

# DFS TEST REPORT FCC PART 15 SUBPART E 15.407 & RSS 247

Report Reference No. ...... CTL1708188063-WF11

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Product Name .....: Vehicle Communicator

Model/Type reference .....: UV350

List Model(s)..... N/A

Trade Mark.....: Uniden

FCC ID...... 2AOCX-UV350 IC .....: 23378-UV350

Applicant's name ...... Siyata Mobile Inc.

Address of applicant.....: 1001 Lenoir St Suite A, Montreal, Quebec H4C 2Z6 Canada

Test Firm...... Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Address of Test Firm .....

Nanshan District, Shenzhen, China 518055

Test specification .....:

Standard ...... 47 CFR FCC Part 15 Subpart E 15.407 &

RSS 247 Issue 2, February 2017

TRF Originator ...... Shenzhen CTL Testing Technology Co., Ltd.

Master TRF.....: Dated 2011-01

Date of Receipt...... Sep. 27, 2017

Date of Test Date .....: Nov. 22, 2017

**Data of Issue**.....: Nov. 25, 2017

Result.....: Pass

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# **TEST REPORT**

Toot Bonort No.	CTL1708188063-WF11	Nov. 25, 2017
Test Report No. :	CILI/00100003-WFII	Date of issue

Equipment under Test : Vehicle Communicator

Model /Type : UV350

Listed Models : N/A

Applicant : Siyata Mobile Inc.

Address : 1001 Lenoir St Suite A, Montreal, Quebec H4C 2Z6 Canada

Manufacturer : Siyata Mobile Inc.

Address : 1001 Lenoir St Suite A, Montreal, Quebec H4C 2Z6 Canada

Test result	C L Pass *
	Name of the Control o

<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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# \*\* Modified History \*\*

Report No.: CTL1708188063-WF11

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2017-11-25	CTL1708188063-WF11	Tracy Qi



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### 1. SUMMARY

### 1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15 Subpart E—Unlicensed National Information Infrastructure Devices

RSS-247-Issue 2: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02

KDB 905462 D04 Operational Modes for DFS Testing New Rules v01

## 1.2. Test Description

Test Description	FCC CFR 47/ ISED Rule Part	Limit	Test Result
In-Service Monitoring	15.407(h)(2)(iv) RSS-247 [6.3]	Monitor Co-channel Radar	N/A*
Channel Availability Check	15.407 (h)(2)(ii) RSS-247 [6.3]	60s Detection	N/A*
Channel Move Time	15.407 (h)(2)(iii) RSS-247 [6.3]	10s	Pass
Channel Closing Transmission Time	15.407 (h)(2)(iii) RSS-247 [6.3]	200ms + Aggregate 60ms over remaining 10s period	Pass
Non-Occupancy Period	15.407 (h)(2)(iv) RSS-247 [6.3]	30 minutes	Pass

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<sup>\*</sup>Note: The EUT is a Client device without radar detection function.

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### 1.3. Test Facility

#### 1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

### 1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

### IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

### FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December 19, 2013.

### 1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods — Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±3.20dB	(1)

<sup>(1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

# 2. GENERAL INFORMATION

## 2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

## 2.2. General Description of EUT

Product Name:	Vehicle Communicator				
Model:	UV350				
Power supply:	DC 12V form battery	/			
WIFI					
	20MHz system	40MHz system	80MHz system	160MHz system	
Supported type:	802.11a 802.11n 802.11ac	802.11n 802.11ac	802.11ac	N/A	
Operation frequency:	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755MHz,5795MHz	5210MHz; 5290MHz; 5530MHz; 5610MHz; 5775MHz	N/A	
Modulation:	OFDM OFDM	OFDM	OFDM	N/A	
Channel number:	24	11	5.0	N/A	
Channel separation:	20MHz 40MHz 80MHz N/A				
Antenna type/gain: FIFA Antenna: 1dBi on 5GHz					

Note: For more details, please refer to the user's manual of the EUT.

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## 2.3. Description of Test Modes

The EUT operates over the 5260 MHz - 5320 MHz and 5500 MHz - 5700 MHz ranges.

The EUT is a slave device without radar detection.

The EUT antenna has a gain of 1 dBi in 5260 MHz - 5320 MHz and 5500 MHz- 5700 MHz band.

The highest power level within these bands in 19.06 dBm EIRP in the 5260 MHz - 5320 MHz band and 18.70 dBm EIRP in the 5500 MHz – 5700 MHz band.

The EUT one transmitter/receiver chain connected to a coaxial cable to perform conducted tests.

TPC is not required since the maximum EIRP is less than 500 mW.

The EUT utilizes the 802.11a/n/ac architecture.

