3.6 Radiated Emissions Measurement

3.6.1 Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). 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 (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.6.2 Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

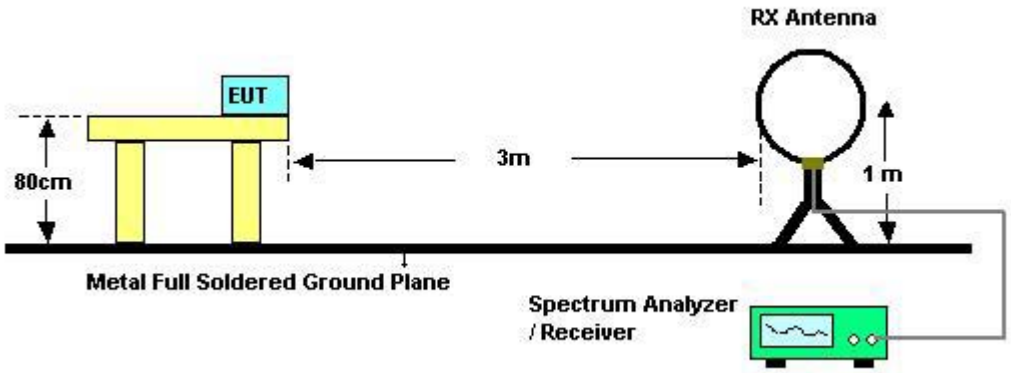
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.6.3 Test Procedures

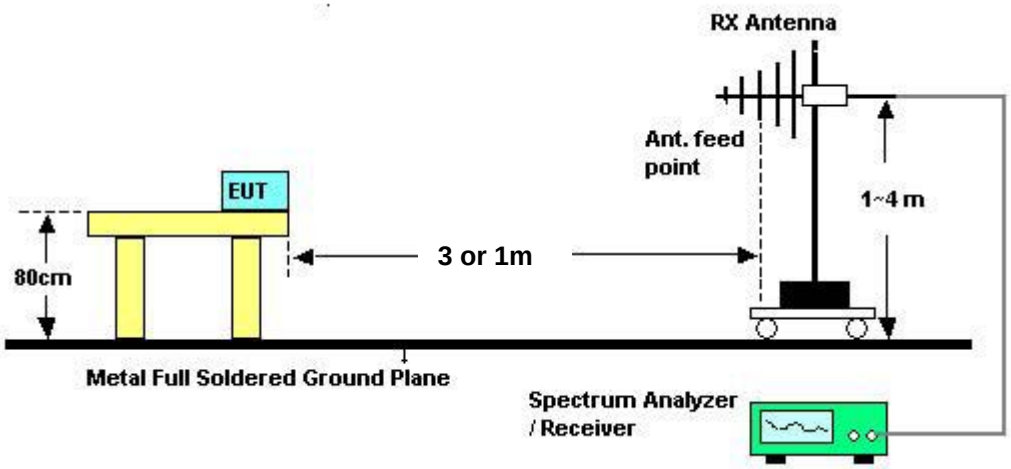
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.6.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.6.5 Test Deviation

There is no deviation with the original standard.

3.6.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7 Results of Radiated Emissions (9kHz~30MHz)

Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

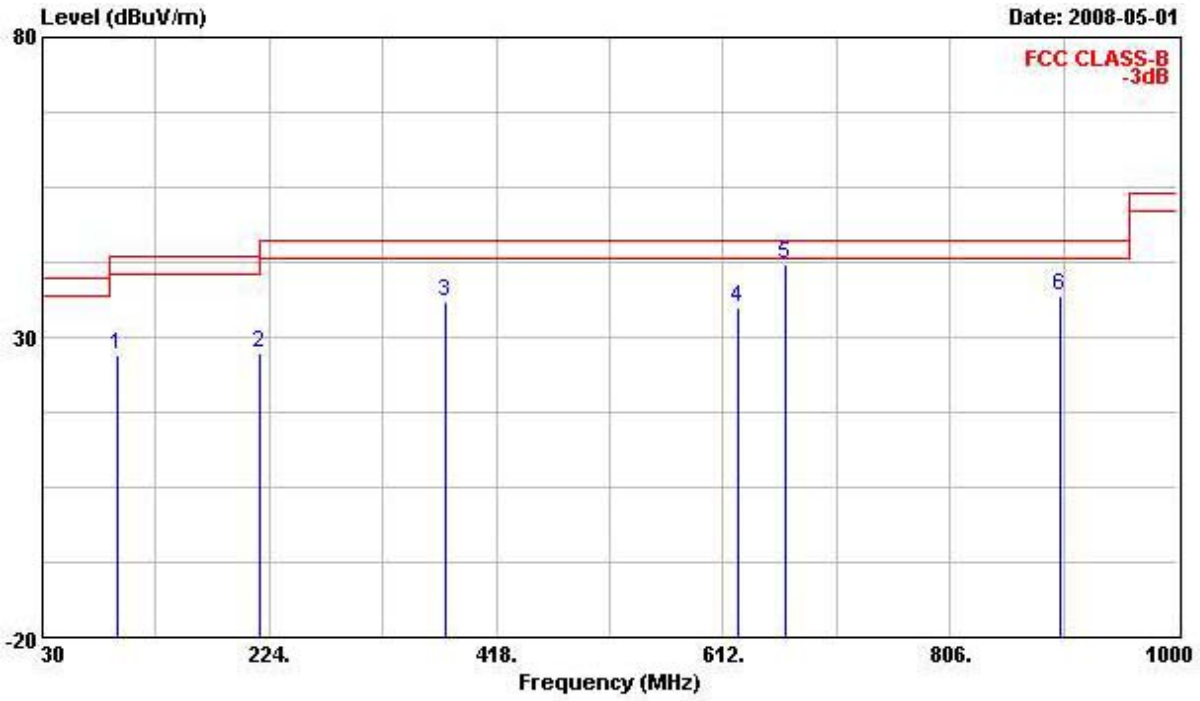
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

3.6.8 Results of Radiated Emissions (30MHz~1GHz)

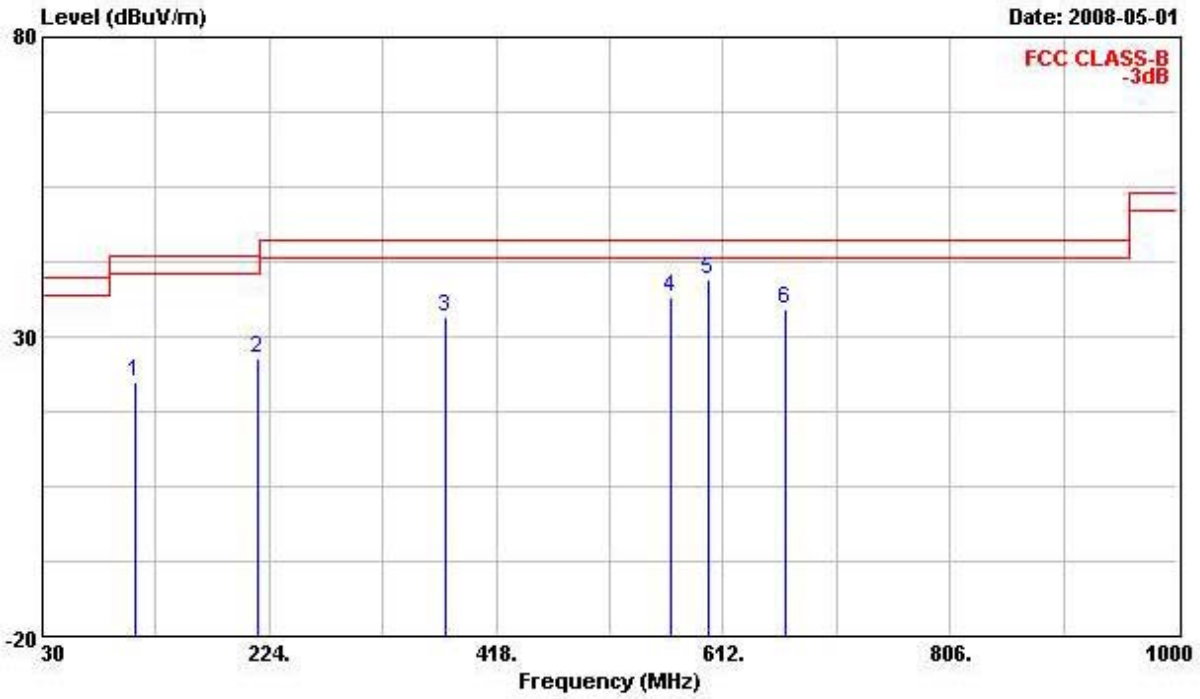
Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	(Power Supply: POE20U-560(G) -R)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	94.990	27.16	-16.34	43.50	42.95	10.35	1.68	27.81	Peak
2	215.270	27.24	-16.26	43.50	43.61	9.27	2.52	28.15	Peak
3	374.350	36.00	-10.00	46.00	45.72	15.62	3.42	28.76	Peak
4	625.580	34.80	-11.20	46.00	40.54	19.47	4.29	29.50	Peak
5 @	665.350	42.26	-3.74	46.00	47.62	19.73	4.45	29.55	Peak
6	901.060	36.81	-9.19	46.00	39.85	21.04	5.25	29.33	Peak

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	109.540	22.36	-21.14	43.50	36.00	12.40	1.76	27.80	Peak
2	214.300	26.38	-17.12	43.50	42.71	9.29	2.53	28.15	Peak
3	374.350	33.36	-12.64	46.00	43.08	15.62	3.42	28.76	Peak
4	567.380	36.47	-9.53	46.00	41.97	19.30	4.09	28.90	Peak
5 @	599.390	39.62	-6.38	46.00	45.00	19.30	4.45	29.14	Peak
6	665.350	34.75	-11.25	46.00	40.11	19.73	4.45	29.55	Peak

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

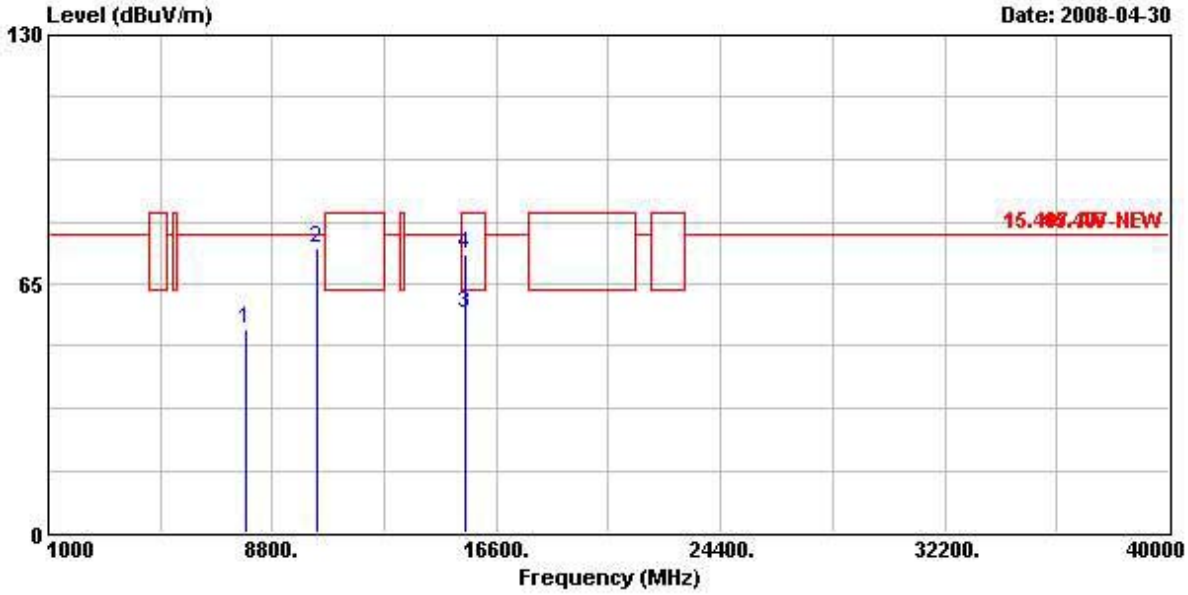
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6.9 Results for Radiated Emissions (1GHz~40GHz)

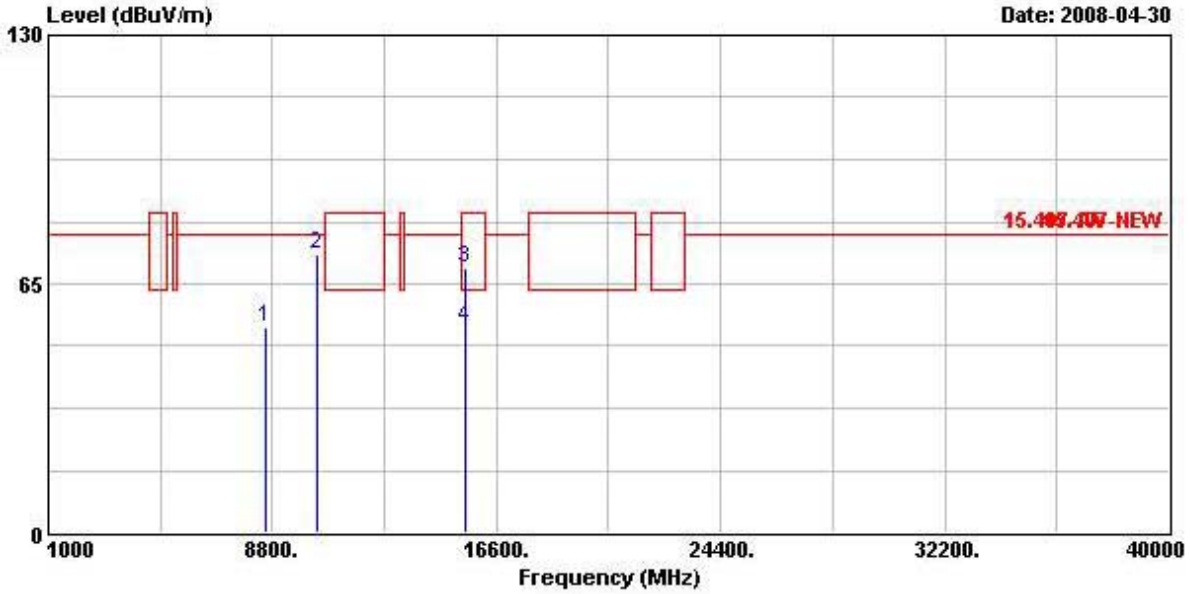
Test date	Apr. 30, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11a CH 36

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7852.000	53.29	-24.55	77.84	43.84	37.65	4.65	32.85	PEAK
2 @	10360.000	74.46	-3.38	77.84	60.72	39.33	6.09	31.67	PEAK
3	15540.200	57.16	-6.38	63.54	41.96	37.51	7.37	29.69	AVERAGE
4	15540.200	72.89	-10.65	83.54	57.70	37.51	7.37	29.69	Peak

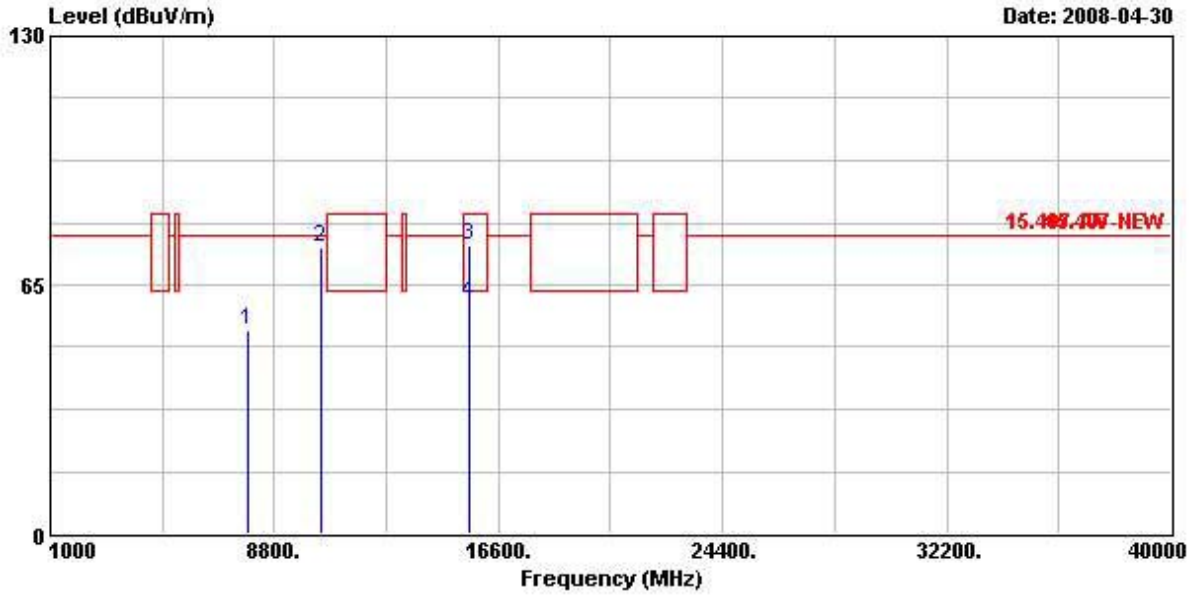
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8532.000	53.87	-23.97	77.84	42.94	38.32	5.42	32.81	PEAK
2	10360.000	72.74	-5.10	77.84	58.99	39.33	6.09	31.67	PEAK
3	15540.000	69.28	-14.26	83.54	54.09	37.51	7.37	29.69	Peak
4	15540.000	53.48	-10.06	63.54	38.29	37.51	7.37	29.69	AVERAGE

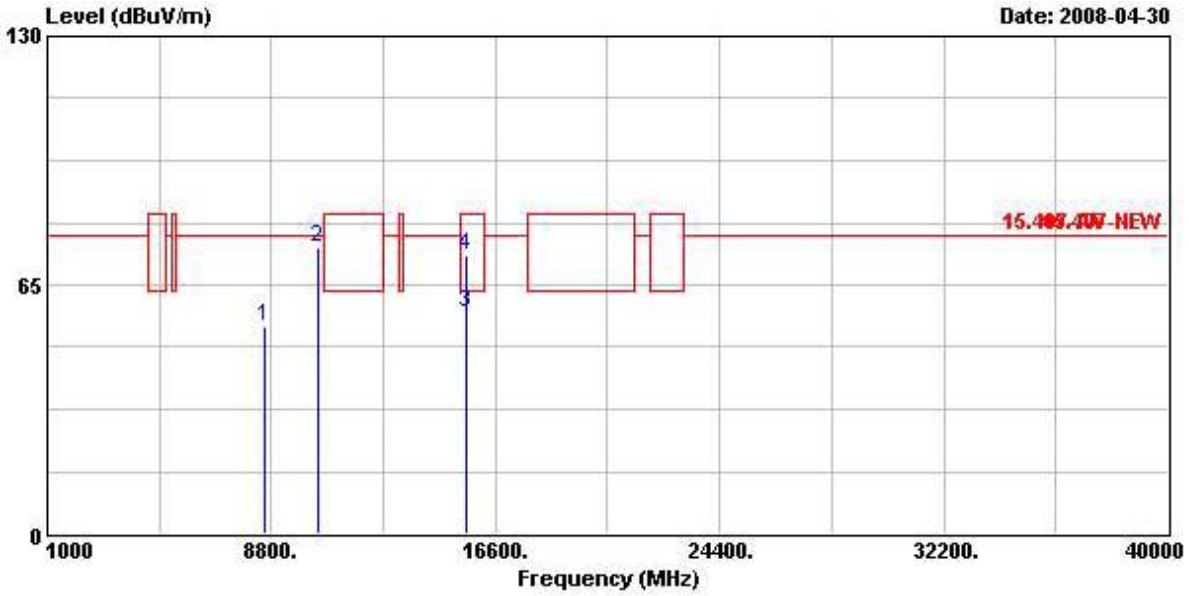
Test date	Apr. 30, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 40

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7896.000	52.96	-24.88	77.84	43.43	37.70	4.67	32.84	PEAK
2 @	10396.000	74.71	-3.13	77.84	60.85	39.32	6.14	31.59	PEAK
3	15600.400	75.51	-8.03	83.54	60.24	37.54	7.38	29.65	Peak
4 @	15600.400	60.42	-3.12	63.54	45.16	37.54	7.38	29.65	AVERAGE

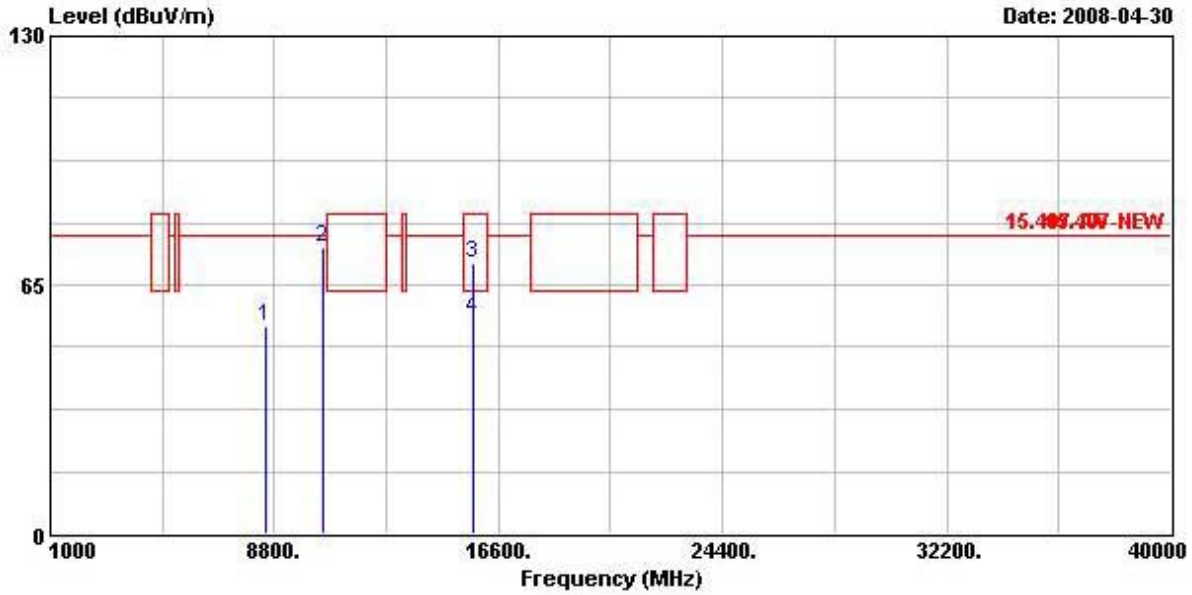
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8572.000	54.08	-23.76	77.84	43.20	38.34	5.35	32.81	PEAK
2 @	10400.000	74.58	-3.26	77.84	60.63	39.32	6.14	31.51	PEAK
3	15600.800	57.97	-5.57	63.54	42.70	37.54	7.38	29.65	AVERAGE
4	15600.800	72.49	-11.05	83.54	57.22	37.54	7.38	29.65	Peak

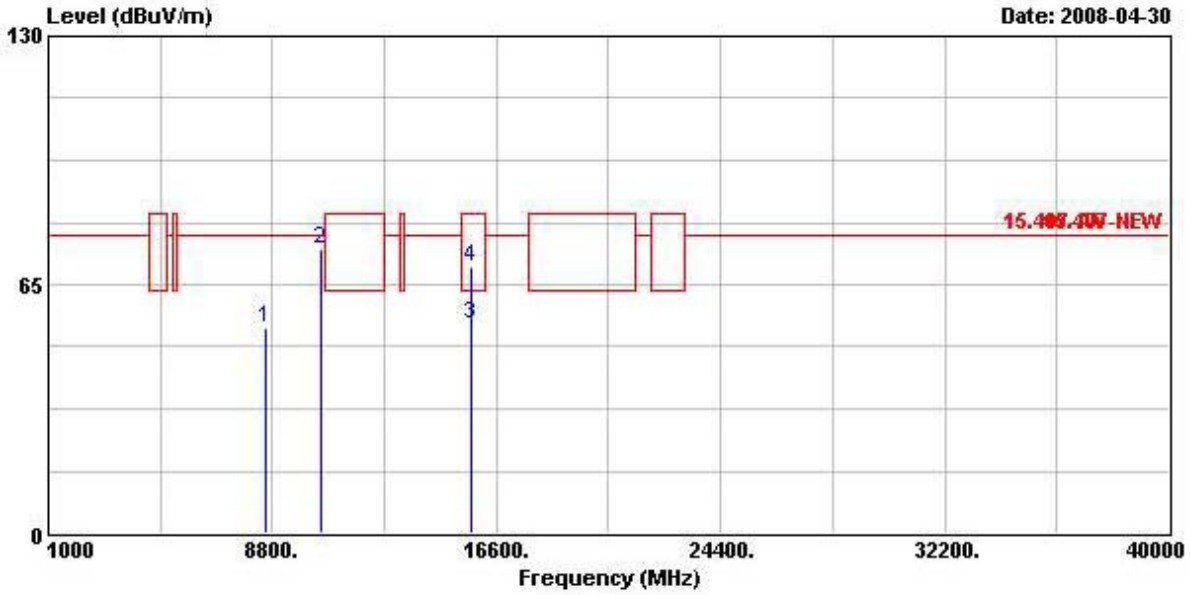
Test date	Apr. 30, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 48

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8508.000	54.21	-23.63	77.84	43.29	38.31	5.42	32.81	PEAK
2 @	10480.000	74.75	-3.09	77.84	60.47	39.30	6.23	31.25	PEAK
3	15718.400	70.70	-12.84	83.54	55.31	37.59	7.40	29.60	Peak
4	15718.400	56.25	-7.29	63.54	40.86	37.59	7.40	29.60	AVERAGE

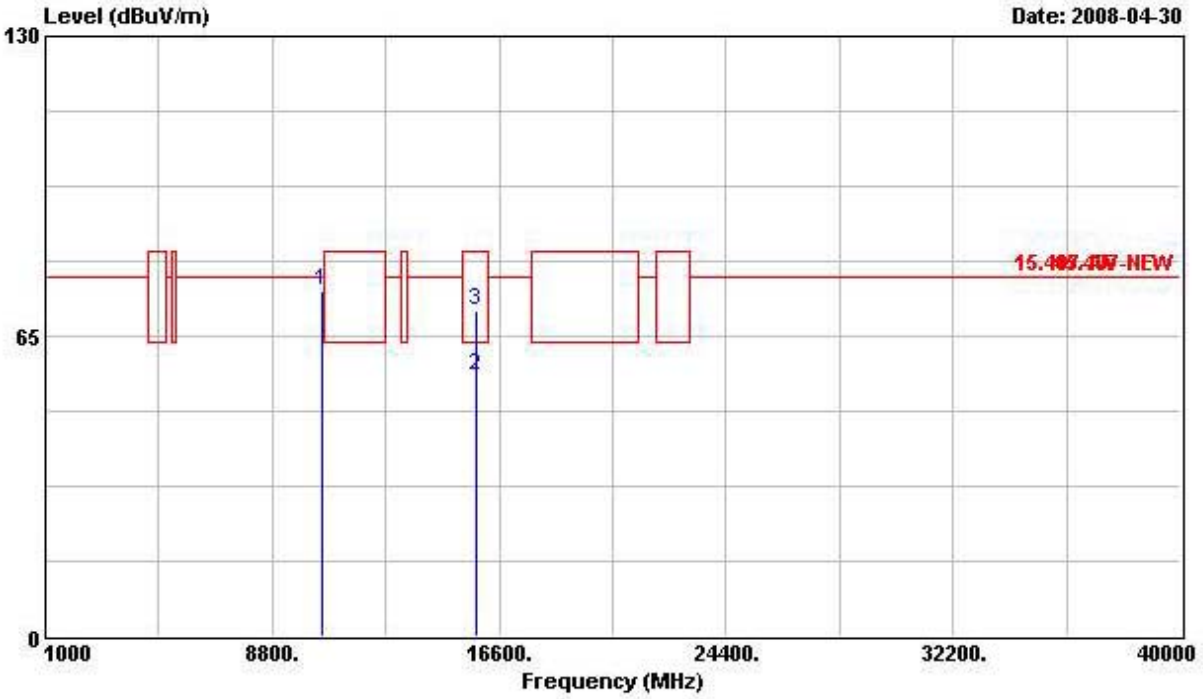
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8592.000	53.82	-24.02	77.84	42.98	38.36	5.28	32.81	PEAK
2 @	10484.000	74.28	-3.56	77.84	60.00	39.30	6.23	31.25	PEAK
3	15721.200	54.82	-8.72	63.54	39.42	37.59	7.41	29.60	AVERAGE
4	15721.200	69.60	-13.94	83.54	54.20	37.59	7.41	29.60	Peak

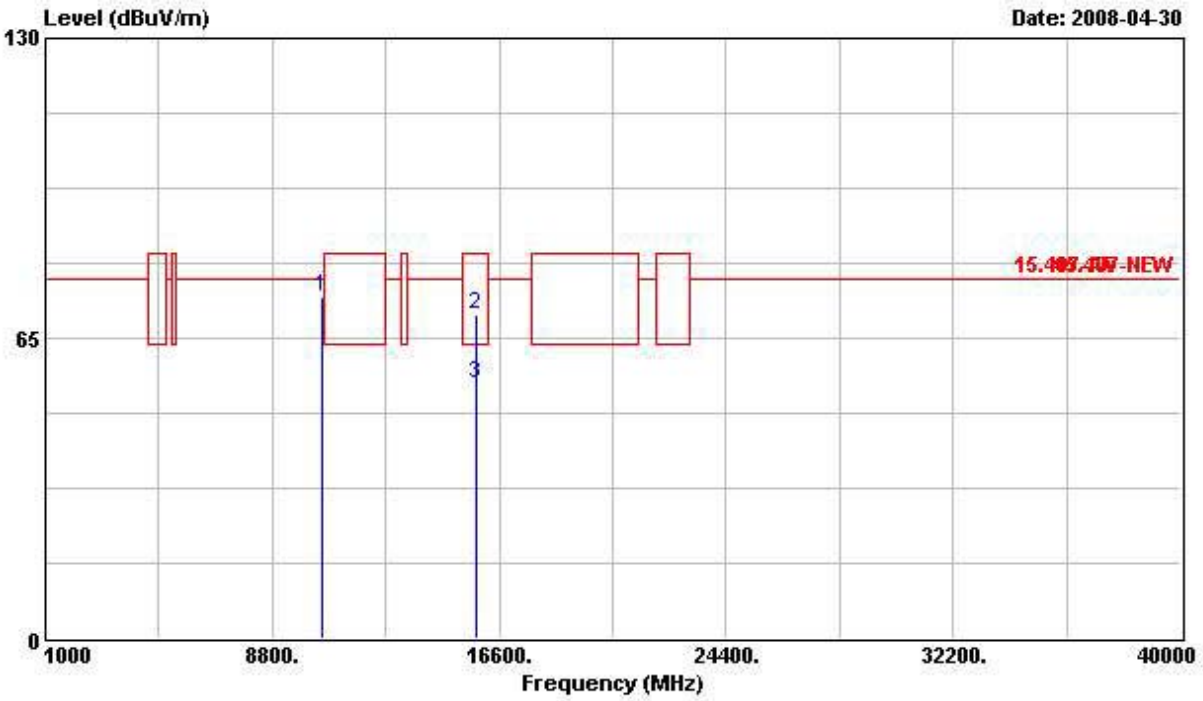
Test date	Apr. 30, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11a CH 52

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10516.000	74.69	-3.15	77.84	60.30	39.29	6.28	31.17	PEAK
2	15779.200	56.35	-7.19	63.54	40.88	37.61	7.42	29.56	AVERAGE
3	15779.200	70.48	-13.06	83.54	55.01	37.61	7.42	29.56	Peak

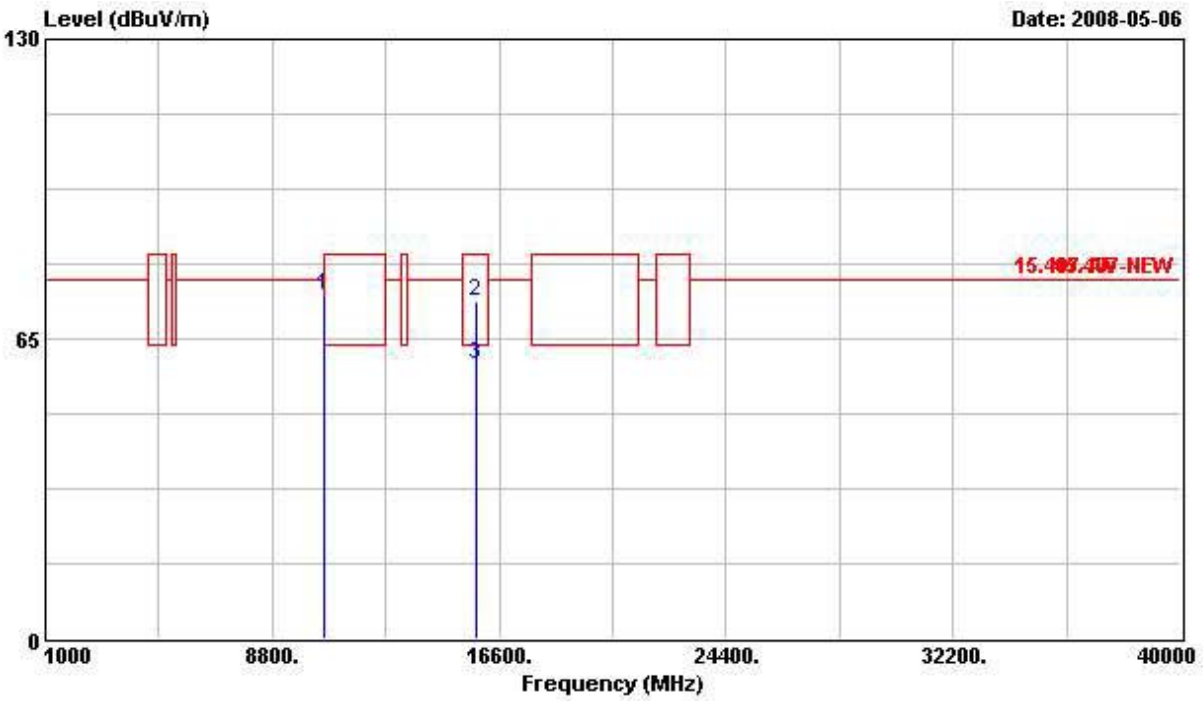
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10516.000	74.08	-3.76	77.84	59.68	39.29	6.28	31.17	PEAK
2	15779.400	70.27	-13.27	83.54	54.80	37.61	7.42	29.56	Peak
3	15779.400	55.35	-8.19	63.54	39.88	37.61	7.42	29.56	AVERAGE

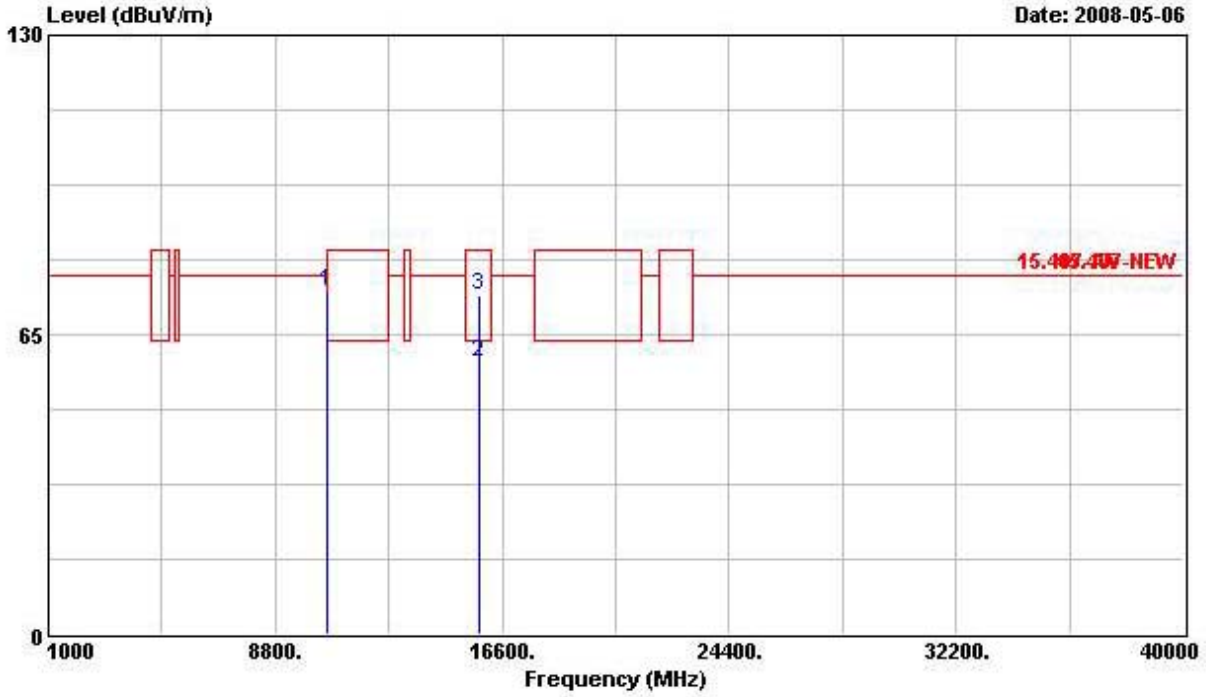
Test date	May 06, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 56

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10568.000	74.53	-3.31	77.84	60.00	39.26	6.30	31.03	PEAK
2	15842.500	73.09	-10.45	83.54	57.55	37.64	7.43	29.53	Peak
3	15842.500	59.23	-4.31	63.54	43.69	37.64	7.43	29.53	AVERAGE

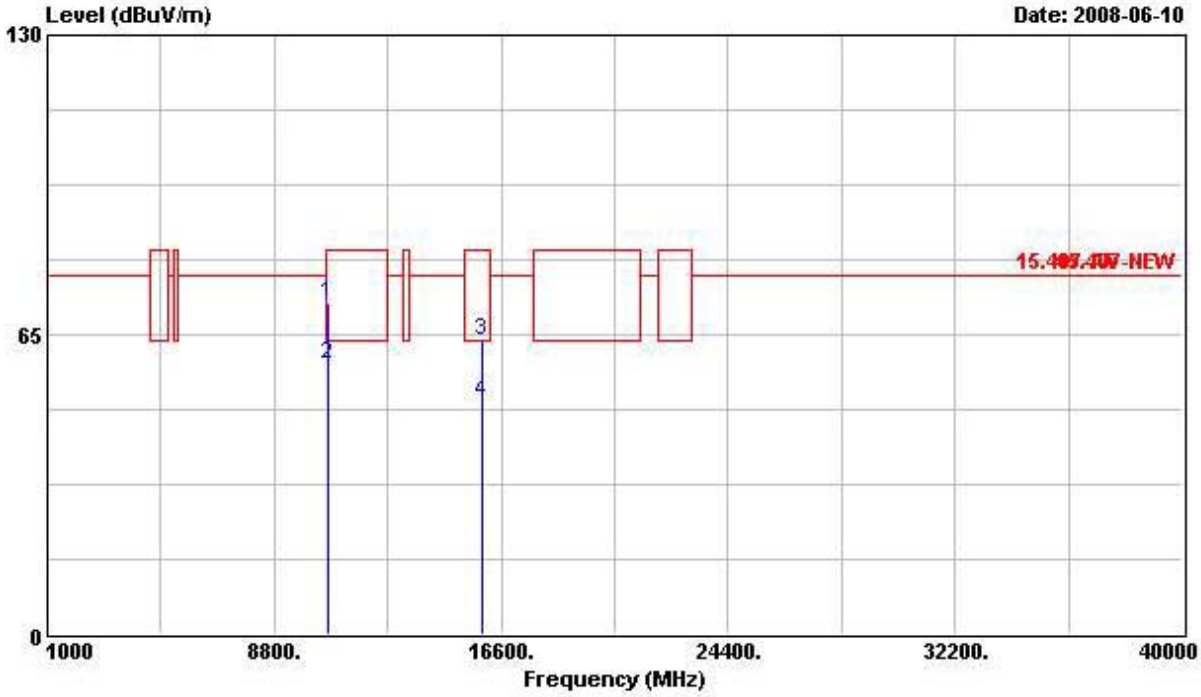
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10564.000	74.35	-3.49	77.84	59.82	39.26	6.30	31.03	PEAK
2	15839.600	58.84	-4.70	63.54	43.30	37.64	7.43	29.53	AVERAGE
3	15839.600	73.36	-10.18	83.54	57.82	37.64	7.43	29.53	Peak

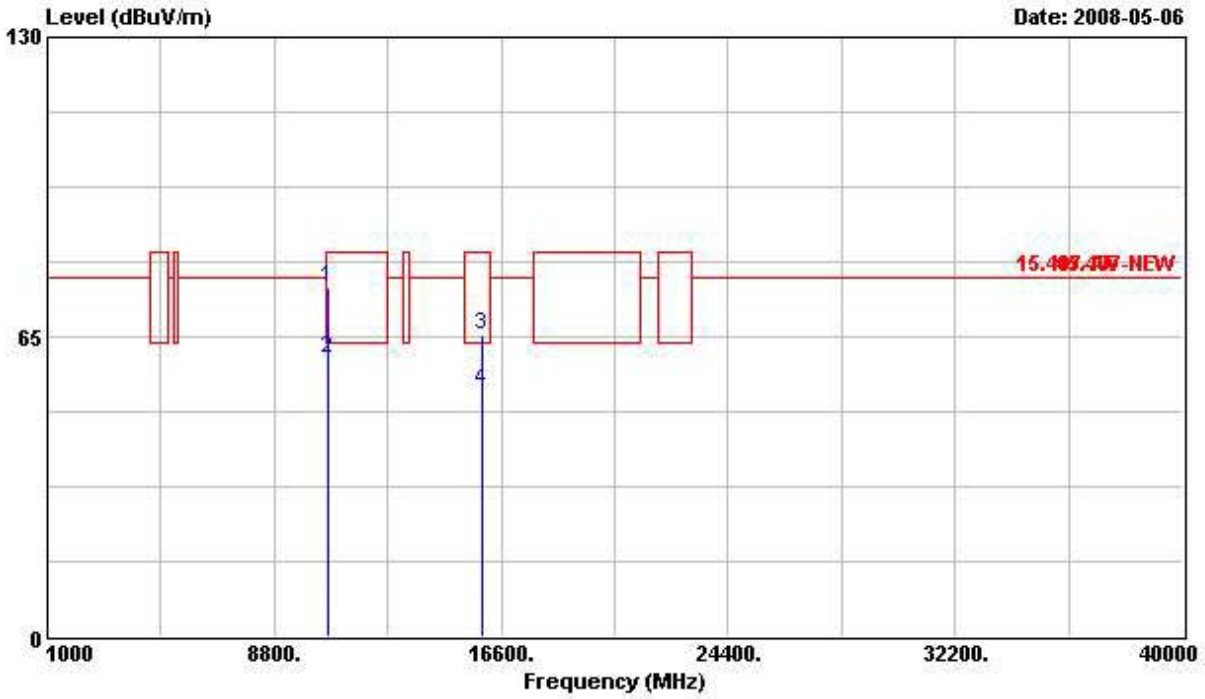
Test date	Jun. 10, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 64

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10640.680	71.72	-11.82	83.54	56.97	39.22	6.34	30.81	Peak
2	10640.680	58.51	-5.03	63.54	43.76	39.22	6.34	30.81	AVERAGE
3	15958.680	63.59	-19.95	83.54	47.91	37.69	7.46	29.46	Peak
4	15958.680	50.59	-12.95	63.54	34.91	37.69	7.46	29.46	AVERAGE

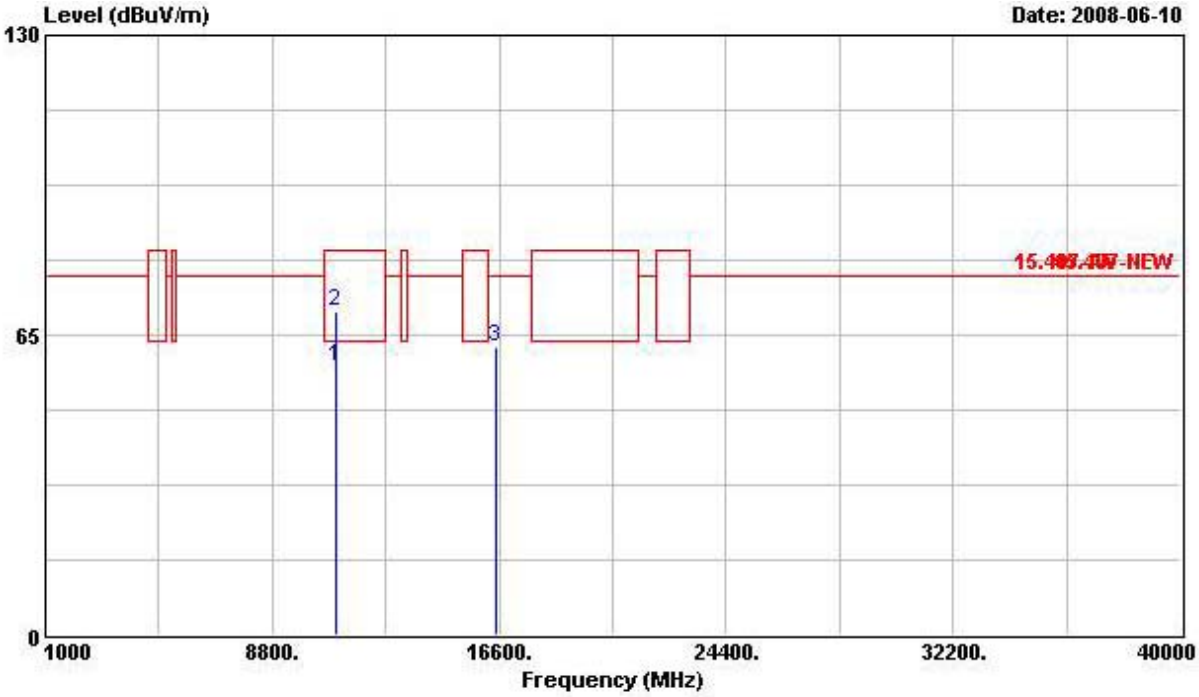
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10640.240	75.64	-7.90	83.54	60.89	39.22	6.34	30.81	Peak
2	10640.240	60.17	-3.37	63.54	45.42	39.22	6.34	30.81	AVERAGE
3	15962.840	65.42	-18.12	83.54	49.74	37.69	7.46	29.46	Peak
4	15962.840	53.24	-10.30	63.54	37.56	37.69	7.46	29.46	AVERAGE

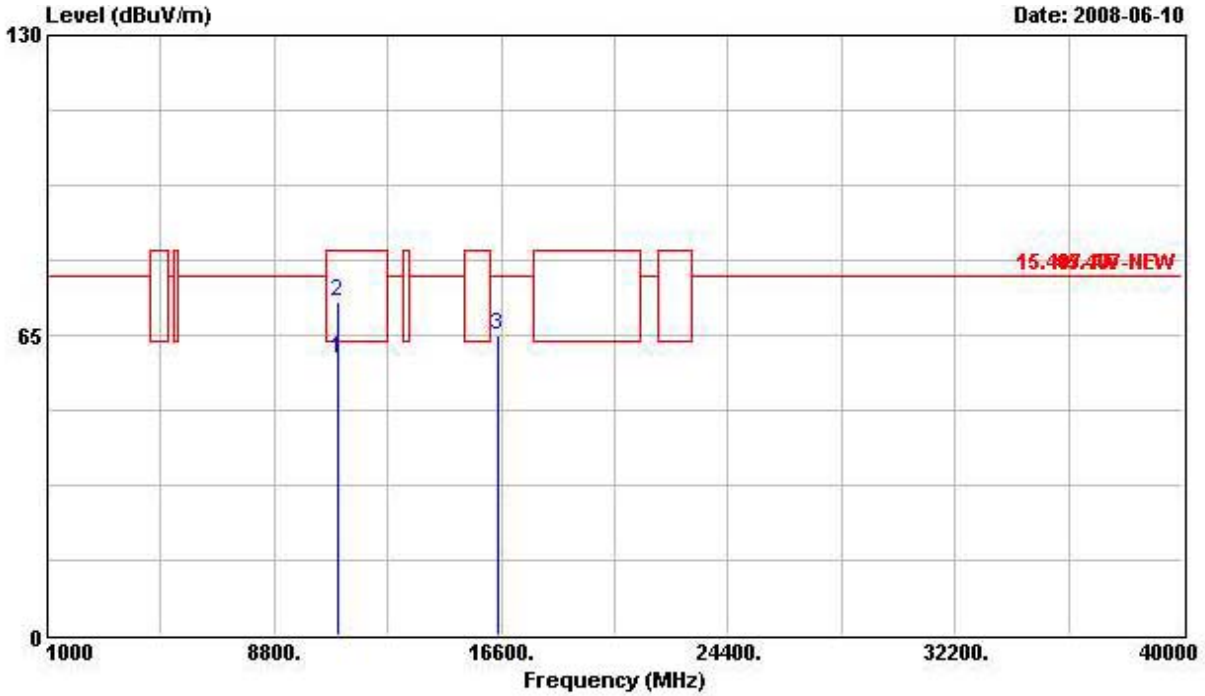
Test date	Jun. 10, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 100

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10999.120	58.19	-5.35	63.54	42.45	39.00	6.55	29.81	AVERAGE
2	10999.120	70.31	-13.23	83.54	54.57	39.00	6.55	29.81	Peak
3	16499.560	62.63	-15.21	77.84	45.54	39.00	7.52	29.44	PEAK

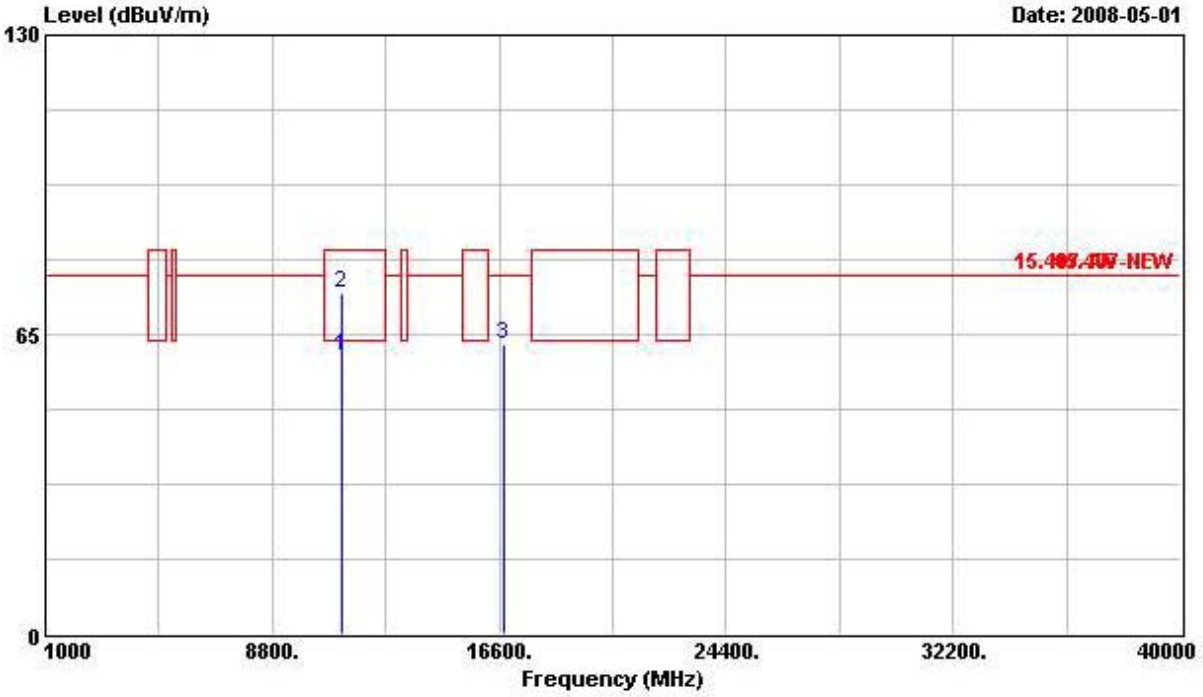
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10999.120	59.79	-3.75	63.54	44.04	39.00	6.55	29.81	AVERAGE
2	10999.120	72.45	-11.09	83.54	56.71	39.00	6.55	29.81	Peak
3	16499.560	64.98	-12.86	77.84	47.90	39.00	7.52	29.44	PEAK

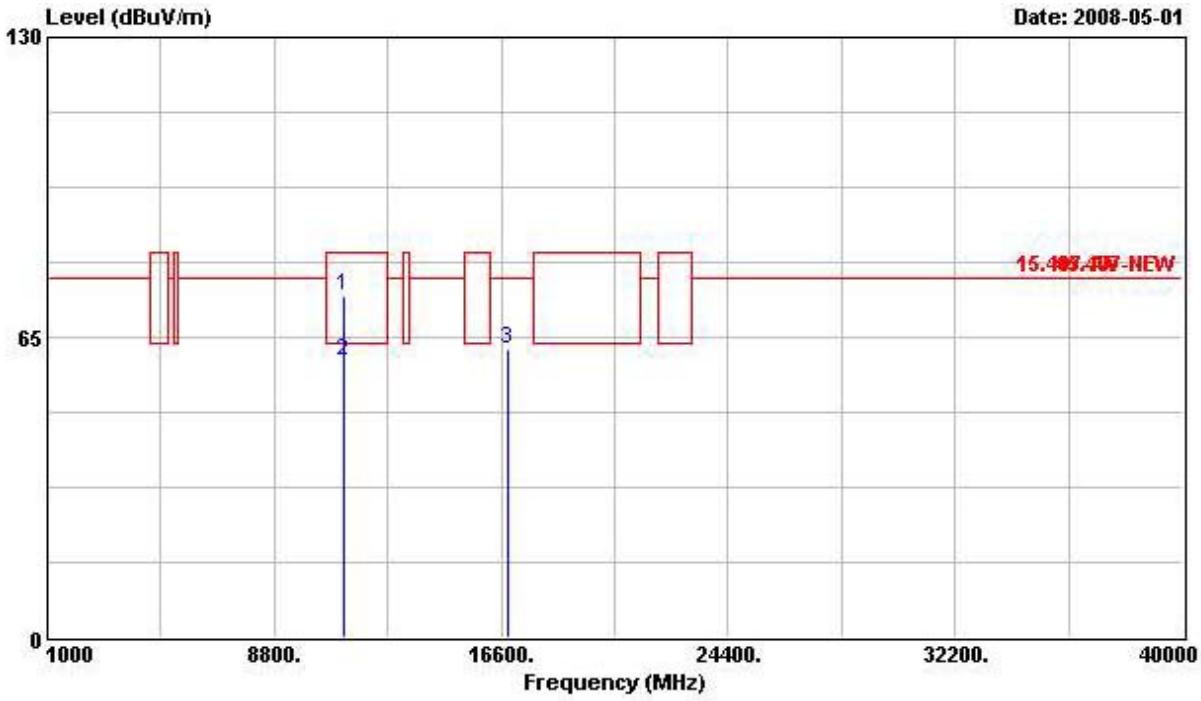
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 120

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11200.100	60.10	-3.44	63.54	45.03	39.28	6.66	30.86	AVERAGE
2	11200.100	74.15	-9.39	83.54	59.08	39.28	6.66	30.86	Peak
3	16796.000	62.76	-15.08	77.84	43.65	40.35	7.67	28.90	PEAK

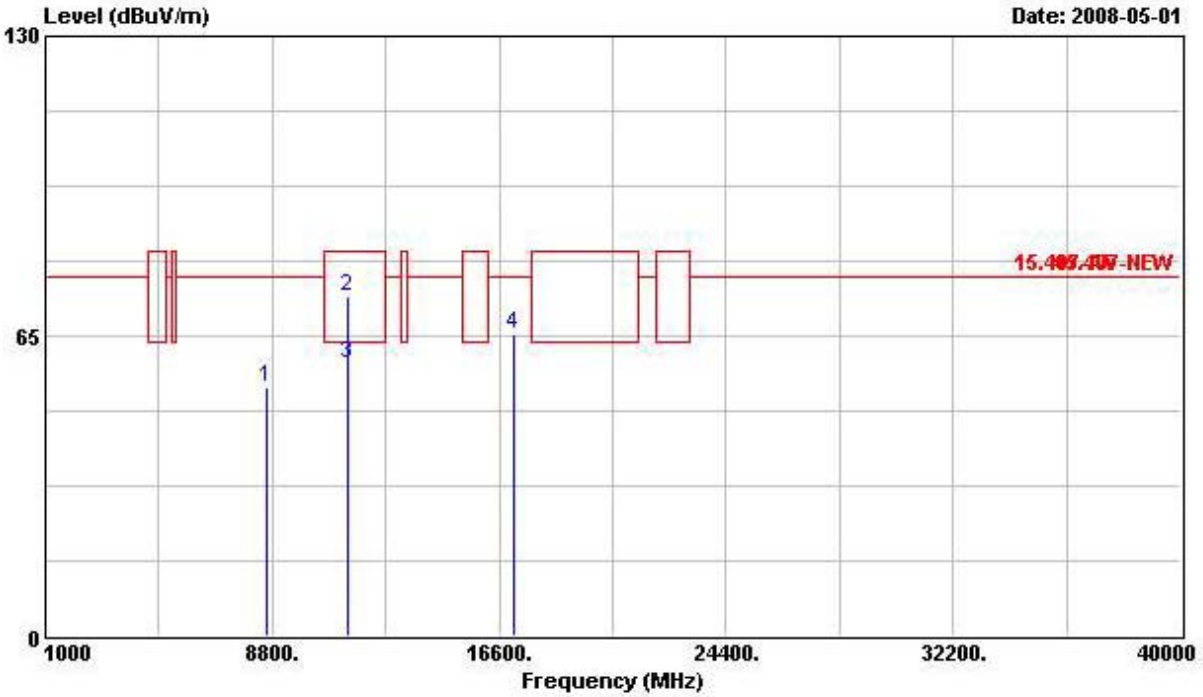
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11200.300	74.15	-9.39	83.54	59.08	39.28	6.66	30.86	Peak
2	11200.300	60.02	-3.52	63.54	44.95	39.28	6.66	30.86	AVERAGE
3	16804.000	62.31	-15.53	77.84	43.07	40.43	7.67	28.85	PEAK

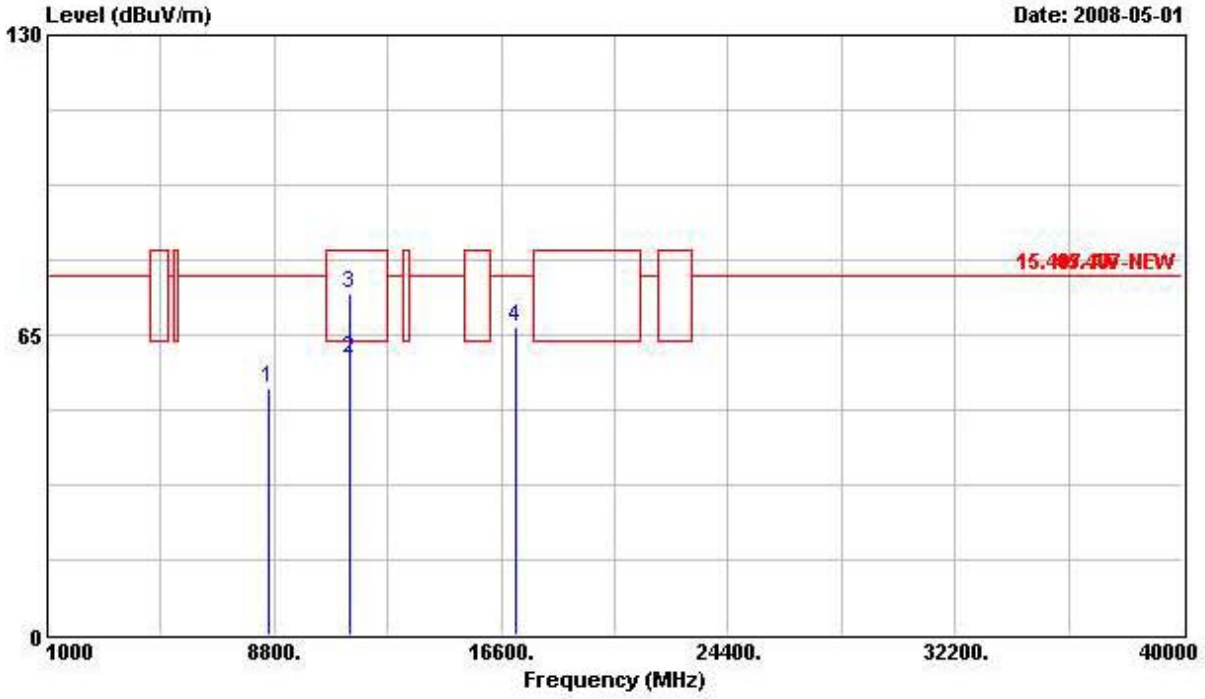
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 140

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8592.000	53.89	-23.95	77.84	43.05	38.36	5.28	32.81	PEAK
2	11400.000	73.53	-10.01	83.54	59.14	39.56	6.75	31.92	Peak
3	11400.000	58.86	-4.68	63.54	44.47	39.56	6.75	31.92	AVERAGE
4	17100.000	65.43	-12.41	77.84	44.03	42.14	7.79	28.53	PEAK

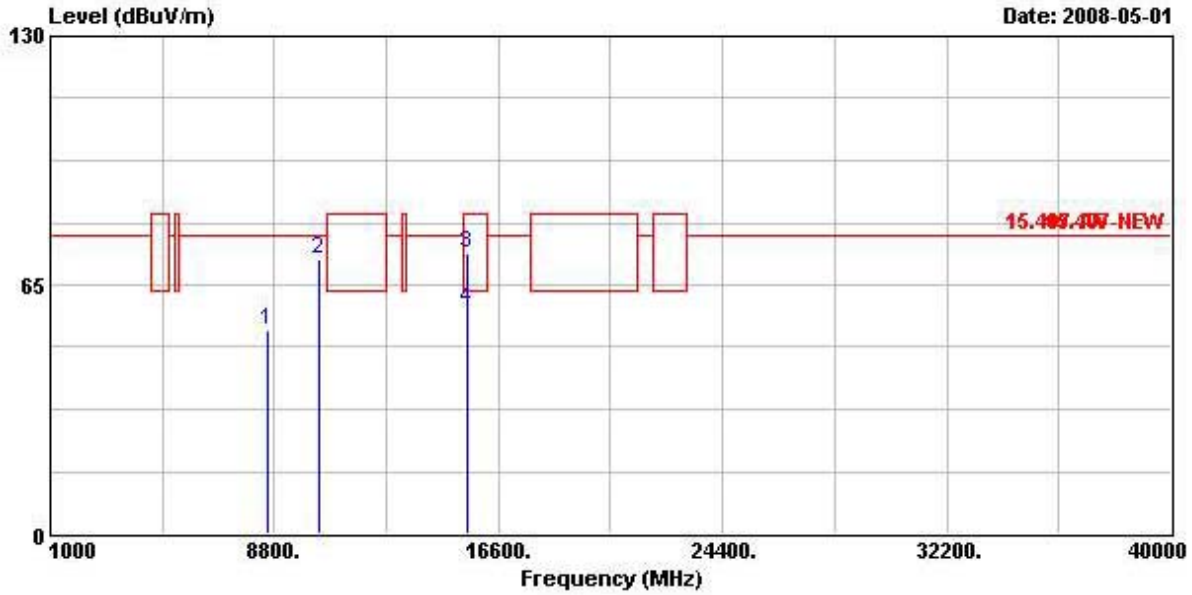
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8620.000	53.38	-24.46	77.84	42.54	38.37	5.28	32.81	PEAK
2	11400.100	59.97	-3.57	63.54	45.58	39.56	6.75	31.92	AVERAGE
3	11400.100	74.03	-9.51	83.54	59.64	39.56	6.75	31.92	Peak
4	17104.000	66.59	-11.25	77.84	45.19	42.14	7.79	28.53	PEAK

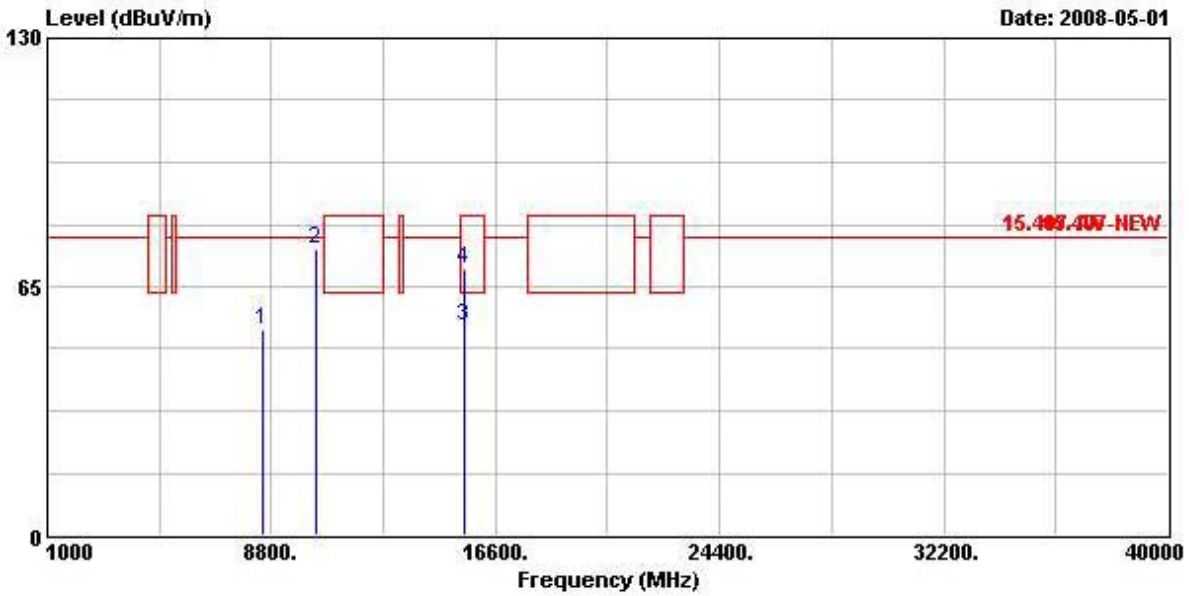
Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 36 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8544.000	53.37	-24.47	77.84	42.43	38.33	5.42	32.81	PEAK
2	10364.000	71.69	-6.15	77.84	57.95	39.33	6.09	31.67	PEAK
3	15540.000	73.49	-10.05	83.54	58.30	37.51	7.37	29.69	Peak
4	15540.000	58.83	-4.71	63.54	43.63	37.51	7.37	29.69	AVERAGE

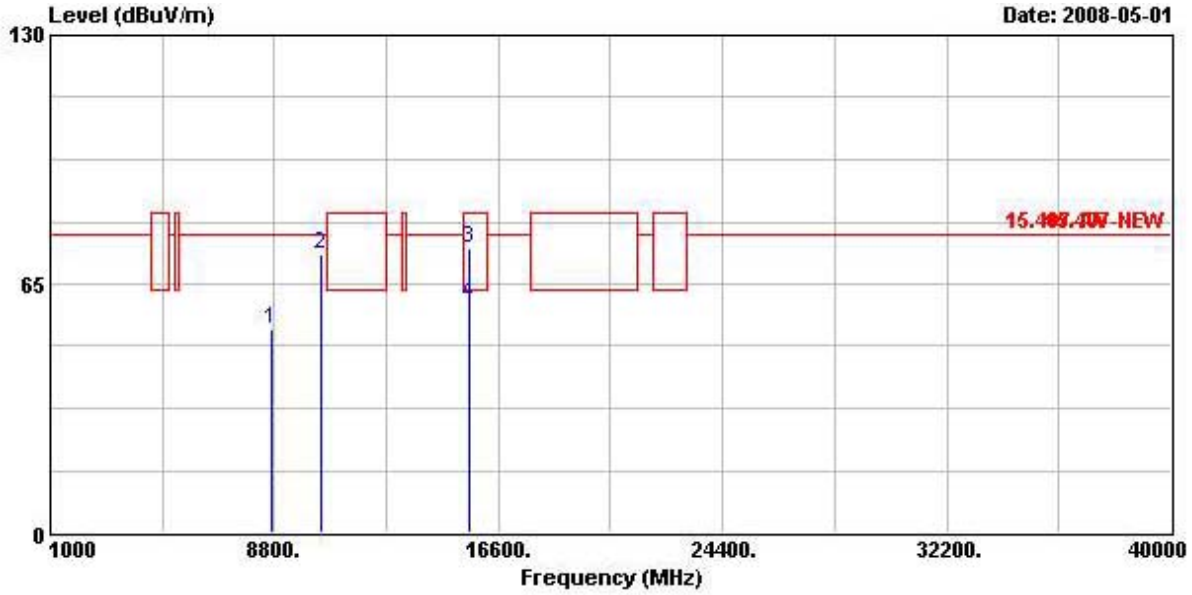
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8524.000	53.53	-24.31	77.84	42.60	38.32	5.42	32.81	PEAK
2 @	10360.000	74.61	-3.23	77.84	60.87	39.33	6.09	31.67	PEAK
3	15540.200	54.52	-9.02	63.54	39.33	37.51	7.37	29.69	AVERAGE
4	15540.200	69.40	-14.14	83.54	54.21	37.51	7.37	29.69	Peak

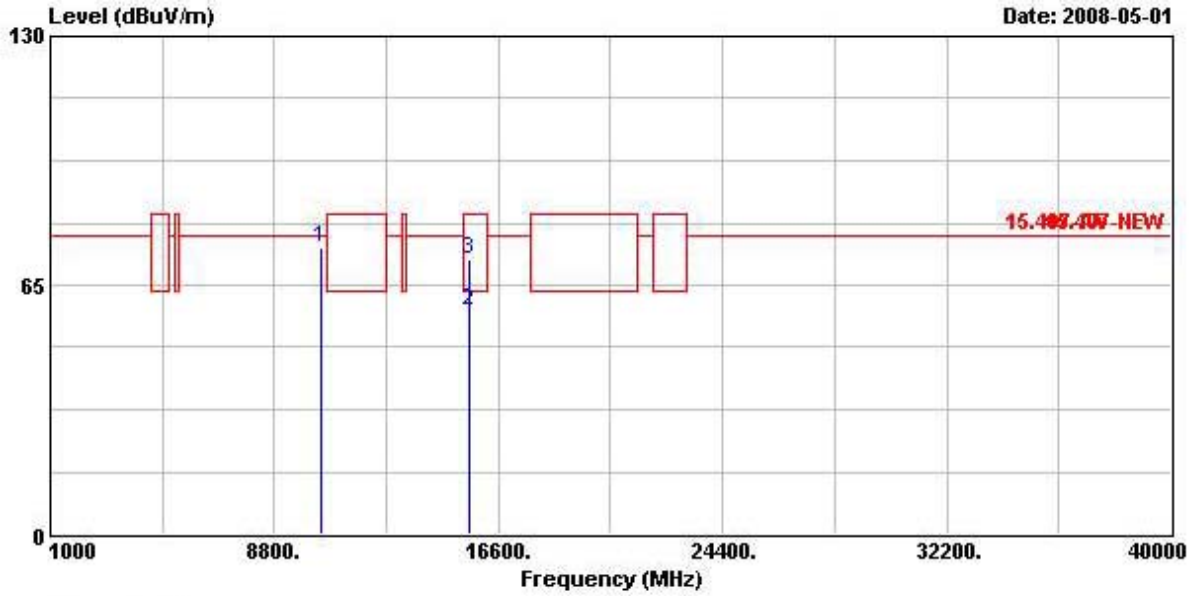
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 40 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8688.000	53.06	-24.78	77.84	42.31	38.41	5.15	32.81	PEAK
2	10400.000	72.65	-5.19	77.84	58.70	39.32	6.14	31.51	PEAK
3	15597.400	74.05	-9.49	83.54	58.79	37.54	7.38	29.67	Peak
4 @	15597.400	60.09	-3.45	63.54	44.84	37.54	7.38	29.67	AVERAGE

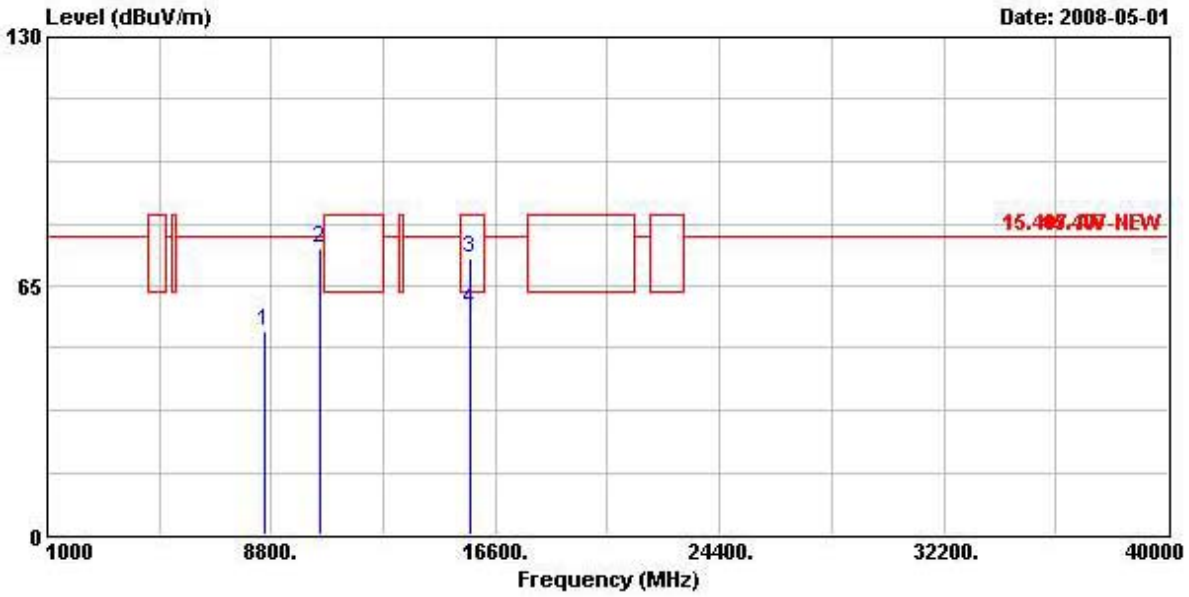
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	10392.000	74.57	-3.27	77.84	60.70	39.32	6.14	31.59	PEAK
2	15600.800	58.28	-5.26	63.54	43.01	37.54	7.38	29.65	AVERAGE
3	15600.800	71.85	-11.69	83.54	56.58	37.54	7.38	29.65	Peak

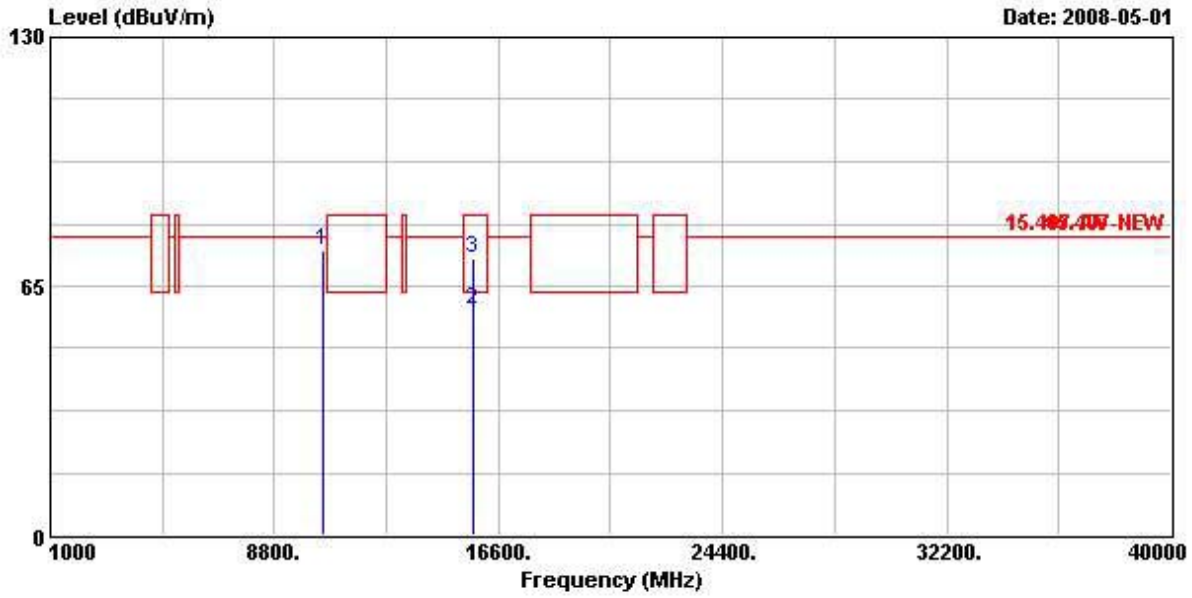
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 48 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8592.000	53.14	-24.70	77.84	42.31	38.36	5.28	32.81	PEAK
2 @	10484.000	74.74	-3.10	77.84	60.46	39.30	6.23	31.25	PEAK
3	15720.700	72.15	-11.39	83.54	56.75	37.59	7.41	29.60	Peak
4	15720.700	58.91	-4.63	63.54	43.51	37.59	7.41	29.60	AVERAGE

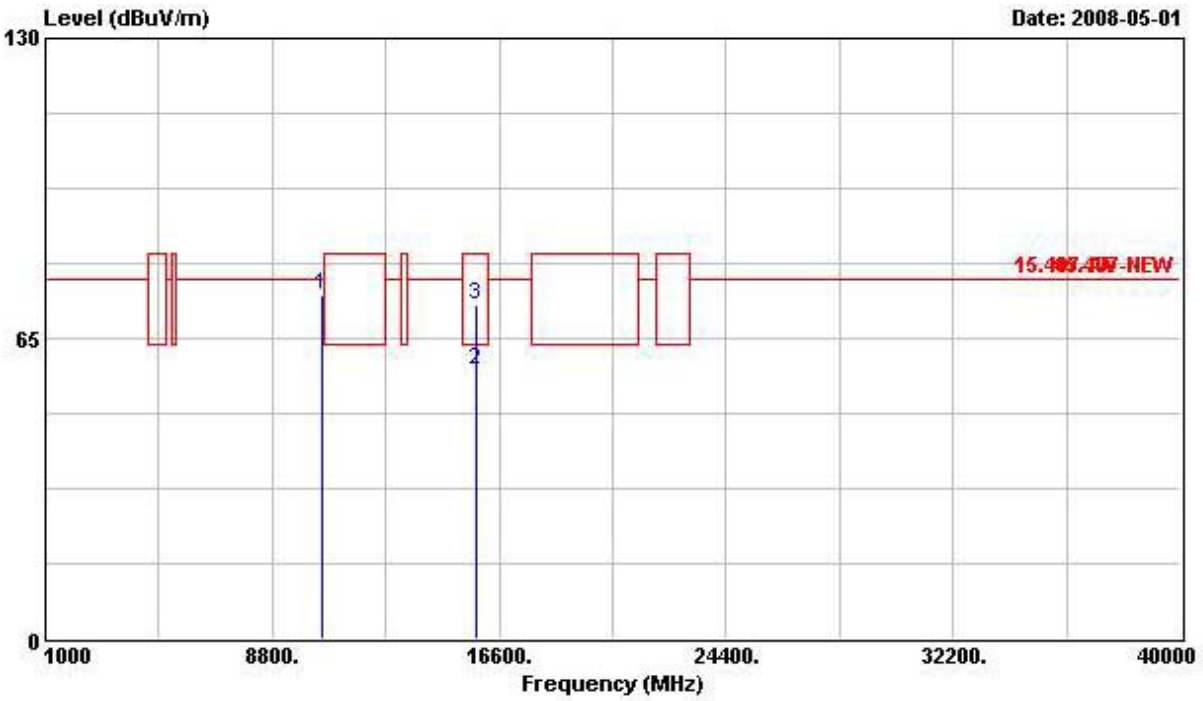
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	10480.000	74.17	-3.67	77.84	59.89	39.30	6.23	31.25	PEAK
2	15722.000	58.91	-4.63	63.54	43.51	37.59	7.41	29.60	AVERAGE
3	15722.000	72.12	-11.42	83.54	56.72	37.59	7.41	29.60	Peak

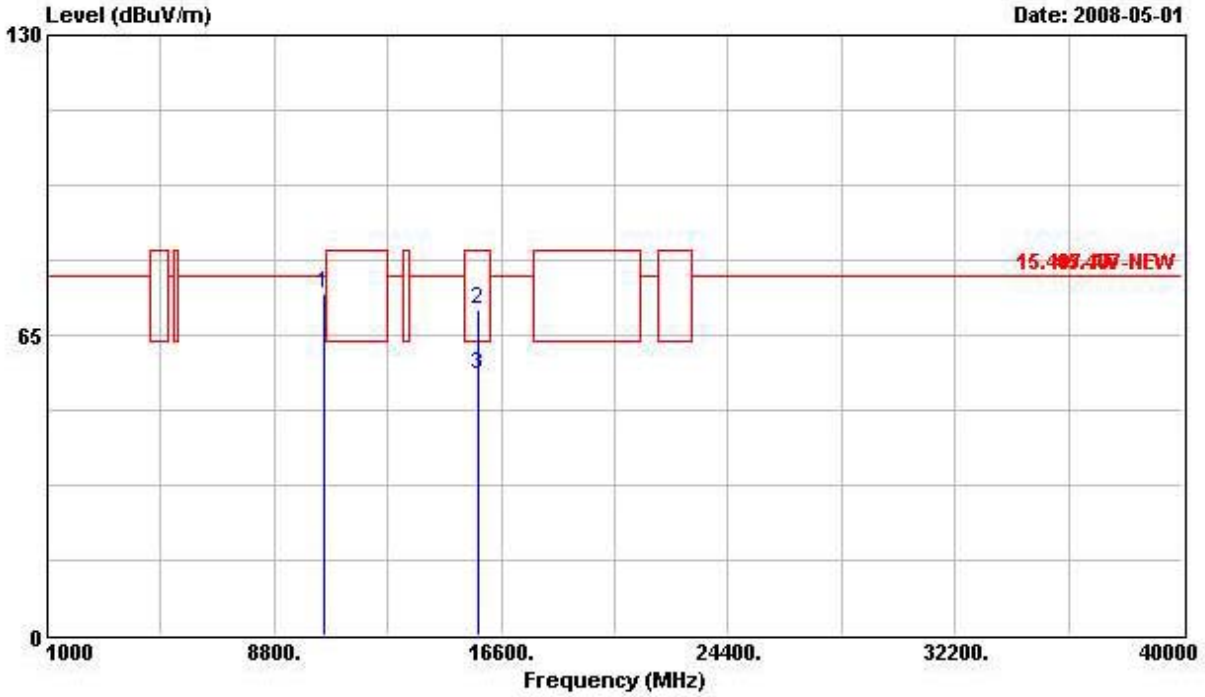
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 52 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10520.000	74.23	-3.61	77.84	59.83	39.29	6.28	31.17	PEAK
2	15782.200	58.27	-5.27	63.54	42.80	37.62	7.42	29.56	AVERAGE
3	15782.200	72.09	-11.45	83.54	56.61	37.62	7.42	29.56	Peak

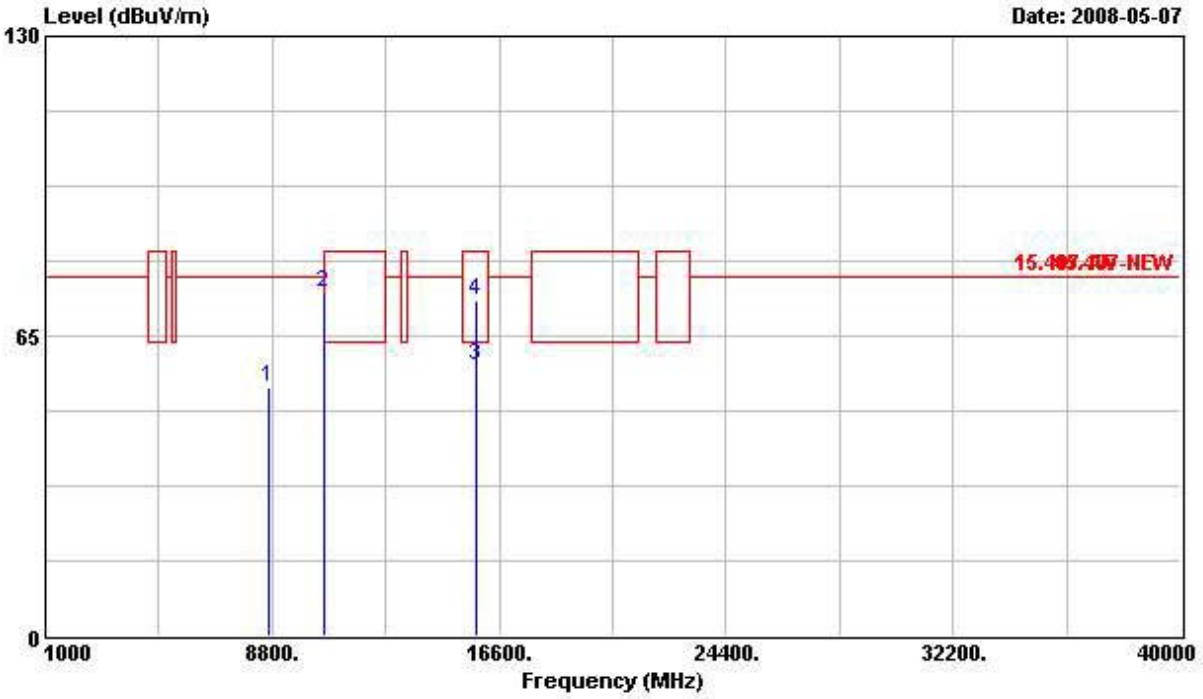
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10520.000	74.04	-3.80	77.84	59.64	39.29	6.28	31.17	PEAK
2	15780.200	70.53	-13.01	83.54	55.06	37.61	7.42	29.56	Peak
3	15780.200	56.39	-7.15	63.54	40.92	37.61	7.42	29.56	AVERAGE

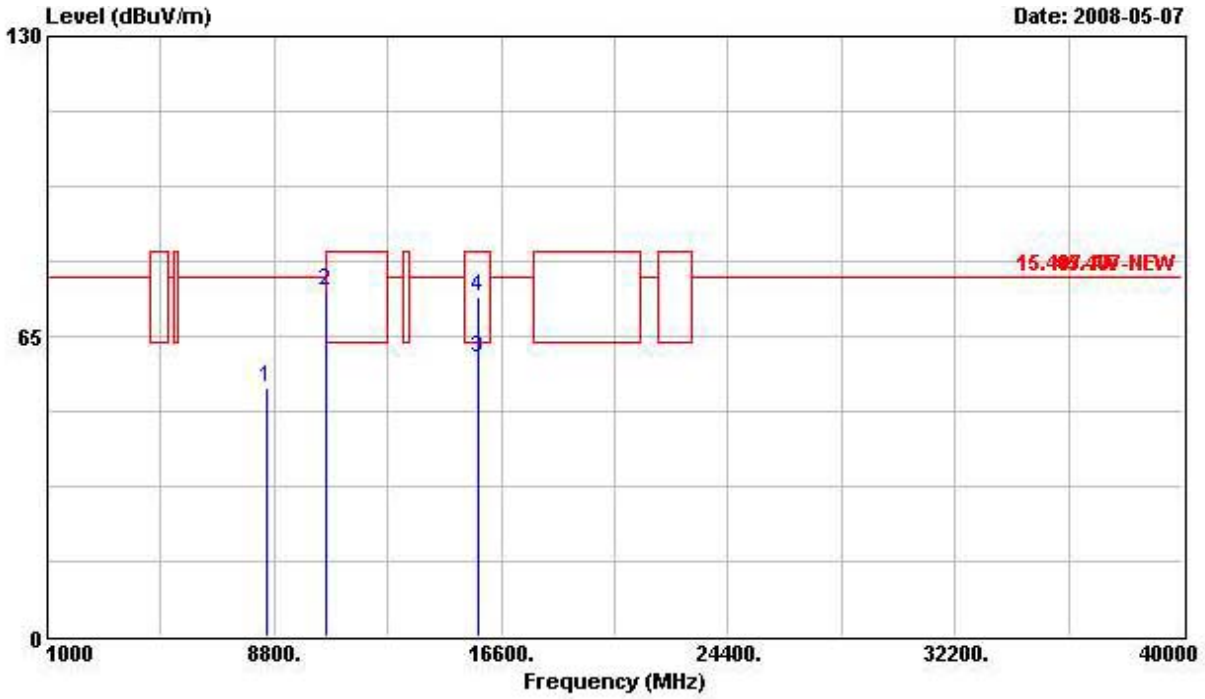
Test date	May 07, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 56 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8708.000	54.00	-23.84	77.84	43.30	38.42	5.08	32.81	PEAK
2	10564.000	74.22	-3.62	77.84	59.68	39.26	6.30	31.03	PEAK
3	15842.800	58.74	-4.80	63.54	43.20	37.64	7.43	29.53	AVERAGE
4	15842.800	72.79	-10.75	83.54	57.25	37.64	7.43	29.53	Peak

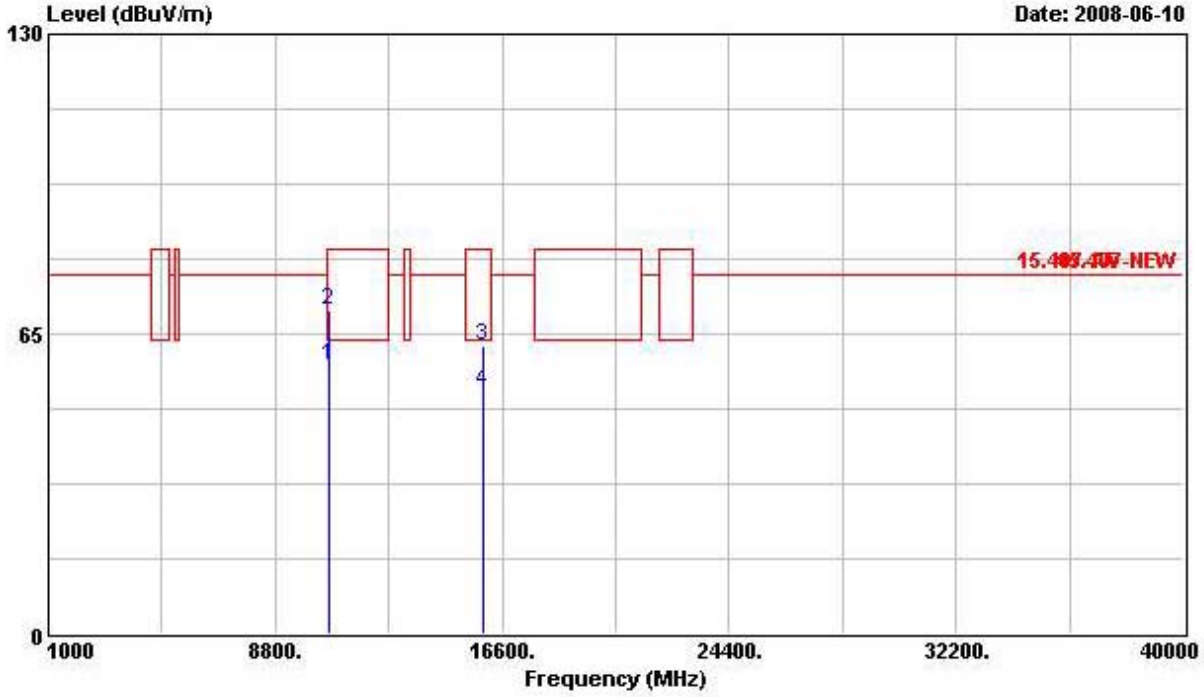
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8564.000	53.90	-23.94	77.84	43.02	38.34	5.35	32.81	PEAK
2	10556.000	74.78	-3.06	77.84	60.24	39.27	6.30	31.03	PEAK
3	15842.100	60.10	-3.44	63.54	44.56	37.64	7.43	29.53	AVERAGE
4	15842.100	73.51	-10.03	83.54	57.97	37.64	7.43	29.53	Peak

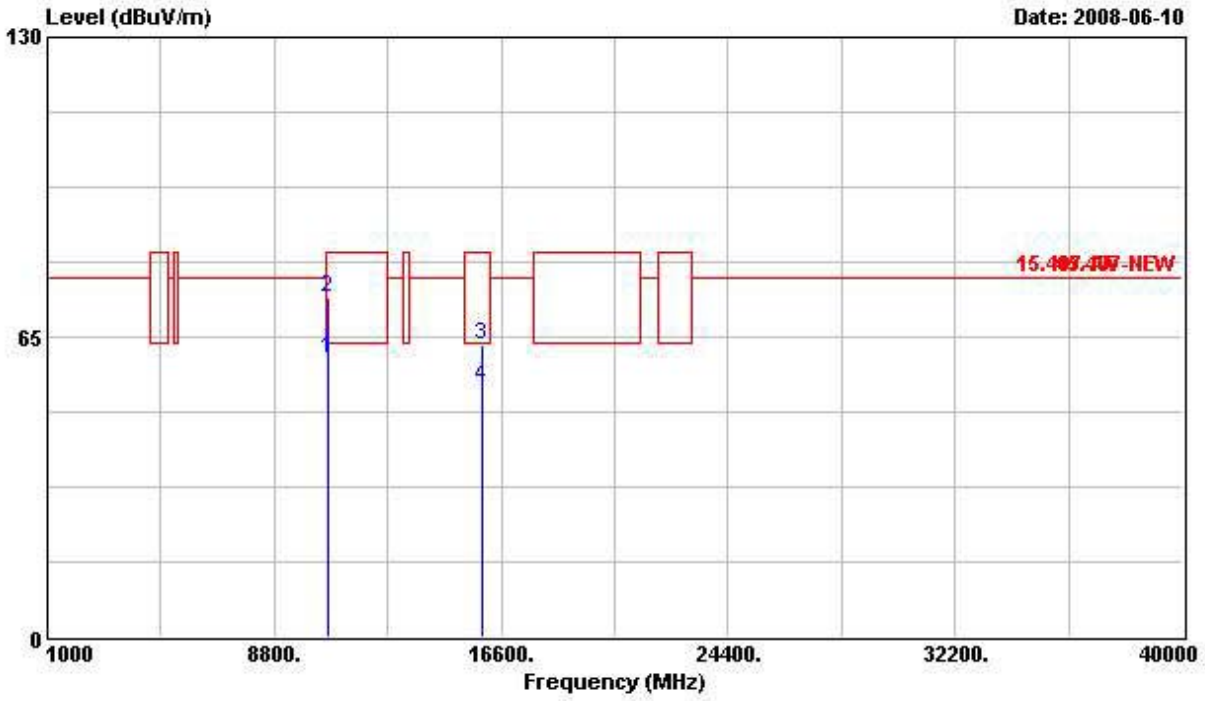
Test date	Jun. 10, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 64 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10640.360	57.96	-5.58	63.54	43.21	39.22	6.34	30.81	AVERAGE
2	10640.360	70.18	-13.36	83.54	55.43	39.22	6.34	30.81	Peak
3	15959.920	62.38	-21.16	83.54	46.70	37.69	7.46	29.46	PEAK
4	15959.920	52.43	-11.11	63.54	36.75	37.69	7.46	29.46	Average

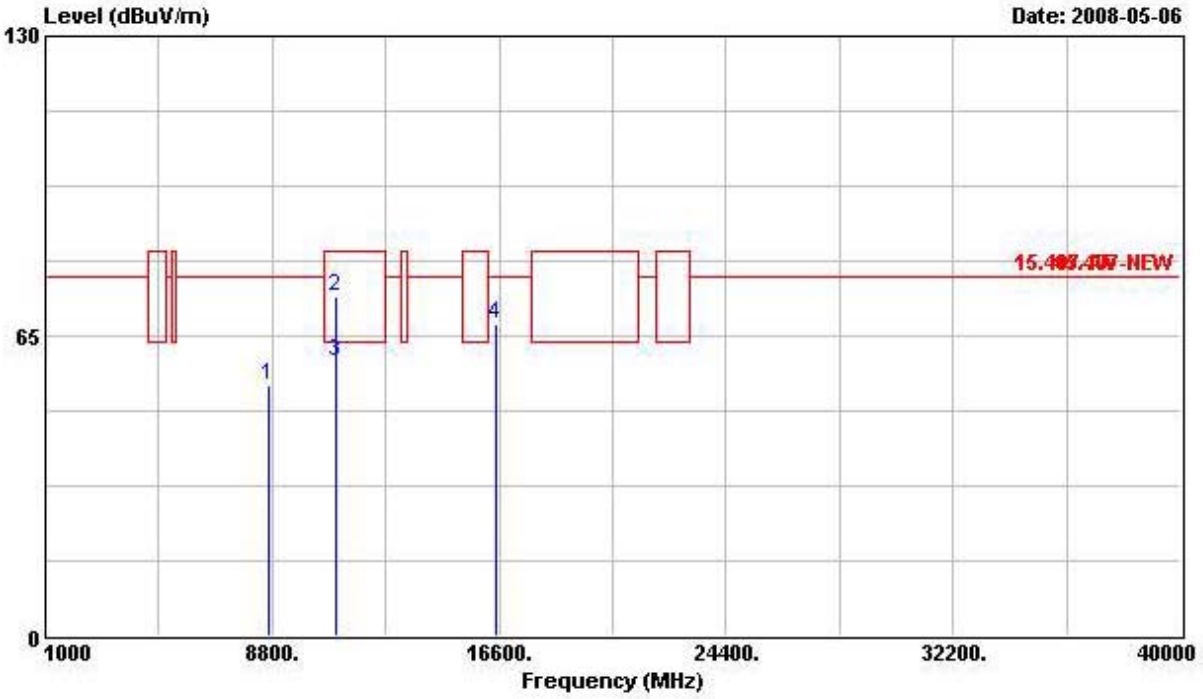
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10640.360	60.30	-3.24	63.54	45.55	39.22	6.34	30.81	AVERAGE
2	10640.360	73.39	-10.15	83.54	58.64	39.22	6.34	30.81	Peak
3	15959.920	63.36	-20.18	83.54	47.68	37.69	7.46	29.46	PEAK
4	15959.920	54.36	-9.18	63.54	38.68	37.69	7.46	29.46	Average

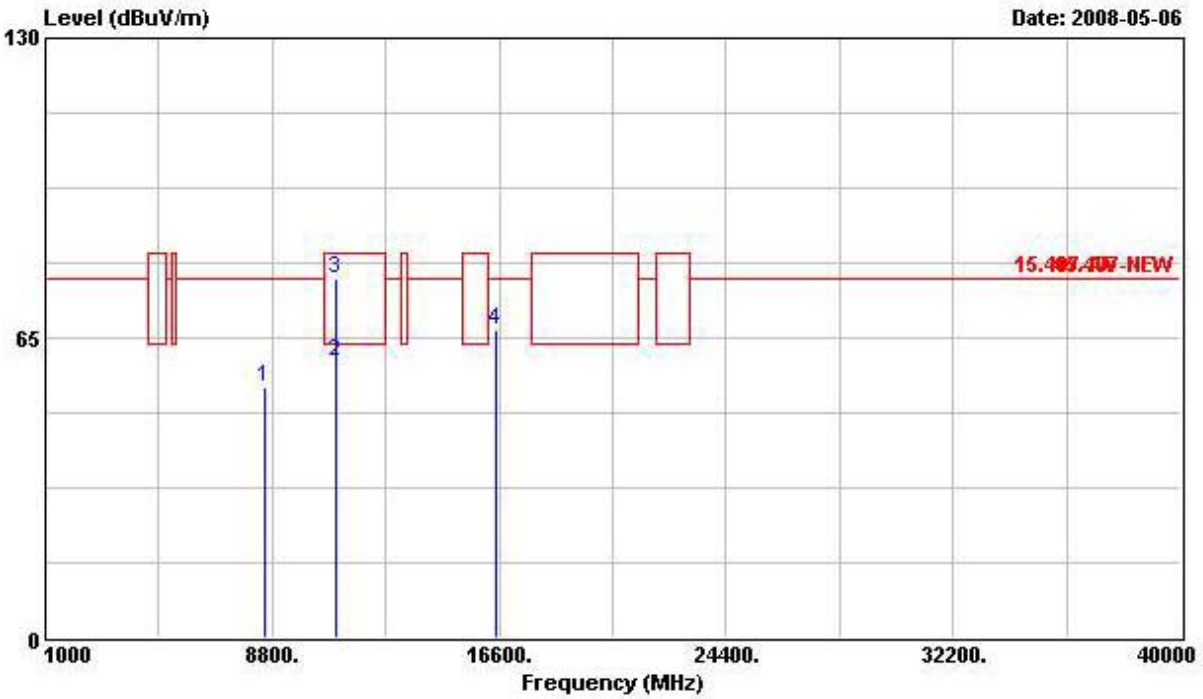
Test date	May 06, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 100 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8652.000	54.47	-23.37	77.84	43.67	38.39	5.21	32.81	PEAK
2	10999.600	73.61	-9.93	83.54	57.87	39.00	6.55	29.81	Peak
3	10999.600	59.60	-3.94	63.54	43.85	39.00	6.55	29.81	AVERAGE
4	16500.000	67.43	-10.41	77.84	50.34	39.00	7.52	29.44	PEAK

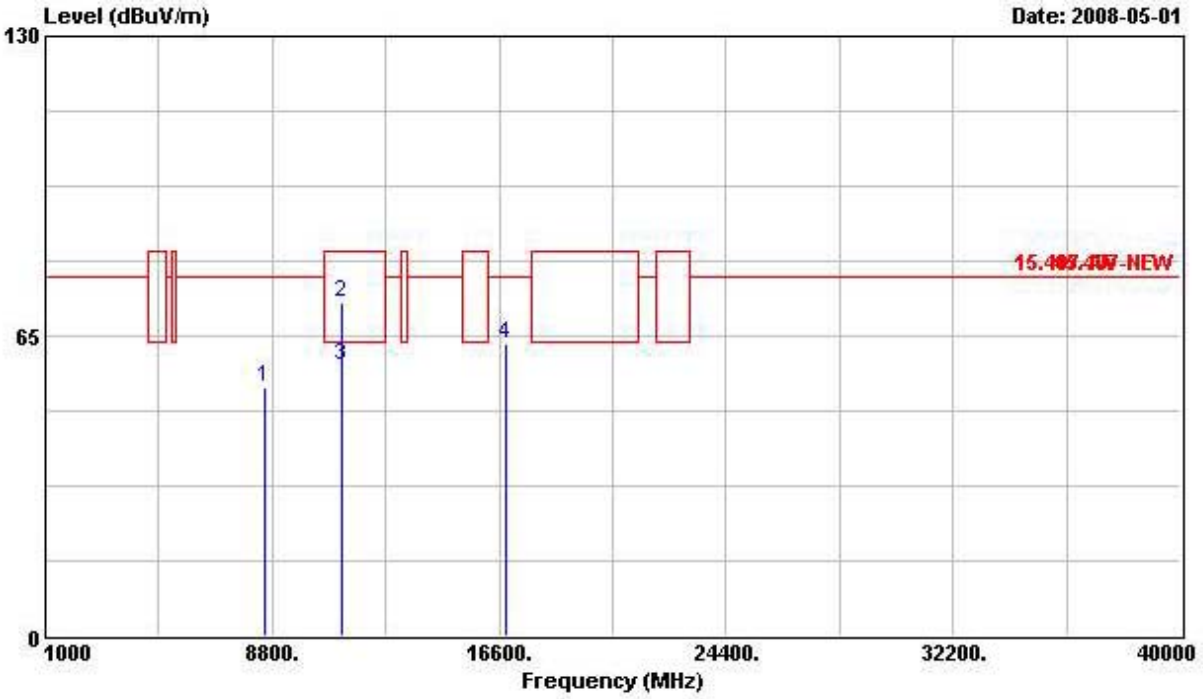
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8548.000	54.13	-23.71	77.84	43.26	38.33	5.35	32.81	PEAK
2	10999.300	60.03	-3.51	63.54	44.29	39.00	6.55	29.81	AVERAGE
3	10999.300	77.86	-5.68	83.54	62.12	39.00	6.55	29.81	Peak
4	16492.000	66.80	-11.04	77.84	49.76	38.96	7.52	29.44	PEAK

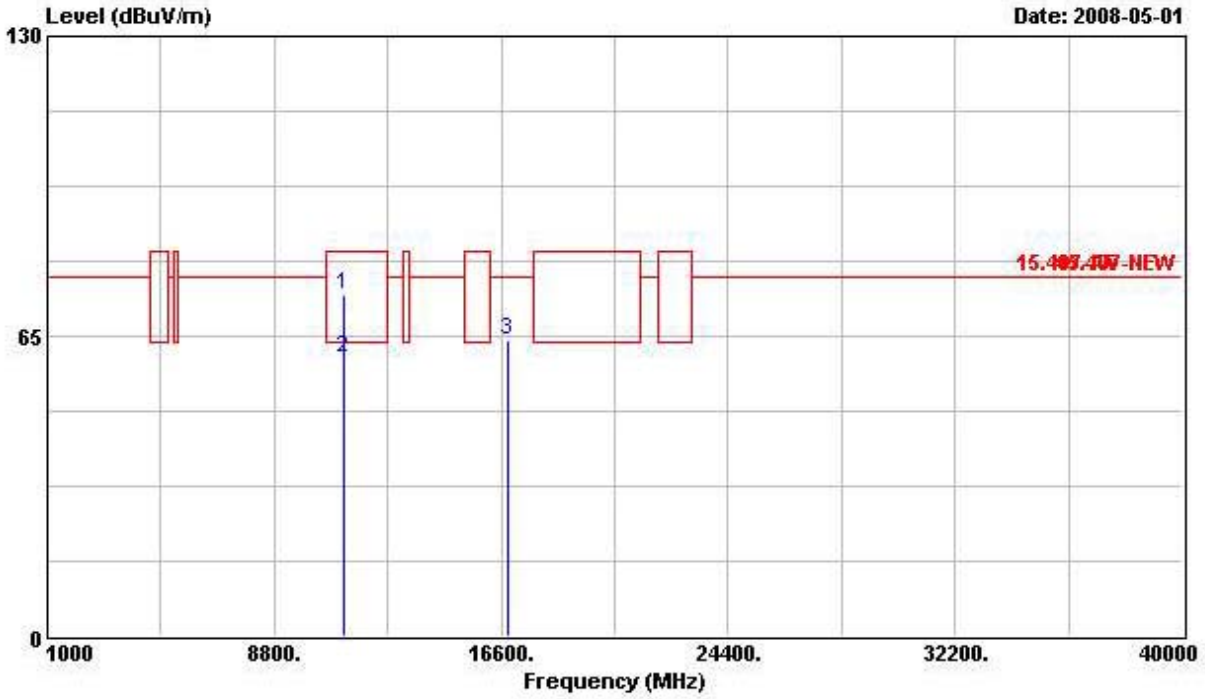
Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 120 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8540.000	53.69	-24.15	77.84	42.75	38.33	5.42	32.81	PEAK
2	11200.200	72.44	-11.10	83.54	57.37	39.28	6.66	30.86	PEAK
3	11200.200	58.39	-5.15	63.54	43.32	39.28	6.66	30.86	Average
4	16799.400	63.14	-14.70	77.84	43.98	40.35	7.67	28.85	PEAK

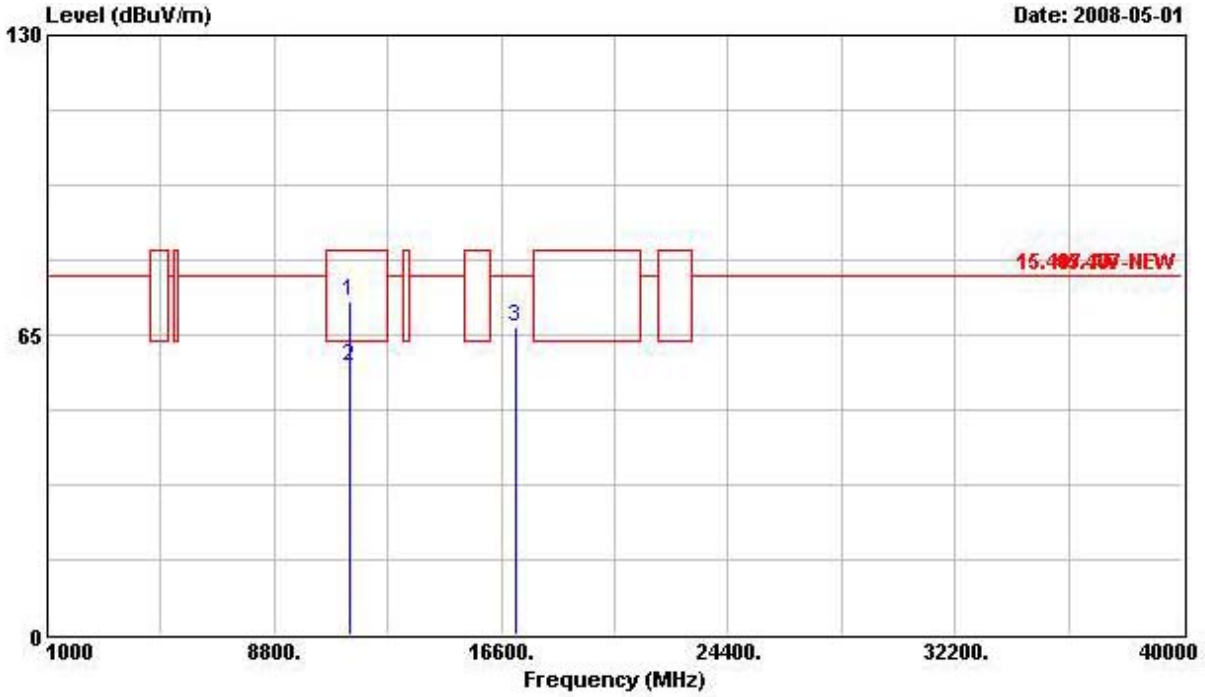
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11200.500	74.11	-9.43	83.54	59.04	39.28	6.66	30.86	PEAK
2	11200.500	60.10	-3.44	63.54	45.03	39.28	6.66	30.86	Average
3	16805.300	64.01	-13.83	77.84	44.77	40.43	7.67	28.85	PEAK

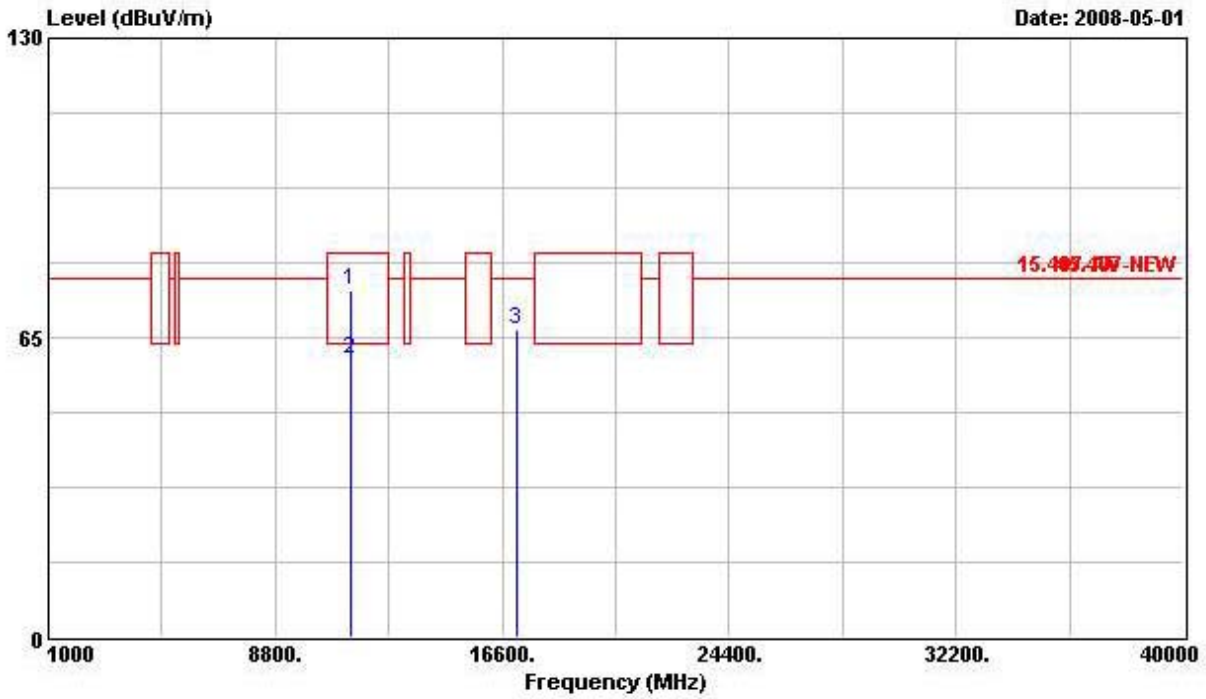
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 140 (20MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11400.800	72.31	-11.23	83.54	57.92	39.56	6.75	31.92	PEAK
2	11400.800	58.04	-5.50	63.54	43.65	39.56	6.75	31.92	Average
3	17093.300	66.69	-11.15	77.84	45.29	42.14	7.79	28.53	PEAK

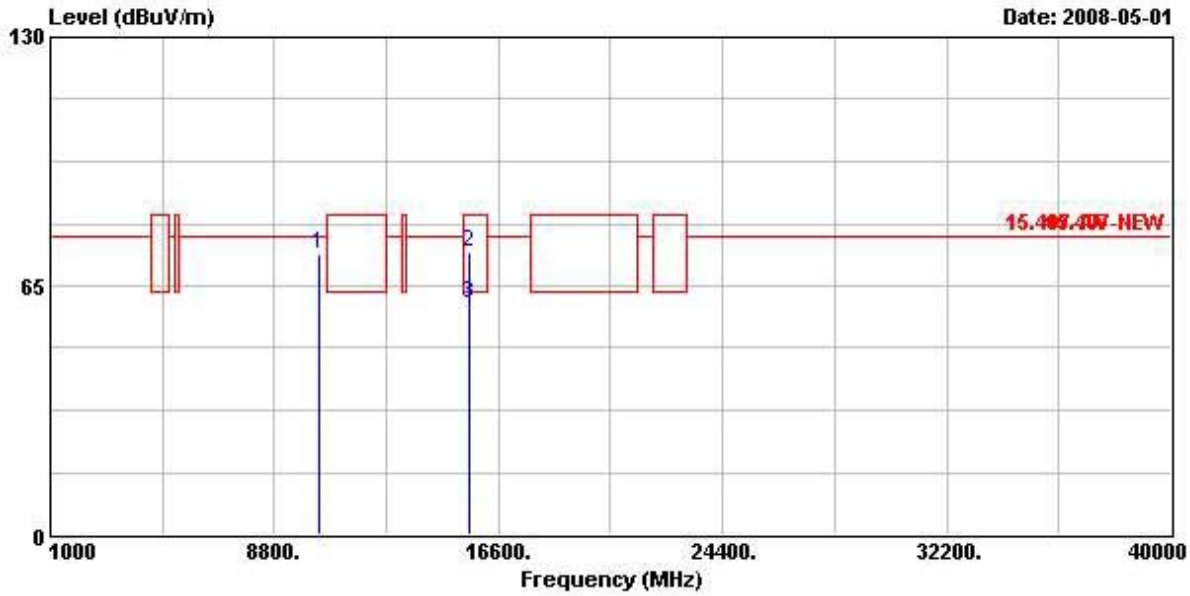
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11397.900	75.48	-8.06	83.54	61.09	39.56	6.75	31.92	PEAK
2	11397.900	60.18	-3.36	63.54	45.79	39.56	6.75	31.92	Average
3	17103.100	66.59	-11.25	77.84	45.19	42.14	7.79	28.53	PEAK

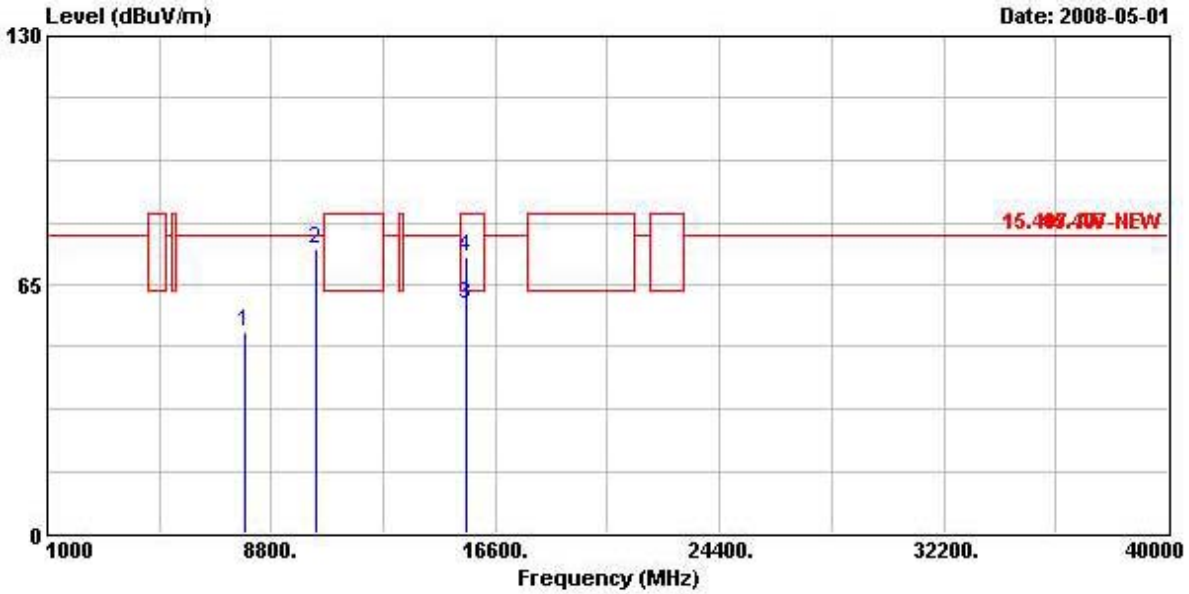
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 38 (40MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10361.100	73.32	-4.52	77.84	59.58	39.33	6.09	31.67	PEAK
2	15560.800	73.67	-9.87	83.54	58.45	37.53	7.37	29.68	PEAK
3 @	15560.800	60.45	-3.09	63.54	45.23	37.53	7.37	29.68	Average

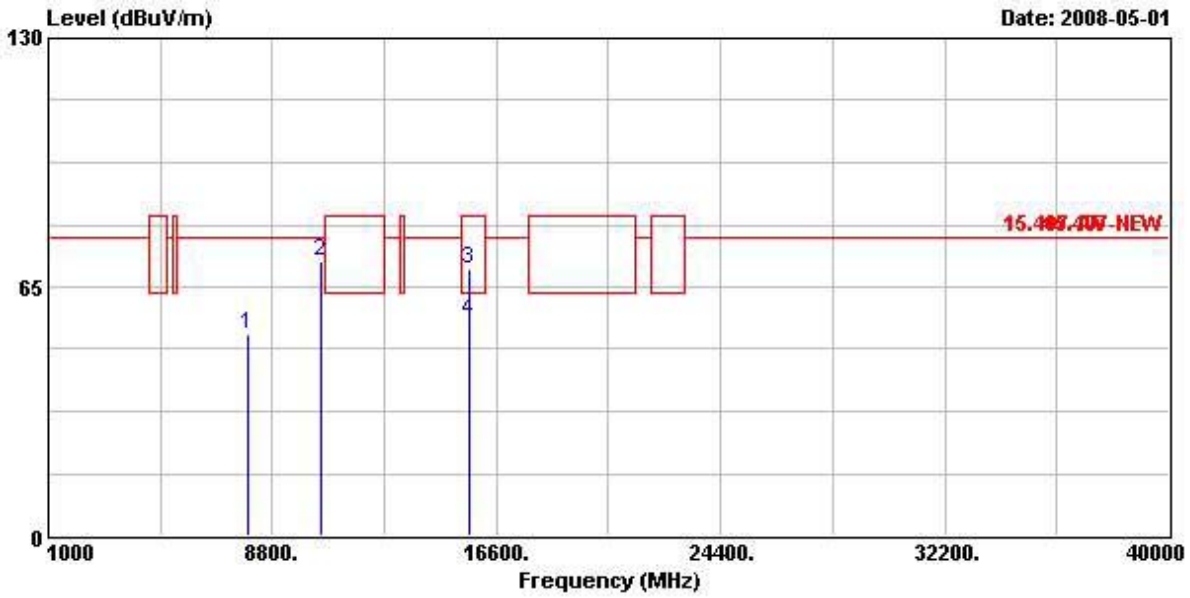
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7912.000	52.40	-25.44	77.84	42.84	37.72	4.67	32.83	PEAK
2 @	10376.600	74.21	-3.63	77.84	60.39	39.32	6.09	31.59	PEAK
3 @	15561.600	60.02	-3.52	63.54	44.80	37.53	7.37	29.68	Average
4	15561.600	72.08	-11.46	83.54	56.86	37.53	7.37	29.68	PEAK

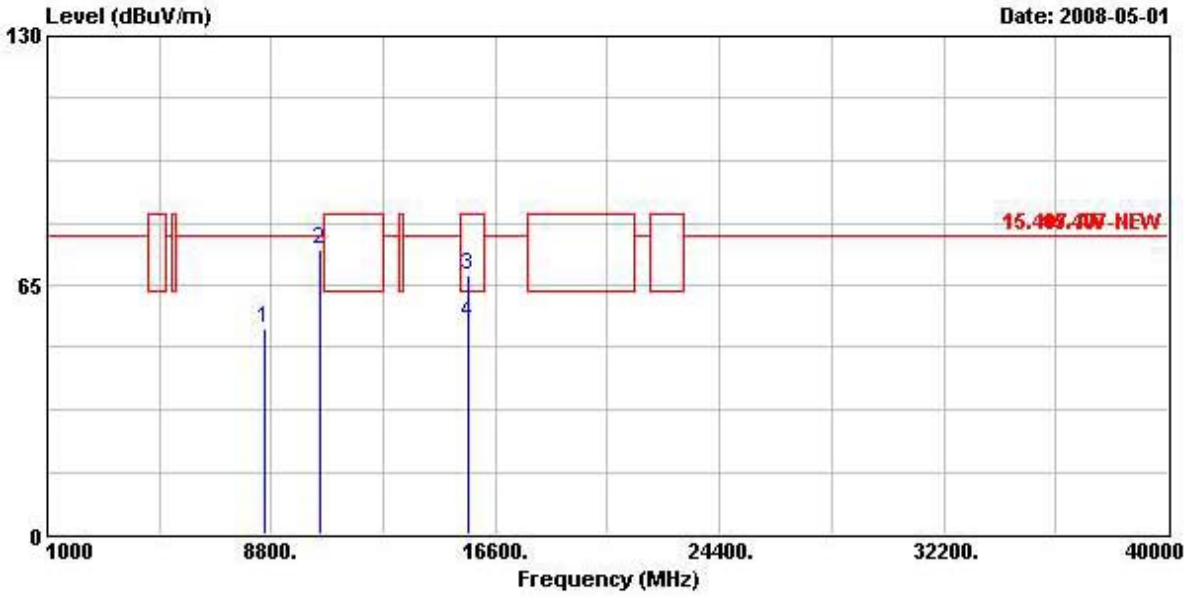
Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 46 (40MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7980.000	52.45	-25.39	77.84	42.77	37.78	4.70	32.80	PEAK
2	10460.600	71.88	-5.96	77.84	57.68	39.31	6.23	31.34	PEAK
3	15677.200	69.60	-13.94	83.54	54.25	37.57	7.39	29.61	PEAK
4	15677.200	56.11	-7.43	63.54	40.76	37.57	7.39	29.61	Average

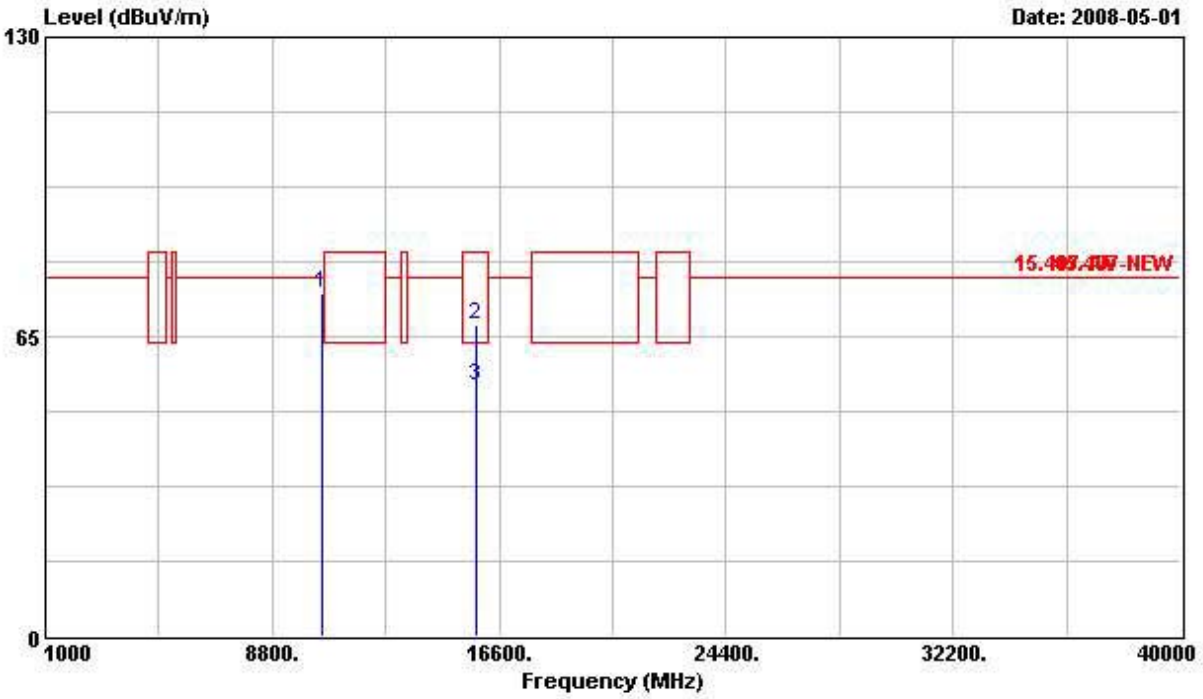
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8552.000	53.45	-24.39	77.84	42.58	38.33	5.35	32.81	PEAK
2 @	10461.000	74.47	-3.37	77.84	60.27	39.31	6.23	31.34	PEAK
3	15673.800	67.73	-15.81	83.54	52.39	37.57	7.39	29.63	PEAK
4	15673.800	55.06	-8.48	63.54	39.72	37.57	7.39	29.63	Average

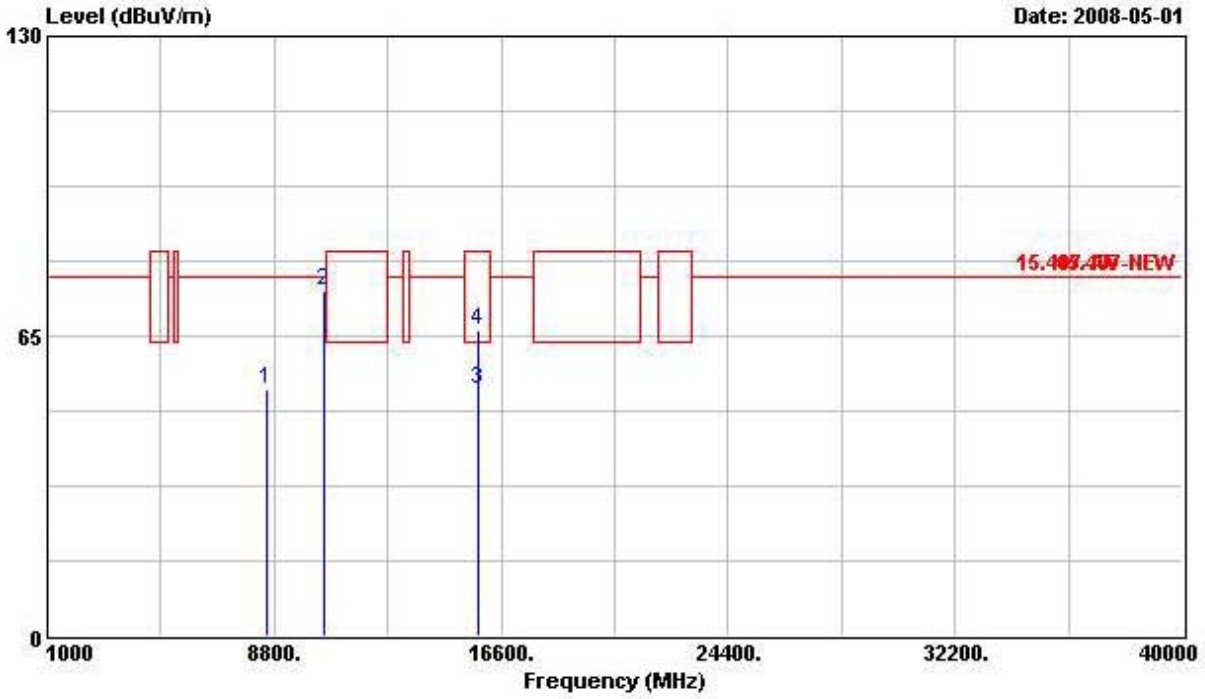
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 54 (40MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10541.000	74.30	-3.54	77.84	59.82	39.28	6.30	31.10	PEAK
2	15817.800	67.55	-15.99	83.54	52.04	37.63	7.43	29.54	PEAK
3	15817.800	54.46	-9.08	63.54	38.95	37.63	7.43	29.54	Average

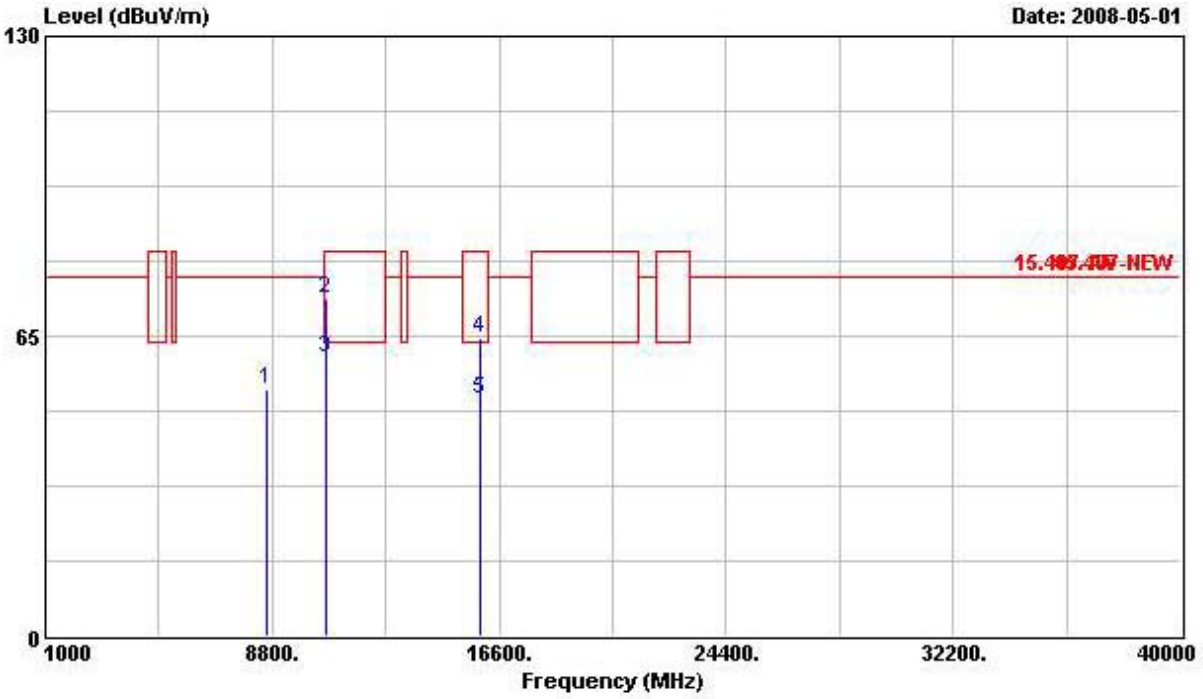
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8536.000	53.42	-24.42	77.84	42.49	38.32	5.42	32.81	PEAK
2	10540.400	74.73	-3.11	77.84	60.25	39.28	6.30	31.10	PEAK
3	15817.600	53.30	-10.24	63.54	37.79	37.63	7.43	29.54	Average
4	15817.600	66.37	-17.17	83.54	50.85	37.63	7.43	29.54	PEAK

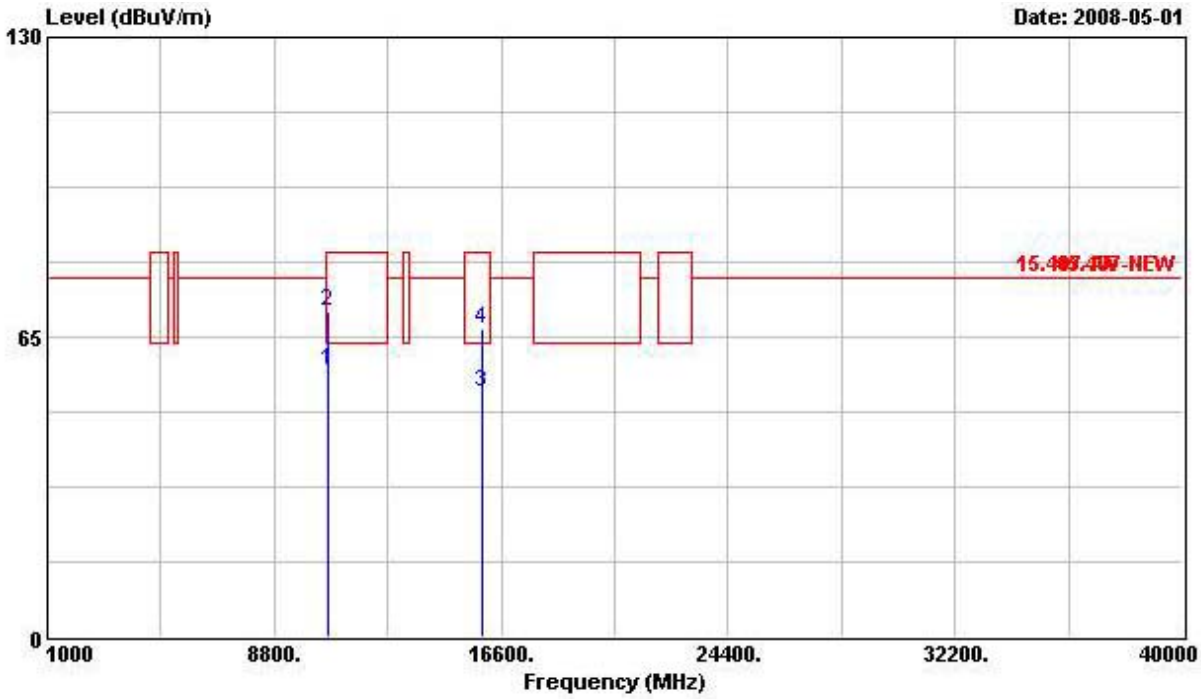
Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 62 (40MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8604.000	53.38	-24.46	77.84	42.54	38.36	5.28	32.81	PEAK
2	10620.000	72.97	-10.57	83.54	58.28	39.23	6.34	30.88	PEAK
3	10620.000	60.18	-3.36	63.54	45.49	39.23	6.34	30.88	Average
4	15943.000	64.67	-18.87	83.54	49.02	37.68	7.45	29.48	PEAK
5	15943.000	51.46	-12.08	63.54	35.81	37.68	7.45	29.48	Average

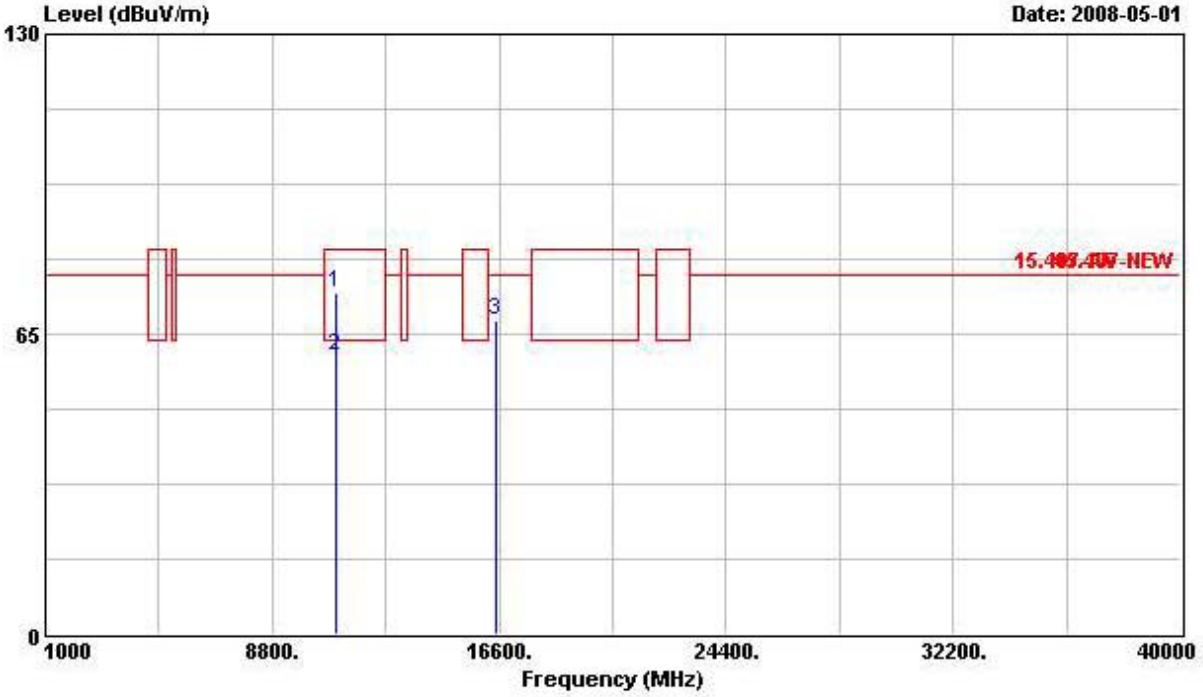
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	10616.400	57.59	-5.95	63.54	42.90	39.23	6.34	30.88	Average
2	10616.400	70.75	-12.79	83.54	56.06	39.23	6.34	30.88	PEAK
3	15937.800	53.08	-10.46	63.54	37.43	37.68	7.45	29.48	Average
4	15937.800	66.58	-16.96	83.54	50.93	37.68	7.45	29.48	PEAK

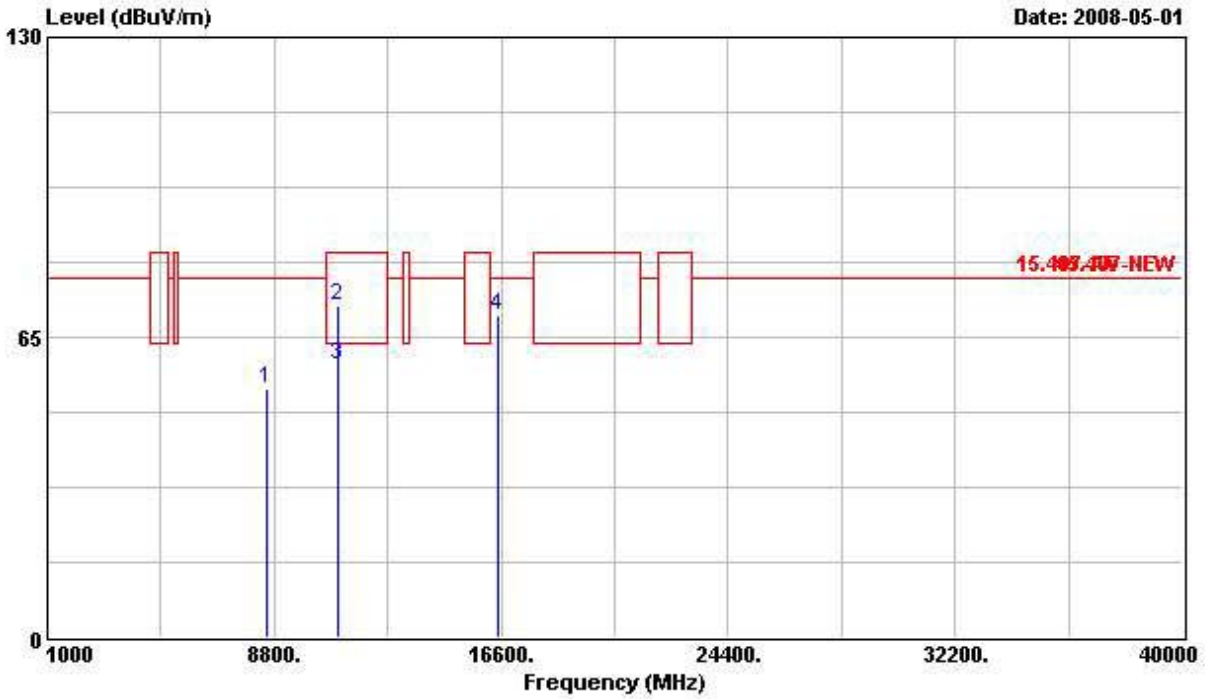
Test date	May 01, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 102 (40MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11001.400	73.77	-9.77	83.54	58.01	39.00	6.57	29.81	PEAK
2	11001.400	60.44	-3.10	63.54	44.68	39.00	6.57	29.81	Average
3	16497.000	67.82	-10.02	77.84	50.73	39.00	7.52	29.44	PEAK

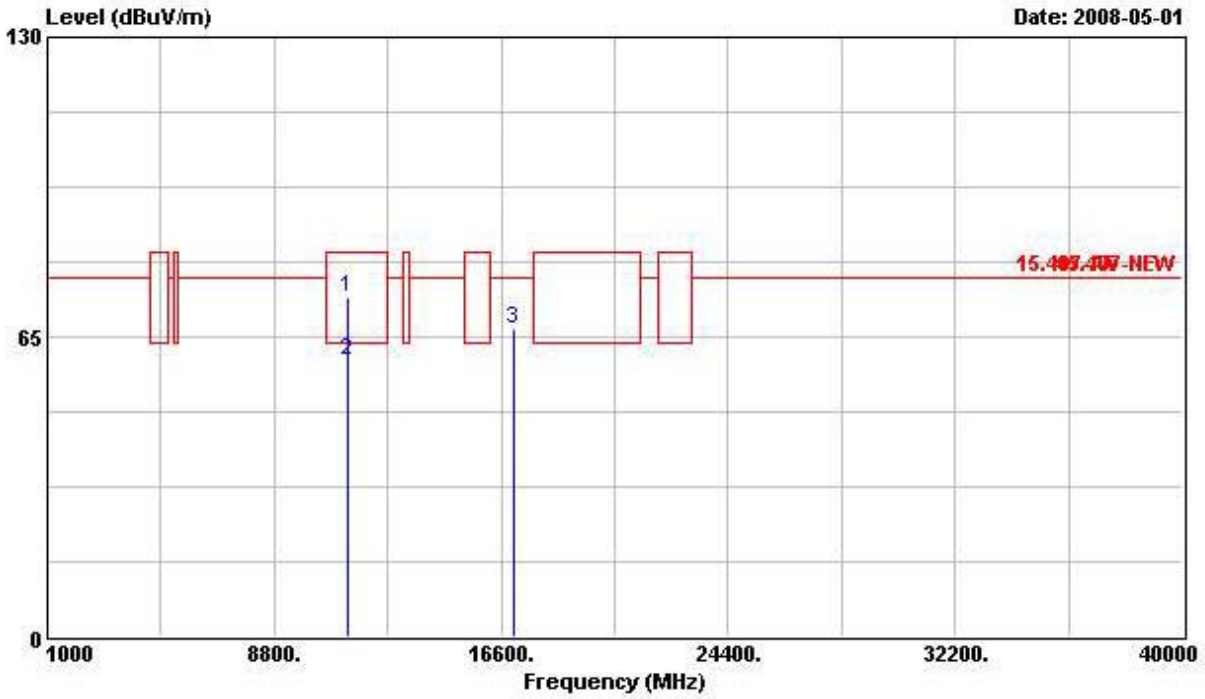
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8548.000	53.91	-23.93	77.84	43.04	38.33	5.35	32.81	PEAK
2	11020.400	71.93	-11.61	83.54	56.28	39.02	6.57	29.94	PEAK
3	11020.400	59.00	-4.54	63.54	43.35	39.02	6.57	29.94	Average
4	16509.200	69.71	-8.13	77.84	52.62	39.00	7.52	29.44	PEAK

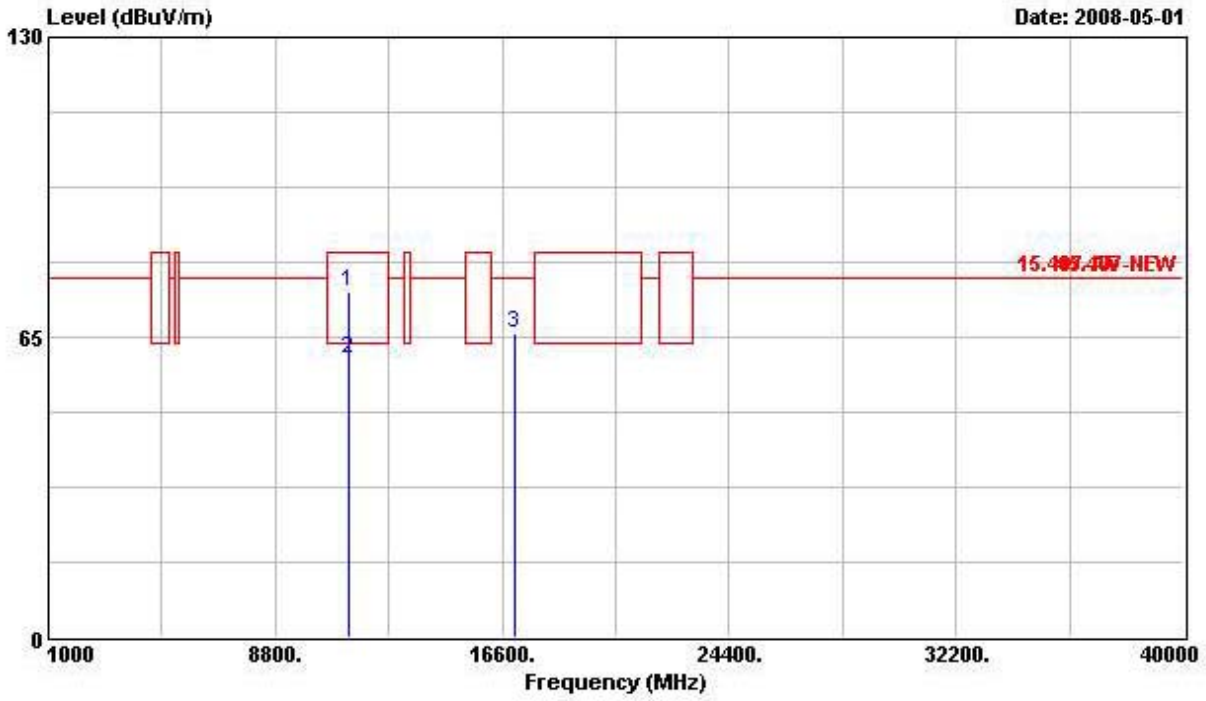
Test date	May 01, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 134 (40MHz)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11343.600	73.54	-10.00	83.54	59.02	39.47	6.71	31.65	PEAK
2	11343.600	59.91	-3.63	63.54	45.39	39.47	6.71	31.65	Average
3	17022.600	66.70	-11.14	77.84	45.86	41.58	7.78	28.52	PEAK

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	11339.600	74.77	-8.77	83.54	60.11	39.47	6.71	31.52	PEAK
2	11339.600	60.23	-3.31	63.54	45.58	39.47	6.71	31.52	Average
3	17018.200	65.94	-11.90	77.84	45.24	41.44	7.78	28.52	PEAK

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.7 Band Edge and Fundamental Emissions Measurement

3.7.1 Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). 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 (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.7.2 Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1 MHz /1 MHz for Peak

3.7.3 Test Procedures

1. The test procedure is the same as section 3.6.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

3.7.4 Test Setup Layout

This test setup layout is the same as that shown in section 3.6.4.

3.7.5 Test Deviation

There is no deviation with the original standard.

3.7.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.7.7 Test Result of Band Edge and Fundamental Emissions

Test date	Apr. 29, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 36,40, 48

Channel 36

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5149.900	62.31	-1.23	63.54	24.02	34.35	3.94	0.00	Average
2 @	5178.500	115.53			77.22	34.38	3.92	0.00	Average
1 @	5148.800	80.28	-3.26	83.54	41.99	34.35	3.94	0.00	Peak
2 @	5177.700	124.68			86.37	34.38	3.92	0.00	Peak

An item 2 is Fundamental Emissions.

Channel 40

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5143.900	70.88	-12.66	83.54	32.59	34.35	3.94	0.00	Peak
2 @	5203.000	126.61			88.31	34.40	3.90	0.00	Peak
1	5148.700	58.88	-4.66	63.54	20.59	34.35	3.94	0.00	Average
2 @	5201.400	116.91			78.61	34.40	3.90	0.00	Average

An item 2 is Fundamental Emissions.

Channel 48

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5137.200	70.01	-13.53	83.54	31.73	34.33	3.94	0.00	Peak
2 @	5242.800	126.18			87.85	34.45	3.88	0.00	Peak
3	5399.600	70.24	-13.30	83.54	31.84	34.60	3.80	0.00	Peak
1	5149.600	58.19	-5.35	63.54	19.90	34.35	3.94	0.00	Average
2 @	5237.600	116.71			78.40	34.43	3.88	0.00	Average
3	5402.800	58.37	-5.17	63.54	19.97	34.60	3.80	0.00	Average

An item 2 is Fundamental Emissions.

Test date	Jun.10, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11a CH 52, 56, 64

Channel 52

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5088.000	70.26	-13.28	83.54	32.01	34.28	3.96	0.00	Peak
2 @	5262.800	125.92			87.57	34.47	3.88	0.00	Peak
3	5401.600	70.25	-13.29	83.54	31.85	34.60	3.80	0.00	Peak
1	5149.200	58.41	-5.13	63.54	20.12	34.35	3.94	0.00	Average
2 @	5264.400	117.12			78.77	34.47	3.88	0.00	Average
3	5398.400	58.47	-5.07	63.54	20.07	34.60	3.80	0.00	Average

An item 2 is Fundamental Emissions.

Channel 56

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5282.800	127.43			89.09	34.48	3.86	0.00	Peak
2	5363.800	70.86	-12.68	83.54	32.48	34.57	3.82	0.00	Peak
1 @	5282.800	117.79			79.45	34.48	3.86	0.00	Average
2	5350.200	58.44	-5.10	63.54	20.07	34.55	3.82	0.00	Average

An item 1 is Fundamental Emissions.

Channel 64

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5322.600	126.36			88.01	34.52	3.84	0.00	Peak
2	5352.300	81.92	-1.62	83.54	43.55	34.55	3.82	0.00	Peak
1 @	5321.400	116.80			78.45	34.52	3.84	0.00	Average
2	5350.100	62.11	-1.43	63.54	23.74	34.55	3.82	0.00	Average

An item 1 is Fundamental Emissions.

Test date	Jun. 10, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11a CH 100, 120, 140

Channel 100

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5456.200	74.76	-8.78	83.54	36.33	34.65	3.78	0.00	Peak
2 @	5503.000	124.49			86.04	34.70	3.75	0.00	Peak
1	5459.990	61.09	-2.45	63.54	22.66	34.65	3.78	0.00	Average
2 @	5503.000	114.64			76.19	34.70	3.75	0.00	Average

An item 2 is Fundamental Emissions.

Channel 120

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5603.000	125.74			87.38	34.72	3.64	0.00	Peak
1 @	5601.400	116.55			78.19	34.72	3.64	0.00	Average

An item 1 is Fundamental Emissions.

Channel 140

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5695.100	120.84			82.54	34.74	3.56	0.00	Peak
2	5725.400	76.43	-1.41	77.84	38.17	34.74	3.52	0.00	Peak
1 @	5697.500	112.37			74.07	34.74	3.56	0.00	Average
2	5725.000	59.25	-18.59	77.84	20.99	34.74	3.52	0.00	Average

An item 1 is Fundamental Emissions.

Test date	Apr. 29, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 36, 40, 48 (20MHz)

Channel 36

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5149.600	79.06	-4.48	83.54	40.77	34.35	3.94	0.00	Peak
2 @	5180.100	124.14			85.83	34.38	3.92	0.00	Peak
1 @	5149.900	61.78	-1.76	63.54	23.49	34.35	3.94	0.00	Average
2 @	5178.800	114.52			76.21	34.38	3.92	0.00	Average

An item 2 is Fundamental Emissions.

Channel 40

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5147.400	70.48	-13.06	83.54	32.19	34.35	3.94	0.00	Peak
2 @	5199.500	126.67			88.37	34.40	3.90	0.00	Peak
1	5149.800	58.76	-4.78	63.54	20.47	34.35	3.94	0.00	Average
2 @	5201.900	117.33			79.03	34.40	3.90	0.00	Average

An item 2 is Fundamental Emissions.

Channel 48

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5138.800	69.79	-13.75	83.54	31.51	34.33	3.94	0.00	Peak
2 @	5239.600	125.82			87.51	34.43	3.88	0.00	Peak
3	5378.400	70.38	-13.16	83.54	31.98	34.58	3.82	0.00	Peak
1	5149.600	58.34	-5.20	63.54	20.05	34.35	3.94	0.00	Average
2 @	5237.600	116.23			77.92	34.43	3.88	0.00	Average
3	5399.600	58.37	-5.17	63.54	19.97	34.60	3.80	0.00	Average

An item 2 is Fundamental Emissions.

Test date	Jun. 10, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 52, 56, 64 (20MHz)

Channel 52

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5088.000	69.89	-13.65	83.54	31.64	34.28	3.96	0.00	Peak
2 @	5264.000	126.17			87.82	34.47	3.88	0.00	Peak
3	5369.600	70.02	-13.52	83.54	31.64	34.57	3.82	0.00	Peak
1	5149.200	58.30	-5.24	63.54	20.01	34.35	3.94	0.00	Average
2 @	5261.200	117.19			78.84	34.47	3.88	0.00	Average
3	5384.000	58.35	-5.19	63.54	19.95	34.58	3.82	0.00	Average

An item 2 is Fundamental Emissions.

Channel 56

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5283.200	126.75			88.41	34.48	3.86	0.00	Peak
2	5394.600	70.58	-12.96	83.54	32.18	34.60	3.80	0.00	Peak
1 @	5278.400	117.48			79.14	34.48	3.86	0.00	Average
2	5401.600	58.52	-5.02	63.54	20.12	34.60	3.80	0.00	Average

An item 1 is Fundamental Emissions.

Channel 64

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5323.400	124.80			86.45	34.52	3.84	0.00	Peak
2	5351.400	81.23	-2.31	83.54	42.86	34.55	3.82	0.00	Peak
1 @	5323.400	115.25			76.90	34.52	3.84	0.00	Average
2	5350.100	62.02	-1.52	63.54	23.65	34.55	3.82	0.00	Average

An item 1 is Fundamental Emissions.

Test date	Jun. 10, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 100, 120, 140 (20MHz)

Channel 100

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5459.300	80.99	-2.55	83.54	42.56	34.65	3.78	0.00	Peak
2 @	5497.700	125.57			87.12	34.70	3.75	0.00	Peak
1	5459.900	62.04	-1.50	63.54	23.61	34.65	3.78	0.00	Average
2 @	5498.400	116.09			77.64	34.70	3.75	0.00	Average

An item 2 is Fundamental Emissions.

Channel 120

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5602.300	125.55			87.19	34.72	3.64	0.00	Peak
1 @	5601.000	115.90			77.54	34.72	3.64	0.00	Average

An item 1 is Fundamental Emissions.

Channel 140

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5697.500	120.62			82.32	34.74	3.56	0.00	Peak
2	5725.000	75.10	-2.74	77.84	36.84	34.74	3.52	0.00	Peak
1 @	5697.100	111.10			72.80	34.74	3.56	0.00	Average
2	5725.000	58.15	-19.69	77.84	19.89	34.74	3.52	0.00	Average

An item 1 is Fundamental Emissions.

Test date	May 02, 2008	**Test Site No.**	03CH03-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Duncan	**Configuration**	802.11n CH 38, 46, 54 (40MHz)

Channel 38

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5148.000	76.02	-7.52	83.54	37.73	34.35	3.94	0.00	Peak
2 @	5195.000	113.49			75.19	34.40	3.90	0.00	Peak
1 @	5149.900	62.18	-1.36	63.54	23.89	34.35	3.94	0.00	Average
2 @	5196.000	103.80			65.50	34.40	3.90	0.00	Average

An item 2 is Fundamental Emissions.

Channel 46

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5149.900	74.09	-9.45	83.54	35.80	34.35	3.94	0.00	Peak
2 @	5221.600	123.09			84.77	34.42	3.90	0.00	Peak
1 @	5149.900	60.86	-2.68	63.54	22.57	34.35	3.94	0.00	Average
2 @	5221.000	112.85			74.53	34.42	3.90	0.00	Average

An item 2 is Fundamental Emissions.

Channel 54

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5263.400	123.41			85.06	34.47	3.88	0.00	Peak
2	5354.400	78.88	-4.66	83.54	40.51	34.55	3.82	0.00	Peak
1 @	5276.800	113.81			75.47	34.48	3.86	0.00	Average
2	5412.800	61.20	-2.34	63.54	22.79	34.62	3.80	0.00	Average

An item 1 is Fundamental Emissions.

Test date	May 02, 2008	Test Site No.	03CH03-HY
Temperature	26℃	Humidity	54%
Test Engineer	Duncan	Configuration	802.11n CH 62, 102, 134 (40MHz)

Channel 62

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5320.400	113.23			74.88	34.52	3.84	0.00	Peak
2	5350.100	75.04	-8.50	83.54	36.67	34.55	3.82	0.00	Peak
1 X	5319.600	104.16	26.32	77.84	65.81	34.52	3.84	0.00	Average
2	5350.100	62.17			23.80	34.55	3.82	0.00	Average

An item 1 is Fundamental Emissions.

Channel 102

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	5459.800	79.41	-4.13	83.54	40.98	34.65	3.78	0.00	Peak
2 @	5494.000	117.22			78.78	34.68	3.75	0.00	Peak
1	5459.900	62.36	-1.18	63.54	23.93	34.65	3.78	0.00	Average
2 X	5493.400	108.40			69.96	34.68	3.75	0.00	Average

An item 2 is Fundamental Emissions.

Channel 134

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	5653.600	117.78			79.45	34.73	3.60	0.00	Peak
2	5728.800	75.37	-2.47	77.84	37.11	34.74	3.52	0.00	Peak
1 @	5653.800	109.08			70.75	34.73	3.60	0.00	Average
2	5725.000	59.54	-18.30	77.84	21.28	34.74	3.52	0.00	Average

An item 1 is Fundamental Emissions.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.8 Frequency Stability Measurement

3.8.1 Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emissions is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or ±20ppm (IEEE 802.11a specification).

3.8.2 Measuring Instruments and Setting

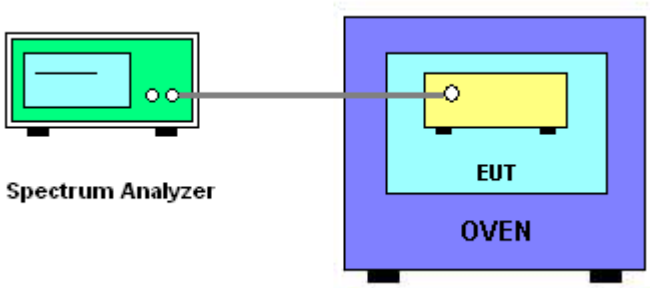
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	10 kHz
VB	10 kHz
Sweep Time	Auto

3.8.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11a specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -30°C~50°C.

3.8.4 Test Setup Layout



3.8.5 Test Deviation

There is no deviation with the original standard.

3.8.6 EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.8.7 Test Result of Frequency Stability

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	**IEEE 802.11a 5200**	**IEEE 802.11a 5500**
126.5	5199.998700	5499.999400
110	5199.998400	5499.998700
93.5	5199.996900	5499.995800
Max. Deviation (MHz)	0.003100	0.004200
Max. Deviation (ppm)	0.60	0.76

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(℃)	**IEEE 802.11a 5200**	**IEEE 802.11a 5500**
-30	5199.988700	5499.968400
-20	5199.991700	5499.971800
-10	5199.994200	5499.978400
0	5199.997400	5499.985700
10	5199.998700	5499.991400
20	5199.998400	5499.998700
30	5199.999200	5500.003100
40	5200.009400	5500.012400
50	5200.015700	5500.019700
Max. Deviation (MHz)	0.015700	0.031600
Max. Deviation (ppm)	3.02	5.75

3.9 Antenna Requirements

3.9.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

3.9.2 Antenna Connector Construction

Please refer to section 2.2 in this test report; antenna connector complied with the requirements.

4 LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	836858/024	9 kHz - 2.75 GHz	Sep. 11, 2007	Conduction (CO01-LK)
LISN	SCHAFFNER	NNB-41	98087	9 kHz - 30 MHz	Sep. 21, 2007	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9 kHz - 30 MHz	Nov. 30, 2007	Conduction (CO01-LK)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Jan. 10, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2008	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2007	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2007	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2007	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2007	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 10, 2008	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2007	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 14, 2008	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jun. 07, 2007	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jun. 06, 2008	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100305	9 kHz - 40 GHz	Sep. 27, 2007	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 21, 2007	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Mar. 04, 2008	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.18, 2008	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 22, 2008*	Radiation (03CH03-HY)

Note: Calibration Interval of instruments listed above is two year.

5 TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

6 TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2007 to January 09, 2010
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

P1, total 9 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.