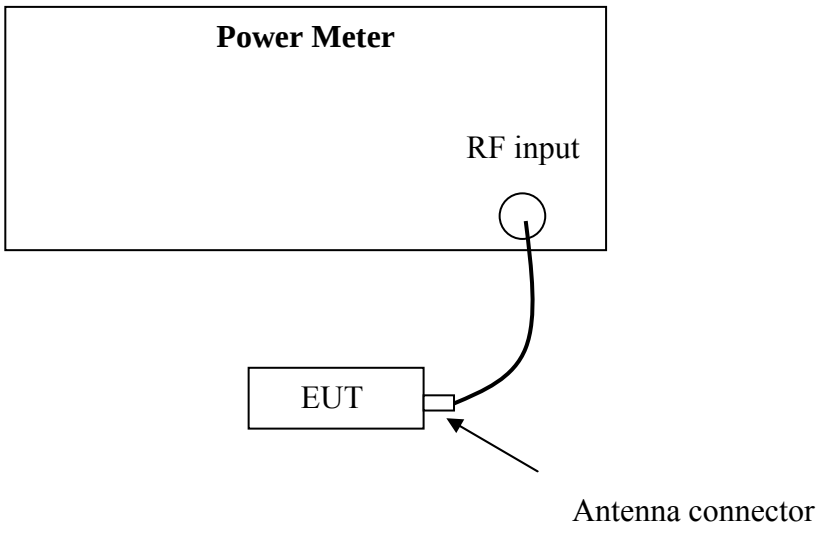
Test result: PASS

3.1 Limit

Channel Bandwidth (MHz)	Transmitter Power, P (dBm)	
	Low-power Device	High-power Device
1	P ≤ 7	7 < P ≤ 20
5	P ≤ 14	14 < P ≤ 27
10	P ≤ 17	17 < P ≤ 30
15	P ≤ 18.8	18.8 < P ≤ 31.8
20	P ≤ 20	20 < P ≤ 33

Note: If transmitting antennas of directional gain greater than 9 dBi are used, the maximum conducted output power should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9dBi.

3.2 Test Configuration



3.3 Test Procedure and test setup

Test procedure is followed as TIA-603-C 2.2.1.

3.4 Test Protocol

Temperature : 22°C
Relative Humidity : 43 %

For the highest gain of all applied antennas is 14dBi, the limit for output power should be 20dBm - (14dBi – 9dBi) = 15dBm.

Mode	CH	Chain 0-1 (dBm)	Chain 0-2 (dBm)	Output power (dBm)	Limit (dBm)
802.11a	L	11.59	/	11.59	15.00
	H	11.80	/	11.80	
802.11n, HT20 Single Chain	L	11.53	/	11.53	
	H	11.67	/	11.67	
802.11n, HT20 Dual Chain	L	11.29	11.56	14.44	
	H	11.50	11.65	14.59	

802.11a, Channel L

802.11a, Channel H

802.11n, HT20, single chain mode, Channel L

802.11n, HT20, single chain mode, Channel H

802.11n, HT20, dual chain mode, Channel L
Chain 0-1

Chain 0-2

802.11n, HT20, dual chain mode, Channel H

Chain 0-1

Chain 0-2

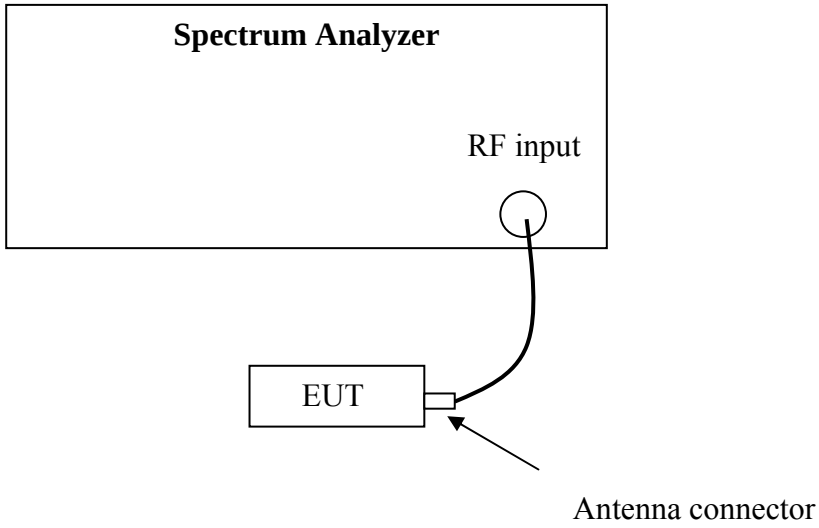
4. Transmitter Occupied Bandwidth

Test result: **Pass**

4.1 Test limit

Channel Bandwidth (MHz)	Transmitter Power, P (dBm)	
	Low-power Device	High-power Device
1	P ≤ 7	7 < P ≤ 20
5	P ≤ 14	14 < P ≤ 27
10	P ≤ 17	17 < P ≤ 30
15	P ≤ 18.8	18.8 < P ≤ 31.8
20	P ≤ 20	20 < P ≤ 33

4.2 Test Configuration



4.3 Test procedure and test setup

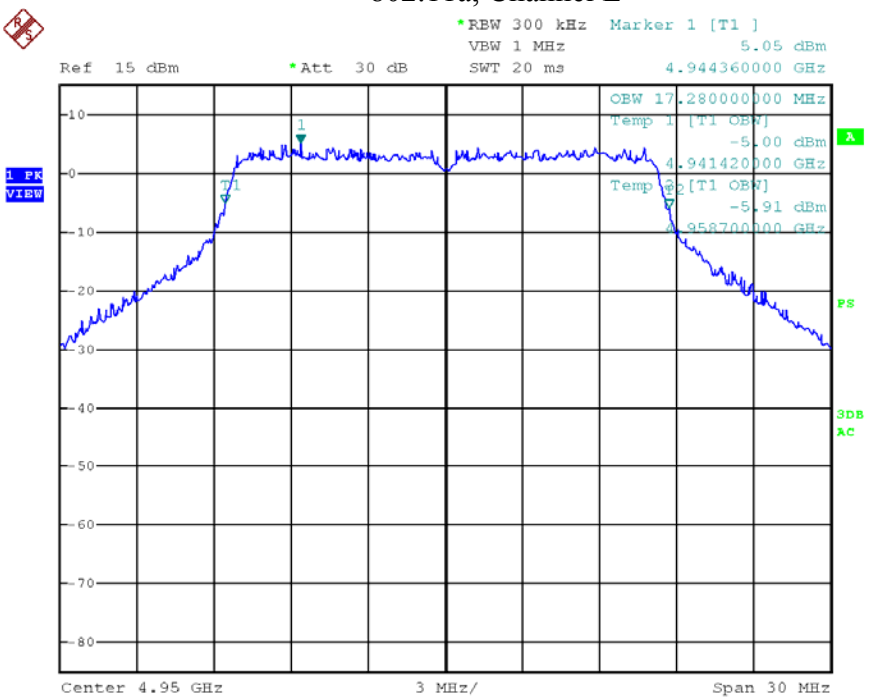
Occupied bandwidth is tested for 99% bandwidth with Channel Power Function of the Spectrum Analyzer.

4.4 Test protocol

Temperature : 22 °C
Relative Humidity : 43 %

Mode	CH	OB of Chain 0-1 (MHz)	OB of Chain 0-2 (MHz)	Limit (MHz)
802.11a	L	18.28	/	20.00
	H	18.28	/	
802.11n, HT20 Single Chain	L	18.24	/	
	H	18.30	/	
802.11n, HT20 Dual Chain	L	18.24	18.24	
	H	18.24	18.24	

802.11a, Channel L



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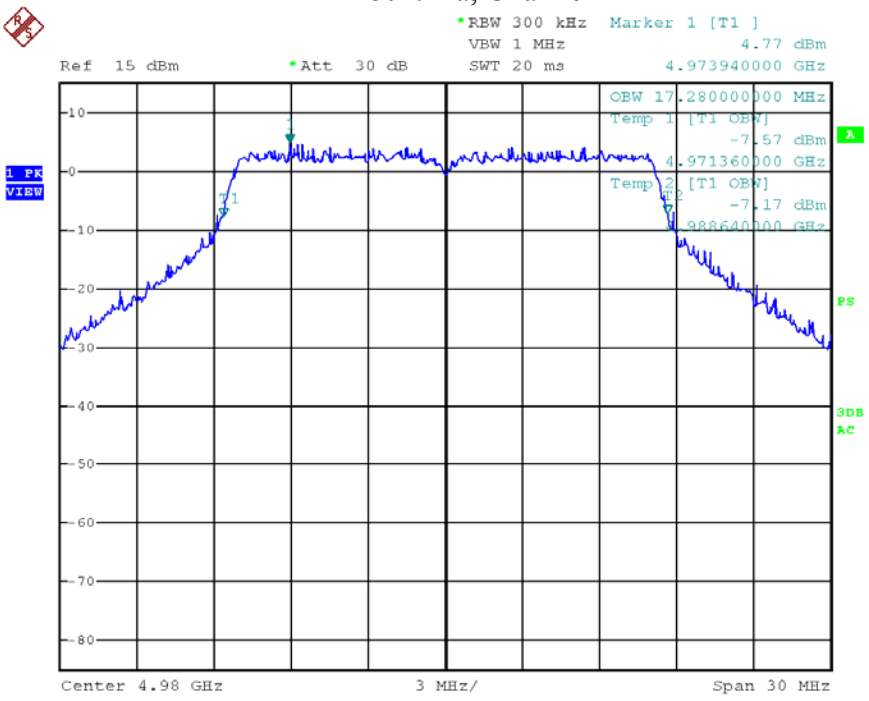
802.11a, Channel H



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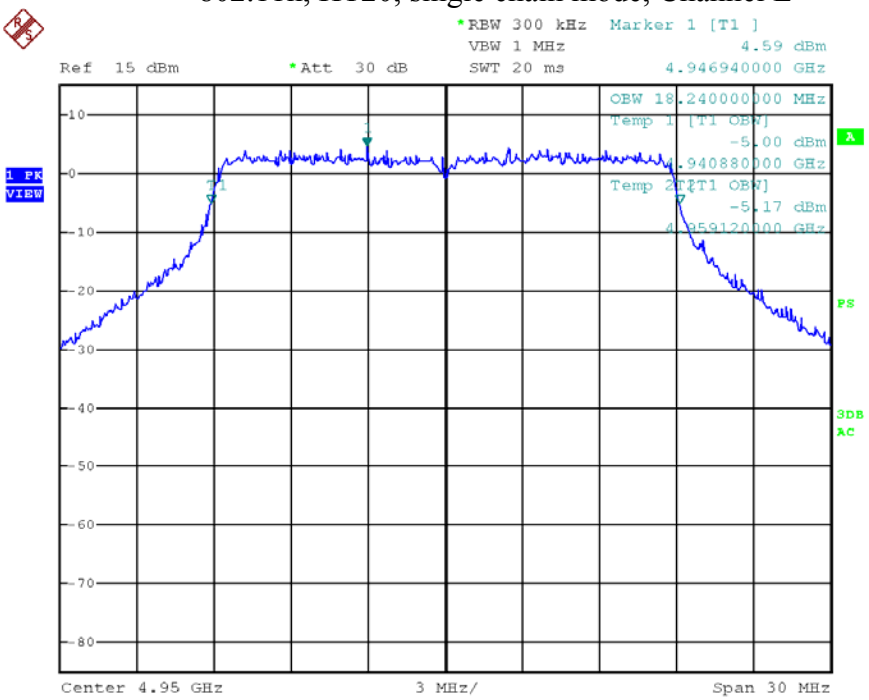
802.11n, HT20, single chain mode, Channel L



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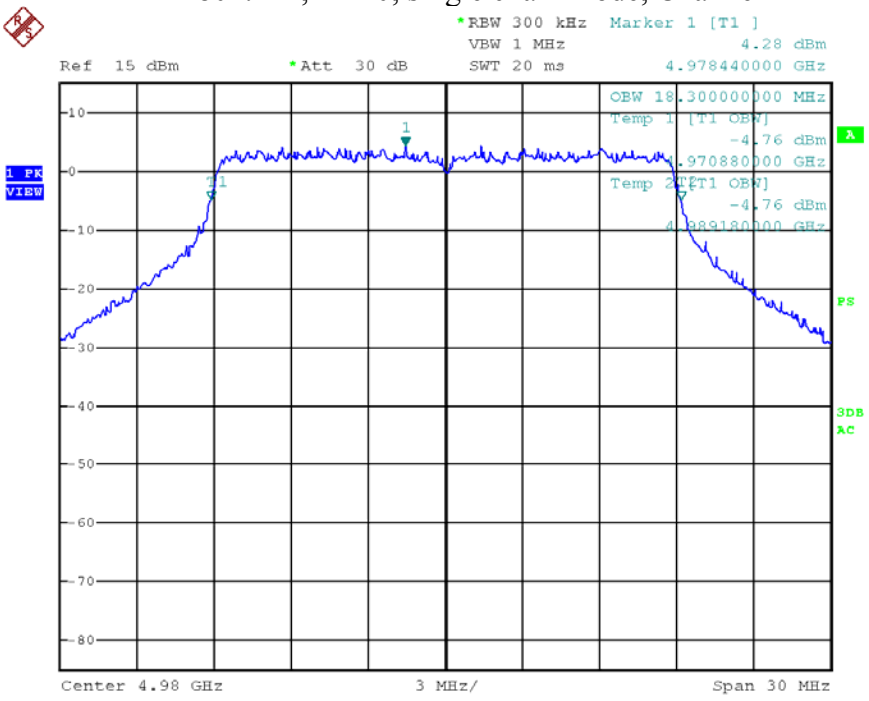
802.11n, HT20, single chain mode, Channel H



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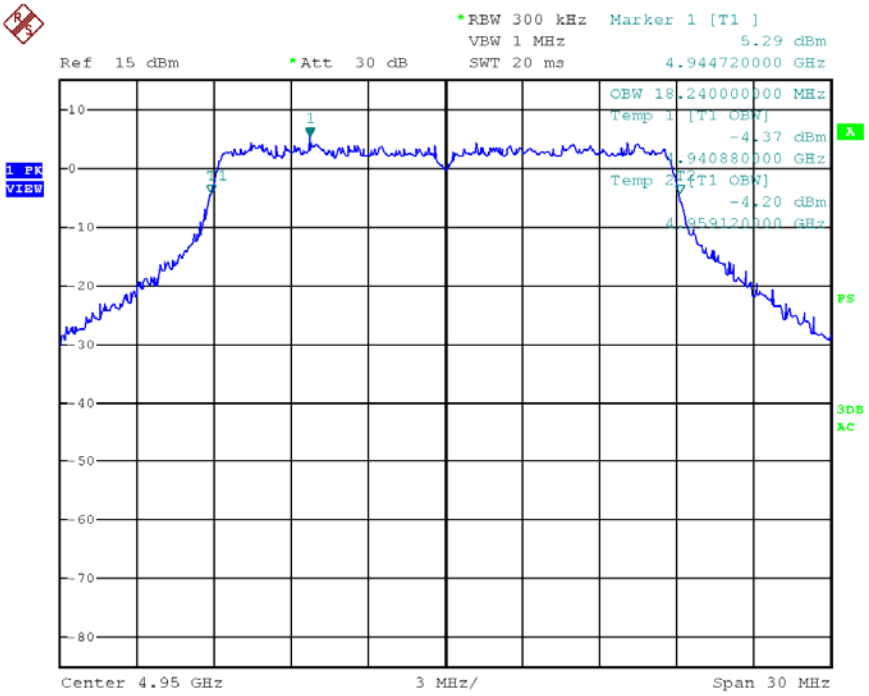
802.11n, HT20, dual chain mode, Channel L

Chain 0-1



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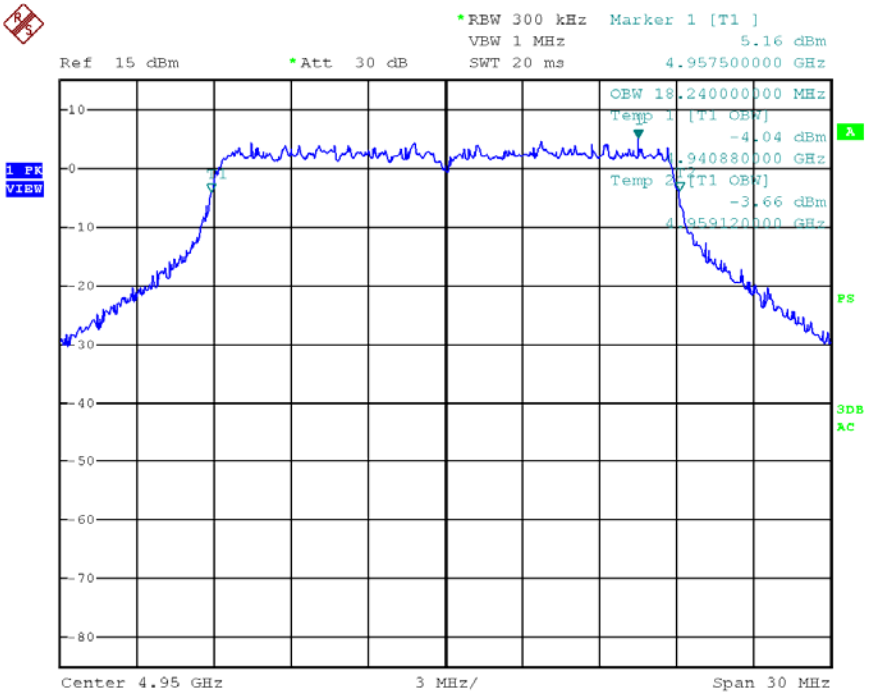
Chain 0-2



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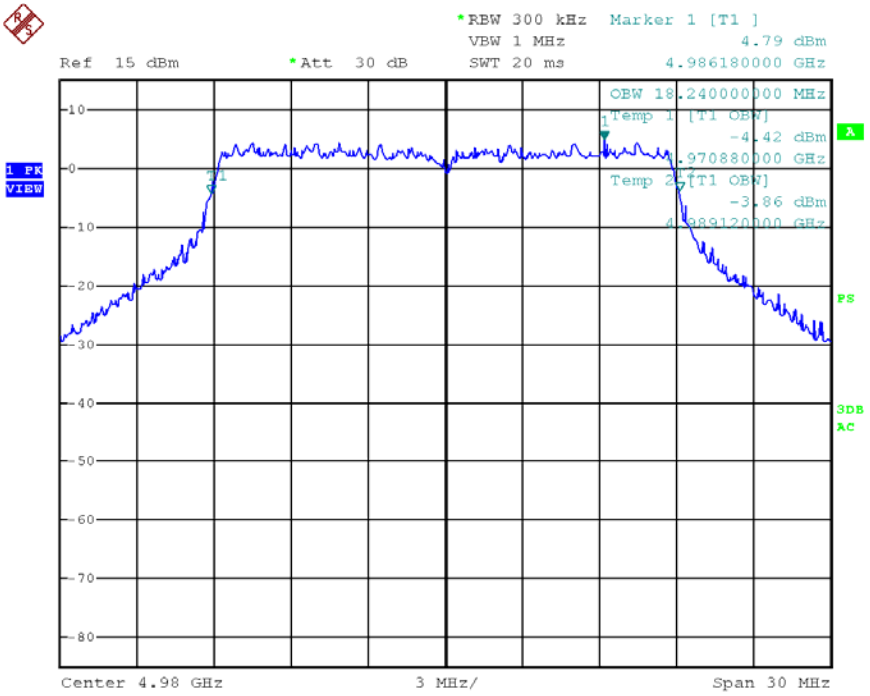
802.11n, HT20, dual chain mode, Channel H