The nominal channel bandwidth is implemented: 20, 40, 80 MHz

## 2.4. Measurement Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	N9020	US46220290	2017/01/17	2018/01/16
Vertor Signal Generator	Agilent	N5182A	MY50142850	2017/01/17	2018/01/16
DFS test box	Tonscend	JS0806-2	JS00001	2017/05/19	2018/05/18

The calibration interval was one year

# 2.5. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Manufacturer	Model	Certification
1	GPON ONU	Alcatel Lucent	G-240W-B	FCC ID: 2ADZRG240WB
	1	10-11	TOCILI	
		estino	160	

# 2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.407 of the FCC Part 15, Subpart E and RSS-247 Rules.

### 2.7. Modifications

No modifications were implemented to meet testing criteria.

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### 3. TEST CONDITIONS AND RESULTS

### 3.1. APPLICABILITY

The following table from KDB905462 D02 v02(04/08/2016) lists the applicable requirements for the DFS testing. The device evaluated in this report is considered a client device without radar detection capability.

Table 3-1. DFS Applicability

		Operation Mod	le
Requirement	Master	Client Without Radar	Client With Radar
	Master	Detection	Detection
Non-Occupancy Period	Yes	Not required	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

Table 3-2. DFS Applicability during Normal Operation

		Operation Mod	e
Requirement	Mostor	Client Without Radar	Client With Radar
	Master Detection	Detection	Detection
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

# 3.2. REQUIREMENTS

Per KDB905462 D02 v02 (04/08/2016) the following are the requirements for 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.

Channel Move Time and Channel Closing Transmission Time requirements are listed following table.

Table 3-3: DFS Response requirements

Parameter	Value	
Non-occupancy period	Minimum 30 minutes	
Channel Availability Check Time	60 seconds	
Channel Move Time	10 seconds Note 1	
Channel Closing Transmission Time	200 milliseconds + an Aggregate of 60 milliseconds over Remaining 10 second period Notes1 and 2	
U-NII Detection Bandwidth	Minimum 100 % of the U-NII99 % transmission	
	Power bandwidth <sup>Note 3</sup>	

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 Channell 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.

Note3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed With no data traffic.

### 3.3. DFS DETECTION THRESHOLD VALUES

The DFS detection thresholds are defined for Master devices and Client Devices with In-service monitoring. These detection thresholds are listed in the following table.

Table 3-4: Detection Thresholds for Master Devices and Client Devices with Radar Detection

Value		
(See Notes 1 and 2)		
-64 dBm		
-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.

### 3.4. PARAMETERS OF DFS TEST SIGNALS

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. Table 3-5 lists the parameters for the Short Pulse Radar Waveforms. A plot of the Radar pulse Type 0 used for testing is included in Section 7.7 of this report.

Table 3-5: Parameters for Short Pulse Radar Waveforms

Radar Type	Pulse Width ( μ sec)	PRI ( $\mu$ sec)	Number Of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1 Shen	Test A: 15 unique PRI values Randomly selected From the list of 23 PRI values in Table 5a  Test B: 15 unique PRI values Randomly selected within the range of 518-3066 $\mu$ sec, with a minimum increment of 1 $\mu$ sec, excluding PRI values	Roundup 1 360 19·10 <sup>6</sup> PRI µseg	60%	30
	N	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
				80%	120

Note1: Short pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

### 3.5. TEST AND MEASUREMENT SYSTEM

#### **General Test Setup Procedure:**

- 1. The EUT was operating 802.11a, 802.11n\_HT20/40, 802.11ac\_VHT20/40/80 during the test.
- 2. Connect FCC approved Master AP to a network, via wired Ethernet, that allows connection to an FTP server.
- 3. Associate the EUT with the Master AP.
- 4. Launch the FTP application on the EUT.
- 5. Connect to the FTP server application to the FTP server hosting the file
- 6. Initiate an FTP download of the file from the host.
- 7. Monitor the channel loading during transfer.
- 8. Reduce the maximum allowed data rate for the Master AP, using the AP's GUI interface.
- 9. Repeat steps 5-7 until the channel loading is as close to 20 % as possible.
- 10. Record the data rate setting on the Master AP and the channel loading.
- 11. While the system is performing an FTP transfer using the settings form item 9 above, perform the Channel Closing Transmission Time and Channel Move Time Measurements as required by KDB905462 D02 v02 using a conducted test.

#### **PROCEDURE**

The KDB905462 D02 v02 describes a radiated test setup and a conducted test setup. A conducted test setup was used for this testing. Figure 3-1 shows the typical test setup. Each one channel selected between 5260 and 5320 MHz, 5500 and 5700 is chosen for the testing.

