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MEASUREMENT REPORT FCC PART 15.407 / IC RSS-210 802.11a/n (UNII)

Applicant Name:
Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220
United States

Date of Testing:
01/26/12 - 01/31/12
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1201230113.A3L

FCC ID:	A3LSPHL700
APPLICANT:	Samsung Electronics, Co. Ltd.

Application Type: Certification
Model(s): SPH-L700
EUT Type: Portable Handset
FCC Classification: Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s): Part 15.407
IC Specification(s): RSS-210 Issue 8

Mode	UNII Band	Tx Frequency (MHz)	Conducted Power	
			Max. Power (mW)	Max. Power (dBm)
802.11a	1	5180 - 5240	26.730	14.27
	2	5260 - 5320	26.363	14.21
	3	5500 - 5700	25.293	14.03
802.11n	1	5180 - 5240	20.417	13.10
	2	5260 - 5320	20.370	13.09
	3	5500 - 5700	19.055	12.80

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 C-63.4-2003. 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: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 1 of 66	

TABLE OF CONTENTS

FCC PART 15.407 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 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS.....		5
2.4 LABELING REQUIREMENTS.....		5
3.0 DESCRIPTION OF TEST.....		6
3.1 EVALUATION PROCEDURE.....		6
3.2 CONDUCTED EMISSIONS.....		6
3.3 RADIATED EMISSIONS.....		7
4.0 ANTENNA REQUIREMENTS.....		8
5.0 TEST EQUIPMENT CALIBRATION DATA.....		9
6.0 TEST RESULTS.....		10
6.1 SUMMARY.....		10
6.2 26DB BANDWIDTH MEASUREMENT – 802.11A/N.....		11
6.3 UNII OUTPUT POWER MEASUREMENT – 802.11A/N.....		21
6.4 PEAK POWER SPECTRAL DENSITY – 802.11A/N.....		23
6.5 PEAK EXCURSION RATIO – 802.11A/N.....		33
6.6 FREQUENCY STABILITY.....		43
6.7 RADIATED SPURIOUS EMISSION MEASUREMENTS.....		46
6.8 RADIATED BAND EDGE MEASUREMENTS.....		56
6.9 LINE-CONDUCTED TEST DATA.....		60
7.0 CONCLUSION.....		66

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 2 of 66



MEASUREMENT REPORT

FCC Part 15.407



§ 2.1033 General Information

APPLICANT: Samsung Electronics, Co. Ltd.

APPLICANT ADDRESS: 18600 Broadwick St.
Rancho Dominguez, CA 90220, United States

TEST SITE: PCTEST ENGINEERING LABORATORY, INC.

TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA

FCC RULE PART(S): Part 15.407

IC SPECIFICATION(S): RSS-210 Issue 8

MODEL NAME: SPH-L700

FCC ID: A3LSPHL700

Test Device Serial No.: EMC #4, 6 Production Pre-Production Engineering

FCC CLASSIFICATION: Unlicensed National Information Infrastructure (UNII)

DATE(S) OF TEST: 01/26/12 - 01/31/12



TEST REPORT S/N: 0Y1201230113.A3L

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) 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 (2451A-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 (2451A-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: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 3 of 66

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 in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. 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 on January 28, 2009.

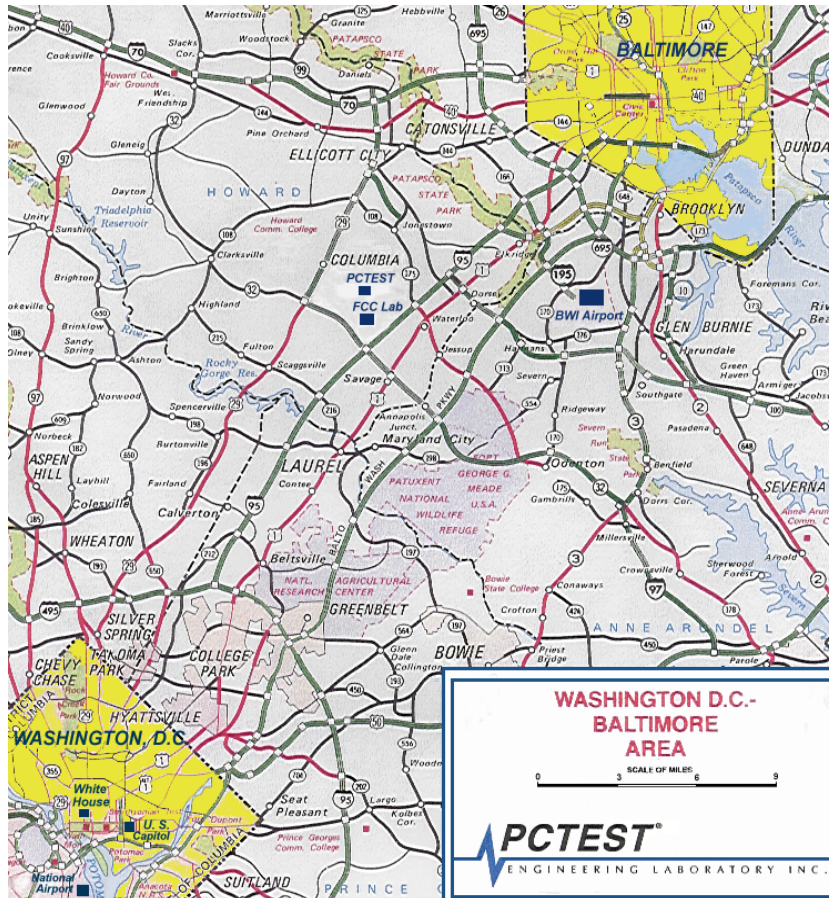


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 4 of 66

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSPHL700**. The EUT consisted of the following component(s):

Manufacturer / Model	FCC ID	Description
Samsung / Model: SPH-L700	A3LSPHL700	Portable Handset

Table 2-1. EUT Equipment Description

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO (BC0, BC1, BC10), Band 25 LTE, 802.11a/b/g/n WLAN, 802.11a/n UNII, Bluetooth, NFC

2.3 EMI Suppression Device(s)/Modifications



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

2.4 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: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 5 of 66	

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) were used in the measurement of **Samsung Portable Handset FCC ID: A3LSPHL700**.

Deviation from measurement procedure.....None

3.2 Conducted Emissions

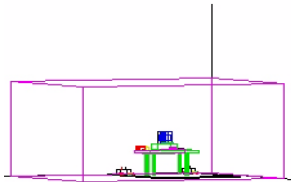


Figure 3-1. Shielded Enclosure Line-Conducted Test Facility

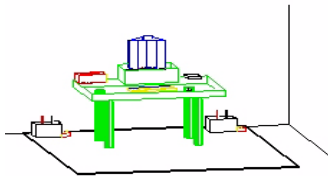


Figure 3-2. Line Conducted Emission Test Set-Up

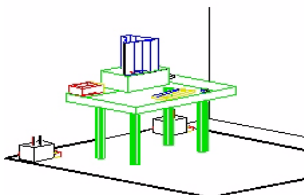


Figure 3-3. Wooden Table & Bonded LISNs

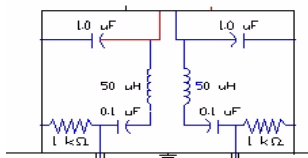


Figure 3-4. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure, manufactured by Ray Proof Series 81 (see Figure 3-1). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the sidewall of the shielded room (see Figure 3-2). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (see Figure 3-3). The EUT is powered from the Solar LISN and the support equipment is powered from the EMCO LISN. Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filter (100dB 14Hz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with an inner diameter of ½". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the Solar LISN. The LISN schematic diagram is shown (see Figure 3-4). All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion). 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 RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to CISPR quasi-peak and average mode. The bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator.

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 6 of 66

3.3 Radiated Emissions

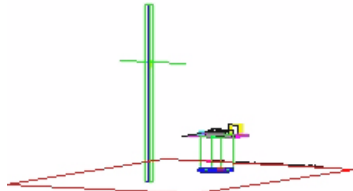


Figure 3-5. 3-Meter Test Site

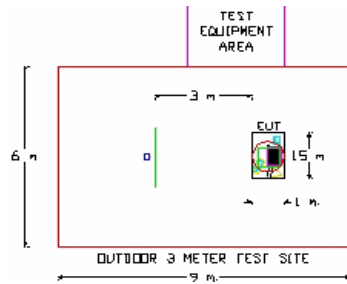


Figure 3-6. Dimensions of Outdoor Test Site

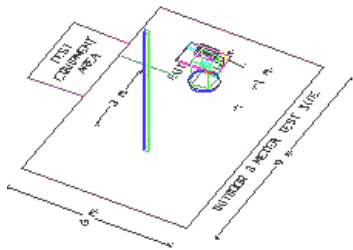


Figure 3-7. Turntable and System Setup

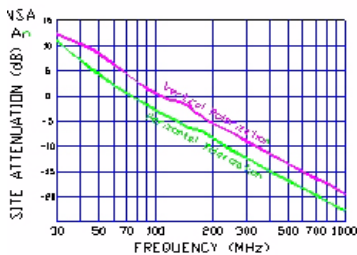


Figure 3-8. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1-meter using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, and turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using a bi-conical antenna and from 200 to 1000 MHz using a log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using Roberts™ Dipole antennas or horn antennas (see Figure 3-5). The test equipment was placed on a wooden and plastic bench situated on a 1.5m x 2m area adjacent to the measurement area (see Figure 3-6). 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 detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 100kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. Above 1GHz the detector function was set to average mode (RBW = 1MHz, VBW = 10Hz).

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 3-7). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated 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 exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-8.

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 7 of 66

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 **Samsung Portable Handset FCC ID: A3LSPHL700** unit complies with the requirement of §15.203.

Band 1		Band 2		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5180	52	5260	100	5500
:	:	:	:	:	:
42	5210	56	5280	116	5580
:	:	:	:	:	:
48	5240	64	5320	140	5700

Table 4-1. 802.11a Frequency / Channel Operations

Band 1		Band 2		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5180	52	5260	100	5500
:	:	:	:	:	:
42	5210	56	5280	116	5580
:	:	:	:	:	:
48	5240	64	5320	140	5700

Table 4-2. 802.11n Frequency / Channel Operations



FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 8 of 66

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
-	No.165	(30MHz - 1000MHz) RG58 Coax Cable	N/A		N/A	N/A
-	RE1	Radiated Emissions Cable Set	6/7/2011	Annual	6/7/2012	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/8/2011	Annual	2/8/2012	3008A00985
Agilent	N9020A	MXA Signal Analyzer	10/10/2011	Annual	10/10/2012	US46470561
Agilent	N9038A	MXE EMI Receiver	8/5/2011	Annual	8/5/2012	MY51210133
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Emco	3115	Horn Antenna (1-18GHz)	1/12/2012	Biennial	1/12/2014	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	1/20/2012	Triennial	1/20/2015	9203-2178
Rohde & Schwarz	RS-PR18	1-18 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100071
Rohde & Schwarz	RS-PR26	18-26.5 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	4/27/2011	Annual	4/27/2012	100342
Solar Electronics	8012-50-R-24-BNC	LISN	6/23/2011	Biennial	6/23/2013	310233

Table 5-1. Annual Test Equipment Calibration Schedule

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 9 of 66

6.0 TEST RESULTS

6.1 Summary



Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSPHL700
 Method/System: Unlicensed National Information Infrastructure (UNII)
 Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (n – 20MHz)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)						
N/A	RSS-210 [A9.2]	26dB Bandwidth [FCC] Occupied Bandwidth [IC]	N/A	CONDUCTED	PASS	Section 6.2
15.407 (a)(1)	RSS-210 [A9.2]	Maximum Conducted Output Power	< 4 + 10log ₁₀ (BW) dBm (5150-5250MHz) [FCC] < 10 + 10log ₁₀ (BW) dBm (5150-5250MHz) [IC] < 11 + 10log ₁₀ (B) dBm (5250-5350MHz) < 11 + 10log ₁₀ (B) dBm (5470 – 5725MHz)		PASS	Section 6.3
15.407 (a)(1), (5)	RSS-210 [A9.2]	Peak Power Spectral Density	< 4 dBm/MHz (5150-5250) [FCC] < 10dBm/MHz (5150-5250) [IC] < 11dBm/MHz (5250-5350) < 11dBm/MHz (5470-5725)		PASS	Section 6.4
15.407(a)(6)	N/A	Peak Excursion	< 13 dB/MHz maximum difference		PASS	Section 6.5
15.407(g)	N/A	Frequency Stability	N/A		PASS	Section 6.6
15.407(b)(1), (2),(3)	RSS-210 [A9.2]	Undesirable Emissions	< -27 dBm/MHz EIRP (5150-5350MHz, 5470-5725MHz)		RADIATED	PASS
15.407(h)	RSS-210 [A9.3]	Dynamic Frequency Selection	See DFS Test Report	PASS		See DFS Test Report
15.205, 15.407(b)(1), (5), (6)	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-210 table 3 limits)	PASS		Section 6.8
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits or < RSS-Gen table 2 limits	LINE CONDUCTED	PASS	Section 6.9
RECEIVER MODE (RX) / DIGITAL EMISSIONS						
15.107	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits or < RSS-Gen table 2 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 or < RSS-210 table 3 limits	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Part 15B Test Report

Table 6-1. Summary of Test Results

NOTE:

All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 10 of 66	

6.2 26dB Bandwidth Measurement – 802.11a/n

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. **The 26dB bandwidth is used to determine the conducted power limits.**

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
Band I	5180	36	a	6	18.480
	5200	40	a	6	18.240
	5240	48	a	6	18.690
	5180	36	n	6.5/7.2 (MCS0)	18.950
	5200	40	n	6.5/7.2 (MCS0)	19.010
	5240	48	n	6.5/7.2 (MCS0)	18.910
Band II	5260	52	a	6	18.330
	5280	56	a	6	18.630
	5320	64	a	6	18.490
	5260	52	n	6.5/7.2 (MCS0)	18.980
	5280	56	n	6.5/7.2 (MCS0)	18.970
	5320	64	n	6.5/7.2 (MCS0)	18.940
Band III	5500	100	a	6	18.150
	5580	116	a	6	18.450
	5700	140	a	6	18.180
	5500	100	n	6.5/7.2 (MCS0)	18.950
	5580	116	n	6.5/7.2 (MCS0)	18.940
	5700	140	n	6.5/7.2 (MCS0)	18.880

Table 6-2. Conducted Bandwidth Measurements

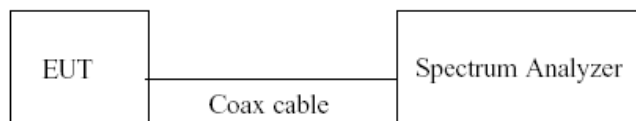


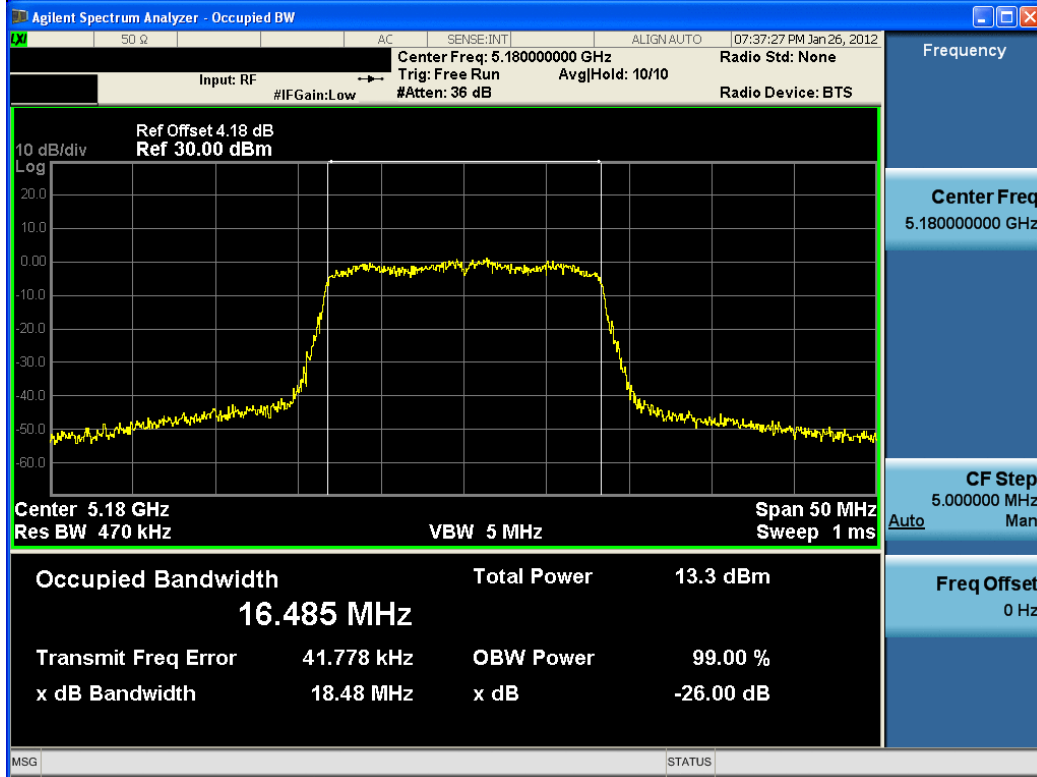
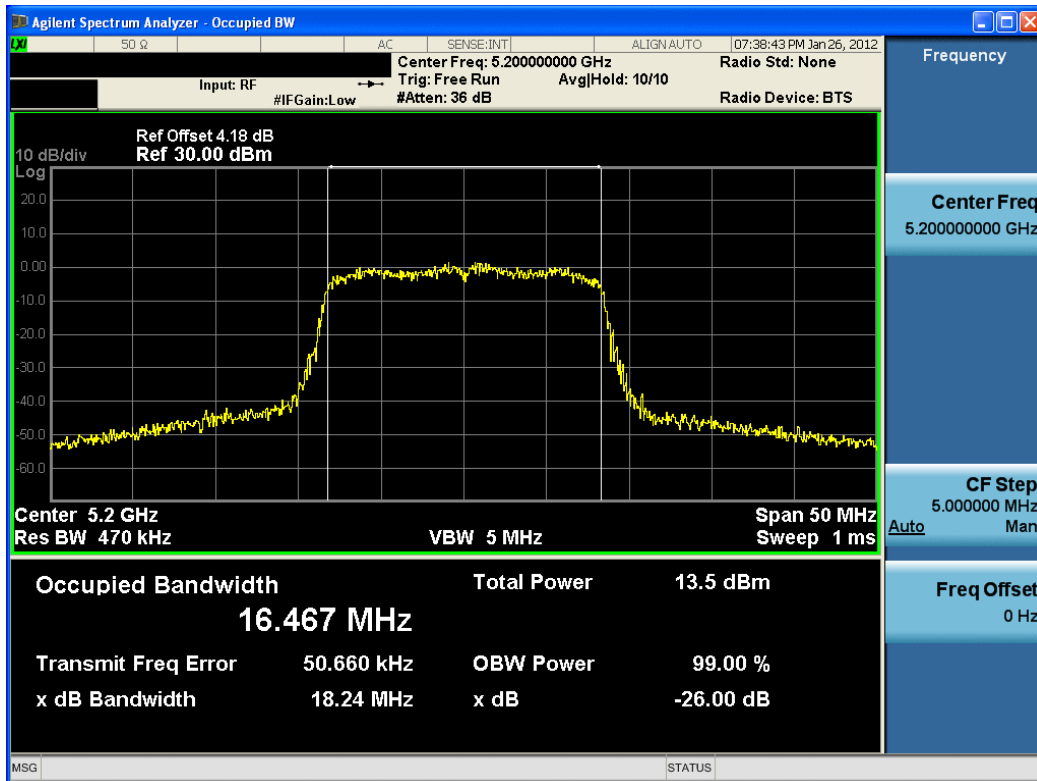


Figure 6-1. Test Instrument & Measurement Setup

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 11 of 66

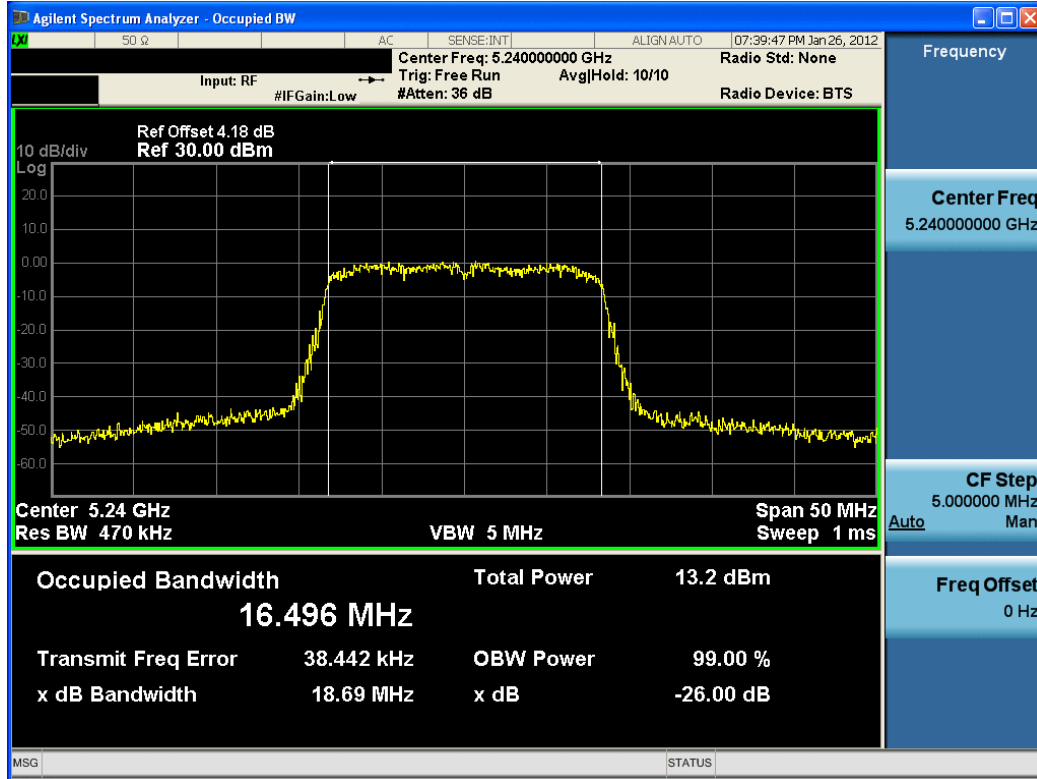


Plot 6-1. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 36)

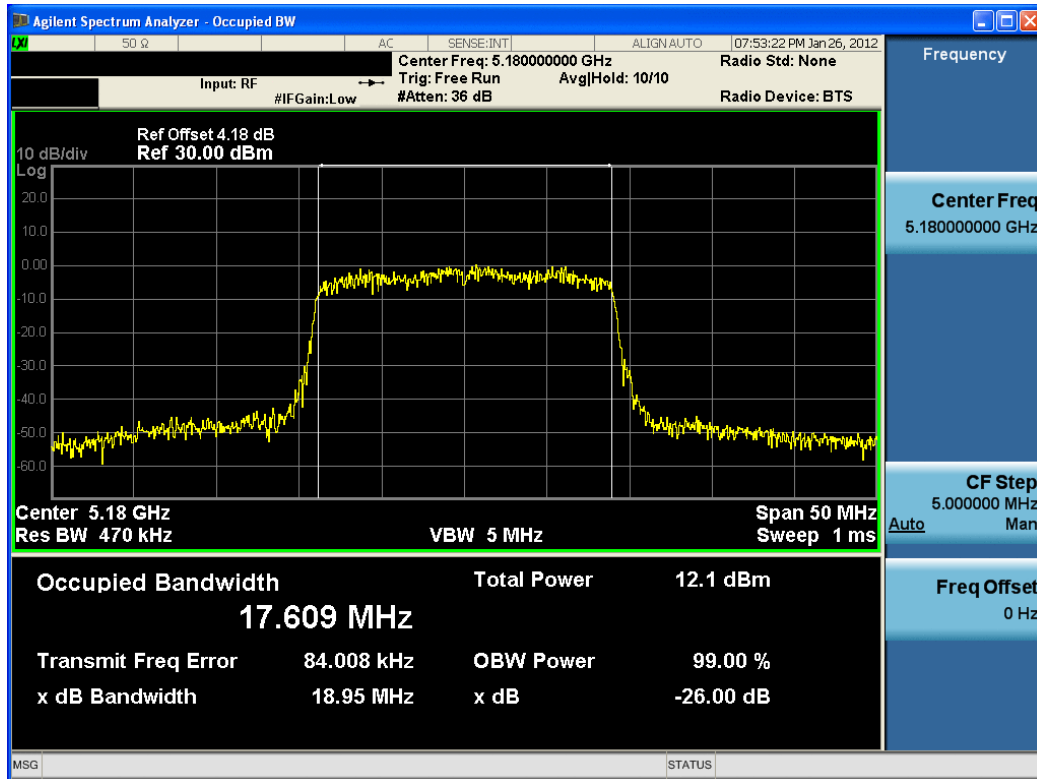


Plot 6-2. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 12 of 66

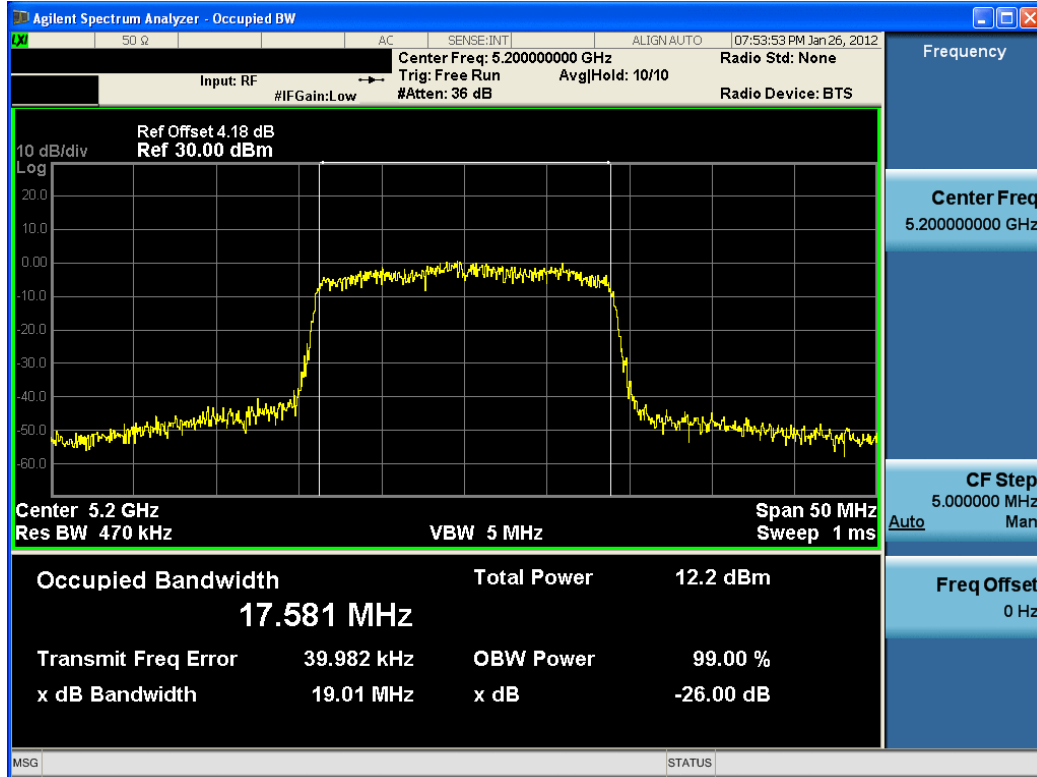


Plot 6-3. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 48)

