TEST REPORT

DT&C Co., Ltd.
42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC1905-0182
2. Customer
   - Name (FCC) : Janam Technologies LLC / Name (IC) : JANAM TECHNOLOGIES LLC
   - Address : 100 Crossways Park West Suite 105, Woodbury, New York, 11797, United States
3. Use of Report : FCC & IC Original Grant
4. Product Name / Model Name : Mobile Computer / XT2WE
   FCC ID : UTWXT2WE / IC : 6914A-XT2WE
5. Test Method Used : KDB905462 D02v02, KDB905462 D03v01r02
   Test Specification : FCC Part 15.407
   RSS-247 Issue 2
6. Date of Test : 2017.04.27(Original test), 2019.02.07 ~ 2019.02.10(Spot check test)
7. Testing Environment : See appended test report.
8. Test Result : Refer to the attached test result.

Affirmation	Tested by Name : SunGeun Lee (Signature)	Technical Manager Name : GeunKi Son (Signature)

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Test Report Version

Test Report No.	Date	Description
DRTFCC1905-0182	May. 03, 2019	Initial issue

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1. GENERAL INFORMATIONEUT DESCRIPTION

1.1. EUT Description

FCC equipment class	Unlicensed National Information Infrastructure (UNII)		
Product	Mobile computer		
Model Name(FCC, IC)	XT2WE		
Add Model Name(FCC, IC)	NA		
EUT capabilities	DFS		
Power supply	DC 3.8 V		
Test condition	☒ Conducted	☐ Radiated	
Channel bandwidth	802.11a/n: 20 MHz	802.11n: 40 MHz	
Frequency Range	**U-NII 2A(5250 ~ 5350 MHz)** ▪ 802.11a/n(HT20): 5260 ~ 5320 MHz ▪ 802.11n(HT40): 5270 ~ 5310 MHz	**U-NII 2C(5470 ~ 5725 MHz)** ▪ 802.11a/n(HT20): 5500 ~ 5580, 5660 ~ 5700 MHz ▪ 802.11n(HT40): 5510 ~ 5550, 5670 MHz	
Modulation type	OFDM		
Operational mode	☐ Master mode ☒ Client mode without radar detection ☐ Client mode with radar detection		
Antenna specification	Antenna type: Internal Antenna		
	Antenna gain	U-NII-2A	-2.42 dBi
		U-NII-2C	-2.42 dBi

Note1: The above EUT information was declared by the manufacturer.
Note2: Refer to UNII report

1.2. Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Access Point (Master)	DIR-868L	R3X81E6000093	D-Link	FCCID: RRK2012060056-1
-	-	-	-	-

1.3. Testing environment

Ambient Condition	Original test	Spot check test
▪ Temperature	+23 ℃,	+22 ~ 23 ℃
▪ Relative Humidity	43 %	35 ~ 38 %

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1.4. Reference test data explanations

- **Introduction**

  This report includes the test data of FCC ID: V2X-PM80W1/ IC: 10664A-PM80W1 with reference to KDB 484596 D01v01.

  The applicant takes full responsibility that the test data as reference section below represents compliance for FCC ID: UTWX2WE /IC: 6914A-XT2WE.

Reference FCC ID/ IC	Exhibit type	Separated FCC ID/ IC
FCC ID: V2X-PM80W1 / IC: 10664A-PM80W1	Original Grant / Certification	**NA**
FCC ID: UTWXT2WD / IC: 6914A-XT2WD	Change in FCC ID / Multiple listing	FCC ID: UTWXT2WE / IC: 6914A-XT2WE

- **Explain the differences**

  FCC ID: UTWXT2WE/ IC: 6914A-XT2WE is same the internal printed circuit board with FCC ID: UTWXT2WD / IC: 6914A-XT2WD. The only difference between the two products is that the NFC chipset was changed.

  Where, FCC ID: UTWXT2WD/ IC: 6914A-XT2WD was performed the change-in-FCC ID application to FCC ID: V2X-PM80W1/ IC: 10664A-PM80W1.

