FCC / ISED Test Report

FOR:
Axon Enterprise, Inc.

Model Name:
Axon Body 3

Product Description:
Body Worn Camera

FCC ID: X4GS01200
IC: 8803A-S01200

Applied Rules and Standards:
47 CFR Part 15.407 (NII) & 5 GHz (UNII)
RSS-247 Issue 2 (DTSs) & (LE-LAN), and RSS-Gen Issue 5

REPORT #: EMC_AXONN-004-19001_15.407_UNII

DATE: 2020-02-27

A2LA Accredited

IC recognized # 3462B-1

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1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.407 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-247.

No deviations were ascertained.

Company	Description	Marketing Name	Model #
Axon Enterprise, Inc.	Body Worn Camera	Axon Body 3	AX1023

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2020-02-27	Compliance	Cindy Li (EMC Lab Manager)	Cindy Li Digitally signed by cindy.li@cetecom.com DN: CN=cindy.li@cetecom.com Reason: I am approving this document Location: Date: 2020-02-27 18:03:02

Responsible for the Report:

Date	Section	Name	Signature
2020-02-27	Compliance	Kevin Wang (Senior EMC Engineer)	Kevin Wang Digitally signed by: Kevin Wang DN: CN = Kevin Wang email = kevin.wang@cetecom.com C = US O = Cetecom Inc. Date: 2020.02.27 15:00:50 -08'00'

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Cindy Li
Responsible Project Leader:	Kevin Wang

2.2 Identification of the Client

Applicant's Name:	Axon Enterprise, Inc.
Street Address:	17800 N 85th St.
City/Zip Code	Scottsdale, AZ / 85255
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Applicant
Manufacturers Address:	----------
City/Zip Code	----------
Country	----------

3 Equipment Under Test (EUT)

3.1 EUT Specifications

<table>
<tr><td>Marketing Name:</td><td>Axon Body 3</td></tr>
<tr><td>Model No:</td><td>AX1023</td></tr>
<tr><td>HW Version :</td><td>Rev B</td></tr>
<tr><td>SW Version :</td><td>1.2</td></tr>
<tr><td>FCC-ID :</td><td>X4G01200</td></tr>
<tr><td>IC-ID:</td><td>8803A-S01200</td></tr>
<tr><td>FWIN:</td><td>N/A</td></tr>
<tr><td>HVIN:</td><td>AX1023</td></tr>
<tr><td>PMN:</td><td>Axon Body 3</td></tr>
<tr><td>Product Description:</td><td>Body Worn Camera, with Wi-Fi 802.11a/b/g/n40/ac80, Bluetooth Classis + BLE, Passive NFC TAG, LTE, 3G Fallback support, GPS/GLONASS Receiver
Model AX1023 has Sierra Wireless WP7610</td></tr>
<tr><td>Frequency Range / number of channels:</td><td>
<table>
<tr><td>Frequency Range (MHz)</td><td>Channel Number</td></tr>
<tr><td>5150-5250</td><td>36-48 [4]</td></tr>
<tr><td>5250-5350</td><td>52-64[4]</td></tr>
<tr><td>5470-5725</td><td>100-144 [12]</td></tr>
<tr><td>5725-5850</td><td>149-165 [5]</td></tr>
</table>
</td></tr>
<tr><td>Modes of Operation / Channel Bandwidths:</td><td>
<table>
<tr><td>IEEE Std. 802.11(xxxx)</td><td>Data Rate / MCS</td></tr>
<tr><td>a</td><td>6-54 Mbps</td></tr>
<tr><td>n: HT20 & HT40</td><td>MCS 0-7; MCS 8-15</td></tr>
<tr><td>ac: VHT20; VHT40; VHT80</td><td>MCS 0-9</td></tr>
</table>
</td></tr>
<tr><td>Transmit Chains(N_{TX})</td><td>1</td></tr>
<tr><td>Type(s) of Modulation:</td><td>OFDM</td></tr>
<tr><td>Antenna Information as declared:</td><td>Refer to section 3.6 for more information</td></tr>
<tr><td>Max. Output Power:</td><td>Conducted Power 19.28dBm</td></tr>
<tr><td>Power Supply/ Rated Operating Voltage Range:</td><td>Rechargeable Battery Vmin: 3.4 VDC/ Vnom: 3.8 VDC / Vmax: 4.3 VDC</td></tr>
<tr><td>Operating Temperature Range</td><td>-20º to 50º C</td></tr>
</table>

Other Radios included in the device:	Bluetooth Basic / EDR: GFSK, π /4 DQPSK, 8DPSK Bluetooth 4.0 Low Energy (BT LE) GPS, Qualcomm WGR7640 UMTS/LTE, Sierra Wireless WP7610
Sample Revision	☐Prototype Unit; ■Production Unit; ☐Pre-Production

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	X60000190	DVT3	1.0.48	Conducted Sample
2	X60495001	PVT1	1.0.68	Radiated Sample

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	Laptop	HSTNN-I33C-4	HP	-
2	USB Cable	-	AXON	-
3	AC Adaptor	KSA01A5210100D5	Ktec	-

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1 + AE#1 + AE#2	The radio of the EUT was configured to a fixed channel transmission with 100% duty cycle using Putty tool and Qualcomm software QRCT to configure the EUT. The measurement equipment was connected to the 50 ohm RF port of the EUT.
2	EUT#2 + AE#1 + AE#2	The radio of the EUT was configured to a fixed channel transmission with 100% duty cycle using Putty tool and Qualcomm software QRCT to configure the EUT. The internal antenna was connected.
3	EUT#2 + AE#2 + AE#3	The radio of the EUT was configured to a fixed channel transmission with 100% duty cycle using Putty tool and Qualcomm software QRCT to configure the EUT. The internal antenna was connected.

3.5 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on low, mid and high channels, and highest possible duty cycle of 100%. For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

3.6 Antenna Gain provided by the Customer

Frequency (MHz)	2400	2420	2440	2460	2480
Antenna Gain (dBi)	2.01	2.9	2.81	3.4	3.22

Frequency (MHz)	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850
Antenna Gain (dBi)	2.93	2.63	3.02	3.25	3.58	3.94	3.85	4.11	3.96	4.14	4.1	4.13	3.57	3.29	3.58

3.7 Power Setting Table

	CH36 - CH 64		CH100 - CH 144		CH149 - CH165
a	17		17		17
n20	17		17		17

	CH38	CH46	CH54	CH62		CH102	CH110	CH118	CH126	CH134	CH142		CH151	CH159
n40	14	17	17	12.5		12.5	17	17	17	17	17		17	17

	CH42	CH58		CH106	CH122	CH138		CH155
ac80	14.5	13		13	17	17		17

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT according to the relevant requirements specified in FCC rules Part 15.407 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of ISED Canada.

This test report is to support a request for new equipment authorization under the:

- FCC ID: X4GS01200
- IC: 8803A-S01200

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	NA	NP	Result
§15.407(e) RSS-247 6.2.4.1	Emission Bandwidth	Nominal	802.11 a/n/ac	■	☐	☐	Complies
§15.407(a) RSS-247 6	Power Spectral Density	Nominal	802.11 a/n/ac	■	☐	☐	Complies
§15.407(a) RSS-247 6	Maximum Output Power and EIRP	Nominal	802.11 a/n/ac	■	☐	☐	Complies
§15.407; 15.205 RSS-247 6; RSS-Gen 8.10	Band Edge Compliance	Nominal	802.11 a/n/ac	■	☐	☐	Complies
§15.407(b); §15.209; 15.205 RSS-247 6; RSS-Gen 8.9; 8.10	Radiated TX Spurious Emissions	Nominal	802.11 n/ac	■	☐	☐	Complies
§15.407(g)	Frequency stability	Extreme temperature -20 °C to 50 °C	802.11 n	■	☐	☐	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	802.11 n/ac	■	☐	☐	Complies

Note: NA= Not Applicable; NP= Not Performed.

6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=1.

Radiated measurement

9 kHz to 30 MHz	±2.5 dB (Magnetic Loop Antenna)
30 MHz to 1000 MHz	±2.0 dB (Biconilog Antenna)
1 GHz to 40 GHz	±2.3 dB (Horn Antenna)

Conducted measurement

150 kHz to 30 MHz	±0.7 dB (LISN)
RF conducted measurement	±0.5 dB

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: http://physics.nist.gov/cuu/Uncertainty/typeb.html. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3 dB to the limit.

6.1 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25° C
- Relative humidity: 40-60%

6.2 Dates of Testing:

05/07/2019 - 06/26/2019

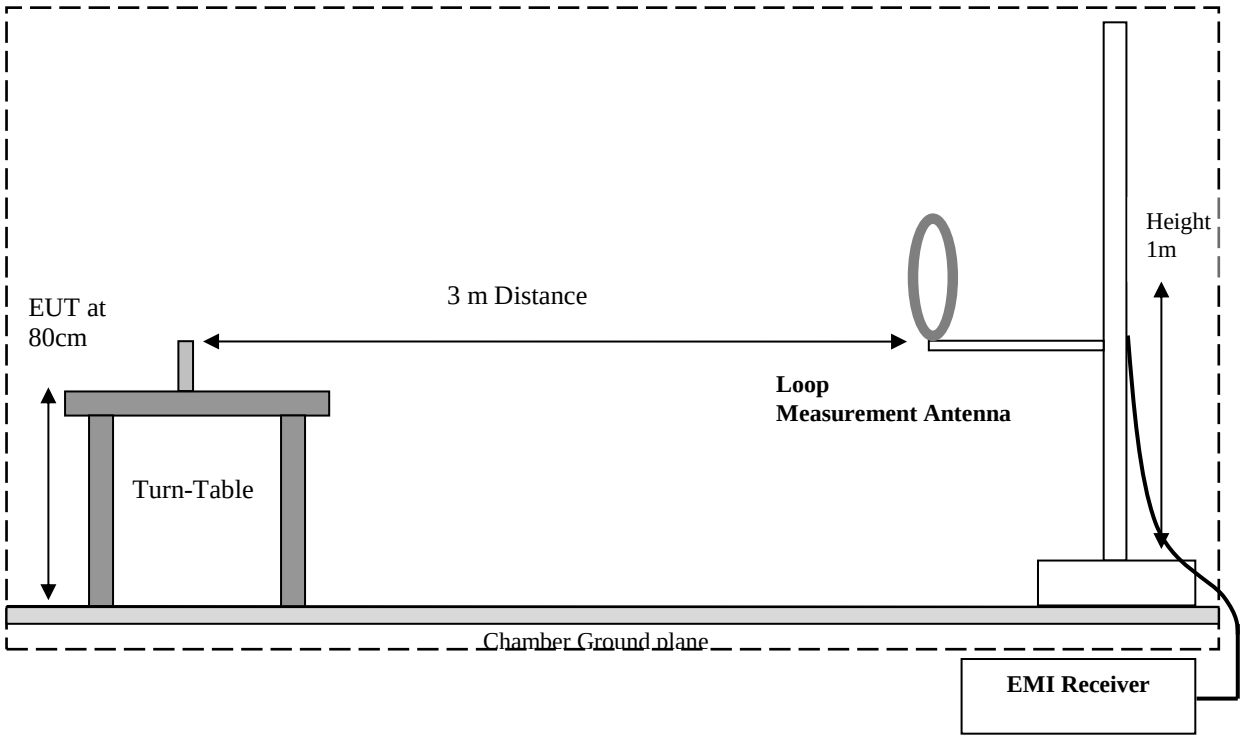
7 Measurement Procedures

7.1 Radiated Measurement

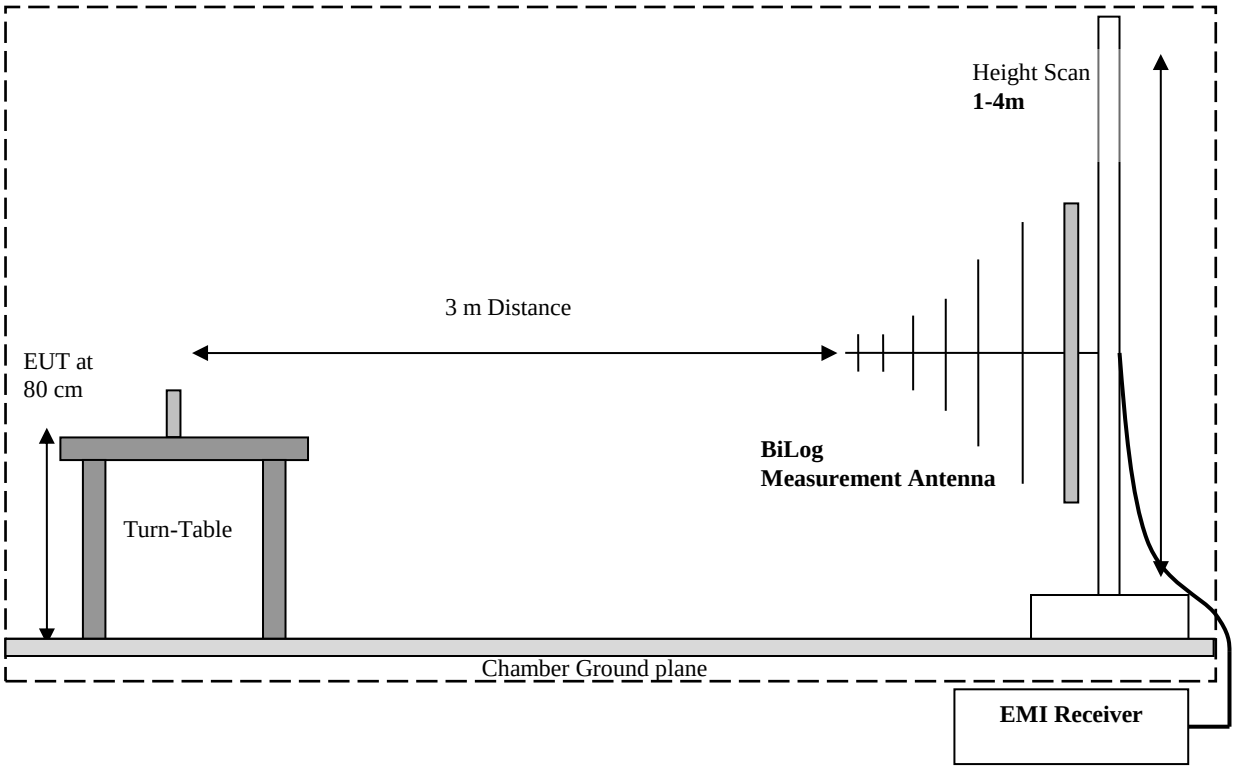
The radiated measurement is performed according to ANSI C63.10 (2013)

- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

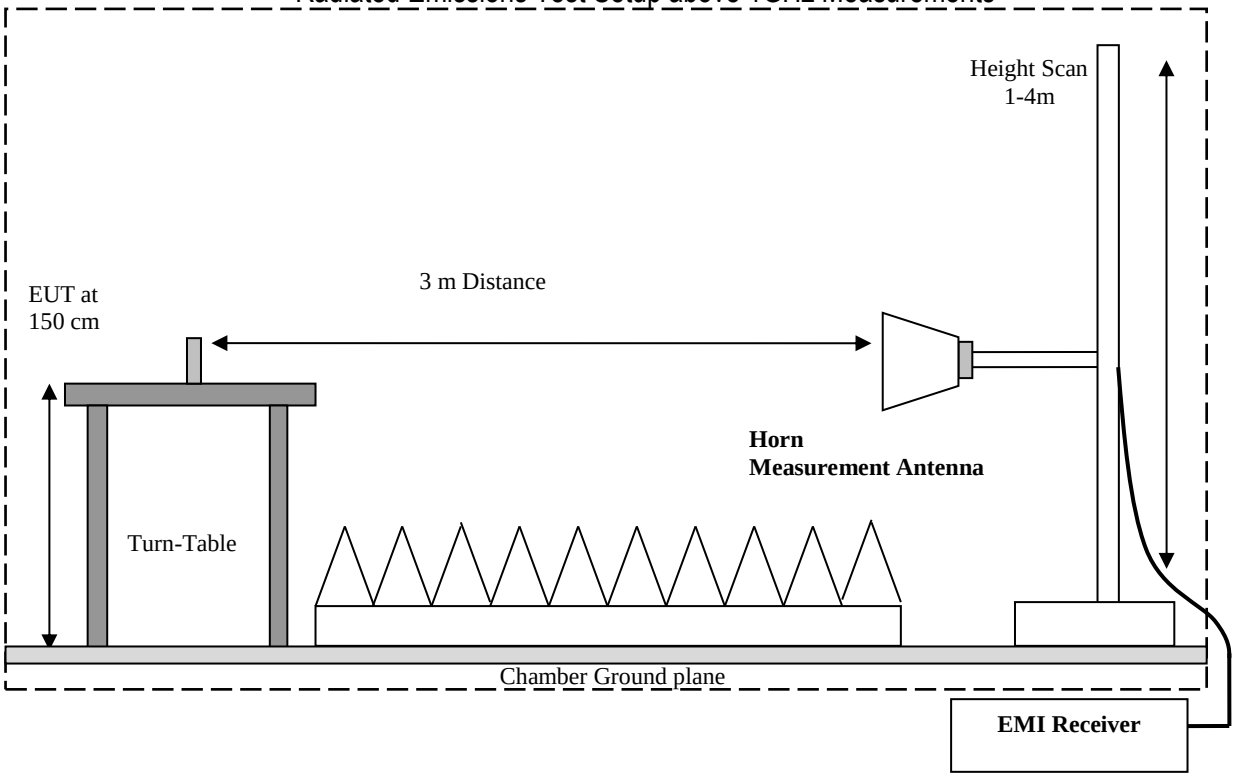
Radiated Emissions Test Setup below 30MHz Measurements



Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup above 1GHz Measurements



7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dBµV
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

FS (dBµV/m) = Measured Value on SA (dBµV)- Cable Loss (dB)+ Antenna Factor (dB/m)

Example:

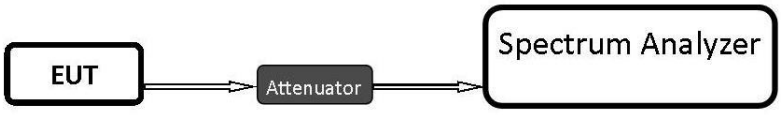
Frequency (MHz)	Measured SA (dBµV)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dBµV/m)
1000	80.5	3.5	14	98.0

7.2 Power Line Conducted Measurement Procedure

AC Power Line conducted emissions measurements performed according to: ANSI C63.4 (2014)

7.3 RF Conducted Measurement Procedure

Testing procedures are based on 558074 D01 DTS Meas Guidance v04 – "GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247" - April 5, 2017, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.



- Connect the equipment as shown in the above diagram.
- Adjust the settings of the SA (Rohde-Schwarz Spectrum Analyzer) to connect the EUT at the required mode of test.
- Measurements are to be performed with the EUT set to the low, middle and high channels and for worst case modulation schemes.

8 Test Result Data

8.1 Maximum Output Power

8.1.1 Measurement according to FCC 789033 D02 General UNII Test Procedures New Rules v02r01

Spectrum Analyzer settings **for method SA-1:**

- Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- Set RBW = 1 MHz
- Set the VBW ≥ 3 MHz
- Detector = RMS
- Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
- Sweep time = Auto Couple
- Trace mode = Trace average at least 100 traces in power averaging (i.e., RMS mode).
- If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
- Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

8.1.2 Limits:

FCC§15.407

Sub-band 5150-5250 MHz

- For AP the maximum conducted output power over the frequency band of operation shall not exceed 1 W
- For Client Devices the maximum conducted output power over the frequency band of operation shall not exceed 250 mW

Sub-band 5250-5350 MHz and 5470-5725 MHz and

- The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz

Sub-band 5725-5850 MHz

- The maximum conducted output power over the frequency band of operation shall not exceed 1 W

RSS-247

Sub-band 5150-5250 MHz

- For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.
- For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz.

Sub-band 5250-5350 MHz

- For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.
  - Devices, other than devices installed in vehicles, shall comply with the following:
    a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less.
    b) b.The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

- Additional requirements

  In addition to the above requirements, devices shall comply with the following, where applicable:

  a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

i. -13 dBW/MHz	for $0^\circ \leq \theta < 8^\circ$
ii. -13 − 0.716 (θ-8) dBW/MHz	for $8^\circ \leq \theta < 40^\circ$
iii. -35.9 − 1.22 (θ-40) dBW/MHz	for $40^\circ \leq \theta \leq 45^\circ$
iv. -42 dBW/MHz	for $\theta > 45^\circ$

  The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.

  b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:

  i. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or

  ii. devices shall implement a method to permanently reduce their e.i.r.p. via a firmware feature in the event that the Department requires it. The test report must demonstrate how the device's power table can be updated to meet this firmware requirement. The manufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

Sub-band 5470-5600 MHz and 5650-5725 MHz

- The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less.
- The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Sub-band 5725-5850 MHz

- The maximum conducted output power shall not exceed 1 W.

Note: All limits are conducted. 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.

8.1.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	1	802.11a/n20/n40/ac80	120 VAC	Section 3.6

8.1.4 Measurement result:

UNII-1:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Output Power (dBm)	Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Result
a	6Mbps	Low	36	5180	17.12	3	20.12	30/36	Pass
		Mid	40	5200	16.99	3	19.99	30/36	Pass
		High	48	5240	16.93	3	19.93	30/36	Pass
n20	MCS0	Low	36	5180	17.38	3	20.38	30/36	Pass
		Mid	40	5200	17.01	3	20.01	30/36	Pass
		High	48	5240	16.96	3	19.96	30/36	Pass
n40	MCS0	Low	38	5190	13.73	3	16.73	30/36	Pass
		High	46	5230	16.93	3	19.93	30/36	Pass
ac80	MCS0	Mid	42	5210	14.08	3	17.08	30/36	Pass

UNII-2A:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Output Power (dBm)	Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Result
a	6Mbps	Low	52	5260	16.96	3.6	20.56	24/30	Pass
		Mid	60	5300	16.84	3.6	20.44	24/30	Pass
		High	64	5320	16.24	3.6	19.84	24/30	Pass
n20	MCS0	Low	52	5260	17.04	3.6	20.64	24/30	Pass
		Mid	60	5300	16.87	3.6	20.47	24/30	Pass
		High	64	5320	16.28	3.6	19.88	24/30	Pass
n40	MCS0	Low	54	5270	16.99	3.6	20.59	24/30	Pass
		High	62	5310	12.57	3.6	16.17	24/30	Pass
ac80	MCS0	Mid	58	5290	13.1	3.6	16.70	24/30	Pass

UNII-2C:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Output Power (dBm)	Antenna Gain(dBi)	EIRP (dBm)	Limit	Result
a	6Mbps	Low	100	5500	17.94	4.2	22.14	24/30	Pass
		Mid	116	5580	19.1	4.2	23.30	24/30	Pass
		High	140	5700	18.32	4.2	22.52	24/30	Pass
			144	5720	19.25	4.2	23.45	24/30	Pass
n20	MCS0	Low	100	5500	17.95	4.2	22.15	24/30	Pass
		Mid	116	5580	19.1	4.2	23.30	24/30	Pass
		High	140	5700	18.34	4.2	22.54	24/30	Pass
			144	5720	19.28	4.2	23.48	24/30	Pass
n40	MCS0	Low	102	5510	12.5	4.2	16.70	24/30	Pass
		Mid	110	5550	19.14	4.2	23.34	24/30	Pass
		High	134	5670	17.25	4.2	21.45	24/30	Pass
			142	5710	18.17	4.2	22.37	24/30	Pass
ac80	MCS0	Low	106	5530	13.55	4.2	17.75	24/30	Pass
		Mid	122	5610	17.68	4.2	21.88	24/30	Pass
		High	138	5690	17.04	4.2	21.24	24/30	Pass

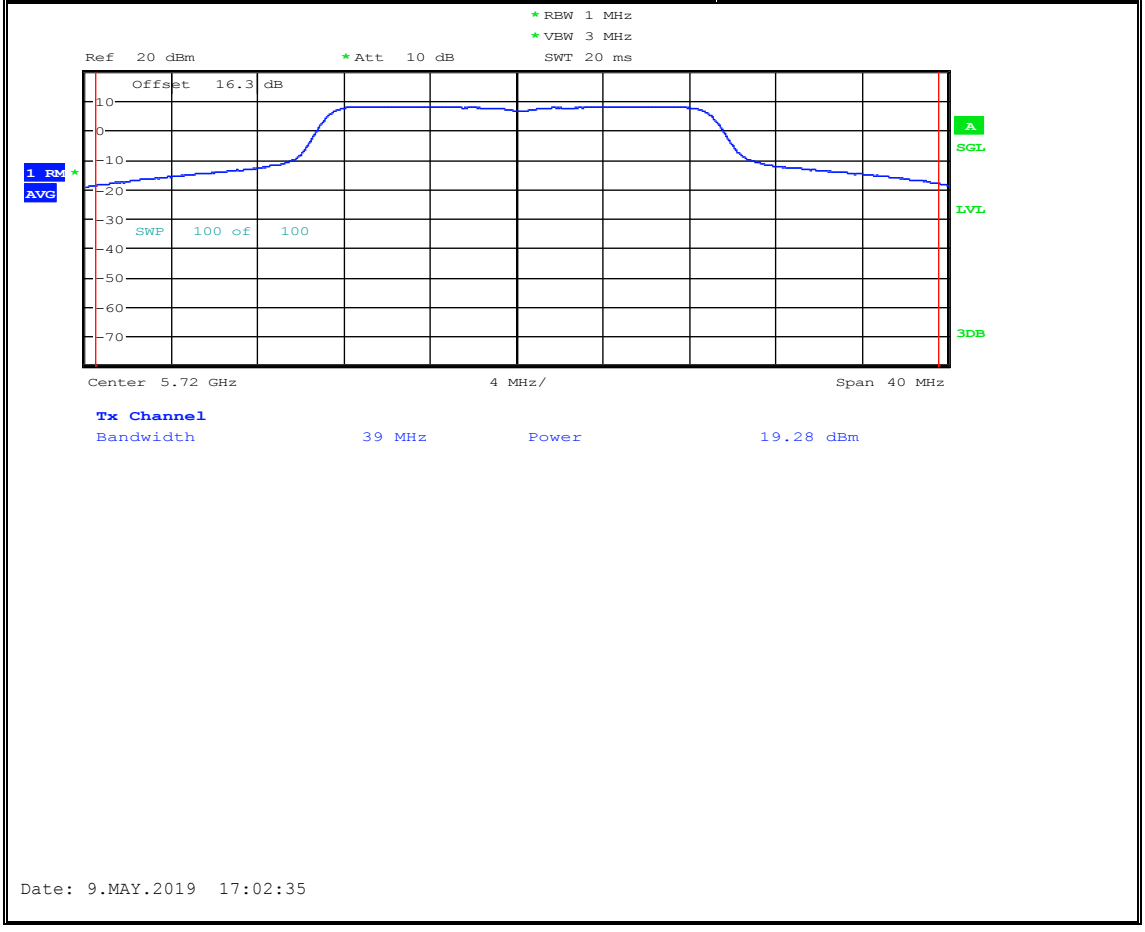
UNII-3:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Output Power (dBm)	Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Result
a	6Mbps	Low	149	5745	17.22	3.6	20.82	30/36	Pass
		Mid	157	5785	16.65	3.6	20.25	30/36	Pass
		High	165	5825	15.47	3.6	19.07	30/36	Pass
n20	MCS0	Low	149	5745	17.26	3.6	20.86	30/36	Pass
		Mid	157	5785	16.68	3.6	20.28	30/36	Pass
		High	165	5825	15.5	3.6	19.10	30/36	Pass
n40	MCS0	Low	151	5755	17.25	3.6	20.85	30/36	Pass
		High	159	5795	16.6	3.6	20.20	30/36	Pass
ac80	MCS0	Mid	155	5775	15.99	3.6	19.59	30/36	Pass

8.1.5 Highest Power Measurement Plot:

Transmit Chain:

Channel: 144	Mode of operation:802.11n20	Duty Cycle:100%



8.2 Power Spectral Density

8.2.1 Measurement according to FCC 789033 D02 General UNII Test Procedures New Rules v02r01

Spectrum Analyzer Settings for Peak PSD in 1 MHz Band with Method SA-1:

- Use the settings in section 8.1.1
- Use the peak marker function to determine the maximum amplitude level within the RBW. The result is the Maximum PSD over 1 MHz reference bandwidth

Spectrum Analyzer Settings for Peak PSD in 500 kHz Band with Method SA-1:

- Set RBW 500 kHz
- Set VBW ≥ 3 RBW.
- Measure the Maximum PSD in 500 kHz reference bandwidth for sub-band 5725-5850 MHz

8.2.2 Limits:

FCC§15.407

Sub-band 5150-5250 MHz

- For AP the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band
- For Client Devices the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band

Sub-band 5250-5350 MHz and 5470-5725 MHz and

- The maximum power spectral density shall not exceed 11 dBm in any 1 MHz band

Sub-band 5725-5850 MHz

- The maximum power spectral density shall not exceed 30 dBm in any 500 kHz band

RSS-247

Sub-band 5150-5250 MHz

- PSD shall be less than 10 dBm in any 1 MHz band- EIRP

Sub-band 5250-5350 MHz

- PSD shall be less than 11 dBm in any 1 MHz band

Sub-band 5470-5600 MHz and 5650-5725 MHz

- PSD shall be less than 11 dBm in any 1 MHz band

Sub-band 5725-5850 MHz

- PSD shall be less than 30 dBm in any 500 kHz band

Note: All limits are conducted. 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.

8.2.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	1	802.11a/n20/n40/ac80	120VAC	Section 3.6

8.2.4 Measurement result:

UNII-1:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
a	6Mbps	Low	36	5180	6.05	17	Pass
		Mid	40	5200	5.69	17	Pass
		High	48	5240	5.64	17	Pass
n20	MCS0	Low	36	5180	5.84	17	Pass
		Mid	40	5200	5.47	17	Pass
		High	48	5240	5.36	17	Pass
n40	MCS0	Low	38	5190	0	17	Pass
		High	46	5230	2.59	17	Pass
ac80	MCS0	Mid	42	5210	-3.32	17	Pass

UNII-2A:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
a	6Mbps	Low	52	5260	5.73	11	Pass
		Mid	60	5300	5.67	11	Pass
		High	64	5320	5.19	11	Pass
n20	MCS0	Low	52	5260	5.47	11	Pass
		Mid	60	5300	5.44	11	Pass
		High	64	5320	4.94	11	Pass
n40	MCS0	Low	54	5270	2.7	11	Pass
		High	62	5310	-0.98	11	Pass
ac80	MCS0	Mid	58	5290	-3.84	11	Pass

UNII-2C:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
a	6Mbps	Low	100	5500	6.67	11	Pass
		Mid	116	5580	8.08	11	Pass
		High	140	5700	7.28	11	Pass
			144	5720	8	11	Pass
n20	MCS0	Low	100	5500	6.39	11	Pass
		Mid	116	5580	7.82	11	Pass
		High	140	5700	7.01	11	Pass
			144	5720	7.6	11	Pass
n40	MCS0	Low	102	5510	2.87	11	Pass
		Mid	110	5550	4.86	11	Pass
		High	134	5670	3.22	11	Pass
			142	5710	4	11	Pass

ac80	MCS0	Low	106	5530	-1.79	11	Pass
		Mid	122	5610	1.67	11	Pass
		High	138	5690	0.56	11	Pass

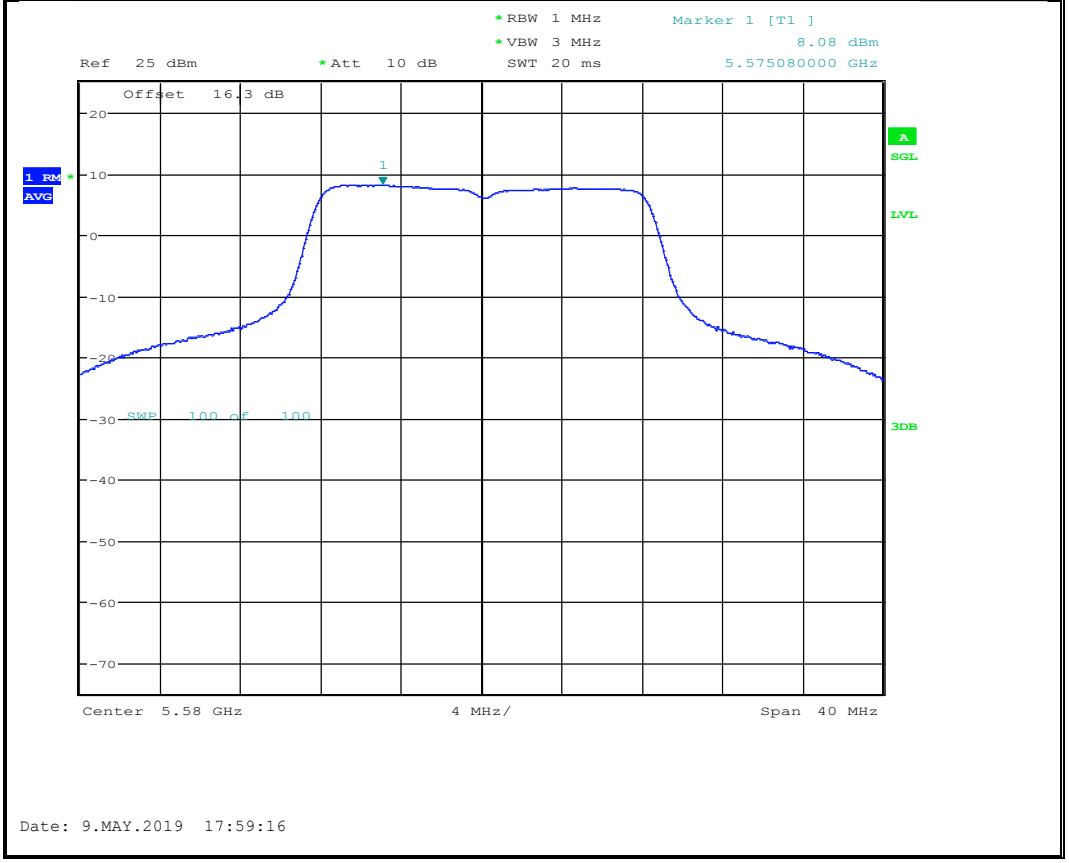
UNII-3:

Mode	Data Rate	Channel / Frequency (MHz)			Maximum Power Spectral Density (dBm/MHz)	Limit (dBm/500kHz)	Result
a	6Mbps	Low	149	5745	3.19	30	Pass
		Mid	157	5785	2.48	30	Pass
		High	165	5825	1.26	30	Pass
n20	MCS0	Low	149	5745	2.95	30	Pass
		Mid	157	5785	2.21	30	Pass
		High	165	5825	1	30	Pass
n40	MCS0	Low	151	5755	0.26	30	Pass
		High	159	5795	-0.68	30	Pass
ac80	MCS0	Mid	155	5775	-3.77	30	Pass

8.2.5 Highest PSD Measurement Plots:

Transmit Chain:

Channel: 116	Mode of operation:802.11a	Duty Cycle:100%



8.3 Band Edge Compliance

8.3.1 Measurement according to FCC 789033 D02 General UNII Test Procedures New Rules v02r01 and ANSI 63.10

Non Restricted Band Edge and Restricted Band Edge Peak Measurement Spectrum Analyzer Settings:

- Set the center frequency and span to encompass frequency range to be measured
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep Time: Auto couple
- Detector = Peak
- Trace = Max hold
- Allow trace to fully stabilize
- Use the peak marker function to determine the maximum amplitude level
- Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge

Restricted Band Edge Average Measurement Spectrum Analyzer Settings(Method VB):

- Set the center frequency and span to encompass frequency range to be measured
- RBW = 1 MHz
- VBW = 10 Hz
- Sweep Time: Auto couple
- Detector = Peak
- Trace = Max hold
- Perform a trace max hold of at least 50 traces if the transmission is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.
- Use the peak marker function to determine the maximum amplitude level
- Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge

8.3.2 Limits non restricted band:

FCC§15.407 (b); RSS-247 6

- 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.

