



# PCTEST ENGINEERING LABORATORY, INC.

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## MEASUREMENT REPORT

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

**Applicant Name:**

Samsung Electronics Co., Ltd.  
129, Samsung-ro, Yeongtong-gu  
Suwon-city, Gyeonggi-do, 443-803  
Republic of Korea

**Date of Testing:**

02/19 - 4/4/2013

**Test Site/Location:**

PCTEST Lab, Columbia, MD, USA

**Test Report Serial No.:**

0Y1303010388.A3L

**FCC ID:**

**A3LSHVE300LA**

**APPLICANT:**

**Samsung Electronics Co., Ltd.**

**Application Type:**

Certification

**Model(s):**

SHV-E300L

**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

**Test Procedure(s):**

ANSI C63.10-2009, KDB 789033 v01r02

Mode	UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	Conducted Power	
				Max. Power (mW)	Max. Power (dBm)
802.11a	1	20	5180 - 5240	18.323	12.63
	2	20	5260 - 5320	18.239	12.61
	3	20	5500 - 5700	18.365	12.64
802.11n	1	20	5180 - 5240	18.535	12.68
	2	20	5260 - 5320	18.535	12.68
	3	20	5500 - 5700	18.113	12.58
802.11n	1	40	5190 - 5230	15.668	11.95
	2	40	5270 - 5310	15.740	11.97
	3	40	5510 - 5670	15.776	11.98
802.11ac	1	80	5210	9.506	9.78
	2	80	5290	9.376	9.72
	3	80	5530	9.162	9.62

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2009 and KDB 789033. 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.



Randy Ortanez  
President



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<b>Test Report S/N:</b> 0Y1303010388.A3L	<b>Test Dates:</b> 02/19 - 4/4/2013	<b>EUT Type:</b> Portable Handset		Page 1 of 87

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# MEASUREMENT REPORT

## FCC Part 15.407



### § 2.1033 General Information

**APPLICANT:** Samsung Electronics Co., Ltd.

**APPLICANT ADDRESS:** 129, Samsung-ro, Yeongtong-gu  
Suwon-city, Gyeonggi-do, 443-803, Republic of Korea

**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.

**TEST SITE ADDRESS:** 7185 Oakland Mills Road, Columbia, MD 21046 USA

**FCC RULE PART(S):** Part 15.407

**IC SPECIFICATION(S):** RSS-210 Issue 8

**MODEL NAME:** SHV-E300L

**FCC ID:** A3LSHVE300LA

**Test Device Serial No.:** 41875, FK-040-C, B     Production     Pre-Production     Engineering

**FCC CLASSIFICATION:** Unlicensed National Information Infrastructure (UNII)

**DATE(S) OF TEST:** 02/19 - 4/4/2013



**TEST REPORT S/N:** 0Y1303010388.A3L

### Test Facility / Accreditations

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

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



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# 1.0 INTRODUCTION

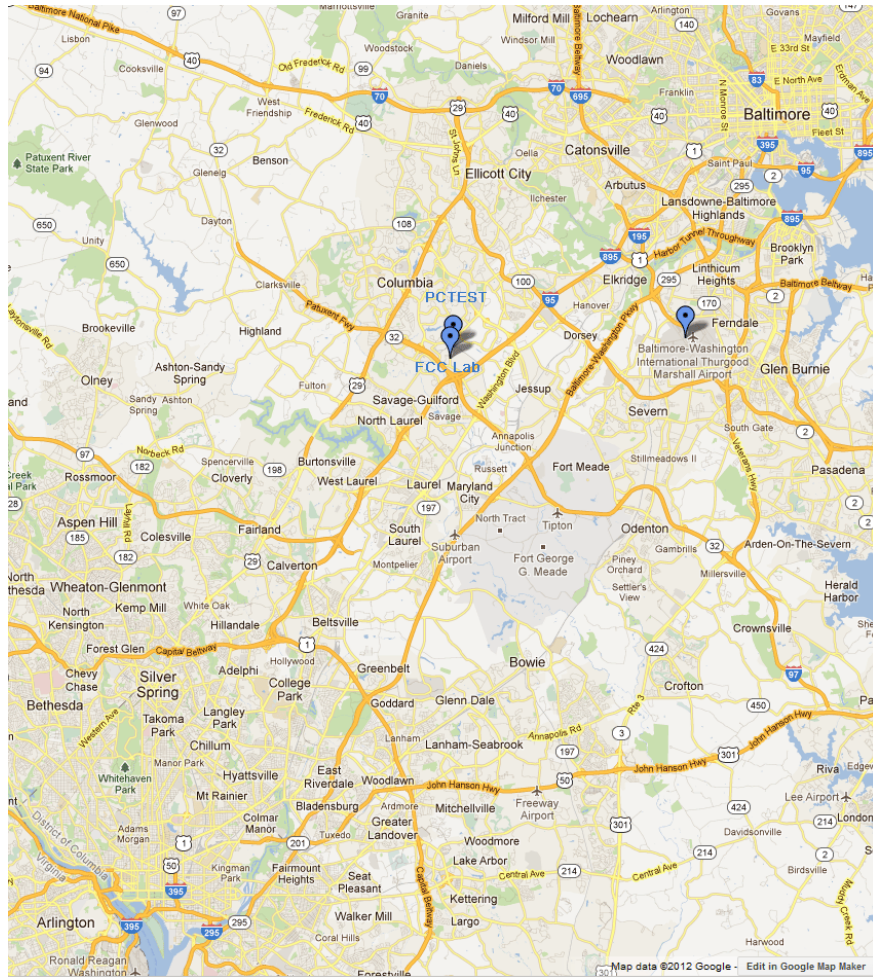
## 1.1 Scope

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'tl (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

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



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

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSHVE300LA**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

### 2.2 Device Capabilities

This device contains the following capabilities:

1900 GSM/GPRS, 850/1900 WCDMA/HSPA, Bands 5 (5MHz BW, 10MHz BW) LTE, 802.11a/b/g/n/ac WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

**Note:** 5GHz WLAN (DTS/NII) operation is possible in 20MHz, 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles are as follows:

- 802.11a/n 20MHz Bandwidth – 98.9%
- 802.11n 40MHz Bandwidth – 98.7%
- 802.11ac 80MHz Bandwidth – 98.1%

### 2.3 Test Configuration

The Samsung Portable Handset FCC ID: A3LSHVE300LA was tested per the guidance of ANSI C63.10-2009 and KDB 789033. See Sections 3.2, 3.3, and 6.1 of this test report for a description of the AC line conducted emissions, radiated emissions, and antenna port conducted emissions test setups, respectively.

### 2.4 EMI Suppression Device(s)/Modifications



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

### 2.5 Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5).

Please see attachment for FCC ID label and label location.

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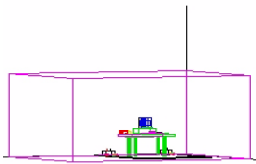
## 3.0 DESCRIPTION OF TEST

### 3.1 Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009) and the guidance provided in KDB 789033 were used in the measurement of **Samsung Portable Handset FCC ID: A3LSHVE300LA**.

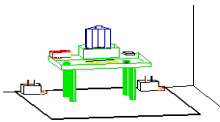
Deviation from measurement procedure.....None

### 3.2 AC Line Conducted Emissions



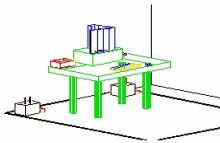
**Figure 3-1. Shielded Enclosure Line-Conducted Test Facility**

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). Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (see Figure 3-3). 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”.



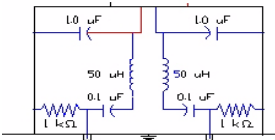
**Figure 3-2. Line Conducted Emission Test Set-Up**

The EUT is powered from one LISN and the support equipment is powered from the second LISN. 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) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.



**Figure 3-3. Wooden Table & Bonded LISNs**

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 and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements. The bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was maximized by varying: power lines, 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. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz bandwidth for final measurements. Each emission reported was calibrated using a signal generator.



**Figure 3-4. LISN Schematic Diagram**

Line conducted emissions test results are shown in Section **Error! Reference source not found..** Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is the PCTEST Conduction Automatic Measurement, Version 2.7.



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### 3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

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

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by varying: the mode of operation or resolution, clock or data rate, scrolling H pattern to the EUT and/or support equipment, and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

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## 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: A3LSHVE300LA** 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 / 802.11n (20MHz) Frequency / Channel Operations**

Band 1		Band 2		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510
:	:	:	:	:	:
46	5230	62	5310	110	5550
				:	:
				134	5670

**Table 4-2. 802.11n (40MHz BW) Frequency / Channel Operations**

Band 1		Band 2		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
42	5210	58	5290	106	5530

**Table 4-3. 802.11ac (80MHz BW) Frequency / Channel Operations**

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## 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
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/10/2012	Annual	7/10/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	3/13/2012	Annual	3/13/2013	N/A
-	WL25-1	Conducted Cable Set (25GHz)	1/16/2013	Annual	1/16/2014	N/A
Agilent	8447D	Broadband Amplifier	5/8/2012	Annual	5/8/2013	2443A01900
Agilent	N9020A	MXA Signal Analyzer	10/9/2012	Annual	10/9/2013	US46470561
Anritsu	MA2411B	Pulse Sensor	9/19/2012	Annual	9/19/2013	1027293
Anritsu	ML2495A	Power Meter	10/11/2012	Annual	10/11/2013	1039008
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	5/10/2012	Annual	5/10/2013	121034
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Biennial	7/22/2013	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	Biennial	5/30/2014	135427
ETS Lindgren	3160-10	26.5-40 GHz Standard Gain Horn	6/6/2012	Biennial	6/6/2014	130993
Mini-Circuits	VHF-3100+	High Pass Filter	1/21/2013	Annual	1/21/2014	31144
Mini-Circuits	VHF-8400+	3.4GHz - 9.9GHz High Pass Filter	1/17/2013	Annual	1/17/2014	31048
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	6/26/2012	Annual	6/26/2013	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/30/2012	Annual	5/30/2013	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	6/6/2012	Annual	6/6/2013	100037
Rohde & Schwarz	ESU26	EMI Test Receiver	3/15/2012	Annual	3/15/2013	100342
Solar Electronics	8012-50-R-24-BNC	LISN	6/23/2011	Biennial	6/23/2013	310233
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

**Table 5-1. Annual Test Equipment Calibration Schedule**

**Note:**

All test equipment was in calibration when used for testing. Certain items (i.e., the RE1 Cable Set, the RE2 Cable Set, and the R&S EMI Receiver) were calibrated during the testing period- their new calibration dates are listed below.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	3/29/2013	Annual	3/29/2014	N/A
Rohde & Schwarz	ESU26	EMI Test Receiver	2/25/2013	Annual	2/25/2014	100342

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## 6.0 TEST RESULTS

### 6.1 Summary



Company Name: Samsung Electronics Co., Ltd.  
 FCC ID: A3LSHVE300LA  
 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)  
13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150 (n – 40MHz BW)  
29.3/32.5, 58.5/65, 87.8/97.5, 117/130, 175.5/195, 234/260, 263.3/292.5, 292.5/325,  
351/390, 390/433.3 (n – 80MHz BW)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
<b>TRANSMITTER MODE (TX)</b>						
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 <sub>10</sub> (BW) dBm (5150-5250MHz) [FCC] < 10 + 10log <sub>10</sub> (BW) dBm (5150-5250MHz) [IC] < 11 + 10log <sub>10</sub> (B) dBm (5250-5350MHz, 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(h)	RSS-210 [A9.3]	Dynamic Frequency Selection	See DFS Test Report		PASS	See DFS Test Report
15.407(b)(1), (2),(3)	RSS-210 [A9.2]	Undesirable Emissions	< -27 dBm/MHz EIRP (5150-5350MHz, 5470-5725MHz)	RADIATED	PASS	Section 6.7
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, 6.9
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

**Table 6-1. Summary of Test Results**

**Notes:**

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "UNII Automation", Version 1.5.

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## 6.2 26dB Bandwidth Measurement – 802.11a/n/ac

### Test Overview and Limit

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 at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

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

### Test Procedure Used

KDB 789033 v01r02 – Section D

### Test Settings

1. RBW = approximately 1% of the emission bandwidth
2. VBW  $\geq$  3 x RBW
3. Detector = Peak
4. Trace mode = max hold
5. The automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

### Test Setup



The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-1. Test Instrument & Measurement Setup**



### Test Notes

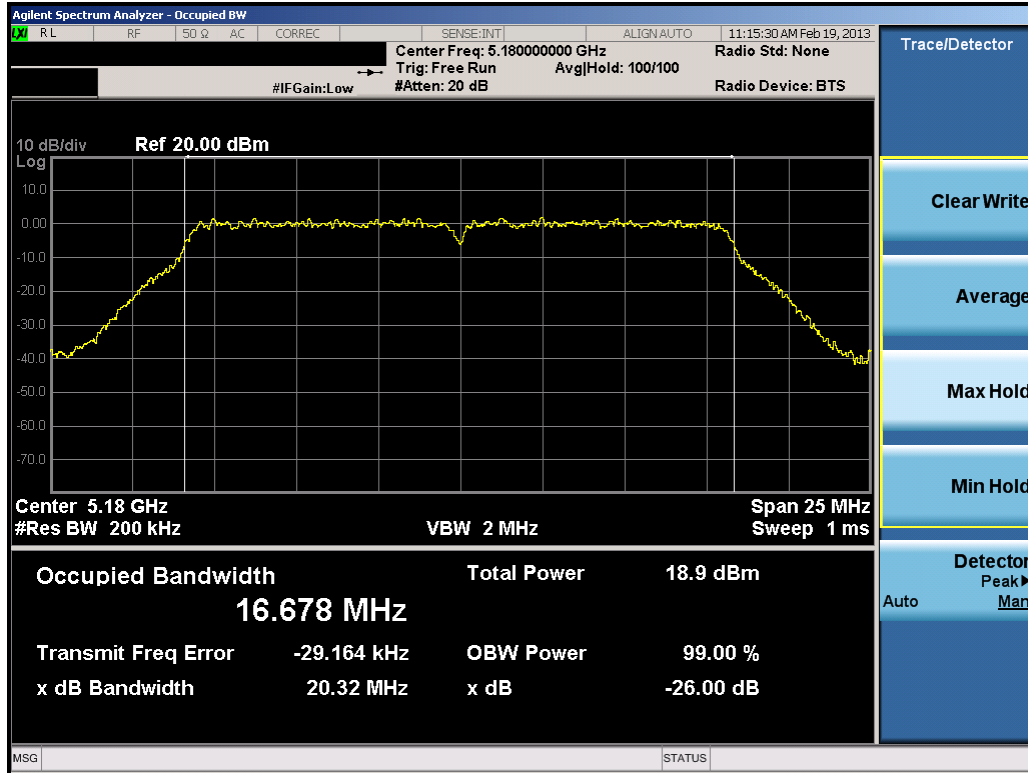
None

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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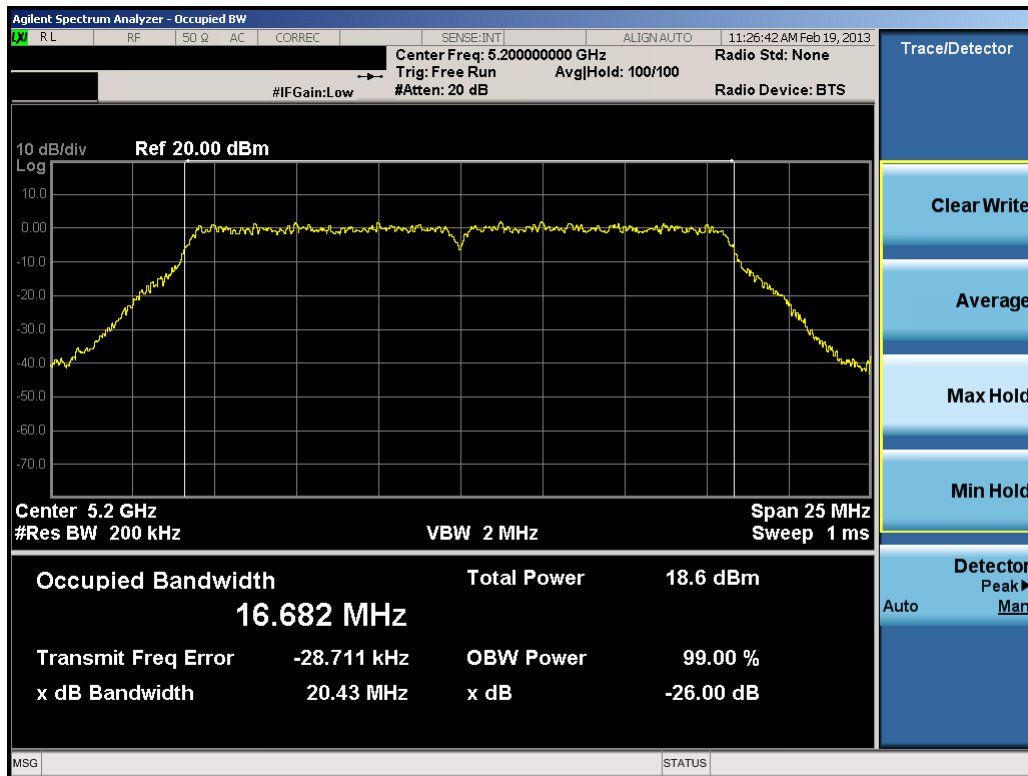
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
Band I	5180	36	a	6	20.32
	5200	40	a	6	20.43
	5240	48	a	6	20.39
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	20.79
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	20.92
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	20.78
	5190	38	n (40MHz)	13.5/15 (MCS0)	39.64
	5230	46	n (40MHz)	13.5/15 (MCS0)	39.60
	5210	42	n (80MHz)	351/390 (MCS8)	82.23
Band II	5260	52	a	6	20.43
	5280	56	a	6	20.39
	5320	64	a	6	20.20
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	20.70
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	20.67
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	20.79
	5270	54	n (40MHz)	13.5/15 (MCS0)	39.70
	5310	62	n (40MHz)	13.5/15 (MCS0)	39.44
	5290	58	n (80MHz)	351/390 (MCS8)	82.22
Band III	5500	100	a	6	20.30
	5580	116	a	6	20.44
	5700	140	a	6	20.36
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	20.62
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	20.79
	5700	140	n (20MHz)	6.5/7.2 (MCS0)	20.63
	5510	102	n (40MHz)	13.5/15 (MCS0)	39.49
	5550	110	n (40MHz)	13.5/15 (MCS0)	39.70
	5670	134	n (40MHz)	13.5/15 (MCS0)	39.69
5530	106	n (80MHz)	351/390 (MCS8)	82.80	

**Table 6-2. Conducted Bandwidth Measurements**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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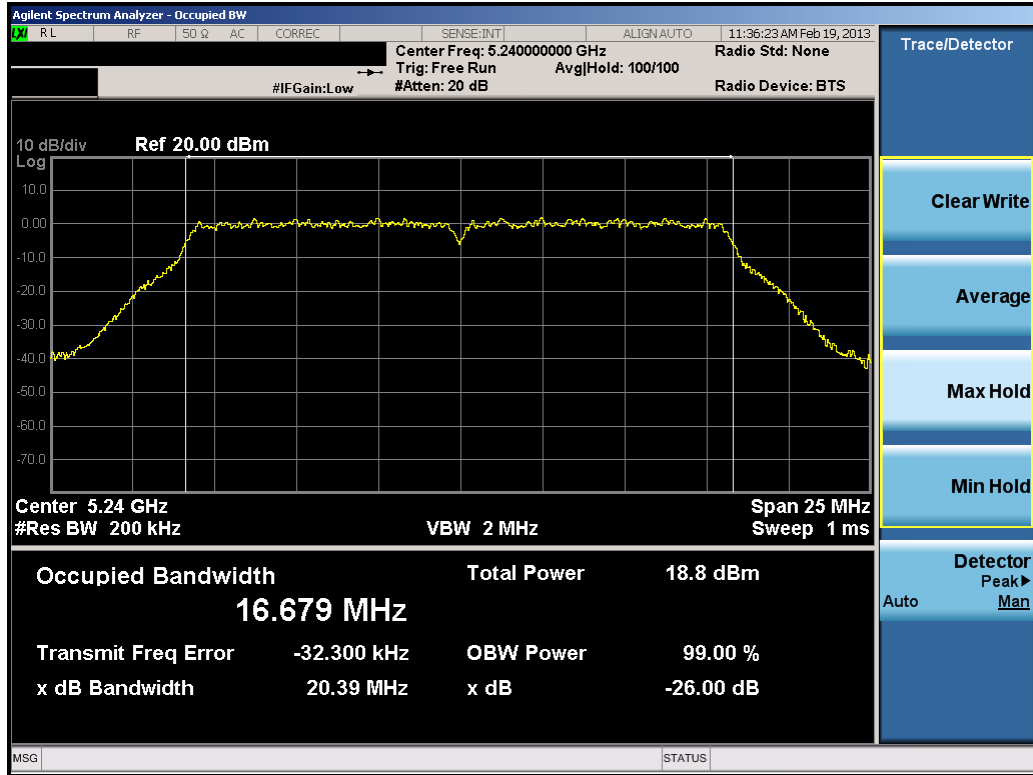


Plot 6-1. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 36)

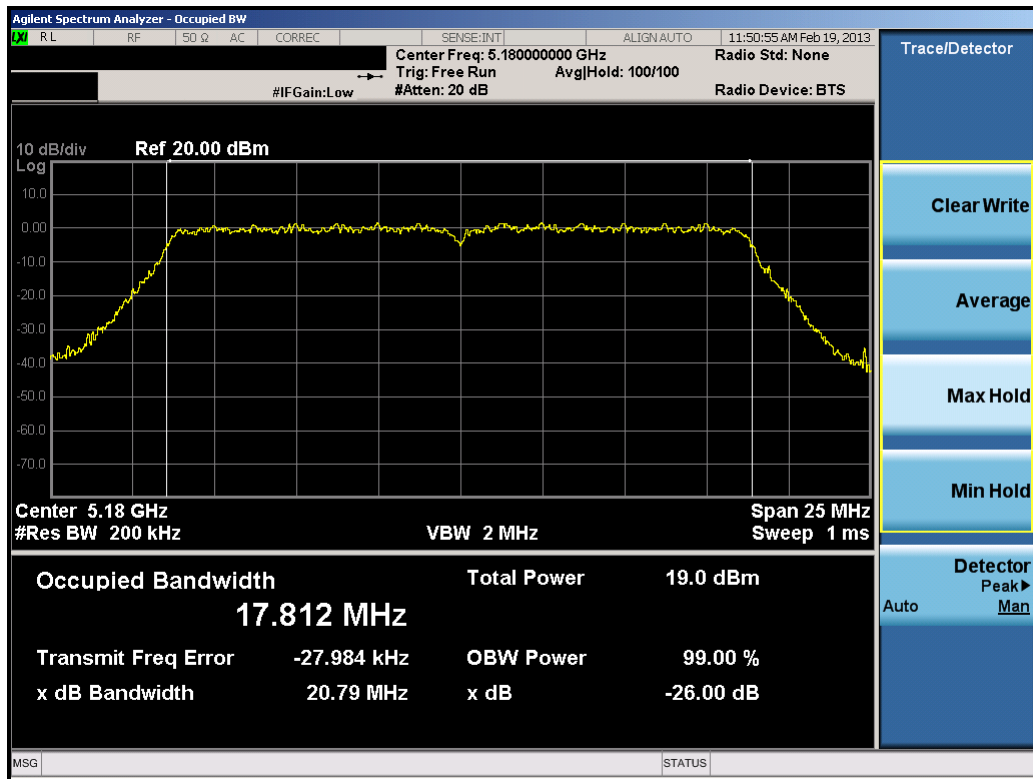


Plot 6-2. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 13 of 87

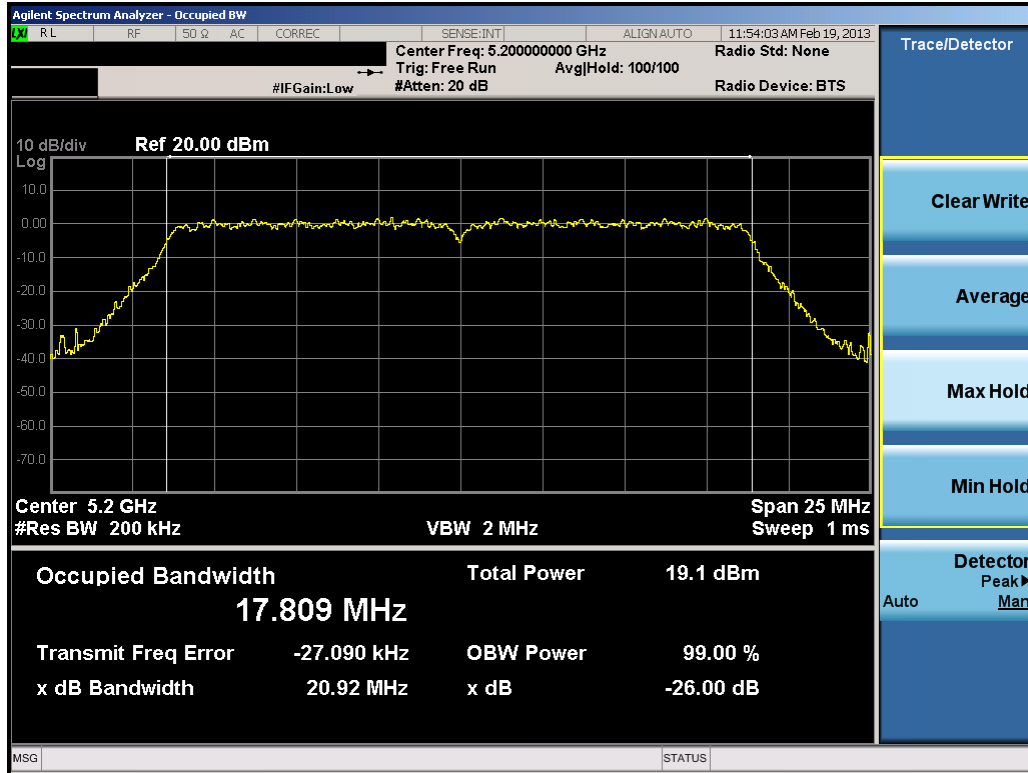


Plot 6-3. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 48)

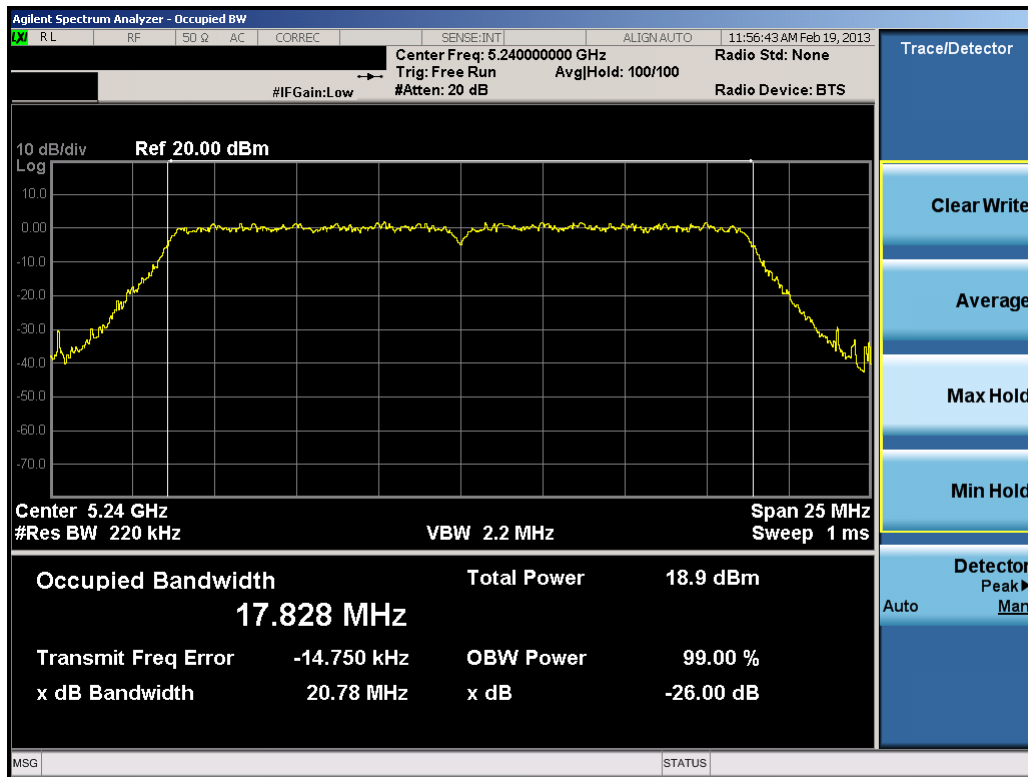


Plot 6-4. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 14 of 87

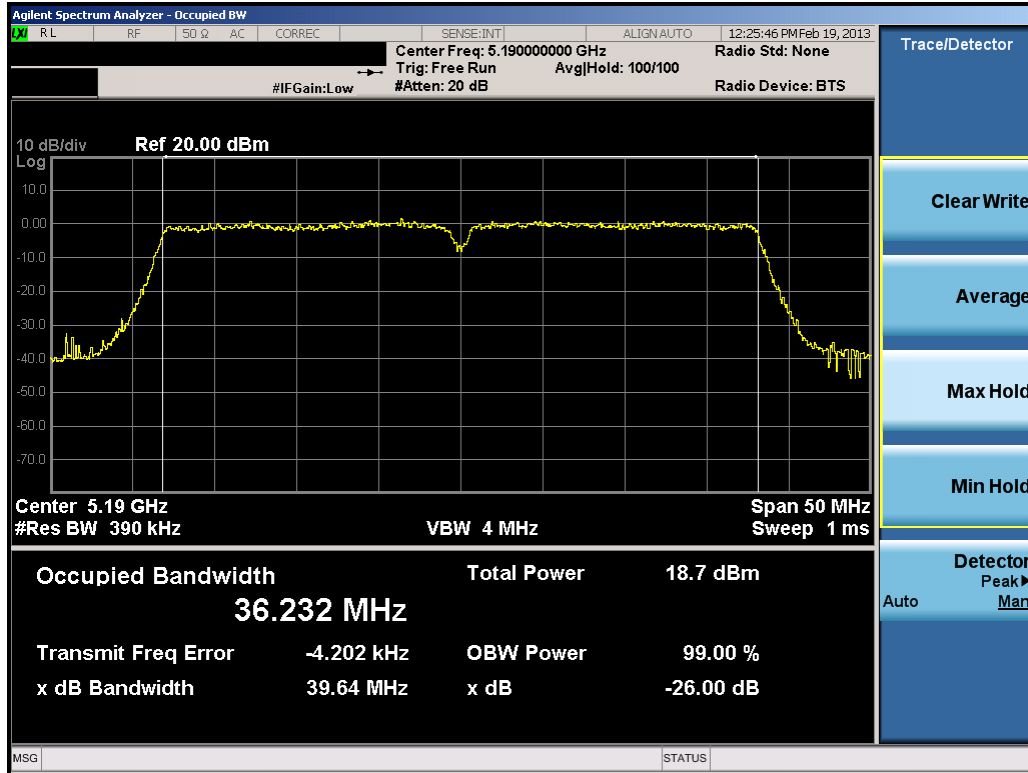


Plot 6-5. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

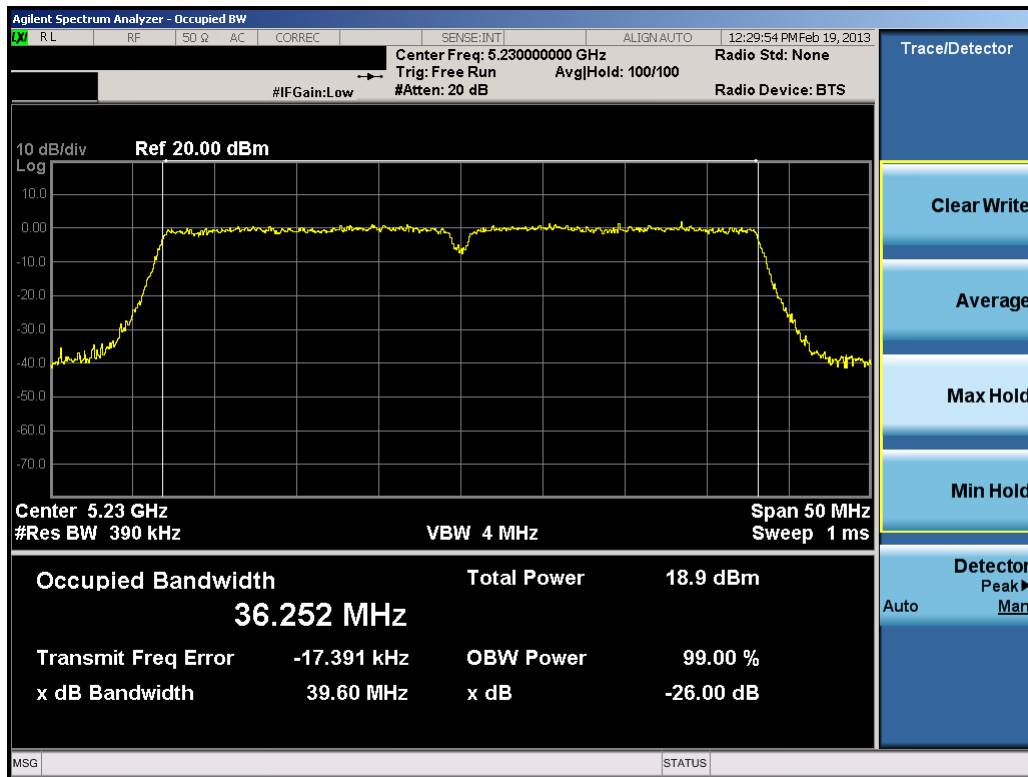


Plot 6-6. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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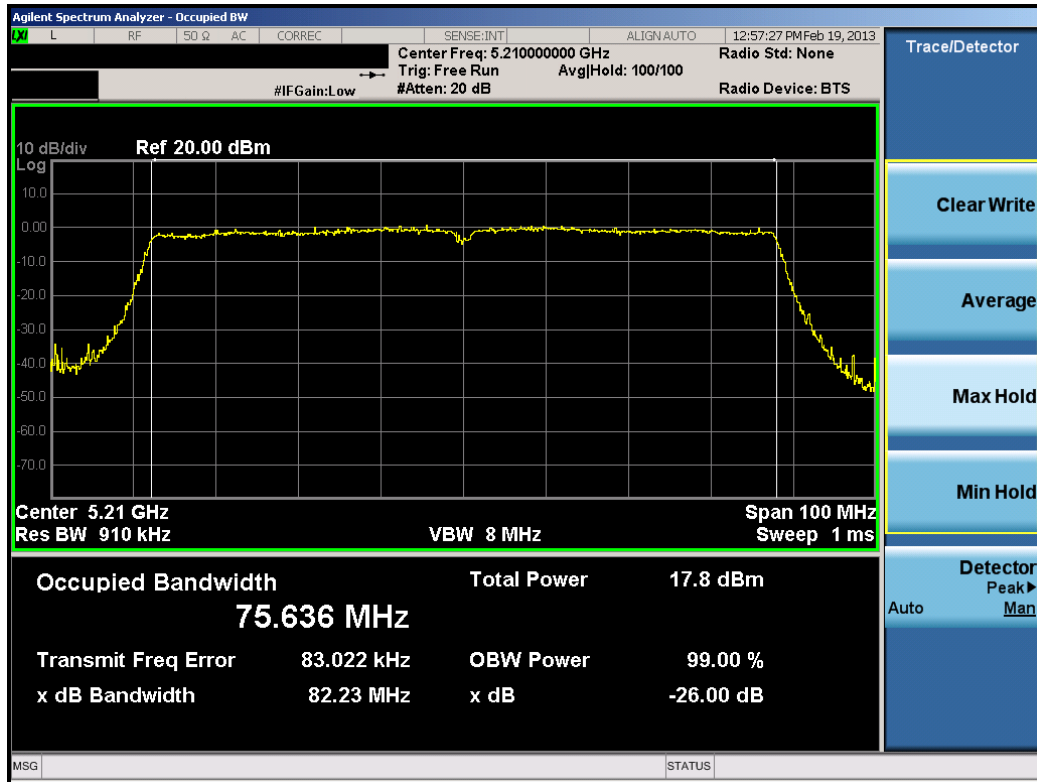


