Conducted Output Power (802.11n-CH 9) 121.5 Mbps

Conducted Output Power (802.11n-CH 9) 135 Mbps

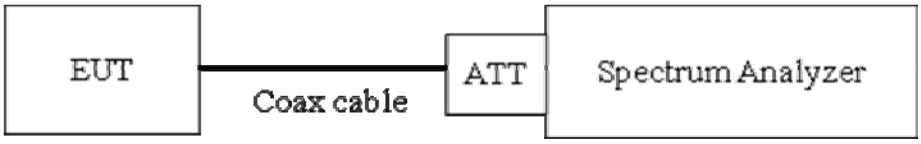
8.3 POWER SPECTRAL DENSITY (802.11b/g/n)

Test Requirements and limit, §15.247(e)

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

Minimum Standard – the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to Procedure 9.1 Option1 in KDB 558074, issued 10/04/2012

The spectrum analyzer is set to :

Set analyzer center frequency to DTS channel center frequency.

Span = 1.5 times the DTS channel bandwidth

RBW ≥ 3 kHz

VBW ≥ 9 kHz

Sweep = Auto couple

Detector Mode = Peak

Trace Mode = Max hold

Allow trace to fully stabilize.

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

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

▣ Sample Calculation

PSD = Reading Value + ATT loss + Cable loss(1 ea)

= -5 dBm + 10 dB + 0.8 dB = 5.8 dBm

Note :

1. Spectrum reading values are not plot data. The PSD 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. Actual value of loss for the attenuator and cable combination is below table.
   So, 10.1 dB is offset. And the offset gap in the 2.4 GHz range do not affect the power spectral density final result.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	10.11
	2437	10.10
	2462	10.12

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

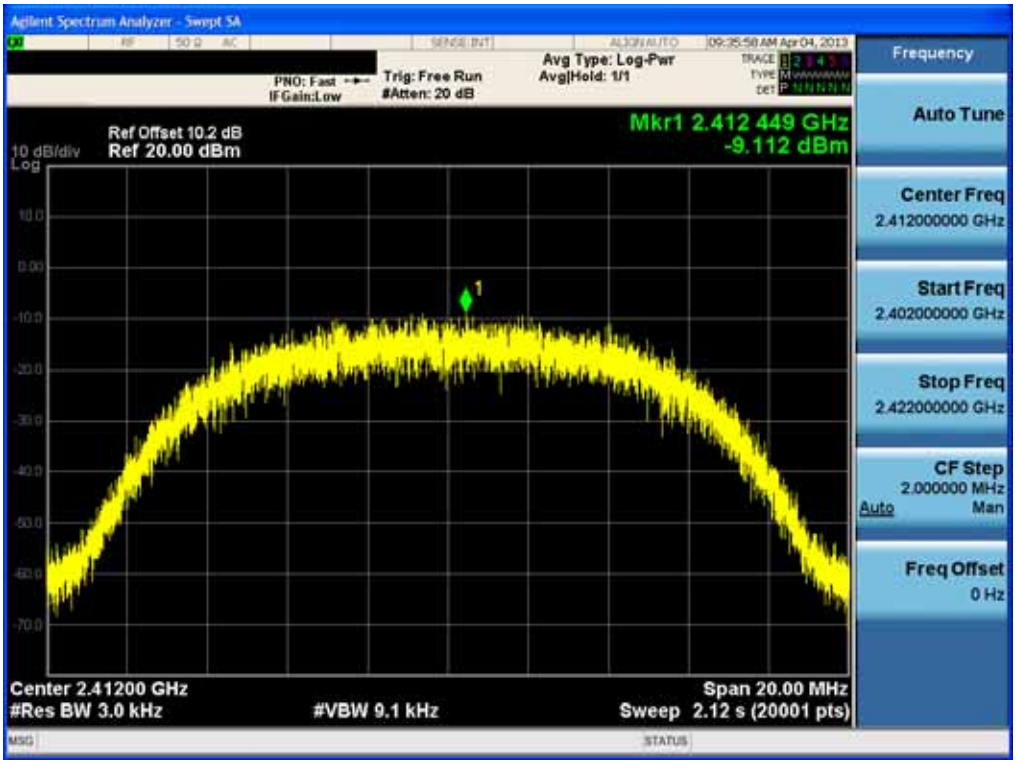
▣ TEST RESULTS

Conducted Power Density Measurements

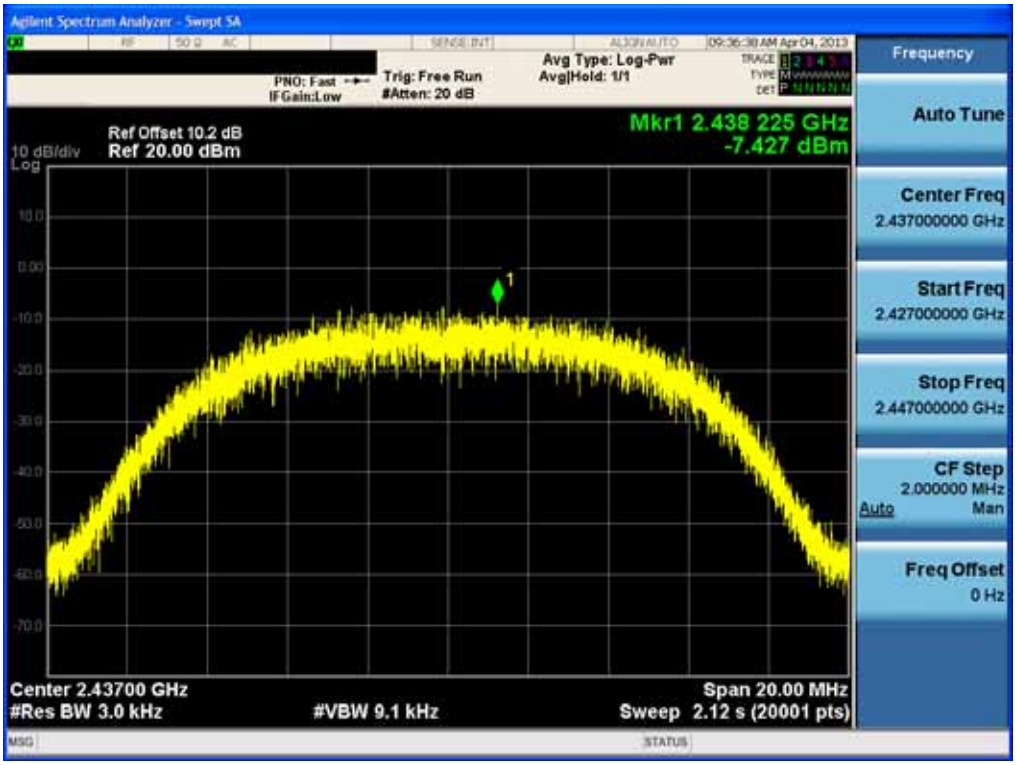
Frequency (MHz)	Channel No.	Mode	Test Result		
			PSD (dBm)	Limit (dBm)	Pass/Fail
2412	1	802.11b	-9.112	8	Pass
2437	6		-7.427	8	Pass
2462	11		-8.828	8	Pass
2412	1	802.11g	-15.931	8	Pass
2437	6		-14.731	8	Pass
2462	11		-15.520	8	Pass
2412	1	802.11n (20 MHz BW)	-18.621	8	Pass
2437	6		-16.655	8	Pass
2462	11		-17.875	8	Pass
2422	3	802.11n (40 MHz BW)	-23.354	8	Pass
2437	6		-21.289	8	Pass
2452	9		-20.373	8	Pass

▣ RESULT PLOTS

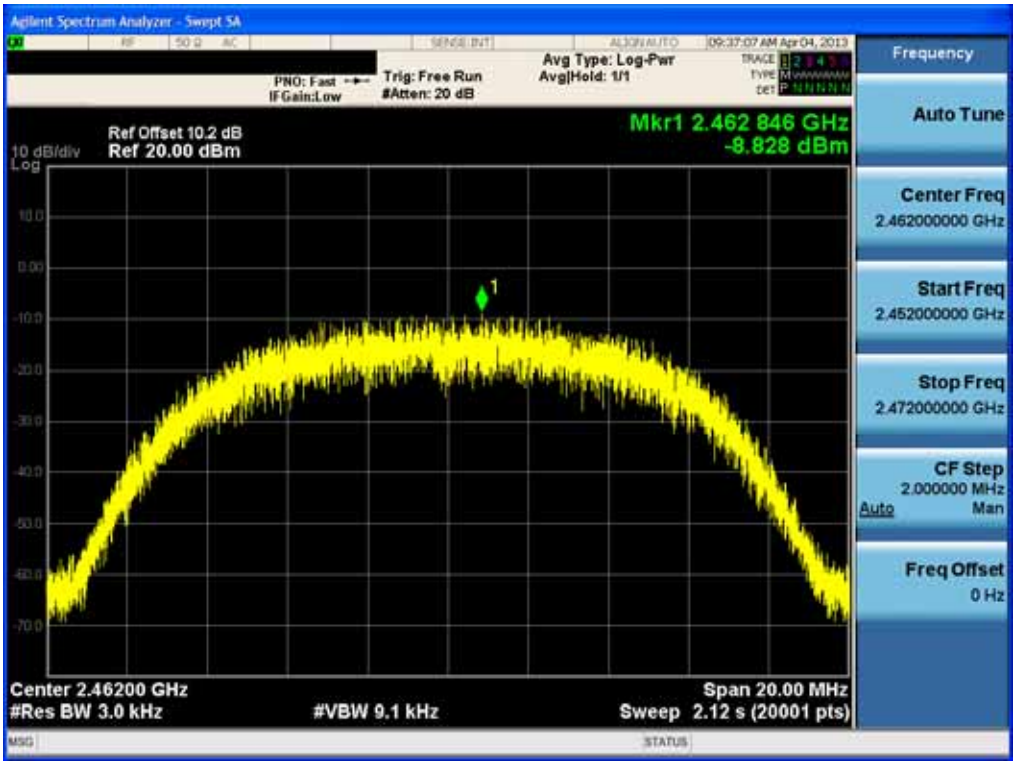
Power Spectral Density (802.11b-CH 1)



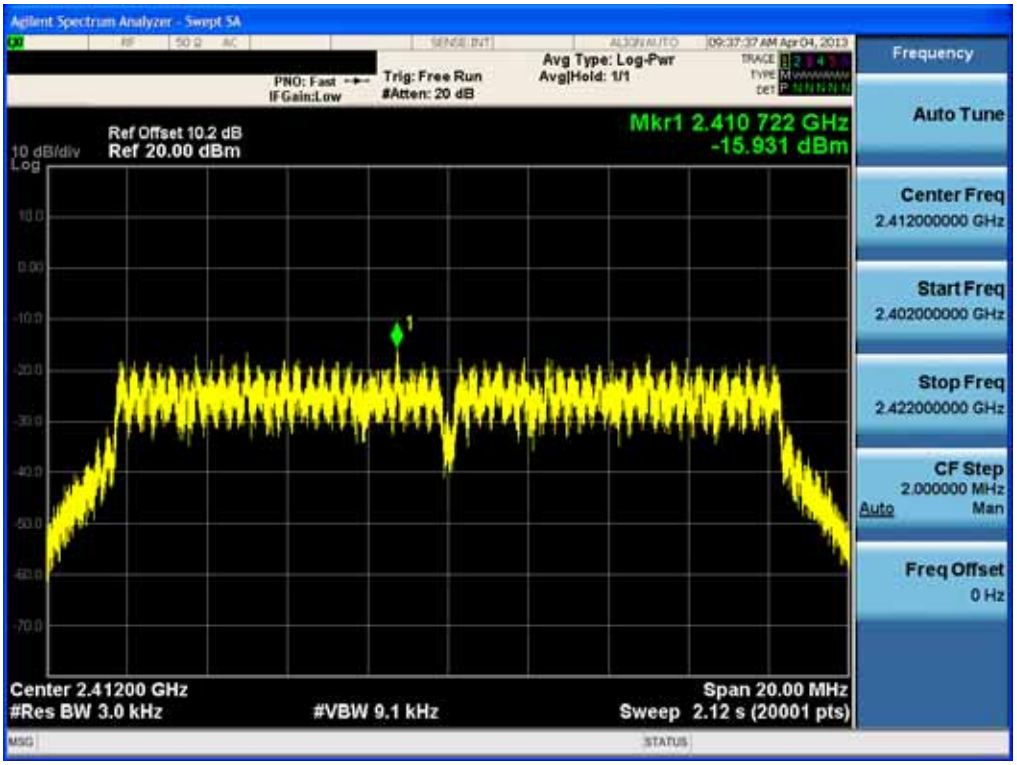
Power Spectral Density (802.11b-CH 6)



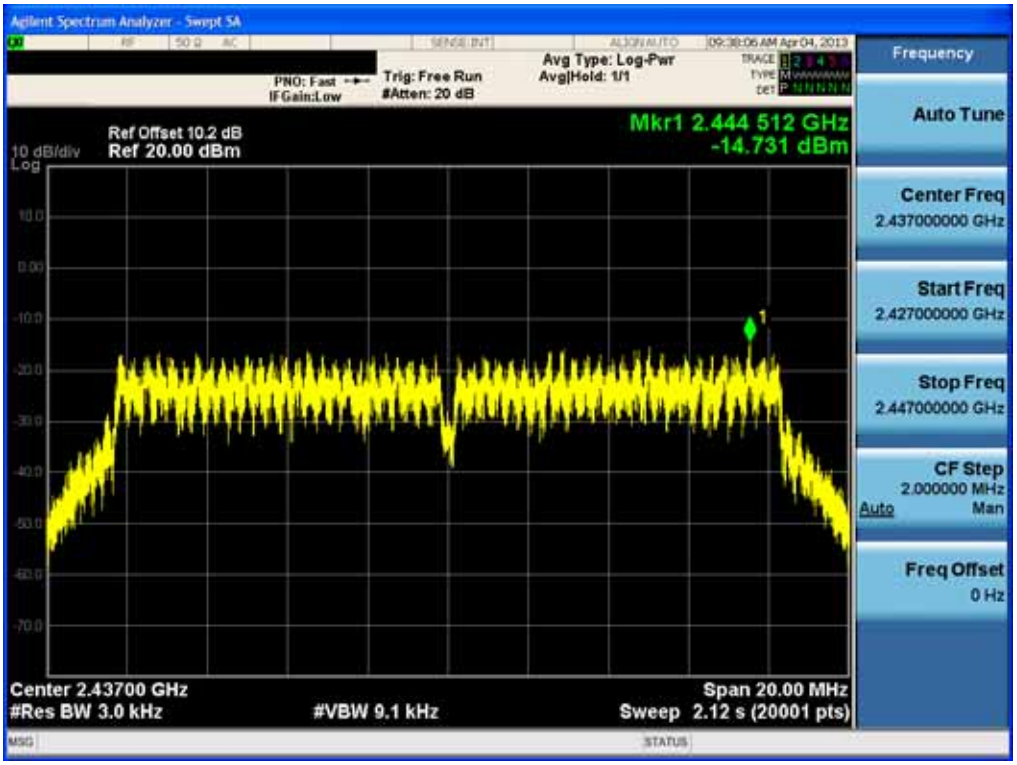
Power Spectral Density (802.11b-CH 11)



