

10. PEAK EXCURSION MEASUREMENT

10.1 Standard Applicable

15.407(a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

10.2 Measurement Procedure (following procedure G in KDB789033)

1. Pre-evaluation in selection for test mode based on KDB789033
2. Tests mode selection is based on the variations in signal structure,
 - (i) All signal types - OFDM;
 - (ii) All modulation types (BPSK, QPSK, 16-QAM, 64-QAM);
 - (iii) All bandwidth modes (20MHz, and 40MHz for 802.11n);
 - (iv) All variations in signal parameters (inapplicable);
 - (v) Error-correction coding rate (not required);
3. Place the EUT on the table and set it in transmitting mode.
4. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
5. Set RBW=1MHz, VBW = 3MHz, span =enough to capture the signal of the interest, Max. Hold, Detector = peak
6. use the procedure specified in KDB 789033 F) to determine the PPSD
7. compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD by the subtraction
8. Adjust the appropriate offset factor to the spectrum, where *Offset 14.01dB (5150~5250MHz, where = cable loss + attenuator + duty factor + MIMO factor, MIMO factor = $10 * \log(2) = 3dB$, attenuator = 10dB, cable loss+ duty factor = 1.01dB*
9. Repeat above procedures until all default test mode of default frequency band of the test is completed.

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802.11a

Table 18-4—Modulation-dependent parameters

Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSK})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})	Data rate (Mb/s) (20 MHz channel spacing)	Data rate (Mb/s) (10 MHz channel spacing)	Data rate (Mb/s) (5 MHz channel spacing)
BPSK	1/2	1	48	24	6	3	1.5
BPSK	3/4	1	48	36	9	4.5	2.25
QPSK	1/2	2	96	48	12	6	3
QPSK	3/4	2	96	72	18	9	4.5
16-QAM	1/2	4	192	96	24	12	6
16-QAM	3/4	4	192	144	36	18	9
64-QAM	2/3	6	288	192	48	24	12
64-QAM	3/4	6	288	216	54	27	13.5

802.11n_20

Table 20-30—MCS parameters for mandatory 20 MHz, $N_{SS} = 1$, $N_{ES} = 1$

MCS Index	Modulation	R	$N_{BPSK}(i_{SS})$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI (see NOTE)
0	BPSK	1/2	1	52	4	52	26	6.5	7.2
1	QPSK	1/2	2	52	4	104	52	13.0	14.4
2	QPSK	3/4	2	52	4	104	78	19.5	21.7
3	16-QAM	1/2	4	52	4	208	104	26.0	28.9
4	16-QAM	3/4	4	52	4	208	156	39.0	43.3
5	64-QAM	2/3	6	52	4	312	208	52.0	57.8
6	64-QAM	3/4	6	52	4	312	234	58.5	65.0
7	64-QAM	5/6	6	52	4	312	260	65.0	72.2

NOTE—Support of 400 ns GI is optional on transmit and receive.

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802.11n_40

Table 20-34—MCS parameters for optional 40 MHz, $N_{SS} = 1$, $N_{ES} = 1$

MCS Index	Modulation	R	$N_{BPSCS}(i_{SS})$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI
0	BPSK	1/2	1	108	6	108	54	13.5	15.0
1	QPSK	1/2	2	108	6	216	108	27.0	30.0
2	QPSK	3/4	2	108	6	216	162	40.5	45.0
3	16-QAM	1/2	4	108	6	432	216	54.0	60.0
4	16-QAM	3/4	4	108	6	432	324	81.0	90.0
5	64-QAM	2/3	6	108	6	648	432	108.0	120.0
6	64-QAM	3/4	6	108	6	648	486	121.5	135.0
7	64-QAM	5/6	6	108	6	648	540	135.0	150.0

802.11n_20_MIMO

MCS Index	Modulation	R	$N_{BPSCS}(i_{SS})$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI (see NOTE)
8	BPSK	1/2	1	52	4	104	52	13.0	14.4
9	QPSK	1/2	2	52	4	208	104	26.0	28.9
10	QPSK	3/4	2	52	4	208	156	39.0	43.3
11	16-QAM	1/2	4	52	4	416	208	52.0	57.8
12	16-QAM	3/4	4	52	4	416	312	78.0	86.7
13	64-QAM	2/3	6	52	4	624	416	104.0	115.6
14	64-QAM	3/4	6	52	4	624	468	117.0	130.0
15	64-QAM	5/6	6	52	4	624	520	130.0	144.4

NOTE—The 400 ns GI rate values are rounded to 1 decimal place.

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802.11n_40_MIMO

MCS Index	Modulation	R	$N_{BPSCS(i_{SS})}$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI
8	BPSK	1/2	1	108	6	216	108	27.0	30.0
9	QPSK	1/2	2	108	6	432	216	54.0	60.0
10	QPSK	3/4	2	108	6	432	324	81.0	90.0
11	16-QAM	1/2	4	108	6	864	432	108.0	120.0
12	16-QAM	3/4	4	108	6	864	648	162.0	180.0
13	64-QAM	2/3	6	108	6	1296	864	216.0	240.0
14	64-QAM	3/4	6	108	6	1296	972	243.0	270.0
15	64-QAM	5/6	6	108	6	1296	1080	270.0	300.0

Note: The test mode to be performed is circle in red as presents above

10.3 Measurement Equipment Used:

Refer to section 7.3 for details.

Remark: as per KDB 662291, MIMO mode is accomplished by the addition of $10 \log(N)$, where $N = 2$ as the simultaneous emission of Peak Excursion.

10.4 Test Set-up:

Refer to section 7.4 for details.

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10.5 Test Results:

Modulation Type: BPSK

Coding Rate: 1/2

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.027	-3.459	10.49	13.00

802.11n HT20, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	10.785	-0.247	11.03	13.00

802.11n HT40, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	7.312	-5.612	12.92	13.00

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Modulation Type: QPSK

Coding Rate: 1/2

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.611	-4.597	12.21	13.00

802.11n HT20, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	10.923	-1.610	12.53	13.00

802.11n HT40, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	6.288	-6.052	12.34	13.00

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Modulation Type: 16-QAM

Coding Rate: 1/2

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.85	-5.075	12.93	13.00

802.11n HT20, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	10.703	-2.139	12.84	13.00

802.11n HT40, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	6.990	-5.355	12.35	13.00

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Modulation Type: 64-QAM

Coding Rate: 2/3

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.576	-5.331	12.91	13.00

802.11n HT20, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	11.118	-1.406	12.52	13.00

802.11n HT40, 5150~5250 MHz_MIMO

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	7.013	-4.465	11.48	13.00

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Modulation Type: BPSK, Coding Rate: 1/2
802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



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Modulation Type: QPSK, Coding Rate: 1/2
802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



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Member of SGS Group

Modulation Type: 16-QAM, Coding Rate: 1/2
802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



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Member of SGS Group

Modulation Type: 64-QAM, Coding Rate: 2/3
802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



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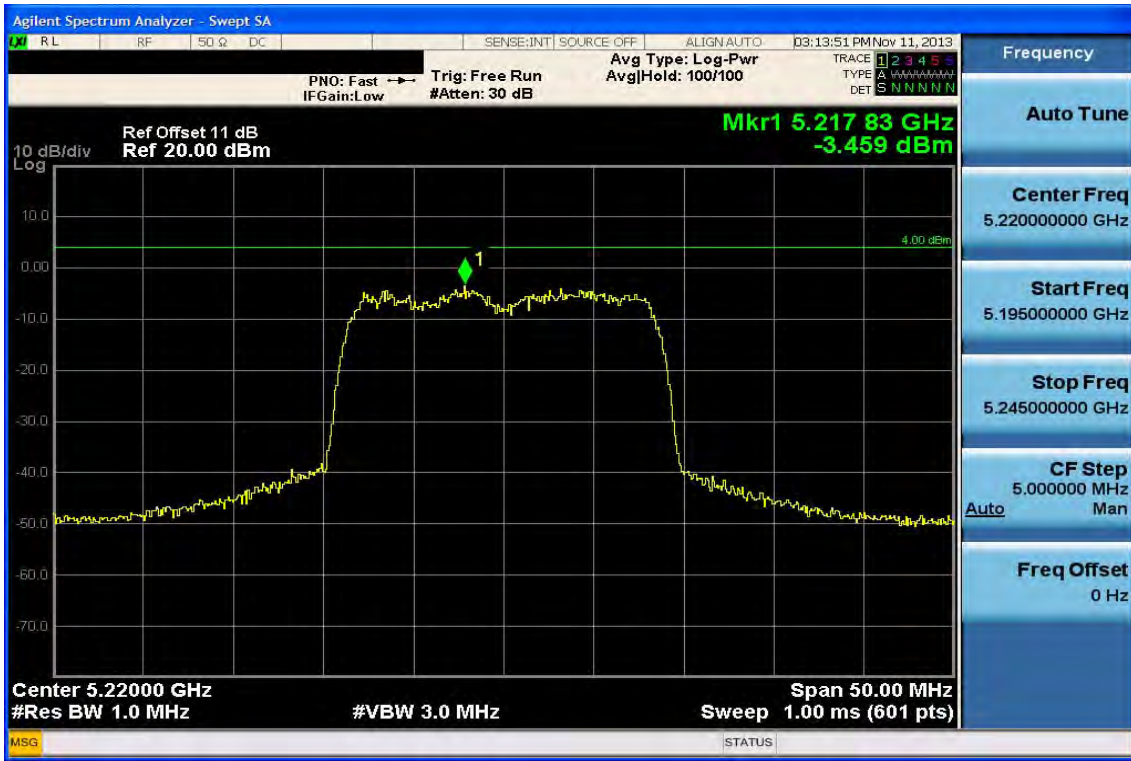
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Member of SGS Group

Modulation Type: BPSK, Coding Rate: 1/2
PPSD Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



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Modulation Type: QPSK, Coding Rate: 1/2
PPSD Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



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Modulation Type: 16-QAM, Coding Rate: 1/2
PPSD Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



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Modulation Type: 64-QAM, Coding Rate: 2/3
PPSD Data Plot (CH Mid 5220 MHz)



802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



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11. UNDESIRABLE EMISSION - CONDUCTED MEASUREMENT

11.1 Standard Applicable

According to §15.407(b),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

According to RSS-210 A9.2

1. For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
2. Emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
3. For transmitters operating in the band 5470-5725 MHz, all emissions outside that band shall not exceed -27 dBm/MHz e.i.r.p.

Procedure H2) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 1) 2) 3), and RSS-210 A9.2 1), 2), and 3)

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11.2 Measurement Procedure

Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100 kHz, VBW = 300 kHz while frequency of the measurement is swept below 1GHz, RBW = 1MHz & VBW = 3MHz while frequency of the measurement is swept above 1GHz on Spectrum. Detector = Peak, set DL as the limit line to -27dBm, add the offset = 4.7dB for frequency below 1GHz, and 2dB for frequency above 1GHz.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 3G, 3G to 6G, 6G to 13G, 13G to 18G, 18G to 26.5G and 26.5G to 40GHz
4. Via Software, combine 6 spans of frequency range into one plot

Conducted RF measurements of the transmitter output were made at the band edges and the adjacent restricted bands.

Also, conducted RF measurements of the transmitter output over the 30 MHz to 40 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

Note: the spike on the spectrum is the fundamental emission that does not account for the test outside the frequency band as required by associative regulatory provision.

11.3 Measurement Equipment Used:

Refer to section 7.3 for details.

11.4 Test Set-up:

Refer to section 7.4 for details.

11.5 Measurement Result:

Refer to next page for plots.

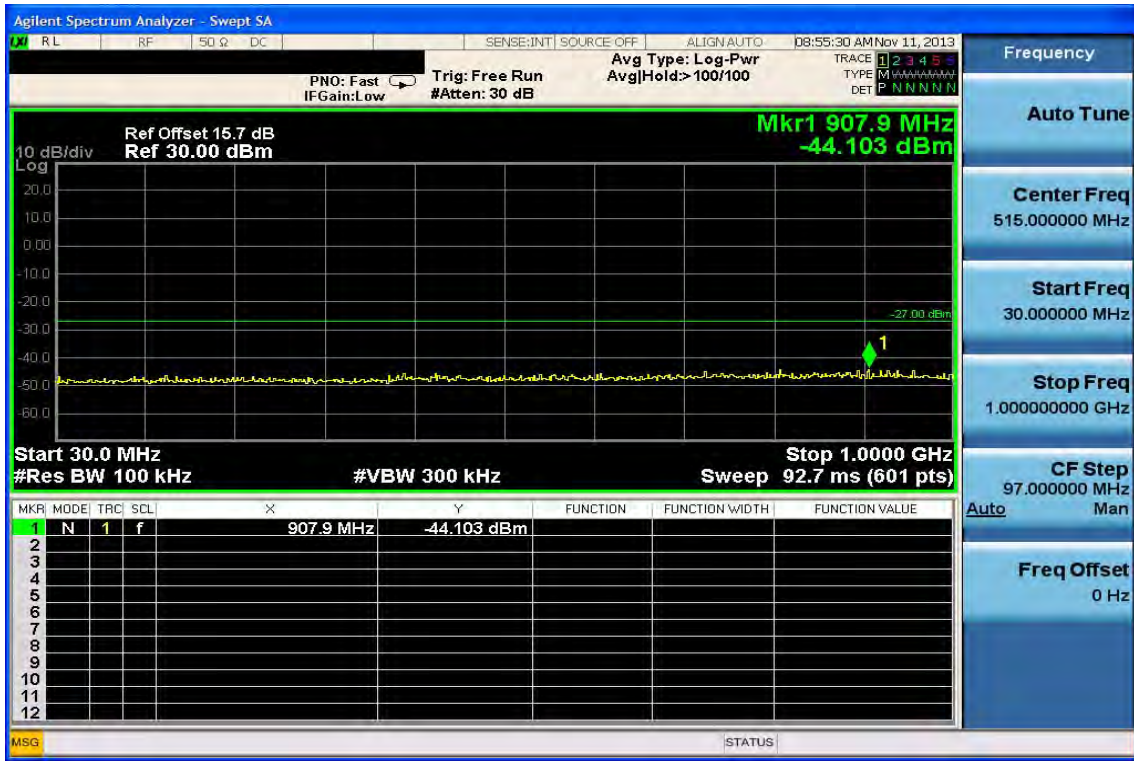
Remark: as per KDB 662291, MIMO mode is accomplished by the addition of $10 \log(N)$, where $N = 2$, and appropriate array gain (4.7dBi below 1GHz, and 2dBi above 1GHz, or gain with the nominal if higher than 4.7dBi, and 2dBi, respectively) as the simultaneous emission of spurious emission, and bandedge for conducted compliance test items.

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802.11a, 5150~5250 MHz
Ch Low 30MHz – 1GHz (5180 MHz)



Ch Low 1GHz – 6GHz



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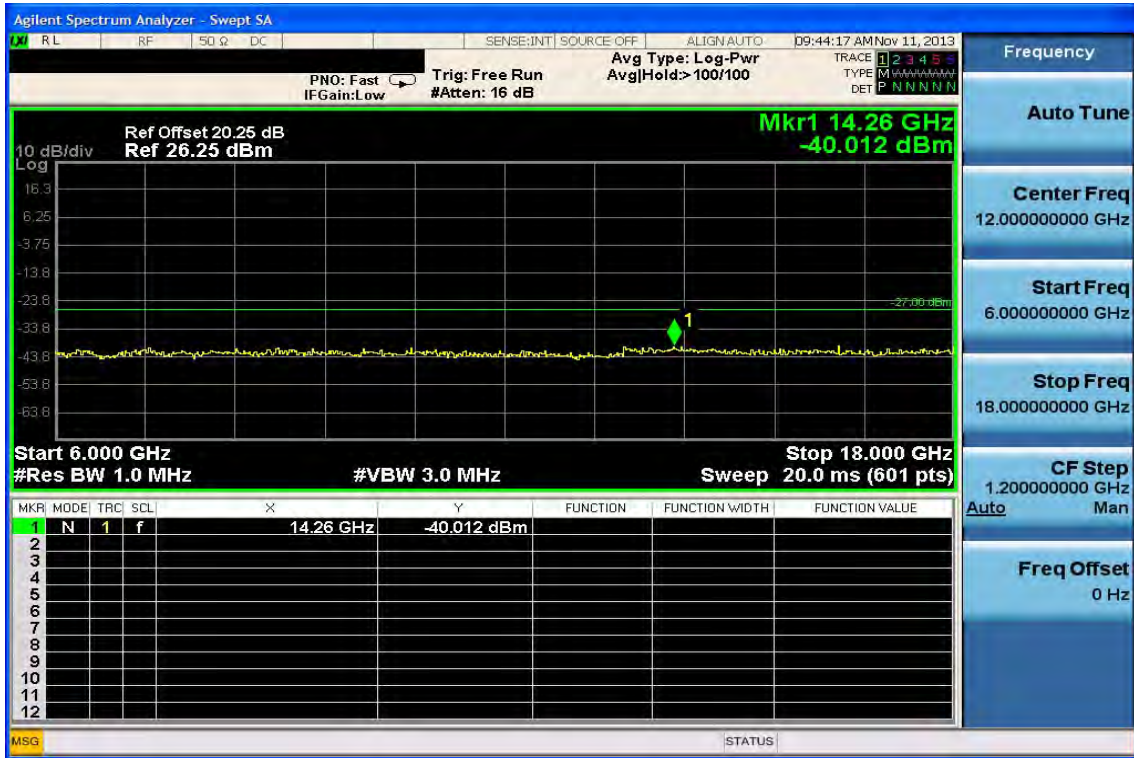
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f (886-2) 2298-0488

