

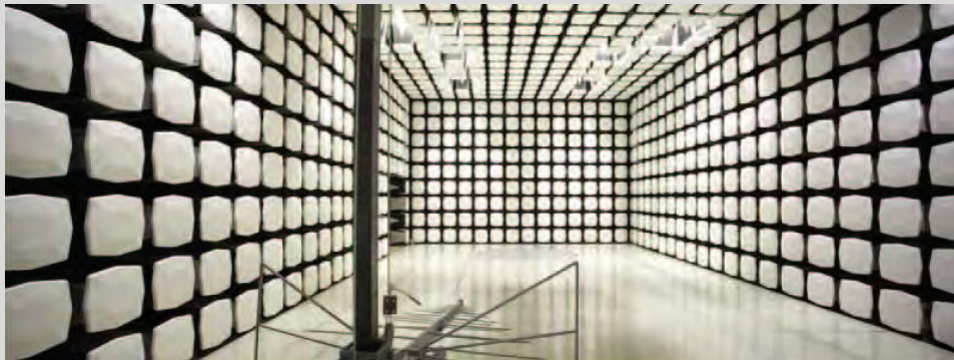


Intel Corporation

The EGG

FCC 15.407:2013

Report #: INSD0001.4



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: December 5, 2013
Intel Corporation
Model: The EGG

Emissions

Test Description	Specification	Test Method	Pass/Fail
Move Time	FCC 15.407:2013	FCC 06-96:2006	Pass
Closing Time	FCC 15.407:2013	FCC 06-96:2006	Pass
Non Occupancy Period	FCC 15.407:2013	FCC 06-96:2006	Pass

Deviations From Test Standards

None

Approved By:



Jeremiah Darden, Operations Manager



NVLAP Lab Code: 200676-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

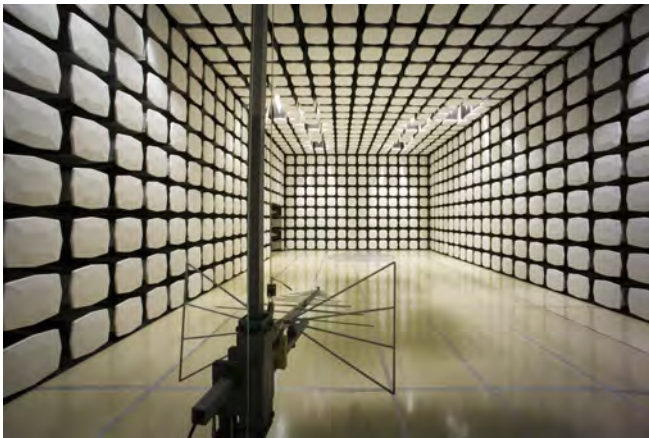
SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05, SU02, SU07 19201 120 th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0



Client and Equipment Under Test (EUT) Information

Company Name:	Intel Corporation
Address:	2111 NE 25th Ave
City, State, Zip:	Hillsboro, OR 97124
Test Requested By:	Phil Auzas
Model:	The EGG
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

802.11abgn SISO radio device with 1 stream and 1 antenna.

Hardware, Firmware, and OS Versions:

Hardware version: EGG EVT

Firmware version: 1121-2

OS versions: Tizen 2.0 with Linux Kernel 3.0.8

The operating frequency band(s) of the equipment.

2400 - 2483.5 MHz

5150 - 5250 MHz

5250 - 5350 MHz (DFS Band)

5470 - 5600 MHz (DFS Band)

5650 - 5725 MHz (DFS Band)

5725 - 5825 MHz

The operating modes (Master and/or Client) of the U-NII device.

Client device with no radar detection and no ad-hoc capability

For Client devices, indicate whether or not it has DFS capabilities and indicate the FCC (and IC) identifier for the Master U-NII Device that is used with it for DFS testing.

The client device has no radar detection and no ad-hoc capability. A DFS-compliant Master device was used for testing. It's the CISCO Model AIR-AP1252AG-A-K9, FCC ID:LDK102061, IC: 2461B-102061

List the highest and the lowest possible power level (equivalent isotropic radiated power (EIRP) of the equipment.

The maximum EIRP of the 5 GHz equipment is 24.4 dBm conducted.

Test sequences or messages that should be used for communication between Master and Client Devices, which are used for loading the Channel.

1. Stream the test file from the Master Device to the Client Device for IP based systems or frame based systems which dynamically allocate the talk/listen ratio.
2. For frame based systems with fixed talk/listen ratio, set the ratio to 45%/55% and stream the test file from the Master to the Client.
3. For other system architectures, supply appropriate Channel loading methodology.

The setup used to stream the data from the access point (master) to the client (EUT) is as follows: a Laptop with the NTIA test file is connected to a DFS compliant (FCC-certified) access point via Ethernet connection. The EUT has direct connection to the Access Point via coaxial cable. The setup uses a program called WinSCP which allows files to be transferred from the laptop to the EUT at a controlled data rate. The Access point is configured for the lowest data rate 6Mbps to increase the time to transfer the test file. The WinSCP program is set to transfer the data at 2Mbps which results in the same or greater amount of channel loading than what is specified in Section 7.7 of the FCC's DFS procedure.

Transmit Power Control description.

This device does not exceed 27dBm EIRP, so no transmit power control is implemented.

System architectures, data rates, U-NII Channel bandwidths.

1. Indicate the type(s) of system architecture (e.g. IP based or Frame based) that the U-NII device employs. Each type of unique architecture must be tested.

The client device (EUT) employs IP based system architecture.

The time required for the Master Device and/or Client Device to complete its power-on cycle.

The Master device used in the test system requires 1.44 minutes to complete its power-on cycle. The client device (EUT) does not have radar detection, so its power-on time is not applicable.

Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

The client device (EUT) does not have radar detection, so the parameters of the Radar Waveforms are not available to the end user.

Uniform Channel Spreading requirement for Master Devices. For Master Devices, indicate how the master provides, on aggregate, uniform Channel loading of the spectrum across all Channels.

The client device (EUT) does not have radar detection, so this requirement is not applicable.

List all antenna assemblies and their corresponding gains.

1. If radiated tests are to be performed, the U-NII Device should be tested with the lowest gain antenna assembly (regardless of antenna type). The report should indicate which antenna assembly was used for the tests. For devices with adjustable output power, list the output power range and the maximum EIRP for each antenna assembly.
2. If conducted tests are to be performed, indicate which antenna port/connection was used for the tests and the antenna assembly gain that was used to set the DFS Detection Threshold level during calibration of the test setup.
 - a. Indicate the calibrated conducted DFS Detection Threshold level.
 - b. For devices with adjustable output power, list the output power range and the maximum EIRP for each antenna assembly.
 - c. Indicate the antenna connector impedance. Ensure that the measurement instruments match (usually 50 Ohms) or use a minimum loss pad and take into account the conversion loss.
3. Antenna gain measurement verification for tested antenna.
 - a. Describe procedure
 - b. Describe the antenna configuration and how it is mounted
 - c. If an antenna cable is supplied with the device, cable loss needs to be taken into account. Indicate the maximum cable length and either measure the gain with this cable or adjust the measured gain accordingly. State the cable loss.

The client device (EUT) has one 50 ohm antenna port. A conducted DFS test was performed on that antenna port at a 20 MHz channel bandwidth. The EUT does not support larger channel bandwidths.

The antenna gain of the client device was measured by the antenna manufacturer. The maximum gain in the 5 GHz bands is 4.2 dBi. The antenna gain values were obtained with the antennas installed in a representative device.

The power levels to the antenna are measured at the antenna feed, so there is no additional loss to consider between the RF power output and the antenna input.

The calibrated conducted DFS detection threshold was set to -63 dBm at the antenna port of the Master. This is equal to the DFS Detection Threshold of the Master + 1 dB.

Configuration INSD0001- 5

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
802.11 abgn SISO radio device	Intel Corporation	The Egg	99
AC/DC Power Adapter	Salcomp	S11A02	1310001174 60

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DFS Host Laptop	Toshiba	PRP614-01J033	19062868H
Laptop Power Supply	Toshiba	PA3679U-1ACA	G71C00098110

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB to USB3	Yes	1.0m	No	The EGG	AC/DC Power Adapter
AC Cable	No	1.8m	No	AC Mains	Laptop Power Supply
DC Cable	No	2.0m	No	DFS Host Laptop	Laptop Power Supply
Ethernet Cable	No	1.0m	No	DFS Host Laptop	DFS DHCP Router

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	12/5/2013	Move Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	12/5/2013	Close Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	12/5/2013	Non Occupancy Period	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
Non-Occupancy Period	Yes	Yes	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

DFS Response Requirement Values

Parameter	Value
Non-occupancy	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. (See Notes 1 and 2).
U-NII Detection Bandwidth	Minimum 80% of the UNII 99% transmission power bandwidth. (See Note 3).
<p>Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:</p> <ul style="list-style-type: none"> For the Short Pulse Radar Test Signals this instant is the end of the Burst. For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated. For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the Radar Waveform. <p>Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.</p> <p>Note 3: During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p>	

DFS Detection Thresholds for Master or Client Devices Incorporating DFS

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.
 Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
1	1	1428	18	60%	30
2	1 - 5	150 - 230	23 - 29	60%	30
3	6 - 10	200 - 500	16 - 18	60%	30
4	11 - 20	200 - 500	12 - 16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Long Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50 - 100	5 - 20	1000 - 2000	1 - 3	8 - 20	80%	30

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

Client Device DFS Conformance Test

For a Client Device without DFS, the Channel Move Time and Channel Closing Transmission Time requirements are verified with one Short Pulse Radar and one Long Pulse Radar.

Channel Closing Transmission Time: The total duration of transmissions, consisting of data signals and the aggregate of control signals, by a U-NII device during the Channel Move Time.

Channel Move Time: The time to cease all transmissions on the current Channel upon detection of a Radar Waveform above the DFS Detection Threshold. A Client Device will not transmit before having received appropriate control signals from a Master Device.

A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.

DFS Detection Thresholds for Master or Client Devices Incorporating DFS

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

DFS Response Requirement Value

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.

Setting the Test Signal Level

The radar test signal level is set at the Master Device, or the Client Device with In-Service Monitoring, as appropriate for the particular test. This device is known as the Radar Detection Device (RDD).

- When a Client Device without In-Service Monitoring is the UUT, the Master Device is the RDD.
- When a Client Device with In-Service Monitoring is the UUT, and is tested for response to the Master Device detections, the Master Device is the RDD.
- When a Client Device with In-Service Monitoring is the UUT, and is tested for independent response to detections by the Client Device, the Client Device is the RDD.

A spectrum analyzer is used to establish the test signal level for each radar type. During this process, there are no transmissions by either the Master Device or Client Device. The spectrum analyzer is switched to the zero span (time domain) mode at the frequency of the Radar Waveform generator. The peak detector function of the spectrum analyzer is utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) are set to at least 3 MHz.

The signal generator amplitude and/or step attenuators are set so that the power level measured at the spectrum analyzer is equal to the DFS Detection Threshold that is required for the tests. The signal generator and attenuator settings are recorded for use during the test.

MOVE TIME

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
DFS Signal Generator	Benchforge Manufacturing	Colt	TIO	NCR	0
SMA Power Divider	S.M. Electronics	MP0208-2	None	NCR	0
SMA Power Divider	S.M. Electronics	MP0208-2	None	NCR	0
Step Attenuator	Aeroflex/Weinchel	3053	26834	NCR	0
Step Attenuator	Aeroflex/Weinchel	3053	26835	NCR	0
Master Access Point	Cisco Systems, Inc.	AIR-AP1252AG-A-K9 (FCC ID: LDK102061) (IC: 2461B-102061)	None	NCR	0
Master DHCP Router	Linksys	BEFSX41	None	NCR	0
20dB Attenuator	Fairview Microwave	SA18H-20	None	NCR	0
10dB Attenuator	Fairview Microwave	SA18H-10	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0

TEST DESCRIPTION

FCC KDB 905462 describes the compliance measurement procedures including acceptable instrument system configurations for performing Dynamic Frequency Selection (DFS) tests under FCC Part 15 Subpart E Rules required for Unlicensed –National Information Infrastructure (U-NII) equipment that operates in the frequency bands 5.25 GHz to 5.35 GHz and/or 5.47 GHz to 5.725 GHz. The master and client were connected using the conducted method described in the procedure via a series of splitters and attenuators which allows the radar signals to be injected and monitored. Where required, a VLC Media file was streamed through the master and client or an alternative method to load the channel. Configuration and status of the master and client devices were monitored. The Move Time test was performed by starting a transmission between the Master and Slave device, and then injecting the appropriate radar signals and making sure both the Master and Slave device vacate the DFS channel.



MOVE TIME

EUT: The EGG		Work Order: INSD0001
Serial Number: 99		Date: 12/05/13
Customer: Intel Corporation		Temperature: 20.4 C°C
Attendees: None		Humidity: 35%
Project: None		Barometric Pres.: 1012
Tested by: Johnny Candelas	Power: 110VAC/60Hz	Job Site: OC13

TEST SPECIFICATIONS		Test Method
FCC 15.407:2013		FCC 06-96:2006

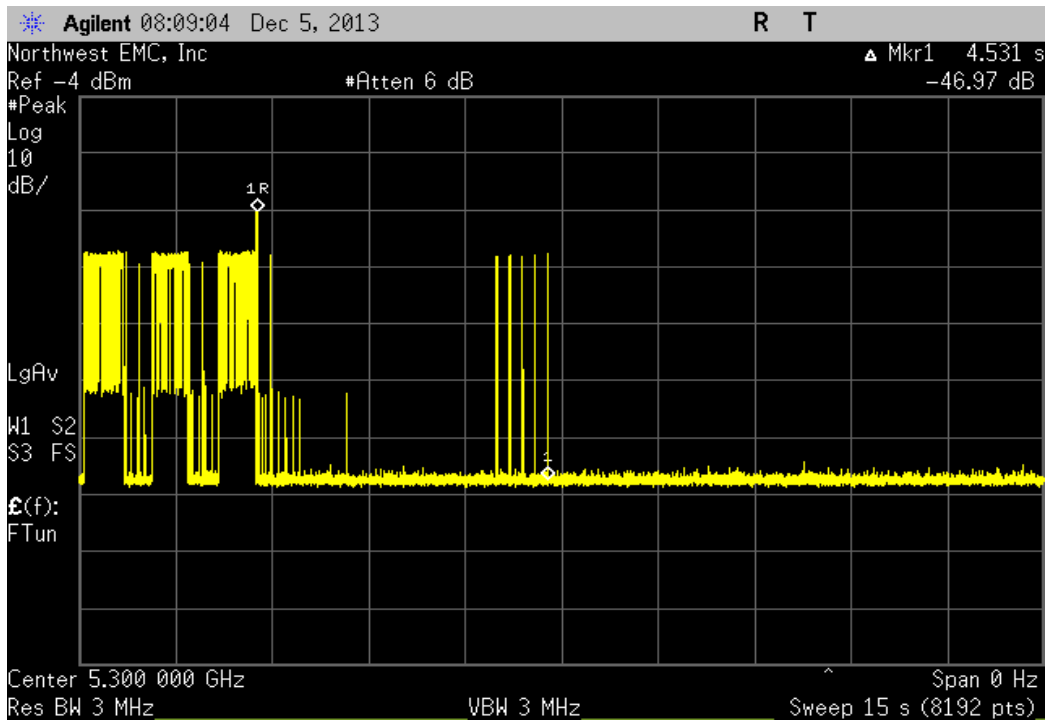
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

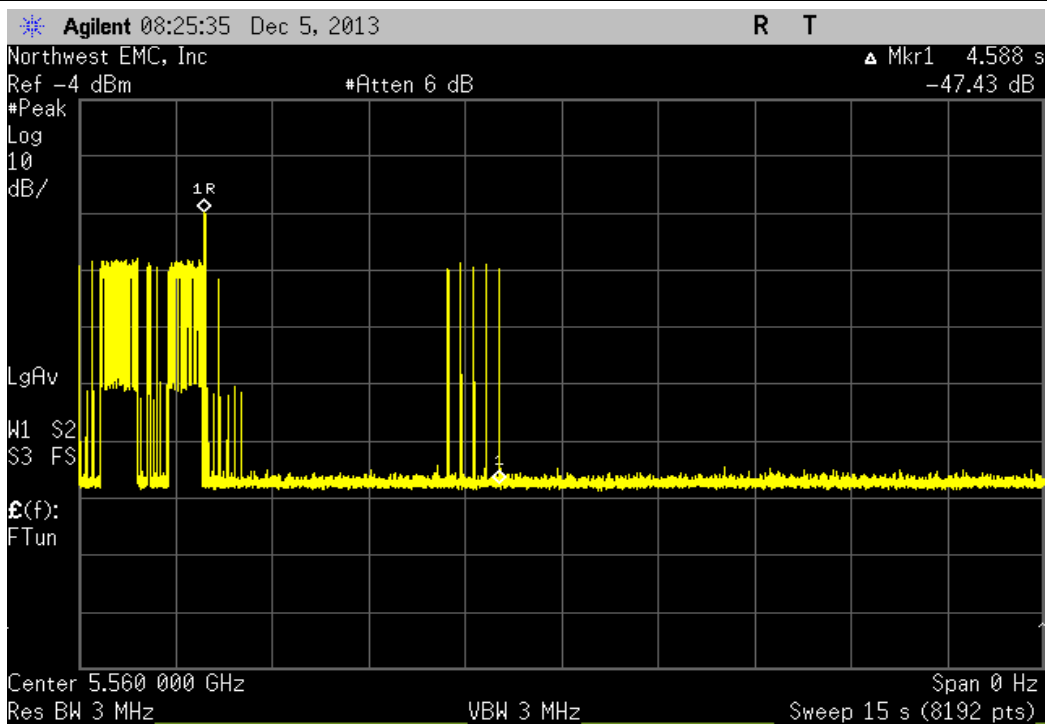
Configuration #	5	Signature 
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			Value (sec)	Limit (sec)	Result
802.11a	Radar1				
		Channel 60 in 5250-5350MHz Band	4.531	<10	Pass
		Channel 112 in 5470-5725MHz Band	4.588	<10	Pass
	Radar5				
		Channel 60 in 5250-5350MHz Band	4.712	<10	Pass
		Channel 112 in 5470-5725MHz Band	4.454	<10	Pass
802.11n	Radar1				
		Channel 60 in 5250-5350MHz Band	4.648	<10	Pass
		Channel 112 in 5470-5725MHz Band	4.681	<10	Pass
	Radar5				
		Channel 60 in 5250-5350MHz Band	4.463	<10	Pass
		Channel 112 in 5470-5725MHz Band	4.566	<10	Pass

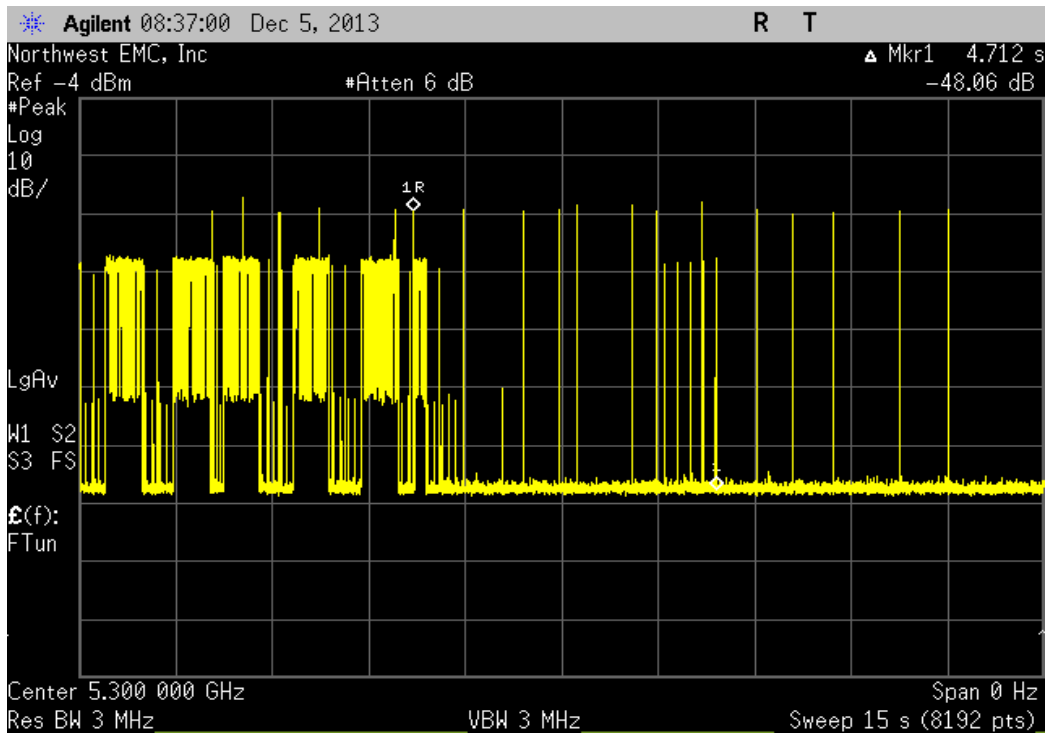
802.11a, Radar1, Channel 60 in 5250-5350MHz Band			
Value (sec)	Limit (sec)	Result	
4.531	<10	Pass	



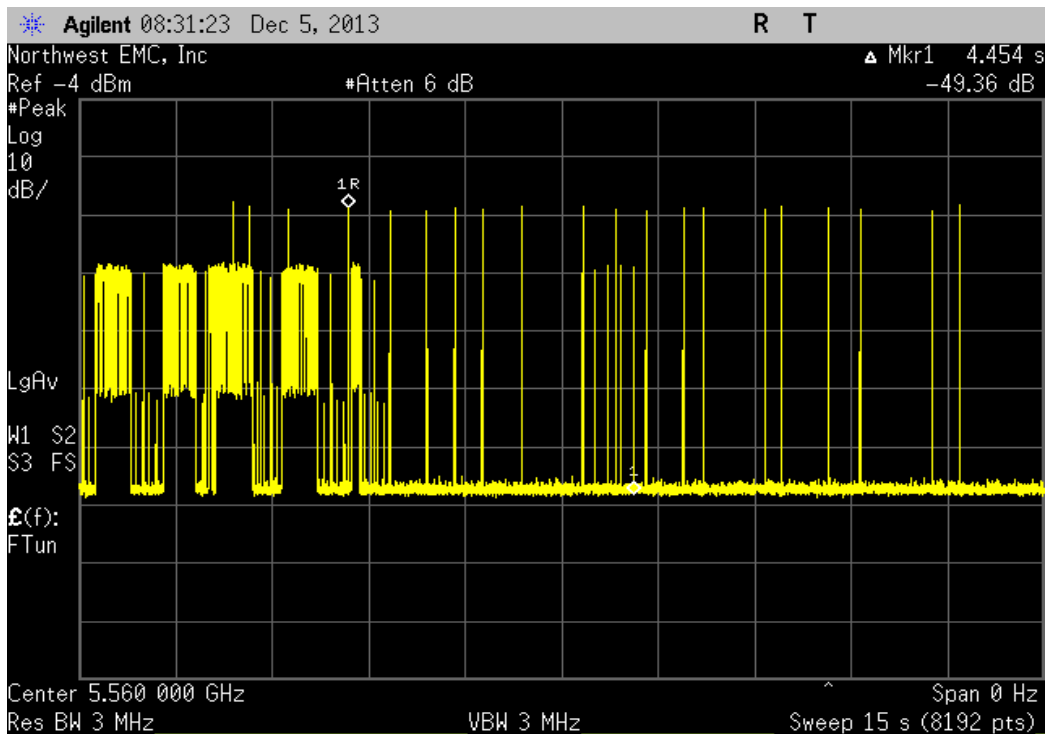
802.11a, Radar1, Channel 112 in 5470-5725MHz Band			
Value (sec)	Limit (sec)	Result	
4.588	<10	Pass	



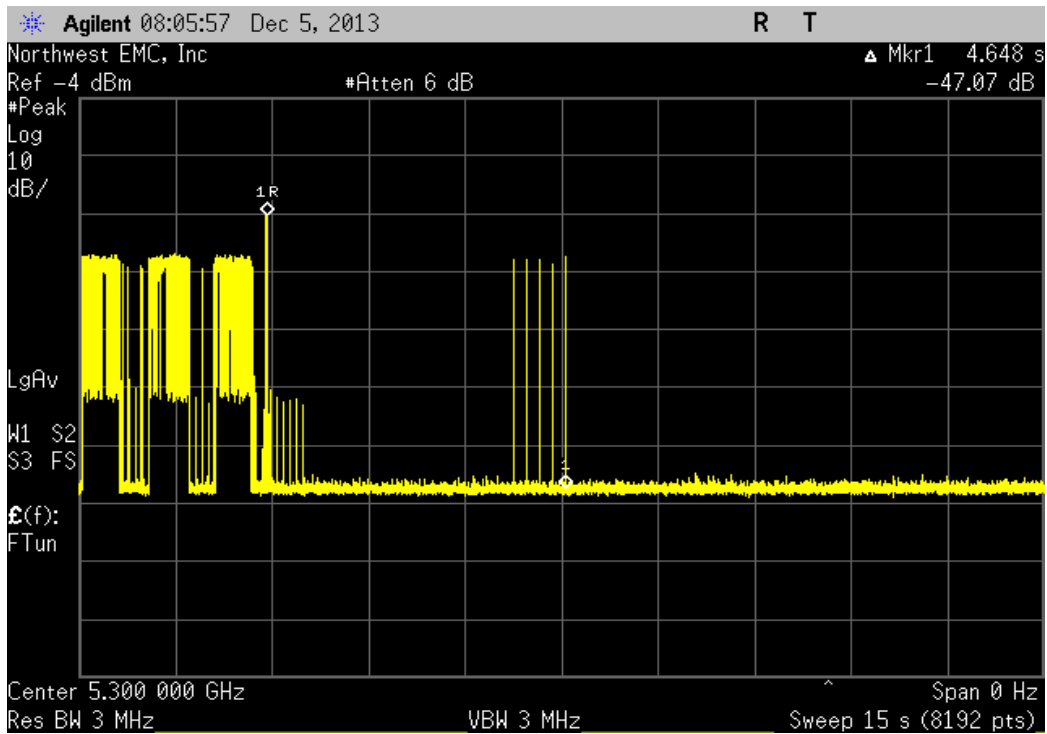
802.11a, Radar5, Channel 60 in 5250-5350MHz Band						
				Value (sec)	Limit (sec)	Result
				4.712	<10	Pass



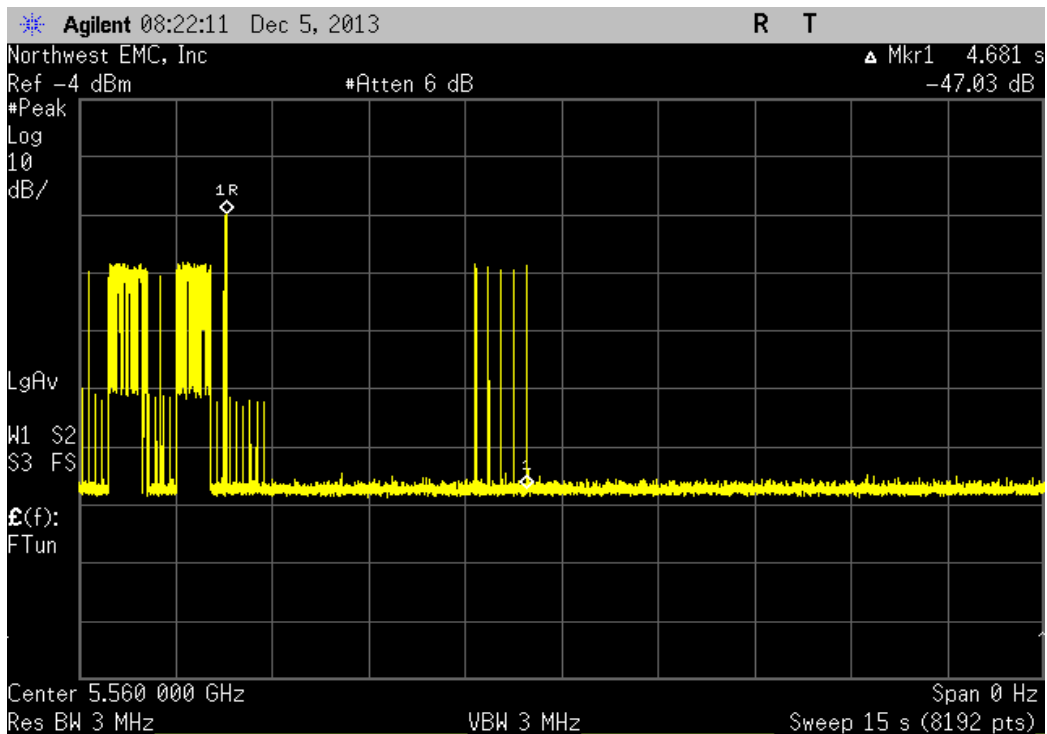
802.11a, Radar5, Channel 112 in 5470-5725MHz Band						
				Value (sec)	Limit (sec)	Result
				4.454	<10	Pass



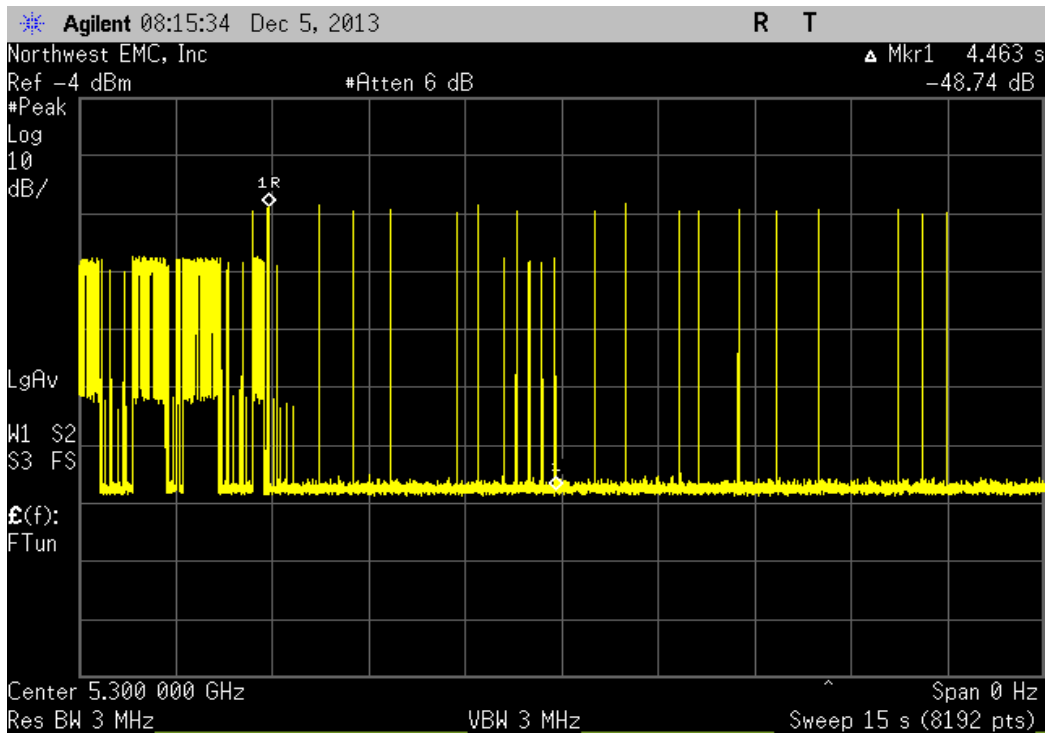
802.11n, Radar1, Channel 60 in 5250-5350MHz Band						
				Value (sec)	Limit (sec)	Result
				4.648	<10	Pass



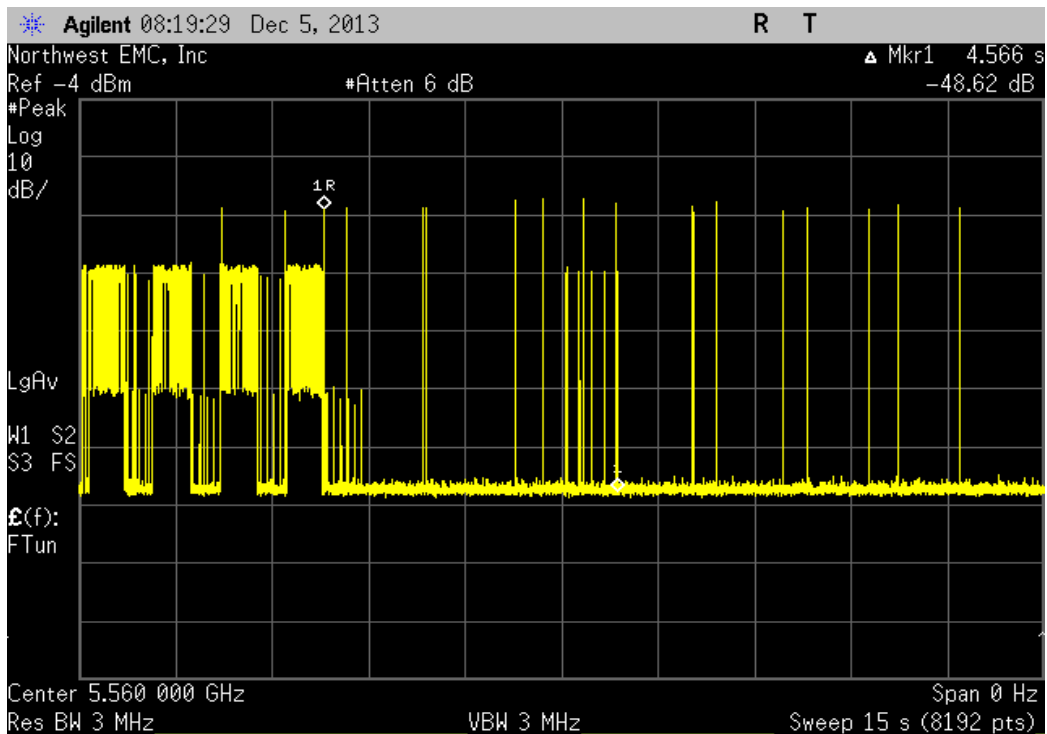
802.11n, Radar1, Channel 112 in 5470-5725MHz Band						
				Value (sec)	Limit (sec)	Result
				4.681	<10	Pass



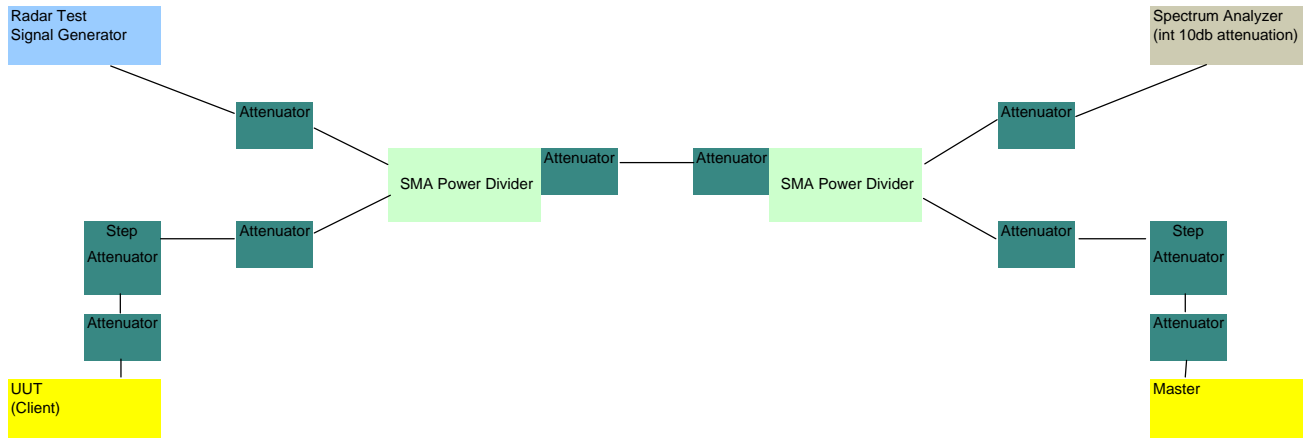
802.11n, Radar5, Channel 60 in 5250-5350MHz Band						
				Value (sec)	Limit (sec)	Result
				4.463	<10	Pass



802.11n, Radar5, Channel 112 in 5470-5725MHz Band						
				Value (sec)	Limit (sec)	Result
				4.566	<10	Pass



System Block Diagram



CLOSING TIME

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
DFS Signal Generator	Benchforge Manufacturing	Colt	TIO	NCR	0
SMA Power Divider	S.M. Electronics	MP0208-2	None	NCR	0
SMA Power Divider	S.M. Electronics	MP0208-2	None	NCR	0
Step Attenuator	Aeroflex/Weinchel	3053	26834	NCR	0
Step Attenuator	Aeroflex/Weinchel	3053	26835	NCR	0
Master Access Point	Cisco Systems, Inc.	AIR-AP1252AG-A-K9 (FCC ID: LDK102061) (IC: 2461B-102061)	None	NCR	0
Master DHCP Router	Linksys	BEFSX41	None	NCR	0
20dB Attenuator	Fairview Microwave	SA18H-20	None	NCR	0
10dB Attenuator	Fairview Microwave	SA18H-10	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0

TEST DESCRIPTION

FCC KDB 905462 describes the compliance measurement procedures including acceptable instrument system configurations for performing Dynamic Frequency Selection (DFS) tests under FCC Part 15 Subpart E Rules required for Unlicensed –National Information Infrastructure (U-NII) equipment that operates in the frequency bands 5.25 GHz to 5.35 GHz and/or 5.47 GHz to 5.725 GHz. The master and client were connected using the conducted method described in the procedure via a series of splitters and attenuators which allows the radar signals to be injected and monitored. Where required, a VLC Media file was streamed through the master and client or an alternative method to load the channel. Configuration and status of the master and client devices were monitored. The Closing Time test was performed by starting a transmission between the Master and Client device, and then injecting the appropriate radar signals. All transmission signals between the Master and Client in the first 200mS are allowed. After this time period, the number of transmissions signals are counted and multiplied by the pulse width value. This aggregate is then added to the 200mS allowance for the final value.



CLOSING TIME

EUT: The EGG		Work Order: INSD0001
Serial Number: 99		Date: 12/05/13
Customer: Intel Corporation		Temperature: 20.4 C°C
Attendees: None		Humidity: 35%
Project: None		Barometric Pres.: 1012
Tested by: Johnny Candelas	Power: 110VAC/60Hz	Job Site: OC13

TEST SPECIFICATIONS		Test Method
FCC 15.407:2013		FCC 06-96:2006

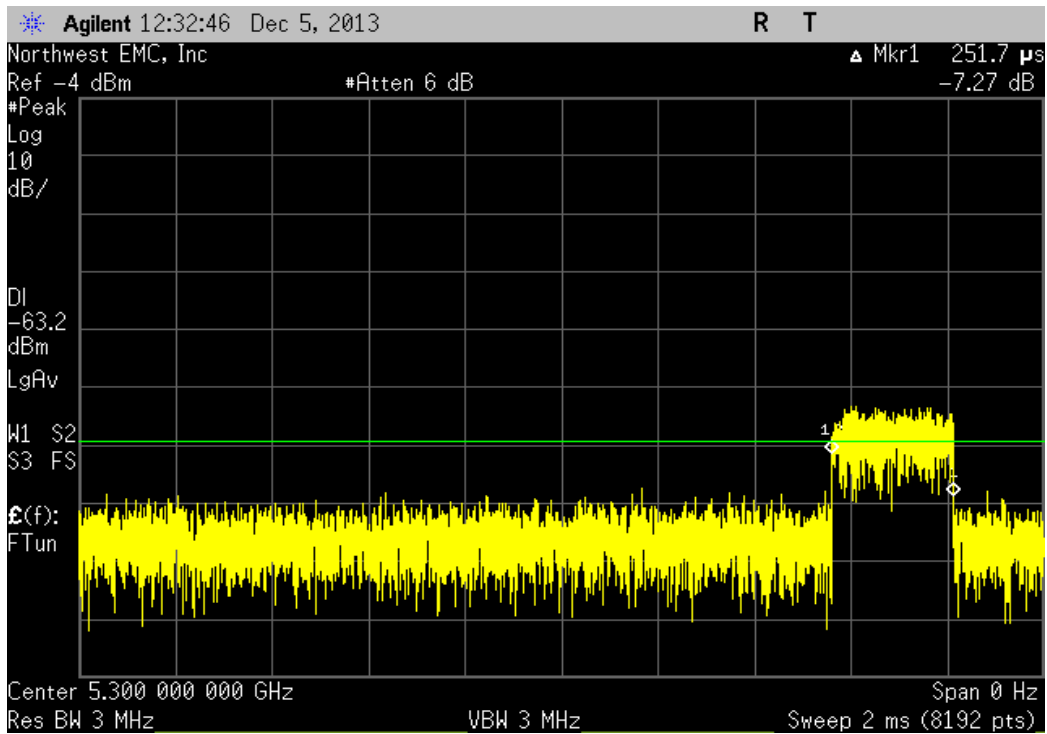
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

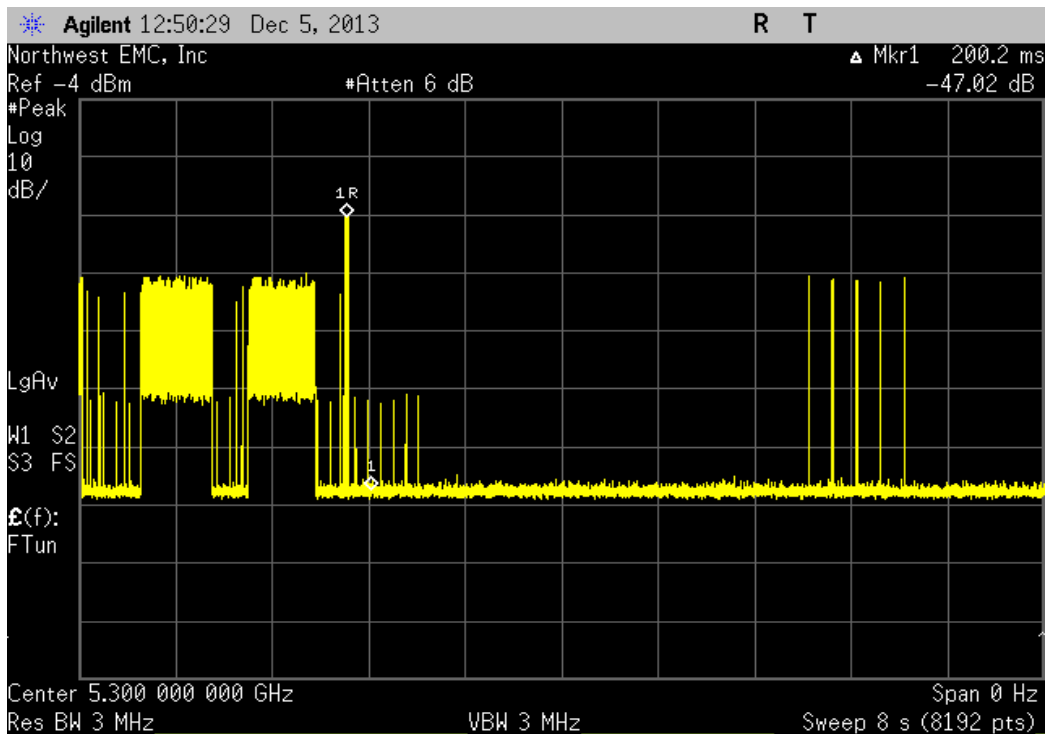
Configuration #	5	Signature 
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		# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result
802.11a	Radar1					
	Channel 60 in 5250-5350MHz Band					
	Control Signal Pulse Width	N/A	0.2517	N/A	N/A	N/A
	200ms + Aggregate	5	0.2517	201.2585	260	Pass
	Channel 112 in 5470-5725MHz Band					
	Control Signal Pulse Width	N/A	0.2515	N/A	N/A	N/A
	200ms + Aggregate	5	0.2515	201.2575	260	Pass
	Radar5					
	Channel 60 in 5250-5350MHz Band					
	200ms + Aggregate	5	0.2517	201.2585	260	Pass
	Channel 112 in 5470-5725MHz Band					
	200ms + Aggregate	5	0.2515	201.2575	260	Pass
802.11n	Radar1					
	Channel 60 in 5250-5350MHz Band					
	Control Signal Pulse Width	N/A	0.252	N/A	N/A	N/A
	200ms + Aggregate	5	0.252	201.26	260	Pass
	Channel 112 in 5470-5725MHz Band					
	Control Signal Pulse Width	N/A	0.252	N/A	N/A	N/A
	200ms + Aggregate	5	0.252	201.26	260	Pass
	Radar5					
	Channel 60 in 5250-5350MHz Band					
	200ms + Aggregate	5	0.252	201.26	260	Pass
	Channel 112 in 5470-5725MHz Band					
	200ms + Aggregate	5	0.252	201.26	260	Pass

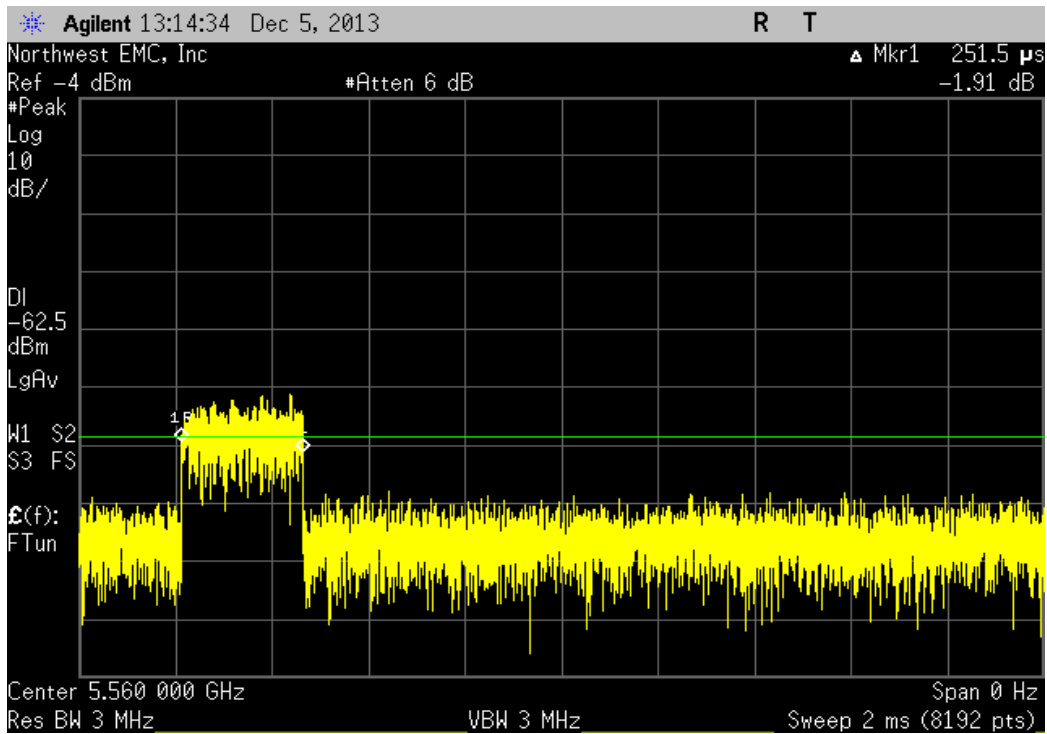
802.11a, Radar1, Channel 60 in 5250-5350MHz Band , Control Signal Pulse Width						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	N/A	0.2517	N/A	N/A	N/A	



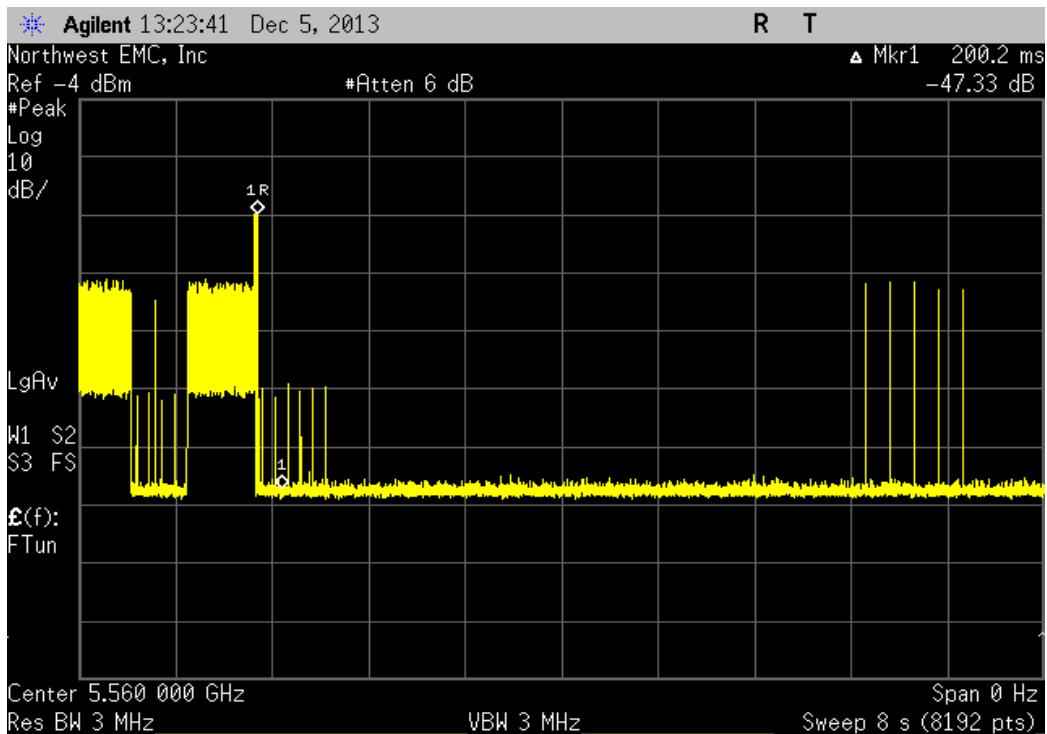
802.11a, Radar1, Channel 60 in 5250-5350MHz Band , 200ms + Aggregate						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	5	0.2517	201.2585	260	Pass	



802.11a, Radar1, Channel 112 in 5470-5725MHz Band, Control Signal Pulse Width						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	N/A	0.2515	N/A	N/A	N/A	

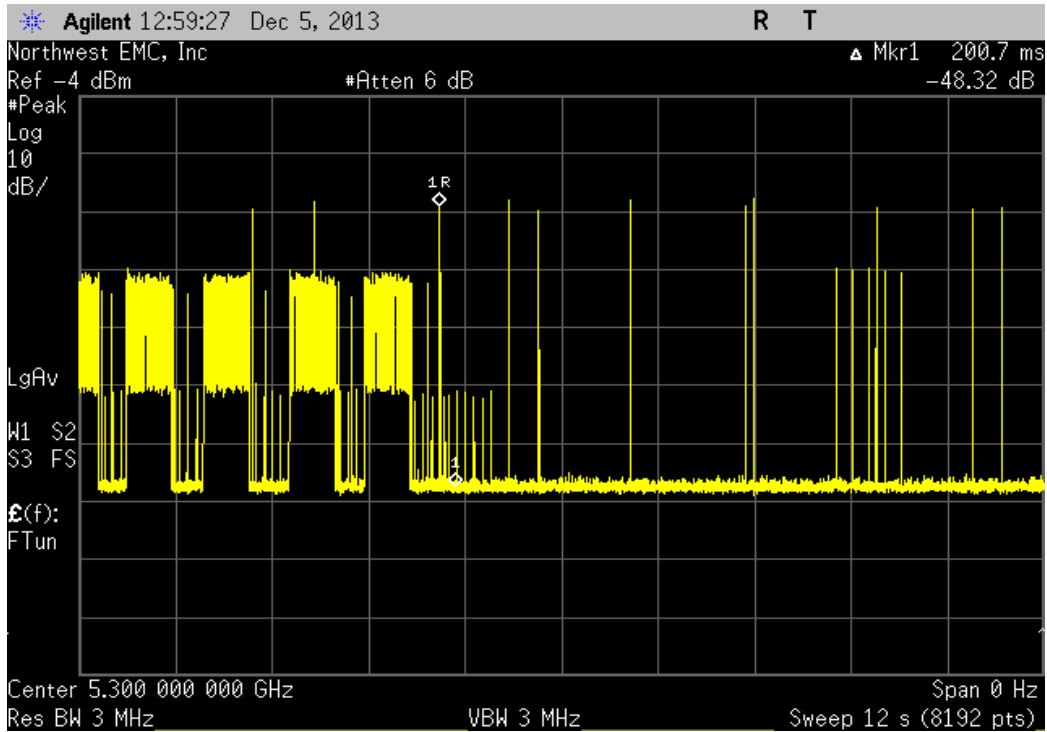


802.11a, Radar1, Channel 112 in 5470-5725MHz Band, 200ms + Aggregate						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	5	0.2515	201.2575	260	Pass	



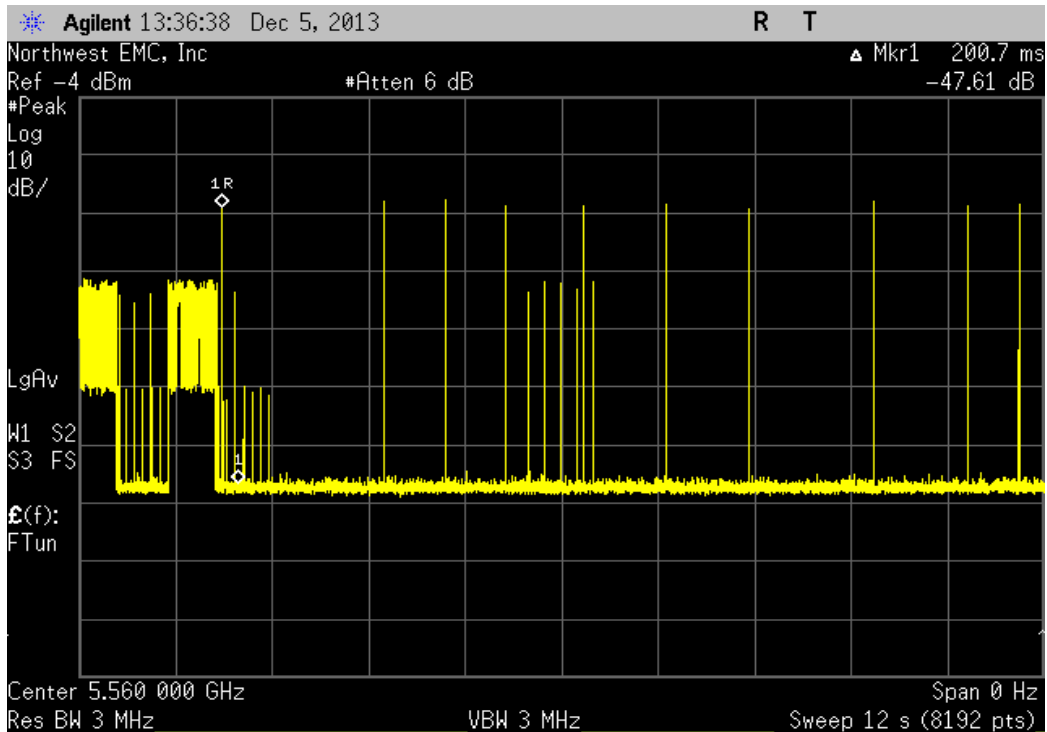
802.11a, Radar5, Channel 60 in 5250-5350MHz Band , 200ms + Aggregate

# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result
5	0.2517	201.2585	260	Pass

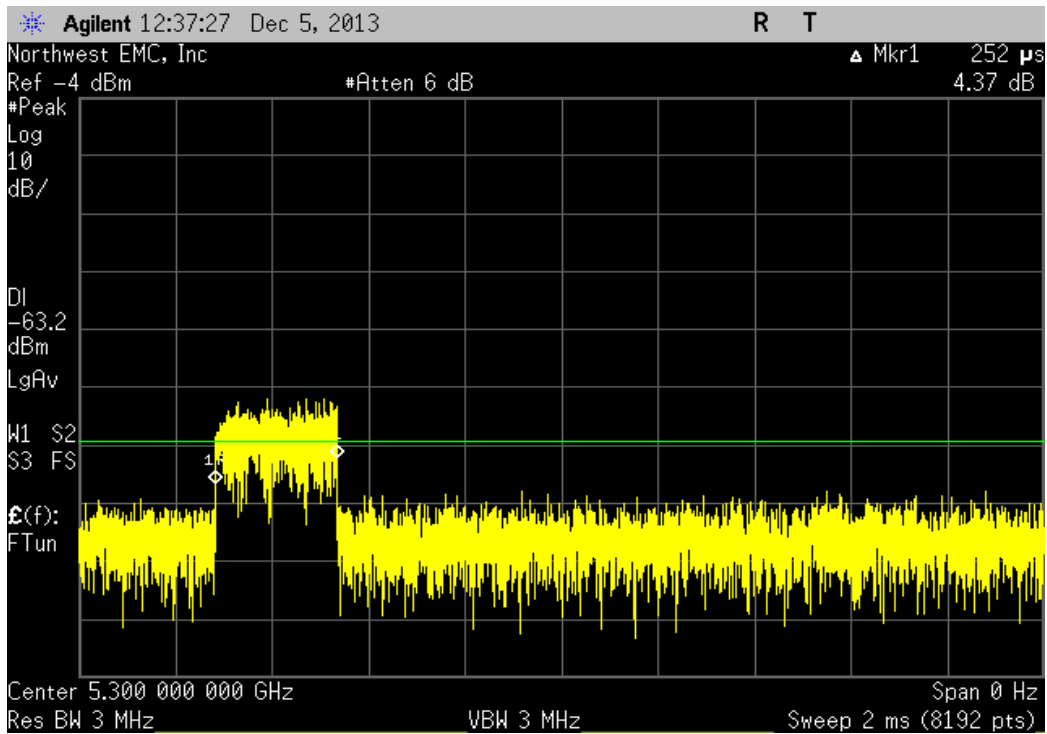


802.11a, Radar5, Channel 112 in 5470-5725MHz Band, 200ms + Aggregate

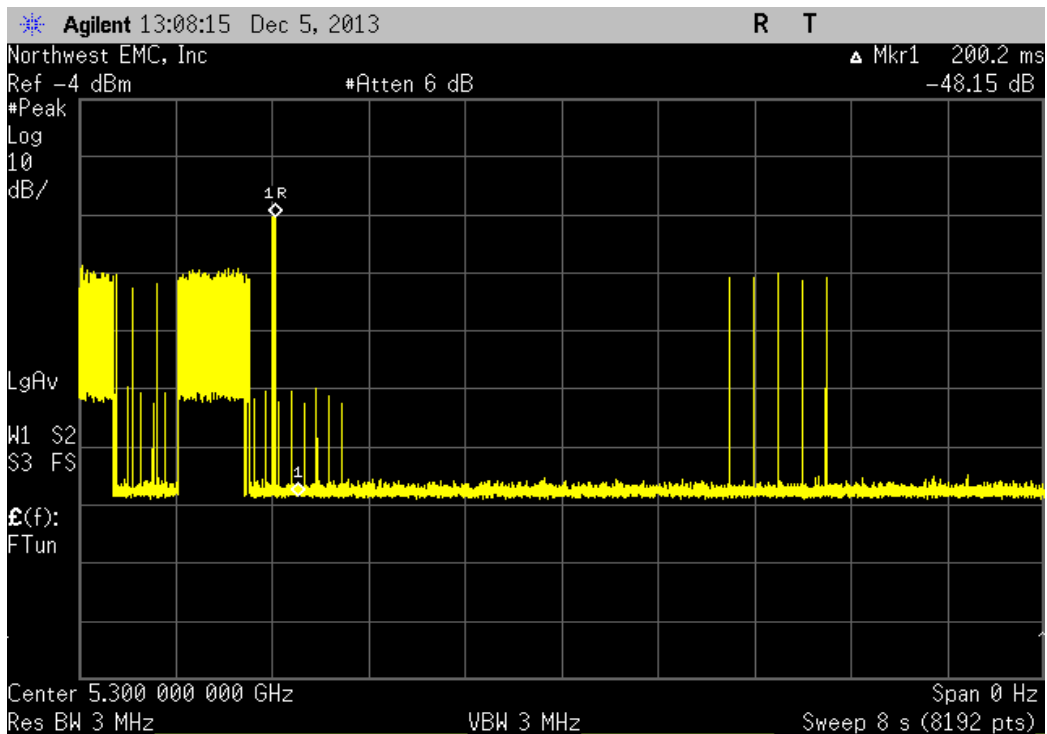
# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result
5	0.2515	201.2575	260	Pass



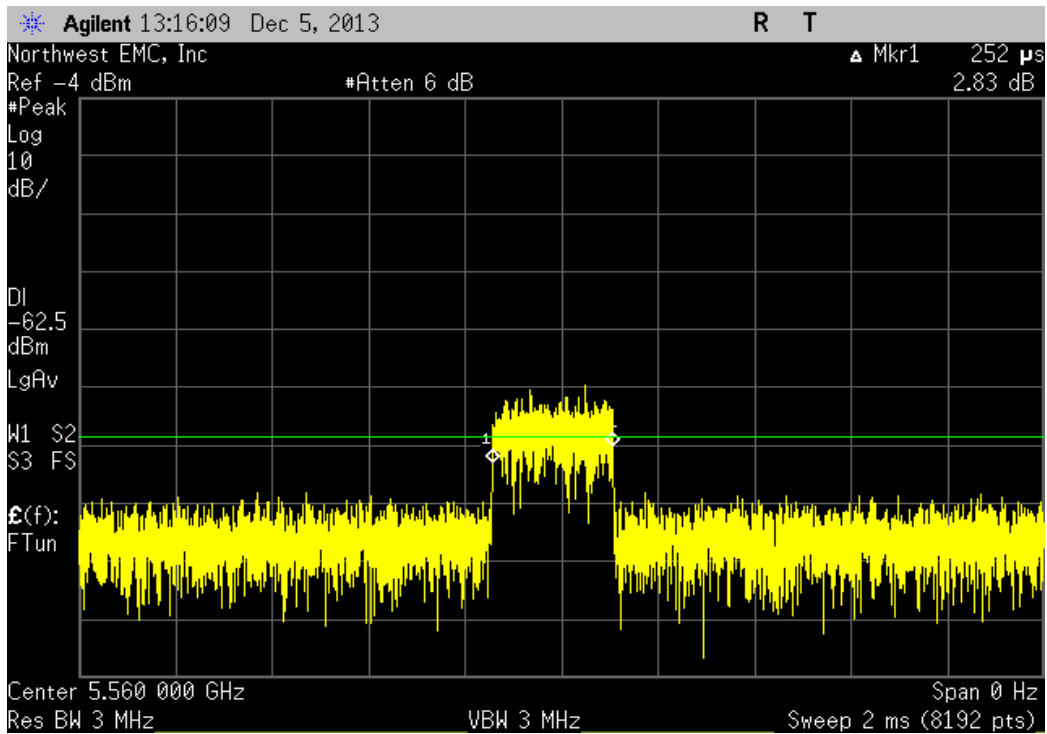
802.11n, Radar1, Channel 60 in 5250-5350MHz Band , Control Signal Pulse Width						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	N/A	0.252	N/A	N/A	N/A	



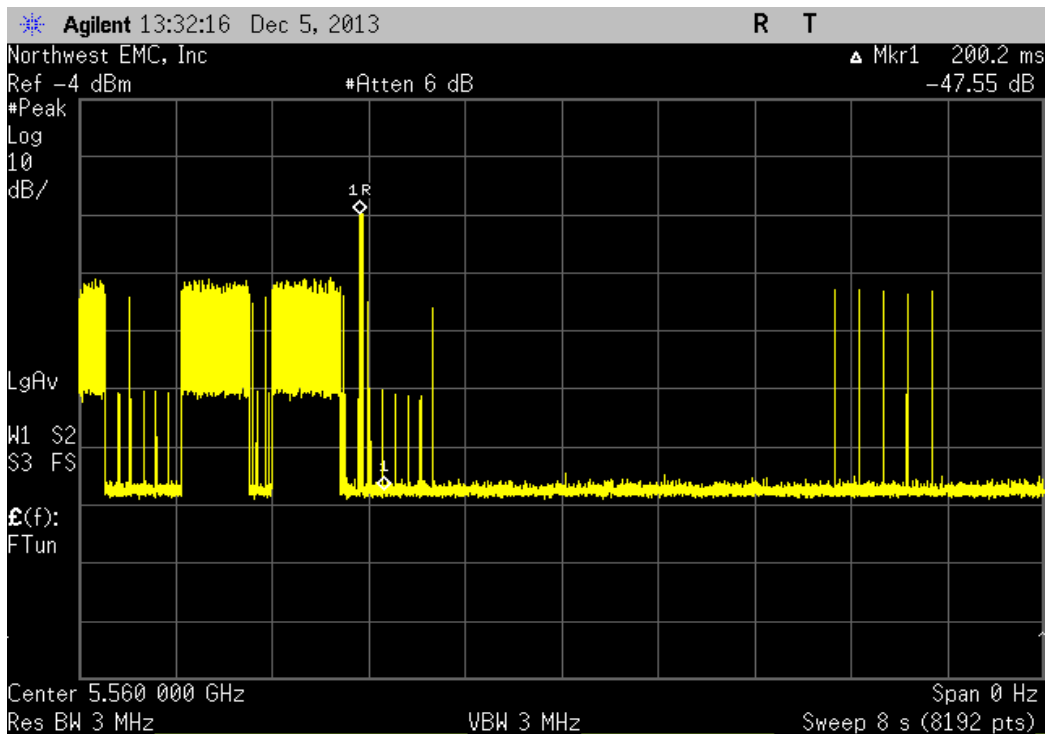
802.11n, Radar1, Channel 60 in 5250-5350MHz Band , 200ms + Aggregate						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	5	0.252	201.26	260	Pass	



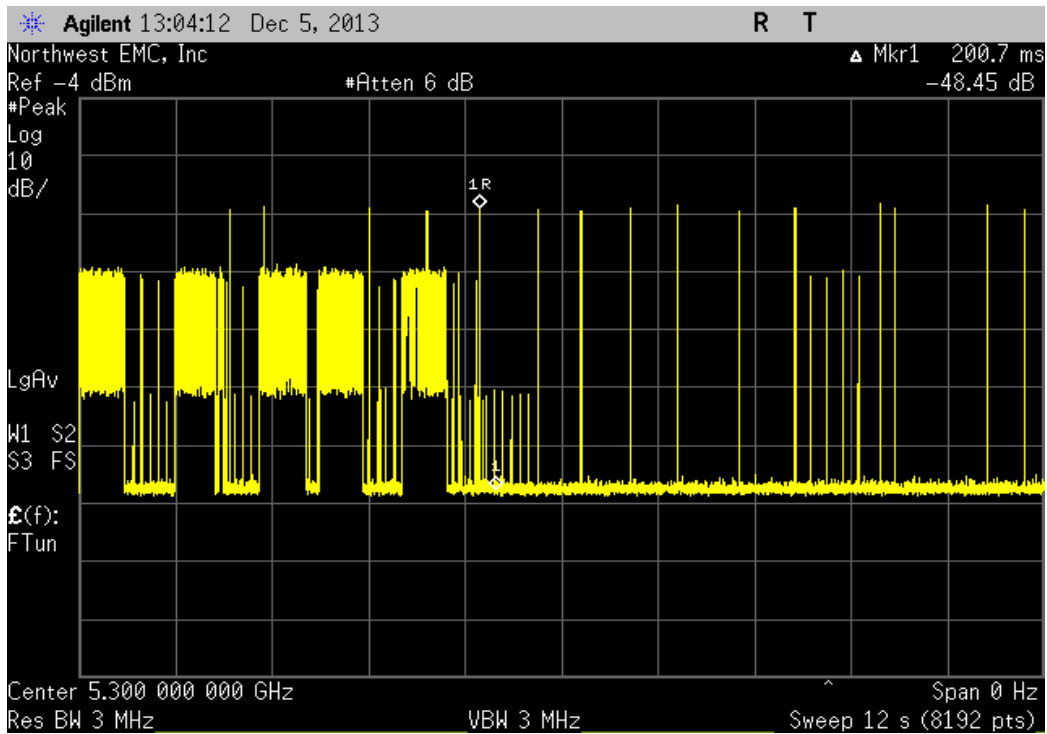
802.11n, Radar1, Channel 112 in 5470-5725MHz Band, Control Signal Pulse Width						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	N/A	0.252	N/A	N/A	N/A	



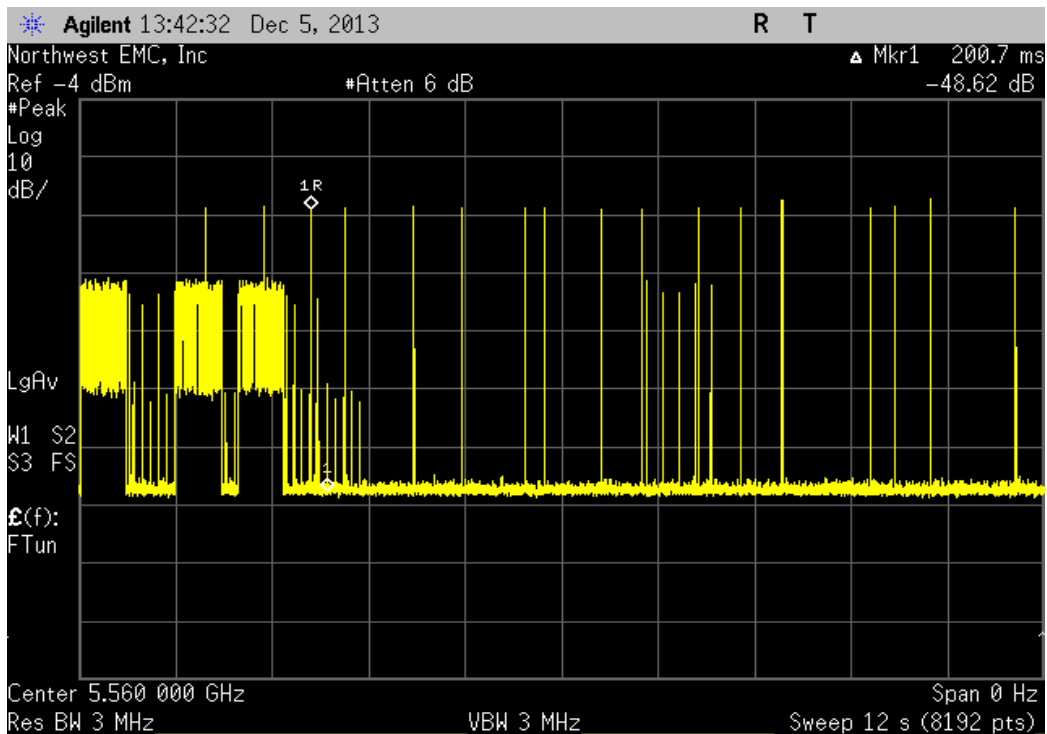
802.11n, Radar1, Channel 112 in 5470-5725MHz Band, 200ms + Aggregate						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	5	0.252	201.26	260	Pass	



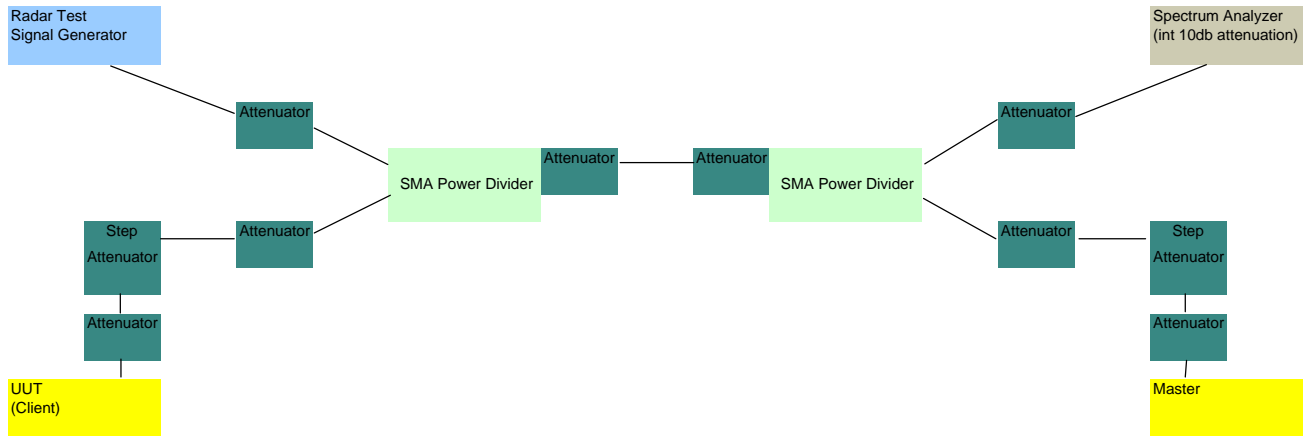
802.11n, Radar5, Channel 60 in 5250-5350MHz Band , 200ms + Aggregate						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	5	0.252	201.26	260	Pass	



802.11n, Radar5, Channel 112 in 5470-5725MHz Band, 200ms + Aggregate						
	# of Pulses	PW (mSec)	Value (mSec)	Limit (mSec)	Result	
	5	0.252	201.26	260	Pass	



System Block Diagram



NON OCCUPANCY PERIOD

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
DFS Signal Generator	Benchforge Manufacturing	Colt	TIO	NCR	0
SMA Power Divider	S.M. Electronics	MP0208-2	None	NCR	0
SMA Power Divider	S.M. Electronics	MP0208-2	None	NCR	0
Step Attenuator	Aeroflex/Weinchel	3053	26834	NCR	0
Step Attenuator	Aeroflex/Weinchel	3053	26835	NCR	0
Master Access Point	Cisco Systems, Inc.	AIR-AP1252AG-A-K9 (FCC ID: LDK102061) (IC: 2461B-102061)	None	NCR	0
Master DHCP Router	Linksys	BEFSX41	None	NCR	0
20dB Attenuator	Fairview Microwave	SA18H-20	None	NCR	0
10dB Attenuator	Fairview Microwave	SA18H-10	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0
6dB Attenuator	Fairview Microwave	SA18H-06	None	NCR	0

TEST DESCRIPTION

FCC KDB 905462 describes the compliance measurement procedures including acceptable instrument system configurations for performing Dynamic Frequency Selection (DFS) tests under FCC Part 15 Subpart E Rules required for Unlicensed –National Information Infrastructure (U-NII) equipment that operates in the frequency bands 5.25 GHz to 5.35 GHz and/or 5.47 GHz to 5.725 GHz. The master and client were connected using the conducted method described in the procedure via a series of splitters and attenuators which allows the radar signals to be injected and monitored. Where required, a VLC Media file was streamed through the master and client or an alternative method to load the channel. Configuration and status of the master and client devices were monitored. The Non Occupancy Period test was performed by starting a transmission between the Master and Client device, and then injecting the appropriate radar signals. After the channel is vacated, it is monitored for a minimum of 30 minutes to ensure the channel is not used during this time period.



NON OCCUPANCY PERIOD

EUT: The EGG		Work Order: INSD0001	
Serial Number: 99		Date: 12/05/13	
Customer: Intel Corporation		Temperature: 20.4 C°C	
Attendees: None		Humidity: 35%	
Project: None		Barometric Pres.: 1012	
Tested by: Johnny Candelas	Power: 110VAC/60Hz	Job Site: OC13	

TEST SPECIFICATIONS		Test Method	
FCC 15.407:2013		FCC 06-96:2006	

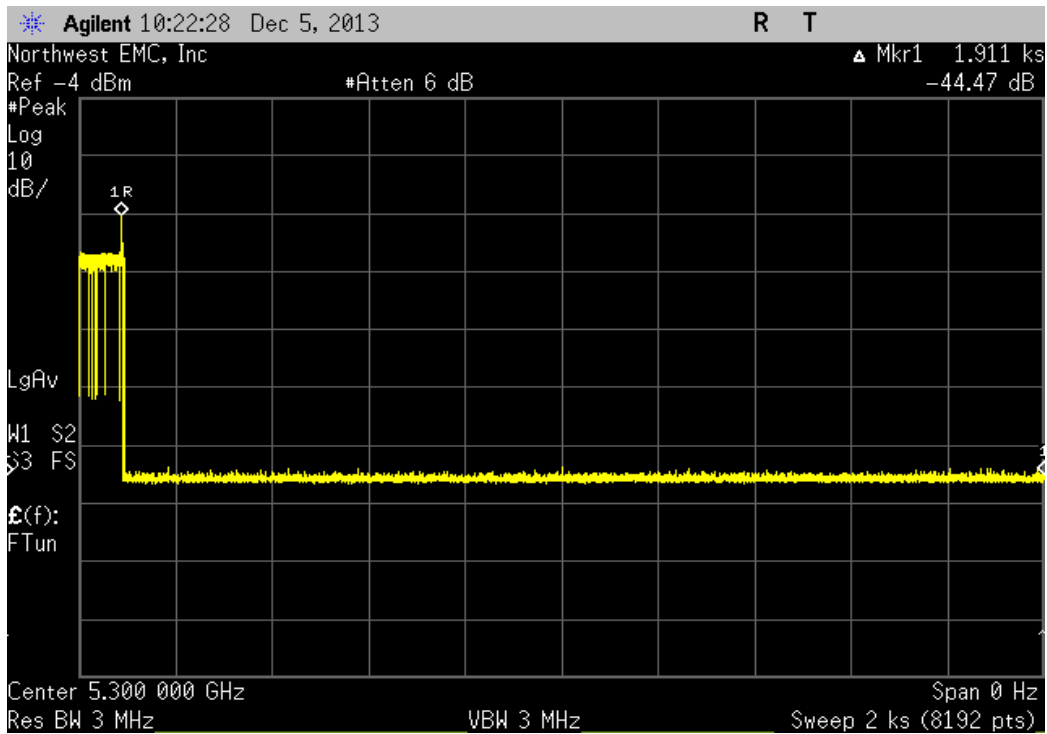
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

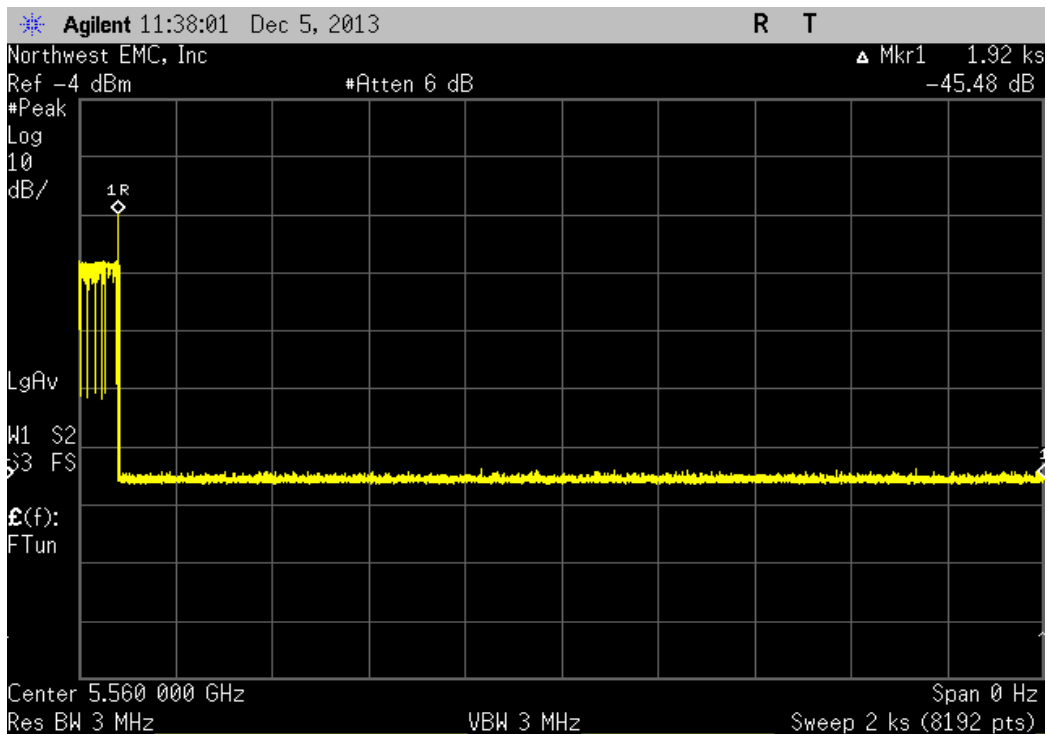
Configuration #	5	Signature 
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			Value	Limit	Result
802.11a	Radar1	Channel 60 in 5250-5350MHz Band	>30min	>=30min	Pass
		Channel 112 in 5470-5725MHz Band	>30min	>=30min	Pass
802.11n	Radar1	Channel 60 in 5250-5350MHz Band	>30min	>=30min	Pass
		Channel 112 in 5470-5725MHz Band	>30min	>=30min	Pass

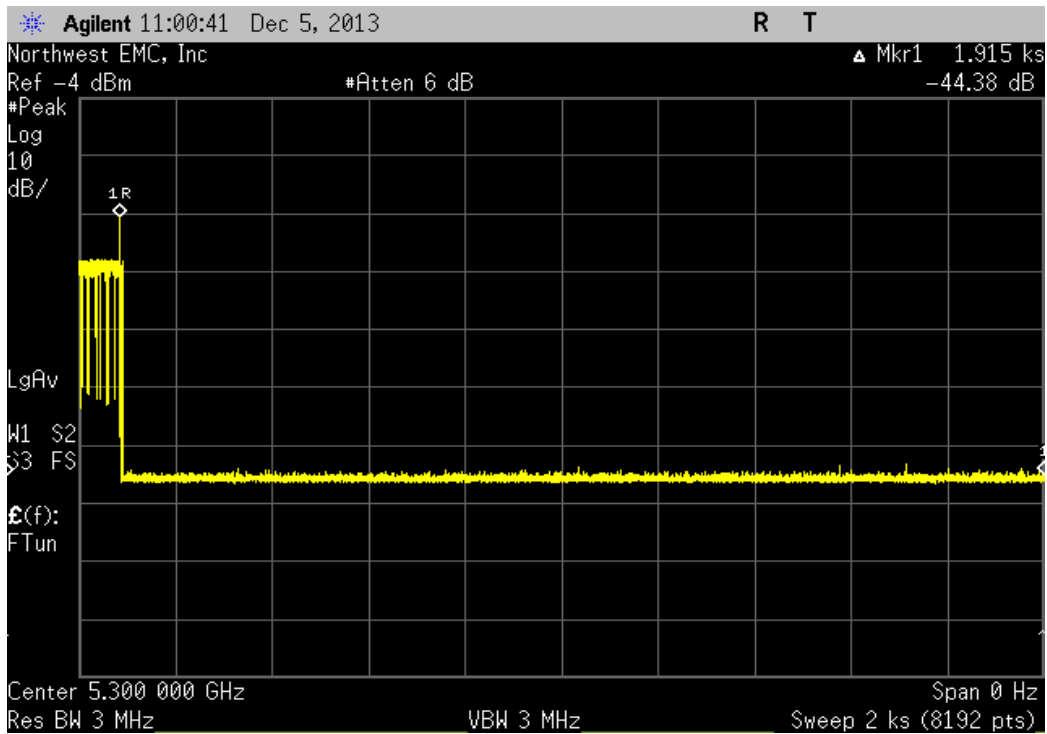
802.11a, Radar1, Channel 60 in 5250-5350MHz Band						
				Value	Limit	Result
				>30min	>=30min	Pass



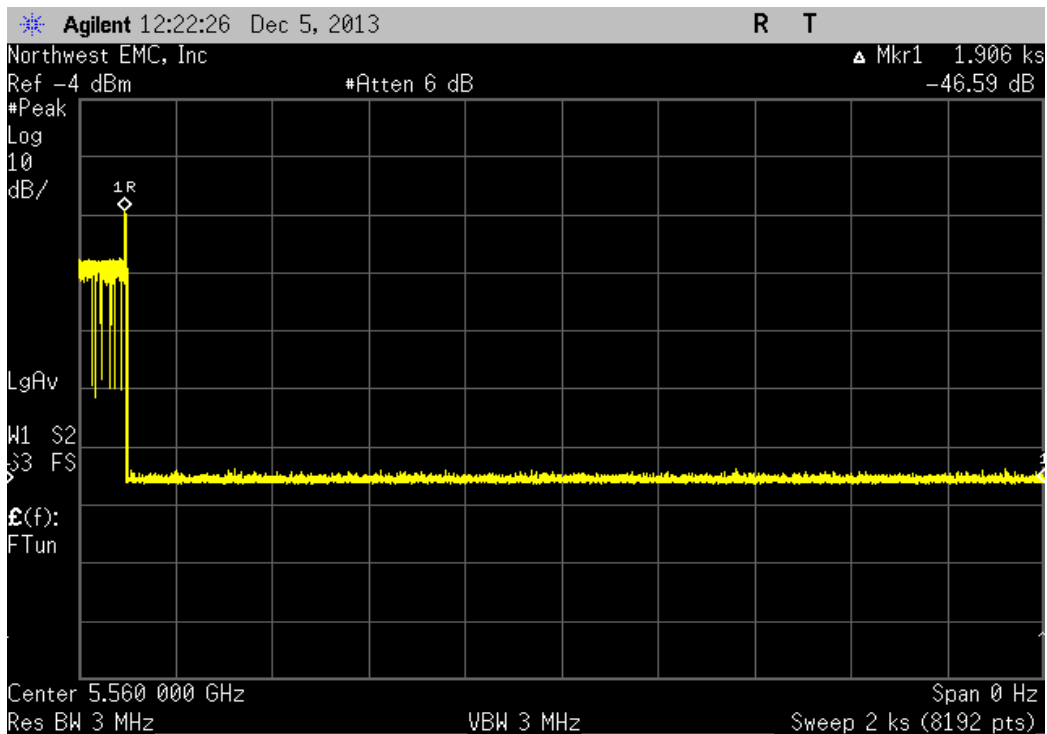
802.11a, Radar1, Channel 112 in 5470-5725MHz Band						
				Value	Limit	Result
				>30min	>=30min	Pass



802.11n, Radar1, Channel 60 in 5250-5350MHz Band						
				Value	Limit	Result
				>30min	>=30min	Pass



802.11n, Radar1, Channel 112 in 5470-5725MHz Band						
				Value	Limit	Result
				>30min	>=30min	Pass



System Block Diagram

