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).

All radiated measurements were conducted with the AC adapter and Battery mode. The worst case data was reported.

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.

Test Date:	October 3 – 24, 2017

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 – 20log D + 104.8+DCF (DCF for Average measurements)
where:
E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.
DCF = Duty Cycle Correction Factor
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. The offset programmed on the analyzer is corrected to include cable loss, attenuator and duty cycle correction.

The maximum antenna gain used by the EUT is 1.00 dBi in the 2.4GHz range. As per KDB 558074 D01 DTS MEAS GUIDANCE V04, the minimum antenna gain for calculating out of band emissions shall be no less than 2.0 dBi. All conducted antenna port plots are corrected with the consideration of a 2.0 dBi Antenna Gain. See KDB 558074 D01 DTS MEAS GUIDANCE V04 section 12.2.6 for more details.

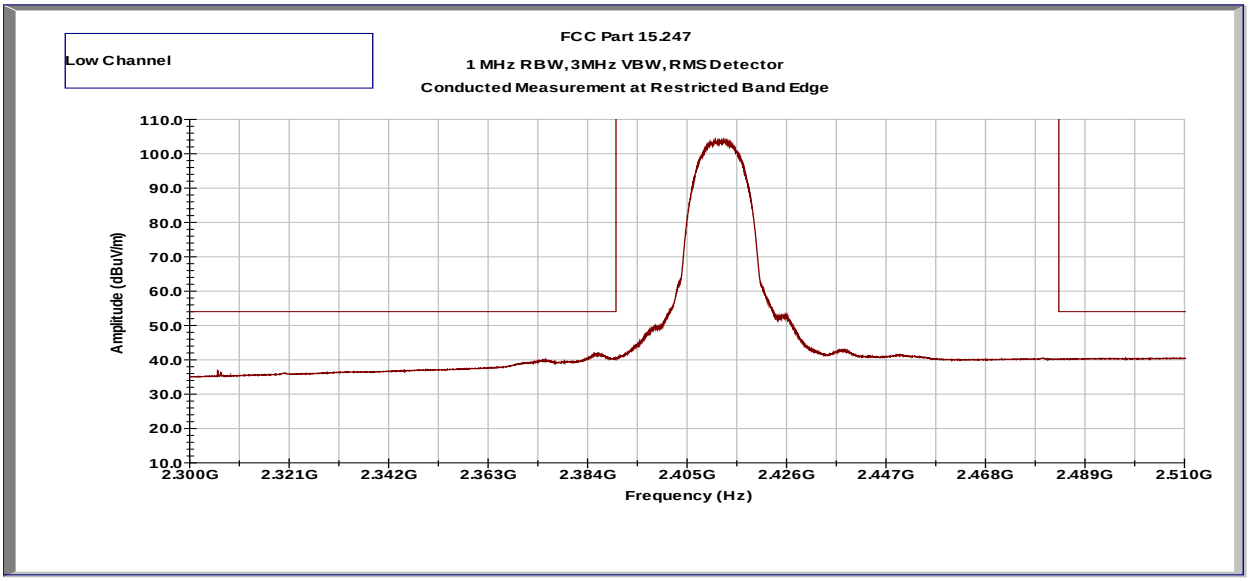
Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz.

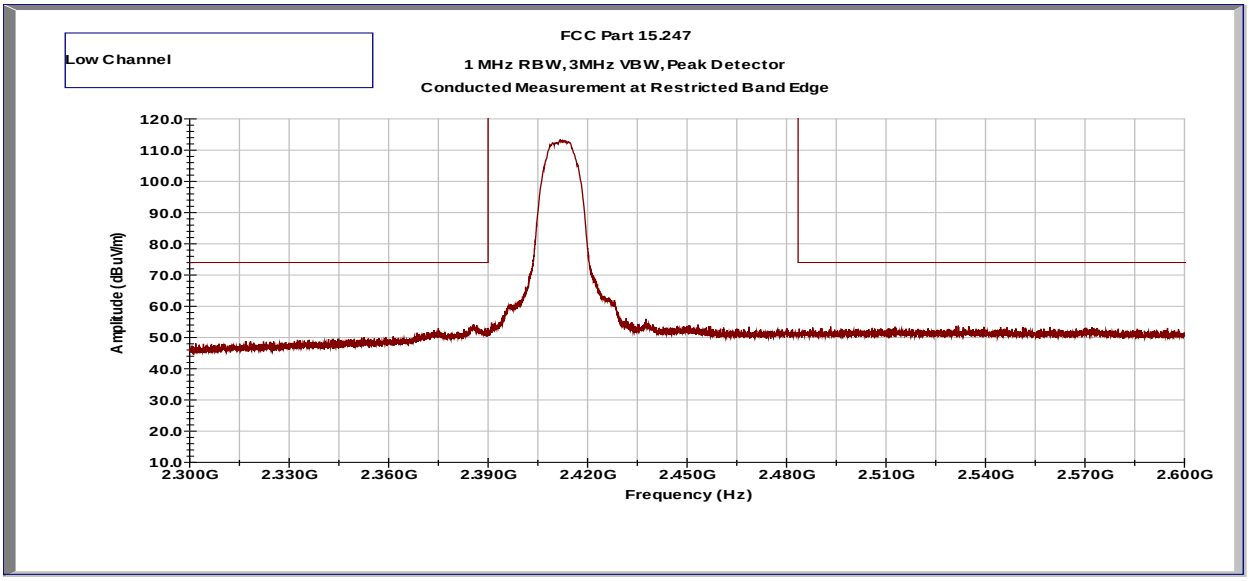
All radiated measurements were conducted with the AC adapter and Battery mode. The worst case data was reported.

Vertical and Horizontal orientations were pre-tested. Worst case orientation was used throughout emission measurements.

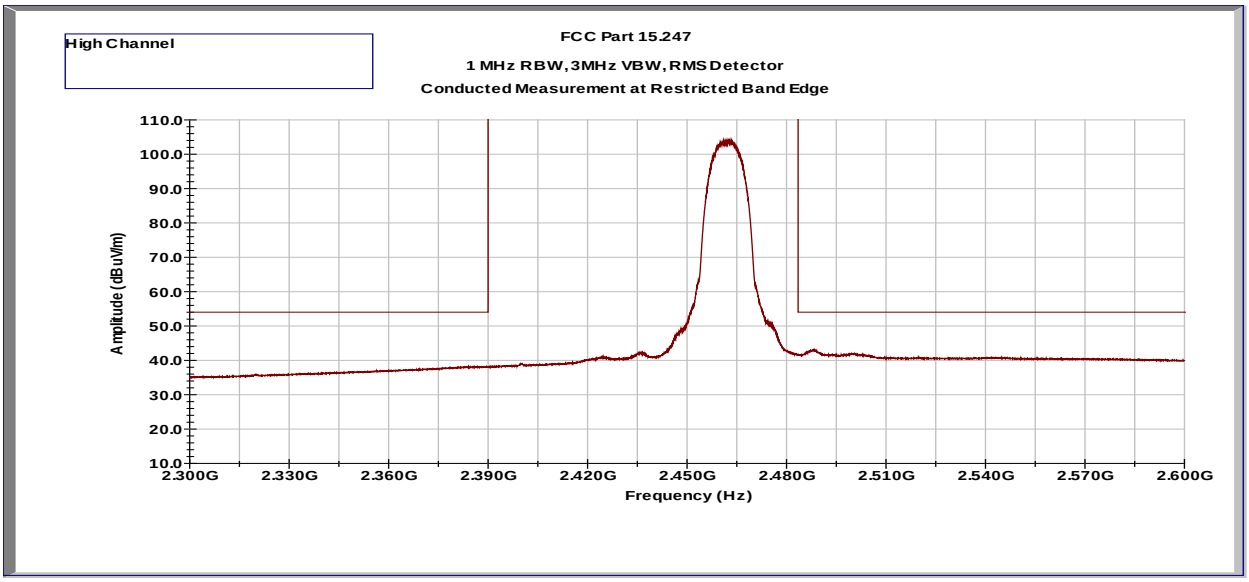
Test Results: 15.209/15.205 Restricted Band Emissions at Antenna Port

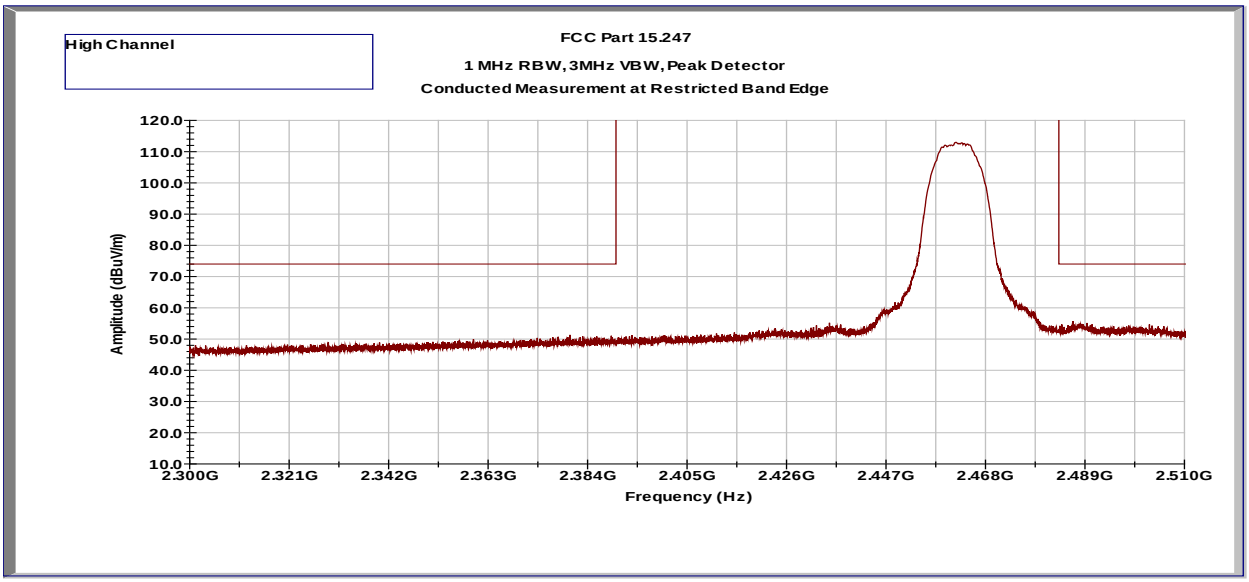
Out-of-Band Spurious Emissions at the Band Edge - 802.11b, 2412 MHz



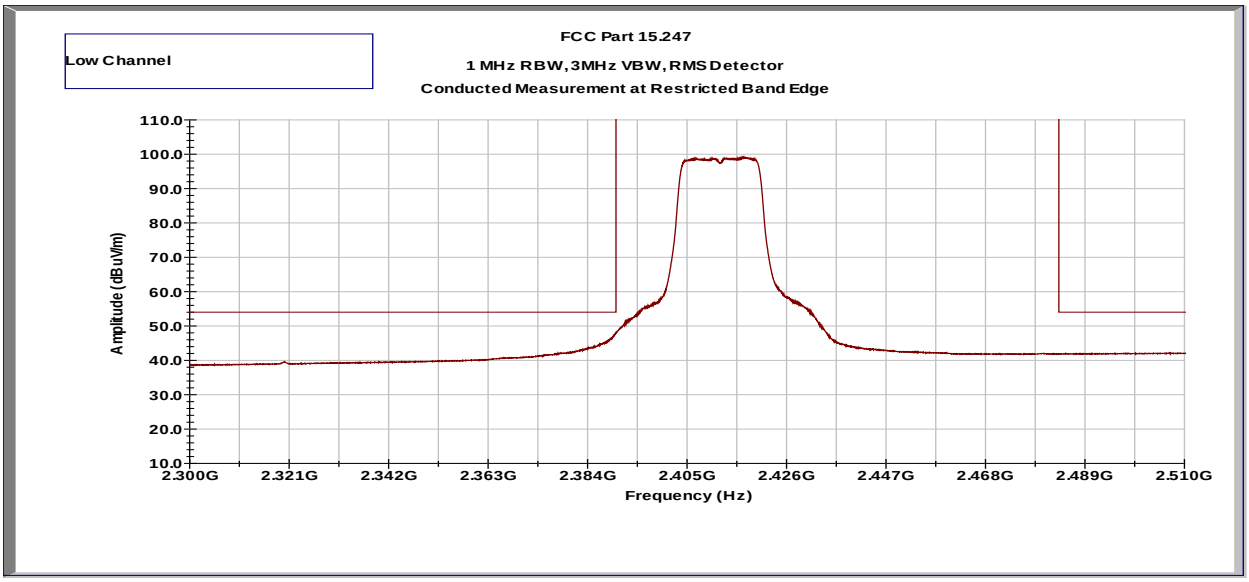


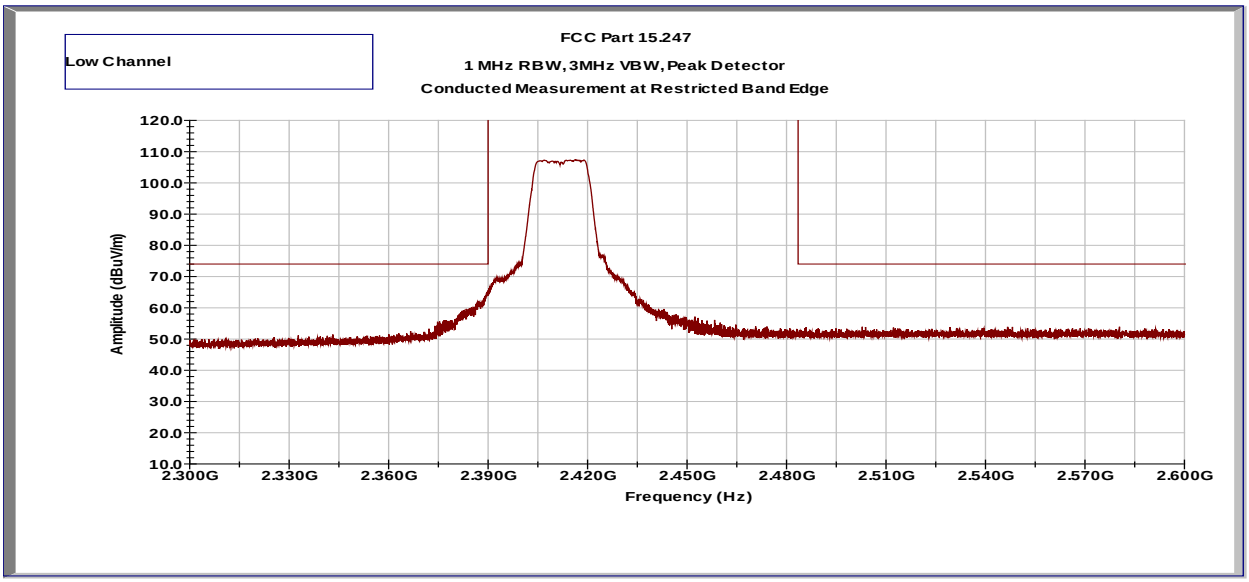
Out-of-Band Spurious Emissions at the Band Edge - 802.11b, 2462 MHz



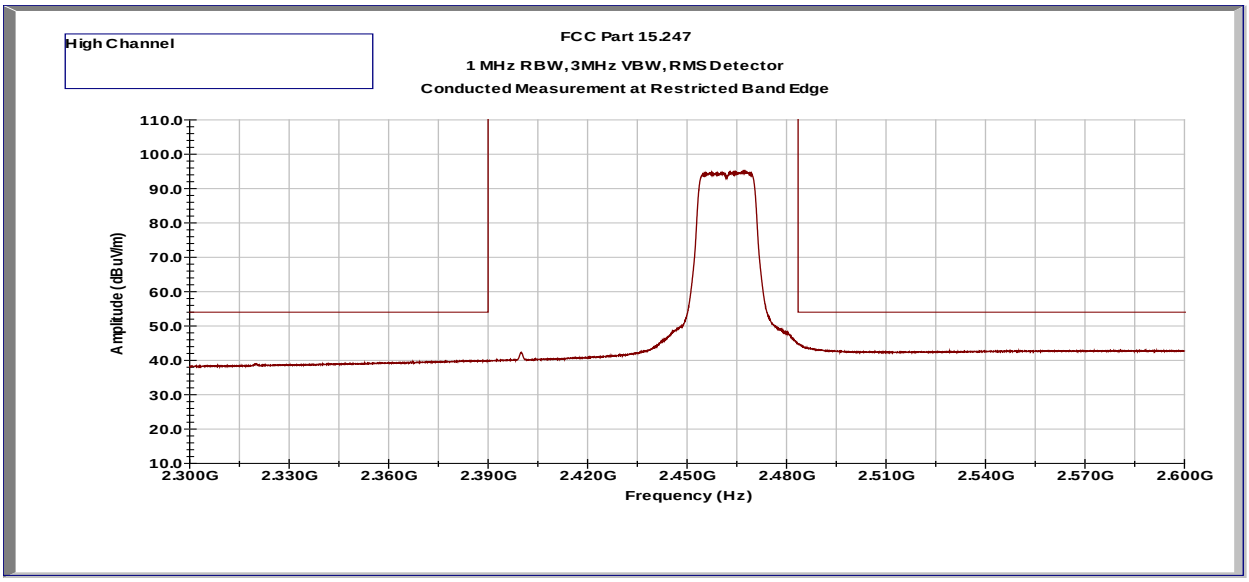


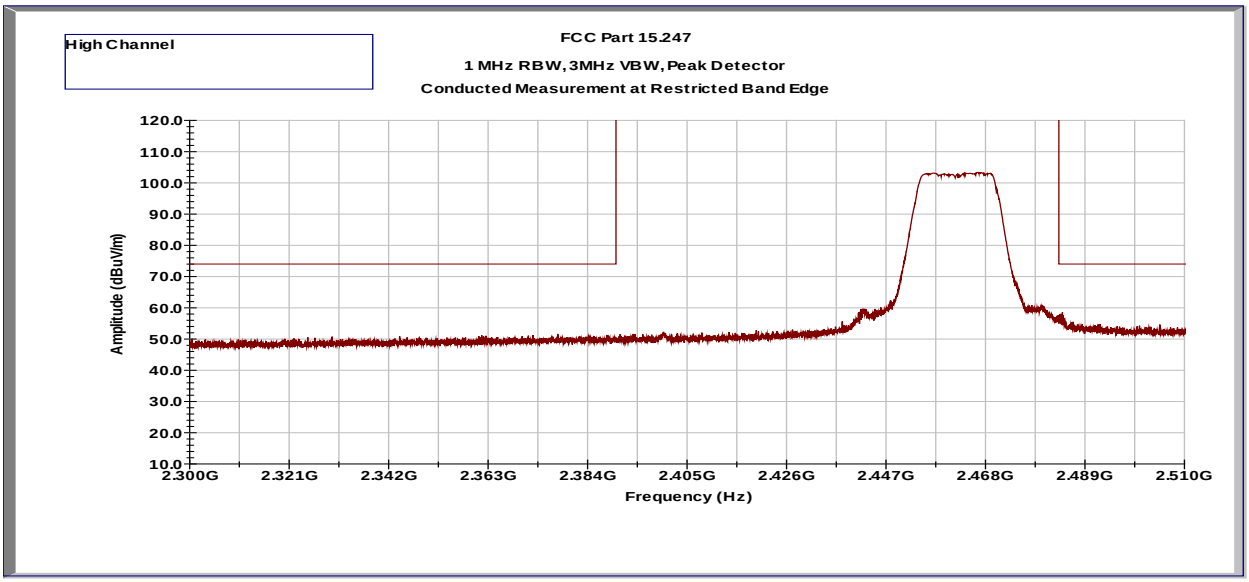
Out-of-Band Spurious Emissions at the Band Edge - 802.11g, 2412 MHz



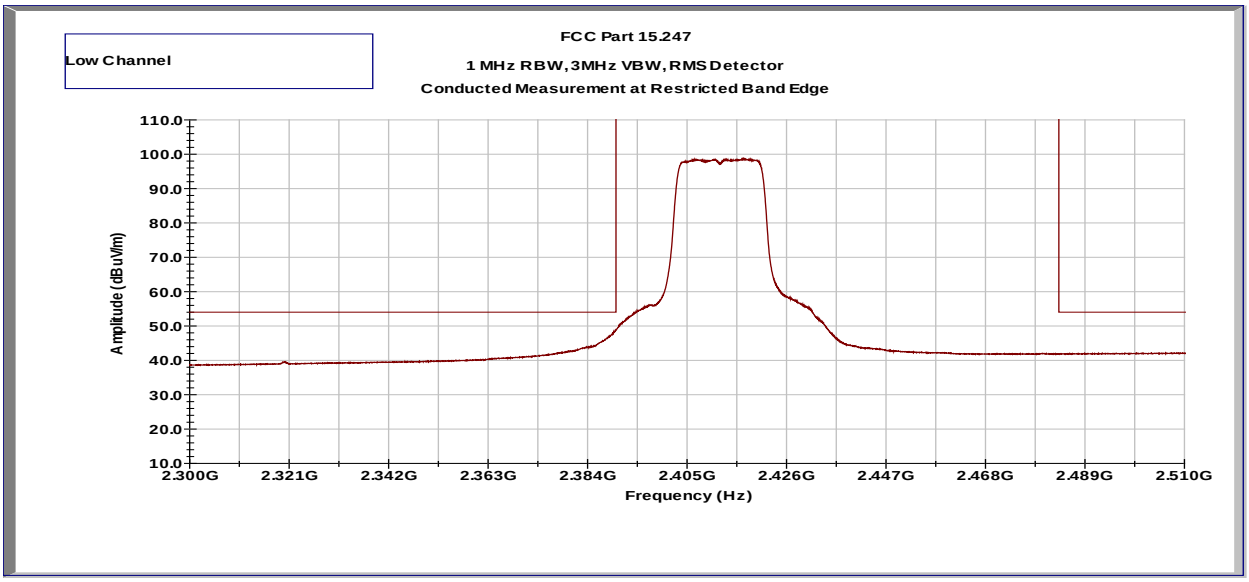


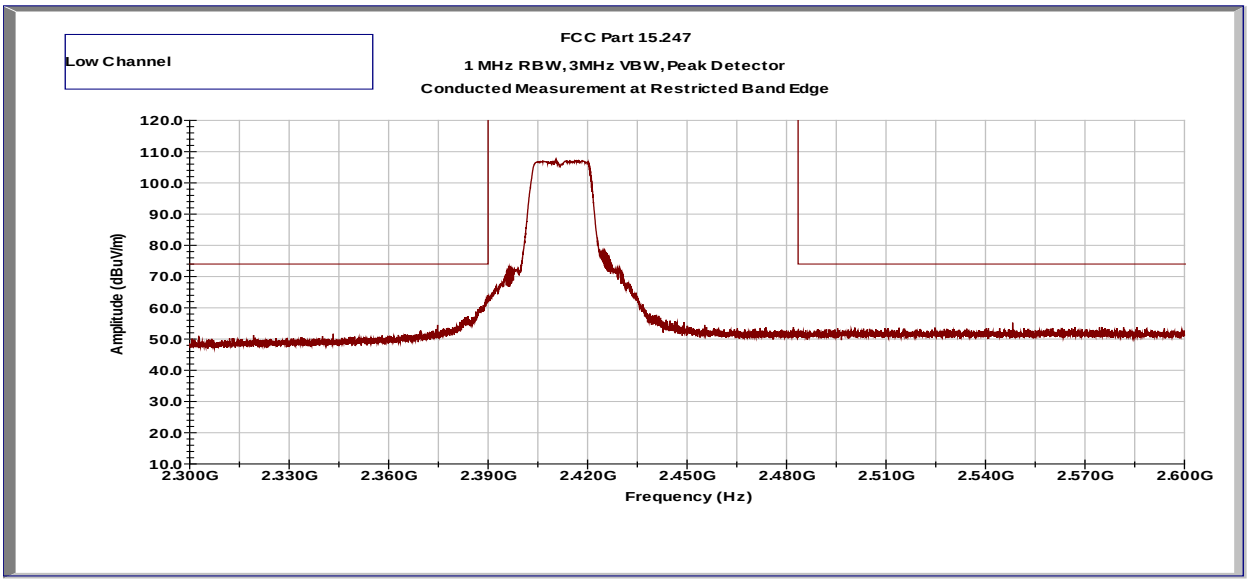
Out-of-Band Spurious Emissions at the Band Edge - 802.11g, 2462 MHz