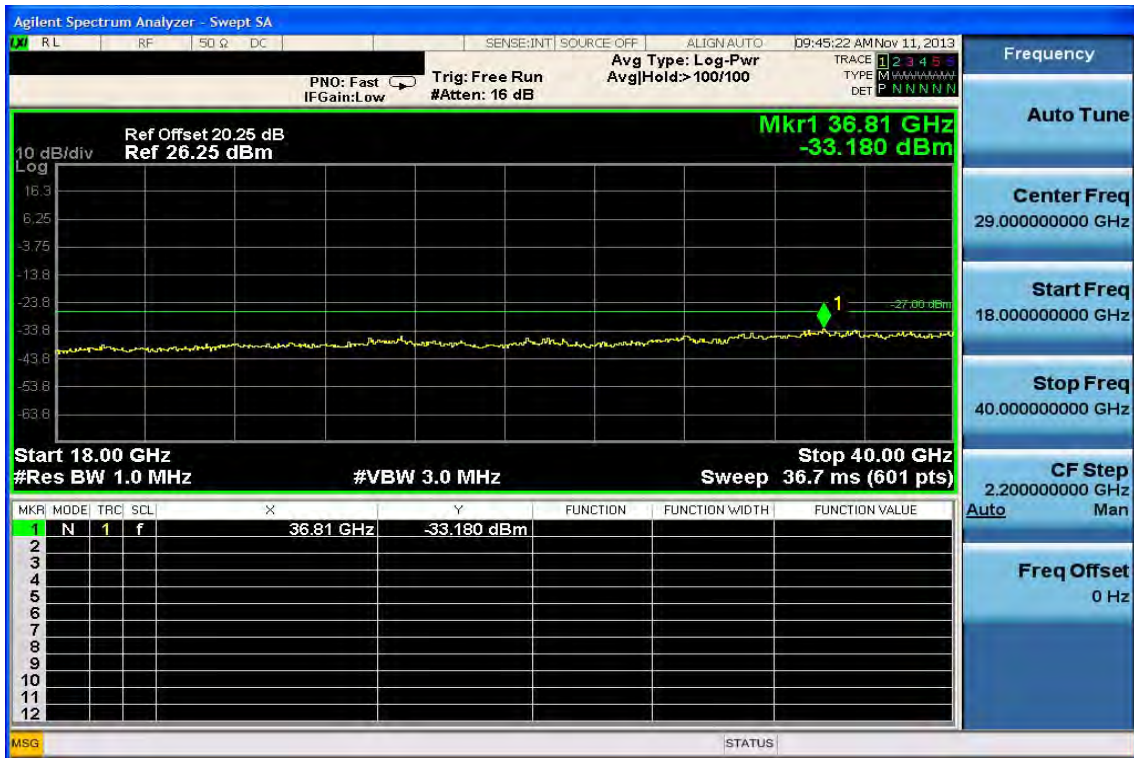
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Ch Low 6GHz – 18GHz



Ch Low 18GHz – 40GHz



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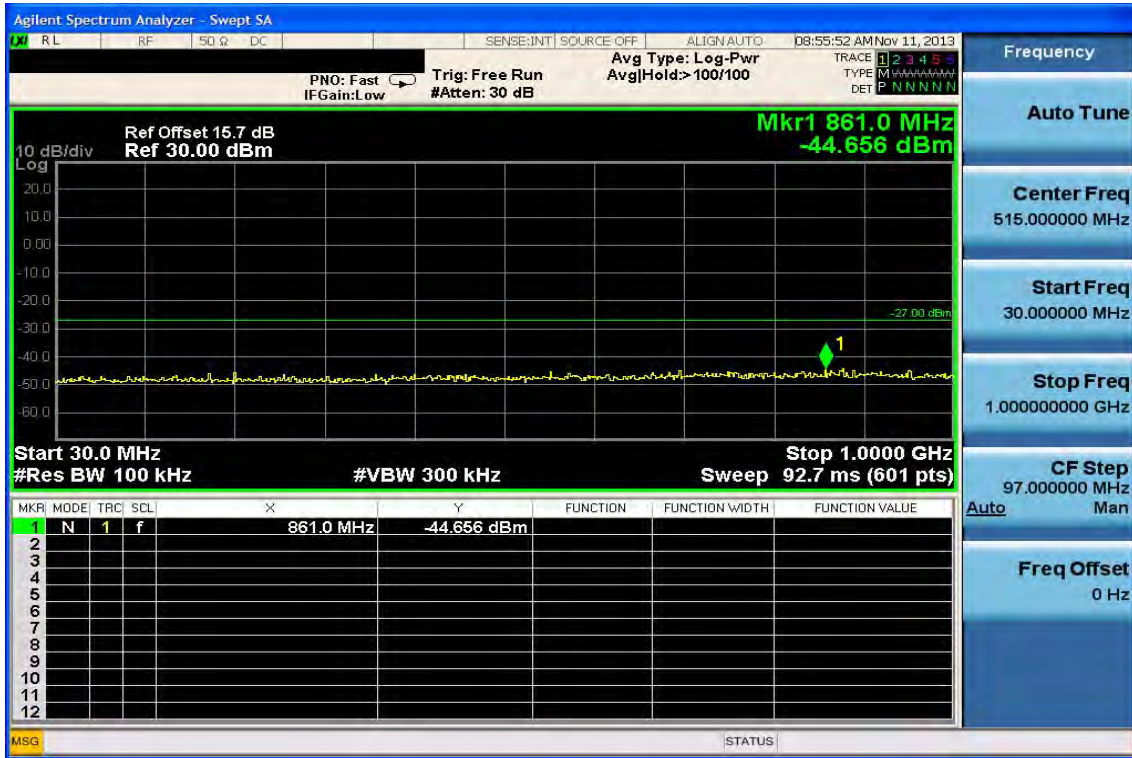
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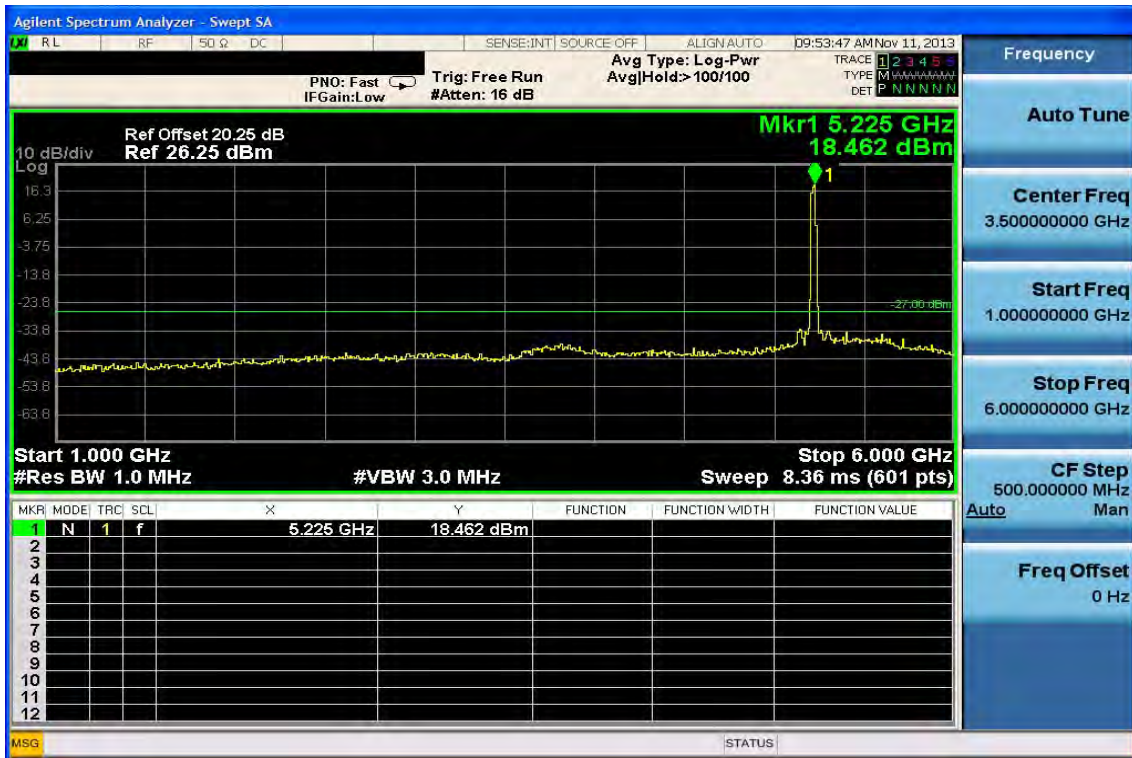
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Ch Mid 30MHz – 1GHz (5220 MHz)



Ch Mid 1GHz – 6GHz



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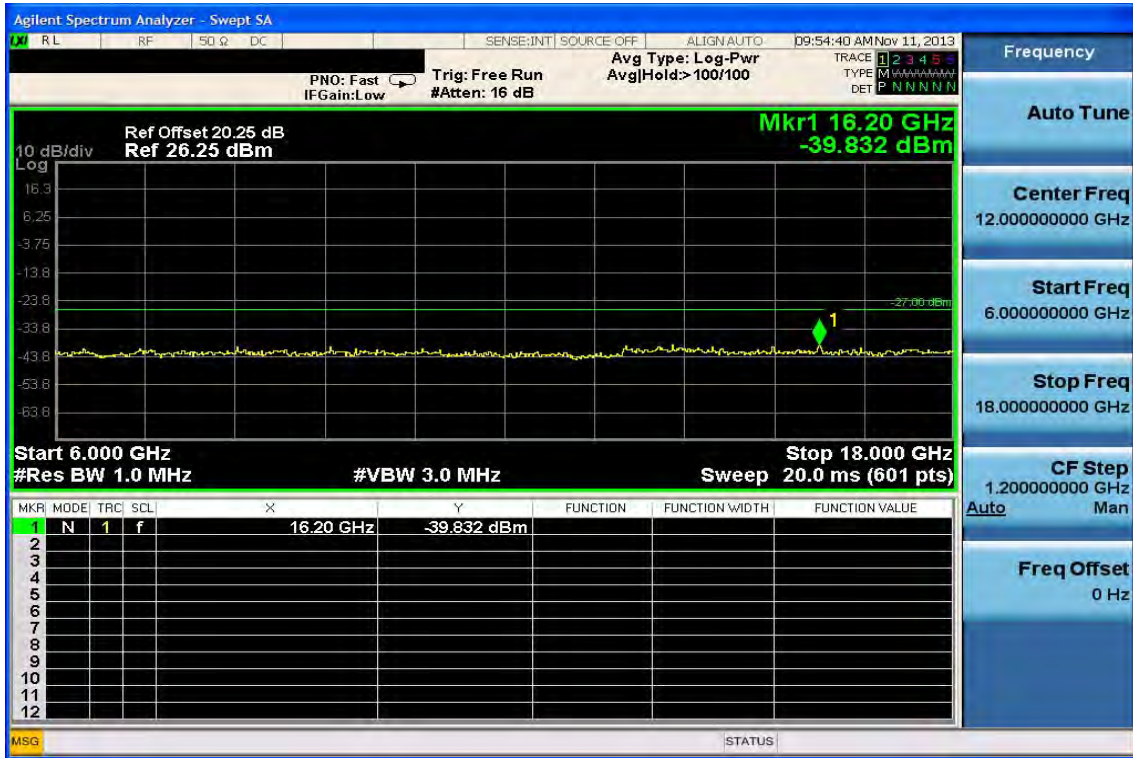
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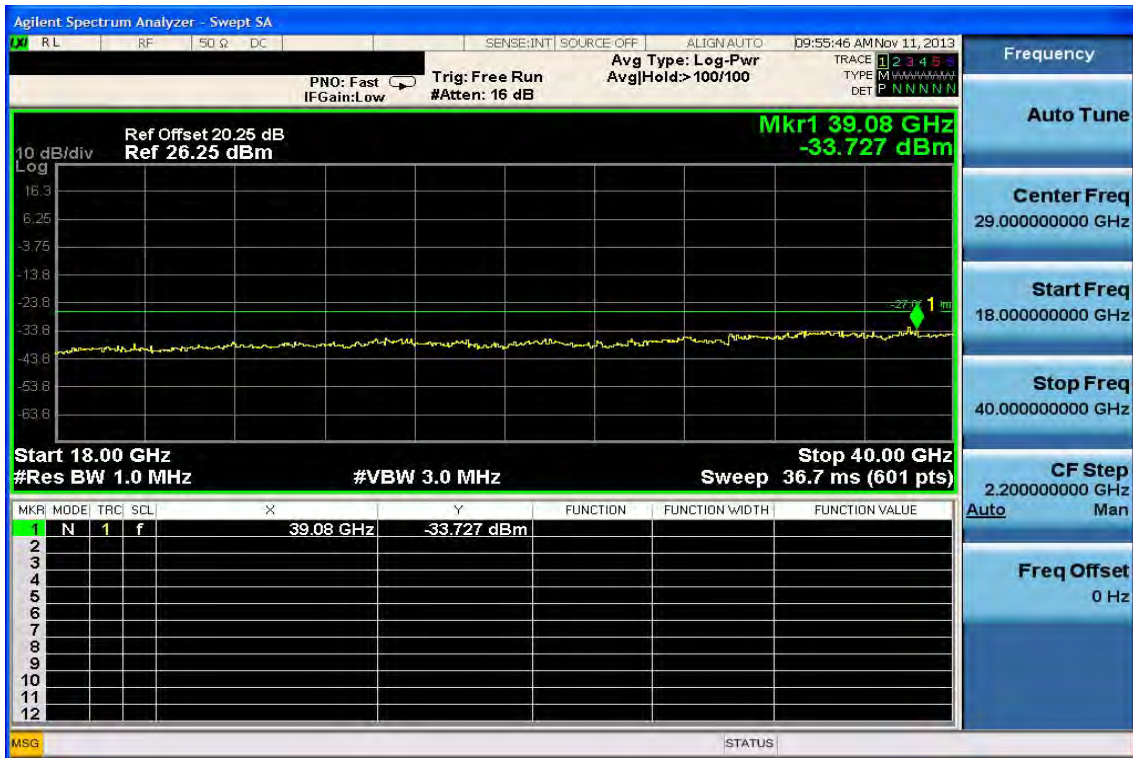
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Ch Mid 6GHz – 18GHz



