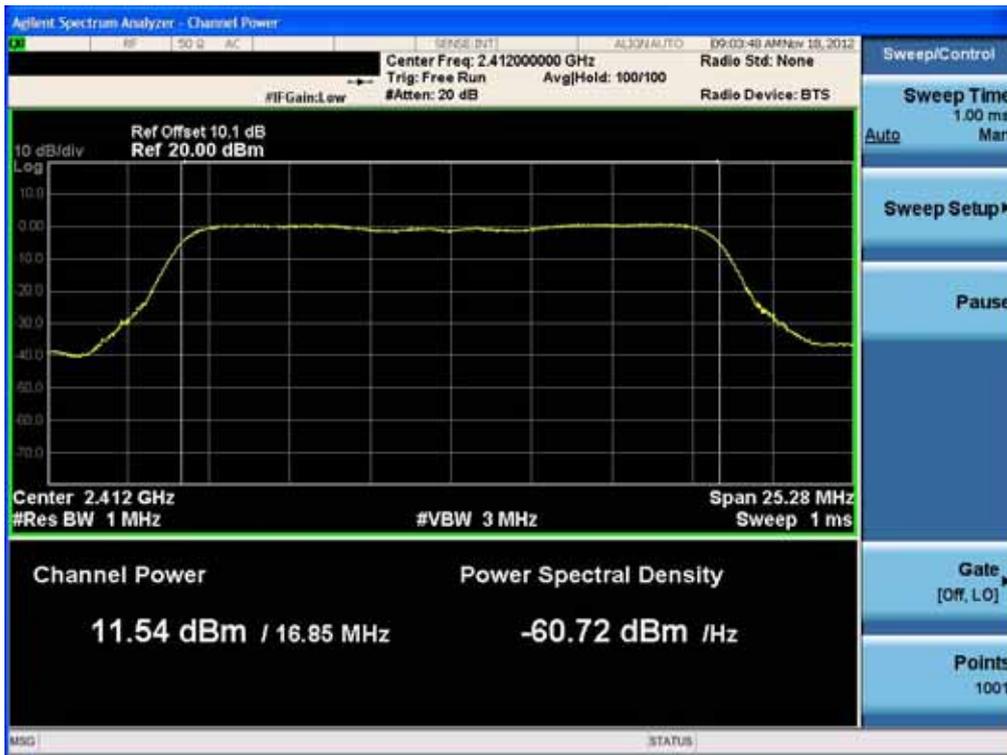


### Conducted Output Power (802.11g-CH 1) 12Mbps



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



### 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



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



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



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



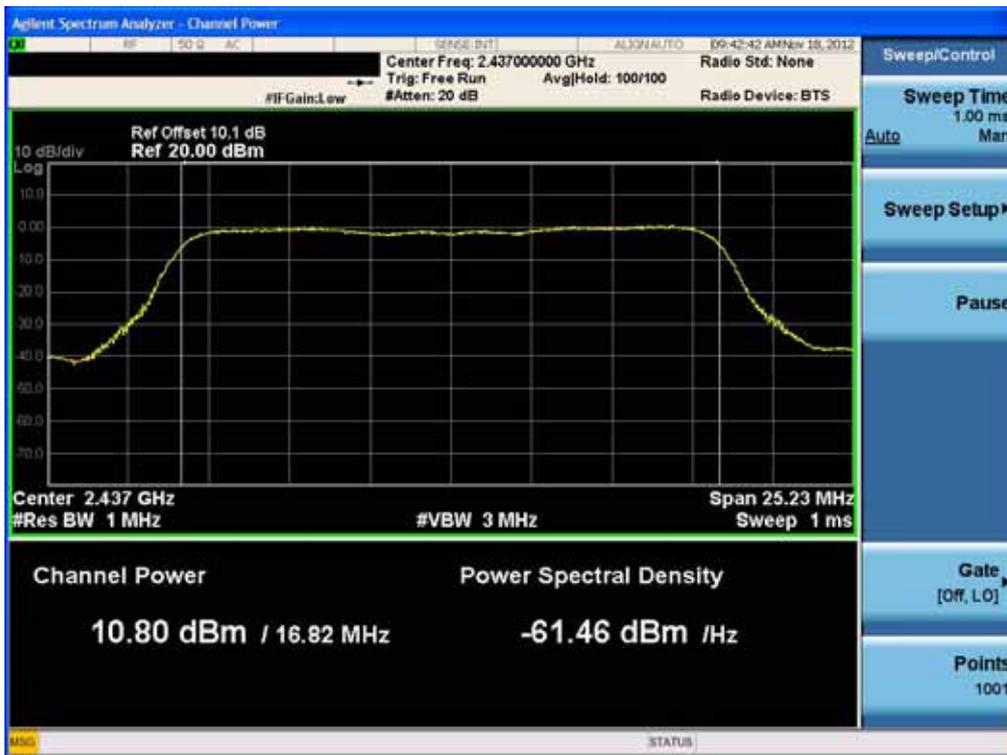
### Conducted Output Power (802.11g-CH 6) 18Mbps



### 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



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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

### 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



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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



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



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



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



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



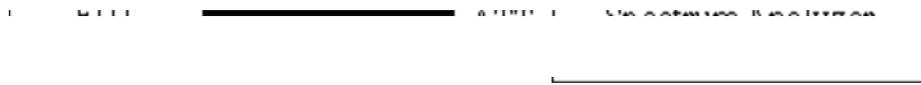
### 8.3 POWER SPECTRAL DENSITY (802.11b/g/n)

#### 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 Procedure 6.11.2.3 in ANSI 63.10

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

|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

■ **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 | -5.224      | 8           | Pass      |
| 2437            | 6           |         | -4.748      | 8           | Pass      |
| 2462            | 11          |         | -3.808      | 8           | Pass      |
| 2412            | 1           | 802.11g | -13.785     | 8           | Pass      |
| 2437            | 6           |         | -13.482     | 8           | Pass      |
| 2462            | 11          |         | -12.700     | 8           | Pass      |
| 2412            | 1           | 802.11n | -15.038     | 8           | Pass      |
| 2437            | 6           |         | -14.033     | 8           | Pass      |
| 2462            | 11          |         | -14.515     | 8           | Pass      |

■ RESULT PLOTS

Power Spectral Density (802.11b-CH 1)



Power Spectral Density (802.11b-CH 6)

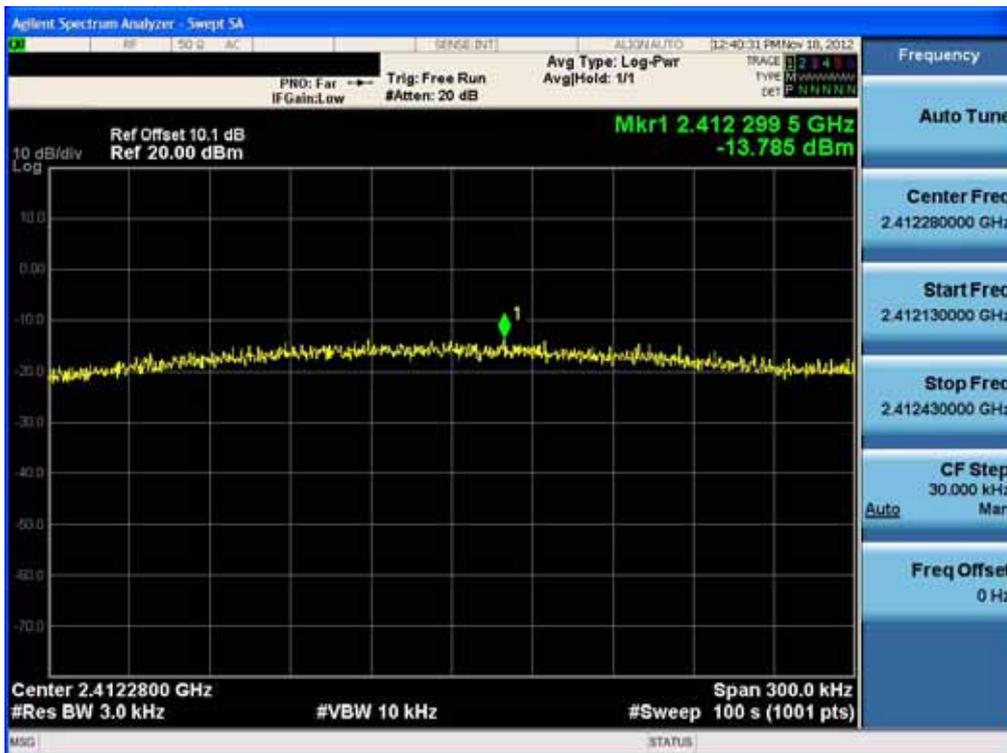


|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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

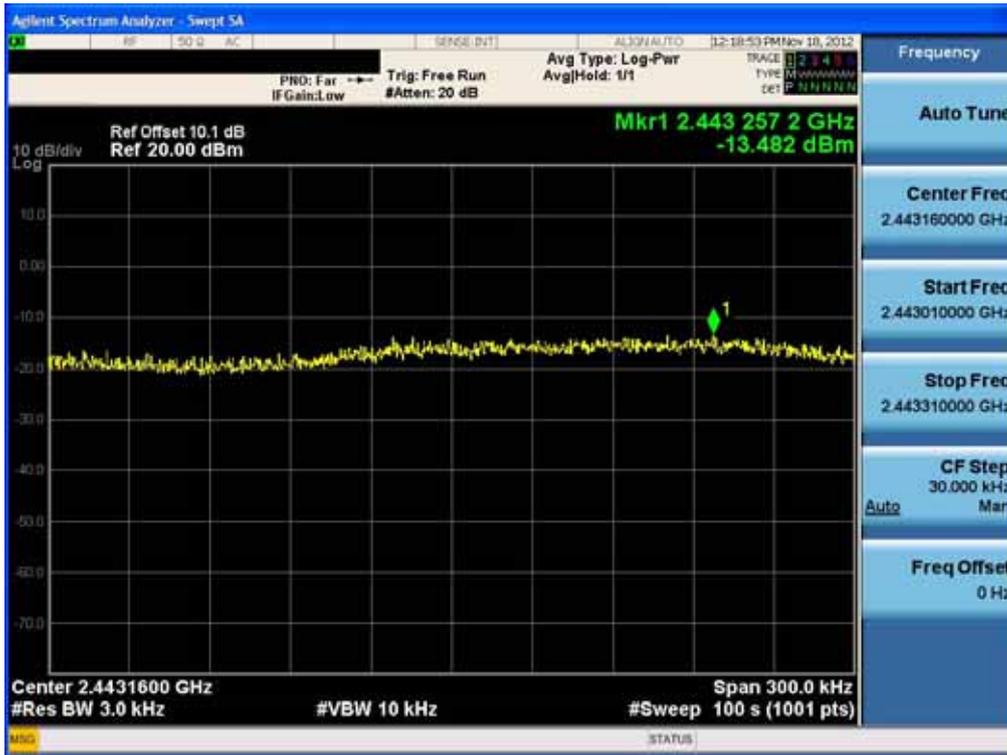


### Power Spectral Density (802.11g-CH 1)



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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

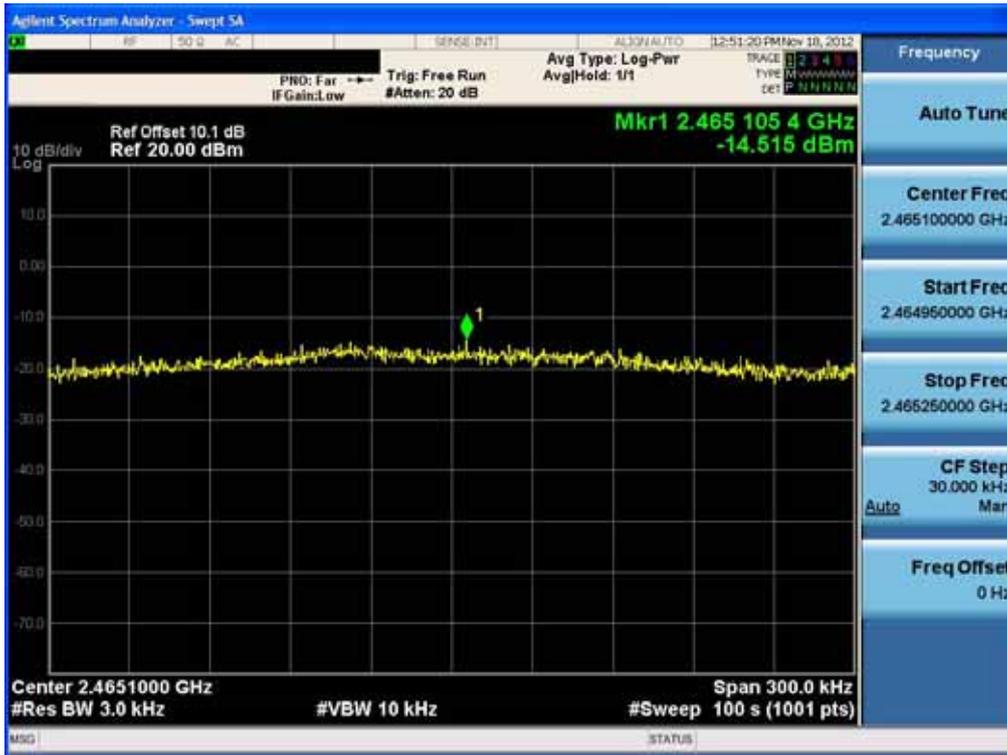


### Power Spectral Density (802.11n-CH 6)



|                              |                                  |   |  |
|------------------------------|----------------------------------|---|--|
| FCC PT.15.247 TEST REPORT    | FCC CERTIFICATION REPORT         |   | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No. HCTR1211FR05 | Date of Issue: November 19, 2012 | EUT Type: Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID: ZNFE615F                                 |

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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

## 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.

|  |  |   |  |  |
|--|--|---|--|--|
| <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><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN |  | <b>FCC ID:</b><br>ZNFE615F                       |

| 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      |

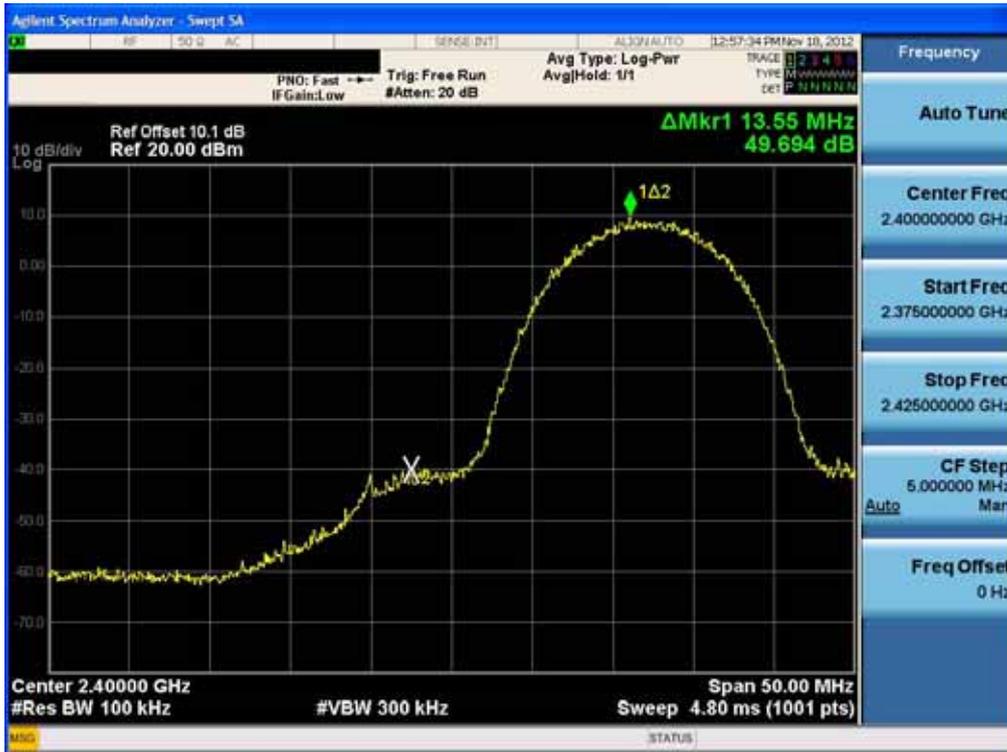
Note : 1. \*\* is fundamental frequency range.

2. Factor = Cable loss + Attenuator loss

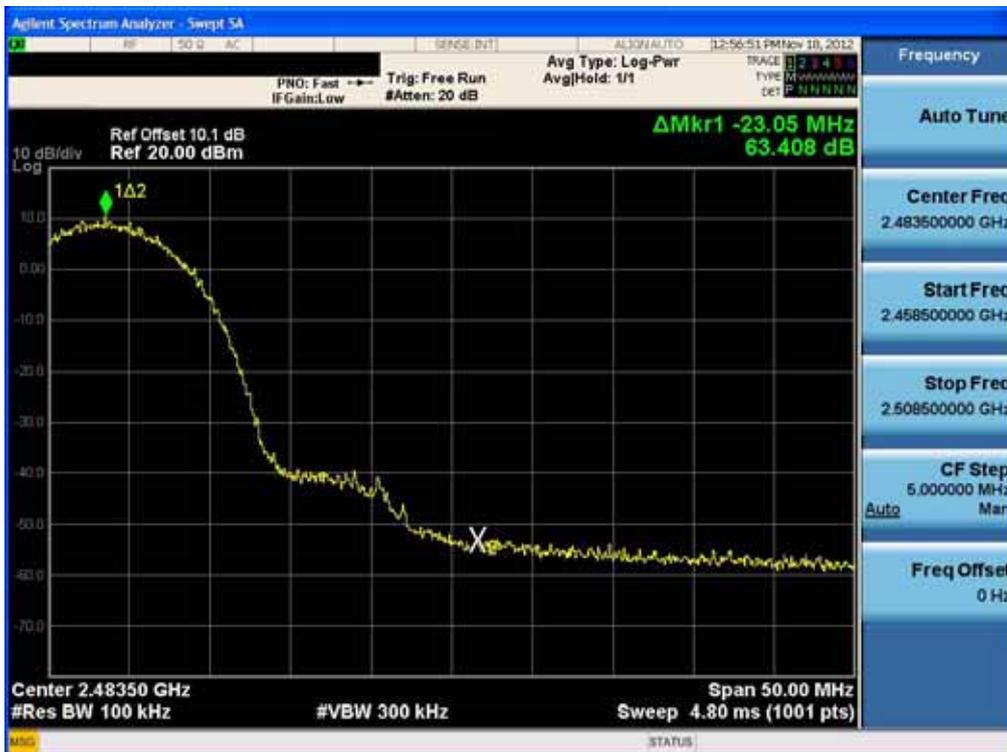
|  |  |   |  |
|--|--|---|--|
| <b>FCC PT.15.247<br/>TEST REPORT</b>   | <b>FCC CERTIFICATION REPORT</b>            |   | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | <b>FCC ID:</b><br>ZNFE615F                       |

RESULT PLOTS

BandEdge (802.11b-CH1)



BandEdge (802.11b-CH11)

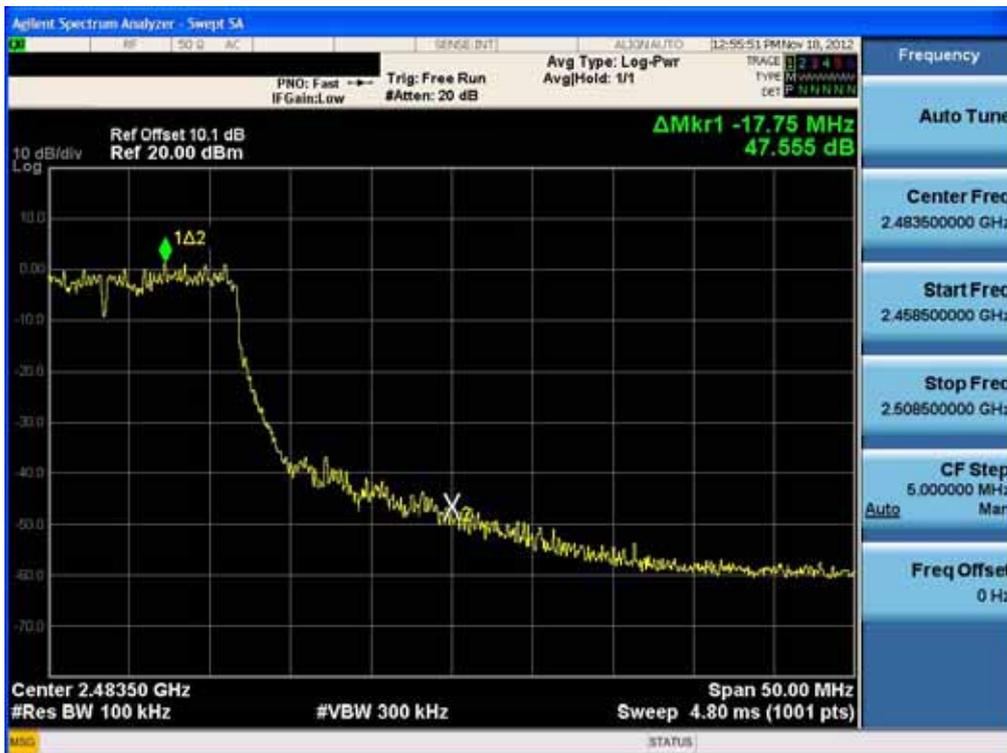


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|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNF615F                               |

### BandEdge (802.11g-CH1)



### BandEdge (802.11g-CH11)

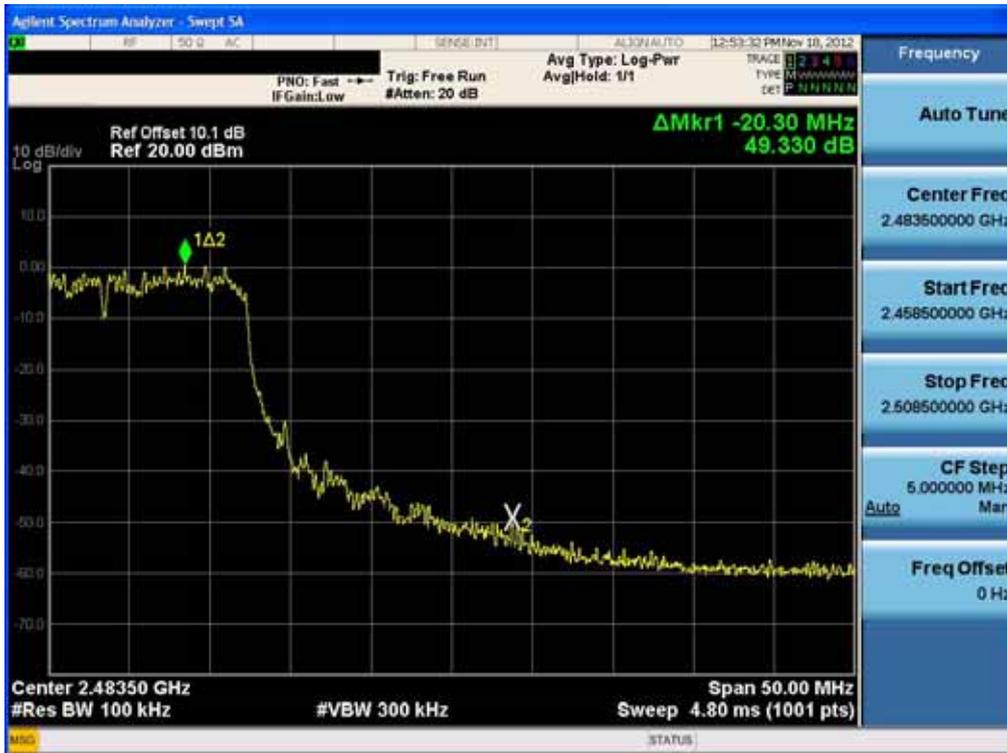


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|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

### BandEdge (802.11n-CH1)

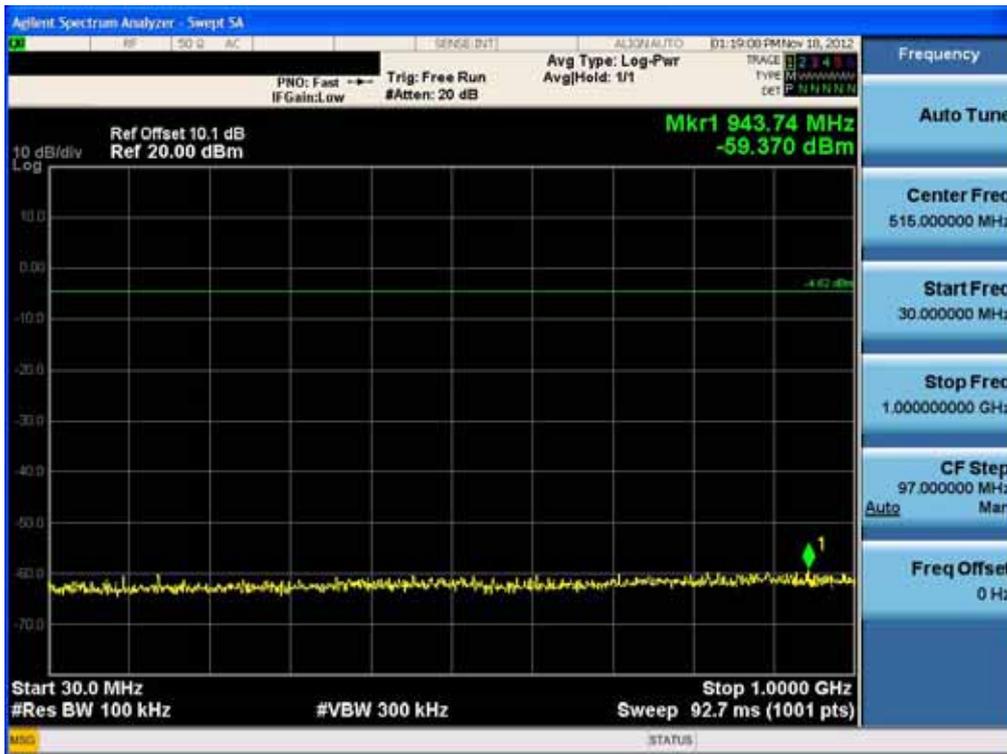


### BandEdge (802.11n-CH11)



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNF615F                               |

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

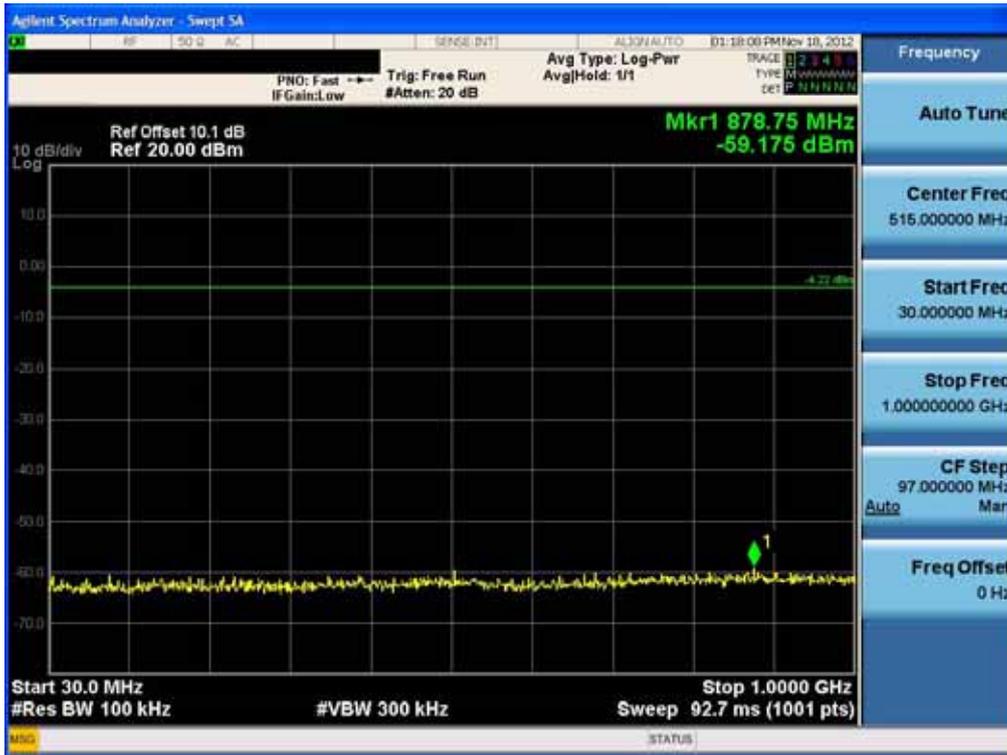


### Conducted Spurious Emission (802.11b-CH6)

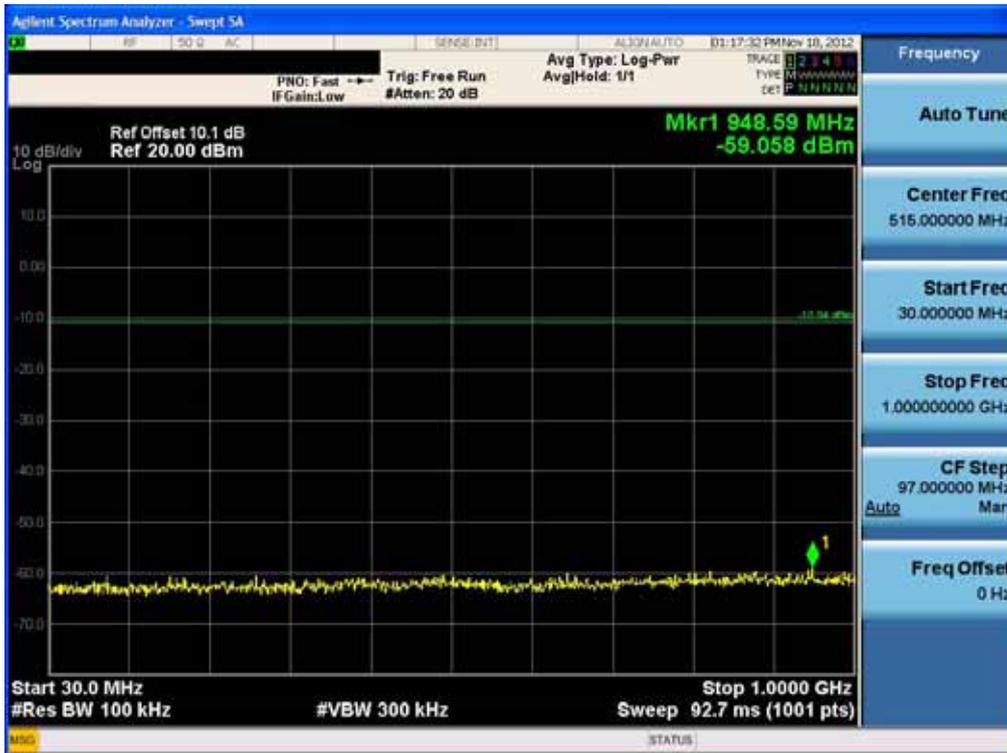


|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNF615F                               |

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

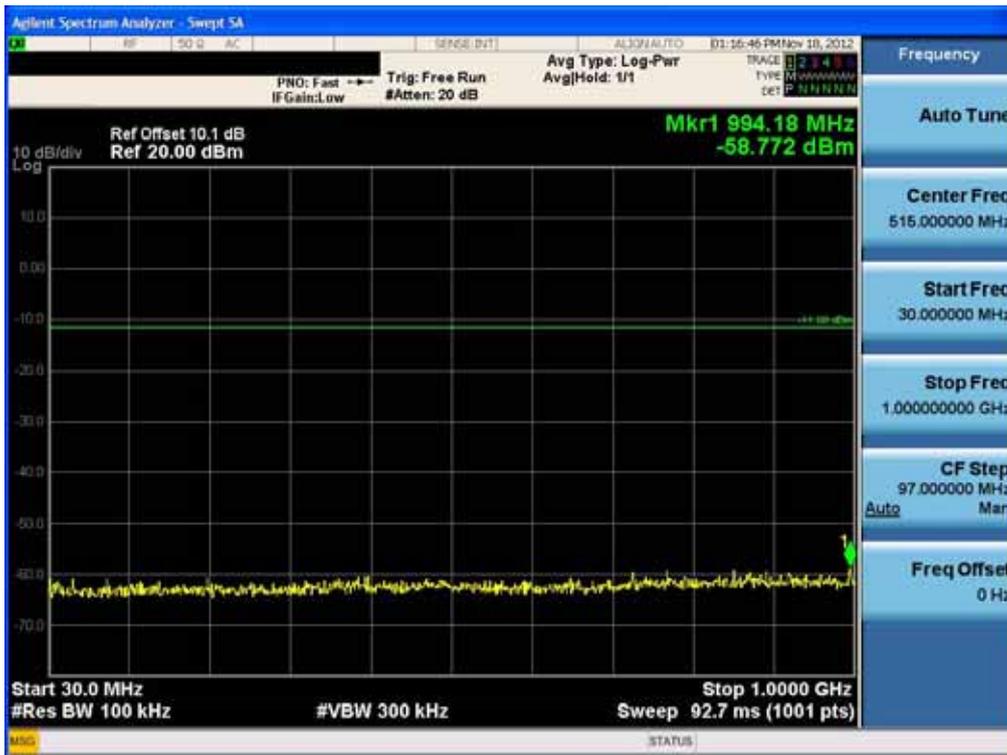


### Conducted Spurious Emission (802.11g-CH1)

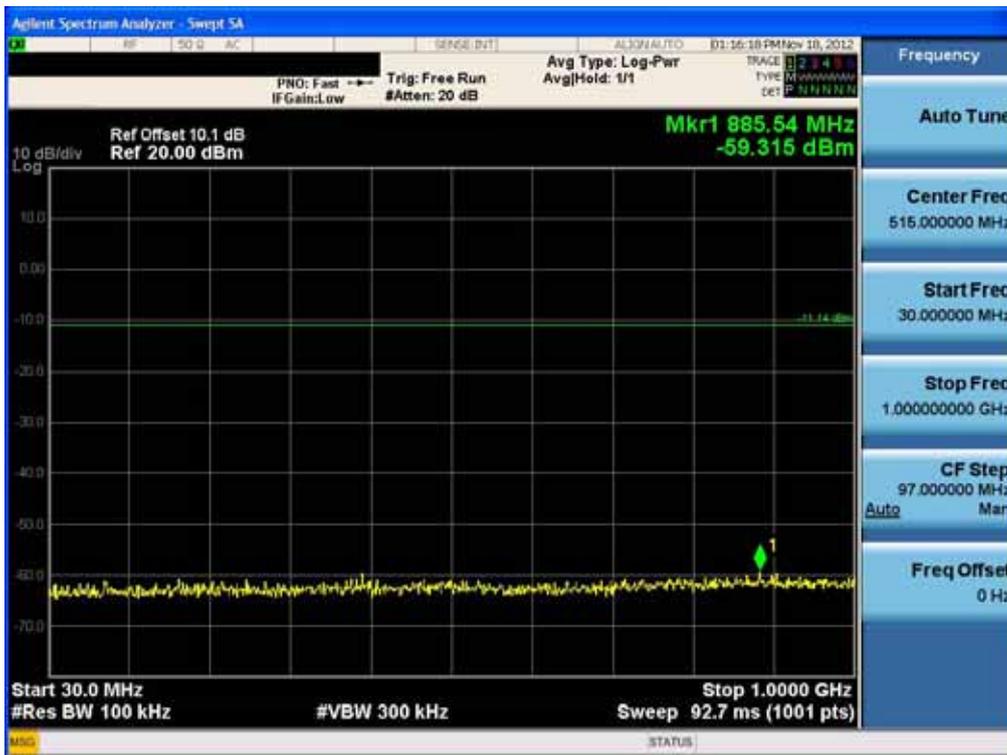


|                              |                                  |   |  |
|------------------------------|----------------------------------|---|--|
| FCC PT.15.247 TEST REPORT    | FCC CERTIFICATION REPORT         |   | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No. HCTR1211FR05 | Date of Issue: November 19, 2012 | EUT Type: Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID: ZNFE615F                                 |

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

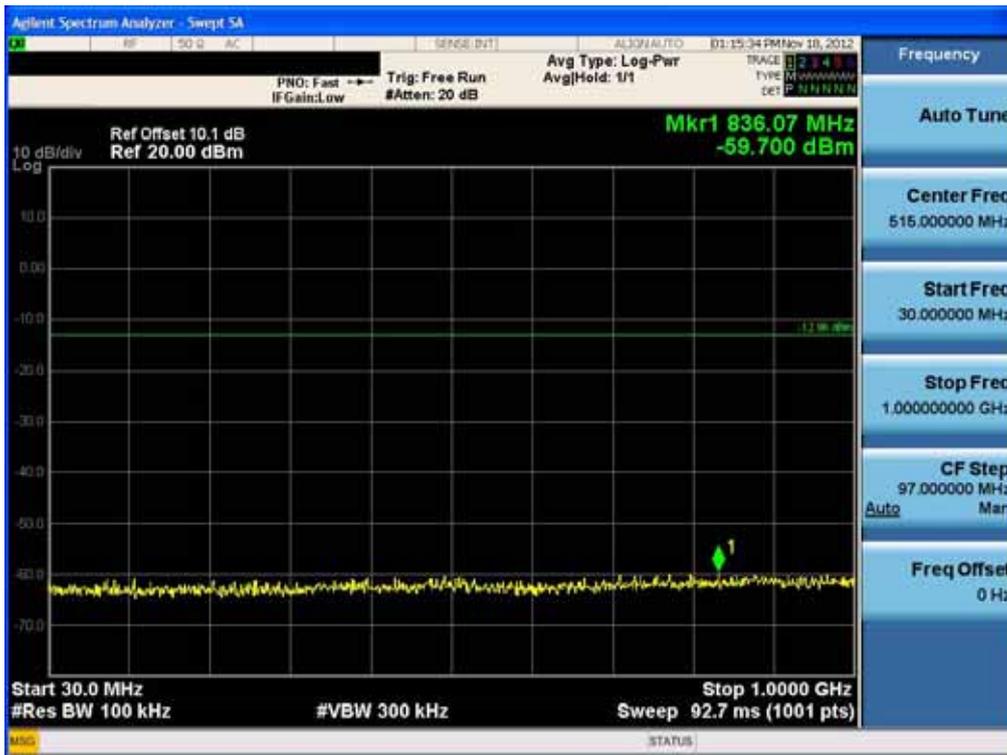


### Conducted Spurious Emission (802.11g-CH11)

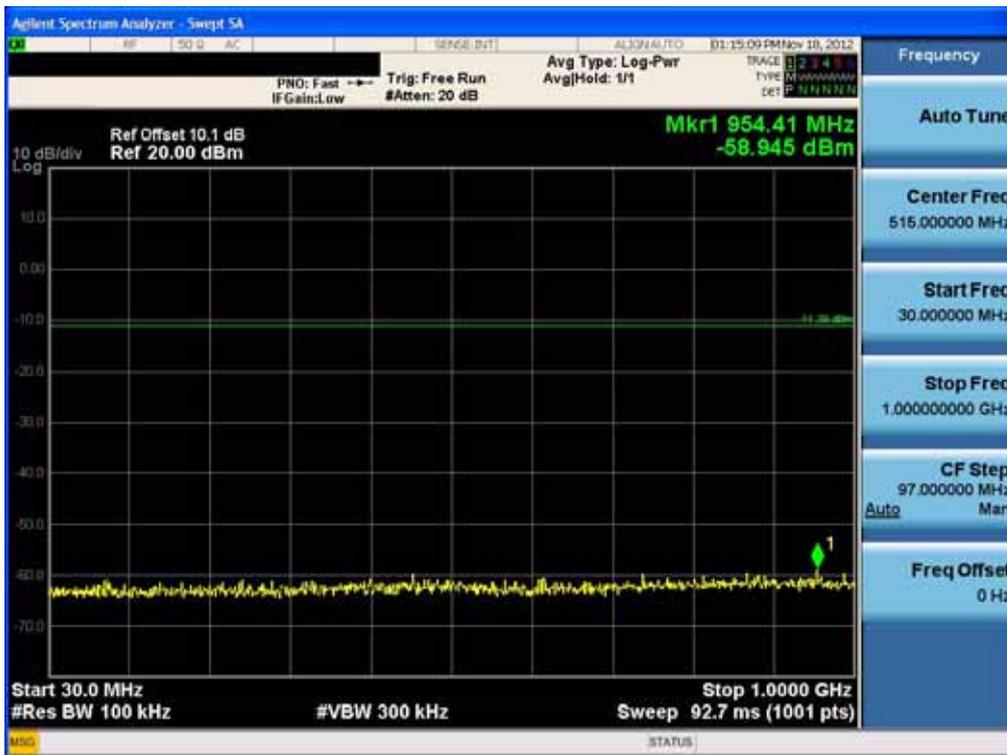


|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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

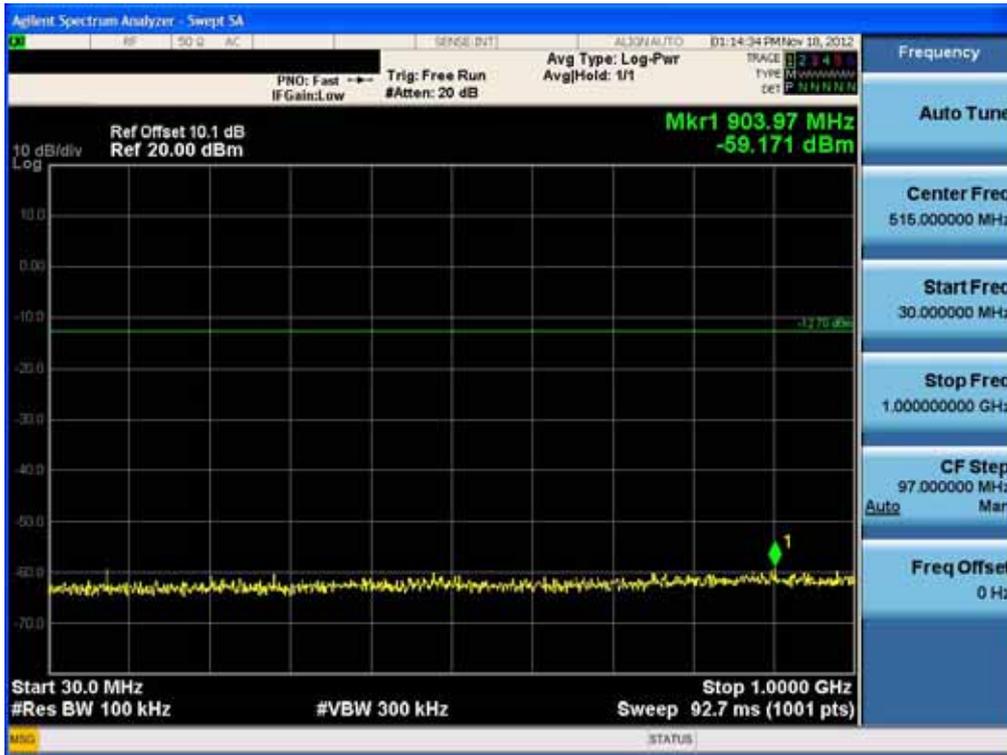


### Conducted Spurious Emission (802.11n-CH6)



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

1 GHz ~ 26 GHz

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNF615F                               |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNF615F                               |

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



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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

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



|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |

**8.5 RADIATED MEASUREMENT.**

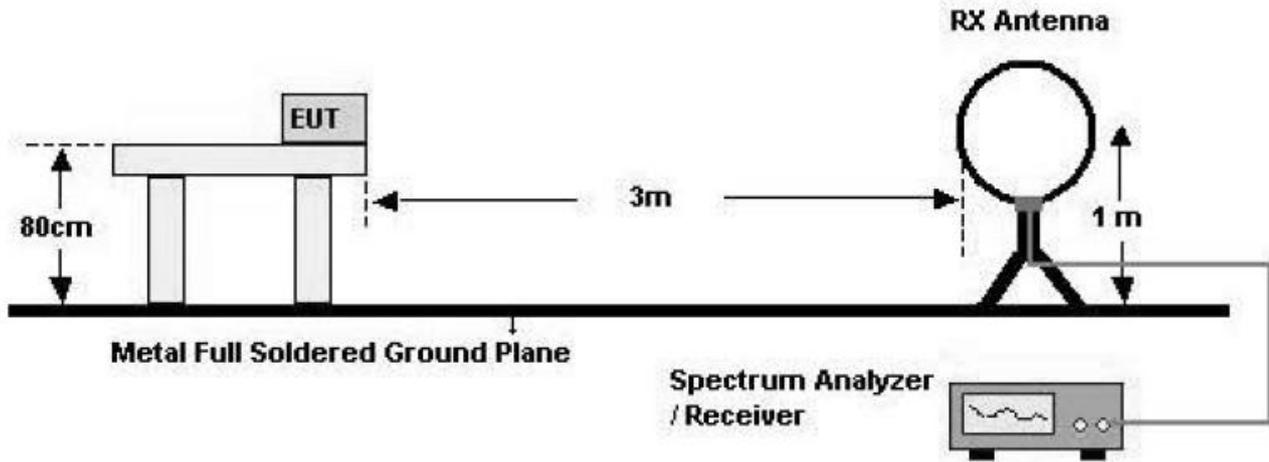
**8.5.1 RADIATED SPURIOUS EMISSIONS.**

Test Requirements and limit, §15.205, §15.209

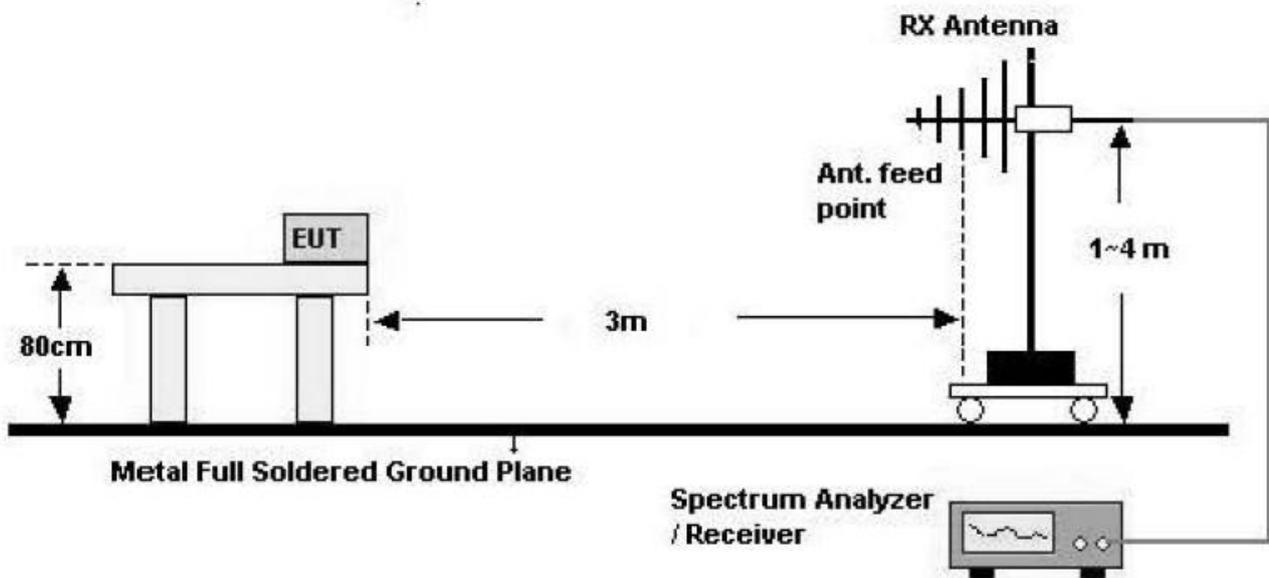
| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 – 0.490   | 2400/F(kHz)           | 300                      |
| 0.490 – 1.705   | 24000/F(kHz)          | 30                       |
| 1.705 – 30    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

## Test Configuration

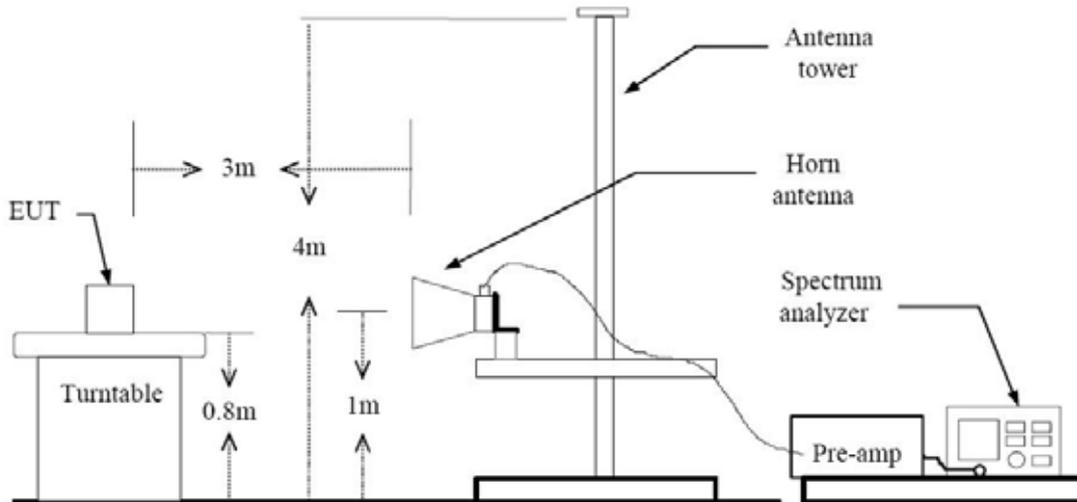
### Below 30 MHz



### 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<br>TEST REPORT    |                                     | FCC CERTIFICATION REPORT   |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN |  | FCC ID:<br>ZNFE615F                              |



**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.

|  |  |   |  |
|--|--|---|--|
| <b>FCC PT.15.247<br/>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><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | <b>FCC ID:</b><br>ZNFE615F                       |

**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            | 52.58        | -0.79             | V              | 51.79          | 74             | 22.21       | PK     |
| 4824            | 42.46        | -0.79             | V              | 41.67          | 54             | 12.33       | AV     |
| 7236            | 49.65        | 9.08              | V              | 58.73          | 74             | 15.27       | PK     |
| 7236            | 36.80        | 9.08              | V              | 45.88          | 54             | 8.12        | AV     |
| 4824            | 55.15        | -0.79             | H              | 54.36          | 74             | 19.64       | PK     |
| 4824            | 46.08        | -0.79             | H              | 45.29          | 54             | 8.71        | AV     |
| 7236            | 49.06        | 9.08              | H              | 58.14          | 74             | 15.86       | PK     |
| 7236            | 36.79        | 9.08              | H              | 45.87          | 54             | 8.13        | 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

|                                 |                                     |  |  |  |
|---------------------------------|-------------------------------------|--|--|--|
| FCC PT.15.247 TEST REPORT       |                                     | FCC CERTIFICATION REPORT   |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN |  | FCC ID:<br>ZNFE615F                              |



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<br/>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><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | <b>FCC ID:</b><br>ZNFE615F                       |

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            | 52.76        | -0.37             | V              | 52.39          | 74             | 21.61       | PK     |
| 4874            | 41.87        | -0.37             | V              | 41.50          | 54             | 12.50       | AV     |
| 7311            | 48.92        | 8.64              | V              | 57.56          | 74             | 16.44       | PK     |
| 7311            | 37.04        | 8.64              | V              | 45.68          | 54             | 8.32        | AV     |
| 4874            | 54.21        | -0.37             | H              | 53.84          | 74             | 20.16       | PK     |
| 4874            | 45.61        | -0.37             | H              | 45.24          | 54             | 8.76        | AV     |
| 7311            | 49.37        | 8.64              | H              | 58.01          | 74             | 15.99       | PK     |
| 7311            | 37.05        | 8.64              | H              | 45.69          | 54             | 8.31        | 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. HCTR1211FR05 | Date of Issue: November 19, 2012 | EUT Type: Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID: ZNFE615F                                 |



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<br/>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><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | <b>FCC ID:</b><br>ZNFE615F                       |

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            | 51.59        | -0.15             | V              | 51.44          | 74             | 22.56       | PK     |
| 4924            | 40.40        | -0.15             | V              | 40.25          | 54             | 13.75       | AV     |
| 7386            | 48.70        | 9.06              | V              | 57.76          | 74             | 16.24       | PK     |
| 7386            | 36.52        | 9.06              | V              | 45.58          | 54             | 8.42        | AV     |
| 4924            | 52.90        | -0.15             | H              | 52.75          | 74             | 21.25       | PK     |
| 4924            | 42.77        | -0.15             | H              | 42.62          | 54             | 11.38       | AV     |
| 7386            | 48.96        | 9.06              | H              | 58.02          | 74             | 15.98       | PK     |
| 7386            | 36.49        | 9.06              | H              | 45.55          | 54             | 8.45        | 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. HCTR1211FR05 | Date of Issue: November 19, 2012 | EUT Type: Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN |  | FCC ID: ZNFE615F                                 |



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<br/>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><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | <b>FCC ID:</b><br>ZNFE615F                       |

## 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          | 32.26        | 33.90       | H              | 66.16          | 74             | 7.84        | PK     |
| 2390.0          | 14.40        | 33.90       | H              | 48.30          | 54             | 5.70        | AV     |
| 2390.0          | 26.14        | 33.90       | V              | 60.04          | 74             | 13.96       | PK     |
| 2390.0          | 13.56        | 33.90       | V              | 47.46          | 54             | 6.54        | AV     |
| 2483.5          | 35.69        | 33.99       | H              | 69.68          | 74             | 4.32        | PK     |
| 2483.5          | 14.54        | 33.99       | H              | 48.53          | 54             | 5.47        | AV     |
| 2483.5          | 32.30        | 33.99       | V              | 66.29          | 74             | 7.71        | PK     |
| 2483.5          | 13.20        | 33.99       | V              | 47.19          | 54             | 6.81        | 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 )

|                                 |                                     |  |  |
|---------------------------------|-------------------------------------|--|--|
| FCC PT.15.247<br>TEST REPORT    | FCC CERTIFICATION REPORT            |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | FCC ID:<br>ZNFE615F                              |



RBW = 1 MH

VBW = 10 Hz

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. Also, 802.11b has no spurious.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|  |  |   |  |
|--|--|---|--|
| <b>FCC PT.15.247<br/>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><br>HCTR1211FR05 | <b>Date of Issue:</b><br>November 19, 2012 | <b>EUT Type:</b><br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN | <b>FCC ID:</b><br>ZNFE615F                       |

## 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.11 and 802.11b. Because 802.11b mode is worst case.

■ RESULT PLOTS

Conducted Emissions (Line 1)

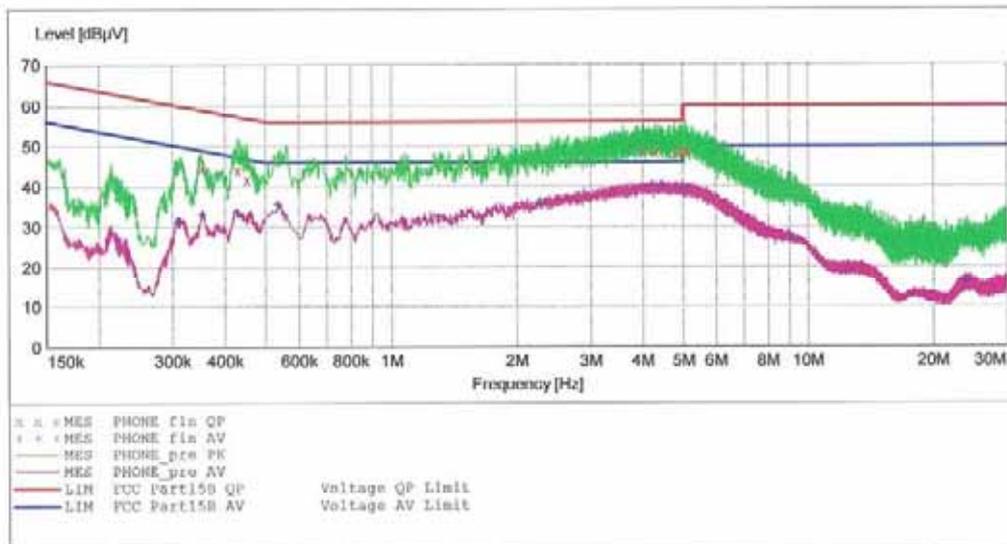
HCT

EMC

EUT: LG-E615f  
 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)"

| 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      | 1.0 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"

11/18/2012 10:37AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE   |
|---------------|------------|-----------|------------|-----------|------|------|
| 0.351010      | 44.50      | 9.7       | 59         | 14.5      | ---- | ---- |
| 0.430010      | 44.00      | 9.8       | 57         | 13.2      | ---- | ---- |
| 0.452010      | 41.60      | 9.8       | 57         | 15.2      | ---- | ---- |
| 4.020000      | 48.50      | 10.1      | 56         | 7.5       | ---- | ---- |
| 4.292000      | 48.40      | 10.1      | 56         | 7.6       | ---- | ---- |
| 4.772000      | 48.10      | 10.2      | 56         | 7.9       | ---- | ---- |
| 5.000000      | 48.40      | 10.2      | 56         | 7.6       | ---- | ---- |
| 5.064000      | 48.60      | 10.2      | 60         | 11.4      | ---- | ---- |
| 5.088000      | 48.60      | 10.2      | 60         | 11.4      | ---- | ---- |

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

11/18/2012 10:37AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.311010         | 31.40         | 9.7          | 50            | 18.5         | ---  | --- |
| 0.353010         | 33.10         | 9.7          | 49            | 15.8         | ---  | --- |
| 0.430010         | 33.40         | 9.8          | 47            | 13.8         | ---  | --- |
| 0.536000         | 35.50         | 9.8          | 46            | 10.5         | ---  | --- |
| 2.284000         | 35.60         | 10.0         | 46            | 10.4         | ---  | --- |
| 4.436000         | 40.00         | 10.2         | 46            | 6.0          | ---  | --- |
| 5.000000         | 39.50         | 10.2         | 46            | 6.5          | ---  | --- |
| 9.220000         | 27.10         | 10.4         | 50            | 22.9         | ---  | --- |
| 23.836000        | 16.10         | 11.9         | 50            | 33.9         | ---  | --- |

|                                 |                                     |  |  |  |
|---------------------------------|-------------------------------------|--|--|--|
| FCC PT.15.247<br>TEST REPORT    |                                     | FCC CERTIFICATION REPORT   |  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1211FR05 | Date of Issue:<br>November 19, 2012 | EUT Type:<br>Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN |  | FCC ID:<br>ZNFE615F                              |

## Conducted Emissions (Line 2)

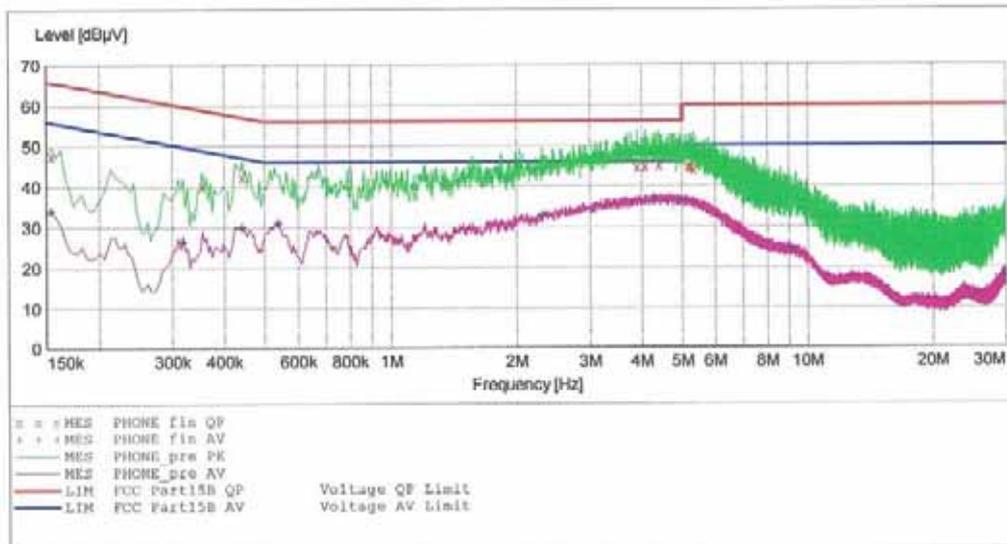
HCT

EMC

EUT: LG-E615f  
 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 |            |           |      | Transducer |
|--------------------|-----------|---------|---------------------|------------|-----------|------|------------|
| Start              | Stop      | Step    | Detector            | Meas. Time | IF Bandw. |      |            |
| 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"

11/18/2012 10:13AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.154010      | 47.60      | 10.0      | 66         | 18.2      | ---  | --- |
| 0.354010      | 40.20      | 9.9       | 59         | 18.6      | ---  | --- |
| 0.442010      | 42.30      | 10.0      | 57         | 14.7      | ---  | --- |
| 3.904000      | 44.50      | 10.3      | 56         | 11.5      | ---  | --- |
| 4.068000      | 44.60      | 10.3      | 56         | 11.4      | ---  | --- |
| 4.412000      | 45.10      | 10.3      | 56         | 10.9      | ---  | --- |
| 5.180000      | 44.80      | 10.4      | 60         | 15.2      | ---  | --- |
| 5.244000      | 44.50      | 10.4      | 60         | 15.5      | ---  | --- |
| 5.324000      | 44.00      | 10.4      | 60         | 16.0      | ---  | --- |

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

11/18/2012 10:13AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.154010         | 33.90         | 10.0         | 56            | 21.9         | ---  | --- |
| 0.318010         | 26.50         | 9.9          | 50            | 23.2         | ---  | --- |
| 0.442010         | 29.90         | 10.0         | 47            | 17.2         | ---  | --- |
| 0.540000         | 30.90         | 10.0         | 46            | 15.1         | ---  | --- |
| 2.316000         | 32.60         | 10.2         | 46            | 13.4         | ---  | --- |
| 4.296000         | 36.70         | 10.3         | 46            | 9.3          | ---  | --- |
| 5.000000         | 36.20         | 10.4         | 46            | 9.8          | ---  | --- |
| 9.172000         | 24.30         | 10.6         | 50            | 25.7         | ---  | --- |
| 29.824000        | 17.90         | 12.7         | 50            | 32.1         | ---  | --- |

|                                 |                                     |  |  |  |
|---------------------------------|-------------------------------------|--|--|--|
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## 9. LIST OF TEST EQUIPMENT

| Manufacturer          | Model / Equipment                                      | Calibration Interval | Calibration Due | Serial No.         |
|-----------------------|--|----------------------|-----------------|--------------------|
| Rohde & Schwarz       | ENV216/ LISN   | Annual               | 02/09/2013      | 100073             |
| 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               | 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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