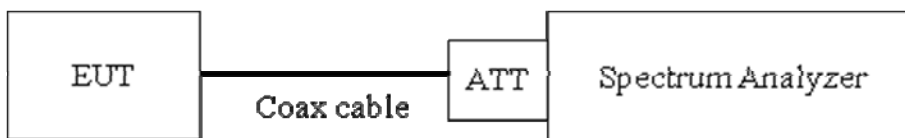


9.6 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS**Test Requirements and limit, §15.247(d) / RSS-247(Issue 1) Section 5.5.**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, 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)).

Limit : 20 dBc**■ TEST CONFIGURATION****■ TEST PROCEDURE**

The transmitter output is connected to the spectrum analyzer. (Procedure 11.0 in KDB 558074 v04)

RBW = 100 kHz

VBW $\geq 3 \times$ RBW

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep time = auto couple

Ensure that the number of measurement points $\geq$ Span/RBW

Allow trace to fully stabilize.

Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 10th harmonic range with the transmitter set to the lowest, middle, and highest channels.

Note :

1. The band edge results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. So, 10.7 dB is

offset for 2.4 GHz Band. Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	10.65
	2437	10.65
	2462	10.66

(Actual value of loss for the attenuator and cable combination)

4. In case of conducted spurious emissions test(not band edge), please check factors blow table.
5. In order to simplify the report, attached plots were only the worst case. (where, worst case is SISO mode and highest power channel)

■ FACTORS FOR FREQUENCY

Freq(MHz)	Factor(dB)
30	11.30
100	9.83
200	10.19
300	10.13
400	10.23
500	10.25
600	10.32
700	10.35
800	10.35
900	10.34
1000	10.39
2000	10.64
2400*	10.65
2500*	10.67
3000	10.68
4000	10.89
5000	11.07
6000	11.06
7000	11.35
8000	11.32
9000	11.48
10000	11.56
11000	11.56
12000	11.68
13000	11.83

14000	11.90
15000	11.98
16000	12.04
17000	12.02
18000	12.08
19000	12.07
20000	12.14
21000	12.17
22000	12.31
23000	12.60
24000	12.34
25000	12.53

Note : 1. '**' is fundamental frequency range.

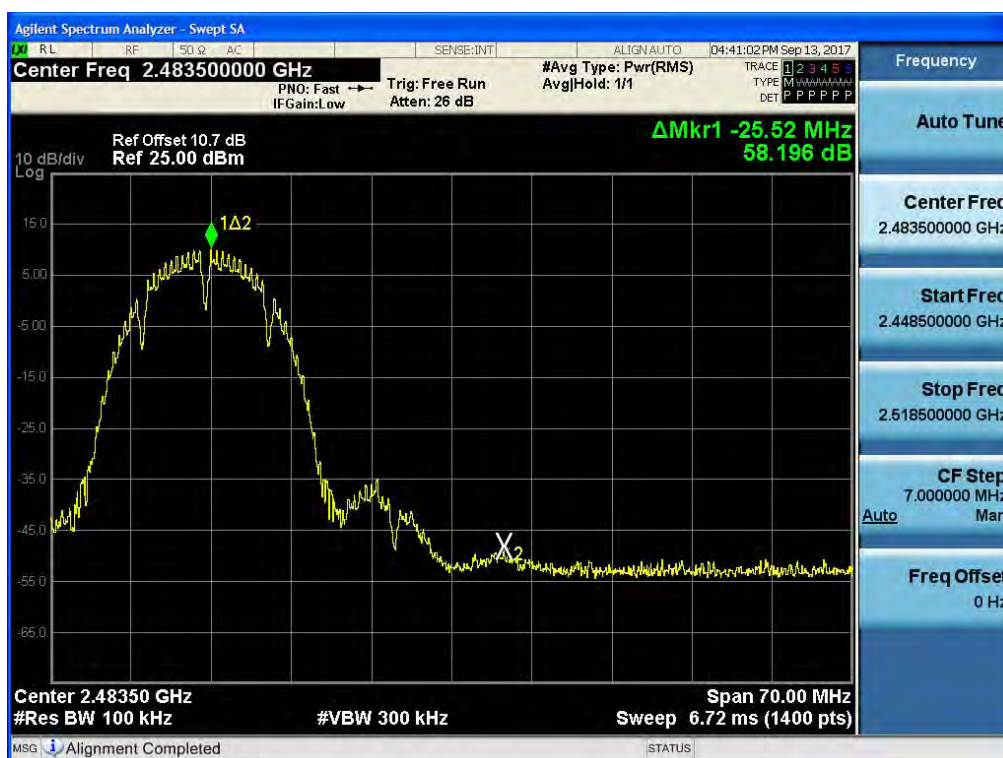
2. Factor = Cable loss + Attenuator loss

■ RESULT PLOTS_Ant.0

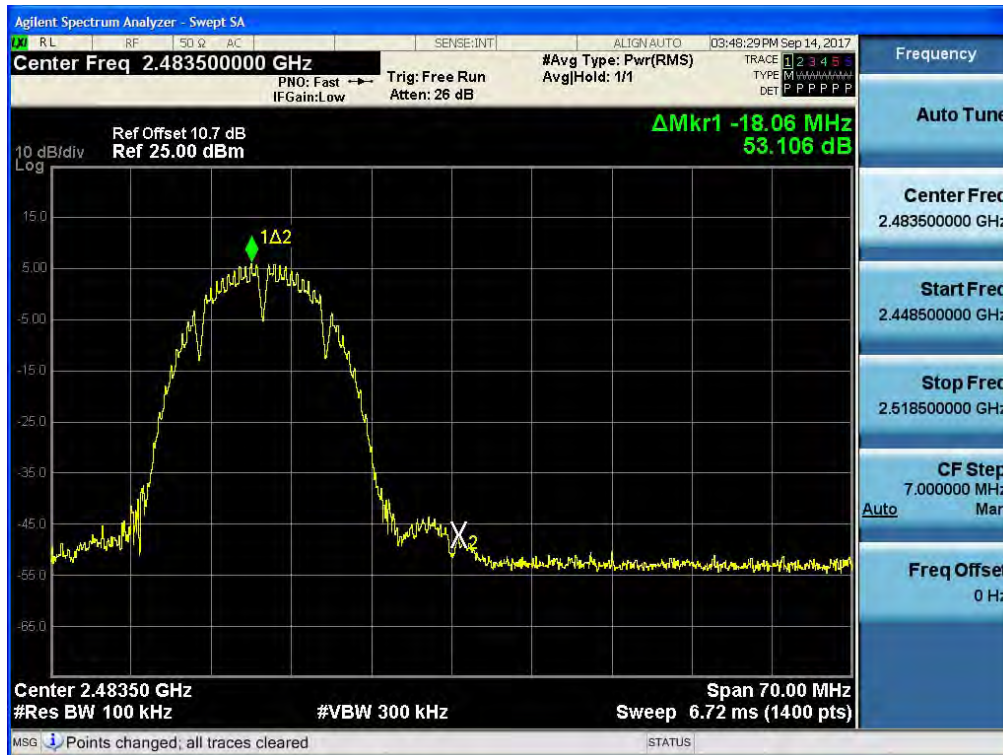
Band Edge (802.11b-CH1)



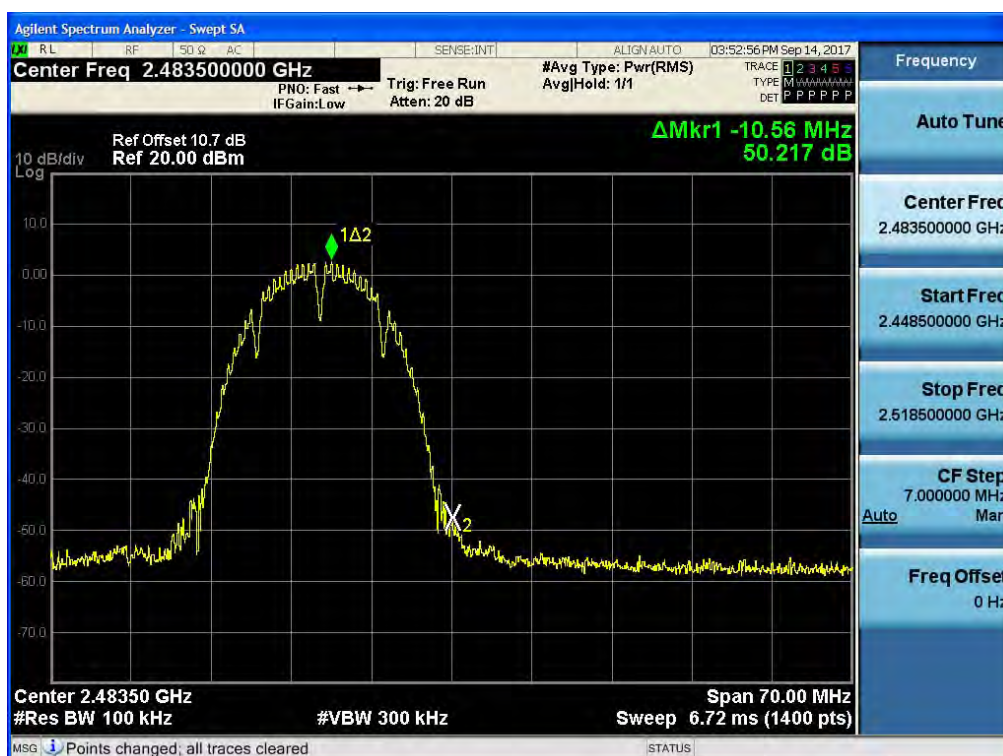
Band Edge (802.11b-CH11)



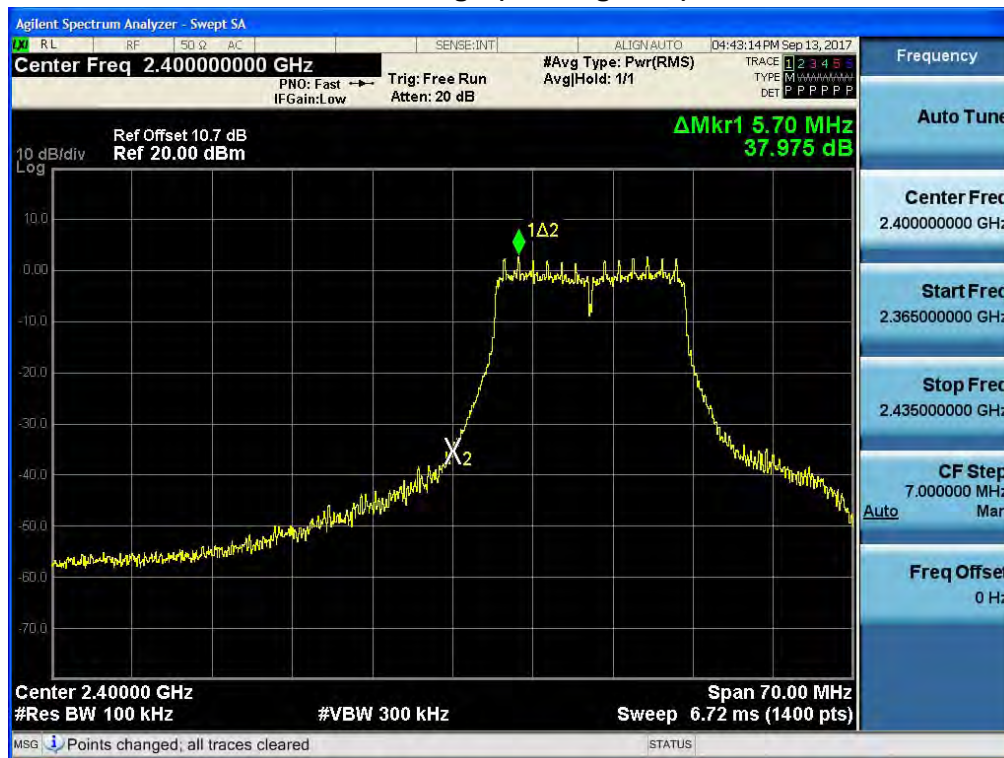
Band Edge (802.11b-CH12)



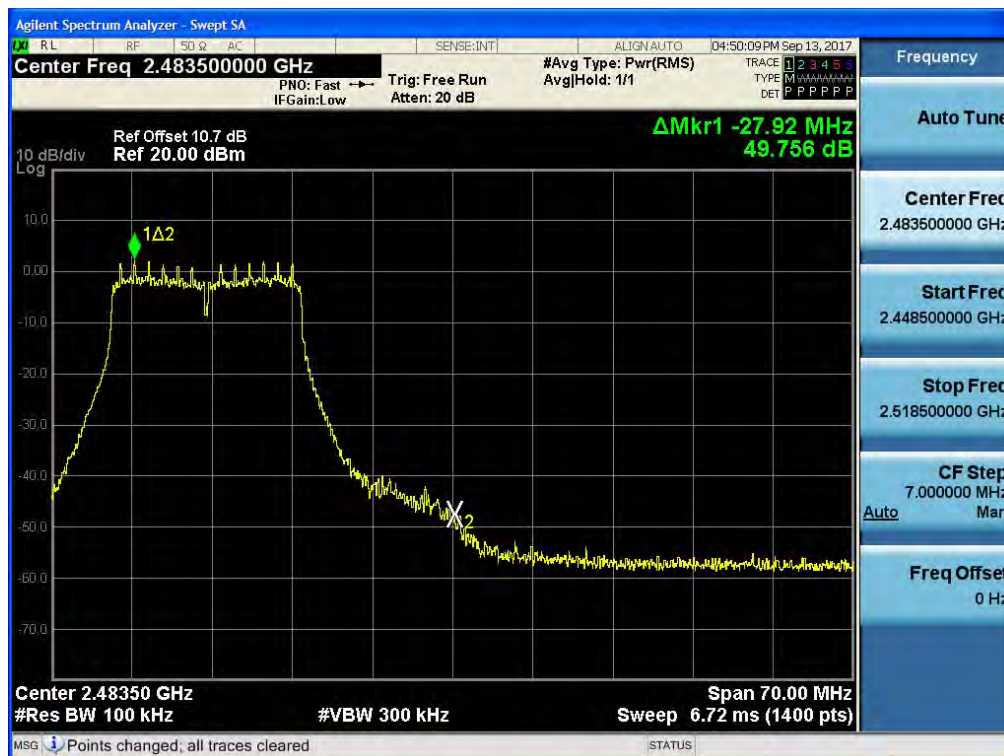
Band Edge (802.11b-CH13)



Band Edge (802.11g-CH1)



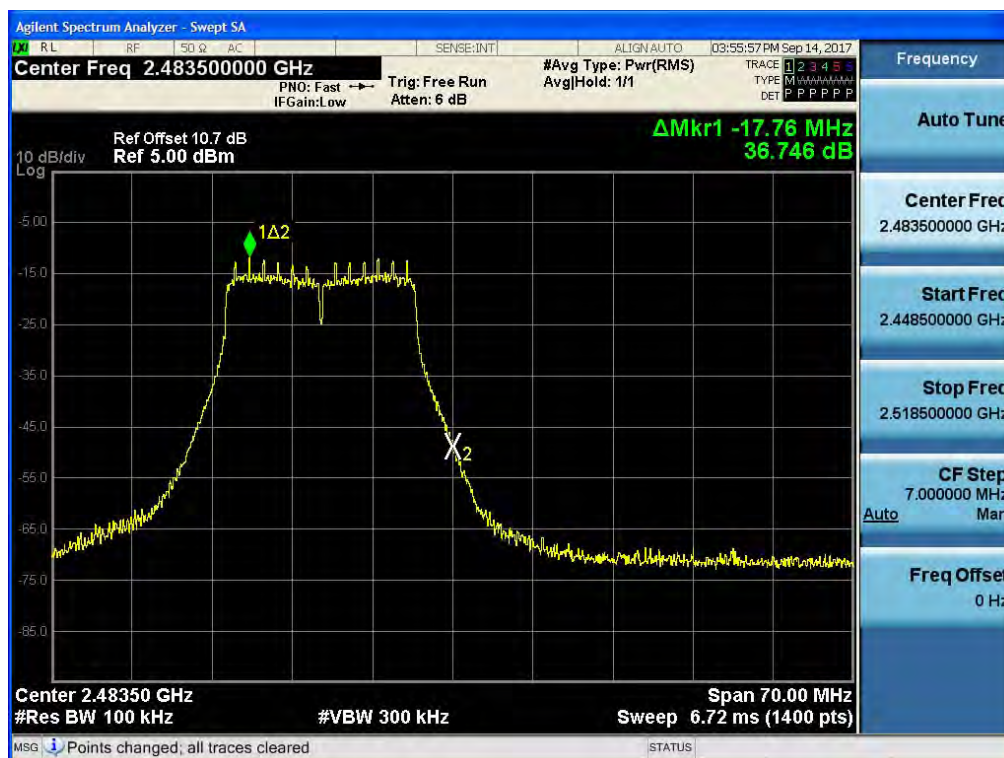
Band Edge (802.11g-CH11)



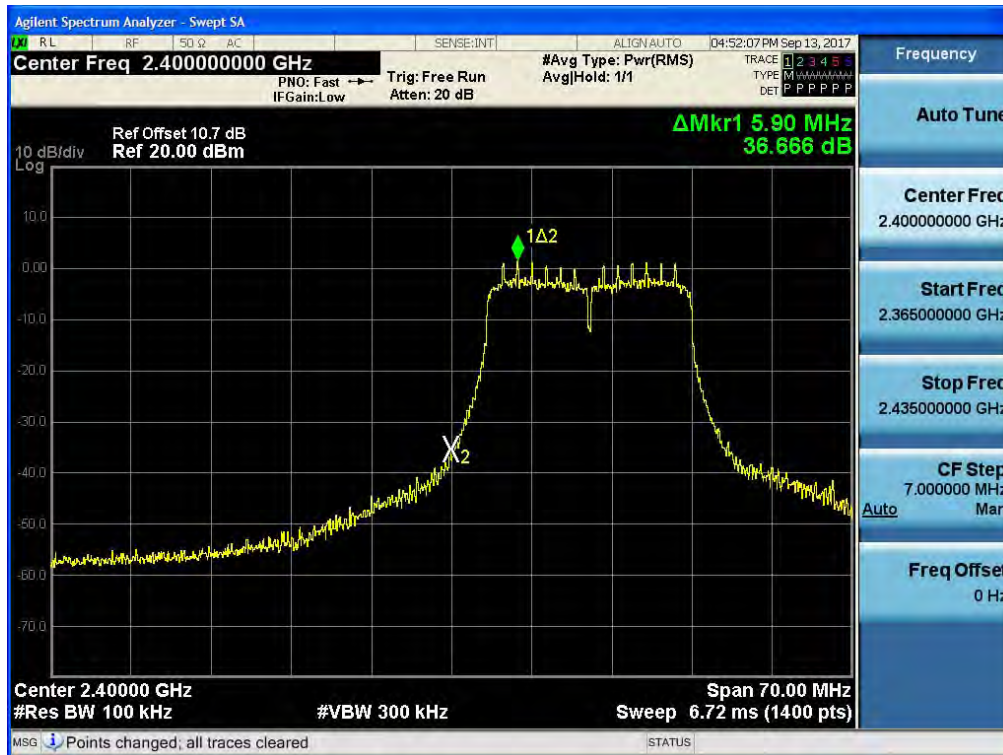
Band Edge (802.11g-CH12)



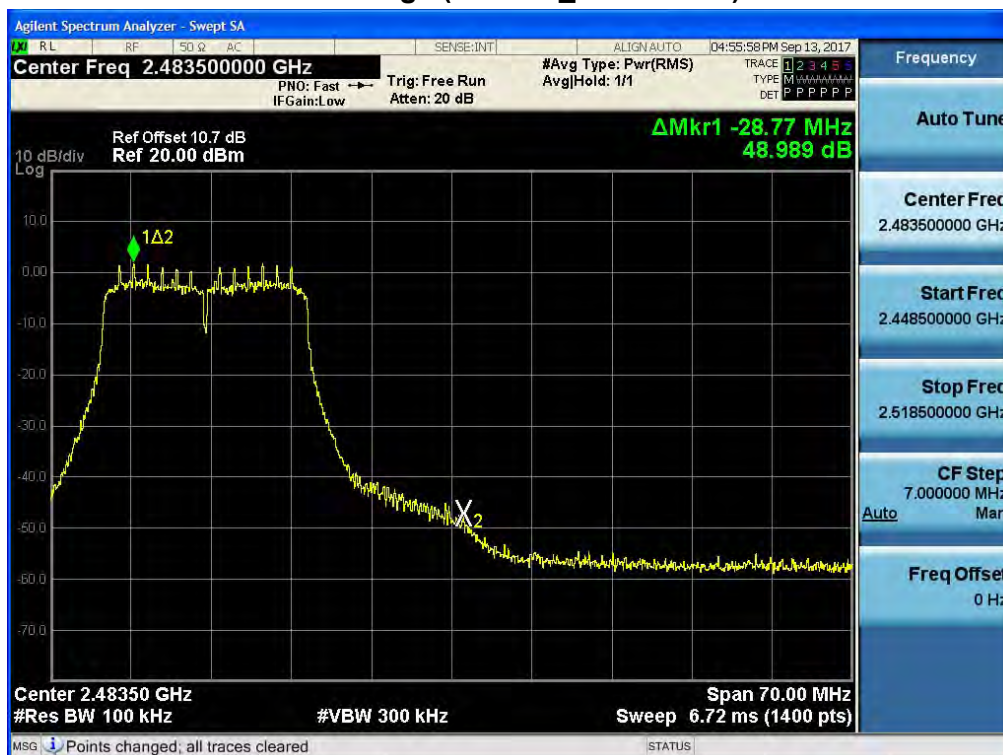
Band Edge (802.11g-CH13)



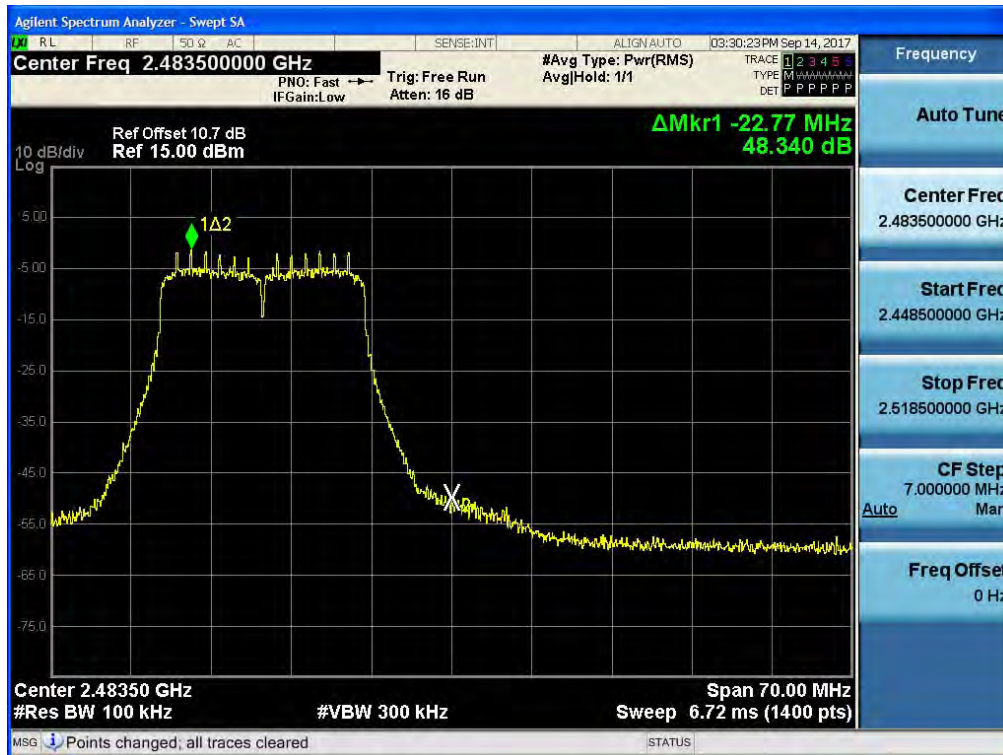
Band Edge (802.11n_HT20-CH1)