Ch Mid 18GHz – 40GHz

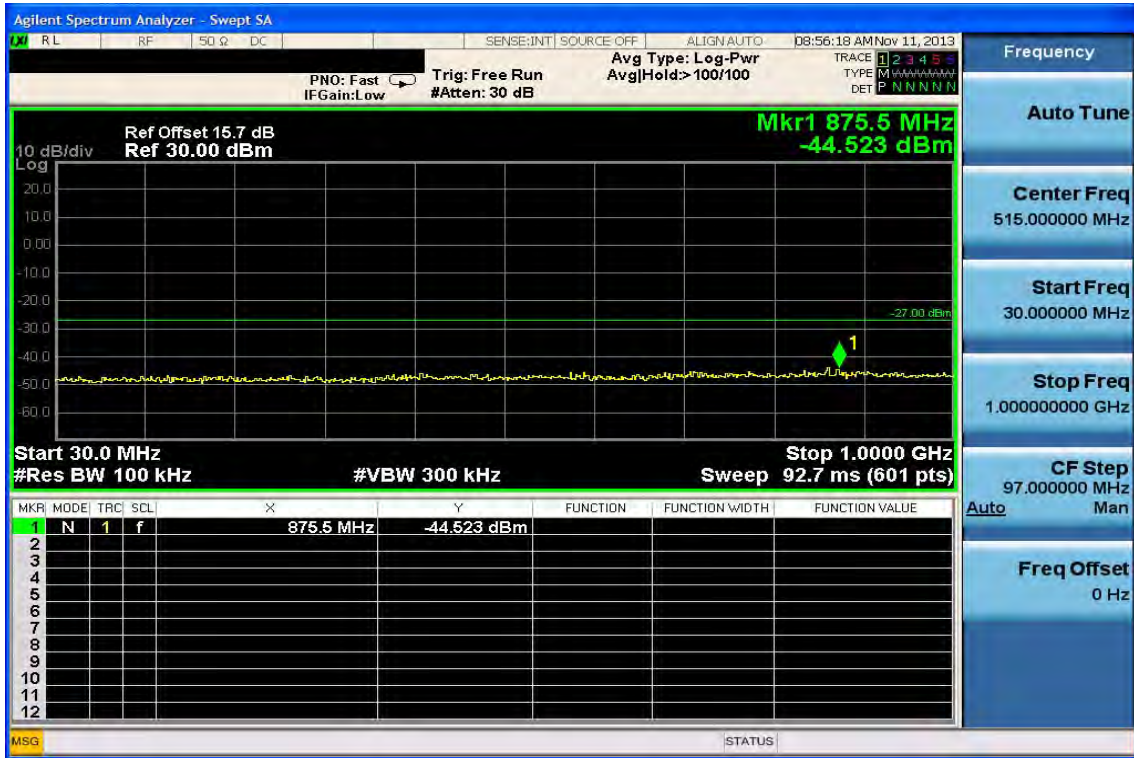


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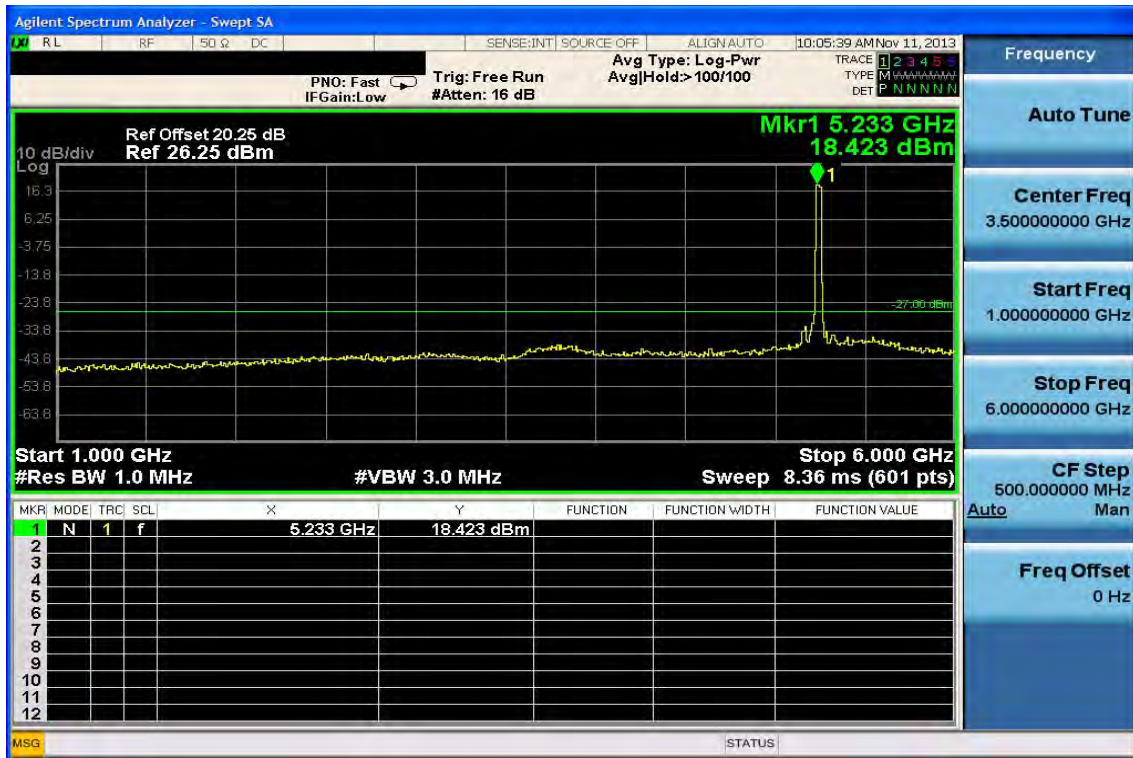
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Ch High 30MHz – 1GHz (5240 MHz)



Ch High 1GHz – 6GHz



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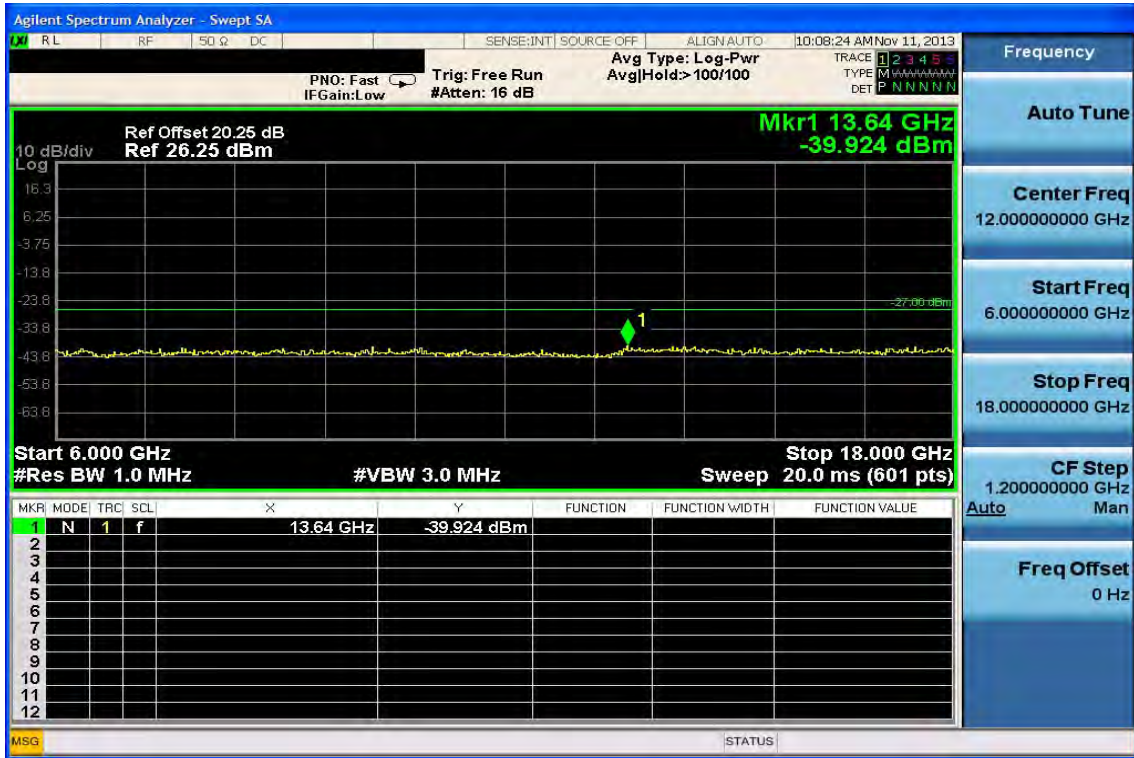
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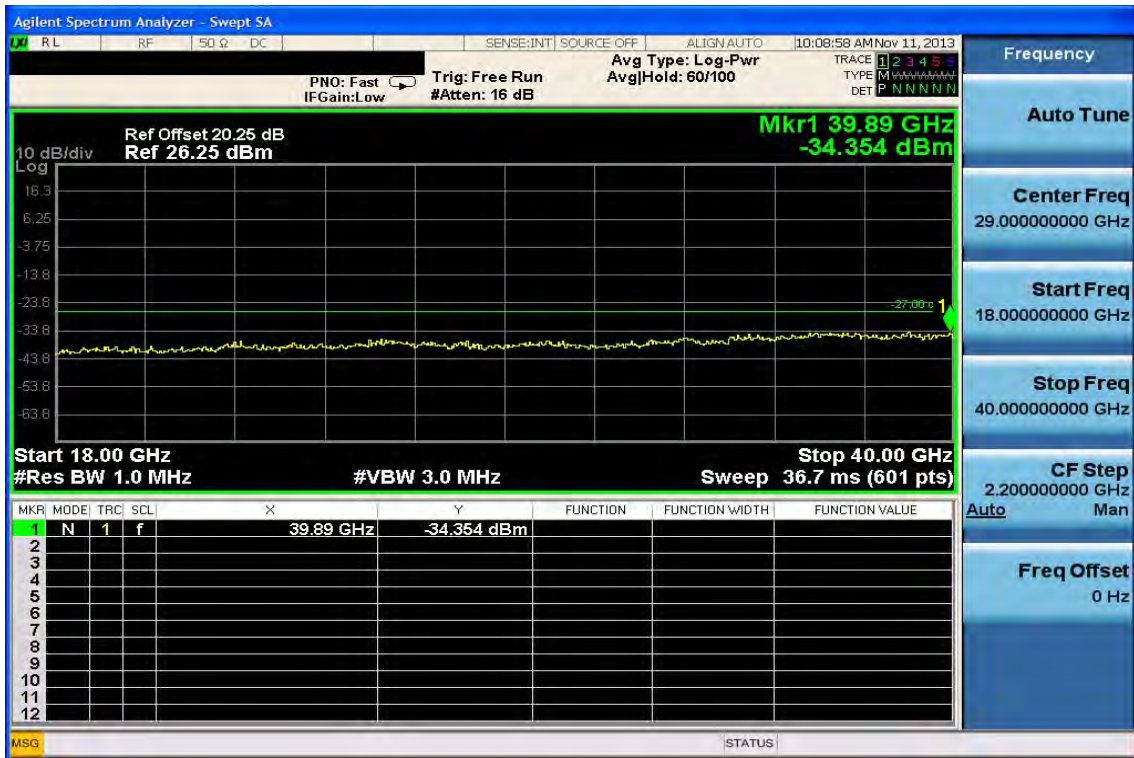
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Ch High 6GHz – 18GHz



Ch High 18GHz – 40GHz



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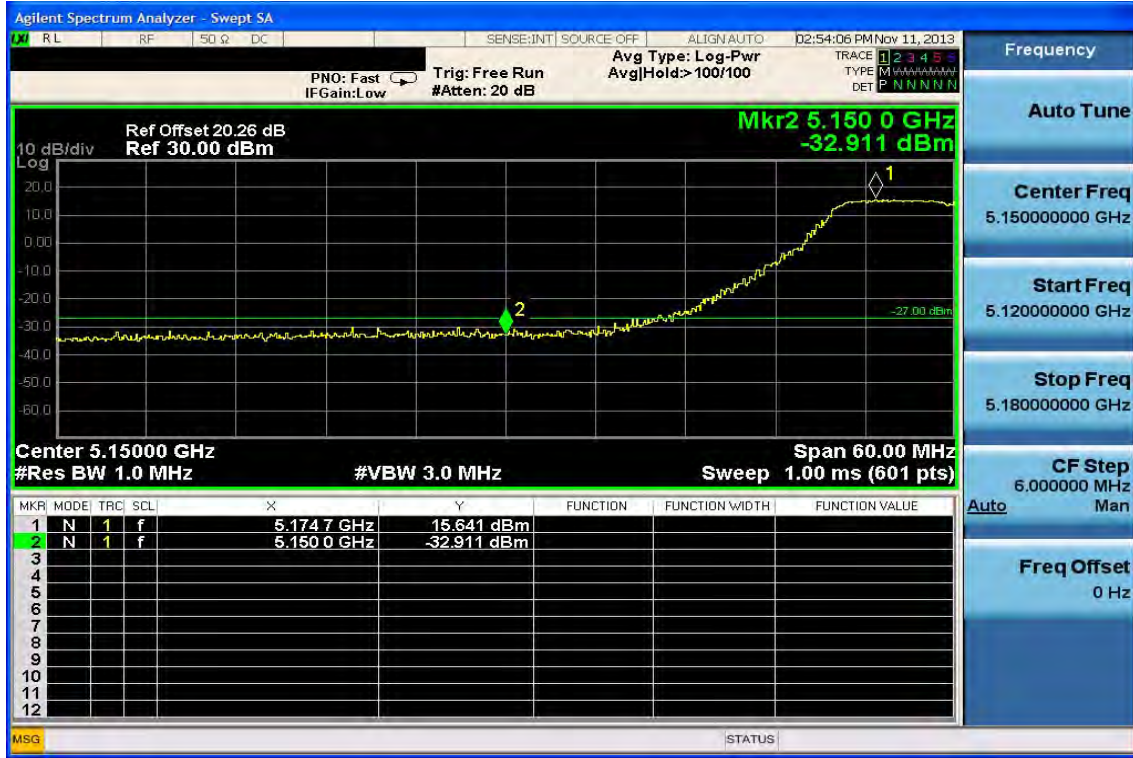
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802.11a 5150~5350 MHz Band Edges Test Data CH 5150



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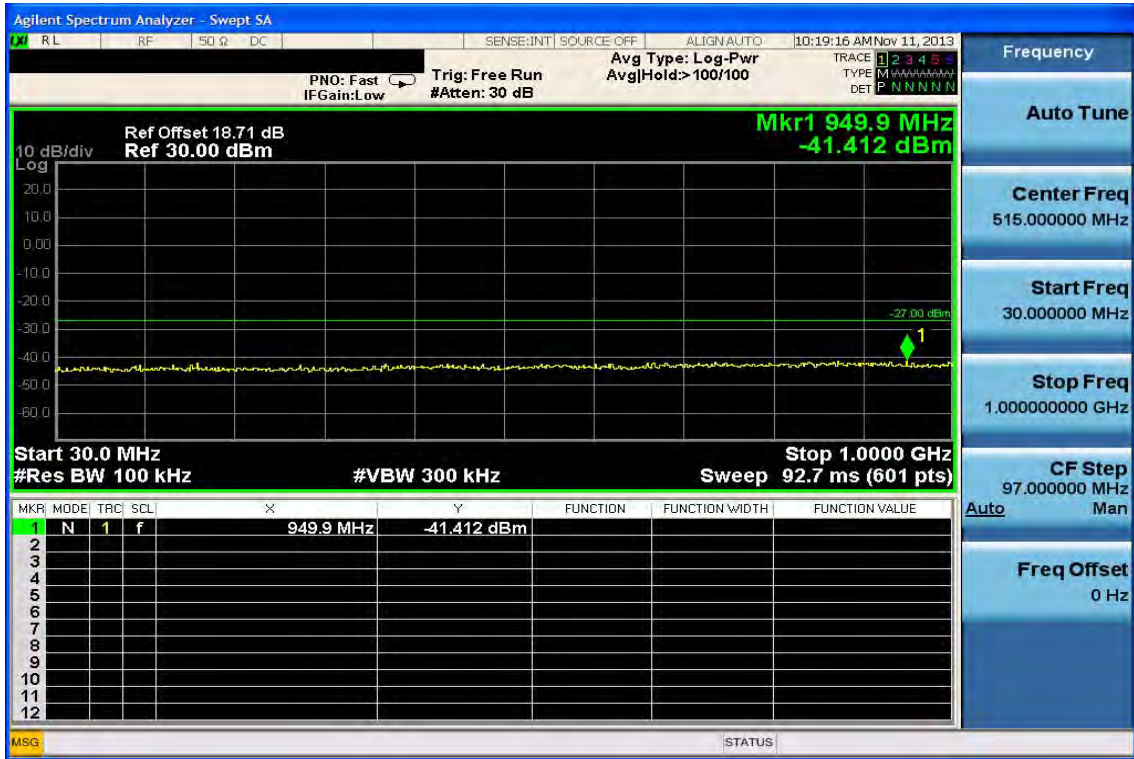
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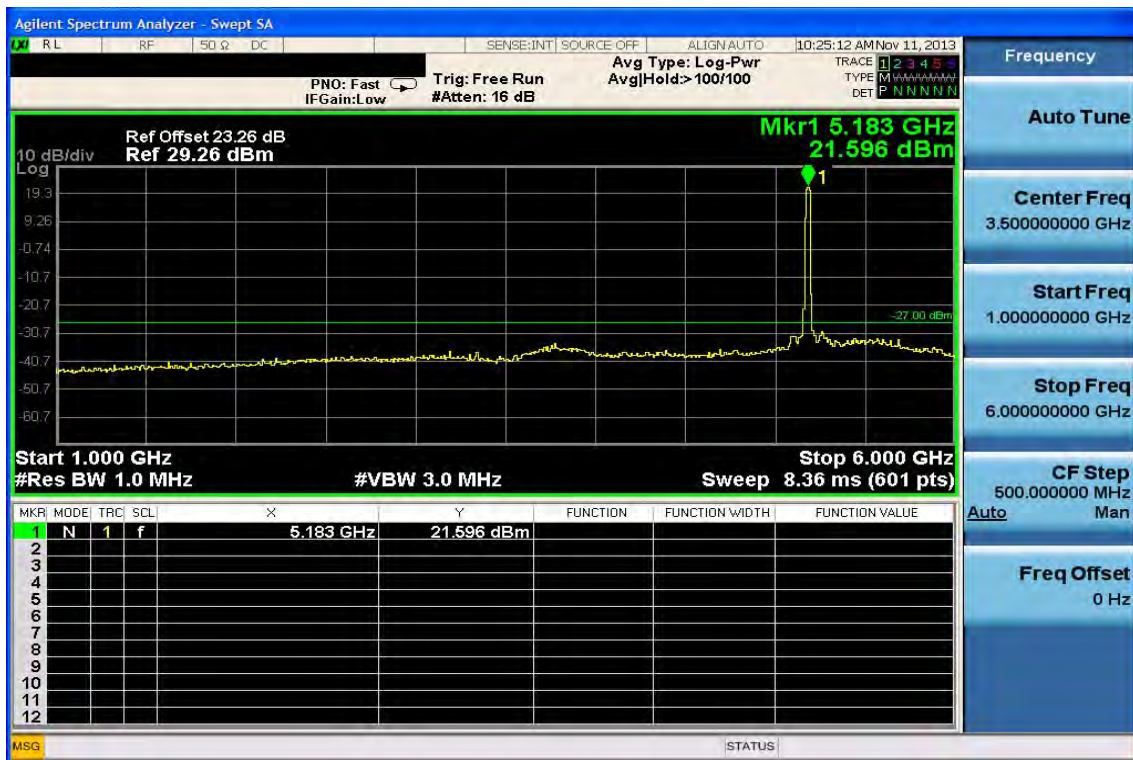
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802.11n HT20, 5150~5250 MHz
Ch Low 30MHz – 1GHz (5180 MHz)