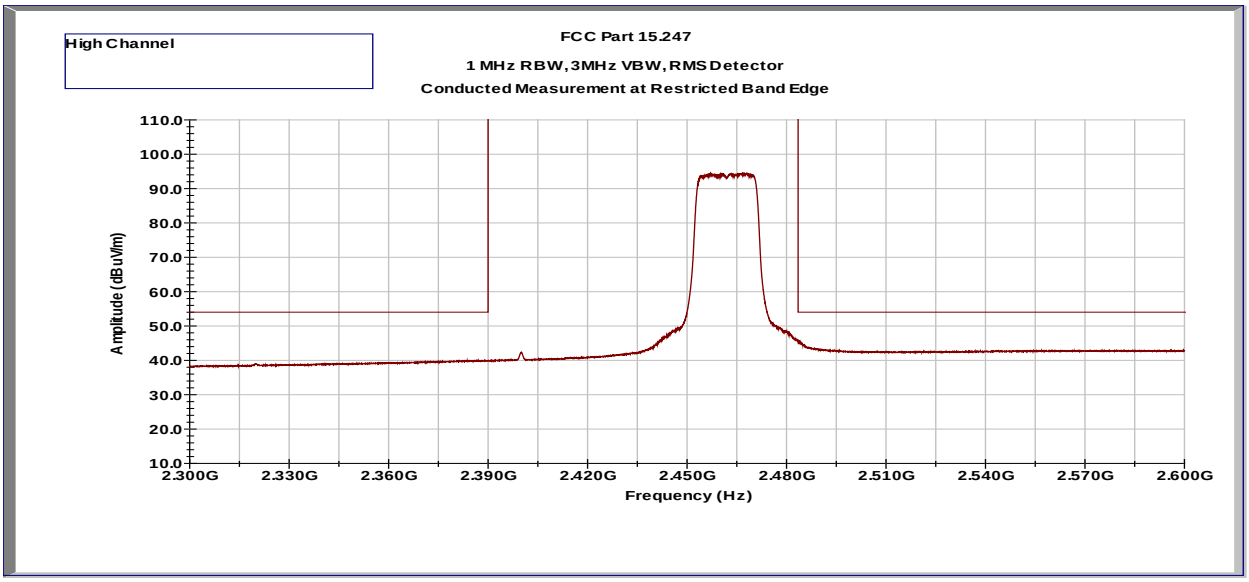


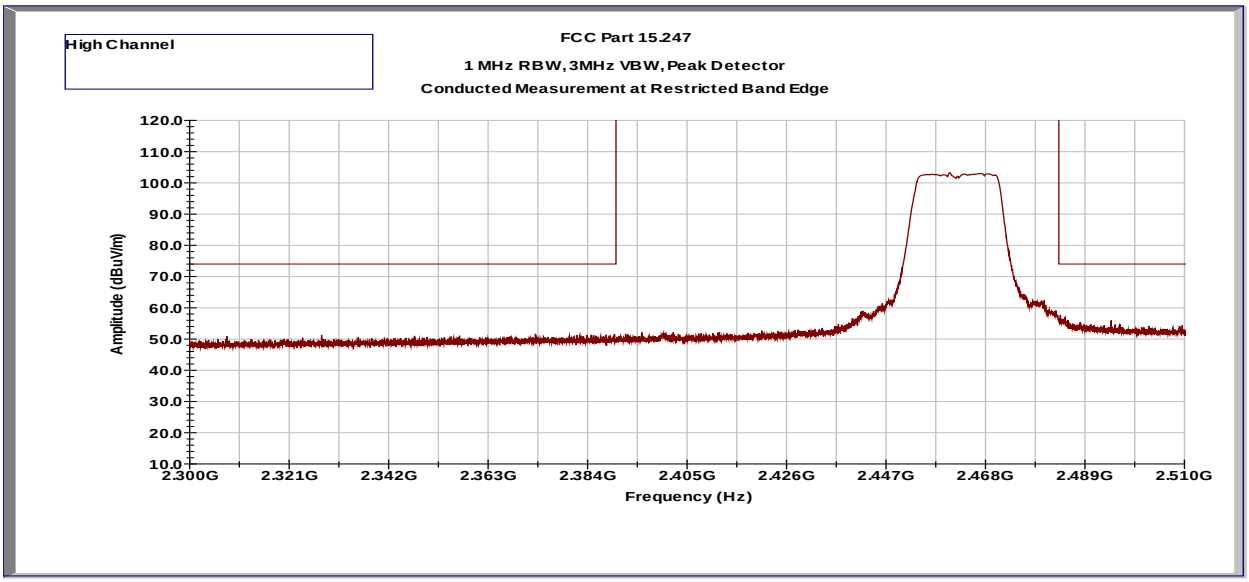
Out-of-Band Spurious Emissions at the Band Edge - 802.11n HT20, 2412 MHz



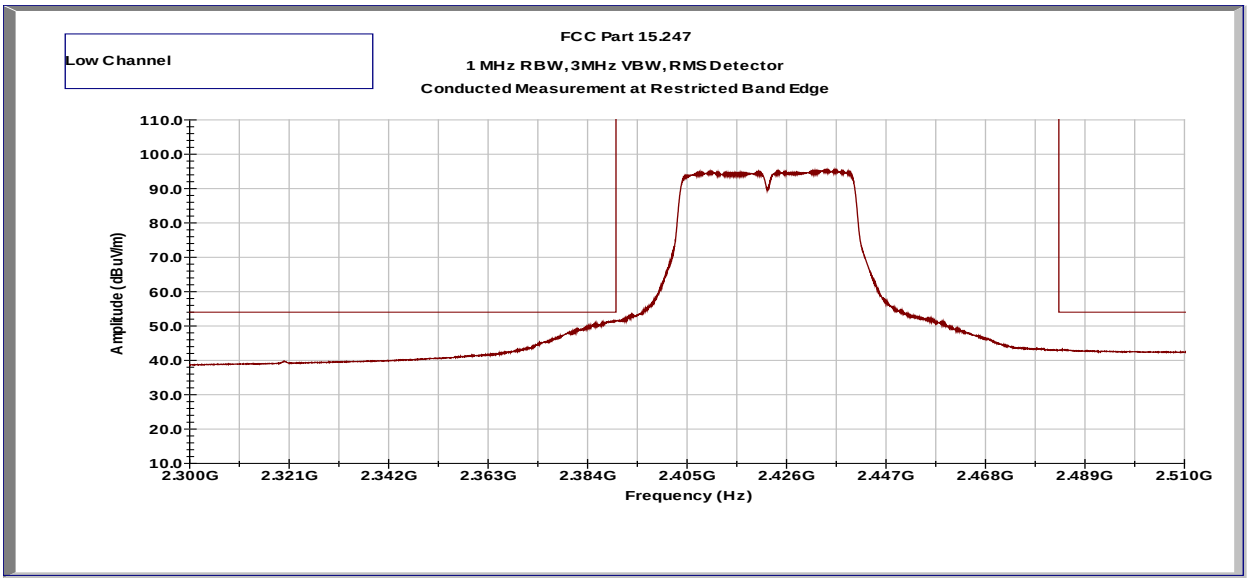


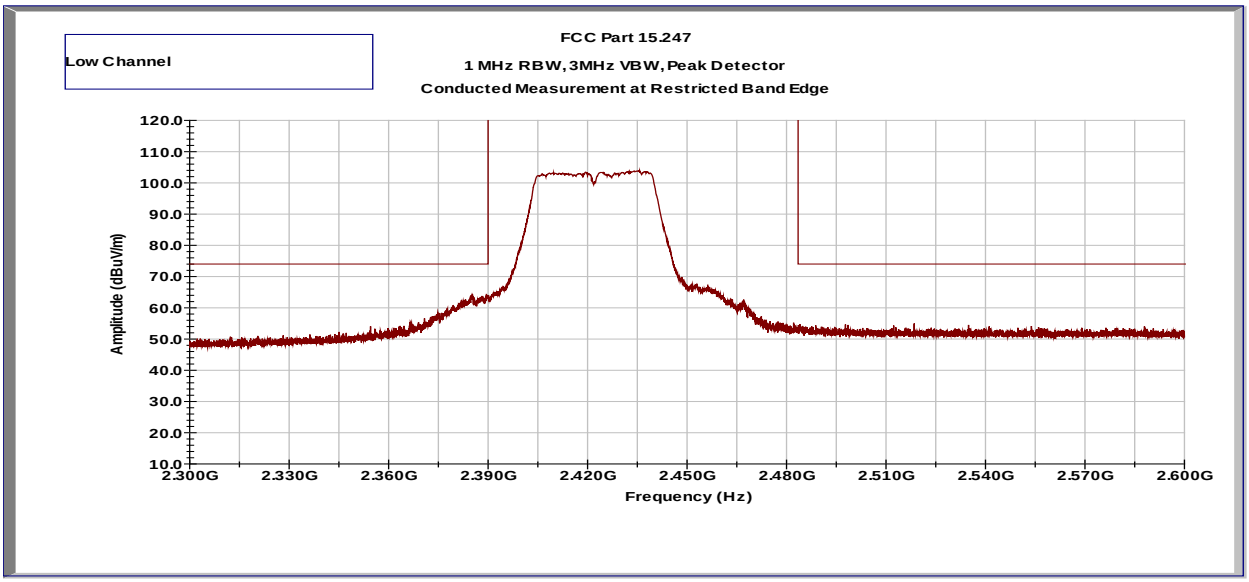
Out-of-Band Spurious Emissions at the Band Edge - 802.11n HT20, 2462 MHz



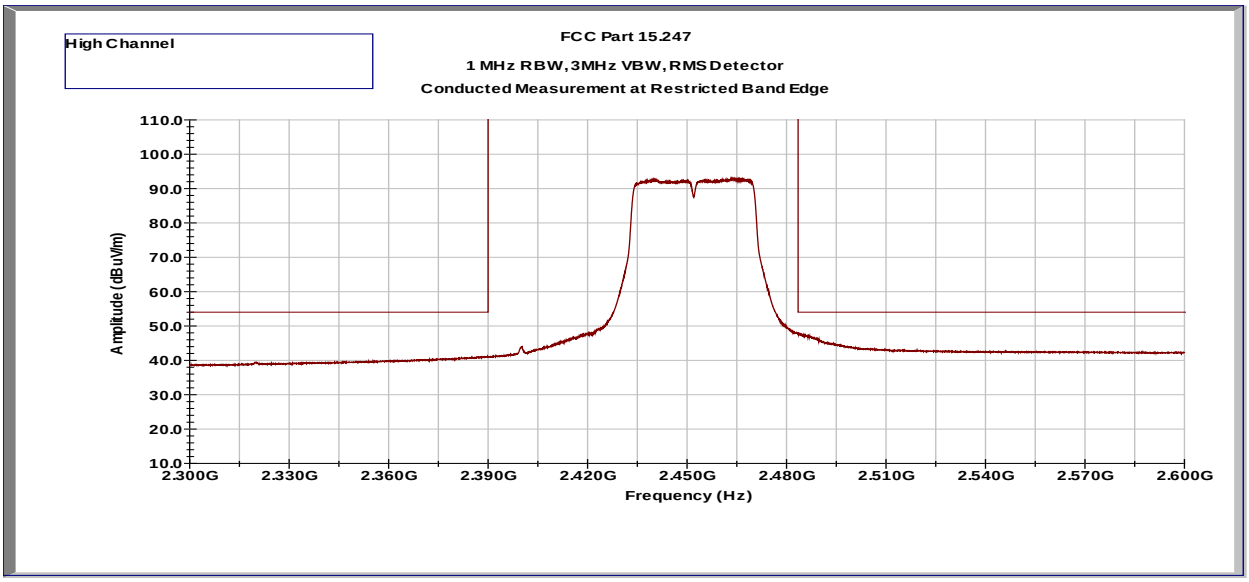


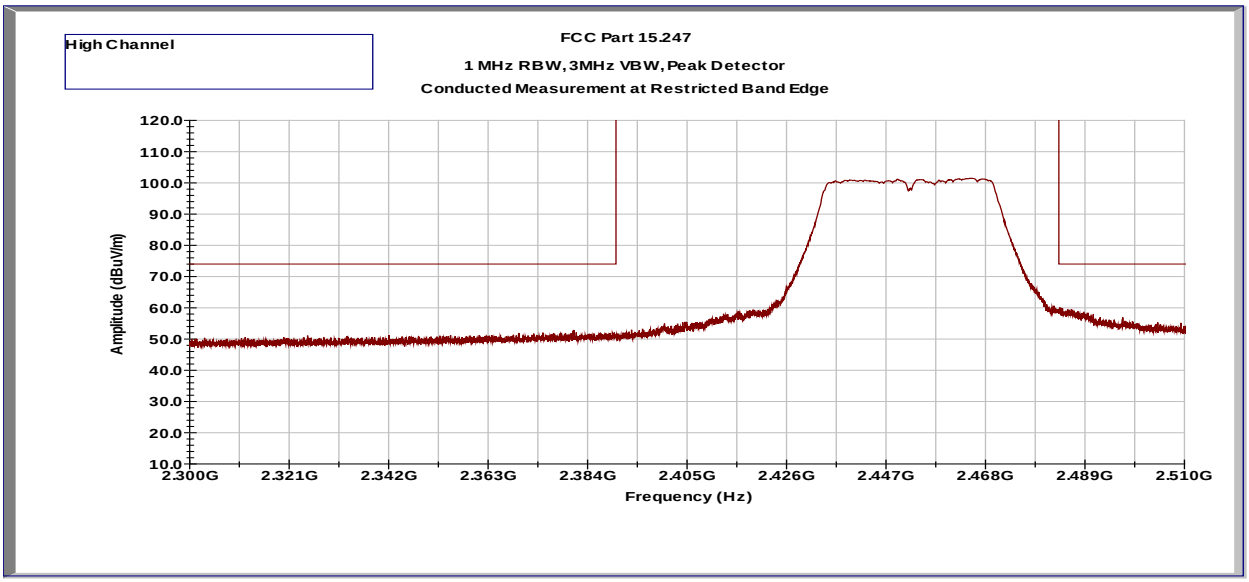
Out-of-Band Spurious Emissions at the Band Edge - 802.11n HT40, 2422 MHz





Out-of-Band Spurious Emissions at the Band Edge - 802.11n HT40, 2452 MHz

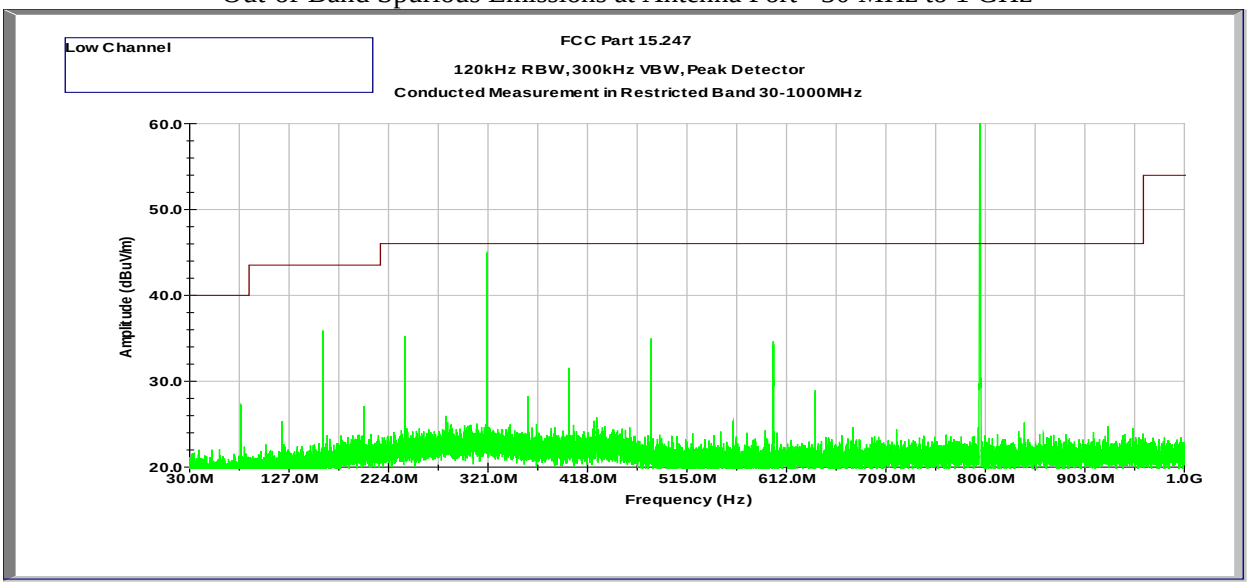




Out-of-Band Conducted Spurious Emissions (at Antenna Port)

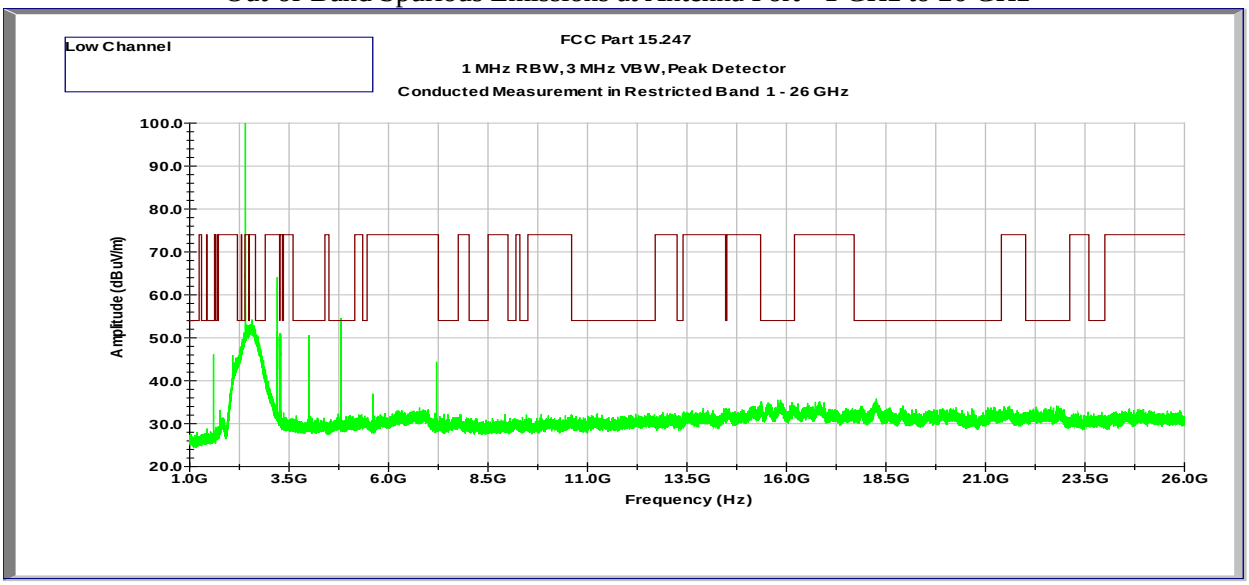
Tx @ 2412MHz 802.11b

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



*The spurious at 320 MHz & 800 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

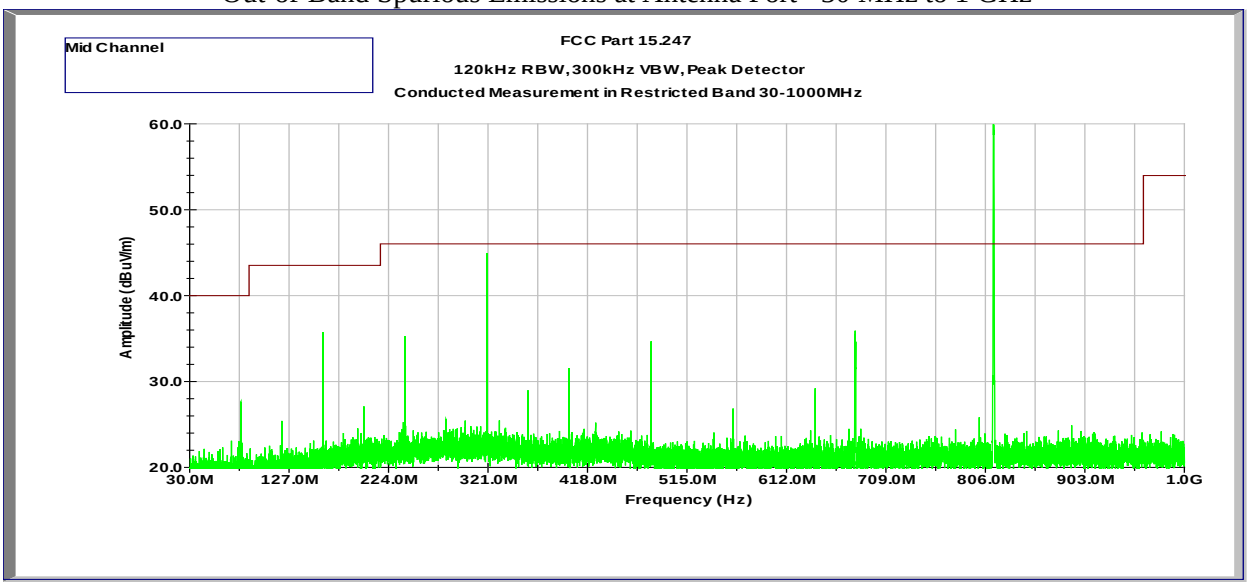


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.824	52.5	54	-1.5	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

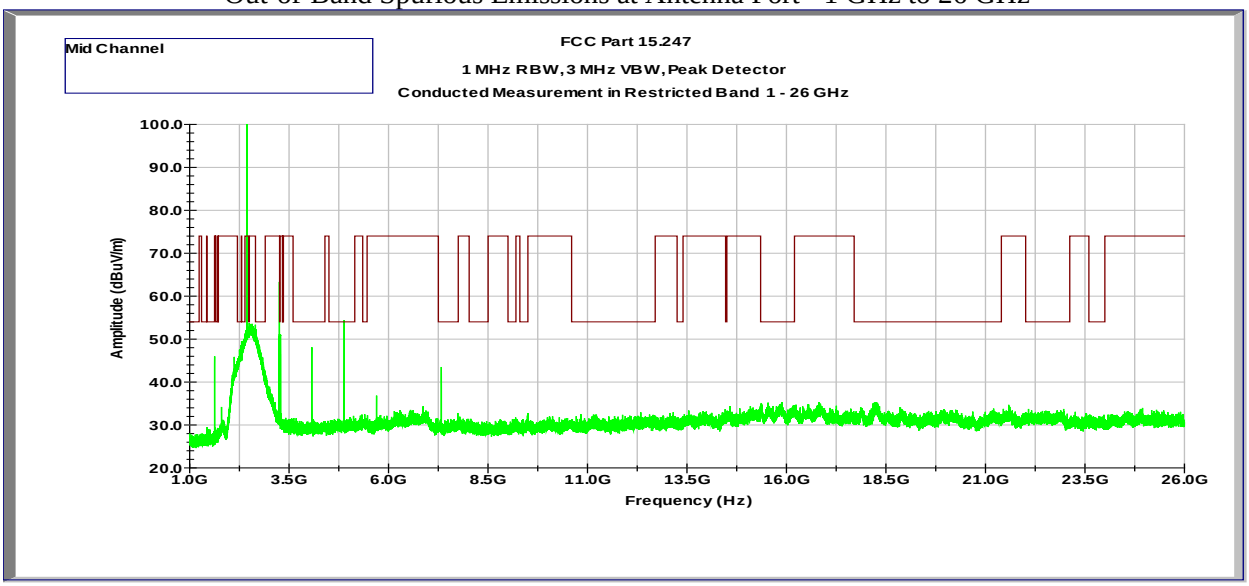
Tx @ 2437MHz 802.11b

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



*The spurious at 320 MHz & 813 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

