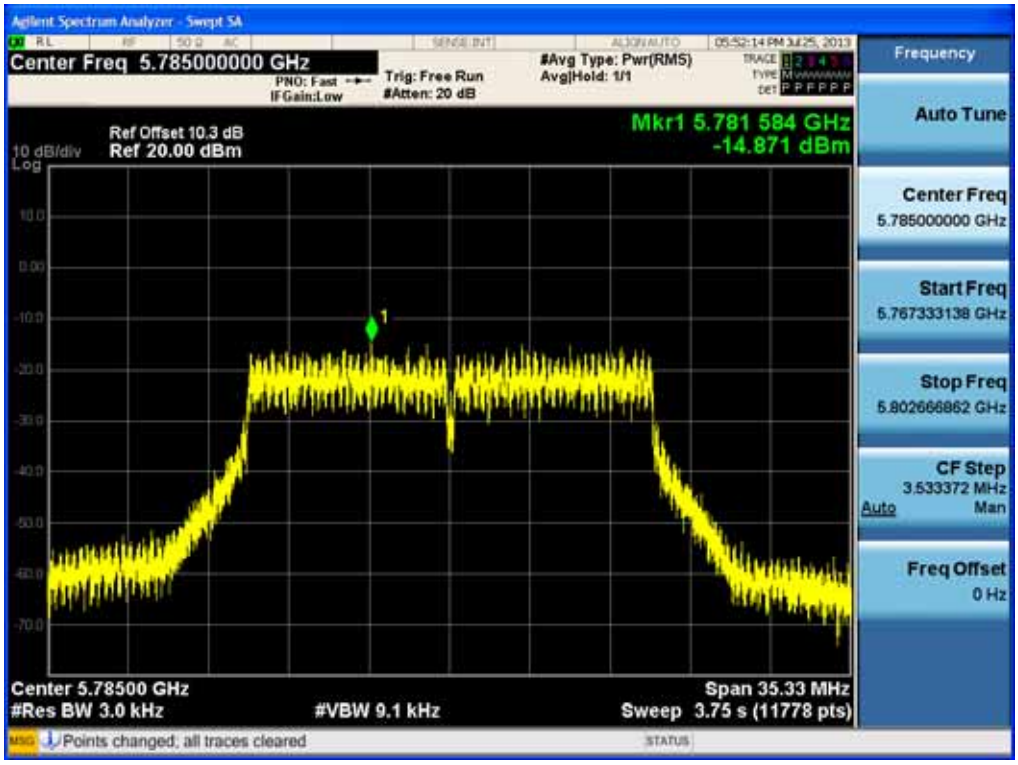
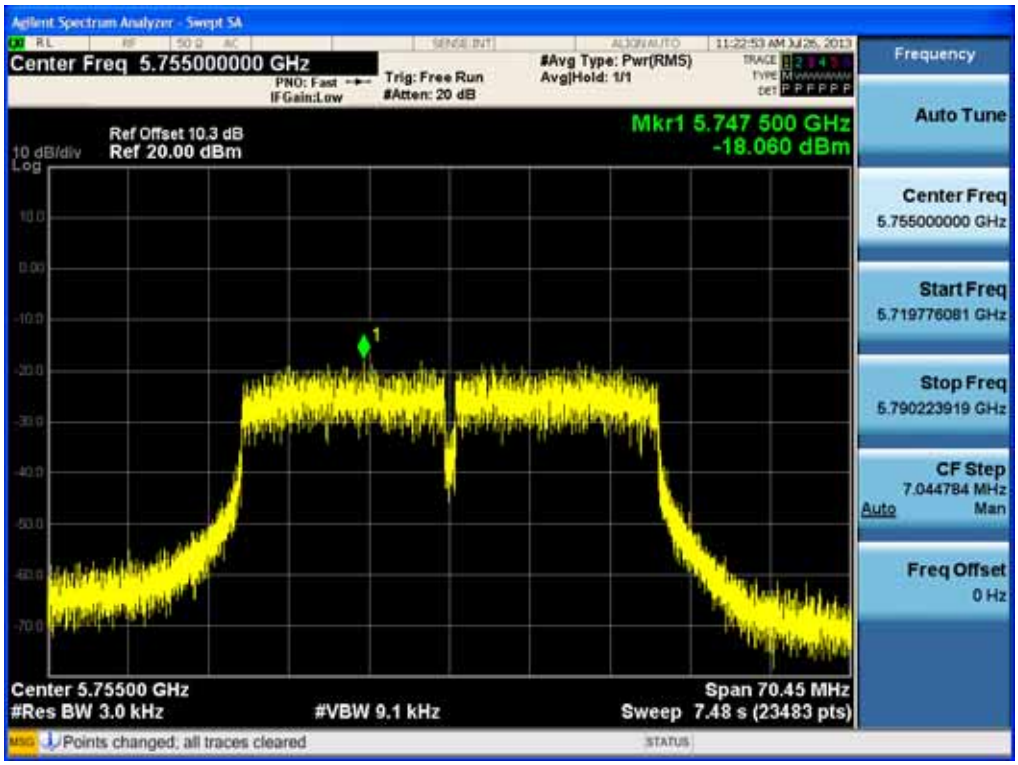
20 MHz BW

Power Spectral Density (802.11n-CH 157)



40 MHz BW

Power Spectral Density (802.11n-CH 151)



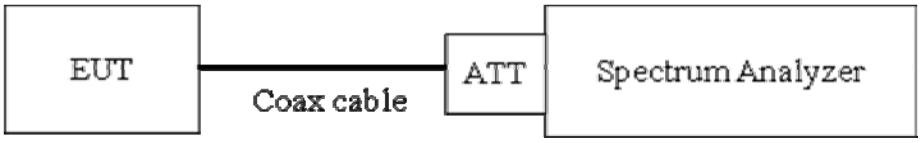
8.5 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

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 11.0 in KDB 558074, issued 04/09/2013)

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

VBW ≥ 3 x RBW(Upon 1 GHz = 3 MHz).

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 ≥ 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 and 5.8 GHz range that was rounded off to the closest tenth dB. So,

10.2 dB is offset for 2.4 GHz Band and 10.3 dB is offset for 5.8 GHz Band.

Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	10.21
	2437	10.24
	2462	10.24
5.8 GHz	5745	10.31
	5755	10.30
	5785	10.29
	5795	10.26
	5825	10.28

(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	9.95
100	10.01
200	10.03
300	10.04
400	10.05
500	10.04
600	10.03
700	10.09
800	10.10
900	10.08
1000	10.11
2000	10.25
2400*	10.19
2500*	10.26
3000	10.27
4000	10.22
5000	10.48
5700*	10.42
5800*	10.48
6000	10.48
7000	10.57

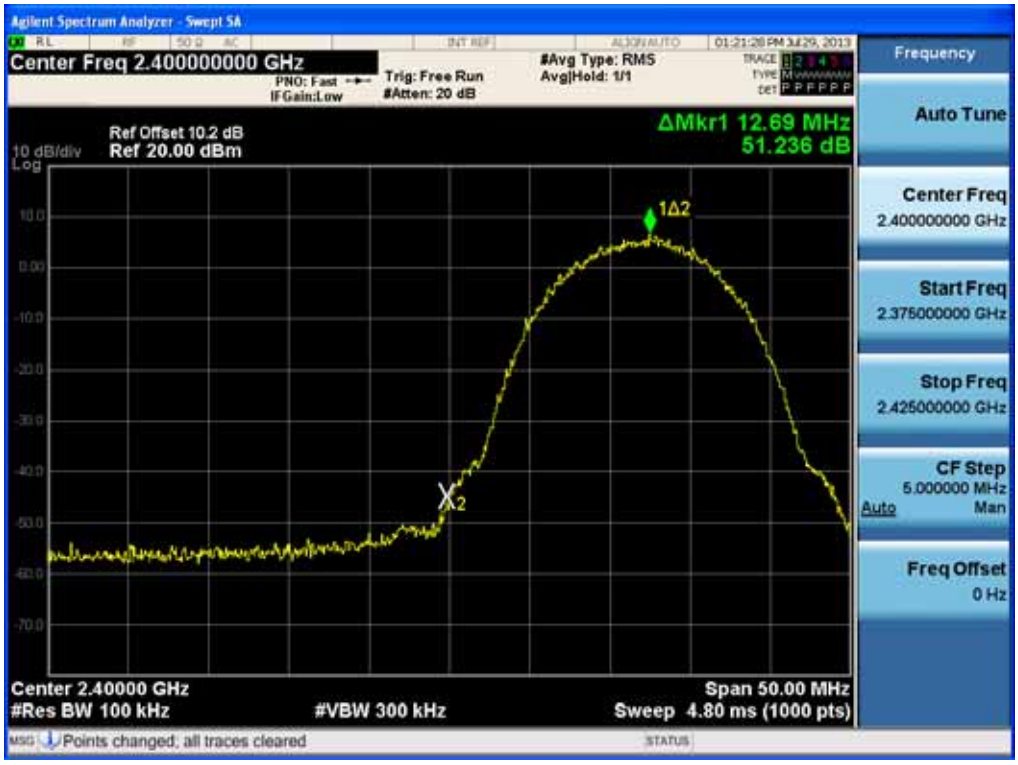
8000	10.45
9000	10.50
10000	10.64
11000	10.69
12000	10.75
13000	10.92
14000	11.90
15000	11.00
16000	11.03
17000	10.93
18000	10.96
19000	10.85
20000	12.11
21000	11.17
22000	10.99
23000	11.12
24000	11.10
25000	11.42
26000	11.28
27000	10.83
28000	11.03
29000	10.99
30000	12.08
31000	10.99
32000	11.32
33000	11.33
34000	12.62
35000	14.85
36000	14.78
37000	15.73
38000	15.81
39000	13.47
40000	14.89

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

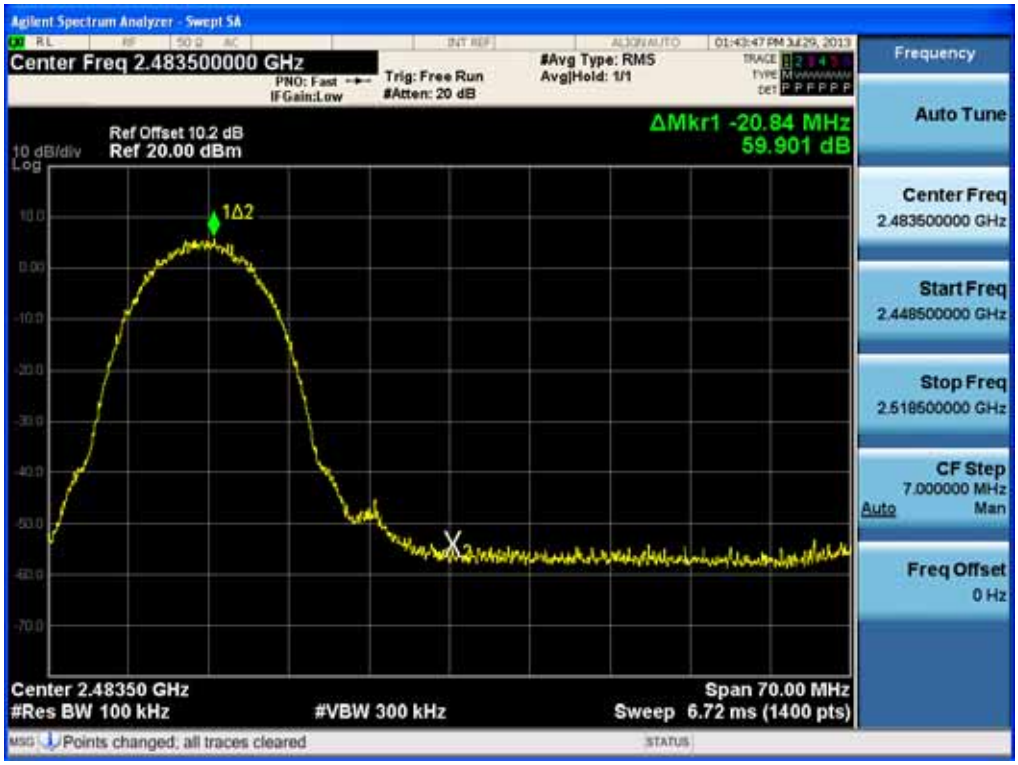
2. Factor = Cable loss + Attenuator loss

▣ RESULT PLOTS

BandEdge (802.11b-CH1)

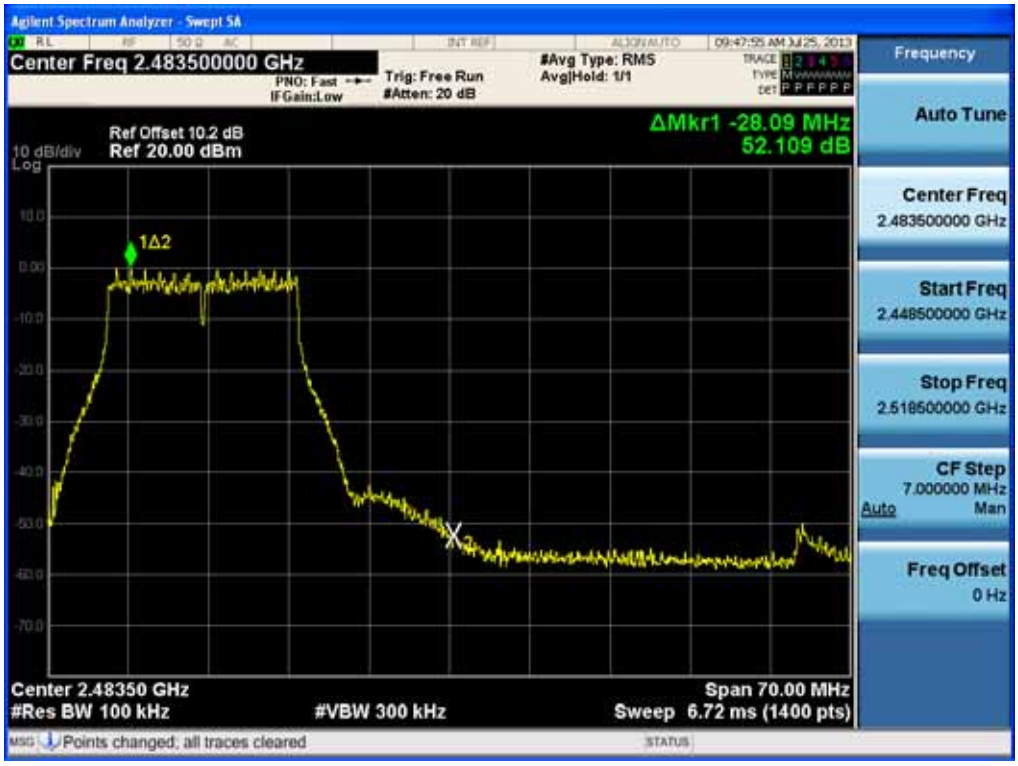


BandEdge (802.11b-CH11)

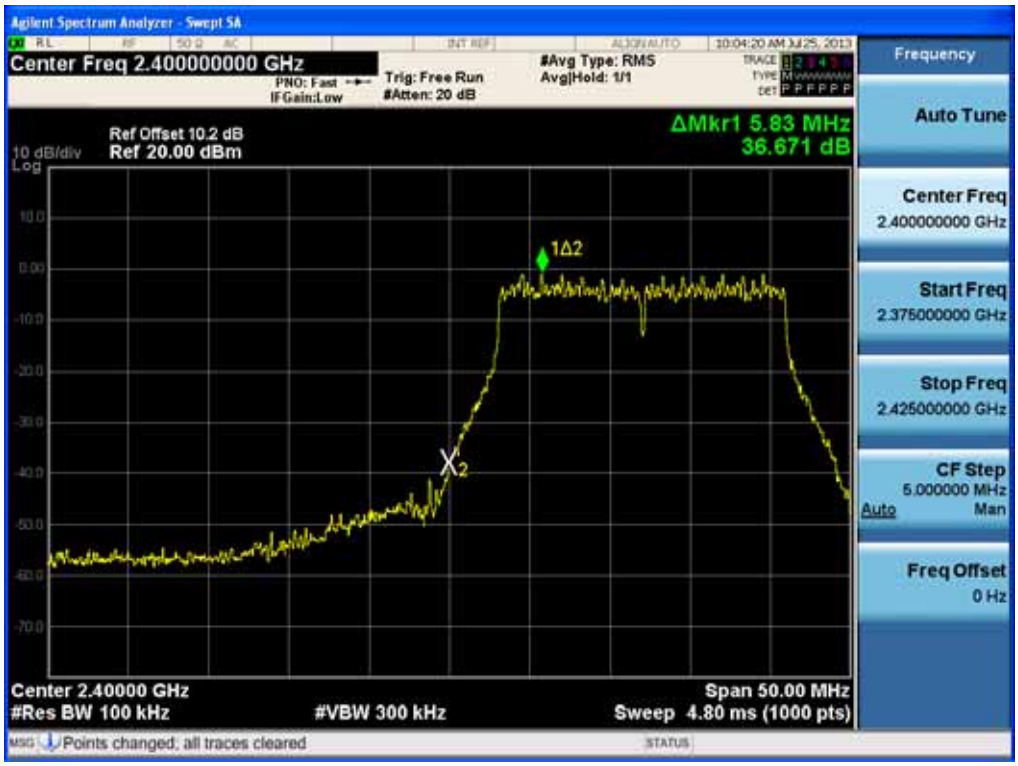


BandEdge (802.11g-CH1)

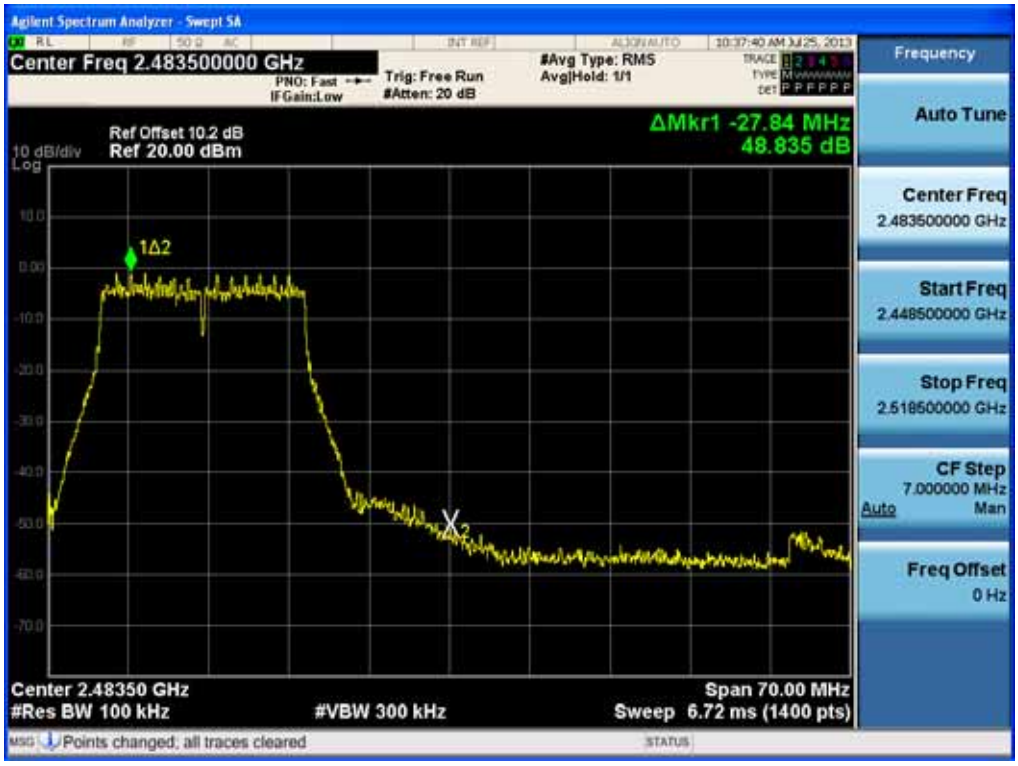
BandEdge (802.11g-CH11)