Ch Low 1GHz – 6GHz



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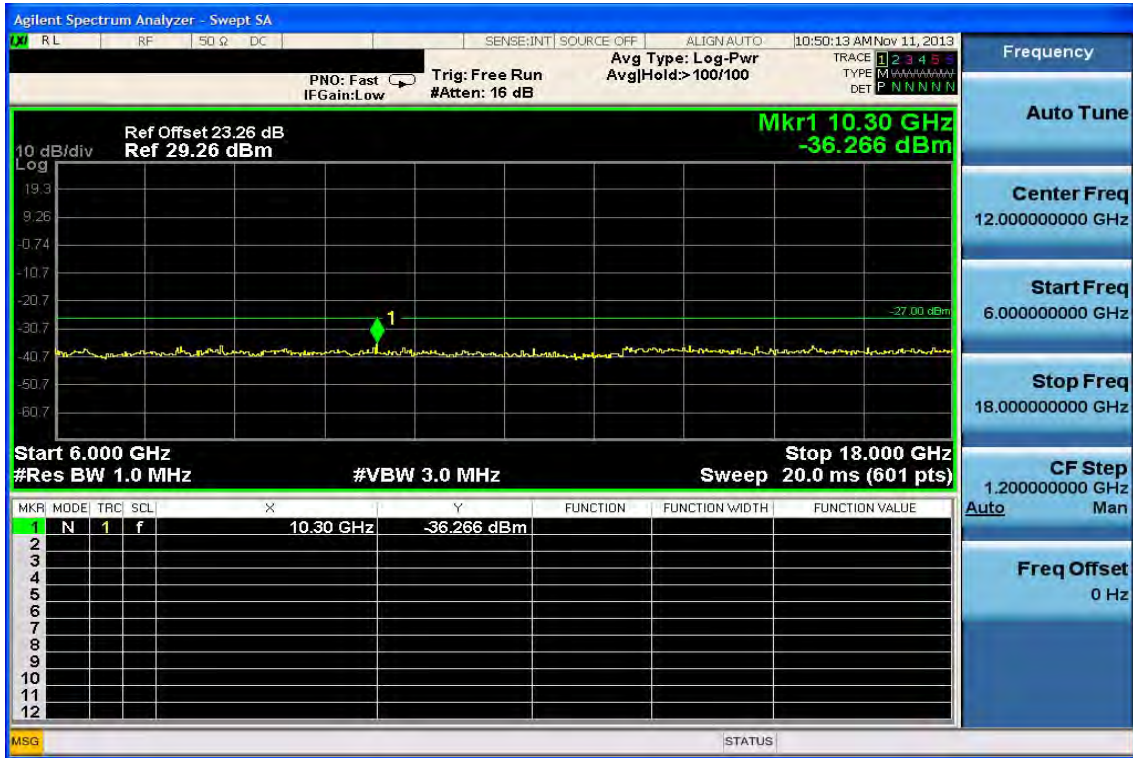
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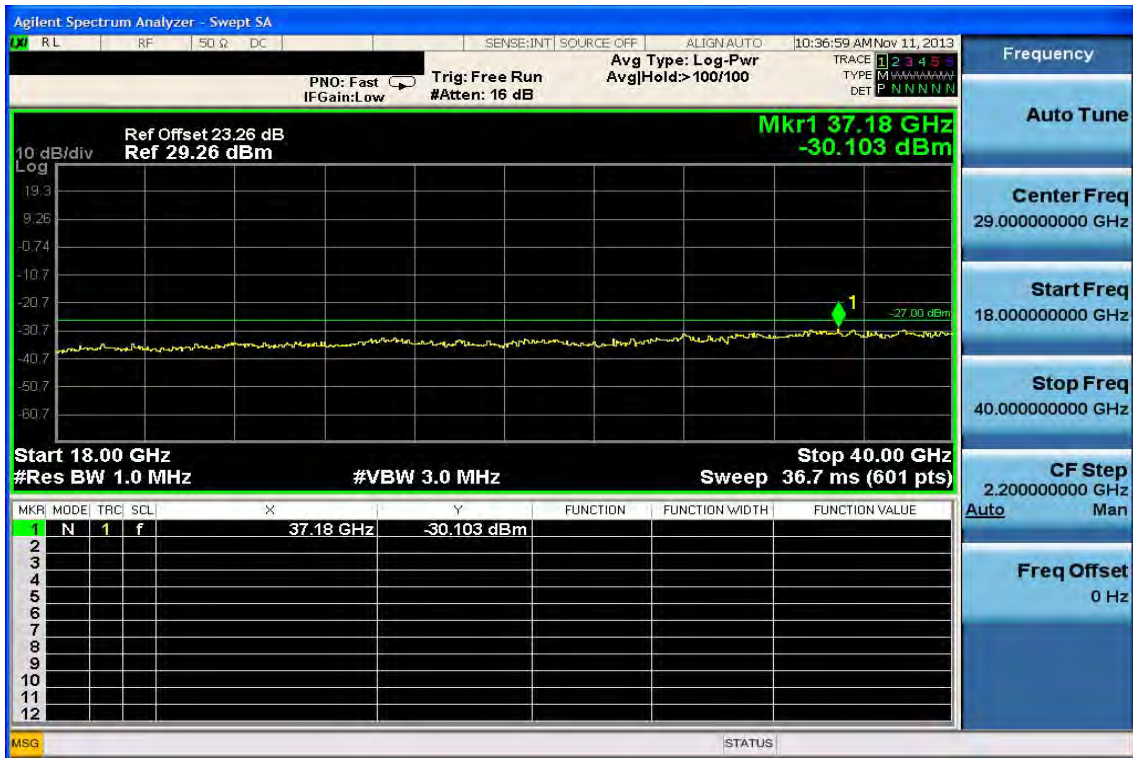
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Ch Low 6GHz – 18GHz



Ch Low 18GHz – 40GHz



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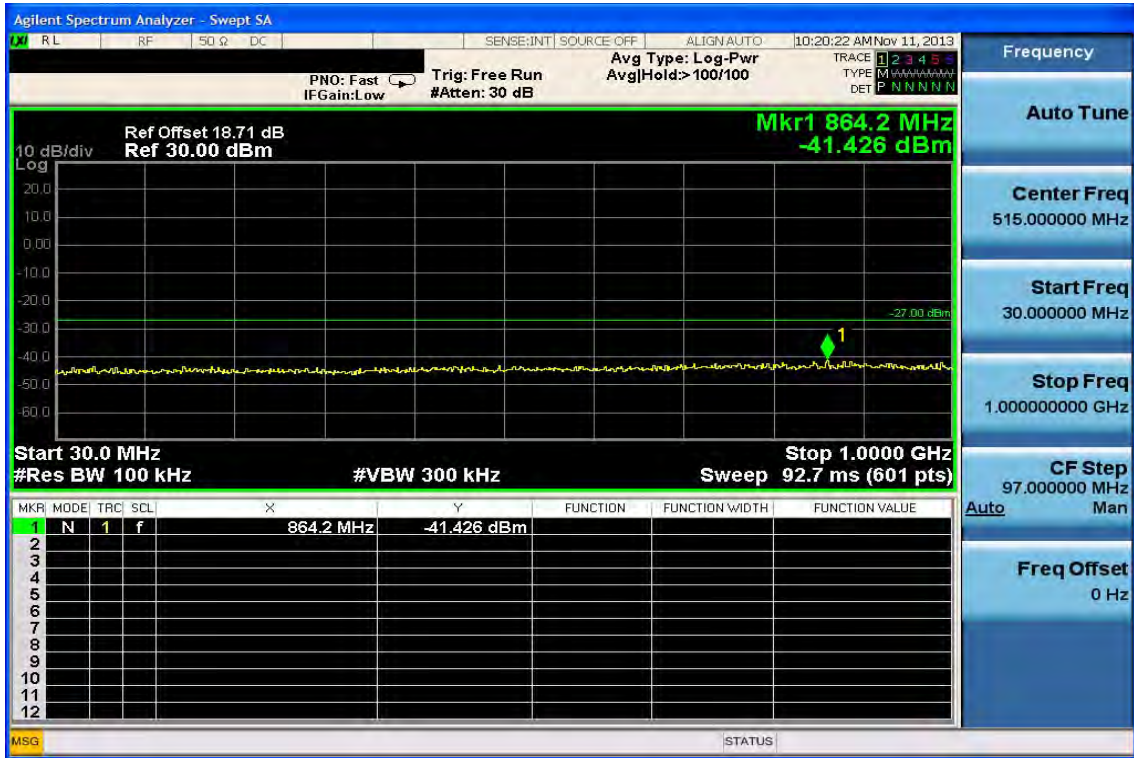
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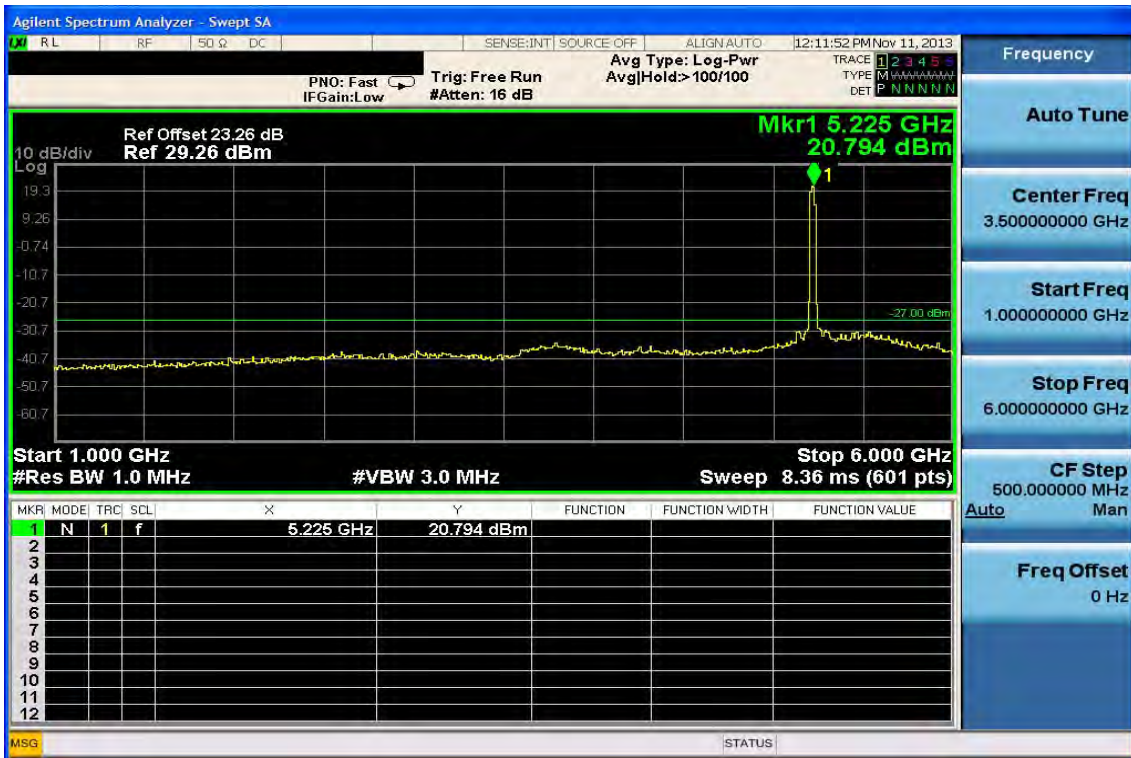
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Ch Mid 30MHz – 1GHz (5220 MHz)



Ch Mid 1GHz – 6GHz



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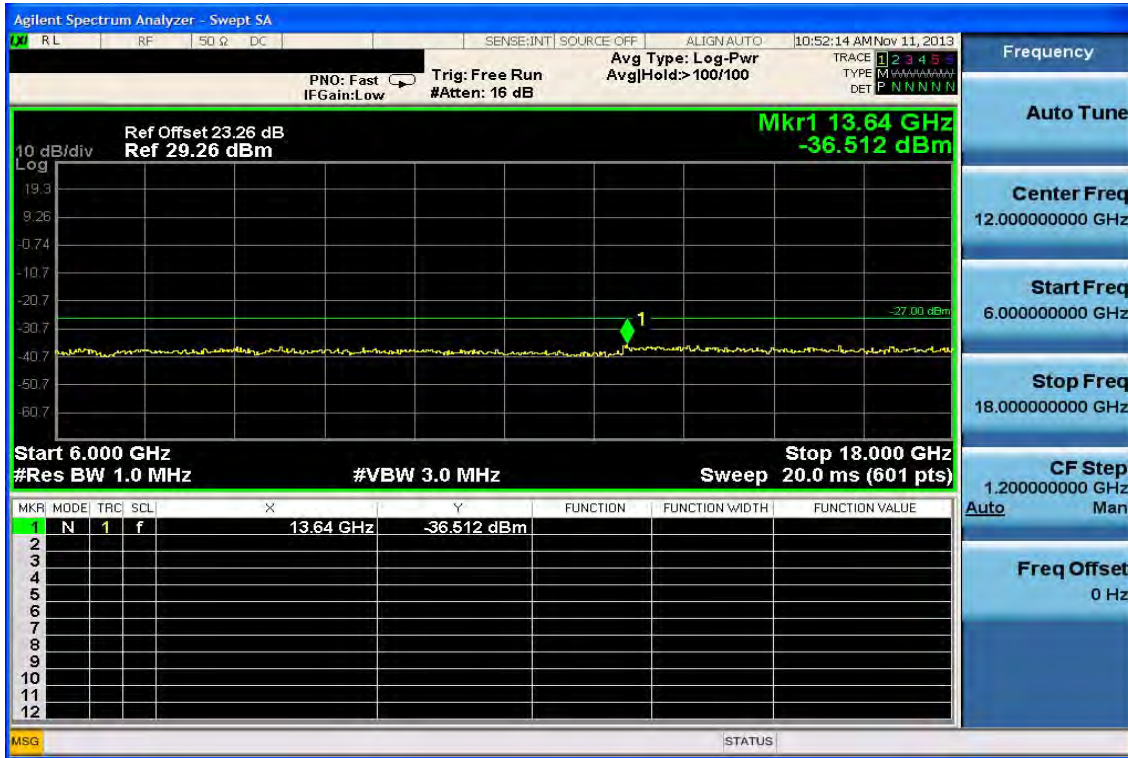
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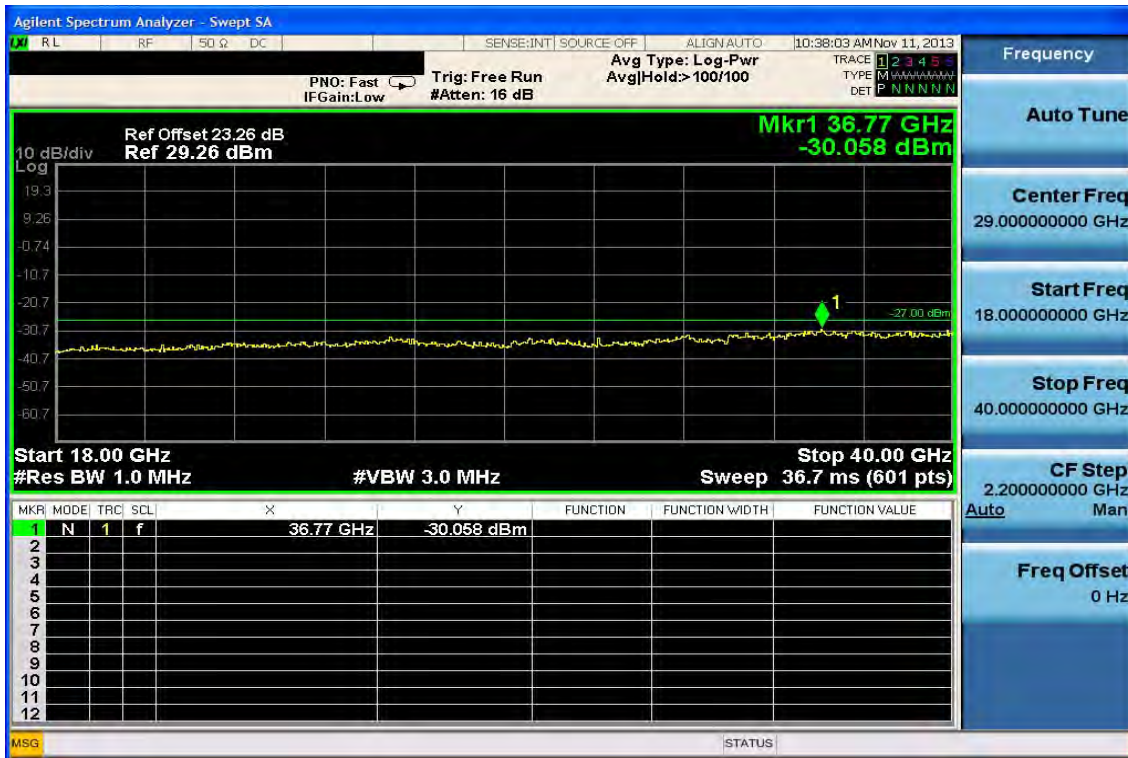
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Ch Mid 6GHz – 18GHz