Chain 0-1



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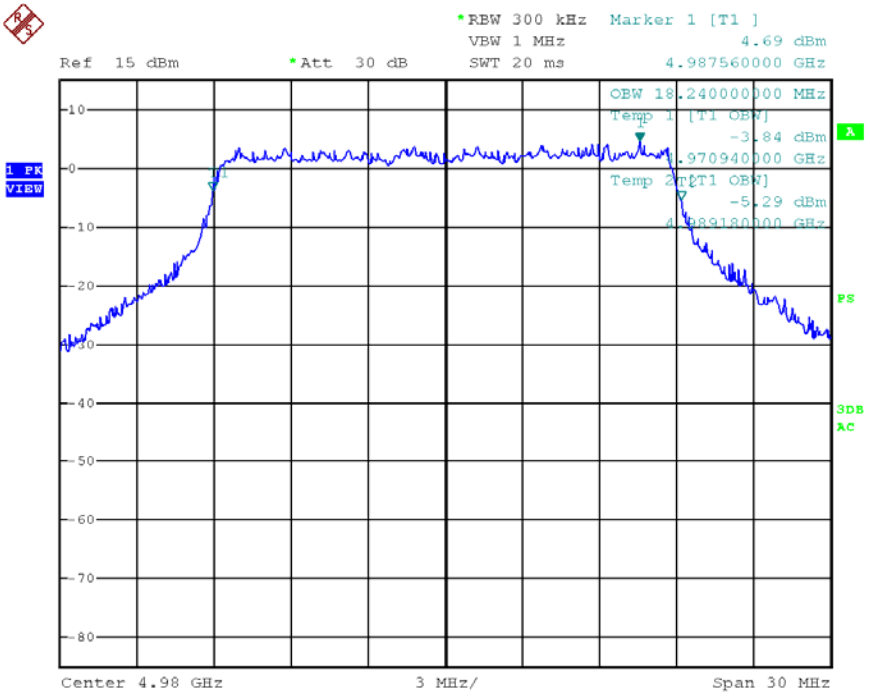
Chain 0-2



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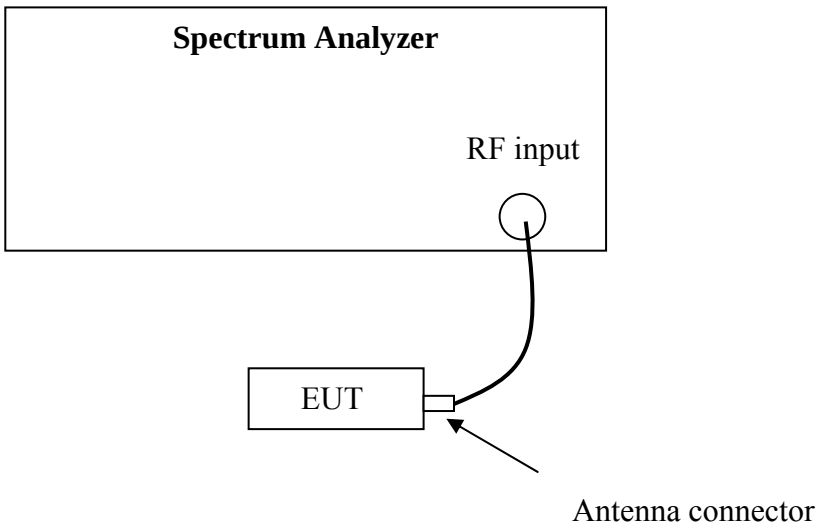
5. Transmitter Conducted Emissions

Test result: **Pass**

5.1 Test limit

Offset Frequency f_d (% of the Equipment's Channel Bandwidth)	Minimum Attenuation (dB)	
	Low-power Transmitter	High-power Transmitter
$0 < f_d \leq 45$	0	0
$45 < f_d \leq 50$	$219 \log (f_d/45)$	$568 \log (f_d/45)$
$50 < f_d \leq 55$	$10 + 242 \log (f_d/50)$	$26 + 145 \log (f_d/50)$
$55 < f_d \leq 100$	$20 + 31 \log (f_d/55)$	$32 + 31 \log (f_d/55)$
$100 < f_d \leq 150$	$28 + 68 \log (f_d/100)$	$40 + 57 \log (f_d/100)$
$f_d > 150$	40	whichever is less stringent 50 or $55 + 10 \log p$

5.2 Test Configuration



5.3 Test procedure and test setup

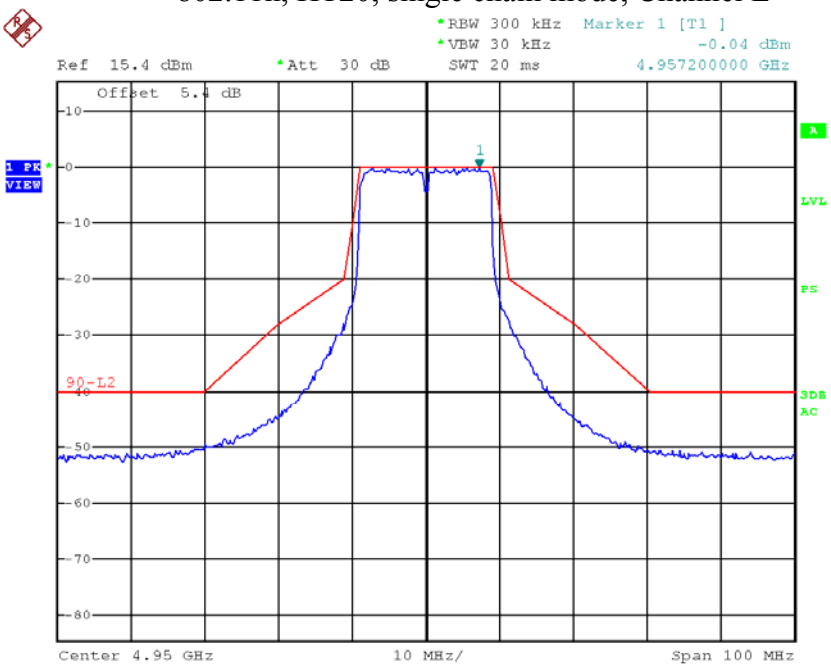
Test procedure as per TIA-603-C Section 2.2.13.

5.4 Test Protocol

Temperature : 22 °C

Relative Humidity : 43 %

802.11n, HT20, single chain mode, Channel L



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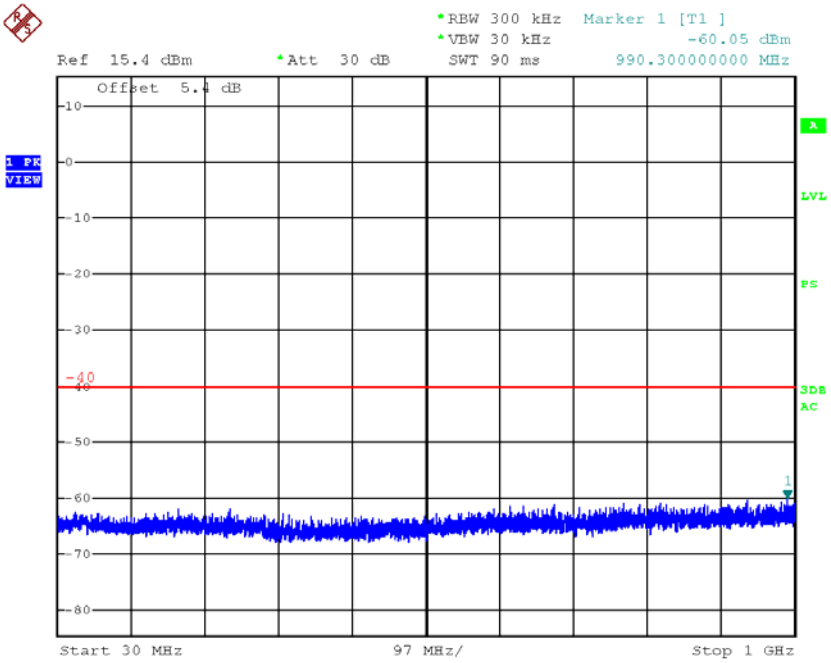

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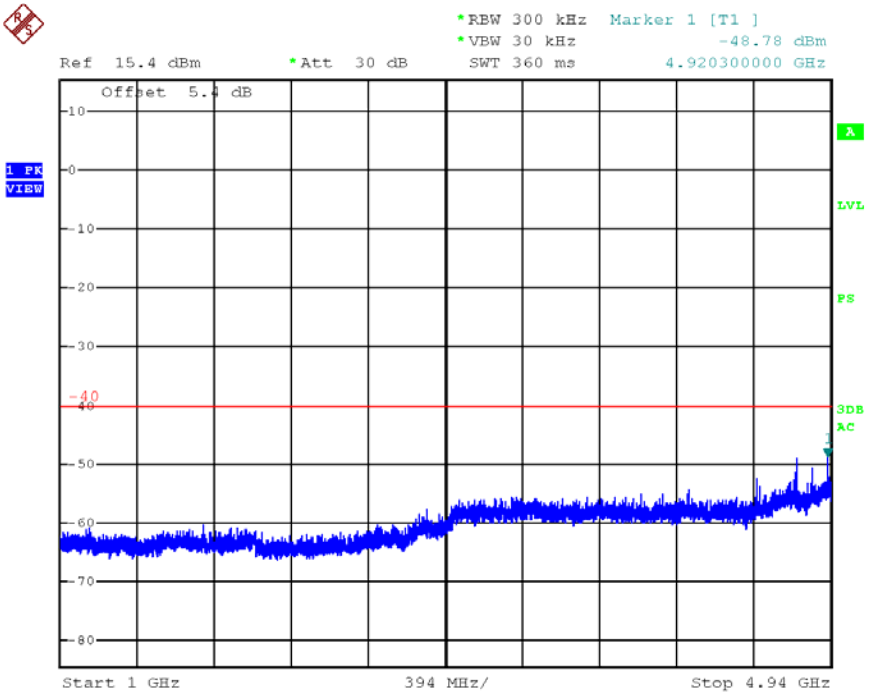

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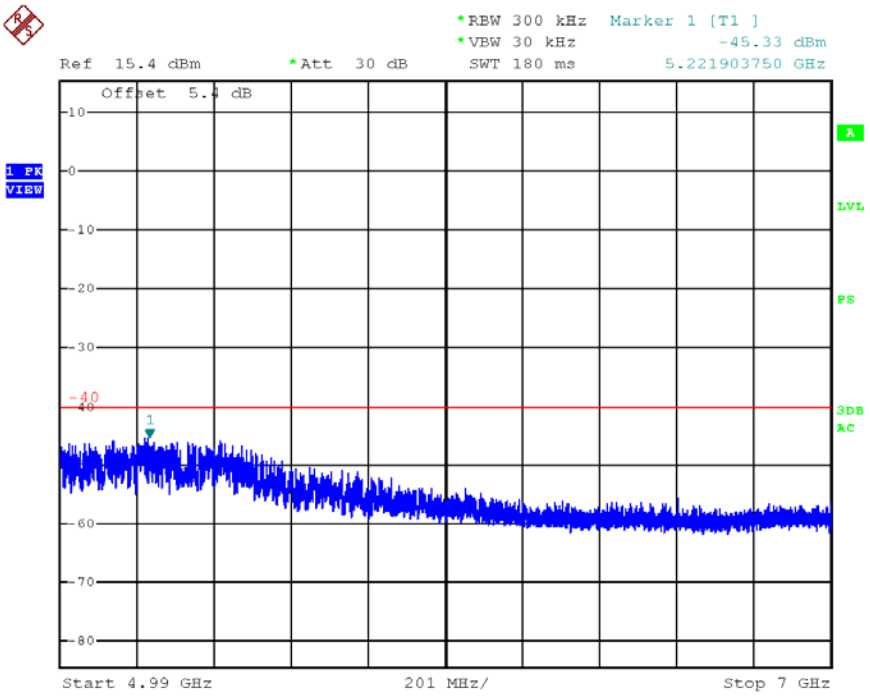

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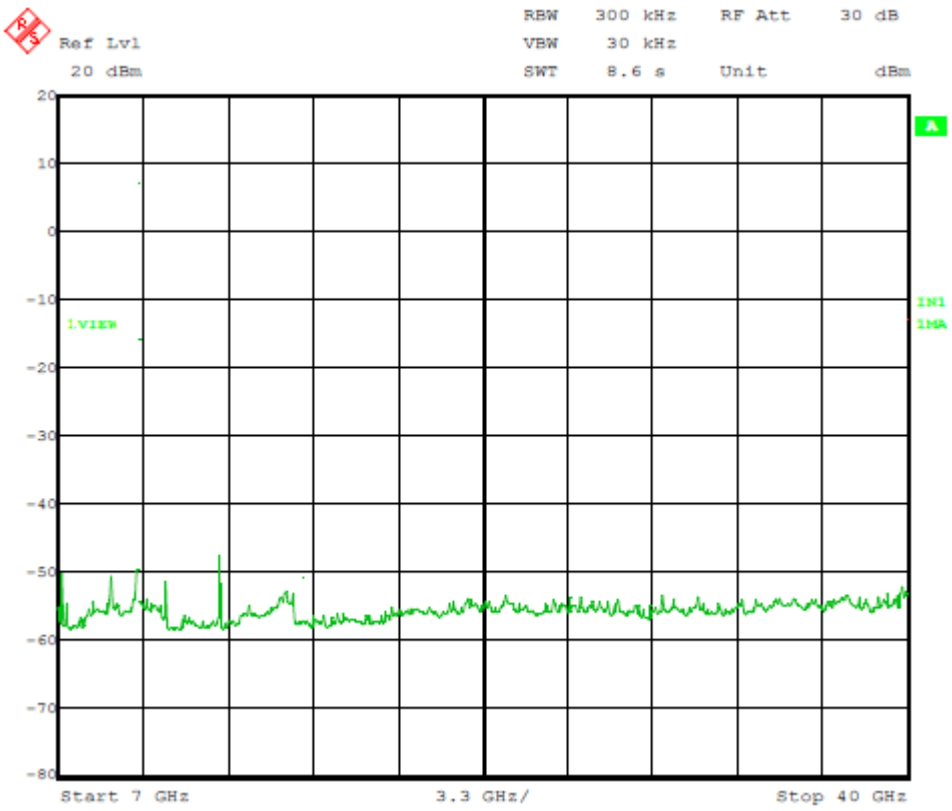
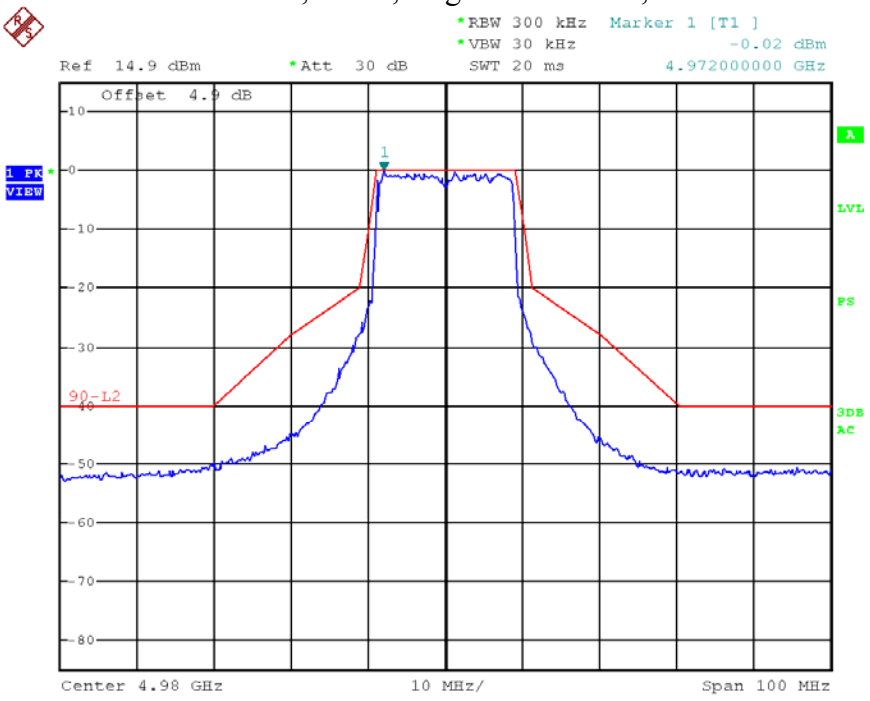


802.11n, HT20, single chain mode, Channel H



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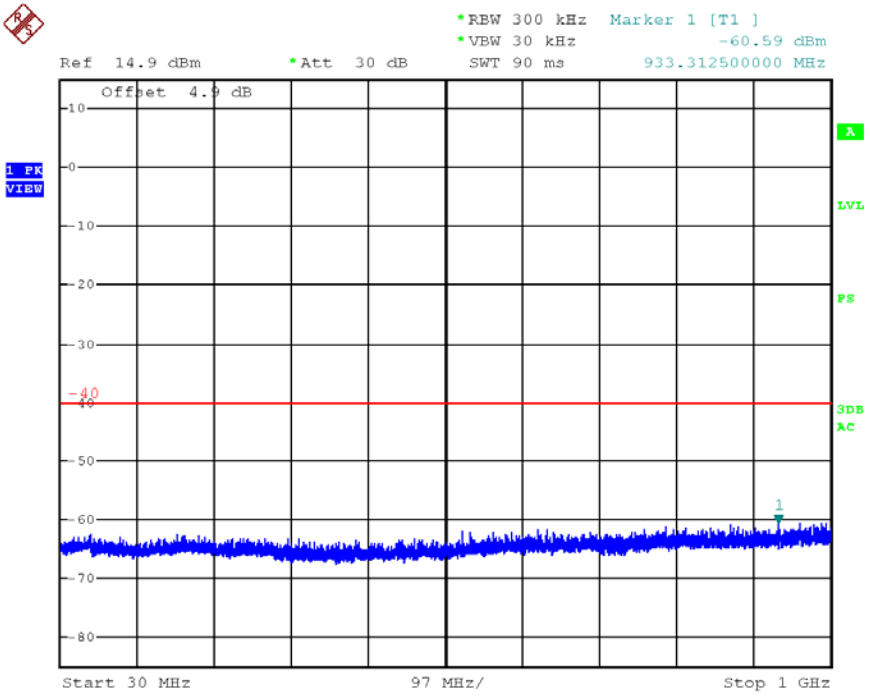

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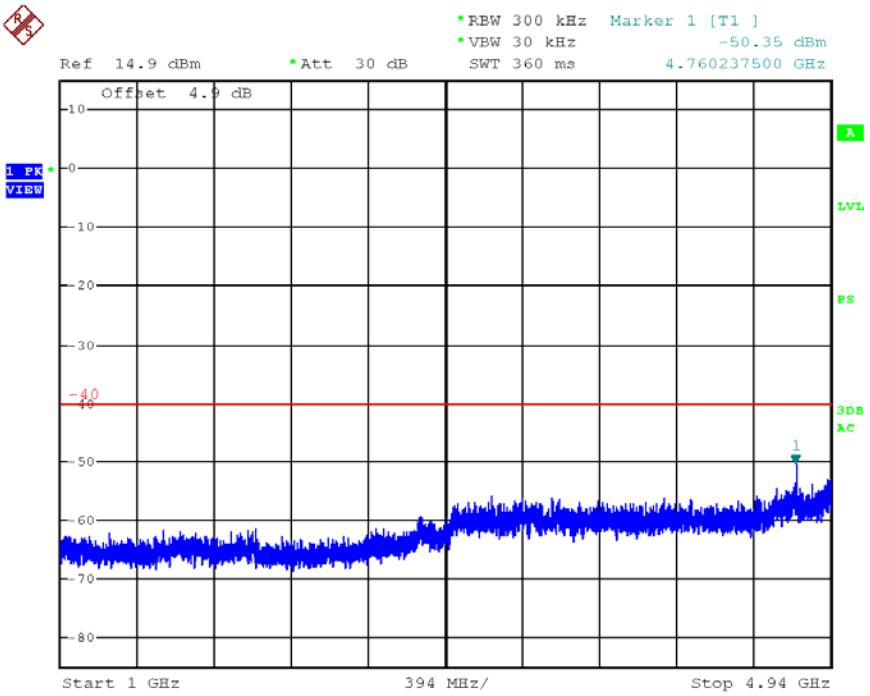