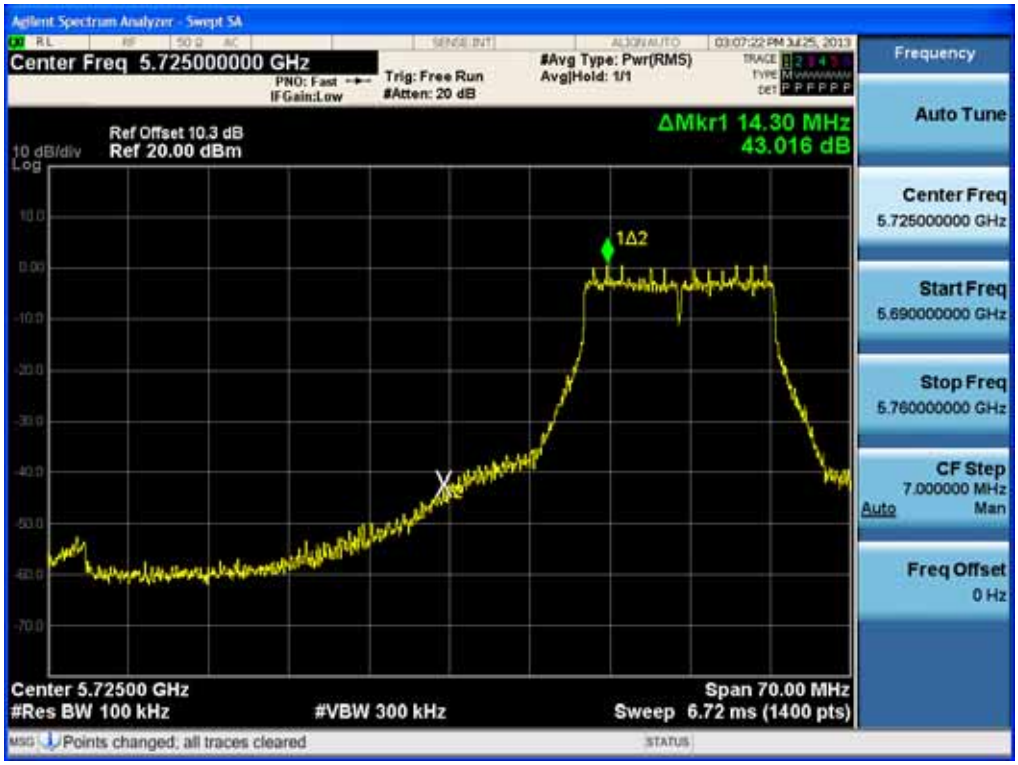
BandEdge (802.11n-CH1)



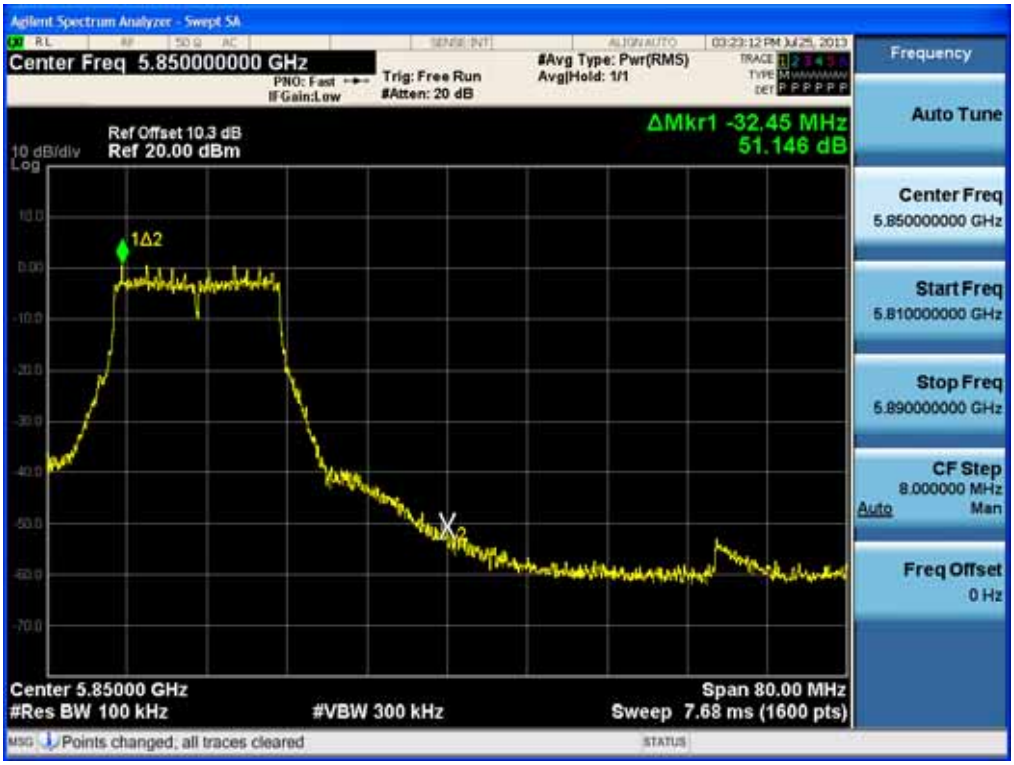
BandEdge (802.11n-CH11)



BandEdge (802.11a-CH 149)



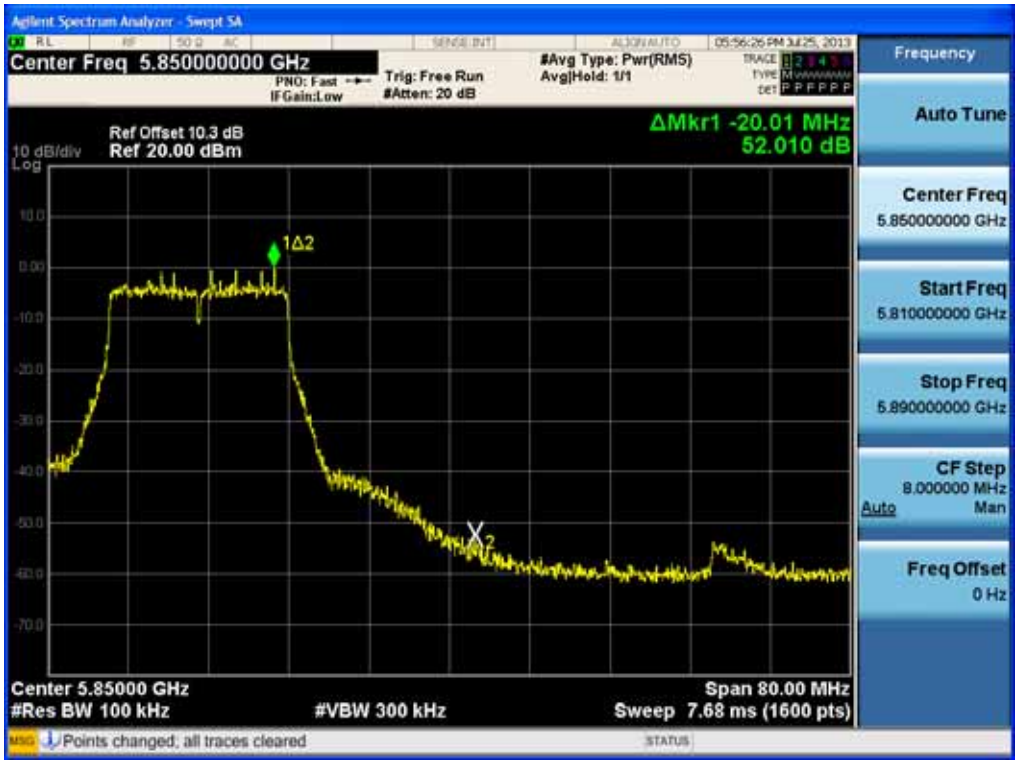
BandEdge (802.11a-CH 165)



20 MHz BW

BandEdge (802.11n-CH 149)

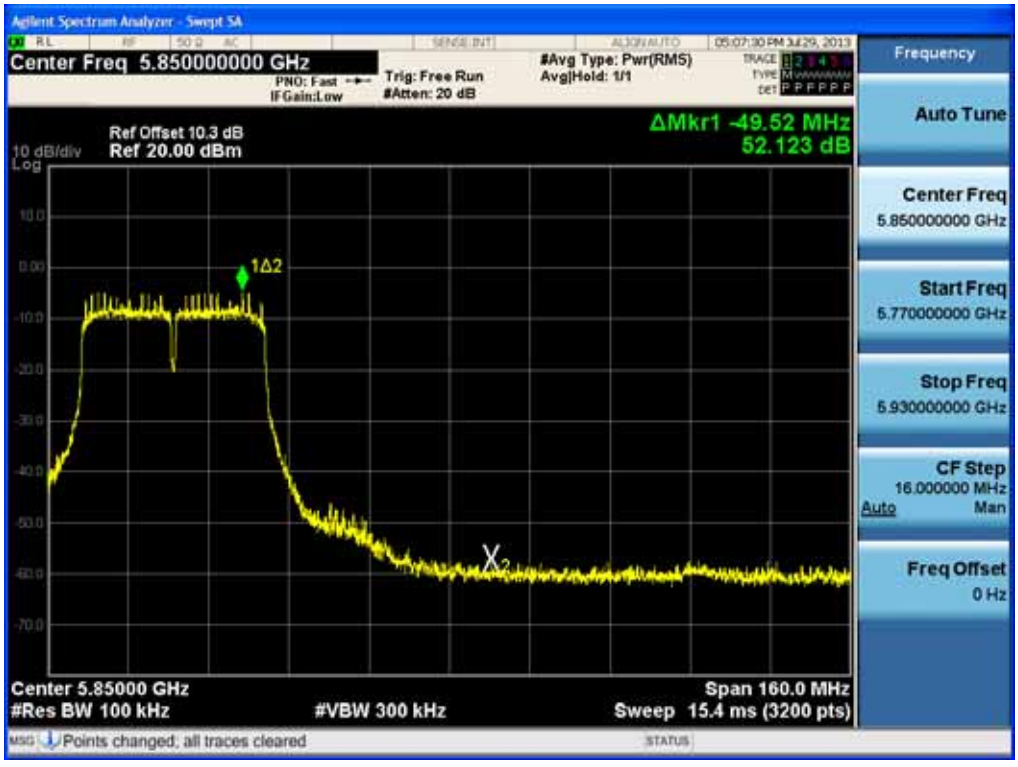
BandEdge (802.11n-CH 165)



40 MHz BW

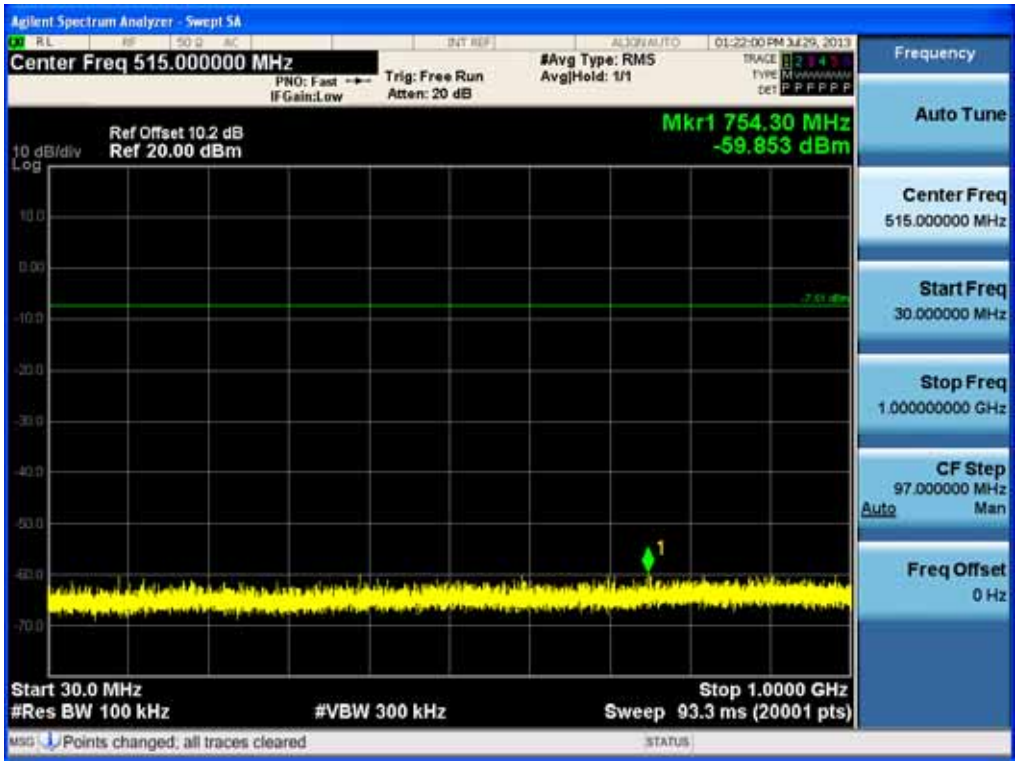
BandEdge (802.11n-CH 151)

BandEdge (802.11n-CH 159)

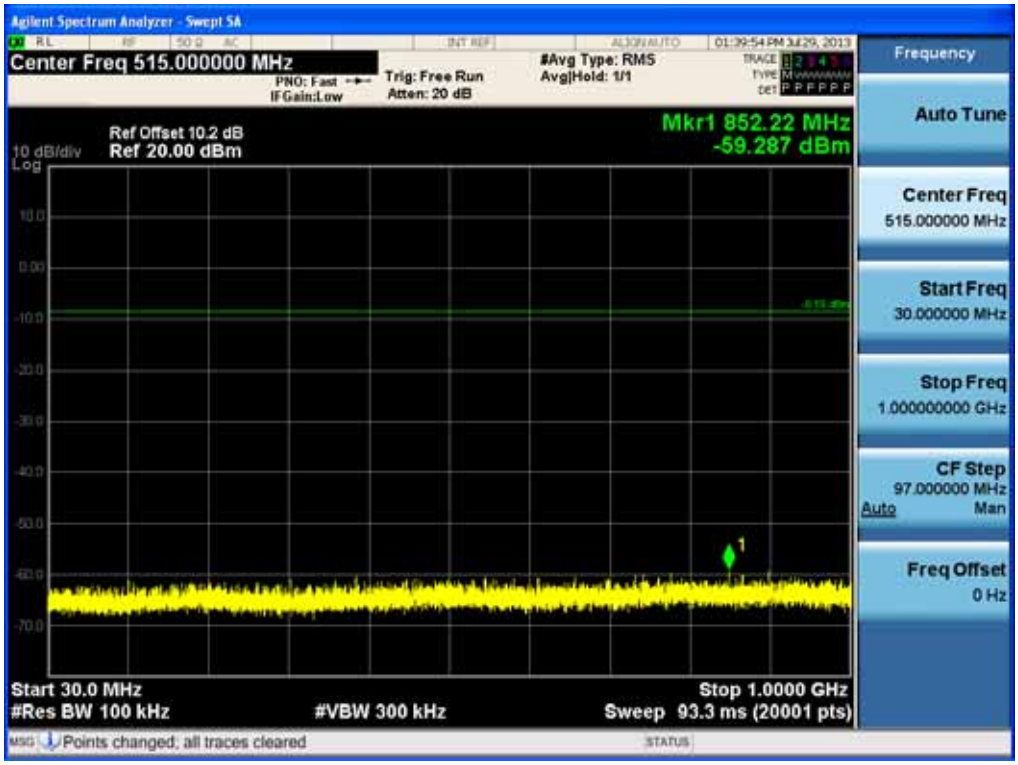


30 MHz ~ 1 GHz

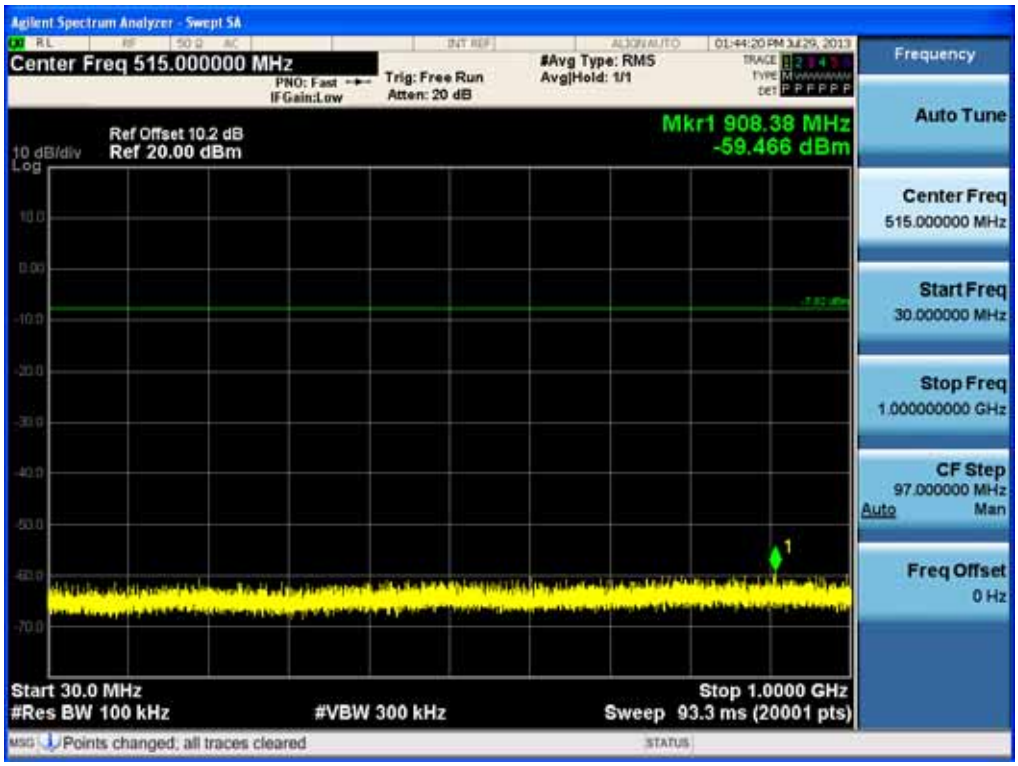
Conducted Spurious Emission (802.11b-CH1)



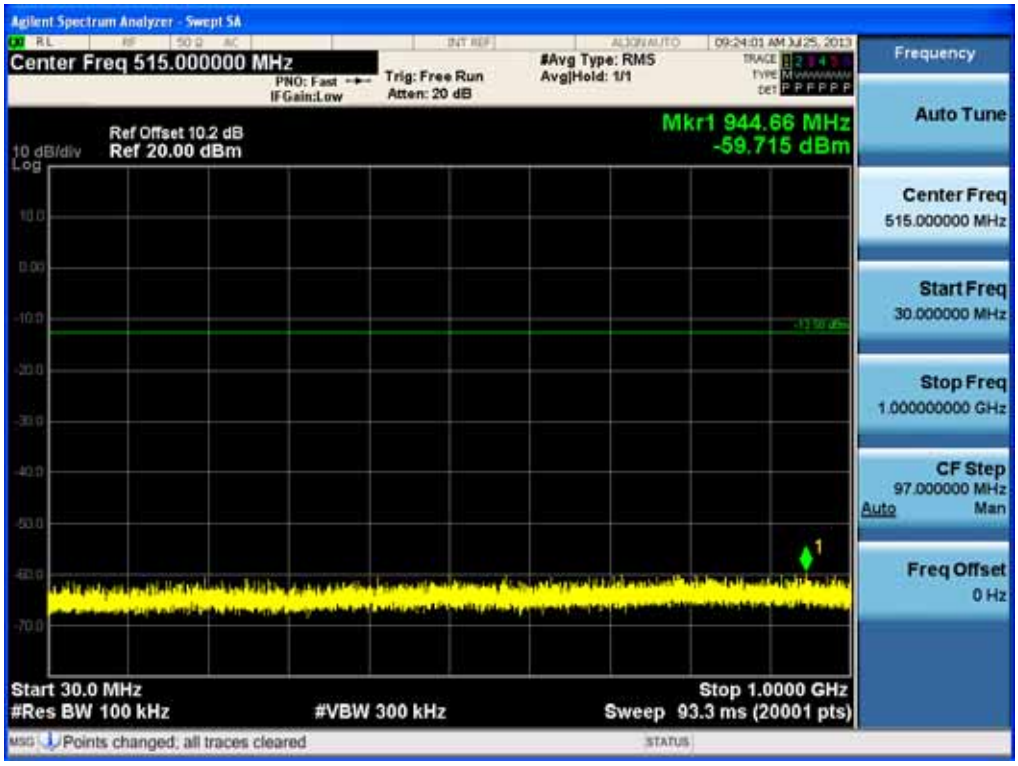
Conducted Spurious Emission (802.11b-CH6)



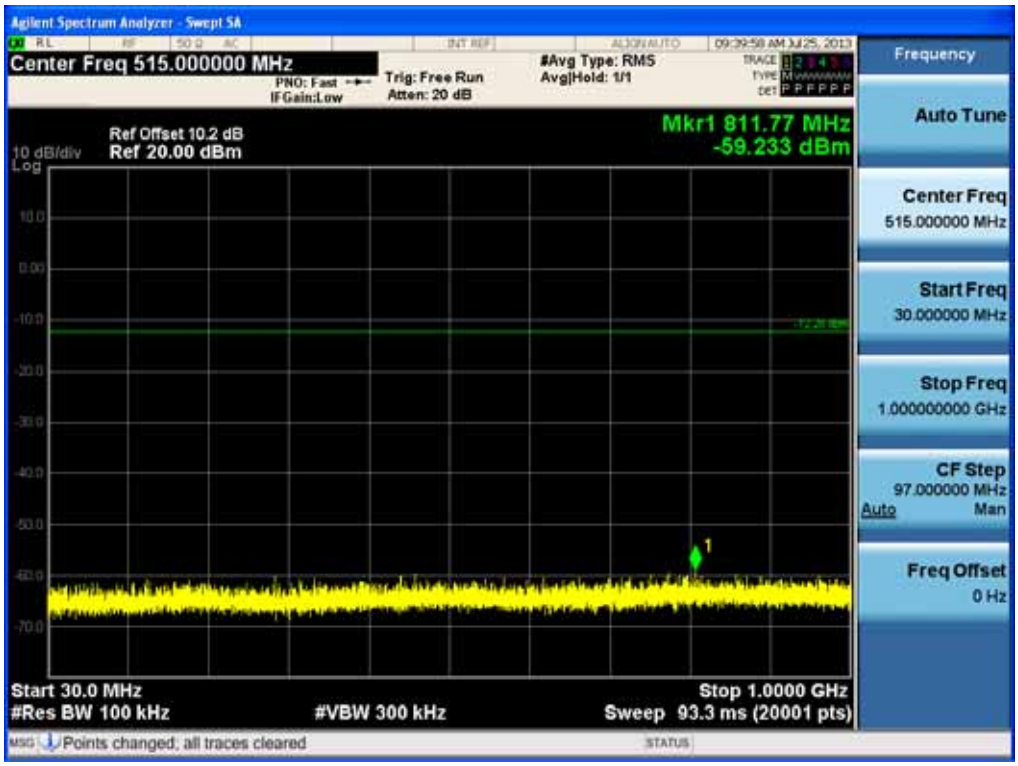
Conducted Spurious Emission (802.11b-CH11)