Ch Mid 18GHz – 40GHz



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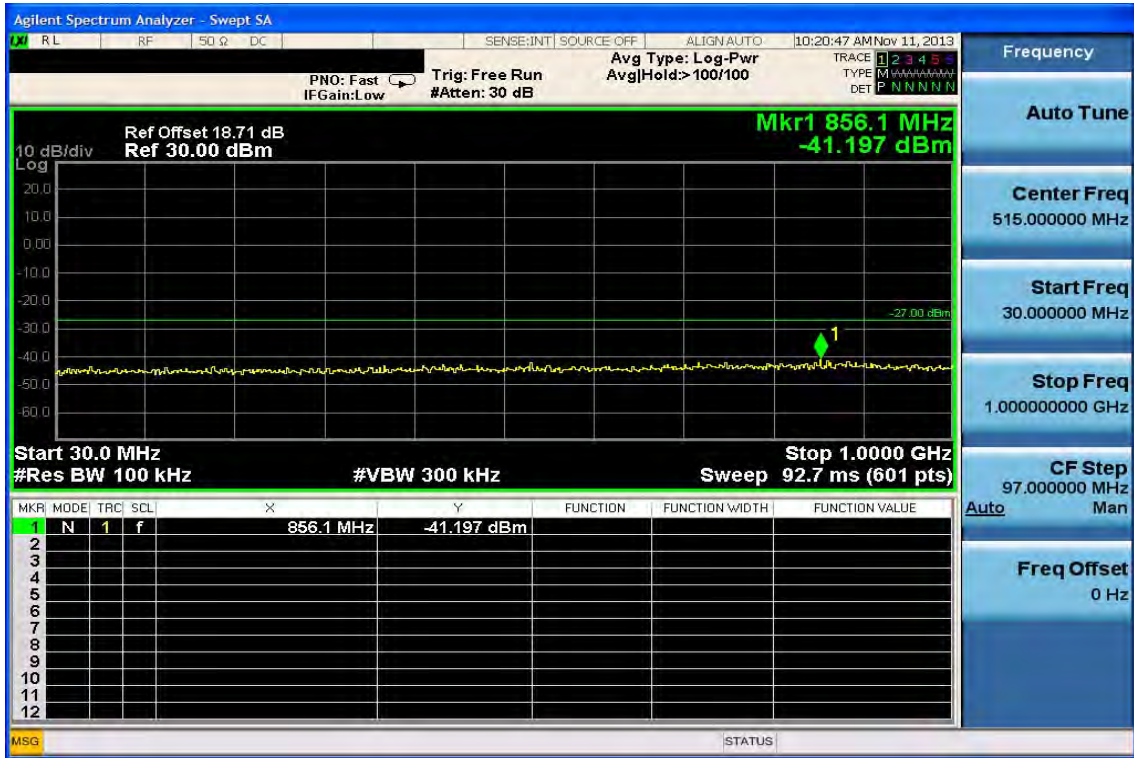
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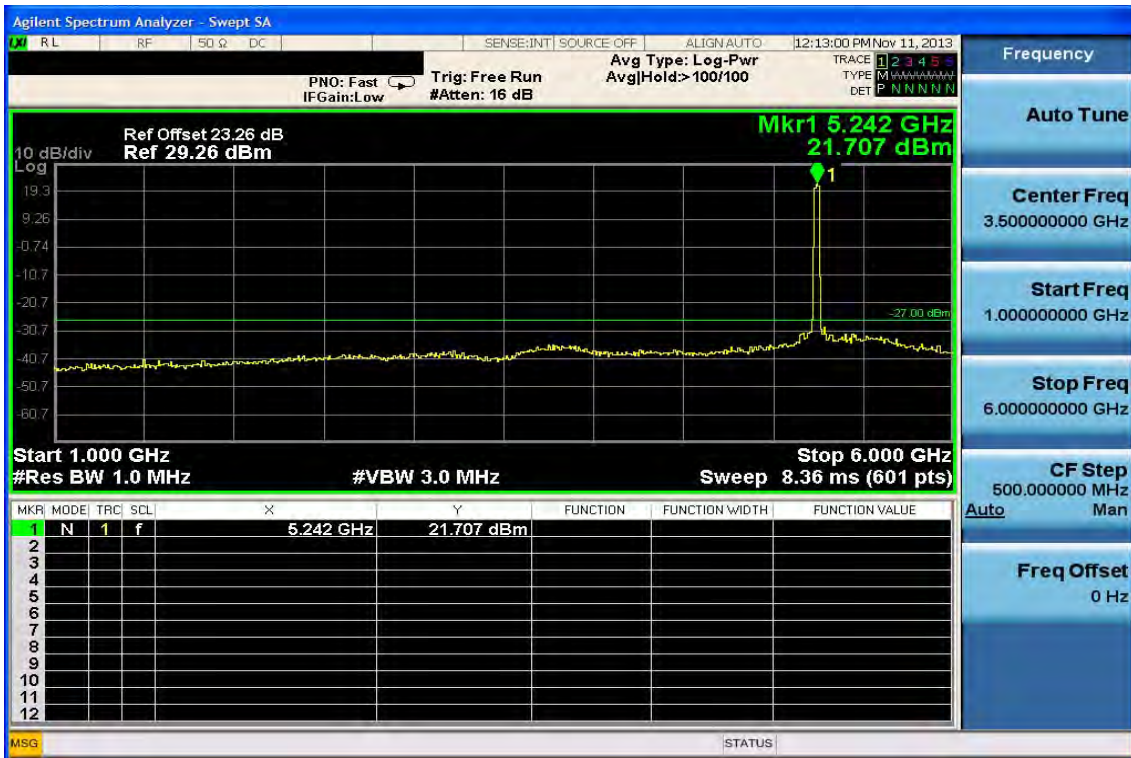
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Ch High 30MHz – 1GHz (5240 MHz)



Ch High 1GHz – 6GHz



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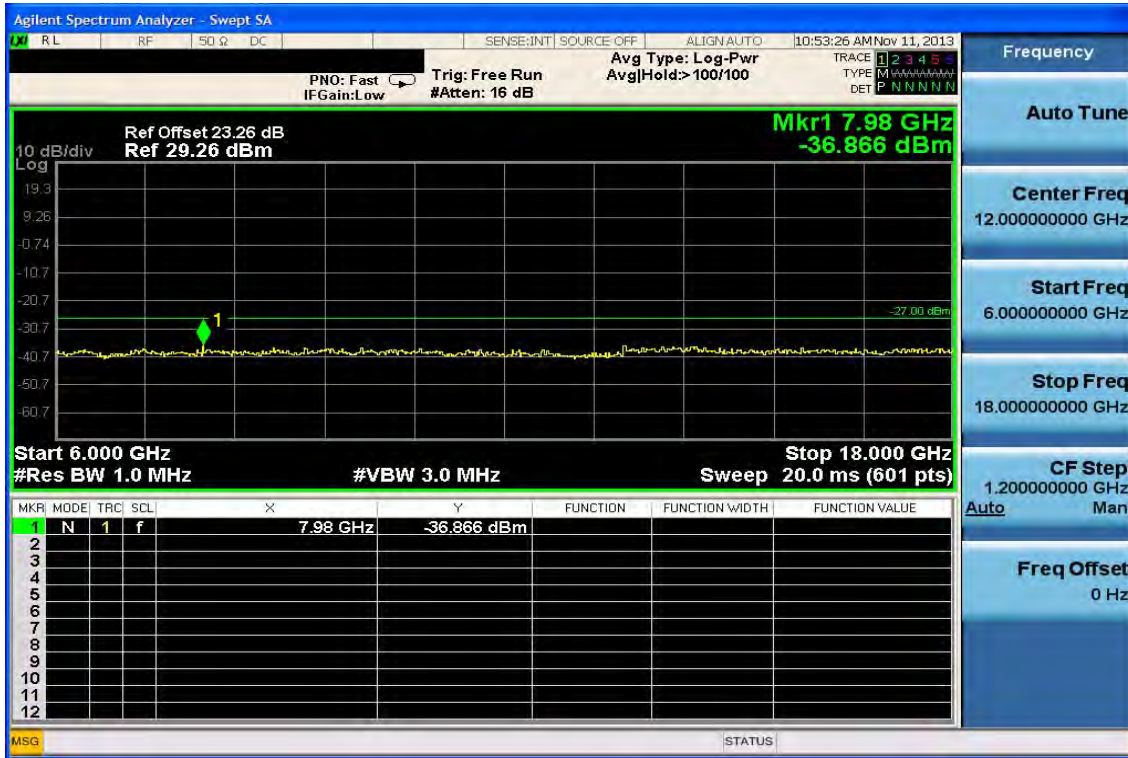
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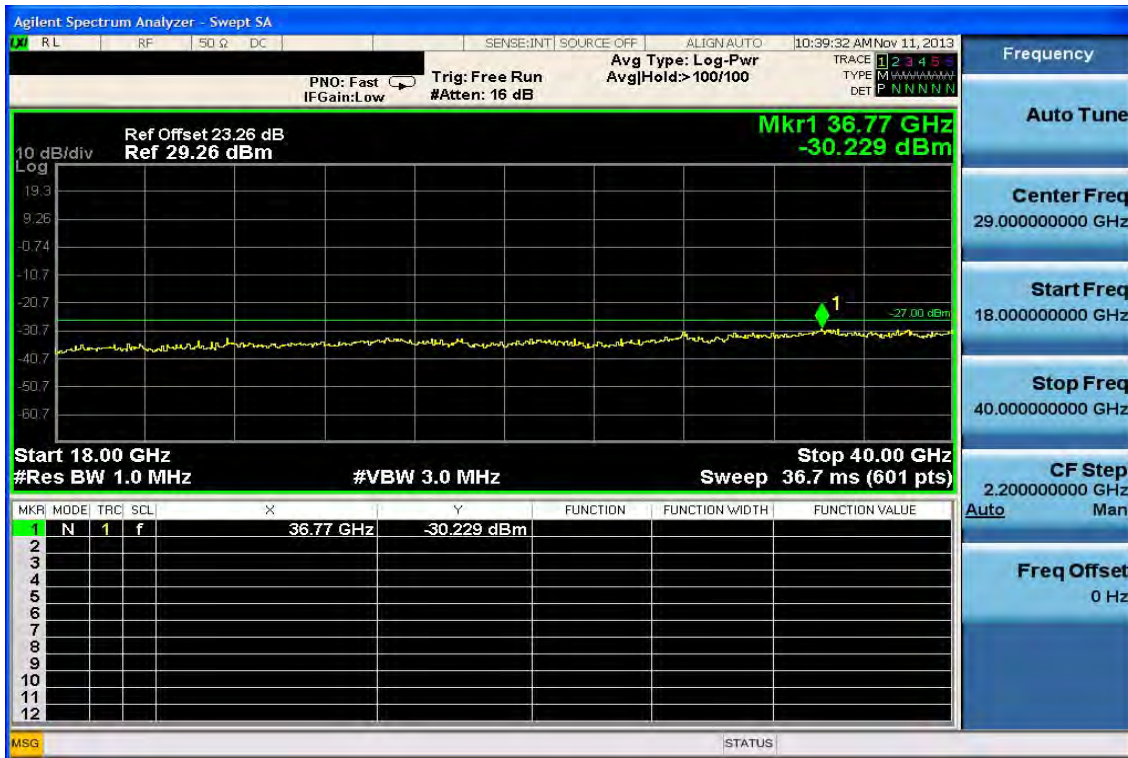
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Ch High 6GHz – 18GHz



Ch High 18GHz – 40GHz



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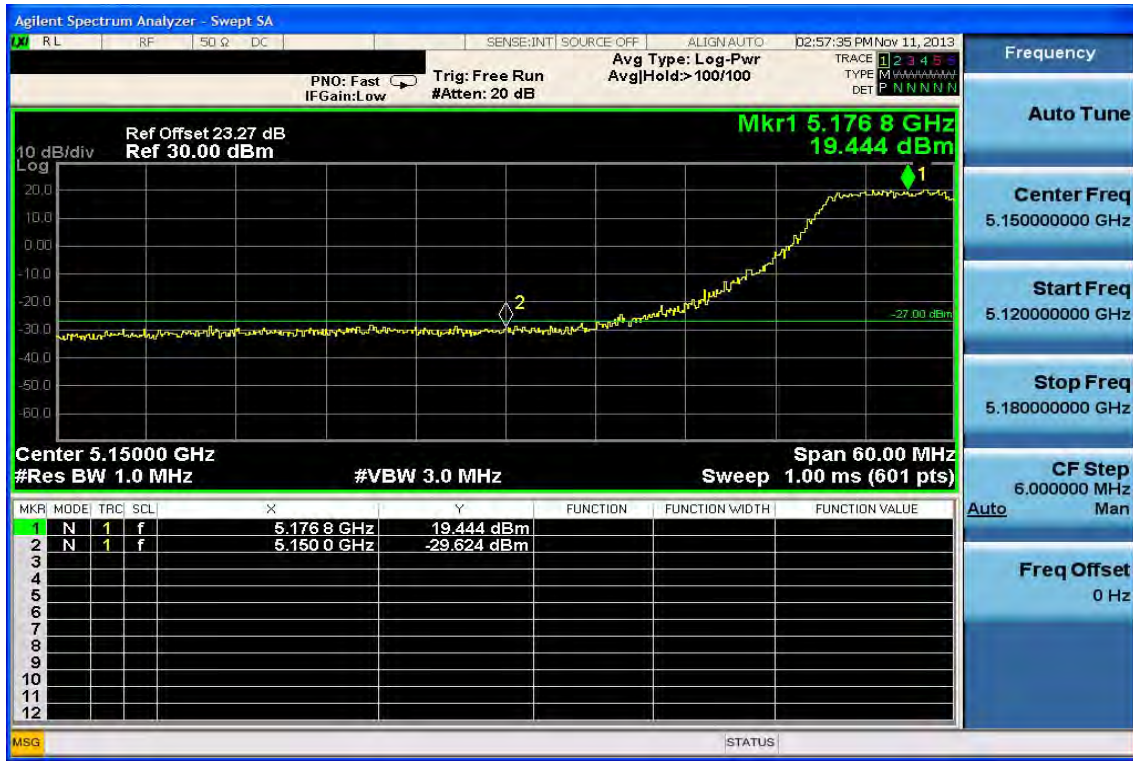
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Band Edges Test Data CH 5150



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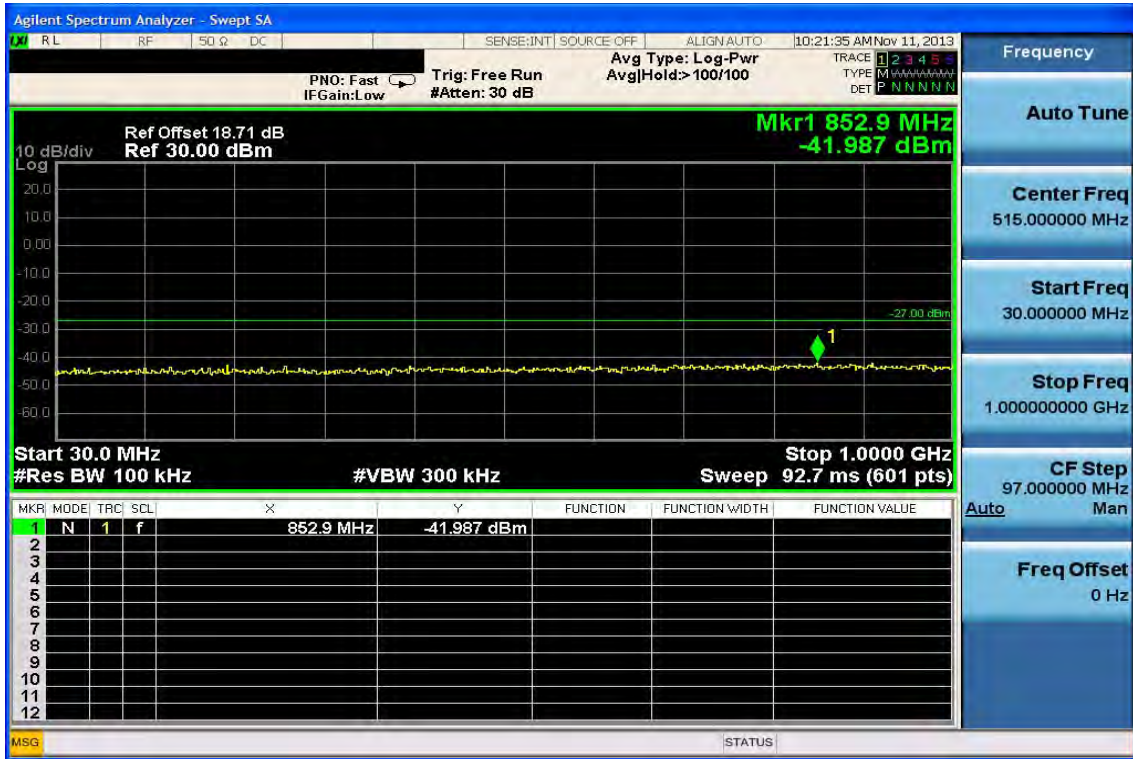
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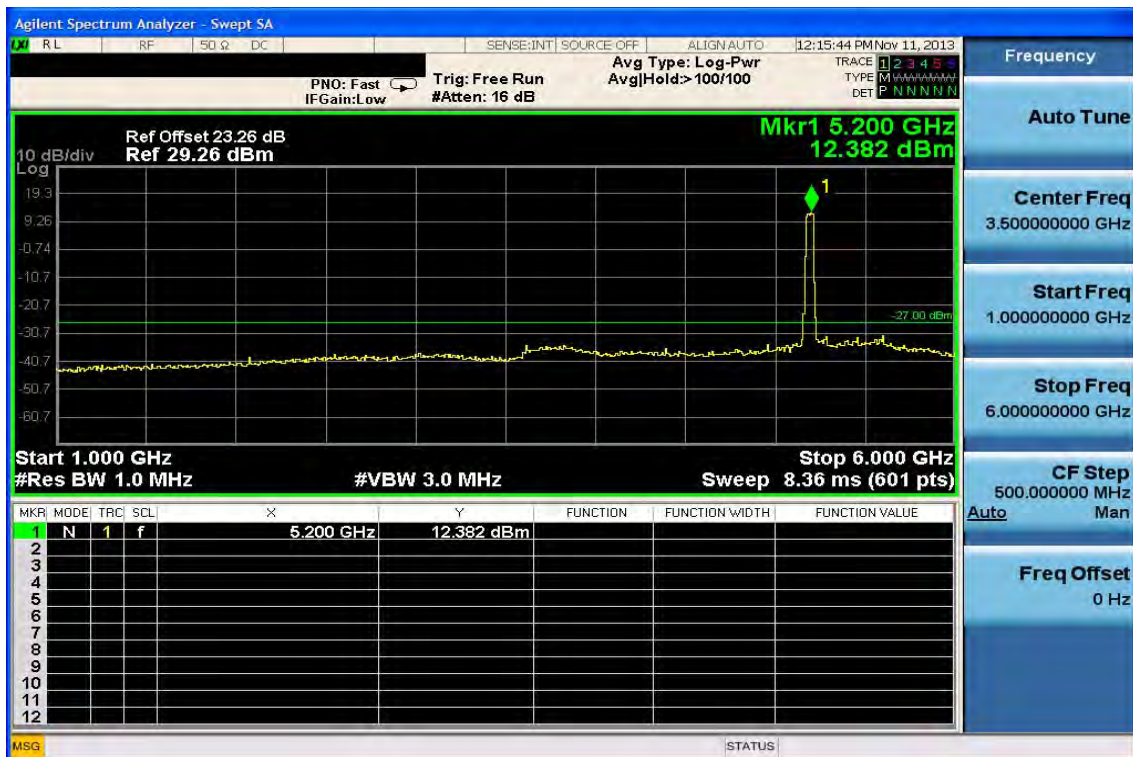
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802.11n HT40, 5150~5250 MHz
Ch Low 30MHz – 1GHz (5190 MHz)



