

## Test Report EN6080

Revision	Description	Author	Issue Date
A	Initial Release	HB	9-April-12

### General Remarks:

In addition to the intentional and unintentional emissions lab test reports submitted with this application, this test report includes additional test data demonstrating compliance with CFR47, 15.247 and RSS-210, A8.1. For the measurements in this report, the antenna was replaced by a coaxial connection to a MXA signal analyzer, model N9020A.

Calculations for Conducted Output Power and Duty Cycle Correction Factor are also included.

## Report Summary

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## General Declarations

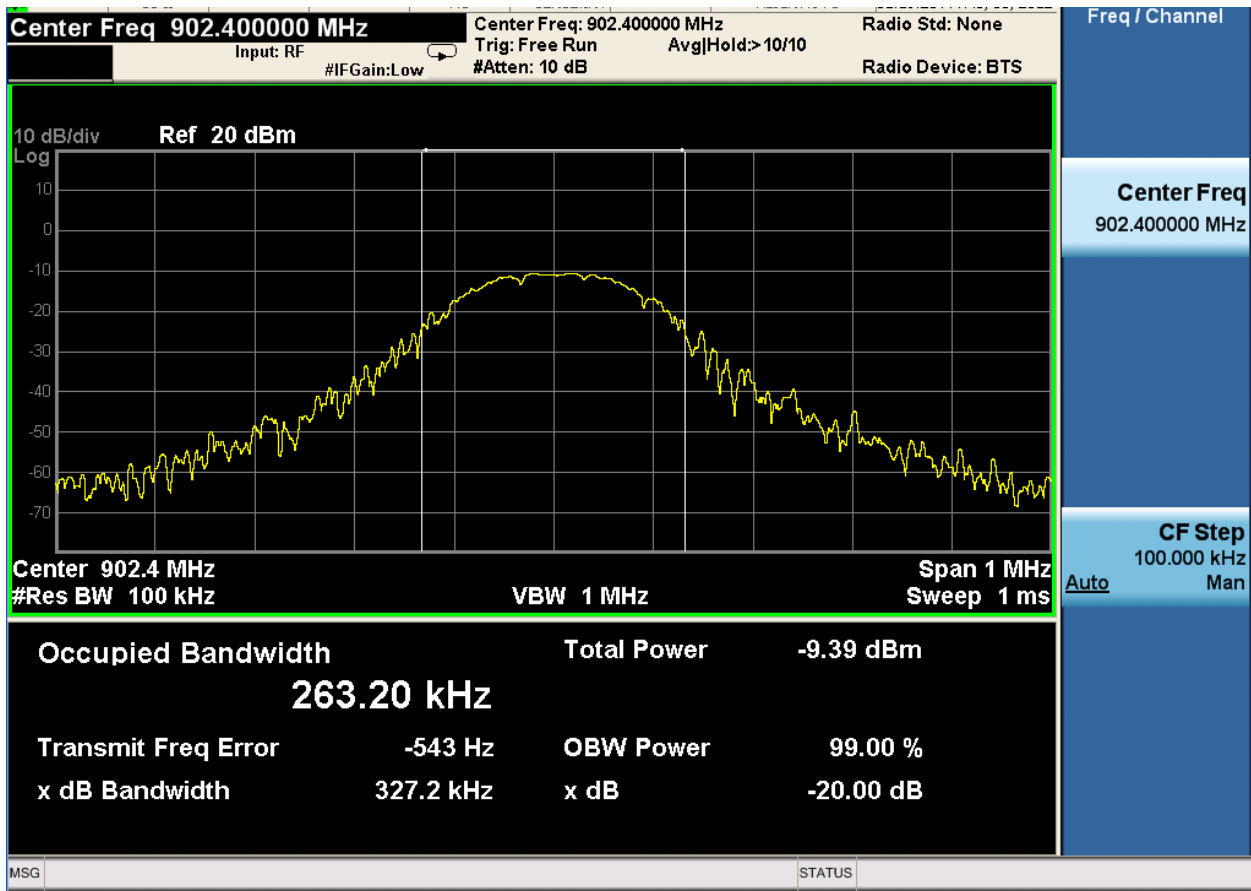
Continuous receiver operation	N/A
Continuous transmitter operation	No
Band of operation (USA and Canada)	902-928 MHz
Band of operation (Australia mode)	915-928 MHz
Band of operation (New Zealand mode)	921-928 MHz
Lower transmit frequency (Australia)	915.6 MHz
Lower transmit frequency (New Zealand)	921.6 MHz
Upper transmit frequency (AUS and NZ)	927.6 MHz
Minimum Transmit Channel Spacing	400KHz
Receiver frequencies	Yes
Frequency hopping transmitter	Yes
Integral antenna equipment	Yes
Normal battery input voltage	N/A
Input Voltage	12V DC
Maximum TX on-time (single message)	22ms



