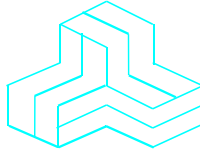


ENGINEERING TEST REPORT



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 E, Section 15.407
Unlicensed National Information Infrastructure (U-NII) Device
Operating in the 5.15–5.25, 5.25-5.35, 5.47–5.725 and 5.725–5.825 GHz Bands

UltraTech's File No.: 16CDTX003_FCC15E407

This Test report is Issued under the Authority of
Tri M. Luu
Vice President of Engineering
UltraTech Group of Labs

Date: July 29, 2016

Report Prepared by: Dharmajit Solanki

Tested by: Hung Trinh

Issued Date: July 29, 2016

Test Dates: July 10 – 28, 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.*
- *This test report shall not be reproduced, except in full, without a written approval from UltraTech*

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AT-1945



SL2-IN-E-
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TL363_B



TPTDP
DA1300

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart E, Section 15.407
Title:	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 – Radio Frequency Devices
Purpose of Test:	Class II Permissive Change Certification Application under FCC Part 15, Subpart E to verify the compliance of modified Unlicensed National Information Infrastructure (U-NII) Device Operating in the 5.15–5.25 GHz, 5.25-5.35 GHz, 5.47–5.725 GHz and 5.725–5.825 GHz Band and for Co-location RF Exposure Evaluation of WIFI and Bluetooth Radios
Test Procedures:	- ANSI C63.4 - ANSI C63.10 - FCC KDB Publication No.789033 D02 General U-NII Test Procedures New Rules v01r02 - FCC, KDB Publication No.662911 D01 Multiple Transmitter Output v02r01
Environmental Classification:	☒ Commercial, industrial or business environment ☒ 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
FCC, KDB Publication No. 789033 D02 General U-NII Test Procedures New Rules v01r02	2016	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices, Part 15, Subpart E
FCC, KDB Publication No. 662911 D01 Multiple Transmitter Output v02r01	2013	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

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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 25 th 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:	Unlicensed National Information Infrastructure TX
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

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2.3. EUT'S TECHNICAL SPECIFICATIONS

Transmitter	
Equipment Type:	- Mobile - Base Station (fixed use)
Intended Operating Environment:	Commercial, Industrial or Business/ Residential environments
Power Supply Requirement:	3.3 VDC
RF Output Power Rating:	14.68 dBm (29.37 mW) (5180 – 5240 MHz) 13.45 dBm (22.15 mW) (5190 – 5230 MHz) 15.05 dBm (32.02 mW) (5260 – 5320 MHz) 15.56 dBm (35.96 mW) (5500 – 5700 MHz) 14.65 dBm (29.17 mW) (5510 – 5670 MHz) 10.14 dBm (13.05 mW) (5530 – 5690 MHz) 16.11 dBm (40.80 mW) (5710 – 5710 MHz) 15.69 dBm (37.05 mW) (5720 – 5720 MHz) 16.07 dBm (40.47 mW) (5745 – 5825 MHz) 15.36 dBm (34.39 mW) (5755 – 5795 MHz) 13.38 dBm (21.76 mW) (5775 – 5775 MHz)
Operating Frequency Range:	5180 – 5240 MHz, 5190 – 5230 MHz 5260 – 5320 MHz 5500 – 5700 MHz, 5510 – 5670 MHz, 5530 – 5690 MHz 5710 – 5710 MHz, 5720 – 5720 MHz 5745 – 5825 MHz, 5755 – 5795 MHz, 5775 – 5775 MHz
RF Output Impedance:	50 Ω
Modulation Modes:	802.11 a/n/ac
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.

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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 °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:	Special 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:	N/A
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):	5180 – 5240 MHz, 5190 – 5230 MHz 5260 – 5320 MHz 5500 – 5700 MHz, 5510 – 5670 MHz, 5530 – 5690 MHz 5710 – 5710 MHz, 5720 – 5720 MHz 5745 – 5825 MHz, 5755 – 5795 MHz, 5775 – 5775 MHz
Frequency(ies) Tested:	5180, 5200, 5240, 5190, 5210, 5230 MHz 5260, 5270, 5290, 5300, 5310, 5320 MHz 5500, 5600, 5700, 5720, 5510, 5590, 5670, 5710, 5530, 5610, 5690 MHz 5745, 5755, 5775, 5785, 5795, 5825 MHz
RF Power Output: (measured maximum output power at antenna terminals)	▪ 14.68 dBm (29.37 mW) (5180 – 5240 MHz) ▪ 13.45 dBm (22.15 mW) (5190 – 5230 MHz) ▪ 15.05 dBm (32.02 mW) (5260 – 5320 MHz) ▪ 15.56 dBm (35.96 mW) (5500 – 5700 MHz) ▪ 14.65 dBm (29.17 mW) (5510 – 5670 MHz) ▪ 10.14 dBm (13.05 mW) (5530 – 5690 MHz) ▪ 16.11 dBm (40.80 mW) (5710 – 5710 MHz) ▪ 15.69 dBm (37.05 mW) (5720 – 5720 MHz) ▪ 16.07 dBm (40.47 mW) (5745 – 5825 MHz) ▪ 15.36 dBm (34.39 mW) (5755 – 5795 MHz) ▪ 13.38 dBm (21.76 mW) (5775 – 5775 MHz)
Normal Test Modulation:	OFDM
Modulating Signal Source:	Internal

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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.

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
15.407(a)	Output Power	Yes
15.407(a)	Power Spectral Density	See Note 1
15.407(b)	Undesirable Emission	Yes
15.407(c)	Transmission Requirements	See Note 1
15.407(e)	6 dB Bandwidth	See Note 1
15.407(f)	RF Exposure	Yes
15.407(g)	Frequency Stability	See Note 1
15.407(h)	Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS).	See Note 1
15.407(i)	Device Security	As per Original filing

Note 1: Refer to the original filing UNII test report under FCC ID: PD97260H, Report Number:38067RRF.003A1.

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

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EXHIBIT 5. TEST DATA

5.1. DUTY CYCLE [§ 15.35(c)]

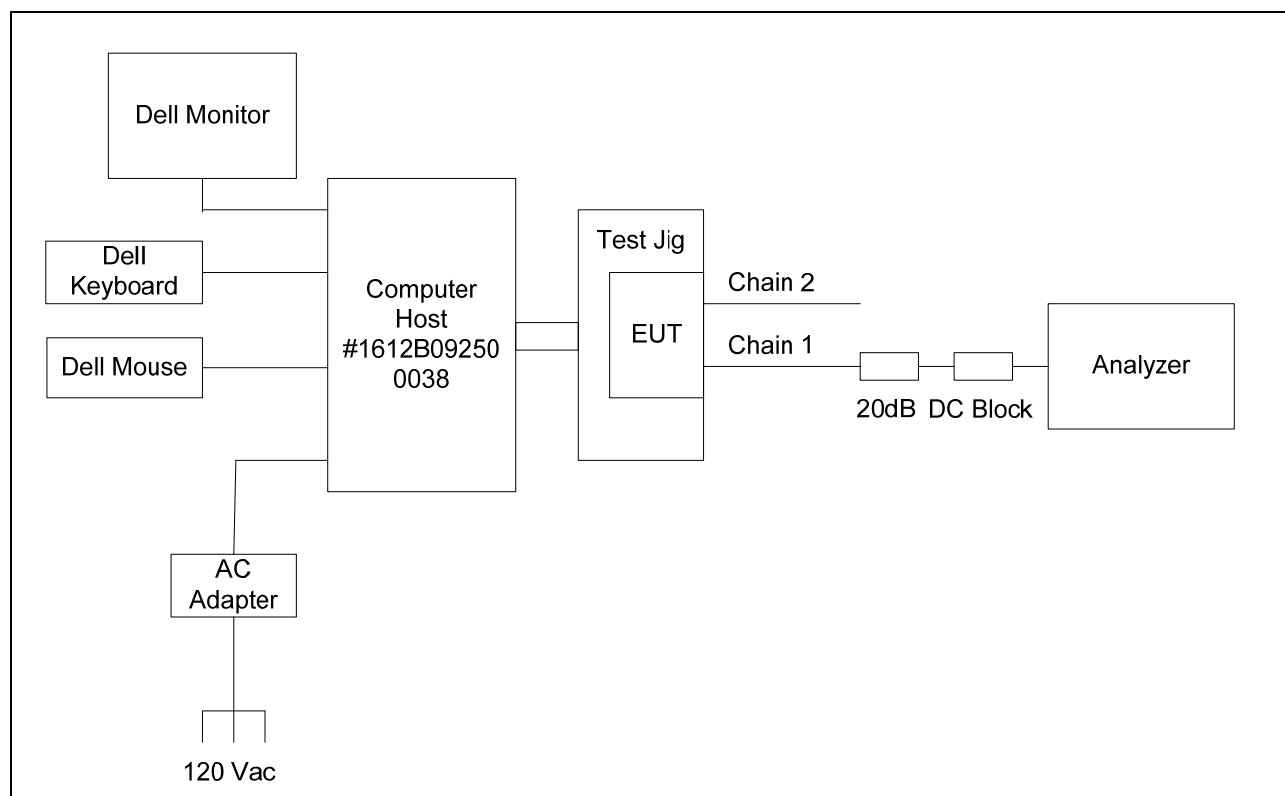
5.1.1. Requirements

§ 15.35(c) Unless otherwise specified, e.g., § 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

5.1.2. Method of Measurements

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02, Section II B.2.b

5.1.3. Test Arrangement



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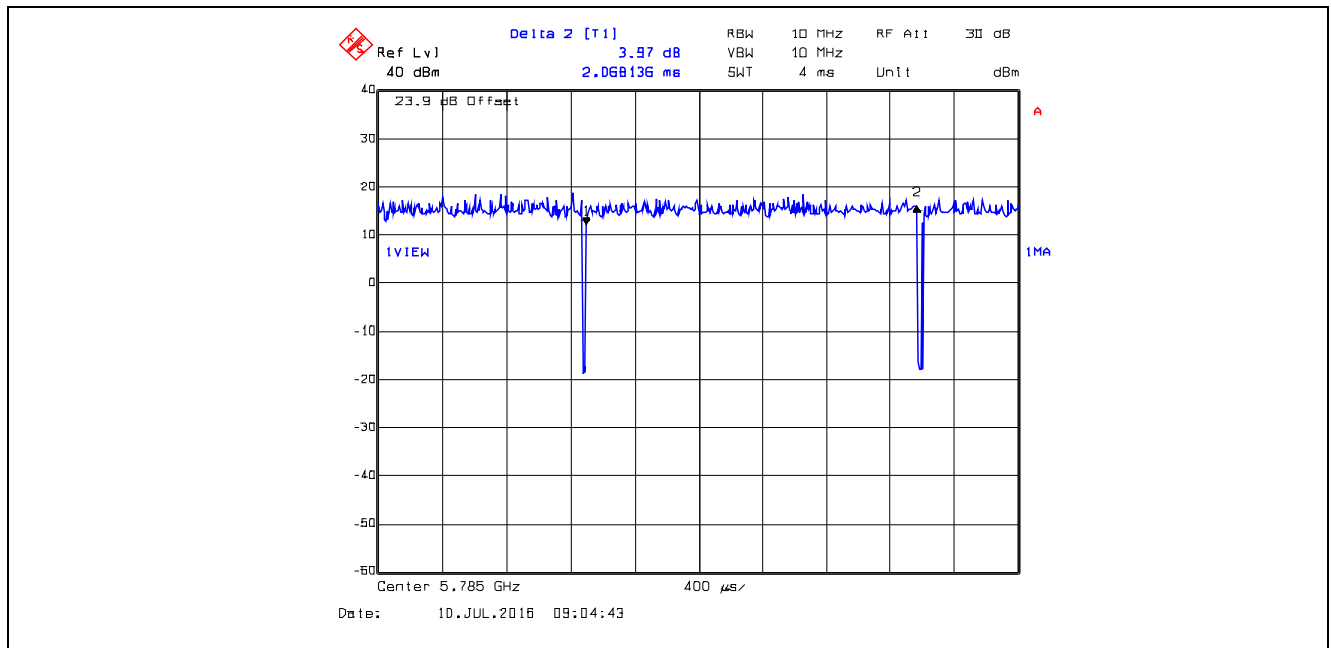
5.1.4. Test Data

Operating Mode	Channel Number	Frequency (MHz)	Duty Cycle X (%)	Duty Cycle Correction Factor (dB)
802.11a	157	5785	98.1	0.0834
802.11n/ac HT20	157	5785	91.68	0.3772
802.11n/ac HT40	151	5755	87.04	0.6030
802.11ac HT80	155	5775	76.52	1.1622

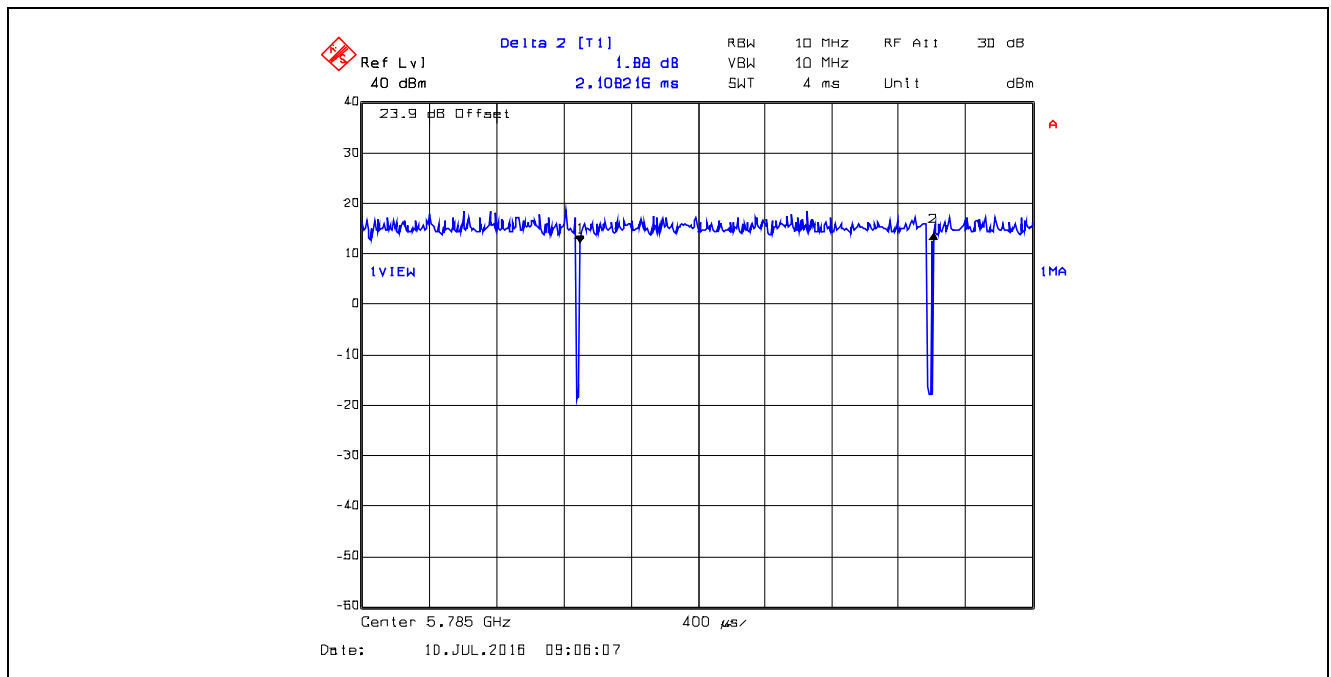
Note: The configuration chosen for testing based on recommendation from Intel: "The data rates of 6Mb/s for 802.11a, HT4 (SISO)/(MIMO) for 802.11 n/ac20 & n/ac40, and VHT6 (SISO)/(MIMO) for 802.11 ac80 were selected based on preliminary testing that identified those data rates corresponding to the worst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

Refer to the following plots for details.

Plot 5.1.4.1. Duty Cycle, 802.11a, 5785 GHz, Data Rate 6 Mbps, Pulse Width = 2.0681 ms



Plot 5.1.4.2. Duty Cycle, 802.11a, 5785 GHz, Data Rate 6 Mbps, Pulse Train = 2.1082 ms



Duty Cycle Correction Factor = $10 \cdot \log [1 / (2.0681 / 2.1082)] = 0.0834 \text{ dB}$

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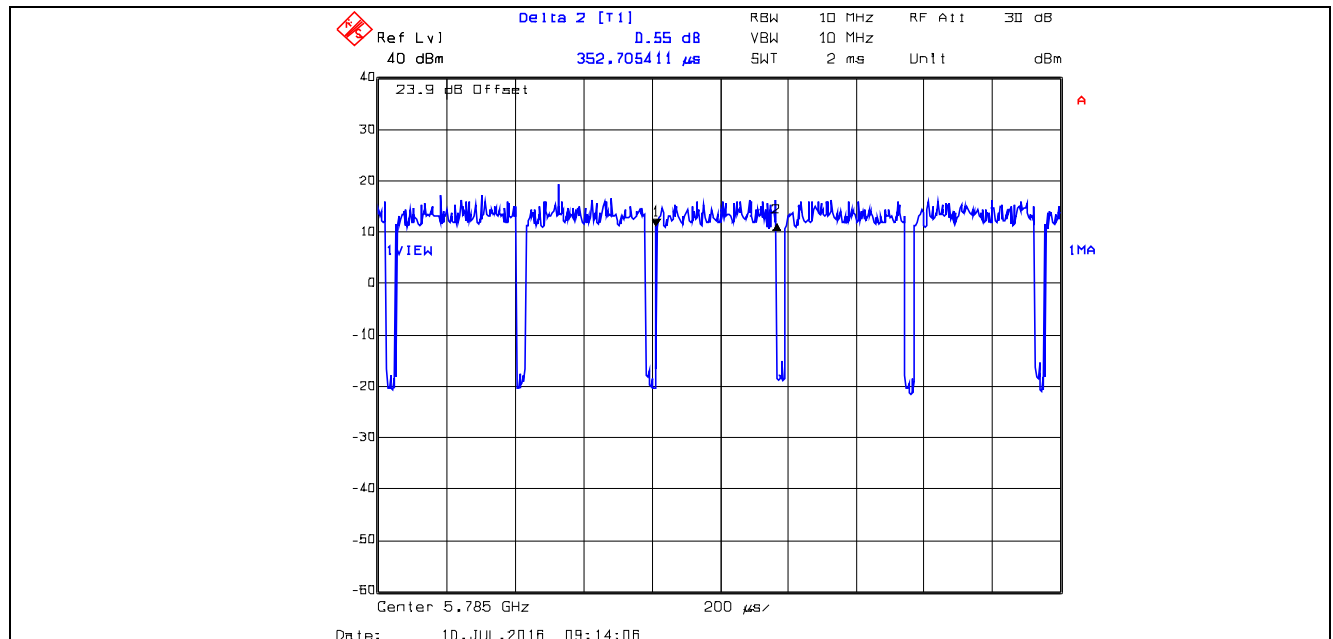
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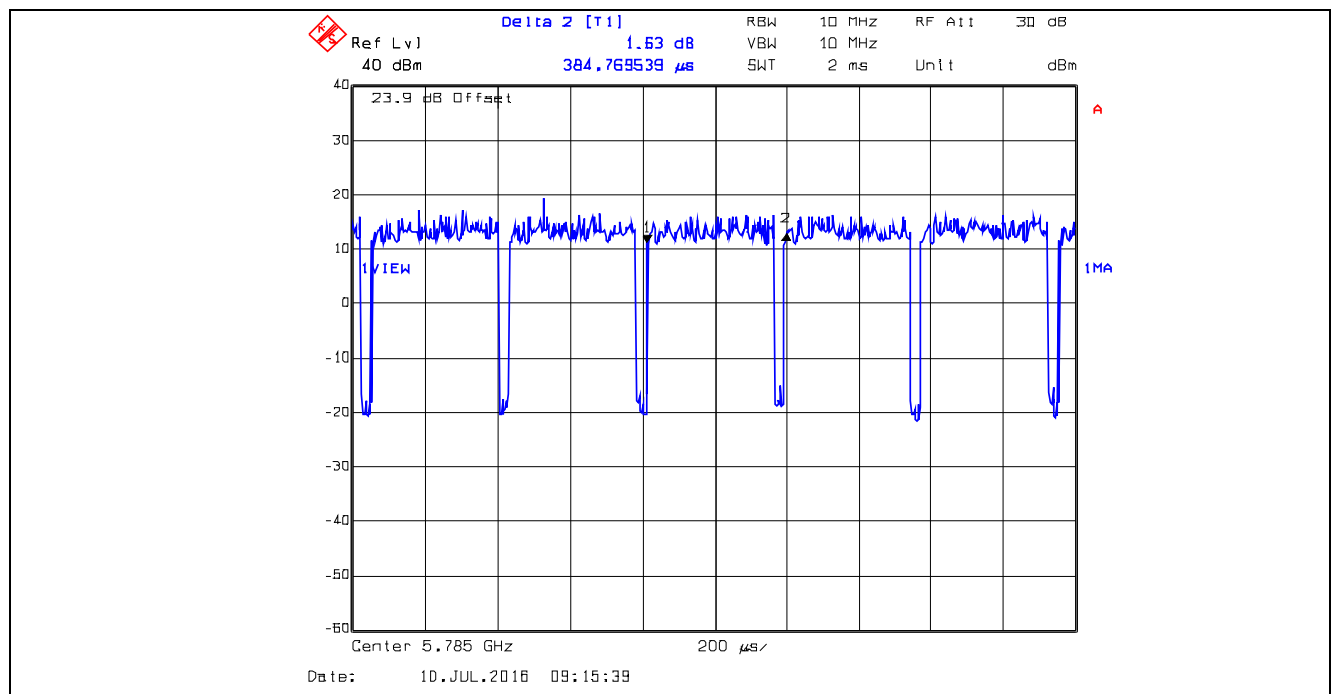
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Plot 5.1.4.3. Duty Cycle, 802.11a HT20, 5785 GHz, Data Rate HT4, Pulse Width = 352.7054 μ s



Plot 5.1.4.4. Duty Cycle, 802.11a HT20, 5785 GHz, Data Rate HT4, Pulse Train = 384.7695 μ s



Duty Cycle Correction Factor = $10 \cdot \log [1 / (352.7054 / 384.7695)] = 0.3772$ dB

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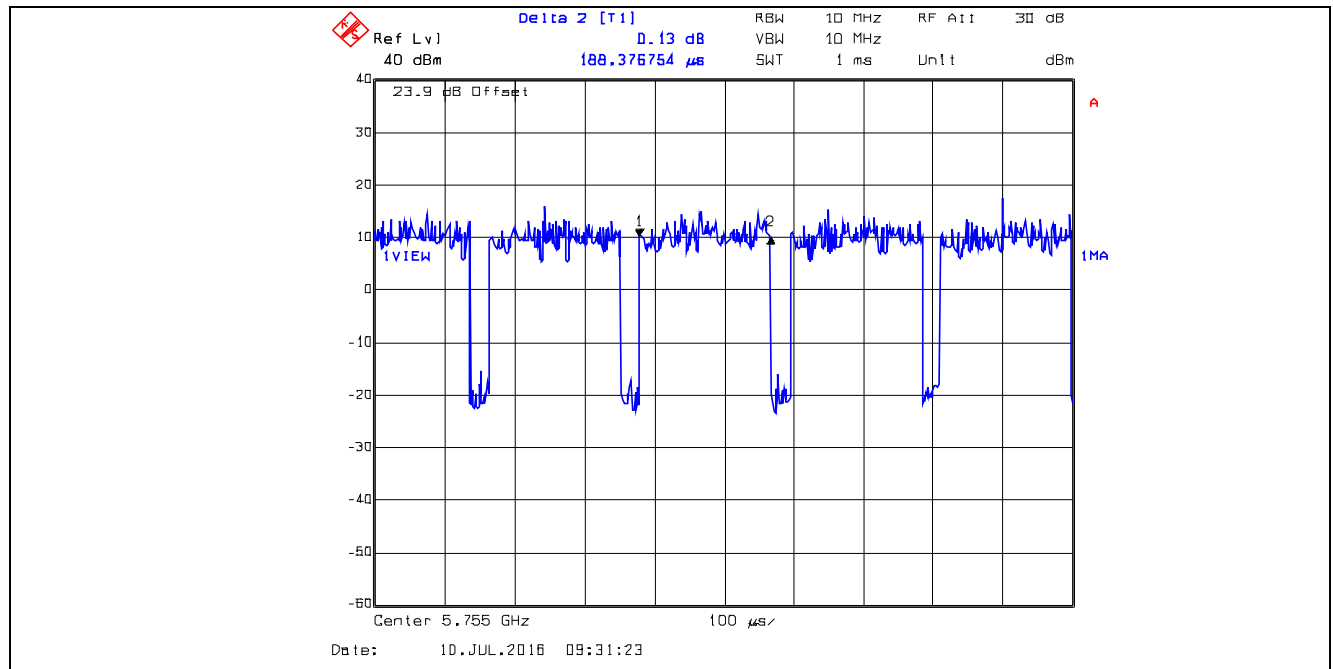
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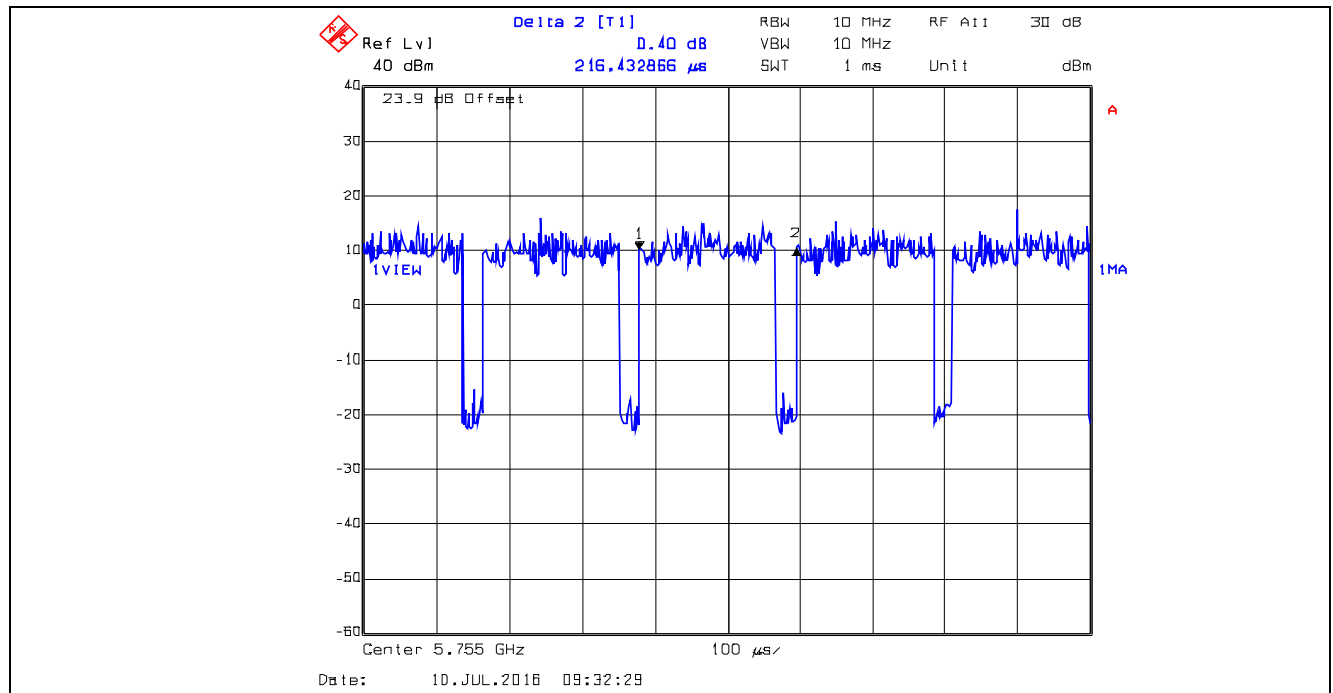
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Plot 5.1.4.5. Duty Cycle, 802.11a HT40, 5755 GHz, Data Rate HT4, Pulse Width = 188.3768 μ s



Plot 5.1.4.6. Duty Cycle, 802.11a HT40, 5755 GHz, Data Rate HT4, Pulse Train = 216.4329 μ s



Duty Cycle Correction Factor = $10 \cdot \log [1 / (188.3768 / 216.4329)] = 0.6030$ dB

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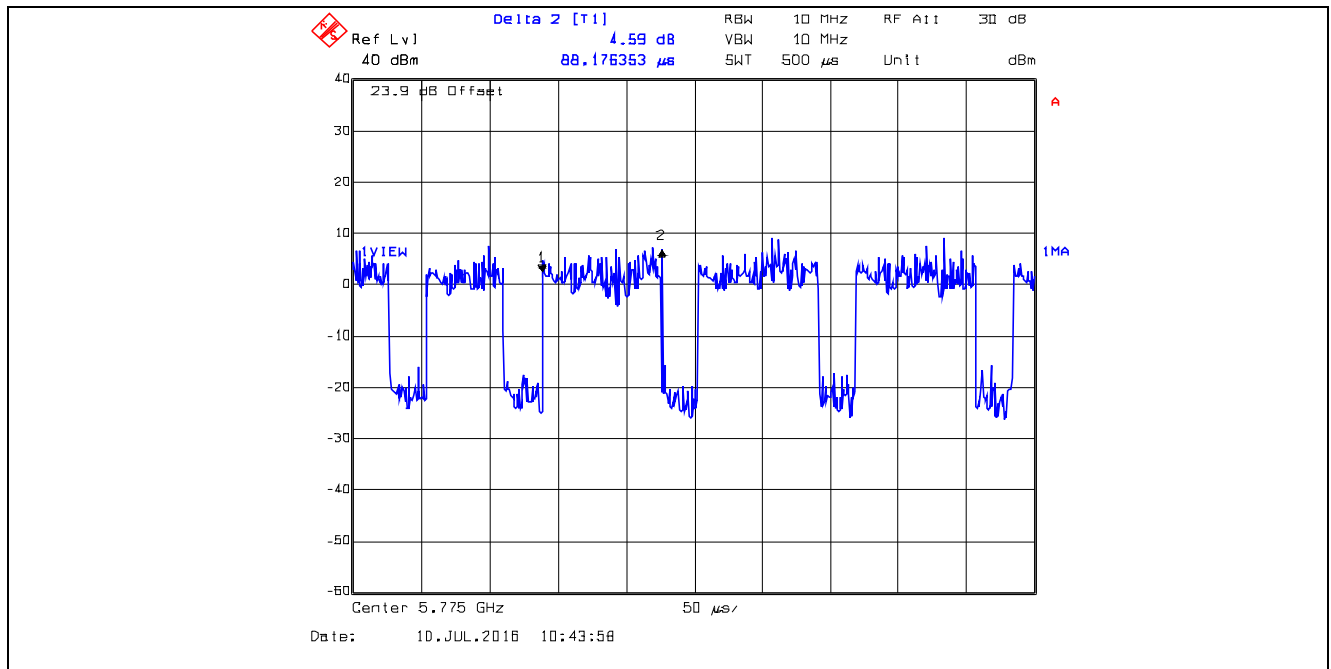
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File #: 16CDTX003_FCC15E407

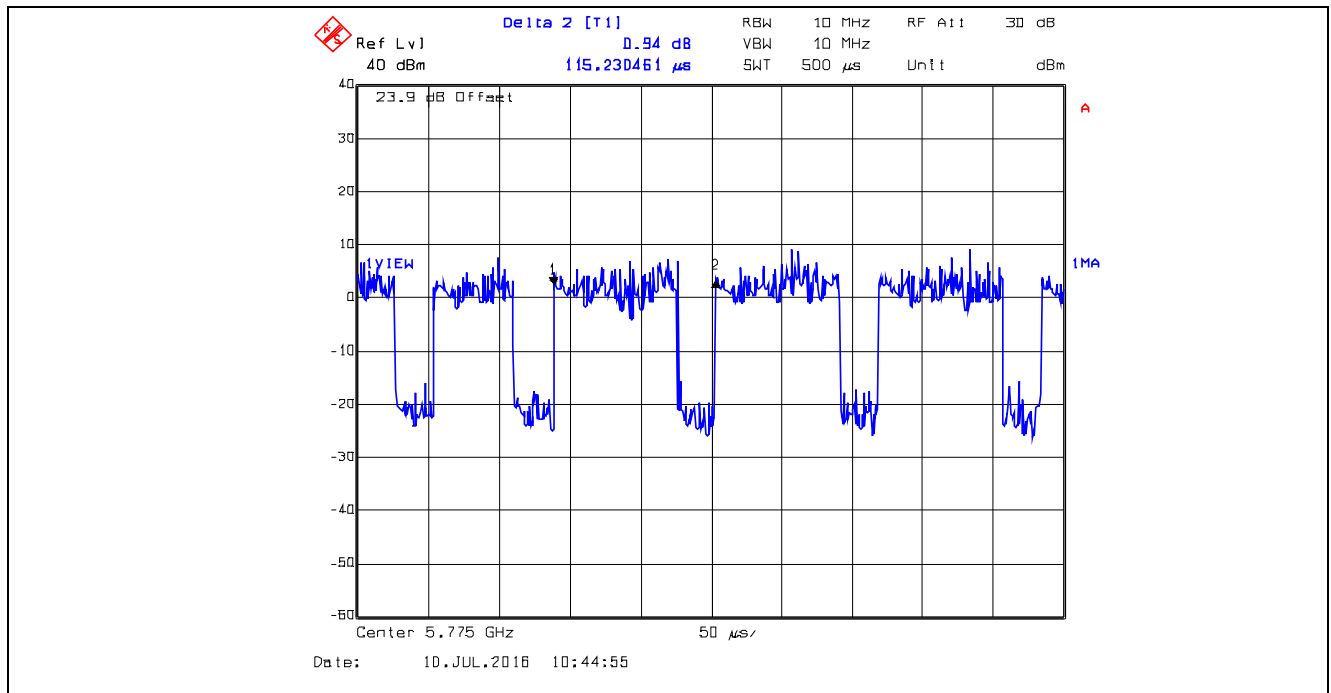
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Plot 5.1.4.7. Duty Cycle, 802.11ac80, 5775 GHz, Data Rate VHT6, Pulse Width = 88.1764 μ s



Plot 5.1.4.8. Duty Cycle, 802.11ac80, 5775 GHz, Data Rate VHT6, Pulse Train = 115.2305 μ s



Duty Cycle Correction Factor = $10 \cdot \log [1 / (88.1764 / 115.2305)] = 1.1622$ dB

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5.2. MAXIMUM CONDUCTED OUTPUT POWER [§ 15.407(a)]

5.2.1. Limit(s)

For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional

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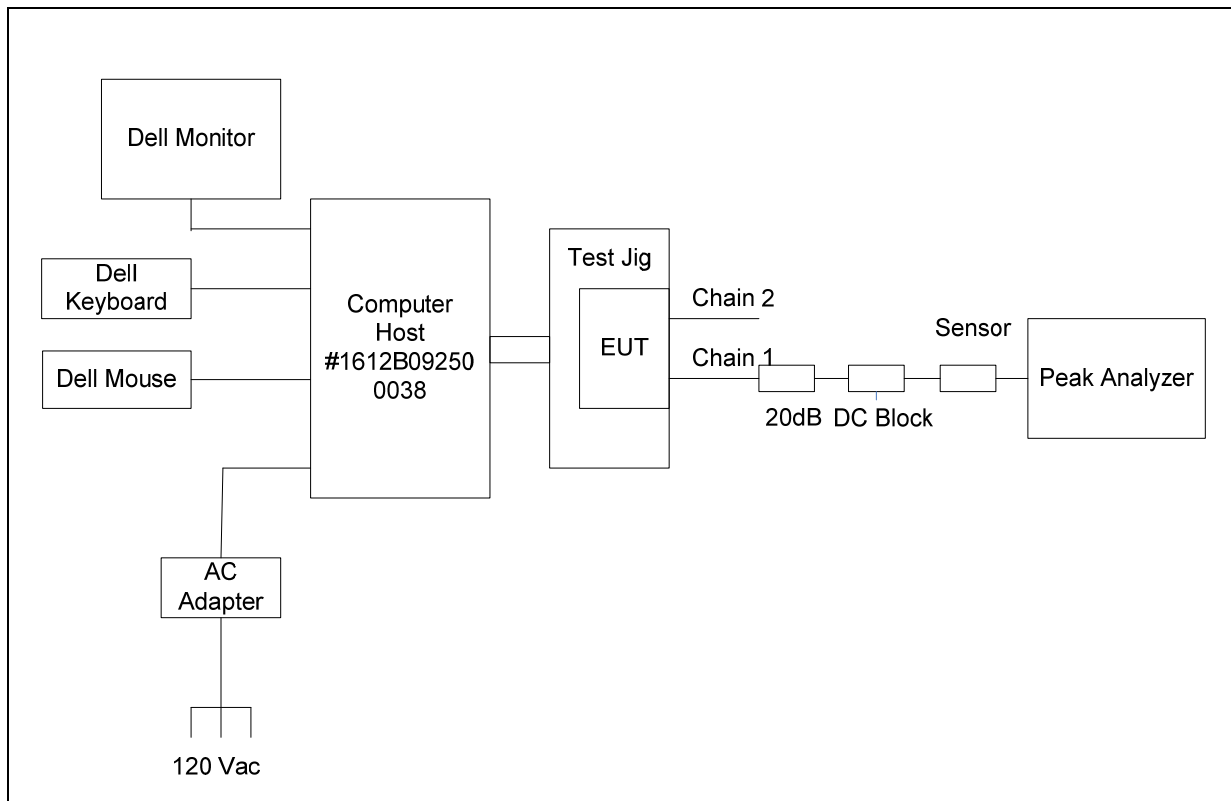
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applications, and multiple collocated transmitters transmitting the same information. The operator of the UNII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2.2. Method of Measurements

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02, Section II.E.3.a
FCC KDB 662911 D01 Multiple Transmitter Output v02r01, Section E.1

5.2.3. Test Arrangement



5.2.4. 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. Duty Cycle is corrected using Duty Cycle Correction factors calculated as in Sec 5.1.

(A) 5150-5250 MHz Band

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

Data Rate (Mbps)	Channel #	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
6	36	5180	31.5	13.21	14.10	0.08	13.29	14.18	16.20	17.09
6	40	5200	31.5	13.83	14.45	0.08	13.91	14.53	16.82	17.44
6	48	5240	31.5	14.46	14.42	0.08	14.54	14.50	17.45	17.41

802.11n/ac, HT20, Chain #1 or #2 (SISO) (no MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	36	5180	31.0	13.08	11.66	0.38	13.46	12.04	16.37	14.95
HT4	40	5200	31.0	13.21	12.44	0.38	13.59	12.82	16.50	15.73
HT4	48	5240	31.0	12.87	12.77	0.38	13.25	13.15	16.16	16.06

802.11n/ac, HT20, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	36	5180	31.0	11.96	8.30	13.51	0.38	13.89	24.50	16.80
HT4	40	5200	31.0	11.57	8.79	13.41	0.38	13.79	23.91	16.70
HT4	48	5240	31.0	12.47	9.67	14.30	0.38	14.68	29.37	17.59

802.11n/ac, HT40, Chain #1 or #2 (SISO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	38	5190	27.5	10.25	11.56	0.60	10.85	12.16	13.76	15.07
HT4	46	5230	27.5	10.81	11.78	0.60	11.41	12.38	14.32	15.29

802.11n/ac, HT40, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	38	5190	27.5	8.17	10.41	12.44	0.60	13.05	20.17	15.96
HT4	46	5230	27.5	9.16	10.43	12.85	0.60	13.45	22.15	16.36

802.11ac80, Chain #1 or #2 (SISO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
VHT6	42	5210	25.0	6.32	6.54	1.16	7.48	7.70	10.39	10.61

802.11ac80, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
VHT6	42	5210	25.0	4.22	4.51	7.38	1.16	8.54	7.14	11.45

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(B) 5250-5350 MHz Band

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

Data Rate (Mbps)	Channel #	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
6	52	5260	30	13.96	14.27	0.08	14.04	14.35	16.95	17.26
6	60	5300	30	14.25	14.69	0.08	14.33	14.77	17.24	17.68
6	64	5320	30	14.07	14.08	0.08	14.15	14.16	17.06	17.07

802.11n/ac, HT20, Chain #1 or #2 (SISO) (no MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	52	5260	31	14.05	14.42	0.38	14.43	14.80	17.34	17.71
HT4	60	5300	31	14.57	14.60	0.38	14.95	14.98	17.86	17.89
HT4	64	5320	31	13.50	14.06	0.38	13.88	14.44	16.79	17.35

802.11n/ac, HT20, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	52	5260	31	10.54	12.56	14.68	0.38	15.05	32.02	17.96
HT4	60	5300	31	10.33	10.65	13.50	0.38	13.88	24.44	16.79
HT4	64	5320	31	10.54	11.98	14.33	0.38	14.71	29.56	17.62

802.11n/ac, HT40, Chain #1 or #2 (SISO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	54	5270	26	9.14	9.47	0.60	9.74	10.07	12.65	12.98
HT4	62	5310	26	9.44	9.54	0.60	10.04	10.14	12.95	13.05

802.11n/ac, HT40, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	54	5270	26	6.59	7.18	9.91	0.60	10.51	11.24	13.42
HT4	62	5310	26	6.87	7.50	10.21	0.60	10.81	12.05	13.72

802.11ac80, Chain #1 or #2 (SISO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
VHT6	58	5290	25	8.85	9.08	1.16	10.01	10.24	12.92	13.15

802.11ac80, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
VHT6	58	5290	25	5.19	5.32	8.27	1.16	9.43	12.34	8.77

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(C) 5470-5725 MHz Band

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

Data Rate (Mbps)	Channel #	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
6	100	5500	29	13.76	14.32	0.08	13.84	14.40	16.75	17.31
6	120	5600	29	13.58	13.53	0.08	13.66	13.61	16.57	16.52
6	140	5700	29	12.24	12.94	0.08	12.32	13.02	15.23	15.93

802.11n/ac, HT20, Chain #1 or #2 (SISO) (no MIMO), Except channel # 144

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	100	5500	30	14.98	14.86	0.38	15.36	15.24	18.27	18.15
HT4	120	5600	30	14.09	14.43	0.38	14.47	14.81	17.38	17.72
HT4	140	5700	30	13.79	12.83	0.38	14.17	13.21	17.08	16.12

802.11n/ac, HT20, Chain #1 & #2 (MIMO), Except channel # 144

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	100	5500	29	12.49	11.70	15.12	0.38	15.50	35.48	18.41
HT4	120	5600	29	12.21	12.13	15.18	0.38	15.56	35.96	18.47
HT4	140	5700	29	12.69	11.06	14.96	0.38	15.34	34.19	18.25

802.11n/ac, HT40, Chain #1 or #2 (SISO), Except channel # 142

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	102	5510	27	12.34	12.13	0.60	12.94	12.73	15.85	15.64
HT4	118	5590	27	12.02	11.52	0.60	12.62	12.12	15.53	15.03
HT4	134	5670	27	10.65	10.94	0.60	11.25	11.54	14.16	14.45

802.11n/ac, HT40, Chain #1 & #2 (MIMO), Except channel # 142

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	EIRP (dBm)	Comb. Power (mW)
HT4	102	5510	27	10.98	11.09	14.05	0.60	14.65	17.56	29.17
HT4	118	5590	27	10.27	10.93	13.62	0.60	14.23	17.14	26.46
HT4	134	5670	27	9.78	9.47	12.64	0.60	13.24	16.15	21.09

802.11ac80, Chain #1 or #2 (SISO), Except channel # 138

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
VHT6	106	5530	23	8.15	7.61	1.16	9.31	8.77	12.22	11.68
VHT6	122	5610	23	7.05	7.56	1.16	8.21	8.72	11.12	11.63

802.11ac80, Chain #1 & #2 (MIMO), Except channel # 138

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
VHT6	106	5530	23	6.64	5.18	8.98	1.16	10.14	13.05	10.34
VHT6	122	5610	23	5.58	5.28	8.44	1.16	9.61	12.52	9.13

802.11ac20, Chain #1 or #2 (SISO), U-NII-2C

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	144	5720	36	15.02	15.12	0.38	15.40	15.50	18.31	18.41

802.11ac20, Chain #1 & #2 (MIMO), U-NII-2C

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	144	5720	36	12.28	12.32	15.31	0.38	15.69	37.05	18.60

802.11ac20, Chain #1 or #2 (SISO), U-NII-3

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	144	5720	25	8.56	8.74	0.38	8.94	9.12	11.85	12.03

802.11ac20, Chain #1 & #2 (MIMO), U-NII-3

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	144	5720	25	5.58	5.21	8.38	0.38	8.76	7.51	11.67

802.11ac40, Chain #1 or #2 (SISO), U-NII-2C

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	142	5710	33	13.56	14.66	0.60	14.16	15.26	17.07	18.17

802.11ac40, Chain #1 & #2 (MIMO), U-NII-2C

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	142	5710	33	12.75	12.22	15.50	0.60	16.11	40.80	19.02

802.11ac40, Chain #1 or #2 (SISO), U-NII-3

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	142	5710	19	2.02	1.90	0.60	2.62	2.50	5.53	5.41

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802.11ac40, Chain #1 & #2 (MIMO), U-NII-3

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	142	5710	19	0.23	-0.92	2.70	0.60	3.31	2.14	6.22

802.11ac80, Chain #1 or #2 (SISO), U-NII-2C

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
VHT6	138	5690	32	12.78	12.37	0.60	13.38	12.97	16.29	15.88

802.11ac80, Chain #1 & #2 (MIMO), U-NII-2C

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
VHT6	138	5690	32	10.76	10.74	13.76	0.60	14.36	27.31	17.27

802.11ac80, Chain #1 or #2 (SISO), U-NII-3

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
VHT6	138	5690	23	-4.53	-4.72	0.60	-3.93	-4.12	-1.02	-1.21

802.11ac80, Chain #1 & #2 (MIMO), U-NII-3

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
VHT6	138	5690	23	-5.65	-4.82	-2.20	0.60	-1.60	0.69	1.31

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(D) 5725-5850 MHz Band

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

Data Rate (Mbps)	Channel #	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
6	149	5745	33	15.29	14.71	0.08	15.37	14.79	18.28	17.70
6	157	5785	33	15.28	13.47	0.08	15.36	13.55	18.27	16.46
6	165	5825	33	14.74	13.38	0.08	14.82	13.46	17.73	16.37

802.11n/ac, HT20, Chain #1 or #2 (SISO) (no MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	149	5745	33	14.12	14.69	0.38	14.50	15.07	17.41	17.98
HT4	157	5785	33	13.57	13.56	0.38	13.95	13.94	16.86	16.85
HT4	165	5825	33	13.10	13.06	0.38	13.48	13.44	16.39	16.35

802.11n/ac, HT20, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	149	5745	33	11.57	13.57	15.69	0.38	16.07	40.47	18.98
HT4	157	5785	33	11.29	12.91	15.19	0.38	15.56	36.00	18.47
HT4	165	5825	33	11.06	12.12	14.63	0.38	15.01	31.69	17.92

802.11n/ac, HT40, Chain #1 or #2 (SISO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
HT4	151	5755	30	13.49	12.54	0.60	14.09	13.14	17.00	16.05
HT4	159	5795	30	12.41	11.54	0.60	13.01	12.14	15.92	15.05

802.11n/ac, HT40, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
HT4	151	5755	30	12.34	11.07	14.76	0.60	15.36	34.39	18.27
HT4	159	5795	30	11.75	11.21	14.50	0.60	15.10	32.37	18.01

802.11ac80, Chain #1 or #2 (SISO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Duty Cycle (dB)	Chain #1 (dBm)	Chain #2 (dBm)	EIRP#1 (dBm)	EIRP#2 (dBm)
VHT6	155	5775	28	10.11	9.93	1.16	11.27	11.09	14.18	14.00

802.11ac80, Chain #1 & #2 (MIMO)

Data Rate	Channel	Frequency (MHz)	Gain Control	Chain #1 (dBm)	Chain #2 (dBm)	Combined Power (dBm)	Duty Cycle (dB)	Comb. Power (dBm)	Comb. Power (mW)	EIRP (dBm)
VHT6	155	5775	28	9.53	8.85	12.21	1.16	13.38	21.76	16.29

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5.3. UNDESIRABLE EMISSIONS [§ 15.407(b)]

5.3.1. Limit(s)

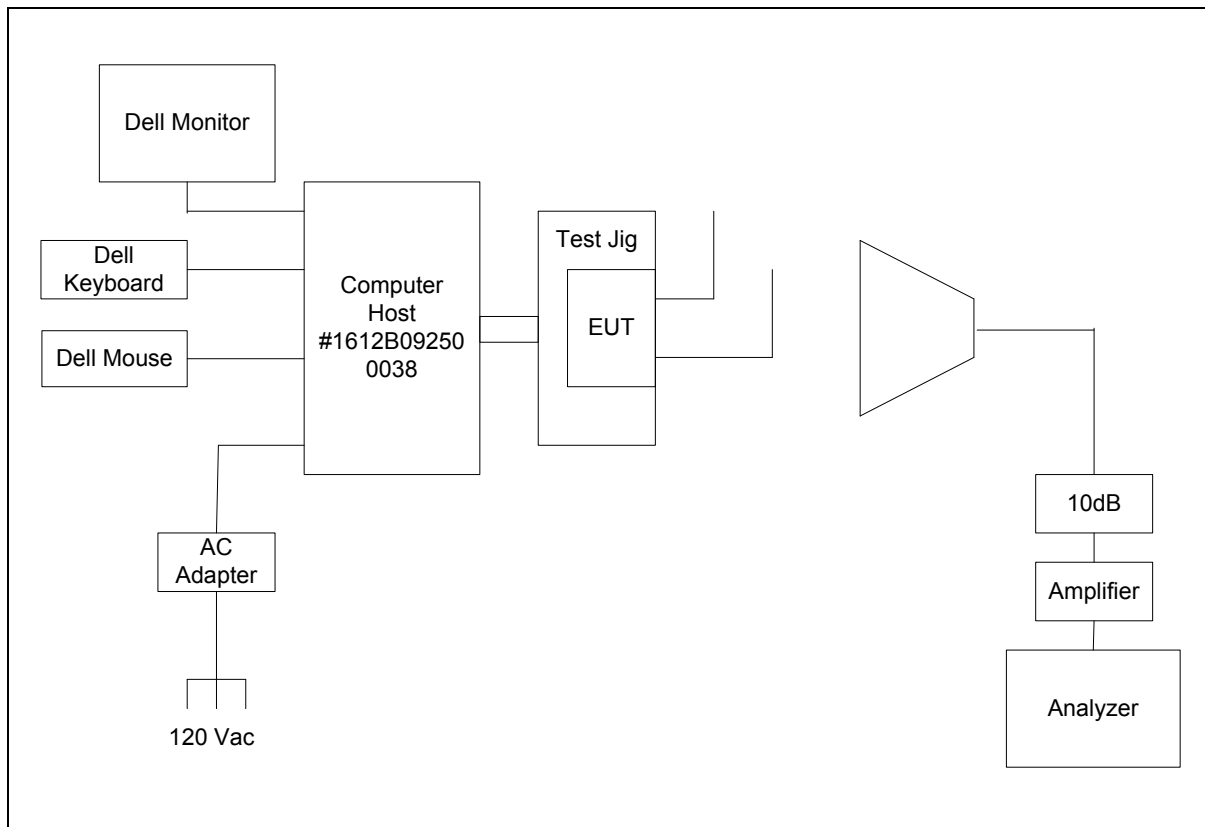
§ 15.407(b) *Undesirable emission limits.* Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
 - (ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

5.3.2. Method of Measurements

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02, Section II.G.

5.3.3. Test Arrangement



5.3.4. 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 determine worst-case test configurations, the following test results are the worst-case measurements.
- Equipment transmits continuously in the selected channel so no necessity for a duty cycle correction.

5.3.5. 5150-5250 MHz Band Tx Spurious Radiated

802.11a, 6 Mbps, Gain Control Setting 31.5, SISO

Fundamental Frequency:		5180 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10360	56.35	--	V	74.0	54.0	68.2	-11.8	Pass
10360	57.72	--	H	74.0	54.0	68.2	-10.5	Pass
20720	49.94	--	V	74.0	54.0	68.2	-4.1	Pass*
20720	49.37	--	H	74.0	54.0	68.2	-4.6	Pass*

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

Fundamental Frequency:		5200 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10400	56.02	--	V	74.0	54.0	68.2	-12.2	Pass
10400	55.58	--	H	74.0	54.0	68.2	-12.6	Pass
20800	49.52	--	V	74.0	54.0	68.2	-4.5	Pass*
20800	50.32	--	H	74.0	54.0	68.2	-3.7	Pass*

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

Fundamental Frequency:		5240 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10480	56.65	--	V	74.0	54.0	68.2	-11.5	Pass
10480	56.56	--	H	74.0	54.0	68.2	-11.6	Pass
20960	49.74	--	V	74.0	54.0	68.2	-4.3	Pass*
20960	49.88	--	H	74.0	54.0	68.2	-4.1	Pass*

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

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File #: 16CDTX003_FCC15E407
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802.11n HT20, HT4, Gain Control Setting 31, SISO & MIMO

Fundamental Frequency:		5180 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10360	57.32	--	V	74.0	54.0	68.2	-10.9	Pass
10360	56.57	--	H	74.0	54.0	68.2	-11.6	Pass
20720	48.32	--	V	74.0	54.0	68.2	-5.7	Pass*
20720	49.35	--	H	74.0	54.0	68.2	-4.6	Pass*

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

Fundamental Frequency:		5200 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10400	56.43	--	V	74.0	54.0	68.2	-11.8	Pass
10400	55.32	--	H	74.0	54.0	68.2	-12.9	Pass
20800	49.93	--	V	74.0	54.0	68.2	-4.1	Pass*
20800	50.33	--	H	74.0	54.0	68.2	-3.7	Pass*

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

Fundamental Frequency:		5240 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10480	58.53	--	V	74.0	54.0	68.2	-10.7	Pass
10480	56.01	--	H	74.0	54.0	68.2	-12.2	Pass
20960	50.50	--	V	74.0	54.0	68.2	-3.5	Pass*
20960	49.99	--	H	74.0	54.0	68.2	-4.0	Pass*

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

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802.11n HT40, HT4, Gain Control Setting 27.5, SISO & MIMO

Fundamental Frequency:		5190 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10380	56.00	--	V	74.0	54.0	68.2	-12.2	Pass
10380	55.43	--	H	74.0	54.0	68.2	-12.8	Pass
20760	49.84	--	V	74.0	54.0	68.2	-4.2	Pass*
20760	50.69	--	H	74.0	54.0	68.2	-3.3	Pass*

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

Fundamental Frequency:		5230 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10460	54.86	--	V	74.0	54.0	68.2	-13.3	Pass
10460	55.55	--	H	74.0	54.0	68.2	-12.6	Pass
20920	50.18	--	V	74.0	54.0	68.2	-3.8	Pass*
20920	50.30	--	H	74.0	54.0	68.2	-3.7	Pass*

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

802.11ac80, VHT6, Gain Control Setting 25, SISO & MIMO

Fundamental Frequency:		5210 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10420	55.12	--	V	74.0	54.0	68.2	-13.1	Pass
10420	54.99	--	H	74.0	54.0	68.2	-13.2	Pass
20840	49.79	--	V	74.0	54.0	68.2	-4.2	Pass*
20840	49.60	--	H	74.0	54.0	68.2	-4.4	Pass*

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

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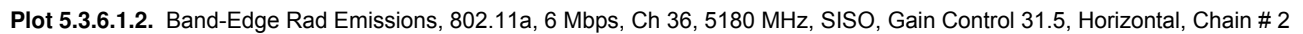
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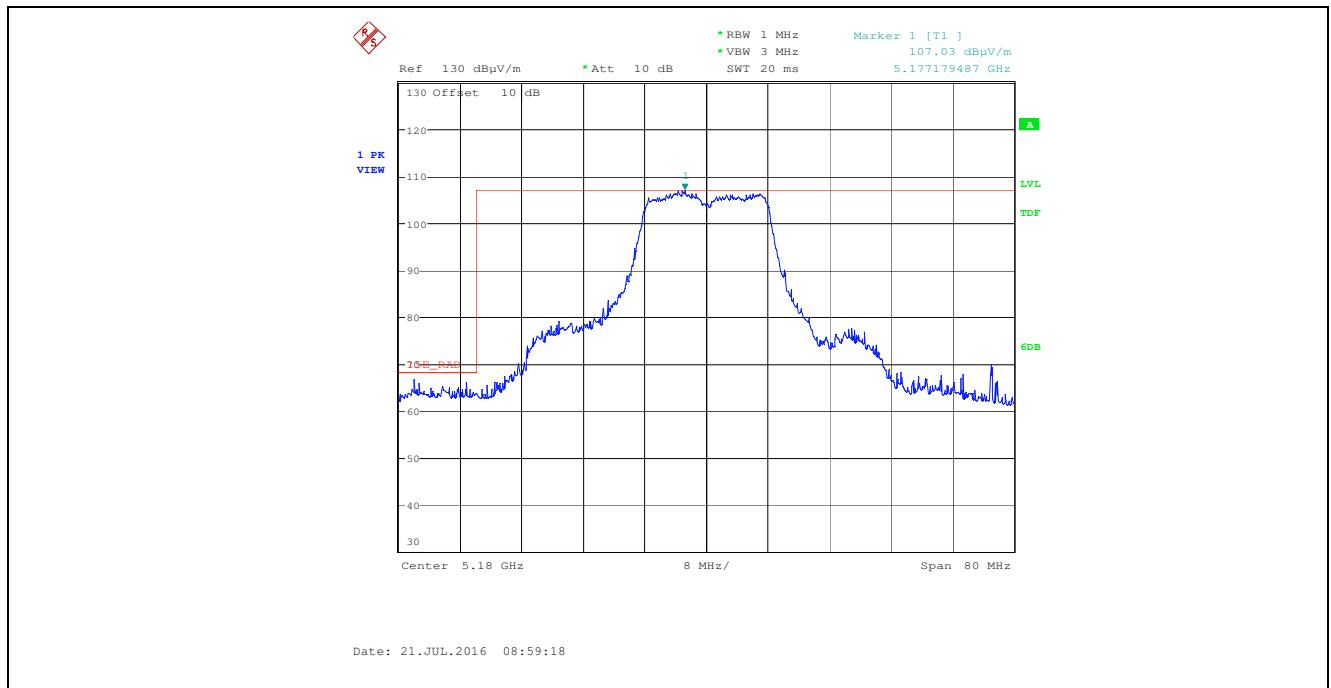
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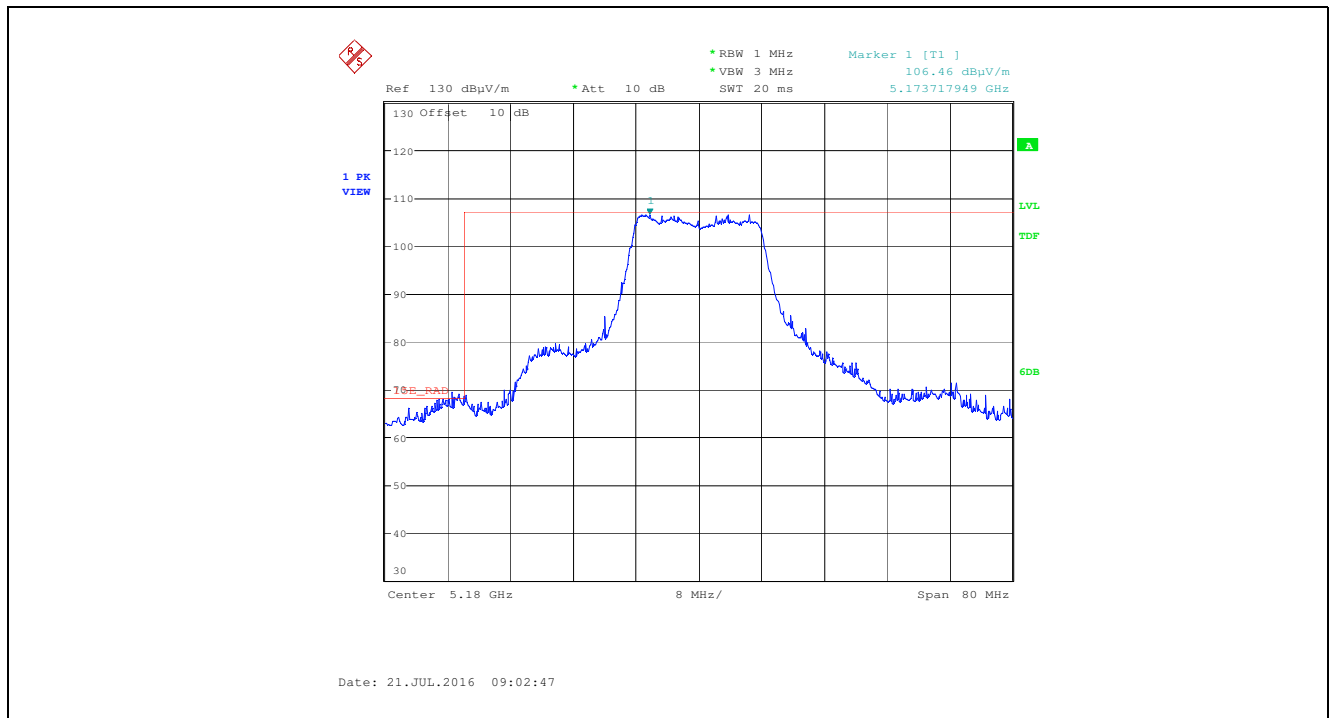
Plot 5.3.6.1.1. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 36, 5180 MHz, SISO, Gain Control 31.5, Horizontal, Chain # 1



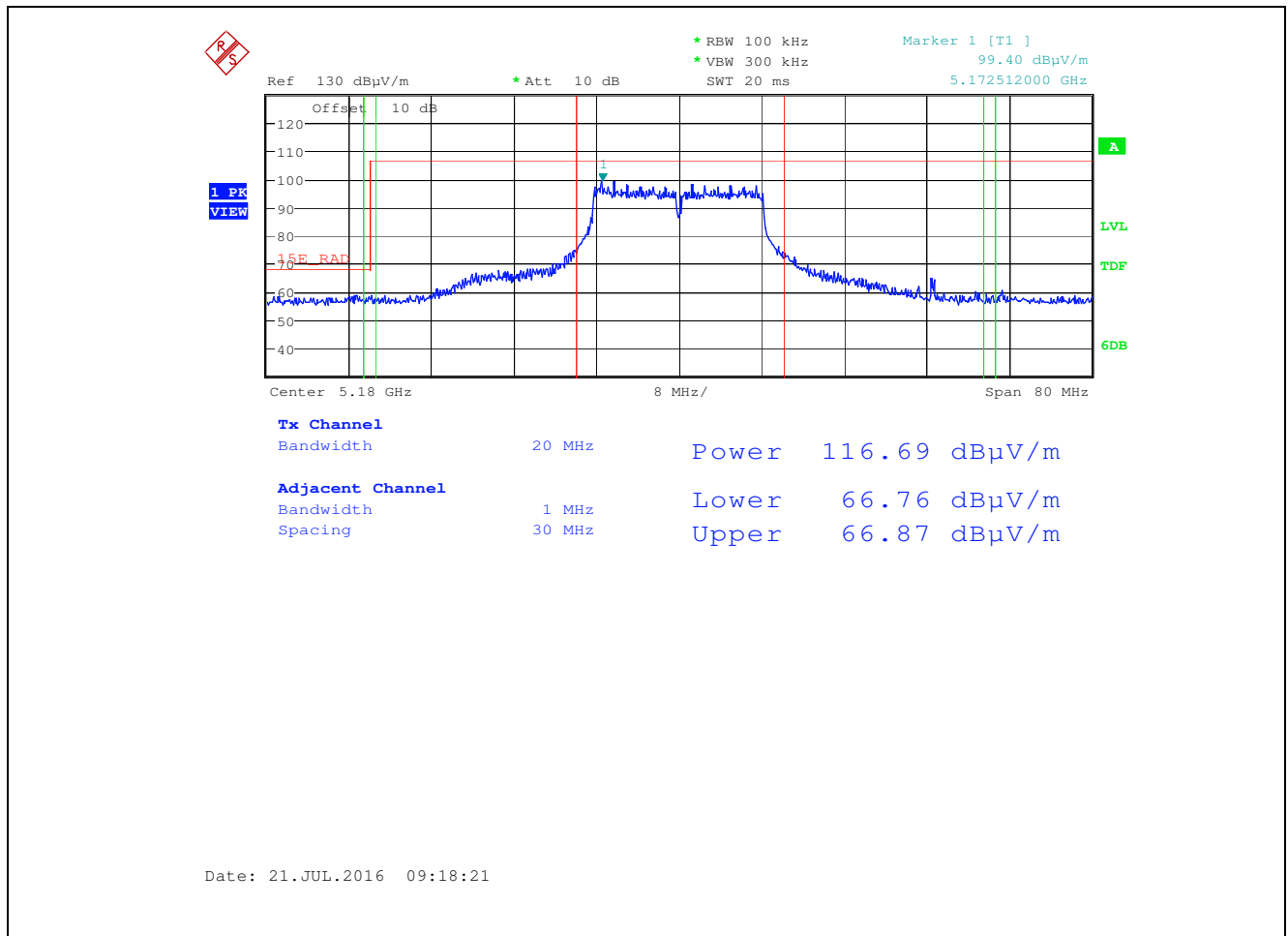
Plot 5.3.6.1.3. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 36, 5180 MHz, SISO, Gain Control 31.5, Vertical, Chain # 1