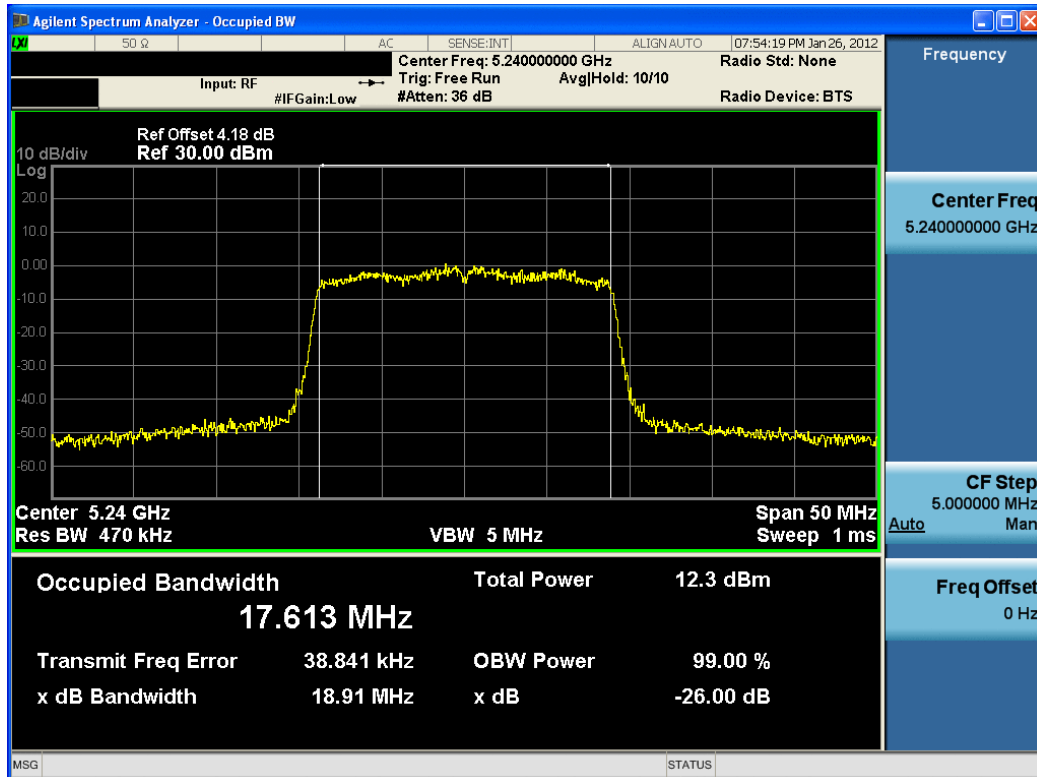


Plot 6-4. 26dB Bandwidth Plot (802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 13 of 66

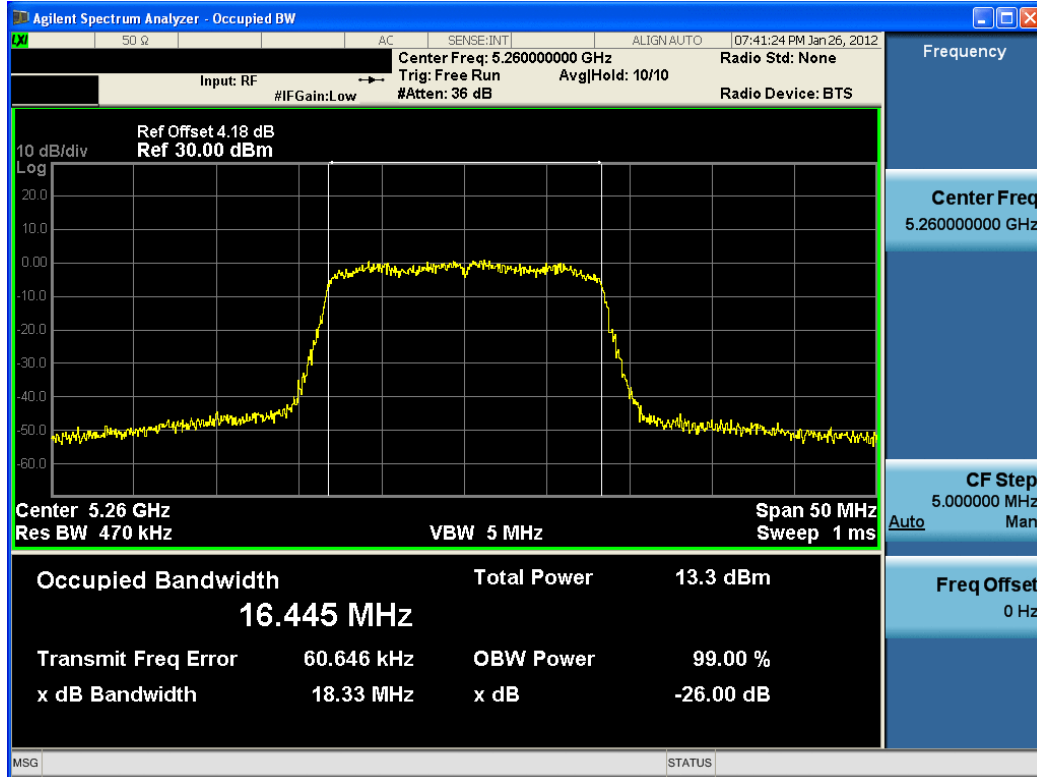


Plot 6-5. 26dB Bandwidth Plot (802.11n (UNII Band 1) – Ch. 40)

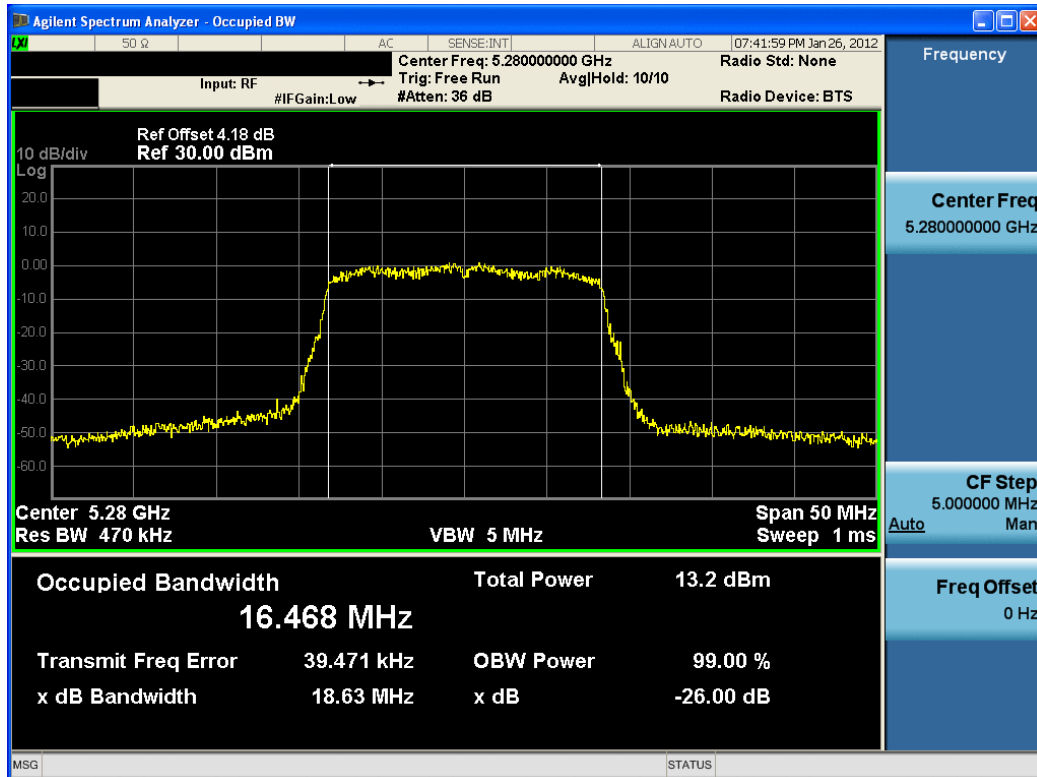


Plot 6-6. 26dB Bandwidth Plot (802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 14 of 66

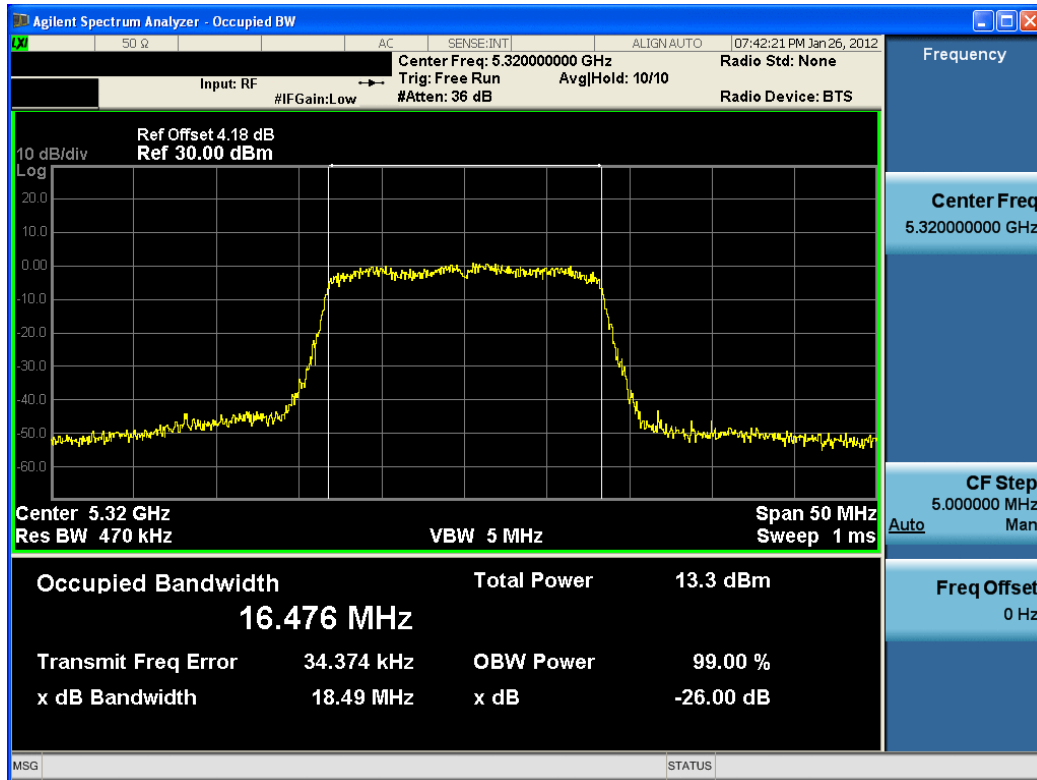


Plot 6-7. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 52)

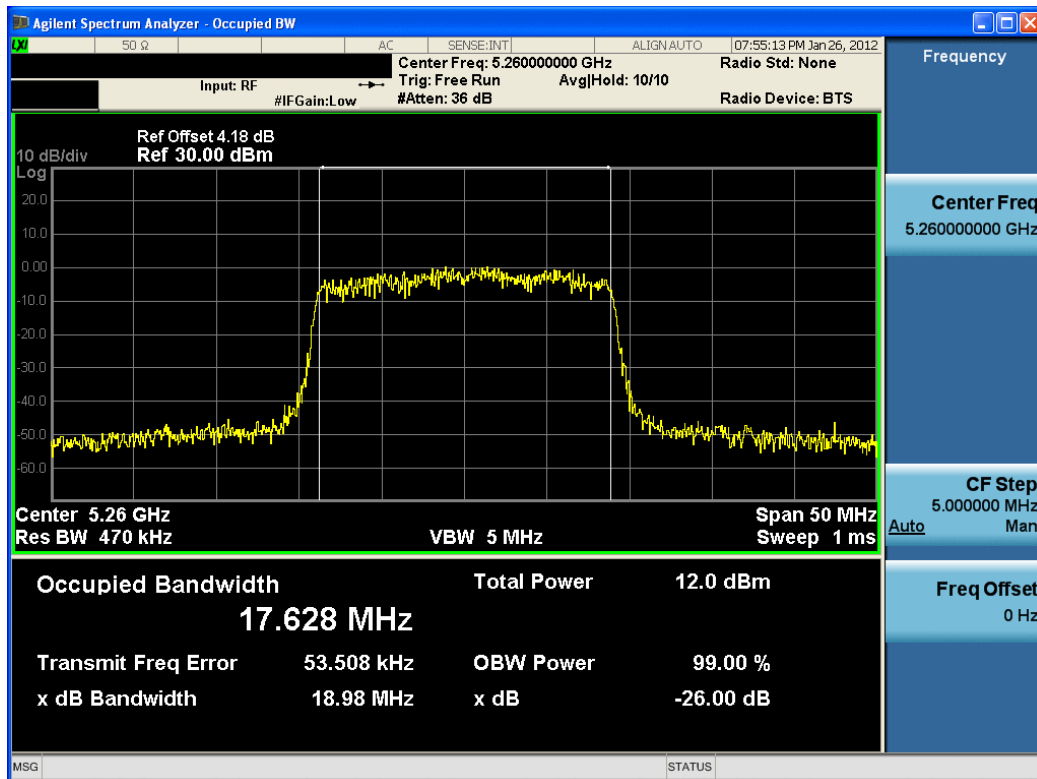


Plot 6-8. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 56)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 15 of 66

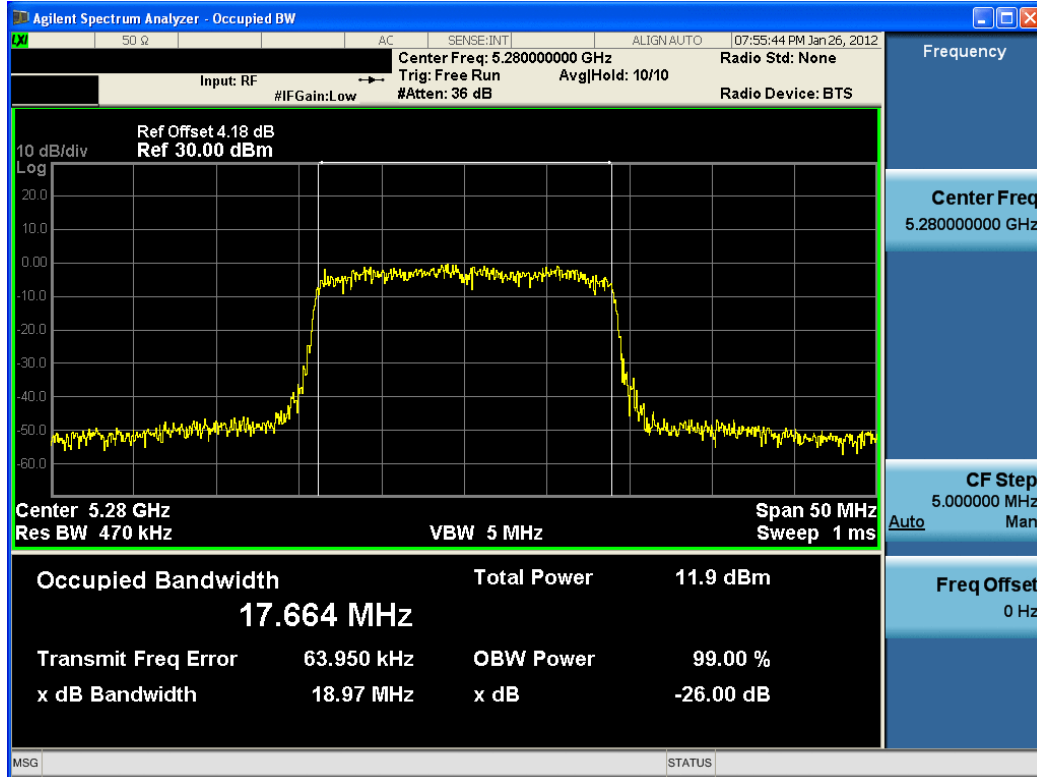


Plot 6-9. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 64)

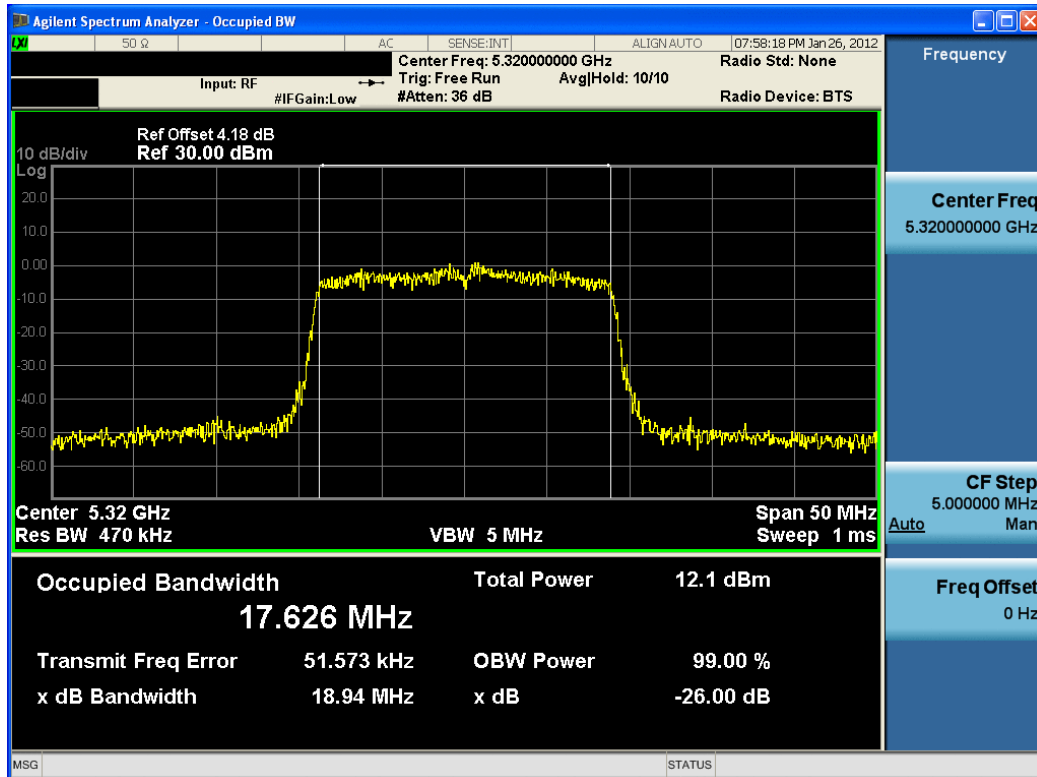


Plot 6-10. 26dB Bandwidth Plot (802.11n (UNII Band 2) – Ch. 52)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 16 of 66

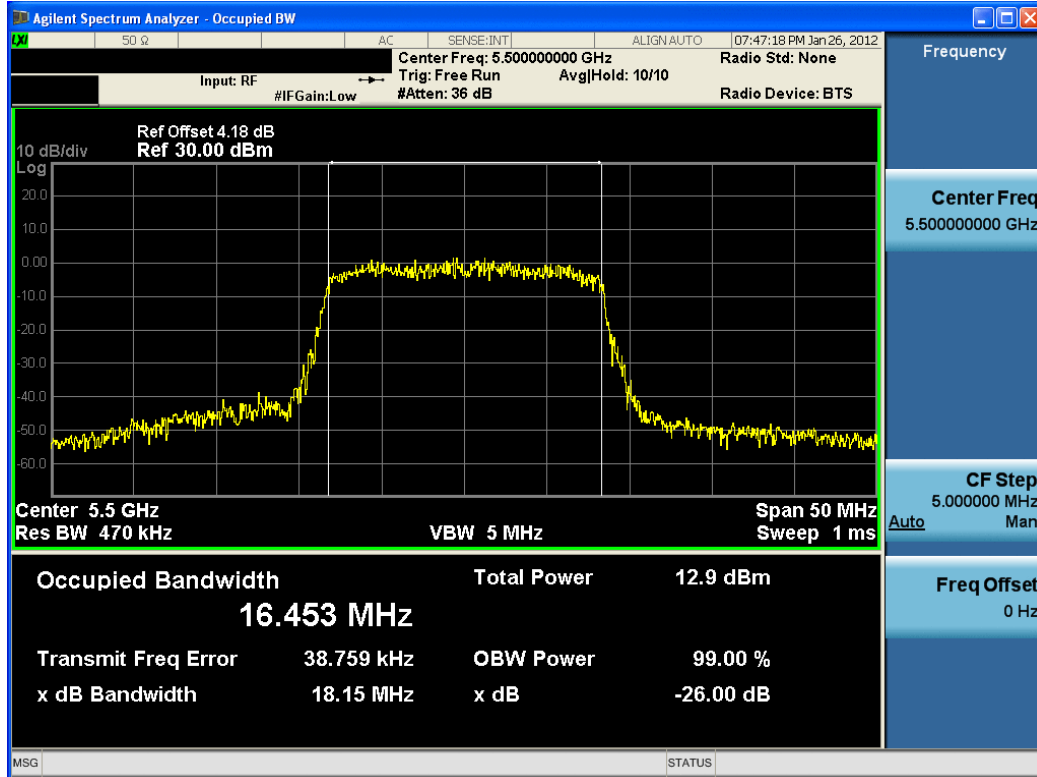


Plot 6-11. 26dB Bandwidth Plot (802.11n (UNII Band 2) – Ch. 56)

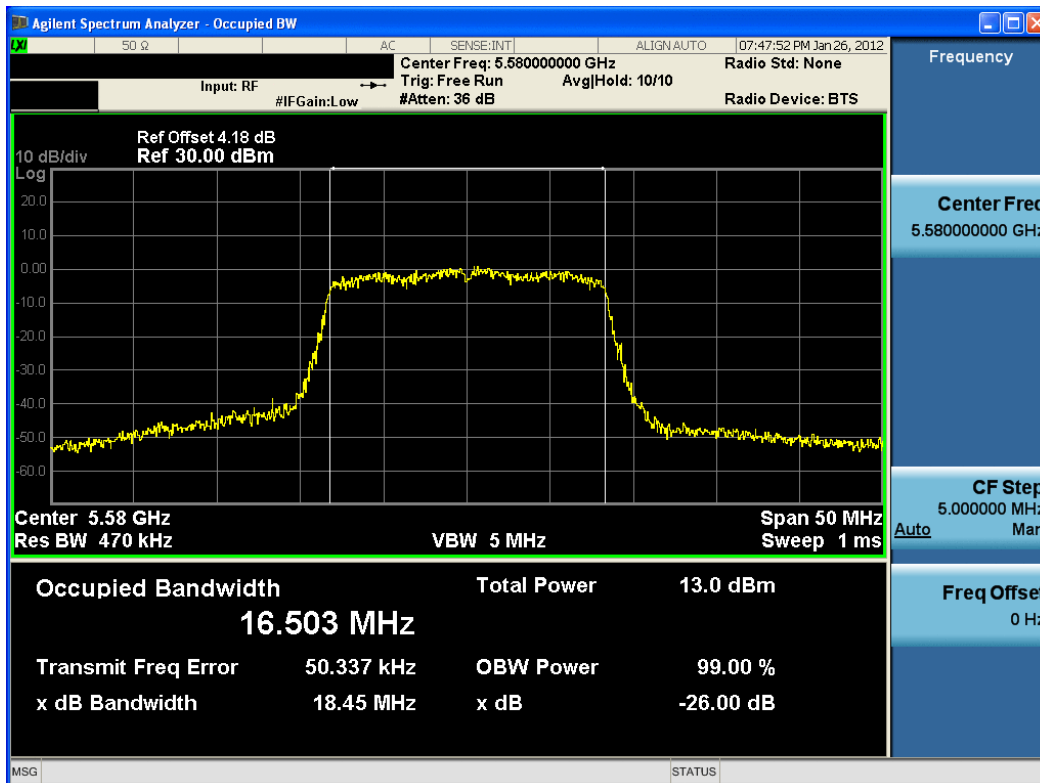


Plot 6-12. 26dB Bandwidth Plot (802.11n (UNII Band 2) – Ch. 64)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 17 of 66

