4.3 Power Spectral Density

Test Procedures

Procedure 10.2 in KDB 558074, Method Peak PSD

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Test Settings:

Center frequency = the highest, middle and the lowest channels

a) RBW : 3 kHz ≤ RBW ≤ 100 kHz

b) VBW ≥ 3 x RBW

c) span ≥ 1.5 x DTS bandwidth

d) Sweep time = auto couple

e) Detector = peak

f) Trace mode= max hold

g) Allow trace to fully stabilize

h) Use the peak marker function to determine the maximum amplitude level within the RBW.

Limit

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)
SISO	802.11b/g/n	ANT0	2.00	8.00
SISO	802.11b/g/n	ANT1	2.00	8.00
SISO	802.11b/g/n	ANT2	2.00	8.00
MIMO (2Tx)	802.11g/n	ANT0 + ANT1	5.01	8.00
MIMO (3Tx)	802.11g/n	ANT0 + ANT1 + ANT2	6.77	7.23

Test Data

CDD Mode_ANT0

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	0.33	8.00	7.67
	2 437	-2.75	8.00	10.75
	2 462	0.64	8.00	7.36
802.11g	2 412	-14.69	8.00	22.69
	2 437	-13.23	8.00	21.23
	2 462	-13.13	8.00	21.13
802.11n_HT20	2 412	-15.34	8.00	23.34
	2 437	-13.48	8.00	21.48
	2 462	-14.87	8.00	22.87
802.11n_HT40	2 422	-21.33	8.00	29.33
	2 437	-20.31	8.00	28.31
	2 452	-20.99	8.00	28.99

CDD Mode_ANT1

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-0.66	8.00	8.66
	2 437	-2.48	8.00	10.48
	2 462	1.21	8.00	6.79
802.11g	2 412	-13.52	8.00	21.52
	2 437	-14.51	8.00	22.51
	2 462	-13.67	8.00	21.67
802.11n_HT20	2 412	-15.98	8.00	23.98
	2 437	-15.83	8.00	23.83
	2 462	-15.45	8.00	23.45
802.11n_HT40	2 422	-22.44	8.00	30.44
	2 437	-20.58	8.00	28.58
	2 452	-19.94	8.00	27.94

CDD Mode_ANT2

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-0.68	8.00	8.68
	2 437	-1.43	8.00	9.43
	2 462	0.64	8.00	7.36
802.11g	2 412	-13.32	8.00	21.32
	2 437	-12.95	8.00	20.95
	2 462	-12.83	8.00	20.83
802.11n_HT20	2 412	-14.23	8.00	22.23
	2 437	-15.48	8.00	23.48
	2 462	-15.68	8.00	23.68
802.11n_HT40	2 422	-22.64	8.00	30.64
	2 437	-20.77	8.00	28.77
	2 452	-21.79	8.00	29.79

CDD Mode_ANT0 +ANT1

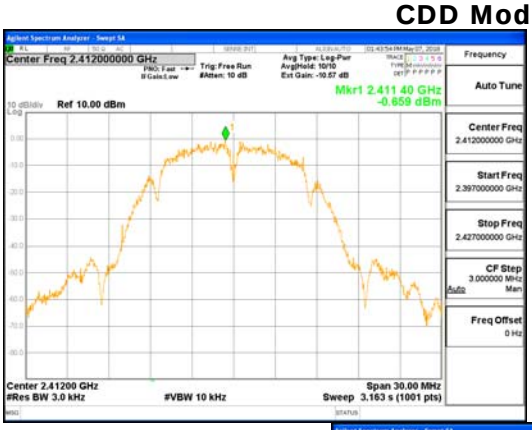
Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11g	2 412	-11.06	8.00	19.06
	2 437	-10.81	8.00	18.81
	2 462	-10.38	8.00	18.38
802.11n_HT20	2 412	-12.64	8.00	20.64
	2 437	-11.49	8.00	19.49
	2 462	-12.14	8.00	20.14
802.11n_HT40	2 422	-18.84	8.00	26.84
	2 437	-17.43	8.00	25.43
	2 452	-17.42	8.00	25.42

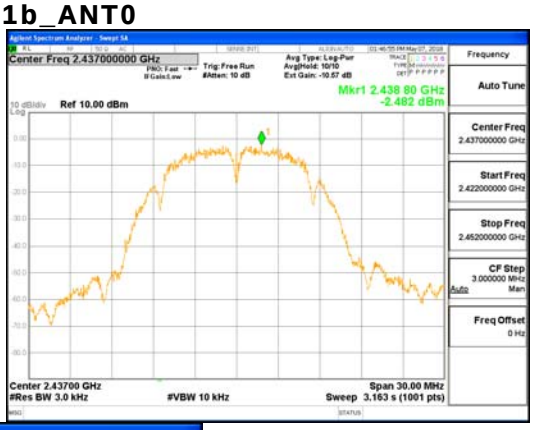
CDD Mode_ANT0 + ANT1 + ANT2

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11g	2 412	-9.03	7.23	16.26
	2 437	-8.74	7.23	15.97
	2 462	-8.43	7.23	15.66
802.11n_HT20	2 412	-10.35	7.23	17.58
	2 437	-10.03	7.23	17.26
	2 462	-10.55	7.23	17.78
802.11n_HT40	2 422	-17.33	7.23	24.56
	2 437	-15.78	7.23	23.01
	2 452	-16.07	7.23	23.30

See next pages for actual measured spectrum plots.

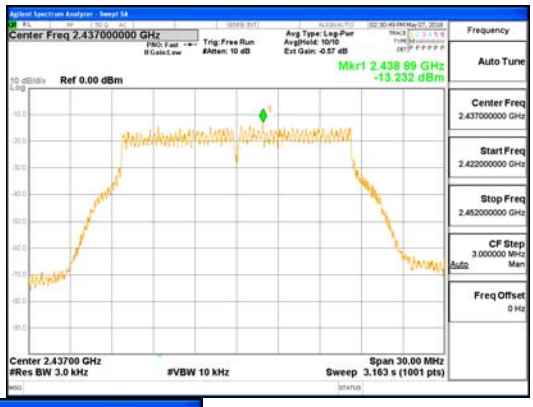
CDD Mode_802.11b_ANT0

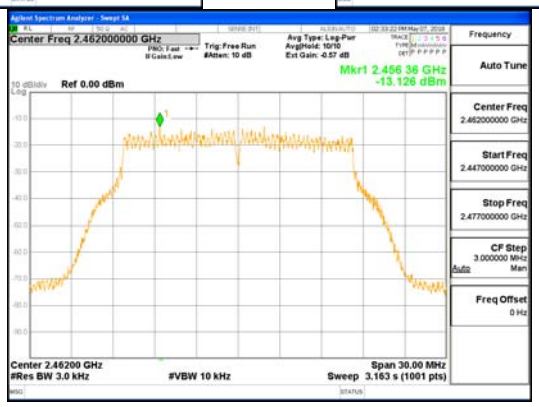




CDD Mode_802.11b_ANT1

CDD Mode_802.11b_ANT2





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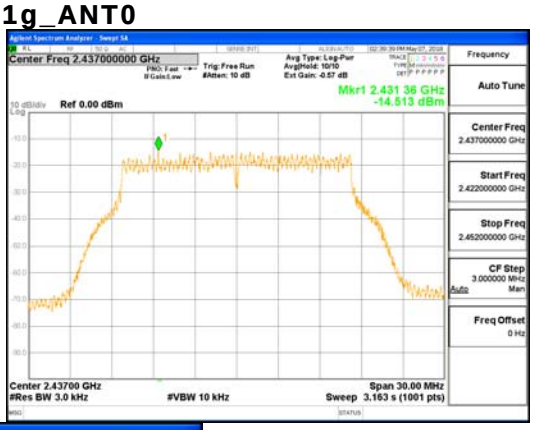

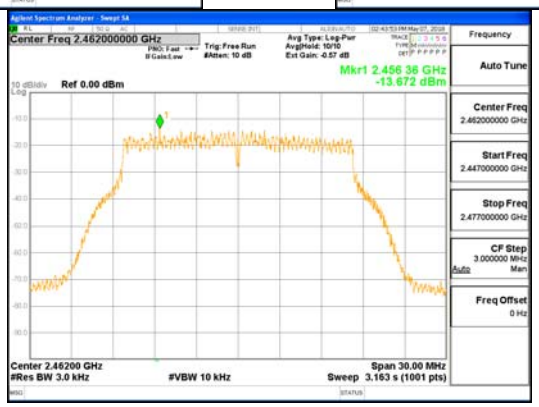

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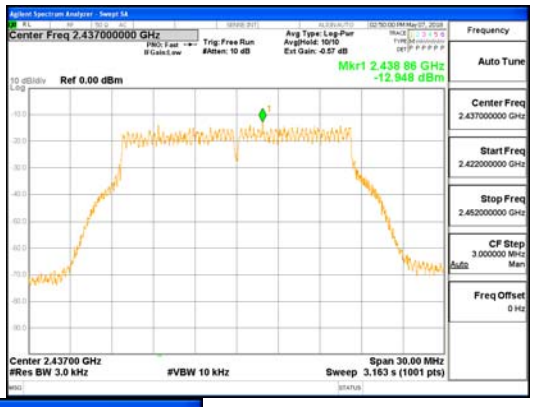
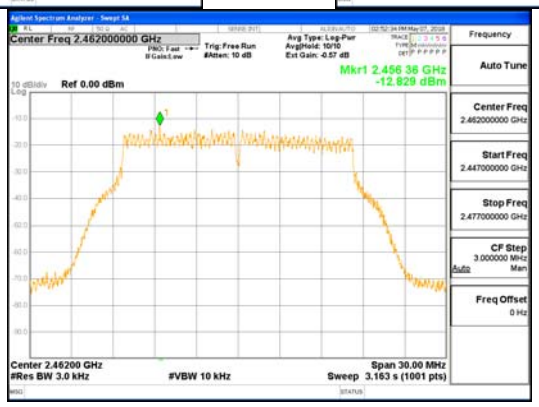
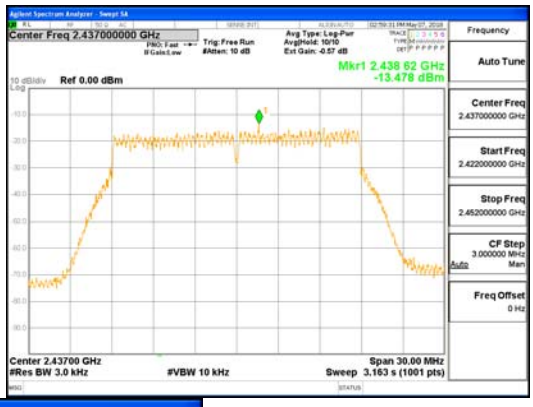
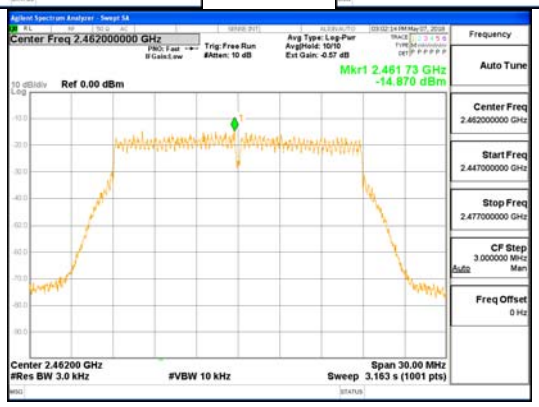