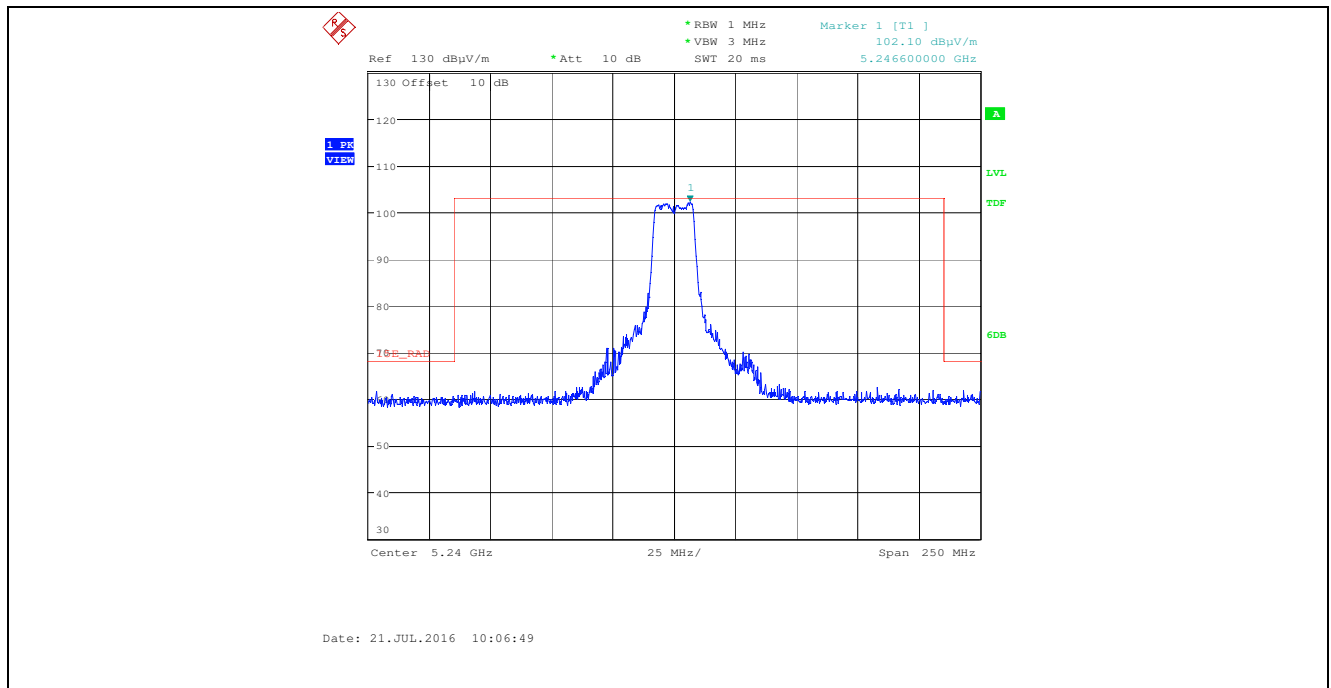
Plot 5.3.6.1.4. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 36, 5180 MHz, SISO, Gain Control 31.5, Vertical, Chain # 2



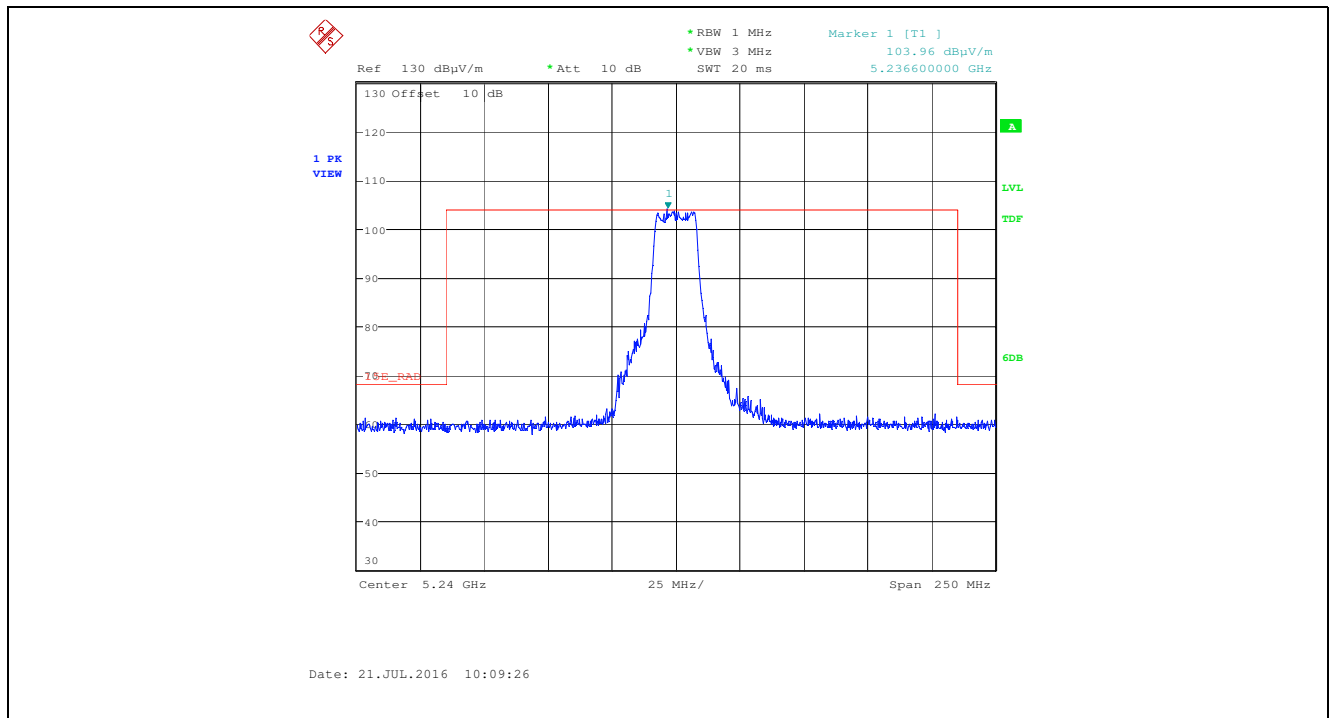
Plot 5.3.6.1.5. Integration Method for Chain # 2, 802.11a, 6 Mbps, Ch 36, 5180 MHz, SISO, Gain Control 31.5, Vertical



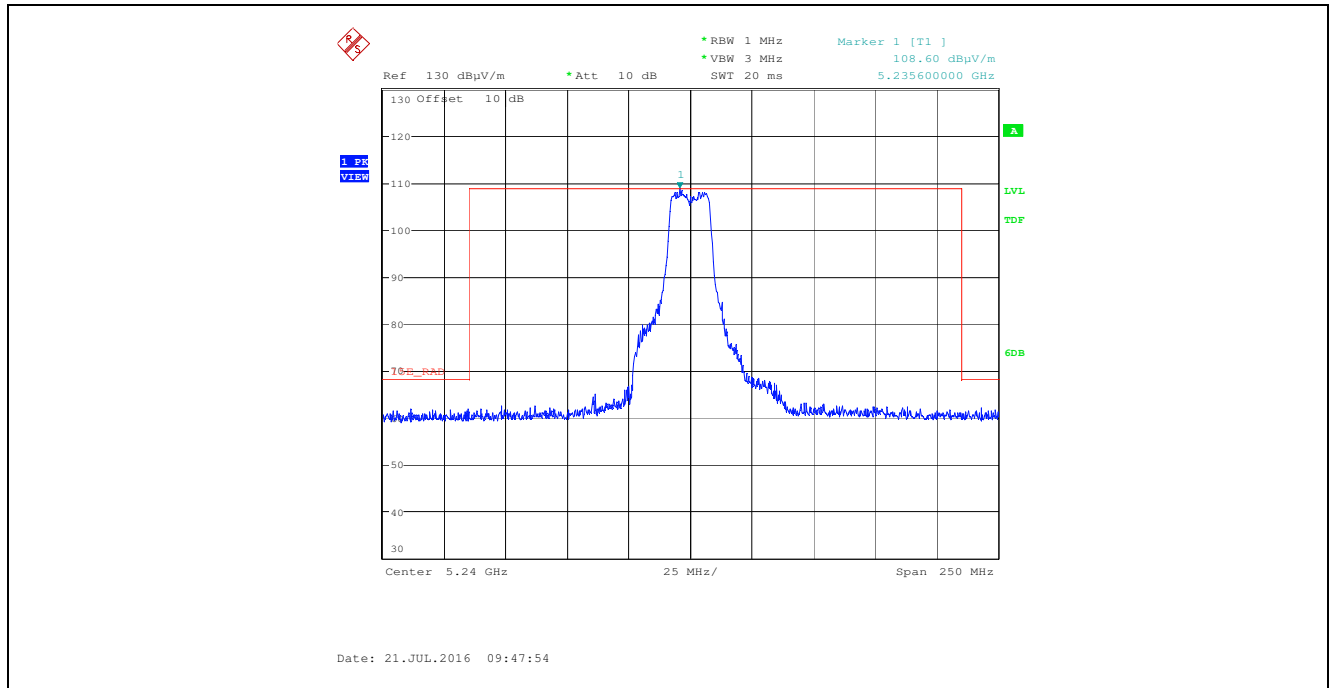
Plot 5.3.6.1.6. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 48, 5240 MHz, SISO, Gain Control 31.5, Horizontal, Chain # 1



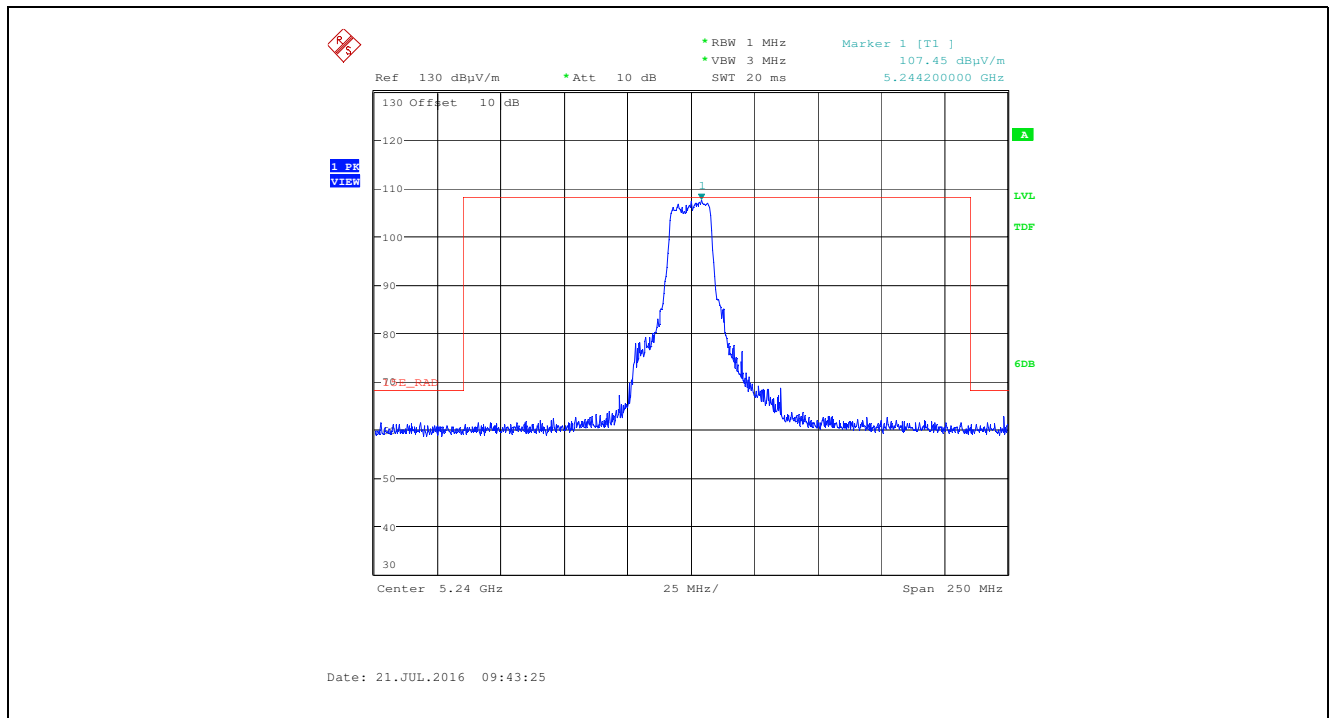
Plot 5.3.6.1.7. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 48, 5240 MHz, SISO, Gain Control 31.5, Horizontal, Chain # 2



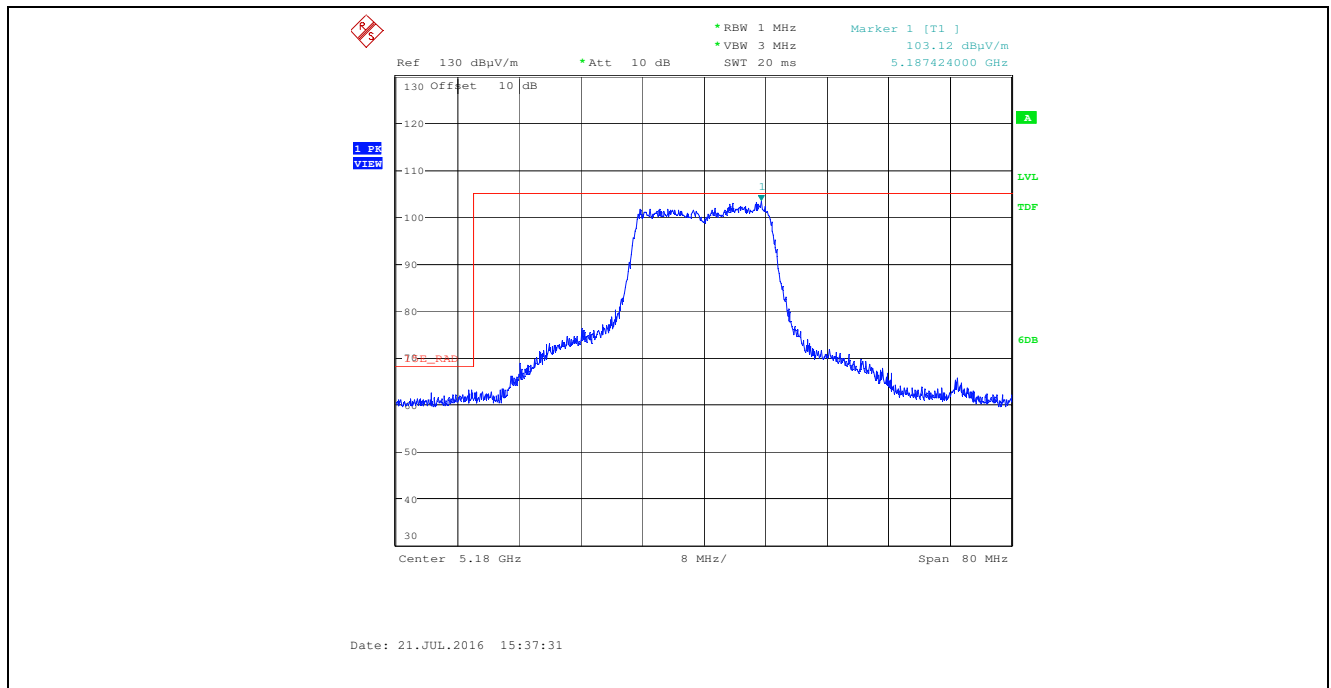
Plot 5.3.6.1.8. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 48, 5240 MHz, SISO, Gain Control 31.5, Vertical, Chain # 1



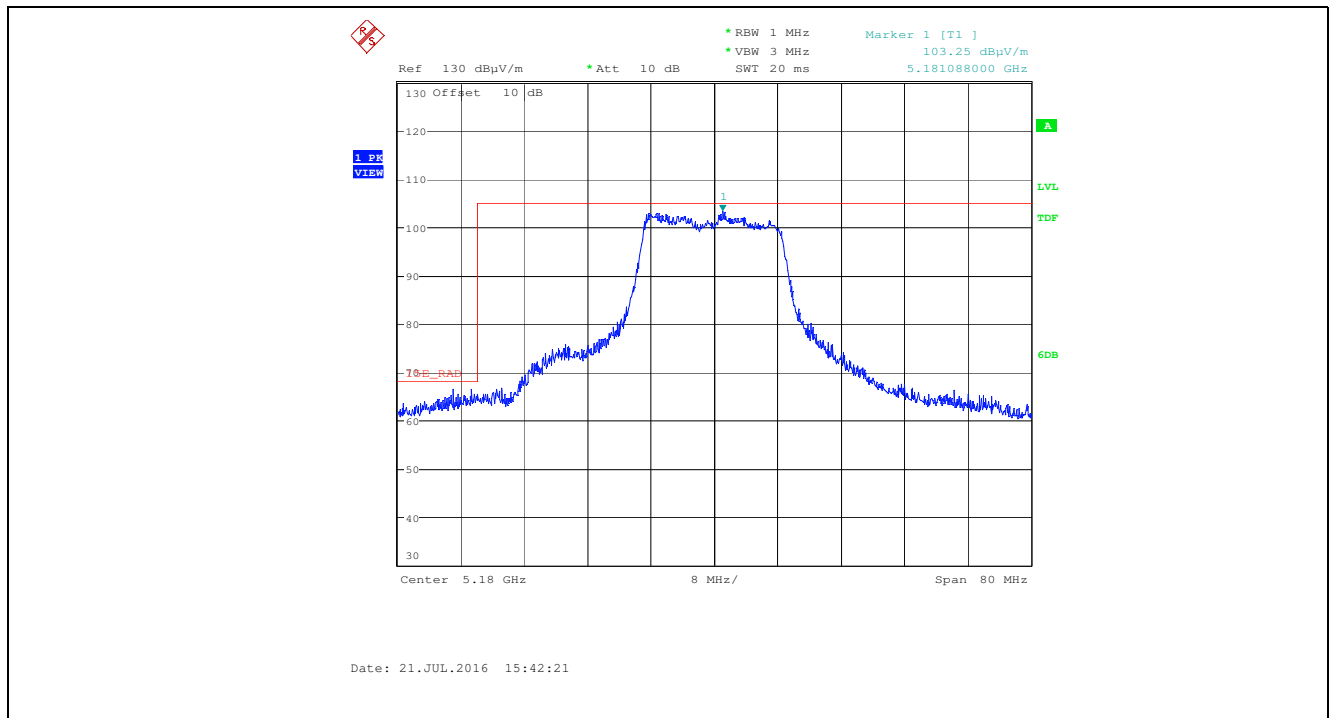
Plot 5.3.6.1.9. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 48, 5240 MHz, SISO, Gain Control 31.5, Vertical, Chain # 2



Plot 5.3.6.1.10. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 36, 5180 MHz, SISO, Gain Control 31, Horiz, Chain # 1



Plot 5.3.6.1.11. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 36, 5180 MHz, SISO, Gain Control 31, Horiz, Chain # 2



[illegible]

Ref 130 dBμV/m * Att 10 dB RBW 1 MHz Marker 1 [T1] 108.35 dBμV/m
 VBW 3 MHz SWT 20 ms 5.187488000 GHz

130 Offset 10 dB

120

110

100

90

80

70

60

50

40

30

Center 5.18 GHz 8 MHz/ Span 80 MHz

1 dB

VIS

LVL

TDF

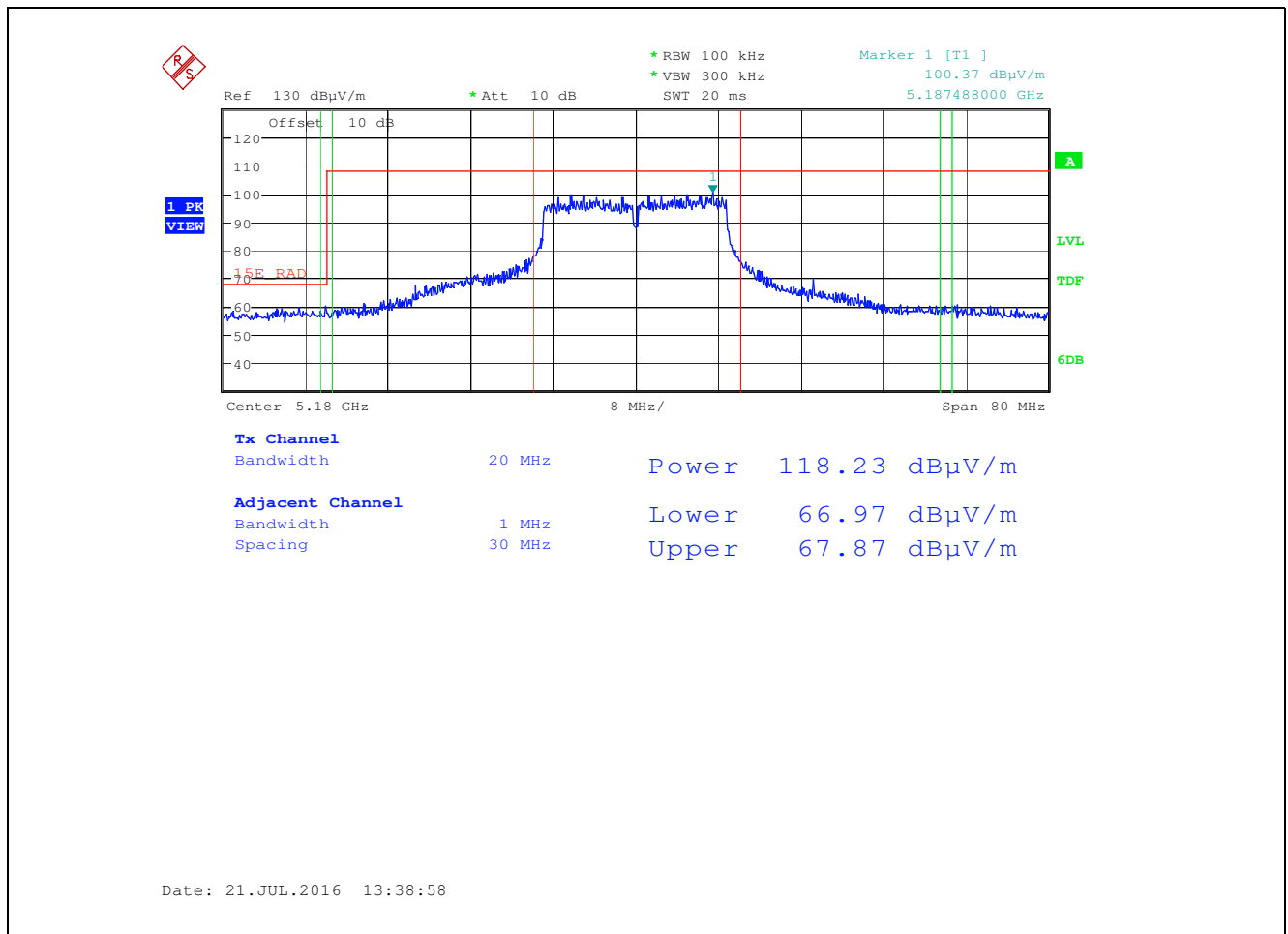
GDB

2

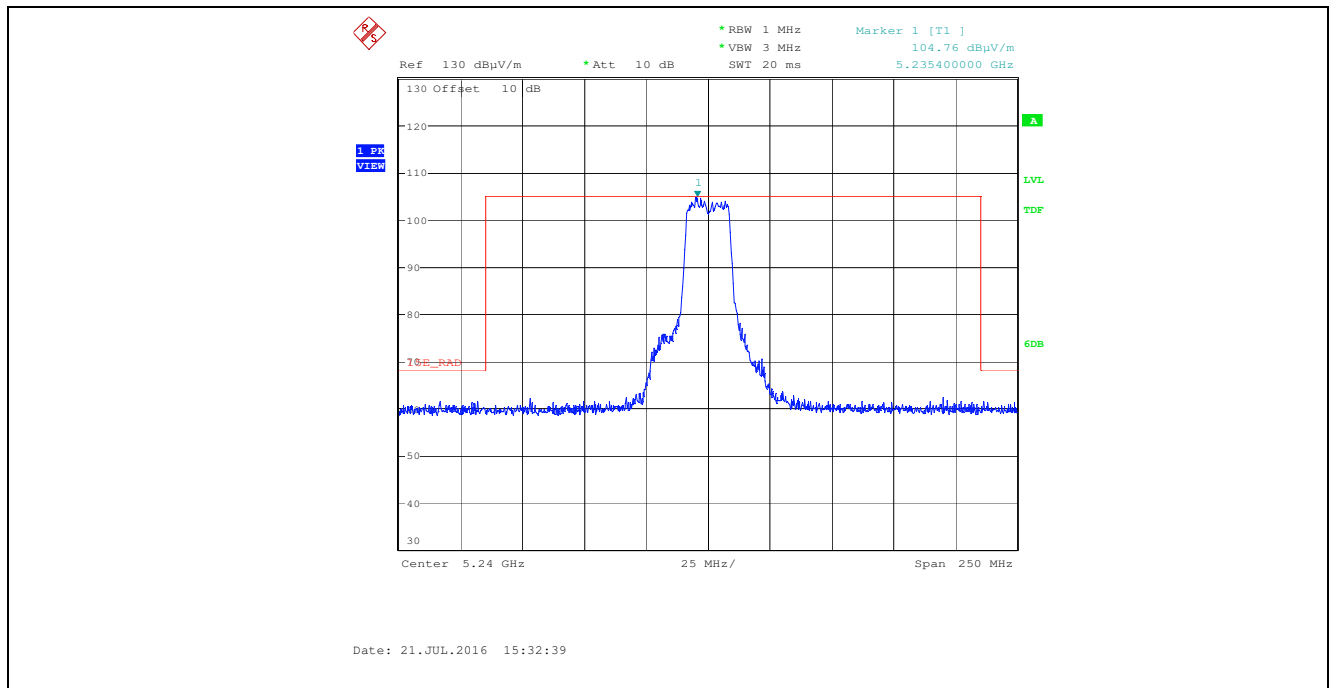
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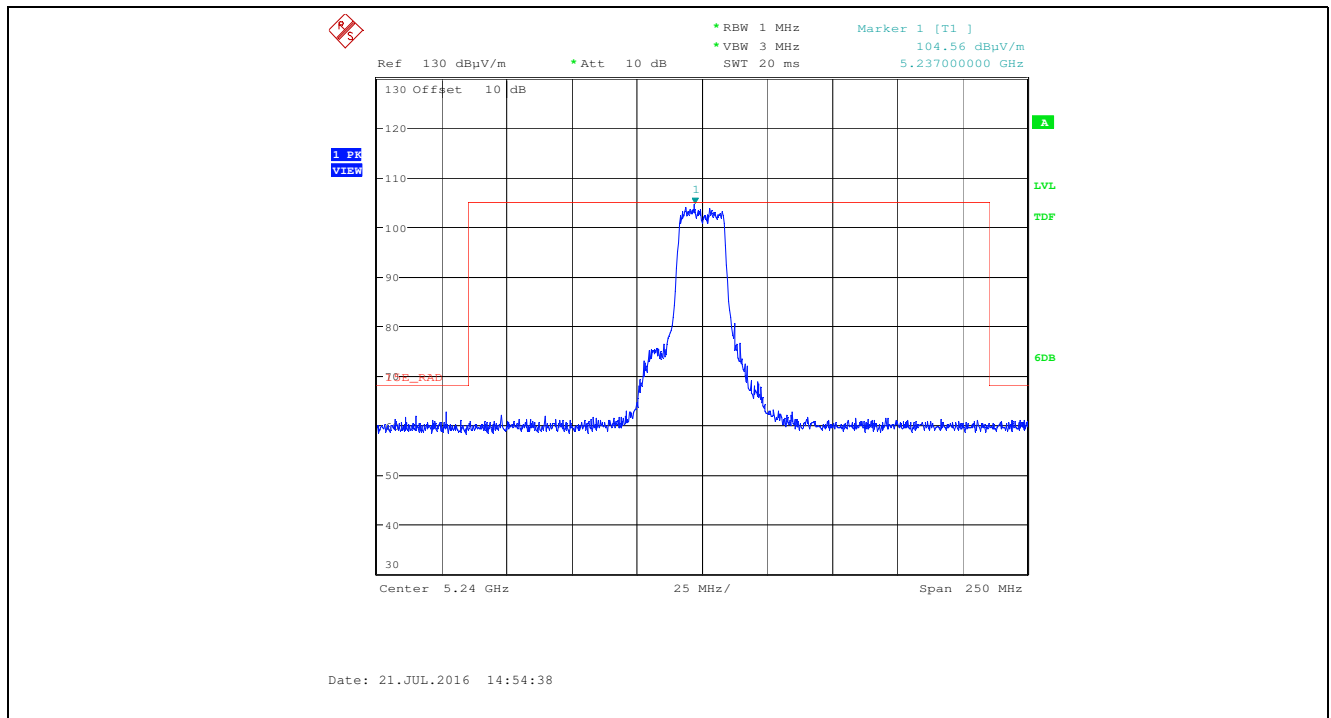
Plot 5.3.6.1.14. Integration Method for Chain # 2, 802.11n HT20, HT4, Ch 36, 5180 MHz, SISO, Gain Control 31, Vertical



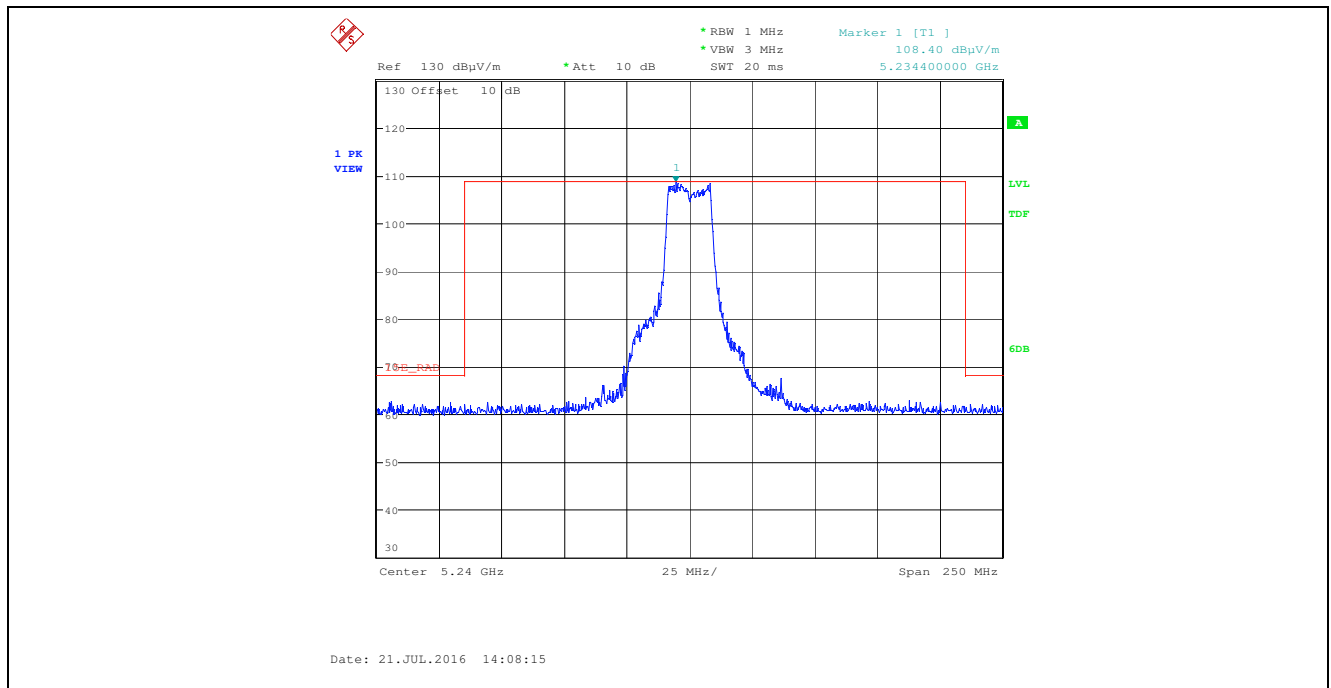
Plot 5.3.6.1.15. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 48, 5240 MHz, SISO, Gain Control 31, Horiz, Chain # 1



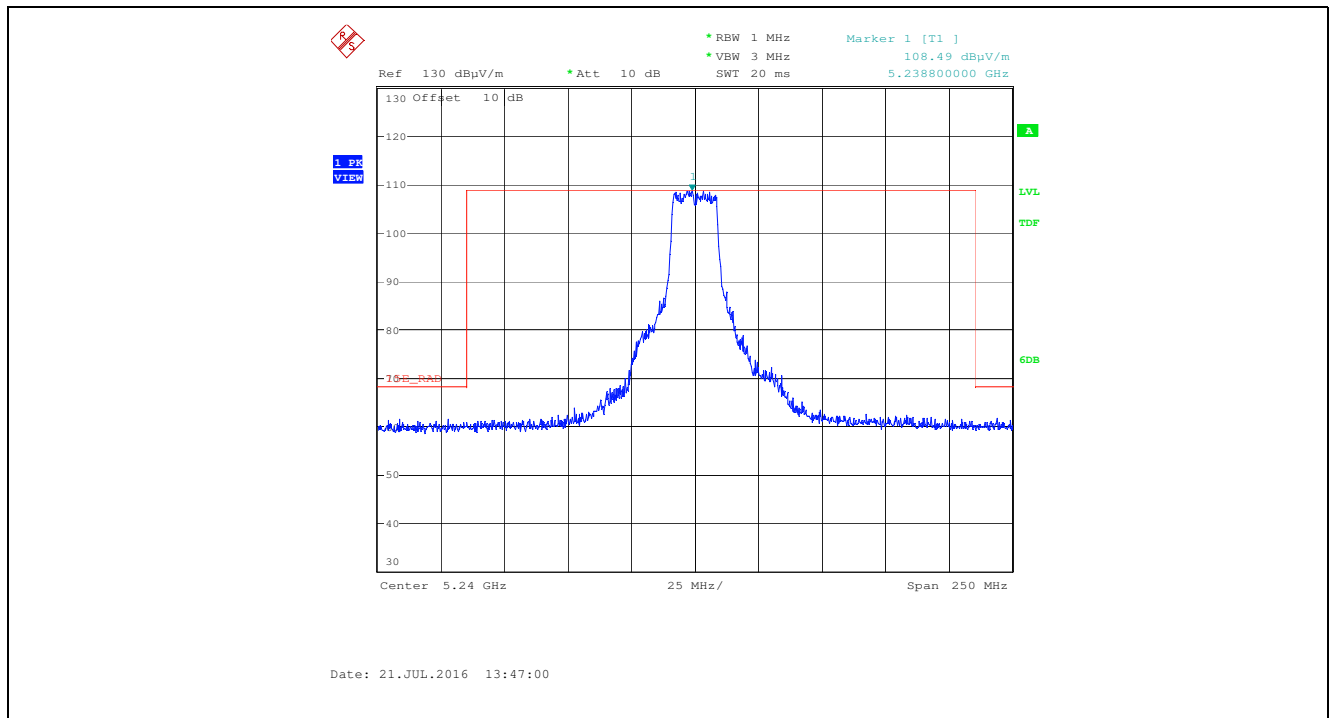
Plot 5.3.6.1.16. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 48, 5240 MHz, SISO, Gain Control 31, Horiz, Chain # 2



Plot 5.3.6.1.17. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 48, 5240 MHz, SISO, Gain Control 31, Vertical, Chain # 1

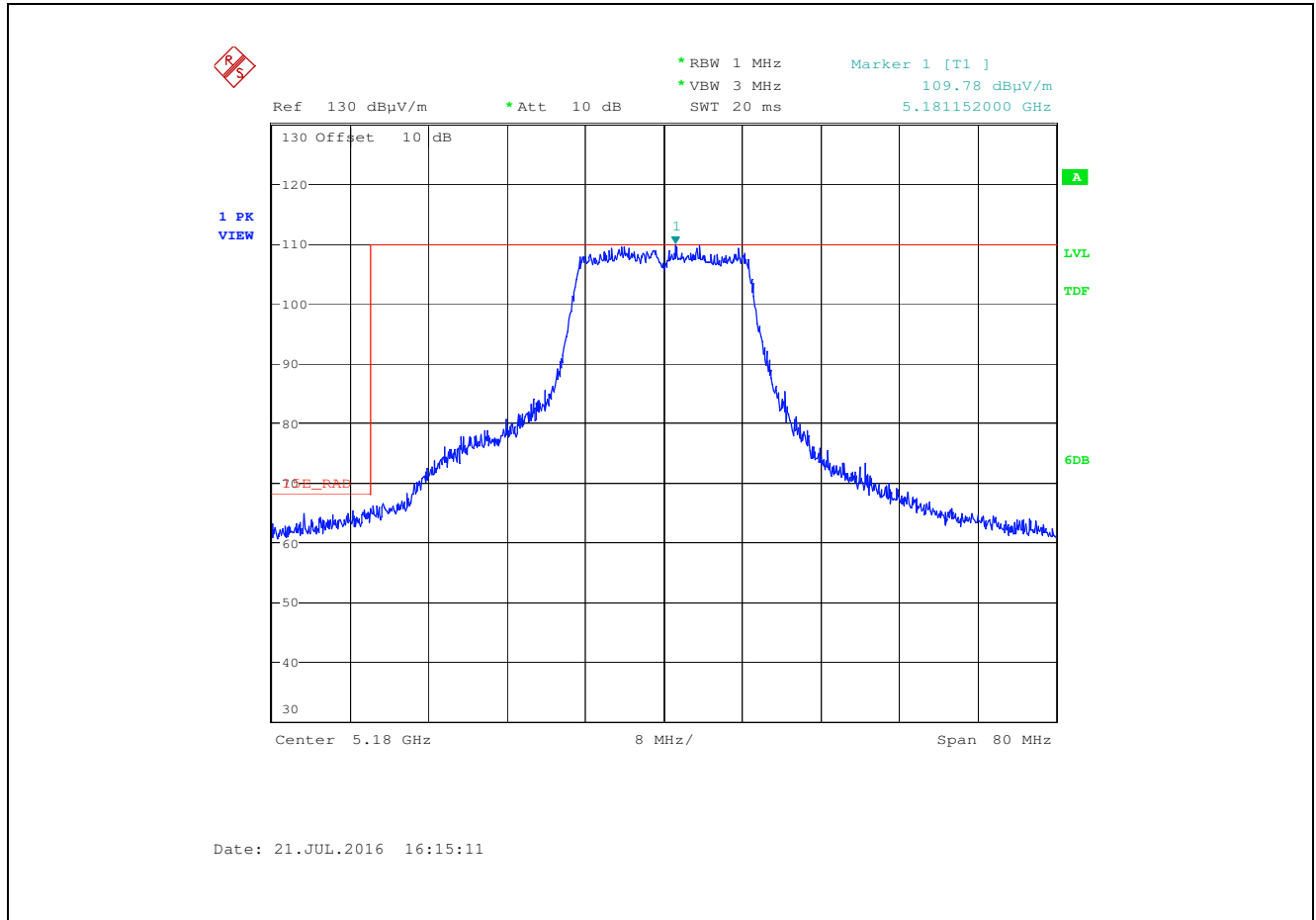


Plot 5.3.6.1.18. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 48, 5240 MHz, SISO, Gain Control 31, Vertical, Chain # 2

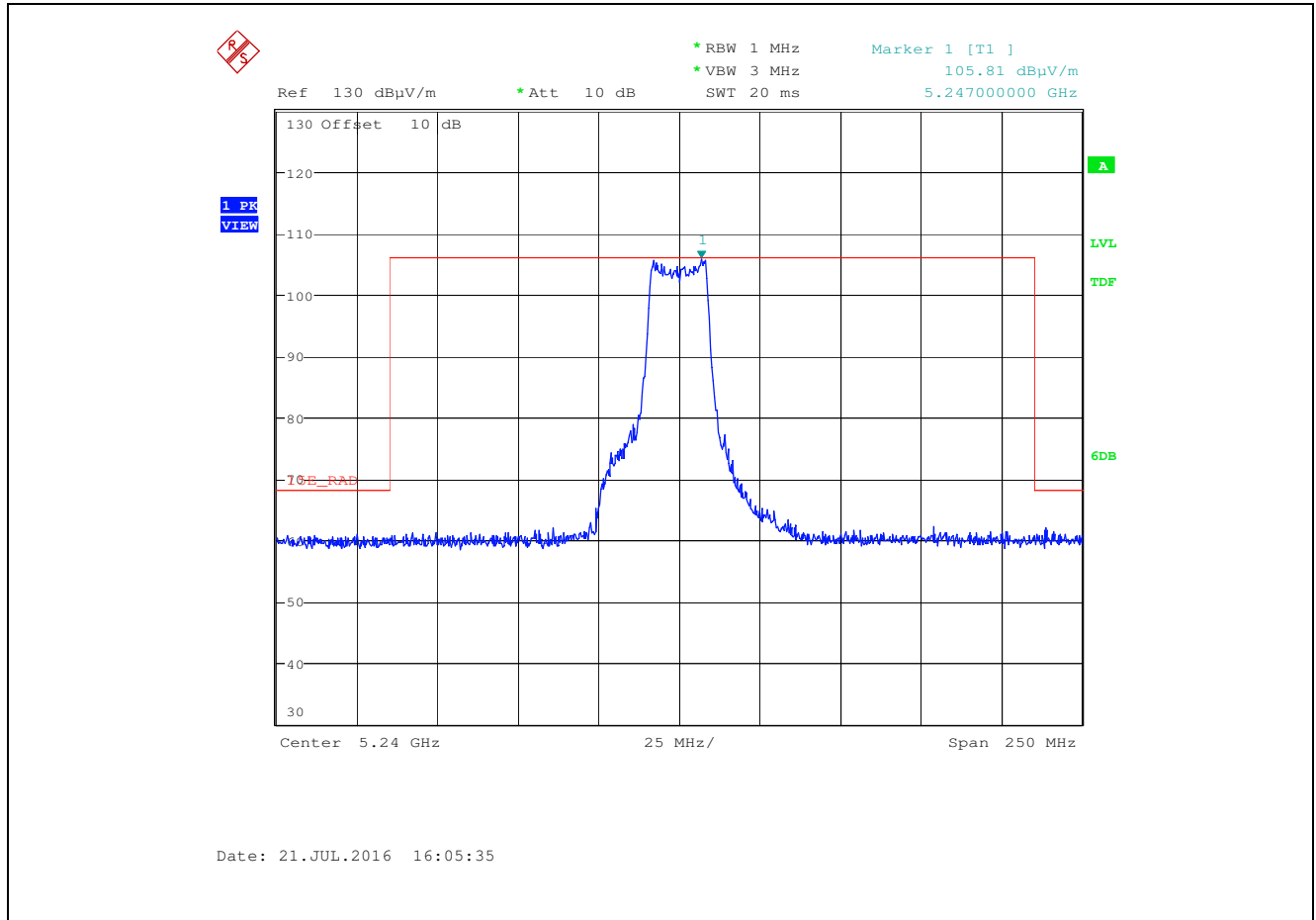


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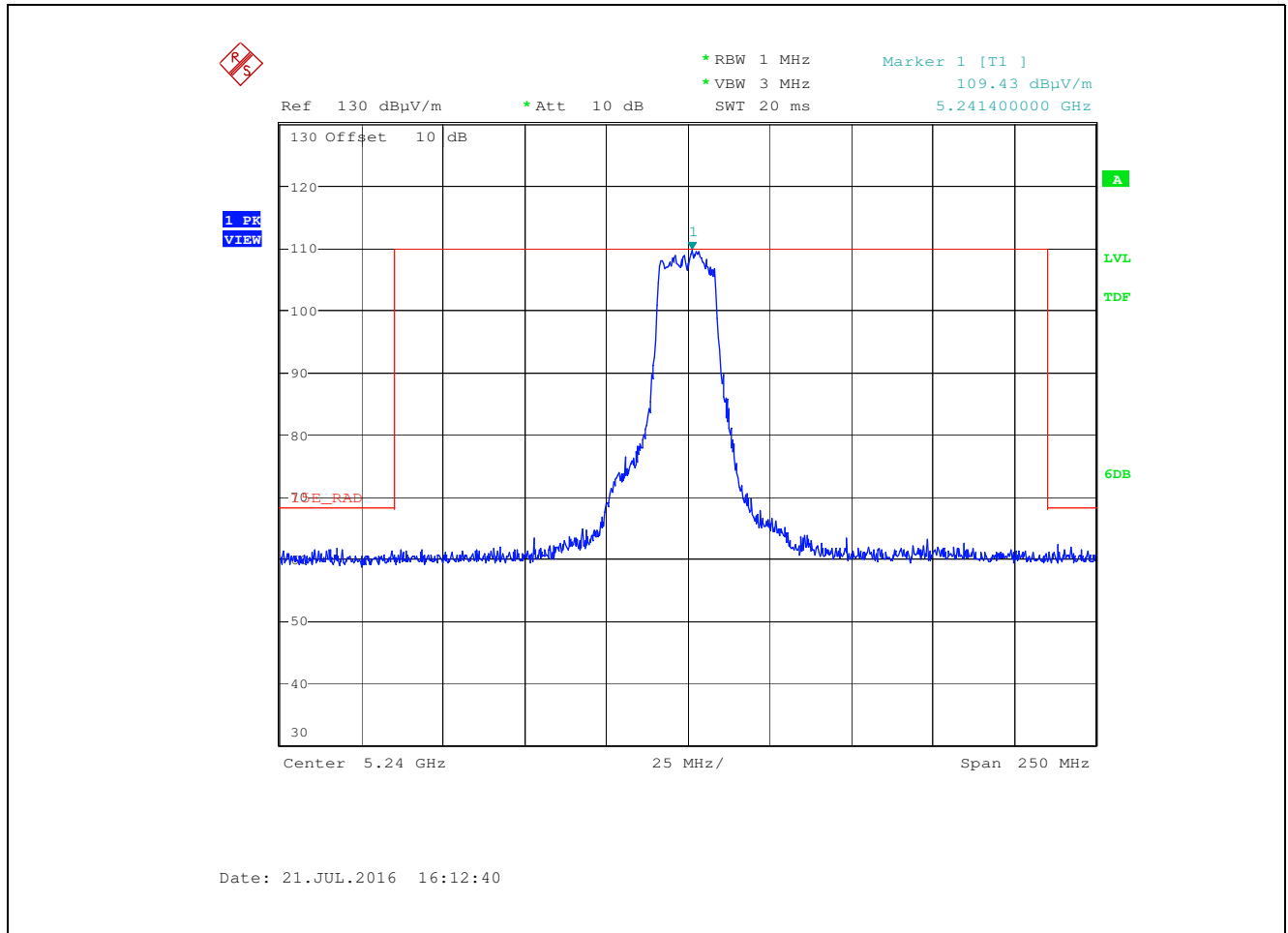
Plot 5.3.6.1.20. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 36, 5180 MHz, MIMO, Gain Control 31, Vertical,
Chain # 1 & 2



Plot 5.3.6.1.21. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 48, 5240 MHz, MIMO, Gain Control 31, Horizontal
Chain # 1 & 2



Plot 5.3.6.1.22. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 48, 5240 MHz, MIMO, Gain Control 31, Vertical Chain # 1 & 2



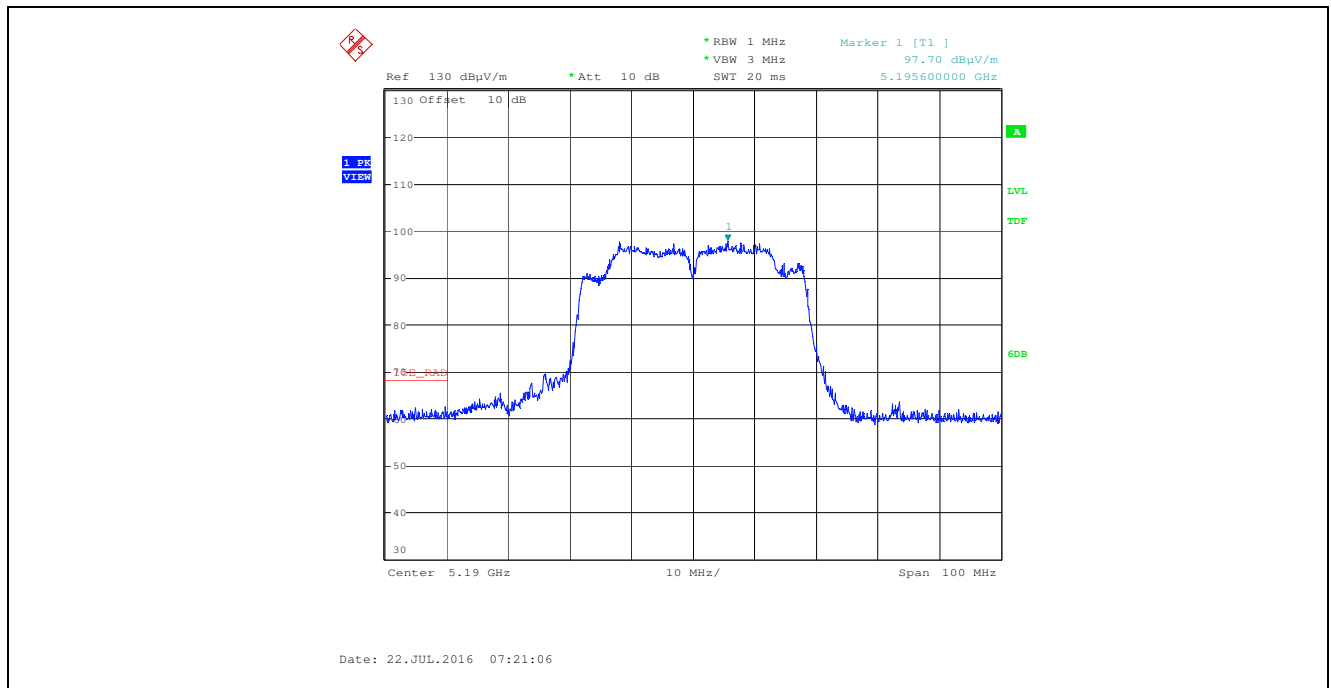
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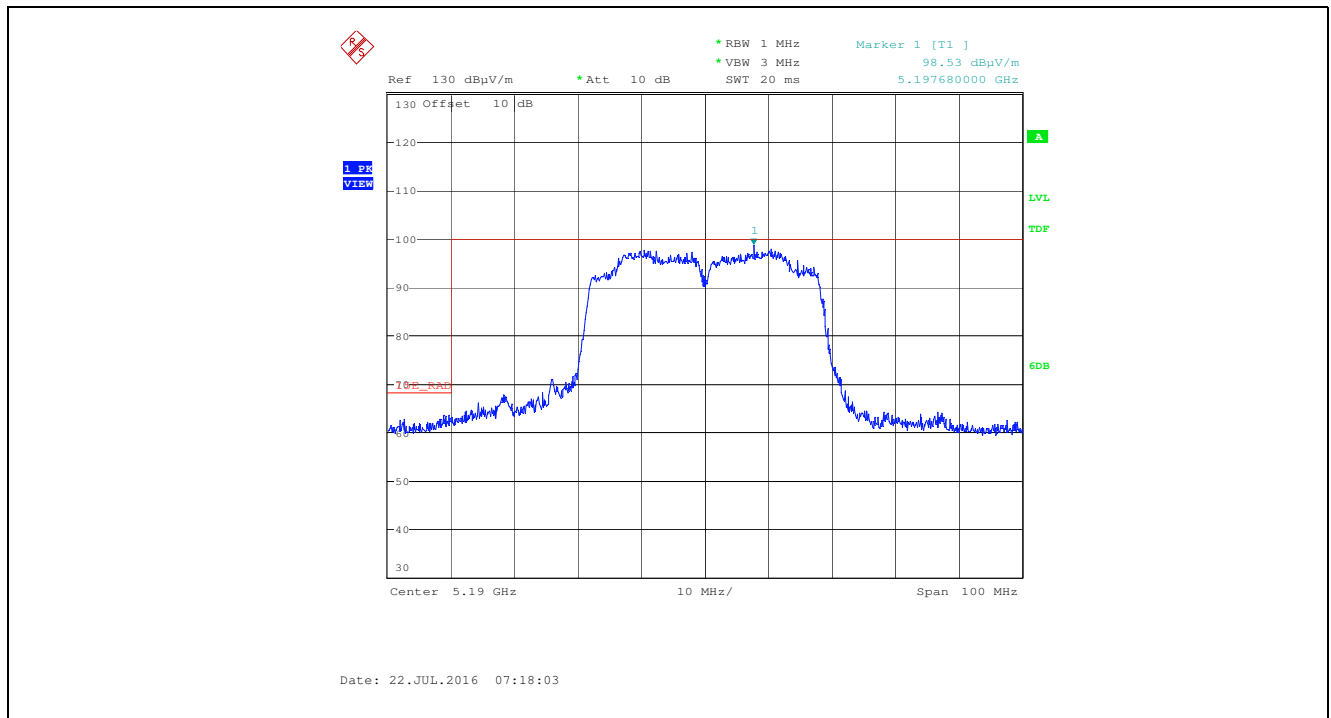
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Plot 5.3.6.1.23. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 38, 5190 MHz, SISO, Gain Control 27.5, Horiz, Chain # 1

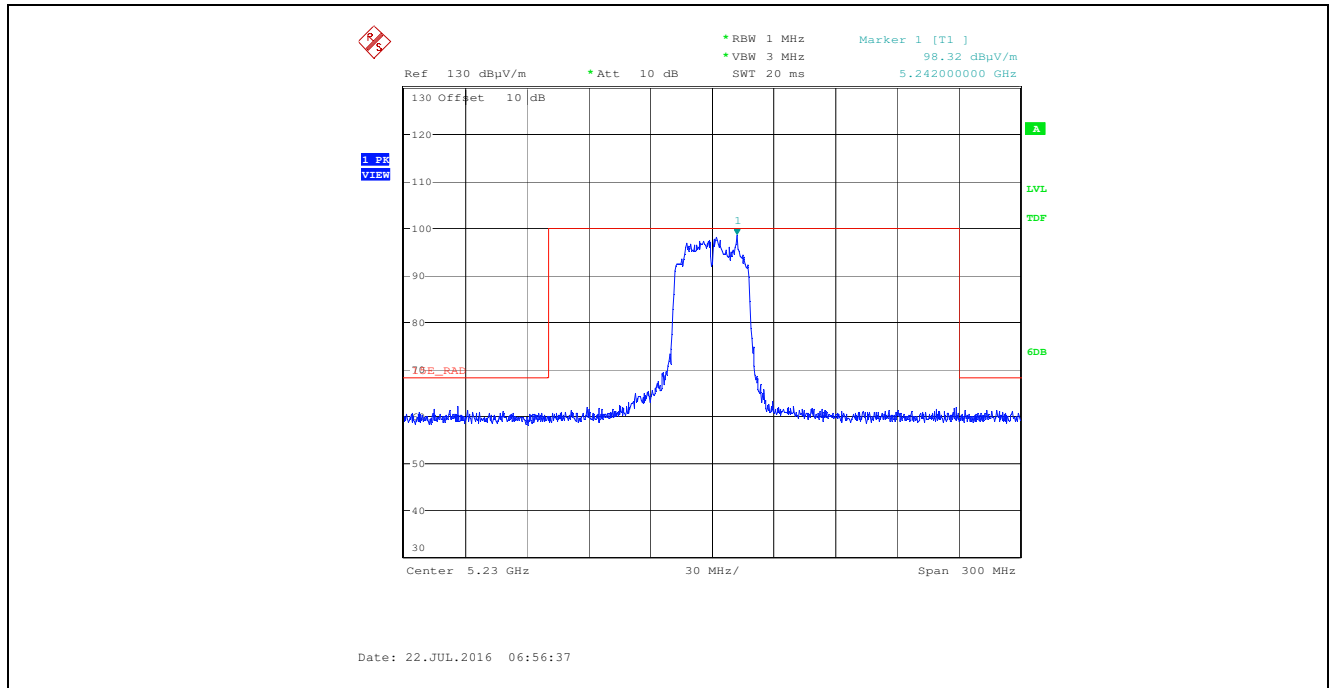


Plot 5.3.6.1.24. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 38, 5190 MHz, SISO, Gain Control 27.5, Horiz, Chain # 2

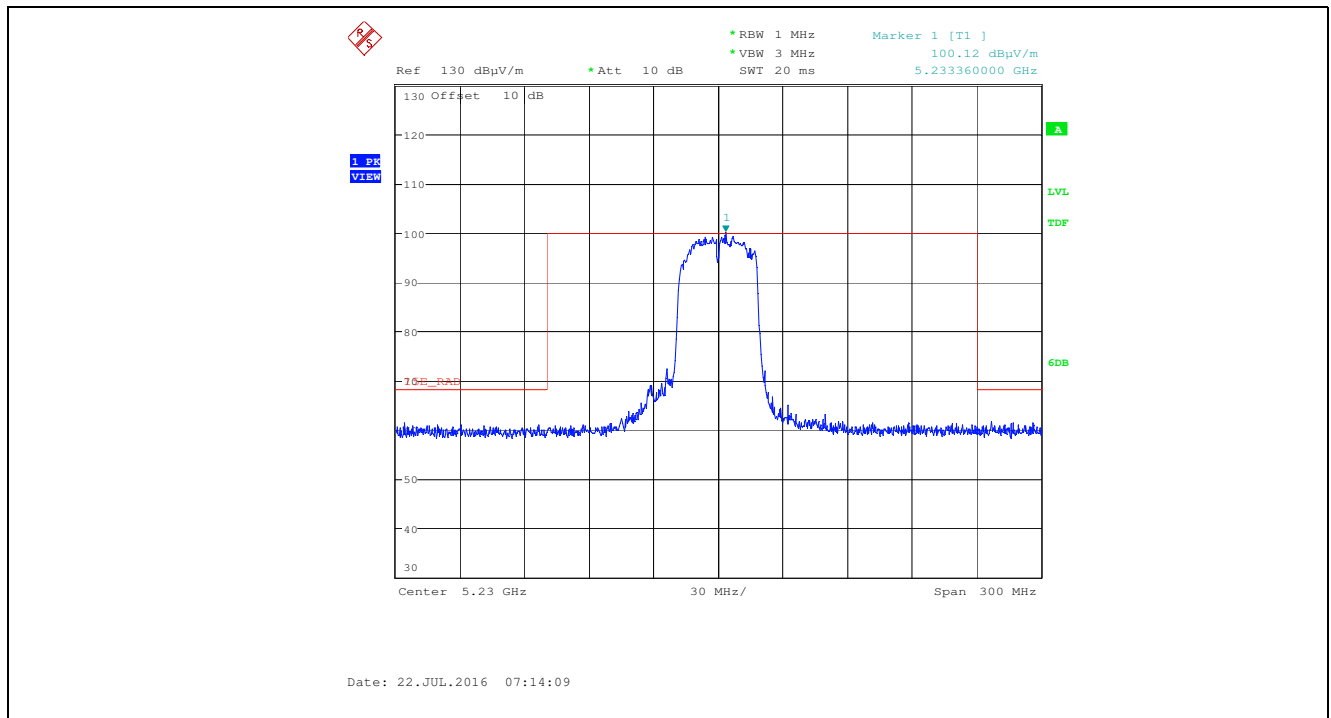


[illegible][illegible]

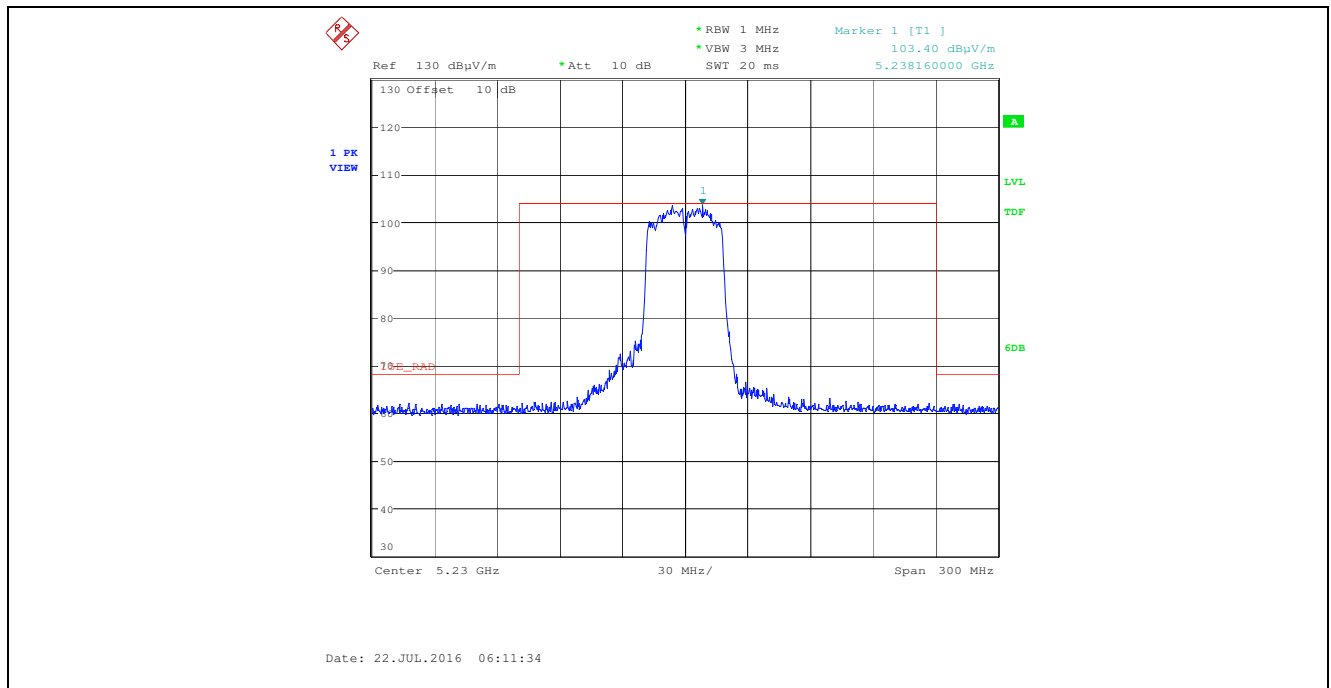
Plot 5.3.6.1.27. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 46, 5230 MHz, SISO, Gain Control 27.5, Horiz, Chain # 1



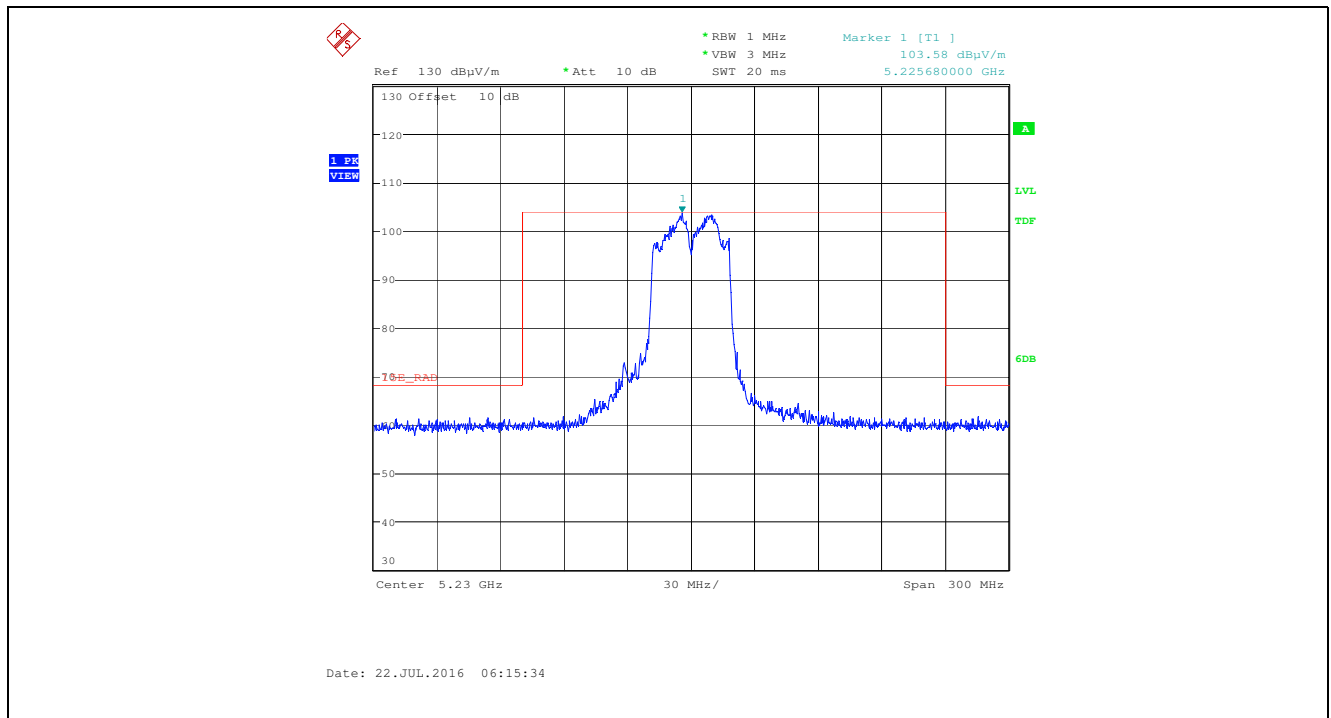
Plot 5.3.6.1.28. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 46, 5230 MHz, SISO, Gain Control 27.5, Horiz, Chain # 2