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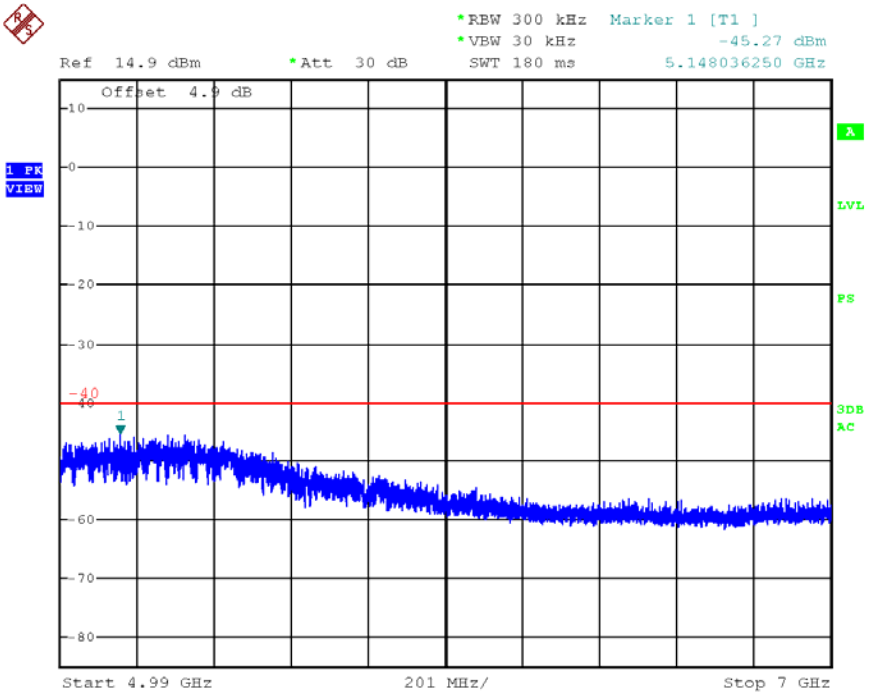

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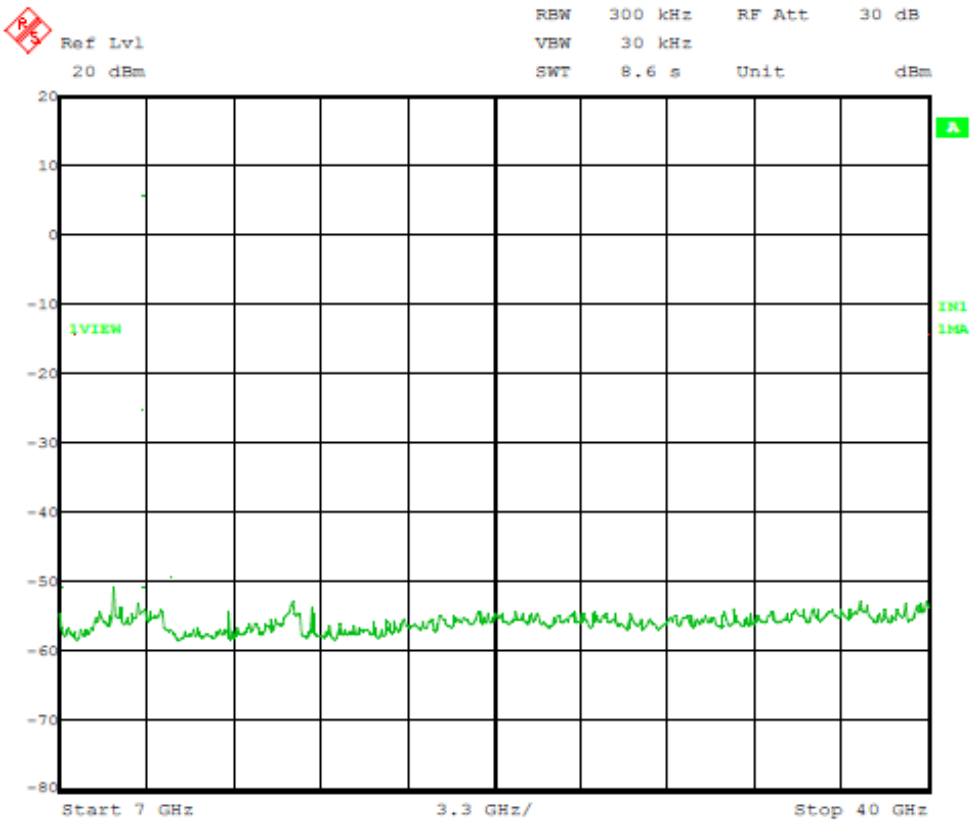
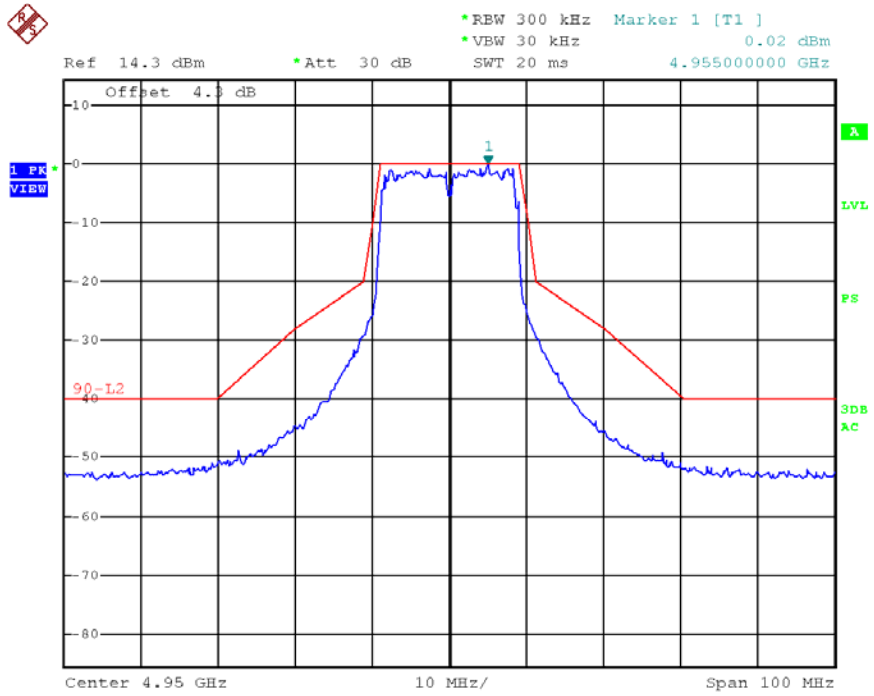


802.11n, HT20, dual chain mode, Channel L
Chain 0-1



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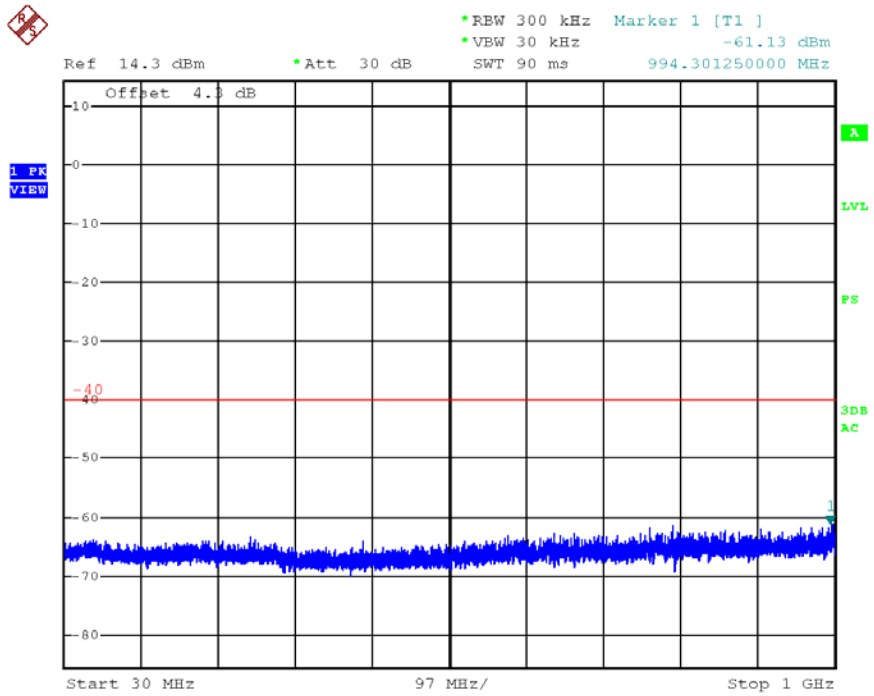

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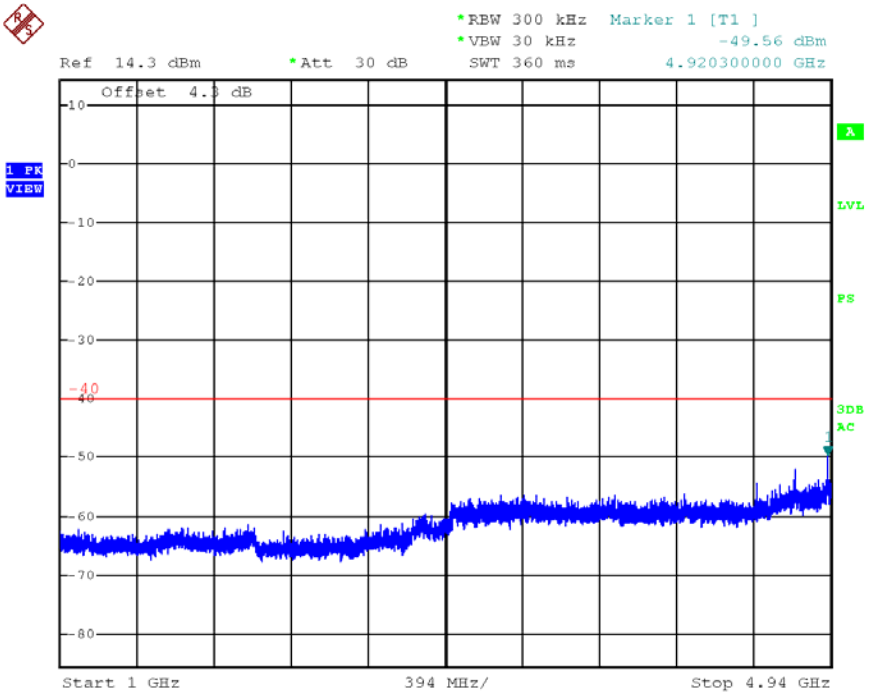

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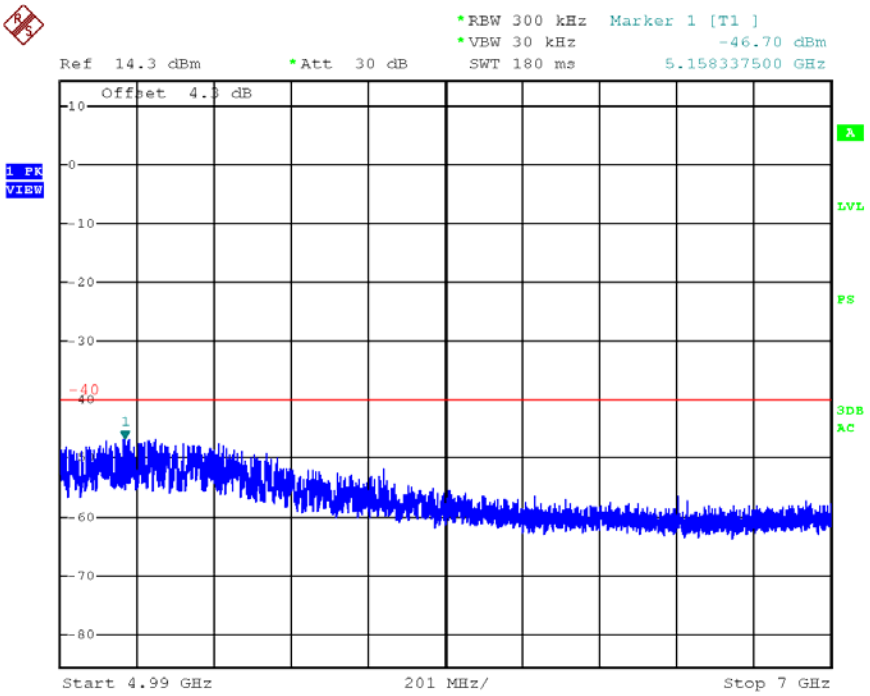

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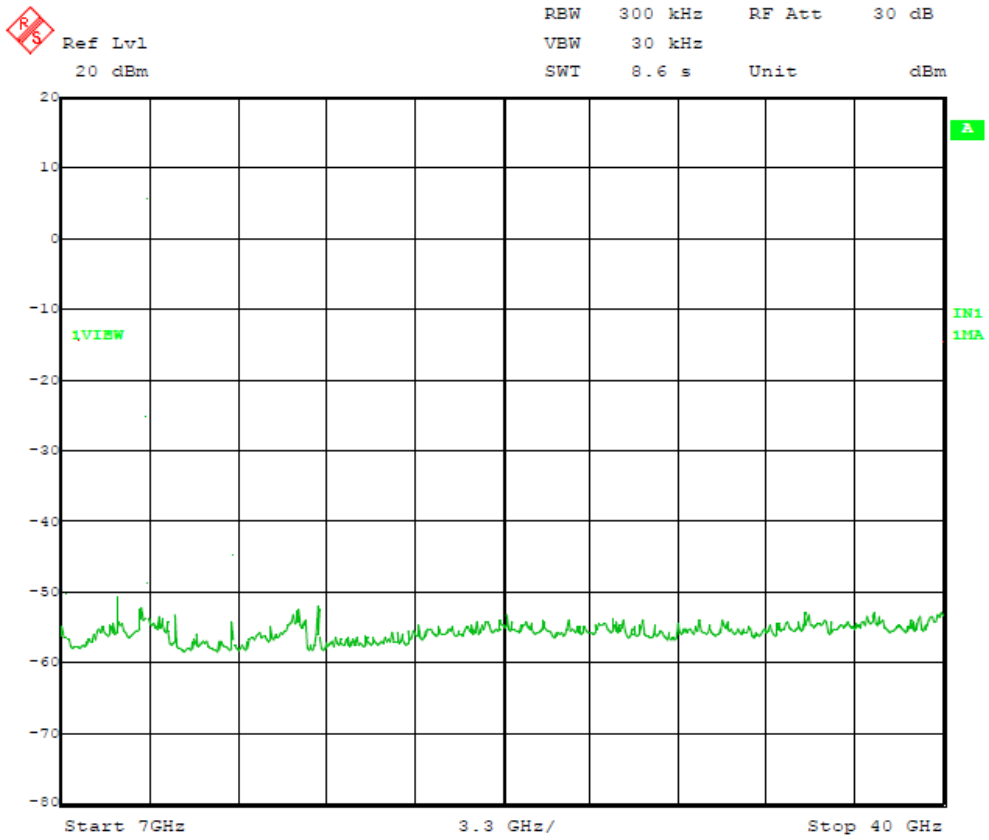
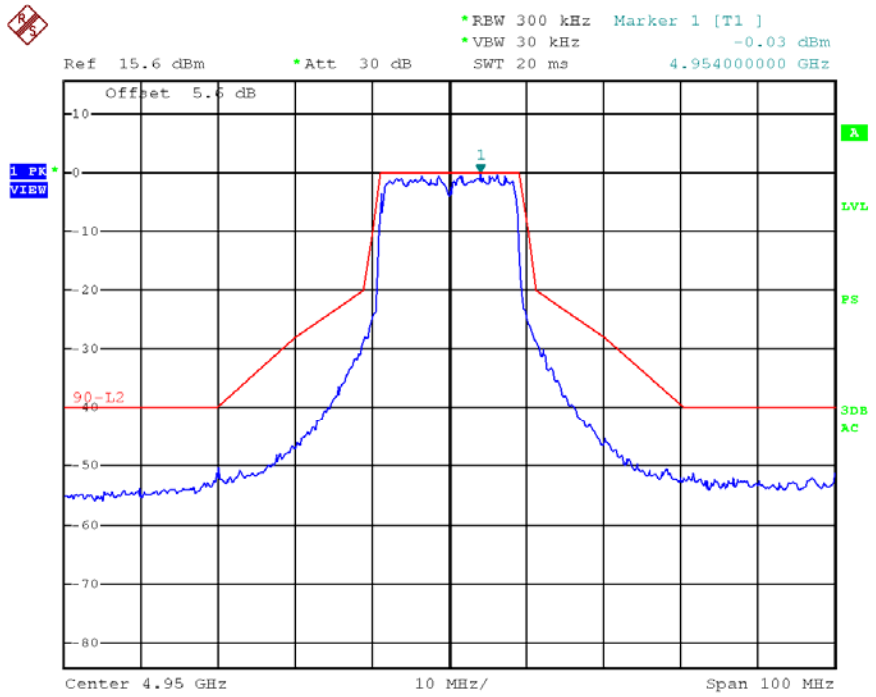


Chain 0-2



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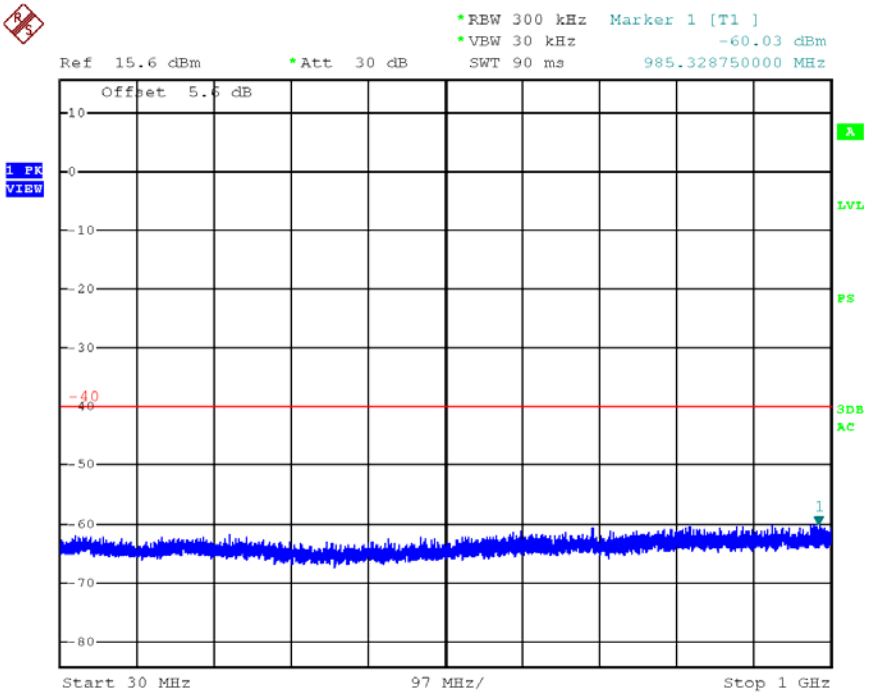

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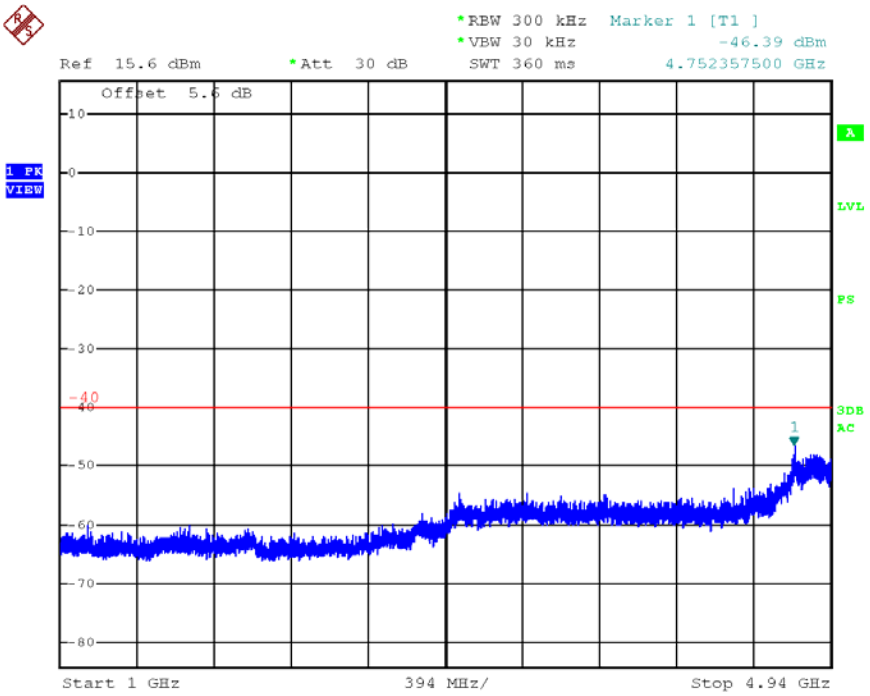

