Exhibit 7: Test Report

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Exhibit 7.0 : REPORT OF MEASUREMENTS

7.0 Introduction

7.0.1 Test Facility Qualifications

The CTL test facility is listed by the FCC, reference number 31040/PRV – 1300F2, as being a site from which the FCC will accept radiated and conducted emissions test data.

7.0.1.1 National Institute of Standards and Technology (NVLAP)

The CTL test facility has achieved NVLAP accreditation in the area of radiated and conducted emissions as specified below:

- International Special Committee on Radio Interference (CISPR)
  - 12/CIS22 : IEC/CISPR 22: 1993: Limits and methods of measurement of radio disturbance characteristics of information technology equipment.

- FCC Methods
  (a) 12/F01 : FCC Method – 47 CFR Part 15 – Digital Devices
  (b) 12/F01a : Conducted Emissions, Power Lines, 450 kHz to 30 MHz
  (c) 12/F01b : Radiated Emissions

- Australian Standards referred to by clauses in AUSTEL Technical Standards
  (a) 12/T50 : AS/NZS 3260: Safety of ITE including Electrical Business Equipment
  (b) 12/T51 : AS/NZS 3548: Electromagnetic Interference

7.0.1.2 Test Results Tractability

CTL personnel performed all testing. All measurements are traceable to NIST as measurements were made using:

- Calibrated test site w/procedures in accordance with ANSI 63.4 1992
- Calibrated measuring instruments traceable to NIST

7.0.2 Standards Referenced

Standards Applicable to EUT

- ANSI, *Methods of Measurement of Radio-Noise Emissions form Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz*, C63.4 (1992).

- Title 47 CFR Part 15, *Radio Frequency Devices* (October 1, 1997).

- Title 47 CFR Part 2, *Frequency Allocations and Radio Treaty Matters; General Rules and Regulations* (October 1, 1997).

Standards Applicable to Measurement Procedures

- *CISPR Specifications for Radio Interference Measuring Apparatus and Measurement Methods*, CISPR Publication 16, 2nd Edition (1996).

7.0.3 Electromagnetic Emissions Test Results Summary

7.0.3.1 Peak Transmit Power (Page 50)- Passed

7.0.3.2 Supply Voltage Variations (Page 56) - Passed

7.0.3.3 20dB Bandwidth (Page 58) – Passed

7.0.3.4 Adjacent Channel Separation (Page 62) – Passed

7.0.3.5 Number of Hopping Channels (Page 64) – Passed

7.0.3.6 Average Time of Occupancy (Page 68) – Passed

7.0.3.7 Conducted Spurious Emissions (See Exhibit 8) – Passed

7.0.3.8 Radiated Spurious Emissions (See Exhibit 8) – Passed

7.0.3.9 Conducted RF Emissions – Power Source (See Exhibit 8) – Passed

7.1 General Test Procedures

7.1.1 In General

The test procedures used in determining compliance with applicable FCC regulations were in accordance with applicable FCC test procedure requirements, and more specifically, with ANSI C63.4.[1] All measurements were performed using the peak, CISPR quasi-peak, or average detector function of the test receiver or spectrum analyzer. The detector bandwidths were as follows:

1. Frequencies Range - 10kHz to 150kHz
   Quasi-Peak : 200 Hz
   Peak : 200 Hz
   Average : 200 Hz
2. Frequency Range - 150kHz to 30kHz
   Quasi-Peak : 9 kHz
   Peak : 10 kHz
   Average : 10 kHz
3. Frequency Range - 30MHz to 1GHz
   Quasi-Peak : 120 kHz
   Peak : 100 kHz
   Average : 100 kHz
4. Frequency Range - > 1GHz
   Quasi-Peak : N/A
   Peak : 1 MHz
   Average : 1 MHz

- Measurement Detector Functions and Bandwidths - **§ 15.35**
  The conducted and radiated emission limits presented in 47 CFR Part 15 are based on the following, unless other wise specified elsewhere in this part:
  (a) Frequencies below 1 GHz: **Quasi-Peak Detector**; Bandwidth – 120 kHz;
  (b) Frequencies above 1 GHz: **Average Detector**; Bandwidth – 1 MHz;
  Please note that there is also a limit on the radio frequency emissions, as measured using a **Peak Detector** function, corresponding to **20dB above the maximum permitted average limit** for the frequency being investigated.

[1] ANSI, *Methods of Measurement of Radio-Noise Emissions form Low-Voltage Electrical Equipment in the Range of 9kHz to 40GHz*, C63.4 (1992).