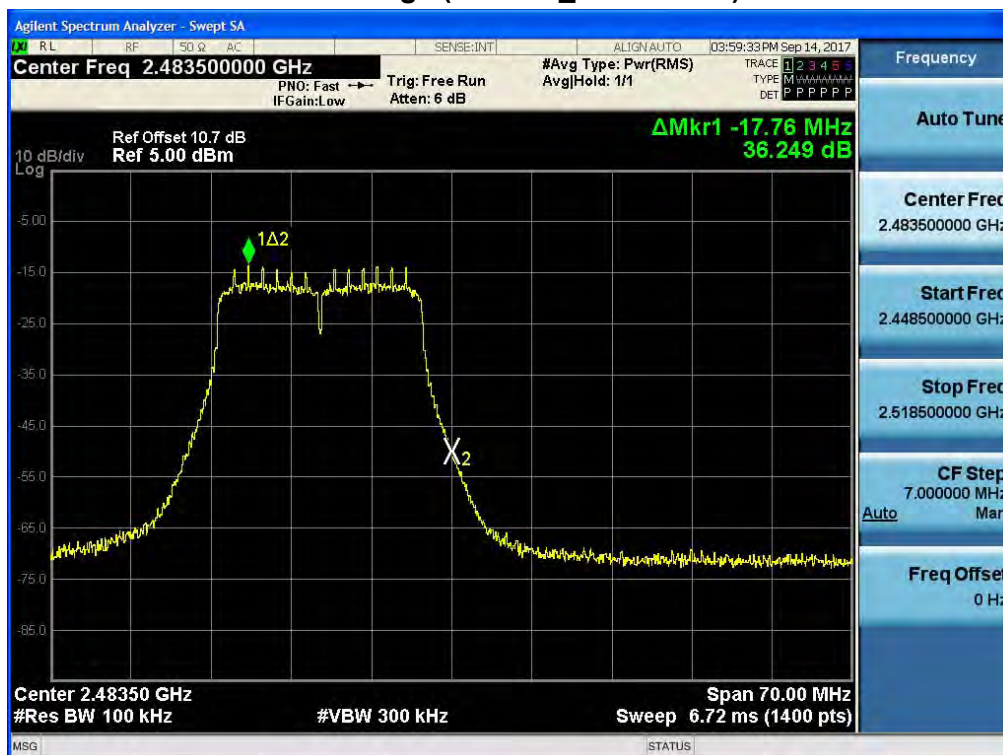
Band Edge (802.11n_HT20-CH11)



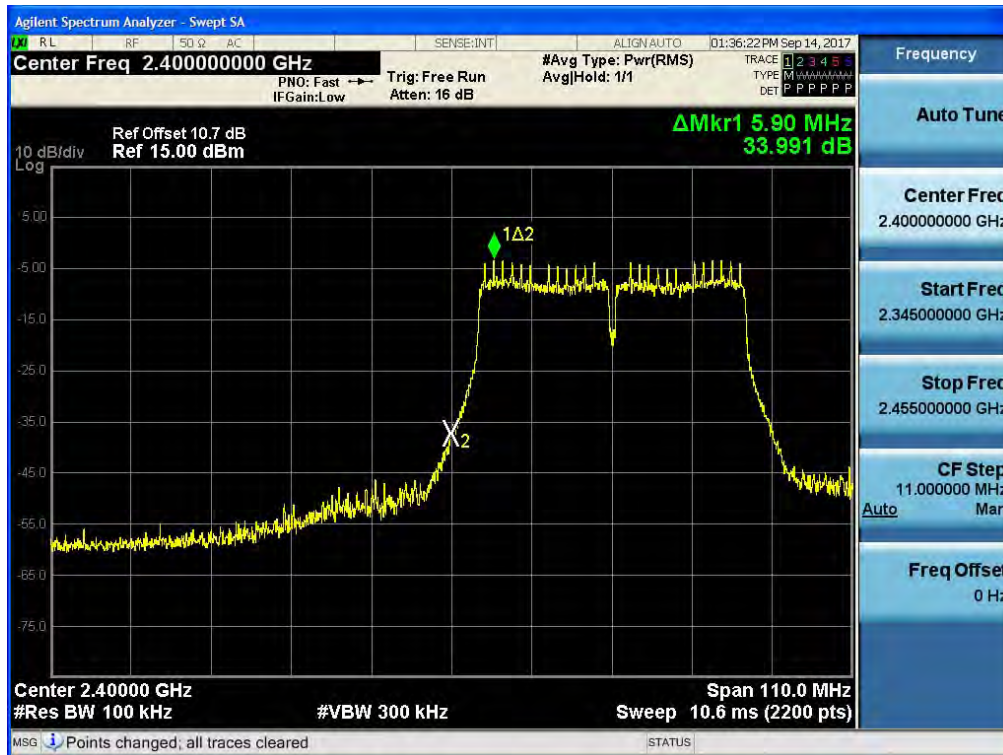
Band Edge (802.11n_HT20-CH12)



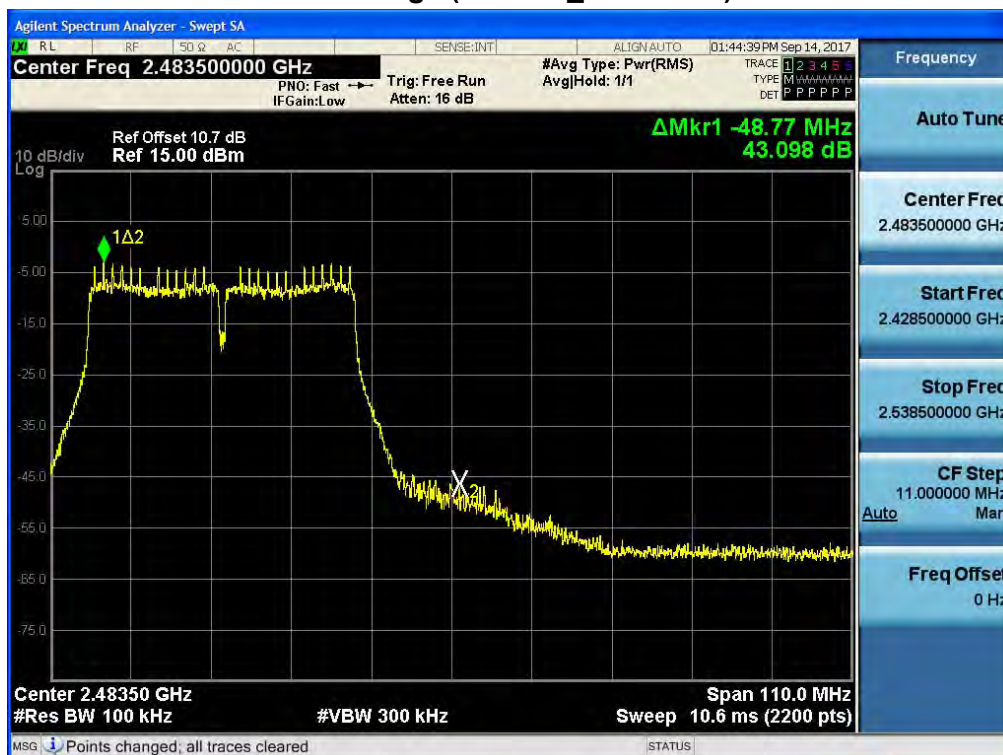
Band Edge (802.11n_HT20-CH13)



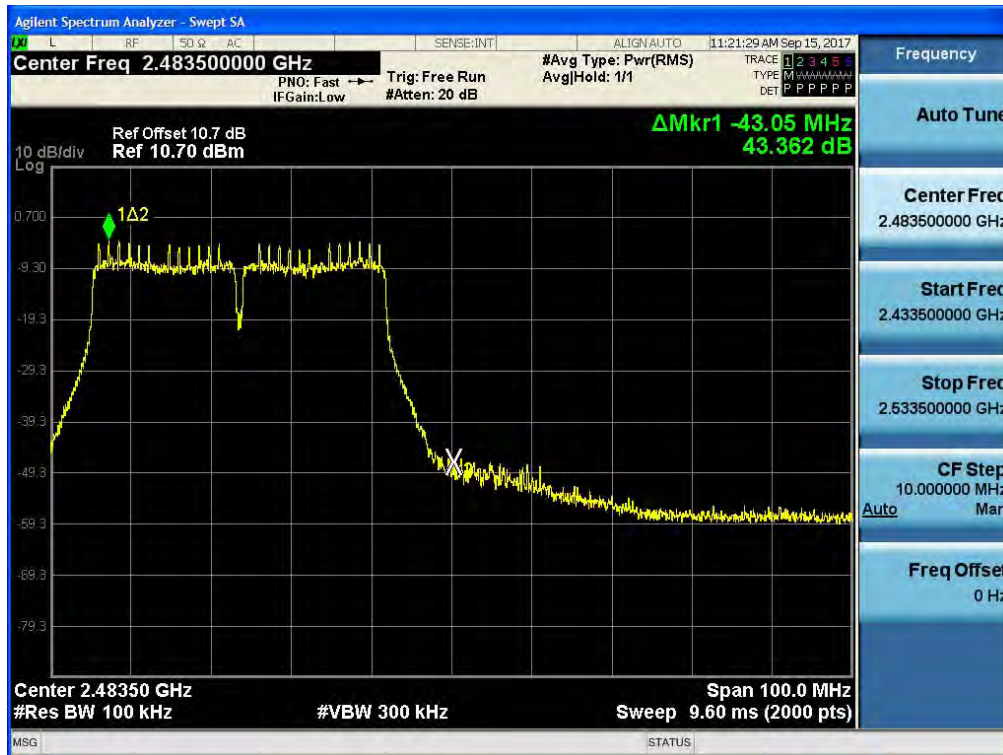
Band Edge (802.11n_HT40-CH3)



Band Edge (802.11n_HT40-CH9)



Band Edge (802.11n_HT40-CH10)

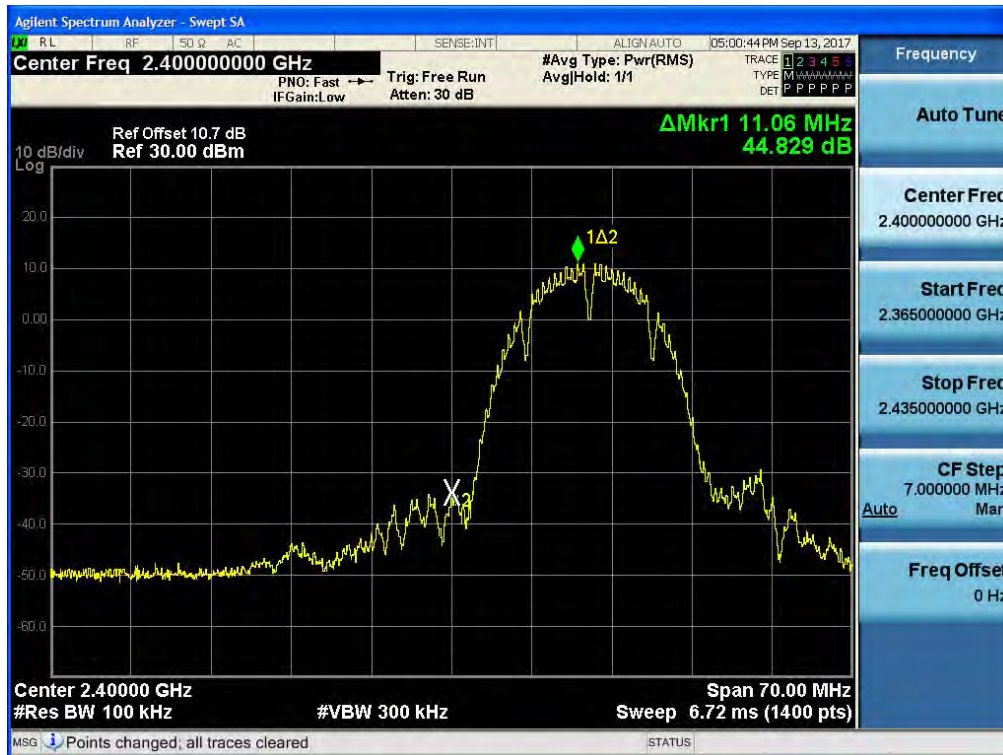


Band Edge (802.11n_HT40-CH11)

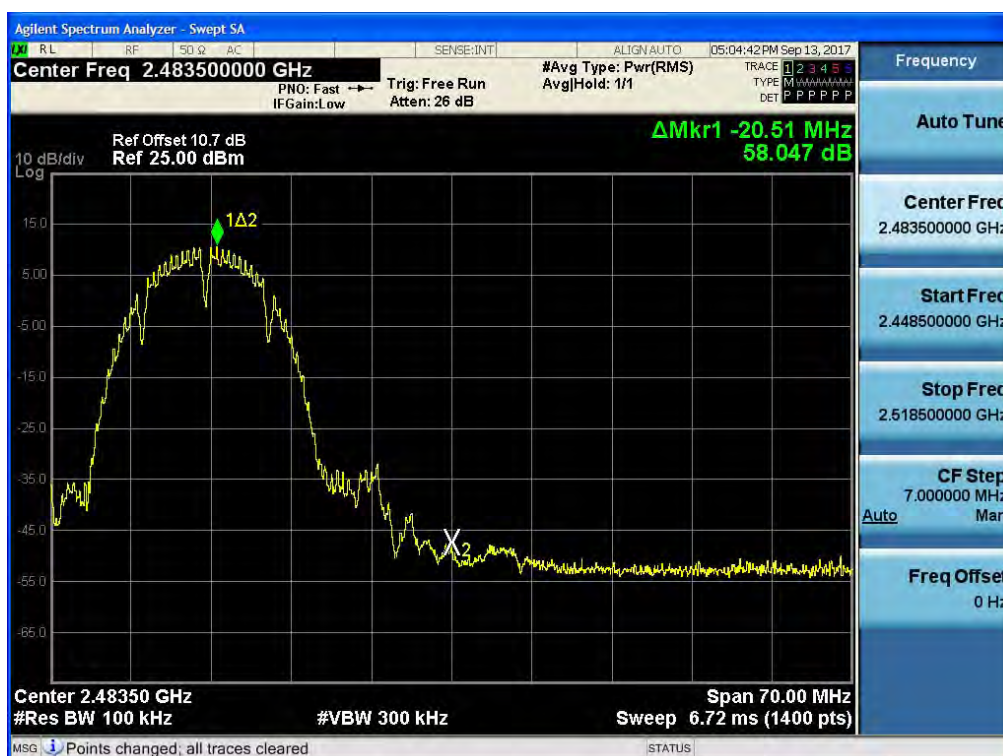


■ RESULT PLOTS_Ant.1

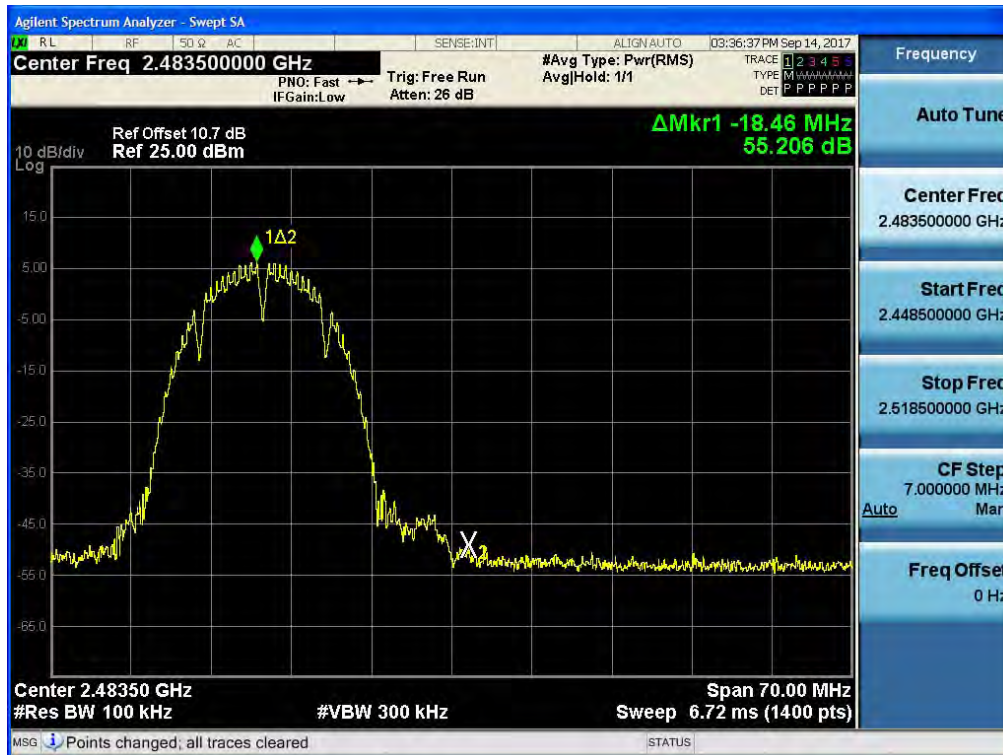
Band Edge (802.11b-CH1)



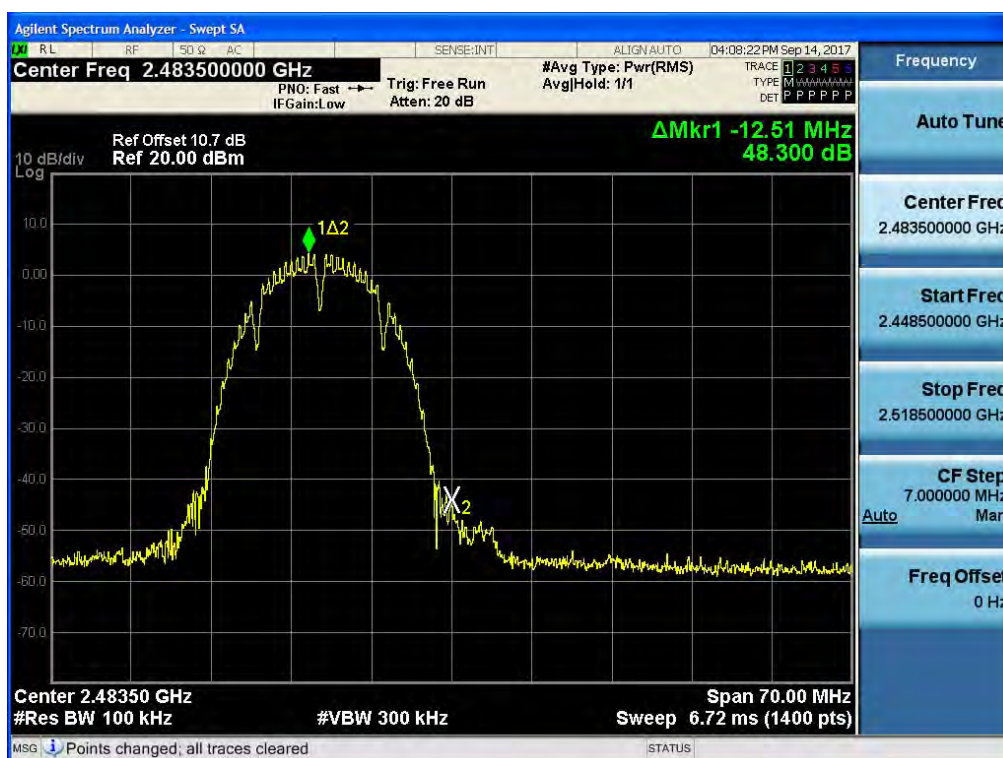
Band Edge (802.11b-CH11)



Band Edge (802.11b-CH12)



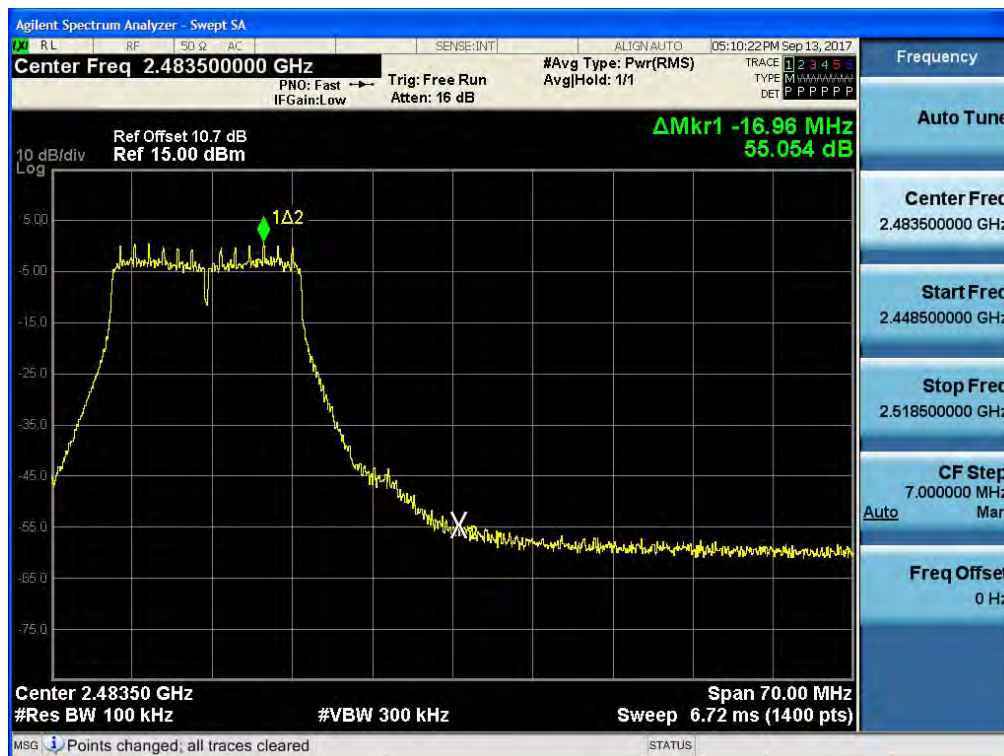
Band Edge (802.11b-CH13)



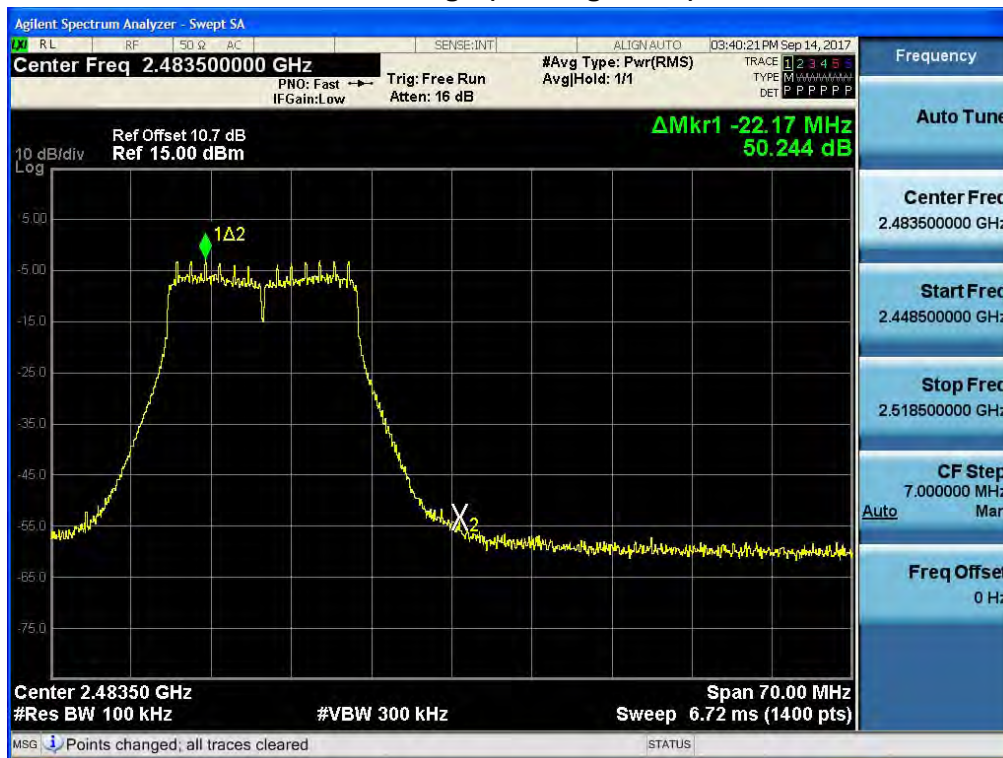
Band Edge (802.11g-CH1)