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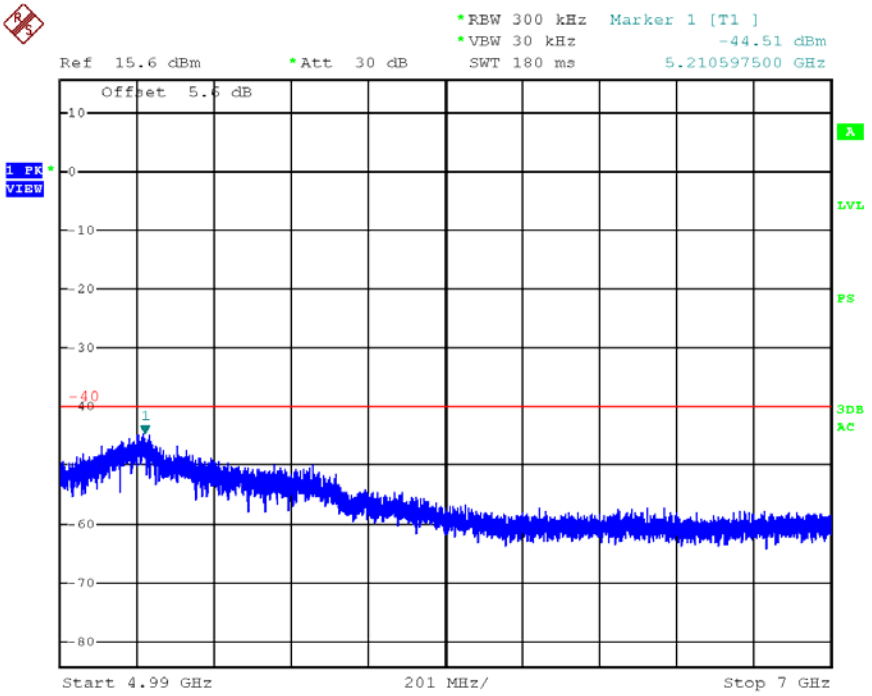

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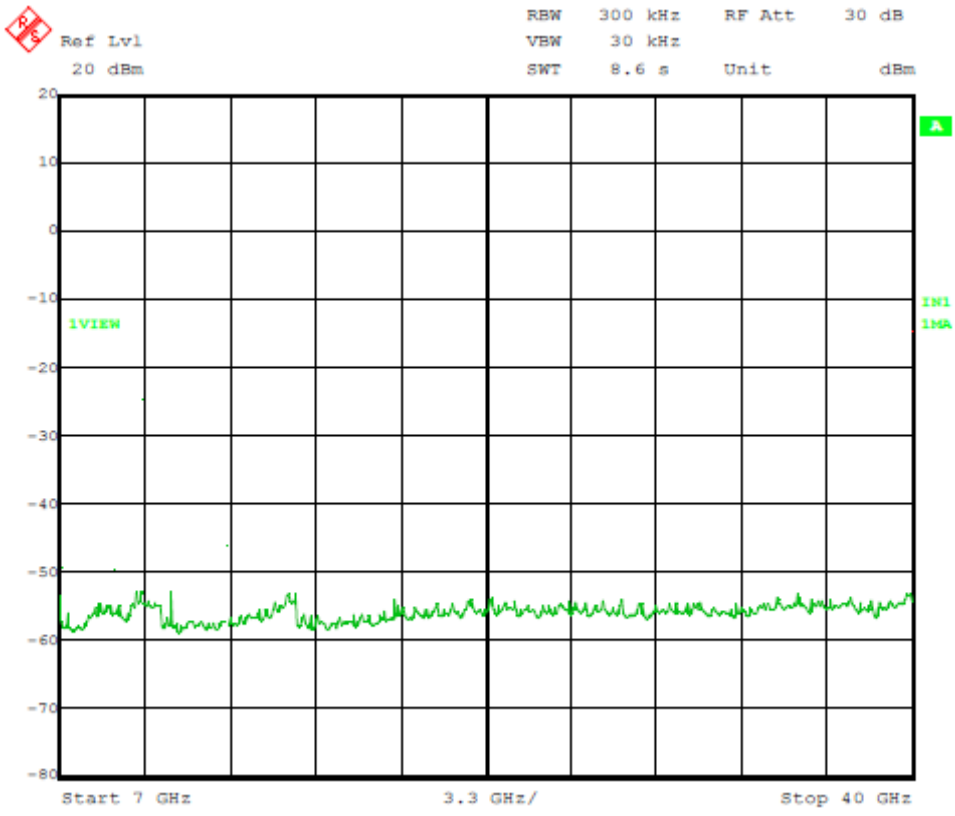
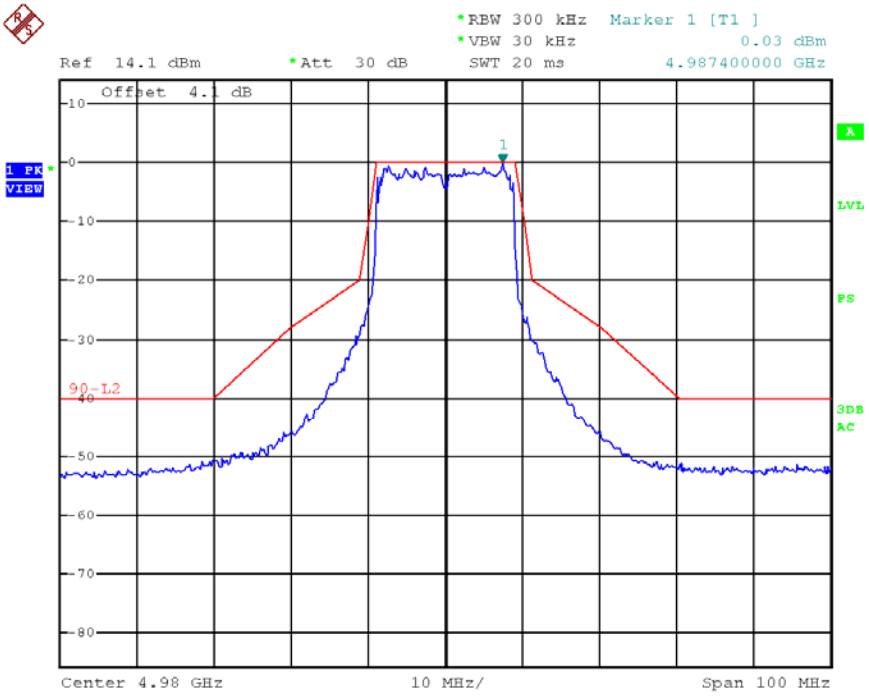


802.11n, HT20, dual chain mode, Channel H
Chain 0-1



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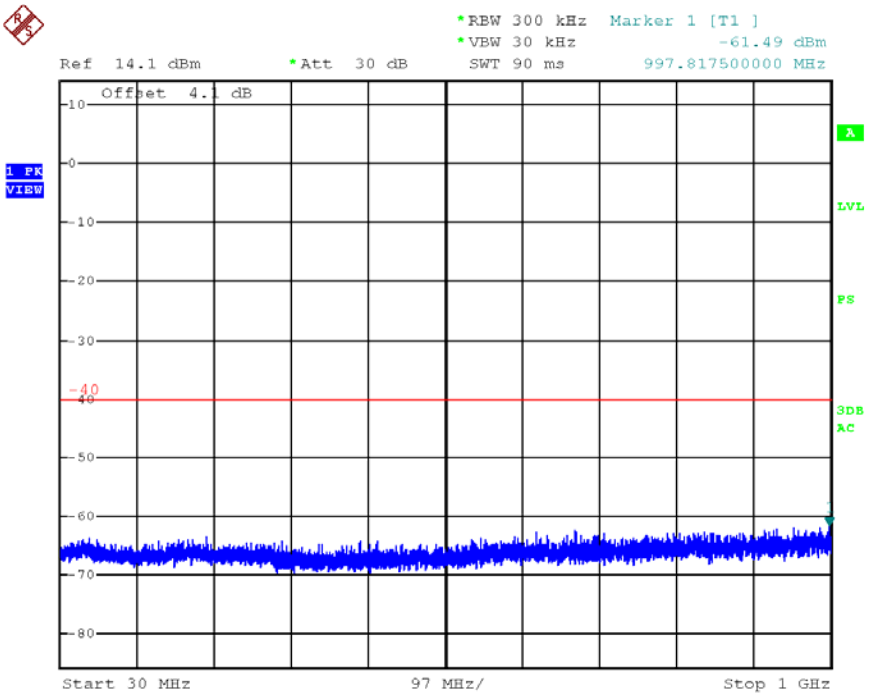

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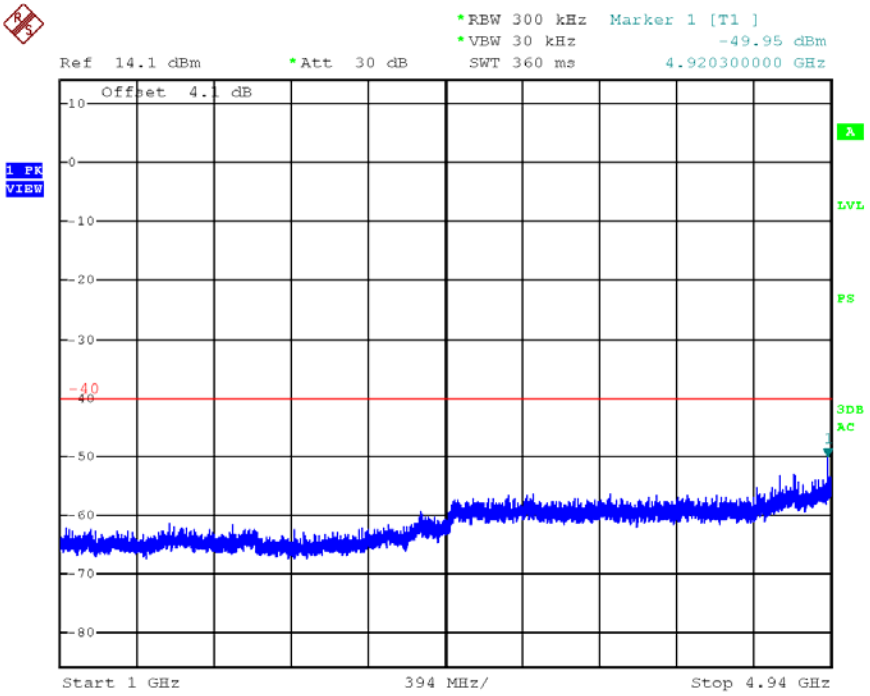

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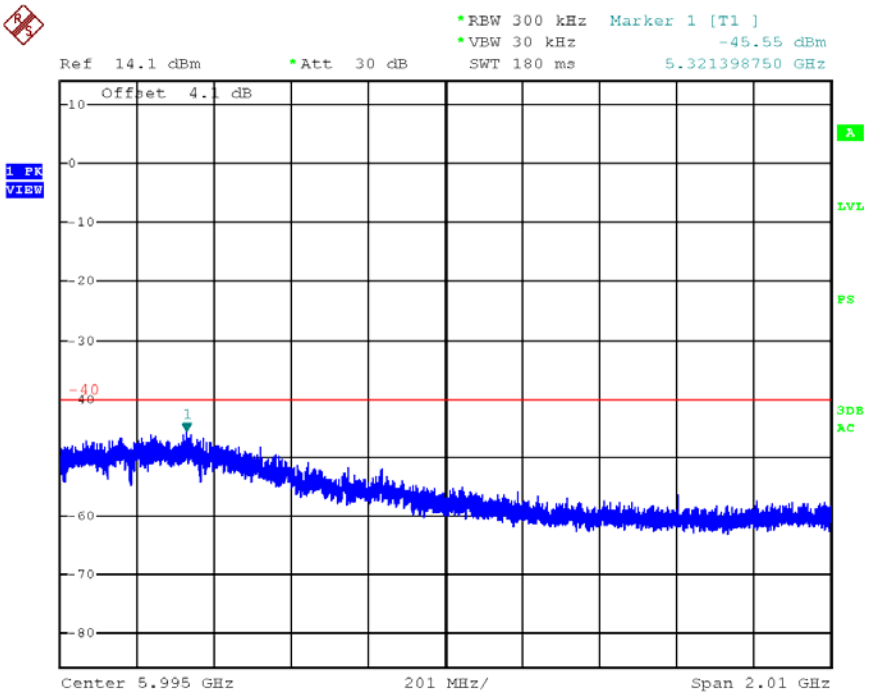

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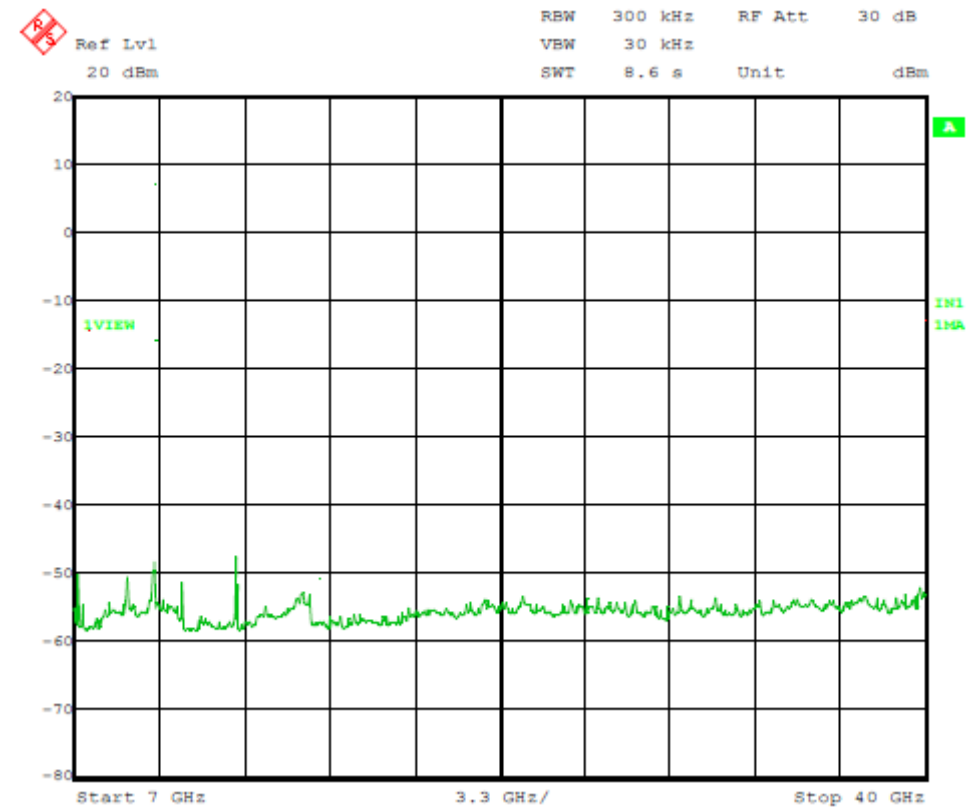
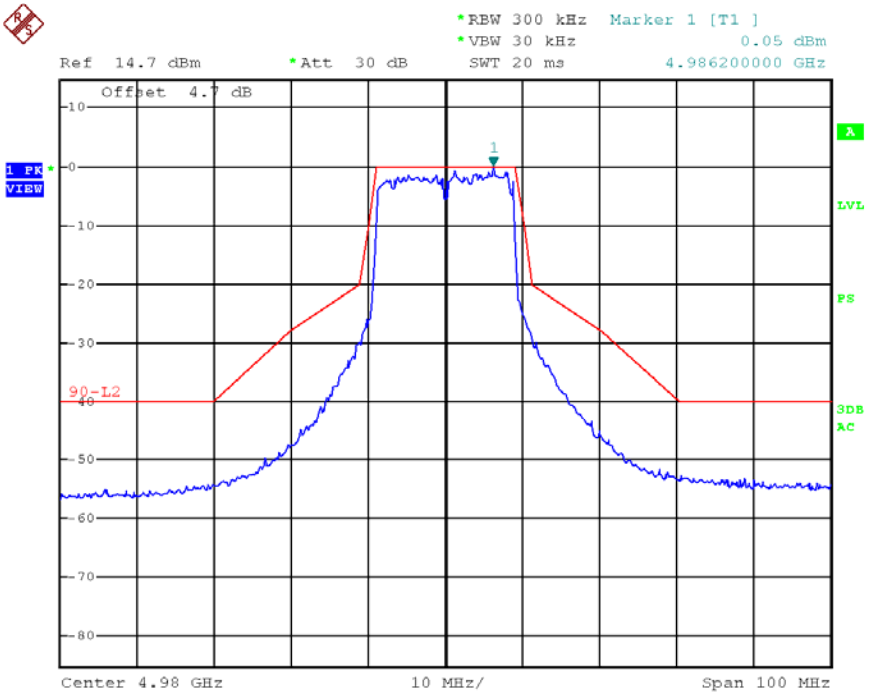


Chain 0-2



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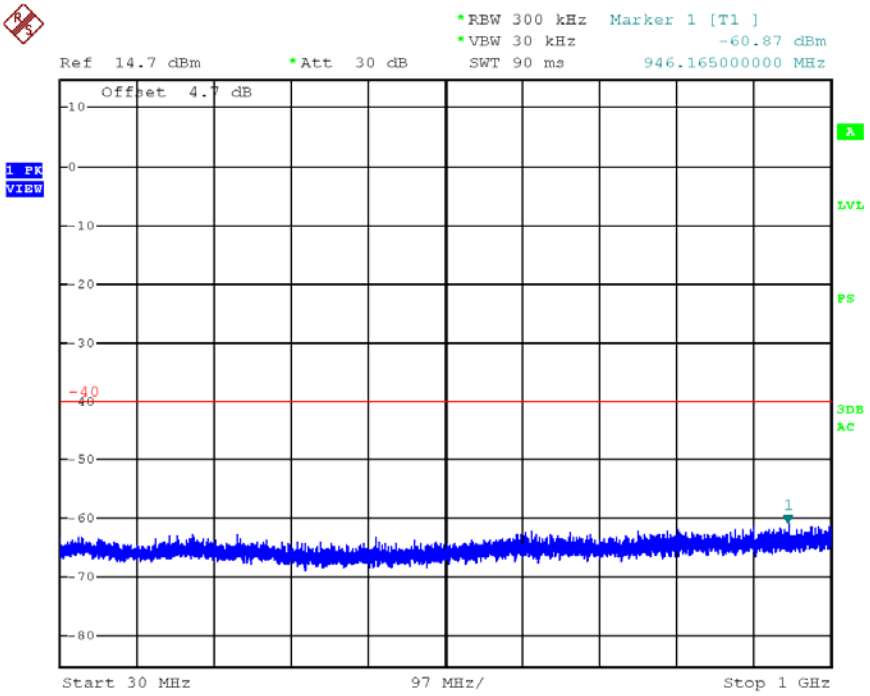

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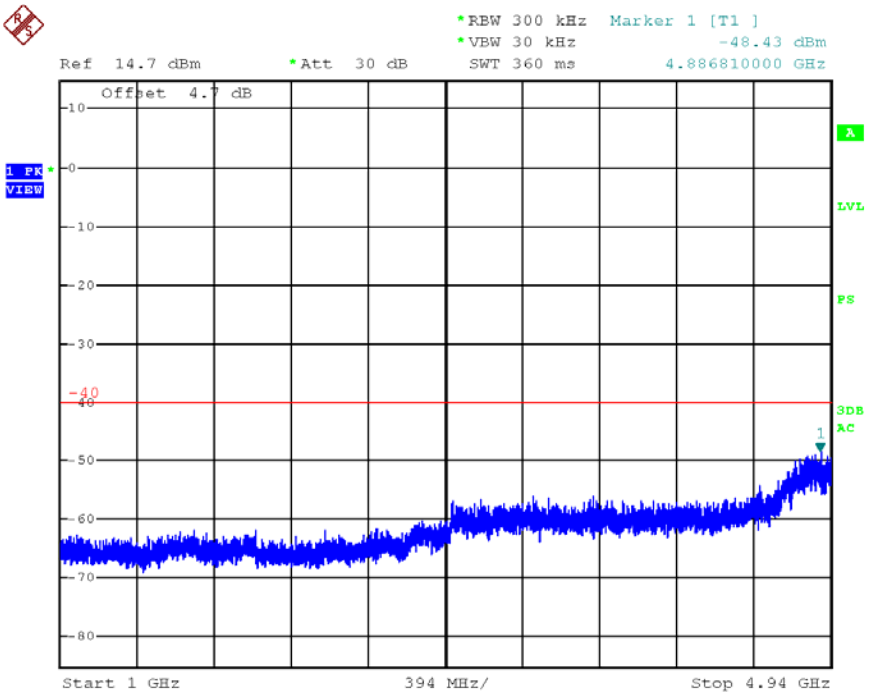

