ENGINEERING TEST REPORT

Dual Band Wireless AC-7260
Model: 7260H
FCC ID: 2AIPX7260H

Applicant:

Contec DTx Inc.
1800 Penn St. Suite 1
Melbourne, FL
USA 32901

In Accordance With

Federal Communications Commission (FCC)
Part 15, Subpart C, Section 15.247
Digital Modulation Systems (DTS) Operating in 2400 – 2483.5 MHz Band

UltraTech's File No.: 16CDTX003_FCC15C247DTS

This Test report is Issued under the Authority of Tri M. Luu Vice President of Engineering UltraTech Group of Labs Date: August 08, 2016	
Report Prepared by: Dharmajit Solanki Issued Date: August 08, 2016	Tested by: Hung Trinh Test Dates: July 31 – August 03, 2016

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
Tel.: (905) 829-1570 Fax.: (905) 829-8050
Website: www.ultratech-labs.com, Email: vic@ultratech-labs.com, Email: tri@ultratech-labs.com

91038	1309	46390-2049	NVLAP LAB CODE 200093-0	AT-1945	SL2-IN-E-1119R	CA2049	TL363_B	TPTDP DA1300

TABLE OF CONTENTS

EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart C, Section 15.247, DTS
Title:	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 – Radio Frequency Devices
Purpose of Test:	Class II Permissive Change Certification for Digital Modulation Systems (DTS) Wi-Fi Transmitter Operating in the Frequency Band 2400-2483.5 MHz.
Test Procedures:	▪ ANSI C63.4 ▪ ANSI C63.10 ▪ FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r05
Environmental Classification:	[x] Commercial, industrial or business environment [x] Residential environment

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None

1.3. NORMATIVE REFERENCES

Publication	Year	Title
47 CFR Parts 0-19	2016	Code of Federal Regulations (CFR), Title 47 – Telecommunication
ANSI C63.4	2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
CISPR 22 & EN 55022	2008-09, Edition 6.0 2006	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement
CISPR 16-1-1 +A1 +A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-1-2 +A1 +A2	2003 2004 2006	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances
FCC, KDB Publication No. 558074 D01 DTS Meas Guidance v03r05	2016	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT	
Name:	Contec DTx Inc.
Address:	1800 Penn St. Suite 1 Melbourne, FL USA 32901
Contact Person:	Mr. Paul Parkinson Phone #: 321 728 0172 Fax #: 321 722 2216 Email Address: Paul.parkinson@dtx.com

MANUFACTURER	
Name:	Intel Corporation
Address:	2111 NE 25th Avenue JF3-302, Hillsboro, OR USA 97124
Contact Person:	Mr. Steven C Hackett Email Address: steven.c.hackett@intel.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Contec DTx Inc.
Product Name:	Dual Band Wireless AC-7260
Model Name or Number:	7260H
Serial Number:	Test Sample
Type of Equipment:	Digital Transmission System (DTS)
Input Power Supply Type:	120 VAC 60 Hz AC Adaptor
Primary User Functions of EUT:	802.11 a/b/g/n/ac wireless LAN + BT PCIe half-mini card

2.3. EUT'S TECHNICAL SPECIFICATIONS

Transmitter	
Equipment Type:	• Mobile • Base Station (fixed use)
Intended Operating Environment:	▪ Commercial, industrial or business environment ▪ Residential environment
Power Supply Requirement:	3.3 VDC
RF Output Power Rating:	▪ 20.45 dBm (110.9 mW) (2412 - 2462 MHz) ▪ 19.80 dBm (95.5 mW) (2422 - 2452 MHz)
Operating Frequency Range:	2412 - 2462 MHz 2422 - 2452 MHz
RF Output Impedance:	50 Ω
Duty Cycle:	Continuous
Modulation Type:	OFDM
Antenna Connector Types:	U.FL to RP-SMA(M) Hinged Antenna

2.4. ASSOCIATED ANTENNA DESCRIPTIONS

New Antenna Type	Maximum Gain after assembly cable loss (dBi)
Dipole Antenna, GW.71.5153	2.07 dBi (2.4-2.5 GHz) & 2.91 dBi (5.0-5.8 GHz) Bands

2.5. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	ANT1 & ANT2	2	U.FL – RP-SMA	Cable connector U.FL- LP-066
2	Connector Interface	1	52-Pin Mini Card Edge	Direct connection (no cable)

2.6. ANCILLARY EQUIPMENT

The EUT was tested with special test-jig connected with the representative configuration of ancillary equipments necessary to exercise the ports during tests as shown in the test set-up diagrams.

EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21 to 23 ^{o}C
Humidity:	45 to 58%
Pressure:	102 kPa
Power Input Source:	3.3 V DC via HMC/NGFC test board

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	The transmitter was operated in a continuous transmission mode with the carrier modulated as specified in the Test Data.
Special Test Software:	Test software provided by the Applicant to operate the EUT at each channel frequency continuously and in the range of typical modes of operation.
Special Hardware Used:	Test Jig
Transmitter Test Antenna:	The EUT is tested with the antenna fitted in a manner typical of normal intended use as non-integral antenna equipment as described with the test results.

Transmitter Test Signals	
Frequency Band(s):	2402 - 2480 MHz 2412 - 2462 MHz 2422 - 2452 MHz
Frequency(ies) Tested:	2412 MHz, 2422 MHz, 2452 MHz, 2462 MHz
RF Power Output: (measured maximum output power at antenna terminals)	▪ 20.45 dBm (110.9 mW) (2412 - 2462 MHz) ▪ 19.80 dBm (95.5 mW) (2422 - 2452 MHz)
Normal Test Modulation:	OFDM
Modulating Signal Source:	Internal

Note: The configuration chosen for testing based on recommendation from Intel: “The data rates of 6Mb/s for 802.11a, HT4 (SISO)/(MIMO) for 802.11 n/ac20 & n/ac40, and VHT6 (SISO)/(MIMO) for 802.11 ac80 were selected based on preliminary testing that identified those data rates corresponding to the worst cases for output power and spurious levels at the band edges.”

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2017-04-02.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.203	Antenna requirements	Yes
15.207(a)	AC Power Line Conducted Emissions	See Note 1
15.247(a)(2)	6 dB Bandwidth	See Note 1
15.247(b)(3)	Peak Conducted Output Power - DTS	Yes
15.247(d)	Band-Edge Spurious Radiated Emissions	Yes
15.247(d), 15.209 & 15.205	Transmitter Spurious Radiated Emissions	Yes
15.247(e)	Power Spectral Density	See Note 1
15.247(i), 1.1307, 1.1310, 2.1091	RF Exposure	Yes

Note 1: Refer to the original filing UNII test report under FCC ID: PD97260H, Report Number:38067RRF.002A1

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

EXHIBIT 5. TEST DATA

5.1. PEAK CONDUCTED OUTPUT POWER - DTS [§ 15.247(b)(3)]

5.1.1. Limit(s)

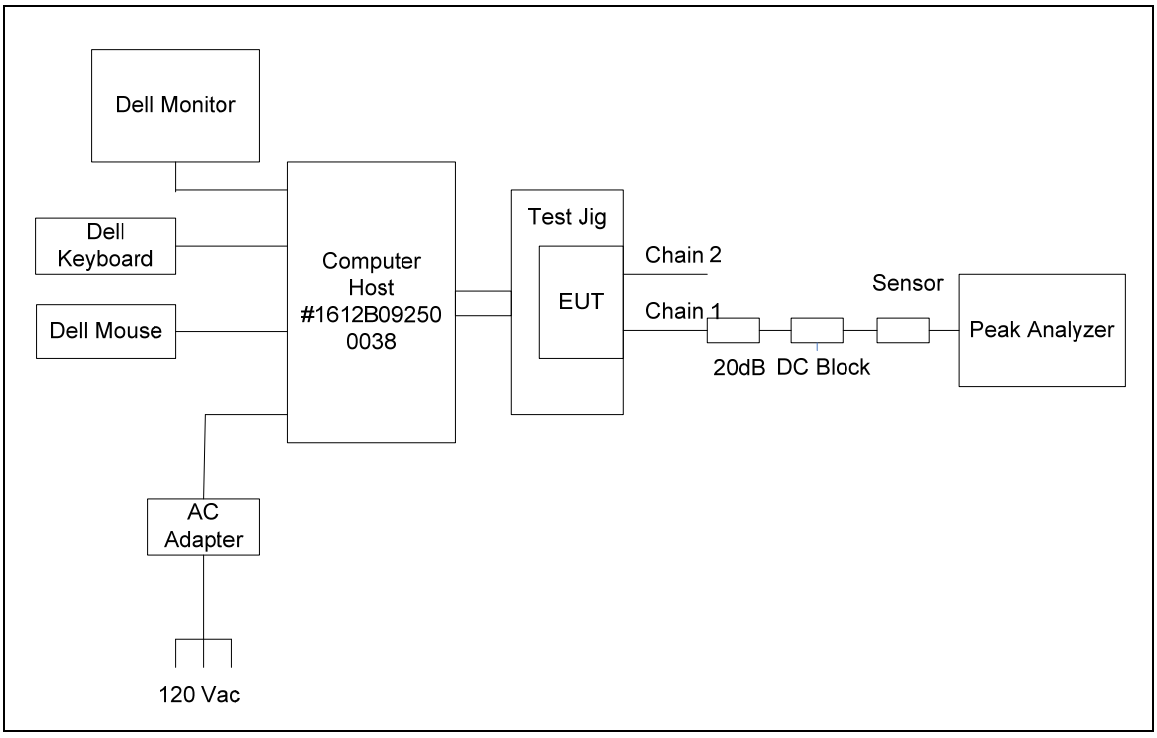
§ 15.247(b)(3): For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power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

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

5.1.2. Method of Measurements & Test Arrangement

KDB 558074 D01 DTS Meas Guidance v03r05, Section 9.1.2 PKPM1 Peak power meter method

5.1.3. Test Arrangement



5.1.4. Test Data

Notes:

1. Assembly Gain for Dipole Antenna = 2.91dBi (Antenna Gain – Assembly Cable loss) = (5.5 – 2.59) dBi
2. Output power is adjusted by Gain Control
3. The configuration chosen for testing based on recommendation from Intel: "The data rates of 6Mb/s for 802.11a, HT4 (SISO)/(MIMO) for 802.11 n/ac20 & n/ac40, and VHT6 (SISO)/(MIMO) for 802.11 ac80 were selected based on preliminary testing that identified those data rates corresponding to the worst cases for output power and spurious levels at the band edges."

802.11b , Chain #1 or #2 (SISO) (no MIMO)

Data Rate (Mbps)	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	EIRP #1 (dBm)	EIRP #2 (dBm)
1	1	2412	19.5	18.99	18.54	21.06	20.61
1	6	2437	19.5	19.15	17.83	21.22	19.90
1	11	2462	19.5	19.01	17.66	21.08	19.73

802.11g , Chain #1 or #2 (SISO) (no MIMO)

Data Rate (Mbps)	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	EIRP #1 (dBm)	EIRP #2 (dBm)
6	1	2412	22.0	20.23	18.61	22.30	20.68
6	6	2437	22.0	20.36	18.57	22.43	20.64
6	11	2462	22.0	20.27	17.91	22.34	19.98

802.11n20 , Chain #1 or #2 (SISO)

Data Rate (Mbps)	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	EIRP #1 (dBm)	EIRP #2 (dBm)
HT4	1	2412	21.5	20.34	19.22	22.41	21.29
HT4	6	2437	21.5	20.45	19.05	22.52	21.12
HT4	11	2462	21.5	20.43	18.89	22.50	20.96

802.11n20 , Chain #1 and #2 (MIMO)

Data Rate (Mbps)	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Total Power (dBm)	EIRP (dBm)
HT4	1	2412	21.5	16.00	14.75	18.43	20.50
HT4	6	2437	21.5	16.21	14.72	18.54	20.61
HT4	11	2462	21.5	16.05	14.76	18.46	20.53

802.11n40 , Chain #1 or #2 (SISO)

Data Rate (Mbps)	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	EIRP #1 (dBm)	EIRP #2 (dBm)
HT4	3	2422	20.5	19.60	18.66	21.67	20.73
HT4	6	2437	20.5	19.78	18.62	21.85	20.69
HT4	9	2452	20.5	19.80	18.77	21.87	20.84

802.11n40 , Chain #1 and #2 (MIMO)

Data Rate (Mbps)	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Total Power (dBm)	EIRP (dBm)
HT4	3	2422	20.5	15.08	13.44	17.35	19.42
HT4	6	2437	20.5	15.28	13.39	17.45	19.52
HT4	9	2452	20.5	15.10	13.43	17.36	19.43

5.2. TRANSMITTER BAND-EDGE & SPURIOUS RADIATED EMISSIONS AT 3 METERS [§§ 15.247(d), 15.209 & 15.205]

5.2.1. Limit(s)

§ 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Section 15.205(a) - Restricted Bands of Operation

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1] 0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	([2])
13.36–13.41.			