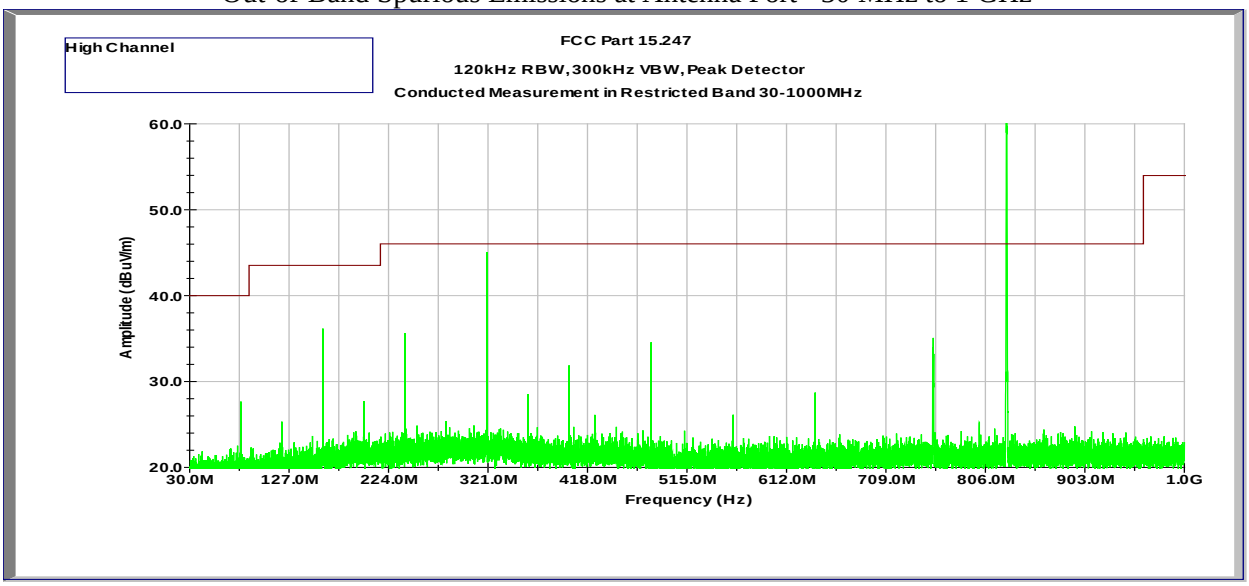


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.874	51.4	54	-2.6	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

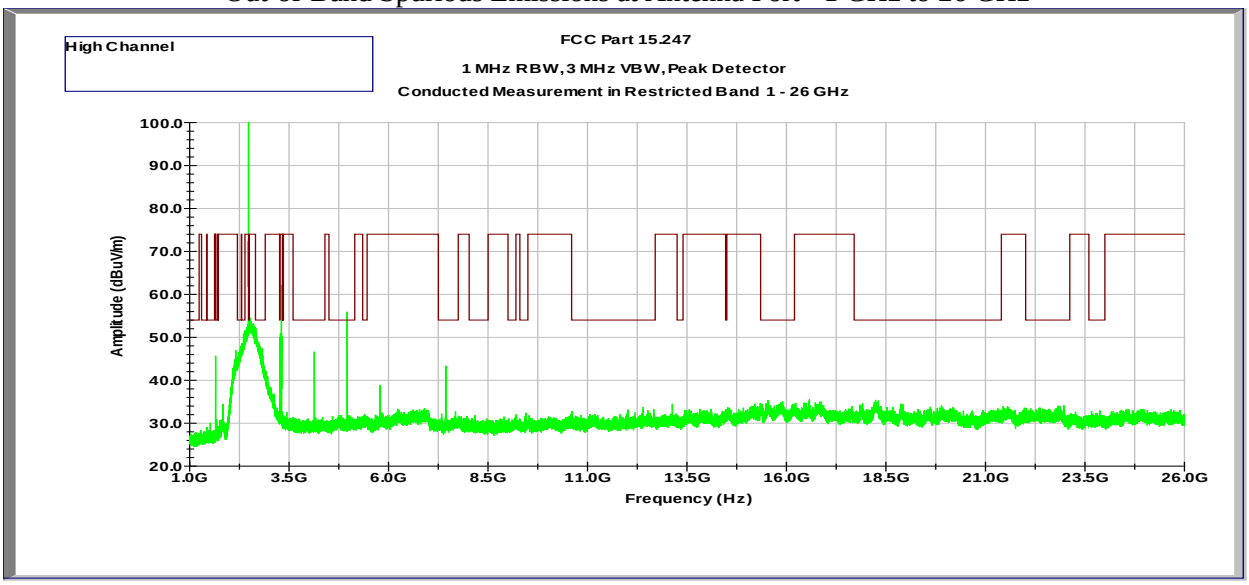
Tx @ 2462MHz 802.11b

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



*The spurious at 320 MHz & 826 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

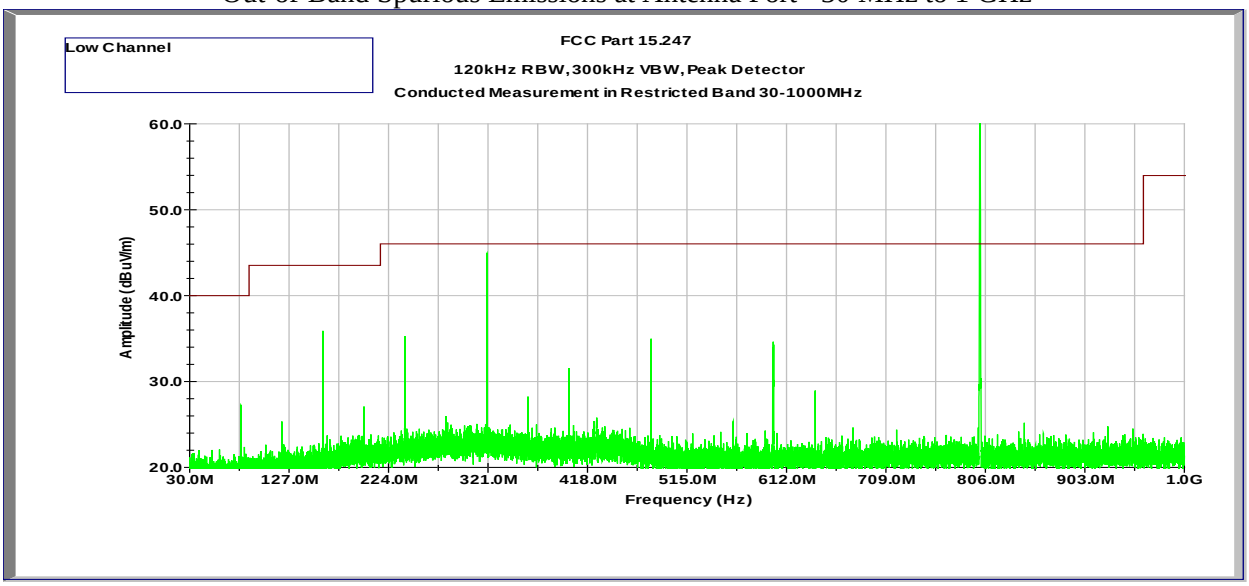


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.924	53.6	54	-0.4	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

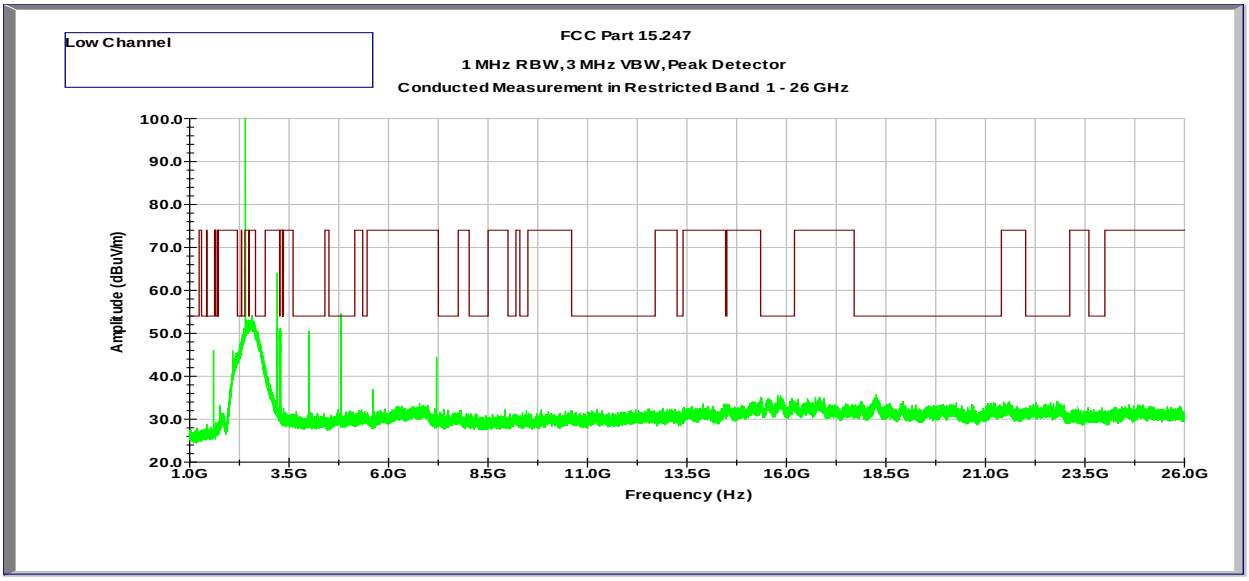
Tx @ 2412MHz 802.11g

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



*The spurious at 320 MHz & 800 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

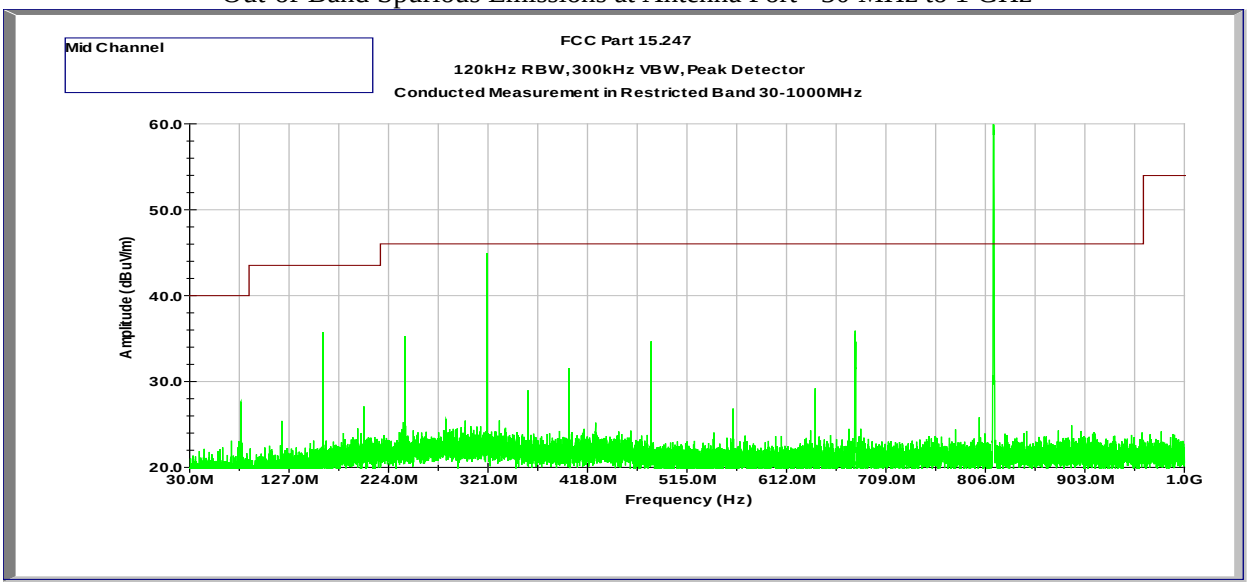


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.824	49.6	54	-4.4	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

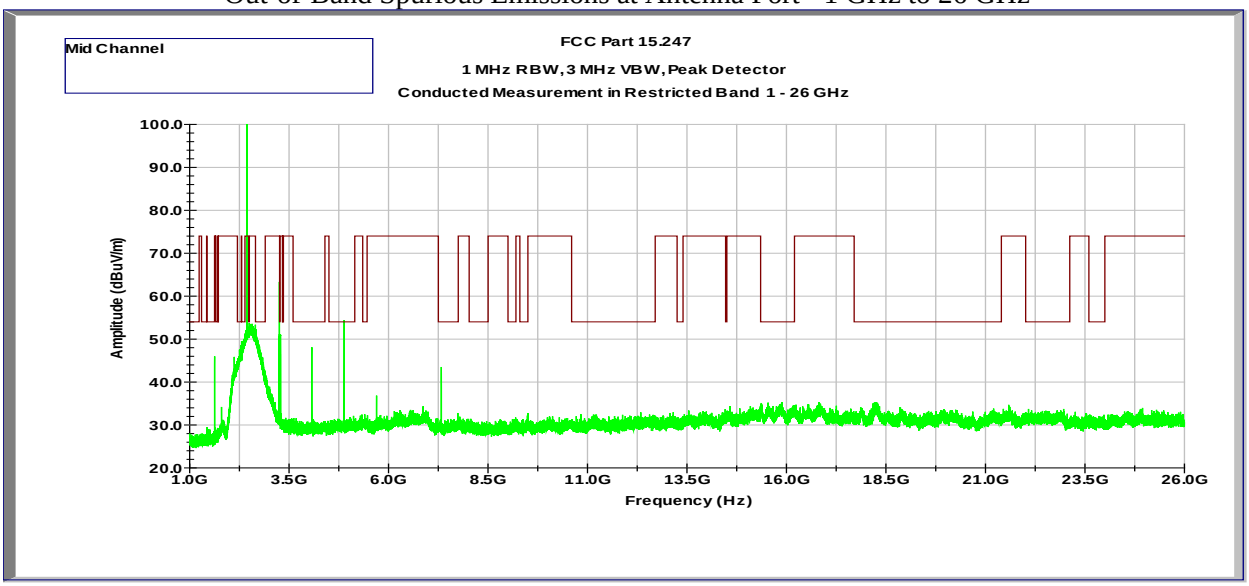
Tx @ 2437MHz 802.11g

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



*The spurious at 320 MHz & 813 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

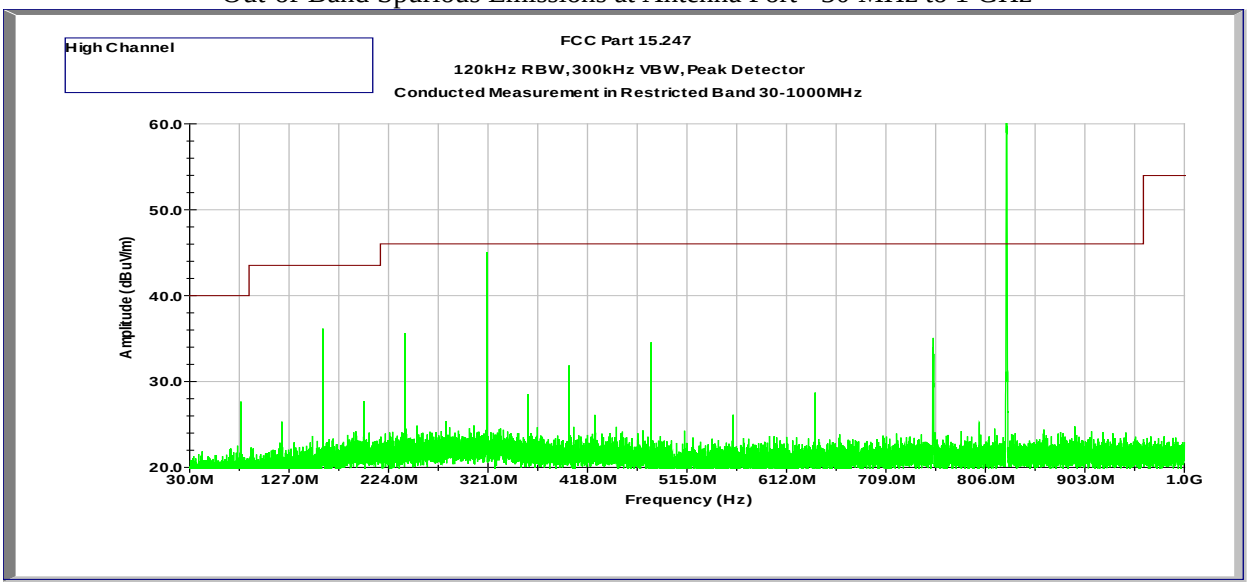


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.874	49.2	54	-4.8	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

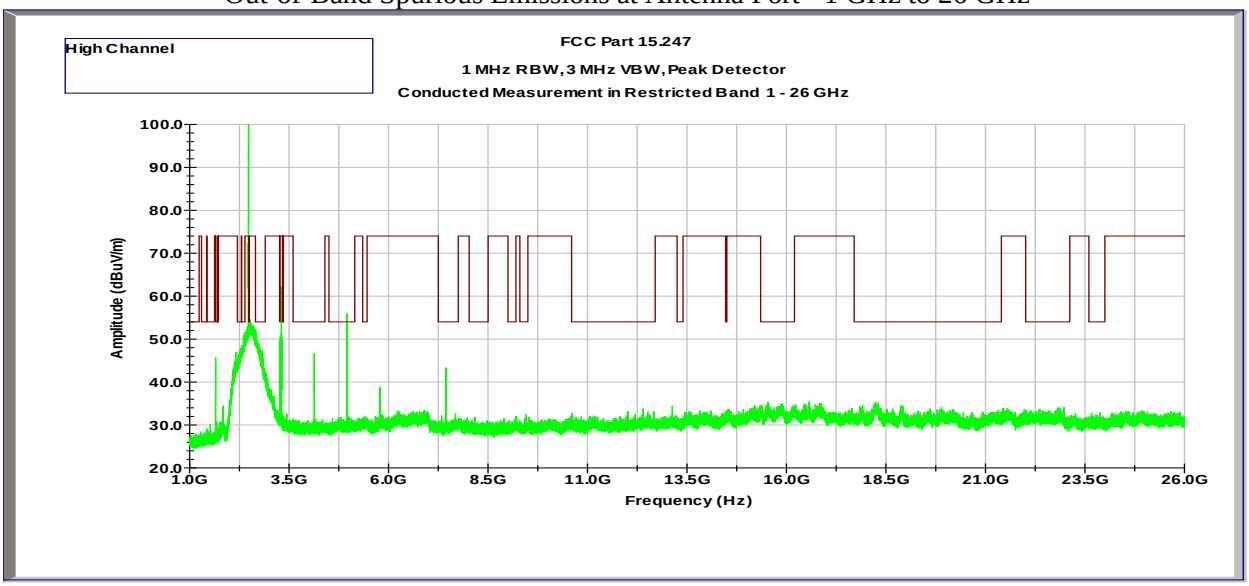
Tx @ 2462MHz 802.11g

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



*The spurious at 320 MHz & 826 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

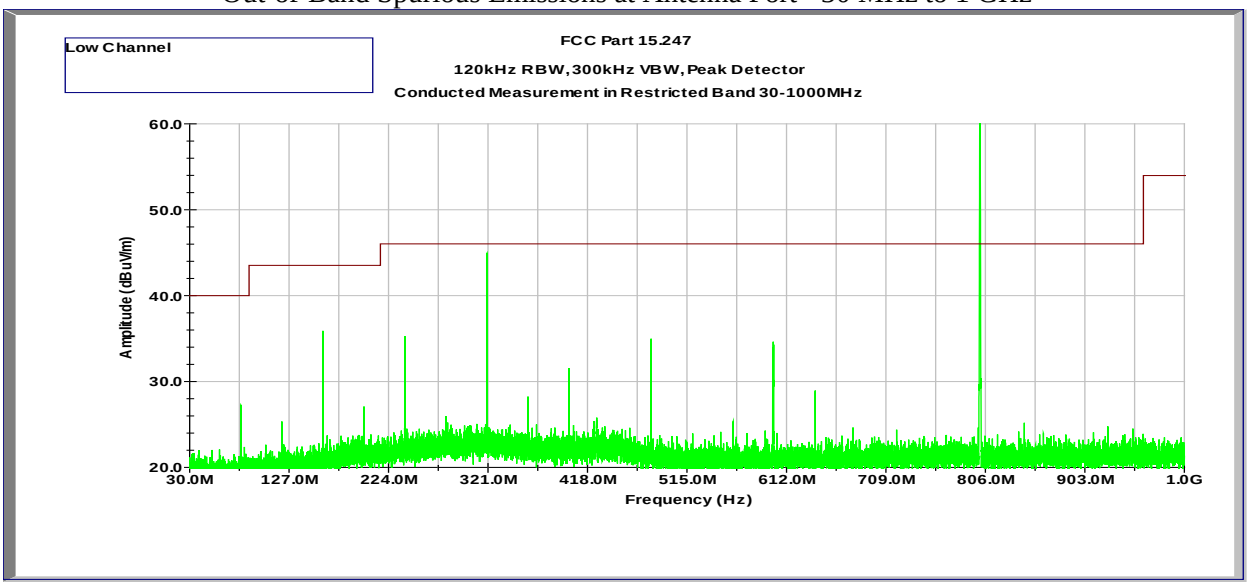


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.924	50	54	-4.0	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

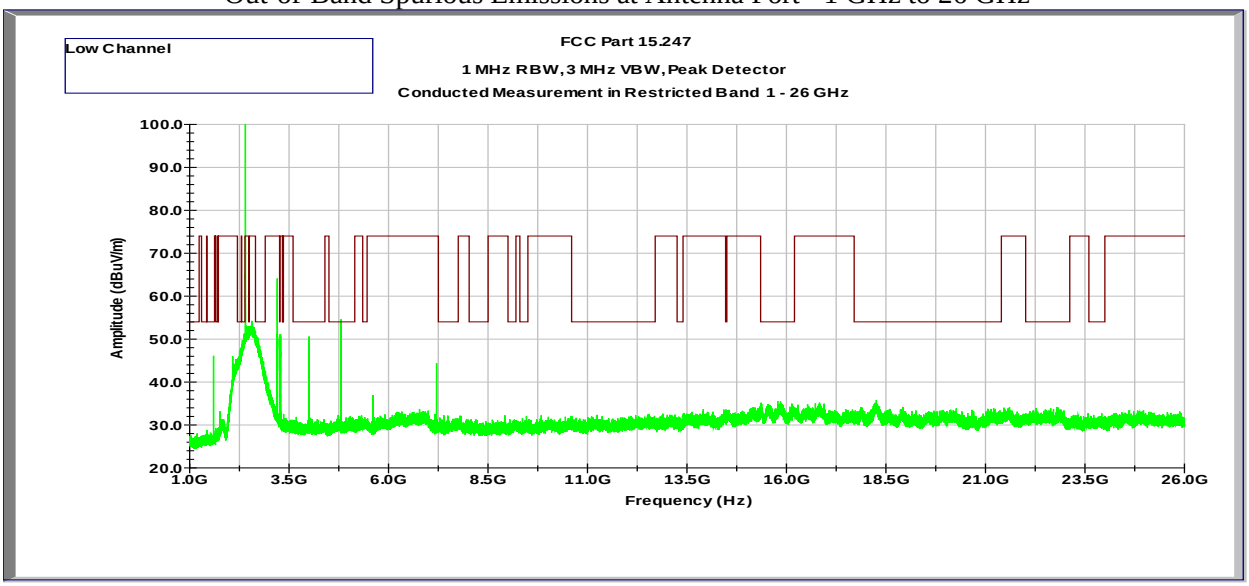
Tx @ 2412MHz 802.11n HT20

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



*The spurious at 320 MHz & 813 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

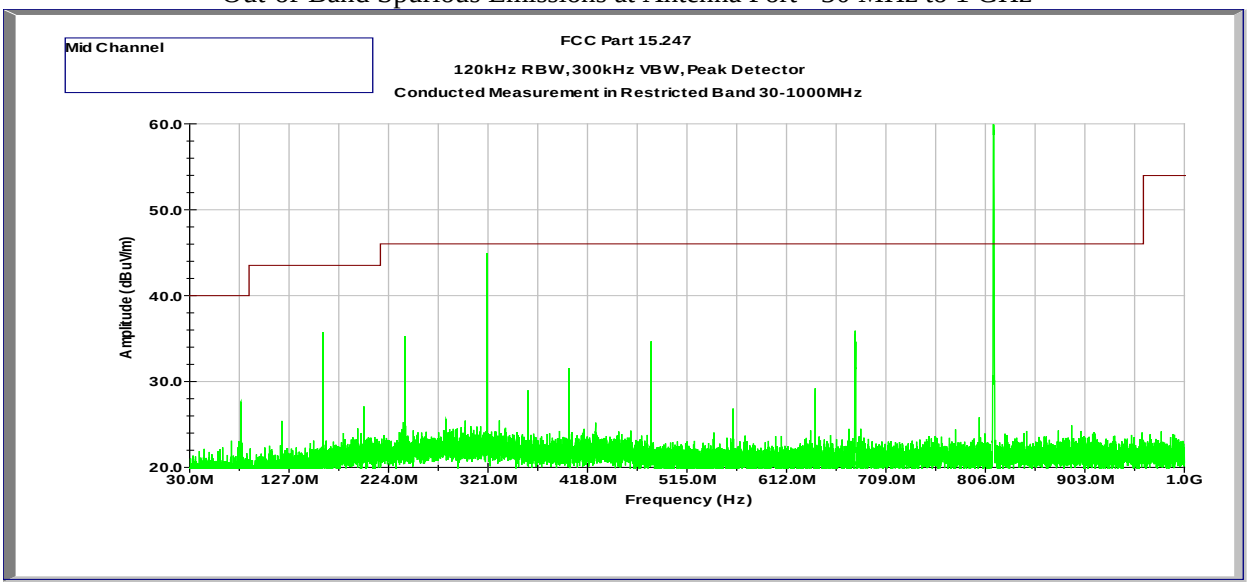


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.824	49.1	54	-4.9	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