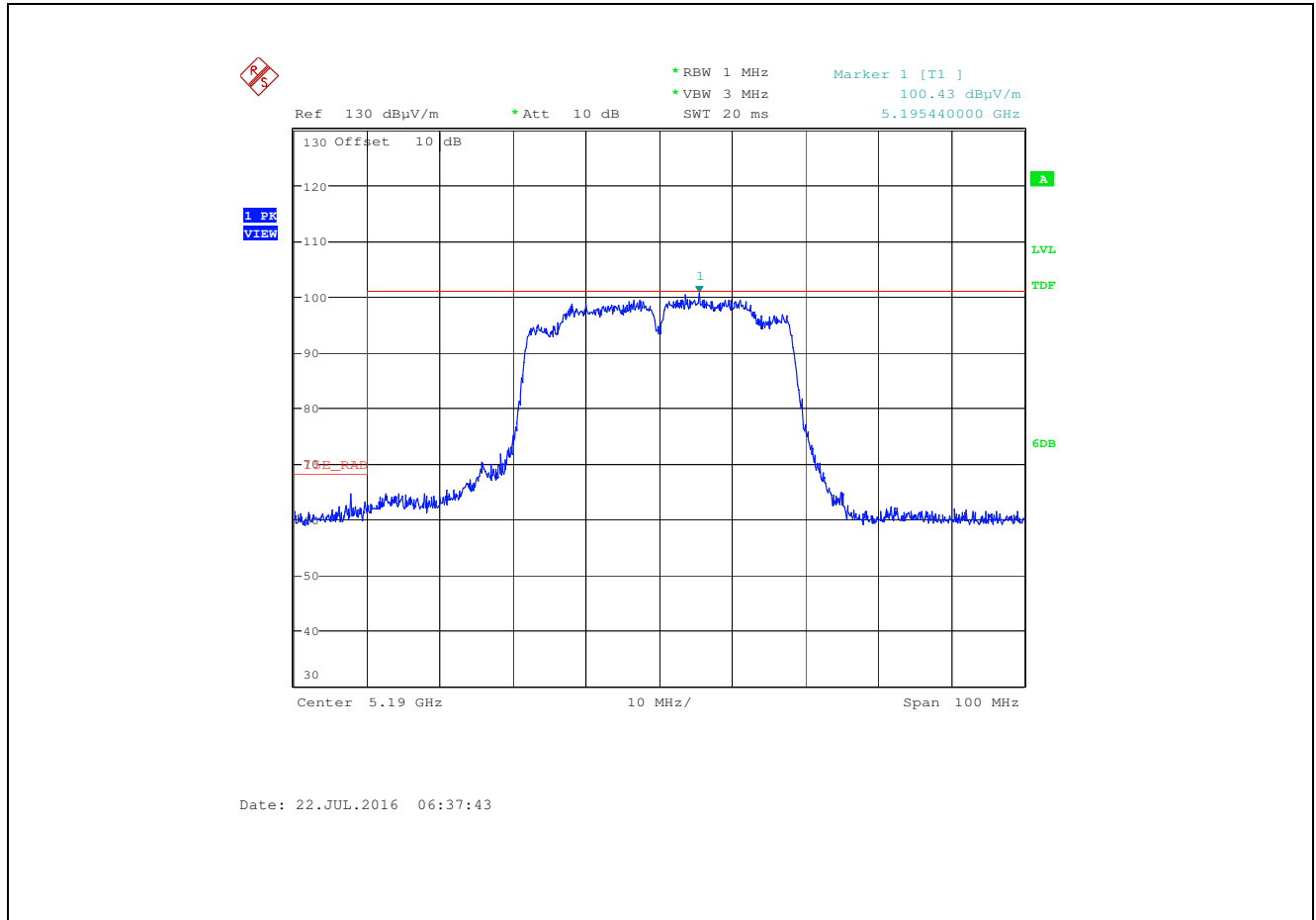
Plot 5.3.6.1.29. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 46, 5230 MHz, SISO, Gain Control 27.5, Vert, Chain # 1



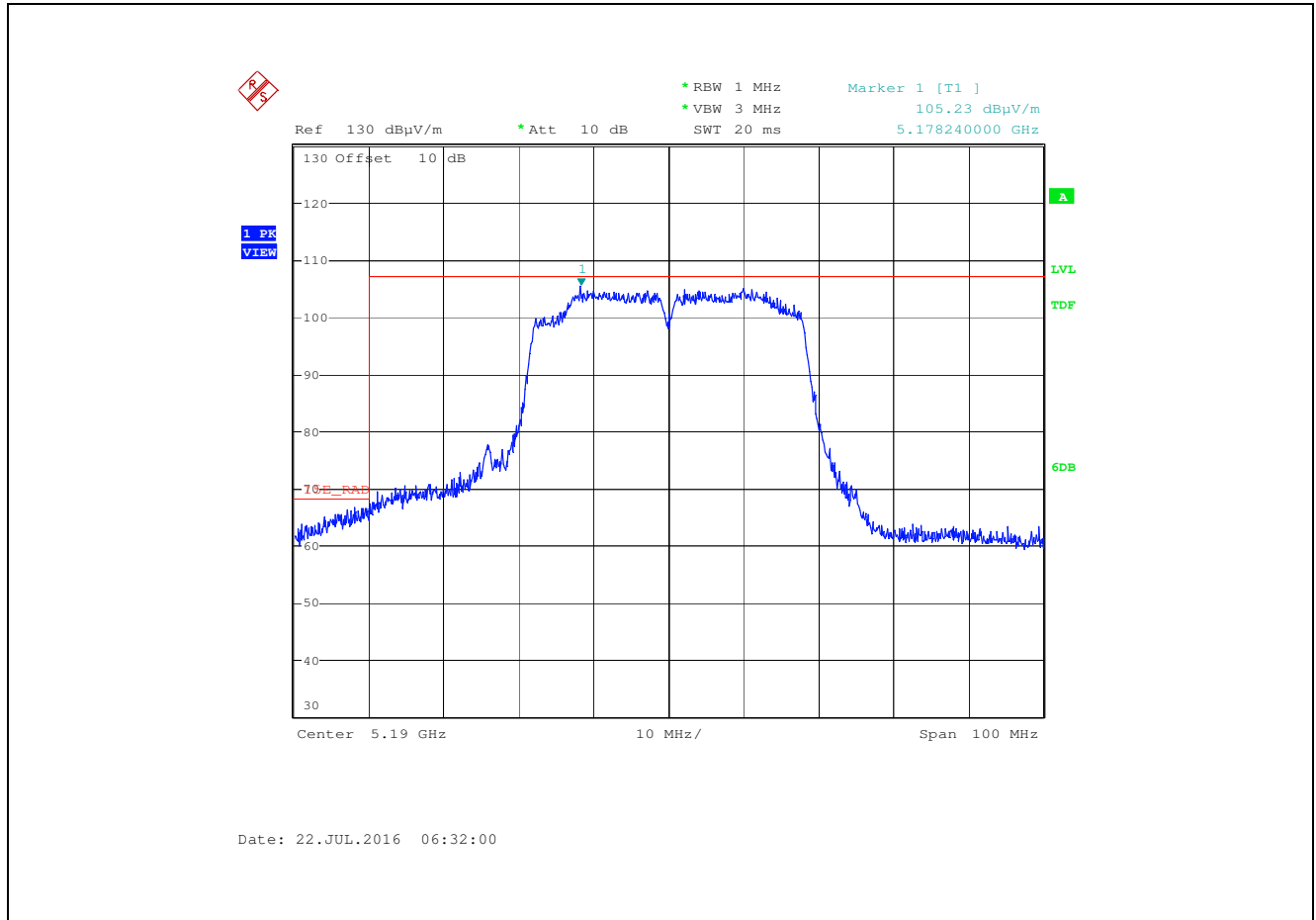
Plot 5.3.6.1.30. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 46, 5230 MHz, SISO, Gain Control 27.5, Vert, Chain # 2



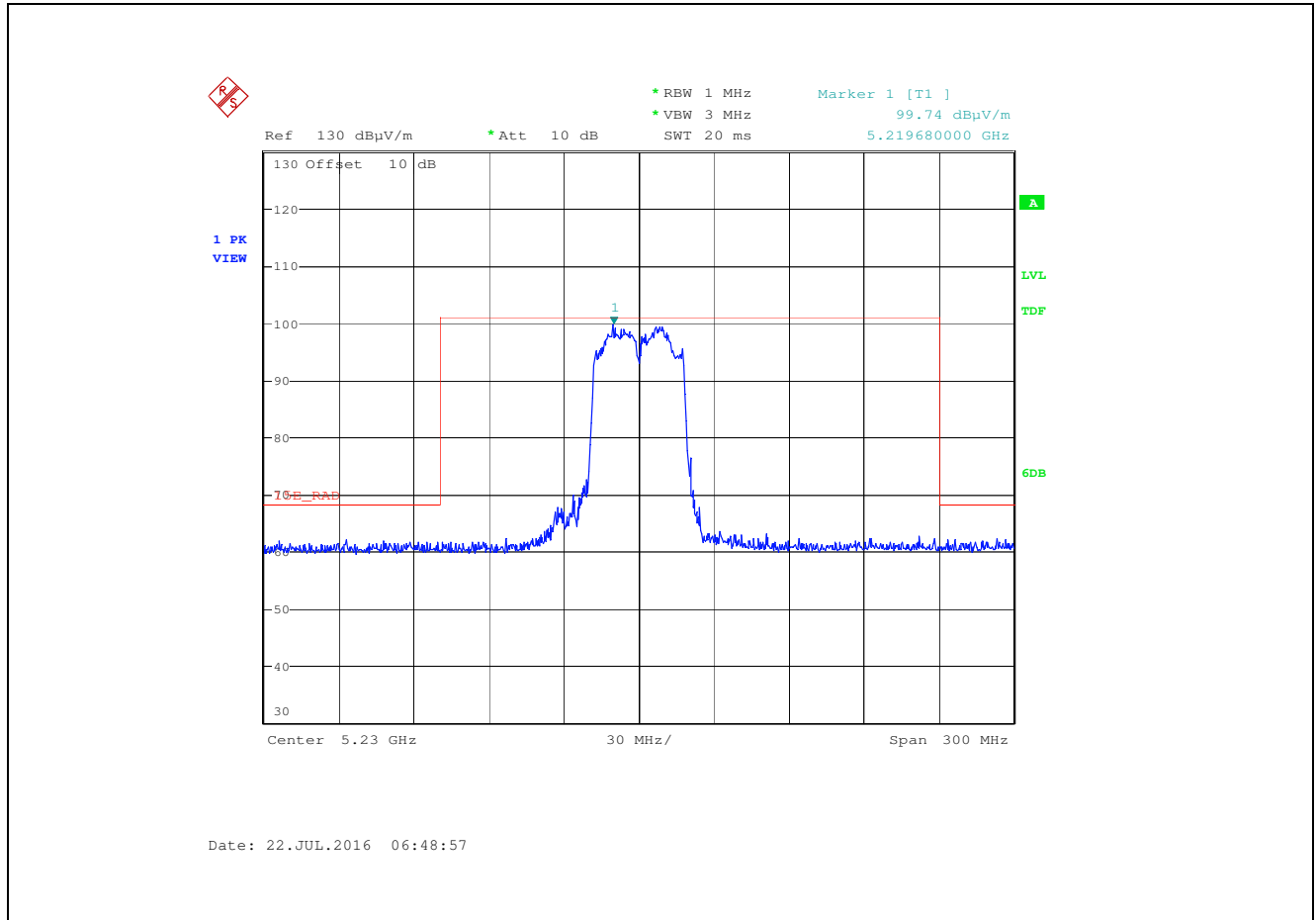
Plot 5.3.6.1.31. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 38, 5190 MHz, MIMO, Gain Control 27.5, Horizontal Chain # 1 & 2



Plot 5.3.6.1.32. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 38, 5190 MHz, MIMO, Gain Control 27.5, Vertical, Chain # 1 & 2



Plot 5.3.6.1.33. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 46, 5230 MHz, MIMO, Gain Control 27.5, Horizontal
Chain # 1 & 2



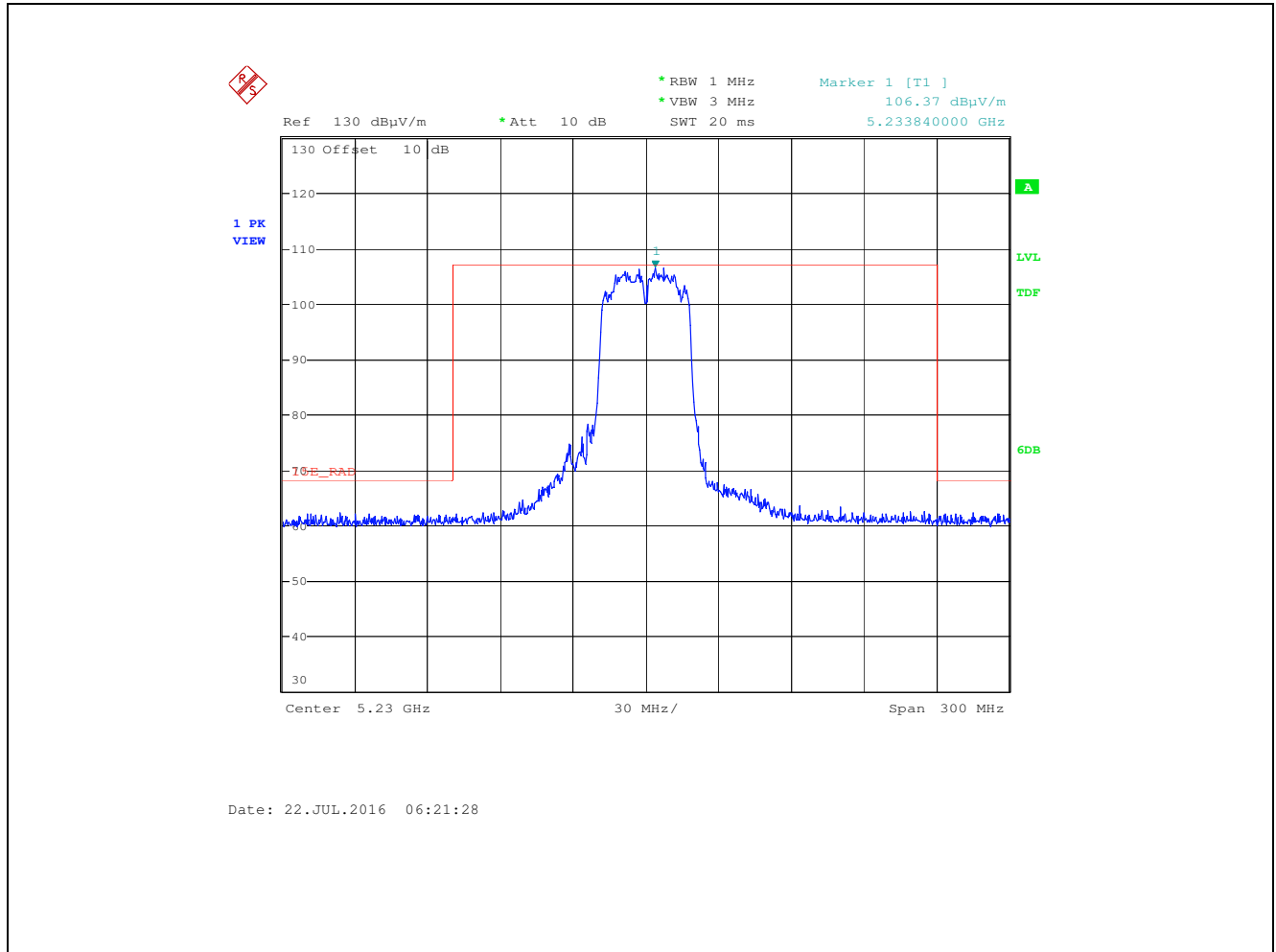
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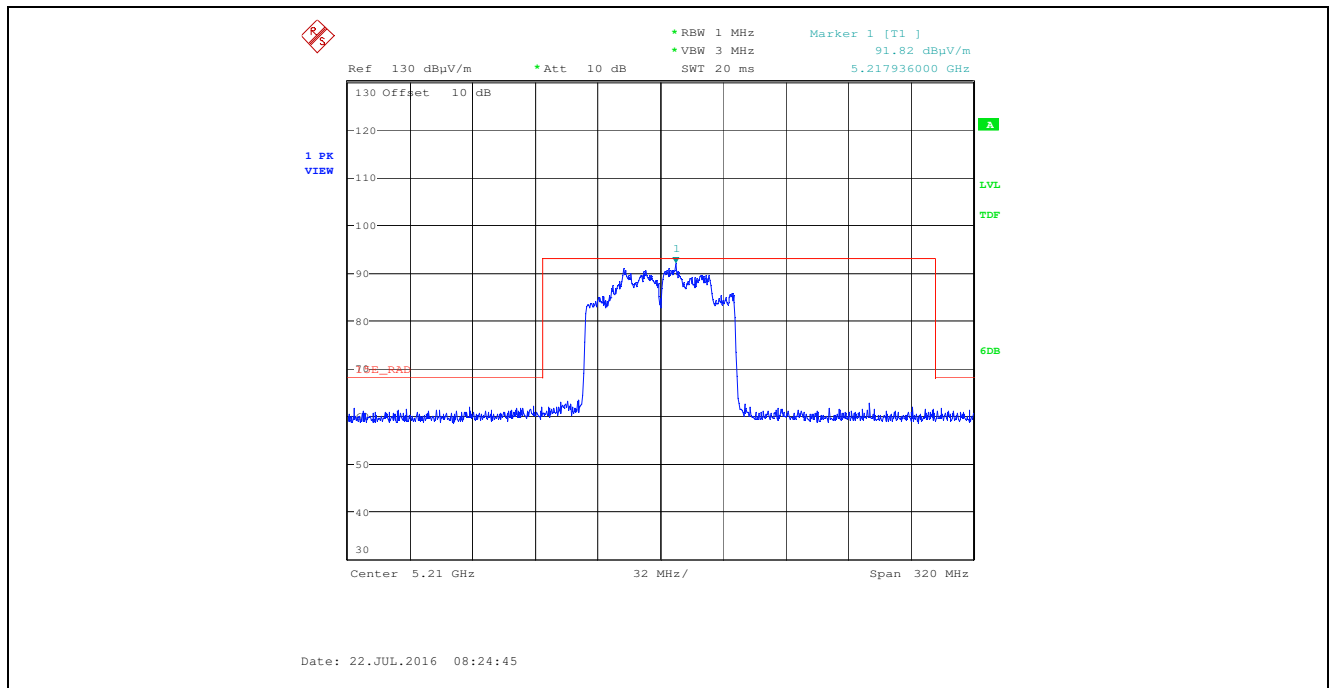
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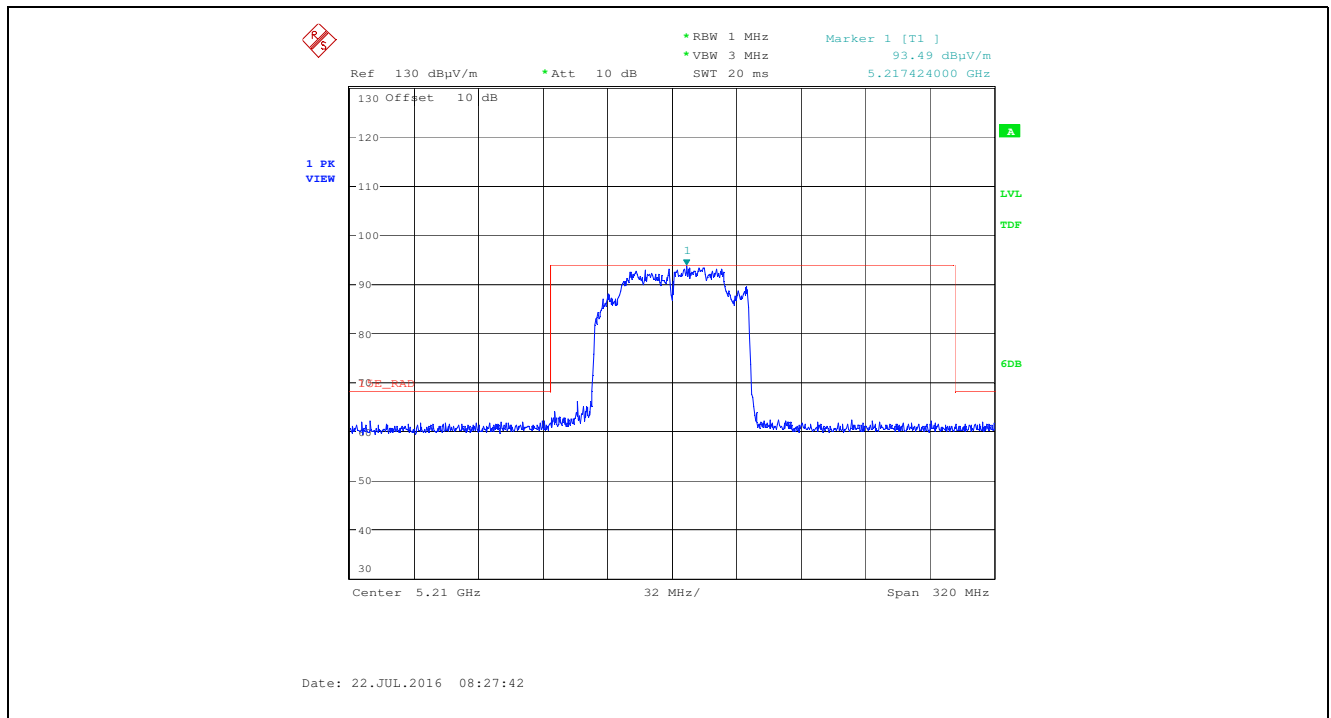
Plot 5.3.6.1.34. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 46, 5230 MHz, MIMO, Gain Control 27.5, Vertical Chain # 1 & 2



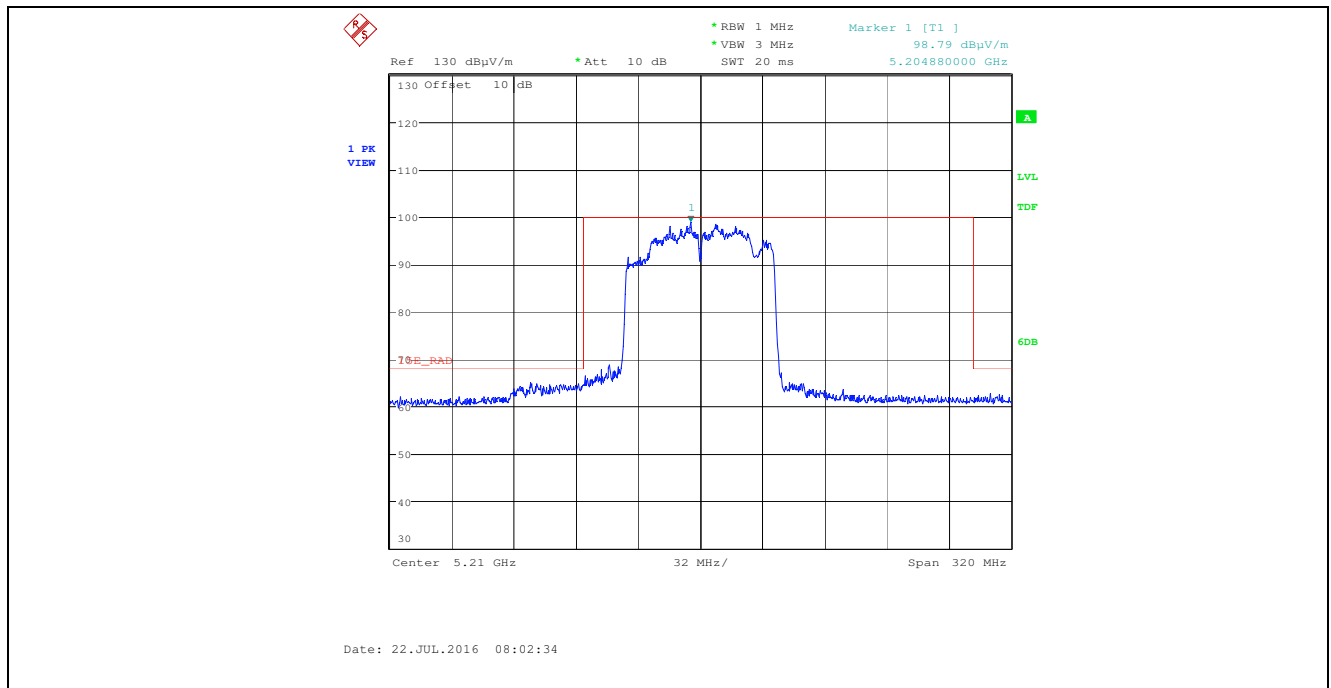
Plot 5.3.6.1.35. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 42, 5210 MHz, SISO, Gain Control 25, Horiz, Chain # 1



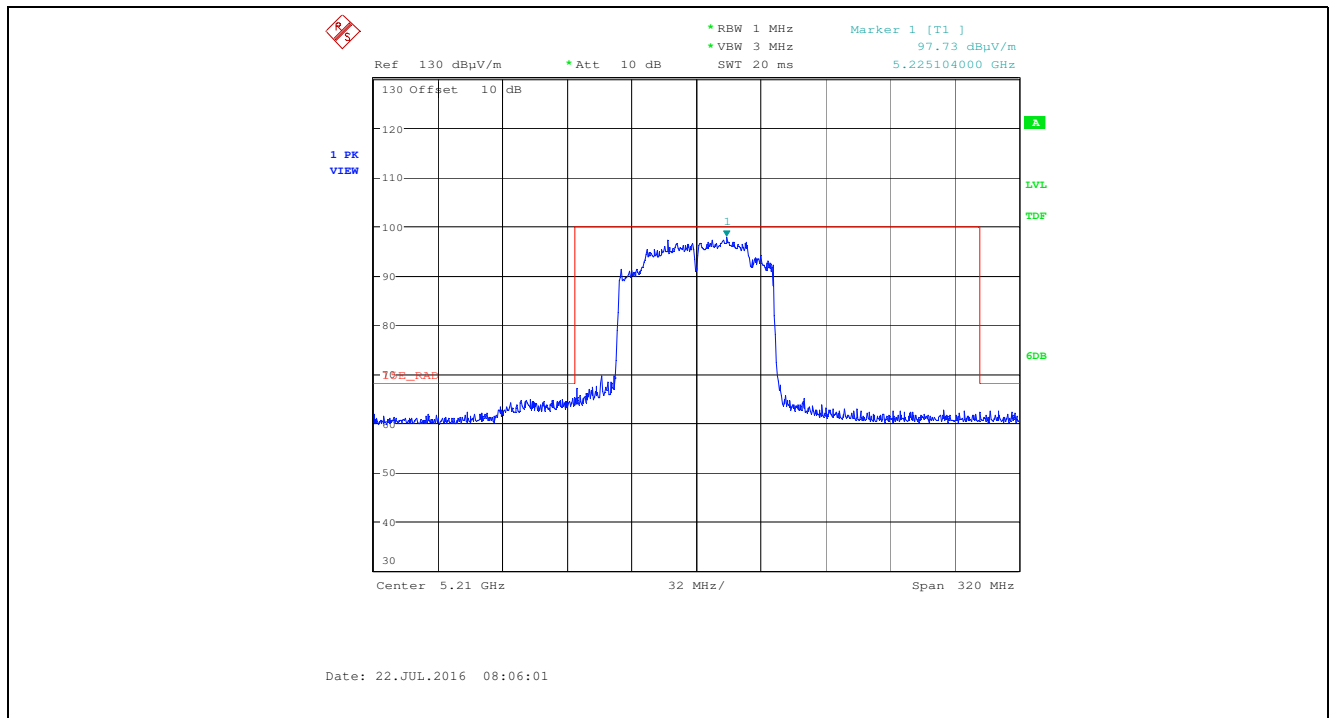
Plot 5.3.6.1.36. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 42, 5210 MHz, SISO, Gain Control 25, Horiz, Chain # 2



Plot 5.3.6.1.37. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 42, 5210 MHz, SISO, Gain Control 25, Vert, Chain # 1



Plot 5.3.6.1.38. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 42, 5210 MHz, SISO, Gain Control 25, Vert, Chain # 2



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File #: 16CDTX003_FCC15E407

July 29, 2016

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Ref 130 dBμV/m * Att 10 dB * RBW 1 MHz Marker 1 [T1] 92.51 dBμV/m
 * VBW 3 MHz SWT 20 ms 5.213840000 GHz

130 Offset 10 dB

1 PR
VIEW

T1E_RAD

6DB

LVL

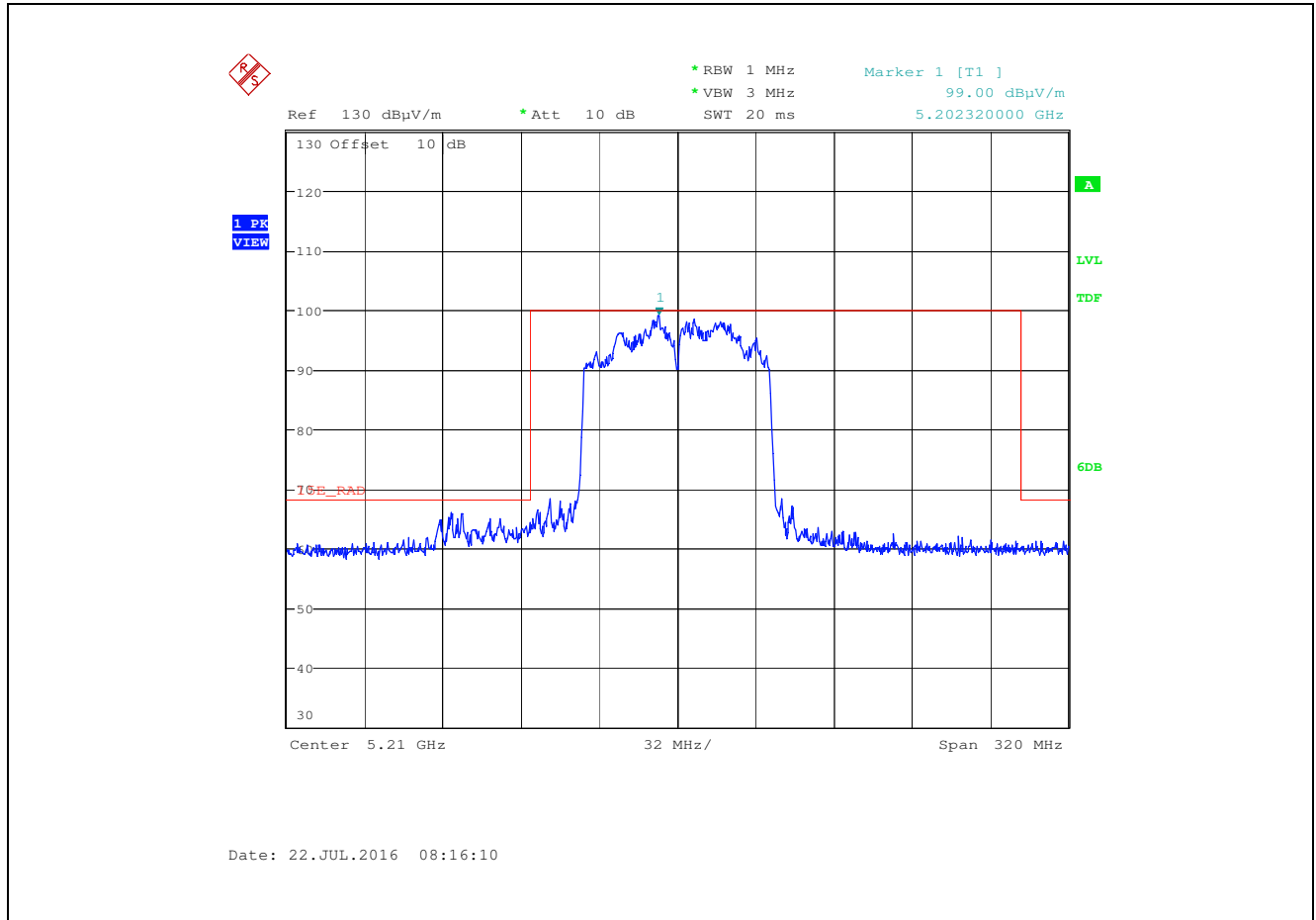
TDF

1

Center 5.21 GHz 32 MHz/ Span 320 MHz

Date: 22.JUL.2016 08:22:32

Plot 5.3.6.1.40. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 42, 5210 MHz, MIMO, Gain Control 25, Vertical,
Chain # 1 & 2



5.3.7. 5250-5350 MHz Band Tx Spurious Radiated

802.11a, 6 Mbps, Gain Control Setting 30, SISO

Fundamental Frequency:		5260 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10520	57.21	--	V	74.0	54.0	68.2	-11.0	Pass
10520	57.10	--	H	74.0	54.0	68.2	-11.1	Pass
21040	48.17	--	V	74.0	54.0	68.2	-5.8	Pass*
21040	48.07	--	H	74.0	54.0	68.2	-5.9	Pass*

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

Fundamental Frequency:		5300 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10600	56.24	--	V	74.0	54.0	68.2	-12.0	Pass
10600	58.45	--	H	74.0	54.0	68.2	-9.7	Pass
21200	49.54	--	V	74.0	54.0	68.2	-4.5	Pass*
21200	49.96	--	H	74.0	54.0	68.2	-4.0	Pass*

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

Fundamental Frequency:		5320 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10640	55.85	--	V	74.0	54.0	68.2	-12.3	Pass
10640	58.24	--	H	74.0	54.0	68.2	-10.0	Pass
21280	49.37	--	V	74.0	54.0	68.2	-4.6	Pass*
21280	50.63	--	H	74.0	54.0	68.2	-3.4	Pass*

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

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July 29, 2016

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802.11n HT20, HT4, Gain Control Setting 31, SISO & MIMO

Fundamental Frequency:		5260 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10520	58.04	--	V	74.0	54.0	68.2	-10.2	Pass
10520	57.42	--	H	74.0	54.0	68.2	-10.8	Pass
21040	48.48	--	V	74.0	54.0	68.2	-5.5	Pass*
21040	48.39	--	H	74.0	54.0	68.2	-5.6	Pass*

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

Fundamental Frequency:		5300 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10600	57.04	--	V	74.0	54.0	68.2	-11.2	Pass
10600	58.27	--	H	74.0	54.0	68.2	-9.9	Pass
21200	49.34	--	V	74.0	54.0	68.2	-4.6	Pass*
21200	48.37	--	H	74.0	54.0	68.2	-5.6	Pass*

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

Fundamental Frequency:		5320 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10640	56.65	--	V	74.0	54.0	68.2	-11.5	Pass
10640	57.90	--	H	74.0	54.0	68.2	-10.3	Pass
21280	50.01	--	V	74.0	54.0	68.2	-4.0	Pass*
21280	49.73	--	H	74.0	54.0	68.2	-4.3	Pass*

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

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July 29, 2016

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802.11n HT40, HT4, Gain Control Setting 26, SISO & MIMO

Fundamental Frequency:		5270 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10540	55.39	--	V	74.0	54.0	68.2	-12.8	Pass
10540	55.14	--	H	74.0	54.0	68.2	-13.0	Pass
21080	48.00	--	V	74.0	54.0	68.2	-6.0	Pass*
21080	47.57	--	H	74.0	54.0	68.2	-6.4	Pass*

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

Fundamental Frequency:		5310 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10620	55.50	--	V	74.0	54.0	68.2	-12.7	Pass
10620	55.94	--	H	74.0	54.0	68.2	-12.2	Pass
21240	49.17	--	V	74.0	54.0	68.2	-4.8	Pass*
21240	50.41	--	H	74.0	54.0	68.2	-3.6	Pass*

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

802.11ac80, VHT6, Gain Control Setting 25, SISO & MIMO

Fundamental Frequency:		5290 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
10580	54.19	--	V	74.0	54.0	68.2	-14.0	Pass
10580	54.90	--	H	74.0	54.0	68.2	-13.3	Pass
21160	46.81	--	V	74.0	54.0	68.2	-7.2	Pass*
21160	47.53	--	H	74.0	54.0	68.2	-6.5	Pass*

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

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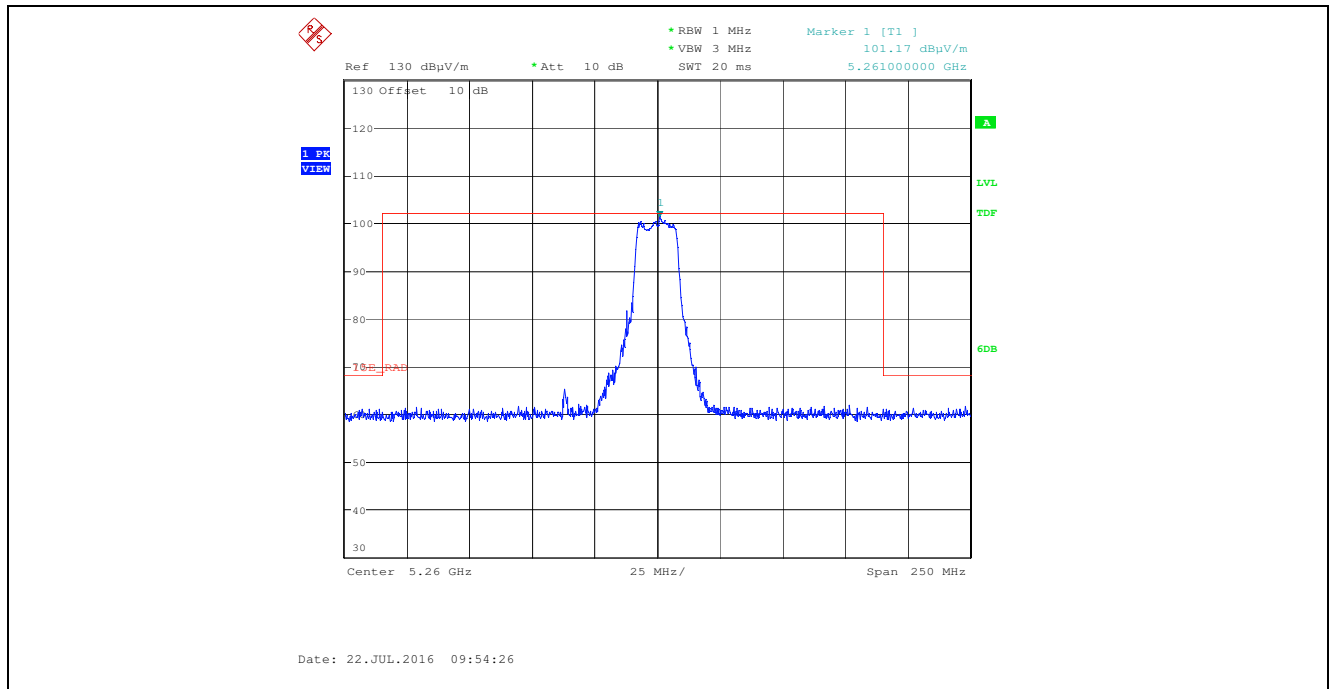
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 16CDTX003_FCC15E407
July 29, 2016

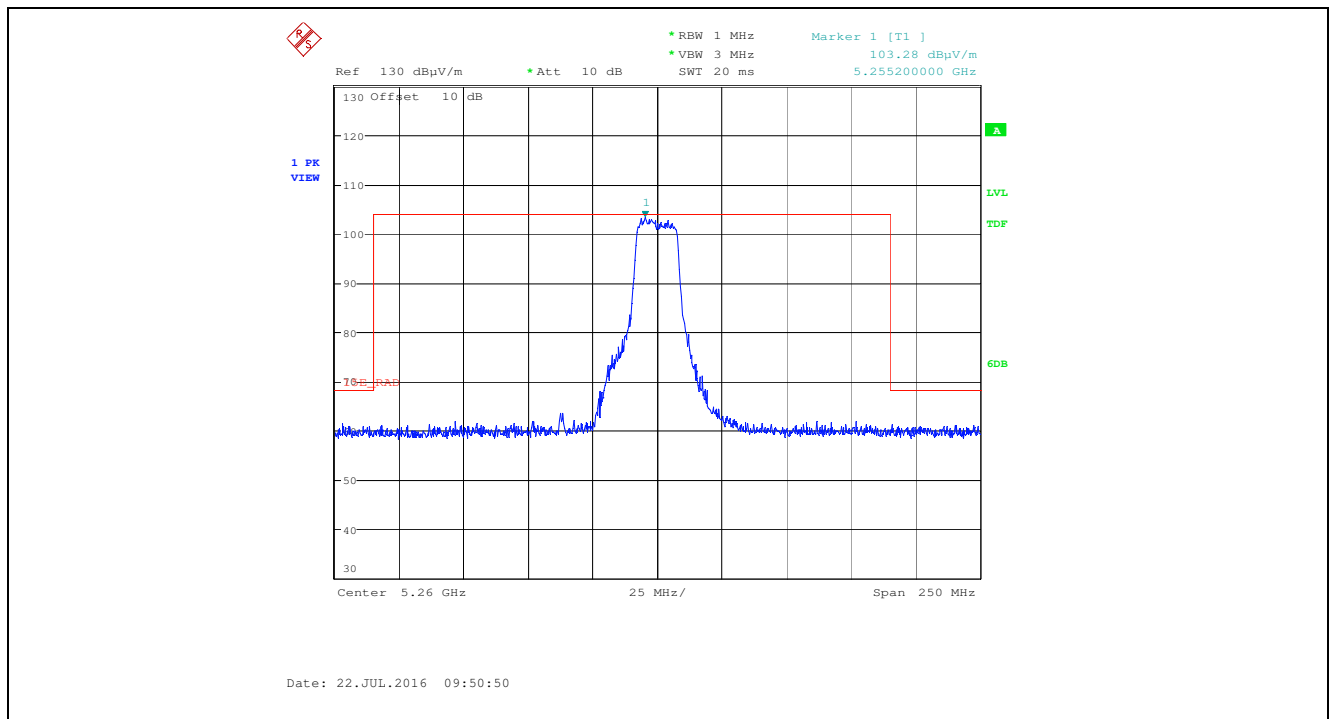
All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

5.3.8. 5250-5350 MHz Band, Band-Edge Radiated

Plot 5.3.8.1.1. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 52, 5260 MHz, SISO, Gain Control 30, Horizontal, Chain # 1



Plot 5.3.8.1.2. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 52, 5260 MHz, SISO, Gain Control 30, Horizontal, Chain # 2



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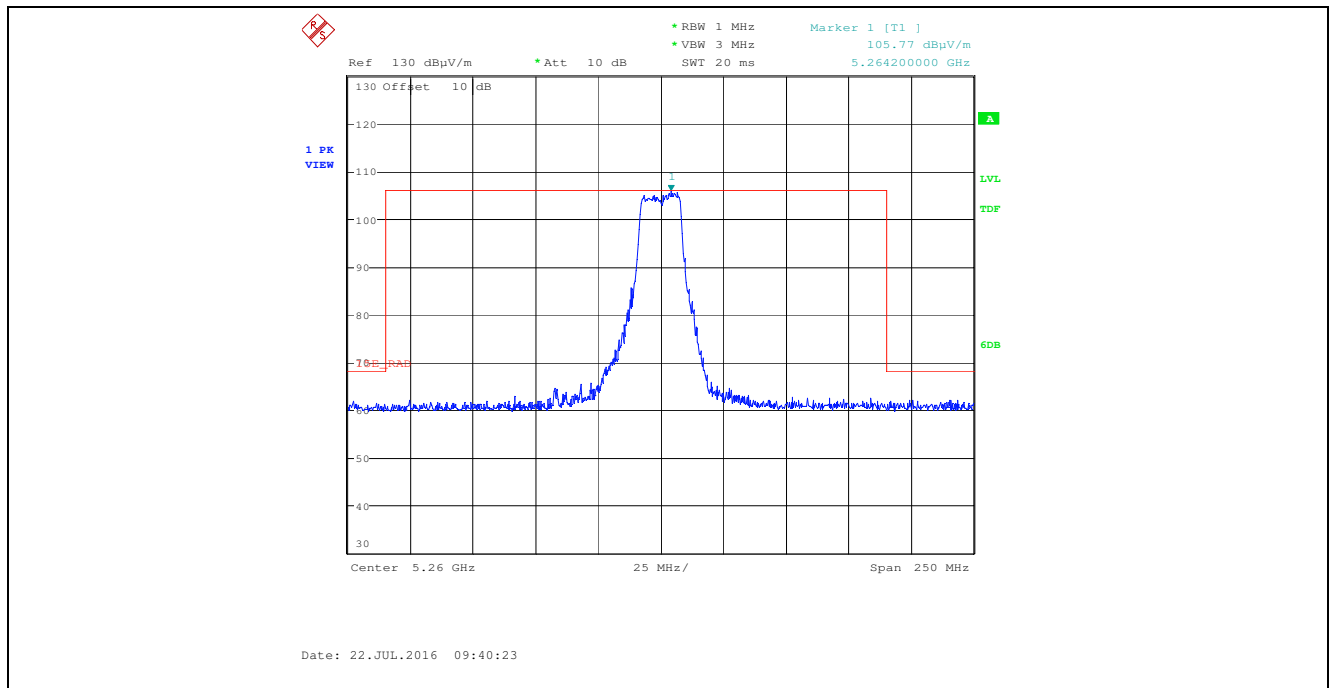
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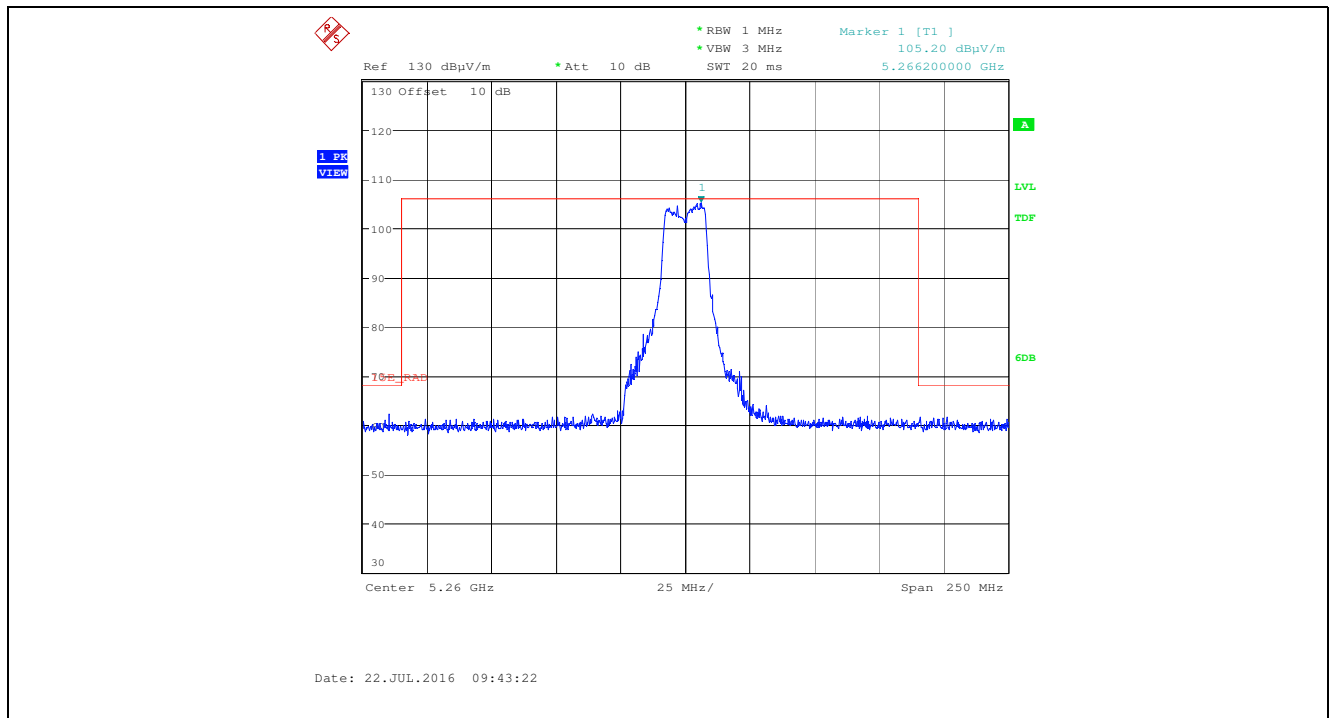
July 29, 2016

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

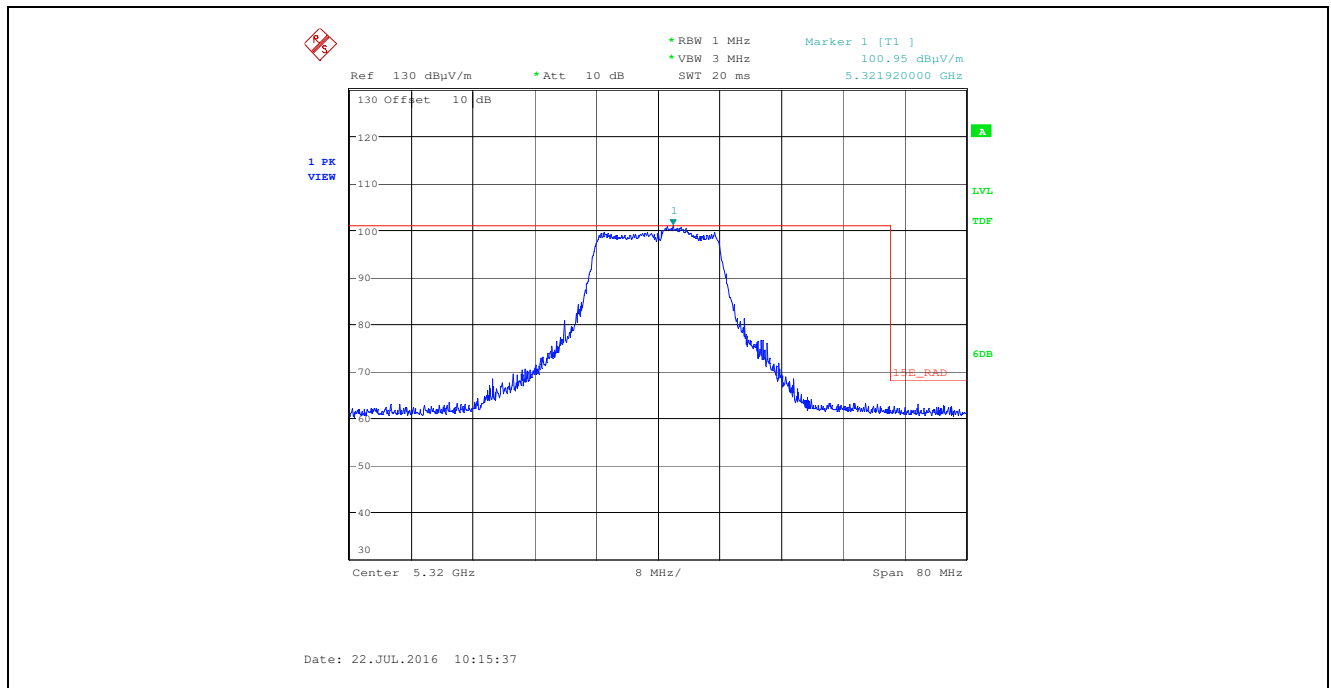
Plot 5.3.8.1.3. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 52, 5260 MHz, SISO, Gain Control 30, Vertical, Chain # 1



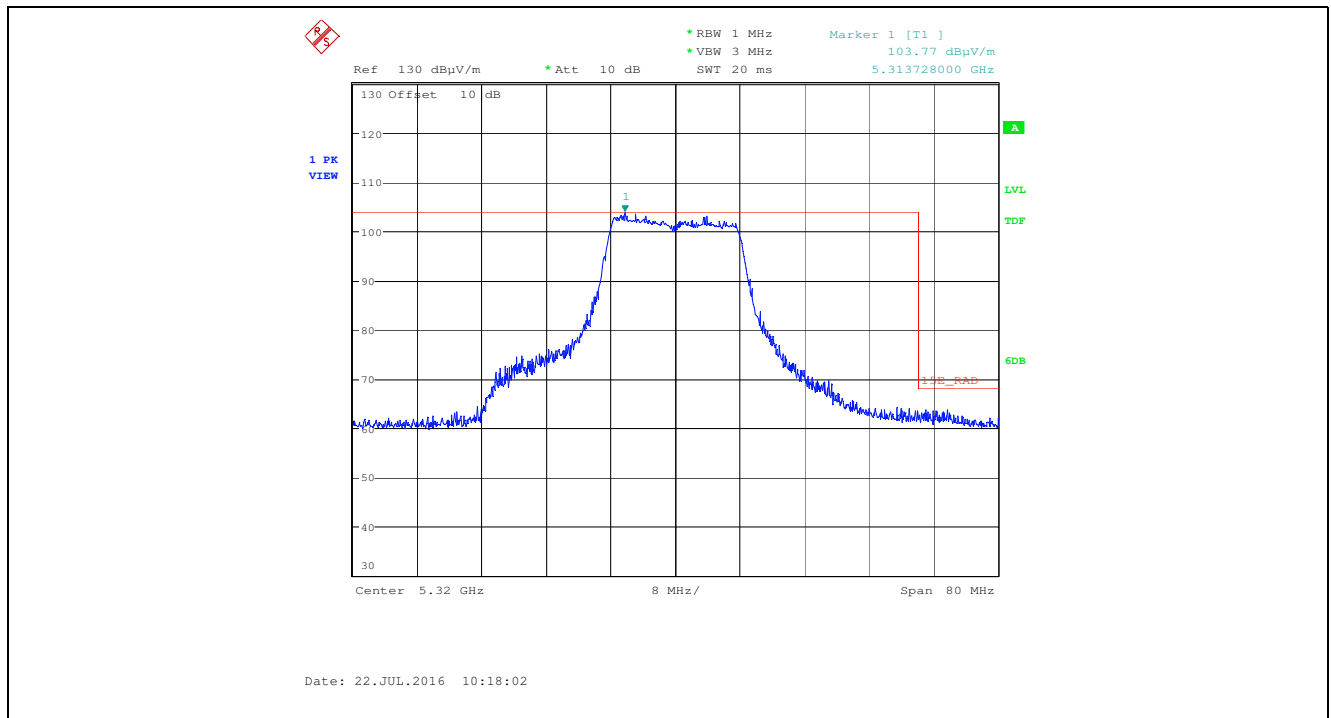
Plot 5.3.8.1.4. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 52, 5260 MHz, SISO, Gain Control 30, Vertical, Chain # 2



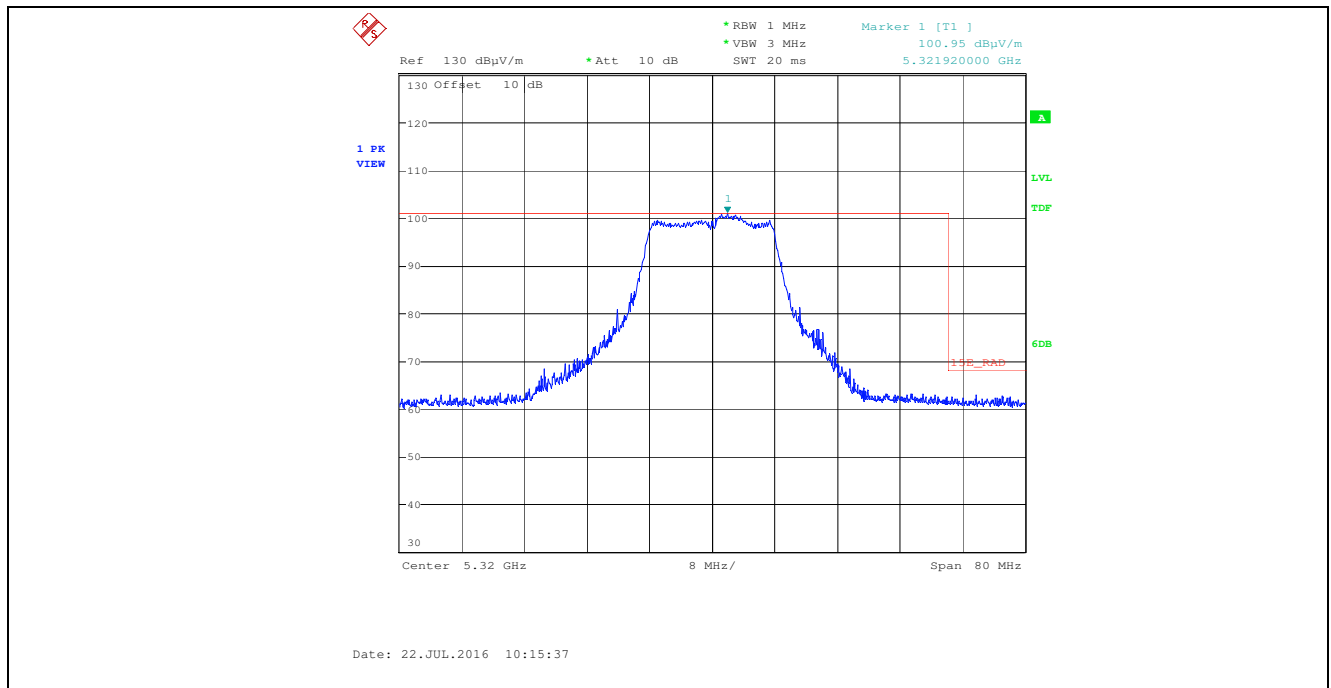
Plot 5.3.8.1.5. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 64, 5320 MHz, SISO, Gain Control 30, Horizontal, Chain # 1



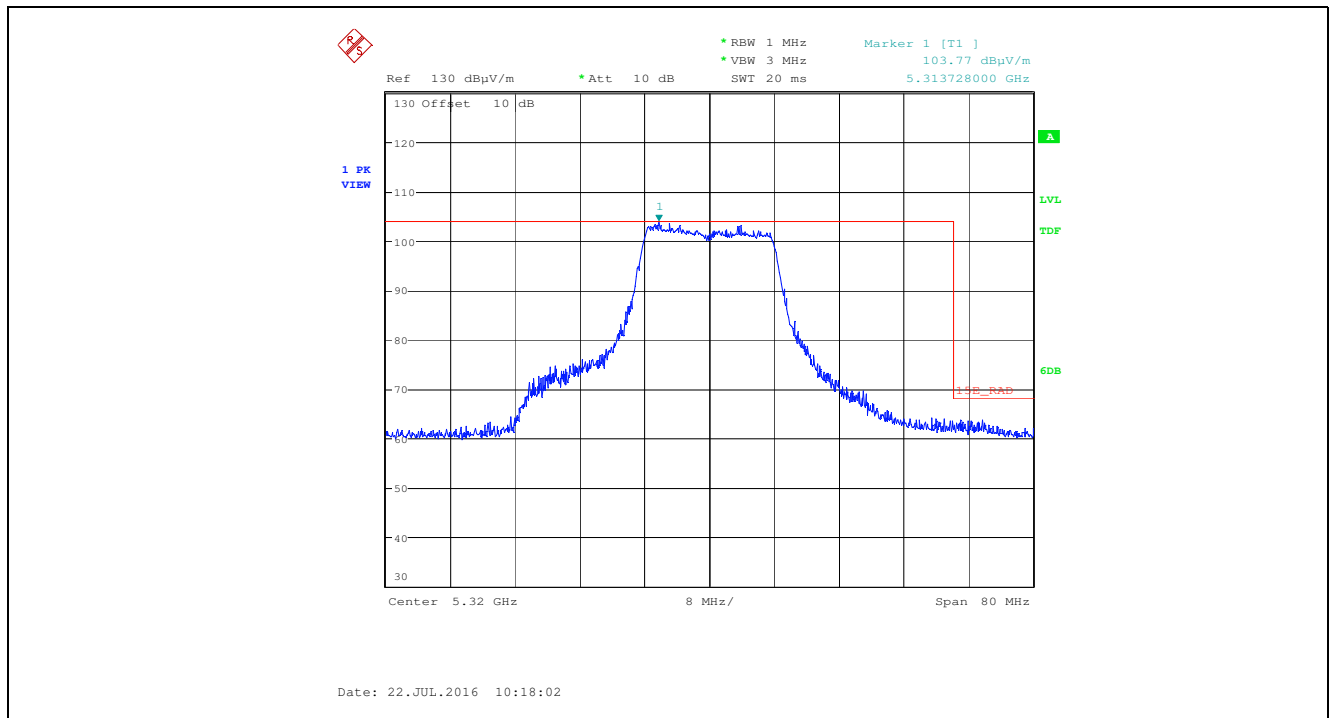
Plot 5.3.8.1.6. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 64, 5320 MHz, SISO, Gain Control 30, Horizontal, Chain # 2



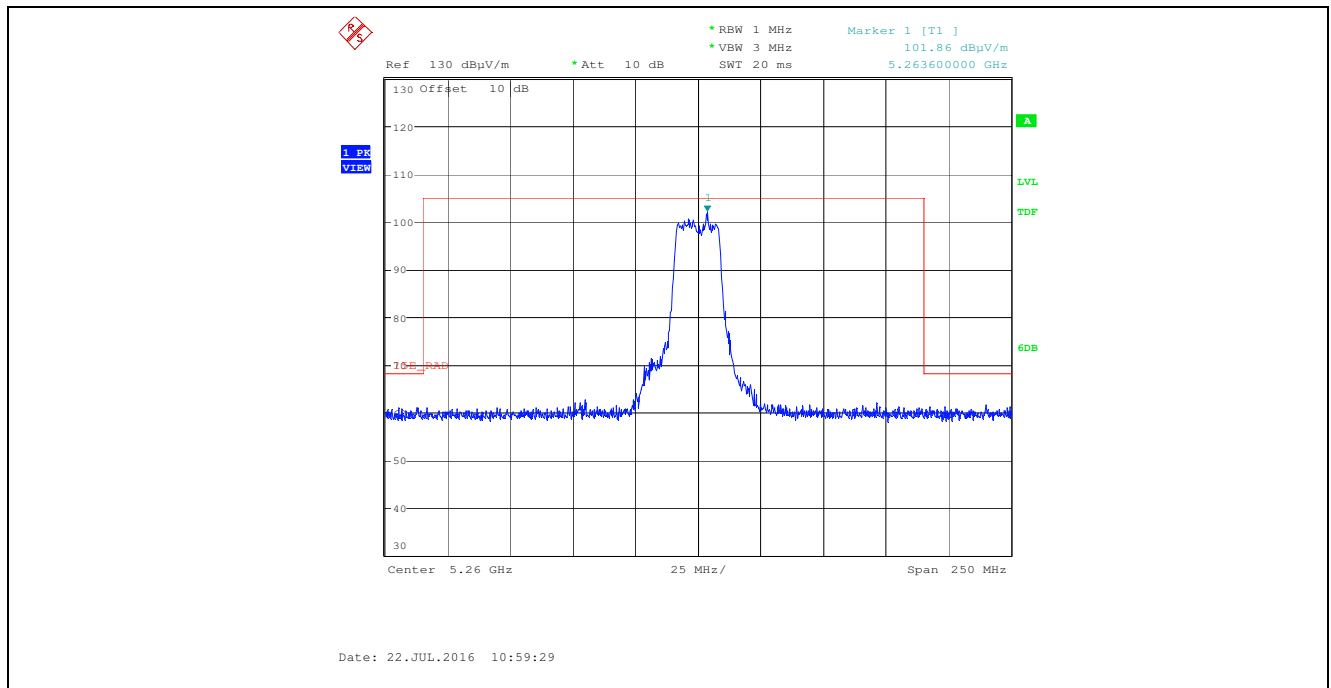
Plot 5.3.8.1.7. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 64, 5320 MHz, SISO, Gain Control 30, Vertical, Chain # 1



