

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:

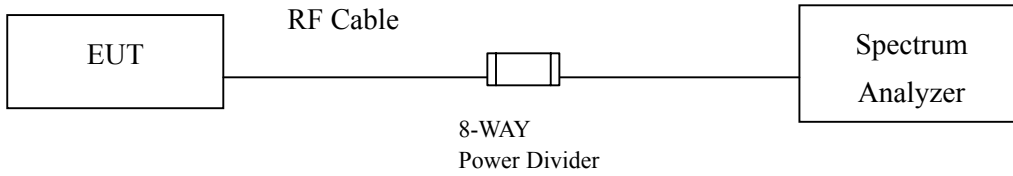
The following test equipments are used during the band edge tests:

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

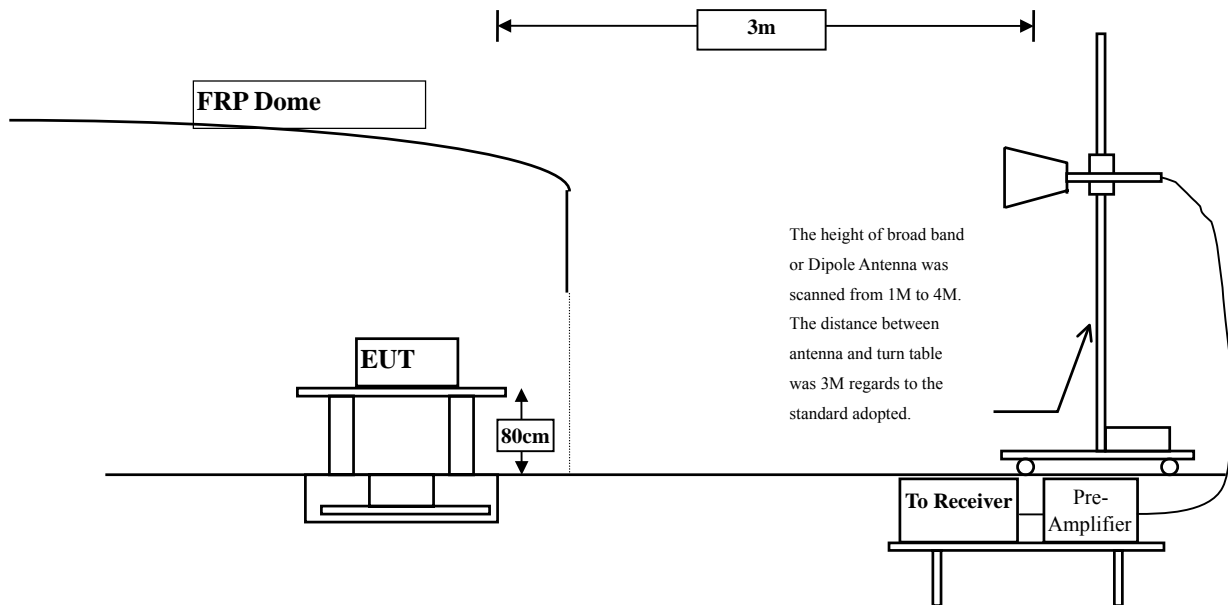
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

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	67.87	102.836	Peak
Horizontal	5180	34.966	55.73	90.696	Average
Vertical	5180	37.073	72.68	109.754	Peak
Vertical	5180	37.073	60.43	97.504	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	5149.3	102.836	39.608	63.228	74.000	Peak
Horizontal	5150	90.696	50.382	40.314	54.000	Average
Vertical	5149.3	109.754	39.608	70.146	74.000	Peak
Vertical	5150	97.504	50.382	47.122	54.000	Average

Note:

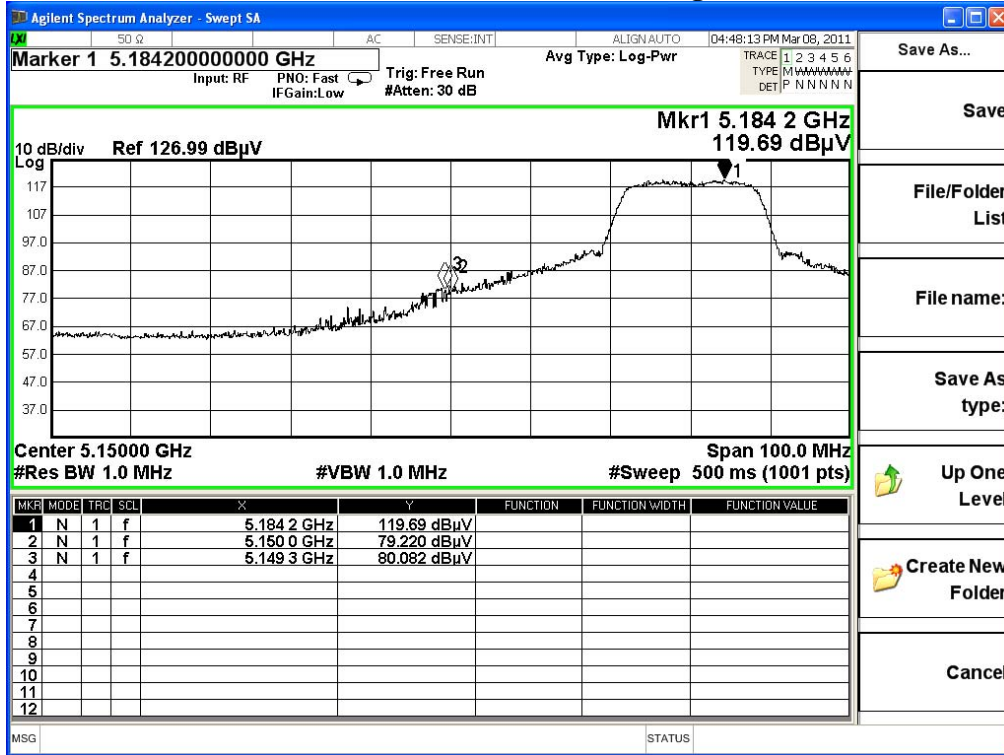
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

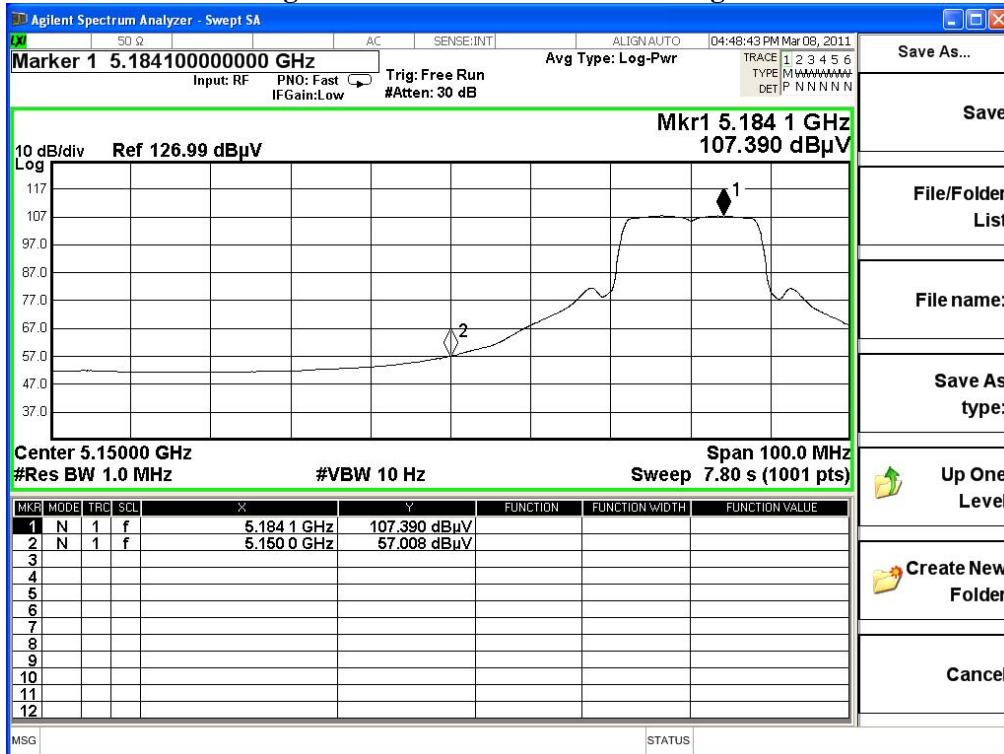
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



