



PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA

Tel. 410.290.6652 / Fax 410.290.6654

<http://www.pctestlab.com>



MEASUREMENT REPORT FCC PART 15.247 / IC RSS-210 WLAN 802.11n 40MHz BW

Applicant Name:

Pantech Co Ltd
Pantech Building, I-2, DMC
Sangam-dong, Mapo-gu,
Seoul, KOREA 121-792

Date of Testing:

July 16 - August 21, 2012

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Test Report Serial No.:

0Y1207120928.JYC

FCC ID: JYCP8010**APPLICANT:** Pantech Co Ltd**Application Type:** Class II Permissive Change**Model(s):** P8010**EUT Type:** Portable Handset**FCC Classification:** Digital Transmission System (DTS)**FCC Rule Part(s):** Part 15.247**IC Specification(s):** RSS-210 Issue 8**Test Procedure(s):** ANSI C63.4-2003/2009, ANSI C63.10-2009, KDB 558074**Class II Perm. Change:** Please see Change Document.**Original Grant Date:** May 15, 2012

Mode	Tx Frequency (MHz)	Avg Conducted		Peak Conducted	
		Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
802.11n (40MHz)	5755 - 5795	5.082	7.06	13.459	11.29

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003/2009 and ANSI C63.10-2009. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

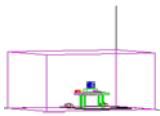
Randy Ortanez
President

FCC ID: JYCP8010	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset			

T A B L E O F C O N T E N T S

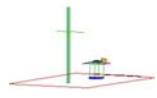
FCC PART 15.247 MEASUREMENT REPORT.....	3
1.0 INTRODUCTION.....	4
1.1 SCOPE.....	4
1.2 PCTEST TEST LOCATION.....	4
2.0 PRODUCT INFORMATION	5
2.1 EQUIPMENT DESCRIPTION.....	5
2.2 DEVICE CAPABILITIES.....	5
2.3 TEST CONFIGURATION	5
2.4 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS.....	5
2.5 LABELING REQUIREMENTS.....	5
3.0 DESCRIPTION OF TEST	6
3.1 EVALUATION PROCEDURE.....	6
3.2 RADIATED EMISSIONS	6
4.0 ANTENNA REQUIREMENTS.....	7
5.0 TEST EQUIPMENT CALIBRATION DATA.....	8
6.0 TEST RESULTS	9
6.1 SUMMARY	9
6.2 6DB BANDWIDTH MEASUREMENT – 802.11N 40MHZ BANDWIDTH.....	10
6.3 OUTPUT POWER MEASUREMENT – 802.11N 40MHZ BANDWIDTH	12
6.4 POWER SPECTRAL DENSITY – 802.11N 40MHZ BANDWIDTH.....	13
6.5 CONDUCTED EMISSIONS AT THE BAND EDGE – 802.11N 40MHZ BANDWIDTH	15
6.6 CONDUCTED SPURIOUS EMISSIONS – 802.11N 40MHZ BANDWIDTH	17
6.7 RADIATED SPURIOUS EMISSION MEASUREMENTS – 802.11N 40MHZ BANDWIDTH	20
7.0 CONCLUSION	23

FCC ID: JYCP8010	 PCTEST	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 PANTECH
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset	Reviewed by: Quality Manager Page 2 of 23



MEASUREMENT REPORT

FCC Part 15.247



§ 2.1033 General Information

APPLICANT:

Pantech Co Ltd

APPLICANT ADDRESS:

Pantech Building, I-2, DMC

Sangam-dong, Mapo-gu, Seoul, KOREA 121-792

TEST SITE:

PCTEST ENGINEERING LABORATORY, INC.

TEST SITE ADDRESS:

7185 Oakland Mills Road, Columbia, MD 21046 USA

FCC RULE PART(S):

Part 15.247

IC SPECIFICATION(S):

RSS-210 Issue 8

MODEL NAME:

P8010

FCC ID:

JYCP8010

Test Device Serial No.:

7MAY-1, 7MAY-2

Production

Pre-Production

Engineering

FCC CLASSIFICATION:

Digital Transmission System (DTS)

DATE(S) OF TEST:

July 16 - August 21, 2012

TEST REPORT S/N:

0Y1207120928.JYC

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EVDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



FCC ID: JYCP8010	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 3 of 23

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See *Figure 1-1*).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003/2009 on February 15, 2012.

