



HCT CO., LTD.

CERTIFICATE OF COMPLIANCE FCC Certification

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: August 01, 2013
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.: HCTR1308FR04
	HCT FRN: 0005866421

FCC ID : ZNFD605

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

FCC Model(s): LG-D605

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

Max. RF Output Power: Wi-Fi 802.11a (5180~5240) (11.41 dBm)/ Wi-Fi 802.11a (5260~5320) (11.77 dBm)/
Wi-Fi 802.11a (5500~5700) (10.70 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (10.49 dBm)/
Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.89 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(9.71 dBm)/
Wi-Fi 802.11n_40 MHz BW(5190~5230) (11.15 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (11.49 dBm)/
Wi-Fi 802.11n_40 MHz BW (5510~5670) (10.14 dBm)dBm)

Frequency Range: 20 MHz BW: 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/
5500 MHz - 5700 MHz (UNII 2e)
40 MHz BW: 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/
5510 MHz - 5670 MHz (UNII 2e)

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
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Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

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FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		www.hct.co.kr
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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1308FR04	August 01, 2013	- First Approval Report

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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: ZNFD605
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)
Model name(s): LG-D605
Date(s) of Tests: June 20, 2013 ~ July 22, 2013
Place of Tests: HCT Co., Ltd.
 105-1, Jangam-ri , Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA.
 (IC Recognition No. : 5944A-3)

2. EUT DESCRIPTION

EUT Type	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	
FCC Model Name	LG-D605	
Power Supply	DC 3.8 V	
Frequency Range	TX_20 MHz BW: 40 MHz BW: RX_20 MHz BW: 40 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) where) Not supported 5600 MHz – 5640 MHz 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 2e) where) Not supported 5590 MHz – 5630 MHz 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) where) Not supported 5600 MHz – 5640 MHz 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 2e) where) Not supported 5590 MHz – 5630 MHz
Max. RF Output Power:	Wi-Fi 802.11a (5180~5240) (11.41 dBm)/ Wi-Fi 802.11a (5260~5320) (11.77 dBm)/ Wi-Fi 802.11a (5500~5700) (10.70 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (10.49 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.89 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(9.71 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (11.15 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (11.49 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (10.14 dBm)dBm)	
Modulation Type	OFDM(802.11a, 802.11n_20 MHz, 802.11n_40 MHz)	
Antenna Specification	Manufacturer: KOMATECH Co., Ltd Antenna type: PIFA Antenna Peak Gain : 2.25 dBi	

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3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D01 General UNII Test Procedures v01r03 dated April 08, 2013 entitled “ Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) – 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 15.407 under the FCC Rules Part 15 Subpart E.

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 8.1 to 8.4.(KDB 789033)

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."

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) dBm (5150-5250 MHz) < 11+10 log ₁₀ (BW) dBm (5250-5350 MHz) < 11+10 log ₁₀ (BW) dBm (5470-5725 MHz)		PASS
Peak Power Spectral Density	§15.407(a)(1), (5)	<4 dBm/ MHz (5150-5250) <11 dBm/ MHz (5250-5350) <11 dBm/ MHz (5470-5725)		PASS
Peak Excursion	§15.407(a)(6)	<13 dB/ MHz maximum difference		PASS
Frequency Stability	§15.407(g)	NA		PASS
Undesirable Emissions	§15.407(b)(1), (2), (3)	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)		RADIATED
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	<FCC 15.207 limits	LINE CONDUCTED	PASS

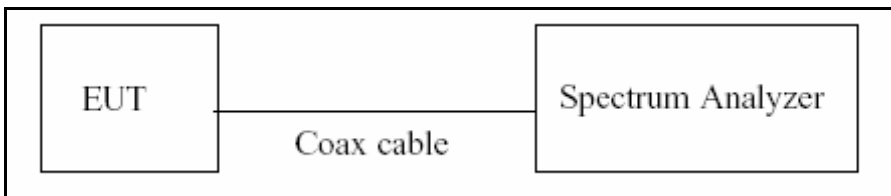
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8. TEST RESULT

8.1 DUTY CYCLE

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 $RBW \geq EBW$ 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 $> 50/T$, where T is defined in section B)1)a), 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 according to the zero-span measurement method, B)2) in KDB 789033(issued 04/08/2013)

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 (\geq RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/T_{total} and Duty Cycle Factor = $10 \cdot \log(1/\text{Duty Cycle})$

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Duty Cycle Factor

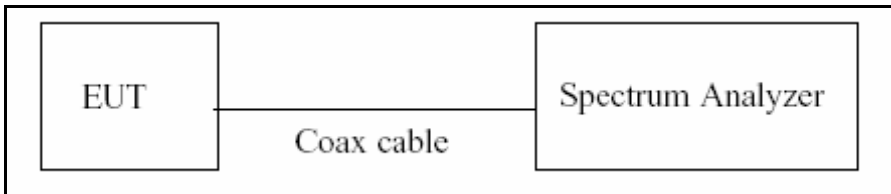
Mode	Data Rate	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor
802.11a Mode	6	2.070	2.167	0.95523766	0.199
	9	1.387	1.488	0.93212366	0.305
	12	1.042	1.143	0.91163605	0.402
	18	0.702	0.803	0.87395691	0.585
	24	0.533	0.632	0.84298829	0.742
	36	0.366	0.466	0.78617432	1.045
	48	0.277	0.377	0.73435843	1.341
	54	0.249	0.349	0.71334290	1.467
802.11n Mode 20 MHz BW	6.5	1.919	2.017	0.95141299	0.216
	13	0.977	1.079	0.90574606	0.430
	19.5	0.665	0.766	0.86790236	0.615
	26	0.508	0.607	0.83662714	0.775
	39	0.352	0.452	0.77981854	1.080
	52	0.273	0.373	0.73129525	1.359
	58.5	0.248	0.349	0.71104735	1.481
	65	0.228	0.329	0.69345510	1.590
802.11n Mode 40 MHz BW	13.5	0.943	1.043	0.90450623	0.436
	27	0.493	0.590	0.83553523	0.780
	40.5	0.342	0.440	0.77707006	1.095
	54	0.263	0.361	0.72840532	1.376
	81	0.188	0.286	0.65618449	1.830
	108	0.153	0.250	0.60991207	2.147
	121.5	0.141	0.239	0.58909853	2.298
	135	0.128	0.226	0.56637168	2.469

8.2 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(issued 04/08/2013), 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(Page 3 in KDB 789033, issued 04/08/2013)

9. RBW = approximately 1 % of the emission bandwidth
10. VBW > RBW
11. Detector = Peak
12. Trace mode = max hold
13. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

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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	22.57	N/A	Pass
5200	40	22.39	N/A	Pass
5240	48	22.83	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	23.06	N/A	Pass
5300	60	22.37	N/A	Pass
5320	64	22.52	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	22.47	N/A	Pass
5580	116	22.42	N/A	Pass
5700	140	22.43	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	23.14	N/A	Pass
5200	40	23.14	N/A	Pass
5240	48	23.41	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	23.13	N/A	Pass
5300	60	23.23	N/A	Pass
5320	64	22.30	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	23.07	N/A	Pass
5580	116	23.55	N/A	Pass
5700	140	23.09	N/A	Pass

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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	49.49	N/A	Pass
5230	46	48.84	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	49.76	N/A	Pass
5310	62	49.48	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	49.55	N/A	Pass
5550	110	49.17	N/A	Pass
5670	134	49.00	N/A	Pass

RESULT PLOTS

26 dB Bandwidth plot (802.11a-CH 36)

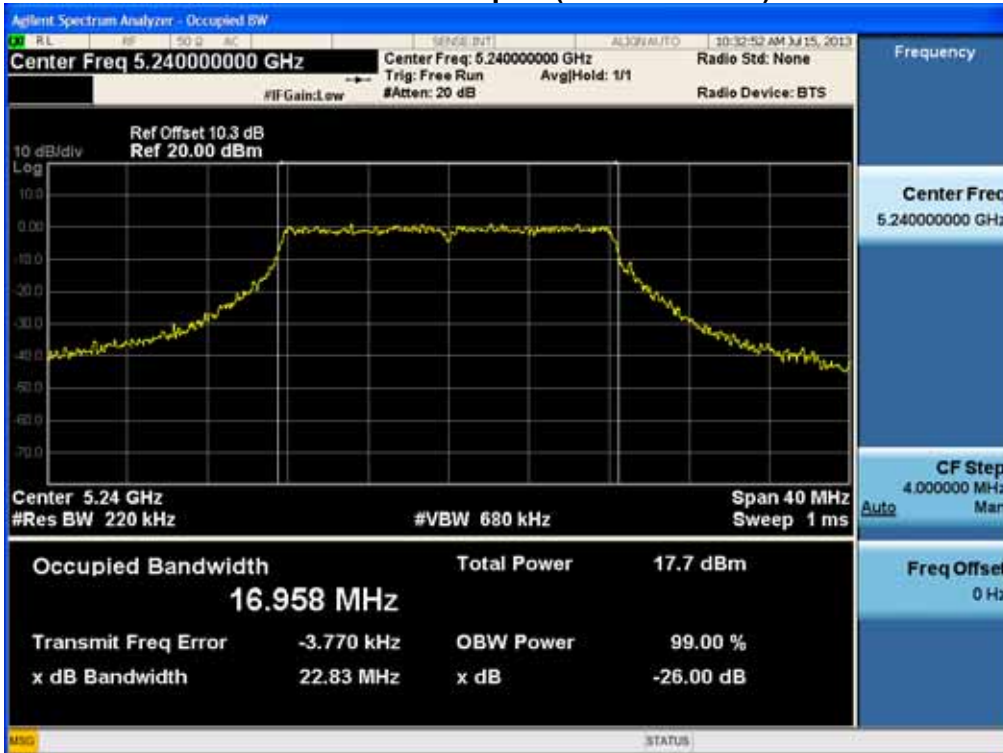


26 dB Bandwidth plot (802.11a-CH 40)

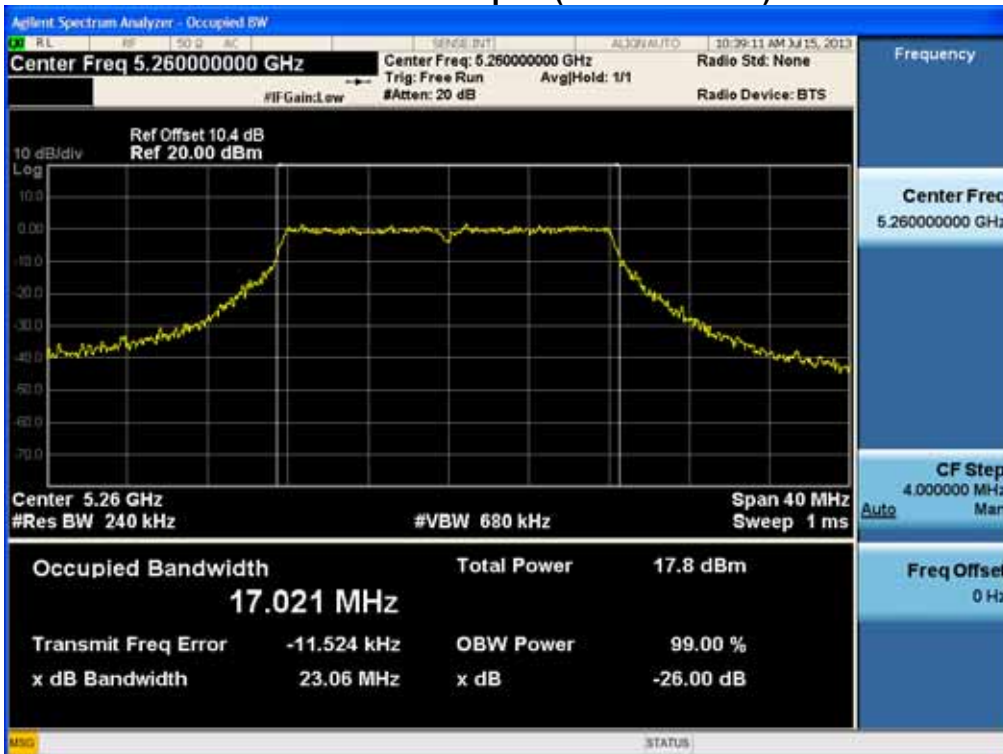


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26 dB Bandwidth plot (802.11a-CH 48)

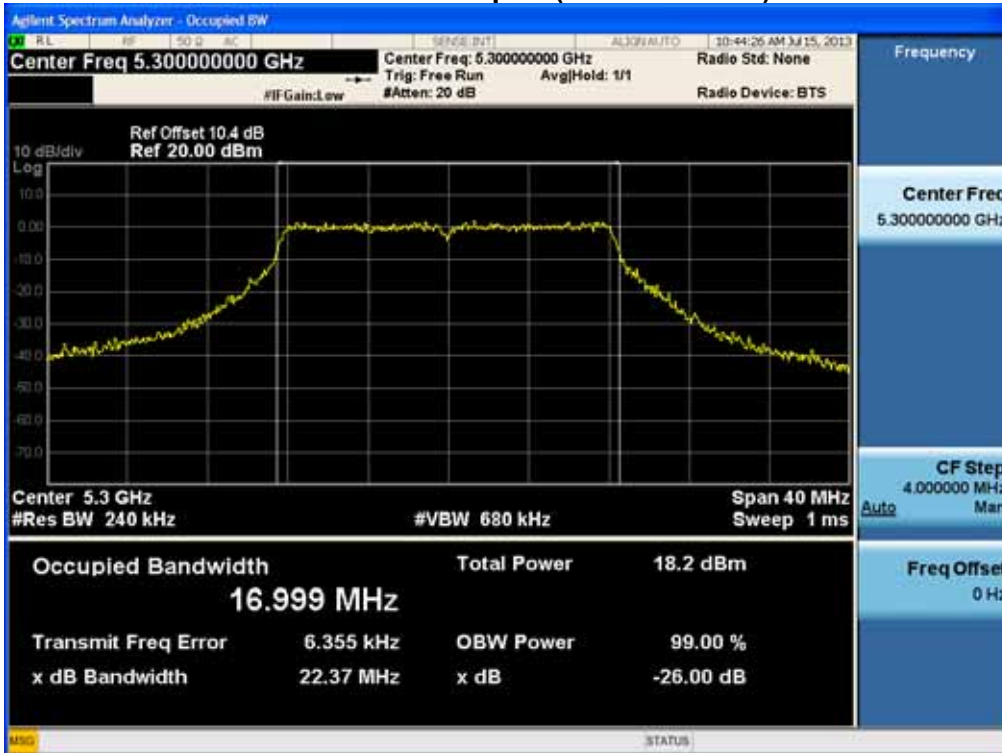


26 dB Bandwidth plot (802.11a-CH 52)



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26 dB Bandwidth plot (802.11a-CH 60)

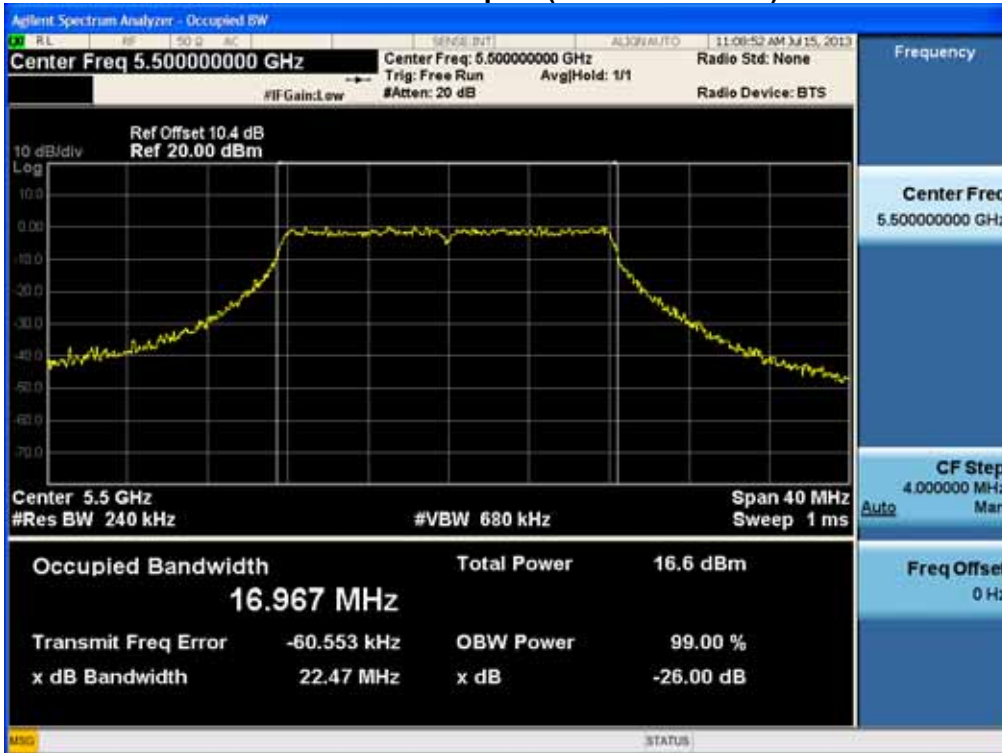


26 dB Bandwidth plot (802.11a-CH 64)

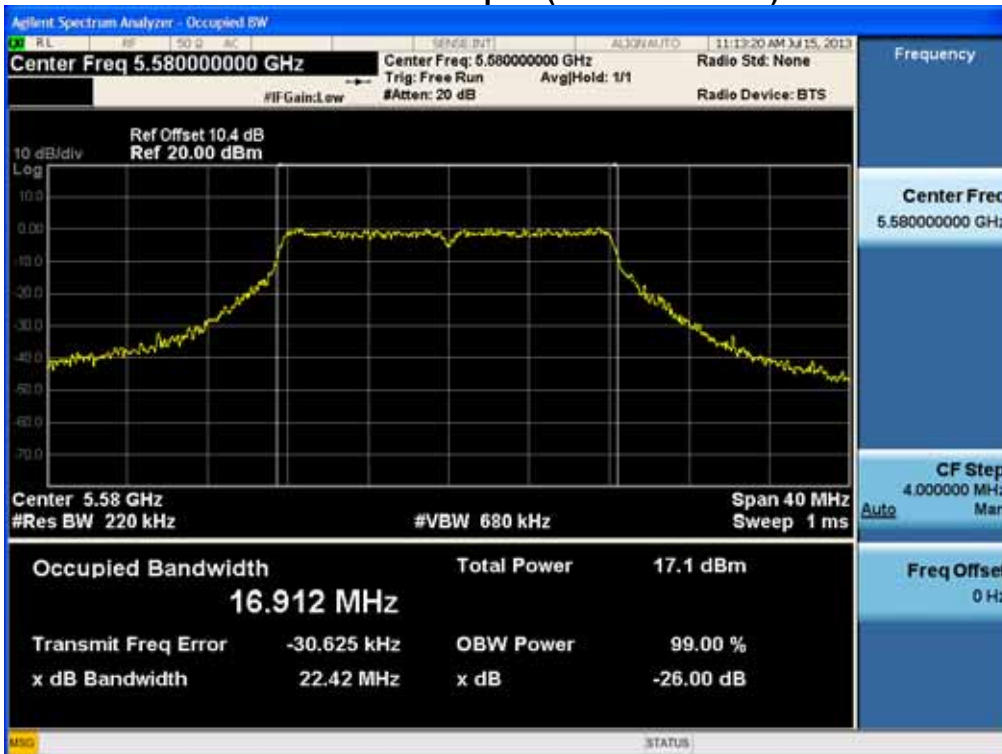


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26 dB Bandwidth plot (802.11a-CH 100)

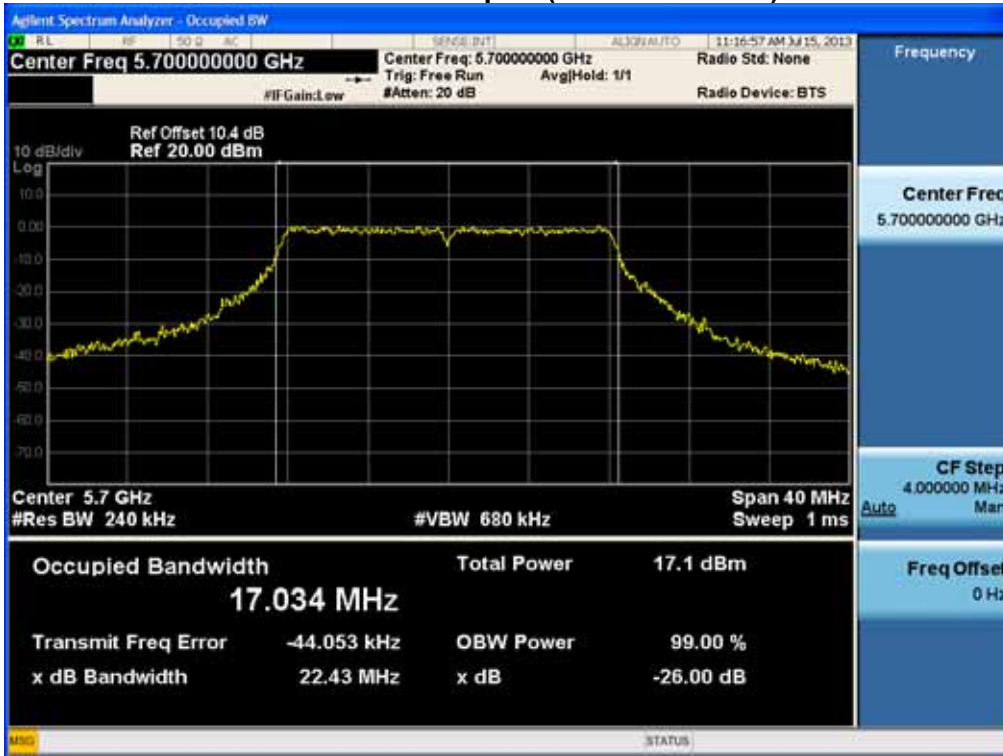


26 dB Bandwidth plot (802.11a-CH 116)



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26 dB Bandwidth plot (802.11a-CH 140)



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26 dB Bandwidth plot (802.11n-CH 36)

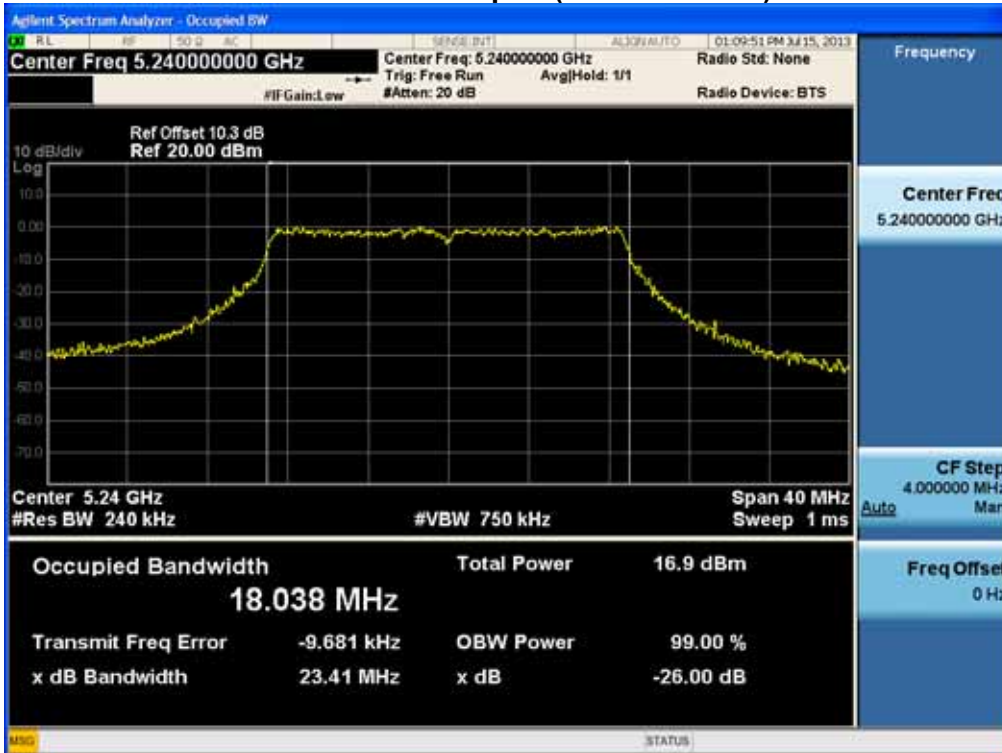


26 dB Bandwidth plot (802.11n-CH 40)



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26 dB Bandwidth plot (802.11n-CH 48)

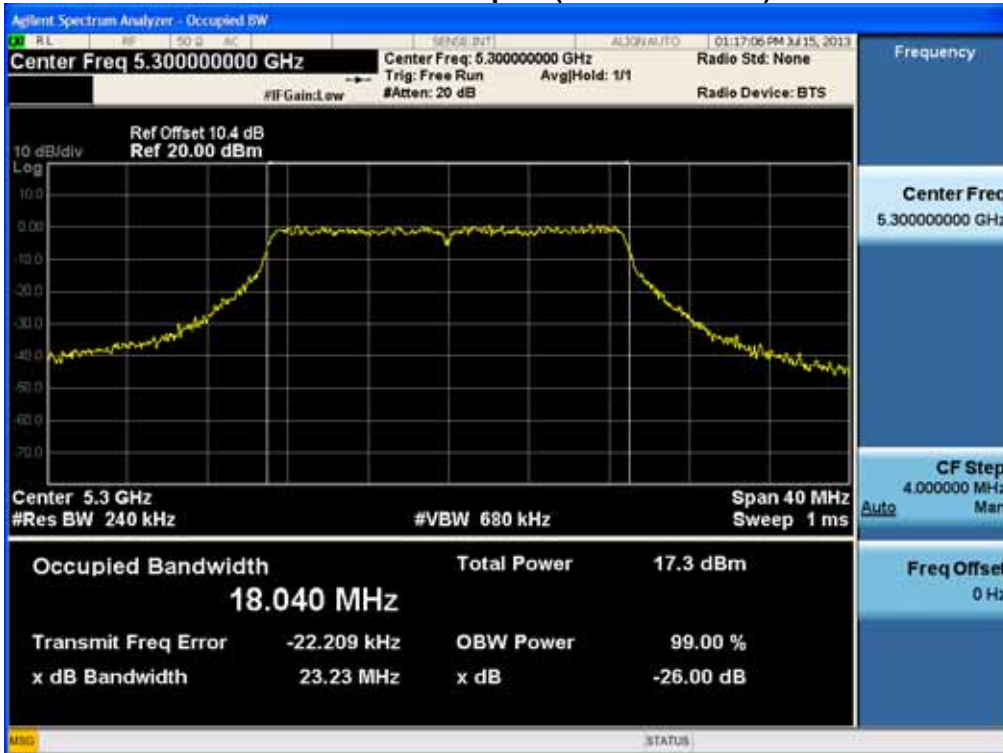


26 dB Bandwidth plot (802.11n-CH 52)

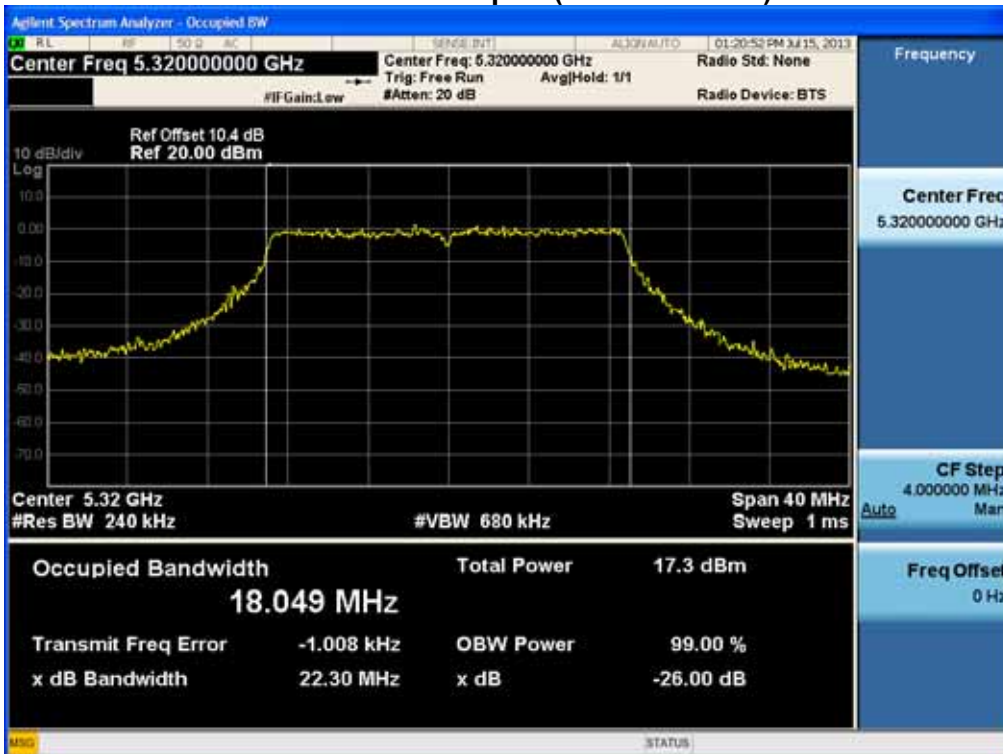


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26 dB Bandwidth plot (802.11n-CH 60)



26 dB Bandwidth plot (802.11n-CH 64)



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26 dB Bandwidth plot (802.11n-CH 100)

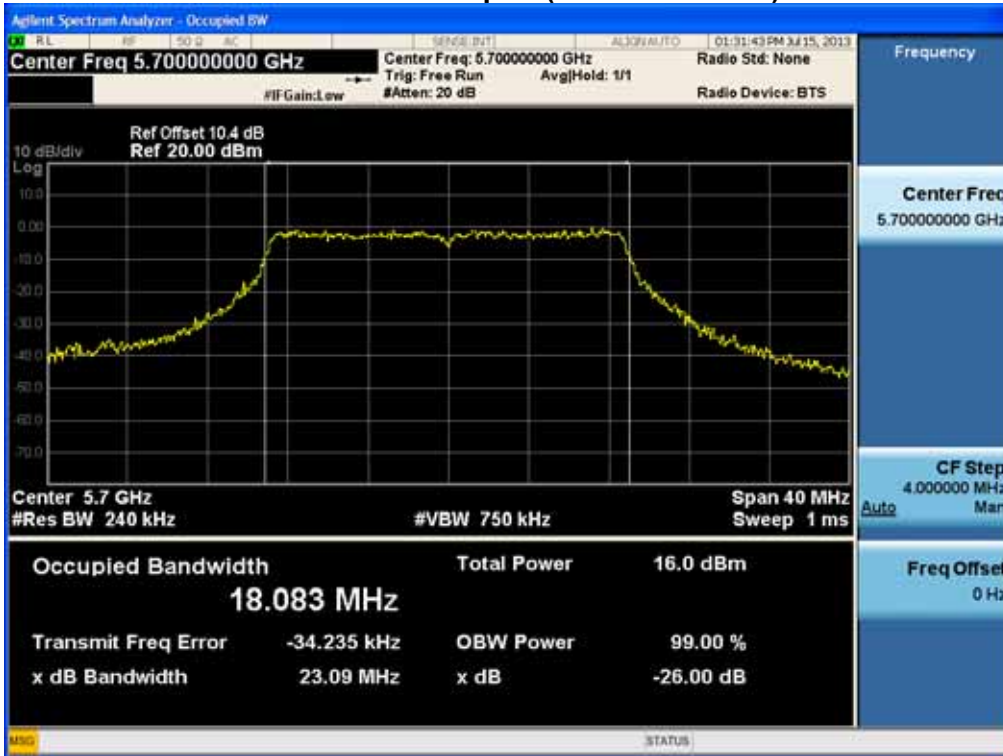


26 dB Bandwidth plot (802.11n-CH 116)



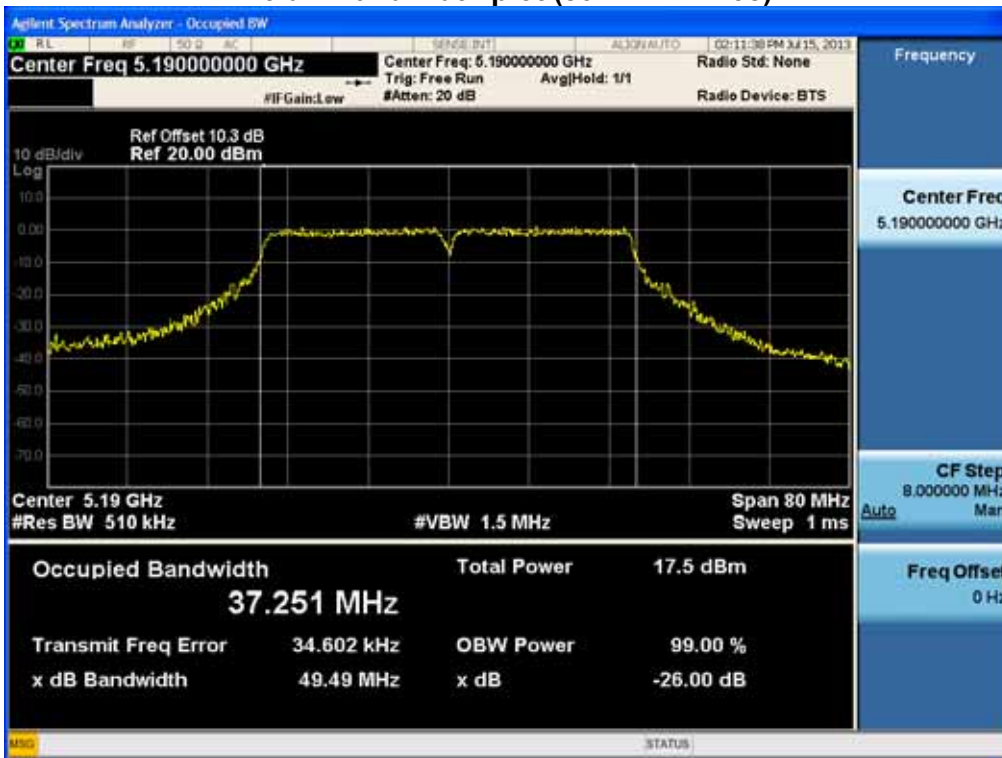
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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26 dB Bandwidth plot (802.11n-CH 140)



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26 dB Bandwidth plot (802.11n-CH 38)

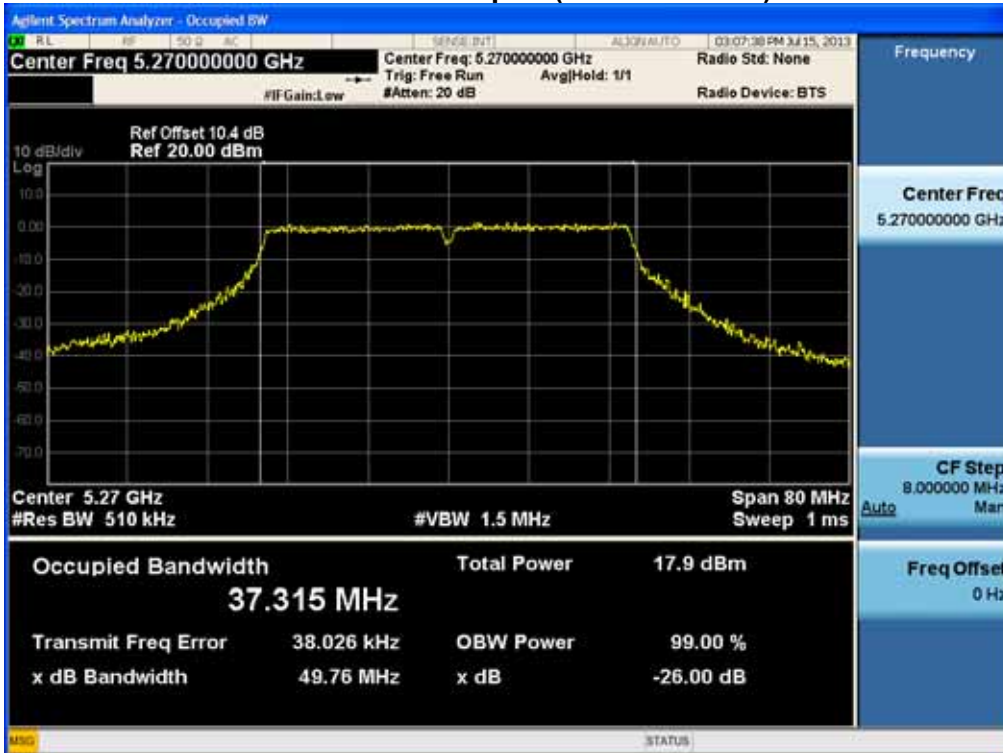


26 dB Bandwidth plot (802.11n-CH 46)



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26 dB Bandwidth plot (802.11n-CH 54)

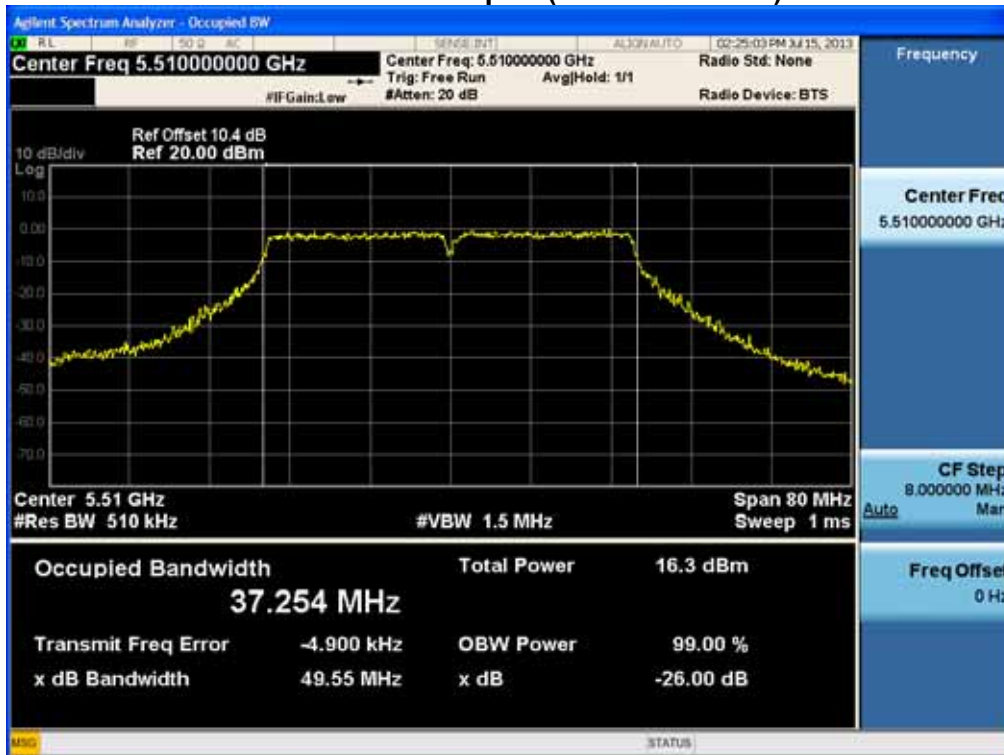


26 dB Bandwidth plot (802.11n-CH 62)



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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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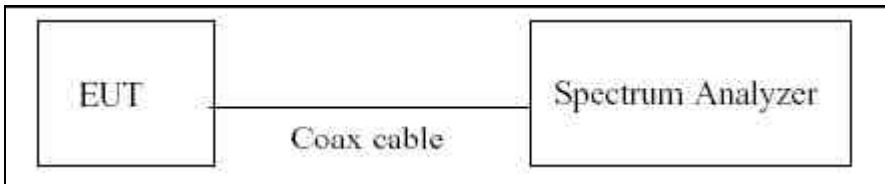
8.3 OUTPUT POWER MEASUREMENT

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_UNII-1_20 MHz BW = 16.99 dBm
- 802.11n_UNII-1_40 MHz BW = 16.99 dBm
- 802.11a_UNII-2 = 23.98 dBm
- 802.11n_UNII-2_20 MHz BW = 23.98dBm
- 802.11n_UNII-2_40 MHz BW = 23.98 dBm
- 802.11a_UNII-2e = 23.98dBm
- 802.11n_UNII-2e_20 MHz BW = 23.98 dBm
- 802.11n_UNII-2e_40 MHz BW = 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-2 in KDB 789033(issued 04/08/2013).

The Spectrum Analyzer is set to

- Average Power
 1. Measure the duty cycle.
 2. Set span to encompass the 26 dB EBW of the signal.
 3. RBW = 1 MHz.
 4. VBW ≥ 3 MHz.
 5. Number of points in sweep ≥ $2 * \text{span} / \text{RBW}$.

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6. Sweep time = auto.
7. Detector = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. 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.

Sample Calculation

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Output Power = 10 dBm + 10 dB + 0.8 dB + 0.21 dB = 21.01 dBm

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	10.30
	5190	10.29
	5200	10.28
	5230	10.29
	5240	10.34
UNII 2	5260	10.37
	5270	10.38
	5300	10.40
	5310	10.39
	5320	10.39
UNII 2e	5500	10.35
	5510	10.36
	5550	10.41
	5580	10.43
	5670	10.43

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

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TEST RESULTS

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6	10.90	0.199	11.10	16.99
		9	10.73	0.305	11.04	16.99
		12	10.61	0.402	11.01	16.99
		18	10.52	0.585	11.11	16.99
		24	10.21	0.742	10.96	16.99
		36	9.89	1.045	10.94	16.99
		48	9.61	1.341	10.96	16.99
		54	9.45	1.467	10.91	16.99
5200	40	6	10.92	0.199	11.12	16.99
		9	10.76	0.305	11.07	16.99
		12	10.65	0.402	11.05	16.99
		18	10.49	0.585	11.08	16.99
		24	10.29	0.742	11.03	16.99
		36	9.92	1.045	10.97	16.99
		48	9.59	1.341	10.93	16.99
		54	9.46	1.467	10.93	16.99
5240	48	6	11.14	0.199	11.34	16.99
		9	11.11	0.305	11.41	16.99
		12	10.91	0.402	11.32	16.99
		18	10.79	0.585	11.38	16.99
		24	10.57	0.742	11.32	16.99
		36	10.19	1.045	11.23	16.99
		48	9.89	1.341	11.23	16.99
		54	9.74	1.467	11.21	16.99

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6	11.35	0.199	11.54	23.98
		9	11.22	0.305	11.53	23.98
		12	11.08	0.402	11.48	23.98
		18	10.88	0.585	11.47	23.98
		24	10.71	0.742	11.45	23.98
		36	10.37	1.045	11.42	23.98
		48	10.08	1.341	11.42	23.98
		54	9.94	1.467	11.40	23.98
5300	60	6	11.57	0.199	11.77	23.98
		9	11.40	0.305	11.70	23.98
		12	11.29	0.402	11.69	23.98
		18	11.04	0.585	11.63	23.98
		24	10.91	0.742	11.65	23.98
		36	10.52	1.045	11.56	23.98
		48	10.27	1.341	11.61	23.98
		54	10.07	1.467	11.54	23.98
5320	64	6	11.53	0.199	11.73	23.98
		9	11.40	0.305	11.71	23.98
		12	11.32	0.402	11.72	23.98
		18	11.01	0.585	11.59	23.98
		24	10.97	0.742	11.71	23.98
		36	10.56	1.045	11.60	23.98
		48	10.19	1.341	11.53	23.98
		54	10.13	1.467	11.60	23.98

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6	10.01	0.199	10.21	23.98
		9	9.90	0.305	10.20	23.98
		12	9.79	0.402	10.19	23.98
		18	9.50	0.585	10.08	23.98
		24	9.39	0.742	10.14	23.98
		36	9.00	1.045	10.05	23.98
		48	8.73	1.341	10.07	23.98
		54	8.56	1.467	10.02	23.98
5580	116	6	10.50	0.199	10.70	23.98
		9	10.32	0.305	10.63	23.98
		12	10.22	0.402	10.63	23.98
		18	10.10	0.585	10.68	23.98
		24	9.82	0.742	10.56	23.98
		36	9.47	1.045	10.51	23.98
		48	9.22	1.341	10.56	23.98
		54	9.01	1.467	10.47	23.98
5700	140	6	10.43	0.199	10.63	23.98
		9	10.33	0.305	10.63	23.98
		12	10.21	0.402	10.61	23.98
		18	9.99	0.585	10.57	23.98
		24	9.90	0.742	10.64	23.98
		36	9.58	1.045	10.63	23.98
		48	9.21	1.341	10.56	23.98
		54	9.13	1.467	10.59	23.98

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20 MHz BW

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6.5	9.95	0.216	10.17	16.99
		13	9.64	0.430	10.07	16.99
		19.5	9.42	0.615	10.03	16.99
		26	9.22	0.775	9.99	16.99
		39	8.87	1.080	9.95	16.99
		52	8.61	1.359	9.97	16.99
		58.5	8.42	1.481	9.90	16.99
		65	8.31	1.590	9.90	16.99
5200	40	6.5	10.00	0.216	10.22	16.99
		13	9.71	0.430	10.14	16.99
		19.5	9.52	0.615	10.14	16.99
		26	9.30	0.775	10.07	16.99
		39	8.97	1.080	10.05	16.99
		52	8.68	1.359	10.04	16.99
		58.5	8.53	1.481	10.01	16.99
		65	8.26	1.590	9.85	16.99
5240	48	6.5	10.27	0.216	10.49	16.99
		13	10.01	0.430	10.44	16.99
		19.5	9.80	0.615	10.41	16.99
		26	9.61	0.775	10.39	16.99
		39	9.29	1.080	10.37	16.99
		52	8.93	1.359	10.29	16.99
		58.5	8.74	1.481	10.22	16.99
		65	8.62	1.590	10.21	16.99

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6.5	10.43	0.216	10.65	23.98
		13	10.20	0.430	10.63	23.98
		19.5	10.01	0.615	10.63	23.98
		26	9.79	0.775	10.56	23.98
		39	9.42	1.080	10.50	23.98
		52	9.19	1.359	10.55	23.98
		58.5	9.14	1.481	10.62	23.98
		65	8.86	1.590	10.45	23.98
5300	60	6.5	10.60	0.216	10.82	23.98
		13	10.40	0.430	10.83	23.98
		19.5	10.22	0.615	10.83	23.98
		26	9.98	0.775	10.75	23.98
		39	9.67	1.080	10.75	23.98
		52	9.36	1.359	10.72	23.98
		58.5	9.12	1.481	10.60	23.98
		65	9.12	1.590	10.71	23.98
5320	64	6.5	10.67	0.216	10.89	23.98
		13	10.44	0.430	10.87	23.98
		19.5	10.28	0.615	10.89	23.98
		26	10.09	0.775	10.86	23.98
		39	9.70	1.080	10.78	23.98
		52	9.43	1.359	10.79	23.98
		58.5	9.35	1.481	10.83	23.98
		65	9.26	1.590	10.85	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6.5	9.12	0.216	9.33	23.98
		13	8.79	0.430	9.22	23.98
		19.5	8.60	0.615	9.21	23.98
		26	8.40	0.775	9.17	23.98
		39	8.05	1.080	9.13	23.98
		52	7.77	1.359	9.13	23.98
		58.5	7.54	1.481	9.02	23.98
		65	7.56	1.590	9.15	23.98
5580	116	6.5	9.49	0.216	9.71	23.98
		13	9.27	0.430	9.70	23.98
		19.5	9.06	0.615	9.67	23.98
		26	8.88	0.775	9.65	23.98
		39	8.56	1.080	9.64	23.98
		52	8.24	1.359	9.60	23.98
		58.5	8.13	1.481	9.61	23.98
		65	7.87	1.590	9.46	23.98
5700	140	6.5	9.37	0.216	9.59	23.98
		13	9.14	0.430	9.57	23.98
		19.5	9.00	0.615	9.61	23.98
		26	8.78	0.775	9.56	23.98
		39	8.46	1.080	9.54	23.98
		52	8.10	1.359	9.46	23.98
		58.5	7.98	1.481	9.46	23.98
		65	7.83	1.590	9.42	23.98

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40 MHz BW

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.5	10.59	0.436	11.03	16.99
		27	10.12	0.780	10.90	16.99
		40.5	9.79	1.095	10.88	16.99
		54	9.46	1.376	10.83	16.99
		81	8.91	1.830	10.74	16.99
		108	8.55	2.147	10.70	16.99
		121.5	8.34	2.298	10.64	16.99
		135	8.22	2.469	10.69	16.99
5230	46	13.5	10.71	0.436	11.15	16.99
		27	10.34	0.780	11.12	16.99
		40.5	9.94	1.095	11.04	16.99
		54	9.62	1.376	10.99	16.99
		81	9.13	1.830	10.96	16.99
		108	8.70	2.147	10.84	16.99
		121.5	8.58	2.298	10.88	16.99
		135	8.36	2.469	10.82	16.99

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5270	54	13.5	10.95	0.436	11.39	23.98
		27	10.55	0.780	11.33	23.98
		40.5	10.16	1.095	11.26	23.98
		54	9.79	1.376	11.16	23.98
		81	9.25	1.830	11.08	23.98
		108	8.93	2.147	11.07	23.98
		121.5	8.83	2.298	11.13	23.98
		135	8.61	2.469	11.08	23.98
5310	62	13.5	11.04	0.436	11.47	23.98
		27	10.71	0.780	11.49	23.98
		40.5	10.28	1.095	11.37	23.98
		54	9.98	1.376	11.36	23.98
		81	9.46	1.830	11.29	23.98
		108	9.01	2.147	11.16	23.98
		121.5	8.95	2.298	11.25	23.98
		135	8.68	2.469	11.15	23.98

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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

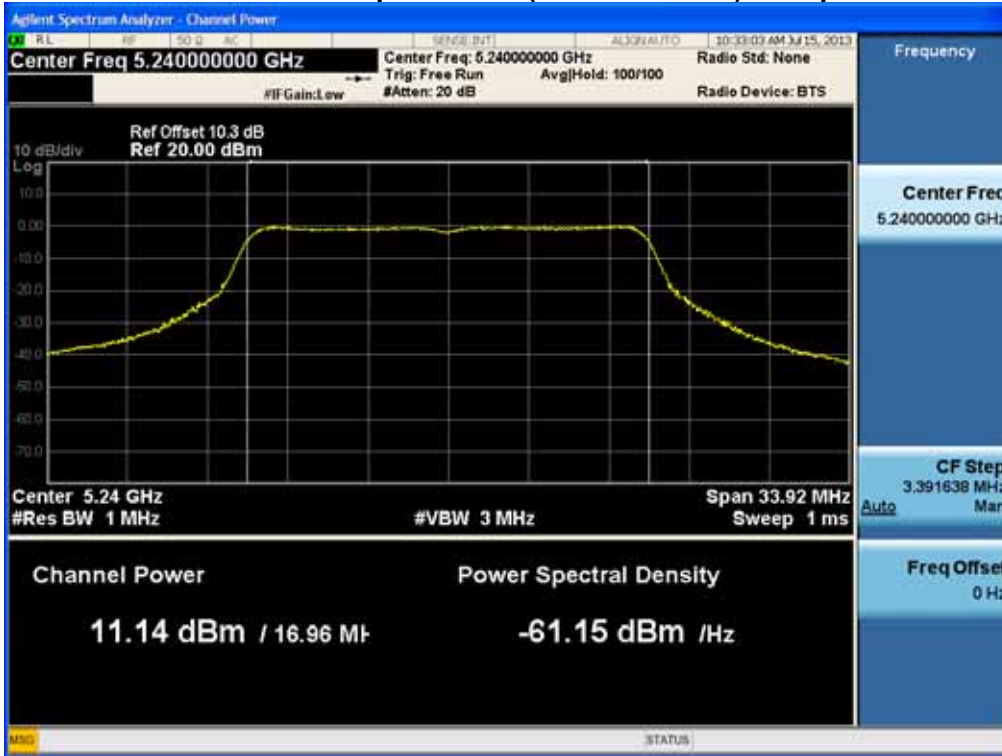
802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5510	102	13.5	9.35	0.436	9.79	23.98
		27	8.99	0.780	9.77	23.98
		40.5	8.55	1.095	9.65	23.98
		54	8.25	1.376	9.63	23.98
		81	7.78	1.830	9.61	23.98
		108	7.37	2.147	9.51	23.98
		121.5	7.16	2.298	9.46	23.98
		135	6.98	2.469	9.45	23.98
5550	110	13.5	9.70	0.436	10.14	23.98
		27	9.21	0.780	9.99	23.98
		40.5	8.90	1.095	9.99	23.98
		54	8.61	1.376	9.99	23.98
		81	8.01	1.830	9.84	23.98
		108	7.63	2.147	9.78	23.98
		121.5	7.52	2.298	9.82	23.98
		135	7.32	2.469	9.79	23.98
5670	134	13.5	9.66	0.436	10.10	23.98
		27	9.28	0.780	10.06	23.98
		40.5	8.82	1.095	9.91	23.98
		54	8.58	1.376	9.96	23.98
		81	8.12	1.830	9.95	23.98
		108	7.62	2.147	9.76	23.98
		121.5	7.49	2.298	9.79	23.98
		135	7.24	2.469	9.71	23.98

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

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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RESULT PLOTS (5180 MHz ~5240 MHz)

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. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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

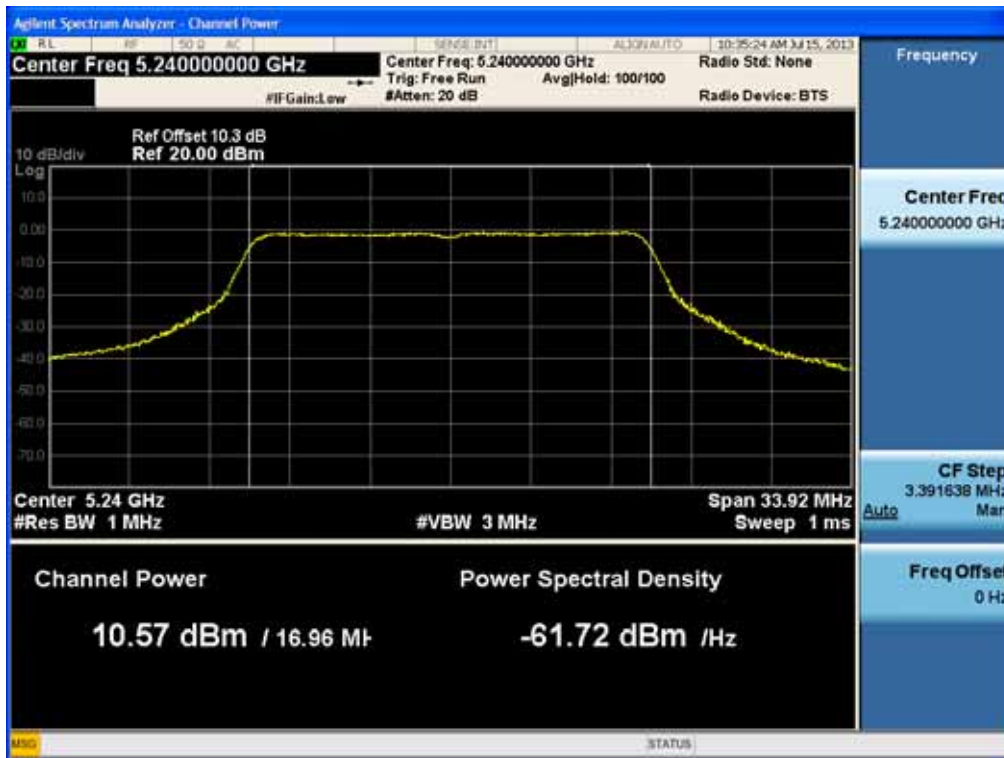


Conducted Output Power (802.11a-CH 48) 18 Mbps

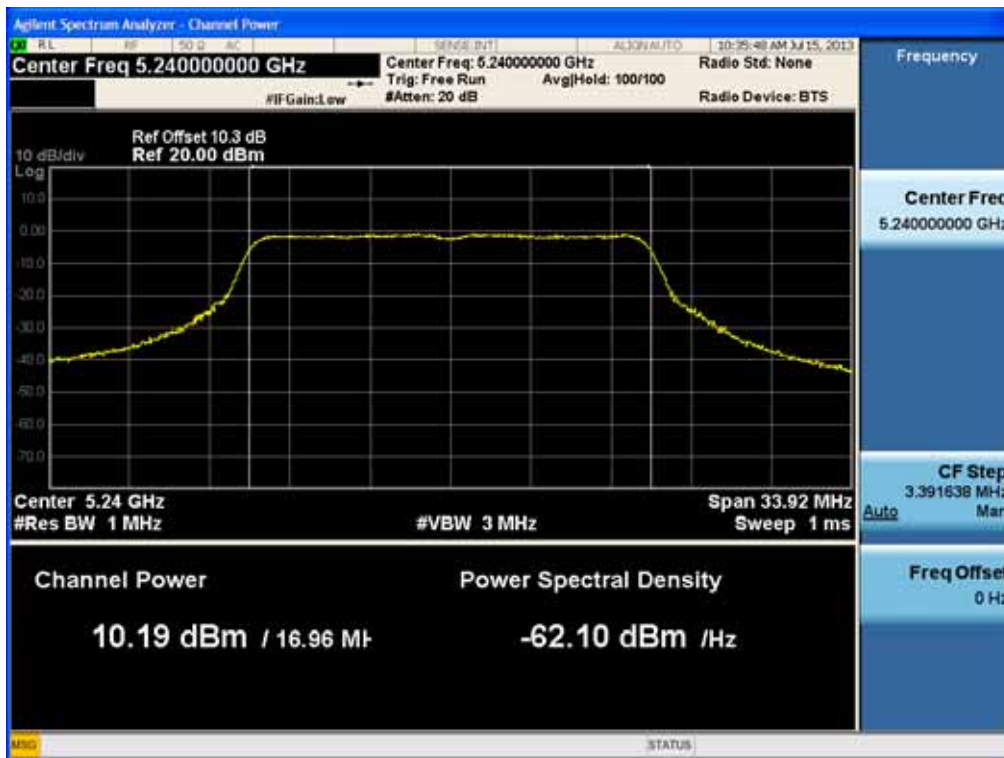


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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

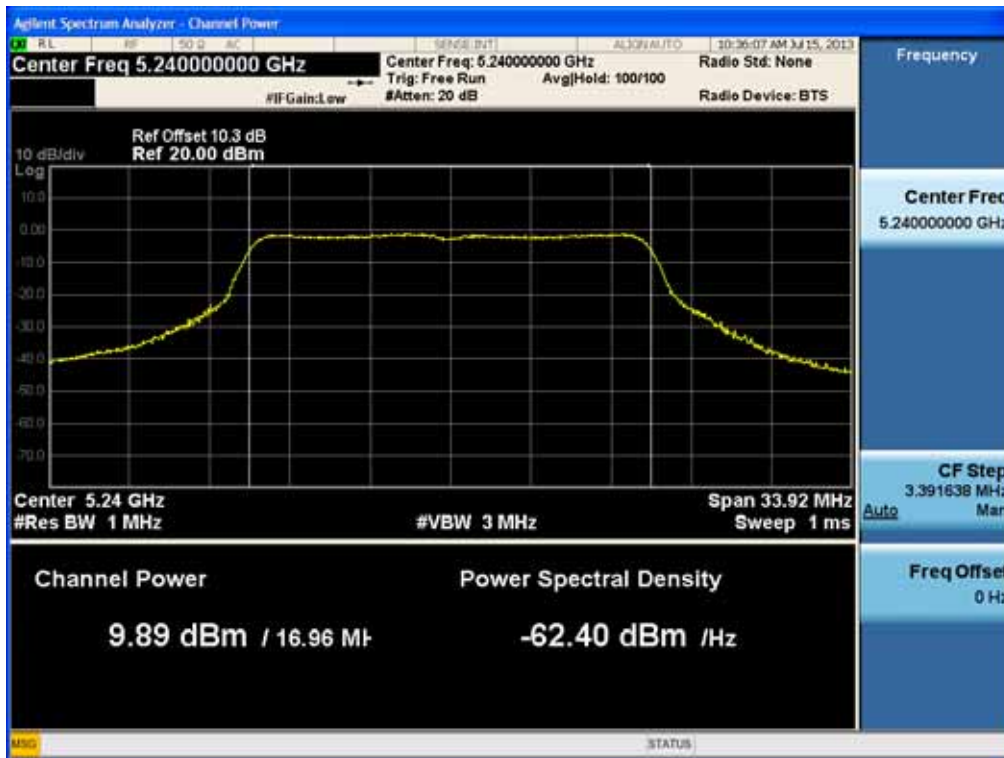


Conducted Output Power (802.11a-CH 48) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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



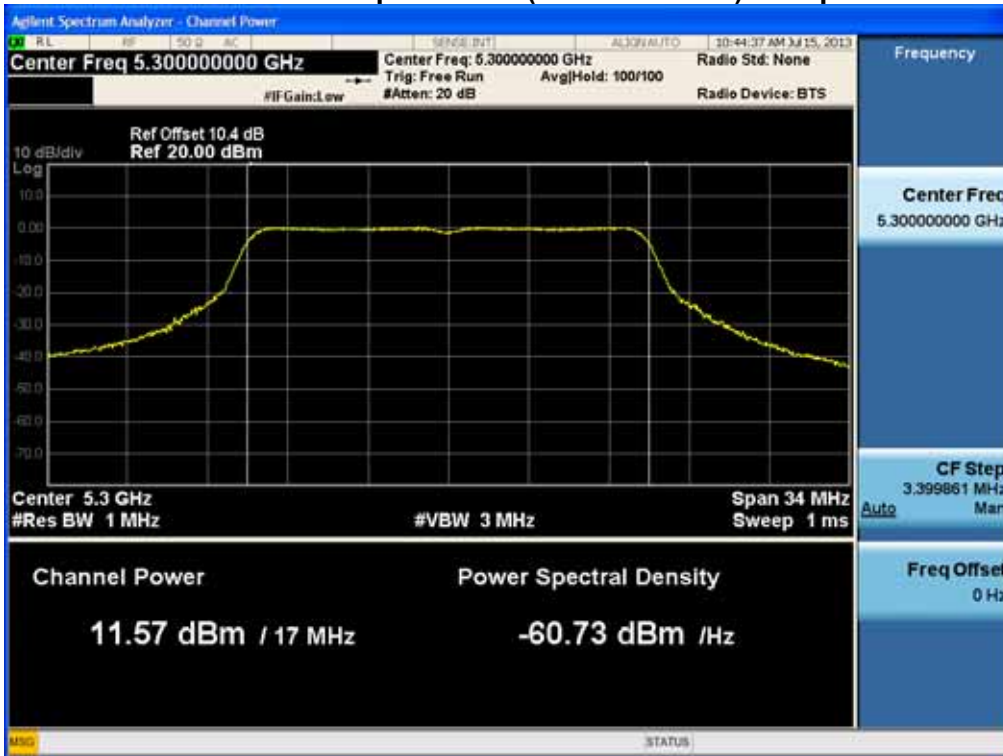
Conducted Output Power (802.11a-CH 48) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

RESULT PLOTS (5260 MHz ~5320 MHz)

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

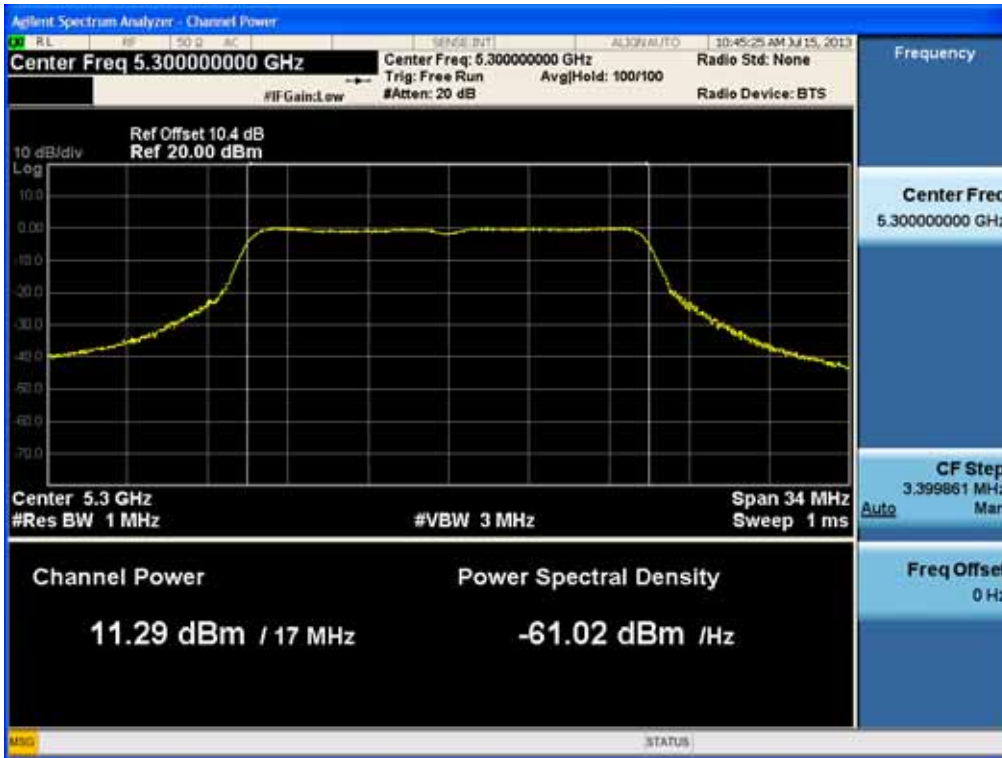


Conducted Output Power (802.11a-CH 60) 9 Mbps

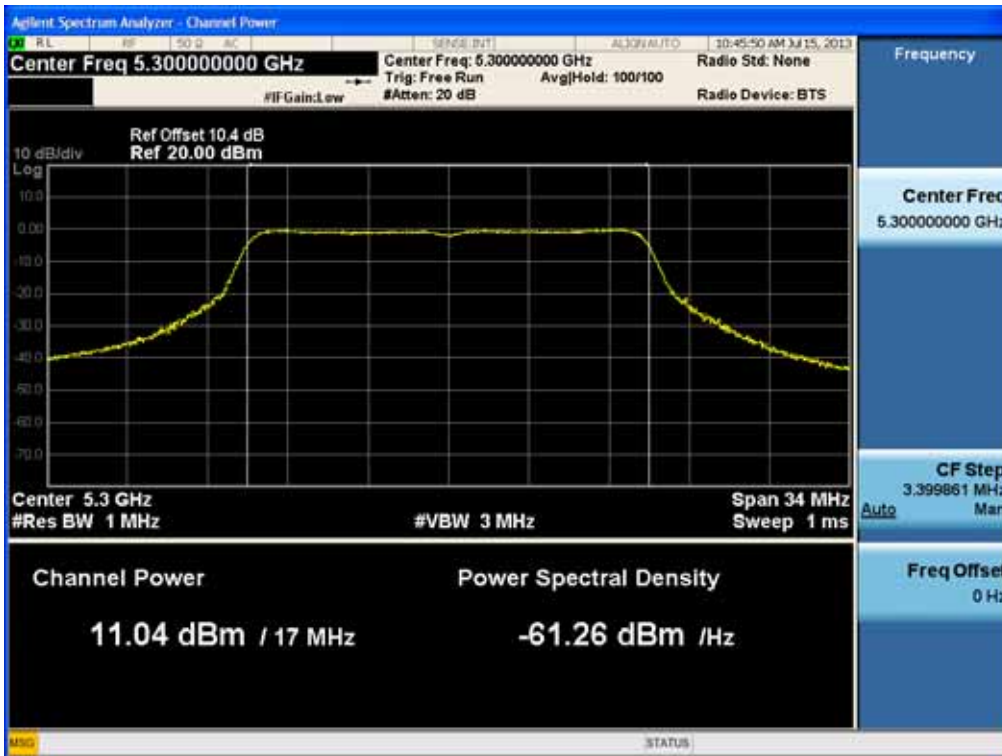


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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



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



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



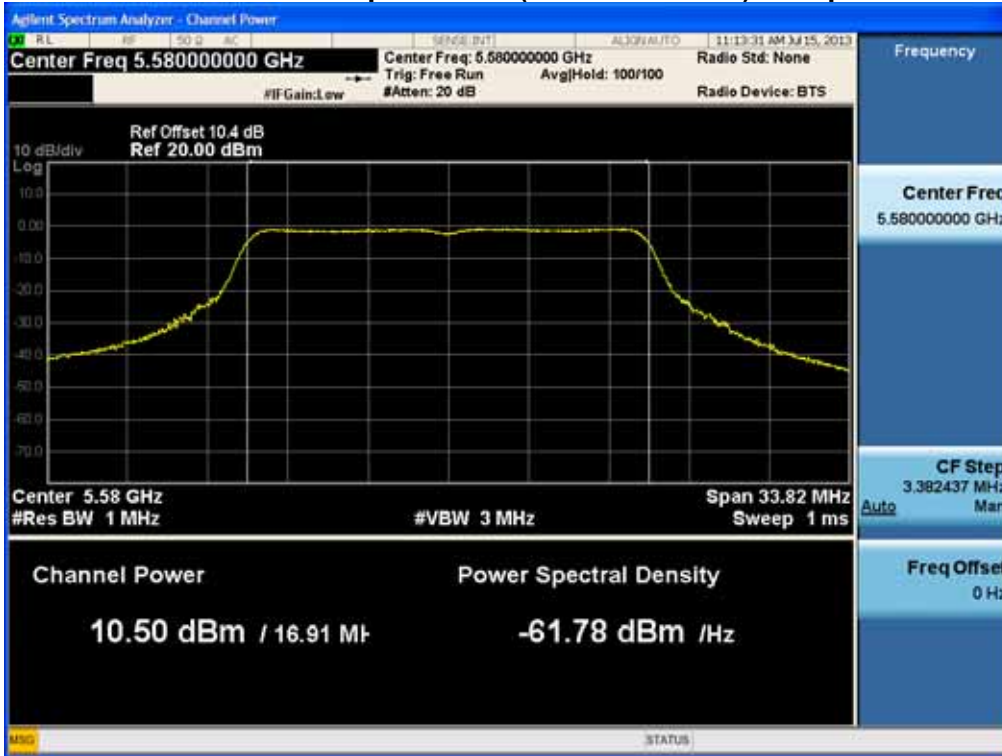
Conducted Output Power (802.11a-CH 60) 54 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

RESULT PLOTS (5500 MHz ~5700 MHz)

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

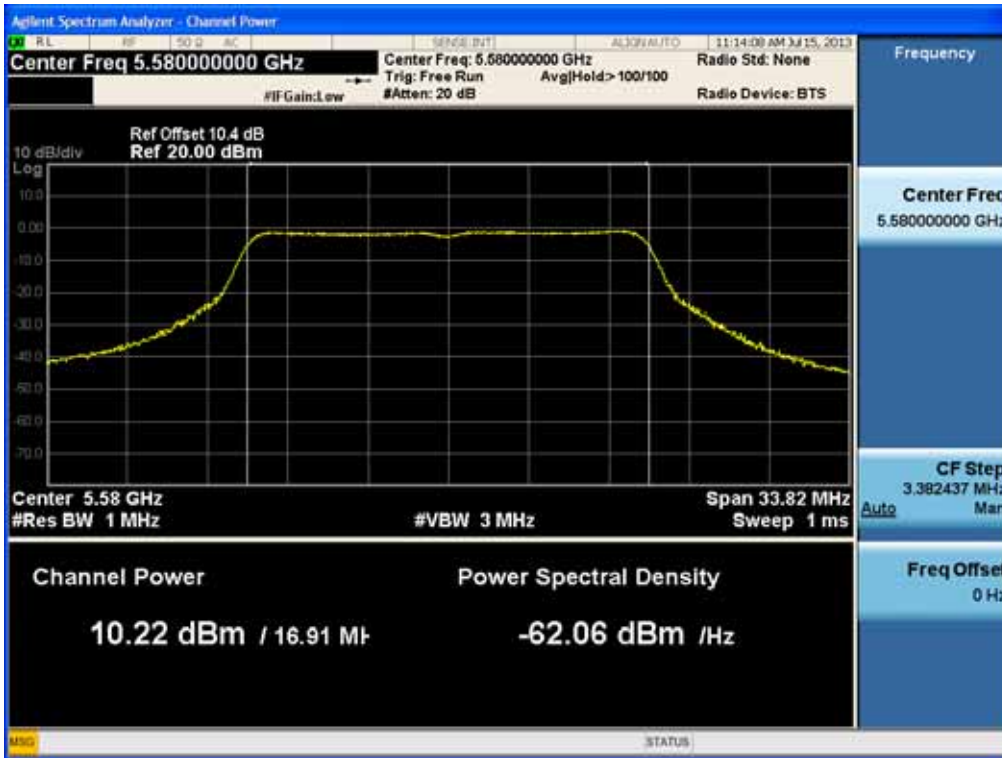


Conducted Output Power (802.11a-CH 116) 9 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNF0605

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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

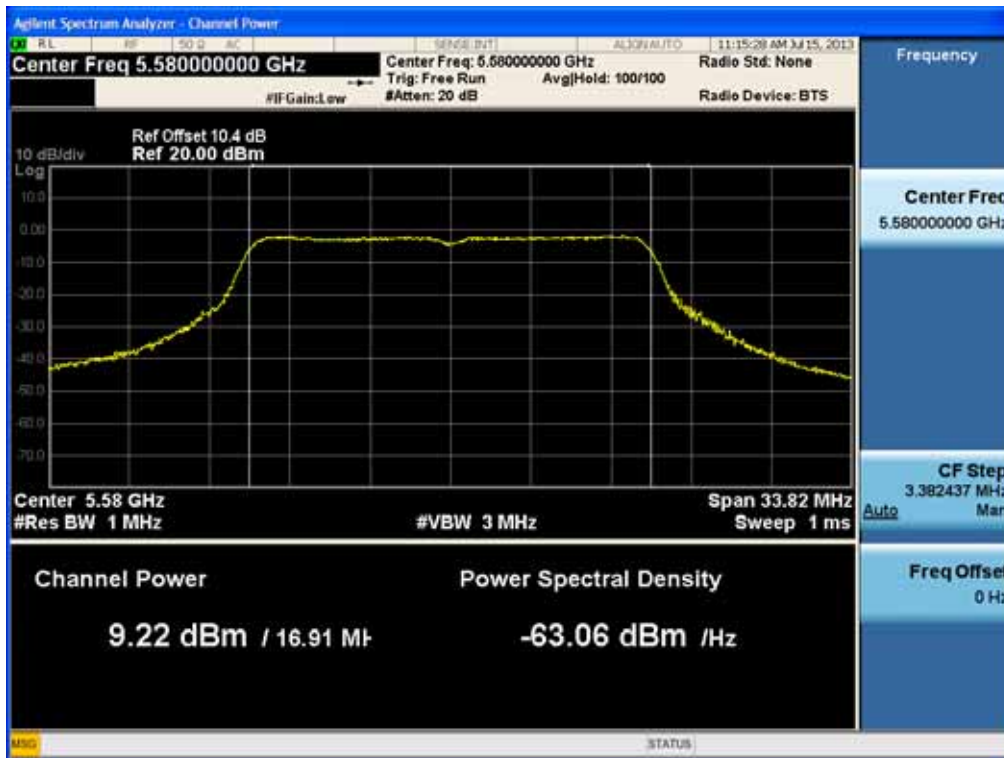


Conducted Output Power (802.11a-CH 116) 36 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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20 MHz BW

RESULT PLOTS (5180 MHz ~5240 MHz)

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



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

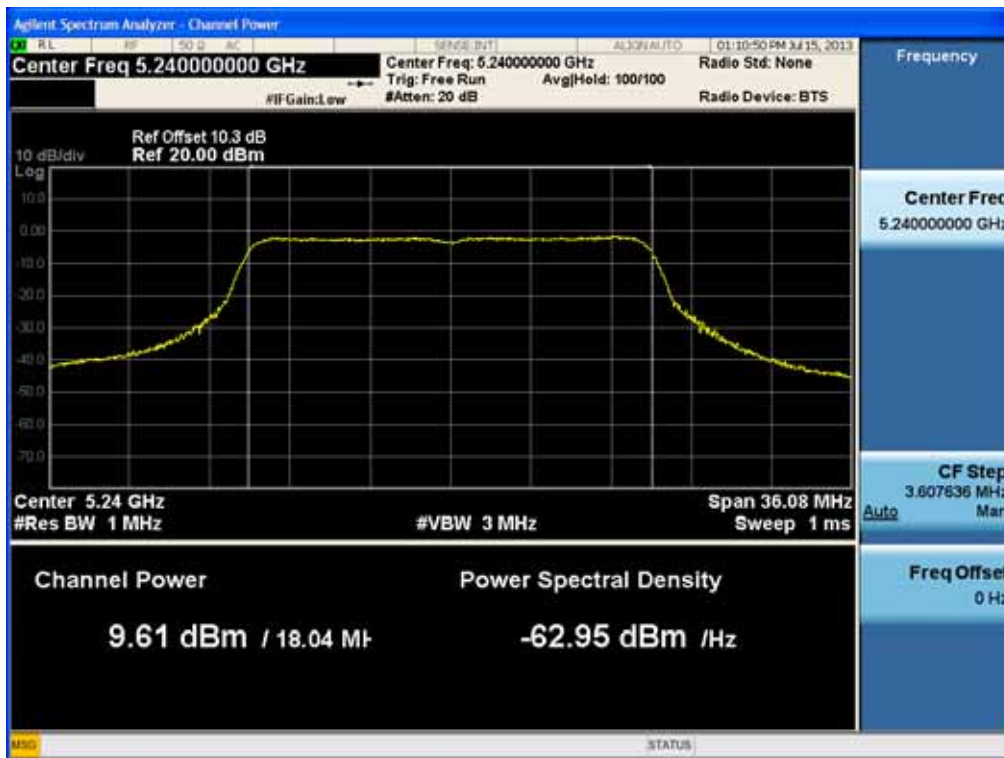


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNF0605

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



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



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Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

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
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

Conducted Output Power (802.11n-CH 48) 58.5 Mbps



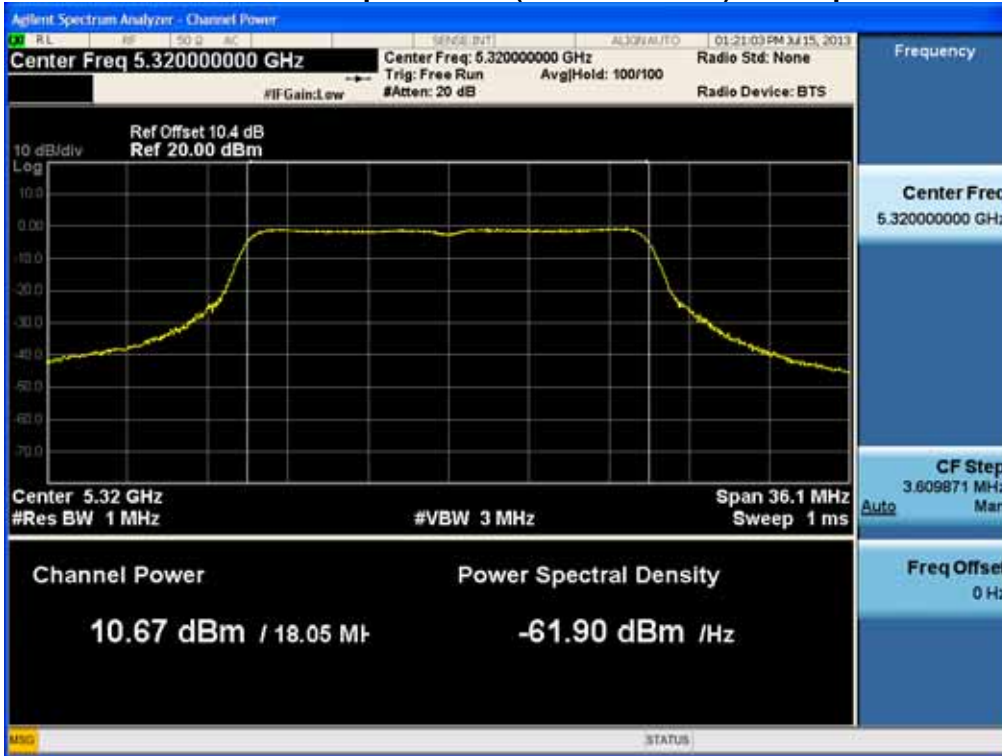
Conducted Output Power (802.11n-CH 48) 65 Mbps



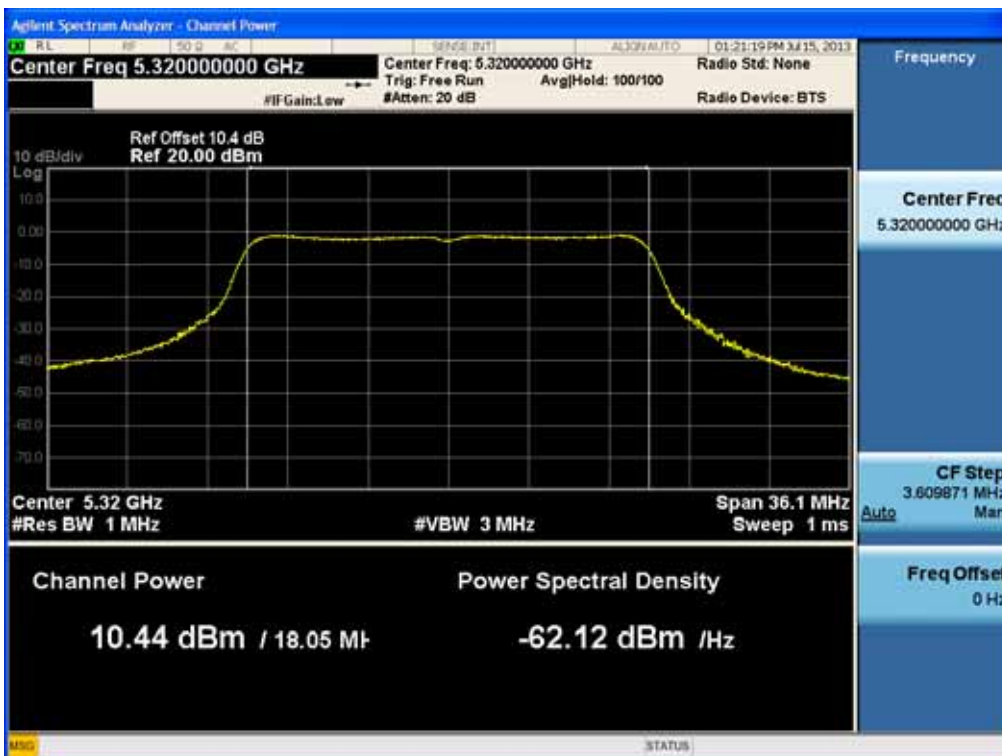
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNF0605

RESULT PLOTS (5260 MHz ~5320 MHz)

Conducted Output Power (802.11n-CH 64) 6.5 Mbps

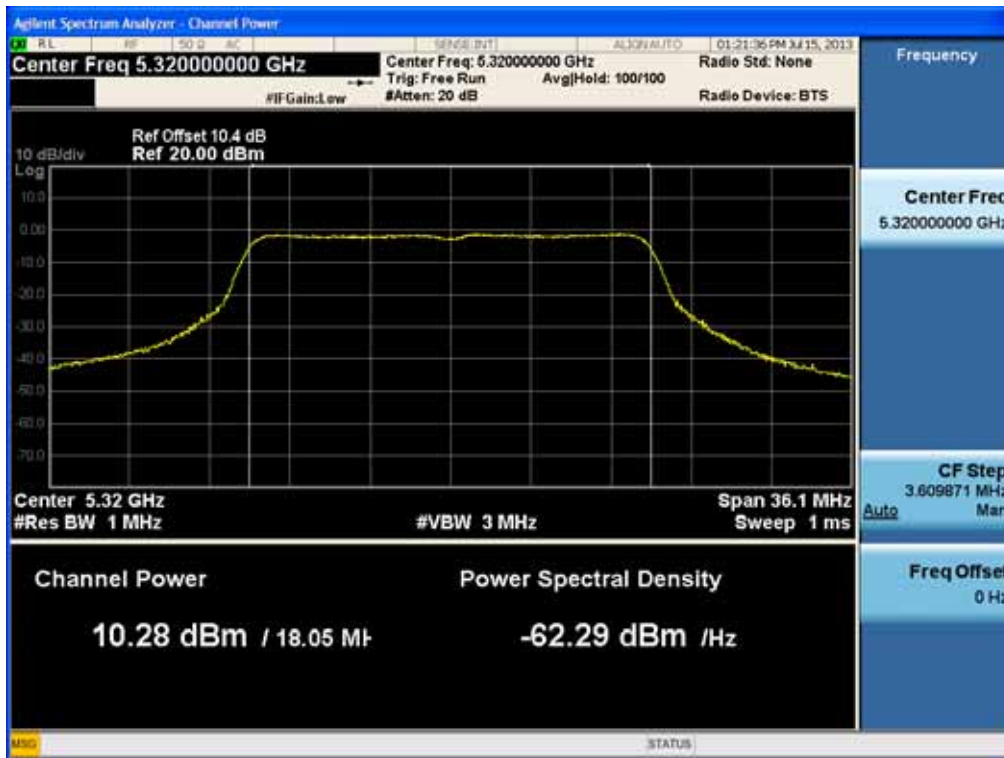


Conducted Output Power (802.11n-CH 64) 13 Mbps

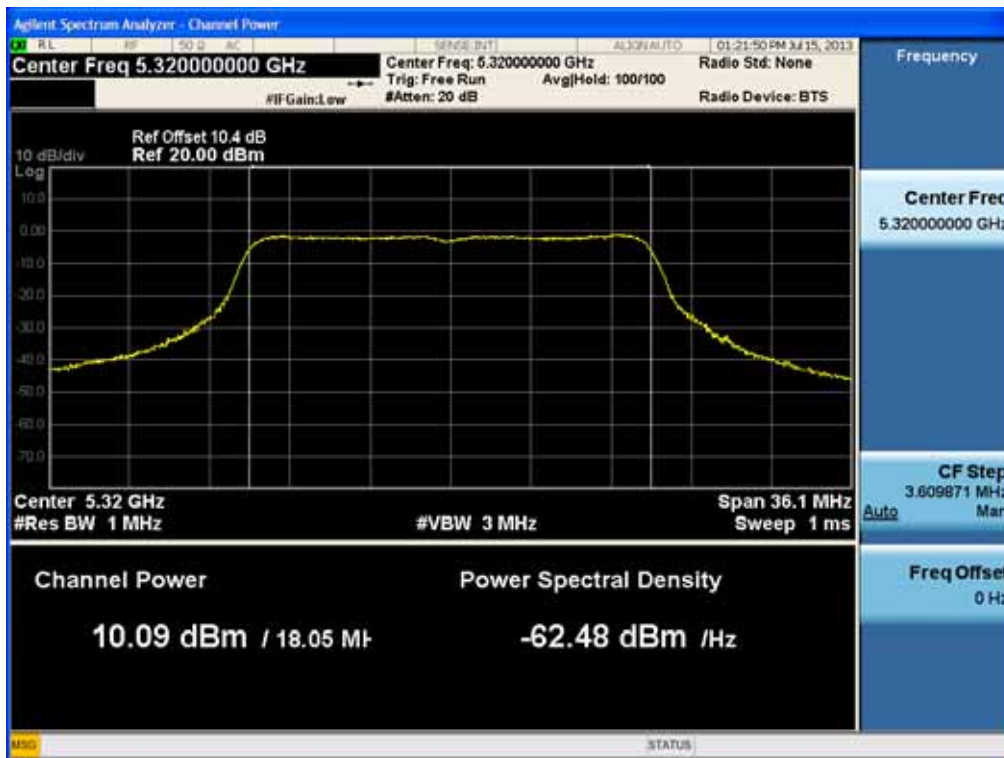


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

Conducted Output Power (802.11n-CH 64) 19.5 Mbps



Conducted Output Power (802.11n-CH 64) 26 Mbps

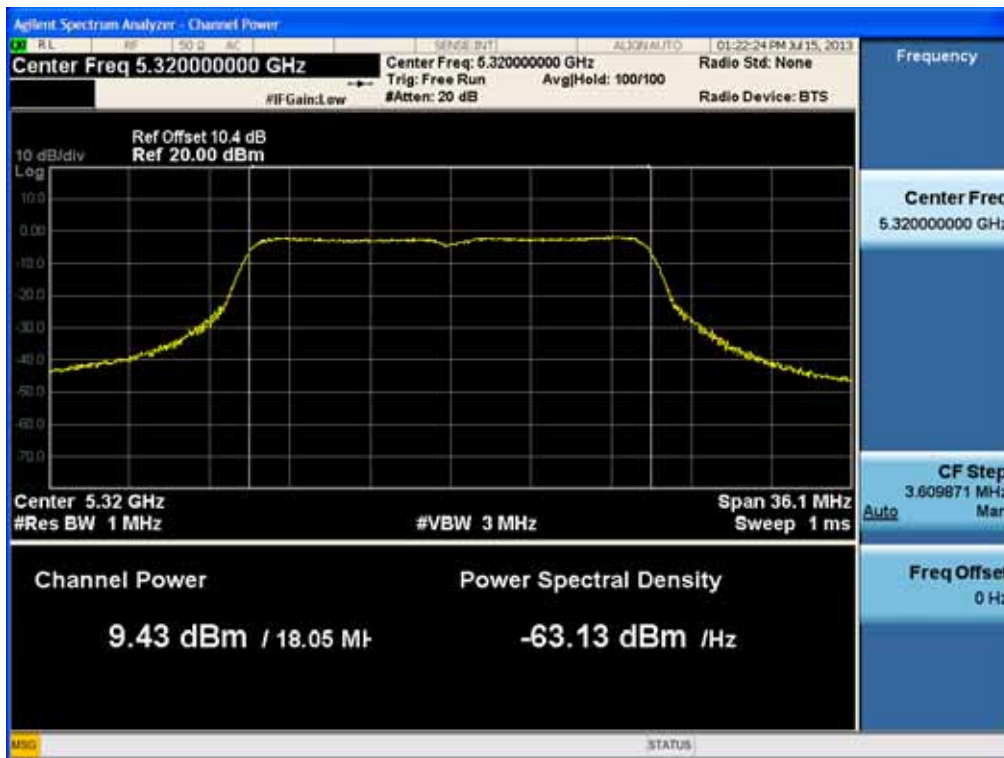


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

Conducted Output Power (802.11n-CH 64) 39 Mbps

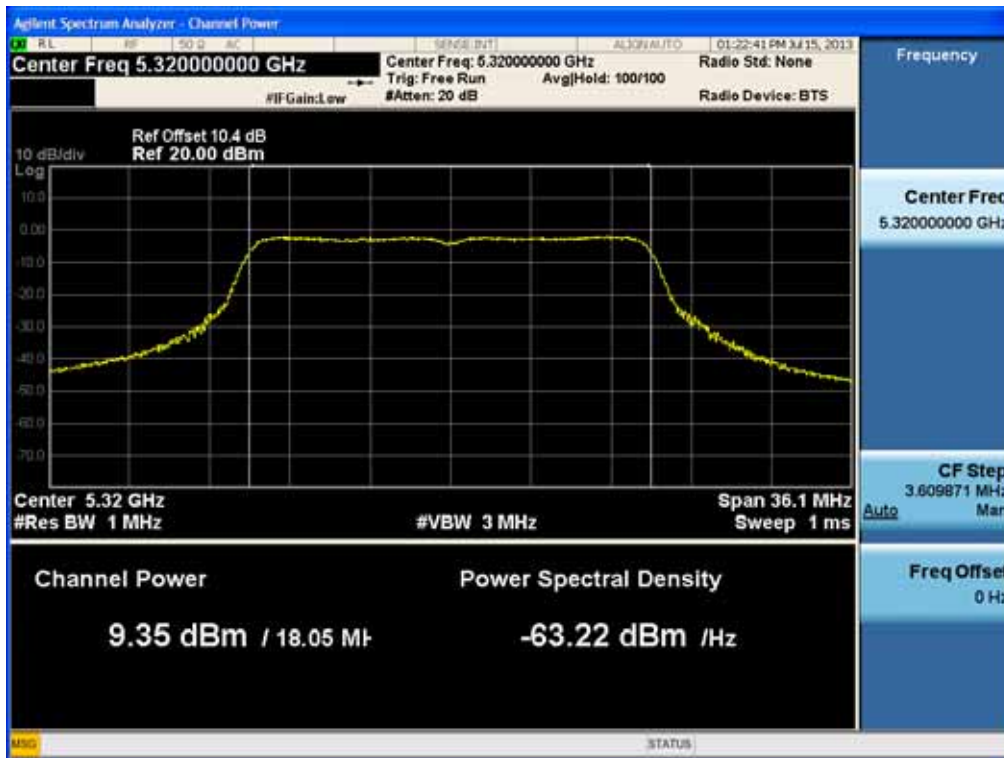


Conducted Output Power (802.11n-CH 64) 52 Mbps

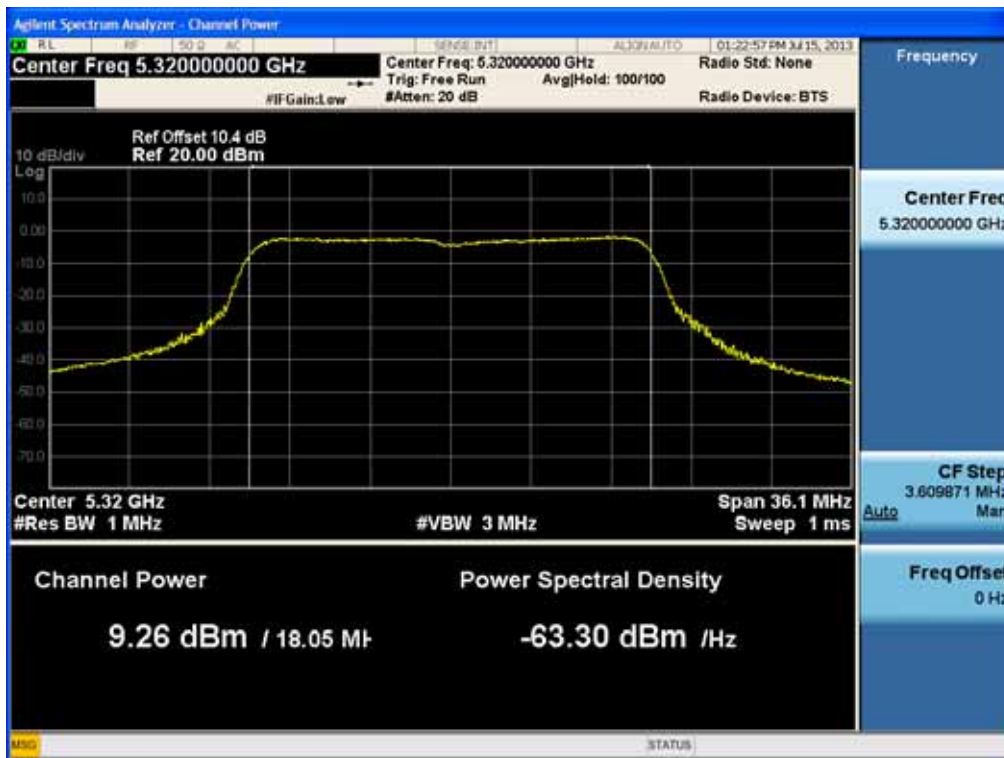


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Conducted Output Power (802.11n-CH 64) 58.5 Mbps



Conducted Output Power (802.11n-CH 64) 65 Mbps



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RESULT PLOTS (5500 MHz ~5700 MHz)

Conducted Output Power (802.11n-CH 116) 6.5 Mbps



Conducted Output Power (802.11n-CH 116) 13 Mbps

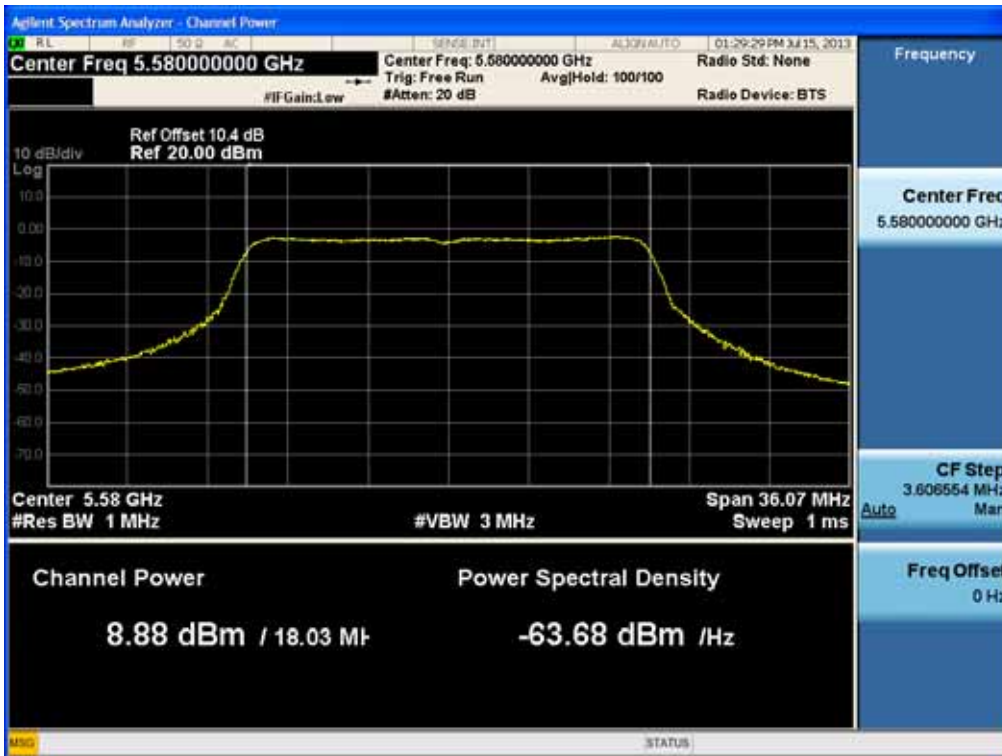


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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Conducted Output Power (802.11n-CH 116) 19.5 Mbps

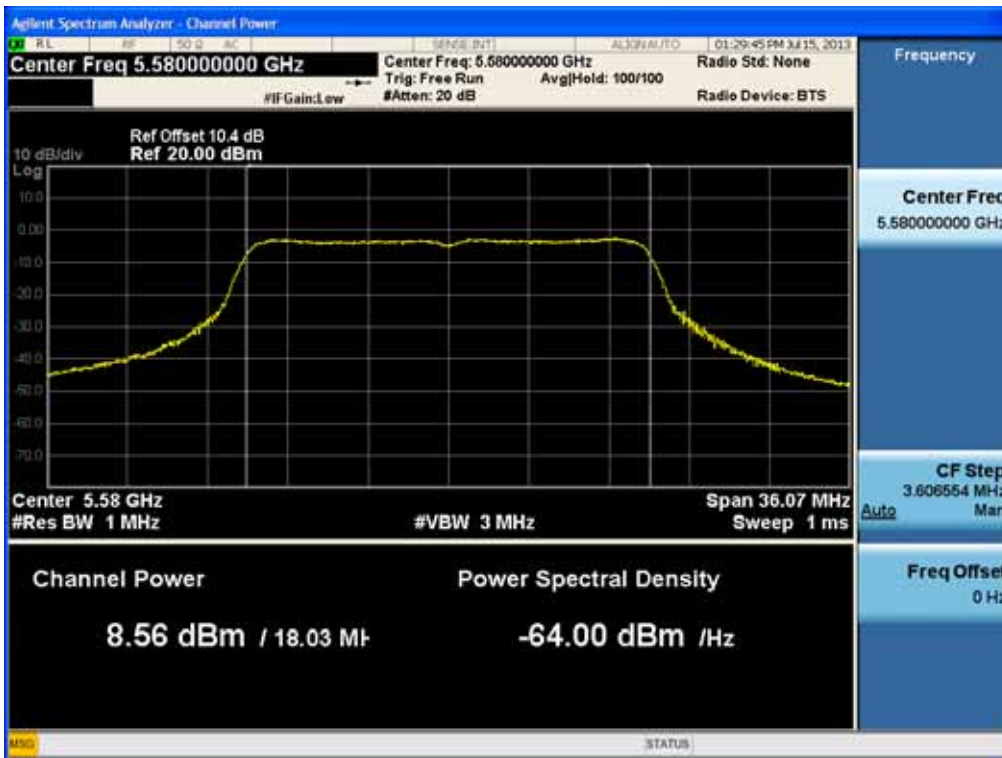


Conducted Output Power (802.11n-CH 116) 26 Mbps

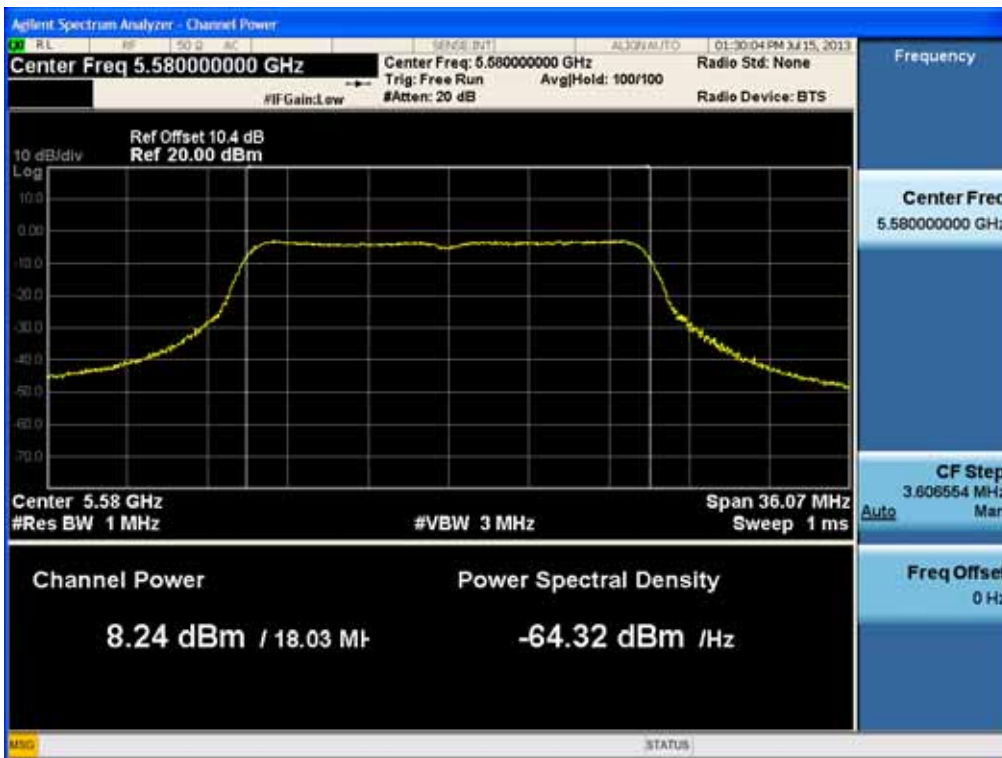


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

Conducted Output Power (802.11n-CH 116) 39 Mbps

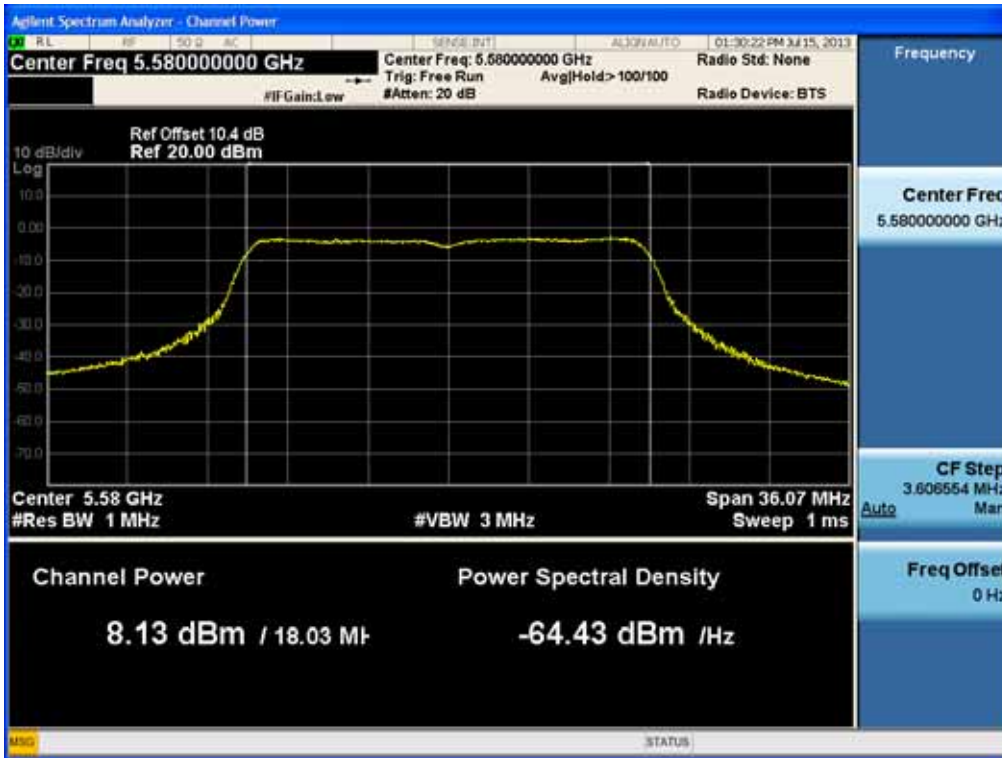


Conducted Output Power (802.11n-CH 116) 52 Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605

Conducted Output Power (802.11n-CH 116) 58.5 Mbps



Conducted Output Power (802.11n-CH 116) 65 Mbps



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Test Report No. HCTR1308FR04	Date of Issue: August 01, 2013	EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth, WLAN and NFC(Felica)	FCC ID: ZNFD605