[1] Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.
[2] Above 38.6

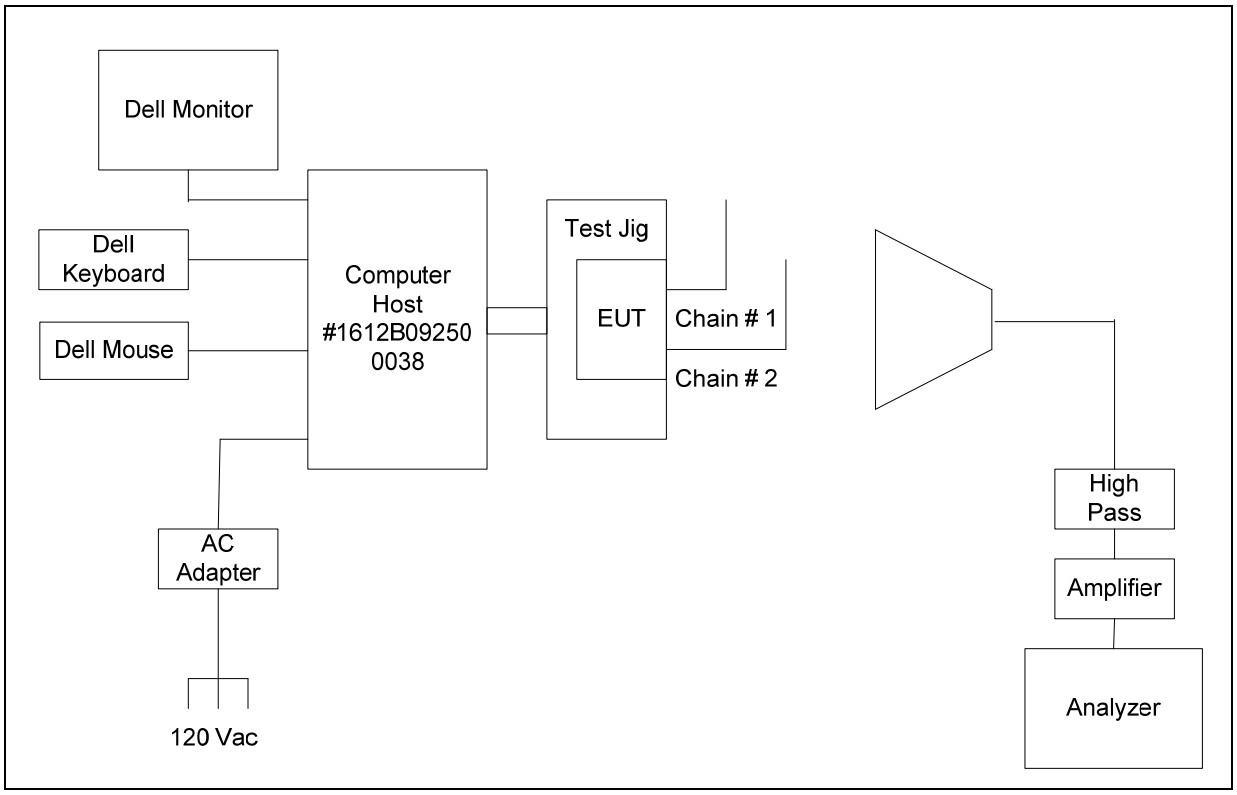
Section 15.209(a) - Field Strength Limits within Restricted Frequency Bands

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / F (kHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

5.2.2. Method of Measurements

KDB 558074D01 DTS Measurement Guidance v03r05, Section 12.2.7 and ANSI C63.10.

5.2.3. Test Arrangement



5.2.4. Test Data

Remark(s):
- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- EUT shall be tested in three orthogonal positions.
- Exploratory tests performed to determined worst-case test configurations, the following test results at high power setting represent the worst-case.

5.2.4.1. 802.11b, 1 Mbps, TX Gain Setting: 19.5, SISO

Fundamental Frequency:	2412 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
4824	51.77	43.42	V	54.0	86.6	-10.6	Pass*
4824	49.84	38.88	H	54.0	86.6	-15.1	Pass*
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.							

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency:	2437 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
4874	52.44	45.19	V	54.0	87.6	-8.8	Pass*
4874	49.65	38.50	H	54.0	87.6	-15.5	Pass*
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.							

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency:	2462 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
4924	54.14	47.76	V	54.0	87.1	-6.2	Pass*
4924	50.51	39.66	H	54.0	87.1	-14.3	Pass*
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.							

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

5.2.4.2. 802.11g, 6 Mbps, TX Gain Setting: 22, SISO

Fundamental Frequency:	2412 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	89.6	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

Fundamental Frequency:	2437 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	90.7	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

Fundamental Frequency:	2462 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	90.6	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

5.2.4.3. 802.11n20, HT4, Gain Control Setting 21.5, SISO & MIMO

Fundamental Frequency:	2412 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	89.6	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

Fundamental Frequency:	2437 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	90.7	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

Fundamental Frequency:	2462 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	90.6	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

5.2.4.4. 802.11n40, HT4, Gain Control Setting 20.5, SISO & MIMO

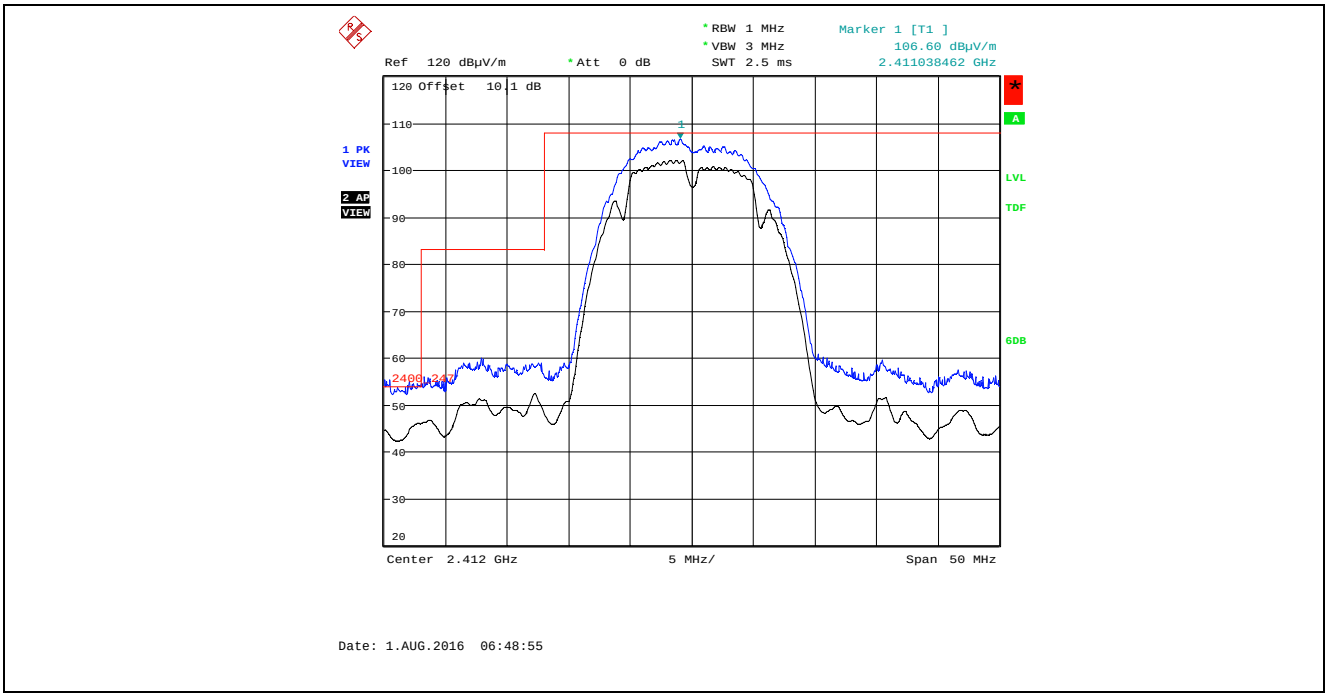
Fundamental Frequency:	2422 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	86.8	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

Fundamental Frequency:	2437 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	87.1	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

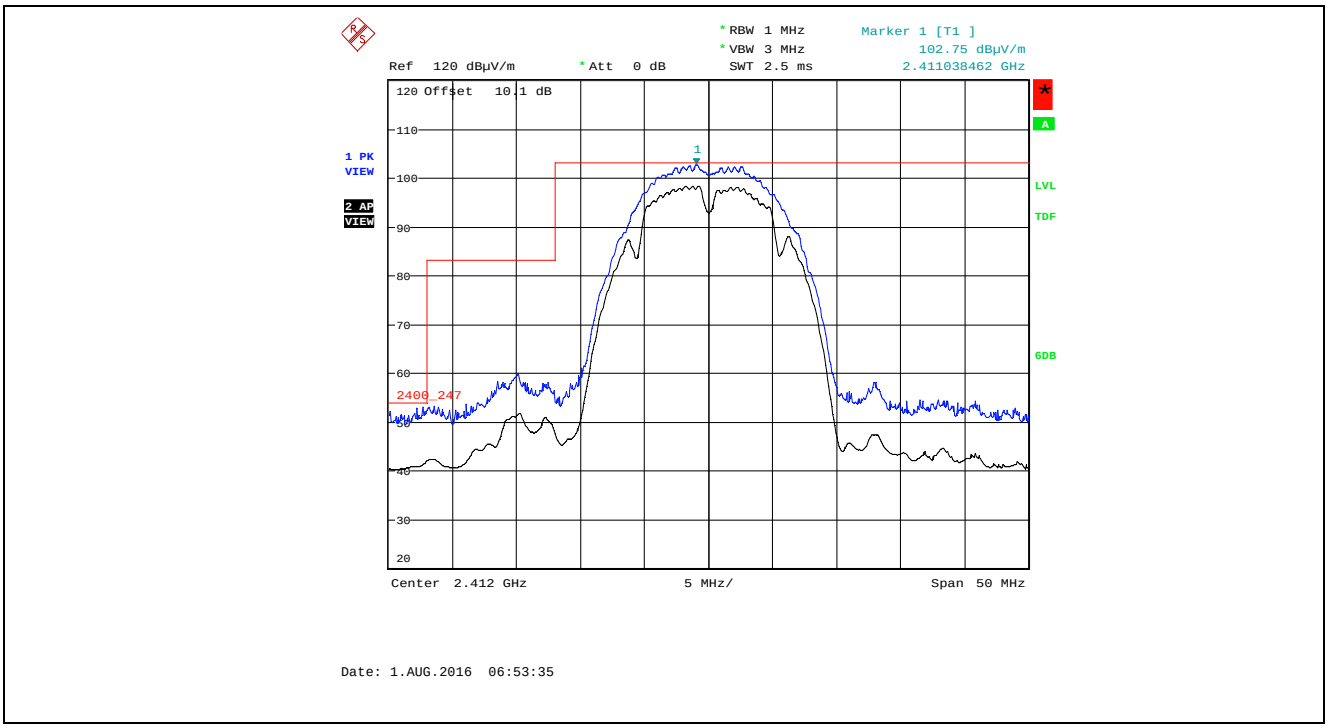
Fundamental Frequency:	2452 MHz						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
30 - 25000	*	*	H/V	*	87.0	*	*
*All spurious emissions and harmonics are more than 20 dB below the applicable limit.							

5.2.5. Band-Edge Radiated Emissions

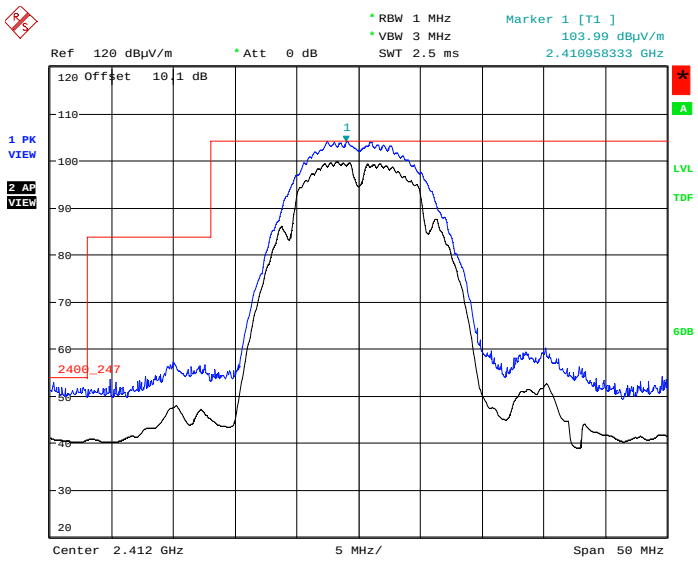
Plot 5.2.5.1.1. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 19.5, Horizontal, Chain # 1



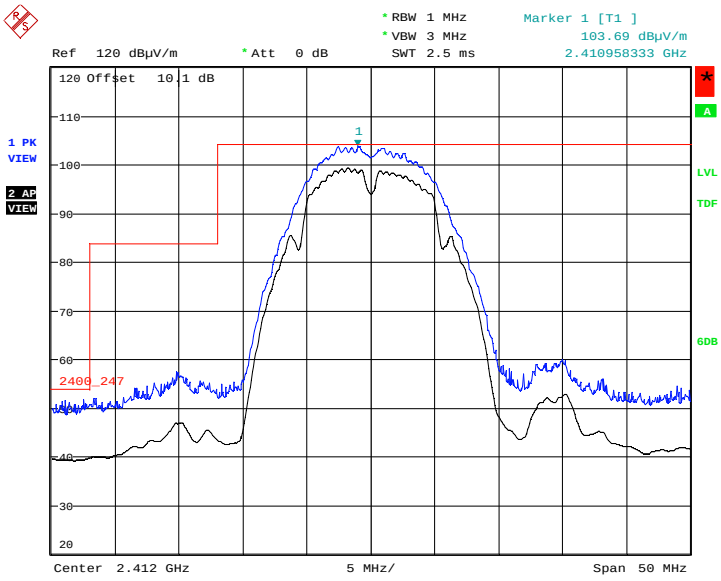
Plot 5.2.5.1.2. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 19.5, Horizontal, Chain # 2



