

# HCT CO., LTD.

## CERTIFICATE OF COMPLIANCE

### FCC Certification

**Applicant Name:**  
SAMSUNG Electronics Co., Ltd.

**Address:**  
129, Samsung-ro, Yeongtong-gu Suwon-si,  
Gyeonggi-do, 443-742 Rep. of Korea

**Date of Issue:**

April 02, 2013

**Test Site/Location:**

HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon,  
Icheon-si, Kyunggi-Do, Korea

**Report No.:** HCTR1304FR02

**HCT FRN:** 0005866421

**FCC ID : A3LGTS6310N**

**APPLICANT : SAMSUNG Electronics Co., Ltd.**

**FCC Model(s):** GT-S6310N

**EUT Type:** 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only

**Max. RF Output Power:** Wi-Fi 802.11b(22.28 dBm) / Wi-Fi 802.11g (22.51 dBm)  
/ Wi-Fi 802.11n (20.18 dBm)

**Frequency Range:** 2412 MHz -2462 MHz

**Modulation type** CCK/DSSS/OFDM

**FCC Classification:** Digital Transmission System(DTS)

**FCC Rule Part(s):** Part 15.247

#### Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a)



**Report prepared by**  
**: Jong Seok Lee**  
**Test engineer of RF Team**



**Approved by**  
**: Chang Seok Choi**  
**Manager of RF Team**

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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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

## Version

| TEST REPORT NO. | DATE           | DESCRIPTION             |
|-----------------|----------------|-------------------------|
| HCTR1304FR02    | April 02, 2013 | - First Approval Report |
|                 |                |                         |
|                 |                |                         |
|                 |                |                         |

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## 1. GENERAL INFORMATION

**Applicant:** SAMSUNG Electronics Co., Ltd.  
**Address:** 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea  
**FCC ID:** A3LGTS6310N  
**EUT Type:** 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only  
**Model name(s):** GT-S6310N  
**Date(s) of Tests:** March 28, 2013 ~ March 30, 2013  
**Place of Tests:** HCT Co., Ltd.  
 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA.  
 (IC Recognition No. : 5944A-3)

## 2. EUT DESCRIPTION

|                              |                                                                                           |                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>EUT Type</b>              | 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |                                                                                     |
| <b>FCC Model Name</b>        | GT-S6310N                                                                                 |                                                                                     |
| <b>Power Supply</b>          | DC 3.7 V                                                                                  |                                                                                     |
| <b>Battery type</b>          | Li-ion Battery(Standard)                                                                  |                                                                                     |
| <b>Frequency Range</b>       | TX: 2412 MHz ~ 2462 MHz<br>RX: 2412 MHz ~ 2462 MHz                                        |                                                                                     |
| <b>Max. RF Output Power</b>  | Peak                                                                                      | Wi-Fi 802.11b(22.28 dBm) / Wi-Fi 802.11g (22.51 dBm)<br>/ Wi-Fi 802.11n (20.18 dBm) |
|                              | Average                                                                                   | Wi-Fi 802.11b(16.38 dBm) / Wi-Fi 802.11g (14.41 dBm)<br>/ Wi-Fi 802.11n (11.74 dBm) |
| <b>Modulation Type</b>       | DSSS/CCK(802.11b), OFDM(802.11g, 802.11n)                                                 |                                                                                     |
| <b>Antenna Specification</b> | Manufacturer: AMOTECH Co., LTD.<br>Antenna type: FPCB Antenna<br>Peak Gain : 2.031 dBi    |                                                                                     |

### 3. TEST METHODOLOGY

FCC KDB 558074 D01 DTS Meas Guidance v02 dated October 04, 2012 entitled “Guidance for Performing Compliance Measurements on Digital Transmission Systems(DTS) Operating Under §15.247” were used in the measurement.

#### 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

#### 3.3 GENERAL TEST PROCEDURES

##### Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

#### 3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

|                                        |                                         |                                                                                                            |                                                  |
|----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <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>HCTR1304FR02 | <b>Date of Issue:</b><br>April 02, 2013 | <b>EUT Type:</b> 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | <b>FCC ID:</b><br>A3LGTS6310N                    |

#### 4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

#### 5. FACILITIES AND ACCREDITATIONS

##### 5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

##### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
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## 6. ANTENNA REQUIREMENTS

### According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

\* The antennas of this E.U.T are permanently attached.

\*The E.U.T Complies with the requirement of §15.203

|                                        |                                         |                                                                                                            |                                                  |
|----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <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> |
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## 7. SUMMARY TEST OF RESULTS

| Test Description                    | FCC Part Section(s)        | Test Limit           | Test Condition | Test Result |
|-------------------------------------|----------------------------|----------------------|----------------|-------------|
| 6 dB Bandwidth                      | §15.247(a)(2)              | > 500 kHz            | CONDUCTED      | PASS        |
| Conducted Maximum Peak Output Power | §15.247(b)(3)              | < 1 Watt             |                | PASS        |
| Power Spectral Density              | §15.247(e)                 | < 8 dBm / 3 kHz Band |                | PASS        |
| Band Edge(Out of Band Emissions)    | §15.247(d)                 | Conducted < 20 dBc   |                | PASS        |
| AC Power line Conducted Emissions   | §15.207                    | cf. Section 8.6      |                | PASS        |
| Radiated Spurious Emissions         | §15.205, 15.209            | cf. Section 8.5.1    | RADIATED       | PASS        |
| Radiated Restricted Band Edge       | §15.247(d), 15.205, 15.209 | cf. Section 8.5.2    |                | PASS        |

## 8. TEST RESULT

### 8.1 6dB BANDWIDTH (802.11b/g/n)

#### Test Requirements and limit, §15.247(a)(2)

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

**The minimum permissible 6dB bandwidth is 500 kHz.**

#### ■ TEST CONFIGURATION

#### ■ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to ( Page 4 in KDB 558074, issued 10/04/2012)

RBW = 1 – 5 % of DTS BW, not to exceed 100 kHz

VBW = 3 \* RBW

SPAN = 40 MHz

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

## ■ TEST RESULTS

### Conducted 6dB Bandwidth Measurements for 802.11b

| 802.11b Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 2412            | 1           | 10.11                       | 0.500                      | Pass        |
| 2437            | 6           | 10.13                       | 0.500                      | Pass        |
| 2462            | 11          | 10.09                       | 0.500                      | Pass        |

### Conducted 6dB Bandwidth Measurements for 802.11g

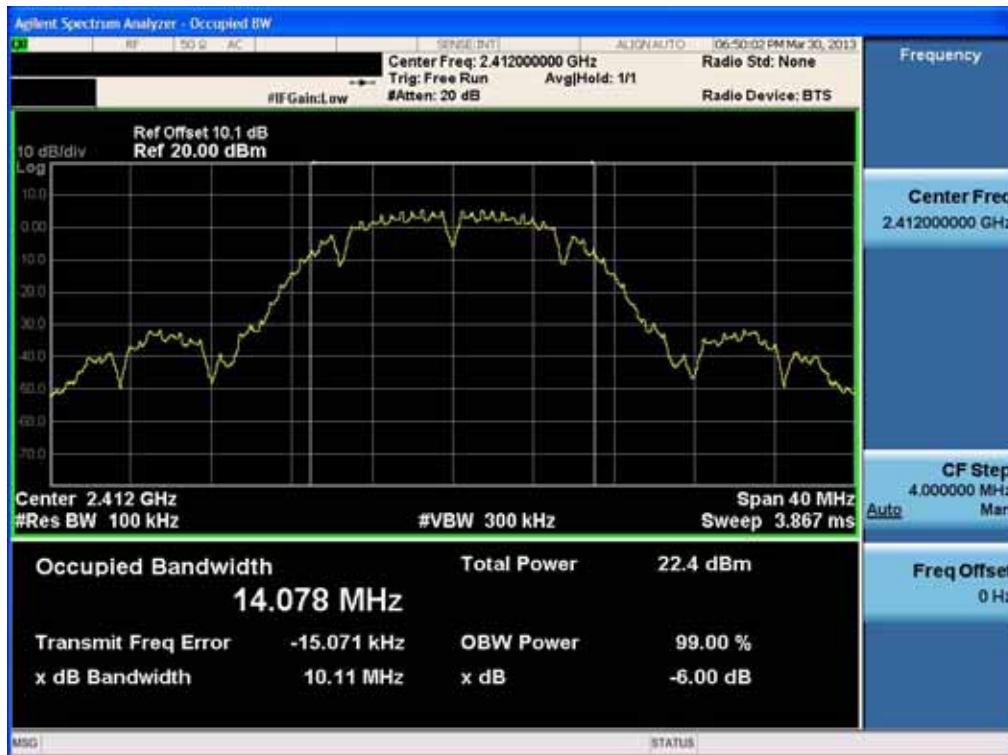
| 802.11g Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 2412            | 1           | 16.37                       | 0.500                      | Pass        |
| 2437            | 6           | 16.34                       | 0.500                      | Pass        |
| 2462            | 11          | 16.36                       | 0.500                      | Pass        |

### Conducted 6dB Bandwidth Measurements for 802.11n

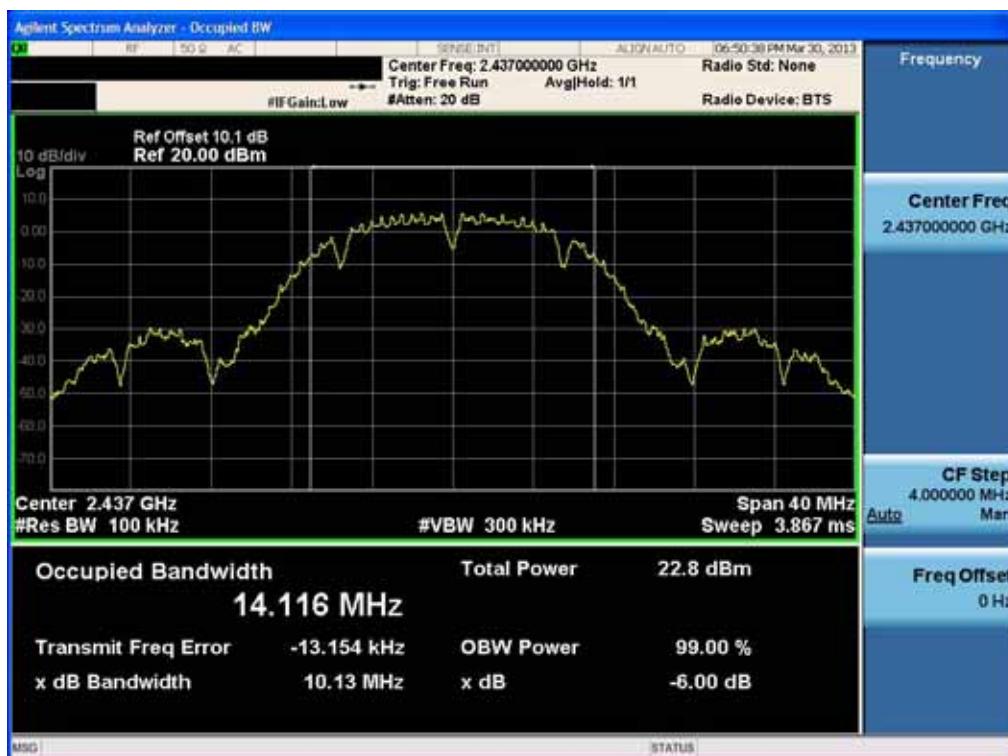
| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 2412            | 1           | 17.10                       | 0.500                      | Pass        |
| 2437            | 6           | 17.56                       | 0.500                      | Pass        |
| 2462            | 11          | 17.09                       | 0.500                      | Pass        |

## RESULT PLOTS

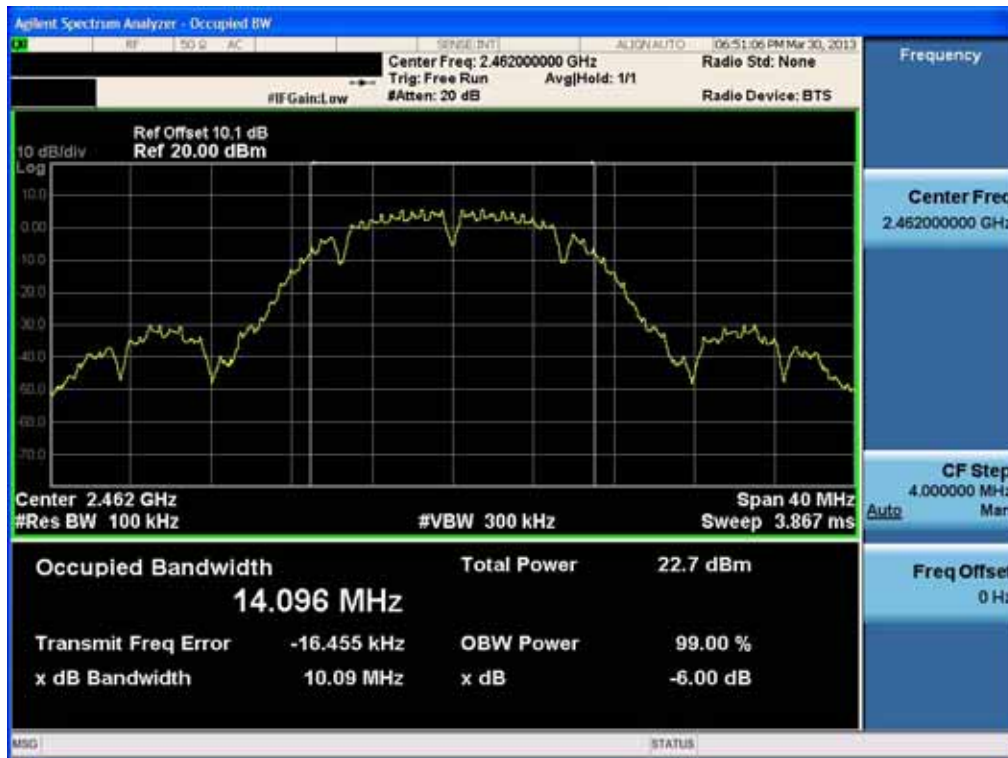
6dB Bandwidth plot (802.11b-CH 1)



6dB Bandwidth plot (802.11b-CH 6)



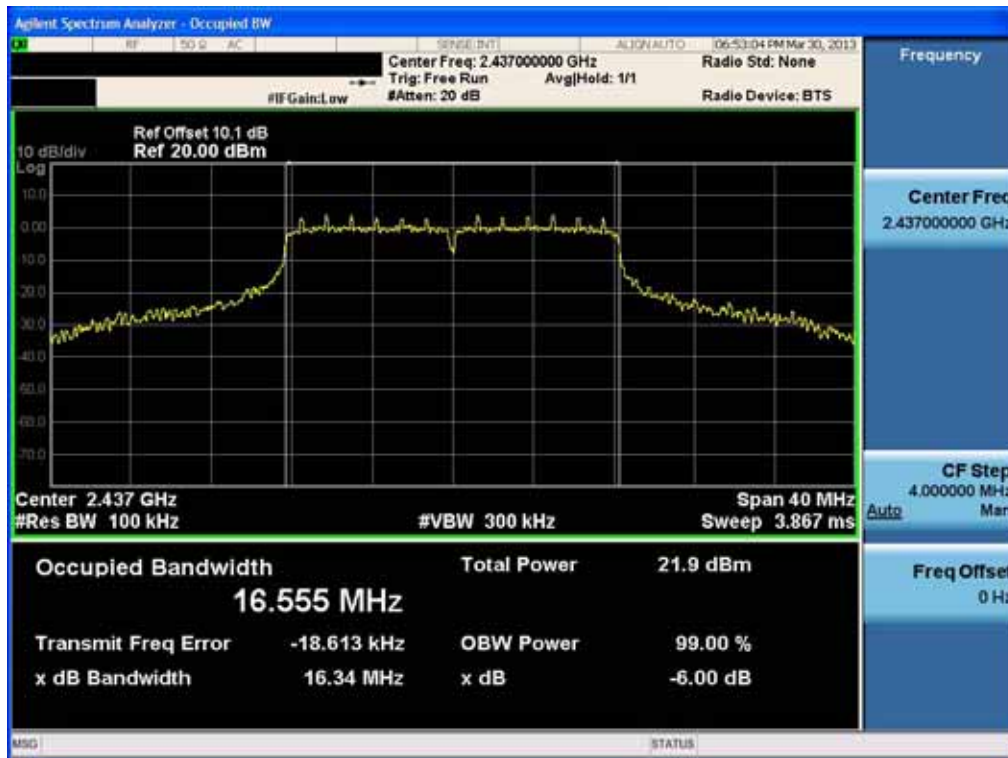
### 6dB Bandwidth plot (802.11b-CH 11)



### 6dB Bandwidth plot (802.11g-CH 1)



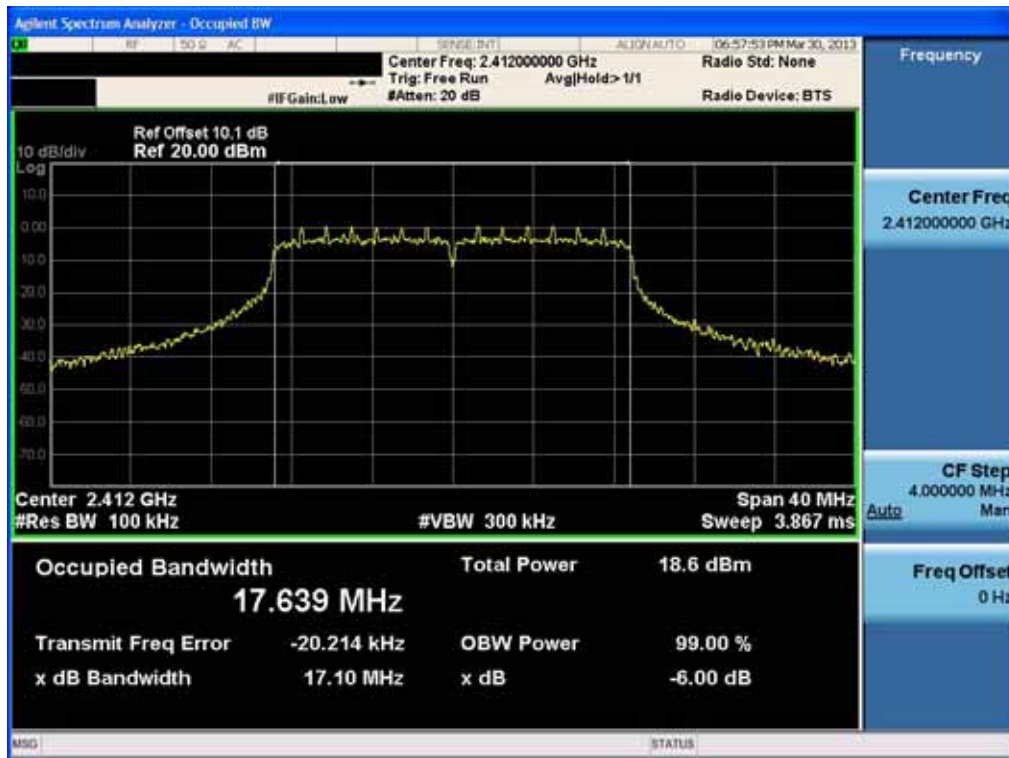
### 6dB Bandwidth plot (802.11g-CH 6)



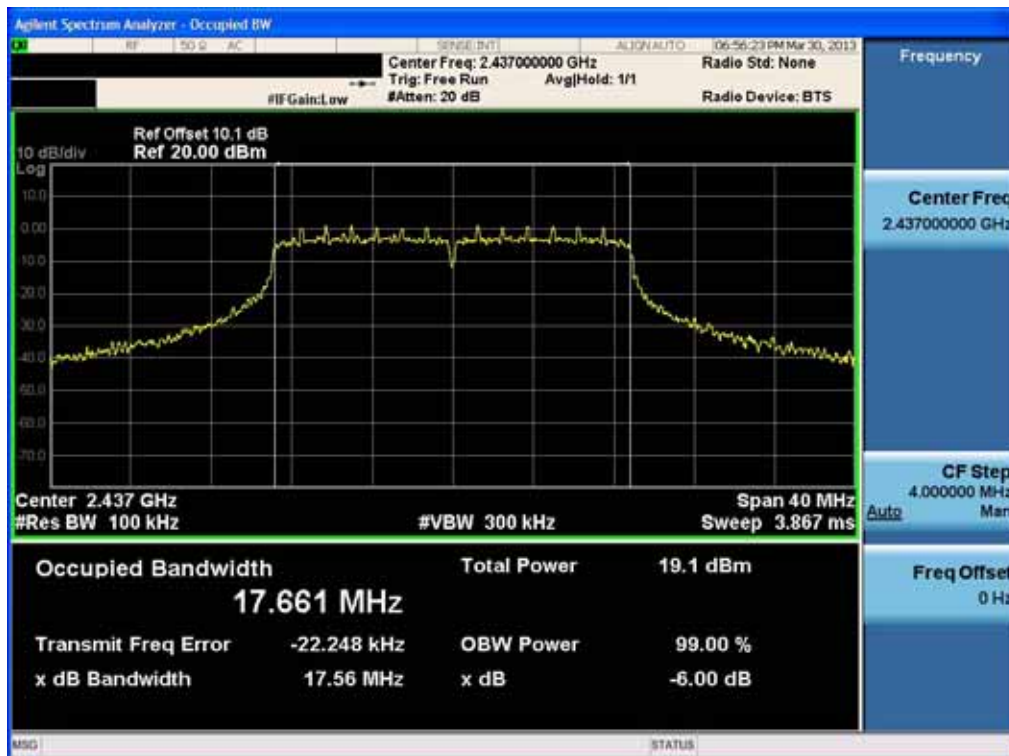
### 6dB Bandwidth plot (802.11g-CH 11)



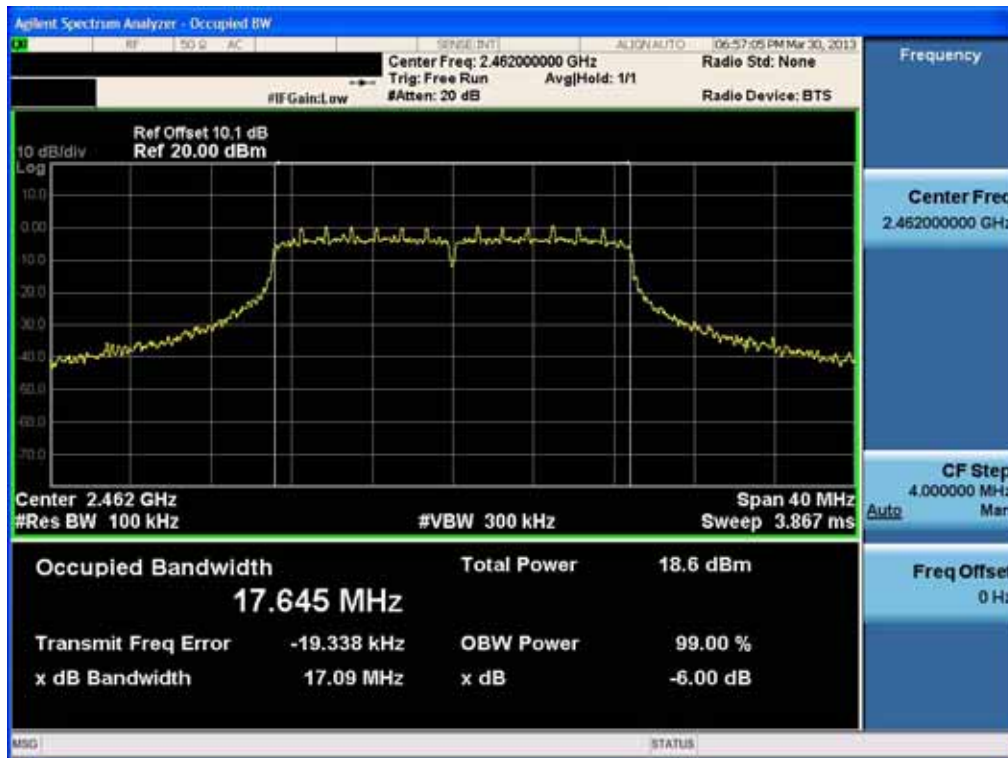
6dB Bandwidth plot (802.11n-CH 1)



6dB Bandwidth plot (802.11n-CH 6)



### 6dB Bandwidth plot (802.11n-CH 11)



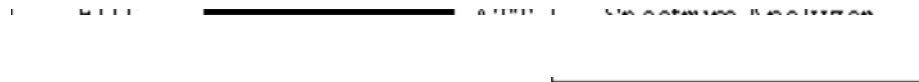
## 8.2 OUTPUT POWER (802.11b/g/n)

### Test Requirements and limit, §15.247(b)(3)

A transmitter antenna terminal of EUT is connected to the input of a Spectrum Analyzer. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

**The maximum permissible conducted output power is 1 Watt.**

### ■ TEST CONFIGURATION



### ■ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function.

The Spectrum Analyzer is set to

- Peak Power ( Procedure 8.1.2 Option2 in KDB 558074, issued 10/04/2012)

RBW = Maximum available (at least 1 MHz)

VBW = 3 x RBW or maximum available setting (must be  $\geq$  RBW)

SPAN = Set the span to fully encompass the DTS bandwidth

Detector Mode = Peak

Sweep = auto couple

Trace Mode = max hold

Allow trace to fully stabilize.

Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth.

- Average Power ( Procedure 8.2.1 Option1 in KDB 558074, issued 10/04/2012)

RBW = 1 MHz

VBW  $\geq$  3 MHz

SPAN = Set the analyzer span to a minimum of 1.5 times the EBW

Ensure that the number of measurement points in the sweep  $\geq$  2 x span/RBW

Detector Mode = Power average (RMS) or sample detector when RMS not available

Sweep = auto couple

Trace average at least 100 traces in power averaging(RMS) mode

Use the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges.

|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
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| Test Report No.<br>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGT56310N                           |

# ■ Sample Calculation

$$\begin{aligned}\text{Output Power} &= \text{Reading Value} + \text{ATT loss} + \text{Cable loss(1 ea)} \\ &= 10 \text{ dBm} + 10 \text{ dB} + 0.8 \text{ dB} = 20.8 \text{ dBm}\end{aligned}$$

Note :

1. Spectrum reading values are not plot data. The power 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 conducted peak power 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)

■ Duty Cycle Factor

| Mode | Data Rate | T <sub>on</sub><br>(ms) | T <sub>total</sub><br>(ms) | Duty Cycle | Duty Cycle Factor<br>(dB) |
|------|-----------|-------------------------|----------------------------|------------|---------------------------|
| b    | 1 Mbps    | 12.4                    | 12.44                      | 0.99678457 | 0.014                     |
|      | 2 Mbps    | 12.62                   | 12.66                      | 0.99684044 | 0.014                     |
|      | 5.5 Mbps  | 2.411                   | 2.441                      | 0.98770995 | 0.054                     |
|      | 11 Mbps   | 1.305                   | 1.33                       | 0.98120301 | 0.082                     |
| g    | 6 Mbs     | 2.055                   | 2.095                      | 0.98090692 | 0.084                     |
|      | 9 Mbs     | 1.375                   | 1.415                      | 0.97173145 | 0.125                     |
|      | 12 Mbs    | 1.038                   | 1.076                      | 0.96468401 | 0.156                     |
|      | 18 Mbs    | 0.696                   | 0.736                      | 0.94565217 | 0.243                     |
|      | 24 Mbs    | 0.532                   | 0.564                      | 0.94326241 | 0.254                     |
|      | 36 Mbs    | 0.364                   | 0.396                      | 0.91919192 | 0.366                     |
|      | 48 Mbs    | 0.277                   | 0.308                      | 0.89935065 | 0.461                     |
|      | 54 Mbs    | 0.248                   | 0.28                       | 0.88571429 | 0.527                     |
| n    | 6.5 Mbs   | 1.92                    | 1.953                      | 0.98310292 | 0.074                     |
|      | 13 Mbs    | 0.981                   | 1.011                      | 0.97032641 | 0.131                     |
|      | 19.5 Mbs  | 0.664                   | 0.696                      | 0.95402299 | 0.204                     |
|      | 26 Mbs    | 0.508                   | 0.54                       | 0.94074074 | 0.265                     |
|      | 39 Mbs    | 0.352                   | 0.384                      | 0.91666667 | 0.378                     |
|      | 52 Mbs    | 0.272                   | 0.304                      | 0.89473684 | 0.483                     |
|      | 58.5 Mbs  | 0.248                   | 0.28                       | 0.88571429 | 0.527                     |
|      | 65 Mbs    | 0.228                   | 0.26                       | 0.87692308 | 0.570                     |

Note : Duty Cycle Factor =  $10 \cdot \log(1/\text{Duty Cycle})$

where, Duty Cycle =  $T_{on} / T_{total}$

■ TEST RESULTS-Peak

Conducted Output Power Measurements (802.11b Mode)

| 802.11b Mode   |             | Rate<br>(Mbps) | Measured<br>Power(dBm) | Limit<br>(dBm) |
|----------------|-------------|----------------|------------------------|----------------|
| Frequency[MHz] | Channel No. |                |                        |                |
| 2412           | 1           | 1 Mbps         | 18.53                  | 30             |
|                |             | 2 Mbps         | 18.82                  | 30             |
|                |             | 5.5 Mbps       | 20.35                  | 30             |
|                |             | 11 Mbps        | 21.86                  | 30             |
| 2437           | 6           | 1 Mbps         | 18.94                  | 30             |
|                |             | 2 Mbps         | 19.60                  | 30             |
|                |             | 5.5 Mbps       | 21.15                  | 30             |
|                |             | 11 Mbps        | 22.28                  | 30             |
| 2462           | 11          | 1 Mbps         | 18.84                  | 30             |
|                |             | 2 Mbps         | 19.13                  | 30             |
|                |             | 5.5 Mbps       | 20.64                  | 30             |
|                |             | 11 Mbps        | 22.12                  | 30             |

### Conducted Output Power Measurements (802.11g Mode)

| 802.11g Mode   |             | Rate<br>(Mbps) | Measured<br>Power(dBm) | Limit<br>(dBm) |
|----------------|-------------|----------------|------------------------|----------------|
| Frequency[MHz] | Channel No. |                |                        |                |
| 2412           | 1           | 6 Mbps         | 21.74                  | 30             |
|                |             | 9 Mbps         | 21.86                  | 30             |
|                |             | 12 Mbps        | 22.09                  | 30             |
|                |             | 18 Mbps        | 21.76                  | 30             |
|                |             | 24 Mbps        | 21.36                  | 30             |
|                |             | 36 Mbps        | 20.41                  | 30             |
|                |             | 48 Mbps        | 20.83                  | 30             |
|                |             | 54 Mbps        | 20.87                  | 30             |
| 2437           | 6           | 6 Mbps         | 22.12                  | 30             |
|                |             | 9 Mbps         | 22.26                  | 30             |
|                |             | 12 Mbps        | 22.51                  | 30             |
|                |             | 18 Mbps        | 22.21                  | 30             |
|                |             | 24 Mbps        | 21.70                  | 30             |
|                |             | 36 Mbps        | 20.82                  | 30             |
|                |             | 48 Mbps        | 21.19                  | 30             |
|                |             | 54 Mbps        | 21.37                  | 30             |
| 2462           | 11          | 6 Mbps         | 21.73                  | 30             |
|                |             | 9 Mbps         | 21.87                  | 30             |
|                |             | 12 Mbps        | 22.14                  | 30             |
|                |             | 18 Mbps        | 21.78                  | 30             |
|                |             | 24 Mbps        | 21.33                  | 30             |
|                |             | 36 Mbps        | 19.97                  | 30             |
|                |             | 48 Mbps        | 20.23                  | 30             |
|                |             | 54 Mbps        | 20.38                  | 30             |

**Conducted Output Power Measurements (802.11n Mode)**

| 802.11n Mode   |             | Rate<br>(Mbps) | Measured<br>Power(dBm) | Limit<br>(dBm) |
|----------------|-------------|----------------|------------------------|----------------|
| Frequency[MHz] | Channel No. |                |                        |                |
| 2412           | 1           | 6.5 Mbps       | 19.15                  | 30             |
|                |             | 13 Mbps        | 19.09                  | 30             |
|                |             | 19.5 Mbps      | 19.16                  | 30             |
|                |             | 26 Mbps        | 19.42                  | 30             |
|                |             | 39 Mbps        | 19.05                  | 30             |
|                |             | 52 Mbps        | 19.22                  | 30             |
|                |             | 58.5 Mbps      | 19.43                  | 30             |
|                |             | 65 Mbps        | 18.43                  | 30             |
| 2437           | 6           | 6.5 Mbps       | 19.62                  | 30             |
|                |             | 13 Mbps        | 19.65                  | 30             |
|                |             | 19.5 Mbps      | 19.70                  | 30             |
|                |             | 26 Mbps        | 19.86                  | 30             |
|                |             | 39 Mbps        | 19.82                  | 30             |
|                |             | 52 Mbps        | 19.65                  | 30             |
|                |             | 58.5 Mbps      | 20.18                  | 30             |
|                |             | 65 Mbps        | 18.74                  | 30             |
| 2462           | 11          | 6.5 Mbps       | 18.91                  | 30             |
|                |             | 13 Mbps        | 18.94                  | 30             |
|                |             | 19.5 Mbps      | 19.00                  | 30             |
|                |             | 26 Mbps        | 19.11                  | 30             |
|                |             | 39 Mbps        | 19.14                  | 30             |
|                |             | 52 Mbps        | 19.27                  | 30             |
|                |             | 58.5 Mbps      | 19.36                  | 30             |
|                |             | 65 Mbps        | 18.37                  | 30             |

■ TEST RESULTS-Average

Conducted Output Power Measurements (802.11b Mode)

| 802.11b Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 2412            | 1           | 1 Mbps      | 15.72               | 0.014             | 15.734                                  | 30          |
|                 |             | 2 Mbps      | 15.70               | 0.014             | 15.714                                  | 30          |
|                 |             | 5.5 Mbps    | 15.77               | 0.054             | 15.824                                  | 30          |
|                 |             | 11 Mbps     | 15.67               | 0.082             | 15.752                                  | 30          |
| 2437            | 6           | 1 Mbps      | 16.38               | 0.014             | 16.394                                  | 30          |
|                 |             | 2 Mbps      | 16.03               | 0.014             | 16.044                                  | 30          |
|                 |             | 5.5 Mbps    | 16.35               | 0.054             | 16.404                                  | 30          |
|                 |             | 11 Mbps     | 16.26               | 0.082             | 16.342                                  | 30          |
| 2462            | 11          | 1 Mbps      | 15.91               | 0.014             | 15.924                                  | 30          |
|                 |             | 2 Mbps      | 15.90               | 0.014             | 15.914                                  | 30          |
|                 |             | 5.5 Mbps    | 16.00               | 0.054             | 16.054                                  | 30          |
|                 |             | 11 Mbps     | 15.89               | 0.082             | 15.972                                  | 30          |

**Conducted Output Power Measurements (802.11g Mode)**

| 802.11g Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 2412            | 1           | 6 Mbps      | 14.02               | 0.08              | 14.104                                  | 30          |
|                 |             | 9 Mbps      | 13.97               | 0.13              | 14.095                                  | 30          |
|                 |             | 12 Mbps     | 13.96               | 0.16              | 14.116                                  | 30          |
|                 |             | 18 Mbps     | 13.98               | 0.24              | 14.223                                  | 30          |
|                 |             | 24 Mbps     | 12.80               | 0.25              | 13.054                                  | 30          |
|                 |             | 36 Mbps     | 11.84               | 0.37              | 12.206                                  | 30          |
|                 |             | 48 Mbps     | 11.90               | 0.46              | 12.361                                  | 30          |
|                 |             | 54 Mbps     | 11.87               | 0.53              | 12.397                                  | 30          |
| 2437            | 6           | 6 Mbps      | 14.41               | 0.08              | 14.494                                  | 30          |
|                 |             | 9 Mbps      | 14.40               | 0.13              | 14.525                                  | 30          |
|                 |             | 12 Mbps     | 14.34               | 0.16              | 14.496                                  | 30          |
|                 |             | 18 Mbps     | 14.36               | 0.24              | 14.603                                  | 30          |
|                 |             | 24 Mbps     | 13.16               | 0.25              | 13.414                                  | 30          |
|                 |             | 36 Mbps     | 12.24               | 0.37              | 12.606                                  | 30          |
|                 |             | 48 Mbps     | 12.37               | 0.46              | 12.831                                  | 30          |
|                 |             | 54 Mbps     | 12.29               | 0.53              | 12.817                                  | 30          |
| 2462            | 11          | 6 Mbps      | 13.88               | 0.08              | 13.964                                  | 30          |
|                 |             | 9 Mbps      | 13.81               | 0.13              | 13.935                                  | 30          |
|                 |             | 12 Mbps     | 13.74               | 0.16              | 13.896                                  | 30          |
|                 |             | 18 Mbps     | 13.97               | 0.24              | 14.213                                  | 30          |
|                 |             | 24 Mbps     | 12.73               | 0.25              | 12.984                                  | 30          |
|                 |             | 36 Mbps     | 11.33               | 0.37              | 11.696                                  | 30          |
|                 |             | 48 Mbps     | 11.37               | 0.46              | 11.831                                  | 30          |
|                 |             | 54 Mbps     | 11.30               | 0.53              | 11.827                                  | 30          |

**Conducted Output Power Measurements (802.11n Mode)**

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 2412            | 1           | 6.5 Mbps    | 11.33               | 0.07              | 11.404                                  | 30          |
|                 |             | 13 Mbps     | 10.89               | 0.13              | 11.021                                  | 30          |
|                 |             | 19.5 Mbps   | 10.80               | 0.20              | 11.004                                  | 30          |
|                 |             | 26 Mbps     | 11.07               | 0.27              | 11.335                                  | 30          |
|                 |             | 39 Mbps     | 10.62               | 0.38              | 10.998                                  | 30          |
|                 |             | 52 Mbps     | 10.54               | 0.48              | 11.023                                  | 30          |
|                 |             | 58.5 Mbps   | 10.61               | 0.53              | 11.137                                  | 30          |
|                 |             | 65 Mbps     | 9.58                | 0.57              | 10.150                                  | 30          |
| 2437            | 6           | 6.5 Mbps    | 11.74               | 0.07              | 11.814                                  | 30          |
|                 |             | 13 Mbps     | 11.65               | 0.13              | 11.781                                  | 30          |
|                 |             | 19.5 Mbps   | 11.69               | 0.20              | 11.894                                  | 30          |
|                 |             | 26 Mbps     | 11.54               | 0.27              | 11.805                                  | 30          |
|                 |             | 39 Mbps     | 11.26               | 0.38              | 11.638                                  | 30          |
|                 |             | 52 Mbps     | 10.94               | 0.48              | 11.423                                  | 30          |
|                 |             | 58.5 Mbps   | 11.01               | 0.53              | 11.537                                  | 30          |
|                 |             | 65 Mbps     | 10.06               | 0.57              | 10.630                                  | 30          |
| 2462            | 11          | 6.5 Mbps    | 11.27               | 0.07              | 11.344                                  | 30          |
|                 |             | 13 Mbps     | 11.13               | 0.13              | 11.261                                  | 30          |
|                 |             | 19.5 Mbps   | 11.21               | 0.20              | 11.414                                  | 30          |
|                 |             | 26 Mbps     | 10.87               | 0.27              | 11.135                                  | 30          |
|                 |             | 39 Mbps     | 10.73               | 0.38              | 11.108                                  | 30          |
|                 |             | 52 Mbps     | 10.68               | 0.48              | 11.163                                  | 30          |
|                 |             | 58.5 Mbps   | 10.72               | 0.53              | 11.247                                  | 30          |
|                 |             | 65 Mbps     | 9.71                | 0.57              | 10.280                                  | 30          |

■ RESULT PLOTS-Peak

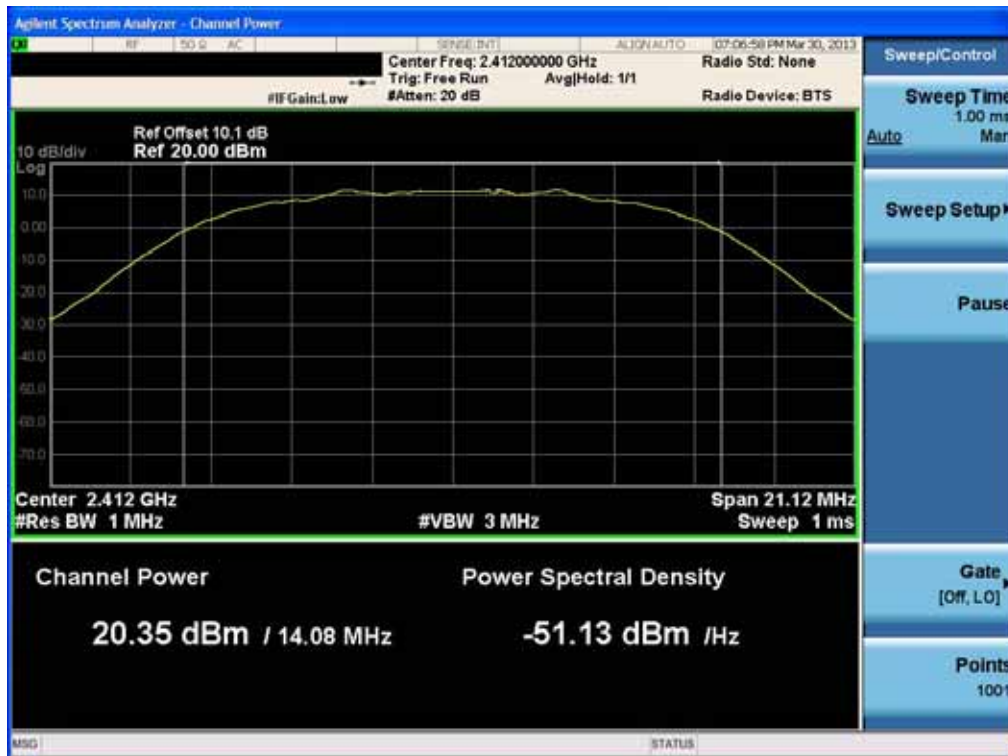
Conducted Output Power (802.11b-CH 1) 1Mbps



Conducted Output Power (802.11b-CH 1) 2Mbps



## Conducted Output Power (802.11b-CH 1) 5.5Mbps



## Conducted Output Power (802.11b-CH 1) 11Mbps



### Conducted Output Power (802.11b-CH 6) 1Mbps



### Conducted Output Power (802.11b-CH 6) 2Mbps



## Conducted Output Power (802.11b-CH 6) 5.5Mbps



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



## Conducted Output Power (802.11b-CH 11) 1Mbps



## Conducted Output Power (802.11b-CH 11) 2Mbps



## Conducted Output Power (802.11b-CH 11) 5.5Mbps



## Conducted Output Power (802.11b-CH 11) 11Mbps



## Conducted Output Power (802.11g-CH 1) 6Mbps



## Conducted Output Power (802.11g-CH 1) 9Mbps



## 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



### 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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



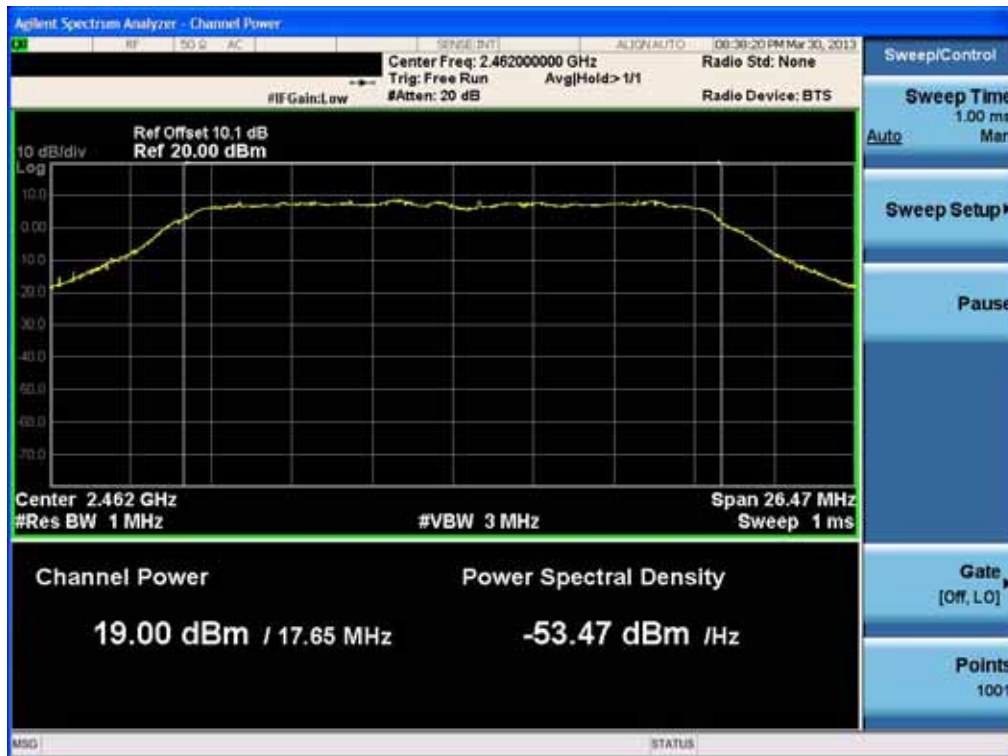
### Conducted Output Power (802.11n-CH 11) 6.5Mbps