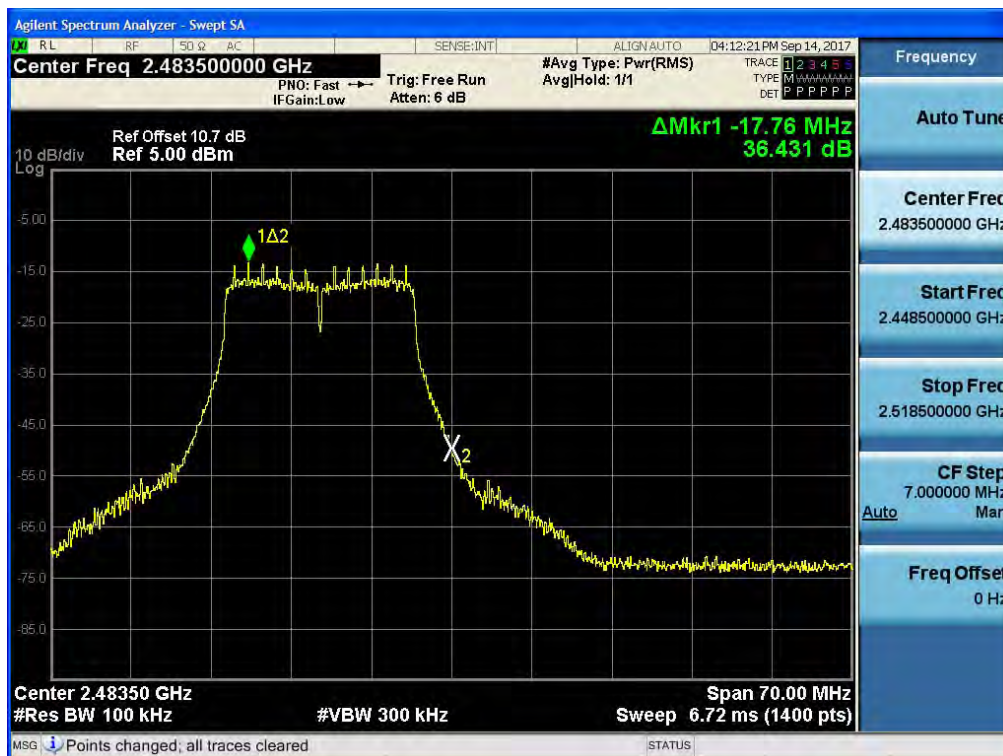
Band Edge (802.11g-CH11)



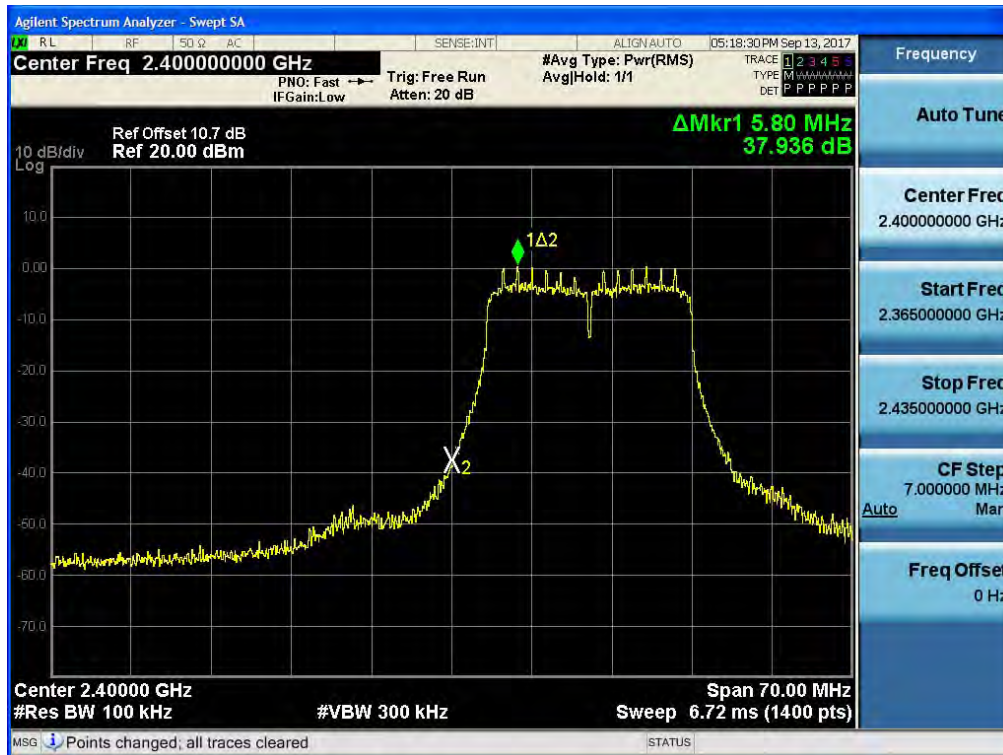
Band Edge (802.11g-CH12)



Band Edge (802.11g-CH13)



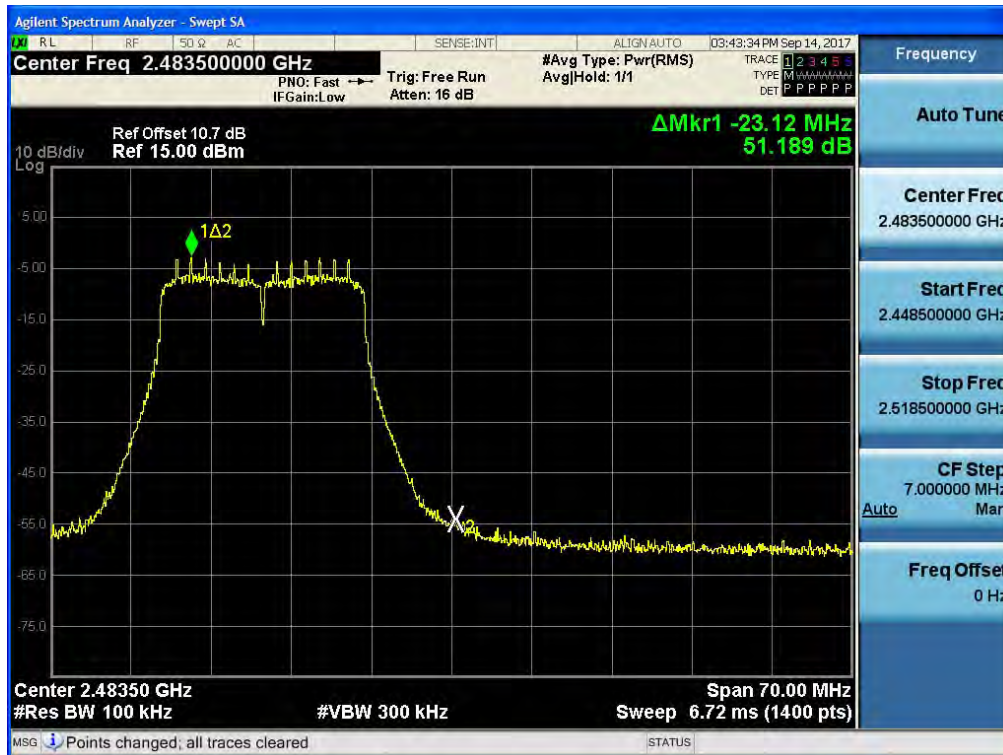
Band Edge (802.11n_HT20-CH1)



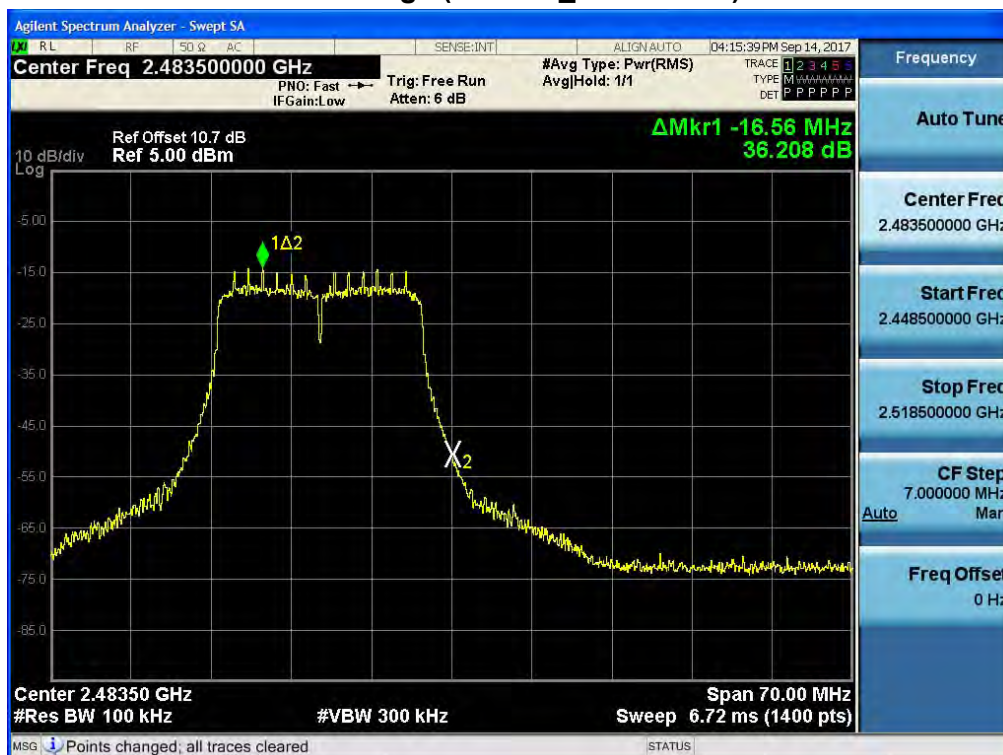
Band Edge (802.11n_HT20-CH11)



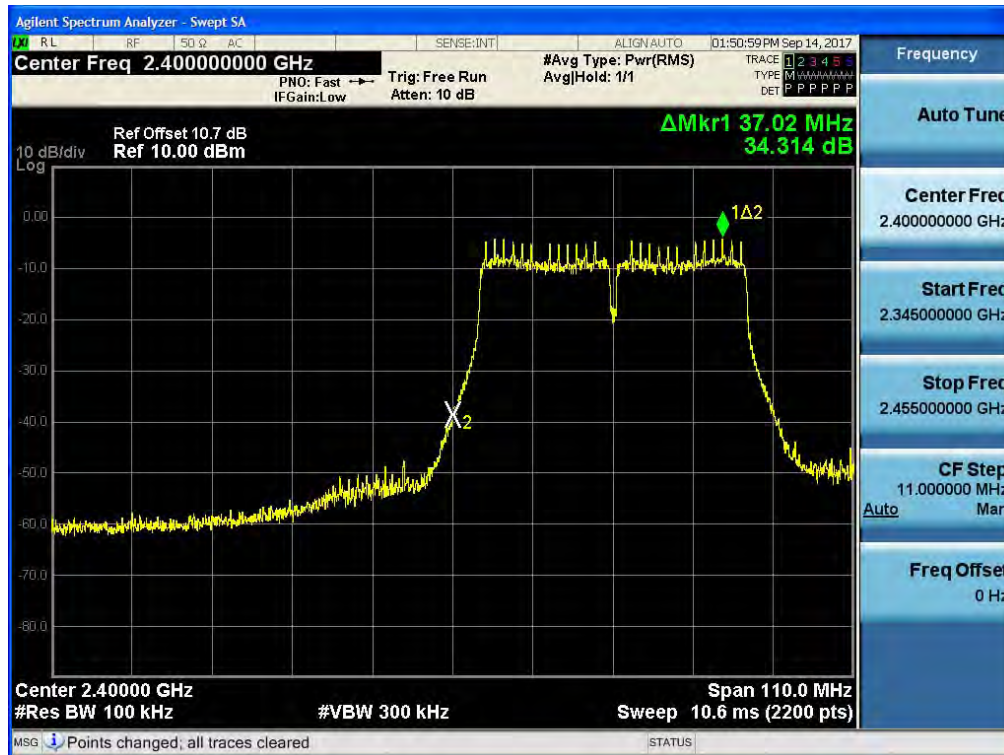
Band Edge (802.11n_HT20-CH12)



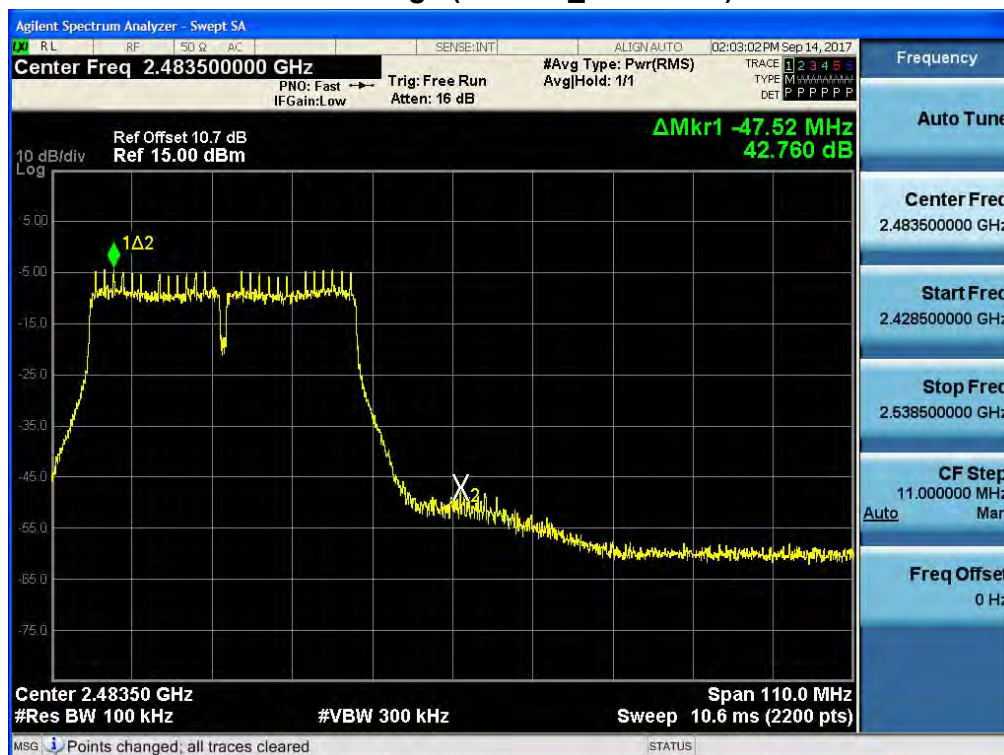
Band Edge (802.11n_HT20-CH13)



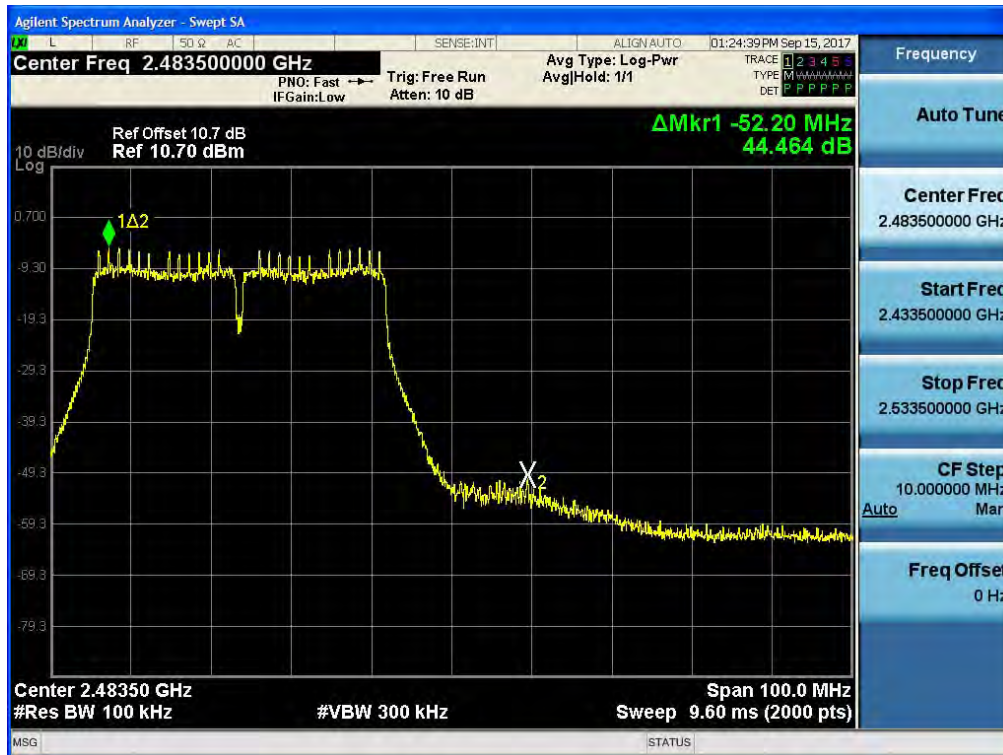
Band Edge (802.11n_HT40-CH3)



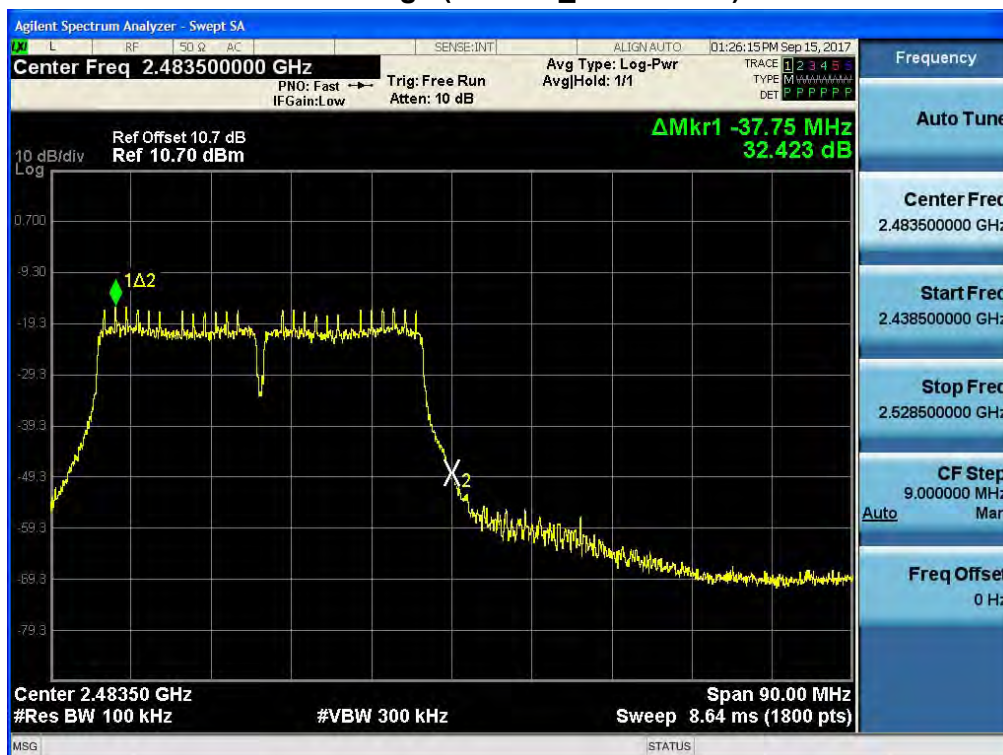
Band Edge (802.11n_HT40-CH9)



Band Edge (802.11n_HT40-CH10)



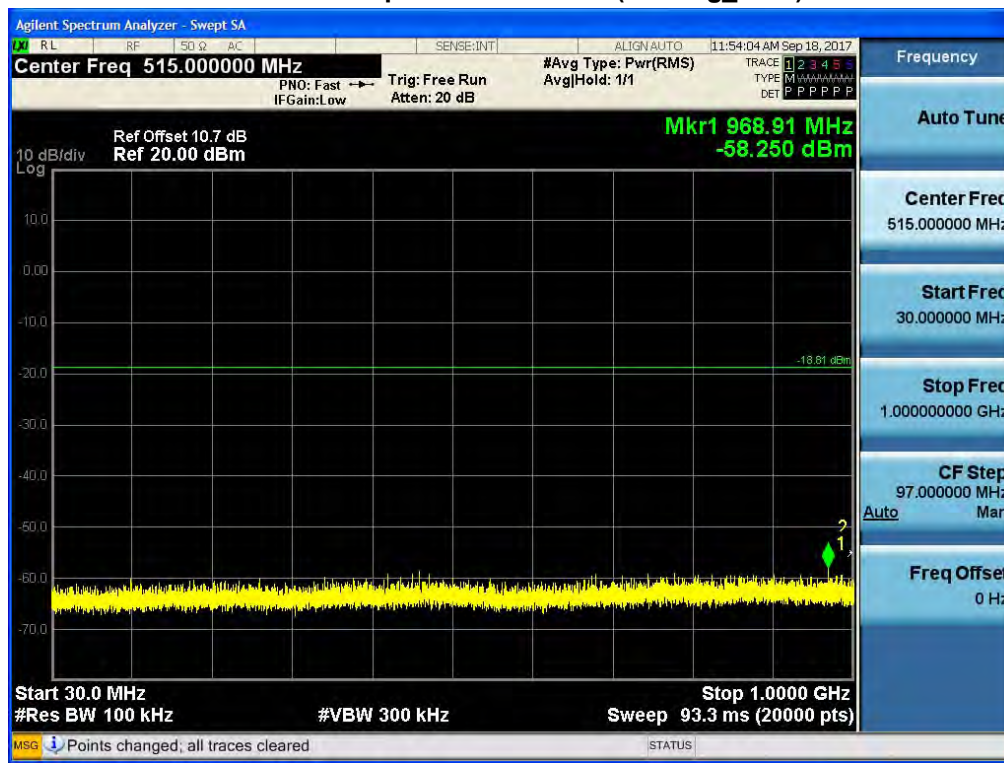
Band Edge (802.11n_HT40-CH11)



[Ant.0]

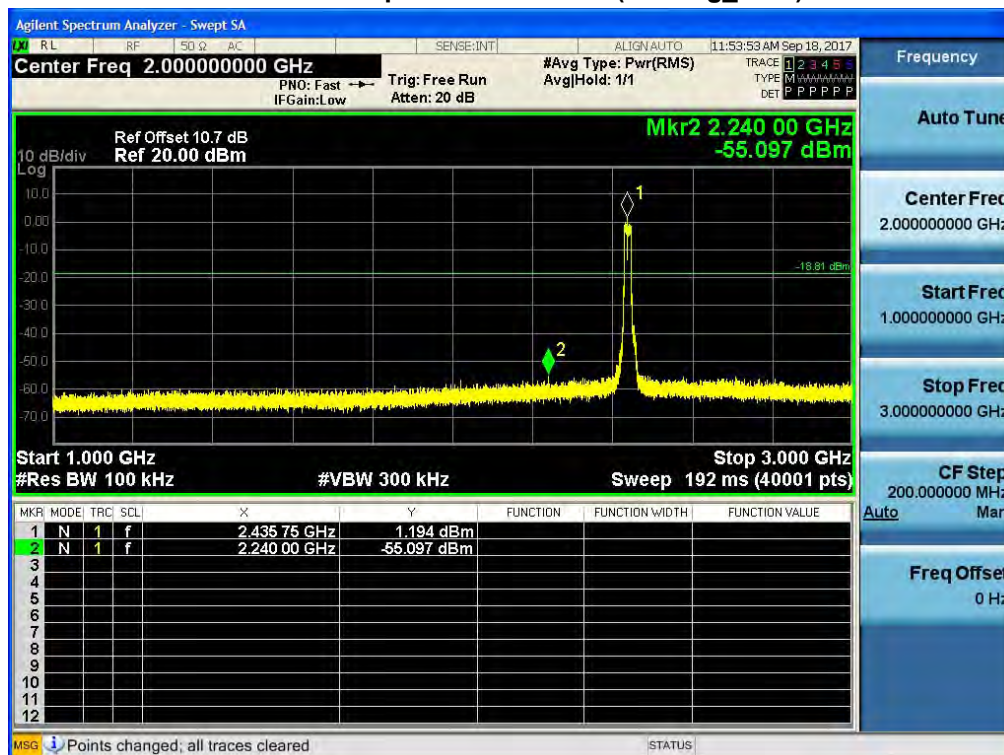
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11g_Ch.6)