- **Spot check verification data**

Equipment Class	FCC Part/ RSS Std.	Technology	Mode	Tx Freq. (MHz)	Test item	Detector Mode	Reference FCC ID: V2X-PM80W1 IC: 10664A-PM80W1		FCC ID: UTWXT2WE IC: 6914A-XT2WE		Limit (dBuV/m)	Deviation (dB)
							Frequency (MHz)	Result (dBuV/m)	Frequency (MHz)	Result (dBuV/m)		
NII	15E/ RSS-247	WLAN	802.11n (HT40)	5190	Radiated Band edge	Peak	5148.34	51.10	5149.80	49.91	74.00	-1.19
						Average	5149.09	41.25	5149.80	41.39	54.00	0.14
			802.11a	5240	Radiated Spurious emission	Peak	10480.22	51.72	10480.15	49.34	68.20	-2.38
						Average	-	-	-	-	-	
			802.11n (HT40)	5310	Radiated Band edge	Peak	5351.36	53.68	5351.84	51.69	74.00	-2.19
						Average	5350.94	42.95	5351.66	41.33	54.00	-1.62
			802.11n (HT20)	5320	Radiated Spurious emission	Peak	10640.17	51.90	10639.65	49.88	74.00	-2.02
						Average	10640.03	45.92	10639.94	44.00	54.00	-1.92
			802.11n (HT20)	5500	Radiated Band edge	Peak	5447.89	50.83	5447.74	49.52	74.00	-1.31
						Average	5448.53	41.54	5448.36	40.14	54.00	-1.40
			802.11a	5700	Radiated Spurious emission	Peak	11400.18	55.96	11400.06	54.03	74.00	-1.93
						Average	11400.07	49.82	11399.96	48.94	54.00	-0.88
			802.11n (HT40)	5755	Radiated Band edge	Peak	5713.58	57.33	5714.00	57.28	68.20	-0.05
						Peak	5724.64	66.44	5725.00	63.73	78.20	-2.71
			802.11n (HT20)	5745	Radiated Spurious emission	Peak	11489.79	54.04	11489.89	52.32	74.00	-1.72
						Average	11490.03	48.10	11489.96	47.37	54.00	-0.73

Note1: The spot check were performed based on worst-case results reported in the original FCC/IC report.
The spot check test results are within 3dB and two products shows a good correlation. It also complies with the FCC/IC limit.

- **Reference section**

  Reference FCC ID: V2X-PM80W1 / Reference IC: 10664A-PM80W1

Equipment Class	FCC Part/ RSS Std.	Technology	Frequency range(MHz)	Exhibit type	Report title	Reference Sections
DSS	15C/ RSS-247	Bluetooth	2402 ~ 2480	Original Grant	DSS	All
DTS	15C/ RSS-247	BLE	2402 ~ 2480	Original Grant	DTS LE	All
DTS	15C/ RSS-247	WLAN	2412 ~ 2462	Original Grant	DTS WLAN	All
NII	15E/ RSS-247	WLAN	5180 ~ 5240 5260 ~ 5320 5500 ~ 5700 5745 ~ 5825	Original Grant	NII, DFS	All
DXX	15C/ RSS-210	NFC	13.56	Original Grant	Not Applicable	Not Applicable

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2. DYNAMIC FREQUENCY SELECTION TEST DESCRIPTION

2.1. Applicability of DFS requirements prior to use of a channel

Requirement	Operational mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

2.2. Applicability of DFS requirements during normal operation

Requirement	Operational mode	
	Master or client with radar detection	Client without radar detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Operational mode	
	Master or client with radar detection	Client without radar detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

The EUT was tested according to the following specification:
905462 D02 UNII DFS Compliance Procedure New Rules v02
905462 D03 Client Without DFS New Rules v01r02

2.3. Requirements of client devices

a) A Client Device will not transmit before having received appropriate control signals from a Master Device.

b) 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.

c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.

d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.

e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

2.4. DFS response requirement values

Parameter	Value
Non-occupancy period	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.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **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..	

