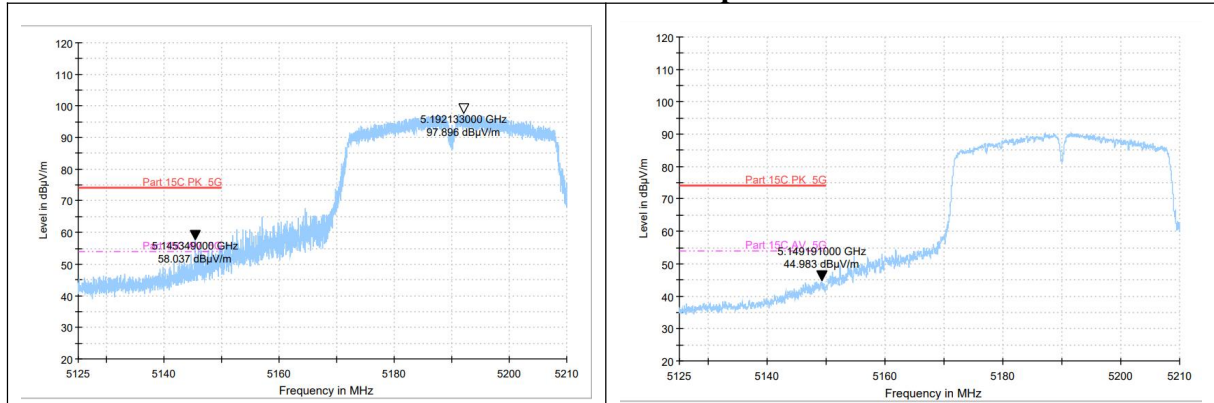
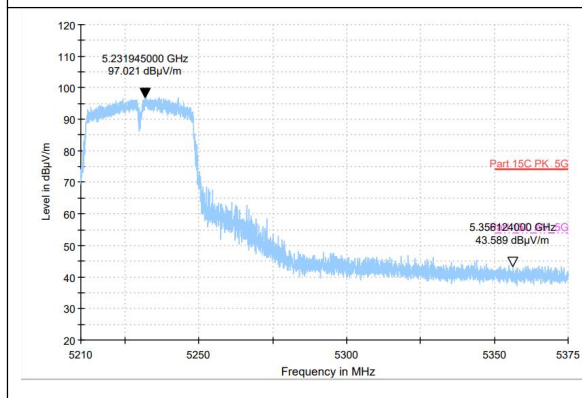


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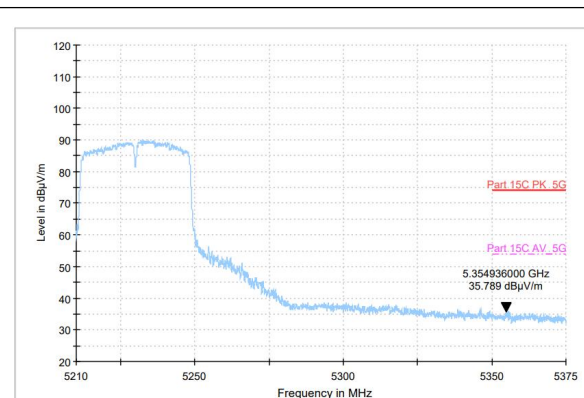


Band Edges (802.11ac 40m, CH46)

Peak detector

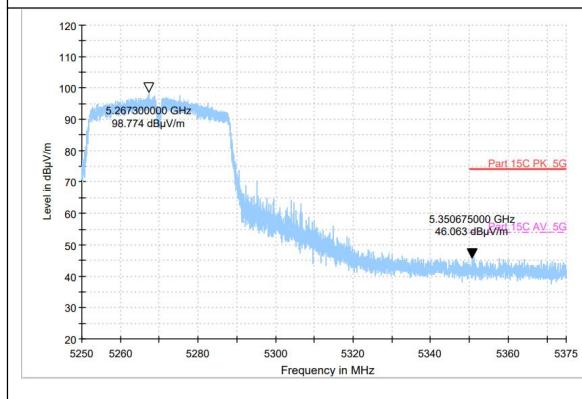


AV detector

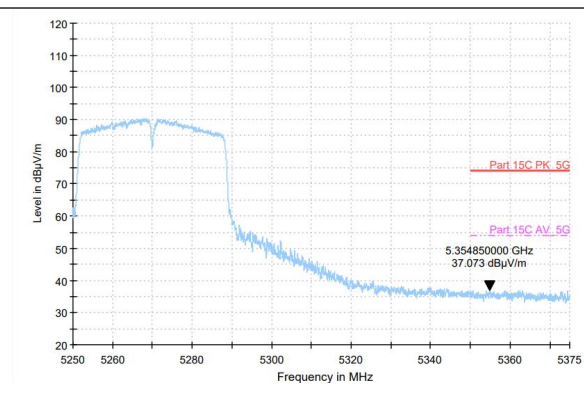


Band Edges (802.11ac 40m, CH54)

Peak detector

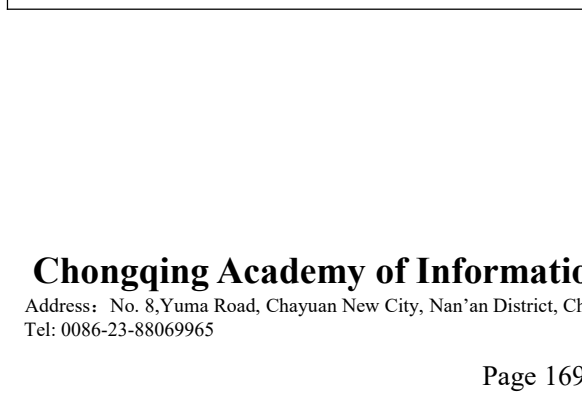


AV detector



Band Edges (802.11ac 40m, CH62)

Peak detector



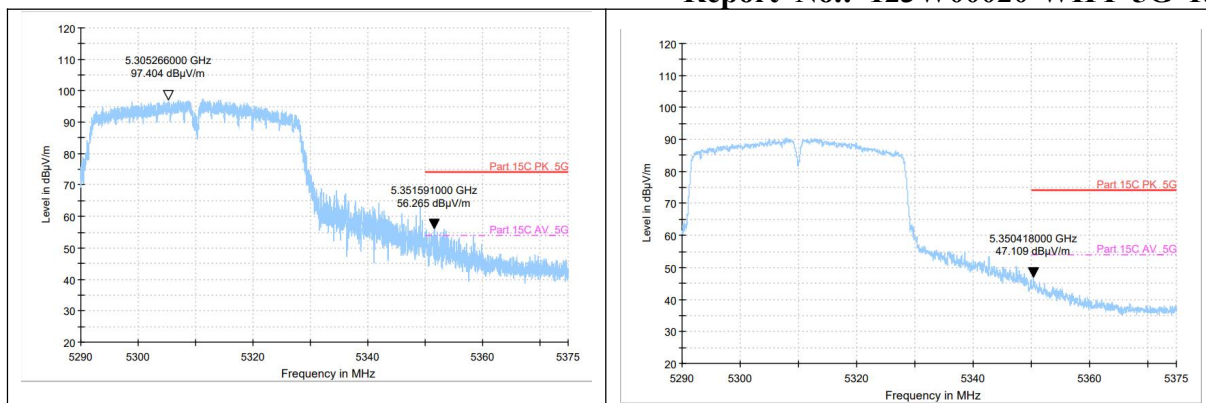
AV detector



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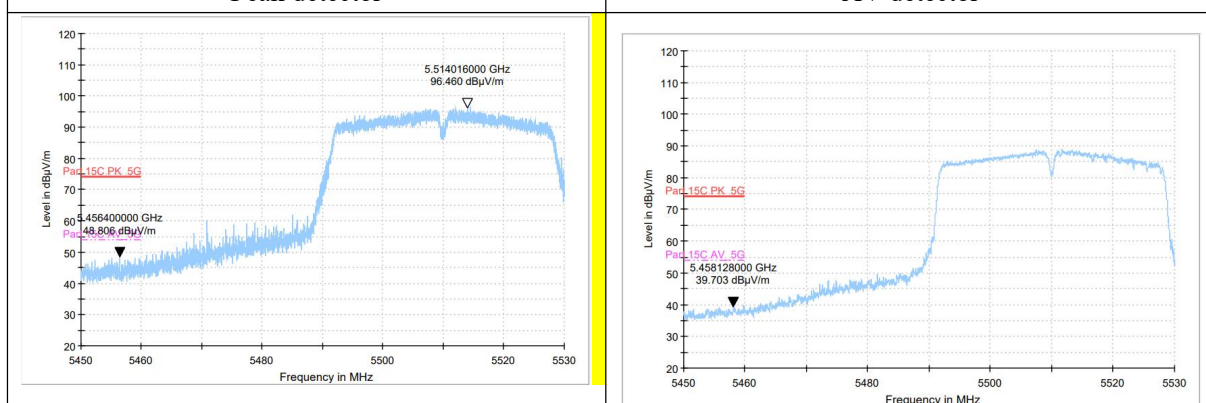
Report No.: 123W00020-WIFI 5G RF