## 20 dB Occupied Bandwidth Lower Channel

<b>Test Method</b>	15.247	<b>Section</b>	2
<b>UUT Model No.</b>	EN6080	<b>Test Date</b>	9-April-12
<b>UUT Serial Number(s)</b>		<b>Normal Temp</b>	25.93 C
<b>UUT Description</b>	Area Control Gateway	<b>Normal Humidity</b>	31.63%
<b>UUT MFGR:</b>	Inovonics Wireless		
<b>Tested By:</b>	HB	<b>Test Result</b>	<b>Pass</b>

Plot shows the 20 dB occupied bandwidth of a single channel to demonstrate compliance with 15.247(a)(1)(i) and RSS-210, A8.1(c).

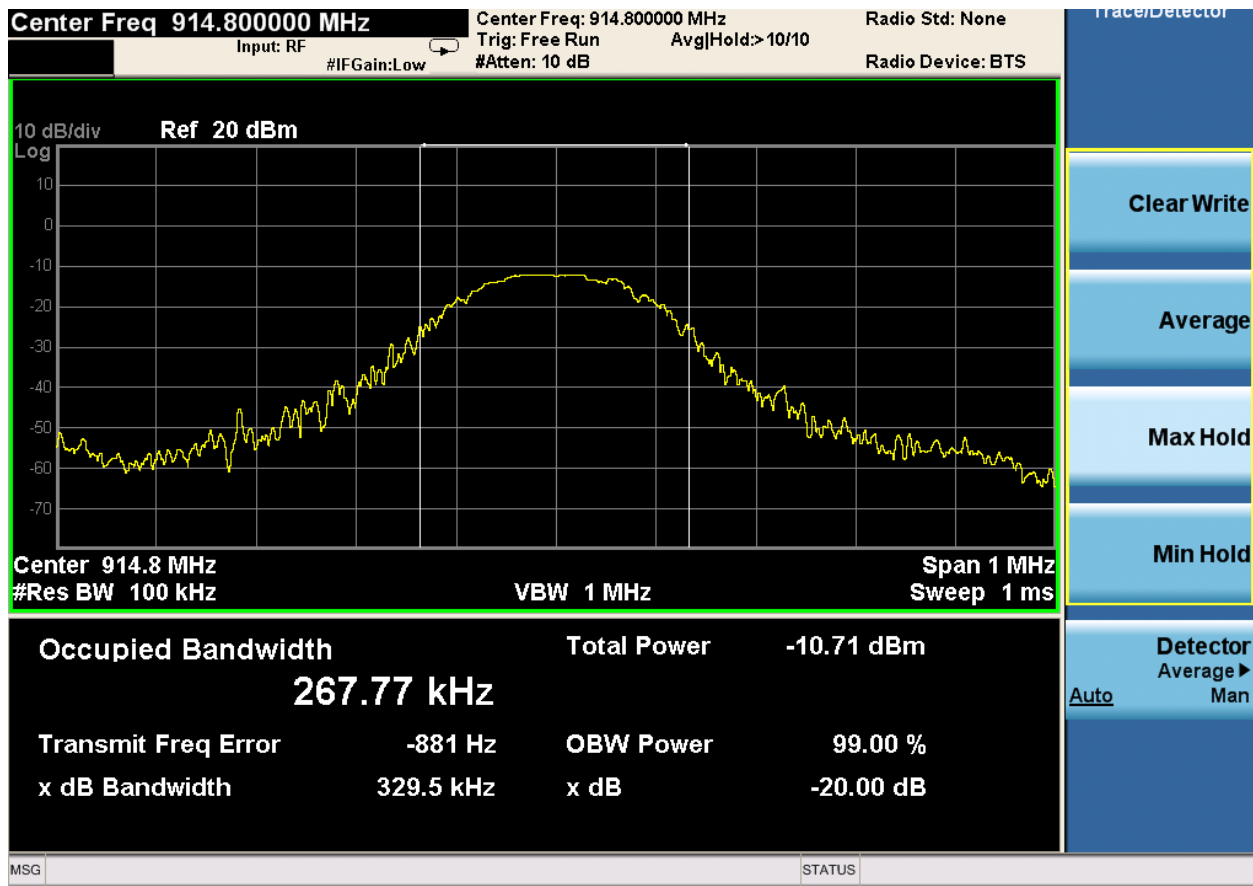


Channel Frequency in MHz	Measured 20dB Bandwidth (KHz)	Maximum Limit (KHz)	Complies
902.4	327.2	500	Yes

## 20 dB Occupied Bandwidth Middle Channel

<b>Test Method</b>	15.247	<b>Section</b>	2
<b>UUT Model No.</b>	EN6080	<b>Test Date</b>	9-April-12
<b>UUT Serial Number(s)</b>		<b>Normal Temp</b>	25.93 C
<b>UUT Description</b>	Area Control Gateway	<b>Normal Humidity</b>	31.63%
<b>UUT MFGR:</b>	Inovonics Wireless		
<b>Tested By:</b>	HB	<b>Test Result</b>	<b>Pass</b>

Plot shows the 20 dB occupied bandwidth of a single channel to demonstrate compliance with 15.247(a)(1)(i) and RSS-210, A8.1(c).