7.1.2 TEST EQUIPMENT

The tables below present the test equipment used to collect the data present in this exhibit:

DESCRIPTION	MANUFACTURER	MODEL	LAST CAL	CAL DUE	START FREQUENCY	STOP FREQUENCY
RECEIVER I	Rohde & Schwarz	ESMI	**06-22 -99**	06-22-00	20 Hz	26.5 GHz
RECEIVER II	Rohde & Schwarz	ESMI	**07-23-99**	07-23-00	20 Hz	26.5 GHz
Receiver	Rohde & Schwarz	ESVP	**N/A**	N/A	20 MHz	1.3 GHz
BiLog Antenna	Chase 1044	CBL6111	**02-15-99**	02-15-00	20 MHz	2.0 GHz
Horn Antenna	Spectrum Tech.	DRH-0118	**01-03-99**	01-03-00	1 GHz	25 GHz
Antenna Mast	EMCO	1050	**N/A**	N/A	N/A	N/A
Turntable	Macton		**N/A**	N/A	N/A	N/A
Antenna Mast	CTL	N/A	**N/A**	N/A	N/A	N/A
LISN	CHASE	ALN2070A	**08-24-99**	08-24-00	0 Hz	30 MHz
PULSE LIMITER	CHASE	CFL9206	**N/A**	N/A	0 Hz	30 MHz

7.2 Peak Transmit Power

7.2.1 Controlling FCC Regulation - § 15.247(b)(1)

The FCC limits the maximum peak output power of spread spectrum intentional radiators that use:

- a frequency hopping system;
- operating in the 2400-2483.5 MHz band;

to 1 watt.

The EUT described in this report, however, is to be certified as an RF MODULE, not a complete system. Consequently, due to safety concerns, the FCC limits the maximum peak output power (for RF Modules) to 250 mWatts.

7.2.2 Test Procedure

The following Test Procedures / Measurement Standards were followed:

- Direct Connection
  The EUT's antenna port was connected directly to the input of a Rohde & Swartz EMI analyzer via a short Cable. The EUT has two antenna ports labeled Port 0 and Port 1. Each port was tested.

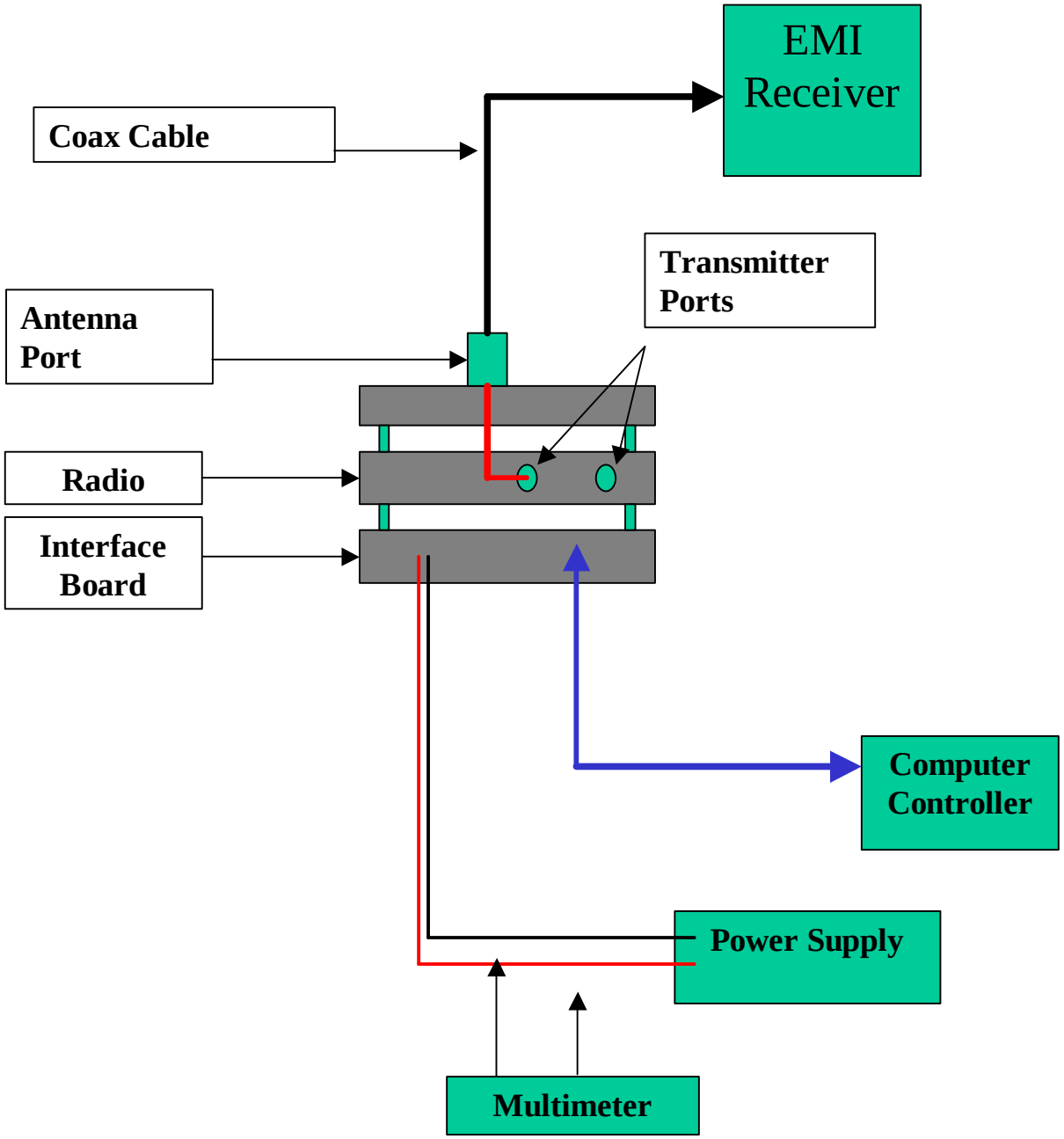
- Hopping Turned Off - **§ 15.31(c)**
  For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported.