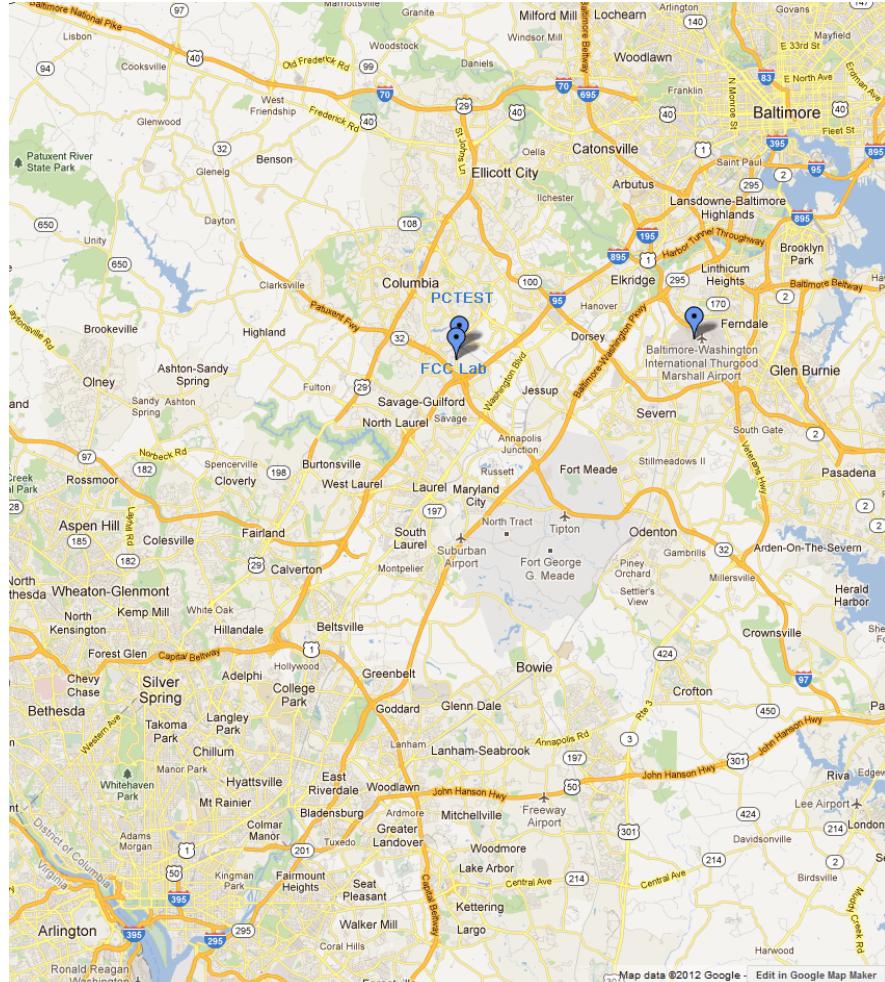


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 4 of 23

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Pantech Portable Handset FCC ID: JYCP8010**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 2, 4, 5, 17 LTE with 5 and 10MHz BW, 802.11a/b/g/n WIFI (DTS/NII), Bluetooth (EDR)

Note: 5GHz WLAN (DTS/NII) operation is possible in 20MHz and 40MHz channel bandwidths.

2.3 Test Configuration

The Pantech Portable Handset FCC ID: JYCP8010 was tested per the guidance of ANSI C63.10-2009 and KDB 558074. KDB 558074 was used in its entirety throughout the testing for this device. See Sections 3.2, and 6.1 of this test report for a description of the AC line conducted emissions, radiated emissions, and antenna port conducted emissions test setups, respectively.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.5 Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

FCC ID: JYCP8010	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 5 of 23

3.0 DESCRIPTION OF TEST

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003), the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009), and the guidance provided in KDB 558074 were used in the measurement of the **Pantech Portable Handset FCC ID: JYCP8010**.

Deviation from measurement procedure.....None

3.2 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A $\frac{3}{4}$ " (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by varying: the mode of operation or resolution, clock or data rate, scrolling H pattern to the EUT and/or support equipment, and changing the polarity of the receive antenna, whichever produced the worst-case emissions. To record the final measurements, the analyzer detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 120kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. For average measurements above 1GHz, measurement procedure "RBAVG1" in Section 5.4.2.2.2.1 of KDB 558074 was used.

FCC ID: JYCP8010	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 6 of 23

4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"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 the Portable Handset are **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The **Pantech Portable Handset FCC ID: JYCP8010** unit complies with the requirement of §15.203.

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

Ch.	BW (MHz)	Frequency (MHz)
149	20	5745
151	20 / 40	5755
153	20	5765
155	20	5775
157	20	5785

Ch.	BW (MHz)	Frequency (MHz)
159	20 / 40	5795
161	20	5805
163	20	5815
165	20	5825

Table 4-1. Frequency/ Channel Operations

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 7 of 23

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	WL25-1	Conducted WLAN Cable Set (25GHz)	2/13/2012	Annual	2/13/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	2/13/2012	Annual	2/13/2013	N/A
-	BT2	Bluetooth Cable Set	2/17/2012	Annual	2/17/2013	N/A
Agilent	8447D	Broadband Amplifier	5/8/2012	Annual	5/8/2013	2443A01900
Agilent	N9020A	MXA Signal Analyzer	10/10/2011	Annual	10/10/2012	US46470561
Anritsu	MA2411B	Power Sensor	3/5/2012	Annual	3/5/2013	846215
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Annual	7/22/2012	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	3-years	5/30/2015	135427
Mini-Circuits	VHF-8400+	3.4GHz - 9.9GHz High Pass Filter	2/28/2012	Annual	2/28/2013	31048
Rohde & Schwarz	RS-PR18	1-18 GHz Pre-Amplifier	6/9/2012	Annual	6/9/2013	100071
Rohde & Schwarz	RS-PR26	18-26.5 GHz Pre-Amplifier	6/9/2012	Annual	6/9/2013	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	12/15/2011	Annual	12/15/2012	100342
Espec	BTZ-133	Temperature Chamber	3/30/2011	Biennial	3/30/2013	80602
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

Table 5-1. Annual Test Equipment Calibration Schedule

Note: For equipment that has a calibration due date that falls within the test date range, care was taken to ensure that the equipment was utilized prior to calibration due date.

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 8 of 23

6.0 TEST RESULTS

6.1 Summary

Company Name: Pantech Co Ltd
 FCC ID: JYCP8010
 FCC Classification: Digital Transmission System (DTS)
 Data Rate(s) Tested: 13.5/15Mbps, 27/30Mbps, 40.5/45Mbps, 54/60Mbps, 81/90Mbps, 108/120Mbps, 121.5/135Mbps, 135/150Mbps (n – 40MHz)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)						
15.247(a)(2)	RSS-210 [A8.2]	6dB Bandwidth	> 500kHz	CONDUCTED	PASS	Section 6.2
15.247(b)(3)	RSS-210 [A8.4]	Transmitter Output Power	< 1 Watt		PASS	Sections 6.3
15.247(e)	RSS-210 [A8.2]	Transmitter Power Spectral Density	< 8dBm / 3kHz Band		PASS	Section 6.4
15.247(d)	RSS-210 [A8.5]	Band Edge / Out-of-Band Emissions	Conducted < 20dBc		PASS	Sections 6.5, 6.6
15.205 15.209	RSS-210 [A8.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	RADIATED	PASS	Sections 6.7
RECEIVER MODE (RX) / DIGITAL EMISSIONS						
15.107	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits	LINE CONDUCTED	PASS	Part 15B Test Report
15.109	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Part 15B Test Report

Table 6-1. Summary of Test Results

Notes:

- 1) For this Class II Permissive Change Test Report, testing was only performed for the 40MHz Bandwidth 802.11n signal. All 802.11n 40MHz Bandwidth modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 9 of 23

6.2 6dB Bandwidth Measurement – 802.11n 40MHz Bandwidth

§15.247(a)(2); RSS-210 [A8.2]

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.***

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
5755	151	n (40MHz)	MCS0	36.15	0.500	Pass
5795	159	n (40MHz)	MCS0	36.28	0.500	Pass