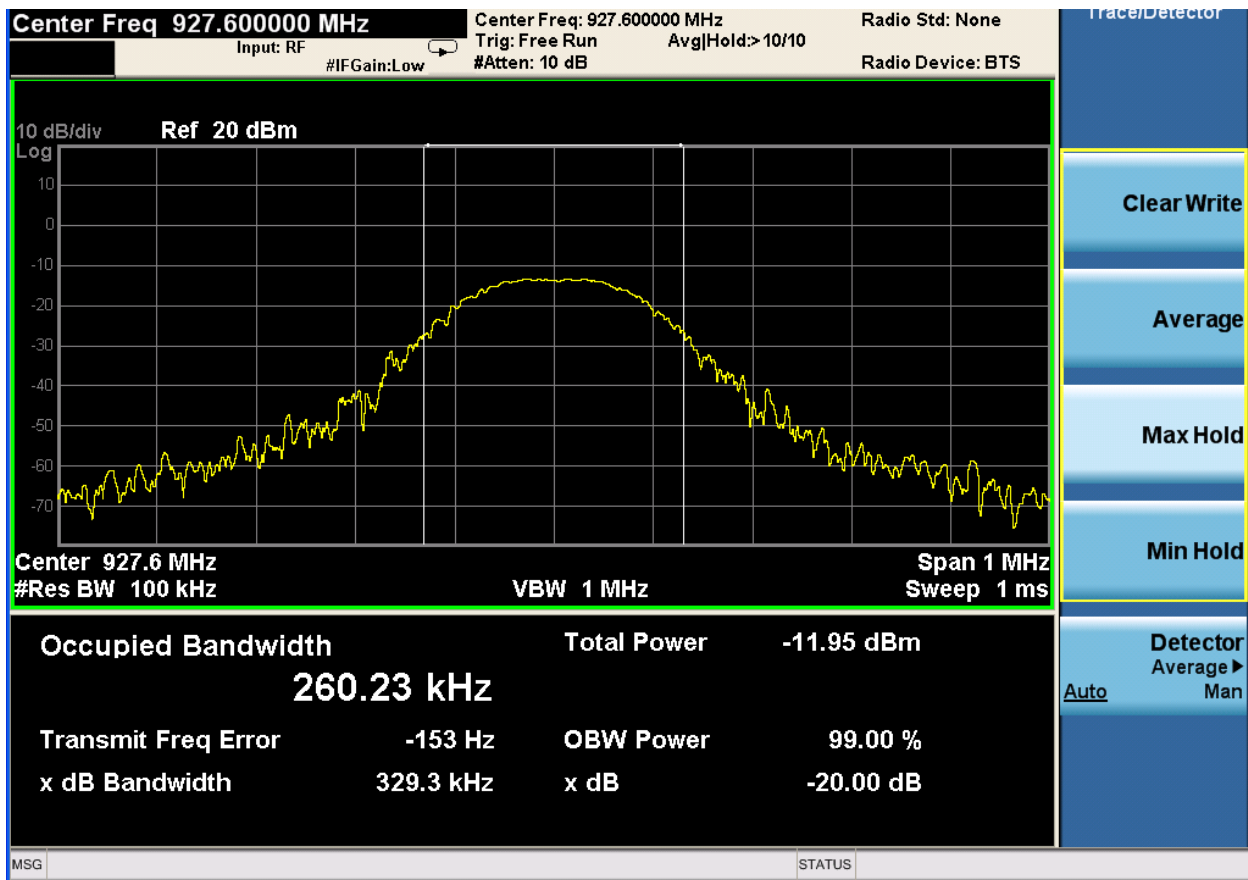


Channel Frequency in MHz	Measured 20dB Bandwidth (KHz)	Maximum Limit (KHz)	Complies
914.8	329.5	500	Yes

## 20 dB Occupied Bandwidth Upper Channel

<b>Test Method</b>	15.247	<b>Section</b>	2
<b>UUT Model No.</b>	EN6080	<b>Test Date</b>	9-April-12
<b>UUT Serial Number(s)</b>		<b>Normal Temp</b>	25.93 C
<b>UUT Description</b>	Area Control Gateway	<b>Normal Humidity</b>	31.63%
<b>UUT MFGR:</b>	Inovonics Wireless		
<b>Tested By:</b>	HB	<b>Test Result</b>	<b>Pass</b>

Plot shows the 20 dB occupied bandwidth of a single channel to demonstrate compliance with 15.247(a)(1)(i) and RSS-210, A8.1(c).