- Number of Test Frequency - **§ 15.31(m)**
  Measurements at three different frequencies are required on intentional radiators or receivers, other than TV broadcast receivers, that have a frequency range of operation of more than 10 MHz: (1) one near the top, (2) one near the middle, (3) one near the bottom.

- The EUT in this report transmits over a frequency range of approximately 80 MHz (2.4005 GHz to 2.4820 GHz). **Consequently, the output power will be measured at the following frequencies: (1) 2.482 GHz, (2) 2.4405 GHz, (3) 2.4005 GHz.**

- Supply Voltage Variation - **§ 15.31(e)**
  For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The supply voltage for the module is 5.0 Volts dc. **Consequently, the supply voltage shall be varies from 4.25 Volts to 5.75 Volts.**

7.2.3 Test Setup Block Diagram



7.2.4 Test Results – Peak Transmit Power

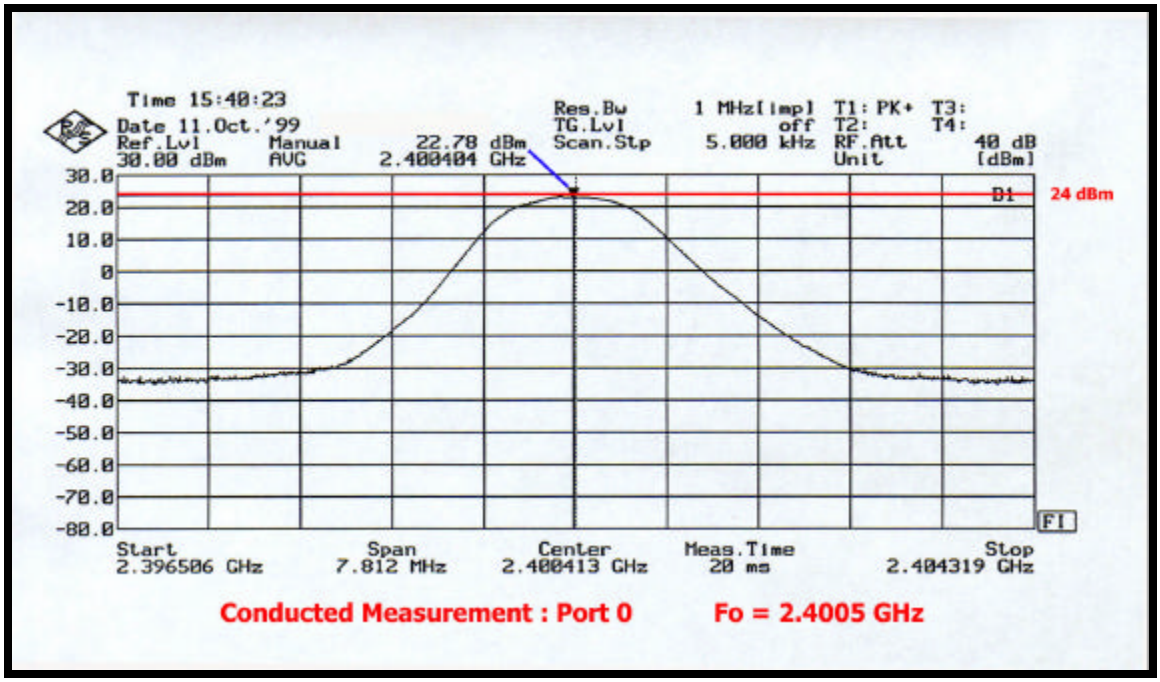
Test Date: October 11, 1999
Equipment Under Test: OverAir Solutions OS2400
Manufacturer: Locus Incorporated

