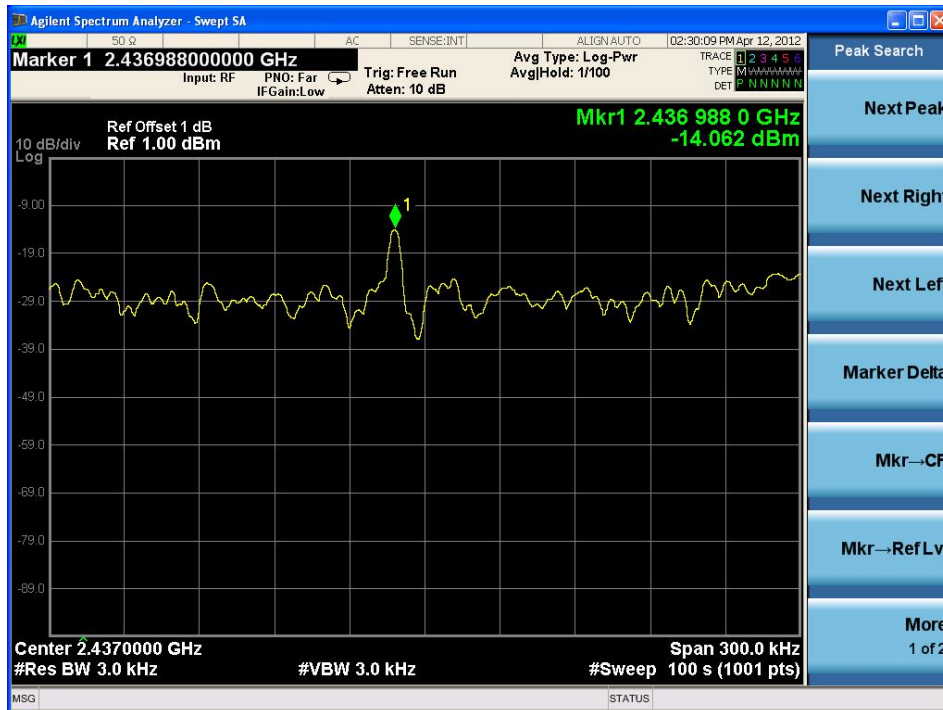
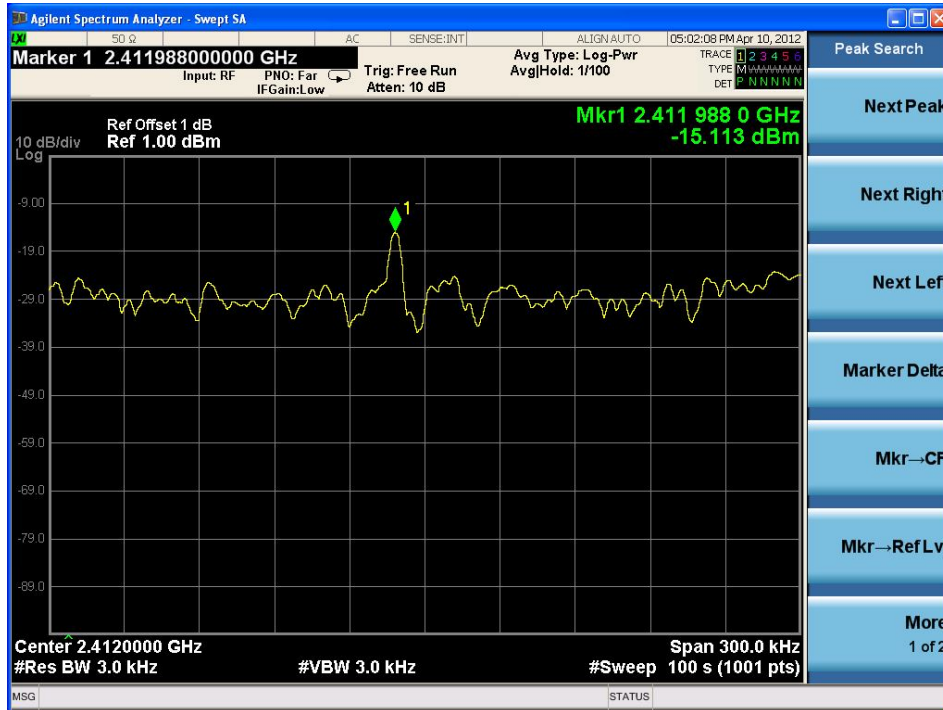
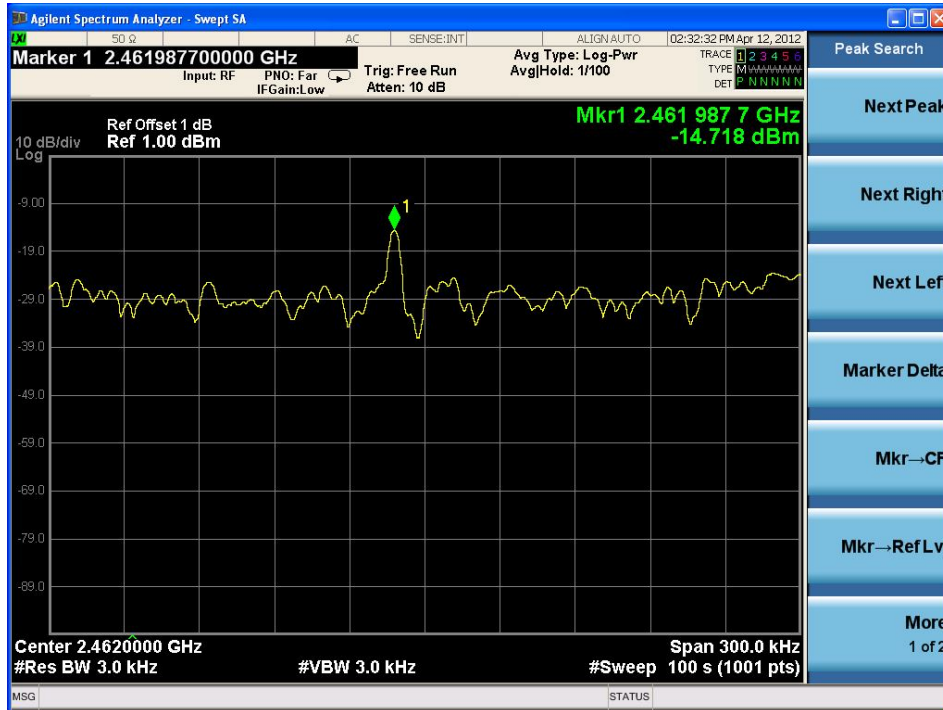
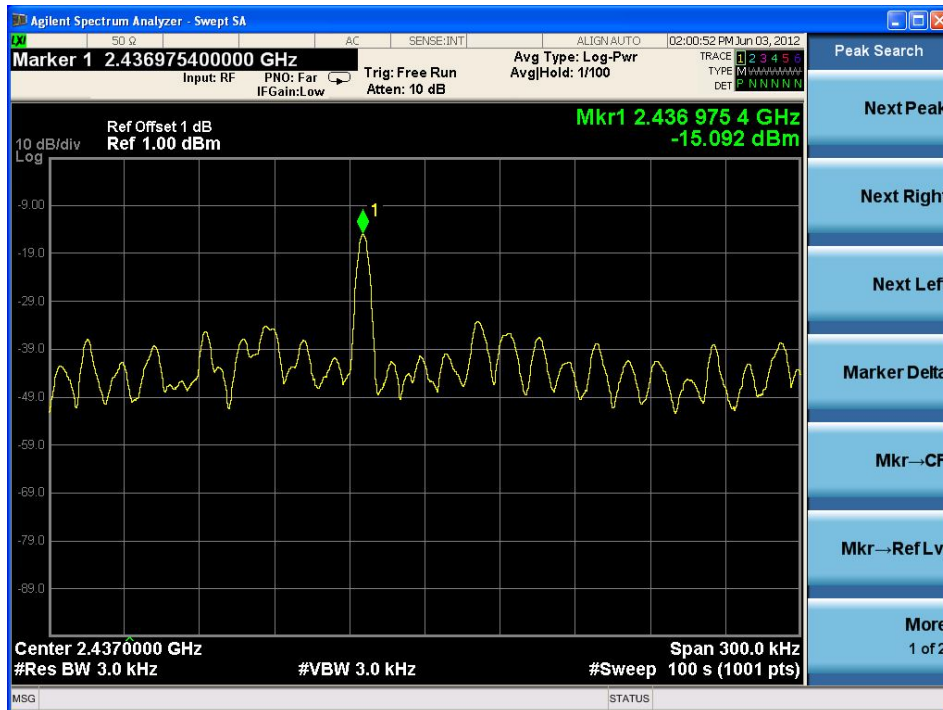
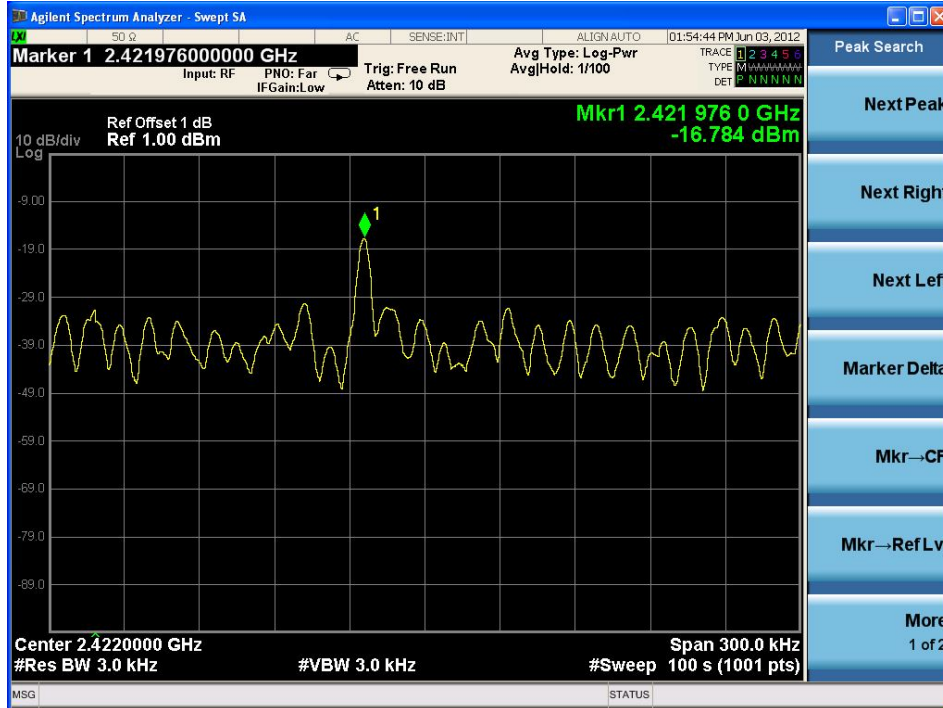