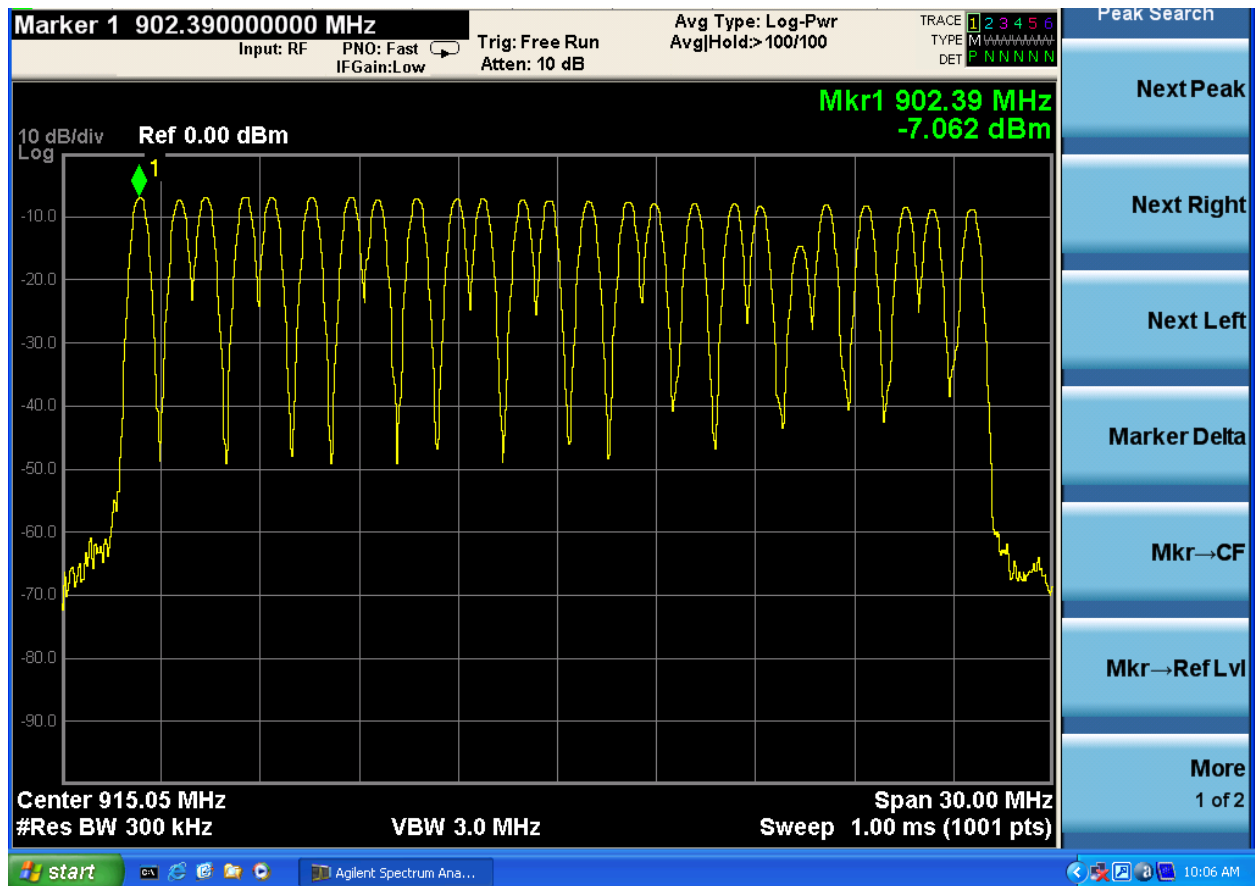


Channel Frequency in MHz	Measured 20dB Bandwidth (KHz)	Maximum Limit (KHz)	Complies
927.6	329.3	500	Yes

## Number of Transmitter Channels

<b>Test Method</b>	15.247	<b>Section</b>	3
<b>UUT Model No.</b>	EN6080	<b>Test Date</b>	9-April-12
<b>UUT Serial Number(s)</b>		<b>Normal Temp</b>	25.93 C
<b>UUT Description</b>	Area Control Gateway	<b>Normal Humidity</b>	31.63%
<b>UUT MFGR:</b>	Inovonics Wireless		
<b>Tested By:</b>	HB	<b>Test Result</b>	<b>Pass</b>

Plot demonstrates compliance with 15.247(a)(1)(i), and RSS-210, A8.1(c). This is a stored display of many sequential transmissions to show the overall band occupied by the transmitter.