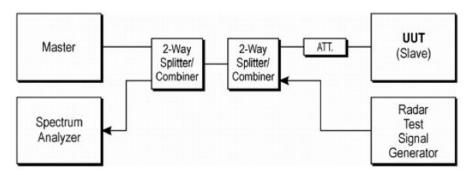


Figure 3-1. Conducted Test Setup for DFS

- 1. The radar pulse generator is setup to provide a pulse at the frequency that the Master and Client are operating. A Type 0 radar pulse with a 1  $\mu$ s pulse width and a 1428  $\mu$ s PRI is used for the testing.
- 2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at a level of approximately -62 dBm at the antenna of the Master device.
- 3. The Client Device (EUT) is set up per the diagram in Figure 3-1 and communications between the Master device and the Client is established.
- 4. The MPEG file specified by the FCC ("6½ Magic Hours") is streamed from the "file computer" through the Master to the Slave Device and played in full motion video using Media Player Classic Ver.6.4.8.6 in order to properly load the network.
- 5. The spectrum analyzer is set to record about 15 sec window to any transmissions occurring up to

and after 10 sec.

- 6. The system is again setup and the monitoring time is shortened in order to capture the Channel Closing Transmission Time. This time is measured to insure that the Client ceases transmission within 200 ms and the aggregate of emissions occurring after 200 ms up to 10 sec do not exceed 60 ms.
  - (Note: the channel may be different since the Master and Client have changed channels due to the detection of the initial radar pulse.)
- 7. After the initial radar burst the channel is monitored for 30 minutes to insure no transmissions or beacons occur. A second monitoring setup is used to verify that the Master and Client have both moved to different channels.



### 3.6. Radar Waveform Verification

A-50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a coaxial cable. The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of - 62 dBm as measured on the spectrum analyzer.

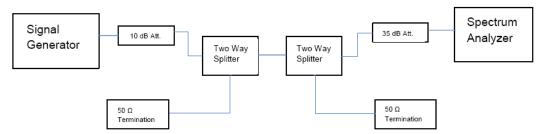


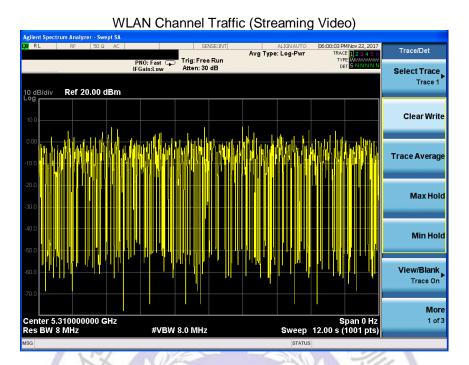
Figure 3-2 Test Setup for Conducted Measurement Radar Verification



Radar Burst Level at -63dBm: Radar Type 0

### 3.7. UNII2A TEST RESULT

For UNII 2A band test performed at channel 62 of 802.11ac40 mode.





Channel Move Time: Marker2- Marker1=0.294 s (Limit:10 s)

Channel Closing Transmission Time, Aggregate Time After 200 ms = (Number of analyzer bins showing transmission) \* (dwell time per bin) =3\*(12000ms/30000)=1.2ms (Limit: 60 ms)

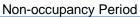
### Remark:

Marker1 is the Reference Marker set at the end of last radar pulse.

Marker2 is the end of the channel move time.

is begins at Reference Marker + 200msec Marker3

Marker4 is Reference Marker + 10 sec point.



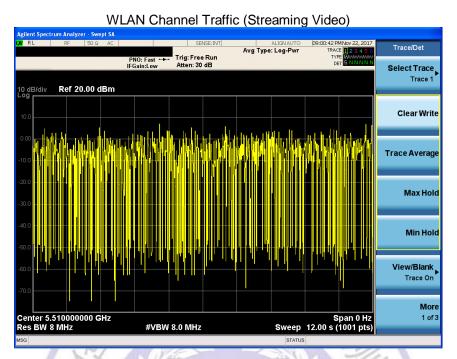




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### 3.8. UNII 2C TEST RESULT

For UNII 2C band test performed at channel 102 of 802.11ac40 mode.





Channel Move Time: Marker2- Marker1=0.4009 s (Limit:10 s)

Channel Closing Transmission Time, Aggregate Time After 200 ms = (Number of analyzer bins showing transmission) \* (dwell time per bin) =6\*(12000ms/30000)=2.4ms (Limit: 60 ms)

### Remark:

Marker1 is the Reference Marker set at the end of last radar pulse.

Marker2 is the end of the channel move time.

Marker3 is begins at Reference Marker + 200msec

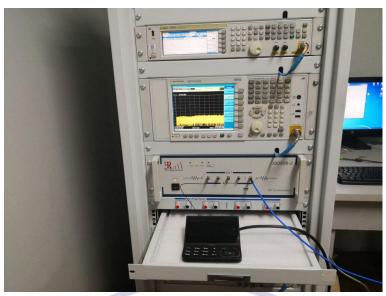
Marker4 is Reference Marker + 10 sec point.







# 4. Test Setup Photos of the EUT





# 5. Photos of the EUT

Reference to the photo documents.

