

# HCT CO., LTD.

# **CERTIFICATE OF COMPLIANCE**

#### **FCC Certification**

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: March 28, 2014 Test Site/Location:
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632	HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang- myeon, Icheon-si, Gyeonggi-do, Korea
	Report No.: HCT-R-1403-F054-1
	HCT FRN: 0005866421

# FCC ID : ZNFD285G

# **APPLICANT** : LG Electronics MobileComm U.S.A., Inc.

FCC Model(s):	LG-D285g
Additional FCC Model(s):	LGD285g, D285g
EUT Type:	GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support
Max. RF Output Power:	Wi-Fi 802.11b(21.21 dBm) / Wi-Fi 802.11g (17.10 dBm) / Wi-Fi 802.11n (16.60 dBm)
Frequency Range:	2412 MHz - 2462 MHz (2.4 GHz Band)
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 : Kyoung Houn Seo Test Engineer of RF Team

Approved by : Chang Seok Choi Manager of RF Team

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# **Version**

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1403-F054	March 24, 2014	- First Approval Report
HCT-R-1403-F054-1	March 28, 2014	-Revised the test procedure on page 41

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Model name(s): Additional Model name(s):	LG-D285g LGD285g, D285g
Date(s) of Tests:	March 03, 2014 ~ March 19, 2014
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. (IC Recognition No. : 5944A-3)

# 2. EUT DESCRIPTION

EUT Type	GSM/WC	GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	
FCC Model Name	LG-D2850		
Additional FCC Model Name	LGD285g	, D285g	
Power Supply	DC 3.8 V		
Battery type	Li-ion Bat	tery(Standard)	
Frequency Range	TX: 2412	TX: 2412 MHz ~ 2462 MHz	
	RX: 2412	RX: 2412 MHz ~ 2462 MHz	
Max. RF Output Power	Peak Wi-Fi 802.11b(21.21 dBm) / Wi-Fi 802.11g (17.10 dBm) / Wi-Fi 802.11n (16.60 dBm)		
	Average Wi-Fi 802.11b (15.37 dBm) / Wi-Fi 802.11g (9.18 dBm) / Wi-Fi 802.11n (8.43 dBm)		
Modulation Type	DSSS/CCK(802.11b), OFDM(802.11g, 802.11n)		
Antenna Specification	Manufacturer: Ace Technology		
	Antenna type: Planar Inverted F Antenna		
	Peak Gai	n : 0.67 dBi	

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# **3. TEST METHODOLOGY**

FCC KDB 558074 D01 DTS Meas Guidance v03r01 dated April 09, 2013 entitled "Guidance for Performing Compliance Measurements on Digital Transmission Systems(DTS) and the measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) 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)

#### **Conducted Antenna Terminal**

See Section from 9.1 to 9.2.(KDB 558074)

## **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.

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# 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 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 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 February 28, 2014 (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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#### 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

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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		PASS
Conducted Maximum Peak Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band	CONDUCTED	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	DADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.5.2	RADIATED	PASS

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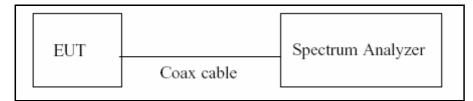


#### **TEST PROCEDURE**

#### According to KDB 558074)6)b), issued 04/09/2013)

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest available value. Set VBW  $\geq$  RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T  $\leq$  16.7 microseconds.)

### **TEST CONFIGURATION**



## **TEST PROCEDURE**

The transmitter output is connected to the Spectrum Analyzer. We tested accroding to the zerospan measurement method, 6.0)b) in KDB 558074( issued 04/09/2013)

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if T  $\leq$  6.25 microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

- 1. RBW = 8 MHz (the largest available value)
- 2. VBW = 8 MHz (≥ RBW)
- 3. SPAN = 0 Hz
- 4. Detector = Peak
- 5. Number of points in sweep > 100
- 6. Trace mode = Clear write
- 7. Measure  $T_{\text{total}} \, \text{and} \, T_{\text{on}}$
- 8. Calculate Duty Cycle =  $T_{on}/T_{total}$  and Duty Cycle Factor = 10\*log(1/Duty Cycle)

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# **Duty Cycle Factor**

Mode	Data Rate	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor (dB)
	1 Mbps	12.240	12.330	0.99270073	0.032
	2 Mbps	6.210	6.300	0.98571429	0.062
b	5.5 Mbps	2.380	2.480	0.95967742	0.179
	11 Mbps	1.281	1.386	0.92424242	0.342
	6 Mbs	2.019	2.124	0.95056497	0.220
	9 Mbs	1.348	1.454	0.92709766	0.329
	12 Mbs	1.020	1.125	0.90666667	0.426
	18 Mbs	0.681	0.789	0.86311787	0.639
g	24 Mbs	0.513	0.621	0.82608696	0.830
	36 Mbs	0.346	0.454	0.76211454	1.180
	48 Mbs	0.264	0.372	0.70967742	1.489
	54 Mbs	0.236	0.342	0.69005848	1.611
	6.5 Mbs	1.870	1.970	0.94923858	0.226
	13 Mbs	0.940	1.050	0.89523810	0.481
	19.5 Mbs	0.636	0.741	0.85829960	0.664
n	26 Mbs	0.480	0.585	0.82051282	0.859
	39 Mbs	0.328	0.434	0.75576037	1.216
	52 Mbs	0.248	0.354	0.70056497	1.546
	58.5 Mbs	0.224	0.330	0.67878788	1.683
	65 Mbs	0.204	0.310	0.65806452	1.817

Note : Duty Cycle Factor =  $10*\log(1/Duty Cycle)$ . where, Duty Cycle = T<sub>on</sub> / T<sub>total</sub>

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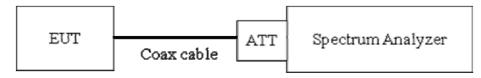
# 8.2 6dB BANDWIDTH (802.11b/g/n)

## 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 5 in KDB 558074, issued 04/09/2013)

RBW = 100 kHz VBW ≥ 3 x RBW Detector = Peak Trace mode = max hold Sweep = auto couple Allow the trace to stabilize

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

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802.11b Mo	ode	Measured Bandwidth	Minimum Bandwidth	
Frequency [MHz]	Channel No.	[MHz]	[MHz]	Pass / Fail
2412	1	7.627	0.500	Pass
2437	6	7.598	0.500	Pass
2462	11	7.593	0.500	Pass

#### Conducted 6dB Bandwidth Measurements for 802.11b

#### Conducted 6dB Bandwidth Measurements for 802.11g

802.11g Mo	ode	Measured Bandwidth	Minimum Bandwidth	
Frequency [MHz]	Channel No.	[MHz]	[MHz]	Pass / Fail
2412	1	16.43	0.500	Pass
2437	6	16.42	0.500	Pass
2462	11	16.49	0.500	Pass

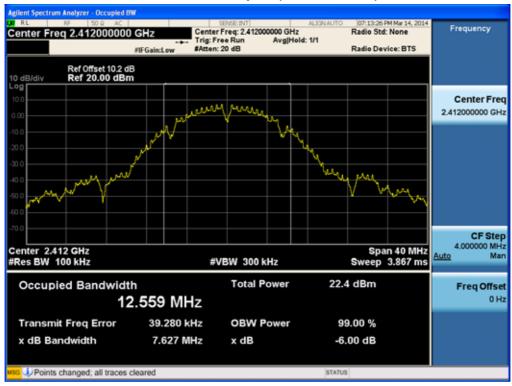
#### Conducted 6dB Bandwidth Measurements for 802.11n\_20 MHz BW

802.11n Mc	ode	Measured Bandwidth	Minimum Bandwidth	Pass / Fail
Frequency [MHz]	Channel No.	[MHz]	[MHz]	
2412	1	17.65	0.500	Pass
2437	6	17.64	0.500	Pass
2462	11	17.63	0.500	Pass

Note : In order to simplify the report, attached plots were only the most wide 6 dB BW channel.