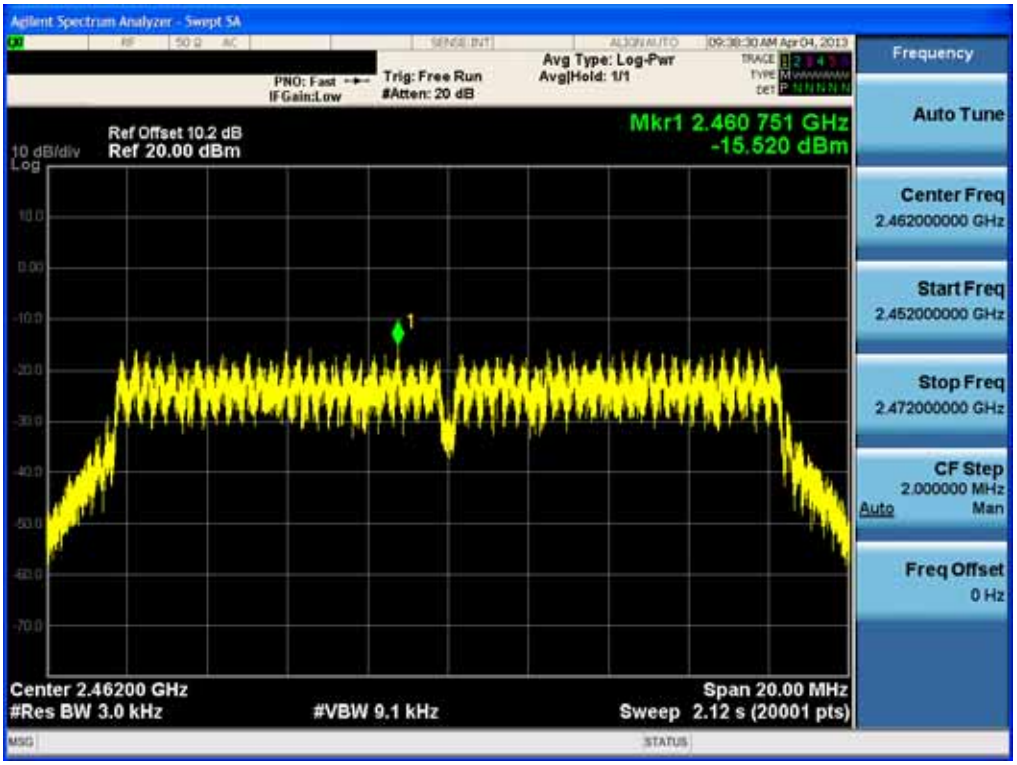
Power Spectral Density (802.11g-CH 1)



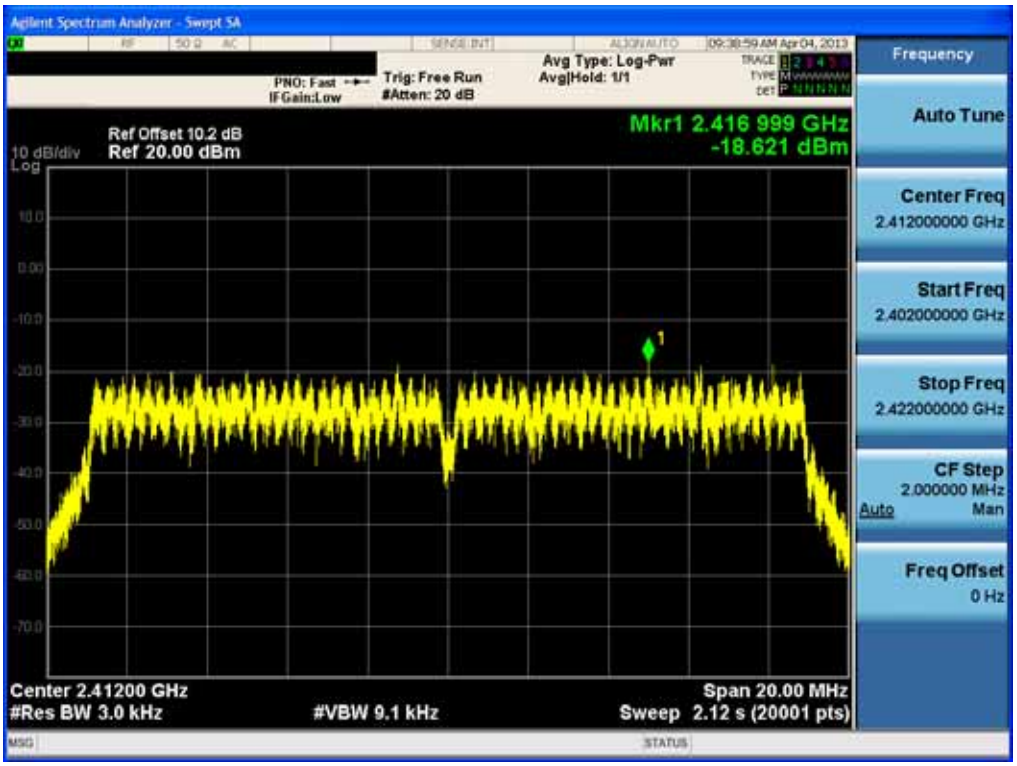
Power Spectral Density (802.11g-CH 6)



Power Spectral Density (802.11g-CH11)



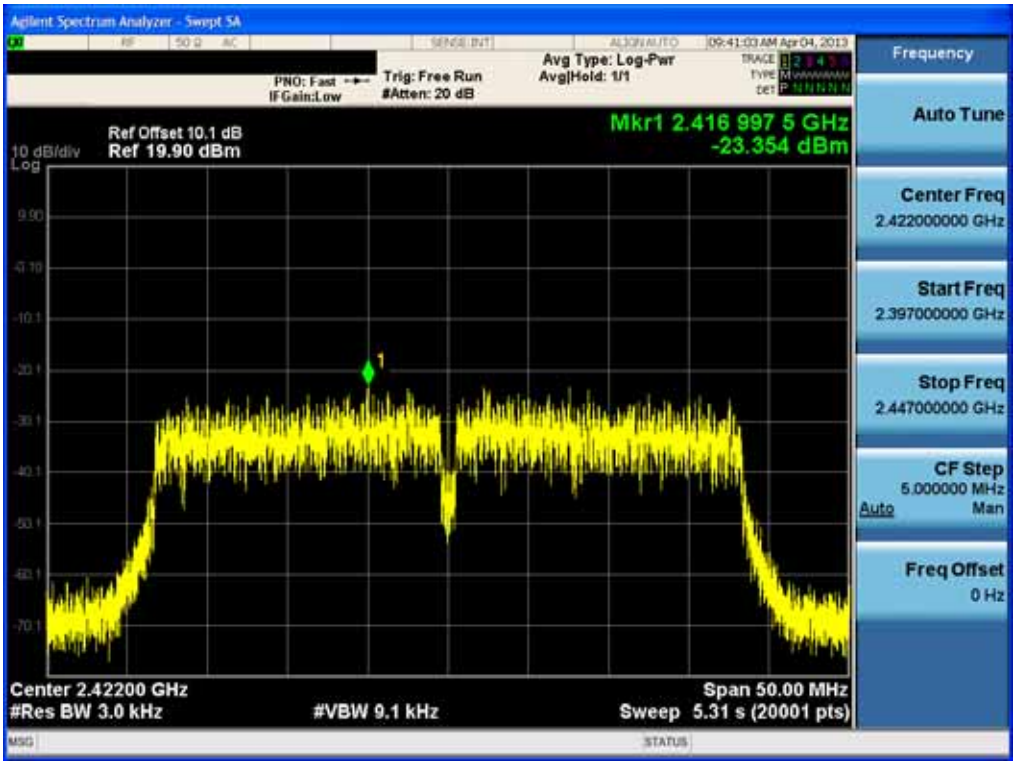
Power Spectral Density (802.11n-CH 1) _ 20 MHz BW



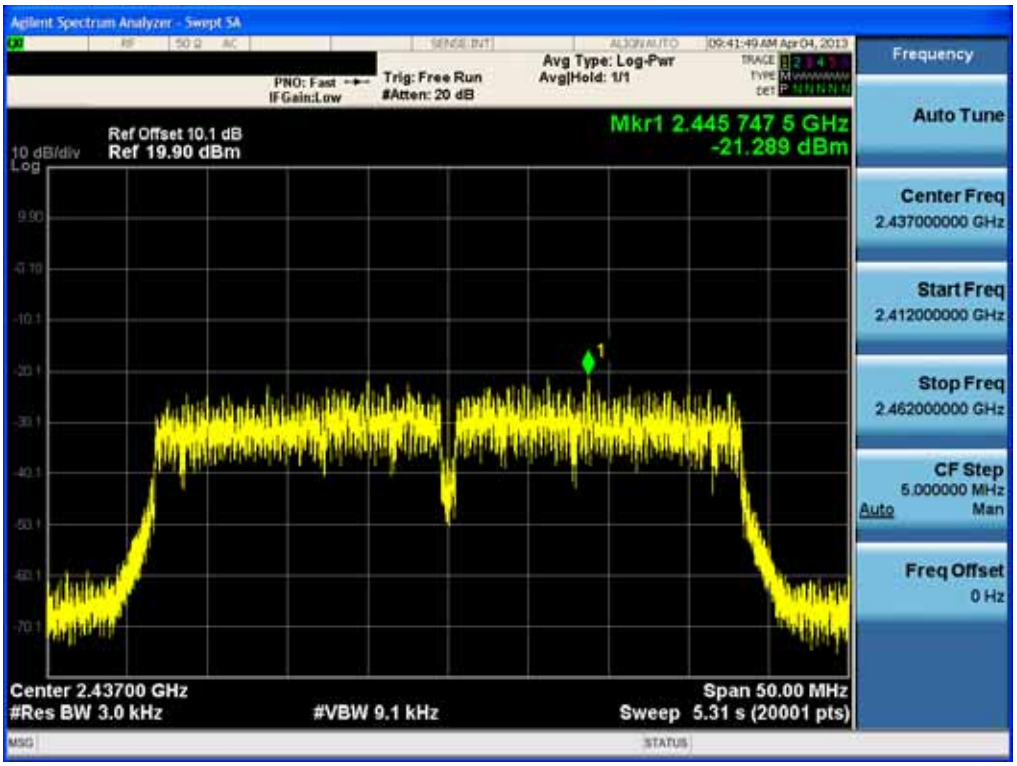
Power Spectral Density (802.11n-CH 6) _ 20 MHz BW

Power Spectral Density (802.11n-CH11) _ 20 MHz BW

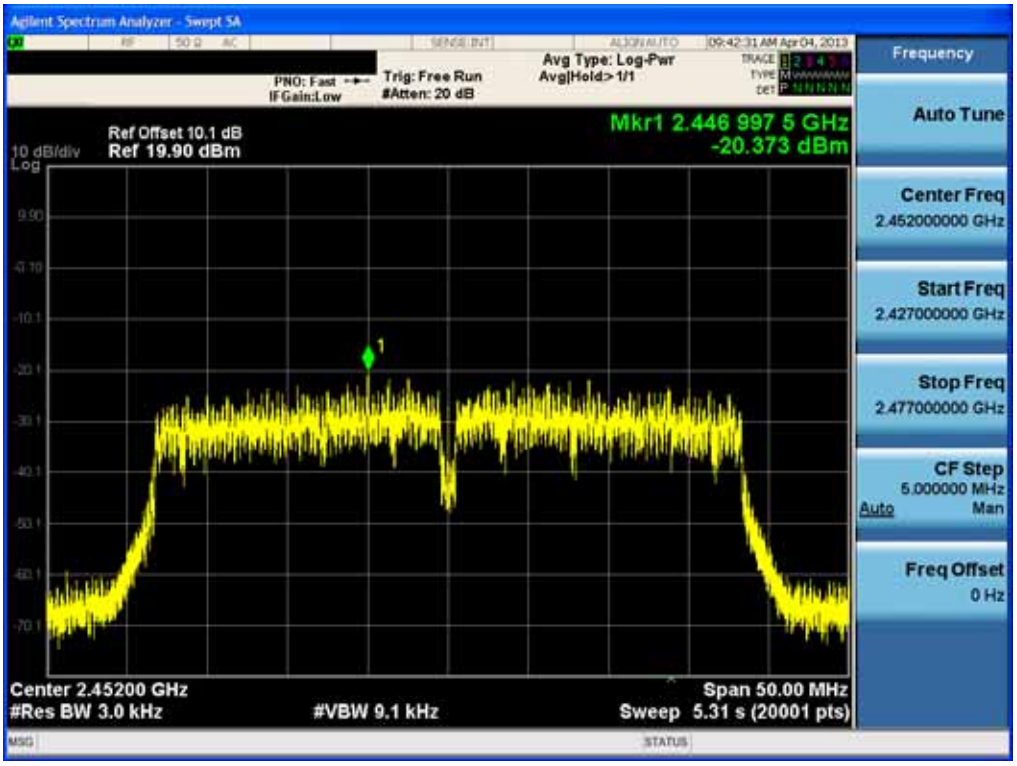
Power Spectral Density (802.11n-CH 3)_ 40 MHz BW



Power Spectral Density (802.11n-CH 6) _ 40 MHz BW



Power Spectral Density (802.11n-CH9) _ 40 MHz BW



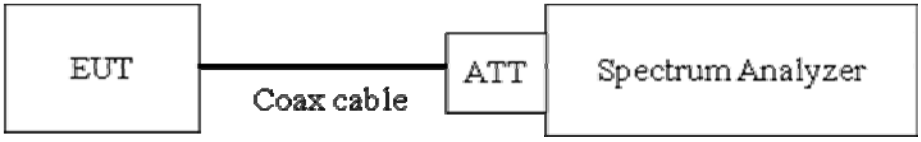
8.4 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Requirements and limit, §15.247(d)

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 10.1.2 in KDB 558074, issued 10/04/2012)

RBW = 100 kHz(Upon 1 GHz = 1 MHz)

VBW ≥ 300 kHz(Upon 1 GHz = 3 MHz)

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep = auto couple

Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Measurements are made over the 30 MHz to 40 GHz 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. Actual value of

loss for the attenuator and cable combination is below table.

So, 10.1 dB is offset. And the offset gap in the 2.4 GHz range do not affect the band edge final result.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	10.11
	2437	10.10
	2462	10.12

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

4. In case of conducted spurious emissions test, please check factors blow table.

▣ FACTORS FOR FREQUENCY

Freq(MHz)	Factor(dB)
30	10.37
100	10.16
200	10.15
300	10.14
400	10.18
500	10.19
600	10.20
700	10.30
800	10.25
900	10.28
1000	10.29
2000	10.17
2412*	10.11
2437*	10.10
2462*	10.12
3000	10.26
4000	10.31
5000	9.85
6000	10.20
7000	10.60
8000	10.53
9000	10.23
10000	10.41
11000	10.65
12000	11.19
13000	10.97
14000	11.42
15000	12.01
16000	11.77
17000	10.78
18000	10.76
19000	11.15
20000	10.75
21000	10.82
22000	10.82
23000	11.26
24000	11.08
25000	11.18
26000	10.90

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

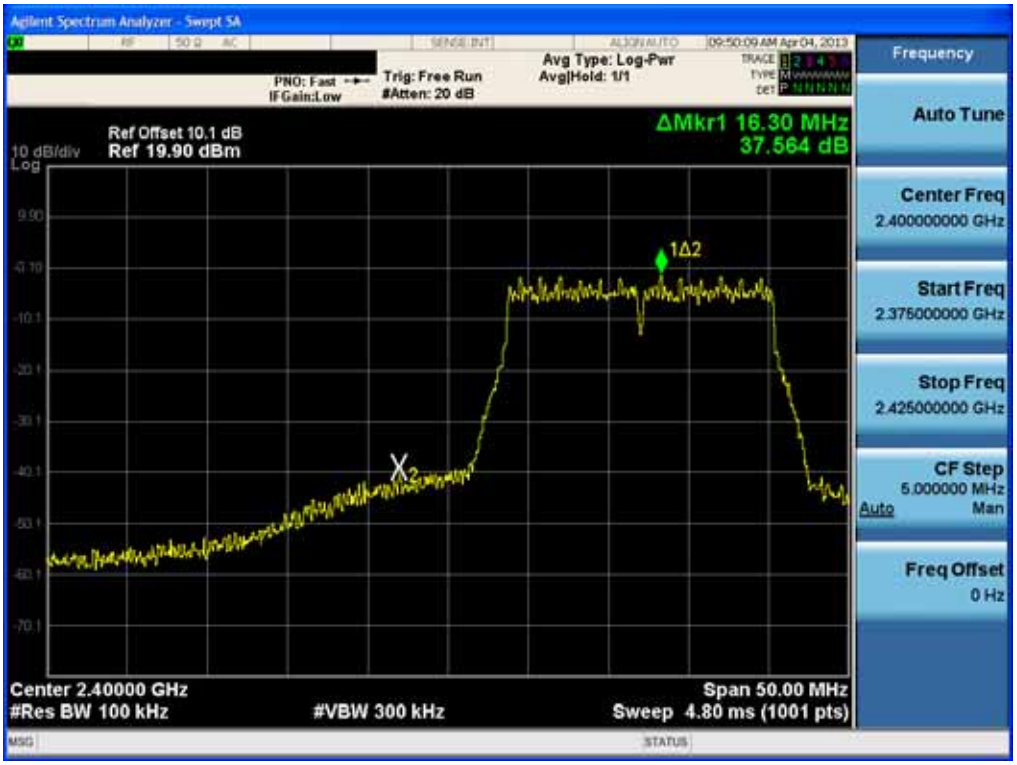
2. Factor = Cable loss + Attenuator loss