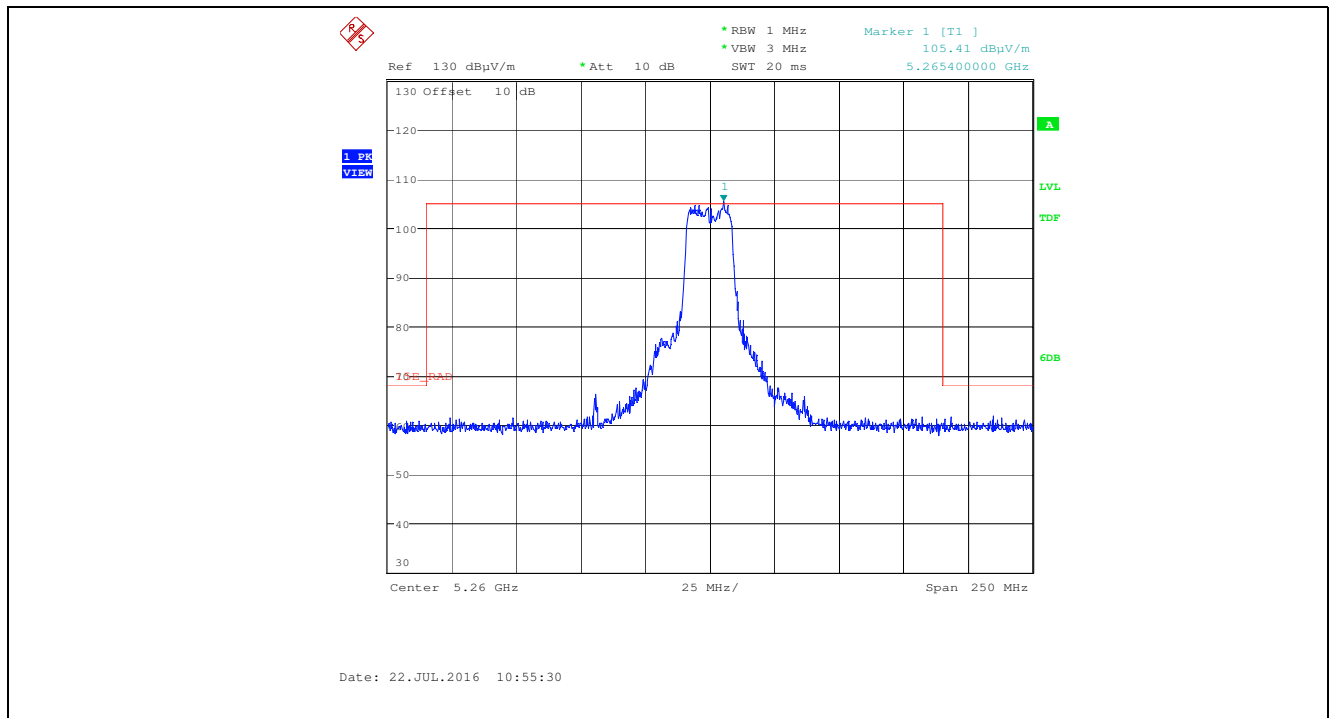
Plot 5.3.8.1.8. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 64, 5320 MHz, SISO, Gain Control 30, Vertical, Chain # 2



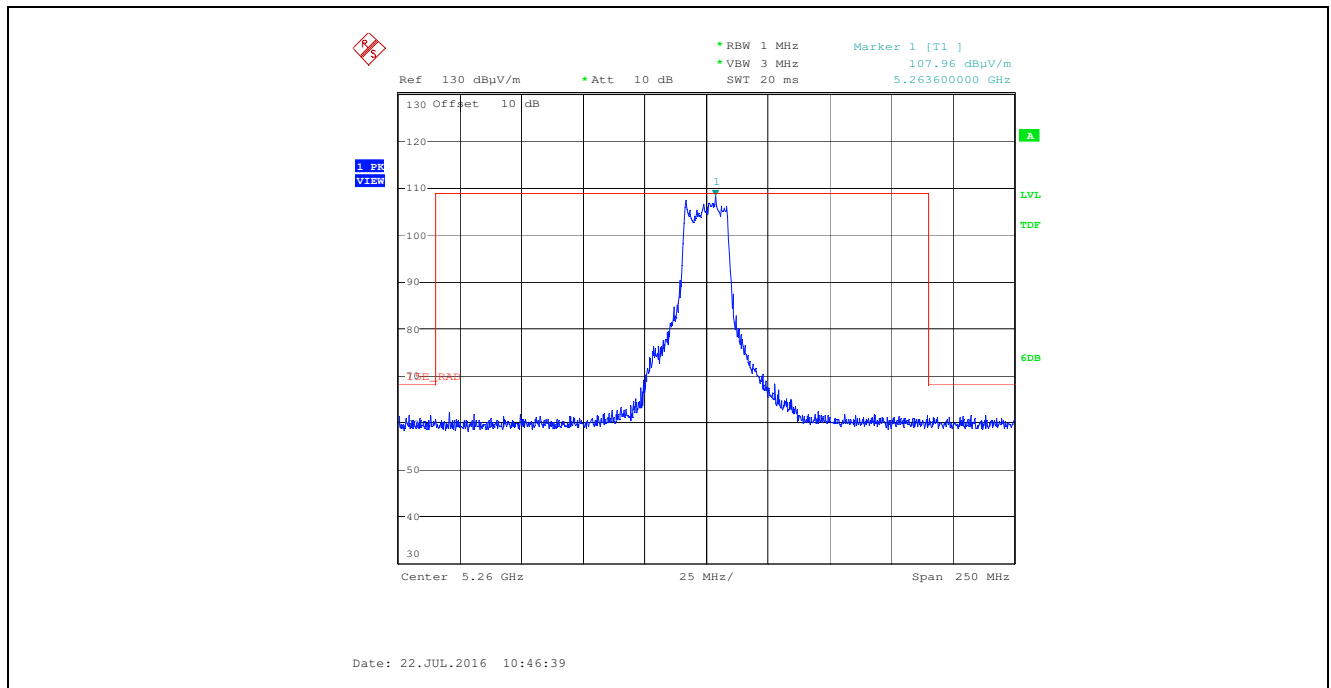
Plot 5.3.8.1.9. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 52, 5260 MHz, SISO, Gain Control 31, Horiz, Chain # 1



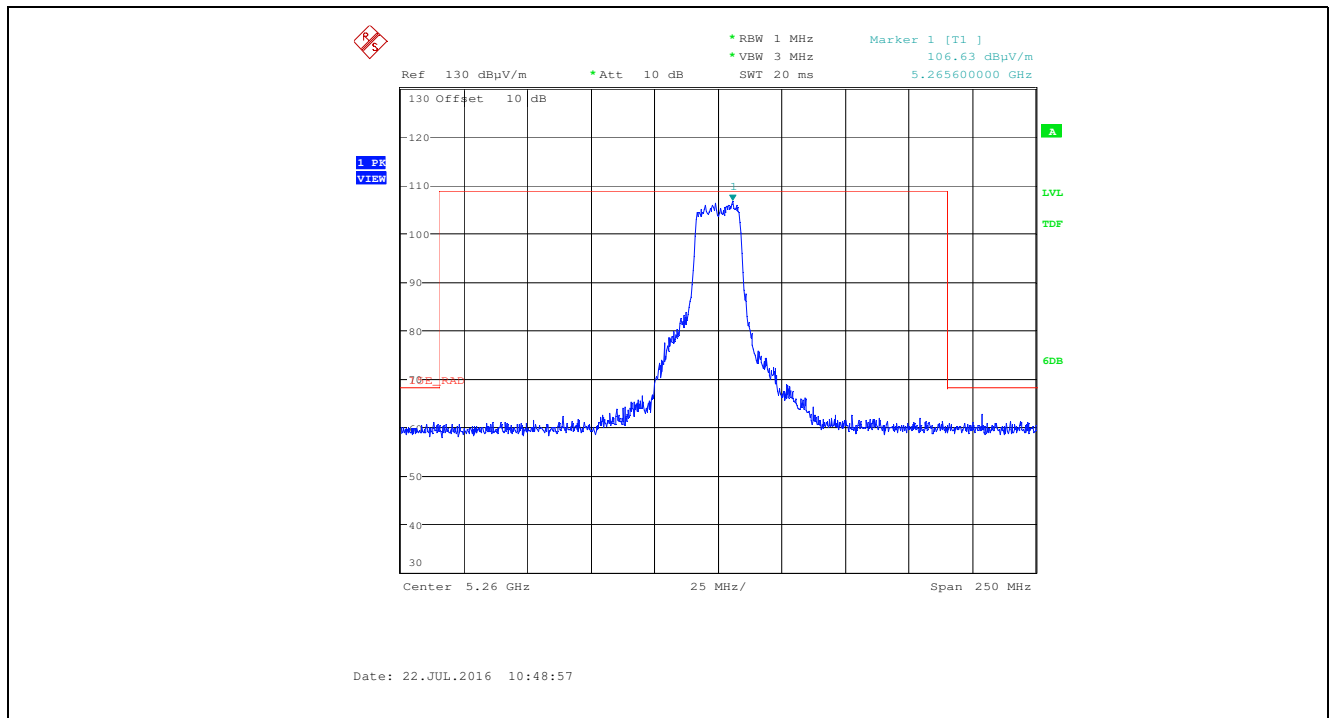
Plot 5.3.8.1.10. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 52, 5260 MHz, SISO, Gain Control 31, Horiz, Chain # 2



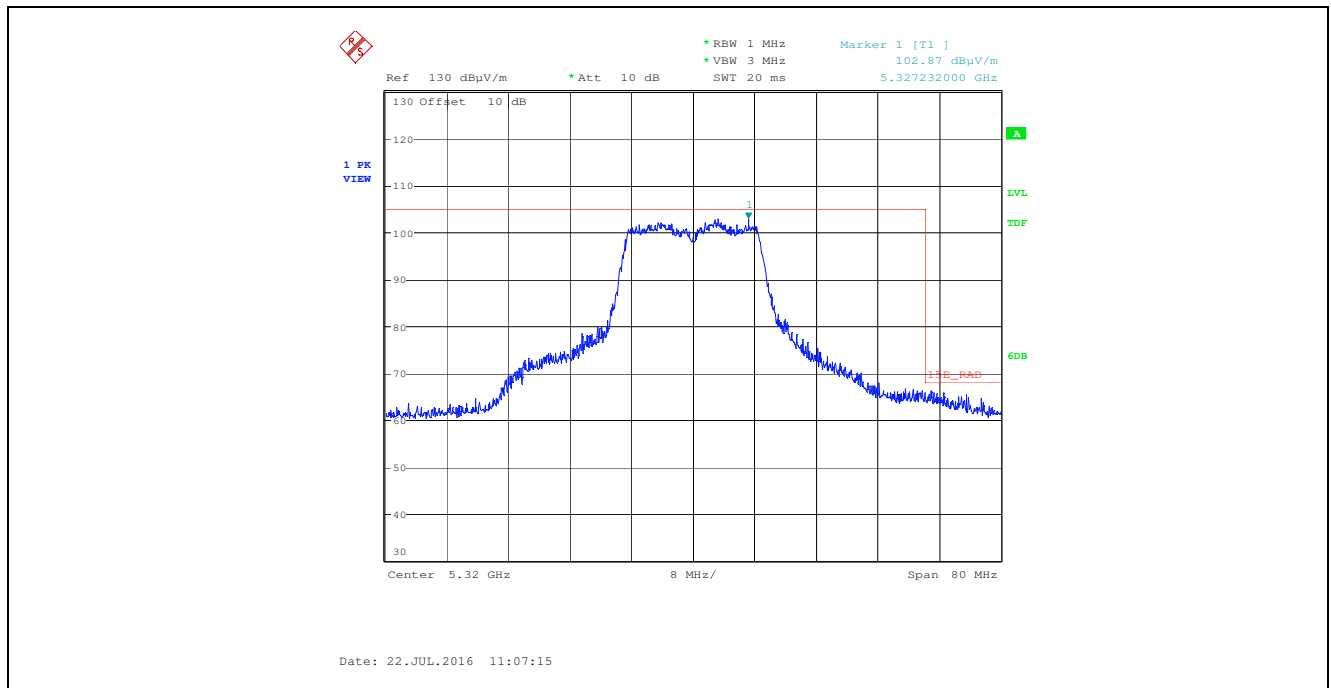
Plot 5.3.8.1.11. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 52, 5260 MHz, SISO, Gain Control 31, Vertical, Chain # 1



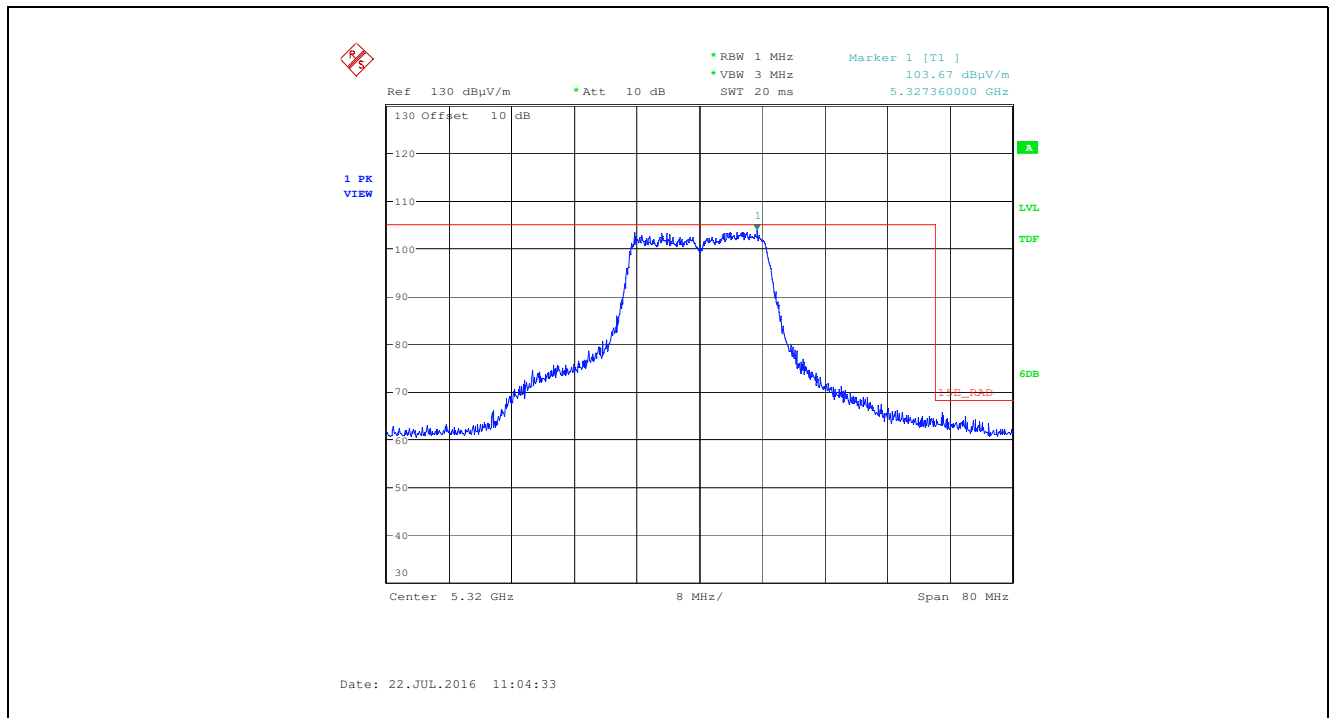
Plot 5.3.8.1.12. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 52, 5260 MHz, SISO, Gain Control 31, Vertical, Chain # 2



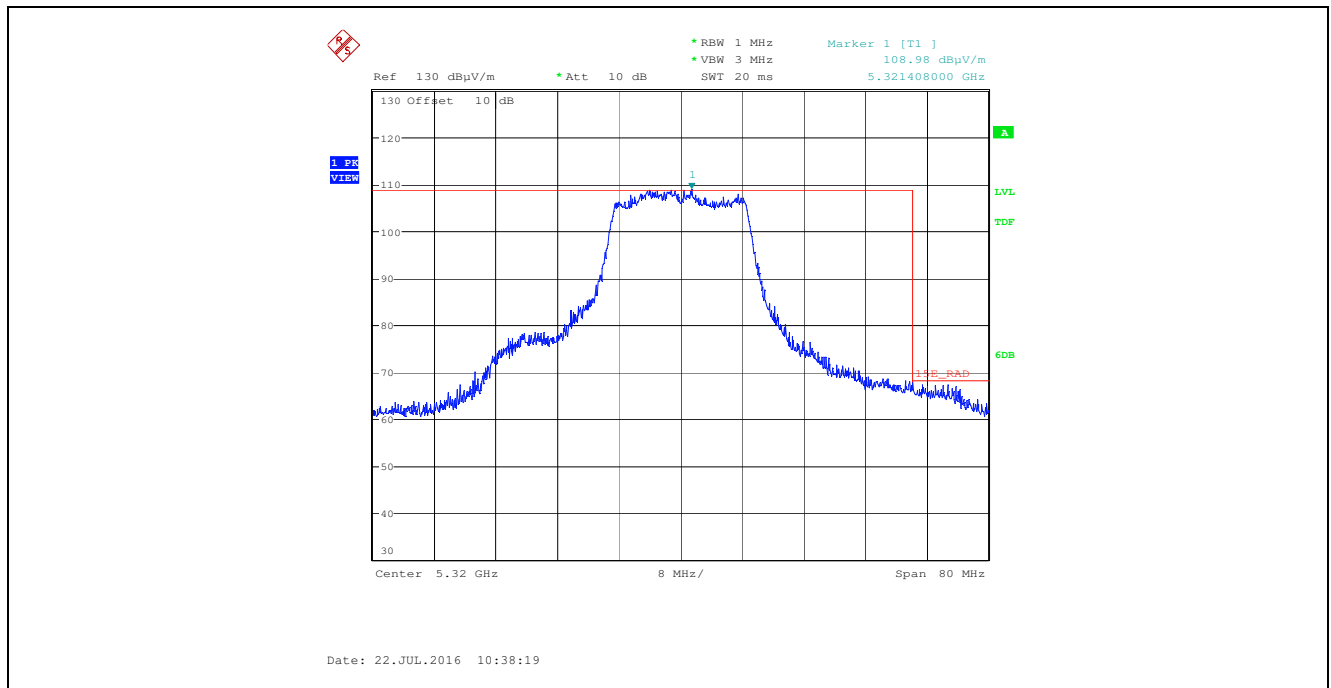
Plot 5.3.8.1.13. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 64, 5320 MHz, SISO, Gain Control 31, Horiz, Chain # 1



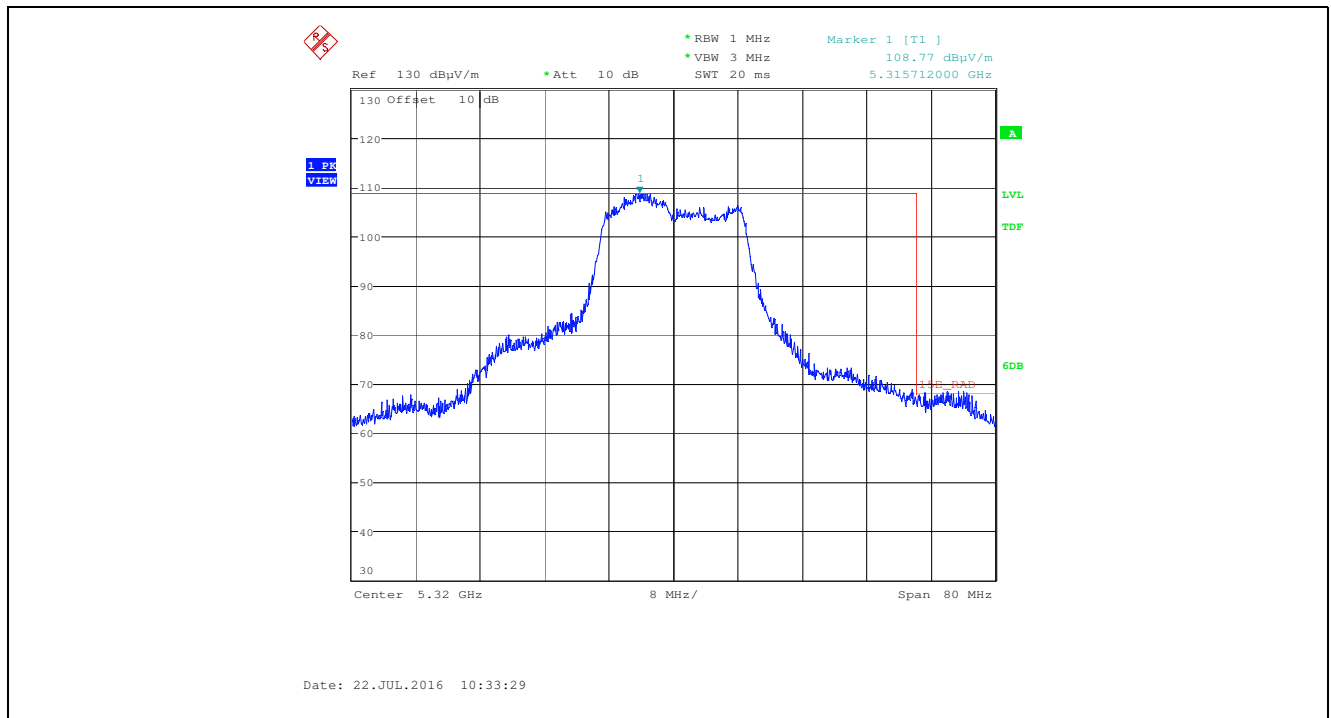
Plot 5.3.8.1.14. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 64, 5320 MHz, SISO, Gain Control 31, Horiz, Chain # 2



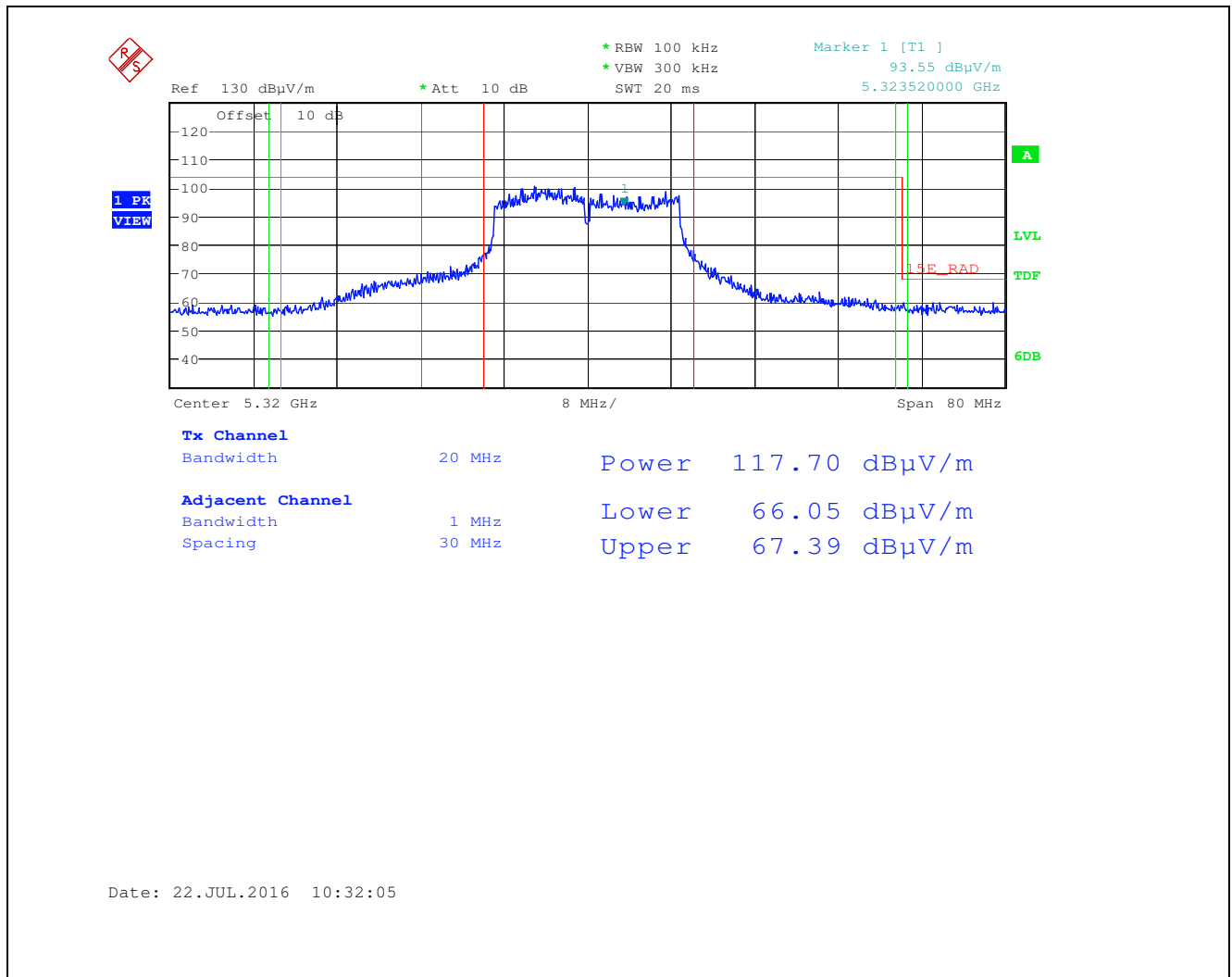
Plot 5.3.8.1.15. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 64, 5320 MHz, SISO, Gain Control 31, Vertical, Chain # 1



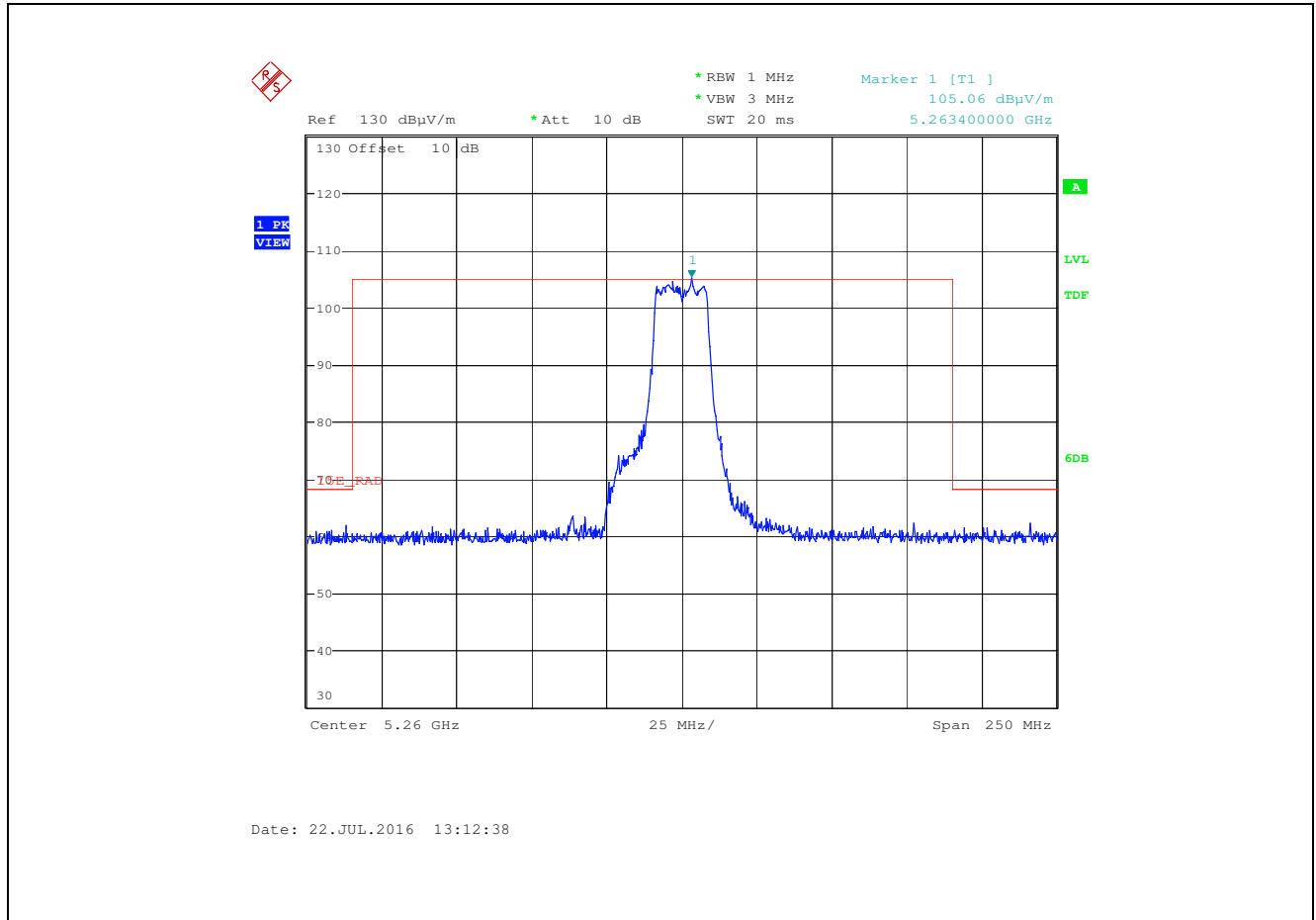
Plot 5.3.8.1.16. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 64, 5320 MHz, SISO, Gain Control 31, Vertical, Chain # 2



Plot 5.3.8.1.17. Integration Method Chain# 2, 802.11n HT20, HT4, Ch 64, 5320 MHz, SISO, Gain Control 31, Vertical



Plot 5.3.8.1.18. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 52, 5260 MHz, MIMO, Gain Control 31, Horizontal
Chain # 1 & 2



Ref 130 dBμV/m *Att 10 dB SWT 20 ms

*RBW 1 MHz *VBW 3 MHz

Marker 1 [T1] 111.55 dBμV/m 5.26340000 GHz

130 Offset 10 dB

1 PK VIEW

1

LVL

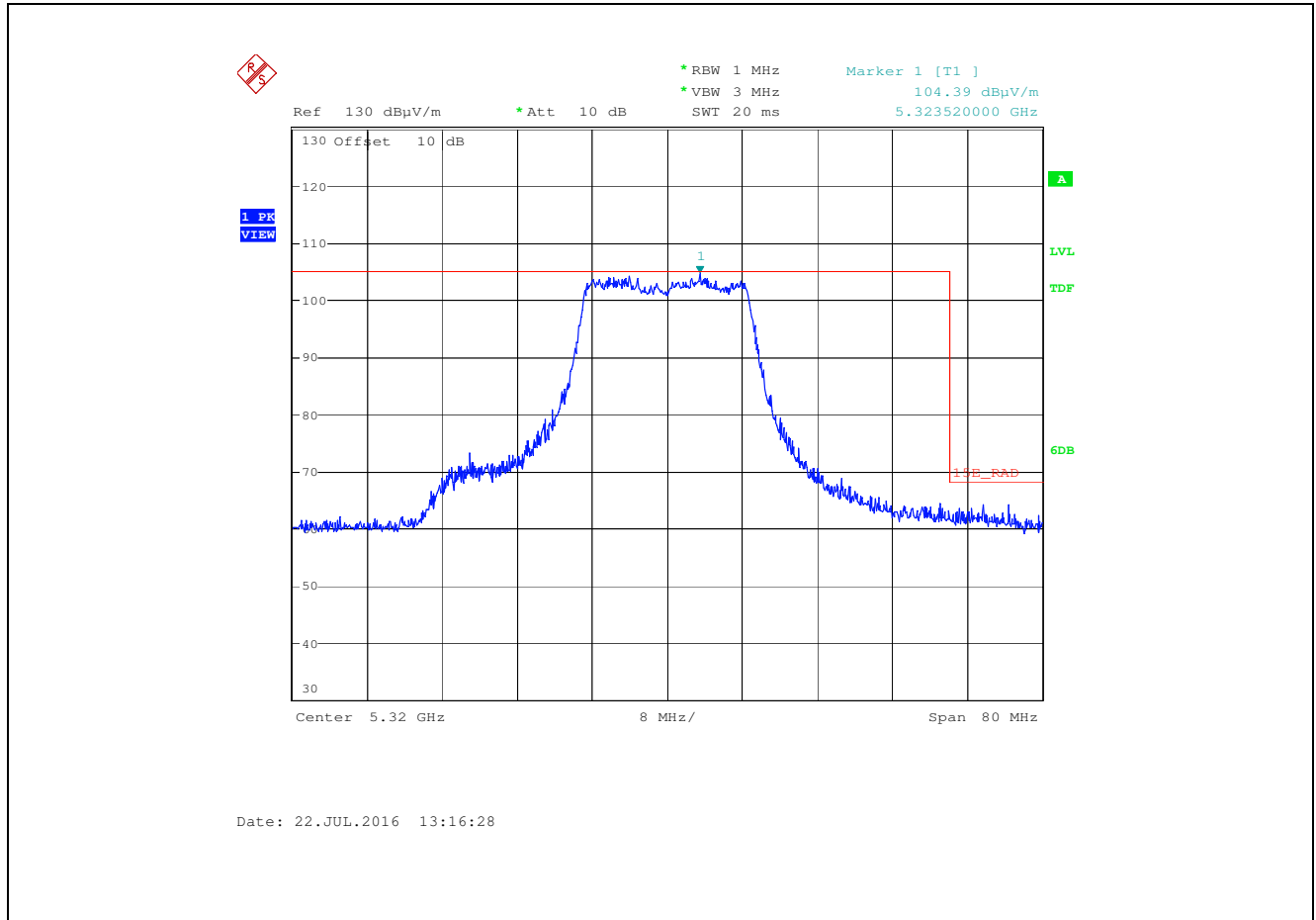
TDF

GDB

Center 5.26 GHz 25 MHz/ Span 250 MHz

Date: 22.JUL.2016 13:08:01

Plot 5.3.8.1.20. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 64, 5320 MHz, MIMO, Gain Control 31, Horizontal
Chain # 1 & 2



Ref 130 dBμV/m *Att 10 dB *RBW 1 MHz *VBW 3 MHz SWT 20 ms Marker 1 [T1] 111.74 dBμV/m 5.323712000 GHz

130 Offset 10 dB

1 PK VIEW

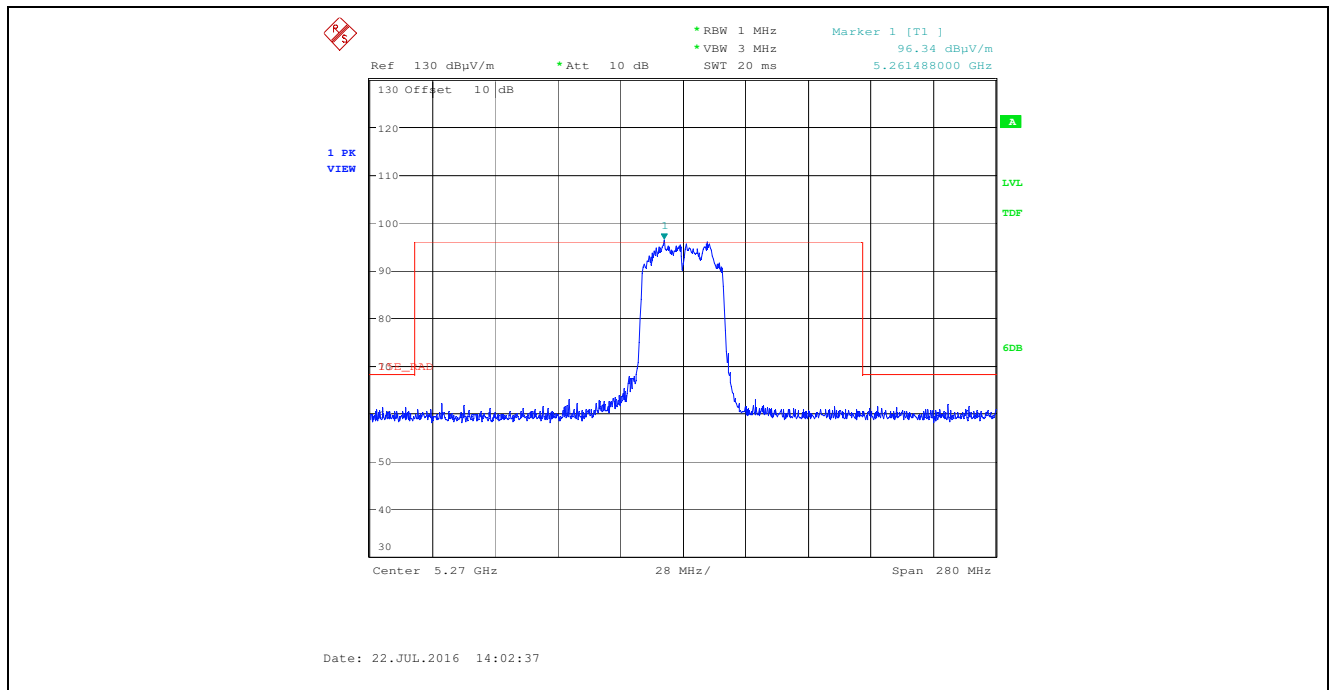
LVL

TDF

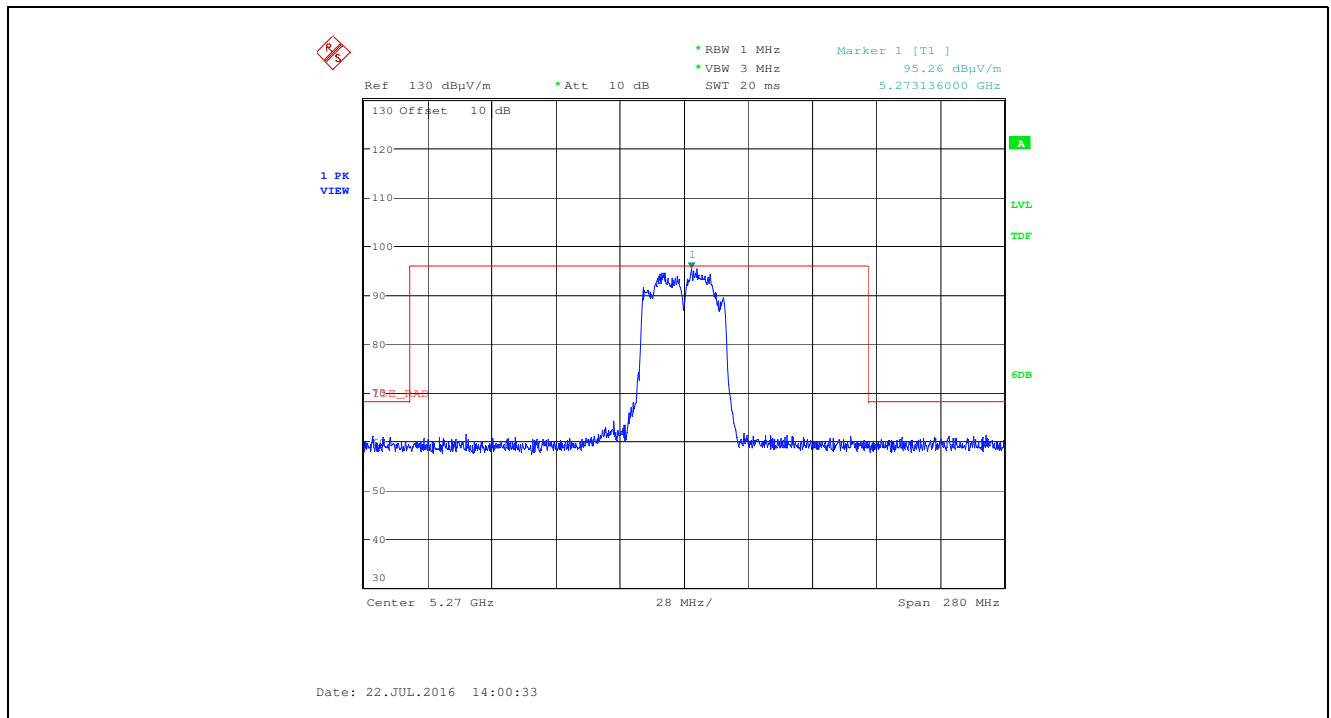
6DB

Center 5.32 GHz 8 MHz/ Span 80 MHz

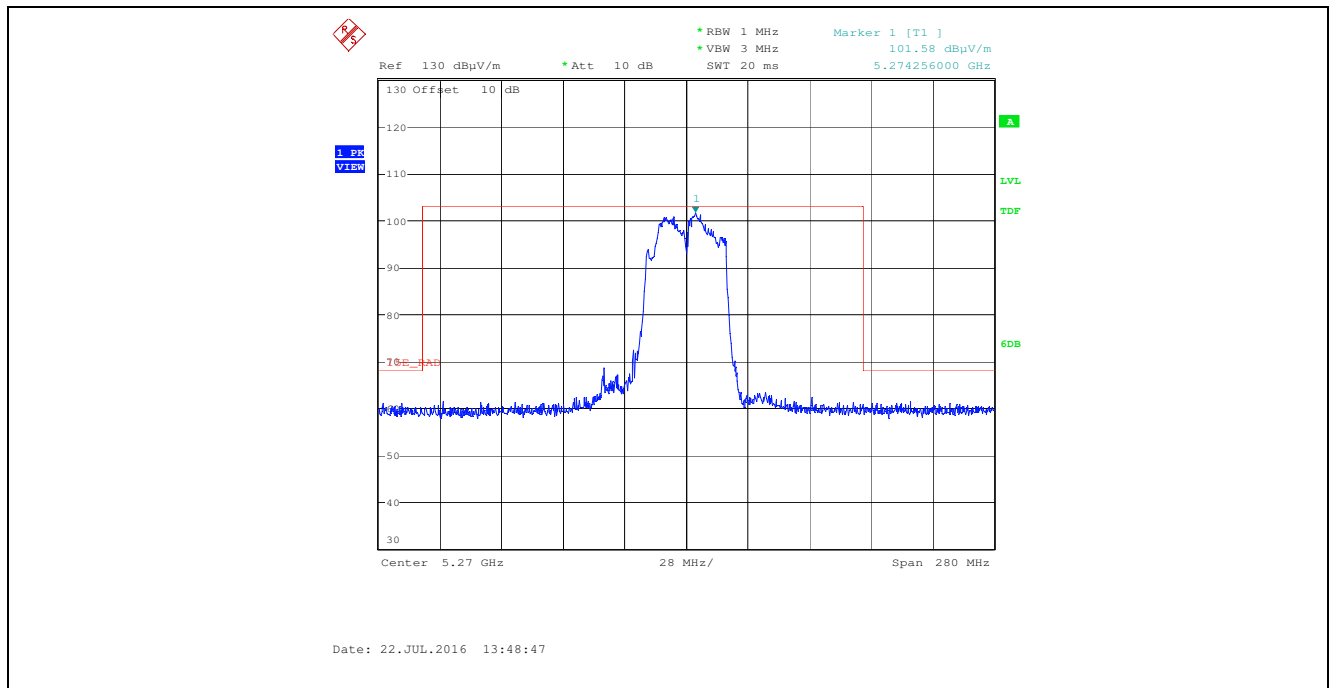
Plot 5.3.8.1.22. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 54, 5270 MHz, SISO, Gain Control 26, Horiz, Chain # 1



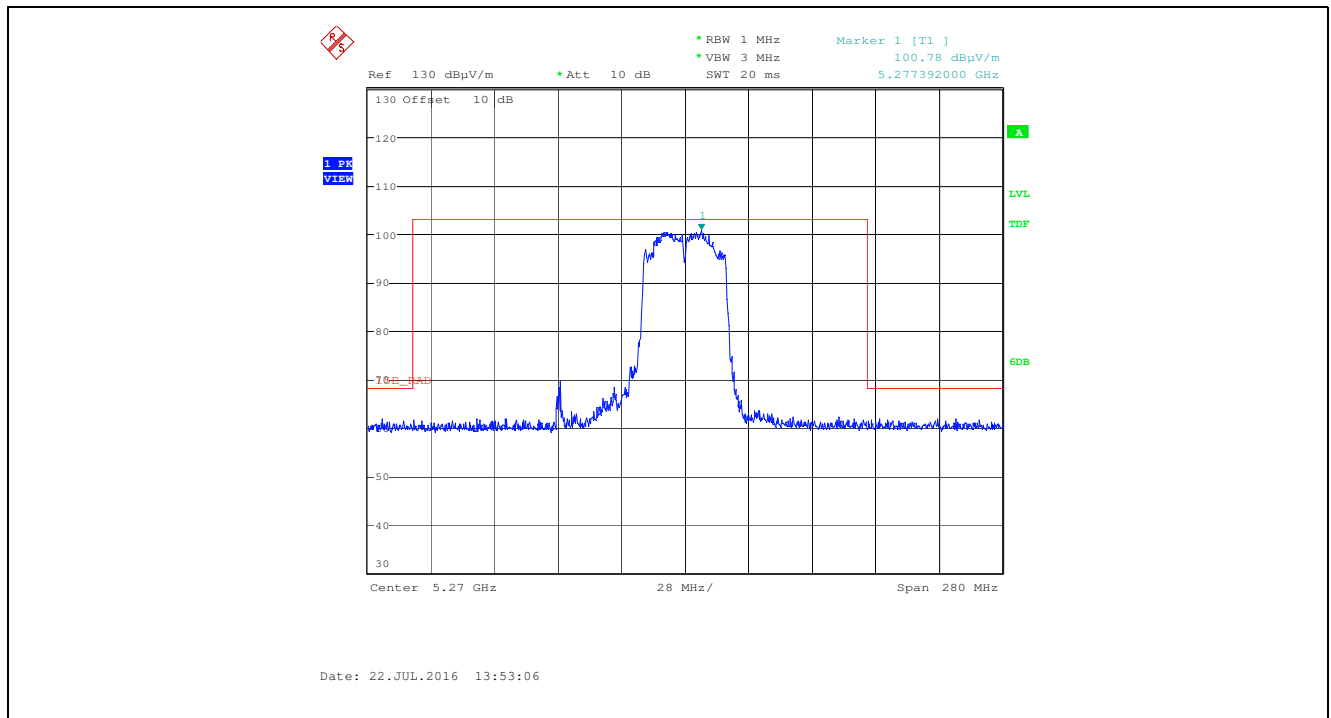
Plot 5.3.8.1.23. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 54, 5270 MHz, SISO, Gain Control 26, Horiz, Chain # 2



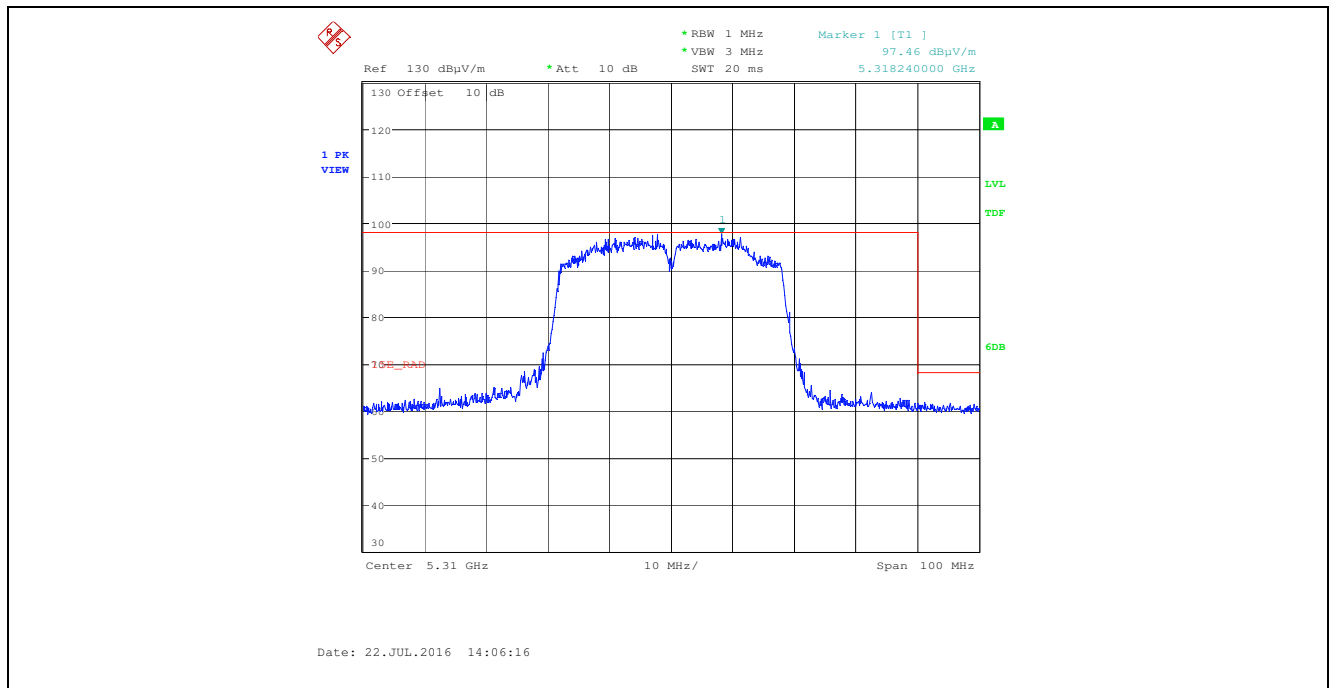
Plot 5.3.8.1.24. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 54, 5270 MHz, SISO, Gain Control 26, Vert, Chain # 1



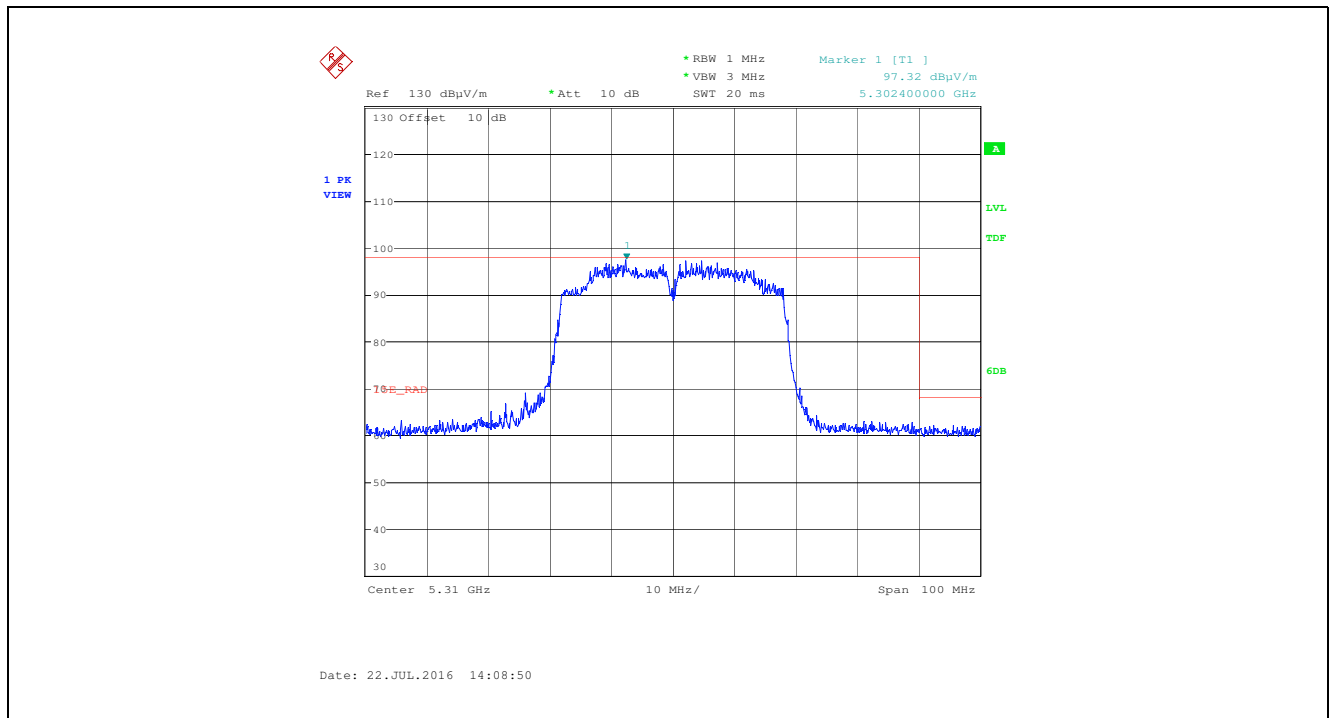
Plot 5.3.8.1.25. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 54, 5270 MHz, SISO, Gain Control 26, Vert, Chain # 2



Plot 5.3.8.1.26. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 62, 5310 MHz, SISO, Gain Control 26, Horiz, Chain # 1



Plot 5.3.8.1.27. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 62, 5310 MHz, SISO, Gain Control 26, Horiz, Chain # 2



[illegible]

Ref 130 dBuV/m Att 10 dB RBW 1 MHz VBW 3 MHz SWT 20 ms Marker 1 [T1] 102.71 dBuV/m 5.31768000 GHz

130 Offset 10 dB

1 PK VIEW

TOE_RAE

1

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LVL

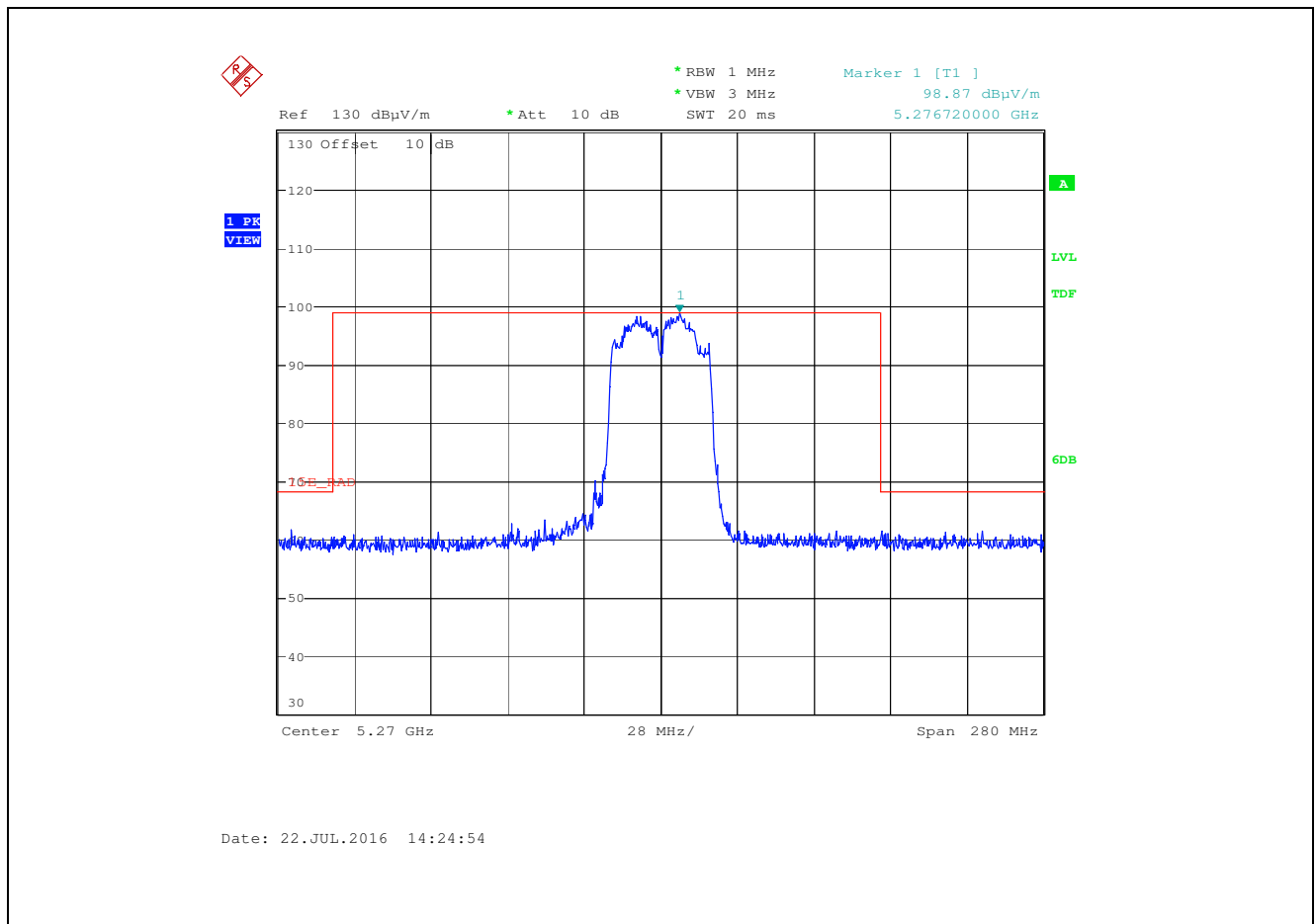
TDF

6DB

Center 5.31 GHz 10 MHz/ Span 100 MHz

Date: 22.JUL.2016 13:29:14

Plot 5.3.8.1.30. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 54, 5270 MHz, MIMO, Gain Control 26, Horizontal
Chain # 1 & 2



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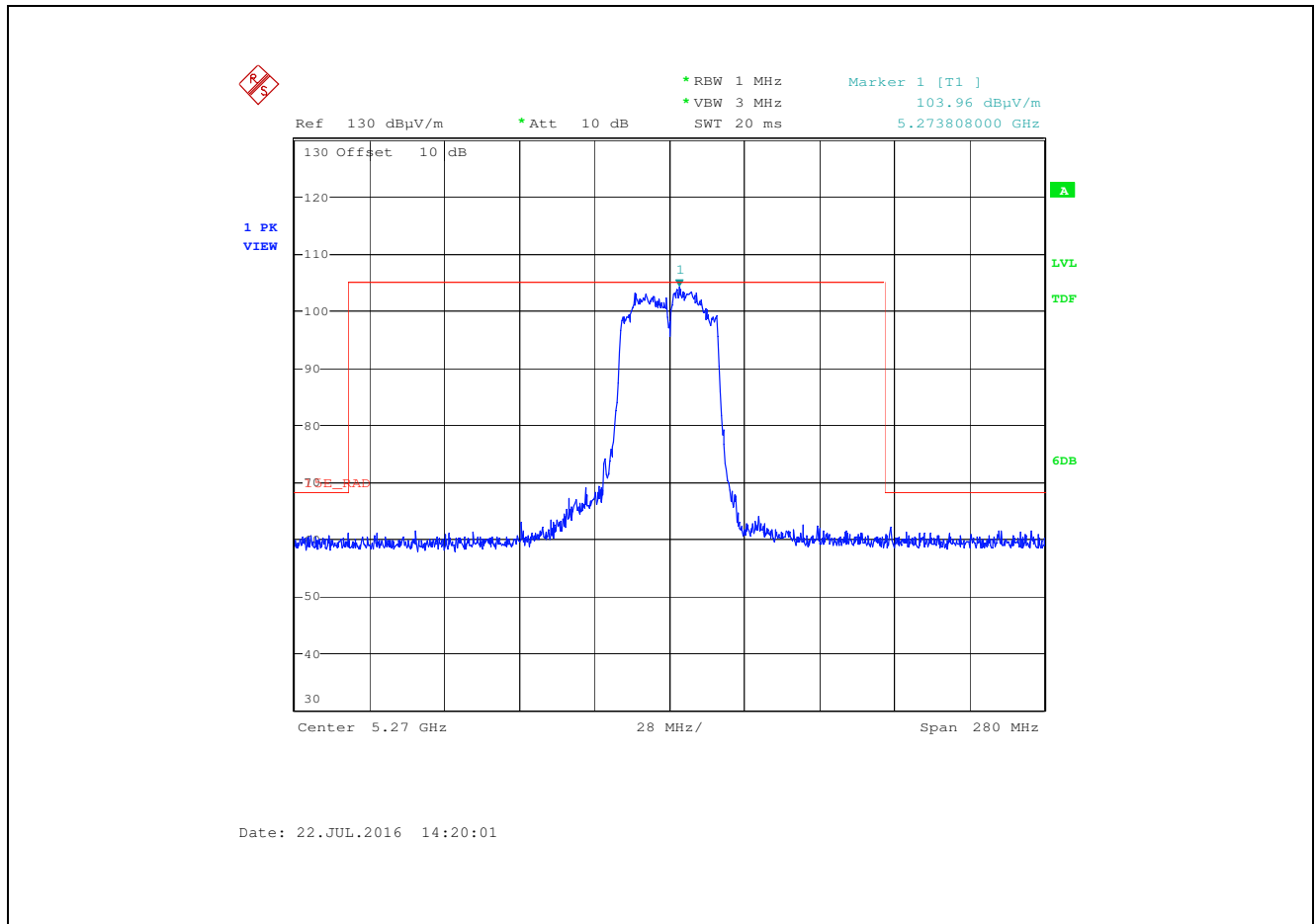
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July 29, 2016

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Plot 5.3.8.1.31. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 54, 5270 MHz, MIMO, Gain Control 26, Vertical, Chain # 1 & 2



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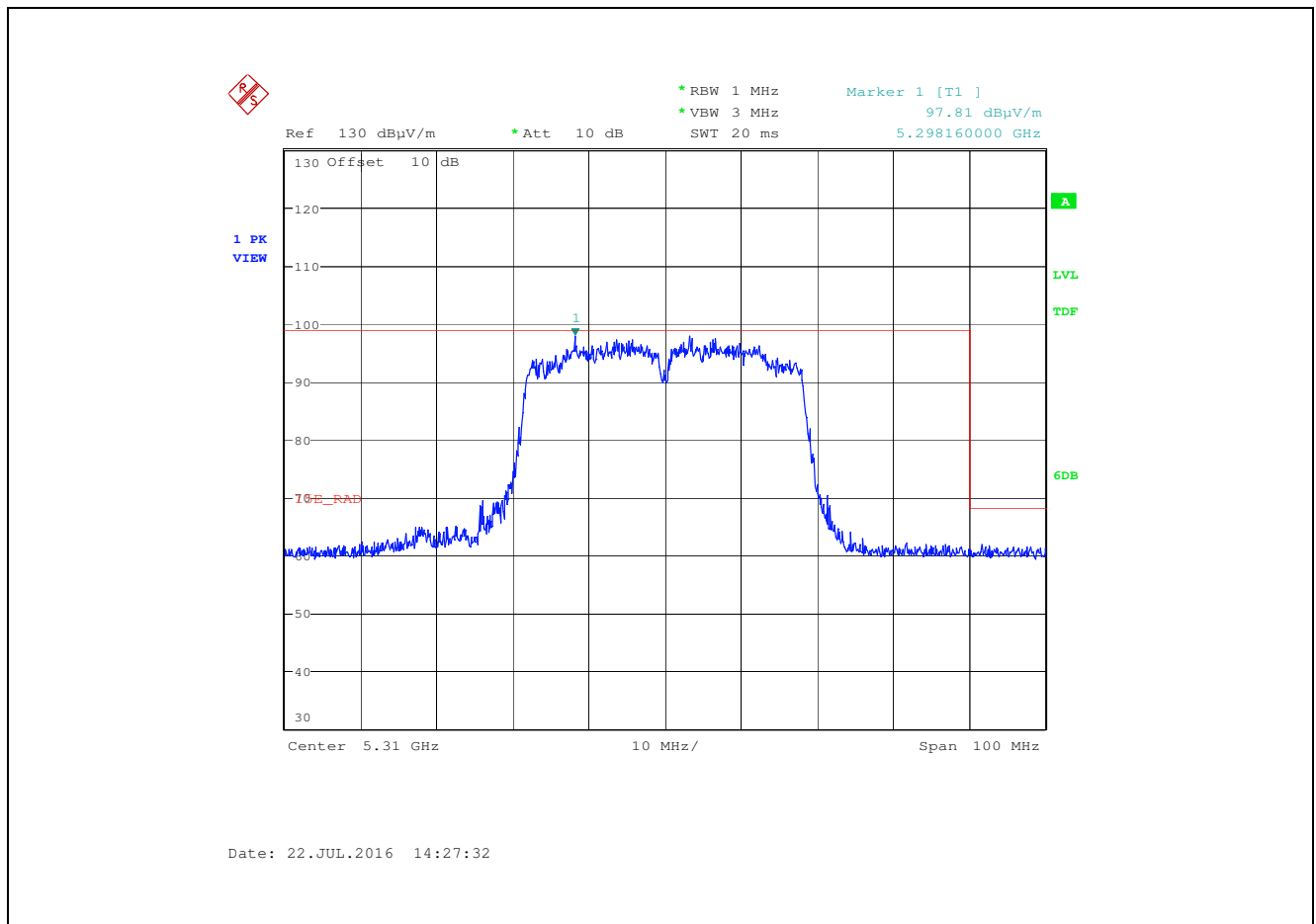
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 16CDTX003_FCC15E407

July 29, 2016

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot 5.3.8.1.32. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 62, 5310 MHz, MIMO, Gain Control 26, Horizontal
Chain # 1 & 2



ULTRATECH GROUP OF LABS

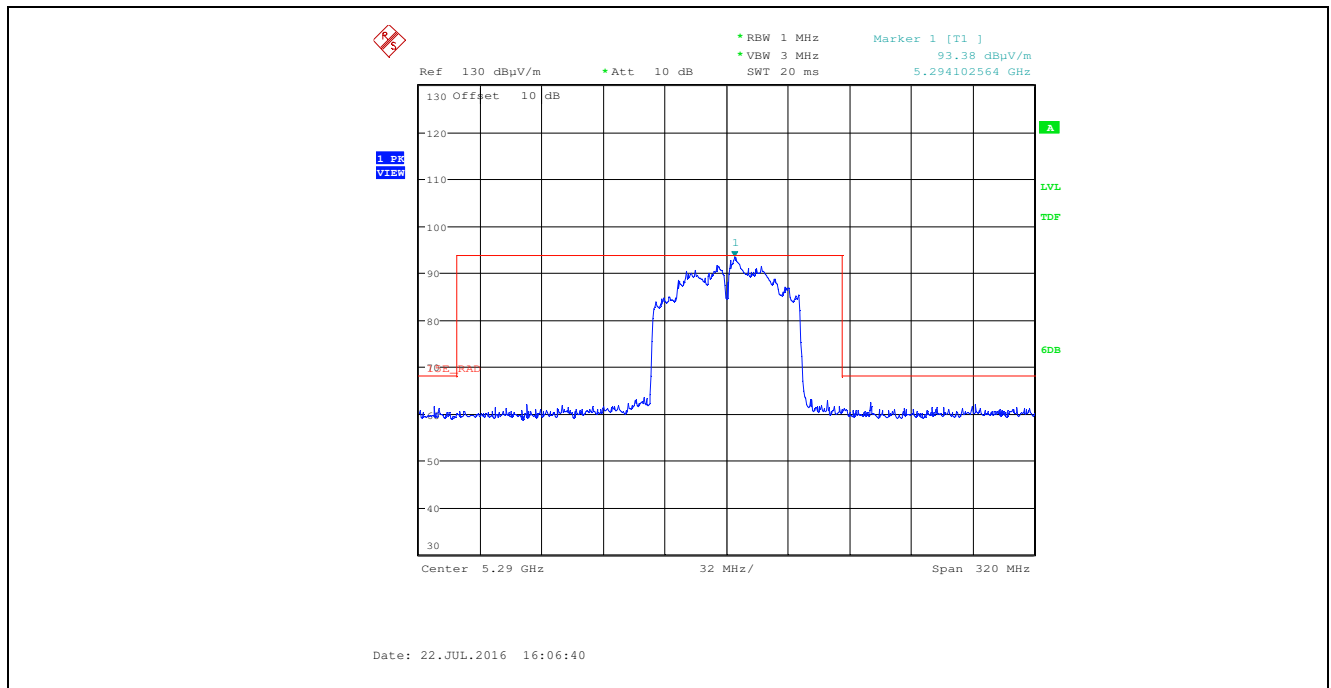
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 16CDTX003_FCC15E407
July 29, 2016