Plot 6-7. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

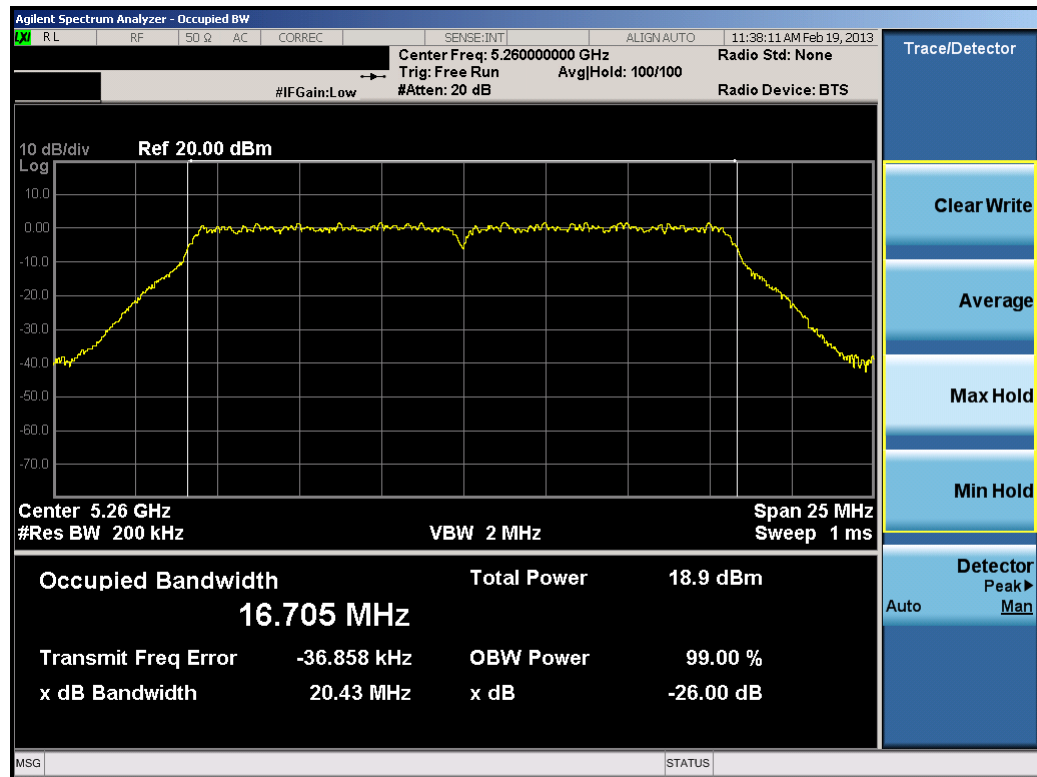


Plot 6-8. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 16 of 87

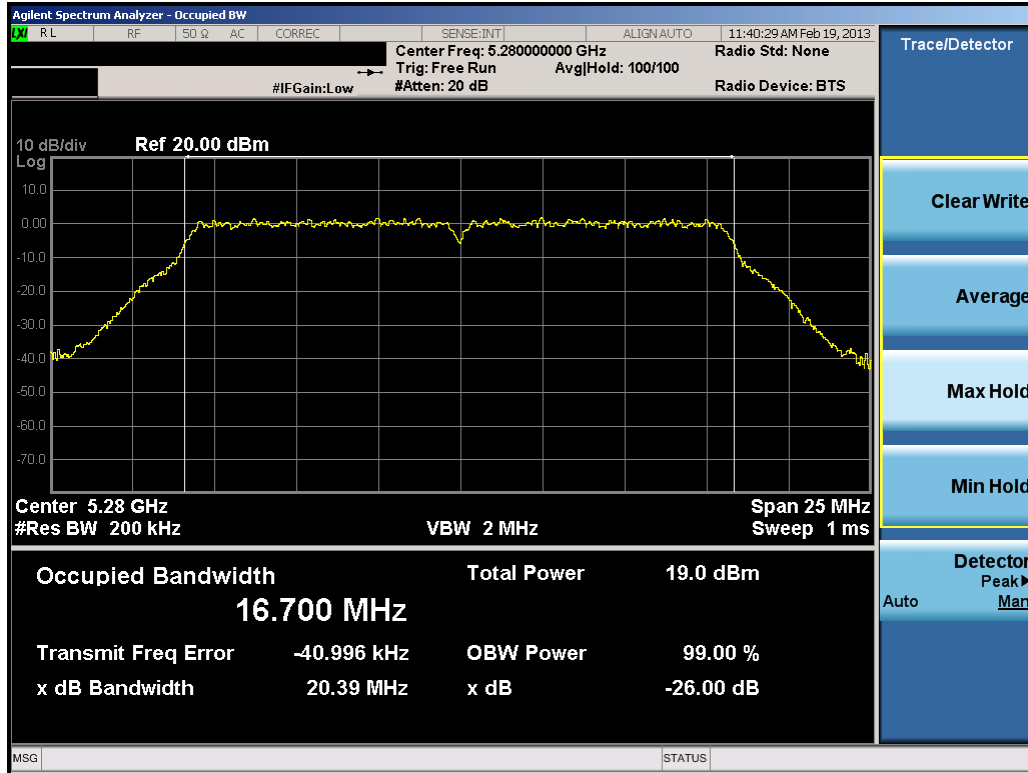


Plot 6-9. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

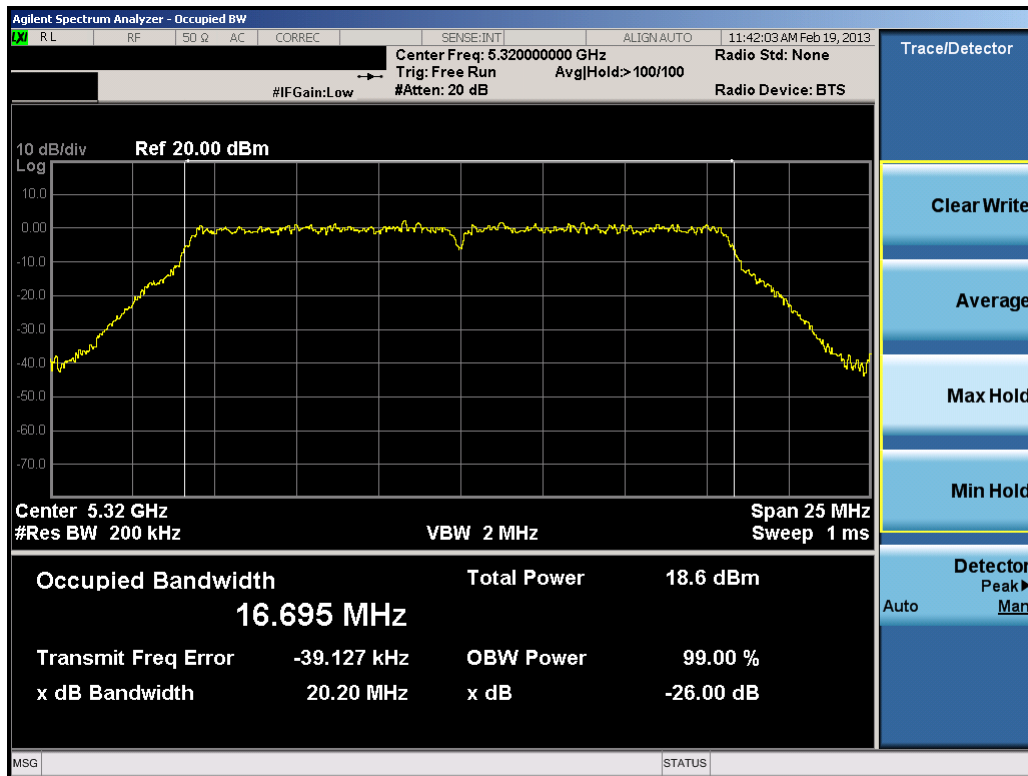


Plot 6-10. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 52)

FCC ID: A3LSHVE300LA	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 17 of 87

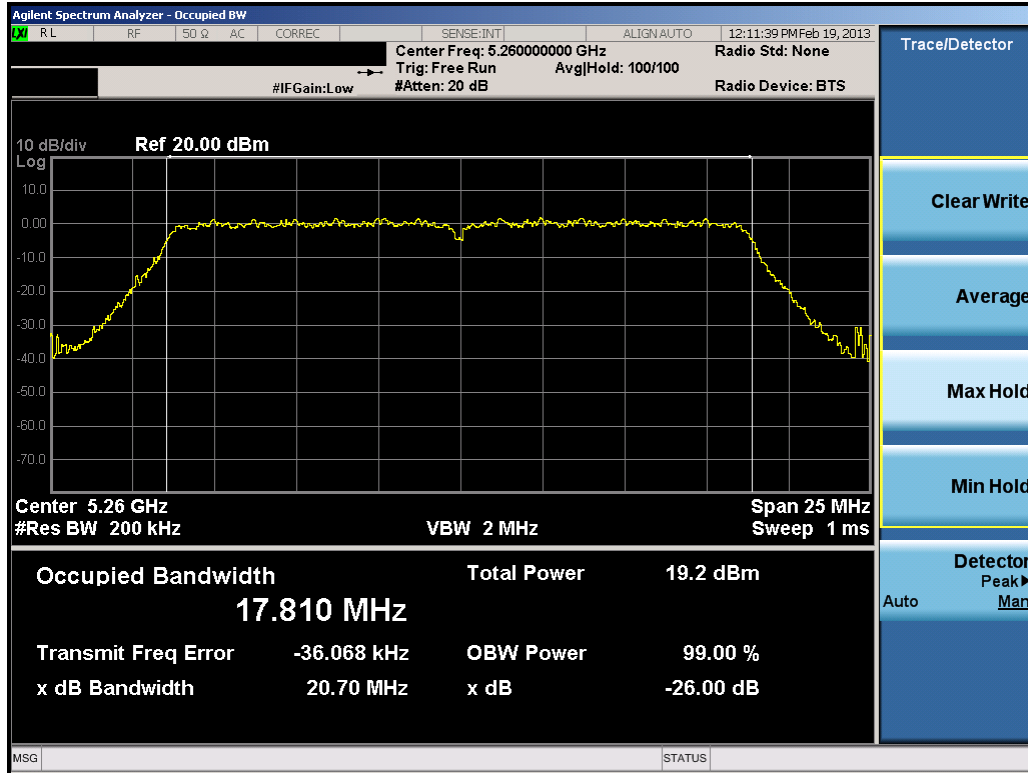


Plot 6-11. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 56)

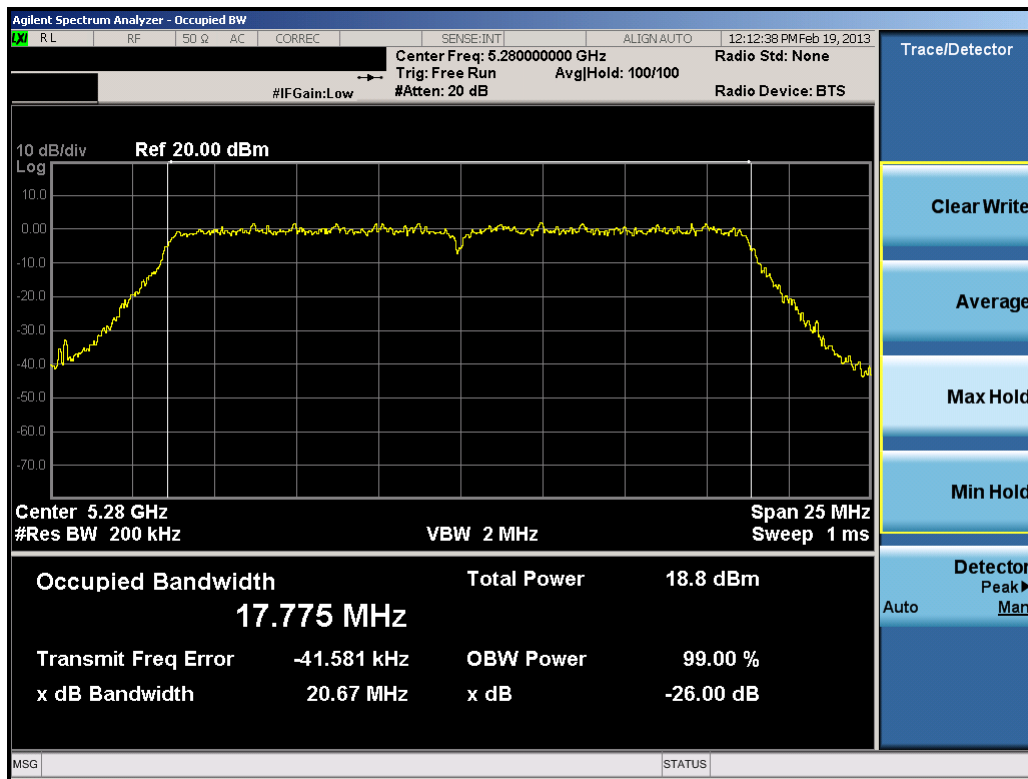


Plot 6-12. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 64)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 18 of 87

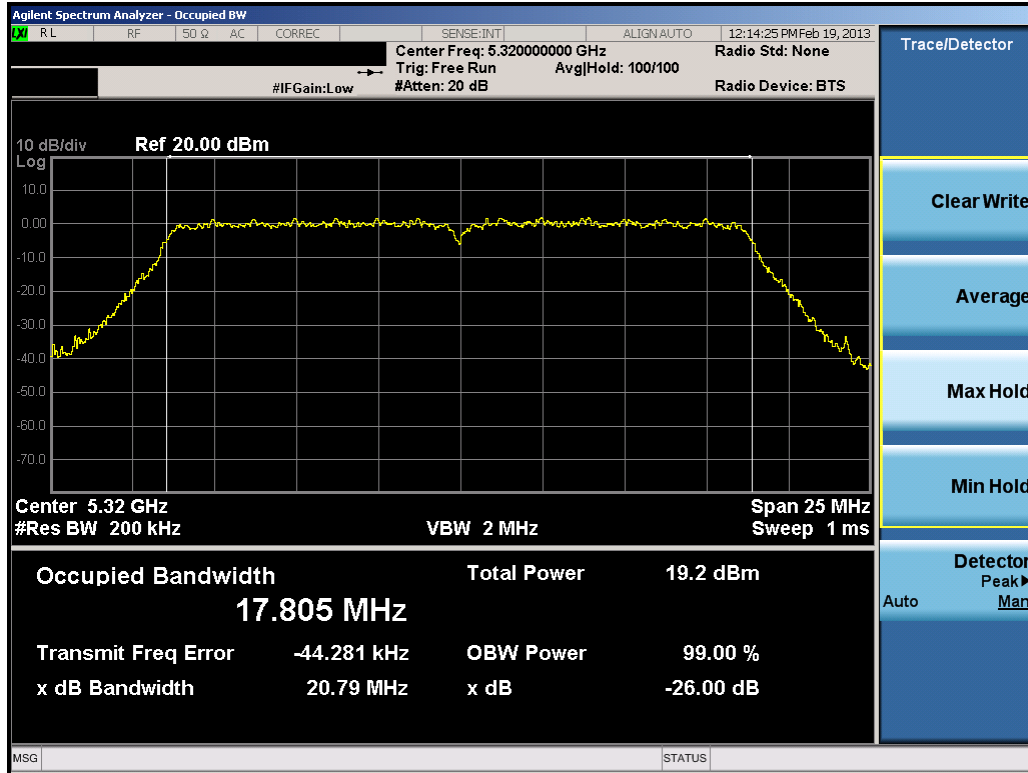


Plot 6-13. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 52)

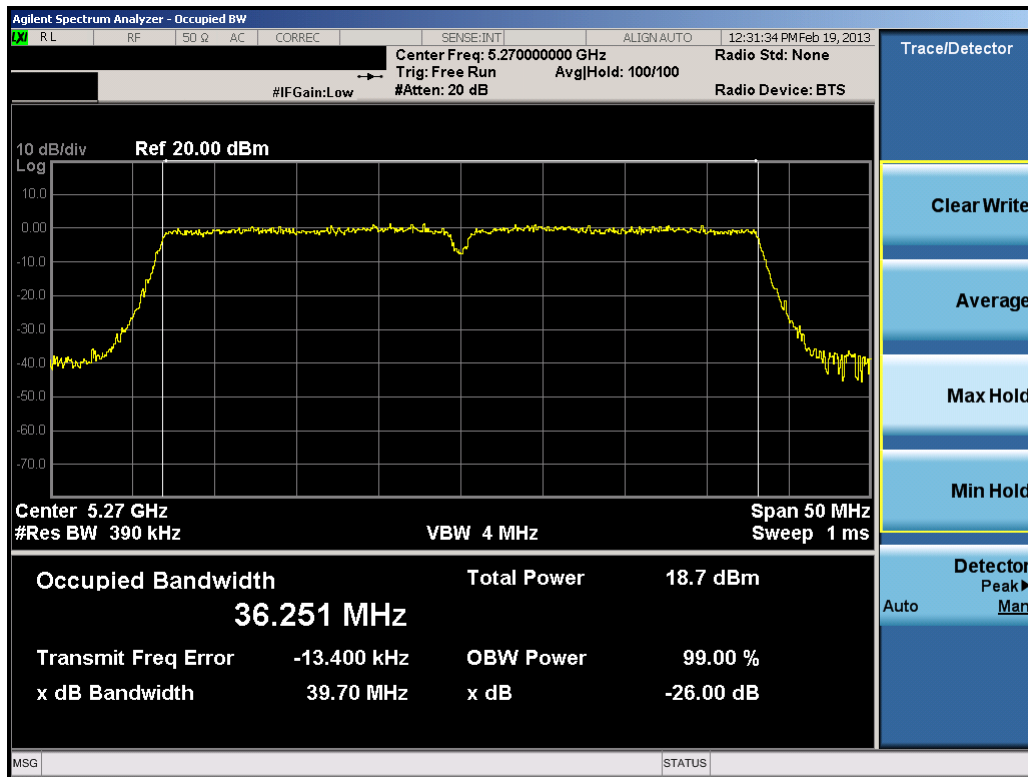


Plot 6-14. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 56)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 19 of 87

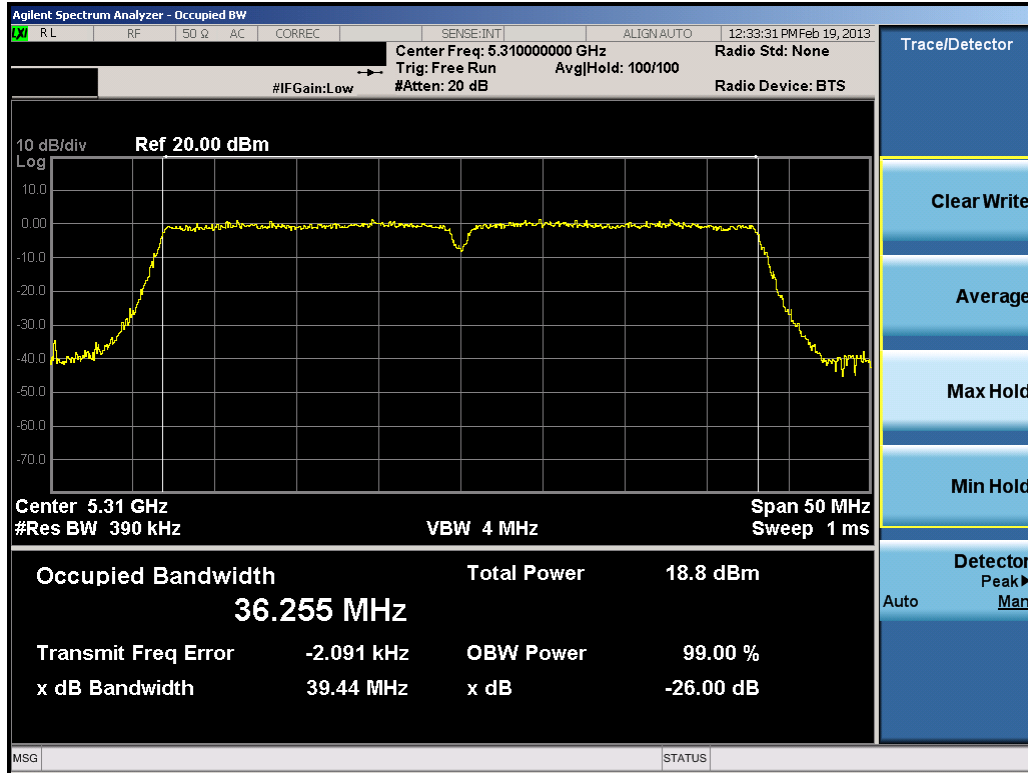


Plot 6-15. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 64)

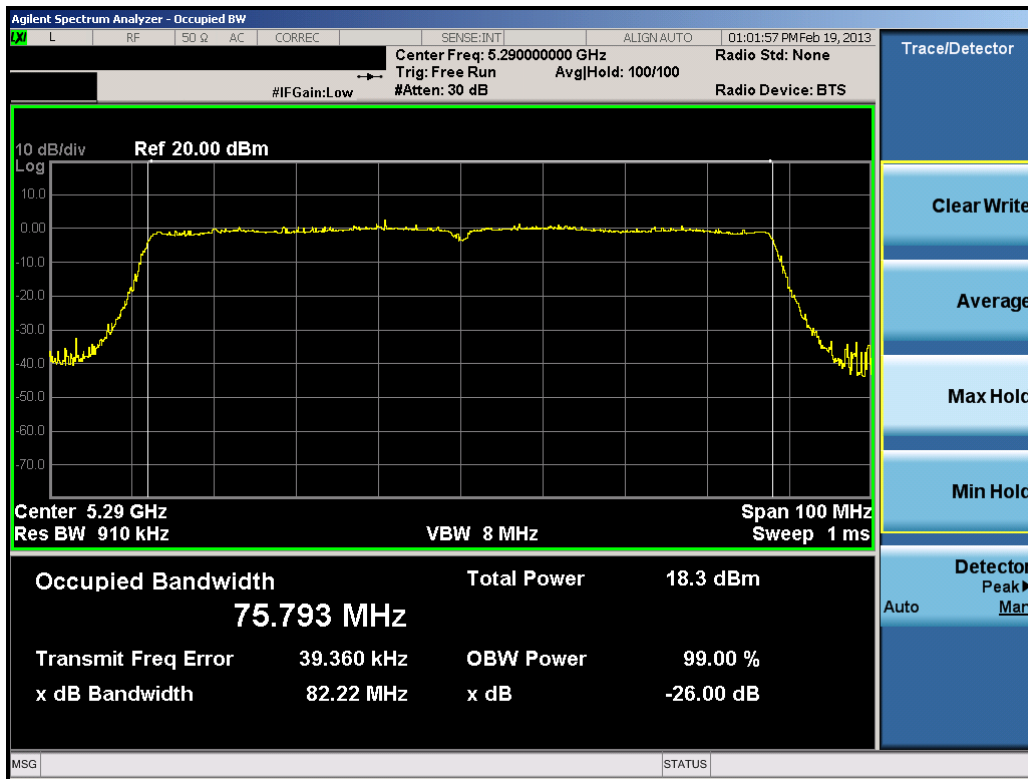


Plot 6-16. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 54)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 20 of 87

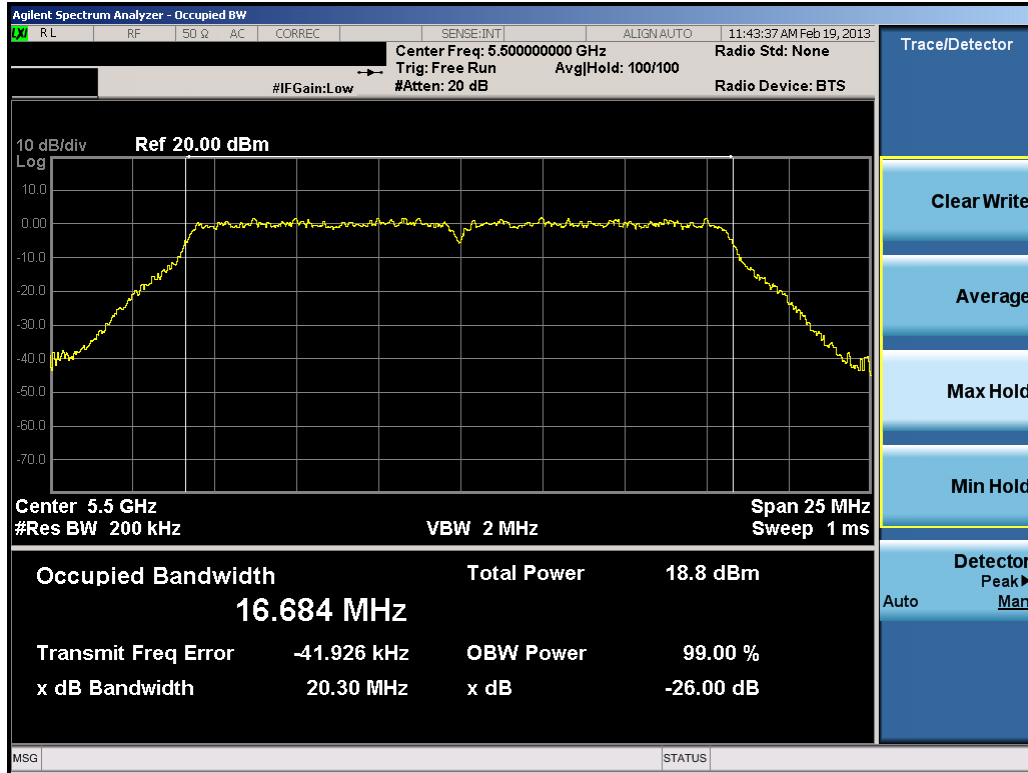


Plot 6-17. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 62)

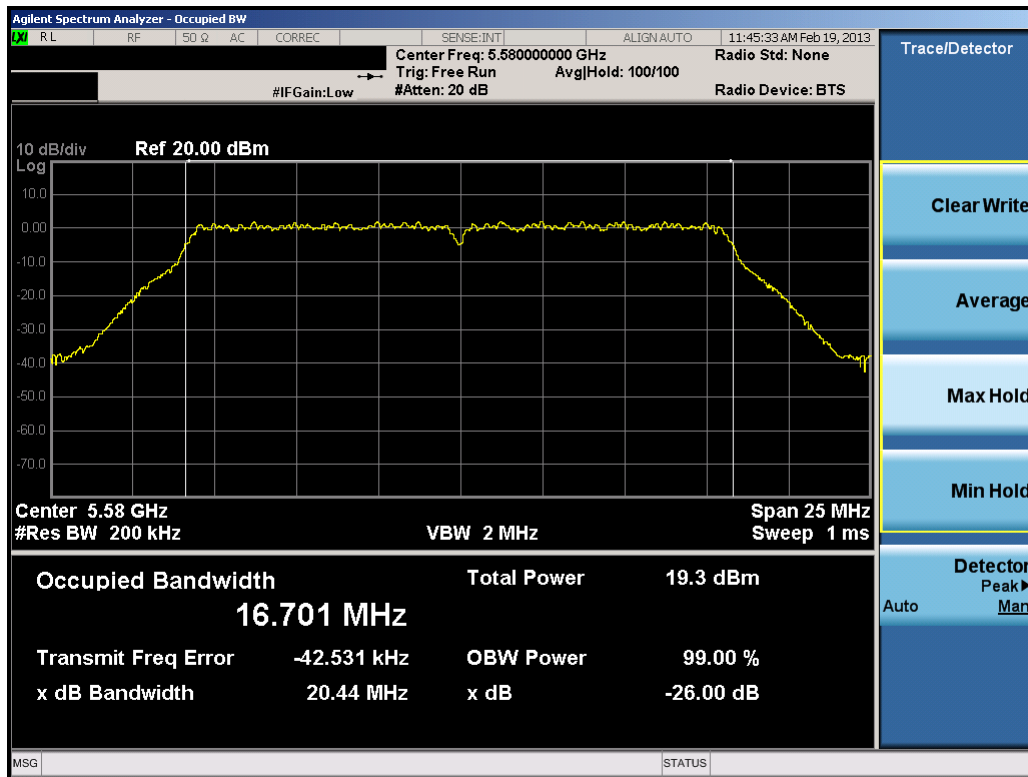


Plot 6-18. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2) – Ch. 58)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 21 of 87