▣ RESULT PLOTS

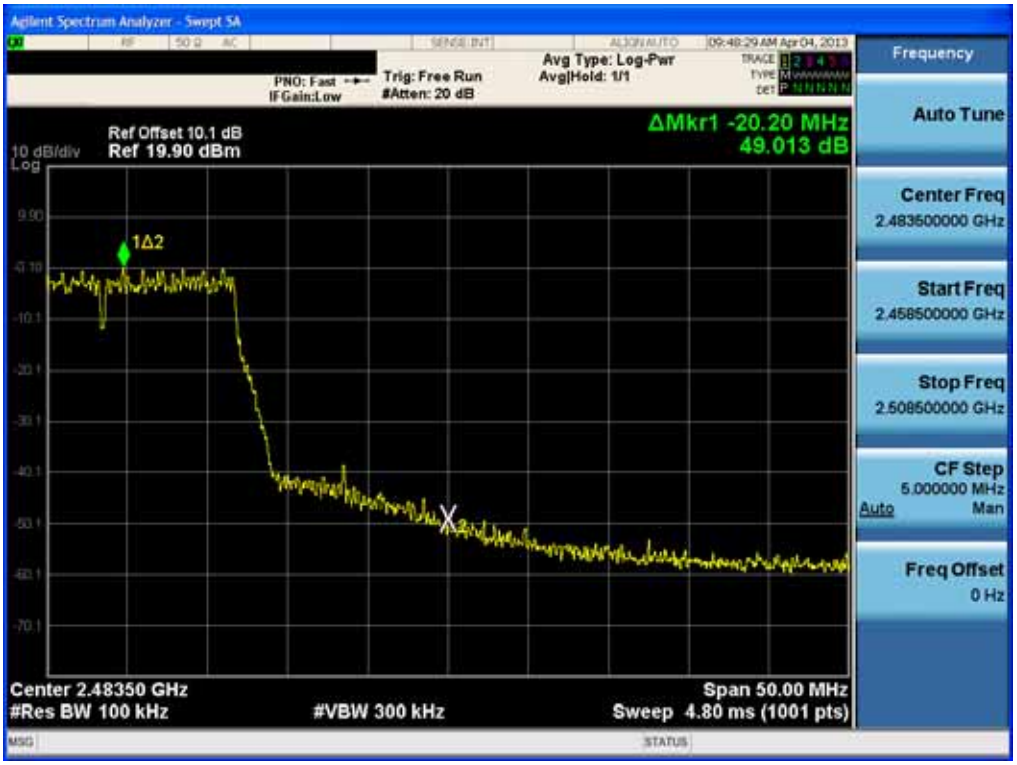
BandEdge (802.11b-CH1)

BandEdge (802.11b-CH11)

BandEdge (802.11g-CH1)

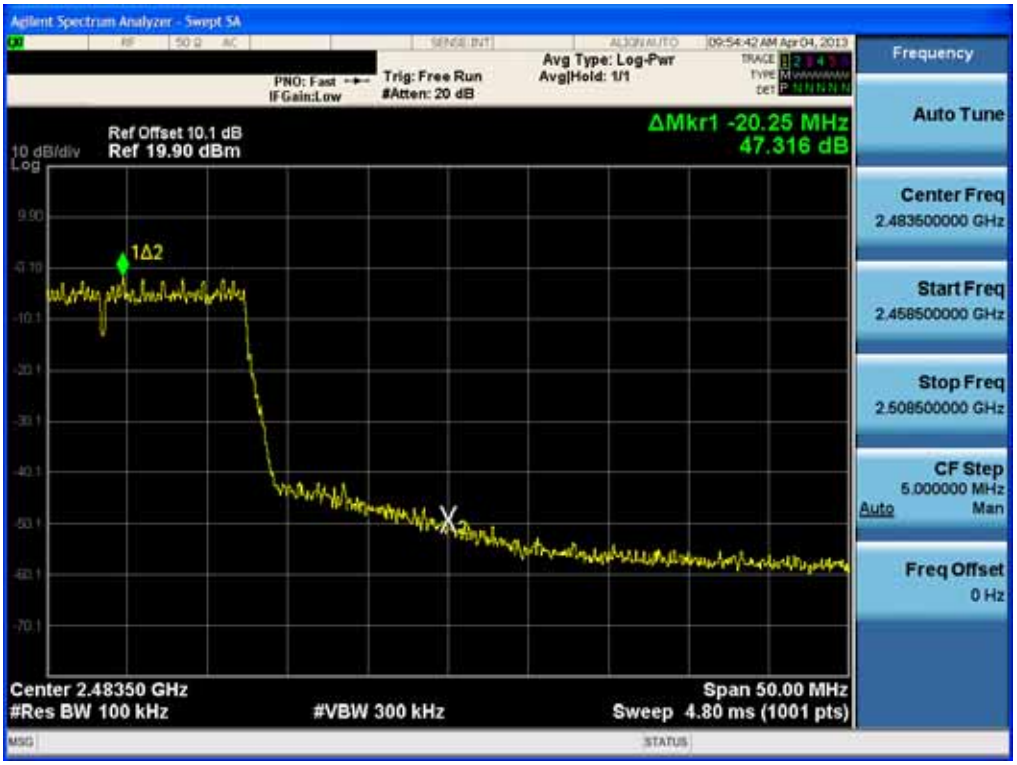


BandEdge (802.11g-CH11)



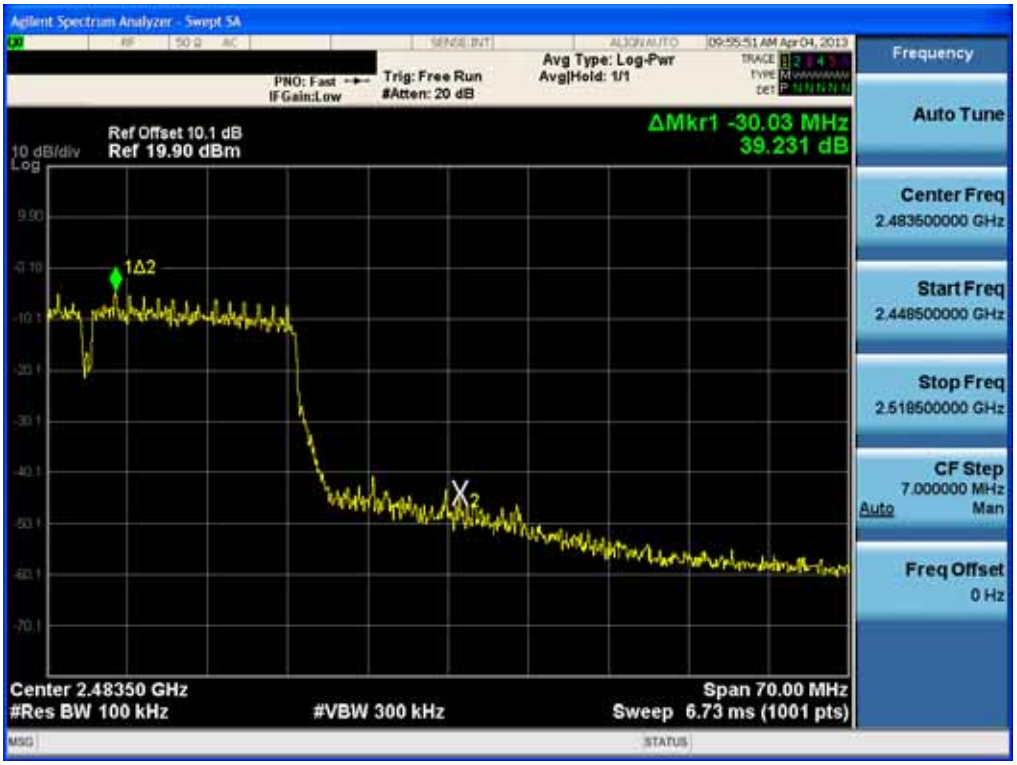
Band Edge (802.11n-CH1) _ 20 MHz BW

Band Edge (802.11n-CH11) _ 20 MHz BW



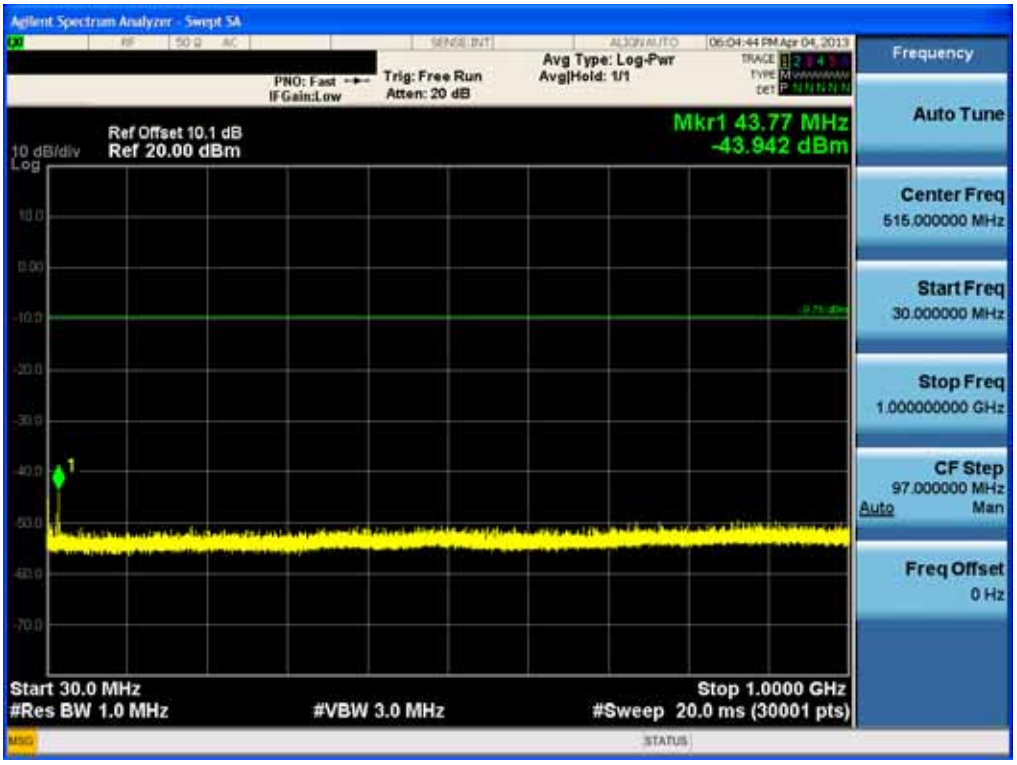
Band Edge (802.11n-CH3)_40 MHz BW

Band Edge (802.11n-CH9) _40 MHz BW

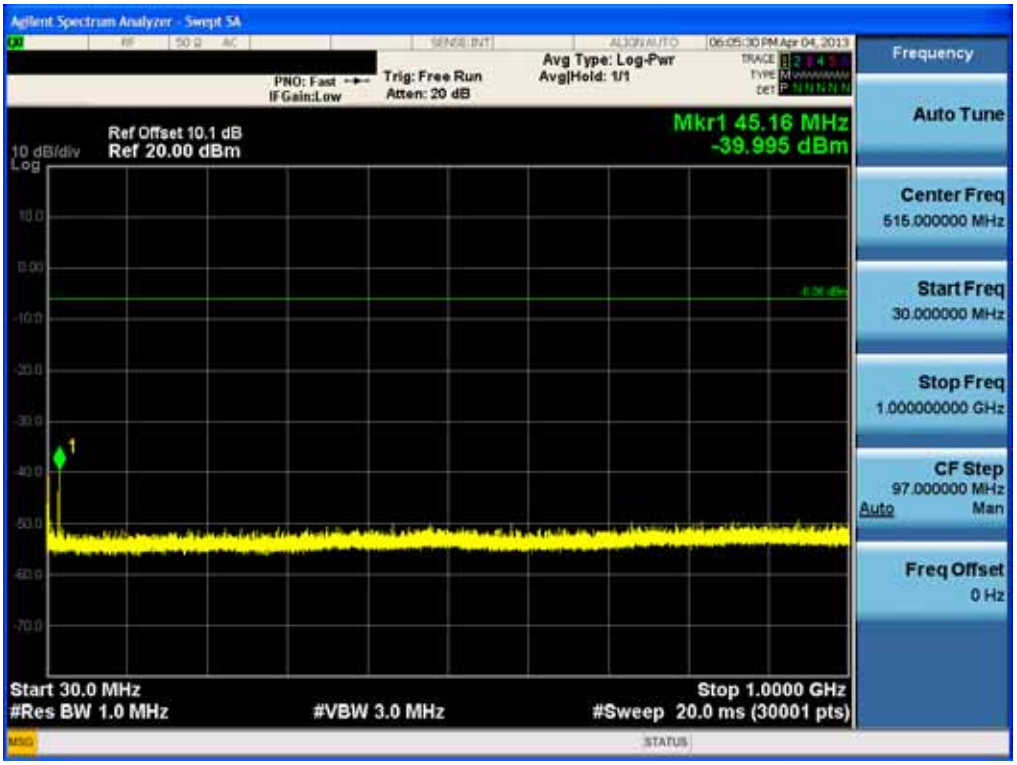


30 MHz ~ 1 GHz

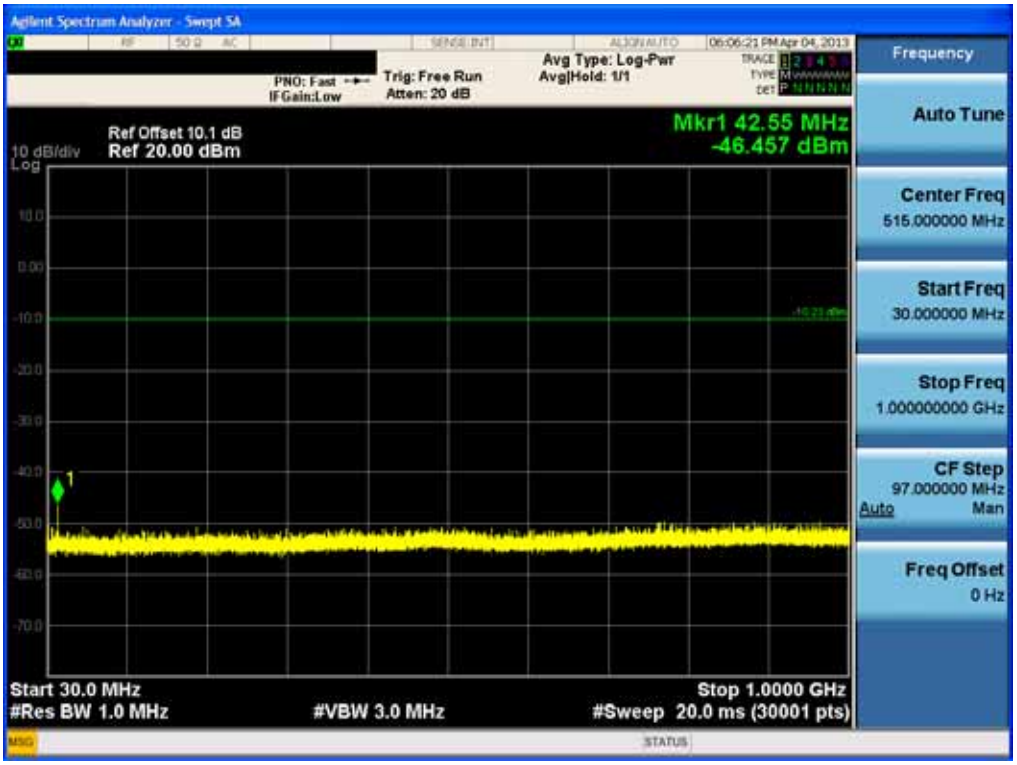
Conducted Spurious Emission (802.11b-CH1)



