4.5 Transmitter Radiated Emissions & Antenna Port Emissions
FCC Rule 15.247(d), 15.209, 15.205; RSS-247

4.5.1 Requirement

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)).

For out of band radiated emissions (except for frequencies in restricted bands), in any 100 kHz bandwidths outside the EUT pass-band, the RF power shall be at least 20dB (peak) or 30 dB (average) below that of the maximum in-band 100 kHz emissions.

4.5.2 Procedure – Radiated Emissions

Radiated emission measurements were performed from 30 MHz to 25 GHz according to the procedure described in ANSI C64.10. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz for frequencies above 1000 MHz. Above 1000 MHz Peak and Average measurements were performed.

The EUT is placed on a plastic turntable that is 80 cm in height for below 1000MHz and 1.5m in height for above 1GHz. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 meters for frequencies above 1 GHz and at 10 meters for frequencies below 1 GHz.

Measurements made from 1 GHz to 18GHz had a 2.4-2.5GHz notch filter in place. A preamp was used from 30MHz to 26GHz.

All measurements were made with a Peak Detector and compared to QP limits for 30MHz – 1GHz and Average limits for 1GHz – 26GHz.

Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels).

4.5.3 Field Strength Calculation

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF – AG; if measurement is performed at a distance other than specified in the rule, a Distance Correction Factor (DCF) shall be added.

Where FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV); AF = Antenna Factor in dB(1/m)
CF = Cable Attenuation Factor in dB; AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μV/m). This value in dB(μV/m) was converted to its corresponding level in μV/m.
RA = 52.0 dB(μV)
AF = 7.4 dB(1/m)
CF = 1.6 dB
AG = 29.0 dB
FS = 52.0+7.4+1.6-29.0 = 32 dB(μV/m).
Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m.

4.5.4 Antenna-port conducted measurements

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

4.5.6 General Procedure for conducted measurements in restricted bands

a) Measure the conducted output power (in dBm) using the detector specified for determining quasi-peak, peak, and average conducted output power, respectively.

b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)

c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).

d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (*e.g.*, Watts, mW).

e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:
$E = EIRP - 20\log D + 104.8$
where:
E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.
f) Compare the resultant electric field strength level to the applicable limit.
g) Perform radiated spurious emission test

4.5.7 Test Results

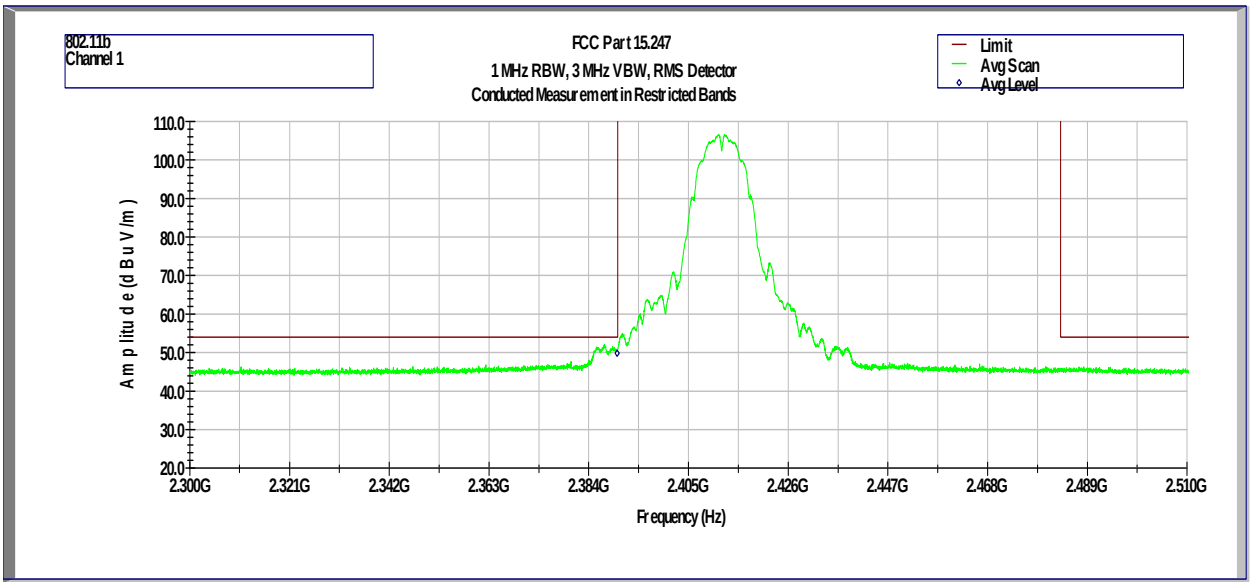
The data on the following pages list the significant emission frequencies, the limit and the margin of compliance where emissions are within 3dB of the limit.

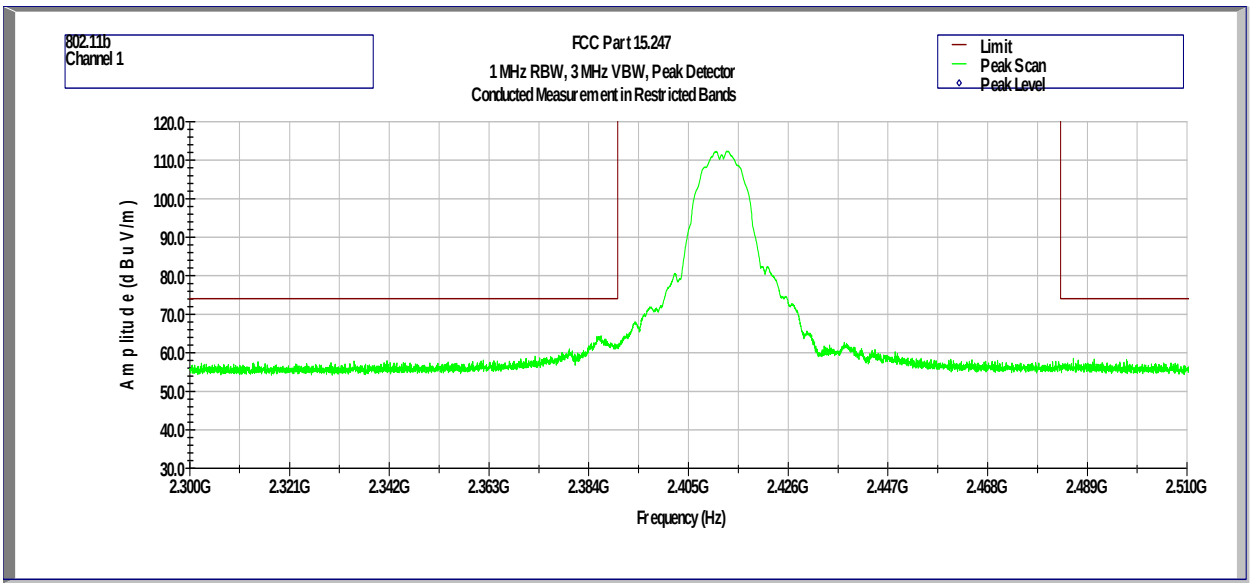
All conducted antenna port plots are corrected with the consideration of a 3.6dBi Antenna Gain.

Radiated emission measurements were performed up to 26GHz. No Emissions were identified when scanned from 18-25 GHz.

Test Results: 15.209/15.205 Restricted Band Emissions at Antenna Port

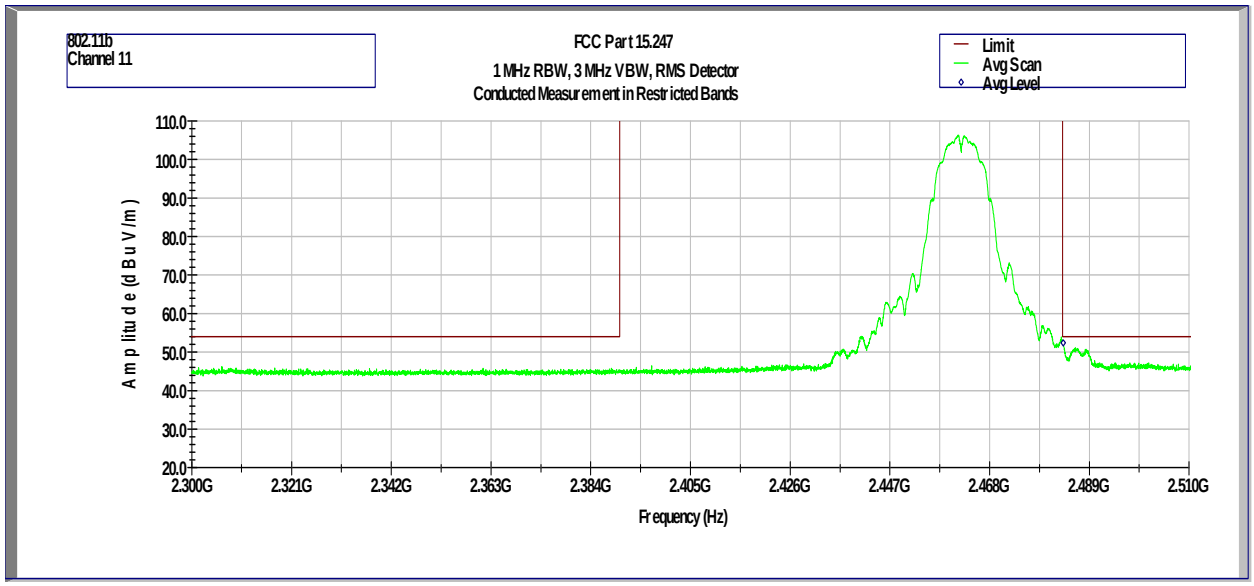
Out-of-Band Spurious Emissions at the Band Edge - 802.11b, 2412 MHz

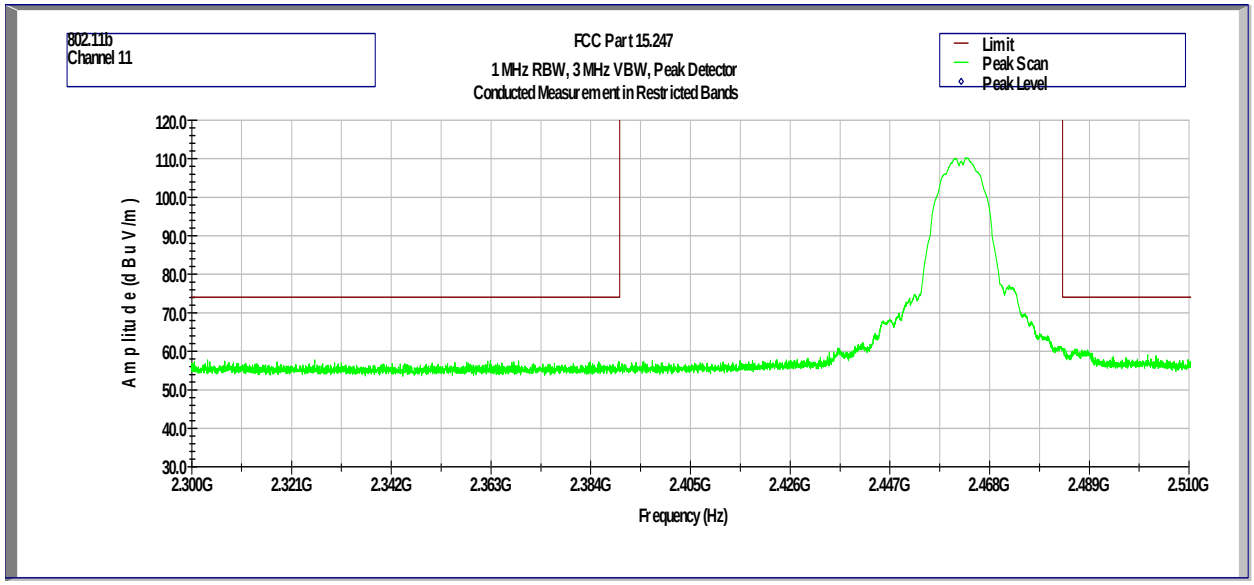




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.390	49.8	54	-4.2	Avg	Pass

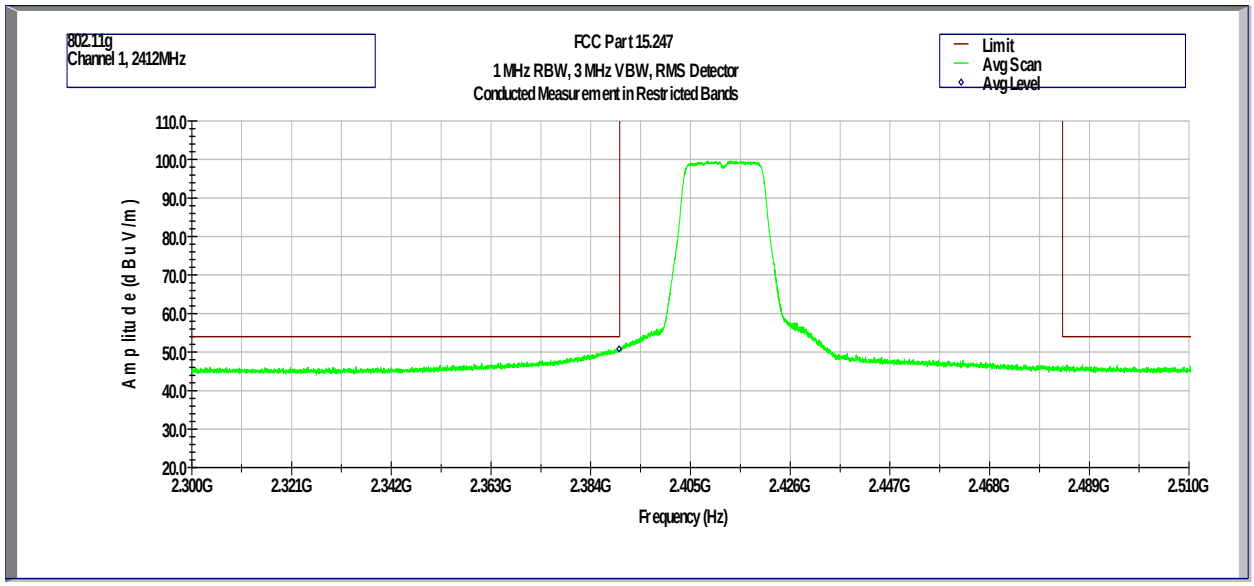
Out-of-Band Spurious Emissions at the Band Edge - 802.11b, 2462 MHz

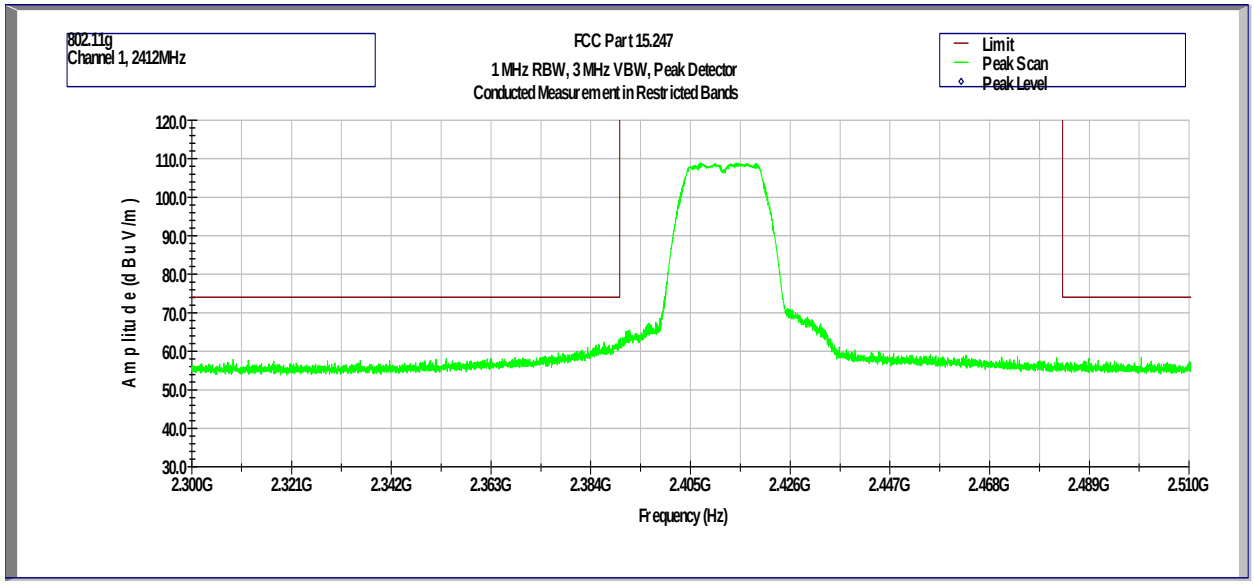




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.4835	52.4	54	-1.6	Avg	Pass

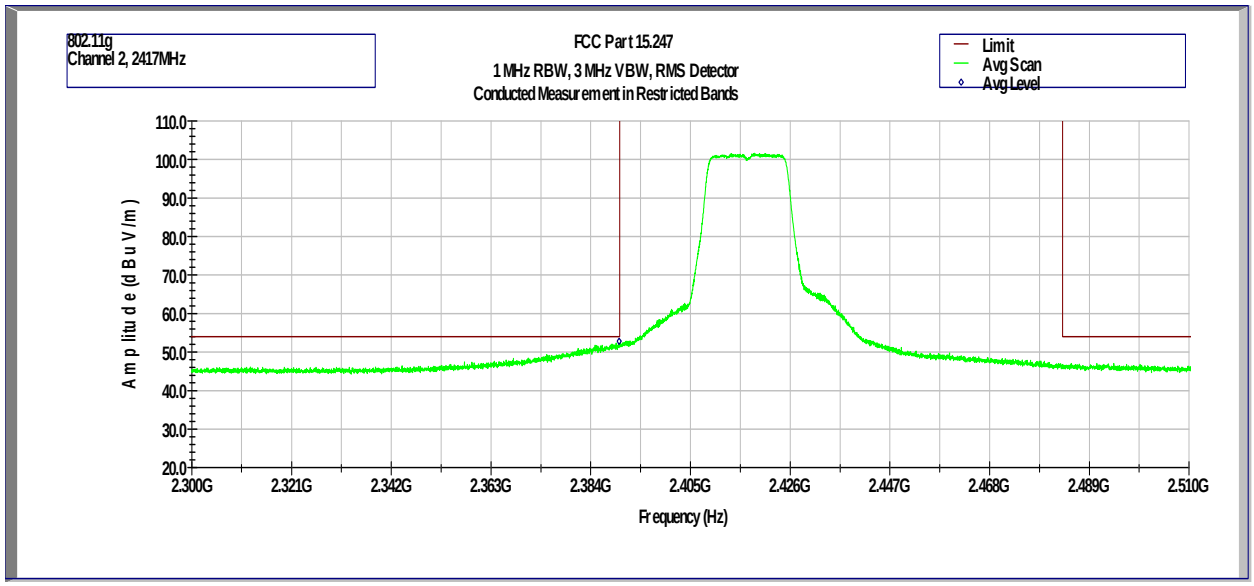
Out-of-Band Spurious Emissions at the Band Edge - 802.11g, 2412 MHz

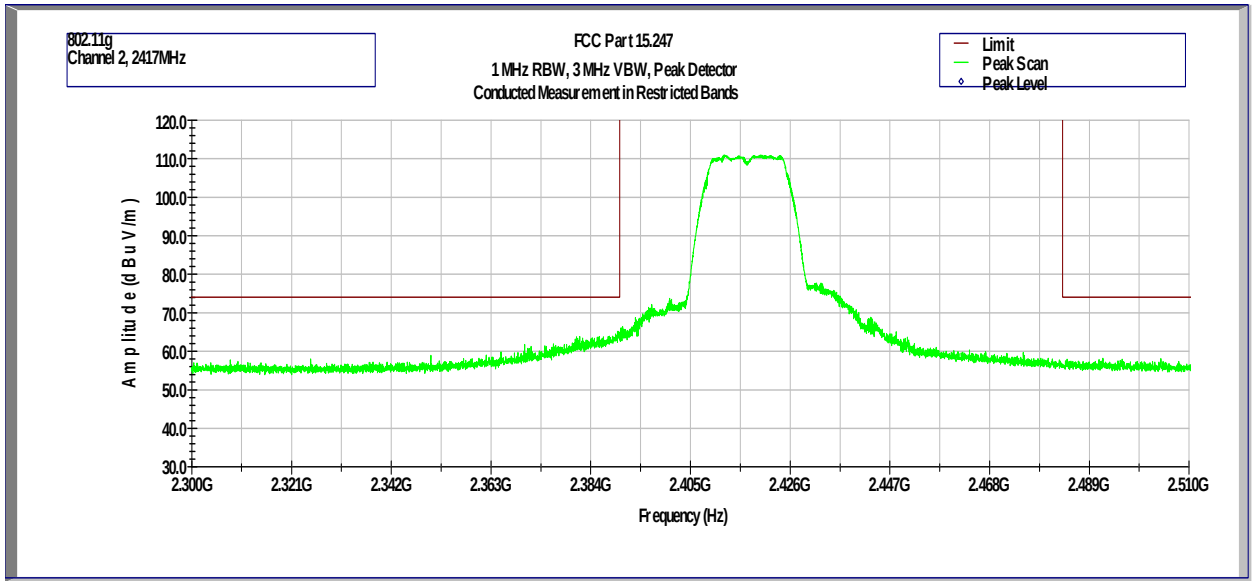




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.390	50.8	54	-3.2	Avg	Pass

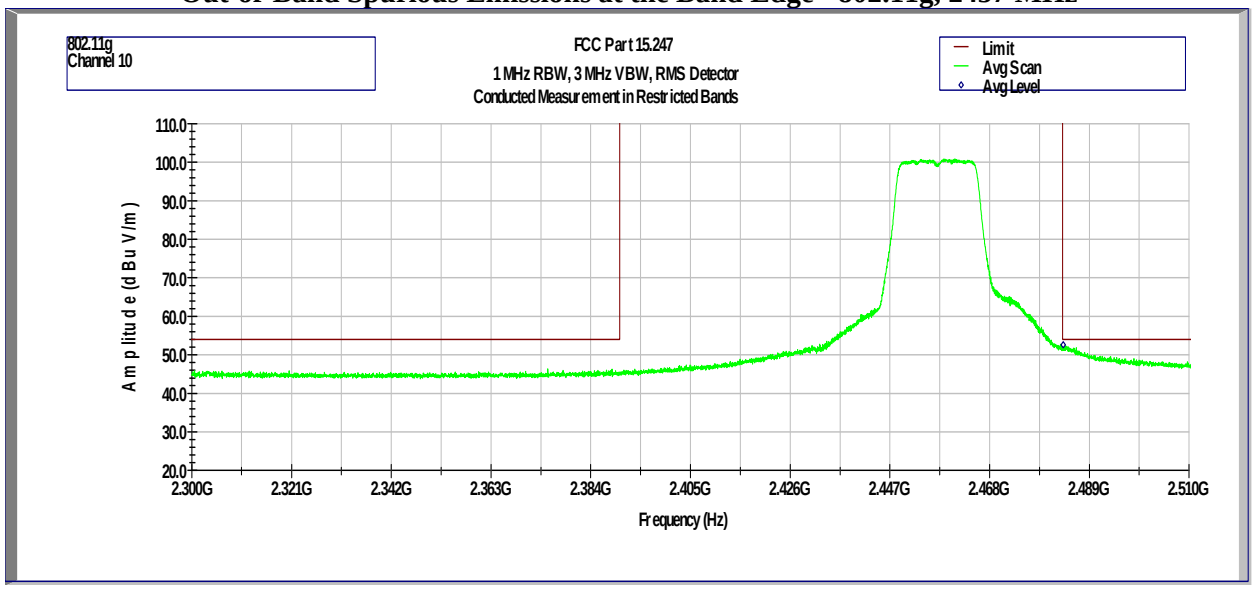
Out-of-Band Spurious Emissions at the Band Edge - 802.11g, 2417 MHz