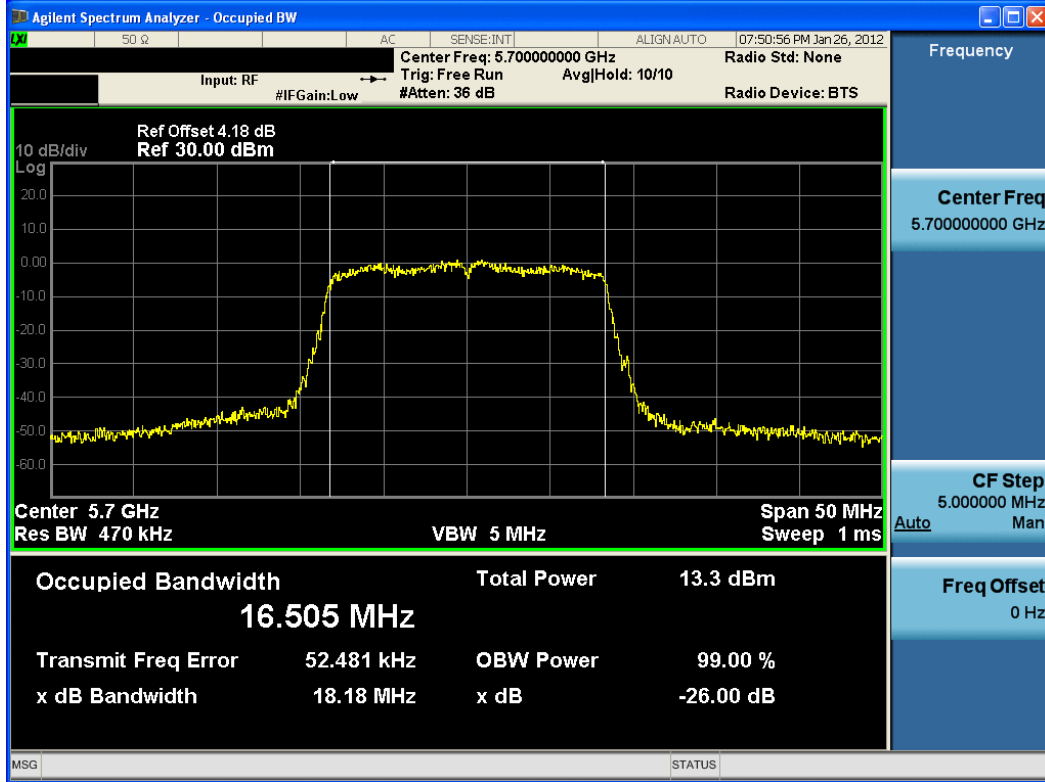


Plot 6-13. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 100)

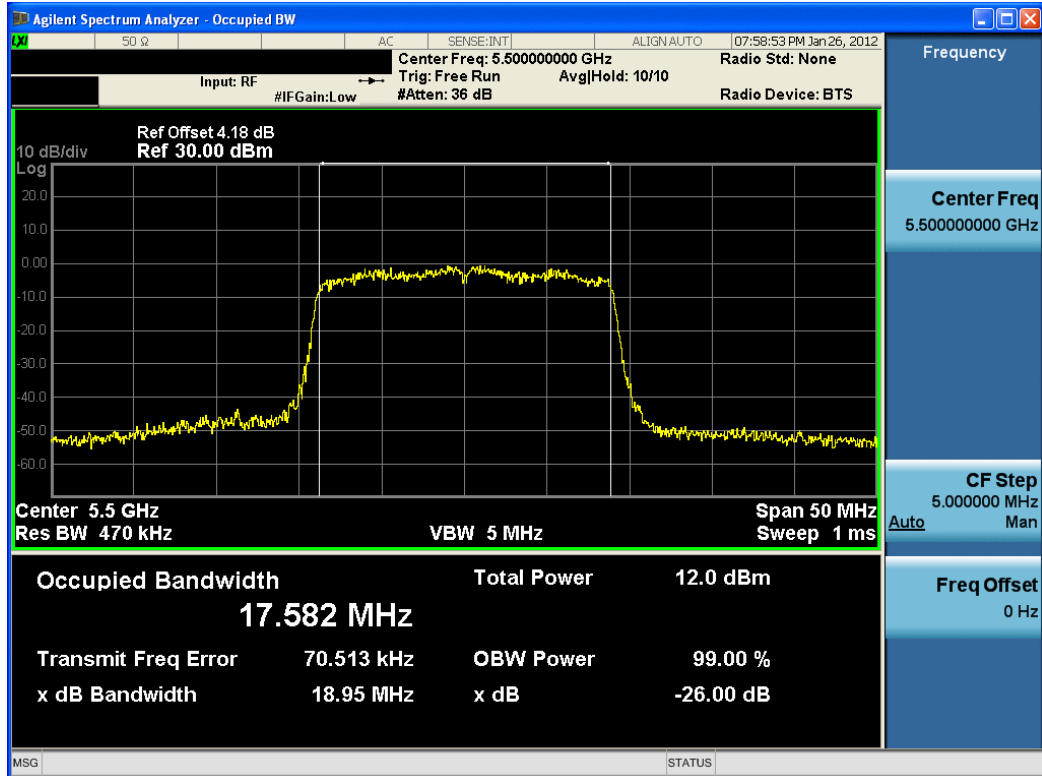


Plot 6-14. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 116)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 18 of 66

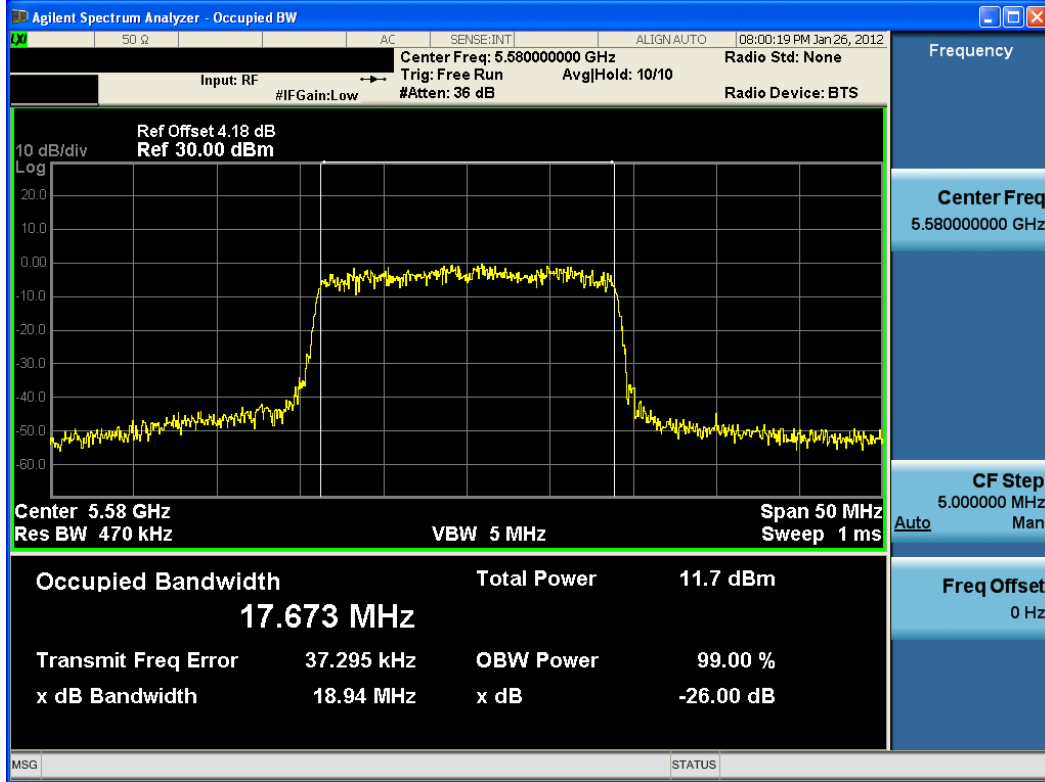


Plot 6-15. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 140)

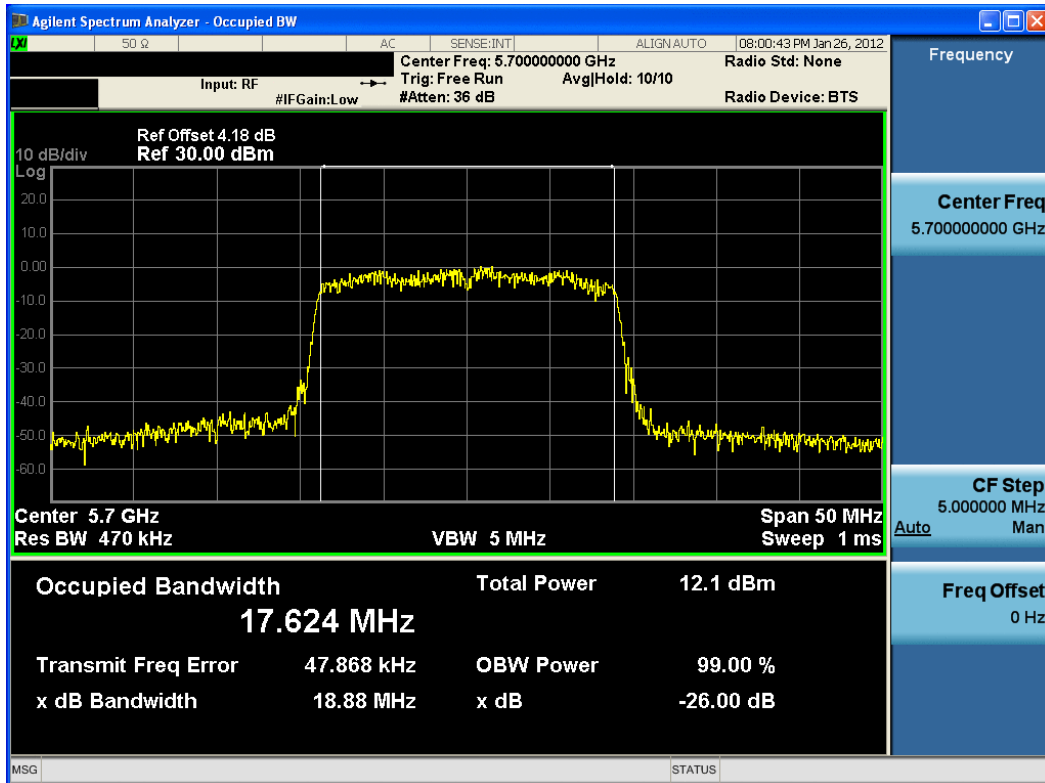


Plot 6-16. 26dB Bandwidth Plot (802.11n (UNII Band 3) – Ch. 100)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 19 of 66



Plot 6-17. 26dB Bandwidth Plot (802.11n (UNII Band 3) – Ch. 116)



Plot 6-18. 26dB Bandwidth Plot (802.11n (UNII Band 3) – Ch. 140)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 20 of 66

6.3 UNII Output Power Measurement – 802.11a/n §15.407 (a)(1); RSS-210 [A9.2]

A transmitter antenna terminal of EUT is connected to the input of a RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies.



In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is the lesser of 50mW (16.99dBm) and $4 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 4 \text{ dBm} + 10\log_{10}(18.24) = 16.61\text{dBm}$.

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(18.33) = 23.63\text{dBm}$.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(18.15) = 23.59\text{dBm}$.



Mode	Freq [MHz]	Channel	Detector	802.11a Conducted Power [dBm]							
				Data Rate [Mbps]							
				6	9	12	18	24	36	48	54
802.11a	5180	36	AVG	14.06	14.15	14.01	14.07	14.18	14.15	14.13	14.26
802.11a	5200	40	AVG	14.03	14.16	14.08	14.03	14.07	14.16	14.22	14.23
802.11a	5220	44	AVG	14.03	14.06	13.98	14.17	14.04	14.17	14.27	14.08
802.11a	5240	48	AVG	14.04	14.06	14.07	14.08	14.16	14.17	14.17	14.21
802.11a	5260	52	AVG	14.06	14.05	14.10	14.14	14.13	14.15	14.21	14.16
802.11a	5280	56	AVG	14.03	14.10	14.05	14.18	14.11	14.06	14.20	14.14
802.11a	5300	60	AVG	14.01	14.07	14.02	14.08	14.13	14.11	14.16	14.15
802.11a	5320	64	AVG	14.06	13.96	14.01	14.07	14.14	14.20	14.19	14.17
802.11a	5500	100	AVG	13.87	13.91	13.73	13.85	13.77	13.82	13.82	13.96
802.11a	5520	104	AVG	13.75	13.79	13.74	13.84	13.73	14.00	13.95	14.00
802.11a	5540	108	AVG	13.84	13.85	13.72	13.80	13.72	13.94	13.97	13.91
802.11a	5560	112	AVG	13.78	13.81	13.95	13.89	13.93	13.97	14.02	14.03
802.11a	5580	116	AVG	13.79	13.76	13.86	13.91	13.91	13.87	13.91	13.85
802.11a	5660	132	AVG	13.78	13.73	13.80	13.82	13.84	13.71	13.79	13.79
802.11a	5680	136	AVG	13.83	13.88	13.78	13.77	13.82	13.90	13.91	13.82
802.11a	5700	140	AVG	13.84	13.80	13.76	13.83	13.85	13.84	13.88	13.91

Table 6-3. UNII (802.11a) Maximum Conducted Output Power

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 21 of 66

Mode	Freq [MHz]	Channel	Detector	802.11n (5GHz) Conducted Power [dBm]								
				Data Rate [Mbps]								
				6.5/7.2	13/14.4	19.5/21.7	26/28.9	39/43.4	52/57.8	58.5/65	65/72.2	
802.11n	5180	36	AVG	12.81	12.85	12.90	12.89	12.94	12.97	13.02	13.01	
802.11n	5200	40	AVG	12.92	12.80	12.85	12.96	12.91	13.00	12.84	13.01	
802.11n	5220	44	AVG	12.84	12.85	12.90	12.85	12.96	12.96	12.88	12.98	
802.11n	5240	48	AVG	12.81	12.89	12.91	12.94	12.95	13.01	13.07	13.10	
802.11n	5260	52	AVG	12.86	12.86	12.95	13.00	12.89	13.00	13.00	13.09	
802.11n	5280	56	AVG	12.81	12.73	12.94	13.01	13.02	13.04	12.99	13.01	
802.11n	5300	60	AVG	12.93	12.92	12.83	12.84	12.94	12.94	12.98	12.91	
802.11n	5320	64	AVG	12.82	12.87	12.80	12.81	13.00	12.87	13.00	12.97	
802.11n	5500	100	AVG	12.77	12.76	12.70	12.74	12.67	12.68	12.79	12.75	
802.11n	5520	104	AVG	12.68	12.64	12.64	12.69	12.73	12.80	12.68	12.68	
802.11n	5540	108	AVG	12.59	12.59	12.66	12.71	12.72	12.79	12.80	12.74	
802.11n	5560	112	AVG	12.66	12.64	12.71	12.70	12.75	12.74	12.73	12.75	
802.11n	5580	116	AVG	12.57	12.61	12.62	12.65	12.63	12.70	12.75	12.71	
802.11n	5660	132	AVG	12.52	12.63	12.57	12.54	12.66	12.70	12.69	12.64	
802.11n	5680	136	AVG	12.56	12.46	12.57	12.55	12.69	12.74	12.74	12.72	
802.11n	5700	140	AVG	12.55	12.53	12.60	12.66	12.63	12.64	12.72	12.73	

Table 6-4. UNII (802.11n) Maximum Conducted Output Power

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 22 of 66	

6.4 Peak Power Spectral Density – 802.11a/n §15.407 (a)(1),(5)

The spectrum analyzer was connected to the antenna terminal while the EUT was operating in a continuous transmission mode at the appropriate center frequencies. **The maximum permissible peak power spectral density is 4dBm/MHz in the 5.15GHz – 5.25GHz band and 11dBm/MHz in the 5.25GHz – 5.35 GHz and 5.47 – 5.725GHz bands.**

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
Band I	5180	36	a	6	3.23	4.0	-0.77
	5200	40	a	6	3.71	4.0	-0.29
	5240	48	a	6	3.46	4.0	-0.54
	5180	36	n	6.5/7.2 (MCS0)	2.19	4.0	-1.81
	5200	40	n	6.5/7.2 (MCS0)	2.19	4.0	-1.81
	5240	48	n	6.5/7.2 (MCS0)	2.41	4.0	-1.59
Band II	5260	52	a	6	3.35	11.0	-7.65
	5280	56	a	6	3.37	11.0	-7.63
	5320	64	a	6	3.61	11.0	-7.39
	5260	52	n	6.5/7.2 (MCS0)	2.21	11.0	-8.79
	5280	56	n	6.5/7.2 (MCS0)	2.17	11.0	-8.84
	5320	64	n	6.5/7.2 (MCS0)	2.67	11.0	-8.34
Band III	5500	100	a	6	3.21	11.0	-7.79
	5580	116	a	6	3.54	11.0	-7.46
	5700	140	a	6	3.59	11.0	-7.41
	5500	100	n	6.5/7.2 (MCS0)	1.82	11.0	-9.18
	5580	116	n	6.5/7.2 (MCS0)	2.21	11.0	-8.79
	5700	140	n	6.5/7.2 (MCS0)	2.45	11.0	-8.55

Table 6-5. Conducted Power Spectral Density Measurements

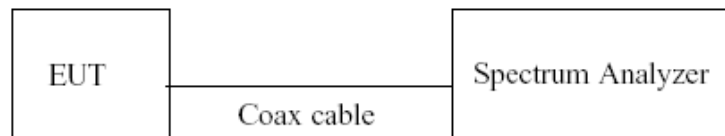


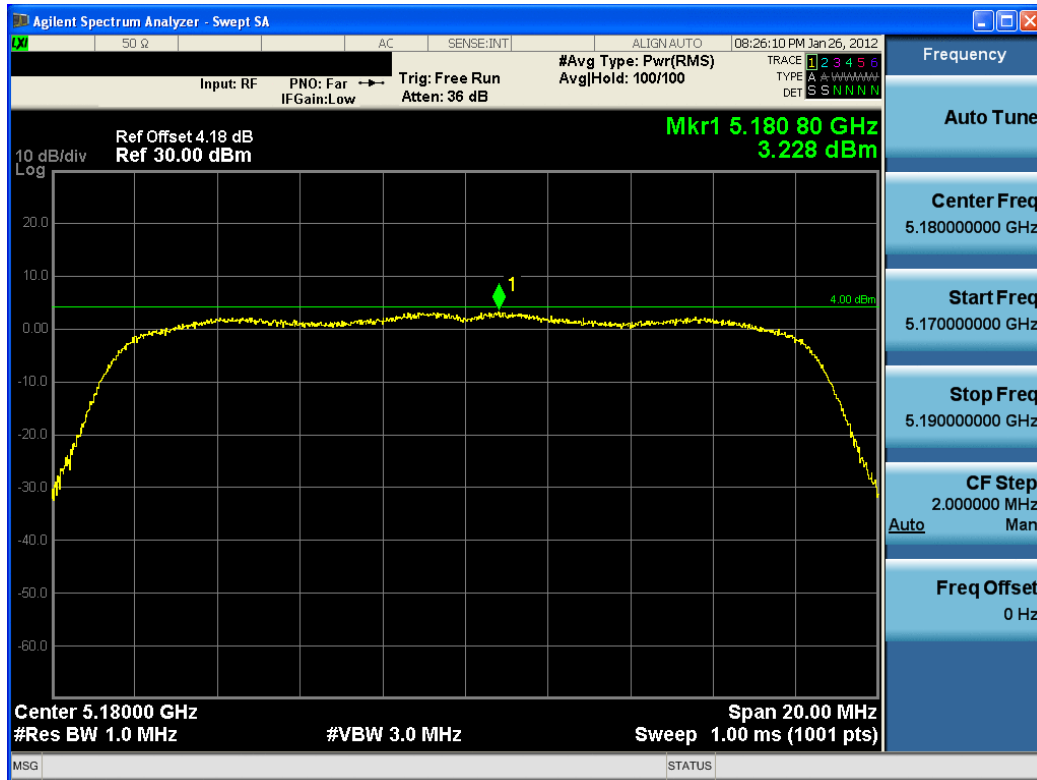
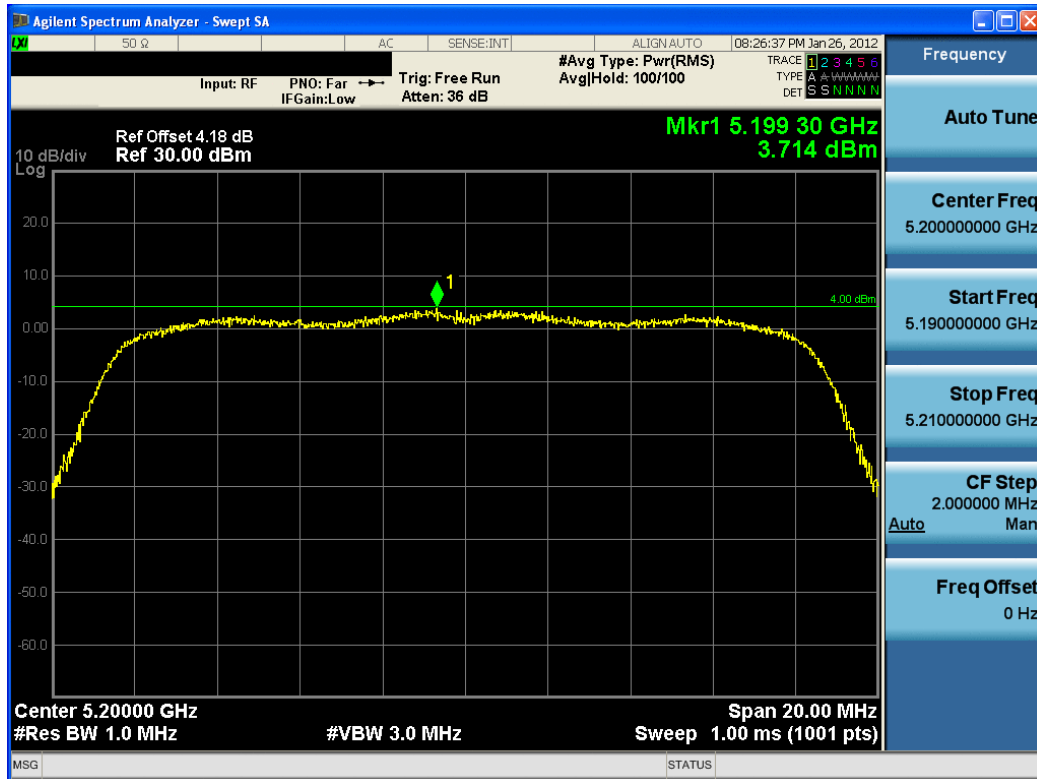