Band Edges (802.11ac 40m, CH102)

Peak detector

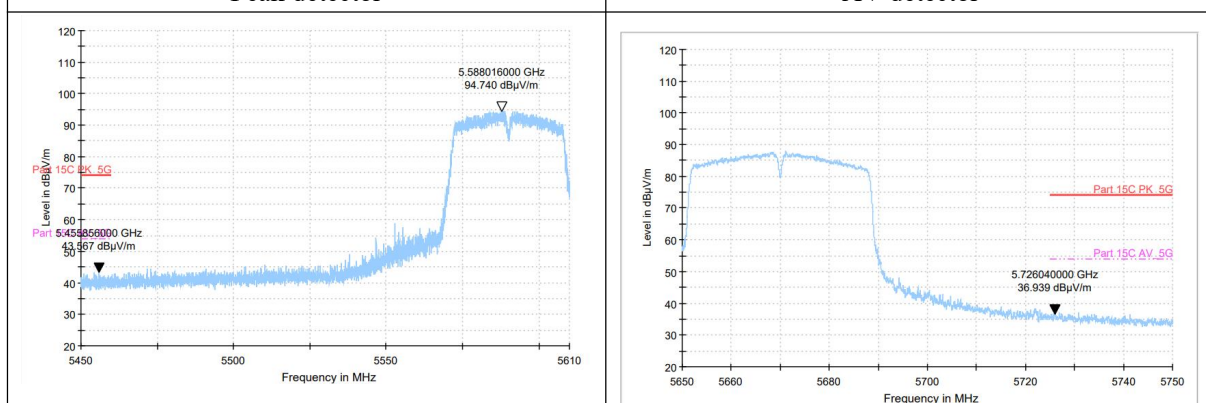
AV detector



Band Edges (802.11ac 40m, CH118)

Peak detector

AV detector



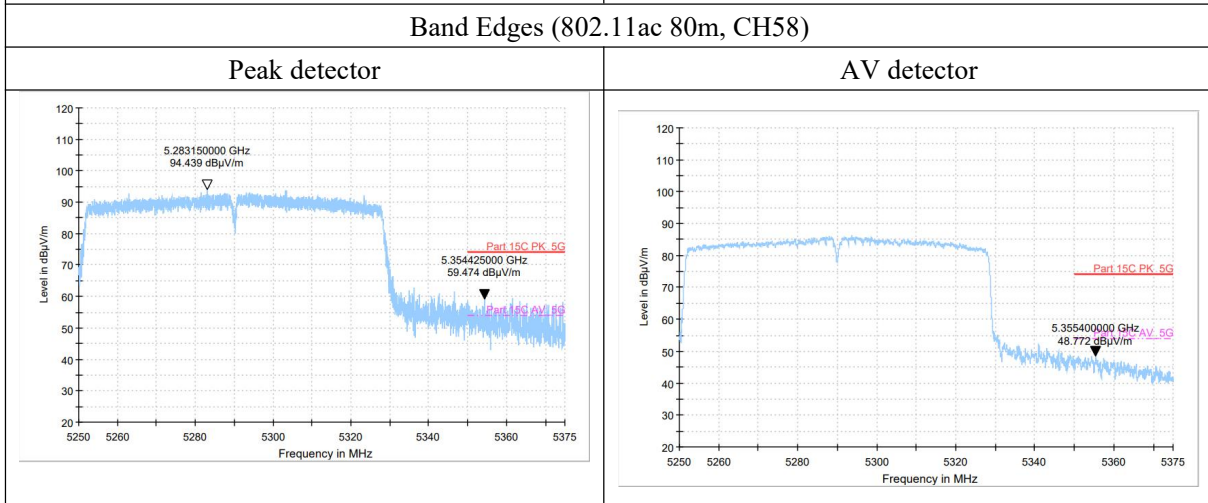
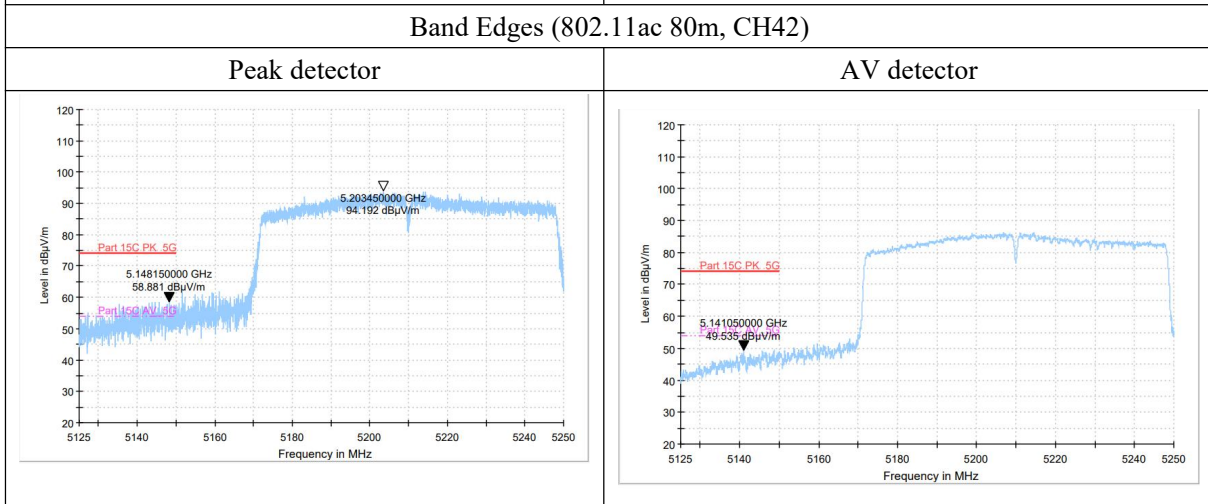
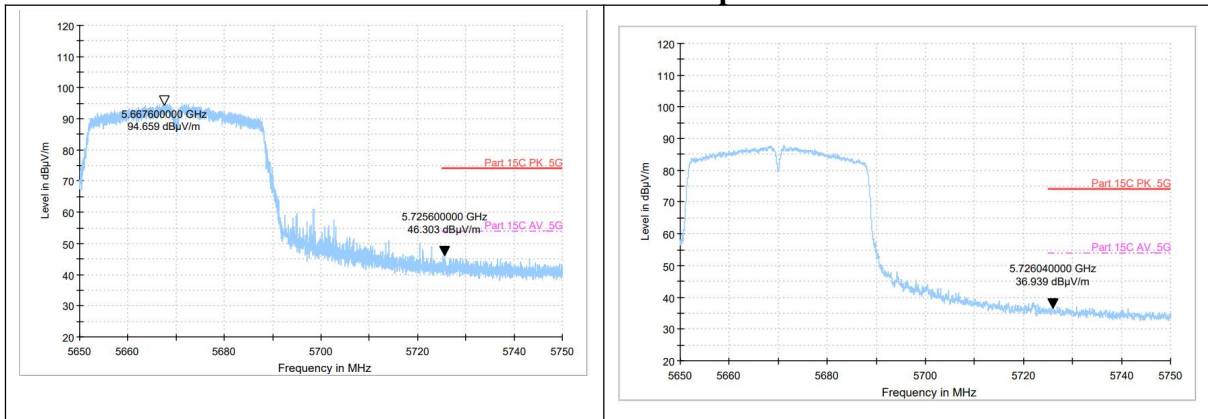
Band Edges (802.11ac 40m, CH134)