2.5. DFS detection thresholds

Below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

Maximum Transmit Power	**Value** **(See Notes 1, 2, and 3)**
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 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.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

2.6. Radar test waveforms

Radar type	Pulse width (μsec)	PRI (μsec)	Number of pulses	Minimum percentage of successful detection	Minimum number of trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in section 2.6.2.	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{\mu sec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
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

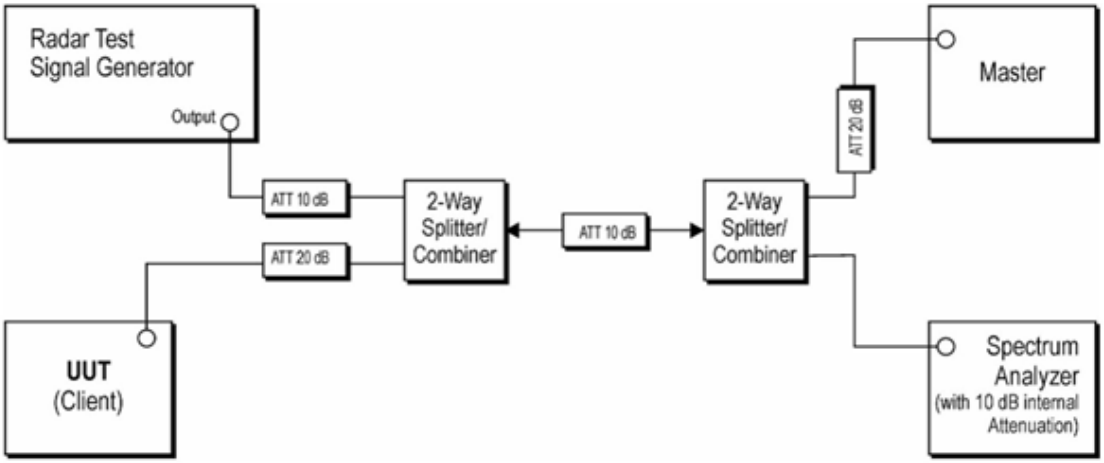
Note 1: As the EUT is a Client Device with no Radar Detection only one type radar pulse is required for the testing. Radar Pulse type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time.

Note 2: This report was applied Short Pulse Radar Type 0.

3. Test procedure

3.1. Setup for Client with injection at the Master

The setup method is shown below diagram. The method according to the 905462 D02 UNII DFS Compliance Procedure New Rules v02 - section 7.2



3.2. Spectrum analyzer setting parameter

The setting parameter is shown below and it according to the 905462 D02 UNII DFS Compliance Procedure New Rules v02 - section 7.5

1) **RBW /VBW ≥ 3MHz**
2) **Detector = Peak**
3) **Span = zero span**
4) **Sweep time ≥ 12s**

3.3. Conducted test procedure

1) One frequency will be chosen from the Operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands.
2) The Client Device (EUT) is set up the above diagram and communications between the Master device and the Client is established.
3) Stream the channel loading test file from the Master Device to the Client Device on the test Channel for the entire period of the test. (The MPEG file specified by the FCC (*"6 ½ Magic Hours"*))
4) An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
5) Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 12 seconds for Radar Type 0 to ensure detection occurs.
6) After the initial radar burst the channel is monitored for 30 minutes to ensure no transmissions or beacons occur. A second monitoring setup is used to verify that the Master and Client have both moved to different channels.

4. SUMMARY OF TESTS

Parameter	Limit	Status Note 1
Channel move time	10 seconds	C Note 2
Channel closing transmission time	200ms + aggregate of 60ms over remaining 10 second period	C Note 2, 3
Non-occupancy period	30 minutes	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 3: 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.