Figure 6-2. Test Instrument & Measurement Setup

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 23 of 66

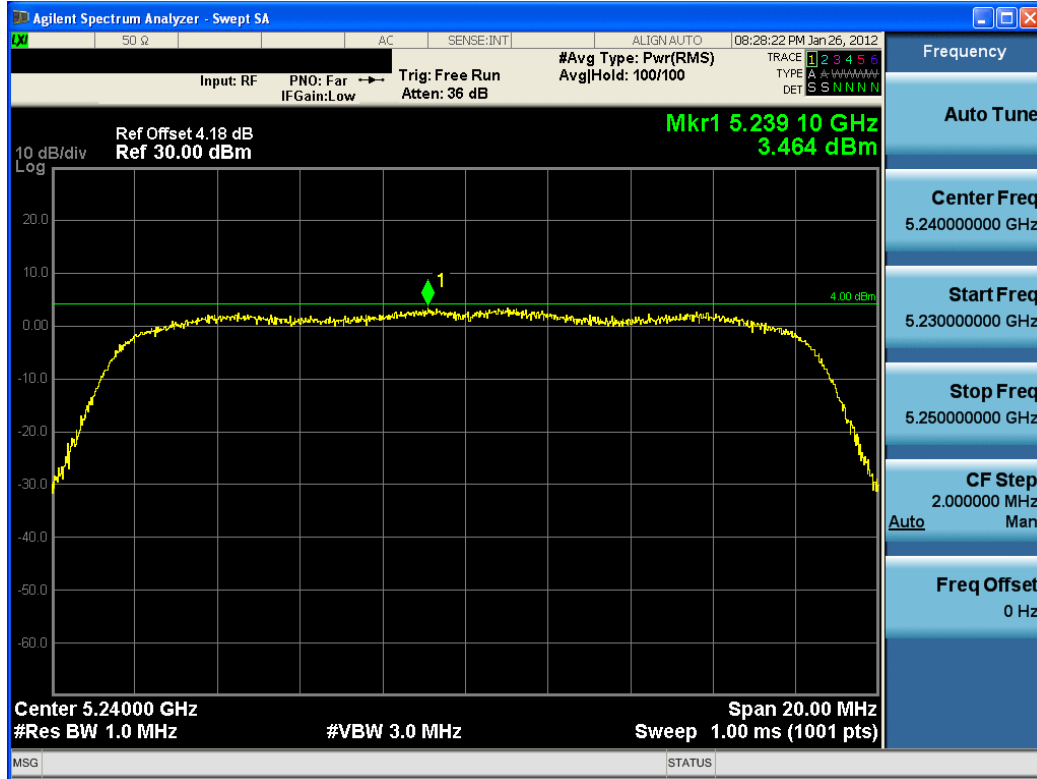


Plot 6-19. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

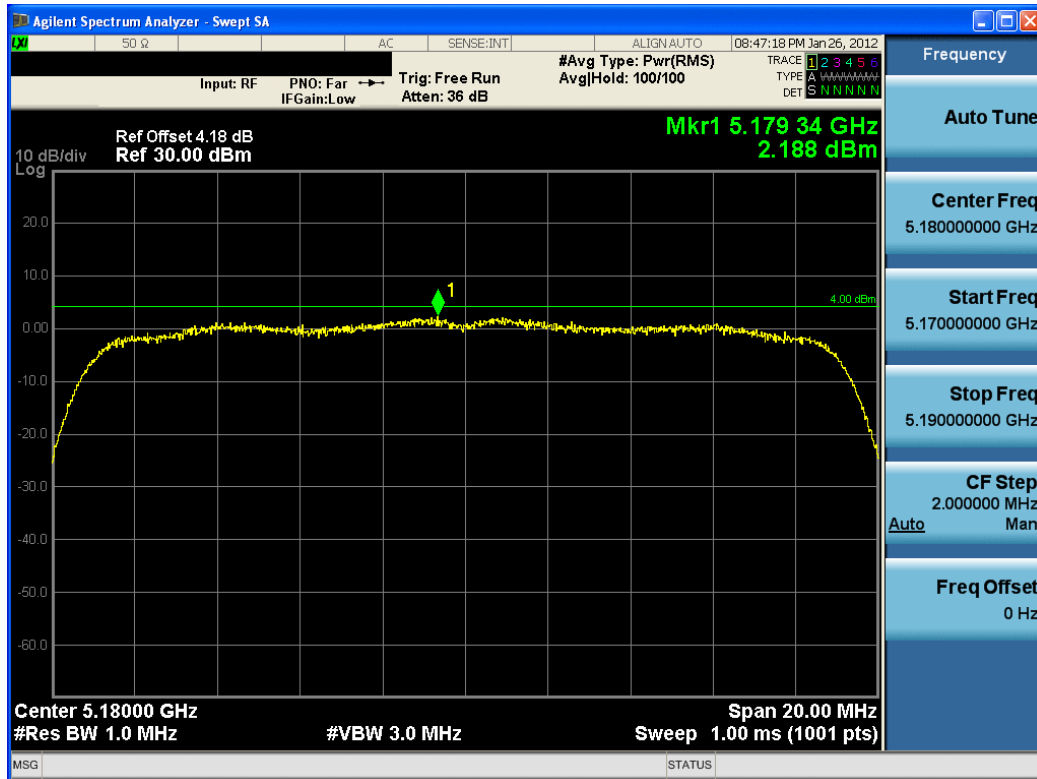


Plot 6-20. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 24 of 66

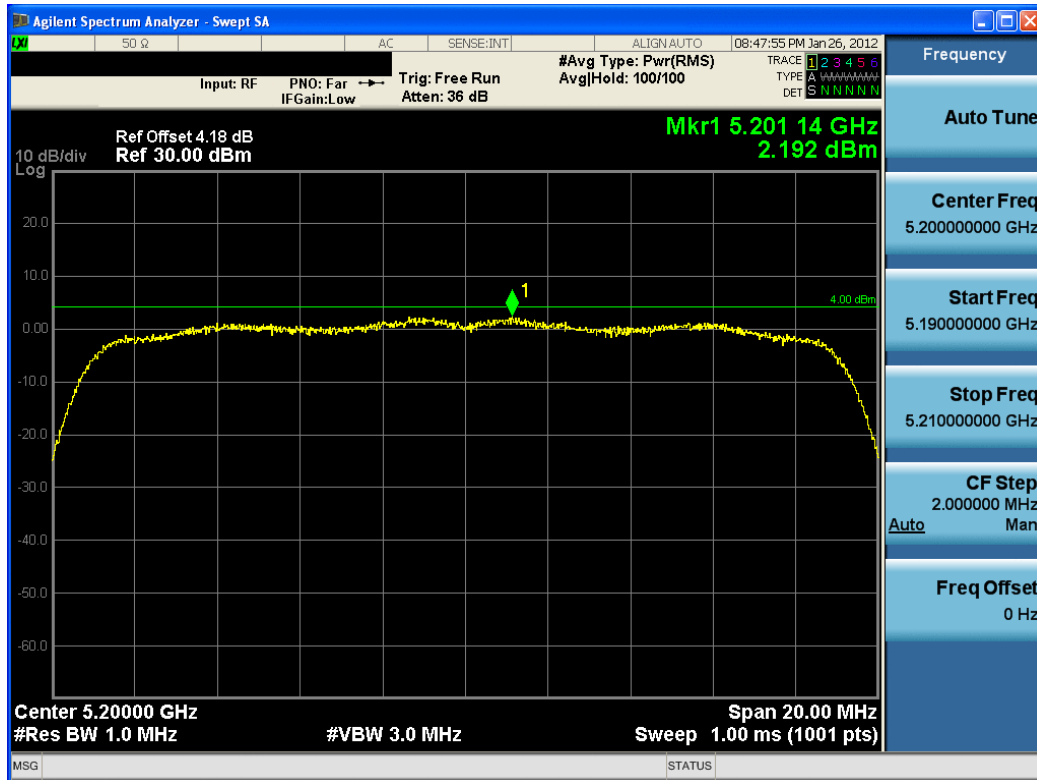


Plot 6-21. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

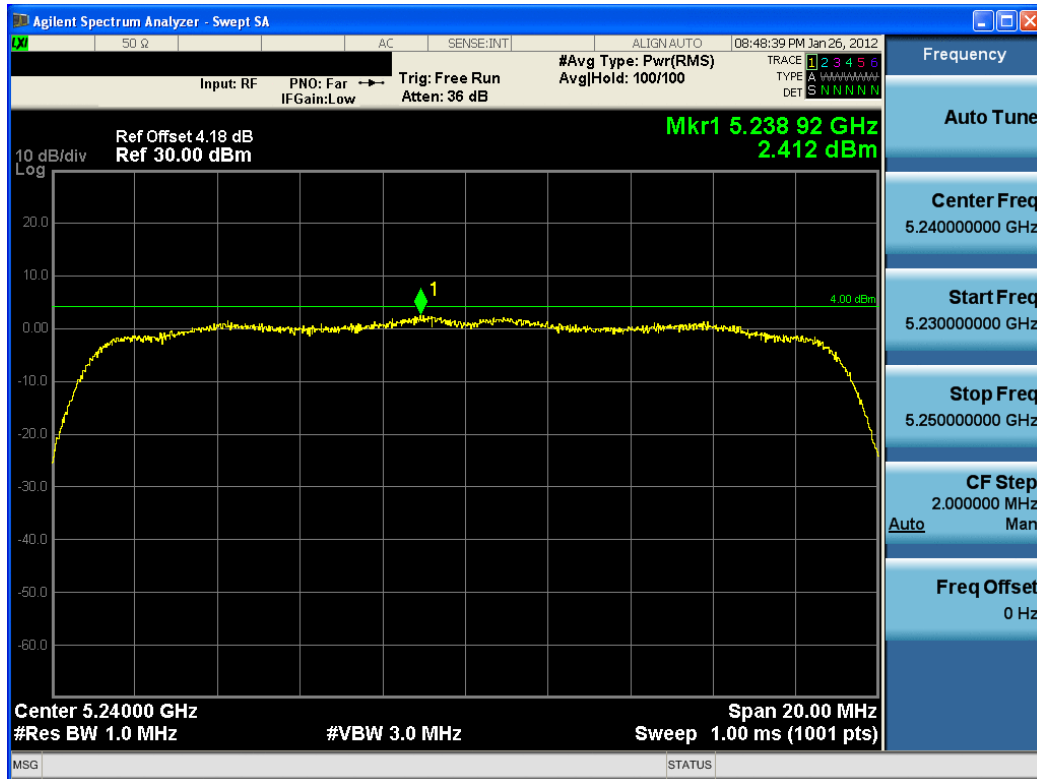


Plot 6-22. Peak Power Spectral Density Plot (802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 25 of 66

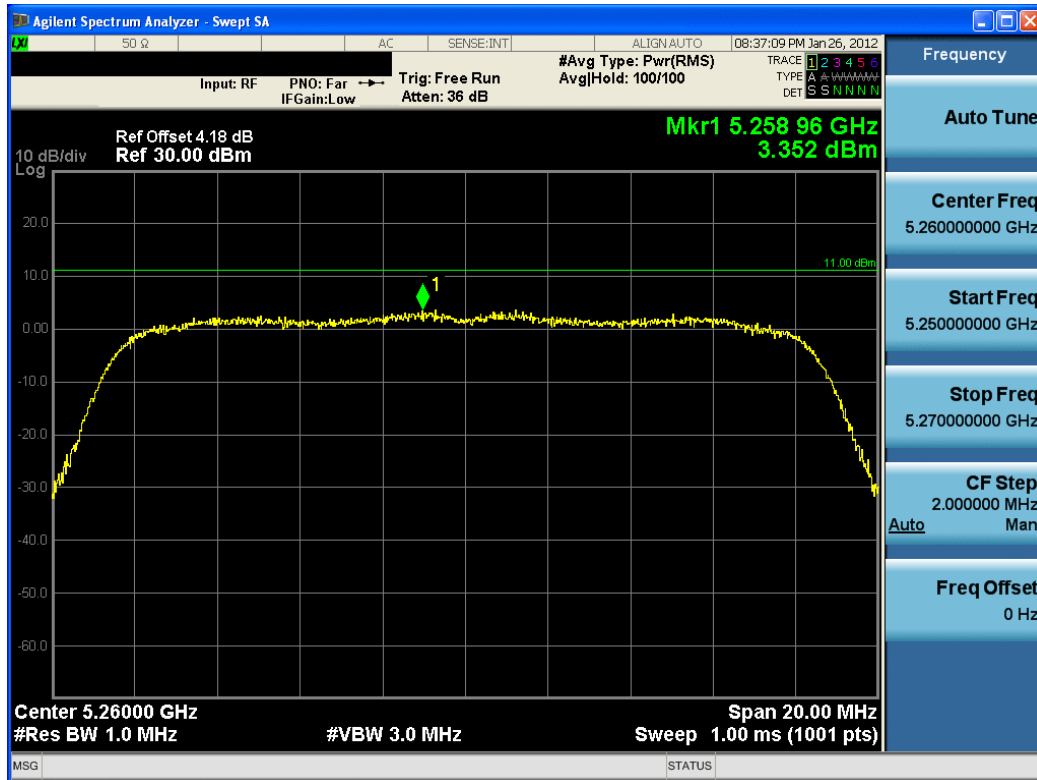


Plot 6-23. Peak Power Spectral Density Plot (802.11n (UNII Band 1) – Ch. 40)

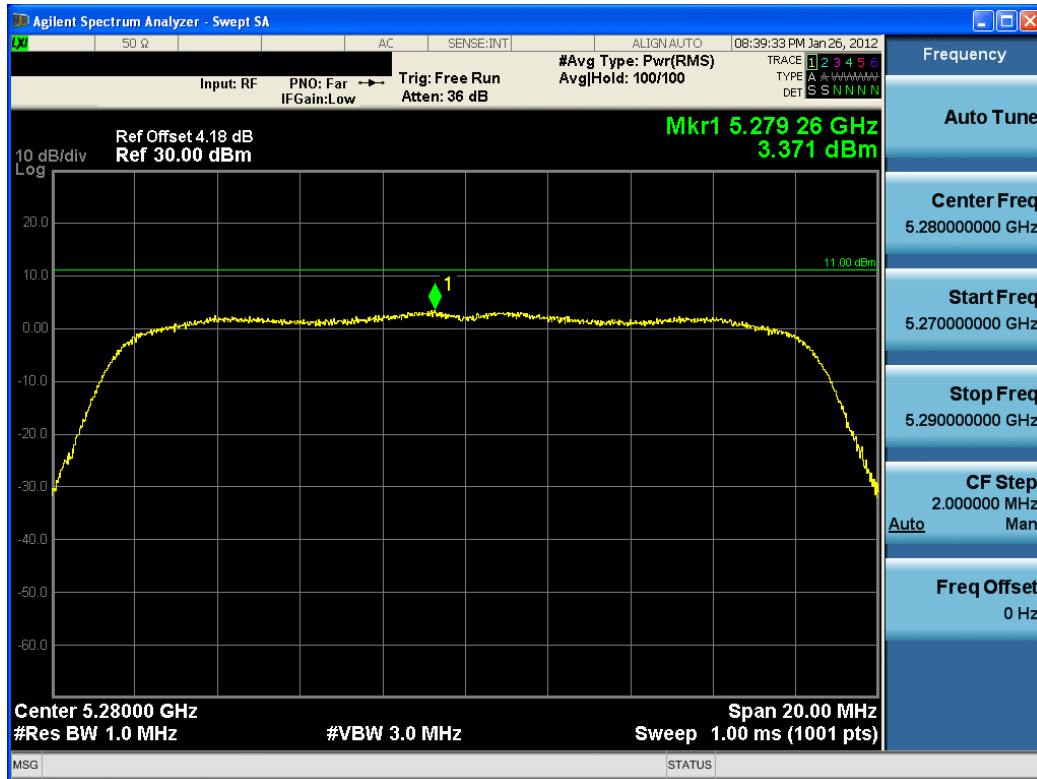


Plot 6-24. Peak Power Spectral Density Plot (802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 26 of 66

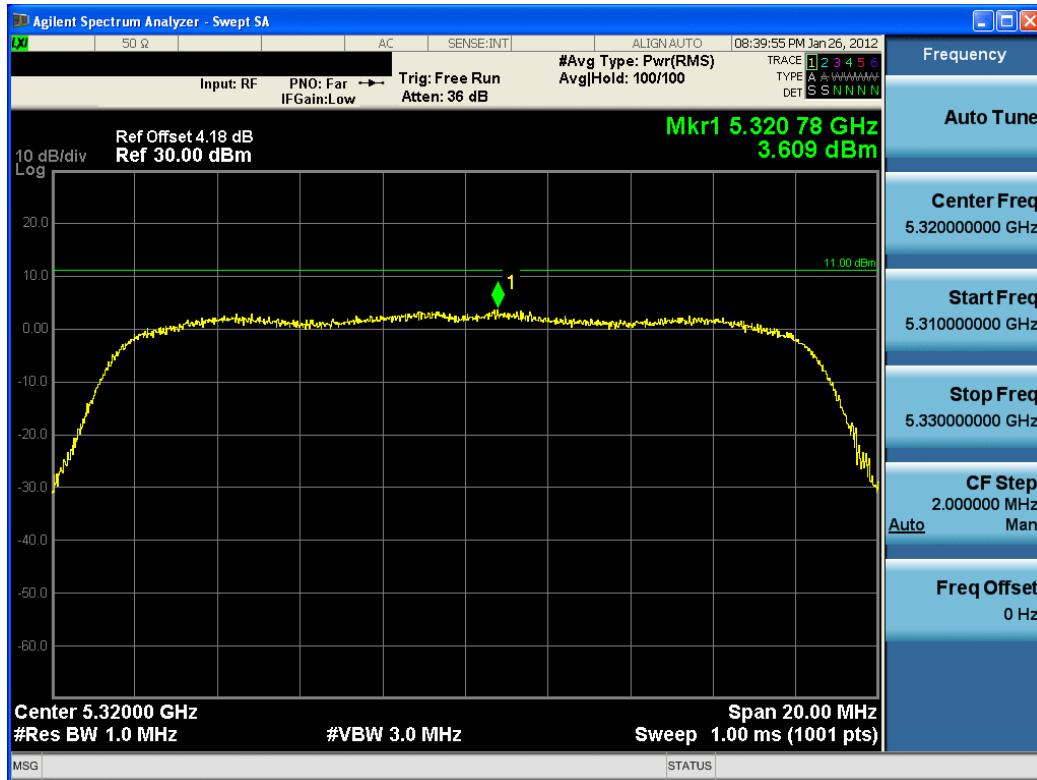


Plot 6-25. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 52)

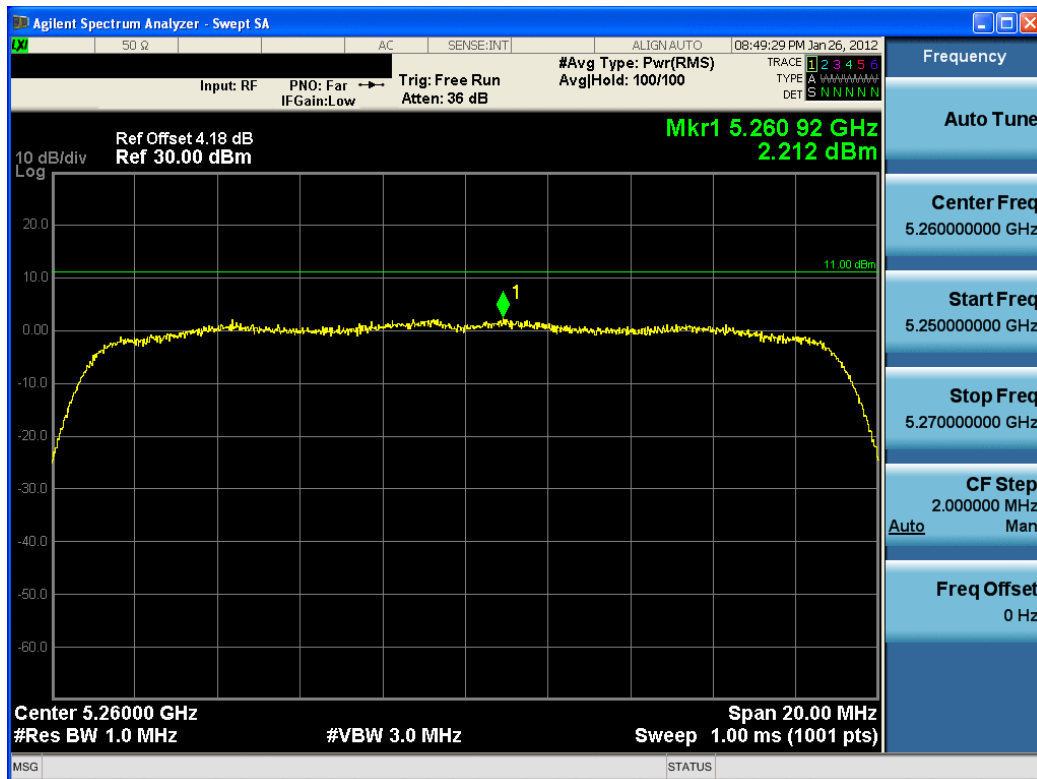


Plot 6-26. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 56)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 27 of 66

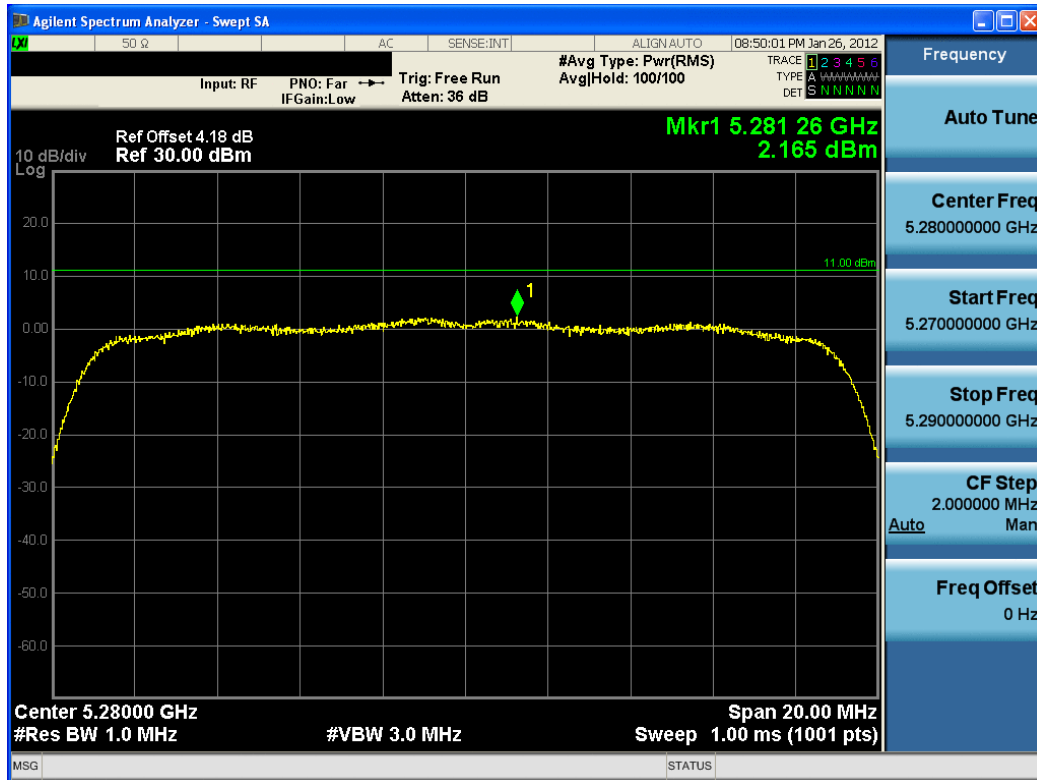


Plot 6-27. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 64)

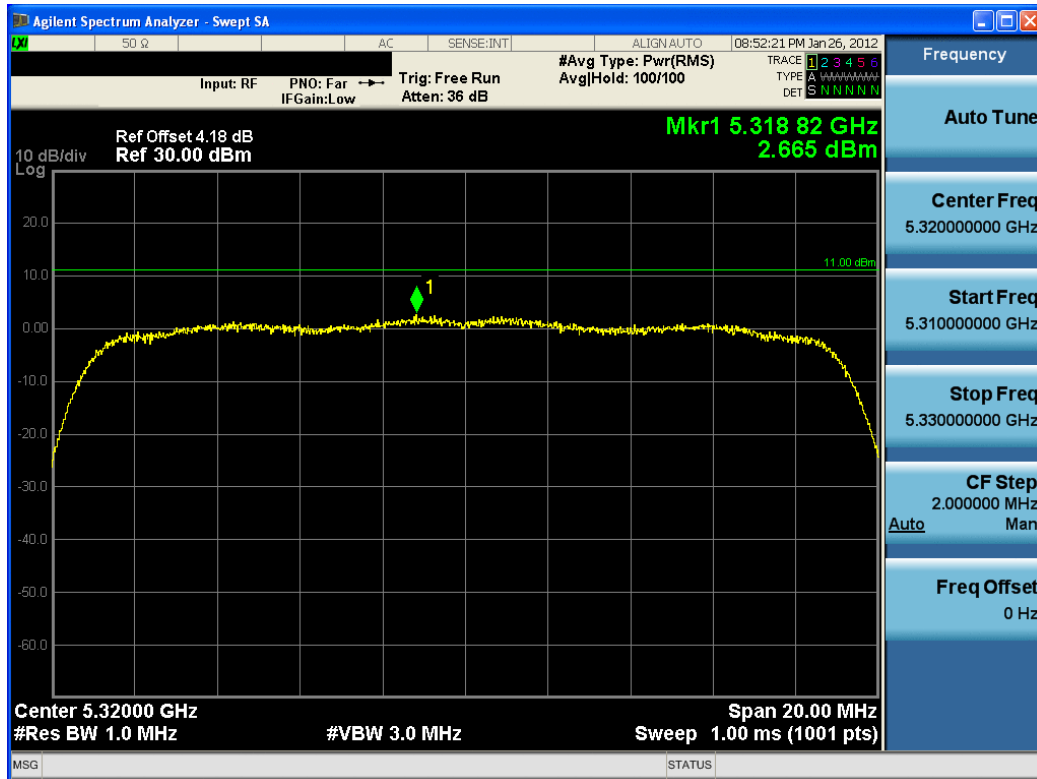


Plot 6-28. Peak Power Spectral Density Plot (802.11n (UNII Band 2) – Ch. 52)



FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 28 of 66

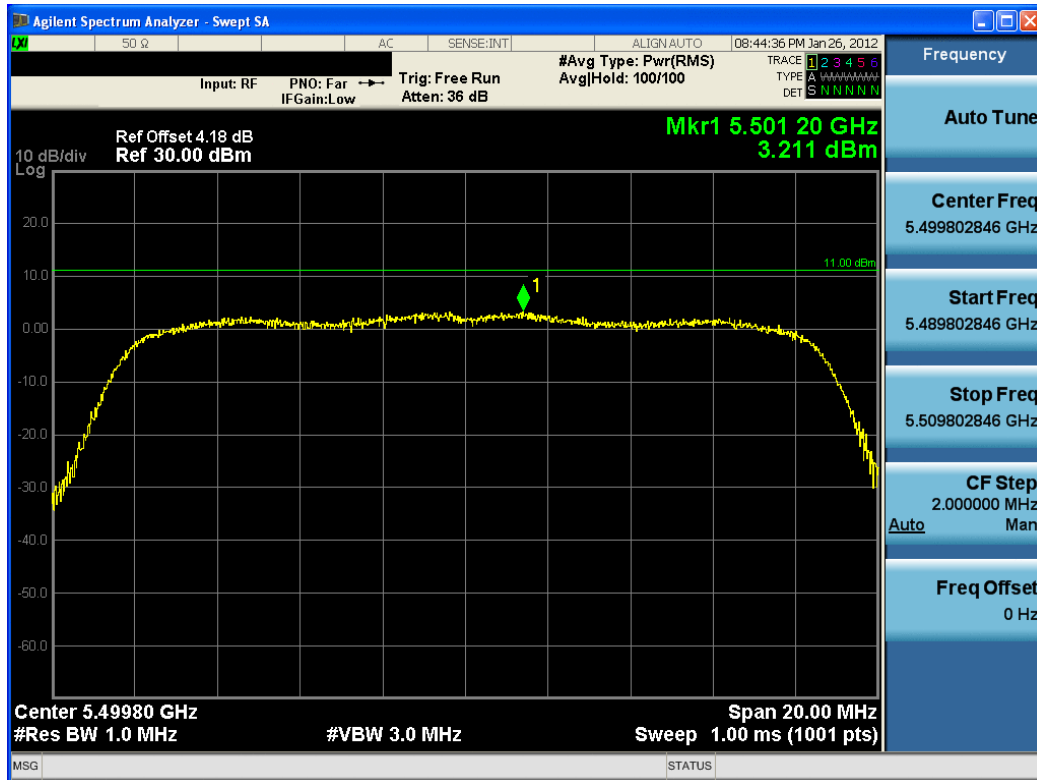


Plot 6-29. Peak Power Spectral Density Plot (802.11n (UNII Band 2) – Ch. 56)

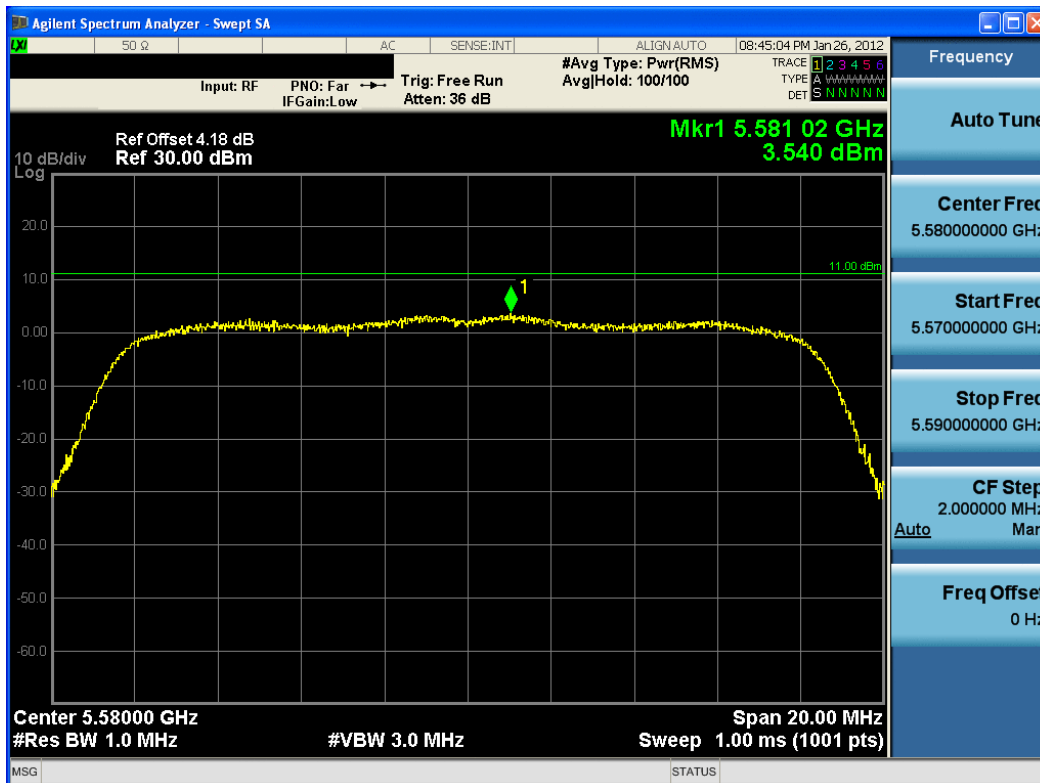


Plot 6-30. Peak Power Spectral Density Plot (802.11n (UNII Band 2) – Ch. 64)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 29 of 66

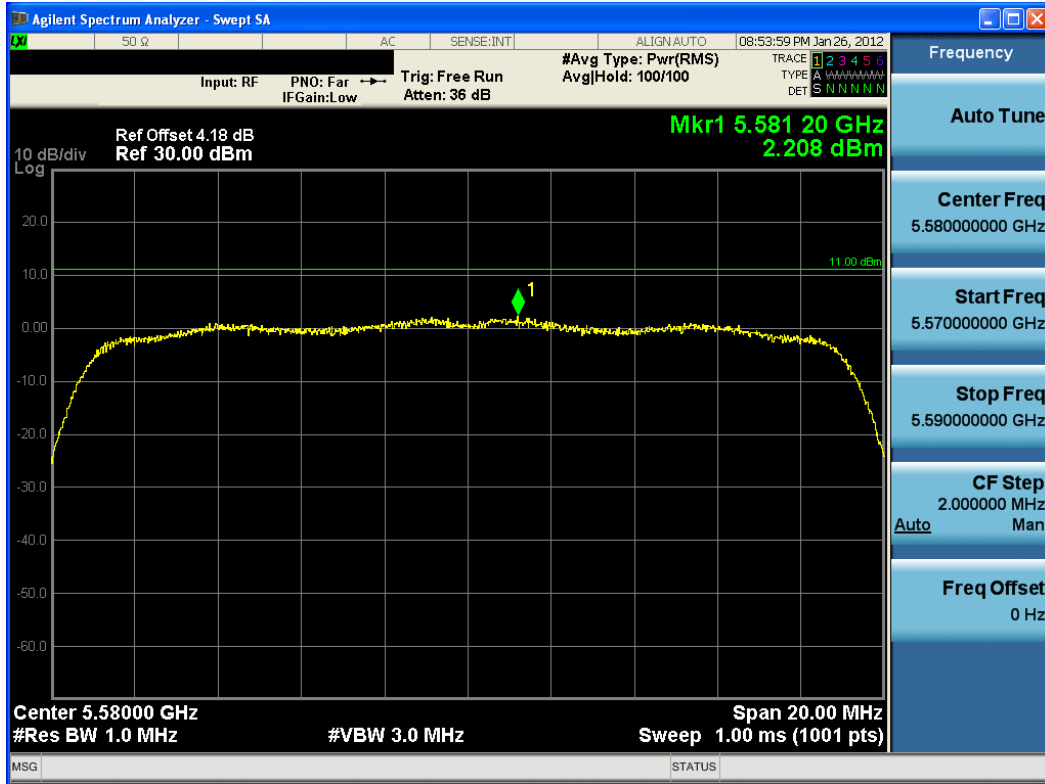


Plot 6-31. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 100)

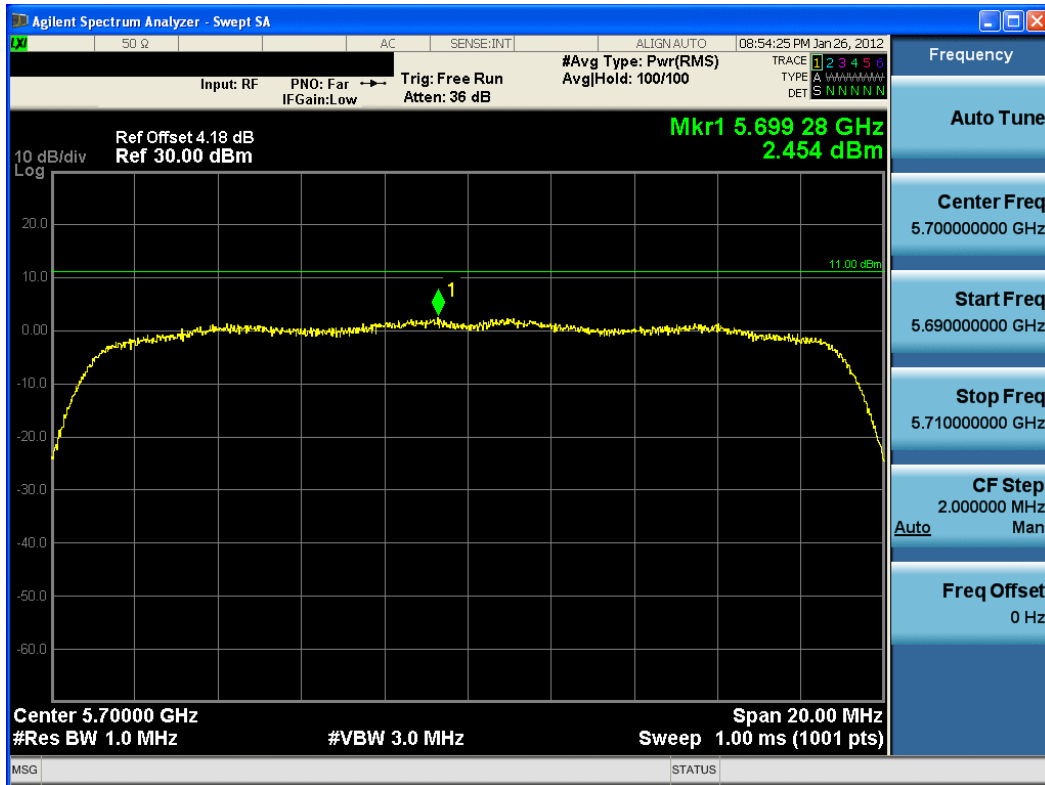


Plot 6-32. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 116)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 30 of 66



Plot 6-35. Peak Power Spectral Density Plot (802.11n (UNII Band 3) – Ch. 116)



Plot 6-36. Peak Power Spectral Density Plot (802.11n (UNII Band 3) – Ch. 140)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 32 of 66

6.5 Peak Excursion Ratio – 802.11a/n §15.407(a)(6)

The spectrum analyzer was connected to the antenna terminal while the EUT was operating in the continuous transmission mode at the appropriate center frequencies. **The largest permissible difference between the modulation envelope (measured using a peak hold function) and the maximum conducted output power is 13 dBm/MHz.**

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Peak Excursion Ratio [dBm]	Max Permissible Peak Excursion Ratio [dBm/MHz]	Margin [dB]
Band I	5180	36	a	6	11.46	13.0	-1.54
	5200	40	a	6	10.36	13.0	-2.64
	5240	48	a	6	7.97	13.0	-5.04
	5180	36	n	6.5/7.2 (MCS0)	8.54	13.0	-4.46
	5200	40	n	6.5/7.2 (MCS0)	11.25	13.0	-1.75
	5240	48	n	6.5/7.2 (MCS0)	9.45	13.0	-3.55
Band II	5260	52	a	6	8.85	13.0	-4.15
	5280	56	a	6	10.14	13.0	-2.86
	5320	64	a	6	9.56	13.0	-3.44
	5260	52	n	6.5/7.2 (MCS0)	9.18	13.0	-3.82
	5280	56	n	6.5/7.2 (MCS0)	9.30	13.0	-3.71
	5320	64	n	6.5/7.2 (MCS0)	8.90	13.0	-4.11
Band III	5500	100	a	6	8.96	13.0	-4.04
	5580	116	a	6	9.20	13.0	-3.80
	5700	140	a	6	9.67	13.0	-3.33
	5500	100	n	6.5/7.2 (MCS0)	8.51	13.0	-4.49
	5580	116	n	6.5/7.2 (MCS0)	8.85	13.0	-4.15
	5700	140	n	6.5/7.2 (MCS0)	8.78	13.0	-4.22

Table 6-6. Conducted Peak Excursion Ratio Measurements

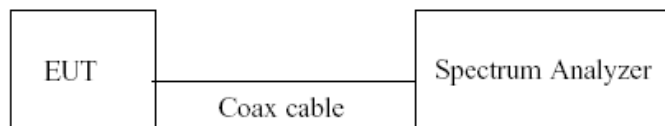


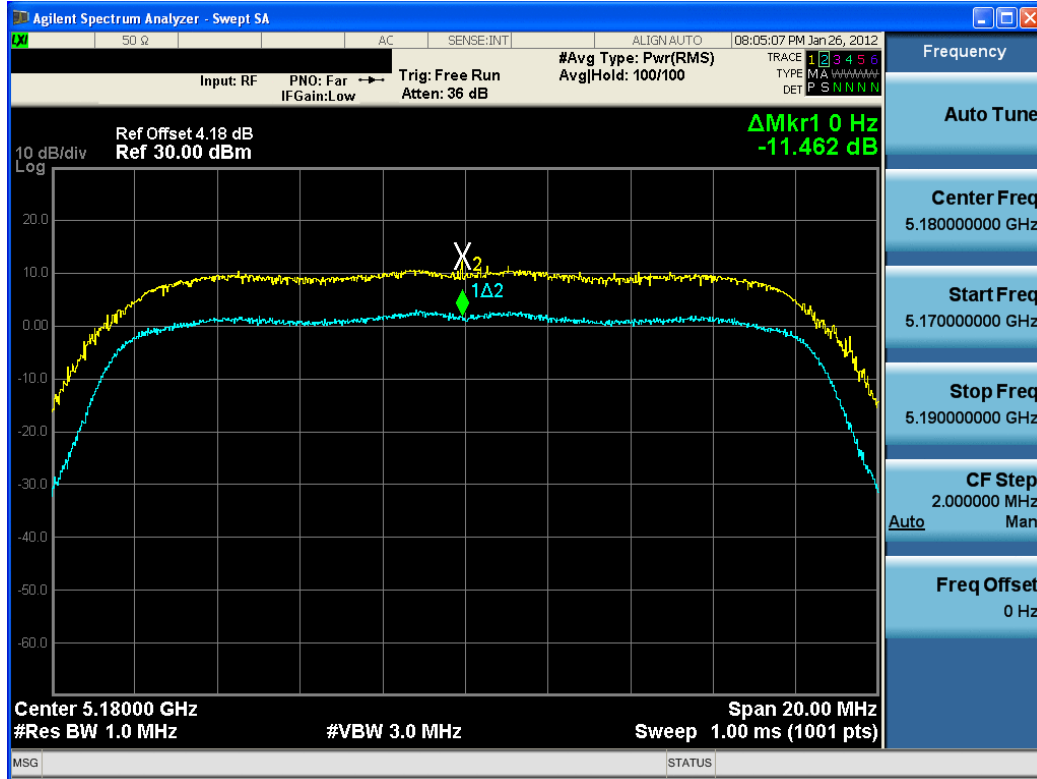
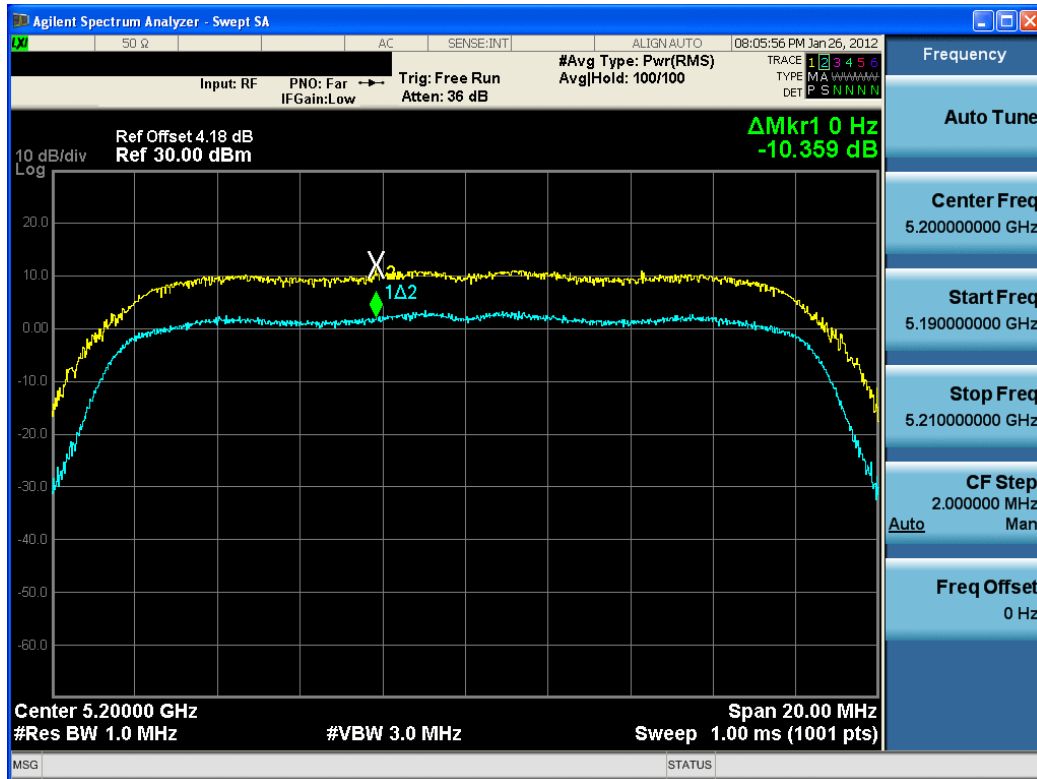


Figure 6-3. Test Instrument & Measurement Setup

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 33 of 66	

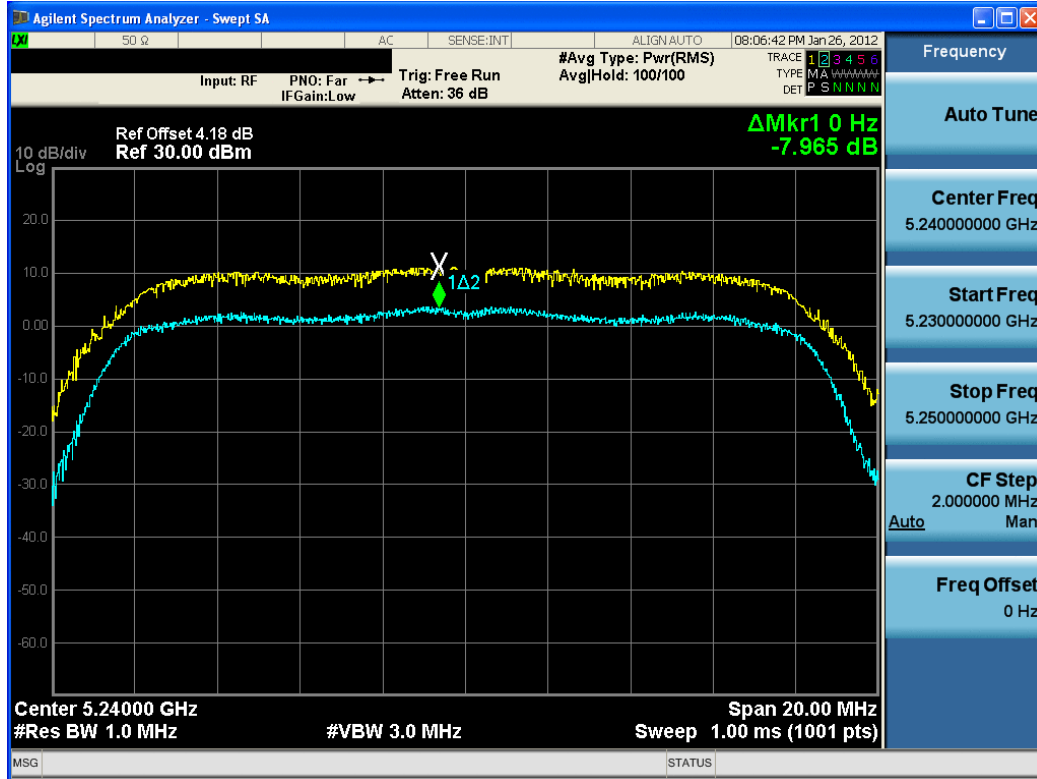


Plot 6-37. Peak Excursion Ratio Plot (802.11a (UNII Band 1) – Ch. 36)

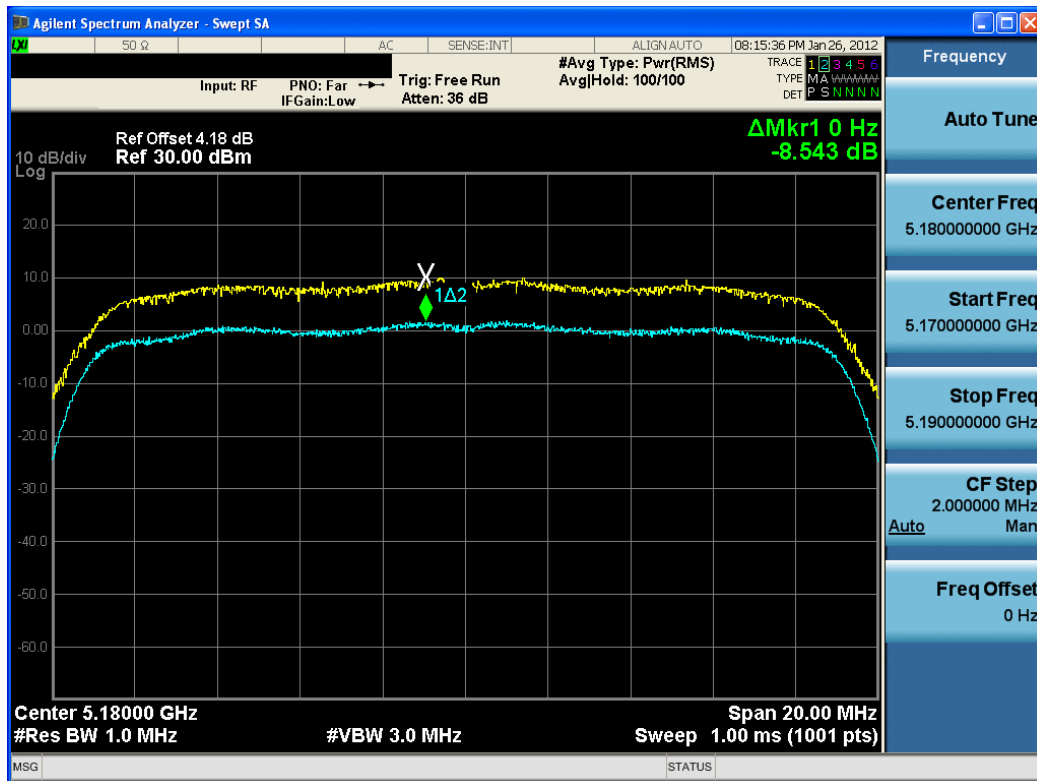


Plot 6-38. Peak Excursion Ratio Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 34 of 66