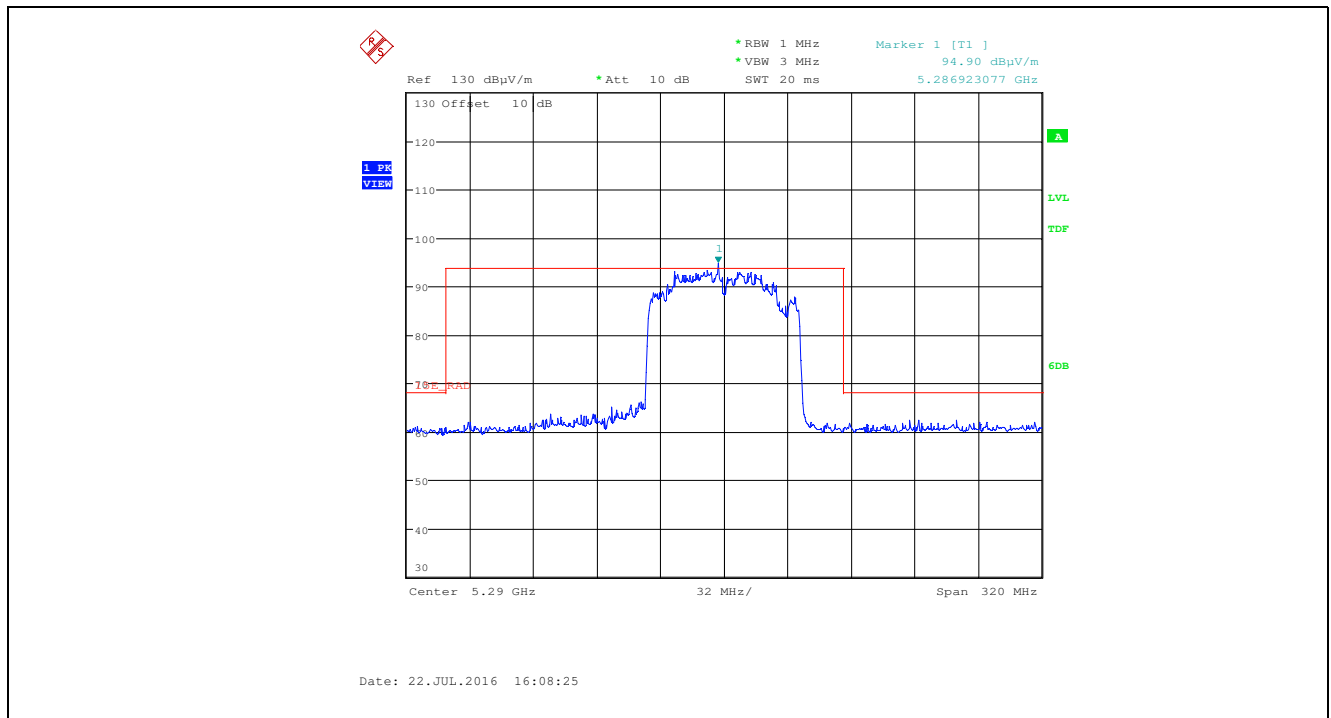
All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

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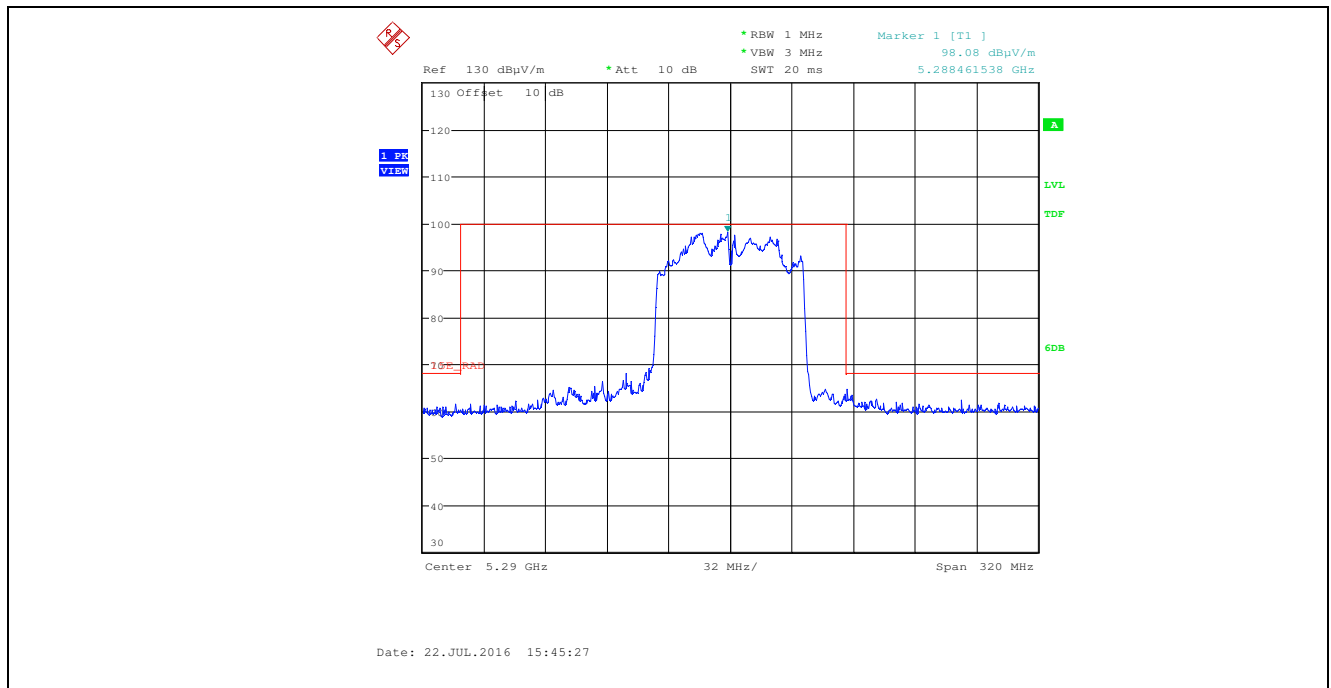
Plot 5.3.8.1.34. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 58, 5290 MHz, SISO, Gain Control 25, Horiz, Chain # 1



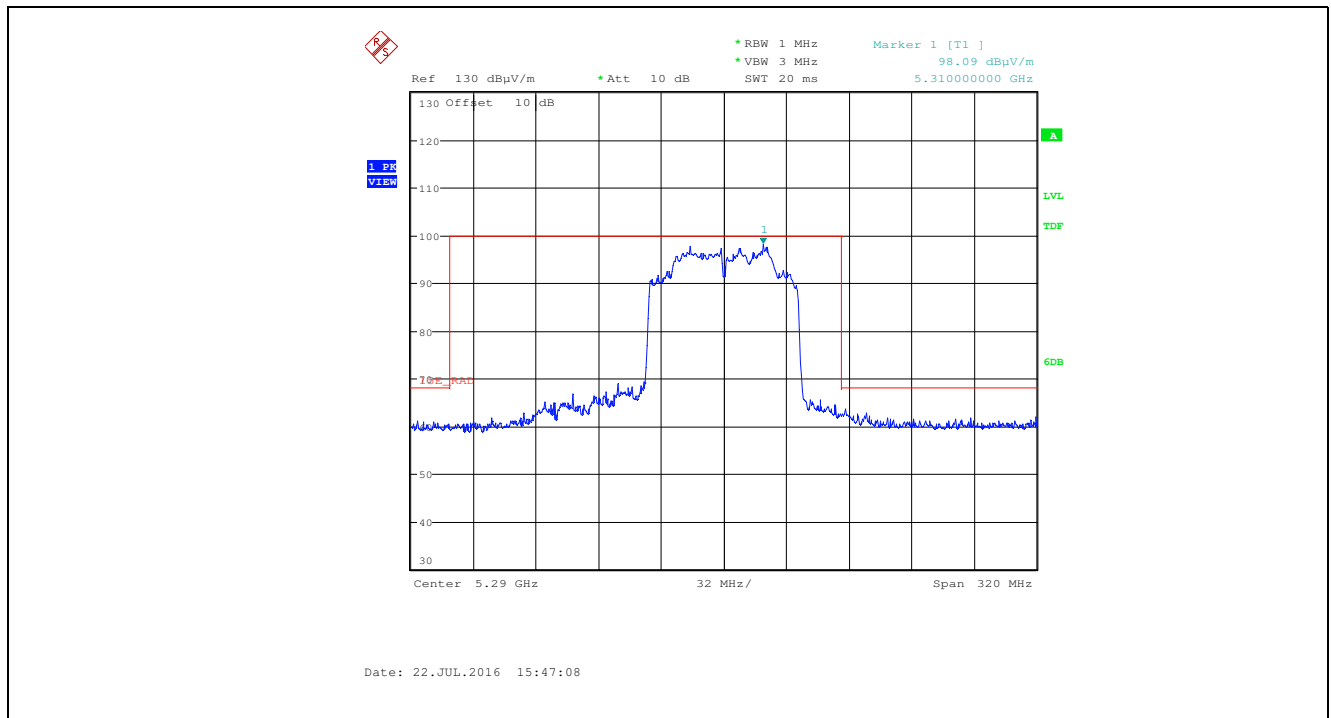
Plot 5.3.8.1.35. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 58, 5290 MHz, SISO, Gain Control 25, Horiz, Chain # 2



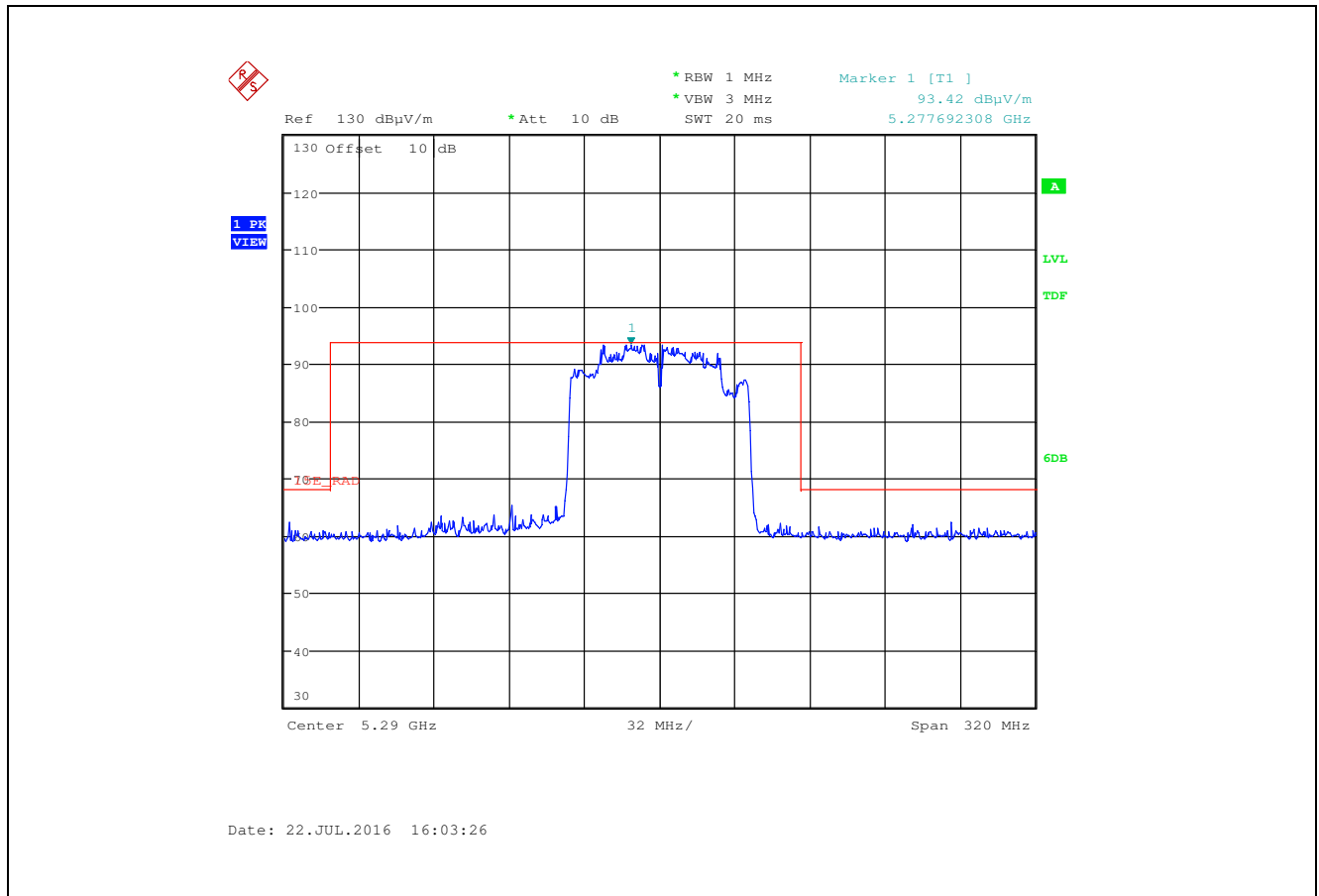
Plot 5.3.8.1.36. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 58, 5290 MHz, SISO, Gain Control 25, Vert, Chain # 1



Plot 5.3.8.1.37. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 58, 5290 MHz, SISO, Gain Control 25, Vert, Chain # 2



Plot 5.3.8.1.38. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 52, 5290 MHz, MIMO, Gain Control 25, Horizontal
Chain # 1 & 2



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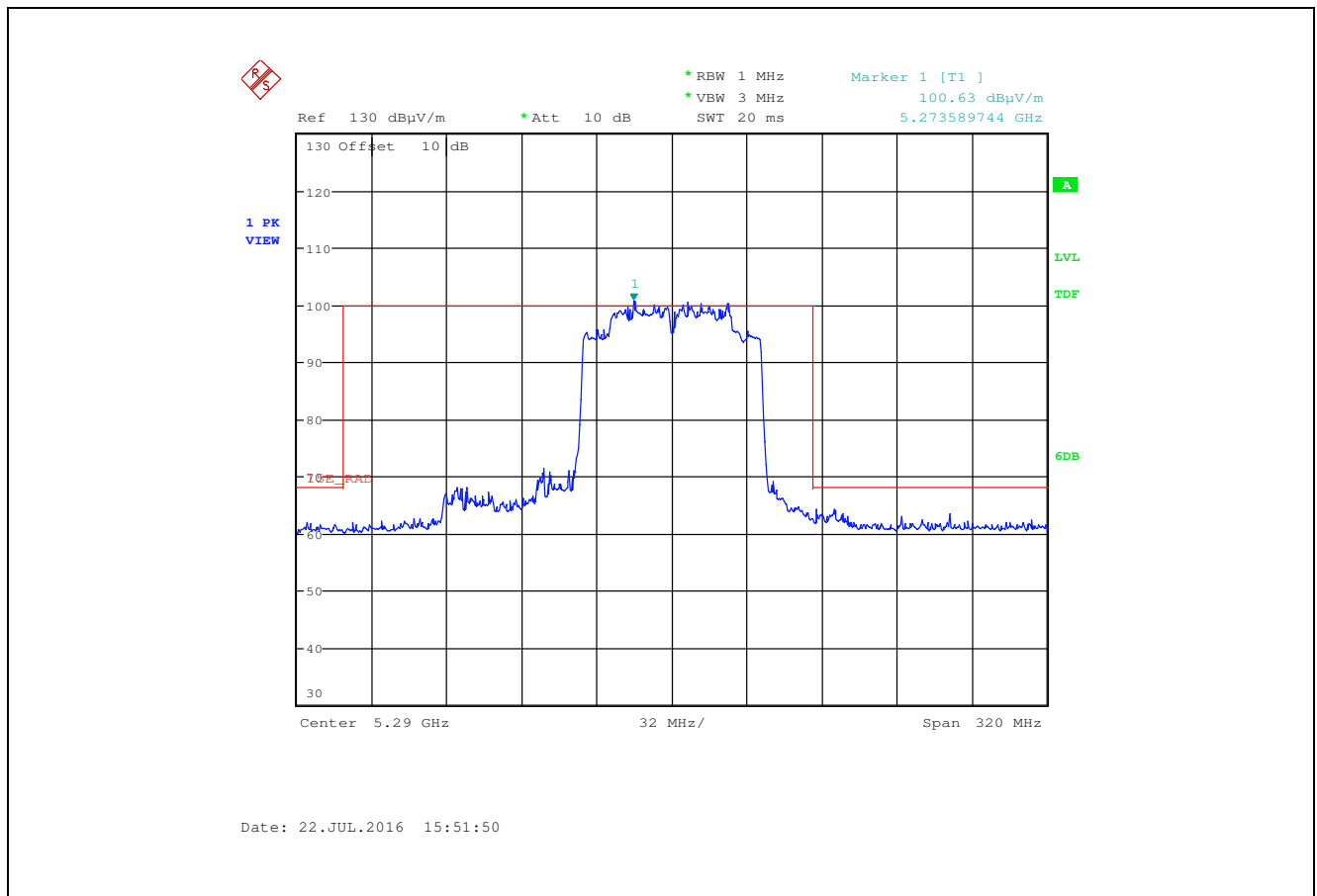
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 16CDTX003_FCC15E407

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Plot 5.3.8.1.39. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 52, 5290 MHz, MIMO, Gain Control 25, Vertical,
Chain # 1 & 2



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5.3.9. 5470-5725 MHz Band Tx Spurious Radiated

802.11a, 6 Mbps, Gain Control Setting 29

Fundamental Frequency:		5500 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11000	59.81	46.63	V	74.0	54.0	68.2	-7.4	Pass*
11000	60.68	48.06	H	74.0	54.0	68.2	-5.9	Pass*
22000	49.40	--	V	74.0	54.0	68.2	-4.6	Pass*
22000	47.97	--	H	74.0	54.0	68.2	-6.0	Pass*

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

Fundamental Frequency:		5600 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11200	59.58	45.94	V	74.0	54.0	68.2	-8.1	Pass*
11200	58.43	47.05	H	74.0	54.0	68.2	-6.9	Pass*
22400	52.99	--	V	74.0	54.0	68.2	-1.0	Pass*
22400	49.81	--	H	74.0	54.0	68.2	-4.2	Pass*

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

Fundamental Frequency:		5700 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11400	57.12	45.02	V	74.0	54.0	68.2	-9.0	Pass*
11400	59.94	45.69	H	74.0	54.0	68.2	-8.3	Pass*
22800	45.11	--	V	74.0	54.0	68.2	-8.9	Pass*
22800	46.97	--	H	74.0	54.0	68.2	-7.0	Pass*

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

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802.11n HT20, HT4, Gain Control Setting 29, SISO & MIMO

Fundamental Frequency:		5500 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11000	60.31	47.82	V	74.0	54.0	68.2	-6.2	Pass*
11000	60.72	47.63	H	74.0	54.0	68.2	-6.4	Pass*
22000	48.26	--	V	74.0	54.0	68.2	-5.7	Pass*
22000	46.66	--	H	74.0	54.0	68.2	-7.3	Pass*

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

Fundamental Frequency:		5600 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11200	60.33	46.08	V	74.0	54.0	68.2	-7.9	Pass*
11200	59.14	46.10	H	74.0	54.0	68.2	-7.9	Pass*
22400	50.88	--	V	74.0	54.0	68.2	-3.1	Pass*
22400	50.72	--	H	74.0	54.0	68.2	-3.3	Pass*

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

Fundamental Frequency:		5700 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11400	56.79	44.39	V	74.0	54.0	68.2	-9.6	Pass*
11400	56.77	45.32	H	74.0	54.0	68.2	-8.7	Pass*
22800	45.69	--	V	74.0	54.0	68.2	-8.3	Pass*
22800	47.05	--	H	74.0	54.0	68.2	-6.9	Pass*

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

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802.11n HT40, HT4, Gain Control Setting 27, SISO & MIMO

Fundamental Frequency:		5510 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11020	57.04	45.53	V	74.0	54.0	68.2	-8.5	Pass*
11020	57.91	45.77	H	74.0	54.0	68.2	-8.2	Pass*
22040	48.53	--	V	74.0	54.0	68.2	-5.5	Pass*
22040	50.14	--	H	74.0	54.0	68.2	-4.9	Pass*

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

Fundamental Frequency:		5590 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11180	57.74	45.05	V	74.0	54.0	68.2	-8.9	Pass*
11180	57.09	46.59	H	74.0	54.0	68.2	-7.4	Pass*
22360	53.39	--	V	74.0	54.0	68.2	-0.6	Pass*
22360	50.47	--	H	74.0	54.0	68.2	-3.5	Pass*

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

Fundamental Frequency:		5670 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11340	56.07	43.80	V	74.0	54.0	68.2	-10.2	Pass*
11340	55.68	44.83	H	74.0	54.0	68.2	-9.2	Pass*
22680	49.00	--	V	74.0	54.0	68.2	-5.0	Pass*
22680	49.47	--	H	74.0	54.0	68.2	-4.5	Pass*

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

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802.11ac80, VHT6, Gain Control Setting 23, SISO & MIMO

Fundamental Frequency:		5530 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11060	56.05	44.55	V	74.0	54.0	68.2	-9.4	Pass*
11060	56.68	47.60	H	74.0	54.0	68.2	-6.4	Pass*
22120	50.24	--	V	74.0	54.0	68.2	-3.8	Pass*
22120	50.26	--	H	74.0	54.0	68.2	-3.7	Pass*

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

Fundamental Frequency:		5610 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11220	56.20	45.07	V	74.0	54.0	68.2	-8.9	Pass*
11220	56.42	45.86	H	74.0	54.0	68.2	-8.1	Pass*
22440	50.37	--	V	74.0	54.0	68.2	-3.6	Pass*
22440	49.98	--	H	74.0	54.0	68.2	-4.0	Pass*

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

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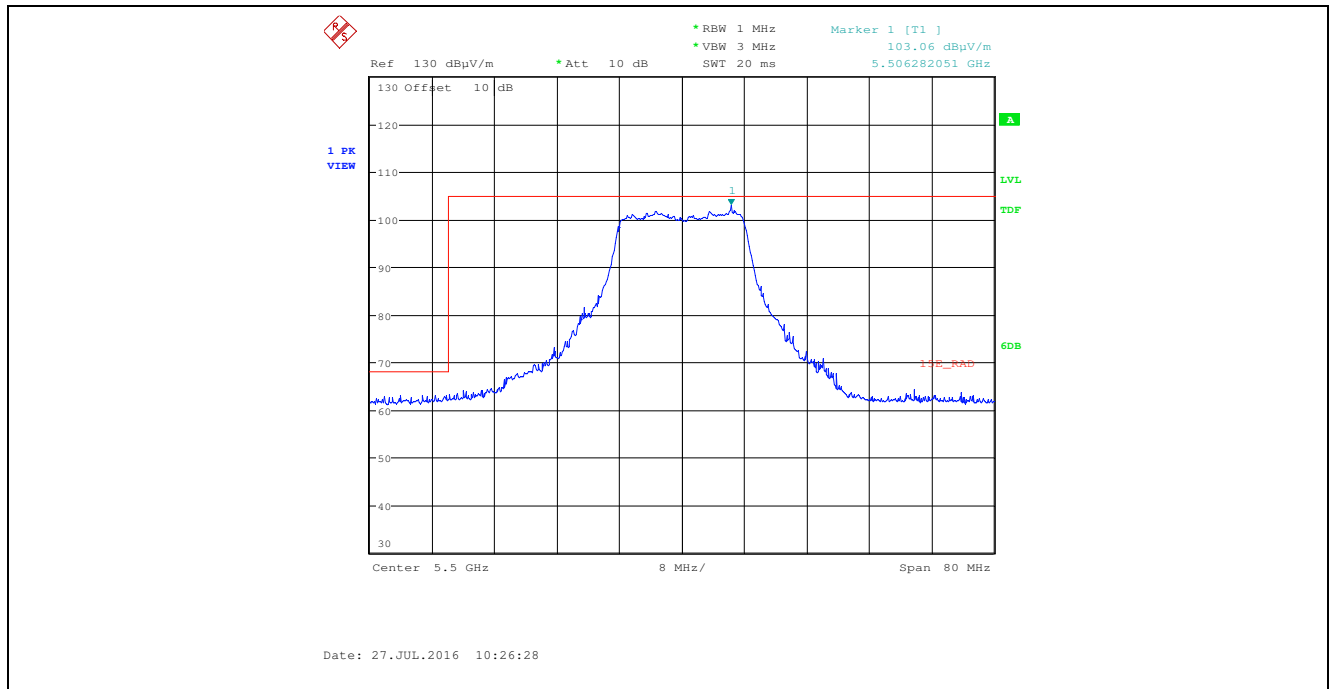
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

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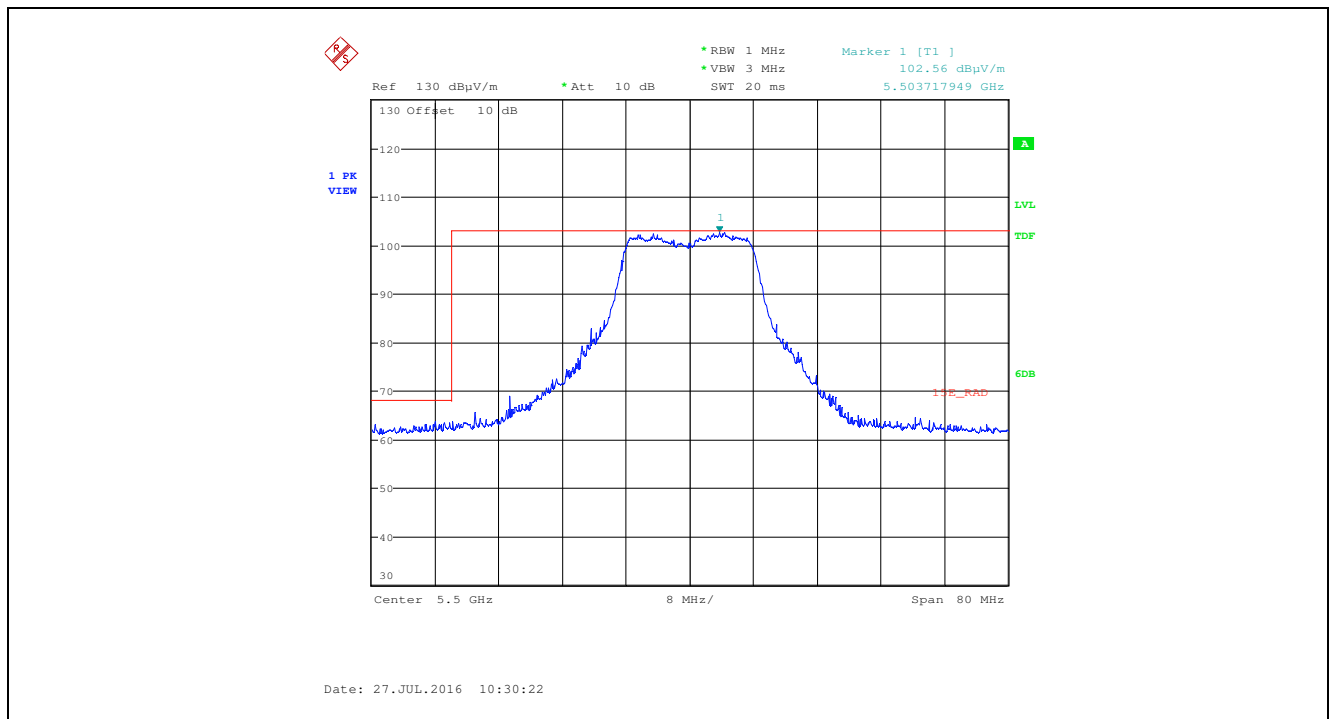
All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

5.3.10. 5470-5725 MHz Band, Band-Edge Radiated

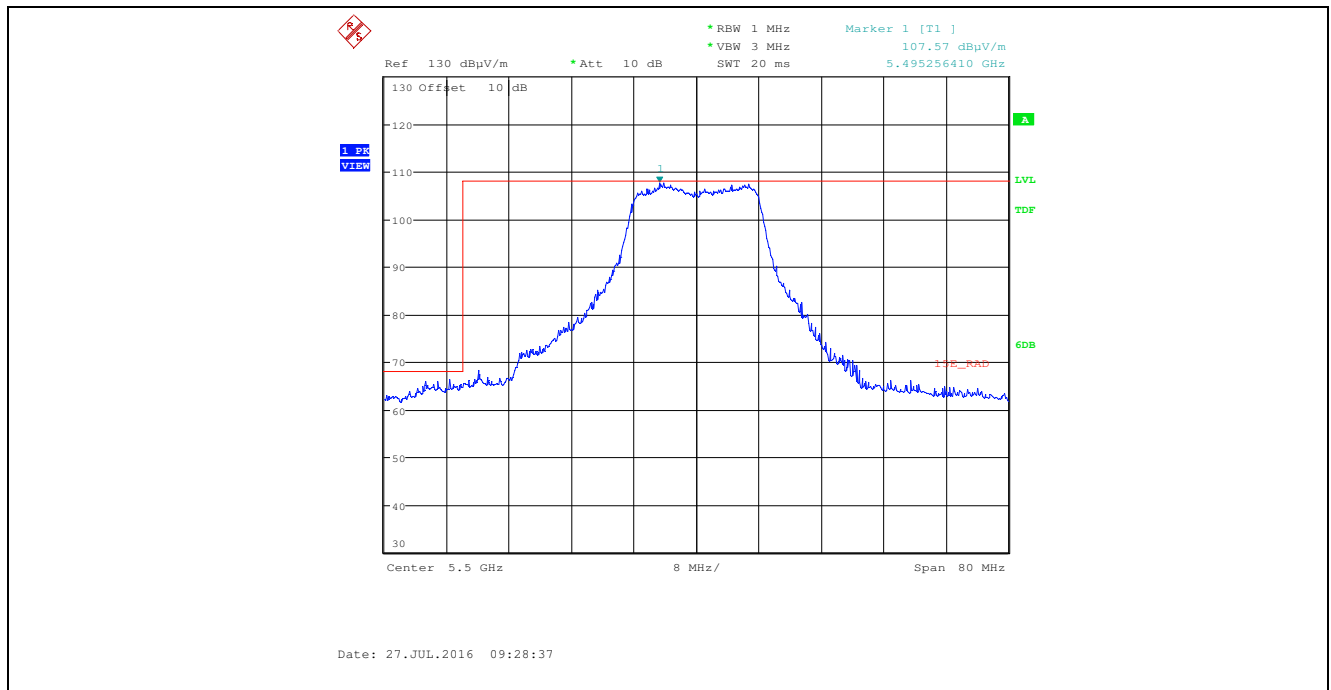
Plot 5.3.10.1.1. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 100, 5500 MHz, SISO, Gain Control 29, Horiz, Chain # 1



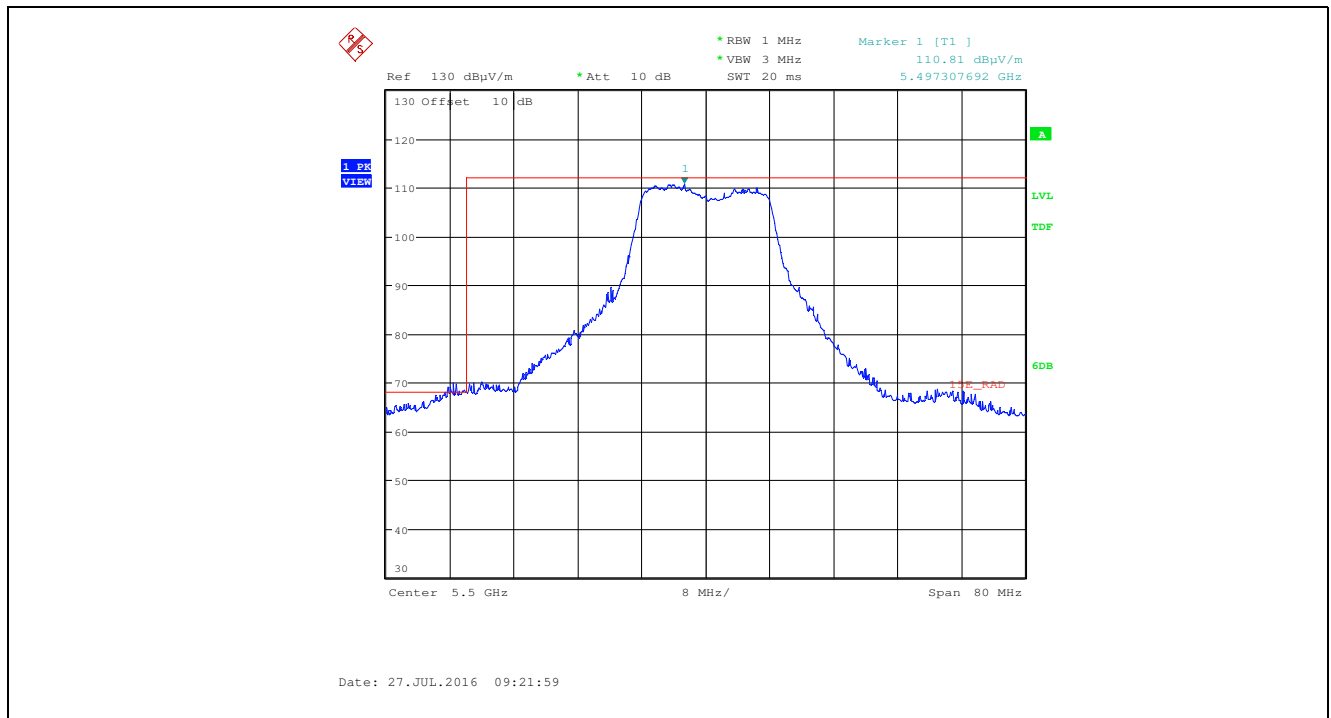
Plot 5.3.10.1.2. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 100, 5500 MHz, SISO, Gain Control 29, Horiz, Chain # 2



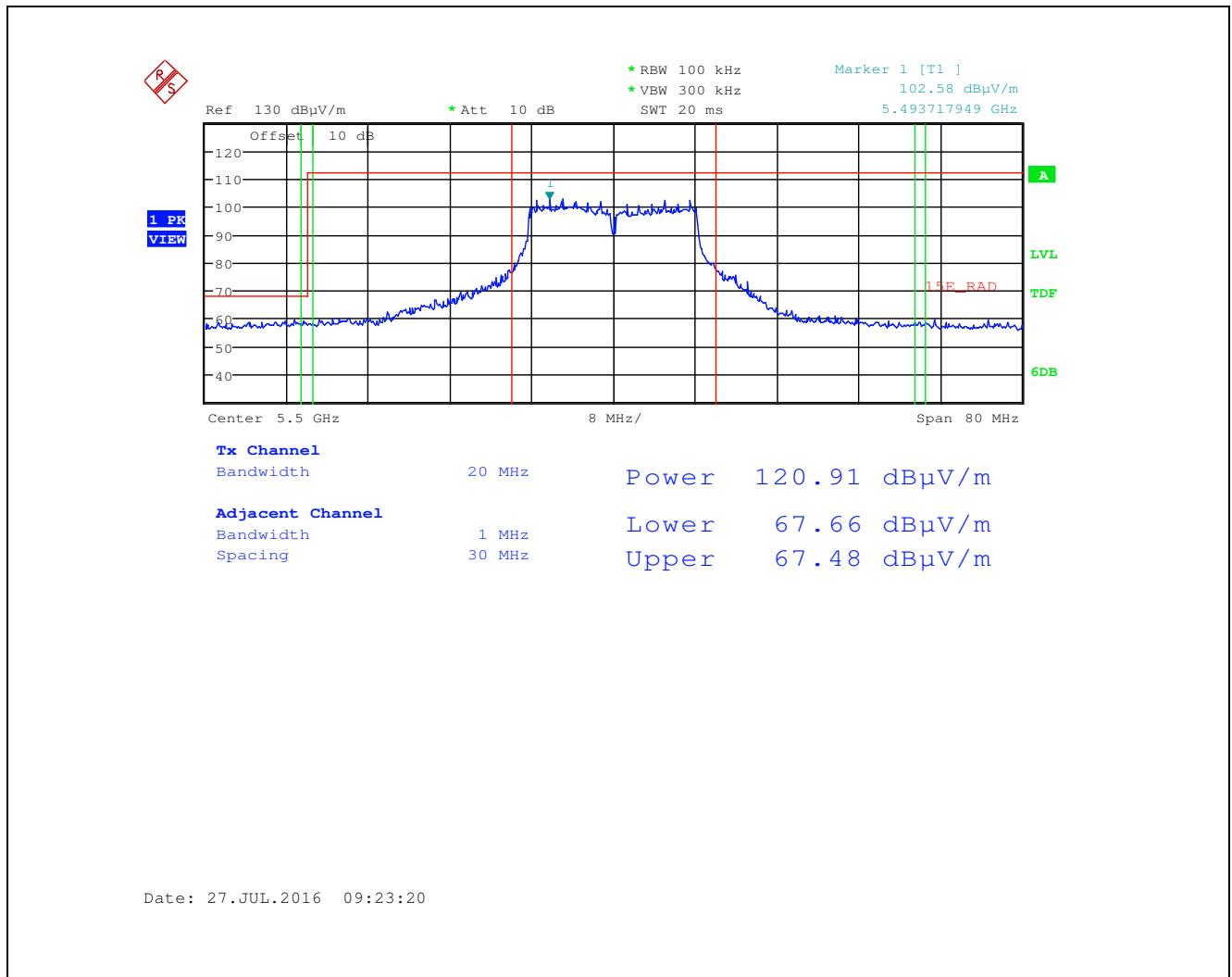
Plot 5.3.10.1.3. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 100, 5500 MHz, SISO, Gain Control 29, Vertical, Chain # 1



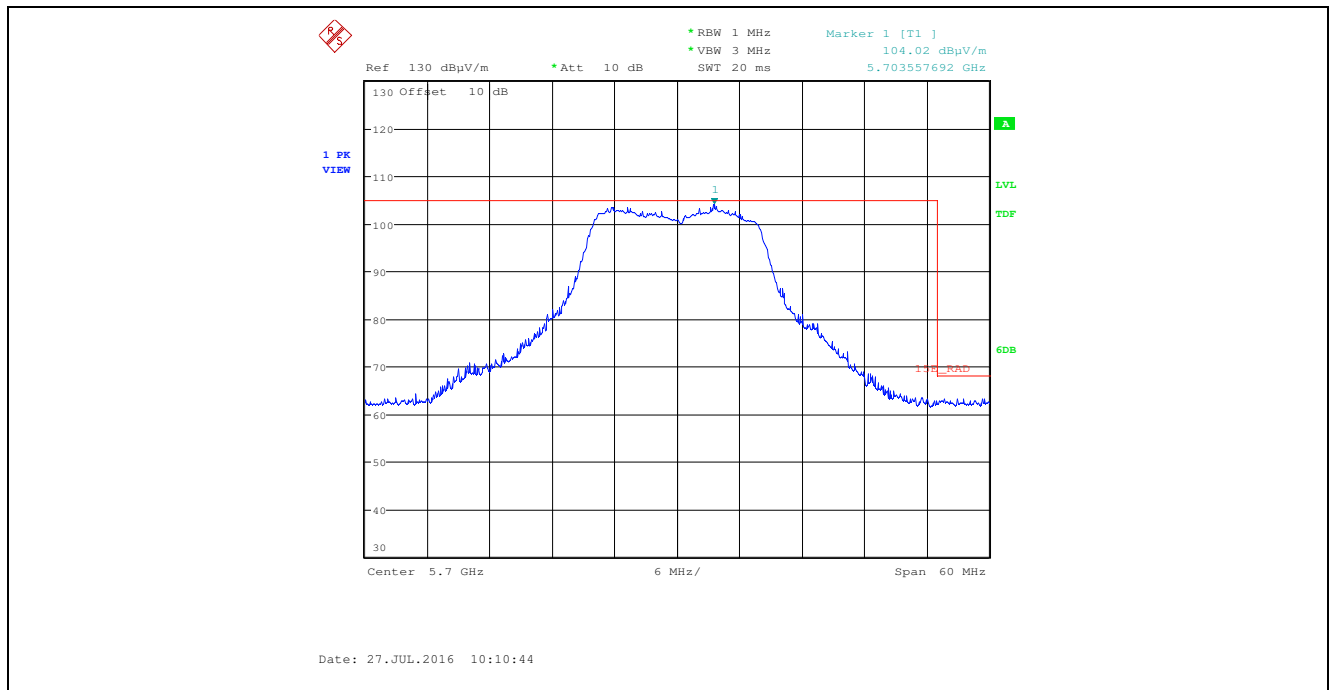
Plot 5.3.10.1.4. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 100, 5500 MHz, SISO, Gain Control 29, Vertical, Chain # 2



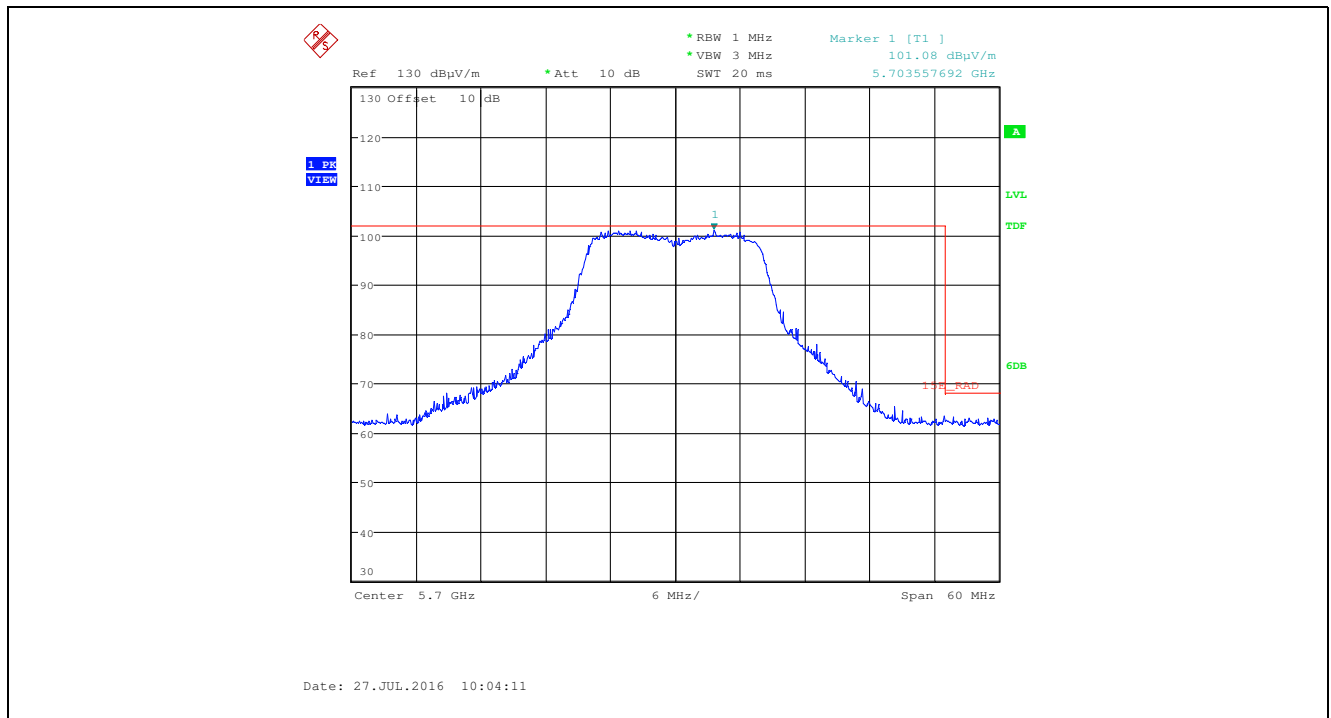
Plot 5.3.10.1.5. Integration Method Chain# 2, 802.11a, 6 Mbps, Ch 100, 5500 MHz, SISO, Gain Control 29, Vertical



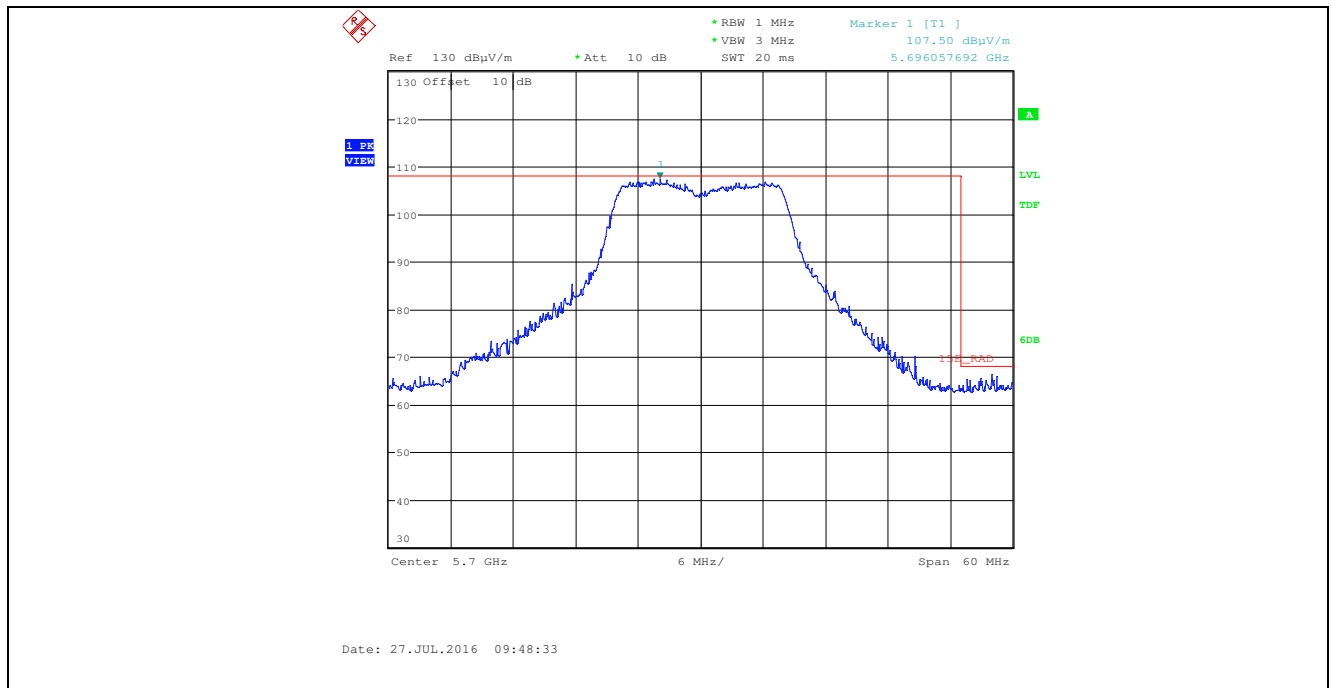
Plot 5.3.10.1.6. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 140, 5700 MHz, SISO, Gain Control 29, Horiz, Chain # 1



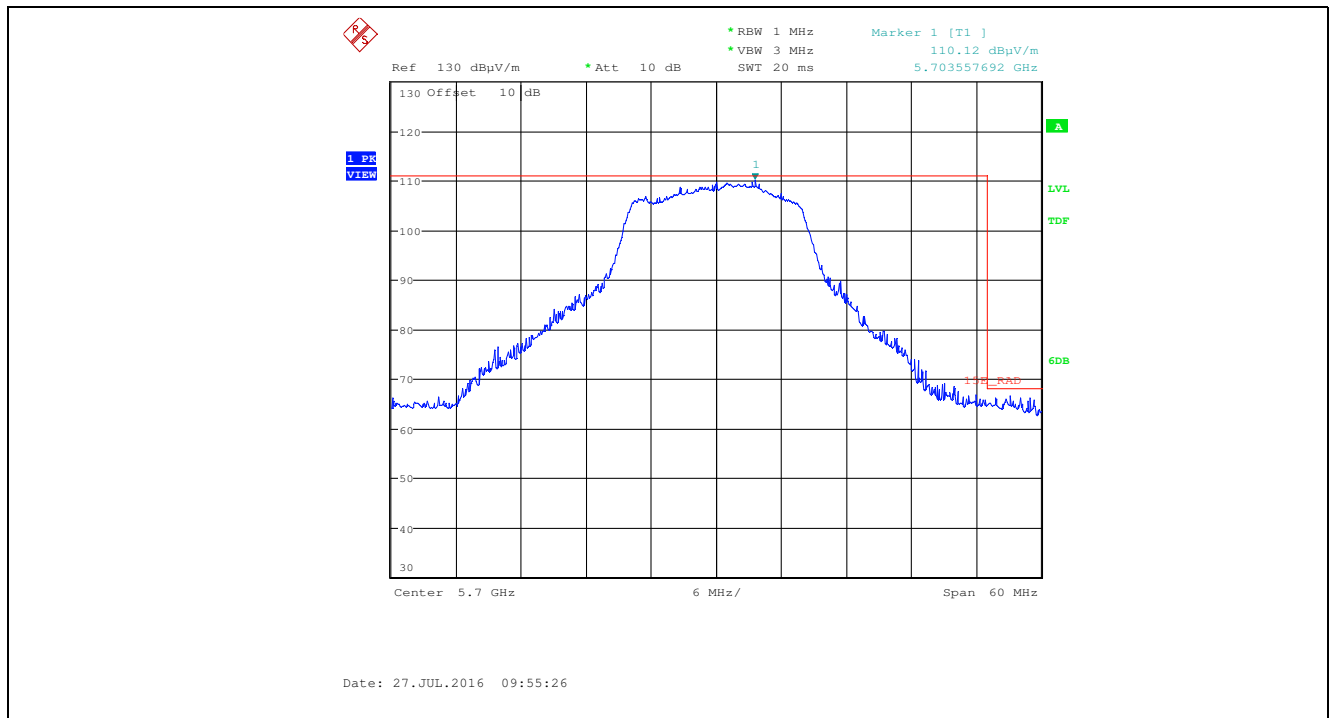
Plot 5.3.10.1.7. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 140, 5700 MHz, SISO, Gain Control 29, Horiz, Chain # 2



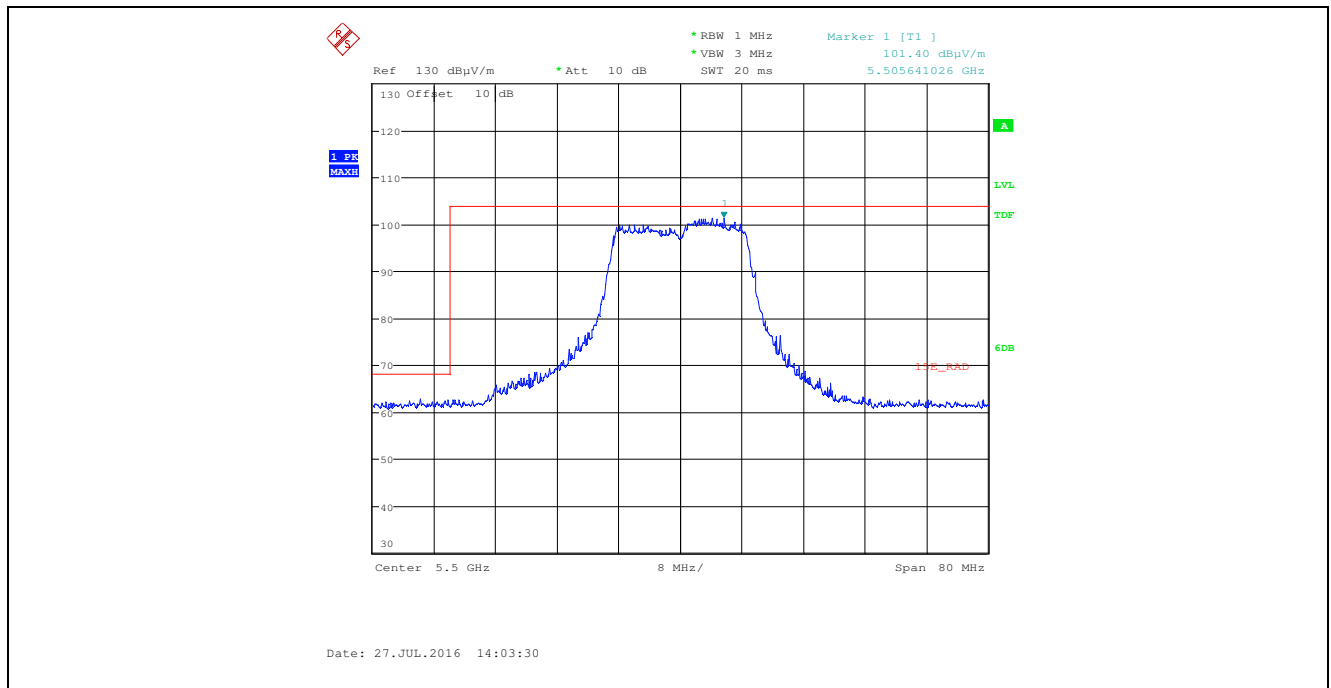
Plot 5.3.10.1.8. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 140, 5700 MHz, SISO, Gain Control 29, Vertical, Chain # 1



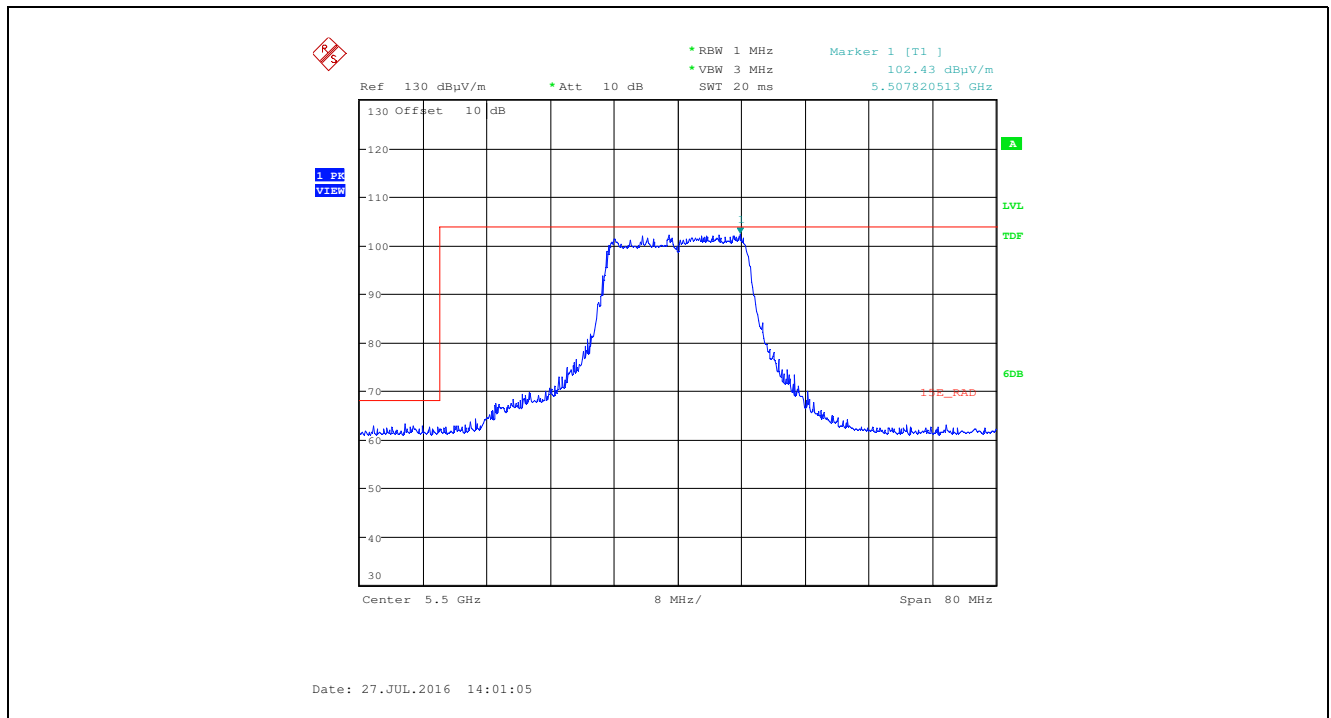
Plot 5.3.10.1.9. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 140, 5700 MHz, SISO, Gain Control 29, Vertical, Chain # 2



Plot 5.3.10.1.10. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 100, 5500 MHz, SISO, Gain Control 30, Horiz, Chain # 1



Plot 5.3.10.1.11. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 100, 5500 MHz, SISO, Gain Control 30, Horiz, Chain # 2



Ref 130 dBpV/m *Att 10 dB *RBW 1 MHz Marker 1 [T1] 108.27 dBpV/m
 *VBW 3 MHz 5.501282051 GHz
 SWI 20 ms

130 Offset 10 dB

1 PK VIEW

LVL
 TDF
 6DB

1 F2_RAD

Center 5.5 GHz 8 MHz/ Span 80 MHz

Date: 27.JUL.2016 11:34:33

Ref 130 dBuV/m * Att 10 dB SWT 20 ms

* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz 110.90 dBuV/m
 5.501153846 GHz

130 Offset 10 dB

1 PK VIEW

1

110.90 dBuV/m

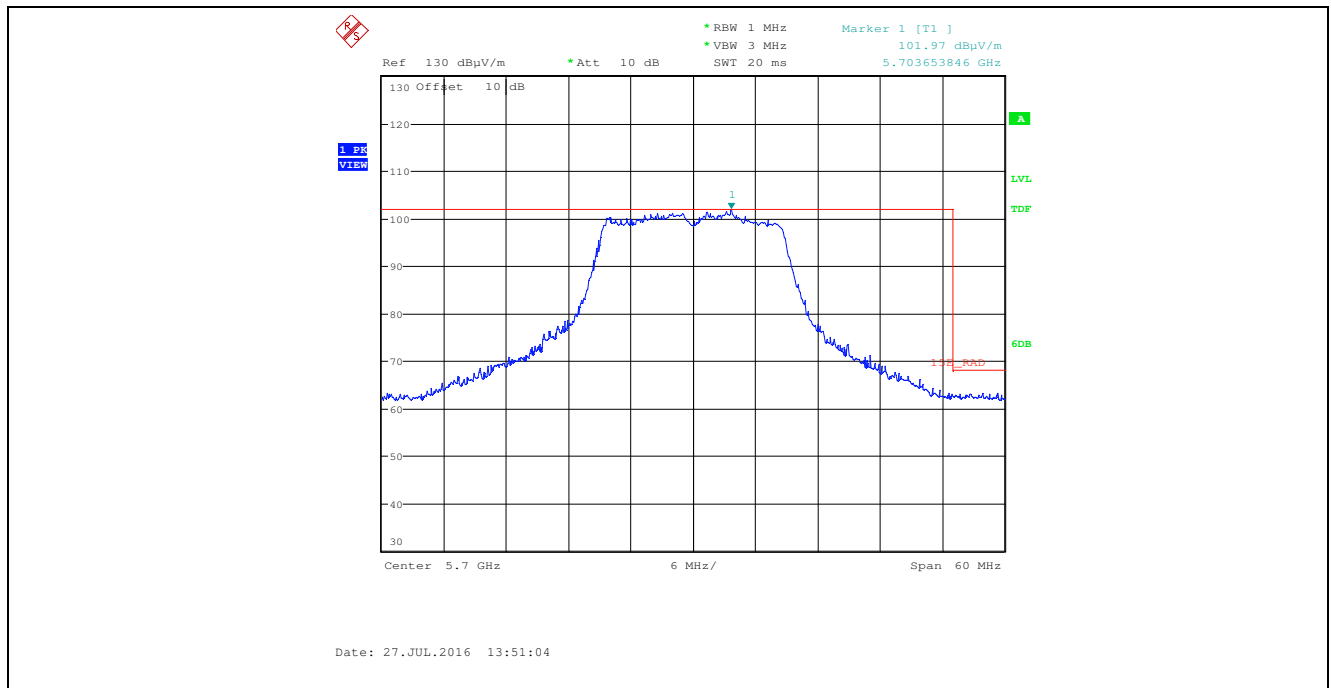
6DB

110.90 dBuV/m

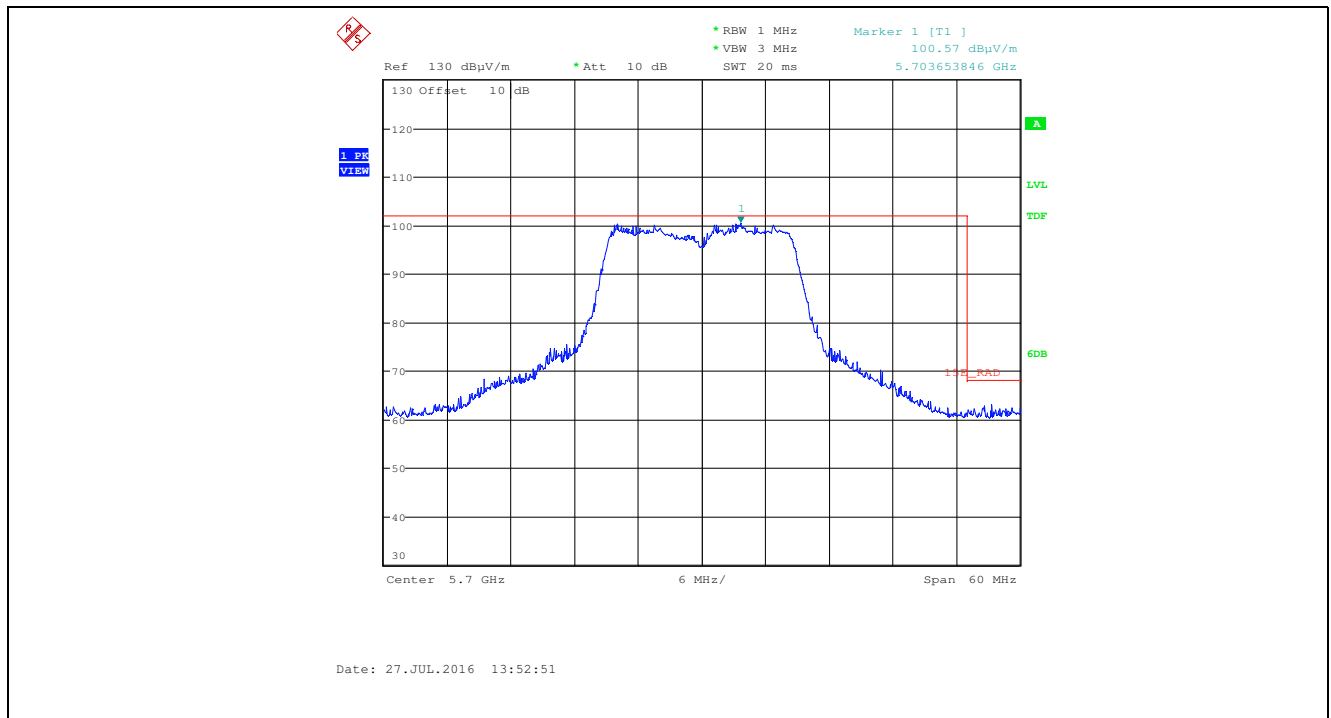
Center 5.5 GHz 8 MHz/ Span 80 MHz

Date: 27.JUL.2016 11:16:02

Plot 5.3.10.1.14. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 140, 5700 MHz, SISO, Gain Control 30, Horiz, Chain # 1



Plot 5.3.10.1.15. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 140, 5700 MHz, SISO, Gain Control 30, Horiz, Chain # 2



