

7. Band Edge

7.1. Test Equipment

RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010
X	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.
3. The power combiner is used for measure 11n mode.

RF Radiated Measurement:

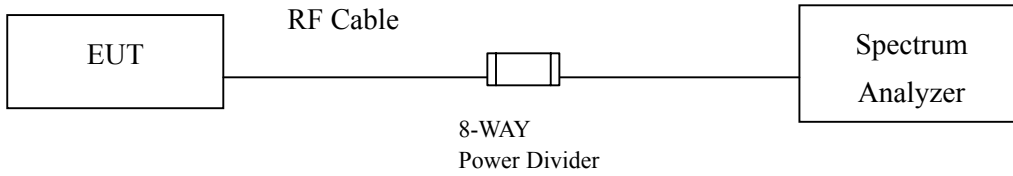
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	
☒ Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2010
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2010
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2010
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2010
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

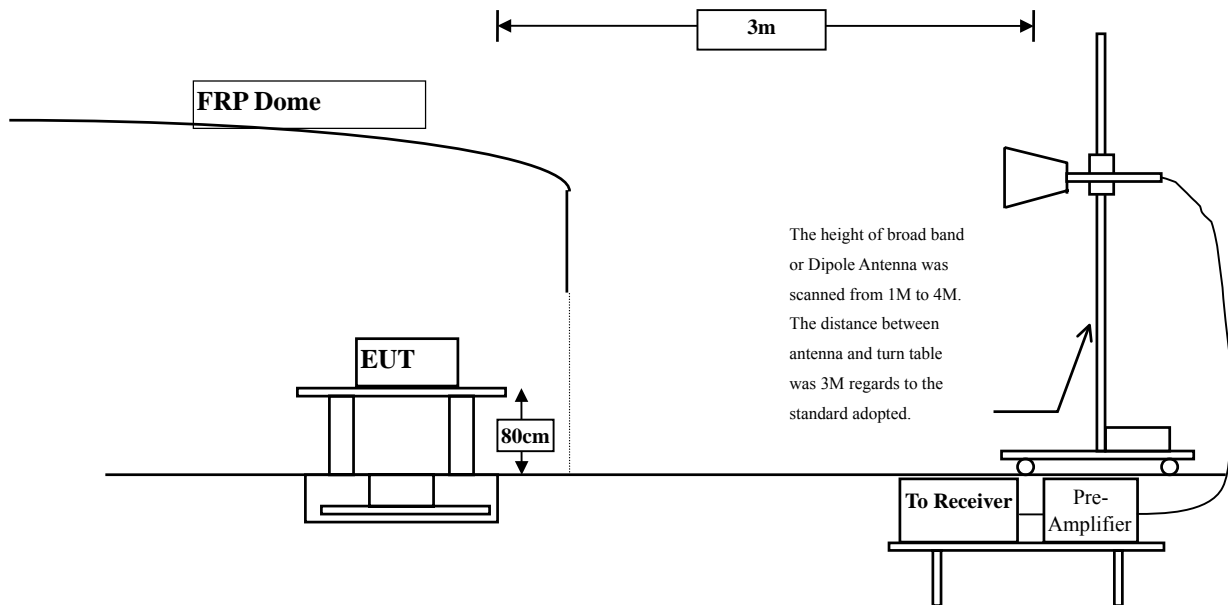
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

7.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



7.3. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

7.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.4: 2009; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

7.5. Uncertainty

- ± 3.8 dB below 1GHz
- ± 3.9 dB above 1GHz

7.6. Test Result of Band Edge

Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 36

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	5180	34.966	70.79	105.756	Peak
Horizontal	5180	34.966	58.77	93.736	Average
Vertical	5180	37.073	73.71	110.784	Peak
Vertical	5180	37.073	62.28	99.354	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5149.1	105.756	41.383	64.373	74.000	Peak
Horizontal	5150	93.736	53.227	40.509	54.000	Average
Vertical	5149.1	110.784	41.383	69.401	74.000	Peak
Vertical	5150	99.354	53.227	46.127	54.000	Average

Note:

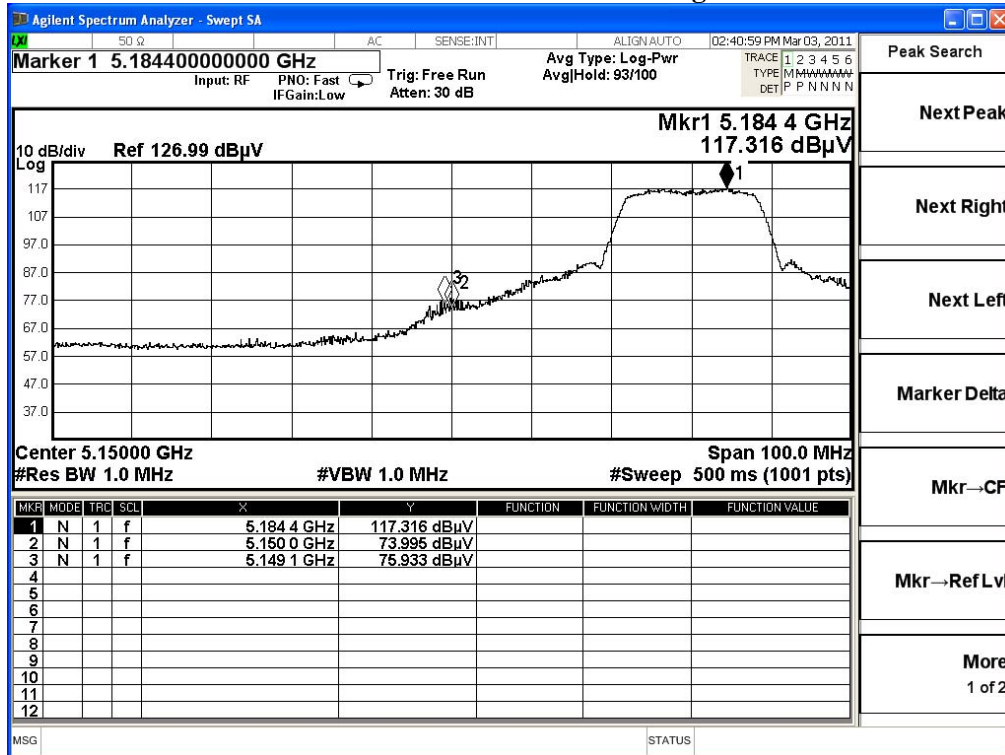
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

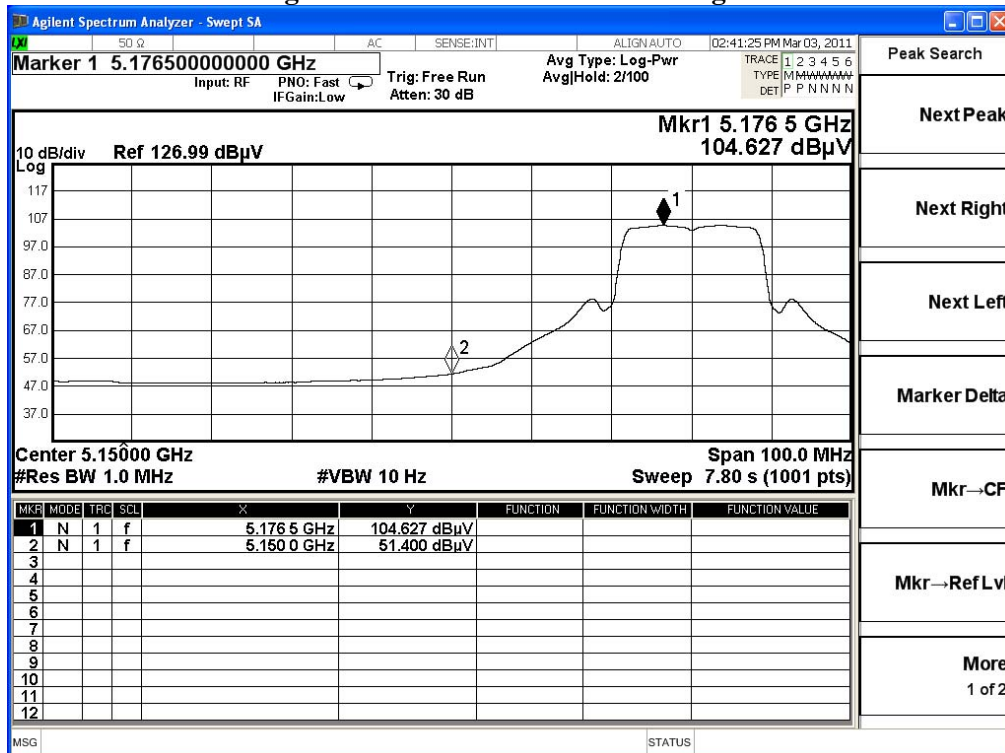
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