Conversion Formulas

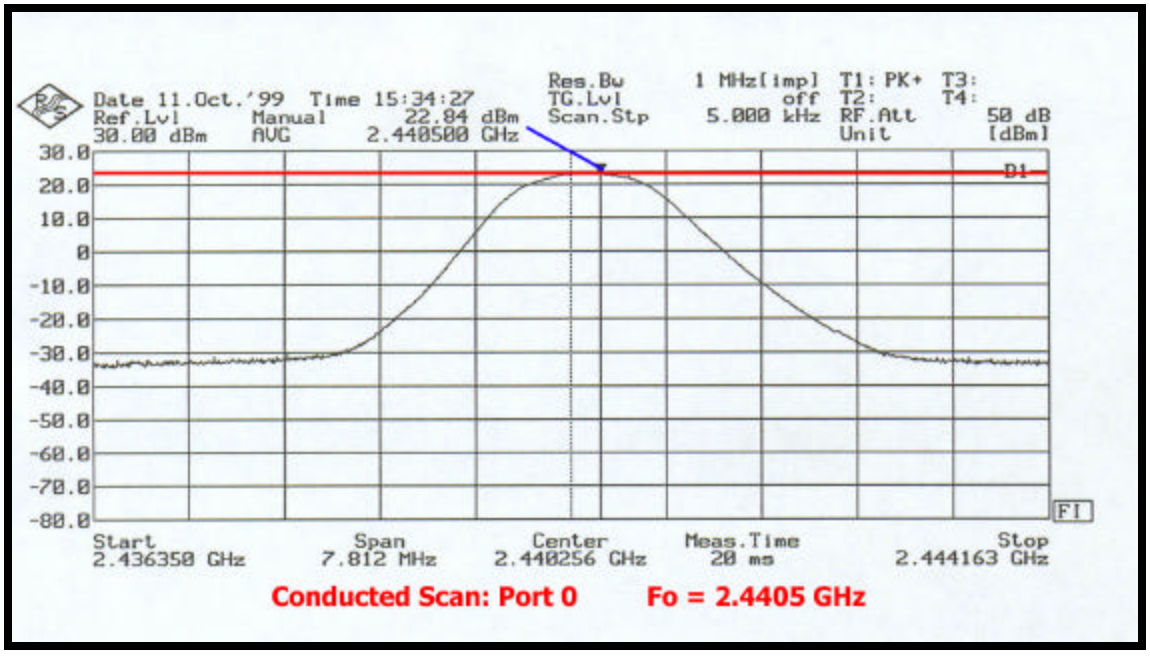
- $P_{dBm} = 30 + 10 \times Log_{10}(P_{Watts})$;
- $P_{(watts)} = 10^{[(P_{dbm} - 30)/10]}$;
- $P_{(dBm)} + 107 = V_{(dB\mu V)}$;

Fundamental Frequency (GHz)	EUT Transmitter Port	Measurement (dBm)	Measurement (dBµV)	Converted To (Watts)	FCC Limit (Watts)
2.4005	0	22.78	129.78	0.190	0.250
2.4405	0	22.84	129.84	0.192	0.250
2.4820	0	23.08	130.08	0.203	0.250
2.4010	1	22.94	129.94	0.197	0.250
2.4410	1	23.42	130.42	0.220	0.250
2.4810	1	22.69	129.69	0.186	0.250