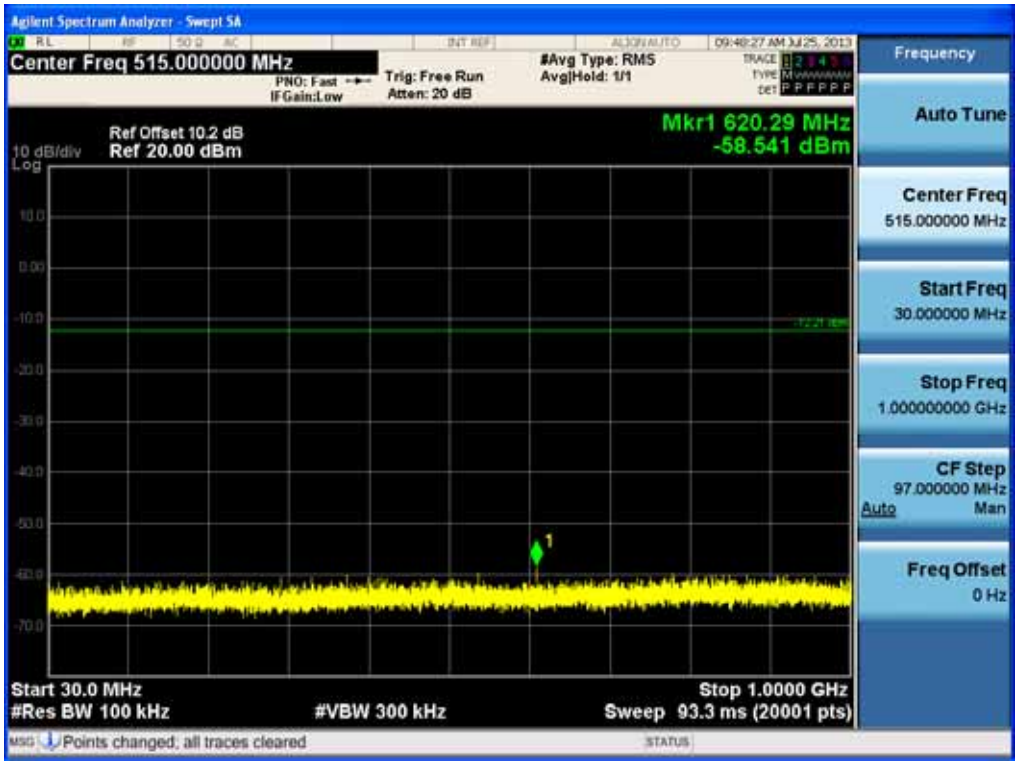
Conducted Spurious Emission (802.11g-CH1)



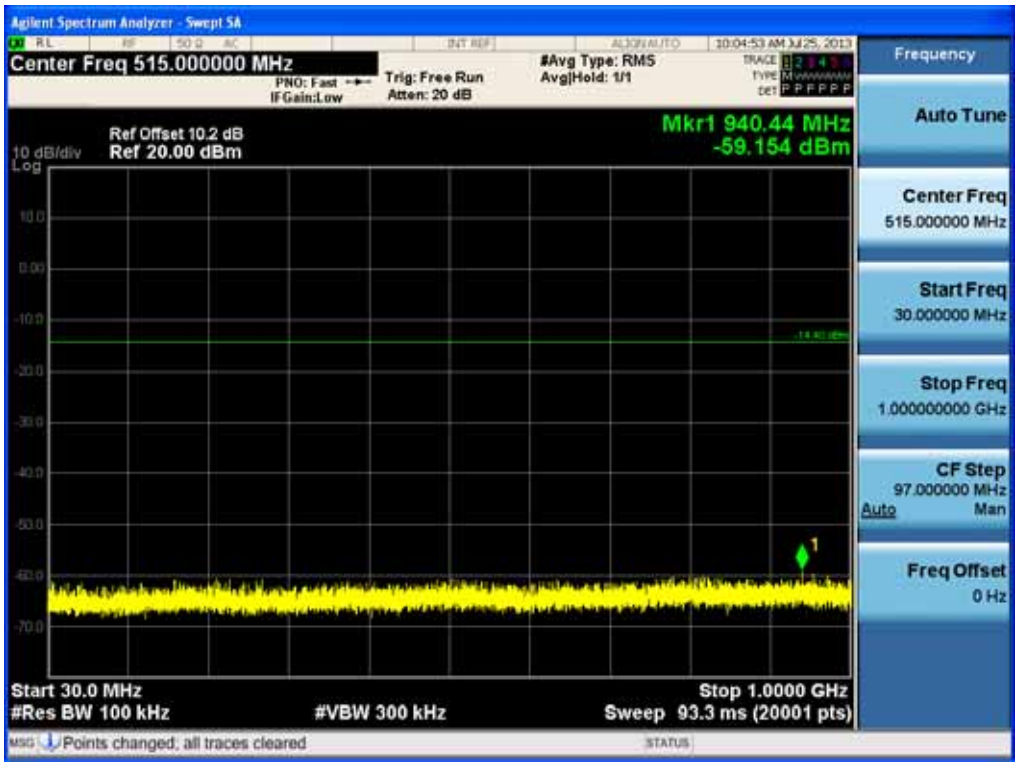
Conducted Spurious Emission (802.11g-CH6)



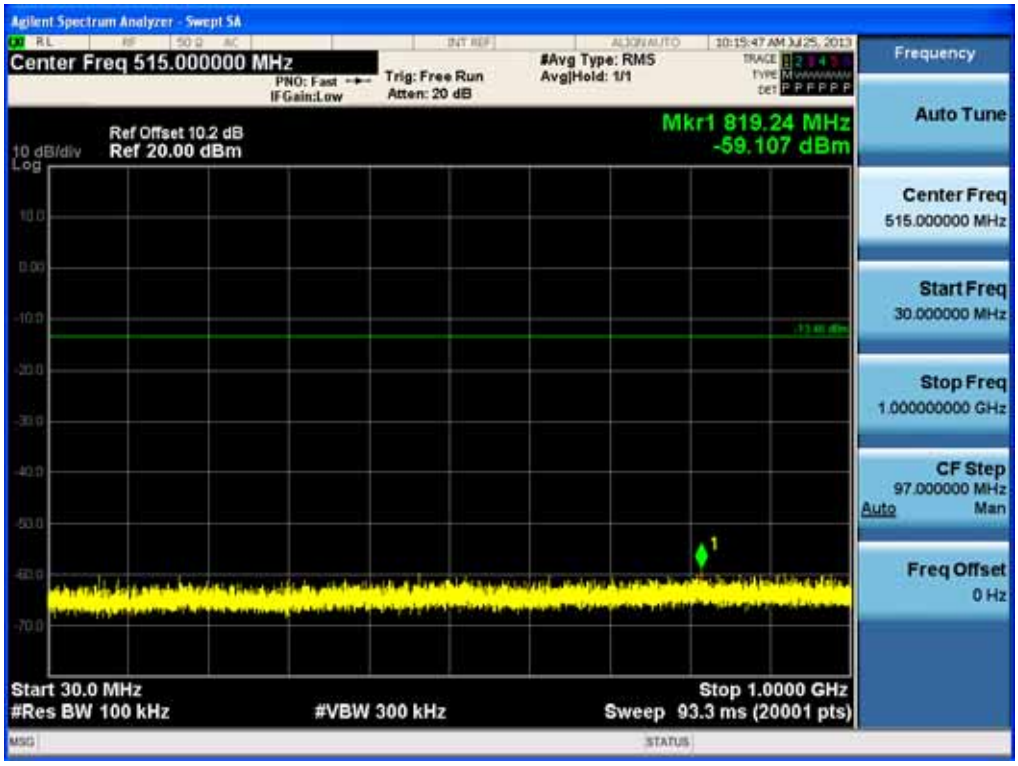
Conducted Spurious Emission (802.11g-CH11)



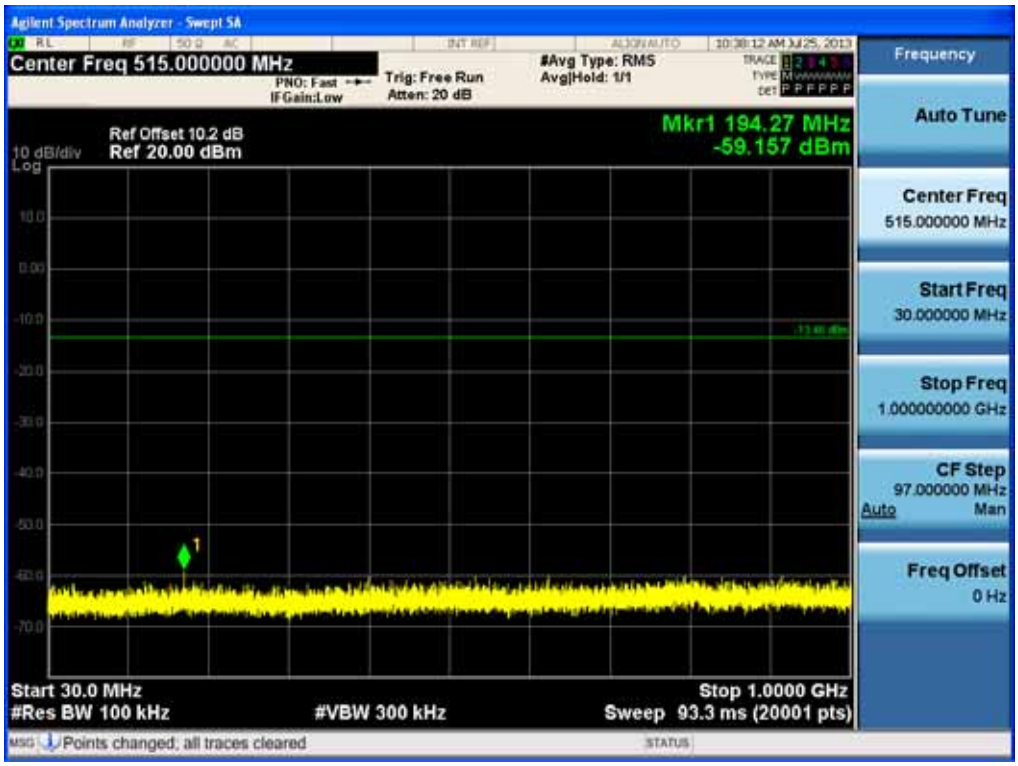
Conducted Spurious Emission (802.11n-CH1)



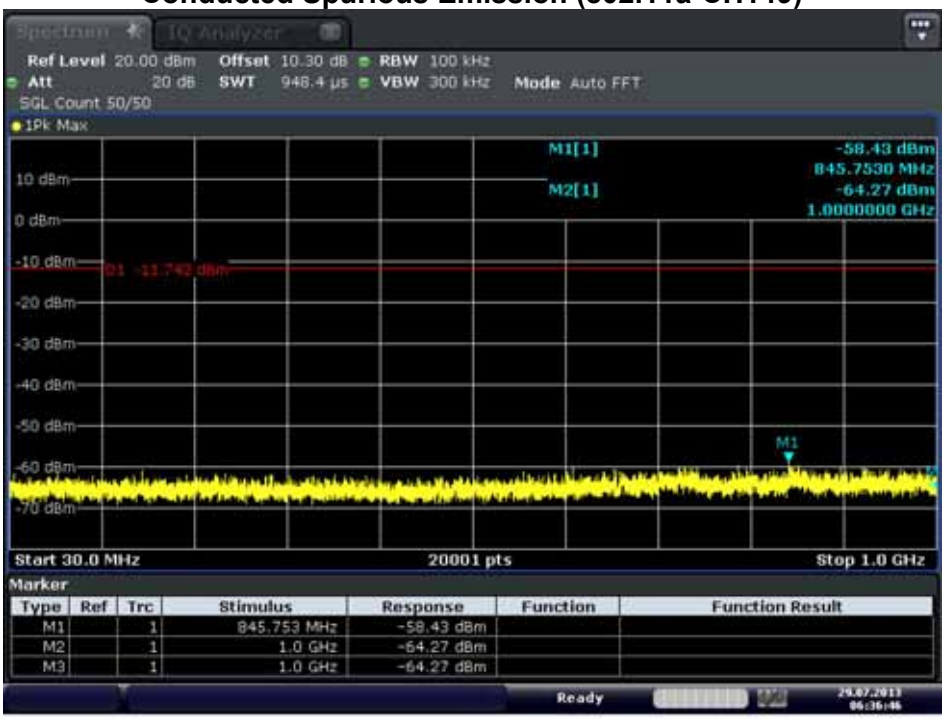
Conducted Spurious Emission (802.11n-CH6)



Conducted Spurious Emission (802.11n-CH11)



Conducted Spurious Emission (802.11a-CH149)



Date: 29.JUL.2013 06:36:46

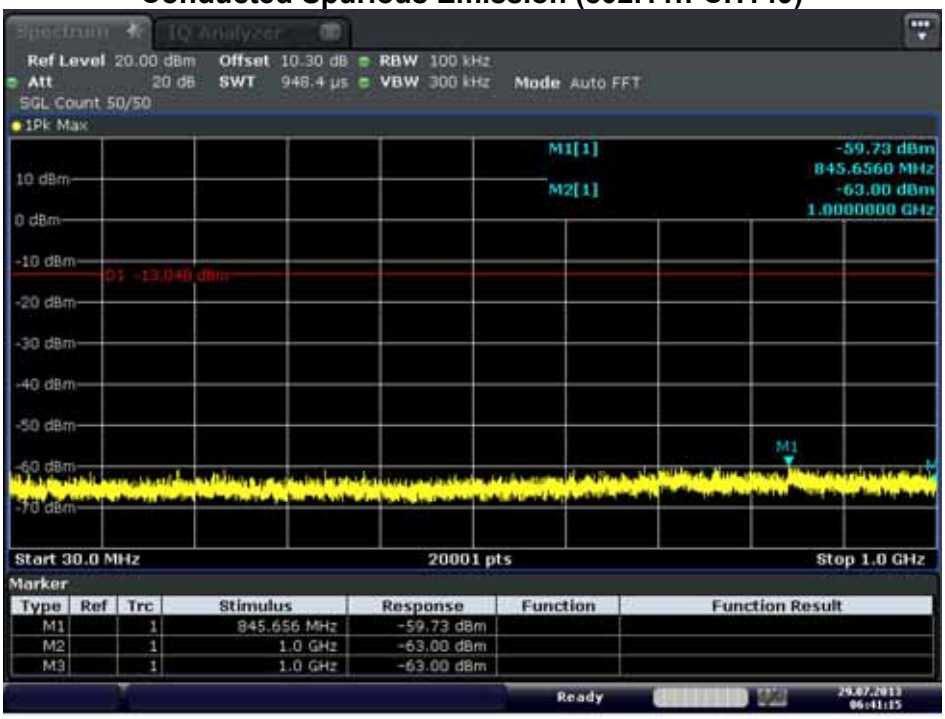
Conducted Spurious Emission (802.11a-CH157)

Date: 29.JUL.2013 06:37:55

Conducted Spurious Emission (802.11a-CH165)

20 MHz BW

Conducted Spurious Emission (802.11n-CH149)



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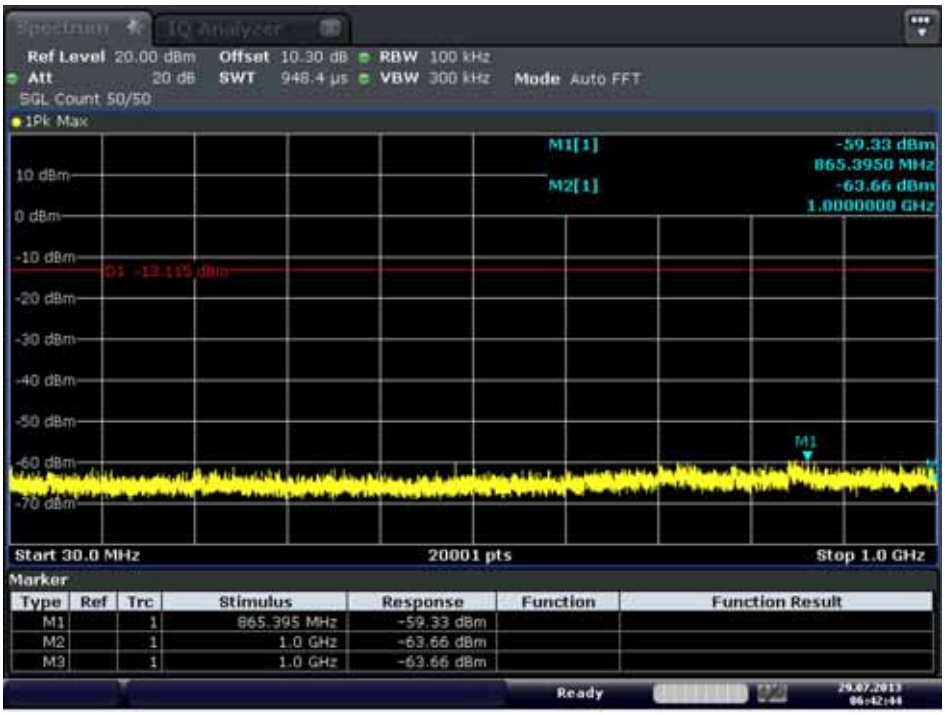
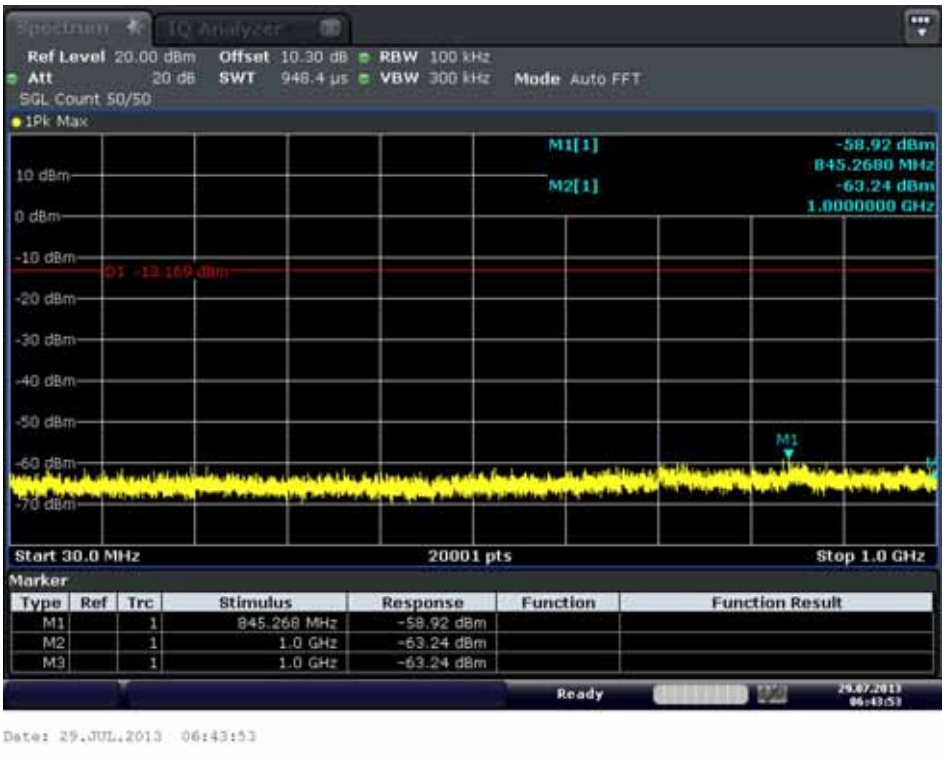
Conducted Spurious Emission (802.11n-CH157)



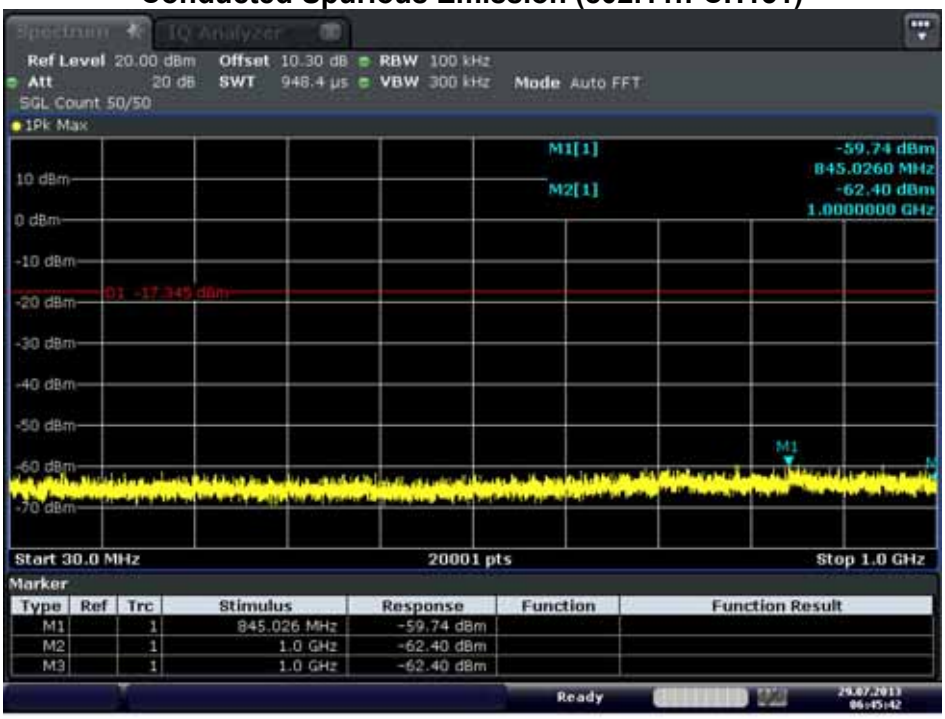
Date: 29.JUL.2013 06:42:45

Conducted Spurious Emission (802.11n-CH165)



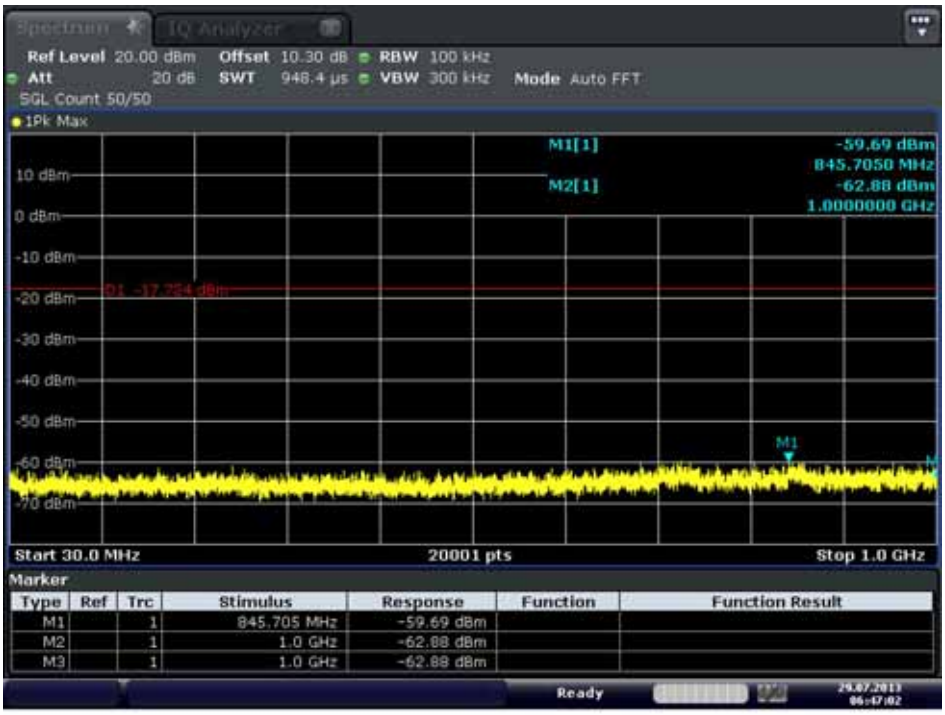
40 MHz BW

Conducted Spurious Emission (802.11n-CH151)



Date: 29.JUL.2013 06:45:42

Conducted Spurious Emission (802.11n-CH159)



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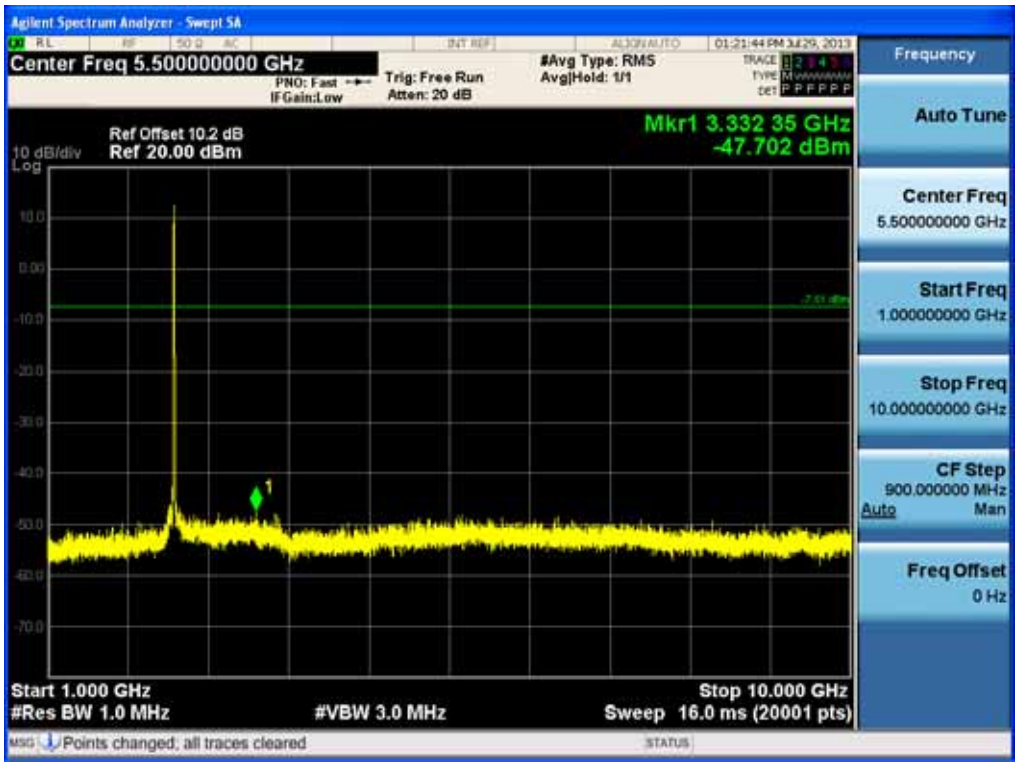
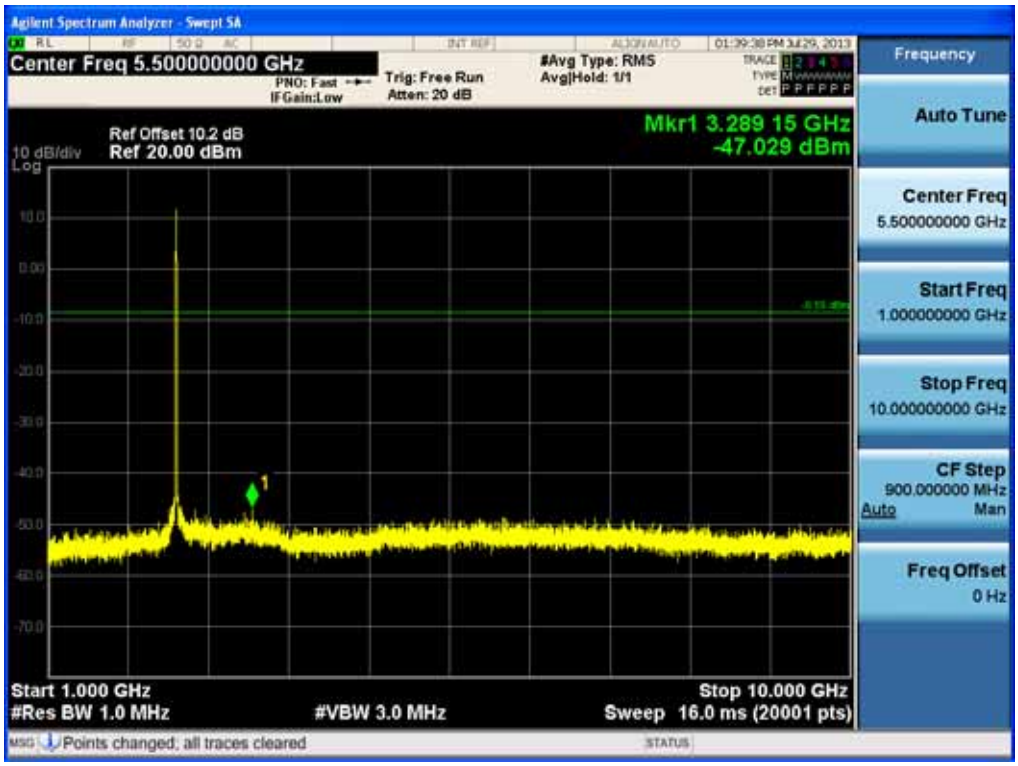
1 GHz ~ 10 GHz

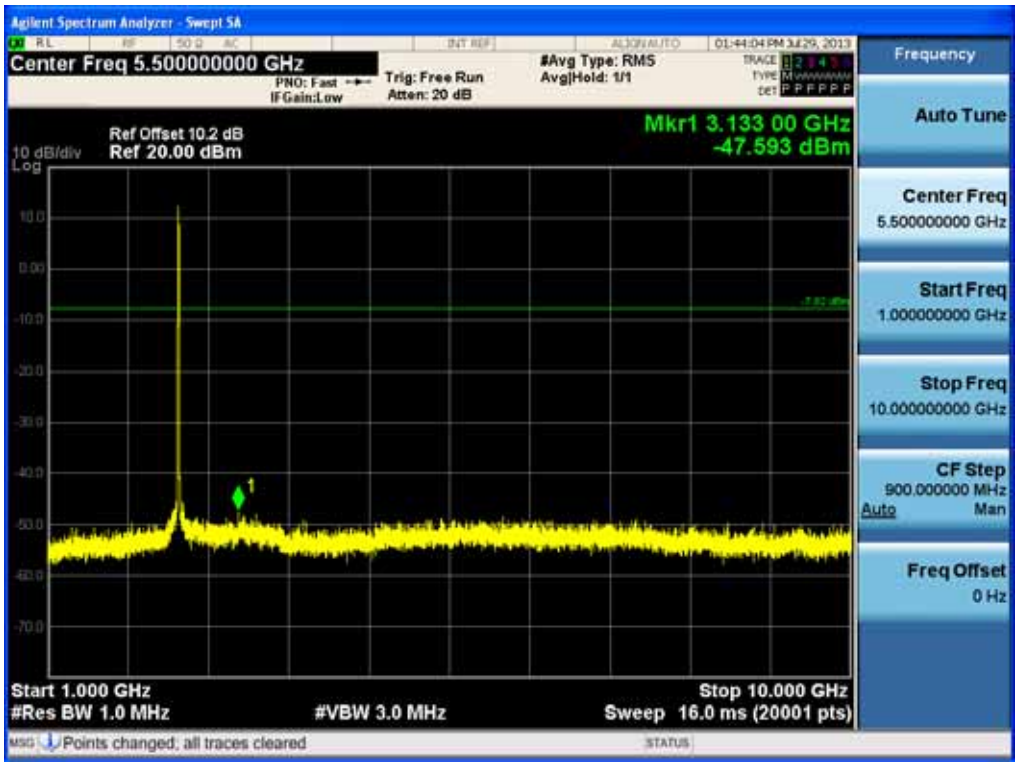
Conducted Spurious Emission (802.11b-CH1)



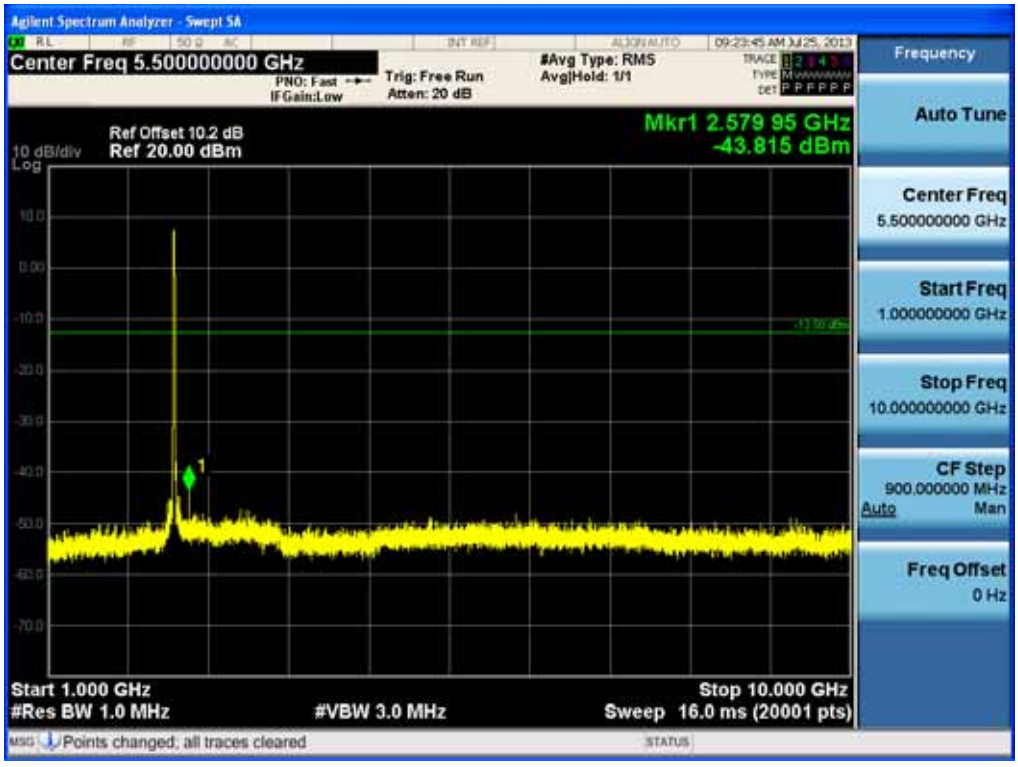
Conducted Spurious Emission (802.11b-CH6)



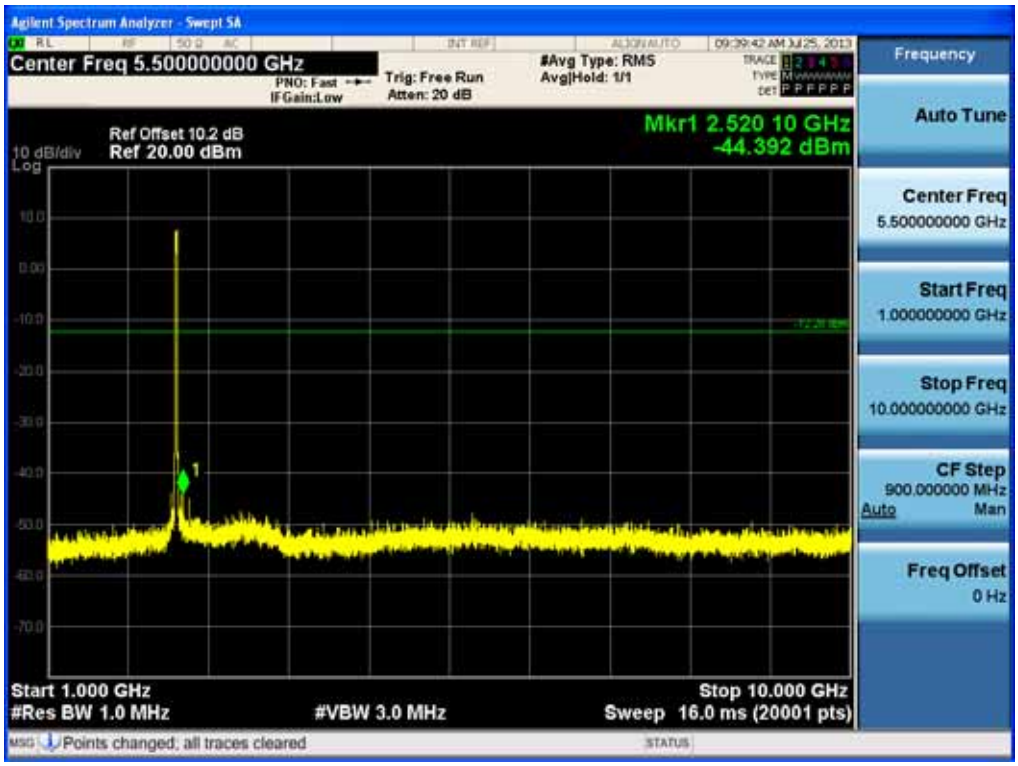
Conducted Spurious Emission (802.11b-CH11)



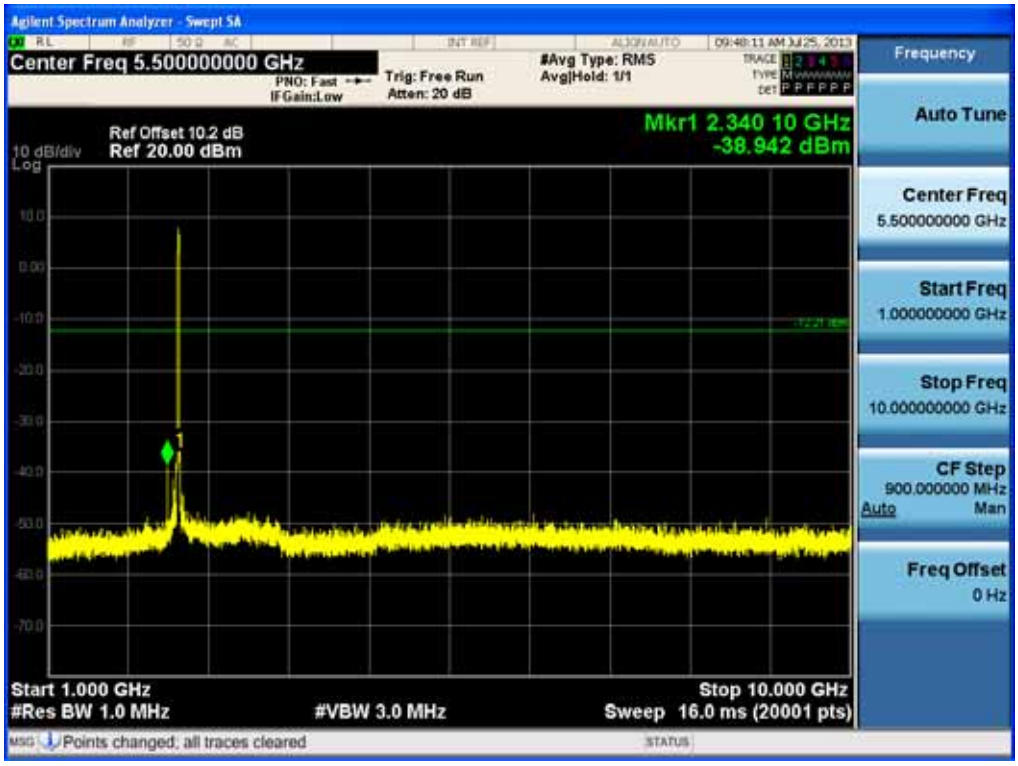
Conducted Spurious Emission (802.11g-CH1)



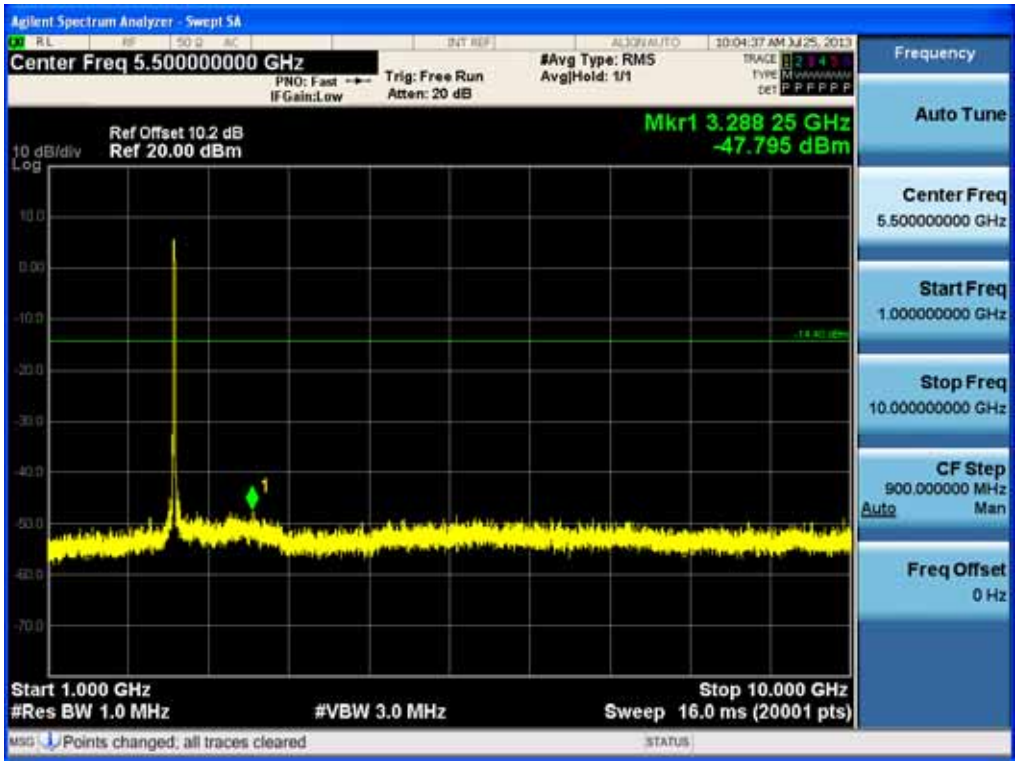
Conducted Spurious Emission (802.11g-CH6)



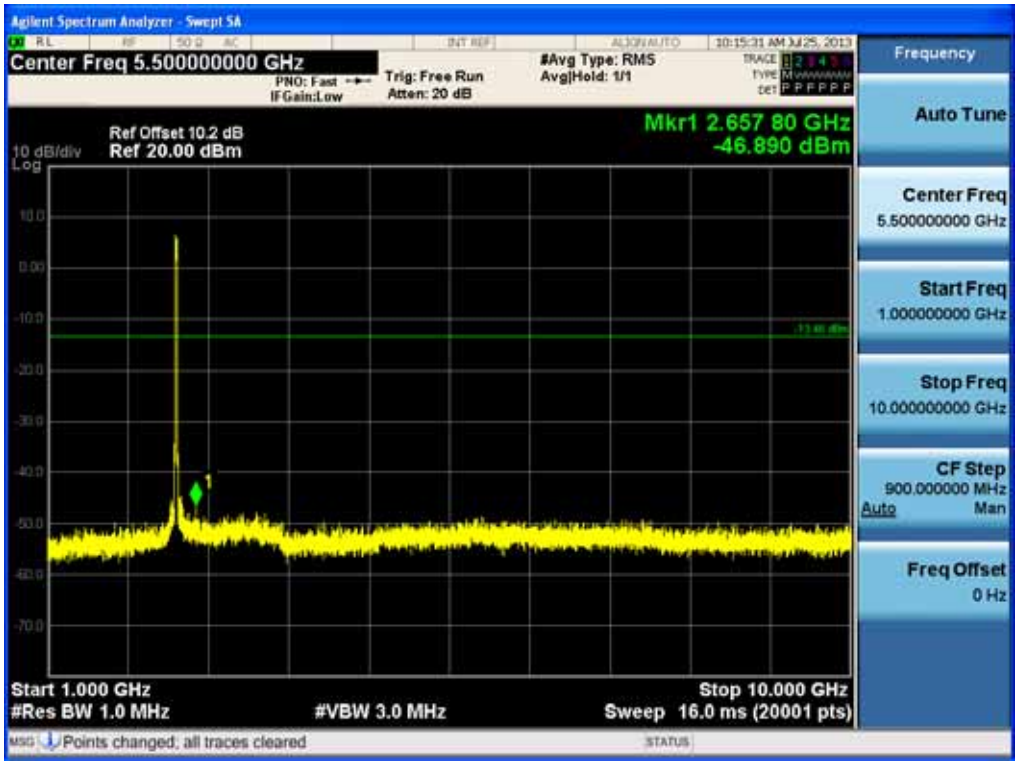
Conducted Spurious Emission (802.11g-CH11)



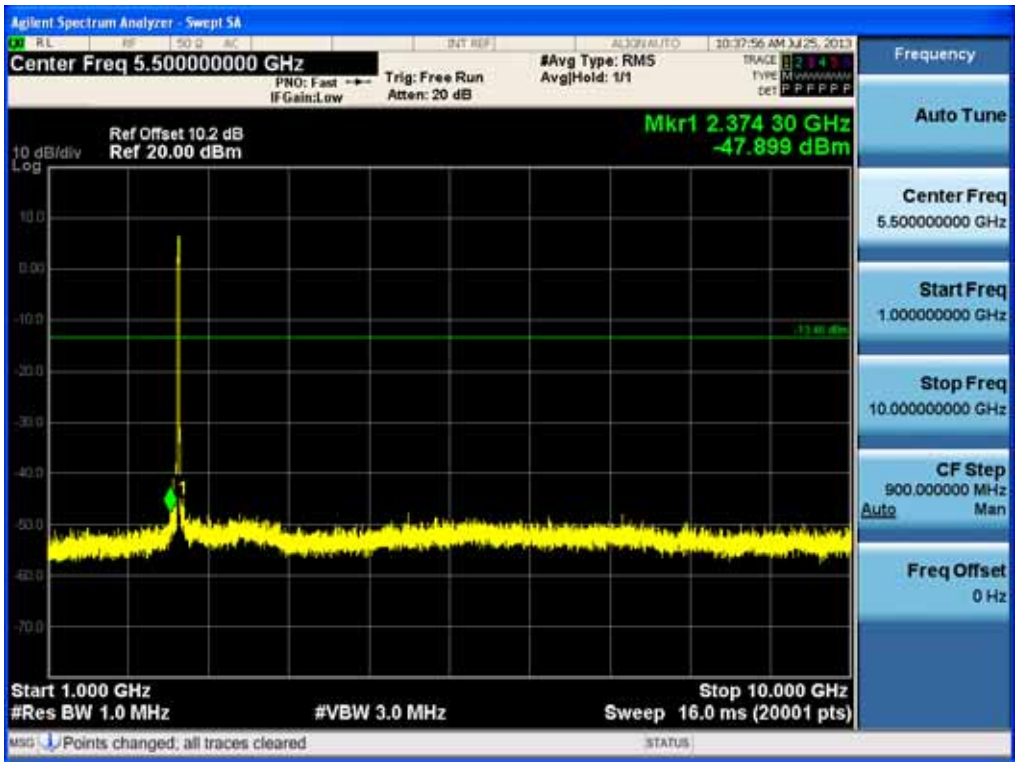
Conducted Spurious Emission (802.11n-CH1)



Conducted Spurious Emission (802.11n-CH6)

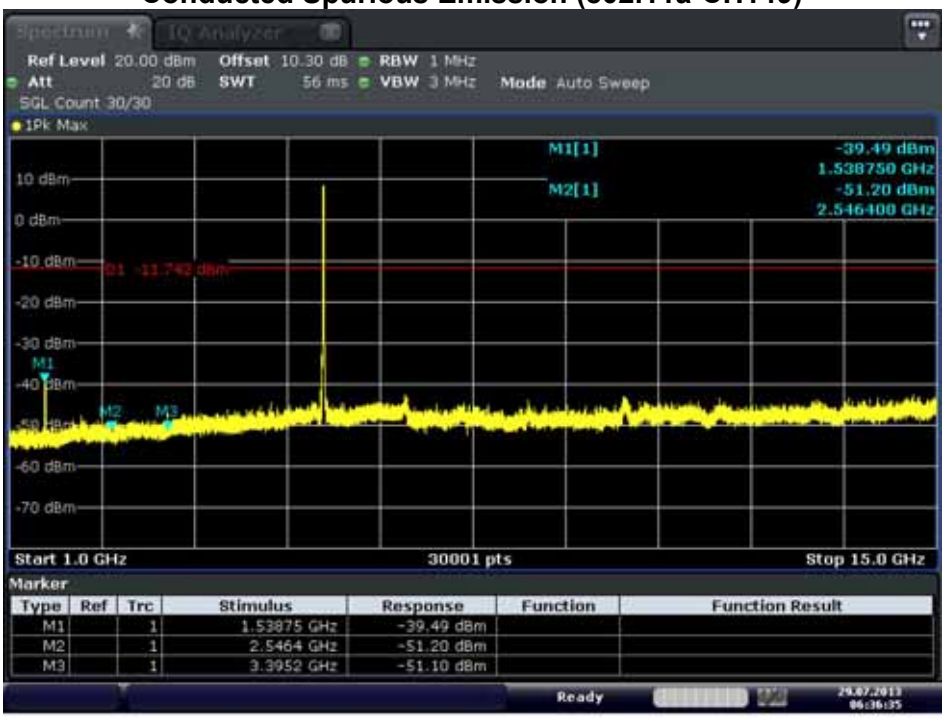


Conducted Spurious Emission (802.11n-CH11)



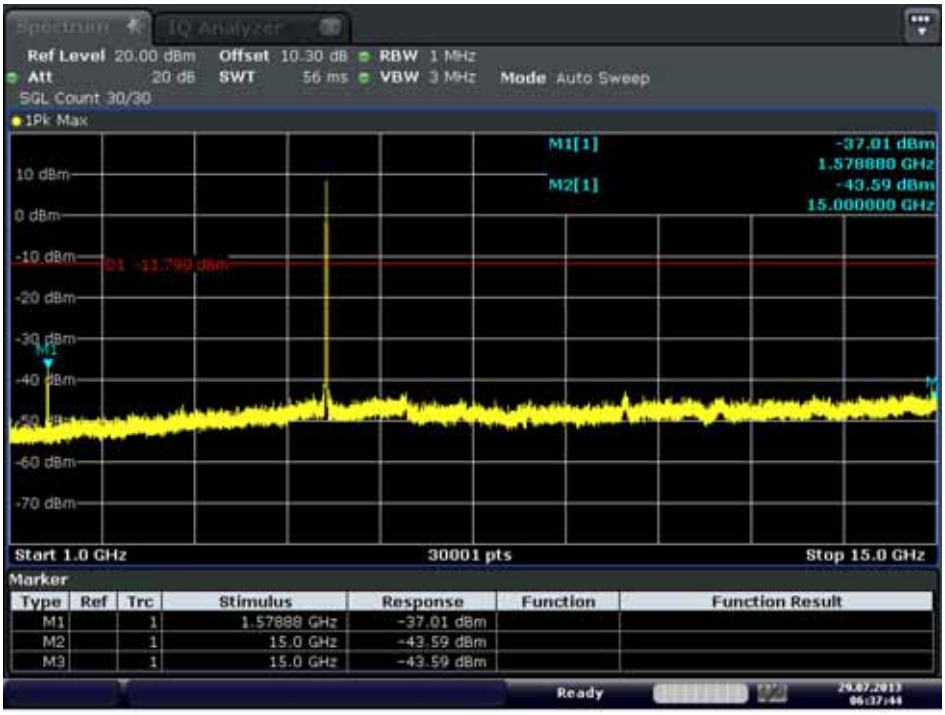
1 GHz ~ 15 GHz

Conducted Spurious Emission (802.11a-CH149)



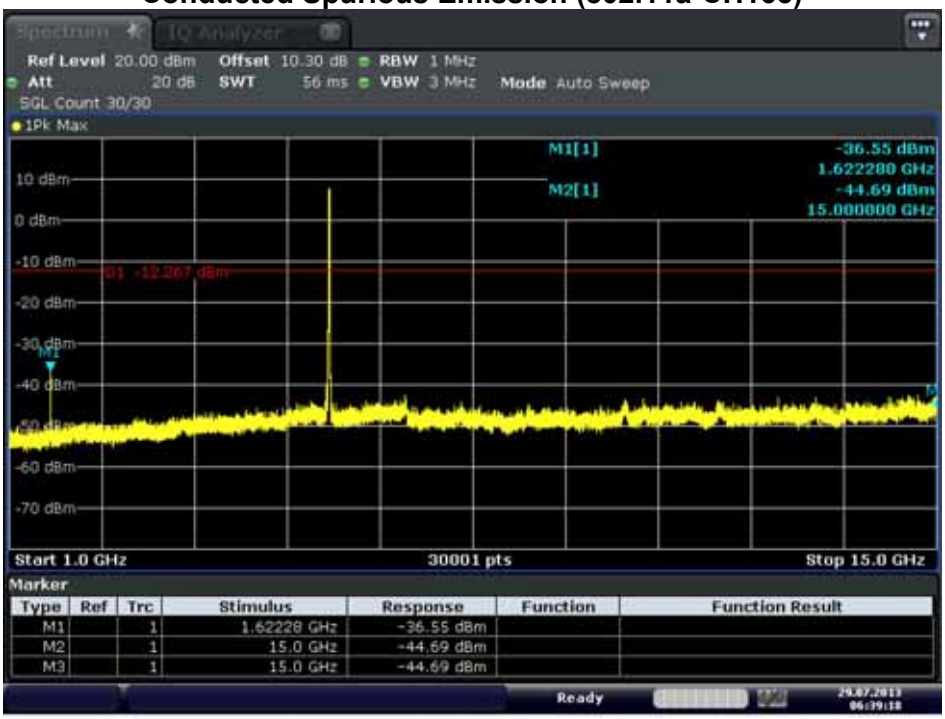
Date: 29.JUL.2013 06:36:35

Conducted Spurious Emission (802.11a-CH157)



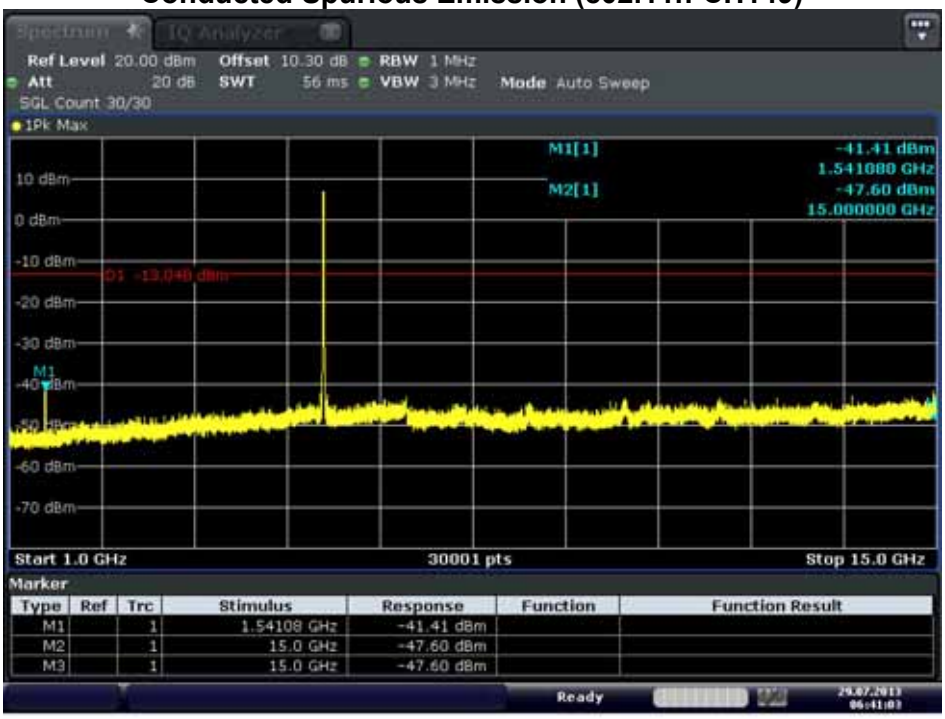
Date: 29.JUL.2013 06:37:44

Conducted Spurious Emission (802.11a-CH165)



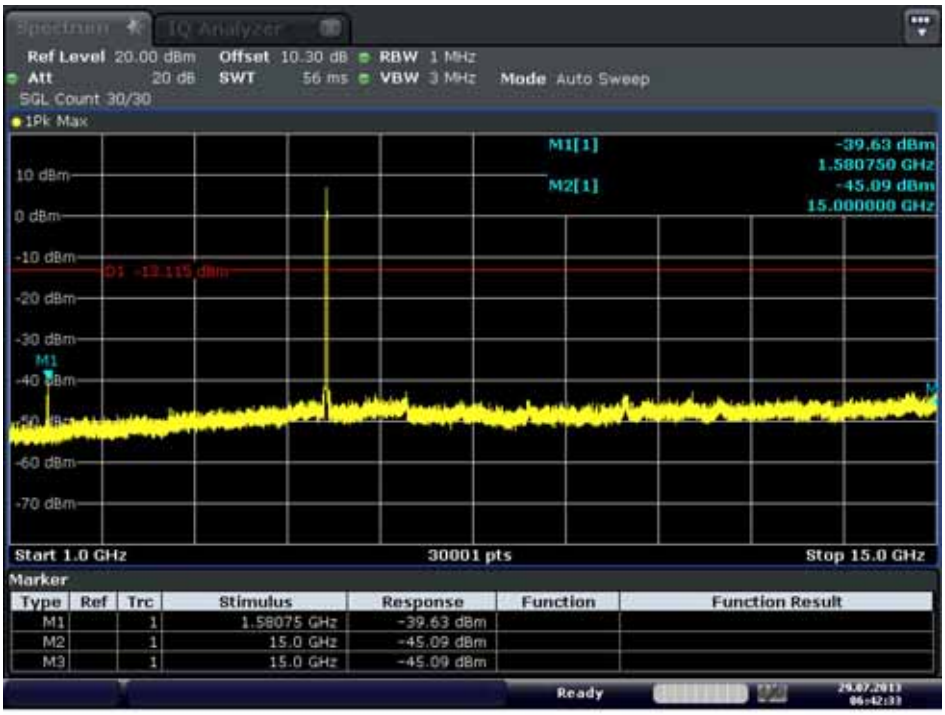
20 MHz BW

Conducted Spurious Emission (802.11n-CH149)



Date: 29.JUL.2013 06:41:04

Conducted Spurious Emission (802.11n-CH157)

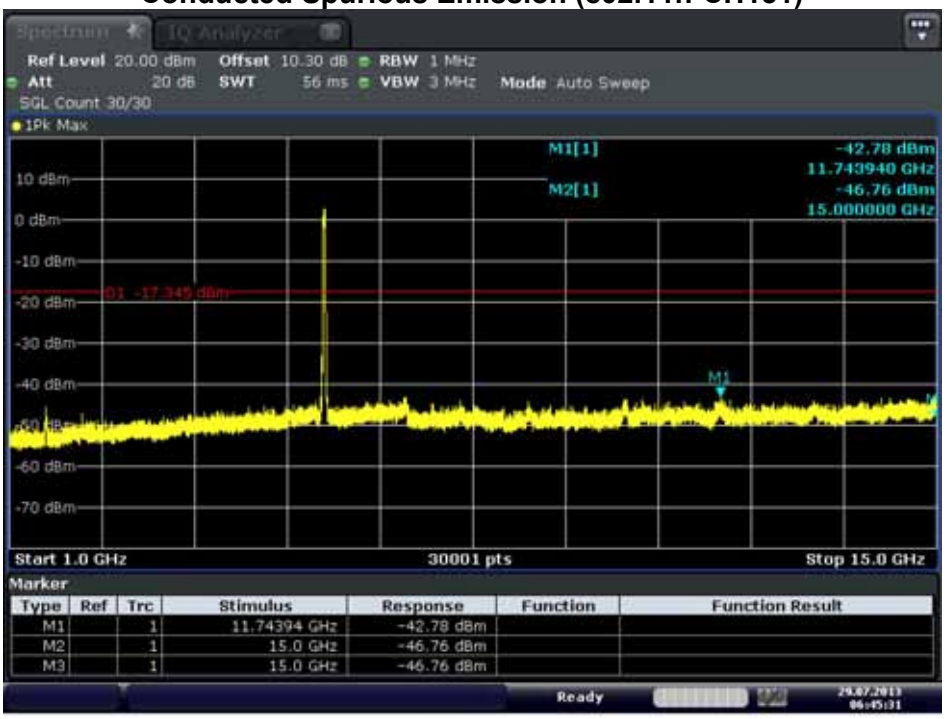


Date: 29.JUL.2013 06:42:33

Conducted Spurious Emission (802.11n-CH165)

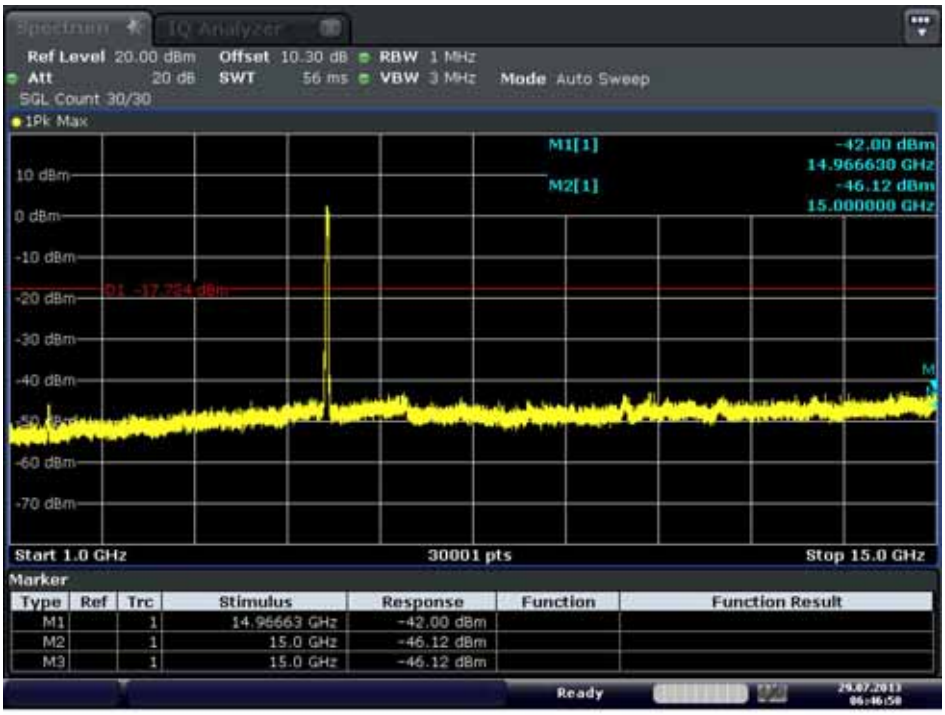
40 MHz BW

Conducted Spurious Emission (802.11n-CH151)



Date: 29.JUL.2013 06:45:31

Conducted Spurious Emission (802.11n-CH159)



Date: 29.JUL.2013 06:46:50

10 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b-CH1)

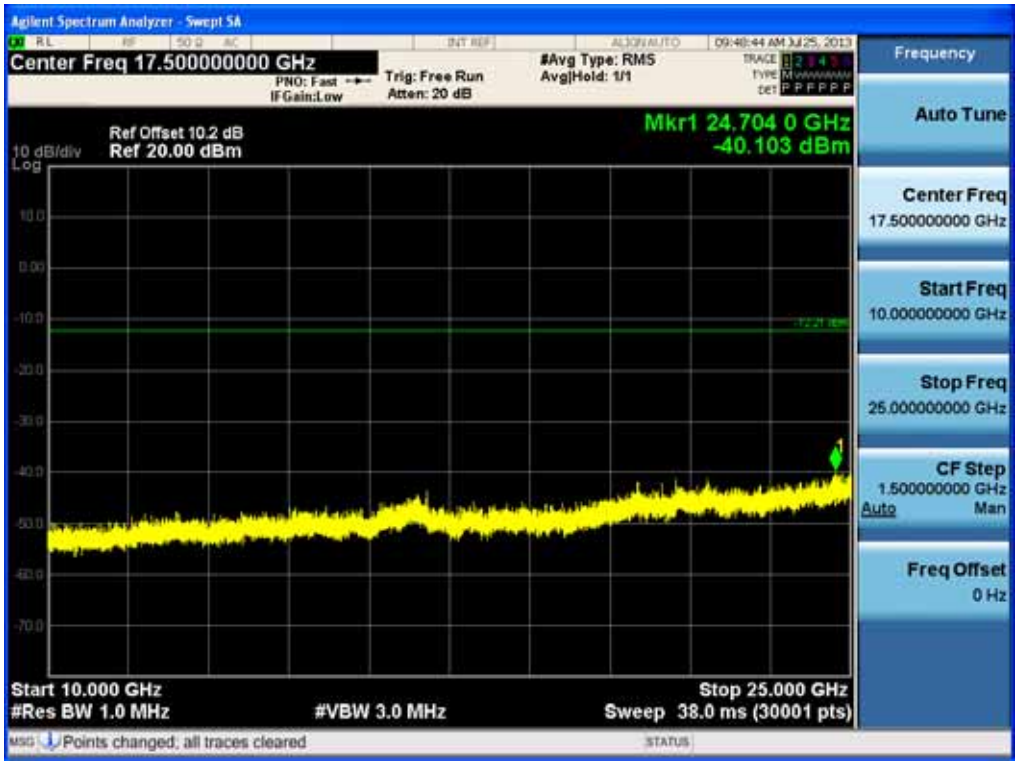
Conducted Spurious Emission (802.11b-CH6)

Conducted Spurious Emission (802.11b-CH11)

Conducted Spurious Emission (802.11g-CH1)

Conducted Spurious Emission (802.11g-CH6)

Conducted Spurious Emission (802.11g-CH11)



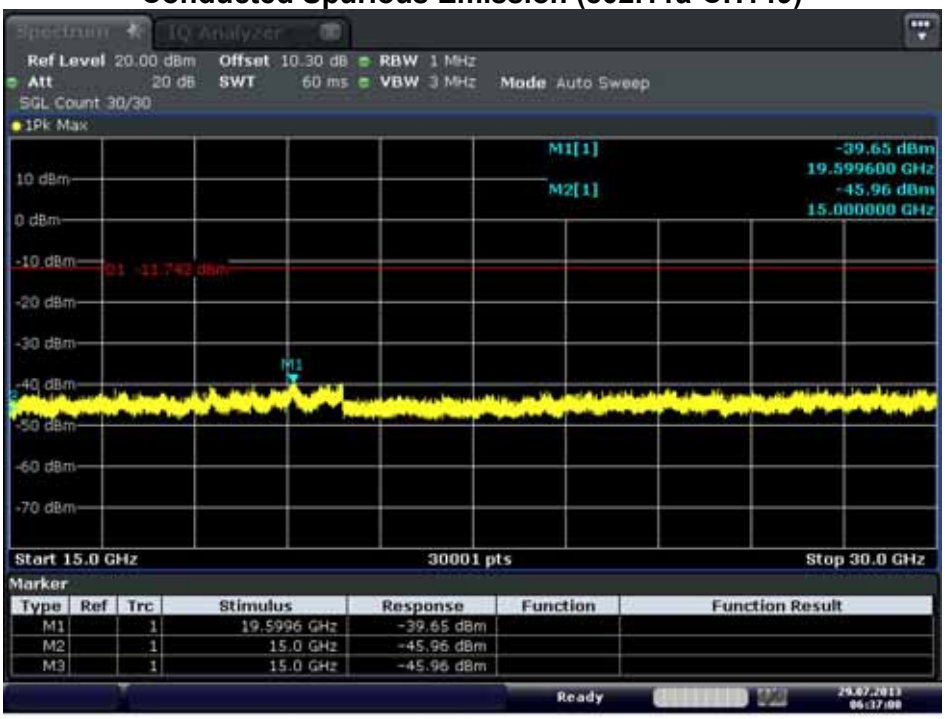
Conducted Spurious Emission (802.11n-CH1)

Conducted Spurious Emission (802.11n-CH6)

Conducted Spurious Emission (802.11n-CH11)

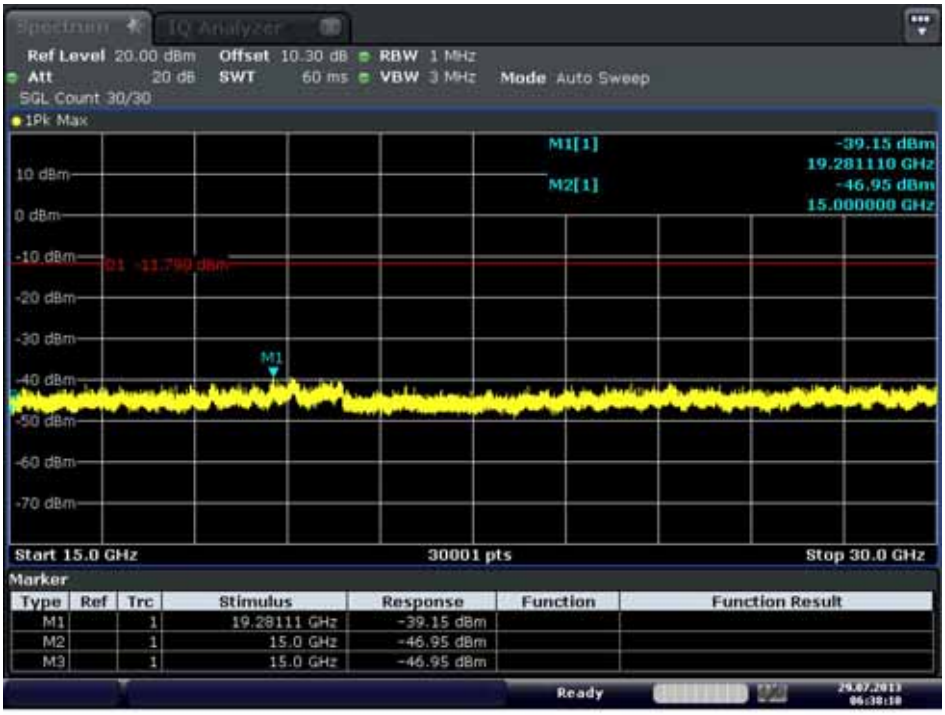
15 GHz ~ 30 GHz

Conducted Spurious Emission (802.11a-CH149)



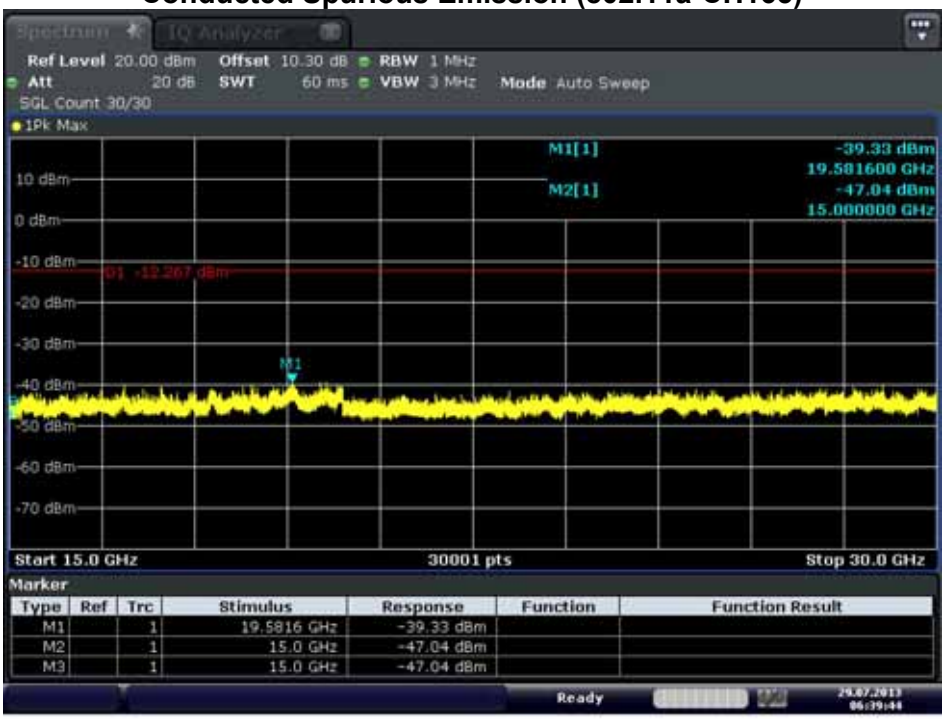
Date: 29.JUL.2013 06:37:00

Conducted Spurious Emission (802.11a-CH157)



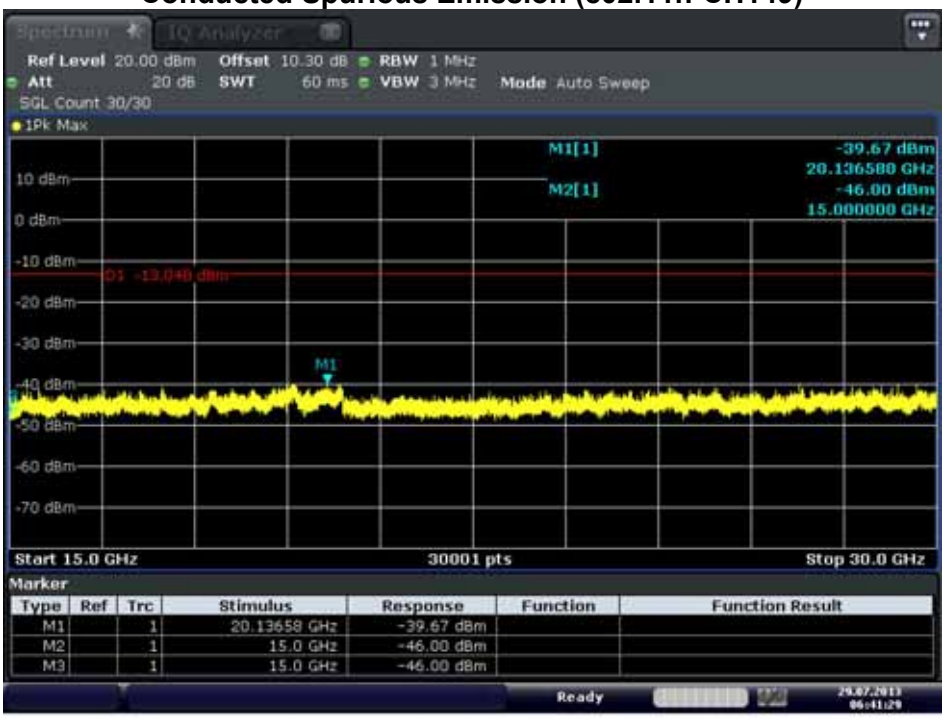
Date: 29.JUL.2013 06:38:10

Conducted Spurious Emission (802.11a-CH165)



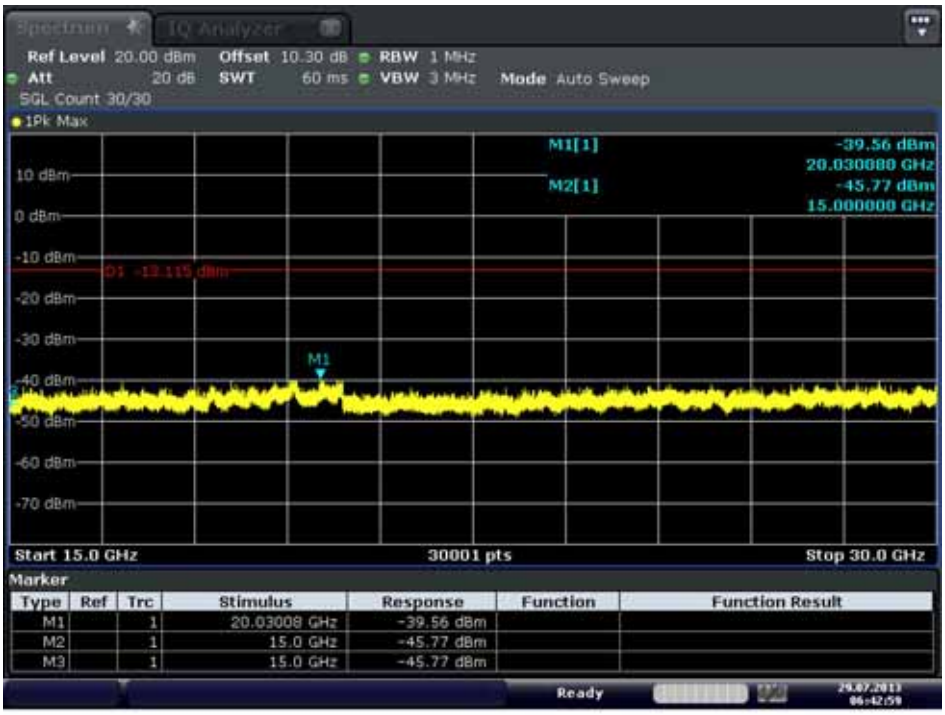
20 MHz BW

Conducted Spurious Emission (802.11n-CH149)



Date: 29.JUL.2013 06:41:29

Conducted Spurious Emission (802.11n-CH157)

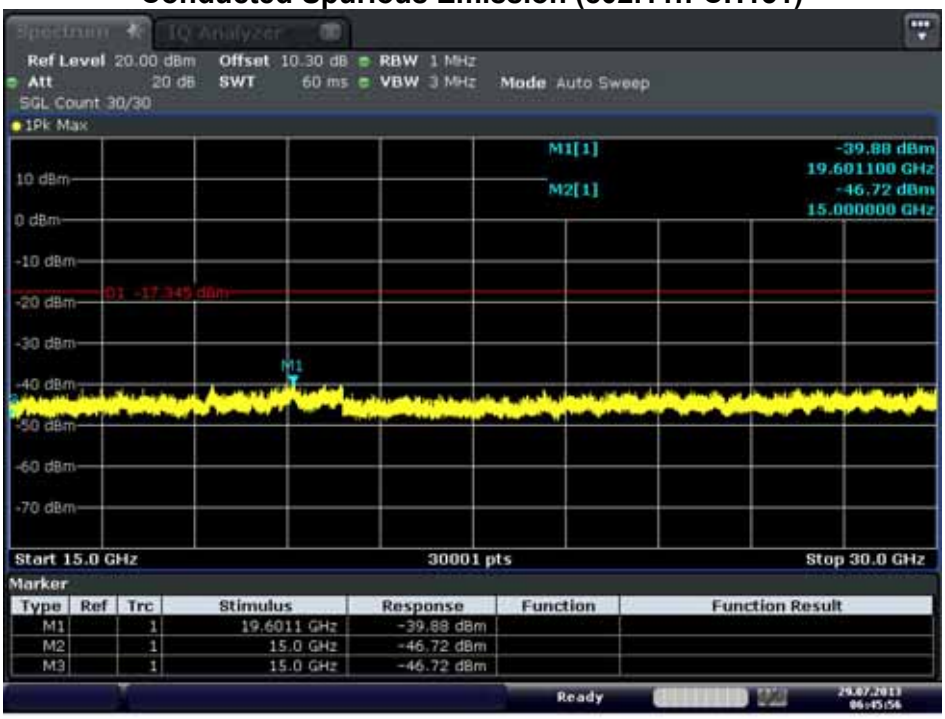


Date: 29.JUL.2013 06:42:59

Conducted Spurious Emission (802.11n-CH165)

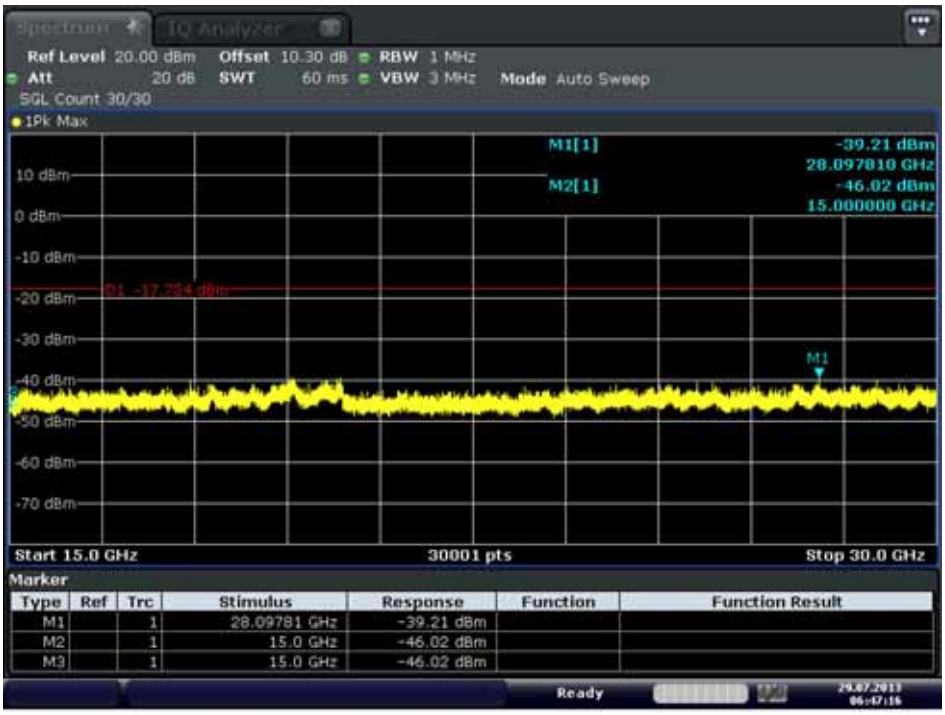
40 MHz BW

Conducted Spurious Emission (802.11n-CH151)



Date: 29.JUL.2013 06:45:56

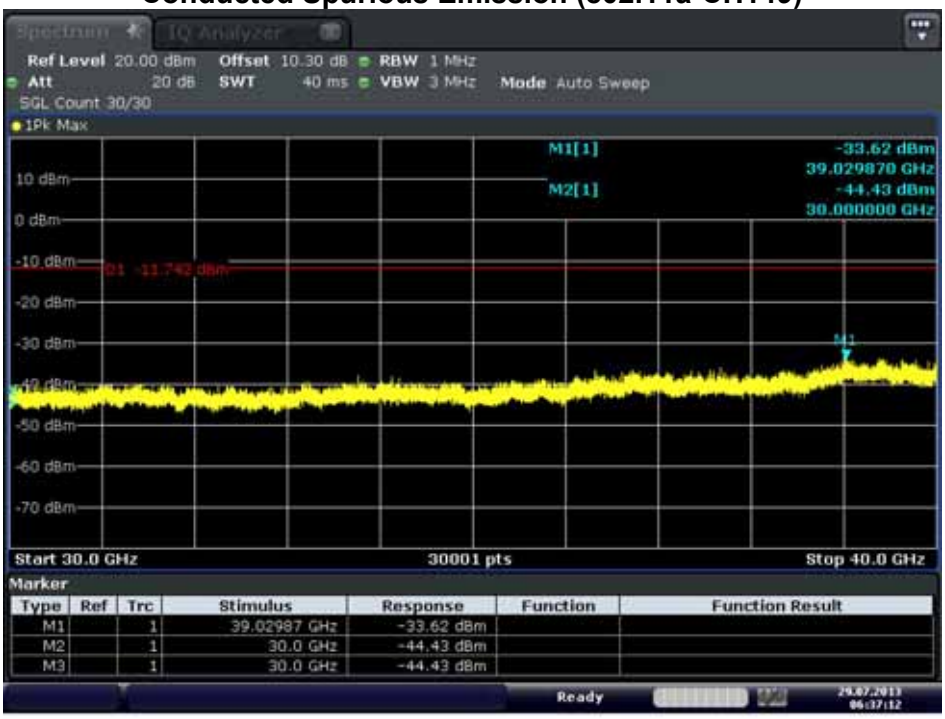
Conducted Spurious Emission (802.11n-CH159)



Date: 29.JUL.2013 06:47:16

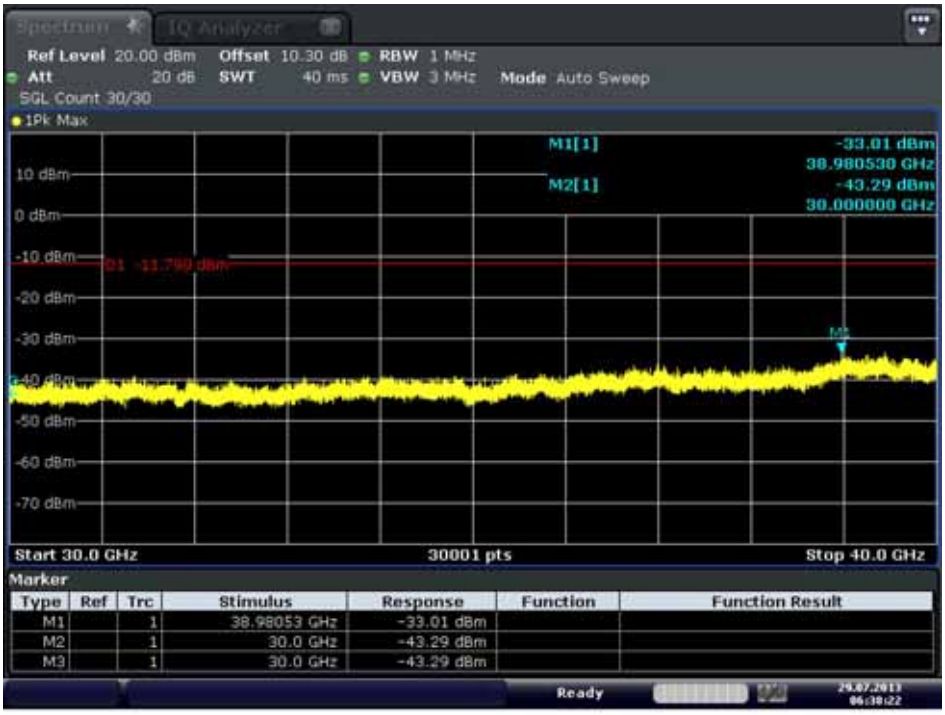
30 GHz ~ 40 GHz

Conducted Spurious Emission (802.11a-CH149)



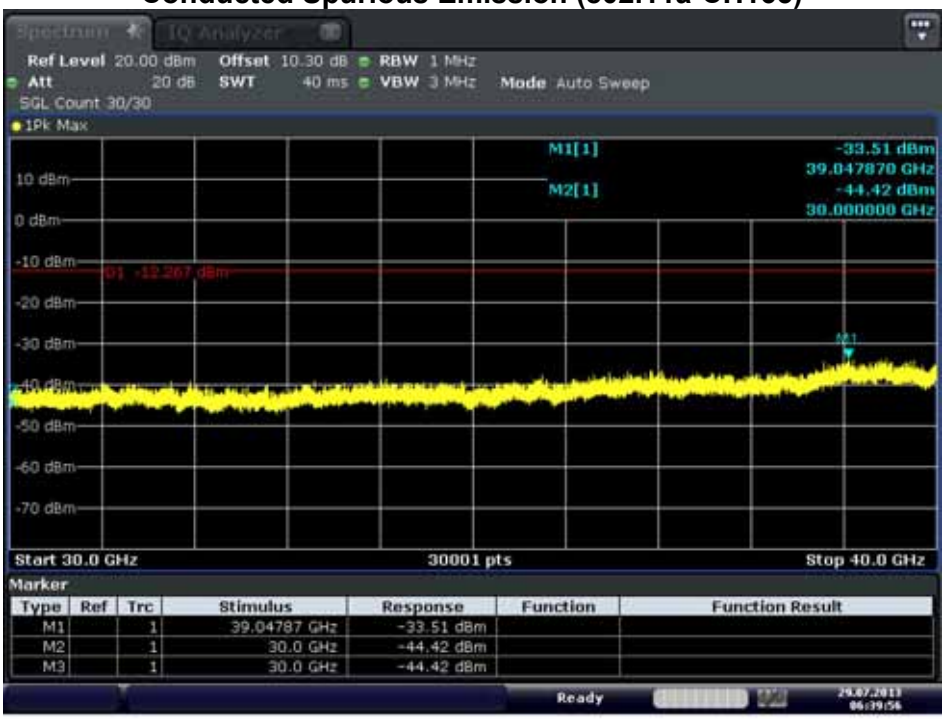
Date: 29.JUL.2013 06:37:12

Conducted Spurious Emission (802.11a-CH157)



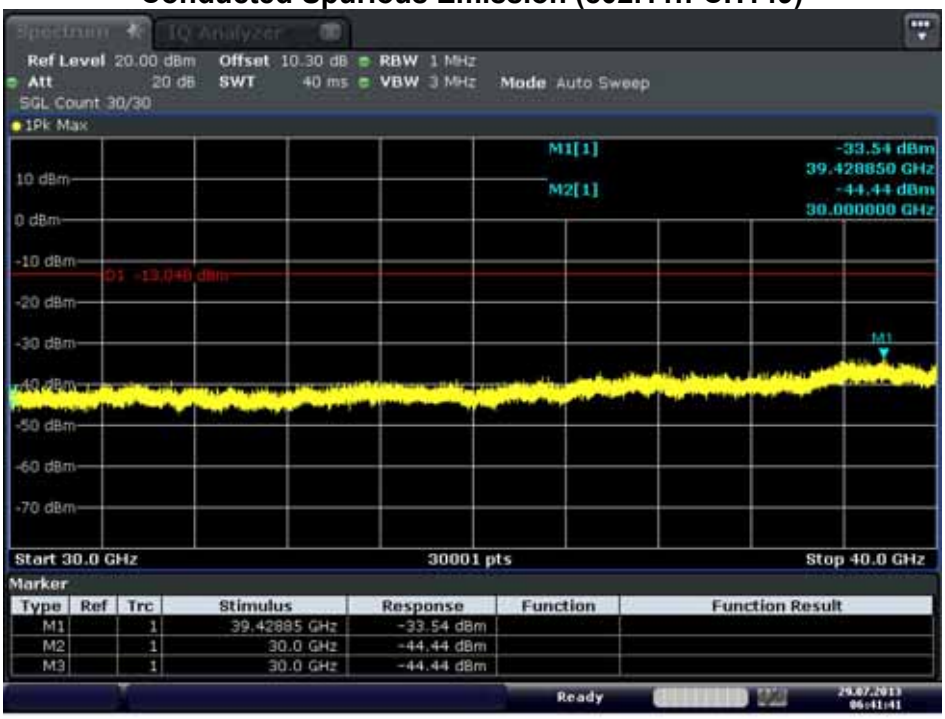
Date: 29.JUL.2013 06:38:22

Conducted Spurious Emission (802.11a-CH165)



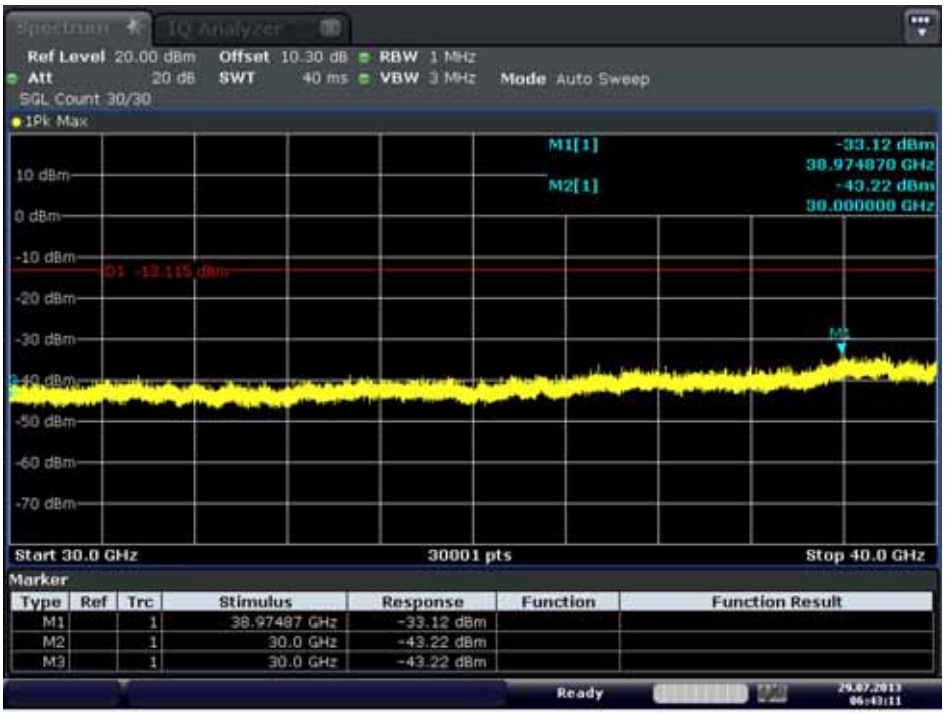
20 MHz BW

Conducted Spurious Emission (802.11n-CH149)



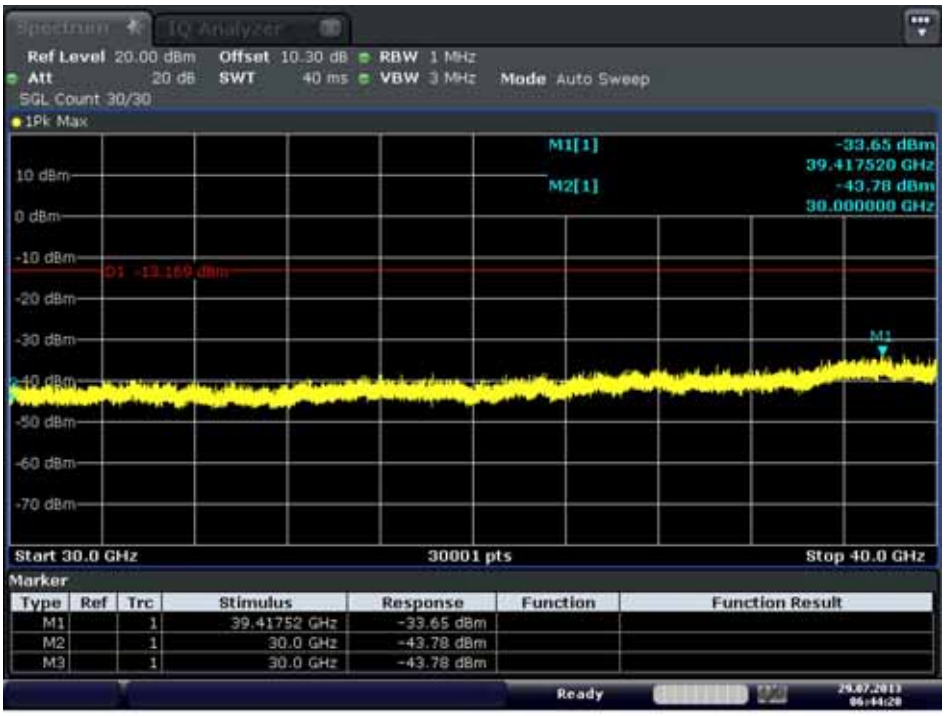
Date: 29.JUL.2013 06:41:42

Conducted Spurious Emission (802.11n-CH157)



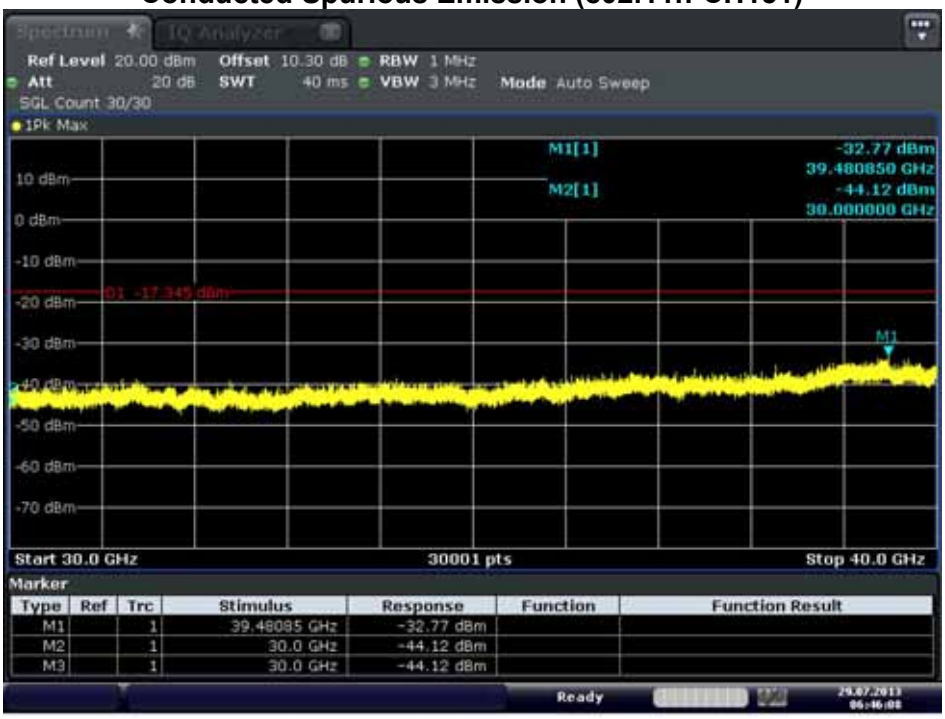
Date: 29.JUL.2013 06:43:11

Conducted Spurious Emission (802.11n-CH165)



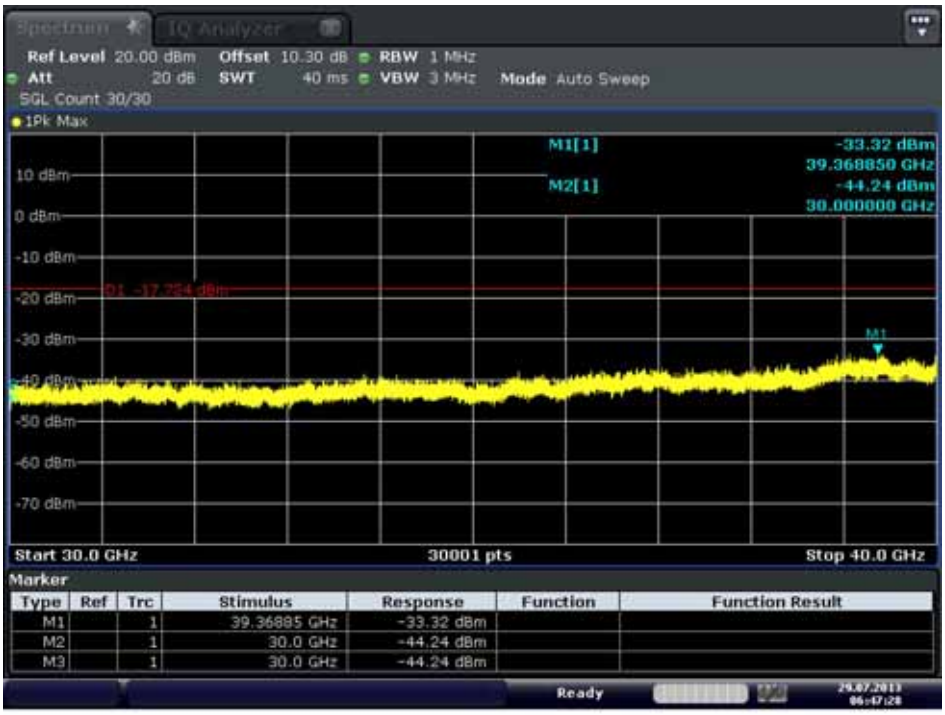
40 MHz BW

Conducted Spurious Emission (802.11n-CH151)



Date: 29.JUL.2013 06:46:09

Conducted Spurious Emission (802.11n-CH159)



Date: 29.JUL.2013 06:47:28

8.6 RADIATED MEASUREMENT.

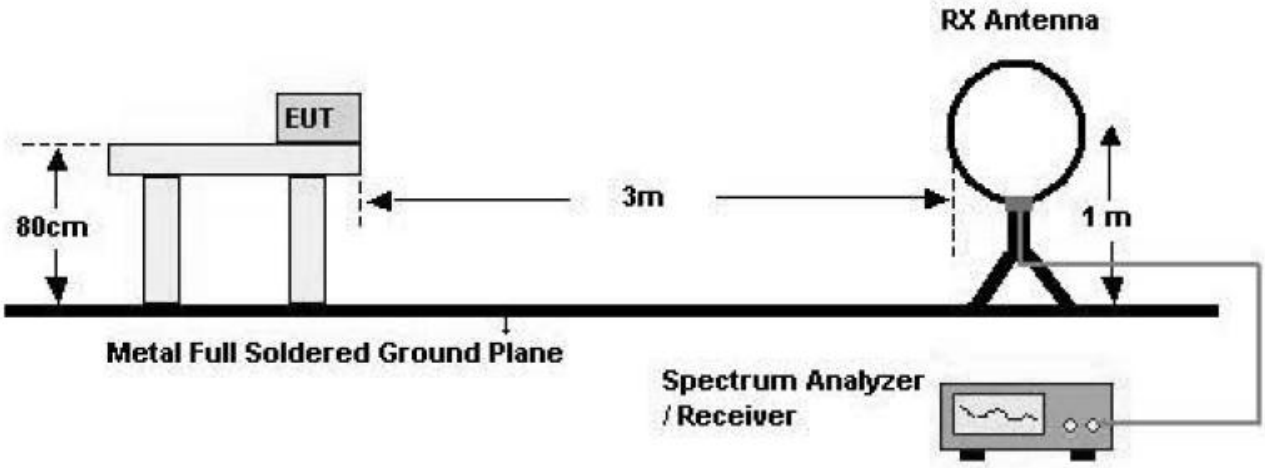
8.6.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

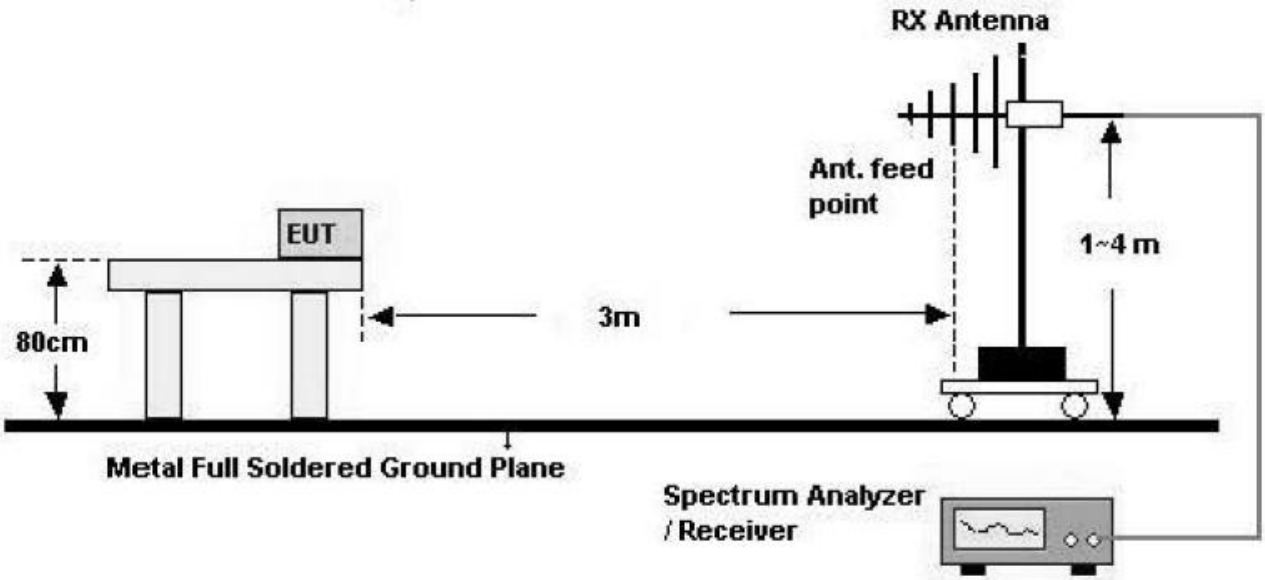
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

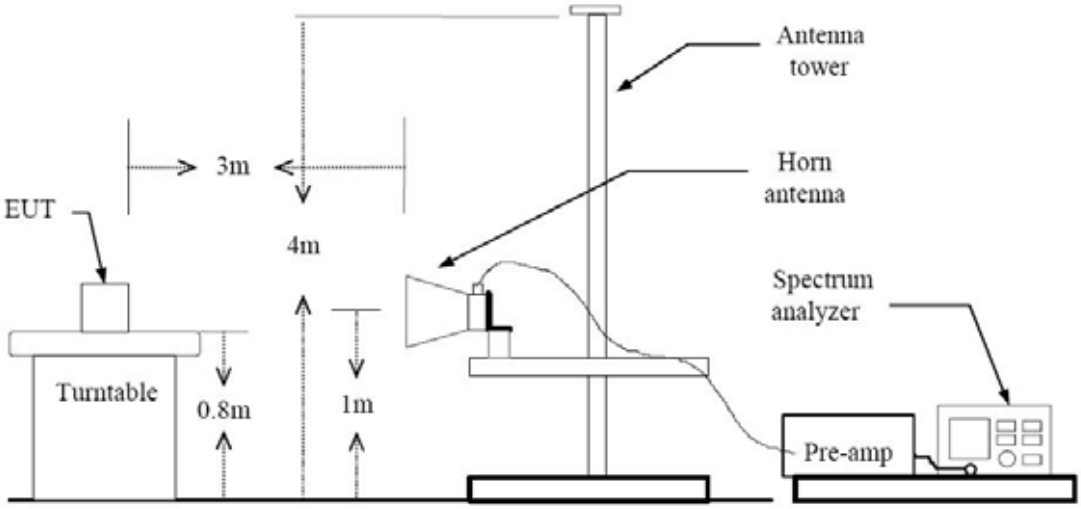
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

ANSI C63.10(2009)

Method 12.2.4 in KDB 558074, issued 04/09/2013 (Peak)

Method 12.2.5.1 in KDB 558074, issued 04/09/2013(Average Case 1)

Method 12.2.5.3 in KDB 558074, issued 04/09/2013(Average Case 2)

Spectrum Setting

- Peak

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

RBW = cf. Table 1.