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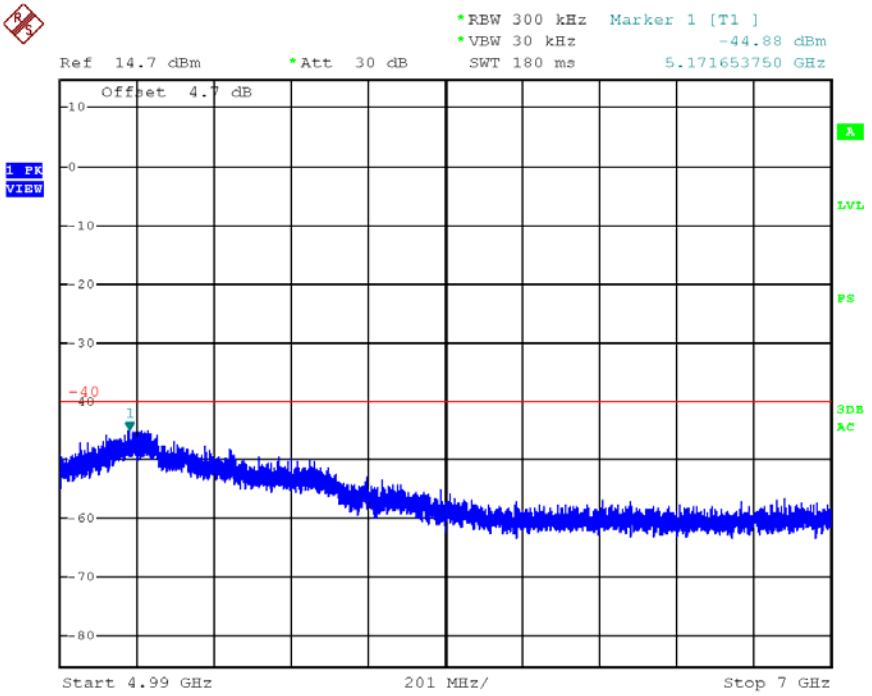

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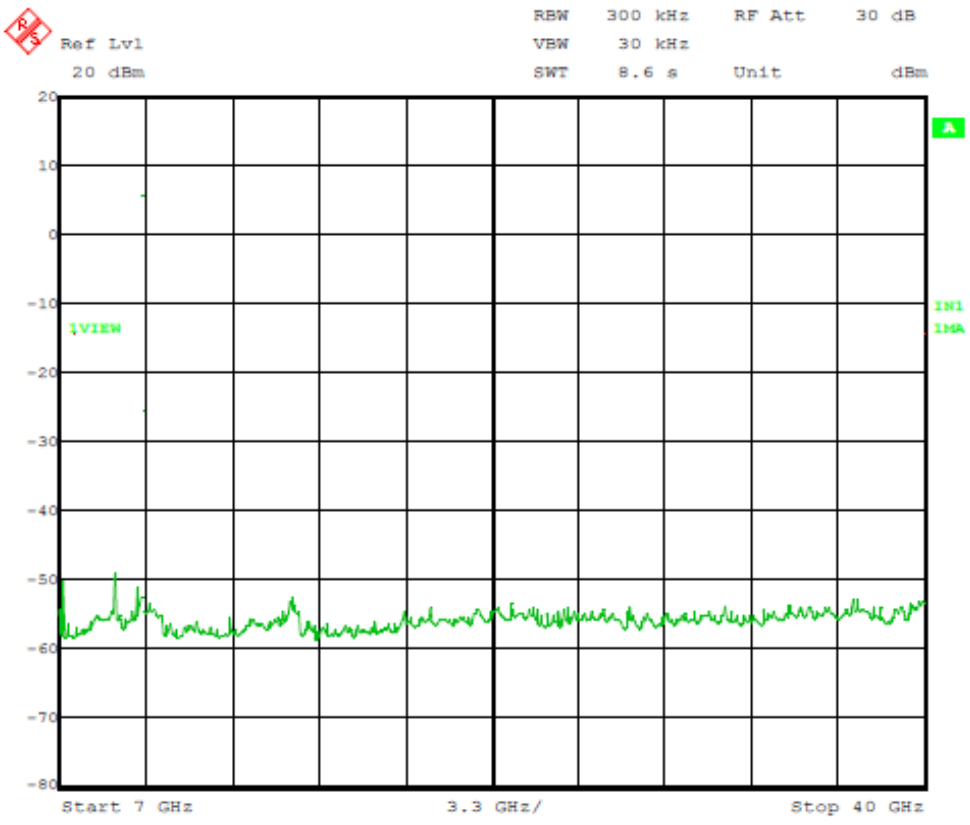
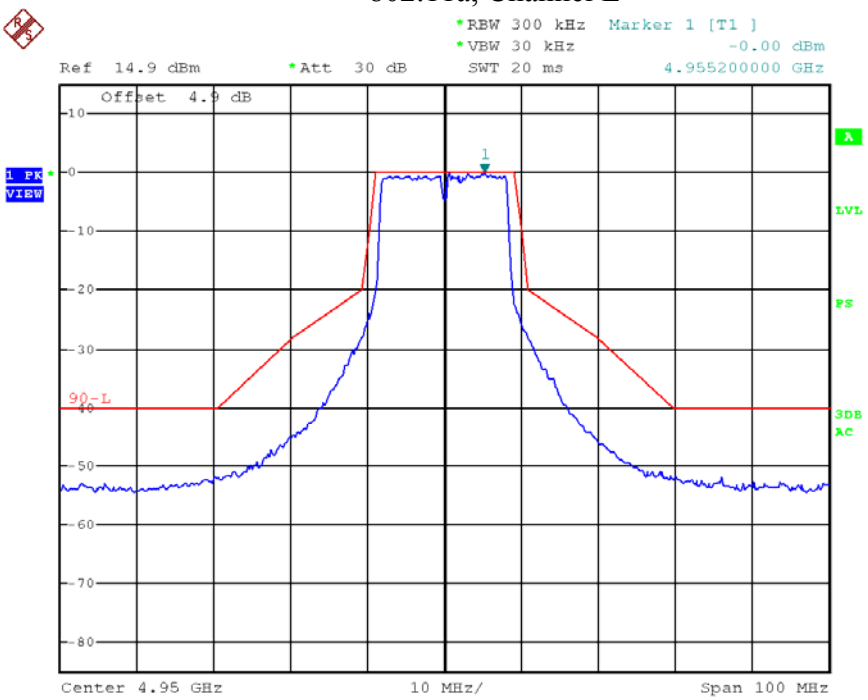


802.11a, Channel L



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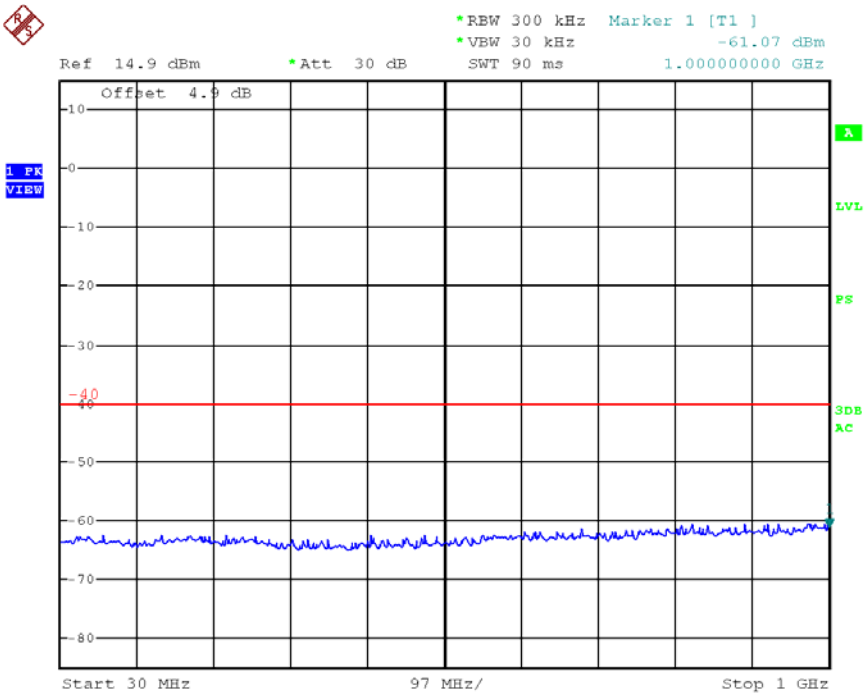

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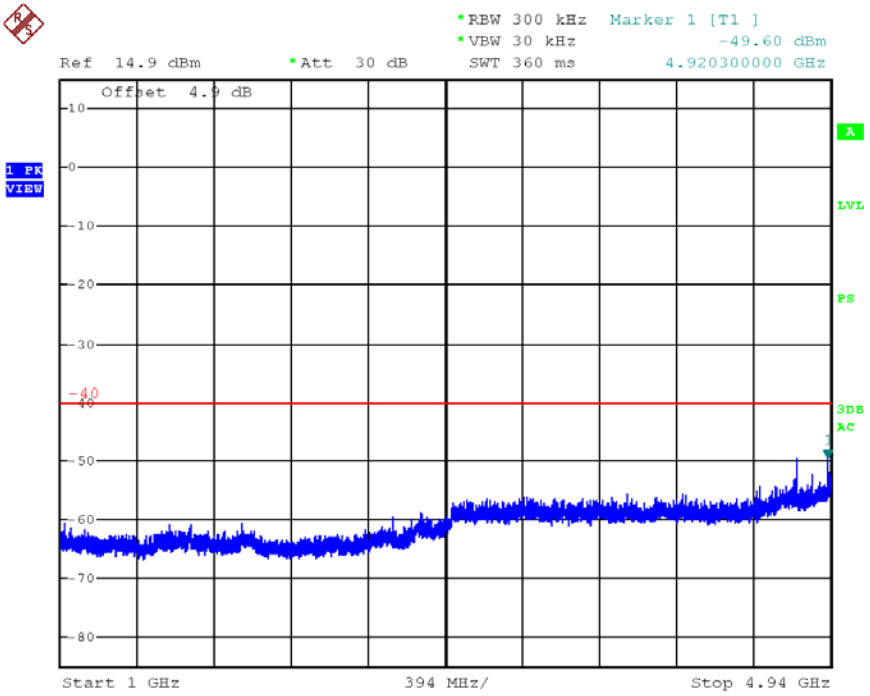

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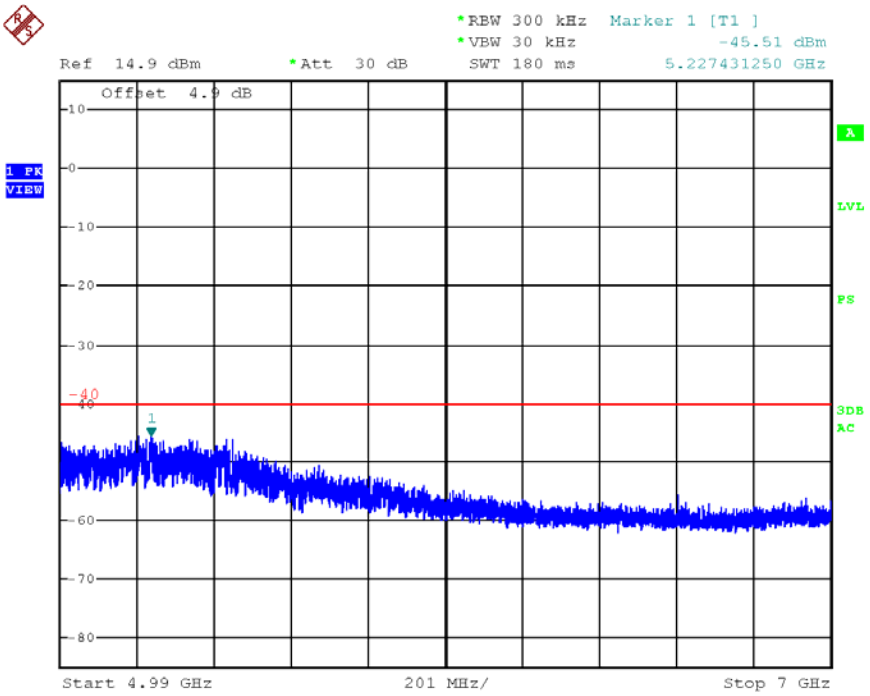

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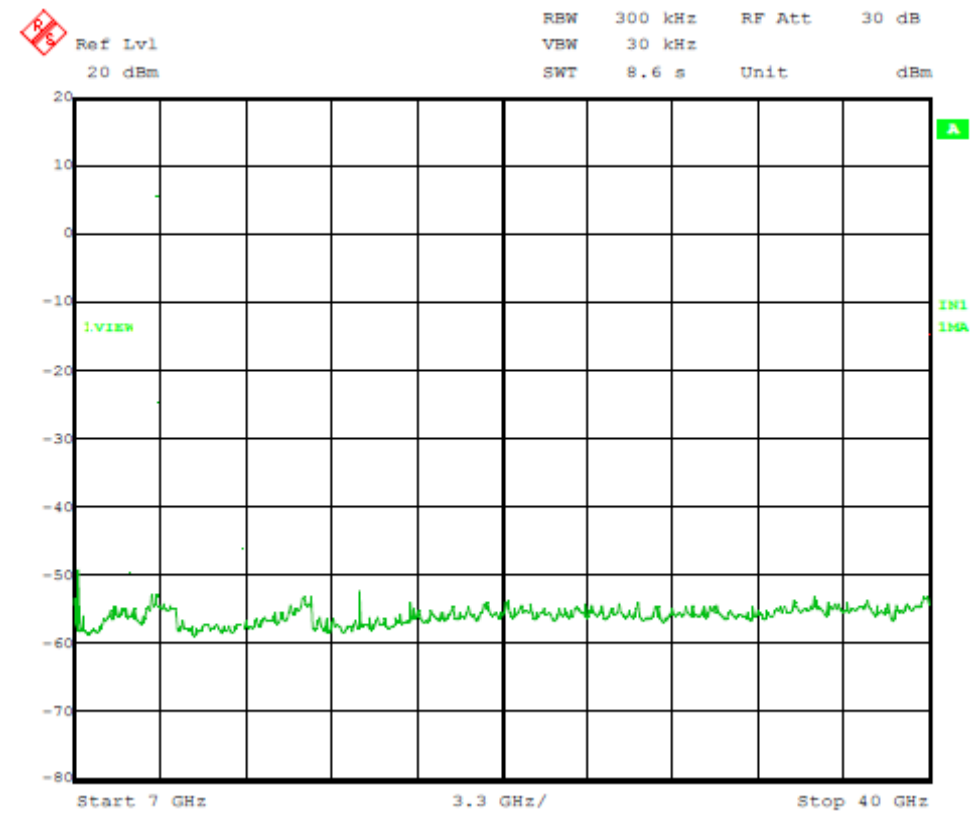
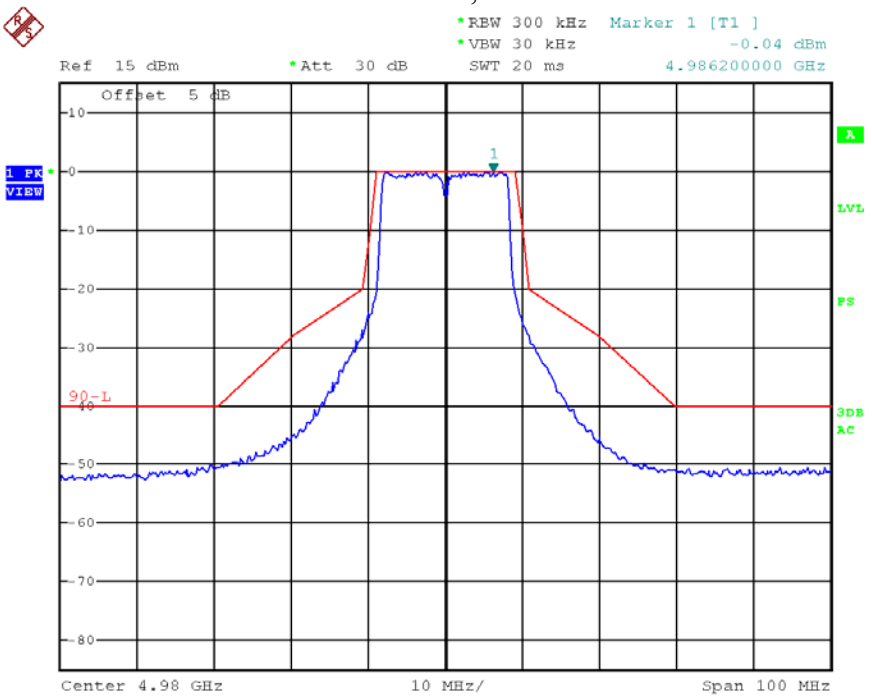


802.11a, Channel H



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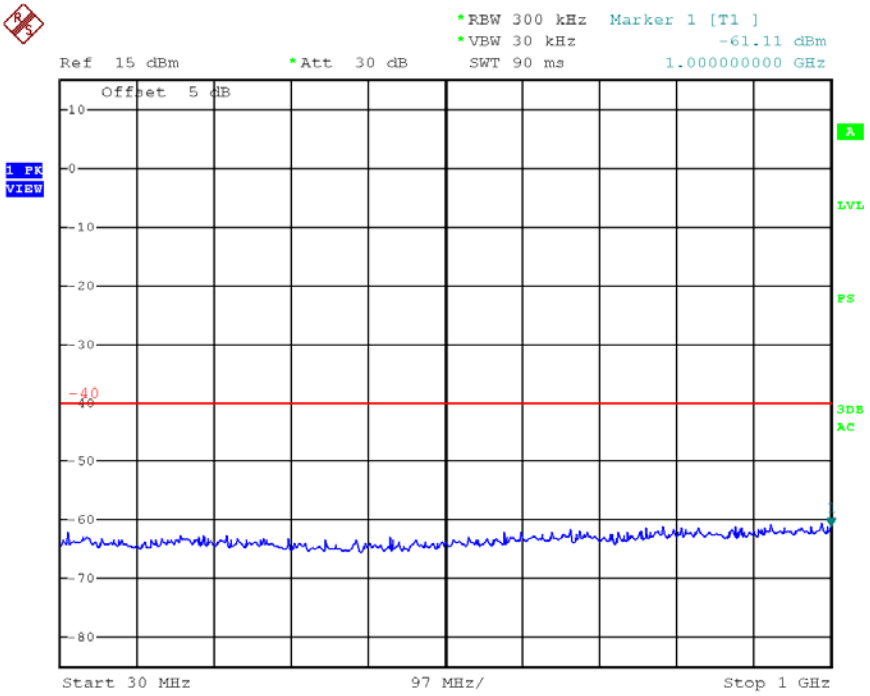

