

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE FCC Certification

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: October 24, 2012
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632	Test Site/Location: HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea
	Report No.: HCTR1210FR21-3
	HCT FRN: 0005866421

FCC ID : ZNFL02E

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

FCC Model(s): L-02E

EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)

Max. RF Output Power: Wi-Fi 802.11a (5180~5240) (10.49 dBm)/ Wi-Fi 802.11a (5260~5320) (10.29 dBm)/
Wi-Fi 802.11a (5500~5700) (10.90 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (10.39 dBm)/
Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.48 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(11.08 dBm)/
Wi-Fi 802.11n_40 MHz BW(5190~5230) (9.71 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (10.60 dBm)/
Wi-Fi 802.11n_40 MHz BW (5510~5670) (11.08 dBm)

Frequency Range: 20 MHz BW
5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/
5500 MHz - 5700 MHz (UNII 3)

40 MHz BW
5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/
5510 MHz - 5670 MHz (UNII 3)

Modulation type: OFDM

FCC Classification: Unlicensed National Information Infrastructure(UNII)

FCC Rule Part(s): Part 15.407

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
: Sang Jun Lee
Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1210FR21	October 15, 2012	- First Approval Report
HCTR1210FR21-1	October 18, 2012	- Revised Power Level Values in Frequency Stability - Add the informations about the procedure and TX Condition of EUT on Page 180.
HCTR1210FR21-2	October 23, 2012	- Insert 3D Antenna Information on Page 4 - Revised EUT TX condition on Page 27,180
HCTR1210FR21-3	October 24, 2012	-Insert Spectrum setting in Note on Section 8.6

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1. GENERAL INFORMATION

Applicant: LG Electronics MobileComm U.S.A., Inc.
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID: ZNFL02E
EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)
Model name(s): L-02E
Date(s) of Tests: September 9, 2012 ~ October 11, 2012
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

EUT Type	Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)		
FCC Model Name	L-02E		
Power Supply	DC 3.7 V		
Frequency Range	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 3) where) Not supported 5600 MHz – 5640 MHz	
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 3) where) Not supported 5600 MHz – 5640 MHz	
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 3) where) Not supported 5600 MHz – 5640 MHz	
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 3) where) Not supported 5600 MHz – 5640 MHz	
Max. RF Output Power:	Wi-Fi 802.11a (5180~5240) (10.49 dBm)/ Wi-Fi 802.11a (5260~5320) (10.29 dBm)/ Wi-Fi 802.11a (5500~5700) (10.90 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (10.39 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.48 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(11.08 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (9.71 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (10.60 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (11.08 dBm)		
Modulation Type	OFDM(802.11a, 802.11n_20 MHz, 802.11n_40 MHz)		
Antenna Specification	Manufacturer: ace technologyA Antenna type: BUILT-IN Antenna Peak 3D Gain : -2.22 dBi		

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3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.10-2009) and FCC KDB 789033 D01 General UNII Test Procedures v01r01 dated March 05, 2012 entitled “ Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E” 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 6.2 of ANSI C63.10. (Version :2009) 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 6.3 of ANSI C63.10. (Version: 2009)

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 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

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7. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
TRANSMITTER MODE(TX)				
26dB Bandwidth	NA	NA	CONDUCTED	PASS
Maximum Conducted Output Power	§15.407(a)(1)	$< 4+10 \log_{10} (BW) \text{ dBm}$ (5150-5250 MHz) $< 11+10 \log_{10} (BW) \text{ dBm}$ (5250-5350 MHz) $< 11+10 \log_{10} (BW) \text{ dBm}$ (5470-5725 MHz)		PASS
Peak Power Spectral Density	§15.407(a)(1), (5)	$< 4 \text{ dBm/ MHz}$ (5150-5250) $< 11 \text{ dBm/ MHz}$ (5250-5350) $< 11 \text{ dBm/ MHz}$ (5470-5725)		PASS
Peak Excursion	§15.407(a)(6)	$< 13 \text{ dB/ MHz}$ maximum difference		PASS
Frequency Stability	§15.407(g)	NA		PASS
Undesirable Emissions	§15.407(b)(1), (2), (3)	$< -27 \text{ dBm/ MHz EIRP}$ (5150-5350 MHz, 5470-5725 MHz)	RADIATED	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 5.407(b)(1), (5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207	$< \text{FCC 15.207 limits}$	LINE CONDUCTED	PASS