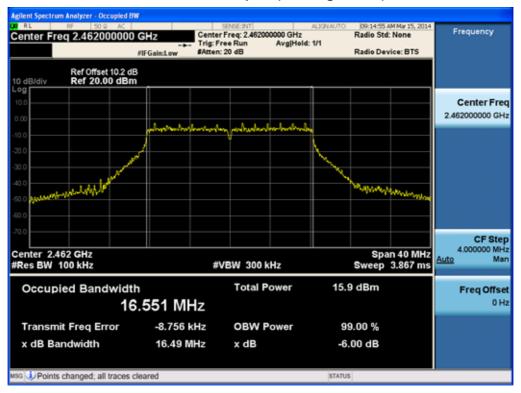
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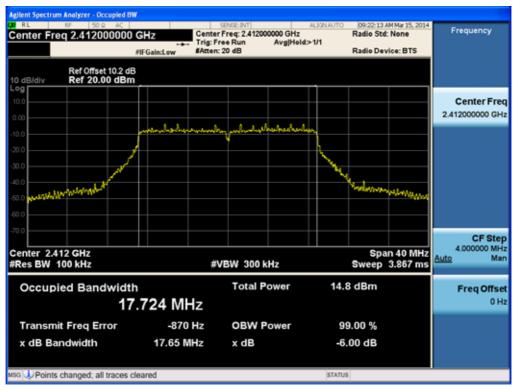
#### 6dB Bandwidth plot (802.11b-CH 1)

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



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

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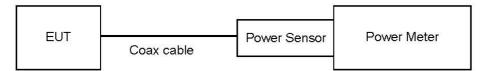
# 8.3 OUTPUT POWER (802.11b/g/n)

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

The transmitter output is connected to the input of an RF power sensor. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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

#### **TEST CONFIGURATION**



### **TEST PROCEDURE**

- Peak Power (Procedure 9.1.3 in KDB 558074, issued 04/09/2013)
  - 1. Measure the peak power of the transmitter.
- Average Power ( Procedure 9.2.3.1 in KDB 558074, issued 04/09/2013)
  - 1. Measure the duty cycle.
  - 2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
  - 3. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

#### Note :

1. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. So, 10.2 dB is offset for 2.4 GHz Band.

Actual value of loss for the attenuator and cable combination is below table.

Band Frequency(MHz)		Loss(dB)
2.4 GHz	2412	10.21
	2437	10.24
	2462	10.24

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

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## TEST RESULTS-Peak

802.11b Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
		1 Mbps	17.45	30
2412	1	2 Mbps	17.72	30
2412	1	5.5 Mbps	19.44	30
		11 Mbps	21.10	30
		1 Mbps	17.61	30
0407	c	2 Mbps	17.83	30
2437	6	5.5 Mbps	19.48	30
		11 Mbps	21.21	30
		1 Mbps	17.60	30
2462	44	2 Mbps 17.84   5.5 Mbps 19.47	30	
2462	11		30	
		11 Mbps	21.15	30

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<b>Conducted Out</b>	put Power Me	easurements (8	802.11a Mode)
			··-···

802.11g Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
		6 Mbps	16.64	30
		9 Mbps	16.72	30
		12 Mbps	16.47	30
2412	1	18 Mbps	16.57	30
2412	1	24 Mbps	16.97	30
		36 Mbps	16.93	30
		48 Mbps	17.01	30
		54 Mbps	17.02	30
		6 Mbps	16.69	30
	6	9 Mbps	16.69	30
		12 Mbps	16.53	30
2437		18 Mbps	16.45	30
2437	o	24 Mbps	4 Mbps 17.09	30
		36 Mbps	16.99	30
		48 Mbps	17.10	30
		54 Mbps	17.07	30
		6 Mbps	16.63	30
		9 Mbps	16.54	30
		12 Mbps	16.49	30
2462	11	18 Mbps	16.42	30
2402		24 Mbps	16.90	30
		36 Mbps	17.03	30
		48 Mbps	17.03	30
		54 Mbps	17.06	30

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	Maron 20, 2011		EIII BECCC



<b>Conducted Out</b>	put Power	Measurements	(802.11n Mode)
		measurements	

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
		6.5 Mbps	15.60	30
		13 Mbps	16.08	30
		19.5 Mbps	16.06	30
2412		26 Mbps	16.56	30
2412	1	39 Mbps	16.52	30
		52 Mbps	16.51	30
		58.5 Mbps	16.51	30
		65 Mbps	16.50	30
		6.5 Mbps	16.06	30
	6	13 Mbps	15.96	30
		19.5 Mbps	15.93	30
2437		26 Mbps	16.48	30
2437	O	39 Mbps	16.52	30
		52 Mbps	16.58	30
		58.5 Mbps	16.57	30
		65 Mbps	16.60	30
		6.5 Mbps	16.04	30
		13 Mbps	15.95	30
		19.5 Mbps	15.94	30
2462	11	26 Mbps	16.40	30
		39 Mbps	16.37	30
		52 Mbps	16.52	30
		58.5 Mbps	16.46	30
		65 Mbps	16.49	30

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# TEST RESULTS-Average

802.11b N					Measured	
Frequency [MHz]	Channel No.	Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Power(dBm) + Duty Cycle Factor	Limit (dBm)
		1 Mbps	15.03	0.032	15.07	30
2442		2 Mbps	14.94	0.062	15.01	30
2412	1	5.5 Mbps	15.07	0.179	15.25	30
		11 Mbps	14.94	0.342	15.29	30
		1 Mbps	15.11	0.032	15.14	30
0407	6	2 Mbps	15.03	0.062	15.09	30
2437	Ø	5.5 Mbps	15.07	0.179	15.25	30
		11 Mbps	14.94	0.342	15.29	30
		1 Mbps	15.16	0.032	15.19	30
2462	44	2 Mbps	15.08	0.062	15.14	30
	11	5.5 Mbps	15.08	0.179	15.26	30
		11 Mbps	15.02	0.342	15.37	30