Table 6-2. Conducted Bandwidth Measurements

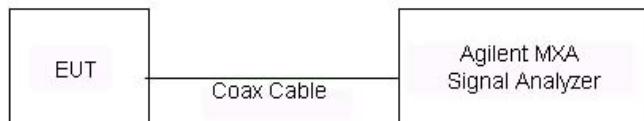
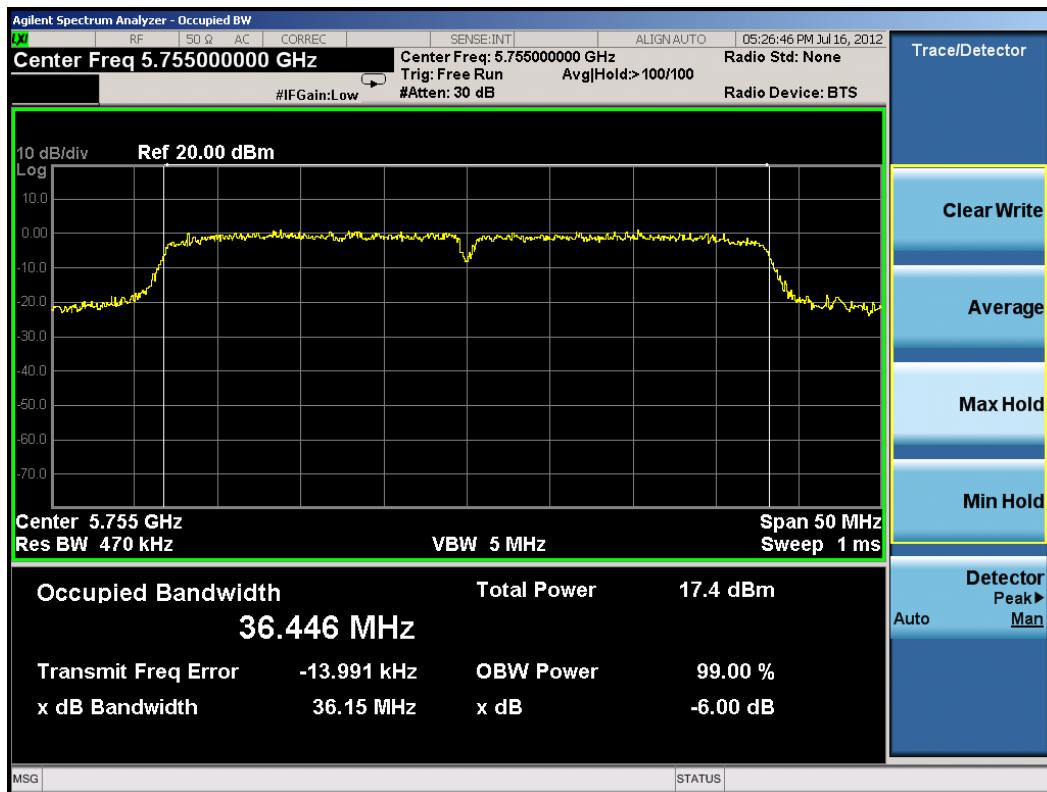
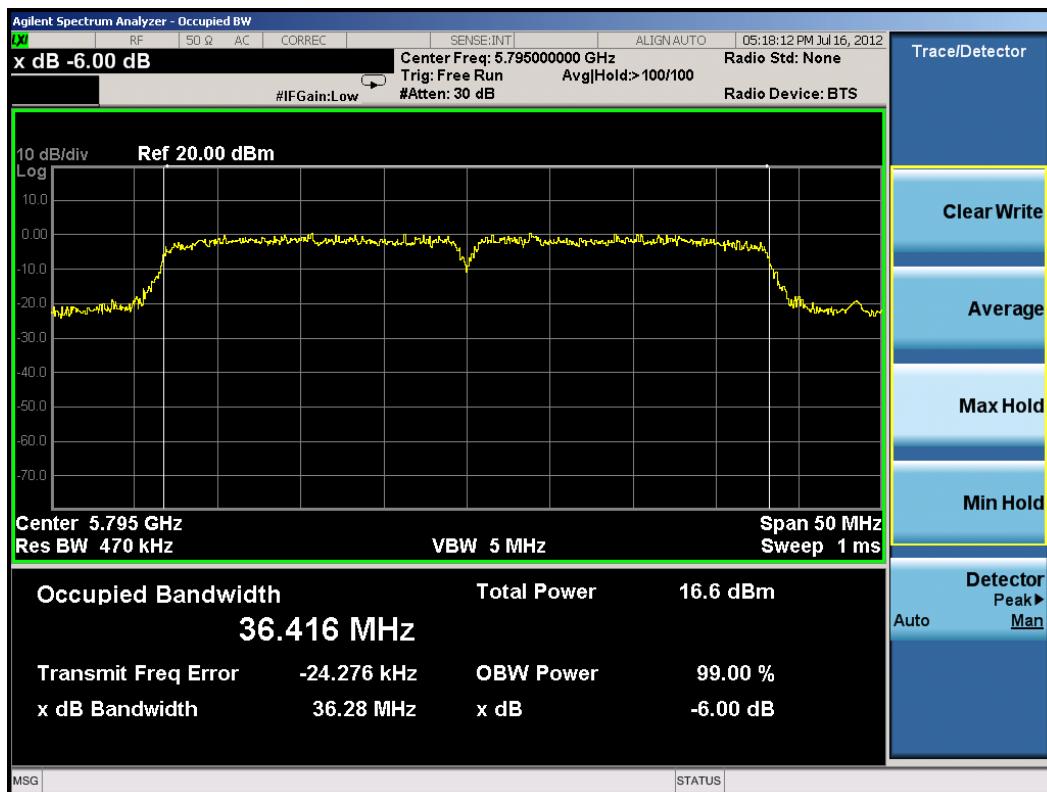


Figure 6-1. Test Instrument & Measurement Setup

FCC ID: JYCP8010	 FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset



Plot 6-1. 6dB Bandwidth Plot (802.11n 40MHz- Ch. 151)



Plot 6-2. 6dB Bandwidth Plot (802.11n 40MHz – Ch. 159)

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 11 of 23

6.3 Output Power Measurement – 802.11n 40MHz Bandwidth

§15.247(b)(3); RSS-210 [A8.4]