- 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.

- 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.

- For transmitters operating in the 5.725-5.85 GHz band: 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.

8.3.3 Limits for restricted band §15.407/15.209/15.205 and RSS-Gen 8.9/8.10

- *PEAK LIMIT= 74 dBµV/m @3m =-21.23 dBm
- *AVG. LIMIT= 54 dBµV/m @3m =-41.23 dBm
- Start frequency & stop frequency according to frequency range specified in the restricted band table in FCC section 15.205 & RSS-Gen 8.10

Only spurious emissions are permitted in any of the frequency bands listed below			
MHz	**MHz**	**MHz**	**GHz**
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

8.3.4 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	1	GFSK continuous fixed channel	3.7 VDC	3.5 dBi

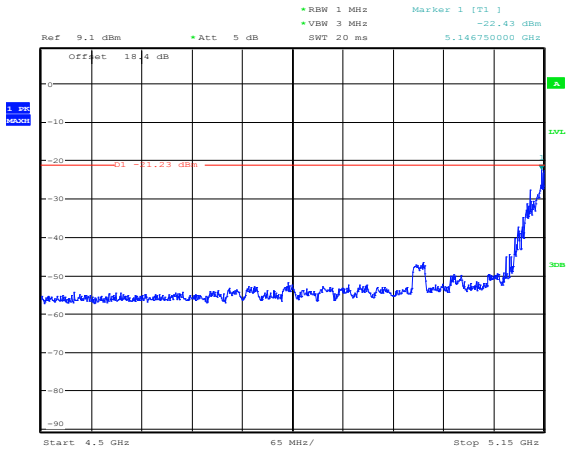
8.3.5 Measurement result:

Plot #	EUT operating mode	Channel #	Band Edge	Band Edge Max (dBm)	Limit (dBm)	Result
1	a	36	Restricted Peak	-22.43	-21.23	Pass
2		36	Restricted AVG	-42.8	-41.23	Pass
3		64	Restricted Peak	-24.84	-21.23	Pass
4		64	Restricted AVG	-43.62	-41.23	Pass
5		100	Non-restricted	-40.15	-27	Pass
6		100	Restricted Peak	-29.11	-21.23	Pass
7		100	Restricted AVG	-46.85	-41.23	Pass

8		140	Non-restricted	-30.04	-27	Pass
9		144	Non-restricted	-59.66	-27	Pass
10		149	Non-restricted	-5.88	See section 8.3.3	Pass
11		165	Non-restricted	-14.71	See section 8.3.3	Pass
12	n20	36	Restricted Peak	-21.56	-21.23	Pass
13		36	Restricted AVG	-41.74	-41.23	Pass
14		64	Restricted Peak	-25.4	-21.23	Pass
15		64	Restricted AVG	-42.71	-41.23	Pass
16		100	Non-restricted	-39.69	-27	Pass
17		100	Restricted Peak	-27.75	-21.23	Pass
18		100	Restricted AVG	-46.13	-41.23	Pass
19		140	Non-restricted	-27.02	-27	Pass
20		144	Non-restricted	-59.77	-27	Pass
21		149	Non-restricted	-6.14	See section 8.3.3	Pass
22		165	Non-restricted	-13.58	See section 8.3.3	Pass
23	n40	36	Restricted Peak	-22.41	-21.23	Pass
24		36	Restricted AVG	-42.17	-41.23	Pass
25		64	Restricted Peak	-22.37	-21.23	Pass
26		64	Restricted AVG	-41.44	-41.23	Pass
27		100	Non-restricted	-28.92	-27	Pass
28		100	Restricted Peak	-21.35	-21.23	Pass
29		100	Restricted AVG	-41.54	-41.23	Pass
30		140	Non-restricted	-36.45	-27	Pass
31		144	Non-restricted	-57.65	-27	Pass
32		149	Non-restricted	-4.72	See section 8.3.3	Pass
33		165	Non-restricted	-19.41	See section 8.3.3	Pass
34	ac80	36	Restricted Peak	-26.58	-21.23	Pass
35		36	Restricted AVG	-42.39	-41.23	Pass
36		64	Restricted Peak	-24.77	-21.23	Pass
37		64	Restricted AVG	-41.58	-41.23	Pass
38		100	Non-restricted	-35.67	-27	Pass
39		100	Restricted Peak	-24.68	-21.23	Pass
40		100	Restricted AVG	-42.58	-41.23	Pass
41		140	Non-restricted	-40.78	-27	Pass
42		144	Non-restricted	-47.71	-27	Pass
43		149	Non-restricted	-10.4	See section 8.3.3	Pass
44		165	Non-restricted	-17.97	See section 8.3.3	Pass

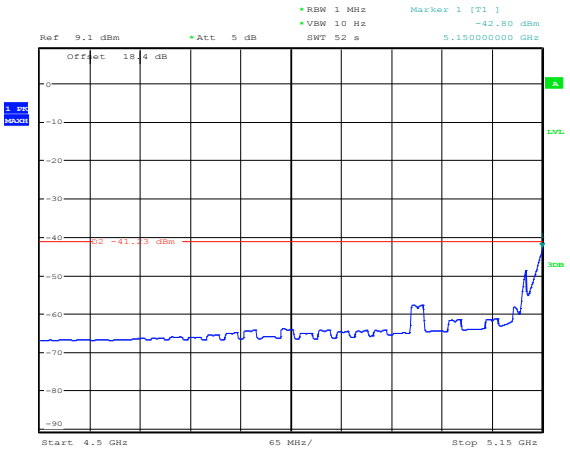
8.3.6 Measurement Plots:

Plot # 1: Band Edge – Restricted Peak	
802.11a	CH#36



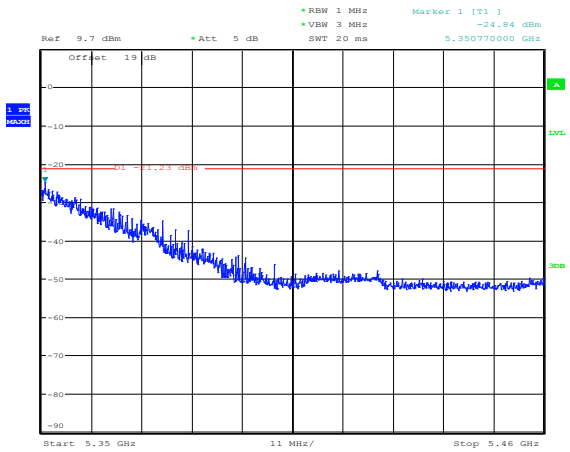
Date: 8.MAY.2019 15:46:06

Plot # 2: Band Edge – Restricted Average	
802.11a	CH#36



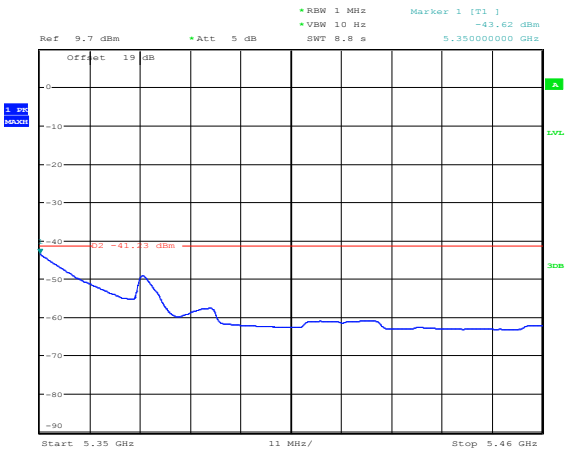
Date: 8.MAY.2019 15:43:24

Plot # 3: Band Edge – Restricted Peak	
802.11a	CH#64



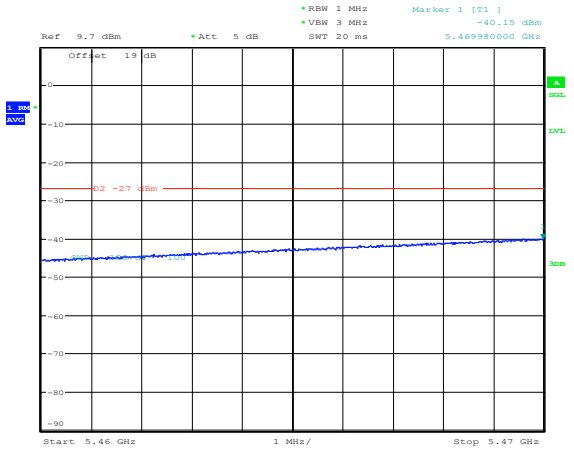
Date: 8.MAY.2019 16:49:24

Plot # 4: Band Edge – Restricted Average	
802.11a	CH#64



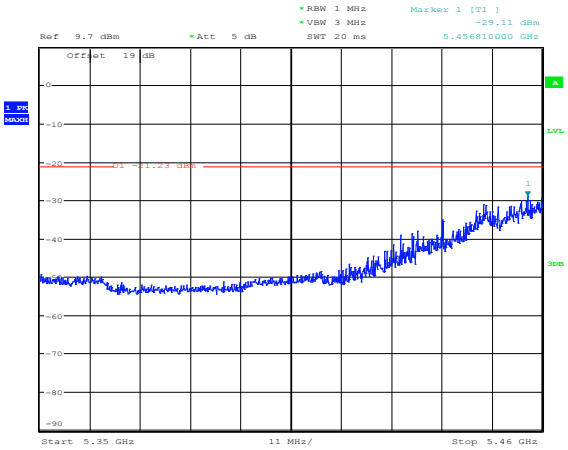
Date: 8.MAY.2019 16:48:50

Plot # 5: Band Edge – Non-Restricted	
802.11a	CH#100



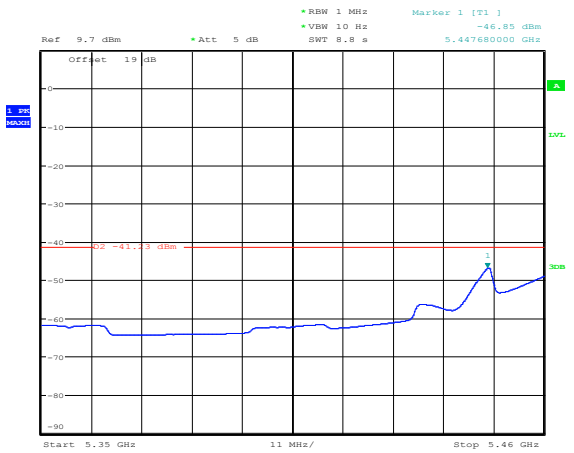
Date: 8.MAY.2019 17:55:56

Plot # 6: Band Edge – Restricted Peak	
802.11a	CH#100



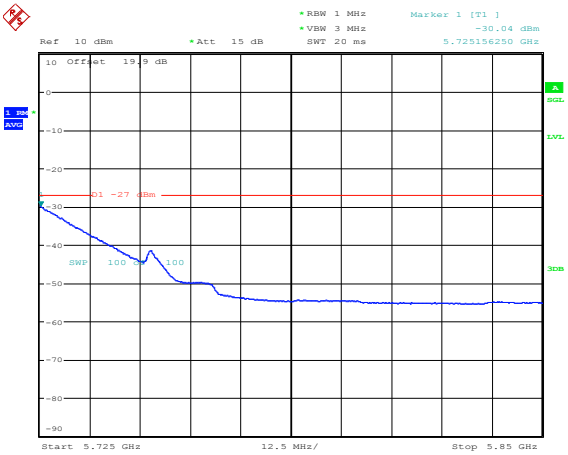
Date: 8.MAY.2019 17:32:00

Plot # 7: Band Edge – Restricted Average	
802.11a	CH#100



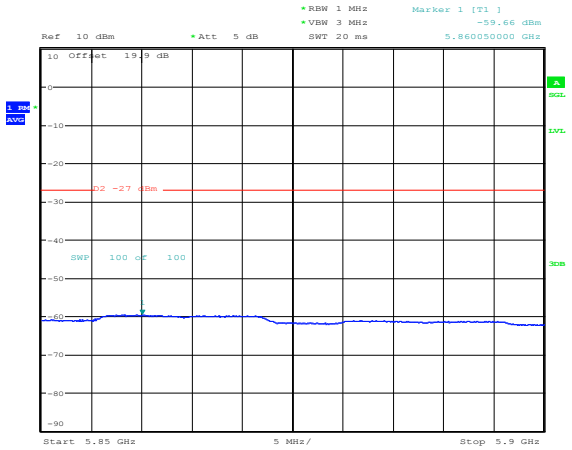
Date: 8.MAY.2019 17:31:22

Plot # 8: Band Edge – Non-Restricted	
802.11a	CH#140



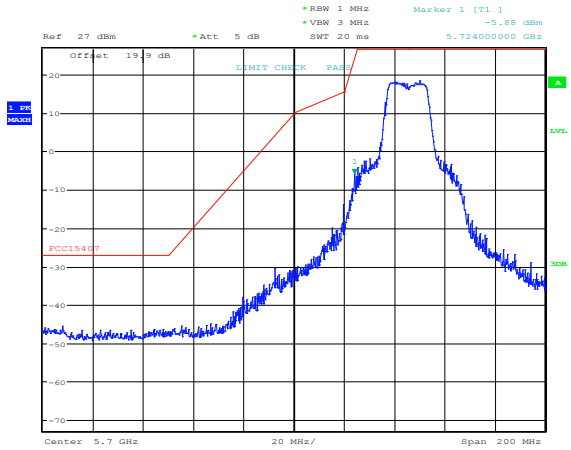
Date: 2.JUL.2019 18:53:47

Plot # 9: Band Edge – Non-Restricted	
802.11a	CH#144



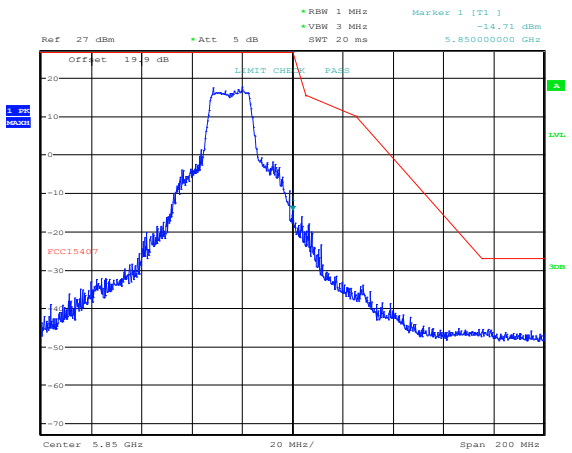
Date: 9.MAY.2019 12:36:10

Plot # 10: Band Edge – Non-Restricted	
802.11a	CH#149



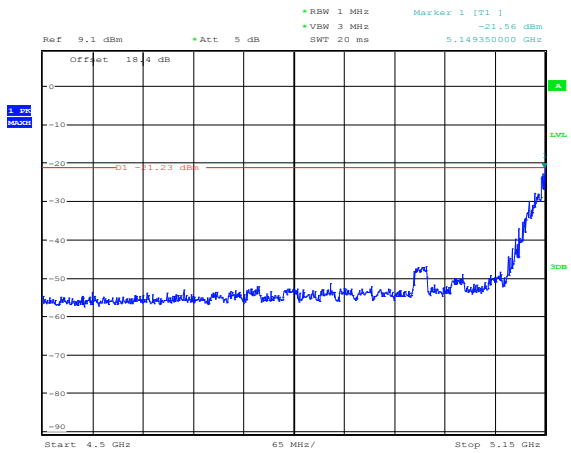
Date: 9.MAY.2019 13:54:57

Plot # 11: Band Edge – Non-Restricted	
802.11a	CH#165



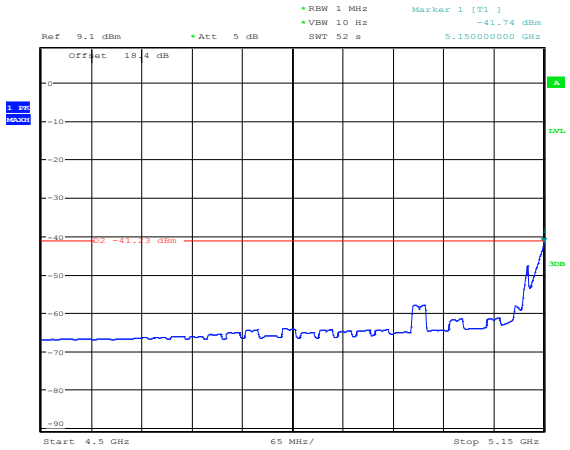
Date: 9.MAY.2019 14:02:16

Plot # 12: Band Edge – Restricted Peak	
802.11n20	CH#36

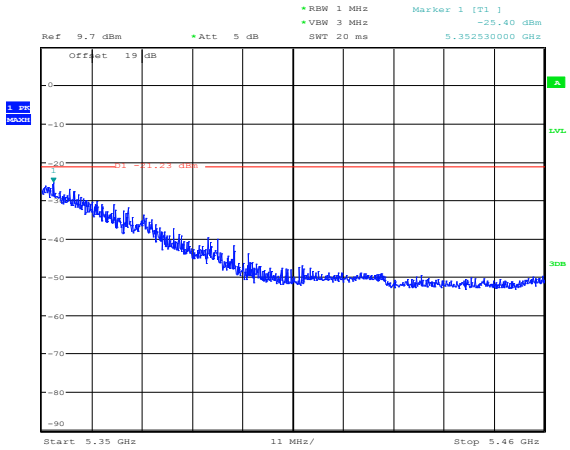


Date: 8.MAY.2019 15:48:38

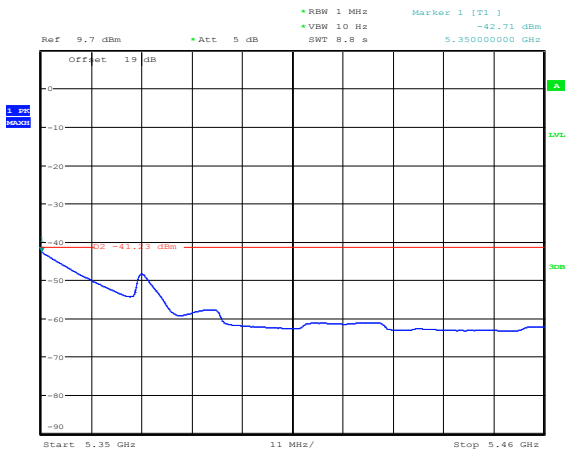
Plot # 13: Band Edge – Restricted Average	
802.11n20	CH#36



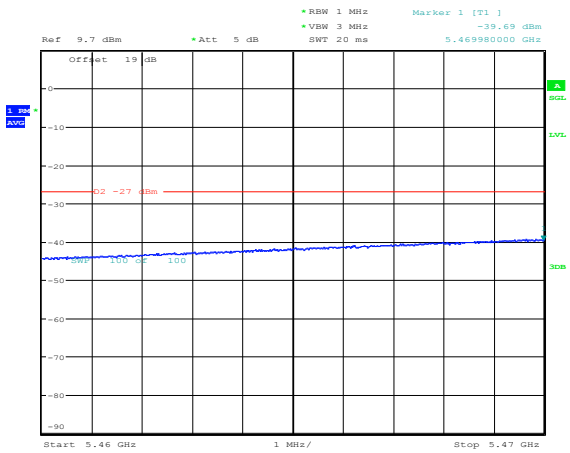
Plot # 14: Band Edge – Restricted Peak	
802.11n20	CH#64



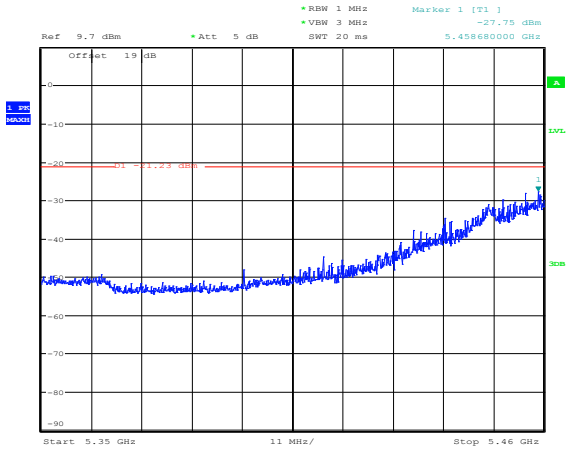
Plot # 15: Band Edge – Restricted Average	
802.11n20	CH#64