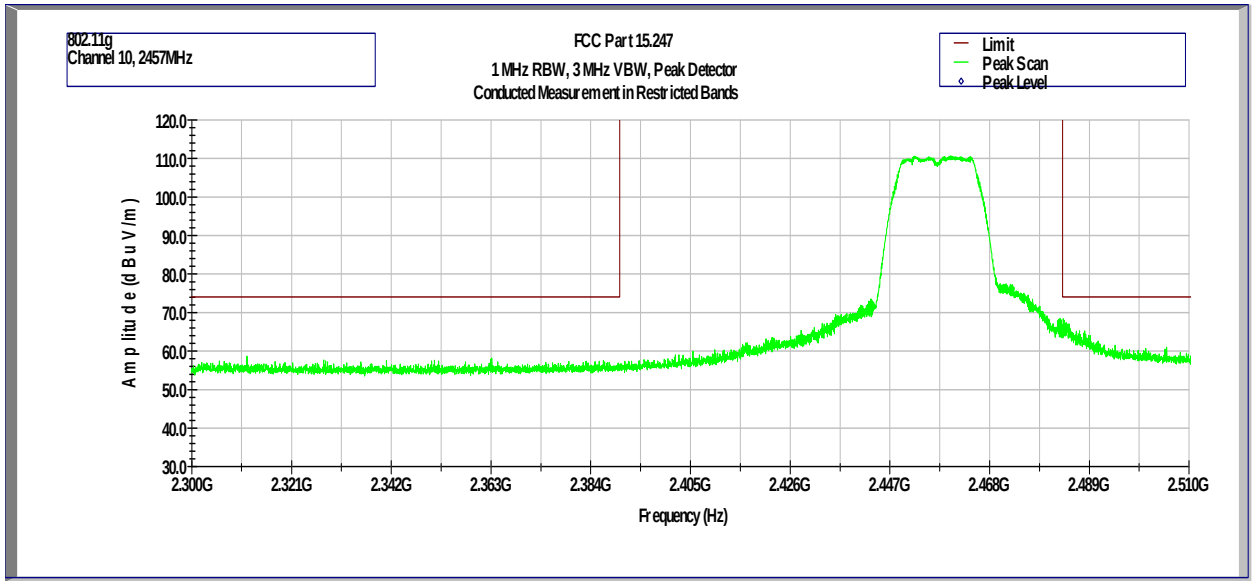




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.390	52.8	54	-1.2	Avg	Pass

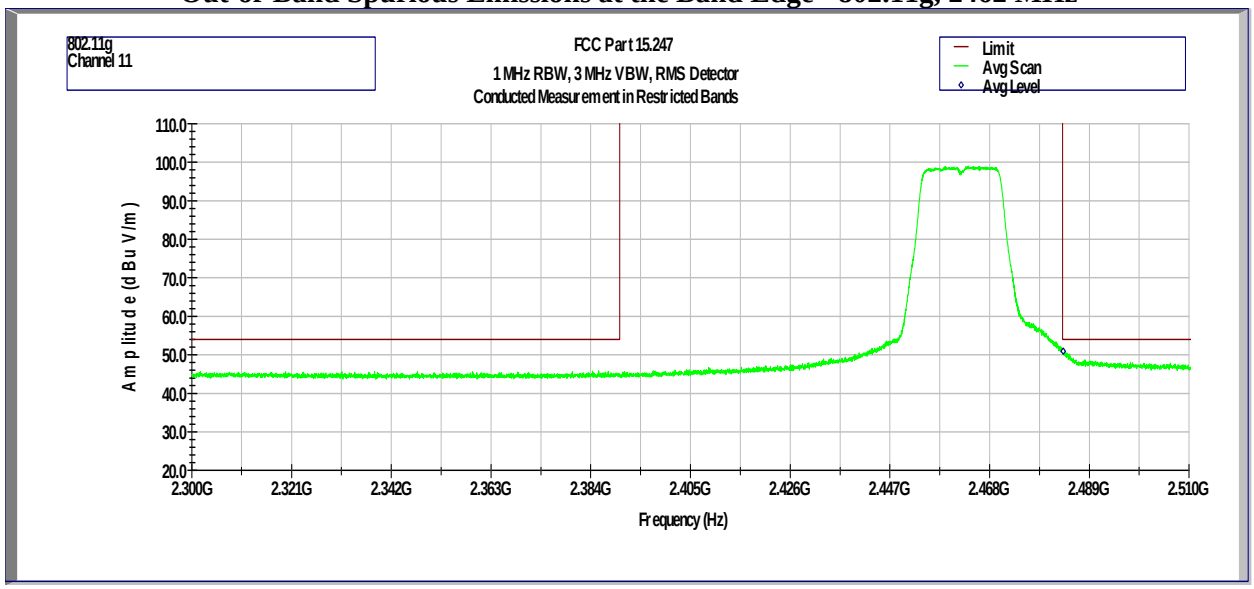
Out-of-Band Spurious Emissions at the Band Edge - 802.11g, 2457 MHz

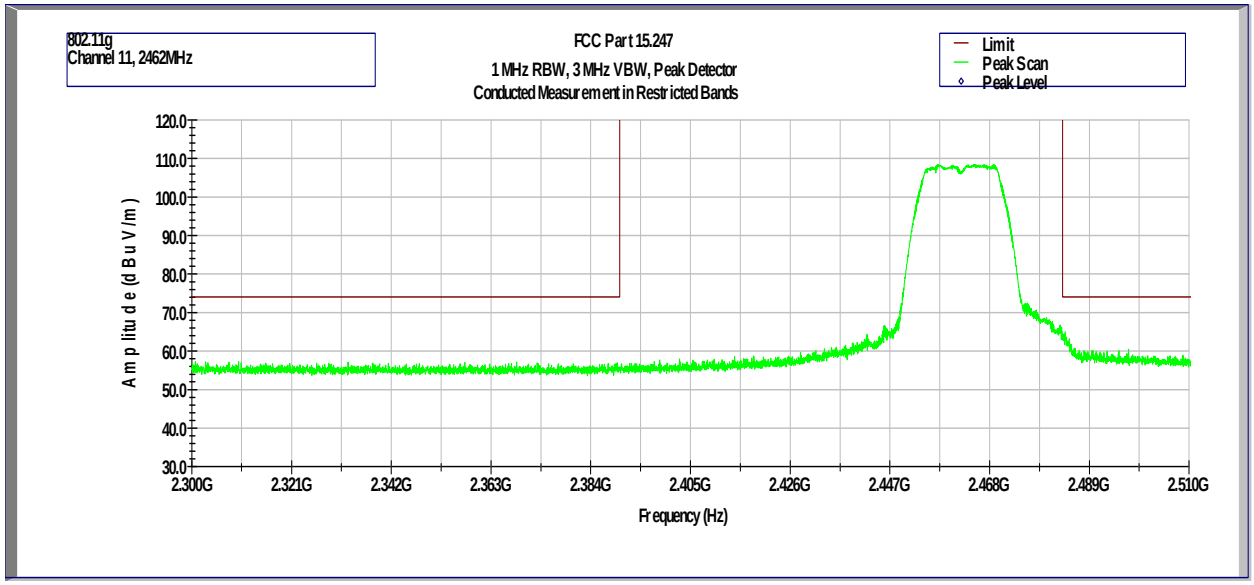




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.4835	52.6	54	-1.4	Avg	Pass

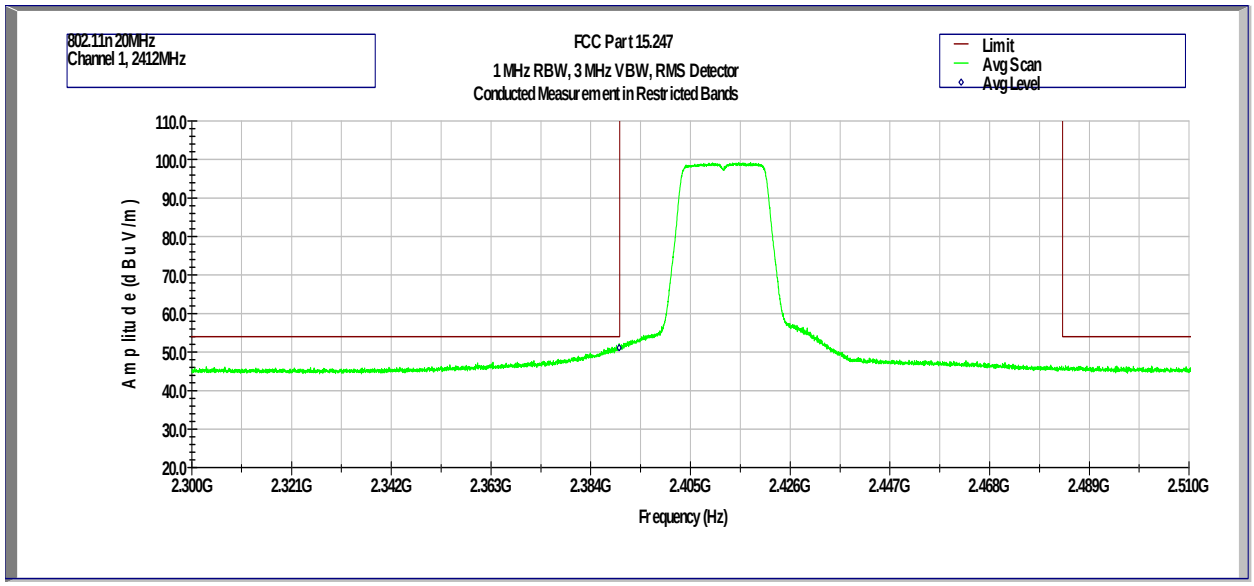
Out-of-Band Spurious Emissions at the Band Edge - 802.11g, 2462 MHz

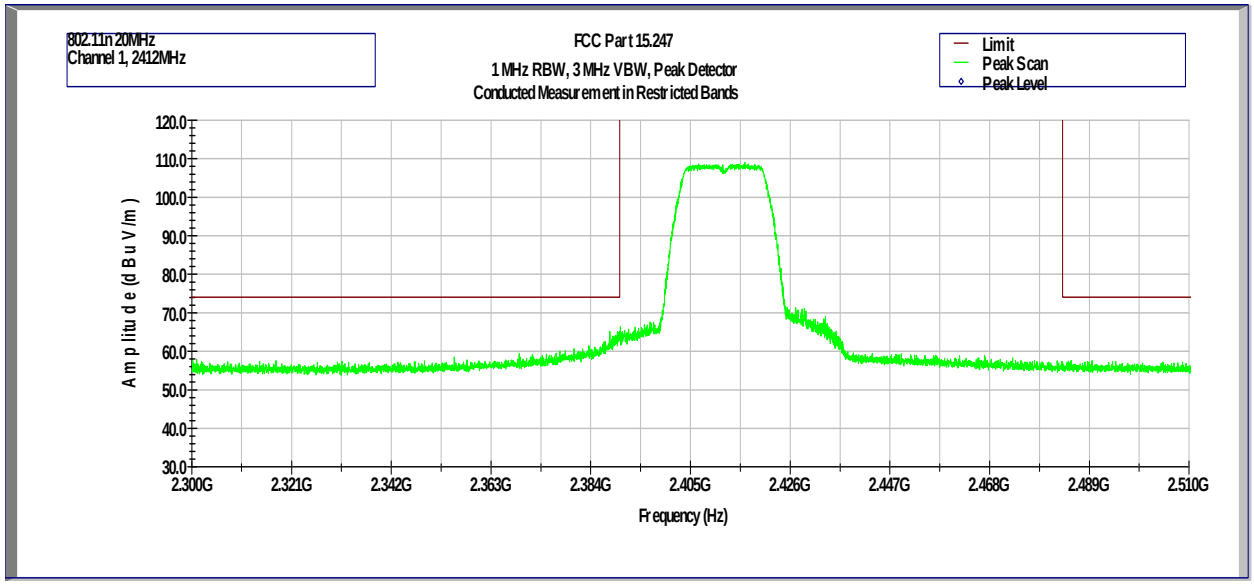




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.4835	50.9	54	-3.1	1.3	Pass

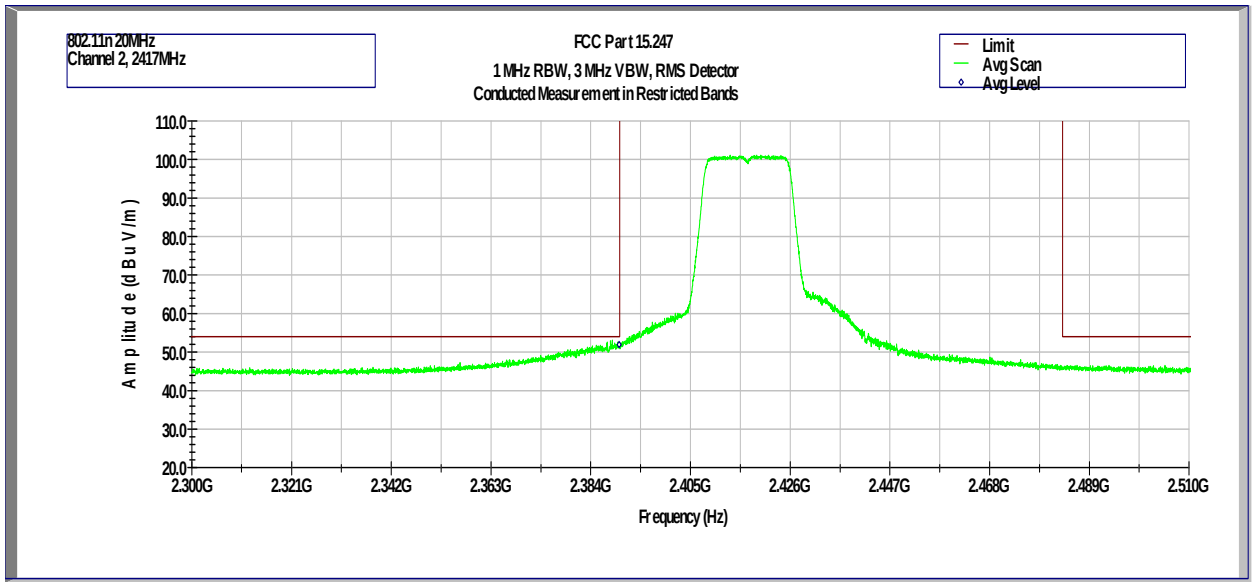
Out-of-Band Spurious Emissions at the Band Edge - 802.11n, 2412 MHz

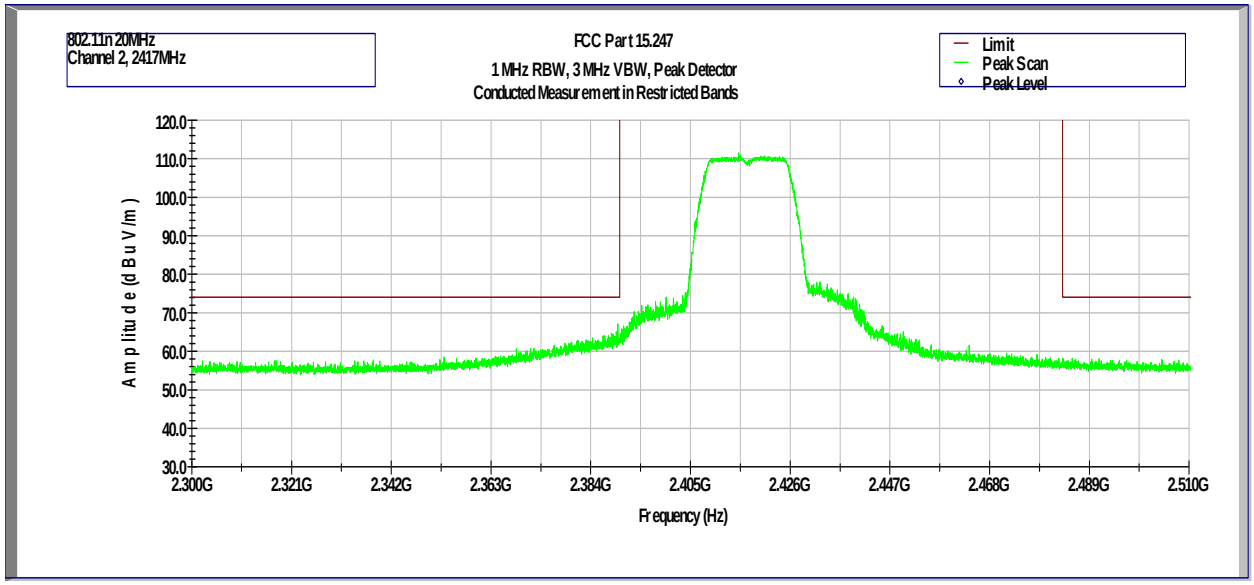




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.390	51.1	54	-2.9	Avg	Pass

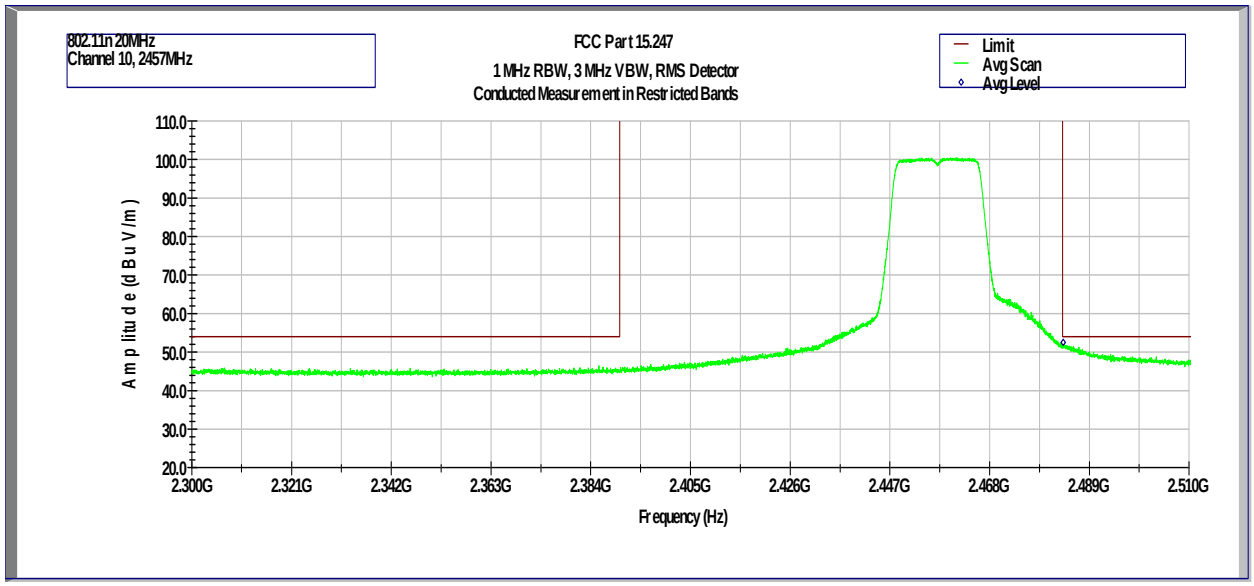
Out-of-Band Spurious Emissions at the Band Edge - 802.11n, 2417 MHz