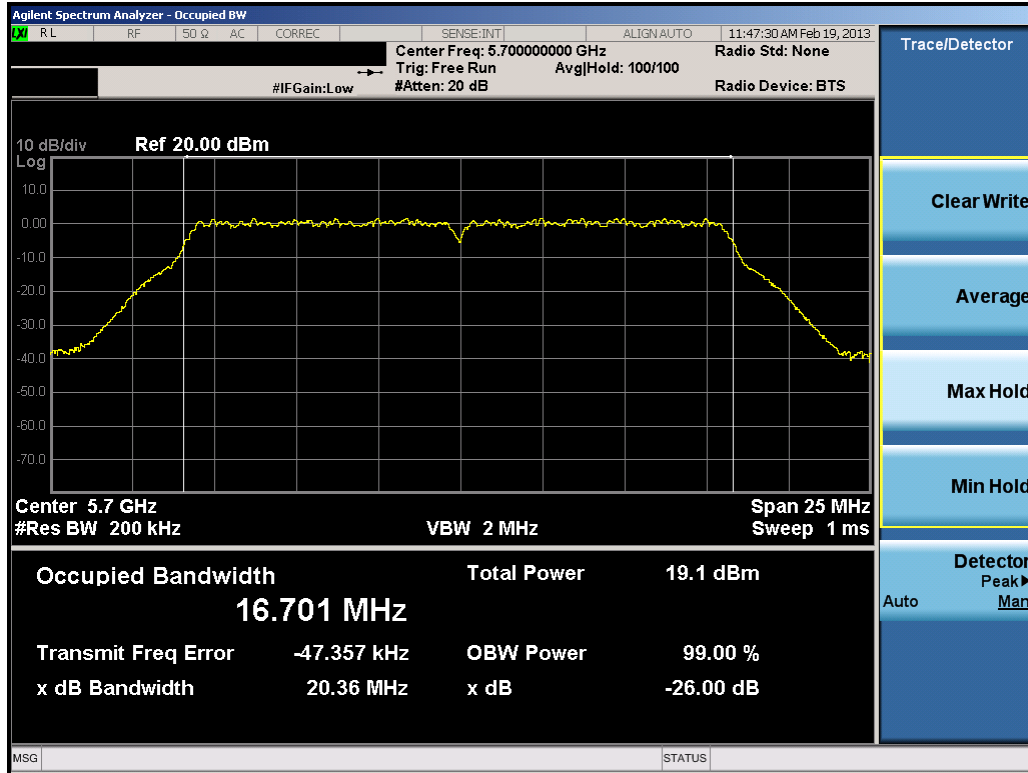


Plot 6-19. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 100)

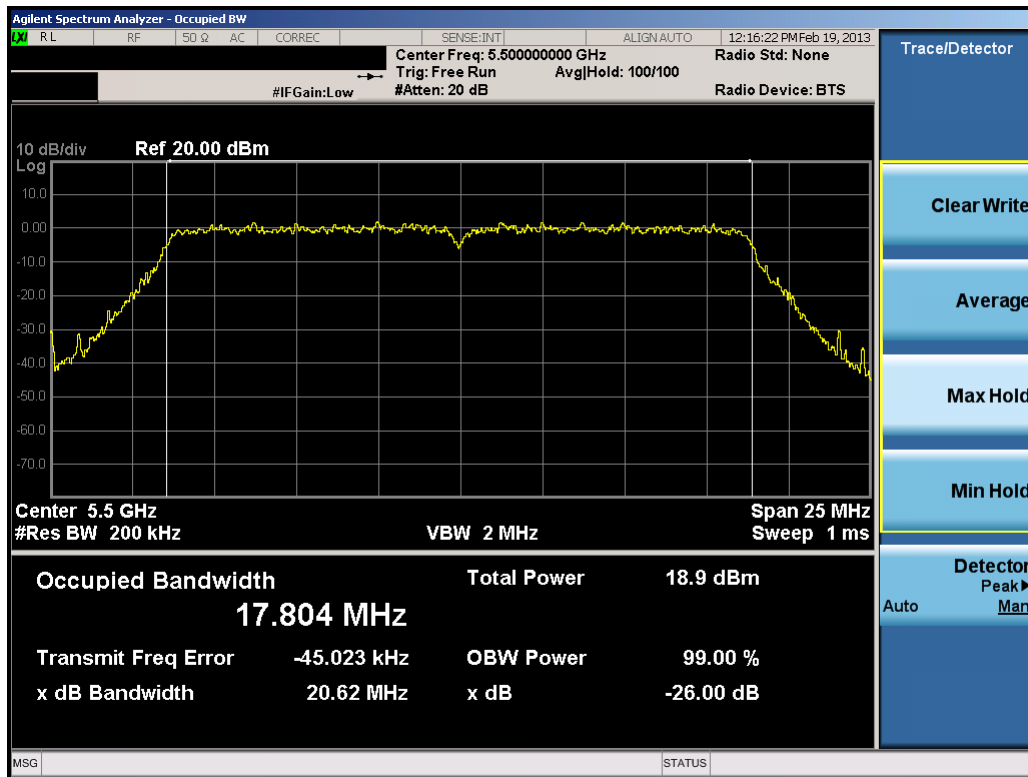


Plot 6-20. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 116)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 22 of 87

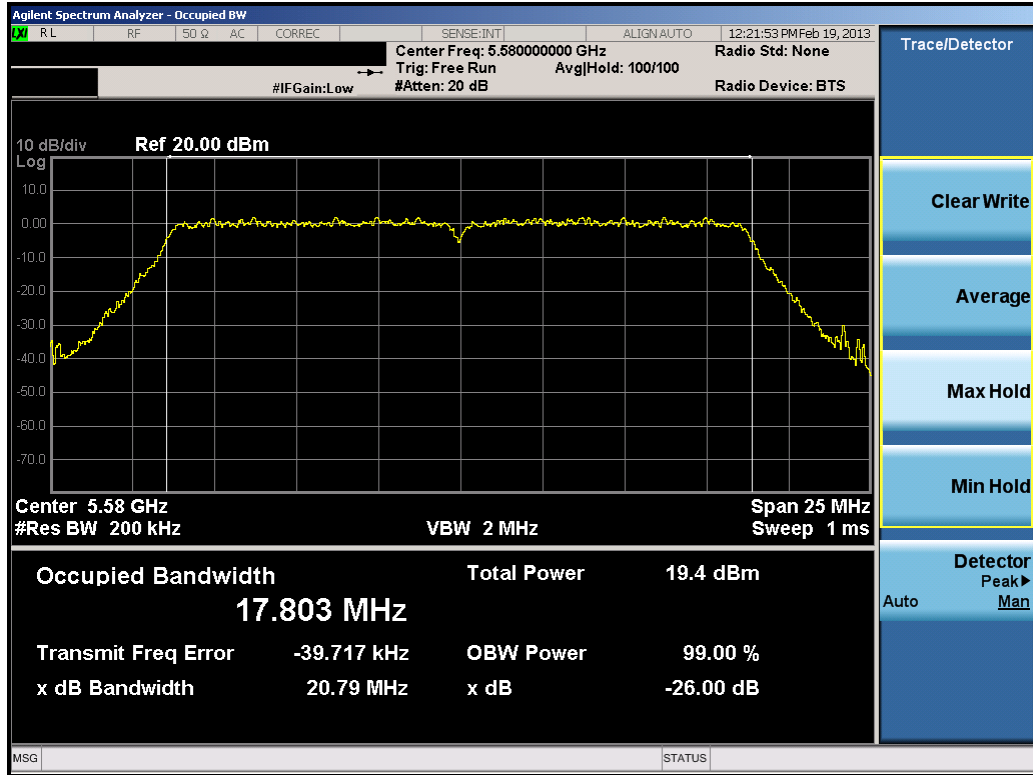


Plot 6-21. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 140)

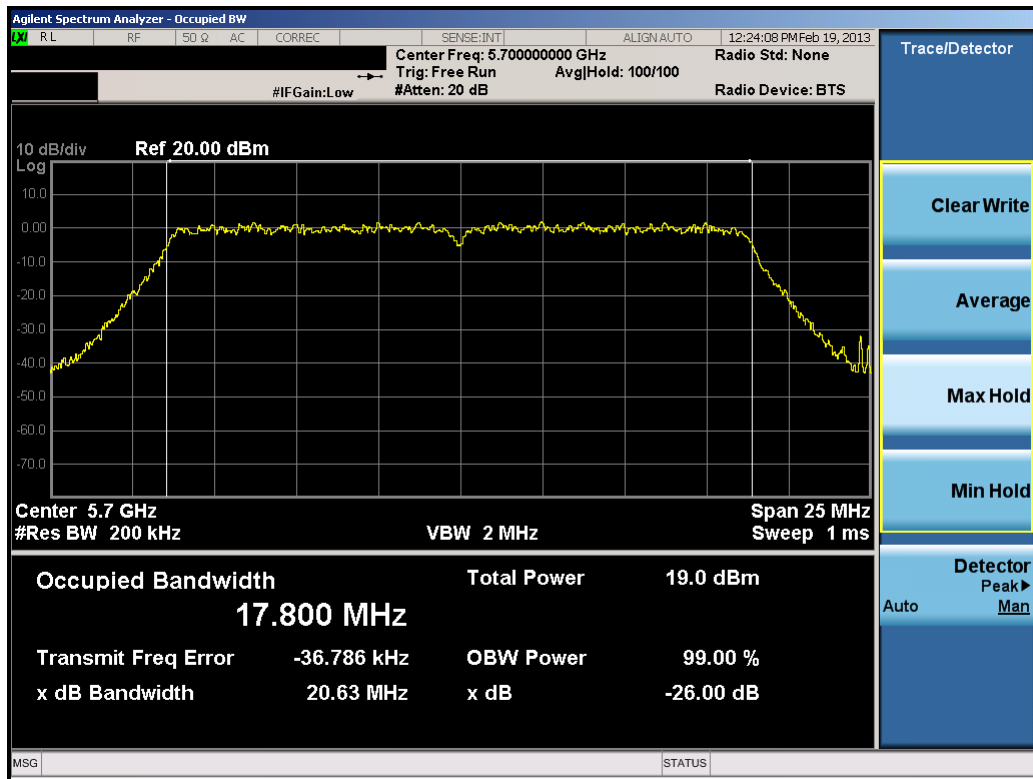


Plot 6-22. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 100)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 23 of 87

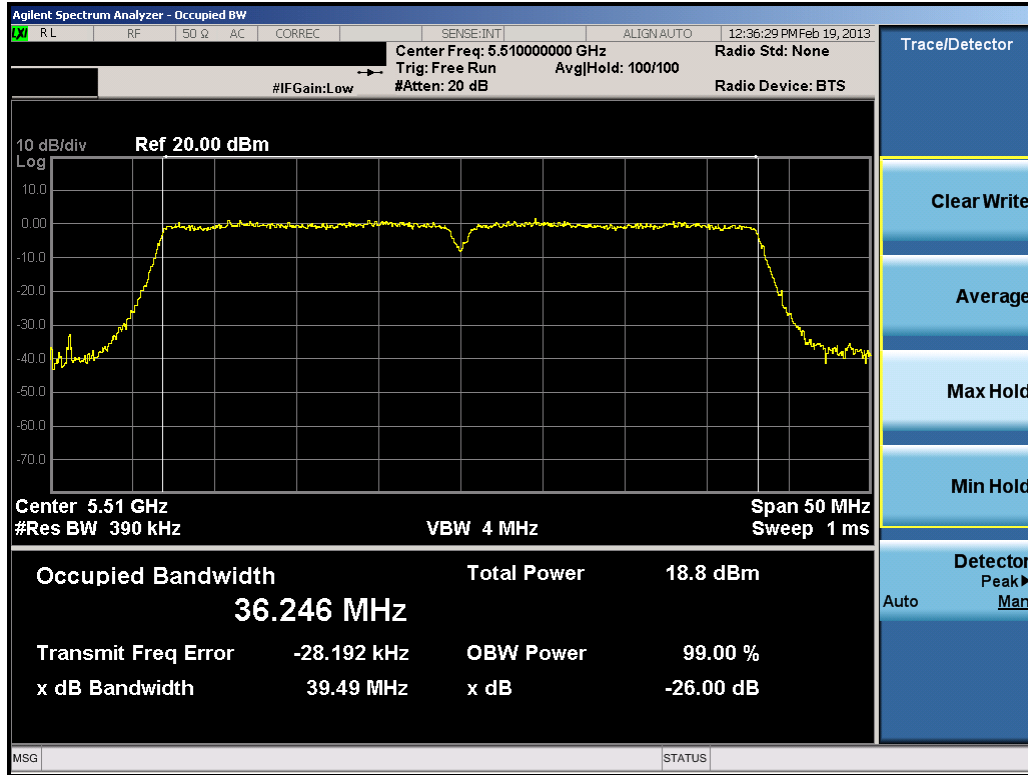


Plot 6-23. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 116)

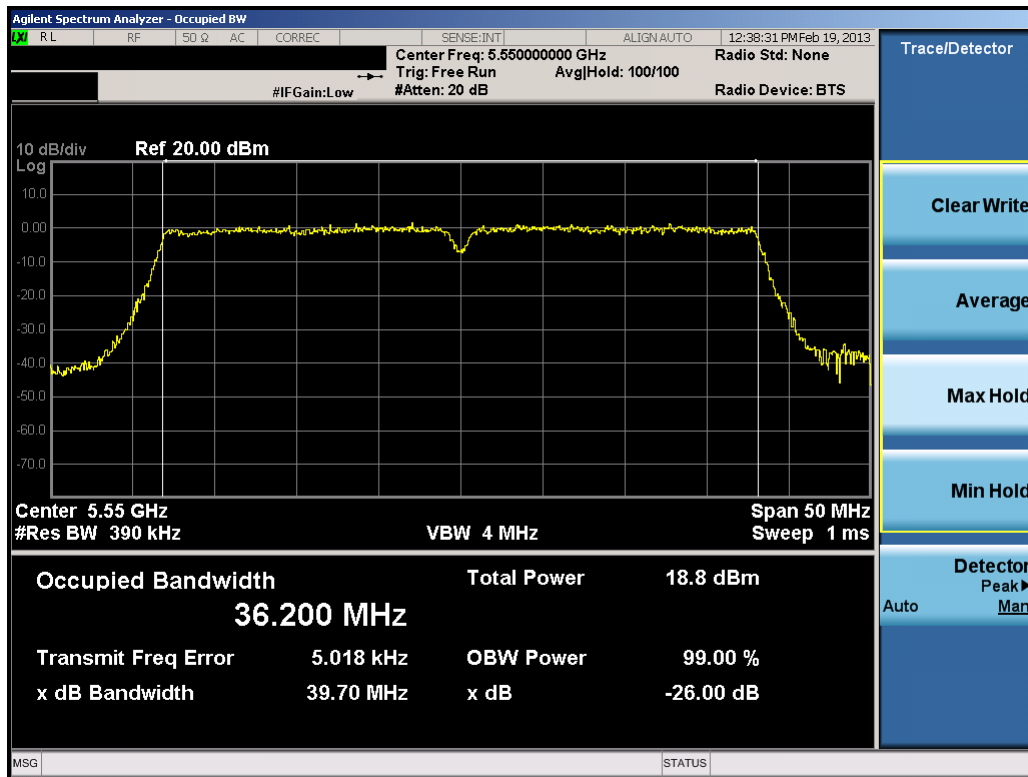


Plot 6-24. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 140)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 24 of 87

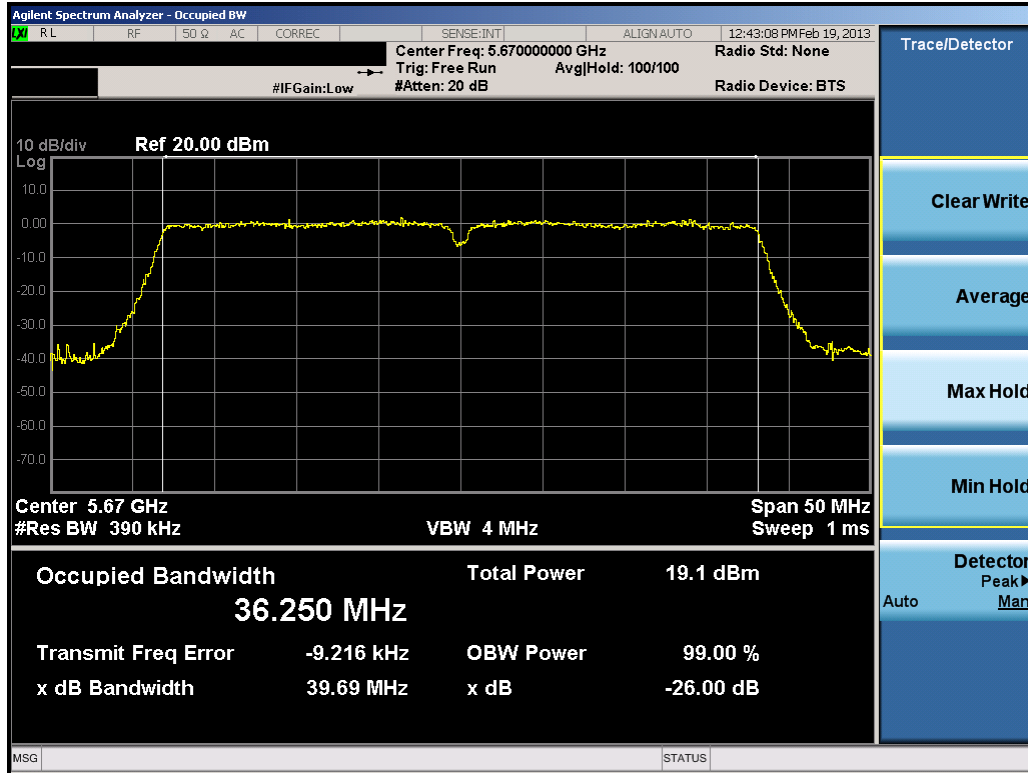


Plot 6-25. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 102)

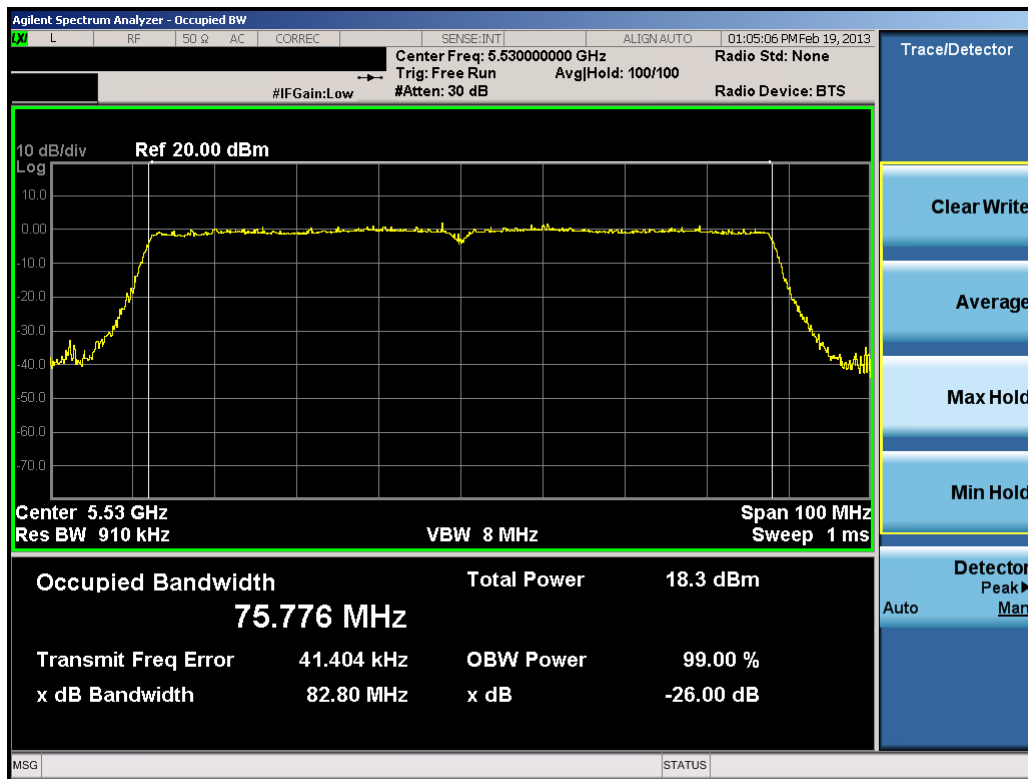


Plot 6-26. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 110)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 6-27. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 134)



Plot 6-28. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 106)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 26 of 87

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

#### Test Overview and Limits

A transmitter antenna terminal of EUT is connected to the input of a RF power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies.

The power meter employs a gating function to only measure the on time of the emission. The integration period of the power meter is set to 10ms in order to capture at least five times the repetition period of 1.530ms for 20MHz BW, 762µsec for 40MHz BW and 200µsec for 80MHz BW.

*In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is the lesser of 50mW (16.99dBm) and  $4 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 4 \text{ dBm} + 10\log_{10}(20.32) = 17.08\text{dBm}$ .*

*In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and  $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(20.2) = 24.05\text{dBm}$ .*

*In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and  $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(20.3) = 24.07\text{dBm}$ .*

#### Test Procedure Used

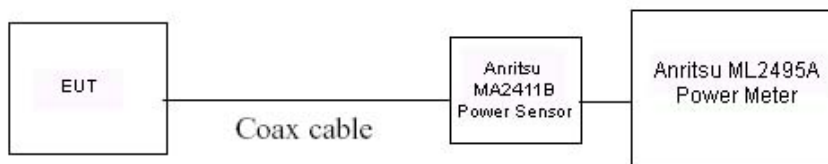
KDB 789033 v01r02 – Section C) 4) (Method PM)

#### Test Settings



1. Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter and power sensor with a thermocouple detector.
2. The trace was averaged over 100 traces to obtain the final measured average power.
3. The integration period of the power meter was more than five times the repetition period of the transmitted signal.

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.





**Figure 6-2. Test Instrument & Measurement Setup**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 27 of 87

**Test Notes**

For 802.11ac (80MHz BW) conducted power measurements, the results obtained using the 50MHz VBW Anritsu power sensor were compared to the results obtained by using the channel integration method (Section 8.1.2 of KDB 558074) on a spectrum analyzer. The powers measured on the spectrum analyzer were found to match the powers from the power meter so it was determined that the limited VBW of the power sensor did not have an effect on the peak power measurements.

<b>FCC ID:</b> A3LSHVE300LA		<b>FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1303010388.A3L	<b>Test Dates:</b> 02/19 - 4/4/2013	<b>EUT Type:</b> Portable Handset	Page 28 of 87	

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	12.54	12.55	12.59	12.59	12.58	12.53	12.63	12.55	
802.11a	5200	40	AVG	12.49	12.47	12.53	12.52	12.47	12.41	12.43	12.47	
802.11a	5220	44	AVG	12.47	12.43	12.44	12.49	12.54	12.46	12.42	12.43	
802.11a	5240	48	AVG	12.51	12.53	12.57	12.49	12.48	12.52	12.56	12.46	
802.11a	5260	52	AVG	12.55	12.56	12.58	12.51	12.50	12.50	12.56	12.50	
802.11a	5280	56	AVG	12.55	12.55	12.59	12.50	12.43	12.56	12.57	12.44	
802.11a	5300	60	AVG	12.50	12.49	12.61	12.52	12.46	12.55	12.60	12.41	
802.11a	5320	64	AVG	12.49	12.56	12.59	12.48	12.46	12.49	12.60	12.42	
802.11a	5500	100	AVG	12.38	12.51	12.47	12.50	12.46	12.43	12.60	12.41	
802.11a	5520	104	AVG	12.40	12.53	12.47	12.54	12.41	12.42	12.56	12.42	
802.11a	5540	108	AVG	12.37	12.52	12.46	12.50	12.42	12.44	12.64	12.37	
802.11a	5560	112	AVG	12.34	12.46	12.42	12.50	12.46	12.40	12.61	12.36	
802.11a	5580	116	AVG	12.42	12.43	12.41	12.39	12.39	12.34	12.41	12.26	
802.11a	5660	132	AVG	12.32	12.25	12.36	12.35	12.27	12.28	12.41	12.23	
802.11a	5680	136	AVG	12.31	12.24	12.35	12.34	12.26	12.27	12.40	12.22	
802.11a	5700	140	AVG	12.29	12.22	12.33	12.32	12.24	12.25	12.38	12.20	

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

Mode	Freq [MHz]	Channel	Detector	20MHz BW 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	12.45	12.57	12.60	12.53	12.52	12.50	12.53	12.52
802.11n	5200	40	AVG	12.50	12.65	12.68	12.55	12.54	12.51	12.60	12.57
802.11n	5220	44	AVG	12.42	12.57	12.64	12.56	12.50	12.52	12.53	12.51
802.11n	5240	48	AVG	12.45	12.65	12.67	12.51	12.55	12.52	12.58	12.49
802.11n	5260	52	AVG	12.47	12.60	12.68	12.59	12.50	12.57	12.56	12.49
802.11n	5280	56	AVG	12.47	12.54	12.62	12.53	12.59	12.55	12.56	12.56
802.11n	5300	60	AVG	12.43	12.57	12.61	12.50	12.59	12.58	12.52	12.52
802.11n	5320	64	AVG	12.45	12.54	12.60	12.54	12.50	12.51	12.55	12.55
802.11n	5500	100	AVG	12.42	12.42	12.51	12.51	12.52	12.51	12.58	12.58
802.11n	5520	104	AVG	12.41	12.43	12.44	12.38	12.40	12.45	12.38	12.48
802.11n	5540	108	AVG	12.40	12.40	12.46	12.48	12.42	12.39	12.42	12.39
802.11n	5560	112	AVG	12.47	12.46	12.45	12.48	12.48	12.42	12.37	12.43
802.11n	5580	116	AVG	12.41	12.40	12.41	12.42	12.44	12.43	12.44	12.44
802.11n	5660	132	AVG	12.38	12.39	12.47	12.37	12.42	12.48	12.46	12.47
802.11n	5680	136	AVG	12.45	12.42	12.46	12.44	12.47	12.43	12.44	12.44
802.11n	5700	140	AVG	12.38	12.44	12.43	12.46	12.46	12.41	12.37	12.42



Table 6-4. 20MHz BW 802.11n (UNII) Maximum Conducted Output Power

Mode	Freq [MHz]	Channel	Detector	40MHz BW 802.11n (5GHz) Conducted Power [dBm]								
				Data Rate [Mbps]								
				13.5/15	27/30	40.5/45	54/60	81/90	108/120	121.5/135	135/150	
802.11n	5190	38	AVG	11.85	11.93	11.85	11.92	11.62	11.87	11.95	11.92	
802.11n	5230	46	AVG	11.83	11.87	11.81	11.90	11.75	11.83	11.92	11.83	
802.11n	5270	54	AVG	11.87	11.92	11.78	11.87	11.72	11.85	11.97	11.83	
802.11n	5310	62	AVG	11.83	11.91	11.85	11.96	11.73	11.81	11.91	11.83	
802.11n	5510	102	AVG	11.85	11.88	11.87	11.87	11.78	11.87	11.94	11.88	
802.11n	5550	110	AVG	11.80	11.86	11.80	11.93	11.76	11.80	11.98	11.84	
802.11n	5670	134	AVG	11.85	11.86	11.78	11.87	11.81	11.88	11.97	11.86	

Table 6-5. 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

Mode	Freq [MHz]	Channel	Detector	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
				Data Rate [Mbps]									
				29.3/32.5	58.5/65	87.8/97.5	117/130	175.5/195	234/260	263.3/292.5	292.5/325	351/390	390/433.3
802.11ac	5210	42	AVG	9.59	9.62	9.75	9.73	9.78	9.74	9.70	9.66	9.67	9.64
802.11ac	5290	58	AVG	9.63	9.64	9.69	9.68	9.72	9.70	9.68	9.66	9.71	9.65
802.11ac	5530	106	AVG	9.47	9.59	9.53	9.56	9.62	9.54	9.53	9.56	9.52	9.54

Table 6-6. 80MHz BW 802.11ac (UNII) Maximum Conducted Output Power

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 29 of 87

## 6.4 Peak Power Spectral Density – 802.11a/n/ac §15.407 (a)(1),(5) / RSS-210 [A9.2]

### Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033, was used to measure the power spectral density.