Plot # 16: Band Edge – Non-Restricted	
802.11n20	CH#100

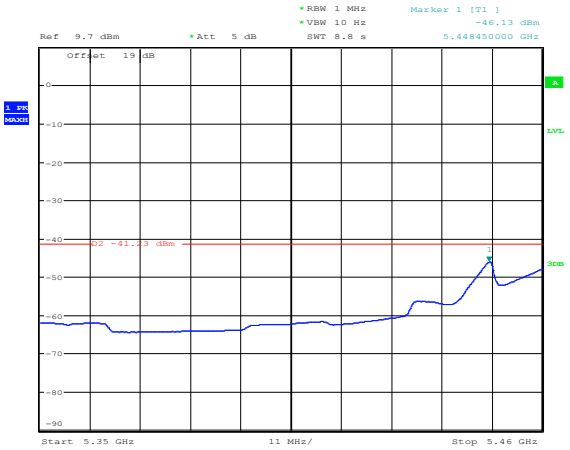


Plot # 17: Band Edge – Restricted Peak	
802.11n20	CH#100



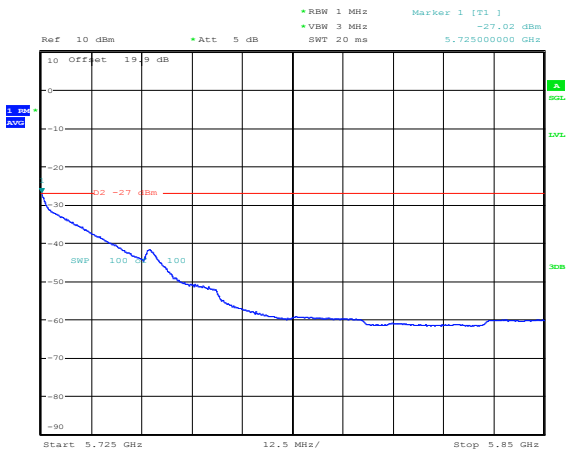
Date: 8.MAY.2019 17:32:37

Plot # 18: Band Edge – Restricted Average	
802.11n20	CH#100



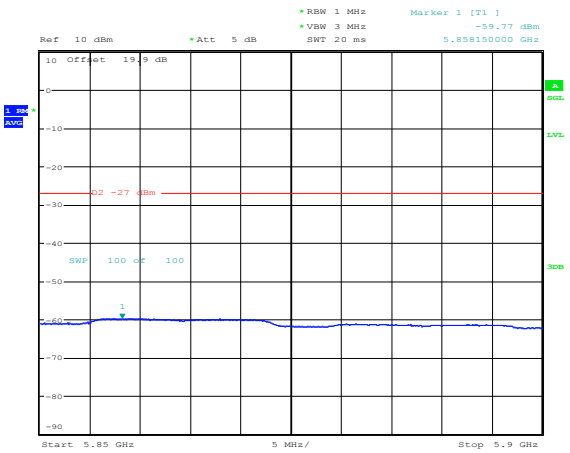
Date: 8.MAY.2019 17:33:26

Plot # 19: Band Edge – Non-Restricted	
802.11n20	CH#140



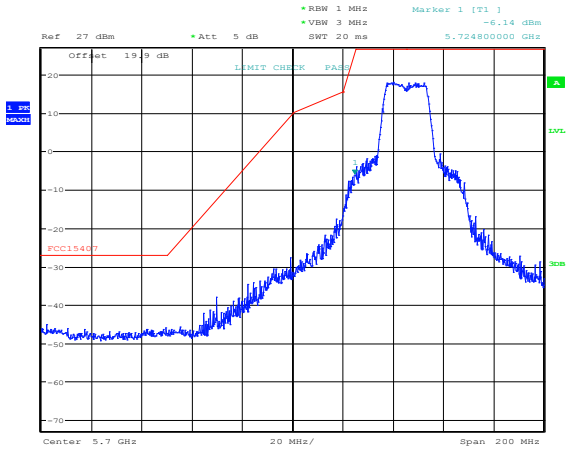
Date: 9.MAY.2019 12:24:08

Plot # 20: Band Edge – Non-Restricted	
802.11n20	CH#144



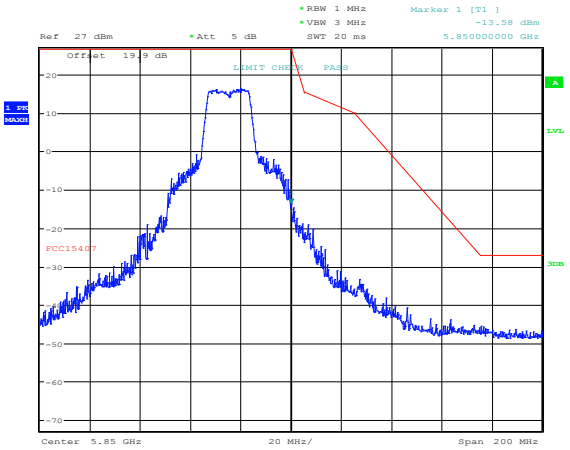
Date: 9.MAY.2019 12:36:43

Plot # 21: Band Edge – Non-Restricted	
802.11n20	CH#149



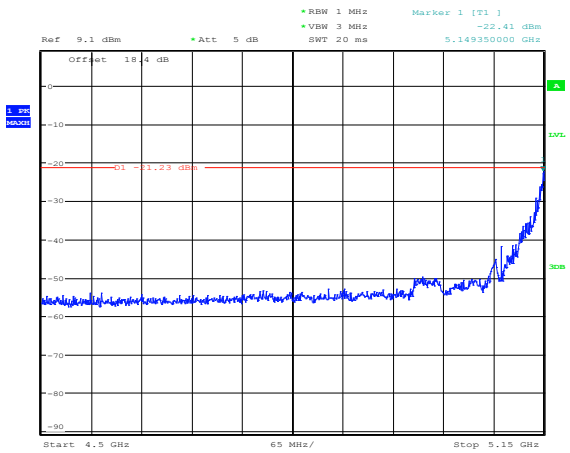
Date: 9.MAY.2019 13:45:58

Plot # 22: Band Edge – Non-Restricted	
802.11n20	CH#165



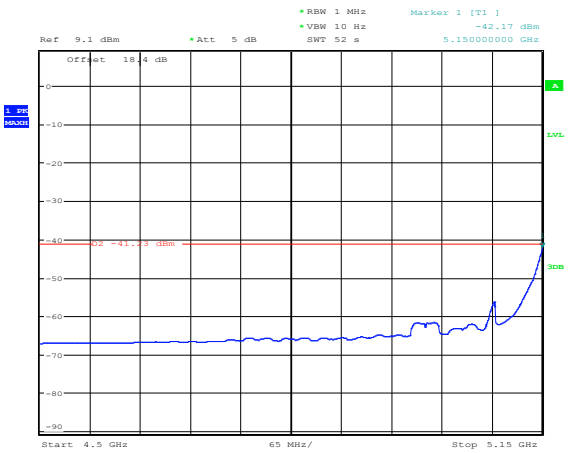
Date: 9.MAY.2019 14:03:08

Plot # 23: Band Edge – Restricted Peak	
802.11n40	CH#38



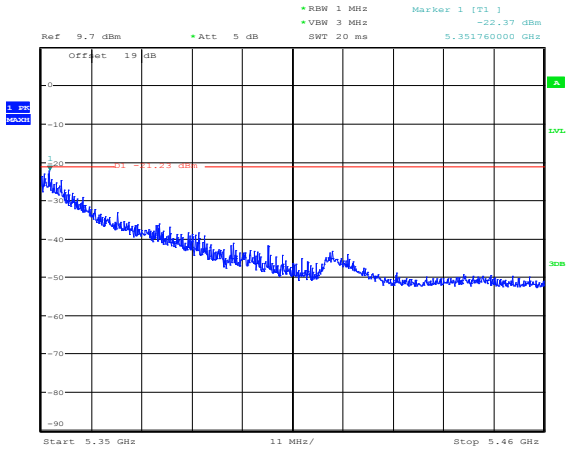
Date: 8.MAY.2019 16:16:23

Plot # 24: Band Edge – Restricted Average	
802.11n40	CH#38



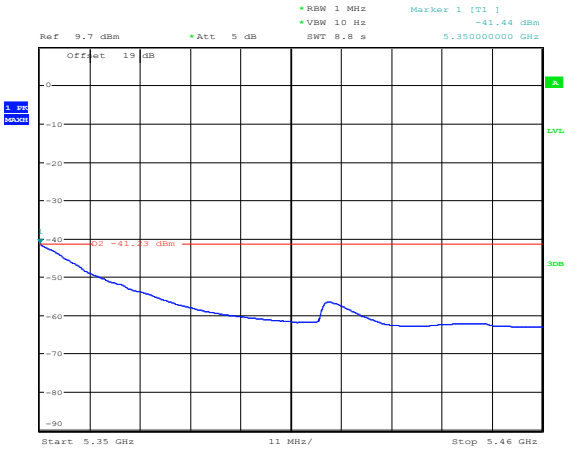
Date: 8.MAY.2019 16:15:21

Plot # 25: Band Edge – Restricted Peak	
802.11n40	CH#62



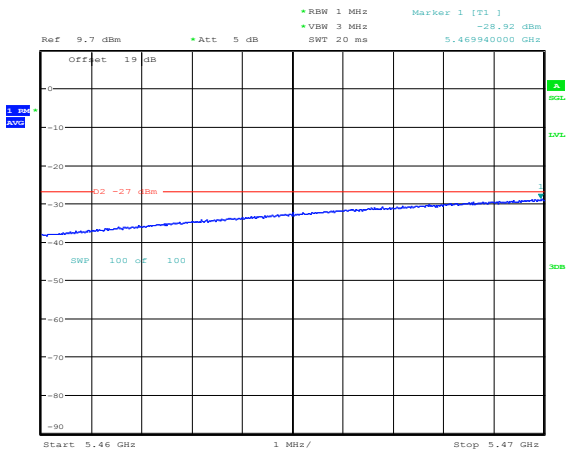
Date: 8.MAY.2019 16:56:08

Plot # 26: Band Edge – Restricted Average	
802.11n40	CH#62



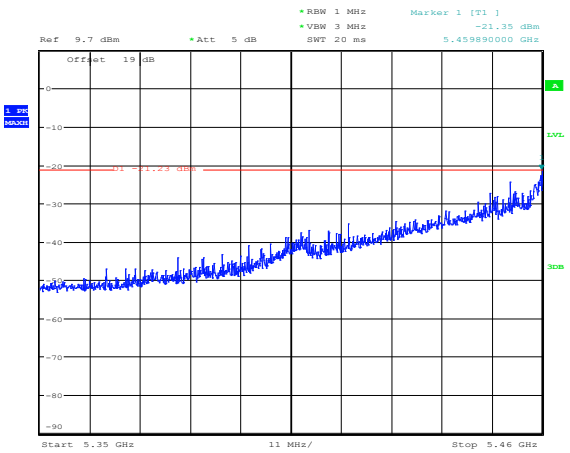
Date: 8.MAY.2019 16:55:25

Plot # 27: Band Edge – Non-Restricted	
802.11n40	CH#102



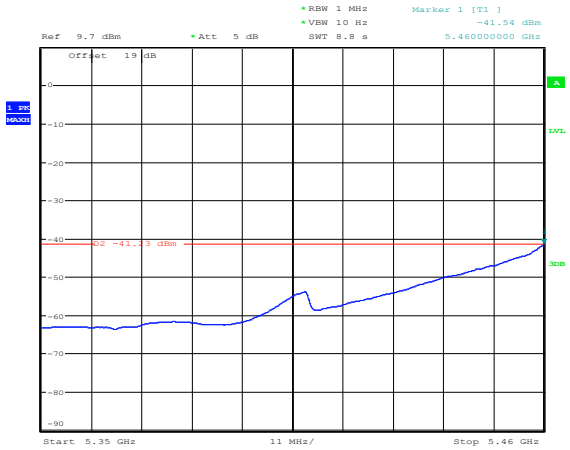
Date: 8.MAY.2019 17:54:56

Plot # 28: Band Edge – Restricted Peak	
802.11n40	CH#102



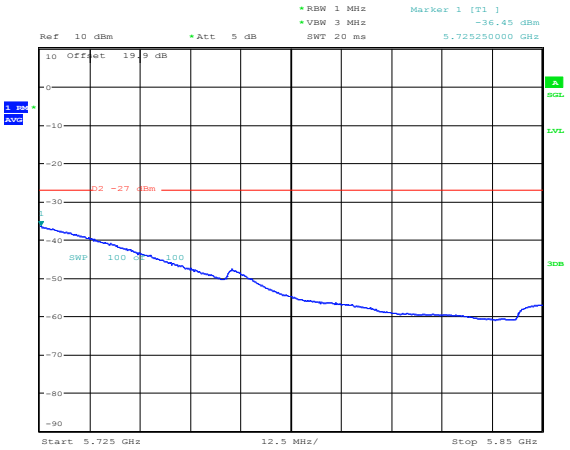
Date: 8.MAY.2019 17:36:36

Plot # 29: Band Edge – Restricted Average	
802.11n40	CH#102



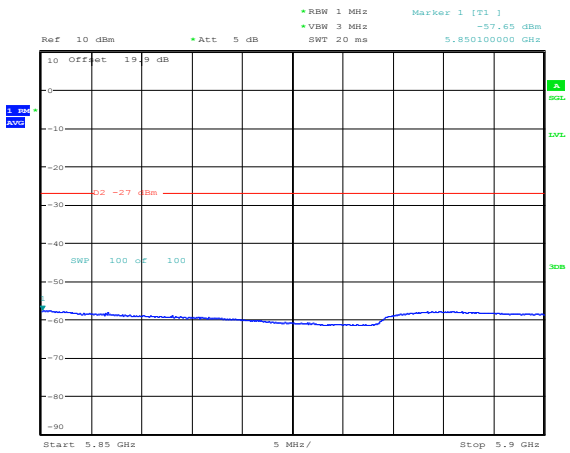
Date: 8.MAY.2019 17:35:59

Plot # 30: Band Edge – Non-Restricted	
802.11n40	CH#134



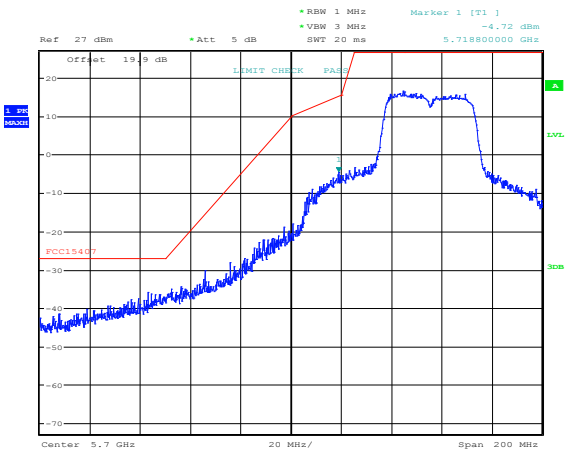
Date: 9.MAY.2019 12:25:33

Plot # 31: Band Edge – Non-Restricted	
802.11n40	CH#142



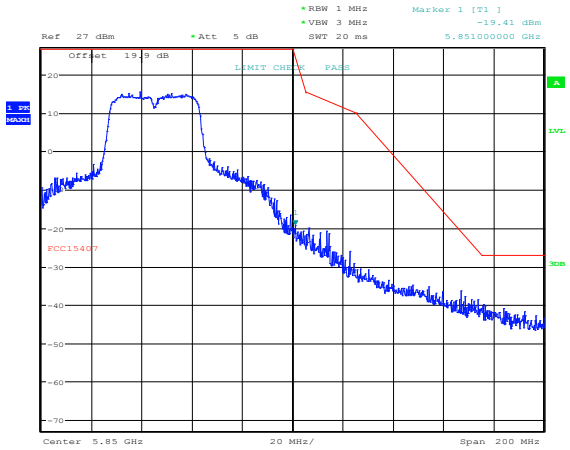
Date: 9.MAY.2019 12:35:15

Plot # 32: Band Edge – Non-Restricted	
802.11n40	CH#151



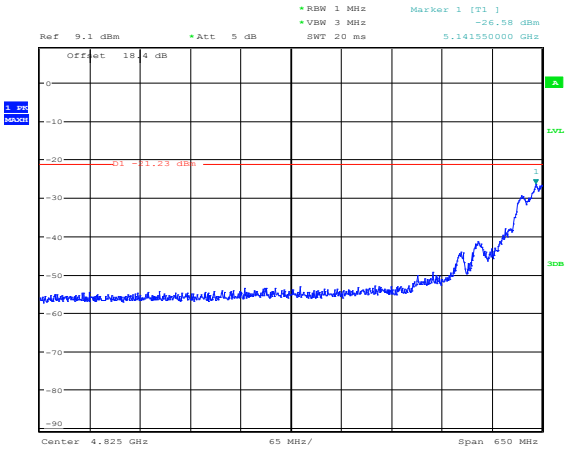
Date: 9.MAY.2019 13:53:35

Plot # 33: Band Edge – Non-Restricted	
802.11n40	CH#159



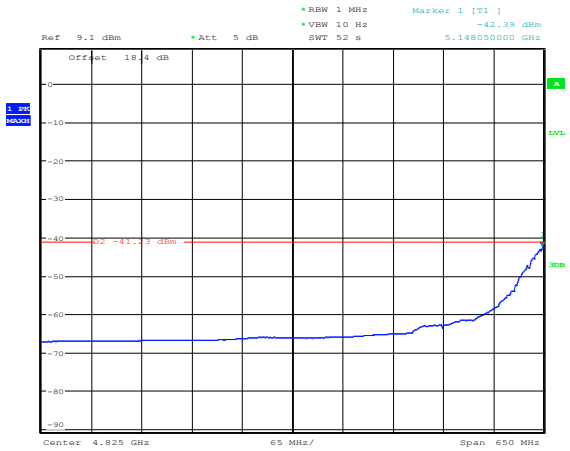
Date: 9.MAY.2019 14:00:49

Plot # 34: Band Edge – Restricted Peak	
802.11ac80	CH#42



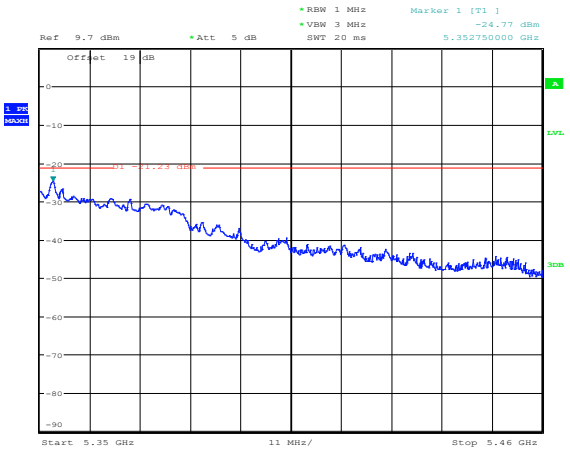
Date: 8.MAY.2019 16:35:32

Plot # 35: Band Edge – Restricted Average	
802.11ac80	CH#42



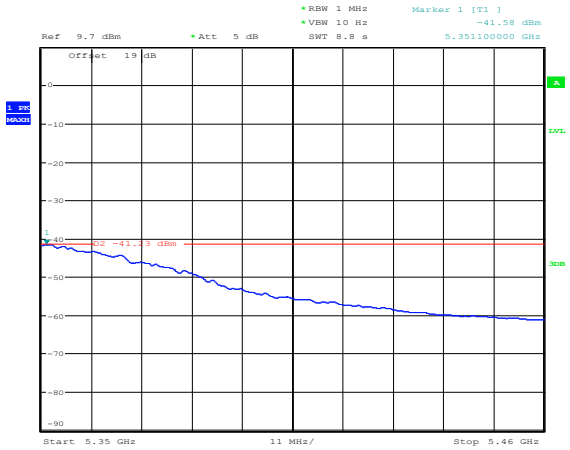
Date: 8.MAY.2019 16:26:12

Plot # 36: Band Edge – Restricted Peak	
802.11ac80	CH#58



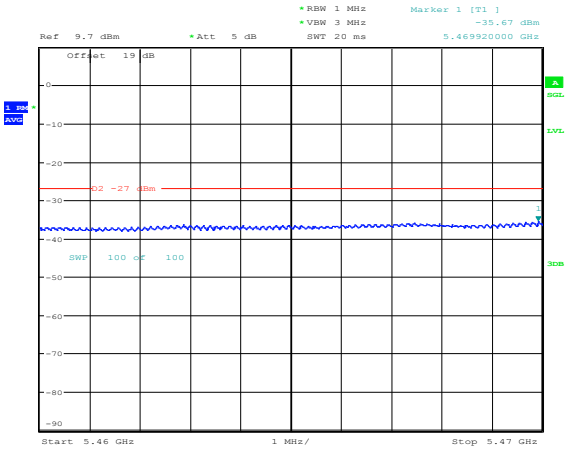
Date: 8.MAY.2019 16:46:38

Plot # 37: Band Edge – Restricted Average	
802.11ac80	CH#58



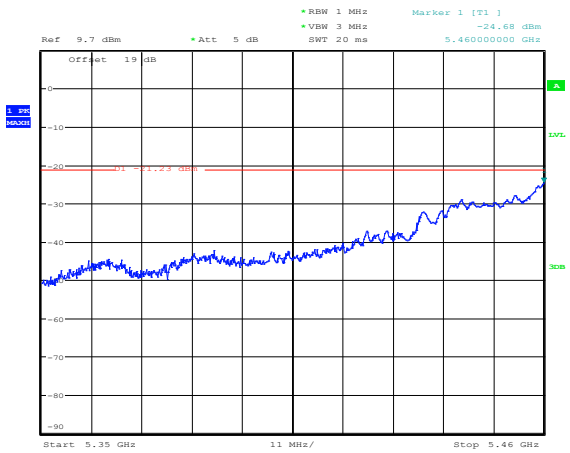
Date: 8.MAY.2019 16:45:54

Plot # 38: Band Edge – Non-Restricted	
802.11ac80	CH#106



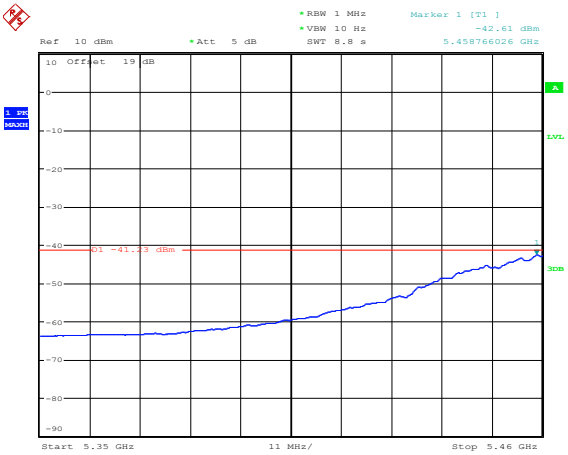
Date: 8.MAY.2019 17:53:07

Plot # 39: Band Edge – Restricted Peak	
802.11ac80	CH#106



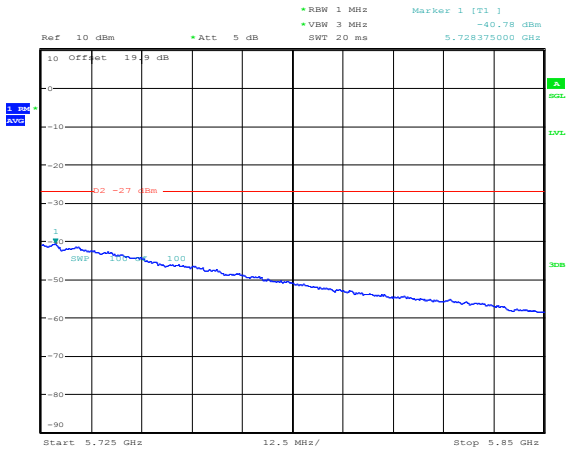
Date: 8.MAY.2019 17:46:28

Plot # 40: Band Edge – Restricted Average	
802.11ac80	CH#106



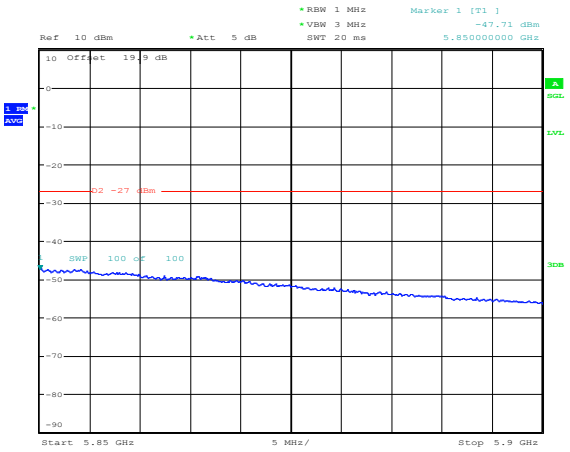
Date: 2.JUL.2019 21:49:21

Plot # 41: Band Edge – Non-Restricted	
802.11ac80	CH#122



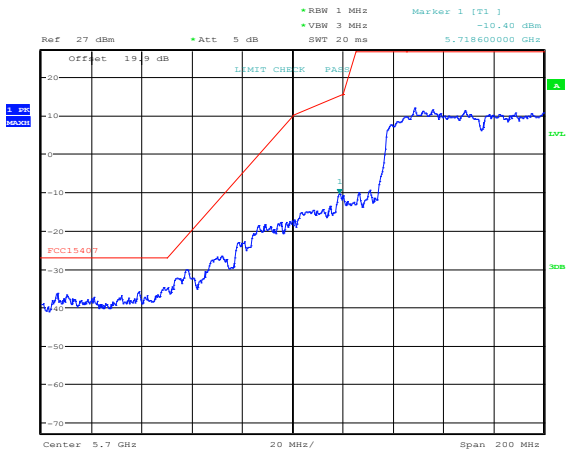
Date: 9.MAY.2019 12:33:12

Plot # 42: Band Edge – Non-Restricted	
802.11ac80	CH#138



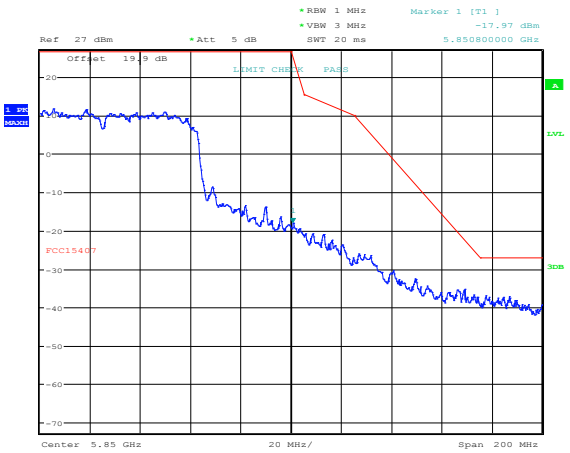
Date: 9.MAY.2019 12:32:06

Plot # 43: Band Edge – Non-Restricted – Lower	
802.11ac80	CH#155



Date: 9.MAY.2019 13:57:34

Plot # 44: Band Edge – Non-Restricted – Upper	
802.11ac80	CH#155



Date: 9.MAY.2019 13:59:16

8.4 Emission Bandwidth 6 dB, 26 dB, and 99%

8.4.1 Measurement according to FCC 789033 D02 General UNII Test Procedures New Rules v02r01

- For the band 5.150-5.250 GHz the 26dB and 99% EBW are measured
- For the bands 5.250-5.350 GHz and 5.470-5.725 GHz the 26 dB and 99% EBW are measured
- For the band 5.725-5.850 GHz the 26dB, 99% and 6 dB EBW are measured

Spectrum Analyzer Settings for 26 dB EBW:

- Set RBW = approximately 1% of the emission bandwidth
- Set the VBW > RBW
- Detector = Peak
- Trace mode = Max Hold
- Sweep = Auto Couple
- Allow the trace to stabilize
- Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%

Spectrum Analyzer Settings for 6 dB EBW in band 5.725 – 5.850 GHz:

- Set RBW = 100 kHz
- Set the video bandwidth (VBW) ≥ 3 x RBW
- Detector = Peak
- Trace mode = max hold
- Sweep = auto couple
- Allow the trace to stabilize
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

Spectrum Analyzer Settings for 99% Occupied Bandwidth

- Set center frequency to the nominal EUT channel center frequency
- Set span = 1.5 times to 5.0 times the OBW
- Set RBW = 1% to 5% of the OBW
- Set VBW ≥ 3 x RBW
- Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used
- Use the 99% power bandwidth function of the instrument (if available)
- If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies

8.4.2 Limits:

FCC §15.247(e) and RSS-407 6.2.4.1

- For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

8.4.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	802.11a/n20/n40/ac80	120VAC

8.4.4 Measurement result:

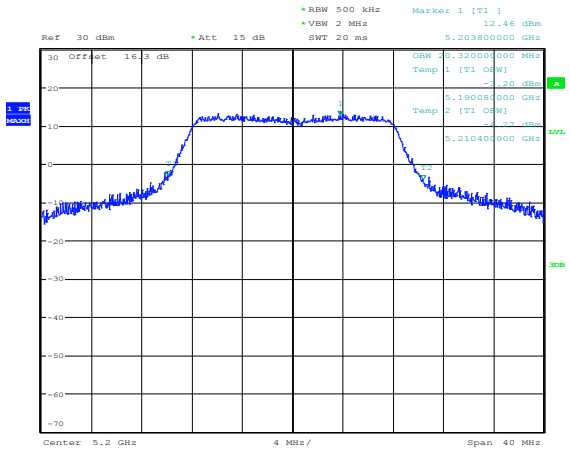
Plot #	Mode	Channel	Frequency (MHz)	99% Emissions Bandwidth (MHz)
1	a	40	5200	20.32
2		60	5300	19.84
3		116	5580	22.56
4		157	5785	21.48
5	n20	40	5200	20.28
6		60	5300	20.24
7		116	5580	23.8
8		157	5785	21.84
9	n40	38	5190	37.6
10		62	5310	37.44
11		110	5550	39.04
12		159	5795	41.04
13	ac80	42	5210	75.36
14		58	5290	75.04
15		106	5530	75.52
16		155	5775	75.84

Plot #	Mode	Channel	Frequency (MHz)	26 dB Emissions Bandwidth (MHz)
17	a	40	5200	31.65
18		60	5300	30.35
19		116	5580	37.4
20		157	5785	34.6
21	n20	40	5200	31.6
22		60	5300	30.3
23		116	5580	39.05
24		157	5785	35.05
25	n40	38	5190	61.1
26		62	5310	58.9
27		110	5550	63.6
28		159	5795	71.2
29	ac80	42	5210	92.64
30		58	5290	92.8
31		106	5530	97.92
32		155	5775	92.8

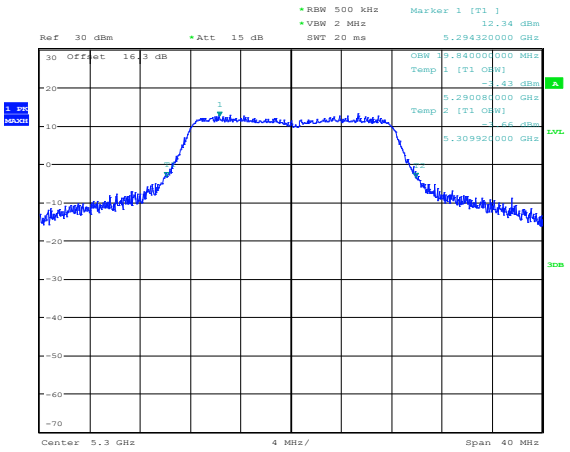
Plot #	Mode	Channel	Frequency (MHz)	6 dB Emissions Bandwidth (MHz)	Limit (MHz)	Result
33	a	157	5785	16.454	> 0.5	Pass
34	n20	157	5785	17.672	> 0.5	Pass
35	n40	159	5795	35.618	> 0.5	Pass
36	ac80	155	5775	75.618	> 0.5	Pass

8.4.5 Measurement Plots:

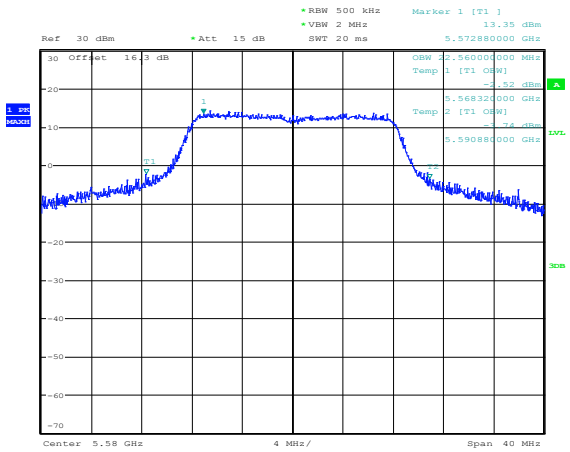
Plot # 1: Emissions Bandwidth (99%)	
Mode: 802.11a	Channel: 40



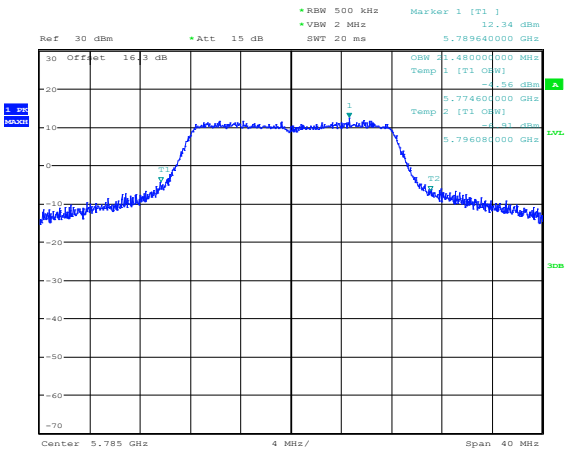
Plot # 2: Emissions Bandwidth (99%)	
Mode: 802.11a	Channel: 60



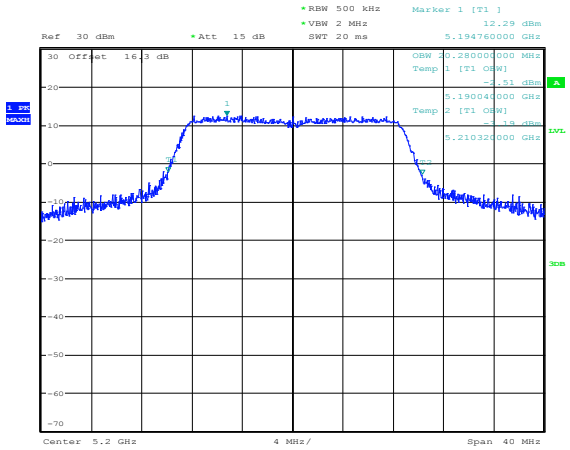
Plot # 3: Emissions Bandwidth (99%)	
Mode: 802.11a	Channel: 116