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

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

802.11g Mode		-			Measured	
Frequency [MHz]	Channel No.	Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Power(dBm) + Duty Cycle Factor	Limit (dBm)
		6 Mbps	8.71	0.220	8.93	30
		9 Mbps	8.57	0.329	8.90	30
		12 Mbps	8.47	0.426	8.89	30
2412	1	18 Mbps	8.28	0.639	8.92	30
2412	•	24 Mbps	8.12	0.830	8.95	30
		36 Mbps	7.77	1.180	8.95	30
		48 Mbps	7.60	1.489	9.09	30
		54 Mbps	7.42	1.611	9.03	30
		6 Mbps	8.71	0.220	8.93	30
		9 Mbps	8.62	0.329	8.94	30
	6	12 Mbps	8.52	0.426	8.95	30
2437		18 Mbps	8.35	0.639	8.99	30
2437	O	24 Mbps	8.13	0.830	8.96	30
		36 Mbps	7.85	1.180	9.03	30
		48 Mbps	7.53	1.489	9.01	30
		54 Mbps	7.57	1.611	9.18	30
		6 Mbps	8.55	0.220	8.77	30
		9 Mbps	8.36	0.329	8.69	30
		12 Mbps	8.24	0.426	8.66	30
2462	44	18 Mbps	8.09	0.639	8.73	30
	11	24 Mbps	7.90	0.830	8.73	30
		36 Mbps	7.67	1.180	8.85	30
		48 Mbps	7.39	1.489	8.88	30
		54 Mbps	7.28	1.611	8.89	30

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

802.11n Mode		-		•	Measured	
Frequency [MHz]	Channel No.	Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Power(dBm) + Duty Cycle Factor	Limit (dBm)
		6.5 Mbps	7.55	0.226	7.78	30
		13 Mbps	7.86	0.481	8.34	30
		19.5 Mbps	7.67	0.664	8.34	30
2412	1	26 Mbps	7.57	0.859	8.43	30
2412	•	39 Mbps	7.17	1.216	8.38	30
		52 Mbps	6.82	1.546	8.37	30
		58.5 Mbps	6.72	1.683	8.40	30
		65 Mbps	6.54	1.817	8.36	30
		6.5 Mbps	7.98	0.226	8.20	30
		13 Mbps	7.73	0.481	8.21	30
		19.5 Mbps	7.62	0.664	8.29	30
0407		26 Mbps	7.31	0.859	8.17	30
2437	6	39 Mbps	7.13	1.216	8.35	30
		52 Mbps	6.86	1.546	8.41	30
		58.5 Mbps	6.73	1.683	8.42	30
		65 Mbps	6.61	1.817	8.43	30
		6.5 Mbps	7.89	0.226	8.12	30
		13 Mbps	7.77	0.481	8.25	30
		19.5 Mbps	7.53	0.664	8.20	30
2462	44	26 Mbps	7.39	0.859	8.25	30
	11	39 Mbps	7.05	1.216	8.27	30
		52 Mbps	6.73	1.546	8.28	30
		58.5 Mbps	6.60	1.683	8.29	30
		65 Mbps	6.55	1.817	8.37	30

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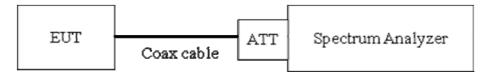
# 8.4 POWER SPECTRAL DENSITY (802.11b/g/n)

#### 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 10.2 in KDB 558074, issued 04/09/2013

The spectrum analyzer is set to :

Set analyzer center frequency to DTS channel center frequency.

Span = 1.5 times the DTS channel bandwidth.

 $RBW = 3 kHz \le RBW \le 100 kHz.$ 

VBW  $\geq$  3 x RBW.

Sweep = auto couple

Detector = peak

Trace Mode = max hold

Allow trace to fully stabilize.

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

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

#### **Sample Calculation**

PSD = Reading Value + ATT loss + Cable loss(1 ea)

Output Power = -5 dBm + 10 dB + 0.8 dB = 5.8 dBm

- 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. So, 10.2 dB is offset for 2.4 GHz Band.

Actual value of loss for the attenuator and cable combination is below table.

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Band	Frequency(MHz)	Loss(dB)
	2412	10.21
2.4 GHz	2437	10.24
	2462	10.24

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

#### **TEST RESULTS**

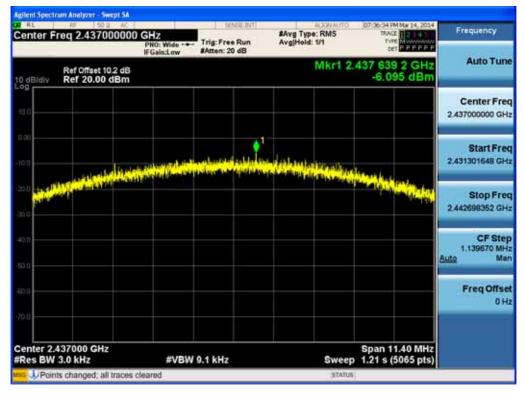
			icu i ower Density measurem		
Fraguanay	Channel		т	est Result	
Frequency (MHz)	No.	Mode	PSD (dBm)	Limit (dBm)	Pass/Fail
2412	1		-6.914	8	Pass
2437	6	802.11b	-6.095	8	Pass
2462	11		-6.974	8	Pass
2412	1		-17.141	8	Pass
2437	6	802.11g	-16.192	8	Pass
2462	11		-16.925	8	Pass
2412	1		-17.755	8	Pass
2437	6	802.11n	-18.007	8	Pass
2462	11		-16.213	8	Pass

#### **Conducted Power Density Measurements**

Note : In order to simplify the report, attached plots were only the highest PSD channel.

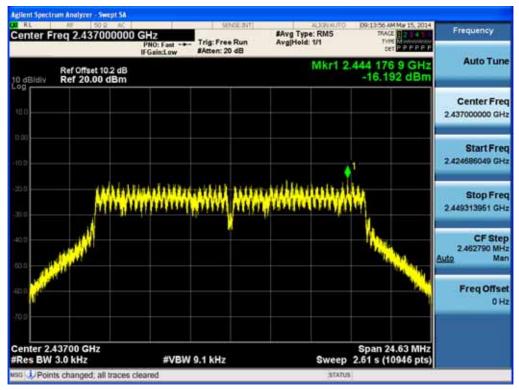
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr		
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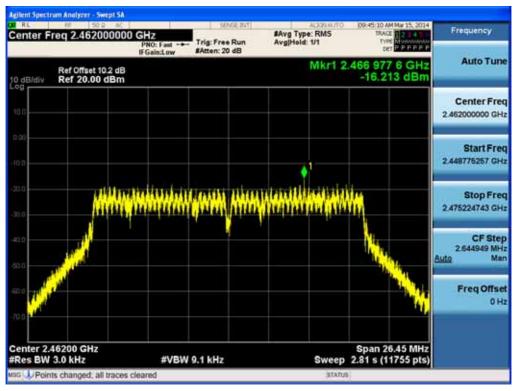
#### Power Spectral Density (802.11b-CH 6)

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



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

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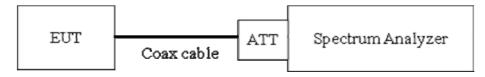


# 8.5 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS Test Requirements and limit, §15.247(d)

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 § 15.205(c)).

#### Limit : 20 dBc

### **TEST CONFIGURATION**



# **TEST PROCEDURE**

The transmitter output is connected to the spectrum analyzer. (Procedure 11.0 in KDB 558074, issued 04/09/2013)

RBW = 100 kHz

VBW ≥ 3 x RBW

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep time = auto couple

Ensure that the number of measurement points ≥ Span/RBW

Allow trace to fully stabilize.

Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 10<sup>th</sup> harmonic 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. So, 10.2 dB is

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offset for 2.4 GHz Band. Actual value of loss for the attenuator and cable combination is below table.

Band Frequency(MI		Loss(dB)
	2412	10.21
2.4 GHz	2437	10.24
	2462	10.24

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

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

5. In order to simplify the report, attached plots were only the worst case channel.

Freq(MHz)	Factor(dB)
30	9.95
100	10.01
200	10.03
300	10.04
400	10.05
500	10.04
600	10.03
700	10.09
800	10.10
900	10.08
1000	10.11
2000	10.25
2400*	10.19
2500*	10.26
3000	10.27
4000	10.22
5000	10.48
5700*	10.42
5800*	10.48
6000	10.48
7000	10.57
8000	10.45
9000	10.50
10000	10.64
11000	10.69
12000	10.75

#### FACTORS FOR FREQUENCY

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10.92
11.90
11.00
11.03
10.93
10.96
10.85
12.11
11.17
10.99
11.12
11.10
11.42

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

2. Factor = Cable loss + Attenuator loss

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#### BandEdge (802.11b-CH1)

#### BandEdge (802.11b-CH11)



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#### ent Spectrum Analyzer - Swept SA RL Mar 15, 2014 Frequency PNO: Fast ----IFGain:Low #Atten: 20 dB #Avg Type: RMS Avg|Hold: 1/1 Center Freq 2.400000000 GHz ter PPPPP Auto Tune ΔMkr1 16.99 MHz 36.975 dB Ref Offset 10.2 dB Ref 20.00 dBm 10 dB/div Center Freq 2.40000000 GHz pledondettlen taritse jorden furginglendetede Start Freq 2.375000000 GHz Stop Freq 2.425000000 GHz Sunsales source of work have been printed CF Step 5.000000 MHz Man Auto 14.0 **Freq Offset** 0 Hz Span 50.00 MHz Sweep 4.80 ms (1000 pts) Center 2.40000 GHz #Res BW 100 kHz #VBW 300 kHz Alignment Completed

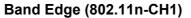
### BandEdge (802.11g-CH1)

#### BandEdge (802.11g-CH11)



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Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:		
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Band Edge (802.11n-CH11)



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Agilent Spectrum Analyzer - Swept S					
Center Freq 515.00000		Trig: Free Run Atten: 20 dB	#Avg Type: RMS Avg[Hold: 1/1	09:56:53 AM Mar 15, 2014 TRACE 2 4 4 TYPE TYPE TYPE TYPE TYPE TYPE TYPE TYPE	Frequency
Ref Offset 10.2 di	3		M	kr1 989.09 MHz -59.422 dBm	Auto Tune
10.0					Center Freq 515.000000 MHz
-10:0				-13.37 alles	Start Freq 30.000000 MHz
-20.0					Stop Freq 1.000000000 GHz
40.0					CF Step 97.000000 MHz Auto Man
and He dis (second as in the last	ata a di atina dia				Freq Offset 0 Hz
Start 30.0 MHz #Res BW 100 kHz	#VBW	300 kHz	Sweep	Stop 1.0000 GHz 3.3 ms (20000 pts)	
vst 🜙 Points changed; all trace			STATU		

#### 1 GHz ~ 3 GHz

Center Freg 2.000000000	CH2	SENGLINT]	#Avg Type: RMS	10 09:56:39 AM Mar 15, 28 TRACE 02	
enter Freq 2.00000000	PNO: East -ter T	rig: Free Run itten: 20 dB	Avg Hold: 1/1	type Museum bet P P F P	
Ref Offset 10.2 dB			М	kr1 2.646 55 GH -56.671 dB	
100			ì		Center Free 2.000000000 GH
10.0				.0132	Start Free 1.000000000 GH
20 0					Stop Free 3.000000000 GH
40.0					CF Step 200.000000 MH Auto Mar
			un the second line		Freq Offse 0 H
Start 1.000 GHz Res BW 100 kHz	#VBW 30		Sweet	Stop 3.000 GF 192 ms (40001 p	Hz (S)

FCC PT.15.247 TEST REPORT		www.hct.co.kr	
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	09:57:07 AM Mar 15, 2014	OTUNINELA		SENGERNT		16 50 Q AC	A RL
Frequency	TWE THE PEPPP		#Avg Typ Avg Hold	Trig: Free Run Atten: 20 dB	PNO: Fast +++		Center Fr
Auto Tune	1 3.309 70 GHz -57.717 dBm	Mkr				Ref Offset 10.2 dB Ref 20.00 dBm	10 dB/div
Center Freq 4.00000000 GHz							10.0
Start Freq 3.000000000 GHz	.13.37.40%						10.0
Stop Freq 5.00000000 GHz							30.0 30.0
CF Step 200.000000 MHz Auto Man							40.0
Freq Offset 0 Hz	and the second second second		and a party of	teres (unitedes selles Seguerary) per constru			40.0 0 000 000
	Stop 5.000 GHz 92 ms (40001 pts)				#VBW 3	GHz	Start 3.00

#### 5 GHz ~ 7 GHz

Center Fr	eq 6.000000000		e Run	#Avg Type: RMS Avg[Hold: 1/1	09:57:21 AMM# 15, 2014 TRACE 2 4 TYPE MONOCOMPENSION SET P P F F P P	Frequency
0 dB/div	Ref Offset 10.2 dB Ref 20.00 dBm			Mkr	1 5.604 70 GHz -58.665 dBm	Auto Tune
10.0						Center Fre 6.000000000 GH
10.0					3132.404	Start Free 5.000000000 GH
200 200						Stop Fre 7.000000000 GH
40.0 93.0						CF Step 200.000000 MH <u>Auto</u> Ma
		ter the second terration of				Freq Offse 0 H
Start 5.000		#VBW 300 kHz		Sweep	Stop 7.000 GHz 192 ms (40001 pts)	

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RL RE 500 AC		SENGLINT	AL3ON AUT		Frequency
Center Freq 8.000000000	PNO: Fast Tri	g: Free Run ten: 20 dB	#Avg Type: RMS Avg[Hold: 1/1	TWE NOT PEPPE	
Ref Offset 10.2 dB			M	kr1 7.368 10 GHz -58.229 dBm	
10.0					Center Freq 8.00000000 GHz
10.0				.13.37.40e	Start Freq 7.00000000 GHz
310					Stop Freq 9.000000000 GHz
40.0					CF Step 200.000000 MHz <u>Auto</u> Man
					Freq Offset 0 Hz
Start 7.000 GHz #Res BW 100 kHz	#VBW 300			Stop 9.000 GHz 192 ms (40001 pts	