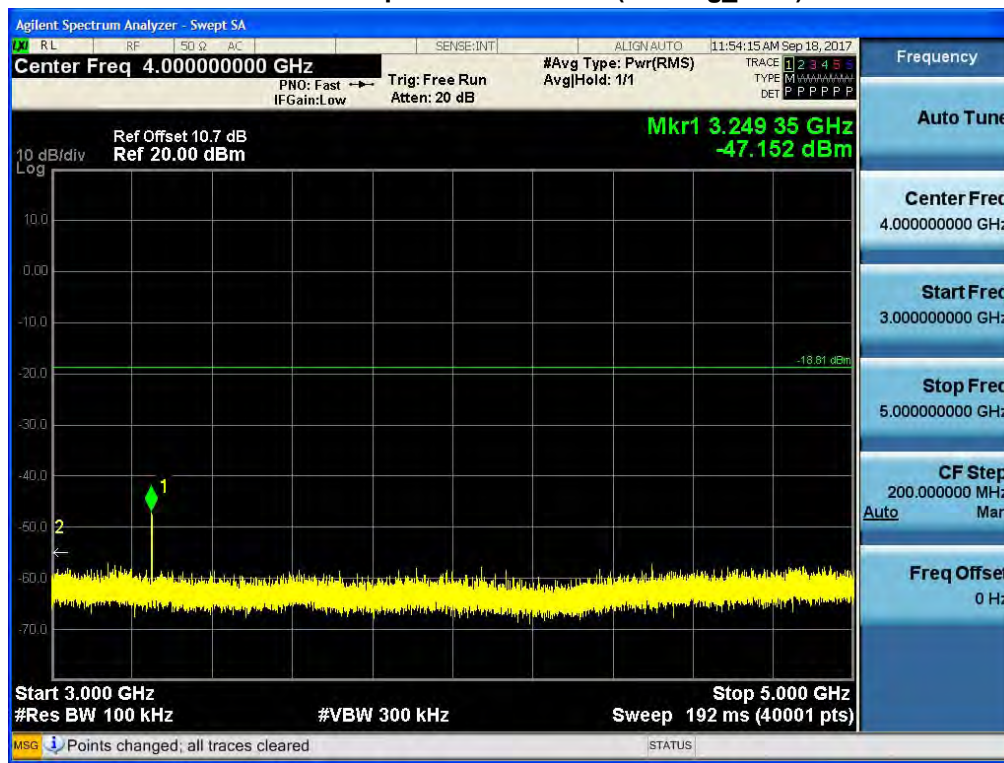
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11g_Ch.6)



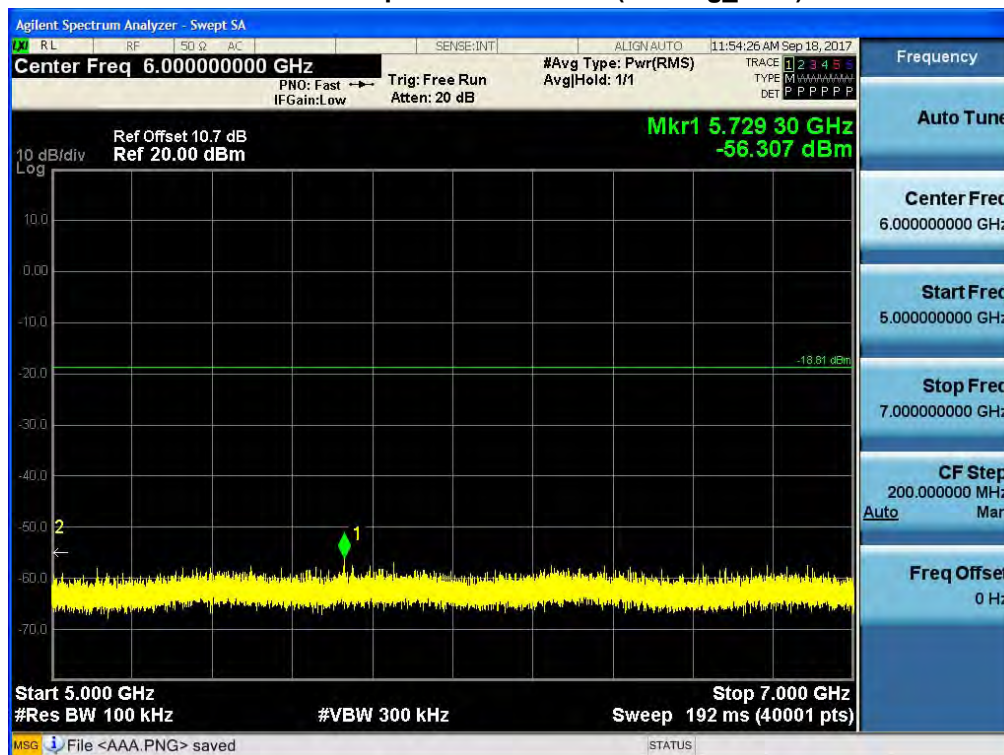
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11g_Ch.6)



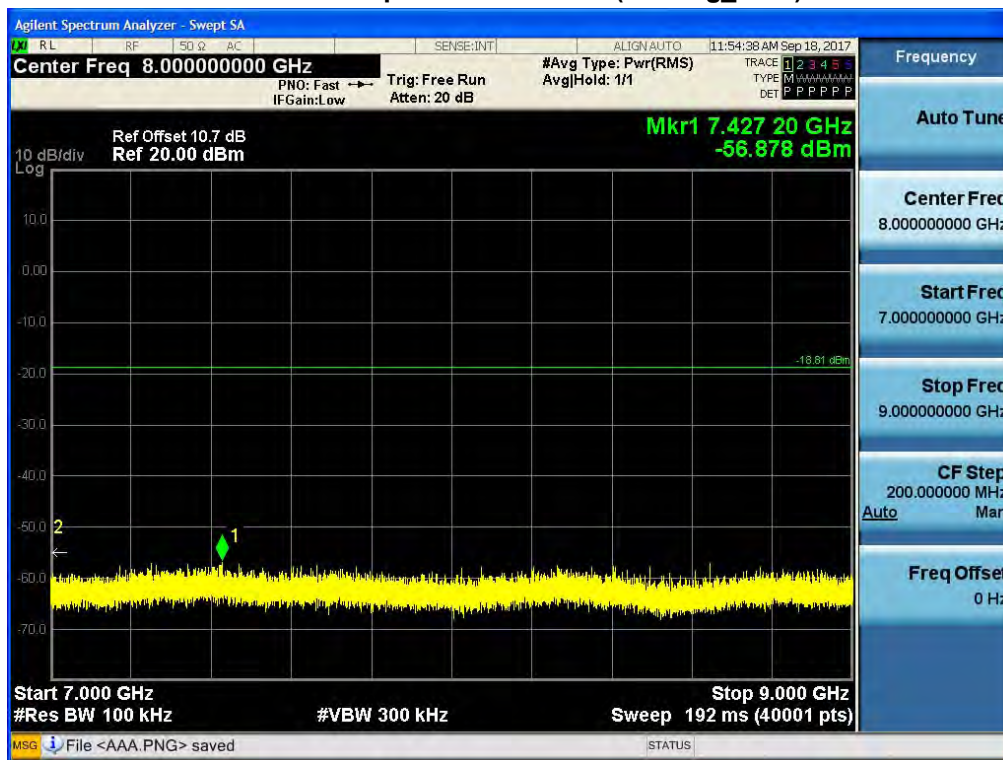
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11g_Ch.6)



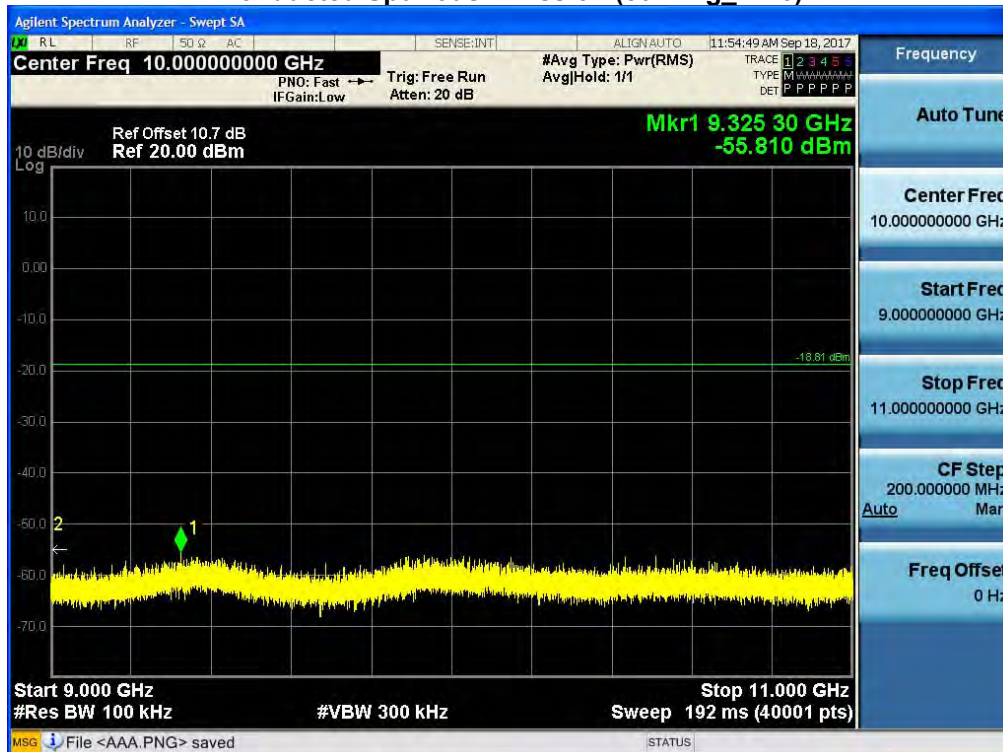
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11g_Ch.6)



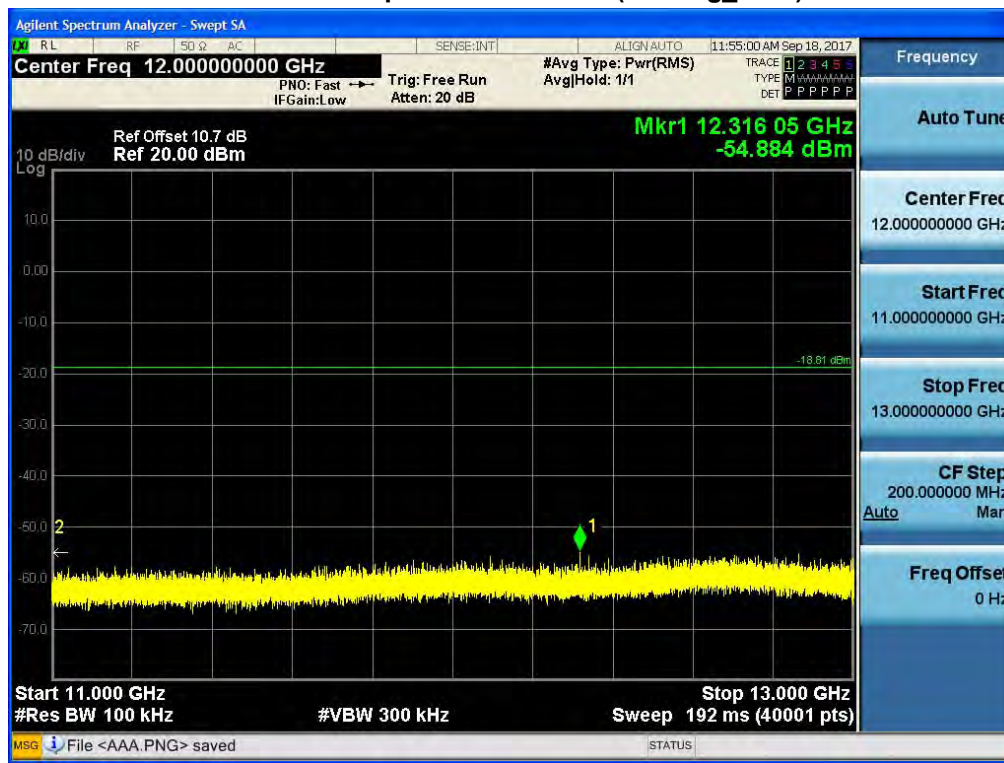
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11g_Ch.6)



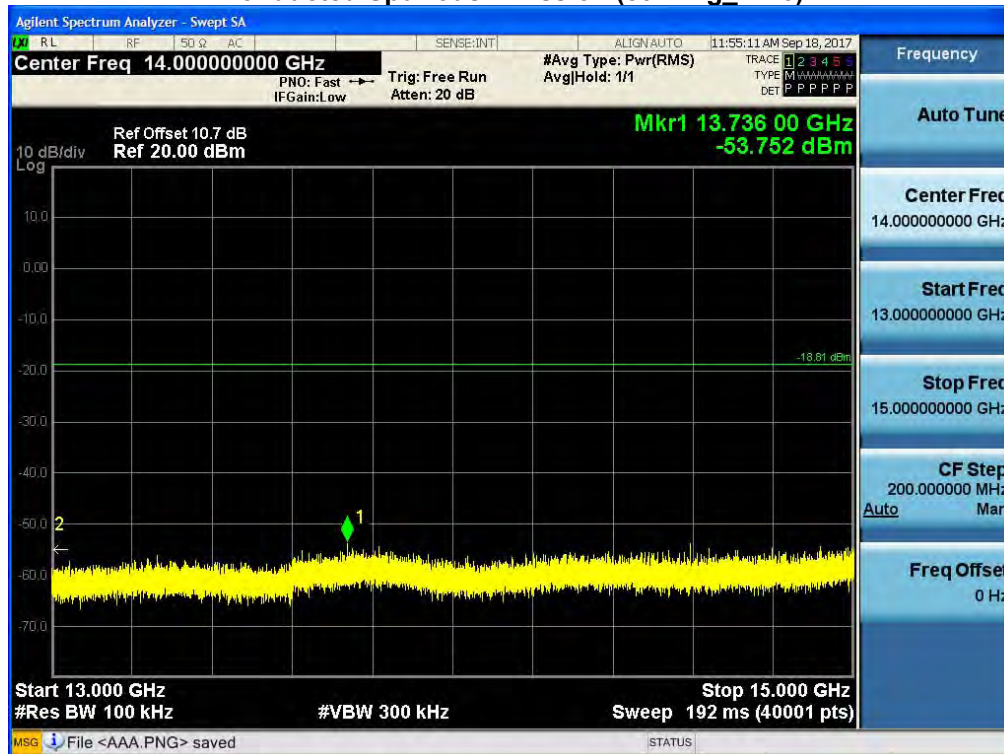
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11g_Ch.6)



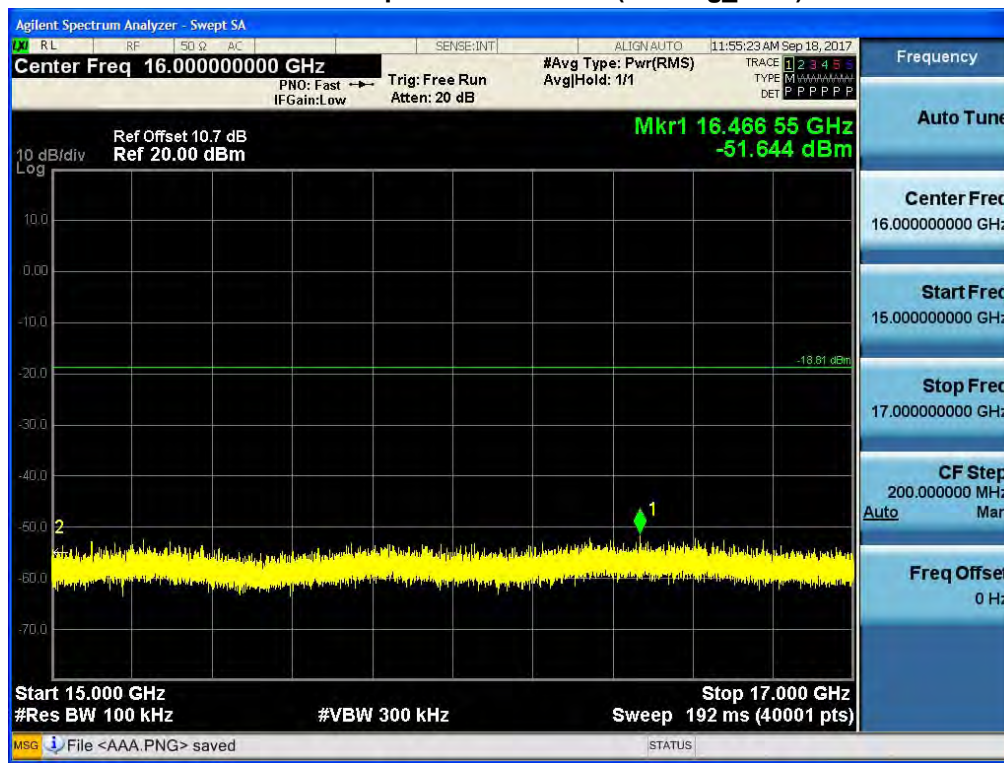
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11g_Ch.6)



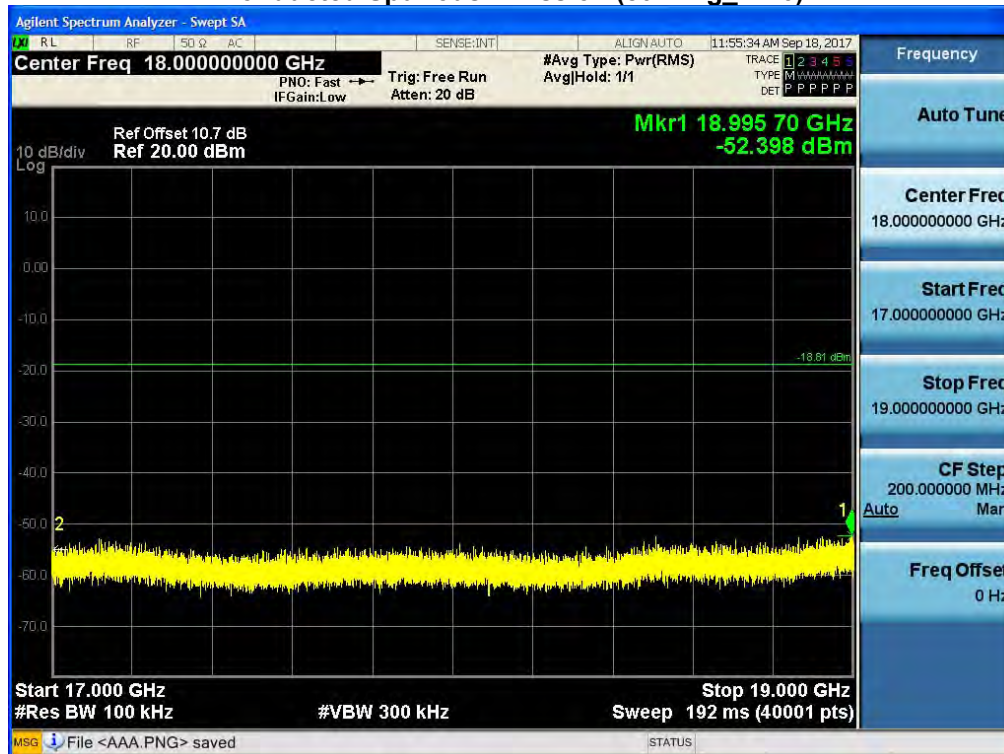
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11g_Ch.6)



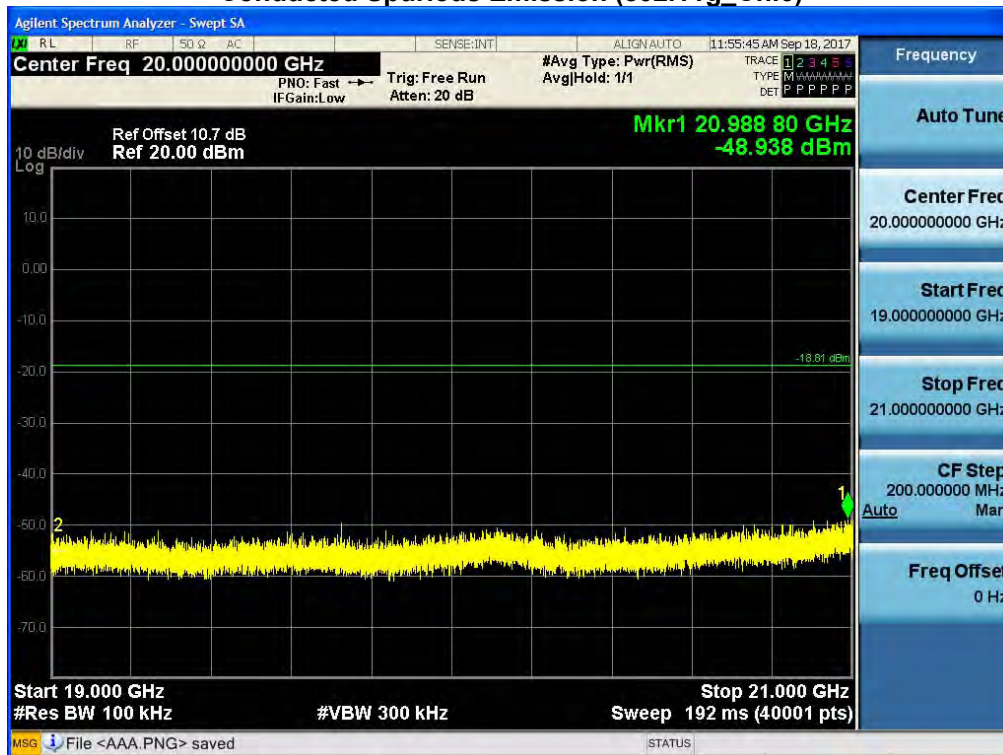
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11g_Ch.6)