Plot # 4: Emissions Bandwidth (99%)	
Mode: 802.11a	Channel: 157

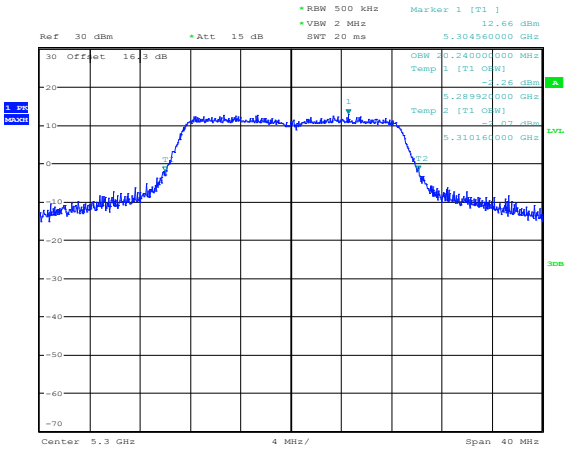


Plot # 5: Emissions Bandwidth (99%)	
Mode: 802.11n20	**Channel: 40**



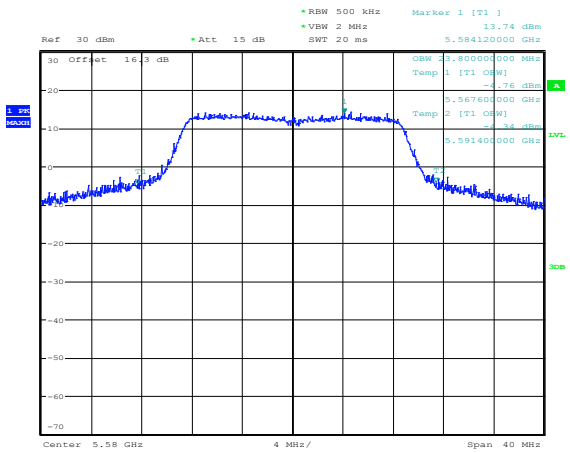
Date: 8.MAY.2019 12:47:34

Plot # 6: Emissions Bandwidth (99%)	
Mode: 802.11n20	**Channel: 60**



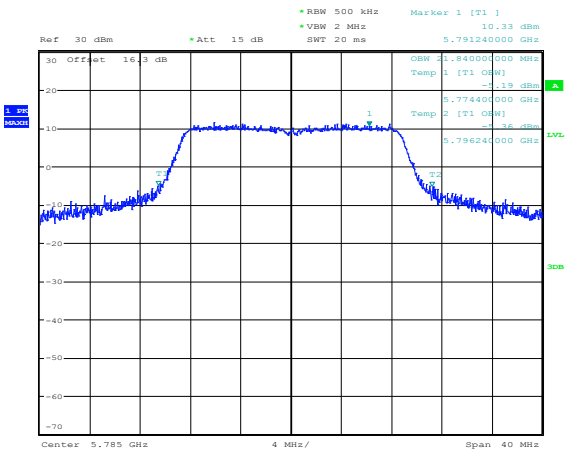
Date: 8.MAY.2019 12:48:30

Plot # 7: Emissions Bandwidth (99%)	
Mode: 802.11n20	**Channel: 116**



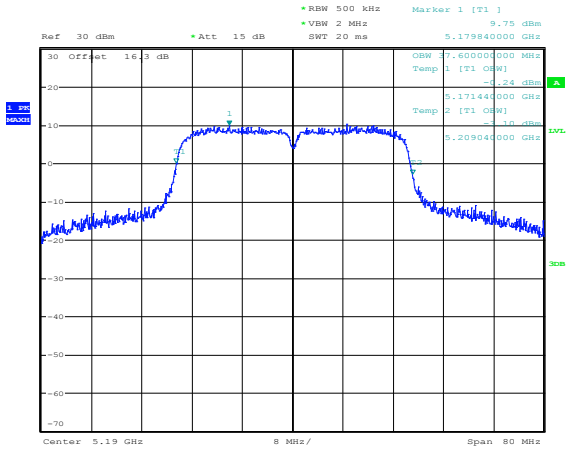
Date: 8.MAY.2019 12:49:38

Plot # 8: Emissions Bandwidth (99%)	
Mode: 802.11n20	**Channel: 157**



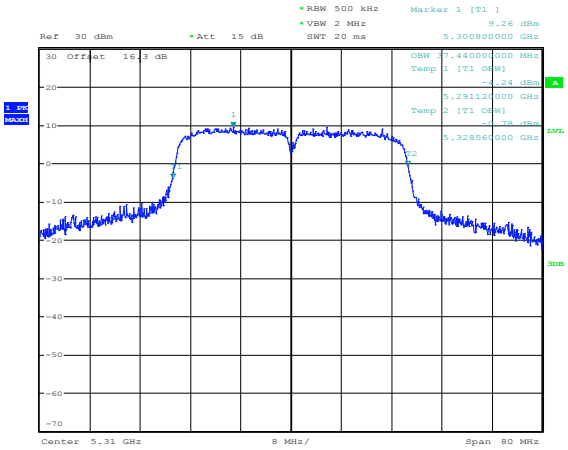
Date: 8.MAY.2019 12:50:31

Plot # 9: Emissions Bandwidth (99%)	
Mode: 802.11n40	**Channel: 38**



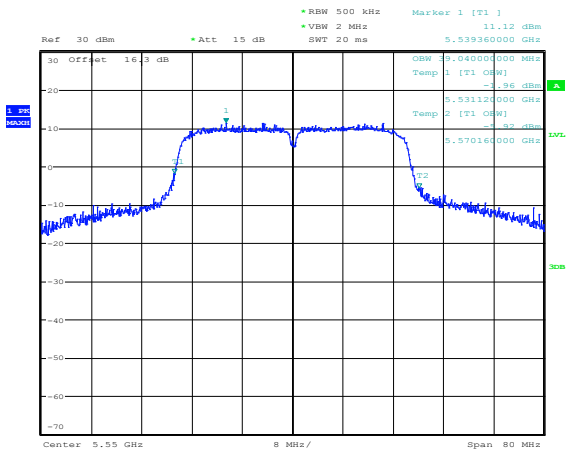
Date: 8.MAY.2019 12:51:52

Plot # 10: Emissions Bandwidth (99%)	
Mode: 802.11n40	**Channel: 62**



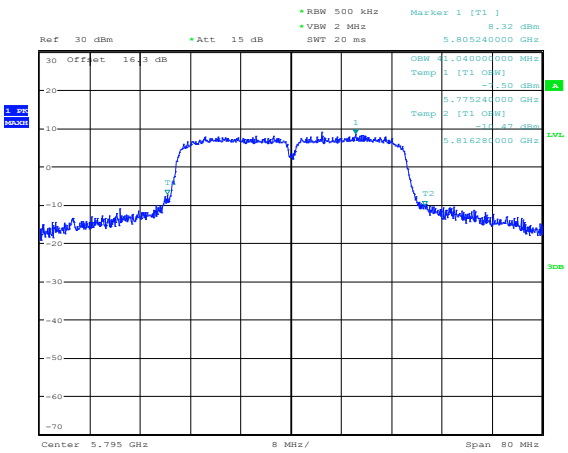
Date: 8.MAY.2019 12:52:40

Plot # 11: Emissions Bandwidth (99%)	
Mode: 802.11n40	**Channel: 110**



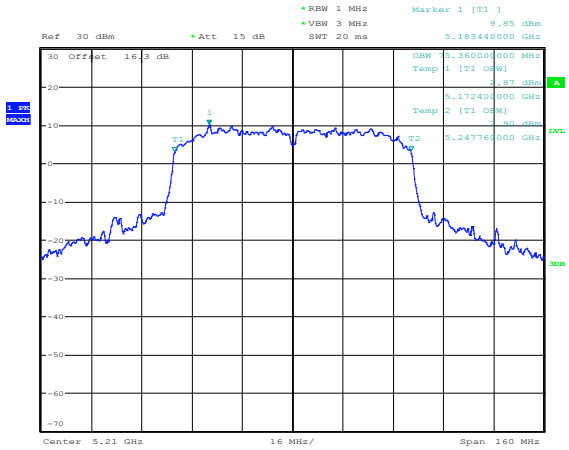
Date: 8.MAY.2019 12:53:47

Plot # 12: Emissions Bandwidth (99%)	
Mode: 802.11n40	**Channel: 159**



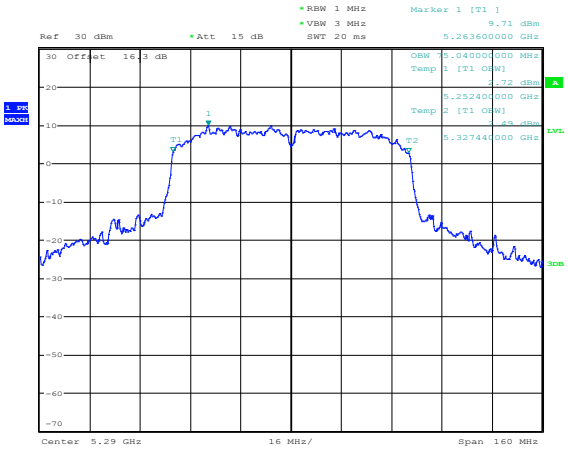
Date: 8.MAY.2019 12:54:41

Plot # 13: Emissions Bandwidth (99%)	
Mode: 802.11ac80	**Channel: 42**



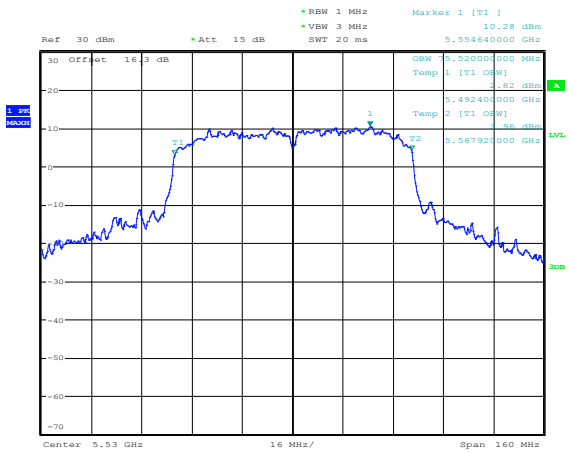
Date: 8.MAY.2019 12:56:45

Plot # 14: Emissions Bandwidth (99%)	
Mode: 802.11ac80	**Channel: 58**



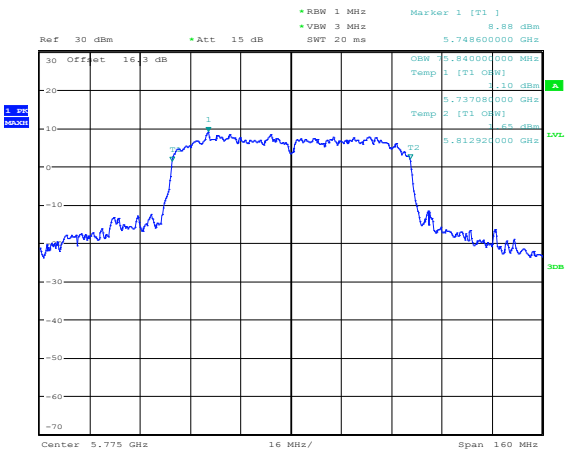
Date: 8.MAY.2019 12:57:45

Plot # 15: Emissions Bandwidth (99%)	
Mode: 802.11ac80	**Channel: 106**



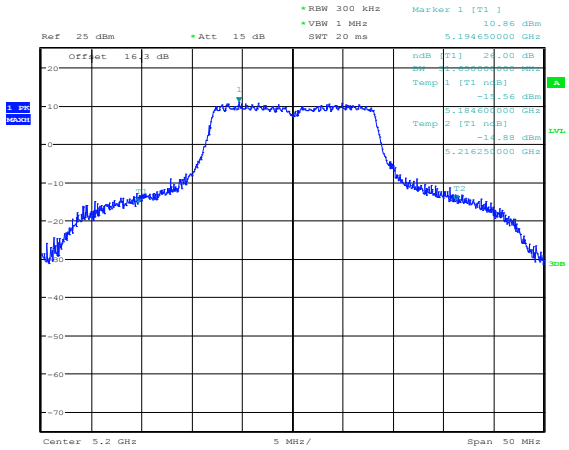
Date: 8.MAY.2019 12:59:11

Plot # 16: Emissions Bandwidth (99%)	
Mode: 802.11ac80	**Channel: 155**



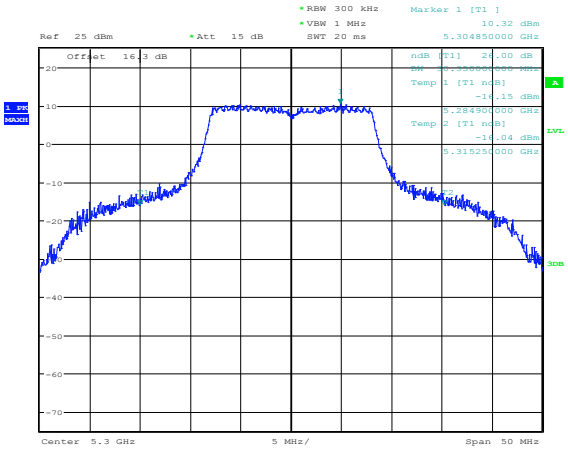
Date: 8.MAY.2019 13:00:03

Plot # 17: Emissions Bandwidth (26 dB)	
Mode: 802.11a	**Channel: 40**



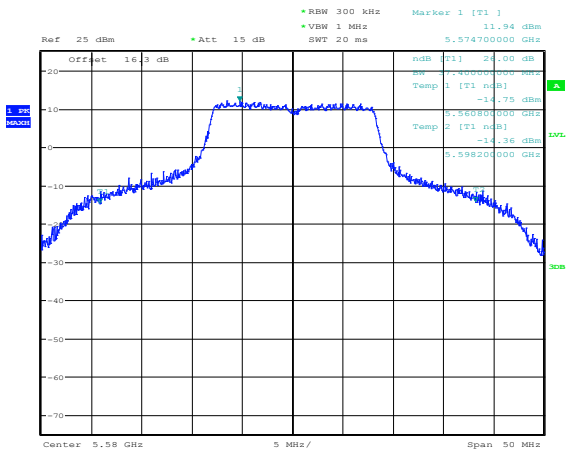
Date: 8.MAY.2019 11:45:38

Plot # 18: Emissions Bandwidth (26 dB)	
Mode: 802.11a	**Channel: 60**



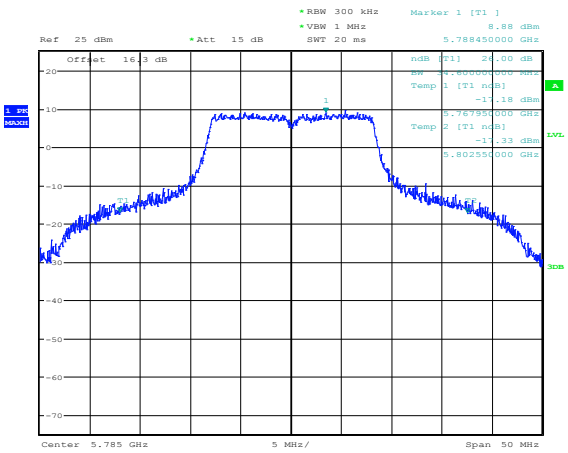
Date: 8.MAY.2019 11:48:01

Plot # 19: Emissions Bandwidth (26 dB)	
Mode: 802.11a	**Channel: 116**



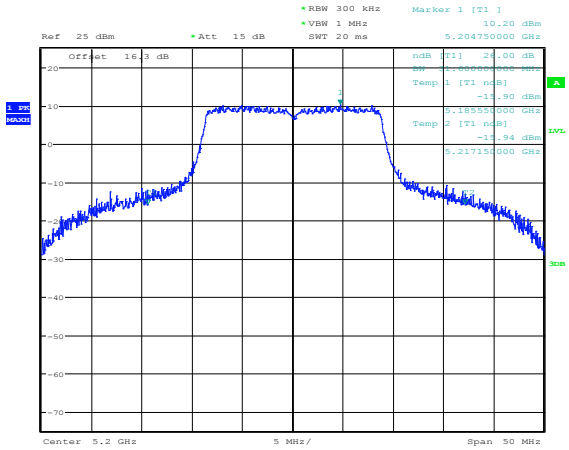
Date: 8.MAY.2019 11:49:29

Plot # 20: Emissions Bandwidth (26 dB)	
Mode: 802.11a	**Channel: 157**



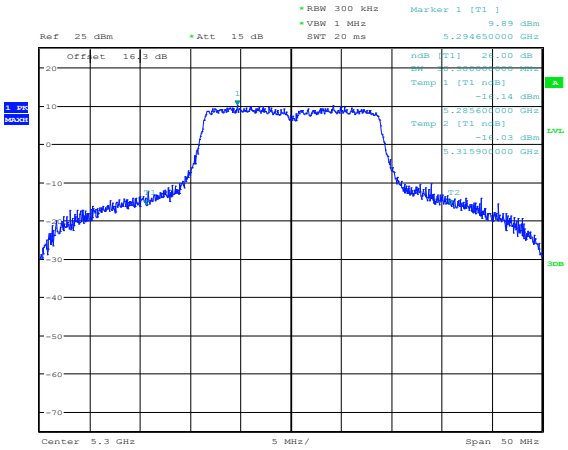
Date: 8.MAY.2019 11:50:53

Plot # 21: Emissions Bandwidth (26 dB)	
Mode: 802.11n20	**Channel: 40**



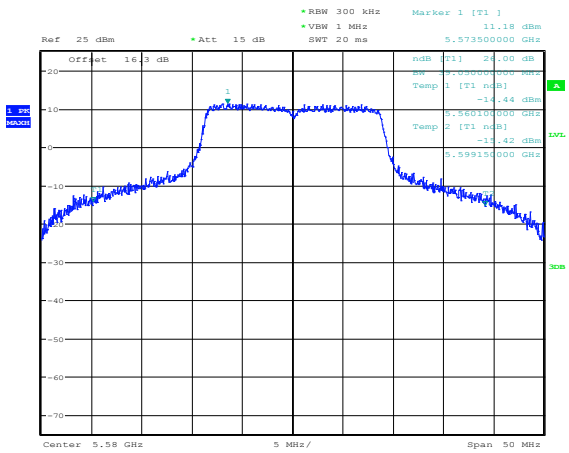
Date: 8.MAY.2019 11:52:18

Plot # 22: Emissions Bandwidth (26 dB)	
Mode: 802.11n20	**Channel: 60**



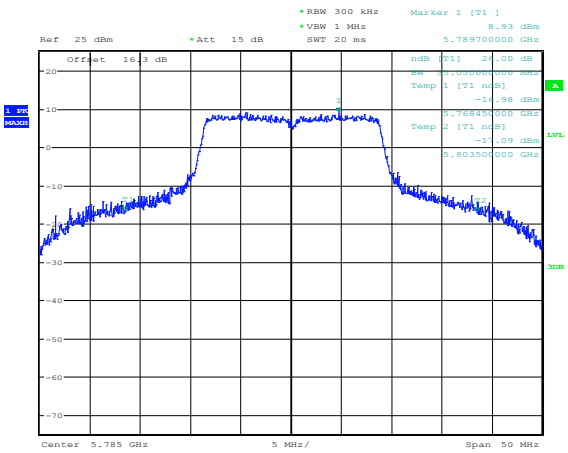
Date: 8.MAY.2019 12:19:23

Plot # 23: Emissions Bandwidth (26 dB)	
Mode: 802.11n20	**Channel: 116**



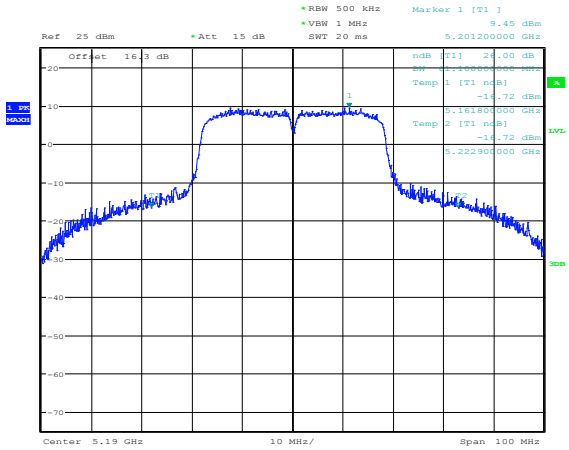
Date: 8.MAY.2019 12:20:42

Plot # 24: Emissions Bandwidth (26 dB)	
Mode: 802.11n20	**Channel: 157**

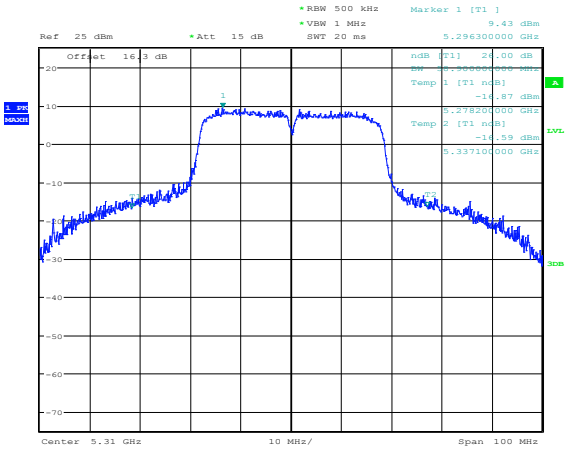


Date: 8.MAY.2019 12:21:53

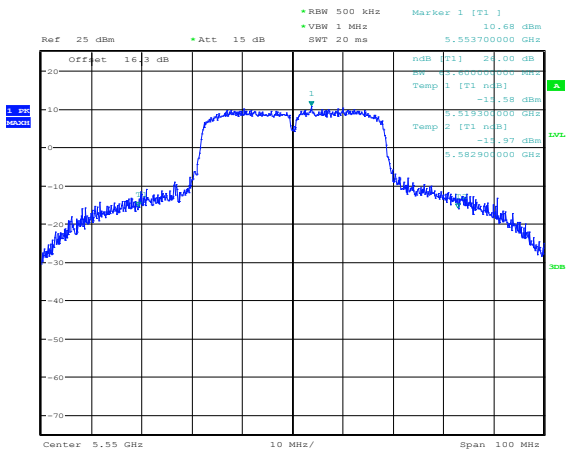
Plot # 25: Emissions Bandwidth (26 dB)	
Mode: 802.11n40	**Channel: 38**



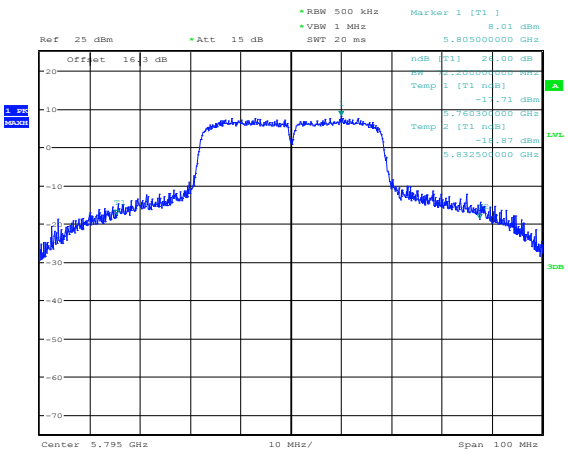
Plot # 26: Emissions Bandwidth (26 dB)	
Mode: 802.11n40	**Channel: 62**



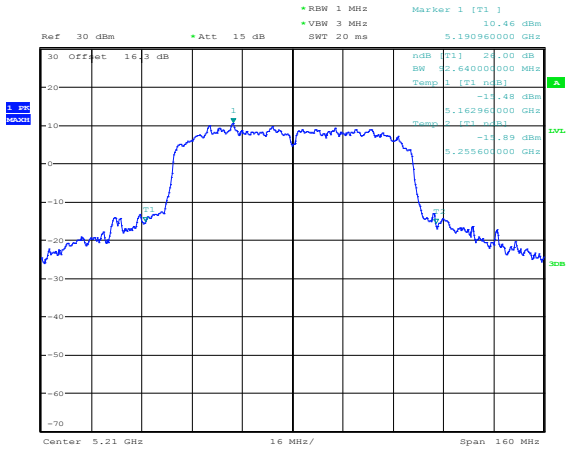
Plot # 27: Emissions Bandwidth (26 dB)	
Mode: 802.11n40	**Channel: 110**



Plot # 28: Emissions Bandwidth (26 dB)	
Mode: 802.11n40	**Channel: 159**

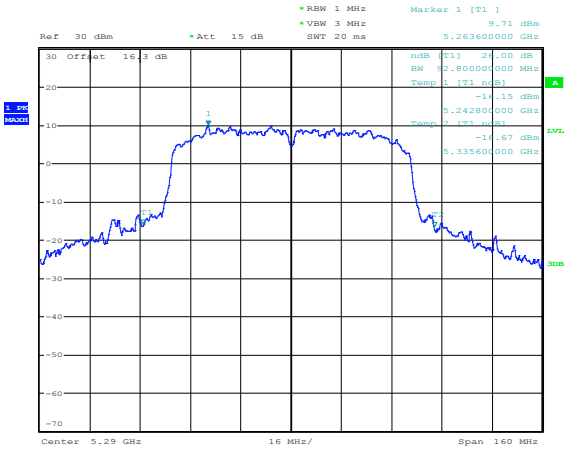


Plot # 29: Emissions Bandwidth (26 dB)	
Mode: 802.11ac80	**Channel: 42**



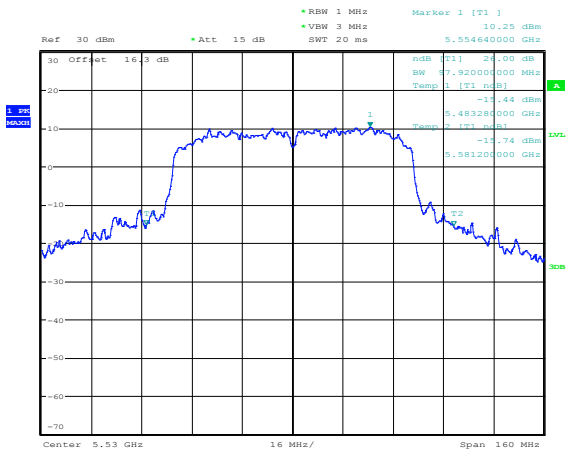
Date: 8.MAY.2019 12:33:41

Plot # 30: Emissions Bandwidth (26 dB)	
Mode: 802.11ac80	**Channel: 58**



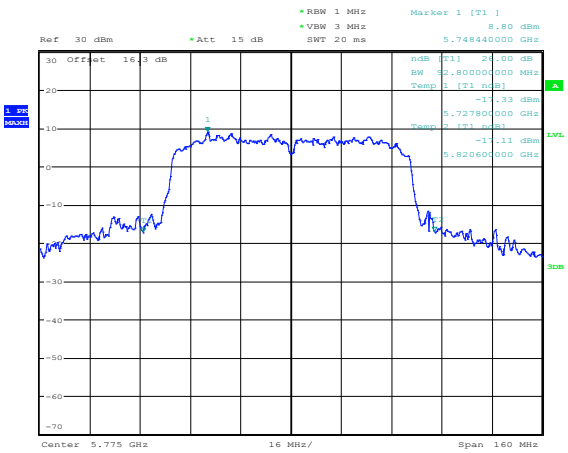
Date: 8.MAY.2019 12:34:47

Plot # 31: Emissions Bandwidth (26 dB)	
Mode: 802.11ac80	**Channel: 106**



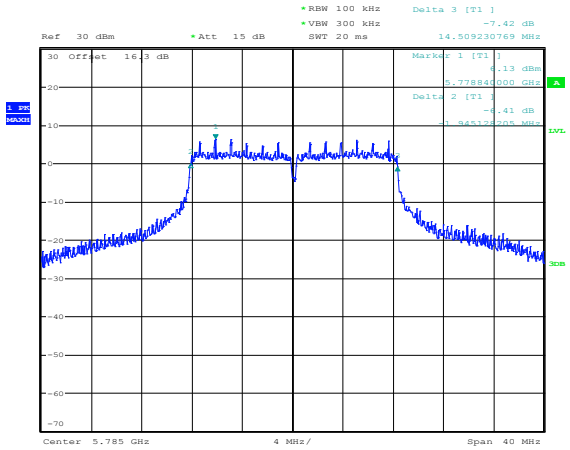
Date: 8.MAY.2019 12:35:39

Plot # 32: Emissions Bandwidth (26 dB)	
Mode: 802.11ac80	**Channel: 155**



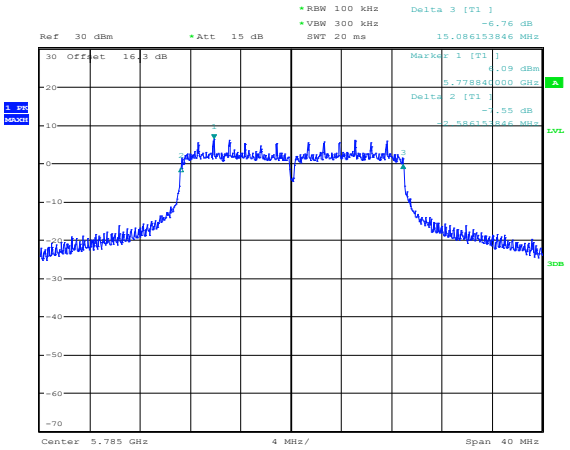
Date: 8.MAY.2019 12:36:36

Plot # 33: Emissions Bandwidth (6 dB)	
Mode: 802.11a	**Channel: 157**



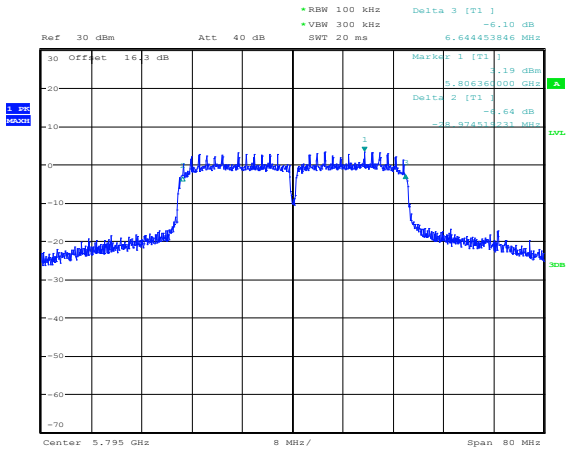
Date: 8.MAY.2019 10:55:58

Plot # 34: Emissions Bandwidth (6 dB)	
Mode: 802.11n20	**Channel: 157**



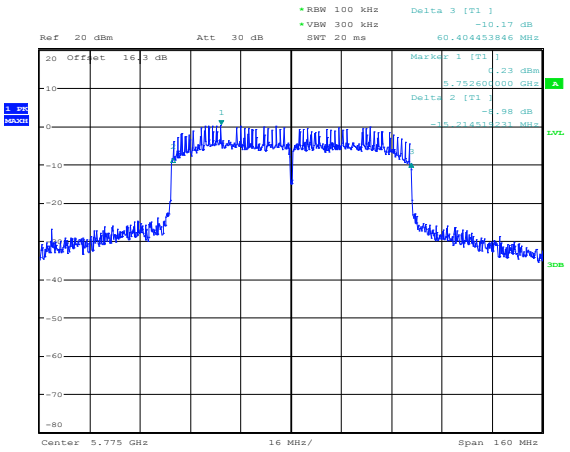
Date: 8.MAY.2019 10:59:15

Plot # 35: Emissions Bandwidth (6 dB)	
Mode: 802.11n40	**Channel: 159**



Date: 8.MAY.2019 11:20:10

Plot # 36: Emissions Bandwidth (6 dB)	
Mode: 802.11ac80	**Channel: 155**



Date: 8.MAY.2019 11:29:18

8.5 Frequency stability

8.5.1 Measurement Procedure

- The EUT was placed inside temperature chamber
- Set the EUT to the operation mode needed
- Set the chamber to the highest temperature specified
- Allow sufficient time for the temperature of the chamber to stabilize, measure the operating frequency
- Repeat step with the temperature chamber set to lowest temperature

8.5.2 Limits:

FCC §15.407(g)

- Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual

8.5.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	2	802.11n20	120VAC

8.5.4 Measurement result:

Temp	Channel #	Measured CF (MHz)	ACF (MHz)	Frequency Stability (ppm)
25ºC	40	5200.06821	5200	13.11635
	60	5300.06410	5300	12.09481
	100	5500.07515	5500	13.66436
	157	5785.07915	5785	13.68263
-20ºC	40	5200.05157	5200	9.916923
	60	5300.05921	5300	11.17132
	100	5500.06855	5500	12.46327
	157	5785.07866	5785	13.59706
50ºC	40	5200.05510	5200	10.59519
	60	5300.05919	5300	11.16774
	100	5500.06620	5500	12.036
	157	5785.07870	5785	13.6038

8.6 Radiated Transmitter Spurious Emissions

8.6.1 Measurement according to ANSI C63.10 (2013)

Spectrum Analyzer Settings:

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

- Frequency = 30 MHz – 1 GHz
- Detector = Peak / Quasi-Peak
- RBW= 120 KHz (<1GHz)

- Frequency > 1 GHz
- Detector = Peak / Average
- RBW = 1 MHz

- Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements.
- The highest (or worst-case) data rate shall be recorded for each measurement.
- For testing at distance other than the specified in the standard, the limit conversion is calculated by using 40 dB/decade extrapolation factor as follow: Conversion factor (CF) = 40 log (D/d) = 40 log (300m / 3m) = 80dB

8.6.2 Limits:

FCC §15.407

- Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
- The provisions of §15.205 apply to intentional radiators operating under this section.

FCC §15.209 & RSS-Gen 8.9

- Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of emission (MHz)	Field strength (µV/m)	Measurement Distance (m)	Field strength @ 3m (dBµV/m)
0.009–0.490	2400/F(kHz) / ---------	300	-
0.490–1.705	24000/F(kHz) / --------	30	-
1.705–30.0	30 / (29.5)	30	-
30–88	100	3	40 dBµV/m
88–216	150	3	43.5 dBµV/m
216–960	200	3	46 dBµV/m
Above 960	500	3	54 dBµV/m

FCC §15.205 & RSS-Gen 8.10

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

- Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
  *PEAK LIMIT= 74 dBµV/m
  *AVG. LIMIT= 54 dBµV/m

8.6.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	2	802.11n20	120VAC

8.6.4 Measurement result:

Plot #	Channel #	Scan Frequency	Limit	Result
1-4	Low (36)	30 MHz – 18 GHz	See section 8.5.2	Pass
5-10	Mid (44)	9 kHz – 40 GHz	See section 8.5.2	Pass
11-14	High (48)	30 MHz – 18 GHz	See section 8.5.2	Pass
15-18	Low (52)	30 MHz – 18 GHz	See section 8.5.2	Pass
19-24	Mid (60)	9 kHz – 40 GHz	See section 8.5.2	Pass
25-28	High (64)	30 MHz – 18 GHz	See section 8.5.2	Pass
29-32	Low (100)	30 MHz – 18 GHz	See section 8.5.2	Pass
33-38	Mid (116)	9 kHz – 40 GHz	See section 8.5.2	Pass
39-42	High (144)	30 MHz – 18 GHz	See section 8.5.2	Pass
43-46	Low (149)	30 MHz – 18 GHz	See section 8.5.2	Pass
47-52	Mid (157)	9 kHz – 40 GHz	See section 8.5.2	Pass
53-56	High (165)	30 MHz – 18 GHz	See section 8.5.2	Pass

8.6.5 Measurement Plots:

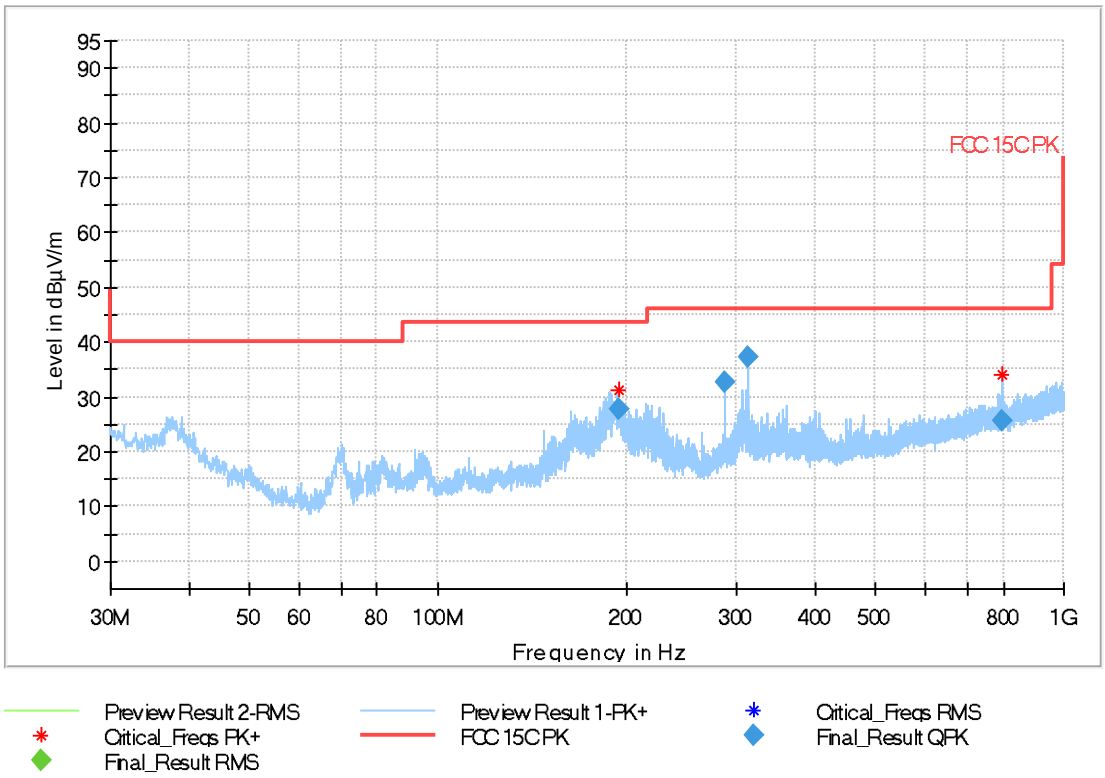
Plot #1 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Low(36)**

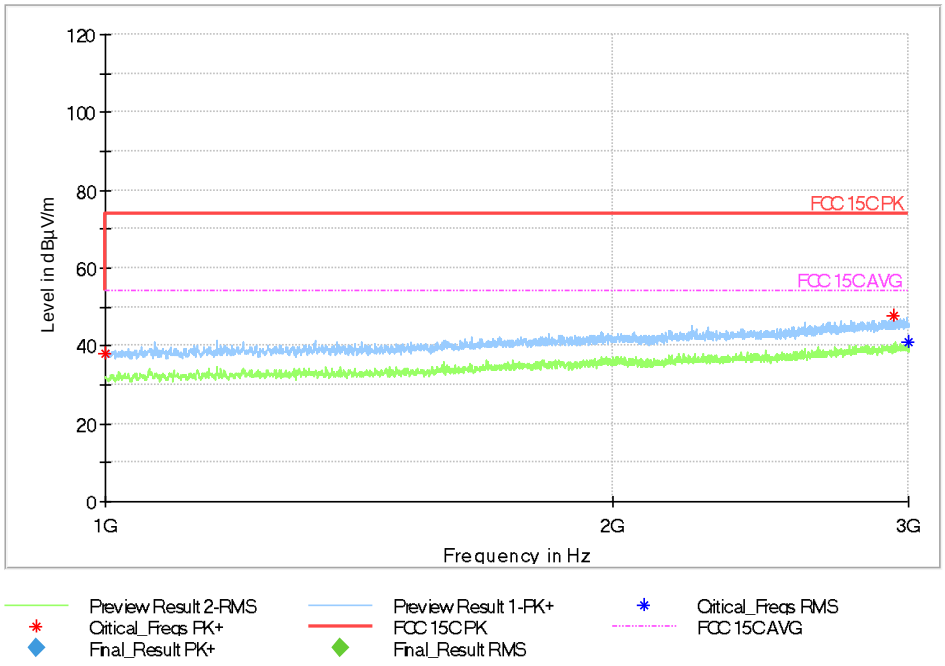
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
194.223	27.64	---	43.50	15.86	100.0	100.0	100.0	V
288.018	32.71	---	46.00	13.29	100.0	100.0	124.0	H
311.989	37.10	---	46.00	8.90	100.0	100.0	100.0	V
794.705	25.71	---	46.00	20.29	100.0	100.0	138.0	V

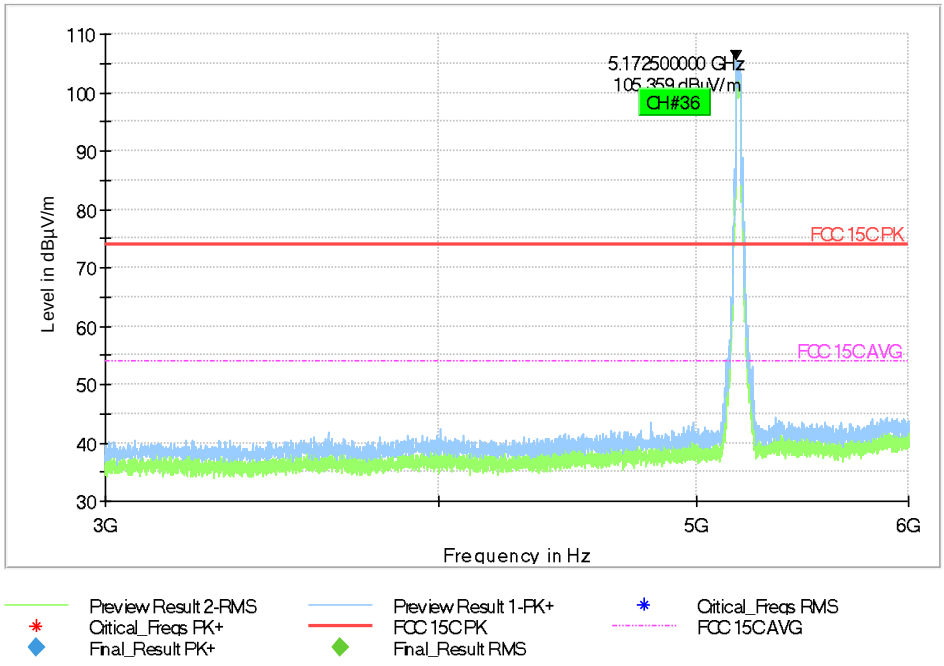
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



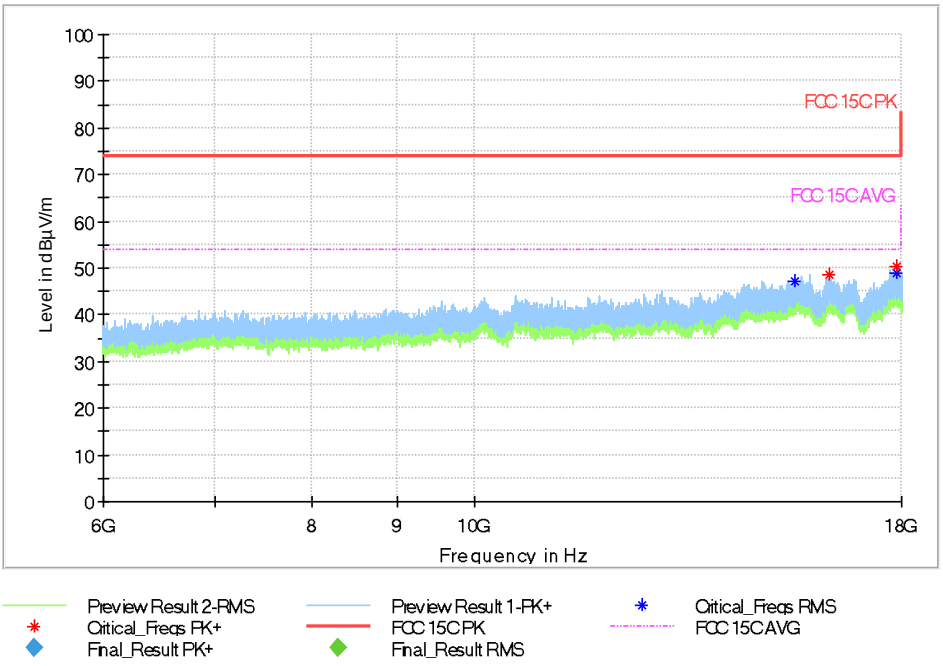
Plot # 2 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Low(36)**	