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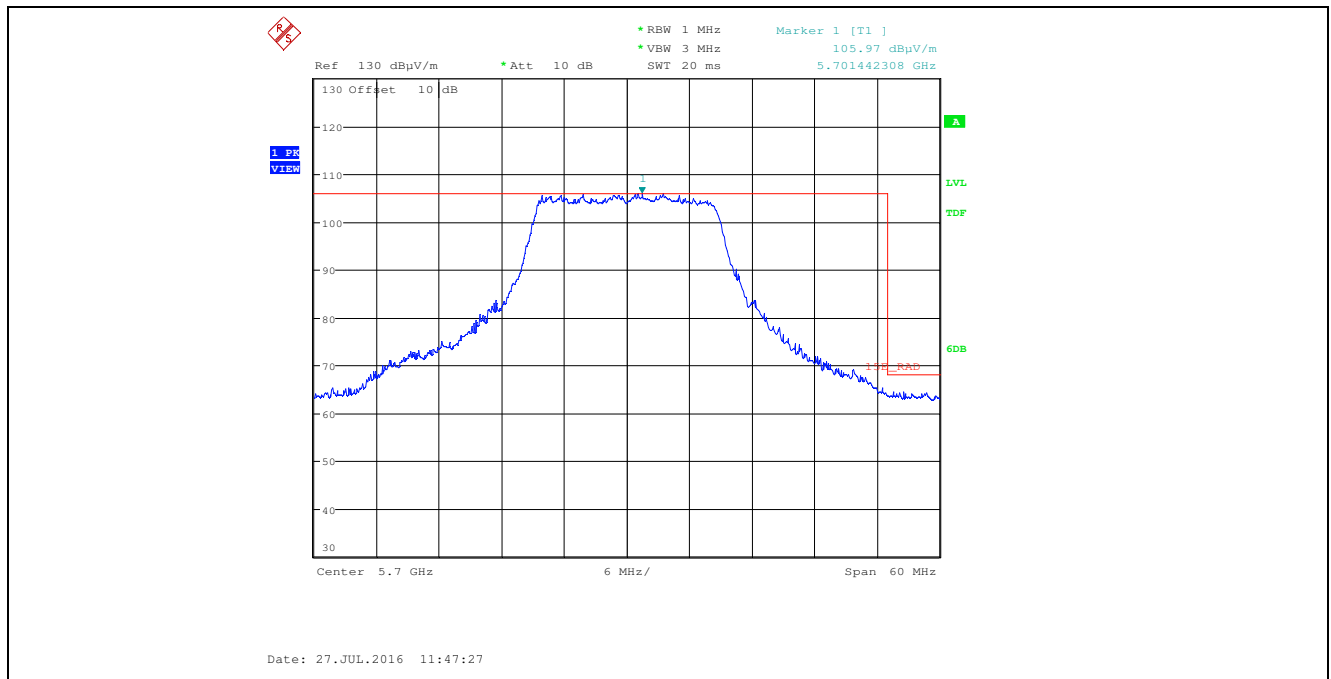
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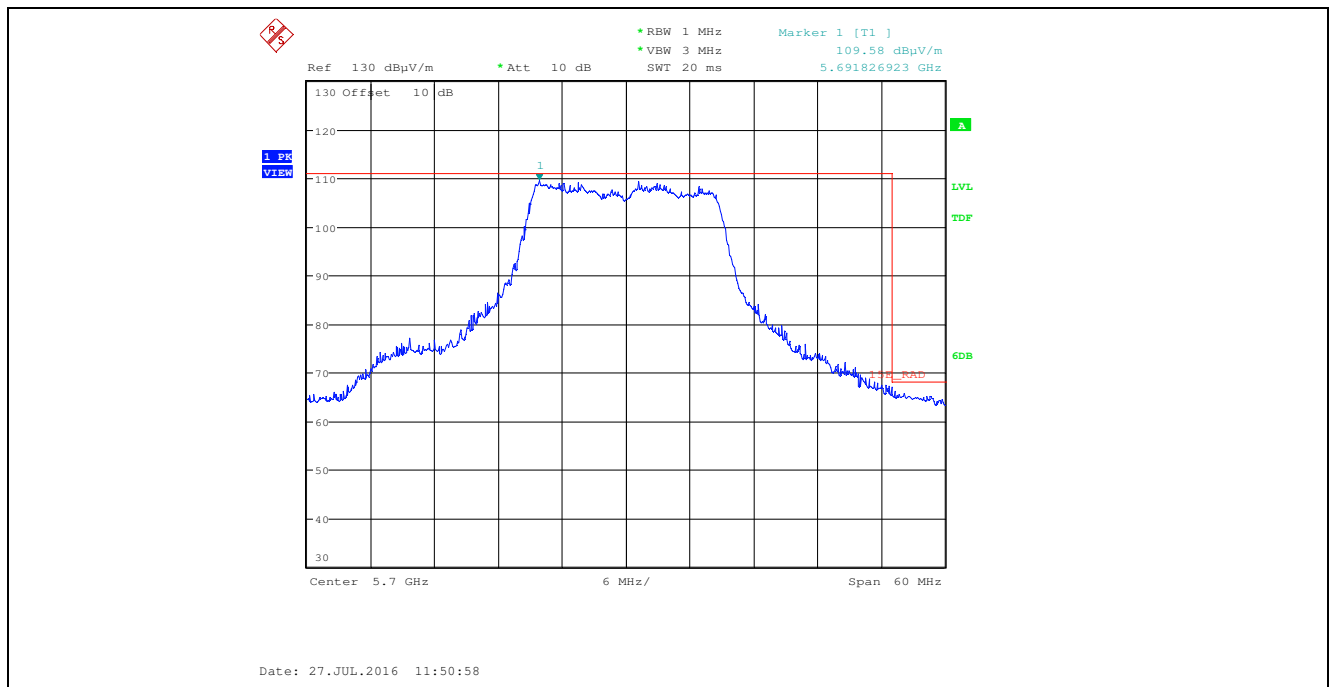
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Plot 5.3.10.1.16. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 140, 5700 MHz, SISO, Gain Control 30, Vert, Chain # 1



Plot 5.3.10.1.17. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 140, 5700 MHz, SISO, Gain Control 30, Vert, Chain # 2



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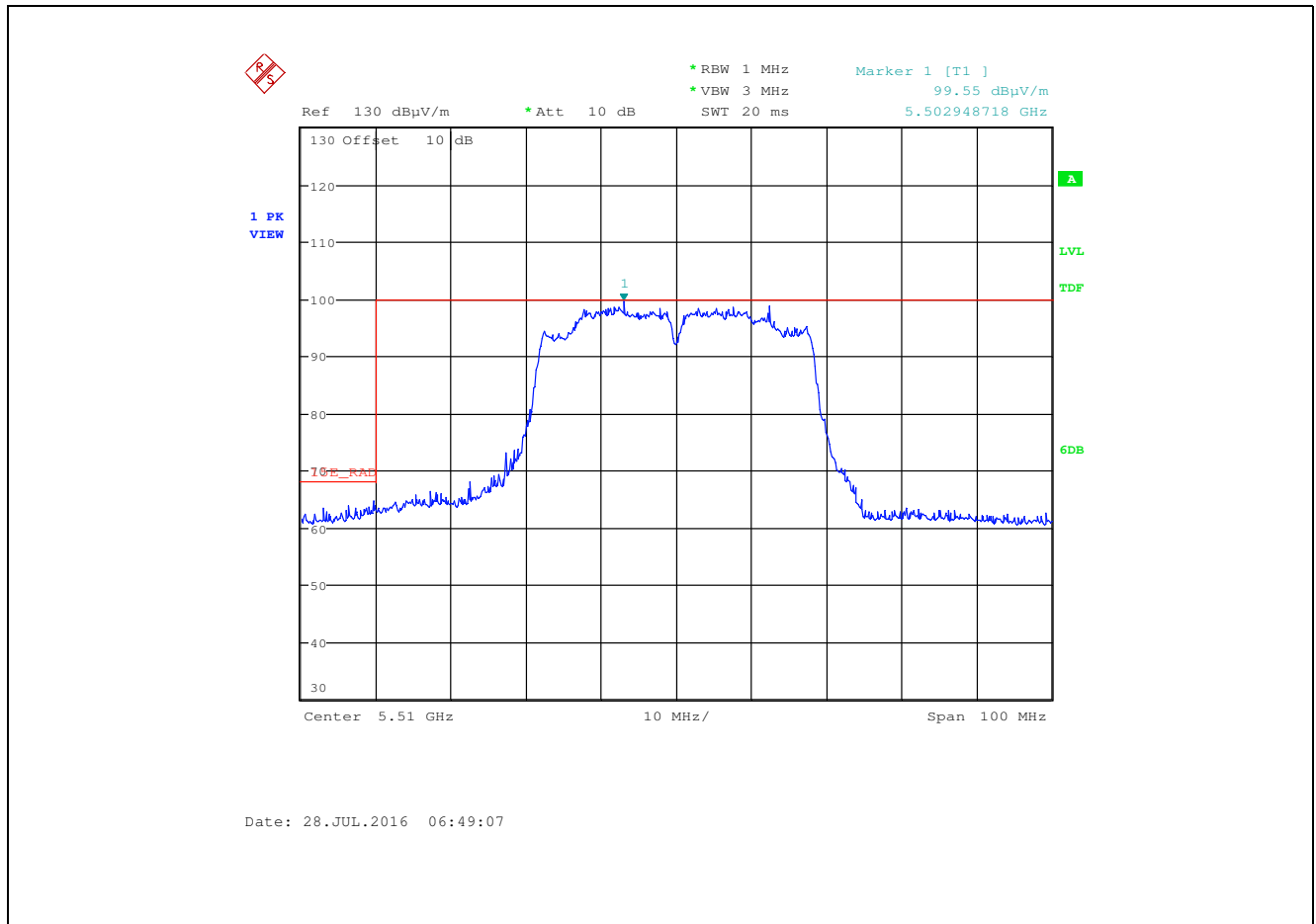
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Plot 5.3.10.1.18. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 102, 5510 MHz, MIMO, Gain Control 27, Horizontal Chain # 1 & 2



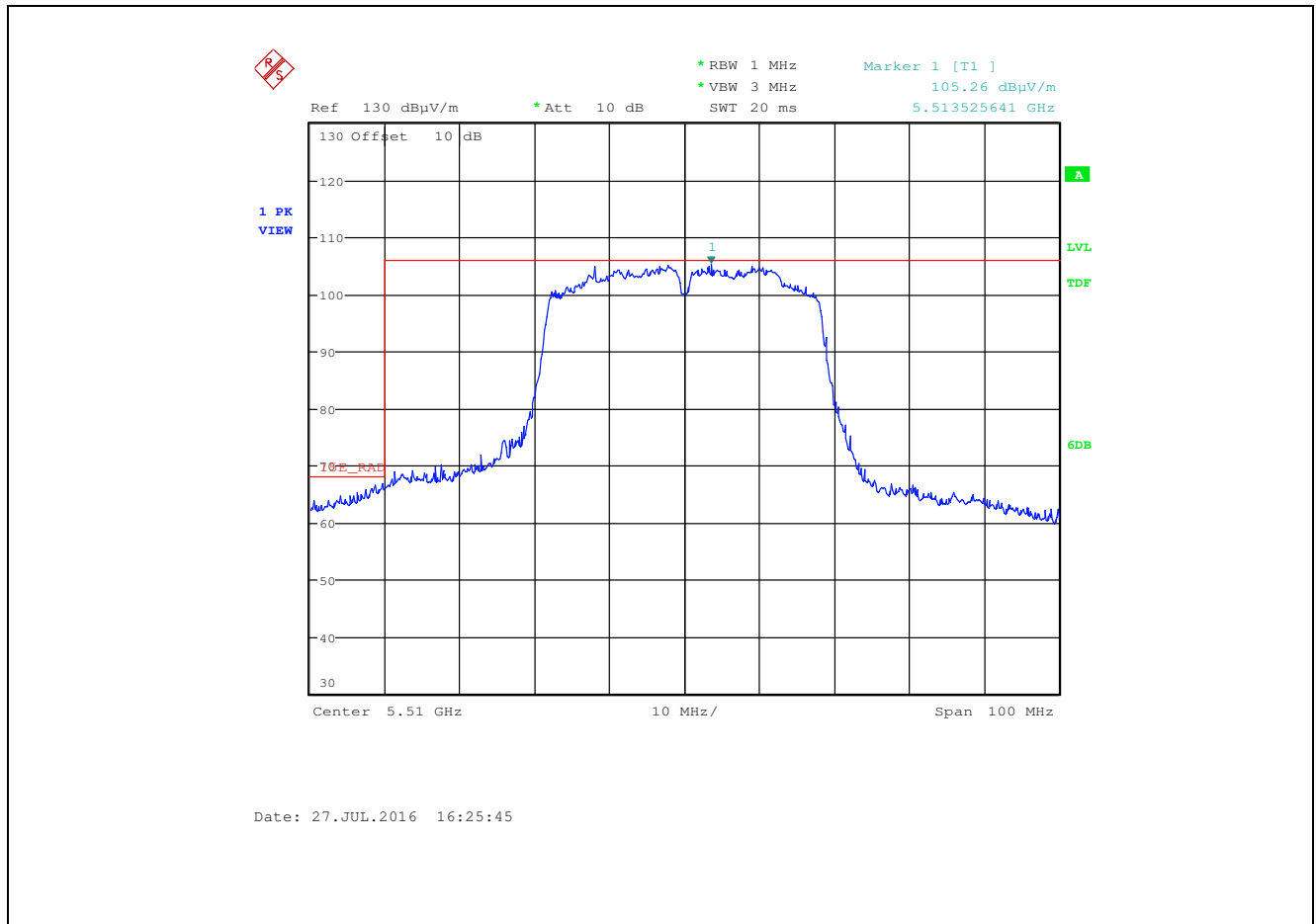
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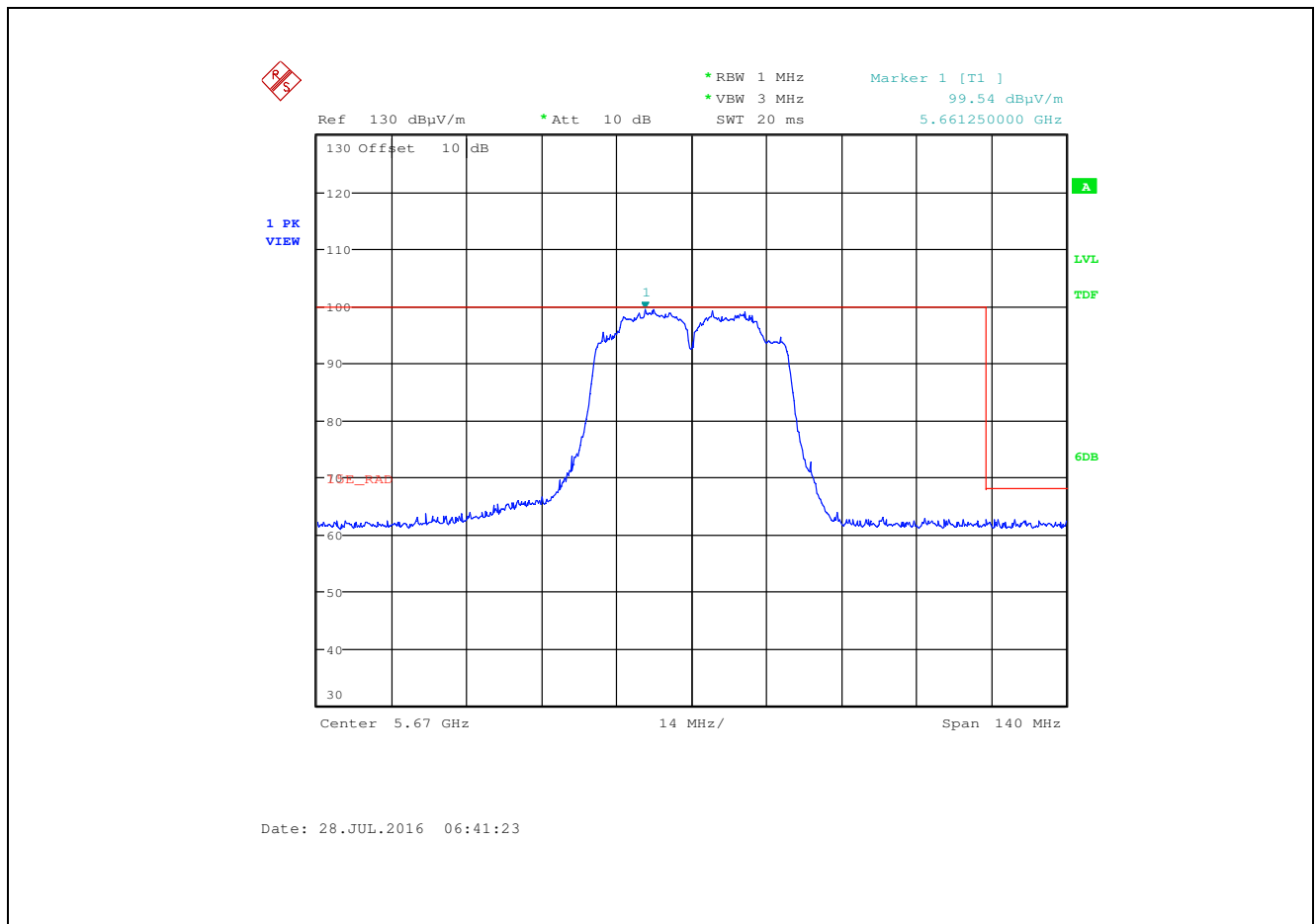
File #: 16CDTX003_FCC15E407
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Plot 5.3.10.1.19. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 102, 5510 MHz, MIMO, Gain Control 27, Vertical, Chain # 1 & 2



Plot 5.3.10.1.20. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 134, 5670 MHz, MIMO, Gain Control 27, Horizontal Chain # 1 & 2



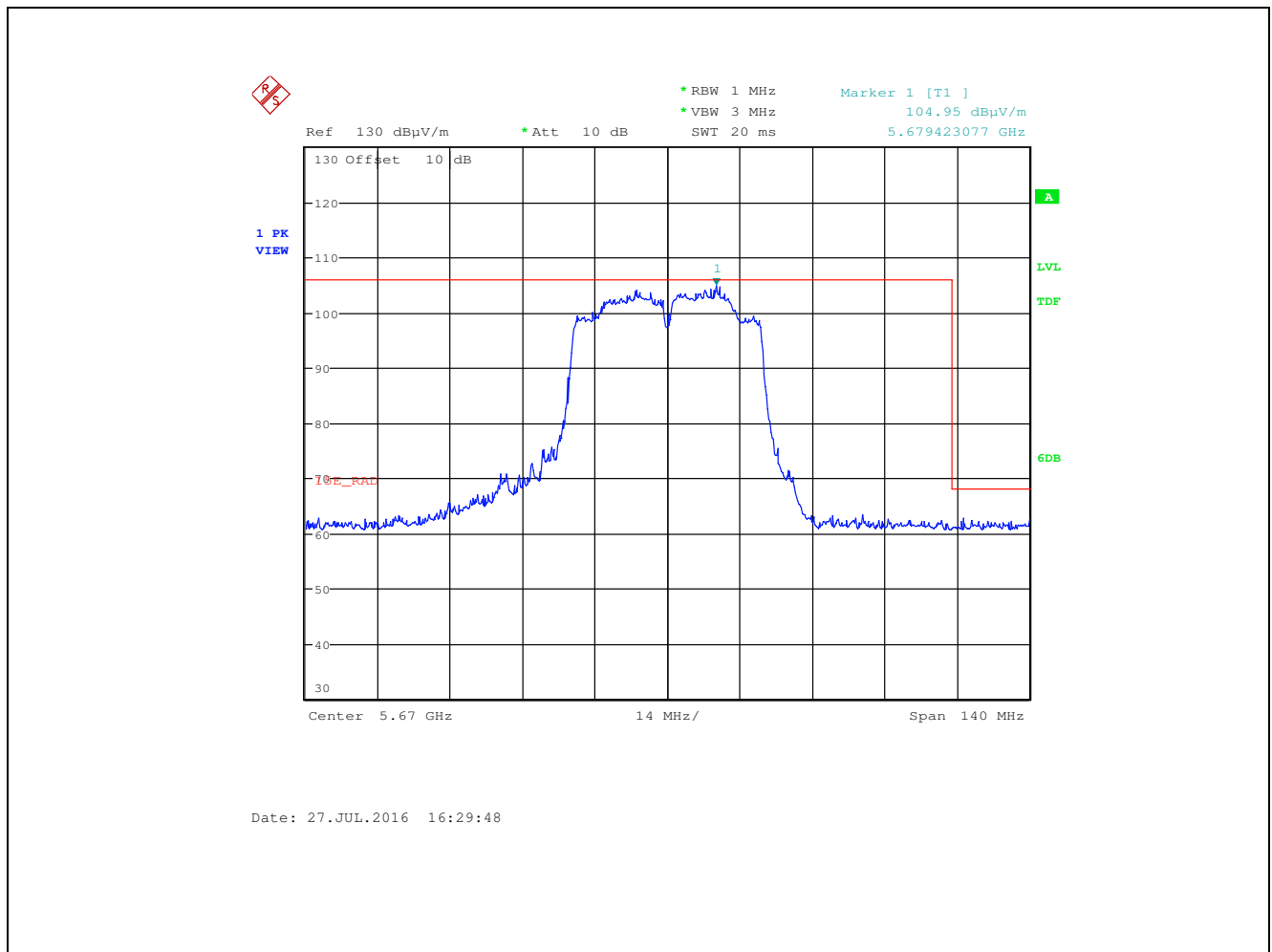
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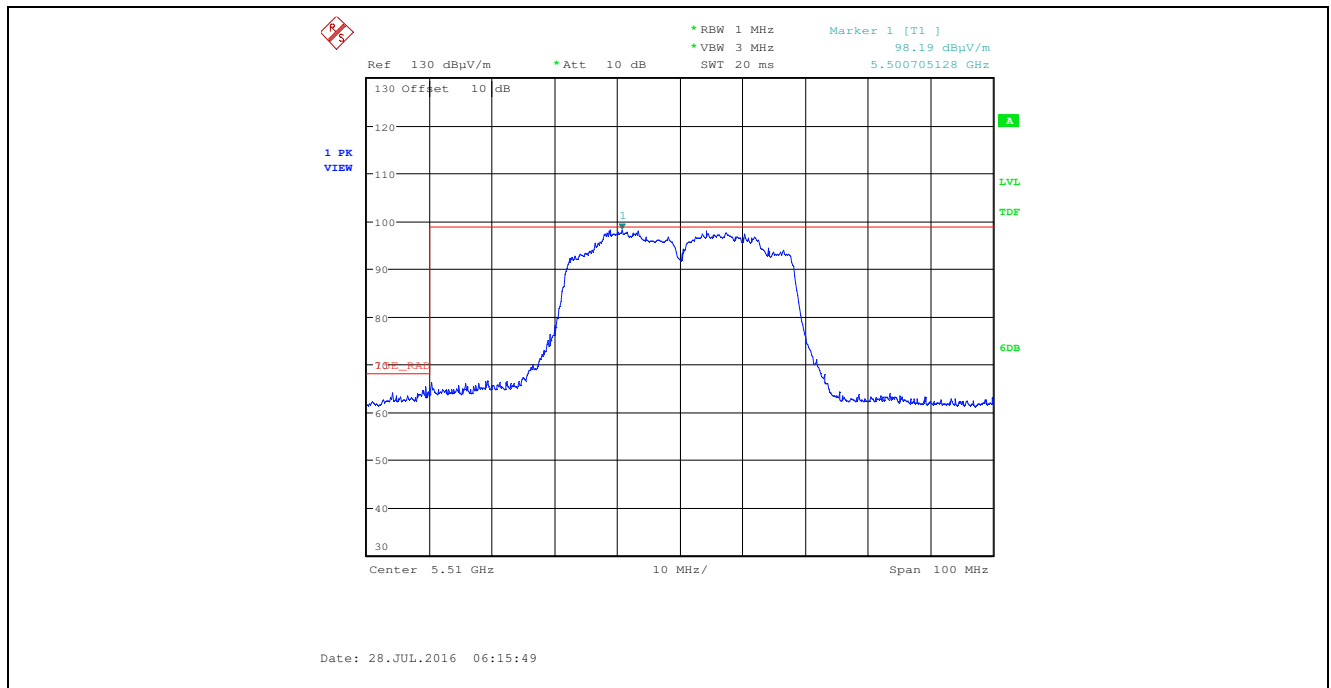
File #: 16CDTX003_FCC15E407
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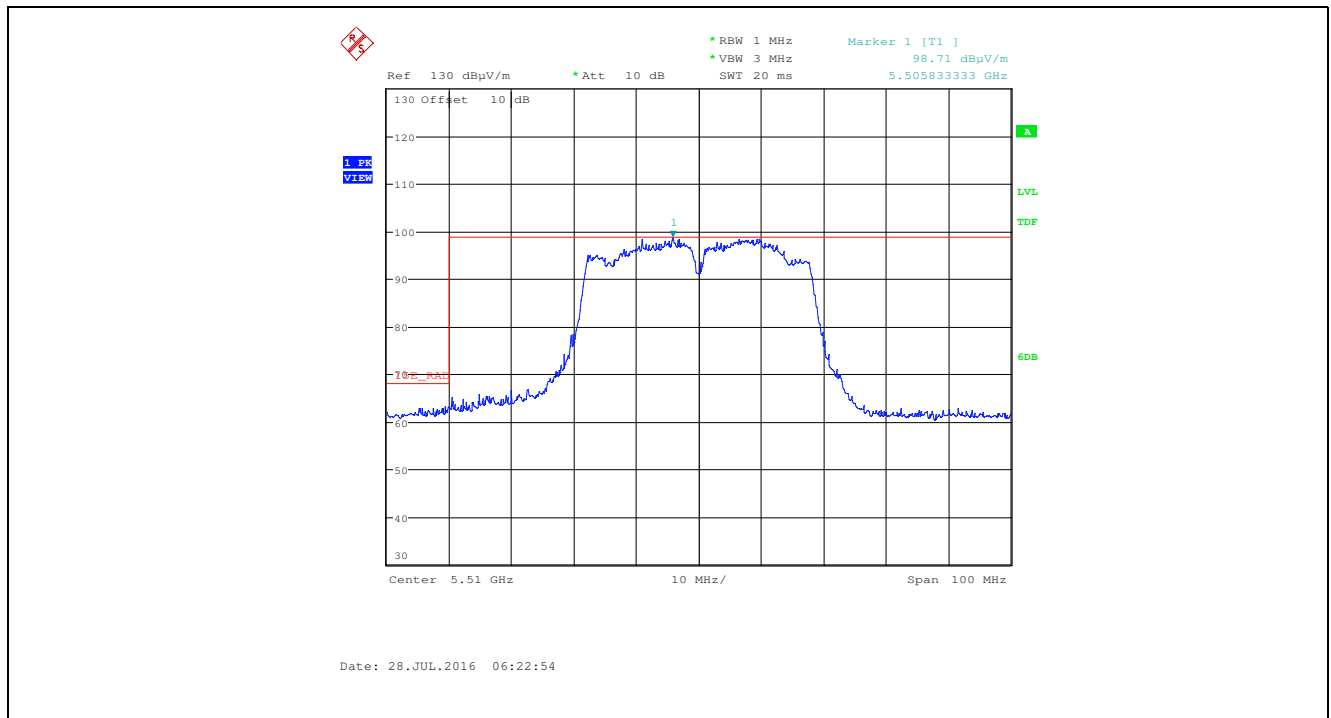
Plot 5.3.10.1.21. Band-Edge Rad Emissions, 802.11n HT20, HT4, HT4, Ch 134, 5670 MHz, MIMO, Gain Control 27, Vertical Chain # 1 & 2



Plot 5.3.10.1.22. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 102, 5510 MHz, SISO, Gain Control 27, Horiz, Chain # 1



Plot 5.3.10.1.23. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 102, 5510 MHz, SISO, Gain Control 27, Horiz, Chain # 2



[illegible]

Ref 130 dBμV/m *Att 10 dB *RBW 1 MHz *VBW 3 MHz *SWT 20 ms Marker 1 [T1] 104.37 dBμV/m 5.50583333 GHz

1 PK VIEW

130 Offset 10 dB

1

LVL

TDF

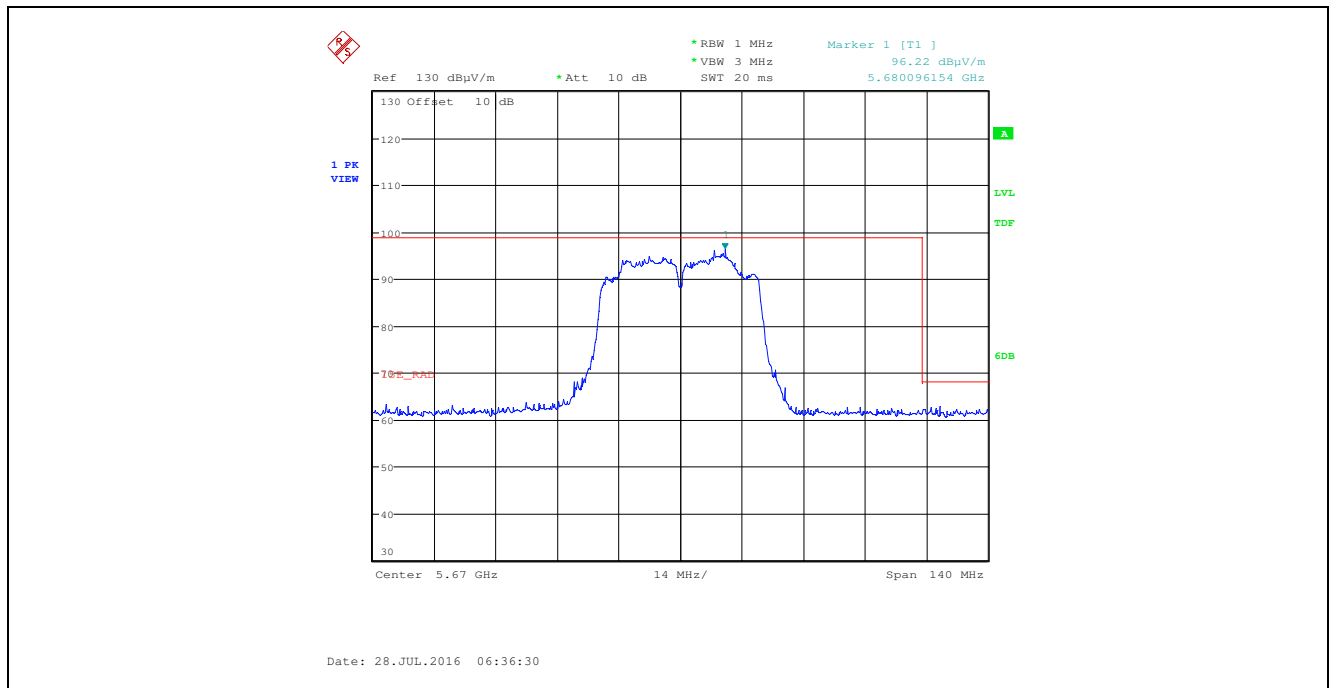
6dB

70dB Ref

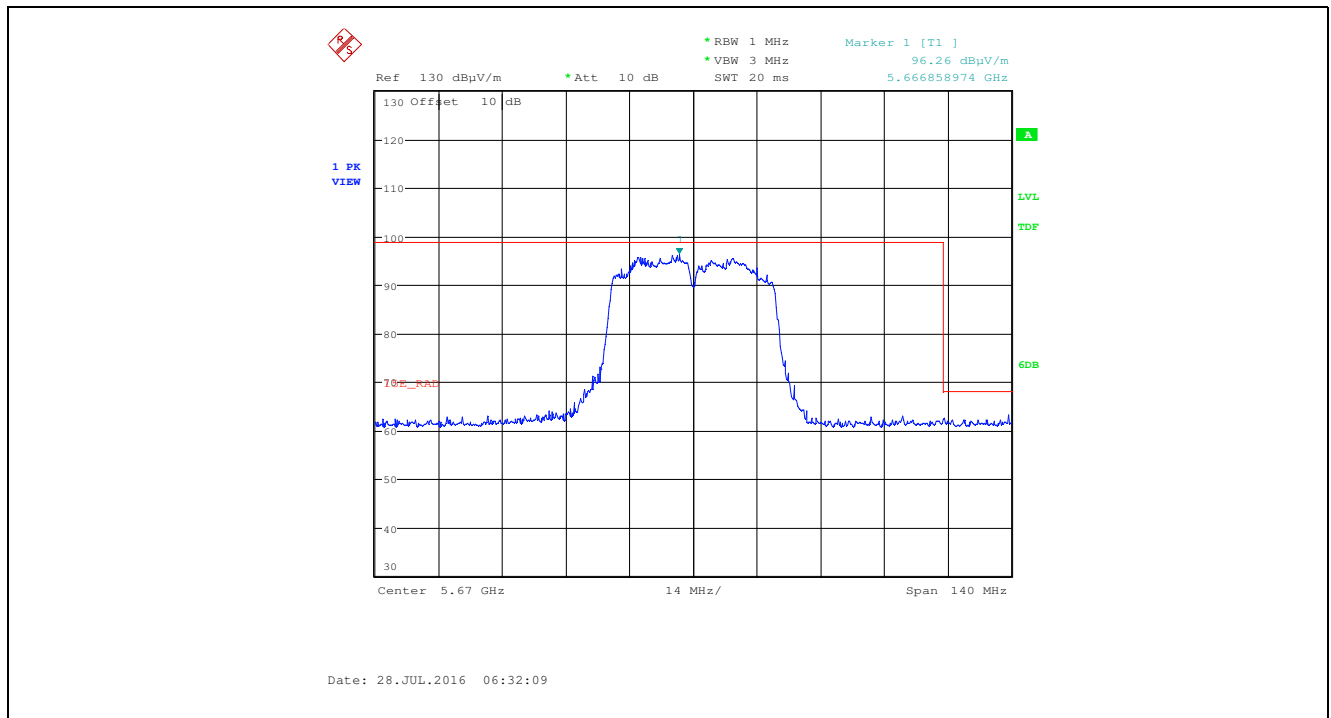
Center 5.51 GHz 10 MHz/ Span 100 MHz

Date: 27.JUL.2016 16:04:00

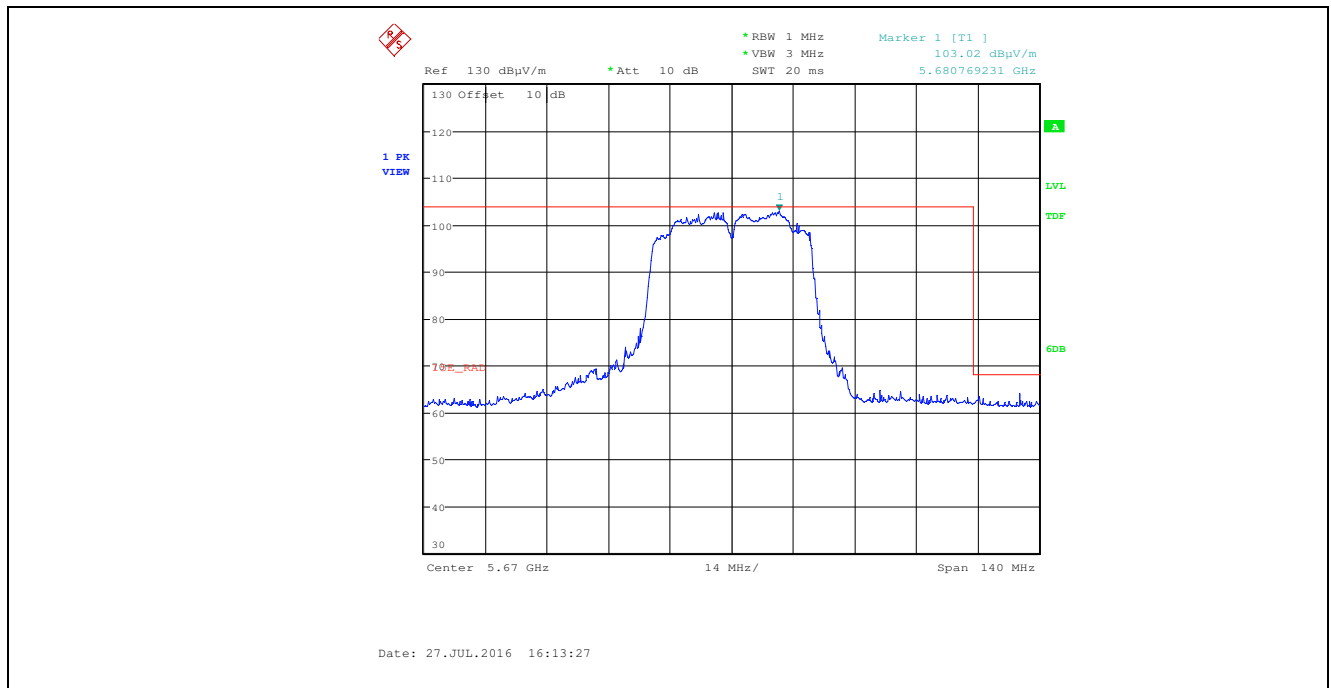
Plot 5.3.10.1.26. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 134, 5670 MHz, SISO, Gain Control 27, Horiz, Chain # 1



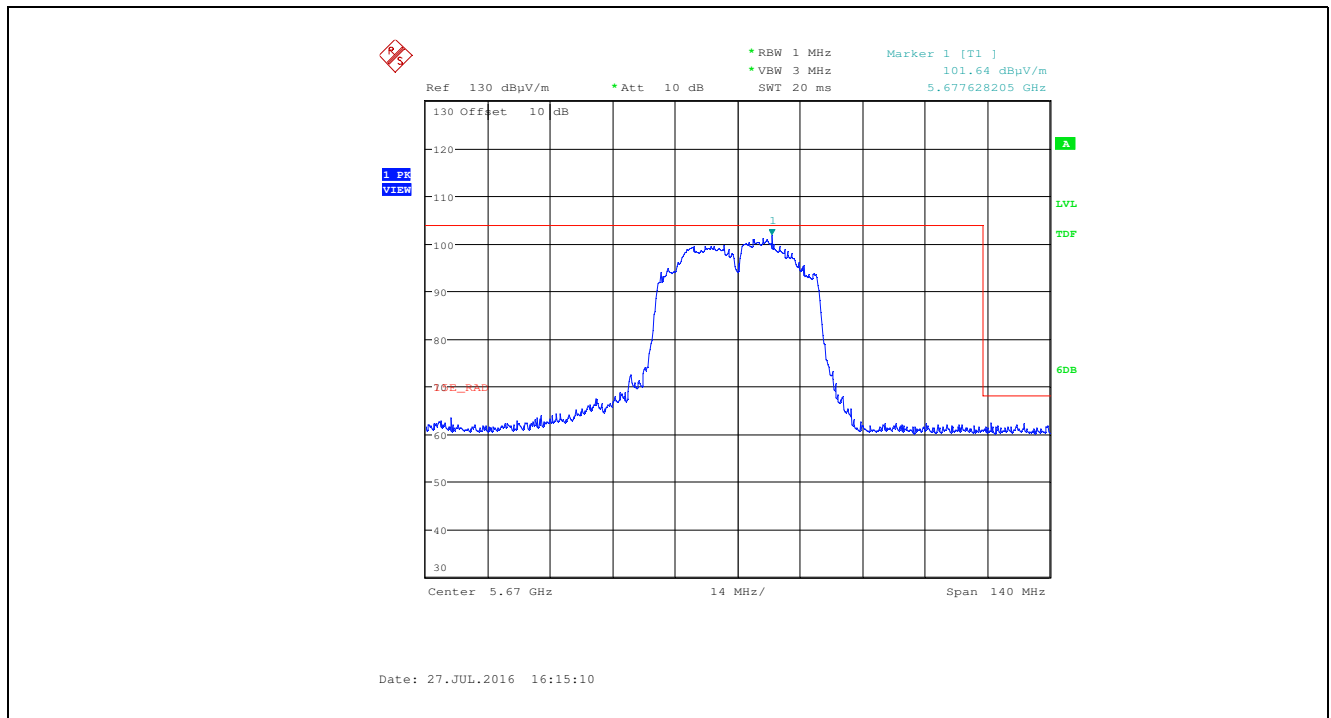
Plot 5.3.10.1.27. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 134, 5670 MHz, SISO, Gain Control 27, Horiz, Chain # 2



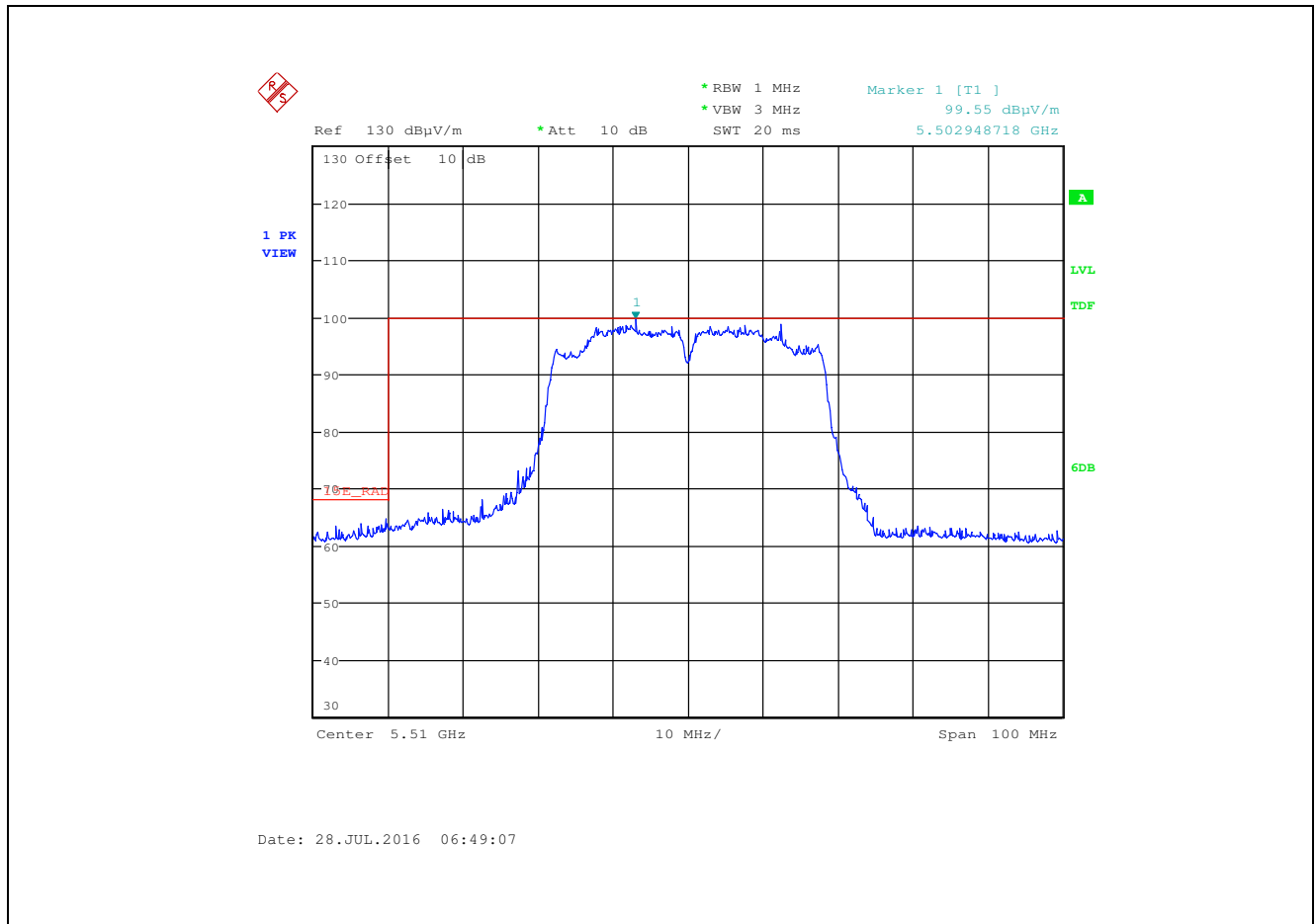
Plot 5.3.10.1.28. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 134, 5670 MHz, SISO, Gain Control 27, Vert, Chain # 1



Plot 5.3.10.1.29. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 134, 5670 MHz, SISO, Gain Control 27, Vert, Chain # 2



Plot 5.3.10.1.30. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 102, 5510 MHz, MIMO, Gain Control 27, Horizontal Chain # 1 & 2



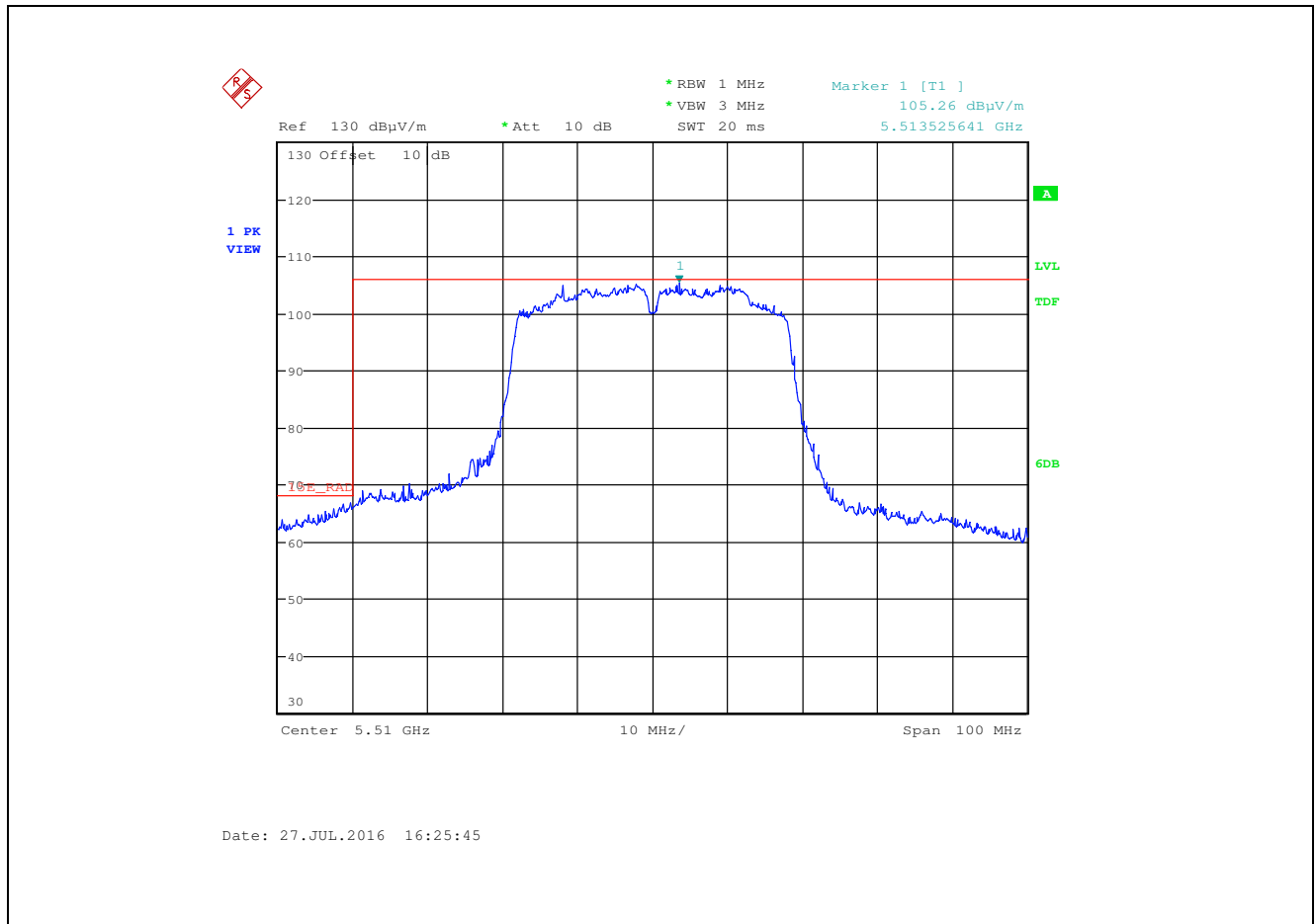
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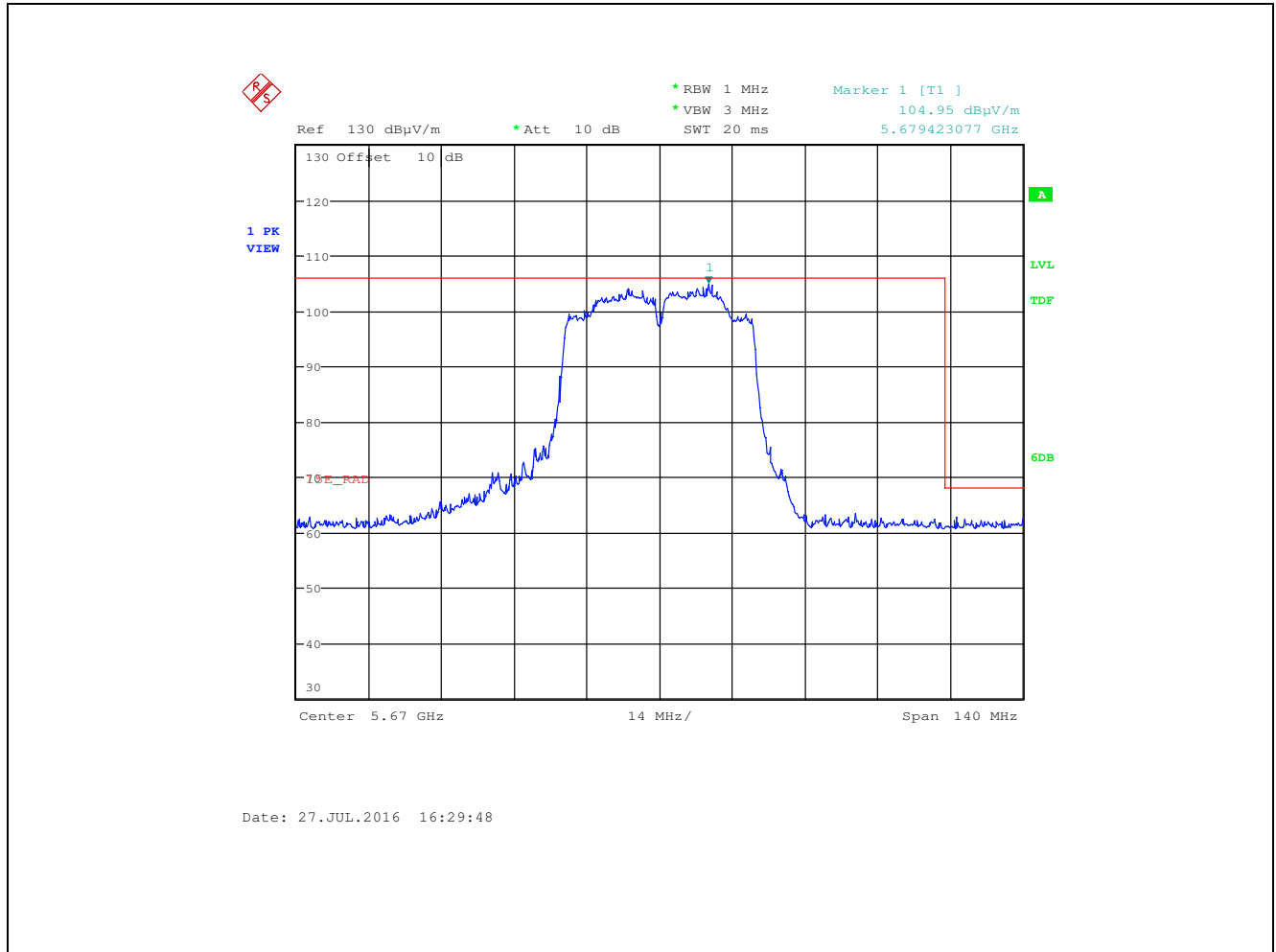
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Plot 5.3.10.1.31. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 102, 5510 MHz, MIMO, Gain Control 27, Vertical, Chain # 1 & 2

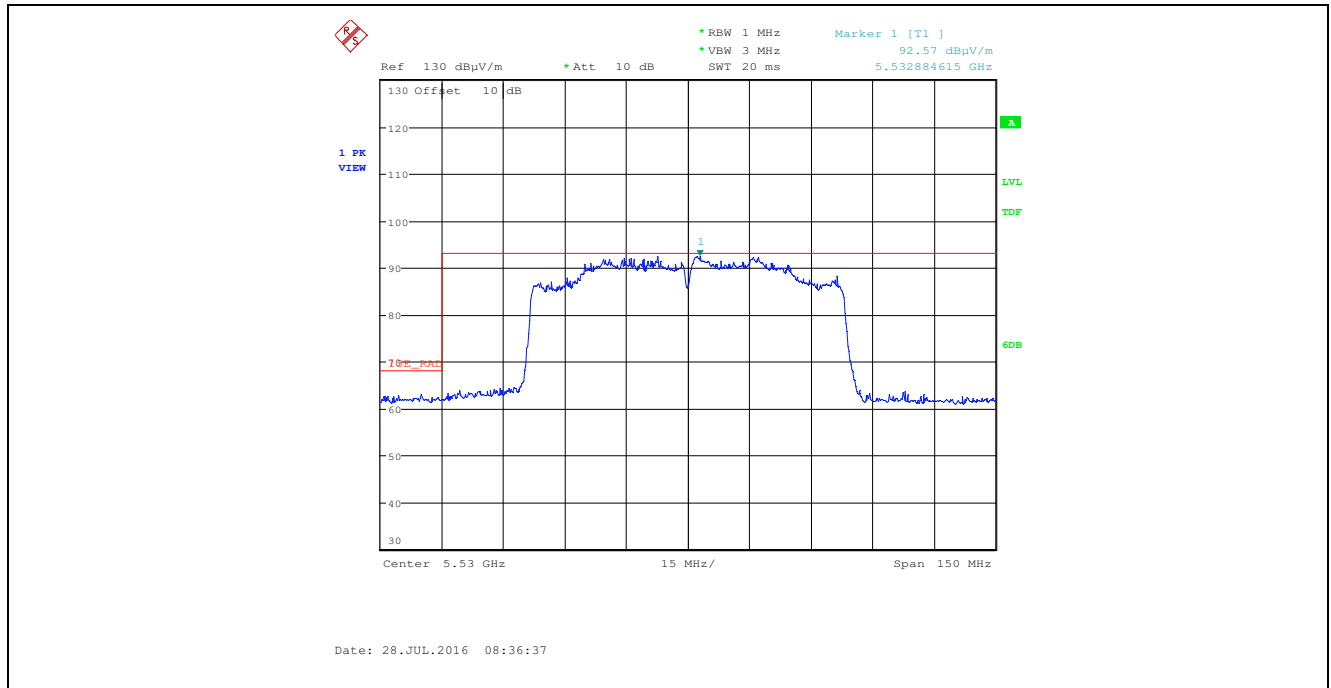


[illegible]

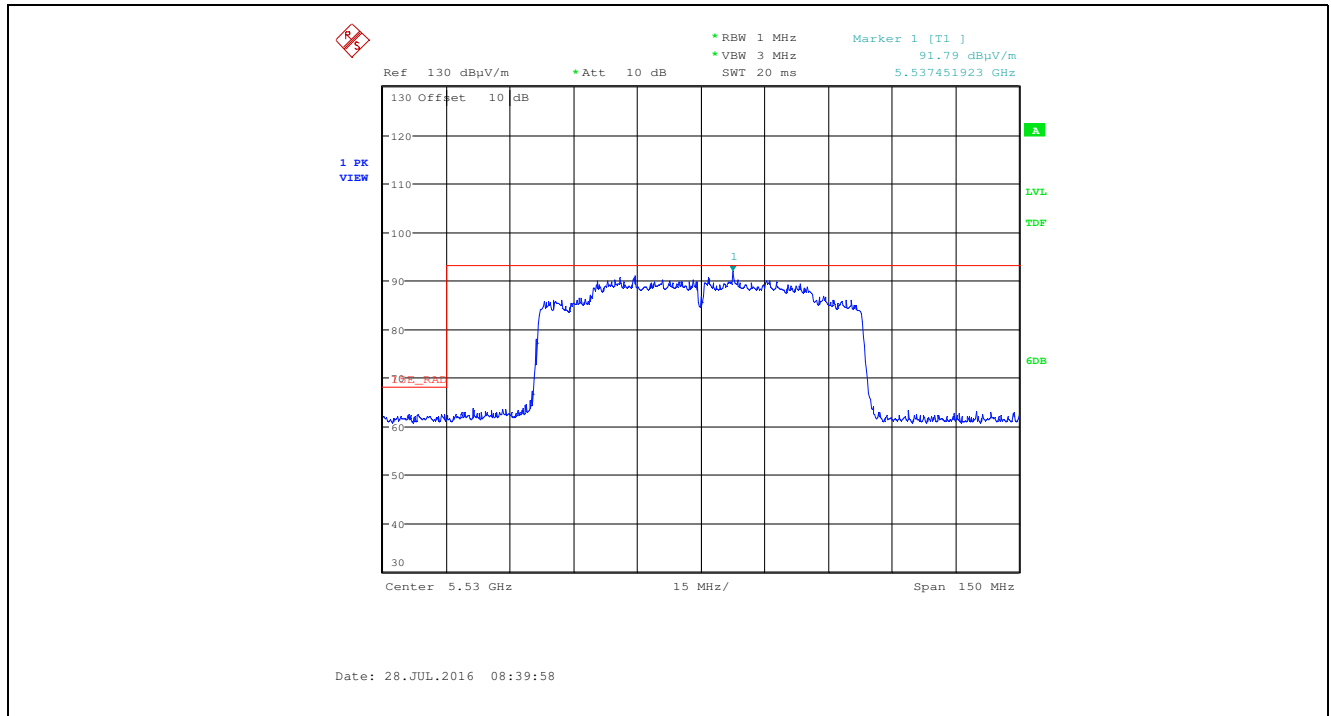
Plot 5.3.10.1.33. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 134, 5670 MHz, MIMO, Gain Control 27, Vertical
Chain # 1 & 2



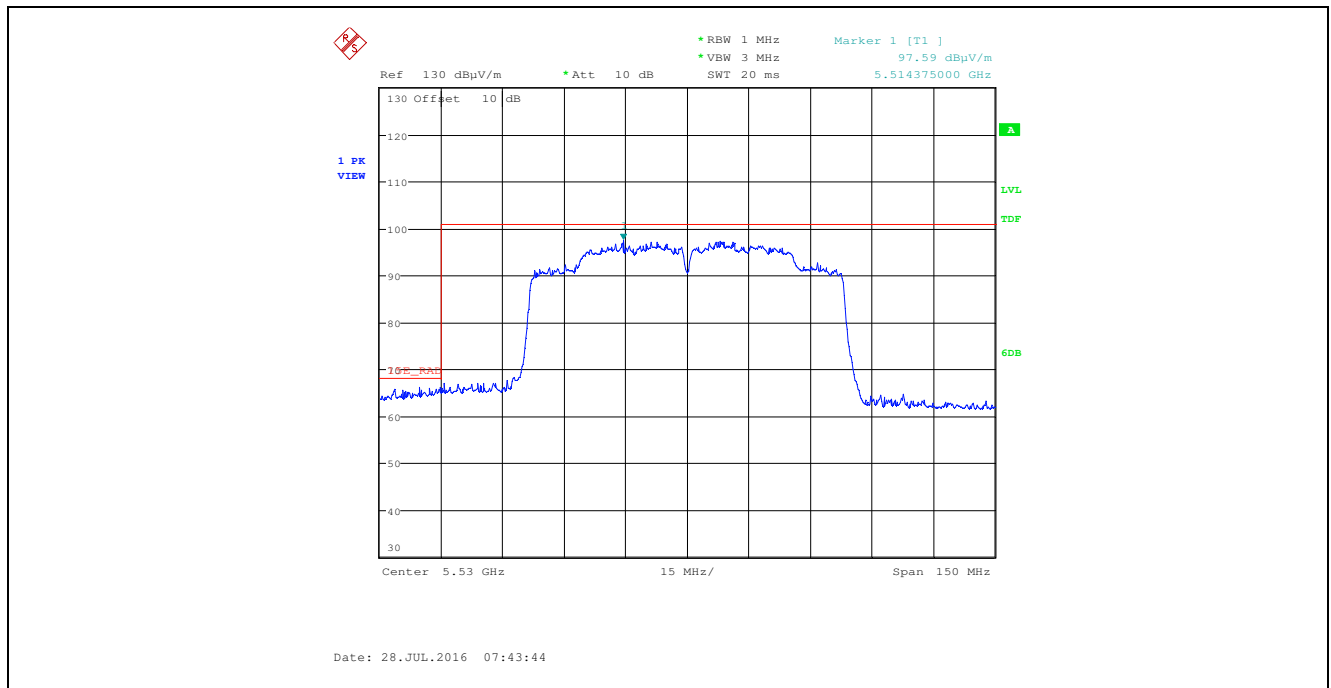
Plot 5.3.10.1.34. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 106, 5530 MHz, SISO, Gain Control 23, Horiz, Chain # 1



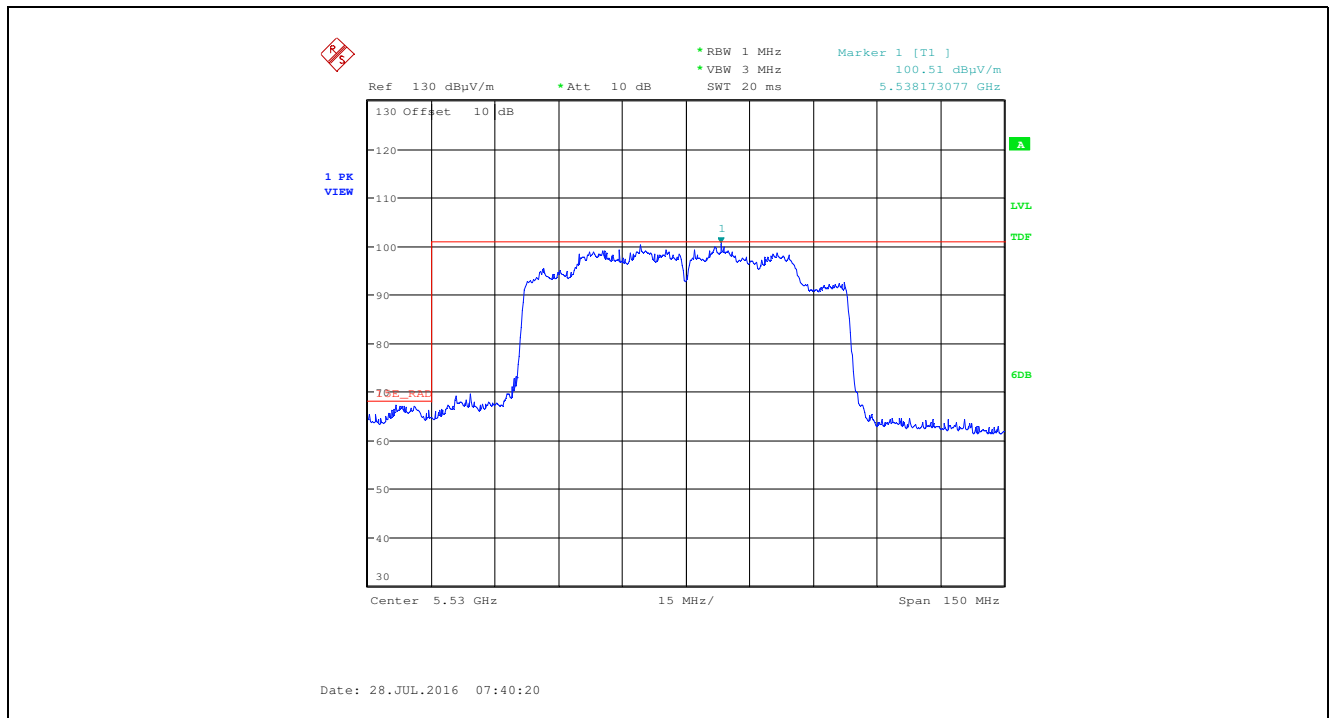
Plot 5.3.10.1.35. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 106, 5530 MHz, SISO, Gain Control 23, Horiz, Chain # 2



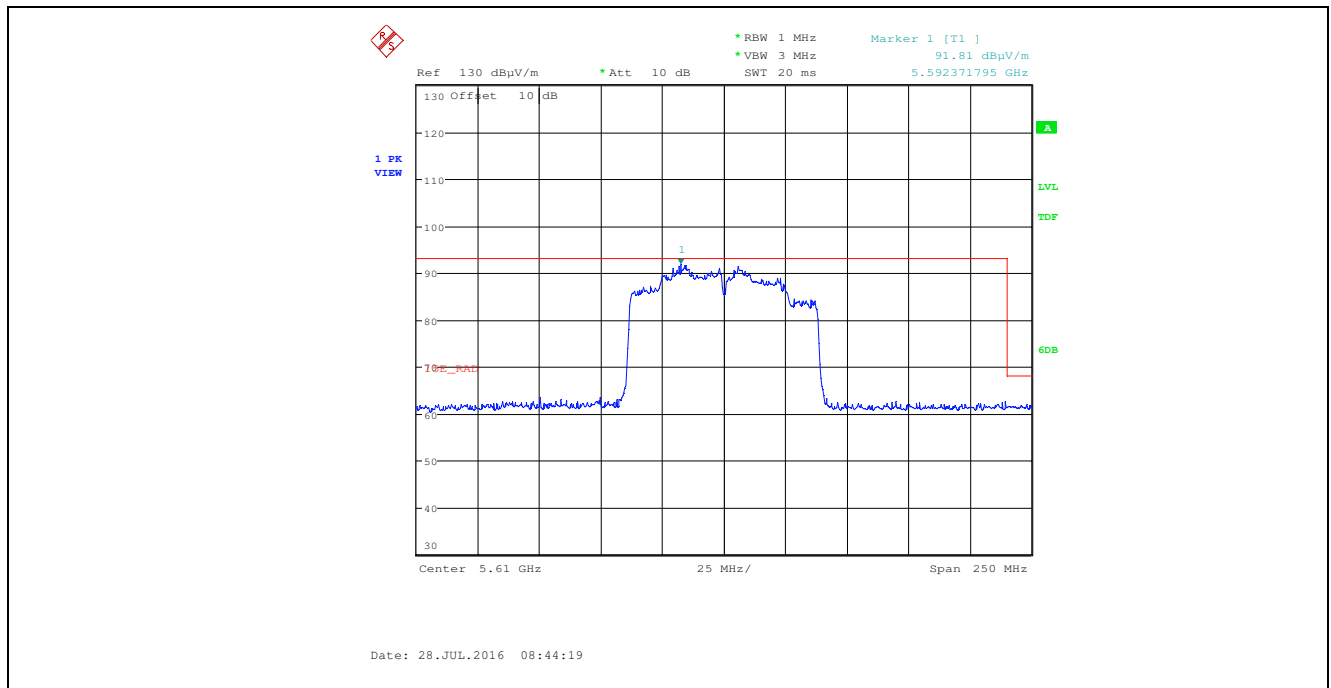
Plot 5.3.10.1.36. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 106, 5530 MHz, SISO, Gain Control 23, Vert, Chain # 1