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



### 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

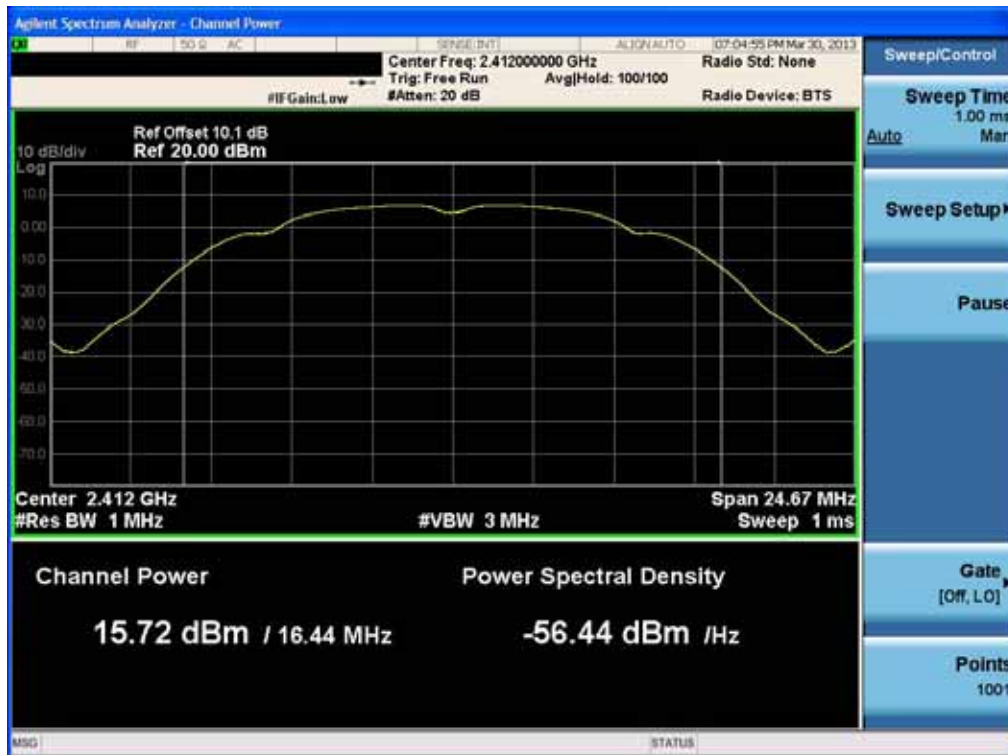


## Conducted Output Power (802.11n-CH 11) 65Mbps



■ RESULT PLOTS-Average

Conducted Output Power (802.11b-CH 1) 1Mbps



Conducted Output Power (802.11b-CH 1) 2Mbps



### Conducted Output Power (802.11b-CH 1) 5.5Mbps



### Conducted Output Power (802.11b-CH 1) 11Mbps



### Conducted Output Power (802.11b-CH 6) 1Mbps



### Conducted Output Power (802.11b-CH 6) 2Mbps



### Conducted Output Power (802.11b-CH 6) 5.5Mbps



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



## Conducted Output Power (802.11b-CH 11) 1Mbps



## Conducted Output Power (802.11b-CH 11) 2Mbps



### Conducted Output Power (802.11b-CH 11) 5.5Mbps



### Conducted Output Power (802.11b-CH 11) 11Mbps



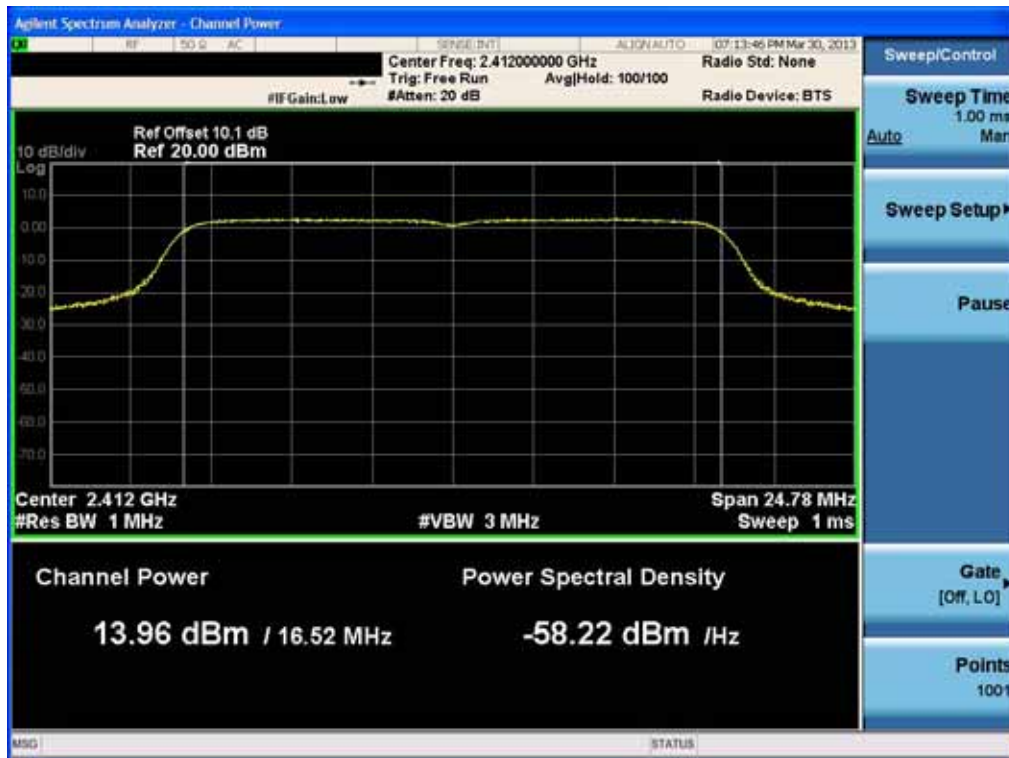
### Conducted Output Power (802.11g-CH 1) 6Mbps



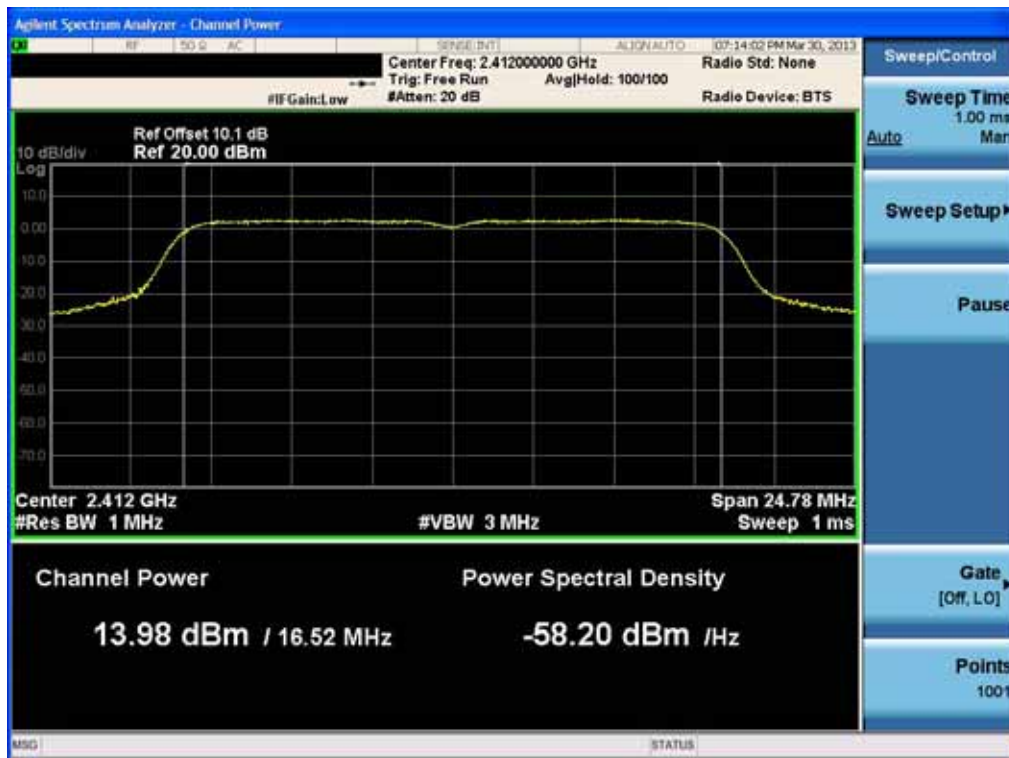
### Conducted Output Power (802.11g-CH 1) 9Mbps



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



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



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



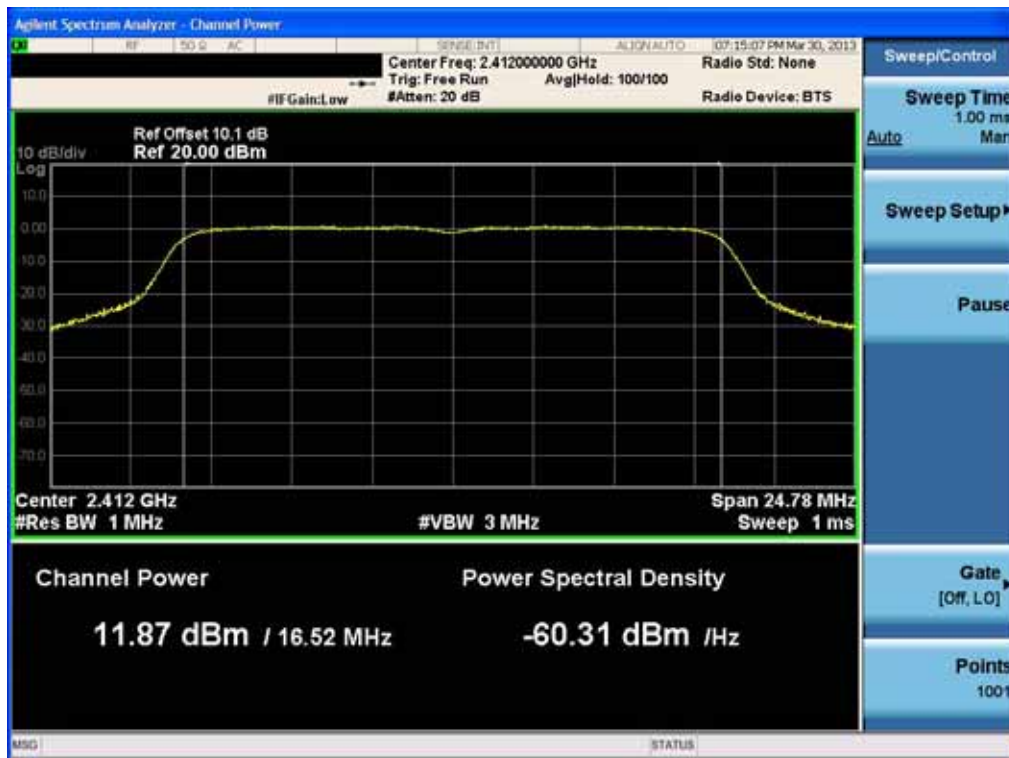
## Conducted Output Power (802.11g-CH 1) 36Mbps



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



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



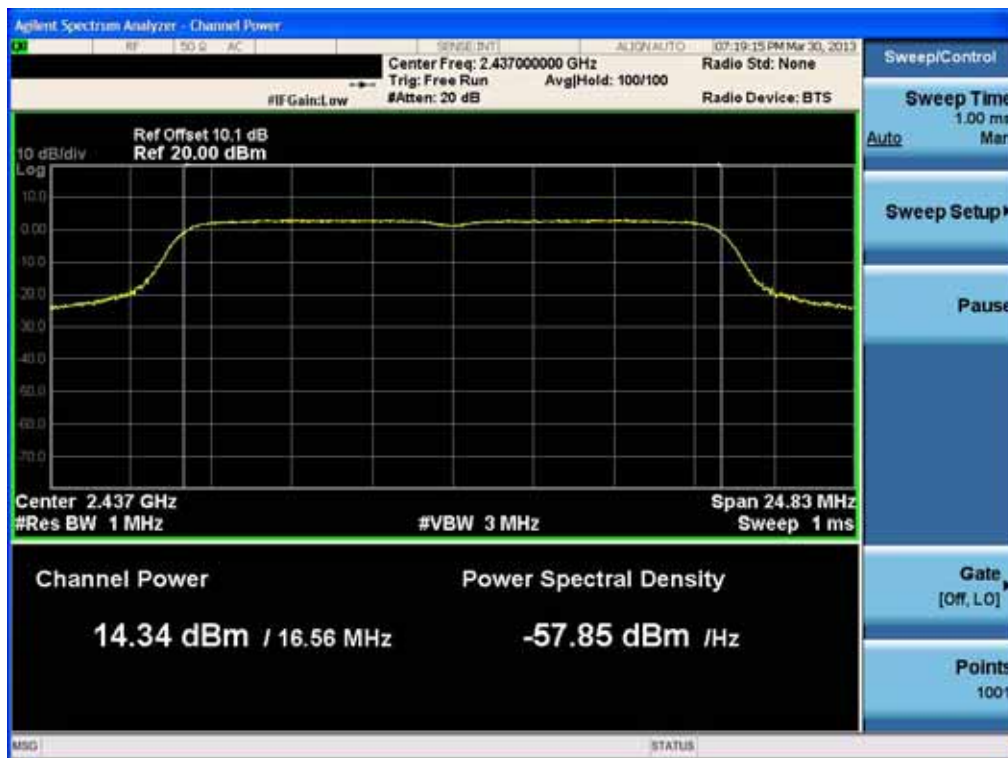
## Conducted Output Power (802.11g-CH 6) 6Mbps



## 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



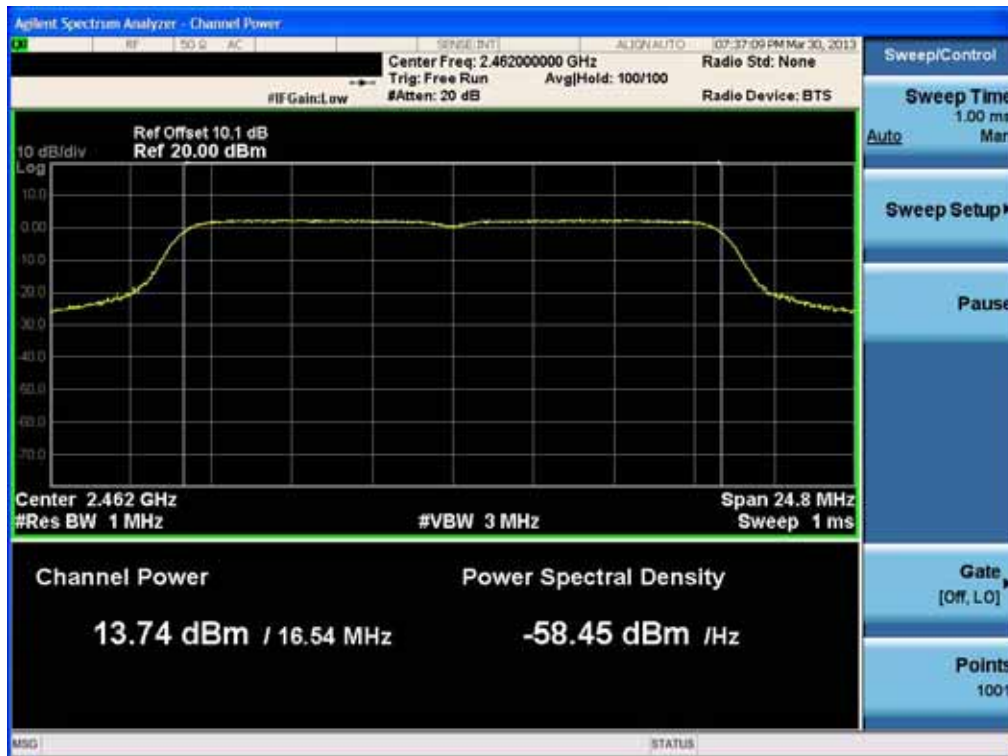
## Conducted Output Power (802.11g-CH 11) 6Mbps



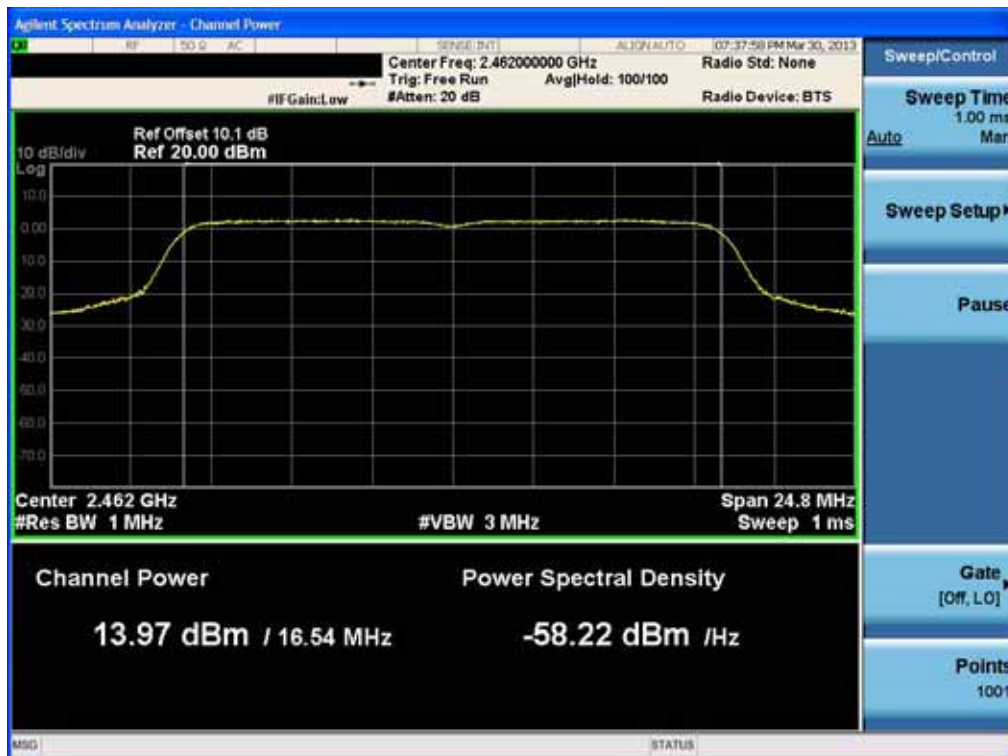
## Conducted Output Power (802.11g-CH 11) 9Mbps



### 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



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



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



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



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



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



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



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



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



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



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



### 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

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



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



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



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



## 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

## 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



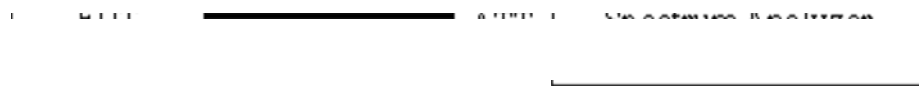
### 8.3 POWER SPECTRAL DENSITY (802.11b/g/n)

#### 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 9.1 Option1 in KDB 558074, issued 10/04/2012

The spectrum analyzer is set to :

Set analyzer center frequency to DTS channel center frequency.

Span = 1.5 times the DTS channel bandwidth

RBW  $\geq$  3 kHz

VBW  $\geq$  9 kHz

Sweep = Auto couple

Detector Mode = Peak

Trace Mode = Max hold

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### ■ Sample Calculation

$$\begin{aligned} \text{PSD} &= \text{Reading Value} + \text{ATT loss} + \text{Cable loss}(1 \text{ ea}) \\ &= -5 \text{ dBm} + 10 \text{ dB} + 0.8 \text{ dB} = 5.8 \text{ dBm} \end{aligned}$$

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.

|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

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)

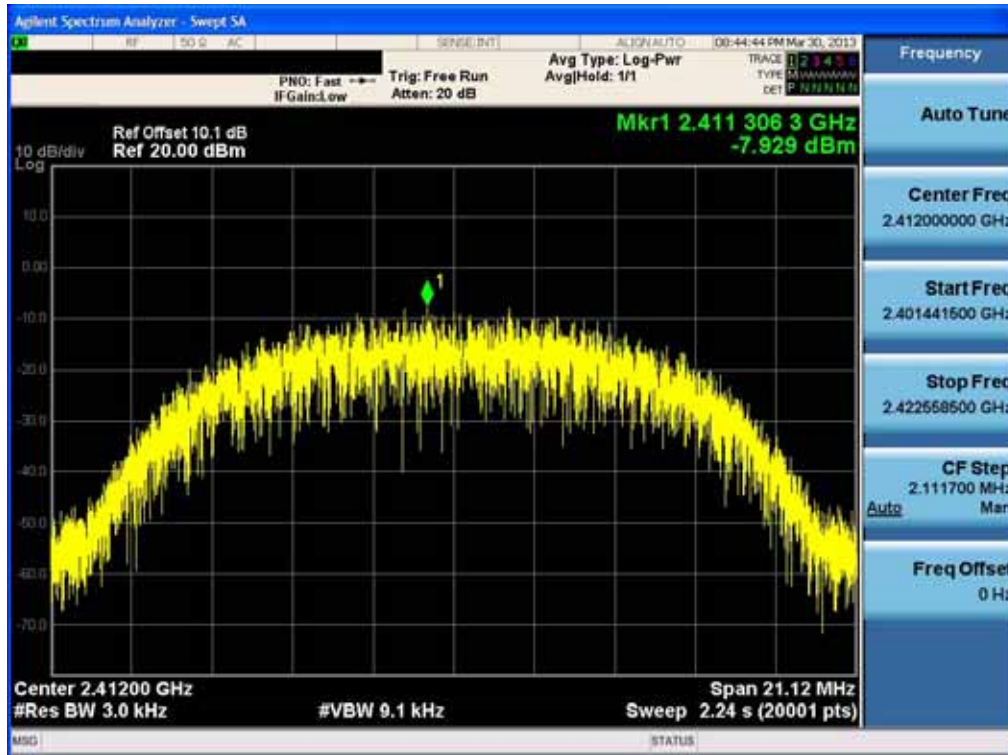
## ■ TEST RESULTS

### Conducted Power Density Measurements

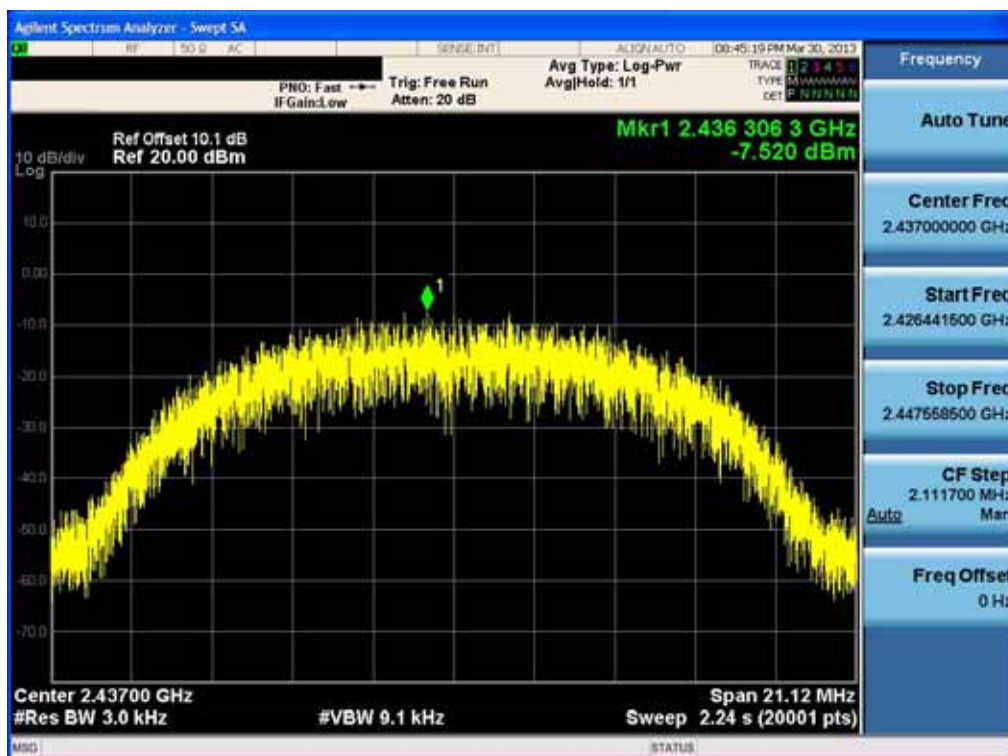
| Frequency<br>(MHz) | Channel<br>No. | Mode    | Test Result  |                |           |
|--------------------|----------------|---------|--------------|----------------|-----------|
|                    |                |         | PSD<br>(dBm) | Limit<br>(dBm) | Pass/Fail |
| 2412               | 1              | 802.11b | -7.929       | 8              | Pass      |
| 2437               | 6              |         | -7.520       | 8              | Pass      |
| 2462               | 11             |         | -8.075       | 8              | Pass      |
| 2412               | 1              | 802.11g | -12.674      | 8              | Pass      |
| 2437               | 6              |         | -11.911      | 8              | Pass      |
| 2462               | 11             |         | -12.104      | 8              | Pass      |
| 2412               | 1              | 802.11n | -14.212      | 8              | Pass      |
| 2437               | 6              |         | -13.851      | 8              | Pass      |
| 2462               | 11             |         | -14.295      | 8              | Pass      |

## RESULT PLOTS

Power Spectral Density (802.11b-CH 1)

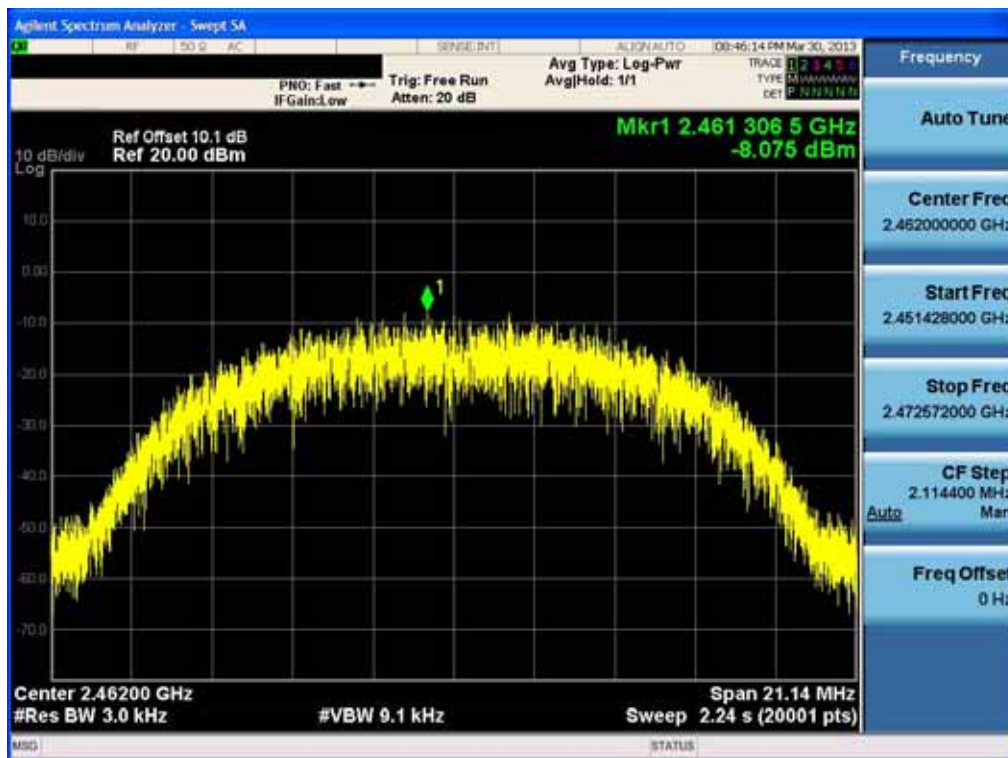


Power Spectral Density (802.11b-CH 6)

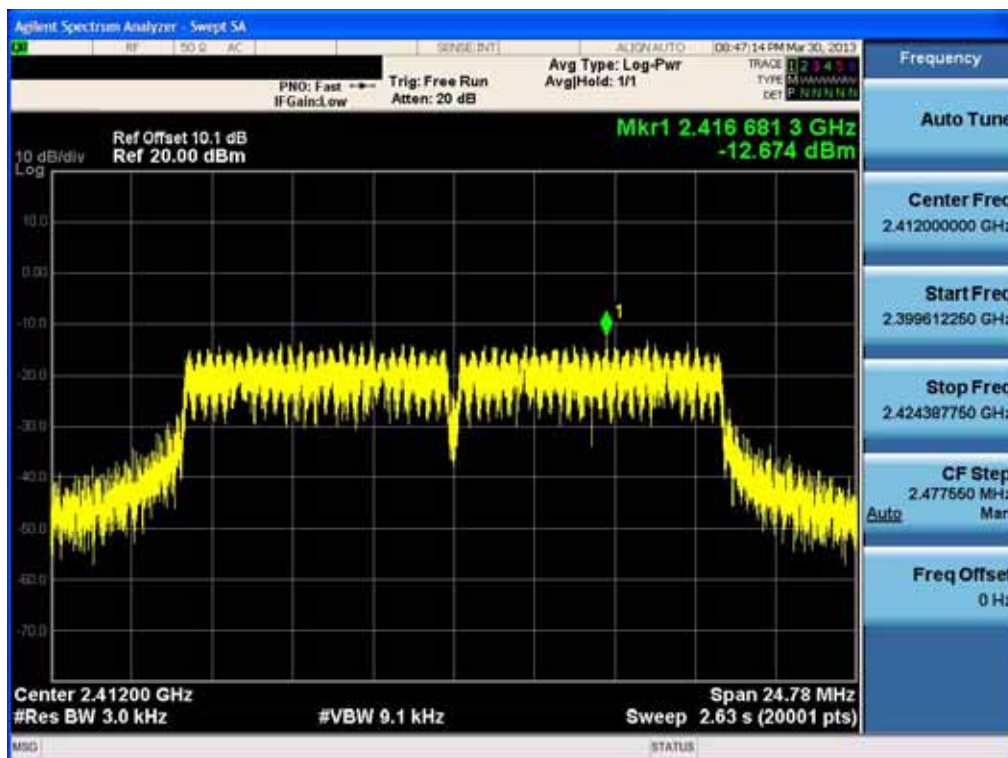


|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

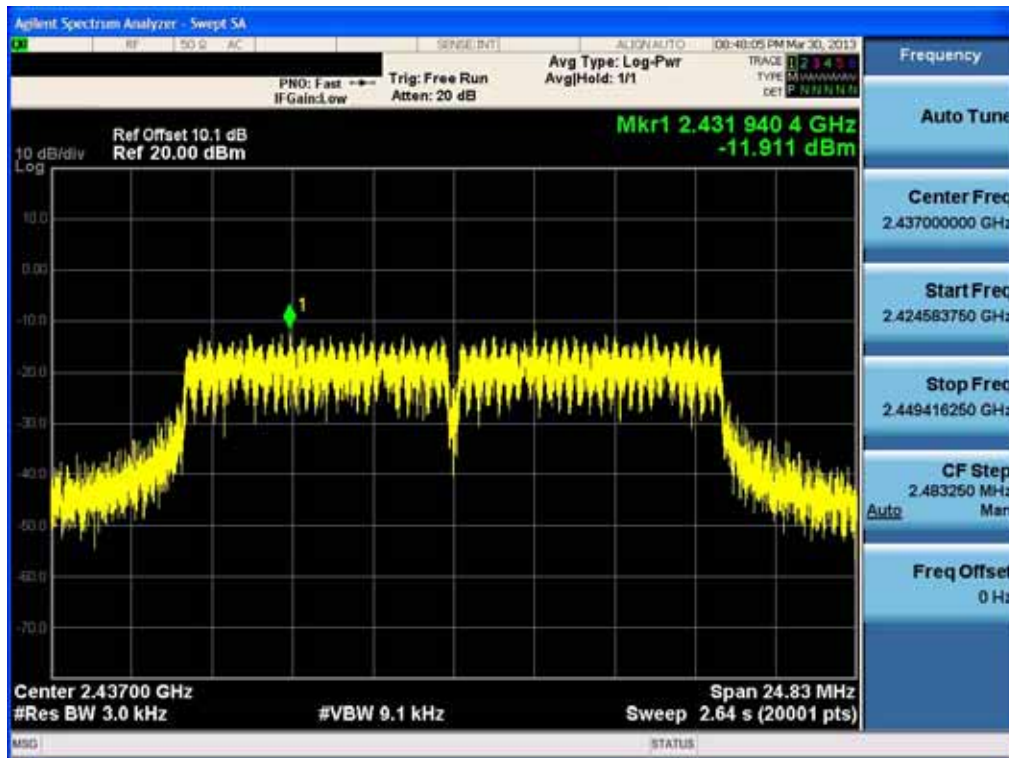
### Power Spectral Density (802.11b-CH 11)



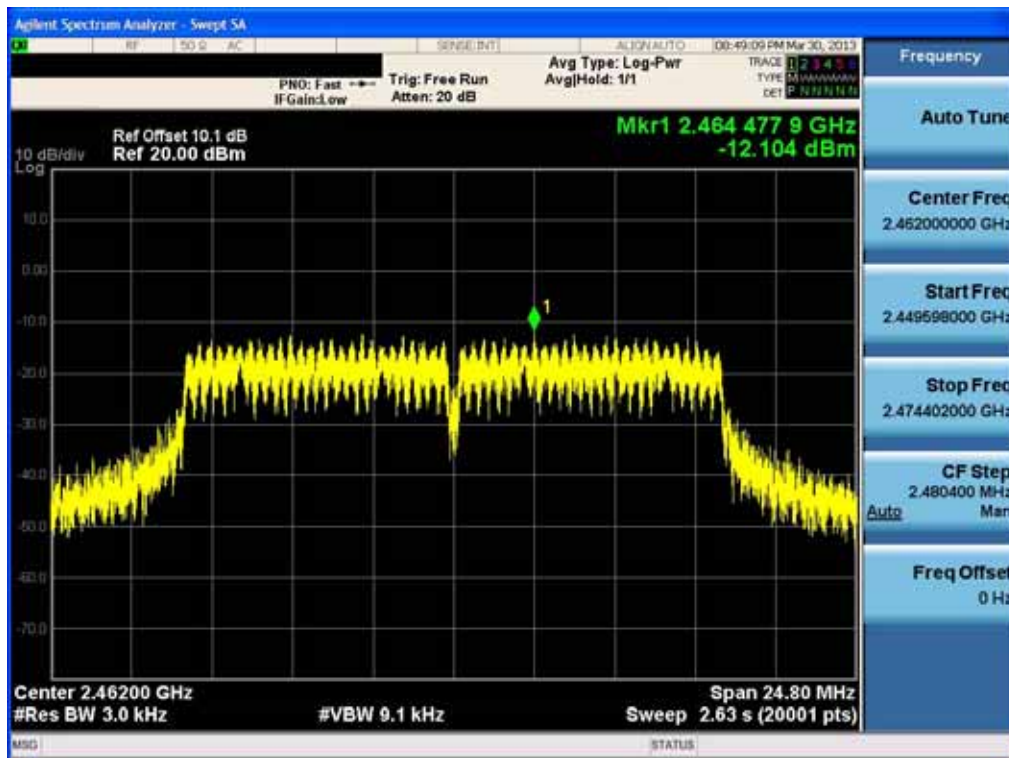
### Power Spectral Density (802.11g-CH 1)



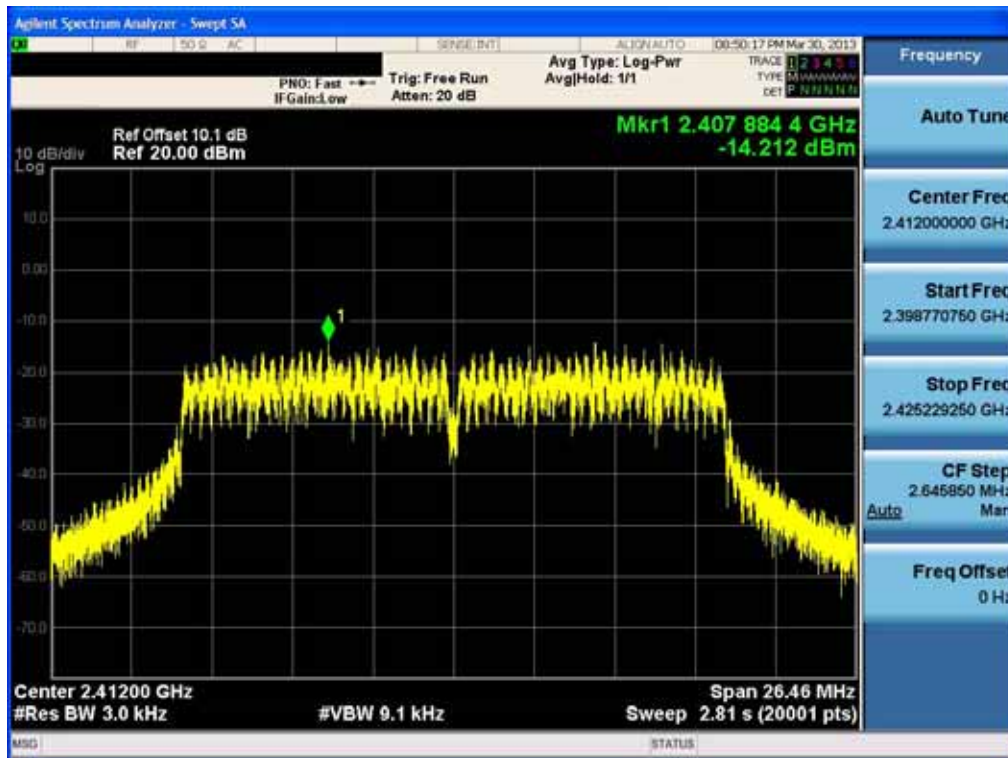
### Power Spectral Density (802.11g-CH 6)



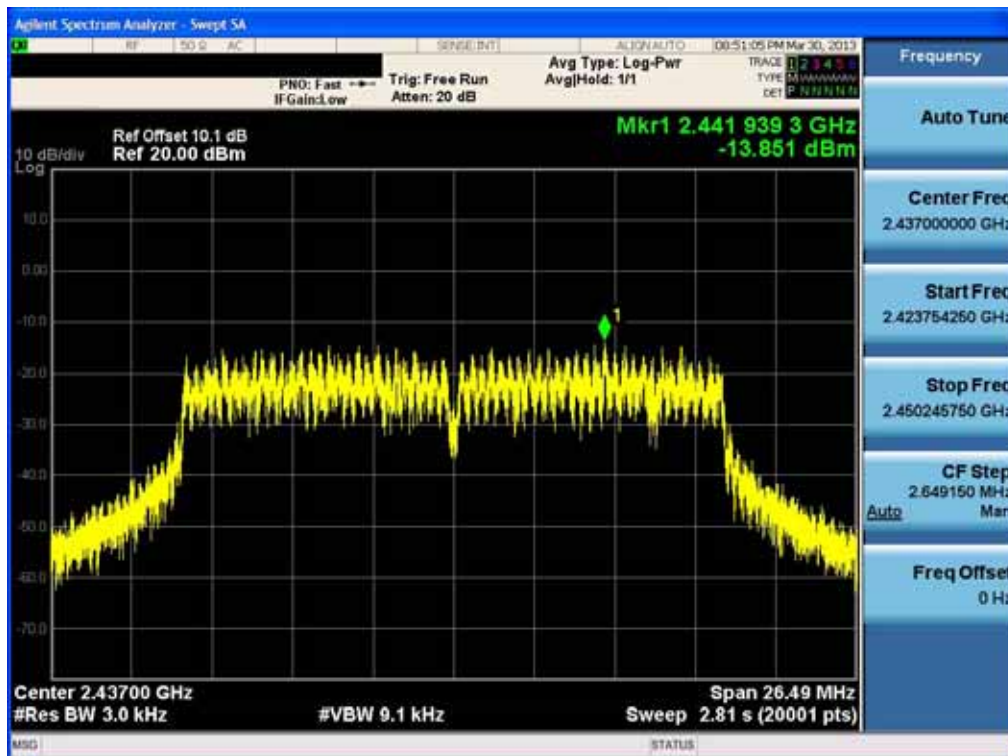
### Power Spectral Density (802.11g-CH11)



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

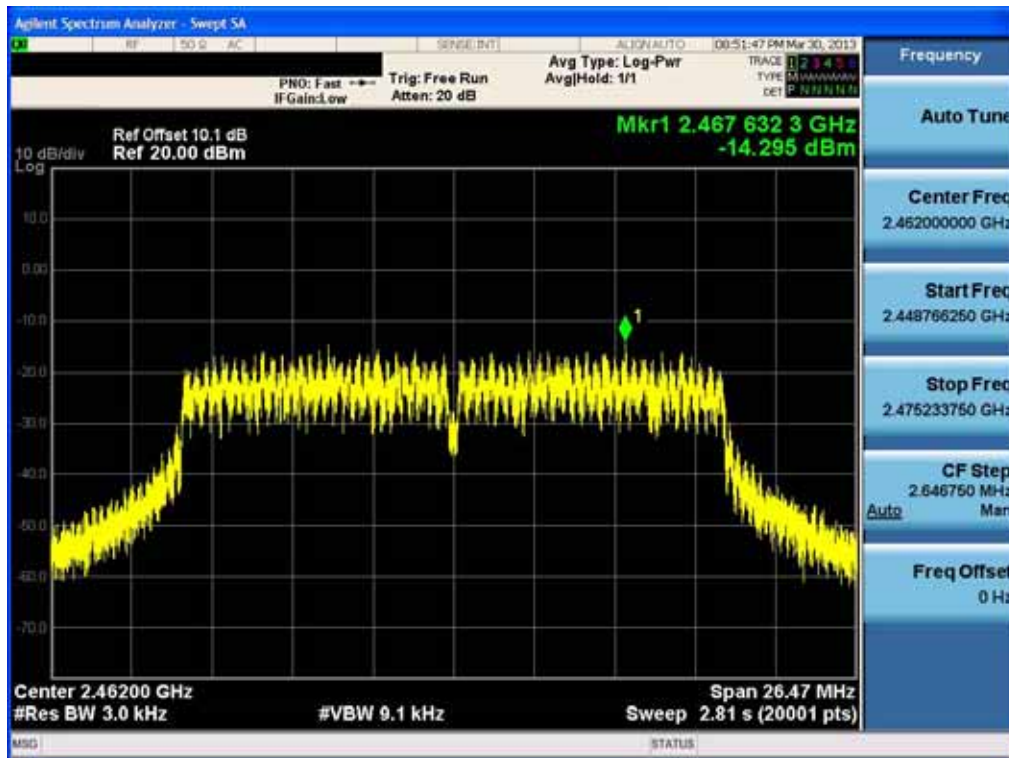


### Power Spectral Density (802.11n-CH 6)



|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

## 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

## 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 10.1.2 in KDB 558074, issued 10/04/2012)

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

VBW ≥ 300 kHz(Upon 1 GHz = 3 MHz)

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep = auto couple

Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Measurements are made over the 30 MHz to 40 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

|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

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.

| 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

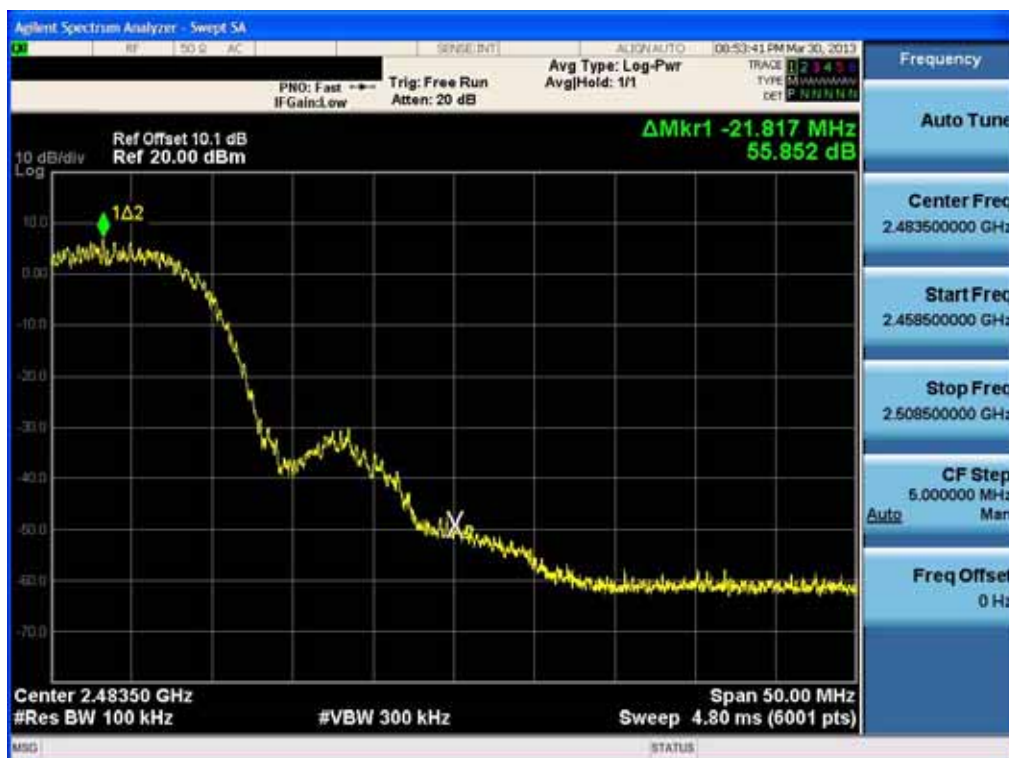
|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

## RESULT PLOTS

BandEdge (802.11b-CH1)

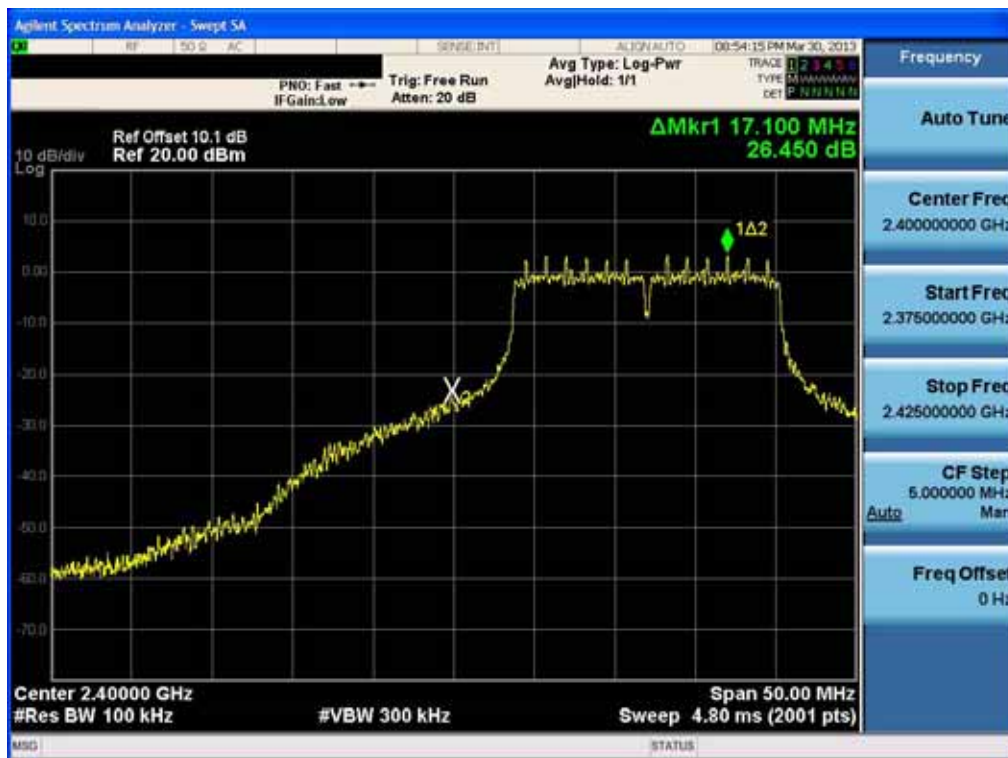


BandEdge (802.11b-CH11)

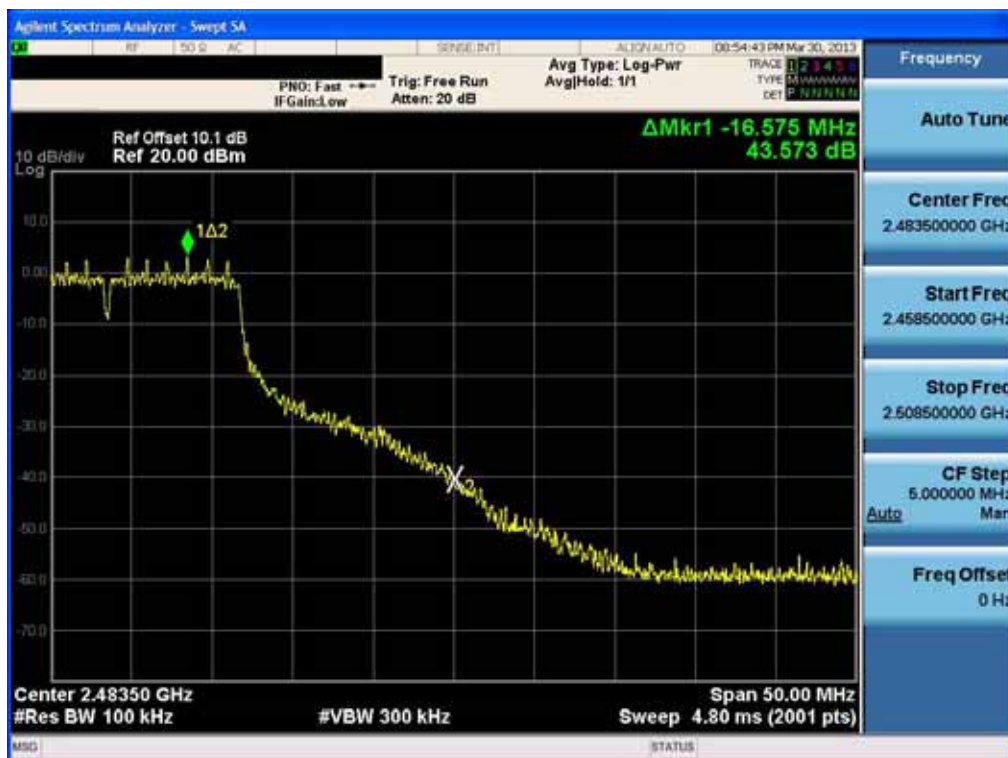


|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

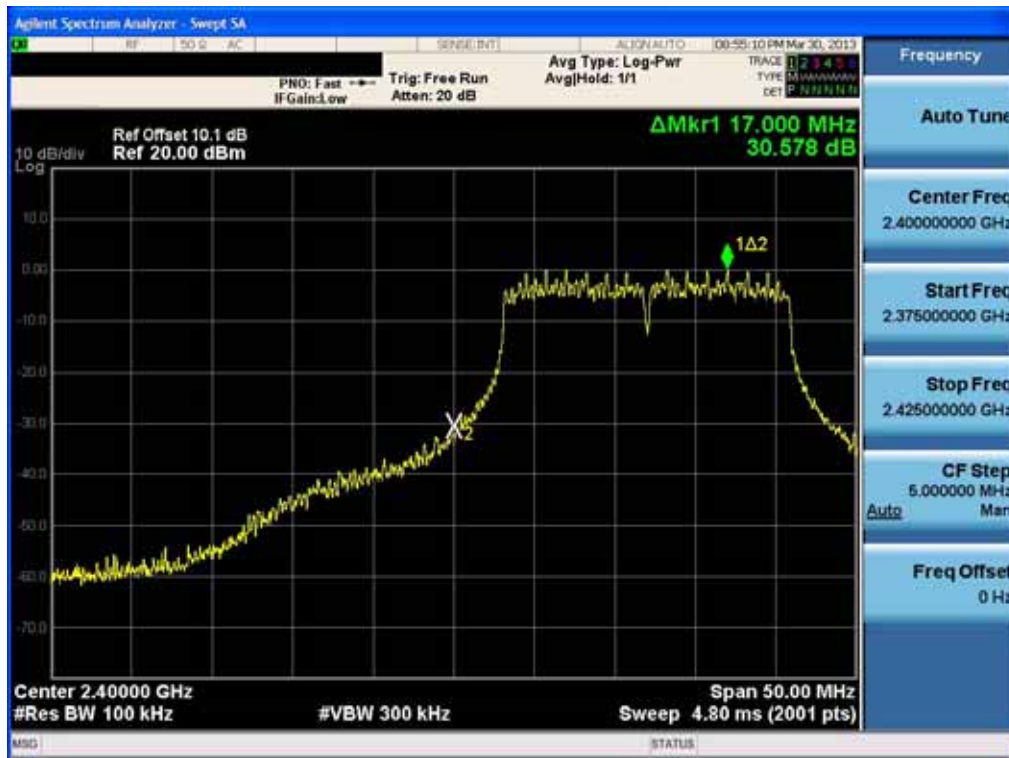
## BandEdge (802.11g-CH1)



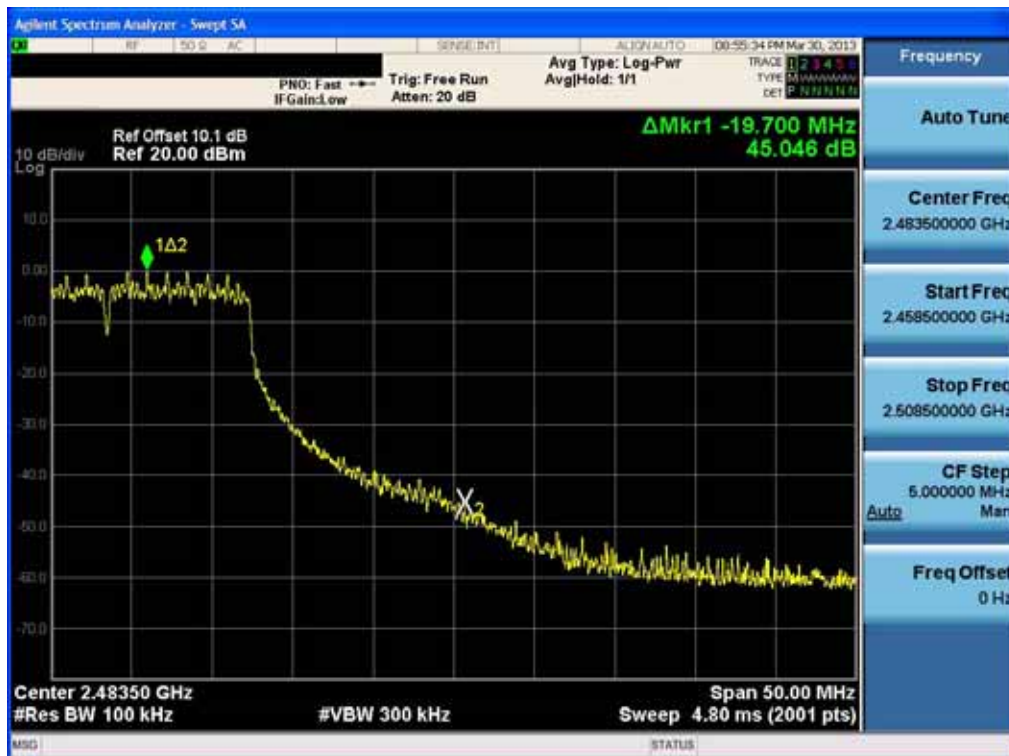
## BandEdge (802.11g-CH11)



## BandEdge (802.11n-CH1)



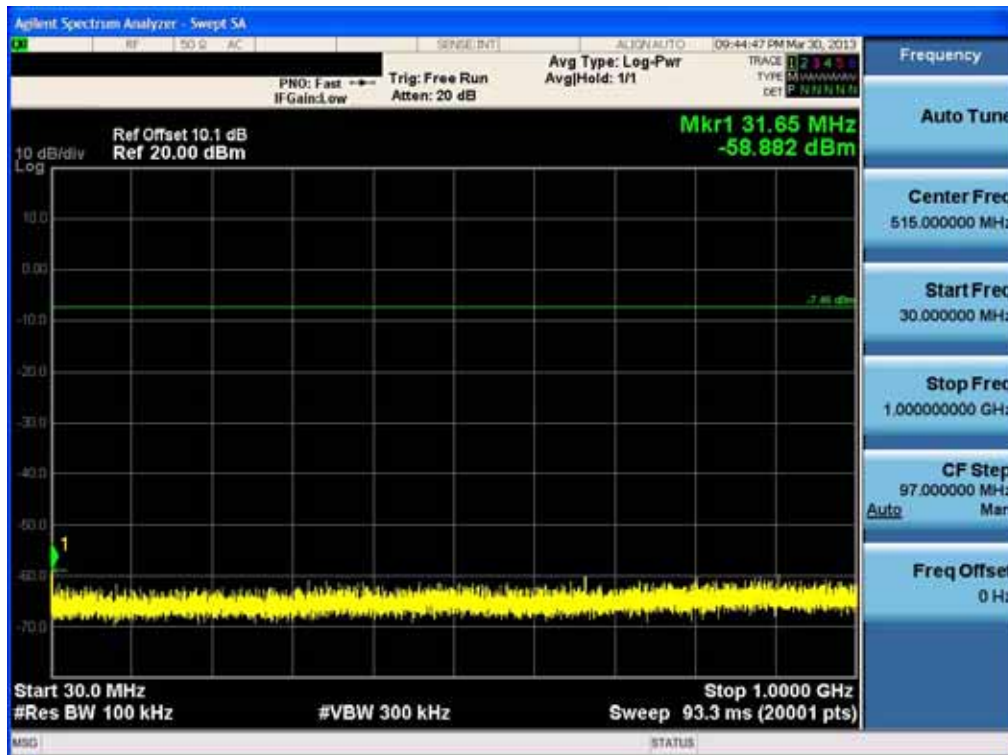
## BandEdge (802.11n-CH11)



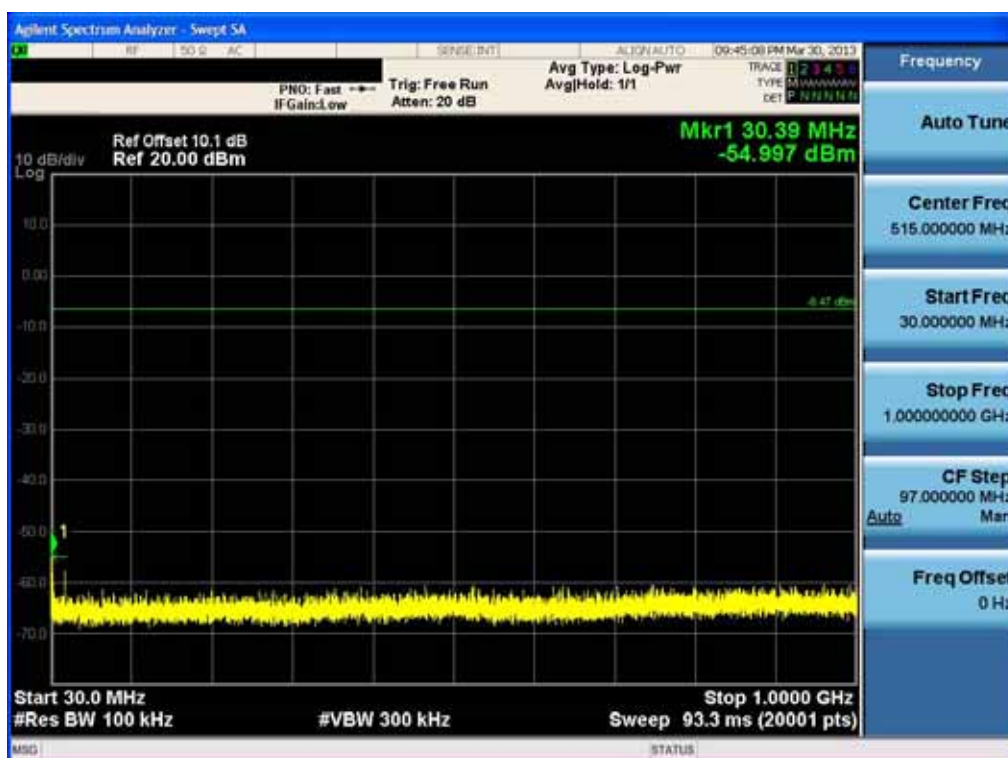
|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

30 MHz ~ 1 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N |                                                  |

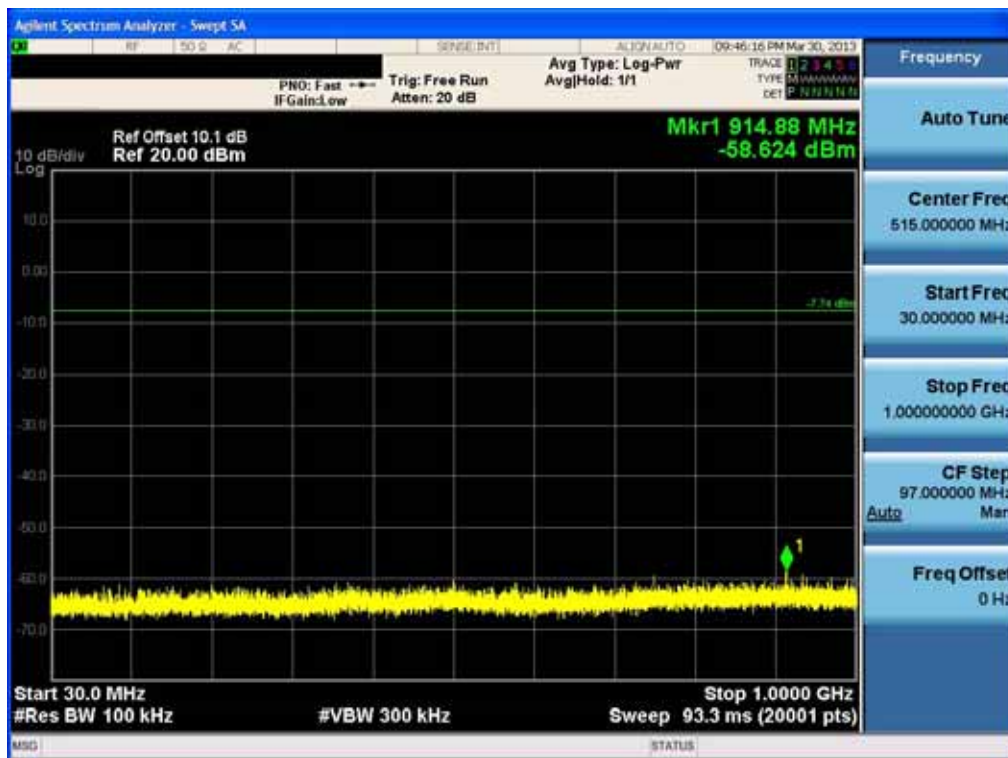
### Conducted Spurious Emission (802.11b-CH11)



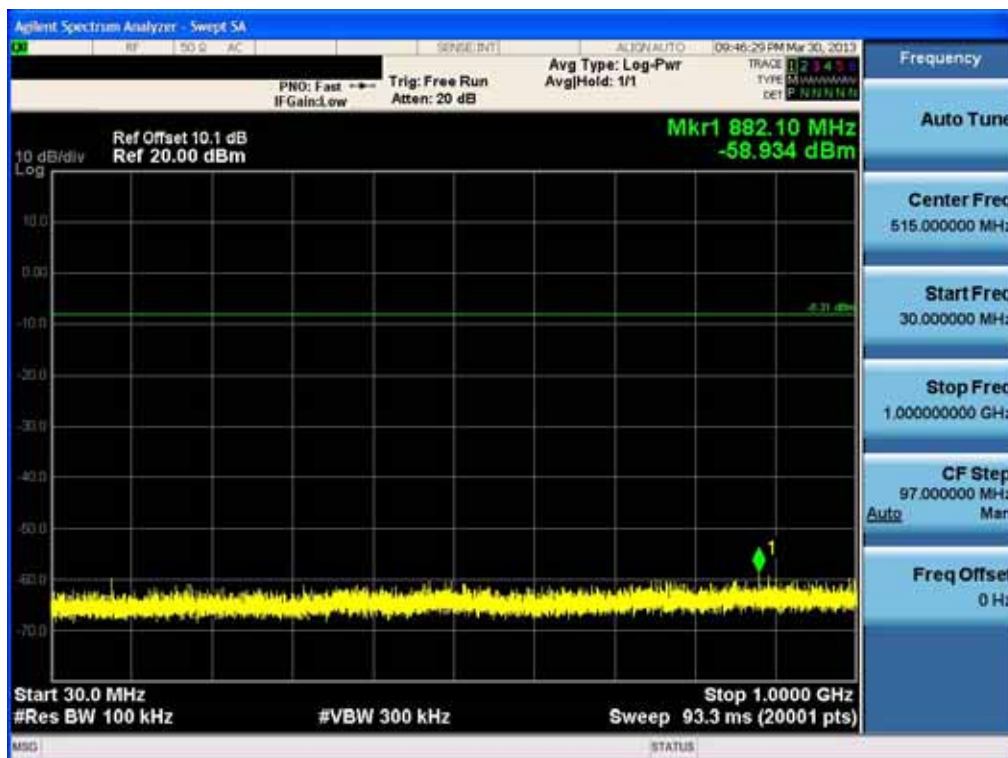
### Conducted Spurious Emission (802.11g-CH1)



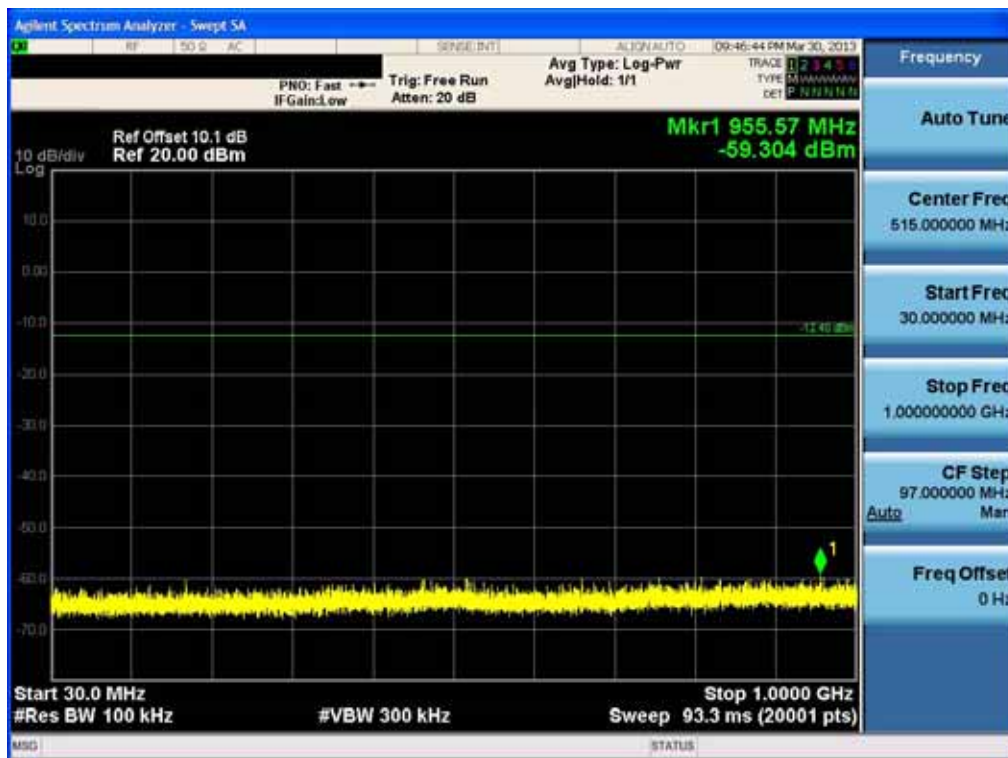
### Conducted Spurious Emission (802.11g-CH6)



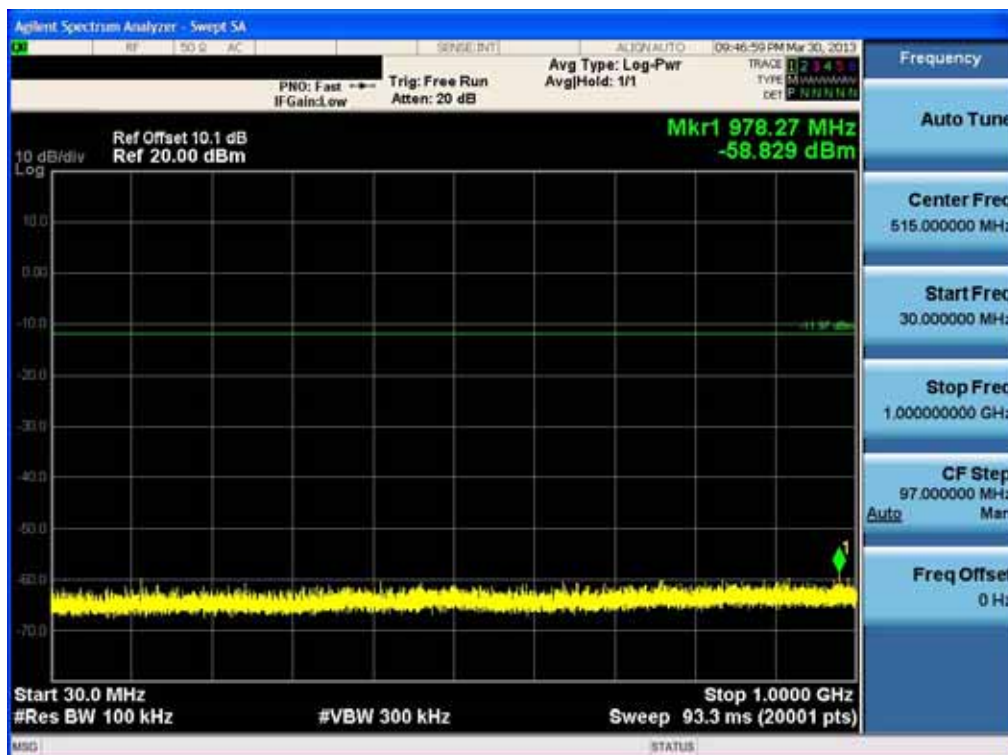
### Conducted Spurious Emission (802.11g-CH11)



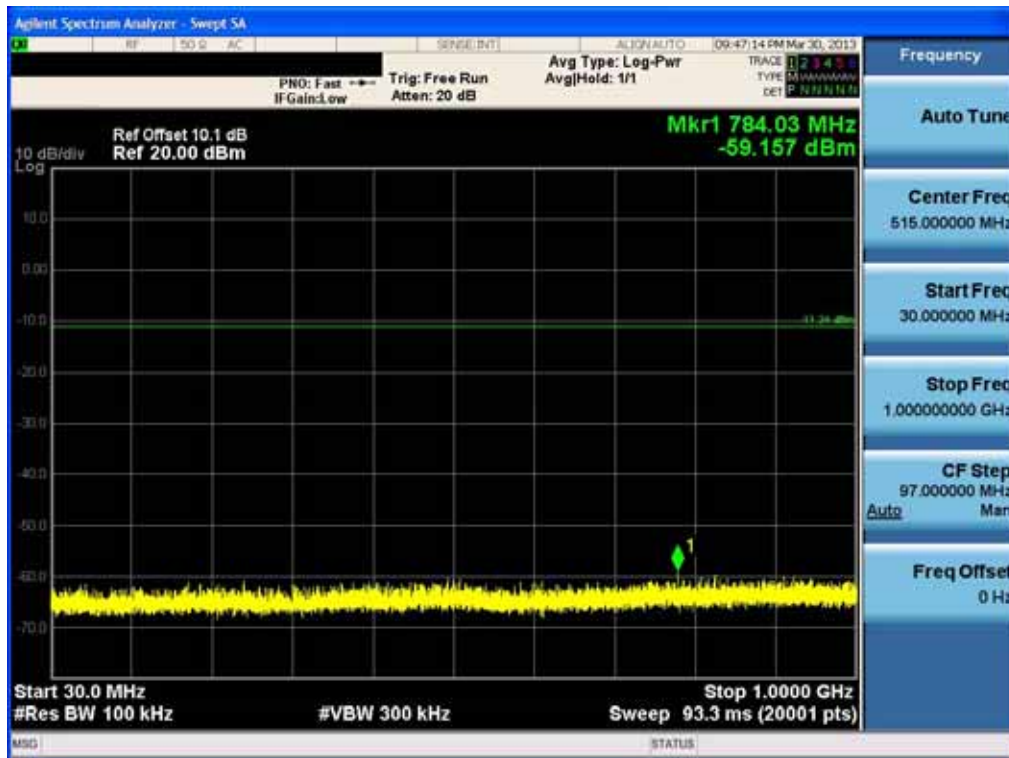
## Conducted Spurious Emission (802.11n-CH1)



## Conducted Spurious Emission (802.11n-CH6)



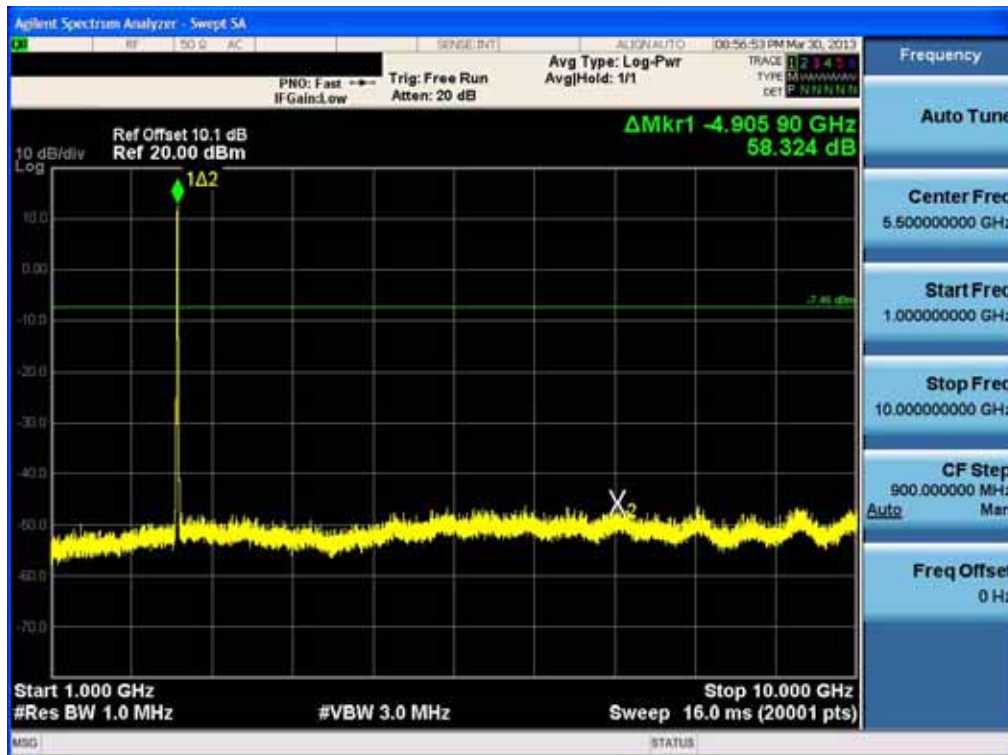
## Conducted Spurious Emission (802.11n-CH11)



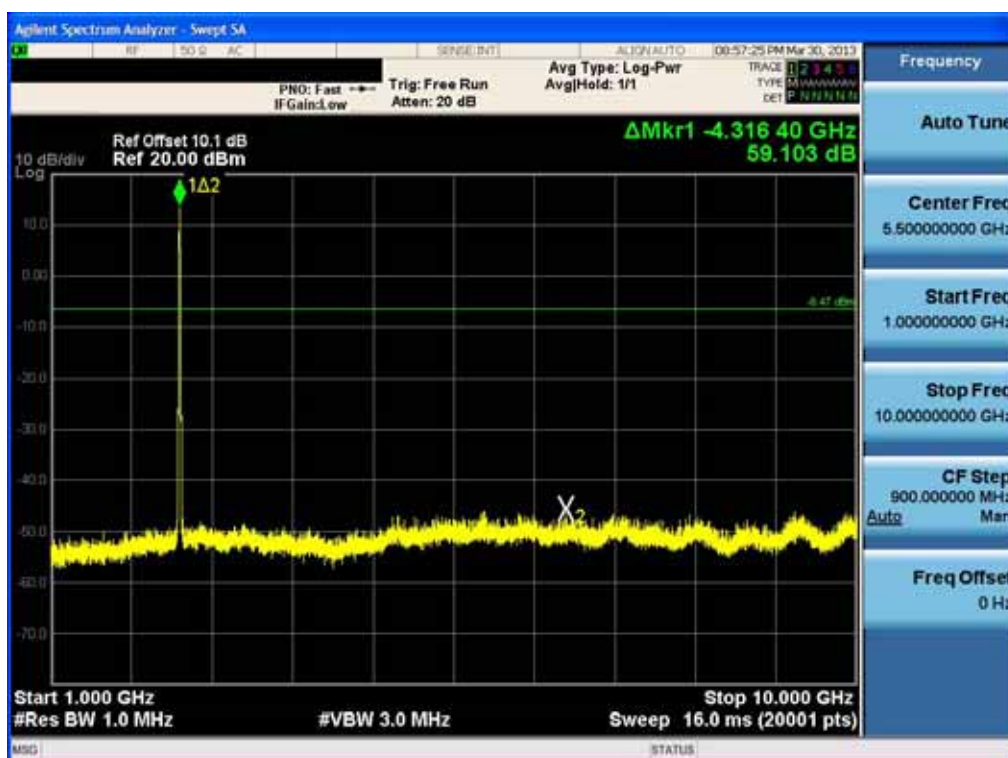
|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

1 GHz ~ 10 GHz

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

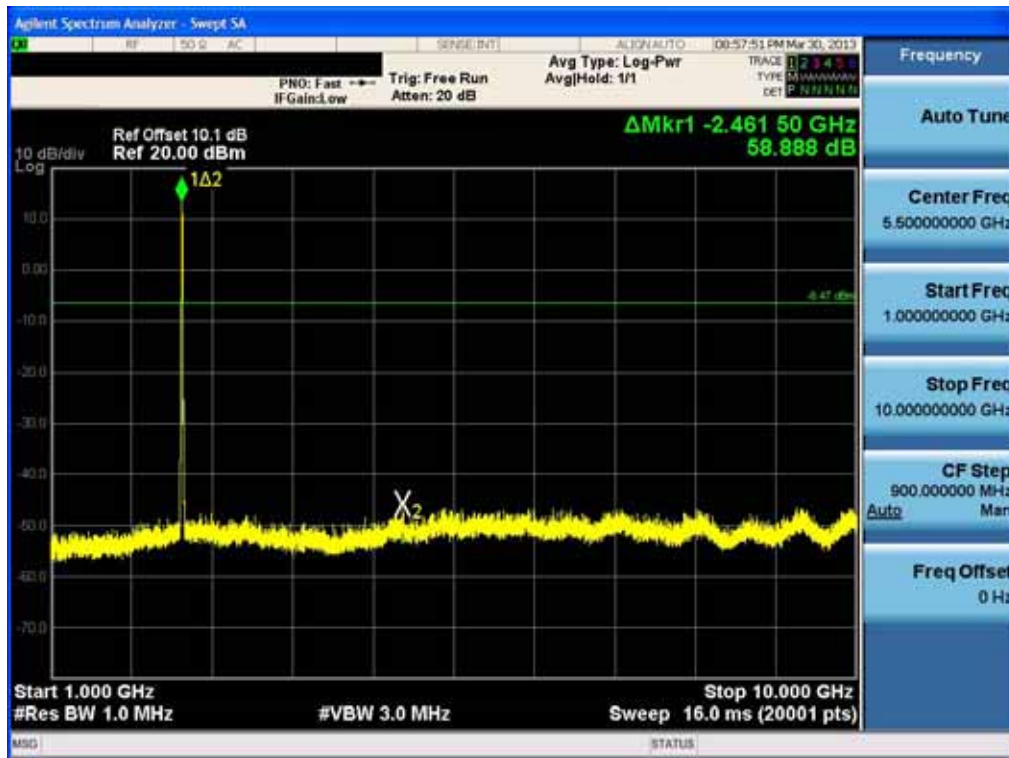


### Conducted Spurious Emission (802.11b-CH6)

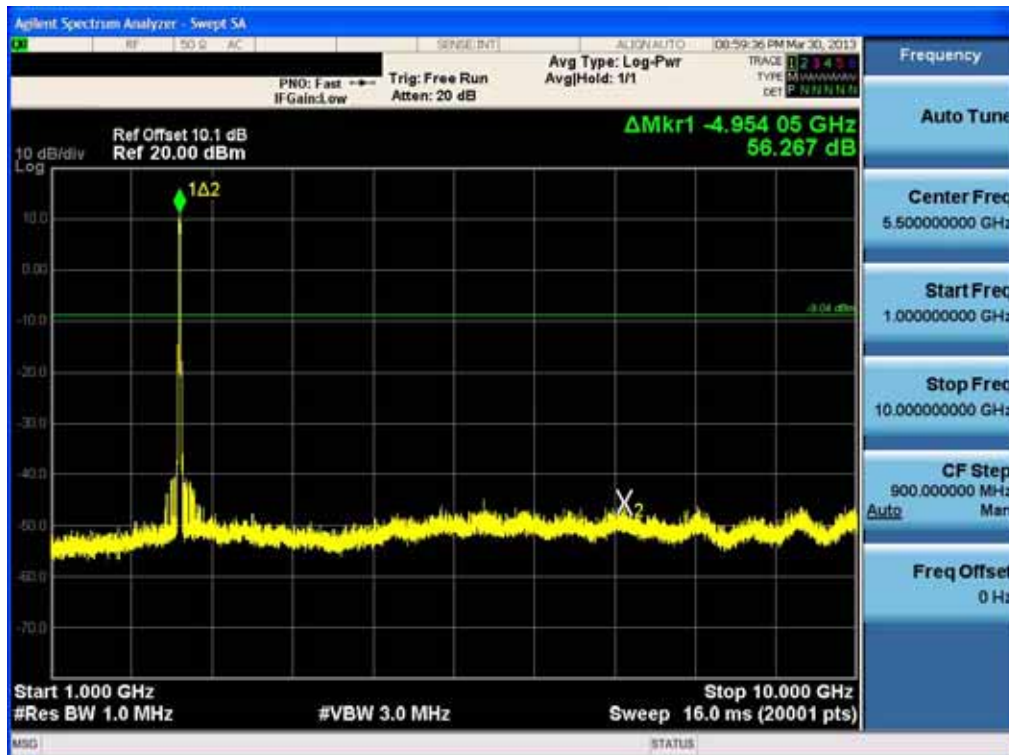


|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

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



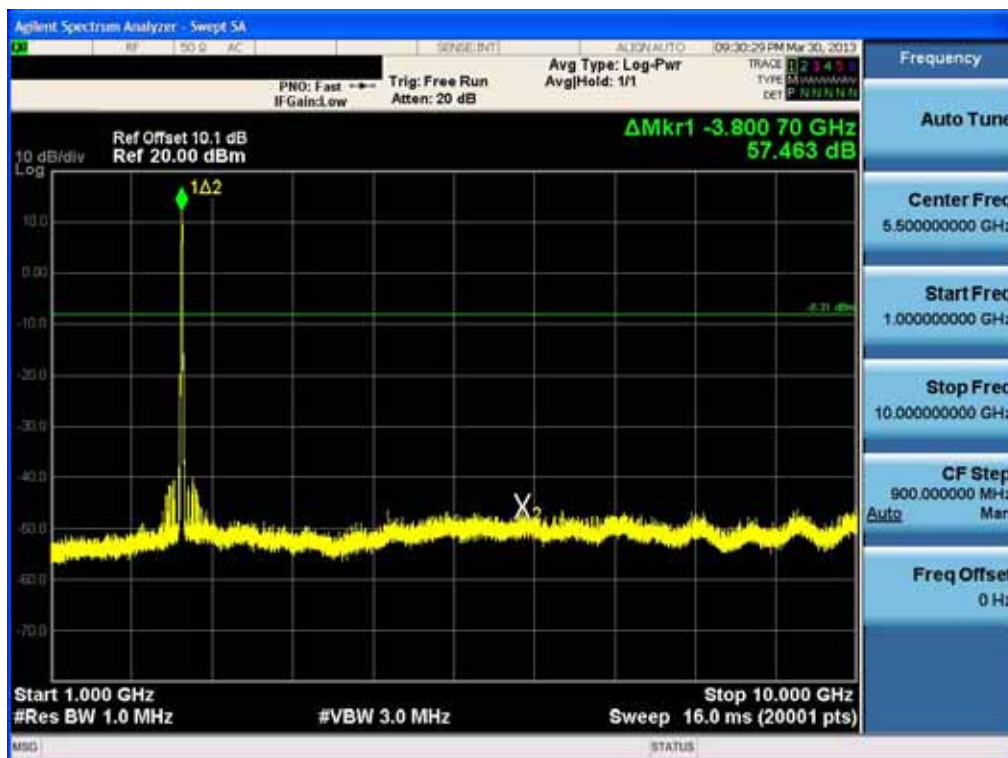
### Conducted Spurious Emission (802.11g-CH11)



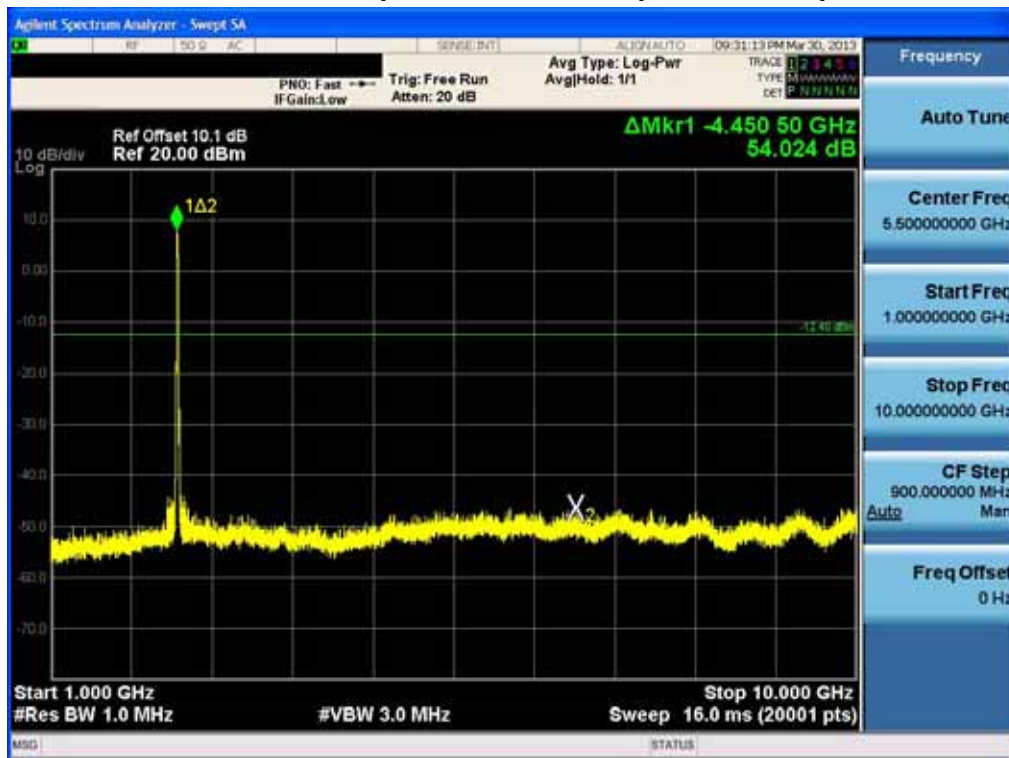
### Conducted Spurious Emission (802.11g-CH6)



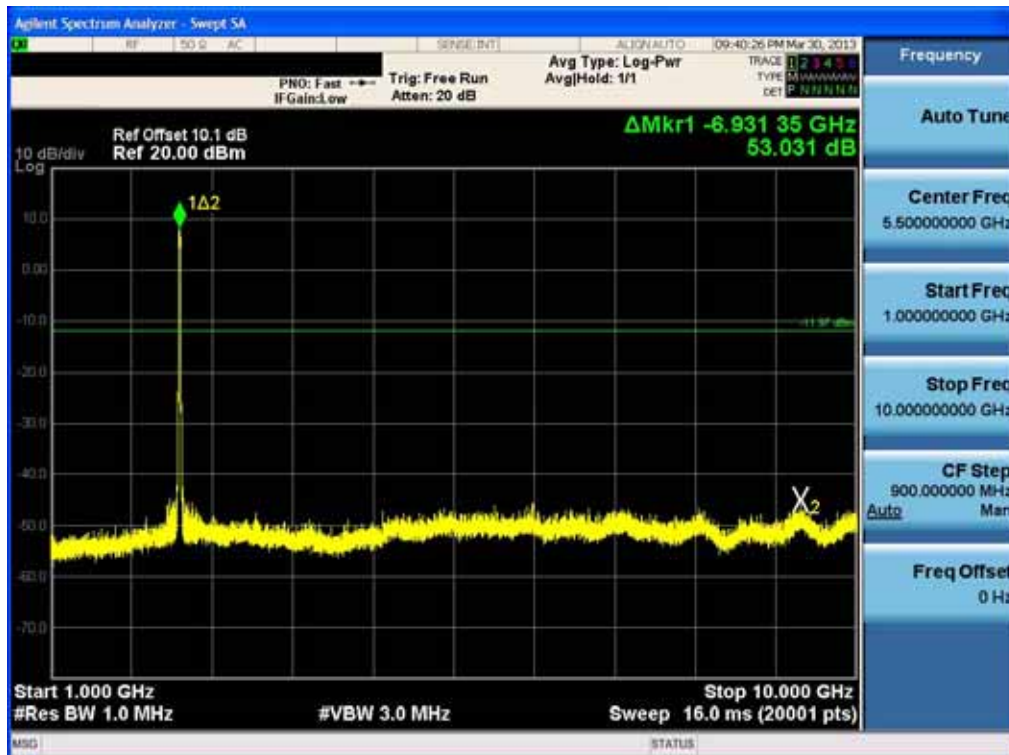
### Conducted Spurious Emission (802.11g-CH11)



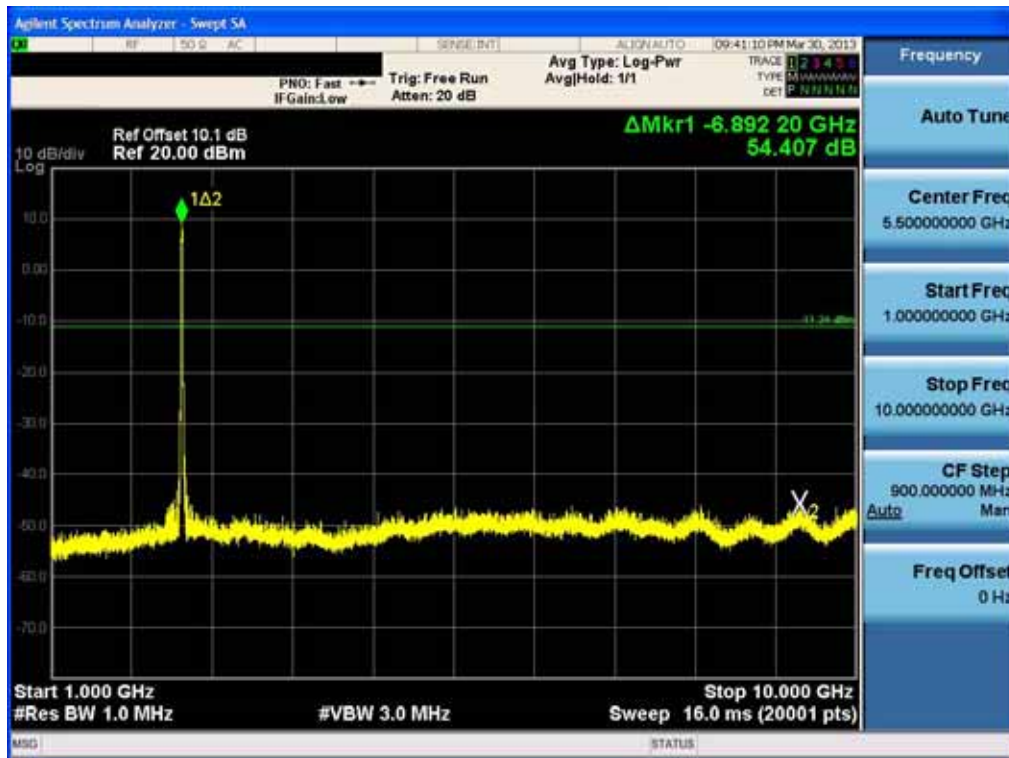
### Conducted Spurious Emission (802.11n-CH1)



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



## Conducted Spurious Emission (802.11n-CH11)



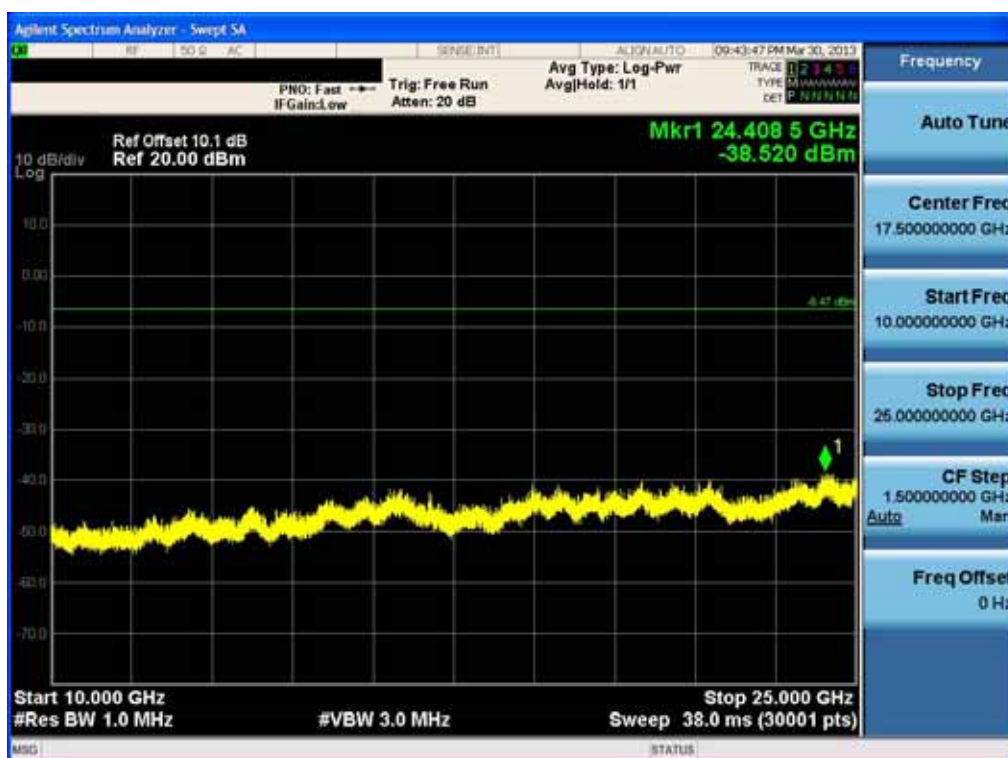
|                                 |                                  |                                                                                                     |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

10 GHz ~ 25 GHz

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



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

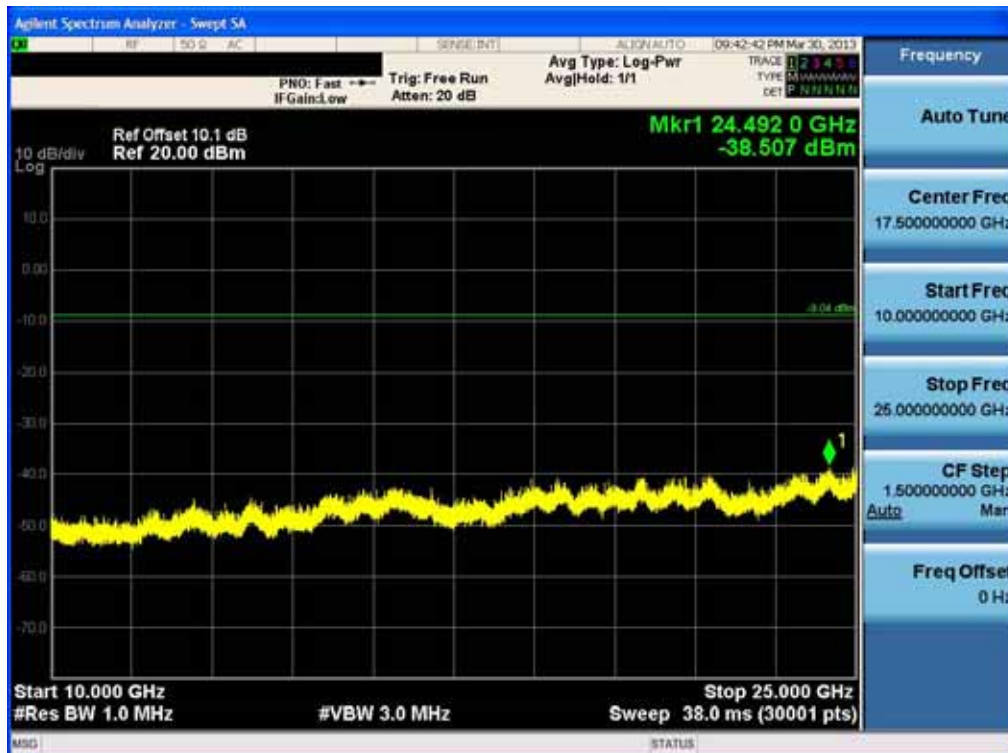


|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

## Conducted Spurious Emission (802.11b-CH11)



## Conducted Spurious Emission (802.11g-CH1)



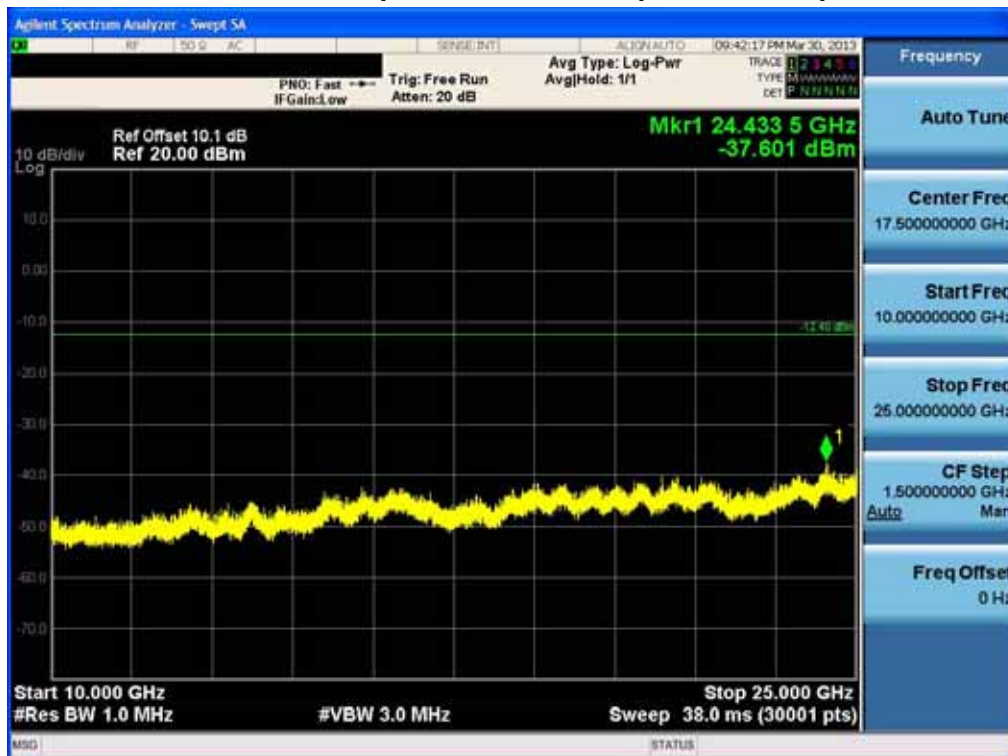
## Conducted Spurious Emission (802.11g-CH6)



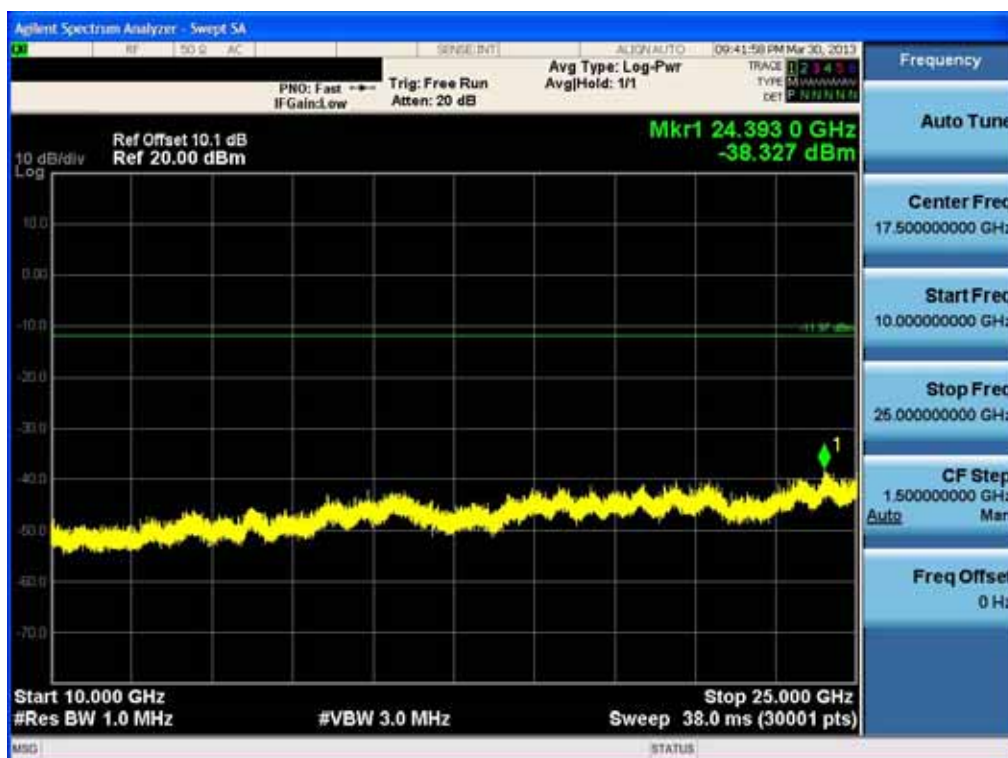
## Conducted Spurious Emission (802.11g-CH11)



## Conducted Spurious Emission (802.11n-CH1)



## Conducted Spurious Emission (802.11n-CH6)



## 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

## 8.5 RADIATED MEASUREMENT.

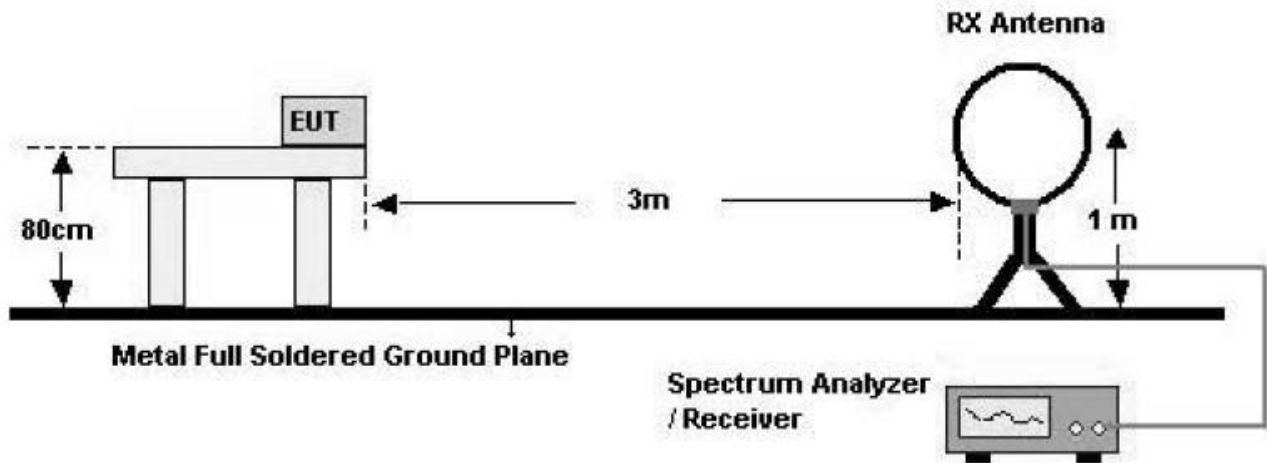
### 8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

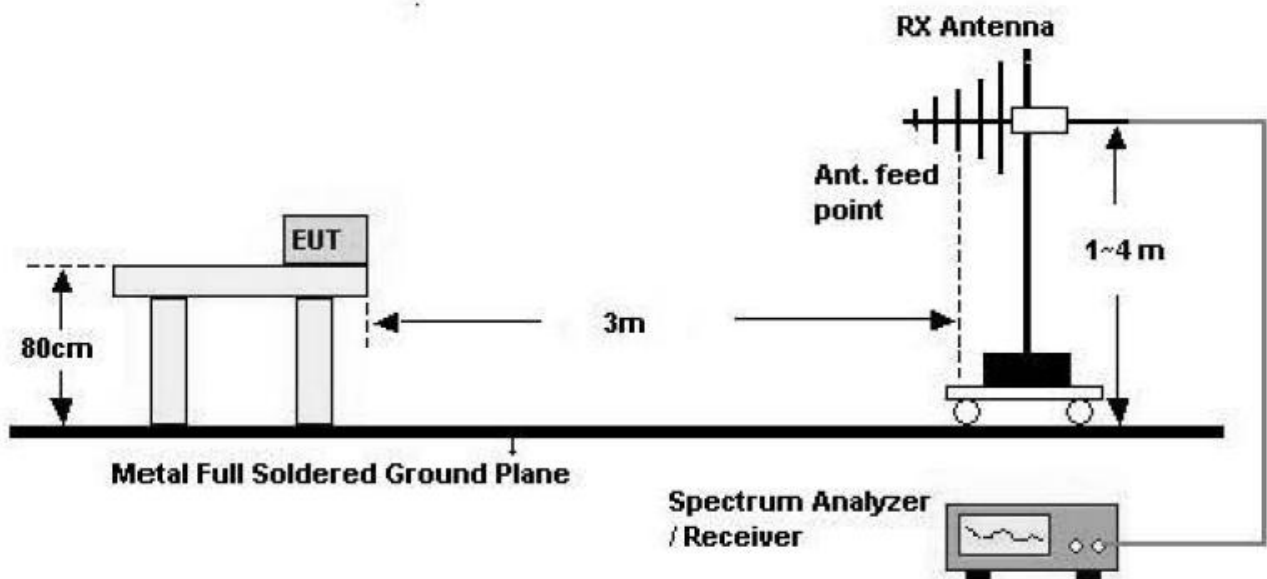
| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 – 0.490   | 2400/F(kHz)           | 300                      |
| 0.490 – 1.705   | 24000/F(kHz)          | 30                       |
| 1.705 – 30    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

## Test Configuration

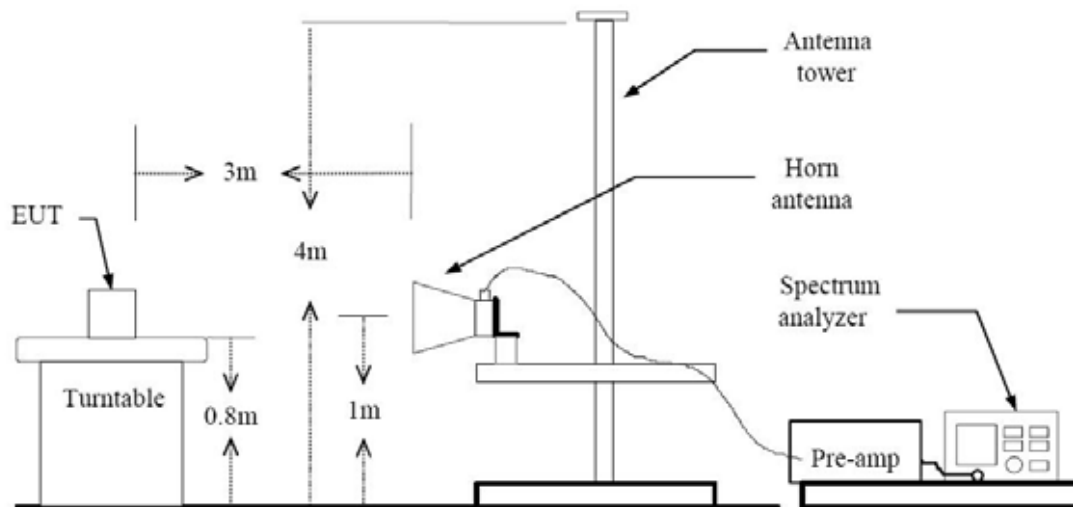
### Below 30 MHz



### 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | FCC ID:<br>A3LGTS6310N                           |

## 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 =  $40 \log (\text{specific distance} / \text{test distance})$  (dB)
4. Limit line = specific Limits (dB $\mu$ V) + 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<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4824               | 54.59           | -0.79                | V                 | 53.80             | 74                | 20.20          | PK     |
| 4824               | 46.84           | -0.79                | V                 | 46.05             | 54                | 7.95           | AV     |
| 7236               | 49.84           | 9.08                 | V                 | 58.92             | 74                | 15.08          | PK     |
| 7236               | 38.38           | 9.08                 | V                 | 47.46             | 54                | 6.54           | AV     |
| 4824               | 55.84           | -0.79                | H                 | 55.05             | 74                | 18.95          | PK     |
| 4824               | 49.63           | -0.79                | H                 | 48.84             | 54                | 5.16           | AV     |
| 7236               | 49.49           | 9.08                 | H                 | 58.57             | 74                | 15.43          | PK     |
| 7236               | 38.32           | 9.08                 | H                 | 47.40             | 54                | 6.60           | AV     |

|                     |          |
|---------------------|----------|
| Operation Mode:     | 802.11 g |
| Transfer Rate:      | 54 Mbps  |
| Operating Frequency | 2412     |
| Channel No.         | 01 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4824               | 51.87           | -0.79                | V                 | 51.08             | 74                | 22.92          | PK     |
| 4824               | 40.34           | -0.79                | V                 | 39.55             | 54                | 14.45          | AV     |
| 7236               | 49.82           | 9.08                 | V                 | 58.9              | 74                | 15.10          | PK     |
| 7236               | 38.33           | 9.08                 | V                 | 47.41             | 54                | 6.59           | AV     |
| 4824               | 52.44           | -0.79                | H                 | 51.65             | 74                | 22.35          | PK     |
| 4824               | 40.77           | -0.79                | H                 | 39.98             | 54                | 14.02          | AV     |
| 7236               | 49.37           | 9.08                 | H                 | 58.45             | 74                | 15.55          | PK     |
| 7236               | 38.31           | 9.08                 | H                 | 47.39             | 54                | 6.61           | AV     |