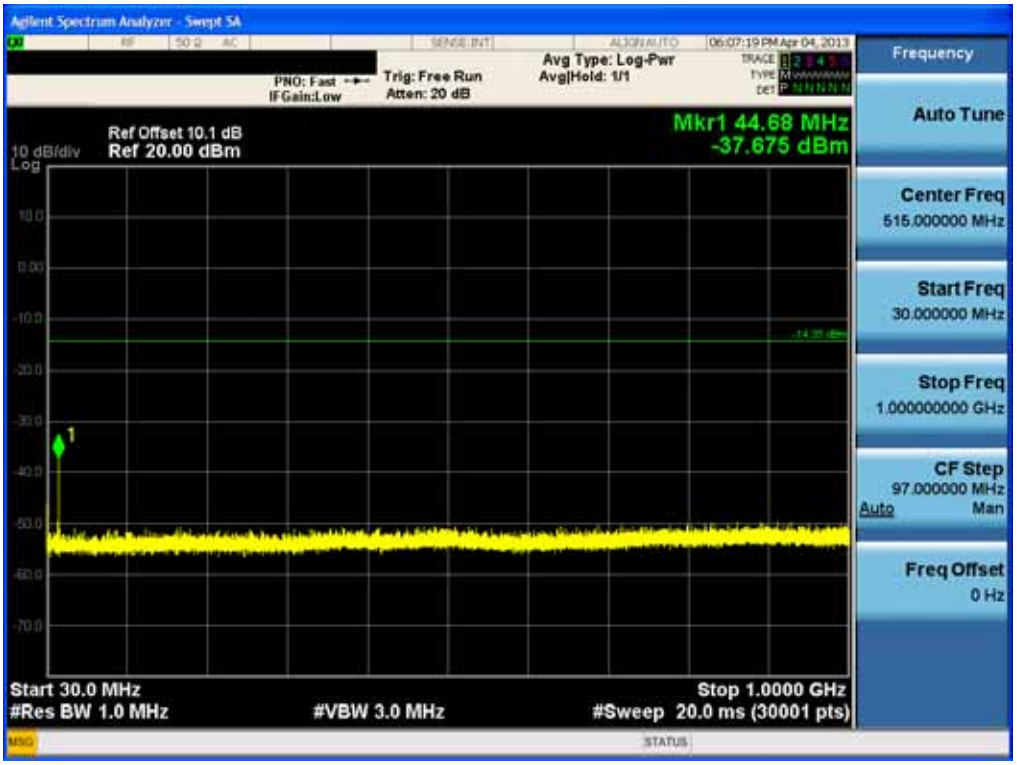
Conducted Spurious Emission (802.11b-CH6)



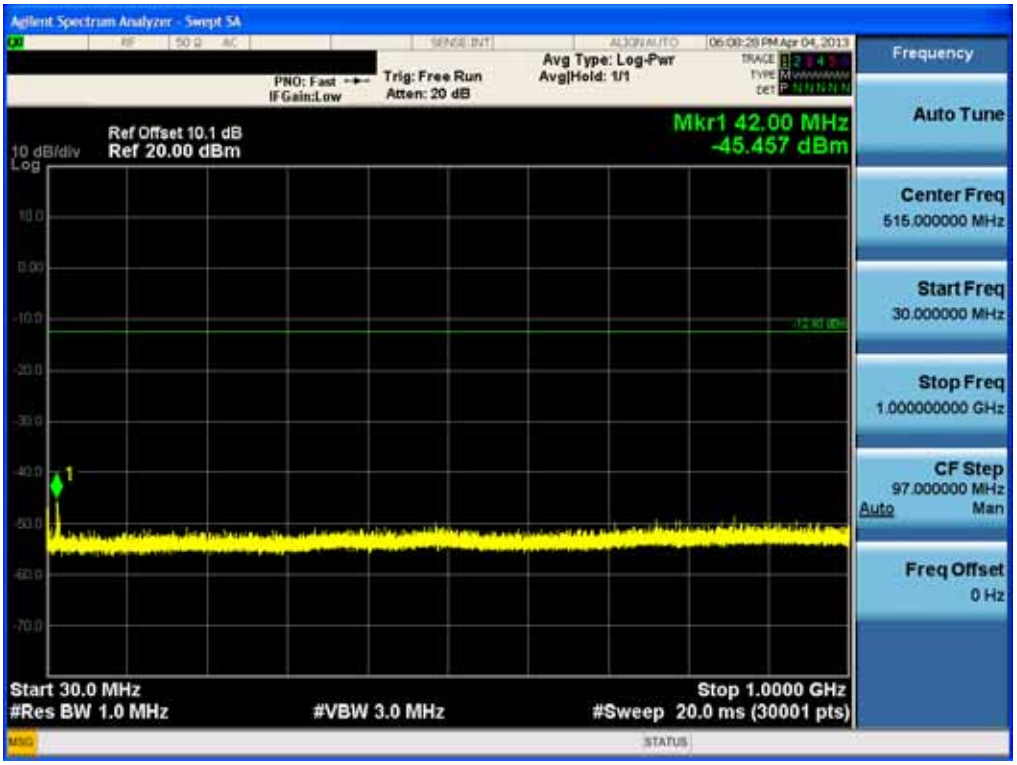
Conducted Spurious Emission (802.11b-CH11)



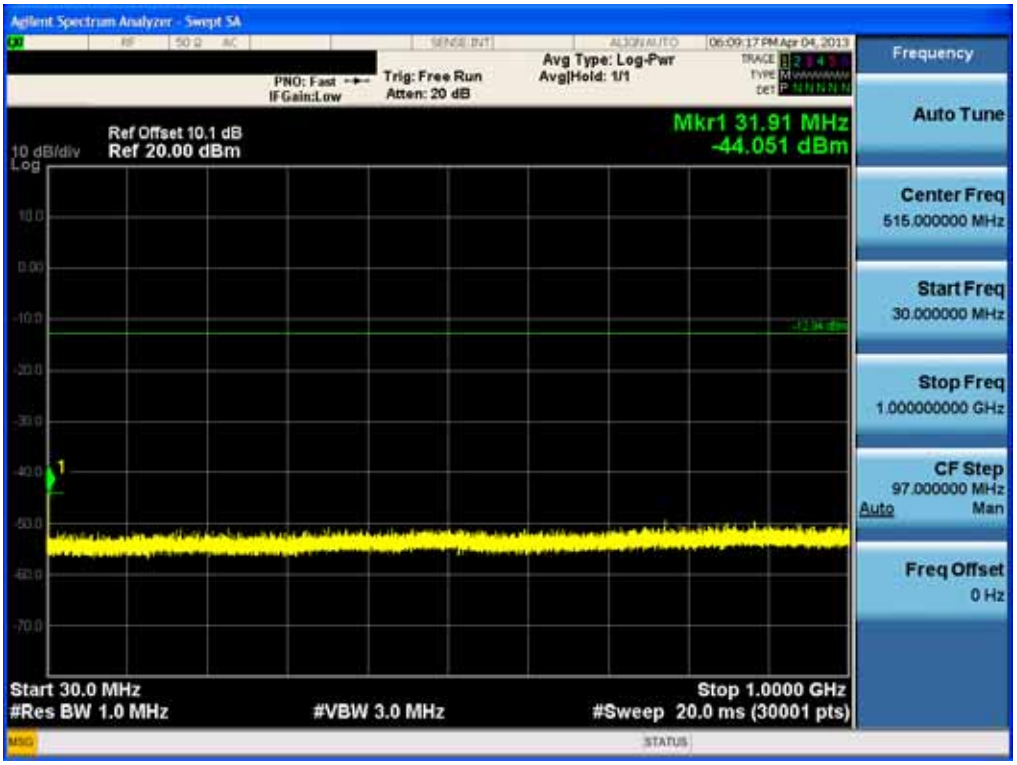
Conducted Spurious Emission (802.11g-CH1)



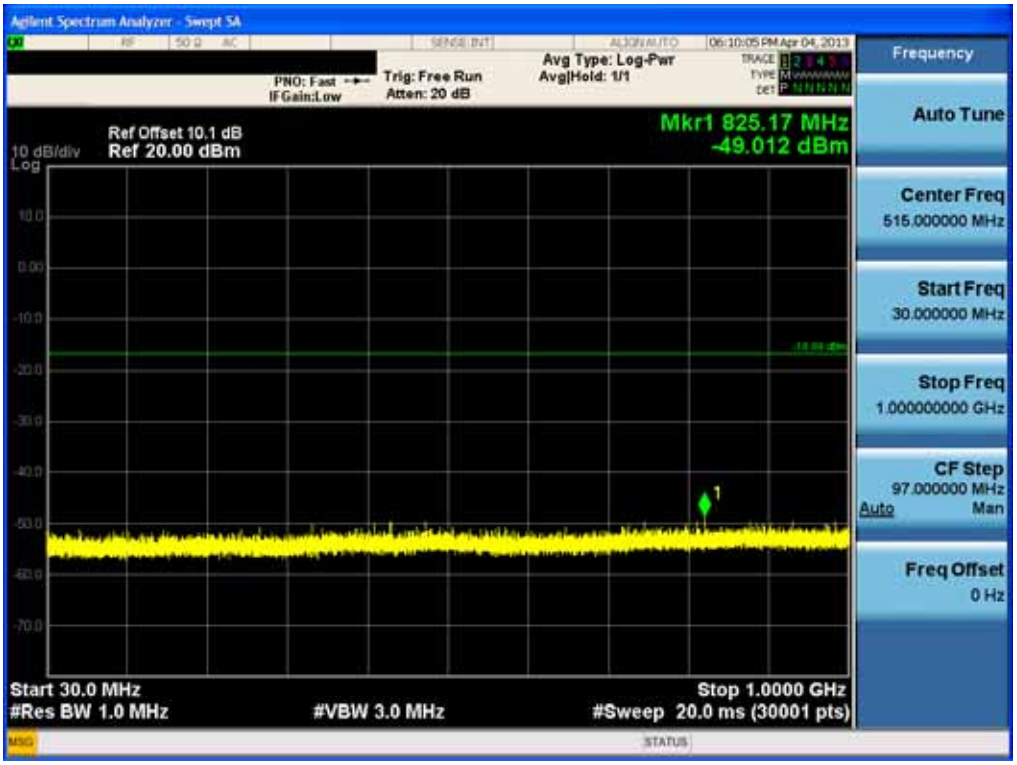
Conducted Spurious Emission (802.11g-CH6)



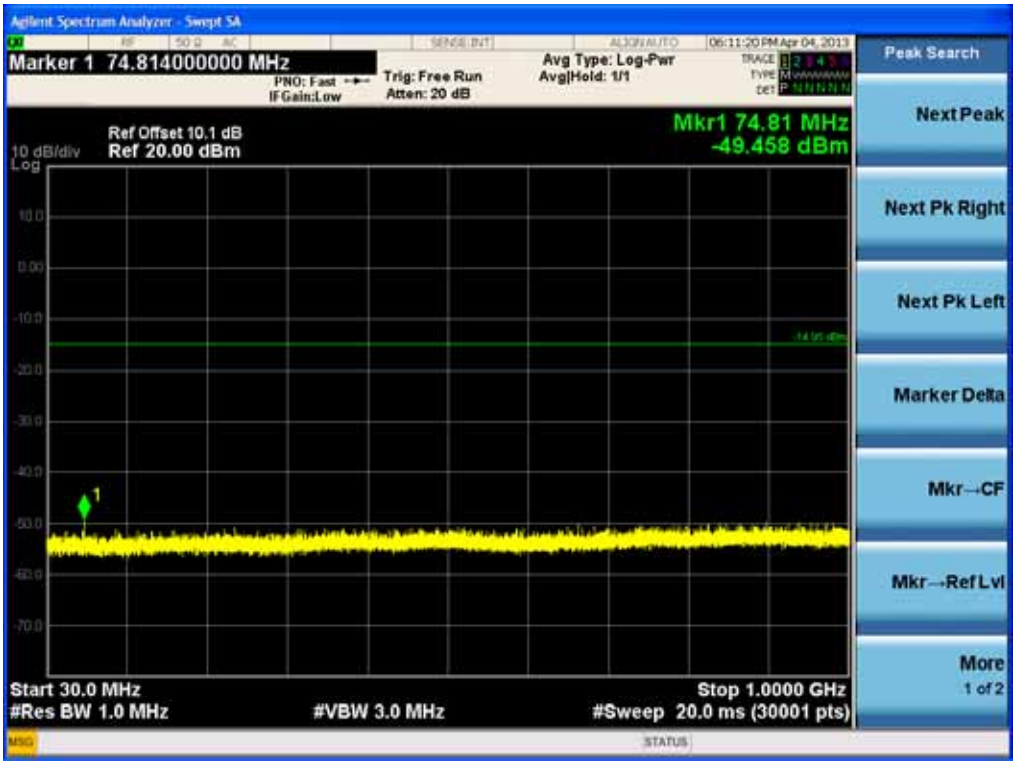
Conducted Spurious Emission (802.11g-CH11)



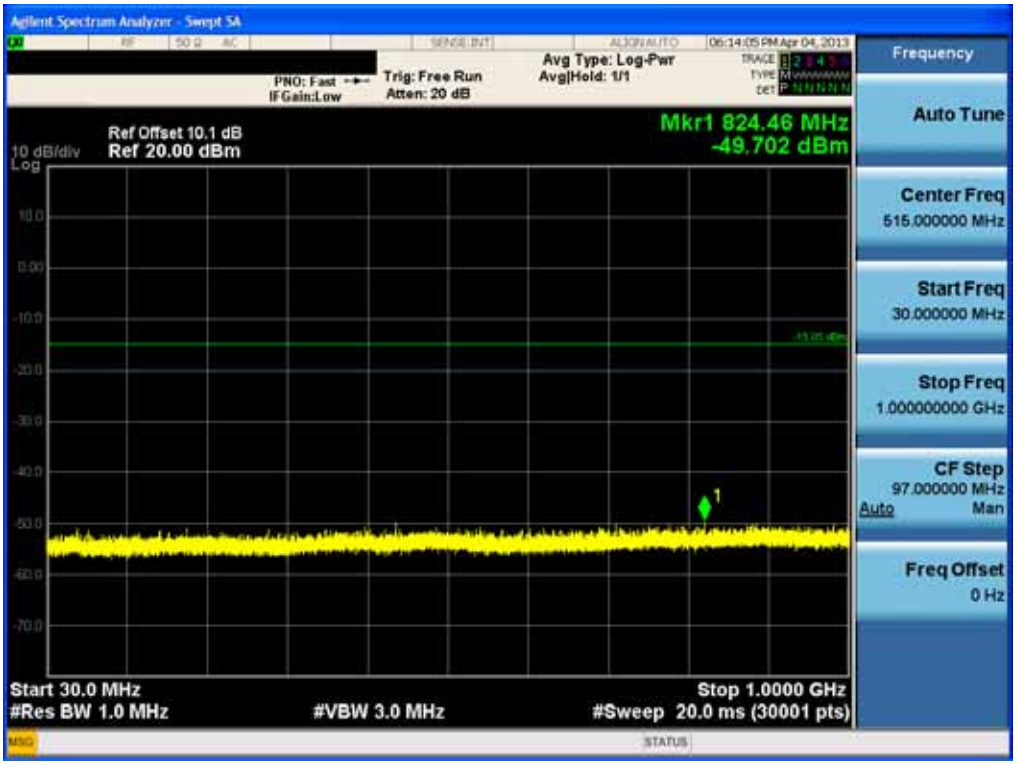
Conducted Spurious Emission (802.11n-CH1)_20 MHz BW