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter capable of making peak and average power measurements while the EUT is operating in transmission mode at the appropriate frequencies. ***The maximum permissible conducted output power is 1 Watt.***

Mode	Freq [MHz]	Channel	Detector	40MHz BW 802.11n (5GHz - 800ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				13.5/15	27/30	40.5/45	54/60	81/90	108/120	121.5/135	135/150
802.11n	5755	151	AVG	7.06	6.85	6.87	7.05	6.94	6.94	6.94	6.88
			PEAK	11.24	11.26	11.17	11.18	11.29	11.07	11.06	11.11
802.11n	5795	159	AVG	6.97	6.82	6.81	7.02	7.04	6.85	6.94	6.99
			PEAK	11.13	11.1	11.28	11.18	11.11	11.27	11.20	11.26

Table 6-3. 40MHz BW 802.11n (5GHz) Conducted Output Power Measurements

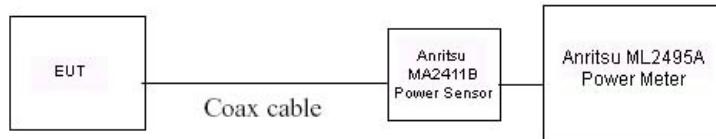


Figure 6-2. Test Instrument & Measurement Setup

FCC ID: JYCP8010	 FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset

6.4 Power Spectral Density – 802.11n 40MHz Bandwidth

§15.247(e); RSS-210 [A8.2]

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible power spectral density is 8 dBm in any 3 kHz band.**

Per the guidance on power spectral density measurements given in KDB 558074, the spectrum is measured with a 100kHz bandwidth using a peak detector. The measured spectrum is compared to the 8dBm/3kHz limit given in 15.247(e) by applying a bandwidth correction factor equal to $10\log(3\text{kHz}/100\text{kHz}) = -15.23\text{dB}$.

Freq [MHz]	Channel No.	802.11 Mode	Data Rate	Measured Power Spectral Density [dBm]	Bandwidth Correction Factor [dB]	Corrected Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]
5755	151	n (40MHz)	MCS0	-3.660	-15.23	-18.889	8.0	-26.89
5795	159	n (40MHz)	MCS0	-4.115	-15.23	-19.344	8.0	-27.34

Table 6-4. Conducted Power Density Measurements

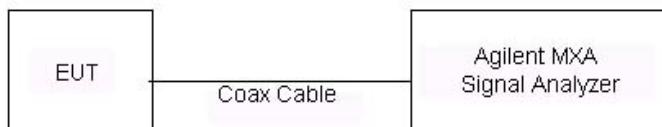
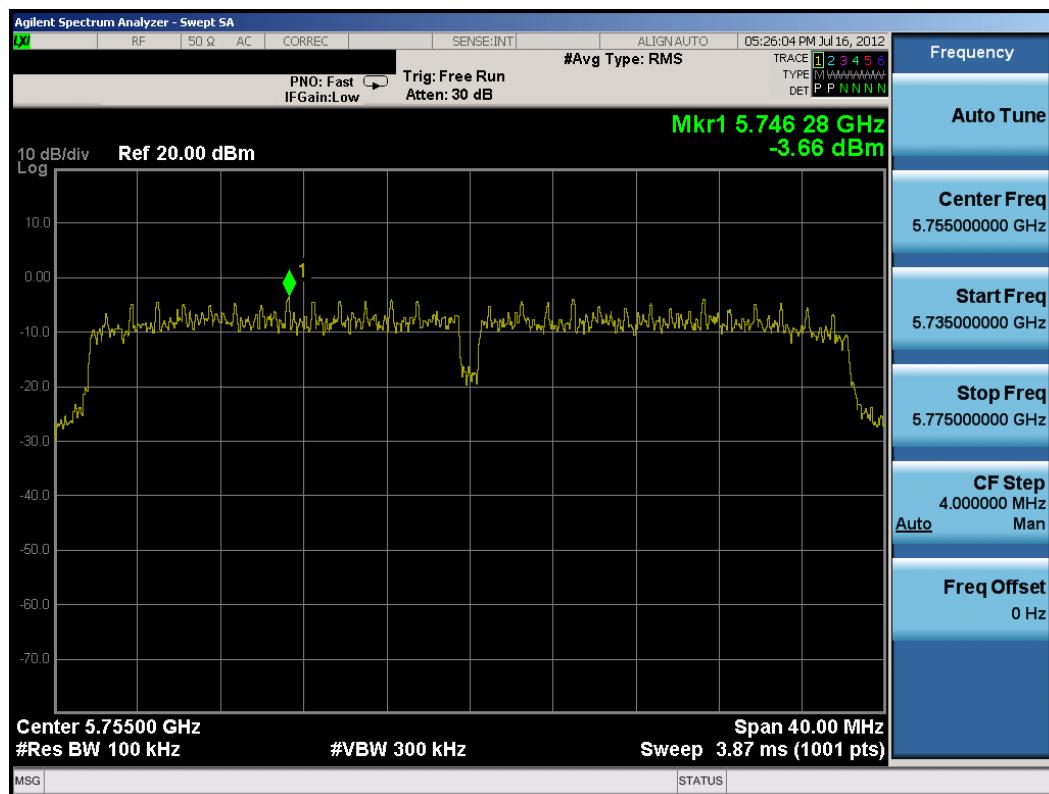
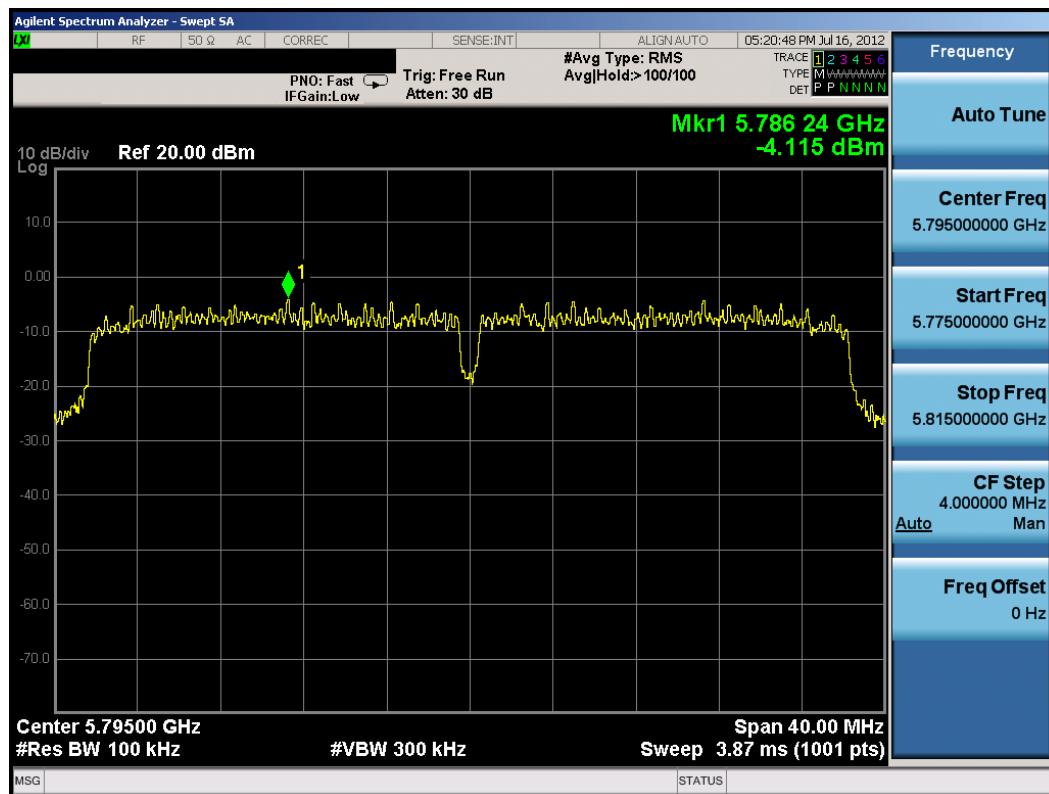


