

### Conducted Output Power (802.11g-CH 1) 12Mbps



### Conducted Output Power (802.11g-CH 1) 18Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Output Power (802.11g-CH 1) 24Mbps



### Conducted Output Power (802.11g-CH 1) 36Mbps



### Conducted Output Power (802.11g-CH 1) 48Mbps



### Conducted Output Power (802.11g-CH 1) 54Mbps



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### Conducted Output Power (802.11g-CH 6) 6Mbps

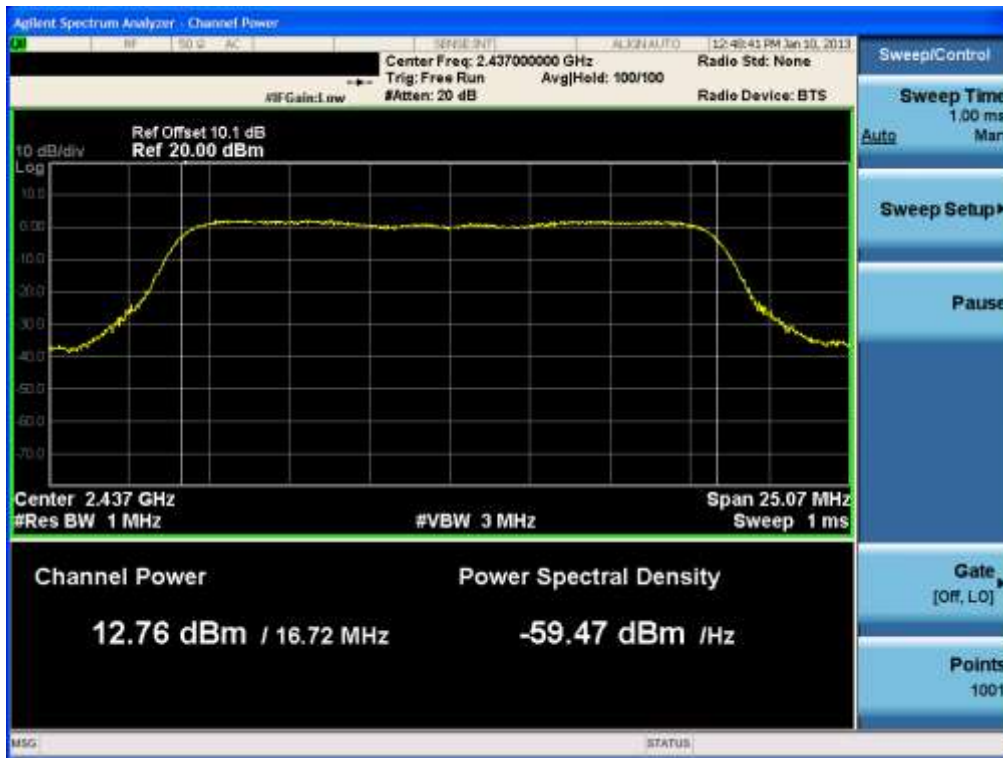


### Conducted Output Power (802.11g-CH 6) 9Mbps



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### Conducted Output Power (802.11g-CH 6) 18Mbps



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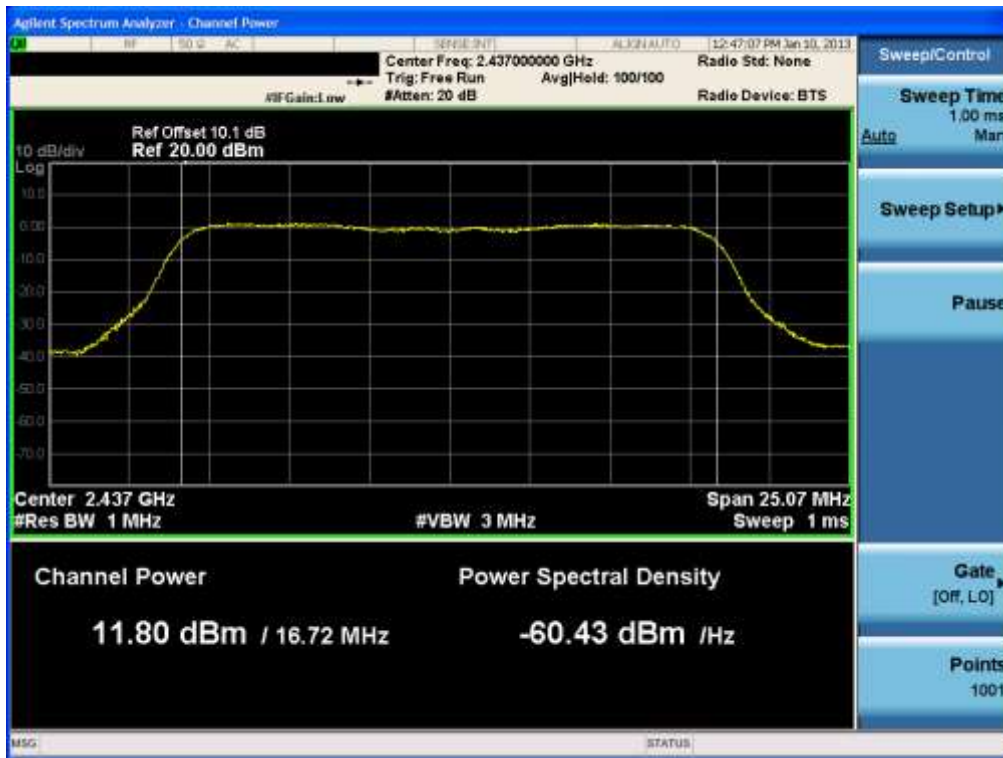
### Conducted Output Power (802.11g-CH 6) 24Mbps



### Conducted Output Power (802.11g-CH 6) 36Mbps



### Conducted Output Power (802.11g-CH 6) 48Mbps

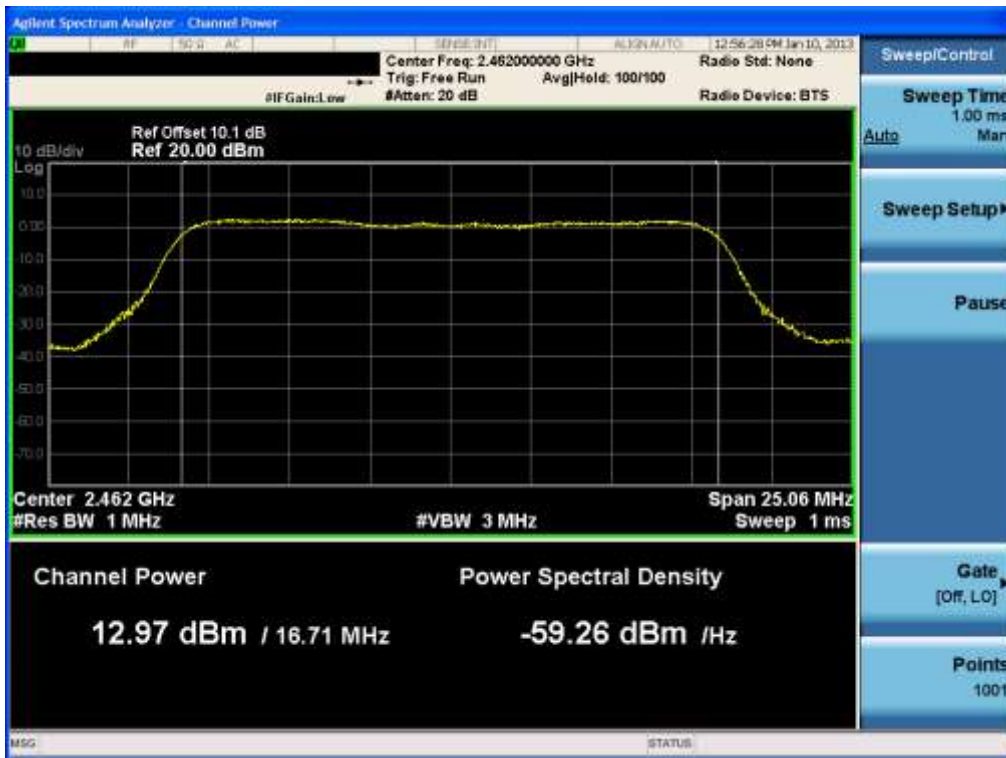


### Conducted Output Power (802.11g-CH 6) 54Mbps



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### Conducted Output Power (802.11g-CH 11) 6Mbps



### Conducted Output Power (802.11g-CH 11) 9Mbps





### Conducted Output Power (802.11g-CH 11) 12Mbps



### Conducted Output Power (802.11g-CH 11) 18Mbps



### Conducted Output Power (802.11g-CH 11) 24Mbps

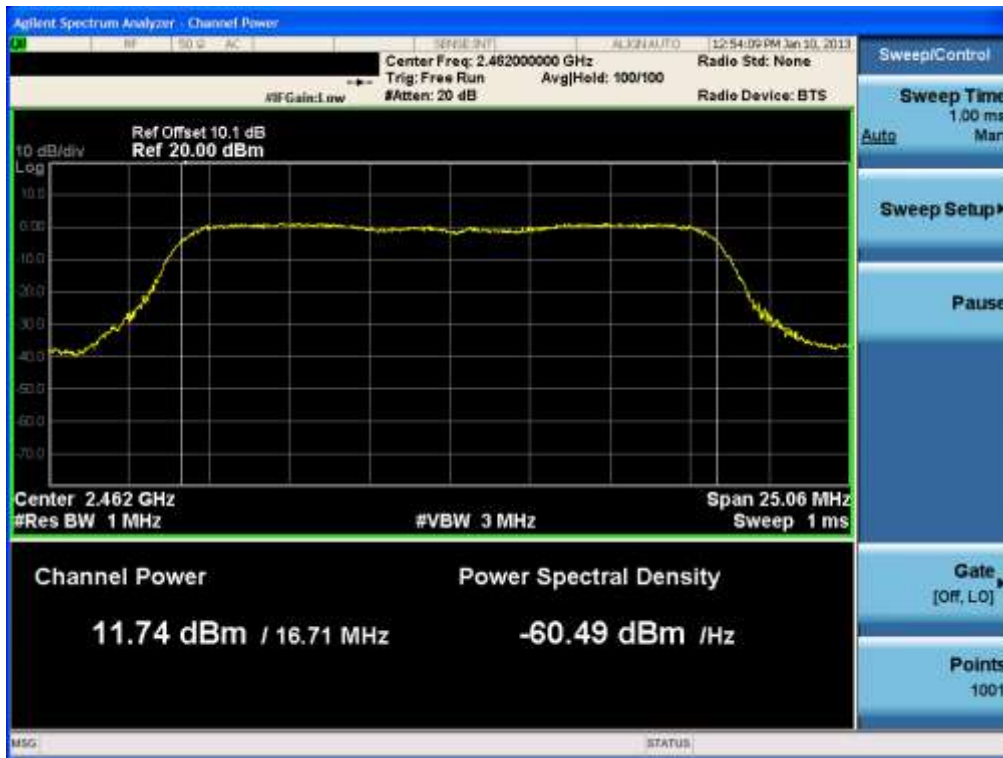


### Conducted Output Power (802.11g-CH 11) 36Mbps



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### Conducted Output Power (802.11g-CH 11) 48Mbps



### Conducted Output Power (802.11g-CH 11) 54Mbps



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### Conducted Output Power (802.11n-CH 1) 6.5Mbps



### Conducted Output Power (802.11n-CH 1) 13Mbps



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### Conducted Output Power (802.11n-CH 1) 19.5Mbps



### Conducted Output Power (802.11n-CH 1) 26Mbps



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### Conducted Output Power (802.11n-CH 1) 39Mbps



### Conducted Output Power (802.11n-CH 1) 52Mbps



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### Conducted Output Power (802.11n-CH 1) 58.5Mbps



### Conducted Output Power (802.11n-CH 1) 65Mbps



### Conducted Output Power (802.11n-CH 6) 6.5Mbps



### Conducted Output Power (802.11n-CH 6) 13Mbps



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### Conducted Output Power (802.11n-CH 6) 19.5Mbps



### Conducted Output Power (802.11n-CH 6) 26Mbps



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### Conducted Output Power (802.11n-CH 11) 6.5Mbps



### Conducted Output Power (802.11n-CH 11) 13Mbps



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### Conducted Output Power (802.11n-CH 11) 65Mbps



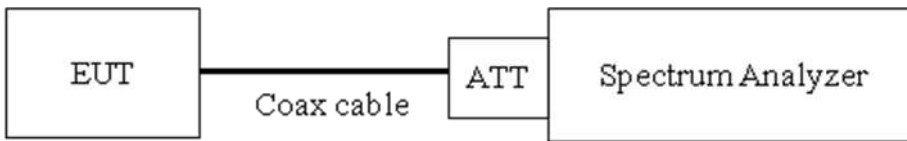
### 8.3 POWER SPECTRAL DENSITY (802.11b/g/n)

#### Test Requirements and limit, §15.247(e)

The peak power spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

**Minimum Standard – the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.**

#### ■ TEST CONFIGURATION



#### ■ TEST PROCEDURE

We tested according to ANSI 63.10 (issued 2009).

The spectrum analyzer is set to :

Span = 20 MHz( For devices with a nominal 40 MHz BW, 50 MHz span will be needed)

Reference level = 20 dBm

Attenuation = 0 dB (add internal attenuation, if necessary)

Sweep time = Auto Coupled

RBW = 3 kHz

VBW = 10 kHz

Detector = Peak

MKR = Center Frequency

Trace = Clear write

Set the TRACE to MAX HOLD, and after the trace stabilizes, the TRACE to VIEW.

SET the marker on the peak of the signal and then adjust the center frequency of the spectrum analyzer to the marker frequency.

After viewing the EUT waveform on the spectrum analyzer, perform the following spectrum analyzer functions to capture the trace

Span = 300 kHz

Sweep time = 100 s

Trace = Max hold

MKR = Peak Search

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■ **Sample Calculation**

$$\begin{aligned} \text{PSD} &= \text{Reading Value} + \text{ATT loss} + \text{Cable loss}(1 \text{ ea}) \\ &= -5 \text{ dBm} + 10 \text{ dB} + 0.8 \text{ dB} = -4.2 \text{ dBm} \end{aligned}$$

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

So, 10.1 dB is offset. And the offset gap in the 2.4 GHz range do not affect the power spectral density final result.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	10.11
	2437	10.10
	2462	10.12

(Actual value of loss for the attenuator and cable combination)

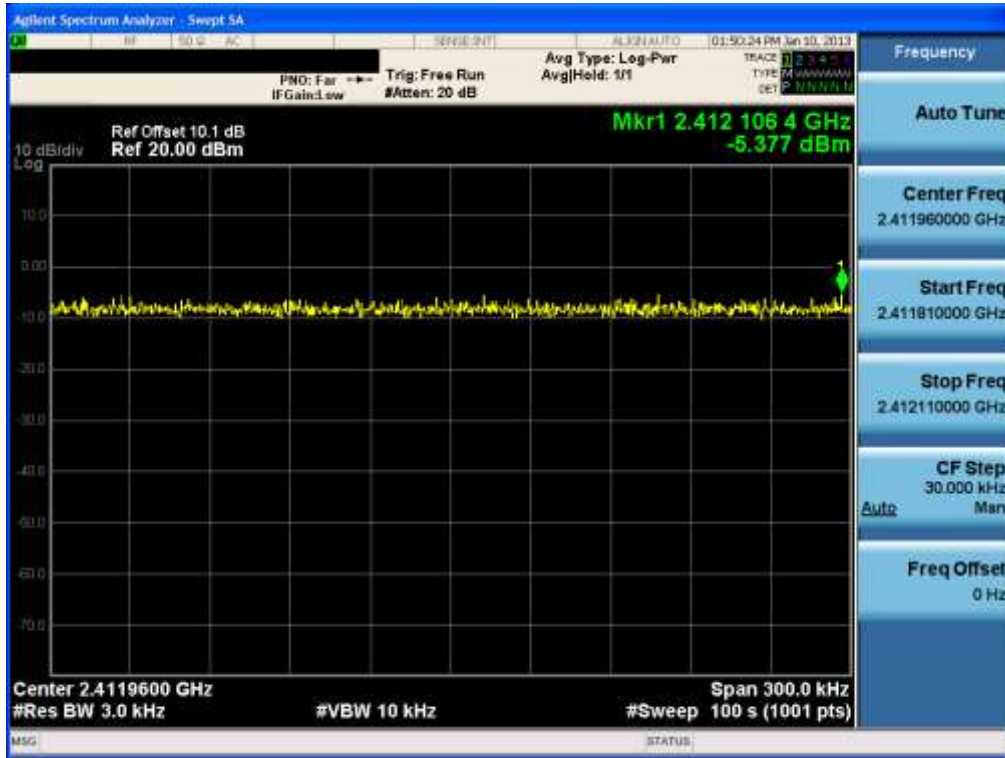
■ **TEST RESULTS**

**Conducted Power Density Measurements**

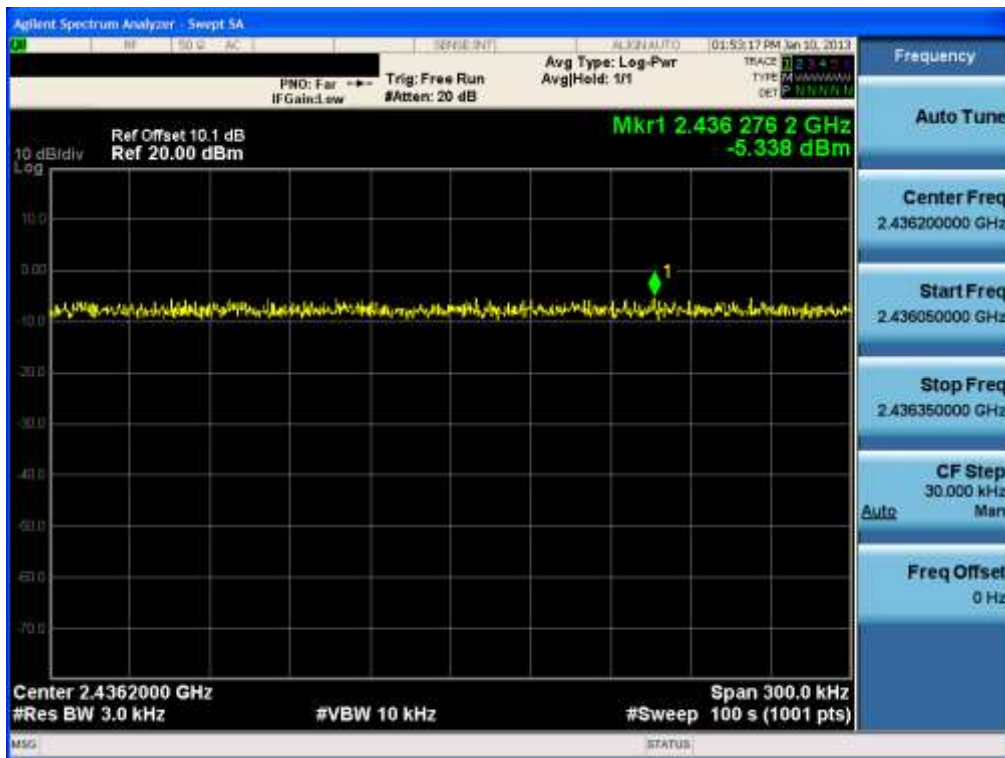
Frequency (MHz)	Channel No.	Mode	Test Result		
			PSD (dBm)	Limit (dBm)	Pass/Fail
2412	1	802.11b	-5.377	8	Pass
2437	6		-5.338	8	Pass
2462	11		-4.654	8	Pass
2412	1	802.11g	-11.346	8	Pass
2437	6		-11.546	8	Pass
2462	11		-11.934	8	Pass
2412	1	802.11n	-12.545	8	Pass
2437	6		-10.888	8	Pass
2462	11		-13.079	8	Pass

■ RESULT PLOTS

Power Spectral Density (802.11b-CH 1)

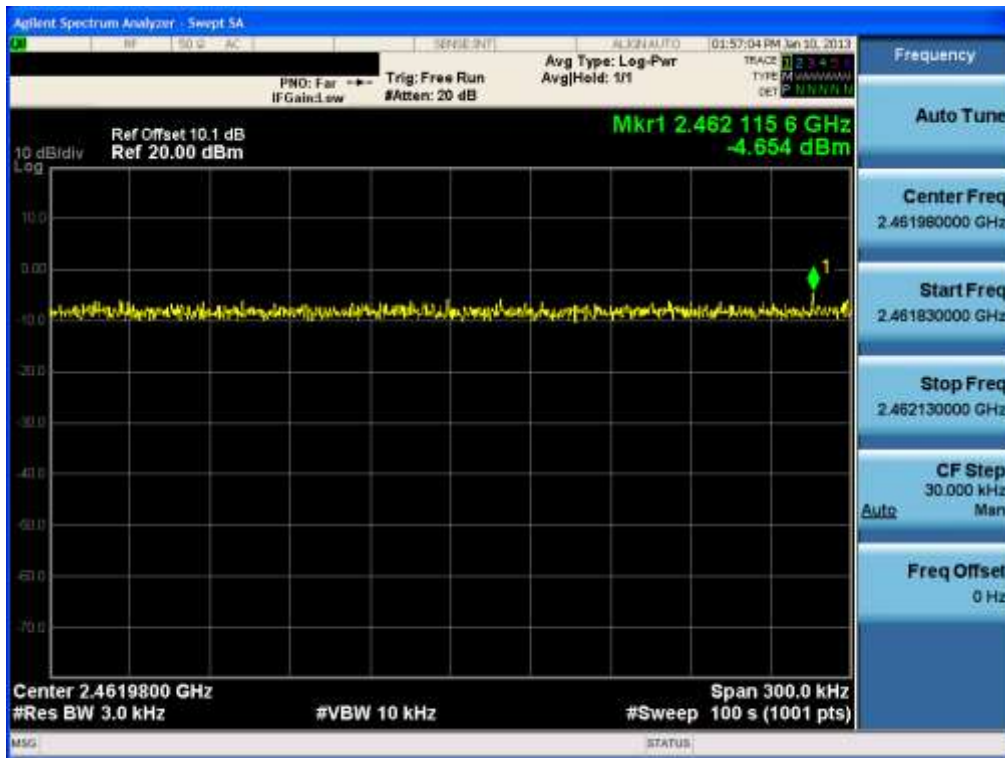


Power Spectral Density (802.11b-CH 6)

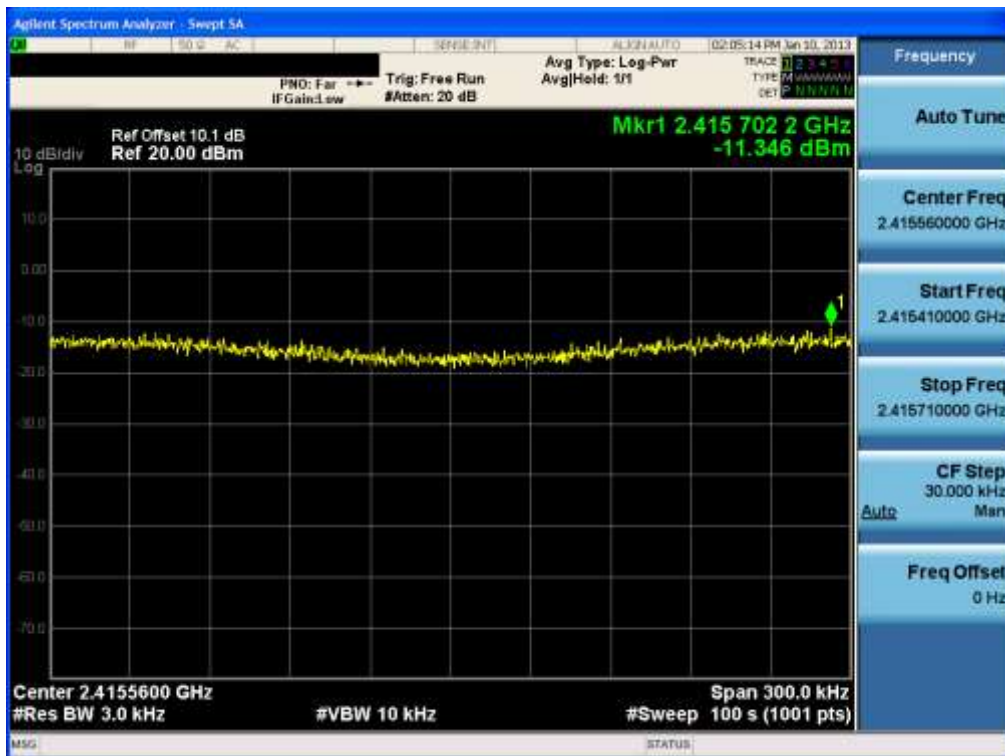


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### Power Spectral Density (802.11b-CH 11)

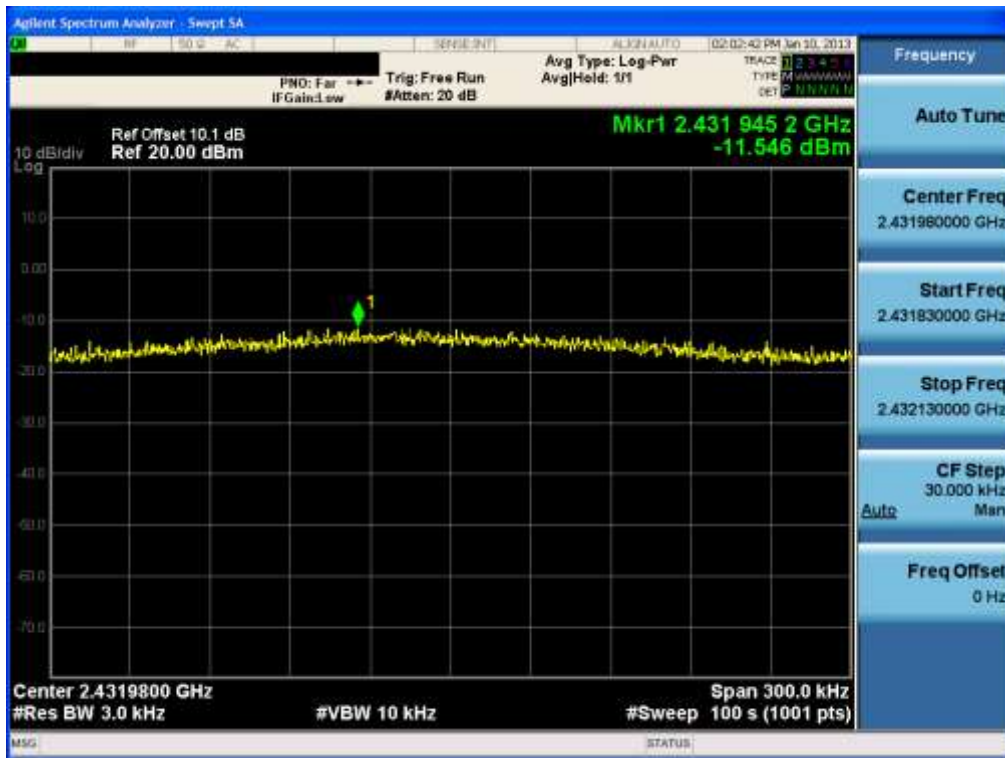


### Power Spectral Density (802.11g-CH 1)

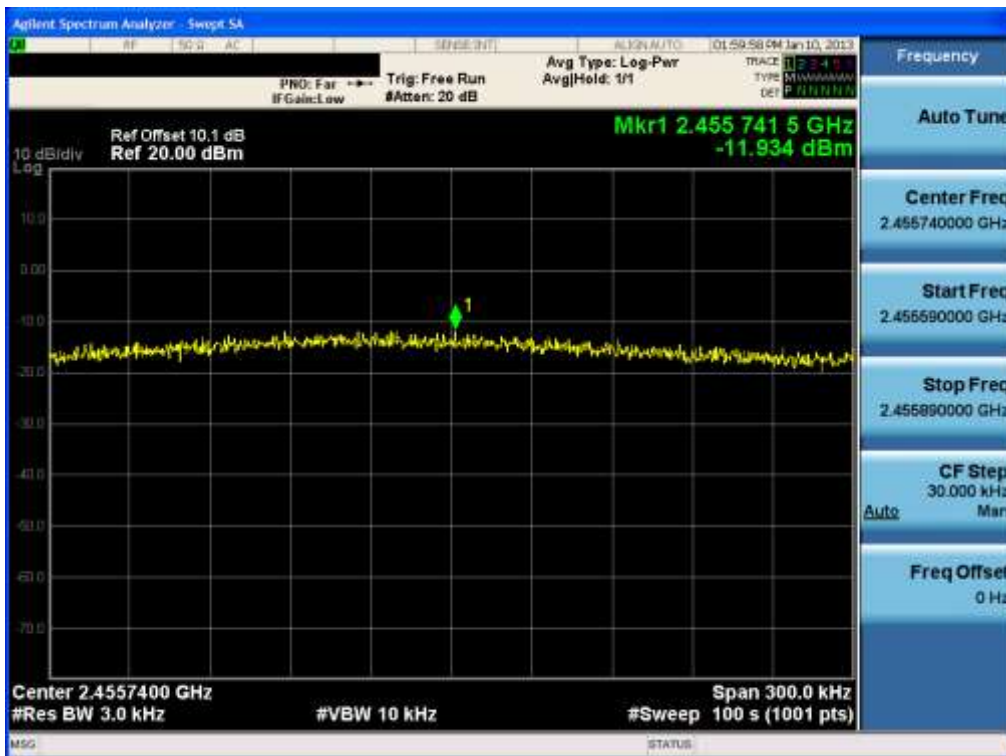


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### Power Spectral Density (802.11g-CH 6)



### Power Spectral Density (802.11g-CH11)



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### Power Spectral Density (802.11n-CH 1)



### Power Spectral Density (802.11n-CH 6)



**Power Spectral Density (802.11n-CH11)**



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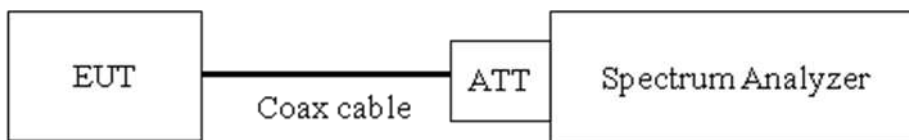
## 8.4 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

### Test Requirements and limit, §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

**Limit : 20 dBc**

#### ■ TEST CONFIGURATION



#### ■ TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. ( Procedure 7.7.10 in ANSI 63.10 )

RBW = 100 kHz(Upon 1 GHz = 1 MHz)

VBW = 300 kHz(Upon 1 GHz = 1 MHz)

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep = auto couple

Measurements are made over the 30 MHz to 26 GHz range with the transmitter set to the lowest, middle, and highest channels.

Note :

1. The band edge results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

So, 10.1 dB is offset. And the offset gap in the 2.4 GHz range do not affect the band edge final result.

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Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	10.11
	2437	10.10
	2462	10.12

(Actual value of loss for the attenuator and cable combination)

5. In case of conducted spurious emissions test, please check factors blow table.

■ **FACTORS FOR FREQUENCY**

Freq(MHz)	Factor(dB)
30	10.37
100	10.16
200	10.15
300	10.14
400	10.18
500	10.19
600	10.20
700	10.30
800	10.25
900	10.28
1000	10.29
2000	10.17
2412*	10.11
2437*	10.10
2462*	10.12
3000	10.26
4000	10.31
5000	9.85
6000	10.20
7000	10.60
8000	10.53
9000	10.23
10000	10.41
11000	10.65
12000	11.19
13000	10.97
14000	11.42
15000	12.01
16000	11.77
17000	10.78
18000	10.76
19000	11.15
20000	10.75
21000	10.82
22000	10.82
23000	11.26
24000	11.08
25000	11.18
26000	10.90

Note : 1. \*\* is fundamental frequency range.

2. Factor = Cable loss + Attenuator loss

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■ RESULT PLOTS

BandEdge (802.11b-CH1)



BandEdge (802.11b-CH11)

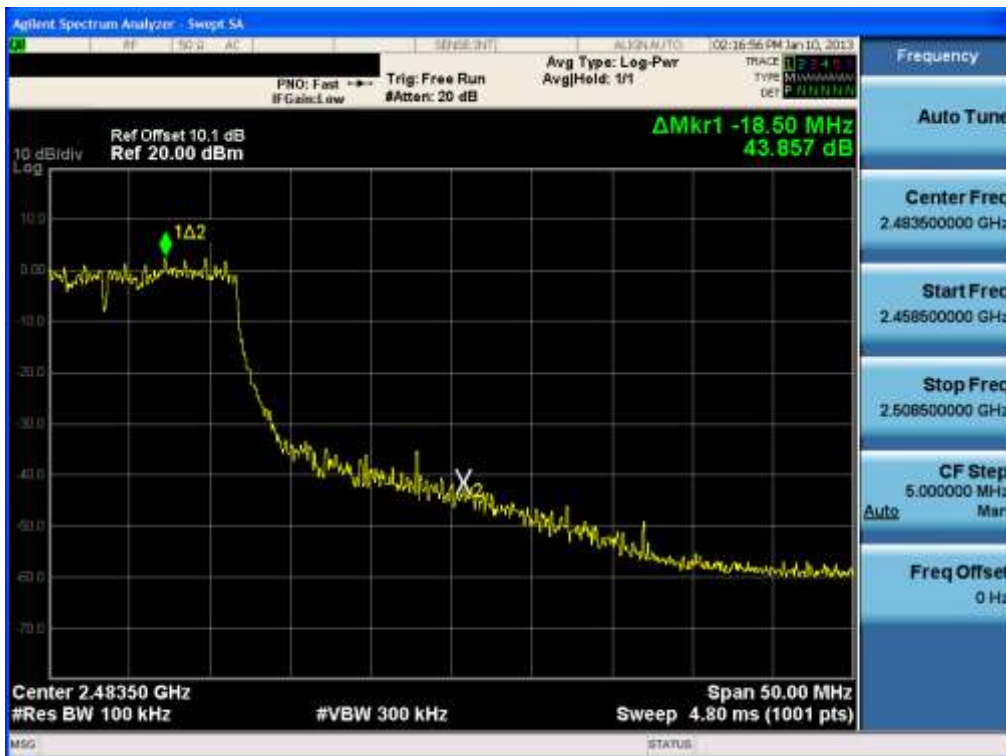


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### BandEdge (802.11g-CH1)



### BandEdge (802.11g-CH11)

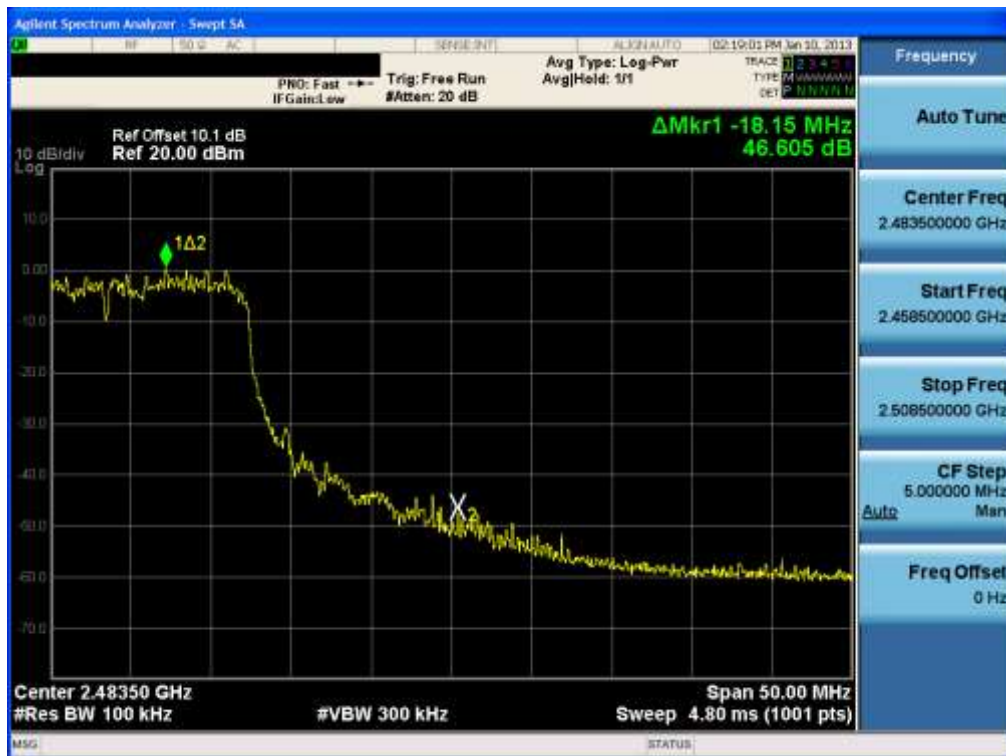


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### BandEdge (802.11n-CH1)

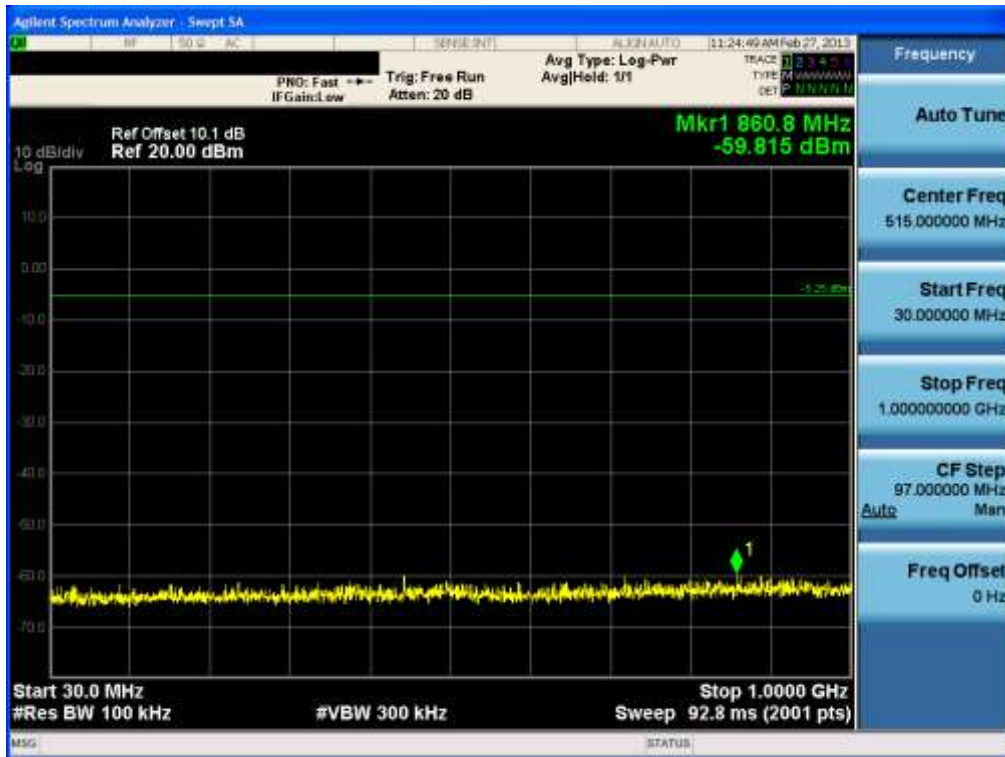


### BandEdge (802.11n-CH11)

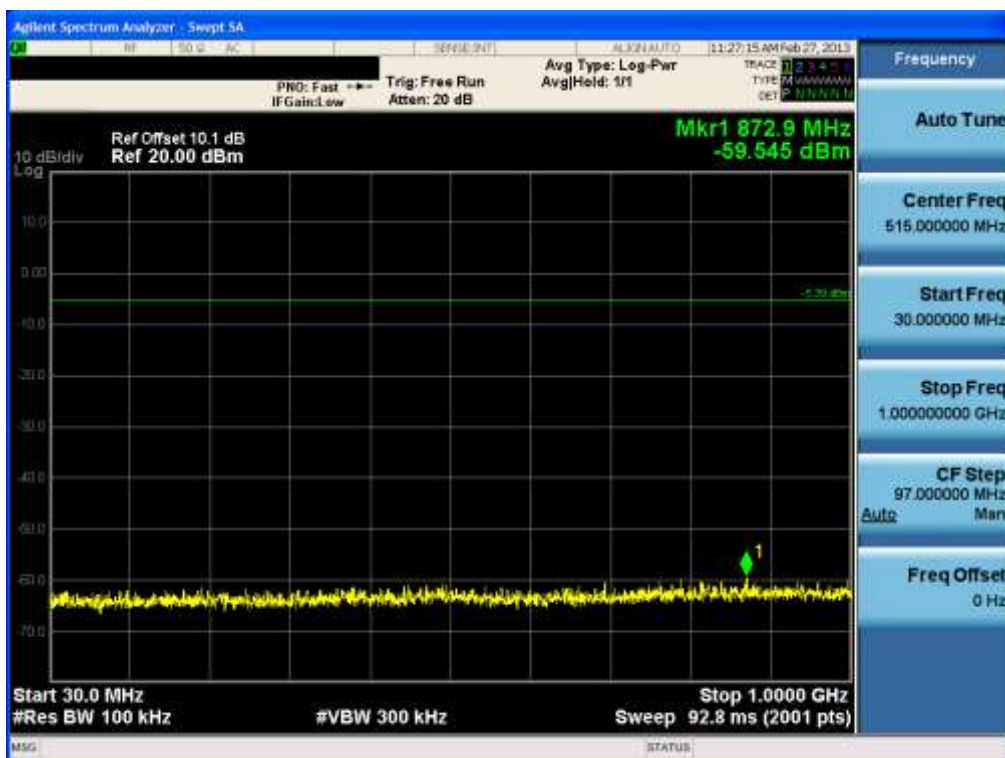


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Conducted Spurious Emission (802.11b-CH1)

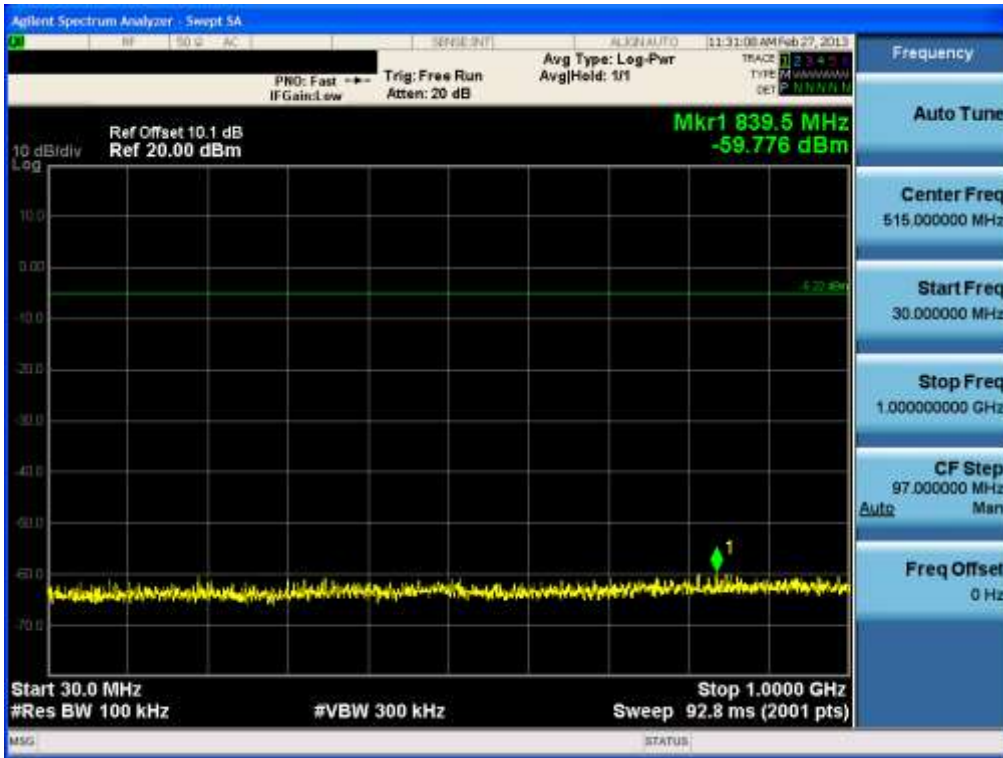


Conducted Spurious Emission (802.11b-CH6)

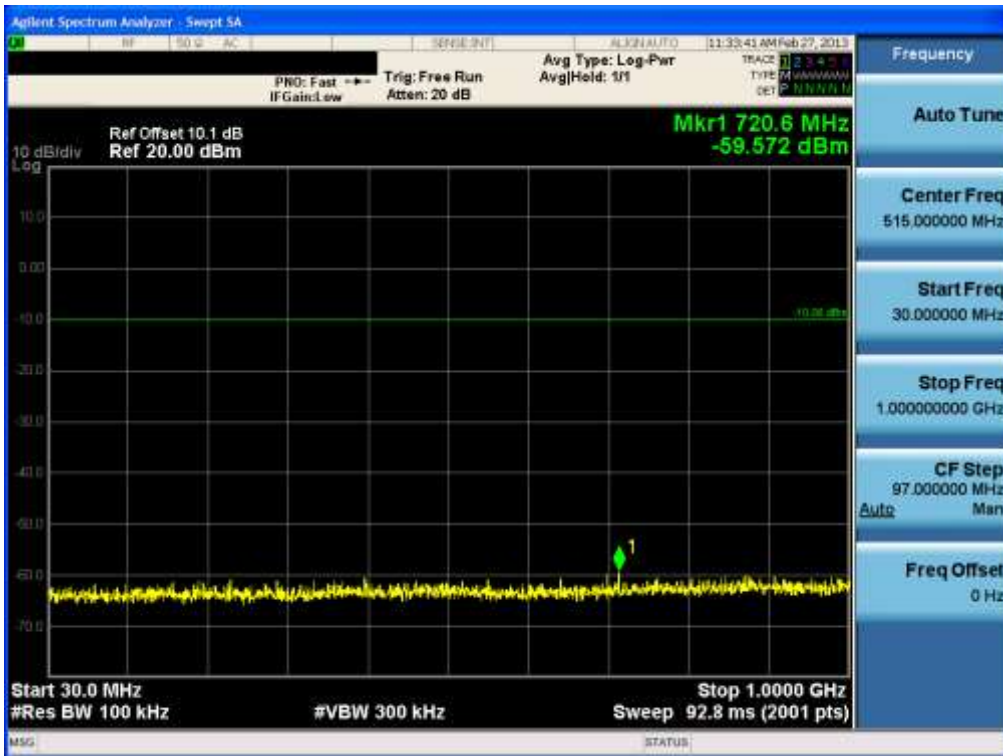


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**Conducted Spurious Emission (802.11b-CH11)**

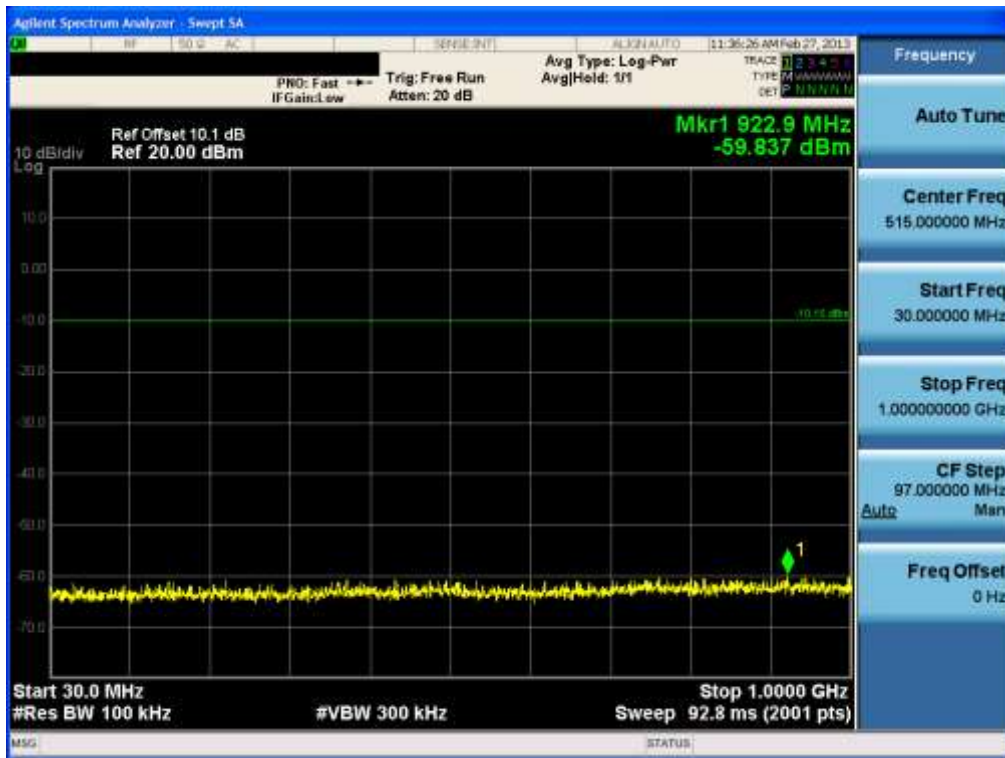


**Conducted Spurious Emission (802.11g-CH1)**

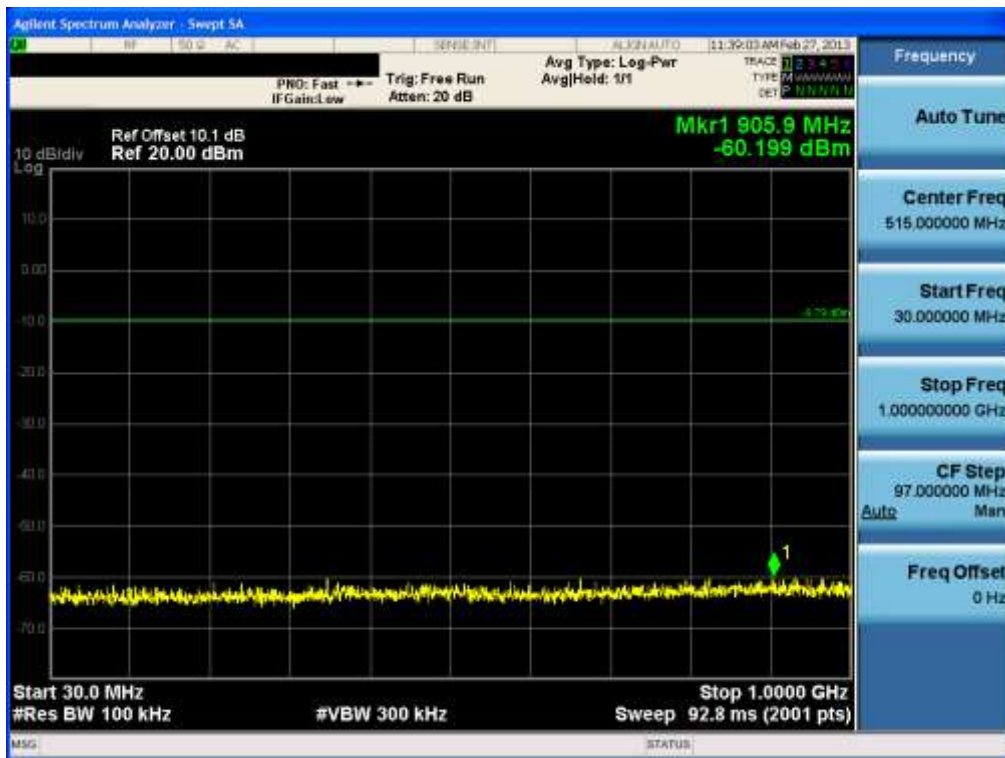


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Spurious Emission (802.11g-CH6)

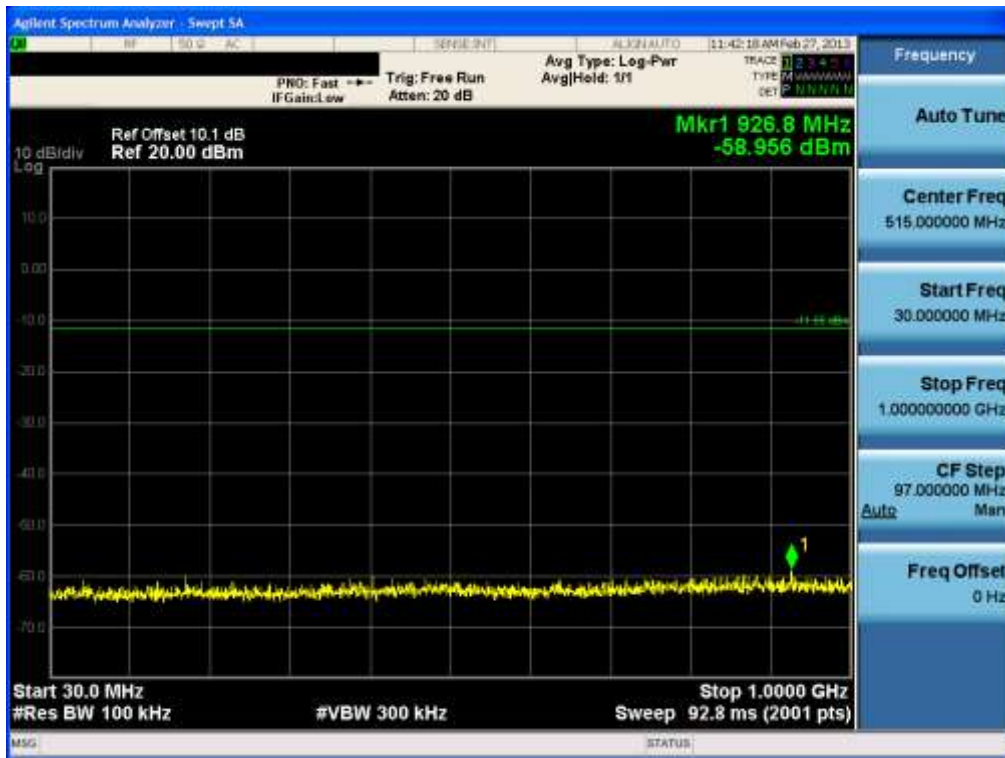


### Conducted Spurious Emission (802.11g-CH11)

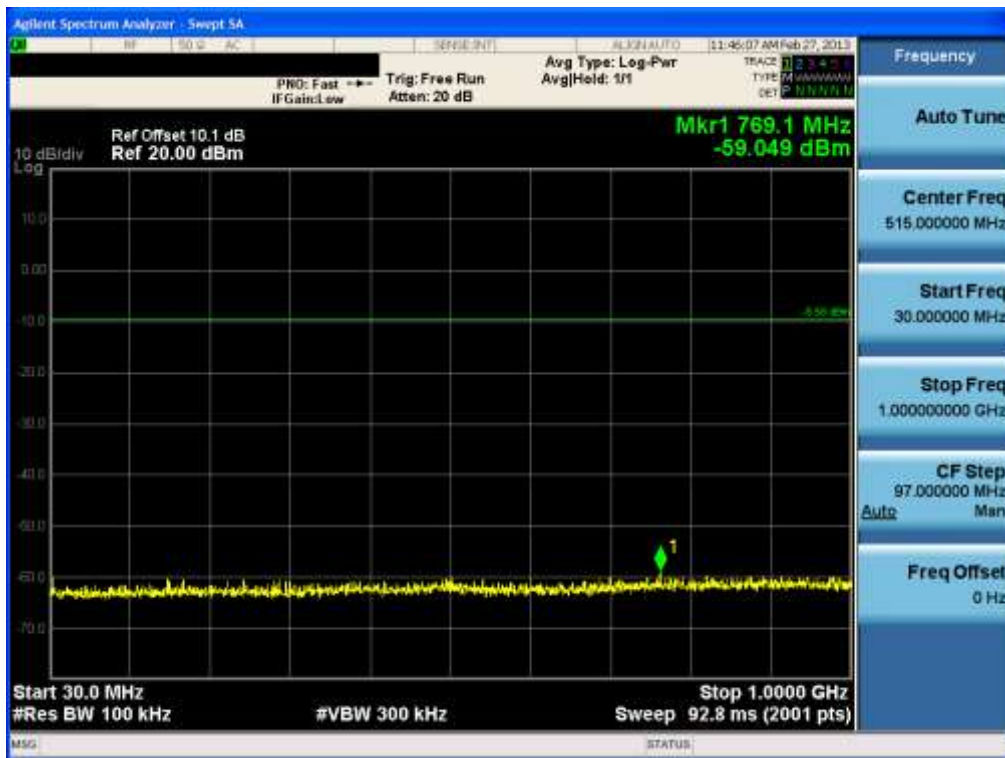


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Spurious Emission (802.11n-CH1)

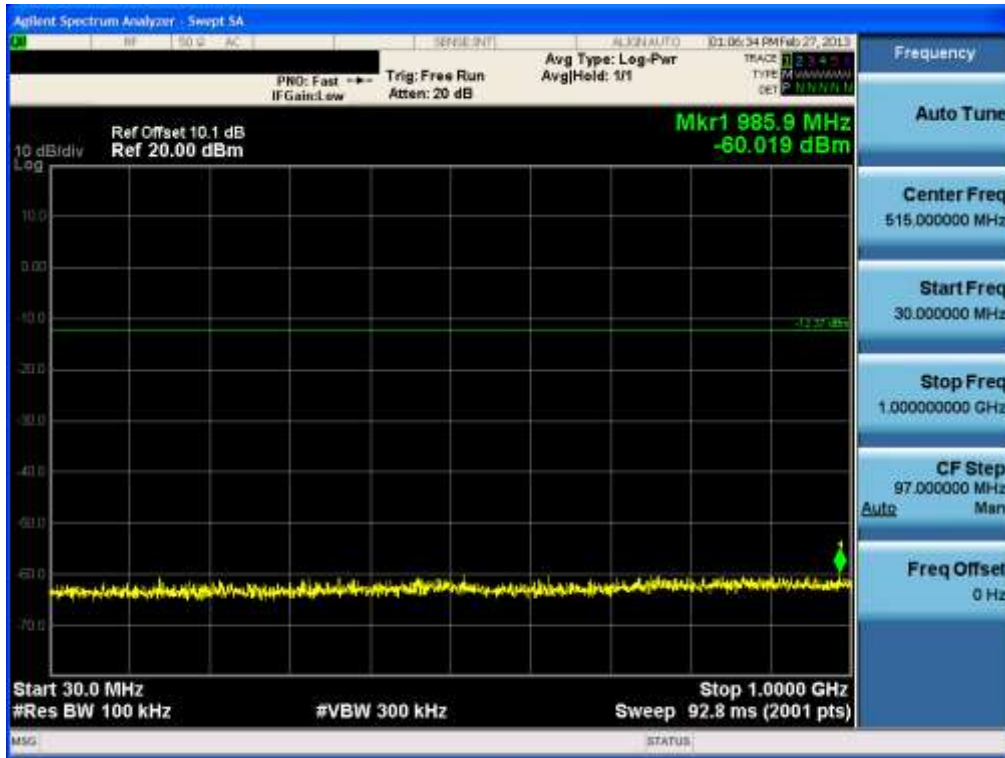


### Conducted Spurious Emission (802.11n-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

**Conducted Spurious Emission (802.11n-CH11)**

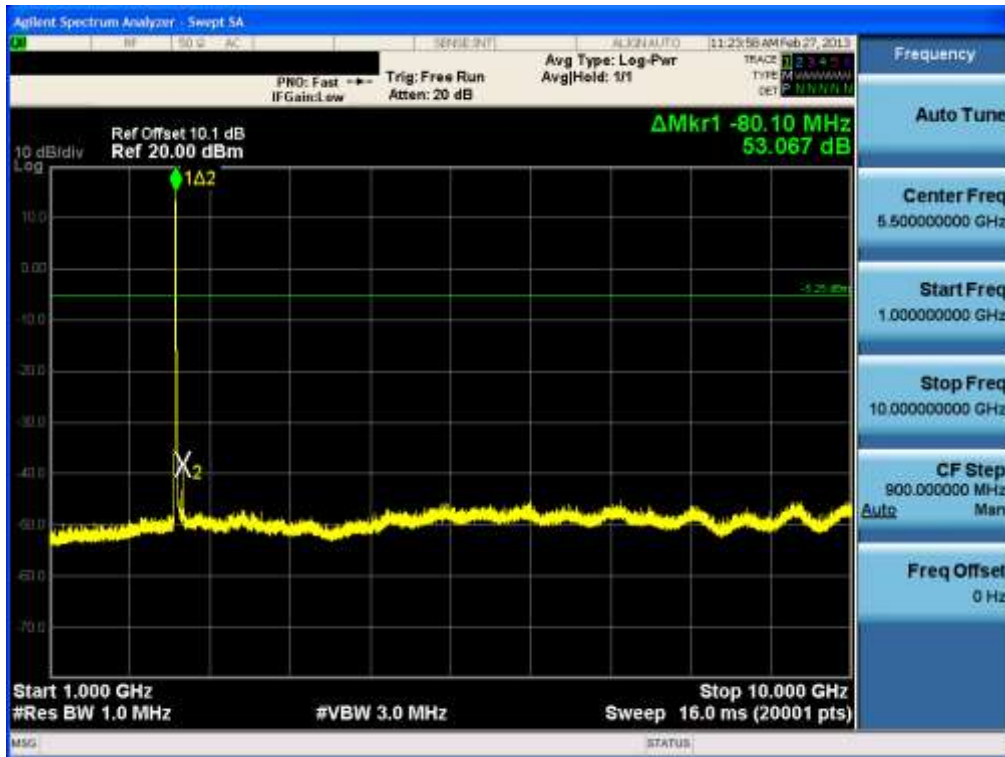


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

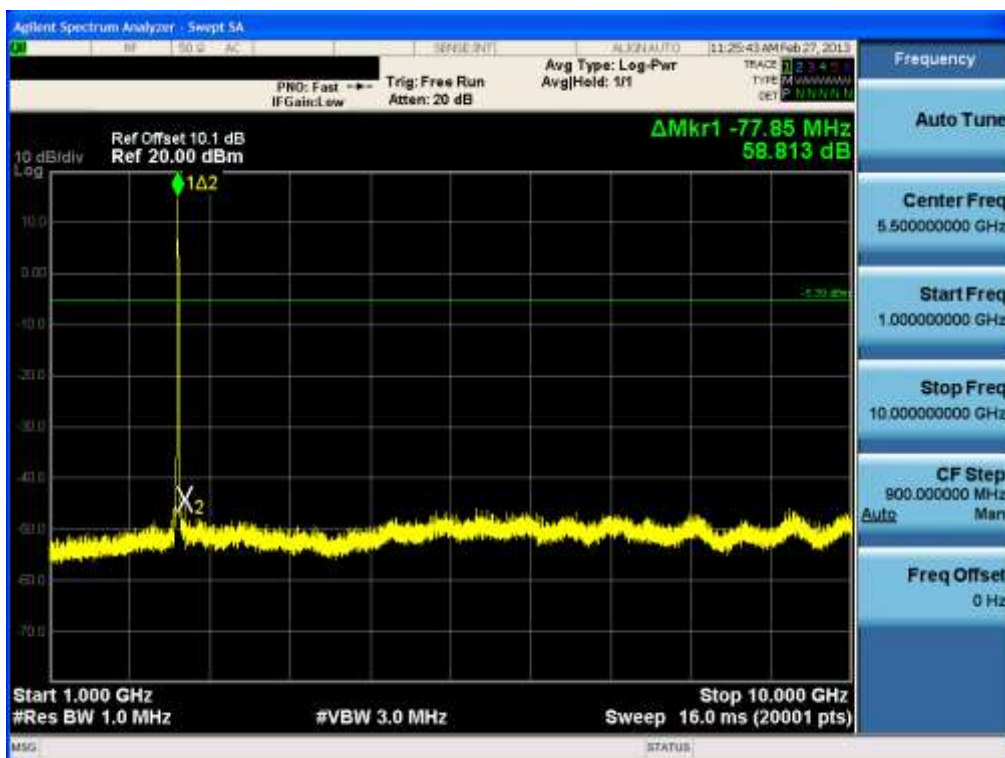


1 GHz ~ 10 GHz

### Conducted Spurious Emission (802.11b-CH1)

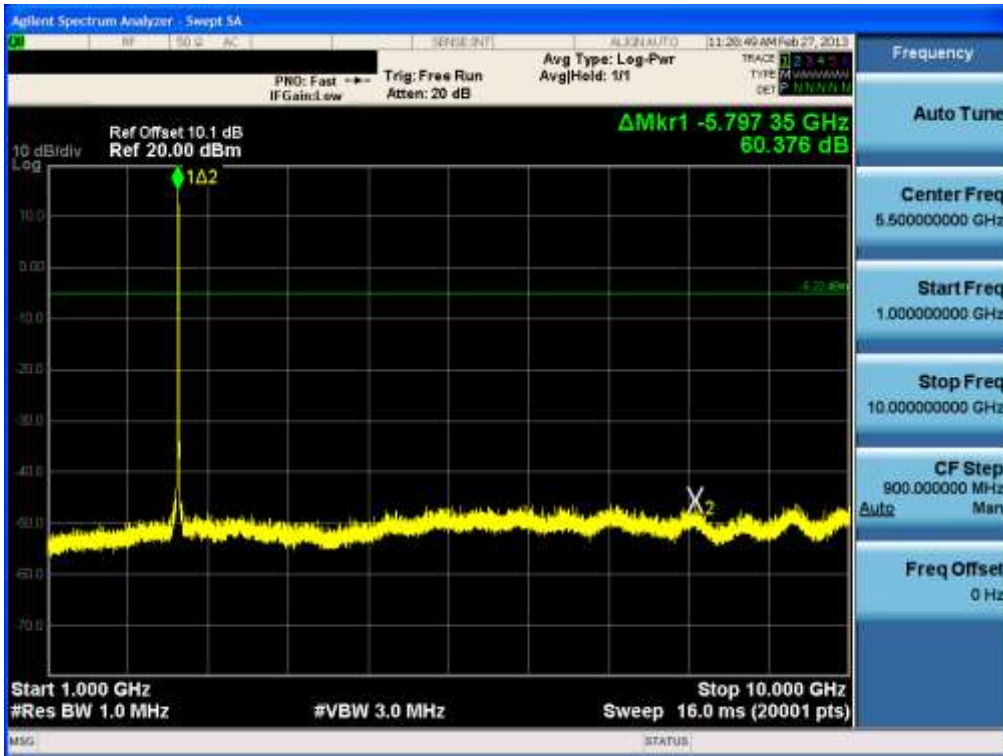


### Conducted Spurious Emission (802.11b-CH6)

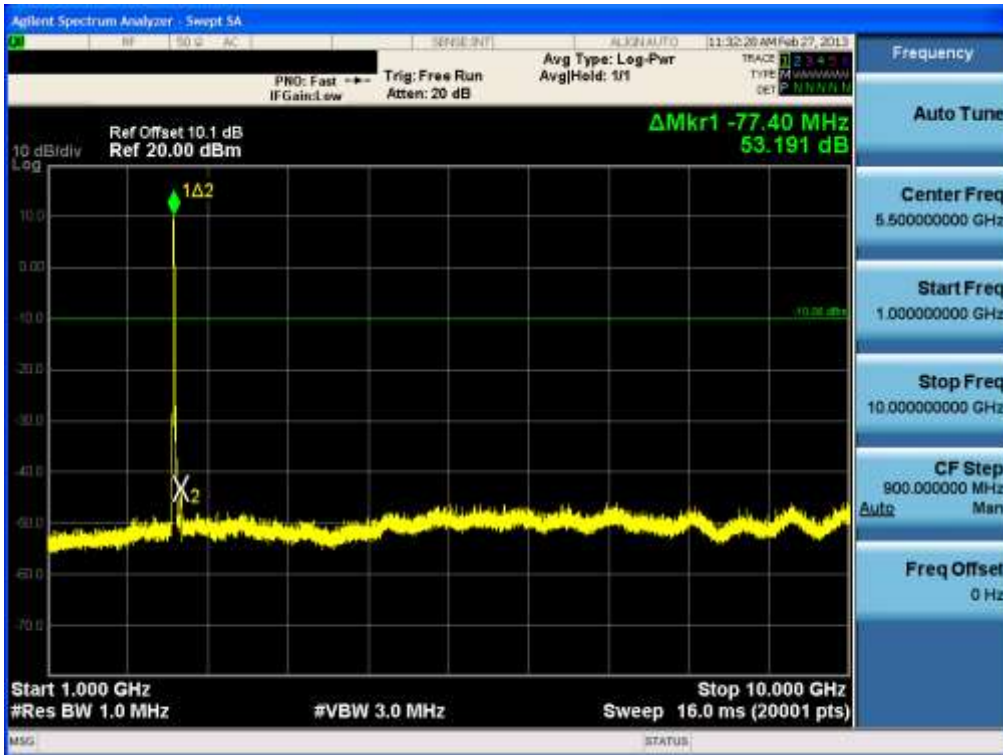


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Spurious Emission (802.11b-CH11)

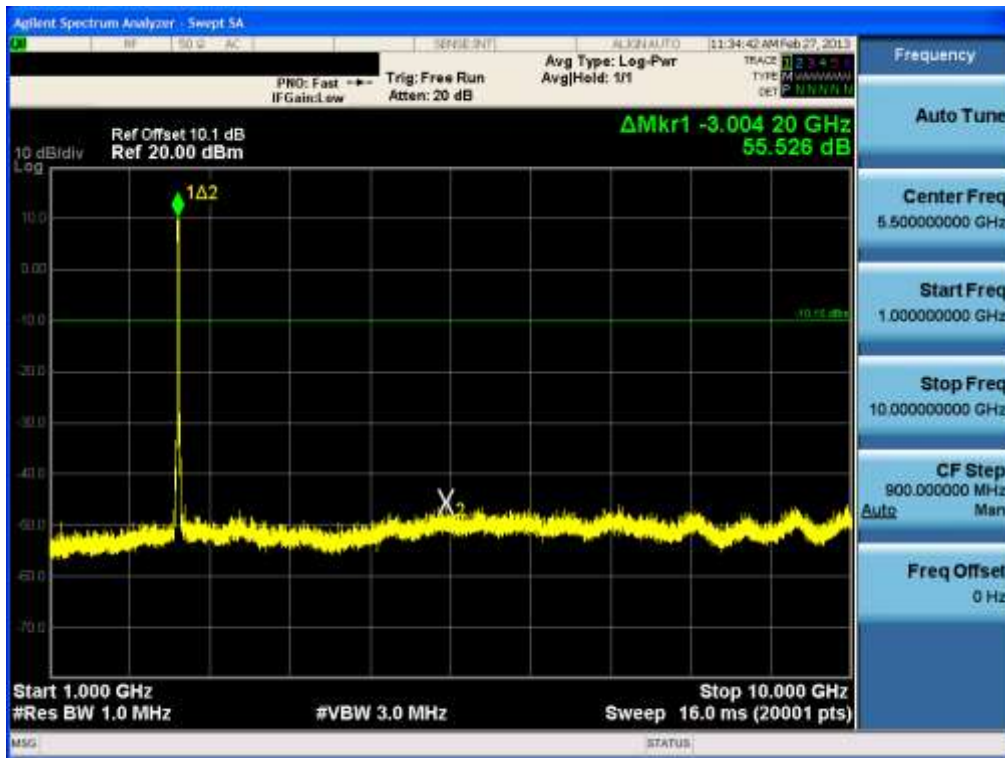


### Conducted Spurious Emission (802.11g-CH1)

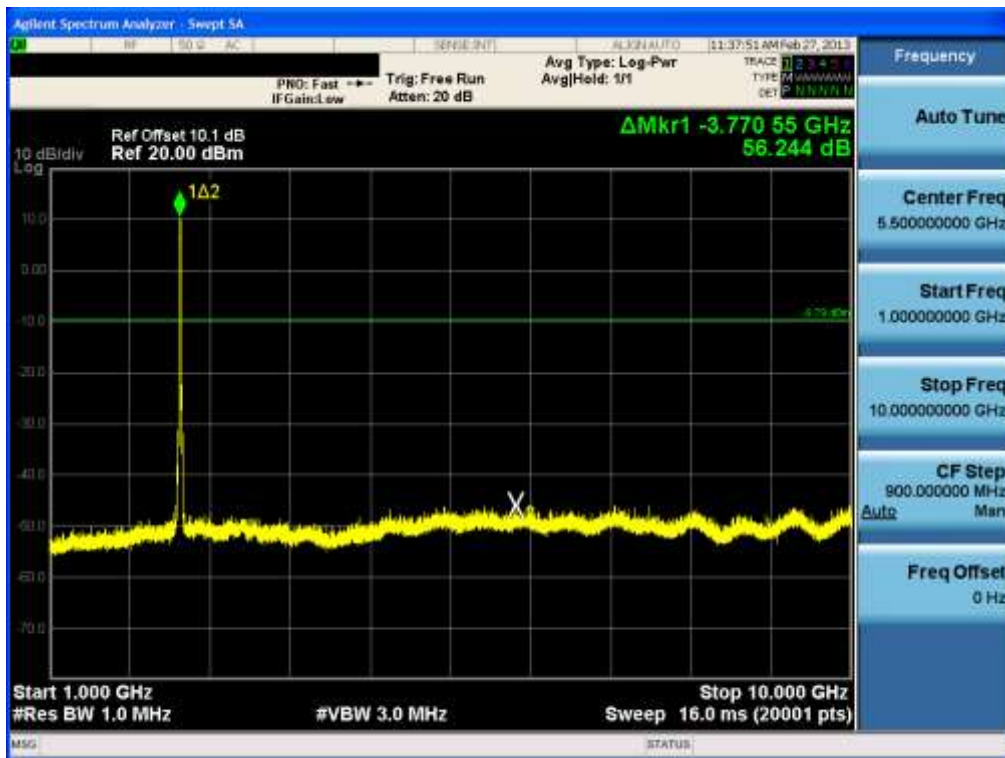


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Spurious Emission (802.11g-CH6)

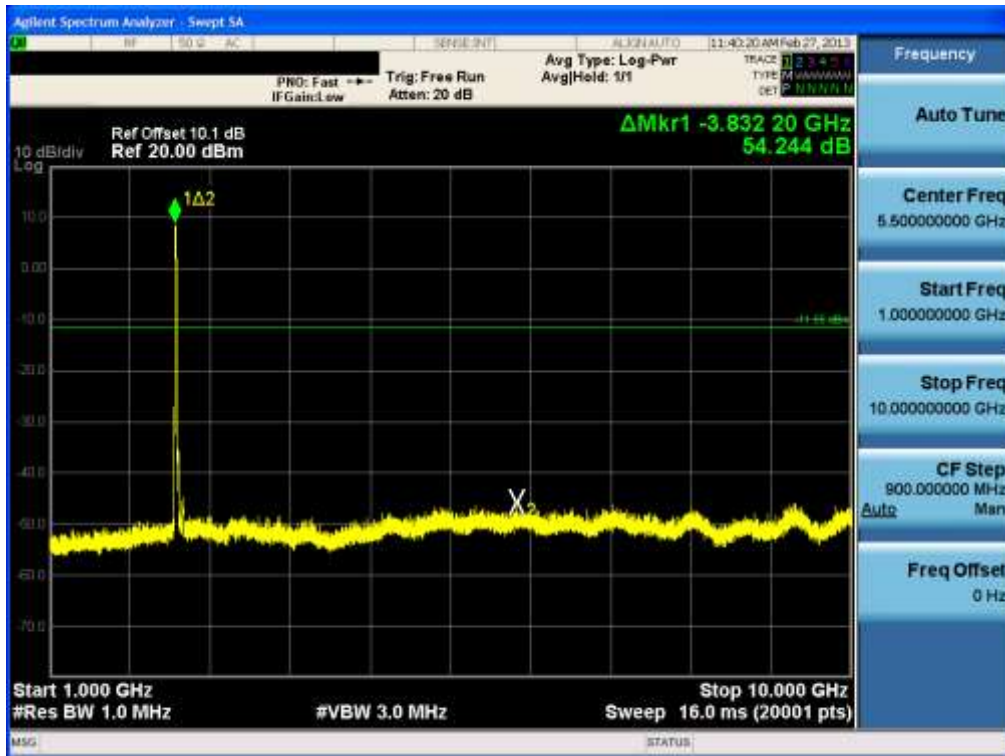


### Conducted Spurious Emission (802.11g-CH11)

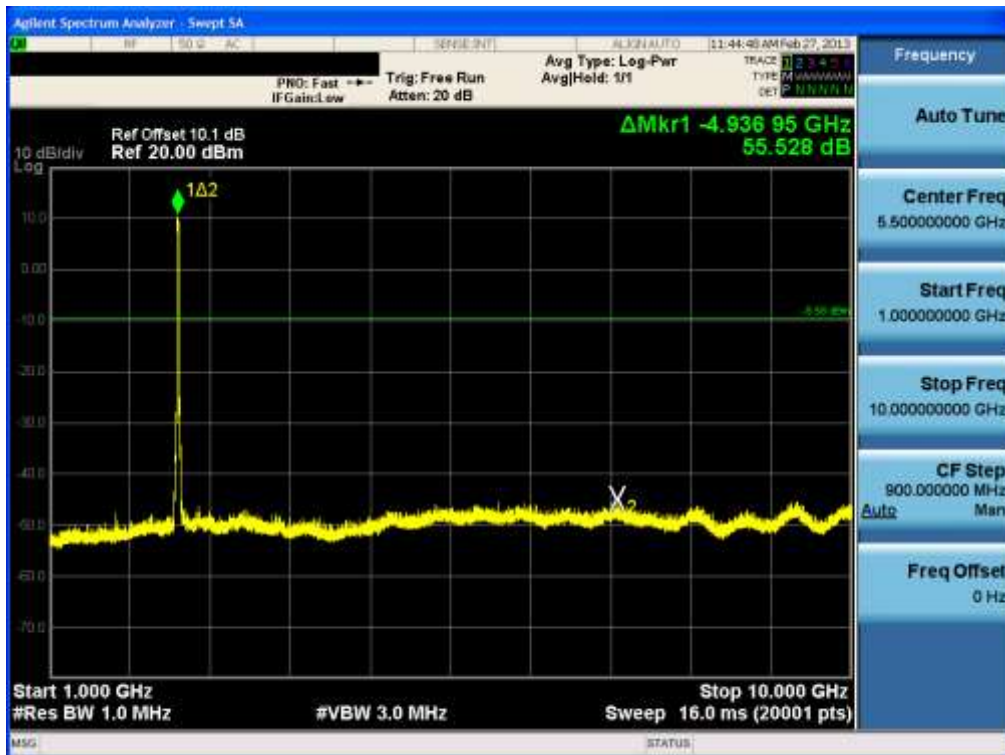


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Spurious Emission (802.11n-CH1)

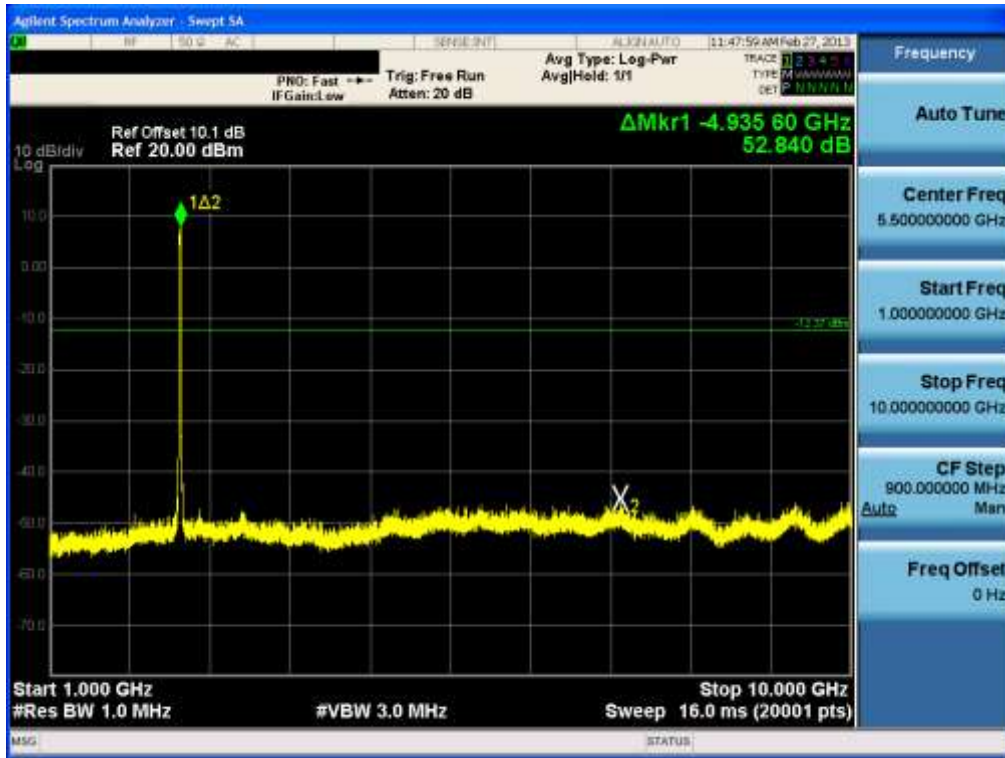


### Conducted Spurious Emission (802.11n-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

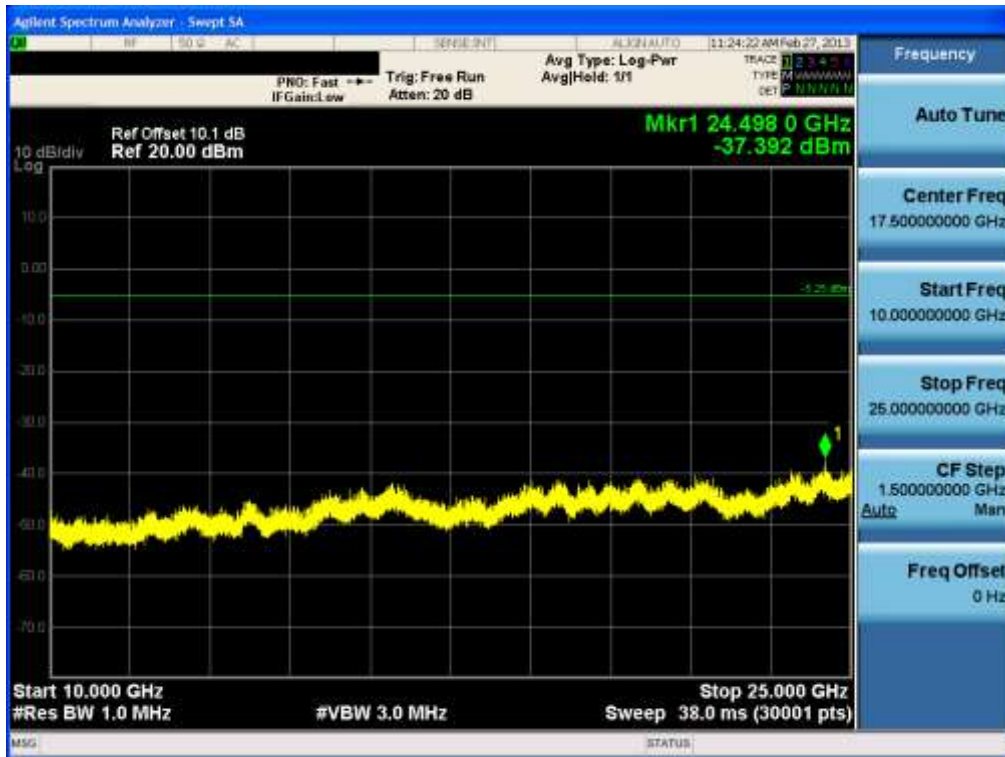
**Conducted Spurious Emission (802.11n-CH11)**



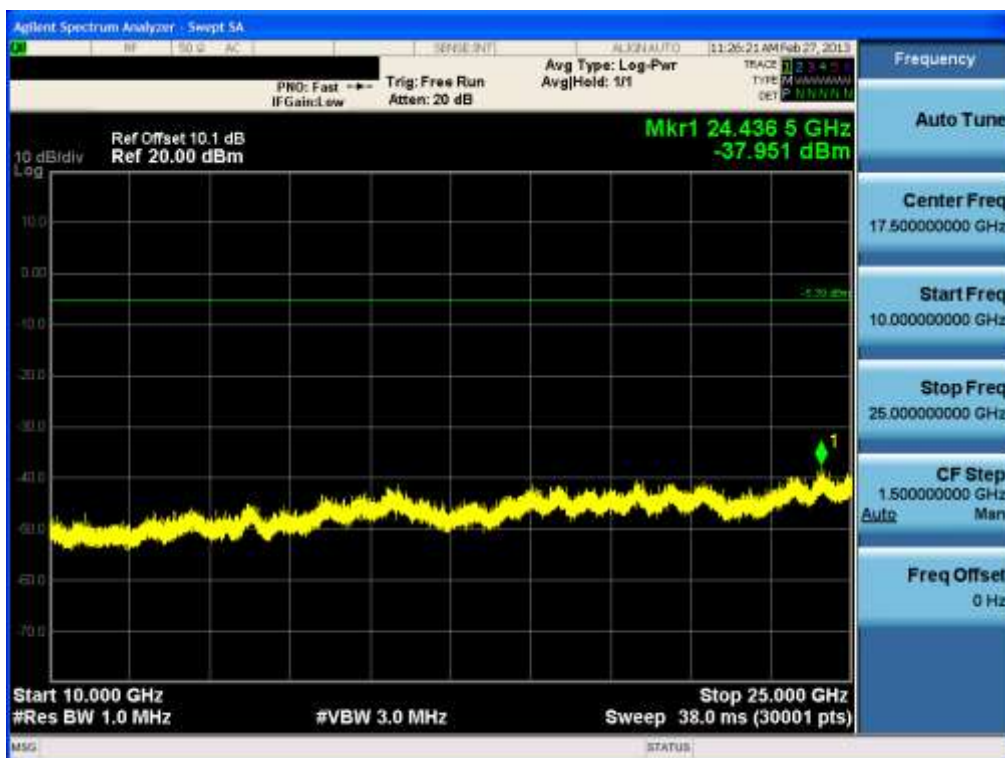
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

10 GHz ~ 25 GHz

**Conducted Spurious Emission (802.11b-CH1)**

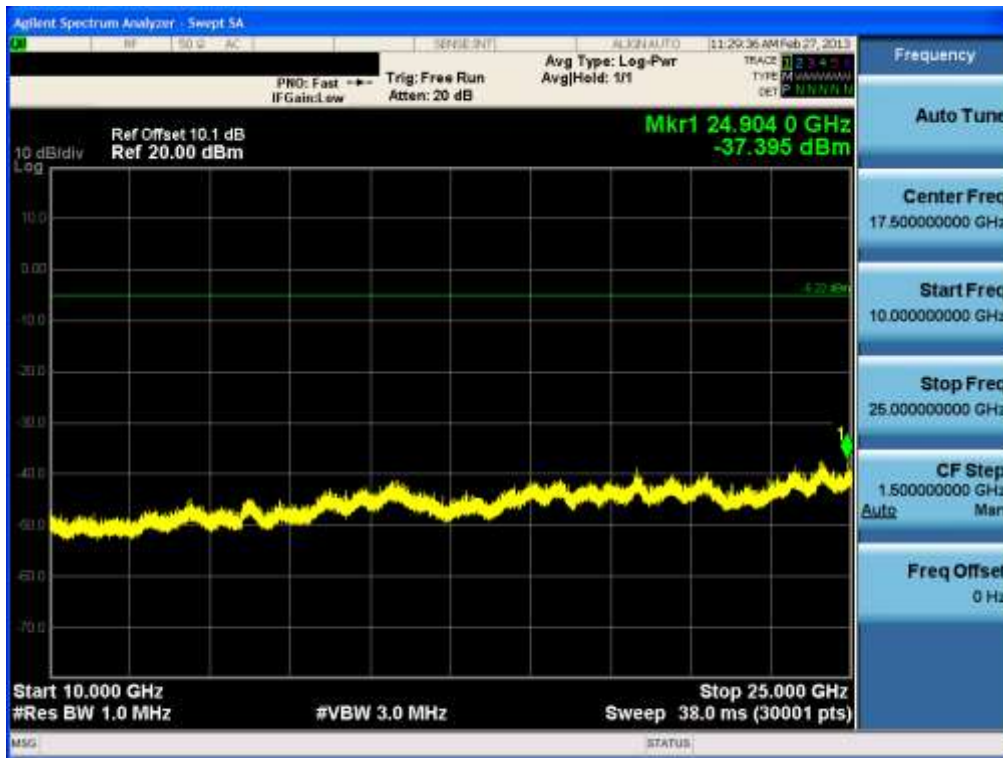


**Conducted Spurious Emission (802.11b-CH6)**

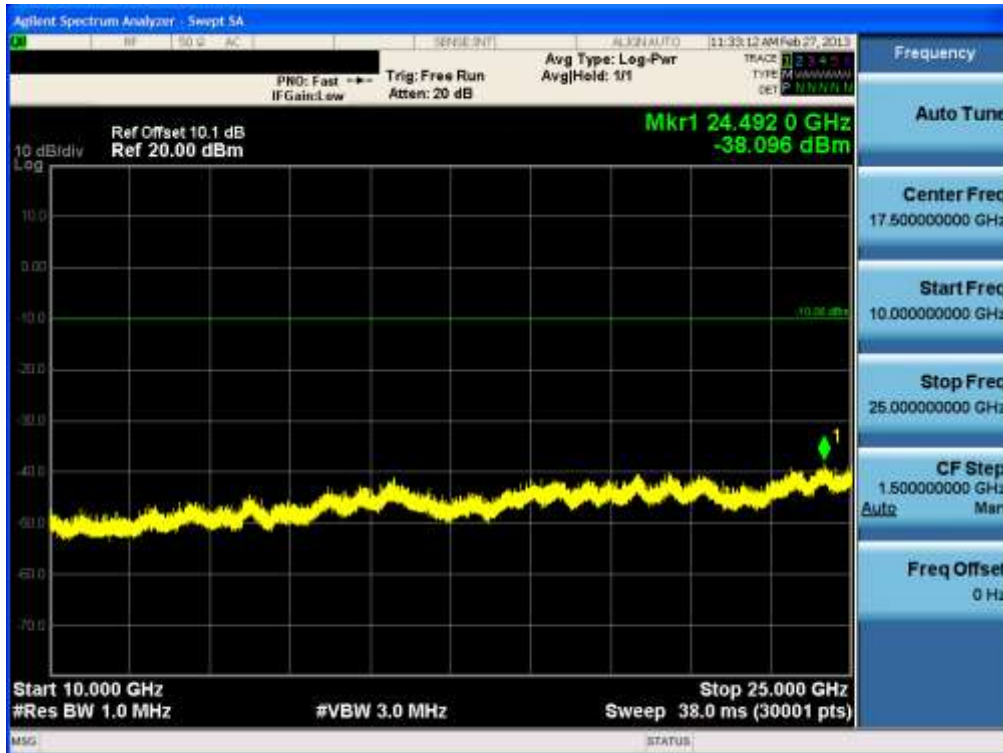


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

### Conducted Spurious Emission (802.11b-CH11)



### Conducted Spurious Emission (802.11g-CH1)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNF713

### Conducted Spurious Emission (802.11g-CH6)



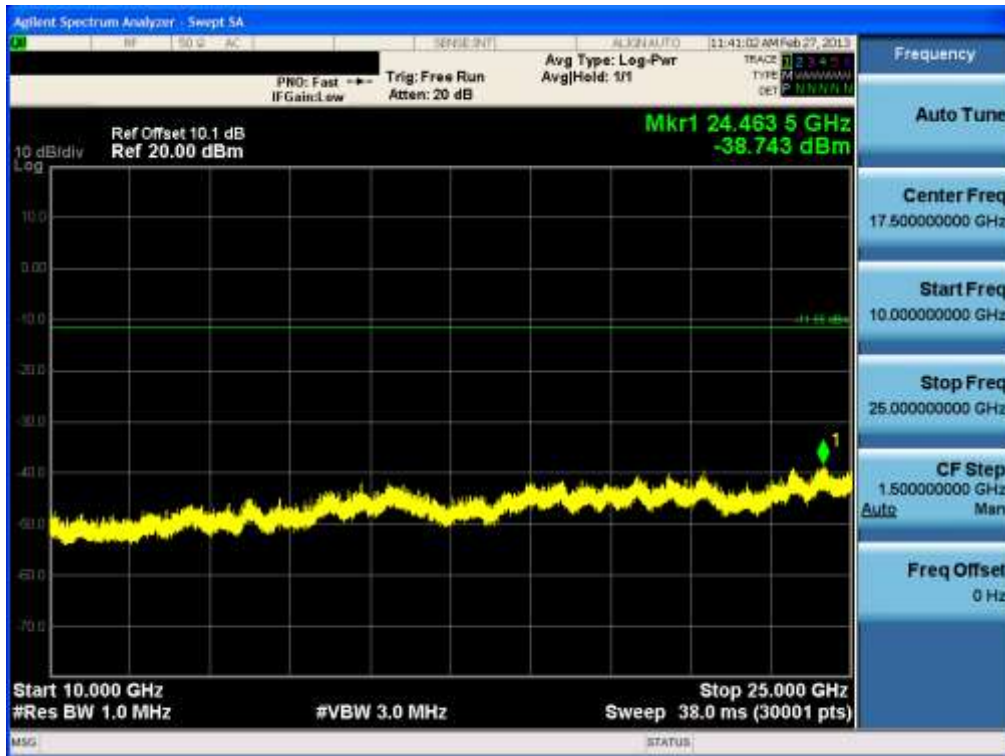
### Conducted Spurious Emission (802.11g-CH11)



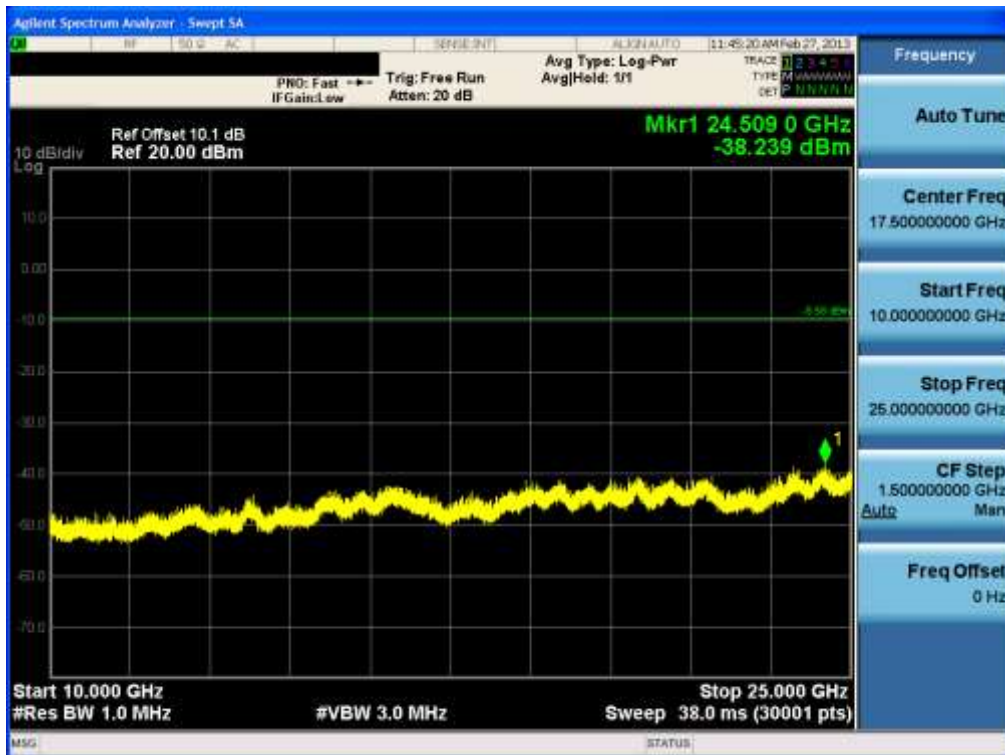
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNF713



### Conducted Spurious Emission (802.11n-CH1)

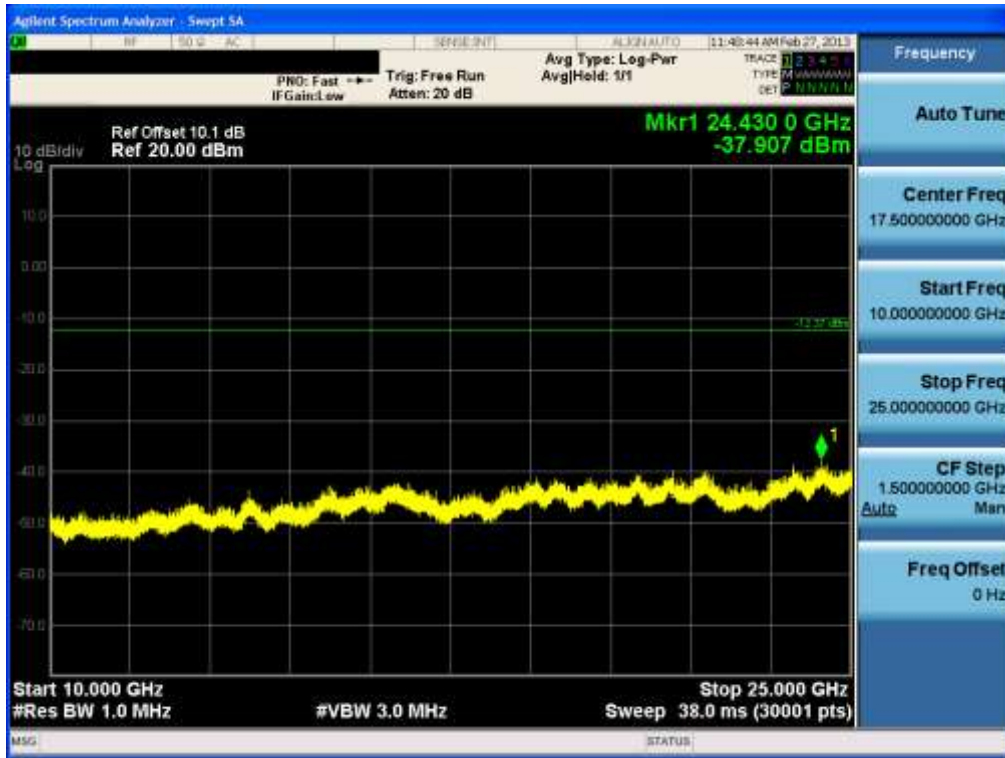


### Conducted Spurious Emission (802.11n-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

**Conducted Spurious Emission (802.11n-CH11)**



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713

**8.5 RADIATED MEASUREMENT.**

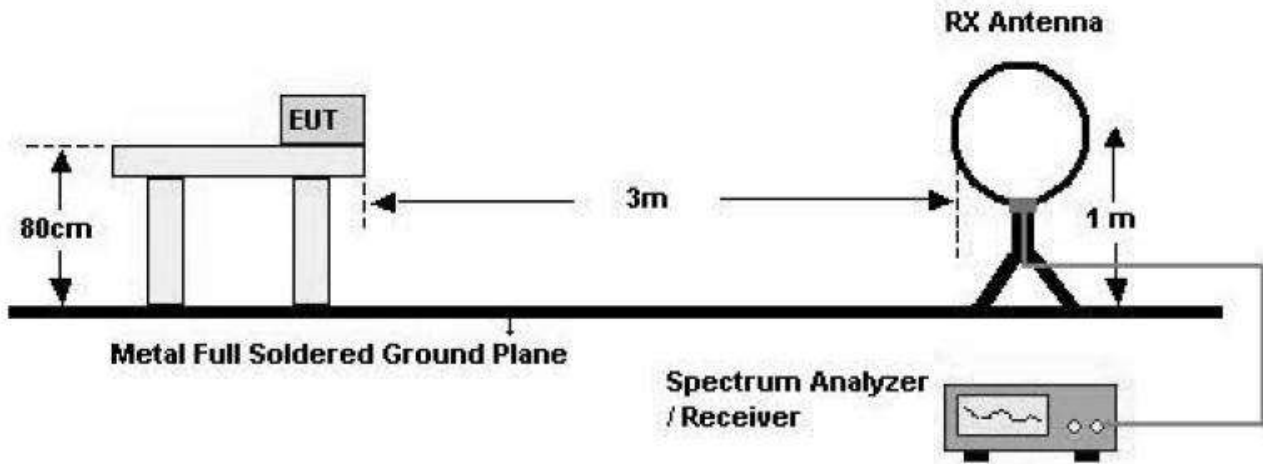
**8.5.1 RADIATED SPURIOUS EMISSIONS.**

Test Requirements and limit, §15.205, §15.209

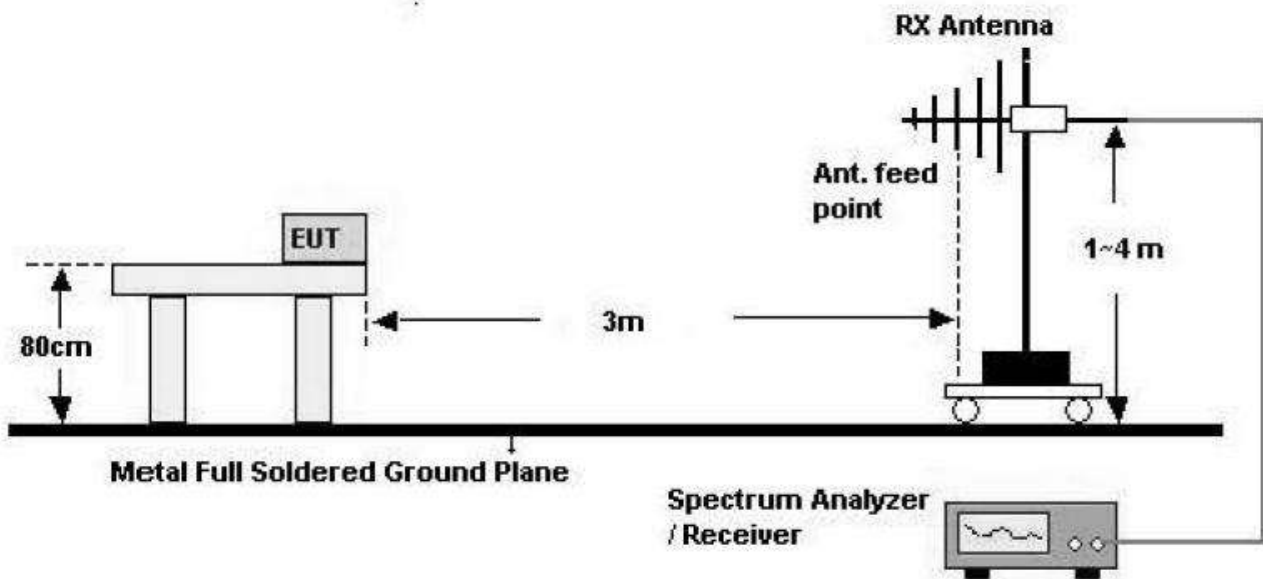
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**Test Configuration**

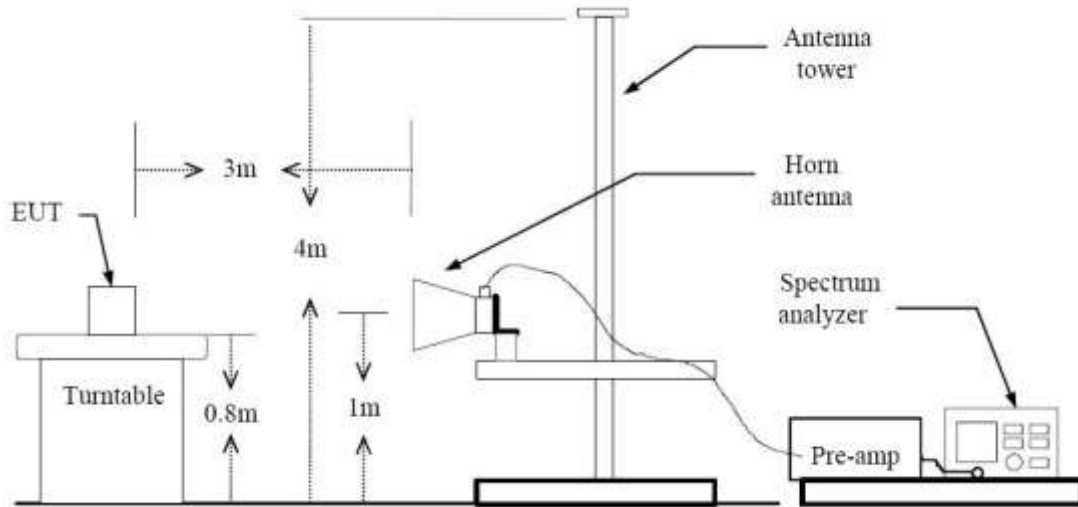
**Below 30 MHz**



**30 MHz - 1 GHz**



**Above 1 GHz**



**TEST PROCEDURE**

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

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN		FCC ID: ZNFP713

**TEST RESULTS**

**9 kHz – 30MHz**

**Operation Mode:** Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V	dB /m	dB	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
No Critical peaks found							

**Notes:**

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

**TEST RESULTS**

**Below 1 GHz**

**Operation Mode:** Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V	dB /m	dB	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
No Critical peaks found							

**Notes:**

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

**Above 1 GHz**

Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	54.61	-0.79	V	53.82	74	20.18	PK
4824	47.97	-0.79	V	47.18	54	6.82	AV
7236	50.04	9.08	V	59.12	74	14.88	PK
7236	36.74	9.08	V	45.82	54	8.18	AV
4824	55.16	-0.79	H	54.37	74	19.63	PK
4824	48.14	-0.79	H	47.35	54	6.65	AV
7236	49.75	9.08	H	58.83	74	15.17	PK
7236	36.72	9.08	H	45.8	54	8.20	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
  - a. Peak ( Procedure 4.2.3.2.2 in ANSI 63.10)
    - RBW = 1 MHz
    - VBW = 3 MHz
    - Detector = Peak
    - Trace = Max hold
    - Sweep = auto couple
  - b. Average ( Procedure 4.2.3.2.3 in ANSI 63.10 )
    - RBW = 1 MH
    - VBW = 10 Hz
    - Span = Zero

<b>FCC PT.15.247 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1302FR25-1	<b>Date of Issue:</b> February 27, 2013	<b>EUT Type:</b> Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	<b>FCC ID:</b> ZNFP713





Detector Mode = Peak

Trace = Max hold

6. We have done 802.11b/g/n mode test. Worst case of EUT is 1 Mbps in 802.11b.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

<b>FCC PT.15.247 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1302FR25-1	<b>Date of Issue:</b> February 27, 2013	<b>EUT Type:</b> Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	<b>FCC ID:</b> ZNFP713

Operation Mode: 802.11 b  
 Transfer Rate: 1 Mbps  
 Operating Frequency: 2437  
 Channel No. 06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	56.27	-0.37	V	55.90	74	18.10	PK
4874	49.97	-0.37	V	49.60	54	4.40	AV
7311	49.34	8.64	V	57.98	74	16.02	PK
7311	35.80	8.64	V	44.44	54	9.56	AV
4874	56.51	-0.37	H	56.14	74	17.86	PK
4874	50.27	-0.37	H	49.90	54	4.10	AV
7311	49.01	8.64	H	57.65	74	16.35	PK
7311	36.65	8.64	H	45.29	54	8.71	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
  - a. Peak ( Procedure 4.2.3.2.2 in ANSI 63.10)
    - RBW = 1 MHz
    - VBW = 3 MHz
    - Detector = Peak
    - Trace = Max hold
    - Sweep = auto couple
  - b. Average ( Procedure 4.2.3.2.3 in ANSI 63.10 )
    - RBW = 1 MH
    - VBW = 10 Hz
    - Span = Zero
    - Detector Mode = Peak

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1302FR25-1	Date of Issue: February 27, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	FCC ID: ZNFP713



Trace = Max hold

- 6. We have done 802.11b/g/n mode test. Worst case of EUT is 1 Mbps in 802.11b.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

<b>FCC PT.15.247 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1302FR25-1	<b>Date of Issue:</b> February 27, 2013	<b>EUT Type:</b> Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	<b>FCC ID:</b> ZNFP713

Operation Mode: 802.11 b  
 Transfer Rate: 1 Mbps  
 Operating Frequency: 2462  
 Channel No. 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	54.70	-0.15	V	54.55	74	19.45	PK
4924	47.18	-0.15	V	47.03	54	6.97	AV
7386	49.72	9.06	V	58.78	74	15.22	PK
7386	36.72	9.06	V	45.78	54	8.22	AV
4924	54.90	-0.15	H	54.75	74	19.25	PK
4924	48.23	-0.15	H	48.08	54	5.92	AV
7386	51.00	9.06	H	60.06	74	13.94	PK
7386	36.58	9.06	H	45.64	54	8.36	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
  - a. Peak ( Procedure 4.2.3.2.2 in ANSI 63.10)
    - RBW = 1 MHz
    - VBW = 3 MHz
    - Detector = Peak
    - Trace = Max hold
    - Sweep = auto couple
  - b. Average ( Procedure 4.2.3.2.3 in ANSI 63.10 )
    - RBW = 1 MH
    - VBW = 10 Hz
    - Span = Zero
    - Detector Mode = Peak

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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Trace = Max hold.

6. We have done 802.11b/g/n mode test. Worst case of EUT is 1 Mbps in 802.11b.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

<b>FCC PT.15.247 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1302FR25-1	<b>Date of Issue:</b> February 27, 2013	<b>EUT Type:</b> Cellular/PCS GSM/GPRS/EDGE Rx only/PCS WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN	<b>FCC ID:</b> ZNFP713

## 8.5.2 RADIATED RESTRICTED BAND EDGES

### Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	30.56	33.90	H	64.46	74	9.54	PK
2390.0	14.97	33.90	H	48.87	54	5.13	AV
2390.0	28.56	33.90	V	62.46	74	11.54	PK
2390.0	13.75	33.90	V	47.65	54	6.35	AV
2483.5	34.00	33.99	H	67.99	74	6.01	PK
2483.5	14.50	33.99	H	48.49	54	5.51	AV
2483.5	32.18	33.99	V	66.17	74	7.83	PK
2483.5	13.93	33.99	V	47.92	54	6.08	AV

### Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. Spectrum setting:
  - a. Peak ( Procedure 4.2.3.2.2 in ANSI 63.10)
    - RBW = 1 MHz
    - VBW = 3 MHz
    - Detector = Peak
    - Trace = Max hold
    - Sweep = auto couple
  - b. Average ( Procedure 4.2.3.2.3 in ANSI 63.10 )
    - RBW = 1 MH
    - VBW = 10 Hz

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Span = Zero

Detector Mode = Peak

Trace = Max hold

3. We have done 802.11b/g/n mode test. . Worst case of EUT is 6 Mbps in 802.11g.

4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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## 8.6 POWERLINE CONDUCTED EMISSIONS

### Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for 11 Mbps, Ch.6 and 802.11b.  
Because 802.11b mode is worst case.



RESULT PLOTS

Conducted Emissions (Line 1)

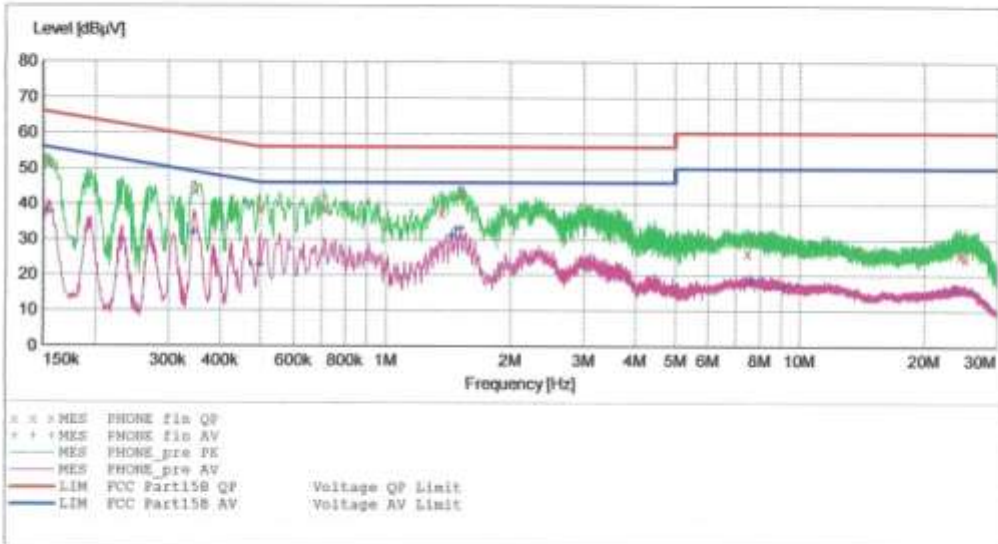
HCT

EMC

EUT: LG-P713  
 Manufacturer: LG  
 Operating Condition: WLAN MODE  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART 15 B  
 Comment: H

SCAN TABLE: "FCC PART 15 B(H)"

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE\_fin\_QP"

1/19/2013 12:31AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.154010	51.50	9.8	66	14.3	---	---
0.348010	43.80	9.7	59	15.2	---	---
0.498010	38.70	9.8	56	17.3	---	---
0.712000	38.70	9.8	56	17.3	---	---
1.368000	37.60	9.8	56	18.4	---	---
1.520000	44.40	9.9	56	11.6	---	---
7.480000	26.40	10.3	60	33.6	---	---
24.432000	25.80	12.0	60	34.2	---	---
25.092000	24.80	12.0	60	35.2	---	---

**MEASUREMENT RESULT: "PHONE\_fin AV"**

1/19/2013 12:31AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.154010	37.70	9.8	56	18.1	---	---
0.346010	32.00	9.7	49	17.1	---	---
0.498010	22.80	9.8	46	23.3	---	---
1.448000	31.10	9.9	46	14.9	---	---
1.484000	32.90	9.9	46	13.1	---	---
1.520000	33.10	9.9	46	12.9	---	---
7.596000	18.10	10.3	50	31.9	---	---
9.168000	17.00	10.4	50	33.0	---	---
23.640000	15.70	11.9	50	34.3	---	---

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## Conducted Emissions (Line 2)

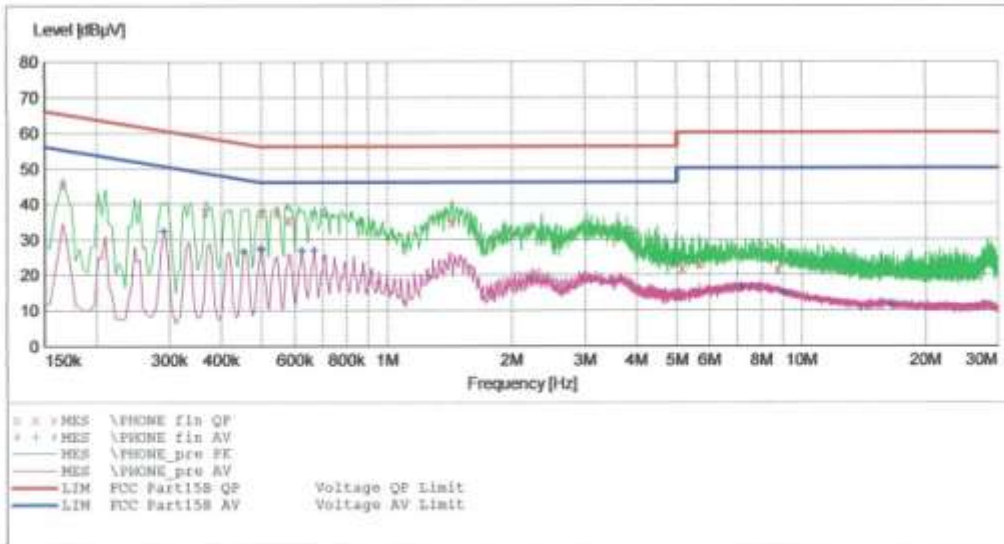
HCT

EMC

EUT: LG-P713  
 Manufacturer: LG  
 Operating Condition: WLAN MODE  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART 15 CLASS B  
 Comment: N

**SCAN TABLE: "FCC PART 15 B(N)"**

Short Description:				FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



**MEASUREMENT RESULT: "\PHONE\_fin QP"**

1/19/2013 12:37AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.166010	45.40	9.9	65	19.8	---	---
0.366010	37.90	10.0	59	20.6	---	---
0.500000	37.50	10.0	56	18.5	---	---
0.544000	37.60	10.0	56	18.4	---	---
0.580000	35.40	10.0	56	20.6	---	---
1.440000	34.80	10.0	56	21.2	---	---
5.160000	21.80	10.4	60	38.2	---	---
5.656000	23.00	10.4	60	37.0	---	---
8.772000	21.50	10.6	60	38.5	---	---

**MEASUREMENT RESULT: "\PHONE\_fin AV"**

1/19/2013 12:37AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.290010	32.20	9.9	51	18.3	---	---
0.454010	26.30	10.0	47	20.5	---	---
0.498010	27.00	10.0	46	19.0	---	---
0.500000	27.30	10.0	46	18.7	---	---
0.624000	26.70	10.0	46	19.3	---	---
0.668000	26.80	10.0	46	19.2	---	---
7.164000	16.70	10.5	50	33.3	---	---
9.108000	14.80	10.6	50	35.2	---	---
16.548000	11.60	11.5	50	38.4	---	---

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## 9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073
Schwarzbeck	VULB 9168/ TRILOG Antenna	Biennial	06/17/2013	255
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	05/03/2013	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	05/02/2013	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	07/31/2013	MY51110020
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/11/2013	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2013	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2013	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/09/2013	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2013	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	05/02/2013	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	05/02/2013	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	05/02/2013	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2013	11377
Hewlett Packard	11667B / Power Splitter	Annual	06/05/2013	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2013	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2013	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/07/2013	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	05/02/2013	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
MITEQ	AMF-6D-001180-35-20P/ POWER AMP	Annual	07/30/2013	990893
Agilent	8493C / Attenuator(10 dB)	Annual	07/30/2013	76649
WEINSCHL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617
CERNEX	CBLU1183540 / POWER AMP	Annual	07/27/2013	21691

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