

Test Report: Additional Information

Model EN1233D

Revision	Description	Author	Issue Date
A	Initial Release	HB	30-Mar-11

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

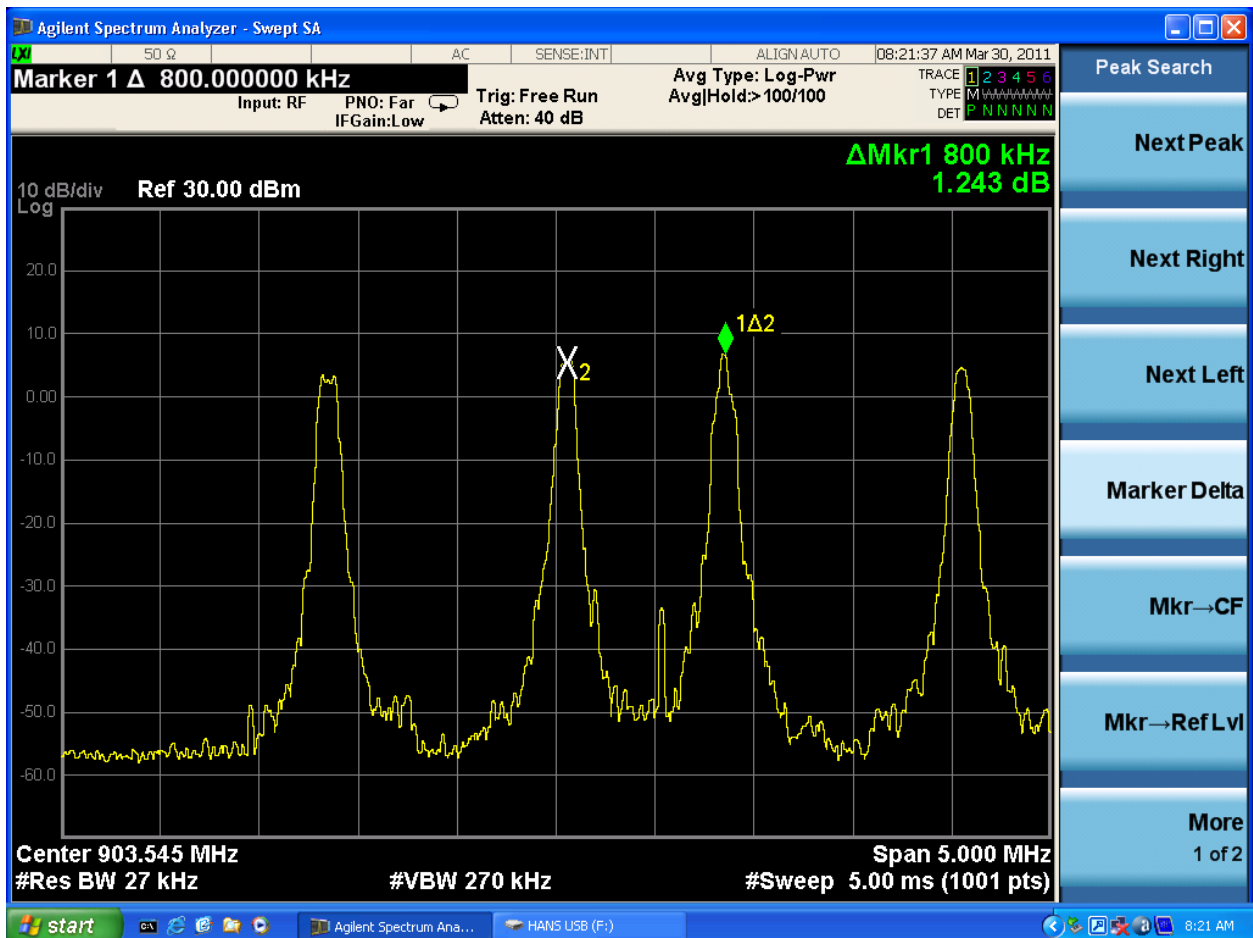
		Result	Page
Section 1	Minimum Channel Separation	Pass	3
Section 2	20 dB Occupied BW	Pass	4
Section 3	Number of Hopping Channels	Pass	5
Section 4	Dwell Time	Pass	6
Section 5	Test Instrument Declarations	Pass	7
Section 6	Conducted Output Power & Duty Cycle Correction Factor	N/A	8

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	N/A
Frequency hopping transmitter	Yes
Integral antenna equipment	Yes
Normal battery input voltage	3V DC
Maximum TX on-time (single message)	22ms