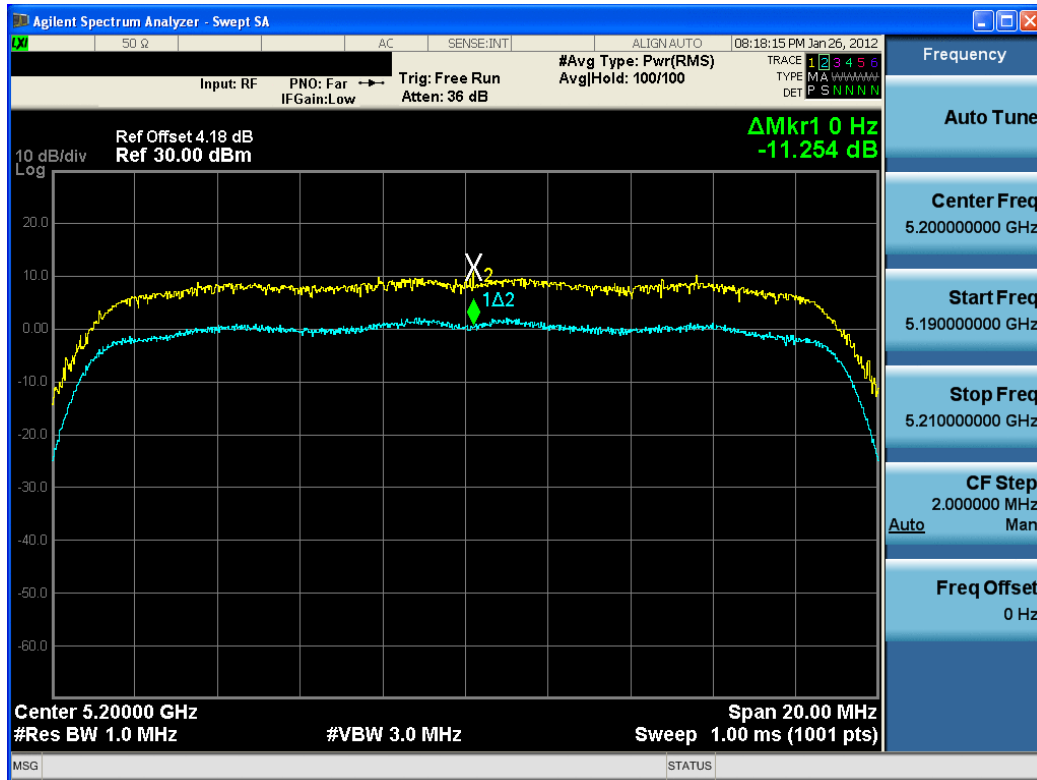


Plot 6-39. Peak Excursion Ratio Plot (802.11a (UNII Band 1) – Ch. 48)

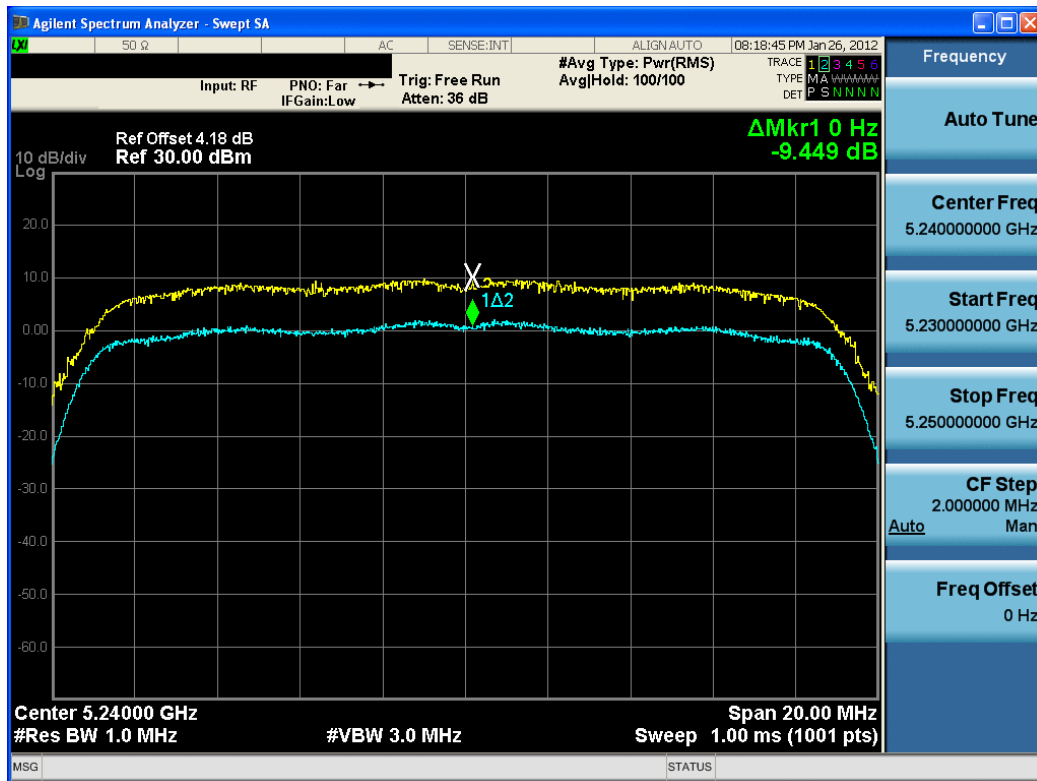


Plot 6-40. Peak Excursion Ratio Plot (802.11n (UNII Band 1) – Ch. 36)



FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 35 of 66

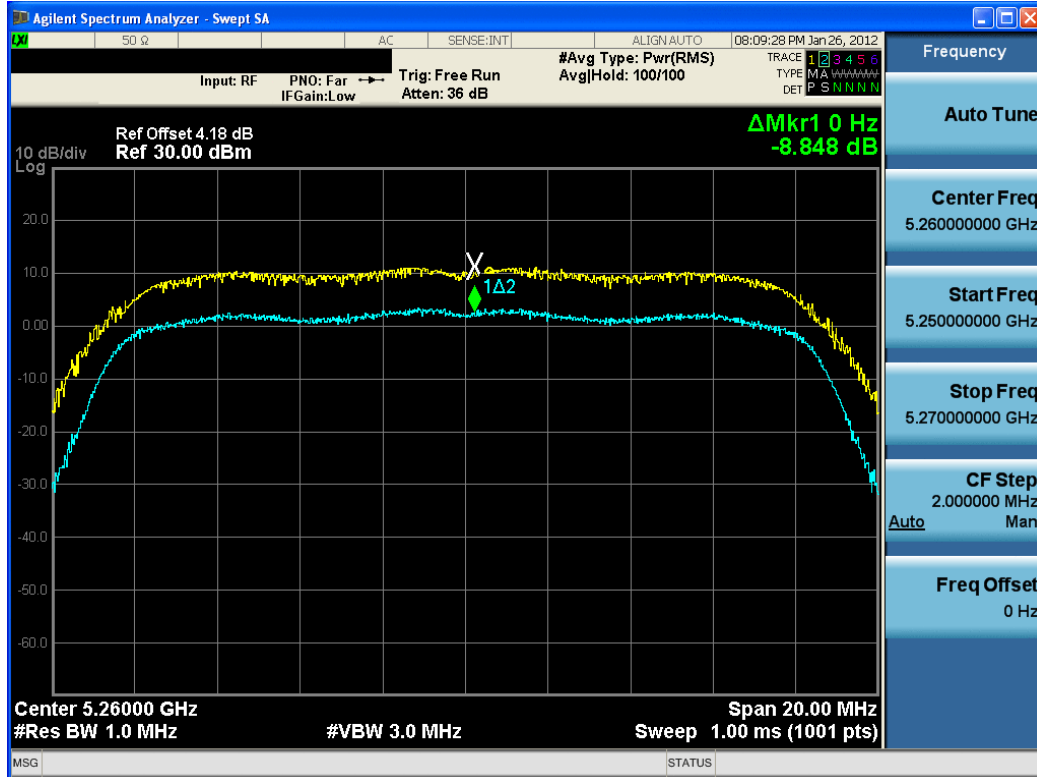


Plot 6-41. Peak Excursion Ratio Plot (802.11n (UNII Band 1) – Ch. 40)

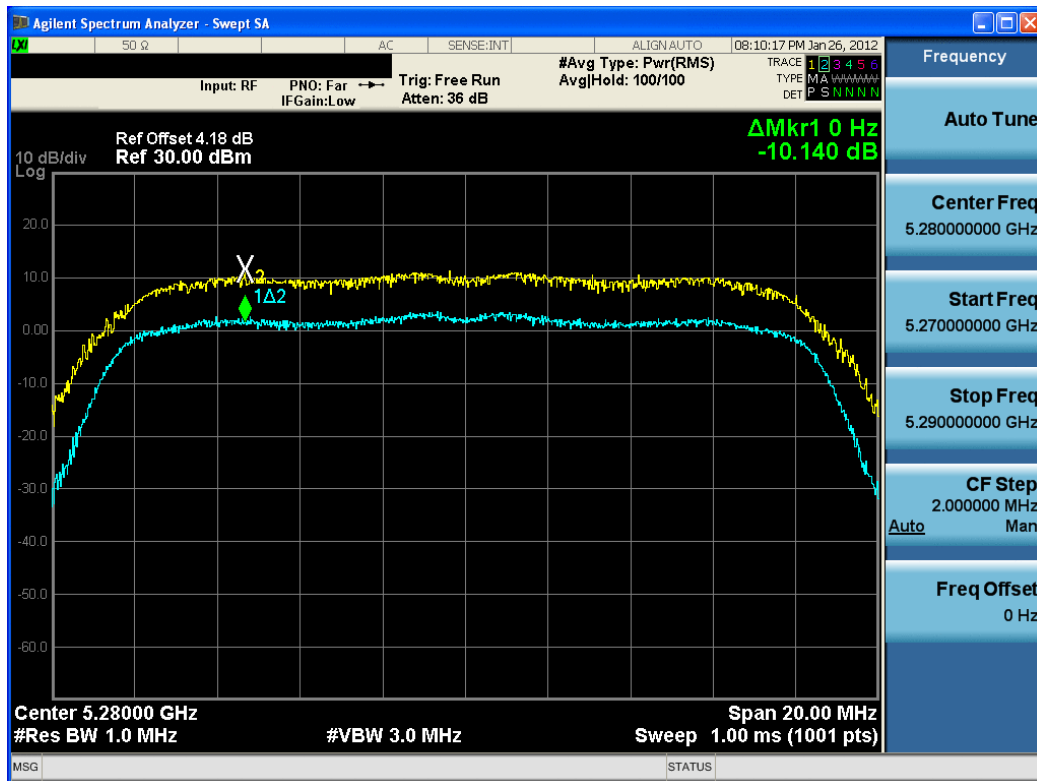


Plot 6-42. Peak Excursion Ratio Plot (802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 36 of 66

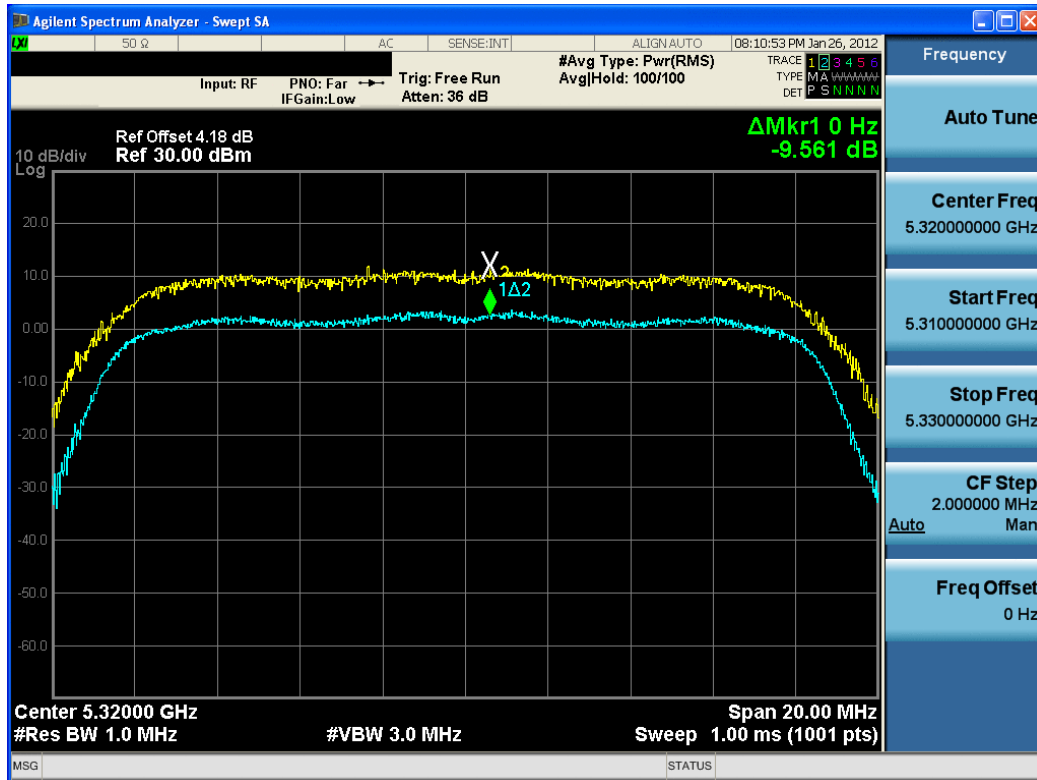


Plot 6-43. Peak Excursion Ratio Plot (802.11a (UNII Band 2) – Ch. 52)

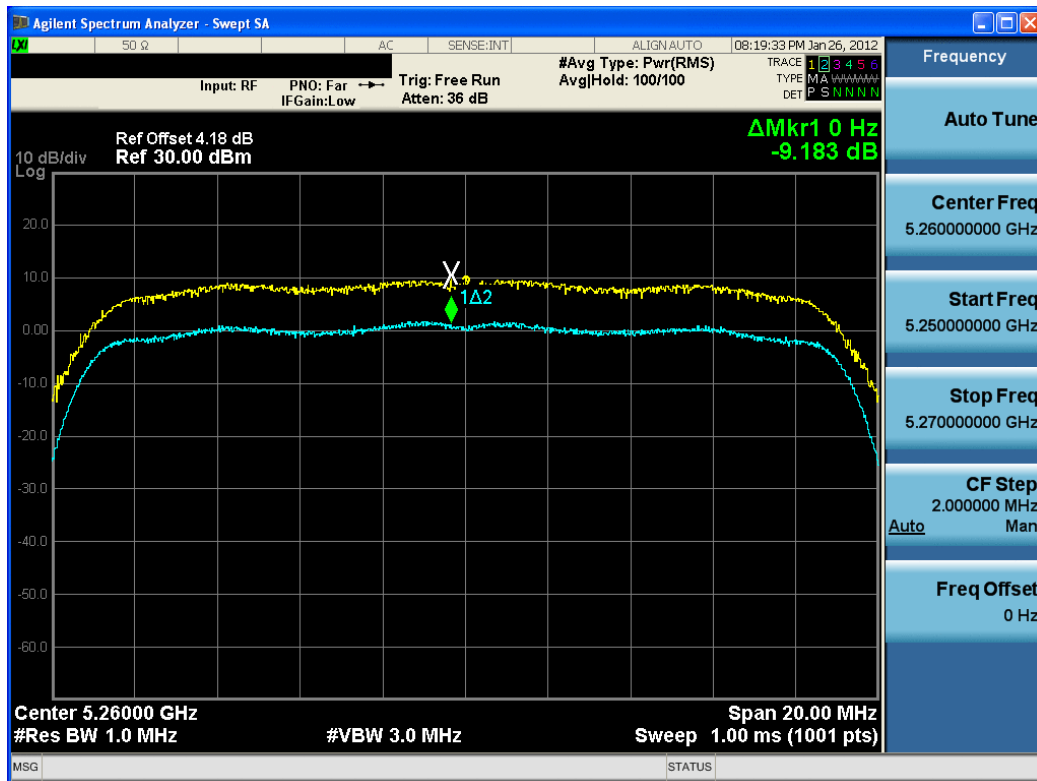


Plot 6-44. Peak Excursion Ratio Plot (802.11a (UNII Band 2) – Ch. 56)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 37 of 66

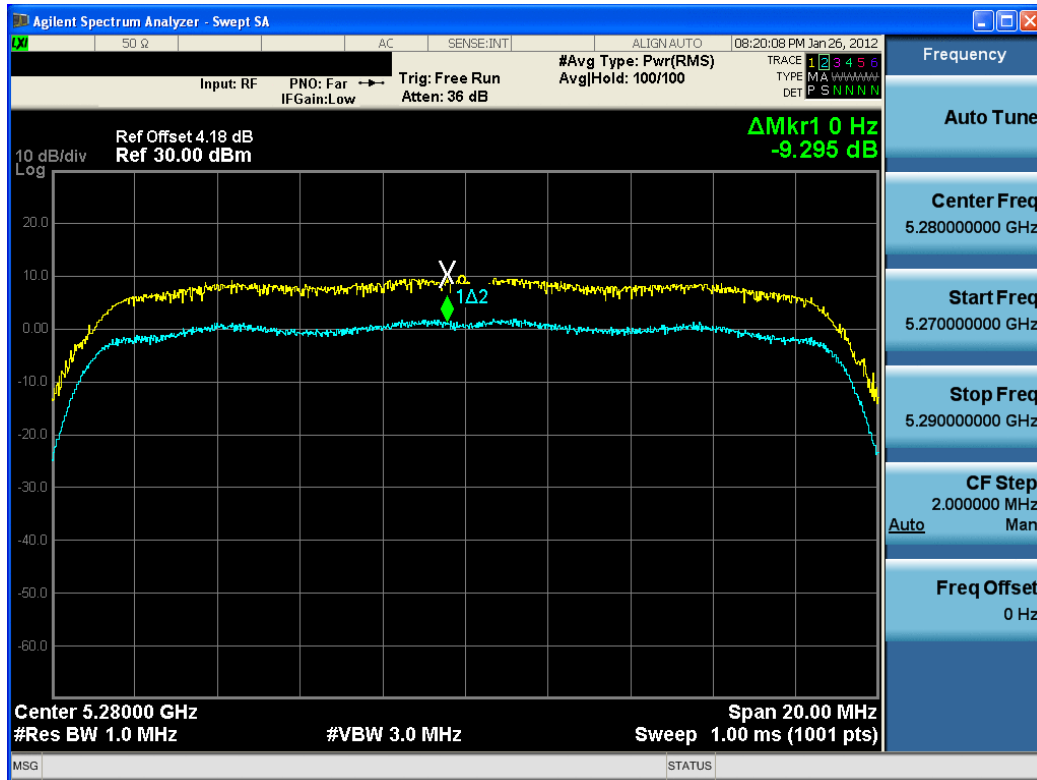


Plot 6-45. Peak Excursion Ratio Plot (802.11a (UNII Band 2) – Ch. 64)

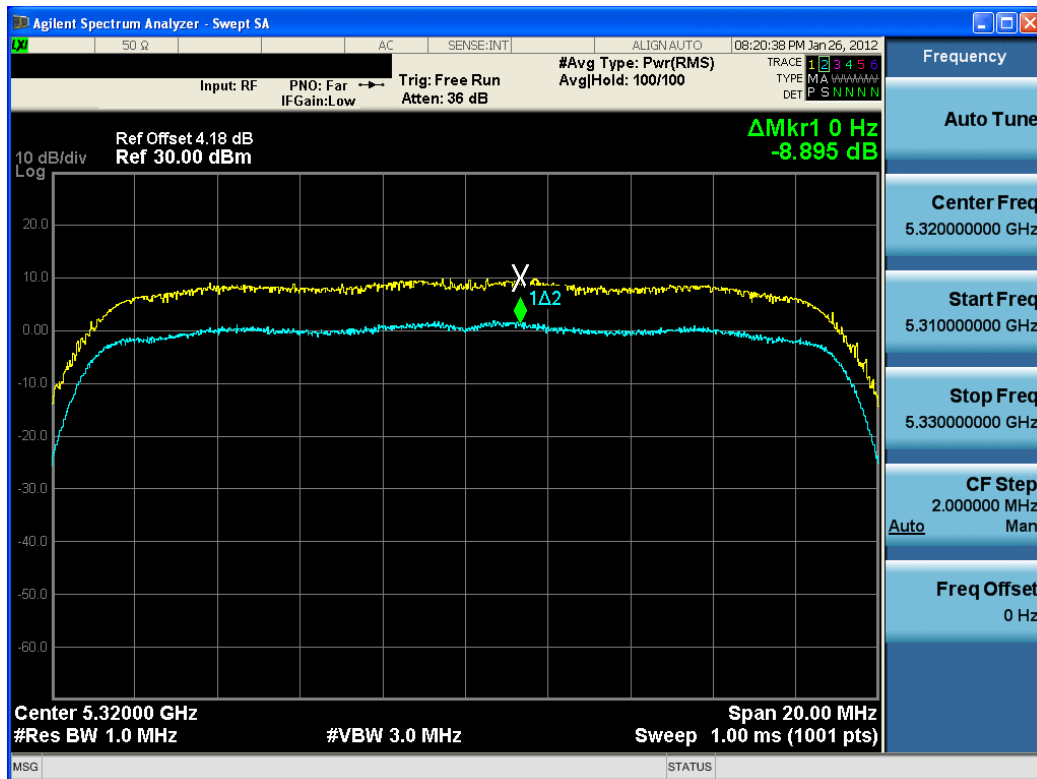


Plot 6-46. Peak Excursion Ratio Plot (802.11n (UNII Band 2) – Ch. 52)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 38 of 66

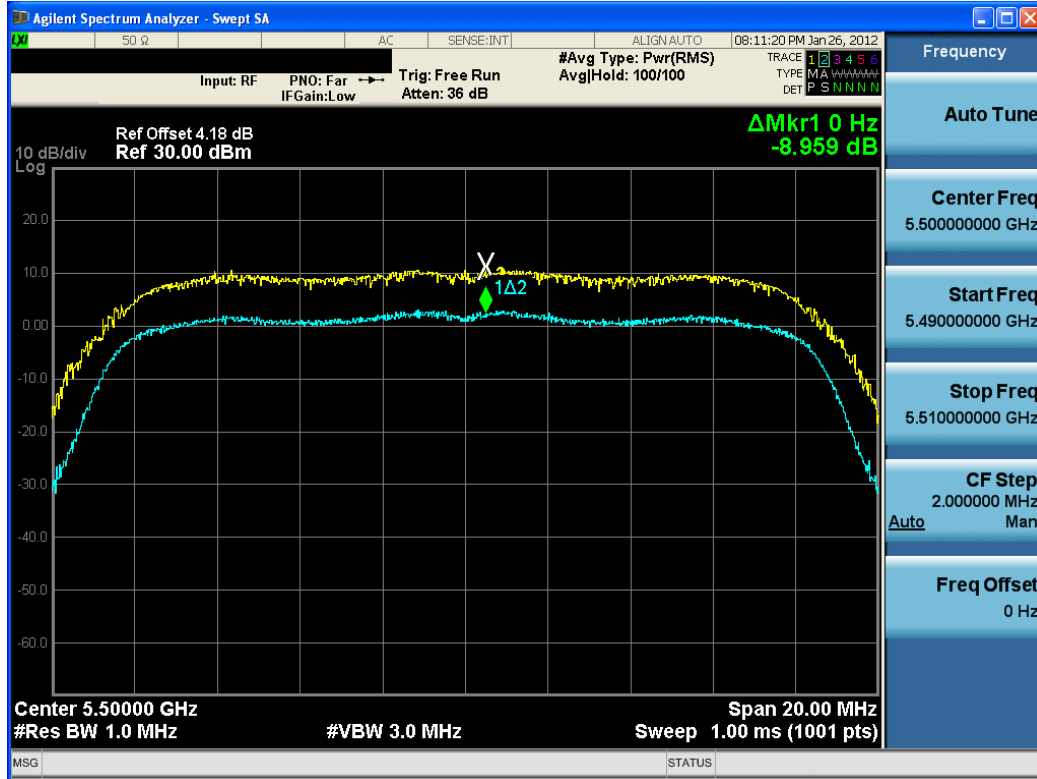


Plot 6-47. Peak Excursion Ratio Plot (802.11n (UNII Band 2) – Ch. 56)

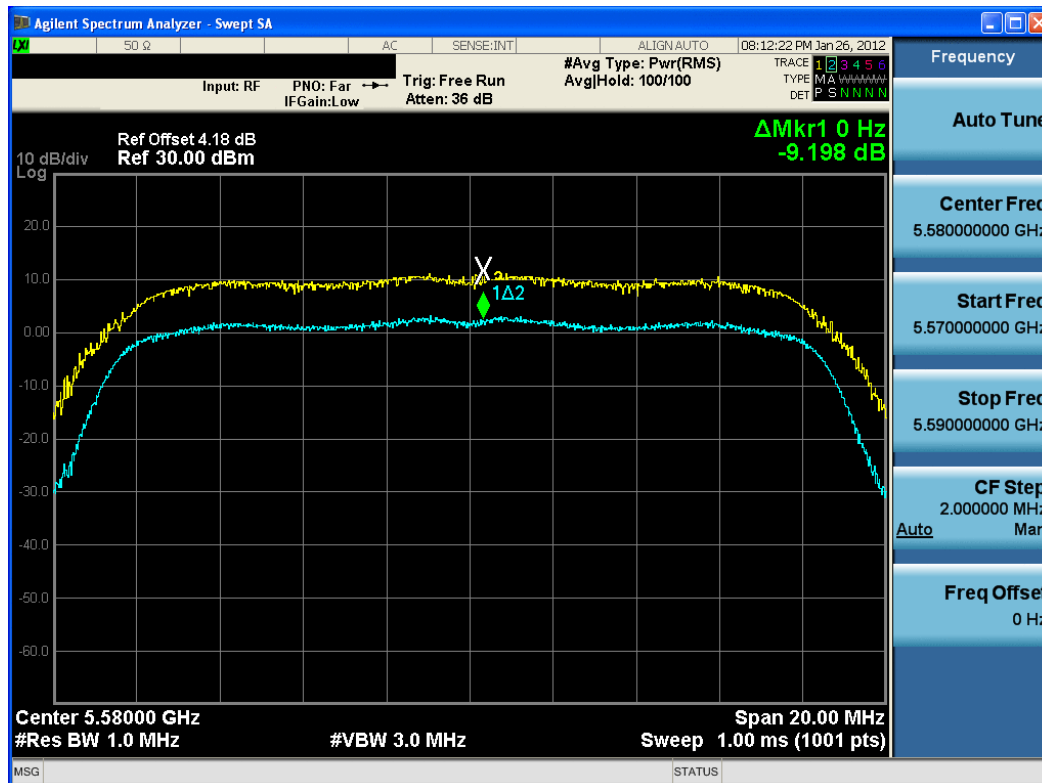


Plot 6-48. Peak Excursion Ratio Plot (802.11n (UNII Band 2) – Ch. 64)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 39 of 66

