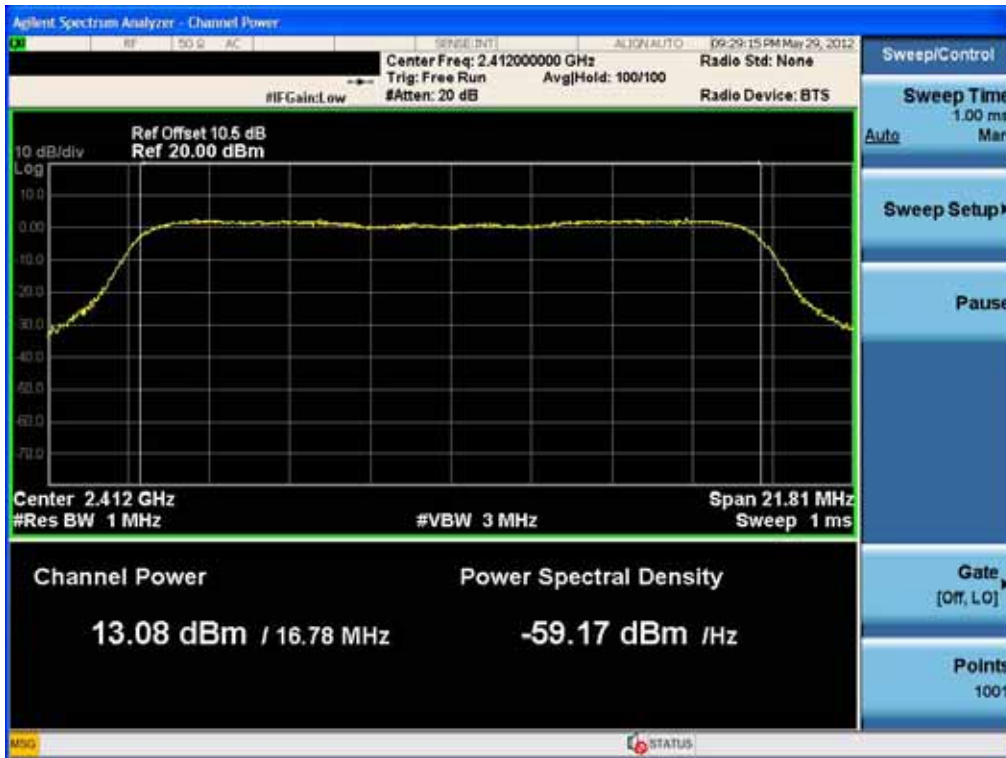


### Conducted Output Power (802.11g-CH 1) 24Mbps



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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

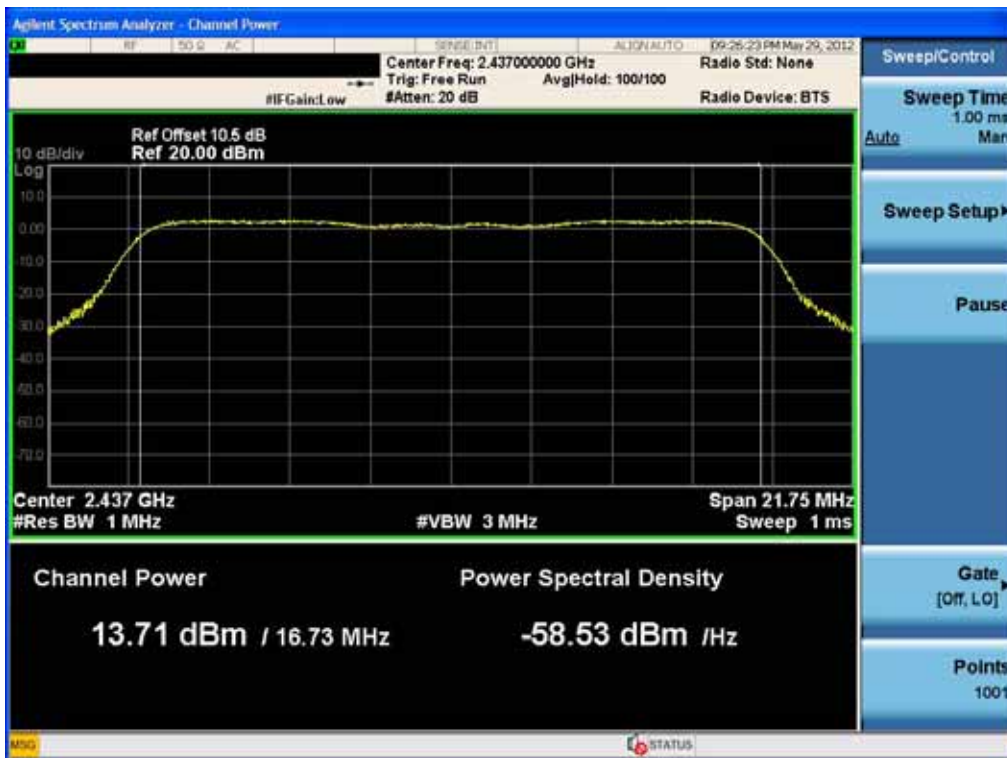


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

### Conducted Output Power (802.11g-CH 6) 12Mbps



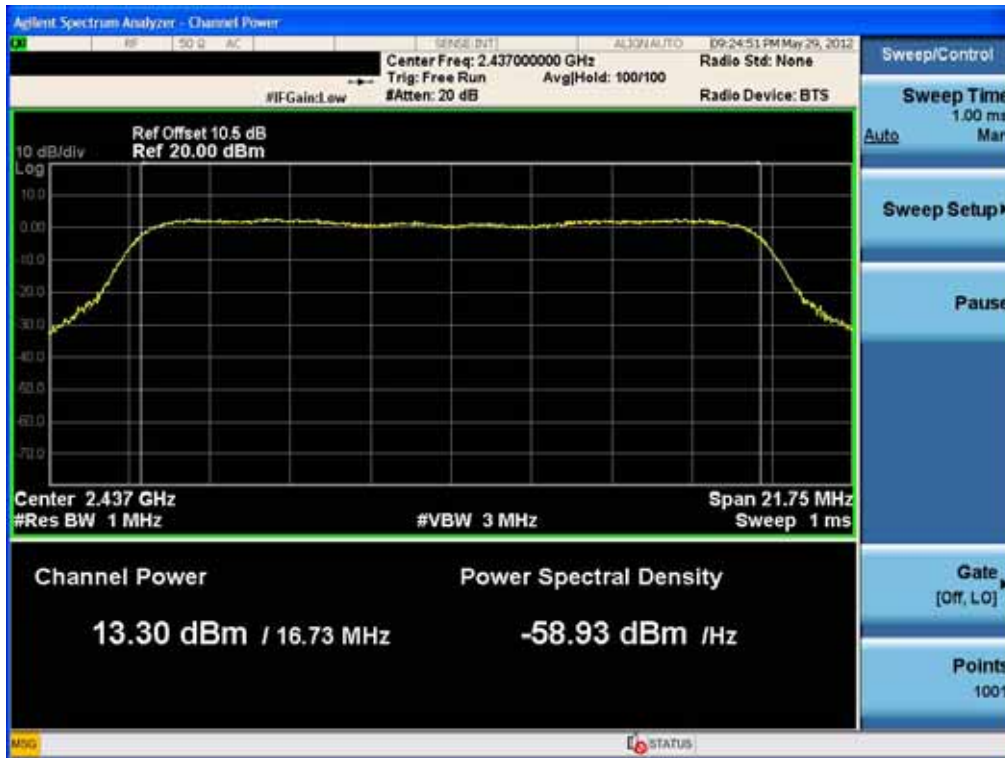
### Conducted Output Power (802.11g-CH 6) 18Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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

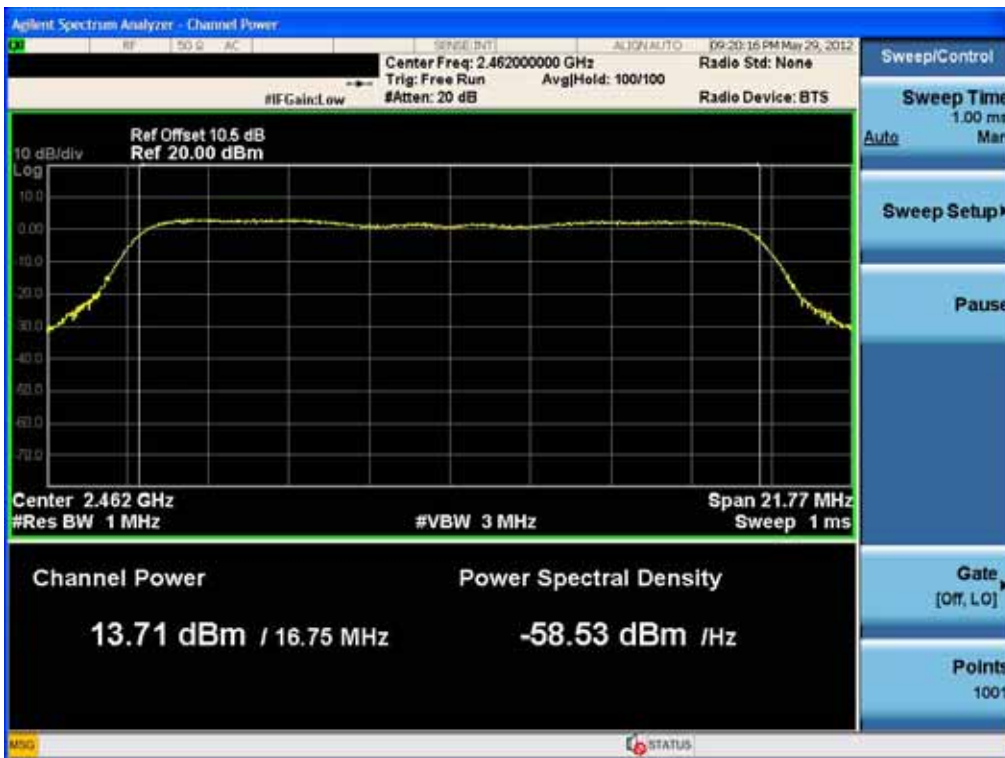


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

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

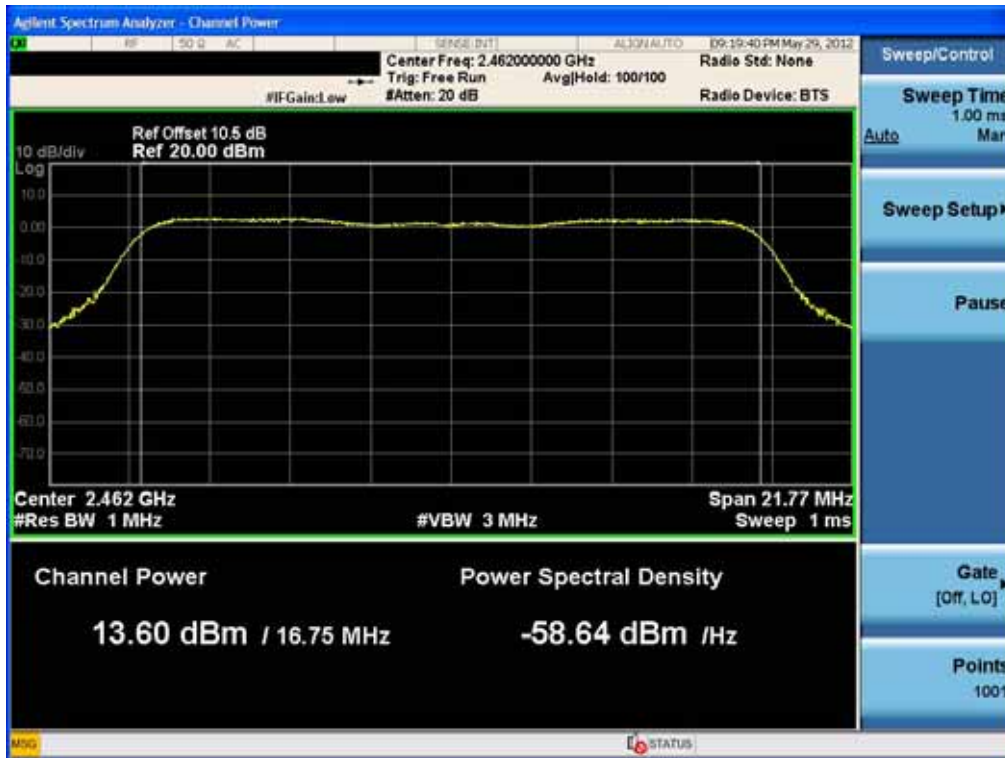


### Conducted Output Power (802.11g-CH 11) 9Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

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



### Conducted Output Power (802.11g-CH 11) 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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

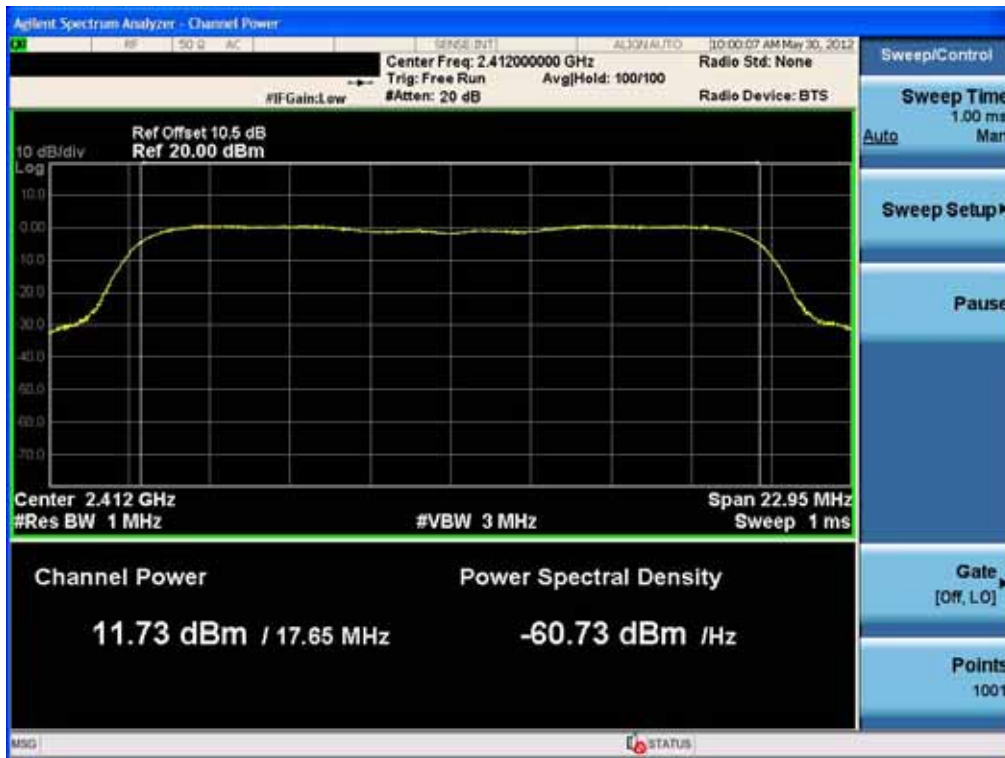


### Conducted Output Power (802.11g-CH 11) 54Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



### Conducted Output Power (802.11n-CH 6) 39Mbps



### Conducted Output Power (802.11n-CH 6) 52Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

### Conducted Output Power (802.11n-CH 6) 58.5Mbps



### Conducted Output Power (802.11n-CH 6) 65Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

### Conducted Output Power (802.11n-CH 11) 19.5Mbps



### Conducted Output Power (802.11n-CH 11) 26Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



### Conducted Output Power (802.11n-CH 11) 39Mbps



### Conducted Output Power (802.11n-CH 11) 52Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

### Conducted Output Power (802.11n-CH 11) 58.5Mbps



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

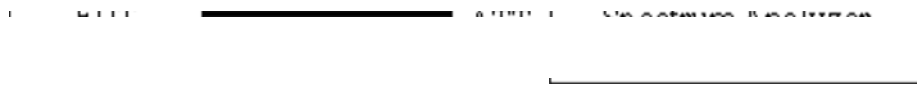
### 8.3 POWER SPECTRAL DENSITY (802.11b/g/n)

#### 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 KDB 558074(issued 1/18/2012).

The spectrum analyzer is set to :

1. Span = 5 – 30 % greater than the EBW
2. RBW = 100 kHz
3. VBW = 300 kHz
4. Sweep = Auto couple
5. Detector Mode = Peak
6. Trace Mode = Max hold
7. Search peak

#### ■ Sample Calculation

$$\begin{aligned} \text{PSD} &= \text{Reading Value} + \text{ATT loss} + \text{Cable loss}(1 \text{ ea}) + \text{BWCF} \\ &= -5 \text{ dBm} + 10 \text{ dB} + 0.8 \text{ dB} - 15.2 \text{ dB} = 0.6 \text{ dBm} \end{aligned}$$

$$\text{Where: BWCF(Bandwidth Correction Factor)} = 10\log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$$

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 10.49 dB at 2412 MHz and is 10.52 dB at 2462 MHz. So, the offset is 10.5 dB. And the offset gab in the 2.4 GHz range do not affect the power spectral density final result.

<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> HCTR1206FR03	<b>Date of Issue:</b> June 05, 2012	<b>EUT Type:</b> Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	<b>FCC ID:</b> ZNFE610V

■ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Spectrum Value(dBm)	BWCF (dB)	PSD (dBm)	Limit (dBm)	Pass/Fail
2412	1	802.11b	10.665	-15.2	-4.54	8	Pass
2437	6		10.290	-15.2	-4.91	8	Pass
2462	11		10.705	-15.2	-4.50	8	Pass
2412	1	802.11g	3.903	-15.2	-11.30	8	Pass
2437	6		4.000	-15.2	-11.20	8	Pass
2462	11		4.235	-15.2	-10.97	8	Pass
2412	1	802.11n	2.822	-15.2	-12.38	8	Pass
2437	6		2.876	-15.2	-12.32	8	Pass
2462	11		3.145	-15.2	-12.06	8	Pass

Note : PSD = Spectrum Value + BWCF



RESULT PLOTS

Power Spectral Density (802.11b-CH 1)



Power Spectral Density (802.11b-CH 6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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

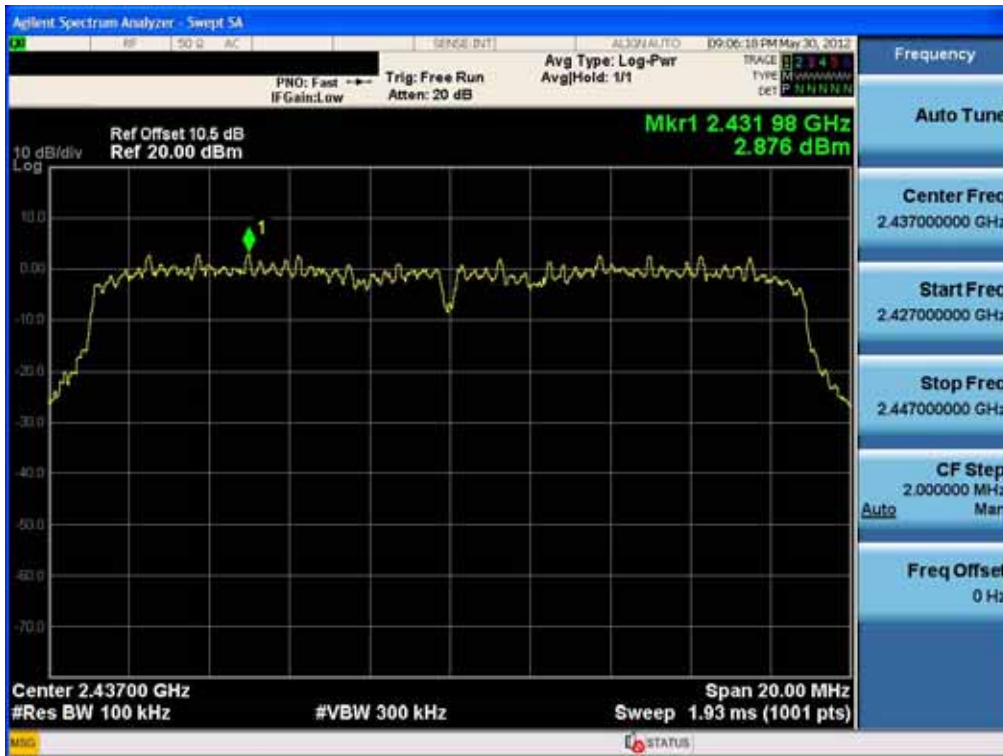


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



**Power Spectral Density (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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

## 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.

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 10.49 dB at 2412 MHz and is 10.52 dB at 2462 MHz. So, the offset is 10.5 dB. And the offset gap in the 2.4 GHz range do not affect the band edge final result.
4. In case of conducted spurious emissions test, please check factors blow table.

<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> HCTR1206FR03	<b>Date of Issue:</b> June 05, 2012	<b>EUT Type:</b> Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	<b>FCC ID:</b> ZNFE610V

■ FACTORS FOR FREQUENCY

Freq(MHz)	Factor(dB)
30	9.96
100	10.00
100	10.06
200	10.12
300	10.16
400	10.12
500	10.14
600	10.19
700	10.34
800	10.25
900	10.29
1000	10.26
1000	10.31
2000	10.53
2400*	10.49
2500*	10.53
3000	10.66
4000	10.77
5000	10.73
6000	10.99
7000	11.18
8000	11.33
9000	11.48
10000	11.61
11000	12.09
12000	14.96
13000	12.55
14000	11.88
15000	11.83
16000	11.81
17000	11.98
18000	11.84
19000	12.14
20000	12.29
21000	12.33
22000	12.82
23000	12.86
24000	12.98
25000	13.08
26000	12.80

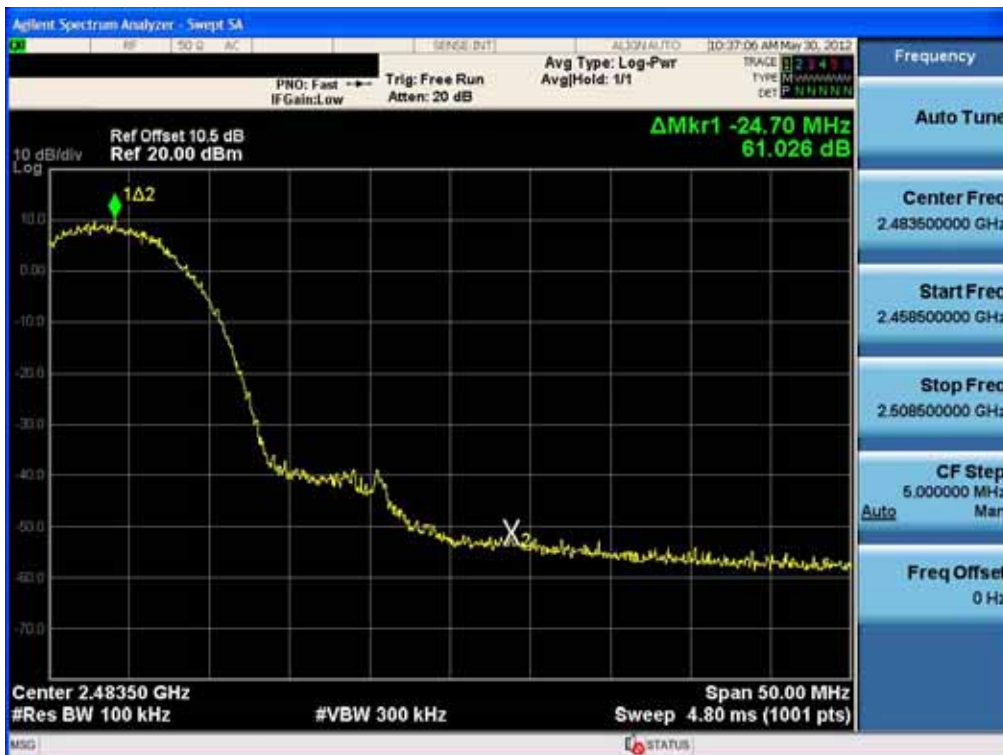
Note : 1. \*\* is fundamental frequency range.  
 2. Factor = Cable loss + Attenuator loss

RESULT PLOTS

BandEdge (802.11b-CH1)



BandEdge (802.11b-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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

### BandEdge (802.11g-CH1)



### BandEdge (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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



### BandEdge (802.11n-CH1)

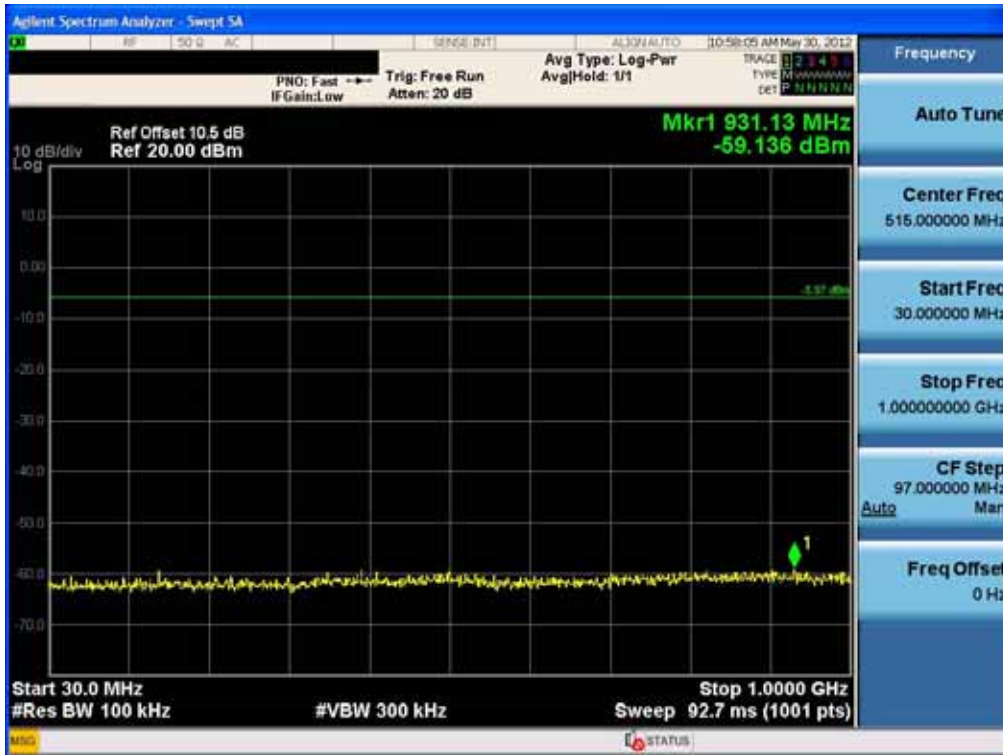


### BandEdge (802.11n-CH11)

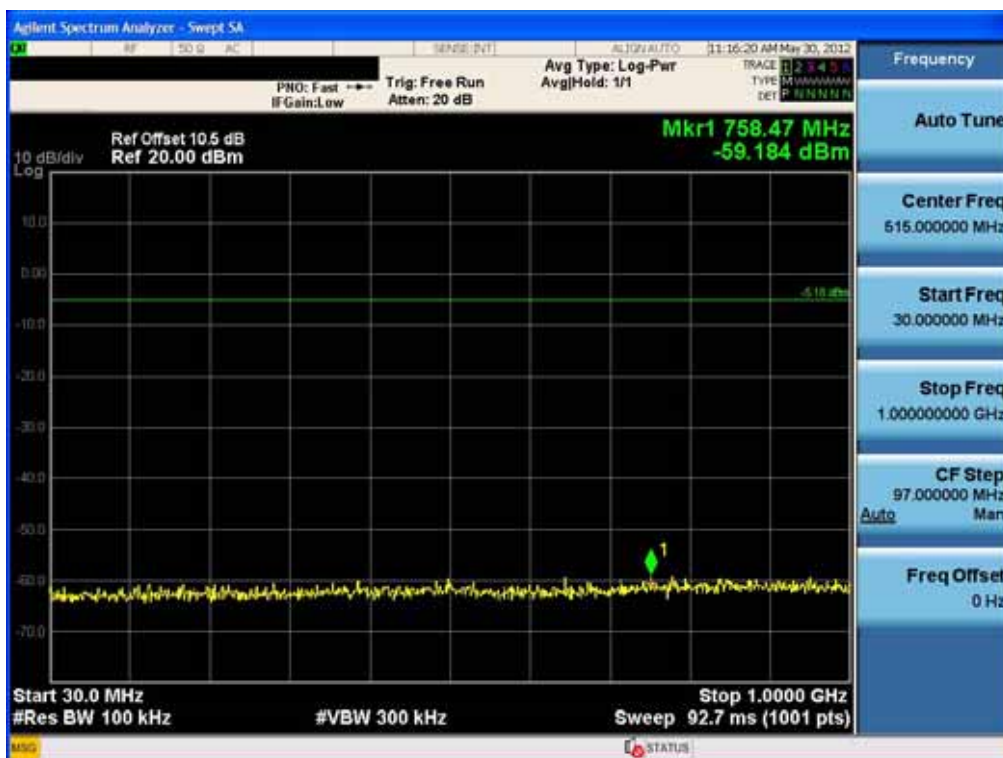


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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

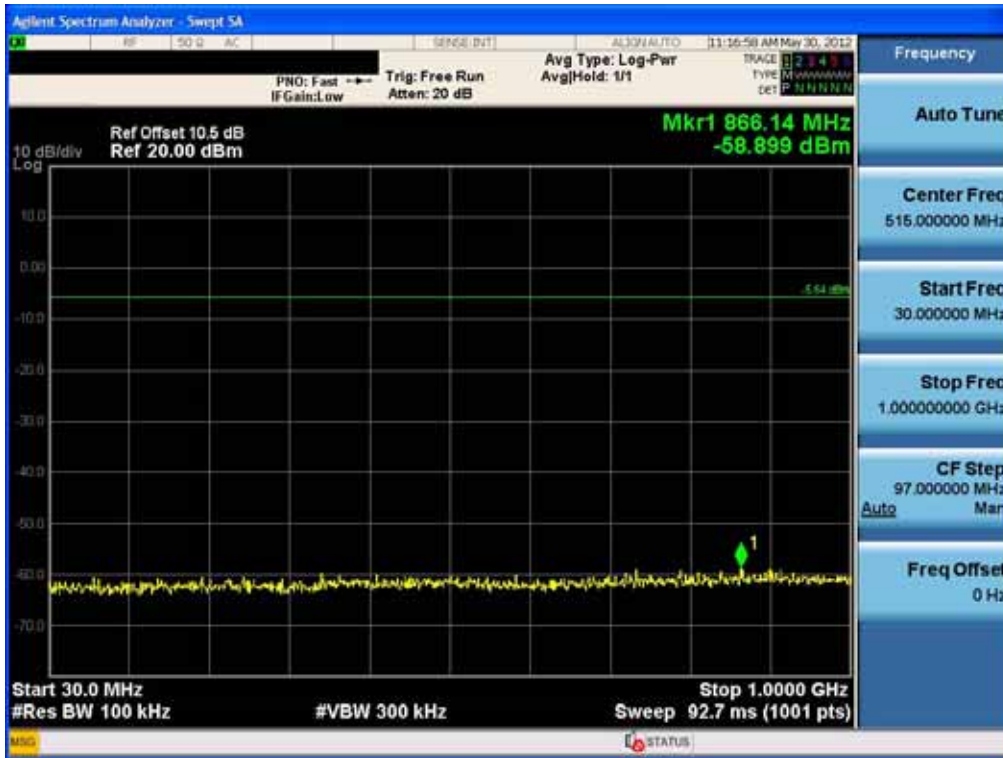


### Conducted Spurious Emission (802.11b-CH6)

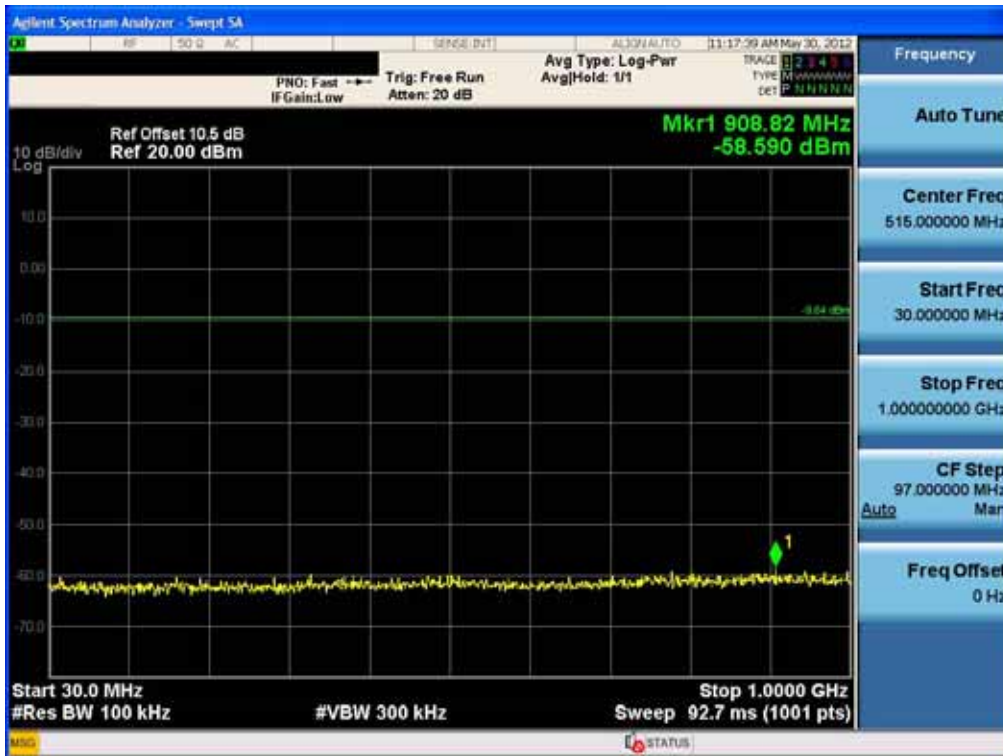


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V

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

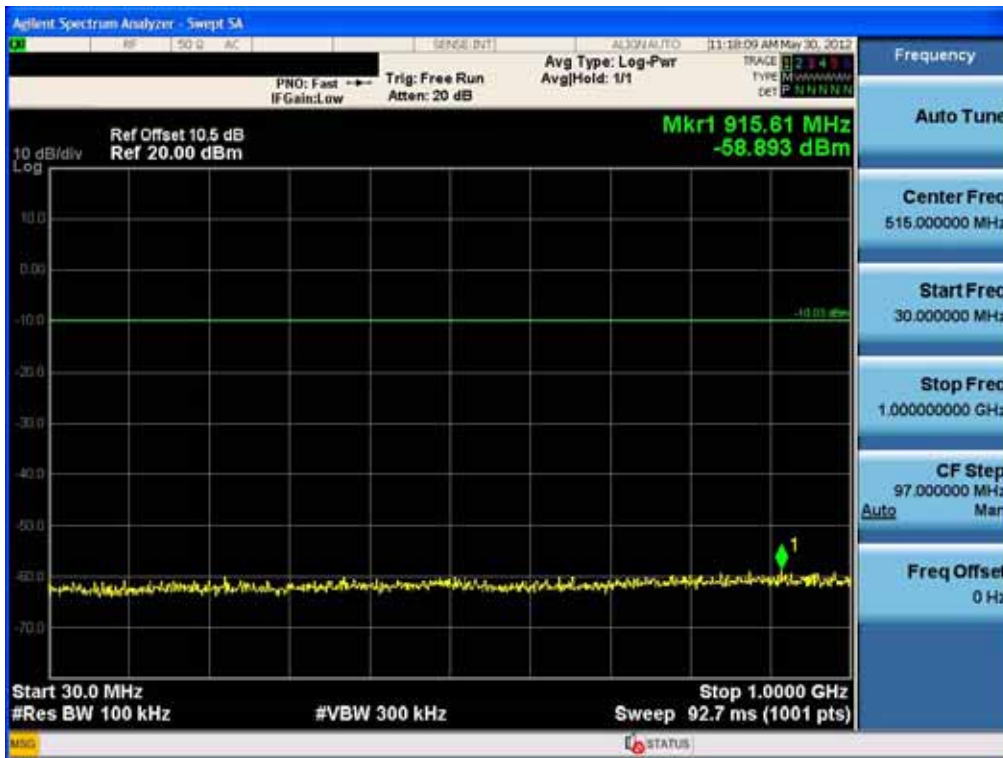


### Conducted Spurious Emission (802.11g-CH1)

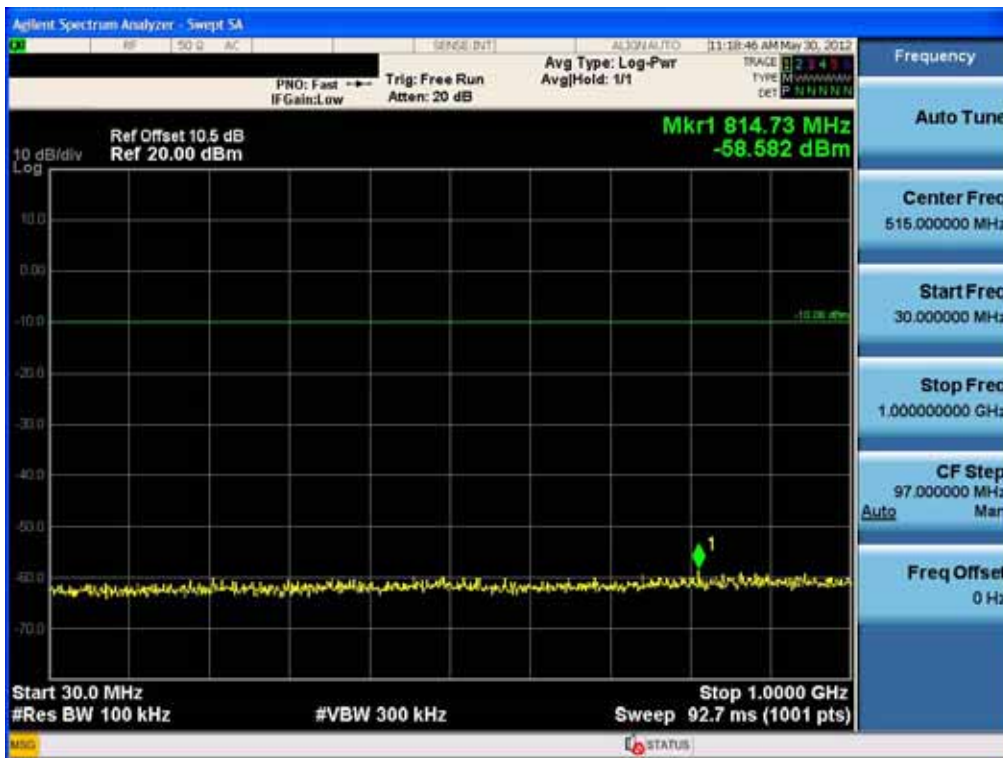


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

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



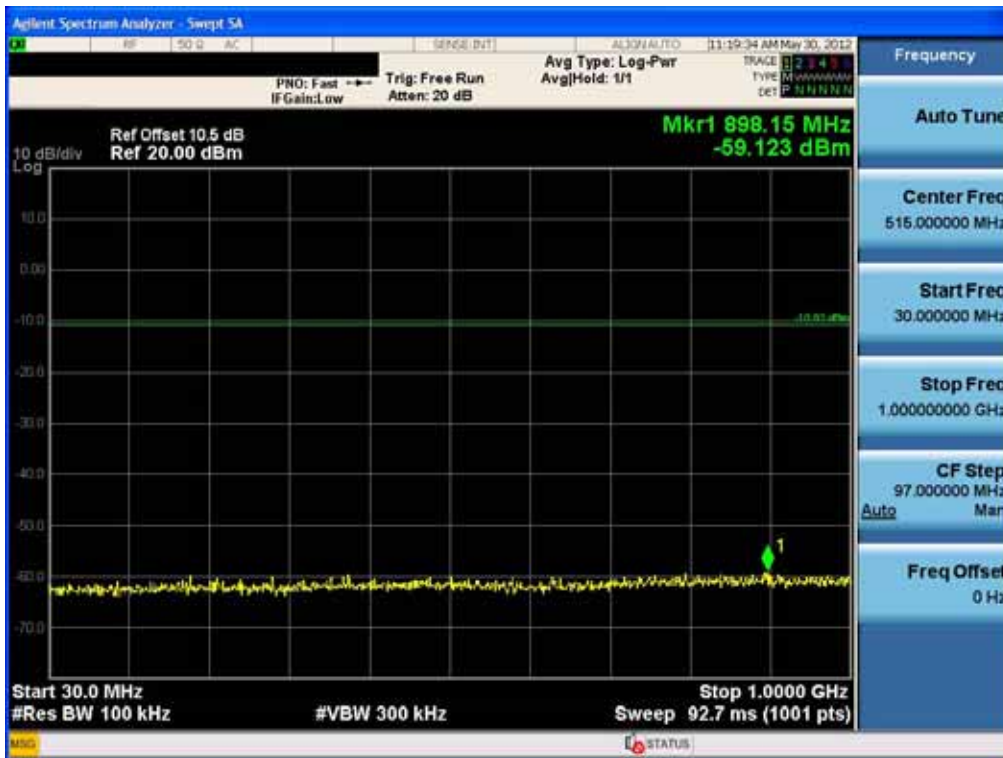
### Conducted Spurious Emission (802.11g-CH11)



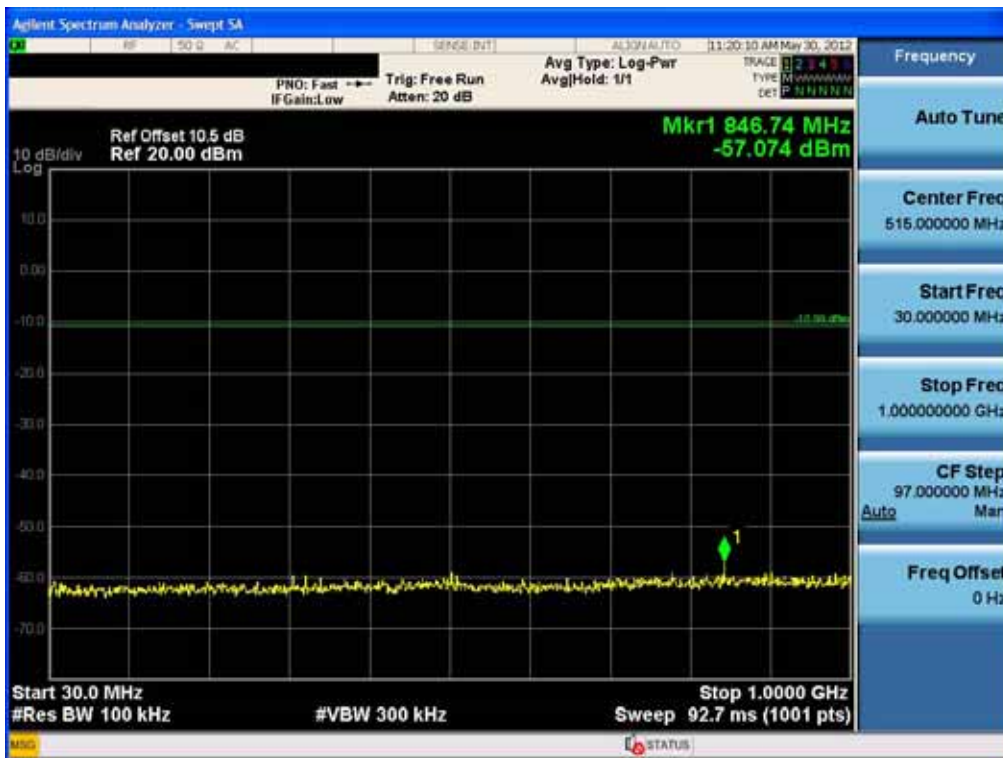
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



### 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V





1 GHz ~ 26 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

### 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

### 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

### 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



### 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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V

**8.5 RADIATED MEASUREMENT.**

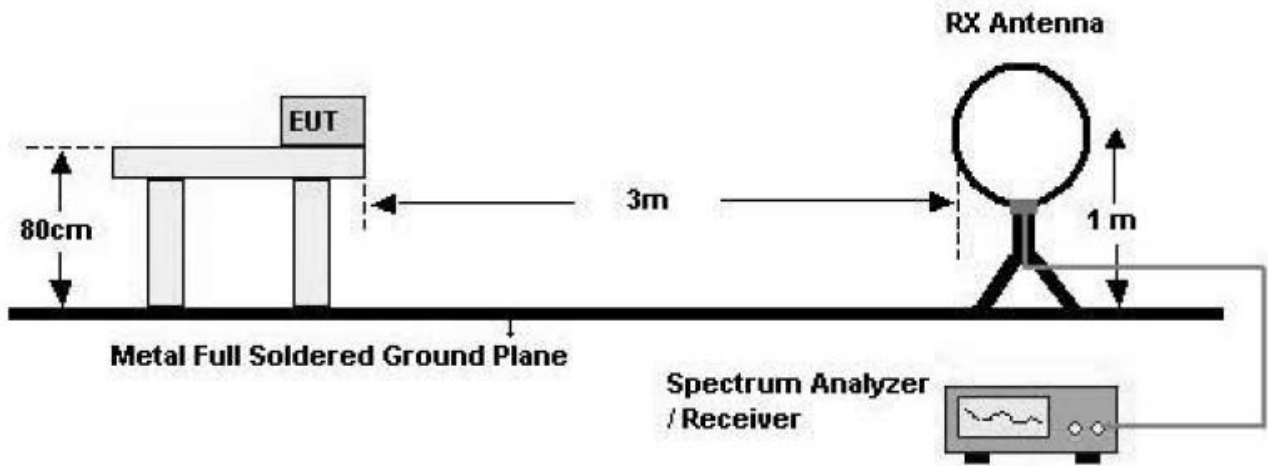
**8.5.1 RADIATED SPURIOUS EMISSIONS.**

Test Requirements and limit, §15.205, §15.209

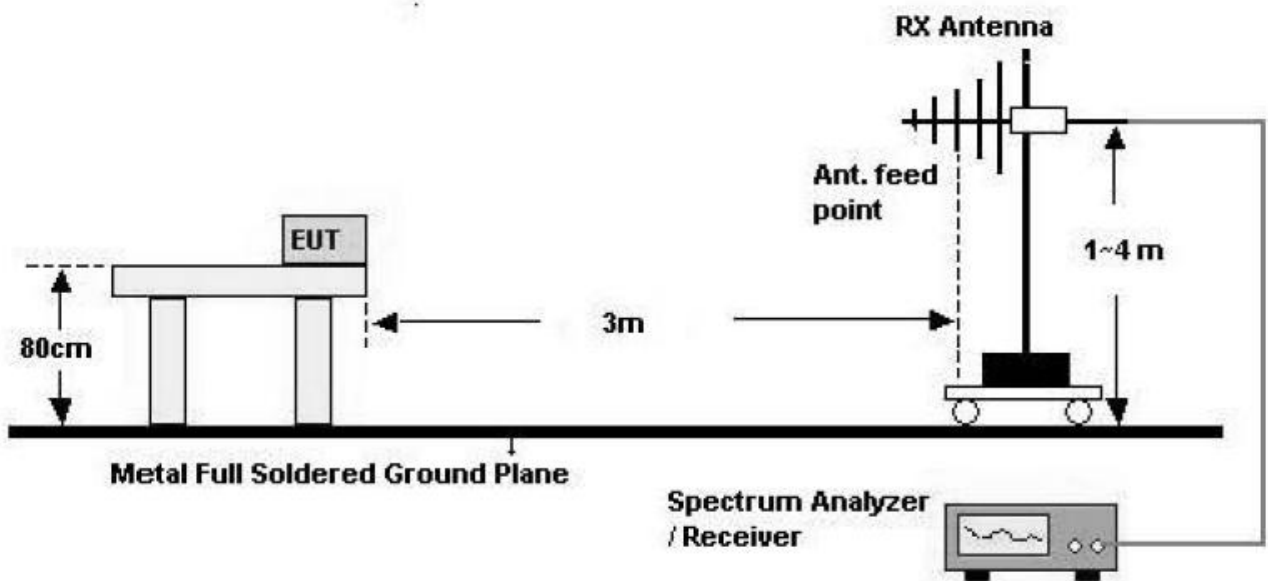
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**Test Configuration**

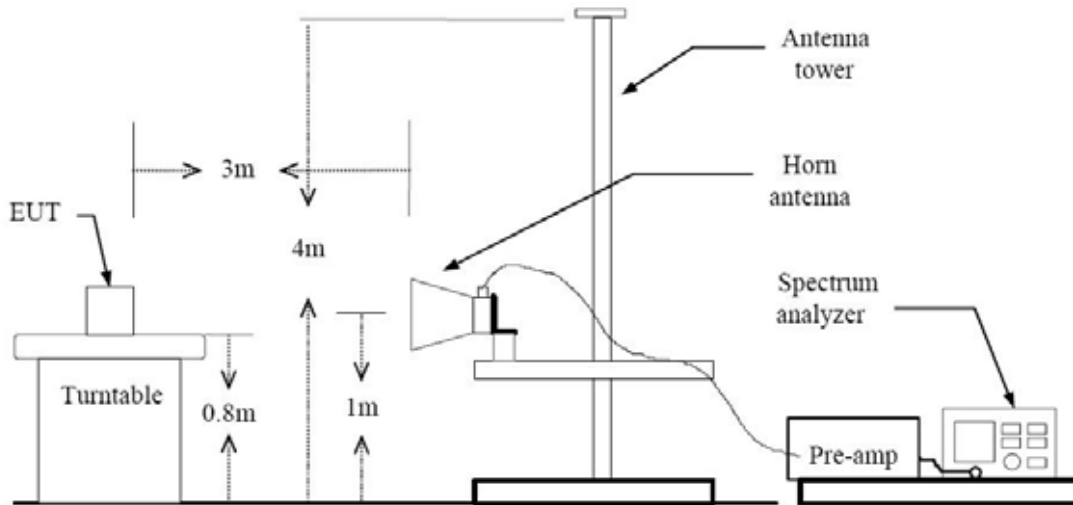
**Below 30 MHz**



**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. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		FCC ID: ZNFE610V

**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	52.34	-0.10	V	52.24	74	21.76	PK
4824	42.17	-0.10	V	42.07	54	11.93	AV
7236	48.34	10.13	V	58.47	74	15.53	PK
7236	34.17	10.13	V	44.30	54	9.70	AV
4824	53.65	-0.10	H	53.55	74	20.45	PK
4824	45.49	-0.10	H	45.39	54	8.61	AV
7236	48.14	10.13	H	58.27	74	15.73	PK
7236	34.19	10.13	H	44.32	54	9.68	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 Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
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.



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	51.51	0.13	V	51.64	74	22.36	PK
4874	40.46	0.13	V	40.59	54	13.41	AV
7311	47.75	10.01	V	57.76	74	16.24	PK
7311	34.03	10.01	V	44.04	54	9.96	AV
4874	52.74	0.13	H	52.87	74	21.13	PK
4874	43.03	0.13	H	43.16	54	10.84	AV
7311	47.75	10.01	H	57.76	74	16.24	PK
7311	34.19	10.01	H	44.20	54	9.80	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 Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
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.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



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	50.77	0.45	V	51.22	74	22.78	PK
4924	38.79	0.45	V	39.24	54	14.76	AV
7386	48.72	10.17	V	58.89	74	15.11	PK
7386	34.70	10.17	V	44.87	54	9.13	AV
4924	51.54	0.45	H	51.99	74	22.01	PK
4924	42.13	0.45	H	42.58	54	11.42	AV
7386	48.28	10.17	H	58.45	74	15.55	PK
7386	34.72	10.17	H	44.89	54	9.11	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 Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
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.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		FCC ID: ZNFE610V

## 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	33.86	H	64.42	74	9.58	PK
2390.0	13.65	33.86	H	47.51	54	6.49	AV
2390.0	30.30	33.86	V	64.16	74	9.84	PK
2390.0	13.50	33.86	V	47.36	54	6.64	AV
2483.5	35.63	34.02	H	69.65	74	4.35	PK
2483.5	16.32	34.02	H	50.34	54	3.66	AV
2483.5	36.37	34.02	V	70.39	74	3.61	PK
2483.5	15.54	34.02	V	49.56	54	4.44	AV

#### Notes:

- Total = Reading Value + Antenna Factor + Cable Loss
- Spectrum setting:
  - Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
- We have done 802.11b/g/n mode test. . Worst case of EUT is 1 Mbps in 802.11b
- We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFE610V



## 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 (dBµV)	
	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 54 Mbps, Ch.11 and 802.11g. Because 802.11g mode is worst case.

■ RESULT PLOTS

Conducted Emissions (Line 1)

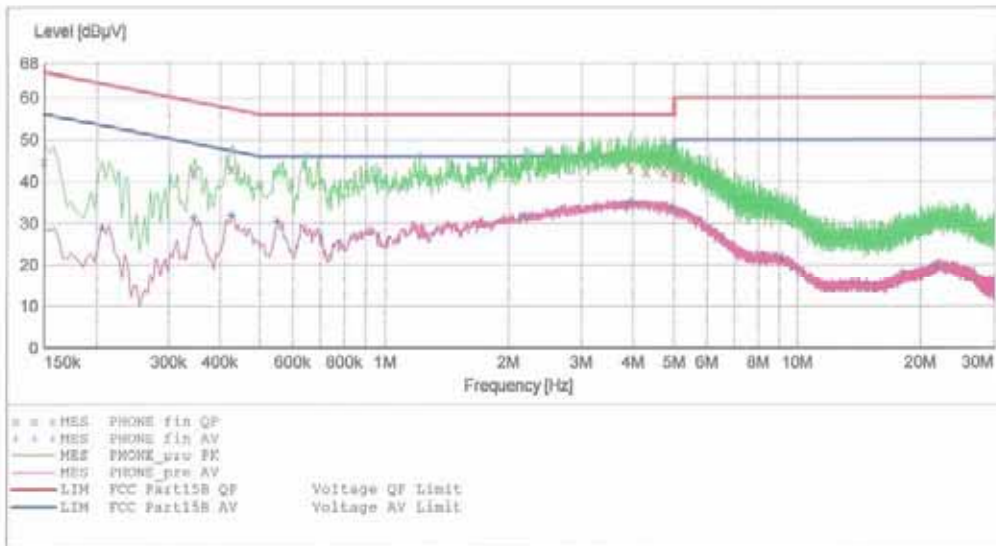
HCT

EMC

EUT: LG-E610v  
 Manufacturer: LGE  
 Operating Condition: WLAN MODE  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART15 CLASS B  
 Comment: N

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

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

5/30/2012 3:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150010	44.80	10.0	66	21.2	---	---
0.346010	42.10	10.1	59	16.9	---	---
0.426010	43.10	10.1	57	14.2	---	---
3.944000	42.90	10.3	56	13.1	---	---
4.292000	42.40	10.4	56	13.6	---	---
4.732000	42.40	10.4	56	13.6	---	---
5.000000	41.00	10.5	56	15.0	---	---
5.048000	41.70	10.5	60	18.3	---	---
5.228000	40.70	10.5	60	19.3	---	---

MEASUREMENT RESULT: "PHONE\_fin AV"

5/30/2012 3:38PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.206010	28.80	10.1	53	24.5	---	---
0.346010	31.10	10.1	49	17.9	---	---
0.426010	31.70	10.1	47	15.6	---	---
0.552000	30.40	10.1	46	15.6	---	---
2.192000	31.50	10.2	46	14.5	---	---
3.956000	34.80	10.3	46	11.2	---	---
5.000000	33.40	10.5	46	12.6	---	---
9.168000	21.40	10.8	50	28.6	---	---
21.872000	19.50	11.5	50	30.5	---	---

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		FCC ID: ZNFE610V

## Conducted Emissions (Line 2)

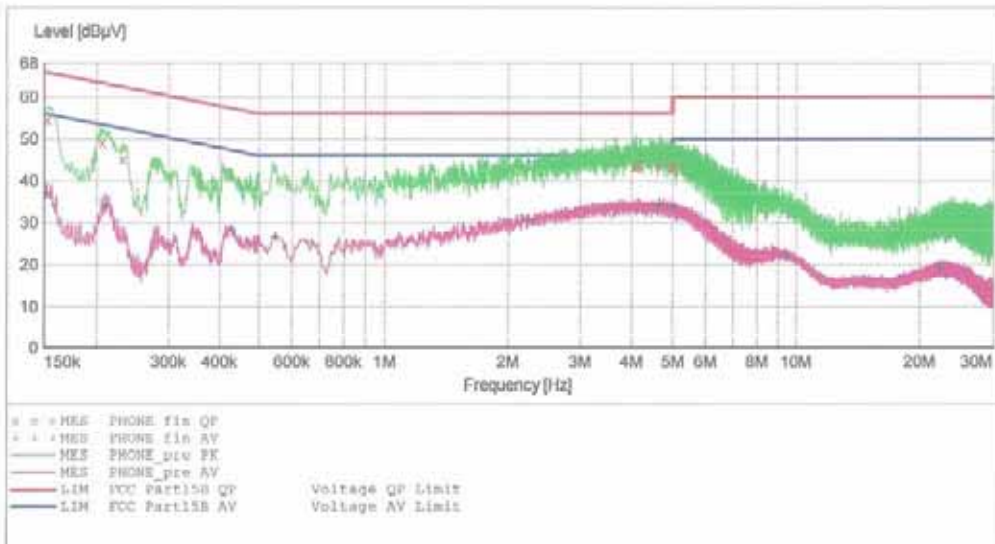
HCT

EMC

EUT: LG-E610v  
 Manufacturer: LGE  
 Operating Condition: WLAN MODE  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART15 CLASS B  
 Comment: H

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

Short Description:			FCC PART 15 CLASS B				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
150.0 kHz	500.0 kHz	1.0 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"

5/30/2012 3:22PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.153010	54.50	10.0	66	11.4	---	---
0.206010	49.20	10.1	63	14.1	---	---
0.231010	45.10	10.1	62	17.3	---	---
4.096000	43.20	10.4	56	12.8	---	---
4.184000	43.70	10.4	56	12.3	---	---
4.656000	43.40	10.4	56	12.6	---	---
5.000000	43.40	10.5	56	12.6	---	---
5.020000	43.10	10.5	60	16.9	---	---
5.032000	43.20	10.5	60	16.8	---	---

MEASUREMENT RESULT: "PHONE\_fin AV"

5/30/2012 3:22PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.152010	36.90	10.0	56	19.0	---	---
0.210010	34.00	10.1	53	19.2	---	---
0.428010	28.30	10.1	47	19.0	---	---
0.548000	26.80	10.1	46	19.2	---	---
2.248000	30.80	10.2	46	15.2	---	---
4.656000	34.10	10.4	46	11.9	---	---
5.000000	33.40	10.5	46	12.6	---	---
9.400000	22.10	10.0	50	27.9	---	---
22.364000	19.20	11.7	50	30.8	---	---

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1206FR03	Date of Issue: June 05, 2012	EUT Type: Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	FCC ID: ZNF610V	



## 9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESH2-Z5/ LISN	Annual	02/03/2013	861741/013
Schwarzbeck	VULB 9168/ TRILOG Antenna	Biennial	02/09/2013	200
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	09/23/2012	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	ESH3-Z2/ PULSE LIMITER	Annual	08/01/2012	375.8810.352
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/19/2012	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	10/26/2012	BBHA9170342
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/09/2013	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2012	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	11/07/2012	11377
Hewlett Packard	11667B / Power Splitter	Annual	11/04/2012	10126
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2012	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2012	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/14/2012	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	12/26/2012	990893
Agilent	8493C / Attenuator(10 dB)	Annual	09/23/2012	76649
WEINSCHL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617

<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> HCTR1206FR03	<b>Date of Issue:</b> June 05, 2012	<b>EUT Type:</b> Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	<b>FCC ID:</b> ZNF610V