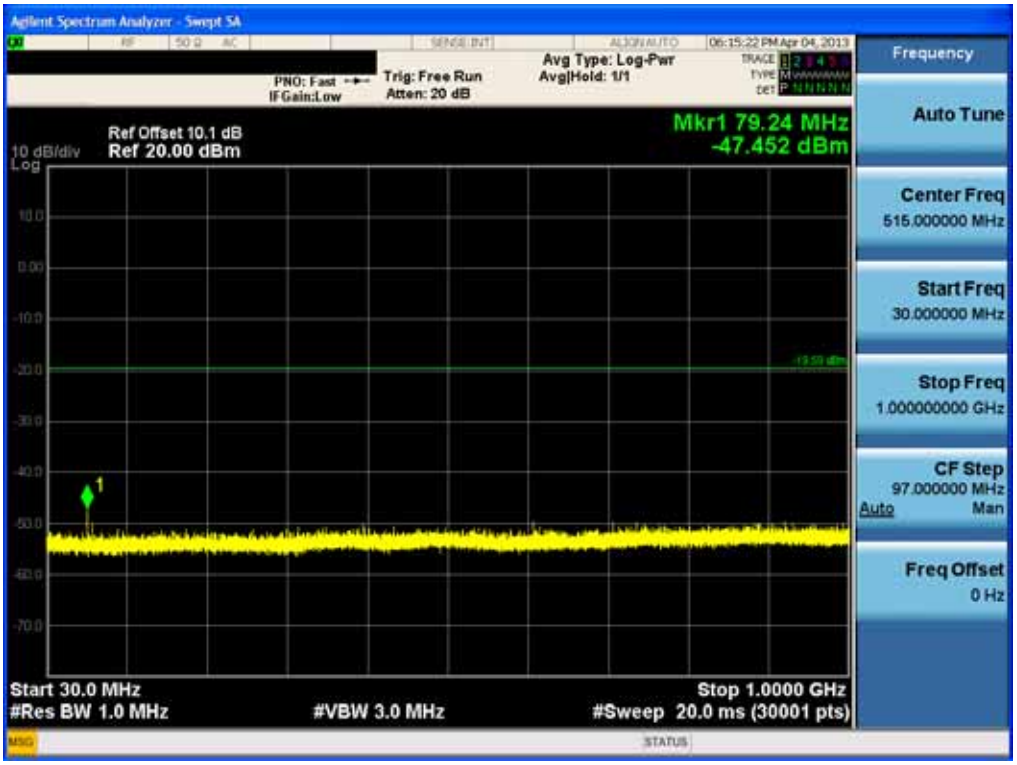
Conducted Spurious Emission (802.11n-CH6) _20 MHz BW



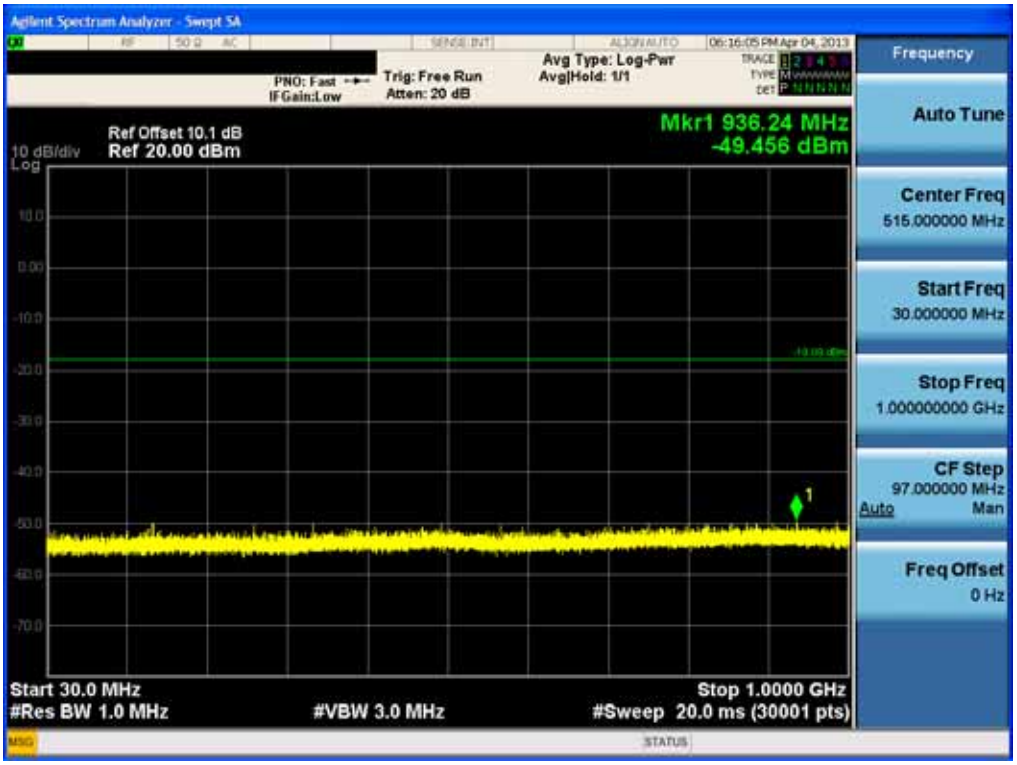
Conducted Spurious Emission (802.11n-CH11) _20 MHz BW



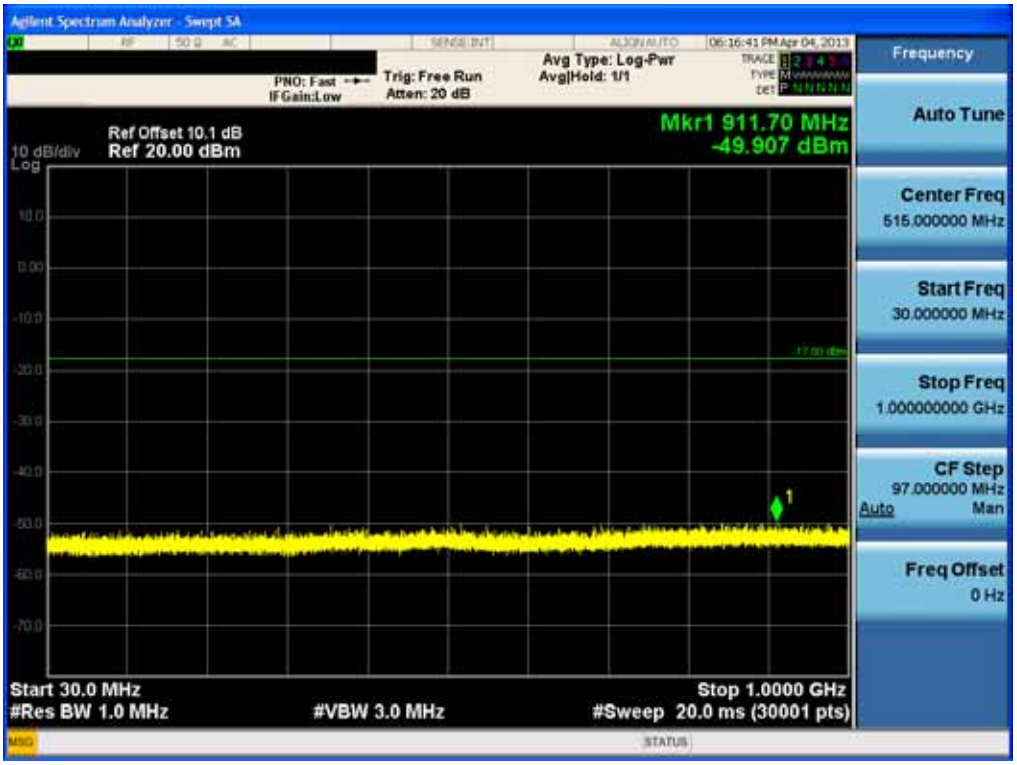
Conducted Spurious Emission (802.11n-CH3)_40 MHz BW



Conducted Spurious Emission (802.11n-CH6)_40 MHz BW

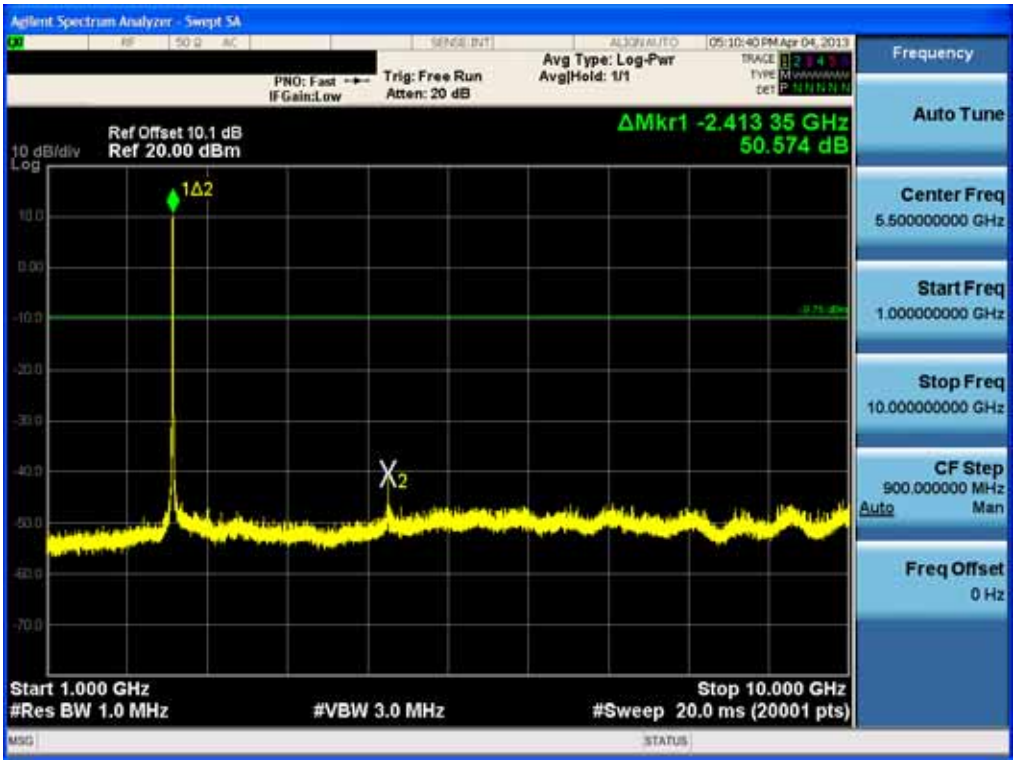


Conducted Spurious Emission (802.11n-CH9) _40 MHz BW

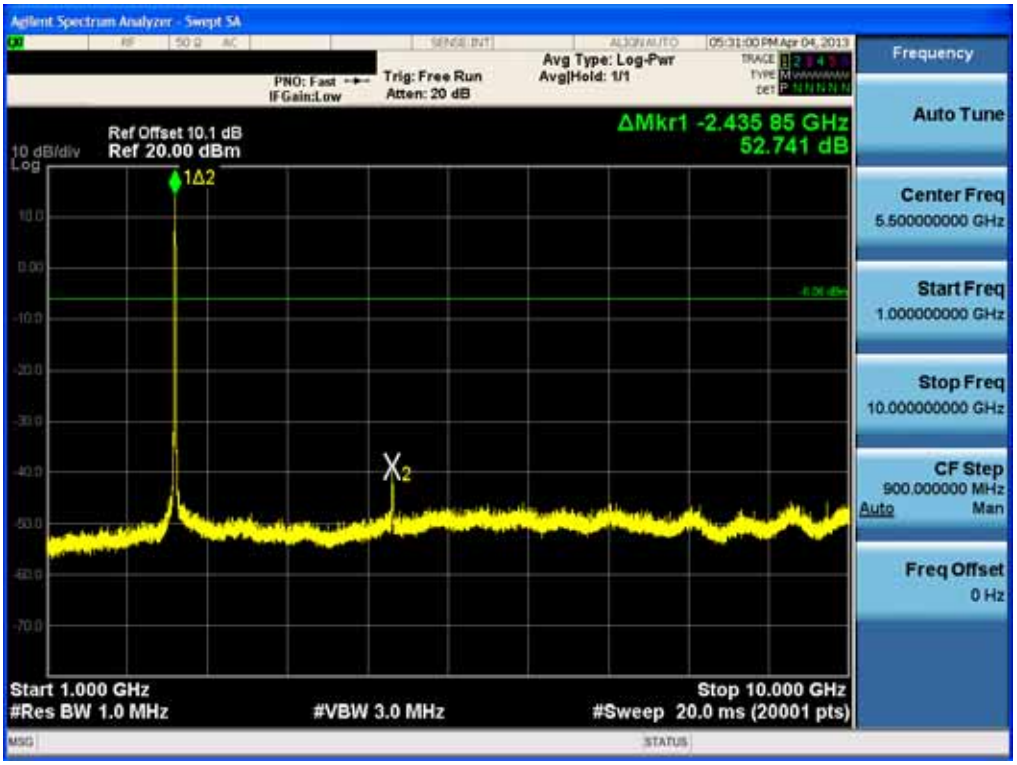


1 GHz ~ 10 GHz

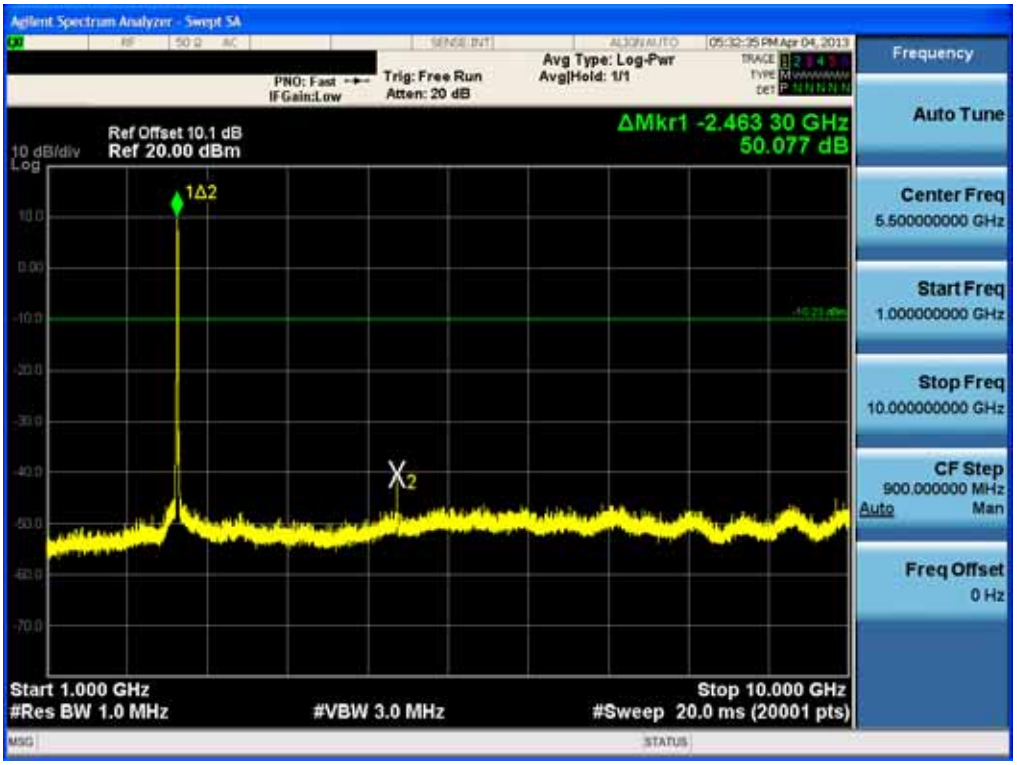
Conducted Spurious Emission (802.11b-CH1)