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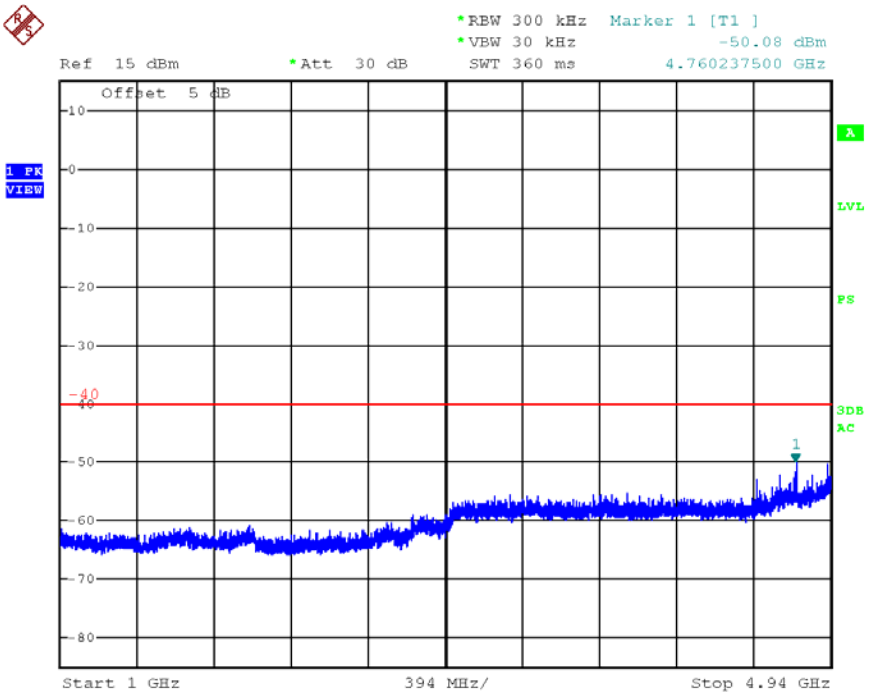

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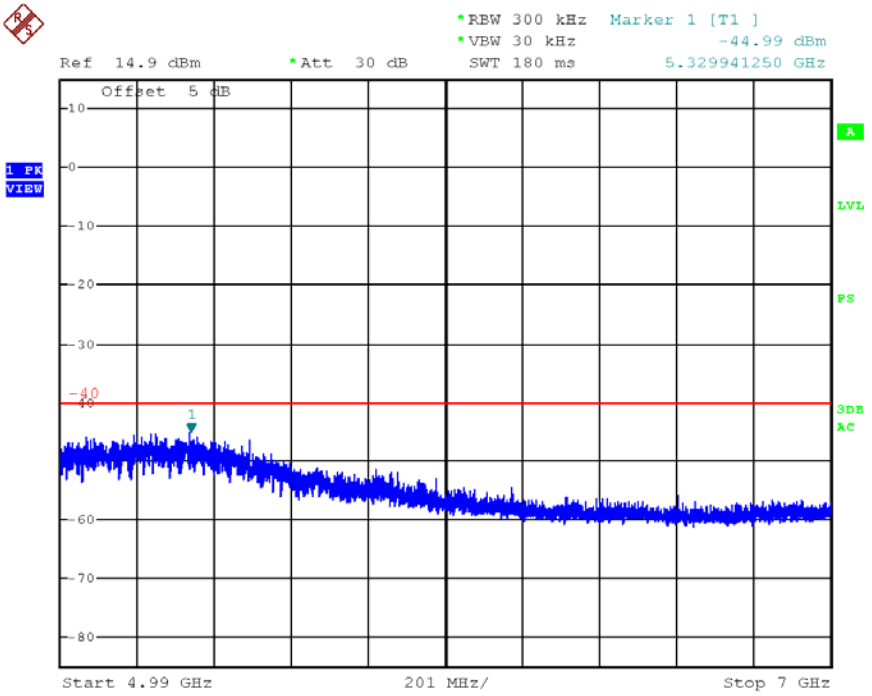

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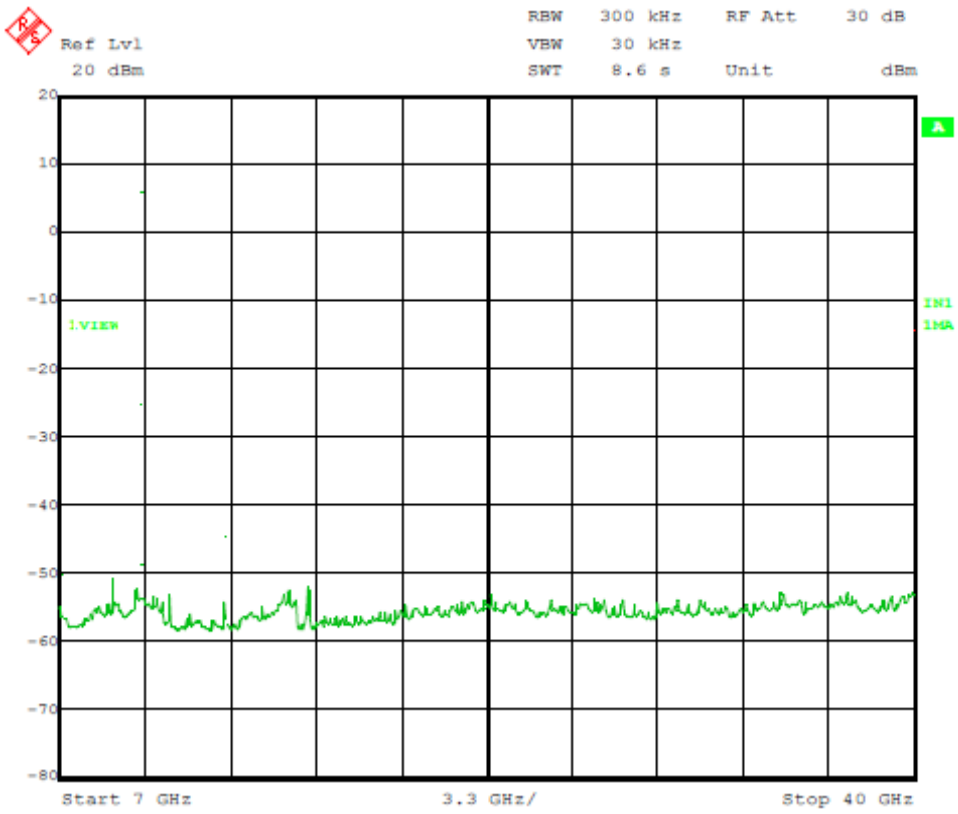


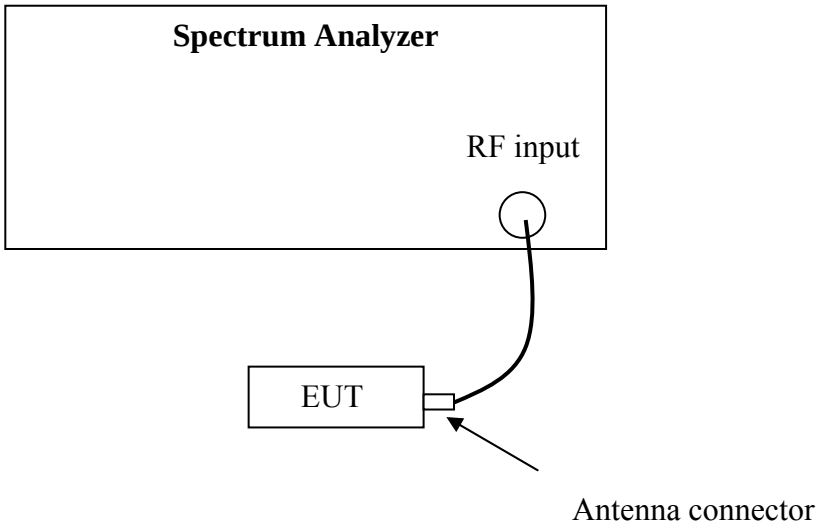
6. Peak Excursion

Test result: **PASS**

6.1 Test limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

6.2 Test Configuration



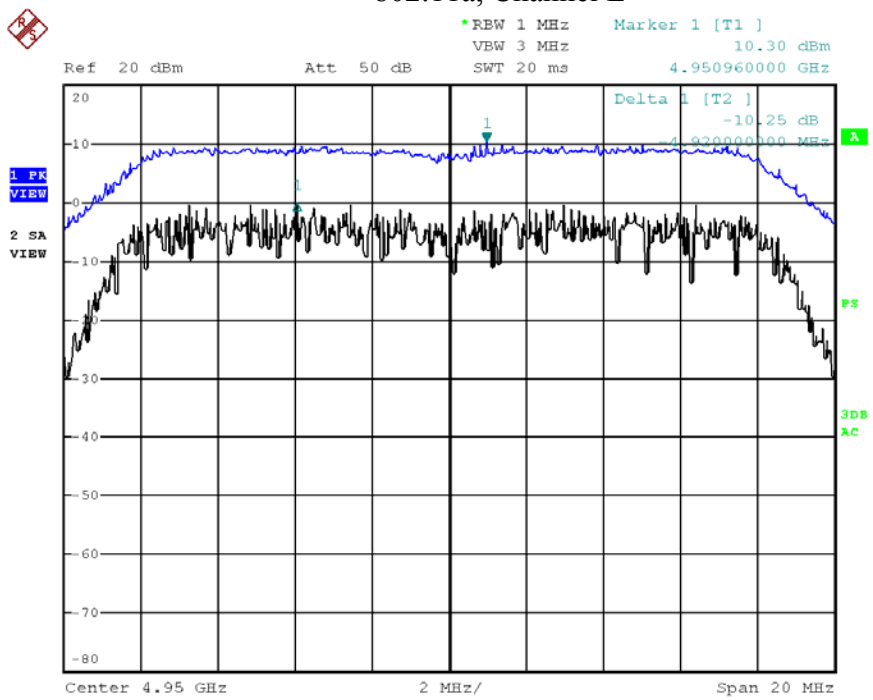
6.3 Test procedure and test setup

For 1st trace, set RBW = 1 MHz, VBW = 3 MHz with peak detector and maxhold settings;
For 2nd trace, set RBW = 1 MHz, VBW = 3 MHz with sample detector and average settings;

6.4 Test protocol

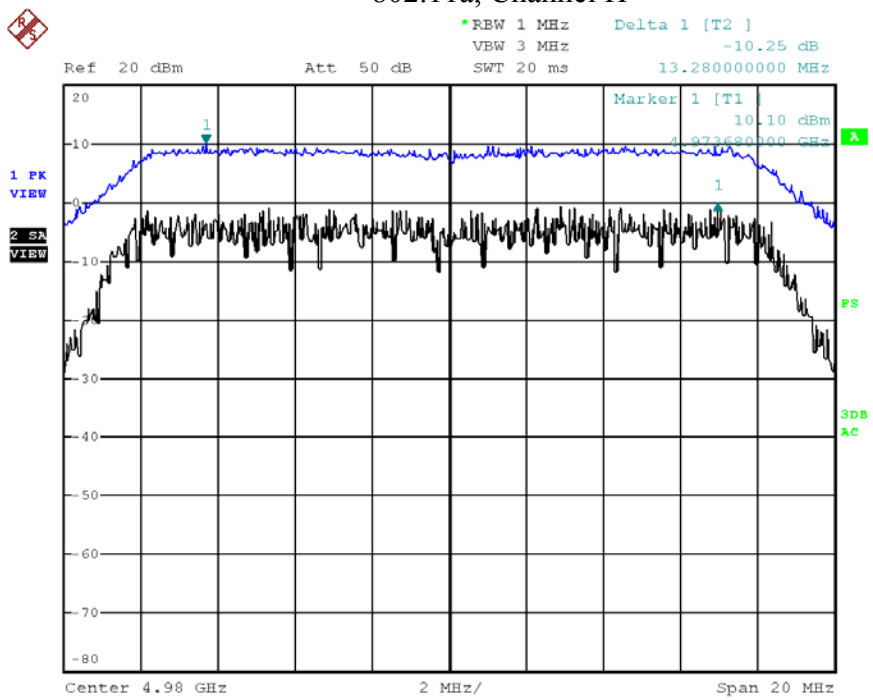
Mode	CH	Peak excursion of Chain 0-1 (dB)	Peak excursion of Chain 0-2 (dB)	Limit (dB)
802.11a	L	10.25	/	13.00
	H	10.25	/	
802.11n, HT20 Single Chain	L	10.86	/	
	H	10.13	/	
802.11n, HT20 Dual Chain	L	10.80	11.54	
	H	10.74	11.24	

802.11a, Channel L



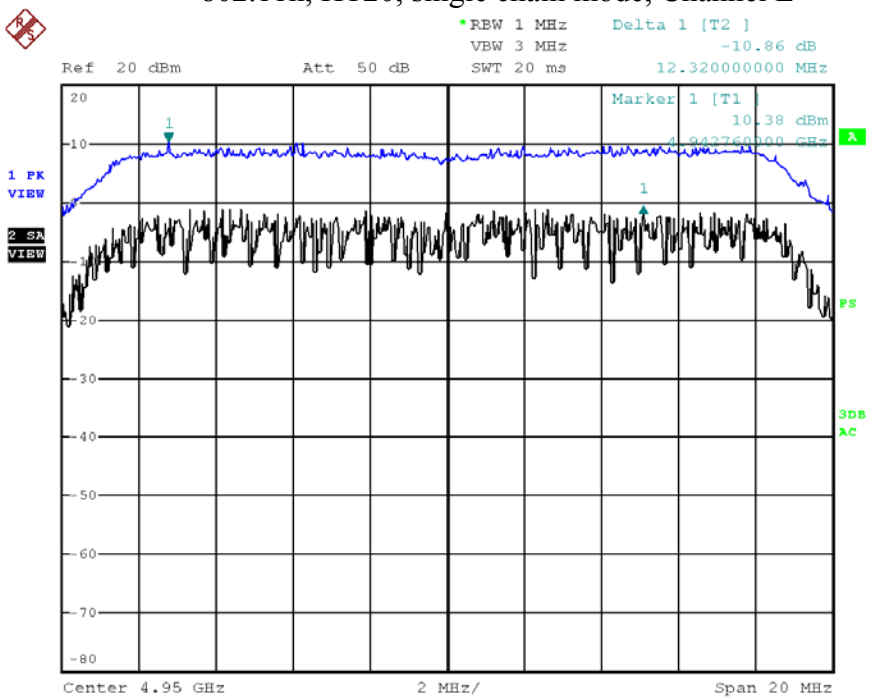
Date: 13.FEB.2012 20:36:43

802.11a, Channel H



Date: 13.FEB.2012 20:35:48

802.11n, HT20, single chain mode, Channel L



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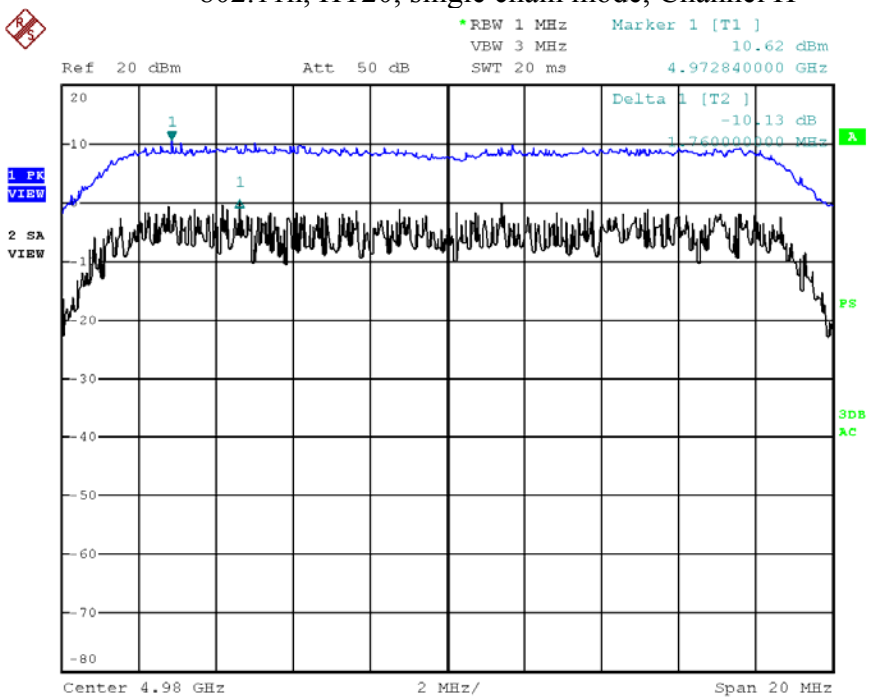
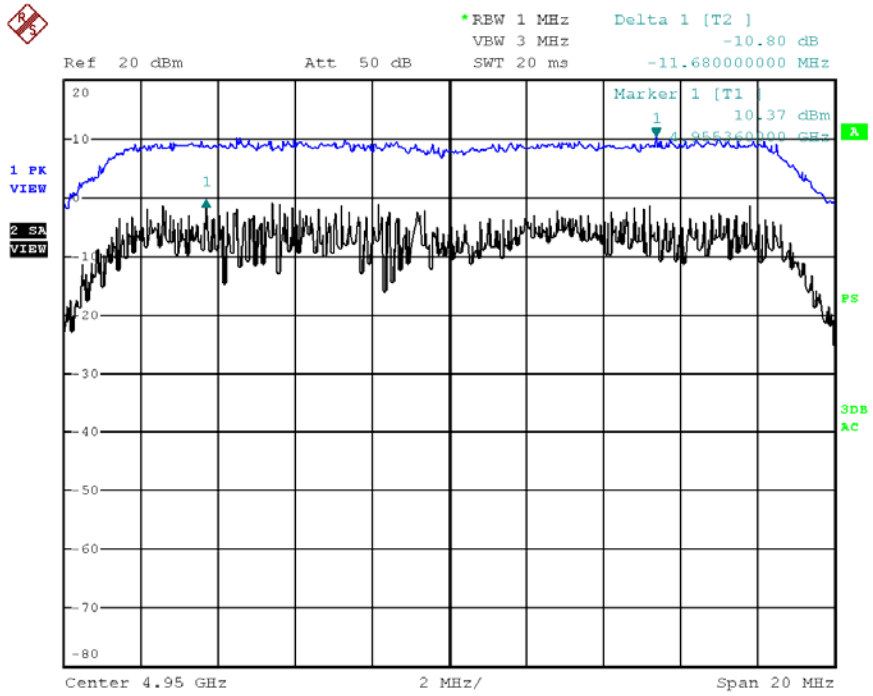
802.11n, HT20, single chain mode, Channel H