Operation Mode: 802.11 n  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency: 2412  
 Channel No. 01 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4824               | 51.78           | -0.79                | V                 | 50.99             | 74                | 23.01          | PK     |
| 4824               | 40.15           | -0.79                | V                 | 39.36             | 54                | 14.64          | AV     |
| 7236               | 50.16           | 9.08                 | V                 | 59.24             | 74                | 14.76          | PK     |
| 7236               | 38.34           | 9.08                 | V                 | 47.42             | 54                | 6.58           | AV     |
| 4824               | 52.09           | -0.79                | H                 | 51.3              | 74                | 22.70          | PK     |
| 4824               | 40.52           | -0.79                | H                 | 39.73             | 54                | 14.27          | AV     |
| 7236               | 50.06           | 9.08                 | H                 | 59.14             | 74                | 14.86          | PK     |
| 7236               | 38.41           | 9.08                 | H                 | 47.49             | 54                | 6.51           | 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 ( Method 10.2.3.2 in KDB 558074, issued 10/04/2012)
 

RBW = 1 MHz  
 VBW ≥ 3 x RBW  
 Detector = Peak  
 Trace = Max hold  
 Sweep = auto couple
  - b. Average ( Method 10.2.3.3 in KDB 558074, issued 10/04/2012)
 

RBW = 1 MH  
 VBW ≥ 3 x RBW  
 Span = least 1MHz



Detector Mode = Power average (RMS) or sample detector when RMS not available

Trace average at least 100 traces in power averaging(RMS) mode

6. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

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

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 55.62           | -0.37                | V                 | 55.25             | 74                | 18.75          | PK     |
| 4874               | 49.67           | -0.37                | V                 | 49.30             | 54                | 4.70           | AV     |
| 7311               | 49.13           | 8.64                 | V                 | 57.77             | 74                | 16.23          | PK     |
| 7311               | 37.73           | 8.64                 | V                 | 46.37             | 54                | 7.63           | AV     |
| 4874               | 56.31           | -0.37                | H                 | 55.94             | 74                | 18.06          | PK     |
| 4874               | 50.71           | -0.37                | H                 | 50.34             | 54                | 3.66           | AV     |
| 7311               | 49.49           | 8.64                 | H                 | 58.13             | 74                | 15.87          | PK     |
| 7311               | 37.73           | 8.64                 | H                 | 46.37             | 54                | 7.63           | AV     |

Operation Mode: 802.11 g  
 Transfer Rate: 54 Mbps  
 Operating Frequency: 2437  
 Channel No. 06 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 52.01           | -0.37                | V                 | 51.64             | 74                | 22.36          | PK     |
| 4874               | 40.66           | -0.37                | V                 | 40.29             | 54                | 13.71          | AV     |
| 7311               | 49.30           | 8.64                 | V                 | 57.94             | 74                | 16.06          | PK     |
| 7311               | 37.70           | 8.64                 | V                 | 46.34             | 54                | 7.66           | AV     |
| 4874               | 52.52           | -0.37                | H                 | 52.15             | 74                | 21.85          | PK     |
| 4874               | 40.99           | -0.37                | H                 | 40.62             | 54                | 13.38          | AV     |
| 7311               | 49.17           | 8.64                 | H                 | 57.81             | 74                | 16.19          | PK     |
| 7311               | 37.69           | 8.64                 | H                 | 46.33             | 54                | 7.67           | AV     |

Operation Mode: 802.11 n  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency: 2437  
 Channel No. 06 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 51.43           | -0.37                | V                 | 51.06             | 74                | 22.94          | PK     |
| 4874               | 40.25           | -0.37                | V                 | 39.88             | 54                | 14.12          | AV     |
| 7311               | 48.89           | 8.64                 | V                 | 57.53             | 74                | 16.47          | PK     |
| 7311               | 37.75           | 8.64                 | V                 | 46.39             | 54                | 7.61           | AV     |
| 4874               | 51.94           | -0.37                | H                 | 51.57             | 74                | 22.43          | PK     |
| 4874               | 40.52           | -0.37                | H                 | 40.15             | 54                | 13.85          | AV     |
| 7311               | 49.17           | 8.64                 | H                 | 57.81             | 74                | 16.19          | PK     |
| 7311               | 37.71           | 8.64                 | H                 | 46.35             | 54                | 7.65           | 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 ( Method 10.2.3.2 in KDB 558074, issued 10/04/2012)
    - RBW = 1 MHz
    - VBW ≥ 3 x RBW
    - Detector = Peak
    - Trace = Max hold
    - Sweep = auto couple
  - b. Average ( Method 10.2.3.3 in KDB 558074, issued 10/04/2012)
    - RBW = 1 MH
    - VBW ≥ 3 x RBW
    - Span = least 1MHz
    - Detector Mode = Power average (RMS) or sample detector when RMS not available
    - Trace average at least 100 traces in power averaging(RMS) mode



6. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

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

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4924               | 54.96           | -0.15                | V                 | 54.81             | 74                | 19.19          | PK     |
| 4924               | 47.42           | -0.15                | V                 | 47.27             | 54                | 6.73           | AV     |
| 7386               | 49.29           | 9.06                 | V                 | 58.35             | 74                | 15.65          | PK     |
| 7386               | 38.16           | 9.06                 | V                 | 47.22             | 54                | 6.78           | AV     |
| 4924               | 55.80           | -0.15                | H                 | 55.65             | 74                | 18.35          | PK     |
| 4924               | 48.60           | -0.15                | H                 | 48.45             | 54                | 5.55           | AV     |
| 7386               | 49.18           | 9.06                 | H                 | 58.24             | 74                | 15.76          | PK     |
| 7386               | 38.15           | 9.06                 | H                 | 47.21             | 54                | 6.79           | AV     |

Operation Mode: 802.11 g  
 Transfer Rate: 54 Mbps  
 Operating Frequency: 2462  
 Channel No. 11 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4924               | 50.85           | -0.15                | V                 | 50.70             | 74                | 23.30          | PK     |
| 4924               | 39.73           | -0.15                | V                 | 39.58             | 54                | 14.42          | AV     |
| 7386               | 49.45           | 9.06                 | V                 | 58.51             | 74                | 15.49          | PK     |
| 7386               | 38.13           | 9.06                 | V                 | 47.19             | 54                | 6.81           | AV     |
| 4924               | 51.15           | -0.15                | H                 | 51                | 74                | 23.00          | PK     |
| 4924               | 39.63           | -0.15                | H                 | 39.48             | 54                | 14.52          | AV     |
| 7386               | 49.73           | 9.06                 | H                 | 58.79             | 74                | 15.21          | PK     |
| 7386               | 38.13           | 9.06                 | H                 | 47.19             | 54                | 6.81           | AV     |

Operation Mode: 802.11 n  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency: 2462  
 Channel No. 11 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4924               | 50.80           | -0.15                | V                 | 50.65             | 74                | 23.35          | PK     |
| 4924               | 39.50           | -0.15                | V                 | 39.35             | 54                | 14.65          | AV     |
| 7386               | 49.43           | 9.06                 | V                 | 58.49             | 74                | 15.51          | PK     |
| 7386               | 38.08           | 9.06                 | V                 | 47.14             | 54                | 6.86           | AV     |
| 4924               | 50.39           | -0.15                | H                 | 50.24             | 74                | 23.76          | PK     |
| 4924               | 39.44           | -0.15                | H                 | 39.29             | 54                | 14.71          | AV     |
| 7386               | 49.23           | 9.06                 | H                 | 58.29             | 74                | 15.71          | PK     |
| 7386               | 38.20           | 9.06                 | H                 | 47.26             | 54                | 6.74           | 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 ( Method 10.2.3.2 in KDB 558074, issued 10/04/2012)
 

RBW = 1 MHz  
 VBW ≥ 3 x RBW  
 Detector = Peak  
 Trace = Max hold  
 Sweep = auto couple
  - b. Average ( Method 10.2.3.3 in KDB 558074, issued 10/04/2012)
 

RBW = 1 MH  
 VBW ≥ 3 x RBW  
 Span = least 1MHz  
 Detector Mode = Power average (RMS) or sample detector when RMS not available  
 Trace average at least 100 traces in power averaging(RMS) mode



6. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                                 |                                  |                                                                                                     |  |                                                  |
|---------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|--|--------------------------------------------------|
| 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>HCTR1304FR02 | Date of Issue:<br>April 02, 2013 | EUT Type: 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only |  | FCC ID:<br>A3LGTS6310N                           |

## 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:      | 48 Mbps            |
| Operating Frequency | 2412 MHz, 2462 MHz |
| Channel No.         | 01 Ch, 11 Ch       |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------|-------------------|-------------------|-------------------|----------------|--------|
| 2390.0             | 32.37           | 33.90          | H                 | 66.27             | 74                | 7.73           | PK     |
| 2390.0             | 19.16           | 33.90          | H                 | 53.06             | 54                | 0.94           | AV     |
| 2390.0             | 31.21           | 33.90          | V                 | 65.11             | 74                | 8.89           | PK     |
| 2390.0             | 18.45           | 33.90          | V                 | 52.35             | 54                | 1.65           | AV     |
| 2483.5             | 29.11           | 33.99          | H                 | 63.10             | 74                | 10.90          | PK     |
| 2483.5             | 16.65           | 33.99          | H                 | 50.64             | 54                | 3.36           | AV     |
| 2483.5             | 27.86           | 33.99          | V                 | 61.85             | 74                | 12.15          | PK     |
| 2483.5             | 15.28           | 33.99          | V                 | 49.27             | 54                | 4.73           | AV     |

Operation Mode: 802.11b  
 Transfer Rate: 1 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          | 25.33        | 33.90       | H              | 59.23          | 74             | 14.77       | PK     |
| 2390.0          | 16.12        | 33.90       | H              | 50.02          | 54             | 3.98        | AV     |
| 2390.0          | 25.62        | 33.90       | V              | 59.52          | 74             | 14.48       | PK     |
| 2390.0          | 15.80        | 33.90       | V              | 49.70          | 54             | 4.30        | AV     |
| 2483.5          | 26.43        | 33.99       | H              | 60.42          | 74             | 13.58       | PK     |
| 2483.5          | 17.41        | 33.99       | H              | 51.40          | 54             | 2.60        | AV     |
| 2483.5          | 26.42        | 33.99       | V              | 60.41          | 74             | 13.59       | PK     |
| 2483.5          | 15.90        | 33.99       | V              | 49.89          | 54             | 4.11        | AV     |

Operation Mode: 802.11n  
 Transfer Rate: 6.5 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          | 34.11        | 33.90       | H              | 68.01          | 74             | 5.99        | PK     |
| 2390.0          | 19.23        | 33.90       | H              | 53.13          | 54             | 0.87        | AV     |
| 2390.0          | 33.07        | 33.90       | V              | 66.97          | 74             | 7.03        | PK     |
| 2390.0          | 19.13        | 33.90       | V              | 53.03          | 54             | 0.97        | AV     |
| 2483.5          | 28.86        | 33.99       | H              | 62.85          | 74             | 11.15       | PK     |
| 2483.5          | 16.30        | 33.99       | H              | 50.29          | 54             | 3.71        | AV     |
| 2483.5          | 27.30        | 33.99       | V              | 61.29          | 74             | 12.71       | PK     |
| 2483.5          | 15.33        | 33.99       | V              | 49.32          | 54             | 4.68        | AV     |

#### Notes:

- Total = Reading Value + Antenna Factor + Cable Loss
  - Spectrum setting:
    - Peak ( Method 10.2.3.2 in KDB 558074, issued 10/04/2012)
- RBW = 1 MHz



VBW  $\geq$  3 x RBW

Detector = Peak

Trace = Max hold

Sweep = auto couple

b. Average ( Method 10.2.3.3 in KDB 558074, issued 10/04/2012)

RBW = 1 MH

VBW  $\geq$  3 x RBW

Span = least 1MHz

Detector Mode = Power average (RMS) or sample detector when RMS not available

Trace average at least 100 traces in power averaging(RMS) mode

3. We have done 802.11b/g/n mode and all data rate. Worst data rate is 48 Mbps for 802.11g, 1 Mbps for 802.11b and 6.5 Mbps for 802.11n.

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>HCTR1304FR02 | <b>Date of Issue:</b><br>April 02, 2013 | <b>EUT Type:</b> 850/1900 GSM/GPRS Phone with Bluetooth v3.0+EDR, WLAN 2.4GHz and Hotspot and EDGE Rx only | <b>FCC ID:</b><br>A3LGTS6310N                    |

## 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 12 Mbps, Ch.6 and 802.11g. Because the 802.11g mode is worst case.

■ RESULT PLOTS

Conducted Emissions (Line 1)

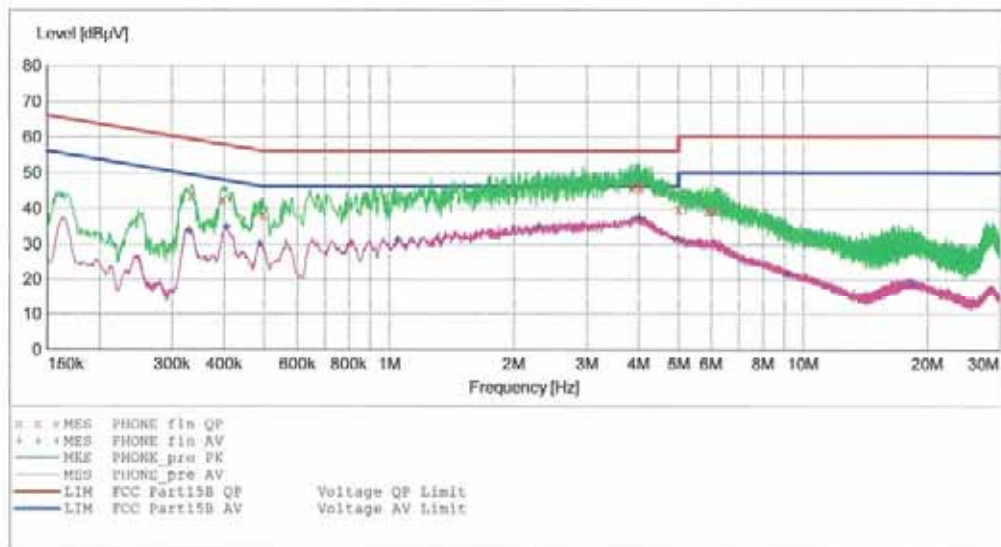
HCT

EMC

EUT: GT-S6310N  
Manufacturer: SAMSUNG  
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              | Stop      | Step    | Detector | Meas. Time          | IF Bandw. | Transducer |  |
| Frequency          | Frequency | Width   |          |                     |           |            |  |
| 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"

3/29/2013 10:15PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.334010      | 43.70      | 9.7       | 59         | 15.7      | ---  | --- |
| 0.397010      | 42.60      | 9.8       | 58         | 15.4      | ---  | --- |
| 0.497010      | 38.50      | 9.8       | 56         | 17.6      | ---  | --- |
| 3.852000      | 45.70      | 10.1      | 56         | 10.3      | ---  | --- |
| 3.972000      | 46.60      | 10.1      | 56         | 9.4       | ---  | --- |
| 4.024000      | 45.60      | 10.1      | 56         | 10.4      | ---  | --- |
| 5.000000      | 39.80      | 10.2      | 56         | 16.2      | ---  | --- |
| 5.888000      | 39.30      | 10.2      | 60         | 20.7      | ---  | --- |
| 6.132000      | 39.50      | 10.2      | 60         | 20.5      | ---  | --- |

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

3/29/2013 10:15PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.329010         | 33.80         | 9.7          | 50            | 15.7         | ---  | --- |
| 0.405010         | 34.80         | 9.8          | 48            | 13.0         | ---  | --- |
| 0.488010         | 30.10         | 9.8          | 46            | 16.1         | ---  | --- |
| 1.052000         | 31.20         | 9.8          | 46            | 14.8         | ---  | --- |
| 2.300000         | 34.70         | 10.0         | 46            | 11.3         | ---  | --- |
| 4.016000         | 37.30         | 10.1         | 46            | 8.7          | ---  | --- |
| 5.000000         | 31.10         | 10.2         | 46            | 14.9         | ---  | --- |
| 9.216000         | 21.70         | 10.4         | 50            | 28.3         | ---  | --- |
| 18.356000        | 18.80         | 11.5         | 50            | 31.2         | ---  | --- |

## Conducted Emissions (Line 2)

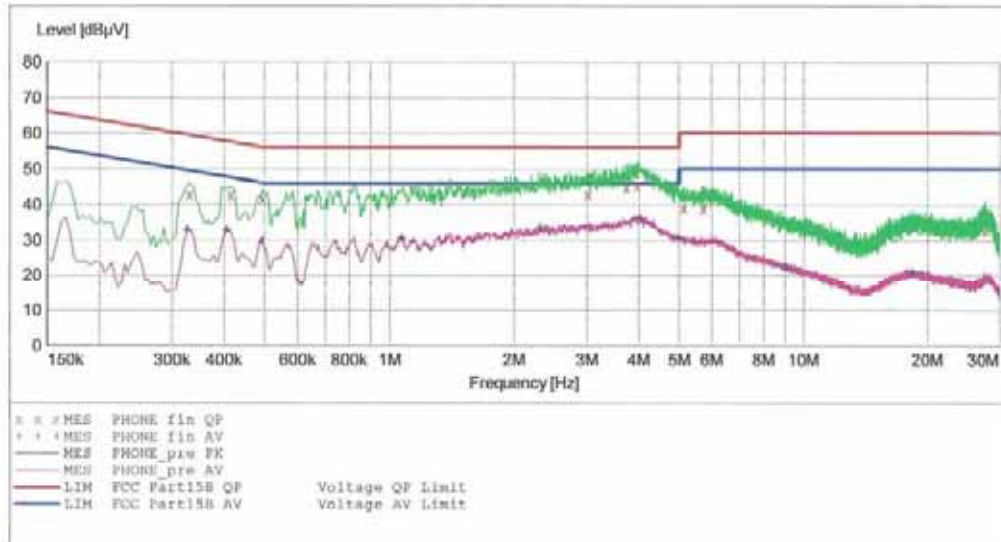
HCT

EMC

EUT: GT-S6310N  
 Manufacturer: SAMSUNG  
 Operating Condition: WLAN MODE  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART 15 CLASS B  
 Comment: N

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

| Short Description: |                |            | FCC PART 15 CLASS B |            |           |            |  |
|--------------------|----------------|------------|---------------------|------------|-----------|------------|--|
| Start 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       |  |
|                    |                |            | 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"

3/29/2013 10:20PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.330010      | 42.90      | 9.9       | 60         | 16.6      | ---  | --- |
| 0.414010      | 42.80      | 10.0      | 58         | 14.7      | ---  | --- |
| 0.494010      | 41.70      | 10.0      | 56         | 14.4      | ---  | --- |
| 3.020000      | 43.00      | 10.2      | 56         | 13.0      | ---  | --- |
| 3.740000      | 44.80      | 10.3      | 56         | 11.2      | ---  | --- |
| 3.972000      | 45.50      | 10.3      | 56         | 10.5      | ---  | --- |
| 5.148000      | 39.00      | 10.4      | 60         | 21.0      | ---  | --- |
| 5.736000      | 38.90      | 10.4      | 60         | 21.1      | ---  | --- |
| 27.556000     | 32.50      | 12.5      | 60         | 27.5      | ---  | --- |

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

3/29/2013 10:20PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.326010         | 32.90         | 9.9          | 50            | 16.7         | ---  | --- |
| 0.406010         | 32.90         | 10.0         | 48            | 14.8         | ---  | --- |
| 0.494010         | 29.90         | 10.0         | 46            | 16.2         | ---  | --- |
| 1.068000         | 30.60         | 10.0         | 46            | 15.4         | ---  | --- |
| 2.316000         | 33.50         | 10.2         | 46            | 12.5         | ---  | --- |
| 4.040000         | 35.90         | 10.3         | 46            | 10.1         | ---  | --- |
| 5.000000         | 30.40         | 10.4         | 46            | 15.6         | ---  | --- |
| 9.092000         | 22.40         | 10.6         | 50            | 27.6         | ---  | --- |
| 18.384000        | 20.50         | 11.8         | 50            | 29.5         | ---  | --- |

## 9. LIST OF TEST EQUIPMENT

| Manufacturer          | Model / Equipment                                      | Calibration Interval | Calibration Due | Serial No.         |
|-----------------------|--------------------------------------------------------|----------------------|-----------------|--------------------|
| Rohde & Schwarz       | ENV216/ LISN                                           | Annual               | 02/06/2014      | 100073             |
| Schwarzbeck           | VULB 9168/ TRILOG Antenna                              | Biennial             | 05/03/2013      | 3125               |
| 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               | 02/08/2014      | 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              |