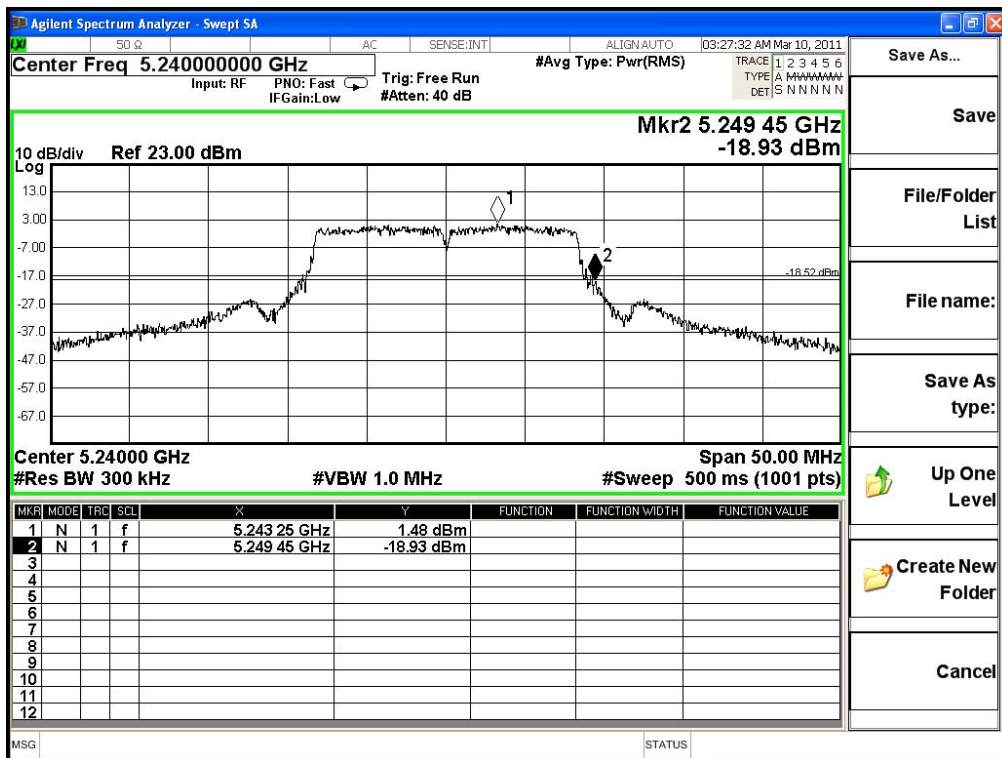
Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 48

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
5240	5249.45	<5250	PASS

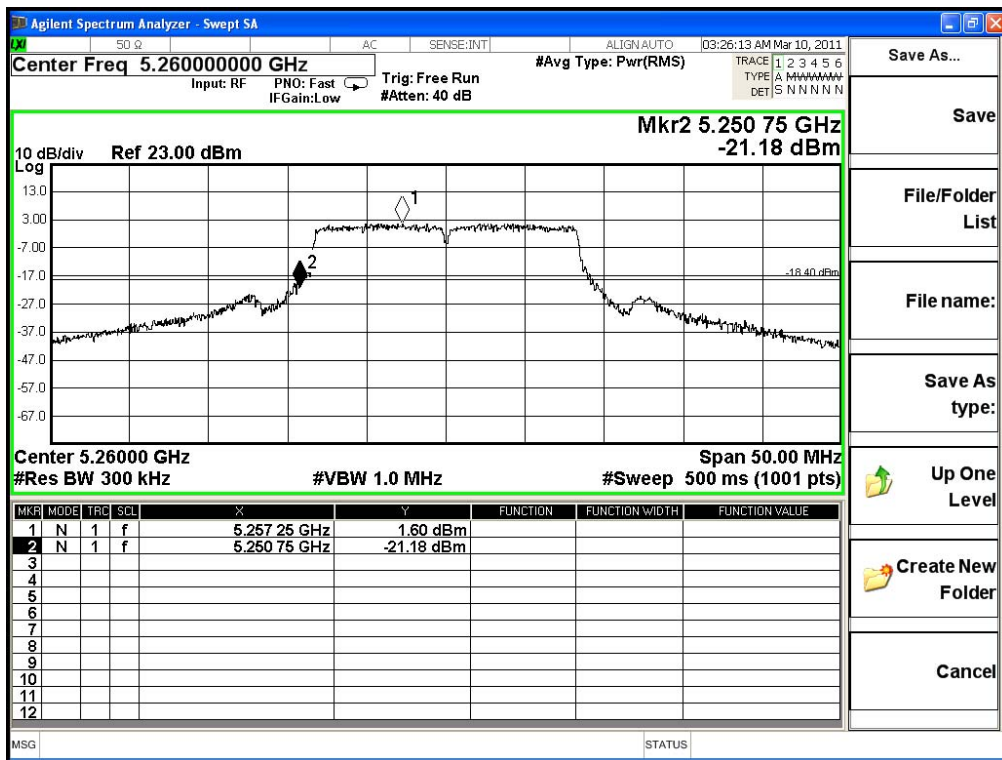
NOTE: Accordance with 15.215 requirement.



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 52

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
5260	5250.75	>5250	PASS

NOTE: Accordance with 15.215 requirement.



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) -Channel 64

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5320	35.635	69.17	104.804	Peak
Horizontal	5320	35.635	56.87	92.504	Average
Vertical	5320	37.552	75.22	112.771	Peak
Vertical	5320	37.552	62.83	100.381	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5350.9	104.804	42.11	62.694	74.000	Peak
Horizontal	5350	92.504	51.271	41.233	54.000	Average
Vertical	5350.9	112.771	42.11	70.661	74.000	Peak
Vertical	5350	100.381	51.271	49.11	54.000	Average

Note:

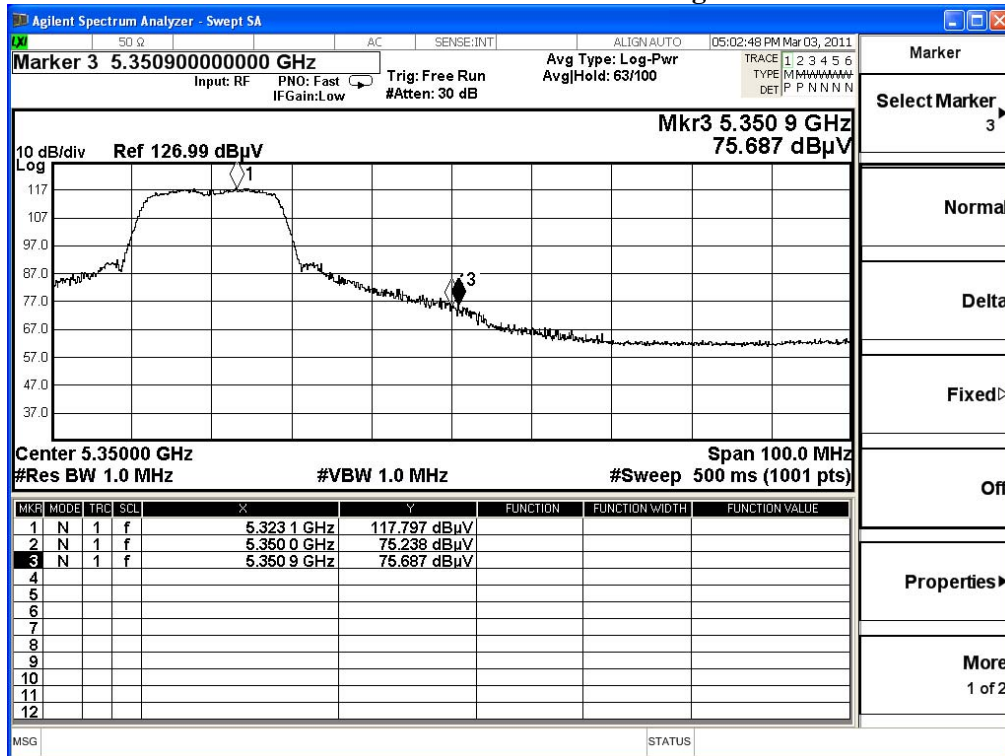
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

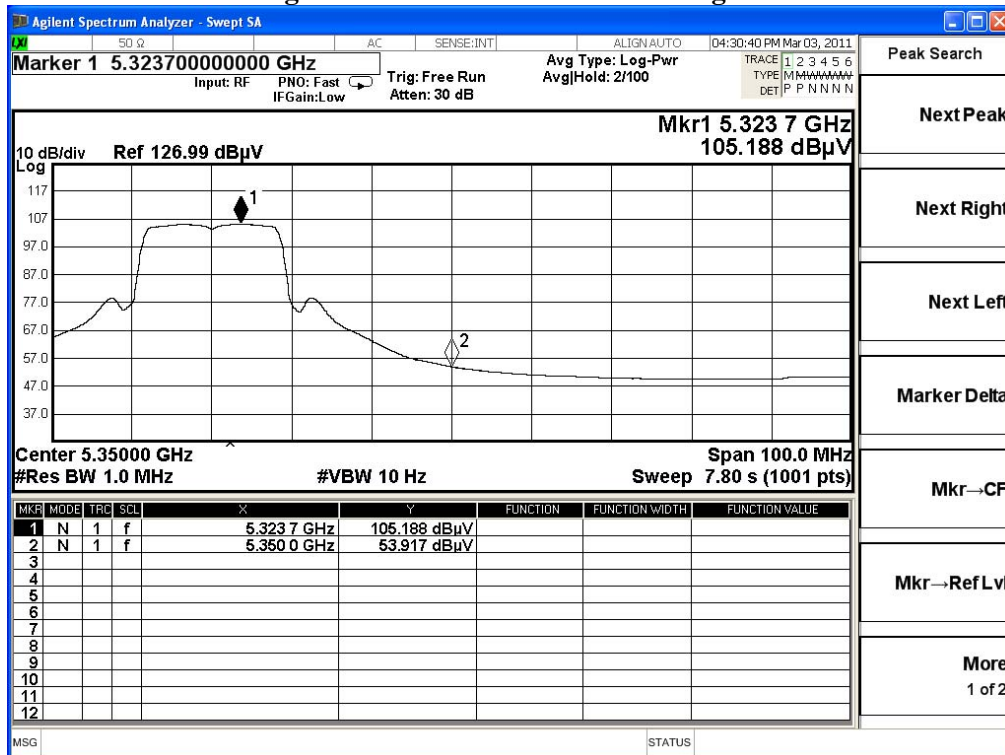
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) -Channel 100