VBW ≥ 3 x 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

Case 1

If the EUT can be configured or modified to transmit continuously (duty cycle ≥ 98 percent then the average emission levels shall be measured using the following method (with EUT transmitting continuously).

RBW = 1 MHz (unless otherwise specified).

VBW ≥3 x RBW.

Detector = RMS, if span/(# of points in sweep) ≤ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

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

1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

Sweep time = auto.

Perform a trace average of at least 100 traces.

Case 2

If continuous transmission of the EUT (i.e., duty cycle ≥ 98 percent) cannot be achieved and the duty cycle is not constant (i.e., duty cycle variations exceed ± 2 percent), then the following procedure shall be used:

Set RBW = 1 MHz.

Set VBW ≥ 1/T.

Video bandwidth mode or display mode

1) The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).
2) As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 times (1/duty cycle) traces.

Note :

1. We used the case 1 for 802.11b mode and the case 2 for802.11a/g/n_20/n_40 to perform the average filed strength measurements for RSE and Band Edge test.
2. The actual setting value of VBW for 802.11a/g/n_20/n_40.

Mode	Worst Data rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	6	2.034	2.154	94.43	491.6	1000
g	6	2.034	2.154	94.43	491.6	1000
n_20	6.5	1.890	2.010	94.03	529.1	1000
n_40	13.5	0.932	0.992	93.95	1073.0	3000

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dBμV/m	dBm /m	dBm	(H/V)	dBμV/m	dBμV/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
㎒	dBμV/m	dBm /m	dBm	(H/V)	dBμV/m	dBμV/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/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	58.85	-4.25	V	54.60	73.98	19.38	PK
4824	53.34	-4.25	V	49.09	53.98	4.89	AV
7236	52.44	5.21	V	57.65	73.98	16.33	PK
7236	40.55	5.21	V	45.76	53.98	8.22	AV
4824	59.42	-4.25	H	55.17	73.98	18.81	PK
4824	54.52	-4.25	H	50.27	53.98	3.71	AV
7236	52.11	5.21	H	57.32	73.98	16.66	PK
7236	40.62	5.21	H	45.83	53.98	8.15	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	54.05	-4.25	V	49.80	73.98	24.18	PK
4824	40.77	-4.25	V	36.52	53.98	17.46	AV
7236	52.51	5.21	V	57.72	73.98	16.26	PK
7236	38.96	5.21	V	44.17	53.98	9.81	AV
4824	54.82	-4.25	H	50.57	73.98	23.41	PK
4824	42.01	-4.25	H	37.76	53.98	16.22	AV
7236	52.07	5.21	H	57.28	73.98	16.70	PK
7236	38.91	5.21	H	44.12	53.98	9.86	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	53.86	-4.25	V	49.61	73.98	24.37	PK
4824	40.22	-4.25	V	35.97	53.98	18.01	AV
7236	53.12	5.21	V	58.33	73.98	15.65	PK
7236	38.91	5.21	V	44.12	53.98	9.86	AV
4824	54.69	-4.25	H	50.44	73.98	23.54	PK
4824	41.33	-4.25	H	37.08	53.98	16.90	AV
7236	52.18	5.21	H	57.39	73.98	16.59	PK
7236	38.97	5.21	H	44.18	53.98	9.80	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 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/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	58.44	-3.93	V	54.51	73.98	19.47	PK
4874	51.21	-3.93	V	47.28	53.98	6.70	AV
7311	52.77	4.97	V	57.74	73.98	16.24	PK
7311	40.95	4.97	V	45.92	53.98	8.06	AV
4874	58.54	-3.93	H	54.61	73.98	19.37	PK
4874	54.10	-3.93	H	50.17	53.98	3.81	AV
7311	53.63	4.97	H	58.60	73.98	15.38	PK
7311	40.92	4.97	H	45.89	53.98	8.09	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	53.46	-3.93	V	49.53	73.98	24.45	PK
4874	40.08	-3.93	V	36.15	53.98	17.83	AV
7311	52.93	4.97	V	57.90	73.98	16.08	PK
7311	39.25	4.97	V	44.22	53.98	9.76	AV
4874	54.57	-3.93	H	50.64	73.98	23.34	PK
4874	41.01	-3.93	H	37.08	53.98	16.90	AV
7311	52.58	4.97	H	57.55	73.98	16.43	PK
7311	39.21	4.97	H	44.18	53.98	9.80	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	53.69	-3.93	V	49.76	73.98	24.22	PK
4874	39.62	-3.93	V	35.69	53.98	18.29	AV
7311	52.84	4.97	V	57.81	73.98	16.17	PK
7311	39.40	4.97	V	44.37	53.98	9.61	AV
4874	54.14	-3.93	H	50.21	73.98	23.77	PK
4874	40.61	-3.93	H	36.68	53.98	17.30	AV
7311	52.86	4.97	H	57.83	73.98	16.15	PK
7311	39.30	4.97	H	44.27	53.98	9.71	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 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/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	56.98	-3.75	V	53.23	73.98	20.75	PK
4924	50.01	-3.75	V	46.26	53.98	7.72	AV
7386	52.93	5.60	V	58.53	73.98	15.45	PK
7386	41.20	5.60	V	46.80	53.98	7.18	AV
4924	58.78	-3.75	H	55.03	73.98	18.95	PK
4924	54.70	-3.75	H	50.95	53.98	3.03	AV
7386	52.36	5.60	H	57.96	73.98	16.02	PK
7386	41.14	5.60	H	46.74	53.98	7.24	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	52.63	-3.75	V	48.88	73.98	25.10	PK
4924	39.55	-3.75	V	35.80	53.98	18.18	AV
7386	52.91	5.60	V	58.51	73.98	15.47	PK
7386	39.52	5.60	V	45.12	53.98	8.86	AV
4924	56.21	-3.75	H	52.46	73.98	21.52	PK
4924	41.97	-3.75	H	38.22	53.98	15.76	AV
7386	53.13	5.60	H	58.73	73.98	15.25	PK
7386	39.53	5.60	H	45.13	53.98	8.85	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	52.30	-3.75	V	48.55	73.98	25.43	PK
4924	39.24	-3.75	V	35.49	53.98	18.49	AV
7386	53.23	5.60	V	58.83	73.98	15.15	PK
7386	39.54	5.60	V	45.14	53.98	8.84	AV
4924	54.26	-3.75	H	50.51	73.98	23.47	PK
4924	40.79	-3.75	H	37.04	53.98	16.94	AV
7386	52.79	5.60	H	58.39	73.98	15.59	PK
7386	39.47	5.60	H	45.07	53.98	8.91	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	42.12	11.22	V	53.34	73.98	20.64	PK
11490	32.56	11.22	V	43.78	53.98	10.20	AV
11490	42.43	11.22	H	53.65	73.98	20.33	PK
11490	33.14	11.22	H	44.36	53.98	9.62	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	41.54	11.71	V	53.25	73.98	20.73	PK
11570	32.01	11.71	V	43.72	53.98	10.26	AV
11570	41.75	11.71	H	53.46	73.98	20.52	PK
11570	32.64	11.71	H	44.35	53.98	9.63	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	42.11	11.34	V	53.45	73.98	20.53	PK
11650	32.15	11.34	V	43.49	53.98	10.49	AV
11650	42.32	11.34	H	53.66	73.98	20.32	PK
11650	33.40	11.34	H	44.74	53.98	9.24	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	5.8 GHz
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	40.87	11.22	V	52.09	73.98	21.89	PK
11490	31.76	11.22	V	42.98	53.98	11.00	AV
11490	42.07	11.22	H	53.29	73.98	20.69	PK
11490	33.03	11.22	H	44.25	53.98	9.73	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	5.8 GHz
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	41.12	11.71	V	52.83	73.98	21.15	PK
11570	31.06	11.71	V	42.77	53.98	11.21	AV
11570	41.23	11.71	H	52.94	73.98	21.04	PK
11570	32.56	11.71	H	44.27	53.98	9.71	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	5.8 GHz
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	41.67	11.34	V	53.01	73.98	20.97	PK
11650	31.83	11.34	V	43.17	53.98	10.81	AV
11650	42.08	11.34	H	53.42	73.98	20.56	PK
11650	33.28	11.34	H	44.62	53.98	9.36	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	5.8 GHz
Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5755 MHz
Channel No.	151 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11510	41.59	11.53	V	53.12	73.98	20.86	PK
11510	32.54	11.53	V	44.07	53.98	9.91	AV
11510	41.72	11.53	H	53.25	73.98	20.73	PK
11510	33.06	11.53	H	44.59	53.98	9.39	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	5.8 GHz
Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5795 MHz
Channel No.	159 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11590	41.29	11.64	V	52.93	73.98	21.05	PK
11590	30.63	11.64	V	42.27	53.98	11.71	AV
11590	41.49	11.64	H	53.13	73.98	20.85	PK
11590	31.29	11.64	H	42.93	53.98	11.05	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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

8.6.2 RECEIVER SPURIOUS EMISSIONS

FCC Rule(s)	**§15.109 (see Table Below)**
Test Requirements:	**Emission Level shall not exceed §15.109 limits**
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: 1 MHz (Peak)**
Mode of operation:	**Receive**

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30 – 88	100 (40 dBuV)	3
88 - 216	150 (43.5 dBuV))	3
216 – 960	200 (46 dBuV)	3
Above 960	500 (54 dBuV)	3

Operation Mode: Receive:

30 MHz ~ 1 GHz

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

Above 1 GHz

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
No Critical peaks found							

8.6.3 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/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	33.14	33.90	H	67.04	73.98	6.94	PK
2390.0	14.00	33.90	H	47.90	53.98	6.08	AV
2390.0	32.20	33.90	V	66.10	73.98	7.88	PK
2390.0	13.40	33.90	V	47.30	53.98	6.68	AV
2483.5	33.10	33.99	H	67.09	73.98	6.89	PK
2483.5	15.29	33.99	H	49.28	53.98	4.70	AV
2483.5	32.44	33.99	V	66.43	73.98	7.55	PK
2483.5	14.85	33.99	V	48.84	53.98	5.14	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/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	26.55	33.90	H	60.45	73.98	13.53	PK
2390.0	13.73	33.90	H	47.63	53.98	6.35	AV
2390.0	26.69	33.90	V	60.59	73.98	13.39	PK
2390.0	13.30	33.90	V	47.20	53.98	6.78	AV
2483.5	26.71	33.99	H	60.70	73.98	13.28	PK
2483.5	14.62	33.99	H	48.61	53.98	5.37	AV
2483.5	25.99	33.99	V	59.98	73.98	14.00	PK
2483.5	13.05	33.99	V	47.04	53.98	6.94	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	35.81	33.90	H	69.71	73.98	4.27	PK
2390.0	15.11	33.90	H	49.01	53.98	4.97	AV
2390.0	34.95	33.90	V	68.85	73.98	5.13	PK
2390.0	14.39	33.90	V	48.29	53.98	5.69	AV
2483.5	33.52	33.99	H	67.51	73.98	6.47	PK
2483.5	15.16	33.99	H	49.15	53.98	4.83	AV
2483.5	31.04	33.99	V	65.03	73.98	8.95	PK
2483.5	13.51	33.99	V	47.50	53.98	6.48	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.

8.7 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 11 Mbps, Ch.1 and 802.11b. Because 802.11b mode is worst case.

▣ RESULT PLOTS

Conducted Emissions (Line 1)

HCT

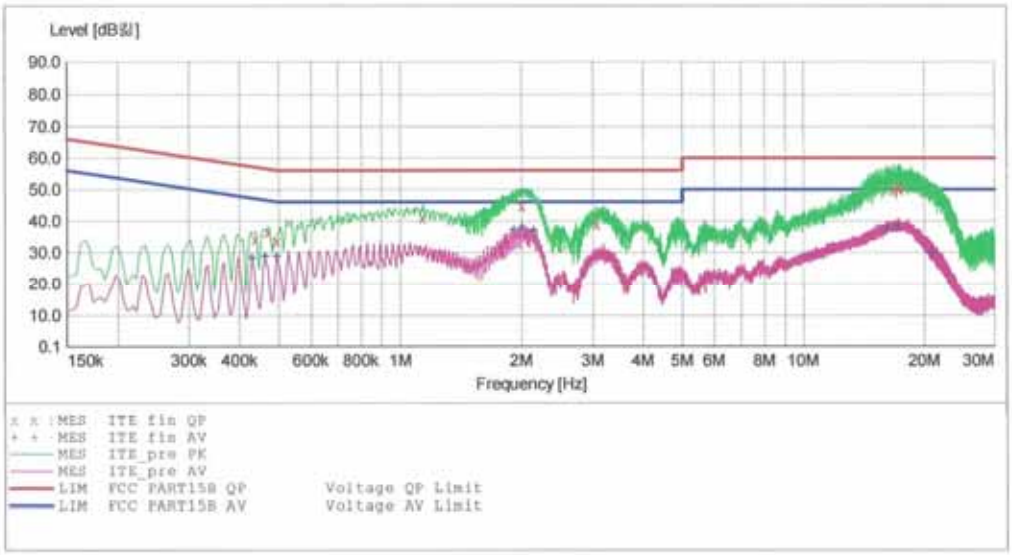
EMC

```
EUT:                    LG-V500
Manufacturer:           LG
Operating Condition:    WLAN MODE
Test Site:              SHIELD ROOM
Operator:               KI-YOON
Test Specification:     KN22 CLASS A
Comment:                H
```

SCAN TABLE: "KN14 CLASS B(H)"

Short Description: KN22 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: "ITE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.438001	34.20	9.8	57	22.9	---	---
0.470001	36.50	9.8	57	20.0	---	---
0.494001	33.70	9.8	56	22.4	---	---
1.140000	41.10	9.9	56	14.9	---	---
2.004000	44.80	9.9	56	11.2	---	---
3.068000	39.00	10.1	56	17.0	---	---
16.756000	49.70	10.8	60	10.3	---	---
17.320000	50.10	10.8	60	9.9	---	---
17.368000	50.50	10.8	60	9.5	---	---

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MEASUREMENT RESULT: "ITE_fin AV"

2013-07-30 9:27오전

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.430001	28.40	9.8	47	18.8	---	---
0.462001	28.80	9.8	47	17.8	---	---
0.494001	28.80	9.8	46	17.3	---	---
1.912000	37.20	9.9	46	8.8	---	---
2.012000	38.00	9.9	46	8.0	---	---
2.144000	37.10	10.0	46	8.9	---	---
16.172000	37.70	10.8	50	12.3	---	---
17.156000	38.60	10.8	50	11.4	---	---
20.856000	29.90	11.0	50	20.1	---	---

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Conducted Emissions (Line 2)

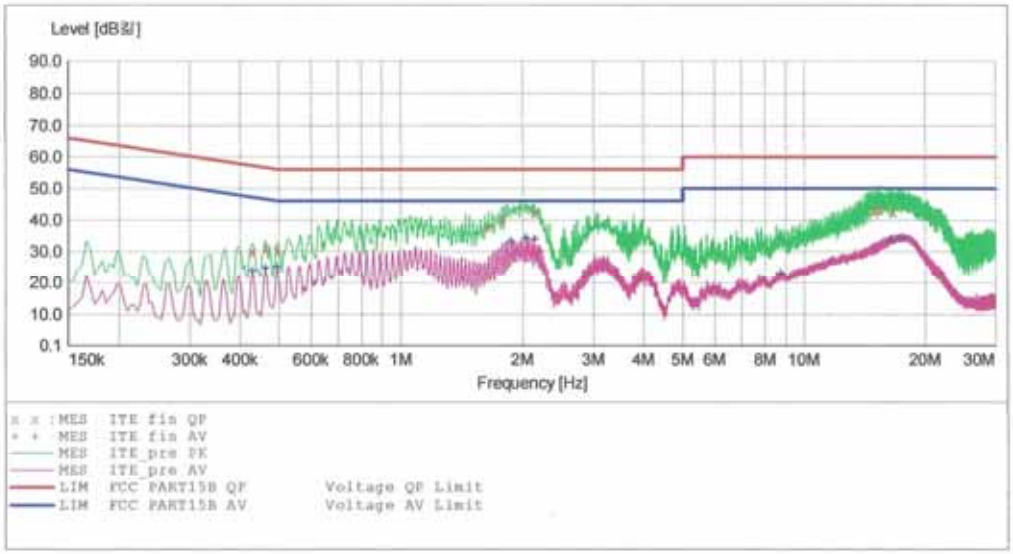
HCT

EMC

```
EUT:                  LG-V500
Manufacturer:         LG
Operating Condition:  WLAN MODE
Test Site:            SHIELD ROOM
Operator:             KI YOON
Test Specification:   KN22 CLASS A
Comment:              N
```

SCAN TABLE: "KN14 CLASS B(H)"

Short Description:			KN22 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: "ITE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.430001	30.10	10.0	57	27.2	---	---
0.462001	31.00	10.0	57	25.7	---	---
0.494001	30.40	10.0	56	25.7	---	---
1.648000	37.80	10.1	56	18.2	---	---
1.776000	40.40	10.1	56	15.6	---	---
2.140000	42.60	10.2	56	13.4	---	---
14.920000	43.10	11.0	60	16.9	---	---
15.356000	43.50	11.1	60	16.5	---	---
16.684000	42.80	11.1	60	17.2	---	---

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MEASUREMENT RESULT: "ITE_fin AV"

2013-07-30 9:39오전

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.430001	23.90	10.0	47	23.4	---	---
0.462001	24.80	10.0	47	21.9	---	---
0.494001	25.20	10.0	46	20.9	---	---
1.876000	33.30	10.1	46	12.7	---	---
2.040000	34.40	10.1	46	11.6	---	---
2.140000	34.00	10.2	46	12.0	---	---
8.756000	23.00	10.6	50	27.0	---	---
16.456000	33.70	11.1	50	16.3	---	---
17.600000	34.50	11.1	50	15.5	---	---

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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	12/17/2014	3150
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	04/16/2014	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	04/25/2014	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/14/2014	MY51110063
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	04/16/2014	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2014	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	04/16/2014	MY4442009
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/08/2014	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	04/16/2014	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	04/16/2014	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	03/19/2014	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2013	11377
Agilent	87300B/Directional Coupler	Annual	12/24/2013	3116A03621
Hewlett Packard	11667B / Power Splitter	Annual	05/29/2014	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	04/24/2014	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
CERNEX	CBLU1183540 / POWER AMP	Annual	07/24/2014	21691
Agilent	8493C / Attenuator(10 dB)	Annual	07/24/2014	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617