#### 9 GHz ~ 11 GHz

RL NF 50-2 AC	SENGLINT	OTUA NOLA	09:57:49 AM Mar 15, 2014	Frequency
enter Freq 10.00000000	PN0: Fast Trig: Free Run IFGain:Low Atten: 20 dB	#Avg Type: RMS Avg Hold: 1/1	TYPE MUNICIPALITY DET PPPPP	Frequency
Ref Offset 10.2 dB		Mkr1	10.416 85 GHz -59.132 dBm	Auto Tune
10.0				Center Fred 10.00000000 GHz
0.0			12.37.alles	Start Fred 9.00000000 GHz
no				Stop Free 11.00000000 GH
12.0				CF Step 200.000000 MH Auto Mar
<sup>210</sup> <mark>Statement supervisitions</mark>		- the second second		Freq Offse 0 Hz
tart 9.000 GHz	la i yan ƙasalan il di ƙalaliyi wasa	All and an and the second s	Stop 11.000 GHz	
Res BW 100 kHz	#VBW 300 kHz	Sweep	192 ms (40001 pts)	

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Agilent Spectrum Analy	rer - Swept SA							
Center Freq 12	.000000000	GHz PNO: Fast	Trig: Free Atten: 20	#Avg Type Avg[Hold:		TRAC TVP	MM# 15, 2014	Frequency
	fset 10.2 dB 0.00 dBm	I Game of			Mkr1	12.918	40 GHz 38 dBm	Auto Tune
100								Center Freq 12.000000000 GHz
-10:0							13.37 after	Start Freq 11.00000000 GHz
-20.0								Stop Freq 13.00000000 GHz
-40.0								CF Step 200.000000 MHz Auto Man
-62.0 -70.0 -70.0								Freq Offset 0 Hz
Start 11.000 GH #Res BW 100 kH		#VBW	300 kHz		Sweep	Stop 13. 192 ms (4	000 GHz 0001 pts)	
was UPoints chang	ed; all traces ch	eared			STATU	15		

#### 13 GHz ~ 15 GHz

RL.	reg 14.000000		SINGLINT	#Avg Type: RMS	09:58:17 AM Mar 15, 2014	Frequency
enter F	req 14.00000	PNO: Fast +++ IFGain:Low	Trig: Free Run Atten: 20 dB	Avg Hold: 1/1	DET P P P P P P	
0 dB/div	Ref Offset 10.2 dl Ref 20.00 dBn	3 1		Mkr1	14.061 80 GHz -56.548 dBm	Auto Tun
100						Center Fre 14.000000000 GH
10.0					-13.37.40m	Start Fre 13.00000000 GH
200						Stop Fre 15.00000000 GH
42.0						CF Ste 200.000000 MH Auto Ma
20.0 (Liper			liningen für Under de Ru gengenden en plager einer st		al an Address a Address dae Antonen Antone Americanis	Freq Offse 0 H
tart 13.0	00 GHz 100 kHz	#VBW	300 kHz	Sweep	Stop 15.000 GHz 192 ms (40001 pts)	

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G
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Frequency	09:58:31 AM Mar 15, 2014	OT/MINCLA	SINGUNT	NF 50 Q AC	RL /
destance of the	TWE NUMBER	#Avg Type: RMS Avg Hold: 1/1	Trig: Free Run Atten: 20 dB	eq 16.00000000 GHz PNO: Fast +++ IFGain:Low	Center Freq
Auto Tune	16.861 25 GHz -53.536 dBm	Mkr1		Ref Offset 10.2 dB Ref 20.00 dBm	Re 10 dB/div Re
Center Fred 16.000000000 GH					10.0
Start Free 15.000000000 GH	.13.37 alba				10.0
Stop Free 17.000000000 GH					200
CF Step 200.000000 MH Auto Mar	1				40.0
Freq Offse 0 H		his sheet in the selection		in in Salling and a start of the Salling of the Salling The Salling of the Sal	en y <mark>1930 da </mark>
	Stop 17.000 GHz 192 ms (40001 pts)	Swaan	800 kHz		Start 15.000 (

#### 17 GHz ~ 19 GHz

RL optor E	reg 18.0000000	00 647	SENGLINT	#Avg Type: RMS	TRACE DESIGNATION	Frequency
enterr	164 10.000000	PNO: Fast	Trig: Free Run Atten: 20 dB	Avg[Hold: 1/1	type Nononanan tet PPPPPP	distance of the
0 dBi/div	Ref Offset 10.2 dB Ref 20.00 dBm			Mkr	1 18.819 15 GHz -55.094 dBm	Auto Tune
uo						Center Free 18.000000000 GH
100					13 32 alpe	Start Fre 17.00000000 GH
100						Stop Fre 19.00000000 GH
40.0 50.0					1	CF Ste 200.000000 MH <u>Auto</u> Ma
	le la contraction de la contraction de La contraction de la c				n det nin ne der det nedatio Networksprechen von der nie	Freq Offse 0 H
art 17.0	000 GHz 100 kHz	#VBW	300 kHz	Sweep	Stop 19.000 GHz 192 ms (40001 pts)	

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G
HC1-R-1403-F034-1	March 20, 2014	Page 3.6 of 59	ZINFD203G



Agilent Spectr	um Analyzer - Swept SA							
10.00	req 20.0000000	PNO: Fast		#Avg Typ Avg Hold		TRACE	PPEPP	Frequency
t0 dB/div	Ref Offset 10.2 dB Ref 20.00 dBm				Mkr	1 20.910 3		Auto Tune
								Center Freq 20.000000000 GHz
-10.0							13.37 alles	Start Freq 19.00000000 GHz
								Stop Freq 21.00000000 GHz
40.0							1	CF Step 200.000000 MHz Auto Man
42.0 44040 70.0	andalarda paradidan Astronomianan Nyario		Population of					Freq Offset 0 Hz
Start 19.0 #Res BW		#VBW	300 kHz		Sweep	Stop 21.0 192 ms (40		
Ist Point	ts changed; all traces	cleared			STAT	US .		

# Conducted Spurious Emission (802.11b\_Ch.6\_11 Mbps)

#### 21 GHz ~ 23 GHz

# Conducted Spurious Emission (802.11b\_Ch.6\_11 Mbps)

Center Fr	eq 22.00000000		[ 90M0001]	#Avg Type:		109:59:14 AM Mar 15, 2014	Frequency
		PNO: Fast ++- IFGain:Low	Trig: Free Run Atten: 20 dB	Avg Hold: 1/	1	DET PPEPPP	12002-0100
0 dB/div	Ref Offset 10.2 dB Ref 20.00 dBm				Mkr1	22.397 65 GHz -51.830 dBm	Auto Tuno
10.0							Center Free 22.000000000 GH
10.0						-13.32.40e	Start Free 21.00000000 GH
200 200							Stop Free 23.000000000 GH
40.0 50.0				•			CF Step 200.000000 MH <u>Auto</u> Ma
	telulogiji iz i teor dale u poli Intera programa na svjet	ann ann Táile Seann an Stàile					Freq Offse 0 H
Start 21.00		#VBW	300 kHz	s	weep	Stop 23.000 GHz 192 ms (40001 pts)	

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G
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#### Igilent Spectrum Analyzer - Swept SA 09:59:28 AM Mar 15, 2014 RL Center Freq 24.00000000 GHz PRO: Fast +++ IFGain:Low Frequency #Avg Type: RMS Avg|Hold: 1/1 TWE NUMERAL Auto Tune Mkr1 24.794 65 GHz -50.050 dBm Ref Offset 10.2 dB Ref 20.00 dBm t0 dB/div Center Freq 24.00000000 GHz Start Freq 23.00000000 GHz Stop Freq 25.00000000 GHz CF Step 200.000000 MHz to Man 1 Auto Freq Offset 100 0 Hz Stop 25.000 GHz Sweep 192 ms (40001 pts) Start 23.000 GHz #Res BW 100 kHz #VBW 300 kHz st 🜙 Points changed; all traces cleared

#### Conducted Spurious Emission (802.11b\_Ch.6\_11 Mbps)

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr			
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:			
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G			
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# 8.6 RADIATED MEASUREMENT. 8.6.1 RADIATED SPURIOUS EMISSIONS.