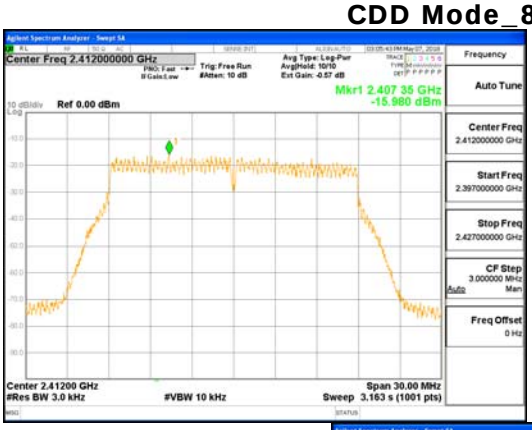


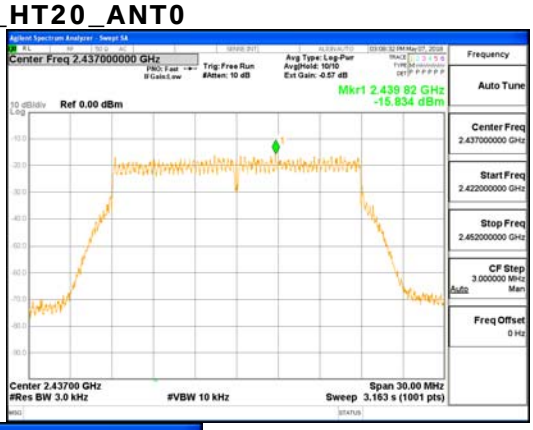
CDD Mode_802.11g_ANT2

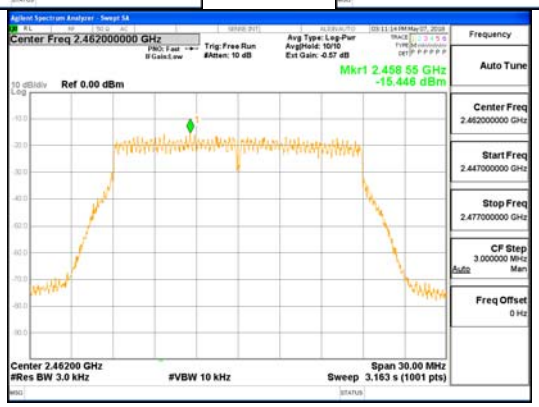




CDD Mode_802.11n_HT20_ANT0







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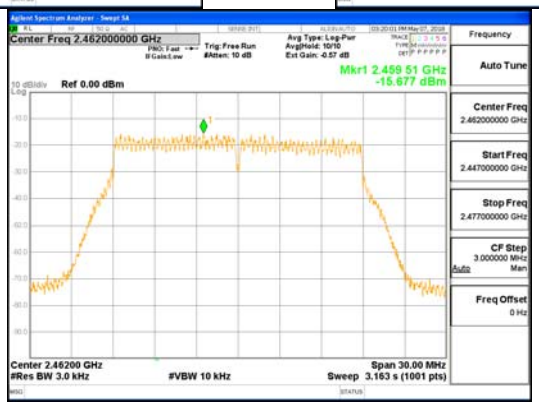

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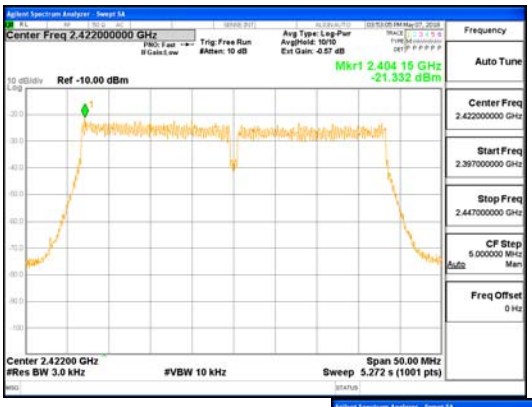

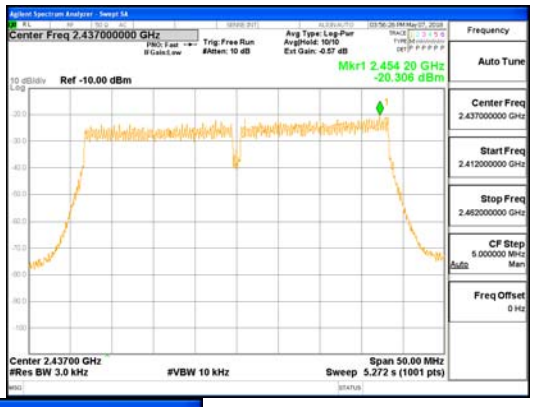

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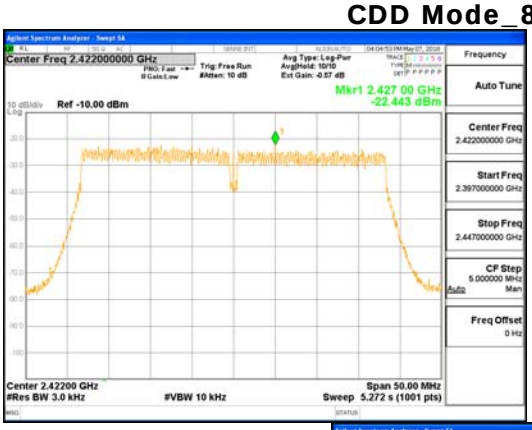
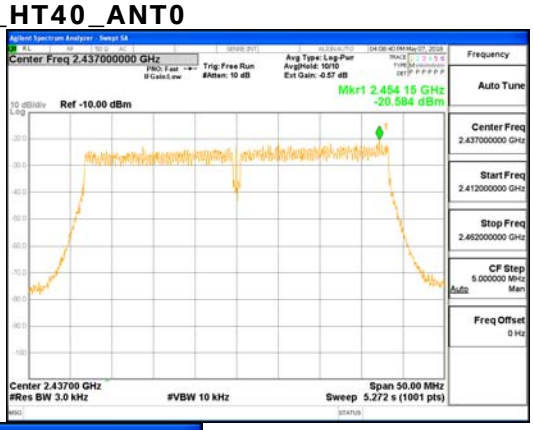
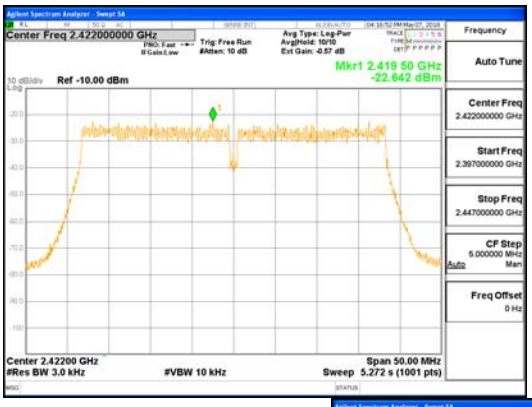
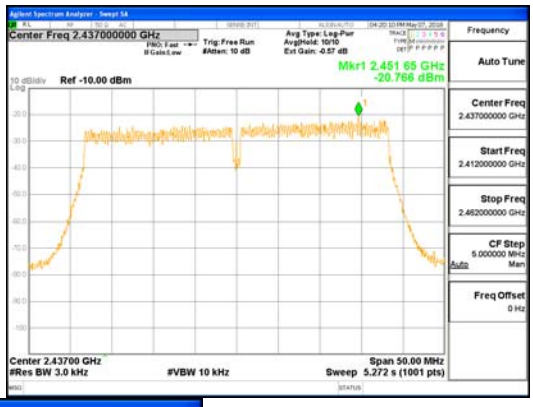
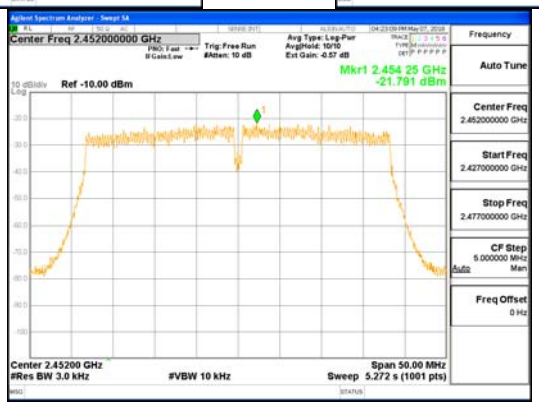




CDD Mode_802.11n_HT40_ANT1







CDD Mode_802.11n_HT40_ANT2

4.4 Band Edge & Conducted Spurious emission

Test Procedures

ANSI C63.10-2013 11.11.3

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.
After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

Test Settings:

Center frequency = the highest, middle and the lowest channels

a) RBW = 100 kHz

b) VBW ≥ 3 x RBW

c) Detector = peak

d) Sweep time = auto couple

e) Trace mode= max hold

f) Allow trace to fully stabilize

g) Use the peak marker function to determine the maximum amplitude level.