Minimum Channel Separation

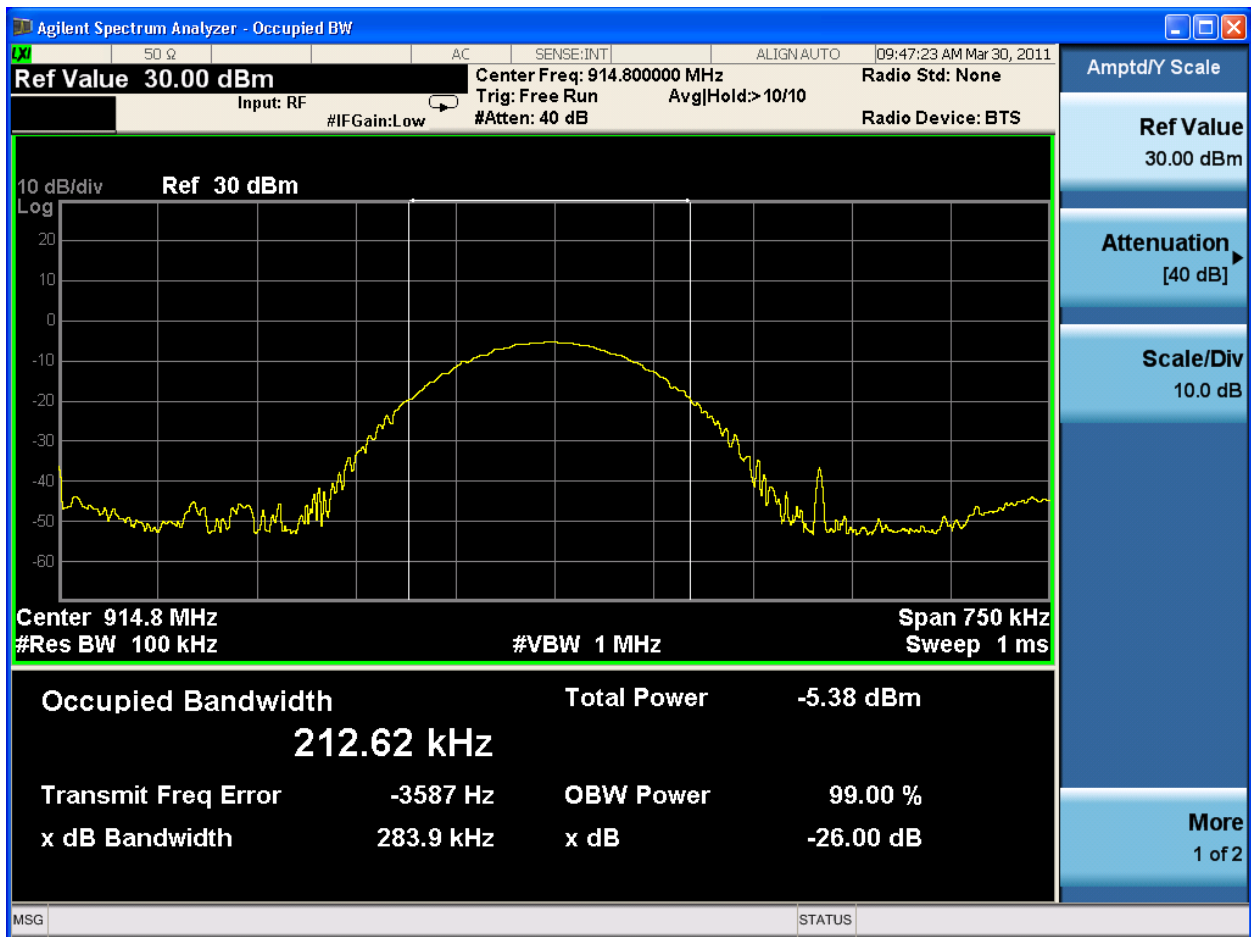
Test Method	15.247	Section	1
UUT Model No.	EN1233D	Test Date	30-Mar-11
UUT Serial Number(s)		Normal Temp	25.93 C
UUT Description	Security transmitter	Normal Humidity	31.63%
UUT MFGR:	Inovonics Wireless		
Tested By:	HB	Test Result	Pass



20 dB Occupied Bandwidth

Test Method	15.247	Section	2
UUT Model No.	EN1233D	Test Date	30-Mar-11
UUT Serial Number(s)		Normal Temp	25.93 C
UUT Description	Security transmitter	Normal Humidity	31.63%
UUT MFGR:	Inovonics Wireless		
Tested By:	HB	Test Result	Pass