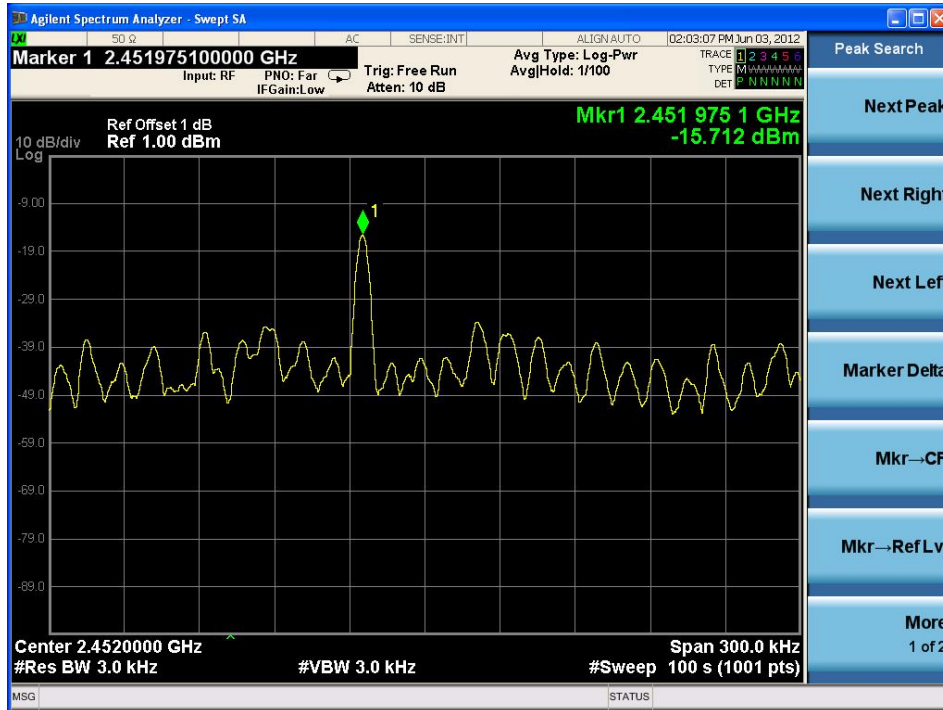
## 802.11n(20 MHz) Power Density Measurement





## 802.11n(40MHz) Power Density Measurement





## 2.1.4 Band - edge

### Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz

Span = 50 MHz

Detector function = peak

Trace = max hold

Sweep = auto

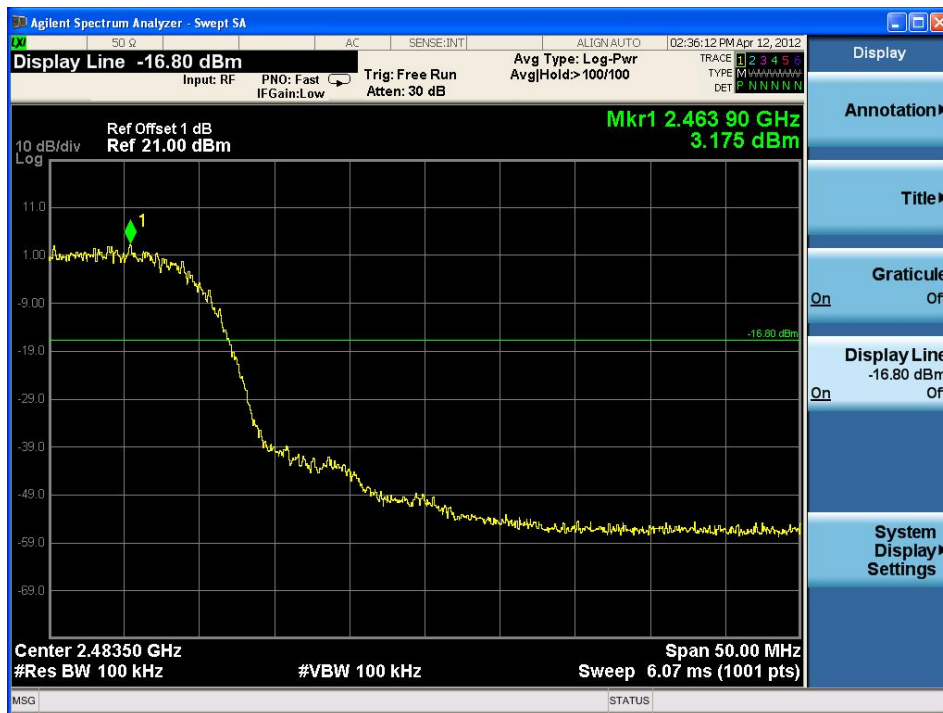
### Measurement Data: Complies

- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

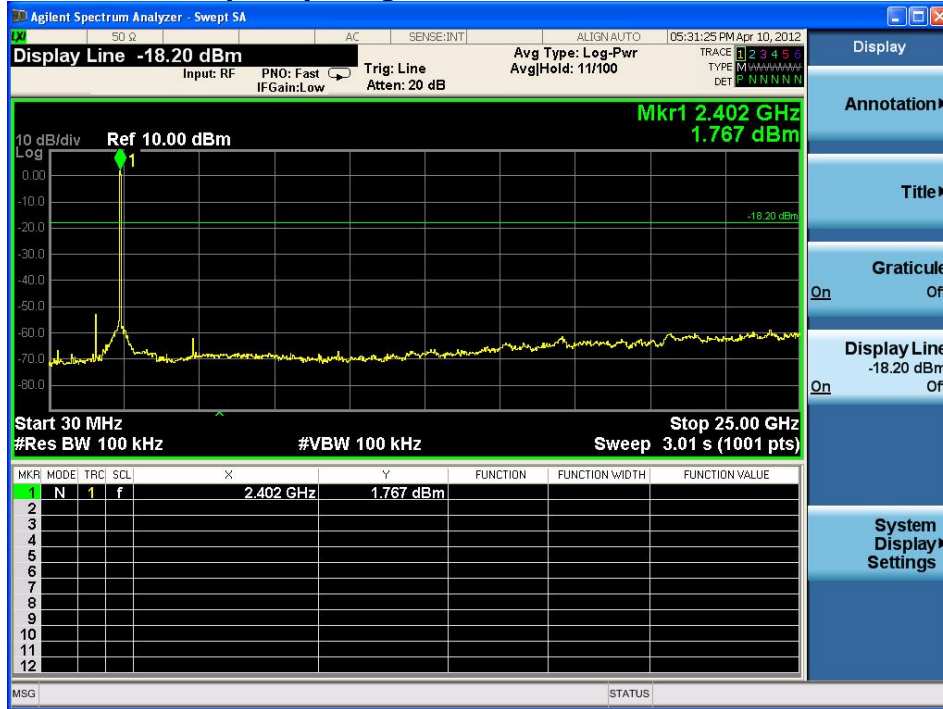
<b>Minimum Standard:</b>	> 20 dBc
--------------------------	----------

See next pages for actual measured spectrum plots.

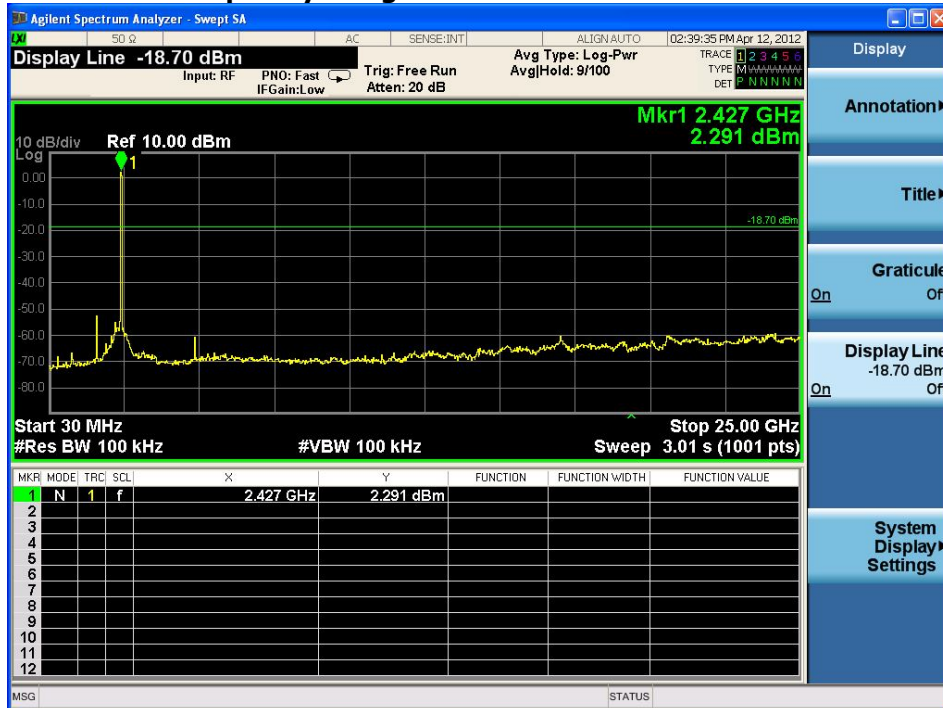
## 802.11b Band-edge Measurements



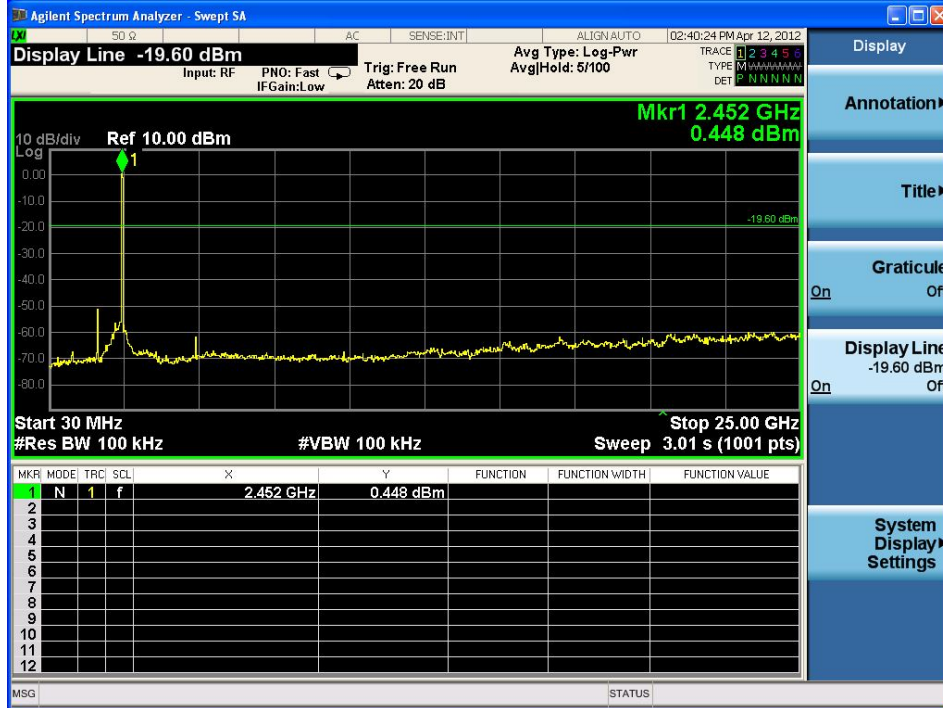
**Band – edge (at 20 dB blow) – Low channel(802.11b)**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



**Band – edge (at 20 dB blow) – Mid channel(802.11b)**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**

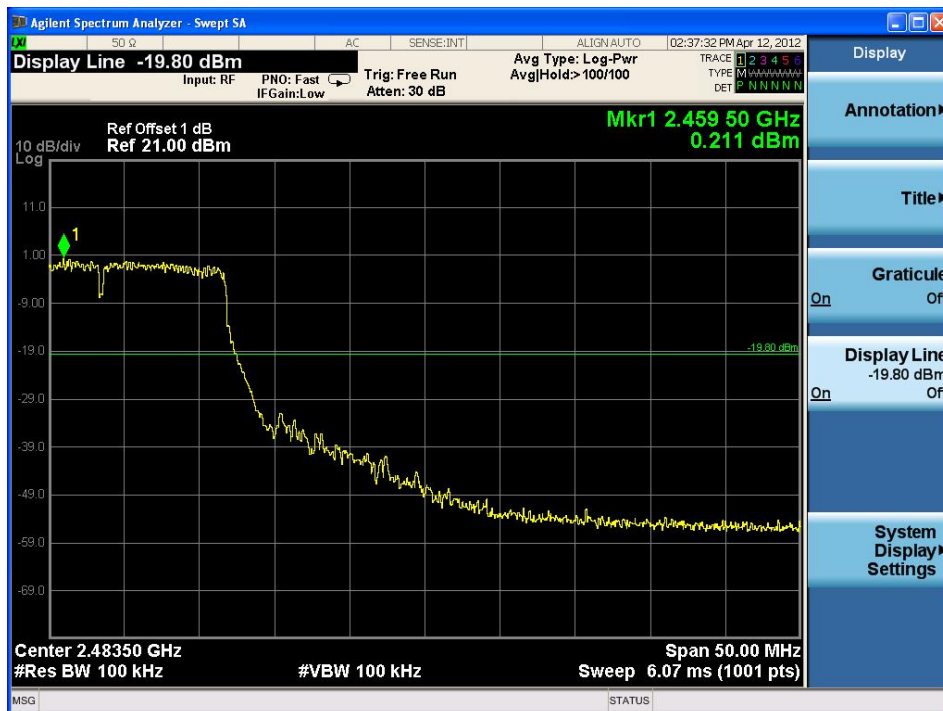
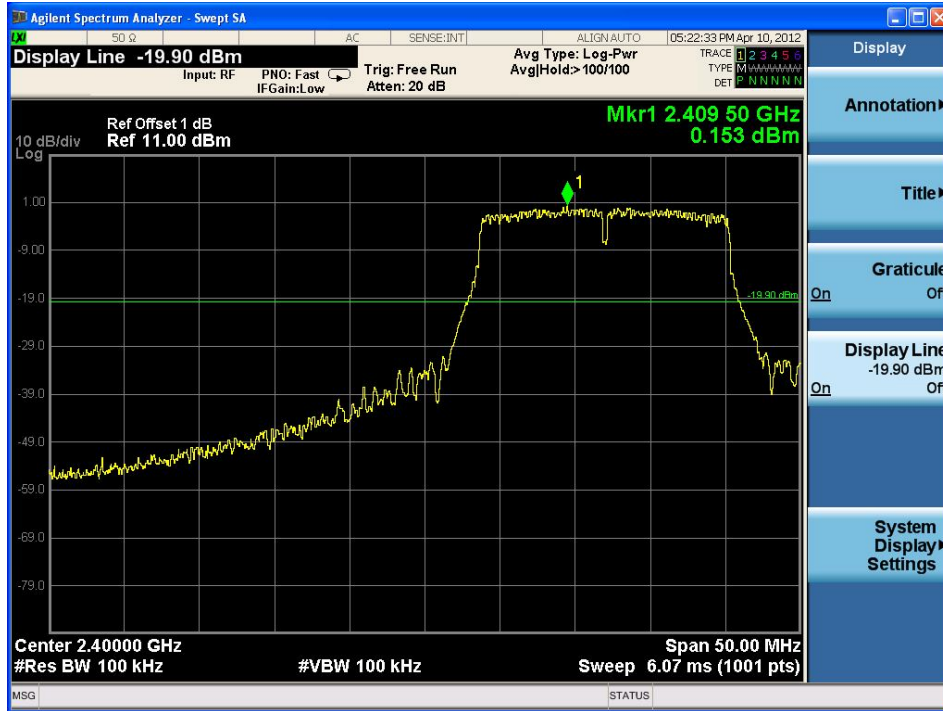


**Band – edge (at 20 dB blow) – High channel(802.11b)  
 Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**

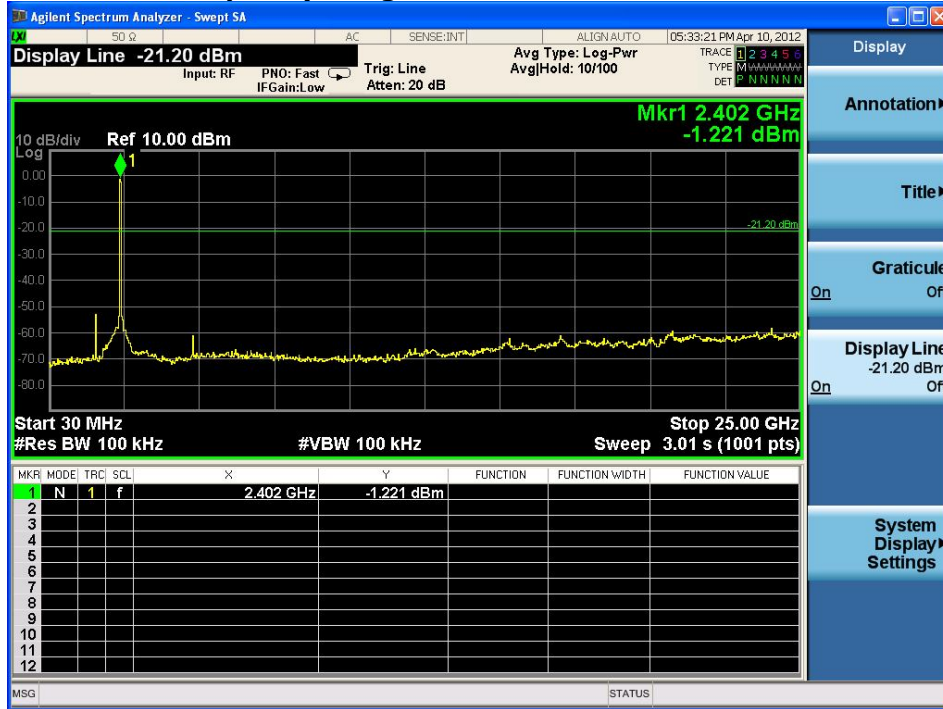




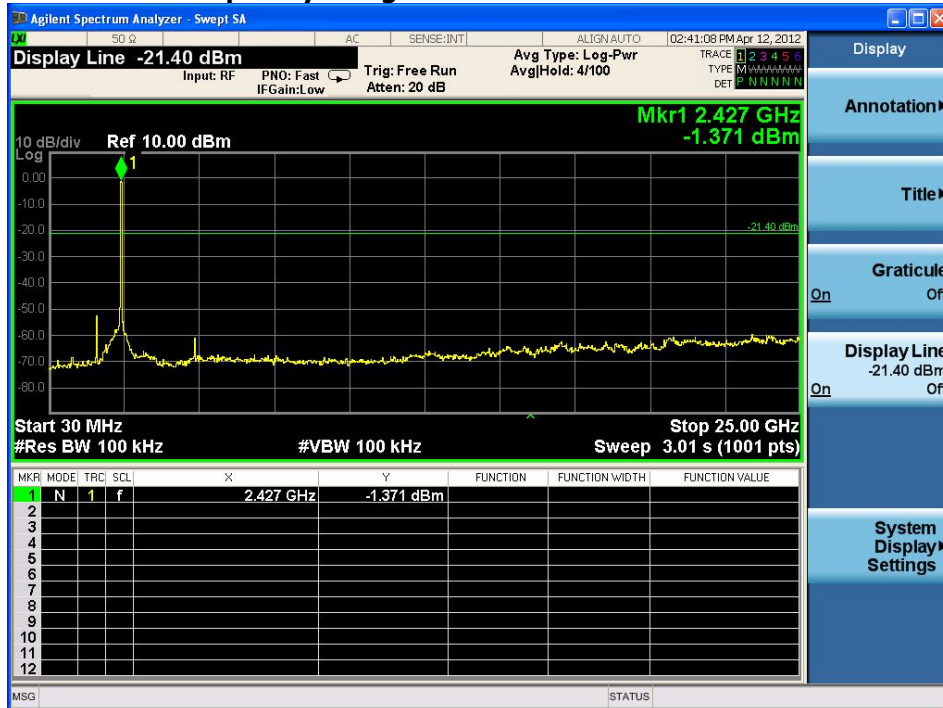
## 802.11g Band-edge Measurements



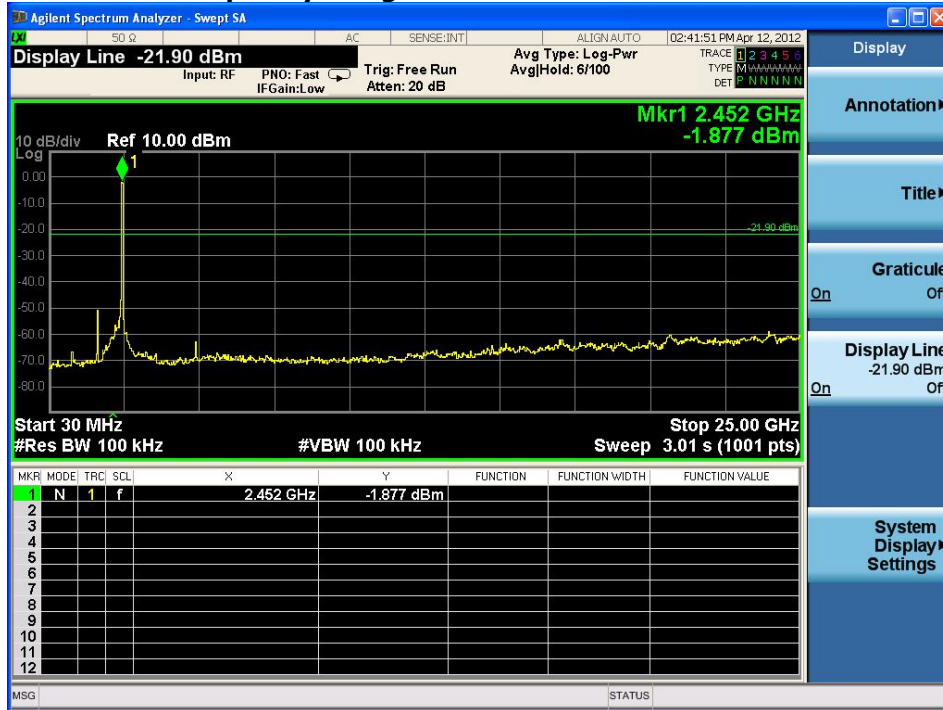
**Band - edge (at 20 dB blow) - Low channel(802.11g)**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



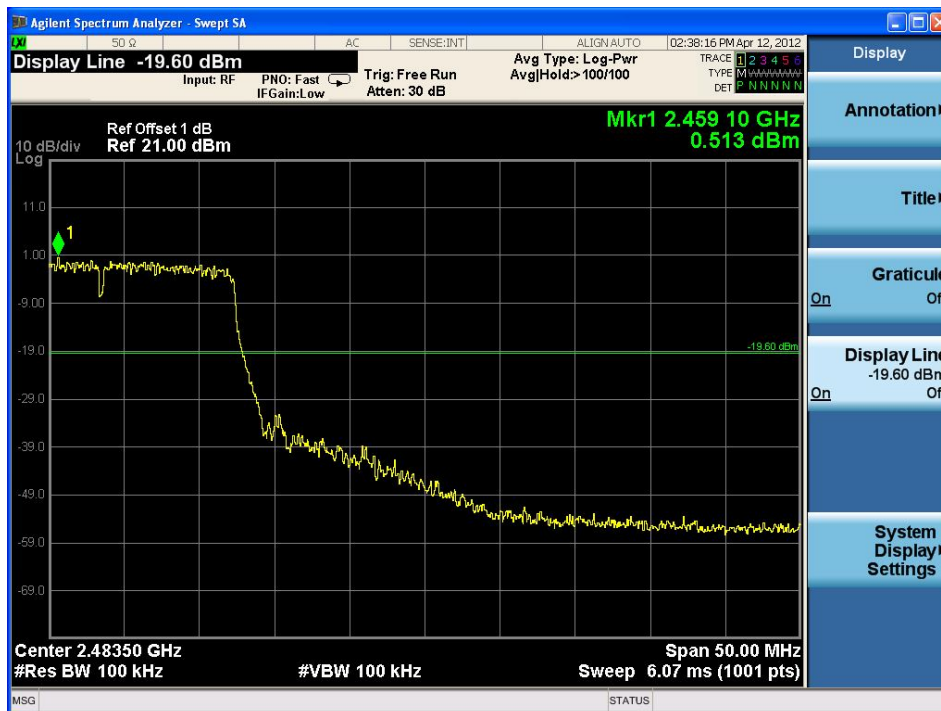
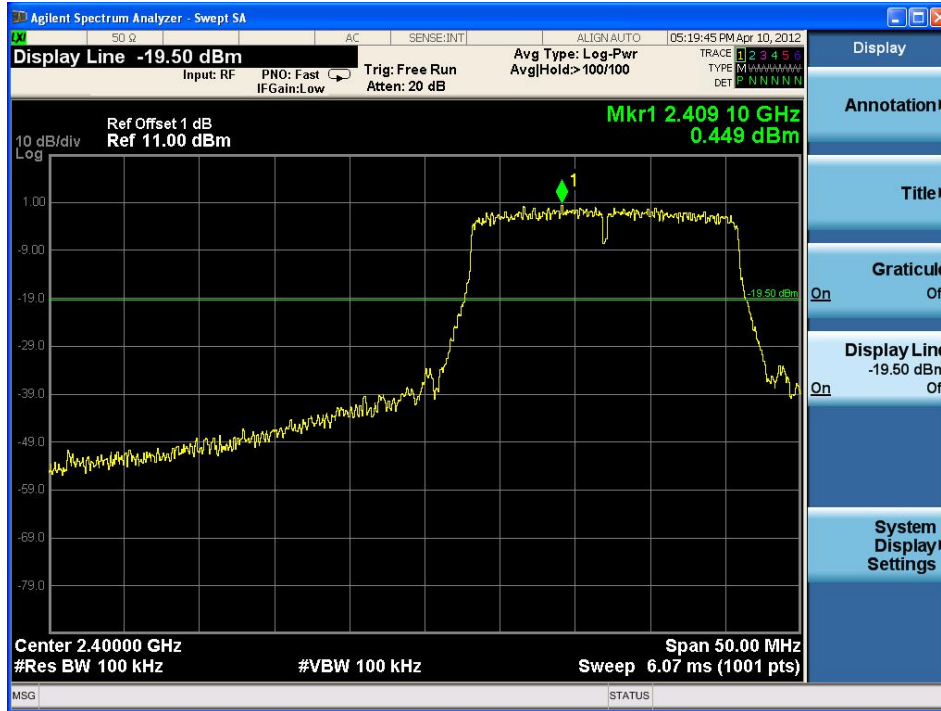
**Band - edge (at 20 dB blow) - Mid channel(802.11g)**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



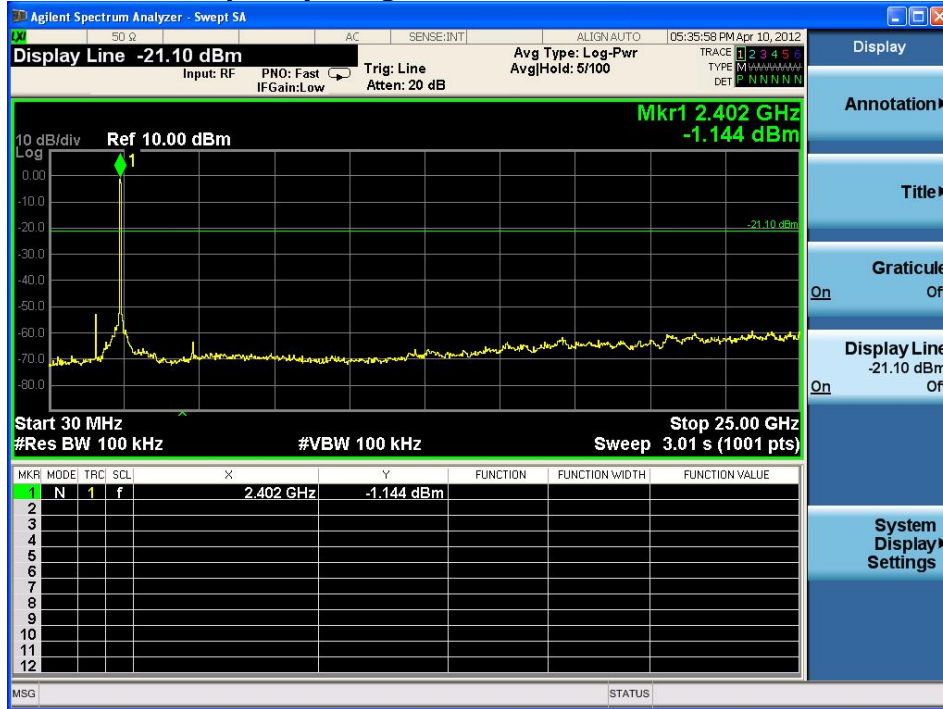
**Band – edge (at 20 dB blow) – High channel(802.11g)  
 Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



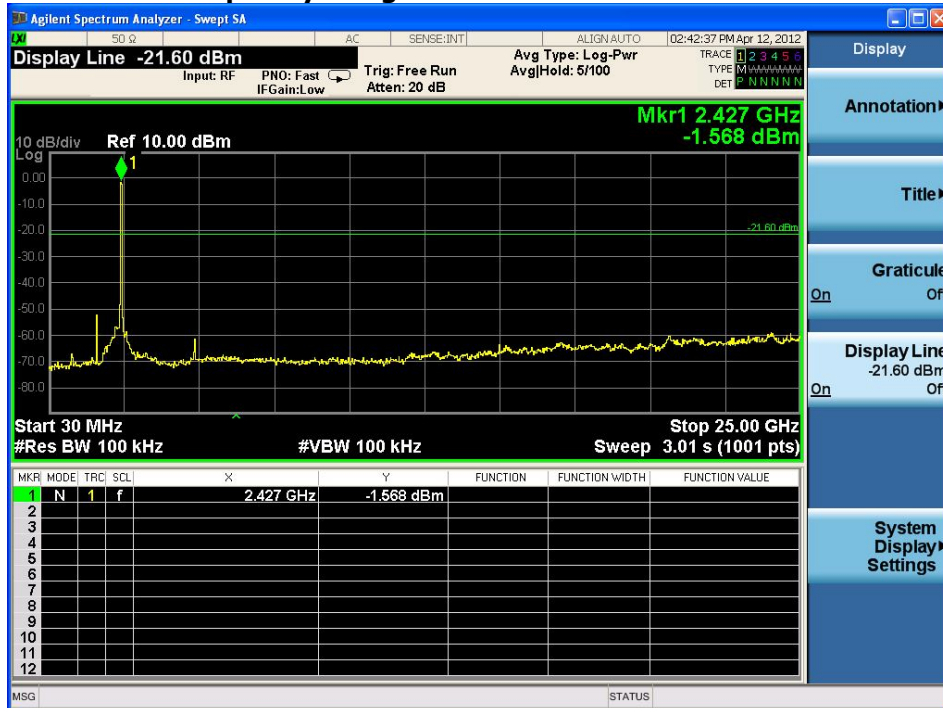
## 802.11n(20MHz) Band-edge Measurements



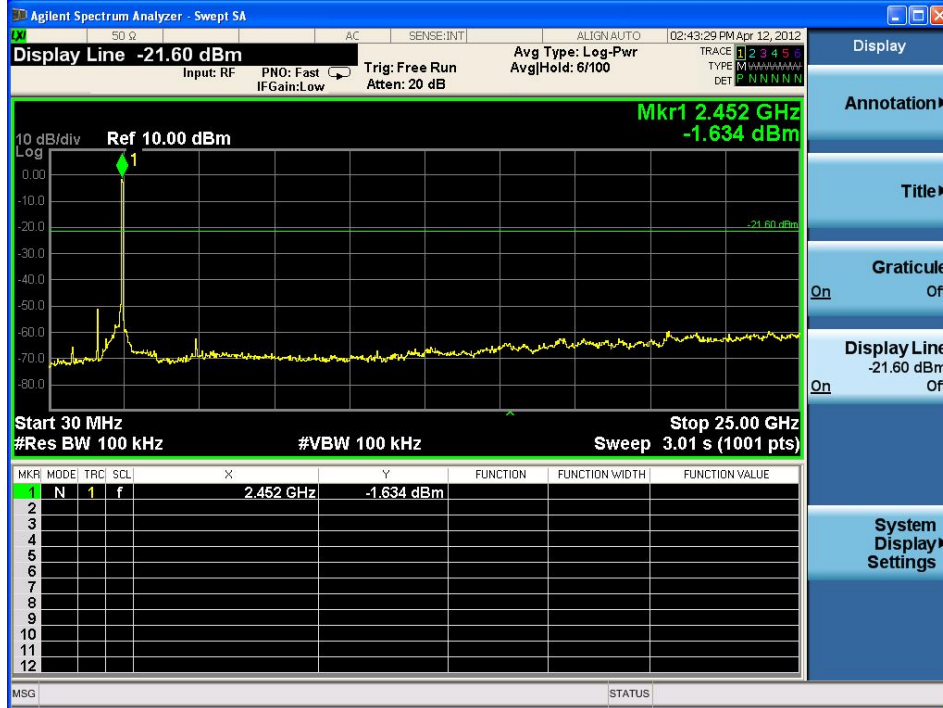
**Band – edge (at 20 dB blow) – Low channel(802.11n(20MHz))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



**Band – edge (at 20 dB blow) – Mid channel(802.11n(20MHz))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



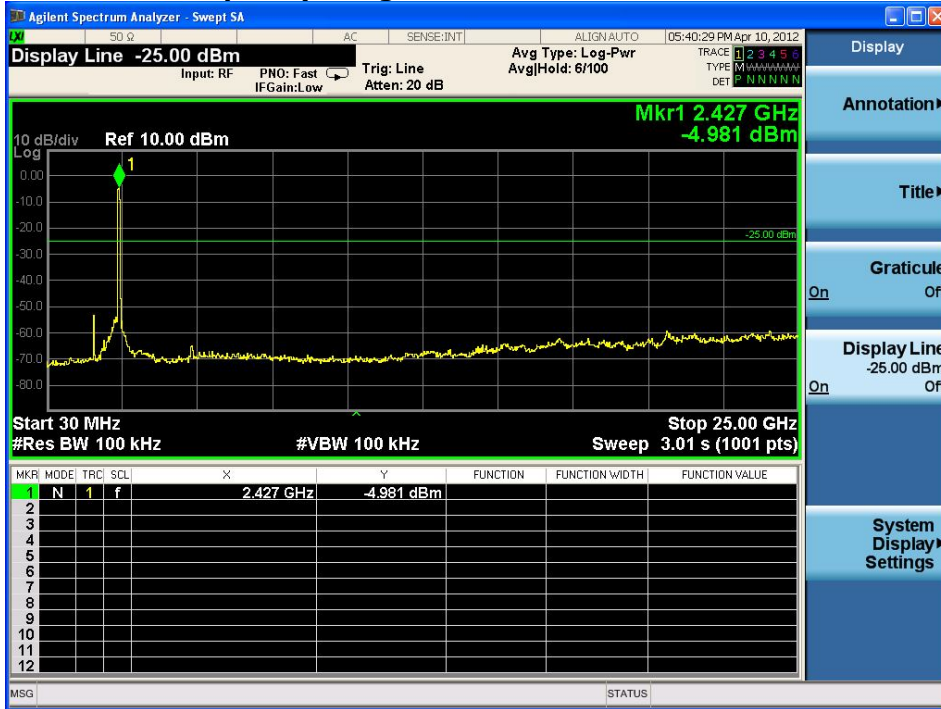
**Band - edge (at 20 dB blow) - High channel(802.11n(20MHz))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



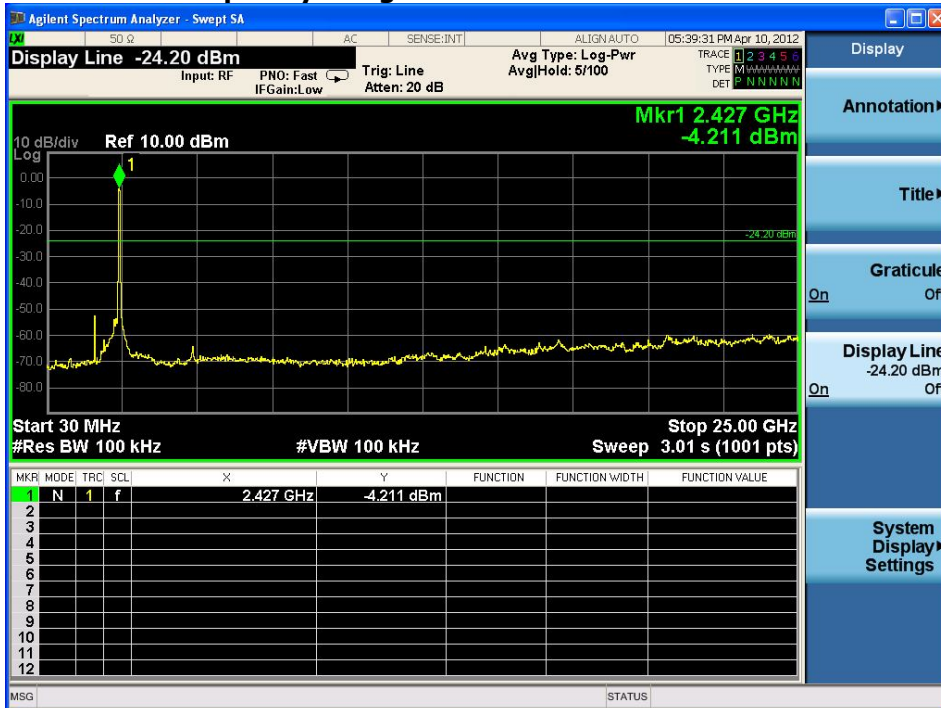
## 802.11n(40MHz) Band-edge Measurements



**Band – edge (at 20 dB blow) – Low channel(802.11n(40MHz))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**

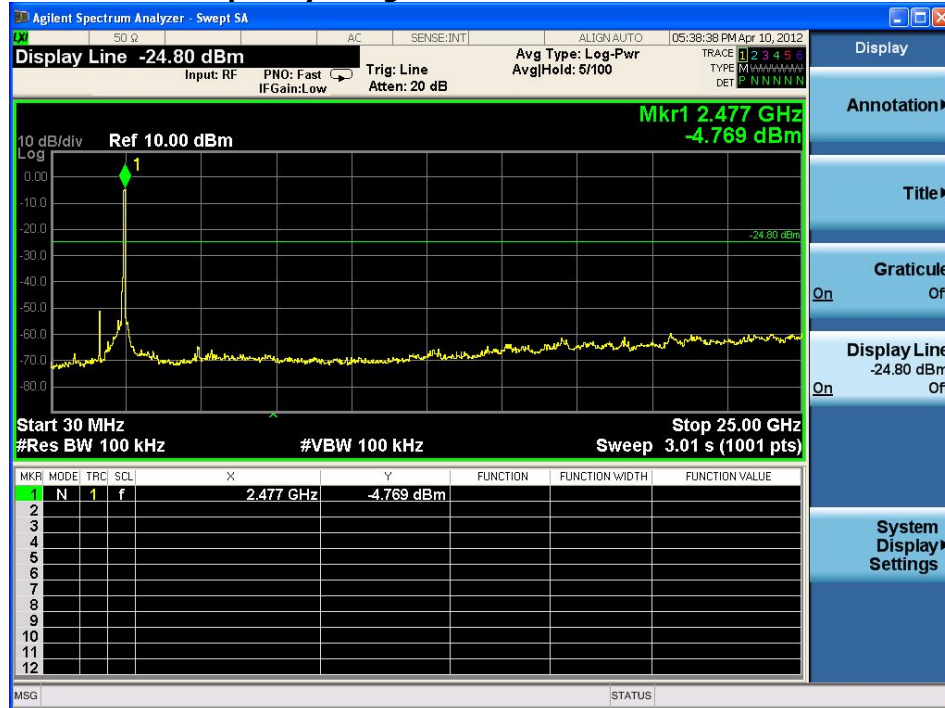


**Band – edge (at 20 dB blow) – Mid channel(802.11n(40MHz))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**





**Band – edge (at 20 dB blow) – High channel(802.11n(40MHz))  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



## 2.1.5 Field Strength of Emissions

### Test Location

Testing was performed at a test distance of 3 meter SAC

### Test Procedures

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic

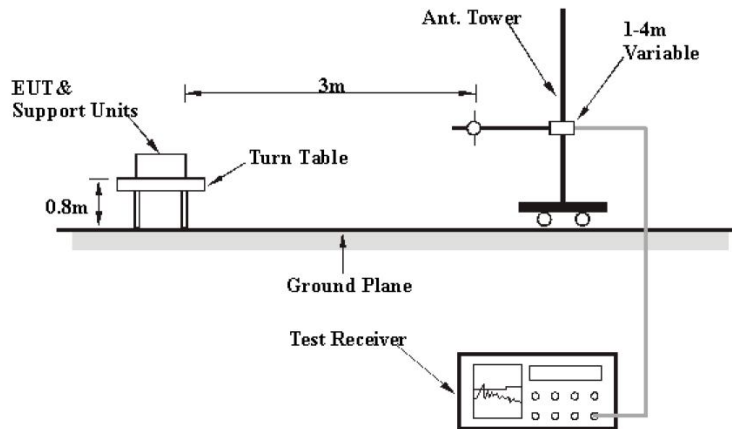
RBW = 120 kHz (30 MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10<sup>th</sup> harmonic)

Span = 100 MHz

Detector function = Quasi-peak

Trace = max hold



### Limit

#### - 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

\*\* Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

## Test Results

### Test mode : 802.11b

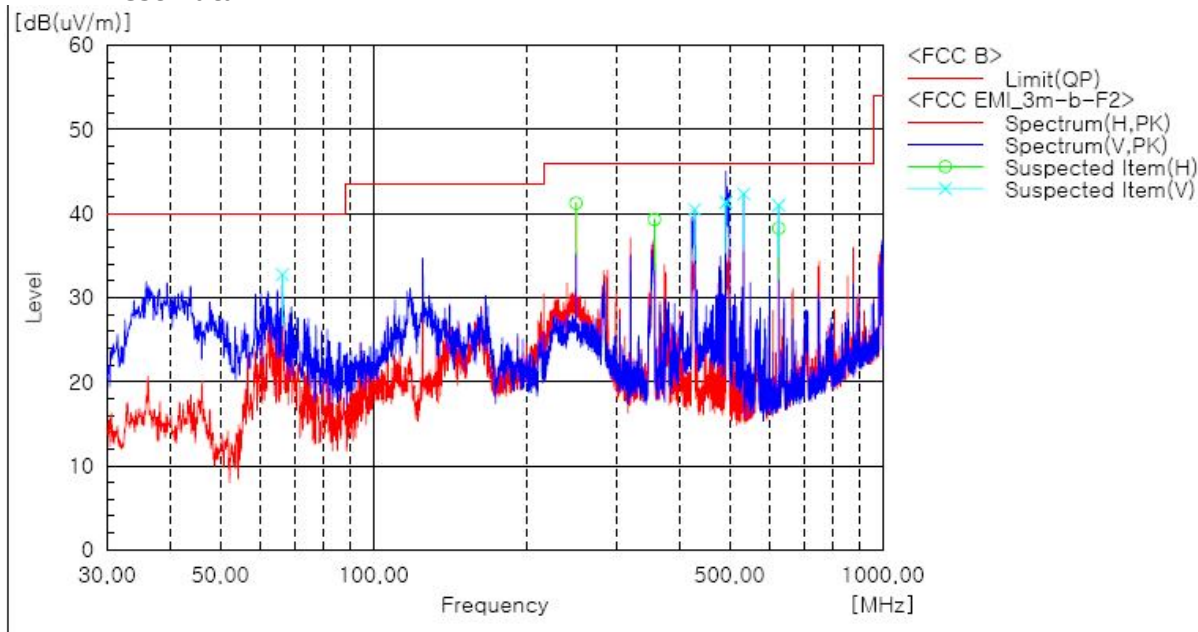
EUT	NetweeN	Measurement Detail	
Model	C140T	Frequency Range	Below 1000MHz
Mode	802.11b(Worst Case)	Detector function	Quasi-Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
533.309	42.3	3.7	Quasi-peak

### Test Data



### Spectrum Selection

No.	Frequency [MHz]	(P)	Reading [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	66.254	V	58.0	-25.3	32.7	40.0	7.3	100.0	92.0
2	249.947	H	59.5	-18.3	41.2	46.0	4.8	100.0	253.0
3	356.284	H	54.3	-15.0	39.3	46.0	6.7	100.0	141.0
4	427.458	V	53.1	-12.6	40.5	46.0	5.5	207.0	290.0
5	492.569	V	52.0	-10.7	41.3	46.0	4.7	207.0	290.0
6	533.309	V	52.0	-9.7	42.3	46.0	3.7	100.0	241.0
7	624.974	V	49.4	-8.4	41.0	46.0	5.0	100.0	203.0
8	624.974	H	46.6	-8.4	38.2	46.0	7.8	191.0	107.0

### Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

## Test Results

EUT	NetweeN	Measurement Detail	
Model	C140T	Frequency Range	1-25GHz
		Detector function	Peak

### Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4924.5	52.8	1.2	Average

### Test Data (Mode: 802.11b, Mid channel)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB]			
					Antenna	Amp. Gain	Cable			AV / Peak	AV / Peak		
4877.50	41.2	55.6	V	1.1	32.7	34.9	11.4	54.0	74.0	50.4	64.8	3.6	9.2

### Test Data (Mode: 802.11g, High channel)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB]			
					Antenna	Amp. Gain	Cable			AV / Peak	AV / Peak		
4924.50	43.6	55.8	V	1.1	32.7	34.9	11.4	54.0	74.0	52.8	65.0	1.2	9.0
7392.00	33.1	44.3	V	1.1	37.7	34.8	14.3	54.0	74.0	50.3	61.5	3.7	12.5

### Test Data (Mode: 802.11n\_20MHz, High channel)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB]			
					Antenna	Amp. Gain	Cable			AV / Peak	AV / Peak		
4924.50	43.4	58.0	V	1.5	32.7	34.9	11.4	54.0	74.0	52.6	67.2	1.4	6.8
7392.00	32.5	44.5	V	1.5	37.7	34.8	14.3	54.0	74.0	49.7	61.7	4.3	12.3

### Test Data (Mode: 802.11n\_40MHz, High channel)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB]			
					Antenna	Amp. Gain	Cable			AV / Peak	AV / Peak		
4904.50	41.8	52.9	V	1.1	32.7	34.9	11.4	54.0	74.0	51.0	62.1	3.0	11.9

### Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

#### Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

#### Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

#### Test Data - 802.11n(20 MHz)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

#### Test Data - 802.11n(40 MHz)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

## 2.1.6 AC Conducted Emissions

### Test Location

Shielded Room

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

### Limit

#### - 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

\* Decreases with the logarithm of the frequency.

### Test Results

The requirements are:

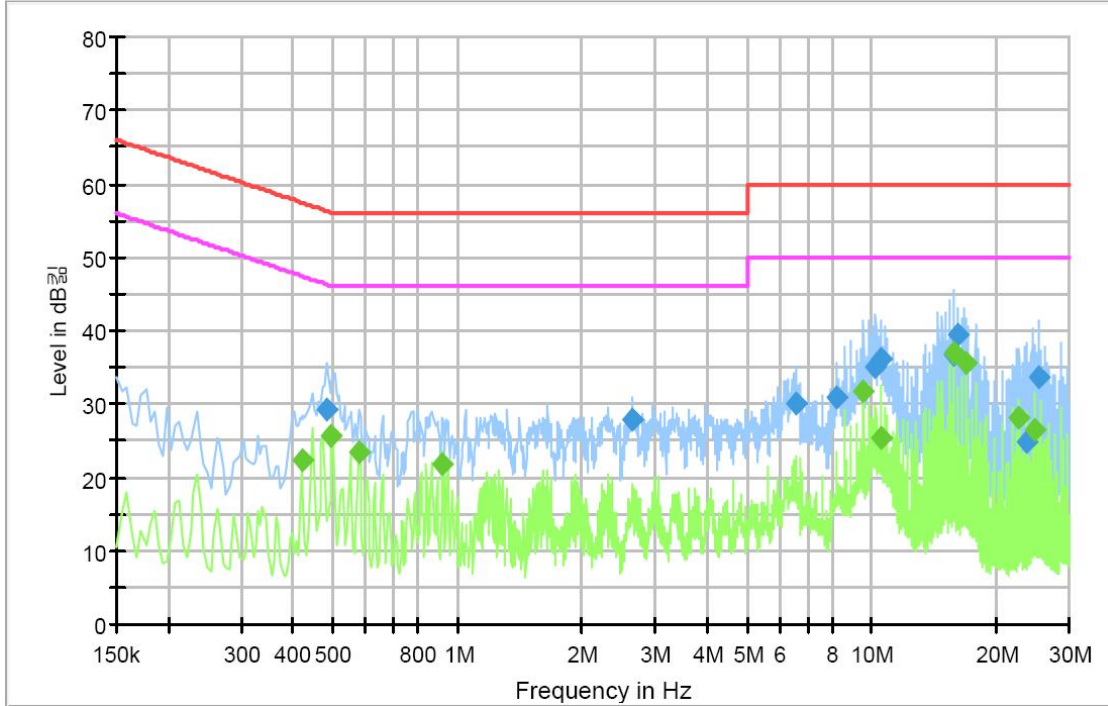
Complies

#### Test mode : 802.11b

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
15.837	36.9	13.1	Average

**Test Data**

[HOT]



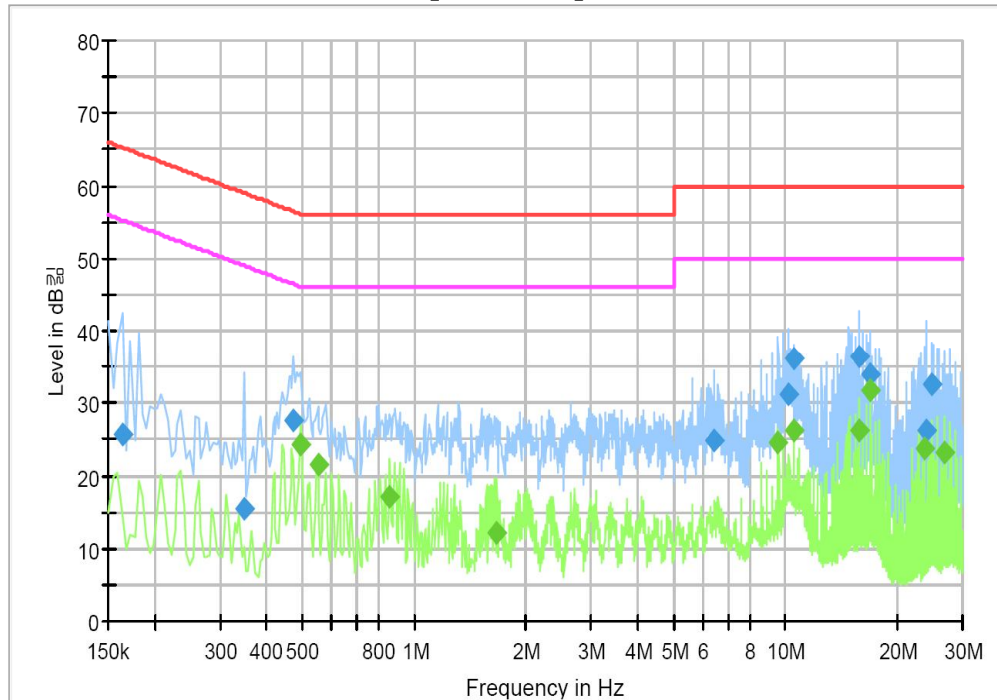
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB <sub>QP</sub> )	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB <sub>QP</sub> )
0.483000	29.4	1000.0	9.000	On	L1	10.0	26.9	56.3
2.638500	27.9	1000.0	9.000	On	L1	9.9	28.1	56.0
6.598500	30.0	1000.0	9.000	On	L1	9.7	30.0	60.0
8.250000	30.9	1000.0	9.000	On	L1	9.7	29.1	60.0
10.243500	35.0	1000.0	9.000	On	L1	9.7	25.0	60.0
10.558500	36.0	1000.0	9.000	On	L1	9.7	24.0	60.0
15.810000	36.7	1000.0	9.000	On	L1	9.8	23.3	60.0
16.165500	39.6	1000.0	9.000	On	L1	9.8	20.4	60.0
23.716500	24.9	1000.0	9.000	On	L1	9.9	35.1	60.0
25.354500	33.7	1000.0	9.000	On	L1	10.0	26.3	60.0

**Final Result 2**

Frequency (MHz)	Average (dB <sub>A</sub> )	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB <sub>A</sub> )
0.420000	22.3	1000.0	9.000	On	L1	10.0	25.2	47.4
0.496500	25.6	1000.0	9.000	On	L1	10.0	20.5	46.1
0.577500	23.6	1000.0	9.000	On	L1	10.0	22.4	46.0
0.919500	21.8	1000.0	9.000	On	L1	10.0	24.2	46.0
9.568500	31.8	1000.0	9.000	On	L1	9.7	18.2	50.0
10.563000	25.5	1000.0	9.000	On	L1	9.7	24.5	50.0
15.837000	36.9	1000.0	9.000	On	L1	9.8	13.1	50.0
16.827000	35.6	1000.0	9.000	On	L1	9.8	14.4	50.0
22.771500	28.1	1000.0	9.000	On	L1	9.9	21.9	50.0
24.747000	26.5	1000.0	9.000	On	L1	10.0	23.5	50.0

[NEUTRAL]



**Final Result 1**

Frequency (MHz)	QuasiPeak (dB <sub>QP</sub> )	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB <sub>QP</sub> )
0.163500	25.8	1000.0	9.000	On	N	10.0	39.5	65.3
0.348000	15.4	1000.0	9.000	On	N	10.0	43.6	59.0
0.474000	27.7	1000.0	9.000	On	N	9.9	28.8	56.4
6.396000	24.9	1000.0	9.000	On	N	9.7	35.1	60.0
10.234500	31.2	1000.0	9.000	On	N	9.7	28.8	60.0
10.563000	36.2	1000.0	9.000	On	N	9.7	23.8	60.0
15.846000	36.3	1000.0	9.000	On	N	9.8	23.7	60.0
16.836000	34.0	1000.0	9.000	On	N	9.8	26.0	60.0
24.049500	26.2	1000.0	9.000	On	N	10.1	33.8	60.0
24.756000	32.5	1000.0	9.000	On	N	10.1	27.5	60.0

**Final Result 2**

Frequency (MHz)	Average (dB <sub>A</sub> )	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB <sub>A</sub> )
0.496500	24.4	1000.0	9.000	On	N	9.9	21.7	46.1
0.550500	21.4	1000.0	9.000	On	N	10.0	24.6	46.0
0.861000	17.1	1000.0	9.000	On	N	10.0	28.9	46.0
1.671000	12.1	1000.0	9.000	On	N	9.9	33.9	46.0
9.573000	24.7	1000.0	9.000	On	N	9.7	25.3	50.0
10.563000	26.3	1000.0	9.000	On	N	9.7	23.7	50.0
15.846000	26.1	1000.0	9.000	On	N	9.8	23.9	50.0
16.831500	31.8	1000.0	9.000	On	N	9.8	18.2	50.0
23.766000	23.7	1000.0	9.000	On	N	10.1	26.3	50.0
26.736000	23.2	1000.0	9.000	On	N	10.1	26.8	50.0





# CTK Co., Ltd.

386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

Tel: +82-31-339-9970 Fax: +82-31-339-9855

www.e-ctk.com

CTK Co., Ltd.  
The Prime Leader of Global Regulatory Certification

## APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2012-11-10
2	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2012-11-10
3	EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2012-07-07
4	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2013-11.03
5	LOOP ANTENNA	EMCO	6502	9107-2652	2012-10-29
6	Attenuator	HP	8498A	1801A06913	2012-11-14
7	EPM Series Power Meter	HP	E4418A	GB38272734	2012-11-10
8	Power Sensor	HP	8487A	3318A03524	2012-07-07
9	Audio Analyzer	HP	8903B	2747A03432	2012-11-10
10	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2012-11-21
11	SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2012-11-10
12	Modulation Analyzer	HP	8901B	3438A05228	2012-11-18
13	Attenuator	HP	8494A	3308A33351	2012-11-14
14	Temp&Humi Chamber	Kunpoong	JT-TH-556-1	9QE5-002	2013-01-12
15	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
16	EMC Analyzer	Agilent	E7405A	MY45110859	2013-02-13
17	Horn Antenna	ETS-Lindgren	3115	00078894	2013-03-22
18	Horn Antenna	ETS-Lindgren	3115	00078895	2013-03-22
19	Dipole Antenna	SCHWARZBECK	VHA 9103	VHA91032557	2013-11-04
20	Dipole Antenna	SCHWARZBECK	UHA 9105	UHA91052417	2013-11-04
21	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2013-03-27
22	PREAMPLIFIER	Agilent	8449B	3008A02307	2012-11-17
23	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2013-02-09
24	LISN	Rohde & Schwarz	ENV216	101235	2012-08-18
25	LISN	Rohde & Schwarz	ENV216	101236	2012-08-18
26	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
27	EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2013-02-09