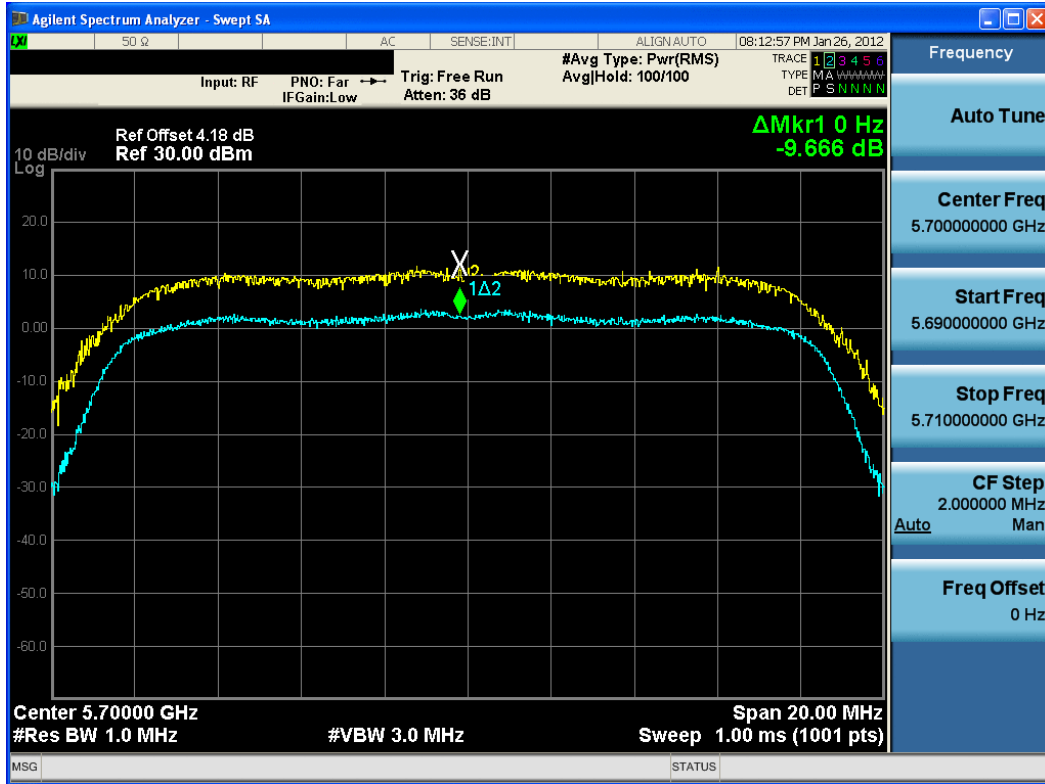


Plot 6-49. Peak Excursion Ratio Plot (802.11a (UNII Band 3) – Ch. 100)

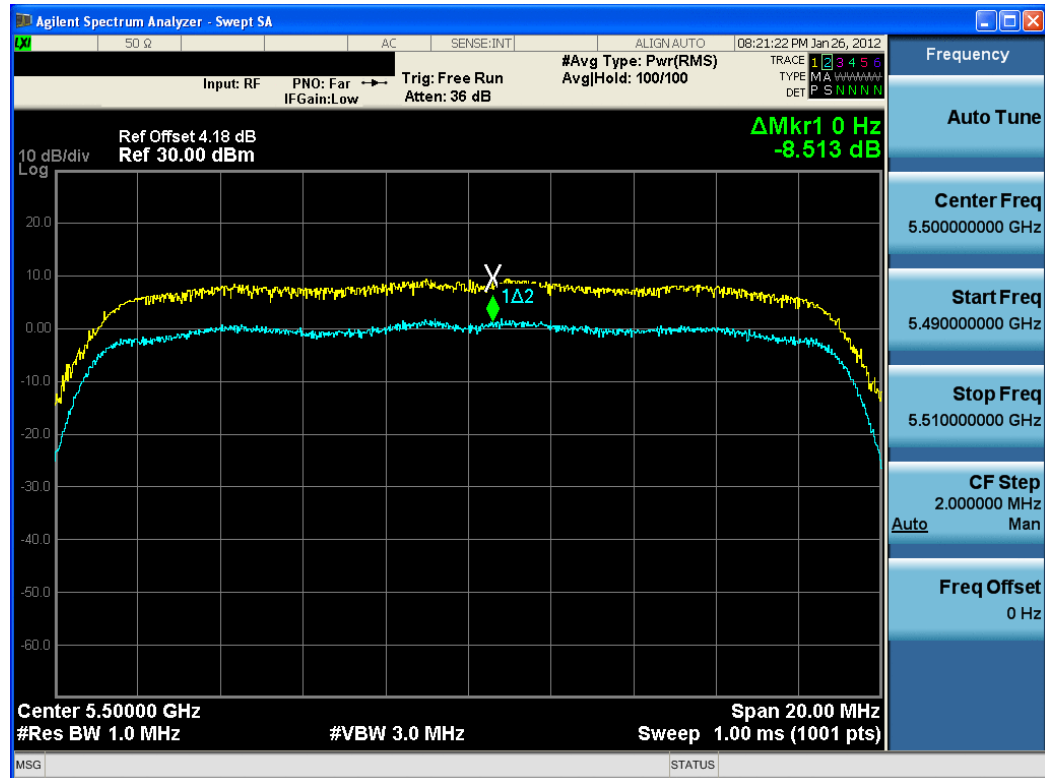


Plot 6-50. Peak Excursion Ratio Plot (802.11a (UNII Band 3) – Ch. 116)

FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 40 of 66

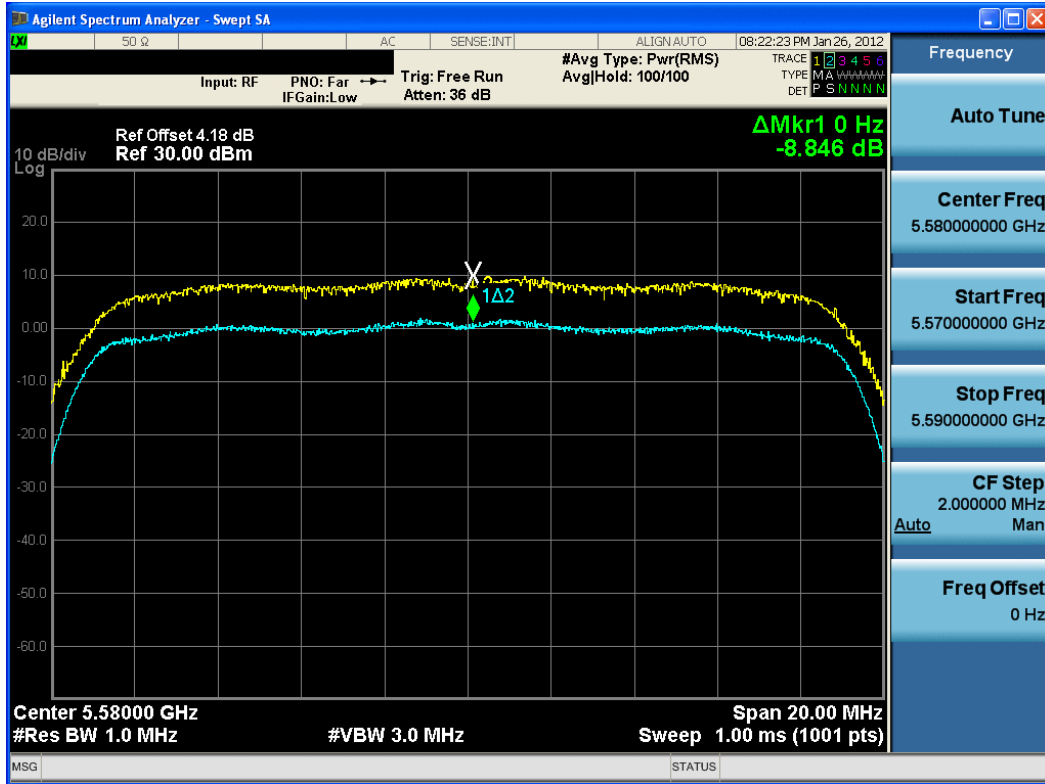


Plot 6-51. Peak Excursion Ratio Plot (802.11a (UNII Band 3) – Ch. 140)

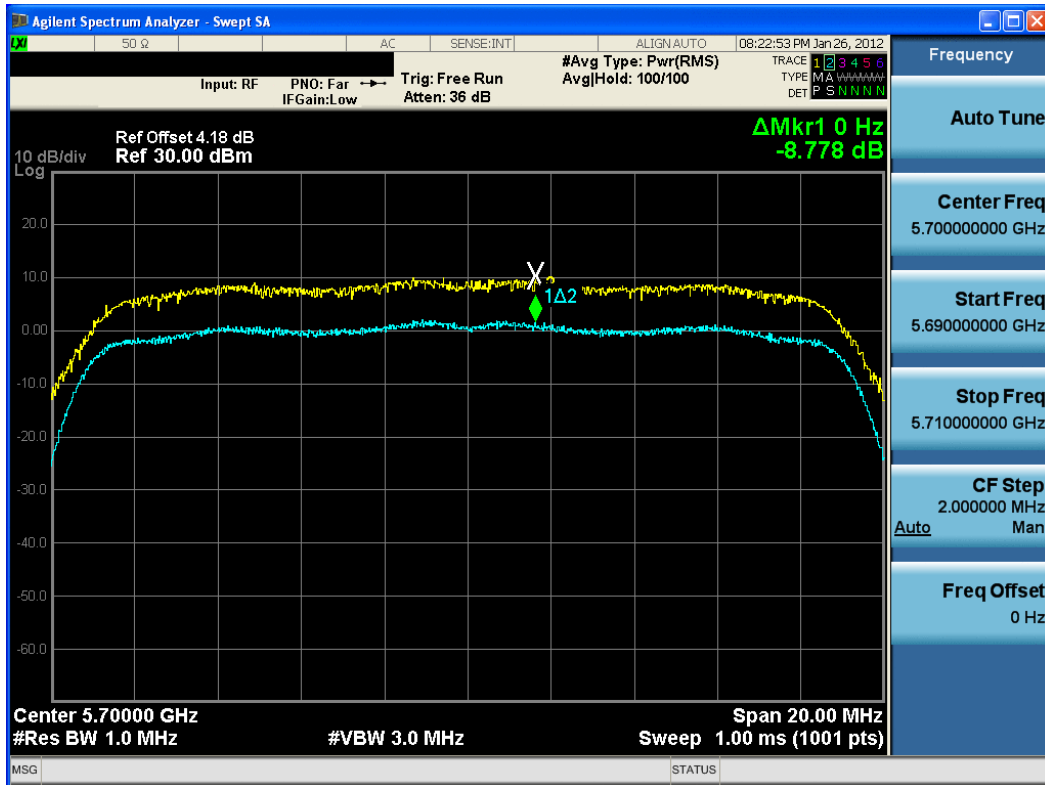


Plot 6-52. Peak Excursion Ratio Plot (802.11n (UNII Band 3) – Ch. 100)



FCC ID: A3LSPHL700	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 41 of 66



Plot 6-53. Peak Excursion Ratio Plot (802.11n (UNII Band 3) – Ch. 116)



Plot 6-54. Peak Excursion Ratio Plot (802.11n (UNII Band 3) – Ch. 140)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 42 of 66

6.6 Frequency Stability



§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,180,000,000 Hz
 CHANNEL: 36
 REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	5,179,999,998	-2	0.000000
100 %		- 30	5,179,999,980	-20	0.000000
100 %		- 20	5,179,999,995	-5	0.000000
100 %		- 10	5,179,999,999	-1	0.000000
100 %		0	5,179,999,985	-15	0.000000
100 %		+ 10	5,179,999,992	-8	0.000000
100 %		+ 20	5,179,999,981	-19	0.000000
100 %		+ 30	5,179,999,996	-4	0.000000
100 %		+ 40	5,180,000,015	15	0.000000
100 %		+ 50	5,180,000,002	2	0.000000
115 %	4.26	+ 20	5,179,999,991	-9	0.000000
BATT. ENDPOINT	3.40	+ 20	5,179,999,992	-8	0.000000

Table 6-7. Frequency Stability Measurements for UNII Band 1 (Ch. 36)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 43 of 66	

Frequency Stability (Cont'd)
§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,260,000,000 Hz
 CHANNEL: 52
 REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	5,179,999,994	-6	0.000000
100 %		- 30	5,180,000,000	0	0.000000
100 %		- 20	5,179,999,990	-10	0.000000
100 %		- 10	5,179,999,996	-4	0.000000
100 %		0	5,179,999,987	-13	0.000000
100 %		+ 10	5,179,999,981	-19	0.000000
100 %		+ 20	5,179,999,999	-1	0.000000
100 %		+ 30	5,179,999,993	-7	0.000000
100 %		+ 40	5,179,999,988	-12	0.000000
100 %		+ 50	5,179,999,986	-14	0.000000
115 %	4.26	+ 20	5,179,999,985	-15	0.000000
BATT. ENDPOINT	3.40	+ 20	5,179,999,987	-13	0.000000

Table 6-8. Frequency Stability Measurements for UNII Band 2 (Ch. 52)

Frequency Stability (Cont'd)



§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,500,000,000 Hz
 CHANNEL: 100
 REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	5,179,999,983	-17	0.000000
100 %		- 30	5,179,999,997	-3	0.000000
100 %		- 20	5,179,999,998	-2	0.000000
100 %		- 10	5,179,999,991	-9	0.000000
100 %		0	5,179,999,985	-15	0.000000
100 %		+ 10	5,179,999,991	-9	0.000000
100 %		+ 20	5,179,999,983	-17	0.000000
100 %		+ 30	5,179,999,984	-16	0.000000
100 %		+ 40	5,179,999,986	-14	0.000000
100 %		+ 50	5,179,999,989	-11	0.000000
115 %		4.26	+ 20	5,179,999,990	-10
BATT. ENDPOINT	3.40	+ 20	5,179,999,981	-19	0.000000

Table 6-9. Frequency Stability Measurements for UNII Band 3 (Ch. 100)

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 45 of 66	

6.7 Radiated Spurious Emission Measurements

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A9.2]

The EUT was tested from 9kHz and up to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHZ. Above 1 GHz, average measurements were taken using RBW = 1MHz and VBW = 10Hz. Peak measurements were taken using RBW = VBW = 1MHz and 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 6-10 per Section 15.209.

All 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.

Frequency	Field Strength [$\mu\text{V/m}$]	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 6-10. Radiated Limits

Sample Calculation

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

Notes:

- AFCL = Antenna Factor [dB] + Cable Loss [dB]

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 46 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5180MHz
 Channel: 36

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	-90.61	Peak	H	52.61	-9.54	59.46	68.20	-8.74
* 15540.00	-135.00	Average	H	58.64	0.00	30.64	53.98	-23.34
* 15540.00	-125.00	Peak	H	58.64	0.00	40.64	73.98	-33.34
* 20720.00	-135.00	Average	H	67.26	0.00	39.26	53.98	-14.72
* 20720.00	-125.00	Peak	H	67.26	0.00	49.26	73.98	-24.72
25900.00	-125.00	Peak	H	69.17	0.00	51.17	68.20	-17.03

Table 6-11. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 47 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5200MHz
 Channel: 40

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10400.00	-90.79	Peak	H	52.67	-9.54	59.34	68.20	-8.86
* 15600.00	-135.00	Average	H	58.55	0.00	30.55	53.98	-23.43
* 15600.00	-125.00	Peak	H	58.55	0.00	40.55	73.98	-33.43
* 20800.00	-135.00	Average	H	67.34	0.00	39.34	53.98	-14.64
* 20800.00	-125.00	Peak	H	67.34	0.00	49.34	73.98	-24.64
26000.00	-125.00	Peak	H	69.21	0.00	51.21	68.20	-16.99

Table 6-12. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 48 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5240MHz
 Channel: 48

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	-91.92	Peak	H	52.82	-9.54	58.36	68.20	-9.84
* 15720.00	-135.00	Average	H	58.27	0.00	30.27	53.98	-23.71
* 15720.00	-125.00	Peak	H	58.27	0.00	40.27	73.98	-33.71
* 20960.00	-135.00	Average	H	67.51	0.00	39.51	53.98	-14.47
* 20960.00	-125.00	Peak	H	67.51	0.00	49.51	73.98	-24.47
26200.00	-125.00	Peak	H	69.33	0.00	51.33	68.20	-16.87

Table 6-13. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 49 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5260MHz
 Channel: 52

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10520.00	-92.88	Peak	H	52.86	-9.54	57.44	68.20	-10.76
* 15780.00	-135.00	Average	H	58.05	0.00	30.05	53.98	-23.93
* 15780.00	-125.00	Peak	H	58.05	0.00	40.05	73.98	-33.93
* 21040.00	-135.00	Average	H	67.57	0.00	39.57	53.98	-14.41
* 21040.00	-125.00	Peak	H	67.57	0.00	49.57	73.98	-24.41
26300.00	-125.00	Peak	H	69.38	0.00	51.38	68.20	-16.82

Table 6-14. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 50 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5280MHz
 Channel: 56

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	-91.34	Peak	H	52.87	-9.54	58.98	68.20	-9.22
* 15840.00	-135.00	Average	H	57.95	0.00	29.95	53.98	-24.03
* 15840.00	-125.00	Peak	H	57.95	0.00	39.95	73.98	-34.03
* 21120.00	-135.00	Average	H	67.60	0.00	39.60	53.98	-14.38
* 21120.00	-125.00	Peak	H	67.60	0.00	49.60	73.98	-24.38
26400.00	-125.00	Peak	H	69.44	0.00	51.44	68.20	-16.76

Table 6-15. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 51 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5320MHz
 Channel: 64

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
*	10640.00	-106.20	Average	H	52.88	-9.54	44.14	53.98	-9.84
*	10640.00	-92.38	Peak	H	52.88	-9.54	57.96	73.98	-16.02
*	15960.00	-135.00	Average	H	57.88	0.00	29.88	53.98	-24.10
*	15960.00	-125.00	Peak	H	57.88	0.00	39.88	73.98	-34.10
*	21280.00	-135.00	Average	H	67.65	0.00	39.65	53.98	-14.33
*	21280.00	-125.00	Peak	H	67.65	0.00	49.65	73.98	-24.33
	26600.00	-125.00	Peak	H	69.48	0.00	51.48	68.20	-16.72

Table 6-16. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 52 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5500MHz
 Channel: 100

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
*	11000.00	-110.98	Average	H	53.54	-9.54	40.02	53.98	-13.96
*	11000.00	-97.18	Peak	H	53.54	-9.54	53.82	73.98	-20.16
	16500.00	-125.00	Peak	H	58.00	0.00	40.00	68.20	-28.20
	22000.00	-125.00	Peak	H	67.90	0.00	49.90	68.20	-18.30
	27500.00	-125.00	Peak	H	69.47	0.00	51.47	68.20	-16.73

Table 6-17. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 53 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5580MHz
 Channel: 116

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
*	11160.00	-111.20	Average	H	53.49	-9.54	39.75	53.98	-14.23
*	11160.00	-97.81	Peak	H	53.49	-9.54	53.14	73.98	-20.84
	16740.00	-125.00	Peak	H	58.71	0.00	40.71	68.20	-27.49
*	22320.00	-135.00	Average	H	68.31	0.00	40.31	53.98	-13.66
*	22320.00	-125.00	Peak	H	68.31	0.00	50.31	73.98	-23.66
	27900.00	-125.00	Peak	H	69.44	0.00	51.44	68.20	-16.76

Table 6-18. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 54 of 66	

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5700MHz
 Channel: 140

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11400.00	-111.29	Average	H	53.66	-9.54	39.83	53.98	-14.15
* 11400.00	-98.08	Peak	H	53.66	-9.54	53.04	73.98	-20.94
17100.00	-125.00	Peak	H	61.61	0.00	43.61	68.20	-24.59
* 22800.00	-135.00	Average	H	68.36	0.00	40.36	53.98	-13.62
* 22800.00	-125.00	Peak	H	68.36	0.00	50.36	73.98	-23.62
28500.00	-125.00	Peak	H	69.35	0.00	51.35	68.20	-16.85

Table 6-19. Radiated Measurements @ 1 meter

NOTES:

- All harmonics that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz (68.2dBμV/m).
- All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-10.
- Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 μV/m (54dBμV/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 55 of 66	

6.8 Radiated Band Edge Measurements

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 1 Meter

Operating Frequency: 5180MHz



Channel: 36

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]
5031.70	-104.50	Average	H	42.36	-9.54	35.32	53.98	-18.66
5031.70	-95.21	Peak	H	42.36	-9.54	44.61	73.98	-29.37
5107.10	-106.71	Average	H	42.64	-9.54	33.39	53.98	-20.59
5107.10	-96.17	Peak	H	42.64	-9.54	43.93	73.98	-30.05
5147.40	-108.56	Average	H	42.86	-9.54	31.76	53.98	-22.22
5147.40	-89.28	Peak	H	42.86	-9.54	51.04	73.98	-22.94

Table 6-20. Radiated Restricted Band Measurements at 1-meter (4.5 – 5.15GHz)

NOTES:

1. Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
2. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
5. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
6. Above 960MHz the limit is 500 μ V/m (54dB μ V/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 56 of 66

Radiated Band Edge Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5320MHz
 Channel: 64

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5354.07	-109.85	Average	H	44.05	-9.54	31.66	53.98	-22.32
5354.07	-95.85	Peak	H	44.05	-9.54	45.66	73.98	-28.32
5356.05	-109.98	Average	H	44.05	-9.54	31.53	53.98	-22.45
5356.05	-94.34	Peak	H	44.05	-9.54	47.17	73.98	-26.81
5432.50	-107.67	Average	H	44.21	-9.54	33.99	53.98	-19.99
5432.50	-94.77	Peak	H	44.21	-9.54	46.89	73.98	-27.09

Table 6-21. Radiated Restricted Band Measurements at 1-meter (5.35 – 5.46GHz, 5.46 – 5.47GHz)

NOTES:

1. Emissions within 5.35 – 5.46GHz lie in a restricted band and are subject to the radiated emissions limits specified in §15.209. Emission within 5.46 – 5.47GHz are at the lower band edge of UNII Band 3 transmission and are subject to the -27dBm/MHz (68.2dBμV/m) EIRP limit specified in §15.407.
2. Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
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 40GHz 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 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricteds band specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 57 of 66	

Radiated Band Edge Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 1 Meter

Operating Frequency: 5500MHz



Channel: 100

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5351.65	-109.68	Average	H	44.04	-9.54	31.82	53.98	-22.16
5351.65	-97.79	Peak	H	44.04	-9.54	43.71	73.98	-30.27
5393.56	-109.73	Average	H	44.11	-9.54	31.83	53.98	-22.15
5393.56	-97.82	Peak	H	44.11	-9.54	43.74	73.98	-30.24
5469.66	-91.62	Peak	H	44.31	-9.54	50.15	68.20	-18.05

Table 6-22. Radiated Restricted Band Measurements at 1-meter (5.35 – 5.46GHz, 5.46 – 5.47GHz)

NOTES:

1. Emissions within 5.35 – 5.46GHz lie in a restricted band and are subject to the radiated emissions limits specified in §15.209. Emission within 5.46 – 5.47GHz are at the lower band edge of UNII Band 3 transmission and are subject to the -27dBm/MHz (68.2dBμV/m) EIRP limit specified in §15.407.
2. Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
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 40GHz 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 μV/m (54dBμ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 58 of 66	

Radiated Band Edge Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 1 Meter

Operating Frequency: 5700MHz



Channel: 140

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5725.25	-95.54	Peak	H	44.42	-9.54	46.34	68.20	-21.86
5726.15	-93.11	Peak	H	44.43	-9.54	48.77	68.20	-19.43
5727.30	-95.66	Peak	H	44.43	-9.54	46.23	68.20	-21.97