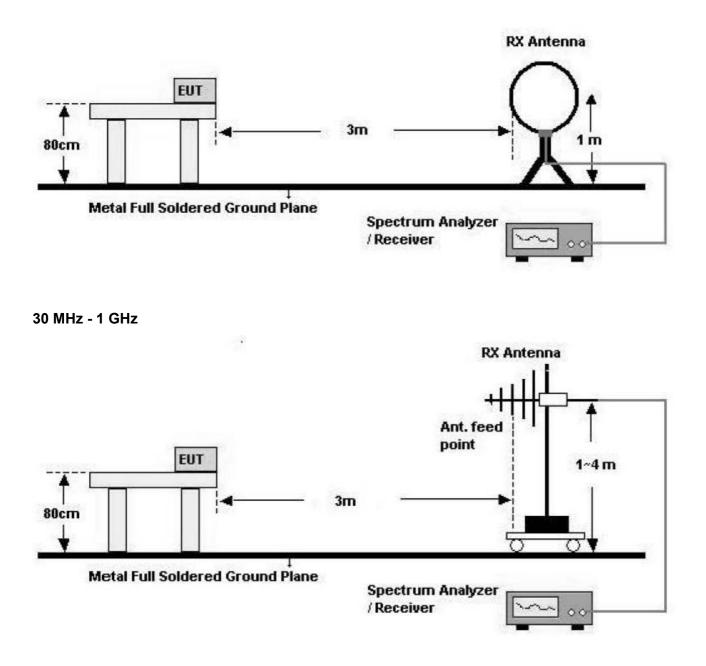
Test Requirements and limit, §15.205, §15.209

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

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	<b>EUT Type:</b> GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G
		Page 3.9 of 50	

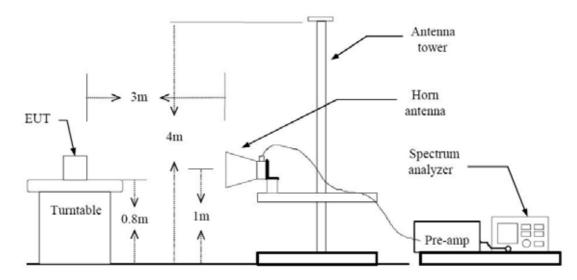


#### Below 30 MHz



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G
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### **TEST PROCEDURE USED**

Method 12.1 in KDB 558074, issued 04/09/2013

Spectrum Setting

- Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW  $\geq$  3 x RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

	nequency
Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

Table 1 — RBW as a funct	ion of frequency
--------------------------	------------------

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G
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- Average

Set RBW = 1 MHz

Set VBW  $\geq$  1/T.( at least 100 times less than the resolution bandwidth, but no less than 10 Hz.) Select spectrum analyzer linear display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

#### Note :

- 1. We are performed the RSE and radiated band edge using standard radiated method.
- 2. The actual setting value of VBW for 802.11 b/g/n

Mode	Worst Data rate (Mbps)	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
b	1	12.240	12.330	99.27	82	1000
g	6	2.019	2.124	95.06	495	1000
n	6.5	1.870	1.970	94.92	535	1000

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G
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#### **TEST RESULTS**

#### 9 kHz – 30MHz

#### **Operation Mode:** Normal Mode

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

#### Notes:

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

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	<b>EUT Type:</b> GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G
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#### Below 1 GHz

#### Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBµV	dB /m	dB	(H/V)	dBµV/m	dBµV/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.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
	ate of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
HCT-R-1403-F054-1	larch 28, 2014	Hotspot support	ZNFD285G



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

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4824	56.36	-4.25	V	52.11	73.98	21.87	PK
4824	48.92	-4.25	V	44.67	53.98	9.31	AV
7236	54.06	5.21	V	59.27	73.98	14.71	PK
7236	38.45	5.21	V	43.66	53.98	10.32	AV
4824	55.67	-4.25	Н	51.42	73.98	22.56	PK
4824	47.48	-4.25	Н	43.23	53.98	10.75	AV
7236	52.27	5.21	Н	57.48	73.98	16.50	PK
7236	38.56	5.21	Н	43.77	53.98	10.21	AV

Operation Mode: Transfer Rate: Operating Frequency Channel No.

802.11 g	
6 Mbps	
2412	
01 Ch	

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4824	52.48	-4.25	V	48.23	73.98	25.75	PK
4824	39.02	-4.25	V	34.77	53.98	19.21	AV
7236	52.44	5.21	V	57.65	73.98	16.33	PK
7236	38.42	5.21	V	43.63	53.98	10.35	AV
4824	52.32	-4.25	Н	48.07	73.98	25.91	PK
4824	38.47	-4.25	Н	34.22	53.98	19.76	AV
7236	52.69	5.21	Н	57.90	73.98	16.08	PK
7236	38.84	5.21	Н	44.05	53.98	9.93	AV

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G
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Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4824	52.43	-4.25	V	48.18	73.98	25.80	PK
4824	38.94	-4.25	V	34.69	53.98	19.29	AV
7236	52.82	5.21	V	58.03	73.98	15.95	PK
7236	38.70	5.21	V	43.91	53.98	10.07	AV
4824	51.83	-4.25	Н	47.58	73.98	26.40	PK
4824	37.94	-4.25	Н	33.69	53.98	20.29	AV
7236	52.18	5.21	Н	57.39	73.98	16.59	PK
7236	38.16	5.21	Н	43.37	53.98	10.61	AV

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	<b>EUT Type:</b> GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G
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Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4874	53.68	-3.93	V	49.75	73.98	24.23	PK
4874	44.64	-3.93	V	40.71	53.98	13.27	AV
7311	52.33	4.97	V	57.30	73.98	16.68	PK
7311	38.41	4.97	V	43.38	53.98	10.60	AV
4874	54.99	-3.93	Н	51.06	73.98	22.92	PK
4874	46.78	-3.93	Н	42.85	53.98	11.13	AV
7311	52.47	4.97	Н	57.44	73.98	16.54	PK
7311	38.33	4.97	Н	43.30	53.98	10.68	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4874	51.98	-3.93	V	48.05	73.98	25.93	PK
4874	38.44	-3.93	V	34.51	53.98	19.47	AV
7311	52.53	4.97	V	57.50	73.98	16.48	PK
7311	38.48	4.97	V	43.45	53.98	10.53	AV
4874	52.10	-3.93	Н	48.17	73.98	25.81	PK
4874	38.19	-3.93	Н	34.26	53.98	19.72	AV
7311	52.64	4.97	Н	57.61	73.98	16.37	PK
7311	38.32	4.97	Н	43.29	53.98	10.69	AV