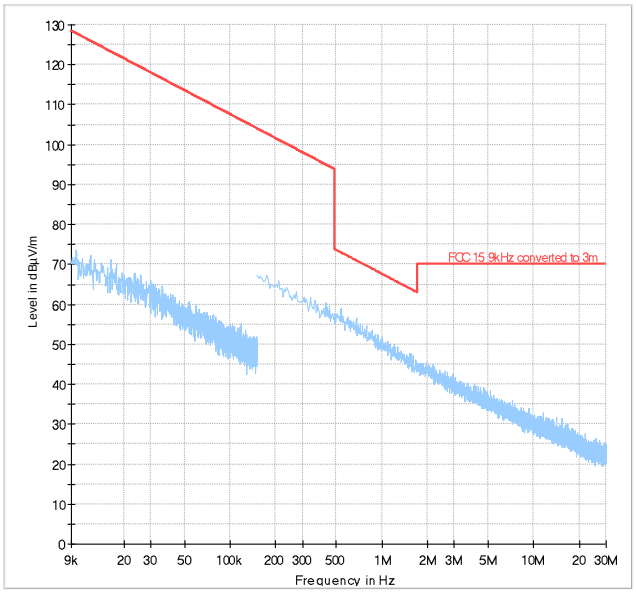
Plot # 3 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Low(36)**	



Plot # 4 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Low(36)**	



Plot # 5 Radiated Emissions: 9 KHz - 30 MHz		
Modulation: 802.11n20	**Channel: Mid(44)**	

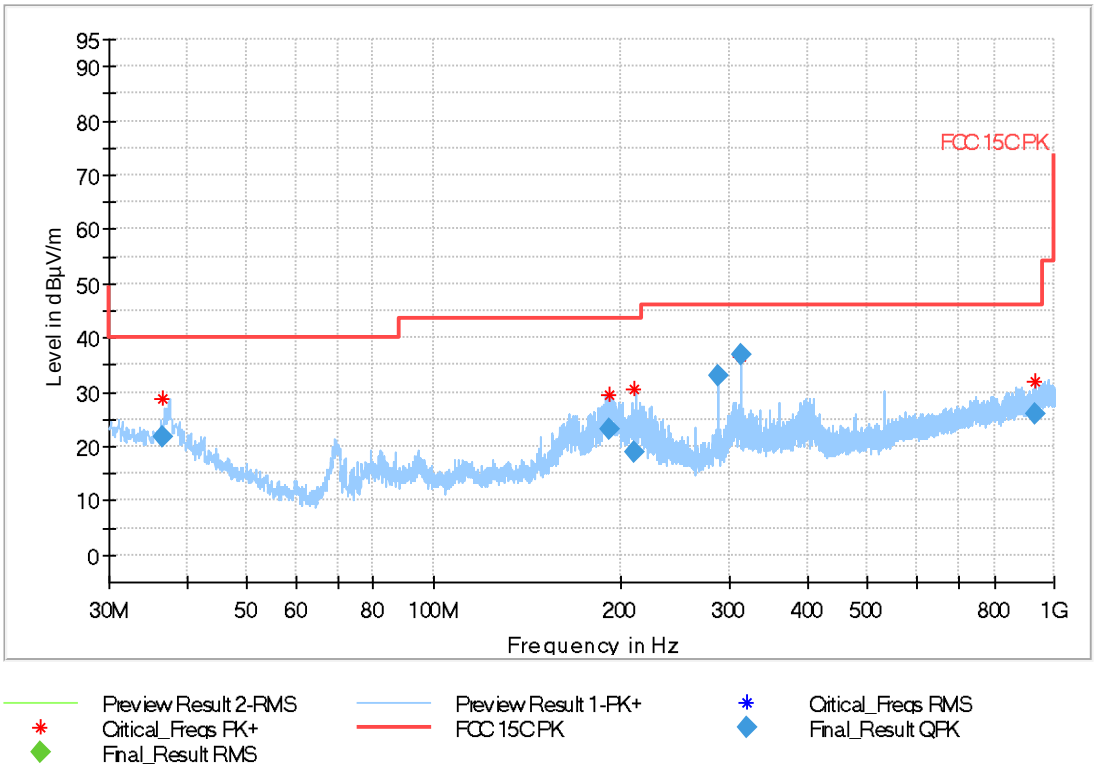


Plot #6 Radiated Emissions: 30 MHz – 1GHz		
Modulation: 802.11n20	**Channel: Mid(44)**	

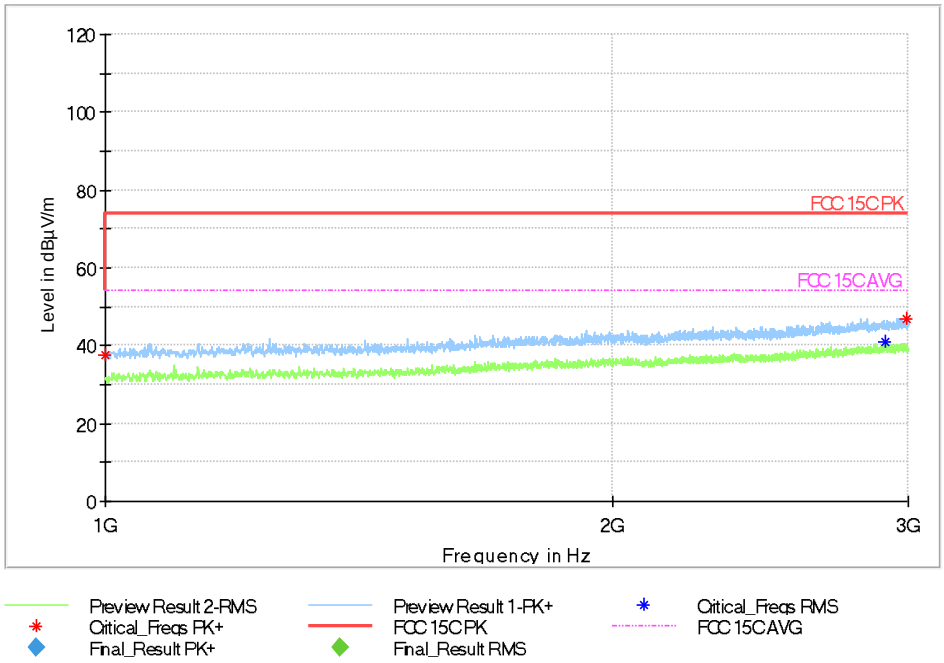
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
36.632	21.73	---	40.00	18.27	100.0	100.0	100.0	V
192.309	23.10	---	43.50	20.40	100.0	100.0	116.0	V
211.038	18.99	---	43.50	24.51	100.0	100.0	100.0	V
287.991	33.11	---	46.00	12.89	100.0	100.0	124.0	H
311.999	37.00	---	46.00	9.00	100.0	100.0	152.0	H
934.299	26.07	---	46.00	19.93	100.0	100.0	124.0	V

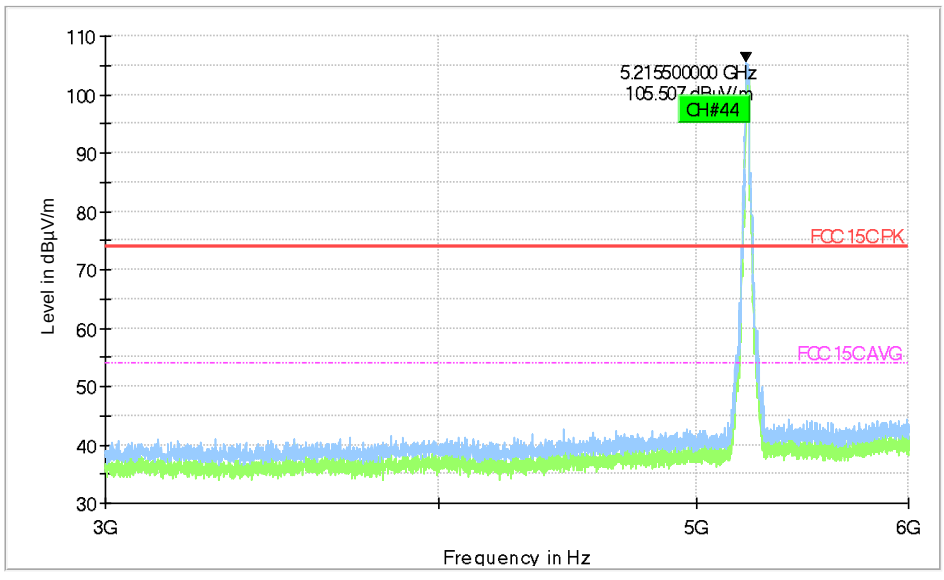
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



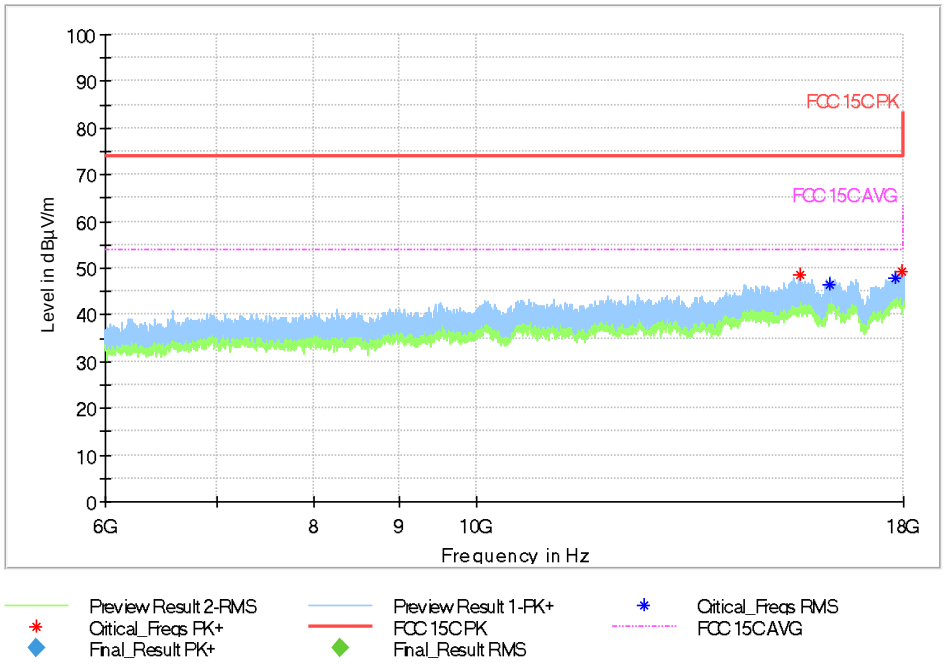
Plot #7 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Mid(44)**	



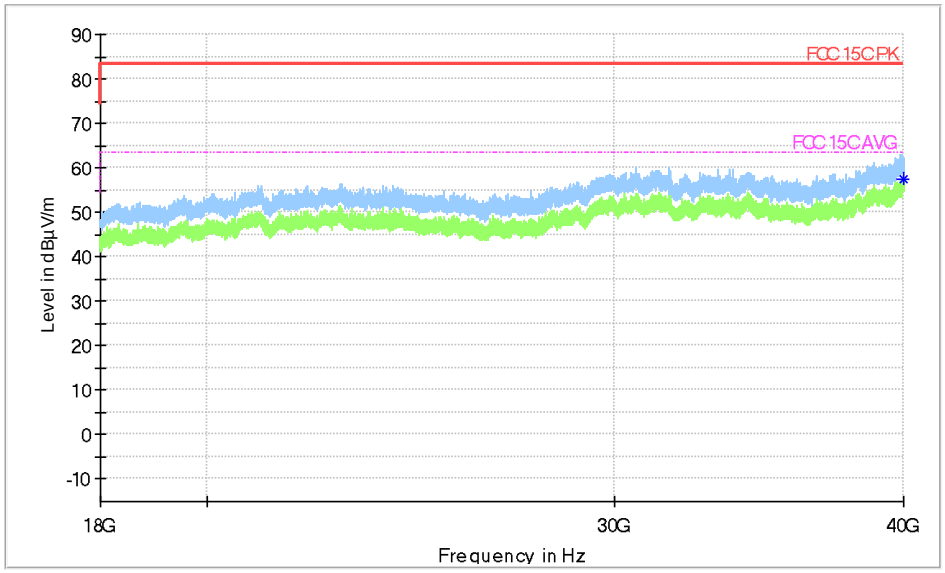
Plot #8 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Mid(44)**	



Plot #9 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Mid(44)**	



Plot #10 Radiated Emissions: 18-40 GHz		
Modulation: 802.11n20	**Channel: Mid(44)**	



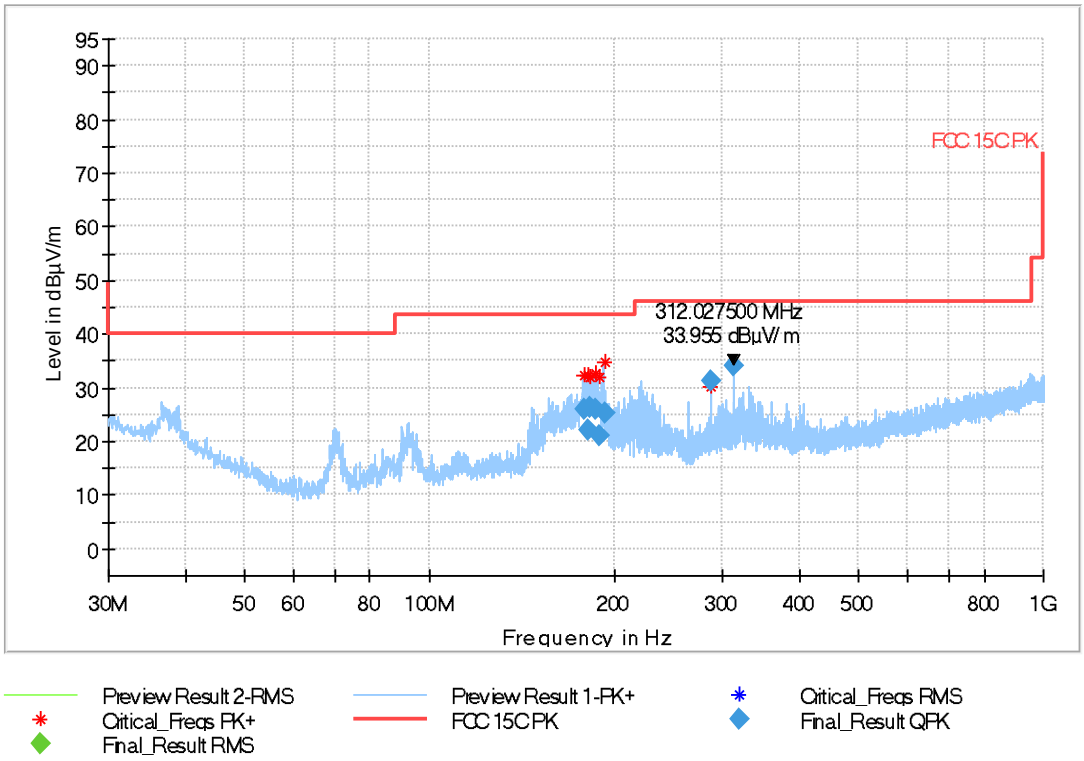
Plot #11 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: High(48)**

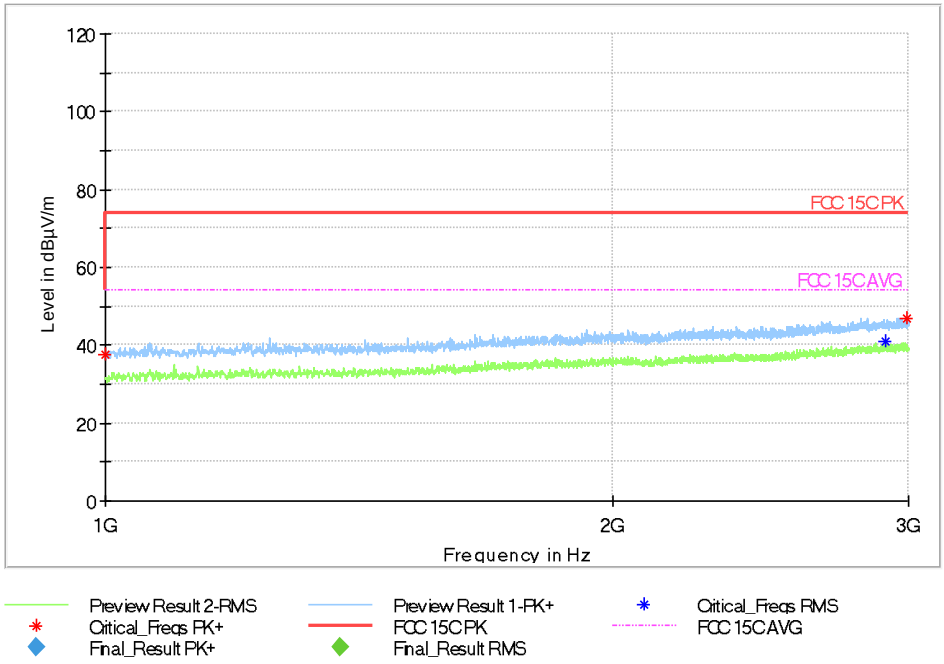
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
178.678	25.81	---	43.50	17.69	100.0	100.0	108.0	V
181.234	22.19	---	43.50	21.31	100.0	100.0	187.0	V
182.443	26.18	---	43.50	17.32	100.0	100.0	108.0	V
185.973	26.12	---	43.50	17.38	100.0	100.0	143.0	V
188.784	21.01	---	43.50	22.49	100.0	100.0	151.0	V
192.761	25.25	---	43.50	18.25	100.0	100.0	108.0	V
287.995	31.21	---	46.00	14.79	100.0	100.0	100.0	V
311.999	34.04	---	46.00	11.96	100.0	100.0	138.0	H

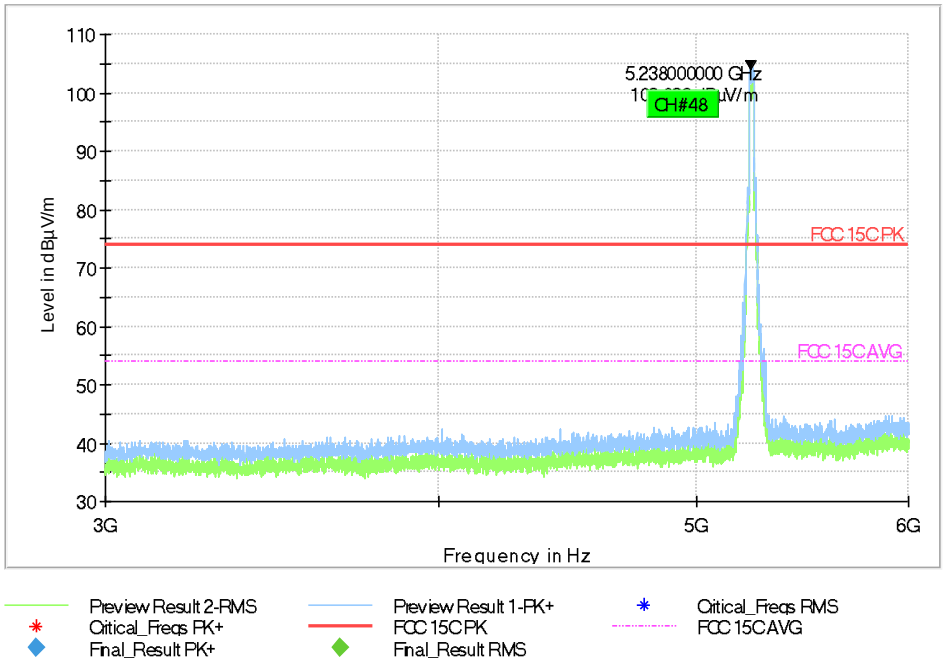
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



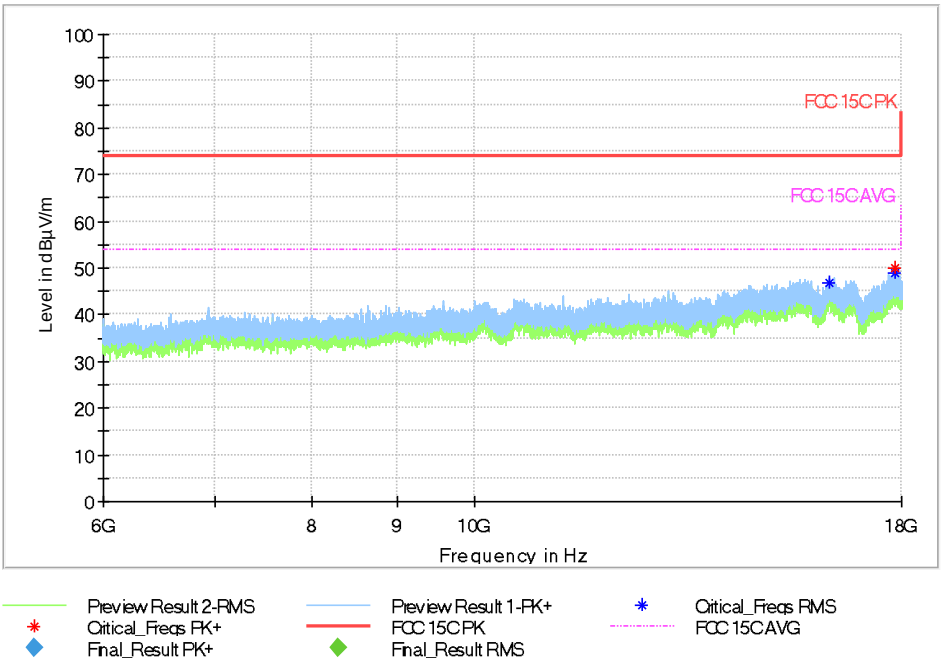
Plot # 12 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: High(48)**	



Plot #13 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: High(48)**	



Plot #14 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: High(48)**	



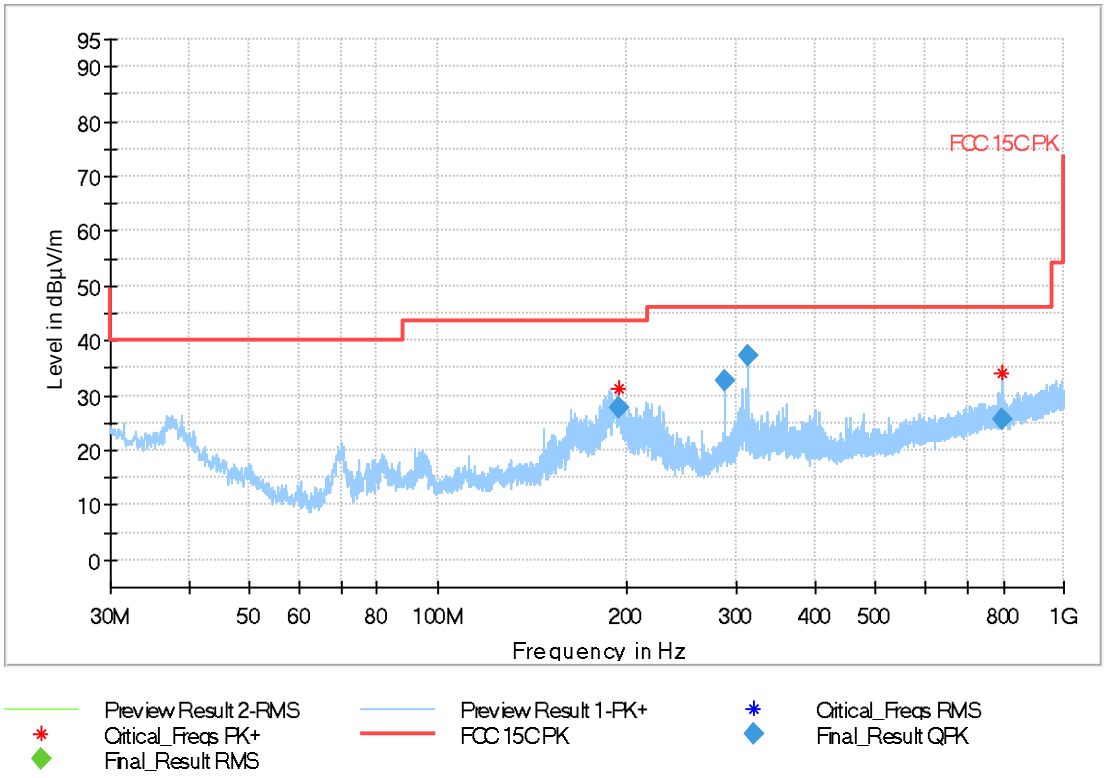
Plot #15 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Low(52)**

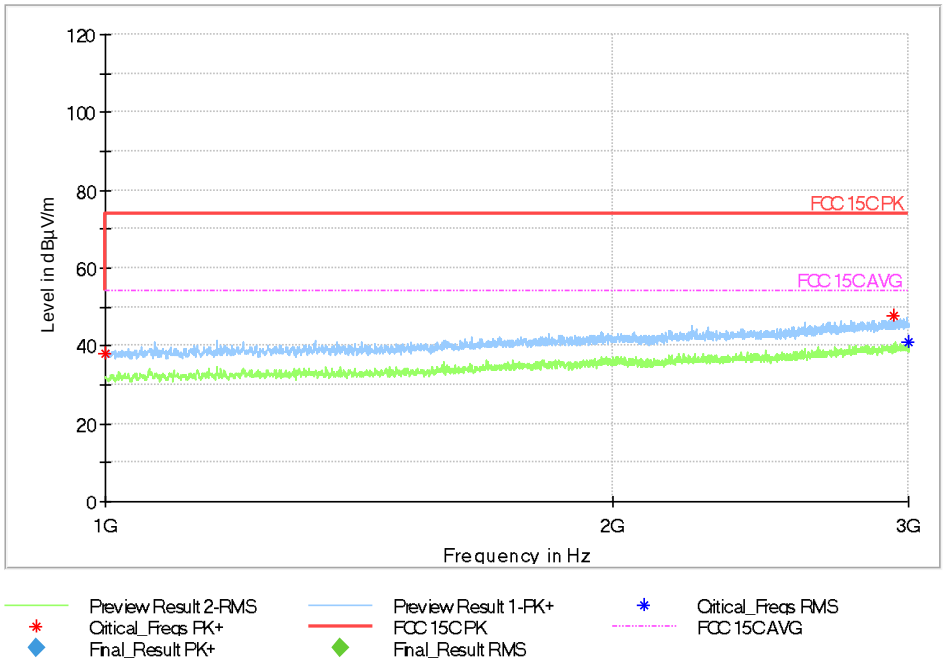
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
194.223	27.64	---	43.50	15.86	100.0	100.0	100.0	V
288.018	32.71	---	46.00	13.29	100.0	100.0	124.0	H
311.989	37.10	---	46.00	8.90	100.0	100.0	100.0	V
794.705	25.71	---	46.00	20.29	100.0	100.0	138.0	V

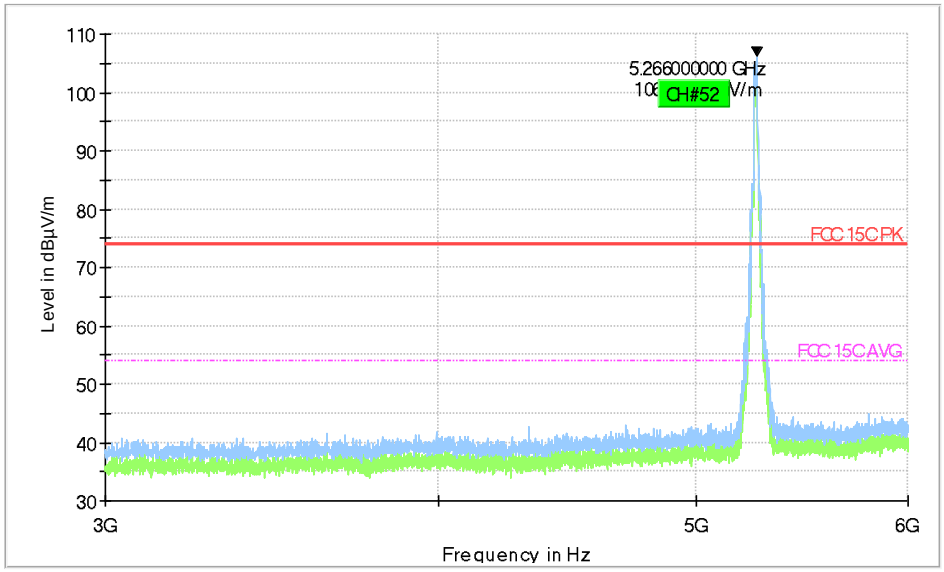
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



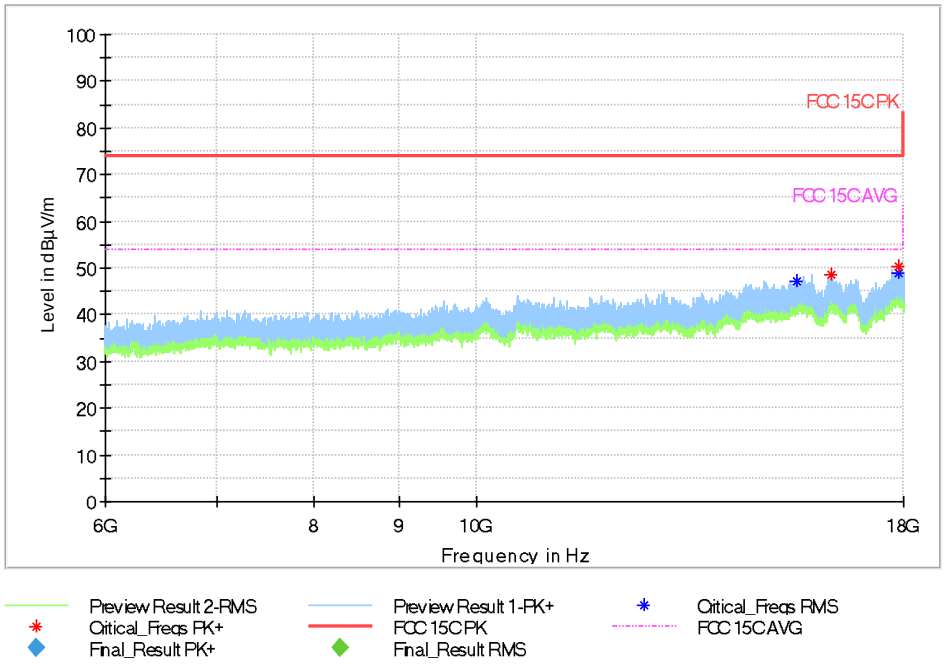
Plot # 16 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Low(52)**	



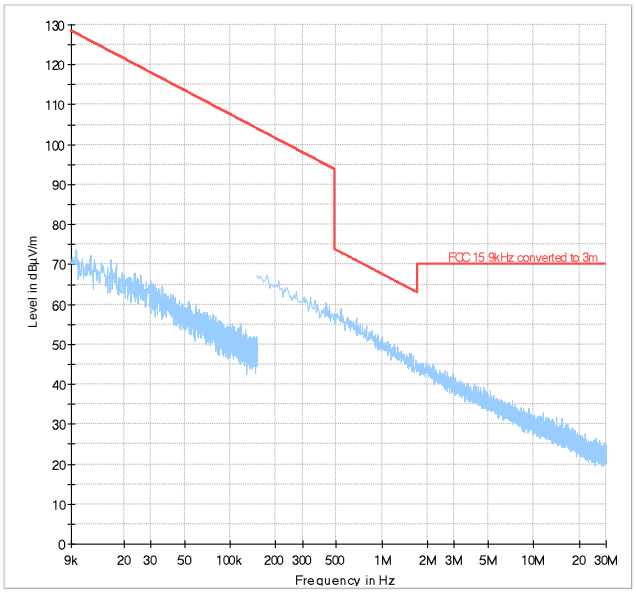
Plot # 17 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Low(52)**	



Plot # 18 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Low(52)**	



Plot # 19 Radiated Emissions: 9 KHz - 30 MHz		
Modulation: 802.11n20	**Channel: Mid(60)**	