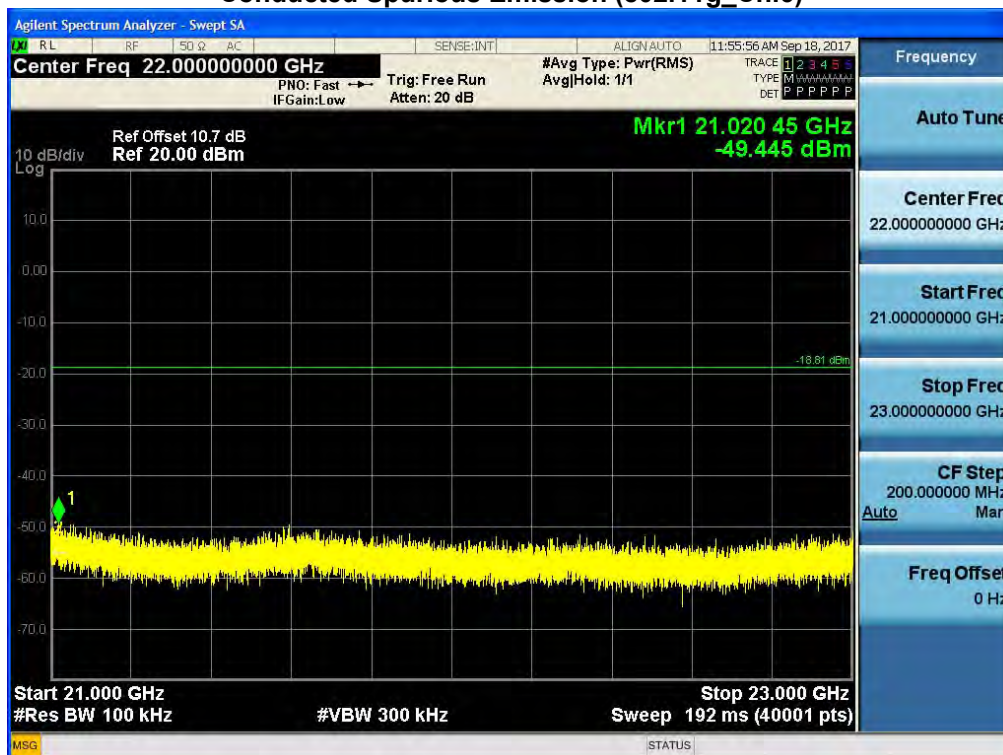
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11g_Ch.6)



21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11g_Ch.6)



23 GHz ~ 25 GHz

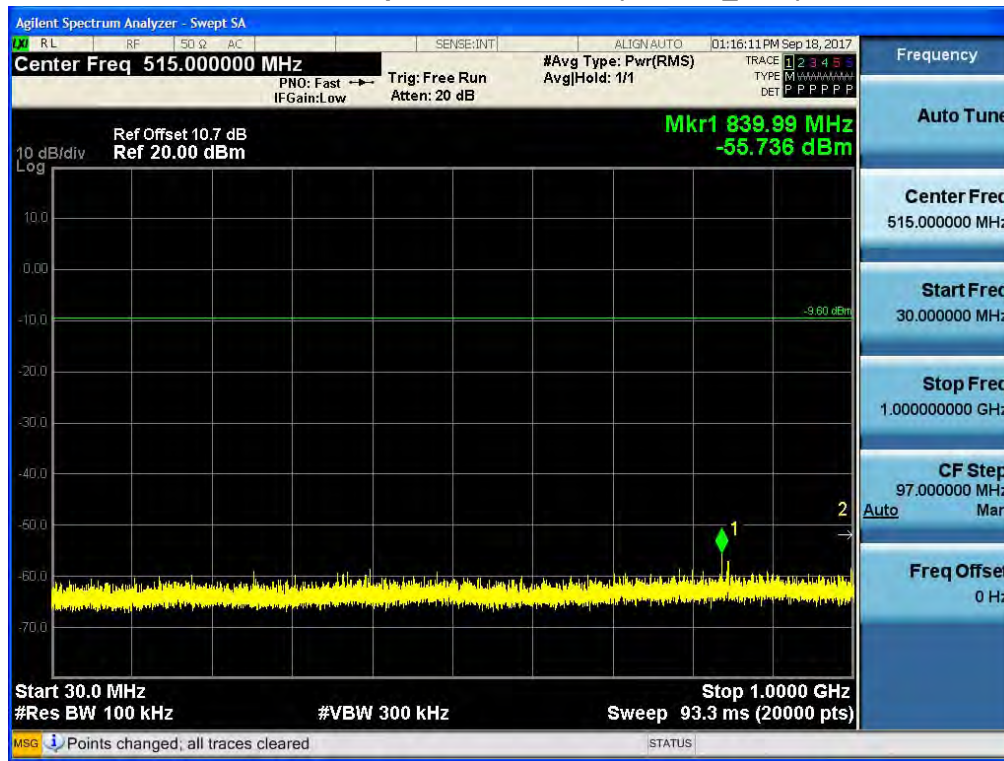
Conducted Spurious Emission (802.11g_Ch.6)



[Ant.1]

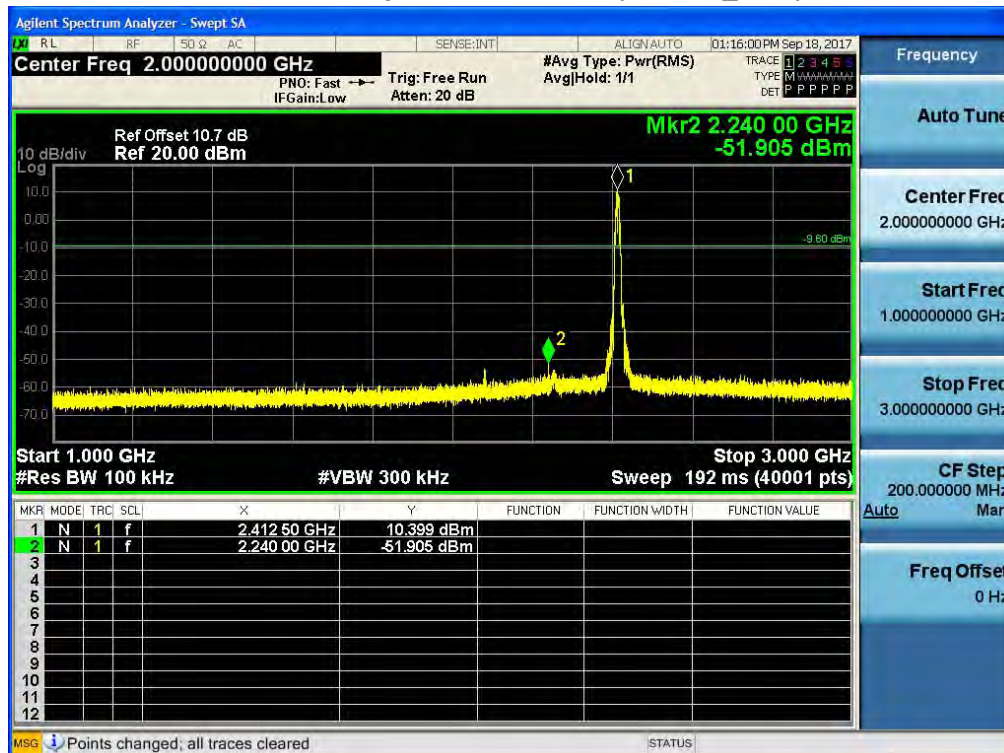
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b_Ch.1)



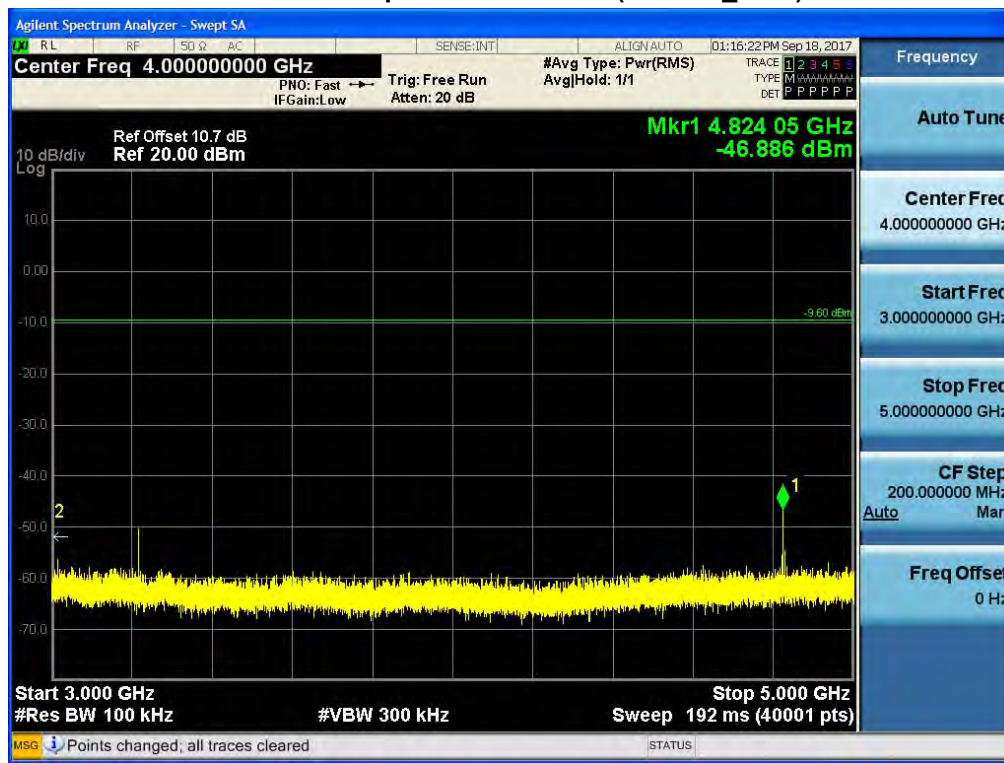
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11b_Ch.1)



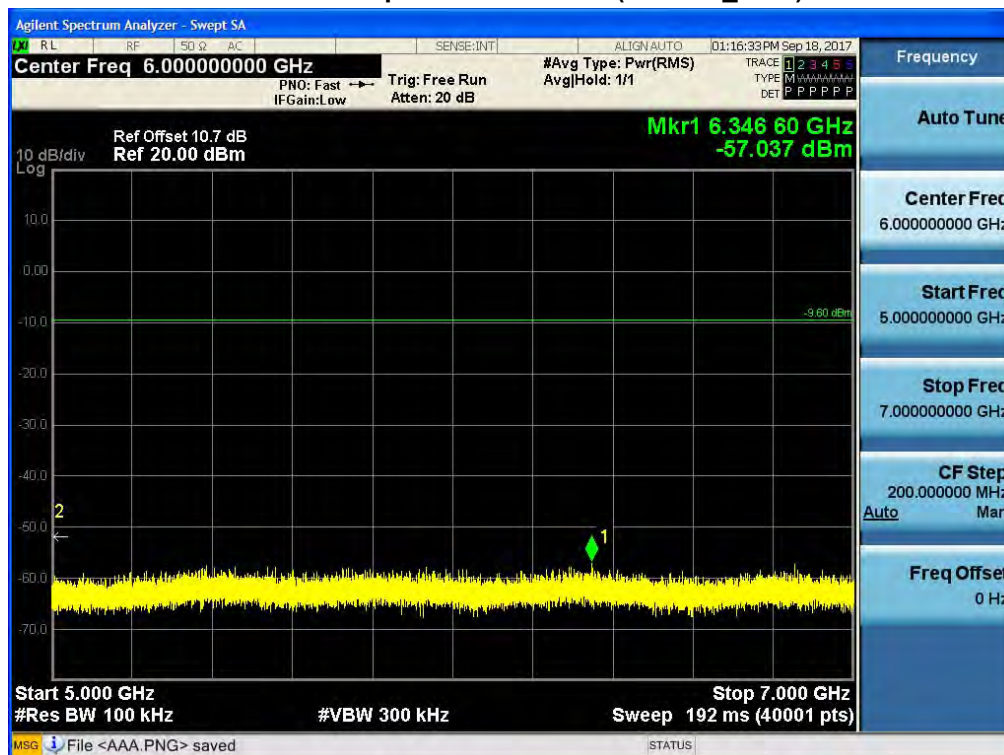
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b_Ch.1)



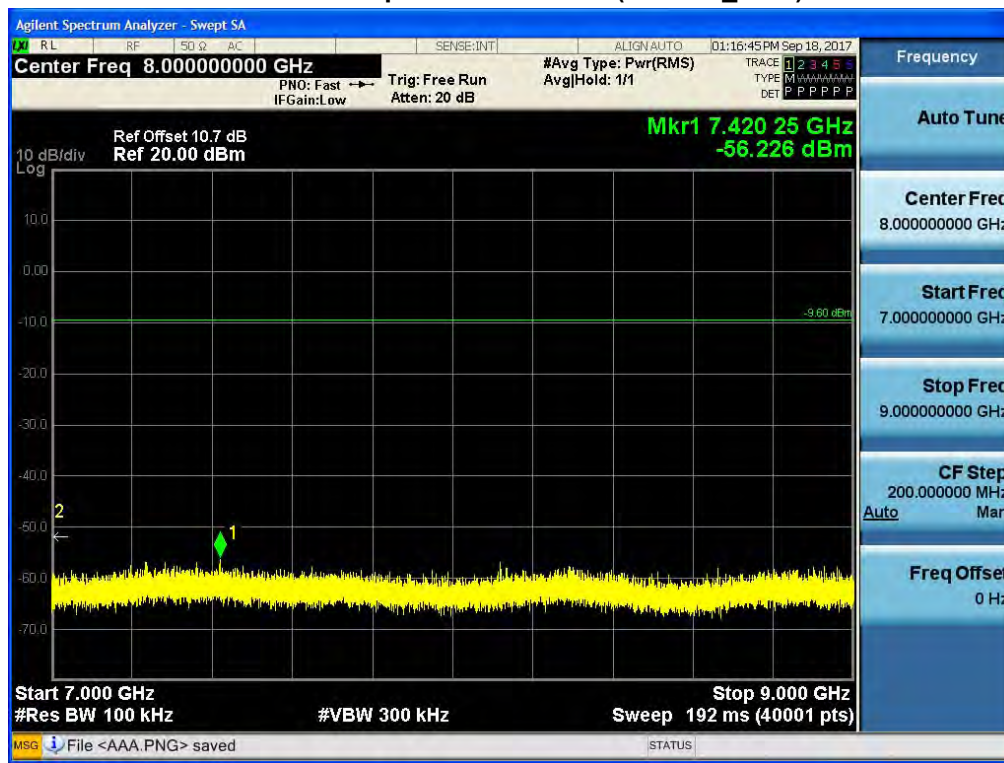
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11b_Ch.1)



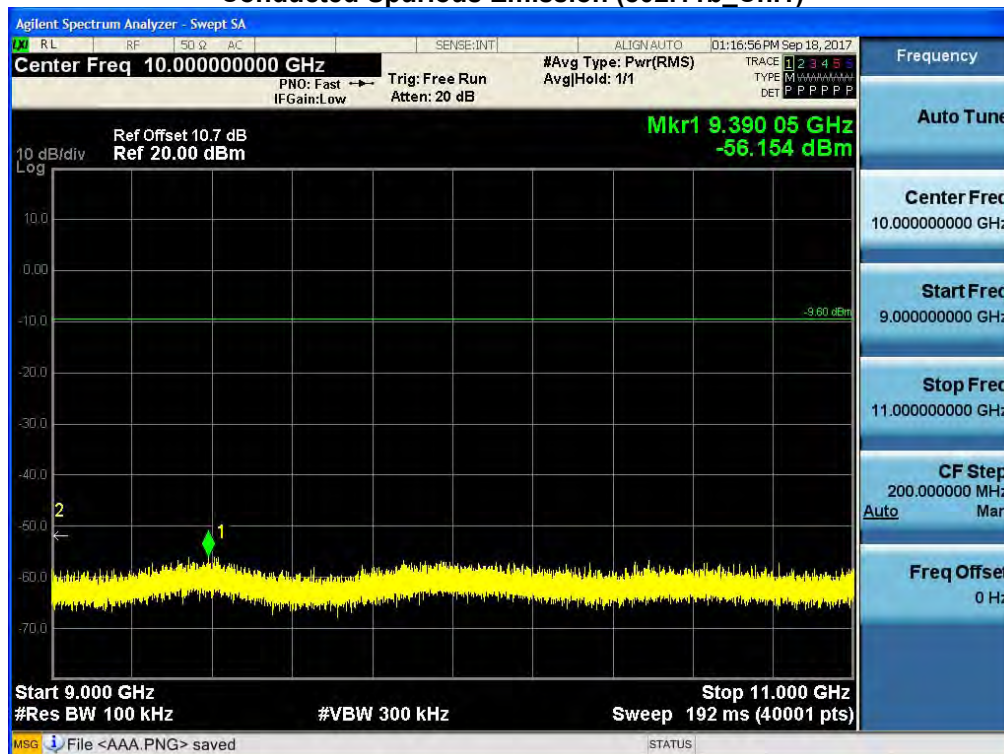
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b_Ch.1)



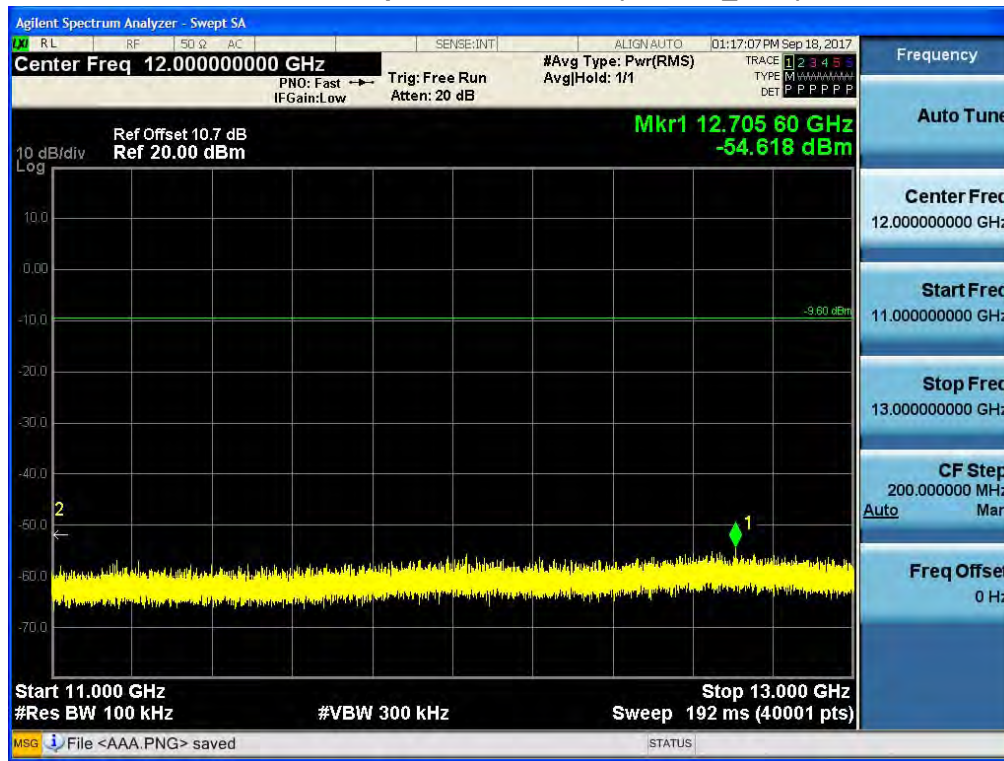
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11b_Ch.1)



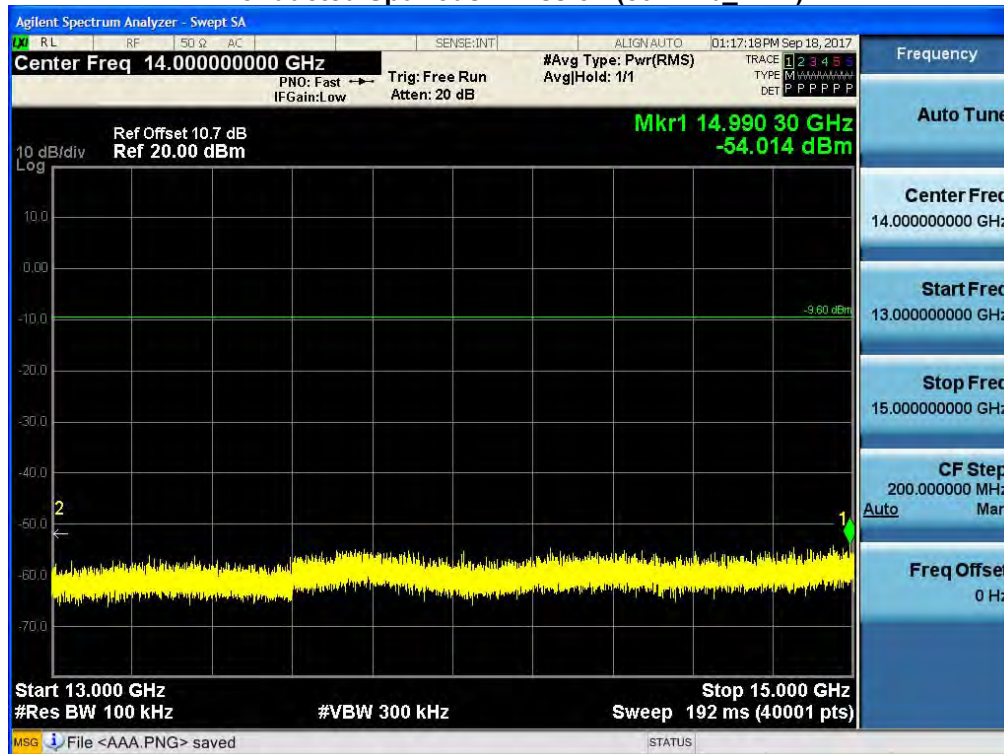
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b_Ch.1)



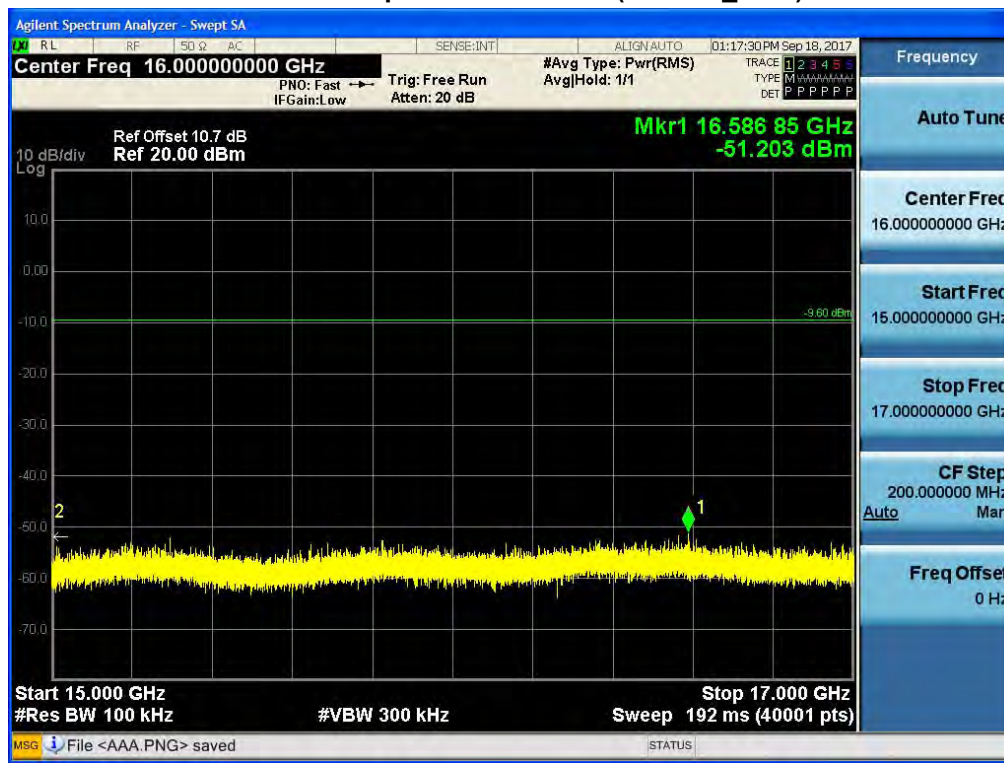
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b_Ch.1)