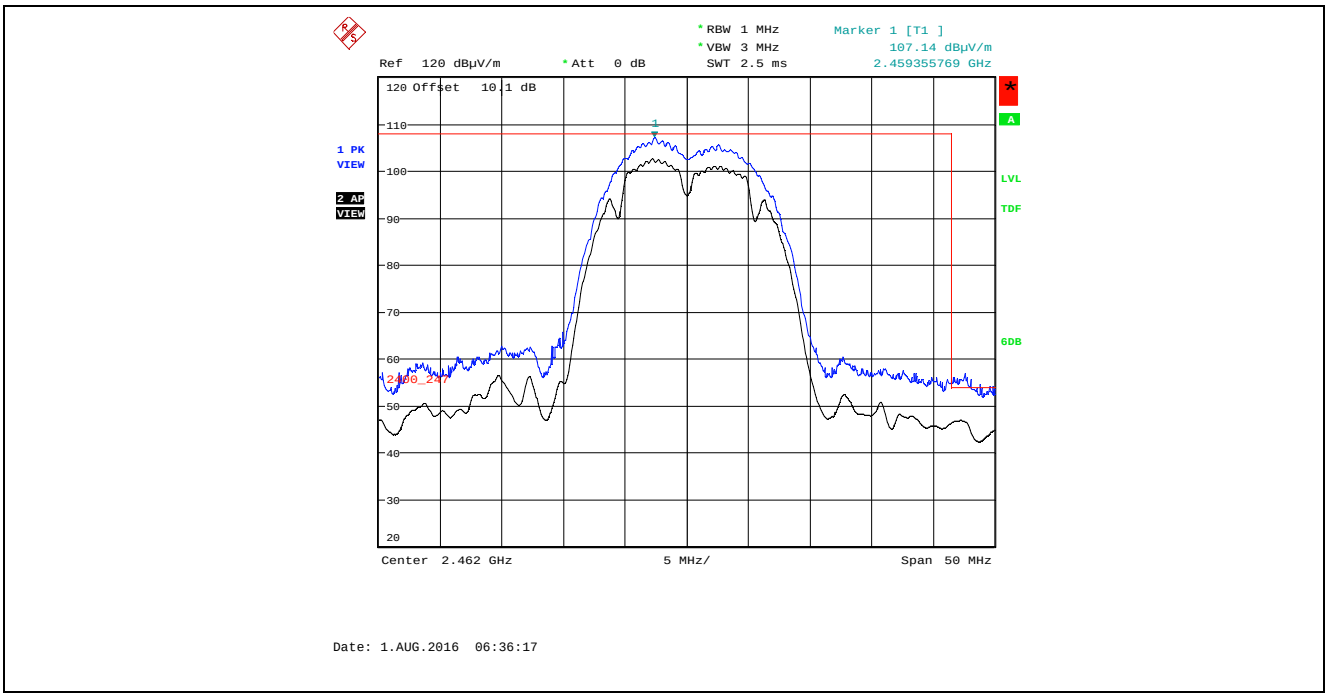
Plot 5.2.5.1.3. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 19.5, Vertical, Chain # 1



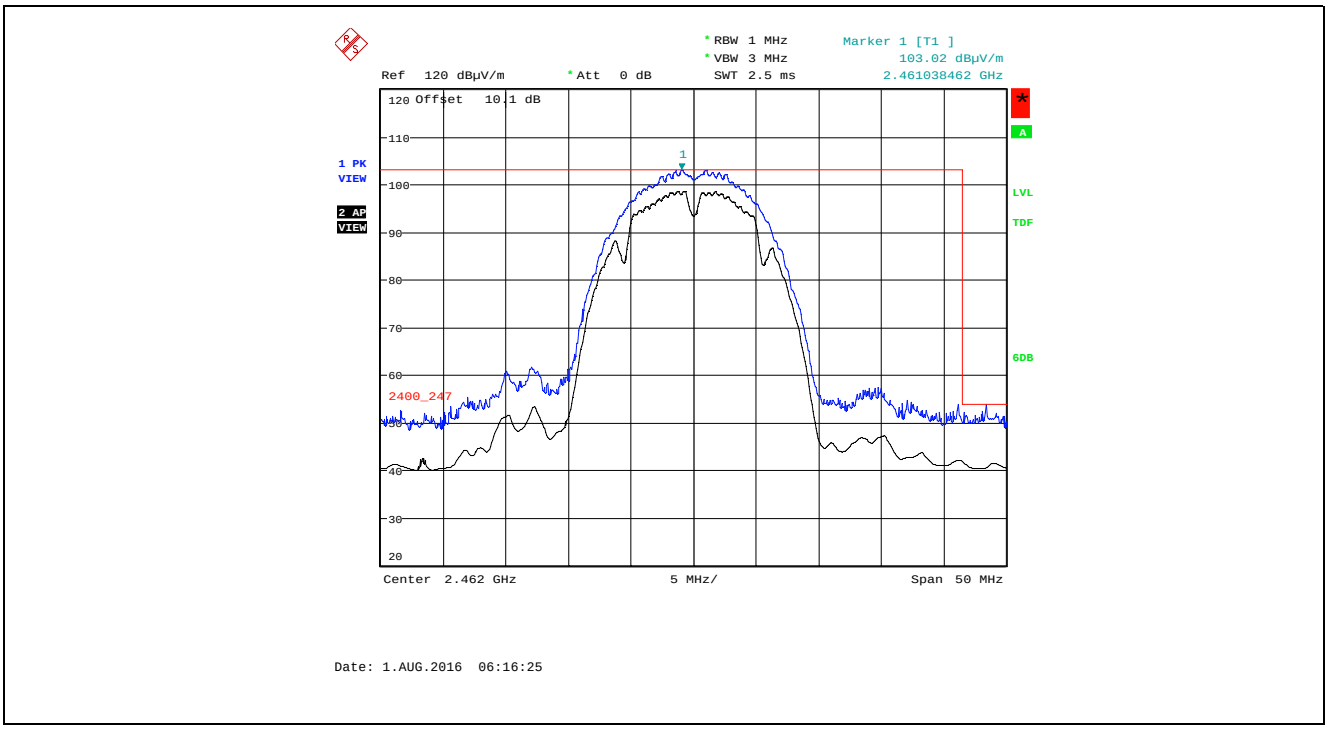
Plot 5.2.5.1.4. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 19.5, Vertical, Chain # 2



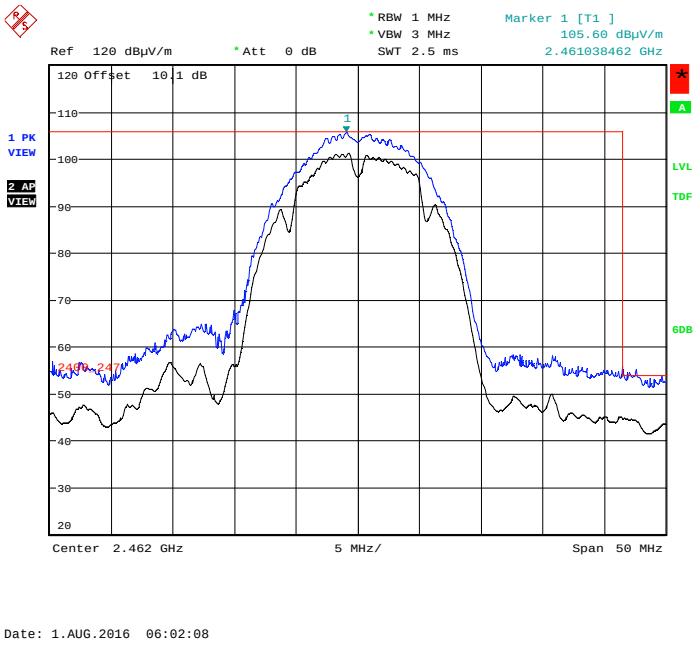
Plot 5.2.5.1.5. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 19.5, Horizontal, Chain # 1



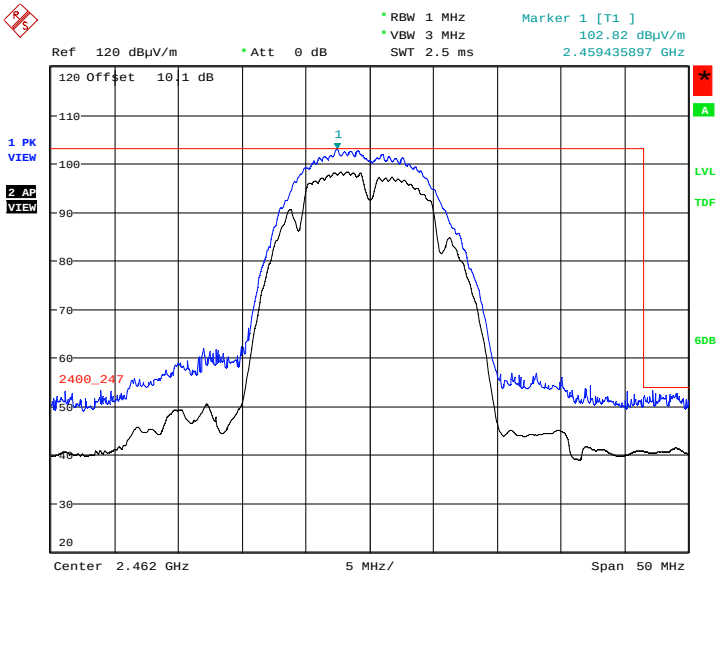
Plot 5.2.5.1.6. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 19.5, Horizontal, Chain # 2



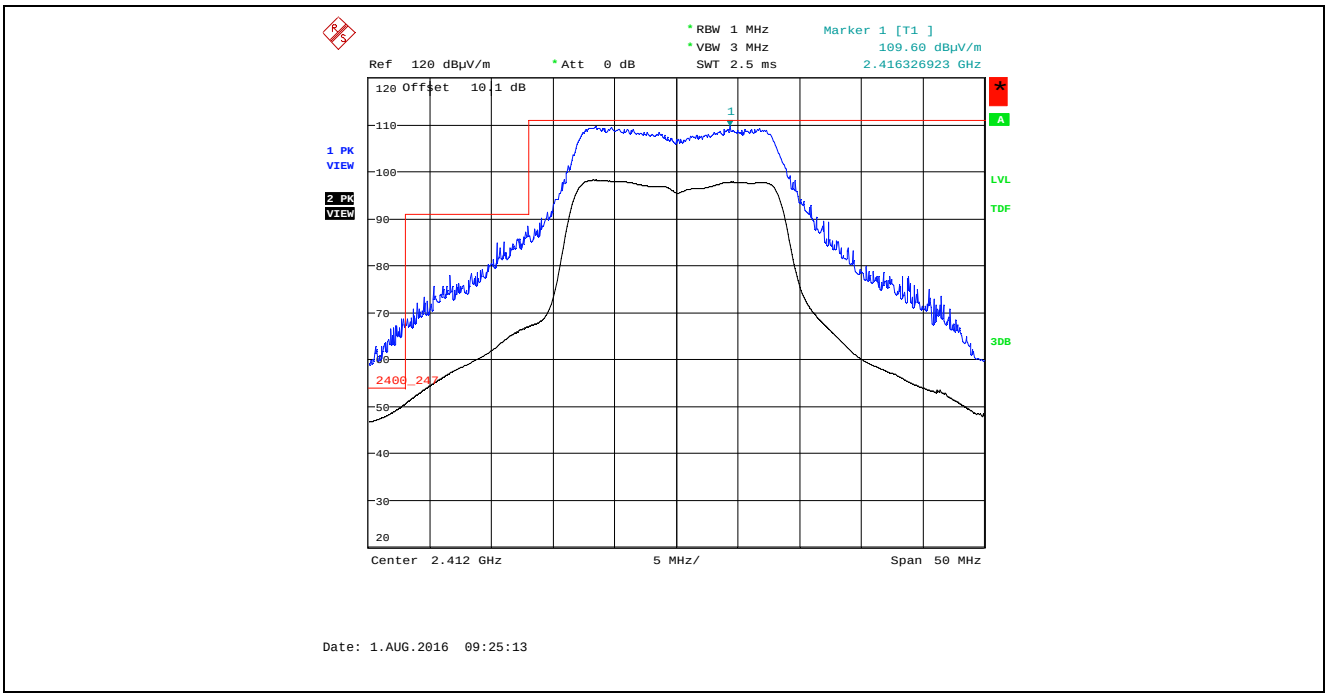
Plot 5.2.5.1.7. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 19.5, Vertical, Chain # 1



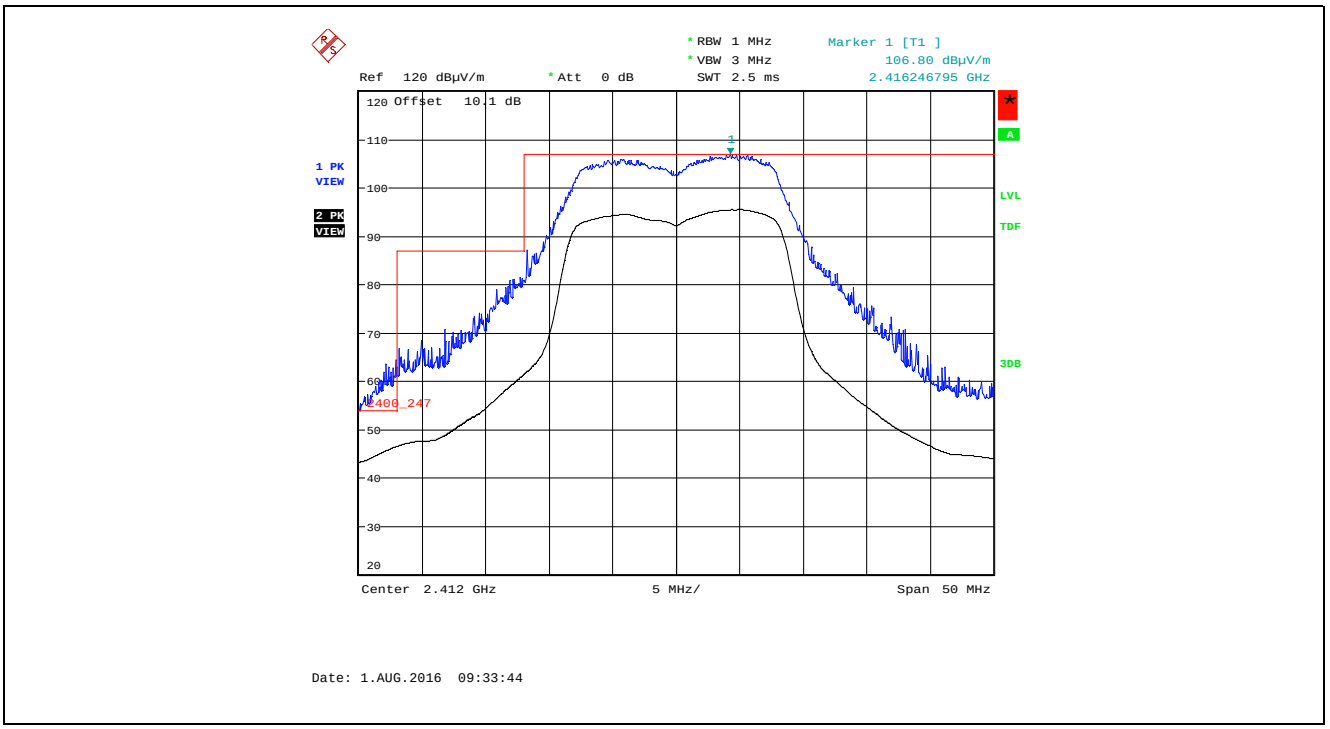
Plot 5.2.5.1.8. Band-Edge Rad Emissions, 802.11b, 1 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 19.5, Vertical, Chain # 2