5. LIST OF EQUIPMENTS

Equipment for Original test(Date of Test: 2017.04.27)

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
MXA Signal Analyzer	Agilent	N9020A	17/01/11	18/01/11	MY50200828
DFS Bridge System	DTNC	DFS-01	16/12/06	17/12/06	T001
Vector Signal Generator	Rohde Schwarz	SMBV100A	17/01/04	18/01/04	255571
Thermohygrometer	BODYCOM	BJ5478	17/01/11	18/01/11	1209
DC Power Supply	Agilent	66332A	16/09/08	17/09/08	GB42110550
PXIS-2670(G)	ADLINK	3025C	16/08/19	17/08/19	302581/834
PXIS-2670(G)	ADLINK	3035C	16/08/19	17/08/19	303581/927

Equipment for Spot check test(Date of Test: 2019.02.07 ~ 2019.02.10)

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	18/07/09	19/07/09	MY46471251
Spectrum Analyzer	Agilent Technologies	N9030A	18/07/09	19/07/09	MY53310140
Thermohygrometer	BODYCOM	BJ5478	18/12/27	19/12/27	120612-2
Signal Generator	Rohde Schwarz	SMBV100A	18/12/19	19/12/19	255571
Signal Generator	ANRITSU	SMF100A	18/06/07	19/06/07	102341
Loop Antenna	Schwarzbeck	FMZB1513	18/01/30	20/01/30	1513-128
Bilog Antenna	Schwarzbeck	VULB 9160	18/07/13	20/07/13	3359
HORN ANT	ETS	3117	18/05/10	20/05/10	00140394
HORN ANT	A.H.Systems	SAS-574	17/07/31	19/07/31	155
PreAmplifier	H.P	8447D	18/12/18	19/12/18	2944A07774
PreAmplifier	Agilent	8449B	18/07/05	19/07/05	3008A02108
PreAmplifier	tsj	MLA-1840-J02-45	18/07/06	19/07/06	16966-10728
High-pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	18/07/05	19/07/05	3
High-pass filter	Wainwright	WHNX8.5/26.5G-6SS	18/07/03	19/07/03	1
Cable	DTNC	Cable	18/07/06	19/07/06	M-01
Cable	DTNC	Cable	18/07/06	19/07/06	M-02
Cable	Junkosha	MWX315	18/11/19	19/11/19	M-05
Cable	Junkosha	MWX221	18/11/19	19/11/19	M-06
Cable	Junkosha	MWX241	18/06/25	19/06/25	G-04
Cable	Junkosha	MWX241	18/06/25	19/06/25	G-07