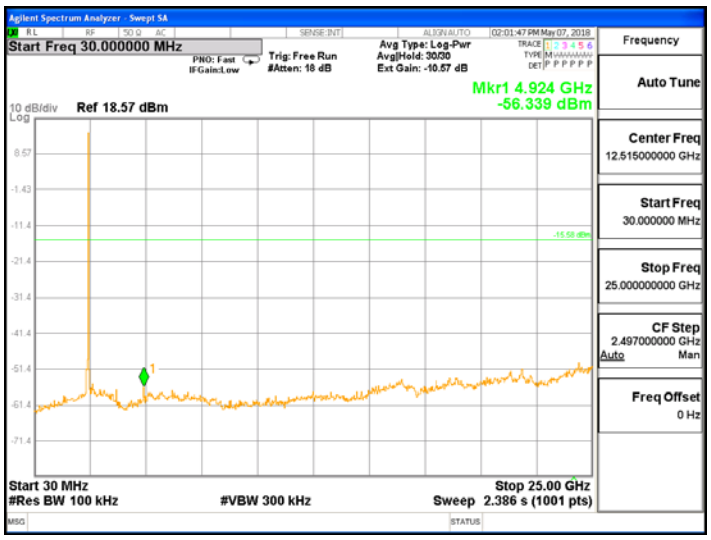
Limit :

Emission level	<	30 dBc

Test Data: Complies

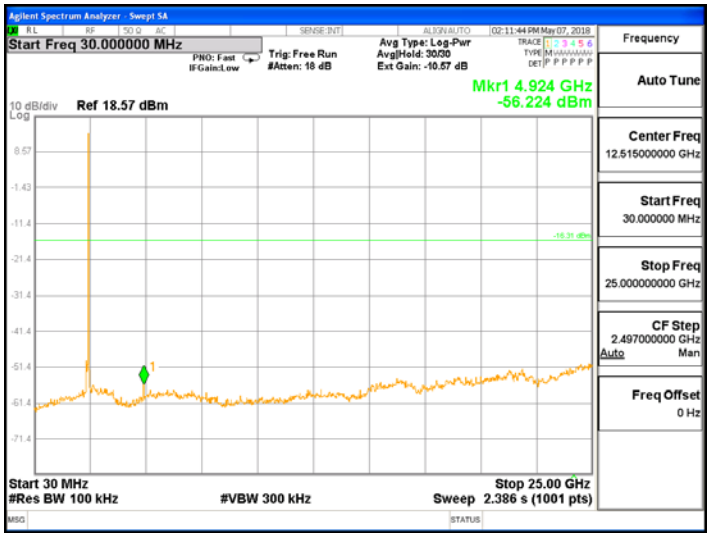
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 30dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

See next pages for actual measured spectrum plots.