Ch Low 1GHz – 6GHz



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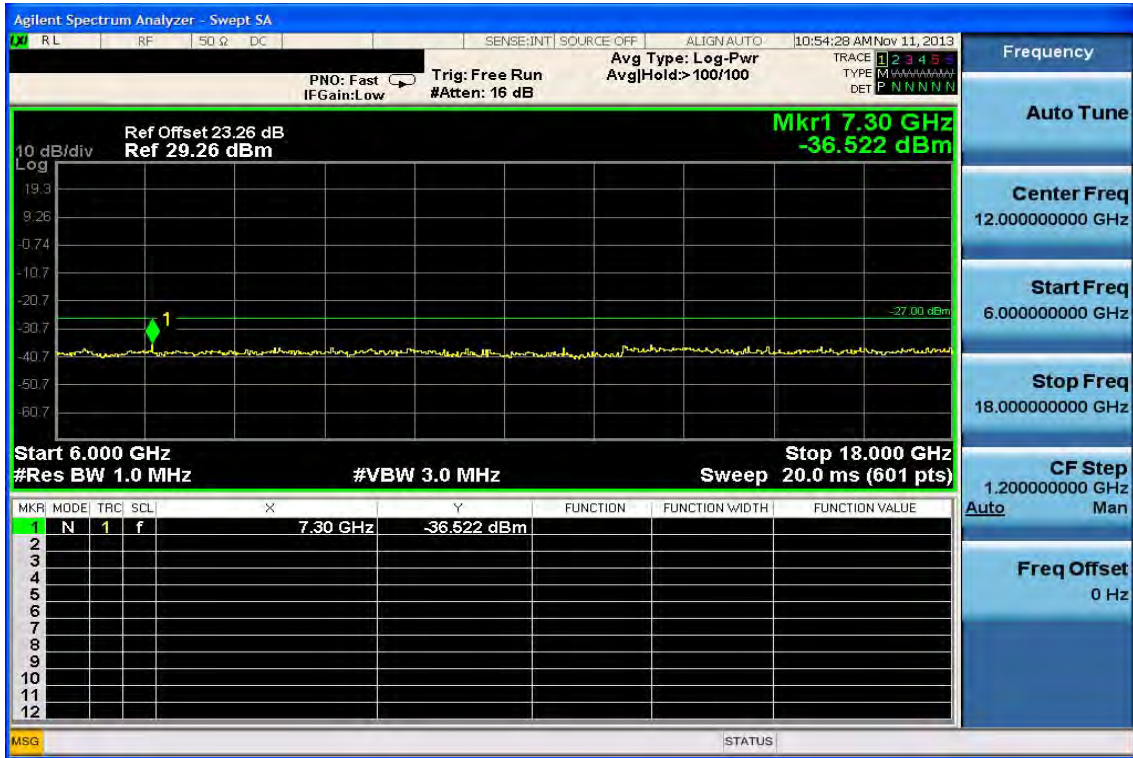
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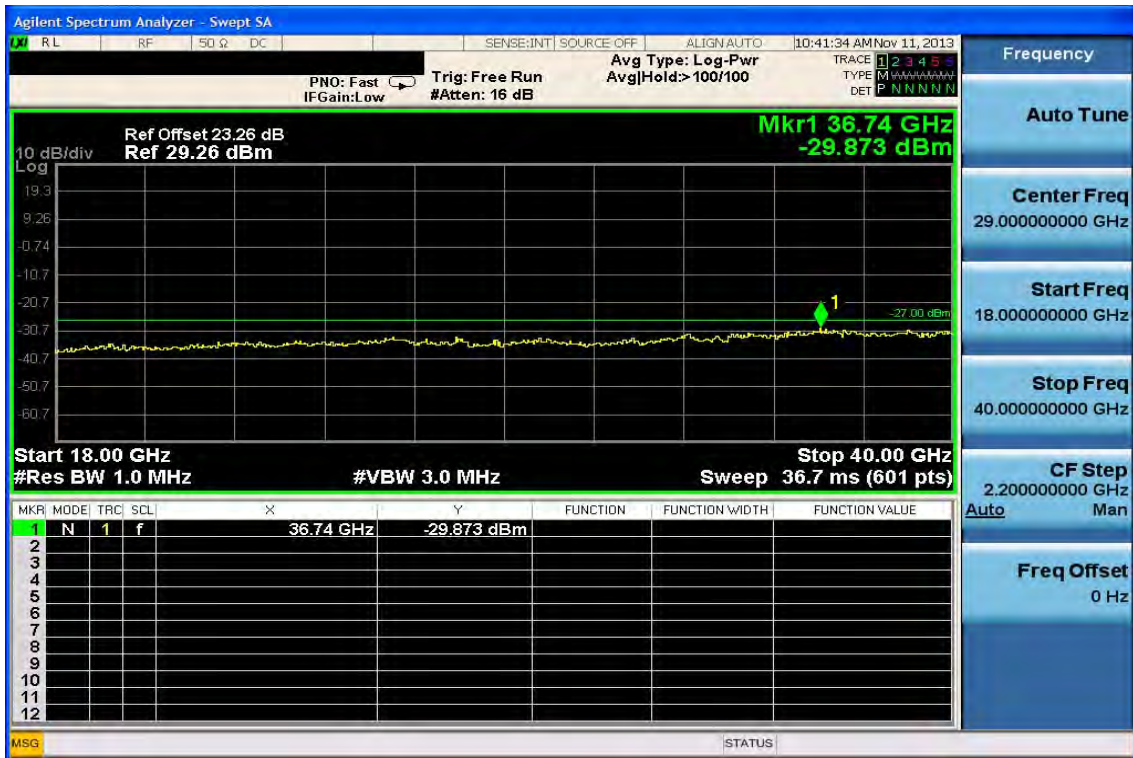
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Ch Low 6GHz – 18GHz



Ch Low 18GHz – 40GHz



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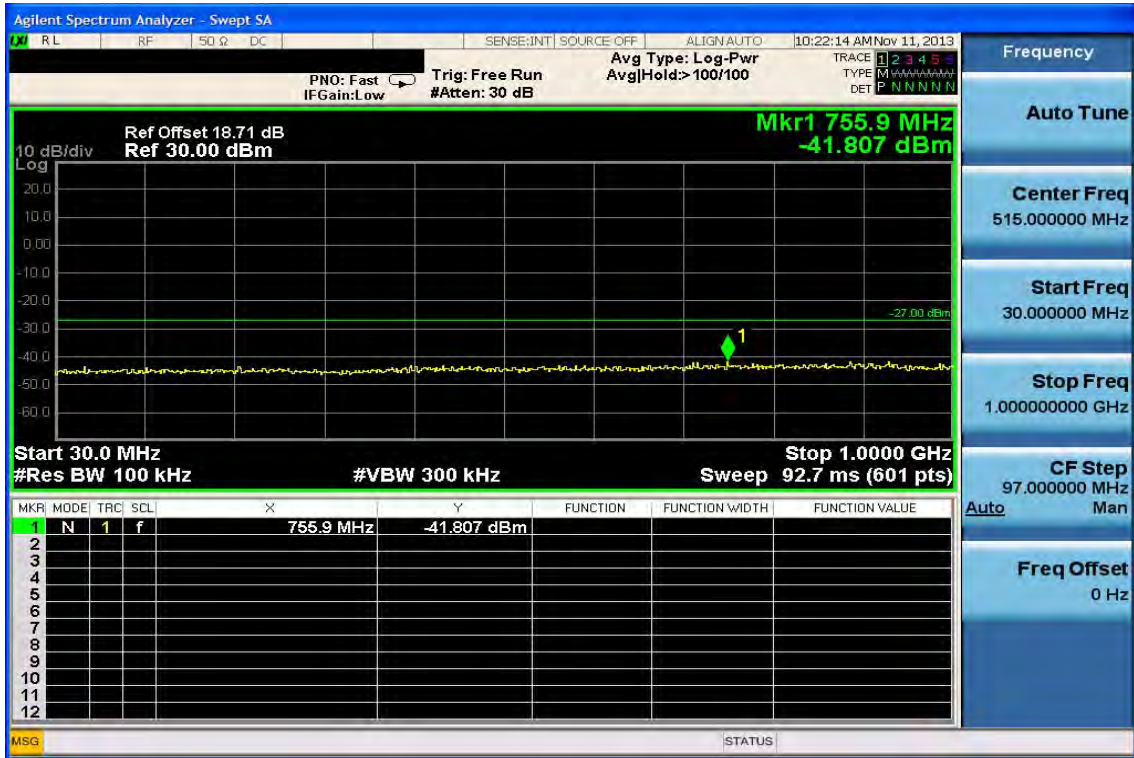
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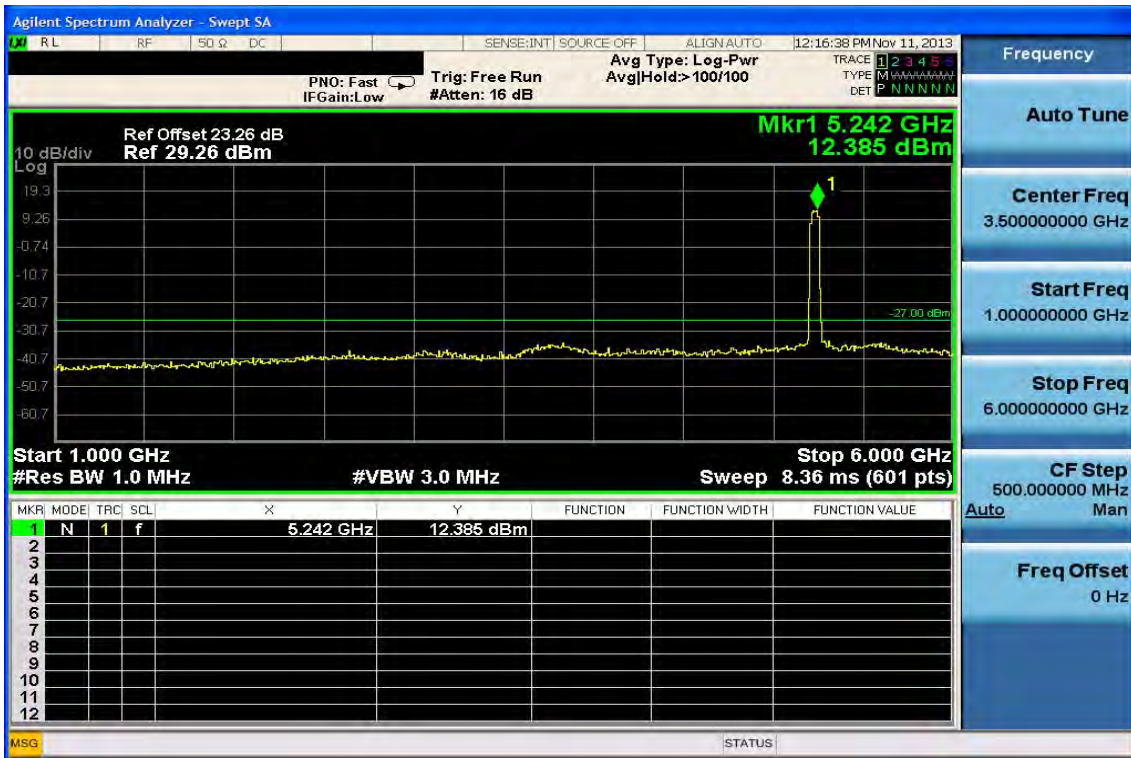
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Ch High 30MHz – 1GHz (5230 MHz)



Ch High 1GHz – 6GHz



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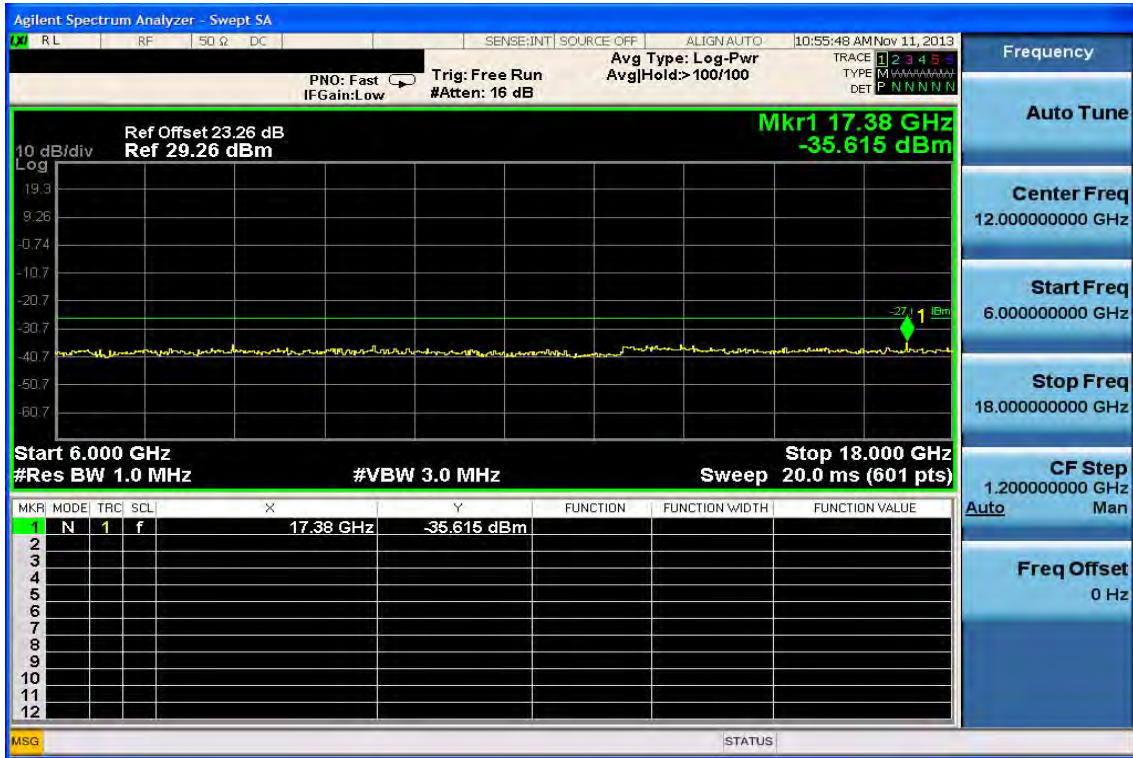
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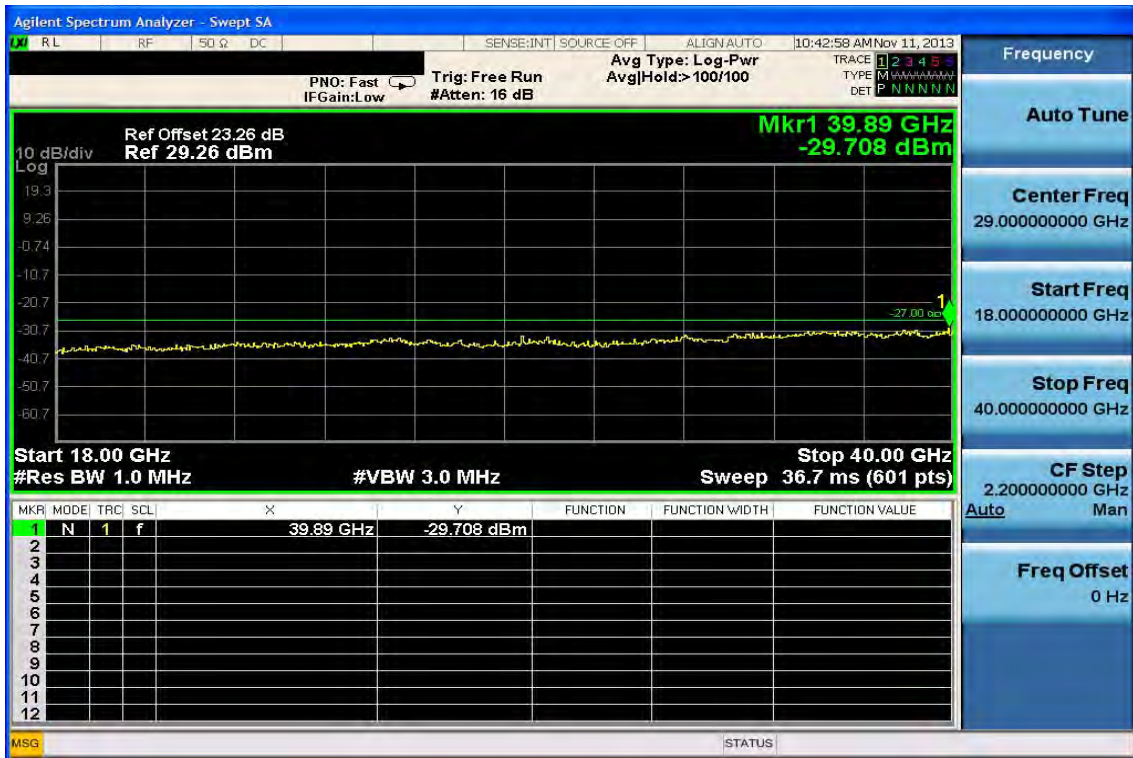
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Ch High 6GHz – 18GHz