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT				
Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:			
HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G			
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Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4874	52.85	-3.93	V	48.92	73.98	25.06	PK
4874	38.44	-3.93	V	34.51	53.98	19.47	AV
7311	52.73	4.97	V	57.70	73.98	16.28	PK
7311	38.53	4.97	V	43.50	53.98	10.48	AV
4874	52.94	-3.93	Н	49.01	73.98	24.97	PK
4874	38.45	-3.93	Н	34.52	53.98	19.46	AV
7311	52.66	4.97	Н	57.63	73.98	16.35	PK
7311	38.78	4.97	Н	43.75	53.98	10.23	AV

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 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. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	<b>EUT Type:</b> GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G		



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

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4924	53.76	-3.75	V	50.01	73.98	23.97	PK
4924	44.91	-3.75	V	41.16	53.98	12.82	AV
7386	53.08	5.60	V	58.68	73.98	15.30	PK
7386	38.74	5.60	V	44.34	53.98	9.64	AV
4924	53.84	-3.75	Н	50.09	73.98	23.89	PK
4924	44.48	-3.75	Н	40.73	53.98	13.25	AV
7386	52.61	5.60	Н	58.21	73.98	15.77	PK
7386	38.60	5.60	Н	44.20	53.98	9.78	AV

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

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4924	51.88	-3.75	V	48.13	73.98	25.85	PK
4924	38.28	-3.75	V	34.53	53.98	19.45	AV
7386	52.17	5.60	V	57.77	73.98	16.21	PK
7386	38.34	5.60	V	43.94	53.98	10.04	AV
4924	51.94	-3.75	Н	48.19	73.98	25.79	PK
4924	38.16	-3.75	Н	34.41	53.98	19.57	AV
7386	52.11	5.60	Н	57.71	73.98	16.27	PK
7386	38.22	5.60	Н	43.82	53.98	10.16	AV

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Test Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
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Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4924	52.75	-3.75	V	49.00	73.98	24.98	PK
4924	38.41	-3.75	V	34.66	53.98	19.32	AV
7386	52.66	5.60	V	58.26	73.98	15.72	PK
7386	38.64	5.60	V	44.24	53.98	9.74	AV
4924	51.97	-3.75	Н	48.22	73.98	25.76	PK
4924	38.64	-3.75	Н	34.89	53.98	19.09	AV
7386	52.71	5.60	Н	58.31	73.98	15.67	PK
7386	38.75	5.60	Н	44.35	53.98	9.63	AV

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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

FCC PT.15.247 TEST REPORT		www.hct.co.kr	
Test Report No. HCT-R-1403-F054-1	Date of Issue: March 28, 2014	<b>EUT Type:</b> GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support	FCC ID: ZNFD285G
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### 8.6.2 RADIATED RESTRICTED BAND EDGES

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

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

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

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	25.26	33.90	Н	59.16	73.98	14.82	PK
2390.0	12.06	33.90	Н	45.96	53.98	8.02	AV
2390.0	25.40	33.90	V	59.30	73.98	14.68	PK
2390.0	11.93	33.90	V	45.83	53.98	8.15	AV
2483.5	30.77	33.99	Н	64.76	73.98	9.22	PK
2483.5	12.58	33.99	Н	46.57	53.98	7.41	AV
2483.5	27.38	33.99	V	61.37	73.98	12.61	PK
2483.5	12.07	33.99	V	46.06	53.98	7.92	AV

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Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	25.18	33.90	Н	59.08	73.98	14.90	PK
2390.0	11.91	33.90	Н	45.81	53.98	8.17	AV
2390.0	25.13	33.90	V	59.03	73.98	14.95	PK
2390.0	11.81	33.90	V	45.71	53.98	8.27	AV
2483.5	25.59	33.99	Н	59.58	73.98	14.40	PK
2483.5	12.19	33.99	Н	46.18	53.98	7.80	AV
2483.5	26.03	33.99	V	60.02	73.98	13.96	PK
2483.5	11.54	33.99	V	45.53	53.98	8.45	AV

Operation Mode:	802.11n
Transfer Rate:	6.5 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	25.33	33.90	Н	59.23	73.98	14.75	PK
2390.0	11.99	33.90	Н	45.89	53.98	8.09	AV
2390.0	25.13	33.90	V	59.03	73.98	14.95	PK
2390.0	11.43	33.90	V	45.33	53.98	8.65	AV
2483.5	31.79	33.99	Н	65.78	73.98	8.20	PK
2483.5	12.92	33.99	Н	46.91	53.98	7.07	AV
2483.5	26.57	33.99	V	60.56	73.98	13.42	PK
2483.5	11.91	33.99	V	45.90	53.98	8.08	AV

- 1. Total = Reading Value + Antenna Factor + Cable Loss
- 2. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

	PT.15.247 REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test R	Report No.	Date of Issue:	EUT Type: GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP,	FCC ID:
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# 8.7 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:

	Limits (dBµV)				
Frequency Range (MHz)	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60	50			

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

#### **Test Configuration**

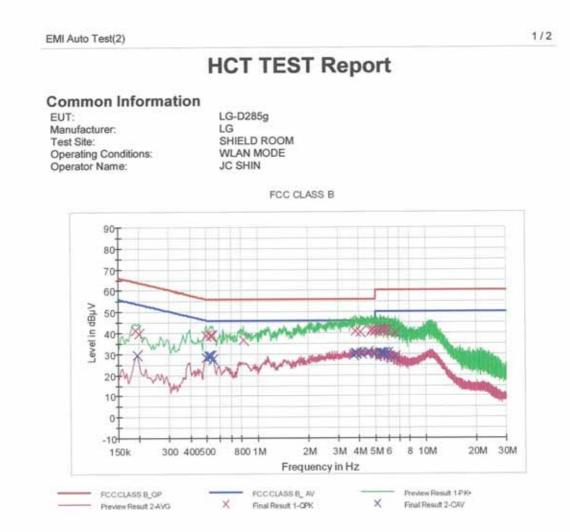
See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

#### **TEST PROCEDURE**

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

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#### **Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190500	41.3	9.000	Off	L1	9.7	22.7	64.0
0.199500	39.4	9.000	Off	L1	9.7	24.2	63.6
0.496500	38.9	9,000	011	L1	9.7	17.2	56,1
0.527000	38.6	9.000	Off	L1.	9.8	17.4	56.0
0.540500	38.8	9.000	Off	L1	9.8	17.2	56.0
0.828500	36.8	9.000	Off	L1	9.8	19.2	56.0
3.834500	40.7	9.000	Off	L1	10.0	15.3	56.0
4.086500	40.4	9.000	Off	L1	10.1	15.6	56.0
4.752500	40.9	9,000	Off	L1	10.1	15.1	56.0
4.811000	41.6	9.000	Off	L1	10.1	14.4	56.0
4.977500	40.7	9,000	Off	L1	10.1	15.3	56.0
5.072000	41.2	9.000	Off	L1	10.1	18.8	60.0
5.373500	41.7	9.000	Off	L1	10.1	18.3	60.0
5.432000	41.3	9.000	Off	L1	10,1	18.7	60.0
5.625500	41.1	9.000	tto	L1	10.1	18.9	60.0
5,693000	41.4	9.000	Off	L1	10.1	18.6	60.0