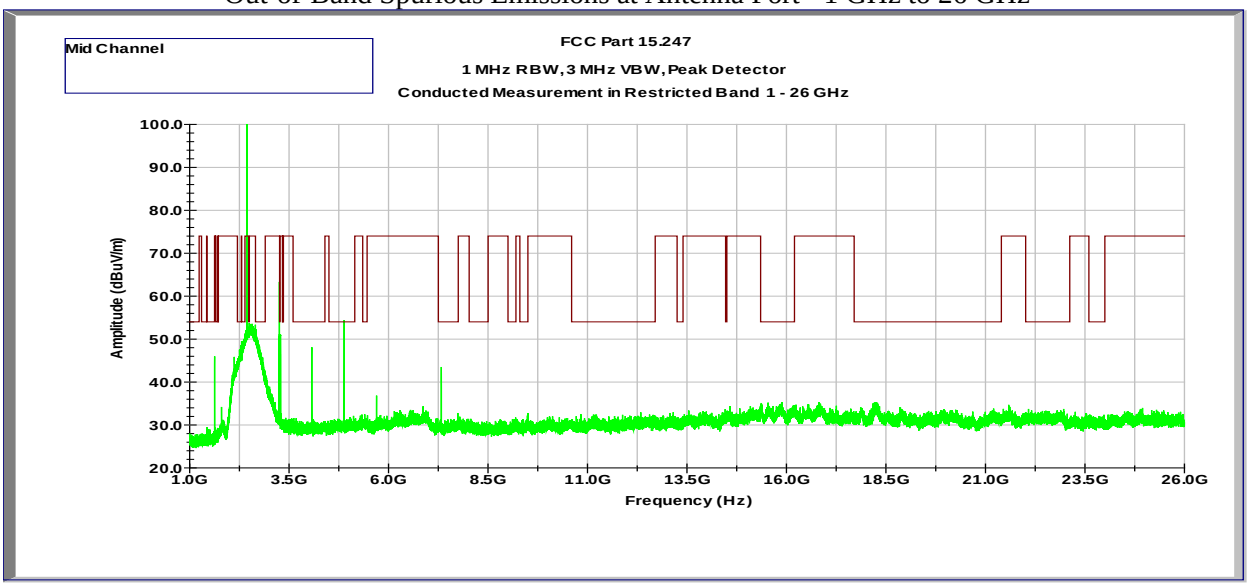
Tx @ 2437MHz 802.11n HT20

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



*The spurious at 320 MHz & 813 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

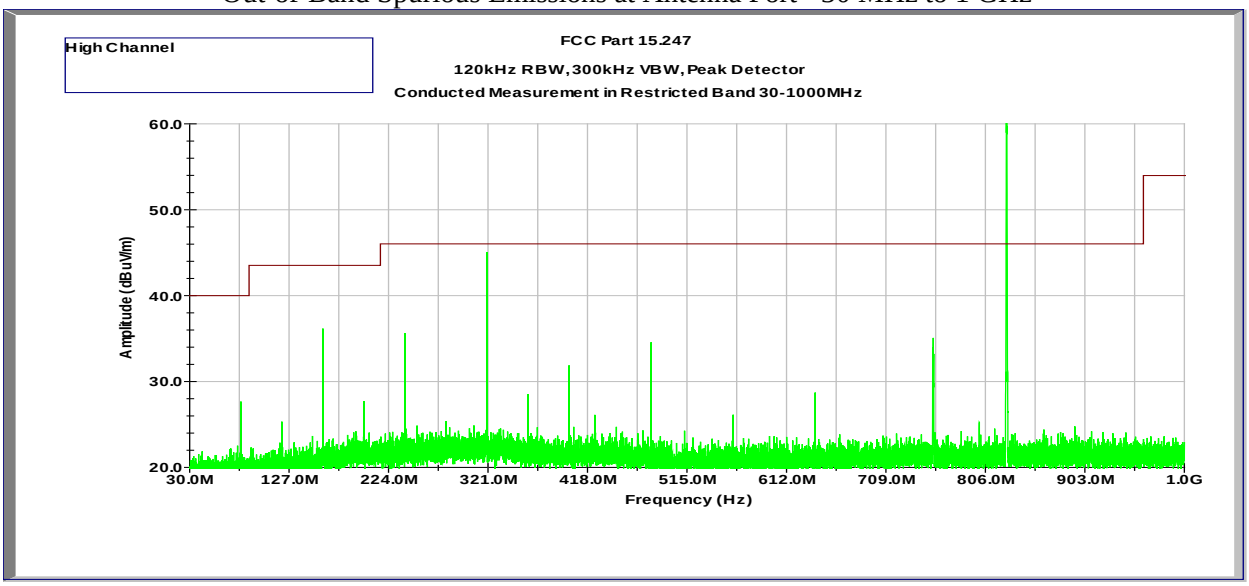


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.874	47.7	54	-6.3	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

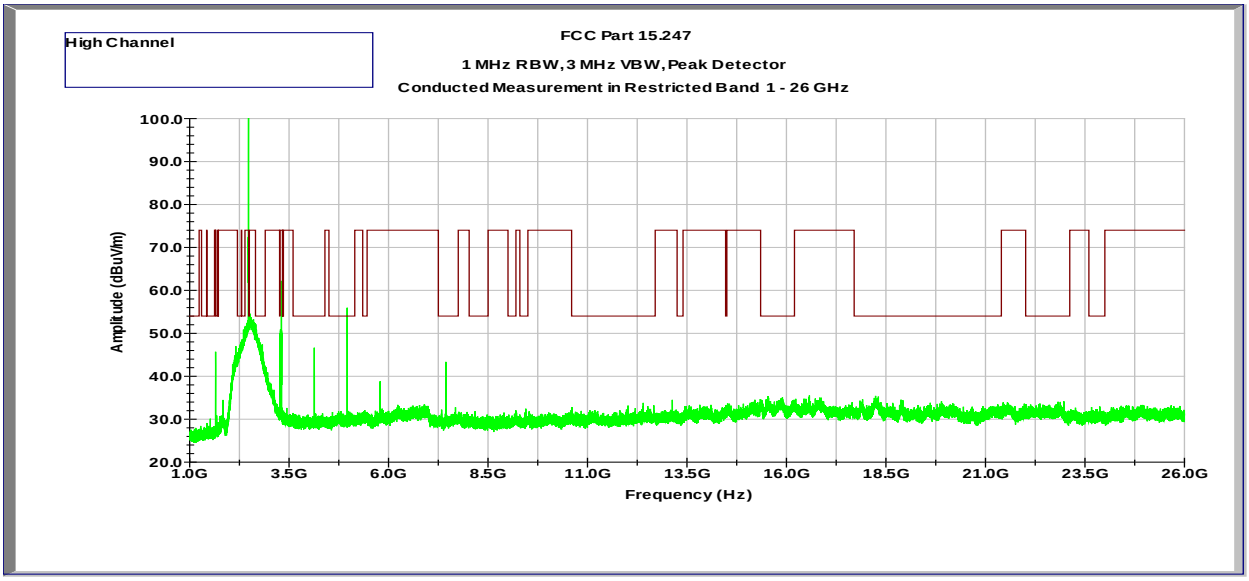
Tx @ 2462MHz 802.11n HT20

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



*The spurious at 320 MHz & 827 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

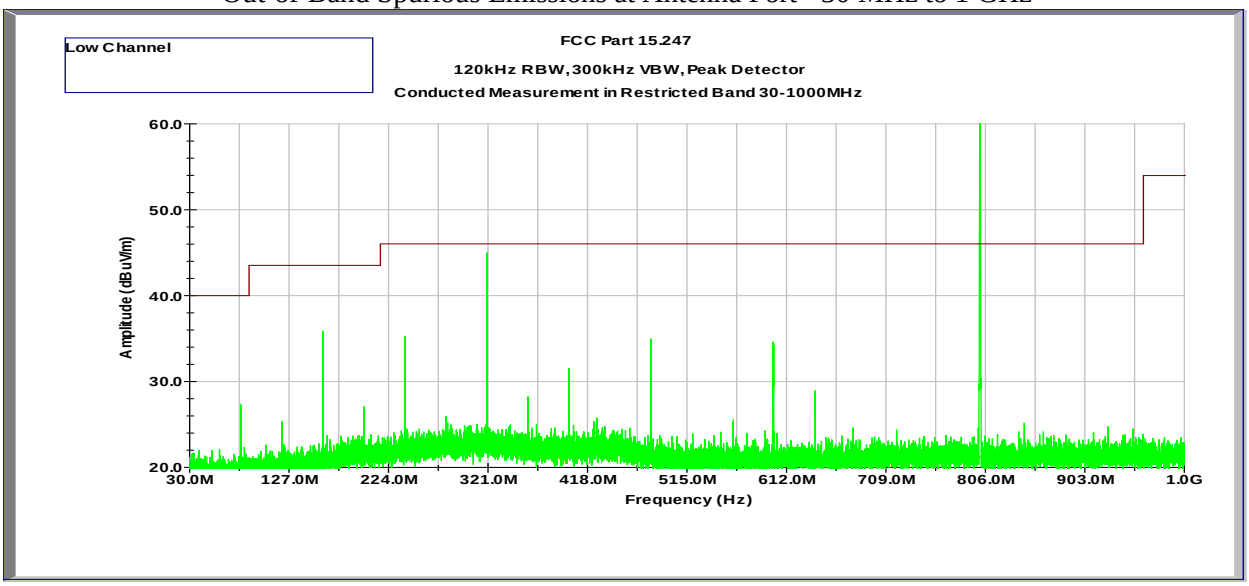


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.924	49.5	54	-4.5	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

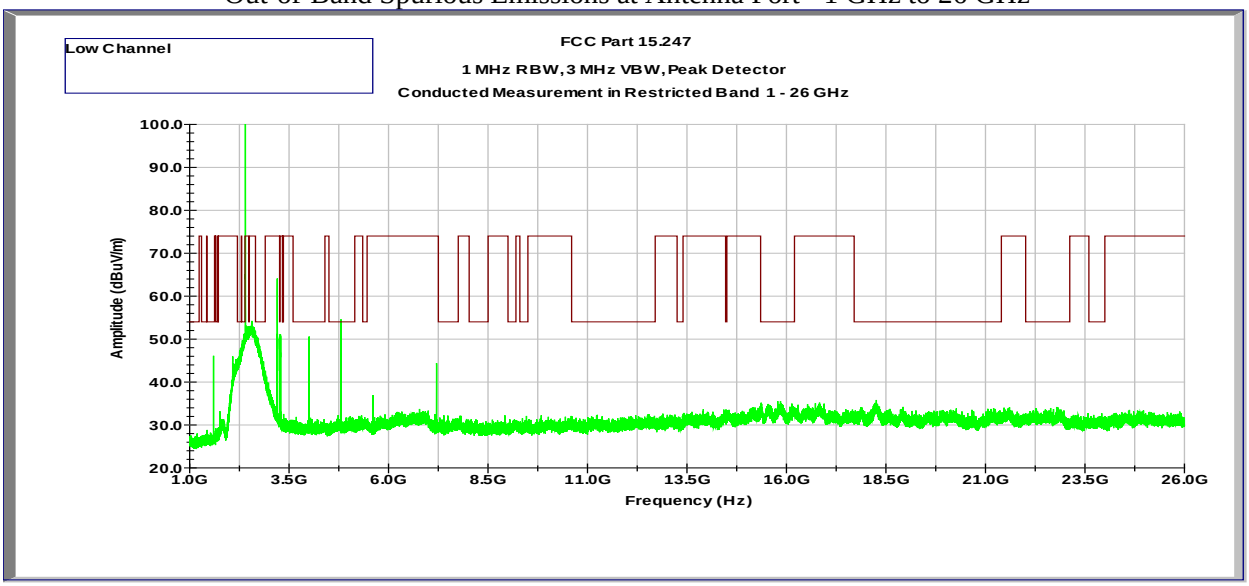
Tx @ 2422MHz 802.11n HT40

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



*The spurious at 320 MHz & 800 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

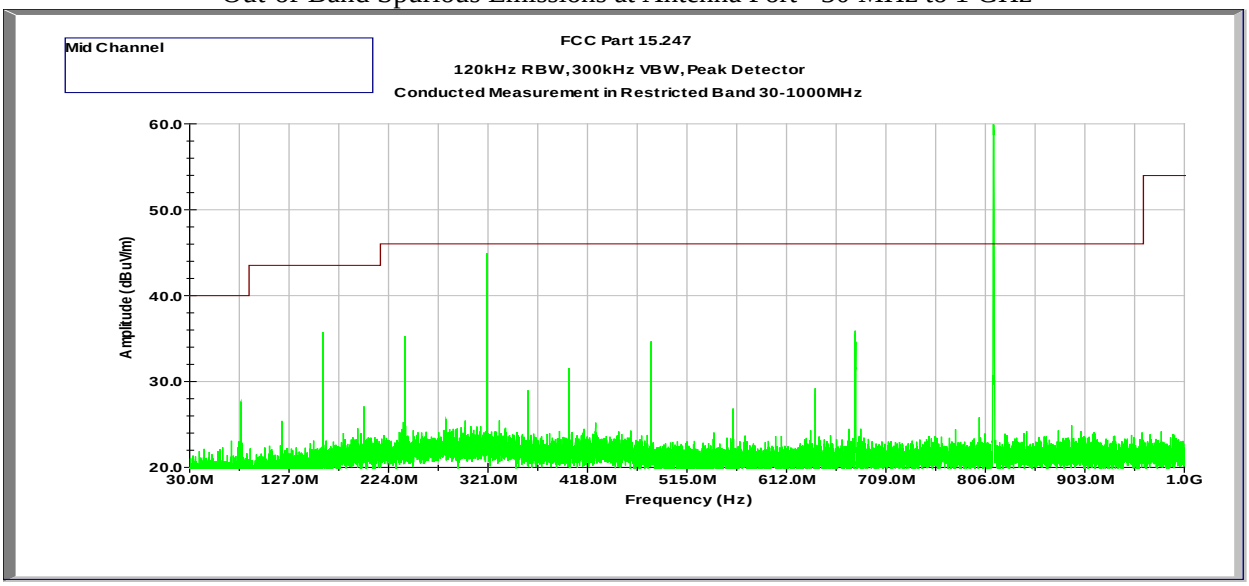


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.844	46.2	54	-7.8	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

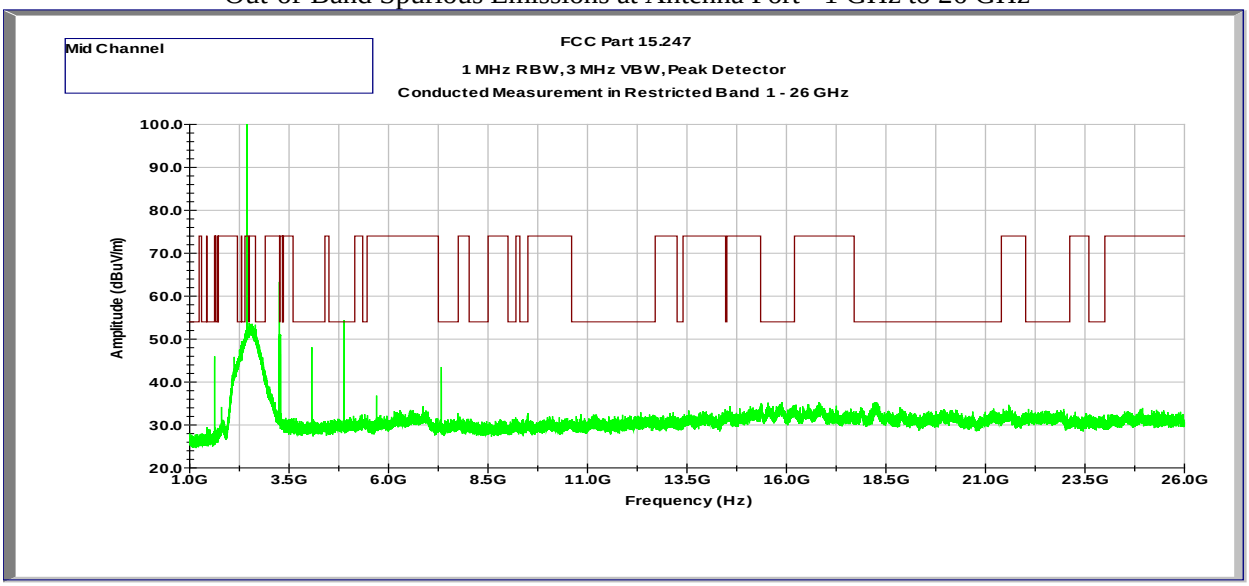
Tx @ 2437MHz 802.11n HT40

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



*The spurious at 320 MHz & 813 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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

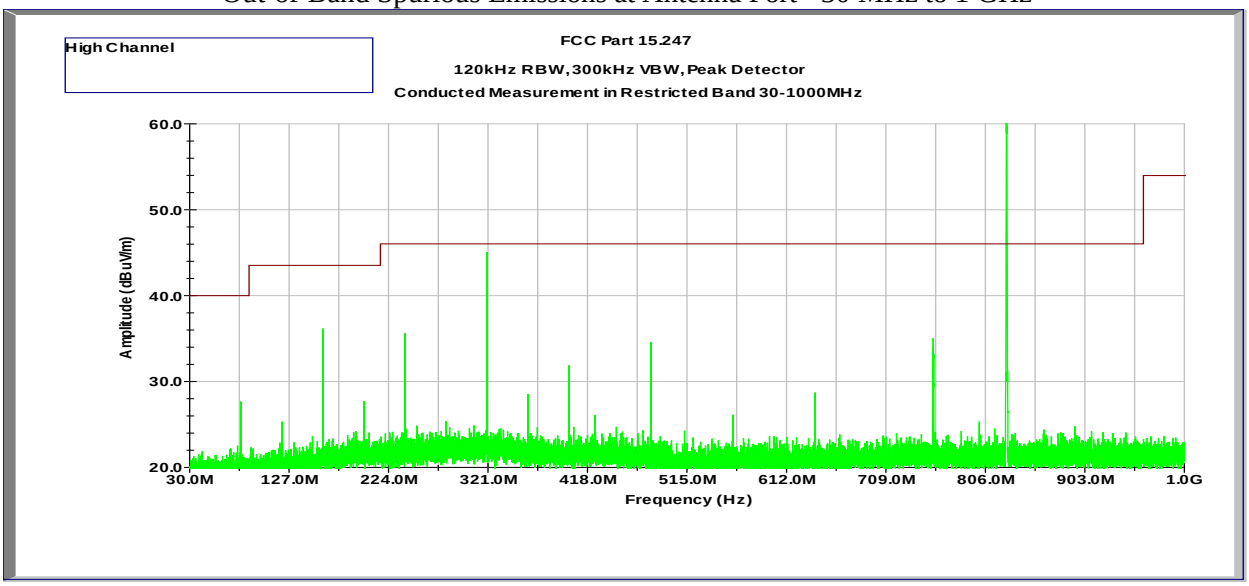


Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.874	45.6	54	-8.4	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

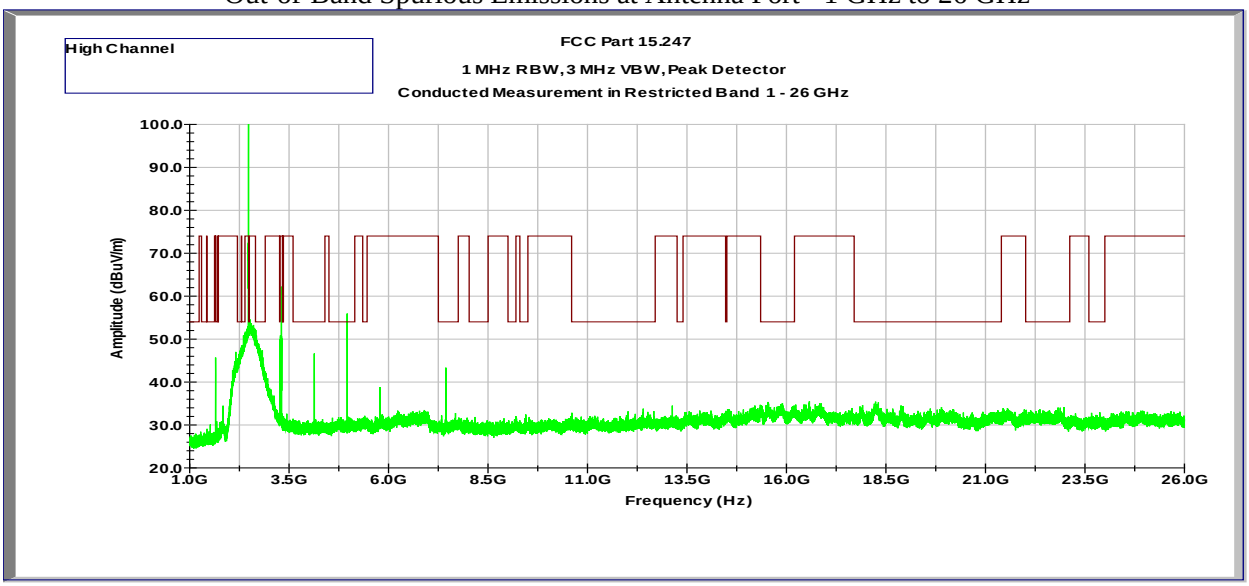
Tx @ 2452MHz 802.11n HT40

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



*The spurious at 320 MHz & 826 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

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



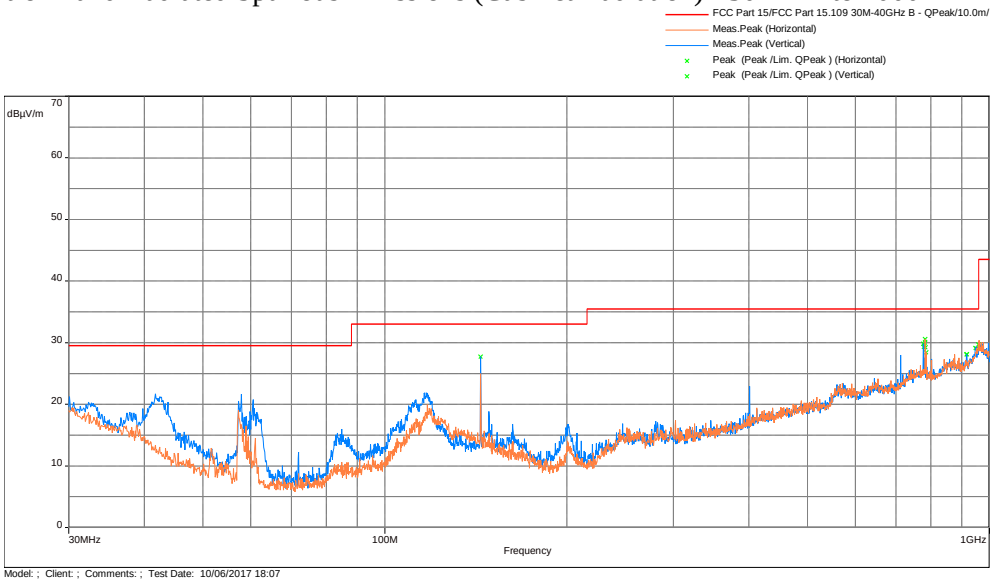
Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dBµV/m	dBµV/m	dB		
4.904	46.0	54	-8.0	RMS	Pass

Note: Duty Cycle Correction Factor **δ** (dB) of 0.6 dB was applied.