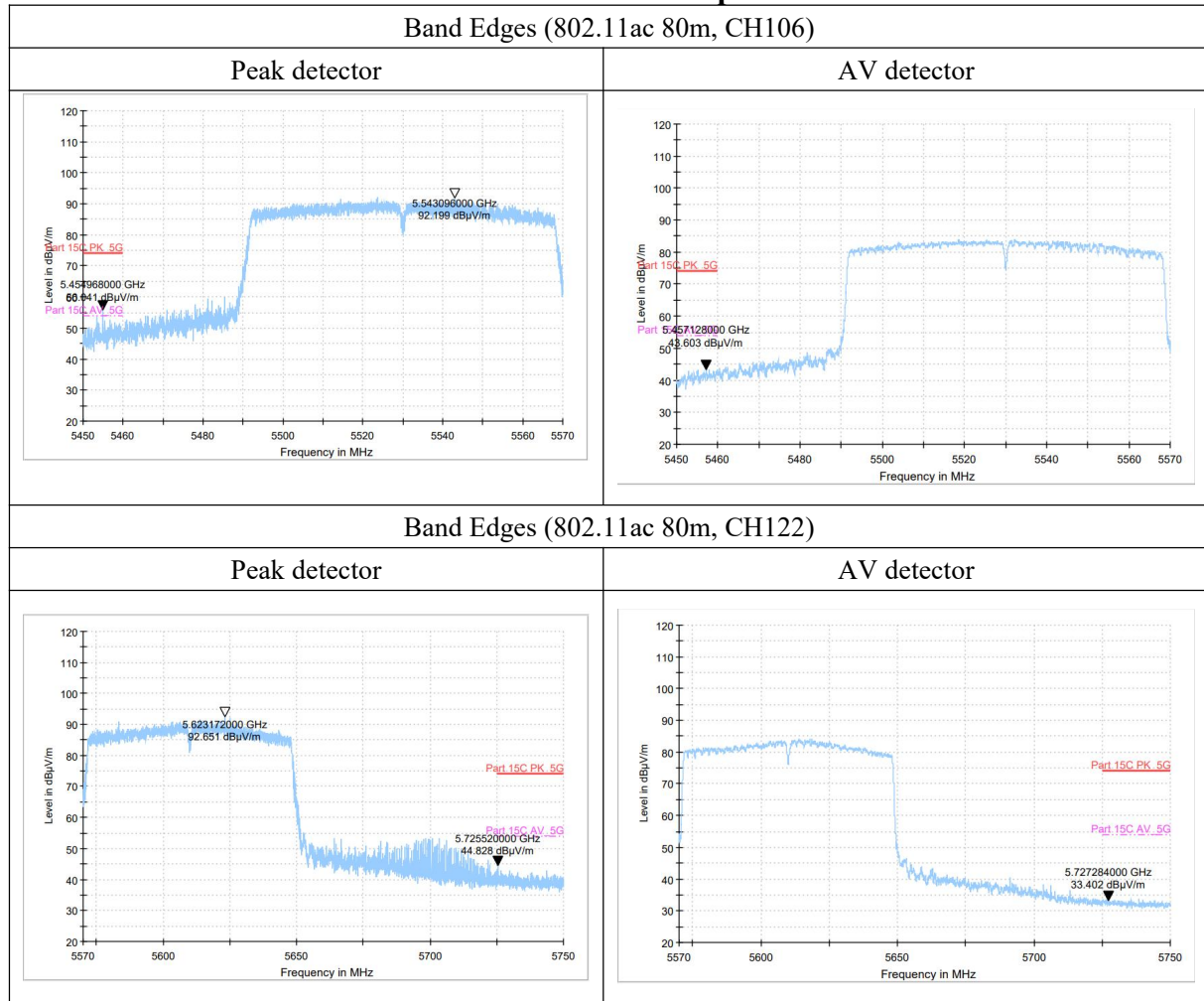
Peak detector

AV detector

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6.8 Transmitter Spurious Emission

Specifications:	FCC 47 CFR Part 15.209 & 15.407(b)(9),(10)
DUT Serial Number:	S4,S8,S9
Test conditions:	Ambient Temperature:20°C Relative Humidity:40% Air pressure: 90kPa
Test Results:	Pass

Measurement Limit and Method

Standard	Limit(dBμV/m)	
FCC 47 CFR Part 15.209 & 15.407(b)(9),(10)	Peak	74
	Average	54

Measurement Uncertainty:

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Measurement Uncertainty	30MHz-1000MHz: 4.09 dB(MAX) (k=2). 1000MHz-6000MHz : 4.84 dB (k=2). 6000MHz-18000MHz : 4.52 dB (k=2). 18GHz-26.5GHz: 6.19 dB (k=2). 26.5GHz-40GHz: 6.03 dB (k=2).
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The measurement is made according to KDB 789033

Set the spectrum analyzer in the following:

Below 1GHz:

- a) Follow the requirements in II.G.3. “General Requirements for Unwanted Emissions Measurements.”
- b) Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

Detector: Peak and Quasi-Peak

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz (detector: Peak):

- a) Follow the requirements in II.G.3, “General Requirements for Unwanted Emissions Measurements.”
- b) Maximum emission levels are measured by setting the analyzer as follows:

(i) RBW = 1 MHz.

(ii) VBW $\geq$ 3 MHz.

(iii) Detector = Peak.

(iv) Sweep time = auto.

(v) Trace mode = max hold.

(vi) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

Limit in restricted band:

Frequency of emission (MHz)	Field strength(dB μ V/m)	Measurement distance(m)
0.009-0.490	129-94	3
0.490-1.705	74-63	3

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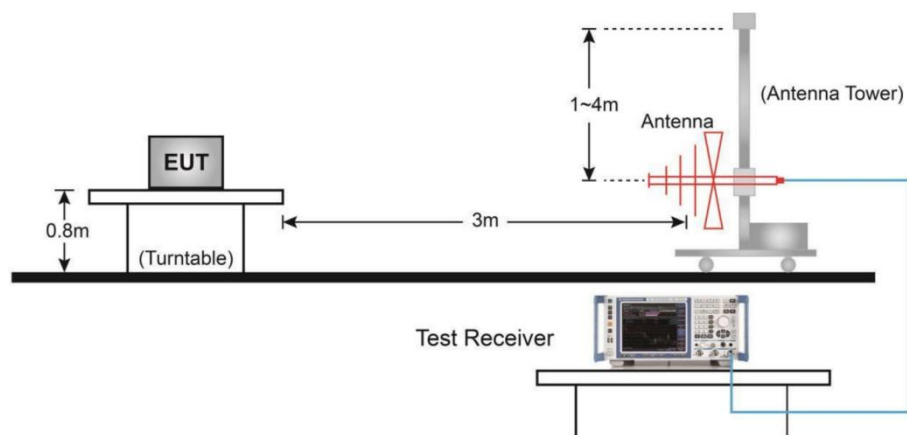
Report No.: 123W00020-WIFI 5G RF

1.705-30	70	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

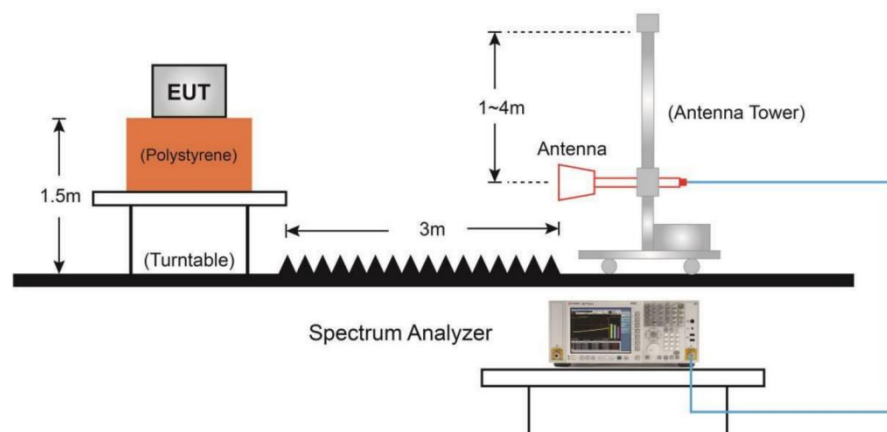
Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

Test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup



Test procedures

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output

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terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turntable rotated 360 degrees to determine the position of the maximum emission level.

The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1 meter to 4 meters to find out the maximum emission level.

The EUT was tested according to KDB 789033 D02: Section G.

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

RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);

RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);

RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)

RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

Remark:

1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)

2. Measured level= Original Receiver Reading + Factor

3. Margin = Limit – Measured level

4. If the PK measured level is lower than AV limit, the AV test can be elided

The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.

Modulation type and data rate tested (Only worst case result is given below):

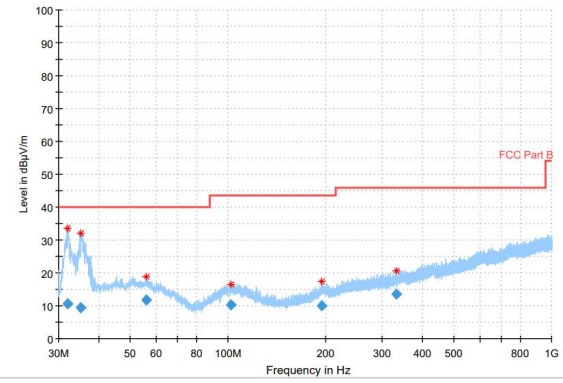
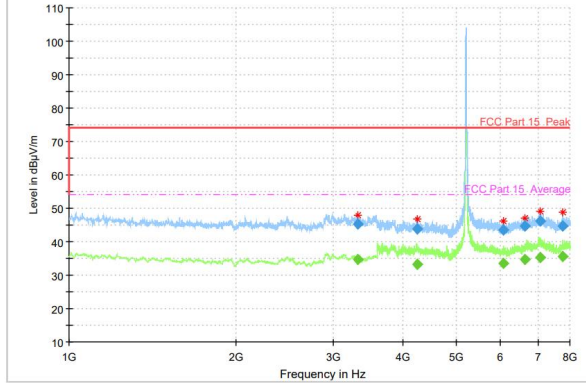
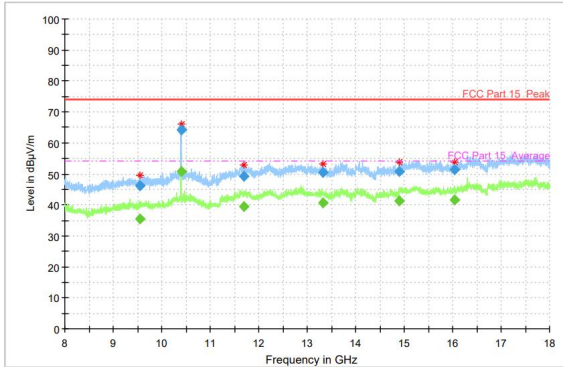
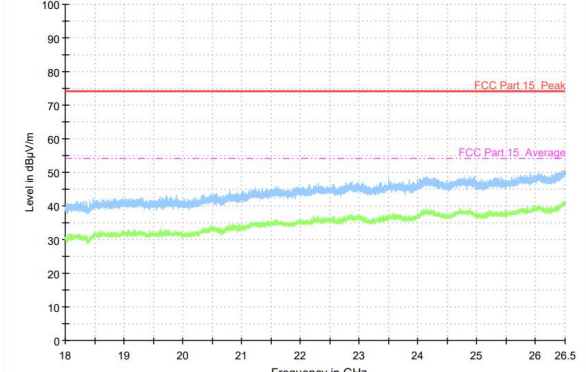
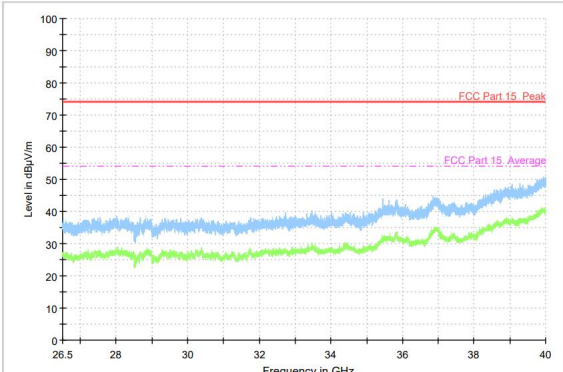
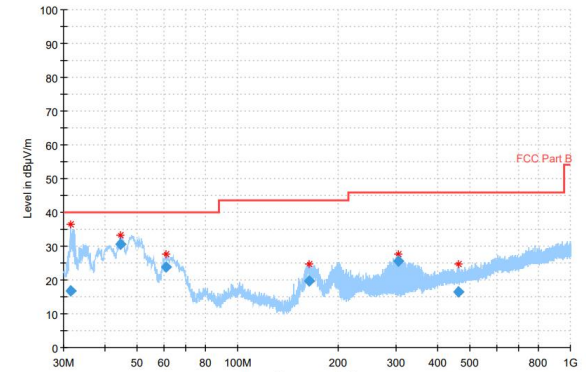
U-NII-1:

Mode	Data rate	Channel
802.11a-	6Mbps	36(5180MHz)
802.11n-HT20	MCS0	36(5180MHz)
802.11n-HT40	MCS0	38(5190MHz)
802.11ac-VHT20	MCS0	36(5180MHz)
802.11ac-VHT40	MCS0	38(5190MHz)
802.11ac-VHT20	MCS0	42(5210MHz)

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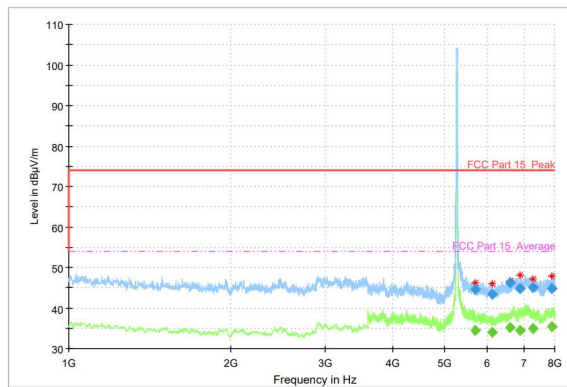
Measurement Results

Radiated Spurious Emission (802.11a, ch40, 30MHz-1GHz) 	Radiated Spurious Emission (802.11a, ch40, 1 GHz-8 GHz) 
Radiated Spurious Emission (802.11a, ch40, 8GHz-18GHz) 	Radiated Spurious Emission (802.11a, ch40, 18GHz-26.5GHz) 
Radiated Spurious Emission (802.11a, ch40, 26.5 GHz-40 GHz) 	Radiated Spurious Emission (802.11a, ch52, 30MHz-1GHz) 
Radiated Spurious Emission (802.11a, ch52, 1 GHz-8 GHz)	Radiated Spurious Emission (802.11a, ch52, 8GHz-18GHz)

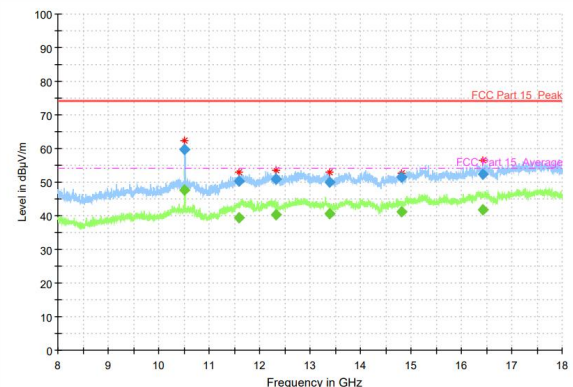
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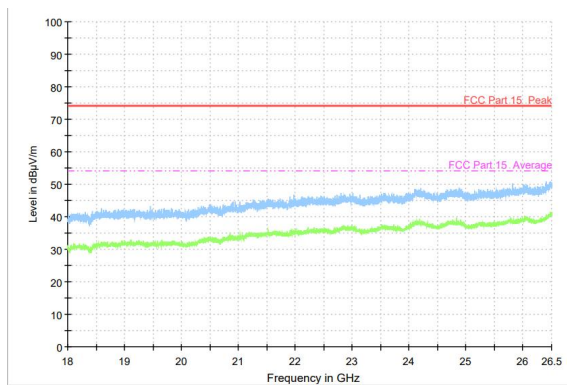
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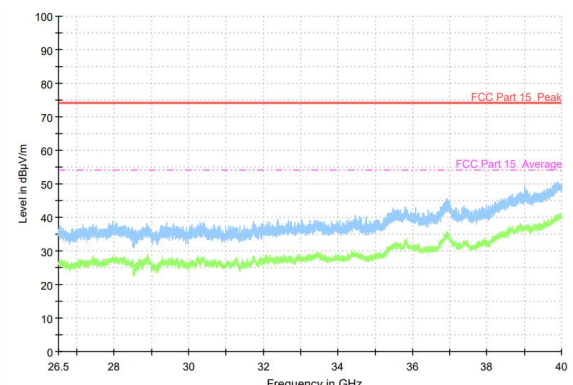
Radiated Spurious Emission
(802.11a, ch52, 18GHz-26.5GHz)



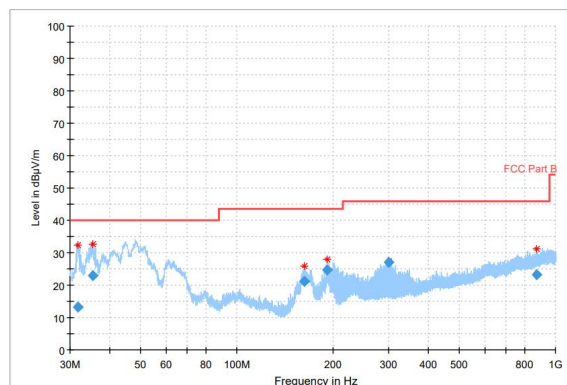
Radiated Spurious Emission
(802.11a, ch52, 26.5 GHz-40 GHz)



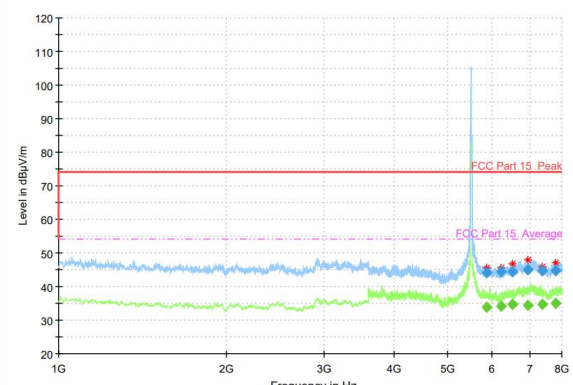
Radiated Spurious Emission
(802.11a, ch100, 30MHz-1GHz)



Radiated Spurious Emission
(802.11a, ch100, 1 GHz-8 GHz)



Radiated Spurious Emission
(802.11a, ch100, 8GHz-18GHz)

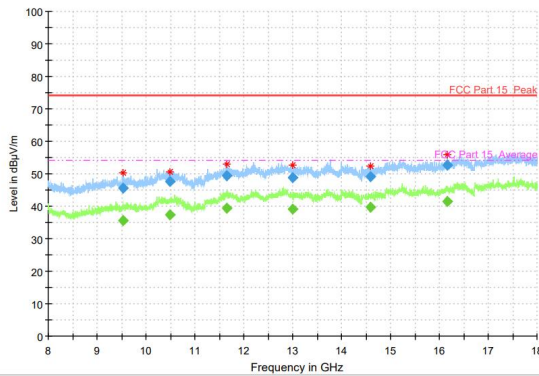


Radiated Spurious Emission
(802.11a, ch100, 18GHz-26.5GHz)

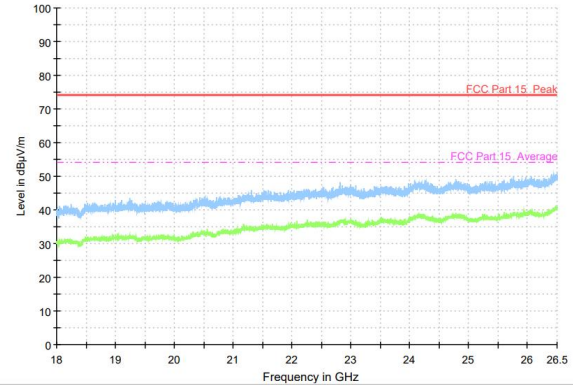
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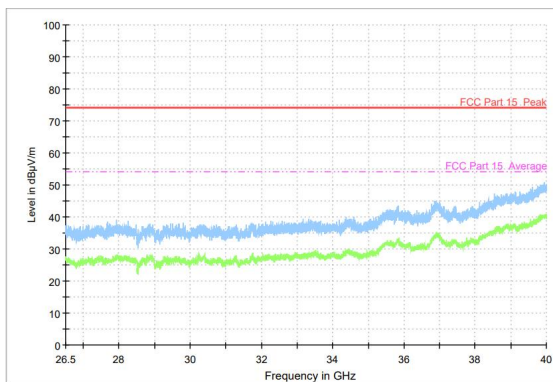
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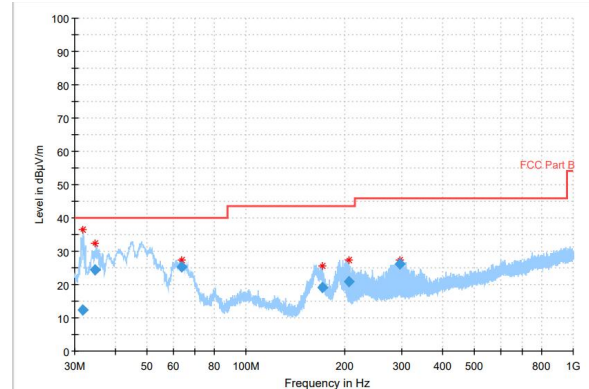
Radiated Spurious Emission
(802.11a, ch100, 26.5 GHz-40 GHz)



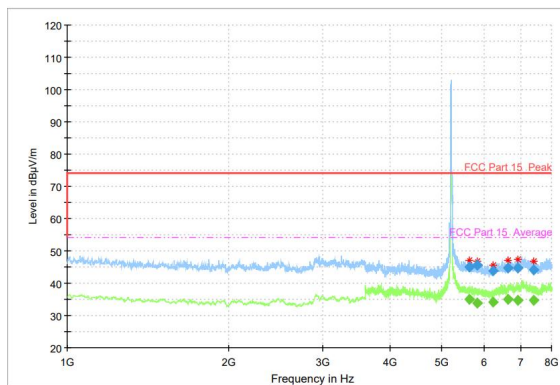
Radiated Spurious Emission
(802.11n, ch40, 30MHz-1GHz)



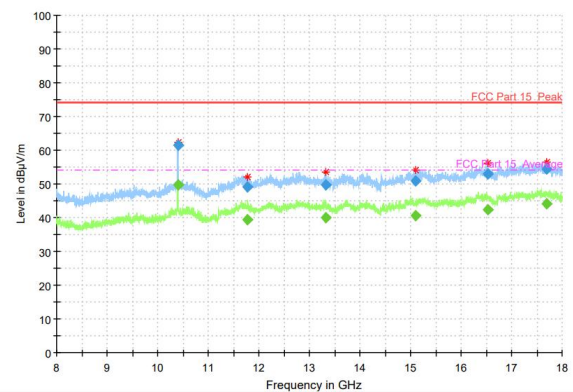
Radiated Spurious Emission
(802.11n, ch40, 1 GHz-8 GHz)



Radiated Spurious Emission
(802.11n, ch40, 8GHz-18GHz)



Radiated Spurious Emission
(802.11n, ch40, 18GHz-26.5GHz)

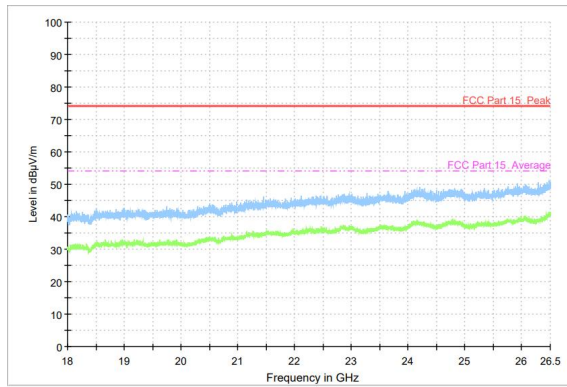


Radiated Spurious Emission
(802.11n, ch40, 26.5 GHz-40 GHz)

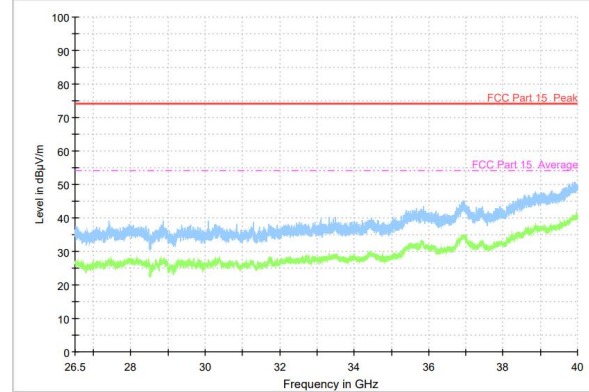
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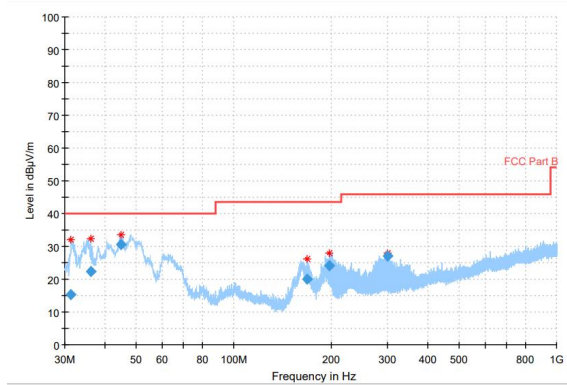
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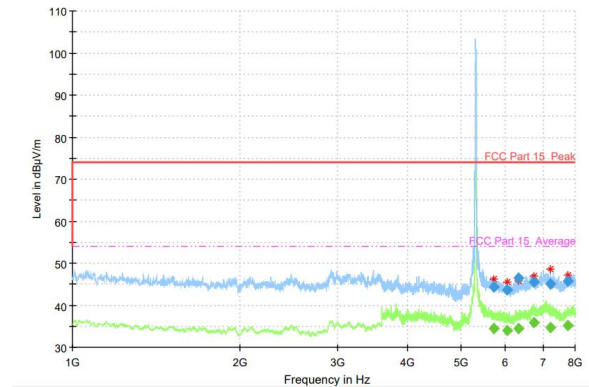
Radiated Spurious Emission
(802.11n, ch60, 30MHz-1GHz)