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5500	36.684	72.69	109.374	Peak
Horizontal	5500	36.684	60.93	97.614	Average
Vertical	5500	38.145	77.01	115.155	Peak
Vertical	5500	38.145	66.16	104.305	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	5458.6	109.374	46.556	62.818	74.000	Peak
Horizontal	5460	97.614	54.994	42.62	54.000	Average
Vertical	5458.6	115.155	46.556	68.599	74.000	Peak
Vertical	5460	104.305	54.994	49.311	54.000	Average

Note:

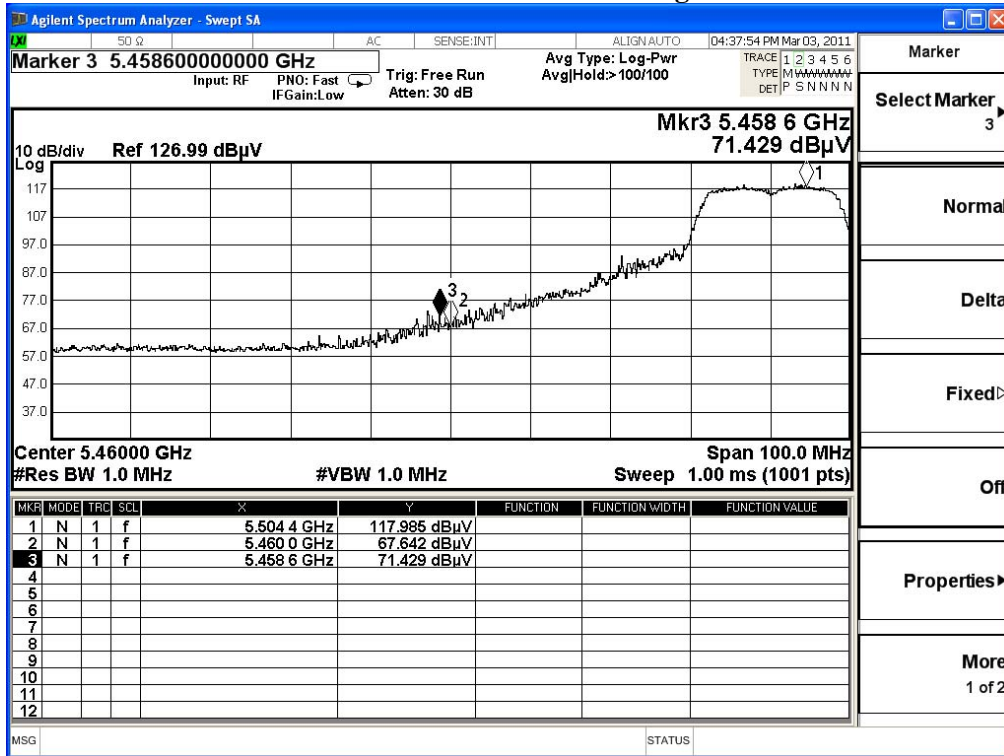
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

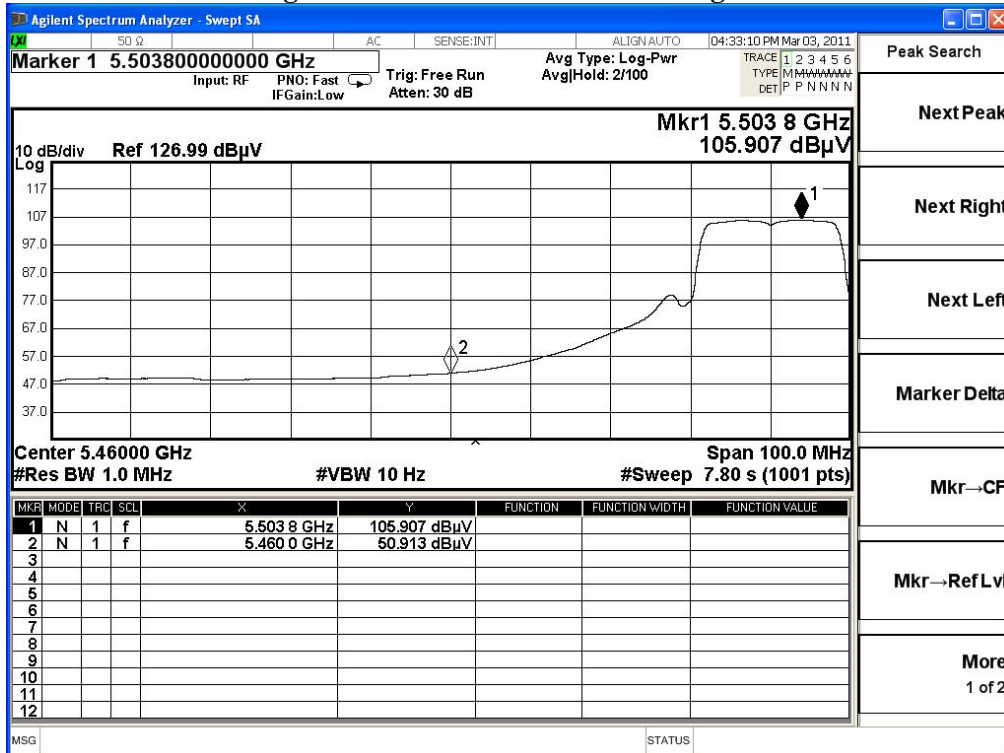
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta -1



Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) -Channel 100

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5470.000	50.755	-87.890	-37.135	-10.135	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5470.000	51.365	-87.900	-36.535	-9.535	-27.000	Pass

Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) -Channel 140

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5725.000	50.994	-82.820	-31.826	-4.826	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5725.000	51.536	-84.160	-32.624	-5.624	-27.000	Pass

Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 36

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	5180	34.966	72.66	107.626	Peak
Horizontal	5180	34.966	58.24	93.206	Average
Vertical	5180	37.073	75.79	112.864	Peak
Vertical	5180	37.073	61.74	98.814	Average

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiptment Limit (dBuV/m)	Detector
Horizontal	5150	107.626	45.822	61.804	74.000	Peak
Horizontal	5150	93.206	48.131	45.075	54.000	Average
Vertical	5150	112.864	45.822	67.042	74.000	Peak
Vertical	5150	98.814	48.131	50.683	54.000	Average

Note:

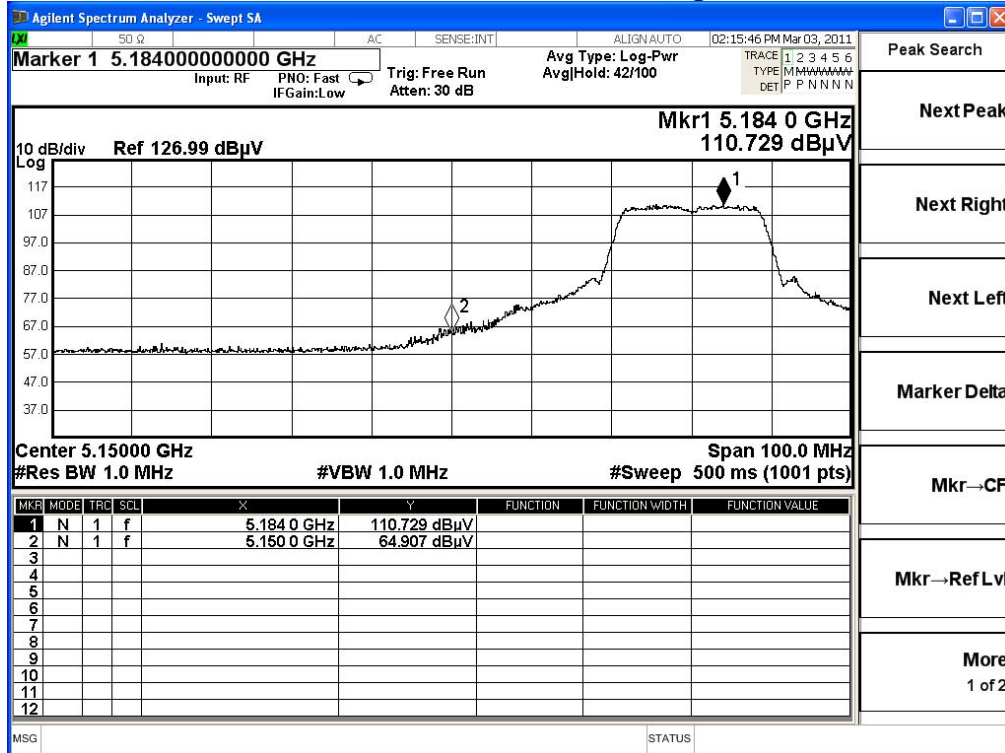
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