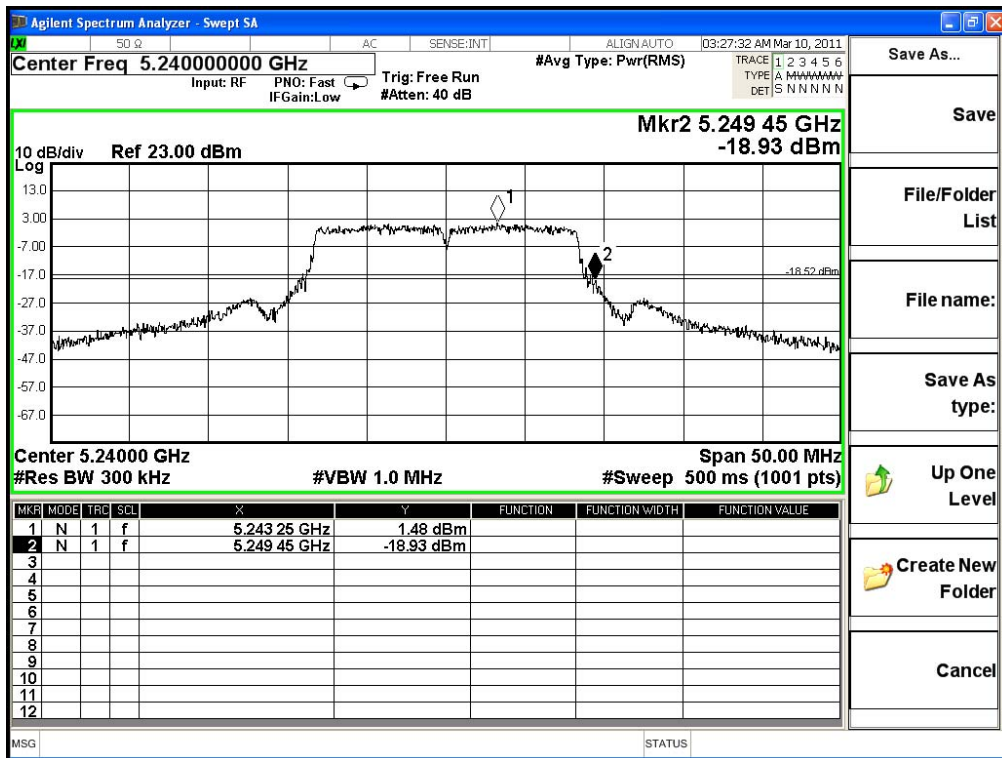
Average Detector of conducted Band Edge Delta



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

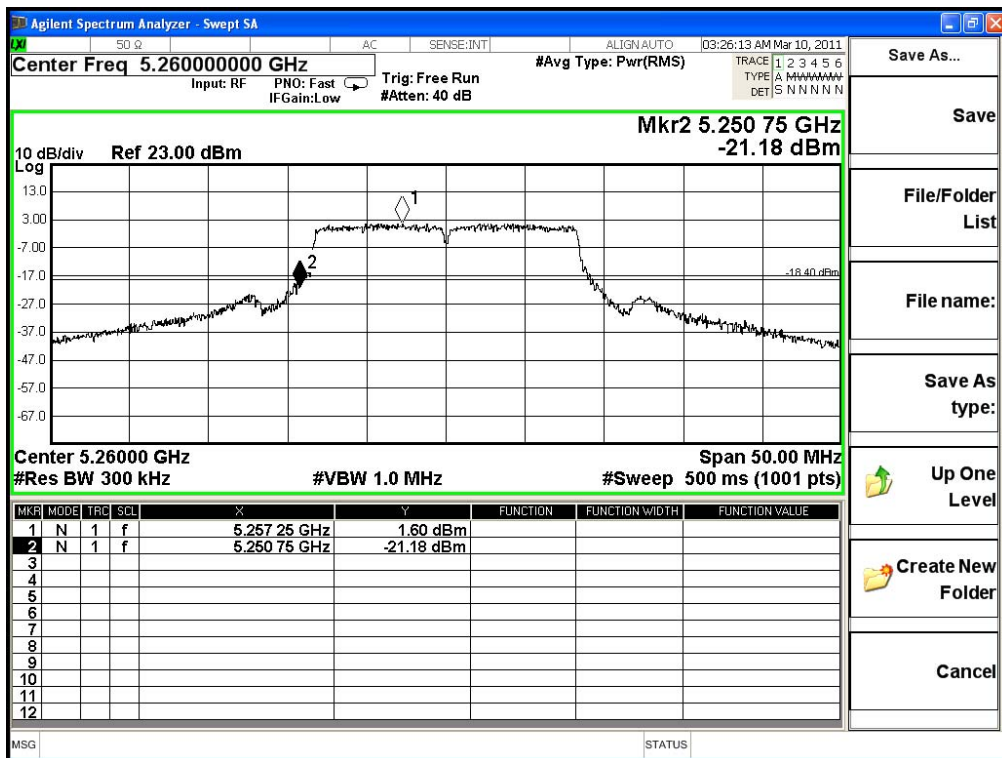
NOTE: Accordance with 15.215 requirement.



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	66.57	102.204	Peak
Horizontal	5320	35.635	54.67	90.304	Average
Vertical	5320	37.552	71.92	109.471	Peak
Vertical	5320	37.552	59.6	97.151	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	102.204	40.363	61.841	74.000	Peak
Horizontal	5350	90.304	47.401	42.903	54.000	Average
Vertical	5350	109.471	40.363	69.108	74.000	Peak
Vertical	5350	97.151	47.401	49.75	54.000	Average

Note:

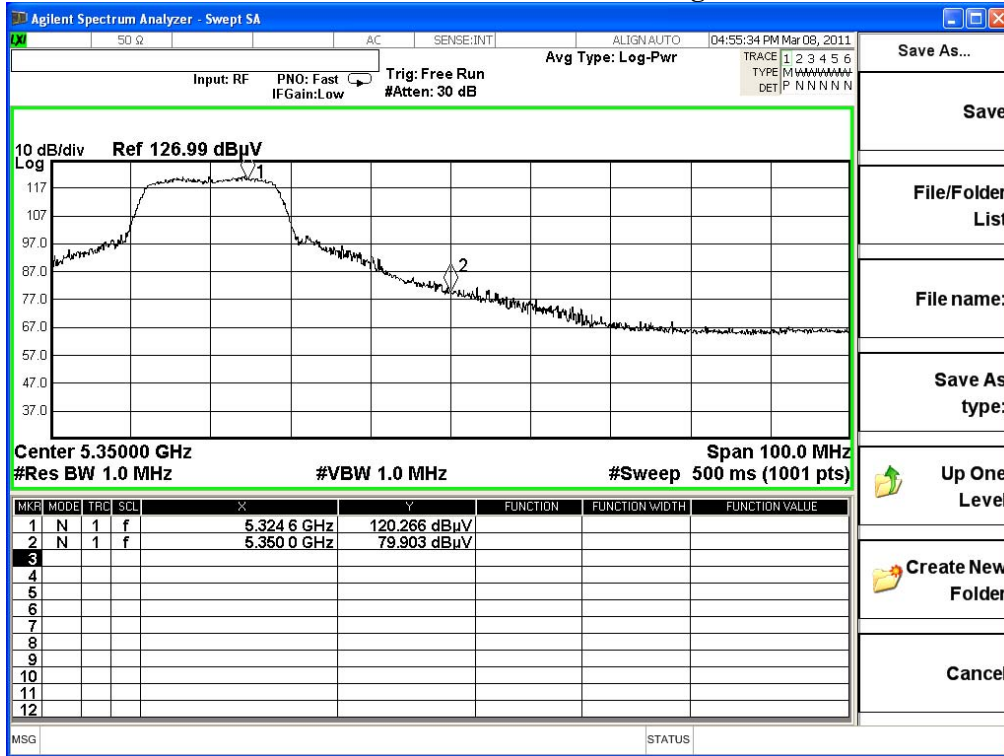
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