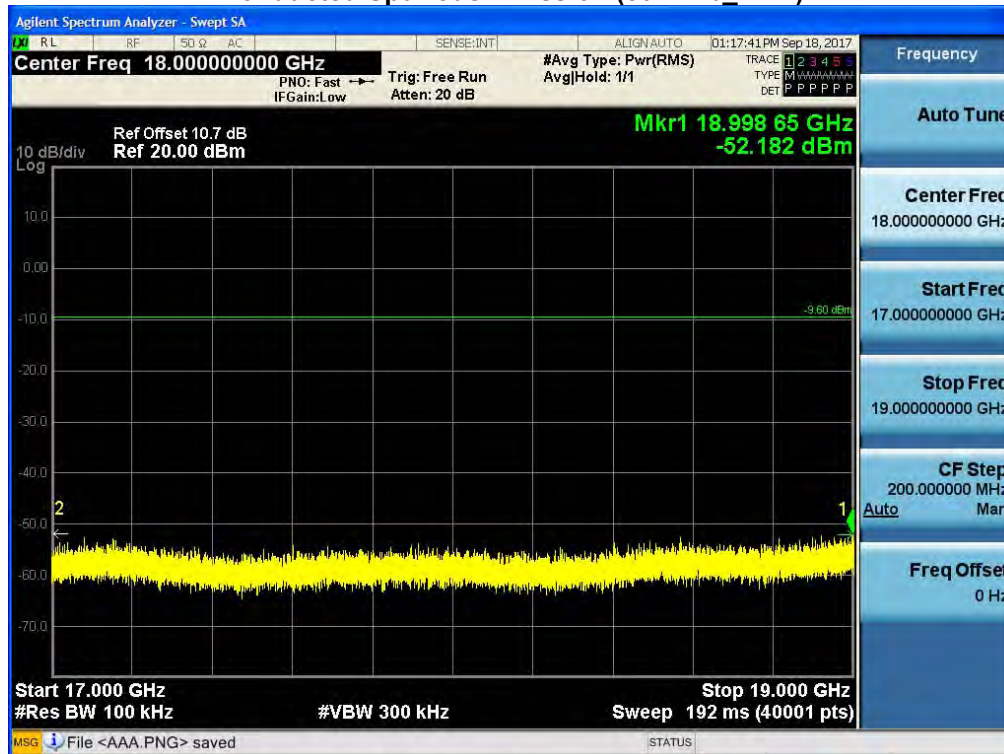
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b_Ch.1)



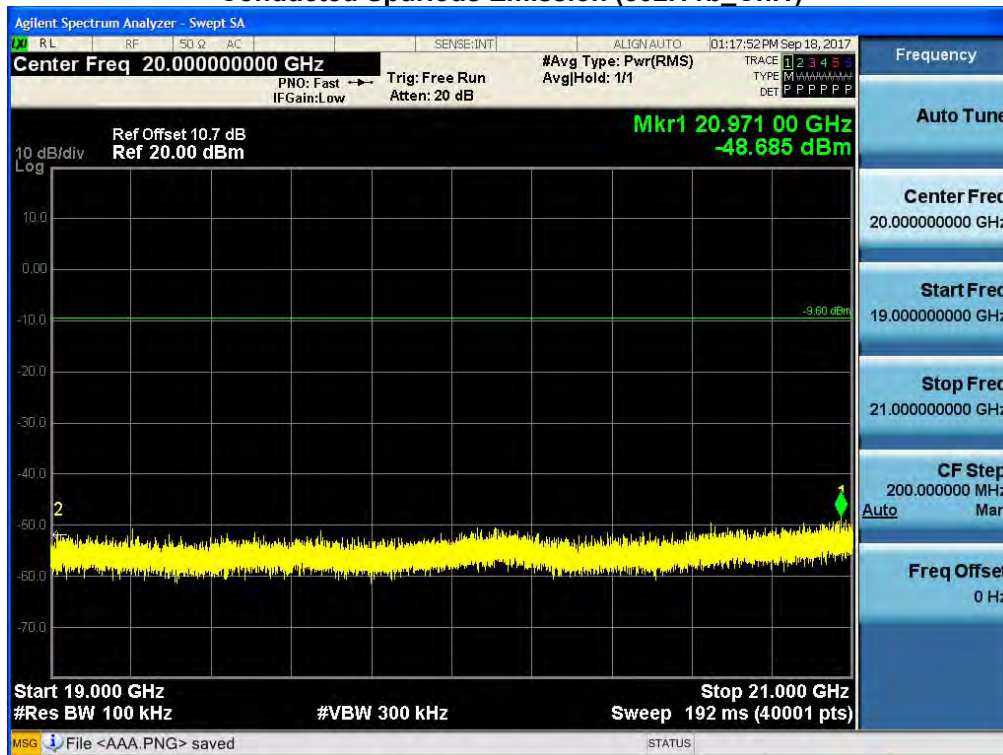
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11b_Ch.1)



19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b_Ch.1)



21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11b_Ch.1)



23 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b_Ch.1)



9.7 RADIATED MEASUREMENT

9.7.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209/ RSS-Gen(Issue 4) Section 8.9.

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

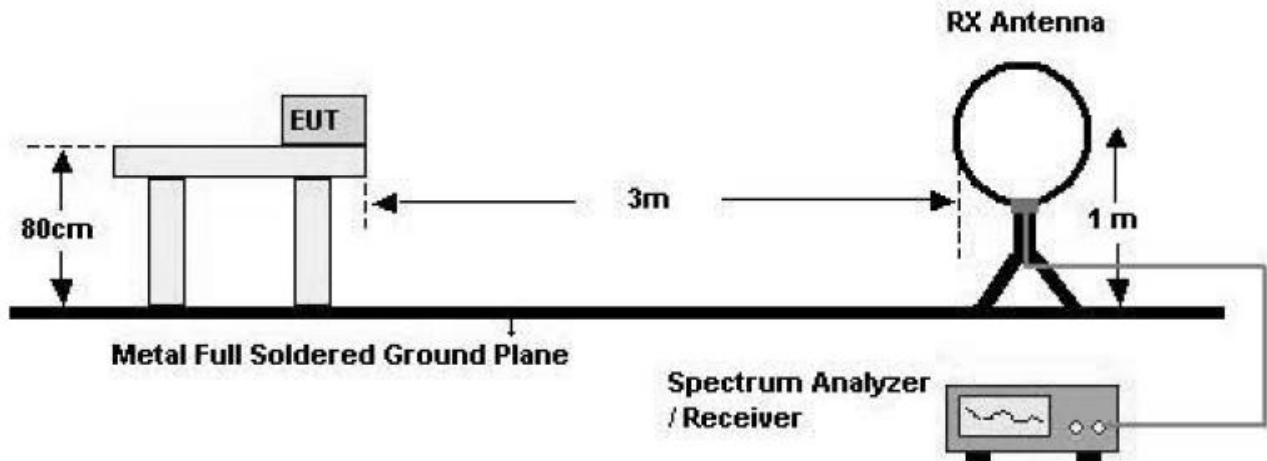
■ Test case

Mode	Operating Mode	Operating Ant.
802.11b/g/n	SISO	Ant 0
		Ant 1
802.11g/n	MIMO	Ant 0 & 1

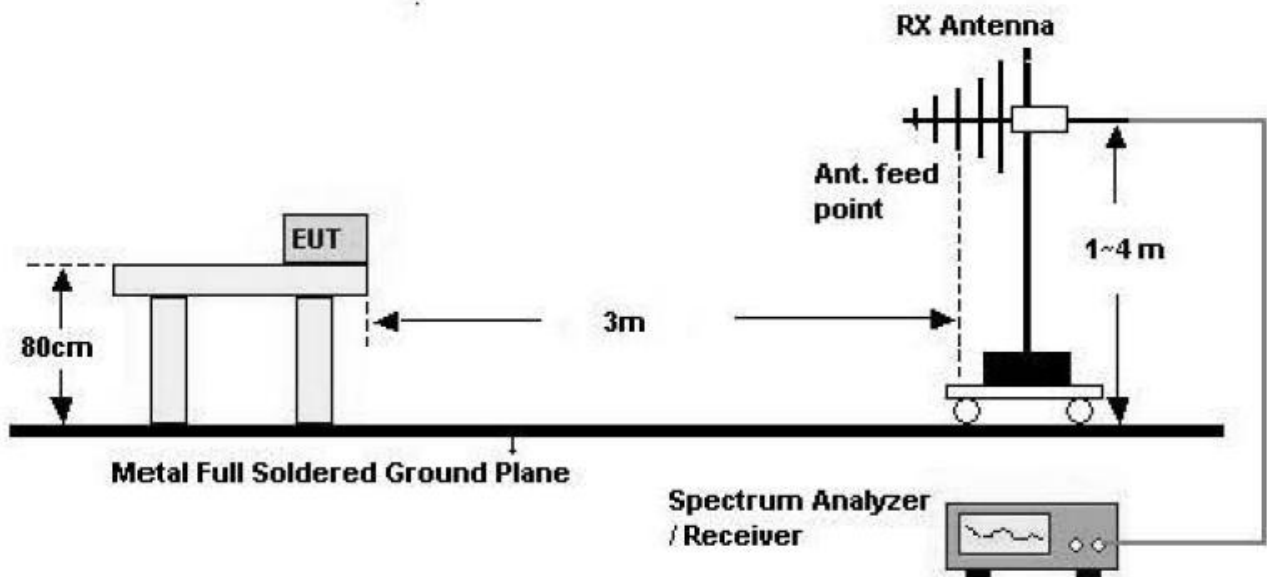
Note : In case of radiation test, we have done all test case. Worst case is MIMO(CDD) for 802.11g/n mode and SISO for 802.11b mode. So, we attached the result of MIMO for 802.11g/n mode and SISO for 802.11b mode.

TEST CONFIGURATION

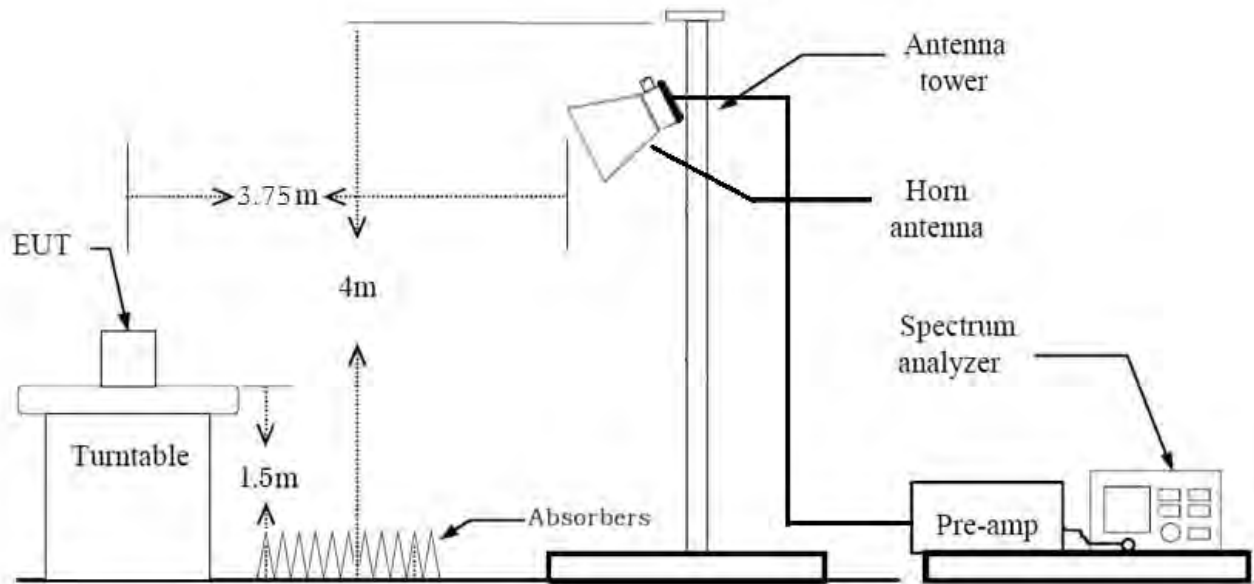
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

Method 12.1 in KDB 558074 v04

Spectrum Setting

- Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW $\geq 3 \times$ RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

- Average (duty cycle $\geq$ 98%)

Set RBW = 1 MHz

Set VBW $\geq$ 3 x RBW

Detector = RMS

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

Sweep time = auto.

Trace mode = average (at least 100 traces).

- Average (duty cycle < 98%, duty cycle variations are less than $\pm 2\%$)

Set RBW = 1 MHz

Set VBW $\geq$ 3 x RBW

Detector = RMS.

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

Sweep time = auto.

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 percent duty cycle.

Note :

1. We are performed the RSE and radiated band edge using standard radiated method(RMS).
2. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
3. Distance extrapolation factor = $20 \log (\text{test distance} / \text{specific distance})$ (dB)

TEST RESULTS**9 kHz – 30MHz****Operation Mode:** Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)
4. Limit line = specific Limits (dB μ V) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
6. The test results for below 30 MHz is correlated to an open site.
The result on OATS is about 2 dB higher than semi-anechoic chamber (10 m chamber)

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	$\text{dB}_{\mu\text{V}}$	dB/m	dB	(H/V)	$\text{dB}_{\mu\text{V/m}}$	$\text{dB}_{\mu\text{V/m}}$	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

[Ant 0]

Above 1 GHz

Operation Mode: 802.11 b
Operating Frequency: 2412
Channel No.: 01 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	55.19	-0.64	V	54.55	73.98	19.43	PK
4824	50.24	-0.64	V	49.60	53.98	4.38	AV
7236	45.61	8.49	V	54.10	73.98	19.88	PK
7236	34.38	8.49	V	42.87	53.98	11.11	AV
4824	56.20	-0.64	H	55.56	73.98	18.42	PK
4824	51.66	-0.64	H	51.02	53.98	2.96	AV
7236	45.77	8.49	H	54.26	73.98	19.72	PK
7236	34.33	8.49	H	42.82	53.98	11.16	AV

Operation Mode: 802.11 b
Operating Frequency: 2437
Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	55.87	0.01	V	55.88	73.98	18.10	PK
4874	50.88	0.01	V	50.89	53.98	3.09	AV
7311	46.11	8.94	V	55.05	73.98	18.93	PK
7311	34.38	8.94	V	43.32	53.98	10.66	AV
4874	56.73	0.01	H	56.74	73.98	17.24	PK
4874	52.16	0.01	H	52.17	53.98	1.81	AV
7311	46.20	8.94	H	55.14	73.98	18.84	PK
7311	34.62	8.94	H	43.56	53.98	10.42	AV

Operation Mode: 802.11 b
Operating Frequency: 2462
Channel No.: 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	55.66	0.38	V	56.04	73.98	17.94	PK
4924	50.60	0.38	V	50.98	53.98	3.00	AV
7386	46.55	9.02	V	55.57	73.98	18.41	PK
7386	34.44	9.02	V	43.46	53.98	10.52	AV
4924	54.42	0.38	H	54.80	73.98	19.18	PK
4924	49.34	0.38	H	49.72	53.98	4.26	AV
7386	46.51	9.02	H	55.53	73.98	18.45	PK
7386	34.41	9.02	H	43.43	53.98	10.55	AV

Operation Mode: 802.11 b
Operating Frequency: 2467
Channel No.: 12 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4934	51.26	0.46	V	51.72	73.98	22.26	PK
4934	43.97	0.46	V	44.43	53.98	9.55	AV
7401	45.75	9.20	V	54.95	73.98	19.03	PK
7401	34.11	9.20	V	43.31	53.98	10.67	AV
4934	52.22	0.46	H	52.68	73.98	21.30	PK
4934	45.33	0.46	H	45.79	53.98	8.19	AV
7401	45.98	9.20	H	55.18	73.98	18.80	PK
7401	34.14	9.20	H	43.34	53.98	10.64	AV

Operation Mode:	802.11 b
Operating Frequency	2472
Channel No.	13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4944	51.28	0.83	V	52.11	73.98	21.87	PK
4944	42.71	0.83	V	43.54	53.98	10.44	AV
7416	45.78	8.94	V	54.72	73.98	19.26	PK
7416	34.12	8.94	V	43.06	53.98	10.92	AV
4944	52.23	0.83	H	53.06	73.98	20.92	PK
4944	43.81	0.83	H	44.64	53.98	9.34	AV
7416	45.99	8.94	H	54.93	73.98	19.05	PK
7416	34.17	8.94	H	43.11	53.98	10.87	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

[Ant 1]

Above 1 GHz

Operation Mode: 802.11 b
Operating Frequency: 2412
Channel No.: 01 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	56.22	-0.64	V	55.58	73.98	18.40	PK
4824	51.42	-0.64	V	50.78	53.98	3.20	AV
7236	48.95	8.49	V	57.44	73.98	16.54	PK
7236	39.82	8.49	V	48.31	53.98	5.67	AV
4824	53.83	-0.64	H	53.19	73.98	20.79	PK
4824	48.35	-0.64	H	47.71	53.98	6.27	AV
7236	49.40	8.49	H	57.89	73.98	16.09	PK
7236	40.18	8.49	H	48.67	53.98	5.31	AV

Operation Mode: 802.11 b
Operating Frequency: 2437
Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	55.70	0.01	V	55.71	73.98	18.27	PK
4874	51.15	0.01	V	51.16	53.98	2.82	AV
7311	49.91	8.94	V	58.85	73.98	15.13	PK
7311	40.90	8.94	V	49.84	53.98	4.14	AV
4874	56.58	0.01	H	56.59	73.98	17.39	PK
4874	51.72	0.01	H	51.73	53.98	2.25	AV
7311	50.84	8.94	H	59.78	73.98	14.20	PK
7311	41.49	8.94	H	50.43	53.98	3.55	AV

Operation Mode: 802.11 b
Operating Frequency: 2462
Channel No.: 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	55.29	0.38	V	55.67	73.98	18.31	PK
4924	50.46	0.38	V	50.84	53.98	3.14	AV
7386	50.35	9.02	V	59.37	73.98	14.61	PK
7386	41.31	9.02	V	50.33	53.98	3.65	AV
4924	55.54	0.38	H	55.92	73.98	18.06	PK
4924	50.67	0.38	H	51.05	53.98	2.93	AV
7386	50.40	9.02	H	59.42	73.98	14.56	PK
7386	41.93	9.02	H	50.95	53.98	3.03	AV

Operation Mode: 802.11 b
Operating Frequency: 2467
Channel No.: 12 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4934	51.59	0.46	V	52.05	73.98	21.93	PK
4934	43.73	0.46	V	44.19	53.98	9.79	AV
7401	47.04	9.20	V	56.24	73.98	17.74	PK
7401	34.81	9.20	V	44.01	53.98	9.97	AV
4934	51.80	0.46	H	52.26	73.98	21.72	PK
4934	43.96	0.46	H	44.42	53.98	9.56	AV
7401	47.12	9.20	H	56.32	73.98	17.66	PK
7401	34.97	9.20	H	44.17	53.98	9.81	AV

Operation Mode: 802.11 b

Operating Frequency: 2472

Channel No.: 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4944	51.07	0.83	V	51.90	73.98	22.08	PK
4944	41.20	0.83	V	42.03	53.98	11.95	AV
7401	46.55	8.94	V	55.49	73.98	18.49	PK
7401	34.54	8.94	V	43.48	53.98	10.50	AV
4944	51.48	0.83	H	52.31	73.98	21.67	PK
4944	41.61	0.83	H	42.44	53.98	11.54	AV
7401	46.81	8.94	H	55.75	73.98	18.23	PK
7401	34.78	8.94	H	43.72	53.98	10.26	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

[MIMO]

Above 1 GHz

Operation Mode: 802.11 g
Operating Frequency: 2412
Channel No.: 01 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	50.10	-0.64	V	49.46	73.98	24.52	PK
4824	38.71	-0.64	V	38.07	53.98	15.91	AV
7236	46.21	8.49	V	54.70	73.98	19.28	PK
7236	34.60	8.49	V	43.09	53.98	10.89	AV
4824	49.31	-0.64	H	48.67	73.98	25.31	PK
4824	38.05	-0.64	H	37.41	53.98	16.57	AV
7236	46.18	8.49	H	54.67	73.98	19.31	PK
7236	34.50	8.49	H	42.99	53.98	10.99	AV

Operation Mode: 802.11 n_HT20
Operating Frequency: 2412
Channel No.: 01 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	50.39	-0.64	V	49.75	73.98	24.23	PK
4824	38.65	-0.64	V	38.01	53.98	15.97	AV
7236	46.23	8.49	V	54.72	73.98	19.26	PK
7236	34.51	8.49	V	43.00	53.98	10.98	AV
4824	50.11	-0.64	H	49.47	73.98	24.51	PK
4824	38.16	-0.64	H	37.52	53.98	16.46	AV
7236	45.98	8.49	H	54.47	73.98	19.51	PK
7236	34.41	8.49	H	42.90	53.98	11.08	AV

Operation Mode: 802.11 n_HT40
Operating Frequency: 2422
Channel No.: 03 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4844	49.68	-0.40	V	49.28	73.98	24.70	PK
4844	39.04	-0.40	V	38.64	53.98	15.34	AV
7266	46.66	8.69	V	55.35	73.98	18.63	PK
7266	34.33	8.69	V	43.02	53.98	10.96	AV
4844	49.12	-0.40	H	48.72	73.98	25.26	PK
4844	38.51	-0.40	H	38.11	53.98	15.87	AV
7266	46.51	8.69	H	55.20	73.98	18.78	PK
7266	34.20	8.69	H	42.89	53.98	11.09	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 g

Operating Frequency: 2437

Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	51.86	0.01	V	51.87	73.98	22.11	PK
4874	39.39	0.01	V	39.40	53.98	14.58	AV
7311	46.09	8.94	V	55.03	73.98	18.95	PK
7311	34.31	8.94	V	43.25	53.98	10.73	AV
4874	50.75	0.01	H	50.76	73.98	23.22	PK
4874	38.98	0.01	H	38.99	53.98	14.99	AV
7311	46.02	8.94	H	54.96	73.98	19.02	PK
7311	34.28	8.94	H	43.22	53.98	10.76	AV

Operation Mode: 802.11 n_HT20

Operating Frequency: 2437

Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	50.77	0.01	V	50.78	73.98	23.20	PK
4874	39.34	0.01	V	39.35	53.98	14.63	AV
7311	46.13	8.94	V	55.07	73.98	18.91	PK
7311	34.50	8.94	V	43.44	53.98	10.54	AV
4874	49.13	0.01	H	49.14	73.98	24.84	PK
4874	38.79	0.01	H	38.80	53.98	15.18	AV
7311	45.76	8.94	H	54.70	73.98	19.28	PK
7311	34.25	8.94	H	43.19	53.98	10.79	AV

Operation Mode: 802.11 n_HT40
Operating Frequency: 2437
Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	49.75	0.01	V	49.76	73.98	24.22	PK
4874	39.14	0.01	V	39.15	53.98	14.83	AV
7311	46.43	8.94	V	55.37	73.98	18.61	PK
7311	34.33	8.94	V	43.27	53.98	10.71	AV
4874	49.16	0.01	H	49.17	73.98	24.81	PK
4874	38.84	0.01	H	38.85	53.98	15.13	AV
7311	46.10	8.94	H	55.04	73.98	18.94	PK
7311	34.28	8.94	H	43.22	53.98	10.76	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 g

Operating Frequency: 2462

Channel No.: 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	49.79	0.38	V	50.17	73.98	23.81	PK
4924	38.40	0.38	V	38.78	53.98	15.20	AV
7386	46.12	9.02	V	55.14	73.98	18.84	PK
7386	34.27	9.02	V	43.29	53.98	10.69	AV
4924	49.53	0.38	H	49.91	73.98	24.07	PK
4924	37.70	0.38	H	38.08	53.98	15.90	AV
7386	45.96	9.02	H	54.98	73.98	19.00	PK
7386	34.21	9.02	H	43.23	53.98	10.75	AV

Operation Mode: 802.11 n_HT20

Operating Frequency: 2462

Channel No.: 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	49.95	0.38	V	50.33	73.98	23.65	PK
4924	38.31	0.38	V	38.69	53.98	15.29	AV
7386	46.07	9.02	V	55.09	73.98	18.89	PK
7386	34.41	9.02	V	43.43	53.98	10.55	AV
4924	49.62	0.38	H	50.00	73.98	23.98	PK
4924	38.27	0.38	H	38.65	53.98	15.33	AV
7386	45.96	9.02	H	54.98	73.98	19.00	PK
7386	34.40	9.02	H	43.42	53.98	10.56	AV