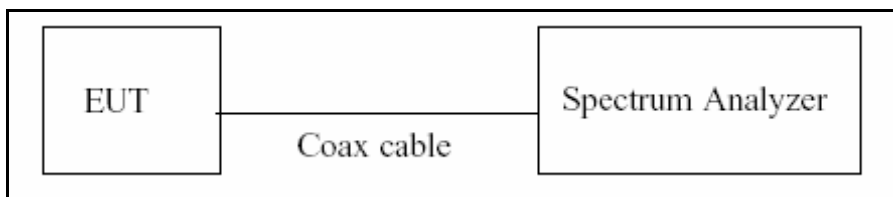
8. TEST RESULT

8.1 26 dB BANDWIDTH MEASUREMENT

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

RBW: approximately 1 % of the emission bandwidth

VBW: >RBW

SPAN: 40 MHz(20 MHz BW) / 60 MHz(40 MHz BW)

Detector = Peak

Trace mode = max hold

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■ TEST RESULTS

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	22.07	N/A	Pass
5200	40	22.75	N/A	Pass
5240	48	22.65	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.41	N/A	Pass
5300	60	22.51	N/A	Pass
5320	64	22.47	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.29	N/A	Pass
5580	116	22.24	N/A	Pass
5700	140	22.33	N/A	Pass

■ TEST RESULTS

20 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	22.96	N/A	Pass
5200	40	22.76	N/A	Pass
5240	48	22.72	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.49	N/A	Pass
5300	60	22.75	N/A	Pass
5320	64	22.68	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.57	N/A	Pass
5580	116	22.65	N/A	Pass
5700	140	22.90	N/A	Pass

40 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	44.05	N/A	Pass
5230	46	44.42	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	44.12	N/A	Pass
5310	62	43.83	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	43.97	N/A	Pass
5550	110	43.62	N/A	Pass
5670	134	43.75	N/A	Pass

RESULT PLOTS

26 dB Bandwidth plot (802.11a-CH 36)



26 dB Bandwidth plot (802.11a-CH 40)



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26 dB Bandwidth plot (802.11a-CH 48)



26 dB Bandwidth plot (802.11a-CH 52)



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26 dB Bandwidth plot (802.11a-CH 60)



26 dB Bandwidth plot (802.11a-CH 64)



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26 dB Bandwidth plot (802.11a-CH 100)



26 dB Bandwidth plot (802.11a-CH 116)



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26 dB Bandwidth plot (802.11a-CH 140)



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20 MHz BW

26 dB Bandwidth plot (802.11n-CH 36)



26 dB Bandwidth plot (802.11n-CH 40)



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26 dB Bandwidth plot (802.11n-CH 48)



26 dB Bandwidth plot (802.11n-CH 52)



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26 dB Bandwidth plot (802.11n-CH 60)



26 dB Bandwidth plot (802.11n-CH 64)



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26 dB Bandwidth plot (802.11n-CH 100)



26 dB Bandwidth plot (802.11n-CH 116)



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26 dB Bandwidth plot (802.11n-CH 140)



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40 MHz BW

26 dB Bandwidth plot (802.11n-CH 38)



26 dB Bandwidth plot (802.11n-CH 46)



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26 dB Bandwidth plot (802.11n-CH 54)



26 dB Bandwidth plot (802.11n-CH 62)



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26 dB Bandwidth plot (802.11n-CH 102)



26 dB Bandwidth plot (802.11n-CH 110)



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26 dB Bandwidth plot (802.11n-CH 134)



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8.2 OUTPUT POWER MEASUREMENT

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. In the 5.15 – 5.25 GHz band, the maximum permissible conducted output power is the lesser of 50 mW (16.99 dBm) and $4 \text{ dBm} + 10 \log_{10} (26 \text{ dB BW})$

frequencies. In the 5.25 – 5.35 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and $11 \text{ dBm} + 10 \log_{10} (26 \text{ dB BW})$

frequencies. In the 5.47 – 5.725 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and $11 \text{ dBm} + 10 \log_{10} (26 \text{ dB BW})$

Limit : 802.11a_UNII-1 = 16.99 dBm

802.11n(20 MHz BW)_UNII-1 = 16.99 dBm

802.11n(40 MHz BW)_UNII-1 = 16.99 dBm

802.11a_UNII-2 = 23.98 dBm

802.11n(20 MHz BW)_UNII-2 = 23.98 dBm

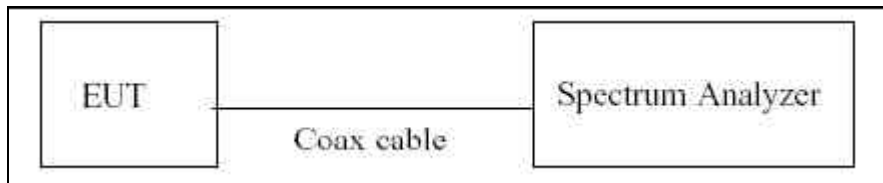
802.11n(40 MHz BW)_UNII-2 = 23.98 dBm

802.11a_UNII-3 = 23.98 dBm

802.11n(20 MHz BW)_UNII-3 = 23.98 dBm

802.11n(40 MHz BW)_UNII-3 = 23.98 dBm

■ TEST CONFIGURATION



■ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function. We tested according to Method SA-1 in KDB 789033(issued 3/05/2012).

This EUT TX condition is actual operating mode(with a duty cycle of greater than or equal to 98%) by WLAN test program.

The Spectrum Analyzer is set to

- Average Power

RBW = 1 MHz

VBW = 3 MHz

Sweep Point = 1001

SPAN = to encompass the entire EBW of the signal

Sweep Time = auto

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Detector Mode = RMS(i.e., power averaging)

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

Integrated bandwidth = 26 dB EBW

▣ Sample Calculation

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

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 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.26
	5190	10.22
	5200	10.18
	5230	10.19
	5240	10.19
UNII 2	5260	10.18
	5270	10.17
	5300	10.14
	5310	10.11
	5320	10.09
UNII 3	5500	10.20
	5510	10.20
	5550	10.23
	5580	10.24
	5670	10.36
	5700	10.40

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

■ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5180~5240)

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5180	36	6 Mbps	10.49	16.99
		9 Mbps	10.22	16.99
		12 Mbps	10.09	16.99
		18 Mbps	9.93	16.99
		24 Mbps	9.43	16.99
		36 Mbps	9.24	16.99
		48 Mbps	9.09	16.99
		54 Mbps	8.80	16.99
5200	40	6 Mbps	10.22	16.99
		9 Mbps	10.23	16.99
		12 Mbps	9.49	16.99
		18 Mbps	9.65	16.99
		24 Mbps	9.41	16.99
		36 Mbps	9.18	16.99
		48 Mbps	9.04	16.99
		54 Mbps	8.84	16.99
5240	48	6 Mbps	10.21	16.99
		9 Mbps	10.19	16.99
		12 Mbps	10.09	16.99
		18 Mbps	9.88	16.99
		24 Mbps	9.64	16.99
		36 Mbps	9.29	16.99
		48 Mbps	9.13	16.99
		54 Mbps	8.99	16.99

Conducted Output Power Measurements (802.11a Mode: 5260~5320)

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5260	52	6 Mbps	10.29	23.98
		9 Mbps	10.28	23.98
		12 Mbps	10.29	23.98
		18 Mbps	9.99	23.98
		24 Mbps	10.09	23.98
		36 Mbps	9.49	23.98
		48 Mbps	8.90	23.98
		54 Mbps	8.96	23.98
5300	60	6 Mbps	10.17	23.98
		9 Mbps	9.98	23.98
		12 Mbps	9.61	23.98
		18 Mbps	9.41	23.98
		24 Mbps	9.37	23.98
		36 Mbps	8.80	23.98
		48 Mbps	8.25	23.98
		54 Mbps	8.14	23.98
5320	64	6 Mbps	9.99	23.98
		9 Mbps	9.51	23.98
		12 Mbps	9.48	23.98
		18 Mbps	9.31	23.98
		24 Mbps	9.02	23.98
		36 Mbps	9.16	23.98
		48 Mbps	8.68	23.98
		54 Mbps	8.24	23.98

Conducted Output Power Measurements (802.11a Mode: 5500~5700)

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5500	100	6 Mbps	10.70	23.98
		9 Mbps	10.43	23.98
		12 Mbps	10.41	23.98
		18 Mbps	10.27	23.98
		24 Mbps	10.11	23.98
		36 Mbps	9.83	23.98
		48 Mbps	9.33	23.98
		54 Mbps	9.13	23.98
5580	116	6 Mbps	10.78	23.98
		9 Mbps	10.48	23.98
		12 Mbps	10.50	23.98
		18 Mbps	10.34	23.98
		24 Mbps	10.23	23.98
		36 Mbps	9.95	23.98
		48 Mbps	9.73	23.98
		54 Mbps	9.68	23.98
5700	140	6 Mbps	10.90	23.98
		9 Mbps	10.89	23.98
		12 Mbps	10.87	23.98
		18 Mbps	10.65	23.98
		24 Mbps	10.40	23.98
		36 Mbps	9.95	23.98
		48 Mbps	9.70	23.98
		54 Mbps	9.60	23.98

Conducted Output Power Measurements (802.11n Mode: 5180~5240)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5180	36	6.5 Mbps	10.39	16.99
		13 Mbps	10.11	16.99
		19.5 Mbps	9.93	16.99
		26 Mbps	9.98	16.99
		39 Mbps	9.74	16.99
		52 Mbps	8.85	16.99
		58.5 Mbps	8.79	16.99
		65 Mbps	8.60	16.99
5200	40	6.5 Mbps	10.21	16.99
		13 Mbps	10.19	16.99
		19.5 Mbps	10.06	16.99
		26 Mbps	9.88	16.99
		39 Mbps	9.56	16.99
		52 Mbps	9.24	16.99
		58.5 Mbps	8.81	16.99
		65 Mbps	8.68	16.99
5240	48	6.5 Mbps	10.10	16.99
		13 Mbps	10.03	16.99
		19.5 Mbps	9.69	16.99
		26 Mbps	9.60	16.99
		39 Mbps	9.36	16.99
		52 Mbps	8.99	16.99
		58.5 Mbps	8.82	16.99
		65 Mbps	8.69	16.99

Conducted Output Power Measurements (802.11n Mode: 5260~5320)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5260	52	6.5 Mbps	10.48	23.98
		13 Mbps	10.37	23.98
		19.5 Mbps	10.26	23.98
		26 Mbps	10.09	23.98
		39 Mbps	9.74	23.98
		52 Mbps	9.48	23.98
		58.5 Mbps	9.35	23.98
		65 Mbps	9.06	23.98
5300	60	6.5 Mbps	9.84	23.98
		13 Mbps	9.82	23.98
		19.5 Mbps	9.56	23.98
		26 Mbps	9.35	23.98
		39 Mbps	9.02	23.98
		52 Mbps	8.83	23.98
		58.5 Mbps	8.79	23.98
		65 Mbps	8.67	23.98
5320	64	6.5 Mbps	9.92	23.98
		13 Mbps	9.63	23.98
		19.5 Mbps	9.47	23.98
		26 Mbps	9.26	23.98
		39 Mbps	8.86	23.98
		52 Mbps	8.52	23.98
		58.5 Mbps	8.40	23.98
		65 Mbps	8.35	23.98

Conducted Output Power Measurements (802.11n Mode: 5500~5700)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5500	100	6.5 Mbps	10.65	23.98
		13 Mbps	10.59	23.98
		19.5 Mbps	10.35	23.98
		26 Mbps	10.10	23.98
		39 Mbps	9.85	23.98
		52 Mbps	9.47	23.98
		58.5 Mbps	9.51	23.98
		65 Mbps	9.42	23.98
5580	116	6.5 Mbps	10.83	23.98
		13 Mbps	10.90	23.98
		19.5 Mbps	10.75	23.98
		26 Mbps	10.60	23.98
		39 Mbps	10.16	23.98
		52 Mbps	9.88	23.98
		58.5 Mbps	9.82	23.98
		65 Mbps	9.74	23.98
5700	140	6.5 Mbps	11.05	23.98
		13 Mbps	11.08	23.98
		19.5 Mbps	10.88	23.98
		26 Mbps	10.60	23.98
		39 Mbps	10.21	23.98
		52 Mbps	9.86	23.98
		58.5 Mbps	9.69	23.98
		65 Mbps	9.67	23.98

Conducted Output Power Measurements (802.11n Mode: 5190~5230)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5190	38	13.5 Mbps	9.71	16.99
		27 Mbps	9.58	16.99
		40.5 Mbps	9.40	16.99
		54 Mbps	9.24	16.99
		81 Mbps	8.95	16.99
		108 Mbps	8.74	16.99
		121.5 Mbps	8.64	16.99
		135 Mbps	8.59	16.99
5230	46	13.5 Mbps	9.06	16.99
		27 Mbps	8.94	16.99
		40.5 Mbps	8.75	16.99
		54 Mbps	8.56	16.99
		81 Mbps	8.34	16.99
		108 Mbps	8.11	16.99
		121.5 Mbps	7.93	16.99
		135 Mbps	7.76	16.99

Conducted Output Power Measurements (802.11n Mode: 5270~5310)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5270	54	13.5 Mbps	9.18	23.98
		27 Mbps	8.66	23.98
		40.5 Mbps	8.69	23.98
		54 Mbps	8.26	23.98
		81 Mbps	7.71	23.98
		108 Mbps	7.60	23.98
		121.5 Mbps	7.51	23.98
		135 Mbps	7.41	23.98
5310	62	13.5 Mbps	10.60	23.98
		27 Mbps	9.86	23.98
		40.5 Mbps	9.71	23.98
		54 Mbps	9.57	23.98
		81 Mbps	9.23	23.98
		108 Mbps	9.01	23.98
		121.5 Mbps	8.87	23.98
		135 Mbps	8.83	23.98

Conducted Output Power Measurements (802.11n Mode: 5510~5670)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5510	102	13.5 Mbps	10.37	23.98
		27 Mbps	9.88	23.98
		40.5 Mbps	9.71	23.98
		54 Mbps	9.52	23.98
		81 Mbps	8.69	23.98
		108 Mbps	8.51	23.98
		121.5 Mbps	8.27	23.98
		135 Mbps	8.71	23.98
5550	110	13.5 Mbps	10.77	23.98
		27 Mbps	10.68	23.98
		40.5 Mbps	10.64	23.98
		54 Mbps	10.61	23.98
		81 Mbps	10.35	23.98
		108 Mbps	9.90	23.98
		121.5 Mbps	9.73	23.98
		135 Mbps	9.67	23.98
5670	134	13.5 Mbps	11.08	23.98
		27 Mbps	11.02	23.98
		40.5 Mbps	10.88	23.98
		54 Mbps	10.64	23.98
		81 Mbps	10.40	23.98
		108 Mbps	10.26	23.98
		121.5 Mbps	10.15	23.98
		135 Mbps	10.11	23.98

RESULT PLOTS (5180 MHz ~5240 MHz)

Conducted Output Power (802.11a-CH 36) 6 Mbps



Conducted Output Power (802.11a-CH 36) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 36) 12 Mbps



Conducted Output Power (802.11a-CH 36) 18 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 36) 24 Mbps



Conducted Output Power (802.11a-CH 36) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 36) 48 Mbps



Conducted Output Power (802.11a-CH 36) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 40) 6 Mbps



Conducted Output Power (802.11a-CH 40) 9 Mbps



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Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 40) 12 Mbps



Conducted Output Power (802.11a-CH 40) 18 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 40) 24 Mbps



Conducted Output Power (802.11a-CH 40) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 40) 48 Mbps



Conducted Output Power (802.11a-CH 40) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 48) 6 Mbps



Conducted Output Power (802.11a-CH 48) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 48) 12 Mbps



Conducted Output Power (802.11a-CH 48) 18 Mbps



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Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 48) 24 Mbps



Conducted Output Power (802.11a-CH 48) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 48) 48 Mbps



Conducted Output Power (802.11a-CH 48) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

RESULT PLOTS (5260 MHz ~5320 MHz)

Conducted Output Power (802.11a-CH 52) 6 Mbps



Conducted Output Power (802.11a-CH 52) 9 Mbps



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Conducted Output Power (802.11a-CH 52) 12 Mbps



Conducted Output Power (802.11a-CH 52) 18 Mbps



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Conducted Output Power (802.11a-CH 52) 24 Mbps



Conducted Output Power (802.11a-CH 52) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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Conducted Output Power (802.11a-CH 52) 48 Mbps



Conducted Output Power (802.11a-CH 52) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 60) 6 Mbps



Conducted Output Power (802.11a-CH 60) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 60) 12 Mbps



Conducted Output Power (802.11a-CH 60) 18 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 60) 24 Mbps



Conducted Output Power (802.11a-CH 60) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 60) 48 Mbps



Conducted Output Power (802.11a-CH 60) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 64) 6 Mbps



Conducted Output Power (802.11a-CH 64) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 64) 12 Mbps



Conducted Output Power (802.11a-CH 64) 18 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 64) 24 Mbps



Conducted Output Power (802.11a-CH 64) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 64) 48 Mbps



Conducted Output Power (802.11a-CH 64) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

RESULT PLOTS (5500 MHz ~5700 MHz)

Conducted Output Power (802.11a-CH 100) 6 Mbps



Conducted Output Power (802.11a-CH 100) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 100) 12 Mbps



Conducted Output Power (802.11a-CH 100) 18 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 100) 24 Mbps



Conducted Output Power (802.11a-CH 100) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 100) 48 Mbps



Conducted Output Power (802.11a-CH 100) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 116) 6 Mbps



Conducted Output Power (802.11a-CH 116) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1210R21-3	Date of Issue: October 24, 2012	EUT Type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFL02E

Conducted Output Power (802.11a-CH 116) 12 Mbps



Conducted Output Power (802.11a-CH 116) 18 Mbps



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Conducted Output Power (802.11a-CH 116) 24 Mbps



Conducted Output Power (802.11a-CH 116) 36 Mbps



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Conducted Output Power (802.11a-CH 116) 48 Mbps



Conducted Output Power (802.11a-CH 116) 54 Mbps



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Conducted Output Power (802.11a-CH 140) 6 Mbps



Conducted Output Power (802.11a-CH 140) 9 Mbps



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Conducted Output Power (802.11a-CH 140) 12 Mbps



Conducted Output Power (802.11a-CH 140) 18 Mbps



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Conducted Output Power (802.11a-CH 140) 24 Mbps



Conducted Output Power (802.11a-CH 140) 36 Mbps



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Conducted Output Power (802.11a-CH 140) 48 Mbps



Conducted Output Power (802.11a-CH 140) 54 Mbps



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20 MHz BW

RESULT PLOTS (5180 MHz ~5240 MHz)

Conducted Output Power (802.11n-CH 36) 6.5 Mbps



Conducted Output Power (802.11n-CH 36) 13 Mbps



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Conducted Output Power (802.11n-CH 36) 19.5 Mbps



Conducted Output Power (802.11n-CH 36) 26 Mbps



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Conducted Output Power (802.11n-CH 36) 39 Mbps



Conducted Output Power (802.11n-CH 36) 52 Mbps



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Conducted Output Power (802.11n-CH 36) 58.5 Mbps



Conducted Output Power (802.11n-CH 36) 65 Mbps



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Conducted Output Power (802.11n-CH 40) 6.5 Mbps



Conducted Output Power (802.11n-CH 40) 13 Mbps



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Conducted Output Power (802.11n-CH 40) 19.5 Mbps



Conducted Output Power (802.11n-CH 40) 26 Mbps



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Conducted Output Power (802.11n-CH 40) 39 Mbps



Conducted Output Power (802.11n-CH 40) 52 Mbps



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Conducted Output Power (802.11n-CH 40) 58.5 Mbps



Conducted Output Power (802.11n-CH 40) 65 Mbps



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Conducted Output Power (802.11n-CH 48) 6.5 Mbps



Conducted Output Power (802.11n-CH 48) 13 Mbps



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Conducted Output Power (802.11n-CH 48) 19.5 Mbps



Conducted Output Power (802.11n-CH 48) 26 Mbps



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Conducted Output Power (802.11n-CH 48) 39 Mbps



Conducted Output Power (802.11n-CH 48) 52 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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Conducted Output Power (802.11n-CH 48) 58.5 Mbps



Conducted Output Power (802.11n-CH 48) 65 Mbps



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