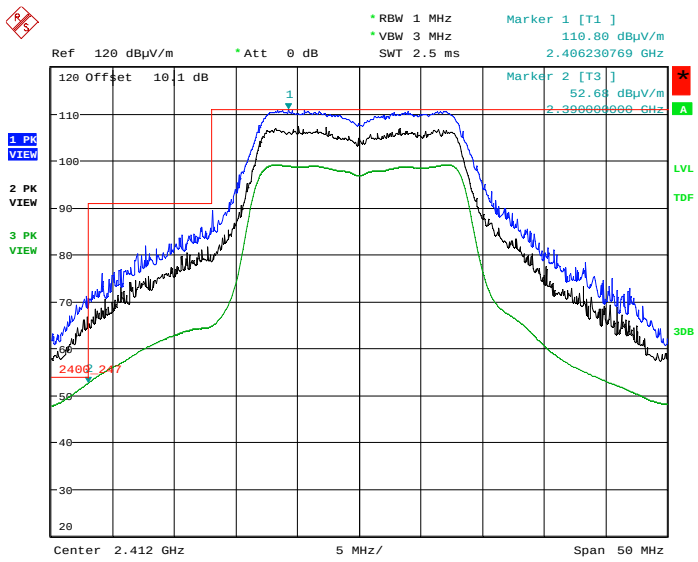
Plot 5.2.5.1.9. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 22, Horiz, Chain # 1

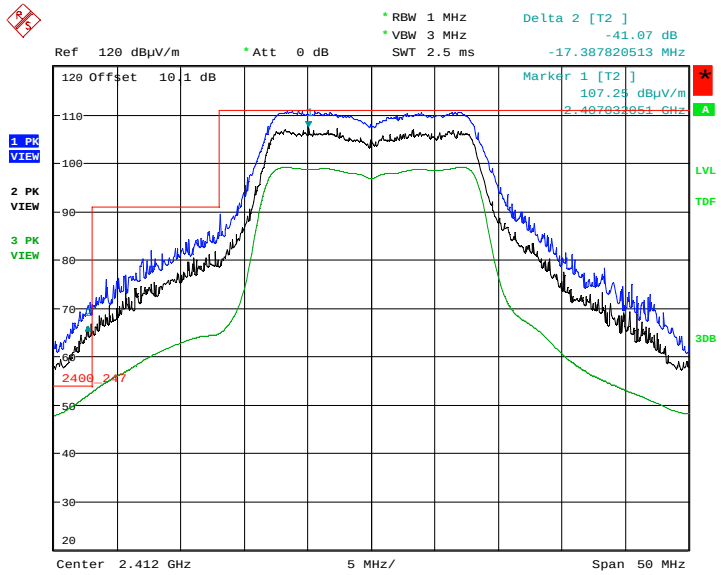


Plot 5.2.5.1.10. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 22, Horiz, Chain # 2



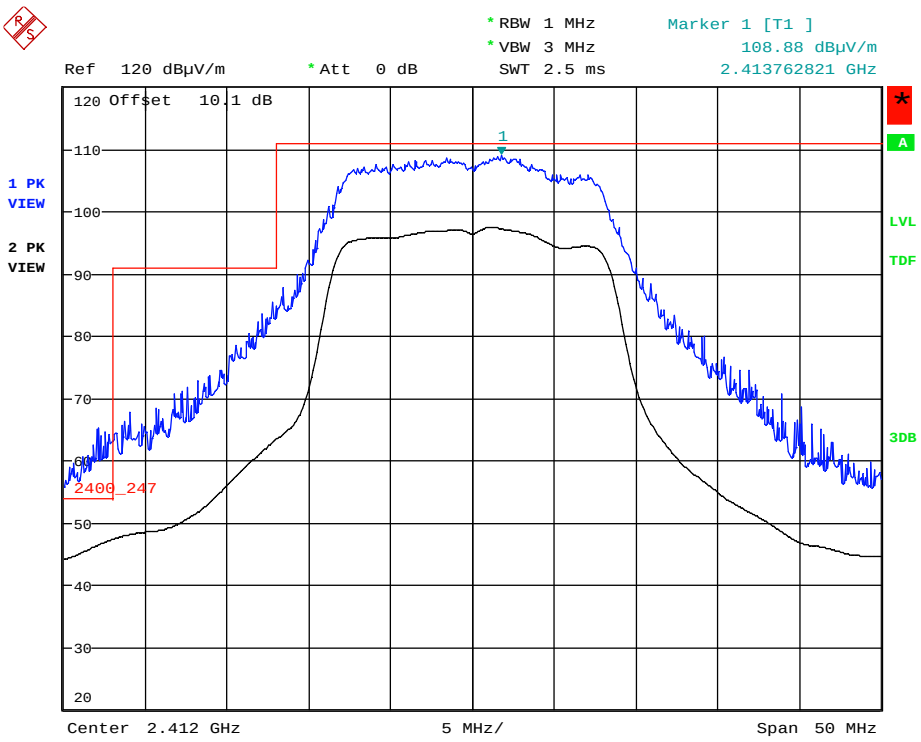
Plot 5.2.5.1.11. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 22, Vertical, Chain # 1



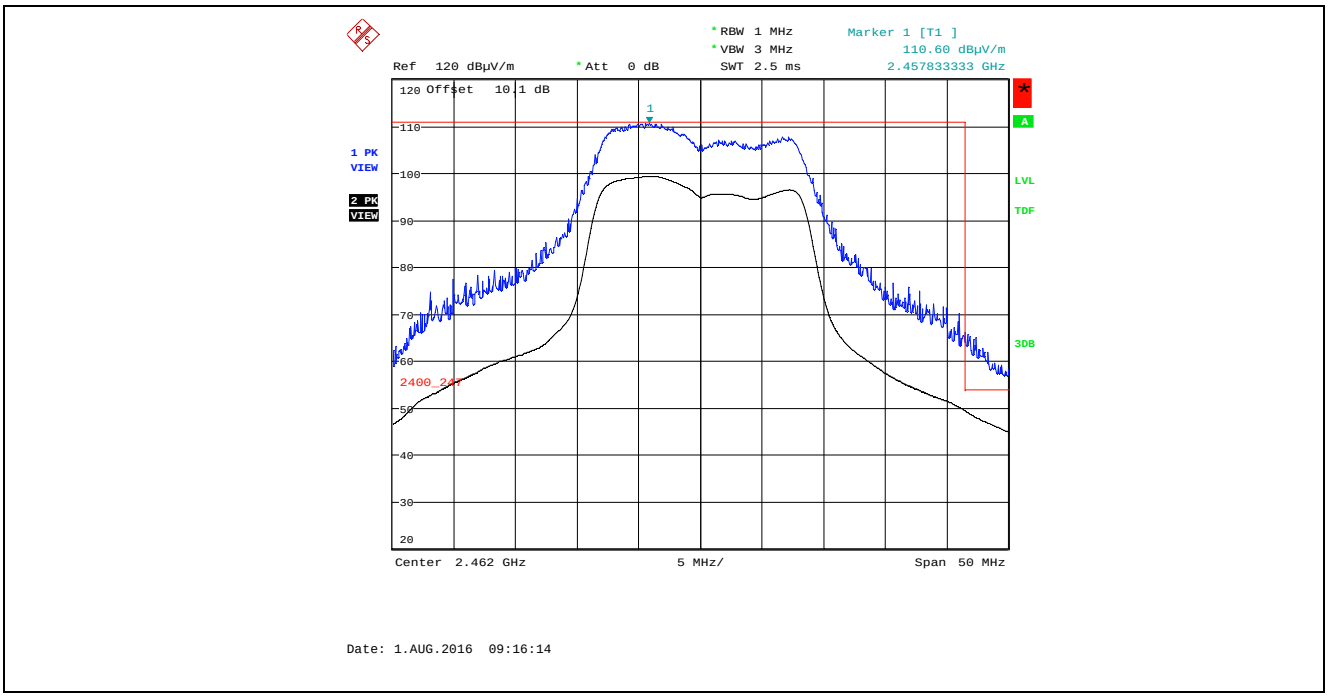


Peak Band-Edge at 2390 MHz: Peak= 110.80dBuV/m – 41.07dB= 69.73dBuV/m (limit 74dBuV/m)
Average at 2390 MHz: 52.68dBuV/m (limit 54dBuV/m)

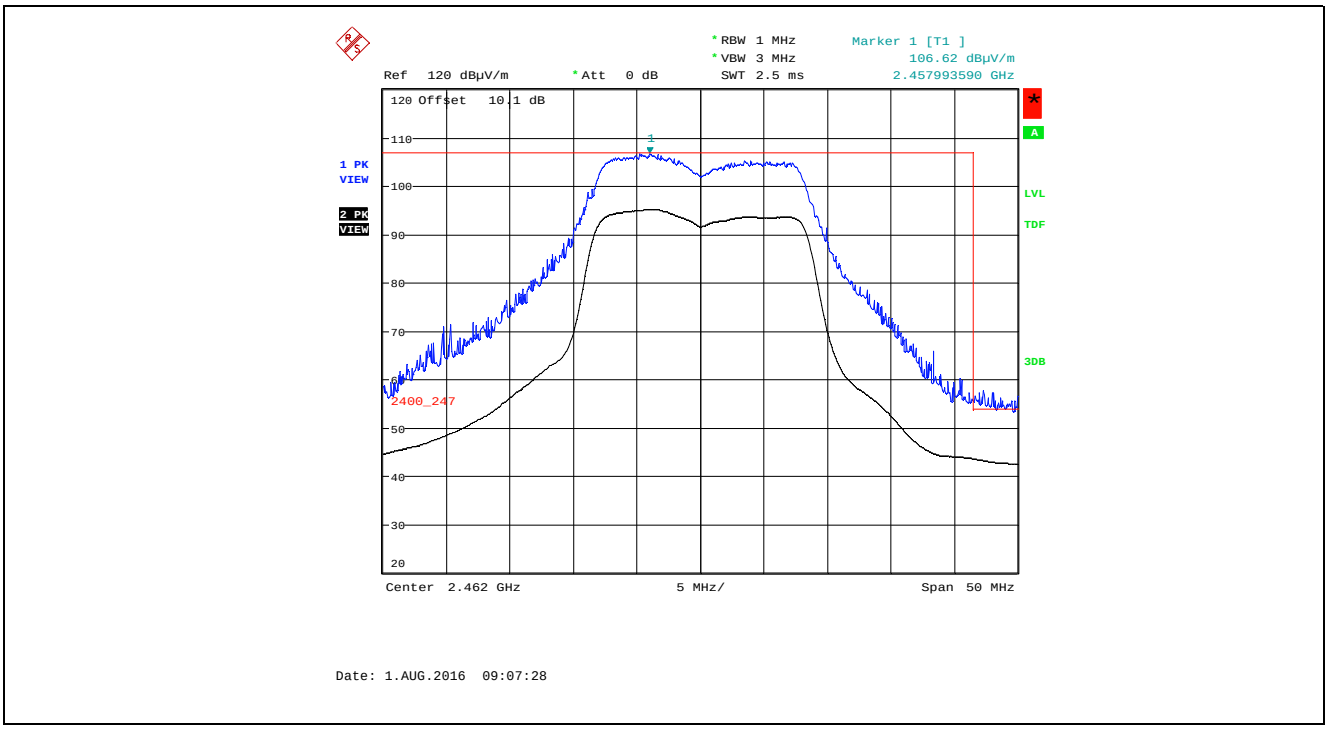
Plot 5.2.5.1.12. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 1, 2412 MHz, SISO, Gain Control 22, Vertical, Chain # 2



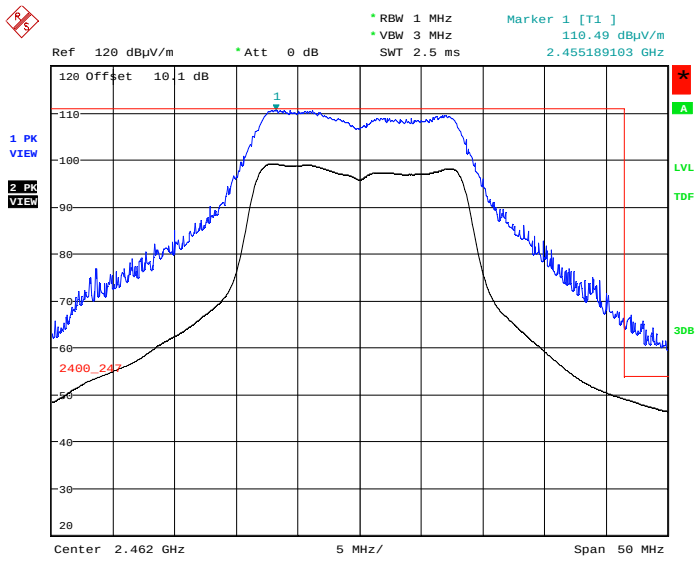
Plot 5.2.5.1.13. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 22, Horiz, Chain # 1