Operation Mode: 802.11 n_HT40
Operating Frequency: 2452
Channel No.: 09 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4904	49.98	0.38	V	50.36	73.98	23.62	PK
4904	38.43	0.38	V	38.81	53.98	15.17	AV
7356	46.10	9.02	V	55.12	73.98	18.86	PK
7356	34.47	9.02	V	43.49	53.98	10.49	AV
4904	48.79	0.38	H	49.17	73.98	24.81	PK
4904	37.98	0.38	H	38.36	53.98	15.62	AV
7356	45.88	9.02	H	54.90	73.98	19.08	PK
7356	34.36	9.02	H	43.38	53.98	10.60	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 g

Operating Frequency: 2467

Channel No.: 12 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4934	49.83	0.46	V	50.29	73.98	23.69	PK
4934	37.16	0.46	V	37.62	53.98	16.36	AV
7401	46.21	9.20	V	55.41	73.98	18.57	PK
7401	34.10	9.20	V	43.30	53.98	10.68	AV
4934	50.30	0.46	H	50.76	73.98	23.22	PK
4934	38.27	0.46	H	38.73	53.98	15.25	AV
7401	46.22	9.20	H	55.42	73.98	18.56	PK
7401	34.11	9.20	H	43.31	53.98	10.67	AV

Operation Mode: 802.11 n_HT20

Operating Frequency: 2467

Channel No.: 12 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4934	49.53	-0.64	V	48.89	73.98	25.09	PK
4934	37.54	-0.64	V	36.90	53.98	17.08	AV
7401	46.11	8.49	V	54.60	73.98	19.38	PK
7401	37.01	8.49	V	45.50	53.98	8.48	AV
4934	49.94	-0.64	H	49.30	73.98	24.68	PK
4934	38.12	-0.64	H	37.48	53.98	16.50	AV
7401	46.18	8.49	H	54.67	73.98	19.31	PK
7401	34.07	8.49	H	42.56	53.98	11.42	AV

Operation Mode: 802.11 n_HT40
Operating Frequency: 2457
Channel No.: 10 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4914	49.55	-0.40	V	49.15	73.98	24.83	PK
4914	37.54	-0.40	V	37.14	53.98	16.84	AV
7371	46.01	8.69	V	54.70	73.98	19.28	PK
7371	33.54	8.69	V	42.23	53.98	11.75	AV
4914	49.98	-0.40	H	49.58	73.98	24.40	PK
4914	38.02	-0.40	H	37.62	53.98	16.36	AV
7371	46.08	8.69	H	54.77	73.98	19.21	PK
7371	33.97	8.69	H	42.66	53.98	11.32	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 g

Operating Frequency: 2472

Channel No.: 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4944	49.25	0.83	V	50.08	73.98	23.90	PK
4944	38.79	0.83	V	39.62	53.98	14.36	AV
7416	46.36	8.94	V	55.30	73.98	18.68	PK
7416	34.34	8.94	V	43.28	53.98	10.70	AV
4944	49.17	0.83	H	50.00	73.98	23.98	PK
4944	37.56	0.83	H	38.39	53.98	15.59	AV
7416	46.08	8.94	H	55.02	73.98	18.96	PK
7416	34.22	8.94	H	43.16	53.98	10.82	AV

Operation Mode: 802.11 n_HT20

Operating Frequency: 2472

Channel No.: 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4944	49.24	0.01	V	49.25	73.98	24.73	PK
4944	37.91	0.01	V	37.92	53.98	16.06	AV
7416	46.24	8.94	V	55.18	73.98	18.80	PK
7416	34.31	8.94	V	43.25	53.98	10.73	AV
4944	49.11	0.01	H	49.12	73.98	24.86	PK
4944	37.78	0.01	H	37.79	53.98	16.19	AV
7416	46.11	8.94	H	55.05	73.98	18.93	PK
7416	34.27	8.94	H	43.21	53.98	10.77	AV

Operation Mode: 802.11 n_HT40
Operating Frequency: 2462
Channel No.: 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	49.17	0.01	V	49.18	73.98	24.80	PK
4924	37.81	0.01	V	37.82	53.98	16.16	AV
7386	46.35	8.94	V	55.29	73.98	18.69	PK
7386	34.06	8.94	V	43.00	53.98	10.98	AV
4924	49.07	0.01	H	49.08	73.98	24.90	PK
4924	37.79	0.01	H	37.80	53.98	16.18	AV
7386	46.22	8.94	H	55.16	73.98	18.82	PK
7386	33.98	8.94	H	42.92	53.98	11.06	AV

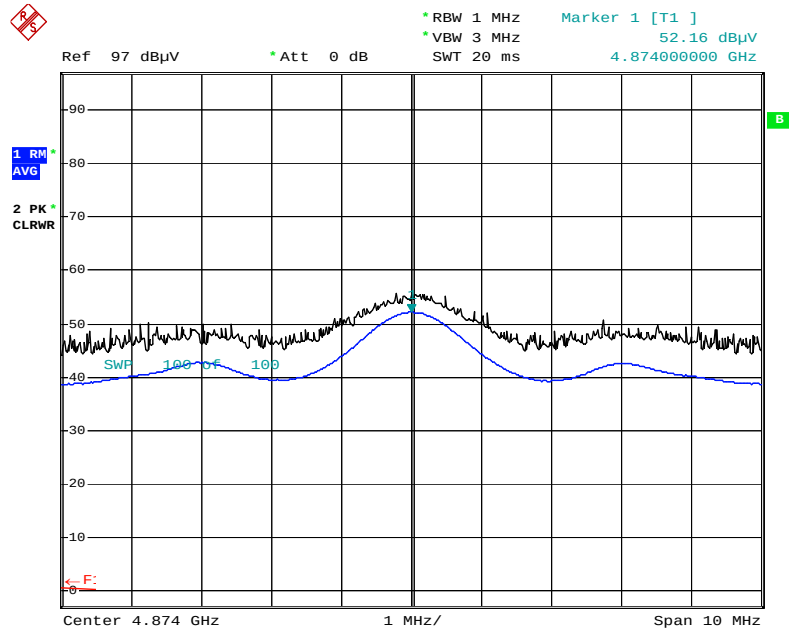
* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

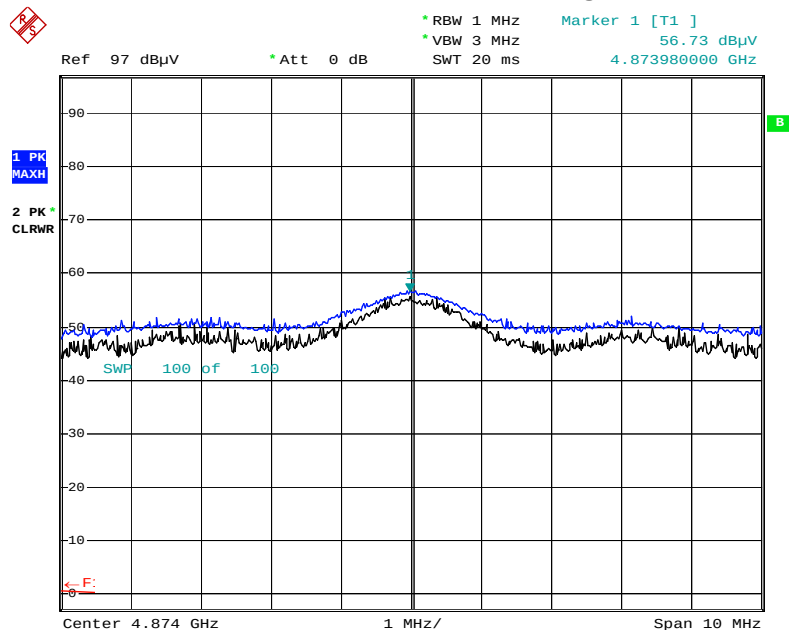
■ **RESULT PLOTS (Worst Case: X-H) – Ant 0**

Radiated Spurious Emissions plot – Average Reading (802.11b, Ch.6 2nd Harmonic)



Date: 31.AUG.2017 16:22:47

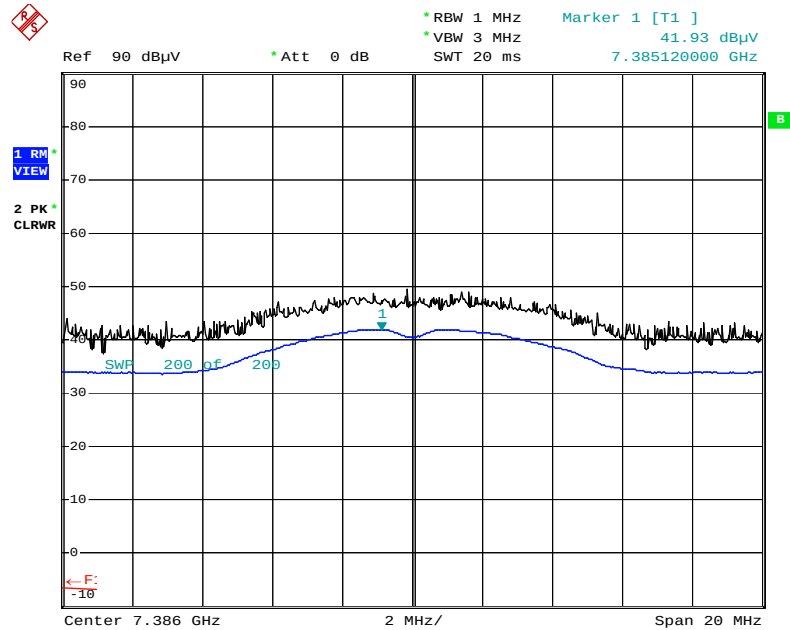
Radiated Spurious Emissions plot – Peak Reading (802.11b, Ch.6 2nd Harmonic)



Date: 31.AUG.2017 16:26:29

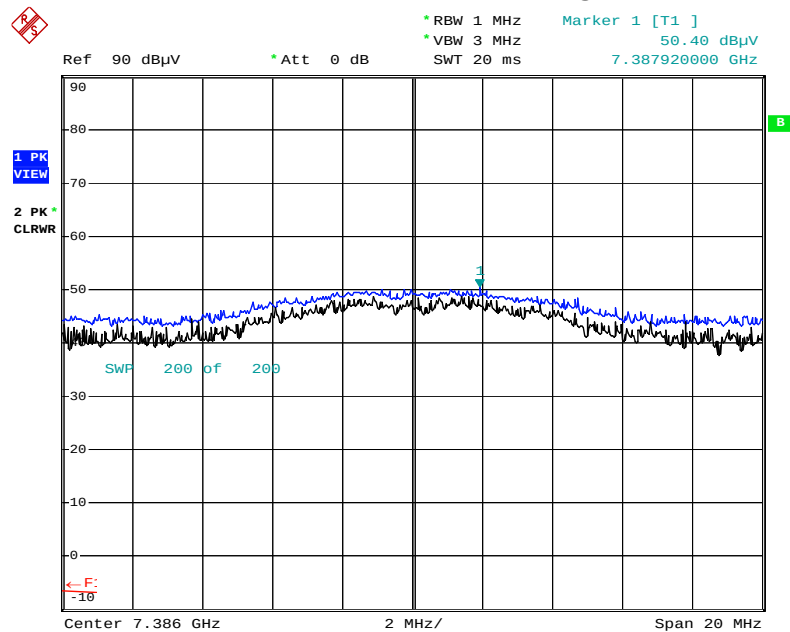
■ **RESULT PLOTS (Worst Case: X-H) – Ant 1**

Radiated Spurious Emissions plot – Average Reading (802.11b, Ch.11 3rd Harmonic)



Date: 11.SEP.2017 19:07:51

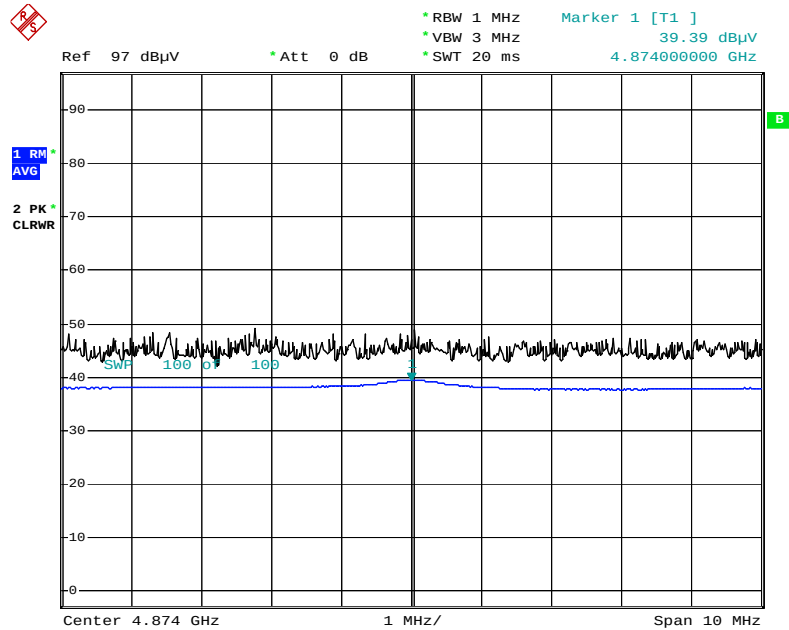
Radiated Spurious Emissions plot – Peak Reading (802.11b, Ch.11 3rd Harmonic)



Date: 11.SEP.2017 19:08:25

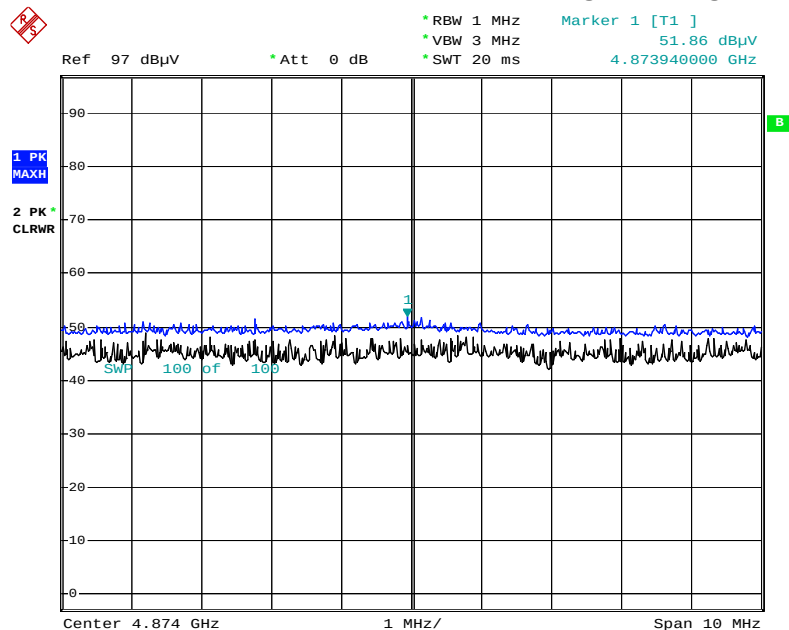
■ **RESULT PLOTS (Worst Case: Z-V) - MIMO**

Radiated Spurious Emissions plot – Average Reading (802.11g, Ch.6 2nd Harmonic)



Date: 4.SEP.2017 10:59:21

Radiated Spurious Emissions plot – Peak Reading (802.11g, Ch.6 2nd Harmonic)



Date: 4.SEP.2017 10:58:08

Note : Only the worst case plots for Radiated Spurious Emissions.

9.7.2 RADIATED RESTRICTED BAND EDGES

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

[Ant 0]

Operation Mode:	802.11b
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	28.97	33.04	H	62.01	73.98	11.97	PK
2390.0	19.88	33.04	H	52.92	53.98	1.06	AV
2390.0	27.12	33.04	V	60.16	73.98	13.82	PK
2390.0	18.94	33.04	V	51.98	53.98	2.00	AV
2483.5	28.02	33.15	H	61.17	73.98	12.81	PK
2483.5	18.57	33.15	H	51.72	53.98	2.26	AV
2483.5	26.88	33.15	V	60.03	73.98	13.95	PK
2483.5	17.89	33.15	V	51.04	53.98	2.94	AV

Operation Mode:	802.11b
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	36.71	33.15	H	69.86	73.98	4.12	PK
2483.5	18.31	33.15	H	51.46	53.98	2.52	AV
2483.5	35.64	33.15	V	68.79	73.98	5.19	PK
2483.5	17.88	33.15	V	51.03	53.98	2.95	AV
2483.5	29.97	33.15	H	63.12	73.98	10.86	PK
2483.5	19.50	33.15	H	52.65	53.98	1.33	AV
2483.5	28.21	33.15	V	61.36	73.98	12.62	PK
2483.5	18.78	33.15	V	51.93	53.98	2.05	AV

[Ant 1]

Operation Mode:	802.11b
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	27.39	33.04	H	60.43	73.98	13.55	PK
2390.0	17.23	33.04	H	50.27	53.98	3.71	AV
2390.0	26.65	33.04	V	59.69	73.98	14.29	PK
2390.0	16.32	33.04	V	49.36	53.98	4.62	AV
2483.5	28.15	33.15	H	61.30	73.98	12.68	PK
2483.5	15.61	33.15	H	48.76	53.98	5.22	AV
2483.5	26.74	33.15	V	59.89	73.98	14.09	PK
2483.5	14.95	33.15	V	48.10	53.98	5.88	AV

Operation Mode:	802.11b
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	34.15	33.15	H	67.30	73.98	6.68	PK
2483.5	19.11	33.15	H	52.26	53.98	1.72	AV
2483.5	33.51	33.15	V	66.66	73.98	7.32	PK
2483.5	18.26	33.15	V	51.41	53.98	2.57	AV
2483.5	28.64	33.15	H	61.79	73.98	12.19	PK
2483.5	17.91	33.15	H	51.06	53.98	2.92	AV
2483.5	27.92	33.15	V	61.07	73.98	12.91	PK
2483.5	17.11	33.15	V	50.26	53.98	3.72	AV

[MIMO]

Operation Mode:	802.11g
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	33.29	33.04	H	66.33	73.98	7.65	PK
2390.0	18.78	33.04	H	51.82	53.98	2.16	AV
2390.0	34.99	33.04	V	68.03	73.98	5.95	PK
2390.0	18.34	33.04	V	51.38	53.98	2.60	AV
2483.5	35.25	33.15	H	68.40	73.98	5.58	PK
2483.5	18.52	33.15	H	51.67	53.98	2.31	AV
2483.5	34.99	33.15	V	68.14	73.98	5.84	PK
2483.5	18.34	33.15	V	51.49	53.98	2.49	AV

Operation Mode:	802.11g
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	36.81	33.15	H	69.96	73.98	4.02	PK
2483.5	19.60	33.15	H	52.75	53.98	1.23	AV
2483.5	34.38	33.15	V	67.53	73.98	6.45	PK
2483.5	17.33	33.15	V	50.48	53.98	3.50	AV
2483.5	34.02	33.15	H	67.17	73.98	6.81	PK
2483.5	18.68	33.15	H	51.83	53.98	2.15	AV
2483.5	32.45	33.15	V	65.60	73.98	8.38	PK
2483.5	15.57	33.15	V	48.72	53.98	5.26	AV

Operation Mode: 802.11n_HT20
Operating Frequency: 2412 MHz, 2462 MHz
Channel No.: 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	34.17	33.04	H	67.21	73.98	6.77	PK
2390.0	18.78	33.04	H	51.82	53.98	2.16	AV
2390.0	34.01	33.04	V	67.05	73.98	6.93	PK
2390.0	18.66	33.04	V	51.70	53.98	2.28	AV
2483.5	37.79	33.15	H	70.94	73.98	3.04	PK
2483.5	19.17	33.15	H	52.32	53.98	1.66	AV
2483.5	37.50	33.15	V	70.65	73.98	3.33	PK
2483.5	19.01	33.15	V	52.16	53.98	1.82	AV

Operation Mode: 802.11n_HT20
Operating Frequency: 2467 MHz, 2472 MHz
Channel No.: 12 Ch, 13 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	35.84	33.15	H	68.99	73.98	4.99	PK
2483.5	19.63	33.15	H	52.78	53.98	1.20	AV
2483.5	35.02	33.15	V	68.17	73.98	5.81	PK
2483.5	17.75	33.15	V	50.90	53.98	3.08	AV
2483.5	36.25	33.15	H	69.40	73.98	4.58	PK
2483.5	18.95	33.15	H	52.10	53.98	1.88	AV
2483.5	31.62	33.15	V	64.77	73.98	9.21	PK
2483.5	16.37	33.15	V	49.52	53.98	4.46	AV

Operation Mode: 802.11n_HT40
Operating Frequency: 2422 MHz, 2452 MHz
Channel No.: 03 Ch, 09 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	34.39	33.04	H	67.43	73.98	6.55	PK
2390.0	19.04	33.04	H	52.08	53.98	1.90	AV
2390.0	34.06	33.04	V	67.10	73.98	6.88	PK
2390.0	18.77	33.04	V	51.81	53.98	2.17	AV
2483.5	32.94	33.15	H	66.09	73.98	7.89	PK
2483.5	18.70	33.15	H	51.85	53.98	2.13	AV
2483.5	32.84	33.15	V	65.99	73.98	7.99	PK
2483.5	18.53	33.15	V	51.68	53.98	2.30	AV

Operation Mode: 802.11n_HT40
Operating Frequency: 2457 MHz, 2462 MHz
Channel No.: 10 Ch, 11 Ch

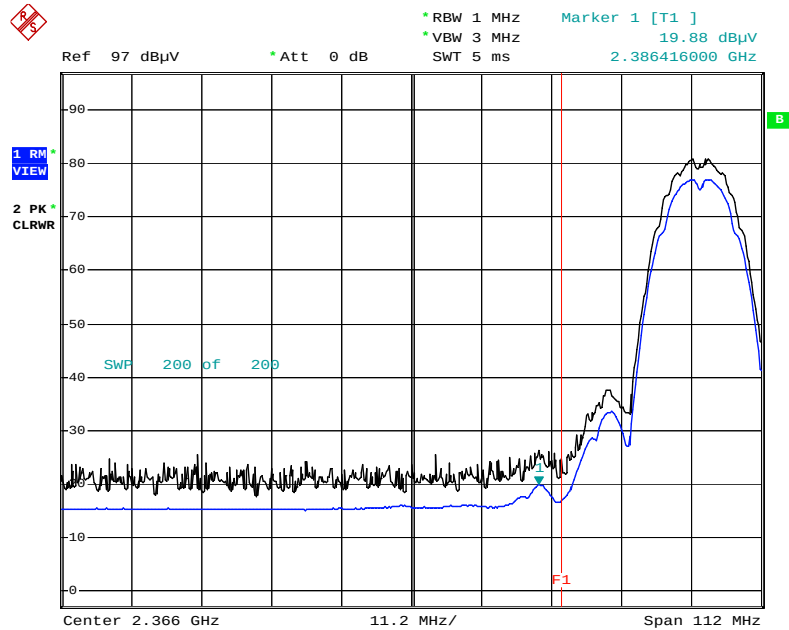
Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	39.43	33.15	H	72.58	73.98	1.40	PK
2483.5	19.53	33.15	H	52.68	53.98	1.30	AV
2483.5	37.19	33.15	V	70.34	73.98	3.64	PK
2483.5	17.50	33.15	V	50.65	53.98	3.33	AV
2483.5	36.67	33.15	H	69.82	73.98	4.16	PK
2483.5	19.10	33.15	H	52.25	53.98	1.73	AV
2483.5	35.67	33.15	V	68.82	73.98	5.16	PK
2483.5	18.21	33.15	V	51.36	53.98	2.62	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss + Distance Factor
2. Distance extrapolation factor = $20 \log (\text{test distance} / \text{specific distance})$ (dB)
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