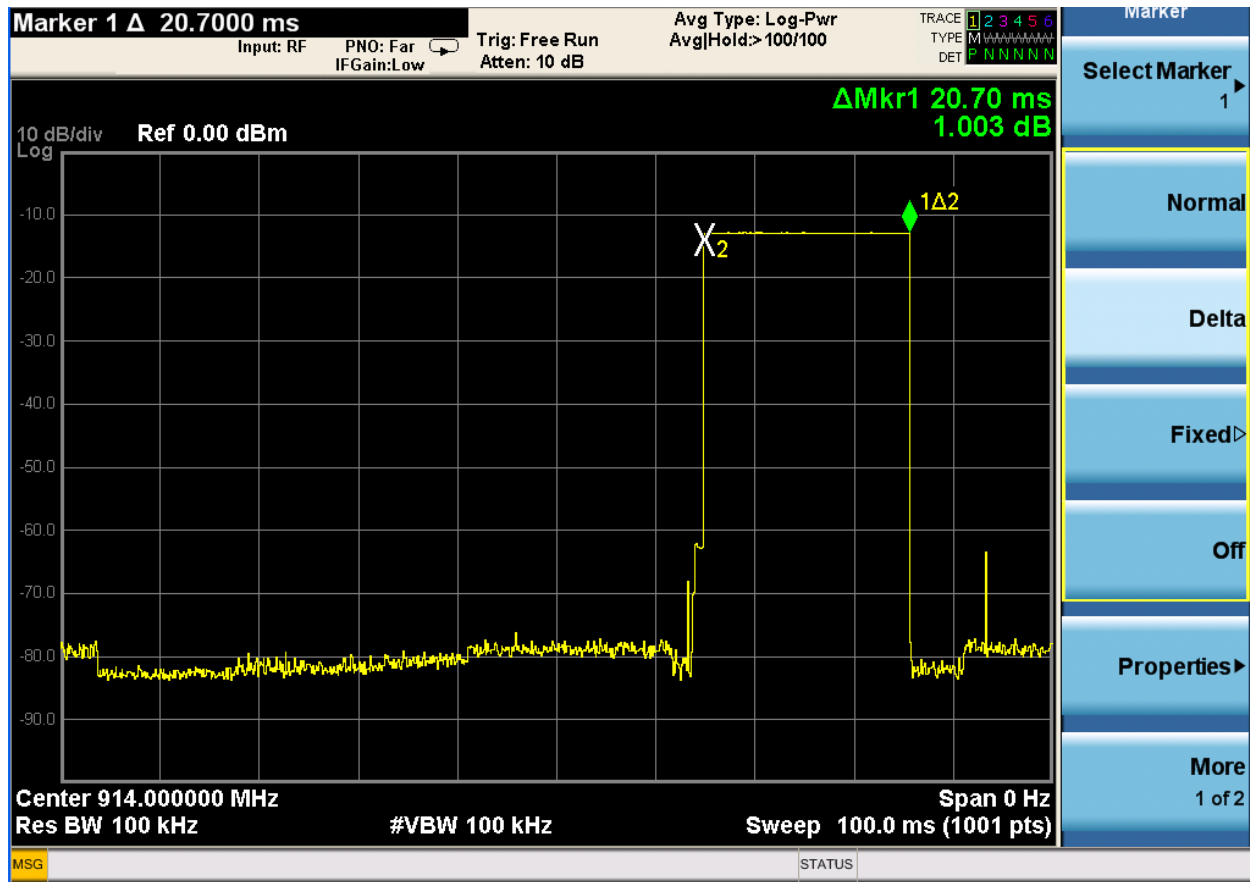


# of Tx channels	Min required # of channels	Complies
25	25	Yes

## Dwell Time

<b>Test Method</b>	15.247	<b>Section</b>	4
<b>UUT Model No.</b>	EN6080	<b>Test Date</b>	9-April-12
<b>UUT Serial Number(s)</b>		<b>Normal Temp</b>	25.93 C
<b>UUT Description</b>	Area Control Gateway	<b>Normal Humidity</b>	31.63%