Ch High 18GHz – 40GHz



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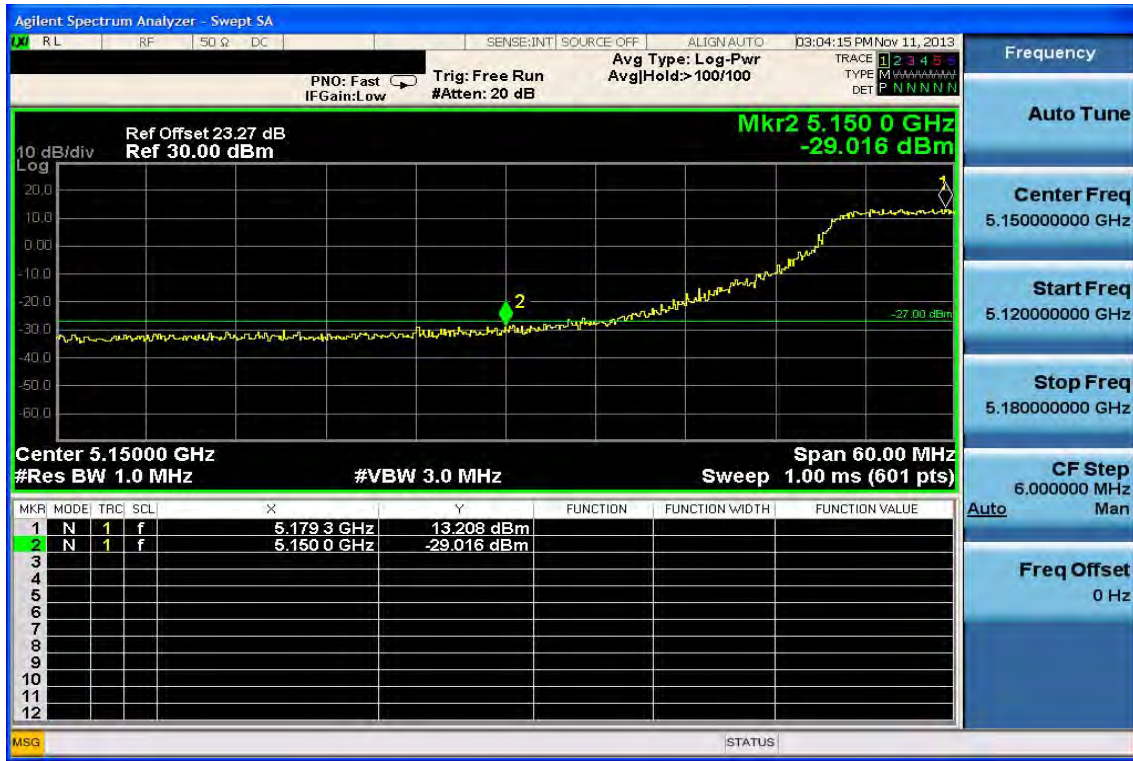
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802.11n HT40 5150~5350 MHz
Band Edges Test Data CH 5150



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12. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

12.1 Standard Applicable

According to §15.407(b) (6) (7),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (2) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (3) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Procedure H1) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 6) 7), and RSS-Gen 7.2.2.

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§15.205- RESTRICTED BANDS OF OPERATIONS

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

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

² Above 38.6

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

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§15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

According to RSS-Gen section 4.9 Transmitter Unwanted Emissions

The measurement method shall be described in the test report. When the applicable unwanted emissions limits are defined in relative terms, the same parameter, peak power or average power, used for the transmitter output power measurement, shall be used for unwanted emission measurements.

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given in (a) and (b):

- (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency, as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported.

When limits are expressed in absolute terms, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below 1000MHz. As an alternative to CISPR quasi-peak measurement, compliance with the emission limits can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

Above 1000 MHz, compliance with the emission limits shall be demonstrated using an average detector with a minimum resolution bandwidth of 1 MHz.

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According to RSS-Gen section 7.2.2 Emissions Falling Within Restricted Frequency Bands

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:

- (a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 1;
- (b) Unwanted emissions falling into restricted bands of Table 1 shall comply with the limits specified in RSS-Gen;
- (c) Unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.

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Table 3: Restricted Frequency Bands ^(Note)

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		

Note: Certain frequency bands listed in Table 1 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300- series RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

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12.1.1 Transmitter Spurious Emission Limits

Spurious emissions from licence-exempt transmitters shall comply with the field strength limits shown below. Additionally, the level of any transmitter spurious emission shall not exceed the level of the transmitter's fundamental emission.

Table 5: General Field Strength Limits for Transmitters at Frequencies Above 30 MHz

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

Note: Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

12.1.2 Unwanted Emission that complies with the undesirable emission ruling by 15.407 (b) (1) (2) (3), RSS-210 A9.2 (1) (2) (3)

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBuV/m)
5150 – 5250	-27	68.3
5250 – 5350	-27	68.3
5470 - 5725	-27	68.3

Limit derivation in terms of Field Strength:

$EIRP = (E \cdot d)^2 / 30$, where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

$$E = 1000000 \cdot (30 \cdot EIRP)^{1/2} / 3 \text{ uV/m}$$

$$= 68.3 \text{ dBuV/m}$$

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12.2 EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4:2009.
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 120Vac/60Hz power source.

12.3 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

For measurements below 1GHz, follow the KDB 789033 D01 requirements in section H)3), "General Requirements for Unwanted Emissions Measurements" Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

For Measurement above 1GHz, for peak unwanted emission measurements follow the KDB 789033 D01 requirements in section H)5) b), for average unwanted emission measurements follow the KDB 789033 D01 requirements in section H)6) c) or d).

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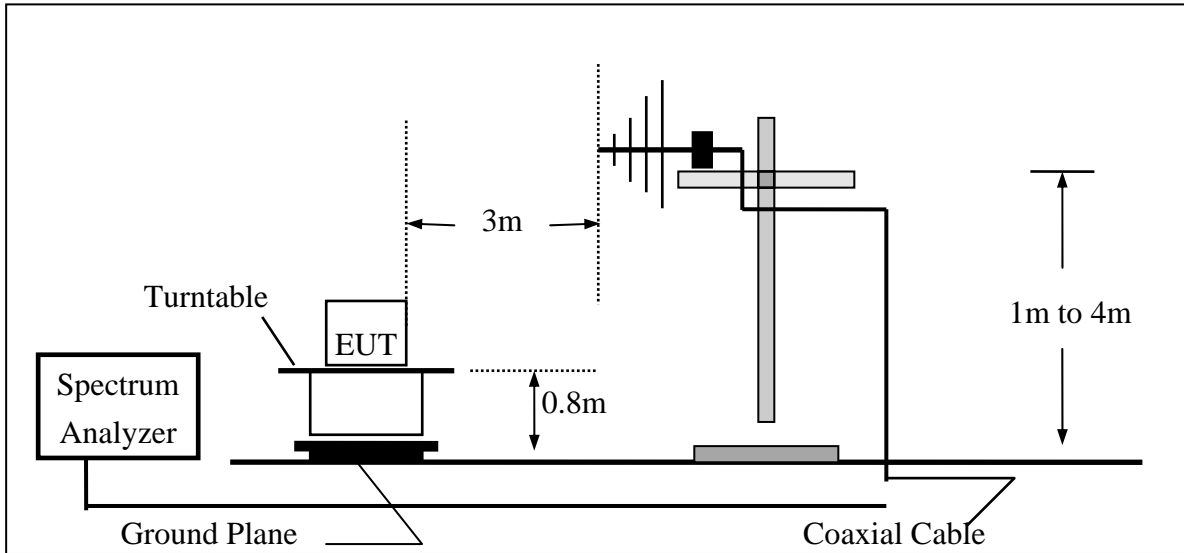
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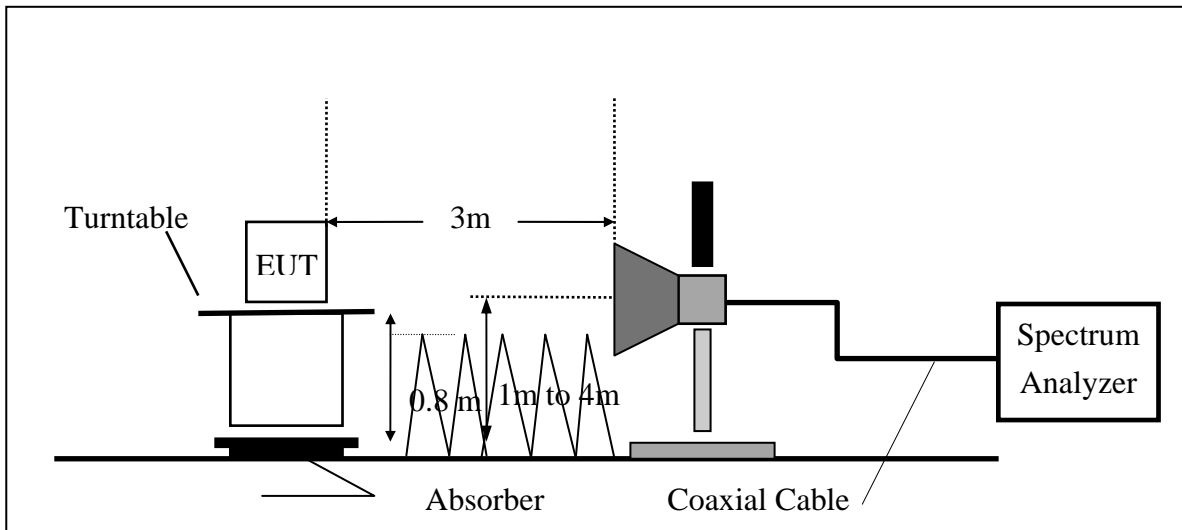
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12.4 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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12.5 Measurement Equipment Used:

SGS SAC Chamber No.C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESU 40	100363	01/30/2013	01/29/2014
Broadband Antenna	TESEQ	CBL 6112D	35240	02/04/2013	02/03/2014
Horn Antenna	ETS-Lindgren	3117	00143272	01/16/2013	01/15/2014
Horn Antenna	ETS-Lindgren	3160-09	00117911	02/14/2013	02/13/2014
Pre-Amplifier	R&S	SCU-18	10203	01/21/2013	01/20/2014
Pre-Amplifier	EMC Instruments	EMC012645	980119	01/24/2013	01/23/2014
Pre-Amplifier	EM Electronics Corp.	EM26400	971576	01/29/2013	01/28/2014
Coaxial Cable	Huber+Suhner	SAC-C TX-30M-1GHz	TX1	04/22/2013	04/21/2014
Coaxial Cable	Huber+Suhner	SAC-C TX-1-26.5GHz	TX2	04/22/2013	04/21/2014
Coaxial Cable	Huber+Suhner	SAC-C RX-150k-30MHz	RX1	04/22/2013	04/21/2014
Coaxial Cable	Huber+Suhner	SAC-C RX-30M-1GHz	RX2	04/22/2013	04/21/2014
Coaxial Cable	Huber+Suhner	SAC-C RX-1-26.5GHz	RX3	04/22/2013	04/21/2014
Controller	Chance Most	886	N/A	N.C.R.	N.C.R.
Antenna Master	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Turn Table	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Filter Bank	R&S	TS8996	SCIN.EMC.1023.12	04/22/2013	04/21/2014
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.

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12.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

12.7 Measurement Result

Refer to attach tabular data sheets.

NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

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Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

Operation Band	:802.11 a	Test Date	:2013-11-17
Fundamental Frequency	:5180 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	56.64	-20.40	36.24	40.00	-3.76
47.46	S	Peak	60.76	-25.34	35.42	40.00	-4.58
93.05	S	Peak	63.97	-24.20	39.77	43.50	-3.73
100.81	S	Peak	60.72	-23.05	37.67	43.50	-5.83
304.51	S	Peak	47.98	-18.76	29.21	46.00	-16.79
400.54	S	Peak	45.79	-15.56	30.23	46.00	-15.77
1119.00	S	Peak	54.92	-10.19	44.73	68.30	-23.57
5578.00	S	Peak	50.00	1.76	51.76	68.30	-16.54
10360.00	H	Peak	43.97	8.09	52.06	68.30	-16.24
15540.00	H	Peak	-	-	-	-	-
20720.00	H	Peak	-	-	-	-	-
25900.00	H	Peak	-	-	-	-	-
31080.00	H	Peak	-	-	-	-	-
36260.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 a	Test Date	:2013-11-17
Fundamental Frequency	:5180 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
93.05	S	Peak	57.31	-24.20	33.11	43.50	-10.39
100.81	S	Peak	58.48	-23.05	35.43	43.50	-8.07
125.06	S	Peak	52.48	-21.59	30.89	43.50	-12.61
149.31	S	Peak	51.87	-22.75	29.12	43.50	-14.38
297.72	S	Peak	54.98	-19.14	35.84	46.00	-10.16
308.39	S	Peak	55.42	-18.64	36.78	46.00	-9.22
1126.00	S	Peak	56.92	-7.17	49.74	68.30	-18.56
5557.00	S	Peak	59.47	1.67	61.15	68.30	-7.15
6908.00	S	Peak	49.58	4.41	53.99	68.30	-14.31
10360.00	H	Peak	52.00	8.09	60.09	68.30	-8.21
15540.00	H	Peak	-	-	-	-	-
20720.00	H	Peak	-	-	-	-	-
25900.00	H	Peak	-	-	-	-	-
31080.00	H	Peak	-	-	-	-	-
36260.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 a	Test Date	:2013-11-17
Fundamental Frequency	:5220 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
38.73	S	Peak	57.03	-20.40	36.63	40.00	-3.37
47.46	S	Peak	59.98	-25.34	34.64	40.00	-5.36
93.05	S	Peak	64.36	-24.20	40.16	43.50	-3.34
101.78	S	Peak	60.29	-22.93	37.36	43.50	-6.14
306.45	S	Peak	48.84	-18.75	30.09	46.00	-15.91
400.54	S	Peak	47.06	-15.56	31.50	46.00	-14.50
1119.00	S	Peak	56.48	-10.19	46.29	68.30	-22.01
1399.00	S	Peak	55.24	-9.80	45.44	68.30	-22.86
4976.00	S	Peak	50.28	0.66	50.94	68.30	-17.36
10440.00	H	Peak	42.47	8.48	50.95	68.30	-17.35
15660.00	H	Peak	-	-	-	-	-
20880.00	H	Peak	-	-	-	-	-
26100.00	H	Peak	-	-	-	-	-
31320.00	H	Peak	-	-	-	-	-
36540.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 a	Test Date	:2013-11-17
Fundamental Frequency	:5220 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
93.05	S	Peak	61.27	-24.20	37.07	43.50	-6.43
100.81	S	Peak	58.44	-23.05	35.39	43.50	-8.11
194.90	S	Peak	54.23	-23.84	30.40	43.50	-13.10
296.75	S	Peak	55.28	-19.19	36.09	46.00	-9.91
307.42	S	Peak	56.10	-18.70	37.40	46.00	-8.60
750.71	S	Peak	43.19	-10.71	32.48	46.00	-13.52
1119.00	S	Peak	57.52	-7.19	50.33	68.30	-17.97
1399.00	S	Peak	55.25	-6.80	48.45	68.30	-19.85
4983.00	S	Peak	58.47	0.69	59.16	68.30	-9.14
5627.00	S	Peak	59.39	1.87	61.26	68.30	-7.04
10440.00	H	Peak	49.46	8.48	57.94	68.30	-10.36
15660.00	H	Peak	-	-	-	-	-
20880.00	H	Peak	-	-	-	-	-
26100.00	H	Peak	-	-	-	-	-
31320.00	H	Peak	-	-	-	-	-
36540.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 a	Test Date	:2013-11-17
Fundamental Frequency	:5240 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	56.78	-20.40	36.38	40.00	-3.62
47.46	S	Peak	60.50	-25.34	35.16	40.00	-4.84
93.05	S	Peak	64.67	-24.20	40.47	43.50	-3.03
101.78	S	Peak	59.65	-22.93	36.72	43.50	-6.78
305.48	S	Peak	48.65	-18.76	29.89	46.00	-16.11
400.54	S	Peak	46.50	-15.56	30.94	46.00	-15.06
1119.00	S	Peak	55.77	-10.19	45.58	68.30	-22.72
1399.00	S	Peak	54.42	-9.80	44.62	68.30	-23.68
4983.00	S	Peak	50.78	0.69	51.46	68.30	-16.84
10480.00	H	Peak	42.75	8.74	51.49	68.30	-16.81
15720.00	H	Peak	-	-	-	-	-
20960.00	H	Peak	-	-	-	-	-
26200.00	H	Peak	-	-	-	-	-
31440.00	H	Peak	-	-	-	-	-
36680.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 a	Test Date	:2013-11-17
Fundamental Frequency	:5240 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
93.05	S	Peak	60.78	-24.20	36.58	43.50	-6.92
100.81	S	Peak	57.84	-23.05	34.78	43.50	-8.72
125.06	S	Peak	51.42	-21.59	29.84	43.50	-13.66
149.31	S	Peak	52.28	-22.75	29.53	43.50	-13.97
297.72	S	Peak	55.45	-19.14	36.31	46.00	-9.69
306.45	S	Peak	55.32	-18.75	36.57	46.00	-9.43
1119.00	S	Peak	57.89	-7.19	50.70	68.30	-17.60
1399.00	S	Peak	55.67	-6.80	48.87	68.30	-19.43
5599.00	S	Peak	59.15	1.85	61.00	68.30	-7.30
6992.00	S	Peak	49.23	4.64	53.87	68.30	-14.43
10480.00	H	Peak	47.78	8.74	56.52	68.30	-11.78
15720.00	H	Peak	-	-	-	-	-
20960.00	H	Peak	-	-	-	-	-
26200.00	H	Peak	-	-	-	-	-
31440.00	H	Peak	-	-	-	-	-
36680.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 a	Test Date	:2013-11-11
Fundamental Frequency	:5180 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5093.80	E	Average	45.76	7.59	53.35	54.00	-0.65
5093.80	E	Peak	62.41	7.59	70.00	74.00	-4.00
5150.00	E	Peak	56.53	7.69	64.22	74.00	-9.78
5150.00	E	Peak	43.58	7.69	51.27	74.00	-22.73