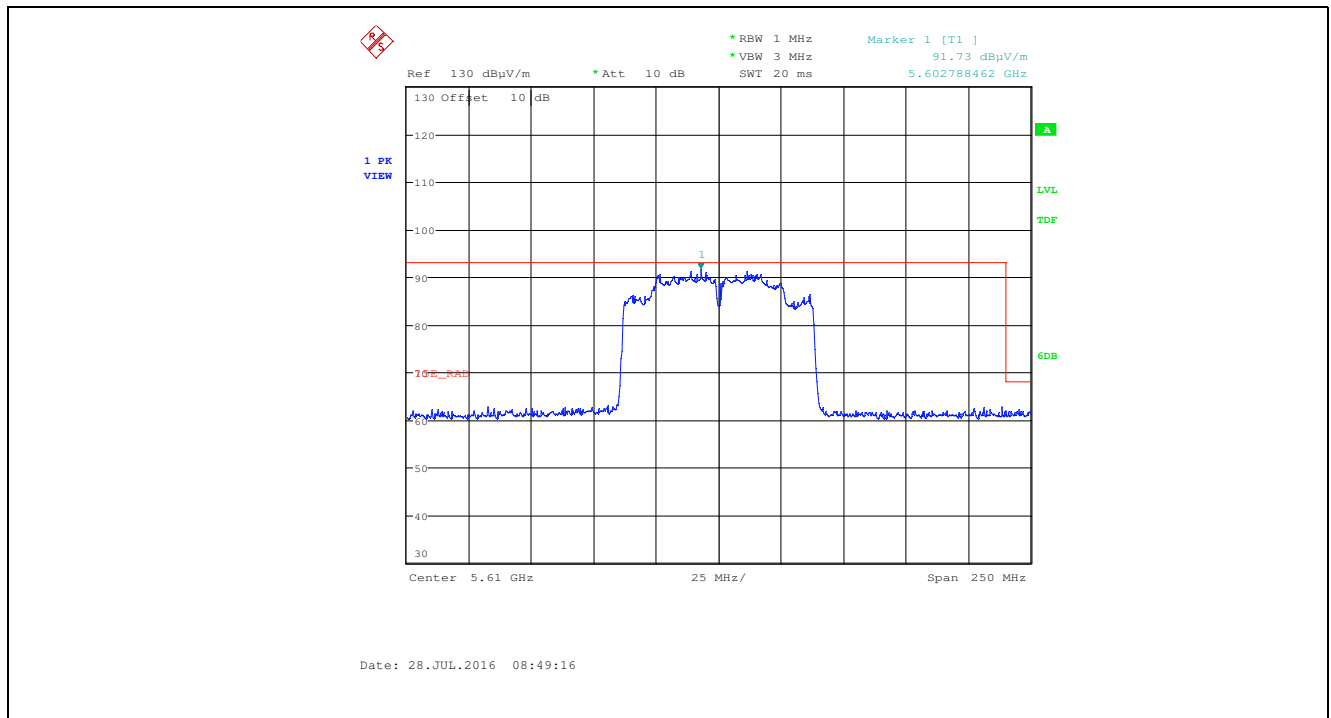
Plot 5.3.10.1.37. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 106, 5530 MHz, SISO, Gain Control 23, Vert, Chain # 2



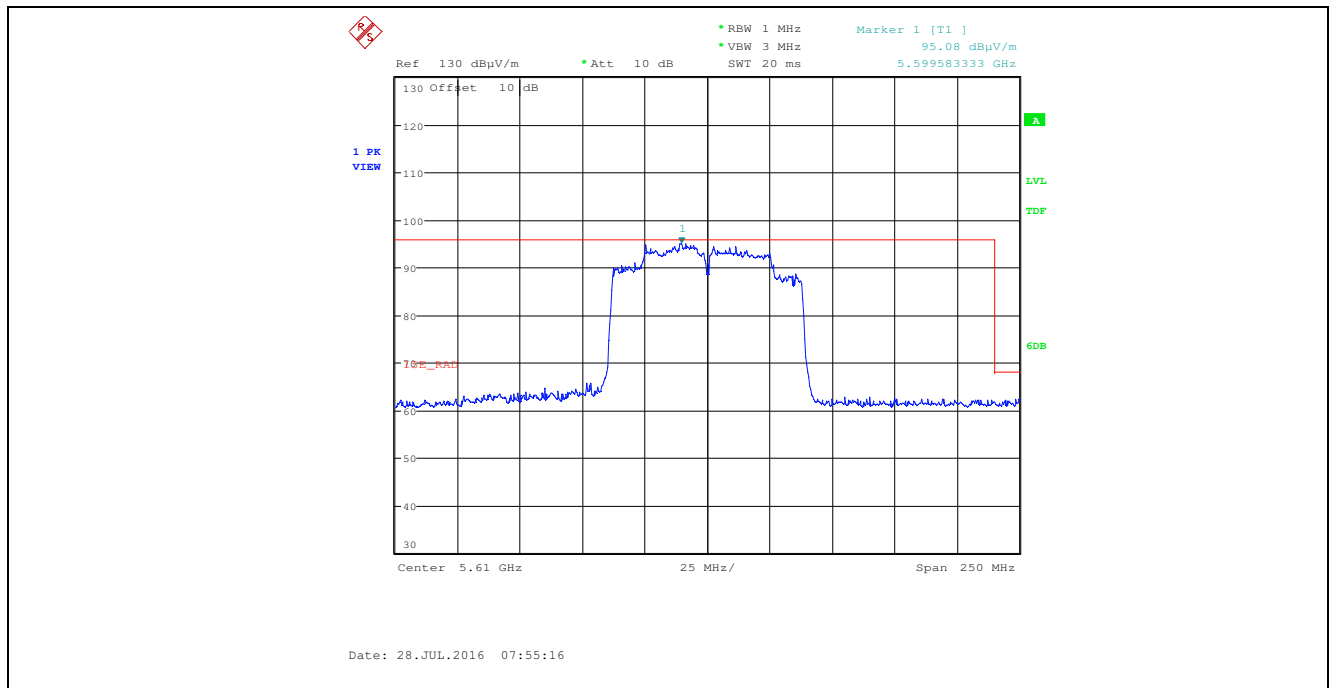
Plot 5.3.10.1.38. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 122, 5610 MHz, SISO, Gain Control 23, Horiz, Chain # 1



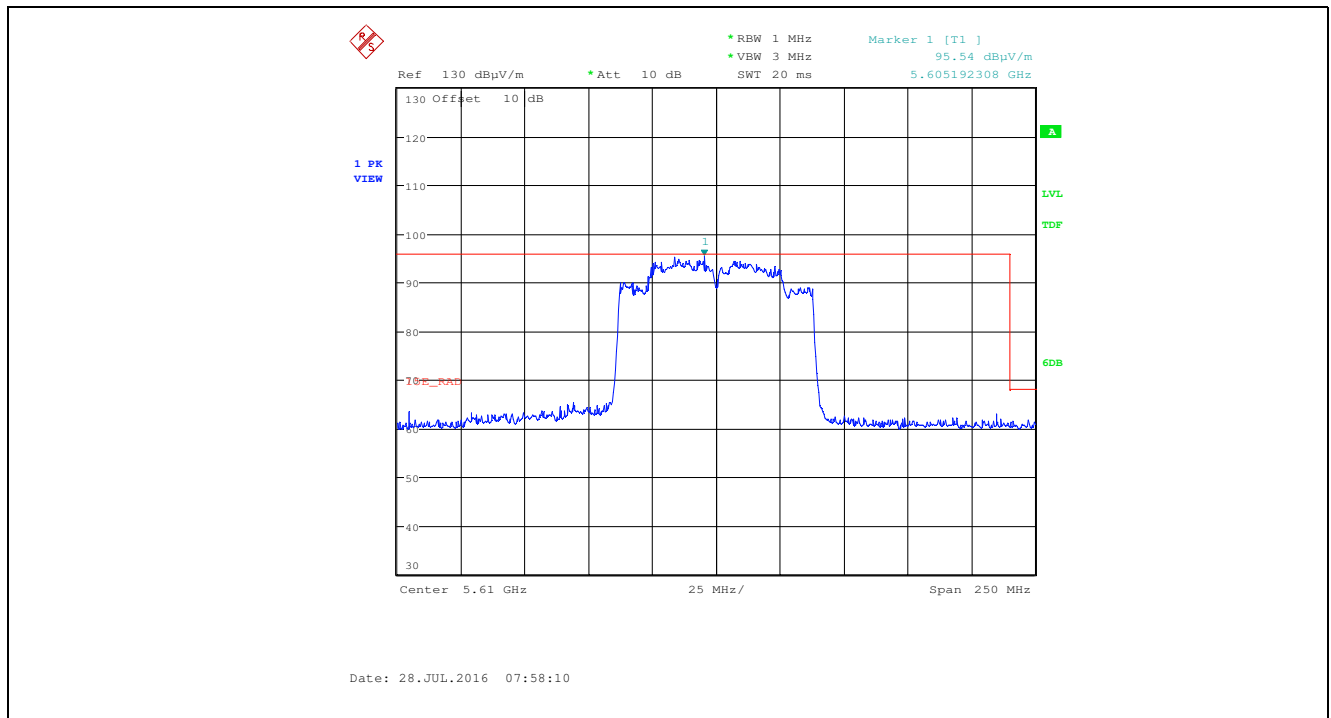
Plot 5.3.10.1.39. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 122, 5610 MHz, SISO, Gain Control 23, Horiz, Chain # 2



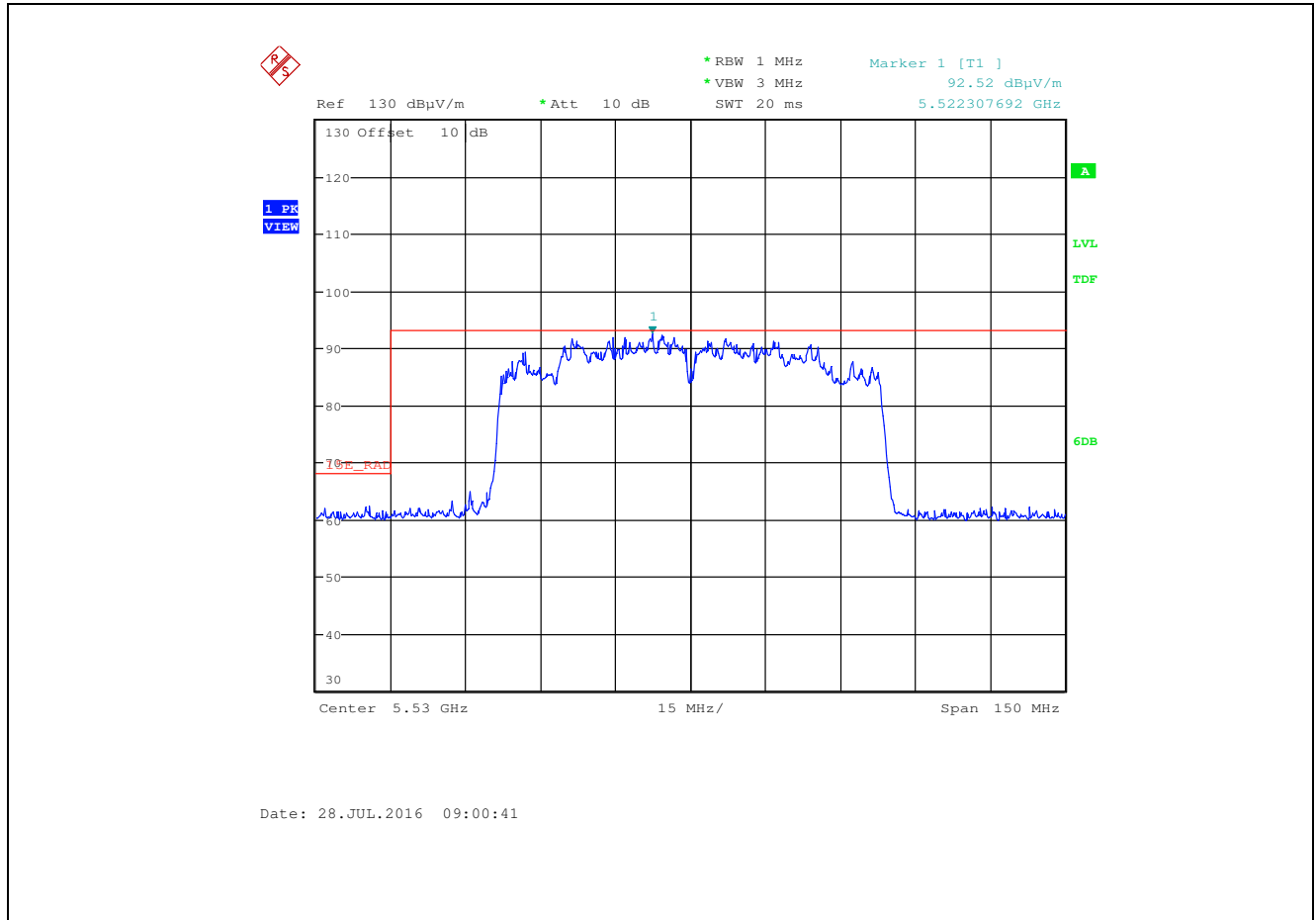
Plot 5.3.10.1.40. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 122, 5610 MHz, SISO, Gain Control 23, Vert, Chain # 1



Plot 5.3.10.1.41. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 122, 5610 MHz, SISO, Gain Control 23, Vert, Chain # 2

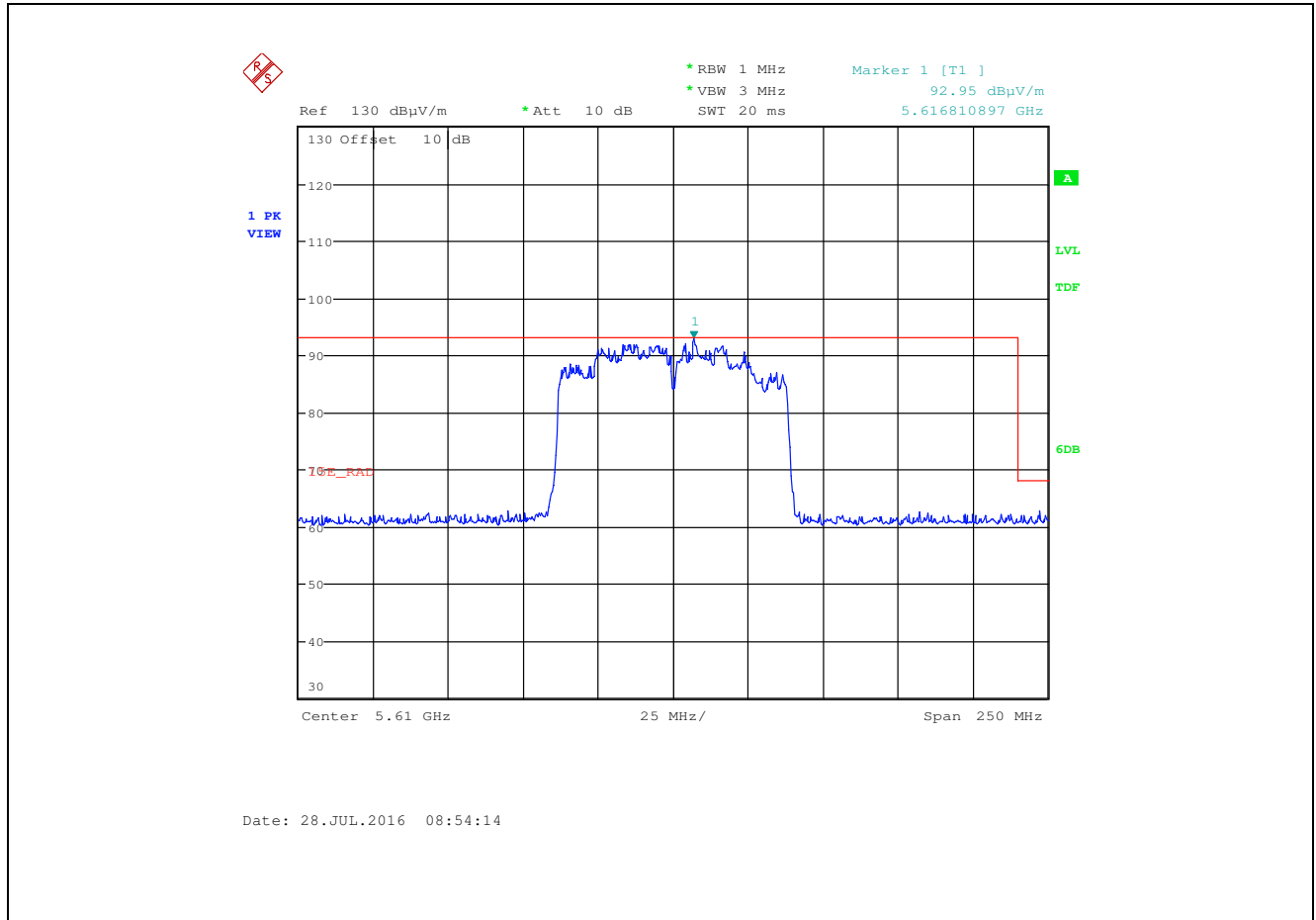


Plot 5.3.10.1.42. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 106, 5530 MHz, MIMO, Gain Control 23, Horizontal
Chain # 1 & 2



[illegible]

Plot 5.3.10.1.44. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 122, 5610 MHz, MIMO, Gain Control 23, Horizontal
Chain # 1 & 2



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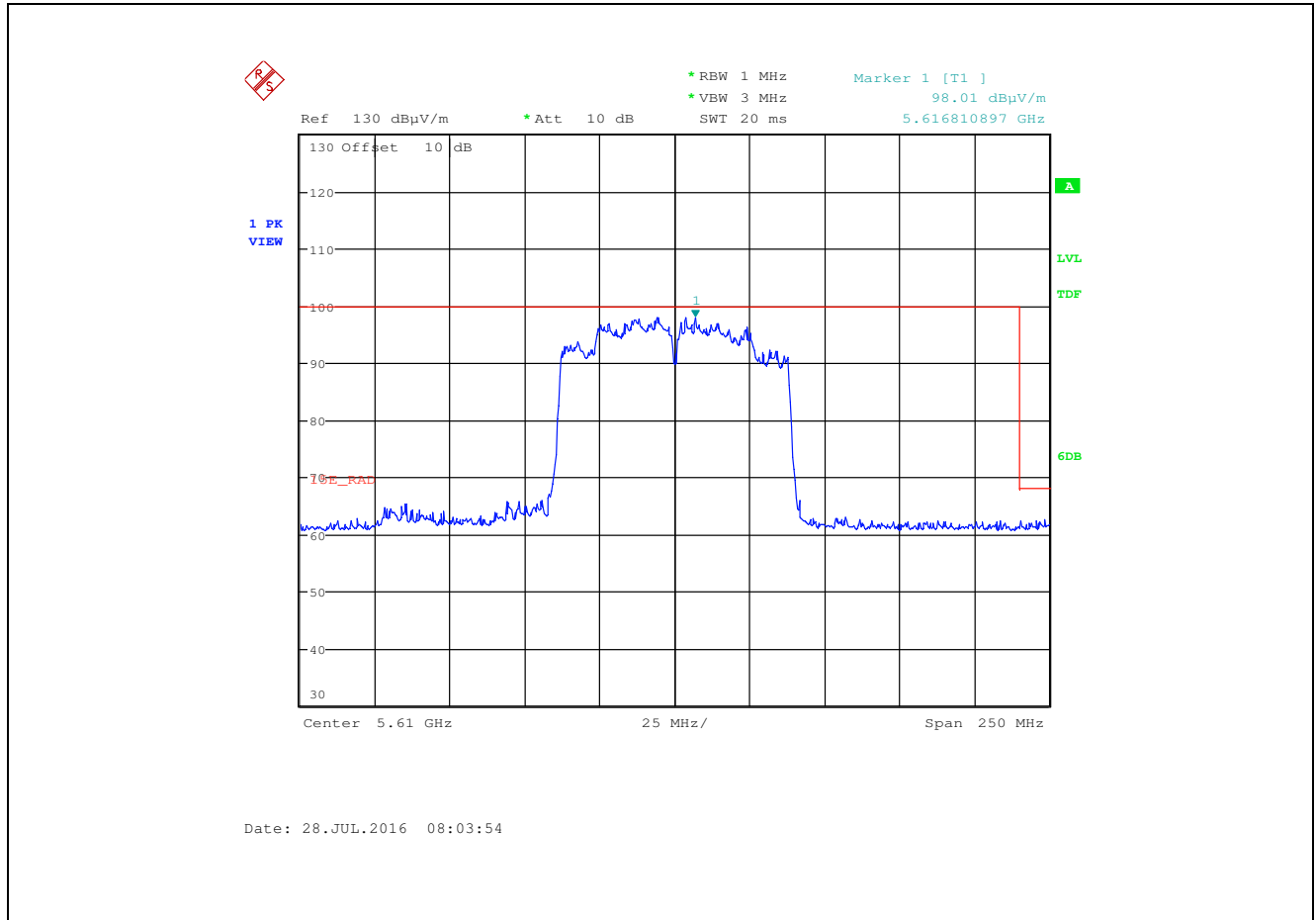
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Plot 5.3.10.1.45. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 122, 5610 MHz, MIMO, Gain Control 23, Vertical, Chain # 1 & 2



Note: As stated in the FCC presentation in April 2015 TCB Workshop for use of 802.11ac channels that straddle in the upper 5725 MHz, No band-edge measurements are required hence not tested.

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5.3.11. 5725-5850 MHz Band Tx Spurious Radiated

802.11a, 6 Mbps, Gain Control Setting 33, SISO

Fundamental Frequency:		5745 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11490	57.94	45.38	V	74.0	54.0	68.2	-8.6	Pass*
11490	59.74	48.25	H	74.0	54.0	68.2	-5.7	Pass*
22980	50.58	--	V	74.0	54.0	68.2	-3.4	Pass*
22980	51.79	--	H	74.0	54.0	68.2	-2.2	Pass*

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

Fundamental Frequency:		5785 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11570	58.42	45.77	V	74.0	54.0	68.2	-8.2	Pass
11570	61.74	48.74	H	74.0	54.0	68.2	-5.3	Pass
23140	50.72	--	V	74.0	54.0	68.2	-17.5	Pass*
23140	53.11	--	H	74.0	54.0	68.2	-15.1	Pass*

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

Fundamental Frequency:		5825 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11650	60.31	46.84	V	74.0	54.0	68.2	-7.2	Pass
11650	61.19	48.92	H	74.0	54.0	68.2	-5.1	Pass
23300	49.47	--	V	74.0	54.0	68.2	-18.7	Pass*
23300	51.37	--	H	74.0	54.0	68.2	-16.8	Pass*

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

802.11n HT20, HT4, Gain Control Setting 33, SISO & MIMO

Fundamental Frequency:		5745 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11490	59.36	46.27	V	74.0	54.0	68.2	-7.7	Pass*
11490	61.47	48.21	H	74.0	54.0	68.2	-5.8	Pass*
22980	51.42	--	V	74.0	54.0	68.2	-2.6	Pass*
22980	51.74	--	H	74.0	54.0	68.2	-2.3	Pass*

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

Fundamental Frequency:		5785 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11570	60.42	45.51	V	74.0	54.0	68.2	-8.5	Pass
11570	61.04	48.18	H	74.0	54.0	68.2	-5.3	Pass
23140	51.94	--	V	74.0	54.0	68.2	-16.3	Pass*
23140	51.97	--	H	74.0	54.0	68.2	-16.2	Pass*

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

Fundamental Frequency:		5825 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11650	59.45	46.42	V	74.0	54.0	68.2	-7.6	Pass
11650	62.98	48.65	H	74.0	54.0	68.2	-5.3	Pass
23300	48.86	--	V	74.0	54.0	68.2	-19.3	Pass*
23300	51.80	--	H	74.0	54.0	68.2	-16.4	Pass*

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

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802.11n HT40, HT4, Gain Control Setting 30, SISO & MIMO

Fundamental Frequency:		5755 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11510	57.21	43.59	V	74.0	54.0	68.2	-10.4	Pass*
11510	56.35	43.93	H	74.0	54.0	68.2	-10.1	Pass*
23020	51.09	--	V	74.0	54.0	68.2	-2.9	Pass*
23020	52.72	--	H	74.0	54.0	68.2	-2.3	Pass*

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

Fundamental Frequency:		5795 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11590	57.60	43.65	V	74.0	54.0	68.2	-8.5	Pass
11590	56.79	43.68	H	74.0	54.0	68.2	-5.3	Pass
23180	51.05	--	V	74.0	54.0	68.2	-16.3	Pass*
23180	52.16	--	H	74.0	54.0	68.2	-16.2	Pass*

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

802.11ac80, VHT6, Gain Control Setting 28, SISO & MIMO

Fundamental Frequency:		5775 MHz						
Test Frequency Range:		30 MHz – 40 GHz						
Frequency (MHz)	RF Peak Level (dBμV/m)	RF Avg Level (dBμV/m)	Antenna Plane (H/V)	Peak Limit 15.209 (dBμV/m)	Avg Limit 15.209 (dBμV/m)	Limit 15.407(b) (dBμV/m)	Margin (dB)	Pass/Fail
11550	56.49	43.29	V	74.0	54.0	68.2	-10.7	Pass*
11550	56.80	46.59	H	74.0	54.0	68.2	-7.4	Pass*
23100	51.24	--	V	74.0	54.0	68.2	-2.8	Pass*
23100	51.88	--	H	74.0	54.0	68.2	-2.1	Pass*

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

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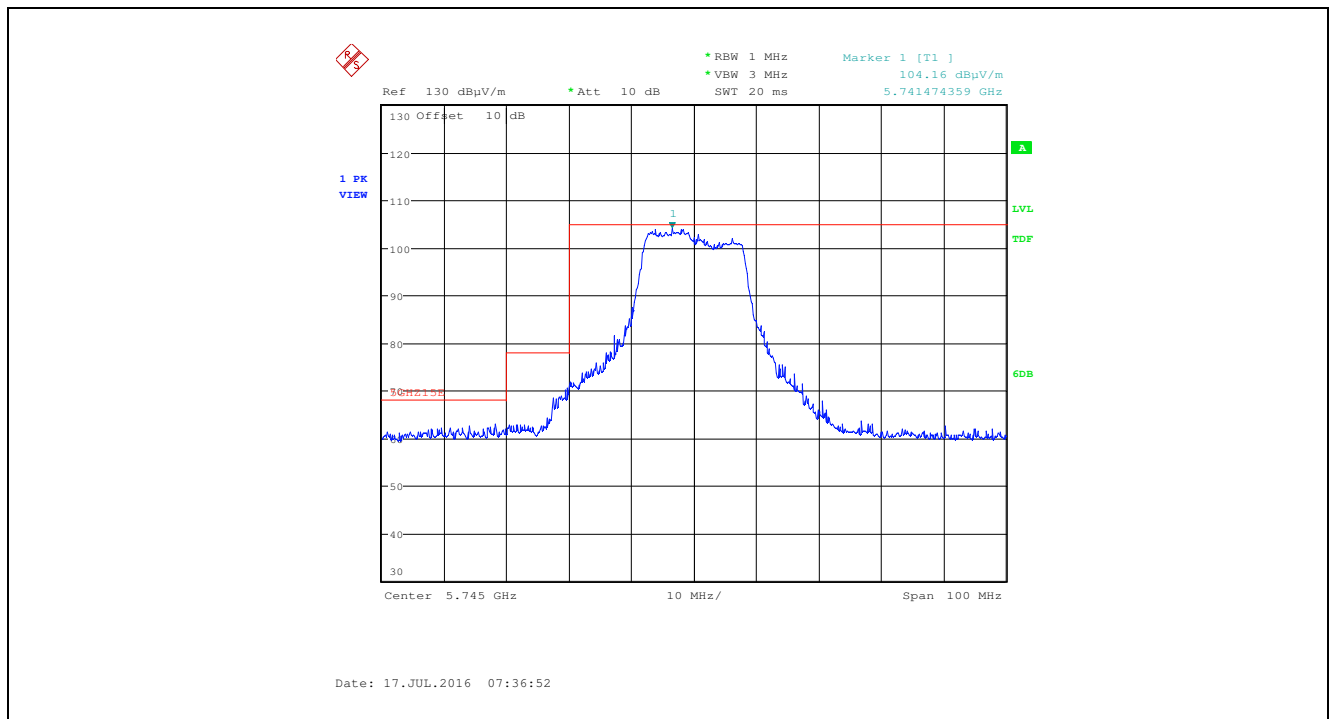
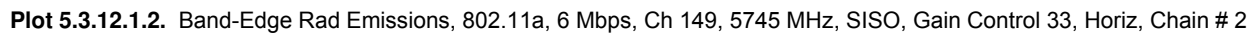
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

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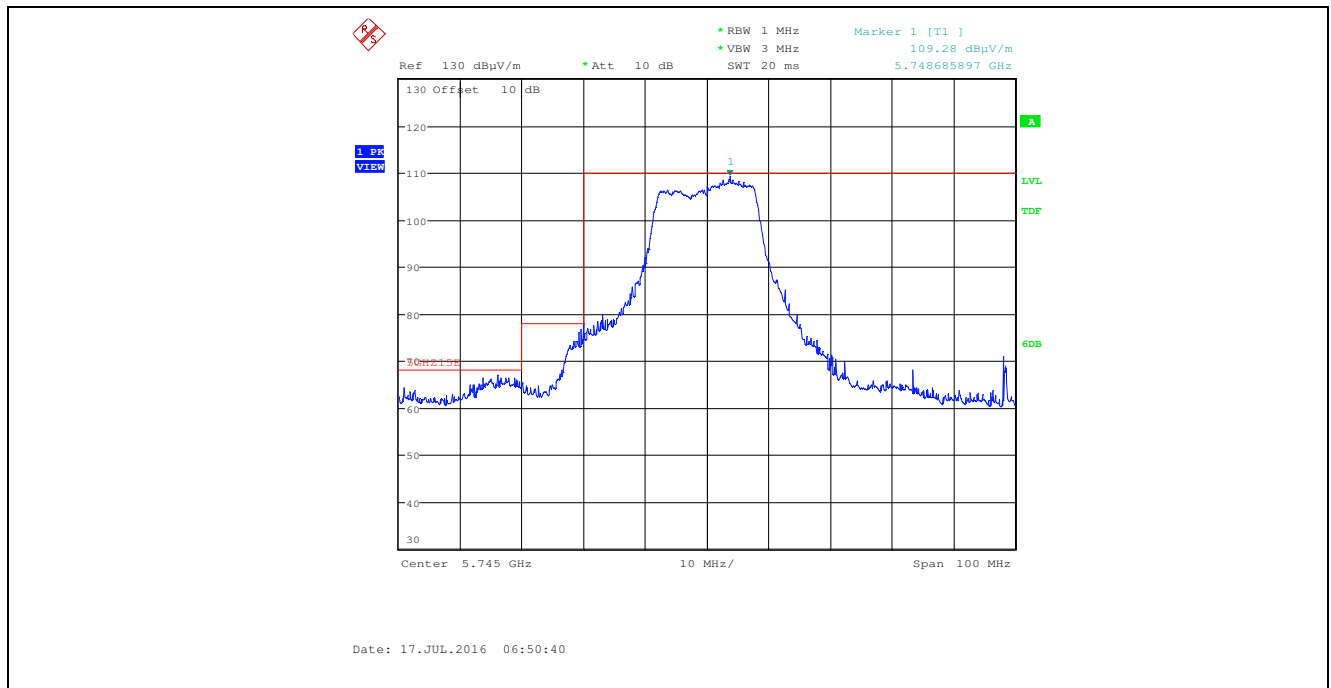
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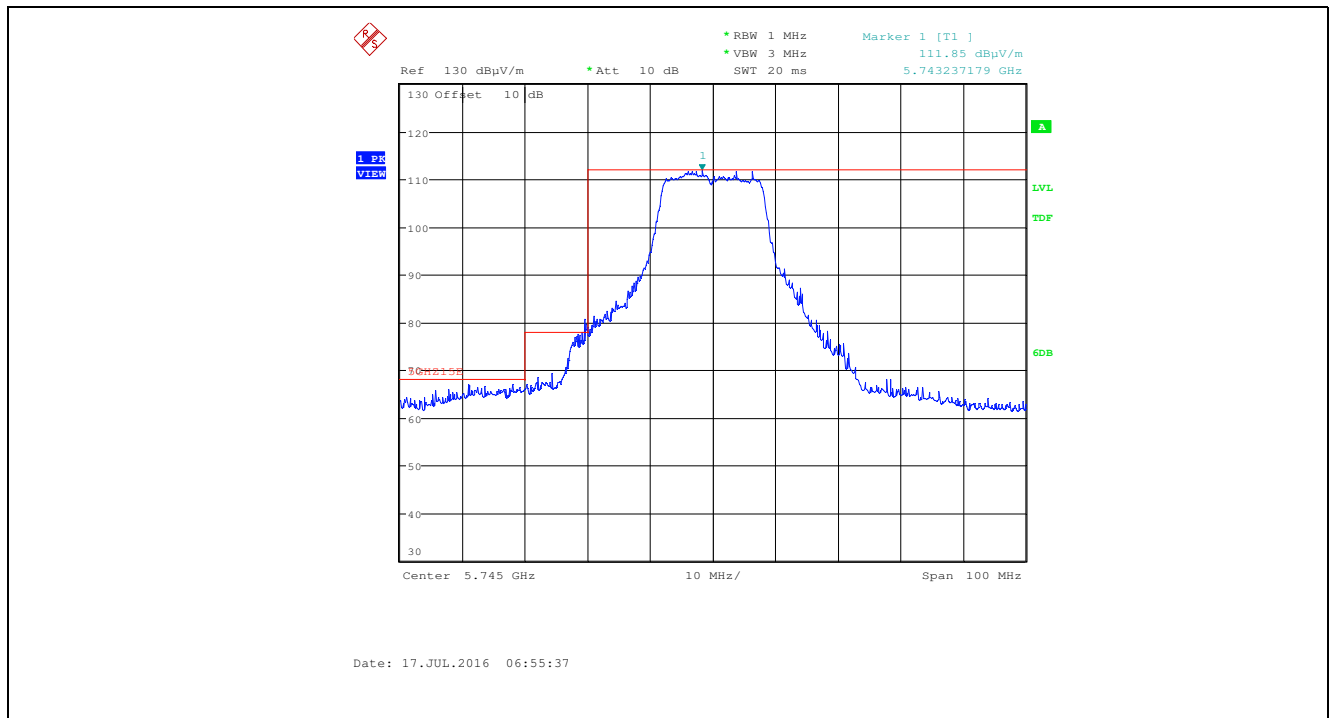
Plot 5.3.12.1.1. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 149, 5745 MHz, SISO, Gain Control 33, Horiz, Chain # 1



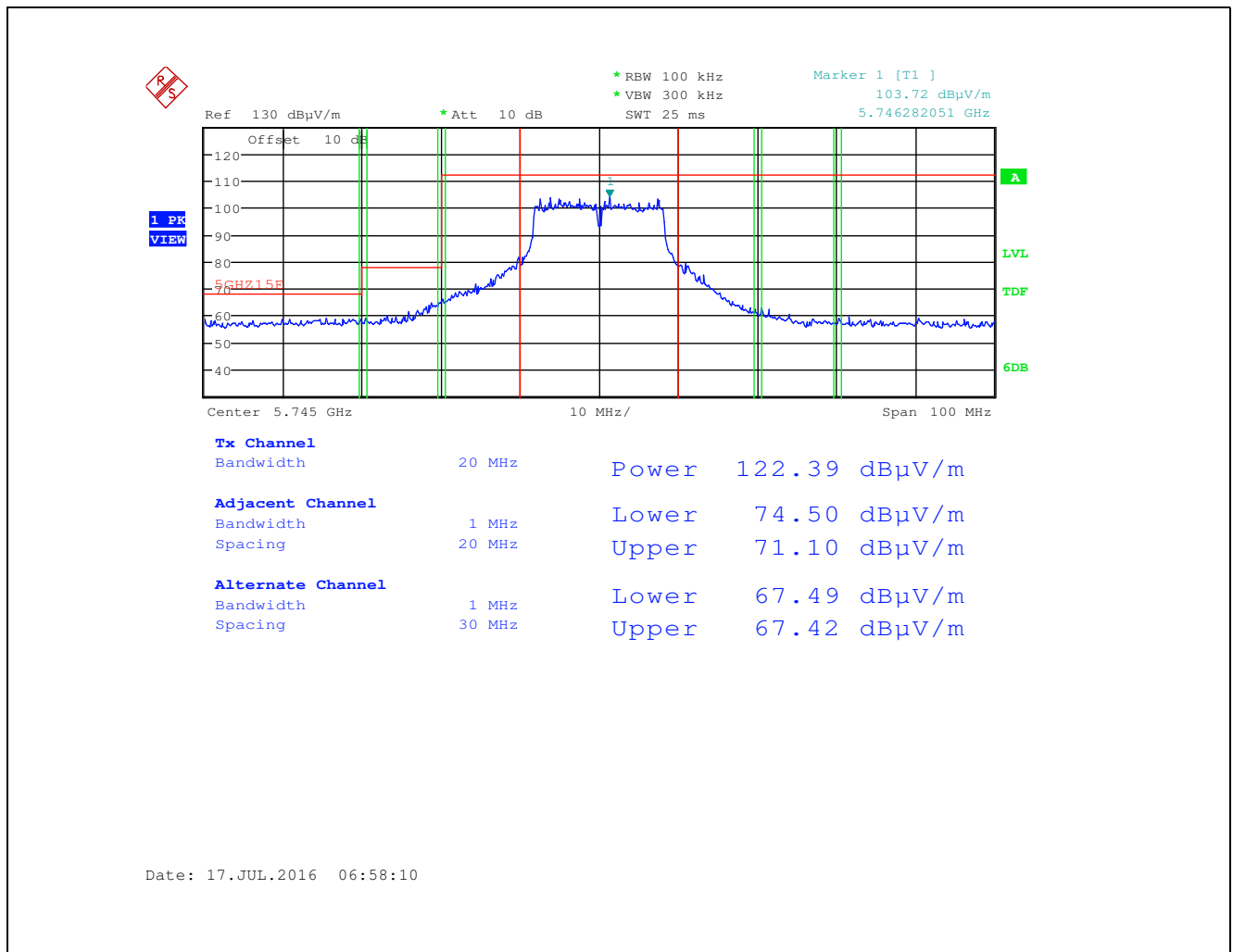
Plot 5.3.12.1.3. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 149, 5745 MHz, SISO, Gain Control 33, Vertical, Chain # 1



Plot 5.3.12.1.4. Band-Edge Rad Emissions, 802.11a, 6 Mbps, Ch 149, 5745 MHz, SISO, Gain Control 33, Vertical, Chain # 2



Plot 5.3.12.1.5. Chain # 2 Integration Method, 802.11a, 6 Mbps, Ch 149, 5745 MHz, SISO, Gain Control 33, Vertical



Ref 130 Offset 10 dB * Att 10 dB RBW 1 MHz Marker 1 [T1] 101.91 dBuV/m
 * Att 10 dB VBW 3 MHz 5.820833333 GHz
 SWT 20 ms

130 Offset 10 dB

1 PK View

1

101.91

100

90

80

70

60

50

40

30

Center 5.825 GHz 10 MHz/ Span 100 MHz

6DB

LVL

TDF

A

1 PK VIEW

Ref 130 dBμV/m * Att 10 dB * RBW 1 MHz * VBW 3 MHz * SWT 20 ms Marker 1 [T1] 101.52 dBμV/m 5.830448718 GHz

130 Offset 10 dB

120

110

100

90

80

70

60

50

40

30

5.825 GHz

10 MHz/

Span 100 MHz

A

LVL

TDF

6DB

5.825 GHz

101.52 dBm

Date: 17.JUL.2016 07:30:10

[illegible]

1 PK VIEW

130 Offset 10 dB

109.07 dBuV/m

5.82596154 GHz

60 dB

Center 5.825 GHz

10 MHz/

Span 100 MHz

1 RBW 1 MHz

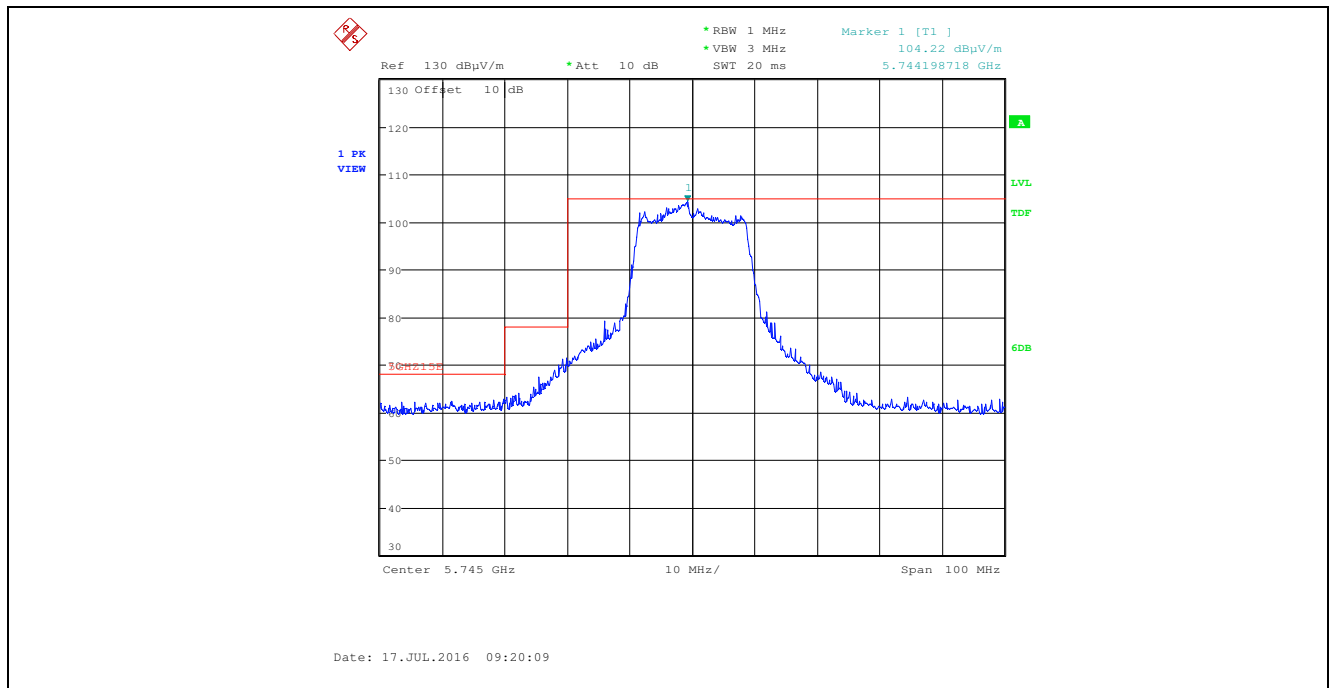
1 VBW 3 MHz

1 Att 10 dB

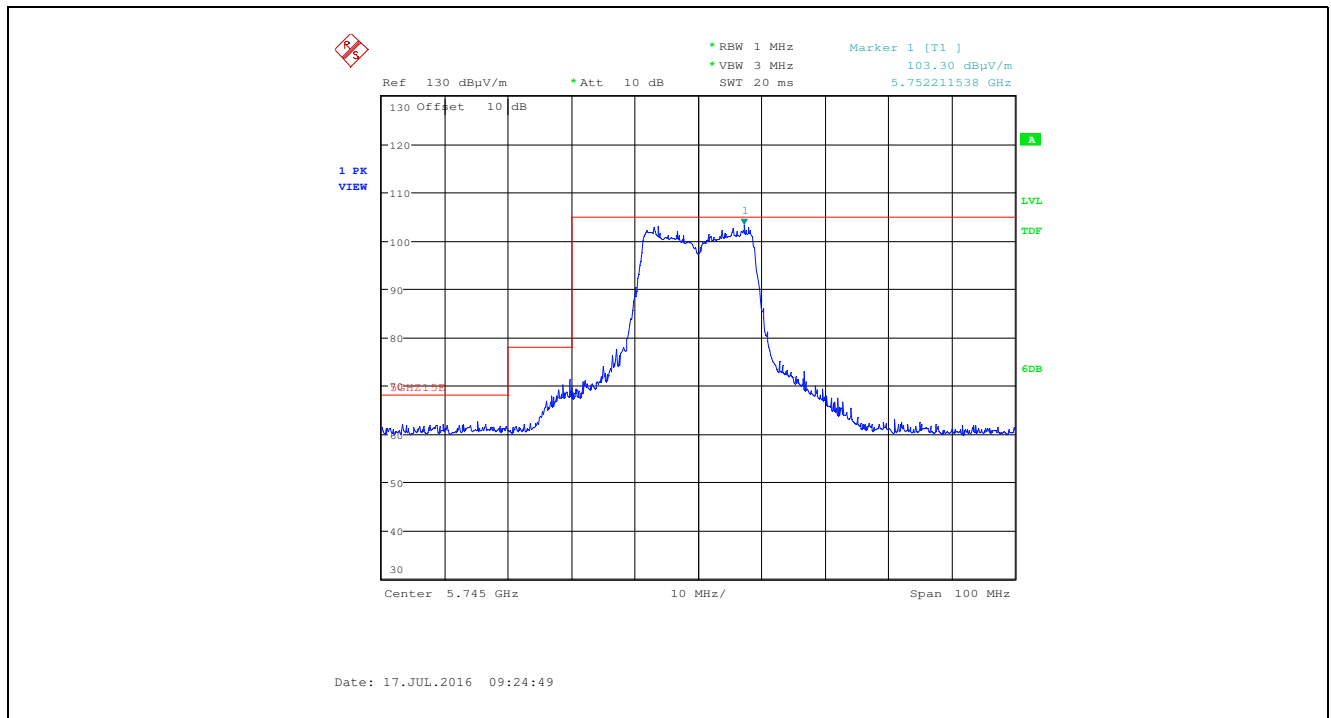
1 SWT 20 ms

Marker 1 [T1]

Plot 5.3.12.1.10. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 149, 5745 MHz, SISO, Gain Control 33, Horiz, Chain # 1



Plot 5.3.12.1.11. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 149, 5745 MHz, SISO, Gain Control 33, Horiz, Chain # 2



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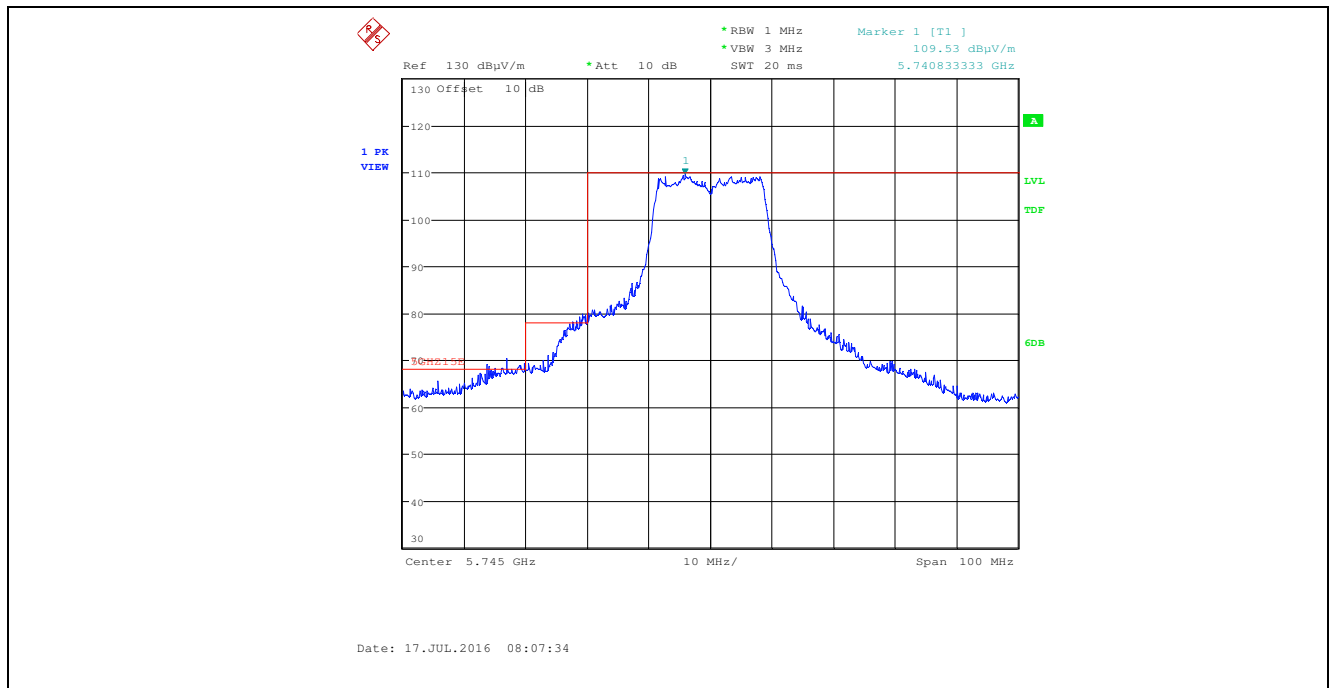
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 16CDTX003_FCC15E407

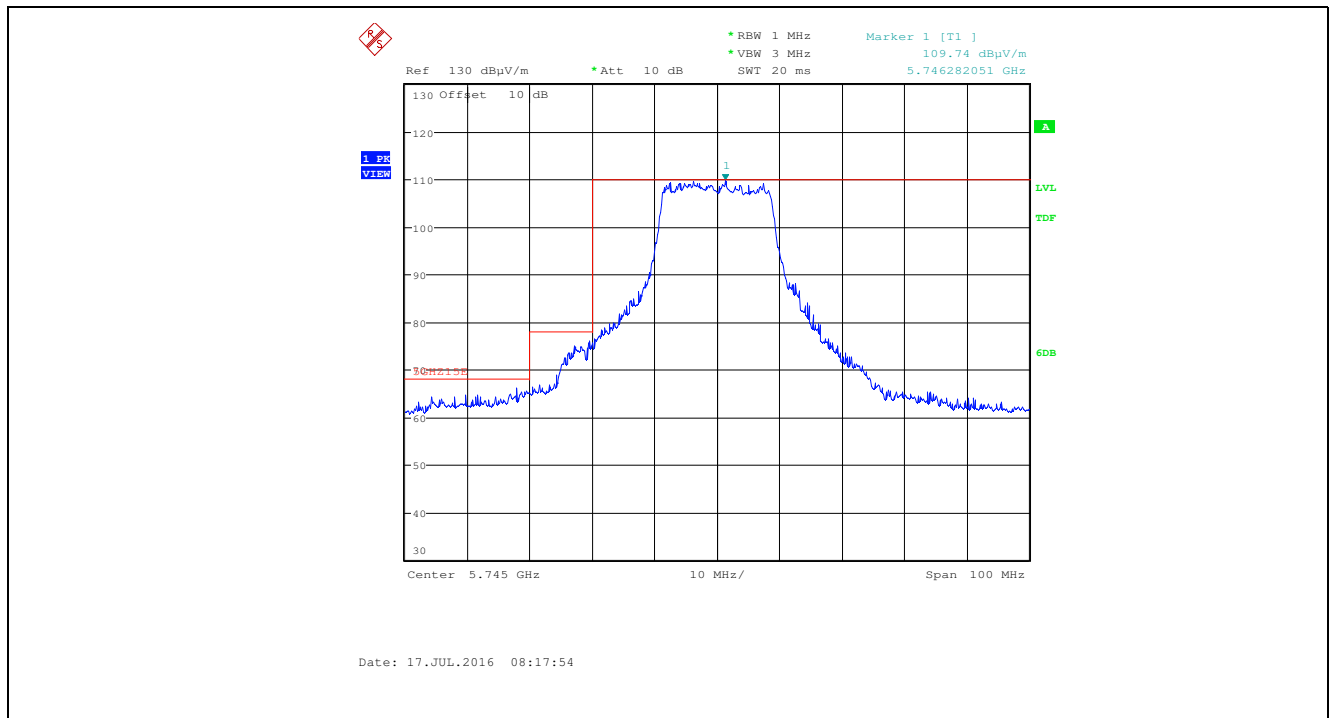
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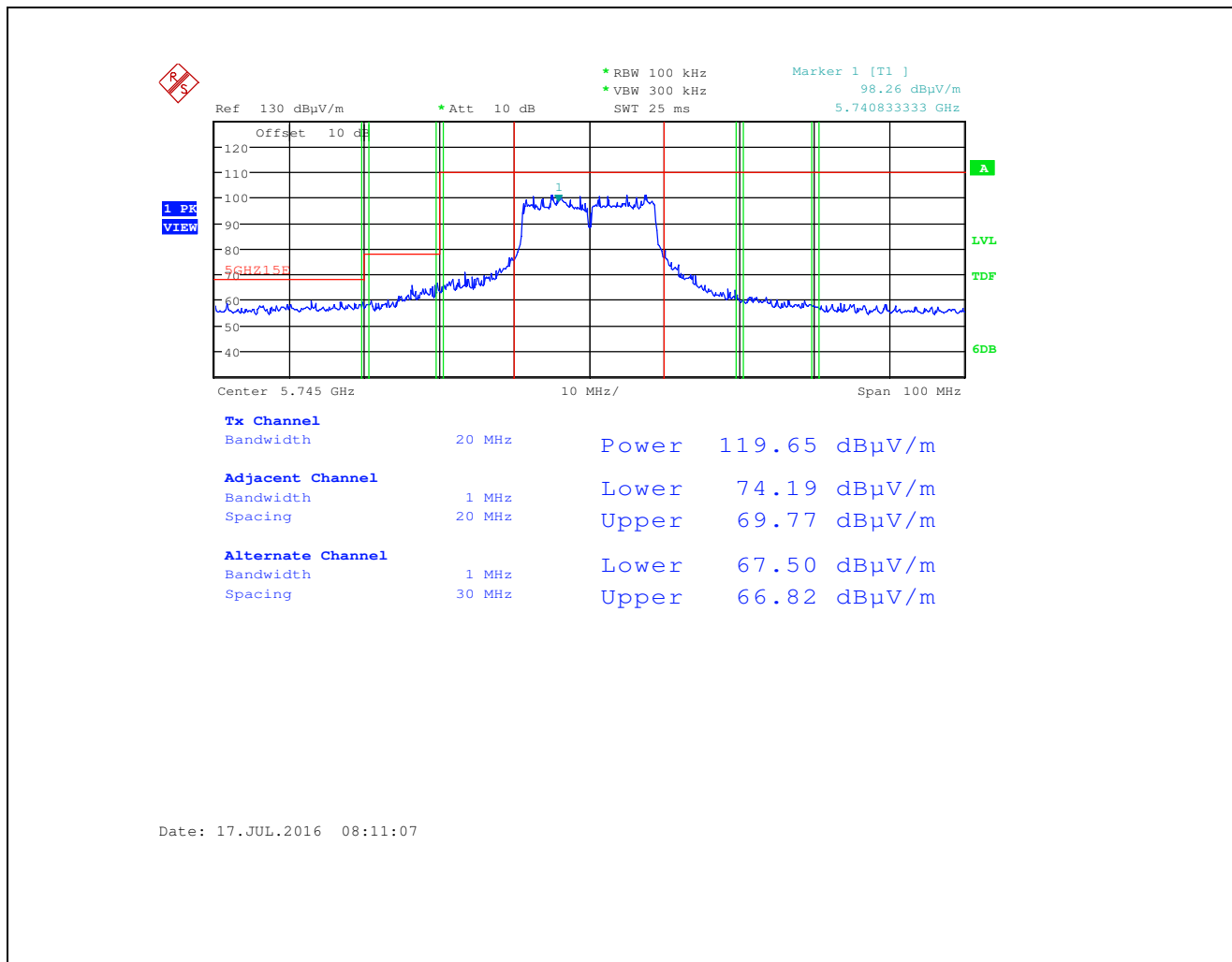
Plot 5.3.12.1.12. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 149, 5745 MHz, SISO, Gain Control 33, Vert, Chain # 1



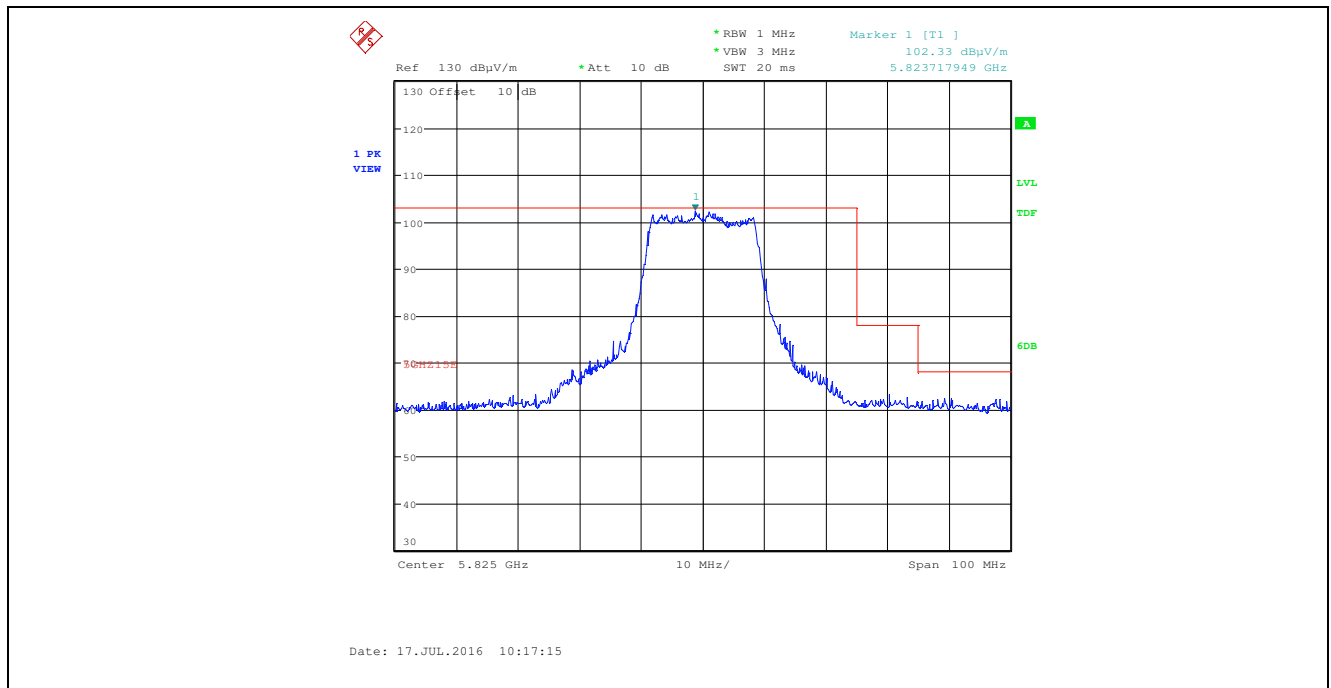
Plot 5.3.12.1.13. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 149, 5745 MHz, SISO, Gain Control 33, Vert, Chain # 2



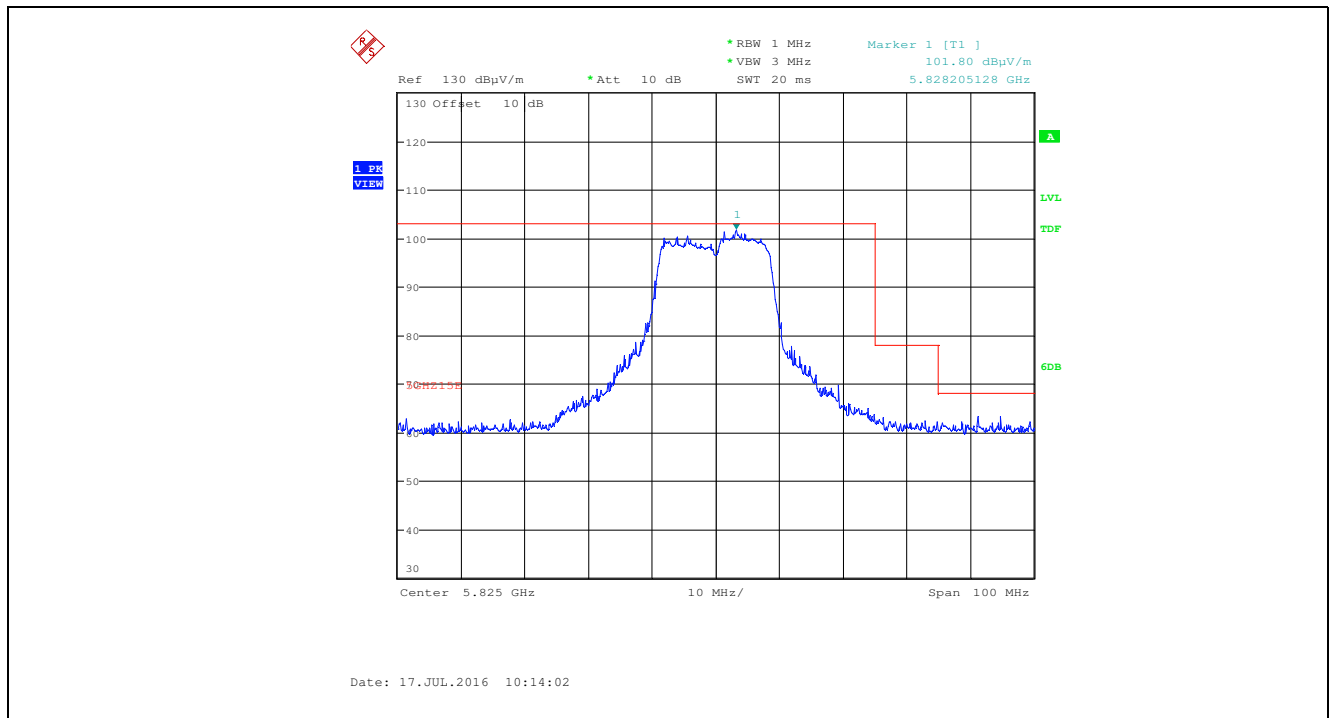
Plot 5.3.12.1.14. Chain # 1 Integration Method, 802.11n HT20, HT4, Ch 149, 5745 MHz, SISO, Gain Control 33, Vertical



Plot 5.3.12.1.15. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 165, 5825 MHz, SISO, Gain Control 33, Horiz, Chain # 1



Plot 5.3.12.1.16. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 165, 5825 MHz, SISO, Gain Control 33, Horiz, Chain # 2



[illegible]

Ref 130 dBuV/m *Att 10 dB *RBW 1 MHz Marker 1 [T1] 109.54 dBuV/m
 130 Offset 10 dB *VBW 3 MHz SWT 20 ms 5.828365385 GHz

1 PK VIEW

1

110

100

90

80

70

60

50

40

30

Center 5.825 GHz 10 MHz/ Span 100 MHz

6dB

EVF

TDF

Date: 17.JUL.2016 08:33:10

Ref 130 dBμV/m * Att 10 dB SWT 20 ms

* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz 102.63 dBμV/m
 5.740673077 GHz