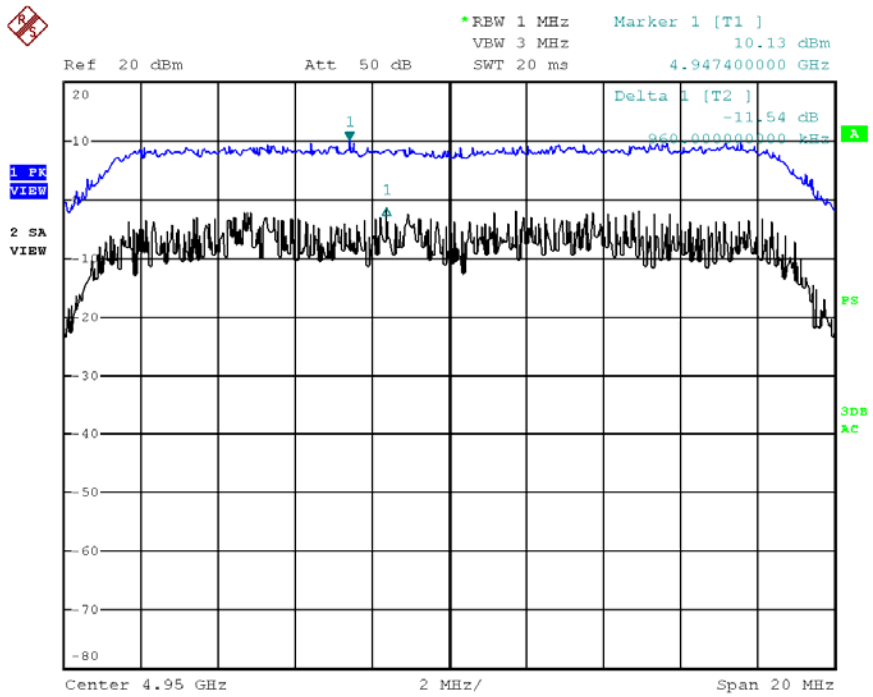
Date: 13.FEB.2012 20:33:42

802.11n, HT20, dual chain mode, Channel L

Chain 0-1

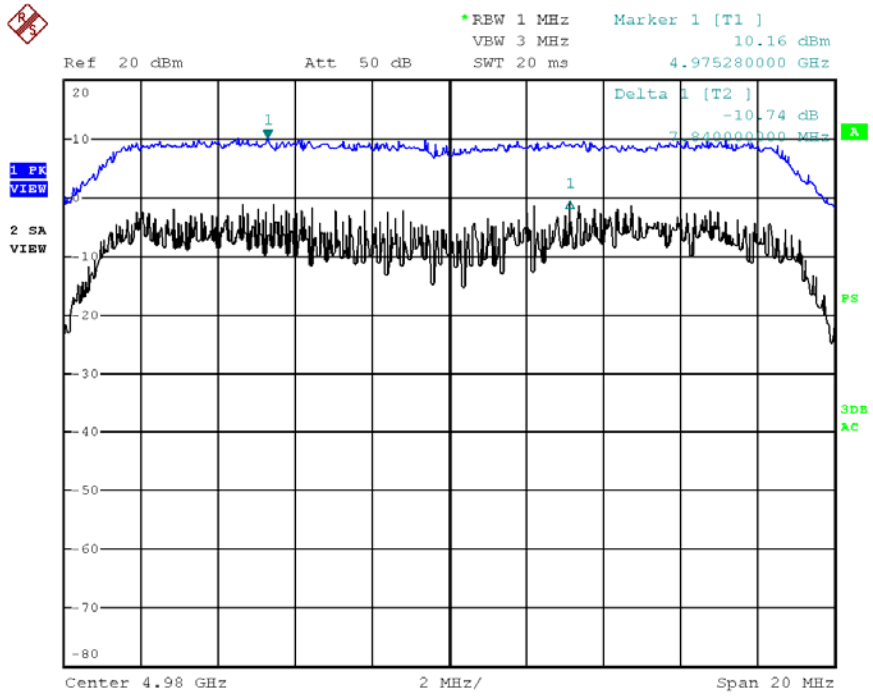


Chain 0-2



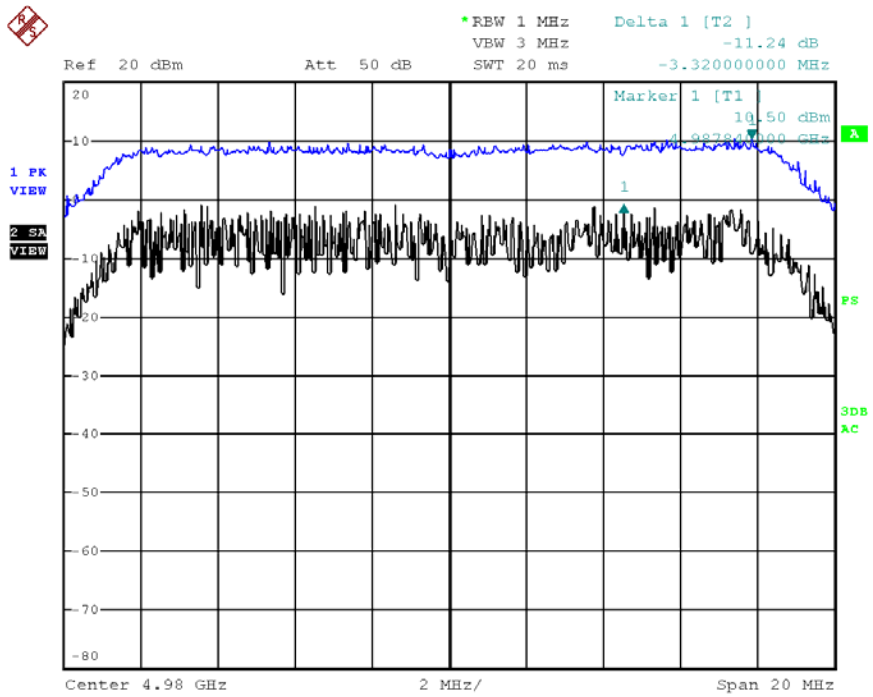
802.11n, HT20, dual chain mode, Channel H

Chain 0-1



Date: 13.FEB.2012 20:38:52

Chain 0-2



Date: 13.FEB.2012 20:40:33

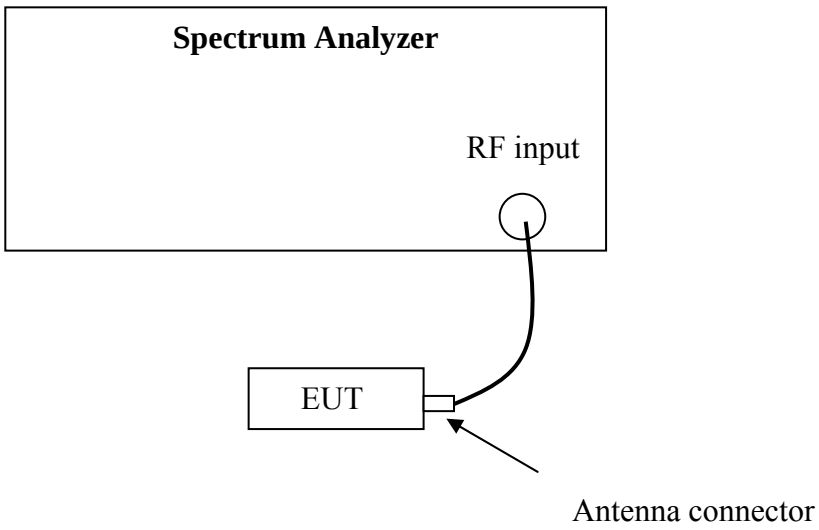
7. Power spectral density

Test result: **PASS**

7.1 Test limit

High- and low-power devices are also limited to a maximum power spectral density of 21dBm/MHz and 8dBm/MHz respectively.
(Note: If transmitting antennas of directional gain greater than 9 dBi are used, the power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9dBi.)

7.2 Test Configuration



7.3 Test procedure and test setup

The transmitter power spectral density shall be measured over a bandwidth of 1 MHz or 99% of the emission bandwidth, whichever is less

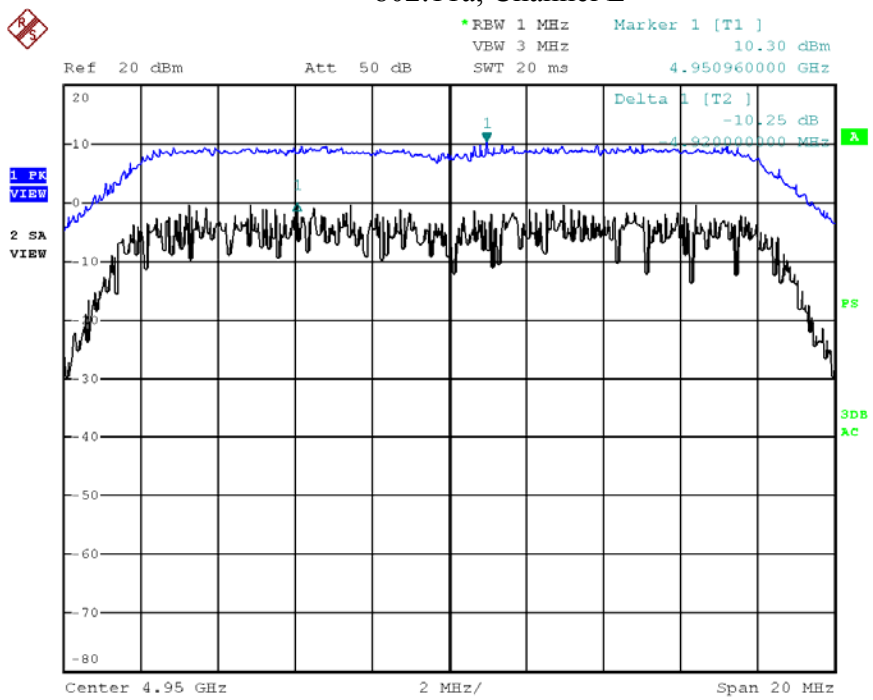
7.4 Test protocol

For the highest gain of all applied antennas is 14dBi, the limit for power spectral density should be 8dBm - (14dBi – 9dBi) = 3dBm.

Mode	CH	Chain 0-1 (dBm/MHz)	Chain 0-2 (dBm/MHz)	Spectral density (dBm/MHz)	Limit (dBm/MHz)
802.11a	L	0.05	/	0.05	3.00
	H	-0.15	/	-0.15	
802.11n, HT20 Single Chain	L	-0.48	/	-0.48	
	H	0.49	/	0.49	
802.11n, HT20 Dual Chain	L	-0.43	-1.41	2.12	
	H	-0.48	-0.74	2.40	

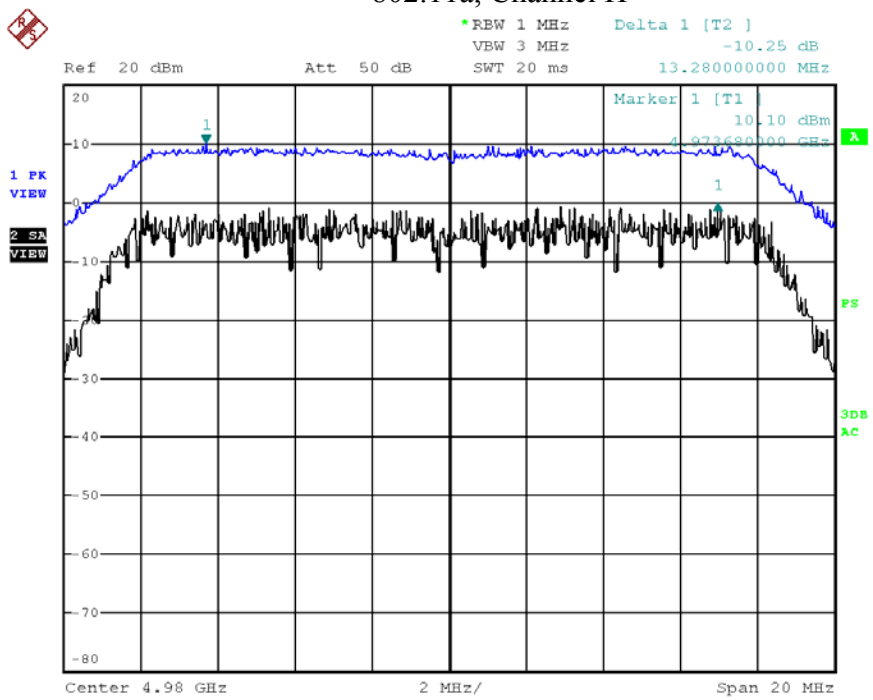
Note: the power spectral density is average reading. For the test data listed below, the power spectral density should be calculated as PK value + delta value. For example, in 802.11a, Channel L mode, the PK value is 10.30dBm/MHz and the delta value is -10.25dB. Therefore, the power spectral density = 10.30 -10.25 = 0.05dBm/MHz.

802.11a, Channel L



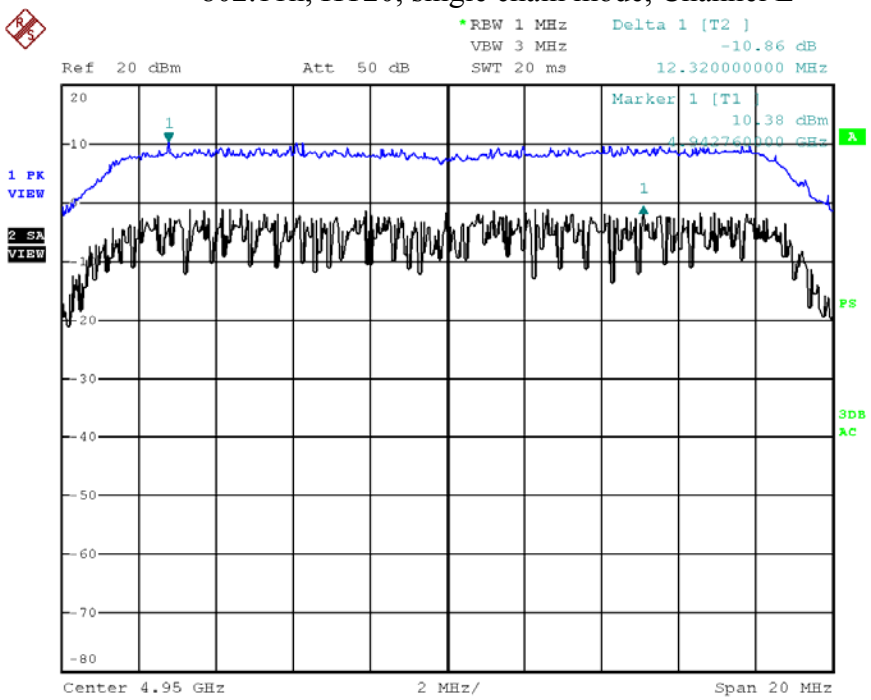
Date: 13.FEB.2012 20:36:43

802.11a, Channel H



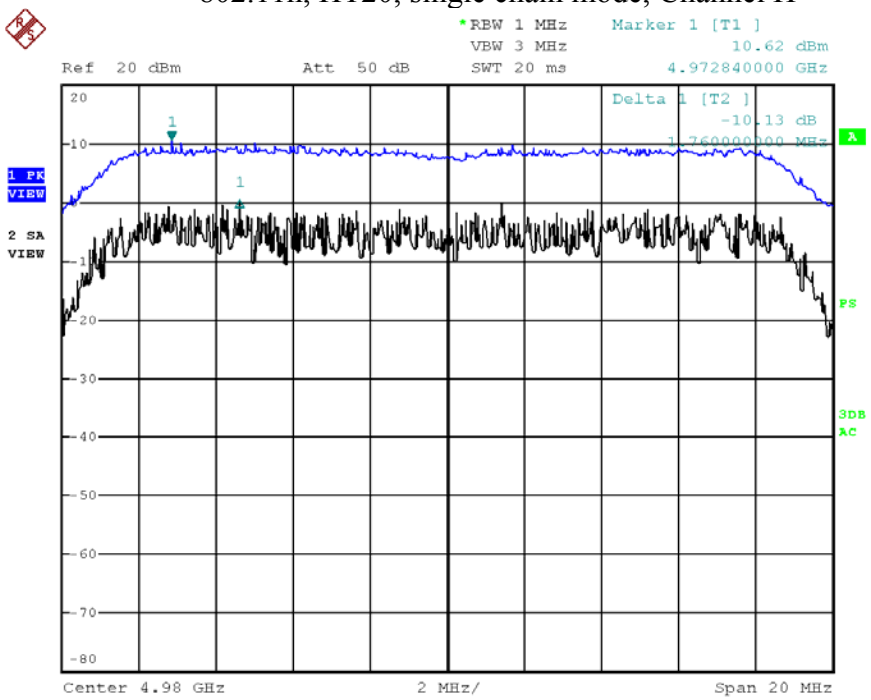
Date: 13.FEB.2012 20:35:48

802.11n, HT20, single chain mode, Channel L



Date: 13.FEB.2012 20:32:43

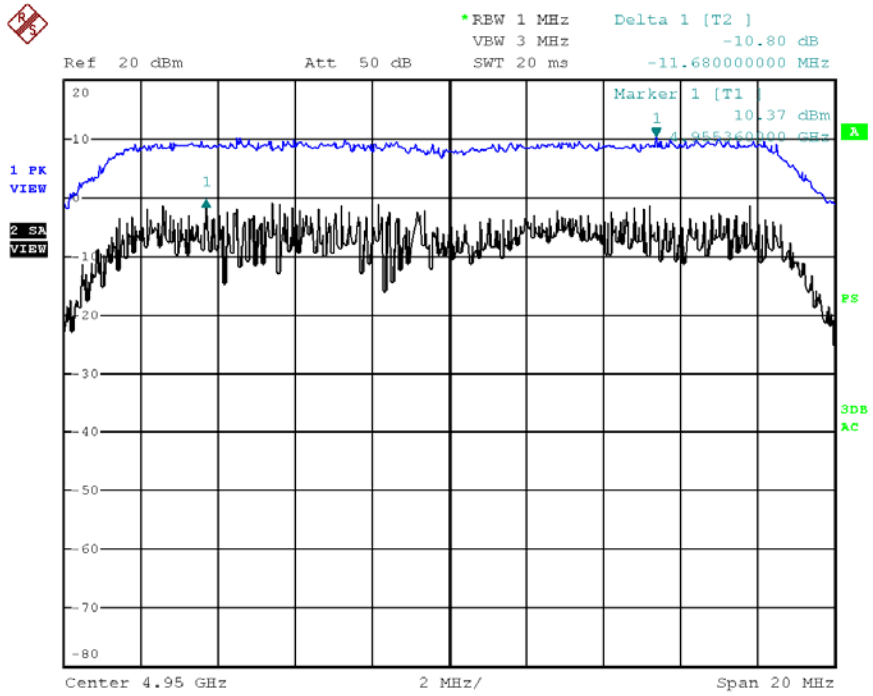
802.11n, HT20, single chain mode, Channel H



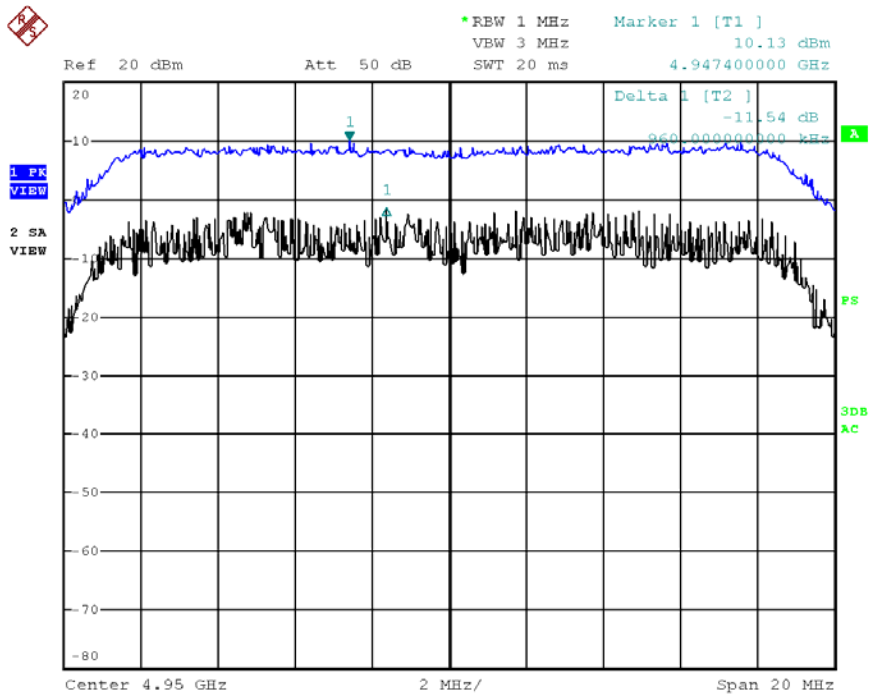
Date: 13.FEB.2012 20:33:42

802.11n, HT20, dual chain mode, Channel L

Chain 0-1

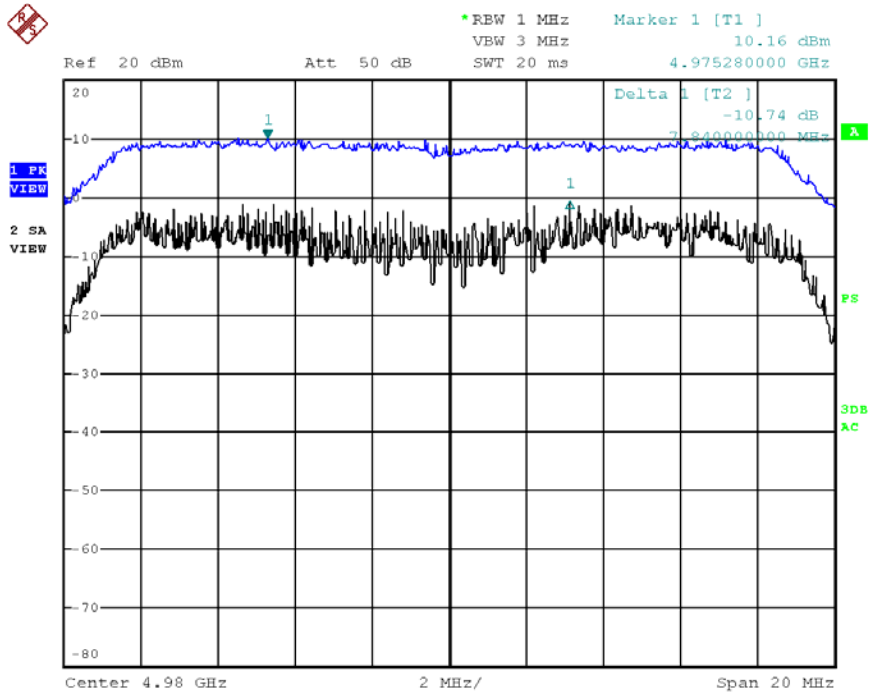


Chain 0-2



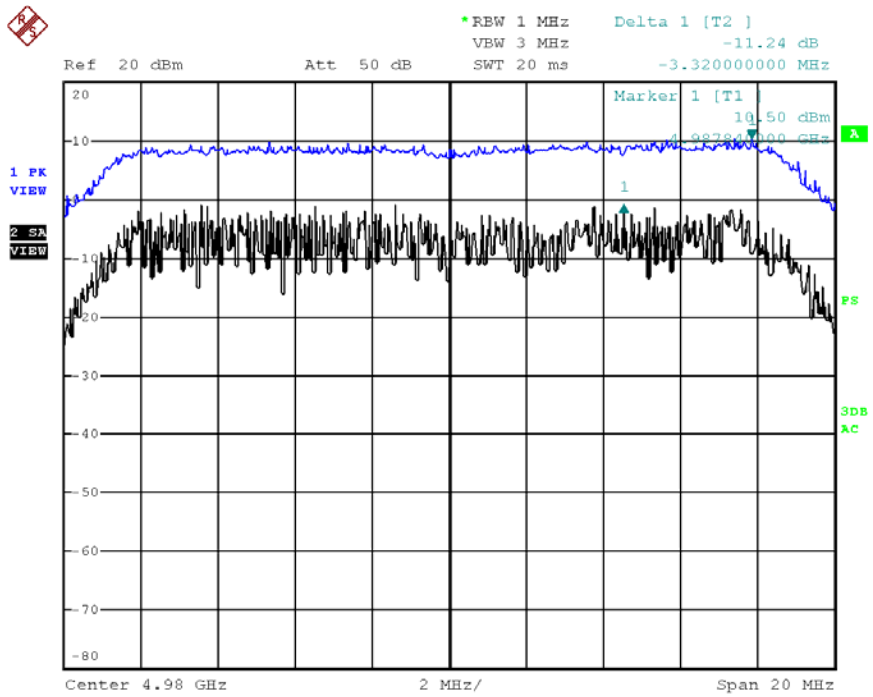
802.11n, HT20, dual chain mode, Channel H