***The maximum permissible power spectral density is 4 dBm/MHz in the 5150 – 5250MHz band and 11dBm/MHz in the 5250 – 5350MHz and 5470 – 5725MHz bands.***

### Test Procedure Used

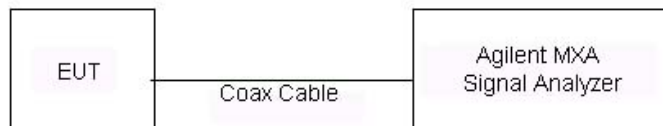
KDB 789033 v01r02 – Section E

### Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points  $\geq 2 \times$  (span/RBW)
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run since the EUT was operating at a duty cycle  $\geq 98\%$
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

### Test Setup



The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-3. Test Instrument & Measurement Setup**



### Test Notes

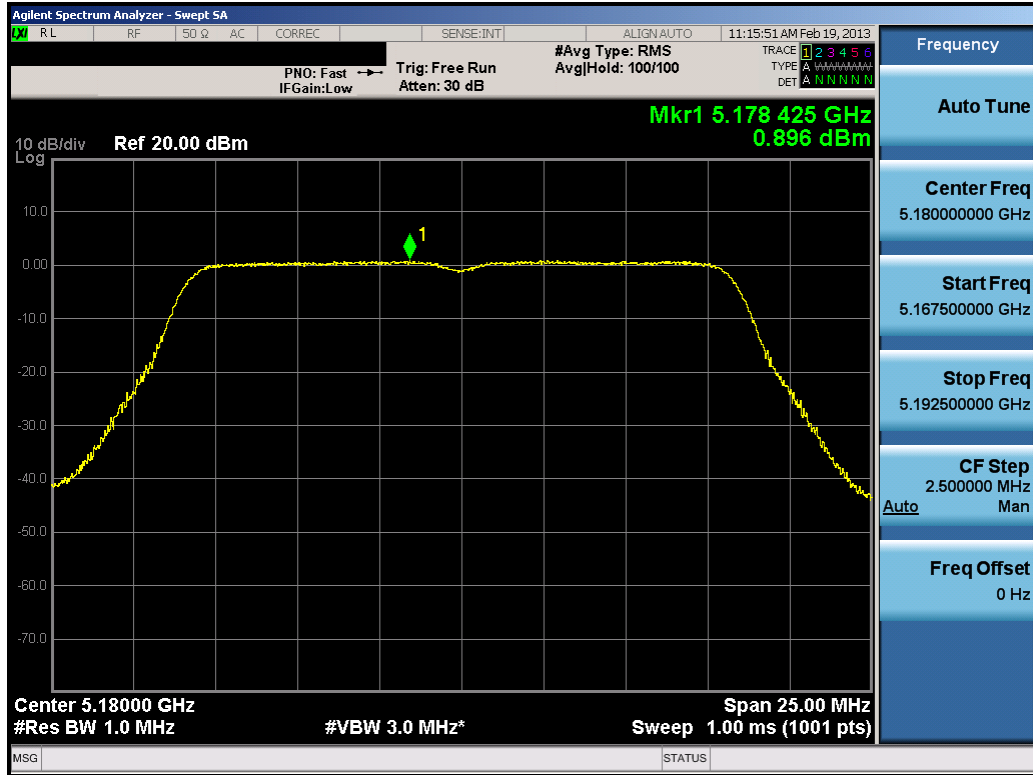
None

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset	Page 30 of 87	

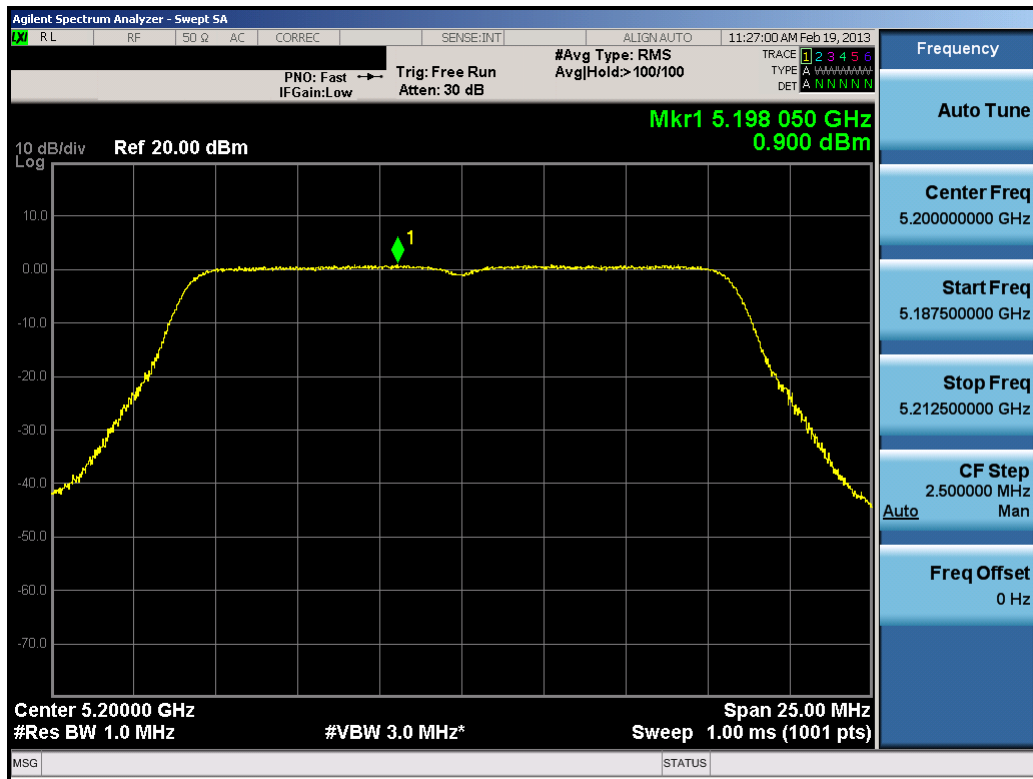
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
Band I	5180	36	a	6	0.896	4.0	-3.10
	5200	40	a	6	0.900	4.0	-3.10
	5240	48	a	6	0.874	4.0	-3.13
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	0.356	4.0	-3.64
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	0.325	4.0	-3.68
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	0.585	4.0	-3.42
	5190	38	n (40MHz)	13.5/15 (MCS0)	-2.895	4.0	-6.90
	5230	46	n (40MHz)	13.5/15 (MCS0)	-2.861	4.0	-6.86
	5210	42	n (80MHz)	351/390 (MCS8)	-7.020	4.0	-11.02
Band II	5260	52	a	6	0.712	11.0	-10.29
	5280	56	a	6	0.988	11.0	-10.01
	5320	64	a	6	1.019	11.0	-9.98
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	0.659	11.0	-10.34
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	0.563	11.0	-10.44
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	0.612	11.0	-10.39
	5270	54	n (40MHz)	13.5/15 (MCS0)	-2.865	11.0	-13.87
	5310	62	n (40MHz)	13.5/15 (MCS0)	-2.864	11.0	-13.86
	5290	58	n (80MHz)	351/390 (MCS8)	-7.000	11.0	-18.00
Band III	5500	100	a	6	0.978	11.0	-10.02
	5580	116	a	6	1.237	11.0	-9.76
	5700	140	a	6	0.847	11.0	-10.15
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	0.857	11.0	-10.14
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	0.555	11.0	-10.45
	5700	140	n (20MHz)	6.5/7.2 (MCS0)	0.650	11.0	-10.35
	5510	102	n (40MHz)	13.5/15 (MCS0)	-2.750	11.0	-13.75
	5550	110	n (40MHz)	13.5/15 (MCS0)	-2.660	11.0	-13.66
	5670	134	n (40MHz)	13.5/15 (MCS0)	-2.650	11.0	-13.65
	5530	106	n (80MHz)	351/390 (MCS8)	-7.080	11.0	-18.08

**Table 6-7. Conducted Power Spectral Density Measurements**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset	Page 31 of 87	

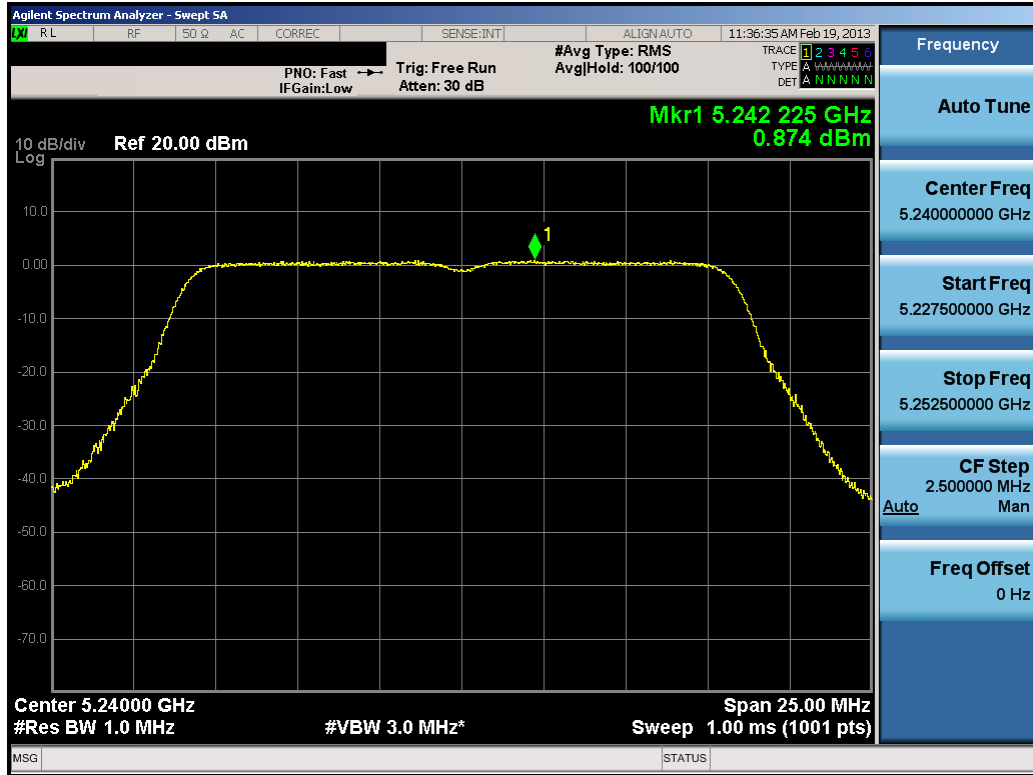


Plot 6-29. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

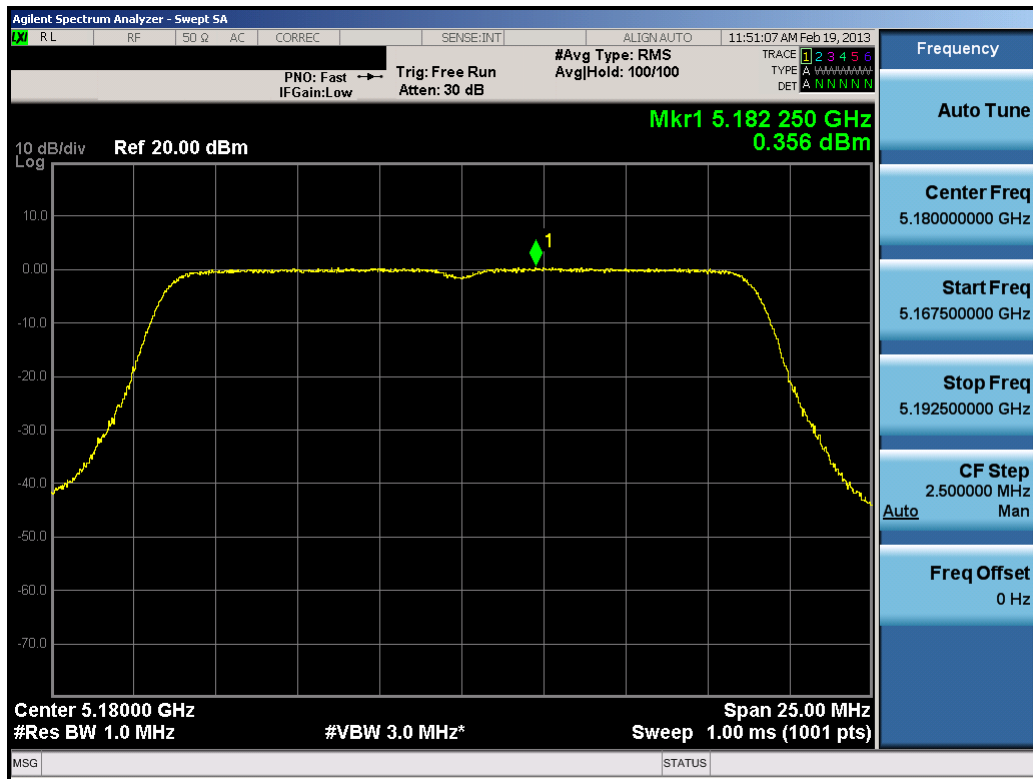


Plot 6-30. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)



FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 32 of 87

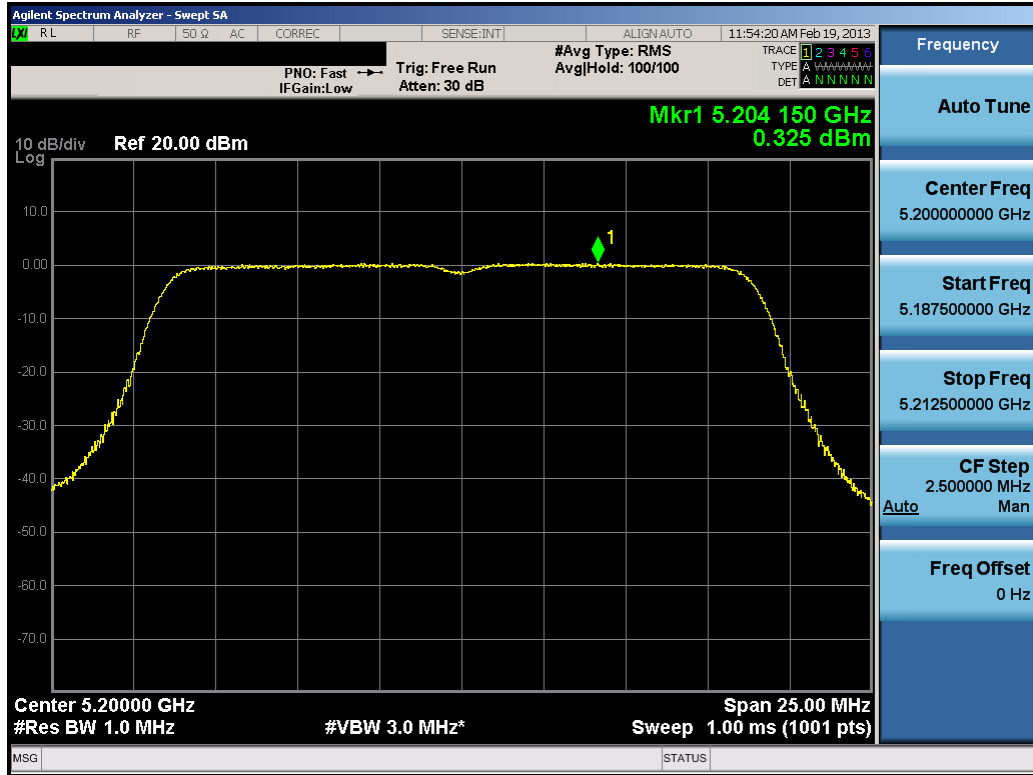


Plot 6-31. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

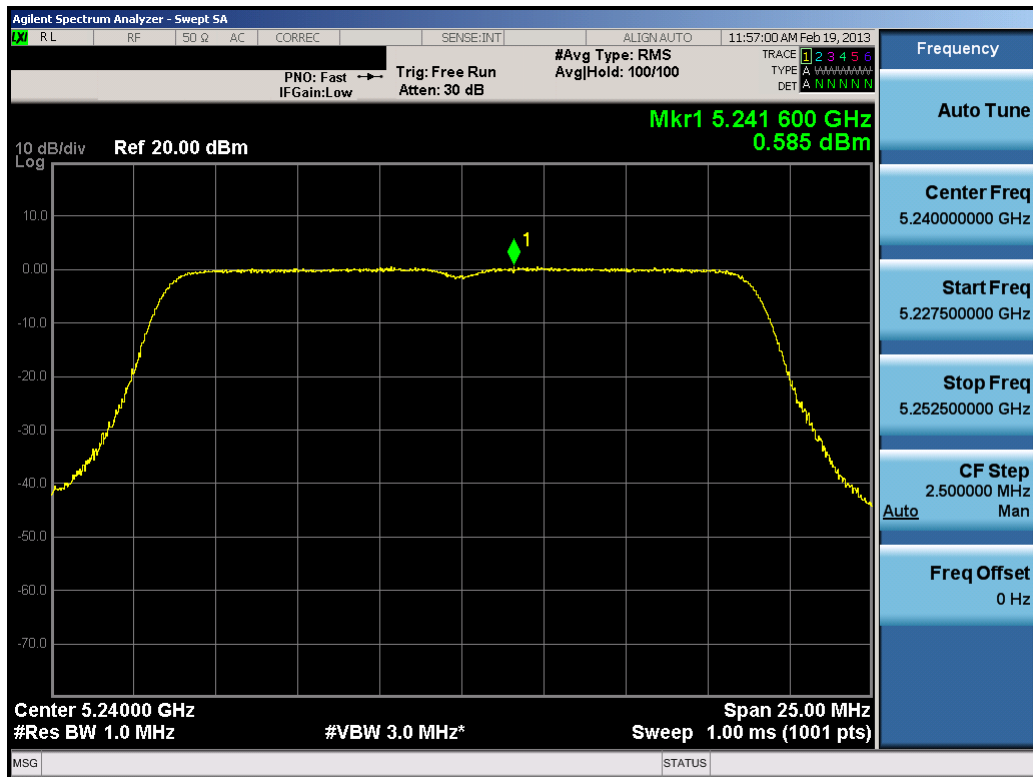


Plot 6-32. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 33 of 87

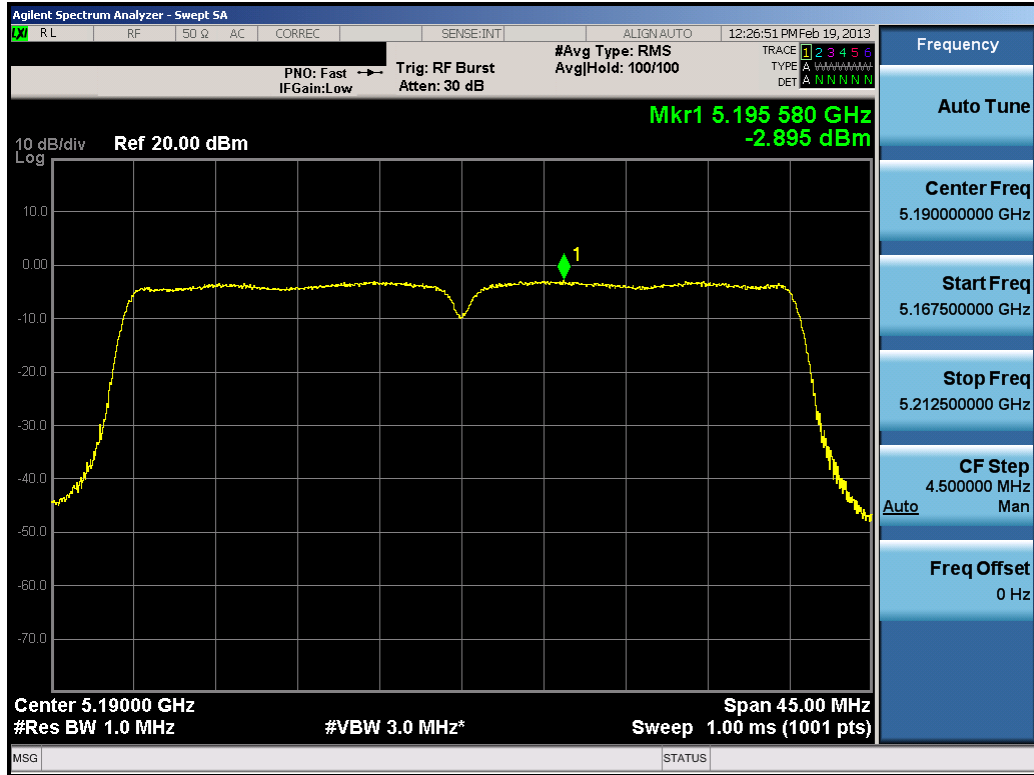


Plot 6-33. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

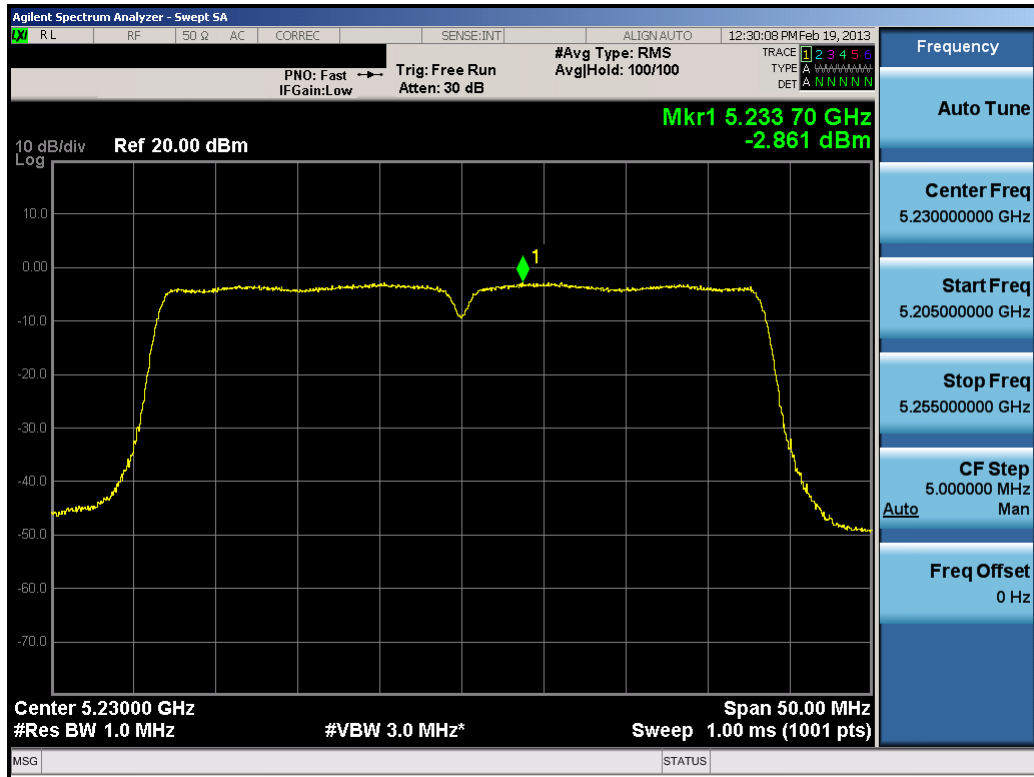


Plot 6-34. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 34 of 87



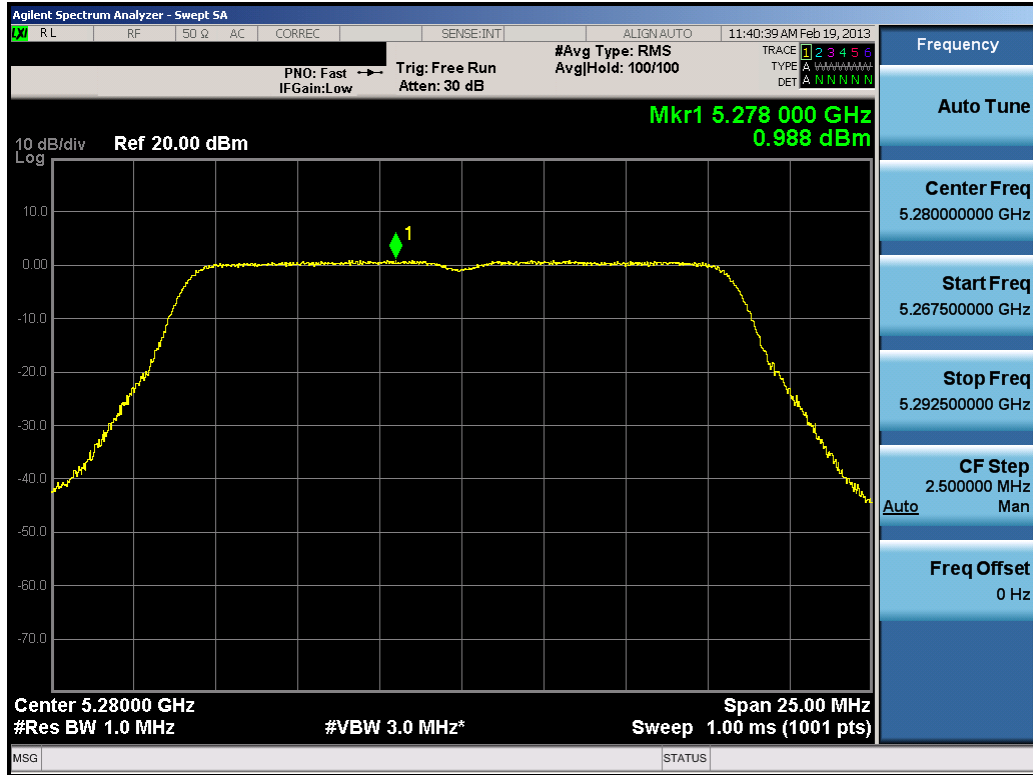
Plot 6-35. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)



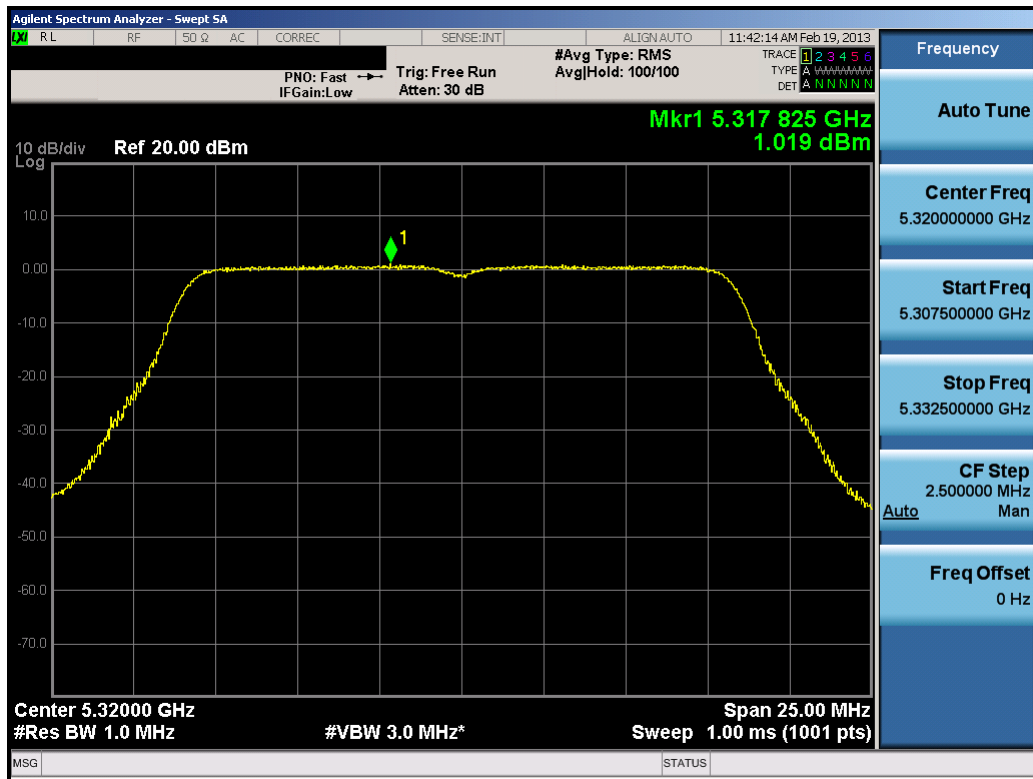
Plot 6-36. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: A3LSHVE300LA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 35 of 87



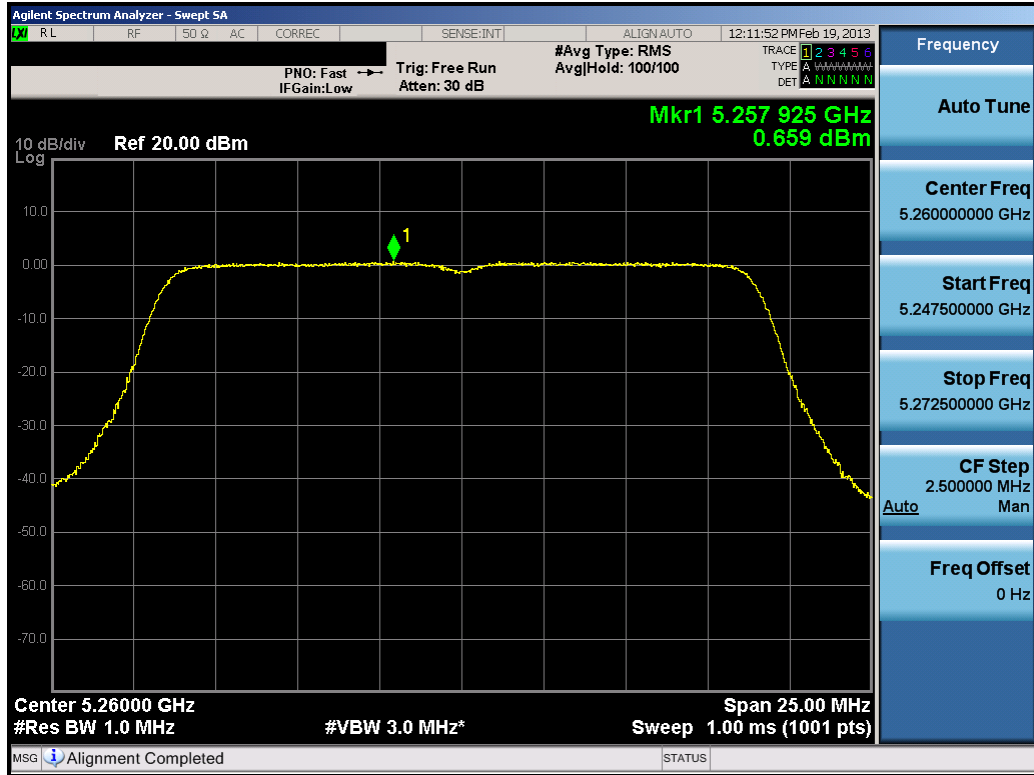


Plot 6-39. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 56)

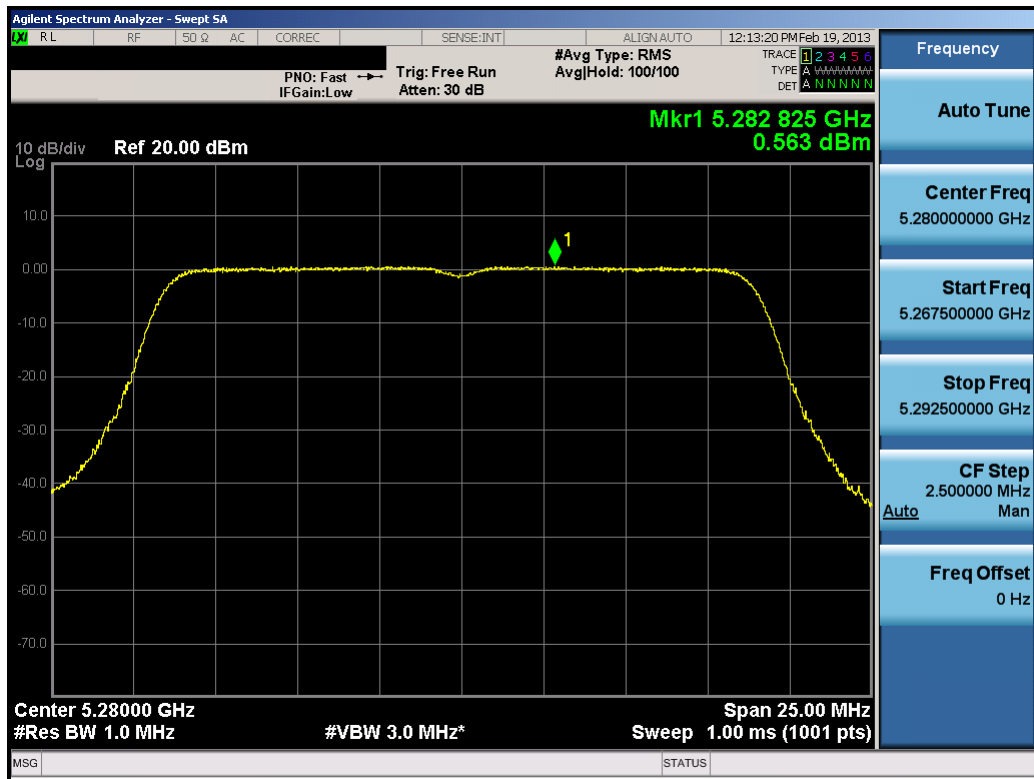


Plot 6-40. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 64)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 37 of 87

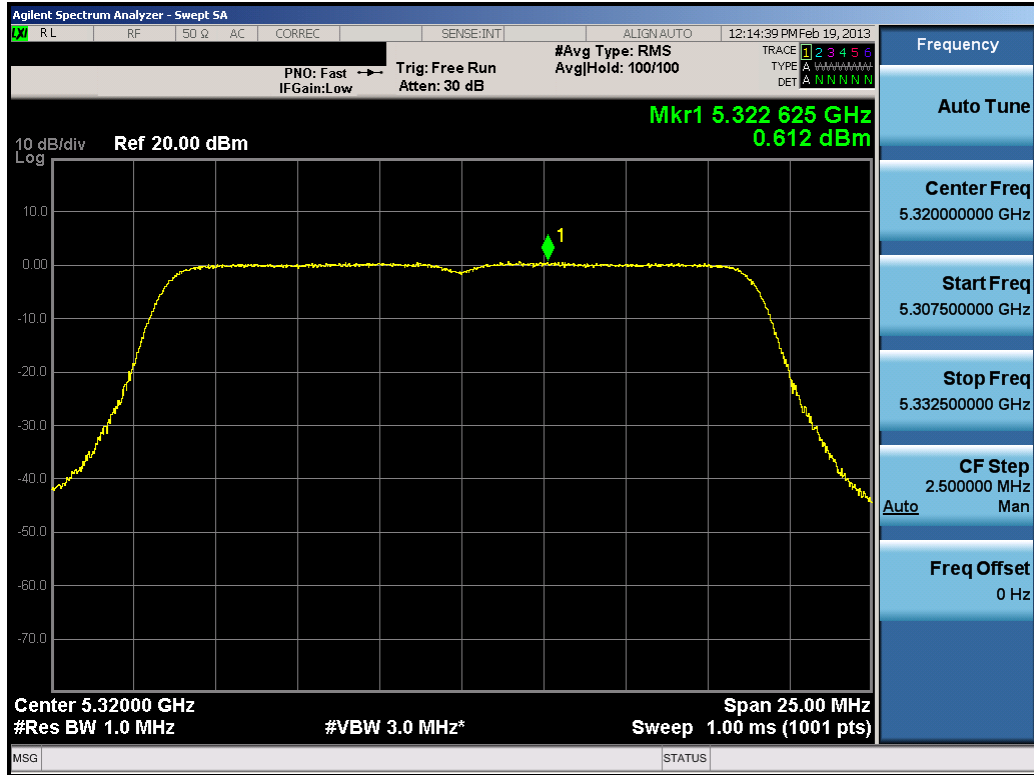


Plot 6-41. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 52)