Figure 6-3. Test Instrument & Measurement Setup

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 13 of 23



Plot 6-3. Power Spectral Density Plot (802.11n 40MHz– Ch. 151)



Plot 6-4. Power Spectral Density Plot (802.11n 40MHz – Ch. 159)

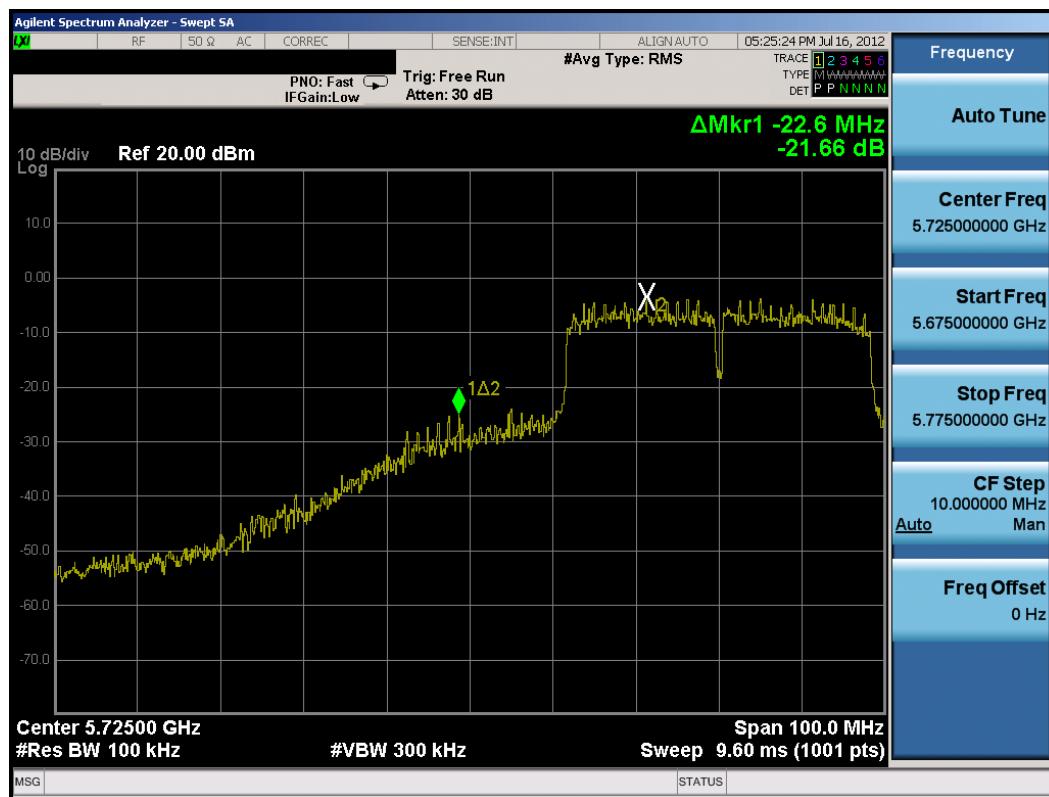
FCC ID: JYCP8010	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset	Page 14 of 23

6.5 Conducted Emissions at the Band Edge – 802.11n 40MHz Bandwidth

§15.247(d); RSS-210 [A8.5]