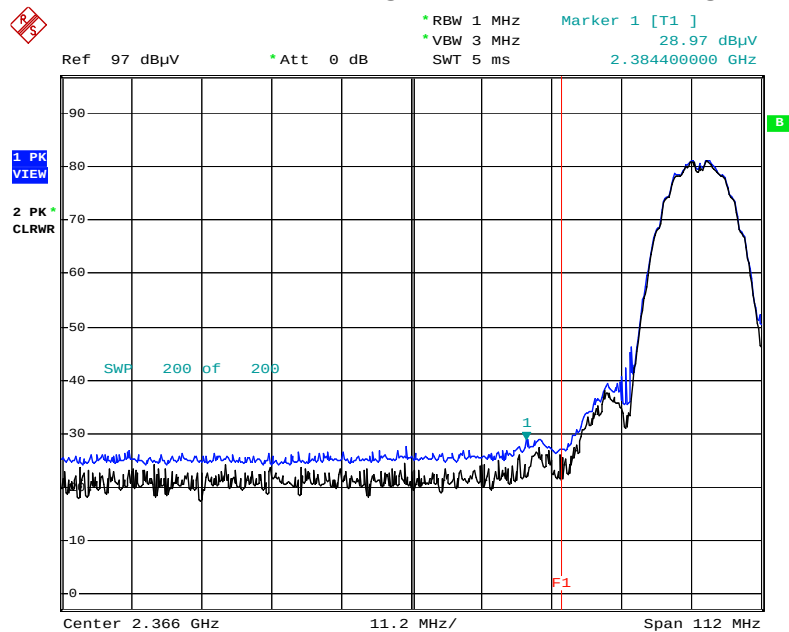
■ **RESULT PLOTS(Worst Case: X-H)_Ant 0**

Radiated Restricted Band Edges plot – Average Reading (802.11b, Ch.1)



Date: 11.SEP.2017 14:45:08

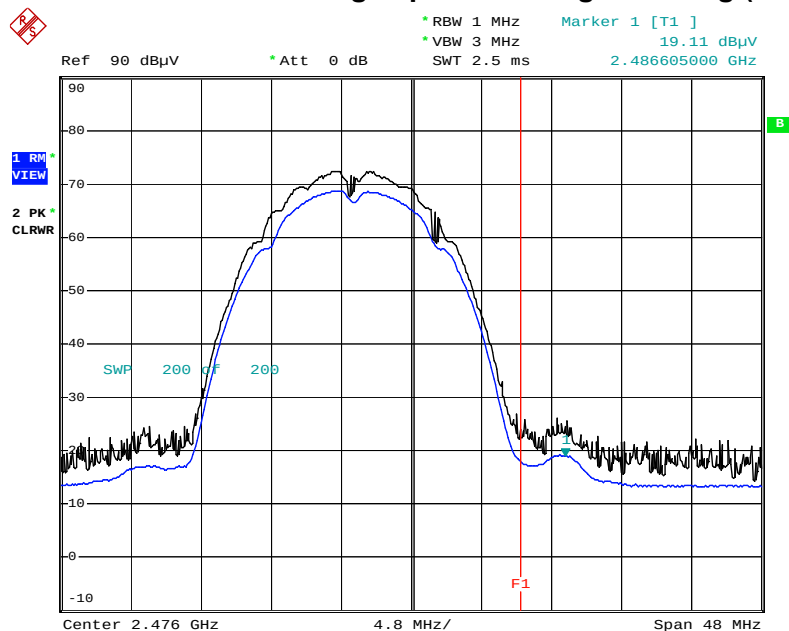
Radiated Restricted Band Edges plot – Peak Reading (802.11b, Ch.1)



Date: 11.SEP.2017 14:43:48

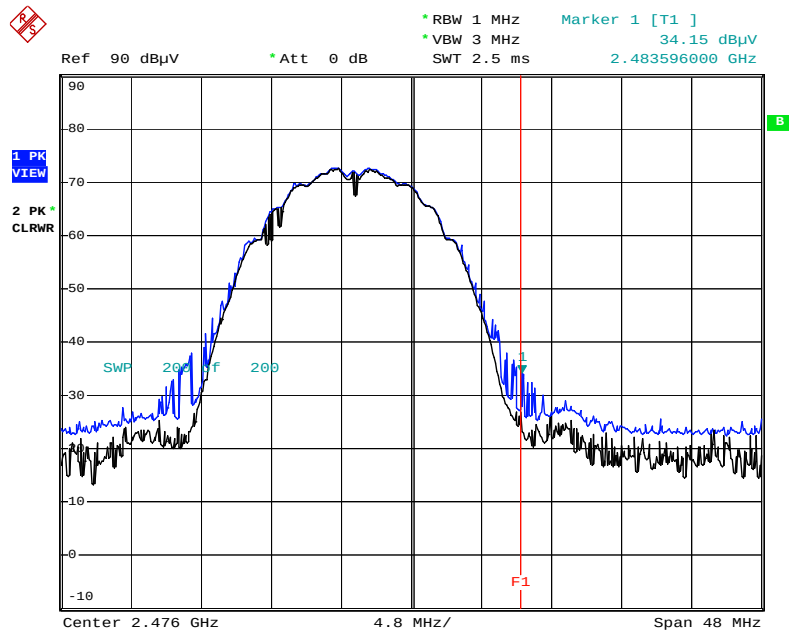
■ **RESULT PLOTS(Worst Case: X-H)_Ant 1**

Radiated Restricted Band Edges plot – Average Reading (802.11b, Ch.13)



Date: 11.SEP.2017 17:52:14

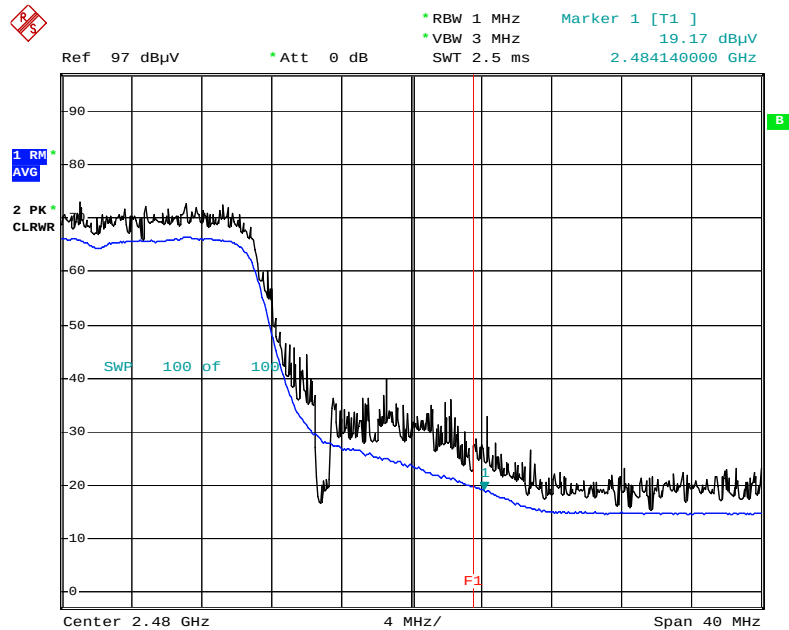
Radiated Restricted Band Edges plot – Peak Reading (802.11b, Ch.13)



Date: 11.SEP.2017 17:53:21

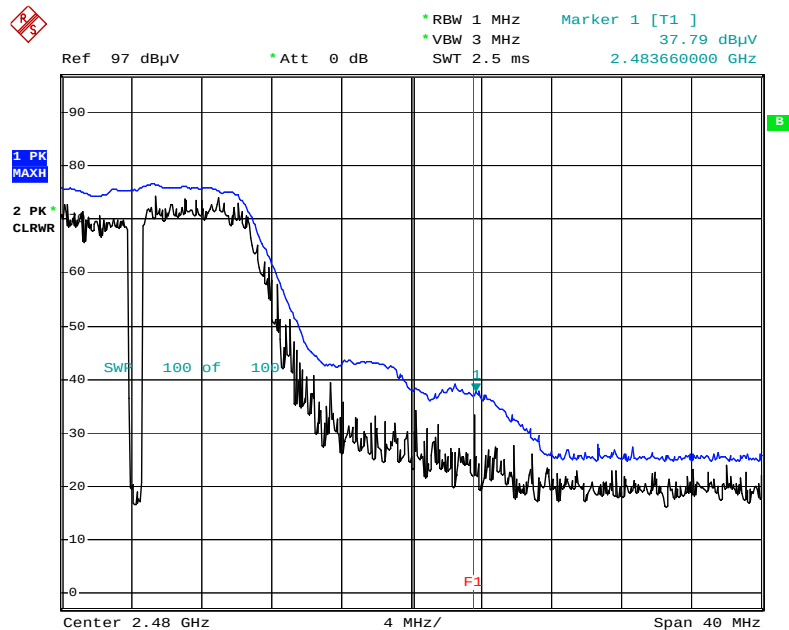
■ **RESULT PLOTS(Worst Case: X-H)_MIMO**

Radiated Restricted Band Edges plot – Average Reading (802.11n_HT20, Ch.11)



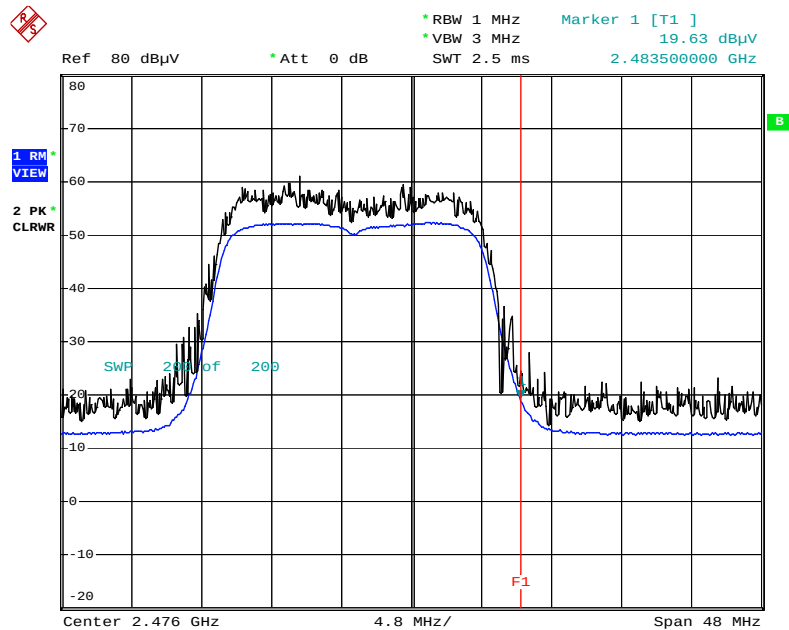
Date: 31.AUG.2017 10:44:00

Radiated Restricted Band Edges plot – Peak Reading (802.11n_HT20, Ch.11)



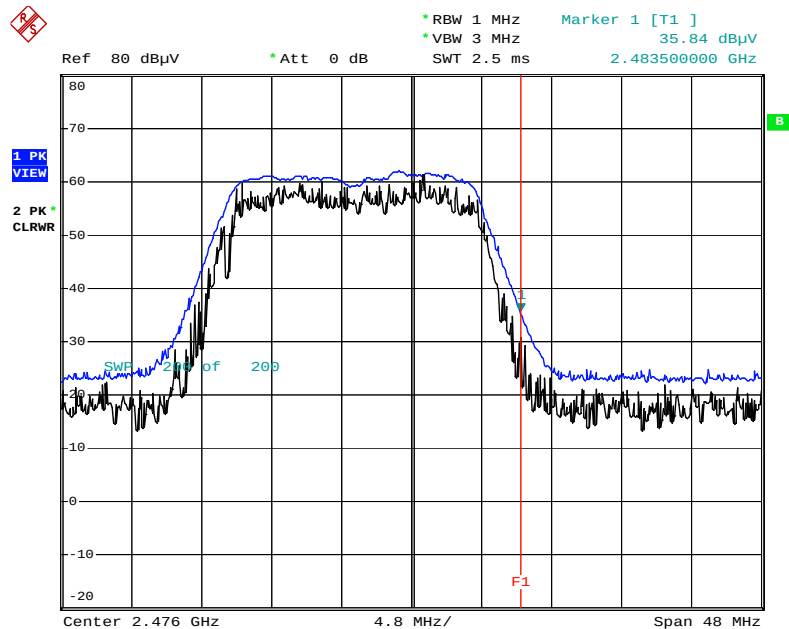
Date: 31.AUG.2017 10:46:15

Radiated Restricted Band Edges plot – Average Reading (802.11n, Ch.13)



Date: 11.SEP.2017 12:30:04

Radiated Restricted Band Edges plot – Peak Reading (802.11n, Ch.13)



Date: 11.SEP.2017 12:31:10

Note : Only the worst case plots for Radiated Restricted Band Edges.

9.7.3 RECEIVER SPURIOUS EMISSIONS

ISED Rule(s) RSS-Gen
Test Requirements: Blow the table
Operating conditions: Under normal test conditions
Method of testing: Radiated

S/A. Settings: F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)
 F > 1 GHz: RBW: 1 MHz, VBW: 3 MHz (Peak)

Mode of operation: Receive

Frequency (MHz)	Field Strength (microvolts/m at 3 meters)
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500

Operation Mode: Receive:

30 MHz ~ 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
No critical peaks found							

Above 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
No critical peaks found							

9.8 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207, RSS-Gen(Issue 4) Section 8.8

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for worst data rate, channel, operation mode.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

RESULT PLOTS

Conducted Emissions (Line 1)

EMI Auto Test(15)

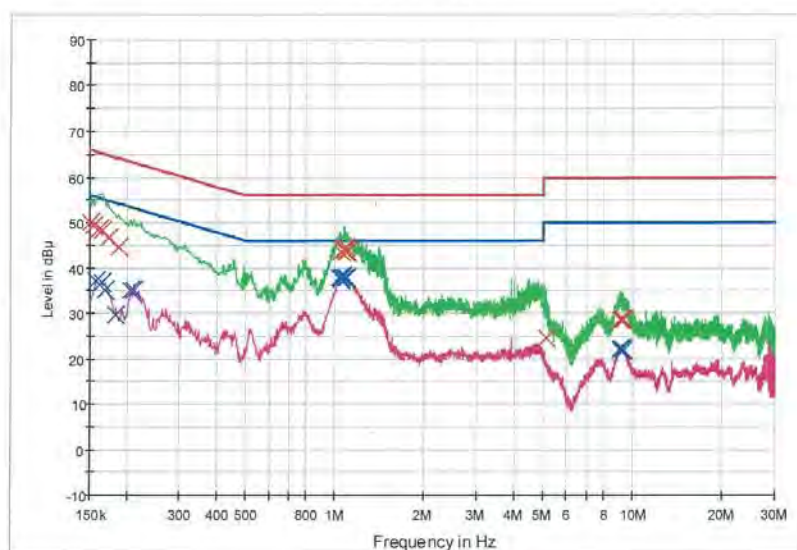
1 / 2

HCT TEST Report

Common Information

EUT: LGSWFAC81
Manufacturer: LG
Test Site: SHIELD ROOM
Operating Conditions: WLAN 2.4GHz MODE

FCC CLASS B



— FCC CLASS B_OP — FCC CLASS B_AV — Preview Result 1-PK+
— Preview Result 2-AVG — Final Result 1-QPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	49.9	9.000	Off	L1	9.6	16.1	66.0
0.154000	49.3	9.000	Off	L1	9.6	16.5	65.8
0.160000	48.7	9.000	Off	L1	9.6	16.7	65.5
0.164000	48.5	9.000	Off	L1	9.6	16.8	65.3
0.172000	46.5	9.000	Off	L1	9.6	18.4	64.9
0.188000	44.6	9.000	Off	L1	9.6	19.5	64.1
1.040000	43.6	9.000	Off	L1	9.7	12.4	56.0
1.066000	43.9	9.000	Off	L1	9.7	12.1	56.0
1.070000	44.3	9.000	Off	L1	9.7	11.7	56.0
1.080000	44.6	9.000	Off	L1	9.7	11.4	56.0
1.086000	43.7	9.000	Off	L1	9.7	12.3	56.0
1.098000	43.6	9.000	Off	L1	9.7	12.4	56.0
5.132000	24.7	9.000	Off	L1	9.9	35.3	60.0
9.048000	28.5	9.000	Off	L1	10.0	31.5	60.0
9.062000	28.8	9.000	Off	L1	10.0	31.2	60.0
9.166000	28.7	9.000	Off	L1	10.0	31.3	60.0
9.182000	28.8	9.000	Off	L1	10.0	31.2	60.0
9.274000	28.5	9.000	Off	L1	10.0	31.5	60.0

Final Result 2

2017-09-19

오후 1:42:38

EMI Auto Test(15)

2 / 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	37.0	9.000	Off	L1	9.6	18.6	55.6
0.164000	36.8	9.000	Off	L1	9.6	18.5	55.3
0.168000	35.2	9.000	Off	L1	9.6	19.9	55.1
0.184000	29.7	9.000	Off	L1	9.6	24.6	54.3
0.206000	35.0	9.000	Off	L1	9.6	18.4	53.4
0.210000	35.2	9.000	Off	L1	9.6	18.0	53.2
1.036000	37.8	9.000	Off	L1	9.7	8.2	46.0
1.040000	37.6	9.000	Off	L1	9.7	8.4	46.0
1.048000	37.9	9.000	Off	L1	9.7	8.1	46.0
1.052000	38.3	9.000	Off	L1	9.7	7.7	46.0
1.088000	37.9	9.000	Off	L1	9.7	8.1	46.0
1.098000	37.6	9.000	Off	L1	9.7	8.4	46.0
9.062000	22.0	9.000	Off	L1	10.0	28.0	50.0
9.072000	22.0	9.000	Off	L1	10.0	28.0	50.0
9.152000	22.2	9.000	Off	L1	10.0	27.8	50.0
9.182000	22.2	9.000	Off	L1	10.0	27.8	50.0
9.218000	22.2	9.000	Off	L1	10.0	27.8	50.0
9.274000	22.0	9.000	Off	L1	10.0	28.0	50.0

2017-09-19

오후 1:42:38

Conducted Emissions (Line 2)

EMI Auto Test(15)

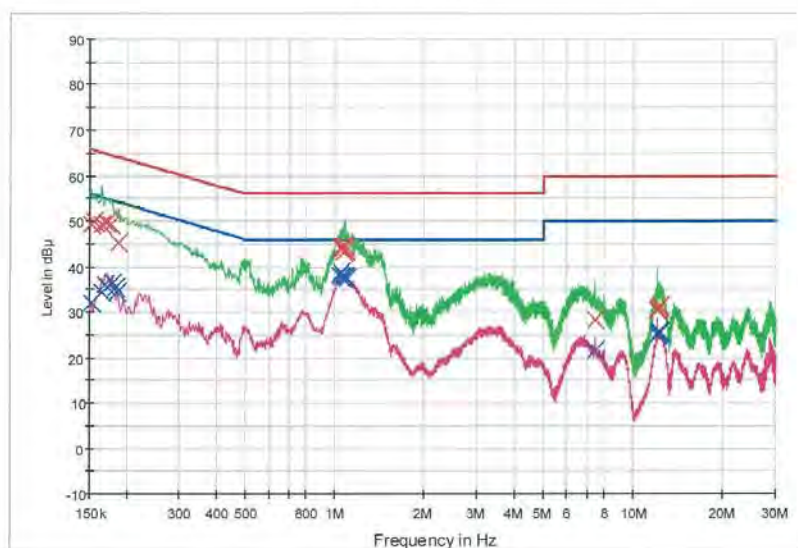
1 / 2

HCT TEST Report

Common Information

EUT: LGSWFAC81
Manufacturer: LG
Test Site: SHIELD ROOM
Operating Conditions: WLAN 2.4GHz MODE

FCC CLASS B



— FCC CLASS B_QP — FCC CLASS B_AV — Preview Result 1-PK+
— Preview Result 2-AVG — Final Result 1-QPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.152000	49.4	9.000	Off	N	9.6	16.5	65.9
0.156000	49.9	9.000	Off	N	9.6	15.8	65.7
0.164000	49.5	9.000	Off	N	9.6	15.8	65.3
0.170000	49.5	9.000	Off	N	9.6	15.5	65.0
0.176000	49.4	9.000	Off	N	9.6	15.3	64.7
0.188000	45.2	9.000	Off	N	9.6	18.9	64.1
1.046000	44.1	9.000	Off	N	9.7	11.9	56.0
1.056000	43.8	9.000	Off	N	9.7	12.2	56.0
1.070000	44.1	9.000	Off	N	9.7	11.9	56.0
1.074000	43.3	9.000	Off	N	9.7	12.7	56.0
1.080000	44.7	9.000	Off	N	9.7	11.3	56.0
1.084000	43.6	9.000	Off	N	9.7	12.4	56.0
7.422000	28.5	9.000	Off	N	10.0	31.5	60.0
7.434000	28.4	9.000	Off	N	10.0	31.6	60.0
12.096000	30.5	9.000	Off	N	10.1	29.5	60.0
12.104000	30.5	9.000	Off	N	10.1	29.5	60.0
12.232000	31.1	9.000	Off	N	10.1	28.9	60.0
12.270000	31.3	9.000	Off	N	10.1	28.8	60.0

Final Result 2

2017-09-19

오후 1:29:41

EMI Auto Test(15)

2 / 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.152000	32.0	9.000	Off	N	9.6	23.9	55.9
0.164000	34.6	9.000	Off	N	9.6	20.7	55.3
0.168000	36.1	9.000	Off	N	9.6	18.9	55.1
0.178000	36.5	9.000	Off	N	9.6	18.1	54.6
0.182000	35.5	9.000	Off	N	9.6	18.9	54.4
0.186000	34.3	9.000	Off	N	9.6	19.9	54.2
1.032000	38.3	9.000	Off	N	9.7	7.7	46.0
1.040000	37.9	9.000	Off	N	9.7	8.1	46.0
1.046000	38.7	9.000	Off	N	9.7	7.3	46.0
1.074000	37.9	9.000	Off	N	9.7	8.1	46.0
1.084000	37.7	9.000	Off	N	9.7	8.3	46.0
1.096000	37.6	9.000	Off	N	9.7	8.4	46.0
7.422000	21.5	9.000	Off	N	10.0	28.5	50.0
12.104000	24.8	9.000	Off	N	10.1	25.2	50.0
12.158000	25.2	9.000	Off	N	10.1	24.8	50.0
12.232000	25.4	9.000	Off	N	10.1	24.6	50.0
12.308000	25.5	9.000	Off	N	10.1	24.5	50.0
12.324000	25.5	9.000	Off	N	10.1	24.5	50.0

2017-09-19

오후 1:29:41

10. LIST OF TEST EQUIPMENT

10.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/23/2016	Annual	100073
Rohde & Schwarz	ESCI / Test Receiver	12/23/2016	Annual	100584
Agilent	N9020A / Signal Analyzer	06/13/2017	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/30/2016	Annual	MY49431210
Agilent	N1911A / Power Meter	04/17/2017	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/17/2017	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/23/2016	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/12/2017	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/30/2017	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/10/2017	Annual	07560
Rohde & Schwarz	EMC32 / Software	-	-	-

10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Audix	AM4000 / Antenna Position Tower	N/A	N/A	N/A
Audix	Turn Table	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	08/25/2016	Biennial	9120D-1300
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	04/25/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/06/2017	Annual	100688
Rohde & Schwarz	FSP(9 kHz ~ 40 GHz) / Spectrum Analyzer	07/27/2017	Annual	100843
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	06/12/2017	Annual	8
Wainwright Instruments	WHFX7.0/18G-8SS / High Pass Filter	05/15/2017	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/30/2017	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/24/2017	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/12/2017	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/19/2017	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	07/11/2017	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/11/2017	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	01/23/2017	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/30/2017	Annual	25956