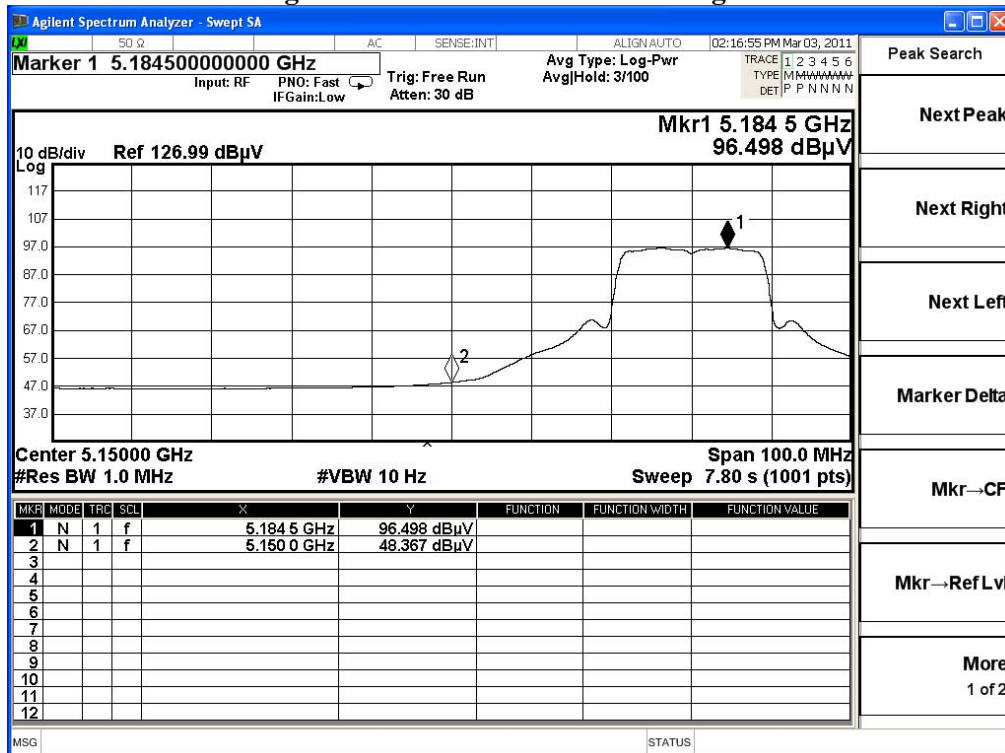
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



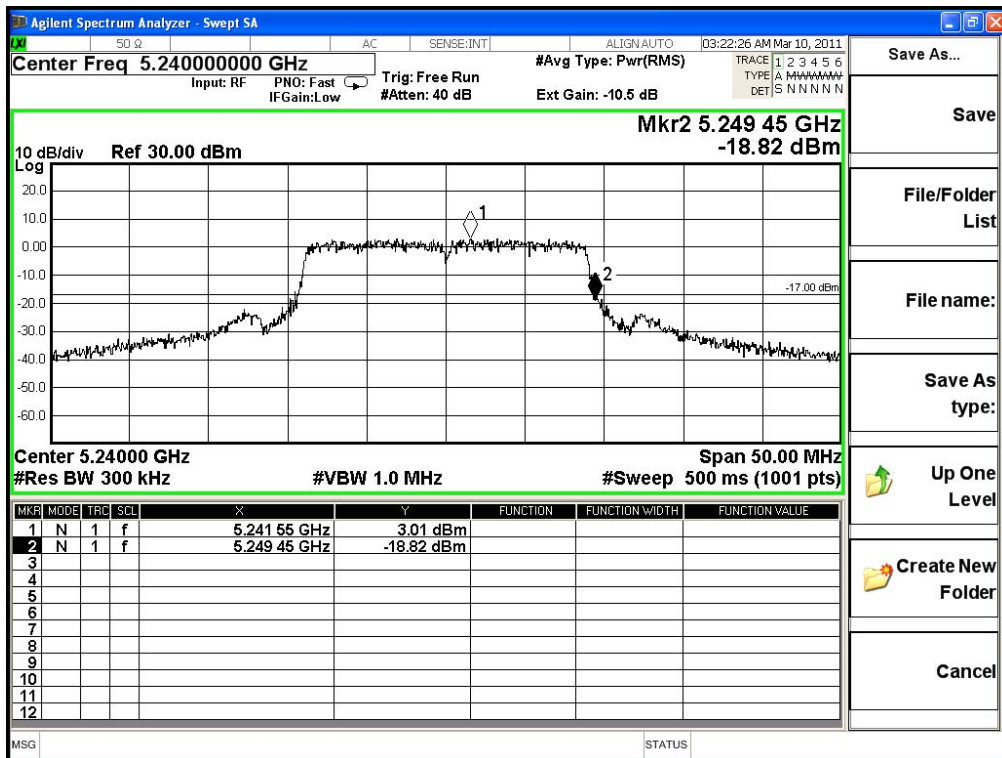
Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)-Channel 48

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
5240	5249.45	<5250	PASS

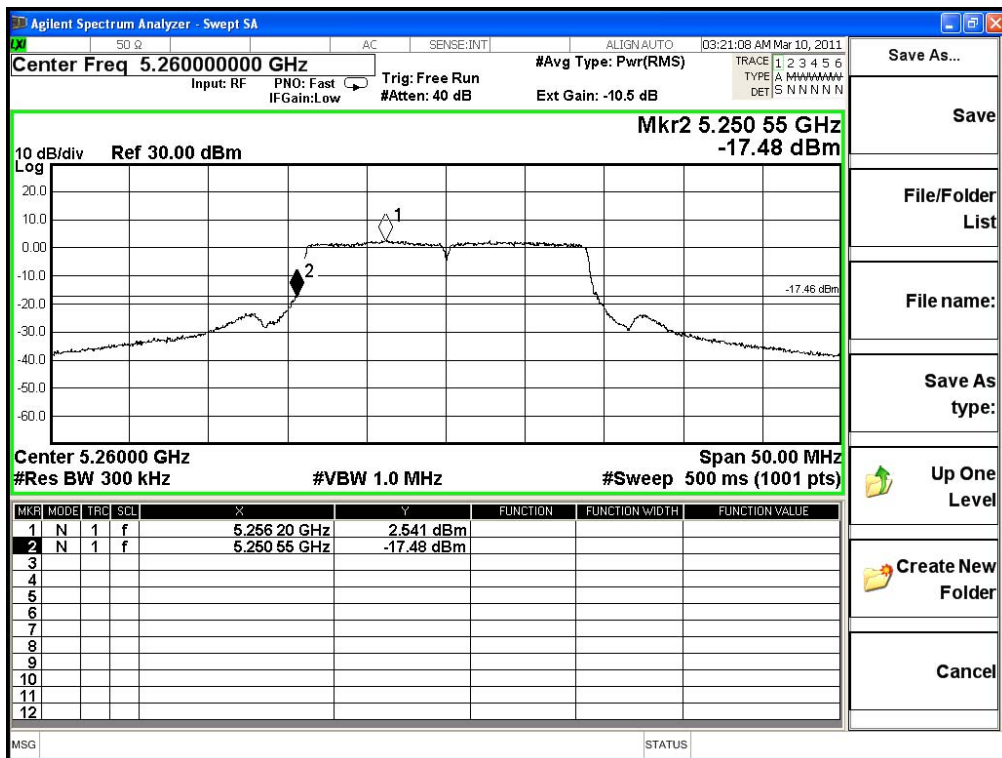
NOTE: Accordance with 15.215 requirement.



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)-Channel 52

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
5260	5250.55	>5250	PASS

NOTE: Accordance with 15.215 requirement.



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 64

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5320	35.635	69.11	104.744	Peak
Horizontal	5320	35.635	55.3	90.934	Average
Vertical	5320	37.552	75.04	112.591	Peak
Vertical	5320	37.552	60.78	98.331	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	5351.7	104.744	44.88	59.864	74.000	Peak
Horizontal	5350	90.934	47.471	43.463	54.000	Average
Vertical	5351.7	112.591	44.88	67.711	74.000	Peak
Vertical	5350	98.331	47.471	50.86	54.000	Average

Note:

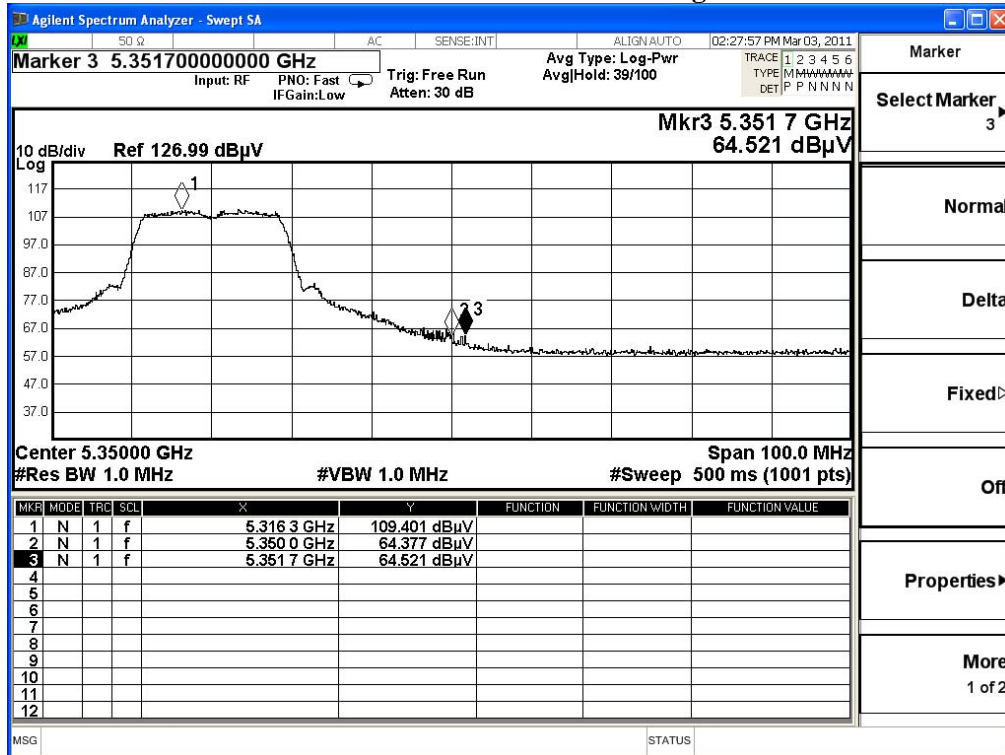
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

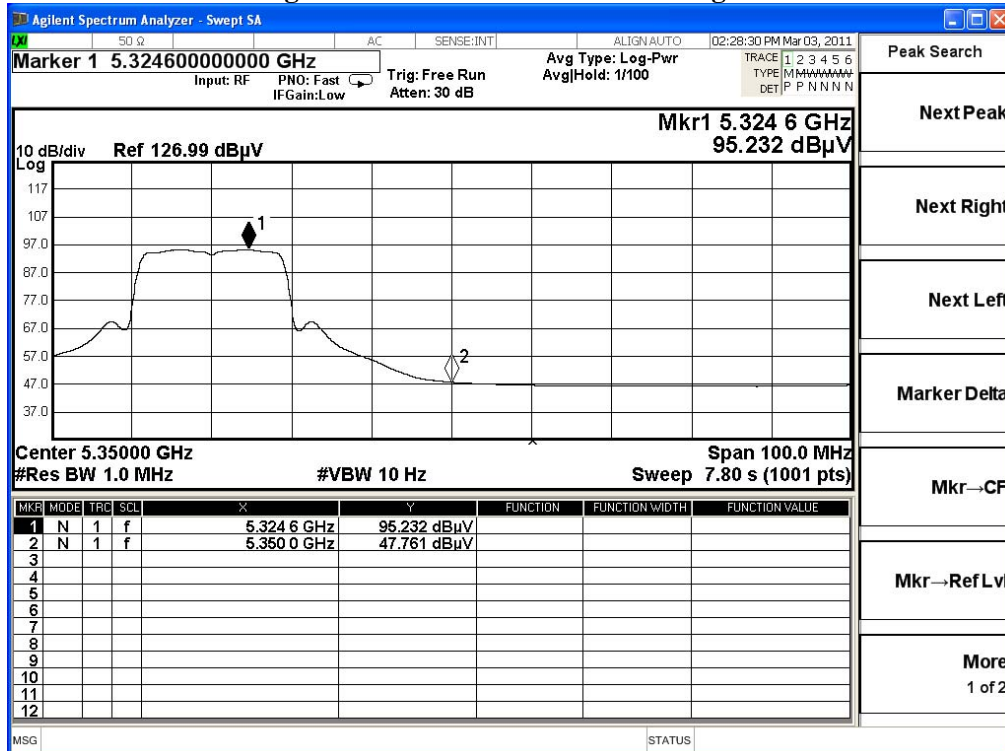
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 100

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5500	36.684	70.82	107.504	Peak
Horizontal	5500	36.684	56.41	93.094	Average
Vertical	5500	38.145	77.03	115.175	Peak
Vertical	5500	38.145	62.45	100.595	Average

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5460	107.504	53.74	53.764	74.000	Peak
Horizontal	5460	93.094	51.104	41.99	54.000	Average
Vertical	5460	115.175	53.74	61.435	74.000	Peak
Vertical	5460	100.595	51.104	49.491	54.000	Average

Note:

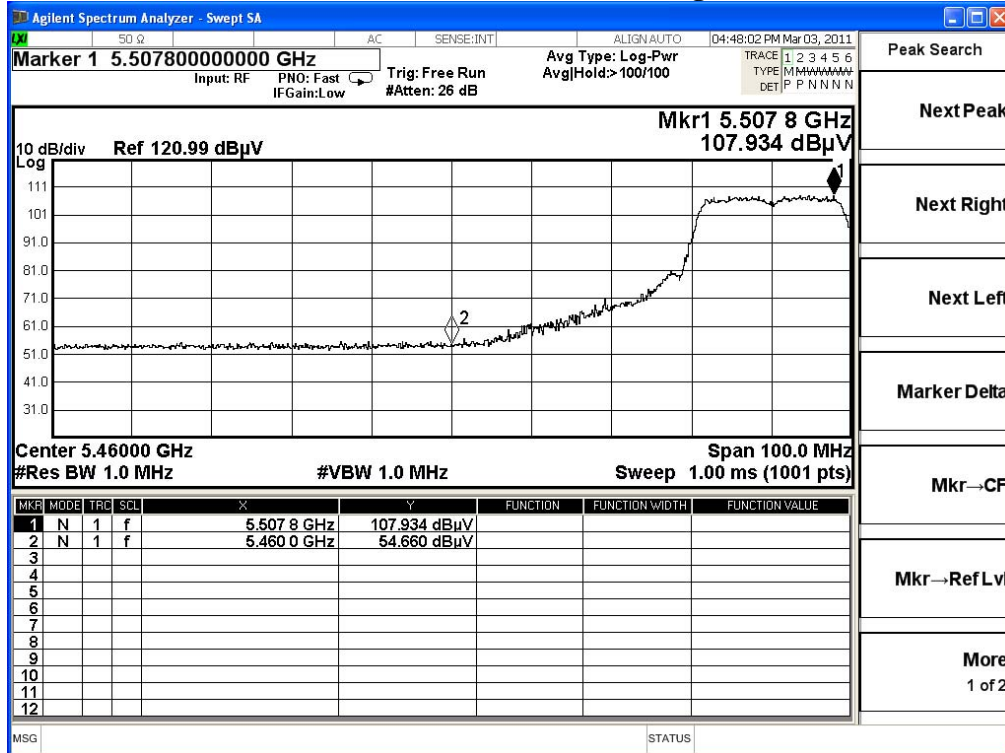
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

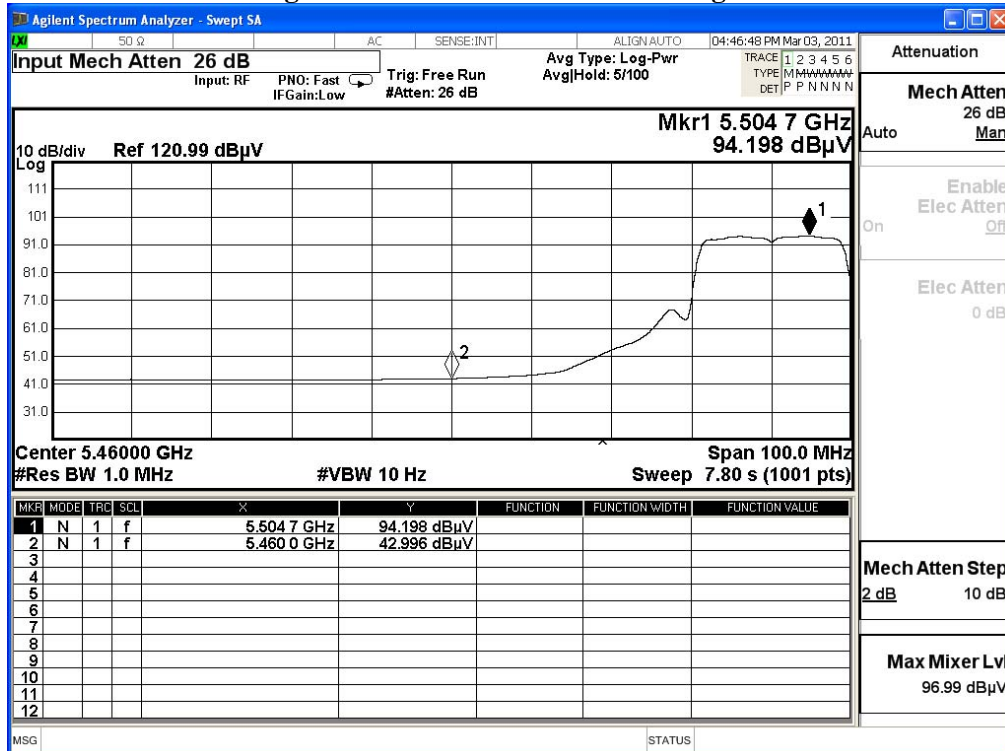
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 100

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5470.000	50.755	-88.740	-37.985	-10.985	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5470.000	51.365	-88.460	-37.095	-10.095	-27.000	Pass

Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 140

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5725.000	50.994	-82.360	-31.366	-4.366	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5725.000	51.536	-82.920	-31.384	-4.384	-27.000	Pass

Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 38

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	5190	34.907	64.29	99.198	Peak
Horizontal	5190	34.907	49.56	84.468	Average
Vertical	5190	37.077	68.19	105.268	Peak
Vertical	5190	37.077	52.95	90.028	Average

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	5150	99.198	42.026	57.172	74.000	Peak
Horizontal	5150	84.468	40.158	44.31	54.000	Average
Vertical	5150	105.268	42.026	63.242	74.000	Peak
Vertical	5150	90.028	40.158	49.87	54.000	Average

Note:

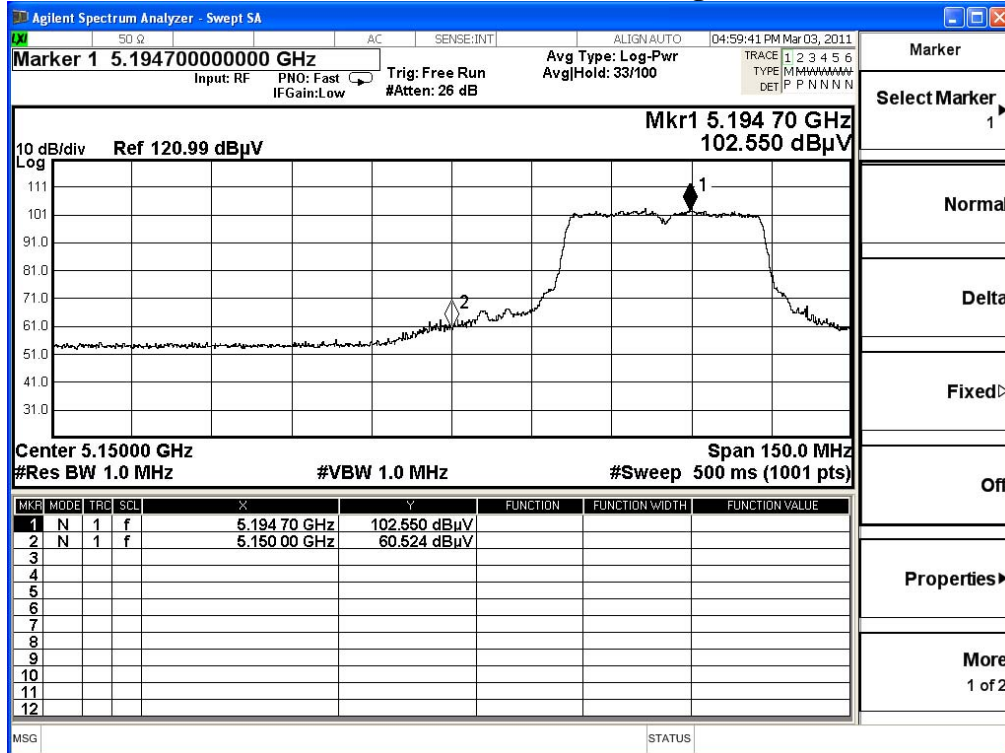
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

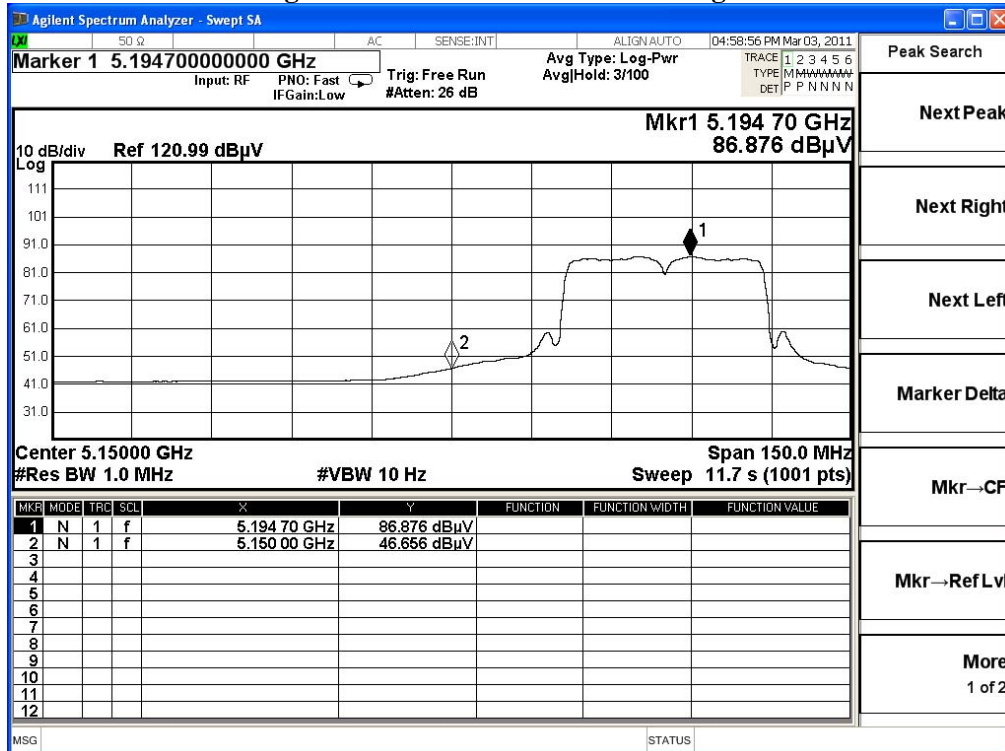
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



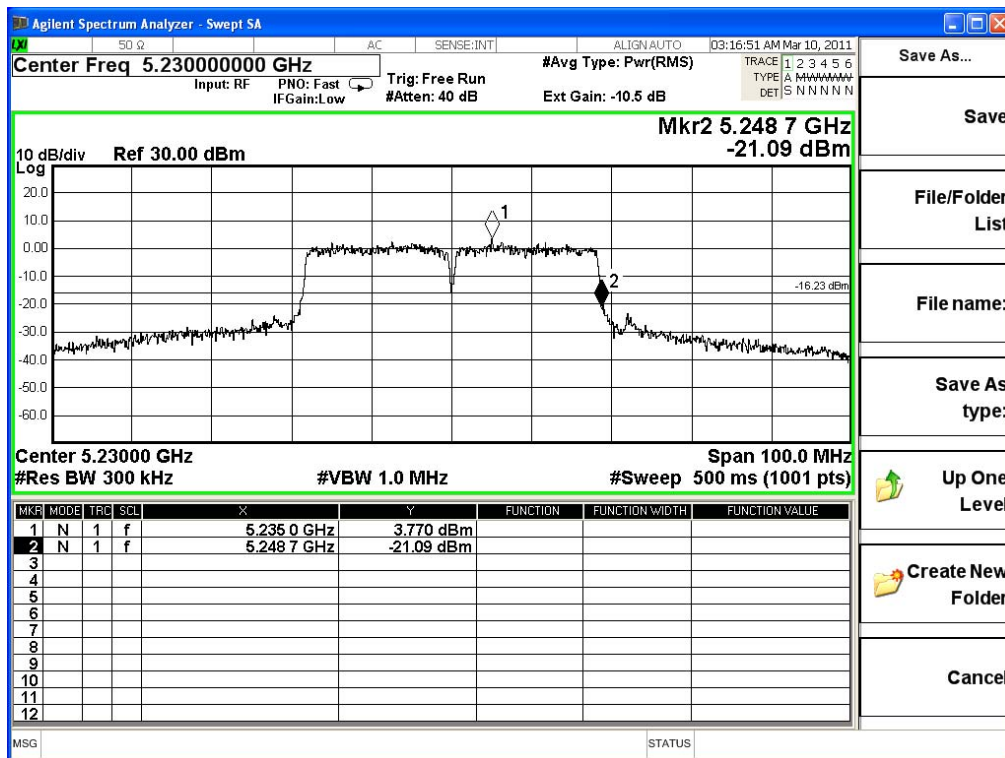
Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)-Channel 46

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
5230	5248.7	<5250	PASS

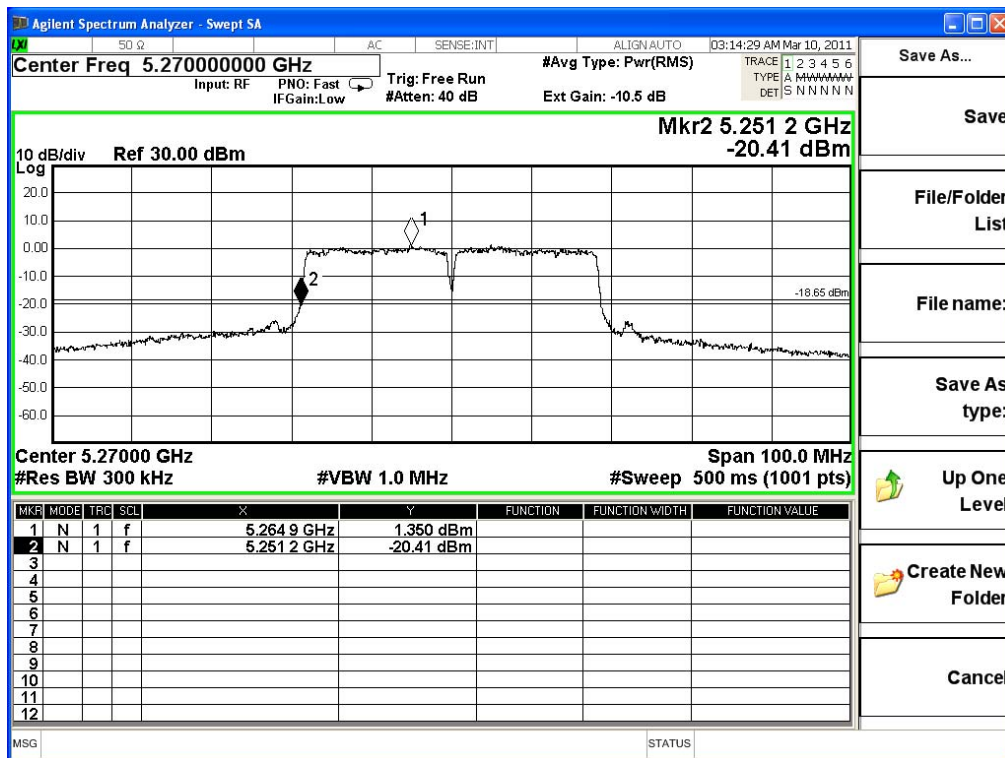
NOTE: Accordance with 15.215 requirement.