130 Offset 10 dB

1 PK VIEW

1

LVL

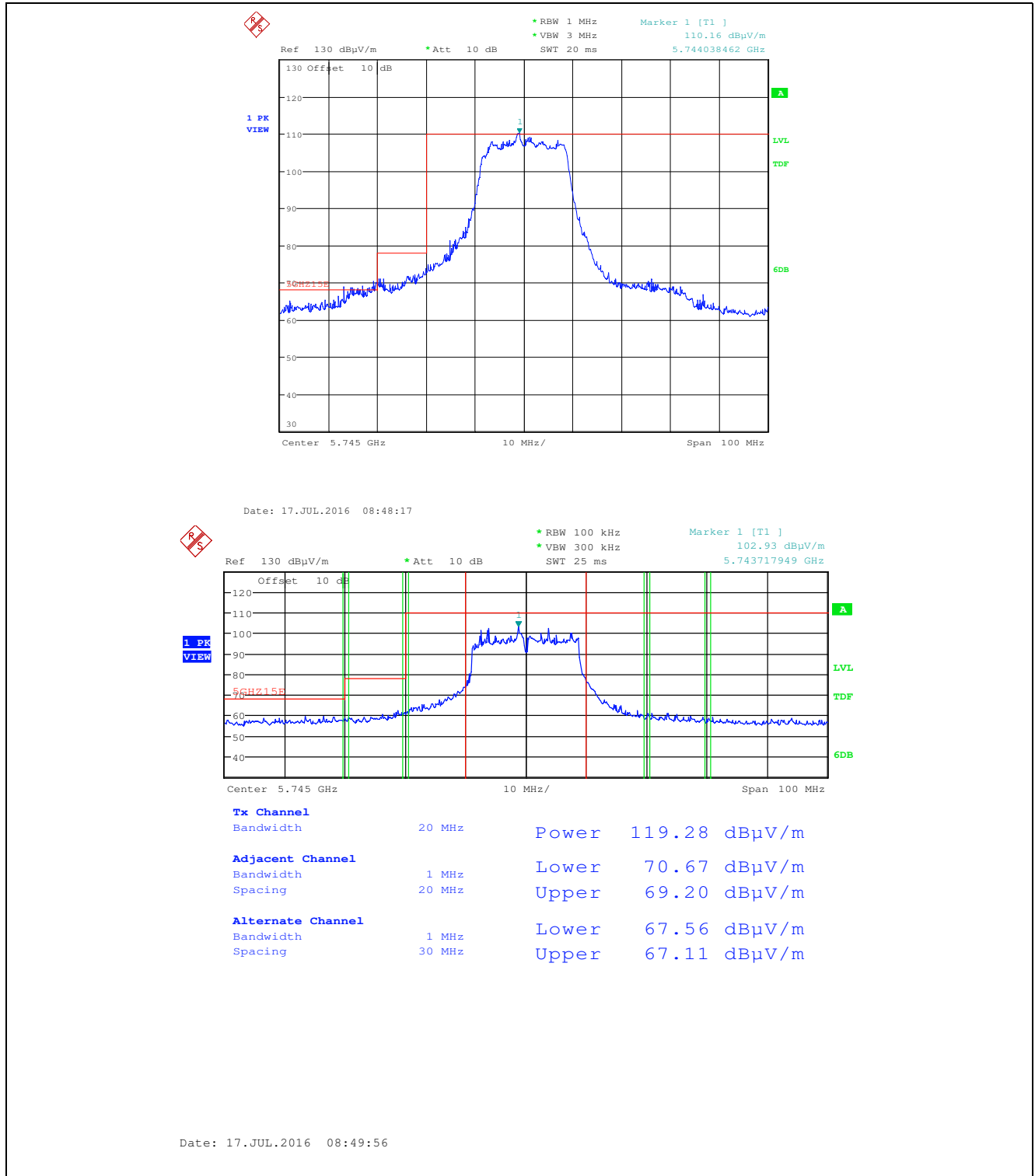
TDF

6DB

Center 5.745 GHz 10 MHz/ Span 100 MHz

Date: 17.JUL.2016 09:11:49

Plot 5.3.12.1.20. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 149, 5745 MHz, MIMO, Gain Control 33, Vertical, Chain # 1 & 2



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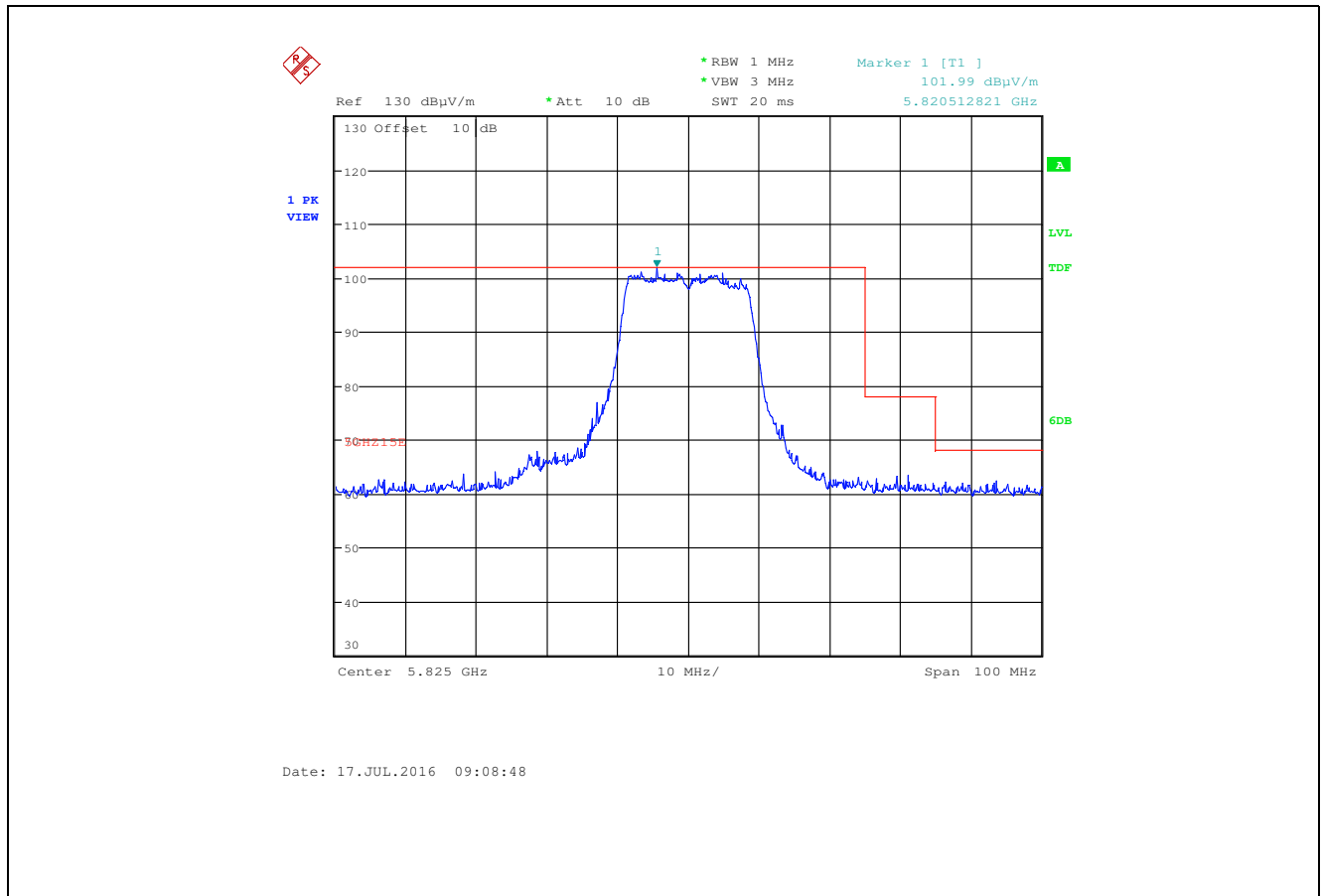
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

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July 29, 2016

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Plot 5.3.12.1.21. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 165, 5825 MHz, MIMO, Gain Control 33, Horizontal Chain # 1 & 2



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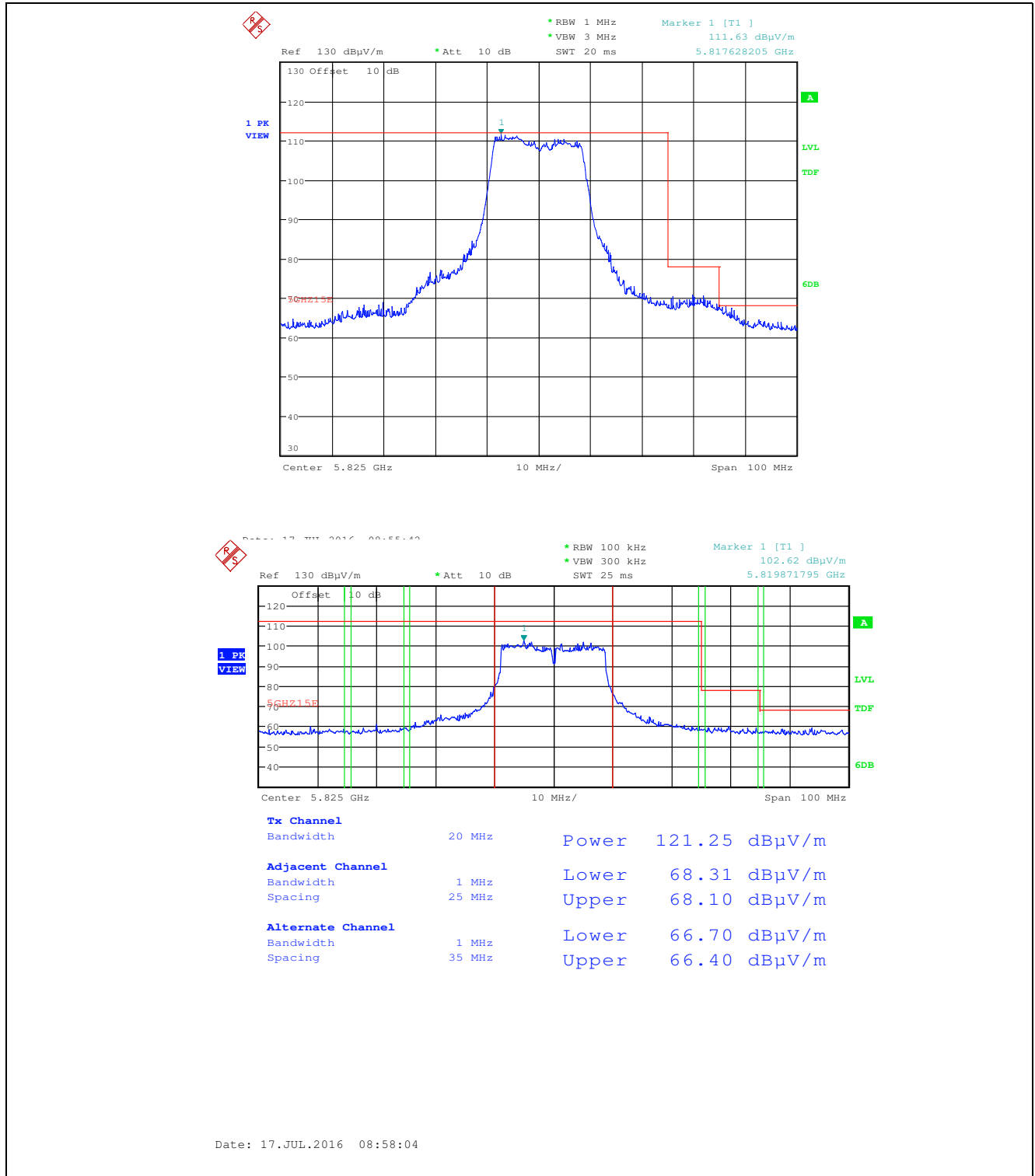
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Plot 5.3.12.1.22. Band-Edge Rad Emissions, 802.11n HT20, HT4, Ch 165, 5825 MHz, MIMO, Gain Control 33, Vertical Chain # 1 & 2



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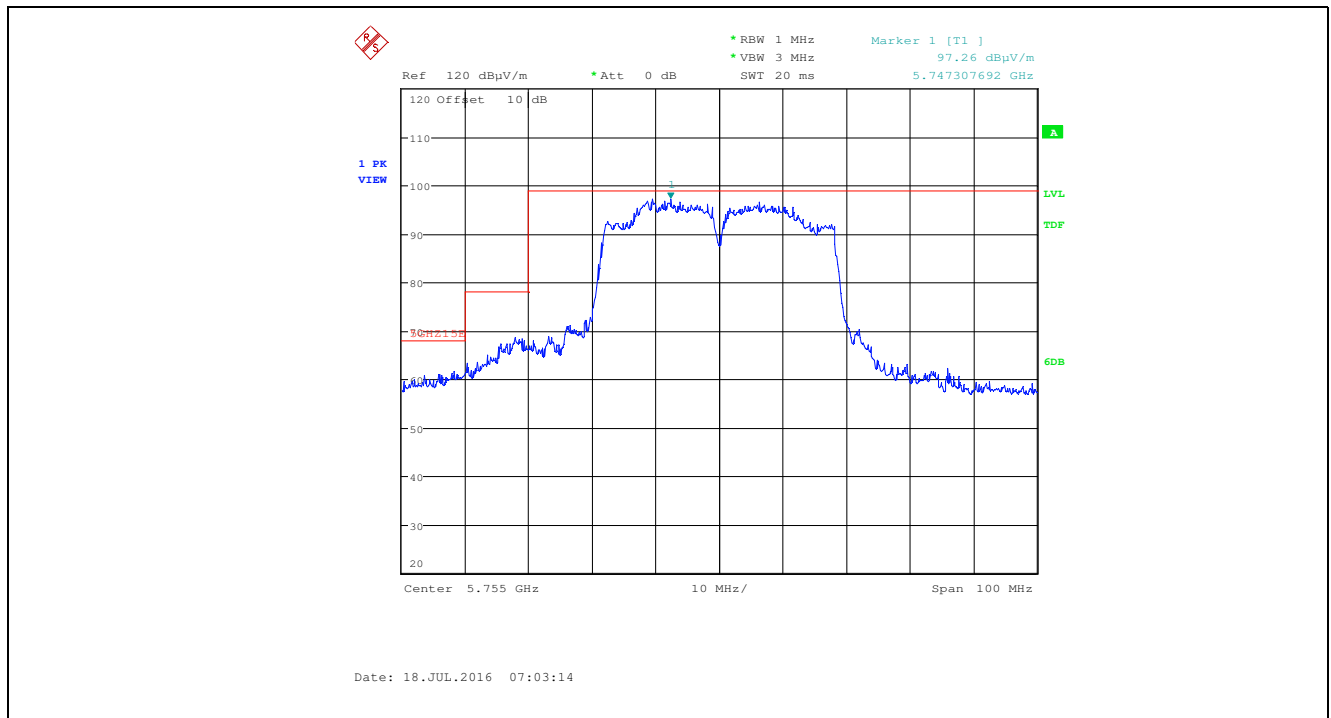
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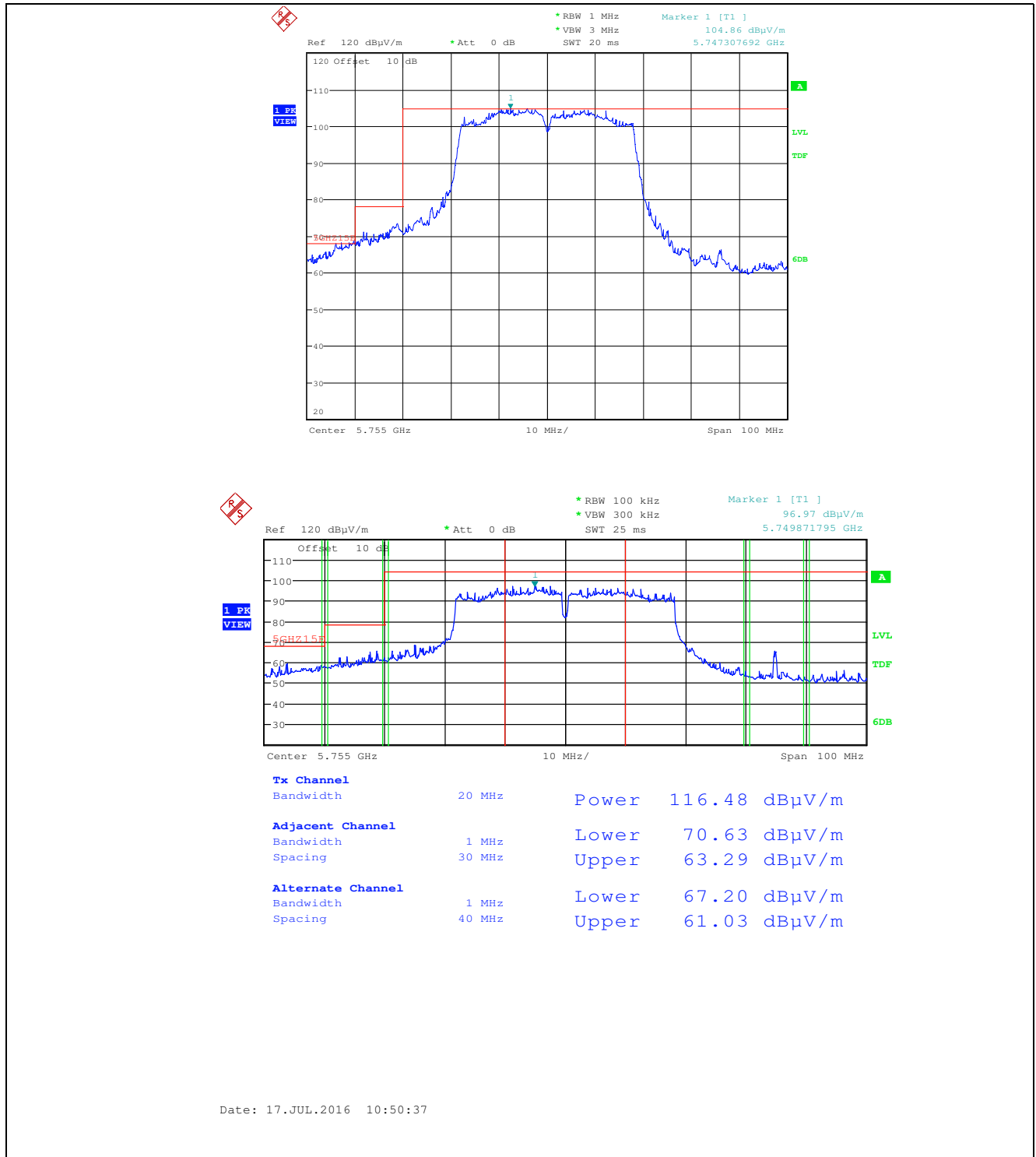
Plot 5.3.12.1.23. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 151, 5755 MHz, SISO, Gain Control 30, Horiz, Chain # 1



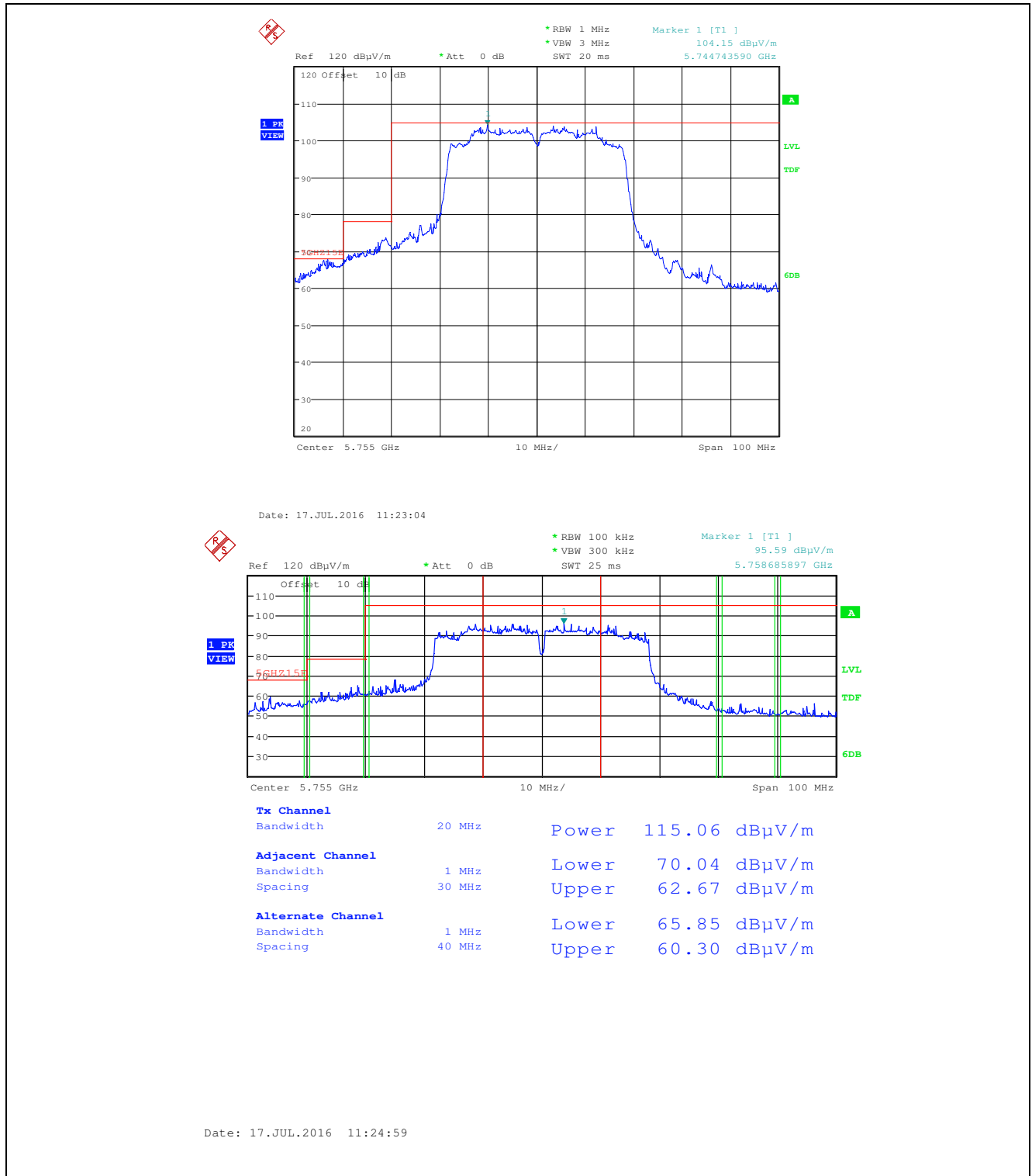
Plot 5.3.12.1.24. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 151, 5755 MHz, SISO, Gain Control 30, Horiz, Chain # 2



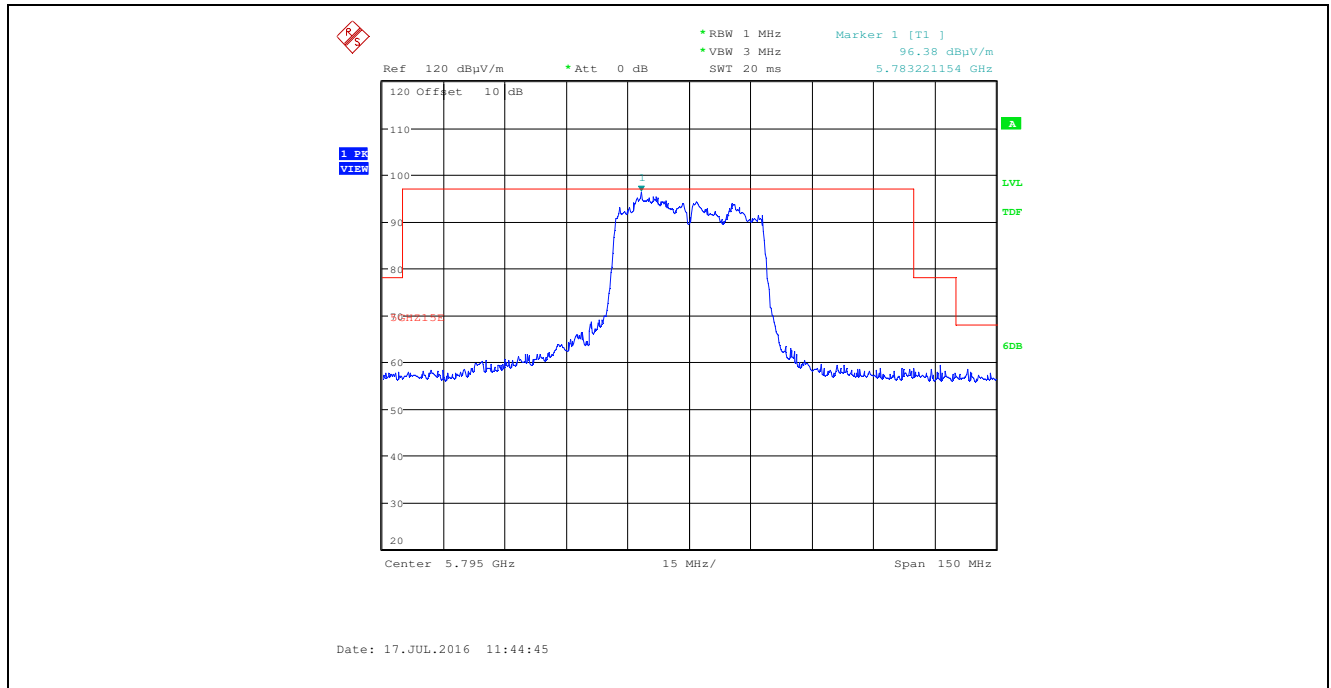
Plot 5.3.12.1.25. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 151, 5755 MHz, SISO, Gain Control 30, Vert, Chain # 1



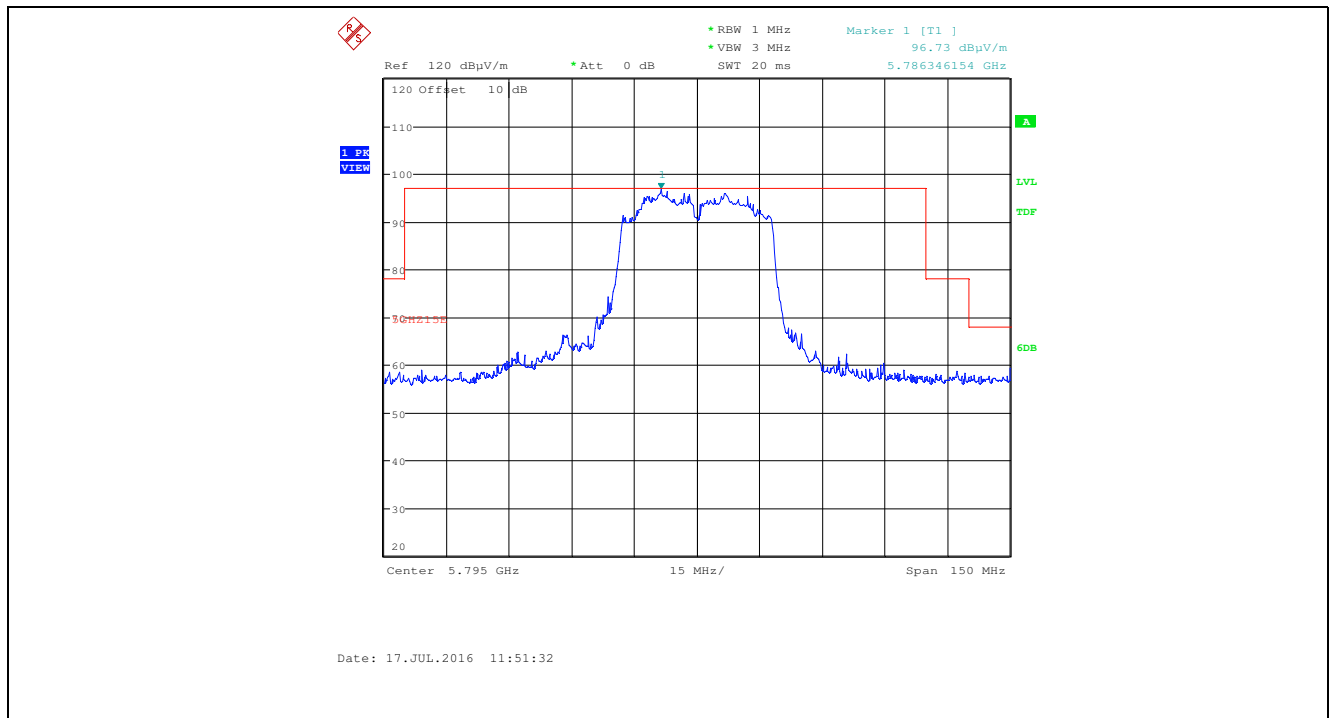
Plot 5.3.12.1.26. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 151, 5755 MHz, SISO, Gain Control 30, Vert, Chain # 2



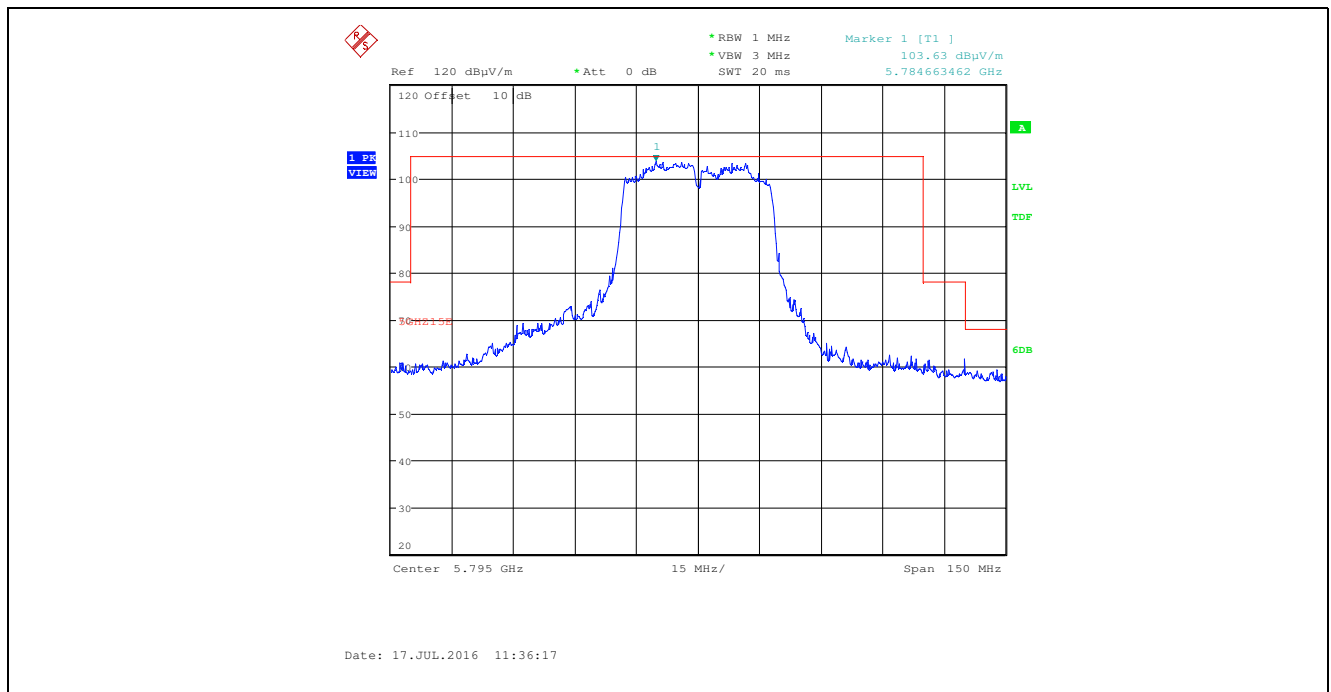
Plot 5.3.12.1.27. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 159, 5795 MHz, SISO, Gain Control 30, Horiz, Chain # 1



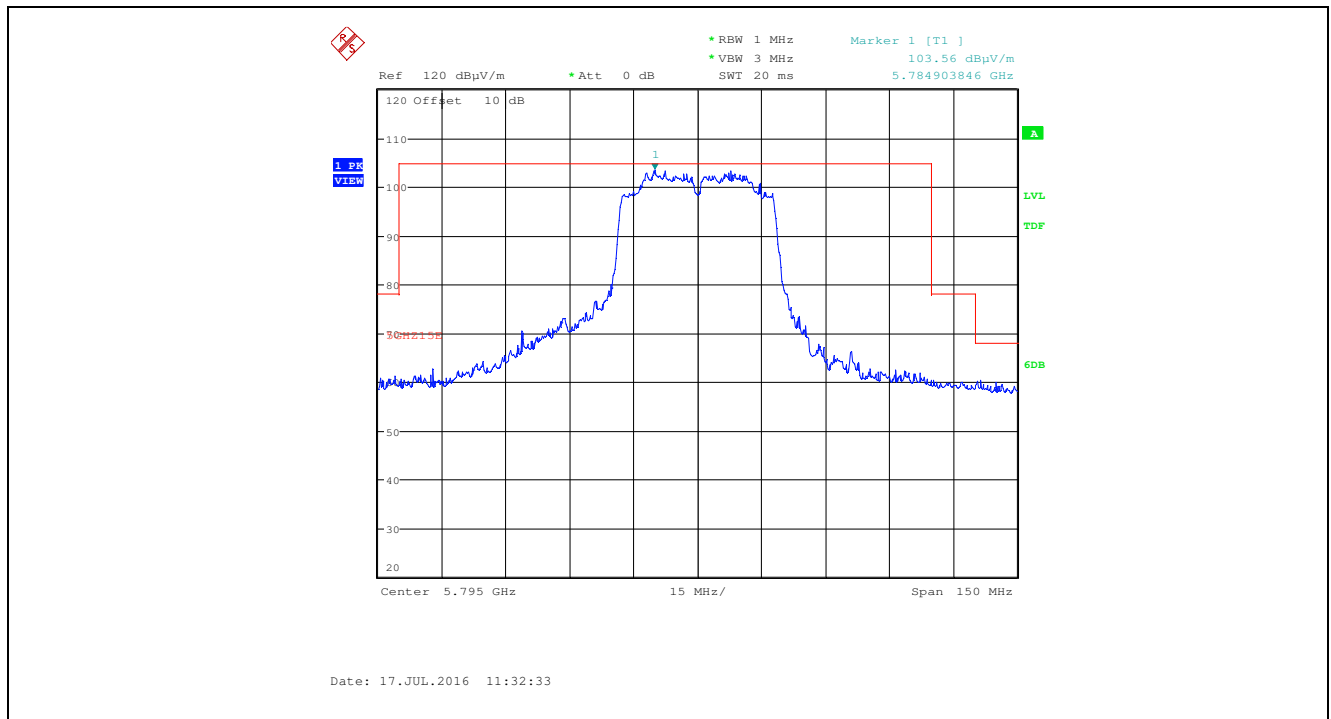
Plot 5.3.12.1.28. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 159, 5795 MHz, SISO, Gain Control 30, Horiz, Chain # 2



Plot 5.3.12.1.29. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 159, 5795 MHz, SISO, Gain Control 30, Vert, Chain # 1

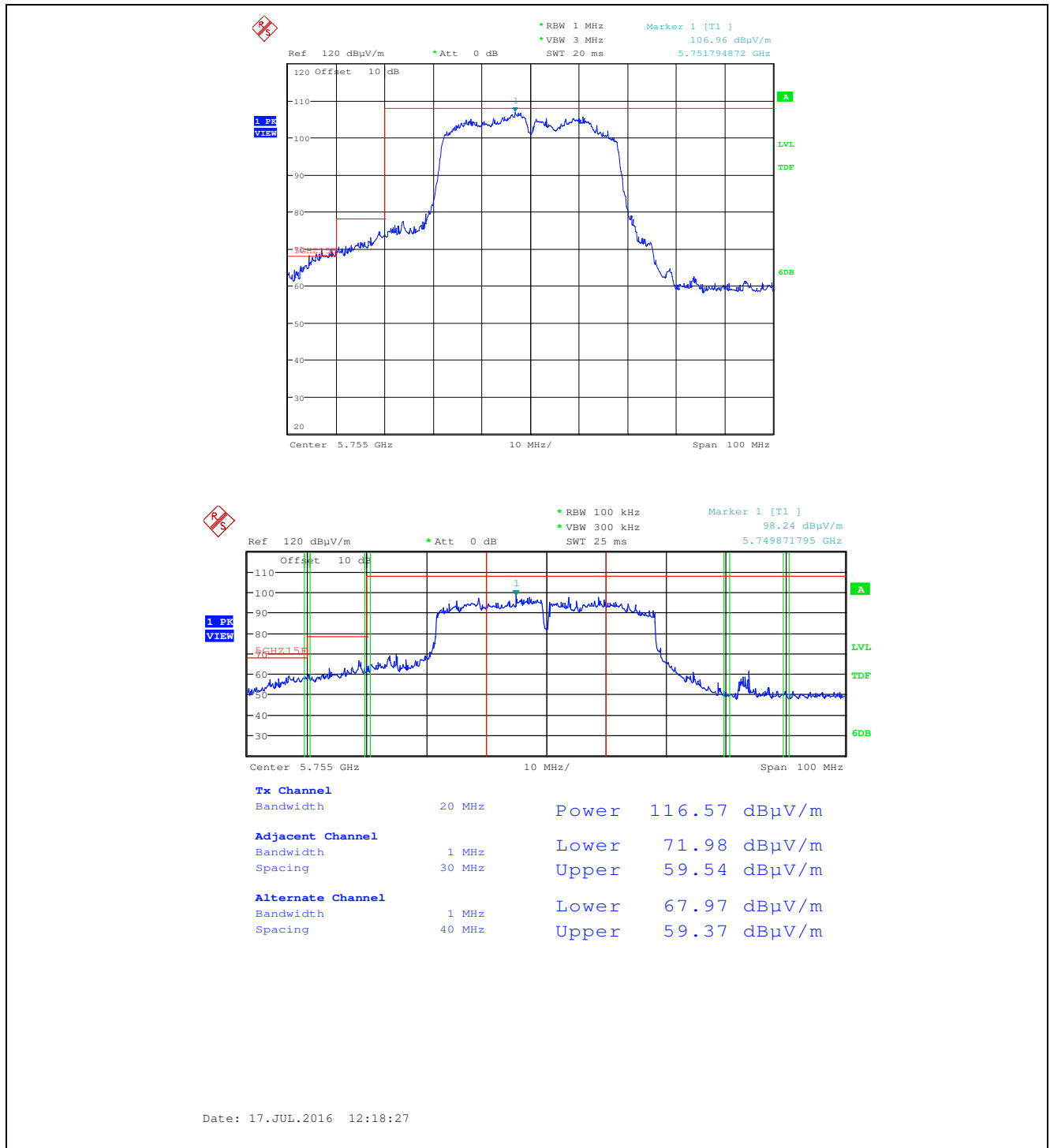


Plot 5.3.12.1.30. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 159, 5795 MHz, SISO, Gain Control 30, Vert, Chain # 2



[illegible]

Plot 5.3.12.1.32. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 151, 5755 MHz, MIMO, Gain Control 30, Vertical, Chain # 1 & 2



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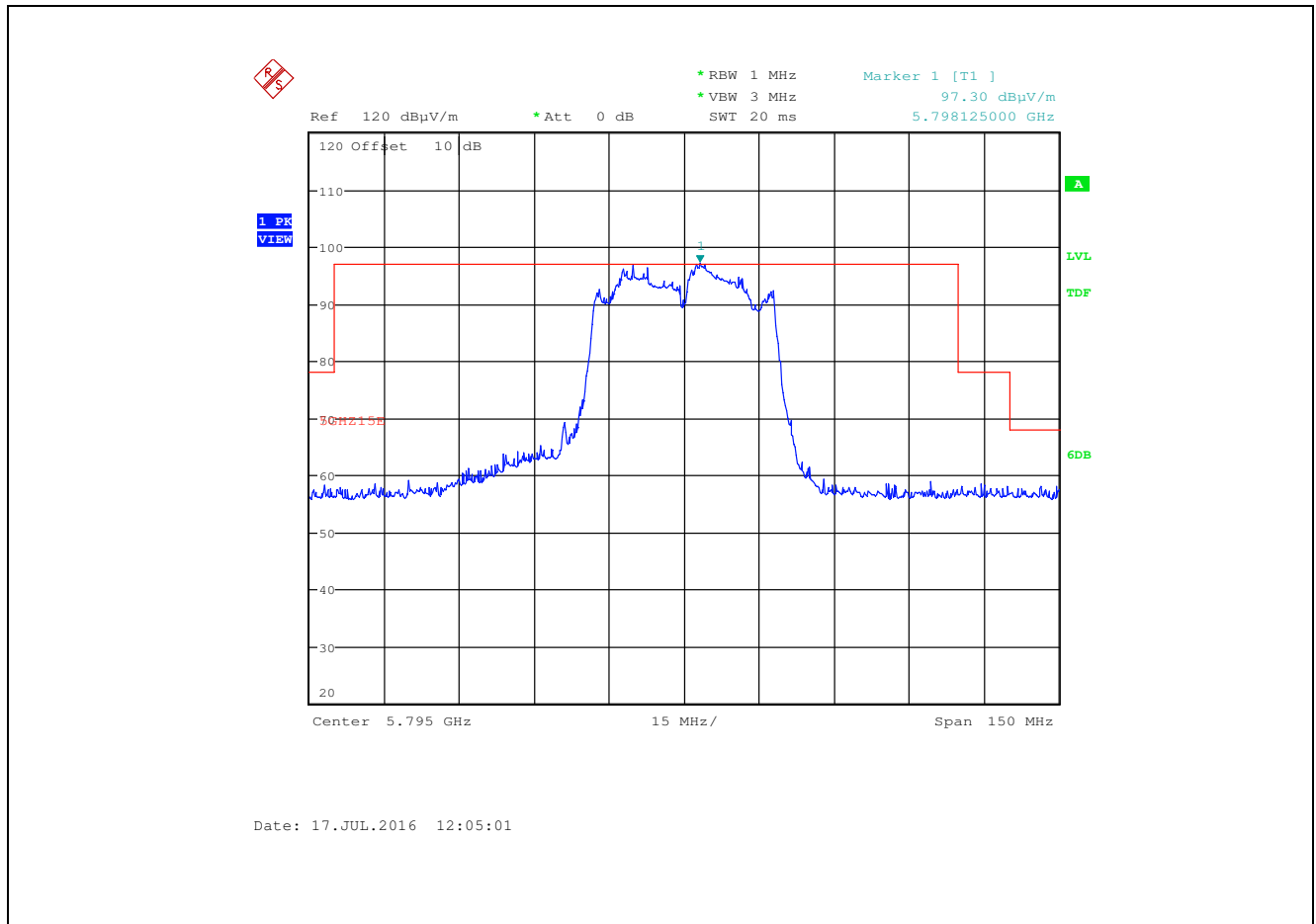
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Plot 5.3.12.1.33. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 159, 5795 MHz, MIMO, Gain Control 30, Horizontal Chain # 1 & 2



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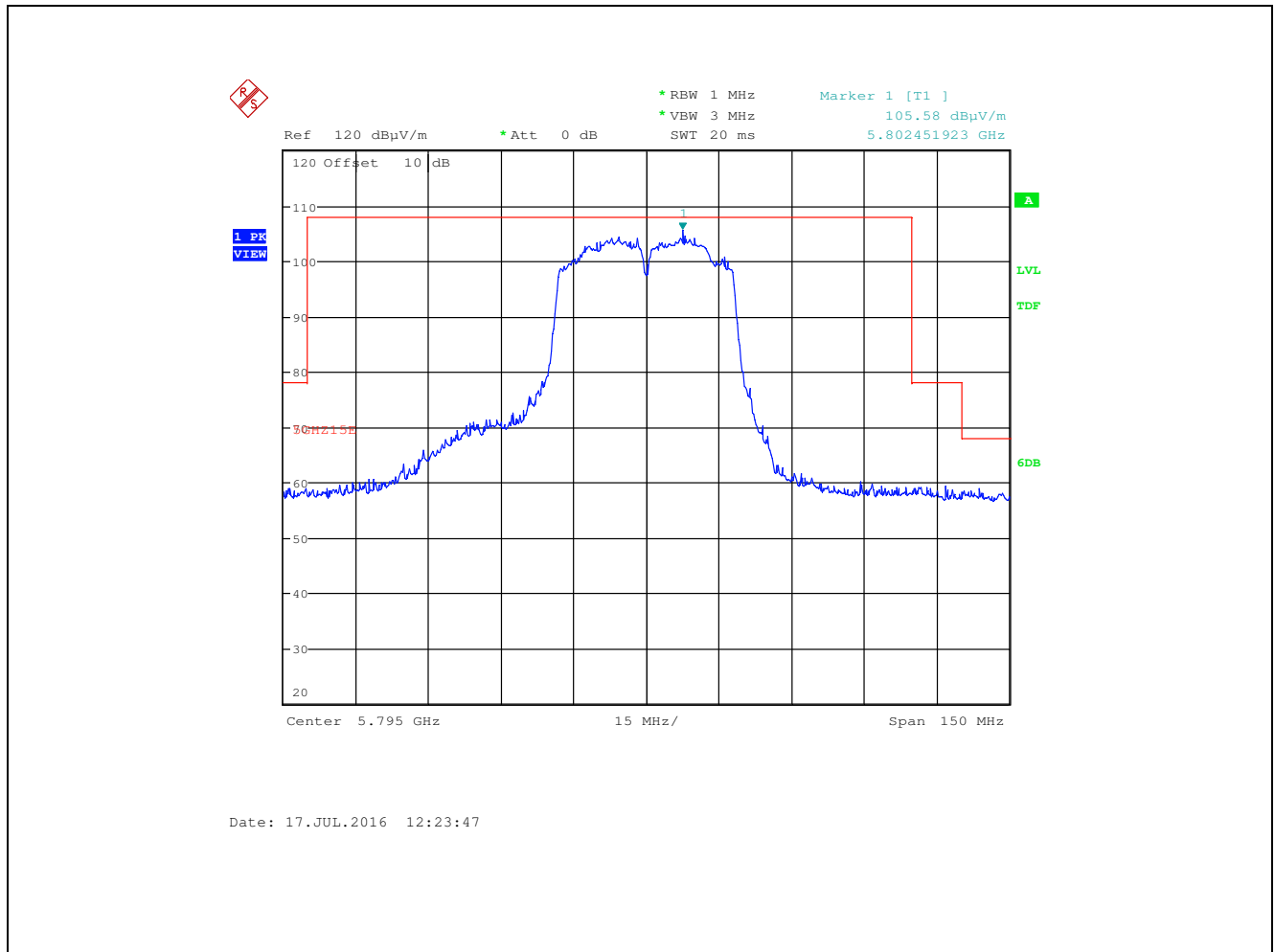
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Plot 5.3.12.1.34. Band-Edge Rad Emissions, 802.11n HT40, HT4, Ch 159, 5795 MHz, MIMO, Gain Control 30, Vertical
Chain # 1 & 2



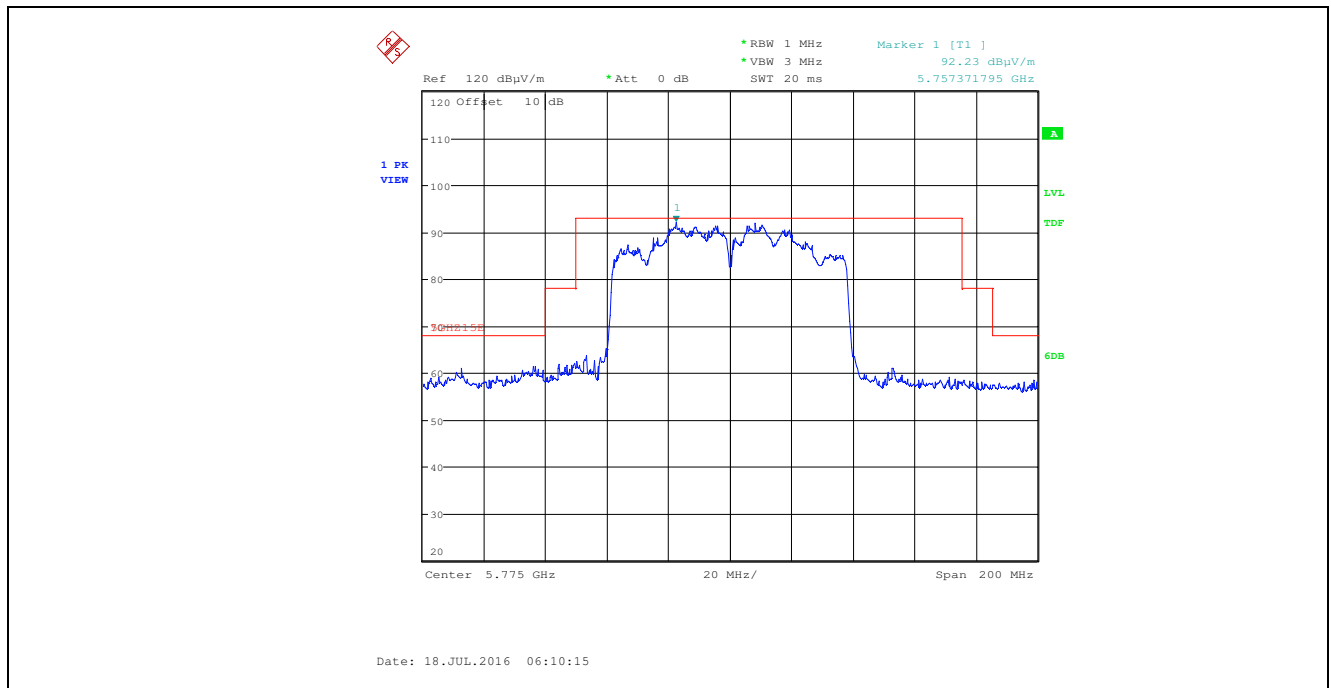
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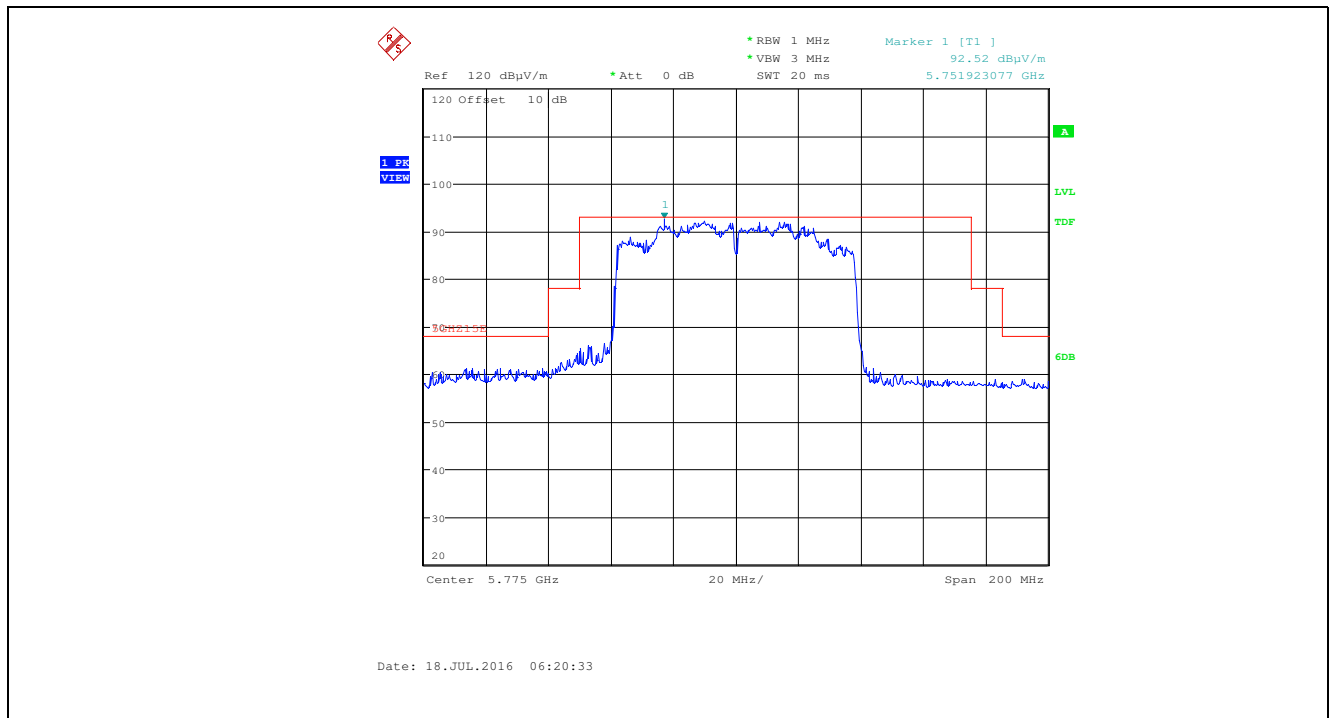
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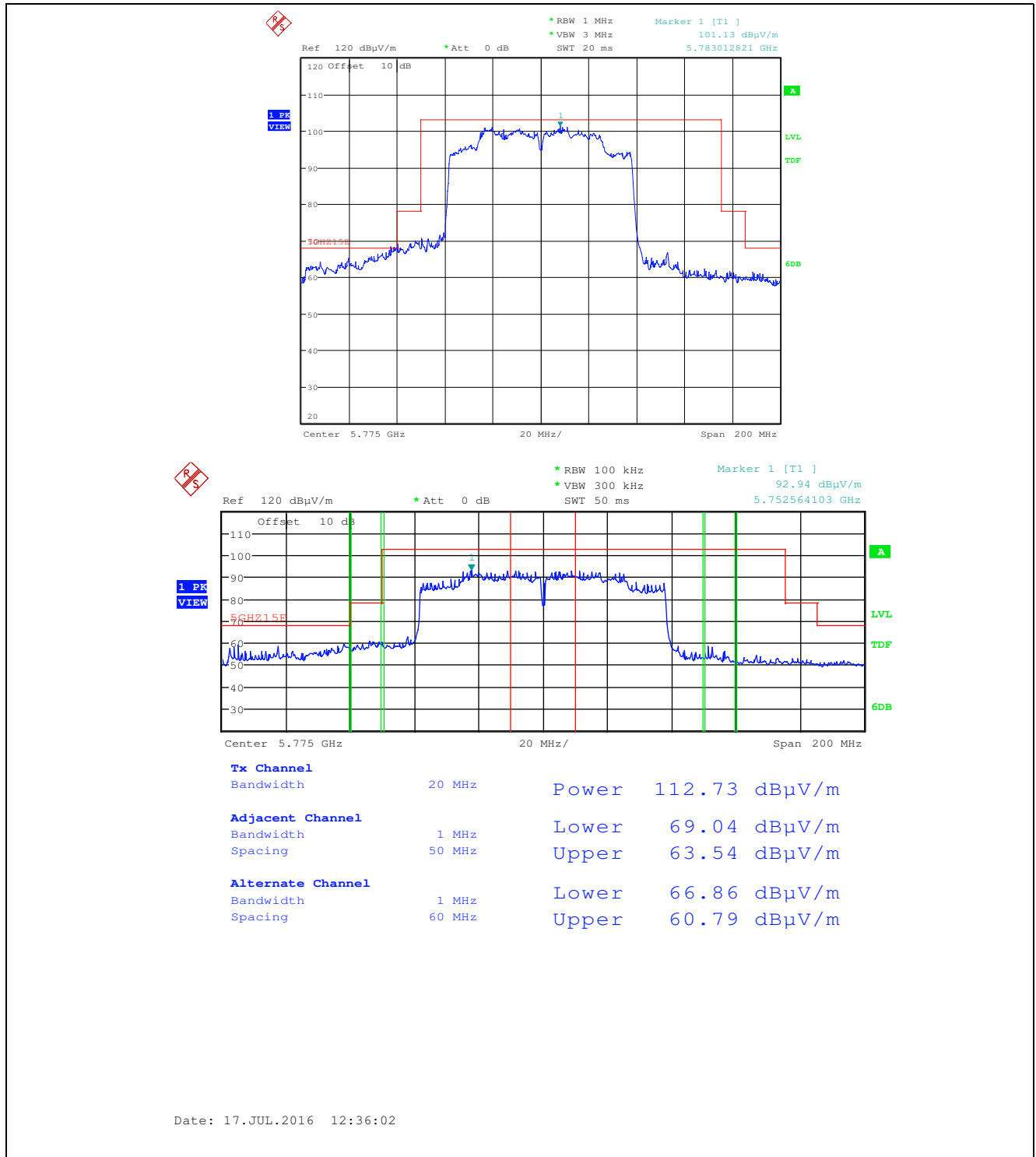
Plot 5.3.12.1.35. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 155, 5775 MHz, SISO, Gain Control 28, Horiz, Chain # 1



Plot 5.3.12.1.36. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 155, 5775 MHz, SISO, Gain Control 28, Horiz, Chain # 2



Plot 5.3.12.1.37. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 155, 5775 MHz, SISO, Gain Control 28, Vert, Chain # 1



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Ref 120 dBμV/m *Att 0 dB *RBW 1 MHz Marker 1 [T1] 100.24 dBμV/m
 *VBW 3 MHz SWT 20 ms 5.764743590 GHz

Offset 10 dB

1 PK VIEW

100 90 80 70 60 50 40 30 20

Center 5.775 GHz 20 MHz/ Span 200 MHz

100 90 80 70 60 50 40 30 20

Center 5.775 GHz 20 MHz/ Span 200 MHz

Ref 120 dBμV/m *Att 0 dB *RBW 100 kHz Marker 1 [T1] 91.49 dBμV/m
 *VBW 300 kHz SWT 50 ms 5.763782051 GHz

Offset 10 dB

1 PK VIEW

100 90 80 70 60 50 40 30 20

Center 5.775 GHz 20 MHz/ Span 200 MHz

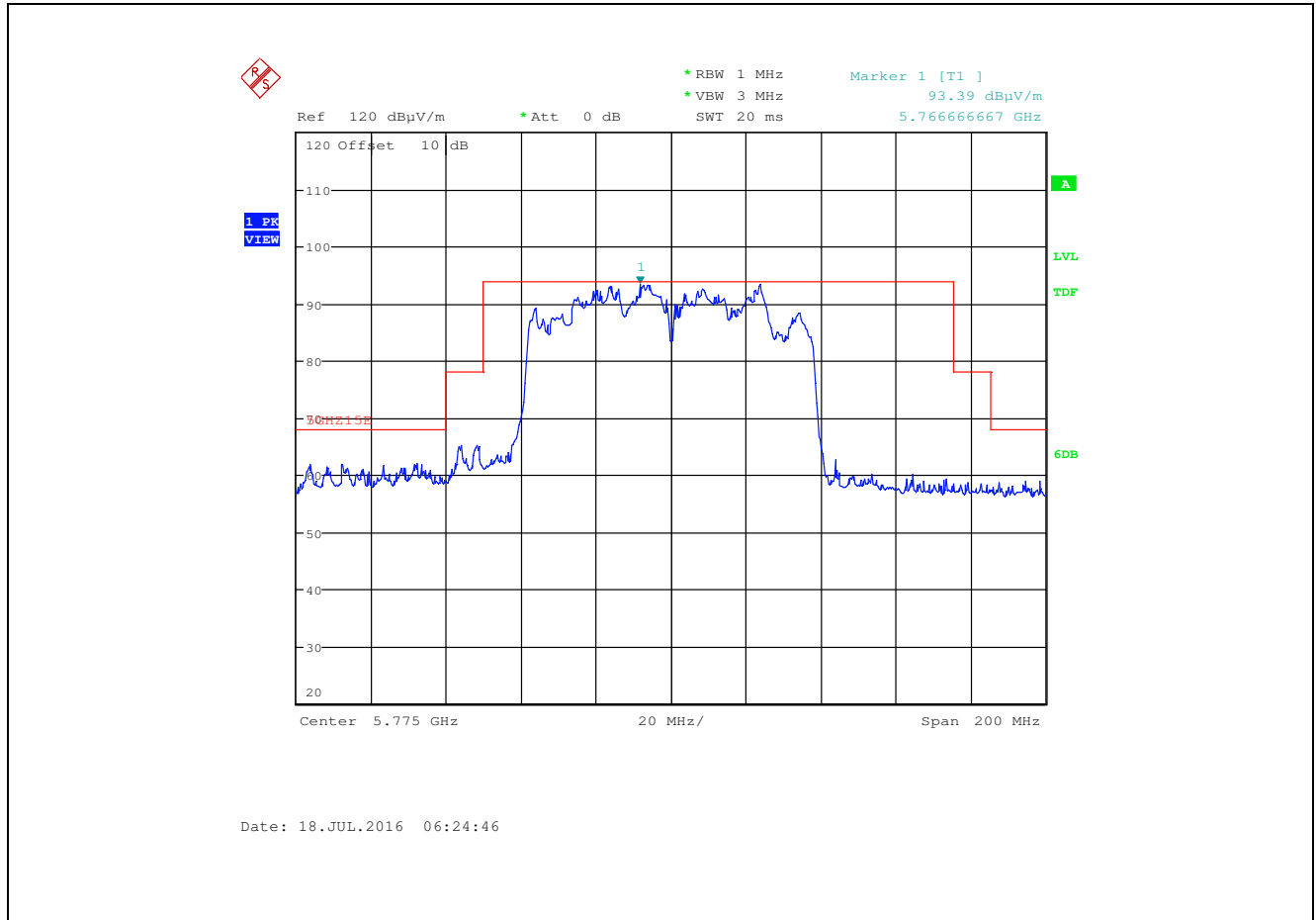
100 90 80 70 60 50 40 30 20

Center 5.775 GHz 20 MHz/ Span 200 MHz

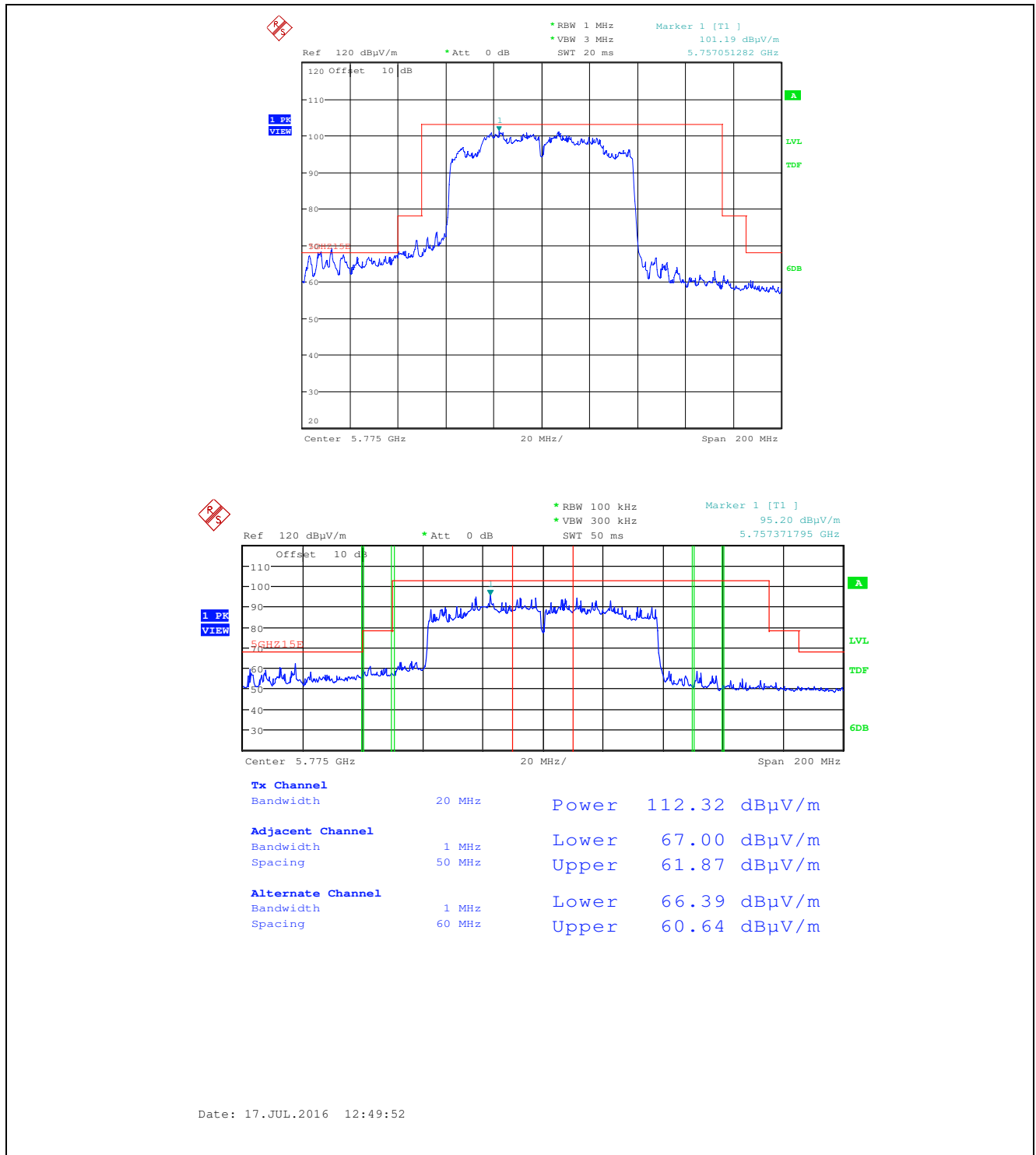
Channel	Bandwidth	Power
Tx Channel	20 MHz	110.90 dBμV/m
Adjacent Channel	Bandwidth	1 MHz
	Spacing	50 MHz
Alternate Channel	Bandwidth	1 MHz
	Spacing	60 MHz

Lower 68.24 dBμV/m
 Upper 59.93 dBμV/m
 Lower 67.42 dBμV/m
 Upper 60.37 dBμV/m

Plot 5.3.12.1.39. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 155, 5775 MHz, MIMO, Gain Control 28, Horizontal
Chain # 1 & 2



Plot 5.3.12.1.40. Band-Edge Rad Emissions, 802.11ac80, VHT6, Ch 155, 5775 MHz, MIMO, Gain Control 28, Vertical, Chain # 1 & 2



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

5.4.1. 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.

5.4.2. 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/cm²

G: numeric gain of antenna relative to isotropic radiator

r: distance to centre of radiation in cm

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5.4.3. 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

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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