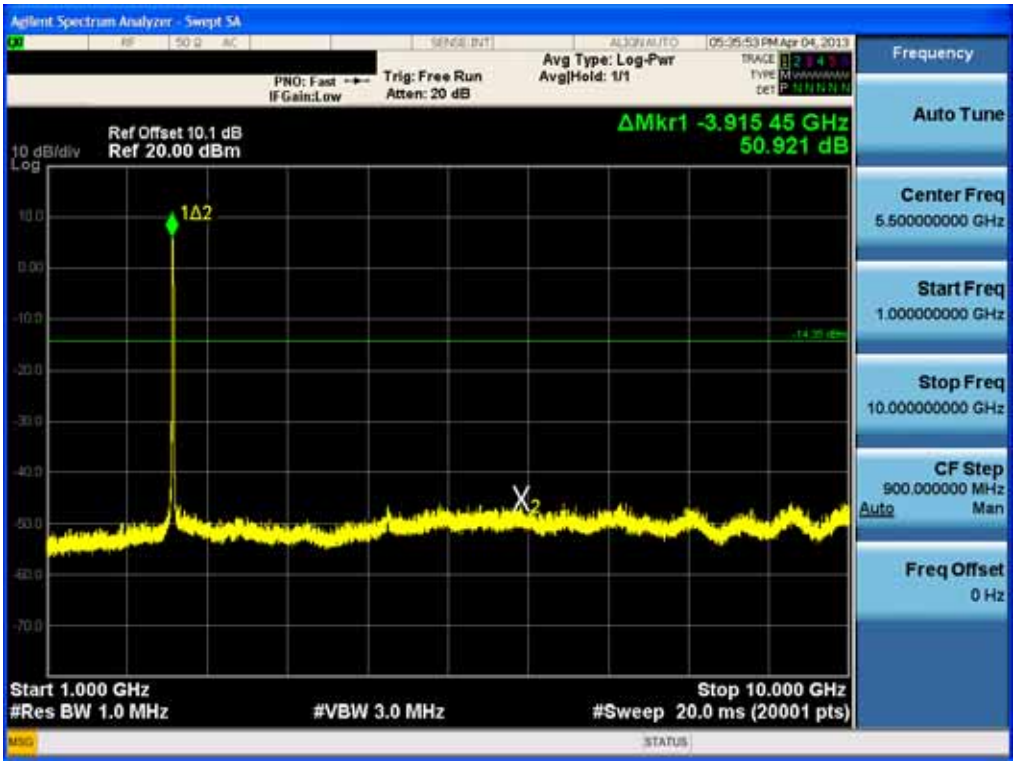
Conducted Spurious Emission (802.11b-CH6)



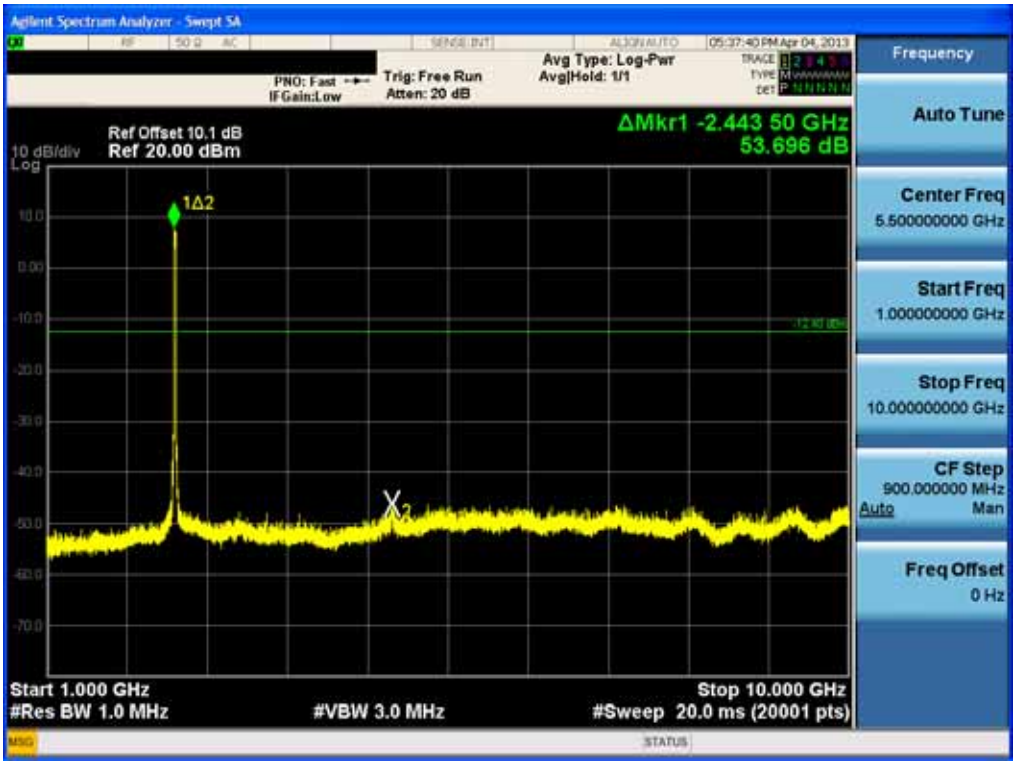
Conducted Spurious Emission (802.11b-CH11)



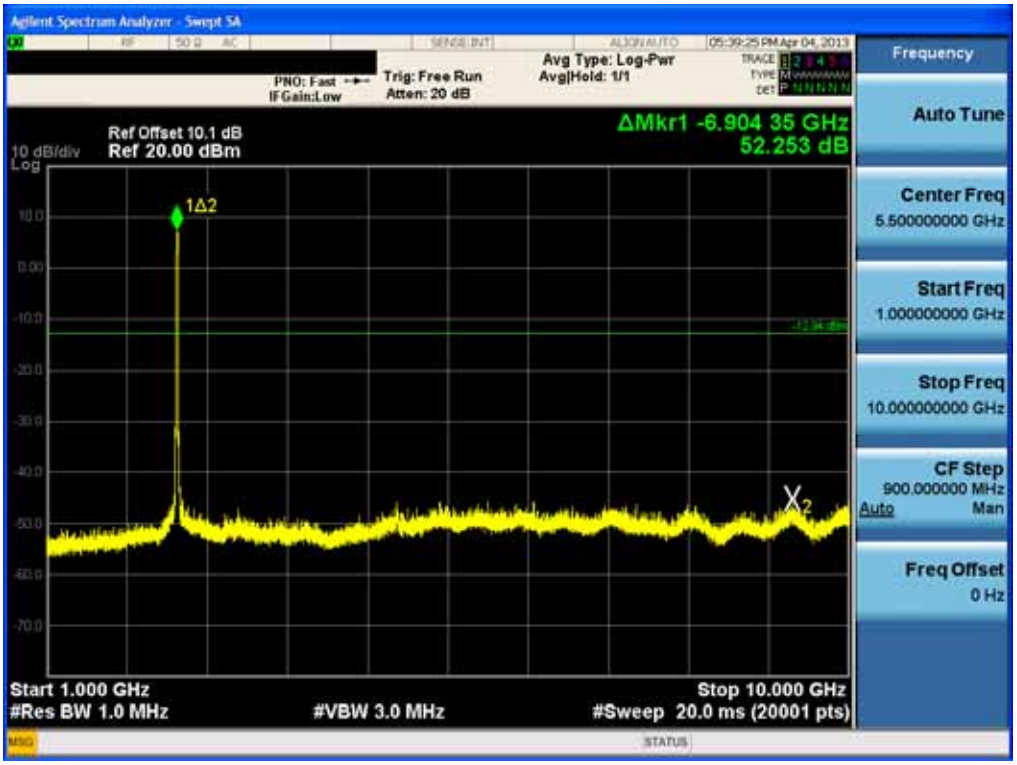
Conducted Spurious Emission (802.11g-CH1)



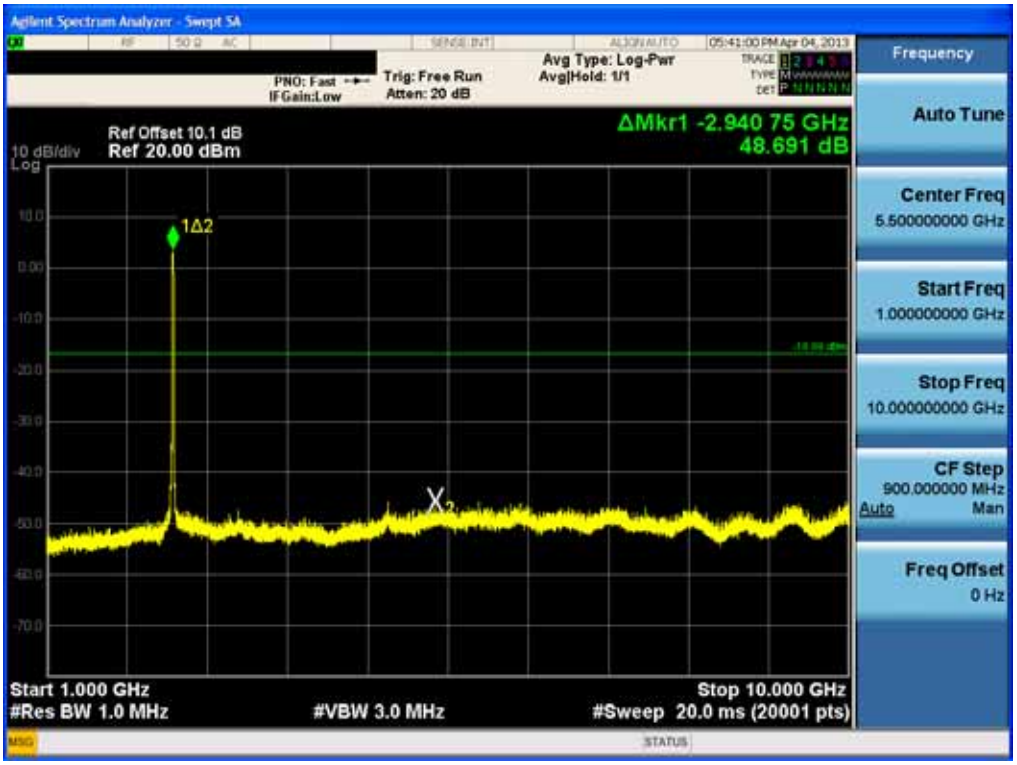
Conducted Spurious Emission (802.11g-CH6)



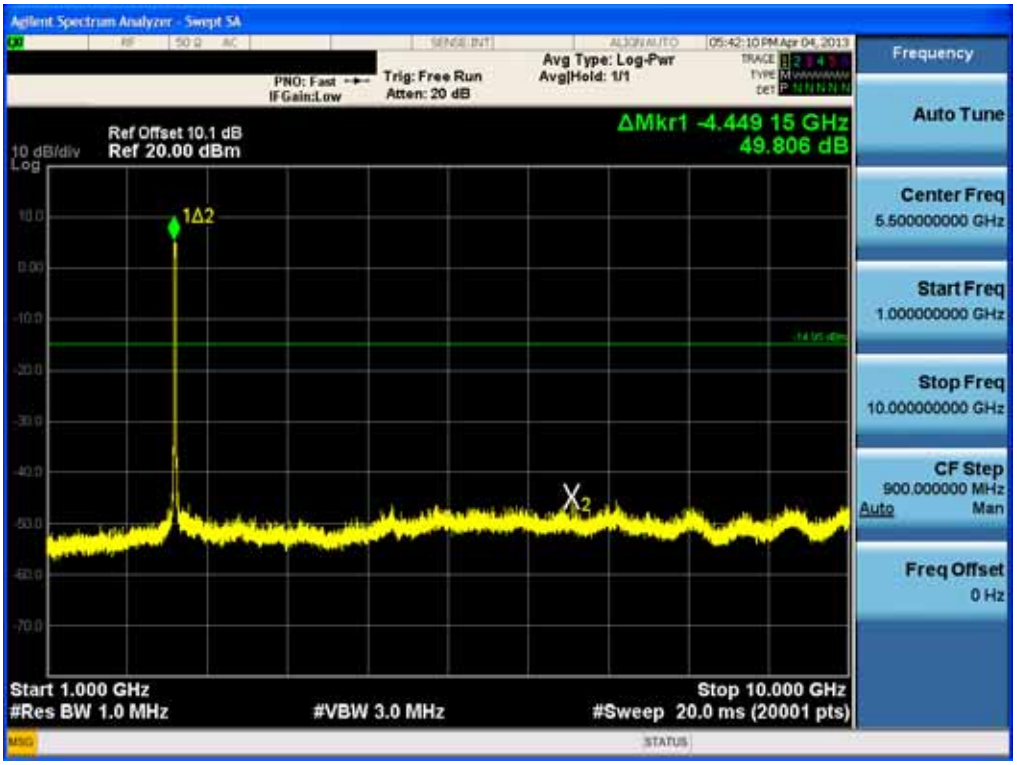
Conducted Spurious Emission (802.11g-CH11)



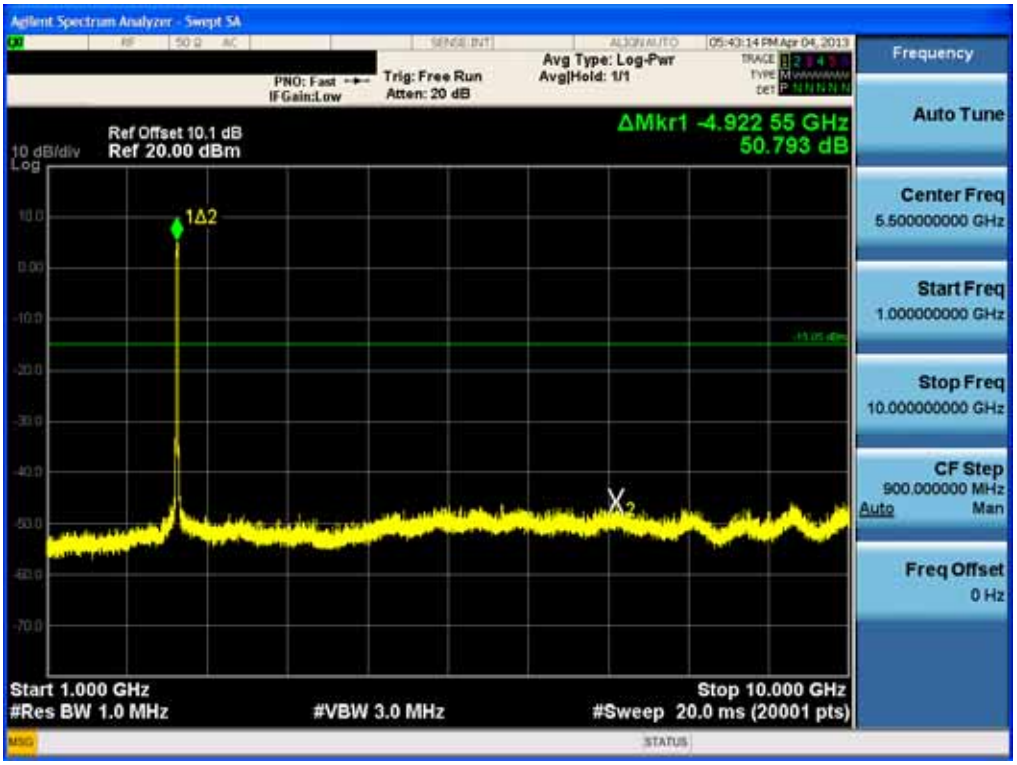
Conducted Spurious Emission (802.11n-CH1) _20 MHz BW