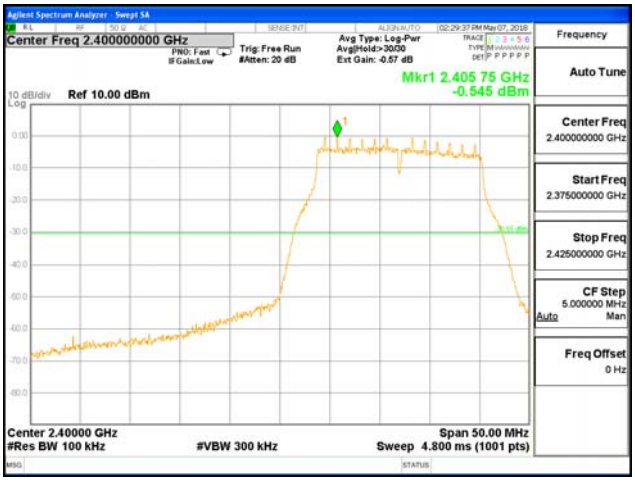


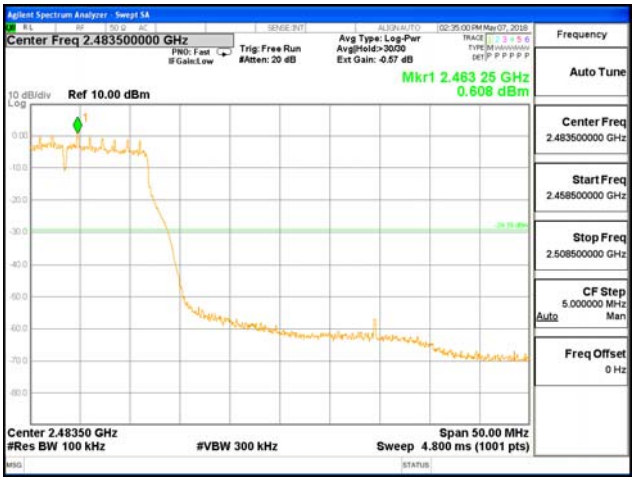
CDD Mode_802.11b_ANT0

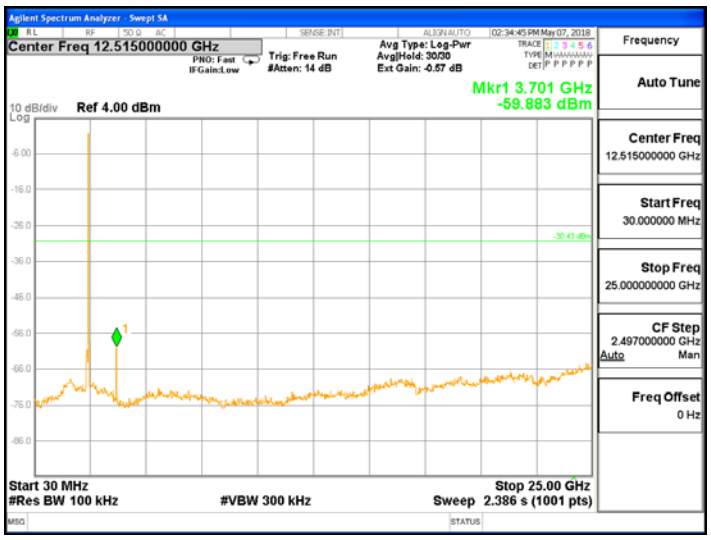
CDD Mode_802.11b_ANT1



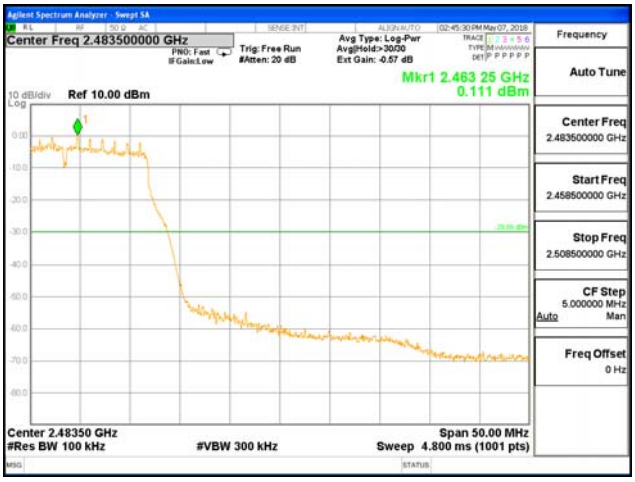
CDD Mode_802.11b_ANT2



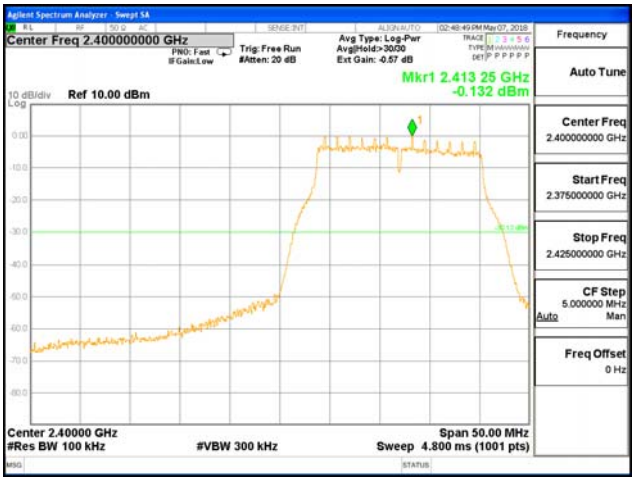


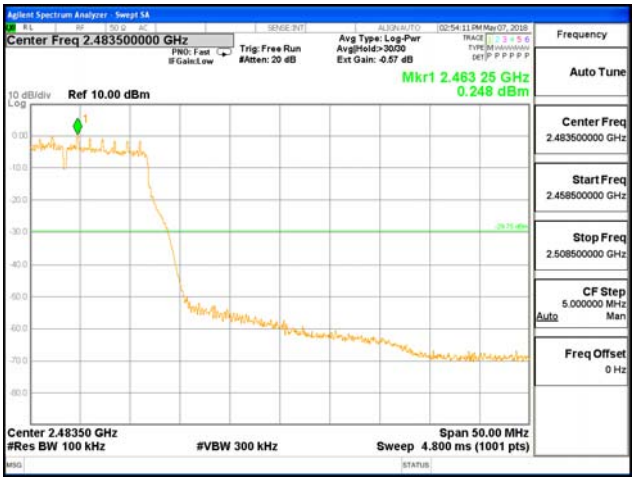


CDD Mode_802.11g_ANT0

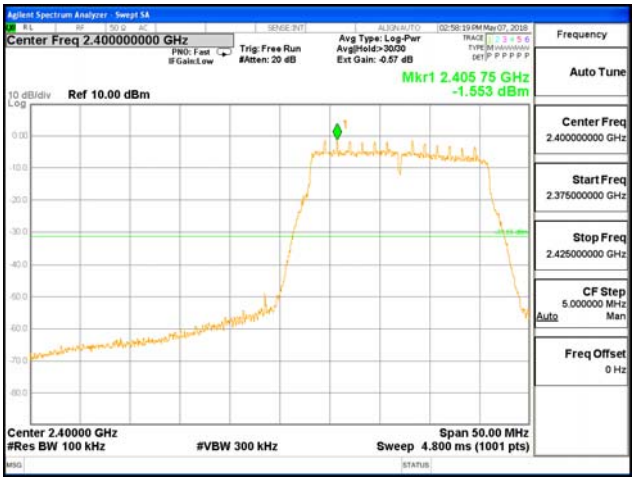


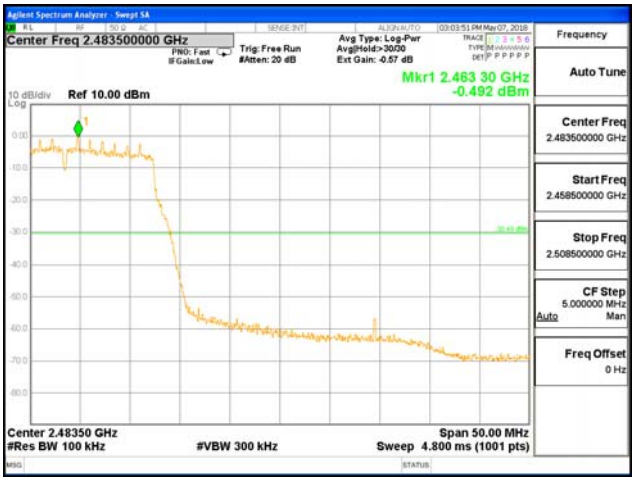
CDD Mode_802.11g_ANT1

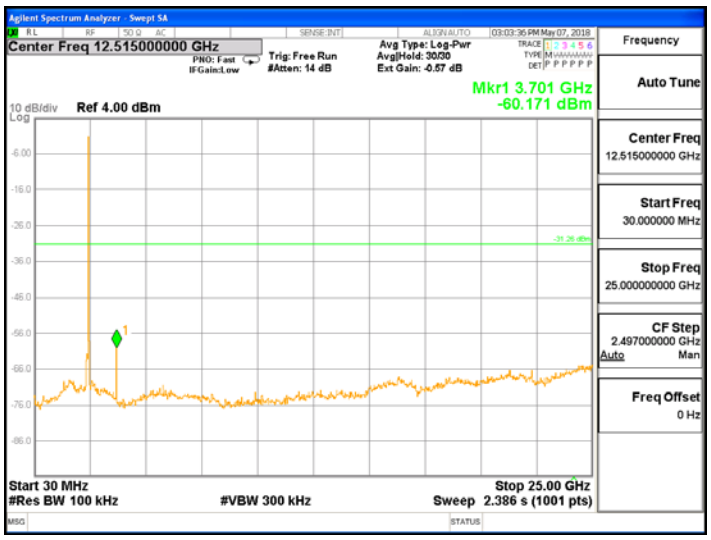




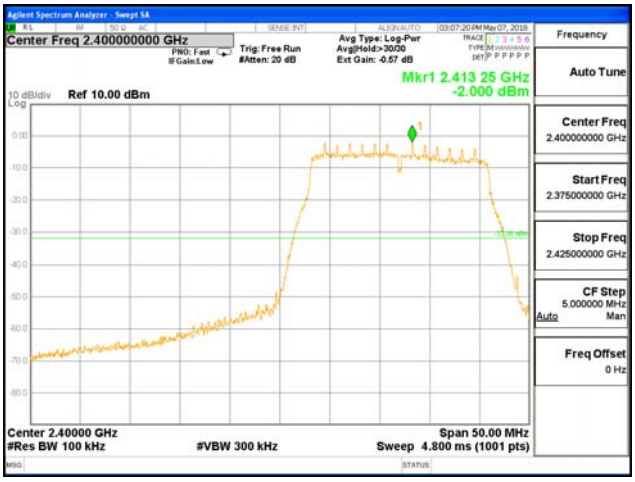
CDD Mode_802.11g_ANT2

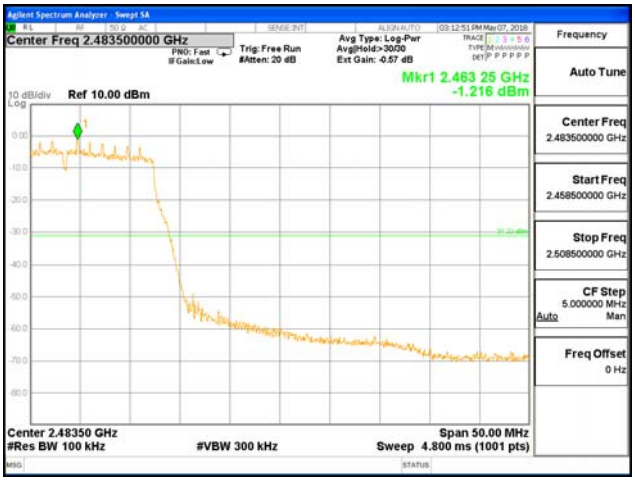


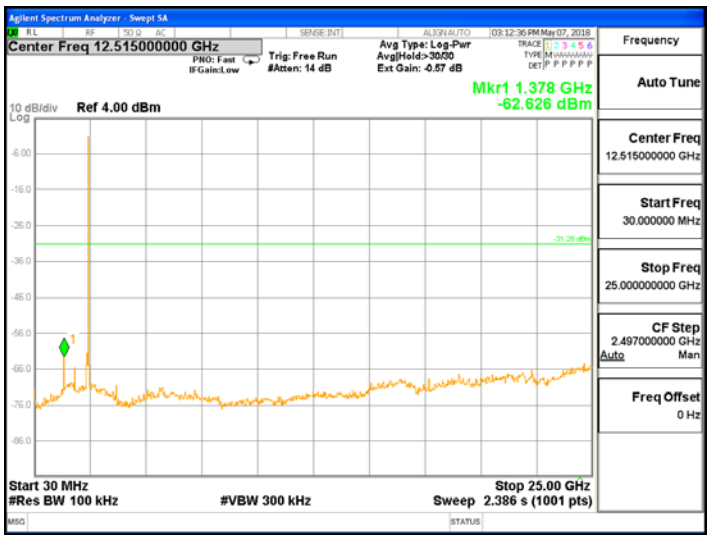




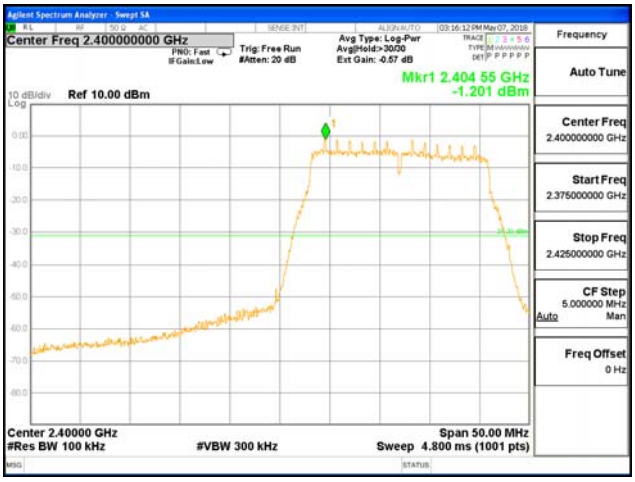
CDD Mode_802.11n_HT20_ANT0

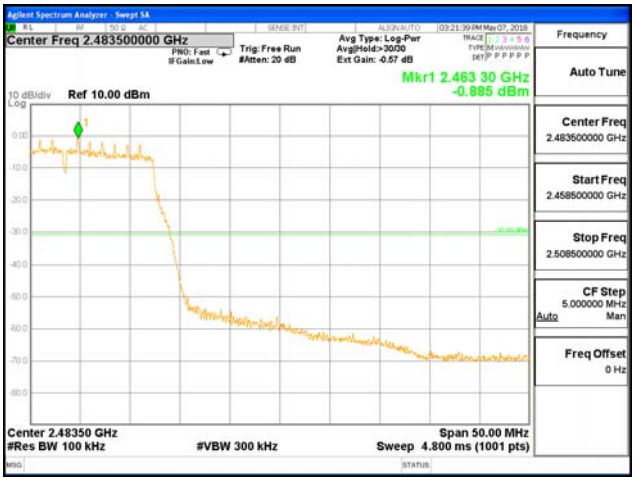


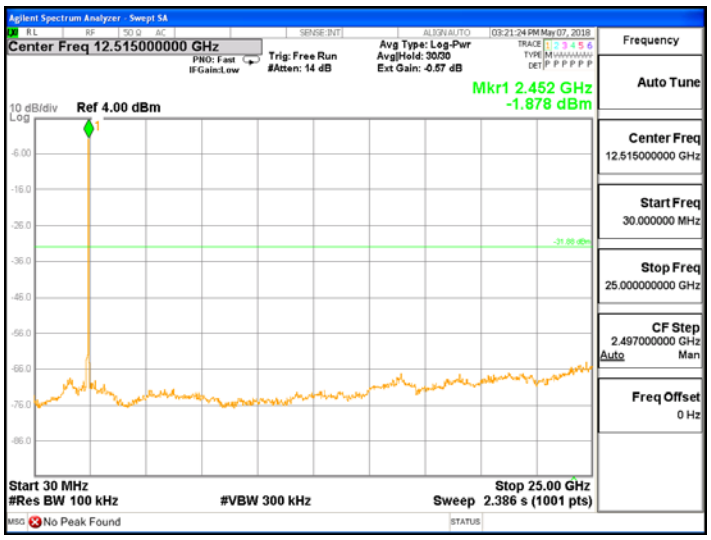




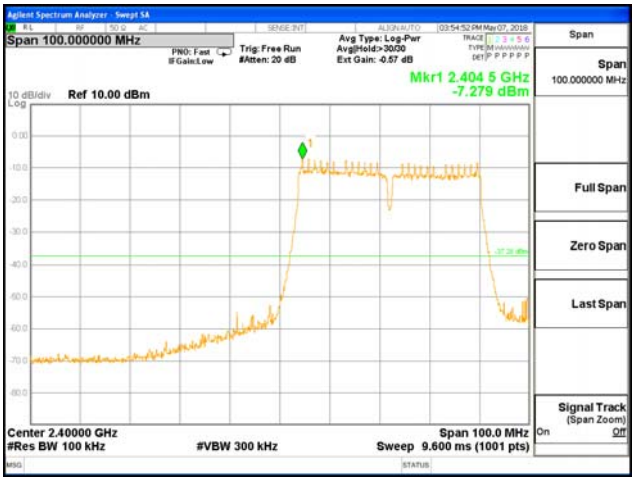
CDD Mode_802.11n_HT20_ANT1

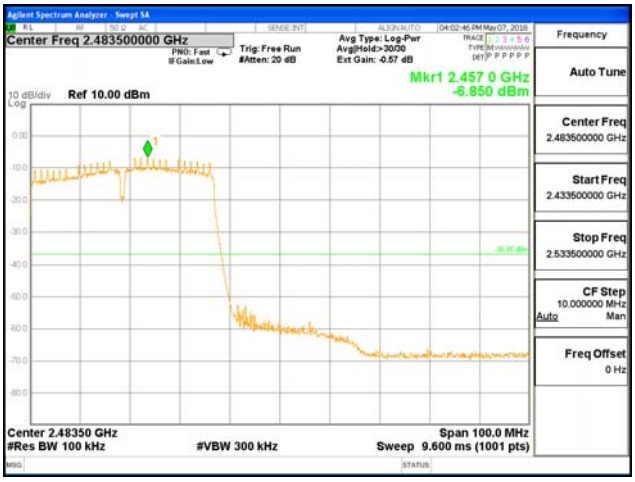


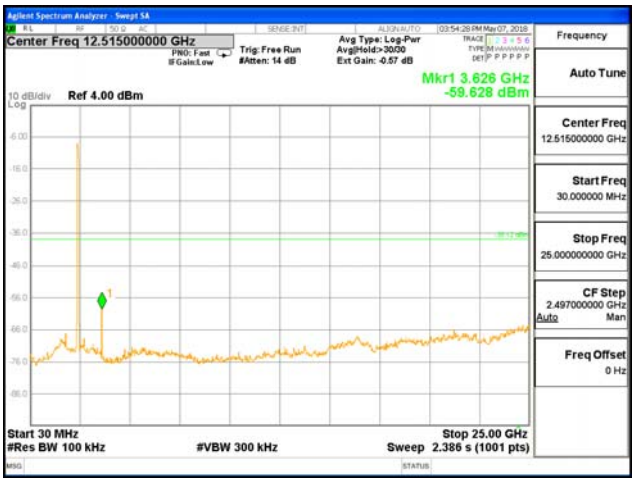


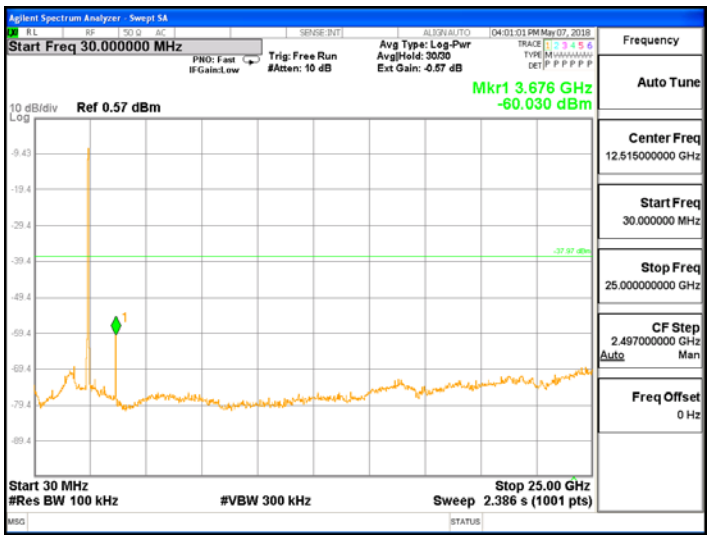


CDD Mode_802.11n_HT20_ANT2

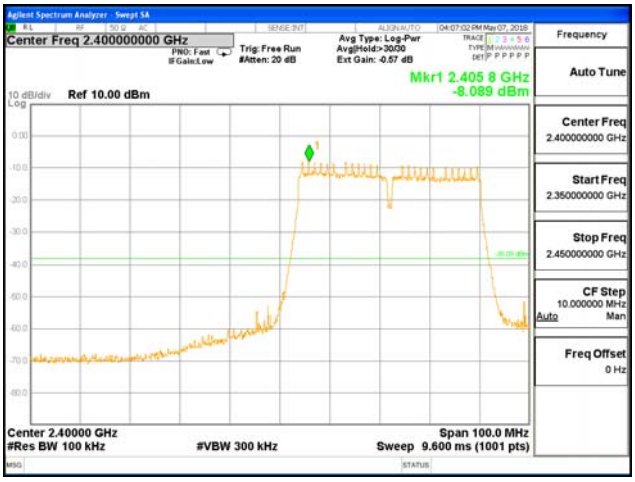


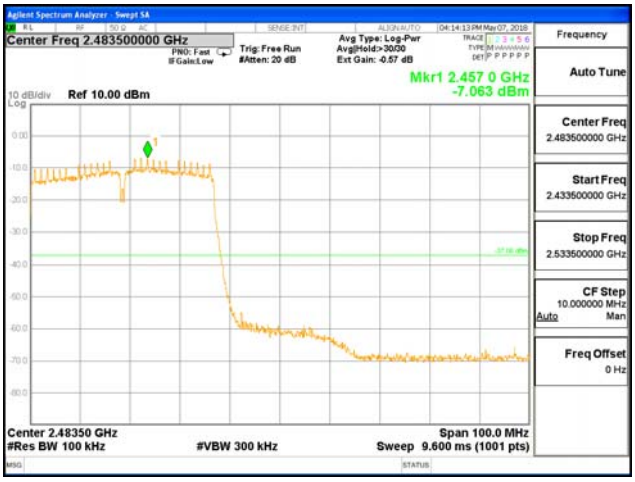


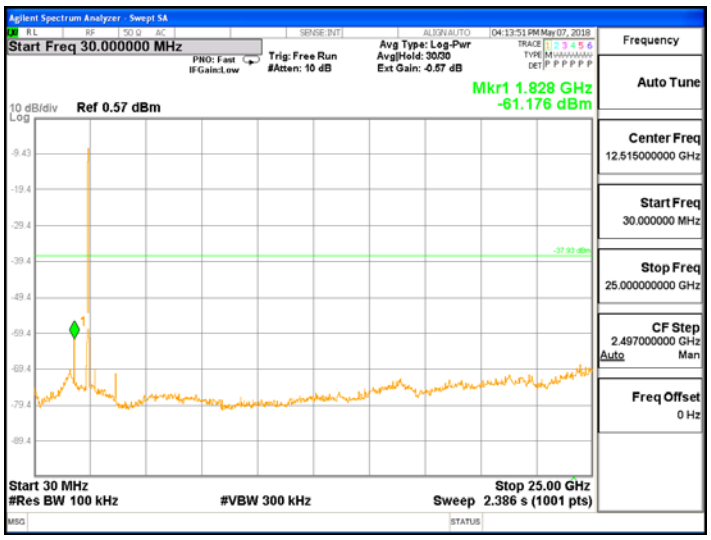




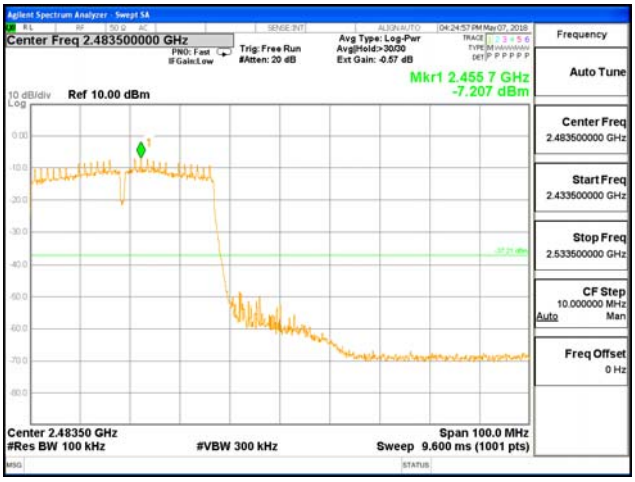
CDD Mode_802.11n_HT40_ANT0

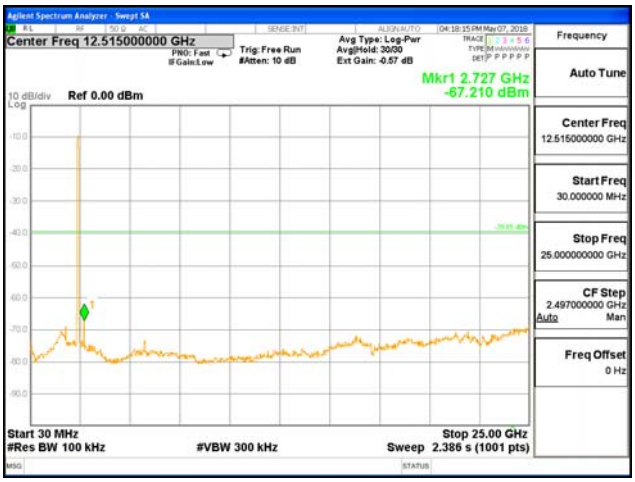


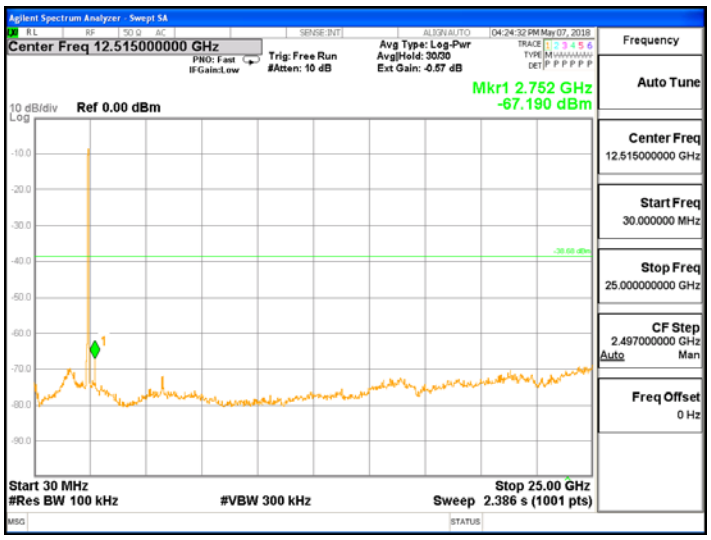




CDD Mode_802.11n_HT40_ANT1







CDD Mode_802.11n_HT40_ANT2

4.5 Radiated Emission

Test Location

☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m SAC (test distance : 3 m)