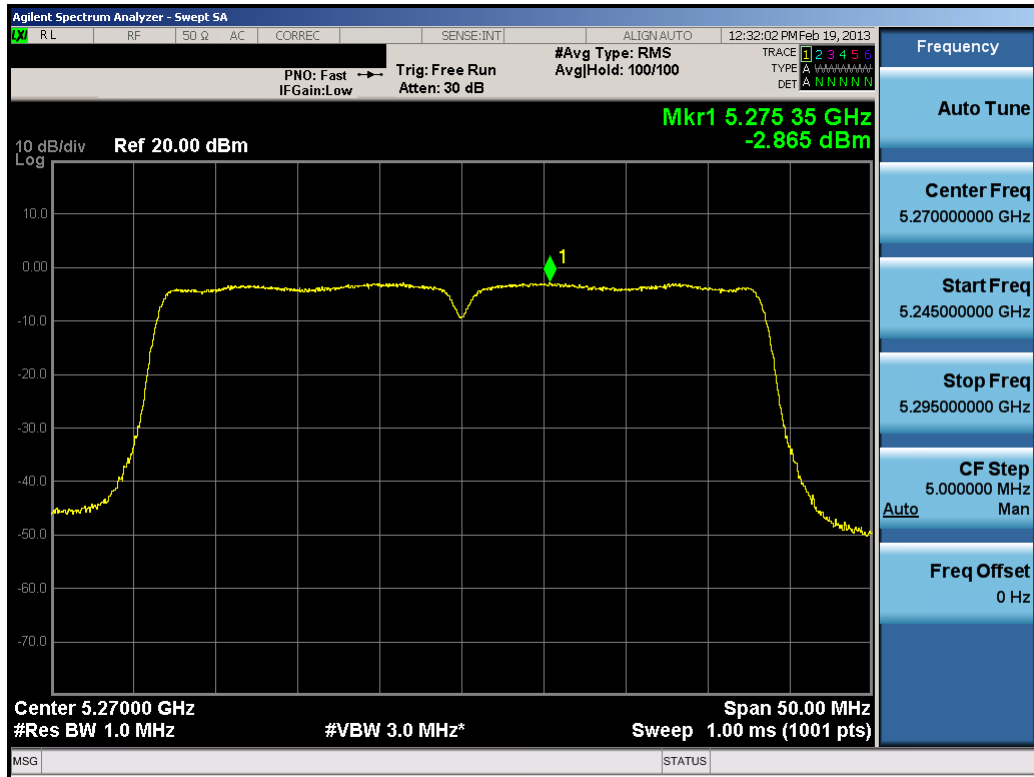


Plot 6-42. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 56)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 38 of 87

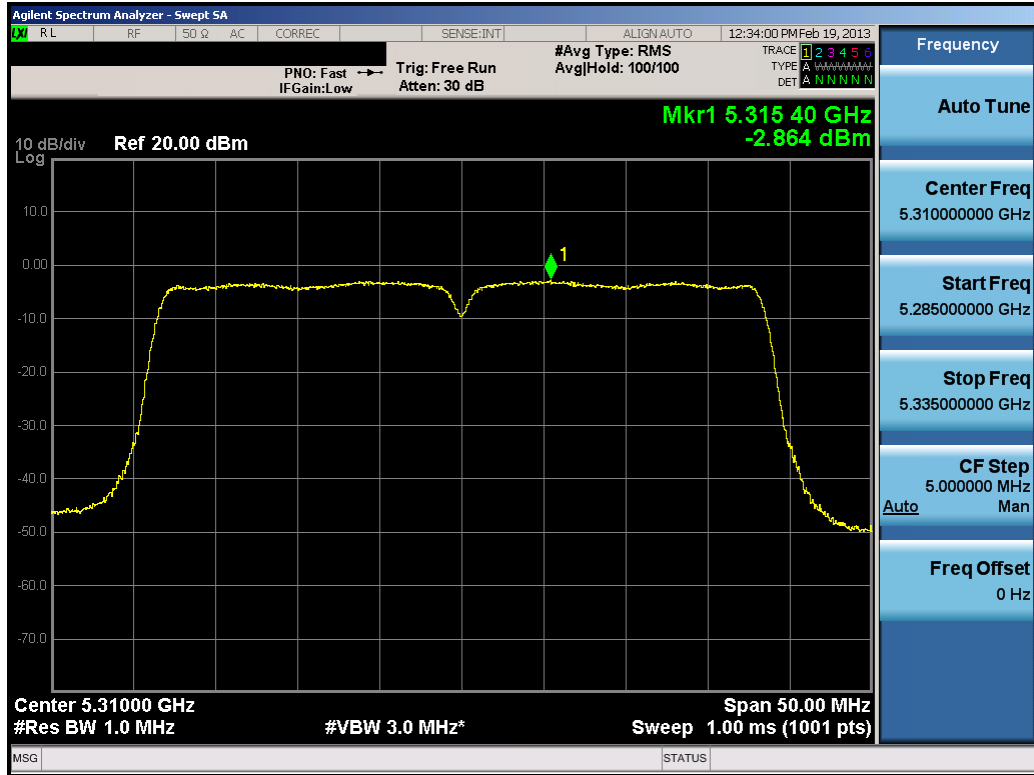


Plot 6-43. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 64)

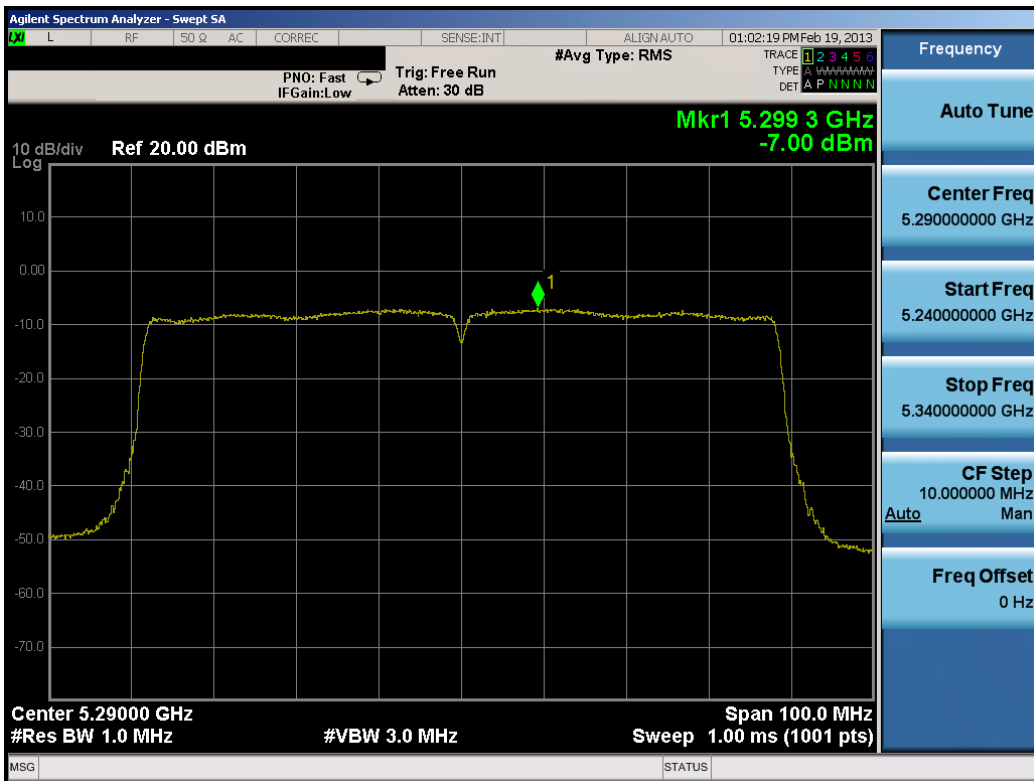


Plot 6-44. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 54)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 39 of 87

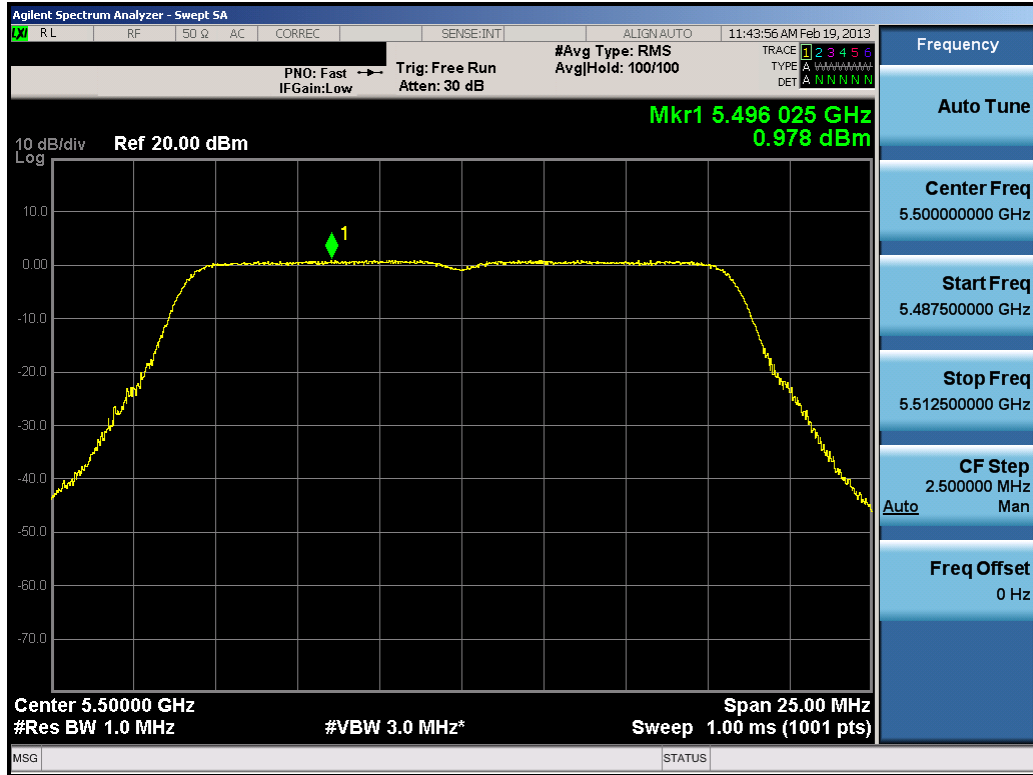


Plot 6-45. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 62)

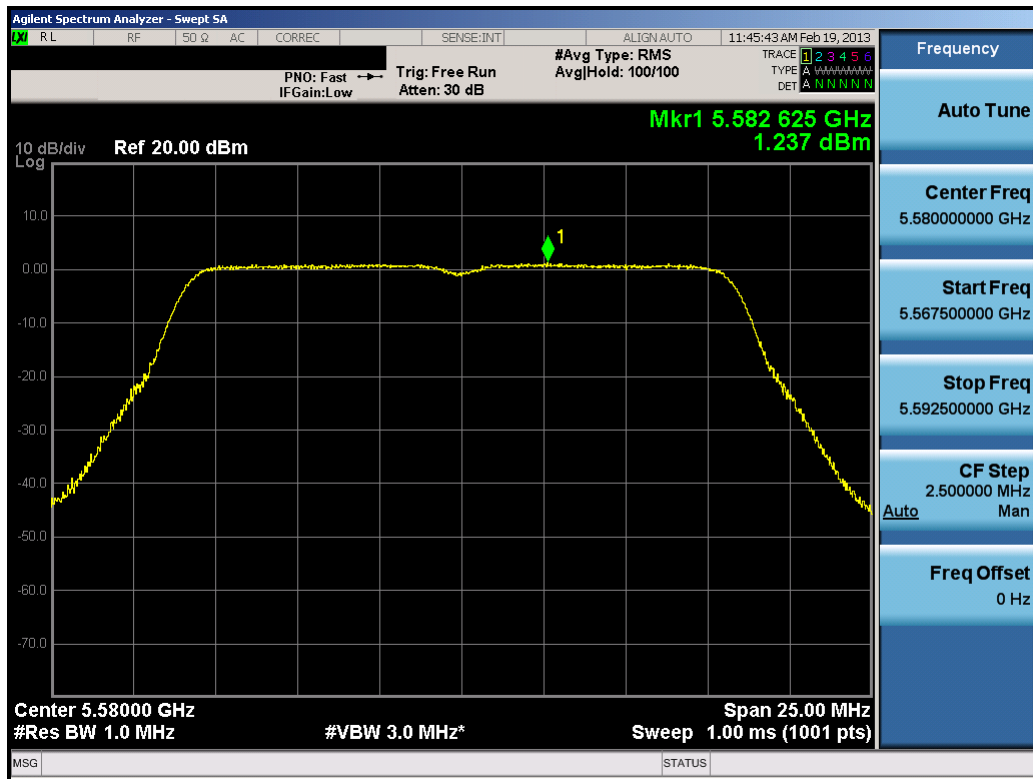


Plot 6-46. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2) – Ch. 58)

FCC ID: A3LSHVE300LA	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 40 of 87

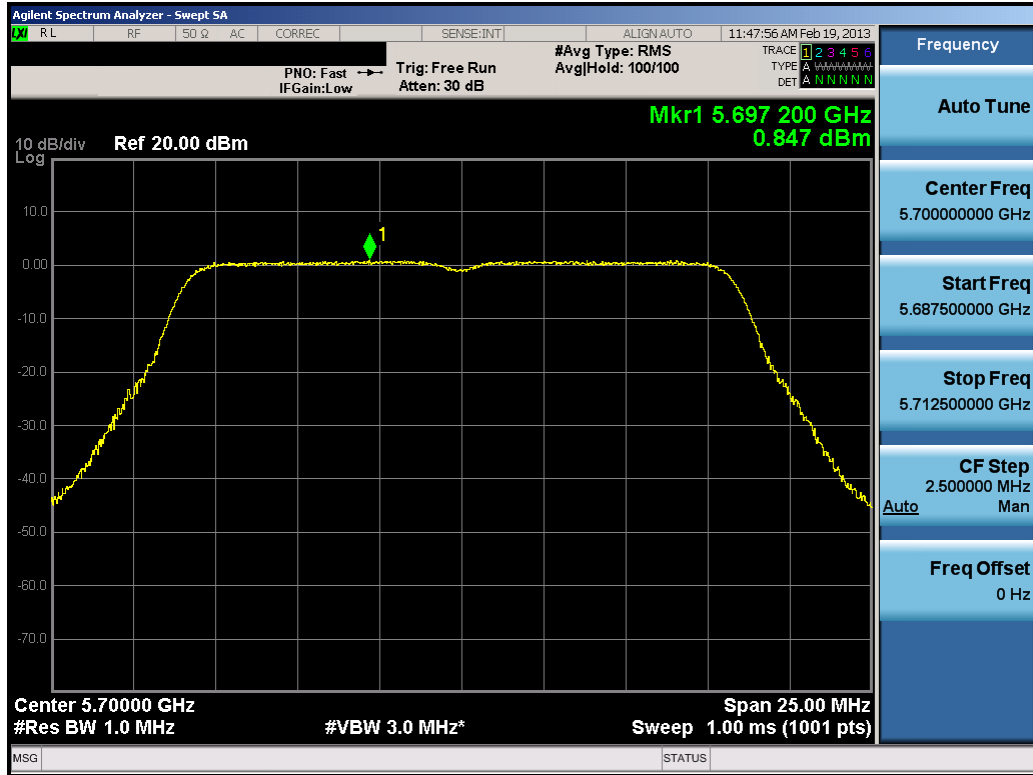


Plot 6-47. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 100)

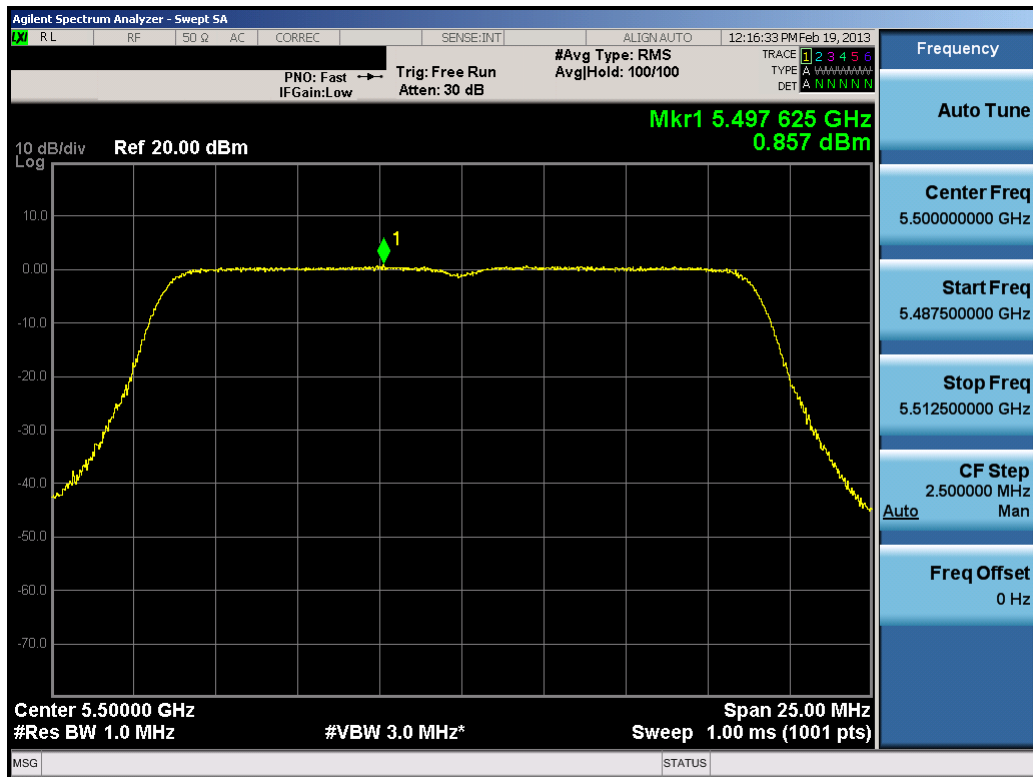


Plot 6-48. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 116)

FCC ID: A3LSHVE300LA	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 41 of 87

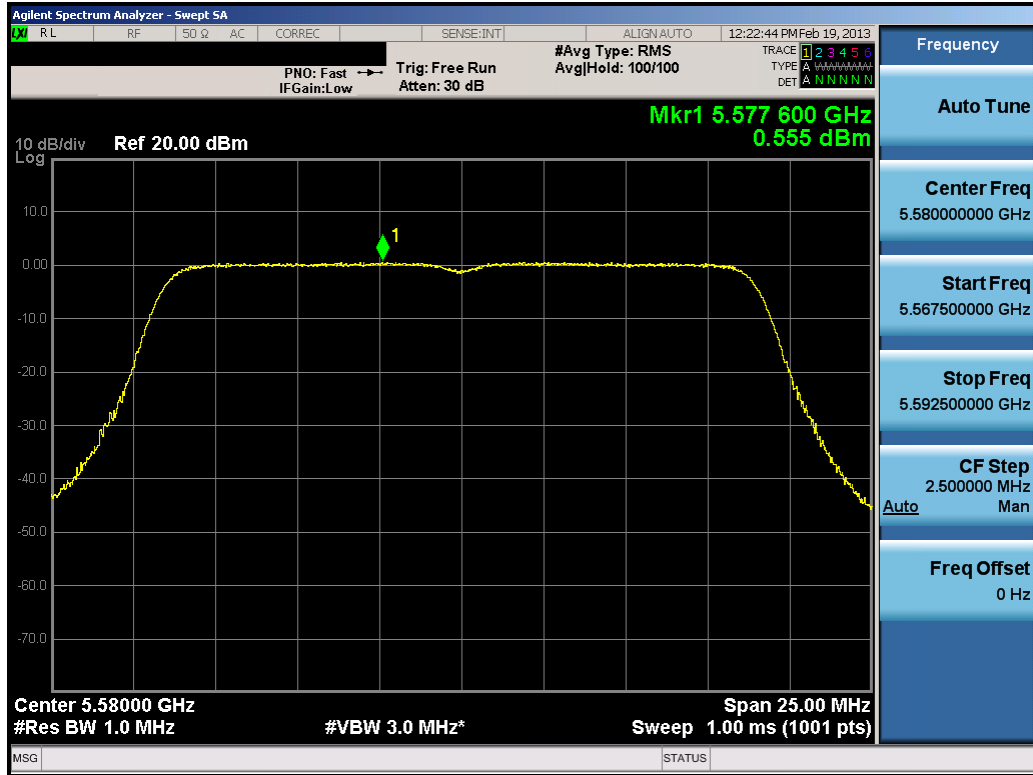


Plot 6-49. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 140)

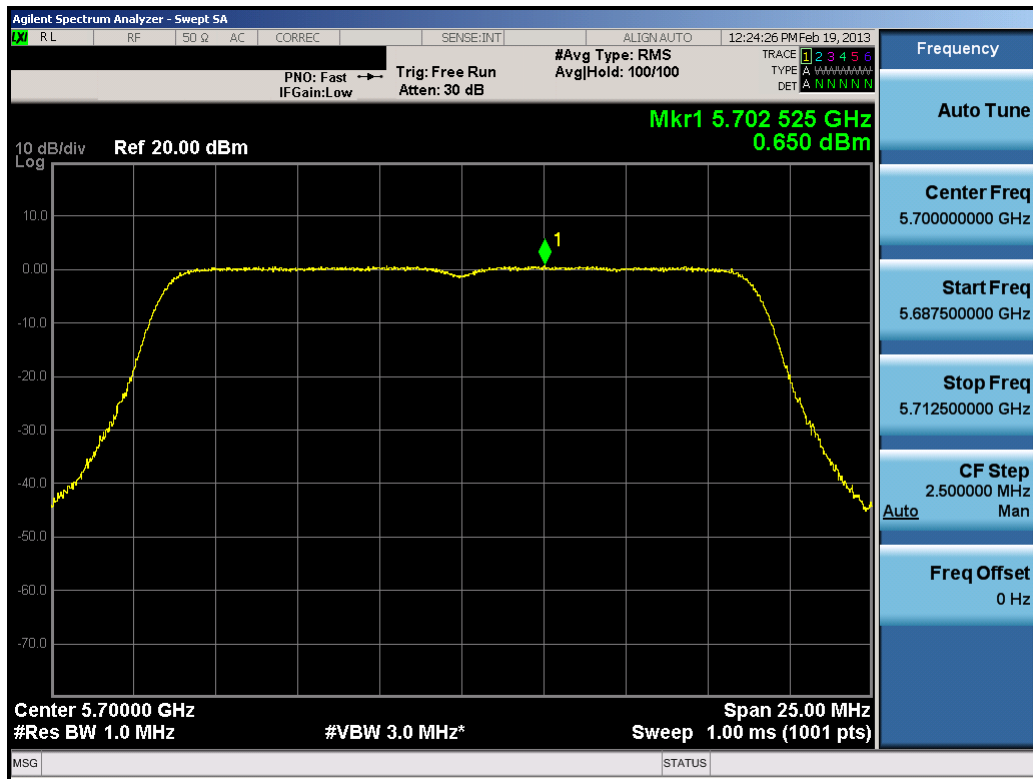


Plot 6-50. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 100)

FCC ID: A3LSHVE300LA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 42 of 87

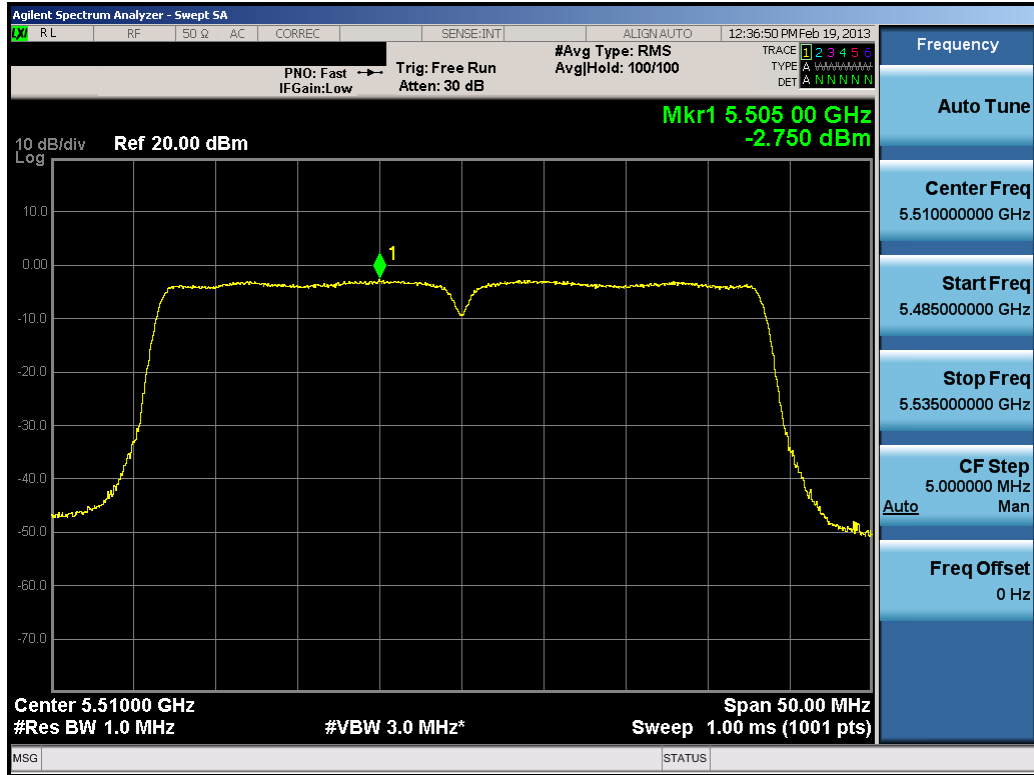


Plot 6-51. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 116)

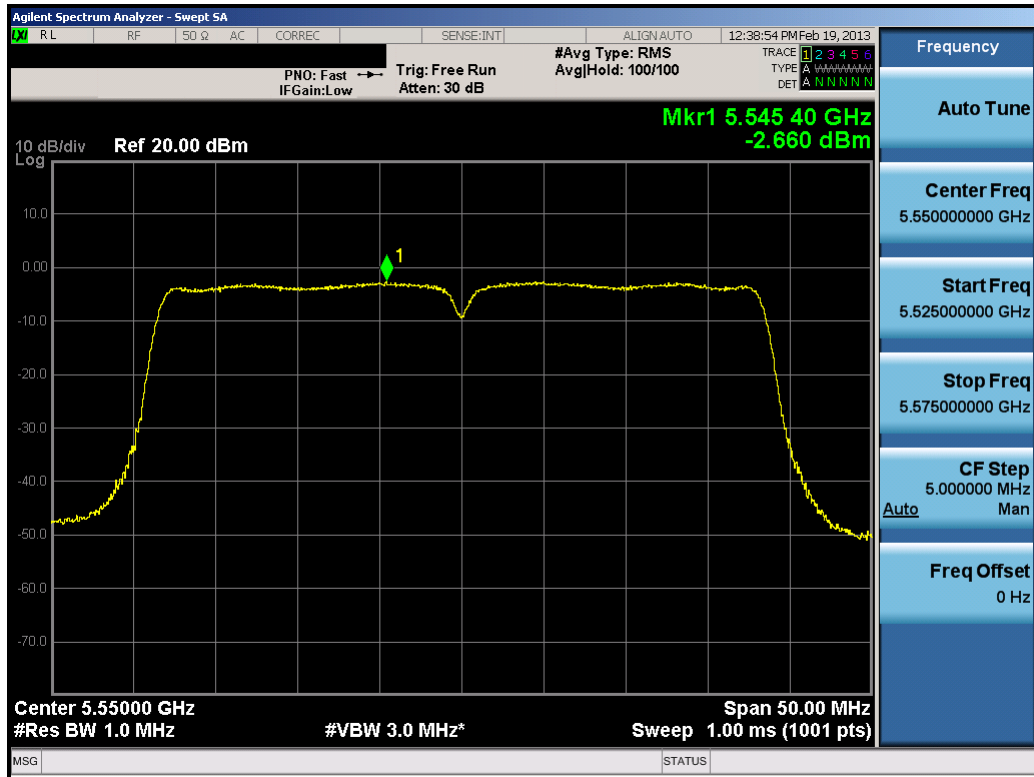


Plot 6-52. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 140)

FCC ID: A3LSHVE300LA	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 43 of 87

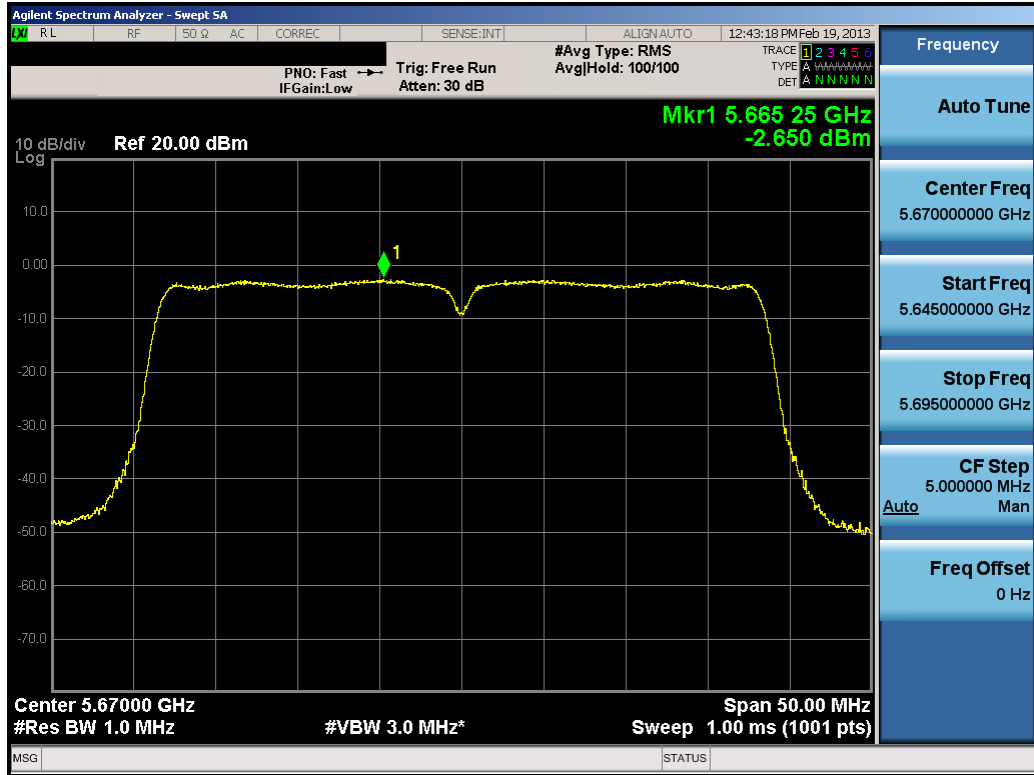


Plot 6-53. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 102)

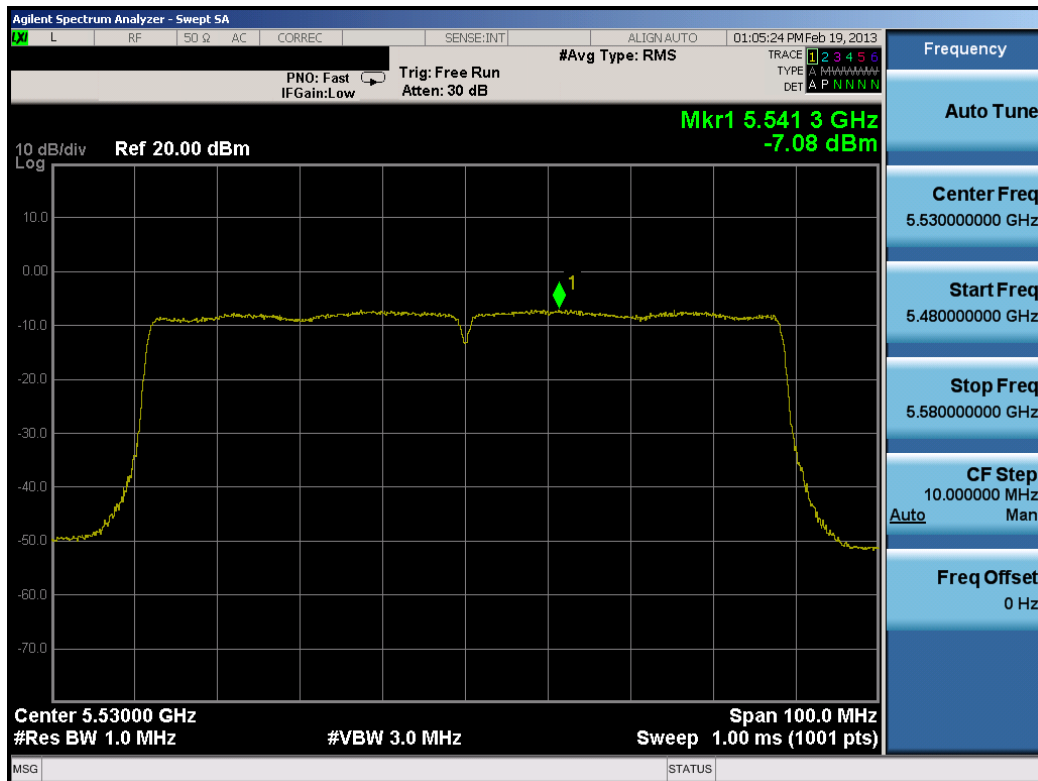


Plot 6-54. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 110)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 44 of 87



Plot 6-55. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 134)



Plot 6-56. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 106)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 45 of 87

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

### Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033, was used to capture the average trace used to make the peak excursion measurement.