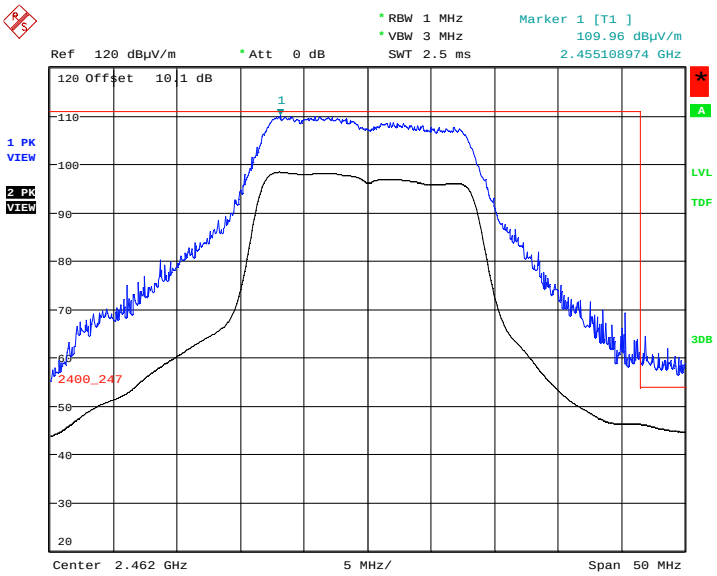
Plot 5.2.5.1.14. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 22, Horiz, Chain # 2



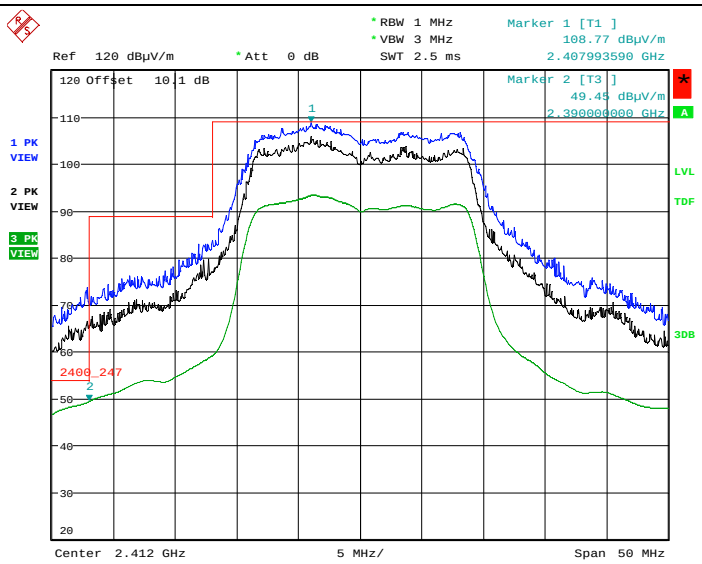
Plot 5.2.5.1.15. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 22, Vertical, Chain # 1



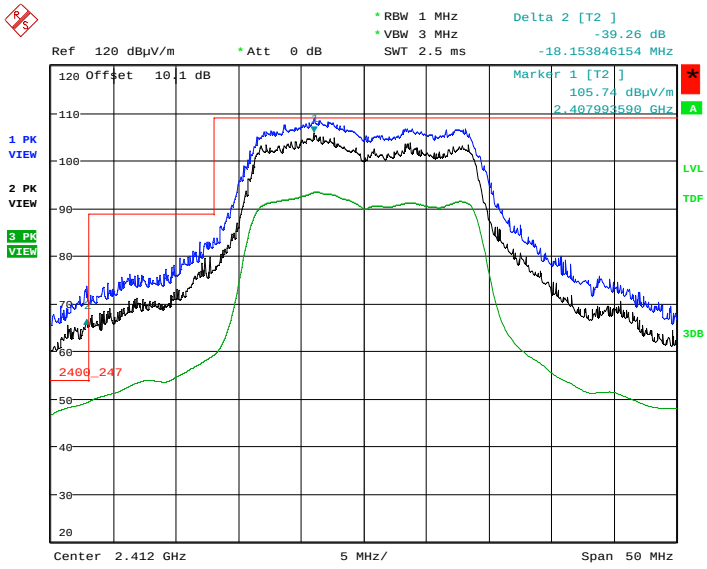
Plot 5.2.5.1.16. Band-Edge Rad Emissions, 802.11g, 6 Mbps, Ch 11, 2462 MHz, SISO, Gain Control 22, Vertical, Chain # 2



Plot 5.2.5.1.17. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 1, 2412 MHz, SISO, Gain Control 21.5, Horiz, Chain # 1



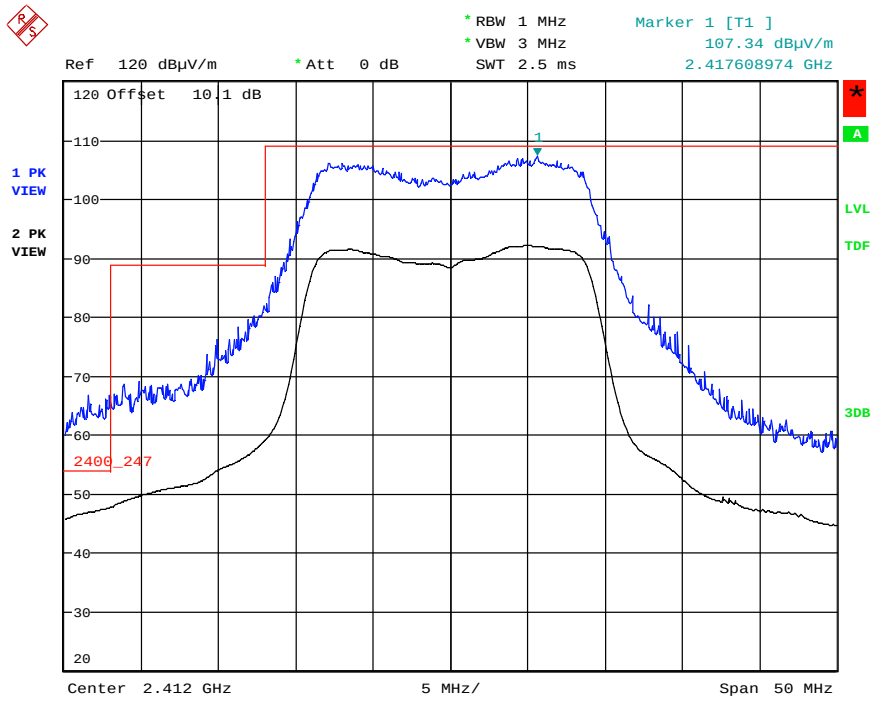
Date: 2.AUG.2016 06:26:31



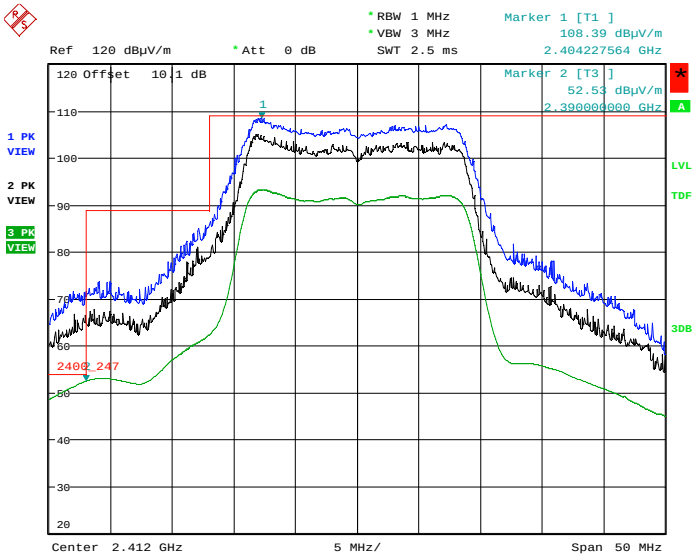
Date: 2.AUG.2016 06:28:26

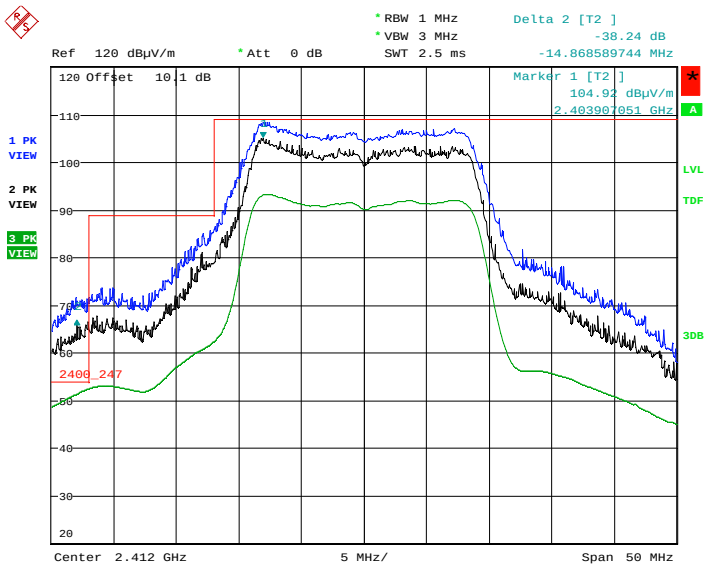
Peak Band-Edge at 2390 MHz: Peak= 108.77dBuV/m – 39.26dB= 69.51dBuV/m (limit 74dBuV/m)
Average at 2390 MHz: 49.45dBuV/m (limit 54dBuV/m)

Plot 5.2.5.1.18. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 1, 2412 MHz, SISO, Gain Control 21.5, Horiz, Chain # 2



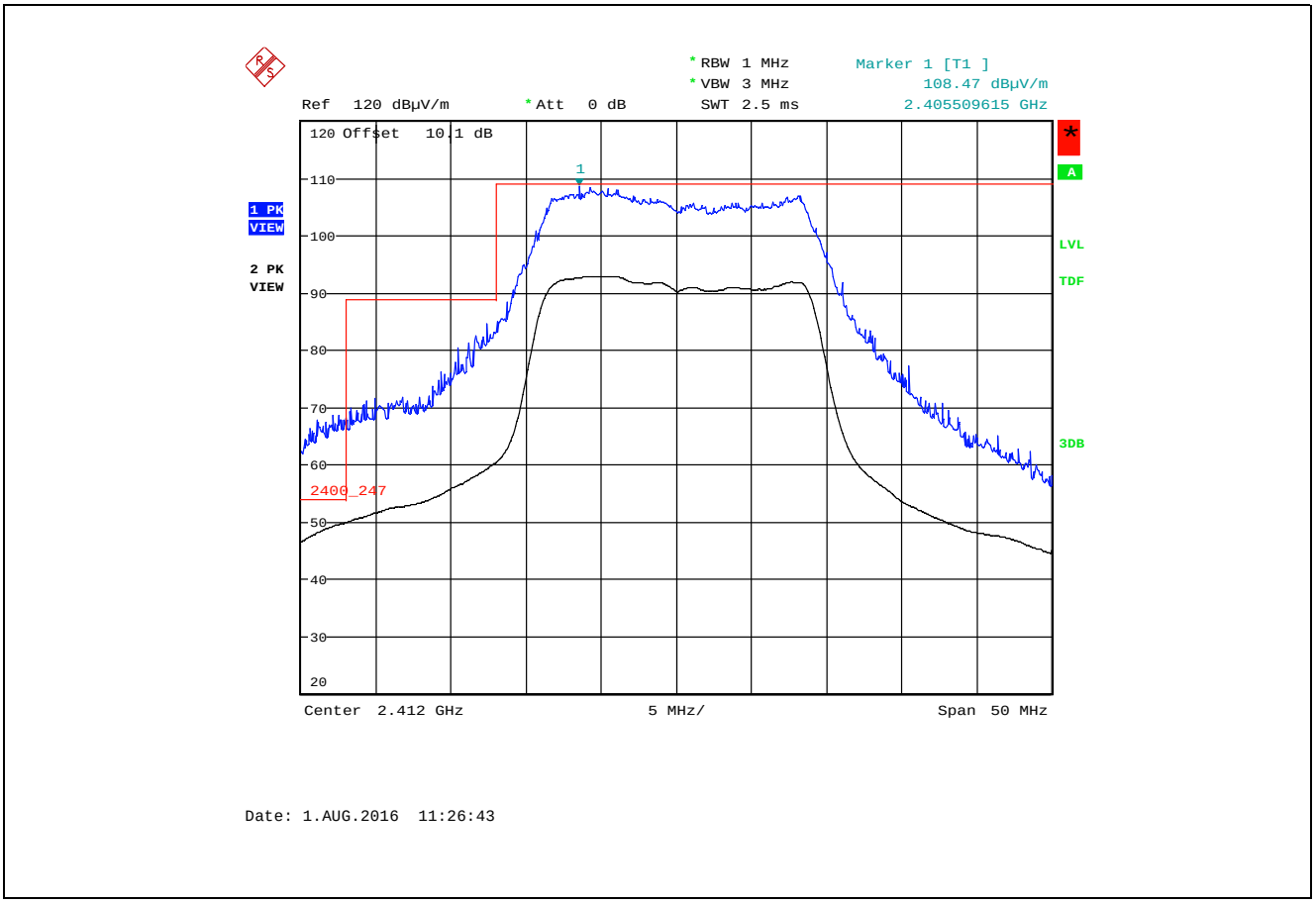
Plot 5.2.5.1.19. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 1, 2412 MHz, SISO, Gain Control 21.5, Vertical, Chain # 1



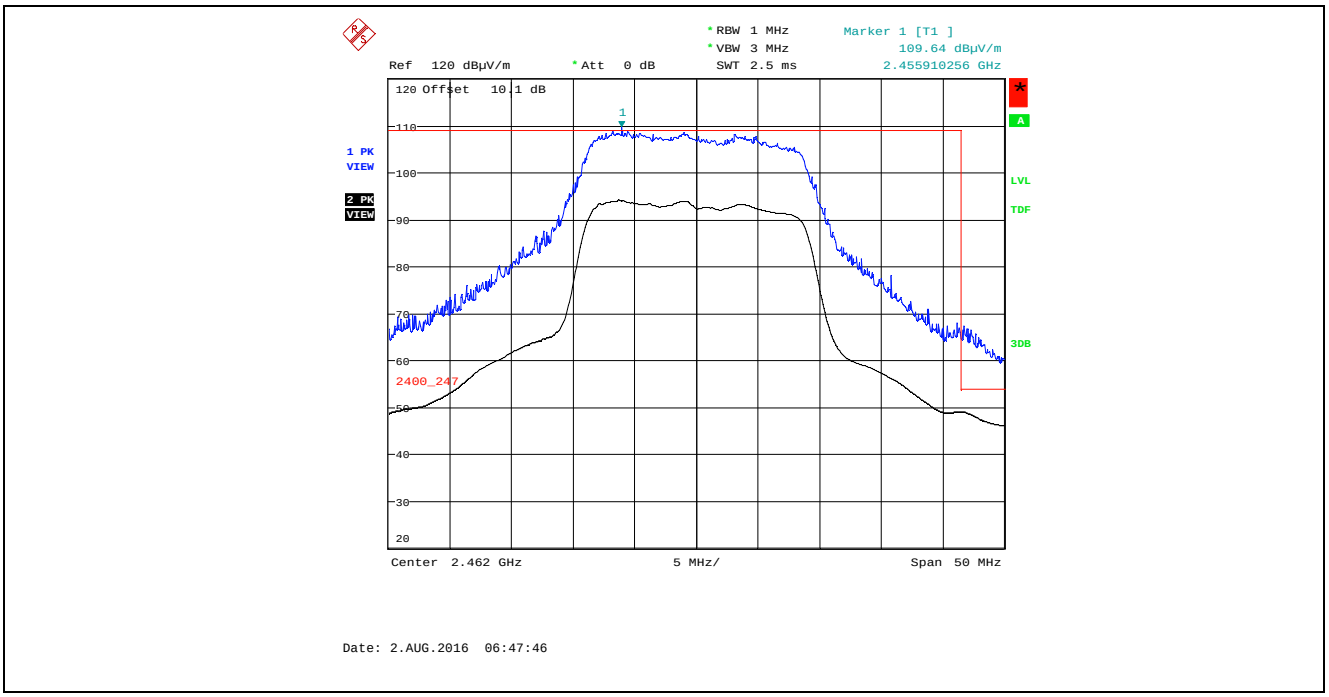


Peak Band-Edge at 2390 MHz: Peak= 108.39dBuV/m – 38.24dB= 70.15dBuV/m (limit 74dBuV/m)
Average at 2390 MHz: 52.53dBuV/m (limit 54dBuV/m)

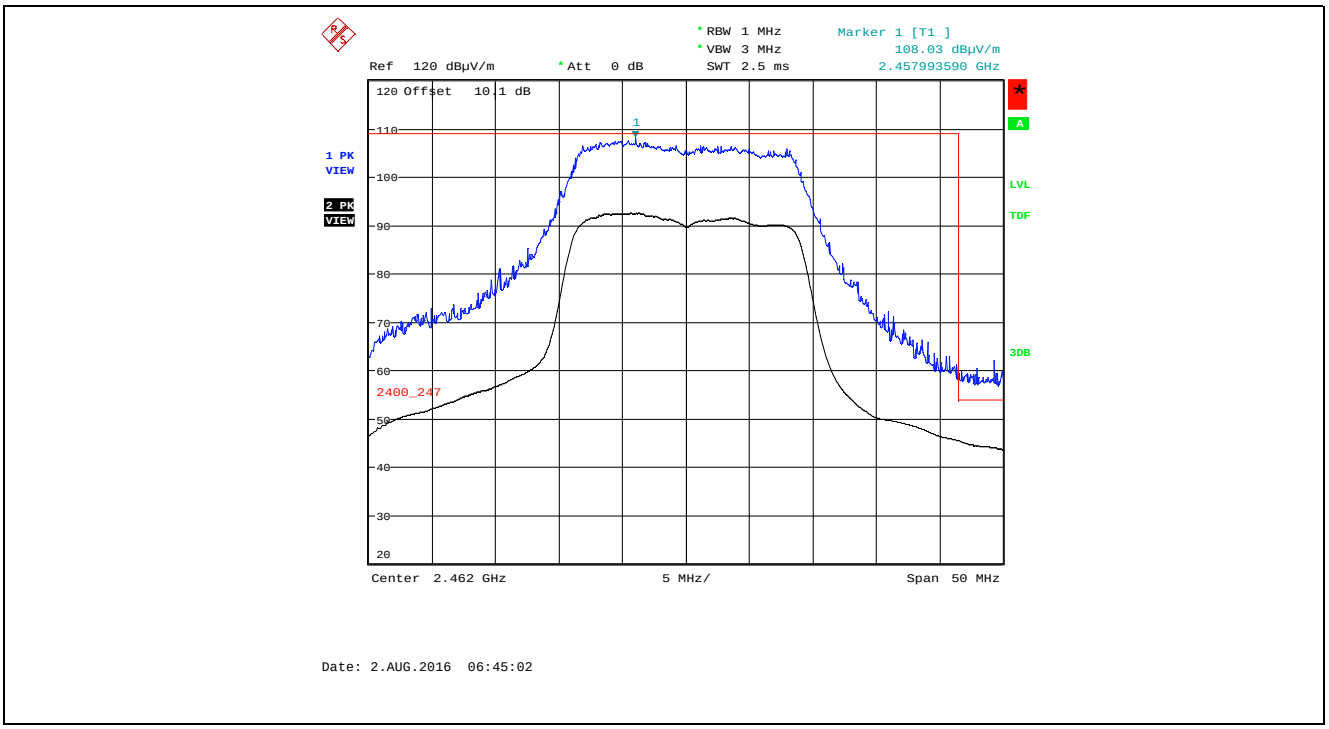
Plot 5.2.5.1.20. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 1, 2412 MHz, SISO, Gain Control 21.5, Vertical, Chain # 2



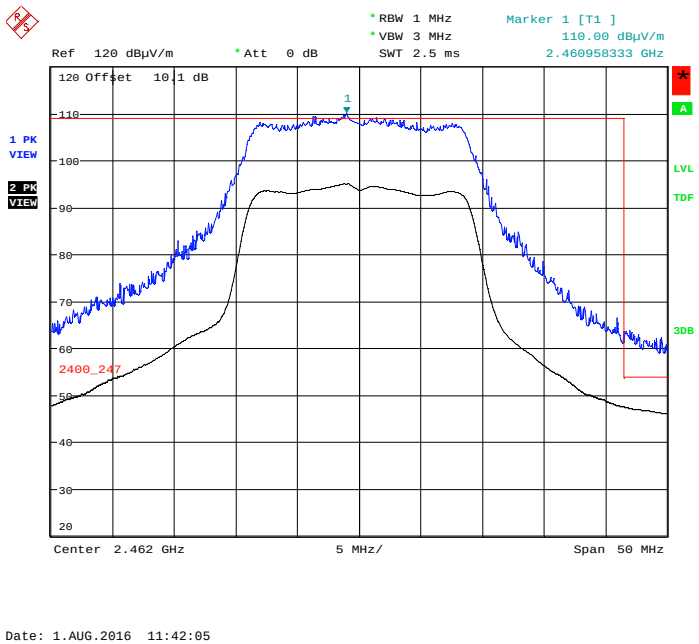
Plot 5.2.5.1.21. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 11, 2462 MHz, SISO, Gain Control 21.5, Horiz, Chain # 1



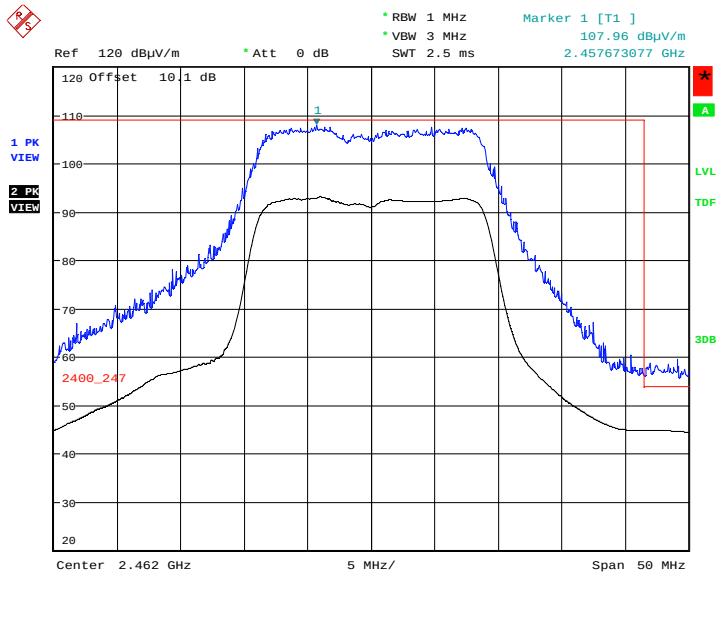
Plot 5.2.5.1.22. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 11, 2462 MHz, SISO, Gain Control 21.5, Horiz, Chain # 2



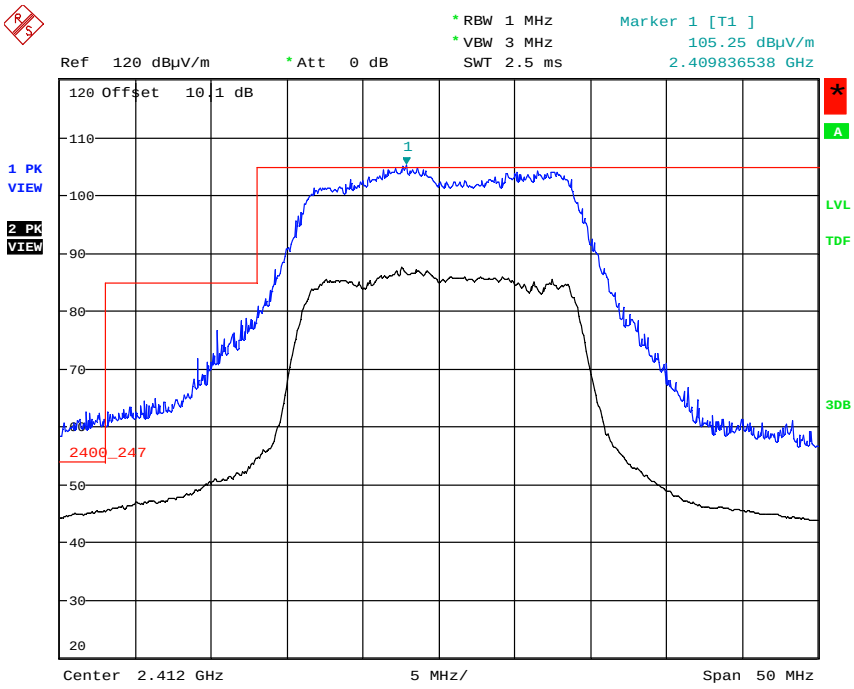
Plot 5.2.5.1.23. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 11, 2462 MHz, SISO, Gain Control 21.5, Vertical, Chain # 1



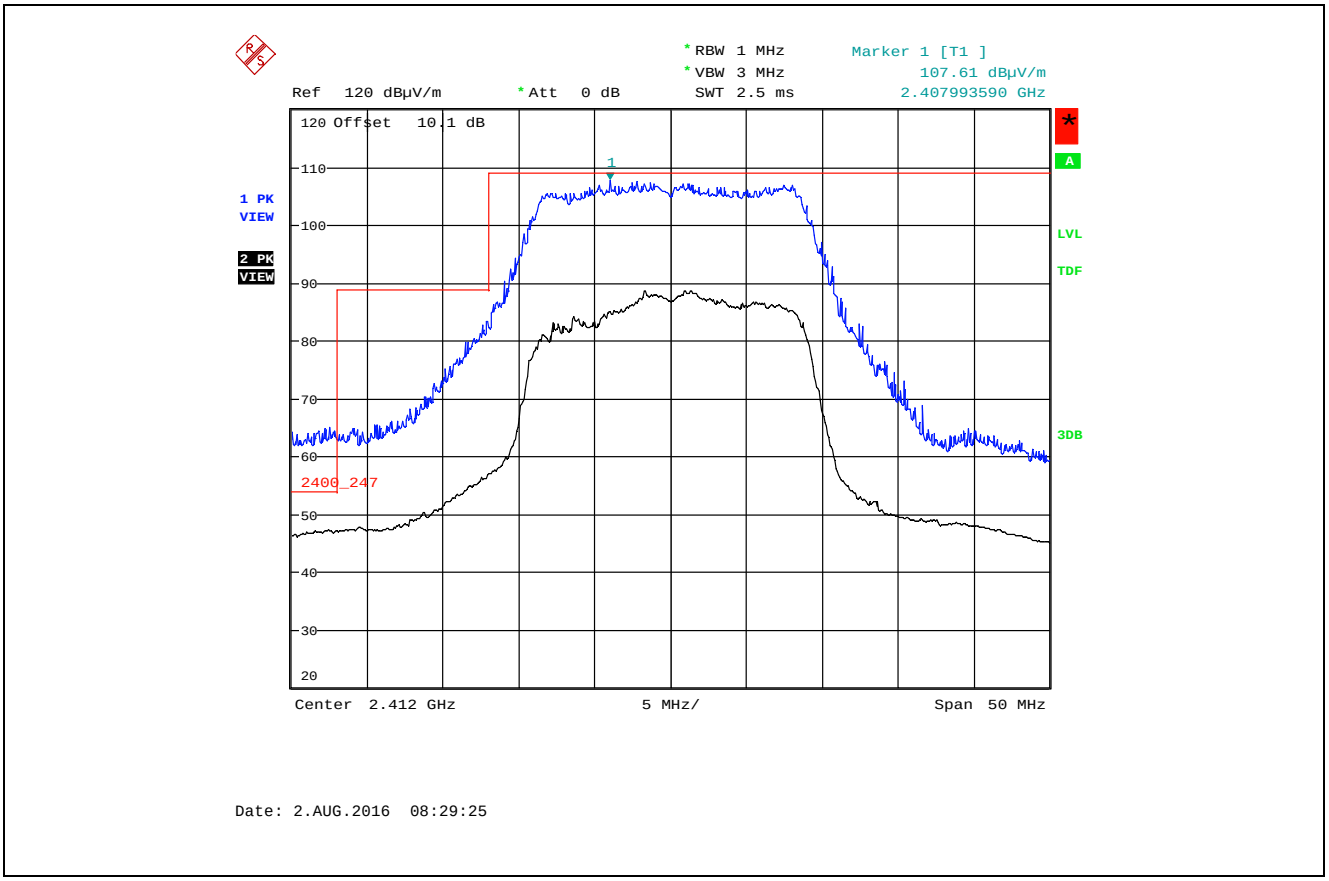
Plot 5.2.5.1.24. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 11, 2462 MHz, SISO, Gain Control 21.5, Vertical, Chain # 2