Operation Band	:802.11 a	Test Date	:2013-11-11
Fundamental Frequency	:5180 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	45.15	7.69	52.84	54.00	-1.16
5150.00	E	Peak	59.49	7.69	67.18	74.00	-6.82

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Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz (MIMO)

Operation Band	:802.11 n20M	Test Date	:2013-11-17
Fundamental Frequency	:5180 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
38.73	S	Peak	57.42	-20.40	37.02	40.00	-2.98
47.46	S	Peak	60.56	-25.34	35.22	40.00	-4.78
93.05	S	Peak	65.11	-24.20	40.91	43.50	-2.59
101.78	S	Peak	59.37	-22.93	36.44	43.50	-7.06
400.54	S	Peak	46.11	-15.56	30.54	46.00	-15.46
625.58	S	Peak	46.02	-11.93	34.09	46.00	-11.91
1119.00	S	Peak	55.40	-10.19	45.21	68.30	-23.09
1399.00	S	Peak	55.59	-9.80	45.79	68.30	-22.51
4962.00	S	Peak	53.15	0.62	53.77	68.30	-14.53
5683.00	S	Peak	57.35	1.92	59.27	68.30	-9.03
10360.00	H	Peak	55.19	8.12	63.32	68.30	-4.98
15540.00	H	Peak	-	-	-	-	-
20720.00	H	Peak	-	-	-	-	-
25900.00	H	Peak	-	-	-	-	-
31080.00	H	Peak	-	-	-	-	-
36260.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n20M	Test Date	:2013-11-17
Fundamental Frequency	:5180 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
93.05	S	Peak	58.93	-24.20	34.72	43.50	-8.78
101.78	S	Peak	58.71	-22.93	35.78	43.50	-7.72
115.36	S	Peak	53.50	-21.90	31.60	43.50	-11.90
306.45	S	Peak	55.58	-18.75	36.83	46.00	-9.17
625.58	S	Peak	44.70	-11.93	32.77	46.00	-13.23
750.71	S	Peak	46.69	-10.71	35.98	46.00	-10.02
1119.00	S	Peak	56.63	-7.19	49.43	68.30	-18.87
1399.00	S	Peak	53.52	-6.80	46.72	68.30	-21.58
4990.00	S	Peak	56.56	0.71	57.27	68.30	-11.03
5627.00	S	Peak	59.00	1.87	60.87	68.30	-7.43
10440.00	H	Peak	54.23	8.48	62.71	68.30	-5.59
15660.00	H	Peak	-	-	-	-	-
20880.00	H	Peak	-	-	-	-	-
26100.00	H	Peak	-	-	-	-	-
31320.00	H	Peak	-	-	-	-	-
36540.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n20M	Test Date	:2013-11-17
Fundamental Frequency	:5220 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	56.97	-20.40	36.57	40.00	-3.43
47.46	S	Peak	60.92	-25.34	35.58	40.00	-4.42
93.05	S	Peak	64.68	-24.20	40.48	43.50	-3.02
102.75	S	Peak	59.93	-22.79	37.13	43.50	-6.37
575.14	S	Peak	47.58	-12.36	35.22	46.00	-10.78
750.71	S	Peak	48.94	-10.71	38.23	46.00	-7.77
1119.00	S	Peak	55.86	-10.19	45.67	68.30	-22.63
1399.00	S	Peak	54.55	-9.80	44.75	68.30	-23.55
4976.00	S	Peak	53.15	0.66	53.82	68.30	-14.48
5641.00	S	Peak	57.04	1.89	58.93	68.30	-9.37
10440.00	H	Peak	52.61	8.48	61.09	68.30	-7.21
15660.00	H	Peak	-	-	-	-	-
20880.00	H	Peak	-	-	-	-	-
26100.00	H	Peak	-	-	-	-	-
31320.00	H	Peak	-	-	-	-	-
36540.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n20M	Test Date	:2013-11-17
Fundamental Frequency	:5220 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
93.05	S	Peak	58.93	-24.20	34.72	43.50	-8.78
101.78	S	Peak	58.71	-22.93	35.78	43.50	-7.72
115.36	S	Peak	53.50	-21.90	31.60	43.50	-11.90
306.45	S	Peak	55.58	-18.75	36.83	46.00	-9.17
625.58	S	Peak	44.70	-11.93	32.77	46.00	-13.23
750.71	S	Peak	46.69	-10.71	35.98	46.00	-10.02
1119.00	S	Peak	56.63	-7.19	49.43	68.30	-18.87
1399.00	S	Peak	53.52	-6.80	46.72	68.30	-21.58
4990.00	S	Peak	56.56	0.71	57.27	68.30	-11.03
5627.00	S	Peak	59.00	1.87	60.87	68.30	-7.43
10440.00	H	Peak	54.23	8.48	62.71	68.30	-5.59
15660.00	H	Peak	-	-	-	-	-
20880.00	H	Peak	-	-	-	-	-
26100.00	H	Peak	-	-	-	-	-
31320.00	H	Peak	-	-	-	-	-
36540.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n20M	Test Date	:2013-11-17
Fundamental Frequency	:5240 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	56.98	-20.40	36.58	40.00	-3.42
47.46	S	Peak	60.25	-25.34	34.91	40.00	-5.09
93.05	S	Peak	64.11	-24.20	39.91	43.50	-3.59
101.78	S	Peak	59.05	-22.93	36.12	43.50	-7.38
600.36	S	Peak	46.41	-12.32	34.09	46.00	-11.91
750.71	S	Peak	47.69	-10.71	36.98	46.00	-9.02
1119.00	S	Peak	55.34	-10.19	45.14	68.30	-23.16
1399.00	S	Peak	55.31	-9.80	45.51	68.30	-22.79
5683.00	S	Peak	57.42	1.92	59.34	68.30	-8.96
10480.00	H	Peak	52.13	8.74	60.87	68.30	-7.43
15720.00	H	Peak	-	-	-	-	-
20960.00	H	Peak	-	-	-	-	-
26200.00	H	Peak	-	-	-	-	-
31440.00	H	Peak	-	-	-	-	-
36680.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n20M	Test Date	:2013-11-17
Fundamental Frequency	:5240 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
38.73	S	Peak	52.24	-20.40	31.84	40.00	-8.16
93.05	S	Peak	60.60	-24.20	36.40	43.50	-7.10
101.78	S	Peak	58.33	-22.93	35.40	43.50	-8.10
308.39	S	Peak	55.82	-18.64	37.18	46.00	-8.82
625.58	S	Peak	45.26	-11.93	33.32	46.00	-12.68
750.71	S	Peak	47.24	-10.71	36.53	46.00	-9.47
1119.00	S	Peak	57.56	-7.19	50.36	68.30	-17.94
4976.00	S	Peak	57.71	0.66	58.38	68.30	-9.92
5634.00	S	Peak	60.07	1.88	61.95	68.30	-6.35
10480.00	H	Peak	52.59	8.74	61.33	68.30	-6.97
15720.00	H	Peak	-	-	-	-	-
20960.00	H	Peak	-	-	-	-	-
26200.00	H	Peak	-	-	-	-	-
31440.00	H	Peak	-	-	-	-	-
36680.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n20M	Test Date	:2013-11-11
Fundamental Frequency	:5180 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5096.60	E	Average	46.03	7.59	53.62	54.00	-0.38
5096.60	E	Peak	61.52	7.59	69.11	74.00	-4.89
5150.00	E	Average	43.04	7.69	50.73	54.00	-3.27
5150.00	E	Peak	57.19	7.69	64.88	74.00	-9.12

Operation Band	:802.11 n20M	Test Date	:2013-11-11
Fundamental Frequency	:5180 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	44.51	7.69	52.20	54.00	-1.80
5150.00	E	Peak	58.14	7.69	65.83	74.00	-8.17

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Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz (MIMO)

Operation Band	:802.11 n40M	Test Date	:2013-11-17
Fundamental Frequency	:5190 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
39.70	S	Peak	57.73	-21.08	36.65	40.00	-3.35
47.46	S	Peak	60.67	-25.34	35.33	40.00	-4.67
93.05	S	Peak	64.37	-24.20	40.17	43.50	-3.33
100.81	S	Peak	60.29	-23.05	37.24	43.50	-6.26
600.36	S	Peak	49.14	-12.32	36.83	46.00	-9.17
750.71	S	Peak	47.09	-10.71	36.38	46.00	-9.62
1119.00	S	Peak	58.50	-10.19	48.31	68.30	-19.99
1399.00	S	Peak	54.55	-9.80	44.75	68.30	-23.55
4990.00	S	Peak	59.67	0.71	60.38	68.30	-7.92
5634.00	S	Peak	59.62	1.88	61.50	68.30	-6.80
10380.00	H	Peak	50.93	8.16	59.09	68.30	-9.21
15570.00	H	Peak	-	-	-	-	-
20760.00	H	Peak	-	-	-	-	-
25950.00	H	Peak	-	-	-	-	-
31140.00	H	Peak	-	-	-	-	-
36330.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n40M	Test Date	:2013-11-17
Fundamental Frequency	:5190 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
93.05	S	Peak	61.99	-24.20	37.79	43.50	-5.71
101.78	S	Peak	60.18	-22.93	37.25	43.50	-6.25
308.39	S	Peak	54.85	-18.64	36.21	46.00	-9.79
575.14	S	Peak	49.22	-12.36	36.86	46.00	-9.14
600.36	S	Peak	52.73	-12.32	40.41	46.00	-5.59
750.71	S	Peak	52.35	-10.71	41.64	46.00	-4.36
1119.00	S	Peak	57.40	-7.19	50.21	68.30	-18.09
1399.00	S	Peak	54.45	-6.80	47.65	68.30	-20.65
4990.00	S	Peak	58.77	0.71	59.48	68.30	-8.82
5592.00	S	Peak	60.00	1.82	61.82	68.30	-6.48
10380.00	H	Peak	51.84	8.16	60.00	68.30	-8.30
15570.00	H	Peak	-	-	-	-	-
20760.00	H	Peak	-	-	-	-	-
25950.00	H	Peak	-	-	-	-	-
31140.00	H	Peak	-	-	-	-	-
36330.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n40M	Test Date	:2013-11-17
Fundamental Frequency	:5230 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
38.73	S	Peak	57.10	-20.40	36.70	40.00	-3.30
47.46	S	Peak	60.60	-25.34	35.26	40.00	-4.74
93.05	S	Peak	64.34	-24.20	40.14	43.50	-3.36
100.81	S	Peak	60.83	-23.05	37.78	43.50	-5.72
600.36	S	Peak	48.61	-12.32	36.29	46.00	-9.71
750.71	S	Peak	48.92	-10.71	38.21	46.00	-7.79
1119.00	S	Peak	57.39	-10.19	47.20	68.30	-21.10
1399.00	S	Peak	54.53	-9.80	44.73	68.30	-23.57
4969.00	S	Peak	56.79	0.64	57.43	68.30	-10.87
5578.00	S	Peak	58.78	1.76	60.54	68.30	-7.76
10460.00	H	Peak	47.39	8.41	55.80	68.30	-12.50
15690.00	H	Peak	-	-	-	-	-
20920.00	H	Peak	-	-	-	-	-
26150.00	H	Peak	-	-	-	-	-
31380.00	H	Peak	-	-	-	-	-
36610.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n40M	Test Date	:2013-11-17
Fundamental Frequency	:5230 MHz	Temp./Humi.	:24.7 deg_C / 56 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
93.05	S	Peak	61.19	-24.20	36.99	43.50	-6.51
101.78	S	Peak	59.21	-22.93	36.28	43.50	-7.22
307.42	S	Peak	54.89	-18.70	36.19	46.00	-9.81
575.14	S	Peak	49.35	-12.36	36.99	46.00	-9.01
600.36	S	Peak	51.70	-12.32	39.38	46.00	-6.62
750.71	S	Peak	52.16	-10.71	41.45	46.00	-4.55
1119.00	S	Peak	57.29	-7.19	50.09	68.30	-18.21
1399.00	S	Peak	54.82	-6.80	48.02	68.30	-20.28
4976.00	S	Peak	58.08	0.66	58.74	68.30	-9.56
5620.00	S	Peak	59.47	1.87	61.34	68.30	-6.96
10460.00	H	Peak	48.39	8.41	56.80	68.30	-11.50
15690.00	H	Peak	-	-	-	-	-
20920.00	H	Peak	-	-	-	-	-
26150.00	H	Peak	-	-	-	-	-
31380.00	H	Peak	-	-	-	-	-
36610.00	H	Peak	-	-	-	-	-

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Operation Band	:802.11 n40M	Test Date	:2013-11-11
Fundamental Frequency	:5190 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	43.28	7.69	50.97	54.00	-3.03
5150.00	E	Peak	57.74	7.69	65.43	74.00	-8.57

Operation Band	:802.11 n40M	Test Date	:2013-11-11
Fundamental Frequency	:5190 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

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The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	45.57	7.69	53.26	54.00	-0.74
5150.00	E	Peak	63.05	7.69	70.74	74.00	-3.26

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13. TRANSMISSION IN THE ABSENCE OF DATA

13.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

According to RSS-210 A9.4(4)

The device shall automatically discontinue transmission in case of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

13.2 Result:

No non-compliance noted:

Refer to the theory of operation.

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14. FREQUENCY STABILITY

14.1 Standard Applicable

According to §15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

14.2 Result:

Refer to next page for plots.

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Operation Mode	802.11 a	Test Date	2013/11/11
Temperature	25 °C	Test By	A-Ken
Humidity	62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
25 °C	24V	36	5180.0000	5,179.931500	0.0685
		44	5220.0000	5,219.929240	0.0708
		48	5240.0000	5,239.927033	0.0730
0 °C	24V	36	5180.0000	5,179.928067	0.0719
		44	5220.0000	5,219.928617	0.0714
		48	5240.0000	5,239.924783	0.0752
40 °C	24V	36	5180.0000	5,179.927750	0.0723
		44	5220.0000	5,219.927500	0.0725
		48	5240.0000	5,239.924683	0.0753

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Operation Mode	802.11n_HT40	Test Date	2013/11/11
Temperature	25 °C	Test By	A-Ken
Humidity	62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
25 °C	24V	38	5190.0000	5,189.938650	0.0613
		46	5230.0000	5,229.938433	0.0616
0 °C	24V	38	5190.0000	5,189.938383	0.0616
		46	5230.0000	5,229.938133	0.0619
40 °C	24V	38	5190.0000	5,189.958783	0.0412
		46	5230.0000	5,229.960483	0.0395

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15. ANTENNA REQUIREMENT

15.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to RSS-GEN 7.1.2, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

15.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 5.31dBi (Main), 5.36dBi (Aux) for frequency band of 5150~5250MHz, 9.26dBi for 802.11 a/n20/n40 (5150~5250MHz_MIMO gain) and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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