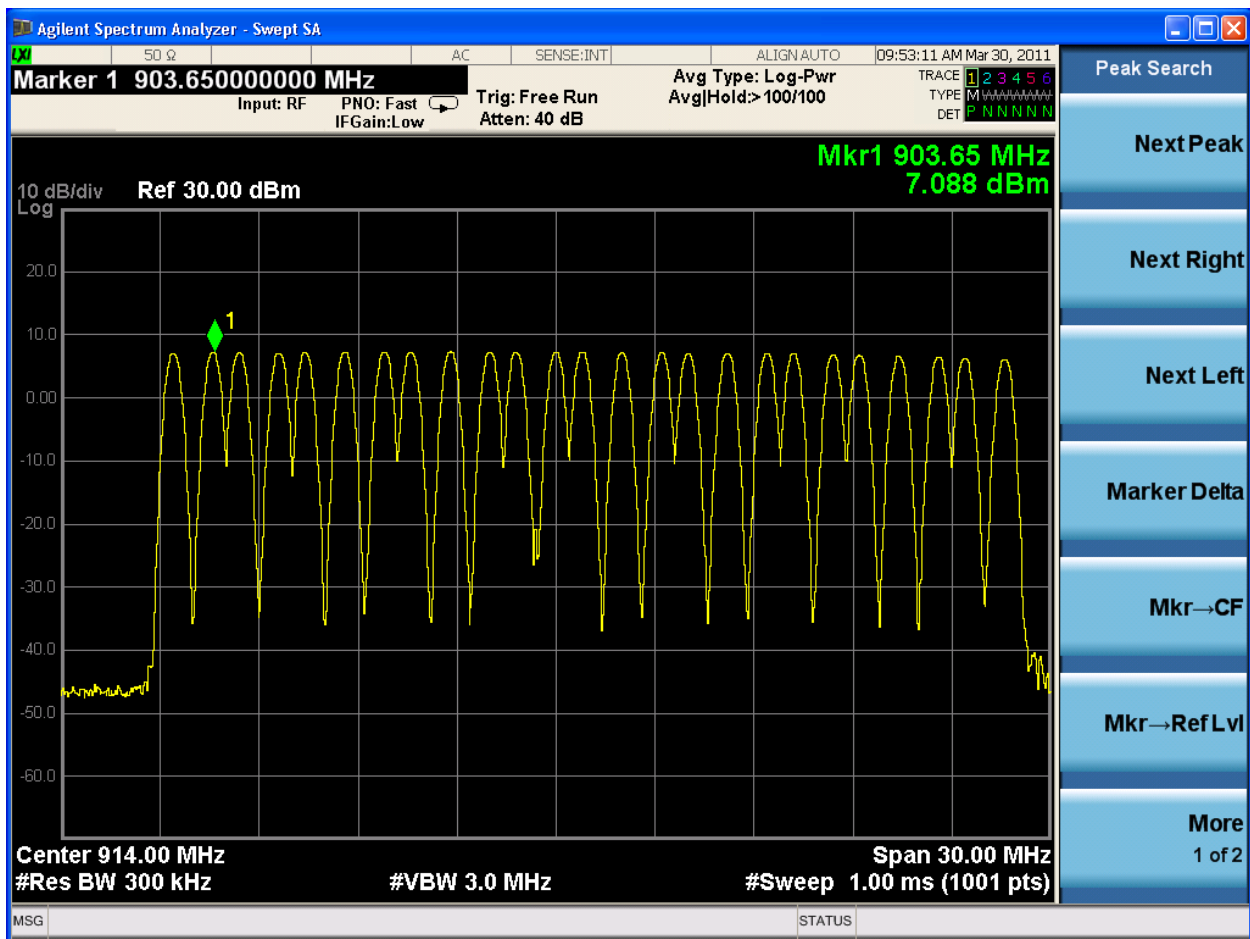
Plot shows the 20 dB occupied bandwidth of a single channel to demonstrate compliance with 15.247(a)(1)(i) and RSS-210, A8.1(c). The 20 dB occupied bandwidth is 268.5 kHz.



Number of Transmitter Channels

Test Method	15.247	Section	3
UUT Model No.	EN1233D	Test Date	30-Mar-11
UUT Serial Number(s)		Normal Temp	25.93 C
UUT Description	Security transmitter	Normal Humidity	31.63%
UUT MFR:	Inovonics Wireless		
Tested By:	HB	Test Result	Pass