Test Procedures

1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
2) In the frequency rage above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:

Frequency Range = 9 kHz ~ 1 GHz

a) RBW = 100 kHz for f < 1 GHz, 9 kHz for f < 30 MHz

b) VBW ≥ RBW

c) Detector = CISPR Quasi-peak

d) Sweep time = auto couple

- Peak

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = Peak

d) Sweep time = auto

e) Trace mode = max hold

- Average (duty cycle ≥ 98%)

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = RMS

d) Sweep time = auto

e) Averaging type = power (i.e., RMS)

f) Trace mode = average (at least 100 traces)

- Average (duty cycle < 98%, duty cycle variations are less than ±2%)

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = RMS

d) Sweep time = auto

e) Averaging type = power (i.e., RMS)

f) Trace mode = average (at least 100 traces)

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.
If power averaging (RMS) mode, then the applicable correction factor is 10 log(1/x), where x is the duty cycle.

CDD Mode	802.11b	0.21 dB
	802.11g	0.21 dB
	802.11n_HT20	0.21 dB
	802.11n_HT40	0.43 dB
SDM Mode	802.11n_HT20	0.59 dB
	802.11n_HT40	1.08 dB

Limit :

FCC Part 15 § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	MHz	GHz
0.09-0.11	8.37626-8.38675	73-74.6	399.9-410	2690-2900	10.6-12.7
[1]0.495-0.505	8.41425-8.41475	74.8-75.2	608-614	3260-3267	13.25-13.4
2.1735-2.1905	12.29-12.293	108-121.94	960-1240	3332-3339	14.47-14.5
4.125-4.128	12.51975-12.52025	123-138	1300-1427	3345.8-3358	15.35-16.2
4.17725-4.17775	12.57675-12.57725	149.9-150.05	1435-1626.5	3600-4400	17.7-21.4
4.20725-4.20775	13.36-13.41	156.52475-156.52525	1645.5-1646.5	4500-5150	22.01-23.12
6.215-6.218	16.42-16.423	156.7-156.9	1660-1710	5350-5460	23.6-24
6.26775-6.26825	16.69475-16.69525	162.0125-167.17	1718.8-1722.2	7250-7750	31.2-31.8
6.31175-6.31225	16.80425-16.80475	167.72-173.2	2200-2300	8025-8500	36.43-36.5
8.291-8.294	25.5-25.67	240-285	2310-2390	9000-9200	[2]Above 38.6
8.362-8.366	37.5-38.25	322-335.4	2483.5-2500	9300-9500	

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

FCC Part 15 § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	Deasurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

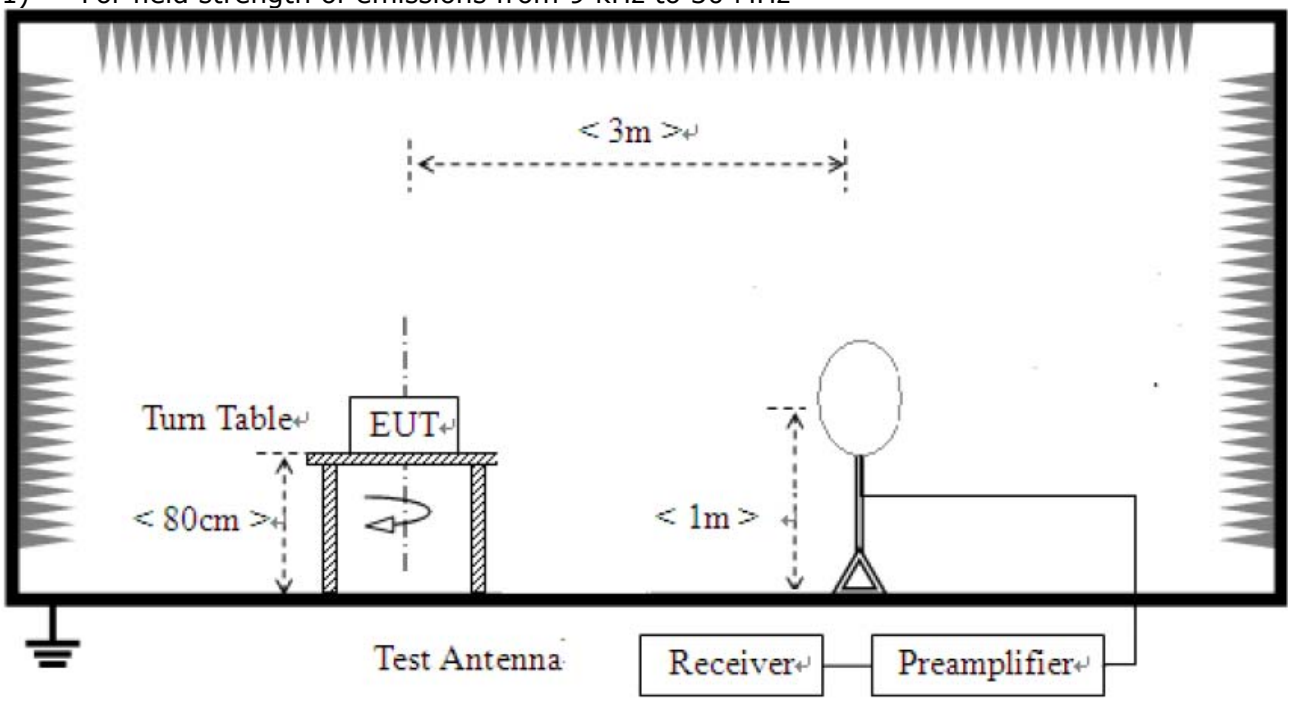
We have done all test mode.
The worst-case antenna configuration and Test mode are determined to be as follows.

802.11b mode : ANT0, ANT1, ANT2 (SISO)
802.11g mode : ANT0 + ANT1 + ANT2 (MIMO)
802.11n SDM mode : ANT0 + ANT1 + ANT2 (MIMO)

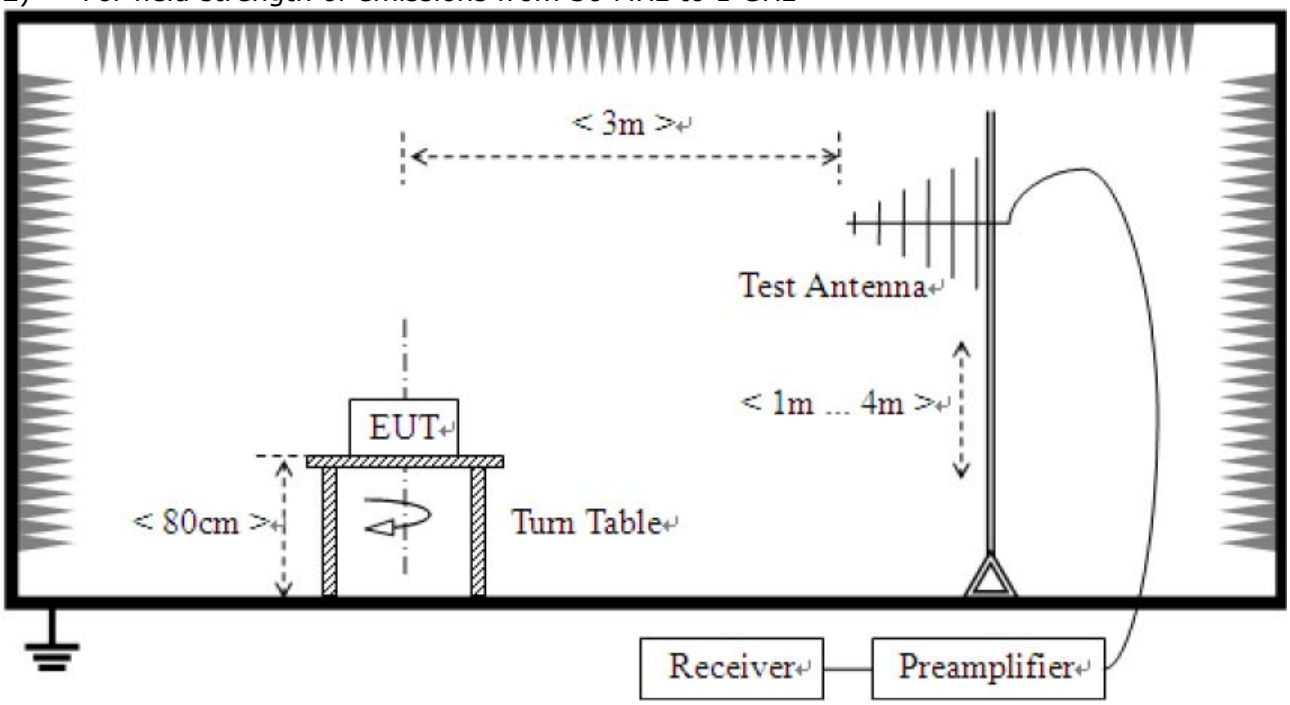
So the results are only attached worst cases.

Test Setup:

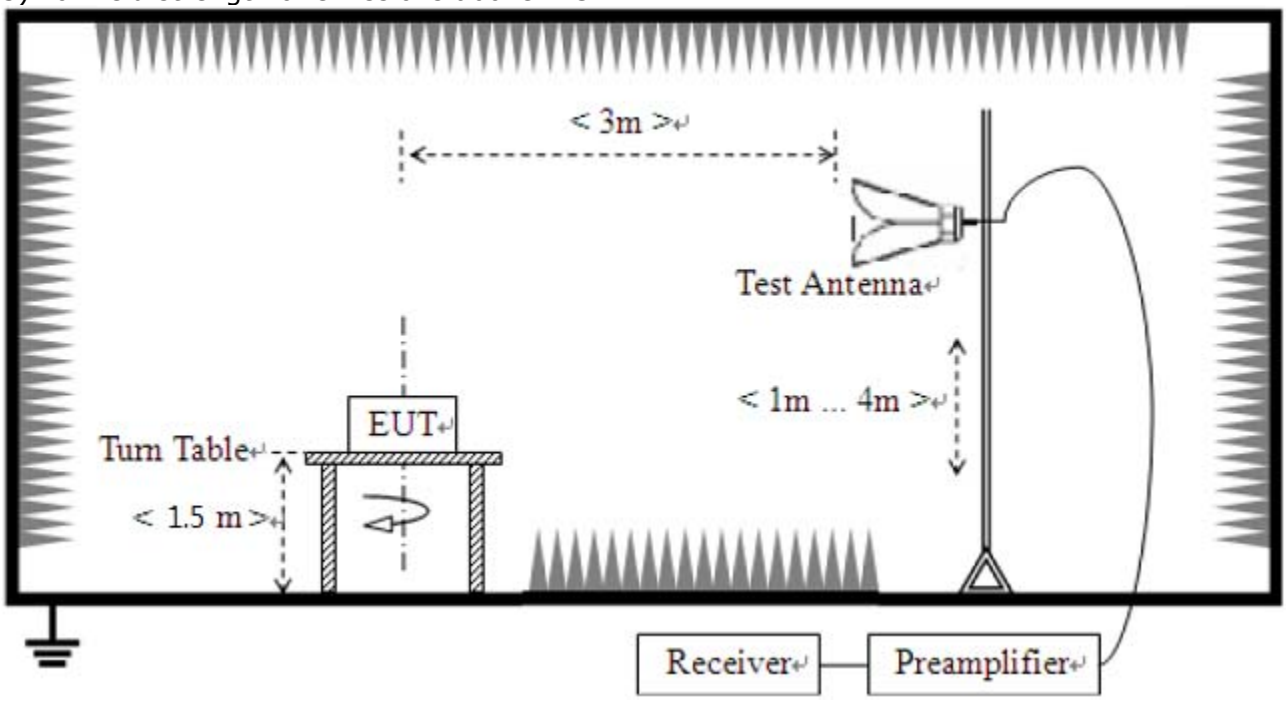
1) For field strength of emissions from 9 kHz to 30 MHz



2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



Test results

1) 9 kHz to 30 MHz

Test mode : 802.11b, 802.11g, 802.11n (Worst case)

The requirements are:
☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	See note

Note :
The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

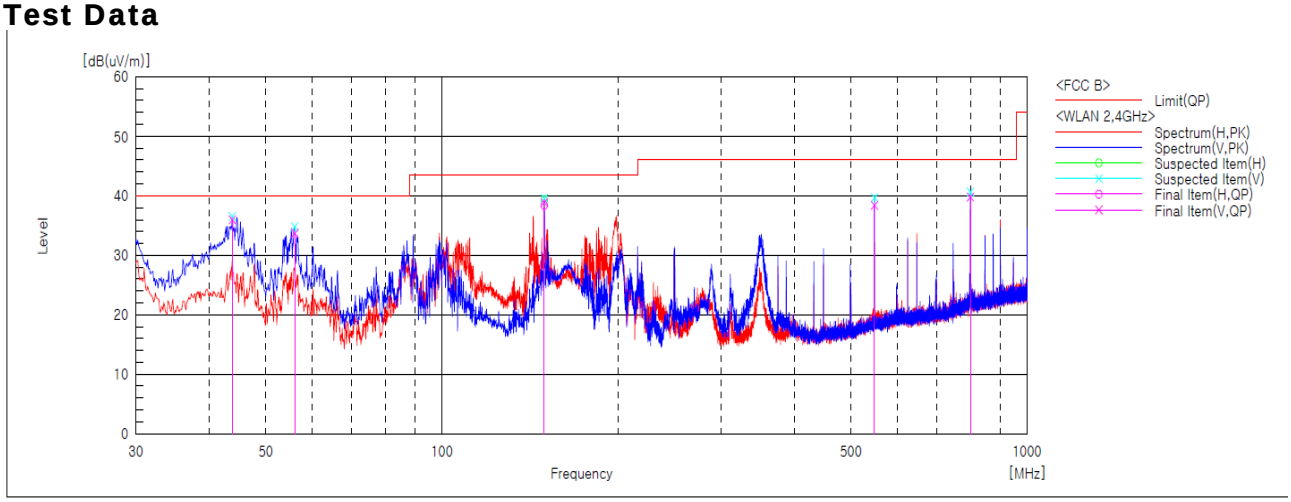
Distance extrapolation factor = 40 log (specific distance / test distance) (dB)

2) 30 MHz to 1 GHz

Test mode : 802.11g, High Channel(Worst Case)

The requirements are:
☒ Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	43.826	V	48.5	-12.5	36.0	40.0	4.0	99.8	328.1	
2	56.019	V	46.7	-13.0	33.7	40.0	6.3	99.8	207.7	
3	149.537	V	56.3	-17.4	38.9	43.5	4.6	99.8	102.9	
4	149.537	H	55.8	-17.4	38.4	43.5	5.1	99.8	118.8	
5	548.319	V	47.0	-8.6	38.4	46.0	7.6	99.8	359.4	
6	800.021	V	45.2	-5.4	39.8	46.0	6.2	99.8	311.2	

Remark :
1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

3) above 1 GHz

Test mode : 802.11b_CDD Mode_ANT0

The requirements are:
☒ Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.81	41.40	19.19	32.60
3 375.00	V	54.00	74.00	36.11	41.20	17.89	32.80
4 824.00	H	54.00	74.00	35.51	43.30	18.49	30.70
4 824.00	V	54.00	74.00	36.61	44.40	17.39	29.60
2 390.00	H	54.00	74.00	44.41	60.60	9.59	13.40
2 390.00	V	54.00	74.00	41.51	51.90	12.49	22.10

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.91	41.30	19.09	32.70
3 375.00	V	54.00	74.00	36.11	41.10	17.89	32.90
4 874.00	H	54.00	74.00	35.81	44.30	18.19	29.70
4 874.00	V	54.00	74.00	36.91	44.60	17.09	29.40

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	36.40	34.51	41.40	19.49
3 375.00	V	54.00	74.00	44.21	36.01	41.40	17.99
4 924.00	H	54.00	74.00	40.72	38.51	45.70	15.49
4 924.00	V	54.00	74.00	45.84	42.91	48.90	11.09
2 483.50	H	54.00	74.00	36.89	43.91	58.90	10.09
2 483.50	V	54.00	74.00	37.05	40.61	53.40	13.39

Remarks

1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.

Test mode : 802.11b_CDD Mode_ANT1

The requirements are:
☒ Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.61	41.70	19.39	32.30
3 375.00	V	54.00	74.00	36.21	41.30	17.79	32.70
4 824.00	H	54.00	74.00	40.61	47.50	13.39	26.50
4 824.00	V	54.00	74.00	39.11	46.20	14.89	27.80
2 390.00	H	54.00	74.00	47.61	63.00	6.39	11.00
2 390.00	V	54.00	74.00	41.21	50.90	12.79	23.10

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.41	41.30	19.59	32.70
3 375.00	V	54.00	74.00	36.01	41.70	17.99	32.30
4 874.00	H	54.00	74.00	38.31	46.00	15.69	28.00
4 874.00	V	54.00	74.00	37.81	45.00	16.19	29.00

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.51	41.50	19.49	32.50
3 375.00	V	54.00	74.00	35.81	41.60	18.19	32.40
4 924.00	H	54.00	74.00	40.71	46.10	13.29	27.90
4 924.00	V	54.00	74.00	41.61	47.60	12.39	26.40
2 483.50	H	54.00	74.00	48.31	65.70	5.69	8.30
2 483.50	V	54.00	74.00	43.61	53.40	10.39	20.60

Remarks

1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.

Test mode : 802.11b_CDD Mode_ANT2

The requirements are:
☒ Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.21	41.70	19.79	32.30
3 375.00	V	54.00	74.00	35.71	41.90	18.29	32.10
4 824.00	H	54.00	74.00	37.51	45.50	16.49	28.50
4 824.00	V	54.00	74.00	43.41	48.50	10.59	25.50
2 390.00	H	54.00	74.00	38.61	50.70	15.39	23.30
2 390.00	V	54.00	74.00	45.41	61.00	8.59	13.00

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.61	41.30	19.39	32.70
3 375.00	V	54.00	74.00	35.81	41.50	18.19	32.50
4 874.00	H	54.00	74.00	34.21	44.00	19.79	30.00
4 874.00	V	54.00	74.00	38.91	45.80	15.09	28.20

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 250.00	H	54.00	74.00	34.81	41.50	19.19	32.50
3 375.00	V	54.00	74.00	36.11	41.70	17.89	32.30
4 924.00	H	54.00	74.00	36.51	45.10	17.49	28.90
4 924.00	V	54.00	74.00	41.91	47.40	12.09	26.60
2 483.50	H	54.00	74.00	47.61	60.50	6.39	13.50
2 483.50	V	54.00	74.00	50.71	65.70	3.29	8.30

Remarks

1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.

Test mode : 802.11g

The requirements are:
☒ Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.01	42.60	17.99	31.40
3 900.00	H	54.00	74.00	36.61	43.30	17.39	30.70
2 390.00	H	54.00	74.00	39.81	51.50	14.19	22.50
2 390.00	V	54.00	74.00	41.71	55.30	12.29	18.70

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.21	42.90	17.79	31.10
3 900.00	H	54.00	74.00	36.31	43.30	17.69	30.70
2 483.50	H	54.00	74.00	40.31	50.60	13.69	23.40
2 483.50	V	54.00	74.00	40.01	49.80	13.99	24.20

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.21	42.50	17.79	31.50
3 900.00	H	54.00	74.00	36.51	43.50	17.49	30.50
2 483.50	H	54.00	74.00	51.21	69.60	2.79	4.40
2 483.50	V	54.00	74.00	47.91	62.10	6.09	11.90

Remarks

1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.

Test mode : 802.11n_SDM Mode_HT20

The requirements are:
☒ Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.01	42.70	17.99	31.30
3 900.00	H	54.00	74.00	36.41	43.20	17.59	30.80
2 390.00	H	54.00	74.00	50.11	63.50	3.89	10.50
2 390.00	V	54.00	74.00	41.71	56.50	12.29	17.50

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	35.91	42.70	18.09	31.30
3 900.00	H	54.00	74.00	36.71	43.40	17.29	30.60
2 483.50	H	54.00	74.00	39.91	49.80	14.09	24.20
2 483.50	V	54.00	74.00	39.81	49.20	14.19	24.80

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.01	42.50	17.99	31.50
3 900.00	H	54.00	74.00	36.71	43.20	17.29	30.80
2 483.50	H	54.00	74.00	51.61	65.80	2.39	8.20
2 483.50	V	54.00	74.00	46.61	62.20	7.39	11.80

Remarks

1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.

Test mode : 802.11n_SDM Mode_HT40

The requirements are:
☒ Complies

Test Data

Low(2 422 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.11	42.60	17.89	31.40
3 900.00	H	54.00	74.00	36.51	43.20	17.49	30.80
2 390.00	H	54.00	74.00	50.51	67.20	3.49	6.80
2 390.00	V	54.00	74.00	40.81	53.20	13.19	20.80

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.21	42.80	17.79	31.20
3 900.00	H	54.00	74.00	36.51	43.30	17.49	30.70
2 390.00	H	54.00	74.00	40.31	51.70	13.69	22.30
2 390.00	V	54.00	74.00	37.81	48.00	16.19	26.00
2 483.50	H	54.00	74.00	43.01	54.80	10.99	19.20
2 483.50	V	54.00	74.00	39.61	50.30	14.39	23.70

High(2 452 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
3 625.00	V	54.00	74.00	36.01	43.00	17.99	31.00
3 900.00	H	54.00	74.00	36.41	43.00	17.59	31.00
2 483.50	H	54.00	74.00	49.91	66.60	4.09	7.40
2 483.50	V	54.00	74.00	43.61	56.00	10.39	18.00

Remarks

1. The EUT was tested in three orientations in order to determine that "Z axis" was the worst case.

4.6 AC Power Line Conducted Emissions

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits.

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.
Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average**
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* The level decreases linearly with the logarithm of the frequency.
** A linear average detector is required.

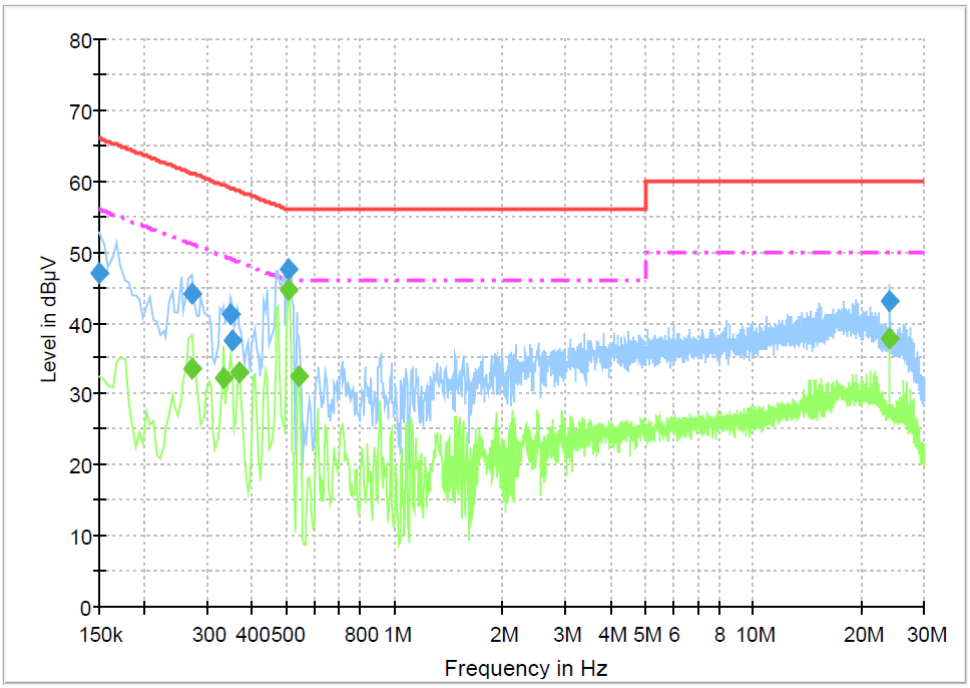
Test Results

The requirements are:
☒ Complies

Test Data

[LINE]

3CE_Class B_L1



Final Result 1

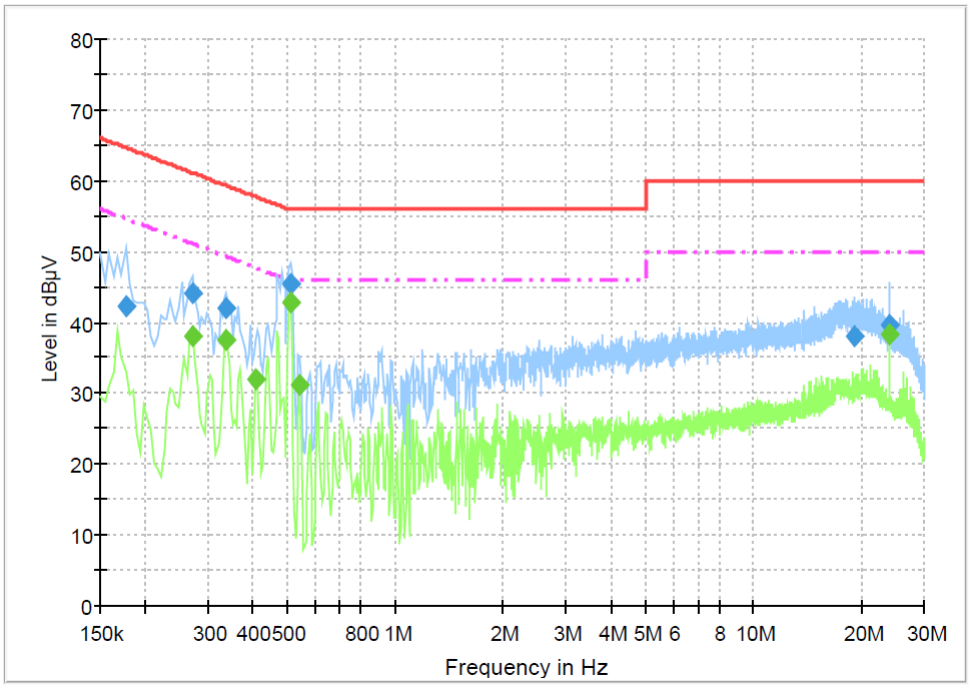
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	47.0	1000.0	9.000	On	L1	9.8	19.0	66.0
0.271500	44.0	1000.0	9.000	On	L1	9.7	17.1	61.1
0.348000	41.2	1000.0	9.000	On	L1	9.9	17.8	59.0
0.352500	37.4	1000.0	9.000	On	L1	9.9	21.5	58.9
0.505500	47.5	1000.0	9.000	On	L1	10.0	8.5	56.0
24.000000	43.0	1000.0	9.000	On	L1	10.1	17.0	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.271500	33.6	1000.0	9.000	On	L1	9.7	17.4	51.1
0.334500	32.1	1000.0	9.000	On	L1	9.9	17.2	49.3
0.370500	33.0	1000.0	9.000	On	L1	9.9	15.5	48.5
0.505500	44.7	1000.0	9.000	On	L1	10.0	1.3	46.0
0.541500	32.5	1000.0	9.000	On	L1	10.0	13.5	46.0
24.000000	37.6	1000.0	9.000	On	L1	10.1	12.4	50.0

[NEUTRAL]

3CE_Class B_N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	42.3	1000.0	9.000	On	N	9.8	22.3	64.6
0.271500	44.1	1000.0	9.000	On	N	9.8	17.0	61.1
0.339000	41.9	1000.0	9.000	On	N	9.9	17.4	59.2
0.510000	45.5	1000.0	9.000	On	N	9.9	10.5	56.0
19.081500	38.0	1000.0	9.000	On	N	10.1	22.0	60.0
24.040500	39.6	1000.0	9.000	On	N	10.2	20.4	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.271500	38.1	1000.0	9.000	On	N	9.8	13.0	51.1
0.339000	37.5	1000.0	9.000	On	N	9.9	11.7	49.2
0.406500	31.9	1000.0	9.000	On	N	9.9	15.8	47.7
0.510000	42.8	1000.0	9.000	On	N	9.9	3.2	46.0
0.541500	31.1	1000.0	9.000	On	N	9.9	14.9	46.0
24.000000	38.3	1000.0	9.000	On	N	10.2	11.7	50.0

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2017-11-01	2018-11-01
2	Signal Generator	Rohde & Schwarz	SMB100A	175528	2017-11-01	2018-11-01
3	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2017-10-25	2018-10-25
4	Bilog Antenna	Schaffner	CBL6111C	2551	2018-05-10	2020-05-10
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2018-05-02	2020-05-02
6	6dB Attenuator	R&S	DNF	272.4110.50-2	2017-10-25	2018-10-25
7	AMPLIFIER	SONOMA	310	291721	2018-02-02	2019-02-02
8	EMI Test Receiver	Rohde & Schwarz	ESU40	100336	2018-02-01	2019-02-01
9	Preamplifier	Agilent	8449B	3008A02011	2017-11-30	2018-11-30
10	Horn Antenna	ETS-Lindgren	3116	00062504	2017-12-04	2019-12-04
11	Horn Antenna	ETS-Lindgren	3117	00154525	2017-02-17	2019-02-17
12	Band Reject Filter	Micro Tronics	BRM50702	G233	2018-01-26	2019-01-26
13	LISN	Rohde & Schwarz	ENV216	101235	2018-01-31	2019-01-31
14	Singnal Canditioning Unit	R&S	SCU-40	10023	2017-11-01	2018-11-01