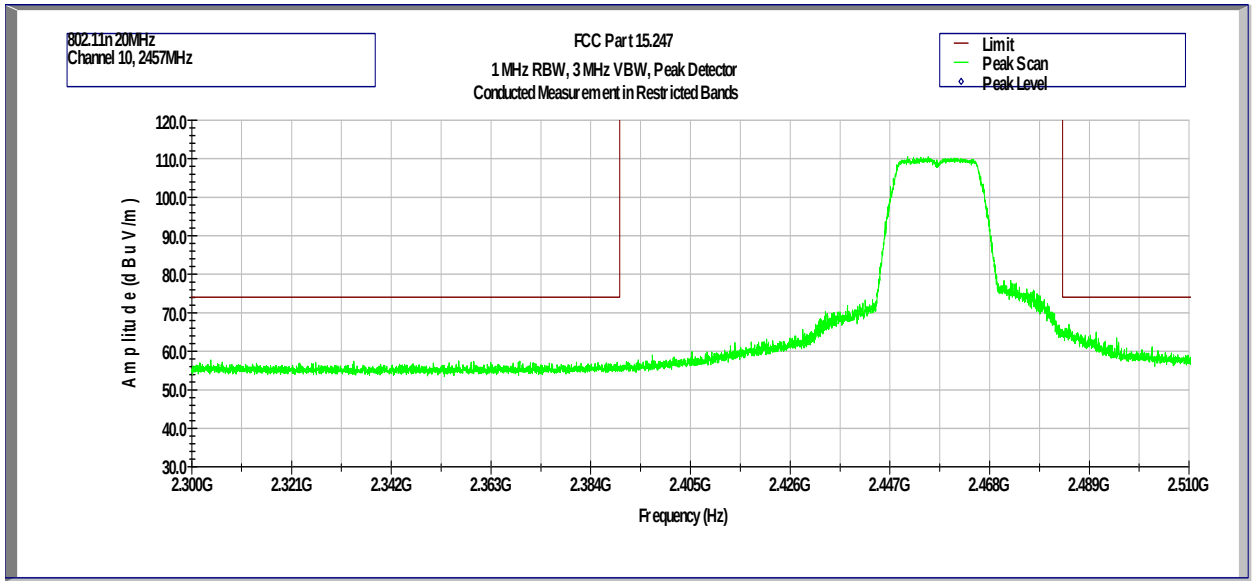




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.390	51.9	54	-2.1	Avg	Pass

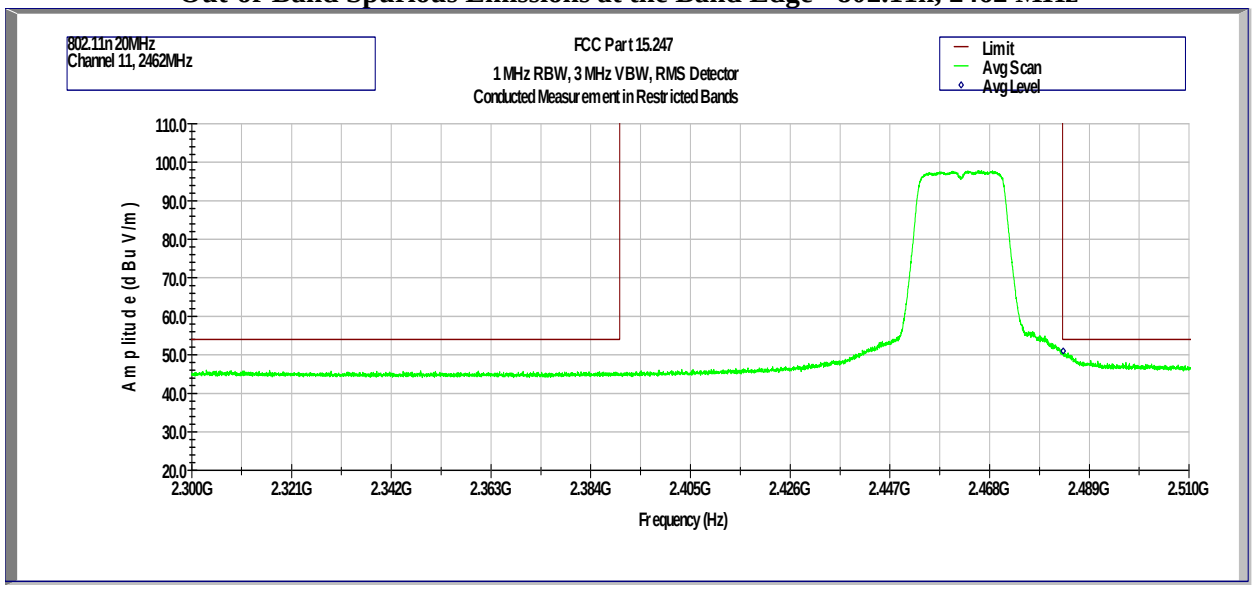
Out-of-Band Spurious Emissions at the Band Edge - 802.11n, 2457 MHz

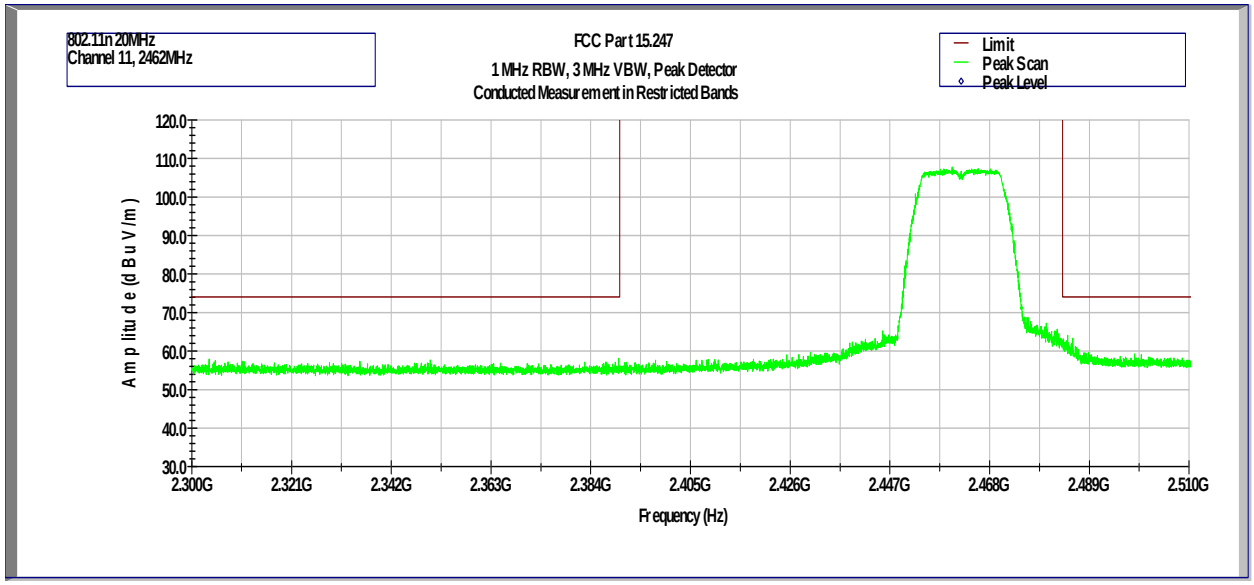




Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.4835	52.5	54	-1.5	Avg	Pass

Out-of-Band Spurious Emissions at the Band Edge - 802.11n, 2462 MHz



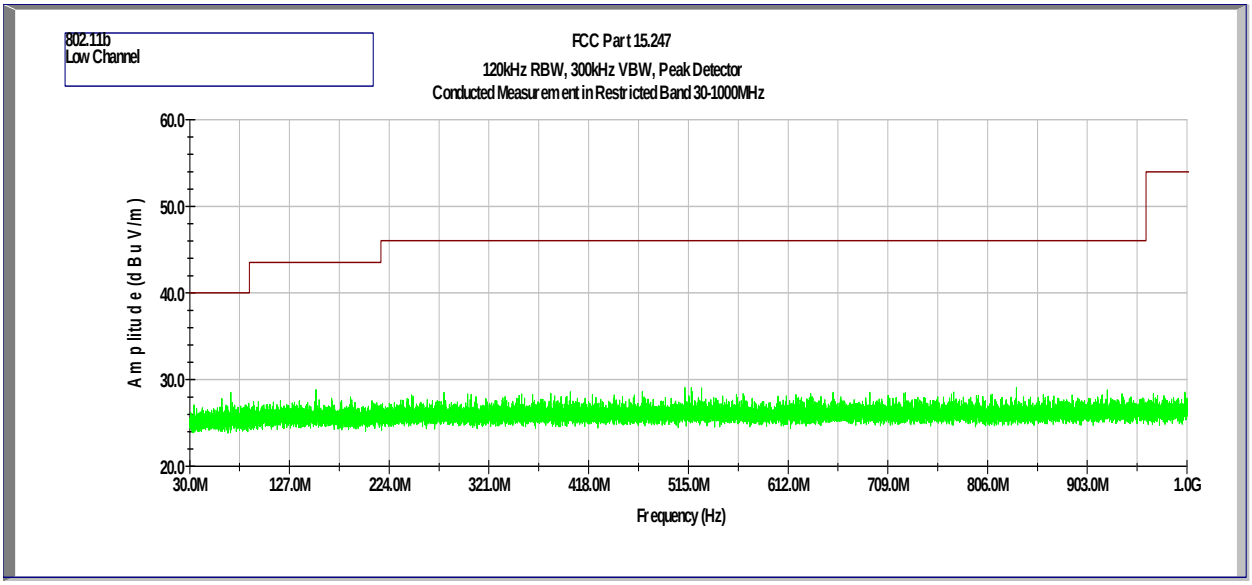


Frequency	Corrected Amplitude	Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
2.4835	51.0	54	-3.0	Avg	Pass

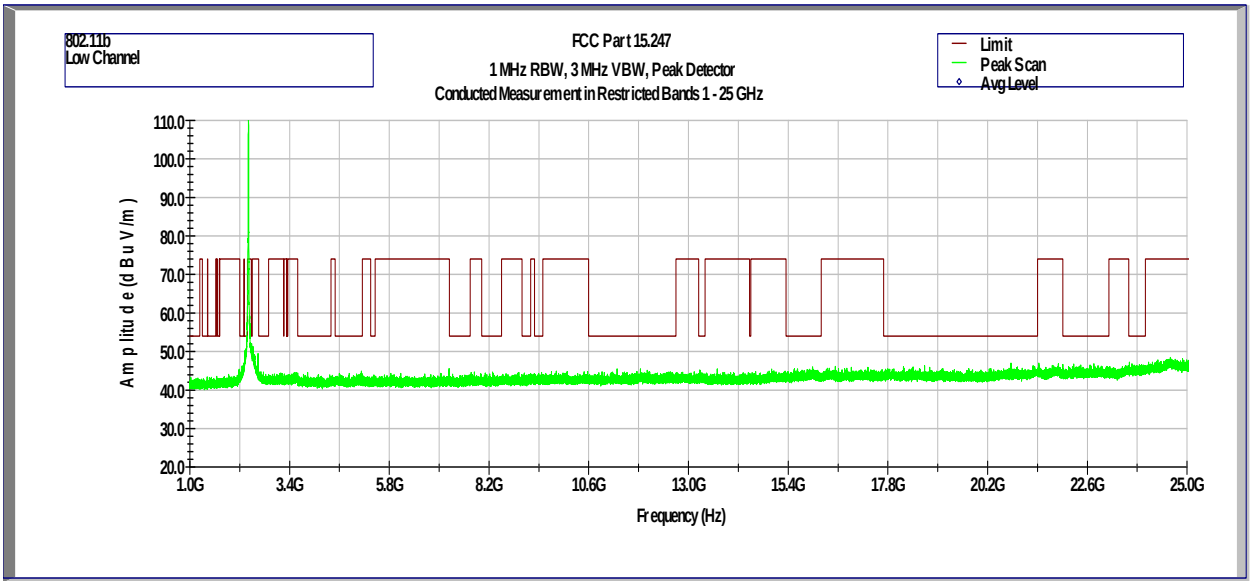
Out-of-Band Conducted Spurious Emissions (at Antenna Port)

Tx @ 2412MHz 802.11b

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

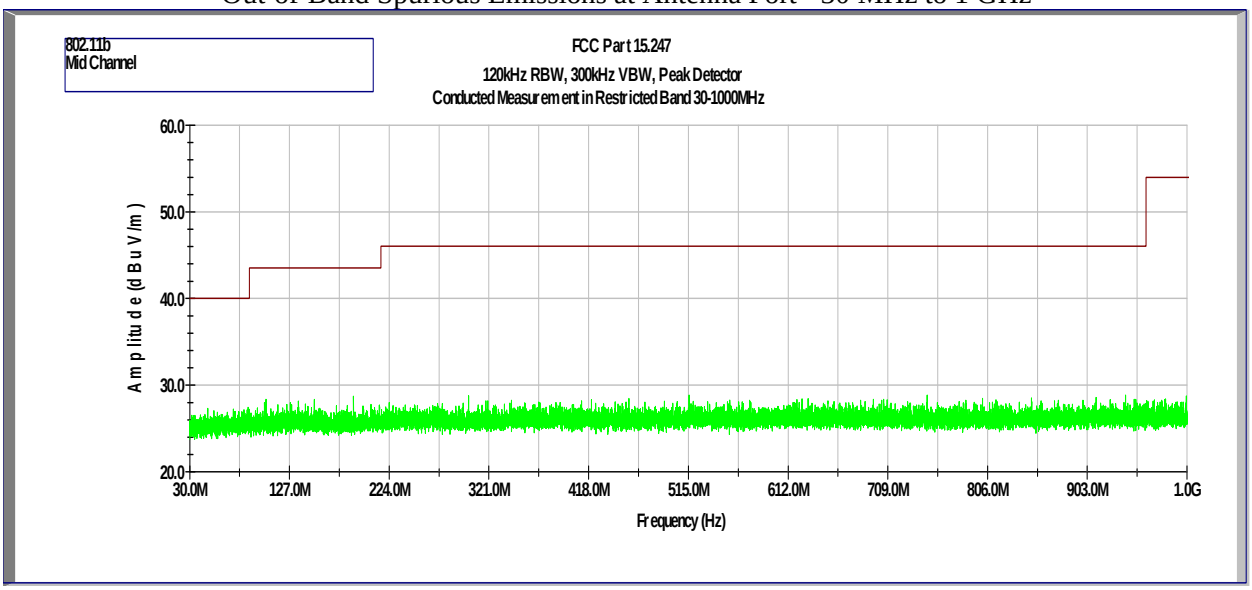


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

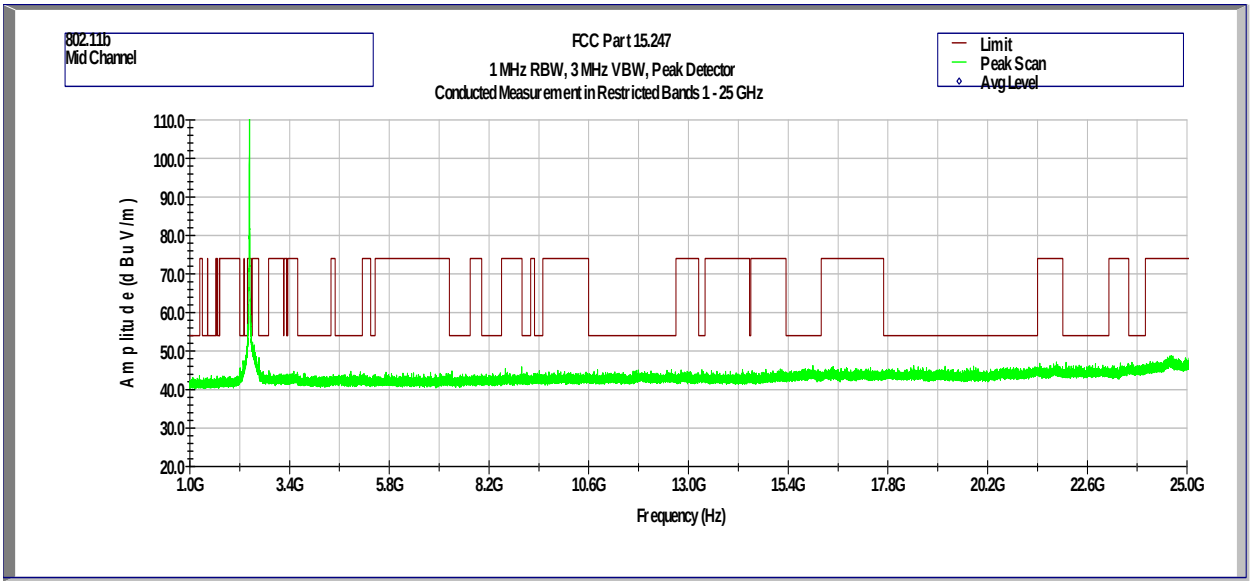


Tx @ 2437MHz 802.11b

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

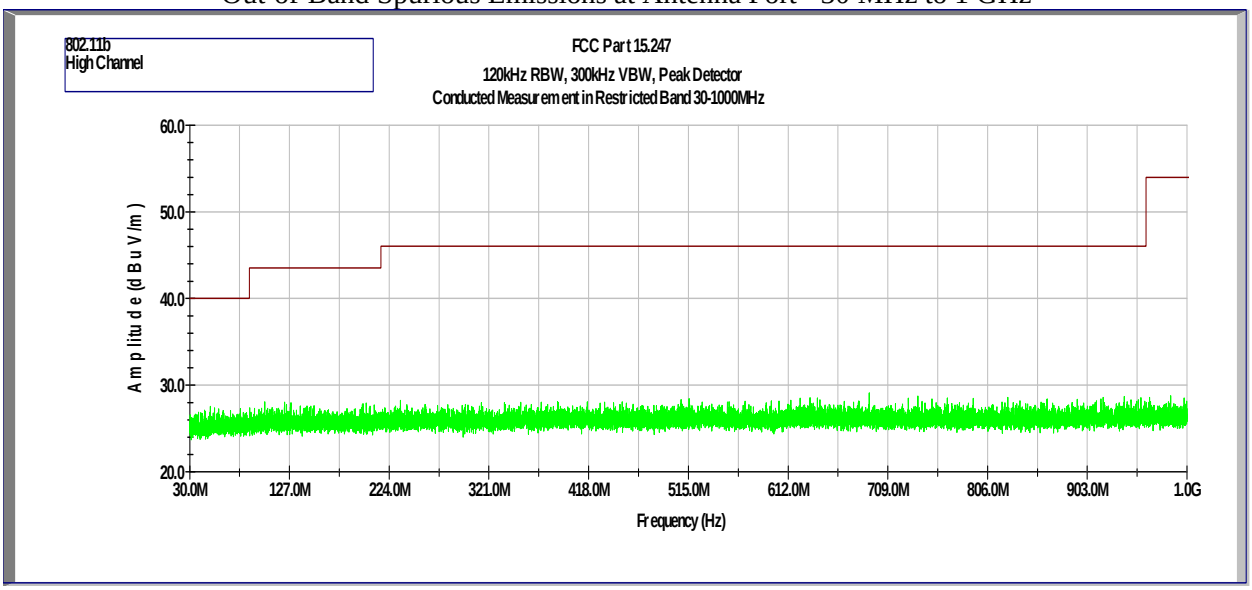


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

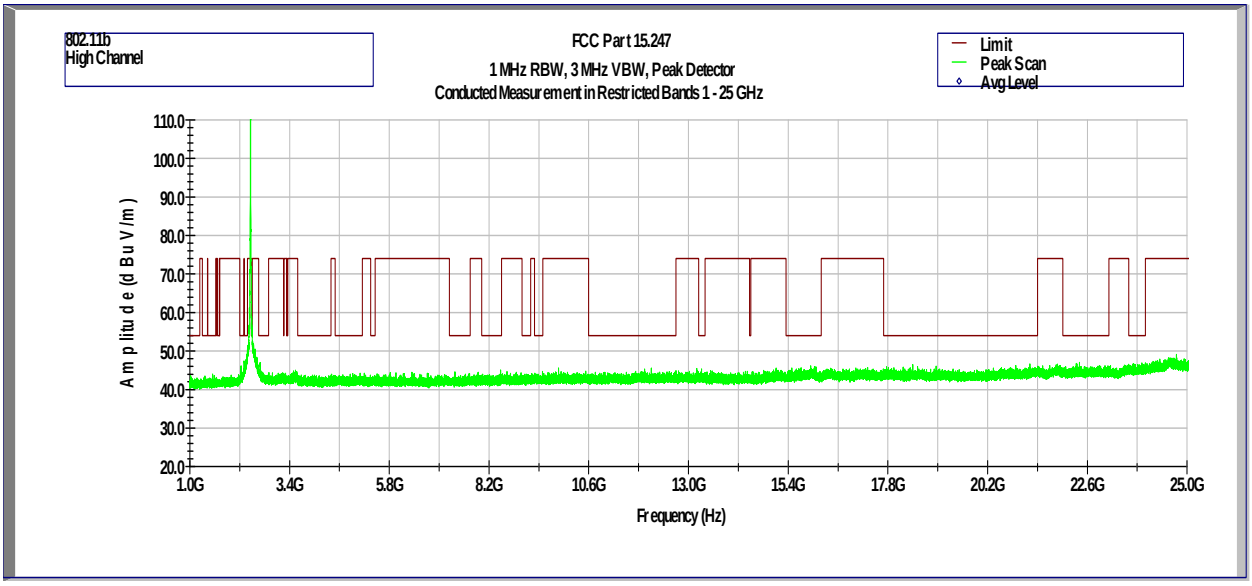


Tx @ 2462MHz 802.11b

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

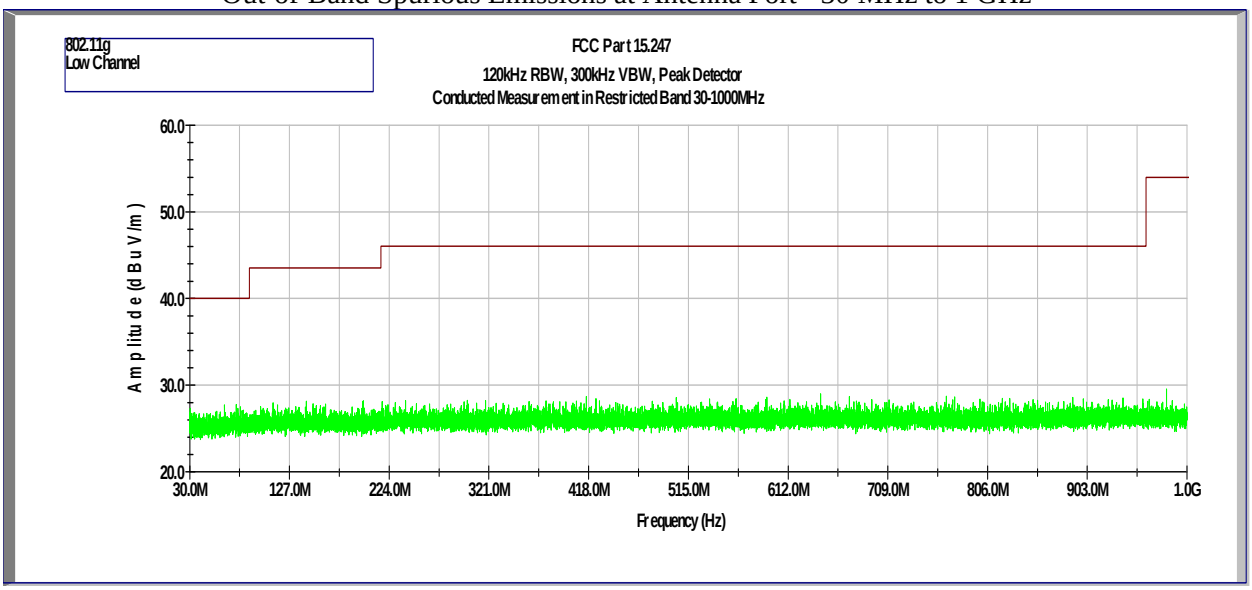


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

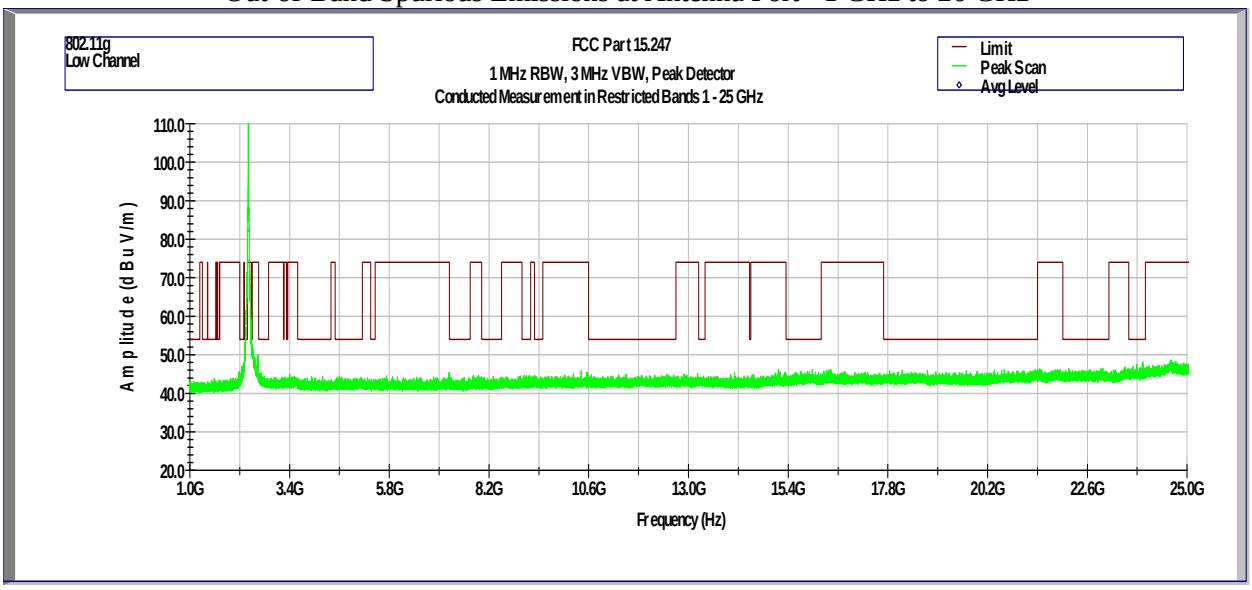


Tx @ 2412MHz 802.11g

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

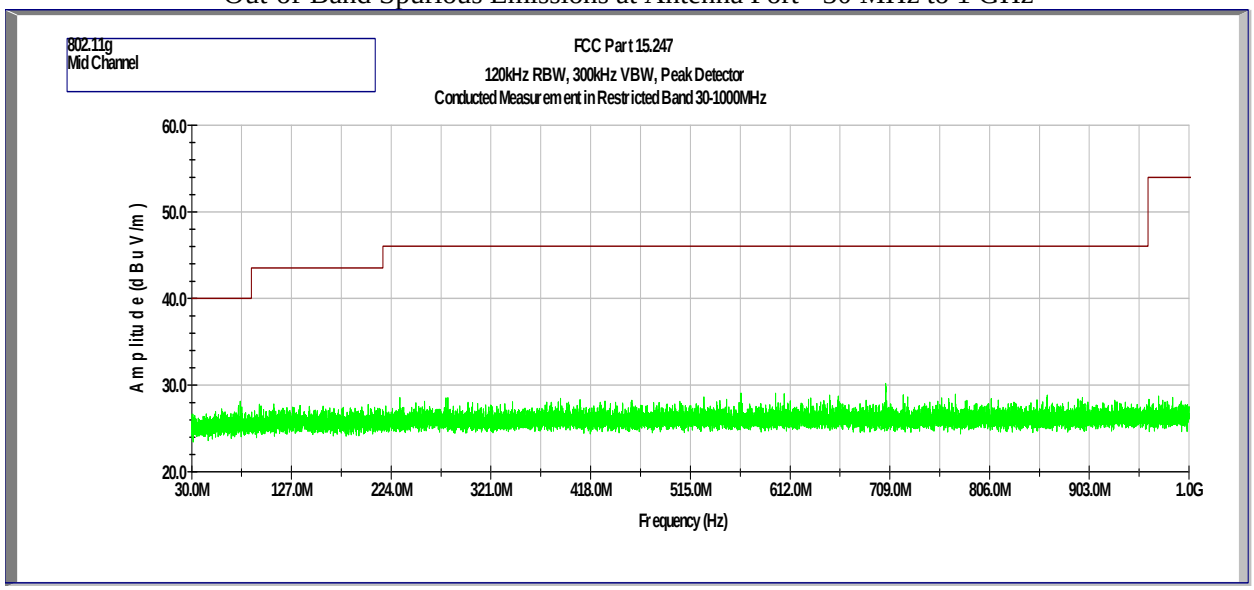


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

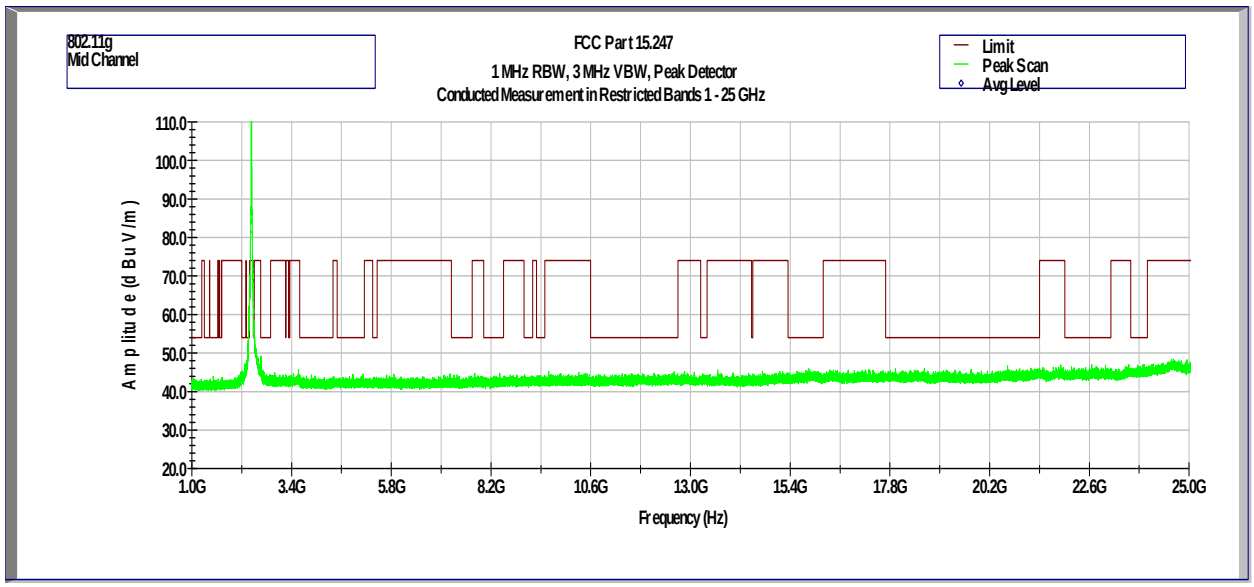


Tx @ 2437MHz 802.11g

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

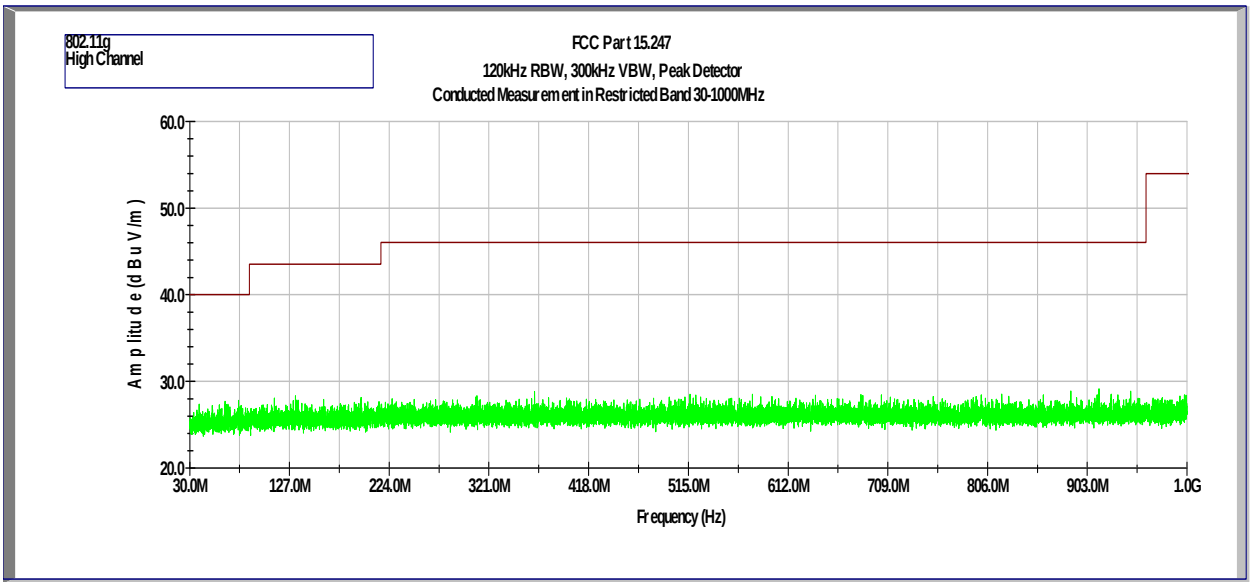


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

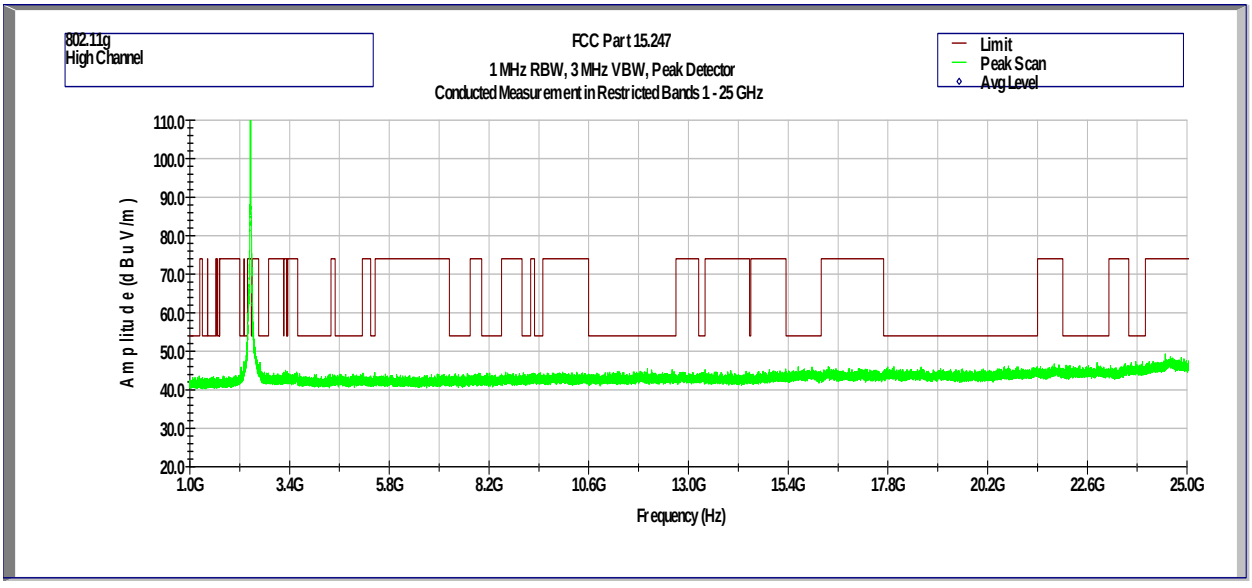


Tx @ 2462MHz 802.11g

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

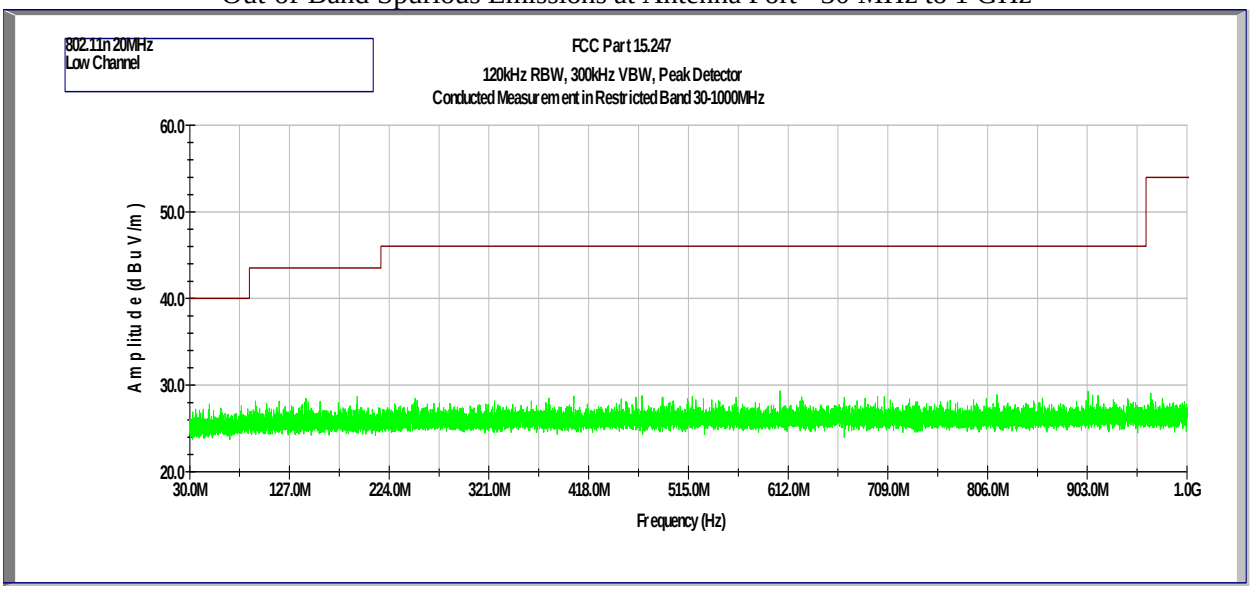


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

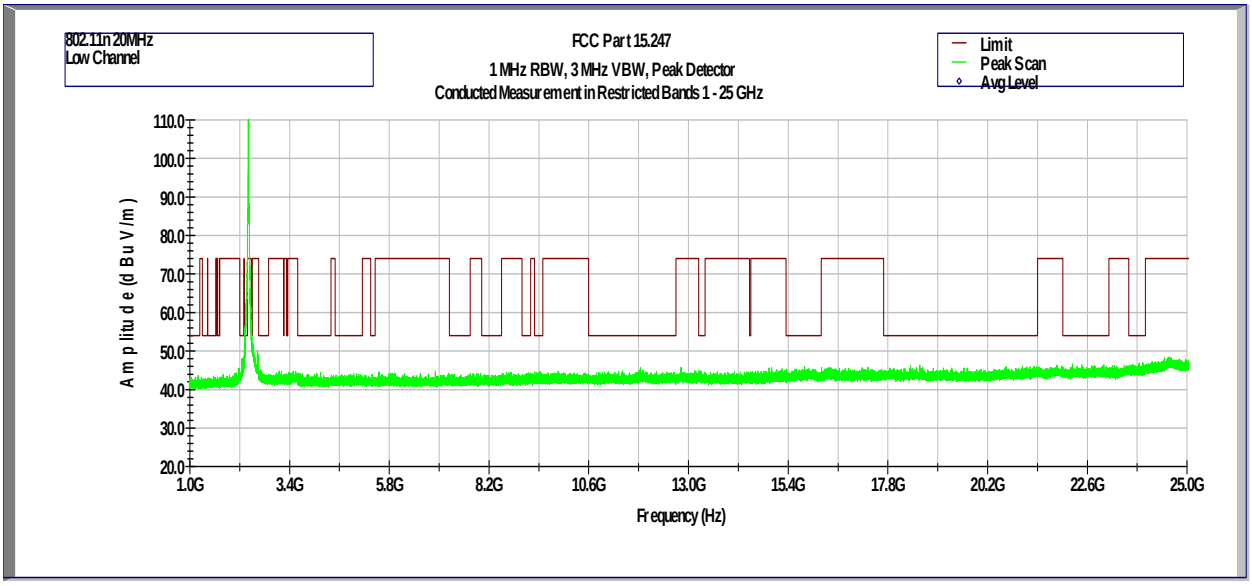


Tx @ 2412MHz 802.11n

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

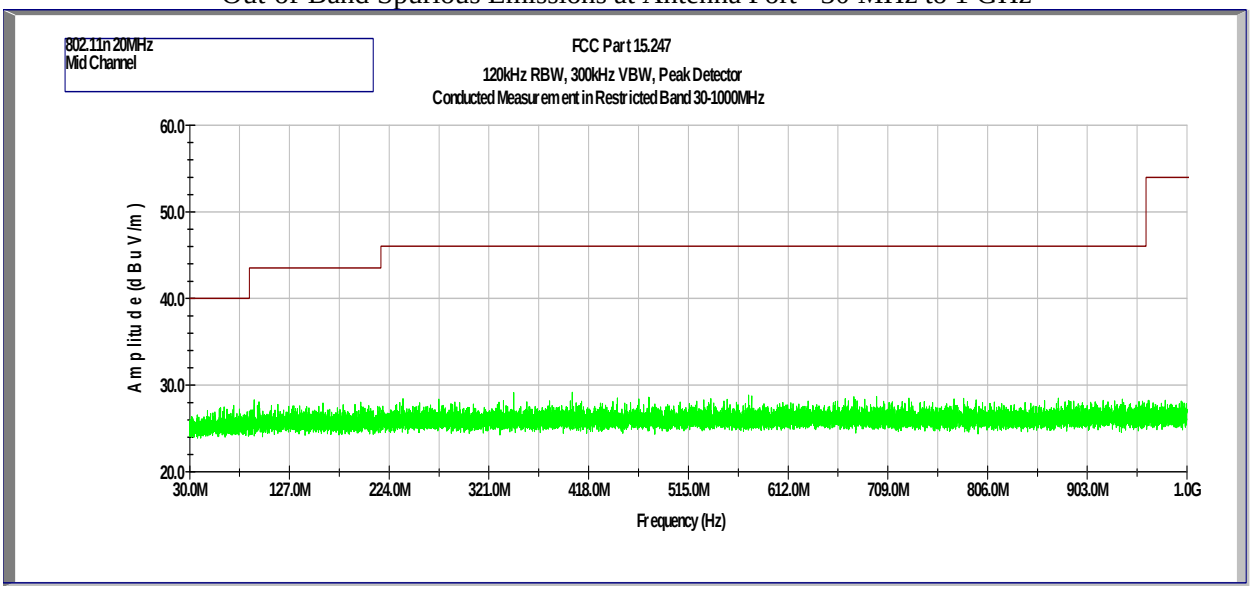


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

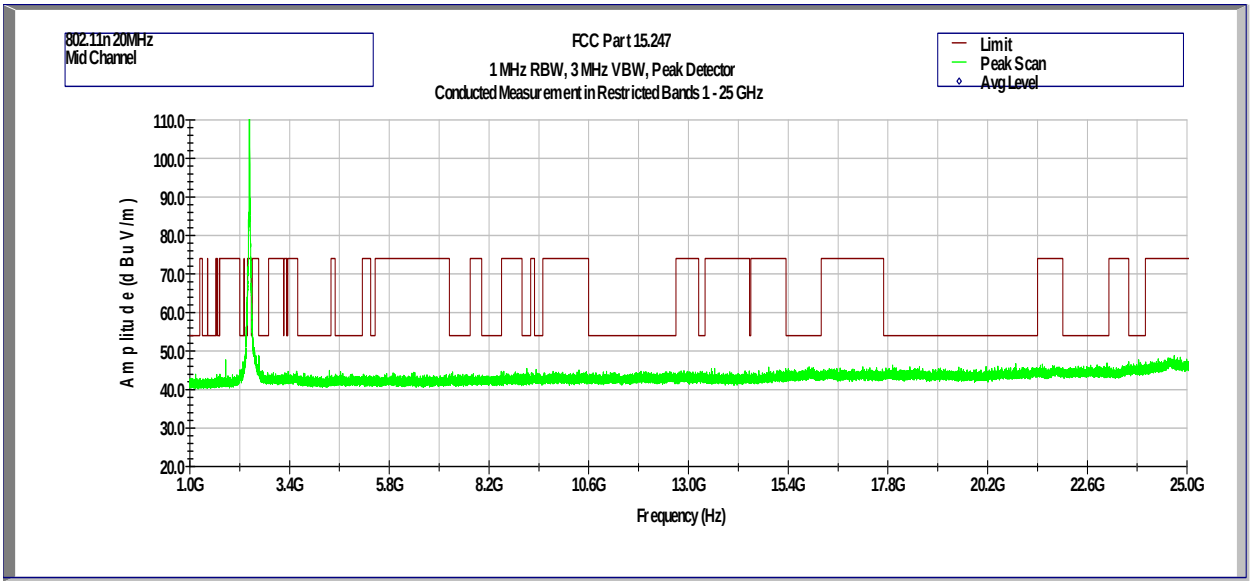


Tx @ 2437MHz 802.11n

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz

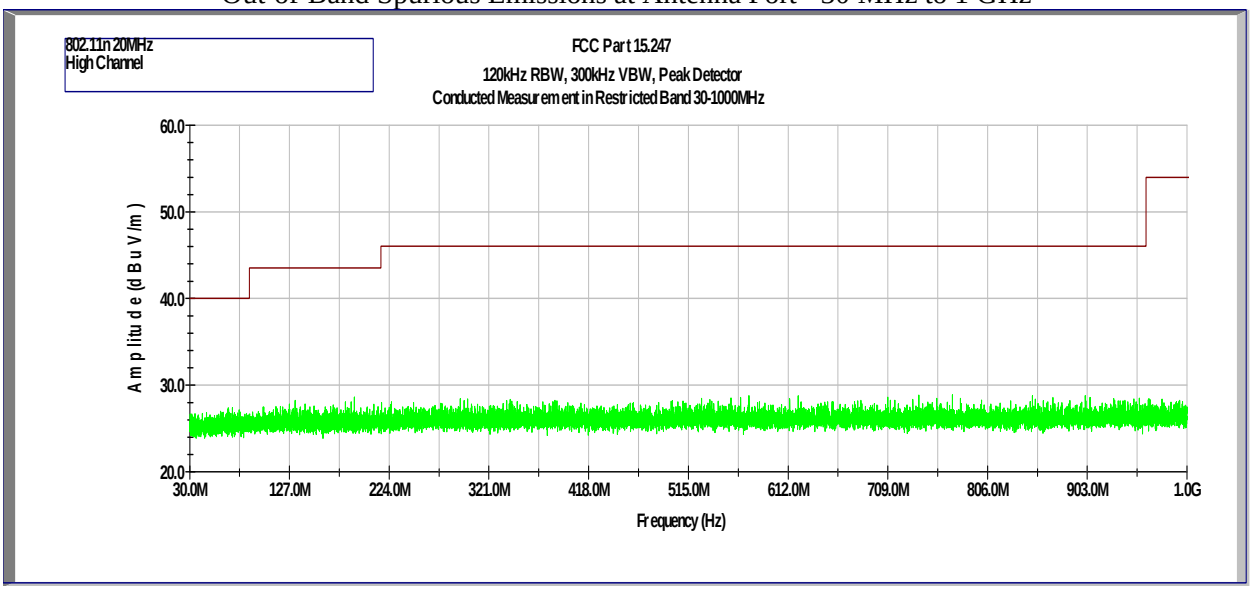


Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz

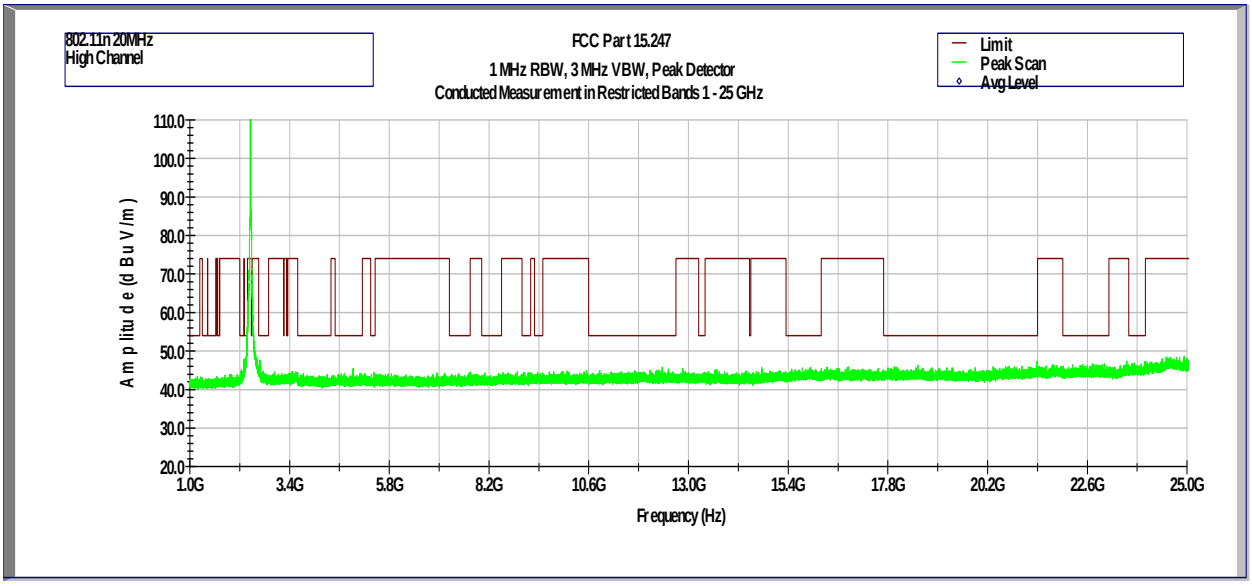


Tx @ 2462MHz 802.11n

Out-of-Band Spurious Emissions at Antenna Port - 30 MHz to 1 GHz



Out-of-Band Spurious Emissions at Antenna Port - 1 GHz to 26 GHz



Out-of-Band Radiated Spurious Emissions (Cabinet Radiation)

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11b 2412MHz

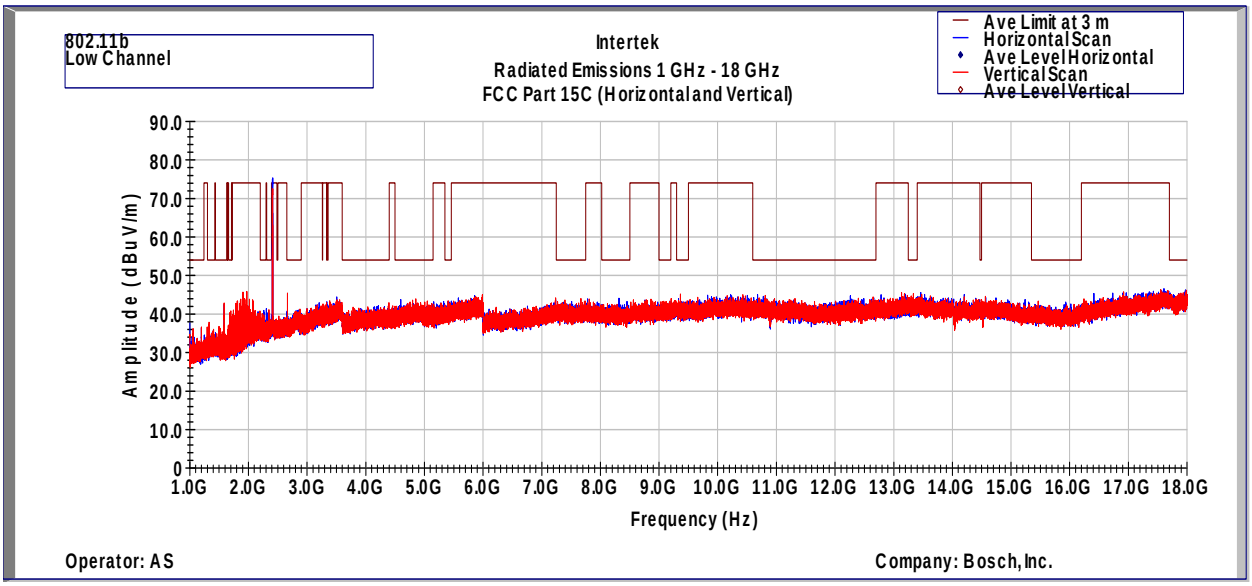
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
168.031	37.0	43.5	-6.5	47.9	1.4	32.0	10.5	9.2
191.990	36.7	43.5	-6.8	47.2	1.5	32.0	10.5	9.5
193.962	36.9	43.5	-6.6	47.4	1.5	32.0	10.5	9.5
216.014	38.4	46.0	-7.6	47.6	1.7	32.0	10.5	10.6
286.080	34.1	46.0	-11.9	40.5	2.2	32.0	10.5	12.8
300.016	36.2	46.0	-9.8	42.0	2.3	32.0	10.5	13.3
312.011	37.9	46.0	-8.1	43.5	2.3	32.0	10.5	13.6
323.296	37.5	46.0	-8.5	42.6	2.4	32.0	10.5	13.9
387.898	34.8	46.0	-11.2	38.2	2.5	32.0	10.5	15.5
393.976	34.9	46.0	-11.1	38.2	2.6	32.0	10.5	15.7
419.972	36.1	46.0	-9.9	38.6	2.6	32.0	10.5	16.5
452.564	34.4	46.0	-11.6	36.2	2.7	32.0	10.5	17.0
479.983	37.0	46.0	-9.0	38.8	2.8	32.1	10.5	16.9
540.026	39.3	46.0	-6.7	40.1	3.0	32.1	10.5	17.8
550.017	35.2	46.0	-10.8	36.2	3.0	32.1	10.5	17.7
576.013	34.6	46.0	-11.4	34.6	3.0	32.2	10.5	18.6
600.004	39.7	46.0	-6.3	40.0	3.1	32.2	10.5	18.3
605.986	35.2	46.0	-10.8	35.4	3.1	32.2	10.5	18.4
624.028	35.6	46.0	-10.4	35.3	3.2	32.2	10.5	18.9
644.010	35.7	46.0	-10.3	34.9	3.3	32.2	10.5	19.3
648.019	37.3	46.0	-8.7	36.5	3.3	32.3	10.5	19.3
711.134	37.8	46.0	-8.2	35.9	3.6	32.3	10.5	20.1
720.026	34.5	46.0	-11.5	32.4	3.6	32.3	10.5	20.2
730.954	36.3	46.0	-9.7	34.1	3.7	32.2	10.5	20.2
769.011	36.8	46.0	-9.2	34.4	3.8	32.2	10.5	20.3
775.833	39.9	46.0	-6.1	37.4	3.8	32.2	10.5	20.4
801.958	35.7	46.0	-10.3	32.4	3.8	32.1	10.5	21.1
928.802	37.4	46.0	-8.6	31.7	4.0	31.4	10.5	22.6
937.500	37.5	46.0	-8.5	31.7	4.0	31.3	10.5	22.6
981.020	38.8	54.0	-15.2	32.3	4.1	31.0	10.5	22.8
1000.000	43.9	54.0	-10.1	37.2	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
124.995	37.2	43.5	-6.3	45.8	1.2	32.0	10.5	11.8
125.448	34.3	43.5	-9.2	42.9	1.2	32.0	10.5	11.8
129.328	35.4	43.5	-8.1	44.1	1.2	32.0	10.5	11.6
164.733	34.2	43.5	-9.3	45.6	1.4	32.0	10.5	8.7
165.800	34.4	43.5	-9.1	45.6	1.4	32.0	10.5	8.9
168.742	36.5	43.5	-7.0	47.3	1.4	32.0	10.5	9.3
169.648	36.5	43.5	-7.0	47.1	1.4	32.0	10.5	9.4
186.332	37.9	43.5	-5.6	48.6	1.5	32.0	10.5	9.3
191.990	38.3	43.5	-5.2	48.8	1.5	32.0	10.5	9.5
193.995	36.4	43.5	-7.1	46.9	1.5	32.0	10.5	9.5
205.732	34.6	43.5	-8.9	44.6	1.6	32.0	10.5	9.9
207.025	35.3	43.5	-8.2	45.3	1.6	32.0	10.5	10.0
208.318	34.2	43.5	-9.3	44.0	1.6	32.0	10.5	10.1
209.547	35.0	43.5	-8.5	44.7	1.6	32.0	10.5	10.2
210.808	34.7	43.5	-8.8	44.3	1.7	32.0	10.5	10.2
212.069	35.2	43.5	-8.3	44.7	1.7	32.0	10.5	10.3
213.330	35.8	43.5	-7.7	45.2	1.7	32.0	10.5	10.4
214.623	35.5	43.5	-8.0	44.9	1.7	32.0	10.5	10.5
217.242	34.6	46.0	-11.4	43.7	1.7	32.0	10.5	10.7
218.503	34.3	46.0	-11.7	43.3	1.7	32.0	10.5	10.7
222.254	34.3	46.0	-11.7	43.0	1.7	32.0	10.5	11.1
223.580	34.5	46.0	-11.5	43.0	1.7	32.0	10.5	11.2
224.841	35.7	46.0	-10.3	44.1	1.8	32.0	10.5	11.3
227.395	35.0	46.0	-11.0	43.1	1.8	32.0	10.5	11.6
229.949	35.4	46.0	-10.6	43.3	1.8	32.0	10.5	11.8
231.210	34.3	46.0	-11.7	42.1	1.8	32.0	10.5	11.9
240.005	39.6	46.0	-6.4	47.1	1.9	32.0	10.5	12.0
527.998	36	46.0	-10	36.7	3	32.1	10.5	18
552.022	36.5	46.0	-9.5	37.4	3	32.1	10.5	17.8
672.011	34.2	46.0	-11.8	33.4	3.4	32.3	10.5	19.2
801.894	36.9	46.0	-9.1	33.6	3.8	32.1	10.5	21.1
952.114	37.3	46.0	-8.7	31.6	4.1	31.2	10.5	22.4

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11b 2437MHz

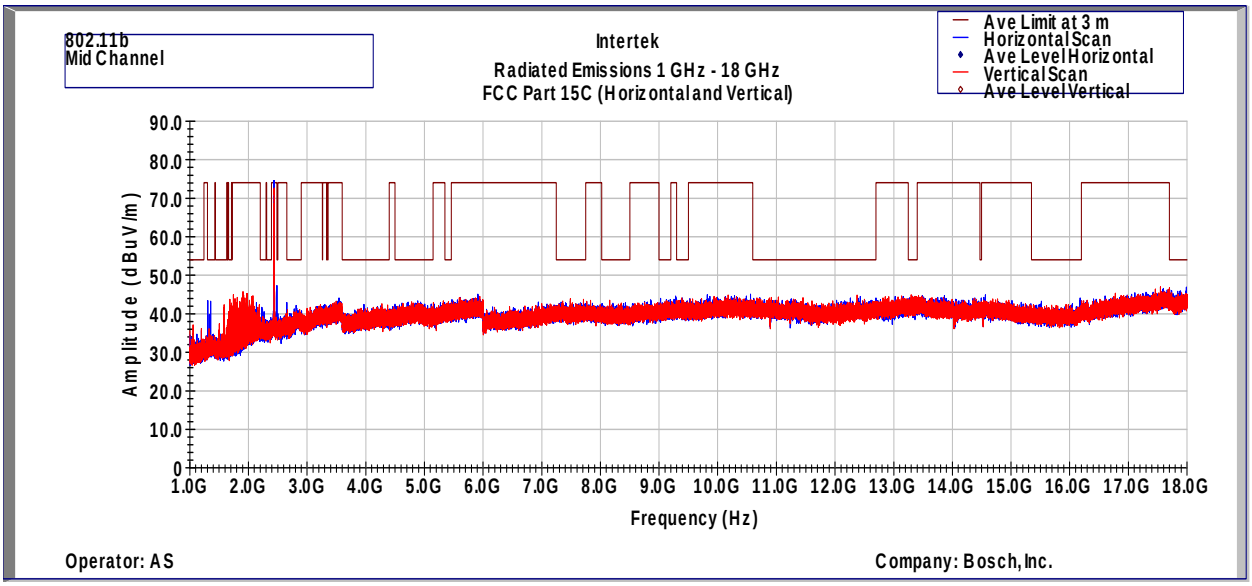
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
168.678	35.8	43.5	-7.7	46.6	1.4	32.0	10.5	9.3
185.265	35.9	43.5	-7.6	46.6	1.5	32.0	10.5	9.3
191.990	35.5	43.5	-8.0	46.0	1.5	32.0	10.5	9.5
193.930	36.1	43.5	-7.4	46.6	1.5	32.0	10.5	9.5
196.743	34.1	43.5	-9.4	44.6	1.6	32.0	10.5	9.4
216.014	38.9	46.0	-7.1	48.1	1.7	32.0	10.5	10.6
264.029	34.5	46.0	-11.5	41.1	2.0	32.0	10.5	12.8
300.016	35.9	46.0	-10.1	41.7	2.3	32.0	10.5	13.3
312.011	37.8	46.0	-8.2	43.3	2.3	32.0	10.5	13.6
323.296	38.2	46.0	-7.8	43.4	2.4	32.0	10.5	13.9
338.007	34.4	46.0	-11.6	39.0	2.4	32.0	10.5	14.4
387.898	34.2	46.0	-11.8	37.7	2.5	32.0	10.5	15.5
389.999	34.5	46.0	-11.5	37.9	2.5	32.0	10.5	15.5
420.005	36.1	46.0	-9.9	38.5	2.6	32.0	10.5	16.5
452.564	34.3	46.0	-11.7	36.2	2.7	32.0	10.5	17.0
479.983	36.9	46.0	-9.1	38.7	2.8	32.1	10.5	16.9
527.998	40.5	46.0	-5.5	41.1	3.0	32.1	10.5	18.0
539.994	38.9	46.0	-7.1	39.7	3.0	32.1	10.5	17.9
550.017	34.7	46.0	-11.3	35.7	3.0	32.1	10.5	17.7
600.037	39.6	46.0	-6.4	40.0	3.1	32.2	10.5	18.3
606.018	35.1	46.0	-10.9	35.3	3.1	32.2	10.5	18.4
624.028	34.6	46.0	-11.4	34.3	3.2	32.2	10.5	18.9
644.01	36.8	46.0	-9.2	36	3.3	32.2	10.5	19.3
648.019	35.9	46.0	-10.1	35	3.3	32.3	10.5	19.3
711.166	38.4	46.0	-7.6	36.5	3.6	32.3	10.5	20.1
719.929	34.3	46.0	-11.7	32.2	3.6	32.3	10.5	20.2
730.954	36.2	46.0	-9.8	34.1	3.7	32.2	10.5	20.2
768.978	36	46.0	-10.0	33.6	3.8	32.2	10.5	20.3
775.833	39.1	46.0	-6.9	36.6	3.8	32.2	10.5	20.4
779.972	34.8	46.0	-11.2	32.2	3.8	32.1	10.5	20.5
801.958	37.2	46.0	-8.8	33.9	3.8	32.1	10.5	21.1
1000	40.8	54.0	-13.2	34.1	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
124.995	37.4	43.5	-6.1	45.9	1.2	32.0	10.5	11.8
166.835	36.9	43.5	-6.6	48.0	1.4	32.0	10.5	9.0
170.553	36.2	43.5	-7.3	46.9	1.4	32.0	10.5	9.4
180.156	39.9	43.5	-3.6	50.8	1.5	32.0	10.5	9.1
191.990	38.5	43.5	-5.0	49.0	1.5	32.0	10.5	9.5
193.930	36.0	43.5	-7.5	46.5	1.5	32.0	10.5	9.5
203.113	35.7	43.5	-7.8	46.0	1.6	32.0	10.5	9.7
205.732	35.6	43.5	-7.9	45.6	1.6	32.0	10.5	9.9
206.993	35.0	43.5	-8.5	44.9	1.6	32.0	10.5	10.0
209.579	34.3	43.5	-9.2	43.9	1.6	32.0	10.5	10.2
212.037	35.5	43.5	-8.0	45.0	1.7	32.0	10.5	10.3
213.362	34.8	43.5	-8.7	44.2	1.7	32.0	10.5	10.4
214.656	35.6	43.5	-7.9	44.9	1.7	32.0	10.5	10.5
217.242	35.0	46.0	-11.0	44.1	1.7	32.0	10.5	10.7
219.797	34.9	46.0	-11.1	43.9	1.7	32.0	10.5	10.8
220.993	34.2	46.0	-11.8	43.1	1.7	32.0	10.5	10.9
222.254	34.8	46.0	-11.2	43.5	1.7	32.0	10.5	11.1
223.580	34.6	46.0	-11.4	43.2	1.7	32.0	10.5	11.2
224.873	35.4	46.0	-10.6	43.8	1.8	32.0	10.5	11.3
226.166	34.4	46.0	-11.6	42.7	1.8	32.0	10.5	11.4
227.460	34.5	46.0	-11.5	42.7	1.8	32.0	10.5	11.6
229.949	36.5	46.0	-9.5	44.3	1.8	32.0	10.5	11.8
240.005	39.7	46.0	-6.3	47.3	1.9	32.0	10.5	12.0
242.689	34.4	46.0	-11.6	42.0	1.9	32.0	10.5	12.0
247.797	34.6	46.0	-11.4	42.3	1.9	32.0	10.5	11.9
265.678	34.5	46.0	-11.5	41.1	2.0	32.0	10.5	12.9
528.03	35.9	46.0	-10.1	36.6	3.0	32.1	10.5	18.0
552.022	35.3	46.0	-10.7	36.2	3.0	32.1	10.5	17.8
749.999	39.4	46.0	-6.6	37.6	3.7	32.2	10.5	19.8
801.926	36.9	46.0	-9.1	33.6	3.8	32.1	10.5	21.1
960.78	37.7	54.0	-16.3	31.9	4.1	31.1	10.5	22.4
972.614	37.4	54.0	-16.6	31.2	4.1	31.0	10.5	22.6
996.476	37.4	54.0	-16.6	30.8	4.2	30.8	10.5	22.8

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11b 2462MHz

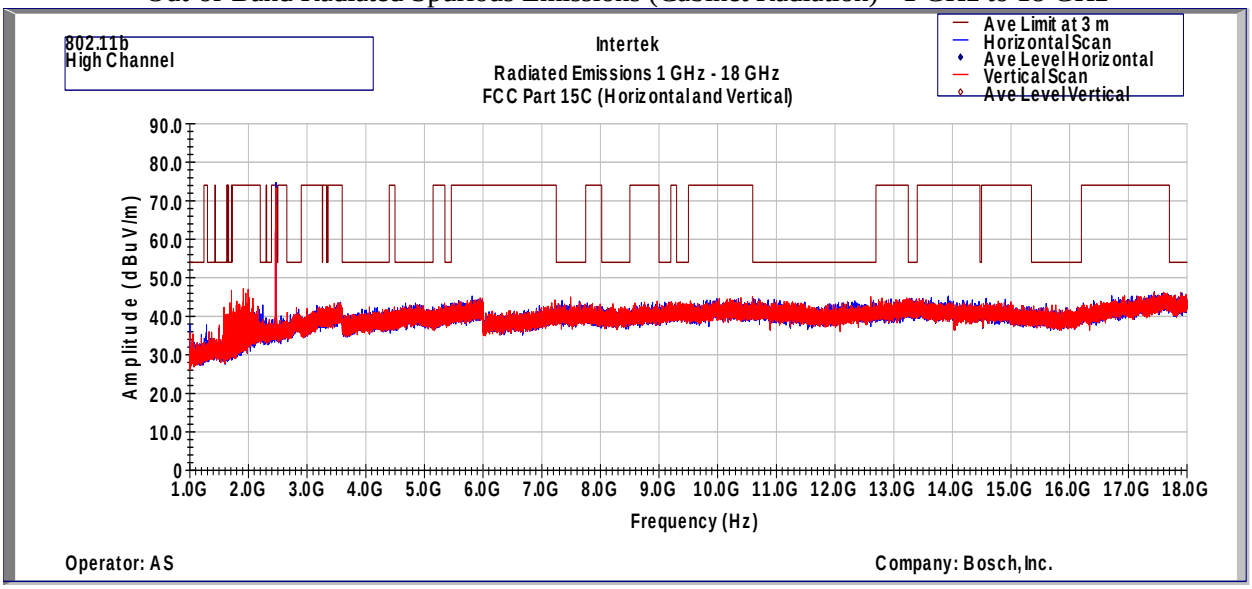
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
167.999	36.4	43.5	-7.1	47.3	1.4	32.0	10.5	9.2
191.990	35.5	43.5	-8.0	46.0	1.5	32.0	10.5	9.5
193.995	35.1	43.5	-8.4	45.6	1.5	32.0	10.5	9.5
216.014	39.2	46.0	-6.8	48.4	1.7	32.0	10.5	10.6
293.840	34.3	46.0	-11.7	40.5	2.3	32.0	10.5	13.1
300.016	36.5	46.0	-9.5	42.4	2.3	32.0	10.5	13.3
312.011	38.0	46.0	-8.0	43.5	2.3	32.0	10.5	13.6
323.263	36.0	46.0	-10.0	41.2	2.4	32.0	10.5	13.9
387.898	36.4	46.0	-9.6	39.9	2.5	32.0	10.5	15.5
389.999	34.5	46.0	-11.5	37.9	2.5	32.0	10.5	15.5
420.005	36.3	46.0	-9.7	38.8	2.6	32.0	10.5	16.5
479.983	36.6	46.0	-9.4	38.4	2.8	32.1	10.5	16.9
527.998	39.6	46.0	-6.4	40.2	3.0	32.1	10.5	18.0
539.994	39.5	46.0	-6.5	40.3	3.0	32.1	10.5	17.9
550.017	36.0	46.0	-10.0	37.0	3.0	32.1	10.5	17.7
600.004	39.6	46.0	-6.4	40.0	3.1	32.2	10.5	18.3
606.018	34.1	46.0	-11.9	34.3	3.1	32.2	10.5	18.4
624.028	34.5	46.0	-11.5	34.1	3.2	32.2	10.5	18.9
644.01	36.8	46.0	-9.2	36.0	3.3	32.2	10.5	19.3
648.019	37.5	46.0	-8.5	36.7	3.3	32.3	10.5	19.3
660.015	34.2	46.0	-11.8	33.3	3.4	32.3	10.5	19.3
672.011	35.0	46.0	-11.0	34.2	3.4	32.3	10.5	19.2
711.166	37.4	46.0	-8.6	35.5	3.6	32.3	10.5	20.1
719.993	34.6	46.0	-11.4	32.4	3.6	32.3	10.5	20.2
730.987	37.3	46.0	-8.7	35.1	3.7	32.2	10.5	20.2
769.011	36.9	46.0	-9.1	34.5	3.8	32.2	10.5	20.3
775.833	39.4	46.0	-6.6	36.9	3.8	32.2	10.5	20.4
779.972	36.2	46.0	-9.8	33.6	3.8	32.1	10.5	20.5
801.926	35.6	46.0	-10.4	32.3	3.8	32.1	10.5	21.1
975.718	38.7	54.0	-15.3	32.4	4.1	31.0	10.5	22.7
997.769	38.4	54.0	-15.6	31.8	4.2	30.8	10.5	22.8
1000	40.1	54.0	-13.9	33.4	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
122.861	34.4	43.5	-9.1	42.9	1.2	32.0	10.5	11.9
125.028	37.8	43.5	-5.7	46.3	1.2	32.0	10.5	11.8
166.123	34.6	43.5	-8.9	45.8	1.4	32.0	10.5	8.9
170.650	36.1	43.5	-7.4	46.8	1.4	32.0	10.5	9.4
186.623	38.3	43.5	-5.2	49.0	1.5	32.0	10.5	9.4
191.990	38.4	43.5	-5.1	48.9	1.5	32.0	10.5	9.5
193.962	35.8	43.5	-7.7	46.3	1.5	32.0	10.5	9.5
204.374	34.2	43.5	-9.3	44.3	1.6	32.0	10.5	9.8
206.993	35.1	43.5	-8.4	45.0	1.6	32.0	10.5	10.0
209.515	34.9	43.5	-8.6	44.6	1.6	32.0	10.5	10.2
210.711	34.3	43.5	-9.2	43.9	1.7	32.0	10.5	10.2
212.069	35.2	43.5	-8.3	44.7	1.7	32.0	10.5	10.3
213.395	34.3	43.5	-9.2	43.7	1.7	32.0	10.5	10.4
214.656	35.5	43.5	-8.0	44.8	1.7	32.0	10.5	10.5
217.210	35.7	46.0	-10.3	44.9	1.7	32.0	10.5	10.7
219.700	34.3	46.0	-11.7	43.3	1.7	32.0	10.5	10.8
220.508	38.0	46.0	-8.0	46.9	1.7	32.0	10.5	10.9
222.351	34.3	46.0	-11.7	43.0	1.7	32.0	10.5	11.1
223.677	34.7	46.0	-11.3	43.3	1.7	32.0	10.5	11.2
224.873	34.5	46.0	-11.5	42.9	1.8	32.0	10.5	11.3
226.199	34.8	46.0	-11.2	43.1	1.8	32.0	10.5	11.4
227.363	34.4	46.0	-11.6	42.6	1.8	32.0	10.5	11.6
230.046	34.7	46.0	-11.3	42.5	1.8	32.0	10.5	11.8
240.005	39.3	46.0	-6.7	46.9	1.9	32.0	10.5	12.0
255.525	34.2	46.0	-11.8	41.3	2.0	32.0	10.5	12.4
265.742	35.6	46.0	-10.4	42.2	2.1	32.0	10.5	12.9
527.998	37.3	46.0	-8.7	38.0	3.0	32.1	10.5	18.0
552.022	36.2	46.0	-9.8	37.1	3.0	32.1	10.5	17.8
625.03	39.0	46.0	-7.0	38.6	3.2	32.2	10.5	18.9
801.926	37.8	46.0	-8.2	34.5	3.8	32.1	10.5	21.1
887.739	36.2	46.0	-9.8	31.6	4.0	31.7	10.5	21.8
912.506	37.3	46.0	-8.7	32.0	4.0	31.5	10.5	22.3
984.027	37.6	54.0	-16.4	31.0	4.1	30.9	10.5	22.8

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz
Note: FS@3m = RA + AF + CF - Preamp, (Peak)
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11g 2412MHz

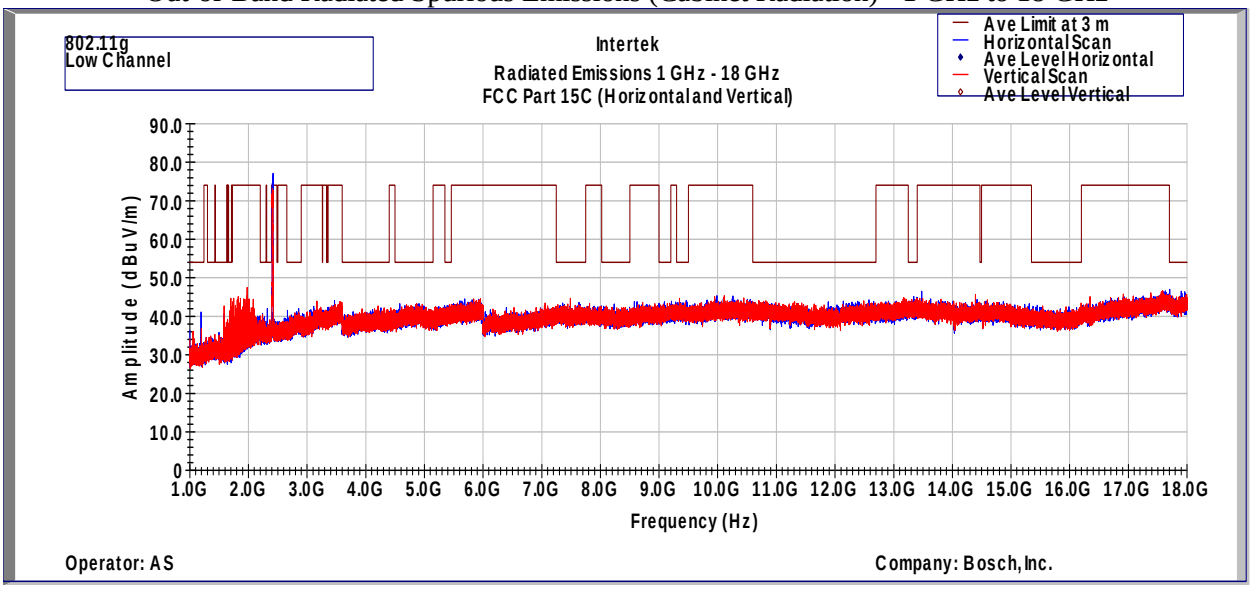
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
173.754	35.8	43.5	-7.7	46.5	1.4	32.0	10.5	9.3
191.990	35.7	43.5	-7.8	46.2	1.5	32.0	10.5	9.5
193.962	35.8	43.5	-7.7	46.3	1.5	32.0	10.5	9.5
250.028	40.9	46.0	-5.1	48.6	1.9	32.0	10.5	11.8
299.983	36.8	46.0	-9.2	42.6	2.3	32.0	10.5	13.3
312.011	36.6	46.0	-9.4	42.1	2.3	32.0	10.5	13.6
323.296	36.7	46.0	-9.3	41.9	2.4	32.0	10.5	13.9
338.007	34.7	46.0	-11.3	39.3	2.4	32.0	10.5	14.4
389.967	34.8	46.0	-11.2	38.2	2.5	32.0	10.5	15.5
419.972	36.2	46.0	-9.8	38.6	2.6	32.0	10.5	16.5
479.983	36.7	46.0	-9.3	38.4	2.8	32.1	10.5	16.9
517.231	34.7	46.0	-11.3	35.6	2.9	32.1	10.5	17.8
527.998	40.4	46.0	-5.6	41.1	3.0	32.1	10.5	18.0
539.994	38.3	46.0	-7.7	39.1	3.0	32.1	10.5	17.9
550.017	34.9	46.0	-11.1	35.9	3.0	32.1	10.5	17.7
576.013	34.5	46.0	-11.5	34.5	3.0	32.2	10.5	18.6
600.037	39.6	46.0	-6.4	40.0	3.1	32.2	10.5	18.3
605.986	35.4	46.0	-10.6	35.6	3.1	32.2	10.5	18.4
624.028	35.1	46.0	-10.9	34.8	3.2	32.2	10.5	18.9
644.01	36.0	46.0	-10.0	35.2	3.3	32.2	10.5	19.3
648.019	36.9	46.0	-9.1	36.1	3.3	32.3	10.5	19.3
659.983	35.4	46.0	-10.6	34.5	3.4	32.3	10.5	19.3
672.011	35.6	46.0	-10.4	34.8	3.4	32.3	10.5	19.2
711.199	37.3	46.0	-8.7	35.4	3.6	32.3	10.5	20.1
719.961	34.5	46.0	-11.5	32.4	3.6	32.3	10.5	20.2
730.987	35.3	46.0	-10.7	33.2	3.7	32.2	10.5	20.2
768.978	37.7	46.0	-8.3	35.3	3.8	32.2	10.5	20.3
775.865	39.4	46.0	-6.6	36.8	3.8	32.2	10.5	20.4
780.004	35.2	46.0	-10.8	32.6	3.8	32.1	10.5	20.5
801.926	36.3	46.0	-9.7	33.0	3.8	32.1	10.5	21.1
981.02	38.7	54.0	-15.3	32.2	4.1	31.0	10.5	22.8
1000	41.6	54.0	-12.4	34.9	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
122.926	34.0	43.5	-9.5	42.5	1.2	32.0	10.5	11.9
123.799	34.8	43.5	-8.7	43.3	1.2	32.0	10.5	11.9
124.995	37.6	43.5	-5.9	46.1	1.2	32.0	10.5	11.8
125.868	35.0	43.5	-8.5	43.5	1.2	32.0	10.5	11.8
134.534	34.4	43.5	-9.1	44.2	1.3	32.0	10.5	10.5
165.865	34.8	43.5	-8.7	46.0	1.4	32.0	10.5	8.9
166.802	36.6	43.5	-6.9	47.7	1.4	32.0	10.5	9.0
169.680	36.1	43.5	-7.4	46.8	1.4	32.0	10.5	9.4
191.990	37.8	43.5	-5.7	48.3	1.5	32.0	10.5	9.5
204.471	34.4	43.5	-9.1	44.5	1.6	32.0	10.5	9.8
205.829	34.4	43.5	-9.1	44.4	1.6	32.0	10.5	9.9
207.057	35.3	43.5	-8.2	45.2	1.6	32.0	10.5	10.0
208.318	35.1	43.5	-8.4	44.9	1.6	32.0	10.5	10.1
209.579	35.9	43.5	-7.6	45.6	1.6	32.0	10.5	10.2
210.84	35.4	43.5	-8.1	45.0	1.7	32.0	10.5	10.2
212.134	35.7	43.5	-7.8	45.2	1.7	32.0	10.5	10.3
213.427	35.4	43.5	-8.1	44.8	1.7	32.0	10.5	10.4
214.72	35.7	43.5	-7.8	45.0	1.7	32.0	10.5	10.5
217.242	36.6	46.0	-9.4	45.8	1.7	32.0	10.5	10.7
219.829	34.0	46.0	-12.0	42.9	1.7	32.0	10.5	10.8
222.351	34.7	46.0	-11.3	43.4	1.7	32.0	10.5	11.1
224.905	34.8	46.0	-11.2	43.3	1.8	32.0	10.5	11.3
227.46	34.9	46.0	-11.1	43.0	1.8	32.0	10.5	11.6
229.982	34.7	46.0	-11.3	42.6	1.8	32.0	10.5	11.8
240.005	39.1	46.0	-6.9	46.6	1.9	32.0	10.5	12.0
260.731	33.9	46.0	-12.1	40.6	2.0	32.0	10.5	12.8
528.03	35.7	46.0	-10.3	36.3	3.0	32.1	10.5	18.0
552.022	36.5	46.0	-9.5	37.4	3.0	32.1	10.5	17.8
801.926	36.8	46.0	-9.2	33.5	3.8	32.1	10.5	21.1
926.345	37.3	46.0	-8.7	31.7	4.0	31.4	10.5	22.5
995.182	37.9	54.0	-16.1	31.3	4.2	30.8	10.5	22.8

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz
Note: FS@3m = RA + AF + CF - Preamp, (Peak)
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11g 2437MHz

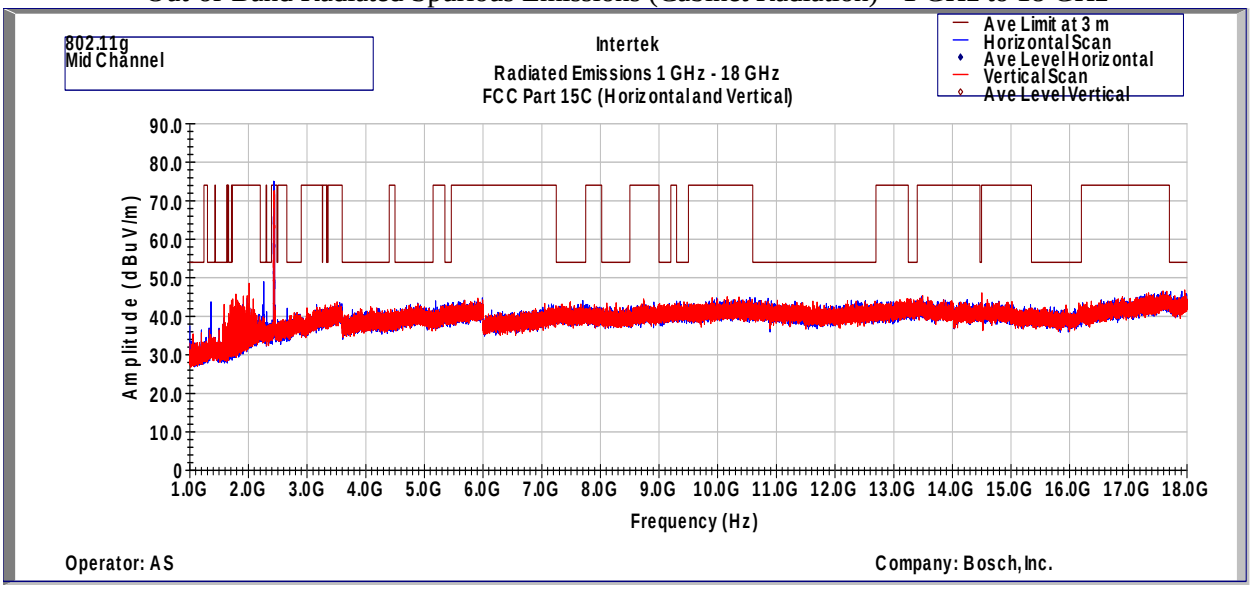
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
171.652	36.9	43.5	-6.6	47.6	1.4	32.0	10.5	9.4
191.990	36.6	43.5	-6.9	47.1	1.5	32.0	10.5	9.5
193.962	35.9	43.5	-7.6	46.4	1.5	32.0	10.5	9.5
216.014	39.3	46.0	-6.7	48.5	1.7	32.0	10.5	10.6
300.016	37.5	46.0	-8.5	43.4	2.3	32.0	10.5	13.3
312.011	37.8	46.0	-8.2	43.4	2.3	32.0	10.5	13.6
323.296	36.6	46.0	-9.4	41.8	2.4	32.0	10.5	13.9
394.009	35.4	46.0	-10.6	38.7	2.6	32.0	10.5	15.7
419.972	36.6	46.0	-9.4	39.0	2.6	32.0	10.5	16.5
480.015	36.7	46.0	-9.3	38.4	2.8	32.1	10.5	16.9
527.998	40.3	46.0	-5.7	41.0	3.0	32.1	10.5	18.0
539.994	38.8	46.0	-7.2	39.6	3.0	32.1	10.5	17.9
550.017	34.8	46.0	-11.2	35.7	3.0	32.1	10.5	17.7
576.013	35.1	46.0	-10.9	35.1	3.0	32.2	10.5	18.6
600.004	39.5	46.0	-6.5	39.8	3.1	32.2	10.5	18.3
606.018	35.1	46.0	-10.9	35.3	3.1	32.2	10.5	18.4
624.028	35.6	46.0	-10.4	35.3	3.2	32.2	10.5	18.9
644.01	35.3	46.0	-10.7	34.4	3.3	32.2	10.5	19.3
648.019	36.0	46.0	-10.0	35.2	3.3	32.3	10.5	19.3
660.015	34.8	46.0	-11.2	33.8	3.4	32.3	10.5	19.3
672.011	34.6	46.0	-11.4	33.8	3.4	32.3	10.5	19.2
711.199	37.5	46.0	-8.5	35.6	3.6	32.3	10.5	20.1
730.987	37.7	46.0	-8.3	35.5	3.7	32.2	10.5	20.2
743.985	34.8	46.0	-11.2	32.8	3.7	32.2	10.5	20.1
769.011	36.4	46.0	-9.6	34.0	3.8	32.2	10.5	20.3
775.865	39.8	46.0	-6.2	37.2	3.8	32.2	10.5	20.4
779.972	35.2	46.0	-10.8	32.5	3.8	32.1	10.5	20.5
801.926	36.2	46.0	-9.8	32.9	3.8	32.1	10.5	21.1
822.846	35.4	46.0	-10.6	31.8	3.9	32.0	10.5	21.2
966.341	38.4	54.0	-15.6	32.4	4.1	31.1	10.5	22.5
980.988	39.0	54.0	-15.0	32.6	4.1	31.0	10.5	22.8
1000	43.8	54.0	-10.2	37.1	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
124.995	37.5	43.5	-6.0	46.0	1.2	32.0	10.5	11.8
125.868	35.3	43.5	-8.2	43.8	1.2	32.0	10.5	11.8
129.296	34.3	43.5	-9.2	43.0	1.2	32.0	10.5	11.6
134.566	34.3	43.5	-9.2	44.1	1.3	32.0	10.5	10.5
164.862	34.8	43.5	-8.7	46.2	1.4	32.0	10.5	8.7
166.673	35.9	43.5	-7.6	47.0	1.4	32.0	10.5	9.0
167.708	37.4	43.5	-6.1	48.3	1.4	32.0	10.5	9.1
168.742	36.9	43.5	-6.6	47.7	1.4	32.0	10.5	9.3
169.648	37.9	43.5	-5.6	48.6	1.4	32.0	10.5	9.4
171.62	36.8	43.5	-6.7	47.5	1.4	32.0	10.5	9.4
191.99	37.6	43.5	-5.9	48.1	1.5	32.0	10.5	9.5
205.635	34.7	43.5	-8.8	44.7	1.6	32.0	10.5	9.9
206.993	35.5	43.5	-8.0	45.4	1.6	32.0	10.5	10.0
209.579	35.1	43.5	-8.4	44.8	1.6	32.0	10.5	10.2
210.808	35.8	43.5	-7.7	45.4	1.7	32.0	10.5	10.2
212.069	35.9	43.5	-7.6	45.4	1.7	32.0	10.5	10.3
213.395	36.2	43.5	-7.3	45.6	1.7	32.0	10.5	10.4
214.656	36.1	43.5	-7.4	45.4	1.7	32.0	10.5	10.5
217.242	35.7	46.0	-10.3	44.8	1.7	32.0	10.5	10.7
219.764	35.7	46.0	-10.3	44.6	1.7	32.0	10.5	10.8
224.905	35.2	46.0	-10.8	43.6	1.8	32.0	10.5	11.3
226.199	35.0	46.0	-11.0	43.3	1.8	32.0	10.5	11.4
227.395	34.3	46.0	-11.7	42.5	1.8	32.0	10.5	11.6
228.688	34.9	46.0	-11.1	42.9	1.8	32.0	10.5	11.7
230.046	34.7	46.0	-11.3	42.6	1.8	32.0	10.5	11.8
240.005	39.0	46.0	-7.0	46.6	1.9	32.0	10.5	12.0
250.449	34.3	46.0	-11.7	42.0	1.9	32.0	10.5	11.9
527.998	35.5	46.0	-10.5	36.2	3.0	32.1	10.5	18.0
551.989	35.4	46.0	-10.6	36.3	3.0	32.1	10.5	17.8
801.958	36.7	46.0	-9.3	33.3	3.8	32.1	10.5	21.1
983.025	37.4	54.0	-16.6	30.9	4.1	30.9	10.5	22.8

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz
Note: FS@3m = RA + AF + CF - Preamp, (Peak)
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11g 2462MHz

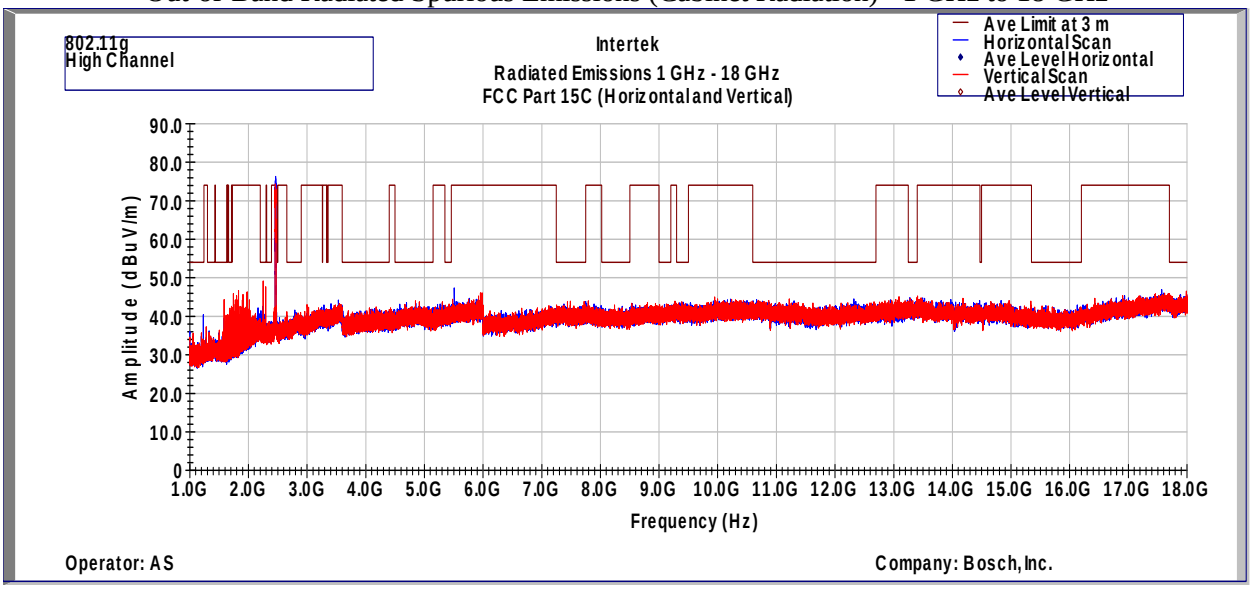
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
168.031	35.7	43.5	-7.8	46.7	1.4	32.0	10.5	9.2
168.678	36.7	43.5	-6.8	47.5	1.4	32.0	10.5	9.3
191.990	35.5	43.5	-8.0	46.0	1.5	32.0	10.5	9.5
193.962	35.0	43.5	-8.5	45.5	1.5	32.0	10.5	9.5
199.330	34.0	43.5	-9.5	44.5	1.6	32.0	10.5	9.4
216.014	39.7	46.0	-6.3	49.0	1.7	32.0	10.5	10.6
249.996	40.8	46.0	-5.2	48.5	1.9	32.0	10.5	11.8
300.048	36.8	46.0	-9.2	42.7	2.3	32.0	10.5	13.3
312.011	37.9	46.0	-8.1	43.4	2.3	32.0	10.5	13.6
323.328	37.2	46.0	-8.8	42.4	2.4	32.0	10.5	13.9
338.04	33.8	46.0	-12.2	38.5	2.4	32.0	10.5	14.4
383.985	34.7	46.0	-11.3	38.2	2.5	32.0	10.5	15.5
387.898	34.8	46.0	-11.2	38.2	2.5	32.0	10.5	15.5
389.999	34.5	46.0	-11.5	37.9	2.5	32.0	10.5	15.5
420.005	36.0	46.0	-10.0	38.4	2.6	32.0	10.5	16.5
480.015	37.0	46.0	-9.0	38.8	2.8	32.1	10.5	16.9
528.03	39.5	46.0	-6.5	40.2	3.0	32.1	10.5	18.0
539.994	38.7	46.0	-7.3	39.5	3.0	32.1	10.5	17.9
550.017	35.8	46.0	-10.2	36.7	3.0	32.1	10.5	17.7
555.869	34.1	46.0	-11.9	34.8	3.0	32.1	10.5	17.9
600.004	39.2	46.0	-6.8	39.6	3.1	32.2	10.5	18.3
606.018	34.7	46.0	-11.3	34.9	3.1	32.2	10.5	18.4
624.028	35.3	46.0	-10.7	35.0	3.2	32.2	10.5	18.9
644.01	36.7	46.0	-9.3	35.8	3.3	32.2	10.5	19.3
648.019	35.1	46.0	-10.9	34.3	3.3	32.3	10.5	19.3
672.043	34.7	46.0	-11.3	33.8	3.4	32.3	10.5	19.2
711.166	37.2	46.0	-8.8	35.3	3.6	32.3	10.5	20.1
719.961	35.4	46.0	-10.6	33.3	3.6	32.3	10.5	20.2
730.987	36.8	46.0	-9.2	34.6	3.7	32.2	10.5	20.2
768.978	36.8	46.0	-9.2	34.4	3.8	32.2	10.5	20.3
775.833	38.3	46.0	-7.7	35.8	3.8	32.2	10.5	20.4
801.926	35.2	46.0	-10.8	31.9	3.8	32.1	10.5	21.1
1000	41.1	54.0	-12.9	34.5	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
124.995	37.9	43.5	-5.6	46.4	1.2	32.0	10.5	11.8
125.804	35.1	43.5	-8.4	43.7	1.2	32.0	10.5	11.8
163.957	34.6	43.5	-8.9	46.1	1.4	32.0	10.5	8.6
167.740	36.0	43.5	-7.5	47.0	1.4	32.0	10.5	9.1
186.590	38.2	43.5	-5.3	48.8	1.5	32.0	10.5	9.4
192.022	37.9	43.5	-5.6	48.4	1.5	32.0	10.5	9.5
193.962	36.4	43.5	-7.1	46.9	1.5	32.0	10.5	9.5
204.374	34.4	43.5	-9.1	44.6	1.6	32.0	10.5	9.8
205.732	34.8	43.5	-8.7	44.9	1.6	32.0	10.5	9.9
206.993	35.5	43.5	-8.0	45.5	1.6	32.0	10.5	10.0
209.547	34.7	43.5	-8.8	44.4	1.6	32.0	10.5	10.2
210.776	34.6	43.5	-8.9	44.2	1.7	32.0	10.5	10.2
212.166	34.6	43.5	-8.9	44.1	1.7	32.0	10.5	10.3
213.459	34.4	43.5	-9.1	43.8	1.7	32.0	10.5	10.4
214.753	35.9	43.5	-7.6	45.2	1.7	32.0	10.5	10.5
217.21	35.3	46.0	-10.7	44.4	1.7	32.0	10.5	10.7
218.471	34.3	46.0	-11.7	43.3	1.7	32.0	10.5	10.7
222.351	34.9	46.0	-11.1	43.6	1.7	32.0	10.5	11.1
224.938	35.2	46.0	-10.8	43.7	1.8	32.0	10.5	11.3
226.231	34.4	46.0	-11.6	42.7	1.8	32.0	10.5	11.5
227.395	34.9	46.0	-11.1	43.0	1.8	32.0	10.5	11.6
230.111	34.7	46.0	-11.3	42.6	1.8	32.0	10.5	11.8
240.005	39.0	46.0	-7.0	46.6	1.9	32.0	10.5	12.0
251.71	35.0	46.0	-11.0	42.6	1.9	32.0	10.5	12.0
527.998	36.1	46.0	-9.9	36.7	3.0	32.1	10.5	18.0
539.994	34.3	46.0	-11.7	35.1	3.0	32.1	10.5	17.9
552.022	35.4	46.0	-10.6	36.3	3.0	32.1	10.5	17.8
625.03	38.3	46.0	-7.7	37.9	3.2	32.2	10.5	18.9
777.708	34.3	46.0	-11.7	31.8	3.8	32.2	10.5	20.5
801.926	36.5	46.0	-9.5	33.2	3.8	32.1	10.5	21.1
878.653	36.6	46.0	-9.4	32.2	3.9	31.7	10.5	21.6
921.301	37.2	46.0	-8.8	31.8	4.0	31.4	10.5	22.4
994.406	37.7	54.0	-16.3	31.1	4.1	30.8	10.5	22.9

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz
Note: FS@3m = RA + AF + CF - Preamp, (Peak)
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11n 2412MHz

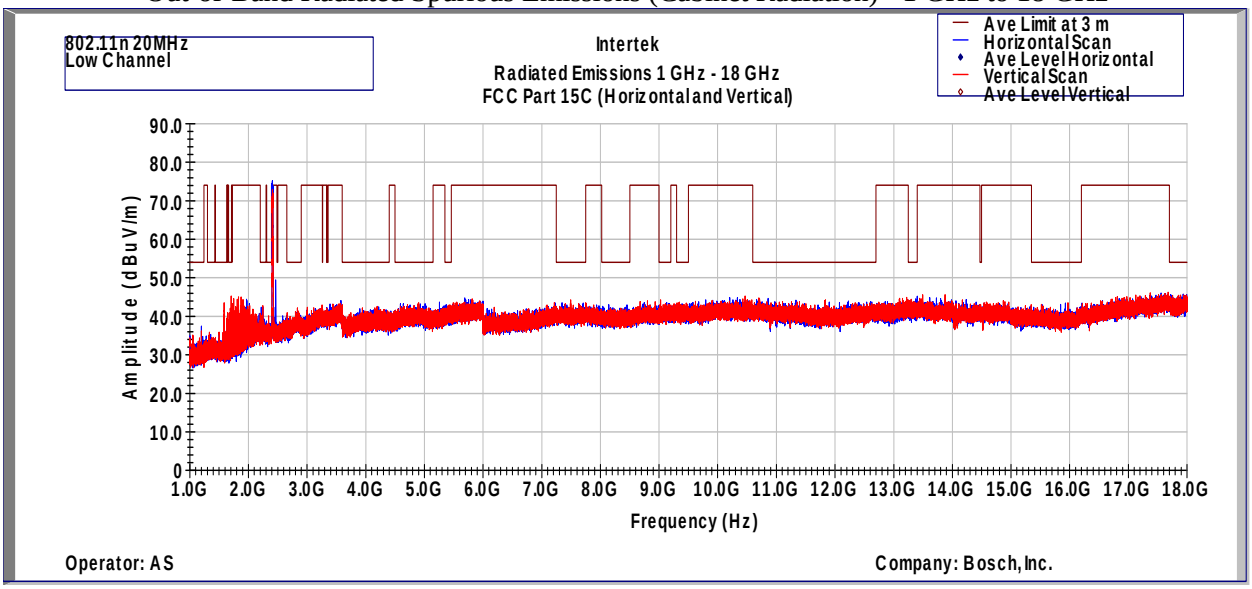
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
168.031	36.9	43.5	-6.6	47.8	1.4	32.0	10.5	9.2
168.678	36.4	43.5	-7.1	47.2	1.4	32.0	10.5	9.3
191.990	35.9	43.5	-7.6	46.4	1.5	32.0	10.5	9.5
193.930	35.6	43.5	-7.9	46.1	1.5	32.0	10.5	9.5
207.057	34.4	43.5	-9.1	44.3	1.6	32.0	10.5	10.0
216.014	39.3	46.0	-6.7	48.5	1.7	32.0	10.5	10.6
300.016	36.3	46.0	-9.7	42.1	2.3	32.0	10.5	13.3
312.011	37.6	46.0	-8.4	43.1	2.3	32.0	10.5	13.6
323.296	36.8	46.0	-9.2	42.0	2.4	32.0	10.5	13.9
387.898	35.8	46.0	-10.2	39.3	2.5	32.0	10.5	15.5
419.972	36.7	46.0	-9.3	39.1	2.6	32.0	10.5	16.5
480.015	36.9	46.0	-9.1	38.7	2.8	32.1	10.5	16.9
518.977	35.8	46.0	-10.2	36.6	2.9	32.1	10.5	17.8
527.998	40.4	46.0	-5.6	41.0	3.0	32.1	10.5	18.0
539.994	38.8	46.0	-7.2	39.6	3.0	32.1	10.5	17.9
550.017	34.9	46.0	-11.1	35.9	3.0	32.1	10.5	17.7
600.004	39.3	46.0	-6.7	39.6	3.1	32.2	10.5	18.3
606.018	34.7	46.0	-11.3	34.9	3.1	32.2	10.5	18.4
623.996	35.5	46.0	-10.5	35.1	3.2	32.2	10.5	18.9
644.01	36.2	46.0	-9.8	35.4	3.3	32.2	10.5	19.3
648.019	35.5	46.0	-10.5	34.7	3.3	32.3	10.5	19.3
660.047	35.1	46.0	-10.9	34.2	3.4	32.3	10.5	19.3
671.978	36.4	46.0	-9.6	35.6	3.4	32.3	10.5	19.2
711.199	38.0	46.0	-8.0	36.1	3.6	32.3	10.5	20.1
731.019	37.1	46.0	-8.9	34.9	3.7	32.2	10.5	20.2
769.011	36.2	46.0	-9.8	33.8	3.8	32.2	10.5	20.3
775.833	38.9	46.0	-7.1	36.3	3.8	32.2	10.5	20.4
790.577	36.7	46.0	-9.3	33.7	3.8	32.1	10.5	20.9
801.926	36.2	46.0	-9.8	32.9	3.8	32.1	10.5	21.1
834.518	35.4	46.0	-10.6	31.8	3.9	31.9	10.5	21.1
936.012	38.1	46.0	-7.9	32.3	4.0	31.3	10.5	22.6
1000	40.7	54.0	-13.3	34.0	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
123.799	34.0	43.5	-9.5	42.4	1.2	32.0	10.5	11.9
124.995	37.3	43.5	-6.2	45.8	1.2	32.0	10.5	11.8
125.674	35.3	43.5	-8.2	43.9	1.2	32.0	10.5	11.8
167.708	37.6	43.5	-5.9	48.5	1.4	32.0	10.5	9.1
168.775	36.8	43.5	-6.7	47.7	1.4	32.0	10.5	9.3
170.682	36.1	43.5	-7.4	46.7	1.4	32.0	10.5	9.4
181.449	37.9	43.5	-5.6	48.8	1.5	32.0	10.5	9.2
191.99	37.9	43.5	-5.6	48.4	1.5	32.0	10.5	9.5
193.962	35.2	43.5	-8.3	45.7	1.5	32.0	10.5	9.5
195.45	35.1	43.5	-8.4	45.6	1.6	32.0	10.5	9.4
205.732	34.0	43.5	-9.5	44.0	1.6	32.0	10.5	9.9
207.057	35.3	43.5	-8.2	45.3	1.6	32.0	10.5	10.0
209.612	35.5	43.5	-8.0	45.2	1.6	32.0	10.5	10.2
212.101	35.5	43.5	-8.0	45.1	1.7	32.0	10.5	10.3
213.298	34.6	43.5	-8.9	44.0	1.7	32.0	10.5	10.4
214.656	35.8	43.5	-7.7	45.1	1.7	32.0	10.5	10.5
217.242	36.3	46.0	-9.7	45.4	1.7	32.0	10.5	10.7
219.894	34.5	46.0	-11.5	43.5	1.7	32.0	10.5	10.8
221.025	34.8	46.0	-11.2	43.6	1.7	32.0	10.5	10.9
222.319	35.3	46.0	-10.7	43.9	1.7	32.0	10.5	11.1
224.938	34.5	46.0	-11.5	42.9	1.8	32.0	10.5	11.3
226.263	35.1	46.0	-10.9	43.4	1.8	32.0	10.5	11.5
227.524	34.6	46.0	-11.4	42.8	1.8	32.0	10.5	11.6
230.079	35.4	46.0	-10.6	43.3	1.8	32.0	10.5	11.8
235.187	34.3	46.0	-11.7	42.0	1.8	32.0	10.5	11.9
240.005	39.6	46.0	-6.4	47.2	1.9	32.0	10.5	12.0
253.003	34.1	46.0	-11.9	41.5	2.0	32.0	10.5	12.1
255.557	34.3	46.0	-11.7	41.5	2.0	32.0	10.5	12.4
527.998	36.1	46.0	-9.9	36.8	3.0	32.1	10.5	18.0
551.989	36.2	46.0	-9.8	37.1	3.0	32.1	10.5	17.8
801.958	36.6	46.0	-9.4	33.3	3.8	32.1	10.5	21.1
988.716	38.0	54.0	-16.0	31.4	4.1	30.9	10.5	22.9

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz
Note: FS@3m = RA + AF + CF - Preamp, (Peak)
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11n 2437MHz