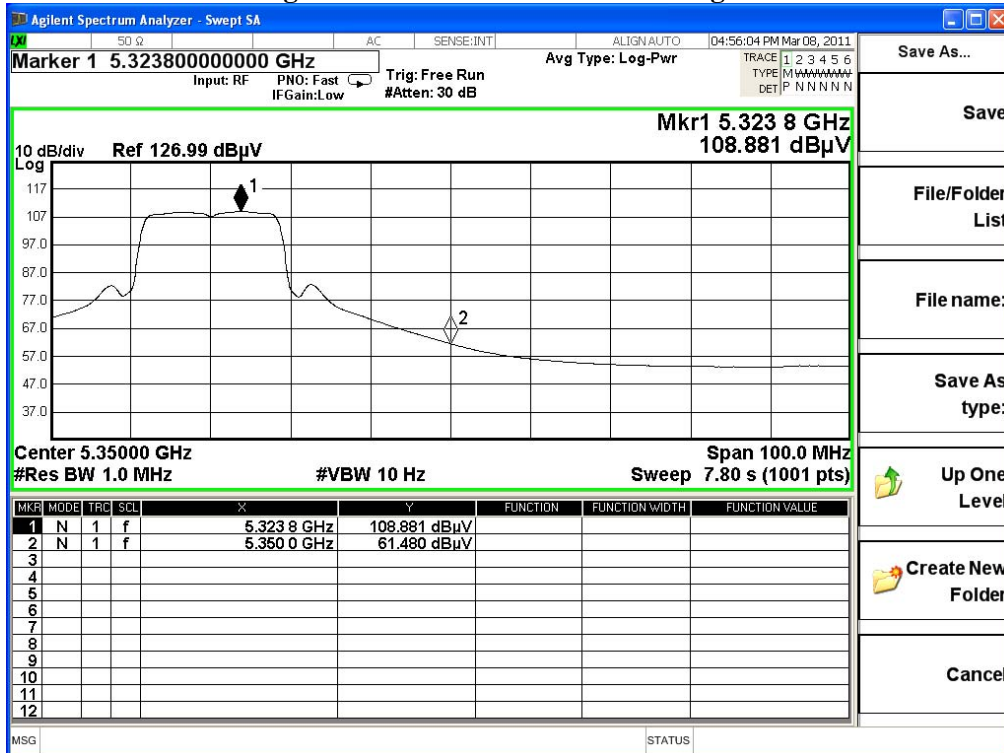
F = Fundamental field Strength (Peak or Average)

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	67.92	104.604	Peak
Horizontal	5500	36.684	55.65	92.334	Average
Vertical	5500	38.145	75.55	113.695	Peak
Vertical	5500	38.145	63.23	101.375	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	5458.4	104.604	43.278	61.326	74.000	Peak
Horizontal	5460	92.334	51.333	41.001	54.000	Average
Vertical	5458.4	113.695	43.278	70.417	74.000	Peak
Vertical	5460	101.375	51.333	50.042	54.000	Average

Note:

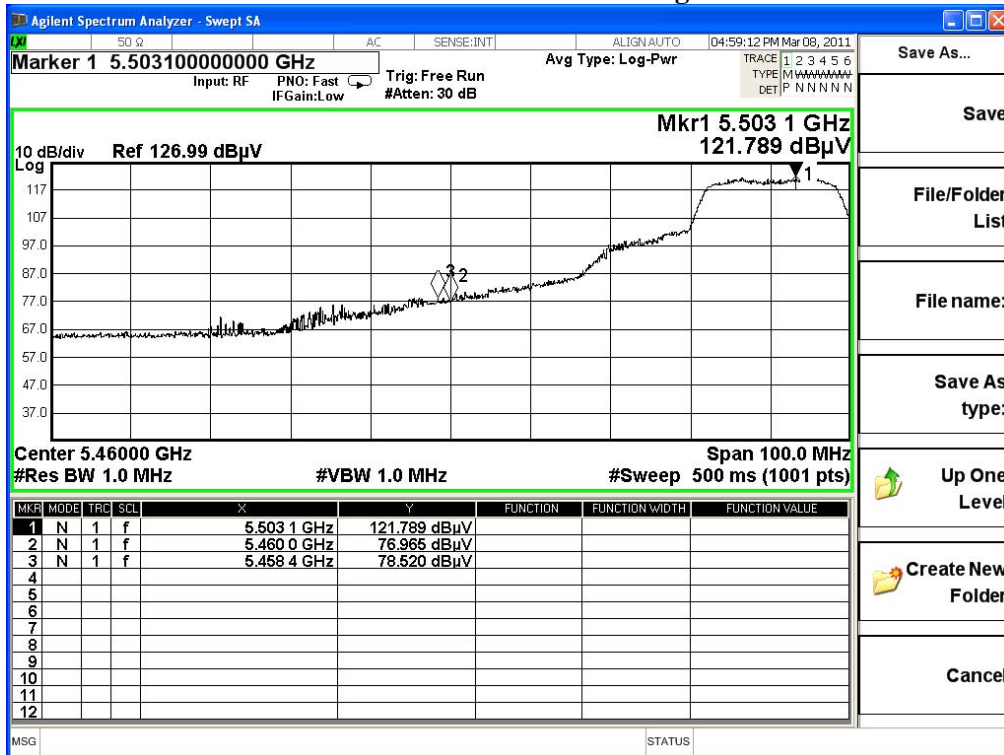
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

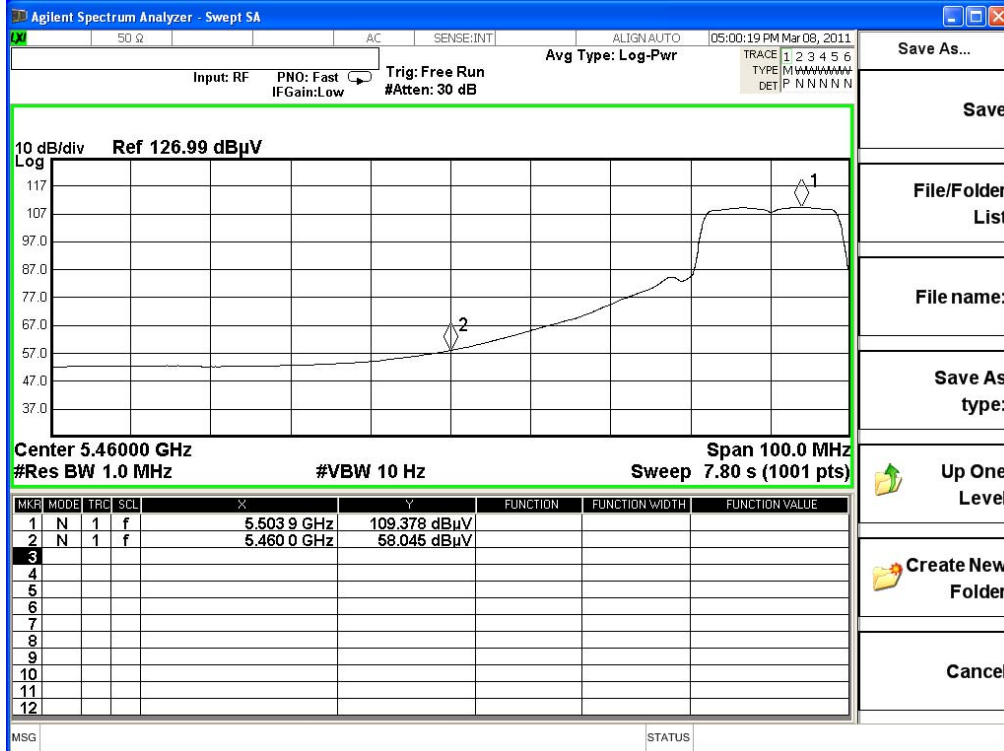
F = Fundamental field Strength (Peak or Average)

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	-86.220	-35.465	-8.465	-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	-86.790	-35.425	-8.425	-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	-87.720	-36.726	-9.726	-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	-84.040	-32.504	-5.504	-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	72.95	107.916	Peak
Horizontal	5180	34.966	58.34	93.306	Average
Vertical	5180	37.073	73.75	110.824	Peak
Vertical	5180	37.073	59.35	96.424	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	5147.4	107.916	41.9	66.016	74.000	Peak
Horizontal	5150	93.306	46.05	47.256	54.000	Average
Vertical	5147.4	110.824	41.9	68.924	74.000	Peak
Vertical	5150	96.424	46.05	50.374	54.000	Average

Note:

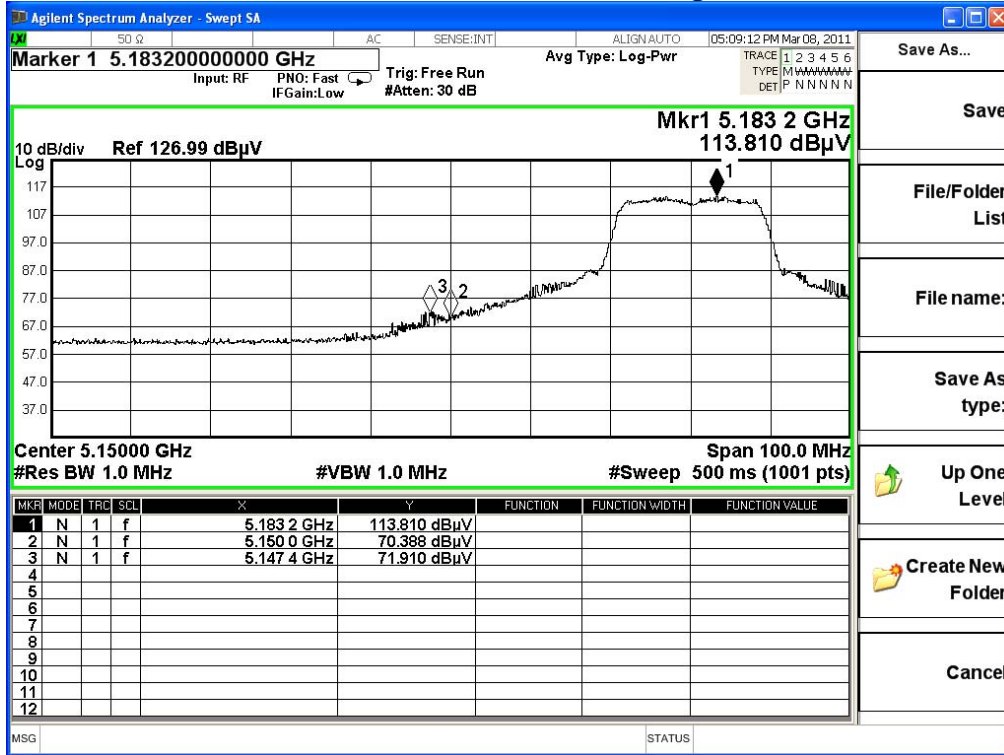
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

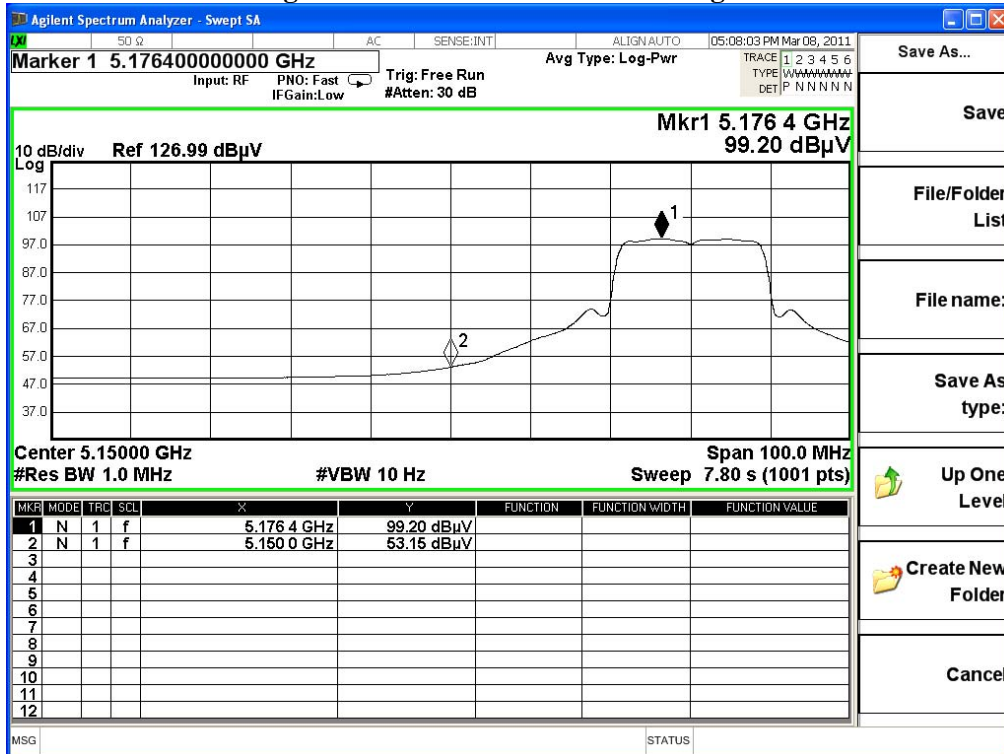
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



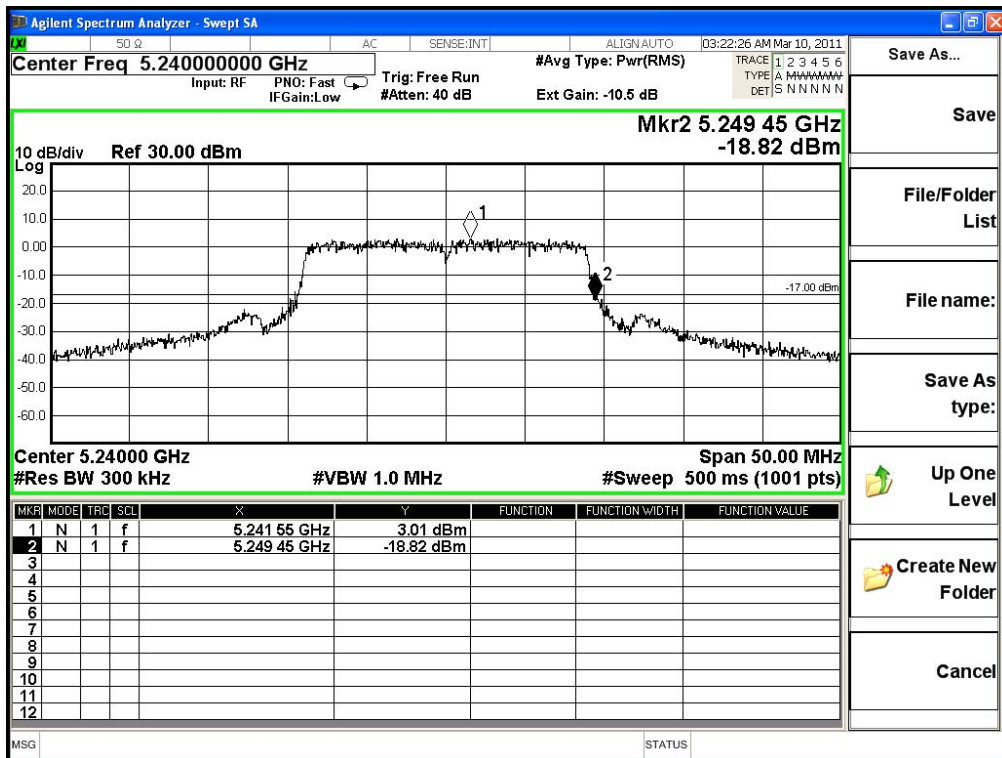
Average Detector of conducted Band Edge Delta



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

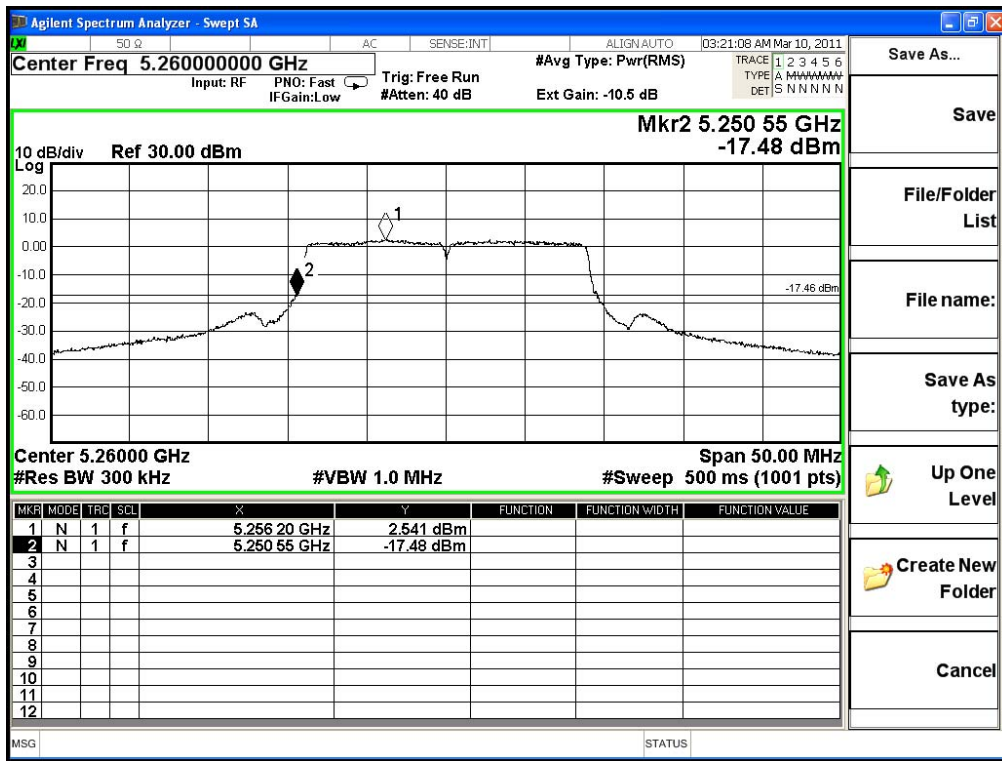
NOTE: Accordance with 15.215 requirement.



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	70.33	105.964	Peak
Horizontal	5320	35.635	56.18	91.814	Average
Vertical	5320	37.552	71.58	109.131	Peak
Vertical	5320	37.552	57.83	95.381	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)	Requiment Limit (dBuV/m)	Detector
Horizontal	5351.6	105.964	42.918	63.046	74.000	Peak
Horizontal	5350	91.814	45.157	46.657	54.000	Average
Vertical	5351.6	109.131	42.918	66.213	74.000	Peak
Vertical	5350	95.381	45.157	50.224	54.000	Average

Note:

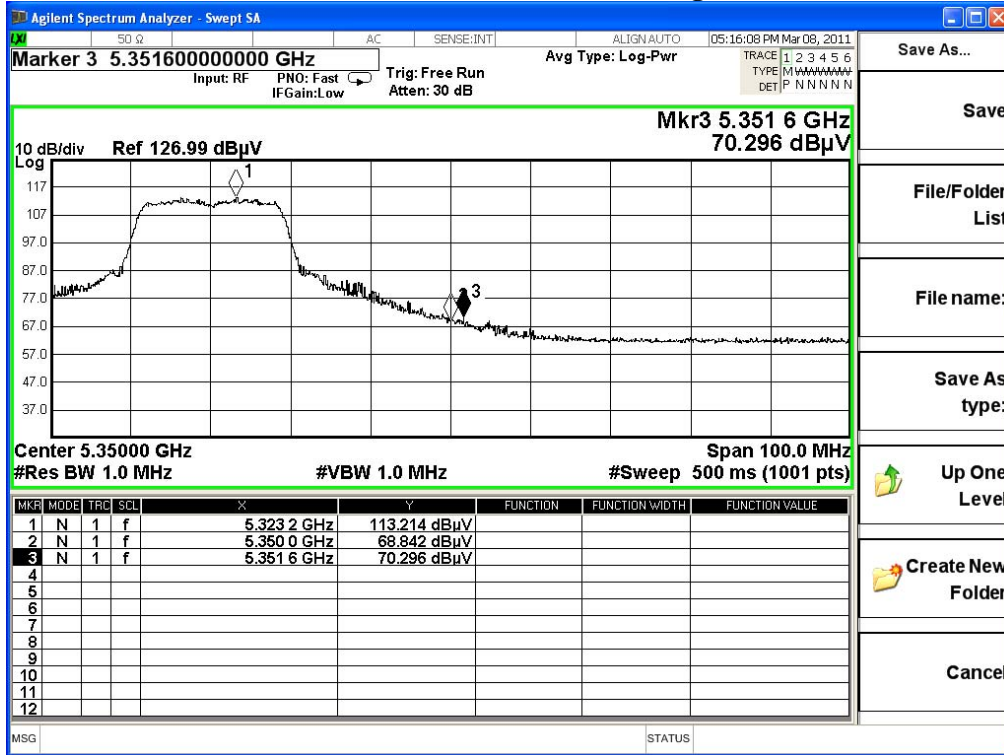
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

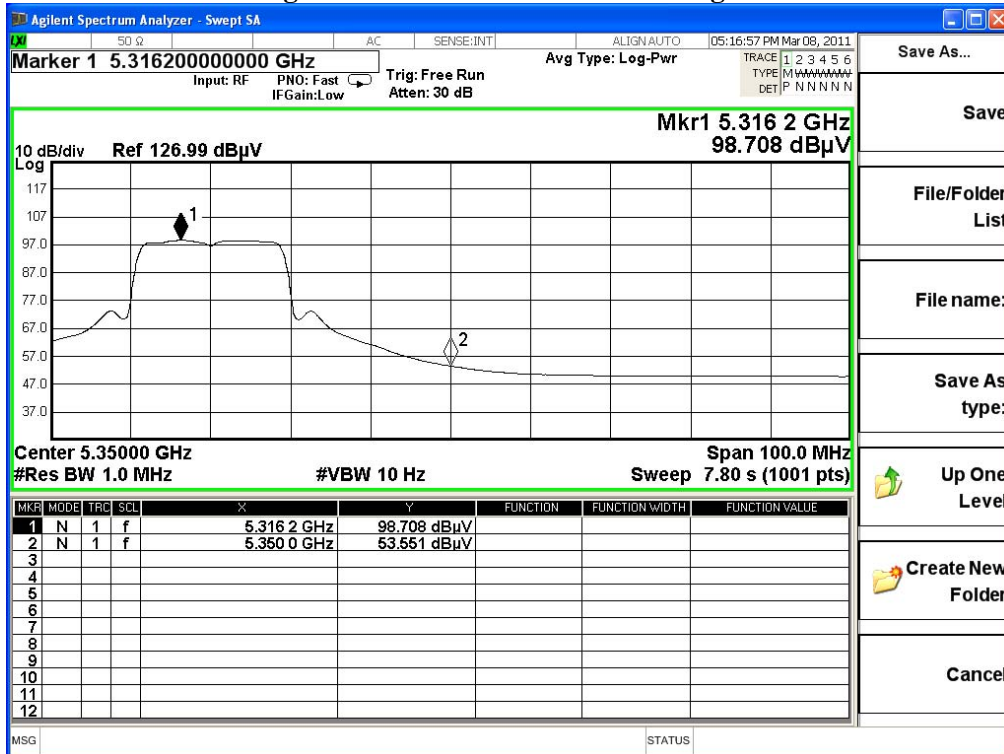
F = Fundamental field Strength (Peak or Average)

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	70.94	107.624	Peak
Horizontal	5500	36.684	56.72	93.404	Average
Vertical	5500	38.145	72.73	110.875	Peak
Vertical	5500	38.145	59.24	97.385	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	5456.8	107.624	47.847	59.777	74.000	Peak
Horizontal	5460	93.404	47.14	46.264	54.000	Average
Vertical	5456.8	110.875	47.847	63.028	74.000	Peak
Vertical	5460	97.385	47.14	50.245	54.000	Average

Note:

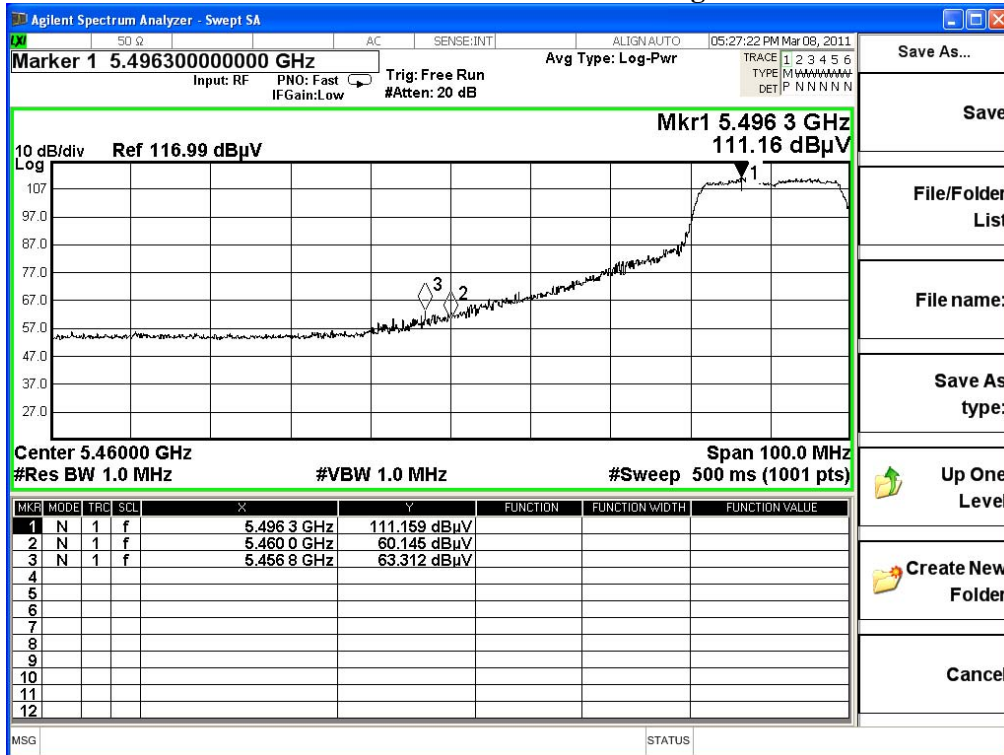
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

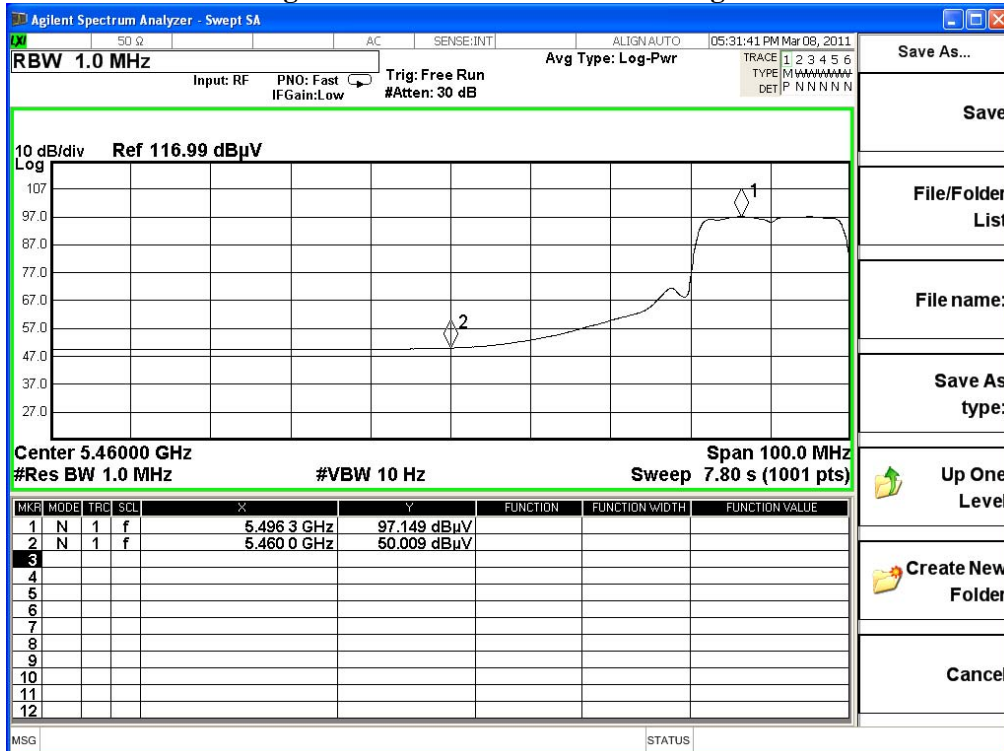
F = Fundamental field Strength (Peak or Average)

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	-88.680	-37.925	-10.925	-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	-88.730	-37.365	-10.365	-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	-86.270	-35.276	-8.276	-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	-83.040	-31.504	-4.504	-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	64.4	99.308	Peak
Horizontal	5190	34.907	49.48	84.388	Average
Vertical	5190	37.077	66.43	103.508	Peak
Vertical	5190	37.077	51.4	88.478	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	5148.05	99.308	36.252	63.056	74.000	Peak
Horizontal	5150	84.388	38.916	45.472	54.000	Average
Vertical	5148.05	103.508	36.252	67.256	74.000	Peak
Vertical	5150	88.478	38.916	49.562	54.000	Average

Note:

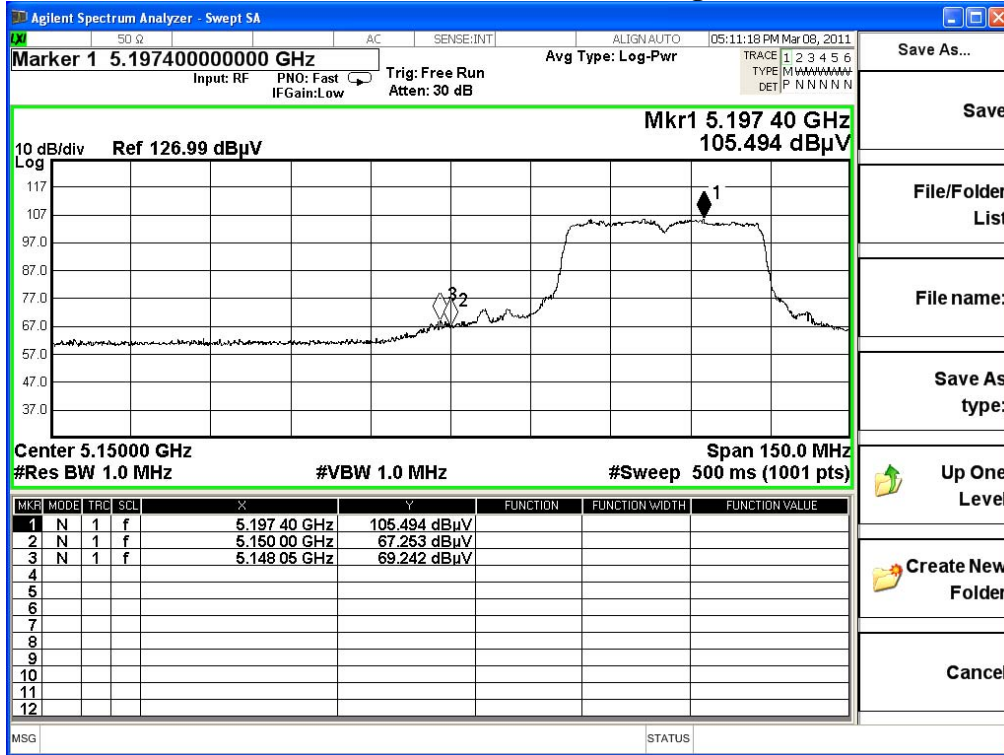
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

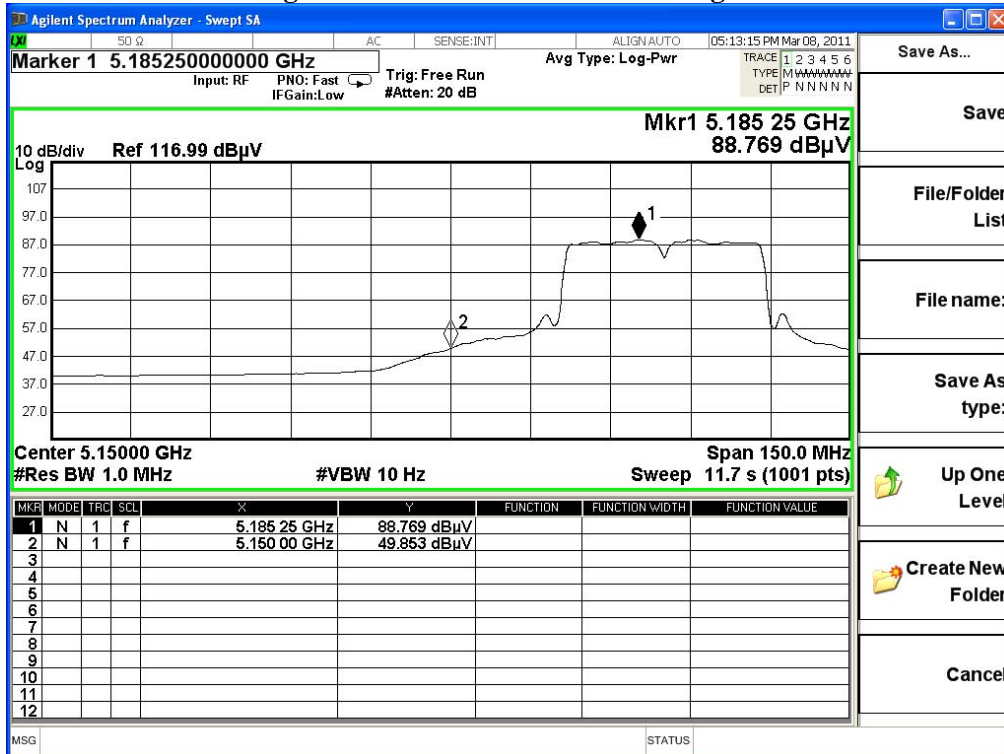
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



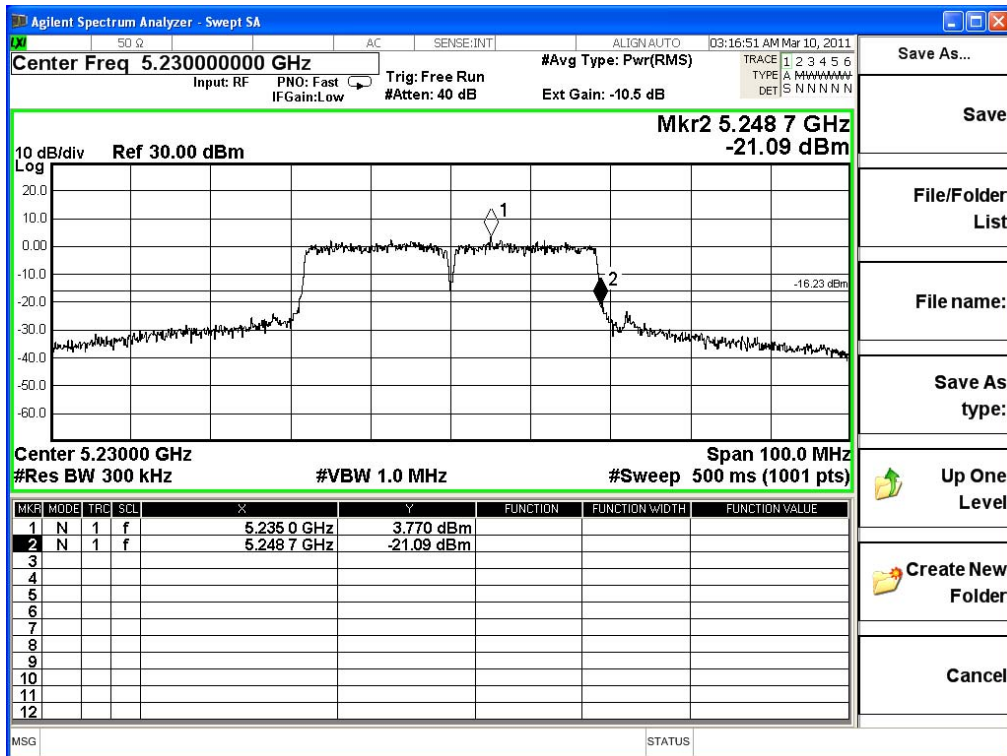
Average Detector of conducted Band Edge Delta



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

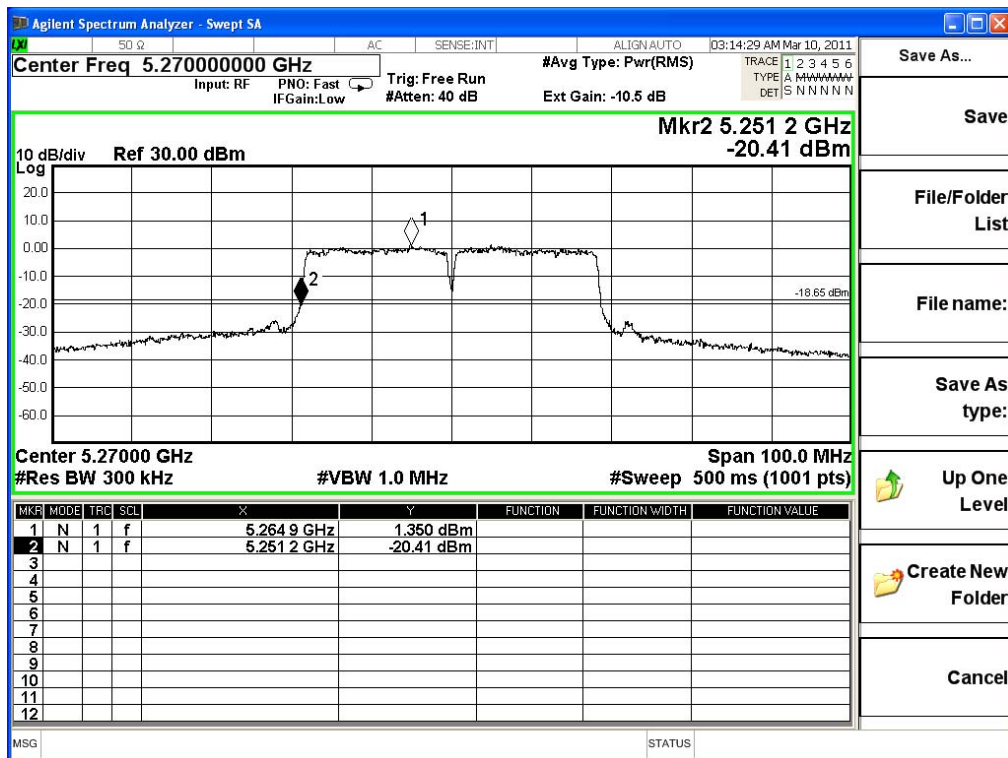
NOTE: Accordance with 15.215 requirement.



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	64.48	100.136	Peak
Horizontal	5310	35.655	49.41	85.066	Average
Vertical	5310	37.553	66.65	104.203	Peak
Vertical	5310	37.553	51.58	89.133	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	5351.65	100.136	41.27	58.866	74.000	Peak
Horizontal	5350	85.066	39.67	45.396	54.000	Average
Vertical	5351.65	104.203	41.27	62.933	74.000	Peak
Vertical	5350	89.133	39.67	49.463	54.000	Average

Note:

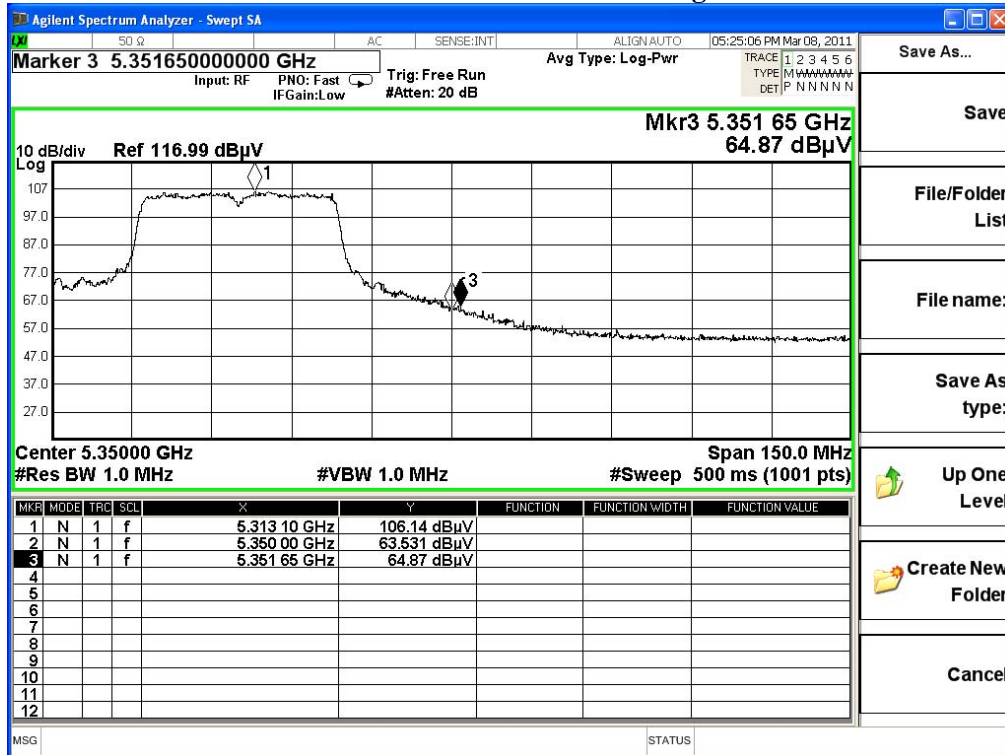
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

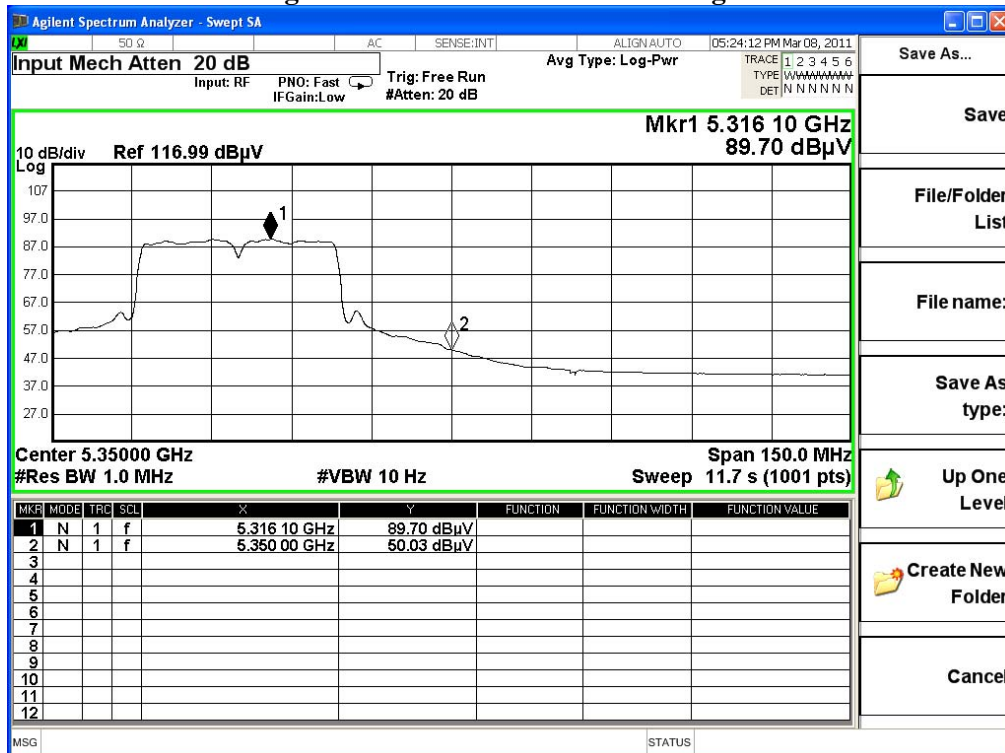
F = Fundamental field Strength (Peak or Average)

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	65.64	102.315	Peak
Horizontal	5510	36.675	50.57	87.245	Average
Vertical	5510	38.124	69.71	107.834	Peak
Vertical	5510	38.124	54.46	92.584	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	5458.8	102.315	47.02	55.295	74.000	Peak
Horizontal	5460	87.245	42.8	44.445	54.000	Average
Vertical	5458.8	107.834	47.02	60.814	74.000	Peak
Vertical	5460	92.584	42.8	49.784	54.000	Average

Note:

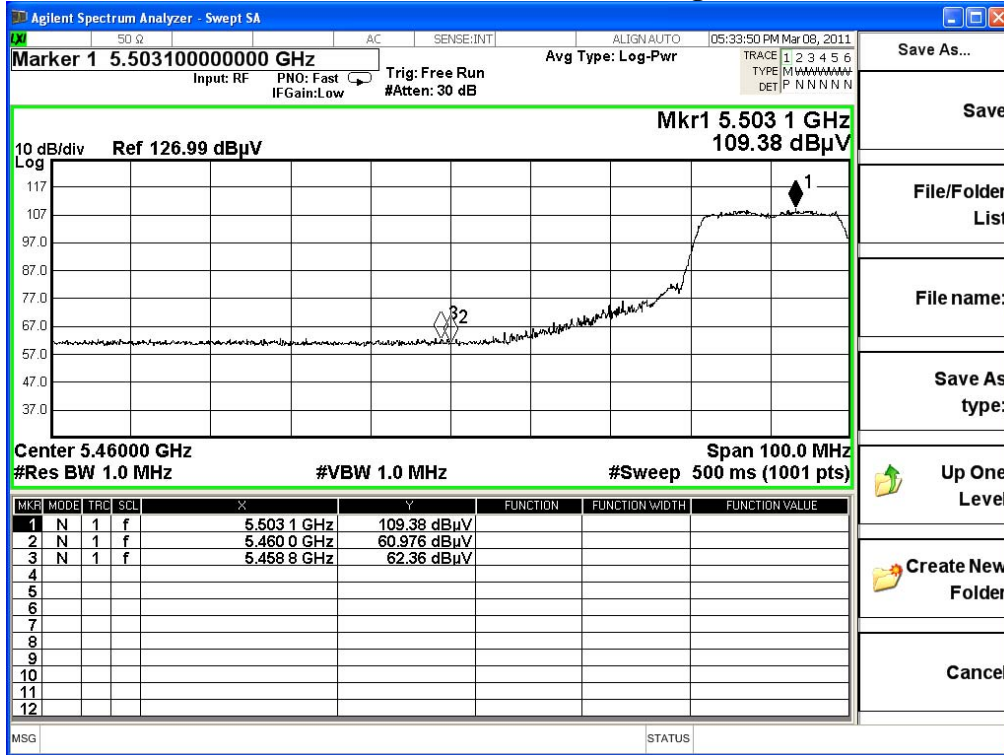
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

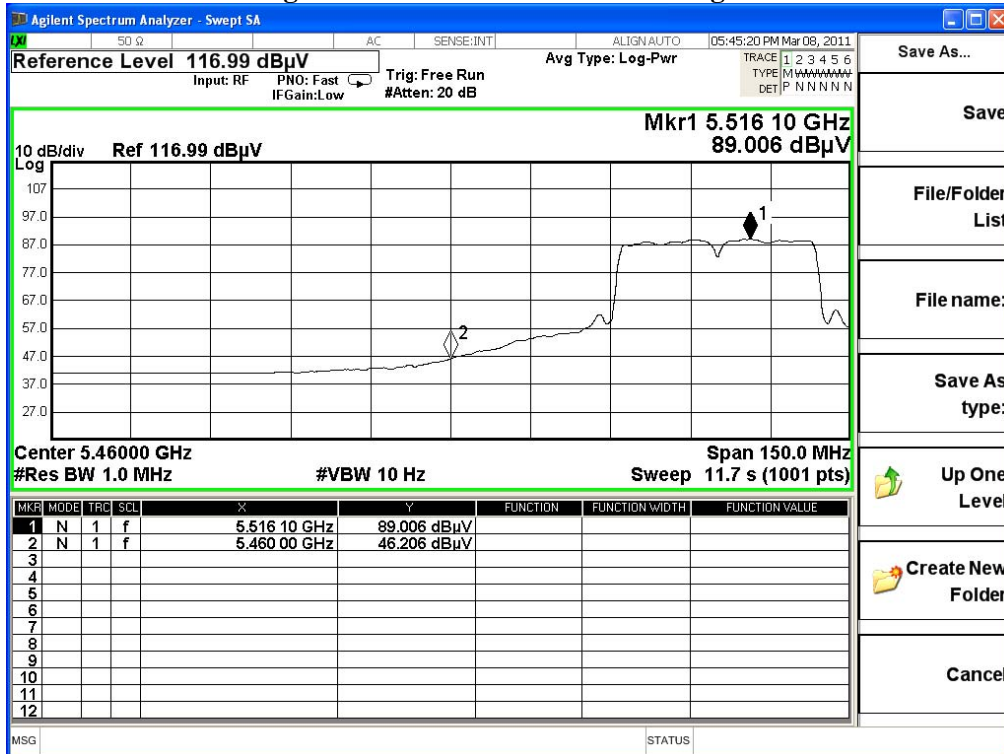
F = Fundamental field Strength (Peak or Average)

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	-88.270	-37.515	-10.515	-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	-88.760	-37.395	-10.395	-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	-87.810	-36.816	-9.816	-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	-88.330	-36.794	-9.794	-27.000	Pass

8. Frequency Stability

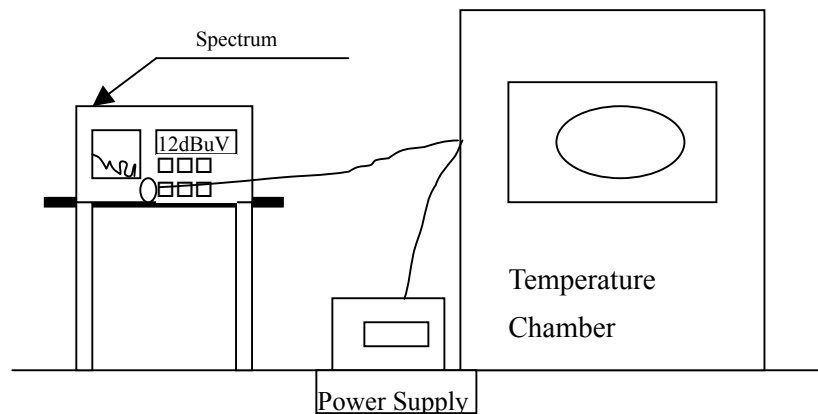
8.1. Test Equipment

	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
140	5700.00	5700.0095	-0.0095		
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