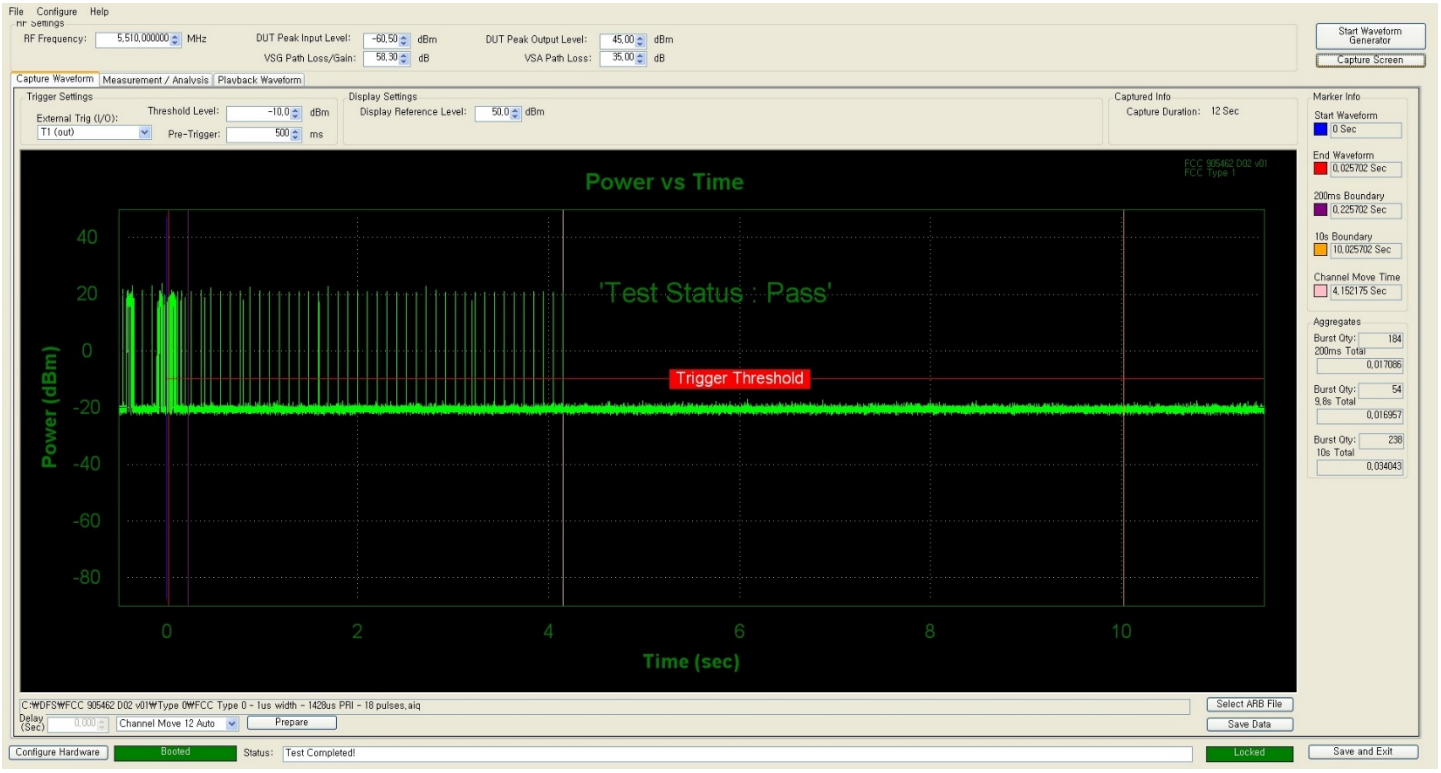
Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.
Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