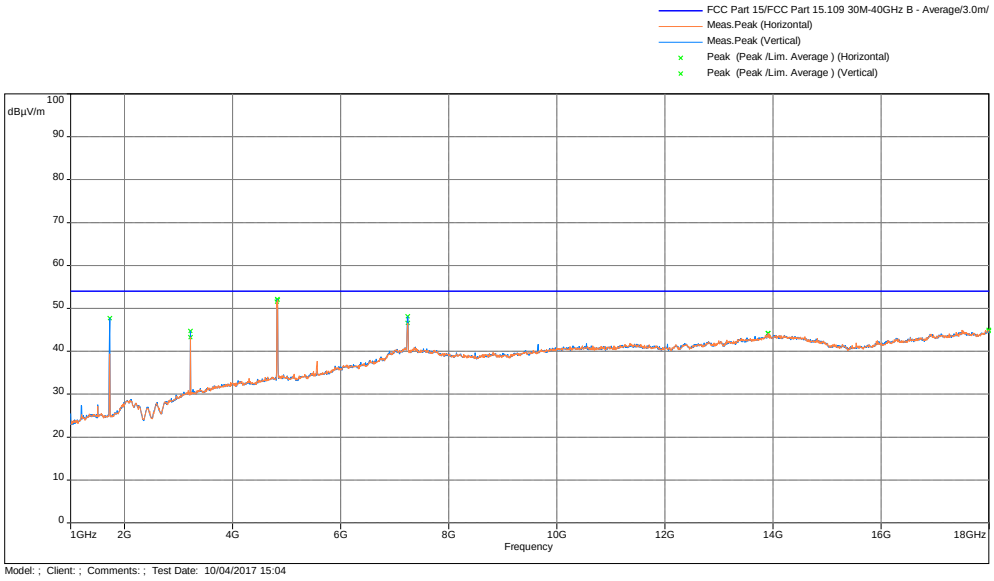
Out-of-Band Radiated Spurious Emissions (Cabinet Radiation)

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

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

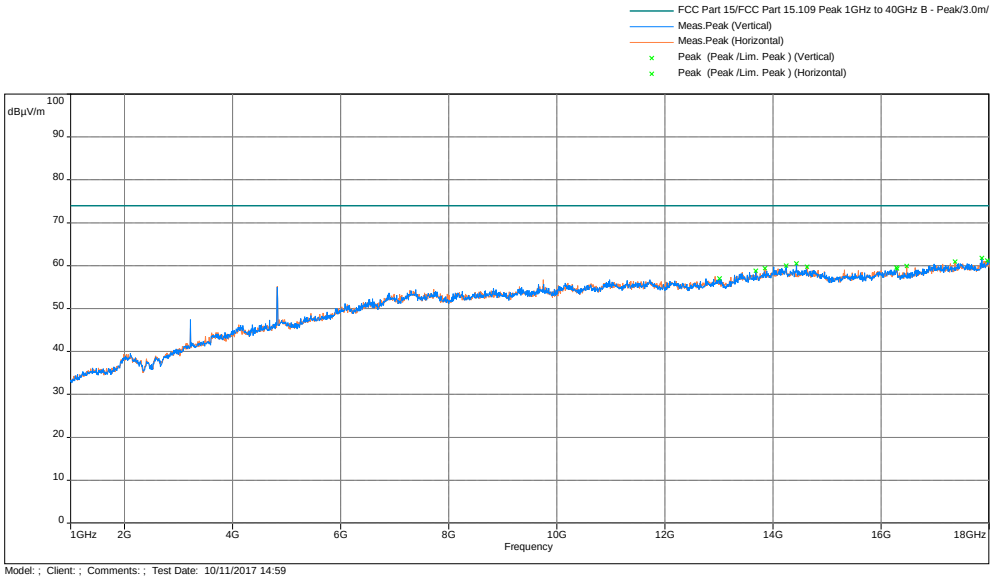


Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



Frequency	Peak	Limit	Margin	Height	Angle	Polarization	Correction
MHz	dBµV/m	dBµV/m	dB	m	°		dB
4824	51.55	54	-2.45	1	271.75	Horizontal	5.99
4824	51.94	54	-2.06	1	271.75	Horizontal	6.01

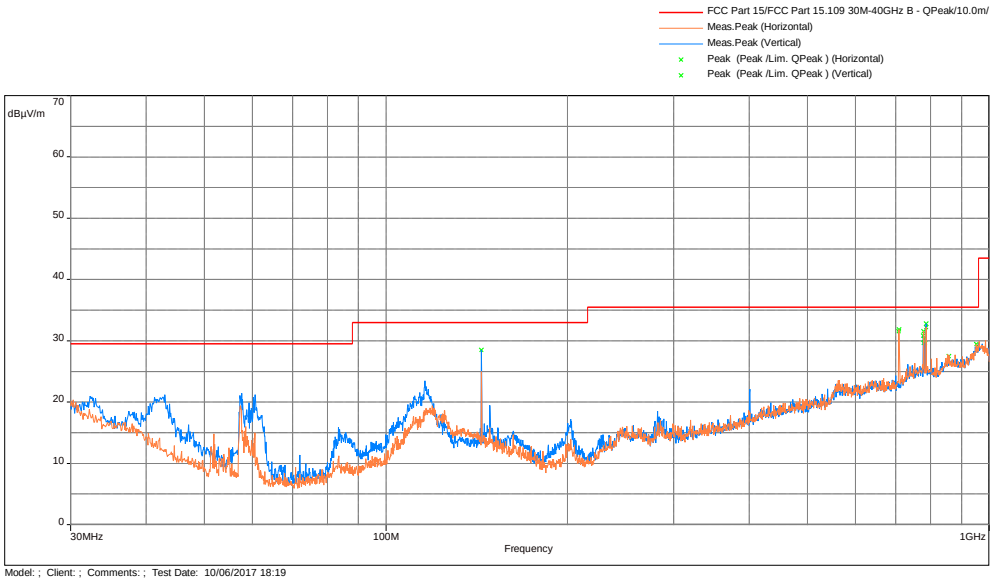
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

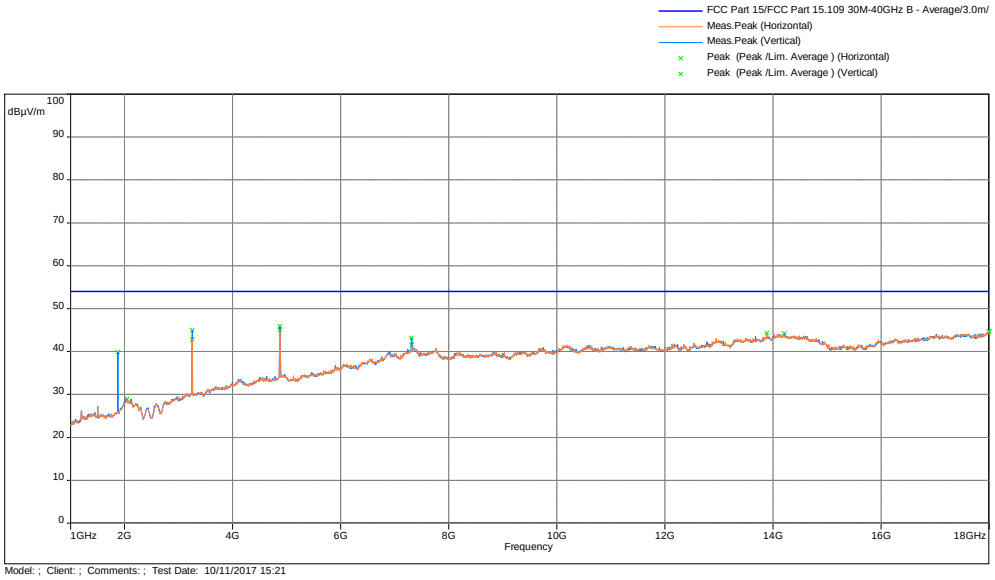
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11b 2437MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz



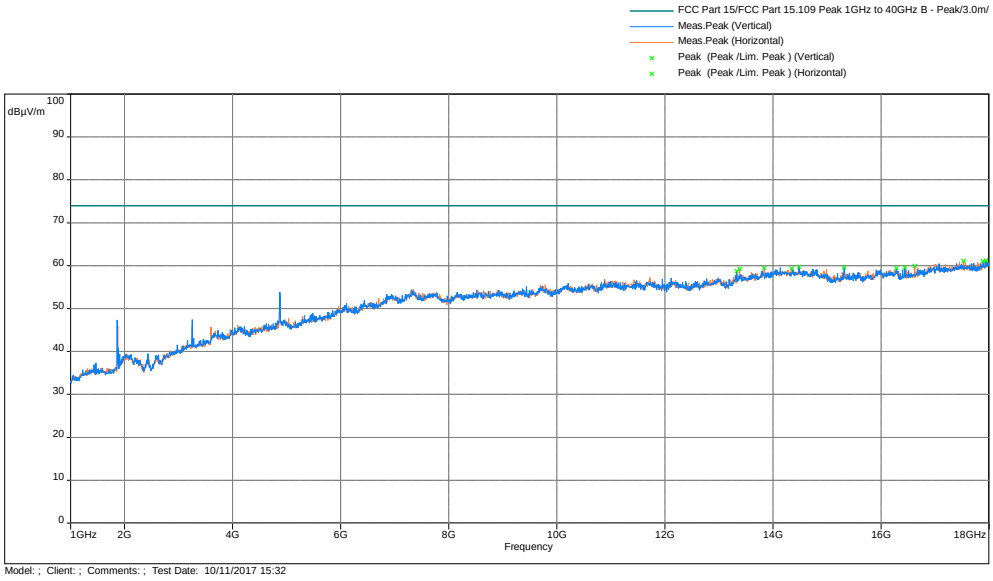
Model: ; Client: ; Comments: ; Test Date: 10/06/2017 18:19

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



Model: ; Client: ; Comments: ; Test Date: 10/11/2017 15:21

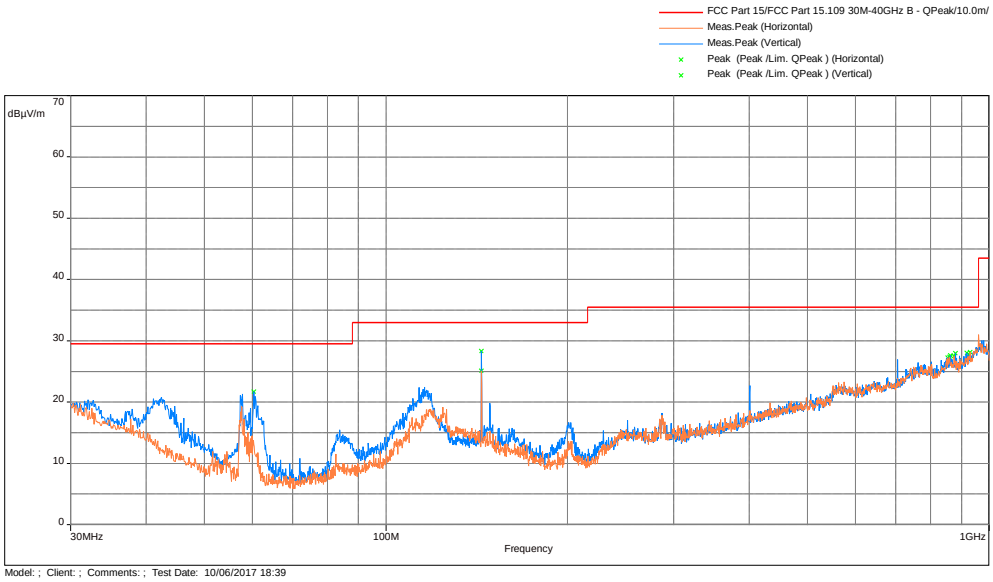
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

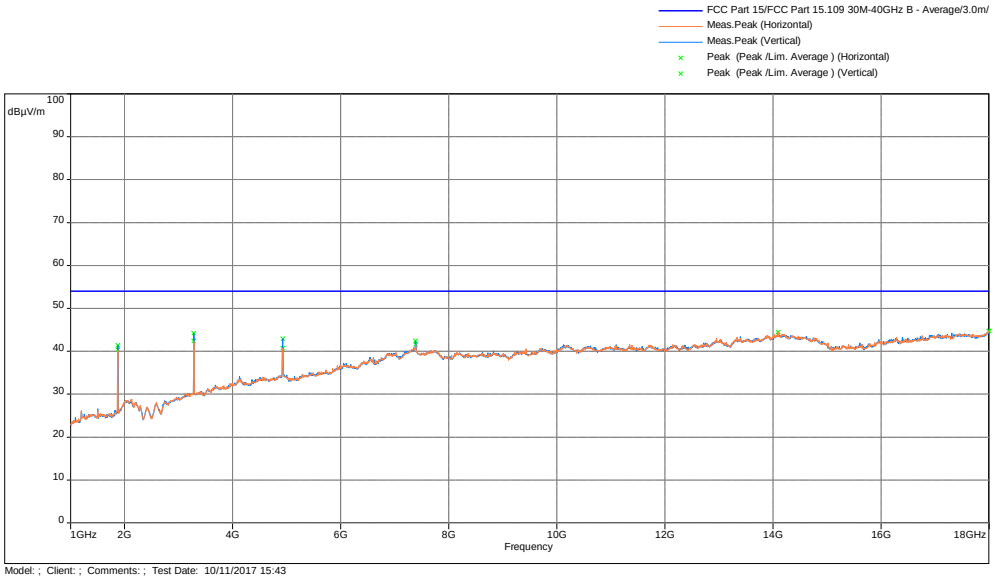
Test Results: 15.209 Radiated Spurious Emissions , Tx at 802.11b 2462MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz



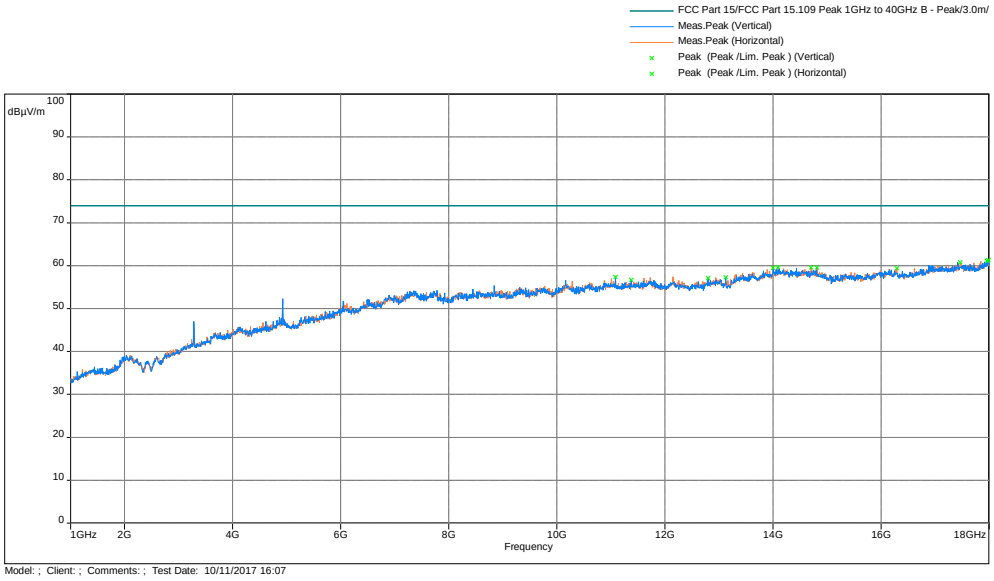
Model: ; Client: ; Comments: ; Test Date: 10/06/2017 18:39

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



Model: ; Client: ; Comments: ; Test Date: 10/11/2017 15:43

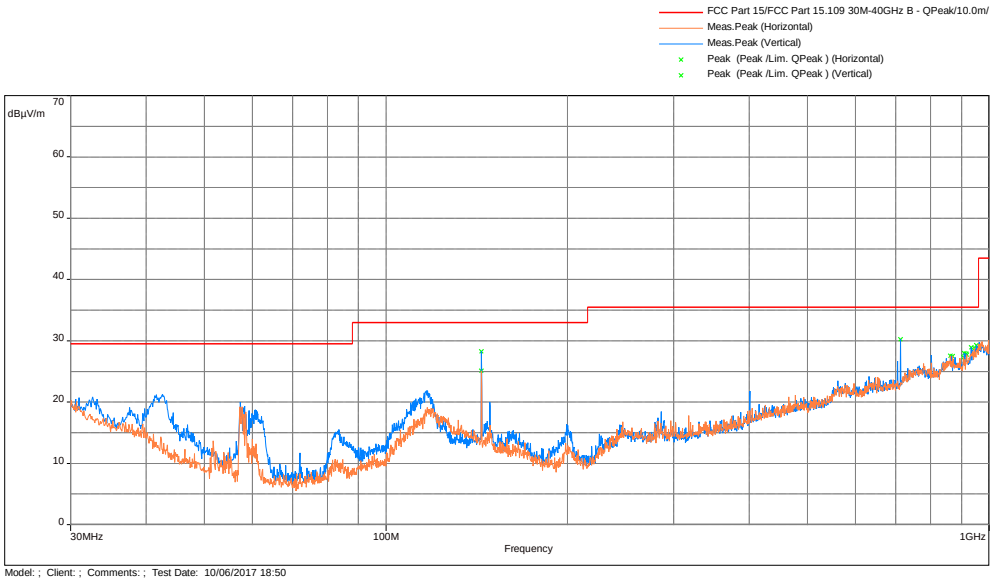
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

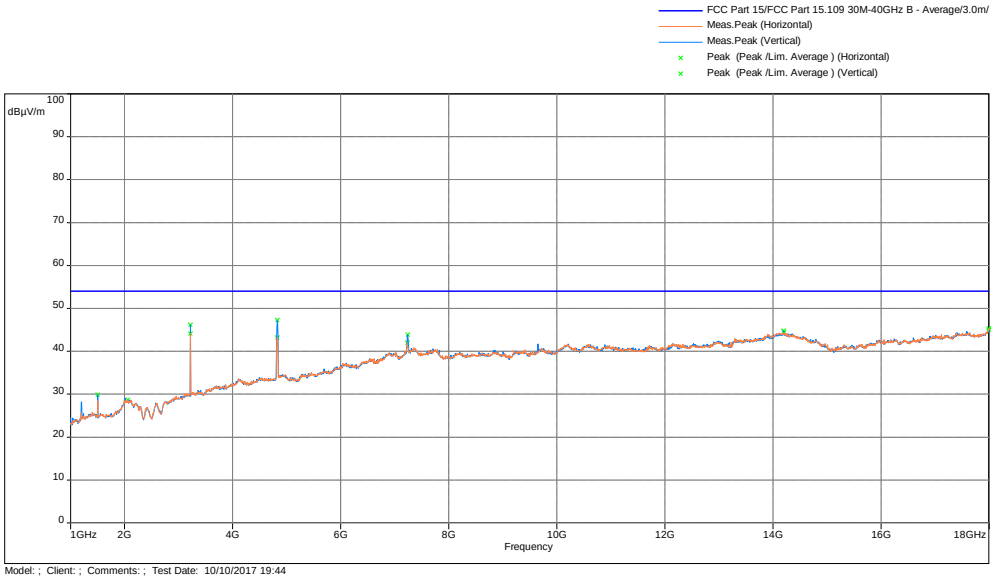
Test Results: 15.209 Radiated Spurious Emissions , Tx at 802.11g 2412MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz



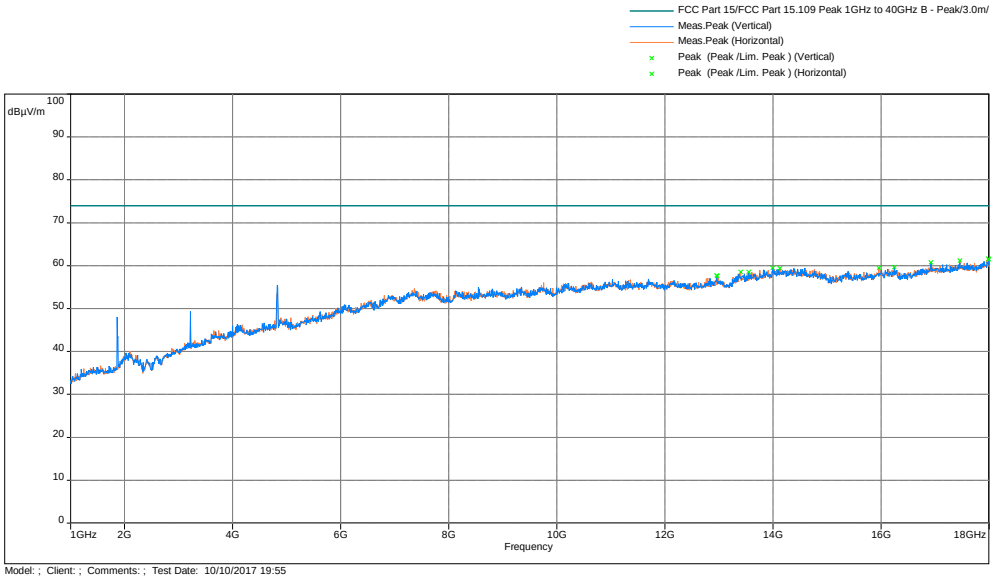
Model: ; Client: ; Comments: ; Test Date: 10/06/2017 18:50

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



Model: ; Client: ; Comments: ; Test Date: 10/10/2017 19:44

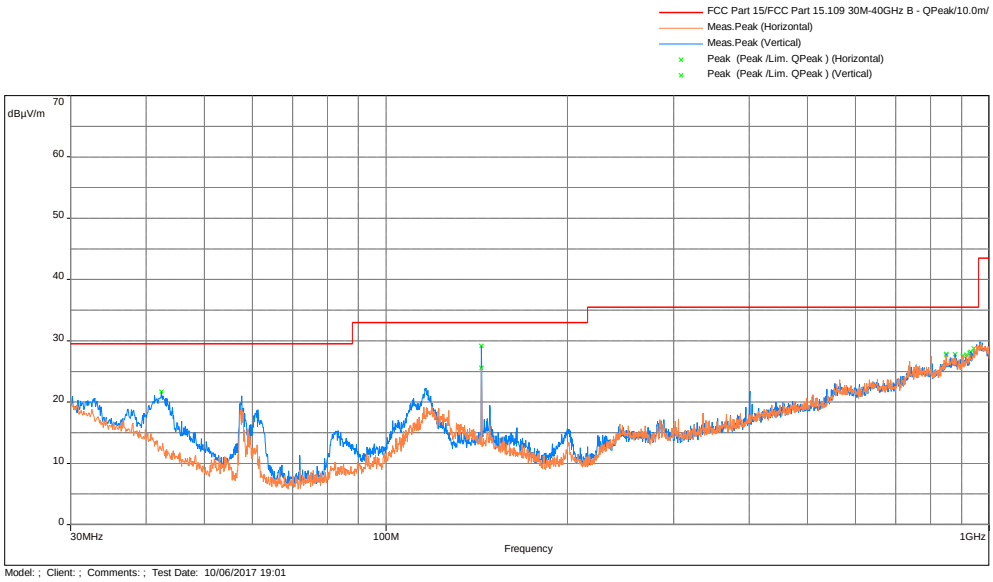
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

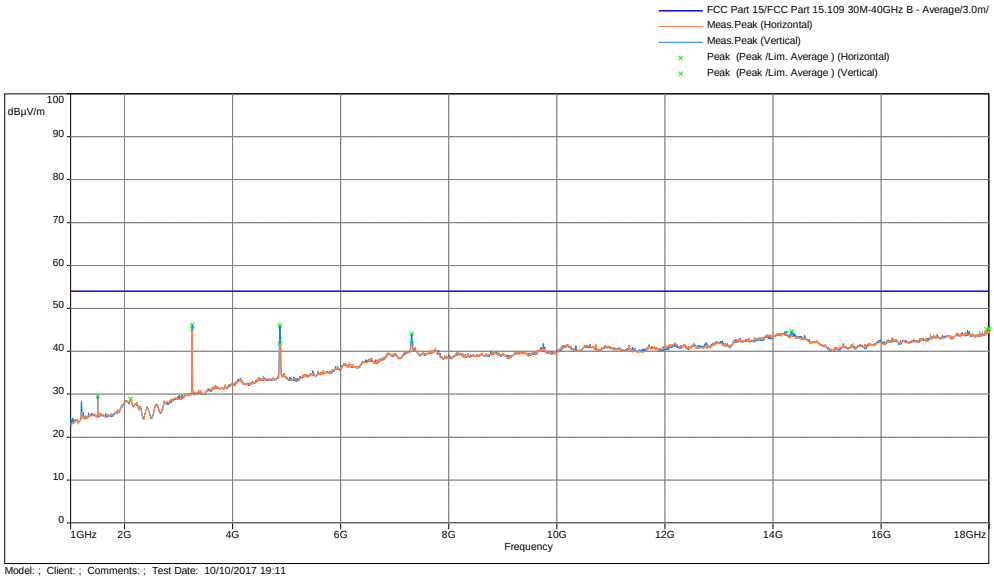
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11g 2437MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz



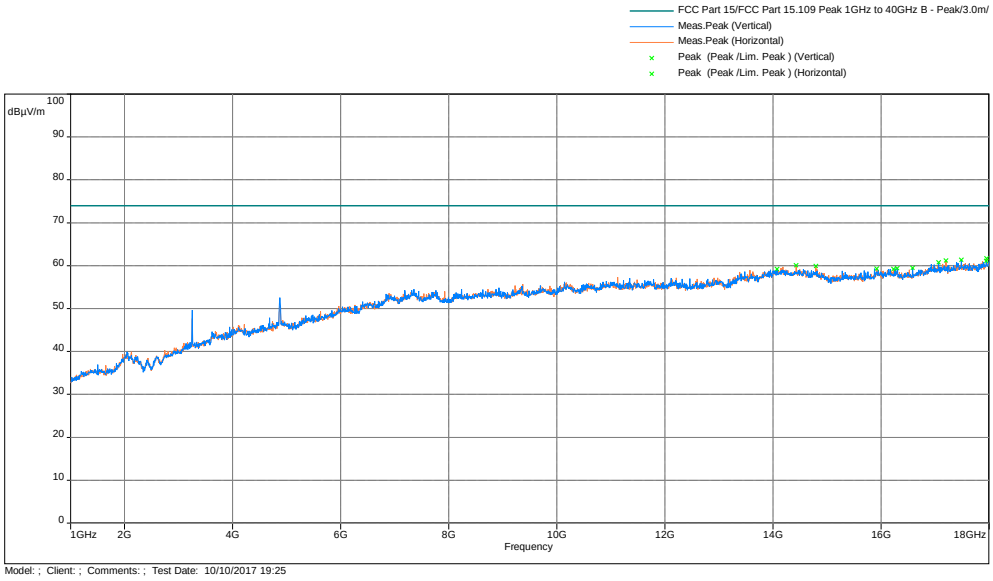
Model: ; Client: ; Comments: ; Test Date: 10/06/2017 19:01

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



Model: ; Client: ; Comments: ; Test Date: 10/10/2017 19:11

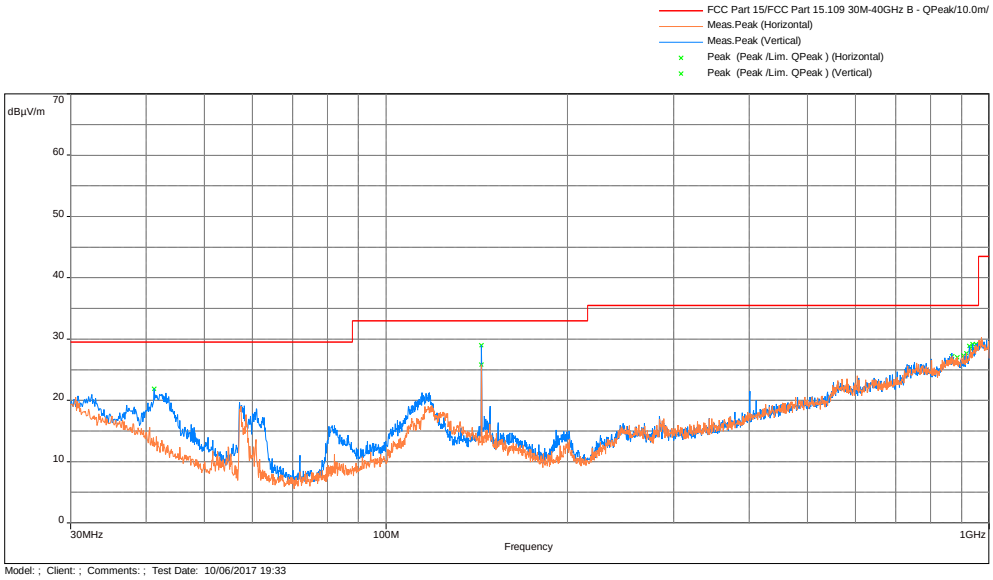
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

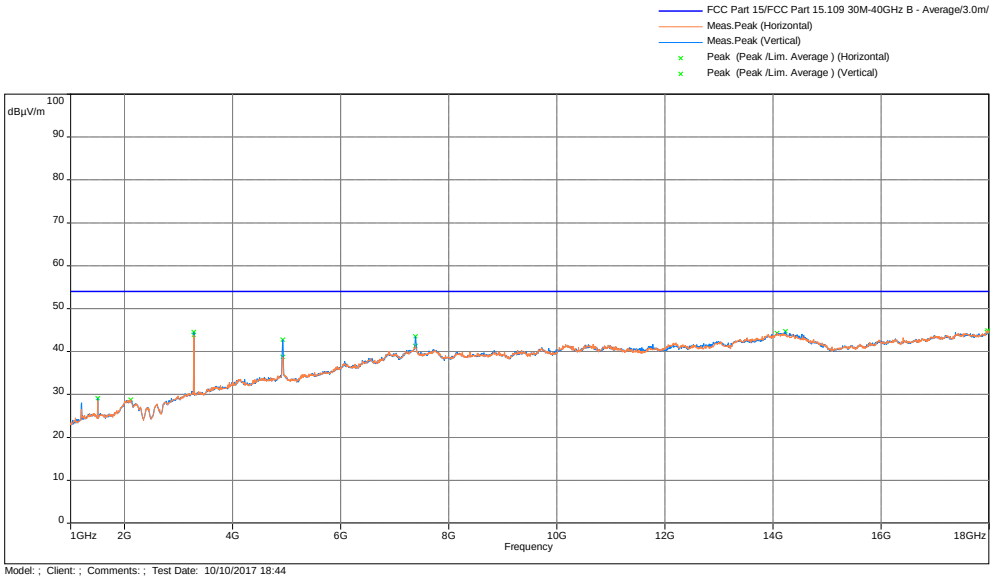
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11g 2462MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz



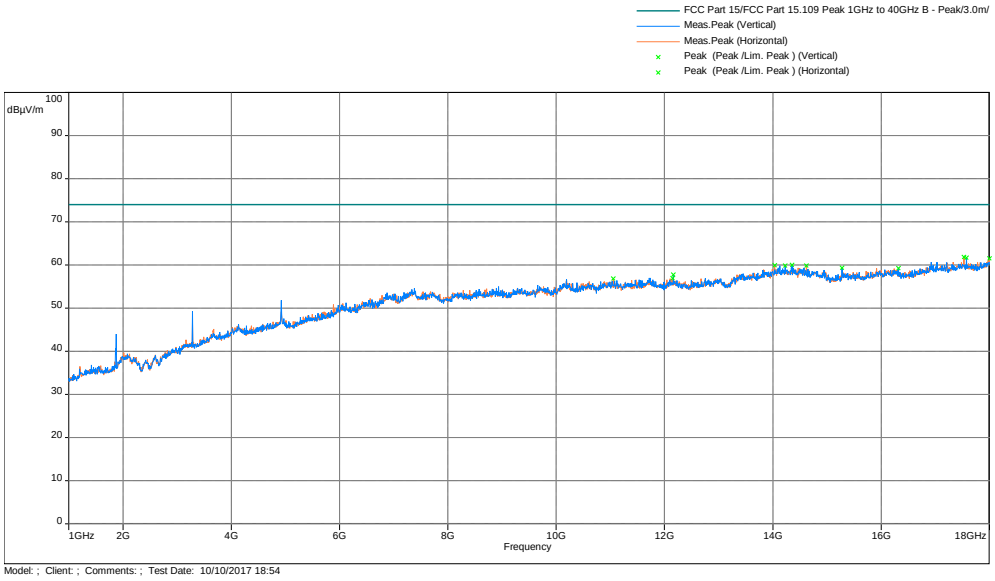
Model: ; Client: ; Comments: ; Test Date: 10/06/2017 19:33

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



Model: ; Client: ; Comments: ; Test Date: 10/10/2017 18:44

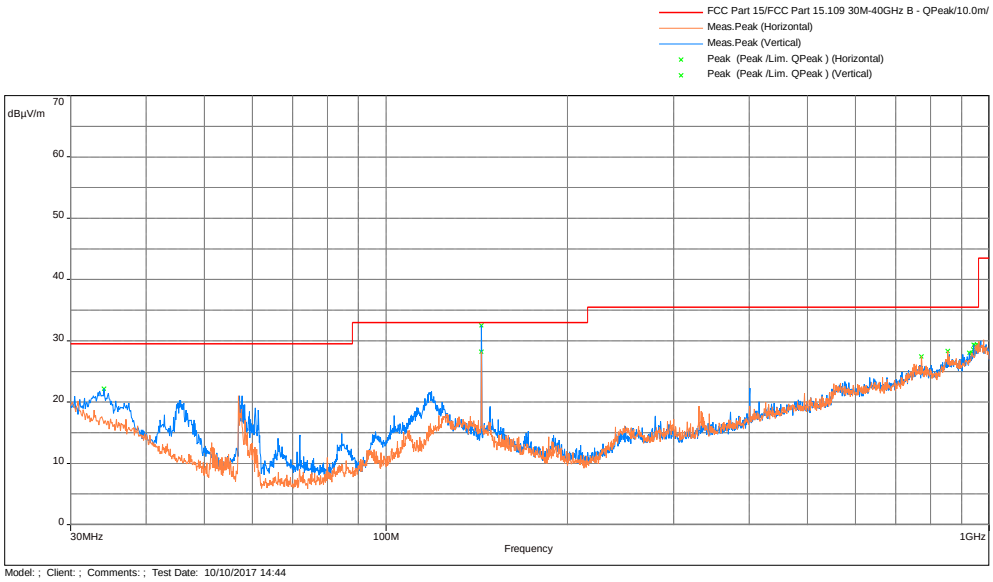
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

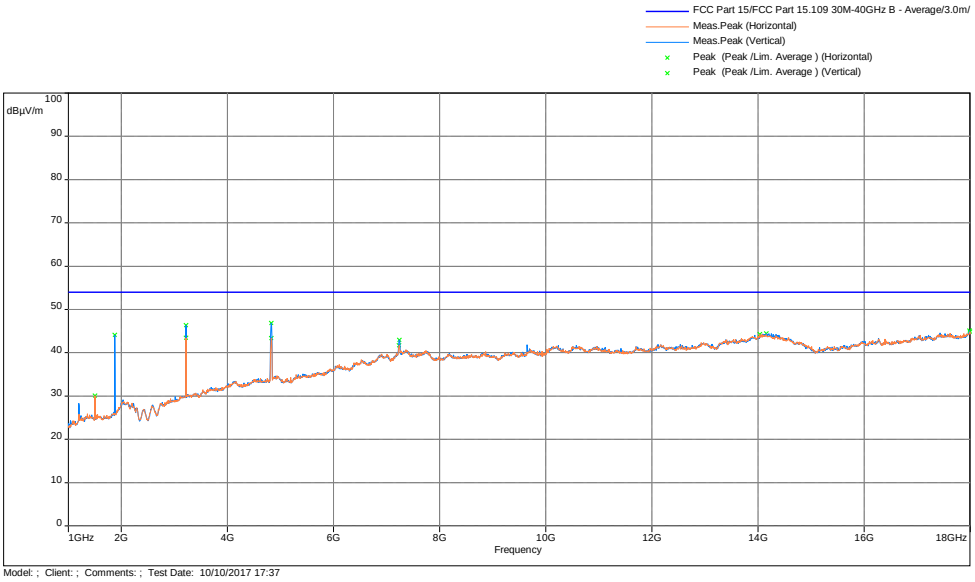
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11n HT20, 2412MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

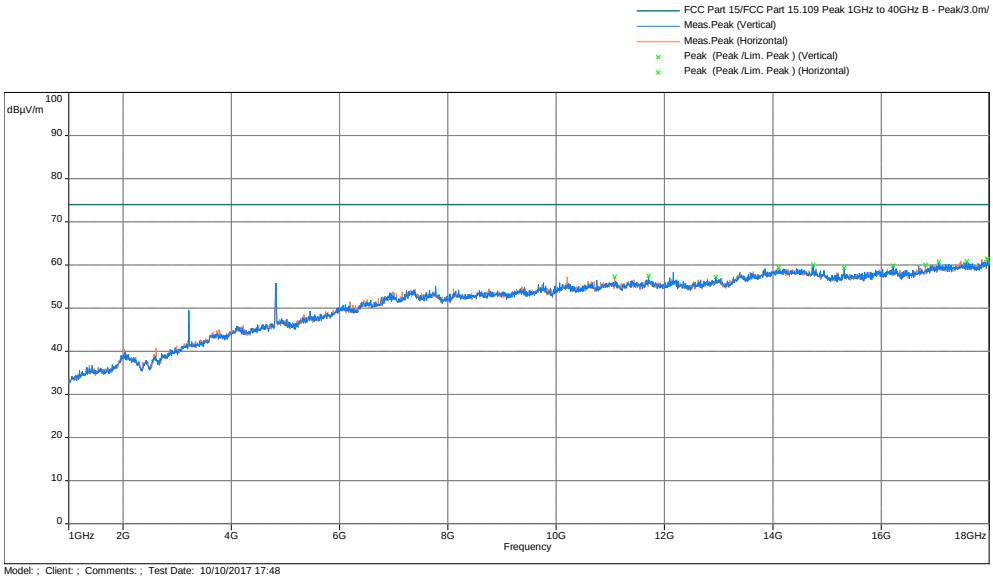


*The spurious at 144 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



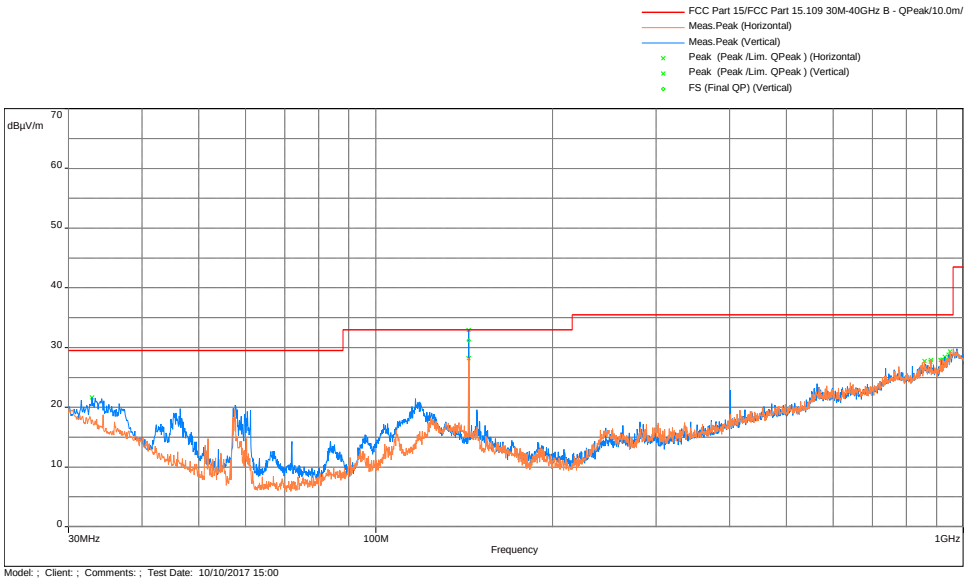
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

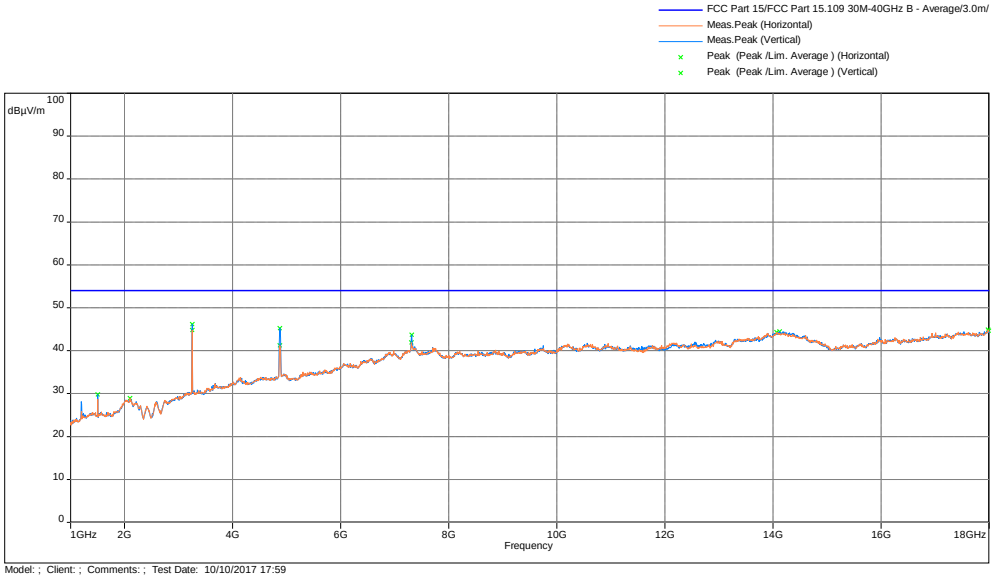
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11n HT20, 2437MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

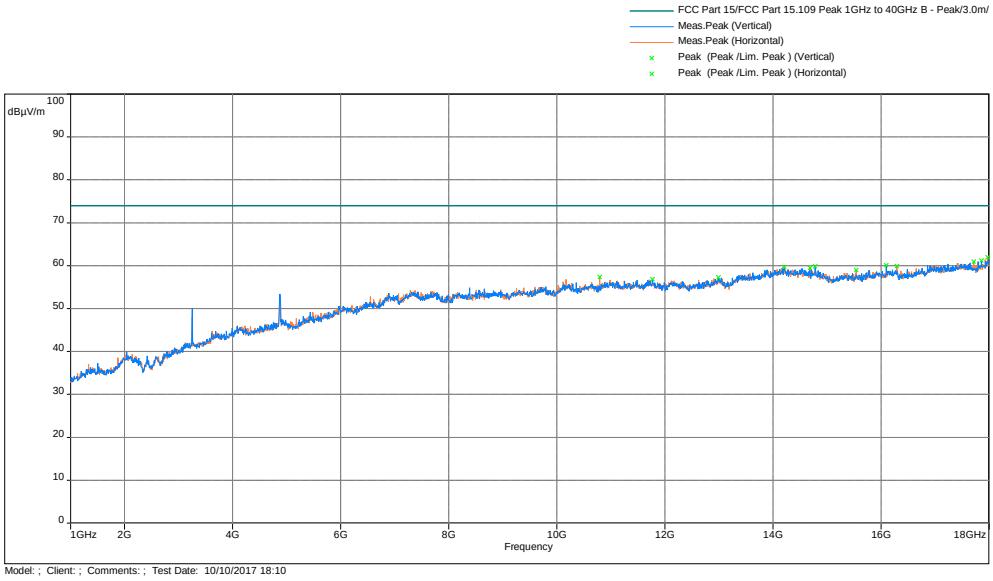


*The spurious at 144 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



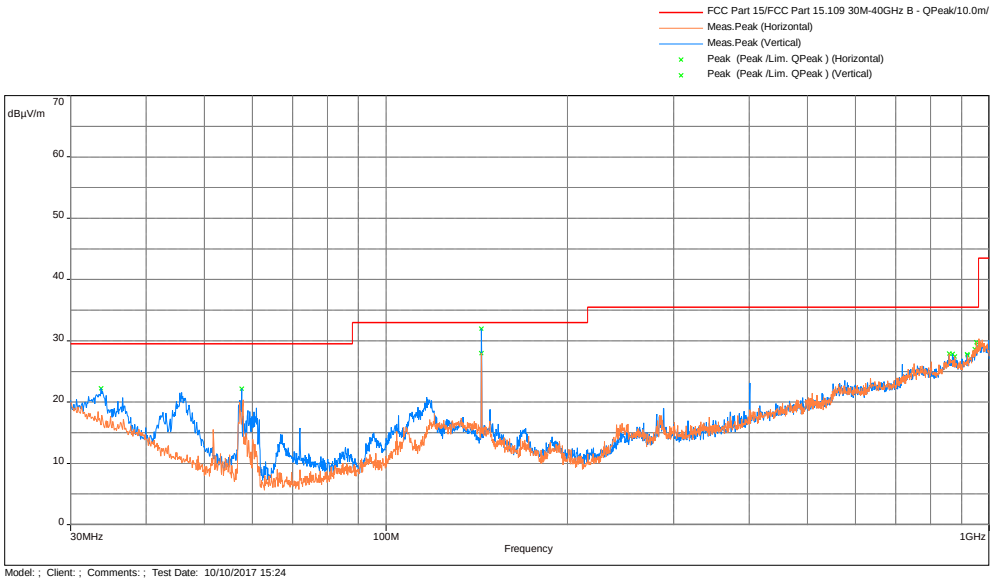
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

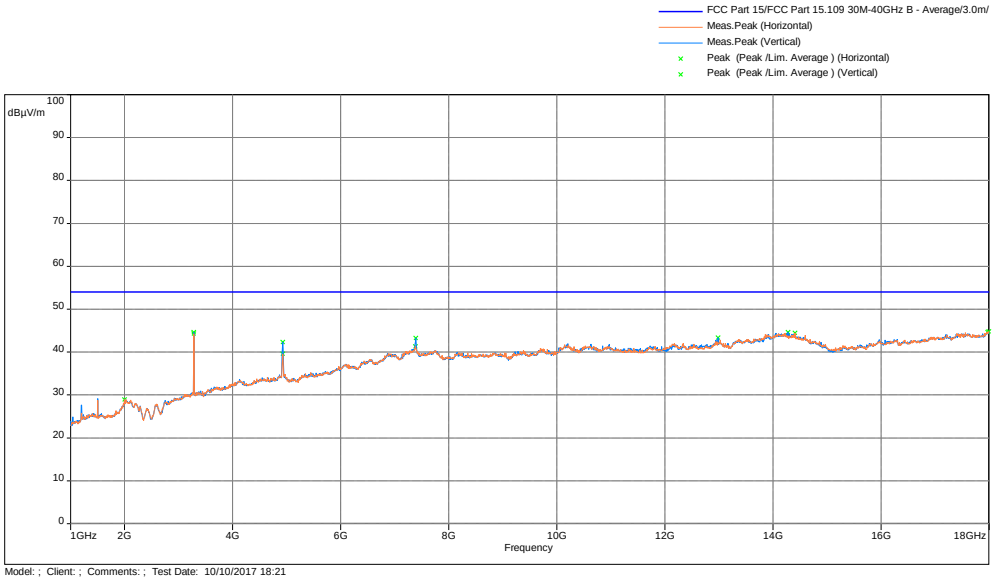
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11n HT20, 2462MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