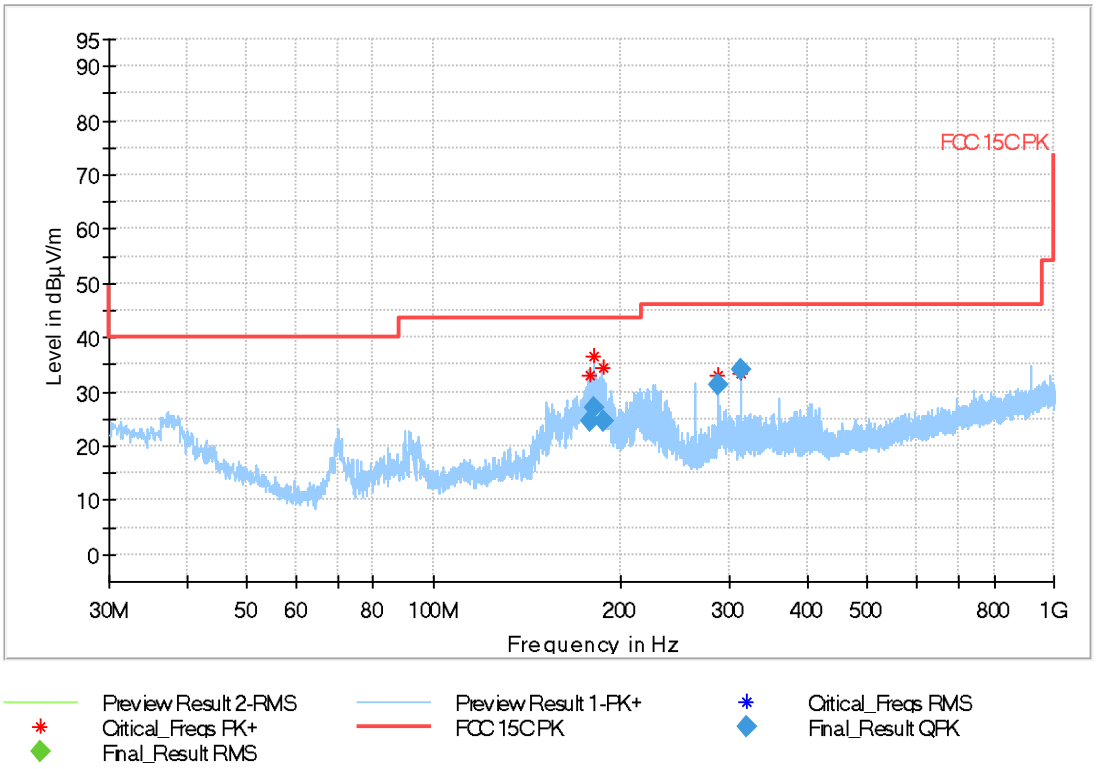
Plot #20 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Mid(60)**

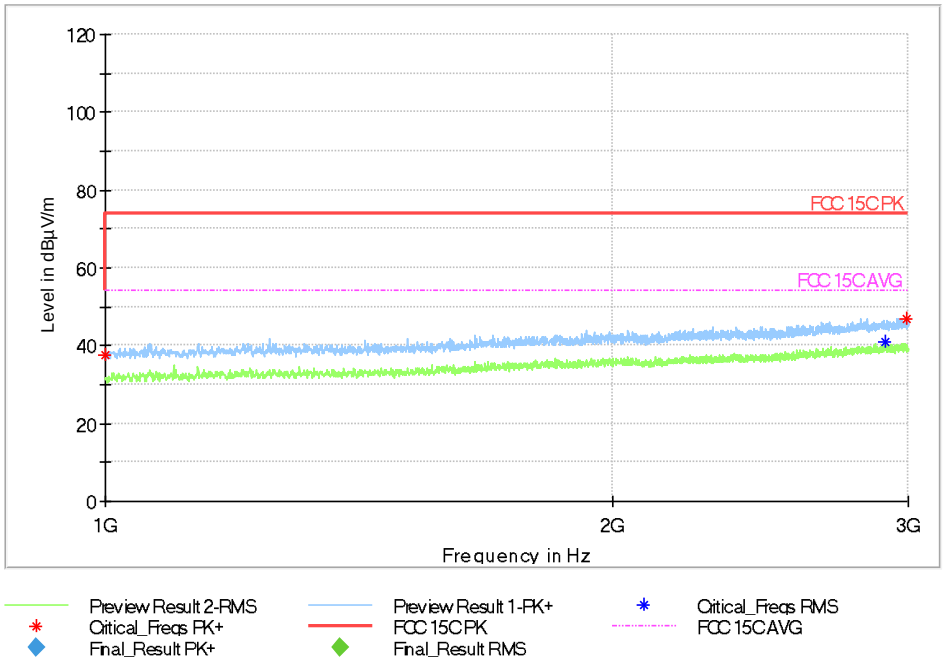
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
179.296	24.70	---	43.50	18.80	100.0	100.0	158.0	V
180.734	27.18	---	43.50	16.32	100.0	100.0	187.0	V
187.931	24.49	---	43.50	19.01	100.0	100.0	151.0	V
288.009	31.28	---	46.00	14.72	100.0	100.0	129.0	H
311.998	33.98	---	46.00	12.02	100.0	100.0	144.0	H

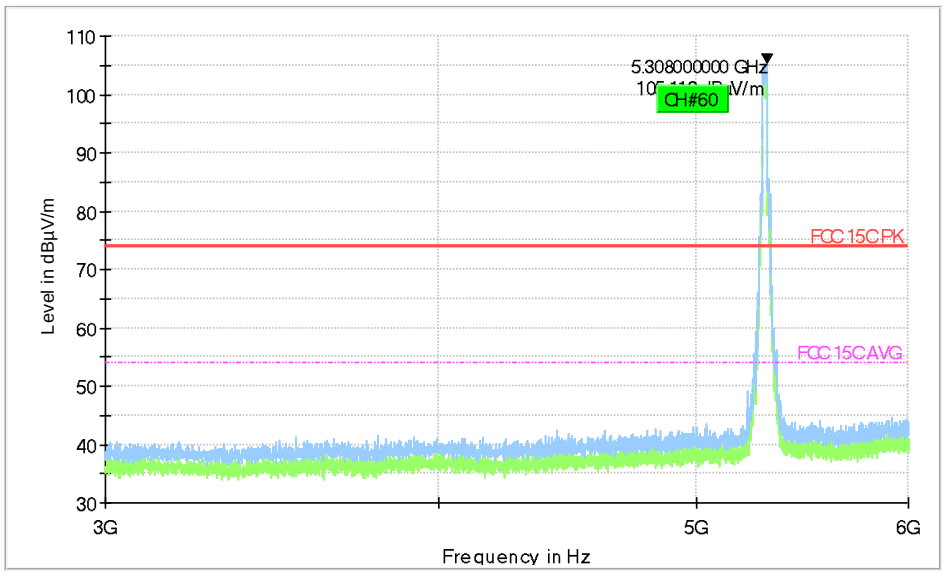
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



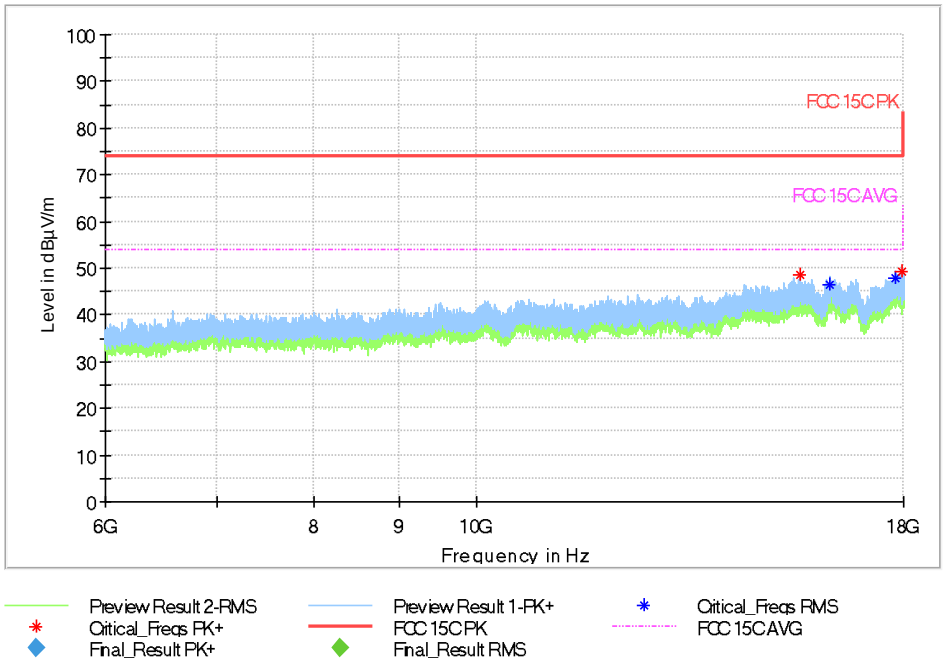
Plot #21 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Mid(60)**	



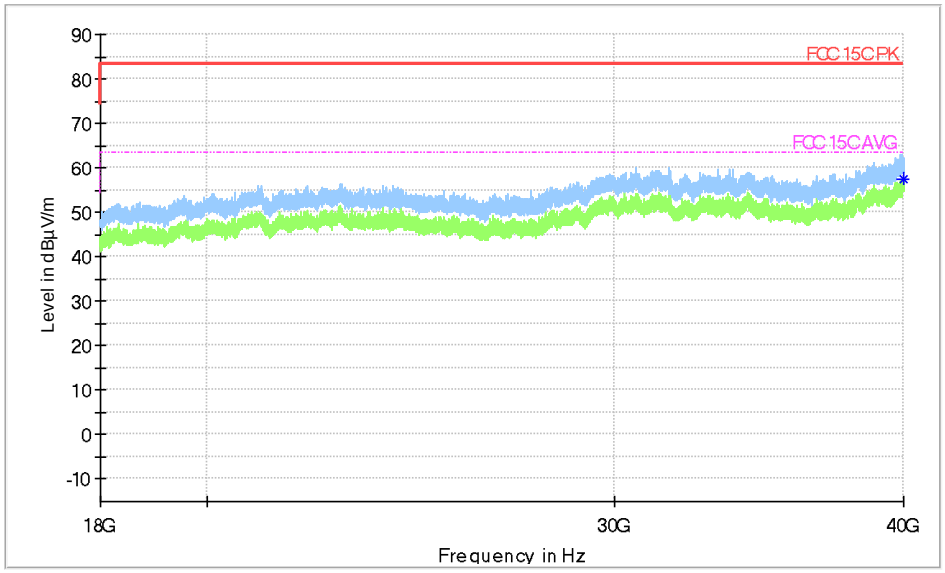
Plot #22 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Mid(60)**	



Plot #23 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Mid(60)**	



Plot #24 Radiated Emissions: 18-40 GHz		
Modulation: 802.11n20	**Channel: Mid(60)**	



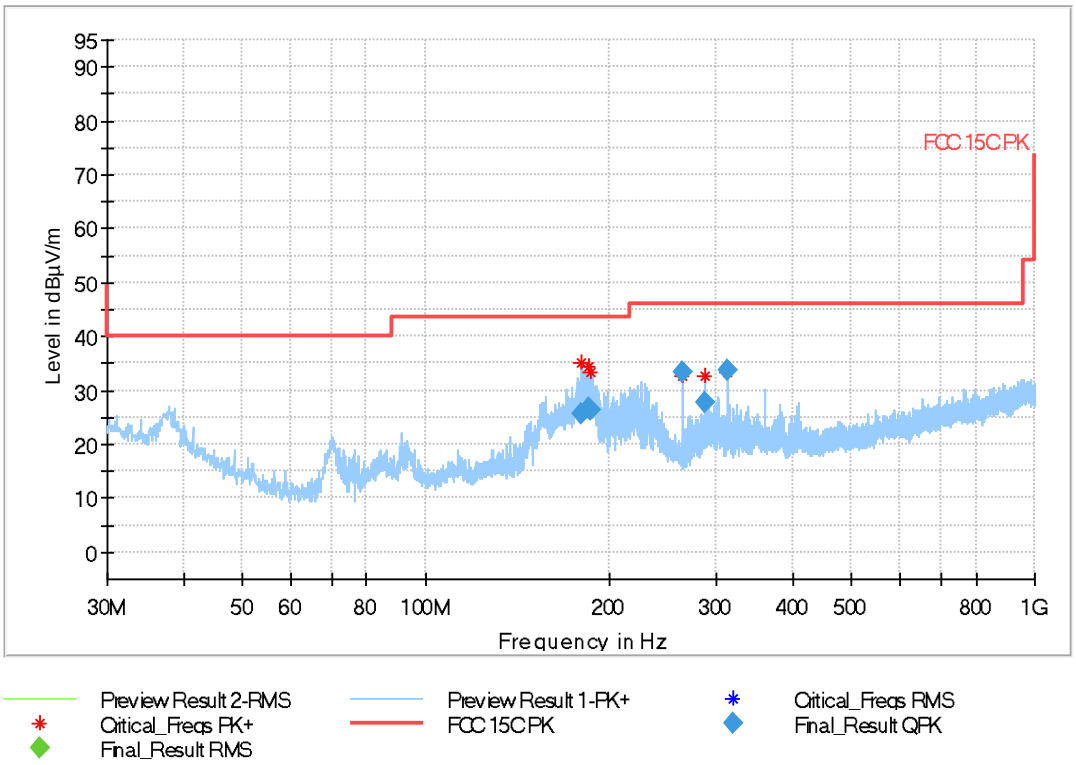
Plot #25 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: High(64)**

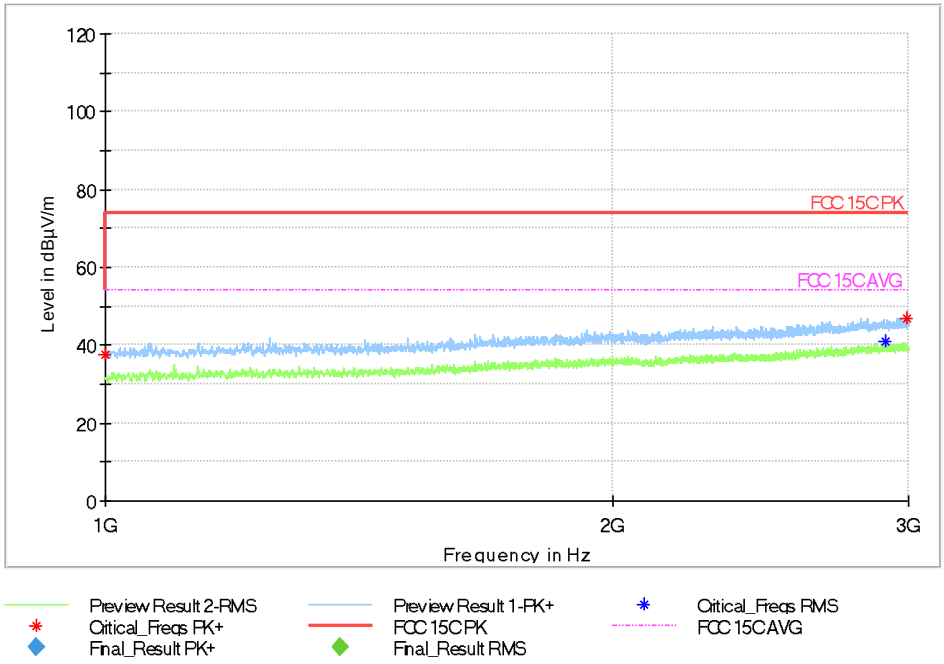
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
180.704	25.75	---	43.50	17.75	100.0	100.0	131.0	V
185.350	26.76	---	43.50	16.74	100.0	100.0	108.0	V
187.096	26.33	---	43.50	17.17	100.0	100.0	116.0	V
263.993	33.21	---	46.00	12.79	100.0	100.0	151.0	H
287.987	27.88	---	46.00	18.12	100.0	100.0	100.0	V
311.984	33.78	---	46.00	12.22	100.0	100.0	145.0	H

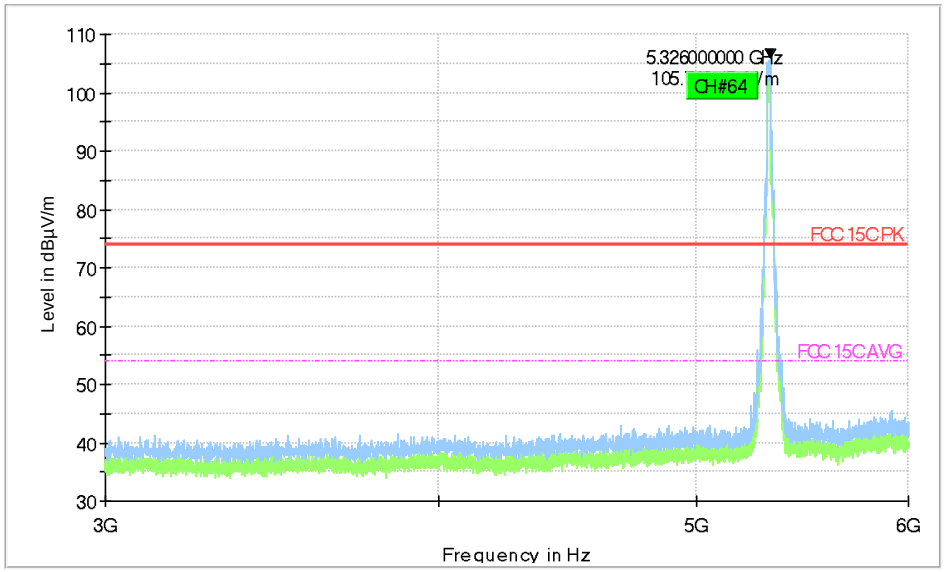
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



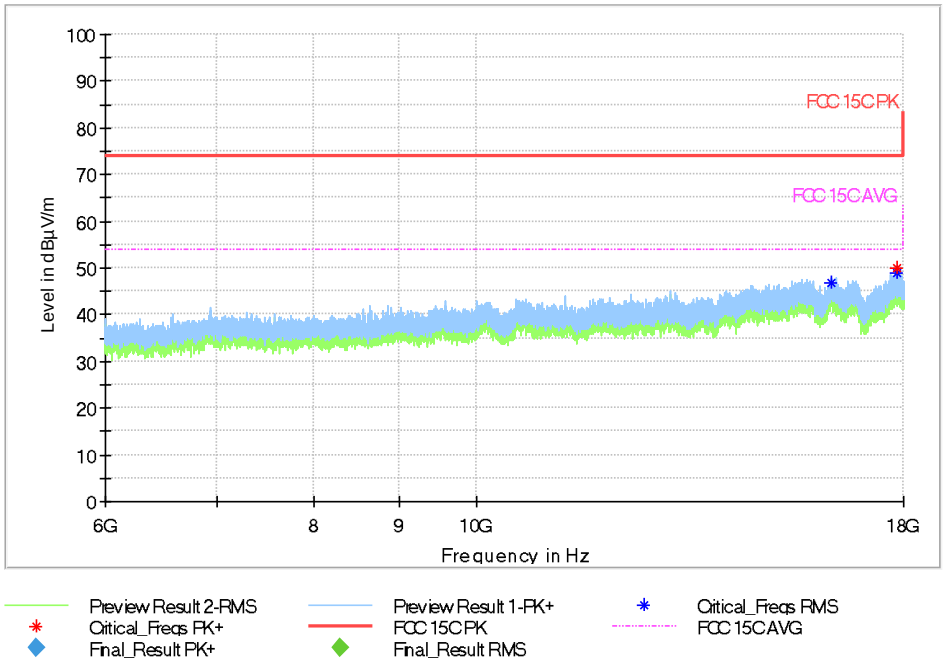
Plot # 26 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: High(64)**	



Plot #27 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: High(64)**	



Plot #28 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: High(64)**	



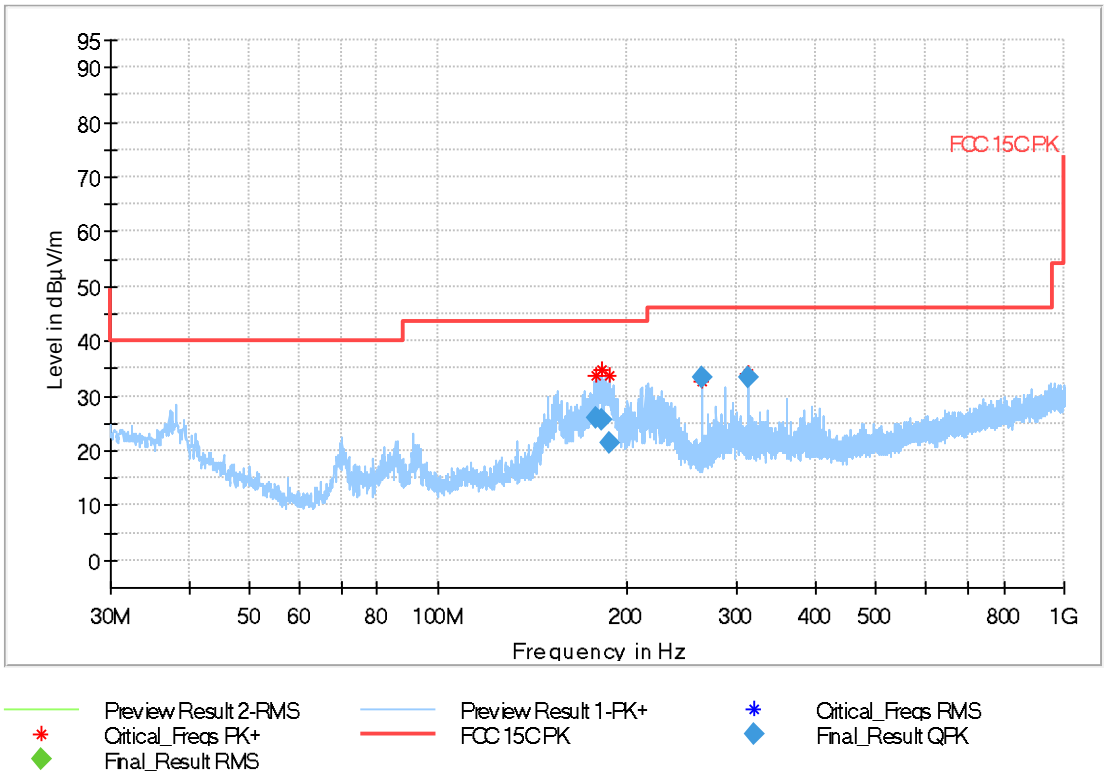
Plot #29 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Low(100)**

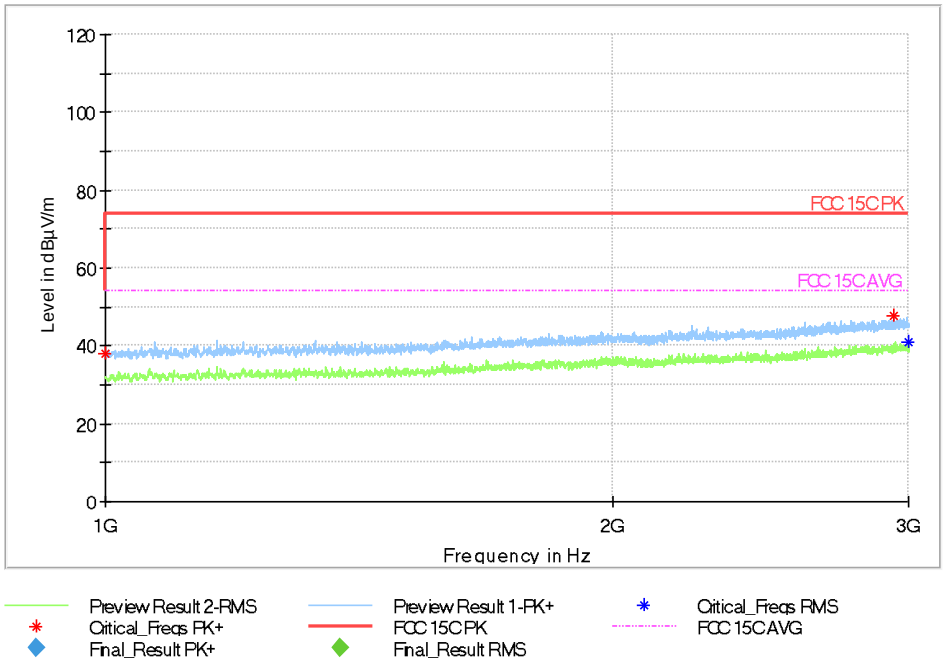
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
178.967	26.16	---	43.50	17.34	100.0	100.0	100.0	V
183.038	25.75	---	43.50	17.75	100.0	100.0	108.0	V
188.228	21.28	---	43.50	22.22	100.0	100.0	165.0	V
264.010	33.50	---	46.00	12.50	100.0	100.0	152.0	H
311.984	33.54	---	46.00	12.46	100.0	100.0	145.0	H

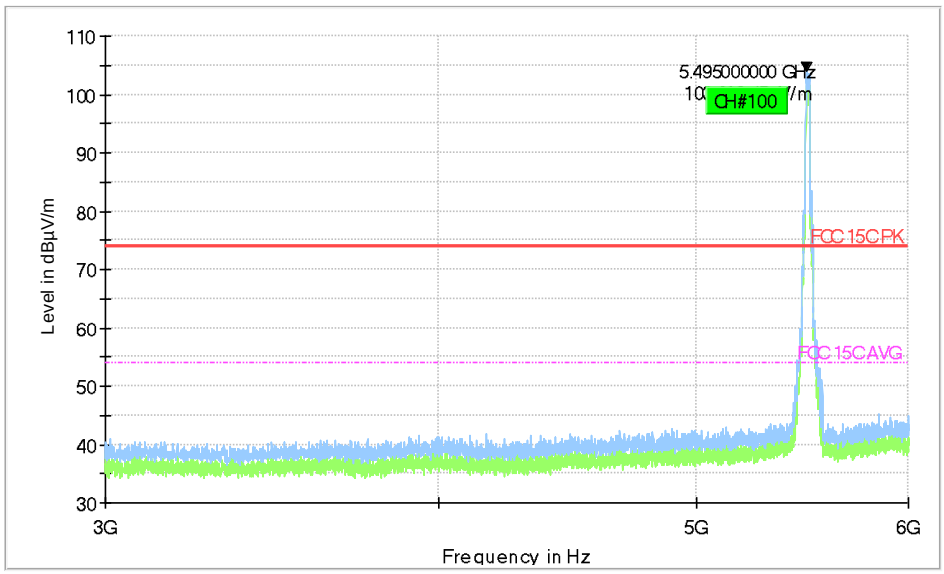
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



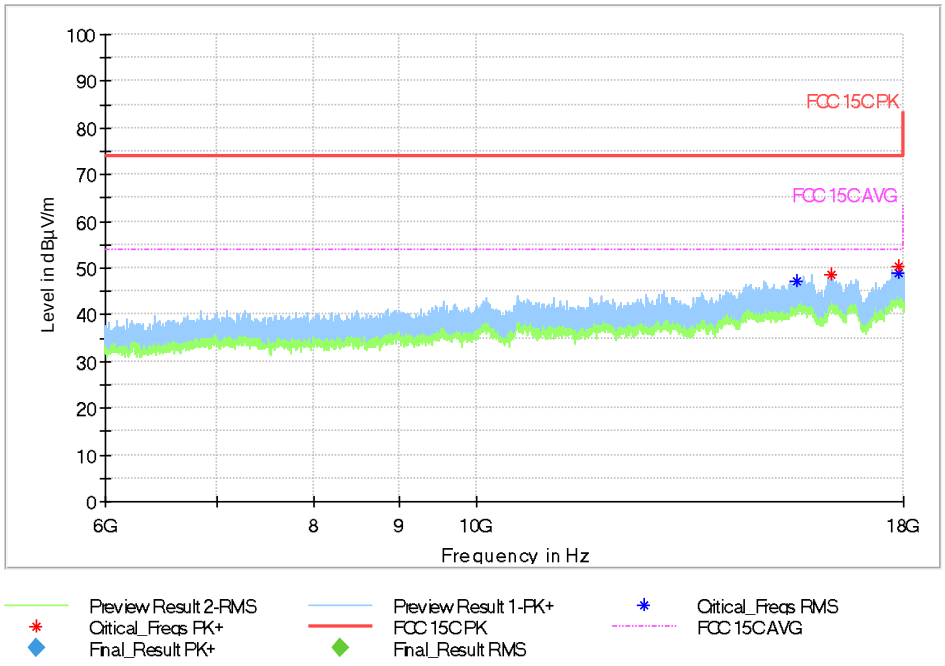
Plot # 30 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Low(100)**	



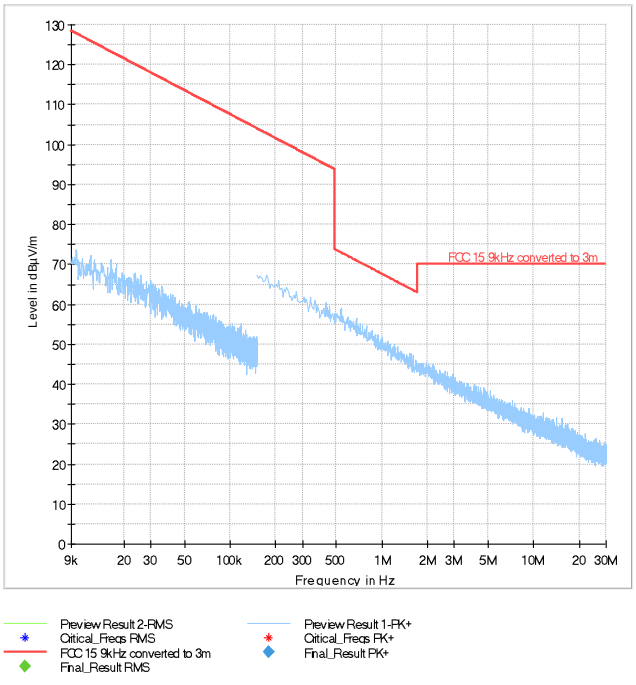
Plot # 31 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Low(100)**	



Plot # 32 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Low(100)**	



Plot # 33 Radiated Emissions: 9 KHz - 30 MHz		
Modulation: 802.11n20	**Channel: Mid(116)**	



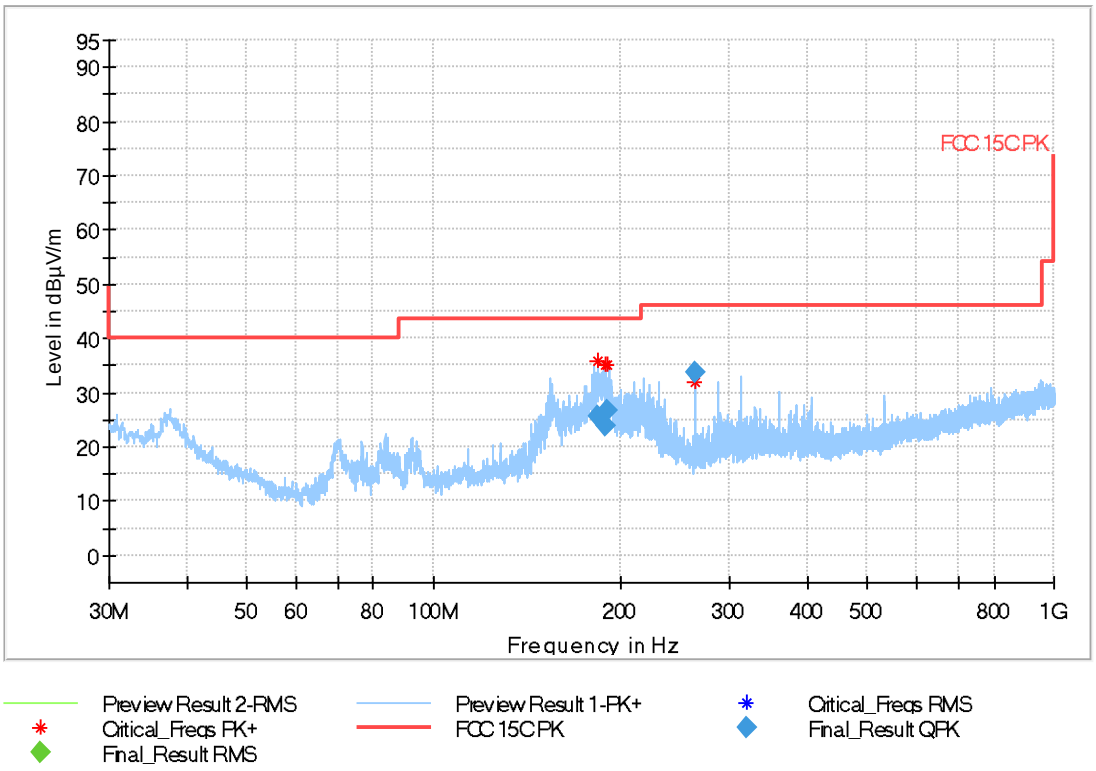
Plot #34 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Mid(116)**

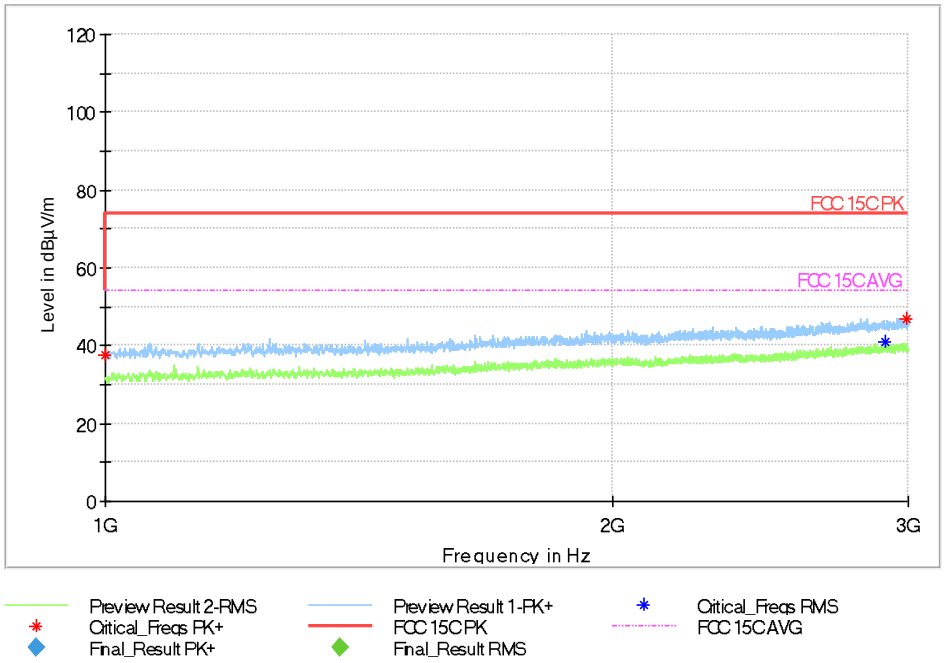
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
183.660	25.78	---	43.50	17.72	100.0	100.0	100.0	V
189.570	24.05	---	43.50	19.45	100.0	100.0	108.0	V
190.988	26.69	---	43.50	16.81	100.0	100.0	100.0	V
263.994	33.71	---	46.00	12.29	100.0	100.0	152.0	H