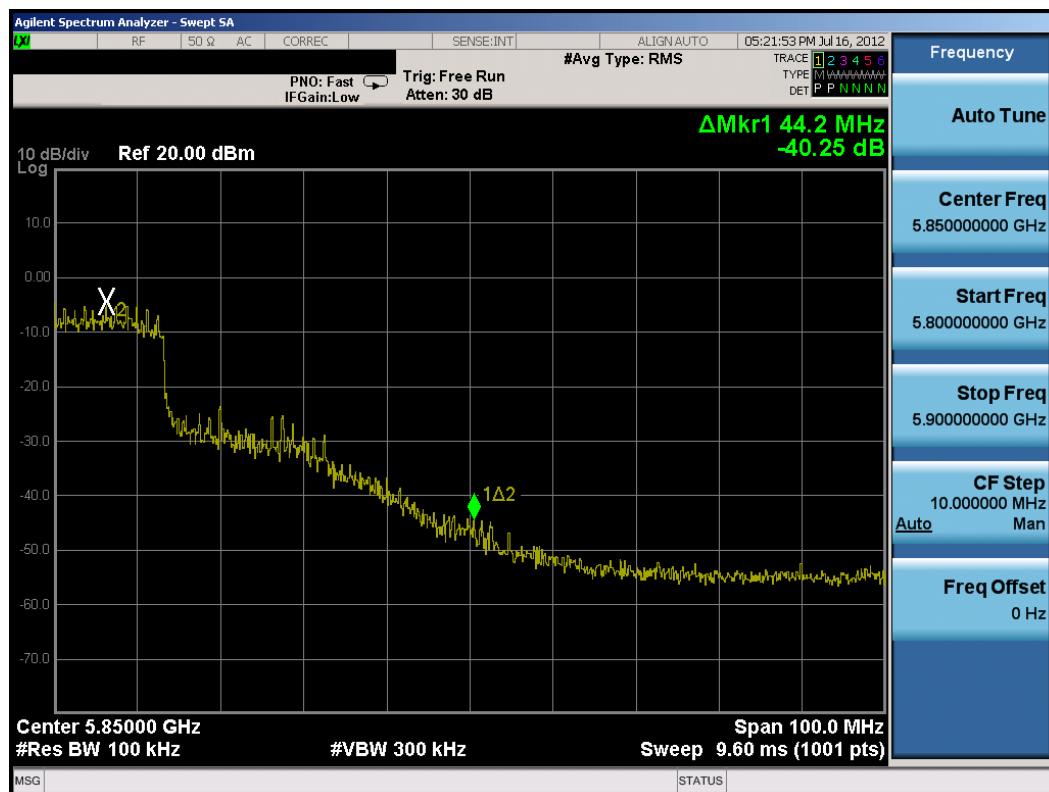
For the following out of band conducted spurious emissions plots at the band edge, the EUT was set to transmit at 802.11n 40MHz Bandwidth, MCS0. These settings produced the worst-case emissions for 40MHz 802.11n mode.

Per the guidance of KDB 558074, section 5.4.1.1, the reference level for out of band emissions is established from the plots of this section since the band edge emissions are measured with a RBW of 100kHz. This reference level is then used as the limit in subsequent plots for out of band spurious emissions shown in Section 6.6. The limit for out of band spurious emissions at the band edge is 20dB below the fundamental emission level measured in a 100kHz bandwidth.



Plot 6-5. Band Edge Plot (40MHz BW 802.11n – Ch. 151)

FCC ID: JYCP8010	 FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset



Plot 6-6. Band Edge Plot (40MHz BW 802.11n – Ch. 159)

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 16 of 23

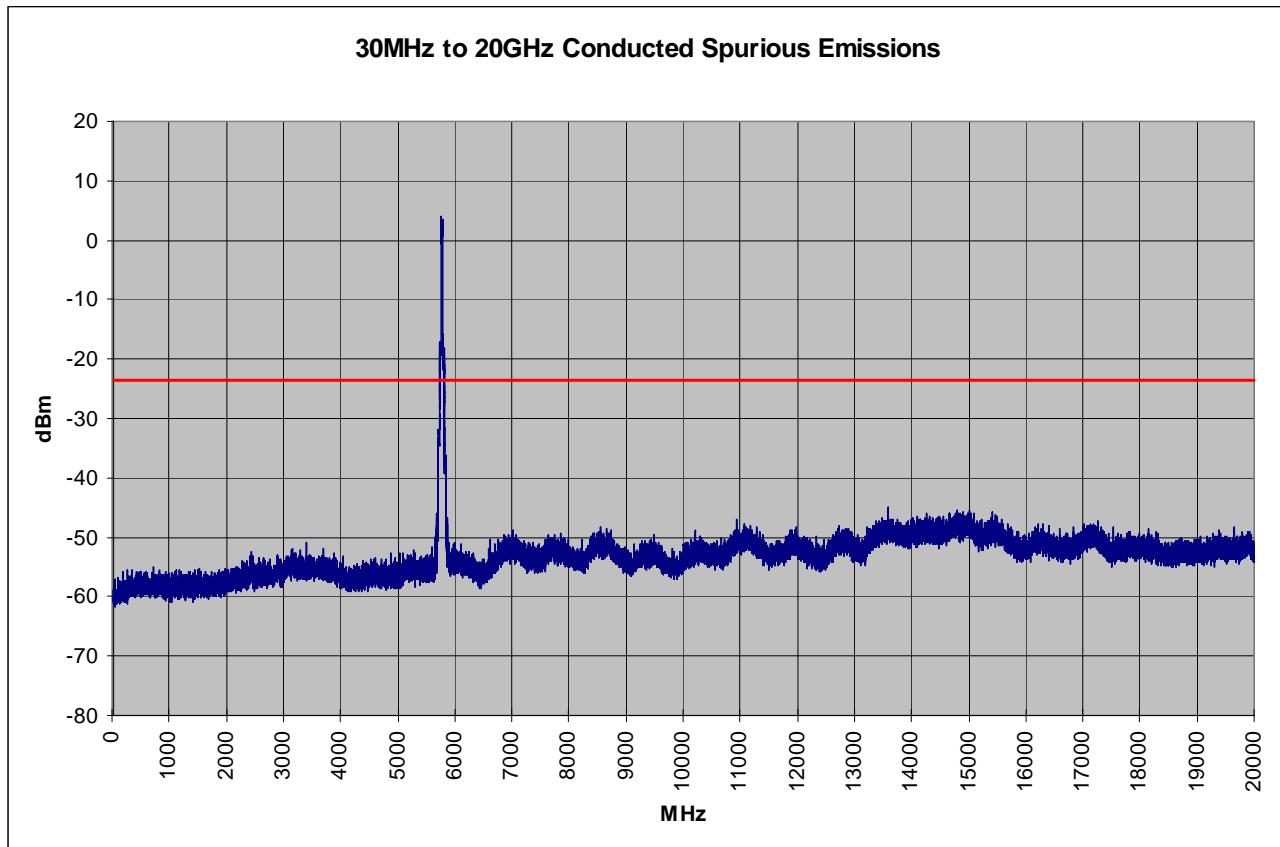
6.6 Conducted Spurious Emissions – 802.11n 40MHz Bandwidth

§15.247(d); RSS-210 [A8.5]

For the following out of band conducted spurious emissions plots, the EUT was investigated in all available data rates for all 40MHz BW “n” modes. The worst case spurious emissions for the 5.8GHz band were found while transmitting at MCS0 and are shown in the plots below.

The display line shown in the following plots denotes the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth, as determined in Section 6.5 of this report. However, since the traces in the following plots are measured with a 1MHz RBW, the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz bandwidth. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.