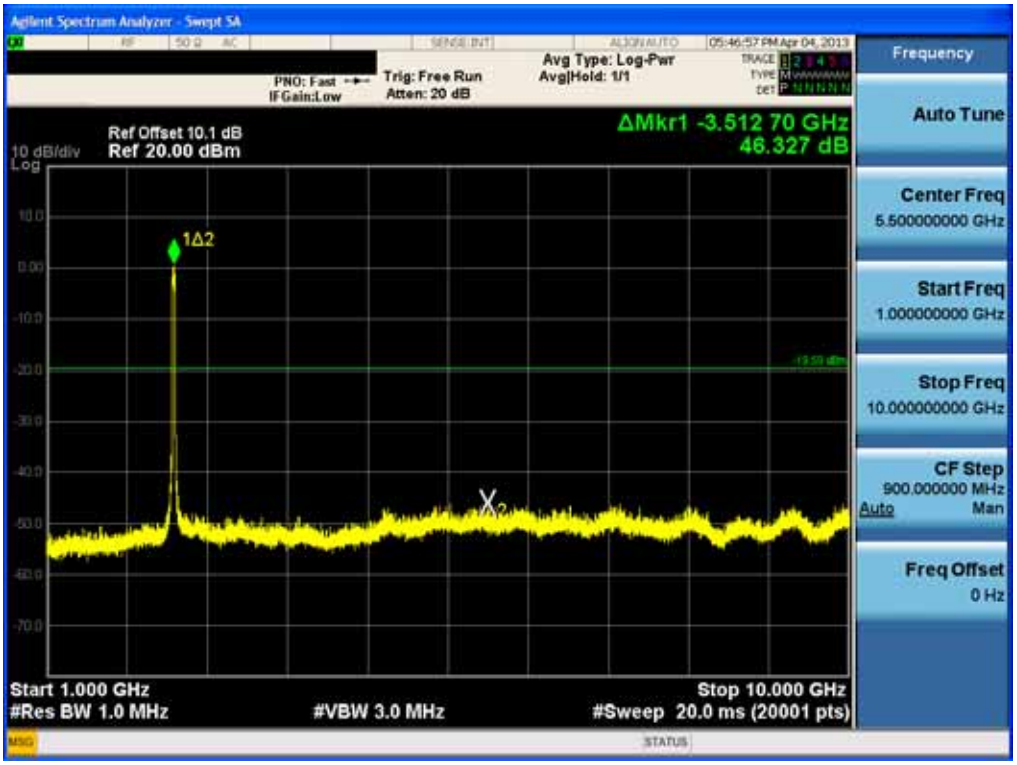
Conducted Spurious Emission (802.11n-CH6) _20 MHz BW



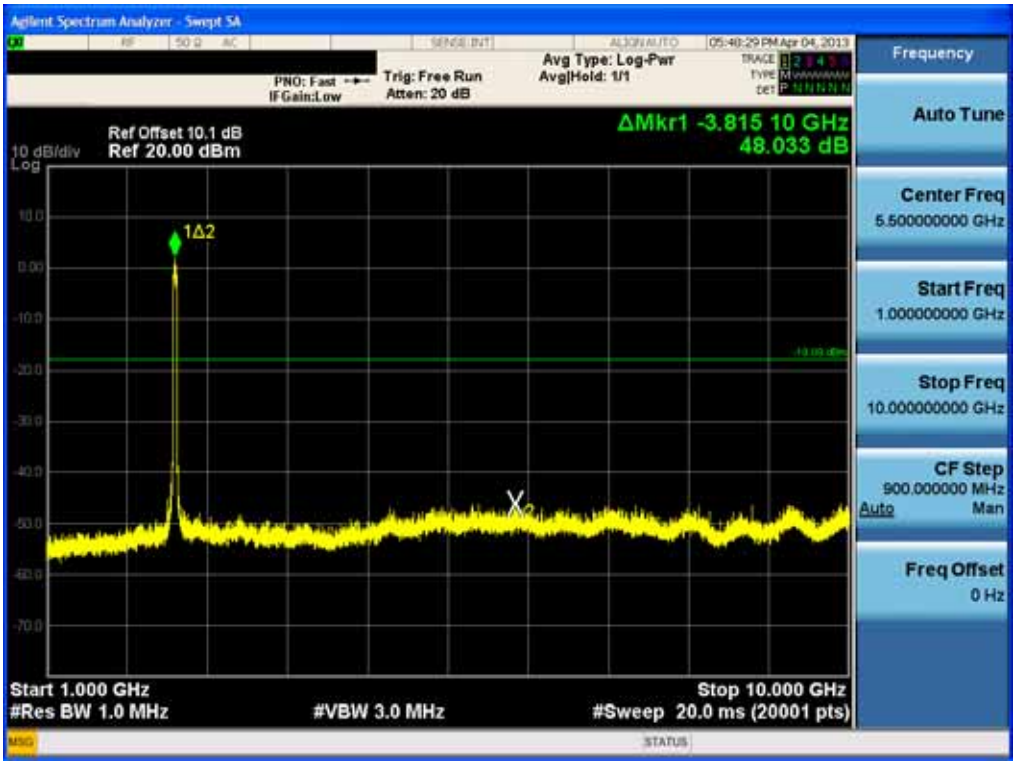
Conducted Spurious Emission (802.11n-CH11) _20 MHz BW



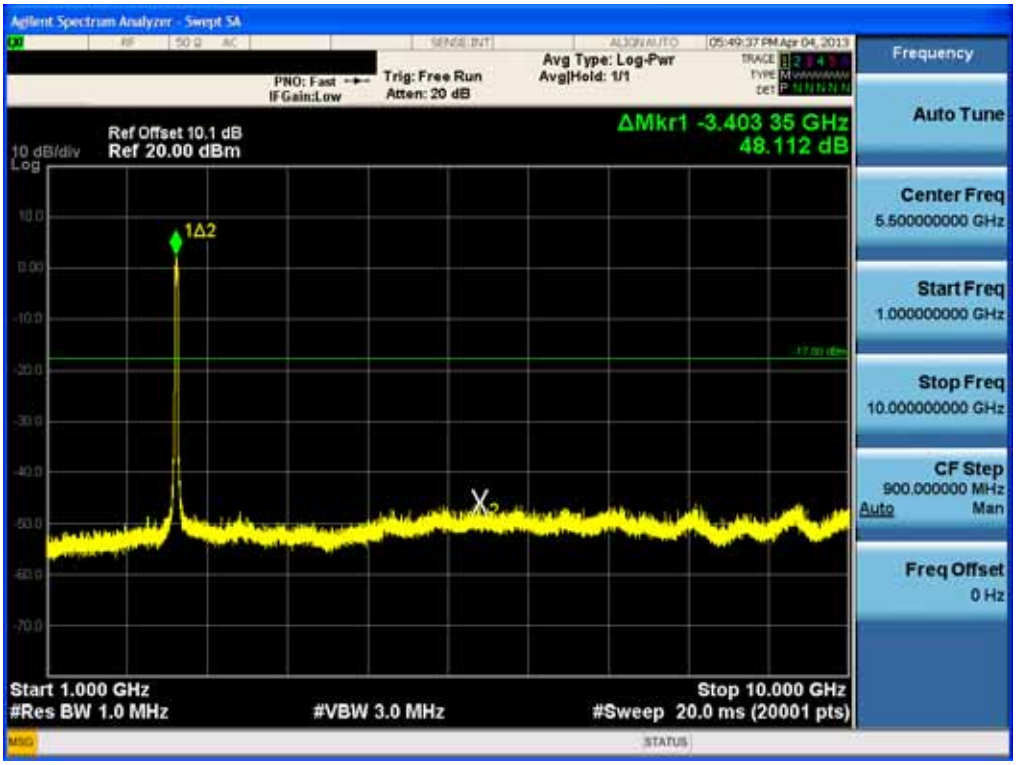
Conducted Spurious Emission (802.11n-CH3)_40 MHz BW



Conducted Spurious Emission (802.11n-CH6)_40 MHz BW



Conducted Spurious Emission (802.11n-CH9) _40 MHz BW



10 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b-CH1)

Conducted Spurious Emission (802.11b-CH6)

Conducted Spurious Emission (802.11b-CH11)

Conducted Spurious Emission (802.11g-CH1)

Conducted Spurious Emission (802.11g-CH6)

Conducted Spurious Emission (802.11g-CH11)

Conducted Spurious Emission (802.11n-CH1) _20 MHz BW

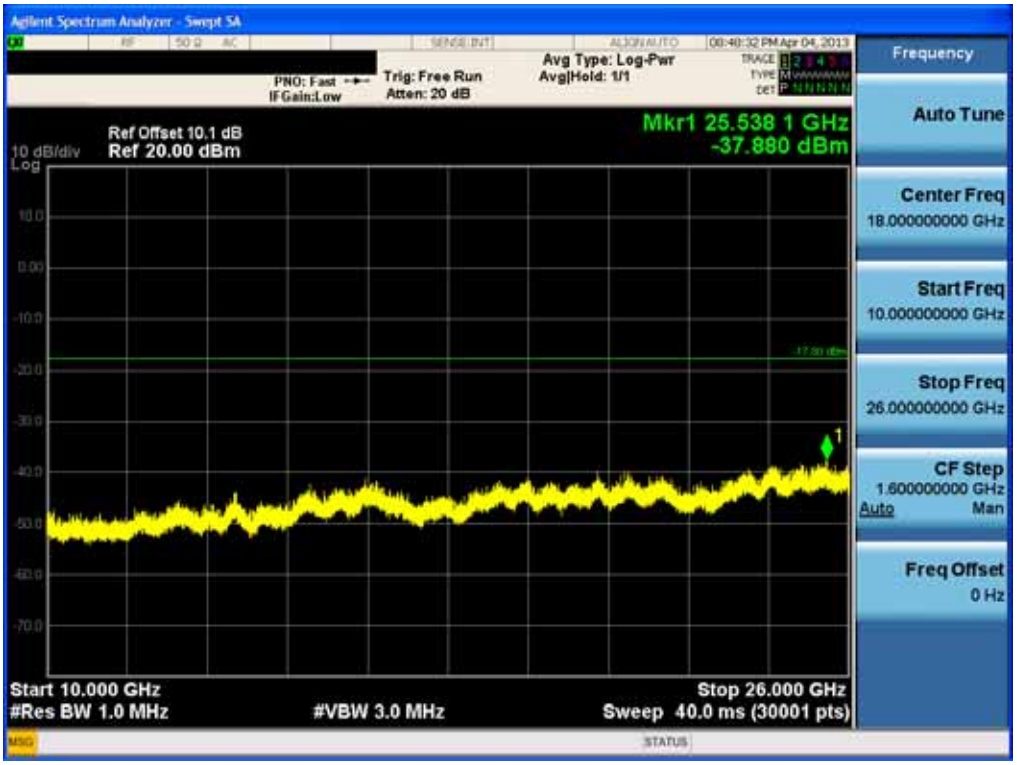
Conducted Spurious Emission (802.11n-CH6) _20 MHz BW

Conducted Spurious Emission (802.11n-CH11) _20 MHz BW

Conducted Spurious Emission (802.11n-CH3) _40 MHz BW

Conducted Spurious Emission (802.11n-CH6) _40 MHz BW

Conducted Spurious Emission (802.11n-CH9) _40 MHz BW



8.5 RADIATED MEASUREMENT.

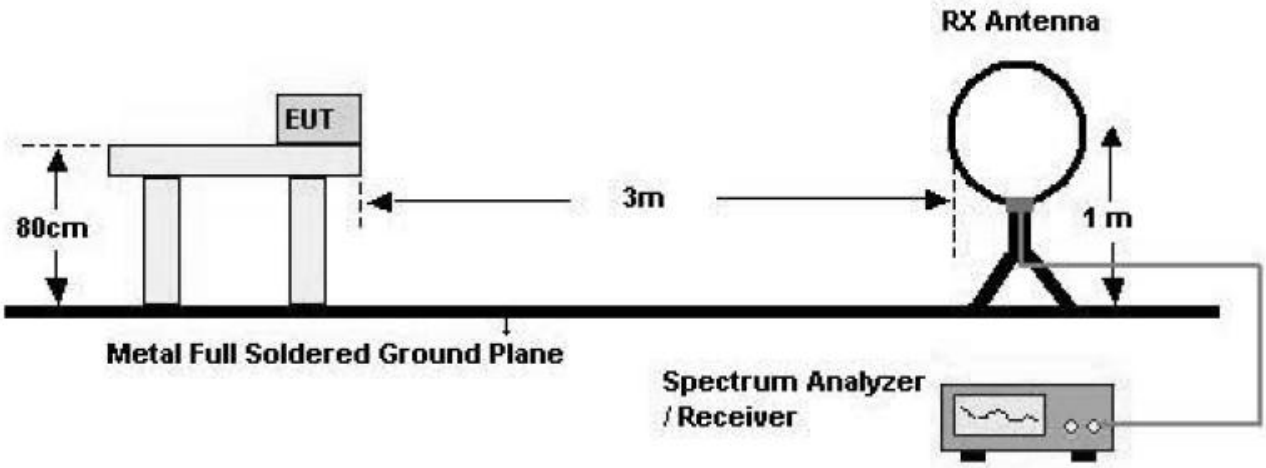
8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

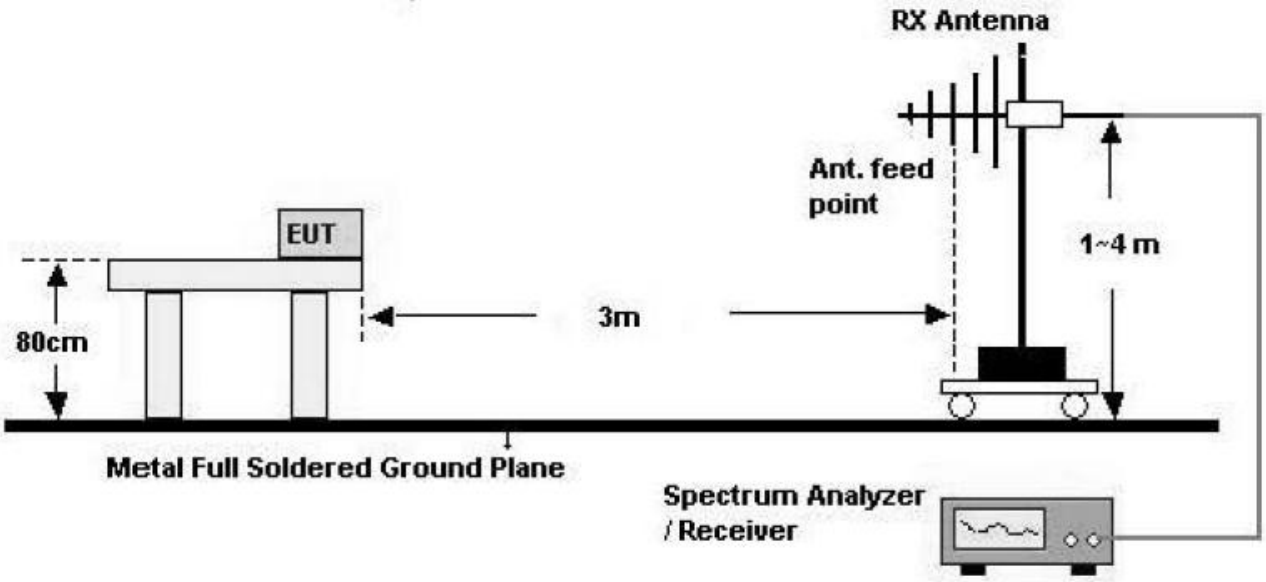
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

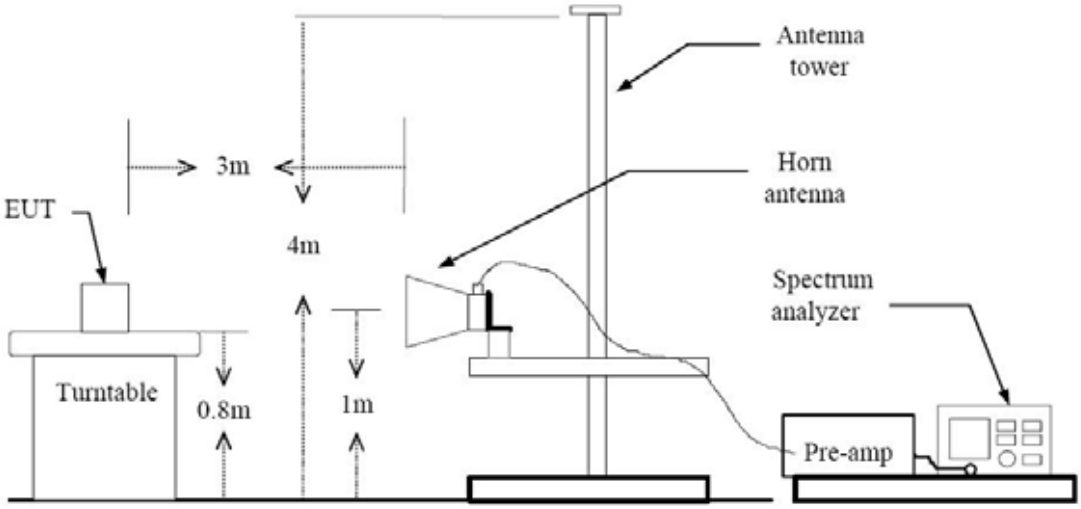
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

ANSI C63.4(2003)

Method 10.2.3.2 in KDB 558074, issued 10/04/2012 (Peak)

Method 10.2.3.3 in KDB 558074, issued 10/04/2012(Average)

Spectrum Setting

- Peak (Method 10.2.3.2 in KDB 558074, issued 10/04/2012)

  RBW = 1 MHz

  VBW ≥ 3 x RBW

  Detector = Peak

  Trace = Max hold

  Sweep = auto couple

- Average (Method 10.2.3.3 in KDB 558074, issued 10/04/2012)

  RBW = 1 MH

  VBW ≥ 3 x RBW

  Span = least 1MHz

  Detector Mode = Power average (RMS) or sample detector when RMS not available

  Trace average at least 100 traces in power averaging(RMS) mode

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/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 (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/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.

Above 1 GHz

Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	54.60	-0.79	V	53.81	74	20.19	PK
4824	47.83	-0.79	V	47.04	54	6.96	AV
7236	49.45	9.08	V	58.53	74	15.47	PK
7236	38.55	9.08	V	47.63	54	6.37	AV
4824	53.34	-0.79	H	52.55	74	21.45	PK
4824	45.89	-0.79	H	45.1	54	8.90	AV
7236	49.88	9.08	H	58.96	74	15.04	PK
7236	38.56	9.08	H	47.64	54	6.36	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	51.02	-0.79	V	50.23	74	23.77	PK
4824	39.55	-0.79	V	38.76	54	15.24	AV
7236	49.45	9.08	V	58.53	74	15.47	PK
7236	38.54	9.08	V	47.62	54	6.38	AV
4824	50.42	-0.79	H	49.63	74	24.37	PK
4824	39.41	-0.79	H	38.62	54	15.38	AV
7236	49.76	9.08	H	58.84	74	15.16	PK
7236	38.55	9.08	H	47.63	54	6.37	AV

Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.02	-0.79	V	49.23	74	24.77	PK
4824	39.41	-0.79	V	38.62	54	15.38	AV
7236	48.79	9.08	V	57.87	74	16.13	PK
7236	38.53	9.08	V	47.61	54	6.39	AV
4824	50.29	-0.79	H	49.5	74	24.50	PK
4824	39.35	-0.79	H	38.56	54	15.44	AV
7236	49.85	9.08	H	58.93	74	15.07	PK
7236	38.57	9.08	H	47.65	54	6.35	AV

Notes:

11. 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
5. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done 20 MHz BW and 40 MHz BW of 802.11n. The results of 20 MHz BW is higher than 40 MHz BW.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	56.38	-0.37	V	56.01	74	17.99	PK
4874	51.25	-0.37	V	50.88	54	3.12	AV
7311	49.61	8.64	V	58.25	74	15.75	PK
7311	37.95	8.64	V	46.59	54	7.41	AV
4874	54.64	-0.37	H	54.27	74	19.73	PK
4874	48.72	-0.37	H	48.35	54	5.65	AV
7311	49.78	8.64	H	58.42	74	15.58	PK
7311	37.97	8.64	H	46.61	54	7.39	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	51.69	-0.37	V	51.32	74	22.68	PK
4874	40.59	-0.37	V	40.22	54	13.78	AV
7311	49.77	8.64	V	58.41	74	15.59	PK
7311	37.93	8.64	V	46.57	54	7.43	AV
4874	50.78	-0.37	H	50.41	74	23.59	PK
4874	39.75	-0.37	H	39.38	54	14.62	AV
7311	49.68	8.64	H	58.32	74	15.68	PK
7311	37.87	8.64	H	46.51	54	7.49	AV

Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	51.18	-0.37	V	50.81	74	23.19	PK
4874	39.73	-0.37	V	39.36	54	14.64	AV
7311	49.82	8.64	V	58.46	74	15.54	PK
7311	37.92	8.64	V	46.56	54	7.44	AV
4874	50.20	-0.37	H	49.83	74	24.17	PK
4874	39.49	-0.37	H	39.12	54	14.88	AV
7311	49.15	8.64	H	57.79	74	16.21	PK
7311	37.90	8.64	H	46.54	54	7.46	AV

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
5. *We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.*
6. We have done 20 MHz BW and 40 MHz BW of 802.11n. The results of 20 MHz BW is higher than 40 MHz BW.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	55.43	-0.15	V	55.28	74	18.72	PK
4924	49.55	-0.15	V	49.40	54	4.60	AV
7386	49.26	9.06	V	58.32	74	15.68	PK
7386	38.22	9.06	V	47.28	54	6.72	AV
4924	54.11	-0.15	H	53.96	74	20.04	PK
4924	47.14	-0.15	H	46.99	54	7.01	AV
7386	49.41	9.06	H	58.47	74	15.53	PK
7386	38.29	9.06	H	47.35	54	6.65	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	51.19	-0.15	V	51.04	74	22.96	PK
4924	39.93	-0.15	V	39.78	54	14.22	AV
7386	49.63	9.06	V	58.69	74	15.31	PK
7386	38.24	9.06	V	47.3	54	6.7	AV
4924	50.43	-0.15	H	50.28	74	23.72	PK
4924	39.47	-0.15	H	39.32	54	14.68	AV
7386	48.97	9.06	H	58.03	74	15.97	PK
7386	38.23	9.06	H	47.29	54	6.71	AV

Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	50.95	-0.15	V	50.80	74	23.20	PK
4924	39.87	-0.15	V	39.72	54	14.28	AV
7386	48.80	9.06	V	57.86	74	16.14	PK
7386	38.23	9.06	V	47.29	54	6.71	AV
4924	50.24	-0.15	H	50.09	74	23.91	PK
4924	39.23	-0.15	H	39.08	54	14.92	AV
7386	49.43	9.06	H	58.49	74	15.51	PK
7386	38.19	9.06	H	47.25	54	6.75	AV

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
5. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done 20 MHz BW and 40 MHz BW of 802.11n. The results of 20 MHz BW is higher than 40 MHz BW.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.5.2 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)).

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	30.12	33.90	H	64.02	74	9.98	PK
2390.0	17.07	33.90	H	50.97	54	3.03	AV
2390.0	31.05	33.90	V	64.95	74	9.05	PK
2390.0	17.07	33.90	V	50.97	54	3.03	AV
2483.5	29.77	33.99	H	63.76	74	10.24	PK
2483.5	16.76	33.99	H	50.75	54	3.25	AV
2483.5	28.06	33.99	V	62.05	74	11.95	PK
2483.5	15.72	33.99	V	49.71	54	4.29	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	27.39	33.90	H	61.29	74	12.71	PK
2390.0	16.34	33.90	H	50.24	54	3.76	AV
2390.0	27.62	33.90	V	61.52	74	12.48	PK
2390.0	16.30	33.90	V	50.20	54	3.80	AV
2483.5	26.15	33.99	H	60.14	74	13.86	PK
2483.5	15.45	33.99	H	49.44	54	4.56	AV
2483.5	25.63	33.99	V	59.62	74	14.38	PK
2483.5	14.80	33.99	V	48.79	54	5.21	AV

Operation Mode:	802.11n_20 MHz
Transfer Rate:	6.5 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	29.67	33.90	H	63.57	74	10.43	PK
2390.0	16.80	33.90	H	50.70	54	3.30	AV
2390.0	29.83	33.90	V	63.73	74	10.27	PK
2390.0	16.70	33.90	V	50.60	54	3.40	AV
2483.5	29.84	33.99	H	63.83	74	10.17	PK
2483.5	16.57	33.99	H	50.56	54	3.44	AV
2483.5	28.68	33.99	V	62.67	74	11.33	PK
2483.5	15.76	33.99	V	49.75	54	4.25	AV

Operation Mode:	802.11n_40 MHz
Transfer Rate:	13.5 Mbps
Operating Frequency	2422 MHz, 2452 MHz
Channel No.	03 Ch, 09 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	30.06	33.90	H	63.96	74	10.04	PK
2390.0	17.10	33.90	H	51.00	54	3.00	AV
2390.0	29.70	33.90	V	63.60	74	10.40	PK
2390.0	17.01	33.90	V	50.91	54	3.09	AV
2483.5	28.60	33.99	H	62.59	74	11.41	PK
2483.5	16.55	33.99	H	50.54	54	3.46	AV
2483.5	27.74	33.99	V	61.73	74	12.27	PK
2483.5	15.77	33.99	V	49.76	54	4.24	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

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 6 Mbps, Ch.6 and 802.11g. Because 802.11g mode is worst case.

▣ RESULT PLOTS

Conducted Emissions (Line 1)

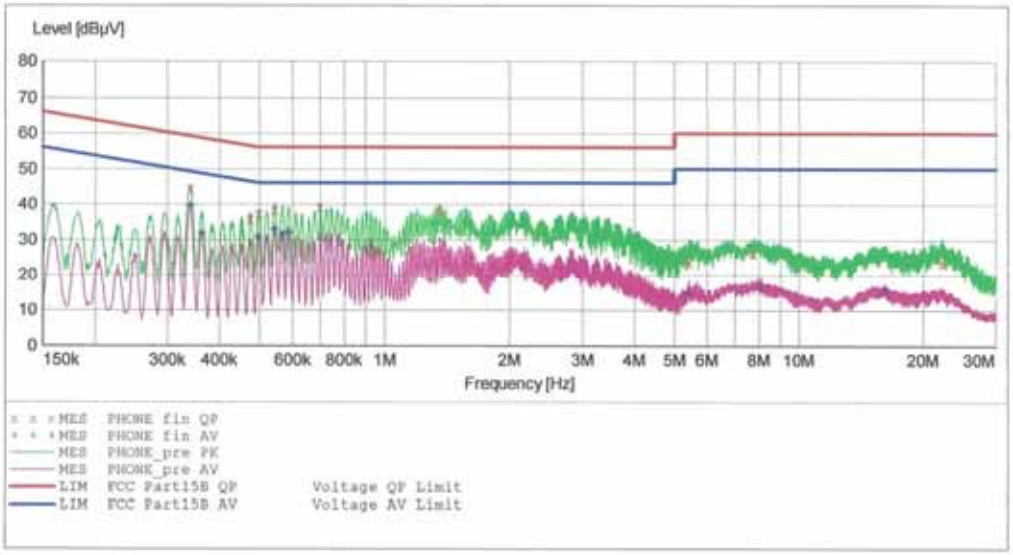
HCT

EMC

```
EUT:                  LG-E440g
Manufacturer:         LG
Operating Condition:  WLAN MODE
Test Site:            SHIELD ROOM
Operator:             JS LEE
Test Specification:   FCC PART 15 B
Comment:              H
```

SCAN TABLE: "FCC PART 15 B(H)"

```
  Short Description:                FCC PART 15 CLASS B
  Start       Stop        Step      Detector   Meas.     IF       Transducer
  Frequency   Frequency   Width                Time      Bandw.
  150.0 kHz   500.0 kHz   1.0 kHz   MaxPeak    10.0 ms   9 kHz    None
                                    Average
  500.0 kHz   5.0 MHz     4.0 kHz   MaxPeak    10.0 ms   9 kHz    None
                                    Average
  5.0 MHz     30.0 MHz    4.0 kHz   MaxPeak    10.0 ms   9 kHz    None
                                    Average
```



MEASUREMENT RESULT: "PHONE_fin QP"

3/29/2013 10:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.340010	44.20	9.7	59	15.0	---	---
0.476010	35.90	9.8	56	20.5	---	---
0.498010	37.30	9.8	56	18.7	---	---
0.544000	38.40	9.8	56	17.6	---	---
0.700000	39.20	9.8	56	16.8	---	---
1.356000	38.40	9.8	56	17.6	---	---
5.432000	23.80	10.2	60	36.2	---	---
7.776000	26.20	10.3	60	33.8	---	---
22.264000	23.50	11.9	60	36.5	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

3/29/2013 10:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.340010	39.40	9.7	49	9.8	---	---
0.362010	31.70	9.8	49	17.0	---	---
0.497010	30.70	9.8	46	15.4	---	---
0.544000	33.00	9.8	46	13.0	---	---
0.568000	31.40	9.8	46	14.6	---	---
0.588000	32.10	9.8	46	13.9	---	---
5.432000	14.70	10.2	50	35.3	---	---
8.124000	16.60	10.3	50	33.4	---	---
16.120000	15.50	11.1	50	34.5	---	---

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Conducted Emissions (Line 2)

HCT

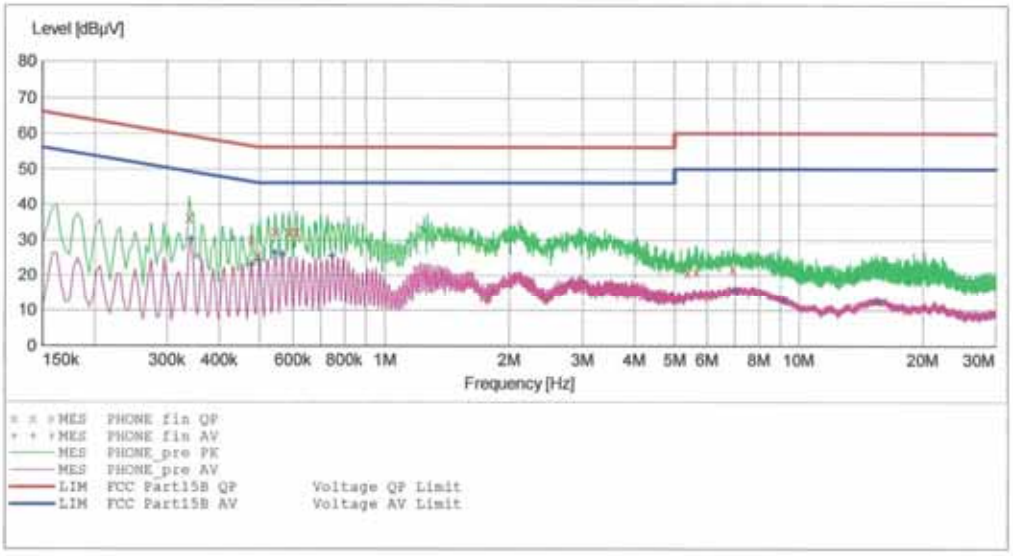
EMC

```
EUT:                    LG-E440g
Manufacturer:           LG
Operating Condition:    WLAN MODE
Test Site:              SHIELD ROOM
Operator:               JS LEE
Test Specification:     FCC PART 15 CLASS B
Comment:                N
```

SCAN TABLE: "FCC PART 15 B(N)"

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

3/29/2013 10:46PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.338010	36.20	9.9	59	23.0	---	---
0.478010	30.10	10.0	56	26.3	---	---
0.494010	25.60	10.0	56	30.5	---	---
0.544000	32.40	10.0	56	23.6	---	---
0.588000	32.30	10.0	56	23.7	---	---
0.612000	32.10	10.0	56	23.9	---	---
5.392000	20.90	10.4	60	39.1	---	---
5.644000	21.10	10.4	60	38.9	---	---
6.920000	21.90	10.5	60	38.1	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.342010	30.10	9.9	49	19.1	---	---
0.478010	22.90	10.0	46	23.5	---	---
0.498010	24.20	10.0	46	21.8	---	---
0.544000	26.30	10.0	46	19.7	---	---
0.568000	25.80	10.0	46	20.2	---	---
0.748000	25.50	10.0	46	20.5	---	---
7.004000	15.80	10.5	50	34.2	---	---
9.180000	12.90	10.6	50	37.1	---	---
15.492000	12.40	11.3	50	37.6	---	---

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9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	05/03/2015	3125
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	05/03/2013	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	05/02/2013	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	07/31/2013	MY51110020
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/11/2013	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2013	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2013	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/08/2014	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2013	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	05/02/2013	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	05/02/2013	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	05/02/2013	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2013	11377
Hewlett Packard	11667B / Power Splitter	Annual	06/05/2013	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2013	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2013	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/07/2013	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	05/02/2013	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
MITEQ	AMF-6D-001180-35-20P/ POWER AMP	Annual	07/30/2013	990893
Agilent	8493C / Attenuator(10 dB)	Annual	07/30/2013	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617
CERNEX	CBLU1183540 / POWER AMP	Annual	07/27/2013	21691