Table 6-23. Radiated Restricted Band Measurements at 1-meter

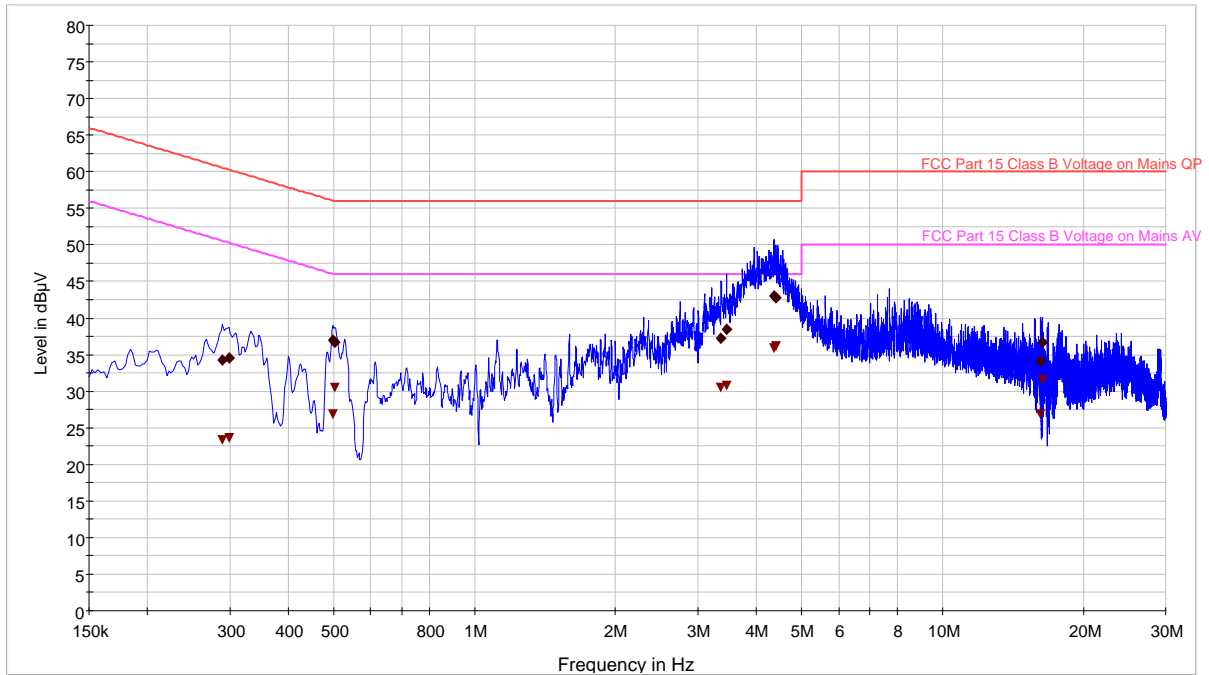
NOTES:

1. Average measurements > 1GHz using RBW = 1MHz and VBW = 10Hz. Peak measurements > 1GHz using RBW = VBW = 1MHz.
2. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to 40GHz and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
5. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
6. Above 960MHz the limit is 500 µV/m (54dBµ/m) at 3 meters radiated for emissions that lie in restricted bands specified in §15.205.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 59 of 66	

6.9 Line-Conducted Test Data

§15.207; RSS-Gen [7.2.2]



◆ FCC Part 15 Class B Voltage on Mains QP.LimitLine
◆ FCC Part 15 Class B Voltage on Mains AV.LimitLine
◆ Preview Result 1-PK+
▼ Final Result 2-AVG

Plot 6-55. Line Conducted Plot with 802.11a (UNII Band 1)

Frequency MHz	Line	Bandwidth kHz	QuasiPeak dBµV	Limit dBµV	Margin dB	Average dBµV	Limit dBµV	Margin dB
0.289500	L1	9	34.20	60.50	26.30	23.30	50.50	27.20
0.298500	L1	9	34.50	60.30	25.80	23.70	50.30	26.60
0.498750	L1	9	36.90	56.00	19.10	26.90	46.00	19.20
0.503250	L1	9	36.70	56.00	19.30	30.50	46.00	15.50
3.363000	L1	9	37.30	56.00	18.70	30.40	46.00	15.60
3.455250	L1	9	38.40	56.00	17.60	30.70	46.00	15.30
4.359750	L1	9	43.10	56.00	12.90	35.90	46.00	10.10
4.402500	L1	9	42.70	56.00	13.30	36.20	46.00	9.80
16.228500	L1	9	34.10	60.00	25.90	26.80	50.00	23.20
16.329750	L1	9	36.70	60.00	23.30	31.50	50.00	18.50

Table 6-24. Line Conducted Data with 802.11a (UNII Band 1)

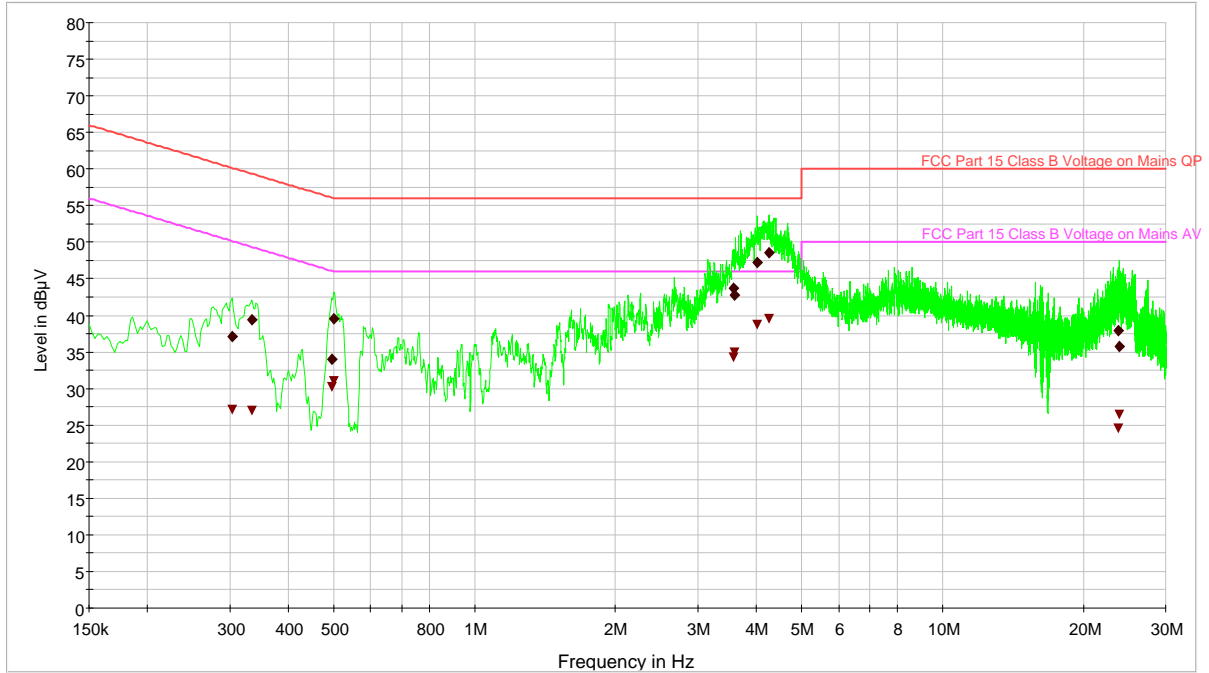
Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 36. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- Line L1 = Phase; Line N = Neutral
- Traces shown in plot made using a peak detector.
- Deviations to the Specifications: None.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 60 of 66

Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



◆ FCC Part 15 Class B Voltage on Mains QP.LimitLine Final Result 1-QPK
 ▼ FCC Part 15 Class B Voltage on Mains AV.LimitLine Final Result 2-AVG
 Preview Result 1-PK+

Plot 6-56. Line Conducted Data with 802.11a (UNII Band 1)

Frequency MHz	Line	Bandwidth kHz	QuasiPeak dBµV	Limit dBµV	Margin dB	Average dBµV	Limit dBµV	Margin dB
0.303000	N	9	37.20	60.20	23.00	27.10	50.20	23.10
0.334500	N	9	39.30	59.30	20.00	27.00	49.30	22.30
0.494250	N	9	34.00	56.10	22.10	30.30	46.10	15.80
0.501000	N	9	39.60	56.00	16.40	31.10	46.00	14.90
3.567750	N	9	43.80	56.00	12.20	34.30	46.00	11.70
3.601500	N	9	42.80	56.00	13.20	34.90	46.00	11.10
4.015500	N	9	47.20	56.00	8.80	38.70	46.00	7.30
4.263000	N	9	48.50	56.00	7.50	39.50	46.00	6.50
23.761500	N	9	37.90	60.00	22.10	24.50	50.00	25.50
23.876250	N	9	35.70	60.00	24.30	26.40	50.00	23.60

Table 6-25. Line Conducted Data with 802.11a (UNII Band 1)

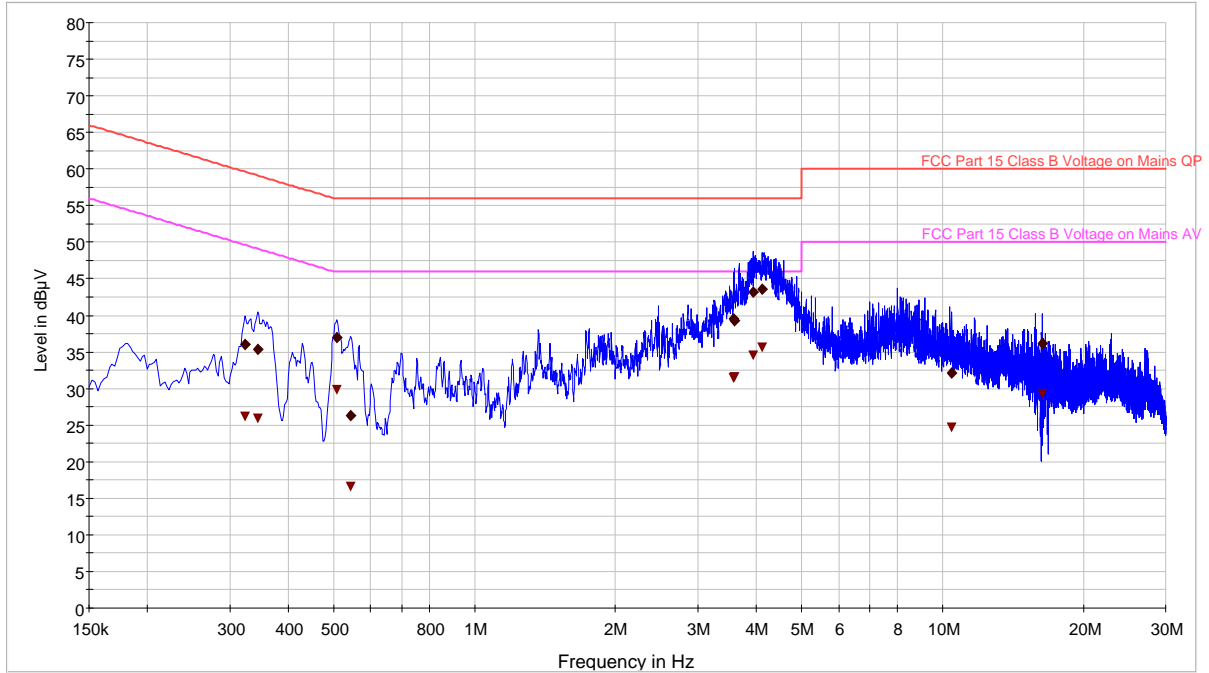
Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 36. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- Line L1 = Phase; Line N = Neutral
- Traces shown in plot made using a peak detector.
- Deviations to the Specifications: None.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 61 of 66

Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



◆ FCC Part 15 Class B Voltage on Mains QP.LimitLine Final Result 1-QPK
 ▼ FCC Part 15 Class B Voltage on Mains AV.LimitLine Final Result 2-AVG
 — Preview Result 1-PK+

Plot 6-56. Line Conducted Plot with 802.11a (UNII Band 2)

Frequency MHz	Line	Bandwidth kHz	QuasiPeak dBµV	Limit dBµV	Margin dB	Average dBµV	Limit dBµV	Margin dB
0.323250	L1	9	36.10	59.60	23.50	26.10	49.60	23.50
0.343500	L1	9	35.40	59.10	23.70	25.90	49.10	23.20
0.507750	L1	9	36.90	56.00	19.10	29.80	46.00	16.20
0.543750	L1	9	26.30	56.00	29.70	16.60	46.00	29.40
3.581250	L1	9	39.50	56.00	16.50	31.50	46.00	14.50
3.588000	L1	9	39.20	56.00	16.80	31.50	46.00	14.50
3.934500	L1	9	43.10	56.00	12.90	34.50	46.00	11.50
4.116750	L1	9	43.50	56.00	12.50	35.60	46.00	10.40
10.482000	L1	9	32.10	60.00	27.90	24.70	50.00	25.30
16.329750	L1	9	36.10	60.00	23.90	29.30	50.00	20.70

Table 6-26. Line Conducted Data with 802.11a (UNII Band 2)

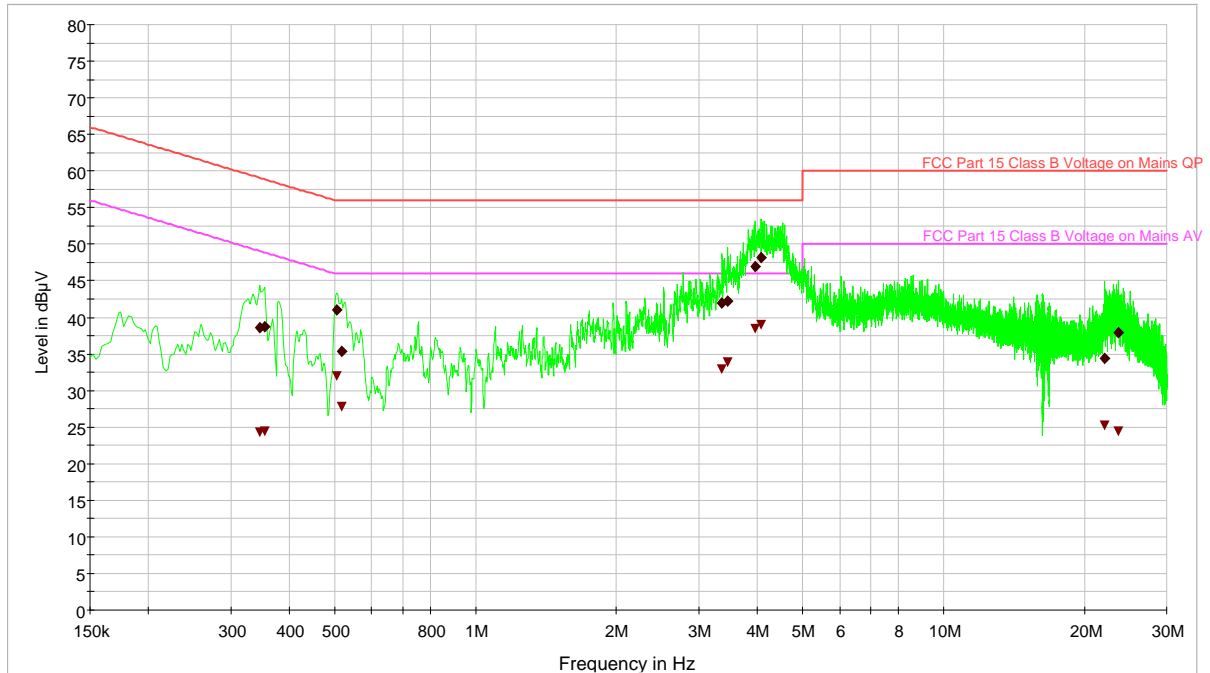
Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 52. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- Line L1 = Phase; Line N = Neutral
- Traces shown in plot made using a peak detector.
- Deviations to the Specifications: None.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 62 of 66	

Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



◆ FCC Part 15 Class B Voltage on Mains QP.LimitLine Final Result 1-QPK
 ▼ FCC Part 15 Class B Voltage on Mains AV.LimitLine Final Result 2-AVG
 Preview Result 1-PK+

Plot 6-57. Line Conducted Data with 802.11a (UNII Band 2)

Frequency MHz	Line	Bandwidth kHz	QuasiPeak dBµV	Limit dBµV	Margin dB	Average dBµV	Limit dBµV	Margin dB
0.345750	N	9	38.50	59.10	20.50	24.20	49.10	24.80
0.354750	N	9	38.70	58.90	20.10	24.40	48.90	24.50
0.505500	N	9	41.00	56.00	15.00	32.00	46.00	14.00
0.516750	N	9	35.40	56.00	20.60	27.80	46.00	18.20
3.363000	N	9	41.90	56.00	14.10	32.90	46.00	13.10
3.455250	N	9	42.30	56.00	13.70	33.90	46.00	12.10
3.952500	N	9	46.90	56.00	9.10	38.50	46.00	7.50
4.083000	N	9	48.20	56.00	7.80	39.00	46.00	7.00
22.103250	N	9	34.50	60.00	25.50	25.30	50.00	24.70
23.628750	N	9	37.90	60.00	22.10	24.40	50.00	25.60

Table 6-27. Line Conducted Data with 802.11a (UNII Band 2)

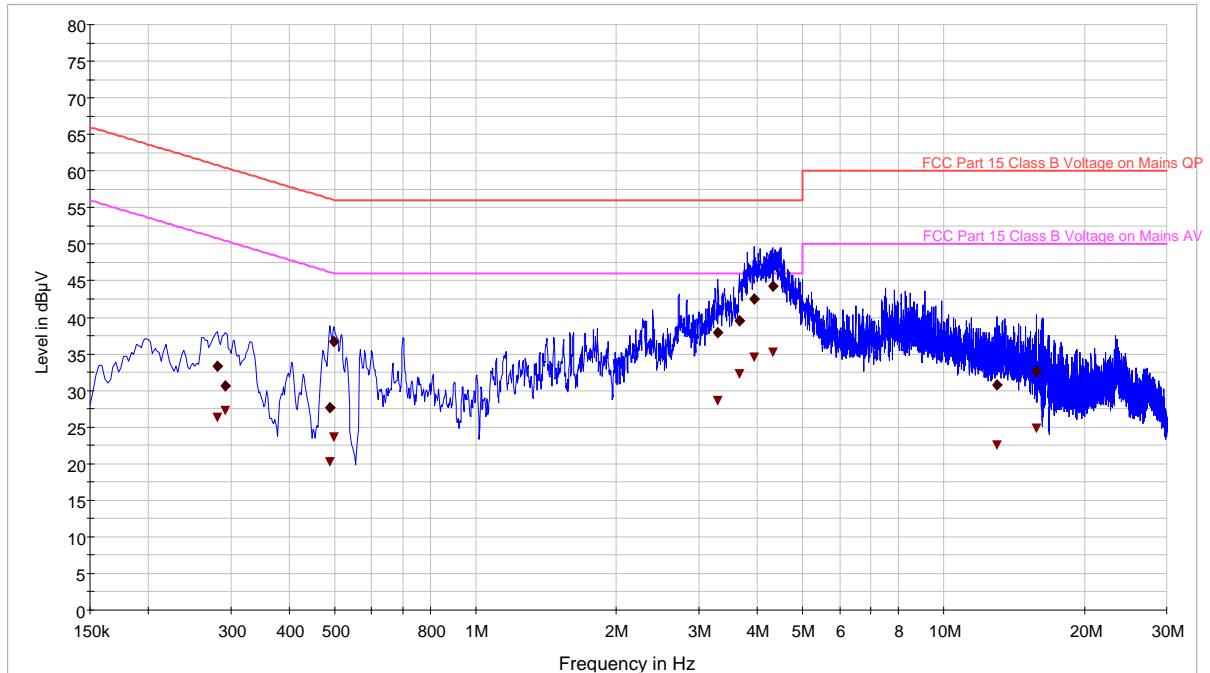
Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 52. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- Line L1 = Phase; Line N = Neutral
- Traces shown in plot made using a peak detector.
- Deviations to the Specifications: None.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 63 of 66	

Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



◆ FCC Part 15 Class B Voltage on Mains QP.LimitLine Final Result 1-QPK
 ▼ FCC Part 15 Class B Voltage on Mains AV.LimitLine Final Result 2-AVG
 — Preview Result 1-PK+

Plot 6-57. Line Conducted Plot with 802.11a (UNII Band 3)

Frequency MHz	Line	Bandwidth kHz	QuasiPeak dBµV	Limit dBµV	Margin dB	Average dBµV	Limit dBµV	Margin dB
0.280500	L1	9	33.30	60.80	27.50	26.30	50.80	24.50
0.291750	L1	9	30.60	60.50	29.80	27.30	50.50	23.20
0.487500	L1	9	27.70	56.20	28.50	20.20	46.20	26.00
0.498750	L1	9	36.70	56.00	19.30	23.50	46.00	22.50
3.297750	L1	9	37.90	56.00	18.10	28.50	46.00	17.50
3.657750	L1	9	39.60	56.00	16.40	32.30	46.00	13.70
3.939000	L1	9	42.50	56.00	13.50	34.60	46.00	11.40
4.312500	L1	9	44.20	56.00	11.80	35.20	46.00	10.80
13.015500	L1	9	30.80	60.00	29.20	22.50	50.00	27.50
15.823500	L1	9	32.60	60.00	27.40	24.90	50.00	25.10

Table 6-28. Line Conducted Data with 802.11a (UNII Band 3)

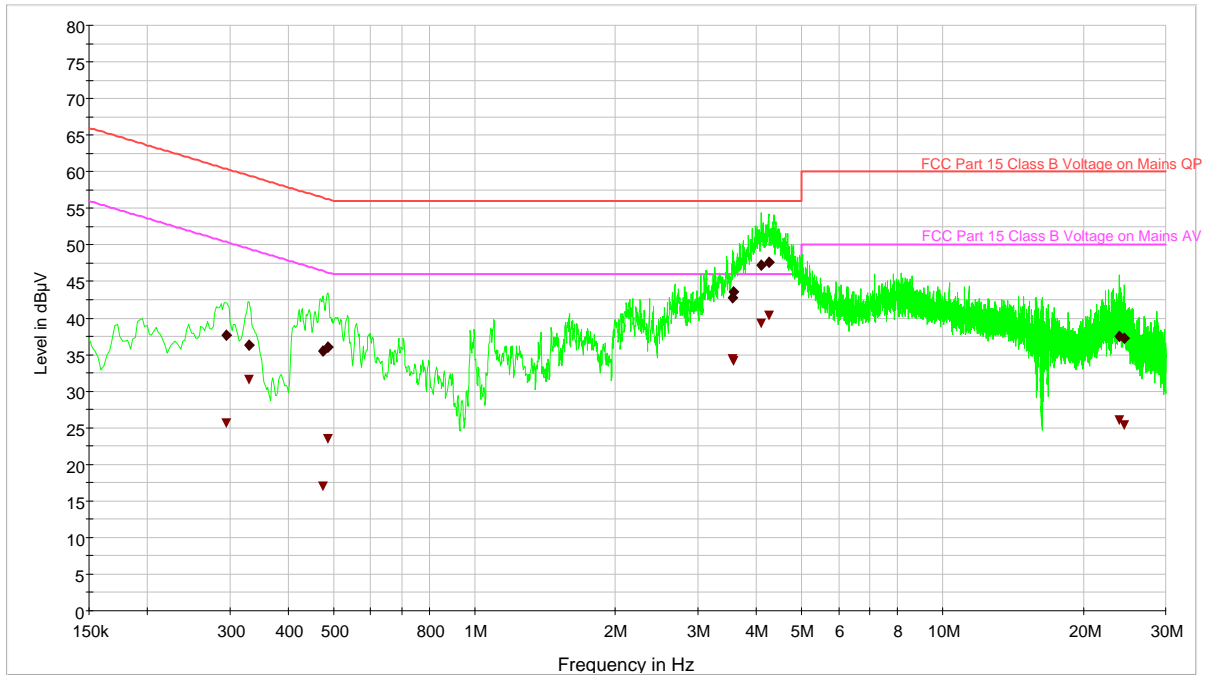
Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 100. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. Line L1 = Phase; Line N = Neutral
4. Traces shown in plot made using a peak detector.
5. Deviations to the Specifications: None.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset		Page 64 of 66

Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



— FCC Part 15 Class B Voltage on Mains QP.LimitLine
 — FCC Part 15 Class B Voltage on Mains AV.LimitLine
 — Preview Result 1-PK+
◆ Final Result 1-QPK
▼ Final Result 2-AVG

Plot 6-58. Line Conducted Data with 802.11a (UNII Band 3)

Frequency MHz	Line	Bandwidth kHz	QuasiPeak dBµV	Limit dBµV	Margin dB	Average dBµV	Limit dBµV	Margin dB
0.294000	N	9	37.60	60.40	22.80	25.70	50.40	24.70
0.330000	N	9	36.30	59.50	23.10	31.60	49.50	17.90
0.474000	N	9	35.50	56.40	20.90	17.00	46.40	29.40
0.485250	N	9	36.00	56.20	20.30	23.50	46.20	22.70
3.563250	N	9	42.70	56.00	13.30	34.40	46.00	11.60
3.570000	N	9	43.60	56.00	12.40	34.10	46.00	11.90
4.094250	N	9	47.30	56.00	8.70	39.30	46.00	6.70
4.249500	N	9	47.60	56.00	8.40	40.40	46.00	5.60
23.889750	N	9	37.50	60.00	22.50	26.10	50.00	23.90
24.499500	N	9	37.30	60.00	22.70	25.40	50.00	24.60

Table 6-29. Line Conducted Data with 802.11a (UNII Band 3)



Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 100. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- Line L1 = Phase; Line N = Neutral
- Traces shown in plot made using a peak detector.
- Deviations to the Specifications: None.

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset			Page 65 of 66

7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSPHL700** is in compliance with Part 15E of the FCC Rules and RSS-210 of the Industry Canada Rules..

FCC ID: A3LSPHL700		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1201230113.A3L	Test Dates: 01/26/12 - 01/31/12	EUT Type: Portable Handset	Page 66 of 66	