***The largest permissible difference between the modulation envelope (measured using a peak hold function) and the maximum power spectral density is 13 dBm/MHz.***

### Test Procedure Used

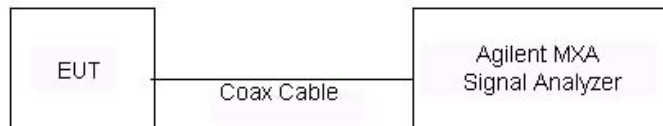
KDB 789033 v01r02 – Section F

### Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = peak
6. Trace mode = max hold
7. Trace was allowed to stabilize
8. The peak search function of the spectrum analyzer was used to find the peak of the spectrum. This level was compared to the peak power density level found from the previous section to determine the peak excursion.

### Test Setup



The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-4. Test Instrument & Measurement Setup**

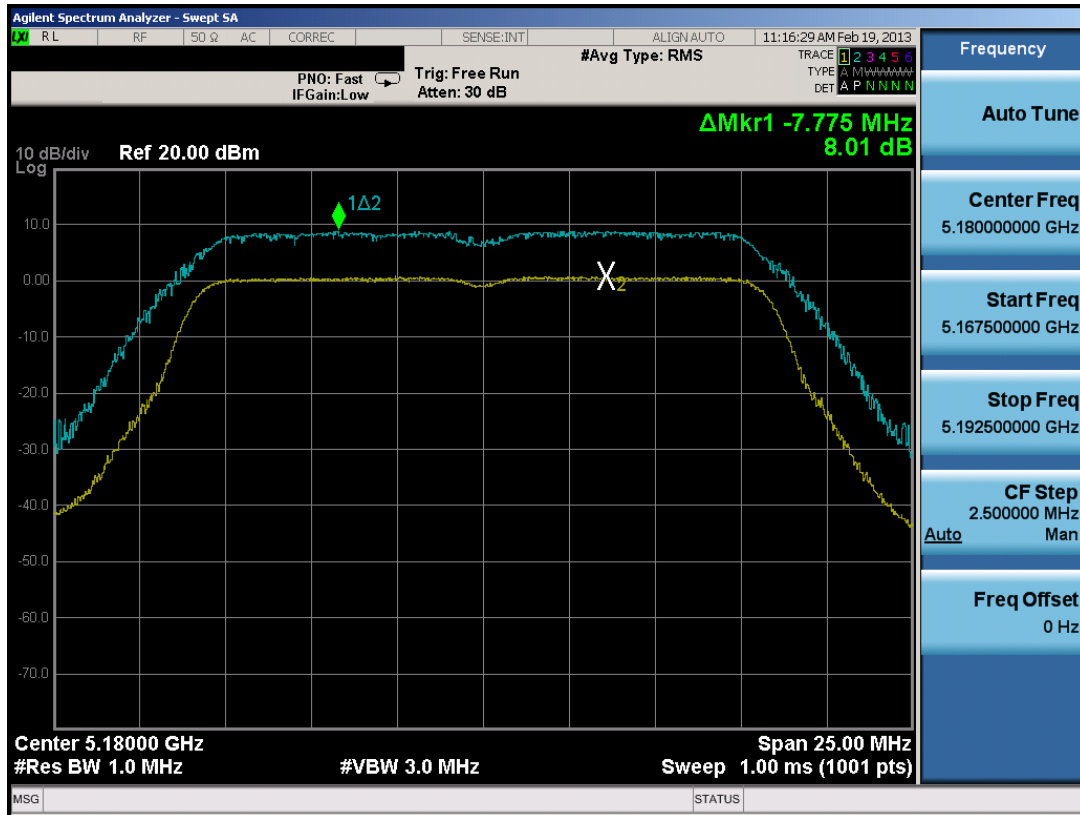
### Test Notes

1. Only the worst case modulation mode on a single channel among all bands is reported since that is sufficient to demonstrate compliance to the peak excursion requirement per KDB 789033 v01r02.

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Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Peak Excursion Ratio [dBm]	Max Permissible Peak Excursion Ratio [dBm/MHz]	Margin [dB]
5180	36	a	6	8.01	13.0	-4.99
5240	44	n (20MHz)	6.5/7.2 (MCS0)	9.29	13.0	-3.71
5270	54	n (40MHz)	13.5/15 (MCS0)	9.08	13.0	-3.92
5530	106	n (80MHz)	351/390 (MCS8)	9.08	13.0	-3.92

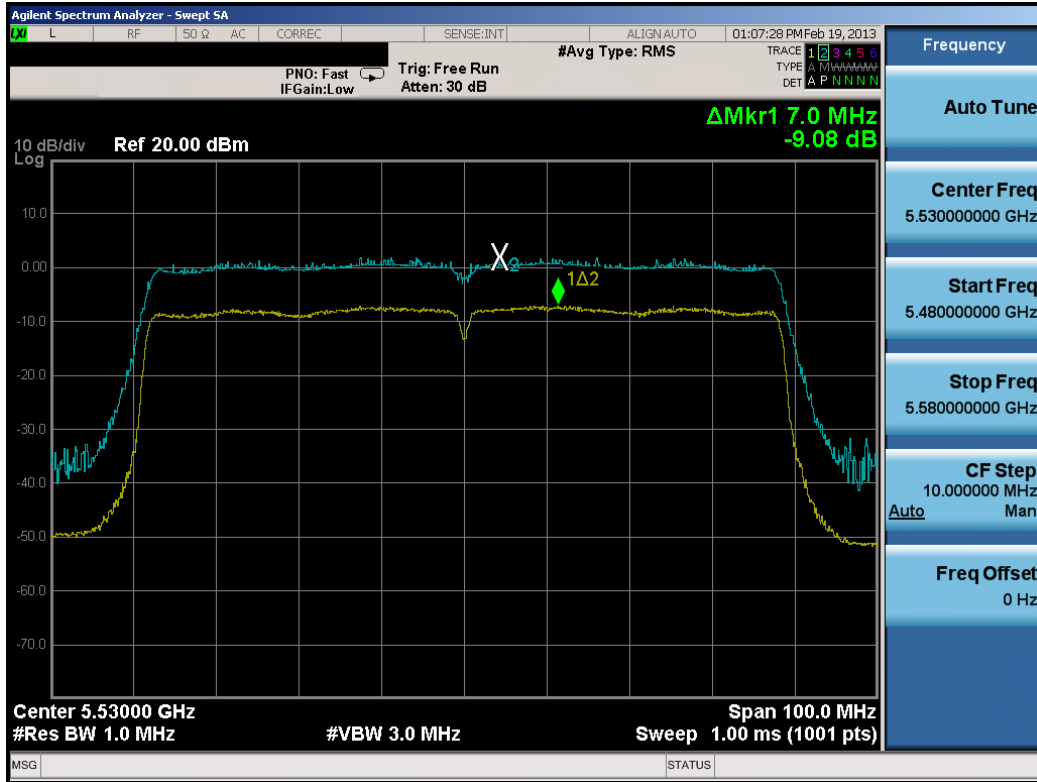
**Table 6-8. Conducted Peak Excursion Ratio Measurements**



**Plot 6-57. Peak Excursion Ratio Plot (802.11a)**

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Plot 6-60. Peak Excursion Ratio Plot (80MHz BW 802.11ac)

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## 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: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,179,999,997	-3	-0.00000006
100 %		- 30	5,180,000,007	7	0.00000014
100 %		- 20	5,180,000,018	18	0.00000035
100 %		- 10	5,179,999,991	-9	-0.00000017
100 %		0	5,179,999,995	-5	-0.00000010
100 %		+ 10	5,179,999,989	-11	-0.00000021
100 %		+ 20	5,180,000,006	6	0.00000012
100 %		+ 30	5,180,000,014	14	0.00000027
100 %		+ 40	5,180,000,011	11	0.00000021
100 %		+ 50	5,179,999,983	-17	-0.00000033
115 %	4.37	+ 20	5,180,000,010	10	0.00000019
BATT. ENDPOINT	3.46	+ 20	5,179,999,987	-13	-0.00000025

**Table 6-9. Frequency Stability Measurements for UNII Band 1 (Ch. 36)**

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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## 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: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,260,000,006	6	0.00000011
100 %		- 30	5,259,999,993	-7	-0.00000013
100 %		- 20	5,259,999,982	-18	-0.00000034
100 %		- 10	5,259,999,990	-10	-0.00000019
100 %		0	5,260,000,011	11	0.00000021
100 %		+ 10	5,259,999,994	-6	-0.00000011
100 %		+ 20	5,259,999,986	-14	-0.00000027
100 %		+ 30	5,259,999,991	-9	-0.00000017
100 %		+ 40	5,260,000,007	7	0.00000013
100 %		+ 50	5,260,000,016	16	0.00000030
115 %	4.37	+ 20	5,259,999,990	-10	-0.00000019
BATT. ENDPOINT	3.46	+ 20	5,260,000,010	10	0.00000019

**Table 6-10. Frequency Stability Measurements for UNII Band 2 (Ch. 52)**

#### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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## 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: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	5,500,000,005	5	0.00000009
100 %		- 30	5,499,999,979	-21	-0.00000038
100 %		- 20	5,500,000,010	10	0.00000018
100 %		- 10	5,500,000,002	2	0.00000004
100 %		0	5,499,999,994	-6	-0.00000011
100 %		+ 10	5,500,000,009	9	0.00000016
100 %		+ 20	5,499,999,987	-13	-0.00000024
100 %		+ 30	5,499,999,994	-6	-0.00000011
100 %		+ 40	5,499,999,996	-4	-0.00000007
100 %		+ 50	5,500,000,005	5	0.00000009
115 %	4.37	+ 20	5,499,999,984	-16	-0.00000029
BATT. ENDPOINT	3.46	+ 20	5,500,000,004	4	0.00000007

**Table 6-11. Frequency Stability Measurements for UNII Band 3 (Ch. 100)**

#### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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## 6.7 Radiated Spurious Emission Measurements

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

### Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW) and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

***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 6-12 per Section 15.209.***

Frequency	Field Strength [ $\mu$ 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 6-12. Radiated Limits**

### Test Procedures Used



ANSI C63.10-2009 (used for reference)

KDB 789033 v01r02 – Section G

### Test Settings

#### Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be  $\geq 2 \times \text{span/RBW}$ )
6. Sweep time = auto couple
7. Trace was averaged over 100 sweeps

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**Peak Measurements above 1GHz**

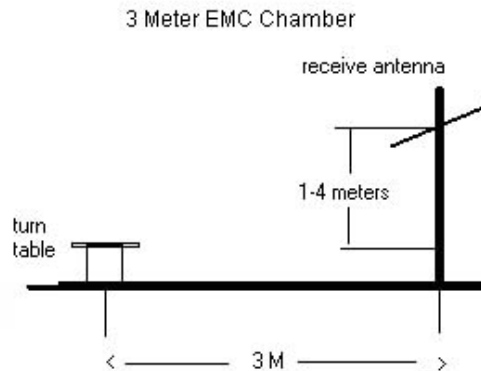
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

**Peak Measurements below 1GHz**



1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

**Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-5. Test Instrument & Measurement Setup**

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## Test Notes

1. The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 789033 v01r02 were not used to evaluate this device.
2. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-10. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dB $\mu$ V/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dB $\mu$ V/m.
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 (the battery implementing the RFID antenna).
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. Average levels at -135dBm and peak levels at -125dBm represent the analyzer noise floor and signify that no emission was detected.

## Sample Calculations



### Determining Spurious Emissions Levels

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

### Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + 10 \text{ dB Attenuator}) - \text{Preamplifier Gain}$$

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## 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 & 3 Meters  
 Operating Frequency: 5180MHz  
 Channel: 36



Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
10360.00	-96.61	Peak	H	47.20	0.00	57.59	68.20	-10.61
* 15540.00	-135.00	Average	H	59.10	0.00	31.10	53.98	-22.88
* 15540.00	-125.00	Peak	H	59.10	0.00	41.10	73.98	-32.88
* 20720.00	-110.65	Average	H	44.02	-9.54	30.83	53.98	-23.15
* 20720.00	-101.60	Peak	H	44.02	-9.54	39.88	73.98	-34.10
25900.00	-102.79	Peak	H	44.85	-9.54	39.52	68.20	-28.68

**Table 6-13. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 & 3 Meters  
 Operating Frequency: 5200MHz  
 Channel: 40

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
10400.00	-99.18	Peak	H	47.30	0.00	55.12	68.20	-13.08
* 15600.00	-135.00	Average	H	59.26	0.00	31.26	53.98	-22.72
* 15600.00	-125.00	Peak	H	59.26	0.00	41.26	73.98	-32.72
* 20800.00	-109.71	Average	H	44.00	-9.54	31.74	53.98	-22.24
* 20800.00	-101.42	Peak	H	44.00	-9.54	40.03	73.98	-33.95
26000.00	-103.39	Peak	H	44.88	-9.54	38.95	68.20	-29.25

**Table 6-14. Radiated Measurements**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
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**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 & 3 Meters  
 Operating Frequency: 5240MHz  
 Channel: 48

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
* 10480.00	-99.29	Peak	H	47.50	0.00	55.21	68.20	-12.99
* 15720.00	-135.00	Average	H	59.56	0.00	31.56	53.98	-22.41
* 15720.00	-125.00	Peak	H	59.56	0.00	41.56	73.98	-32.41
* 20960.00	-111.23	Average	H	43.99	-9.54	30.22	53.98	-23.76
20960.00	-102.71	Peak	H	43.99	-9.54	38.74	73.98	-35.24
26200.00	-104.42	Peak	H	44.82	-9.54	37.86	68.20	-30.34

**Table 6-15. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 & 3 Meters  
 Operating Frequency: 5260MHz  
 Channel: 52

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
10520.00	-99.75	Peak	H	47.58	0.00	54.83	68.20	-13.37
* 15780.00	-135.00	Average	H	59.75	0.00	31.75	53.98	-22.23
* 15780.00	-125.00	Peak	H	59.75	0.00	41.75	73.98	-32.23
* 21040.00	-111.27	Average	H	44.01	-9.54	30.20	53.98	-23.78
* 21040.00	-103.11	Peak	H	44.01	-9.54	38.36	73.98	-35.62
26300.00	-105.26	Peak	H	44.87	-9.54	37.07	68.20	-31.13

**Table 6-16. Radiated Measurements**

**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 & 3 Meters  
 Operating Frequency: 5280MHz  
 Channel: 56



Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
10560.00	-100.62	Peak	H	47.65	0.00	54.04	68.20	-14.16
* 15840.00	-135.00	Average	H	59.98	0.00	31.98	53.98	-22.00
* 15840.00	-125.00	Peak	H	59.98	0.00	41.98	73.98	-32.00
* 21120.00	-111.36	Average	H	44.00	-9.54	30.10	53.98	-23.88
* 21120.00	-102.18	Peak	H	44.00	-9.54	39.28	73.98	-34.70
26400.00	-103.90	Peak	H	44.81	-9.54	38.37	68.20	-29.83

**Table 6-17. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 & 3 Meters  
 Operating Frequency: 5320MHz  
 Channel: 64

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
* 10640.00	-114.58	Average	H	47.79	0.00	40.21	53.98	-13.77
* 10640.00	-101.43	Peak	H	47.79	0.00	53.36	73.98	-20.62
* 15960.00	-135.00	Average	H	62.10	0.00	34.10	53.98	-19.87
* 15960.00	-125.00	Peak	H	62.10	0.00	44.10	73.98	-29.87
* 21280.00	-111.21	Average	H	44.02	-9.54	30.27	53.98	-23.71
* 21280.00	-102.78	Peak	H	44.02	-9.54	38.70	73.98	-35.28
26600.00	-125.00	Peak	H	47.47	0.00	29.47	68.20	-38.73

**Table 6-18. Radiated Measurements**

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**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 & 3 Meters  
 Operating Frequency: 5500MHz  
 Channel: 100

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
* 11000.00	-116.95	Average	H	48.02	0.00	38.07	53.98	-15.91
* 11000.00	-104.30	Peak	H	48.02	0.00	50.72	73.98	-23.26
16500.00	-125.00	Peak	H	60.56	0.00	42.56	68.20	-25.64
22000.00	-103.57	Peak	H	44.30	-9.54	38.19	68.20	-30.01
27500.00	-125.00	Peak	H	47.96	0.00	29.96	68.20	-38.24

**Table 6-19. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 & 3 Meters  
 Operating Frequency: 5580MHz  
 Channel: 116

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
* 11160.00	-116.14	Average	H	50.52	0.00	41.38	53.98	-12.60
* 11160.00	-104.04	Peak	H	50.52	0.00	53.48	73.98	-20.50
16740.00	-125.00	Peak	H	59.50	0.00	41.50	68.20	-26.70
* 22320.00	-111.11	Average	H	44.40	-9.54	30.75	53.98	-23.23
* 22320.00	-102.74	Peak	H	44.40	-9.54	39.12	73.98	-34.86
27900.00	-125.00	Peak	H	48.14	0.00	30.14	68.20	-38.06



**Table 6-20. Radiated Measurements**

**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 & 3 Meters  
 Operating Frequency: 5700MHz  
 Channel: 140

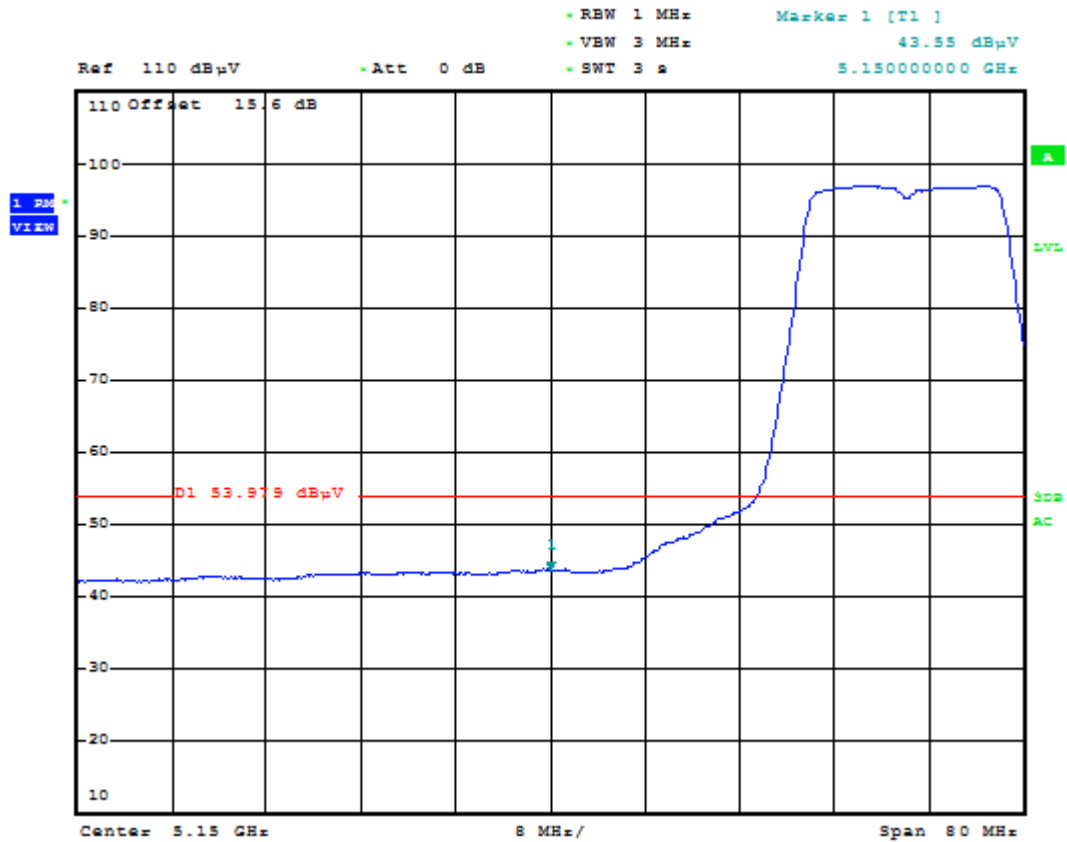
Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
* 11400.00	-118.59	Average	H	48.78	0.00	37.19	53.98	-16.79
* 11400.00	-105.67	Peak	H	48.78	0.00	50.11	73.98	-23.87
17100.00	-125.00	Peak	H	57.51	0.00	39.51	68.20	-28.69
* 22800.00	-110.67	Average	H	44.45	-9.54	31.24	53.98	-22.74
* 22800.00	-102.54	Peak	H	44.45	-9.54	39.37	73.98	-34.61
28500.00	-125.00	Peak	H	48.28	0.00	30.28	68.20	-37.92

**Table 6-21. Radiated Measurements**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 60 of 87

### 6.8 Radiated Band Edge Measurements (20MHz BW) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

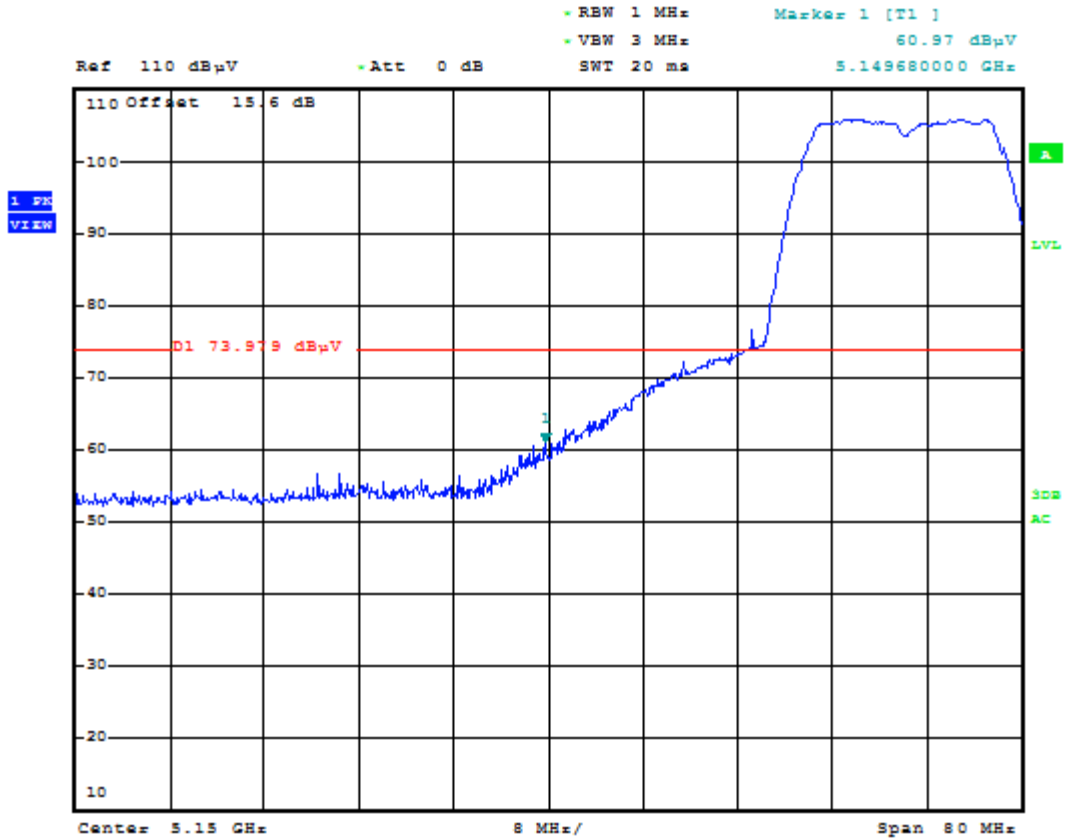
Worst Case Mode: 802.11n (20MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5180MHz  
 Channel: 36



Plot 6-61. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 61 of 87

**Radiated Band Edge Measurements (20MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

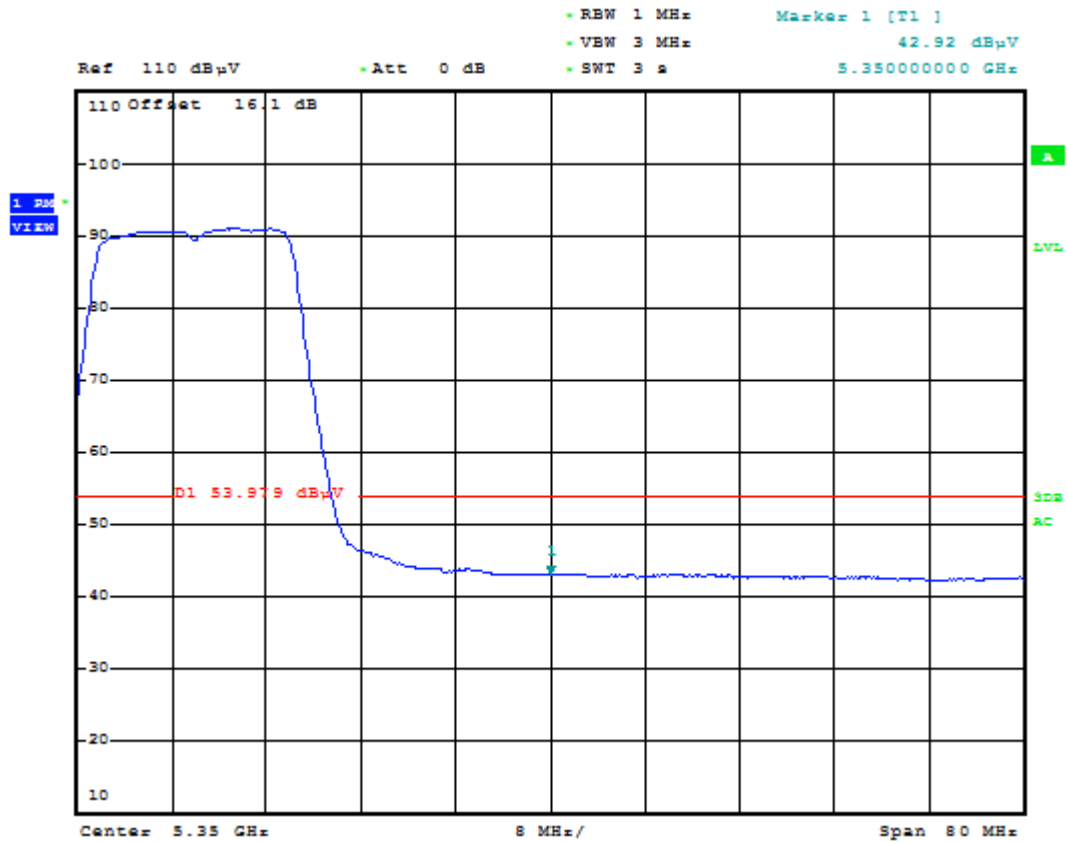


**Plot 6-62. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)**

FCC ID: A3LSHVE300LA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 62 of 87

**Radiated Band Edge Measurements (20MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

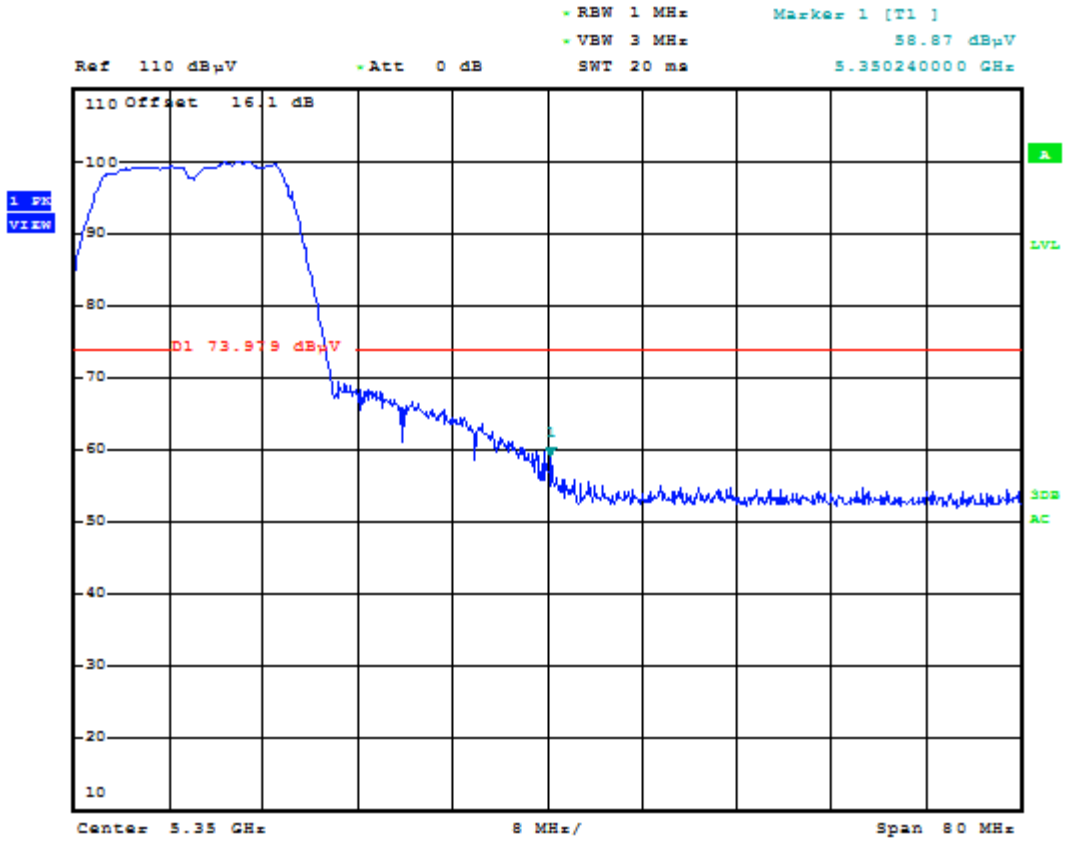
Worst Case Mode: 802.11n (20MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5320MHz  
 Channel: 64



**Plot 6-63. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 63 of 87

**Radiated Band Edge Measurements (20MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

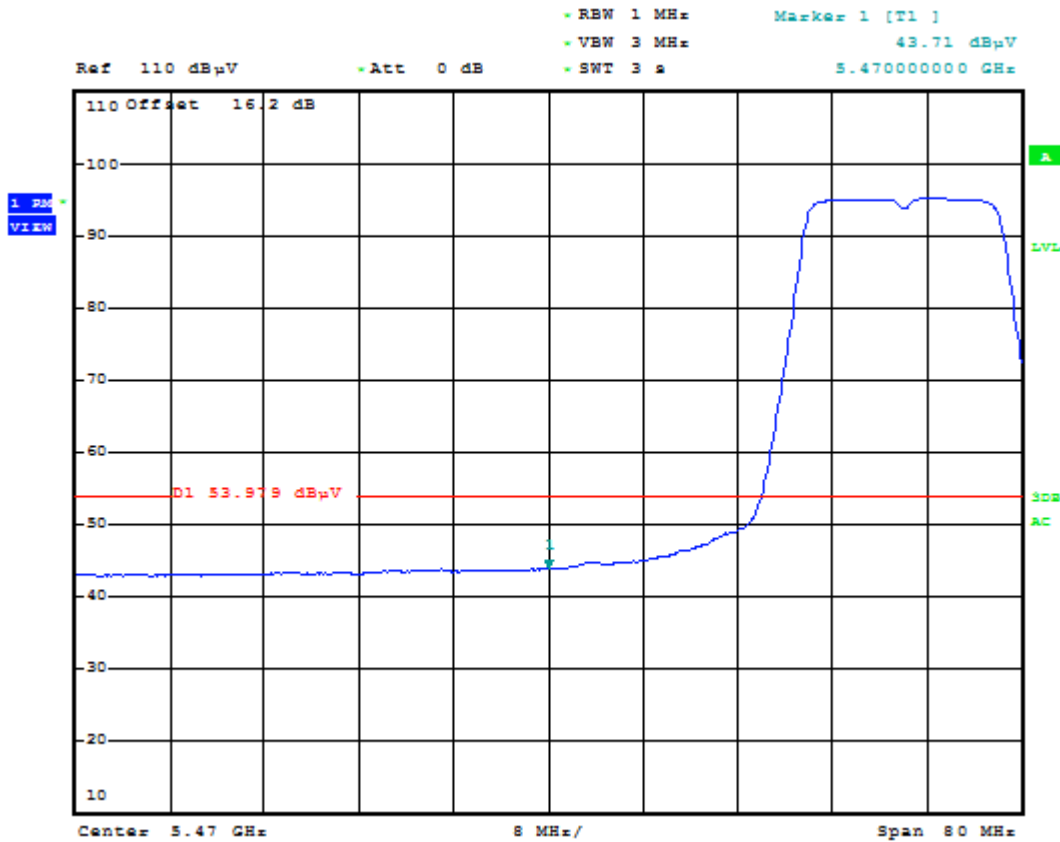


**Plot 6-64. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2)**

FCC ID: A3LSHVE300LA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 64 of 87

**Radiated Band Edge Measurements (20MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (20MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5500MHz  
 Channel: 100



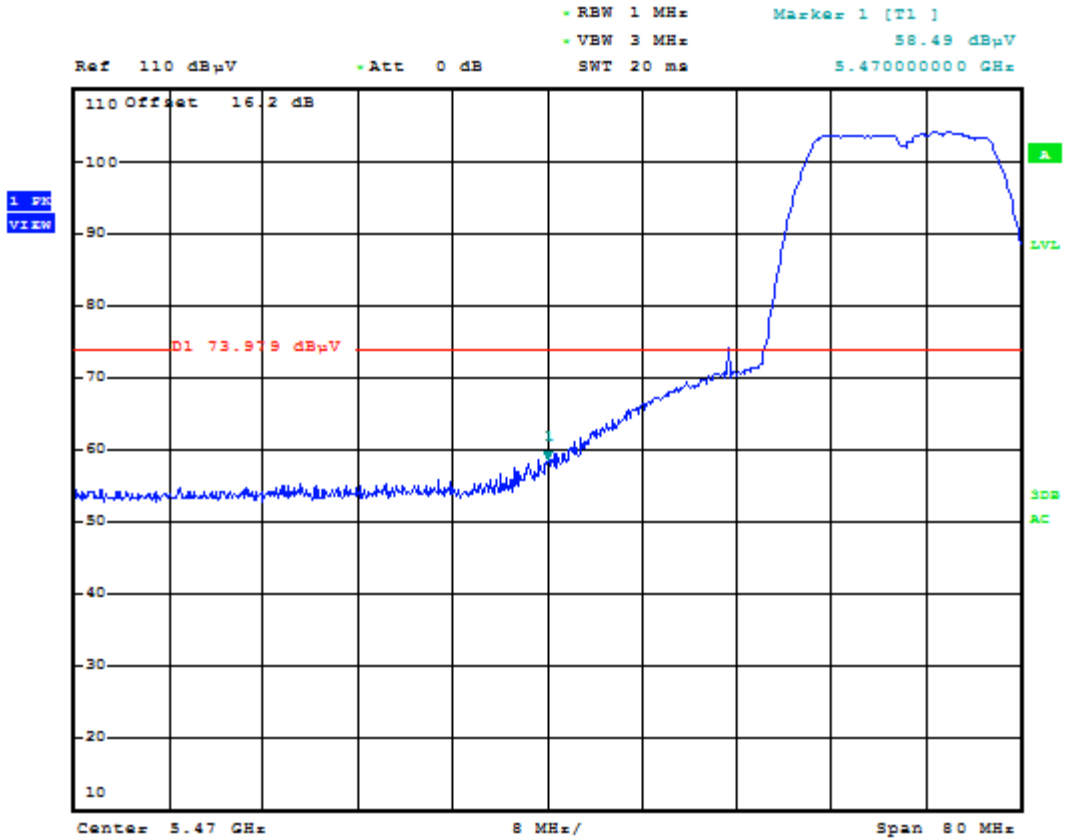
**Plot 6-65. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 3)**

**Note:**



The restricted band ends at 5460 MHz. Though, the marker is put on at 5470 MHz, we can see that the Band Edge measurements passes at or below 5460 MHz by looking at the plot.