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EMI Auto Test(2)

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
5,967500	41.1	9,000	Off	L1	10.2	18.9	60.0
6.615500	40.0	9,000	0ff	L1	10.2	20.0	60.0

#### **Final Result 2**

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	29.6	9,000	Off	L1	9.7	24.2	53.8
0,496500	28.4	9,000	Off	L1	9.7	17.7	46.1
0.513500	28.9	9.000	Off	L1	9.8	17.1	46.0
0.522500	29.0	9.000	Off	L1	9,8	17.0	46.0
0.531500	29.0	9.000	Off	L1	9,8	17.0	46.0
0.545000	27.6	9.000	Off	L1	9,8	18,4	46.0
3.744500	29.7	9.000	Off	L1	10.0	16.3	46.0
3.834500	30,1	9,000	Off	L1	10.0	15.9	46.0
3,884000	30.4	9.000	Off	L1	10.0	15.6	46.0
4.154000	30.3	9,000	Off	L1	10.1	15.7	46.0
4.550000	30.6	9,000	Off	L1	10.1	15.4	46.0
4.977500	30.1	9.000	110	L1	10.1	15.9	46.0
5.373500	30.5	9.000	Off	L1	10.1	19.5	50.0
5,486000	30,4	9.000	Off	L1	10.1	19.6	50.0
5.625500	30.0	9,000	011	L1	10.1	20.0	50.0
5.693000	30.4	9,000	Off	L1	10.1	19.6	50.0
5.967500	30.2	9,000	Off	L1	10.2	19.8	50.0
6,615500	28.7	9.000	Off	L1	10.2	21.3	50.0

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FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
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HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G



EMI Auto Test(2) **HCT TEST Report Common Information** LG-D285g LG EUT: Manufacturer: SHIELD ROOM Test Site: Operating Conditions: Operator Name: WLAN MODE JC SHIN FCC CLASS B 907 80-70 60 Level in dBµV 50 40 30 20 10-

0 -10 20M 30M 3M 4M 5M 6 8 10M 300 400500 800 1M 2M 150k Frequency in Hz FCCCLASS B\_OP FCCCLASS B\_ AV Preview Result 1 PK+ × Final Result 1-OPK X Final Result 2-CAV Preview Result 2 AVG

#### **Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	44.6	9.000	Off	N	9.7	21.4	66.0
0.163500	44.7	9.000	Off	N	9.7	20.6	65.3
0.330000	41.1	9.000	Off	N	9.7	18.4	59.5
0.451500	40.9	9.000	Off	N	9.8	15.9	56.8
0.558500	41.2	9.000	Off	N	9.8	14.8	56.0
0.675500	40.1	9.000	Off	N	9.8	15.9	56.0
2.939000	38.5	9.000	Off	N	10.0	17.5	56.0
2.993000	38.5	9.000	Off	N	10.0	17.5	56.0
3.474500	39.4	9.000	Off	N	10.0	16.6	56.0
3.533000	39.4	9,000	Off	N	10.0	16.6	56.0
4.676000	40.4	9.000	Off	N	10.1	15.6	56.0
4.716500	40.1	9.000	ott	N	10.1	15.9	56.0
5,315000	40.9	9.000	Off	N	10.1	19.1	60.0
5.328500	40.7	9,000	Off	N	10.1	19.3	60.0
5.481500	40.8	9.000	Off	N	10.1	19.2	60.0
5.630000	40.8	9,000	Off	N	10.1	19.2	60.0

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#### EMI Auto Test(2)

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
5.931500	40.9	9,000	Off	N	10.2	19.1	60.0
5.958500	41.0	9.000	Off	N	10.2	19.0	60.0

#### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	34.9	9.000	Off	N	9.7	20.6	55.5
0.226500	23.8	9.000	Off	N	9.7	28.8	52.6
0.325500	32.1	9.000	Off	N	9.7	17.5	49.6
0.447000	30.5	9.000	011	N	9.8	16,4	46.9
0.558500	34.1	9.000	Off	N	9.8	11.9	46.0
0.675500	29.3	9,000	Off	N	9.8	16.7	46.0
2.871500	33.1	9,000	Off	N	10.0	12.9	46.0
2.939000	31.8	9.000	Off	N	10.0	14.2	46.0
4.676000	33.3	9.000	Off	N	10.1	12.7	46.0
4.716500	33.0	9,000	Off	N	10.1	13.0	46.0
4.955000	33.5	9.000	110	N	10.1	12.5	46.0
4.964000	33.3	9.000	Off	N	10.1	12.7	46.0
5.319500	33.7	9.000	Off	N	10.1	16,3	50.0
5.328500	33.7	9,000	Off	N	10.1	16.3	50.0
5.603000	33.5	9.000	Off	N	10.1	16.5	50.0
5.630000	33.7	9.000	Off	N	10.1	16.3	50.0
5.801000	33.5	9.000	Off	N	10.1	16.5	50.0
5,958500	33.5	9.000	110	N	10.2	16.5	50.0

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HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G



# 9.LIST OF TEST EQUIPMENT 9.1LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration	Calibration	Serial No.	
		Interval	Due		
Rohde & Schwarz	ENV216/ LISN	Annual	01/29/2015	100073	
Agilent	E4440A/ Spectrum Analyzer	Annual	04/25/2014	4/25/2014 US45303008	
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/14/2014	MY51110063	
Agilent	N1911A/Power Meter	Annual	01/24/2015	MY45100523	
Agilent	N1921A /POWER SENSOR	Annual	07/11/2014	MY45241059	
Hewlett Packard	11636B/Power Divider	Annual	10/22/2014	11377	
Agilent	87300B/Directional Coupler	Annual	12/18/2014	12/18/2014 3116A03621	
Hewlett Packard	11667B / Power Splitter	Annual	05/29/2014	05001	
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	10/29/2014	3110117	
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/05/2014	010002156287001199	
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	04/24/2014	3000C000276	
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422	
Agilent	8493C / Attenuator(10 dB)	Annual	07/24/2014	76649	
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	10/28/2014	BR0617	

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
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# 9.2LIST OF TEST EQUIPMENT(Radiated Test)

Monufacturer	Model / Equipment	Calibration	Calibration	Serial No.	
Manufacturer		Interval	Due		
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/17/2014	3150	
Rohde & Schwarz	ESCI / EMI TEST RECEIVER	Annual	01/24/2015	100584	
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	09/10/2014	10094	
CERNEX	CBL18265035 / POWER AMP	Annual	07/24/2014	22966	
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2014	19660	
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	07/05/2015	1151	
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124	
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	01/24/2015	839117/011	
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/03/2015	F6	
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	04/16/2014	1	
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	04/16/2014	29	
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	06/24/2014	1	
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	04/24/2014	3000C000276	
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422	
Rohde & Schwarz	LOOP ANTENNA	Biennial	08/14/2014	100179	
CERNEX	CBL06185030 / POWER AMP	Annual	07/24/2014	22965	
CERNEX	CBLU1183540 / POWER AMP	Annual	07/24/2014	22964	

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
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HCT-R-1403-F054-1	March 28, 2014	Hotspot support	ZNFD285G