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)-Channel 54

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
5270	5251.2	>5250	PASS

NOTE: Accordance with 15.215 requirement.



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 62

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5310	35.655	62.95	98.606	Peak
Horizontal	5310	35.655	48.93	84.586	Average
Vertical	5310	37.553	69.47	107.023	Peak
Vertical	5310	37.553	54.14	91.693	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	5352.1	98.606	41.487	57.119	74.000	Peak
Horizontal	5350	84.586	40.886	43.7	54.000	Average
Vertical	5352.1	107.023	41.487	65.536	74.000	Peak
Vertical	5350	91.693	40.886	50.807	54.000	Average

Note:

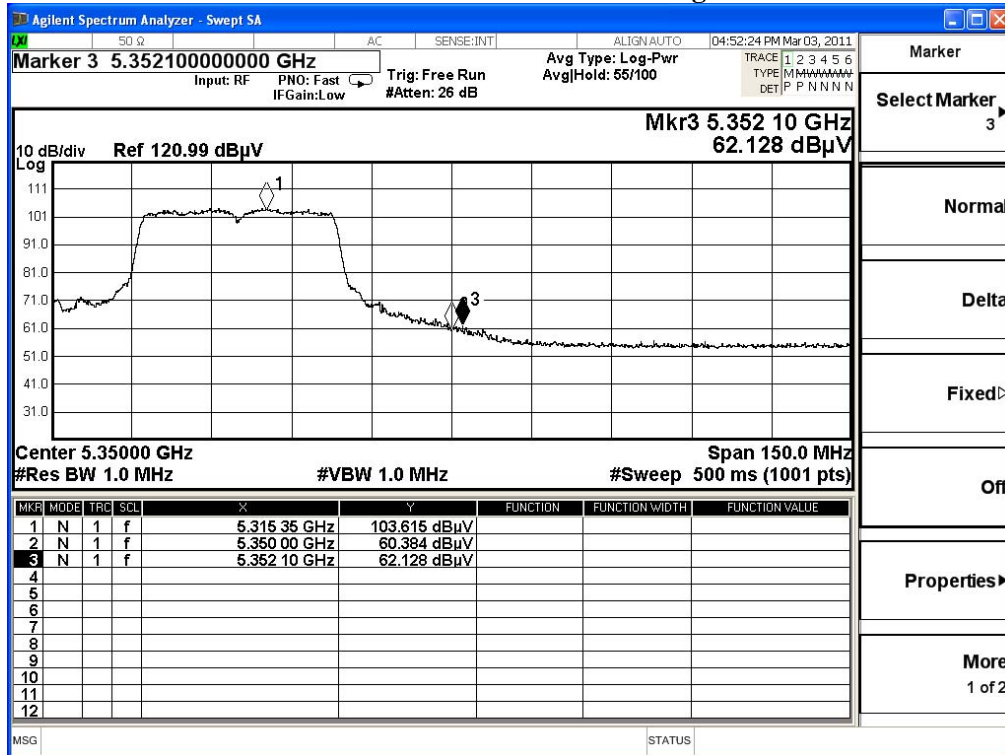
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

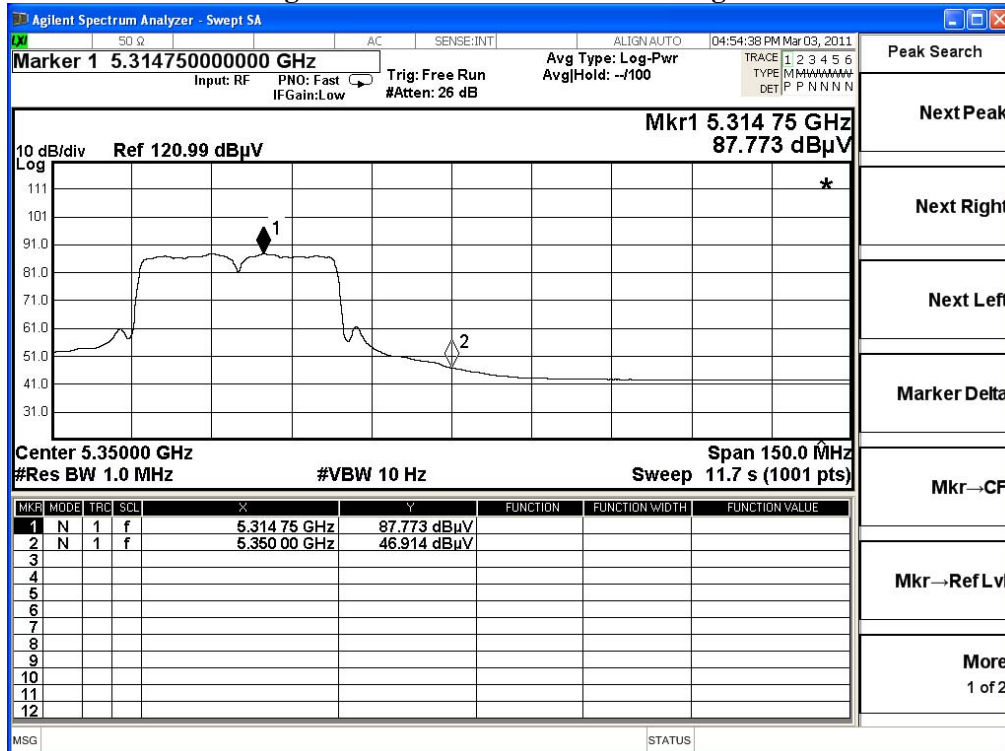
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 102

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5510	36.675	66.07	102.745	Peak
Horizontal	5510	36.675	50.98	87.655	Average
Vertical	5510	38.124	72.34	110.464	Peak
Vertical	5510	38.124	56.5	94.624	Average

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5459.25	102.745	44.279	58.466	74.000	Peak
Horizontal	5460	87.655	43.852	43.803	54.000	Average
Vertical	5459.25	110.464	44.279	66.185	74.000	Peak
Vertical	5460	94.624	43.852	50.772	54.000	Average

Note:

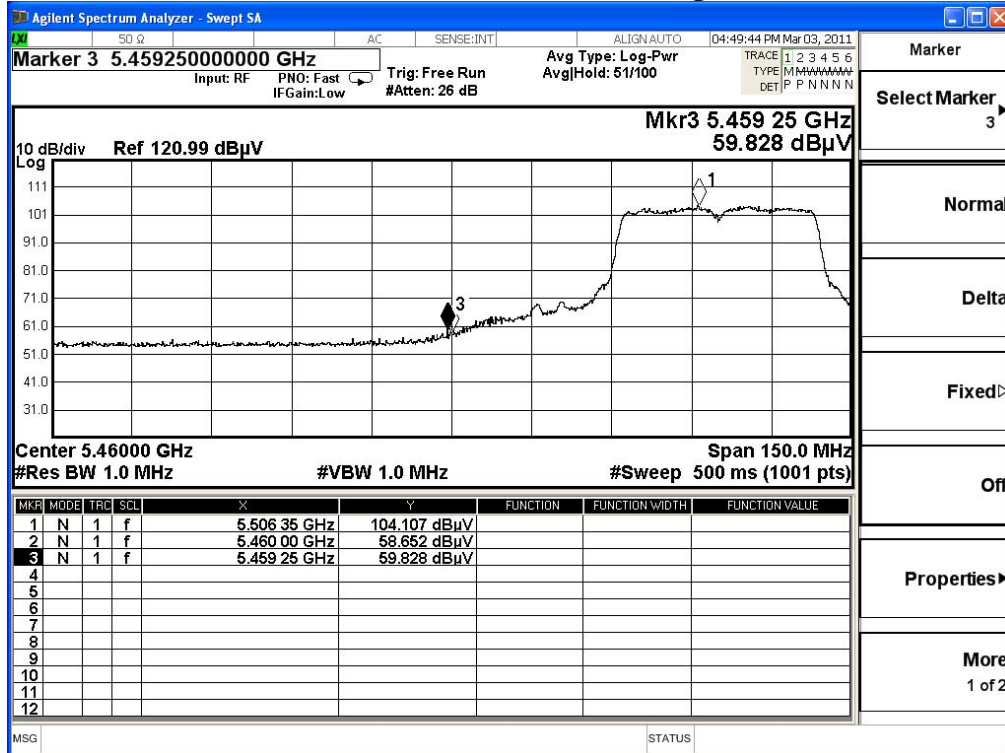
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