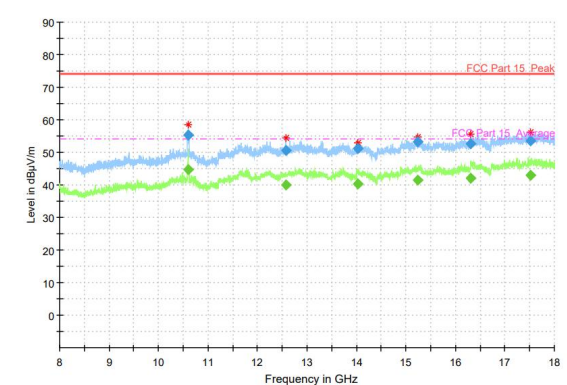
Radiated Spurious Emission
(802.11n, ch60, 1 GHz-8 GHz)



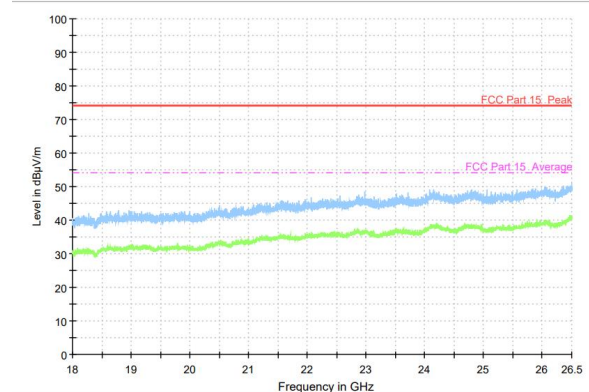
Radiated Spurious Emission
(802.11n, ch60, 8GHz-18GHz)



Radiated Spurious Emission
(802.11n, ch60, 18GHz-26.5GHz)



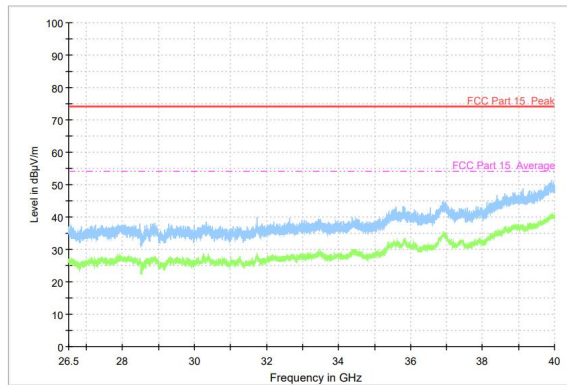
Radiated Spurious Emission
(802.11n, ch60, 26.5 GHz-40 GHz)



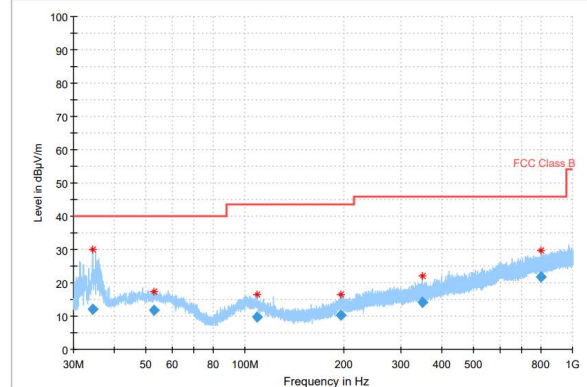
Radiated Spurious Emission
(802.11n, ch100, 30MHz-1GHz)

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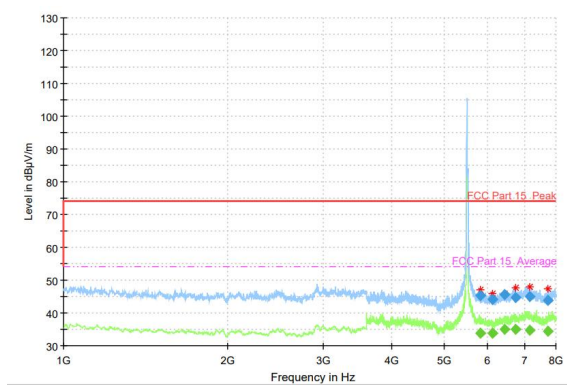
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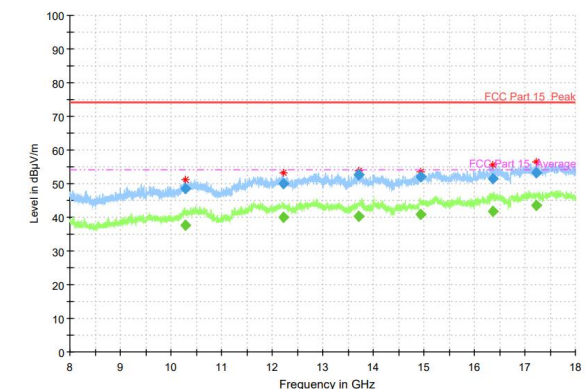
Radiated Spurious Emission
(802.11n, ch100, 1 GHz-8 GHz)



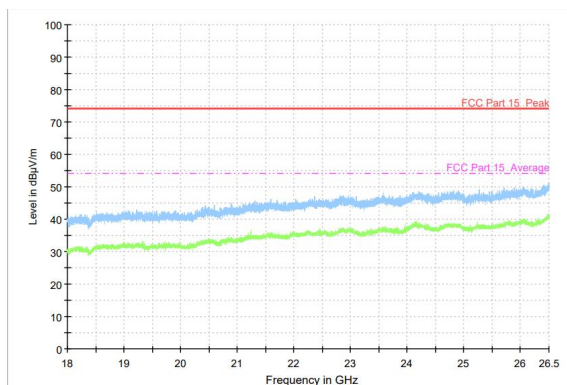
Radiated Spurious Emission
(802.11n, ch100, 8GHz-18GHz)



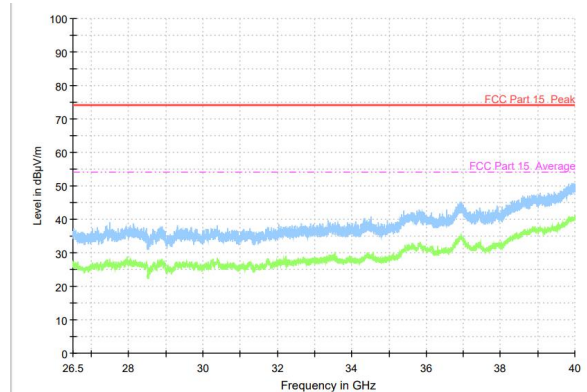
Radiated Spurious Emission
(802.11n, ch100, 18GHz-26.5GHz)



Radiated Spurious Emission
(802.11n, ch100, 26.5 GHz-40 GHz)

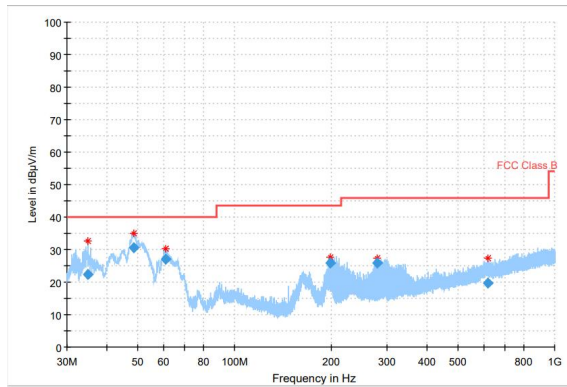


Radiated Spurious Emission
(802.11n 40m, ch46, 30MHz-1GHz)

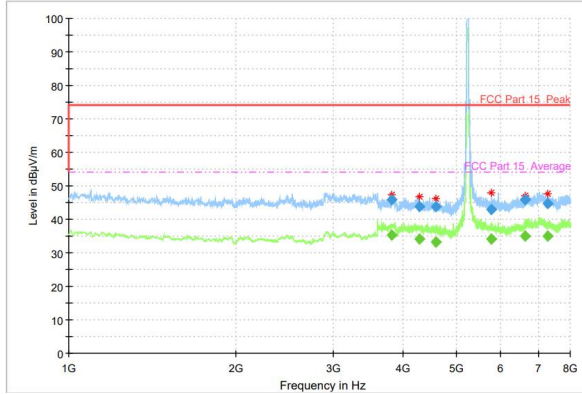


Radiated Spurious Emission
(802.11n 40m, ch46, 1 GHz-8 GHz)

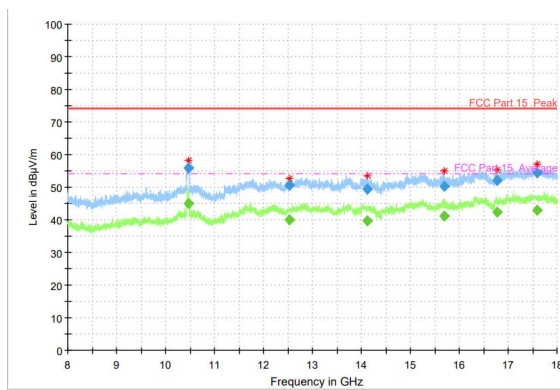
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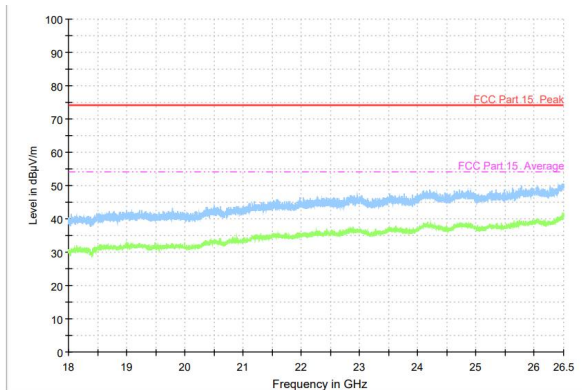
Radiated Spurious Emission
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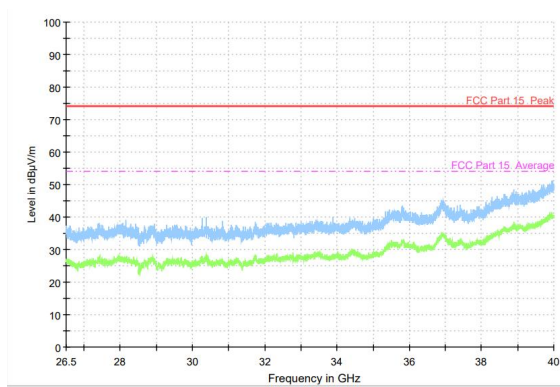
Radiated Spurious Emission
(802.11n 40m, ch46, 18GHz-26.5GHz)



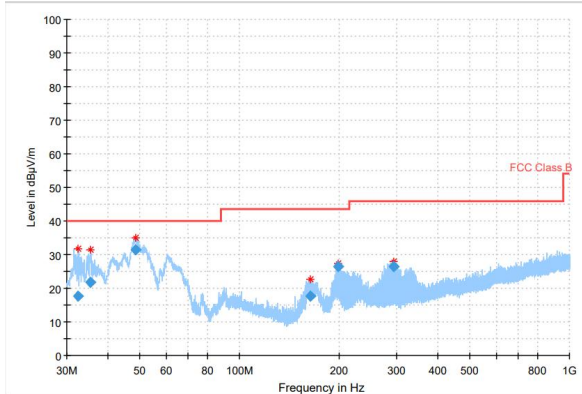
Radiated Spurious Emission
(802.11n 40m, ch46, 26.5 GHz-40 GHz)



Radiated Spurious Emission
(802.11n 40m, ch54, 30MHz-1GHz)



Radiated Spurious Emission
(802.11n 40m, ch54, 1 GHz-8 GHz)

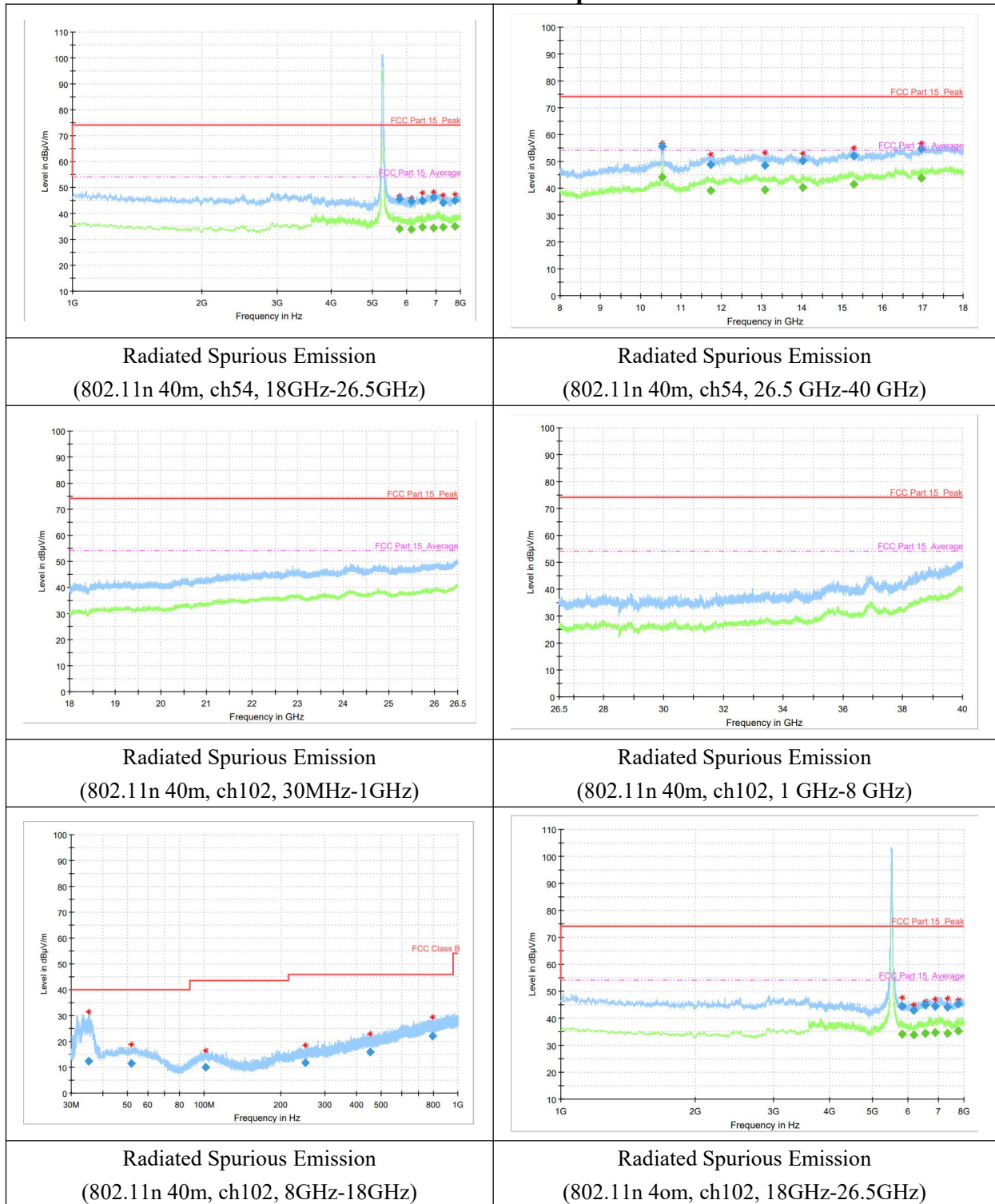


Radiated Spurious Emission
(802.11n 40m, ch54, 8GHz-18GHz)