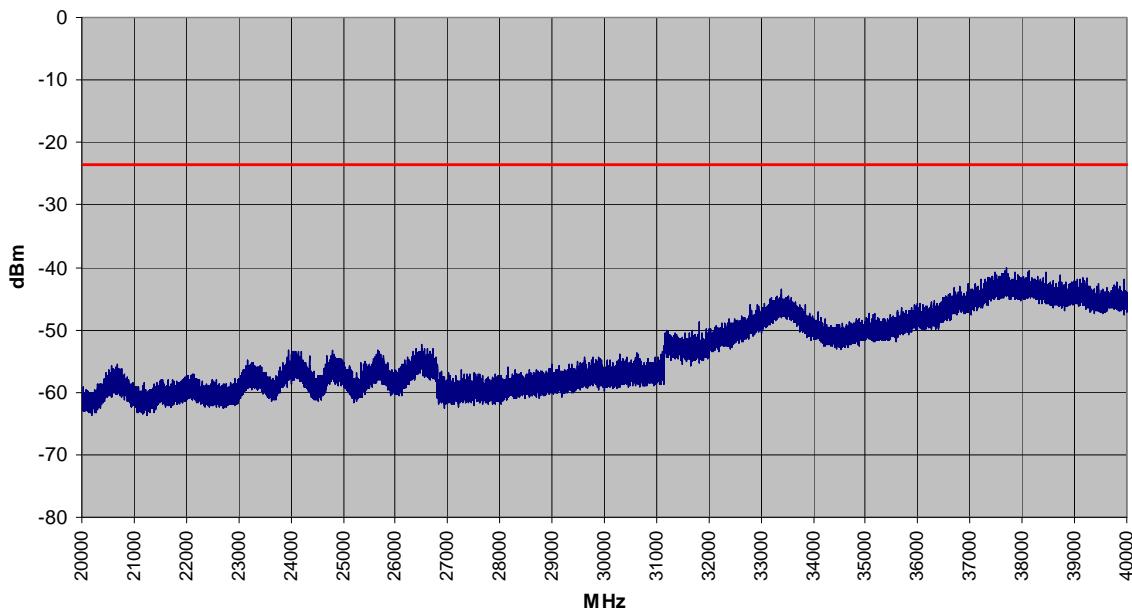
Plots below were recorded using a PSA spectrum analyzer connected to a laptop PC via GPIB connection. Since the PSA is limited to a maximum of 8192 sweeping points, roughly about 4GHz of spectrum can be analyzed while ensuring that the bin-to-bin spacing is such that narrowband emissions are not lost (i.e. # points $\geq 2 * \text{Span/RBW}$). A program installed on the laptop (“PCTEST 40GHz CSE”, Version 1.0) sets the spectrum analyzer to gather the maximum number of spectral points from 30MHz to 40GHz in 4GHz increments and then places the data into an Excel spreadsheet from which the conducted plots are generated. The limit is 20dBc and is determined from the power spectral density plots which are measured with a 100kHz RBW. The spectrum analyzer is set as follows for each 4GHz portion of spectrum that is analyzed: RBW = 1MHz, VBW = 3MHz, sweep time = auto, detector = max peak, number of points = 8192.



Plot 6-7. Conducted Spurious Plot (40MHz BW 802.11n – Ch. 151)

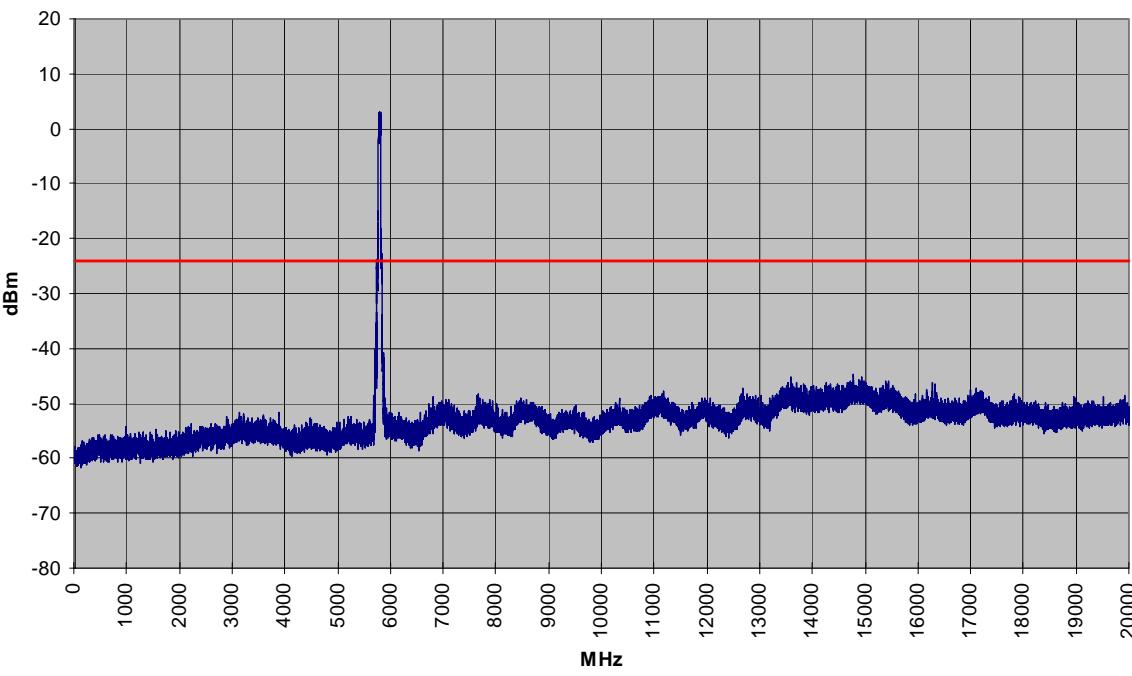
FCC ID: JYCP8010	 FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset

20GHz to 40GHz Conducted Spurious Emissions



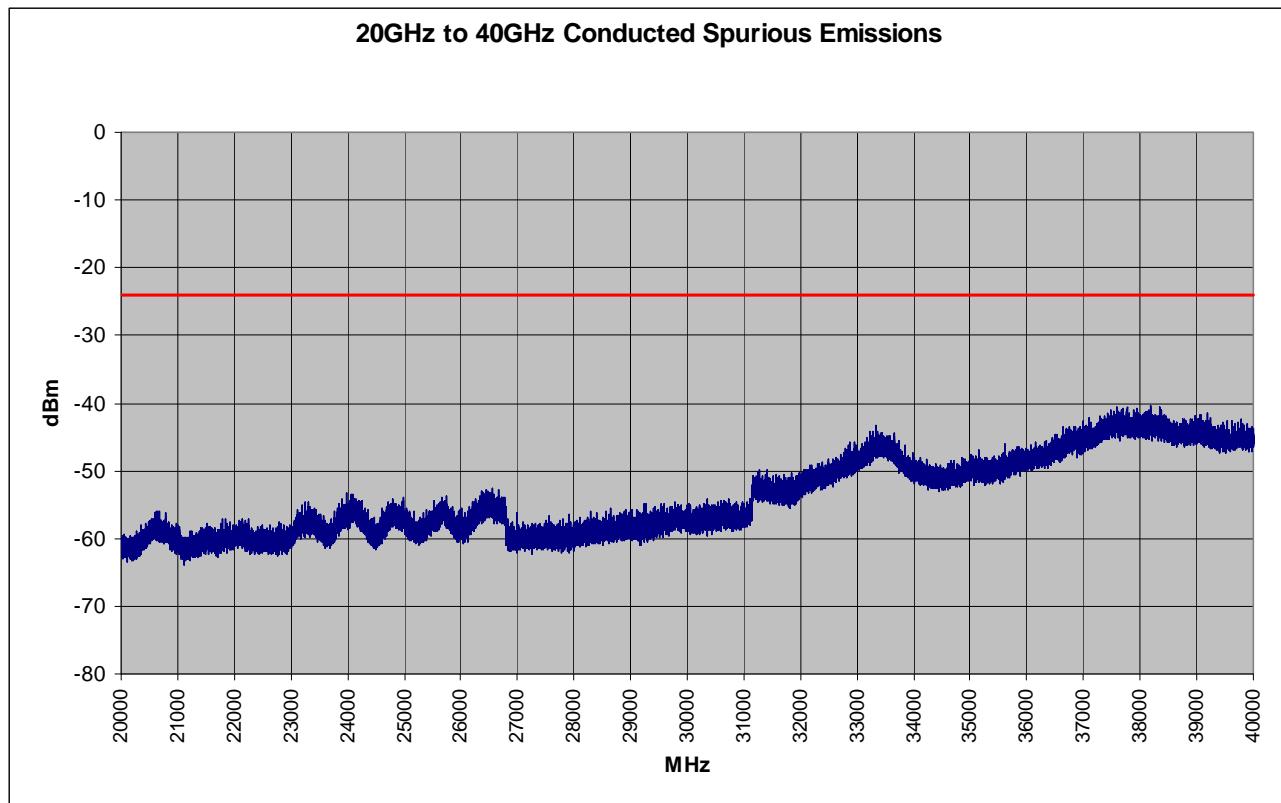
Plot 6-8. Conducted Spurious Plot (40MHz BW 802.11n – Ch. 151)

30MHz to 20GHz Conducted Spurious Emissions



Plot 6-9. Conducted Spurious Plot (40MHz BW 802.11n – Ch. 159)

FCC ID: JYCP8010	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset	Page 18 of 23



Plot 6-10. Conducted Spurious Plot (40MHz BW 802.11n – Ch. 159)

FCC ID: JYCP8010	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 19 of 23

6.7 Radiated Spurious Emission Measurements – 802.11n 40MHz Bandwidth

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

The EUT was tested from 9kHz up to the tenth harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-5 per Section 15.209.

All 802.11n 40MHz Bandwidth data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section. All measurements shown in this section were obtained using traditional radiated test methods as defined in C63.10-2009. The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 were not used to evaluate this device.

Frequency	Field Strength [μ V/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 6-5. Radiated Limits

Sample Calculation

- Field Strength Level [$\text{dB}_{\mu\text{V/m}}$] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]

Margin [dB] = Field Strength Level [$\text{dB}_{\mu\text{V/m}}$] – Limit [$\text{dB}_{\mu\text{V/m}}$]

FCC ID: JYCP8010	 FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset



Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Worst Case Transfer Rate: MCS0
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5755MHz
Channel: 151

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
11590.00	-108.44	Avg	H	47.34	0.00	45.9	53.98	-8.08
11590.00	-99.24	Peak	H	47.34	0.00	55.1	73.98	-18.88
23180.00	-135.00	Avg	H	51.81	0.00	23.8	53.98	-30.17
23180.00	-125.00	Peak	H	51.81	0.00	33.8	73.98	-40.17

Table 6-6. Radiated Measurements @ 1 & 3 meters

NOTES:

1. All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-5.
2. For frequencies > 1GHz, average measurements are recorded using the RBAVG1 measurement procedure of KDB 558074 using RBW = 1MHz, VBW = 3MHz, RMS detector, 1001 measurement points, and a 3 second sweep time. Peak measurements are recorded using RBW = 1MHz, VBW = 3MHz and a peak detector.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 21 of 23



Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Worst Case Transfer Rate: MCS0
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5795MHz
Channel: 159

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
11510.00	-107.93	Avg	H	47.40	0.00	46.5	53.98	-7.51
11510.00	-98.23	Peak	H	47.40	0.00	56.2	73.98	-17.81

Table 6-7. Radiated Measurements @ 1 & 3 meters

NOTES:

1. All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-5.
2. For frequencies > 1GHz, average measurements are recorded using the RBAVG1 measurement procedure of KDB 558074 using RBW = 1MHz, VBW = 3MHz, RMS detector, 1001 measurement points, and a 3 second sweep time. Peak measurements are recorded using RBW = 1MHz, VBW = 3MHz and a peak detector.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

FCC ID: JYCP8010		FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 22 of 23

7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Pantech Portable Handset FCC ID: JYCP8010** is in compliance with Part 15C of the FCC Rules and RSS-210 of the Industry Canada Rules.

FCC ID: JYCP8010	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.247 802.11n 40MHz BW MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 PANTECH	Reviewed by: Quality Manager
Test Report S/N: 0Y1207120928.JYC	Test Dates: July 16 - August 21, 2012	EUT Type: Portable Handset		Page 23 of 23