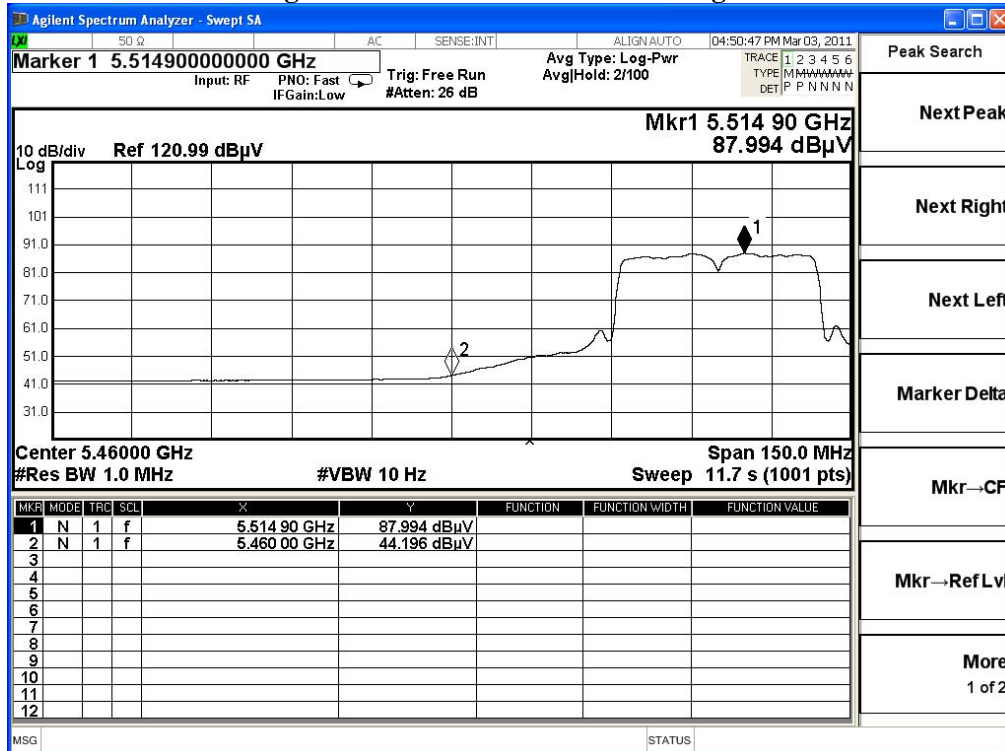
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 102

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5470.000	50.755	-88.310	-37.555	-10.555	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5470.000	51.365	-87.940	-36.575	-9.575	-27.000	Pass

Product : 802.11 a/b/g/n module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 134

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5725.000	50.994	-85.870	-34.876	-7.876	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5725.000	51.536	-84.860	-33.324	-6.324	-27.000	Pass

8. Frequency Stability

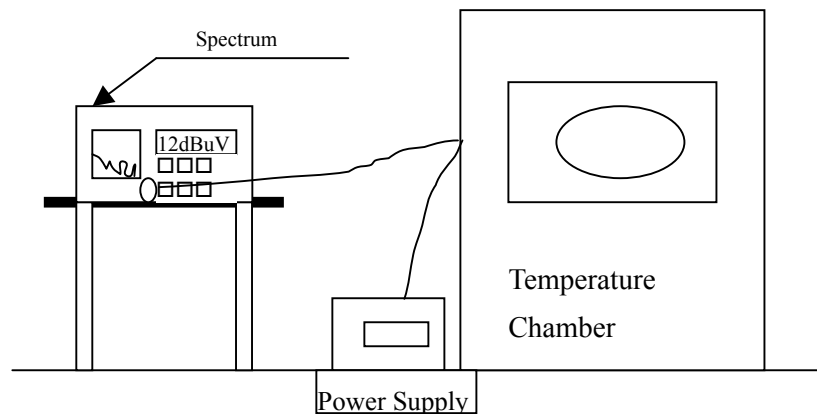
8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

8.2. Test Setup



8.3. Limits

Manufactures 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

8.4. Test Procedure

The EUT was setup to ANSI C63.4: 2009; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

8.5. Uncertainty

± 150 Hz

8.6. Test Result of Frequency Stability

Product : 802.11 a/b/g/n module
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Mode : Carrier Wave (for 802.11a/n-20MHz Channel) (Beginning)

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tnom (20) oC	Vnom (120)V	36	5180.00	5180.0100	-0.0100
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0100	-0.0100
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0093	-0.0093
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
		140	5700.00	5700.0095	-0.0095
Tmax (55) oC	Vnom (120)V	36	5180.00	5180.0058	-0.0058
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0098	-0.0098
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0068	-0.0068
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0098	-0.0098
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
		140	5700.00	5700.0095	-0.0095

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tmin (-20) °C	Vnom (120)V	36	5180.00	5180.0100	-0.0100
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0098	-0.0098
		48	5240.00	5240.0100	-0.0100
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0093	-0.0093
		102	5510.00	5510.0098	-0.0098
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
		140	5700.00	5700.0095	-0.0095

Product : 802.11 a/b/g/n module
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Mode : Carrier Wave (for 802.11a/n-20MHz Channel) (AFTER 2mins)

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	36	5180.00	5180.0068	-0.0068
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0092	-0.0092
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0093	-0.0093
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0098	-0.0098
		134	5670.00	5670.0100	-0.0100
Tmax (55) °C	Vnom (120)V	36	5180.00	5180.0096	-0.0096
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0098	-0.0098
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0093	-0.0093
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0094	-0.0094
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0098	-0.0098
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
140	5700.00	5700.0095	-0.0095		

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tmin (-20) °C	Vnom (120)V	36	5180.00	5180.0100	-0.0100
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0098	-0.0098
		48	5240.00	5240.0092	-0.0092
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0093	-0.0093
		102	5510.00	5510.0098	-0.0098
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
140	5700.00	5700.0063	-0.0063		

Product : 802.11 a/b/g/n module
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Mode : Carrier Wave (for 802.11a/n-20MHz Channel) (AFTER 5mins)

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	36	5180.00	5180.0068	-0.0068
		38	5190.00	5190.0088	-0.0088
		44	5220.00	5220.0094	-0.0094
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0100	-0.0100
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0099	-0.0099
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0098	-0.0098
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
140	5700.00	5700.0095	-0.0095		
Tmax (55) °C	Vnom (120)V	36	5180.00	5180.0094	-0.0094
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0098	-0.0098
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0068	-0.0068
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0098	-0.0098
		118	5600.00	5600.0098	-0.0098
		134	5670.00	5670.0100	-0.0100
140	5700.00	5700.0095	-0.0095		

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tmin (-20) °C	Vnom (120)V	36	5180.00	5180.0100	-0.0100
		38	5190.00	5190.0096	-0.0096
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0098	-0.0098
		48	5240.00	5240.0100	-0.0100
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0099	-0.0099
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0093	-0.0093
		102	5510.00	5510.0098	-0.0098
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0094	-0.0094
140	5700.00	5700.0095	-0.0095		

Product : 802.11 a/b/g/n module
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Mode : Carrier Wave (for 802.11a/n-20MHz Channel) (AFTER 10mins)

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	36	5180.00	5180.0064	-0.0064
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0099	-0.0099
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0096	-0.0096
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0099	-0.0099
		134	5670.00	5670.0100	-0.0100
Tmax (55) °C	Vnom (120)V	140	5700.00	5700.0095	-0.0095
		36	5180.00	5180.0058	-0.0058
		38	5190.00	5190.0099	-0.0099
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0085	-0.0085
		48	5240.00	5240.0098	-0.0098
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0085	-0.0085
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0068	-0.0068
		102	5510.00	5510.0100	-0.0100
		110	5590.00	5590.0098	-0.0098
		118	5600.00	5600.0097	-0.0097
134	5670.00	5670.0099	-0.0099		
140	5700.00	5700.0095	-0.0095		

Test Conditions		Channel	Frequency (MHz)	Spectrum Frequency (MHz)	ΔF (MHz)
Tmin (-20) °C	Vnom (120)V	36	5180.00	5180.0100	-0.0100
		38	5190.00	5190.0089	-0.0089
		44	5220.00	5220.0095	-0.0095
		46	5230.00	5230.0098	-0.0098
		48	5240.00	5240.0094	-0.0094
		52	5260.00	5260.0085	-0.0085
		54	5270.00	5270.0098	-0.0098
		60	5300.00	5300.0089	-0.0089
		62	5310.00	5310.0100	-0.0100
		64	5320.00	5320.0100	-0.0100
		100	5500.00	5500.0093	-0.0093
		102	5510.00	5510.0096	-0.0096
		110	5590.00	5590.0100	-0.0100
		118	5600.00	5600.0097	-0.0097
		134	5670.00	5670.0100	-0.0100
140	5700.00	5700.0095	-0.0095		

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs