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(intel)

TEST REPORT

EUT Description	**WLAN and BT, 2x2 PCIe M.2 2230 adapter card**
Brand Name	**Intel® Wireless-AC 9560**
Model Name	**9560NGW**
FCC ID IC ID	**PD99560NG** **1000M-9560NG**
Date of Test Start/End	**2017-06-28 / 2017-06-30**
Features	**802.11 a/b/g/n/ac Wireless LAN + Bluetooth 5** (see section 5)

Applicant	**Intel Mobile Communications**
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Reference Standards	**FCC CFR Title 47 Part 15E** **RSS-247 issue 2** (see section 1)

Test Report identification	**170524-02.TR06**
Revision Control	**Rev. 00** **This test report revision replaces any previous test report revision** (see section 8)

The test results relate only to the samples tested.
The test report shall not be reproduced in full, without written approval of the laboratory.

Issued by	Reviewed by
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1. Standards, reference documents and applicable test methods

1. FCC 47 CFR part 15 - Subpart E – Unlicensed National Information Infrastructure Devices.
2. FCC OET KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 – Compliance Measurement procedures for Unlicenced-National Information Infrastructure Devices Operating in the 5250-5350 MHz and 5470-5725 MHz Bands Incorporating Dynamic Frequency Selection.
3. RSS-247 Issue 2 — Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices
4. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

2. General conditions, competences and guarantees

✓ Intel Mobile Communications France SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2005 testing laboratory accredited by the American Association for Laboratory Accreditation (A2LA) with the certificate number 3478.01.
✓ Intel Mobile Communications France SAS Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm recognized by the FCC, with Designation Number FR0011.
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✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
✓ This report is only referred to the item that has undergone the test.
✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.

3. Environmental Conditions

✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	23 ºC ±3 ºC
Humidity	50 % ± 20 %

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of receipt
#01	170524-02.S04	Module	9560NGW	WFM: 3413E8900F1F	2017-05-24
	170524-02.S15	Extender Board	PCB00609_01	6092416-442	2017-05-30
	170000-01.S14	Laptop	Latitude E5470	90LKMC2	2017-05-30

5. EUT Features

Brand Name	Intel® Wireless-AC 9560
Model Name	9560NGW
FCC ID	PD99560NG
IC ID	1000M-9560NG
Software Version	Proset 19.70.0
Driver Version	99.0.28.6
Prototype / Production	Production
Supported Radios	802.11b/g/n 2.4GHz (2400.0 – 2483.5 MHz) 802.11a/n/ac 5.2GHz (5150.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz) Bluetooth 5 2.4GHz (2400.0 – 2483.5 MHz)
Antenna Information	**Main WLAN:** Slot antenna. WiFi 2.4GHz & 5GHz (DRTU CHAIN B) **Aux WLAN:** Slot antenna. WiFi 2.4GHz & 5GHz and BT (DRTU CHAIN A)
Additional Information	

6. Remarks and comments

1. The operating mode of the sample is client only without radar detection.
2. The maximum antenna gain is 5dBi.

7. Test Verdicts summary

7.1.   Dynamic frequency selection

FCC part	RSS part	Test name	Verdict
15.407 (h) (2)	RSS-247 part 6.3	Non Occupancy Period	P
		DFS Detection Threshold	NA
		Channel Availability Check Time	NA
		Uniform Spreading	NA
		U-NII Detection Bandwidth	NA
		DFS Detection Threshold	NA
		Channel Closing Transmission Time	P
		Channel Move Time	P
		U-NII Detection Bandwidth	NA

8. Document Revision History

| Revision #	Date	Modified by	Revision Details
Rev. 00	2017-07-06	B.Lavenant	First Issue

Annex A. Test & System Description

A.1   Measurement System

Measurements were performed using the following setups, made in accordance to the general provisions of FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.

The EUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. A second laptop computer was used to configure the access point on the DFS channels; a channel was selected randomly by the access point. To enable channel loading, this second laptop computer is also used as a server host, a video was streamed on the EUT.

Conducted Setup
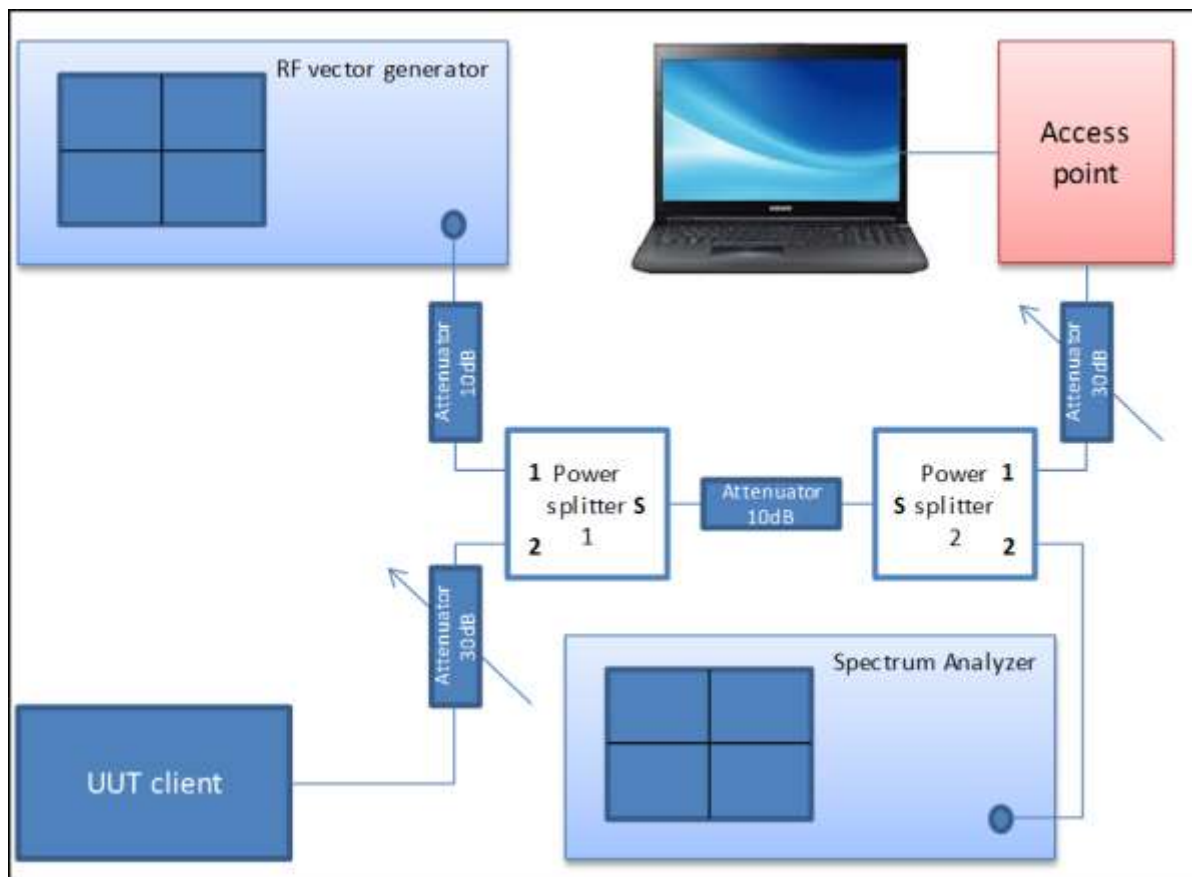
A.2 Test Equipment List

Conducted Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0318	Spectrum analyzer	FSV30	103310	Rohde & Schwarz	2016-09-19	2018-9-19
0017	Vector Signal Generator	SMJ100A	100458	Rohde & Schwarz	2015-10-21	2017-10-21
0261	Access point*	Aironet IOS	FTX134390GV	Cisco	NA	NA
	Laptop DELL	Lattitude E5440	-	DELL	NA	NA

A.3 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the below table:

Measurement type	Uncertainty
Time domain	± 1 ms

Annex B. Test Results

B.1   Test Conditions

The EUT power supply was provided by the Extender test board, $V_{nominal}$ = 3.3 V_{DC}.
The software PROSet/Wireless Intel® 19.70.0 was used to set the EUT in normal operation mode.

B.2   Test results for Dynamic Frequency Selection (DFS)

Test procedure

The conducted setup shown on *§A.2 Measurement system* was used to measure the Channel Closing Transmission Time and Channel Move Time.
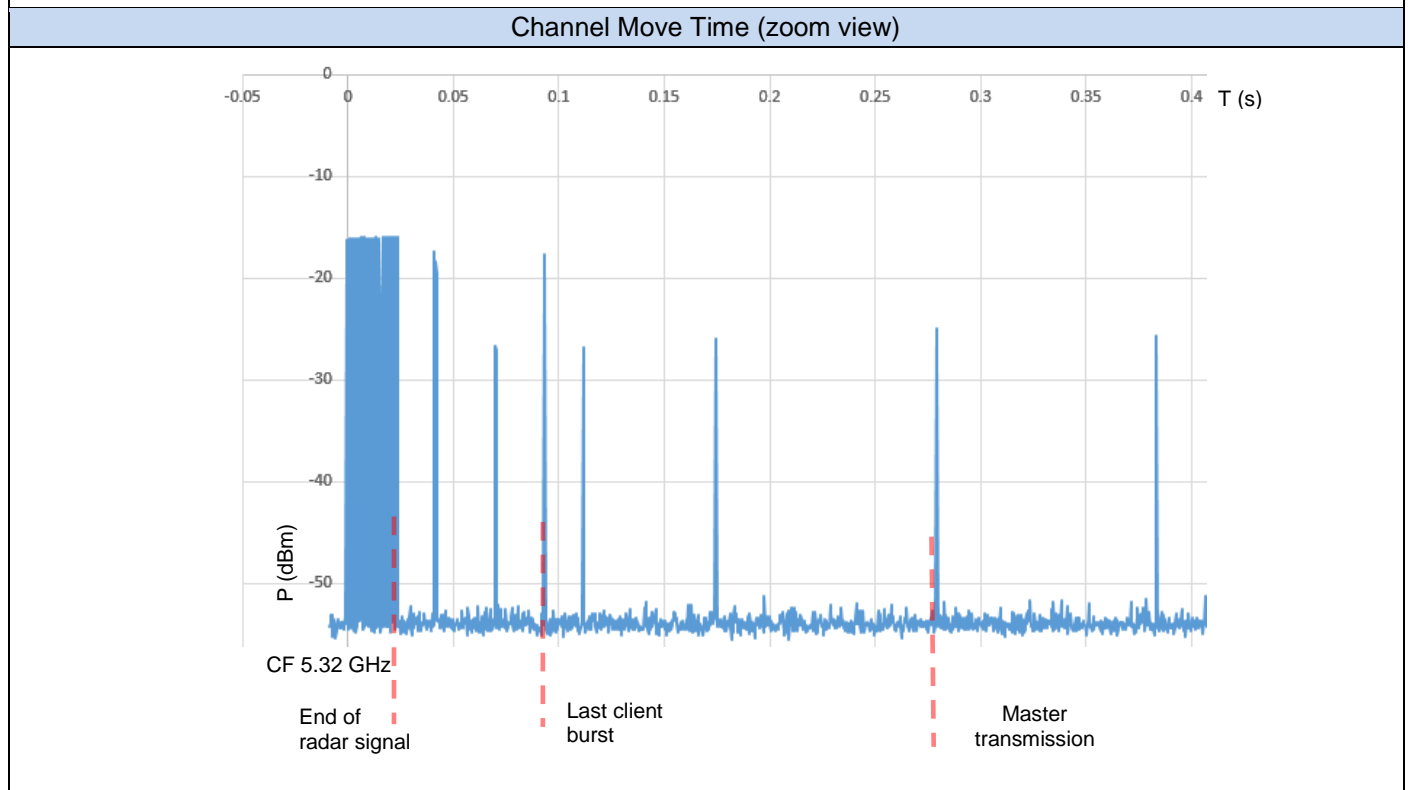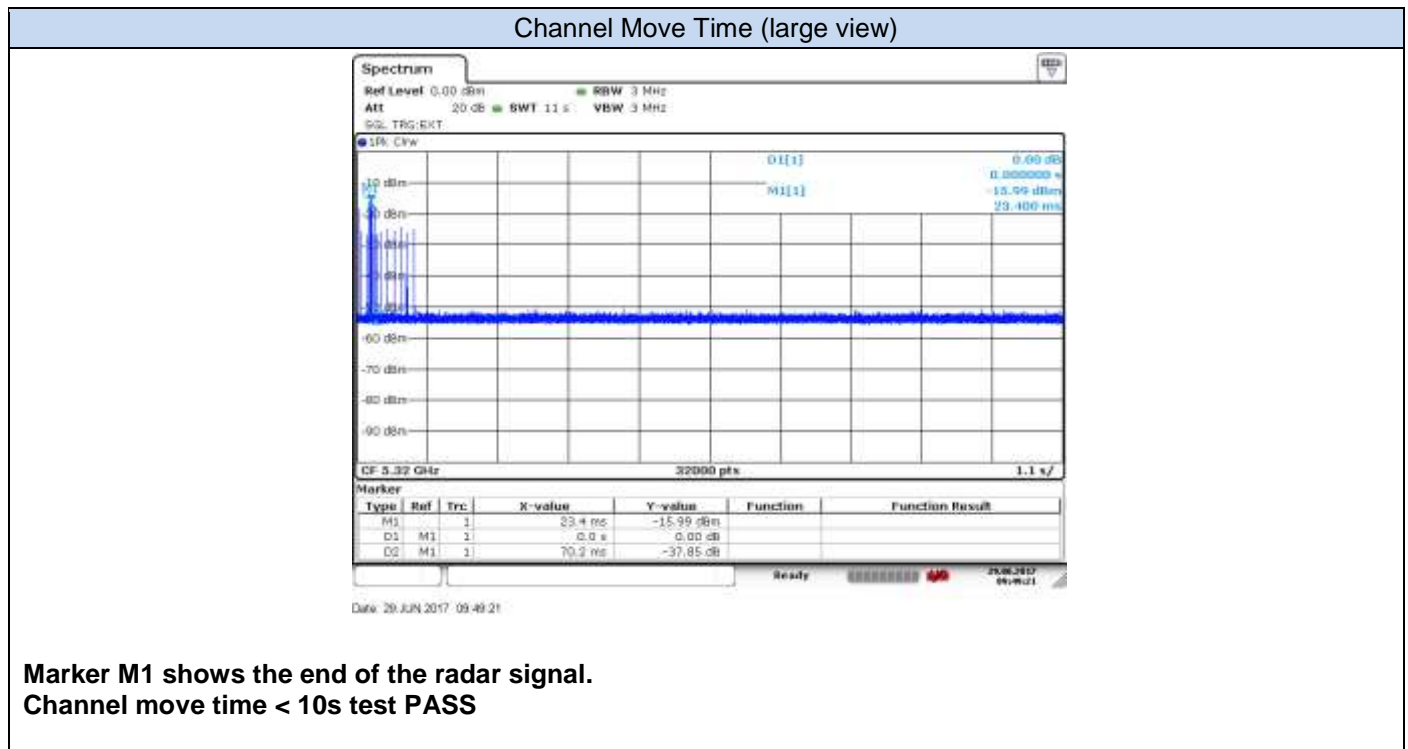
The *Client Device* (UUT) is set up to associate with the *Master Device.* The channel loading test file is streamed from the *Master Device* to the *Client Device.* Radar test waveforms generated with the vector signal generator are injected into the *Master* on the operating channel above the DFS detection threshold. Observations are done on the transmissions of the UUT at the end of the radar burst on the Operating Channel for a duration greater than 10 seconds. We measured the transmissions from the UUT during the observation time, after radar detection occurs the Channel Move Time and Channel Closing Transmission Time are recorded.