Chain 0-1



Date: 13.FEB.2012 20:38:52

Chain 0-2



Date: 13.FEB.2012 20:40:33

8. Transmitter Radiated Emissions (Out of Band)

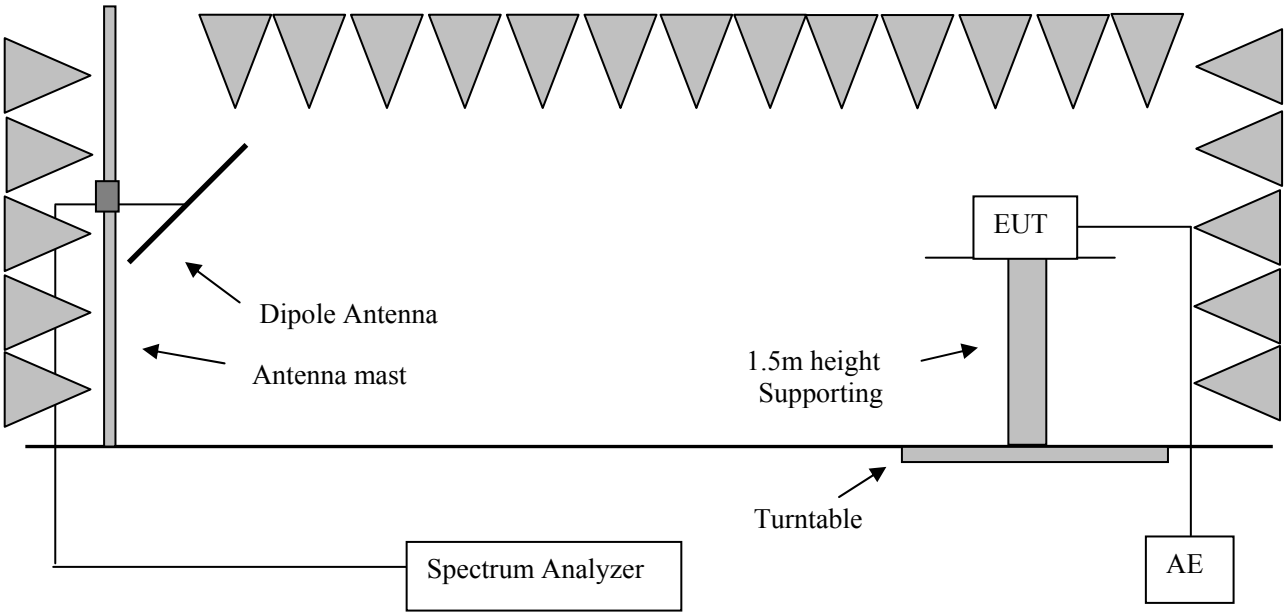
Test result: **PASS**

8.1 Limit

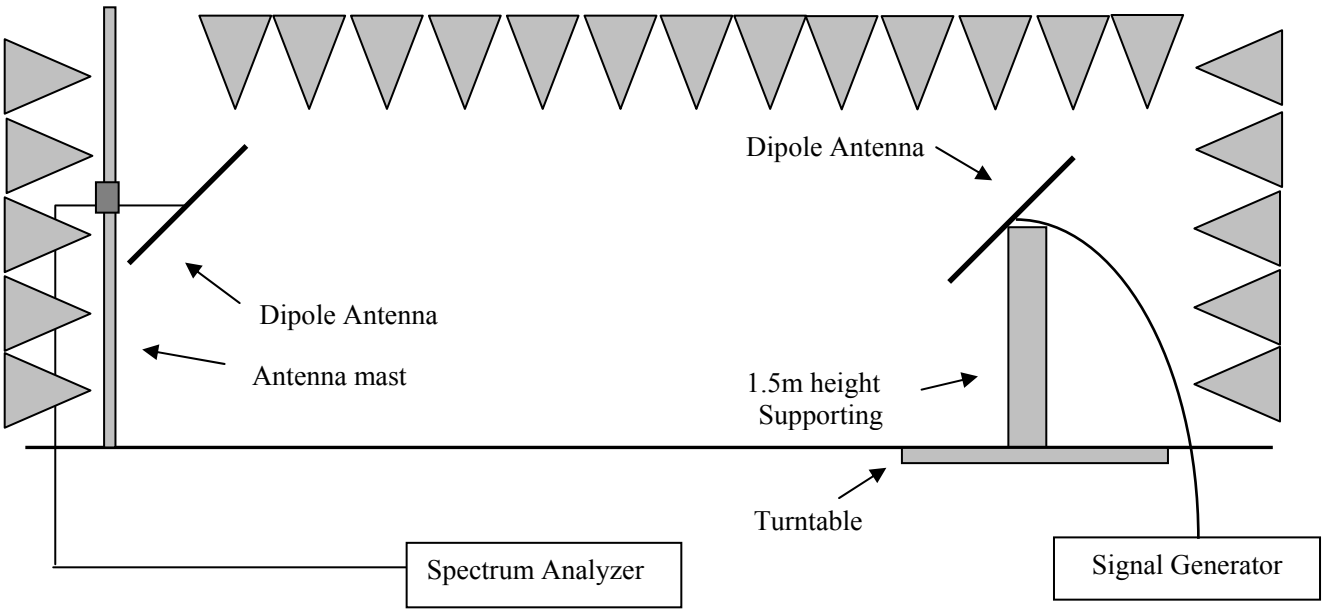
Please refer to Clause 5.1 of this report.

8.2 Test Configuration

8.2.1. Step one



8.2.2 Step two



Note: for frequency below 1GHz, it is permissible to use other antennas provided they can be referenced to a dipole.

8.3 Test procedure and test setup

Test procedure as per TIA-603-C Section 2.2.12.

8.4 Test protocol

The lowest reading of output power in all modes is 11.53dBm. So the worst limit is **lowest output power reading – limit in clause 5.1 for out of band frequencies = 11.53dBm – 40dB = -28.47dBm.**
The test was conducted under the mode with highest output power (802.11n HT20 dual antenna mode).

CH	Ant	Frequency (MHz)	Reading of SG (dBm)	Cable Loss (dB)	Substitution Antenna (dBi)	ERP (dBm)	Limit (dBm)
L	V	53.32	-57.40	0.60	-4.20	-62.20	-28.47
	H	125.25	-59.40	0.80	-1.20	-61.40	
	V	175.85	-58.70	1.20	-1.20	-61.10	
	V	1205.82	-48.20	2.50	8.30	-42.40	
H	V	53.32	-64.30	0.60	2.70	-62.20	
	H	125.25	-66.60	1.30	6.50	-61.40	
	V	175.85	-65.60	2.30	6.80	-61.10	
	V	1768.46	-48.30	3.10	9.80	-41.60	

Note: 1. this test was conducted per using the substitution method.
2. The ERP of EUT = Reading of SG - cable loss + Substitution Antenna

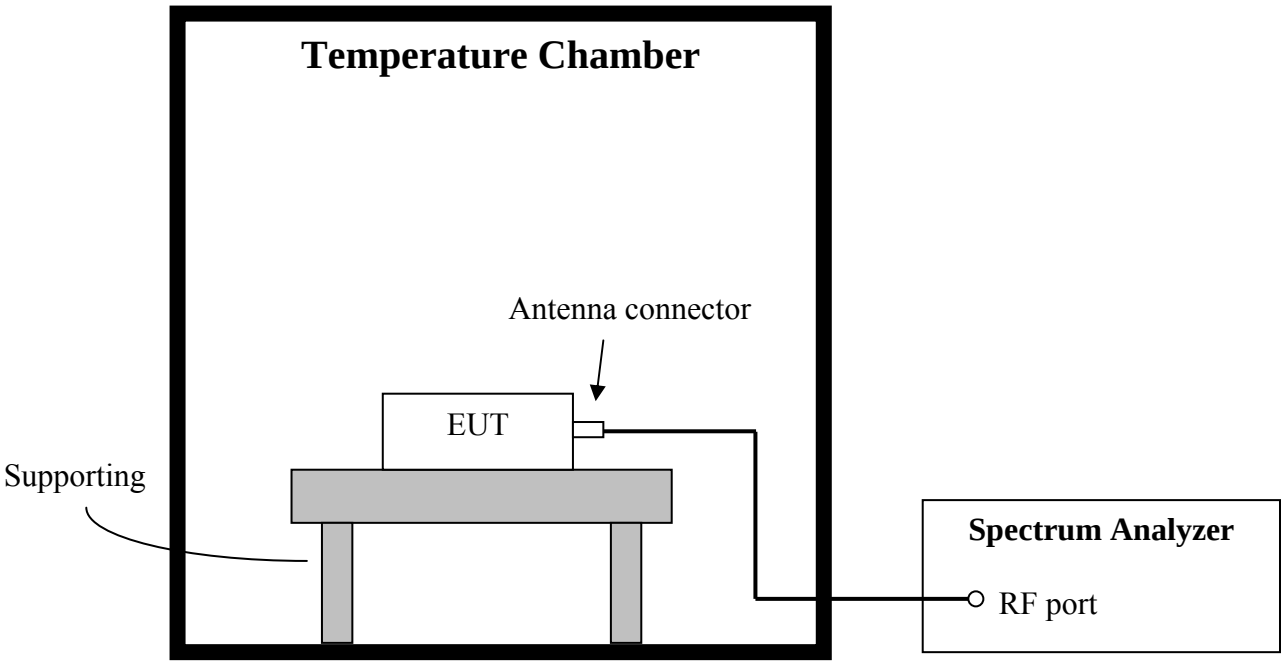
9. Transmitter Frequency Stability (Temperature Variation)

Test result: **PASS**

9.1 Test limit

There's no limit applied.

9.2 Test Configuration



9.3 Test procedure and test setup

Test Procedure as per TIA-603-C 2.2.2.

9.4 Test protocol

CH	Temp (ºC)	Freq measured (MHz)	Freq nominal (MHz)	Freq Error (ppm)
L	-30	4950.0148	4950.0000	2.99
	-20	4950.0108		2.18
	-10	4950.0117		2.36
	0	4950.0114		2.30
	10	4950.0102		2.06
	20	4950.0108		2.18
	30	4950.0015		0.30
	40	4950.0040		0.81
	50	4950.0143		2.89
	55	4950.0146		2.95
H	-30	4980.0152	4980.0000	3.05
	-20	4980.0133		2.67
	-10	4980.0119		2.39
	0	4980.0122		2.45
	10	4980.0111		2.23
	20	4979.9989		0.22
	30	4980.0006		0.12
	40	4979.9990		0.20
	50	4980.0061		1.22
	55	4980.0108		2.17

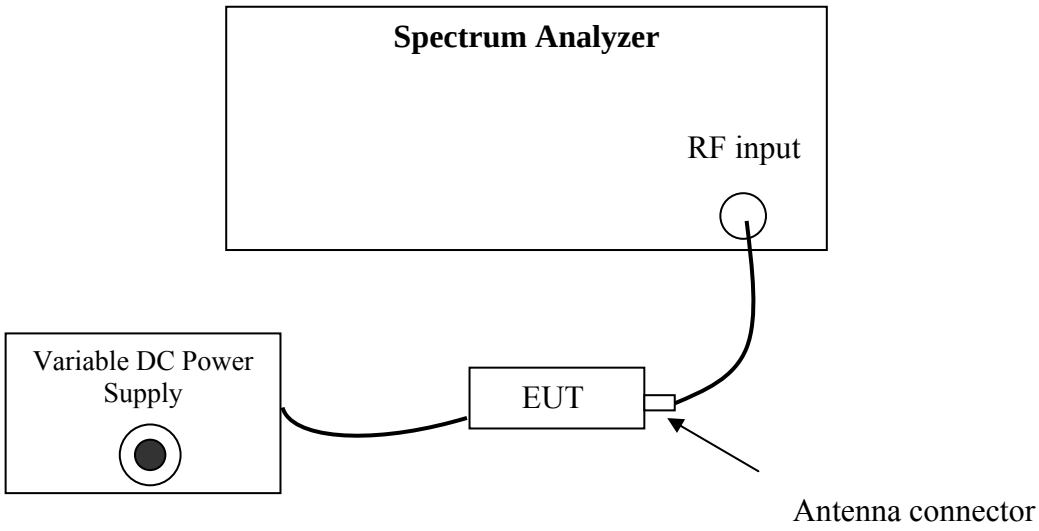
10. Transmitter Frequency Stability (Voltage Variation)

Test result: **PASS**

10.1 Test limit

There's no limit applied.

10.2 Test Configuration



10.3 Test procedure and test setup

Test Procedure as per TIA-603-C 2.2.2.

10.4 Test protocol

CH	Voltage (V)	Freq Measured (MHz)	Freq nominal (MHz)	Freq Error (ppm)
L	85	4950.0114	4950.0000	2.30
	120	4950.0111		2.24
	276	4950.0120		2.42
H	85	4980.0106	4980.0000	2.13
	120	4980.0109		2.19
	276	4980.0109		2.19

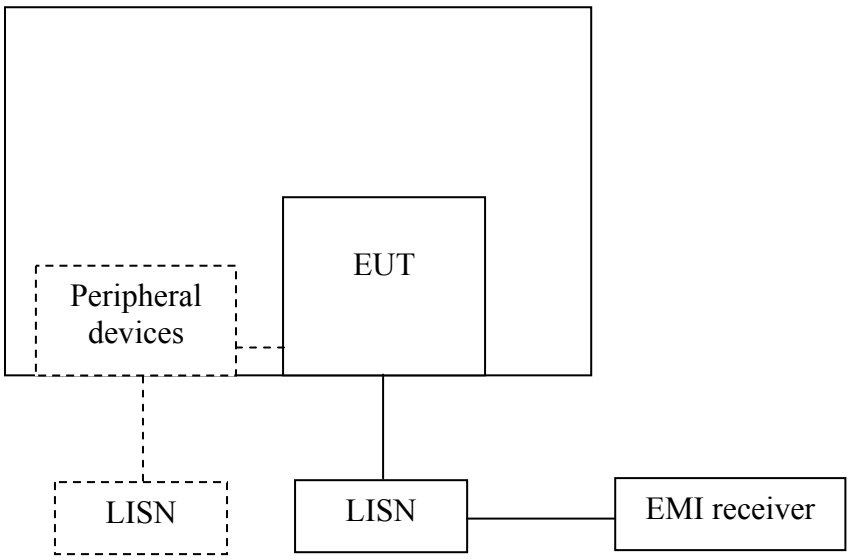
11. Mains Conducted Emissions

Test result: **NA**

11.1 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.		

11.2 Test configuration



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

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

11.3 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.

11.4 Test protocol

Frequency	Level (dBuV)		Limit (dBuV)		Margin (dB)	
	QP	AV	QP	AV	QP	AV
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

12. Spurious emission for receiver

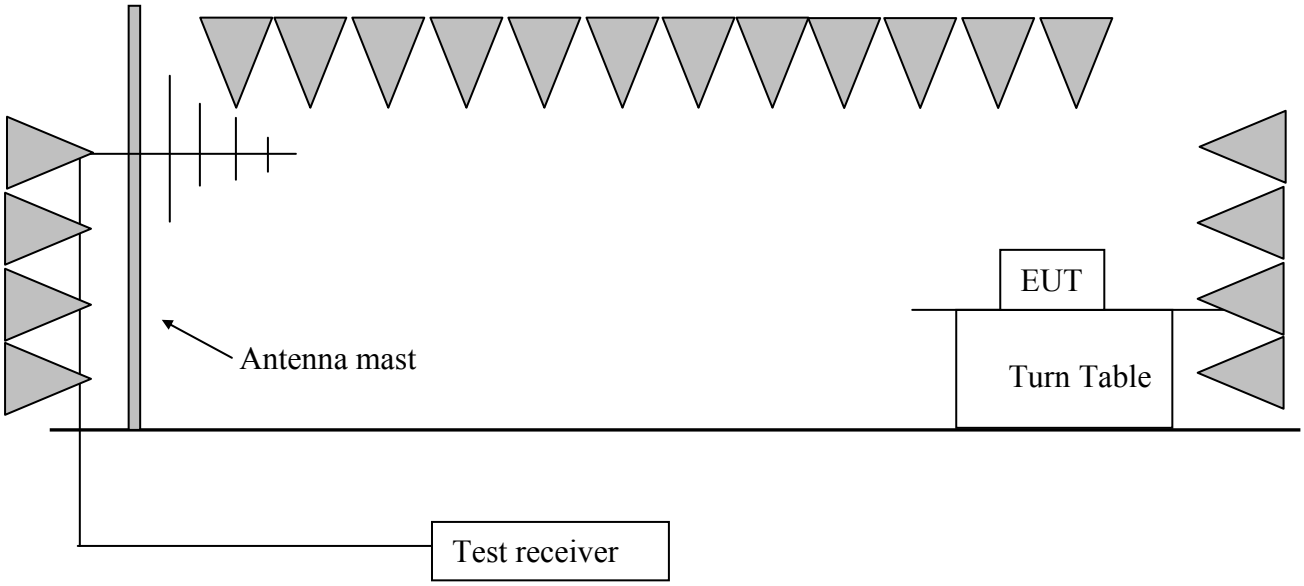
Test result: **NA**

12.1 Test limit

The spurious emission shall test through 3 times tuneable or local oscillator frequency whichever is the higher, without exceeding 40 GHz.
1) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2nW per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5nW above 1 GHz.
2) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 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

12.2 Test Configuration



12.3 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 radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100kHz, VBW = 300kHz (30MHz~1GHz)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);
RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

12.4 Test protocol

Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = limit – Corrected Reading

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 = 32.20dB/m; Corrected Reading = 10dBuV + 32.20dB/m = 42.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 42.20dBuV/m, then Margin = 54 -42.20 = 11.80dBuV/m