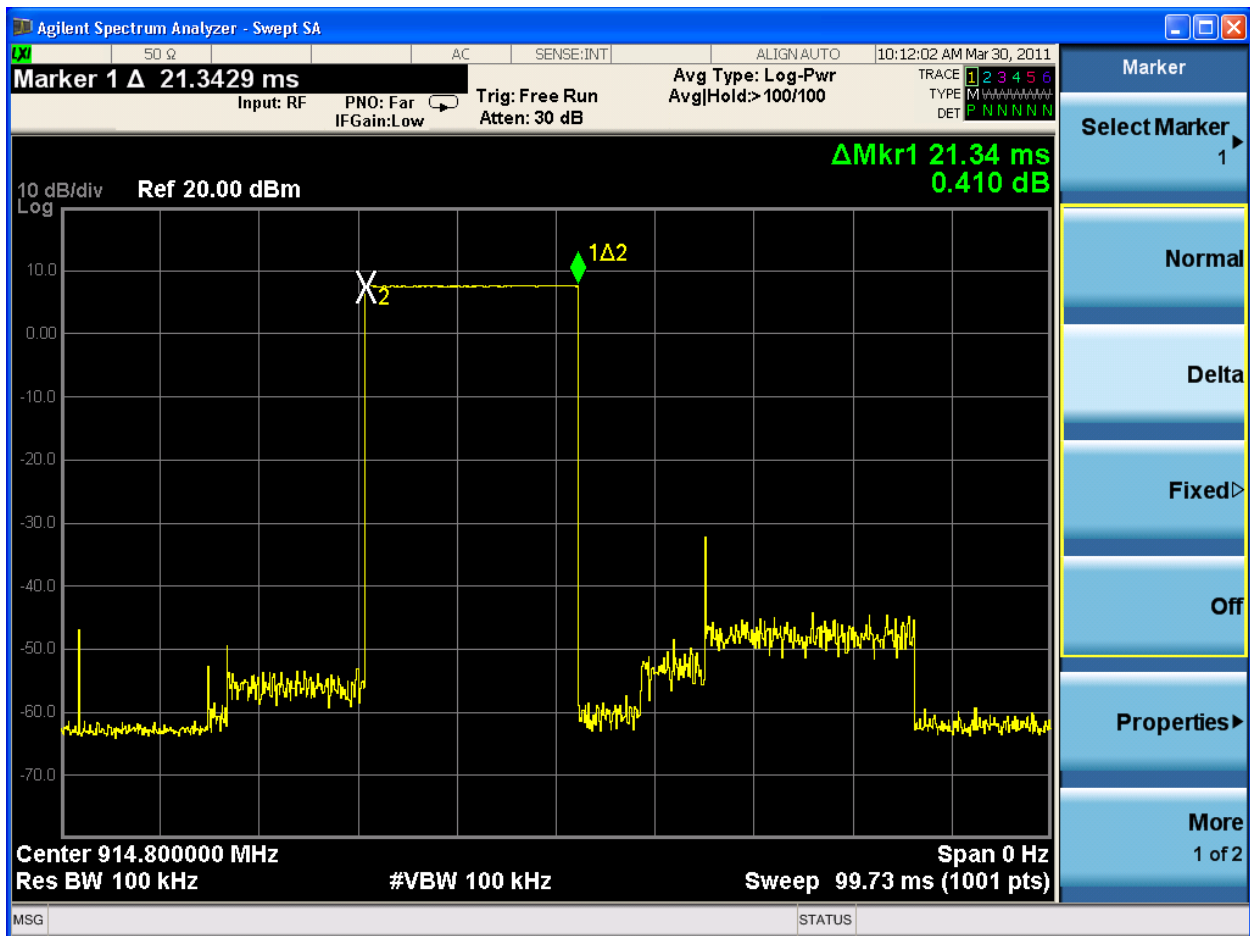
Plot demonstrates compliance with 15.247(a)(1)(i), and RSS-210, A8.1(c). This is a stored display of many sequential transmissions to show the overall band occupied by the transmitter.



Dwell Time

Test Method	15.247	Section	4
UUT Model No.	EN1233D	Test Date	30-Mar-11
UUT Serial Number(s)		Normal Temp	25.93 C
UUT Description	Security transmitter	Normal Humidity	31.63%
UUT MFGR:	Inovonics Wireless		
Tested By:	HB	Test Result	Pass

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 Dwell Time in ms	Maximum limit in seconds	Complies
21.34	0.4	Yes



315 CTC Boulevard Louisville, Colorado 80027 USA

phone: 800.782.2709 | fax: 303.939.8977 | www.inovonics.com

Test Instrument Declarations

Test Method	15.247	Section	1 through 4
UUT Model No.	EN1233D		
UUT Serial Number(s)			
UUT Description	Security transmitter		
UUT MFGR:	Inovonics Wireless		

Testing Instrument

Description	Signal Analyzer		
Make	Agilent	Calibration date	27-Sep-10
Model #	N9020A	Calibration due date	27-Sep-11
Serial #	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

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

$$DCCF = 20 \log \left(\frac{20.8 \text{ ms}}{100 \text{ ms}} \right)$$

$$DCCF = -13.6 \text{ dB}$$