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 65 of 87

**Radiated Band Edge Measurements (20MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



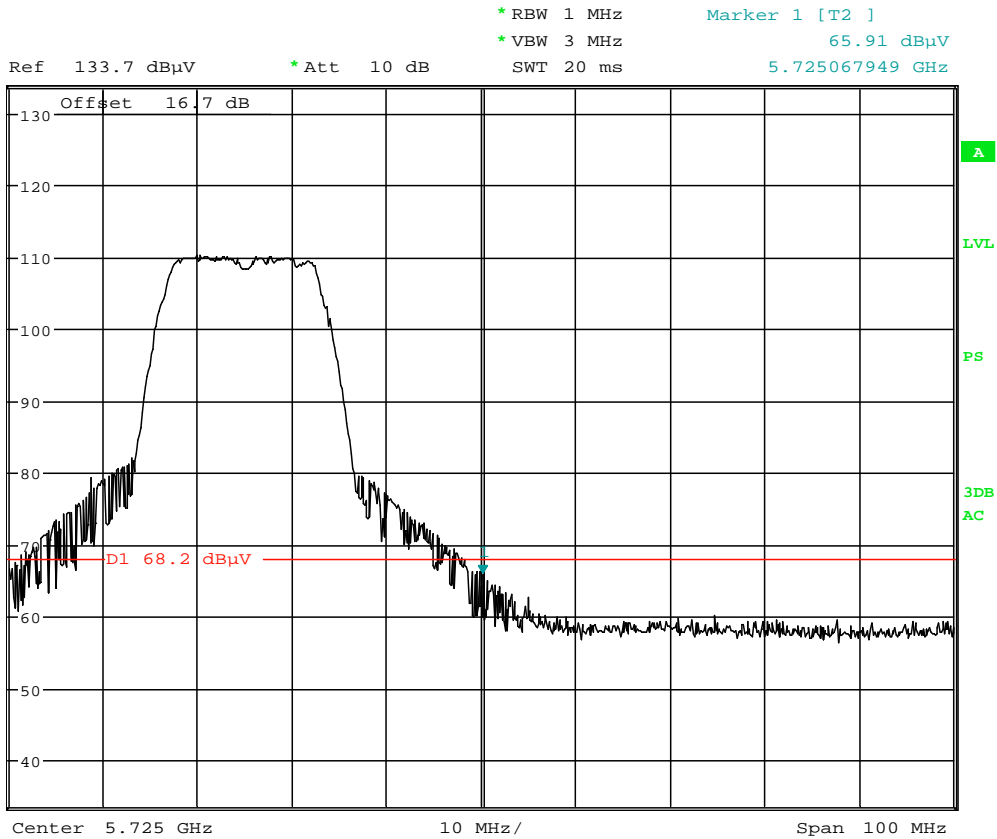
**Plot 6-66. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 3)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 66 of 87

# Radiated Band Edge Measurements (20MHz BW) (Cont'd)

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

Worst Case Mode: 802.11n (20MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5700MHz  
 Channel: 140



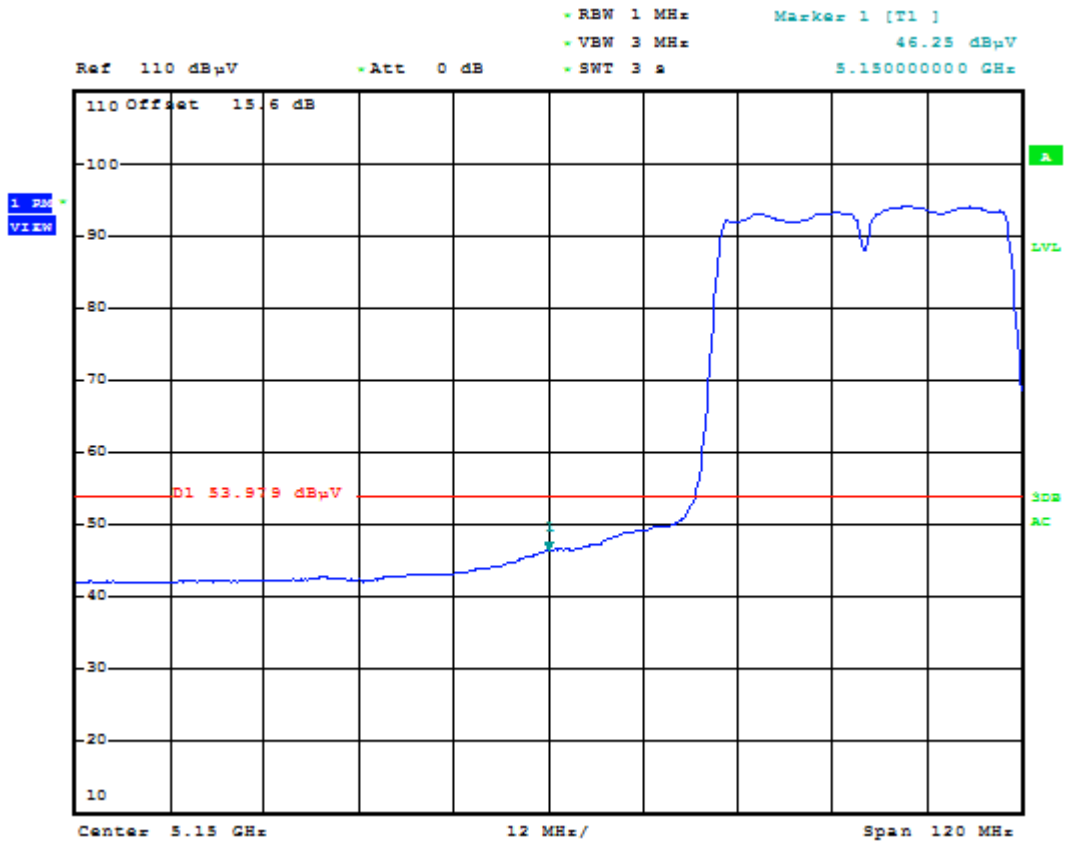
Date: 4.APR.2013 21:29:10

Plot 6-67. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 67 of 87

## 6.9 Radiated Band Edge Measurements (40MHz BW) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

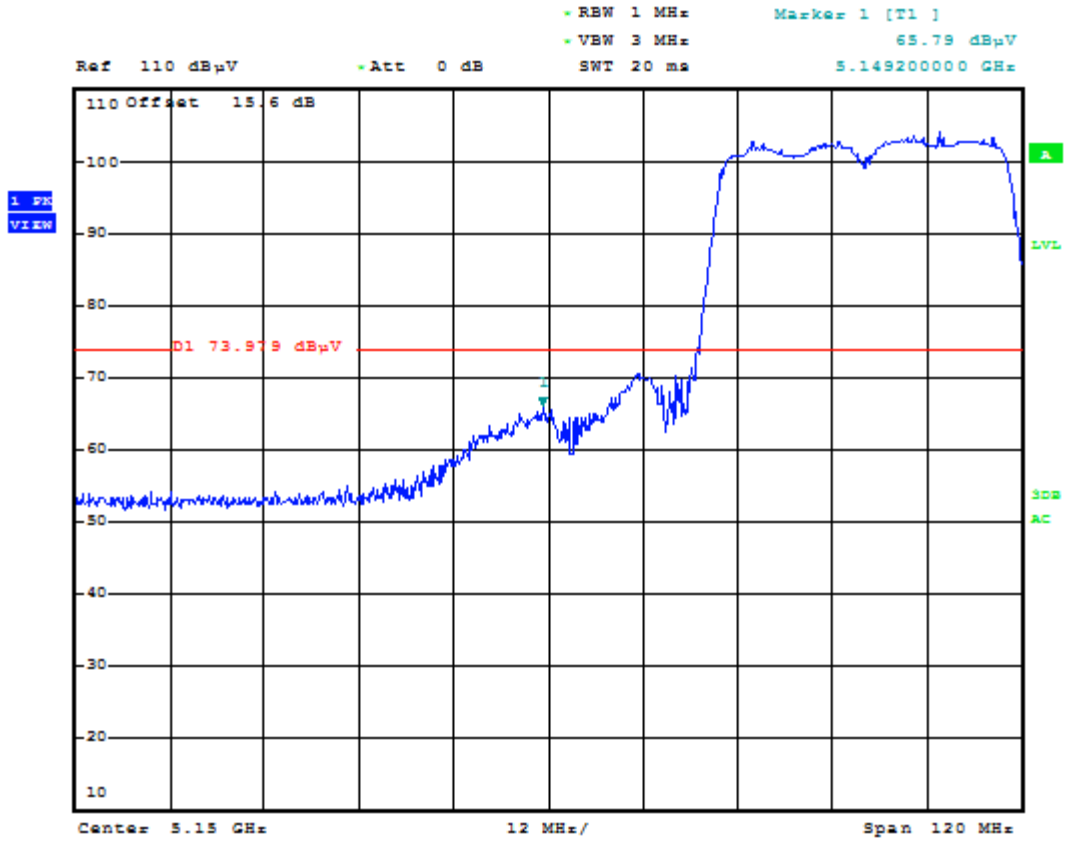
Worst Case Mode: 802.11n (40MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5190MHz  
 Channel: 38





Plot 6-68. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 68 of 87

**Radiated Band Edge Measurements (40MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

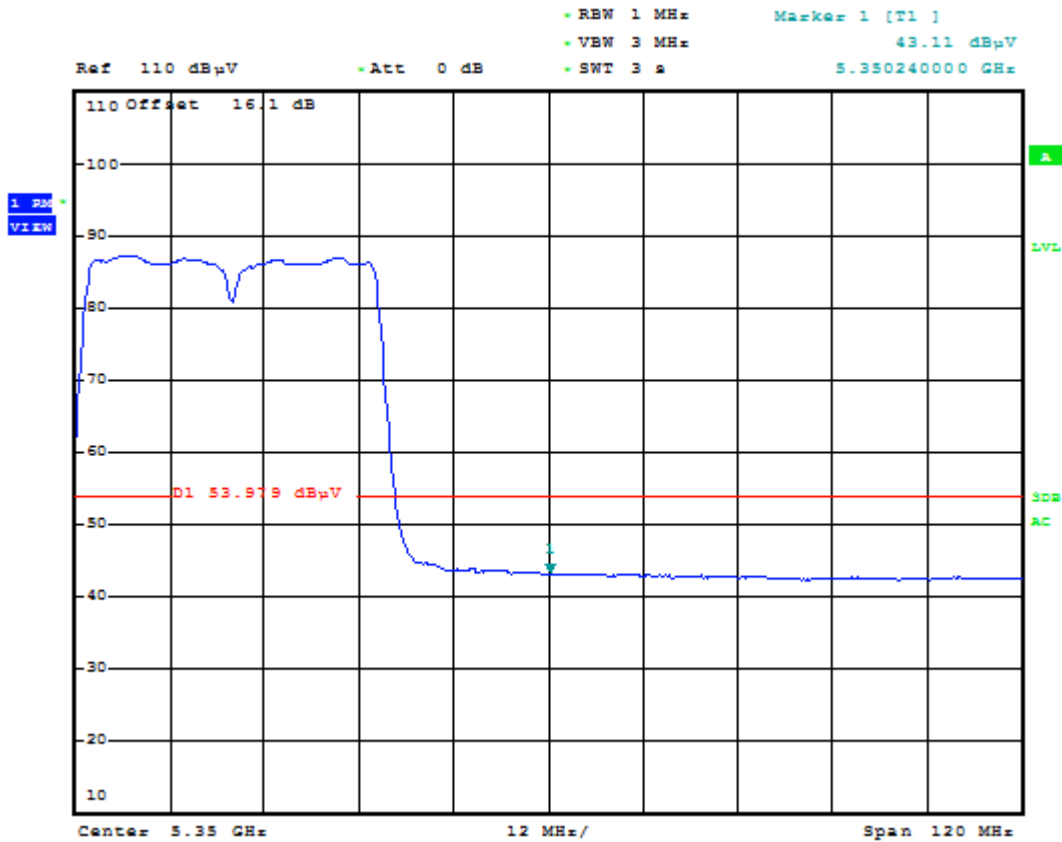


**Plot 6-69. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 69 of 87

**Radiated Band Edge Measurements (40MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

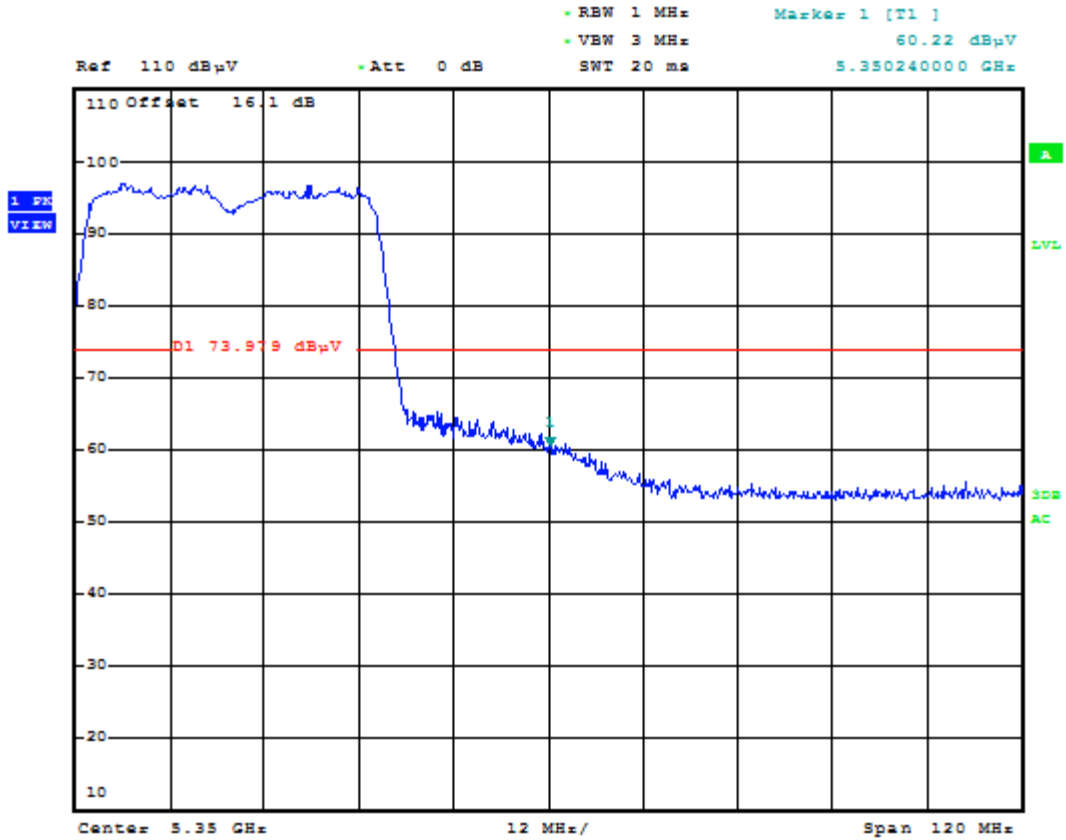
Worst Case Mode: 802.11n (40MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5310MHz  
 Channel: 62



**Plot 6-70. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 70 of 87

**Radiated Band Edge Measurements (40MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

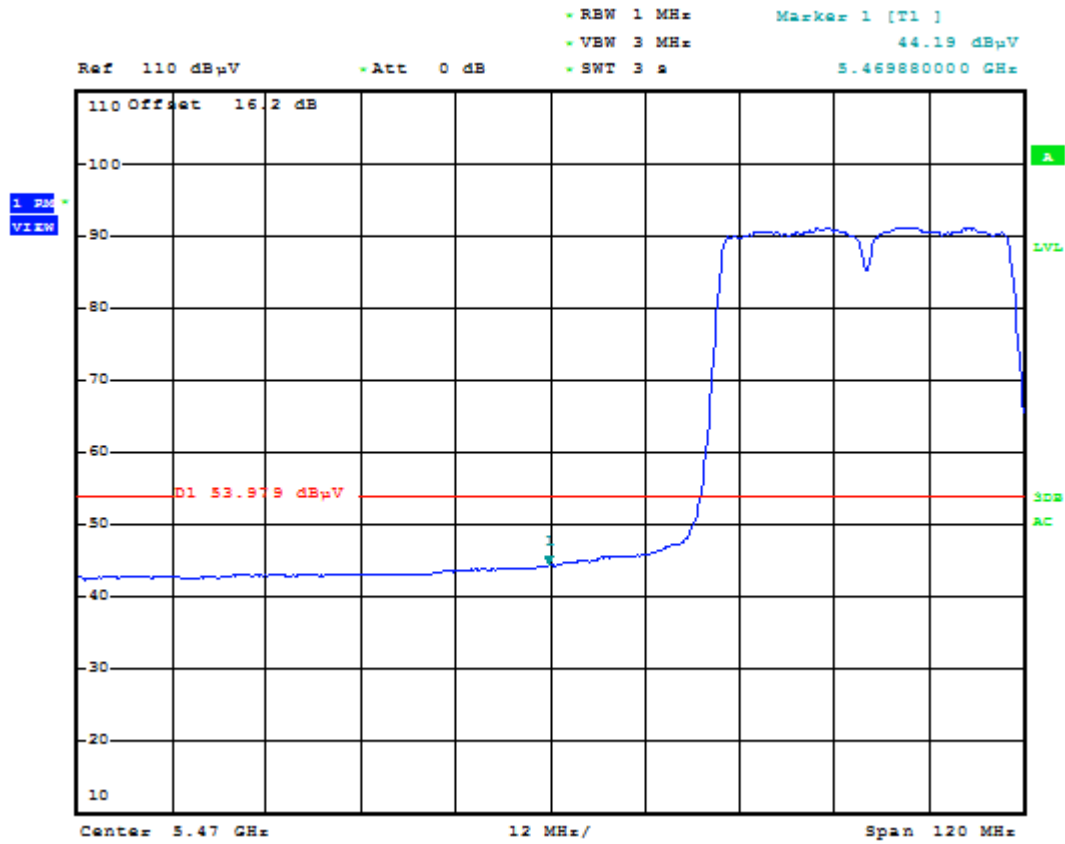


**Plot 6-71. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2)**

FCC ID: A3LSHVE300LA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 71 of 87

**Radiated Band Edge Measurements (40MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (40MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5510MHz  
 Channel: 102



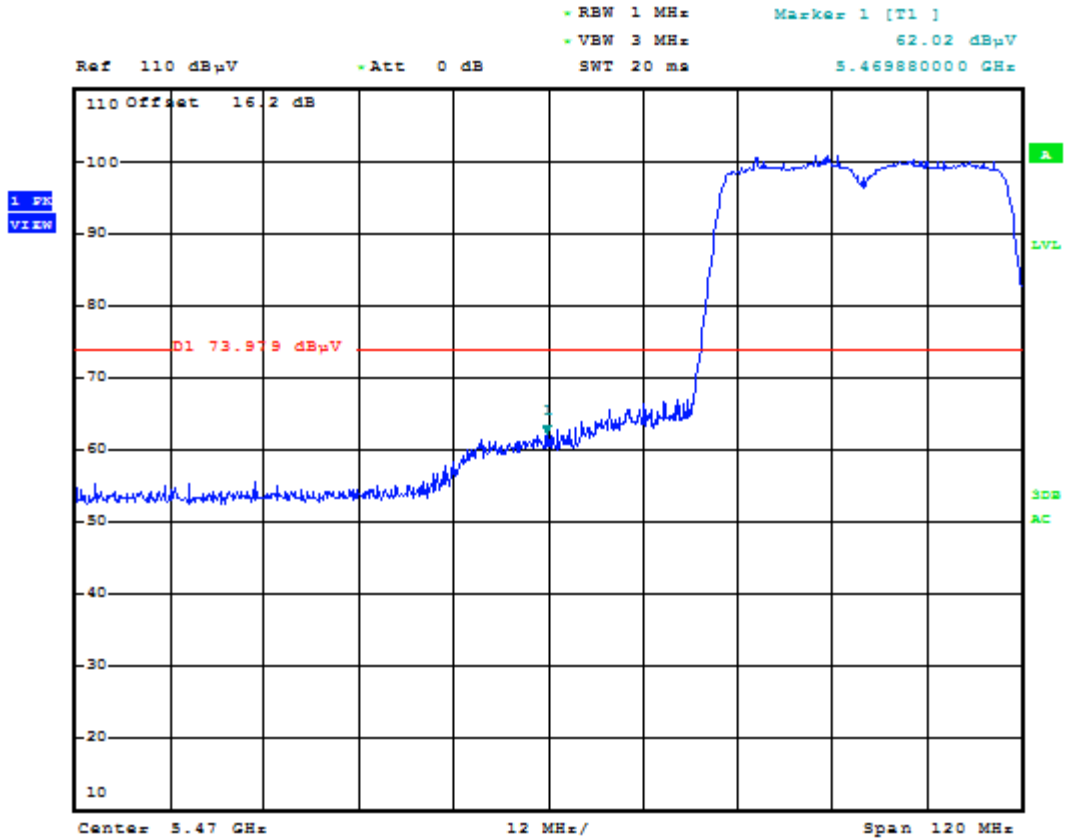
**Plot 6-72. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 3)**

**Note:**

The restricted band ends at 5460 MHz. Though, the marker is put on at 5470 MHz, we can see that the Band Edge measurements passes at or below 5460 MHz by looking at the plot

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 72 of 87

**Radiated Band Edge Measurements (40MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



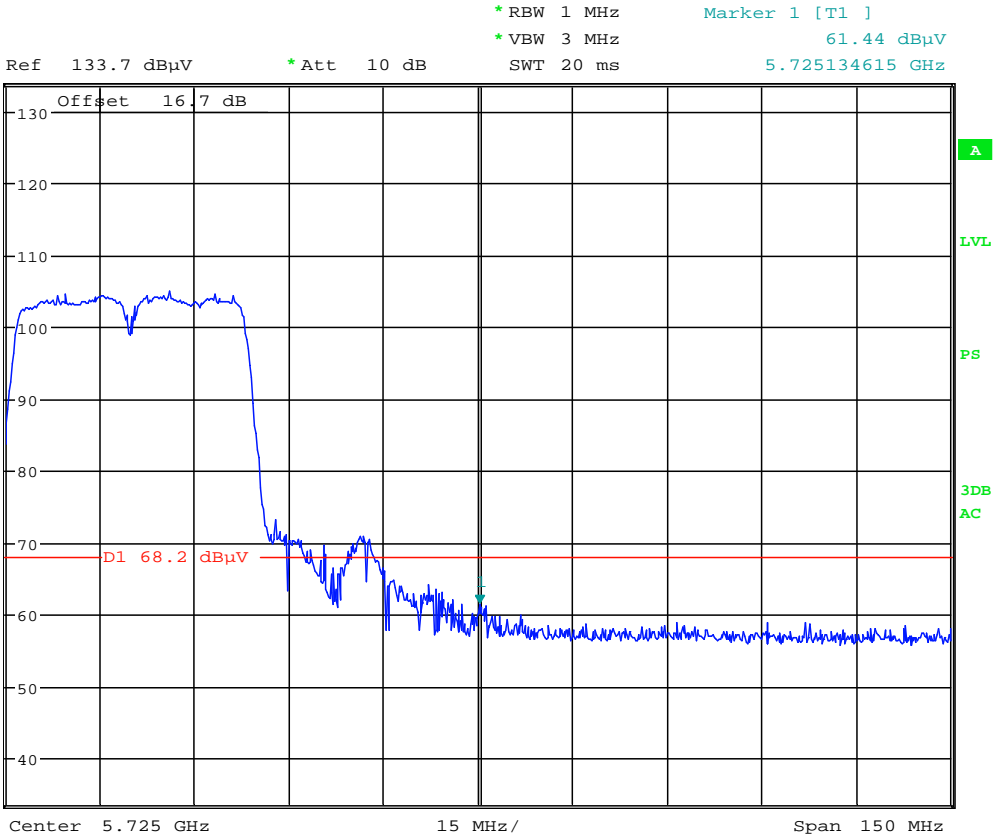
**Plot 6-73. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 3)**

FCC ID: A3LSHVE300LA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 73 of 87

# Radiated Band Edge Measurements (40MHz BW) (Cont'd)

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

Worst Case Mode: 802.11n (40MHz)  
 Worst Case Transfer Rate: MCS0  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5670MHz  
 Channel: 134



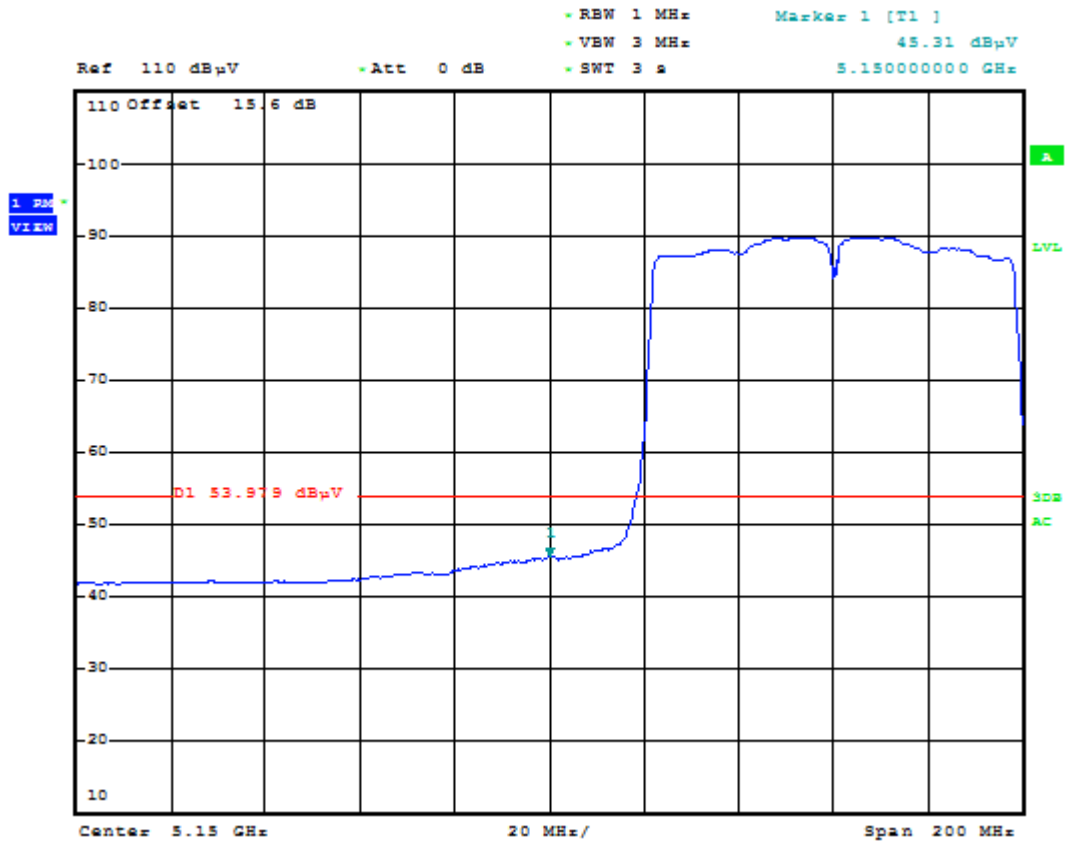
Date: 4.APR.2013 21:40:55

**Plot 6-74. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 74 of 87

**6.10 Radiated Band Edge Measurements (80MHz BW)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

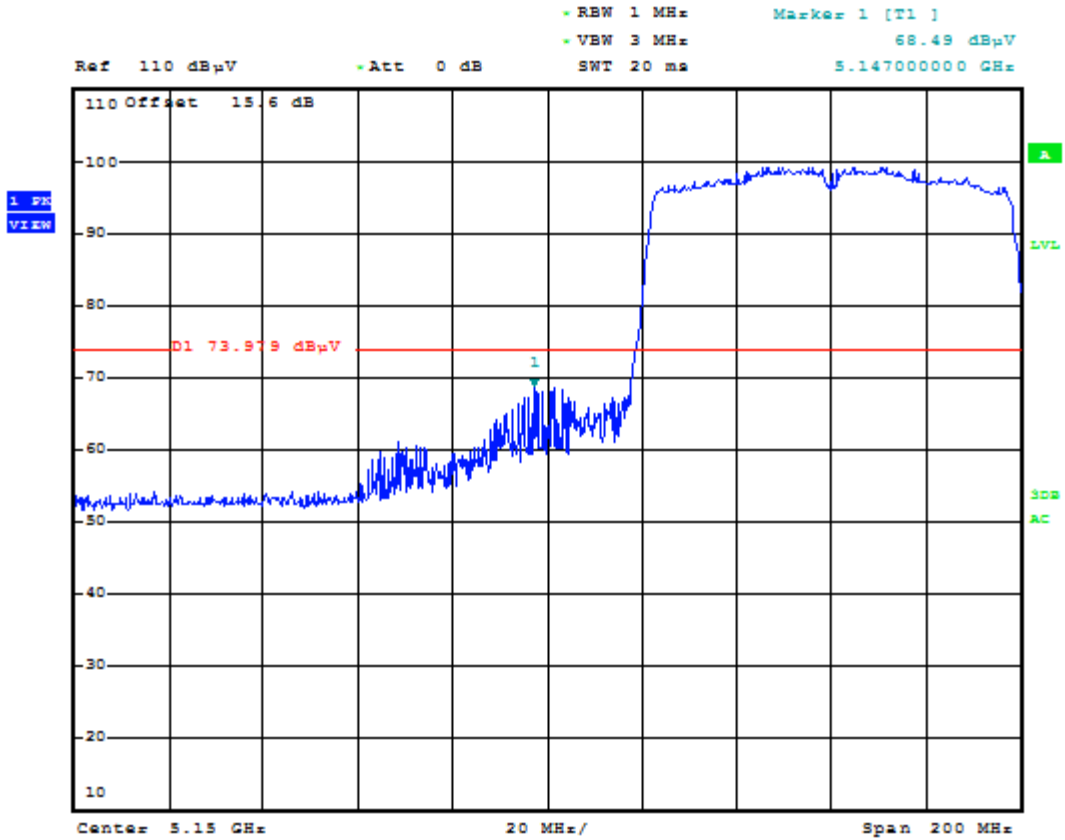
Worst Case Mode: 802.11n (80MHz)  
 Worst Case Transfer Rate: MCS8  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5210MHz  
 Channel: 42