Results tables

Tested Channel: 64, Frequency: 5320 MHz

Test item	Results	Limit
Channel Closing Transmission Time	< 70.2 ms	200 ms + an aggregate of 60ms over remaining 10 seconds period.
Channel Move Time	70.2 ms	10 seconds
Non-Occupancy Period	> 30 minutes	30 minutes

Results Screenshot

Channel Move Time (large view)

Date: 29 JUN 2017 09:49:21

Marker M1 shows the end of the radar signal.
Channel move time < 10s test PASS
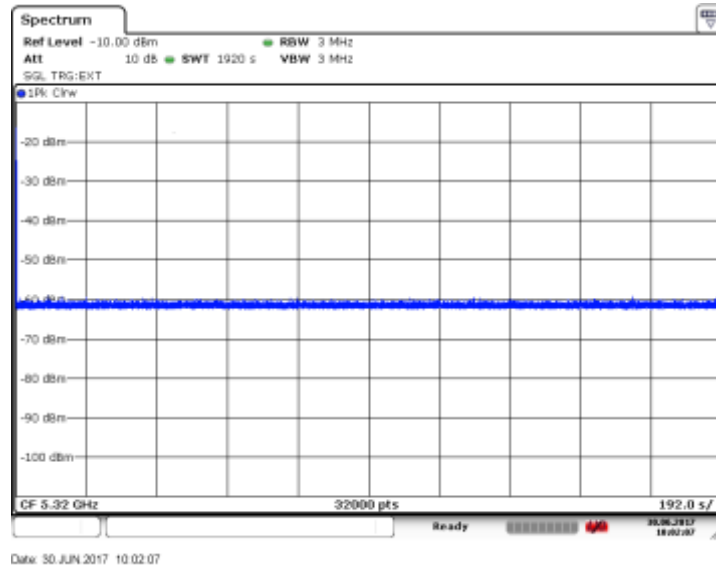
Channel Move Time (zoom view)

This zoom picture is generated with MS Excel using post processing of the sampling trace.

Between end of radar signal and last client burst is the time to cease all transmissions on the current channel.

Channel closing transmission time < 70.2ms, test PASS
Channel move time = 70.2ms, test PASS

Non-Occupancy Time
 Date: 30.JUN.2017 10:02:07
No transmission of any type has occurred for 30 minutes, test PASS