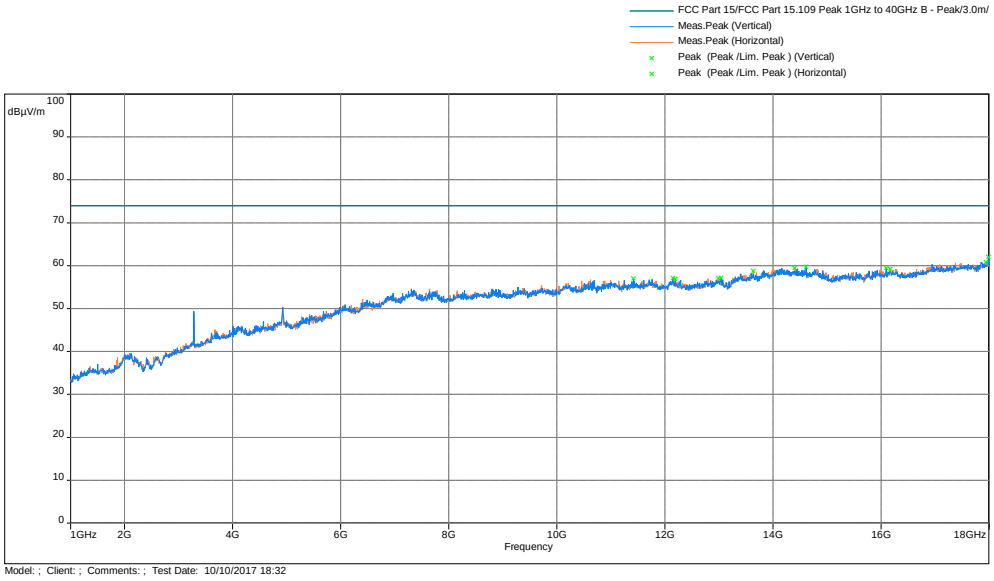


*The spurious at 144 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



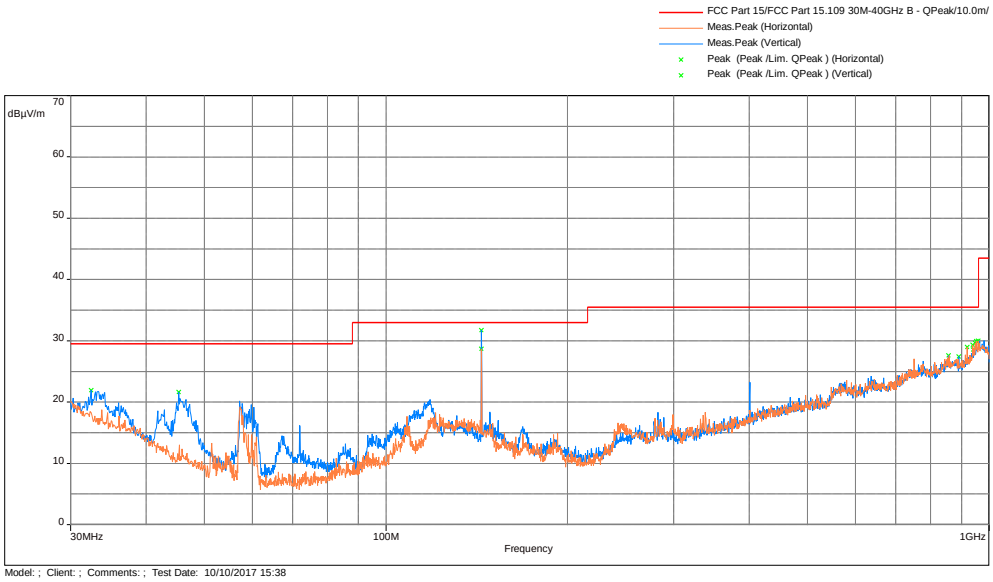
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

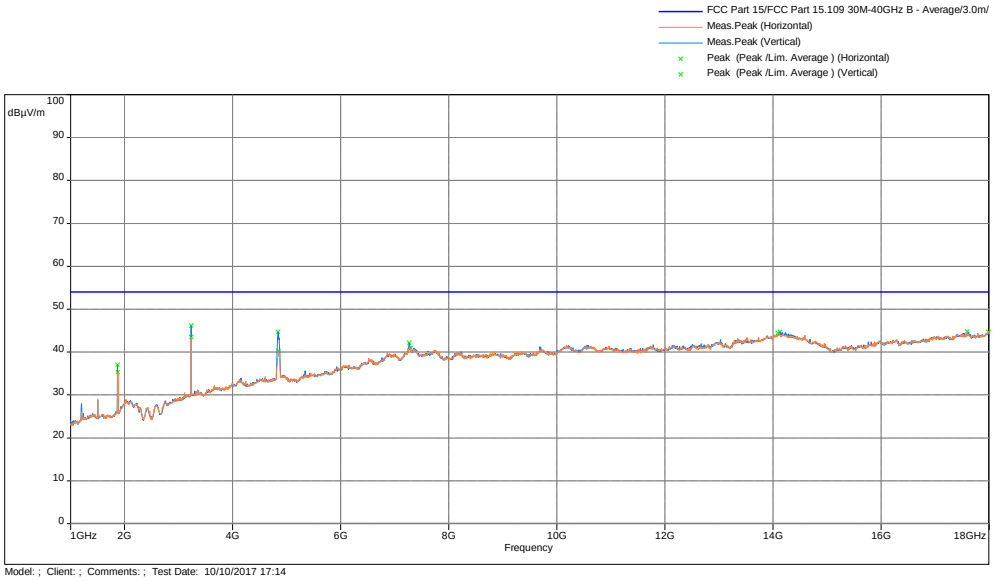
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11n HT40, 2422MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

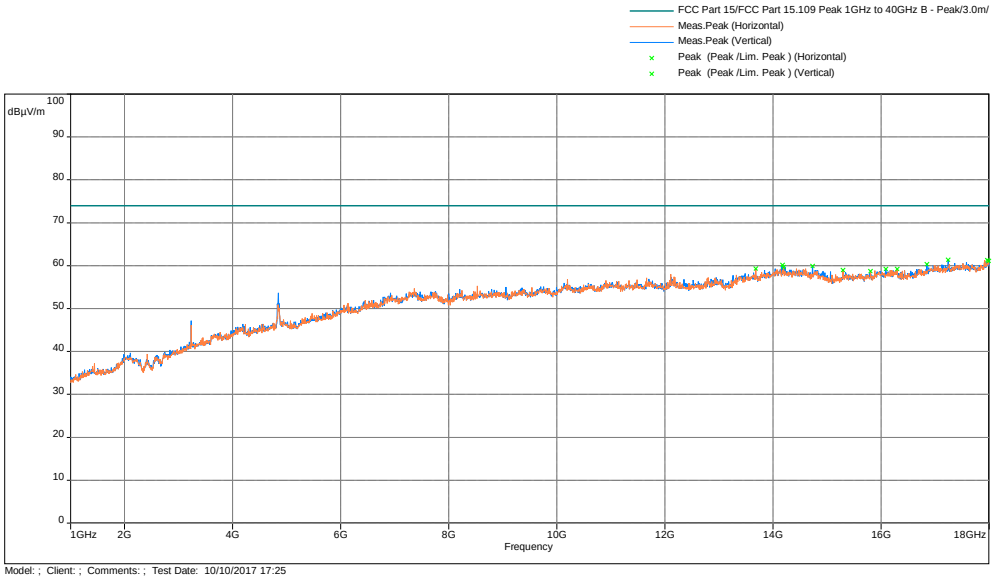


*The spurious at 144 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



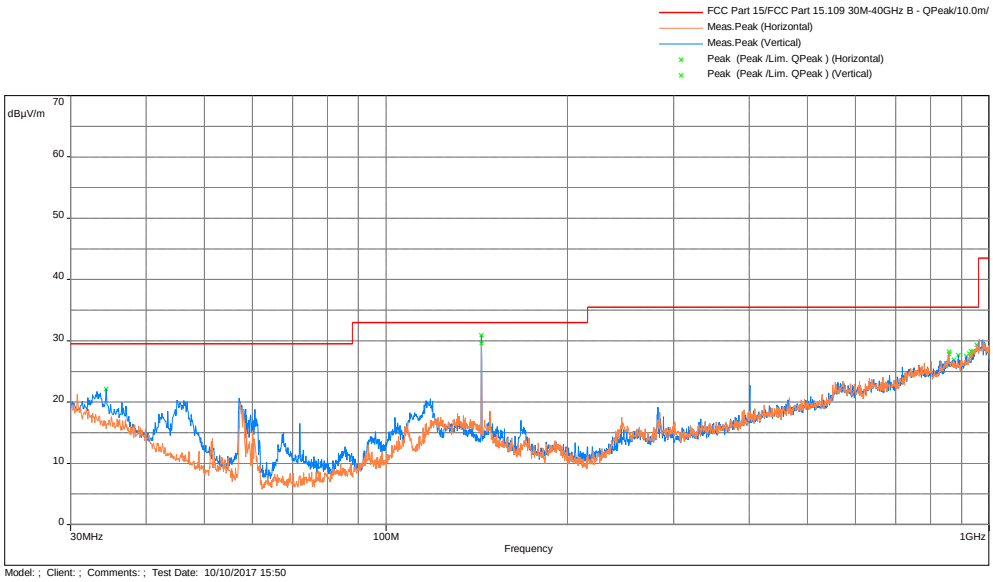
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

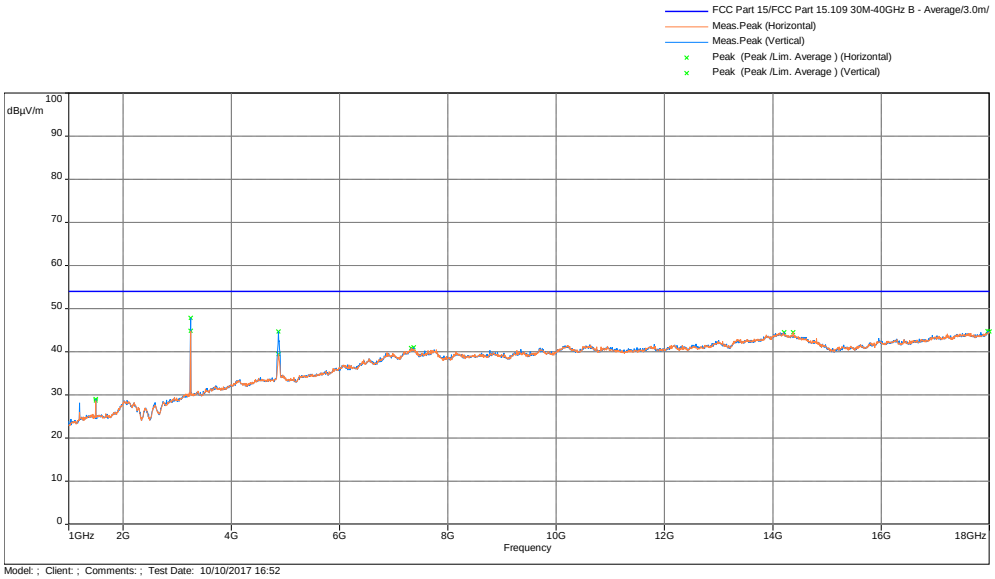
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11n HT40, 2437MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

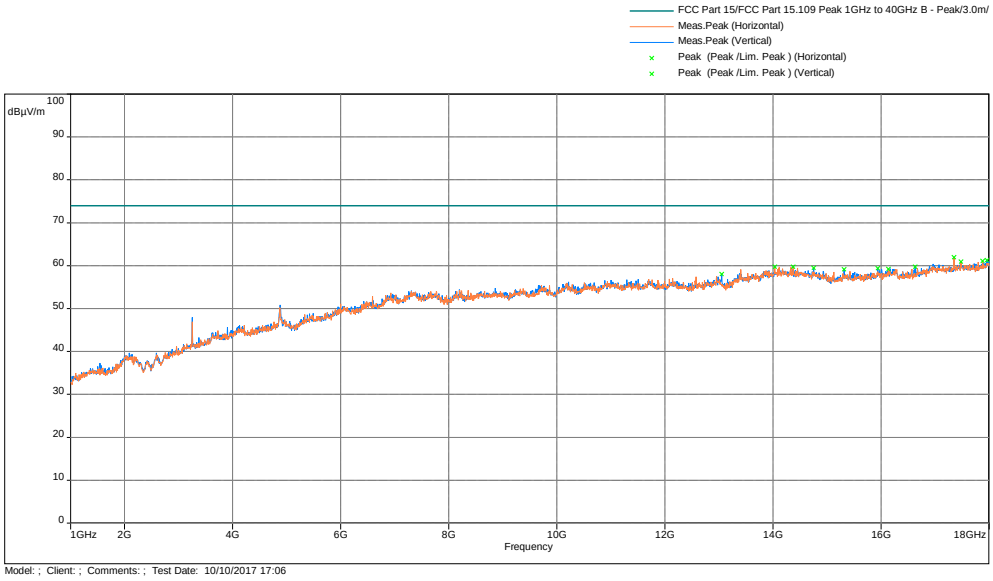


*The spurious at 144 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



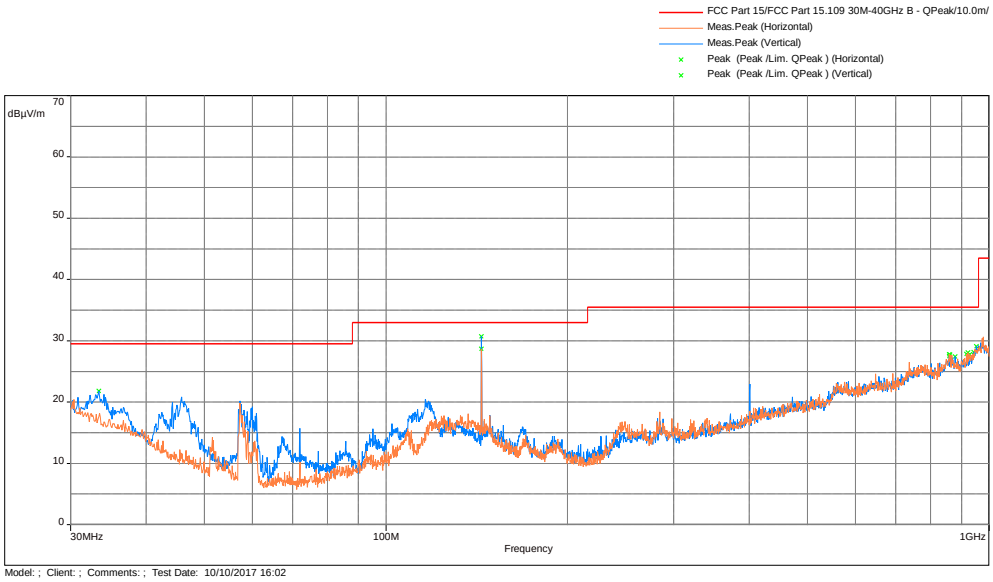
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit



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

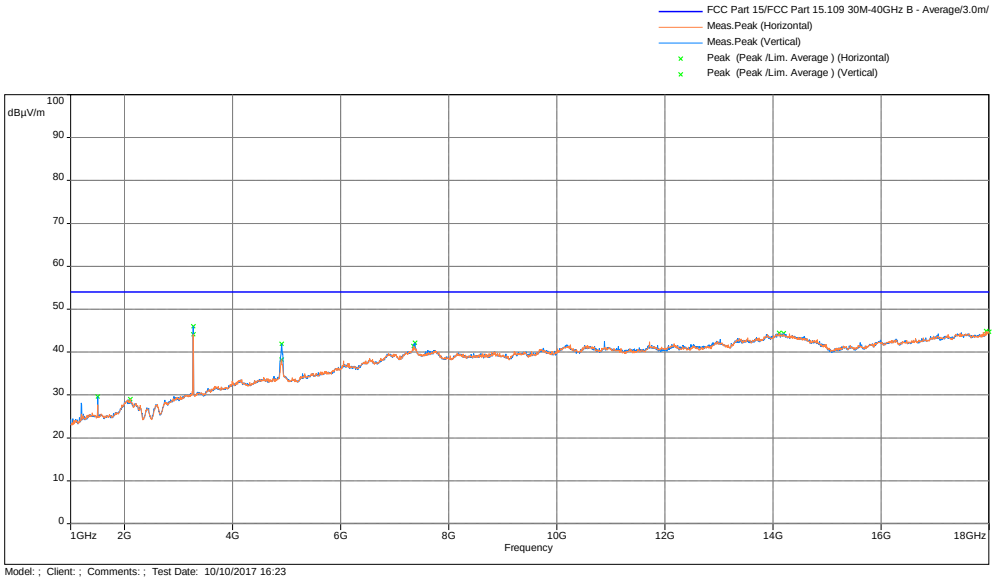
Test Results: 15.209 Radiated Spurious Emissions, Tx at 802.11n HT40, 2452MHz

Out-of-Band Radiated Spurious Emissions (Cabinet Radiation) - 30 MHz to 1000 MHz

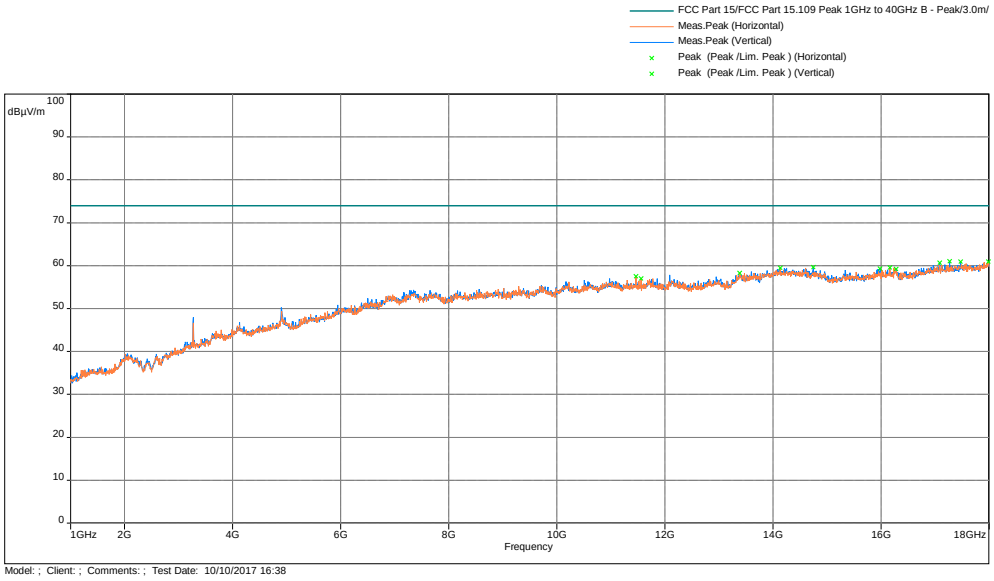


*The spurious at 144 MHz is not in the Restricted Frequency band per §15.205. Therefore the limit of 15.209 does not apply to this particular frequency. Compliance for this frequency outside the restricted band is shown in report number 103177090MPK-003; section 4.4.

Radiated Spurious Emissions 1000 - 18000 MHz, Avg Scan vs Avg Limit



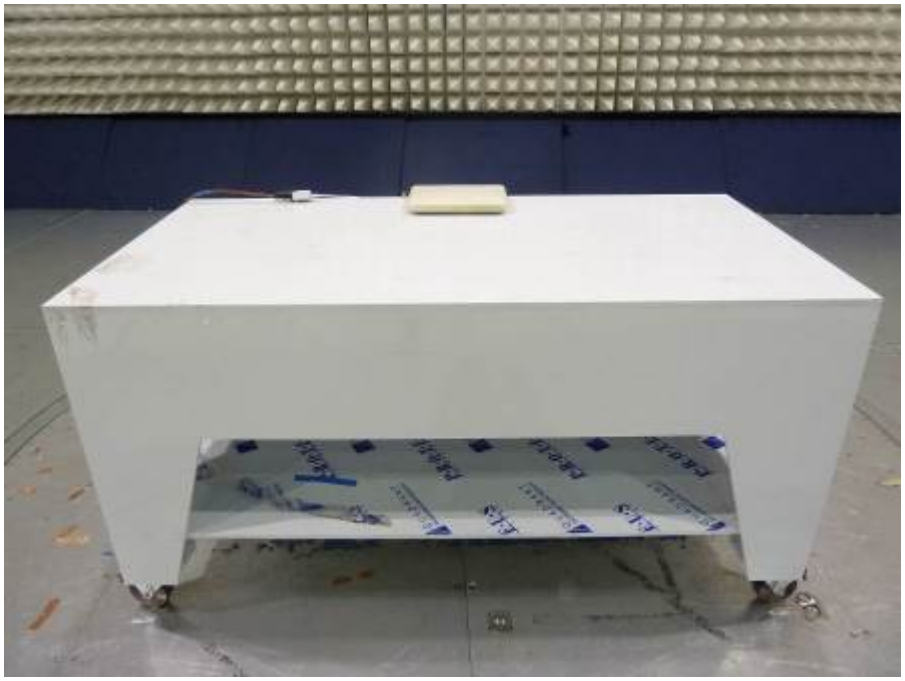
Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak Limit

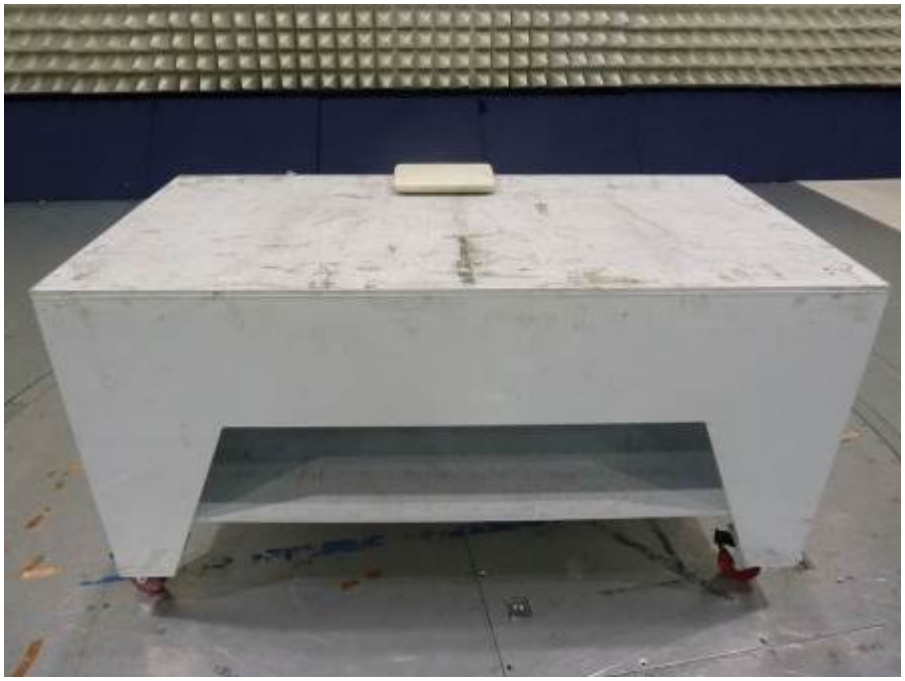


Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

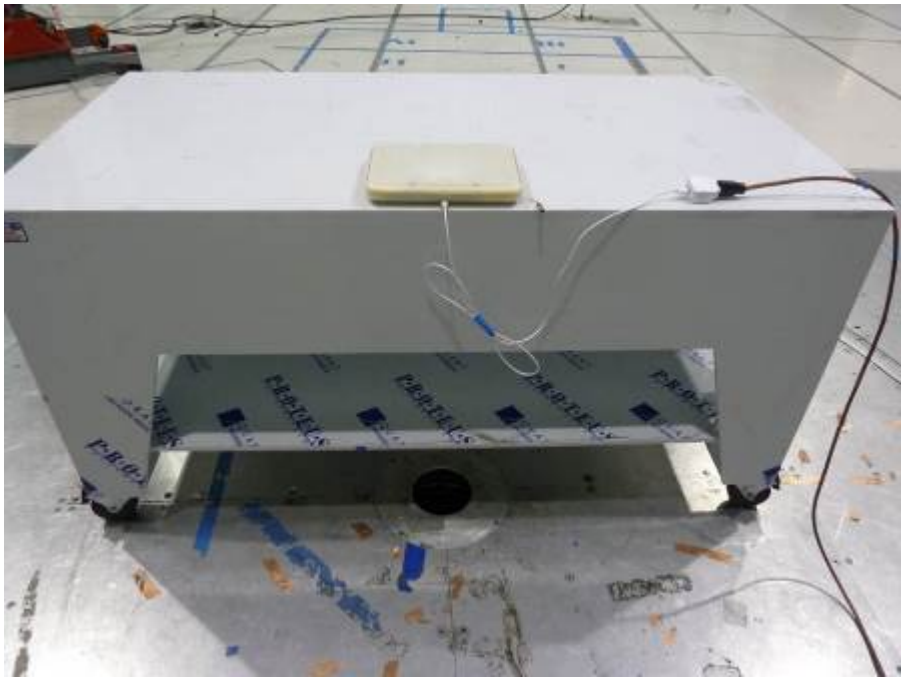
4.5.8 Test Setup Photographs

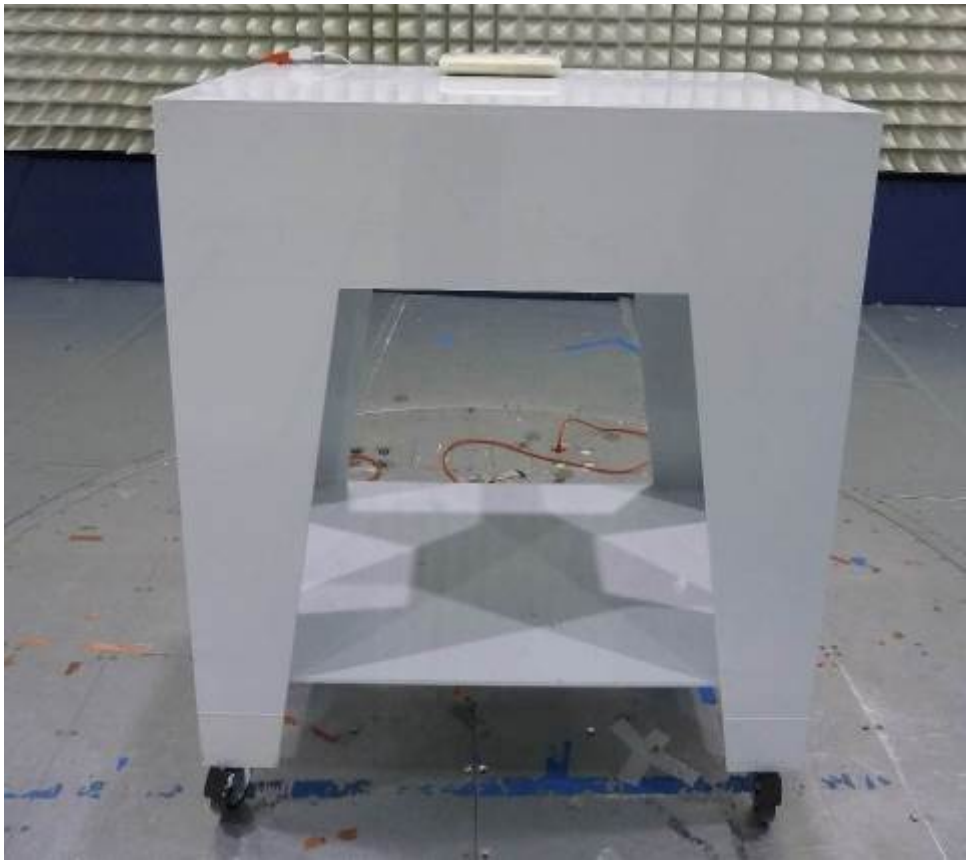
The following photographs show the testing configurations used.