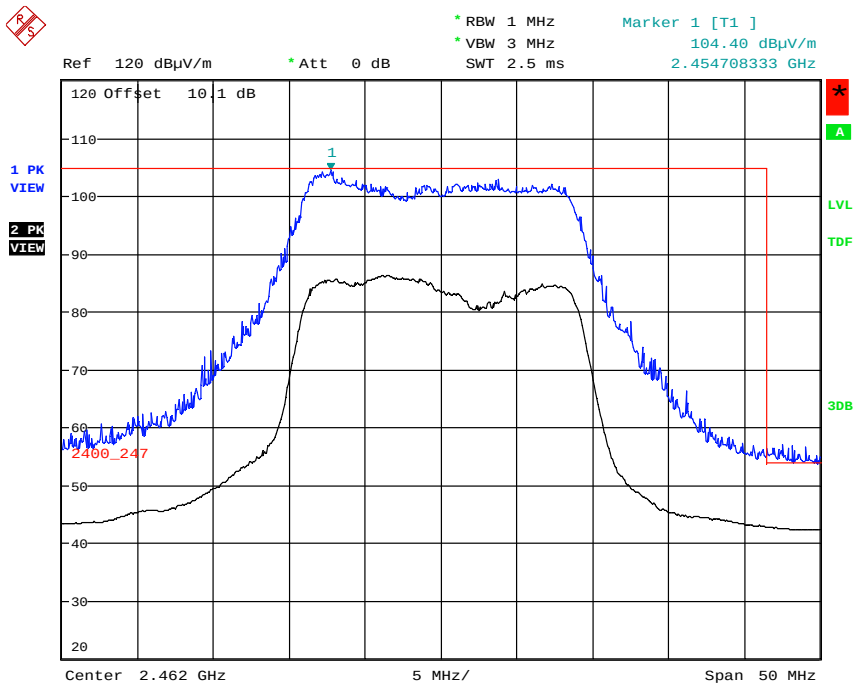
Plot 5.2.5.1.25. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 1, 2412 MHz, MIMO, Gain Control 21.5, Horizontal Chain # 1 & 2



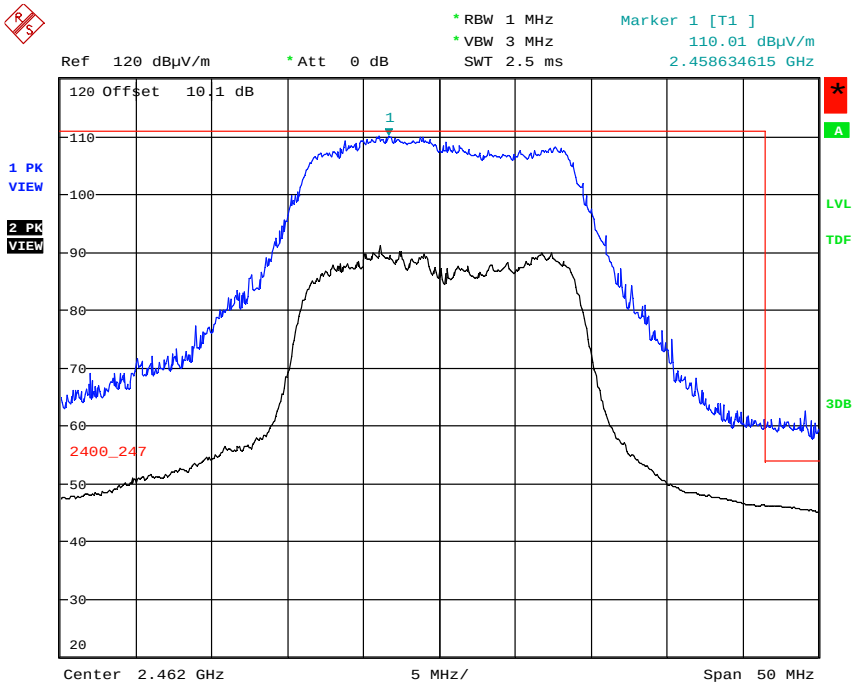
Plot 5.2.5.1.26. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 1, 2412 MHz, MIMO, Gain Control 21.5, Vertical, Chain # 1 & 2



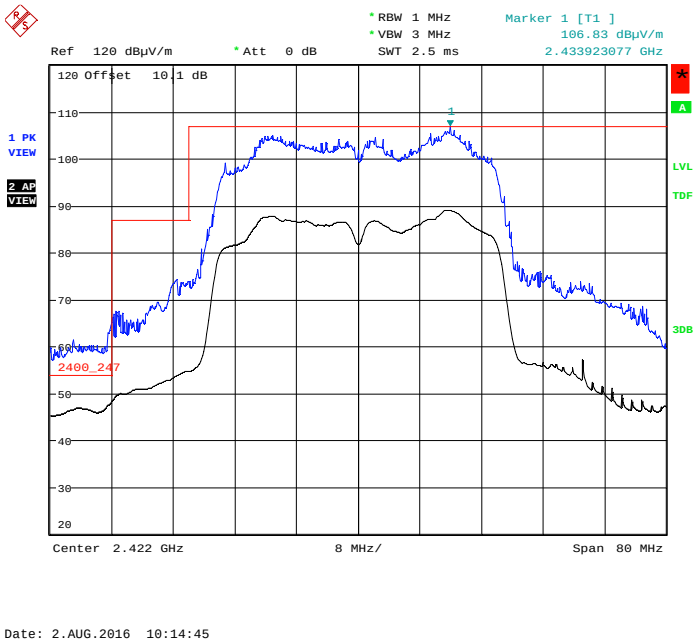
Plot 5.2.5.1.27. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 11, 2462 MHz, MIMO, Gain Control 21.5, Horizontal Chain # 1 & 2



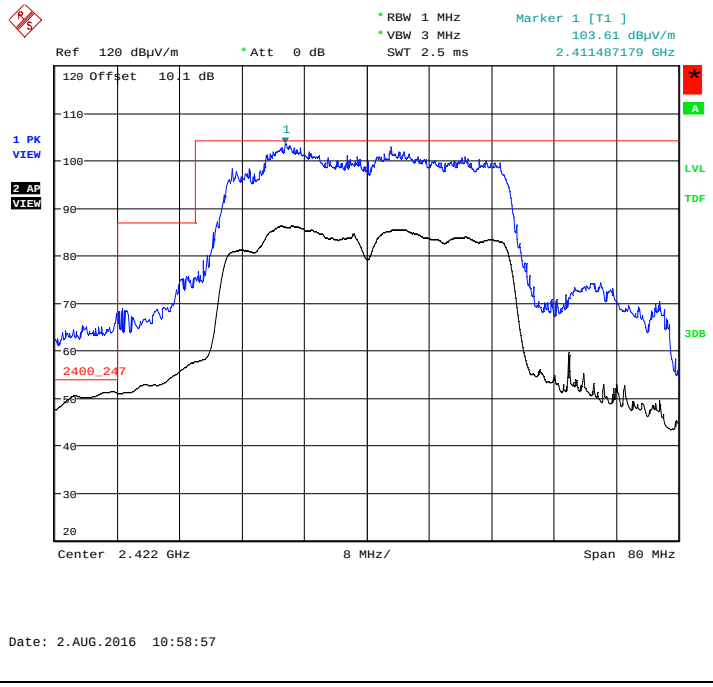
Plot 5.2.5.1.28. Band-Edge Rad Emissions, 802.11n20, HT4, Ch 11, 2462 MHz, MIMO, Gain Control 21.5, Vertical Chain # 1 & 2



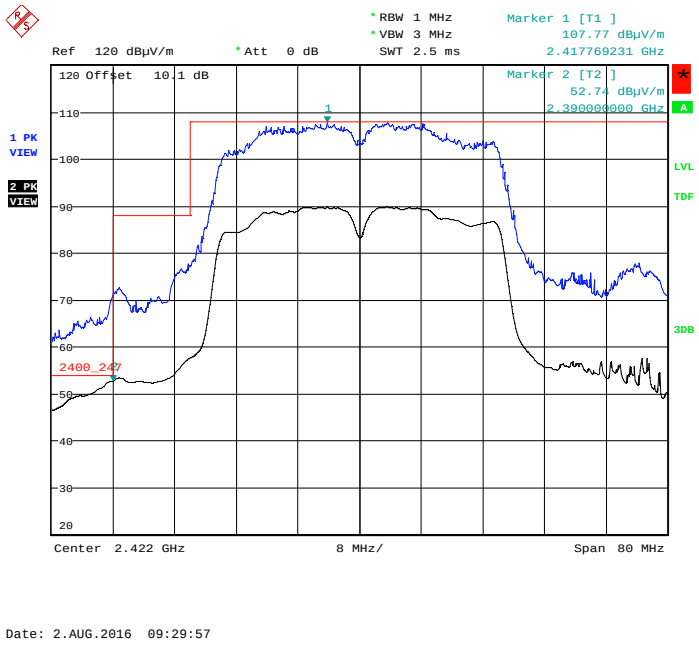
Plot 5.2.5.1.29. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 3, 2422 MHz, SISO, Gain Control 20.5, Horiz, Chain # 1



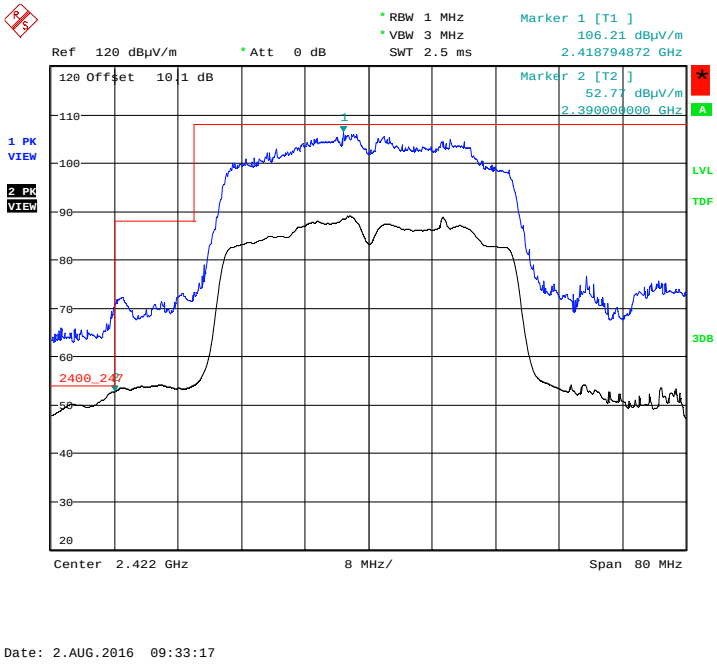
Plot 5.2.5.1.30. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 3, 2422 MHz, SISO, Gain Control 20.5, Horiz, Chain # 2



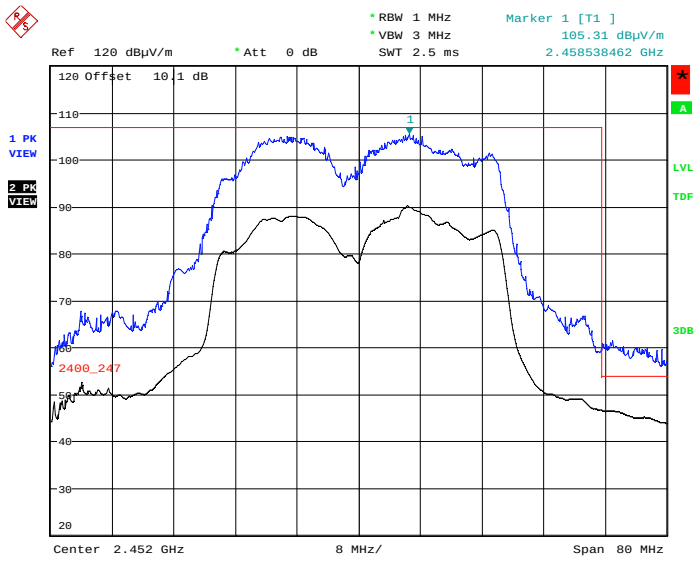
Plot 5.2.5.1.31. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 3, 2422 MHz, SISO, Gain Control 20.5, Vert, Chain # 1



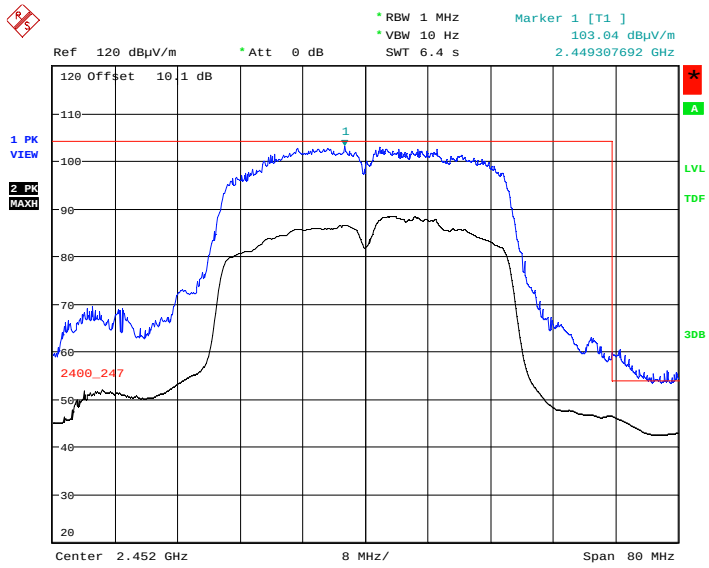
Plot 5.2.5.1.32. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 3, 2422 MHz, SISO, Gain Control 20.5, Vert, Chain # 2