<b>UUT MFR:</b>	Inovonics Wireless		
<b>Tested By:</b>	HB	<b>Test Result</b>	<b>Pass</b>

Plot demonstrates compliance with 15.247(a)(1)(i), and RSS-210, A8.1(c), which states “the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10 second period.”



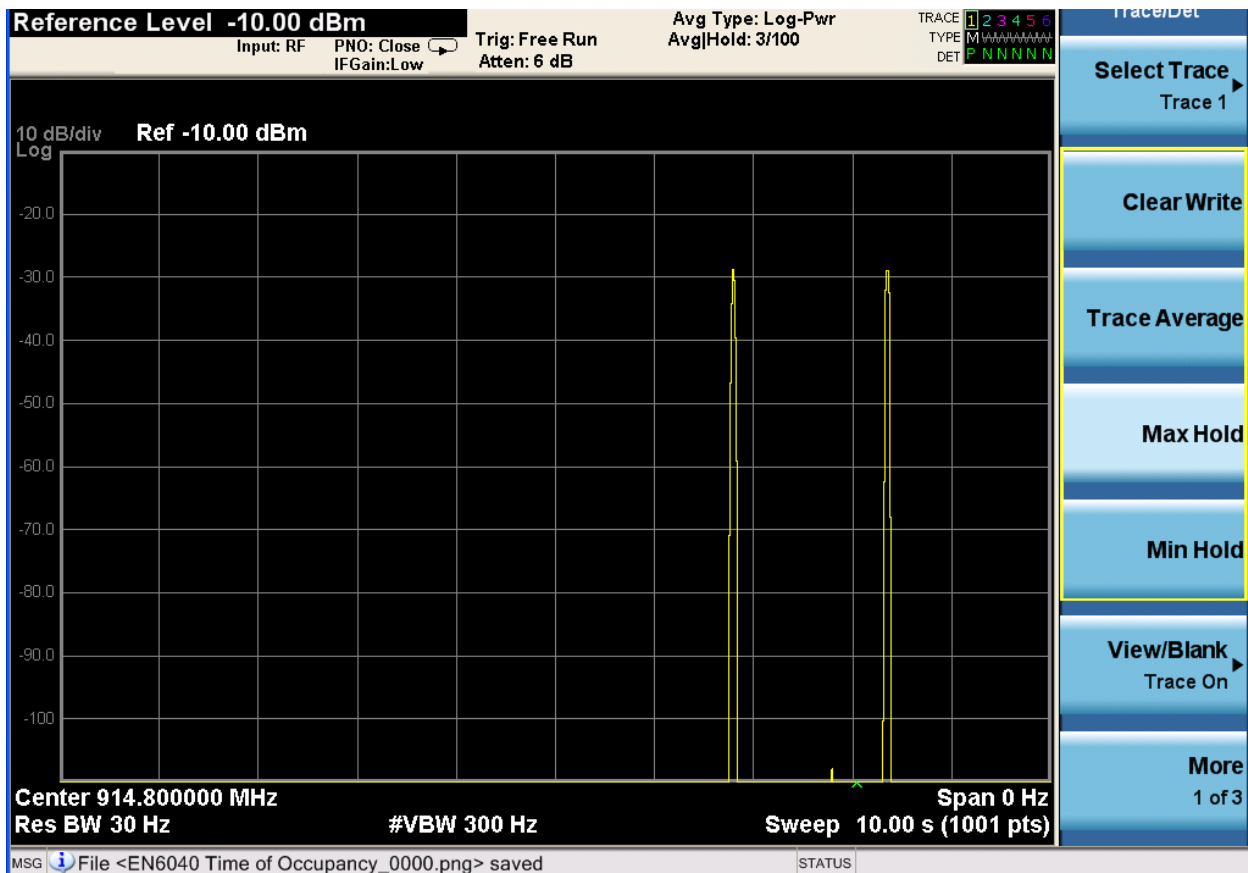
Measured	Maximum	
Dwell Time	Limit in	Complies
In ms	seconds	
20.70	.4	Yes