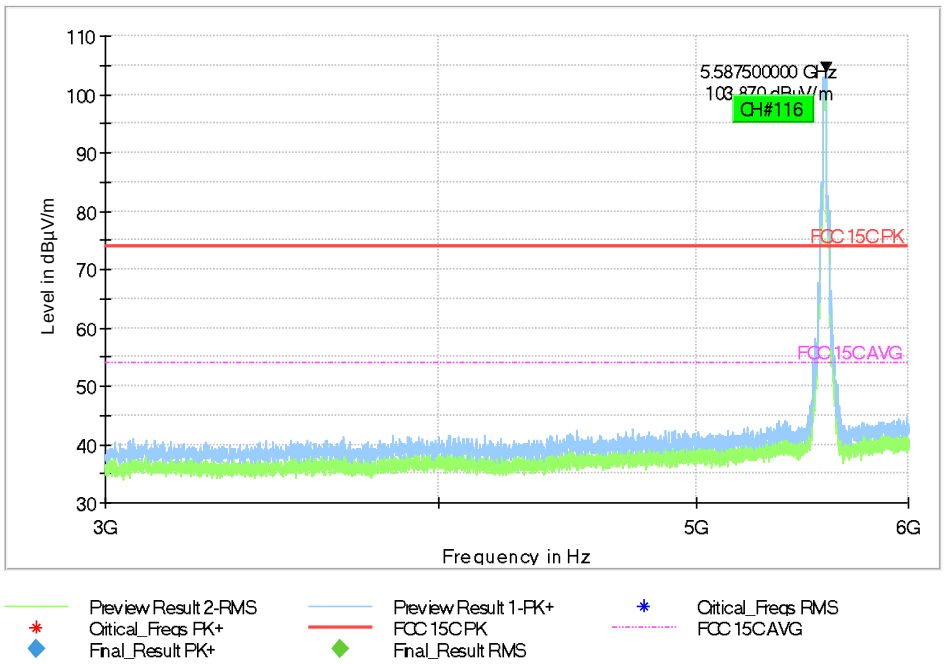
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



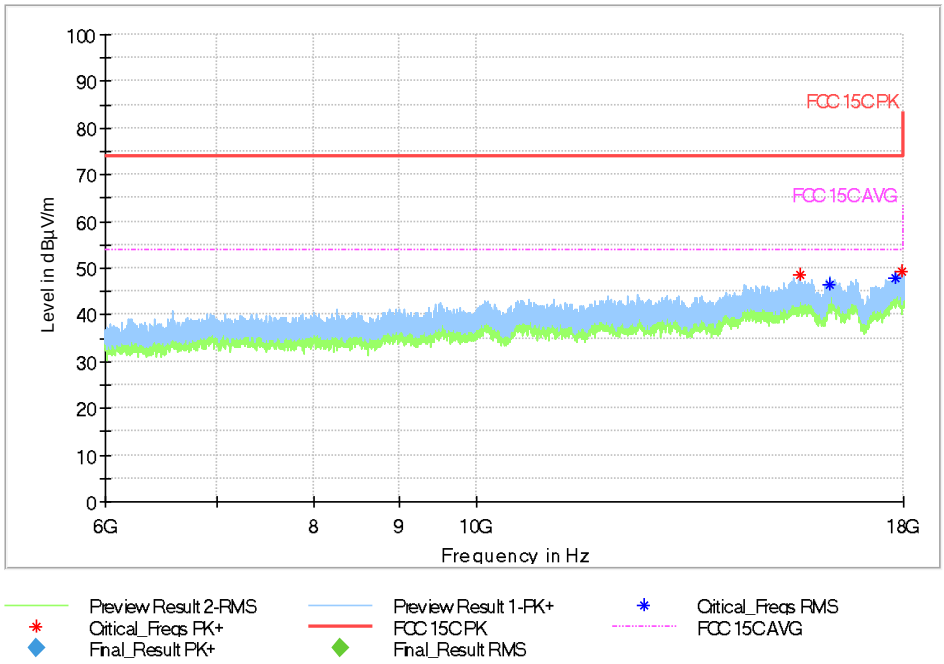
Plot #35 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Mid(116)**	



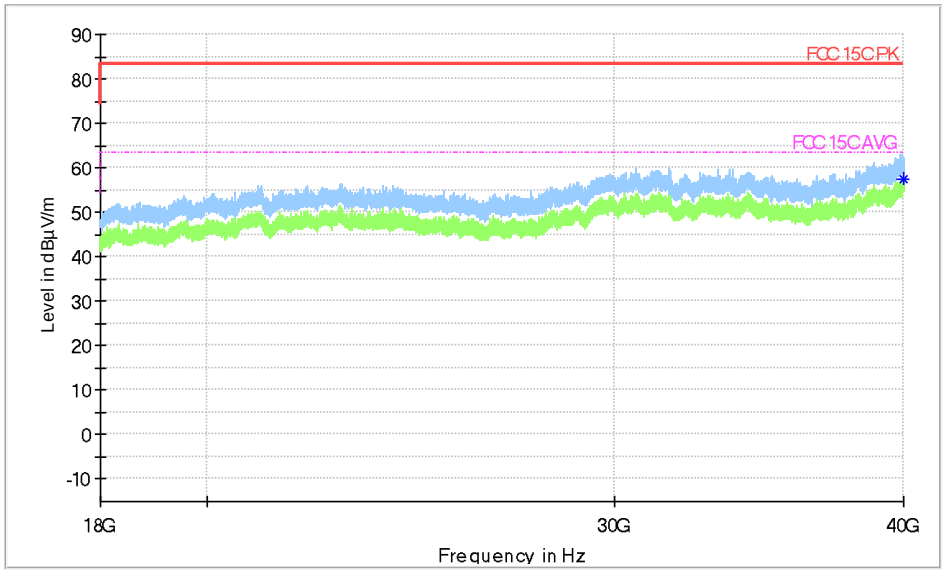
Plot #36 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Mid(116)**	



Plot #37 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Mid(116)**	



Plot #38 Radiated Emissions: 18-40 GHz		
Modulation: 802.11n20	**Channel: Mid(116)**	

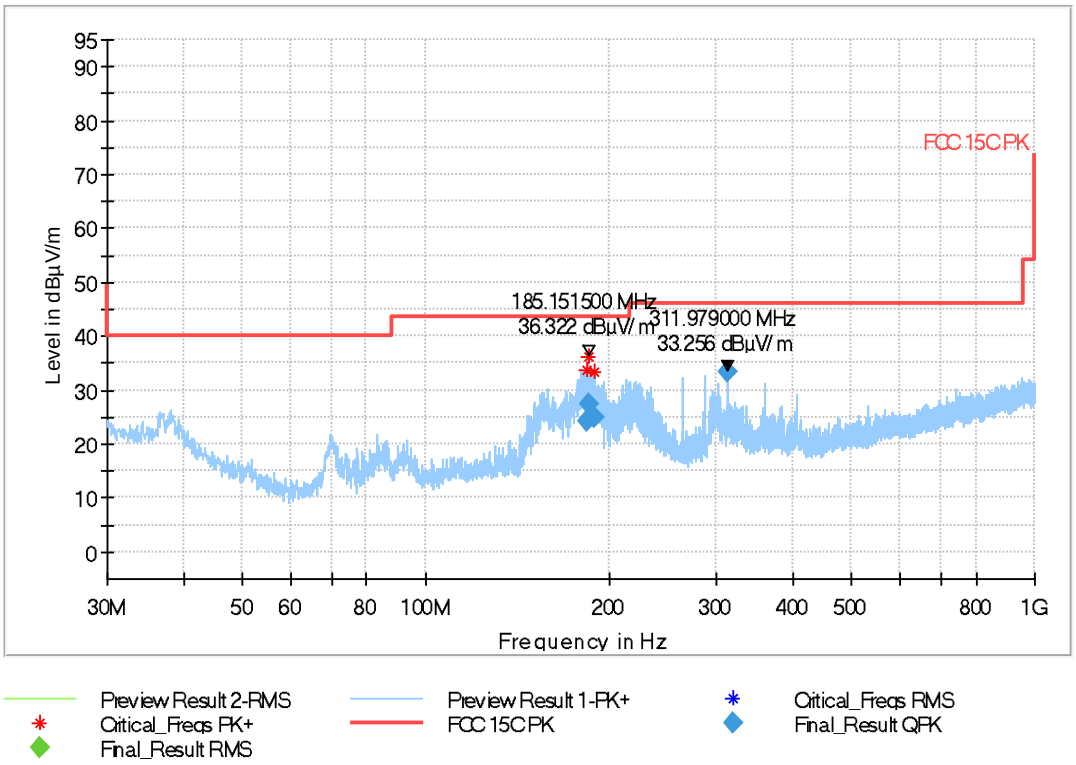


Plot #39 Radiated Emissions: 30 MHz – 1GHz		
Modulation: 802.11n20	Channel: High(144)	

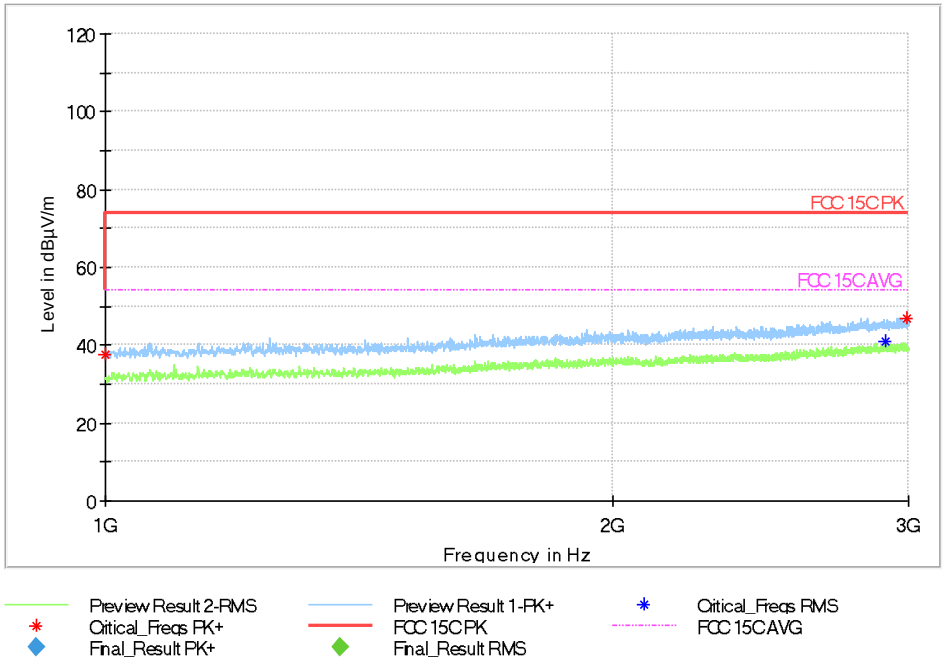
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
183.540	24.23	---	43.50	19.27	100.0	100.0	124.0	V
185.434	27.54	---	43.50	15.96	100.0	100.0	124.0	V
189.317	25.00	---	43.50	18.50	100.0	100.0	152.0	V
312.012	33.50	---	46.00	12.50	100.0	100.0	152.0	H

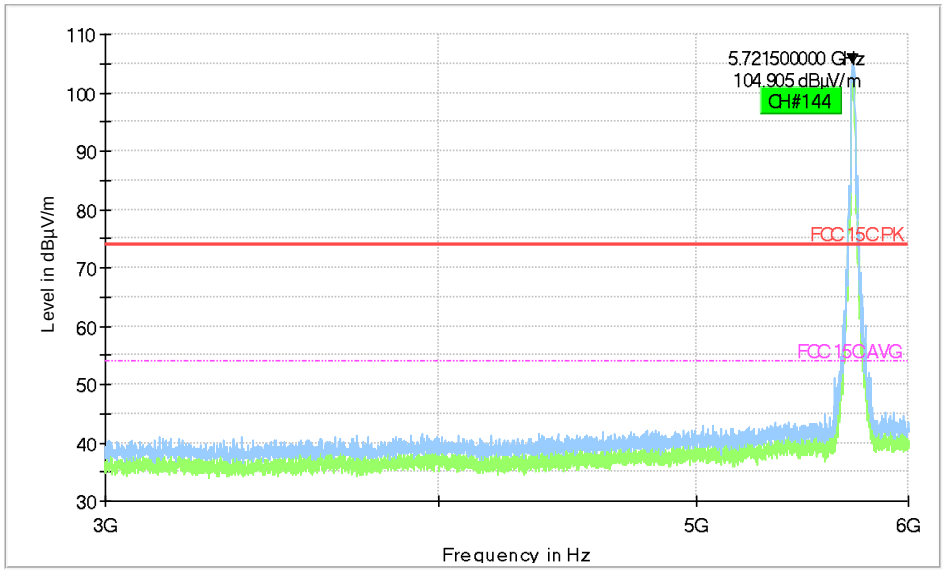
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



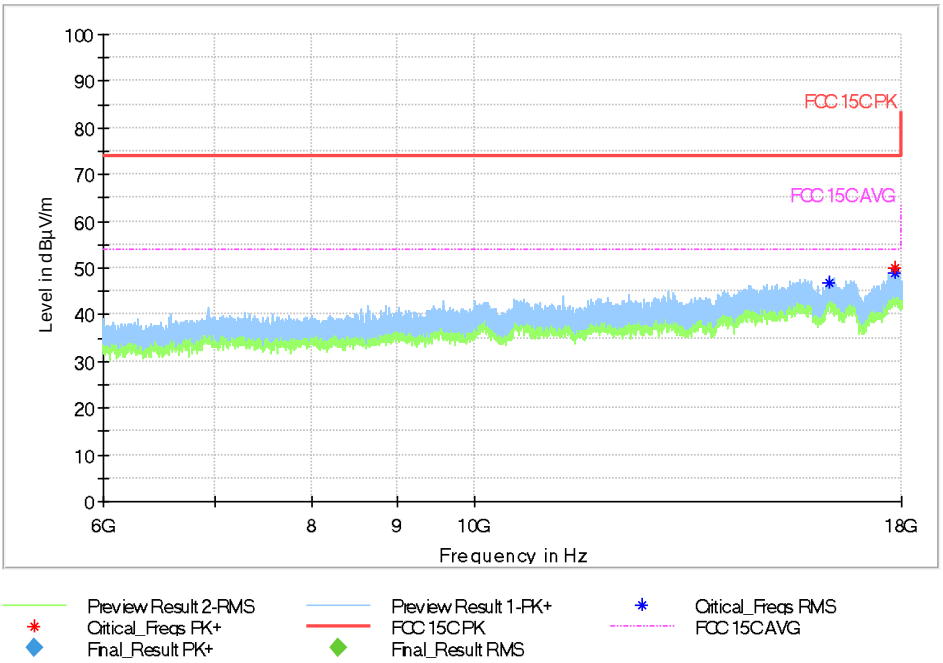
Plot # 40 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: High(144)**	



Plot #41 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: High(144)**	



Plot #42 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: High(144)**	



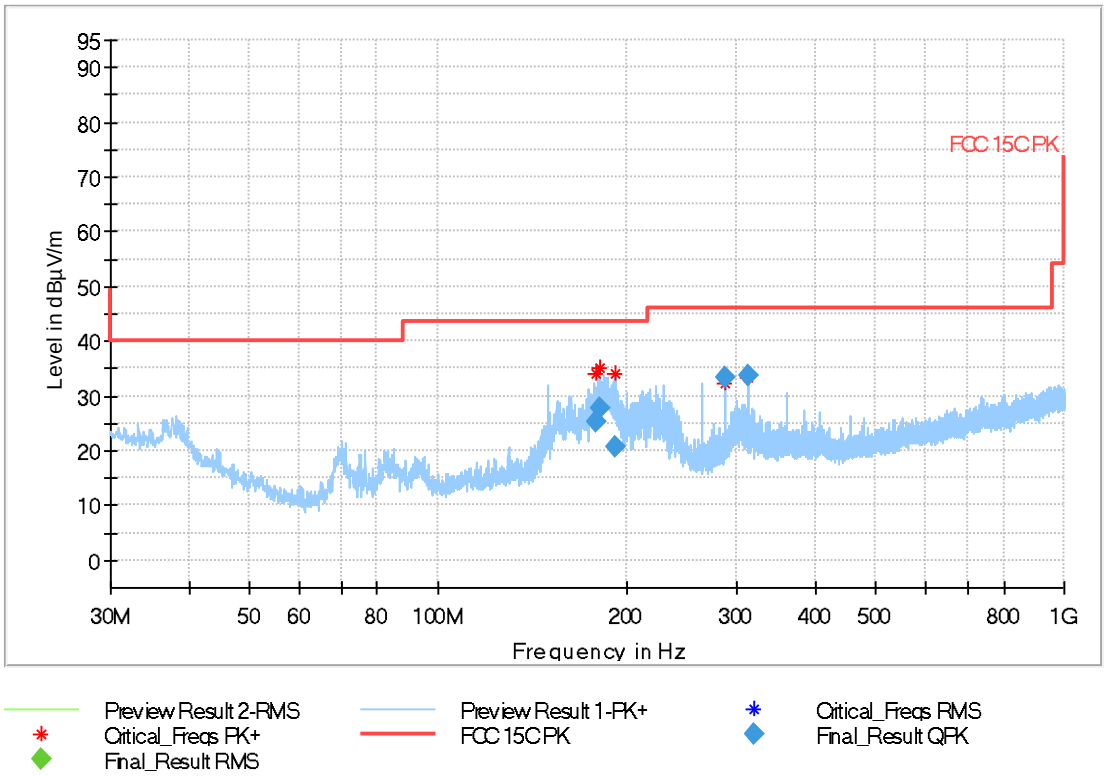
Plot #43 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Low(149)**

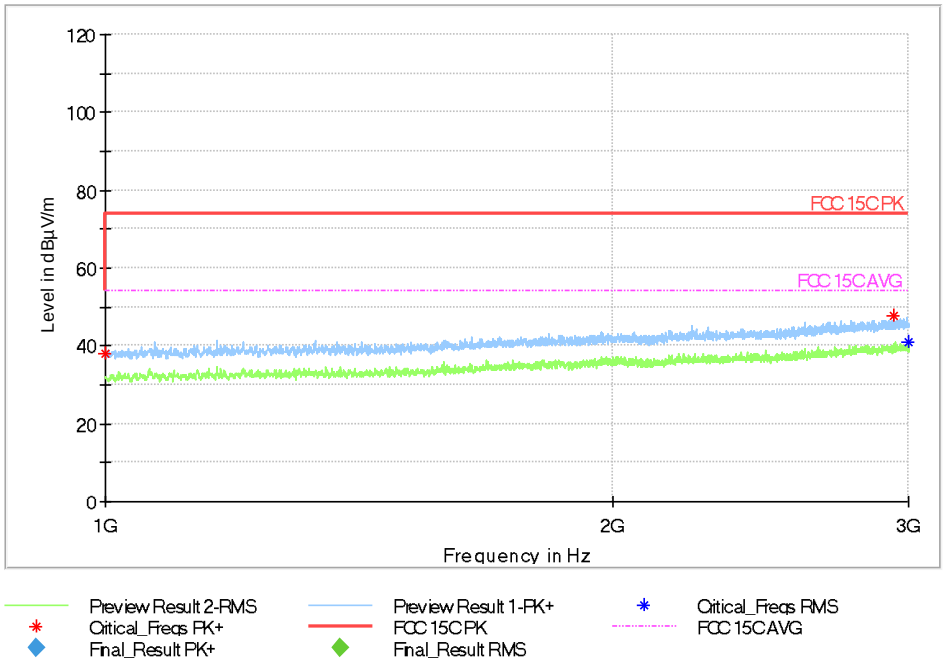
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
179.313	25.28	---	43.50	18.22	100.0	100.0	131.0	V
181.429	27.58	---	43.50	15.92	100.0	100.0	100.0	V
192.062	20.66	---	43.50	22.84	100.0	100.0	157.0	V
287.998	33.54	---	46.00	12.46	100.0	100.0	116.0	H
311.999	33.85	---	46.00	12.15	100.0	100.0	145.0	H

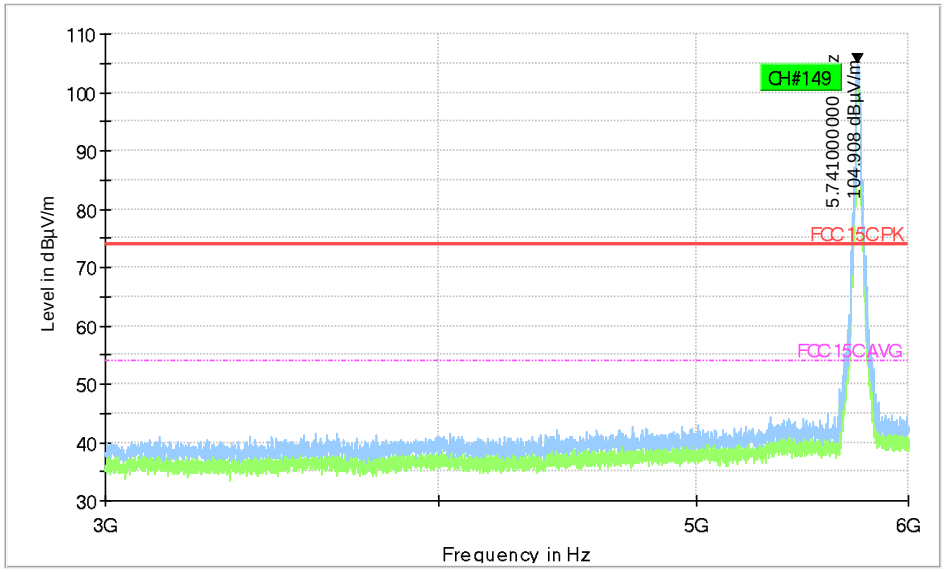
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



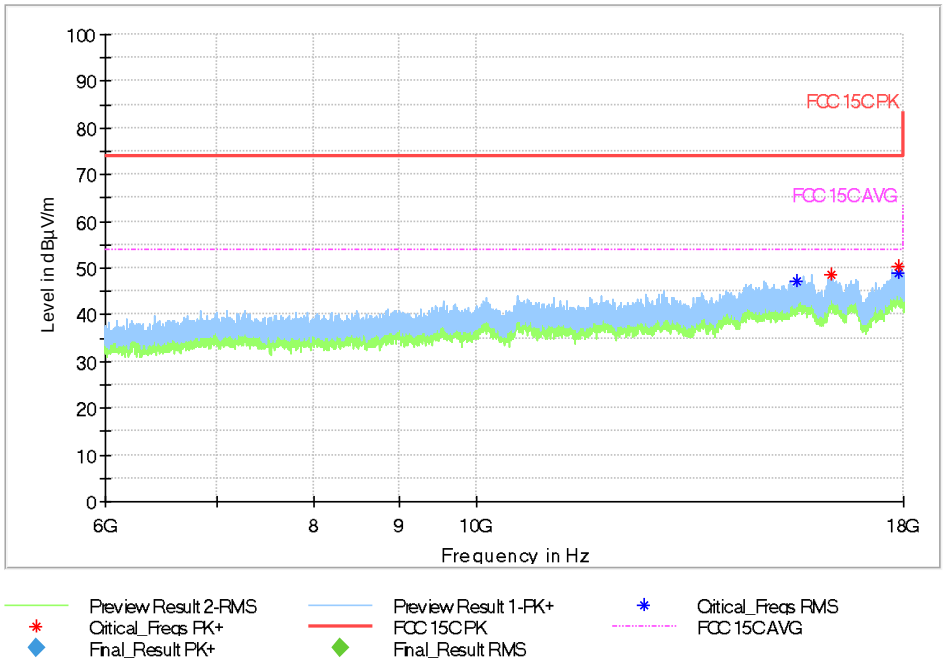
Plot # 44 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Low(149)**	



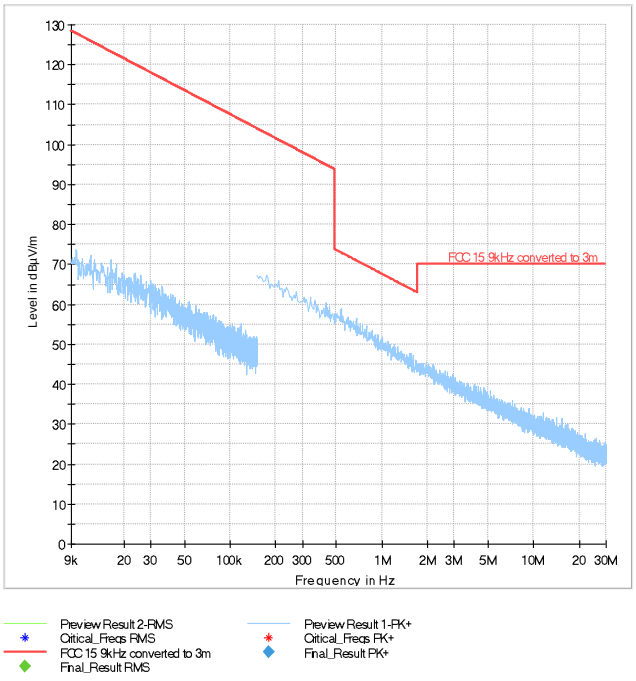
Plot # 45 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Low(149)**	



Plot # 46 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Low(149)**	



Plot # 47 Radiated Emissions: 9 KHz - 30 MHz		
Modulation: 802.11n20	**Channel: Mid(157)**	



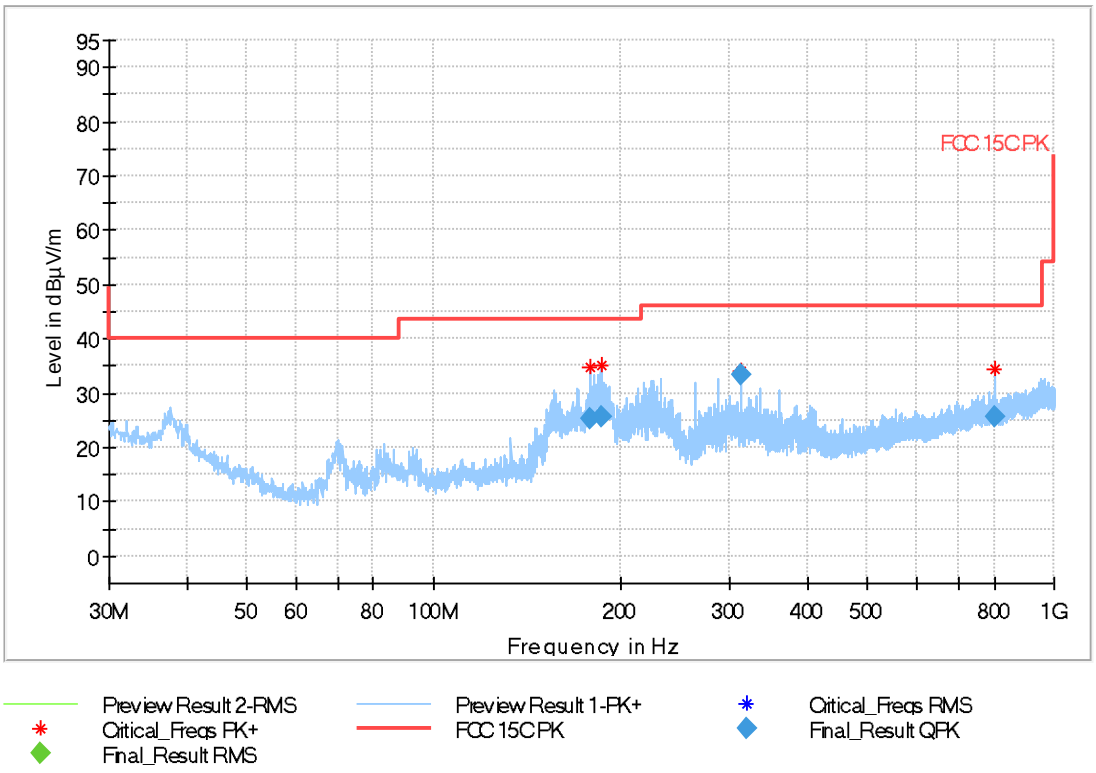
Plot #48 Radiated Emissions: 30 MHz – 1GHz

Modulation: 802.11n20 | **Channel: Mid(157)**

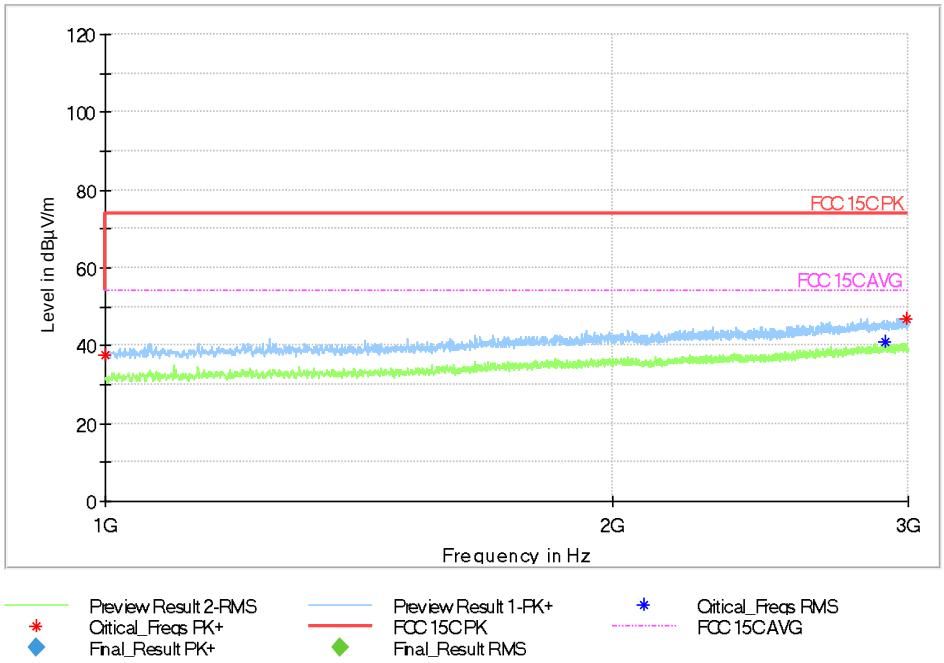
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
178.260	25.14	---	43.50	18.36	100.0	100.0	145.0	V
186.309	25.53	---	43.50	17.97	100.0	100.0	116.0	V
311.981	33.50	---	46.00	12.50	100.0	100.0	144.0	H
800.698	25.68	---	46.00	20.32	100.0	100.0	139.0	V

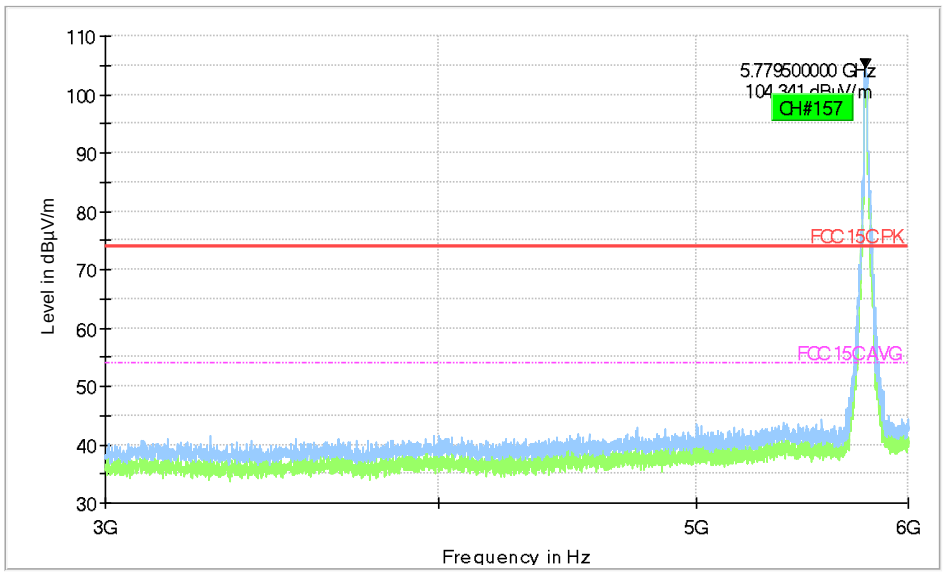
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



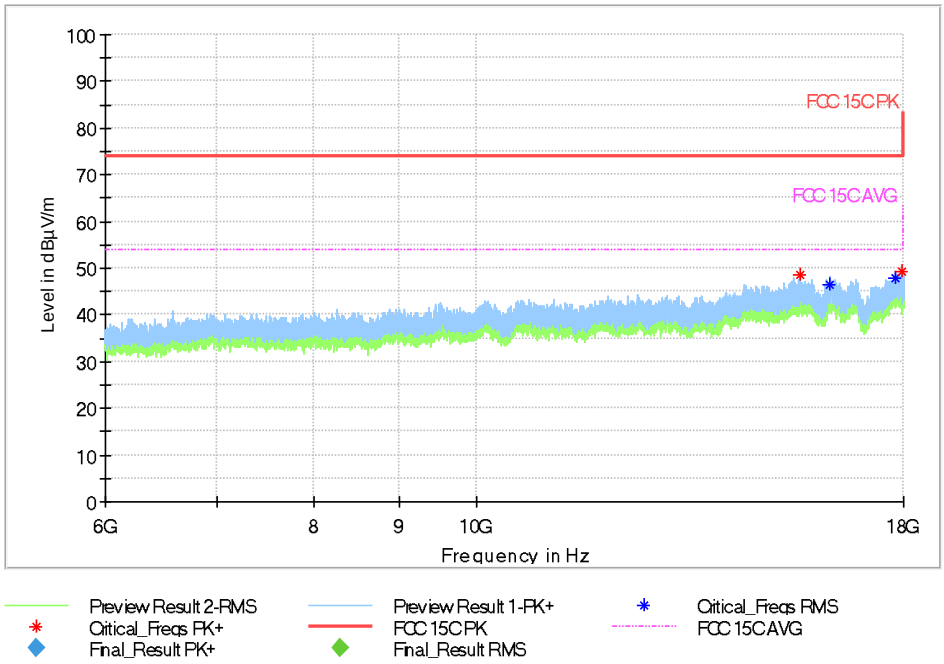
Plot #49 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: Mid(157)**	