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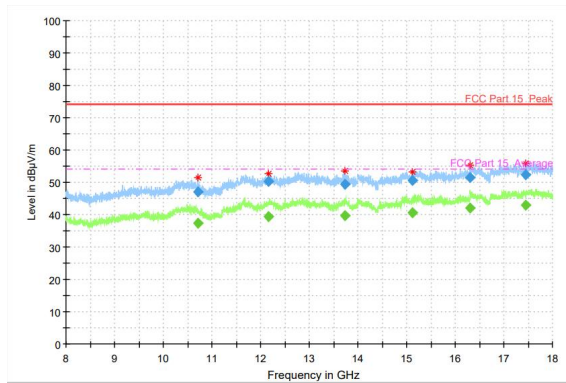
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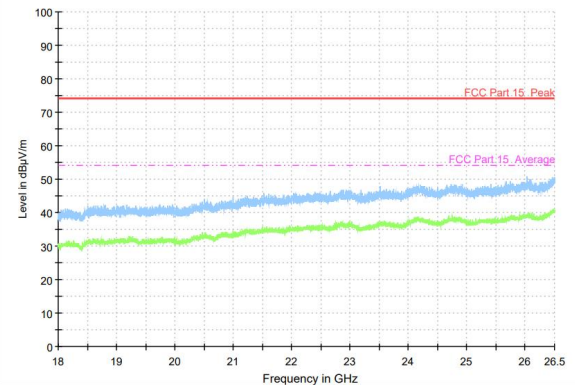
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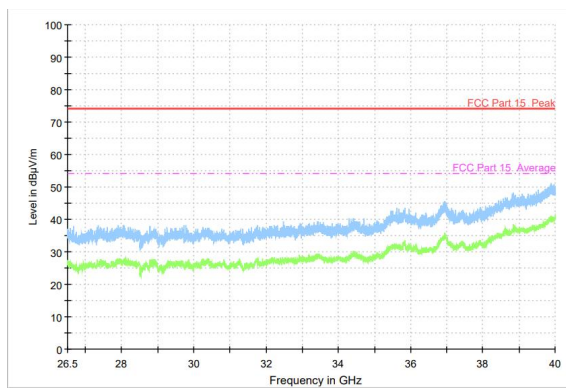
Report No.: 123W00020-WIFI 5G RF



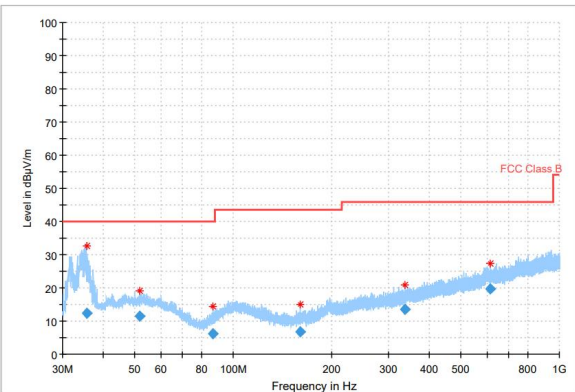
Radiated Spurious Emission
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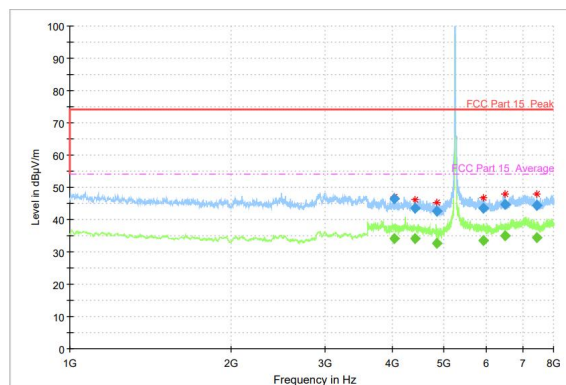
Radiated Spurious Emission
(802.11ac, ch48, 30MHz-1GHz)



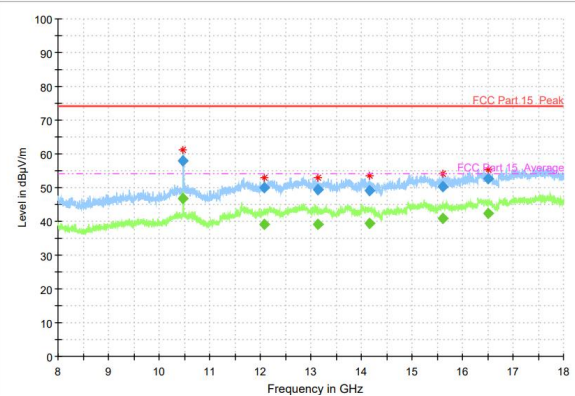
Radiated Spurious Emission
(802.11ac, ch48, 1 GHz-8 GHz)



Radiated Spurious Emission
(802.11ac, ch48, 8GHz-18GHz)



Radiated Spurious Emission
(802.11ac, ch48, 18GHz-26.5GHz)

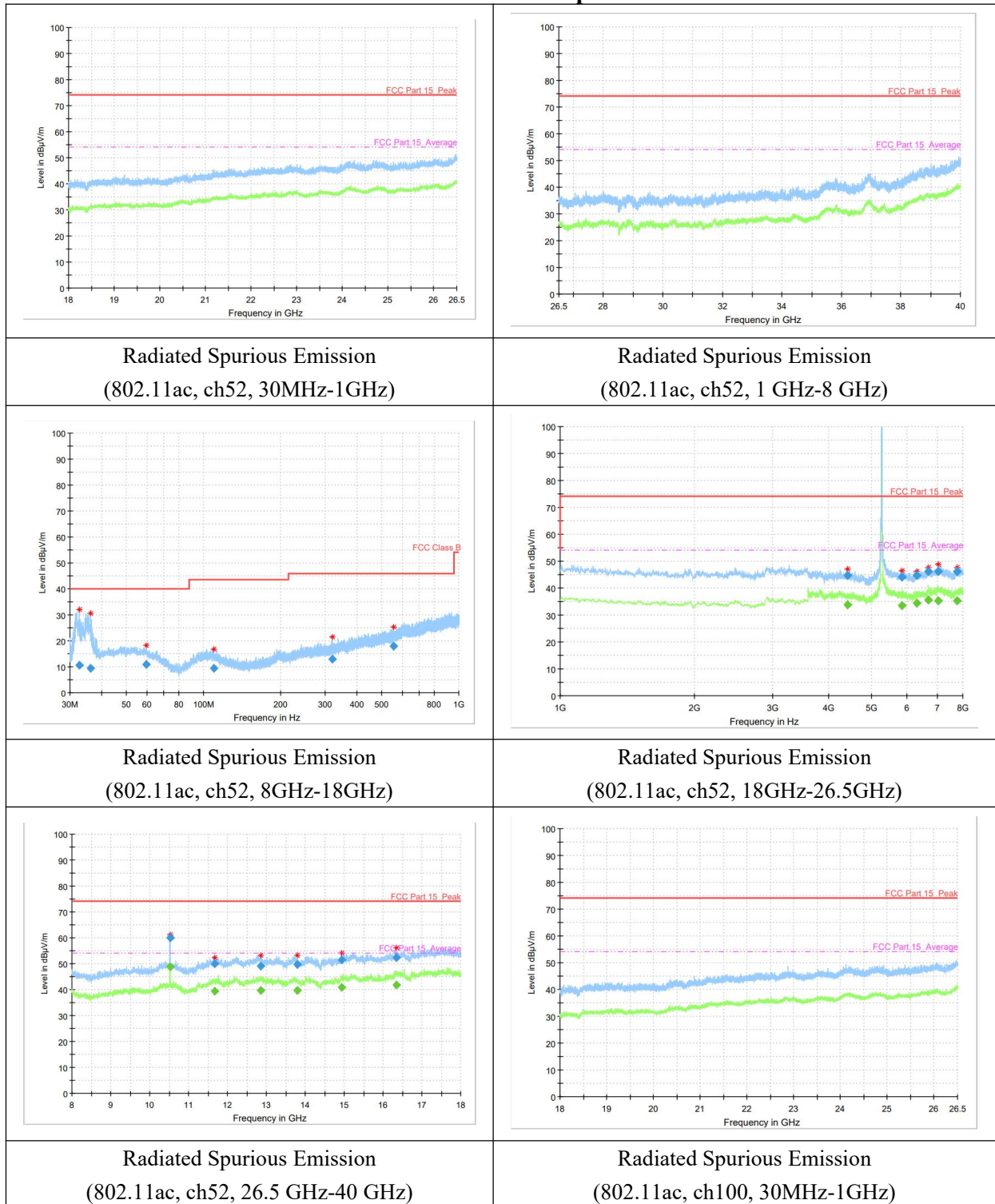


Radiated Spurious Emission
(802.11ac, ch48, 26.5 GHz-40 GHz)

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