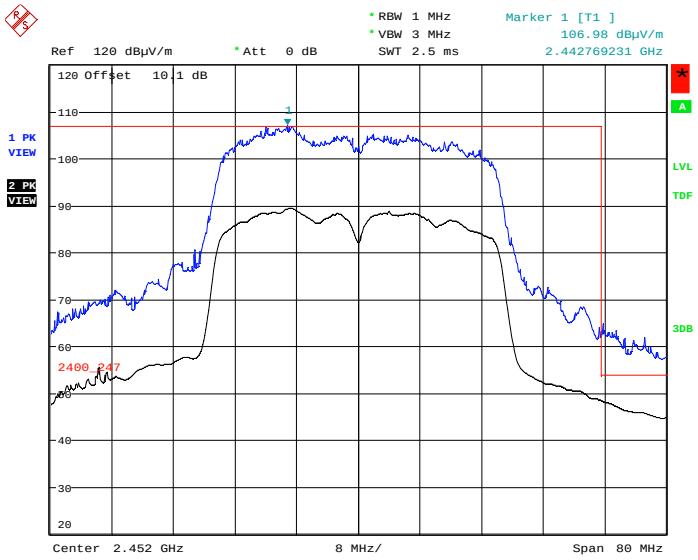
Plot 5.2.5.1.33. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 9, 2452 MHz, SISO, Gain Control 20.5, Horiz, Chain # 1



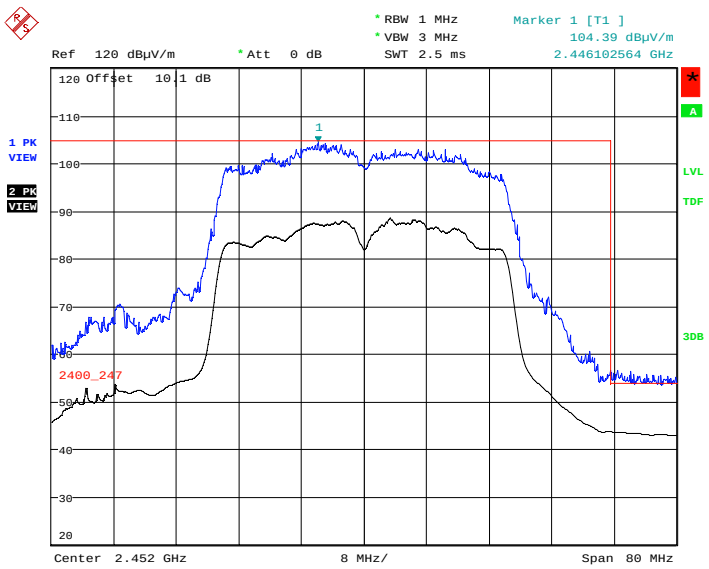
Plot 5.2.5.1.34. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 9, 2452 MHz, SISO, Gain Control 20.5, Horiz, Chain # 2



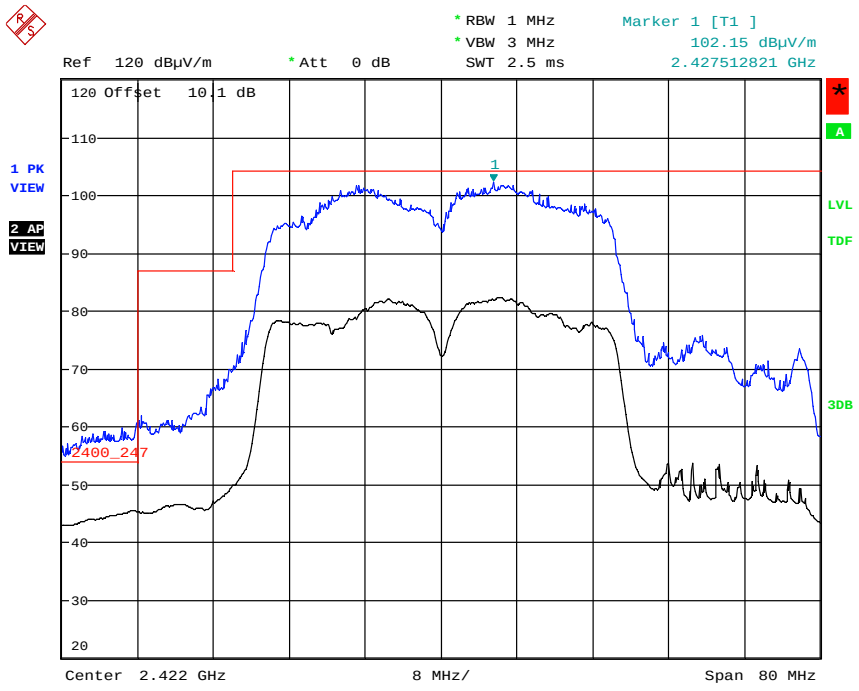
Plot 5.2.5.1.35. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 9, 2452 MHz, SISO, Gain Control 20.5, Vert, Chain # 1



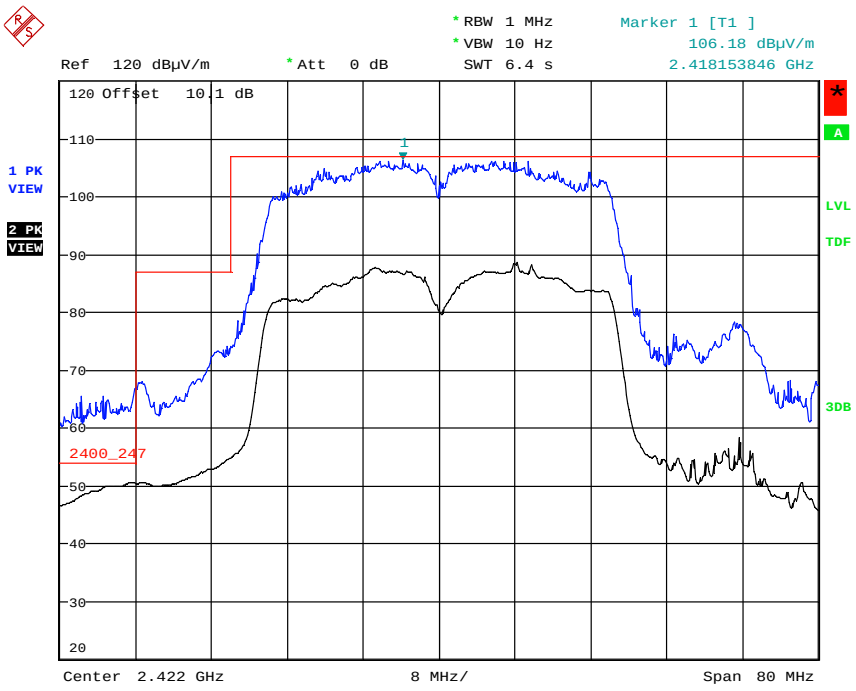
Plot 5.2.5.1.36. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 9, 2452 MHz, SISO, Gain Control 20.5, Vert, Chain # 2



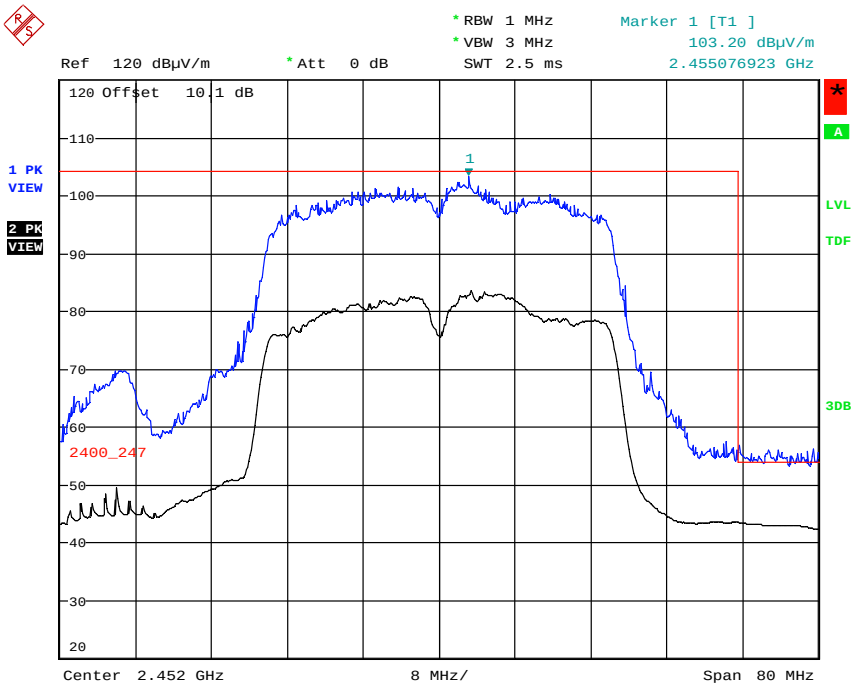
Plot 5.2.5.1.37. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 3, 2422 MHz, MIMO, Gain Control 20.5, Horizontal Chain # 1 & 2



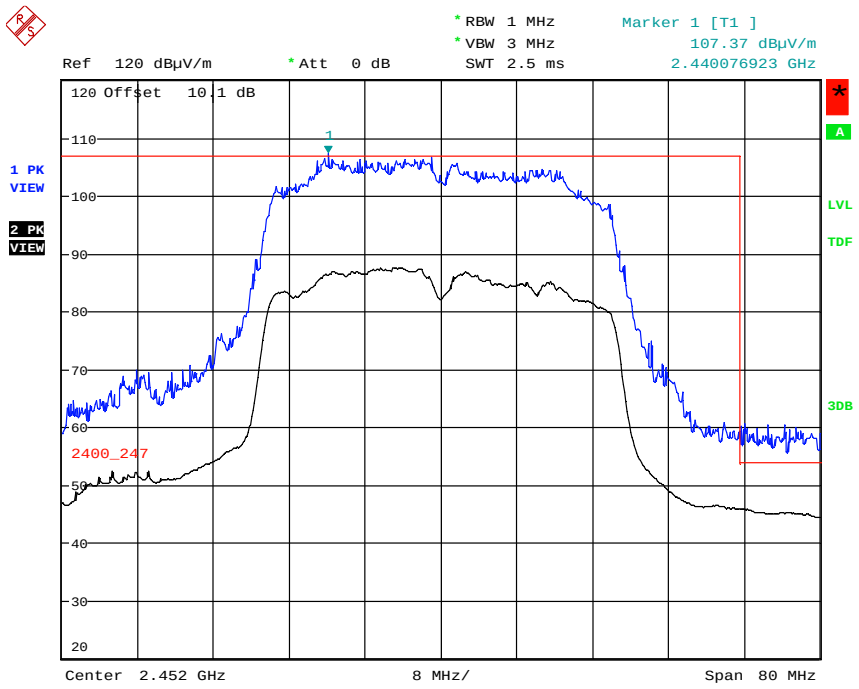
Plot 5.2.5.1.38. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 3, 2422 MHz, MIMO, Gain Control 20.5, Vertical, Chain # 1 & 2



Plot 5.2.5.1.39. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 9, 2452 MHz, MIMO, Gain Control 20.5, Horizontal Chain # 1 & 2



Plot 5.2.5.1.40. Band-Edge Rad Emissions, 802.11n 40, HT4, Ch 9, 2452 MHz, MIMO, Gain Control 20.5, Vertical Chain # 1 & 2



5.3. RF EXPOSURE REQUIRMENTS [§§ 15.247(i), 1.1310 & 2.1091]

5.3.1. Limits

§ **1.1310:** The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*($900/f^2$)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Note 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

5.3.2. Method of Measurements

Calculation Method of Power Density/RF Safety Distance:

$$S = \frac{PG}{4\pi \cdot r^2} = \frac{EIRP}{4\pi \cdot r^2}$$

Where, P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm^2
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

$$r = \sqrt{\frac{PG}{4\pi \cdot S}} = \sqrt{\frac{EIRP}{4\pi \cdot S}}$$

5.3.3. RF Evaluation

Antenna Type Certified with	**Antenna Location (Main/Aux)**	**2.4GHz Peak Gain in dBi***	**2.6GHz Peak Gain in dBi***	**5.2GHz Peak Gain in dBi***	**5.5GHz Peak Gain in dBi***	**5.7GHz Peak Gain in dBi***
PIFA Type (Original Filing)	Main/Aux	3.24	3.47	3.73	4.77	4.77
Dipole Model# GW.71 (**C2PC**)	Main/Aux	**2.07**	**2.07**	**2.91**	**2.91**	**2.91**
*All antenna gains include cable loss.						

Since the single & combined measured conducted power at antenna ports for this C2PC and the above calculated net antenna gains after assembly loss are lower than the Original filing, the RF exposure evaluations submitted with Original filing continue to comply for this filing as well.

EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100077	20Hz–40 GHz	Nov 21, 2016
Attenuator	Pasternack	7024-20	6	DC–26.5 GHz	Cal on use
DC Block	Hewlett Packard	11742A	12460	0.045 – 26.5 GHz	Cal on use
Peak Power Analyzer	Hewlett Packard	8991A	3342A00657	0.5 - 40 GHz	Jul 15, 2016
Peak Power Sensor	Hewlett Packard	84814A	3205A00175	0.5 - 40 GHz	Jul 15, 2016
Spectrum Analyzer	Rohde & Schwarz	FSU26	100398	20Hz–26.5 GHz	Sep 14, 2017
RF Amplifier	Hewlett Packard	84498	3008A00769	1 – 26.5 GHz	May 5, 2017
Environmental Chamber	Envirotronics	SSH32C	11994847-S-11059	-60 to 177 °C	Jun 2, 2017
EMI Receiver	Rohde & Schwarz	ESU40	100037	20Hz–40 GHz	May 8, 2017
RF Amplifier	Com-Power	PAM-0118A	551052	0.5 – 18 GHz	Jul 12, 2017
Biconilog	Emco	3142	9601-1005	26-1000 MHz	May 12, 2017
Horn Antenna	Emco	3155	5955	1 – 18 GHz	Apr 21, 2017
Horn Antenna	Emco	3160-09	118385	18 – 26.5 GHz	Aug 4, 2016
Horn Antenna	Emco	3160-10	102686	26.5 - 40 GHz	Aug 4, 2016
High Pass Filter	K & L	11SH10-8000/T18000	3	Cut off 5800 MHz	Cal on use

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.79**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.78**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 1.87**	**Under consideration**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 3.75**	**Under consideration**