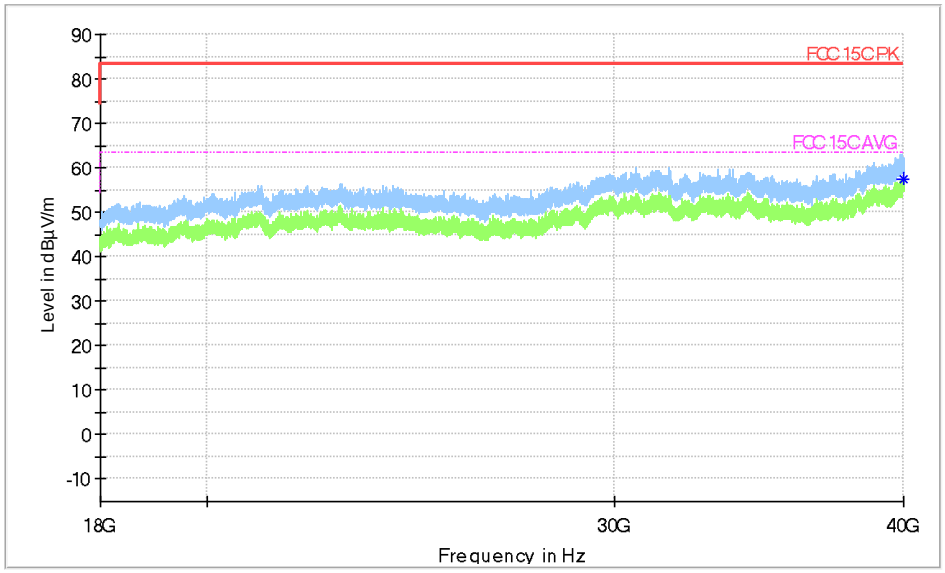
Plot #50 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: Mid(157)**	



Plot #51 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: Mid(157)**	



Plot #52 Radiated Emissions: 18-40 GHz		
Modulation: 802.11n20	**Channel: Mid(157)**	

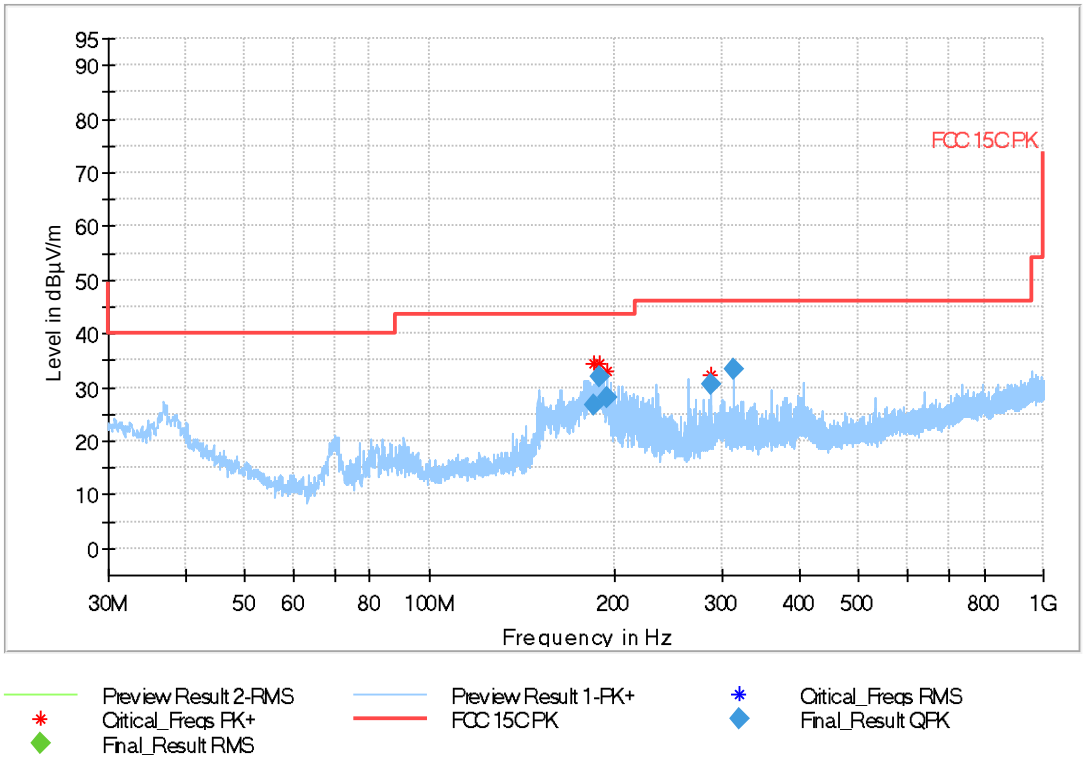


Plot #53 Radiated Emissions: 30 MHz – 1GHz		
Modulation: 802.11n20	Channel: High(165)	

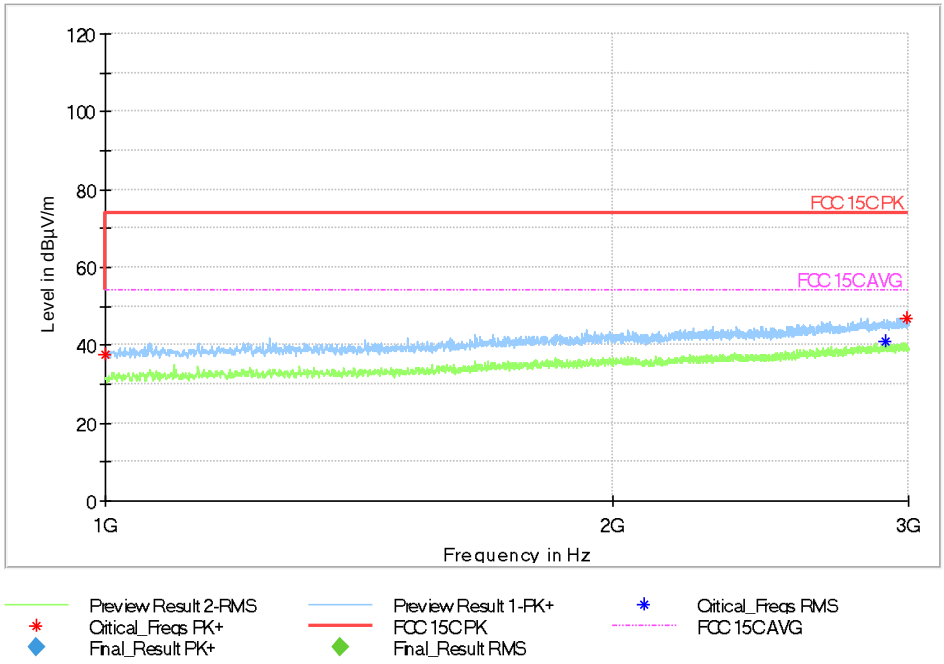
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
185.140	26.64	---	43.50	16.86	100.0	100.0	100.0	V
189.219	31.85	---	43.50	11.65	100.0	100.0	100.0	V
194.686	28.12	---	43.50	15.38	100.0	100.0	108.0	V
287.958	30.56	---	46.00	15.44	100.0	100.0	124.0	H
311.981	33.49	---	46.00	12.51	100.0	100.0	145.0	H

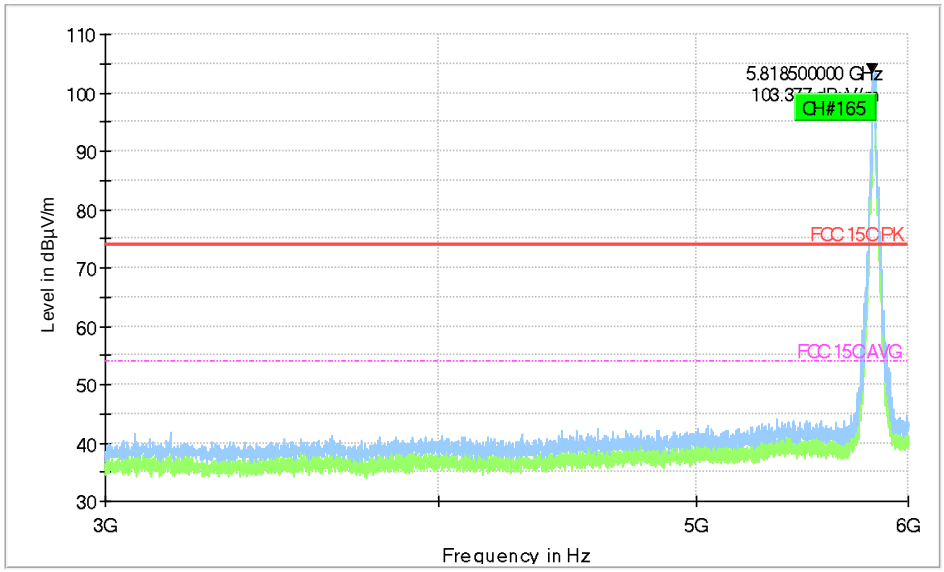
Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



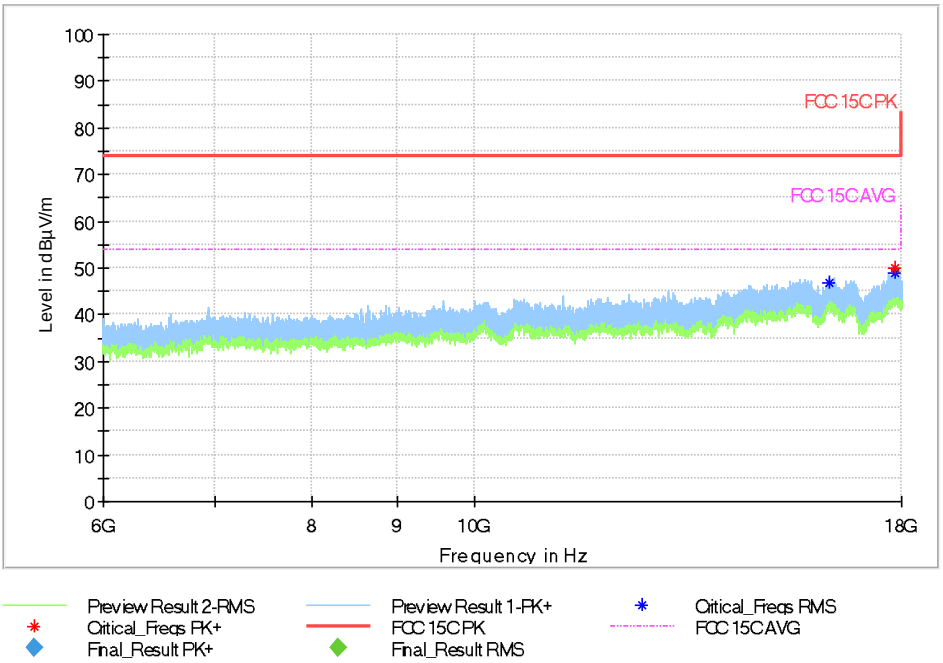
Plot # 54 Radiated Emissions: 1-3 GHz		
Modulation: 802.11n20	**Channel: High(165)**	



Plot #55 Radiated Emissions: 3-6 GHz		
Modulation: 802.11n20	**Channel: High(165)**	



Plot #56 Radiated Emissions: 6-18 GHz		
Modulation: 802.11n20	**Channel: High(165)**	



8.7 AC Power Line Conducted Emissions

8.7.1 Measurement according to ANSI C63.4

Analyzer Settings:

- RBW = 9 KHz (CISPR Bandwidth)
- Detector: Peak / Average for Pre-scan
- Quasi-Peak/Average for Final Measurements

8.7.2 Limits: §15.207 & RSS-Gen 8.8

FCC §15.207(a) & RSS-Gen 8.8

- Except as shown in paragraphs (b) and (c) of this section of the CFR, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table (1), as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

8.7.3 Test conditions and setup:

Ambient Temperature ©	EUT Set-Up #	EUT operating mode	Power line (L1, L2, L3, N)	Power Input
22° C	3	802.11n20/n40/ac80	Line & Neutral	120V / 60Hz

8.7.4 Measurement Result:

Plot #	Port	EUT Set-Up #	EUT operating mode	Scan Frequency	Limit	Result
1	AC Mains - L	3	802.11n20	150 kHz – 30 MHz	See section 8.6.2	Pass
2	AC Mains - N	3	802.11n20	150 kHz – 30 MHz	See section 8.6.2	Pass
3	AC Mains - L	3	802.11n40	150 kHz – 30 MHz	See section 8.6.2	Pass
4	AC Mains - N	3	802.11n40	150 kHz – 30 MHz	See section 8.6.2	Pass
5	AC Mains - L	3	802.11ac80	150 kHz – 30 MHz	See section 8.6.2	Pass
6	AC Mains - N	3	802.11ac80	150 kHz – 30 MHz	See section 8.6.2	Pass

8.7.5 Measurement Plots:

Plot # 1

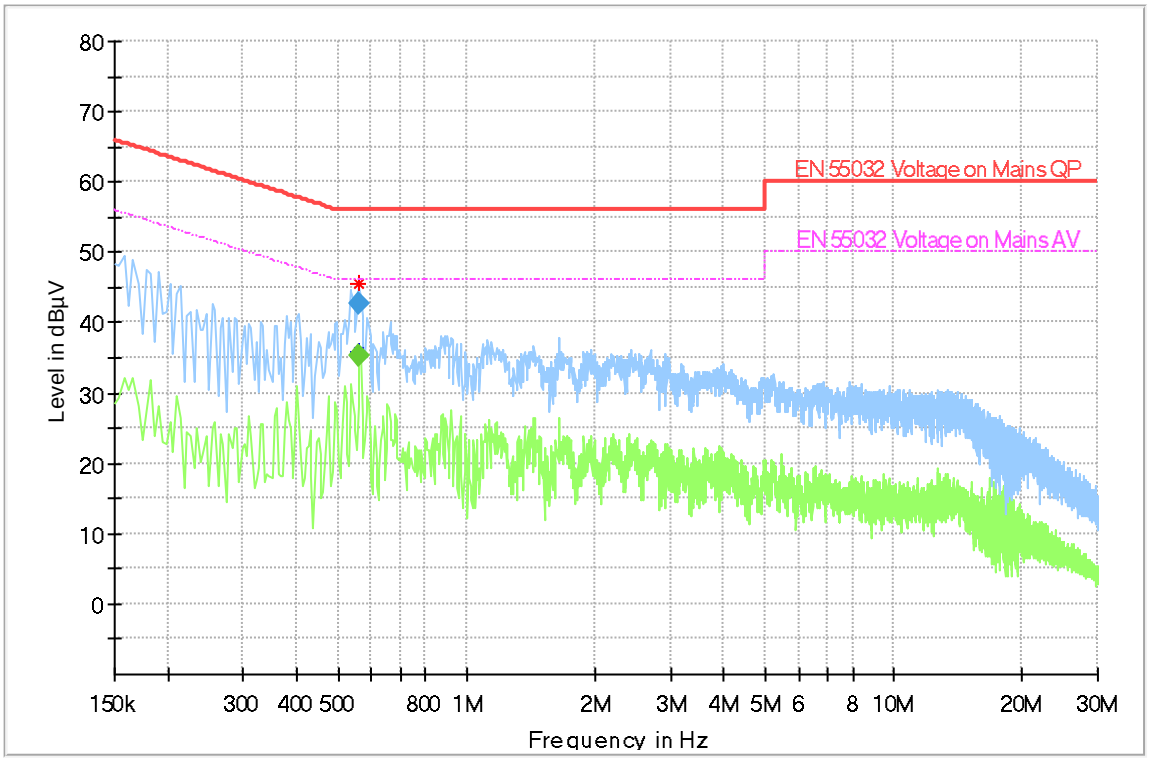
EUT Information

EUT Serial Number: X60495001
Manufacturer: AXON
Comment: L – n20

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.558000	42.70	---	56.00	13.30	500.0	9.000	L1	GND	10.3
0.562000	---	35.37	46.00	10.63	500.0	9.000	L1	GND	10.3

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



Plot # 2

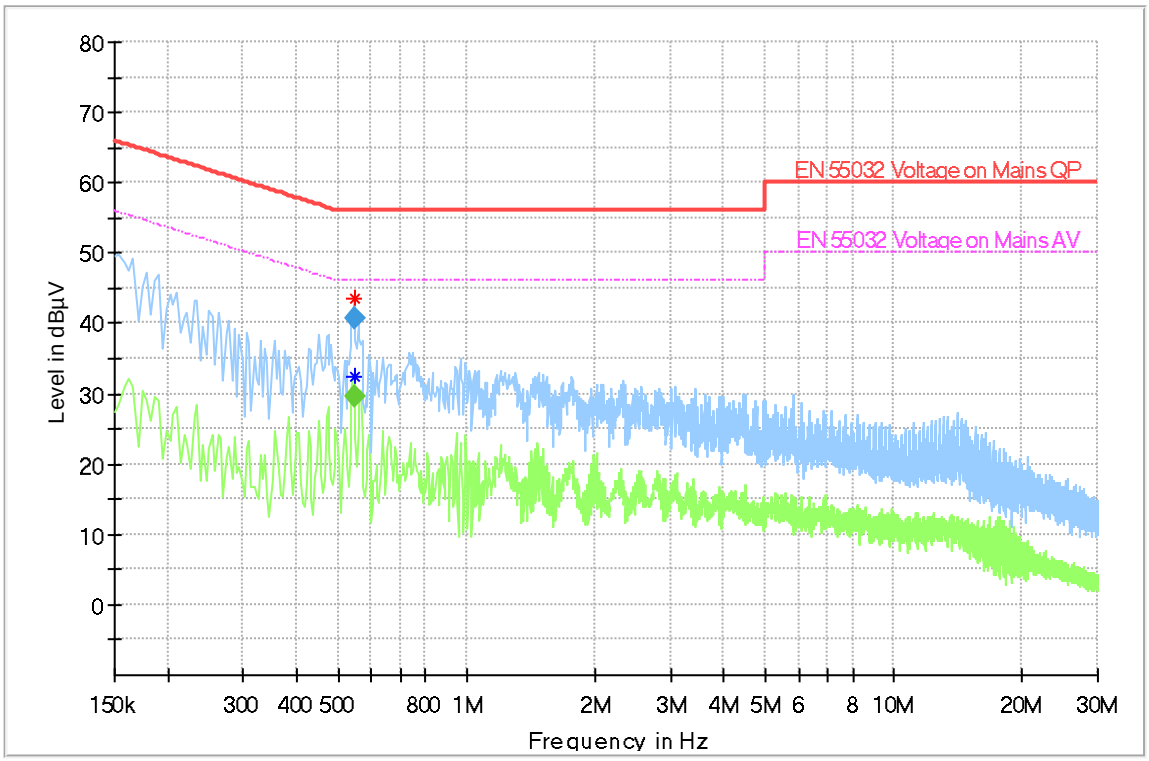
EUT Information

EUT Serial Number: X60495001
Manufacturer: AXON
Comment: N – n20

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.546000	---	29.49	46.00	16.51	500.0	9.000	N	GND	10.2
0.546000	40.62	---	56.00	15.38	500.0	9.000	N	GND	10.2

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



Plot # 3

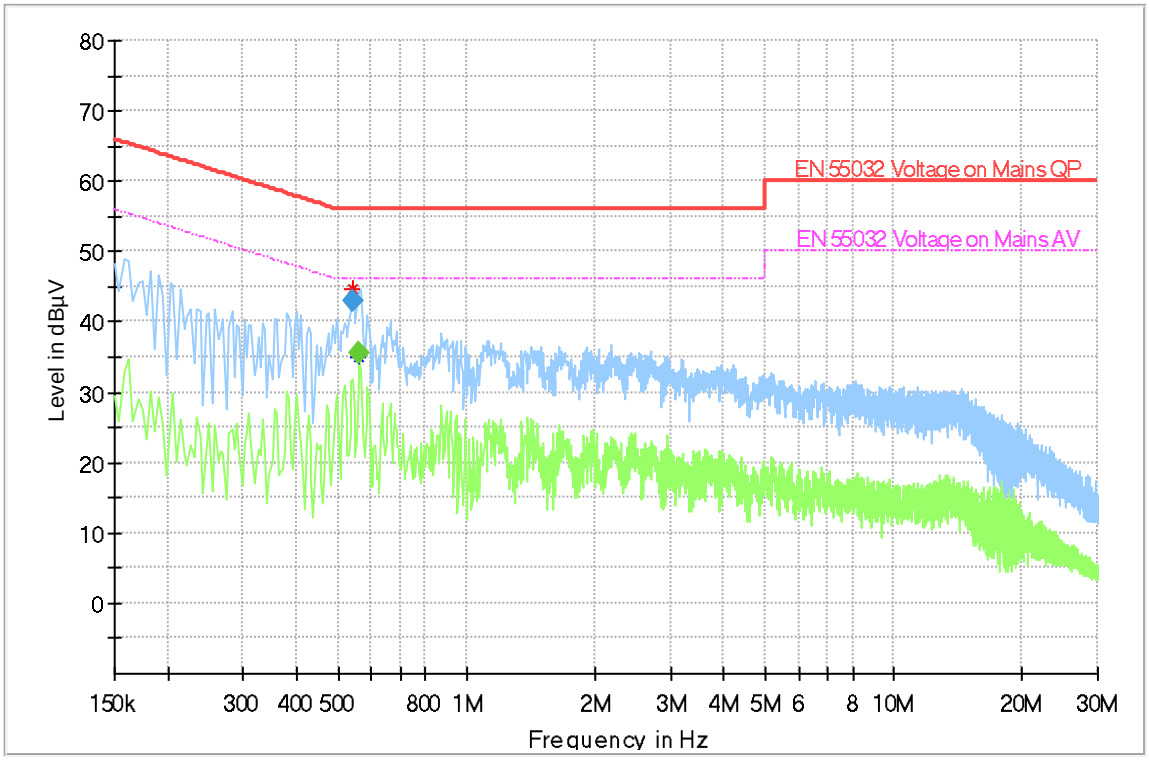
EUT Information

EUT Serial Number: X60495001
Manufacturer: AXON
Comment: L – n40

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.542000	42.93	---	56.00	13.07	500.0	9.000	L1	GND	10.2
0.562000	---	35.49	46.00	10.51	500.0	9.000	L1	GND	10.3

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



Plot # 4

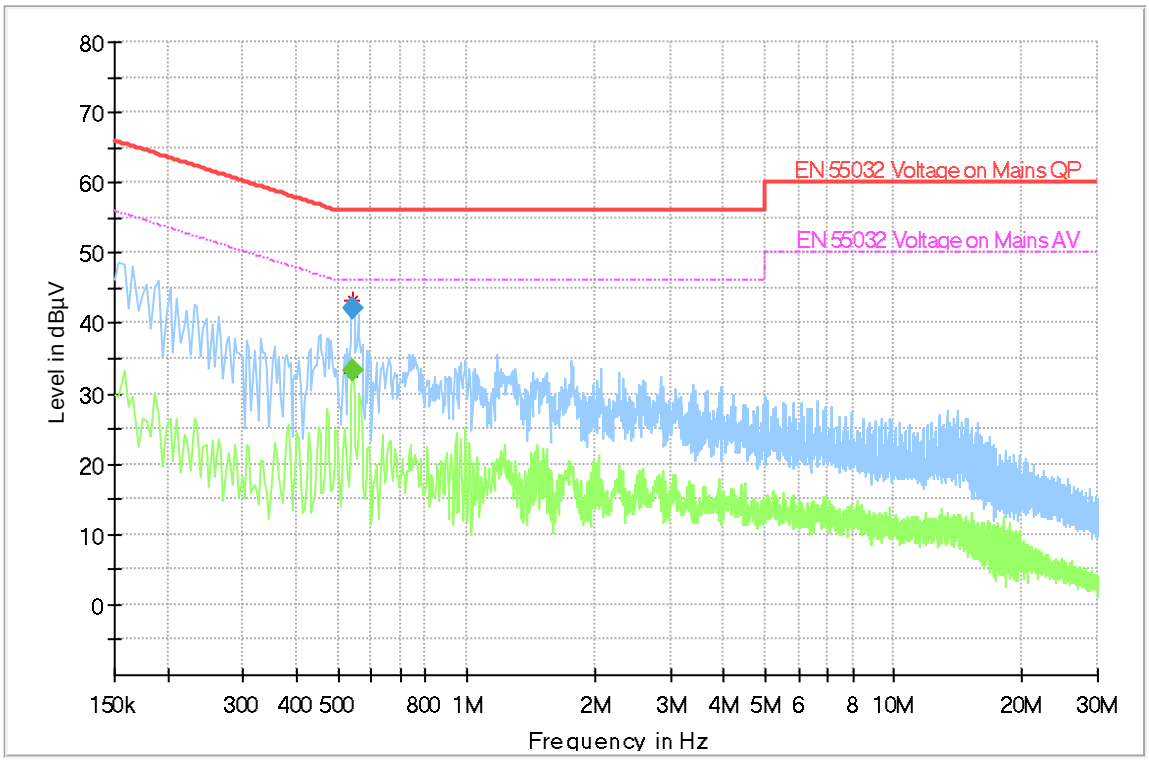
EUT Information

EUT Serial Number: X60495001
Manufacturer: AXON
Comment: N – n40

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.542000	---	33.25	46.00	12.75	500.0	9.000	N	GND	10.2
0.542000	42.25	---	56.00	13.75	500.0	9.000	N	GND	10.2

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



Plot # 5

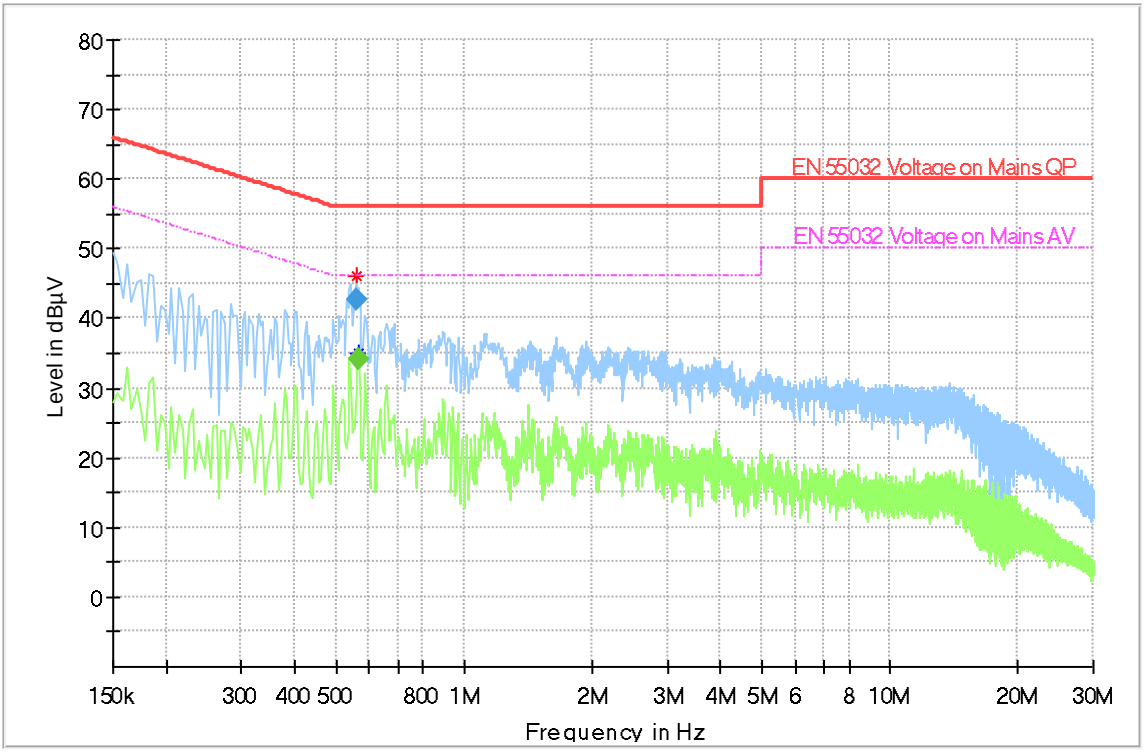
EUT Information

EUT Serial Number: X60495001
Manufacturer: AXON
Comment: L – ac80

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.558000	42.61	---	56.00	13.39	500.0	9.000	L1	GND	10.3
0.566000	---	34.02	46.00	11.98	500.0	9.000	L1	GND	10.2

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



Plot # 6

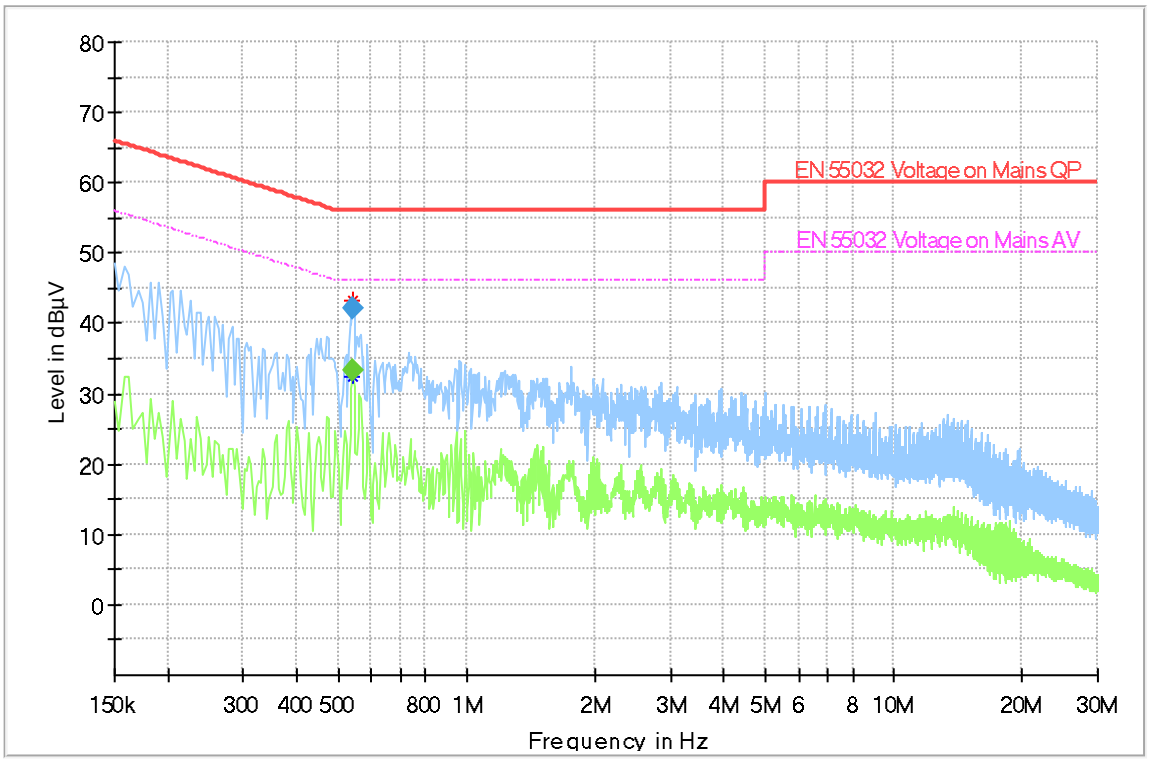
EUT Information

EUT Serial Number: X60495001
Manufacturer: AXON
Comment: N – ac80

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.542000	---	33.27	46.00	12.73	500.0	9.000	N	GND	10.2
0.542000	42.25	---	56.00	13.75	500.0	9.000	N	GND	10.2

Disclaimer: Any measurement data within 2dB from the limit line is conditional PASS/FAIL due to measurement uncertainty considerations.



9 Test setup photos

Setup photos are included in supporting file name: "EMC_AXONN-004-19001_FCC_Setup_Photos.pdf"

10 Test Equipment And Ancillaries Used For Testing

Item Name	Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
Antenna Biconilog 3142E	Biconlog Antenna	EMCO	3142E	166067	3 years	6/28/2017
Antenna Horn 3115 SN 35114	Horn Antenna	EMCO	3115	35114	3 years	7/31/2017
Antenna Horn 3117	Horn Antenna	ETS Lindgren	3117PA	169547	3 years	8/8/2017
Antenna Horn 3116	Horn Antenna	ETS Lindgren	3116C-PA	169535	3 years	9/24/2017
Active Loop Antenna	Active Loop Antenna	ETS Lindgren	6507	161344	3 years	10/26/2017
FSV40	Spectrum Analyzer	R&S	FSV40	101022	3 years	7/5/2017
Thermometer Humidity	Thermometer Humidity	Dickson	TM320	5280063	3 years	11/02/2017
FSU	Spectrum Analyzer	R&S	FSU26	200302	2 Years	7/5/2017
LISN	LISN	FCC	FCC-LISN-50-25-2-08	8014	3 years	11/10/2016

Note:

1. Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.

Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

11 History

Date	Report Name	Changes to report	Report prepared by
2020-02-21	EMC_AXONN-004-19001_15.407_UNII	Initial Version	Kevin Wang