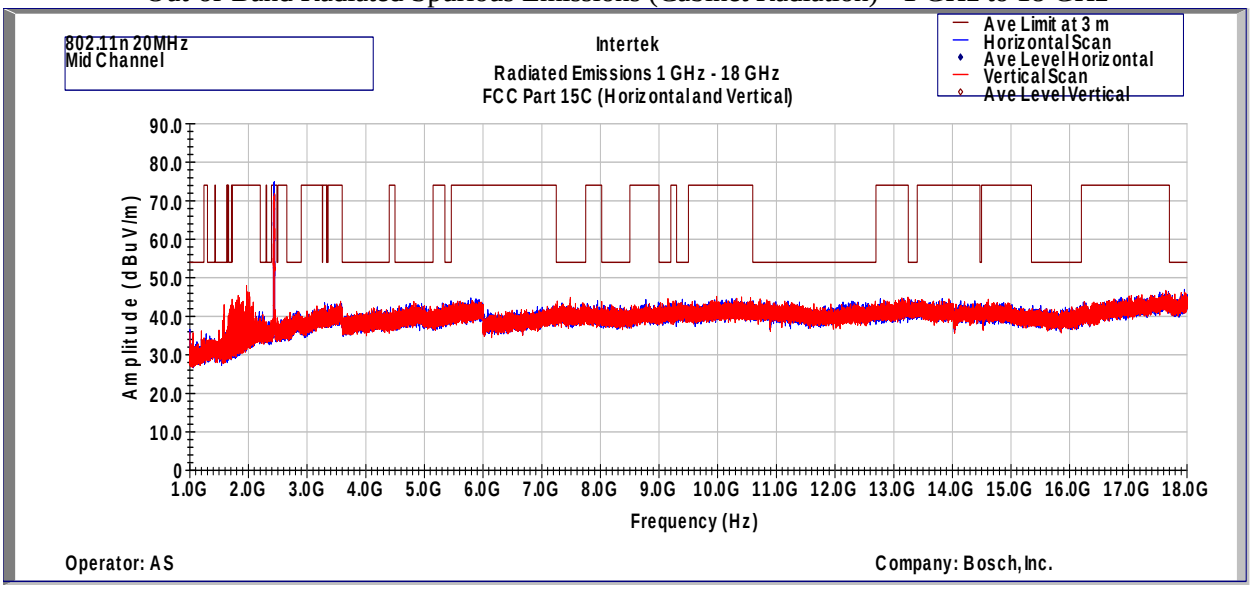
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
168.031	37.2	43.5	-6.3	48.1	1.4	32.0	10.5	9.2
192.022	35.9	43.5	-7.6	46.4	1.5	32.0	10.5	9.5
193.962	35.3	43.5	-8.2	45.8	1.5	32.0	10.5	9.5
201.981	34.2	43.5	-9.3	44.6	1.6	32.0	10.5	9.6
216.014	39.9	46.0	-6.1	49.1	1.7	32.0	10.5	10.6
299.983	37.2	46.0	-8.8	43.0	2.3	32.0	10.5	13.3
312.044	37.6	46.0	-8.4	43.1	2.3	32.0	10.5	13.6
323.296	37.6	46.0	-8.4	42.8	2.4	32.0	10.5	13.9
338.04	34.2	46.0	-11.8	38.9	2.4	32.0	10.5	14.4
387.898	34.0	46.0	-12.0	37.5	2.5	32.0	10.5	15.5
389.999	34.2	46.0	-11.8	37.7	2.5	32.0	10.5	15.5
394.009	34.9	46.0	-11.1	38.2	2.6	32.0	10.5	15.7
419.972	35.4	46.0	-10.6	37.8	2.6	32.0	10.5	16.5
452.564	35.4	46.0	-10.6	37.2	2.7	32.0	10.5	17.0
479.983	37.4	46.0	-8.6	39.2	2.8	32.1	10.5	16.9
527.998	39.8	46.0	-6.2	40.5	3.0	32.1	10.5	18.0
539.994	38.5	46.0	-7.5	39.3	3.0	32.1	10.5	17.9
550.017	34.6	46.0	-11.4	35.5	3.0	32.1	10.5	17.7
600.037	39.2	46.0	-6.8	39.5	3.1	32.2	10.5	18.3
606.018	35.5	46.0	-10.5	35.7	3.1	32.2	10.5	18.4
623.996	34.5	46.0	-11.5	34.2	3.2	32.2	10.5	18.9
644.01	37.4	46.0	-8.6	36.5	3.3	32.2	10.5	19.3
648.019	36.5	46.0	-9.5	35.6	3.3	32.3	10.5	19.3
672.011	34.2	46.0	-11.8	33.4	3.4	32.3	10.5	19.2
711.199	37.3	46.0	-8.7	35.4	3.6	32.3	10.5	20.1
719.993	34.7	46.0	-11.3	32.6	3.6	32.3	10.5	20.2
731.019	38.6	46.0	-7.4	36.4	3.7	32.2	10.5	20.2
769.011	37.5	46.0	-8.5	35.1	3.8	32.2	10.5	20.3
775.833	37.6	46.0	-8.4	35.1	3.8	32.2	10.5	20.4
801.958	36.7	46.0	-9.3	33.4	3.8	32.1	10.5	21.1
922.174	38.1	46.0	-7.9	32.7	4.0	31.4	10.5	22.4
1000	39.5	54.0	-14.5	32.9	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
125.771	34.8	43.5	-8.7	43.3	1.2	32.0	10.5	11.8
129.328	34.8	43.5	-8.7	43.5	1.2	32.0	10.5	11.6
164.895	35.7	43.5	-7.8	47.0	1.4	32.0	10.5	8.7
165.897	35.0	43.5	-8.5	46.2	1.4	32.0	10.5	8.9
168.742	36.2	43.5	-7.3	47.0	1.4	32.0	10.5	9.3
170.618	36.5	43.5	-7.0	47.2	1.4	32.0	10.5	9.4
172.655	35.7	43.5	-7.8	46.4	1.4	32.0	10.5	9.4
177.666	37.4	43.5	-6.1	48.2	1.5	32.0	10.5	9.2
193.962	36.3	43.5	-7.2	46.8	1.5	32.0	10.5	9.5
196.84	36.0	43.5	-7.5	46.5	1.6	32.0	10.5	9.4
201.916	34.6	43.5	-8.9	45.0	1.6	32.0	10.5	9.6
203.177	35.1	43.5	-8.4	45.3	1.6	32.0	10.5	9.7
206.928	35.3	43.5	-8.2	45.2	1.6	32.0	10.5	10.0
209.547	34.8	43.5	-8.7	44.5	1.6	32.0	10.5	10.2
210.905	34.9	43.5	-8.6	44.5	1.7	32.0	10.5	10.2
212.198	35.8	43.5	-7.7	45.3	1.7	32.0	10.5	10.3
213.427	35.0	43.5	-8.5	44.4	1.7	32.0	10.5	10.4
214.72	35.5	43.5	-8.0	44.8	1.7	32.0	10.5	10.5
217.307	36.0	46.0	-10.0	45.2	1.7	32.0	10.5	10.7
221.122	34.9	46.0	-11.1	43.7	1.7	32.0	10.5	10.9
222.383	35.4	46.0	-10.6	44.1	1.7	32.0	10.5	11.1
223.677	34.7	46.0	-11.3	43.2	1.7	32.0	10.5	11.2
225.002	34.8	46.0	-11.2	43.2	1.8	32.0	10.5	11.3
228.785	34.6	46.0	-11.4	42.6	1.8	32.0	10.5	11.7
240.005	39.7	46.0	-6.3	47.3	1.9	32.0	10.5	12.0
528.03	35.9	46.0	-10.1	36.5	3.0	32.1	10.5	18.0
551.989	35.4	46.0	-10.6	36.3	3.0	32.1	10.5	17.8
749.999	37.2	46.0	-8.8	35.4	3.7	32.2	10.5	19.8
801.926	37.1	46.0	-8.9	33.8	3.8	32.1	10.5	21.1
983.284	37.1	54.0	-16.9	30.6	4.1	30.9	10.5	22.8

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz
Note: FS@3m = RA + AF + CF - Preamp, (Peak)
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11n 2462MHz

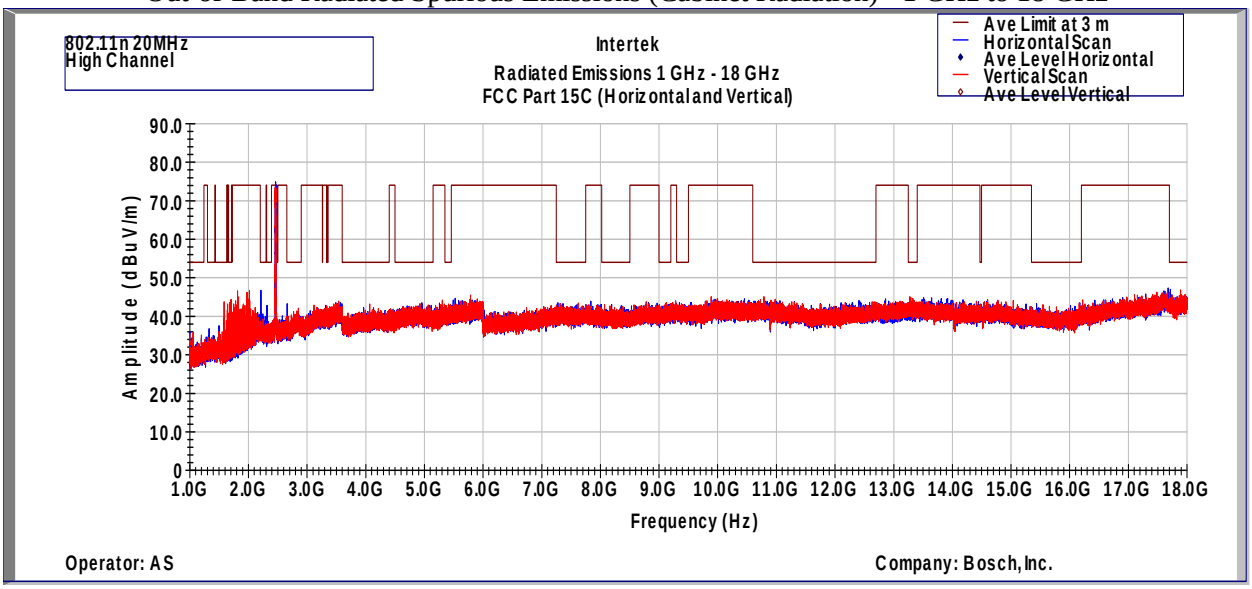
Radiated Spurious Emissions 30 MHz - 1000 MHz (Horizontal)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
167.999	38.0	43.5	-5.5	48.9	1.4	32.0	10.5	9.2
172.655	36.4	43.5	-7.1	47.2	1.4	32.0	10.5	9.4
191.990	36.4	43.5	-7.1	46.9	1.5	32.0	10.5	9.5
193.995	35.7	43.5	-7.8	46.2	1.5	32.0	10.5	9.5
207.057	34.3	43.5	-9.2	44.2	1.6	32.0	10.5	10.0
216.014	39.3	46.0	-6.7	48.5	1.7	32.0	10.5	10.6
300.016	35.7	46.0	-10.3	41.5	2.3	32.0	10.5	13.3
312.011	37.1	46.0	-8.9	42.7	2.3	32.0	10.5	13.6
323.296	36.4	46.0	-9.6	41.6	2.4	32.0	10.5	13.9
389.999	34.5	46.0	-11.5	37.9	2.5	32.0	10.5	15.5
420.037	36.8	46.0	-9.2	39.2	2.6	32.0	10.5	16.5
479.983	36.5	46.0	-9.5	38.2	2.8	32.1	10.5	16.9
528.03	40.4	46.0	-5.6	41.1	3.0	32.1	10.5	18.0
539.994	39.0	46.0	-7.0	39.8	3.0	32.1	10.5	17.9
550.017	35.1	46.0	-10.9	36.1	3.0	32.1	10.5	17.7
600.004	38.7	46.0	-7.3	39.0	3.1	32.2	10.5	18.3
606.018	34.6	46.0	-11.4	34.8	3.1	32.2	10.5	18.4
623.996	34.5	46.0	-11.5	34.1	3.2	32.2	10.5	18.9
644.01	36.3	46.0	-9.7	35.5	3.3	32.2	10.5	19.3
648.019	35.8	46.0	-10.2	34.9	3.3	32.3	10.5	19.3
660.015	34.4	46.0	-11.6	33.5	3.4	32.3	10.5	19.3
672.011	34.6	46.0	-11.4	33.8	3.4	32.3	10.5	19.2
711.166	36.7	46.0	-9.3	34.8	3.6	32.3	10.5	20.1
719.993	34.9	46.0	-11.1	32.8	3.6	32.3	10.5	20.2
731.019	36.1	46.0	-9.9	33.9	3.7	32.2	10.5	20.2
743.985	34.9	46.0	-11.1	32.8	3.7	32.2	10.5	20.1
768.978	36.0	46.0	-10.0	33.6	3.8	32.2	10.5	20.3
775.833	39.1	46.0	-6.9	36.6	3.8	32.2	10.5	20.4
899.961	37.1	46.0	-8.9	32.3	4.0	31.6	10.5	21.9
940.442	38.0	46.0	-8.0	32.2	4.0	31.3	10.5	22.6
981.02	38.5	54.0	-15.5	32.1	4.1	31.0	10.5	22.8
1000	40.9	54.0	-13.1	34.2	4.2	30.8	10.5	22.8

Radiated Spurious Emissions 30 MHz - 1000 MHz (Vertical)

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
123.831	34.7	43.5	-8.8	43.2	1.2	32.0	10.5	11.9
124.995	38.1	43.5	-5.4	46.6	1.2	32.0	10.5	11.8
126.483	35.9	43.5	-7.6	44.5	1.2	32.0	10.5	11.8
163.795	34.6	43.5	-8.9	46.1	1.4	32.0	10.5	8.6
164.895	36.0	43.5	-7.5	47.3	1.4	32.0	10.5	8.7
166.705	35.3	43.5	-8.2	46.4	1.4	32.0	10.5	9.0
168.742	36.7	43.5	-6.8	47.5	1.4	32.0	10.5	9.3
170.1	36.1	43.5	-7.4	46.8	1.4	32.0	10.5	9.4
172.59	37.2	43.5	-6.3	47.9	1.4	32.0	10.5	9.4
173.786	36.4	43.5	-7.1	47.1	1.4	32.0	10.5	9.3
185.717	38.1	43.5	-5.4	48.7	1.5	32.0	10.5	9.3
193.962	36.3	43.5	-7.2	46.8	1.5	32.0	10.5	9.5
207.057	34.9	43.5	-8.6	44.8	1.6	32.0	10.5	10.0
208.318	34.6	43.5	-8.9	44.4	1.6	32.0	10.5	10.1
209.644	35.0	43.5	-8.5	44.7	1.6	32.0	10.5	10.2
212.134	35.6	43.5	-7.9	45.1	1.7	32.0	10.5	10.3
213.459	36.0	43.5	-7.5	45.4	1.7	32.0	10.5	10.4
214.688	35.9	43.5	-7.6	45.3	1.7	32.0	10.5	10.5
217.242	36.0	46.0	-10.0	45.1	1.7	32.0	10.5	10.7
219.732	34.9	46.0	-11.1	43.9	1.7	32.0	10.5	10.8
222.351	35.0	46.0	-11.0	43.6	1.7	32.0	10.5	11.1
226.199	34.9	46.0	-11.1	43.2	1.8	32.0	10.5	11.4
227.46	34.7	46.0	-11.3	42.8	1.8	32.0	10.5	11.6
230.079	34.8	46.0	-11.2	42.7	1.8	32.0	10.5	11.8
240.005	39.4	46.0	-6.6	47.0	1.9	32.0	10.5	12.0
527.998	36.1	46.0	-9.9	36.7	3.0	32.1	10.5	18.0
551.989	35.8	46.0	-10.2	36.7	3.0	32.1	10.5	17.8
801.926	37.5	46.0	-8.5	34.2	3.8	32.1	10.5	21.1
910.178	37.3	46.0	-8.7	32.1	4.0	31.5	10.5	22.3
943.029	37.2	46.0	-8.8	31.5	4.1	31.3	10.5	22.5
986.258	37.3	54.0	-16.7	30.8	4.1	30.9	10.5	22.8

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 1 GHz to 18 GHz



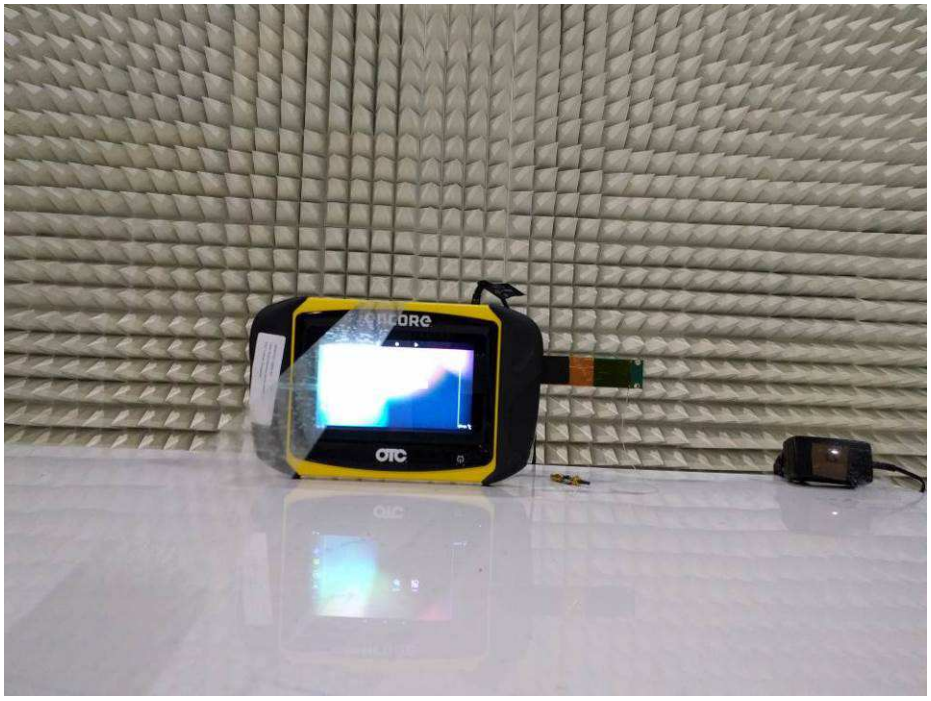
Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

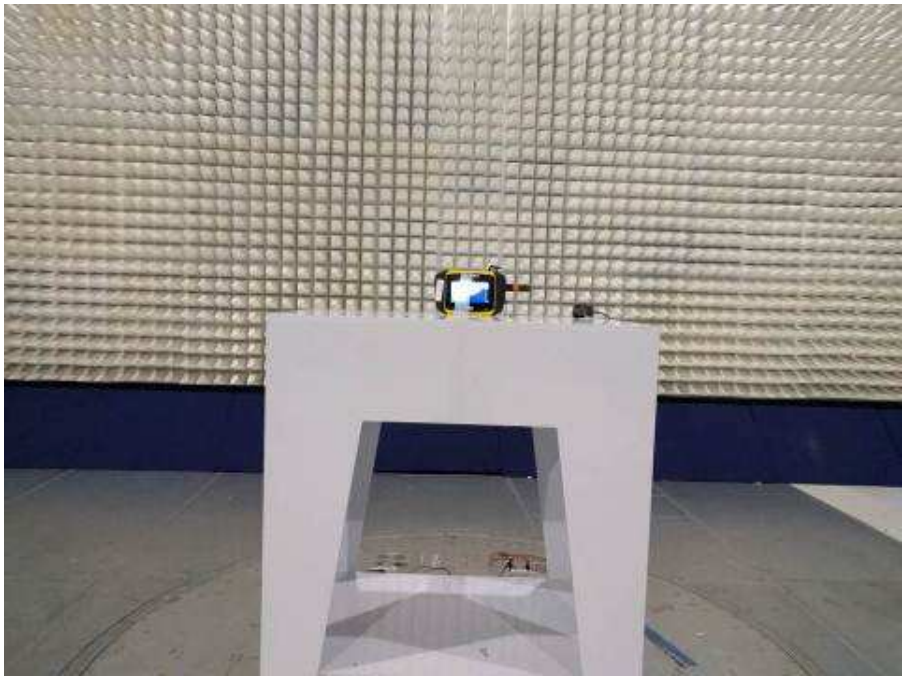
Note: FS@3m = RA + AF + CF - Preamp, (Peak)

Corrected Peak Scans are under the Average Limit of 54.

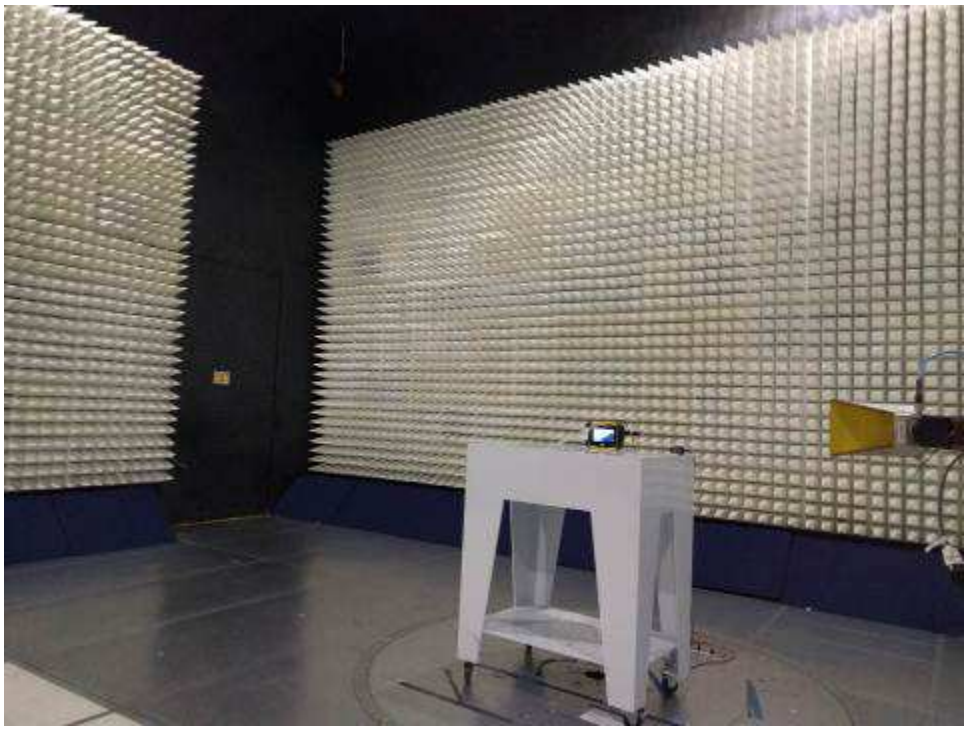
4.5.4 Test Setup Photographs

The following photographs show the testing configurations used.


otc



4.5.4 Test Setup Photographs



5.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Asset #	Cal Int	Cal Due
EMI Receiver	Rohde and Schwarz	ESU	ITS 00961	12	06/02/16
Spectrum Analyzer	Rohde and Schwarz	FSP	ITS 01200	12	02/09/16
BI-Log Antenna	Antenna Research	LPB-2513	ITS 00355	12	08/11/16
Pyramidal Horn Antenna	EMCO	3160-09	ITS 00571	#	#
Pre-Amplifier	Sonoma Instrument	310	ITS 00942	12	01/15/16
Pre-Amplifier (1-18GHz)	Miteq	AMF-4D-001180-24-10P	ITS 00526	12	10/06/16
Pre-Amplifier (18-40GHz)	Miteq	JSD44-18004000-305P	ITS 00921	12	06/18/16
Horn Antenna	EMCO	3115	ITS 01595	12	01/14/16

No Calibration required

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewers Initials	Date	Change
1.0 / G102241369	AS	KV	January 25, 2016	Original document