**Plot 6-75. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 75 of 87

**Radiated Band Edge Measurements (80MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

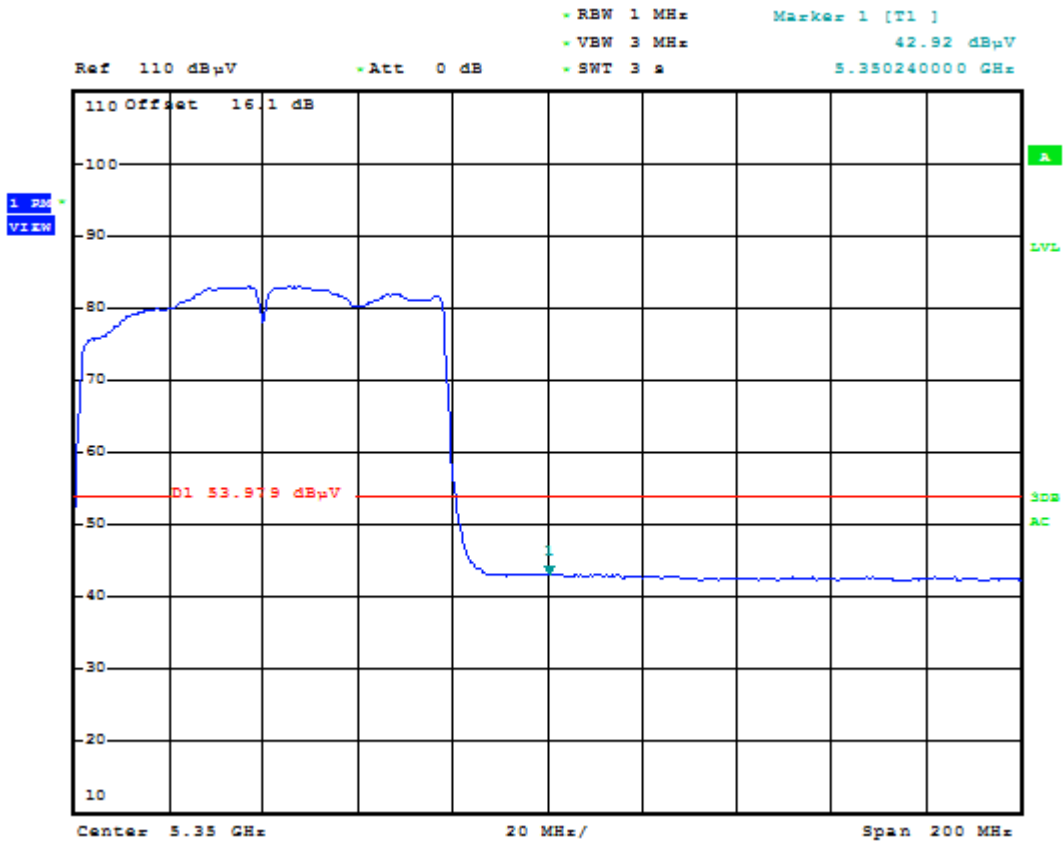


**Plot 6-76. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 76 of 87

**Radiated Band Edge Measurements (80MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

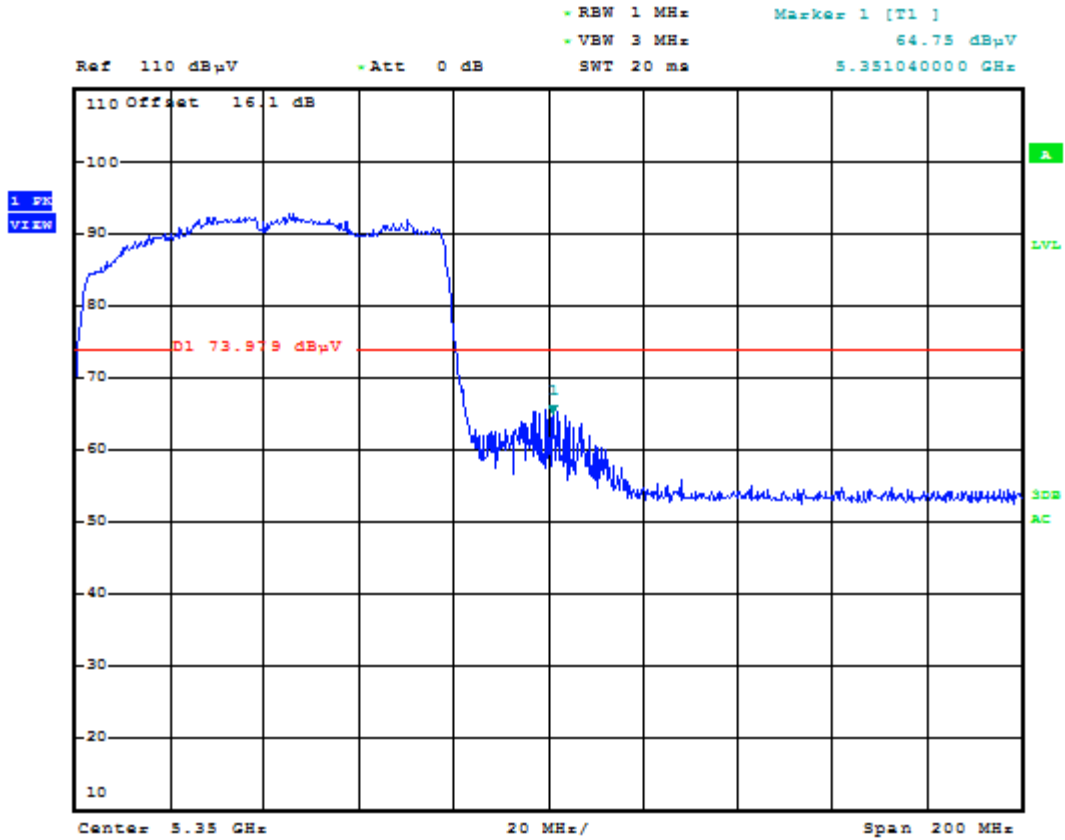
Worst Case Mode: 802.11n (80MHz)  
 Worst Case Transfer Rate: MCS8  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5290MHz  
 Channel: 58





**Plot 6-77. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 77 of 87

**Radiated Band Edge Measurements (80MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

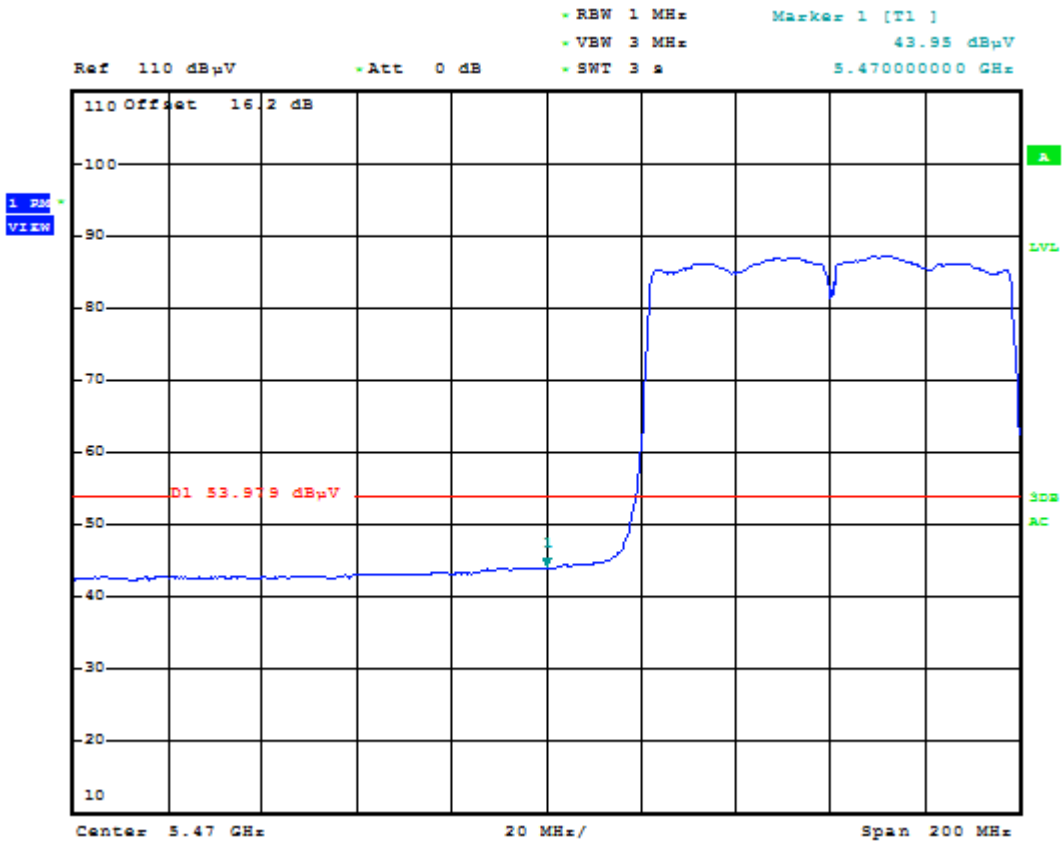


**Plot 6-78. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2)**

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 78 of 87

**Radiated Band Edge Measurements (80MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (80MHz)  
 Worst Case Transfer Rate: MCS8  
 Distance of Measurements: 3 Meters  
 Operating Frequency: 5530MHz  
 Channel: 106



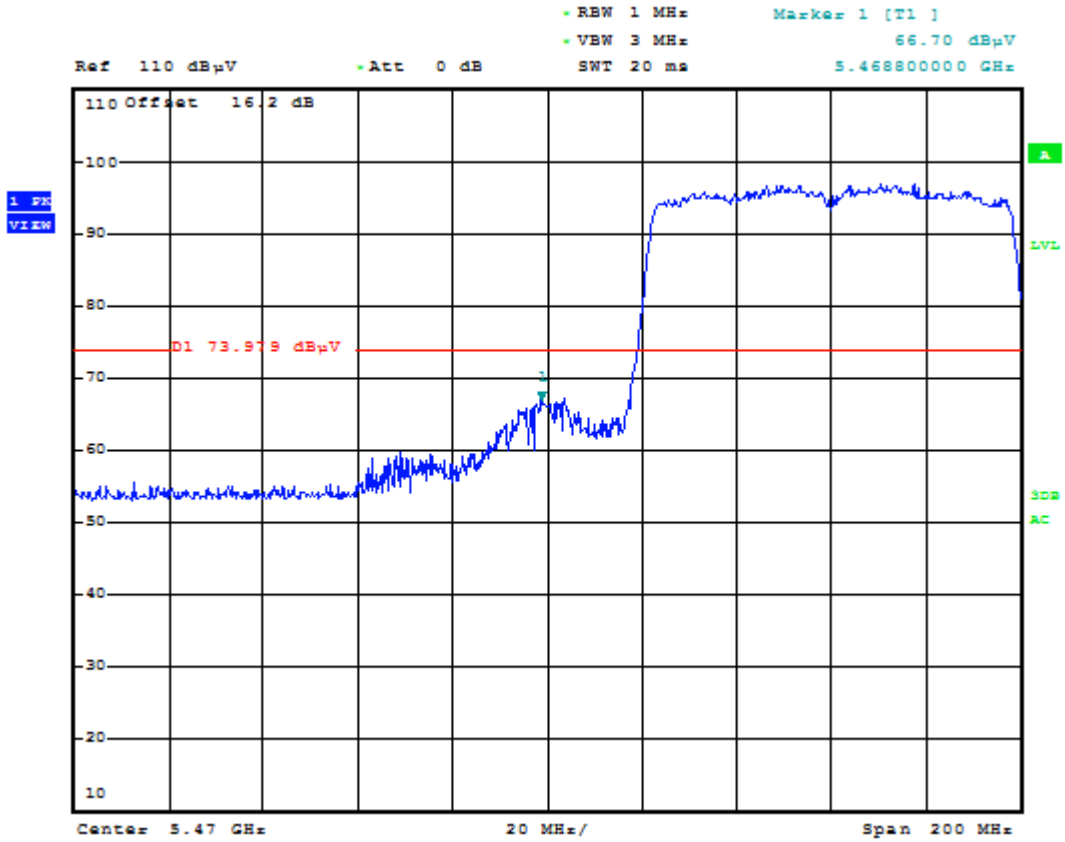
**Plot 6-79. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 3)**

**Note:**

The restricted band ends at 5460 MHz. Though, the marker is put on at 5470 MHz, we can see that the Band Edge measurements passes at or below 5460 MHz by looking at the plot

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 79 of 87



**Radiated Band Edge Measurements (80MHz BW) (Cont'd)**  
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



**Plot 6-80. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 3)**

**Note:**

Emissions were not found in the 5600-5650 MHz Band for 802.11 ac.

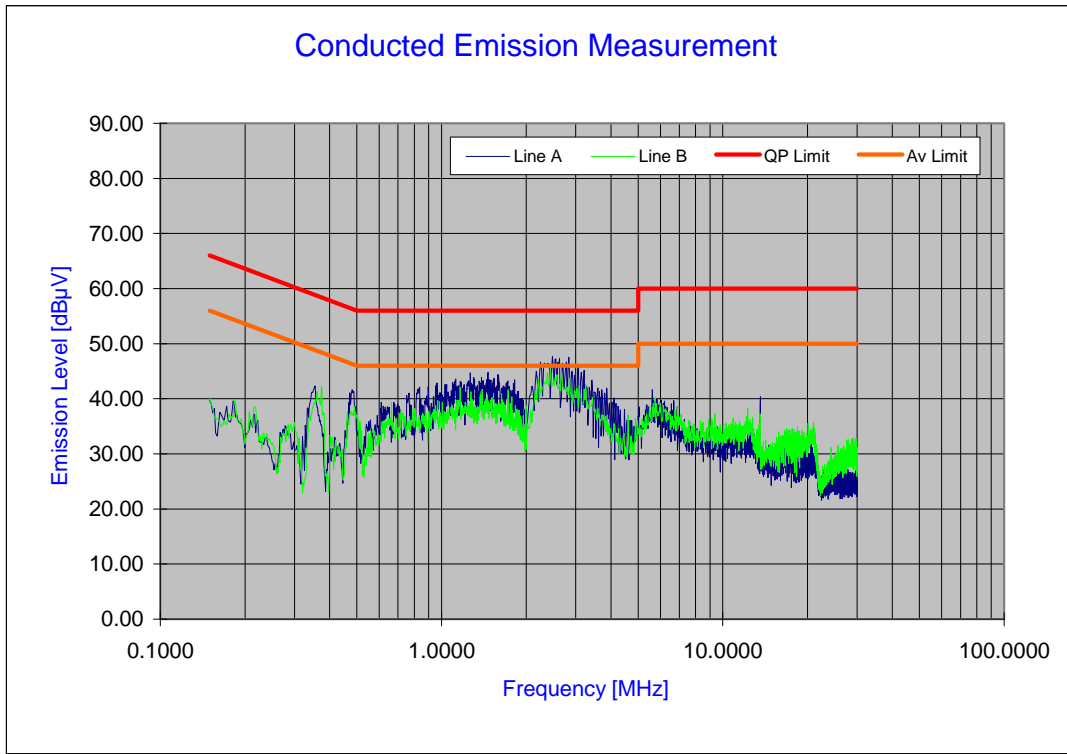
FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset		Page 80 of 87

**Line-Conducted Test Data**  
**§15.207; RSS-Gen [7.2.2]**

# PCTEST Engineering Laboratory Inc.

Company : Samsung Electronics Co., Ltd.  
 Model Number : SHV-E300L  
 FCC ID Code : A3LSHVE300LA  
 Standard : FCC Part 15C, 15.207

Power Source : AC120V/60Hz  
 Tested Date : 03/05/2013  
 Note : Tested with 802.11a  
 UNII Band 1 ON





Ver.1.1 ©PCTEST 2006.08

**Plot 6-81. Line Conducted Plot with 802.11a UNII Band 1**

**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 36. 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. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

FCC ID: A3LSHVE300LA		FCC Pt. 15.407 802.11a/n UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1303010388.A3L	Test Dates: 02/19 - 4/4/2013	EUT Type: Portable Handset	Page 81 of 87	



**Line-Conducted Test Data (Cont'd)**  
**§15.207; RSS-Gen [7.2.2]**

No.	Line	Frequency [MHz]	Factor [dB]	QP [dBμV]	Limit [dBμV]	Margin [dB]	Average [dBμV]	Limit [dBμV]	Margin [dB]
1	A	2.252	7.18	36.58	56.00	-19.42	24.19	46.00	-21.81
2	A	2.289	7.19	37.34	56.00	-18.66	24.22	46.00	-21.78
3	A	2.348	7.20	37.73	56.00	-18.27	25.49	46.00	-20.51
4	A	2.407	7.20	36.96	56.00	-19.04	25.88	46.00	-20.12
5	A	2.581	7.22	37.09	56.00	-18.91	25.24	46.00	-20.76
6	A	2.604	7.22	36.62	56.00	-19.38	25.05	46.00	-20.95
7	A	2.841	7.25	35.43	56.00	-20.57	24.38	46.00	-21.62
8	A	2.882	7.25	35.15	56.00	-20.85	23.79	46.00	-22.21
9	A	3.074	7.27	34.61	56.00	-21.39	23.54	46.00	-22.46
10	A	3.129	7.28	34.26	56.00	-21.74	22.27	46.00	-23.73
11	B	2.361	7.20	34.69	56.00	-21.31	25.55	46.00	-20.45
12	B	1.152	7.06	31.34	56.00	-24.66	20.86	46.00	-25.14
13	B	1.379	7.09	30.51	56.00	-25.49	21.95	46.00	-24.05
14	B	1.710	7.13	28.70	56.00	-27.30	20.93	46.00	-25.07
15	B	1.273	7.08	30.18	56.00	-25.82	21.24	46.00	-24.76
16	B	1.634	7.12	29.73	56.00	-26.27	21.45	46.00	-24.55
17	B	1.771	7.13	28.10	56.00	-27.90	20.42	46.00	-25.58
18	B	1.459	7.10	30.90	56.00	-25.10	21.85	46.00	-24.15
19	B	3.394	7.31	30.78	56.00	-25.22	21.37	46.00	-24.63
20	B	0.363	6.93	34.16	58.67	-24.51	23.41	48.67	-25.26

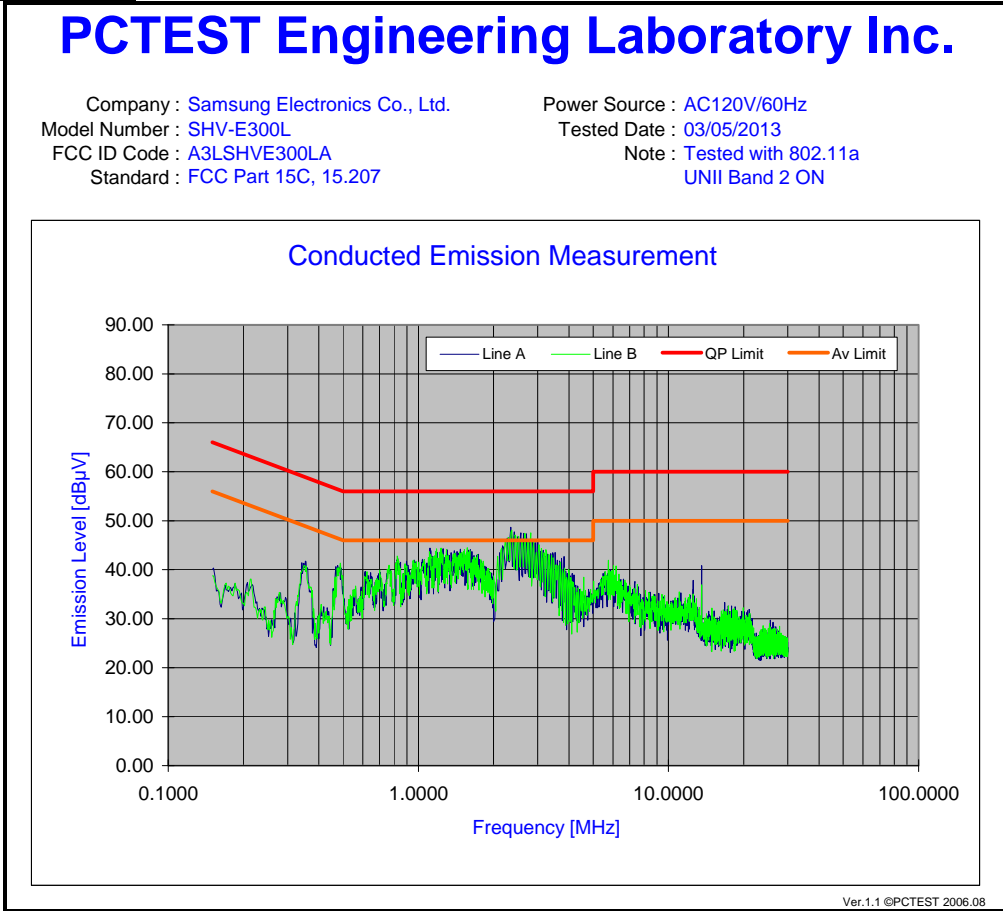
**Table 6-22. Line Conducted Data with 802.11a UNII Band 1**

**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.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
- Margin (dB) = QP/AVLimit (dBμV) - QP/AV Level (dBμV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

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**Line-Conducted Test Data (Cont'd)**  
**§15.207; RSS-Gen [7.2.2]**



**Plot 6-82. Line Conducted Plot with 802.11a UNII Band 2**

**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 52. 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. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

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**Line-Conducted Test Data (Cont'd)**  
**§15.207; RSS-Gen [7.2.2]**

No.	Line	Frequency [MHz]	Factor [dB]	QP [dBμV]	Limit [dBμV]	Margin [dB]	Average [dBμV]	Limit [dBμV]	Margin [dB]
1	A	1.114	7.06	32.95	56.00	-23.05	21.11	46.00	-24.89
2	A	2.257	7.18	36.32	56.00	-19.68	24.56	46.00	-21.44
3	A	2.298	7.19	37.01	56.00	-18.99	25.38	46.00	-20.62
4	A	2.411	7.20	36.79	56.00	-19.21	25.34	46.00	-20.66
5	A	2.522	7.22	36.68	56.00	-19.32	25.18	46.00	-20.82
6	A	2.635	7.23	36.59	56.00	-19.41	25.21	46.00	-20.79
7	A	2.659	7.23	36.17	56.00	-19.83	24.57	46.00	-21.43
8	A	2.717	7.24	36.56	56.00	-19.44	24.30	46.00	-21.70
9	A	2.756	7.24	35.82	56.00	-20.18	24.12	46.00	-21.88
10	A	2.940	7.26	35.16	56.00	-20.84	23.22	46.00	-22.78
11	B	2.352	7.20	37.27	56.00	-18.73	25.66	46.00	-20.34
12	B	2.723	7.24	36.09	56.00	-19.91	24.45	46.00	-21.55
13	B	2.637	7.23	36.21	56.00	-19.79	24.56	46.00	-21.44
14	B	2.393	7.20	37.04	56.00	-18.96	25.78	46.00	-20.22
15	B	2.328	7.19	37.25	56.00	-18.75	25.42	46.00	-20.58
16	B	2.594	7.22	36.59	56.00	-19.41	25.41	46.00	-20.59
17	B	2.817	7.25	35.17	56.00	-20.83	23.86	46.00	-22.14
18	B	2.998	7.26	34.96	56.00	-21.04	23.43	46.00	-22.57
19	B	1.584	7.11	32.92	56.00	-23.08	21.94	46.00	-24.06
20	B	1.237	7.07	33.69	56.00	-22.31	22.03	46.00	-23.97

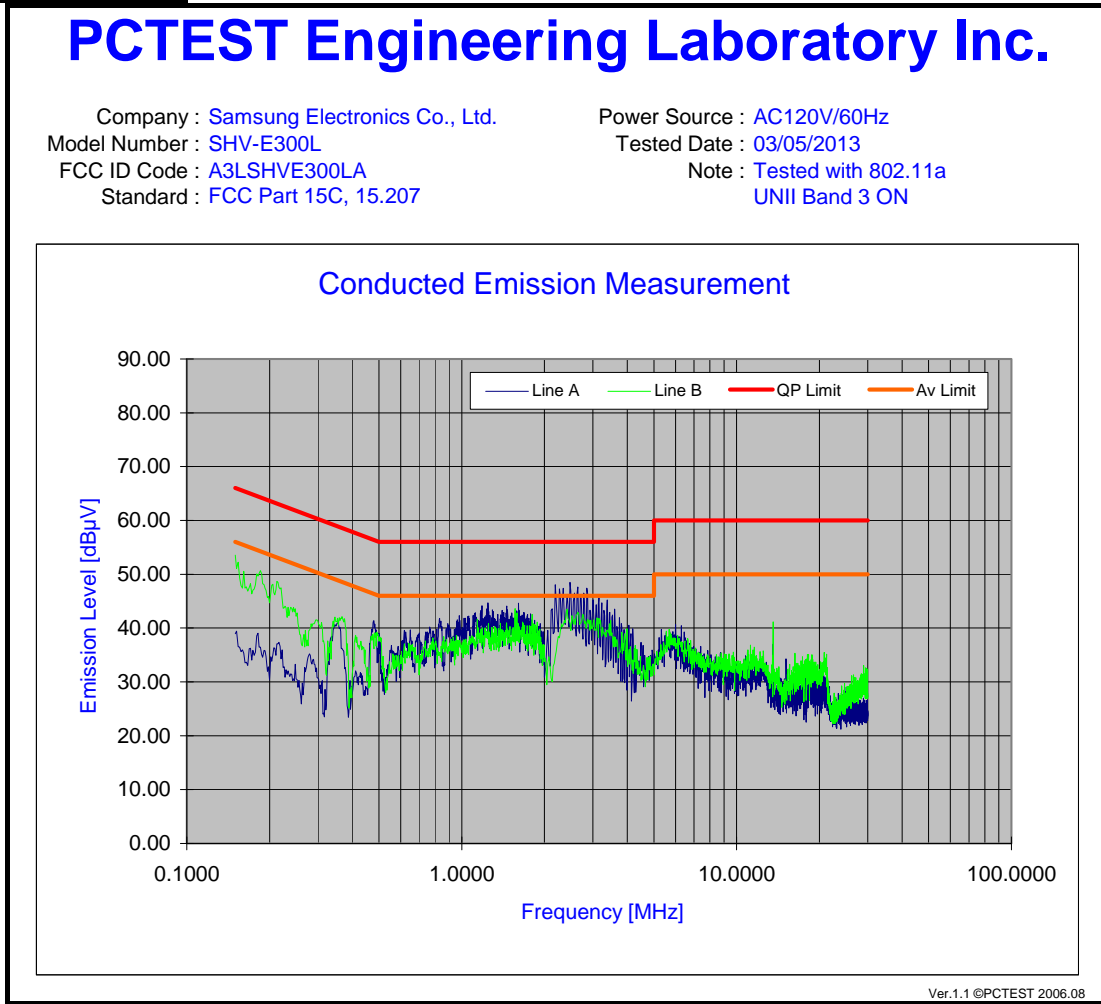
**Table 6-23. Line Conducted Data with 802.11a UNII Band 2**

**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.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
- Margin (dB) = QP/AV Limit (dBμV) - QP/AV Level (dBμV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

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**Line-Conducted Test Data (Cont'd)**  
**§15.207; RSS-Gen [7.2.2]**



**Plot 6-83. Line Conducted Plot 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. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

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**Line-Conducted Test Data (Cont'd)**  
**§15.207; RSS-Gen [7.2.2]**

No.	Line	Frequency [MHz]	Factor [dB]	QP [dBμV]	Limit [dBμV]	Margin [dB]	Average [dBμV]	Limit [dBμV]	Margin [dB]
1	A	2.286	7.19	37.09	56.00	-18.91	24.89	46.00	-21.11
2	A	2.309	7.19	37.04	56.00	-18.96	25.49	46.00	-20.51
3	A	2.346	7.20	37.12	56.00	-18.88	25.72	46.00	-20.28
4	A	2.522	7.22	36.81	56.00	-19.19	25.33	46.00	-20.67
5	A	2.608	7.22	36.80	56.00	-19.20	25.60	46.00	-20.40
6	A	2.661	7.23	36.81	56.00	-19.19	25.30	46.00	-20.70
7	A	2.677	7.23	36.70	56.00	-19.30	25.04	46.00	-20.96
8	A	2.732	7.24	35.62	56.00	-20.38	24.66	46.00	-21.34
9	A	2.819	7.25	35.58	56.00	-20.42	24.34	46.00	-21.66
10	A	3.071	7.27	34.91	56.00	-21.09	22.68	46.00	-23.32
11	B	0.150	6.84	45.47	66.00	-20.53	30.31	56.00	-25.69
12	B	0.176	6.86	35.14	64.70	-29.56	24.16	54.70	-30.54
13	B	0.215	6.88	33.95	63.00	-29.05	21.69	53.00	-31.31
14	B	1.149	7.06	30.51	56.00	-25.49	21.39	46.00	-24.61
15	B	1.581	7.11	30.84	56.00	-25.16	21.53	46.00	-24.47
16	B	1.659	7.11	30.70	56.00	-25.30	21.73	46.00	-24.27
17	B	1.793	7.13	28.69	56.00	-27.31	20.71	46.00	-25.29
18	B	2.381	7.20	33.63	56.00	-22.37	24.99	46.00	-21.01
19	B	2.675	7.24	33.83	56.00	-22.17	24.28	46.00	-21.72
20	B	2.706	7.24	33.66	56.00	-22.34	23.97	46.00	-22.03

**Table 6-24. 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.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
- Margin (dB) = QP/AVLimit (dBμV) - QP/AV Level (dBμV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

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## 7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSHVE300LA** is in compliance with Part 15E of the FCC Rules and RSS-210 of the Industry Canada Rules.

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