## Dwell time within 10 Seconds

<b>Test Method</b>	15.247	<b>Section</b>	5
<b>UUT Model No.</b>	EN6080	<b>Test Date</b>	9-April-12
<b>UUT Serial Number(s)</b>		<b>Normal Temp</b>	25.93 C
<b>UUT Description</b>	Area Control Gateway	<b>Normal Humidity</b>	31.63%
<b>UUT MFGR:</b>	Inovonics Wireless		
<b>Tested By:</b>	HB	<b>Test Result</b>	<b>Pass</b>

Plot demonstrates compliance with 15.247(a)(1)(i), and RSS-210, A8.1(c), which states “the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10 second period.”





## Test Instrument Declarations

<b>Test Method</b>	15.247	<b>Section</b>	1 through 5
<b>UUT Model No.</b>	EN6080		
<b>UUT Serial Number(s)</b>			
<b>UUT Description</b>	Area Control Gateway		
<b>UUT MFGR:</b>	Inovonics Wireless		

### Testing Instrument

<b>Description</b>	Signal Analyzer		
<b>Make</b>	Agilent	<b>Calibration date</b>	27-Sep-10
<b>Model #</b>	N9020A	<b>Calibration due date</b>	27-Sep-12
<b>Serial #</b>	MY46471353		

## Alternative to Conducted Output Power Measurements:

Required conducted power output measurements at low, medium, and high channels (per 15.247(b) and (c)) could not be performed directly since the transmit antenna is integrated onto the printed circuit board. However, compliance with these requirements has been achieved by way of performing and passing the radiated tests described in the ALTERNATIVE TEST PROCEDURES in Public Notice DA 00-705, March 30, 2000.

Specifically, all radiated emissions shown in the test report are less than 119.2 dBuV/m at 3 meters. This is the field strength limit corresponding to the maximum fundamental power output of 0.25 watts from an isotropic antenna per 15.247 (b) (2) for systems employing between 25 and 49 hopping channels.

The calculation as detailed in the above Public Notice is as follows:

$E = \text{Square Root of } (30PG) \text{ all divided by } d$

$E = 912,871 \text{ uV/m} = 119.21 \text{ dB uV/m}$

Where:

E is the maximum allowable fundamental field strength in uV/m

P is the maximum allowable fundamental radiated power = 0.25 watts

G is the antenna gain = 1 (Assume 1 for the worst case (lowest allowable) final field strength.)

d is the measured distance = 3 meters

## Duty Cycle Correction Factor (DCCF)

DCCF formula obtained from Public Notice DA 00-705

$$DCCF = 20 \log \left( \frac{\text{Dwell time}}{100 \text{ ms}} \right)$$

$$DCCF = 20 \log \left( \frac{20.7 \text{ ms}}{100 \text{ ms}} \right)$$

$$DCCF = -13.68 \text{ dB}$$