6. TEST RESULTS

6.1. Move time and aggregate time

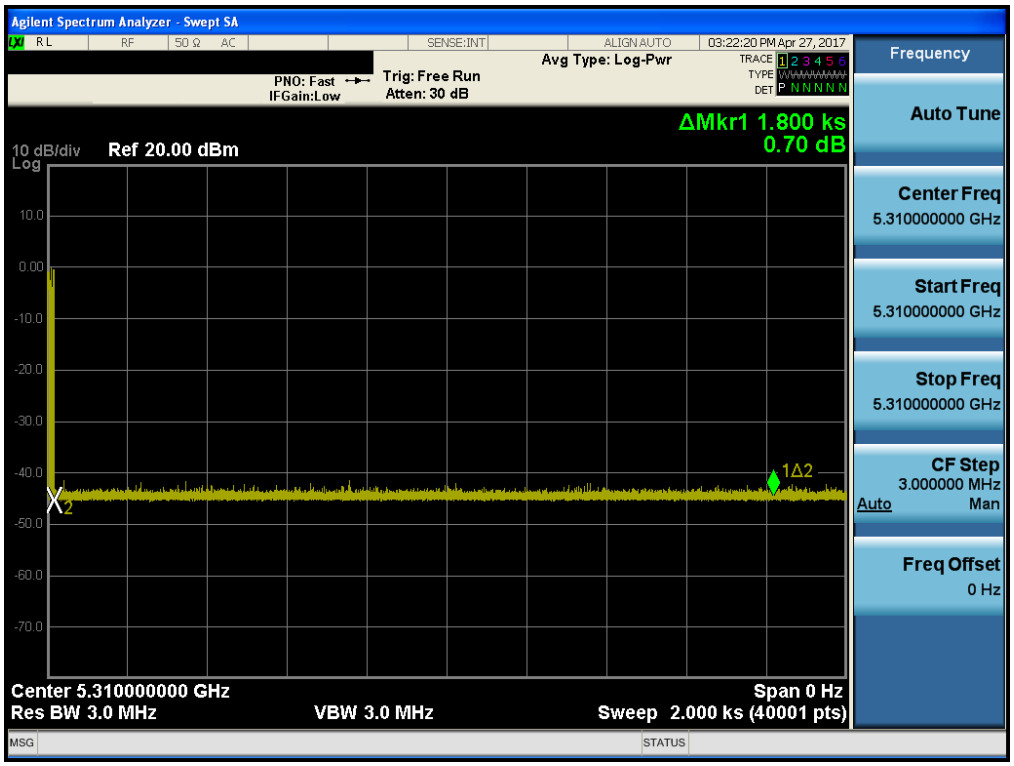
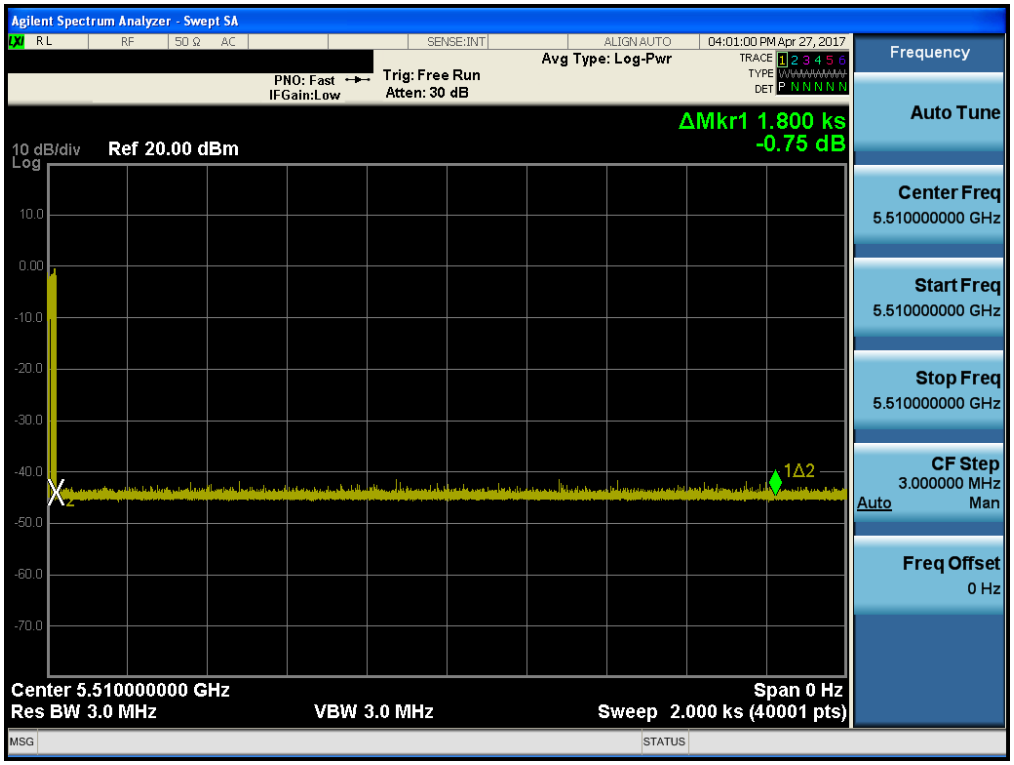
6.1.1. U-NII-2A: 802.11n(HT40), 5310 MHz

6.1.2. U-NII-2C: 802.11n(HT40), 5510 MHz



6.2. Non-occupancy period

6.2.1. U-NII-2A : 802.11n(HT40), 5310 MHz



6.2.2. U-NII-2C : 802.11n(HT40), 5510 MHz