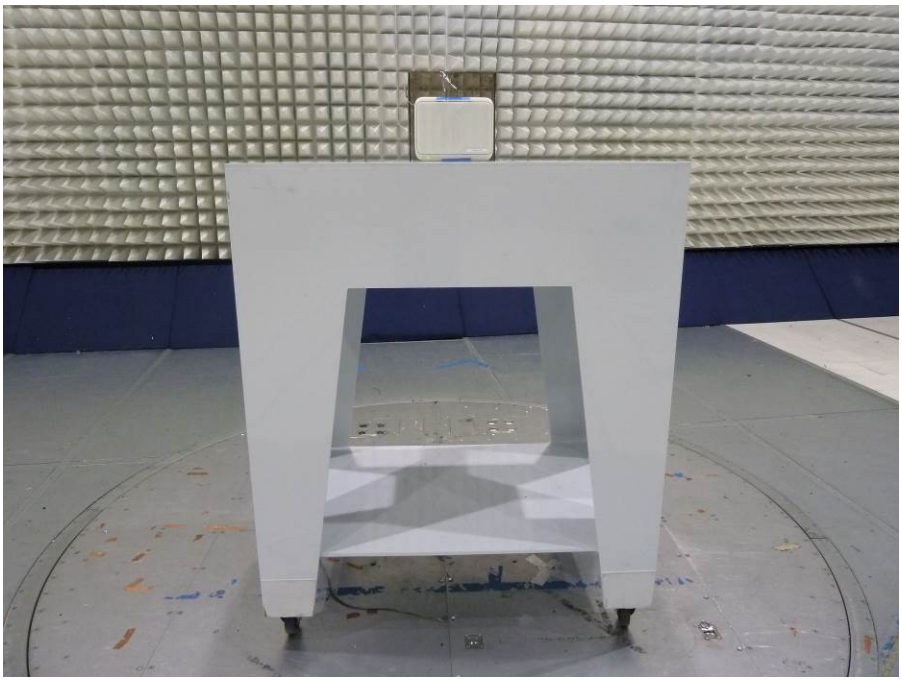


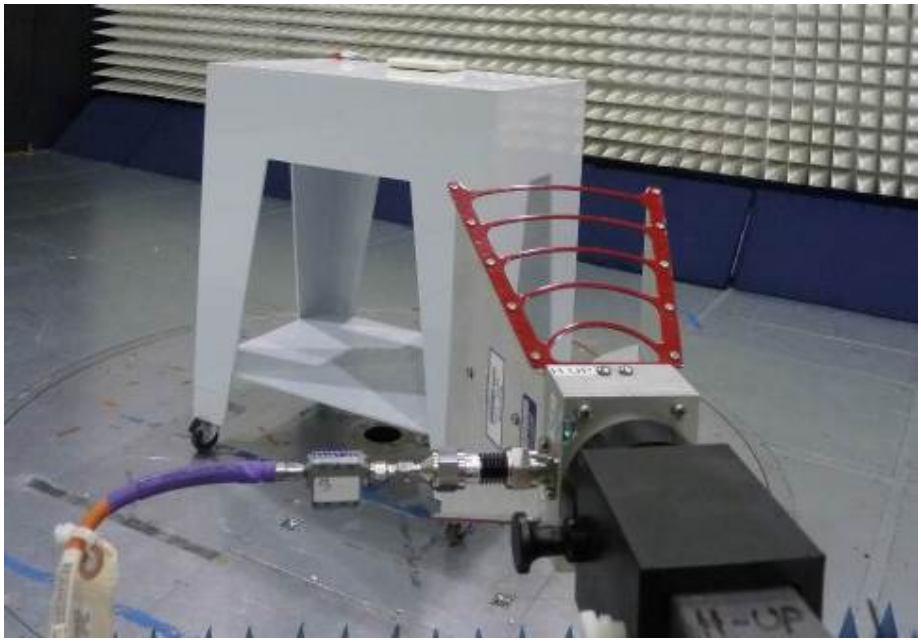
4.5.8 Test Setup Photographs (Continued)





4.5.8 Test Setup Photographs (Continued)





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
Spectrum Analyzer	Rohde and Schwarz	FSV	ITS 01534	12	05/16/18
Pyramidal Horn Antenna	EMCO	3160-09	ITS 00571	#	#
Pre-Amplifier (18-40GHz)	Miteq	TTA1840-35-S-M	ITS 01393	12	04/18/18
Pre-Amplifier (1-18GHz)	Miteq	AMF-4D-001180-24-10P	ITS 00526	12	01/04/18
Horn Antenna	ETS-Lindgren	3115	ITS 00982	12	02/03/18
EMI Receiver	Rohde and Schwarz	ESU	ITS 00961	12	07/10/18
BI-Log Antenna	Teseq	CBL 6111D	ITS 01058	12	08/11/18
Pre-Amplifier	Sonoma Instrument	310	ITS 00942	12	01/19/18
RF Cable	TRU Corporation	TRU CORE 300	ITS 01462	12	08/19/18
Notch Filter	Micro-Tronics	BRM50702	ITS 01166	12	02/08/18
RF Cable	TRU Corporation	TRU CORE 300	ITS 01465	12	08/19/18
RF Cable	TRU Corporation	TRU CORE 300	ITS 01470	12	08/19/18
Attenuator	Narda	FSCM99899	ITS 01583	12	08/31/18
RF Cable	Megaphase	EMC1-K1K1-236	ITS 01538	12	06/13/18
RF Cable	Megaphase	TM40-K1K1-19	ITS 01154	12	01/26/18
Transient Limiter	COM-POWER	LIT-153A	ITS 01452	12	06/19/18
RF Cable	Megaphase	TM40-K1K1-59 RF	ITS 01156	12	01/26/18

No Calibration required

Software used for emission compliance testing utilized the following:

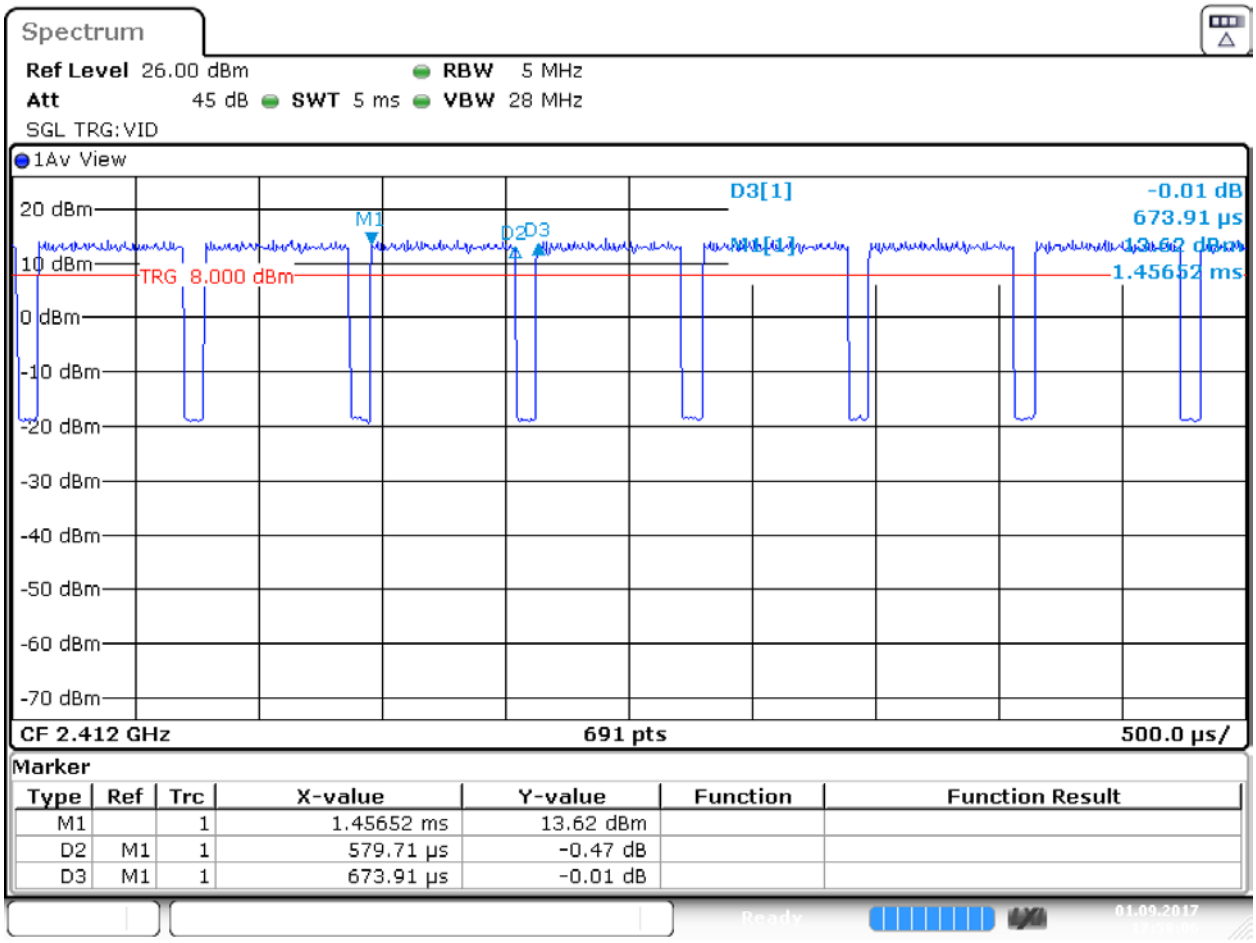
Name	Manufacturer	Version	Template/Profile
Tile	Quantum Change	3.4.K.22	Conducted Restricted Band Edge_Avg Conducted Restricted Band Edge_Peak Conducted Restricted Band_1-26GHz Conducted Restricted Band_30M-1GHz Conducted Spurious_30M-26GHz
BAT-EMC	Nexio	3.16.0.64	Towerview 10-3-17.bpp
RS Commander	Rohde Schwarz	1.6.4	Not Applicable (Screen grabber)

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewers Initials	Date	Change
1.0 / G103177090	AC	KV	October 30, 2017	Original document

Annex A - Duty Cycle Measurement

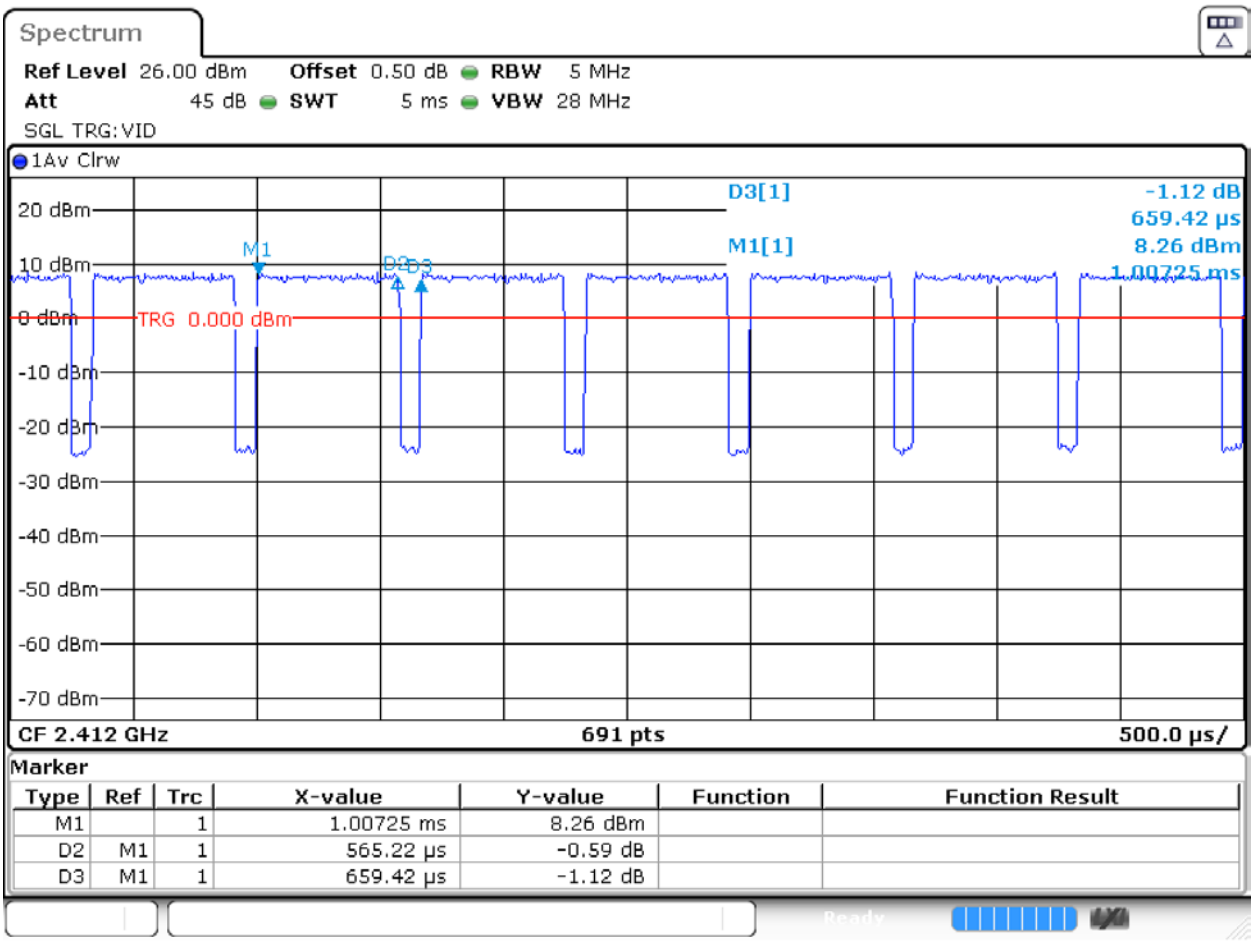
IEEE 802.11b



Date: 1.SEP.2017 17:58:06

Duty Cycle: DC = 579.71/ 673.91 = 0.86
Duty Cycle Correction Factor **δ (dB)** = 10 log (1/0.86) = 0.6

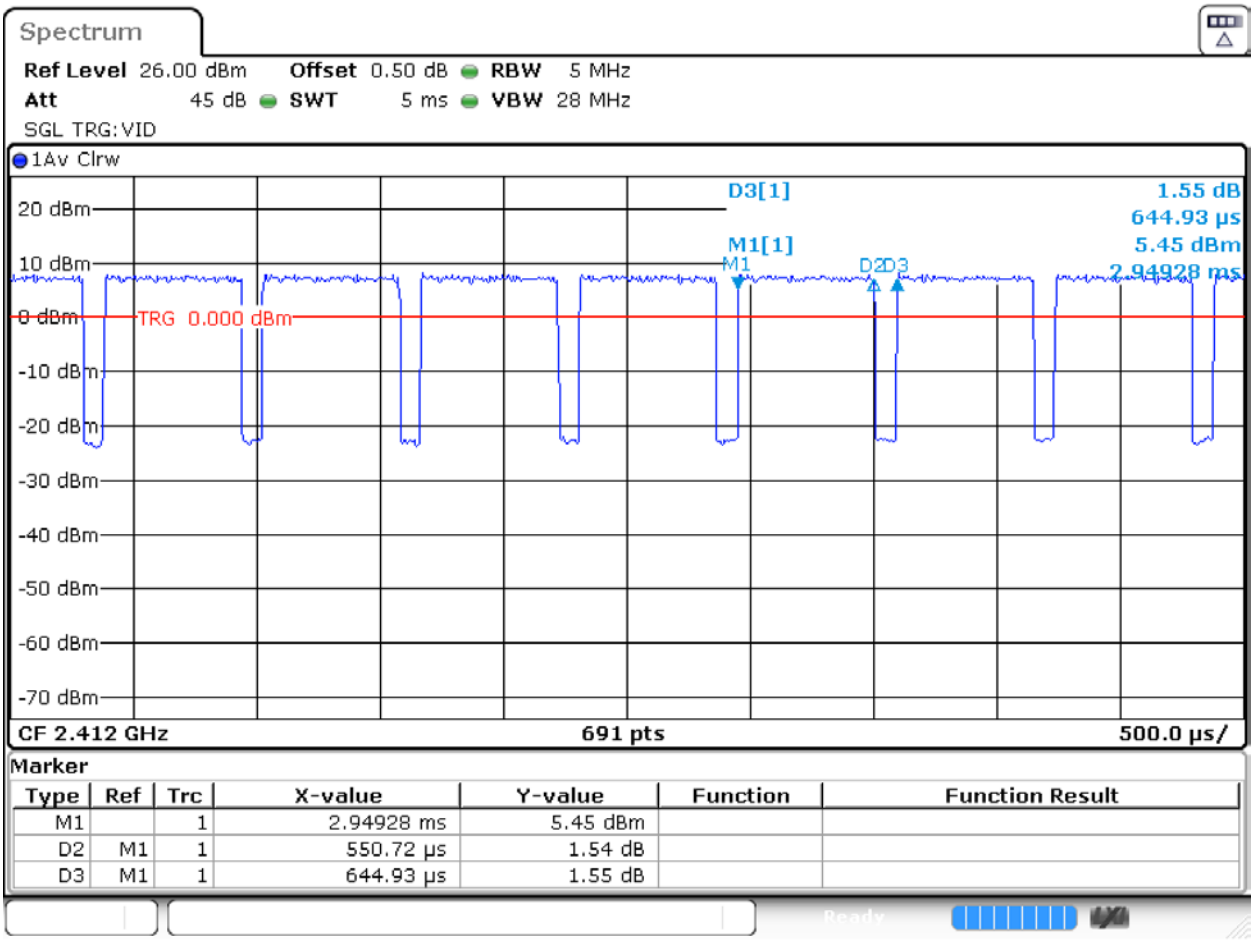
IEEE 802.11g



Date: 26.OCT.2017 18:01:13

Duty Cycle: DC = 565.22/659.42 = 0.86
Duty Cycle Correction Factor **δ (dB)** = 10 log (1/0.86) = 0.6

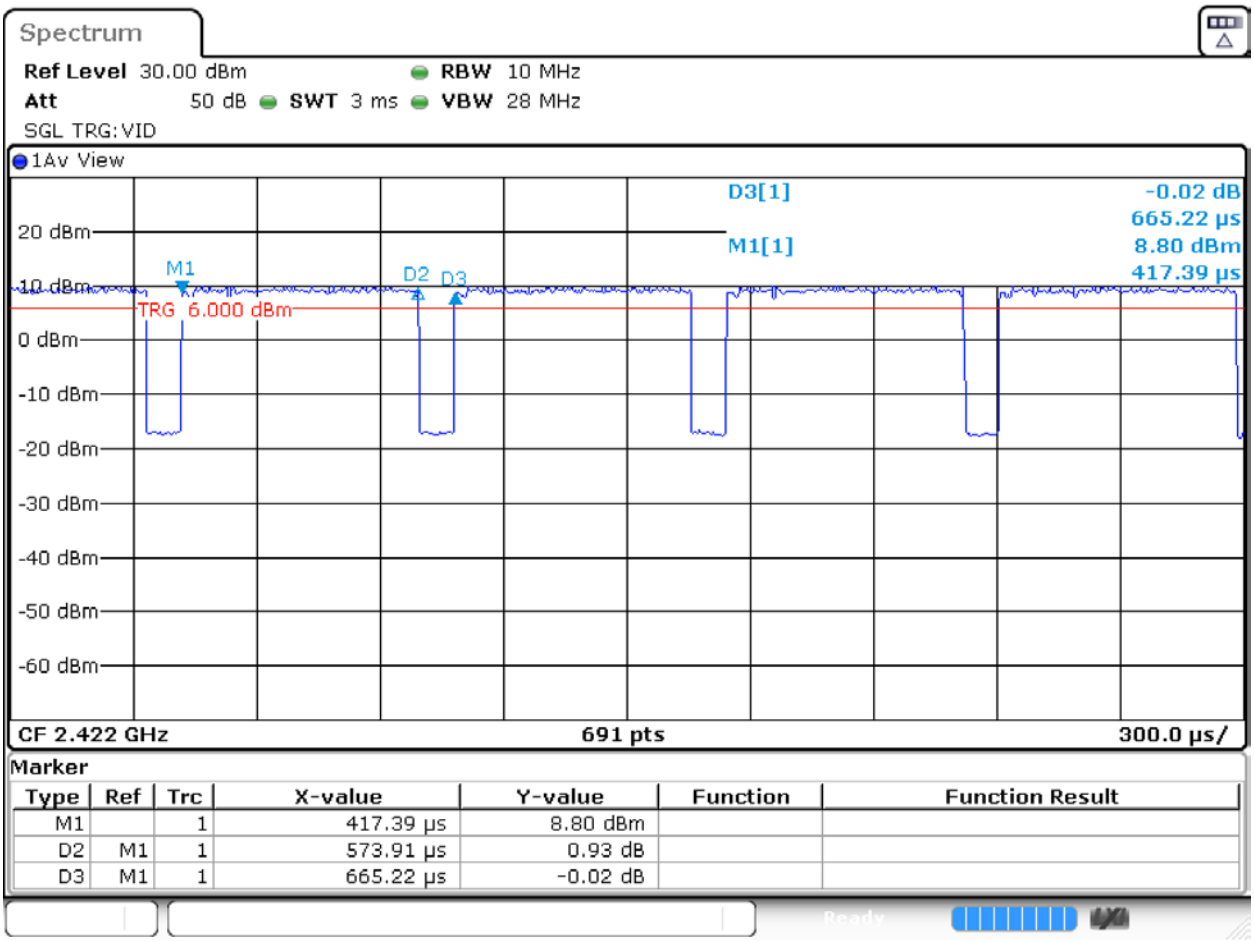
IEEE 802.11n HT20



Date: 26.OCT.2017 18:05:14

Duty Cycle: DC = 550.72/644.93 = 0.86
Duty Cycle Correction Factor **δ (dB)** = 10 log (1/0.86) = 0.6 dB

IEEE 802.11n HT40



Date: 26.OCT.2017 14:24:54

Duty Cycle: DC = 573.91/665.22 = 0.86
Duty Cycle Correction Factor **δ (dB)** = 10 log (1/0.86) = 0.6 dB