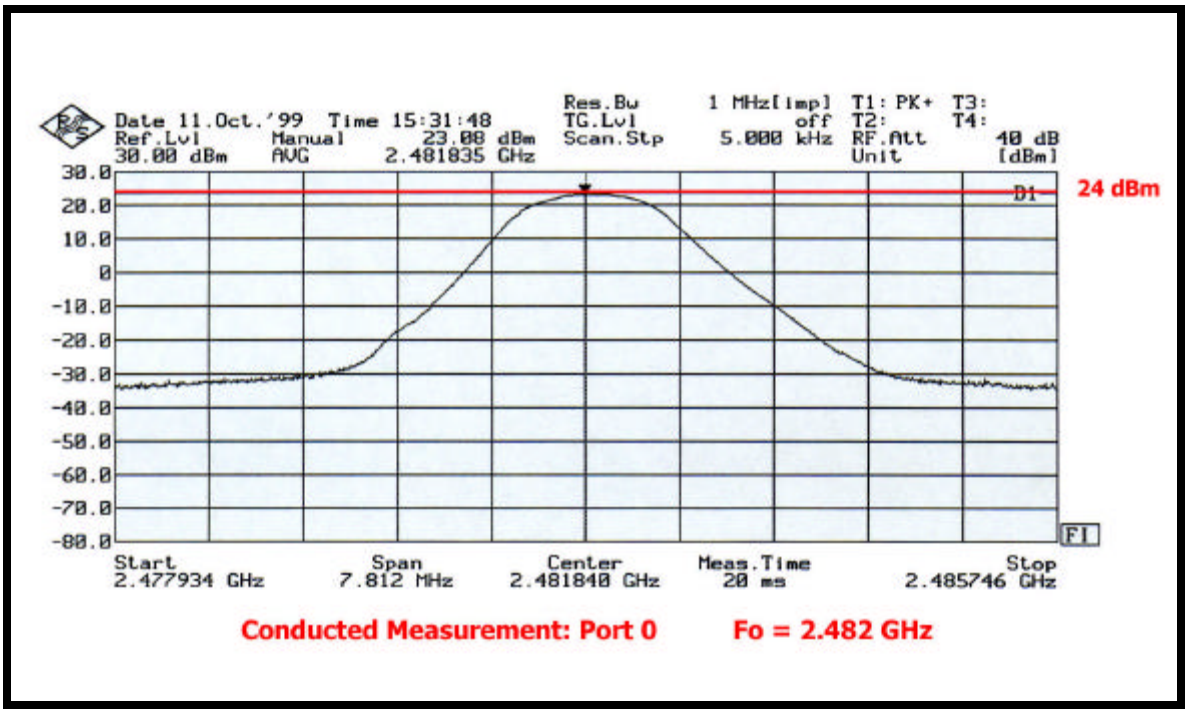
Test Data : Peak Power Plots



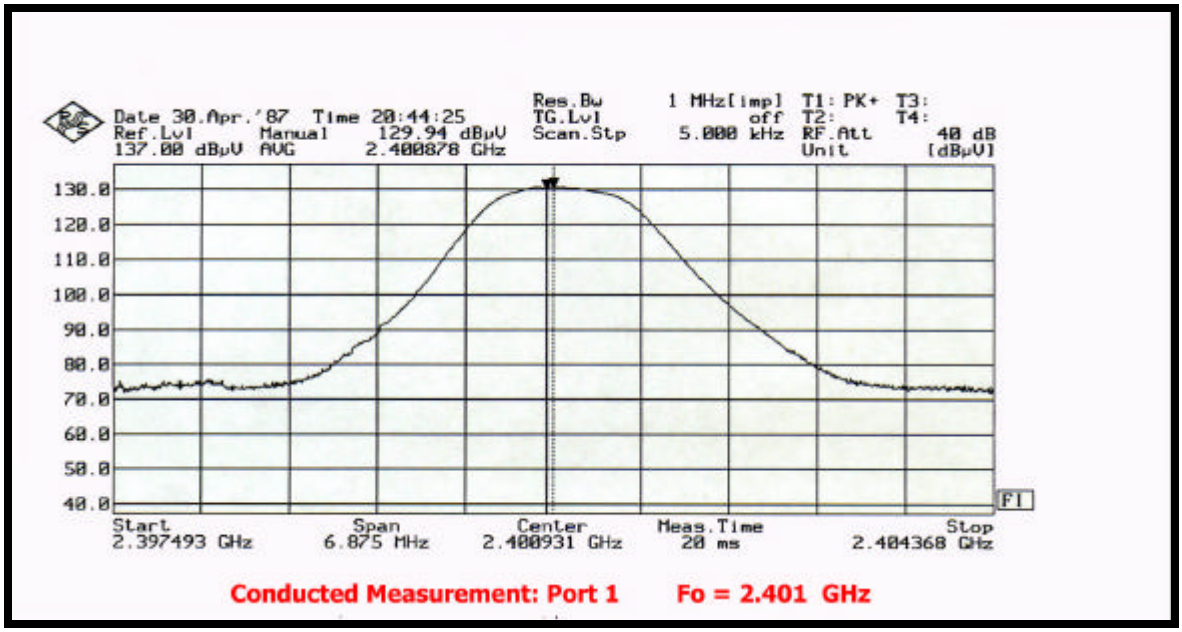
Test Data : Port 0 - 2.4005 GHz (Bottom)



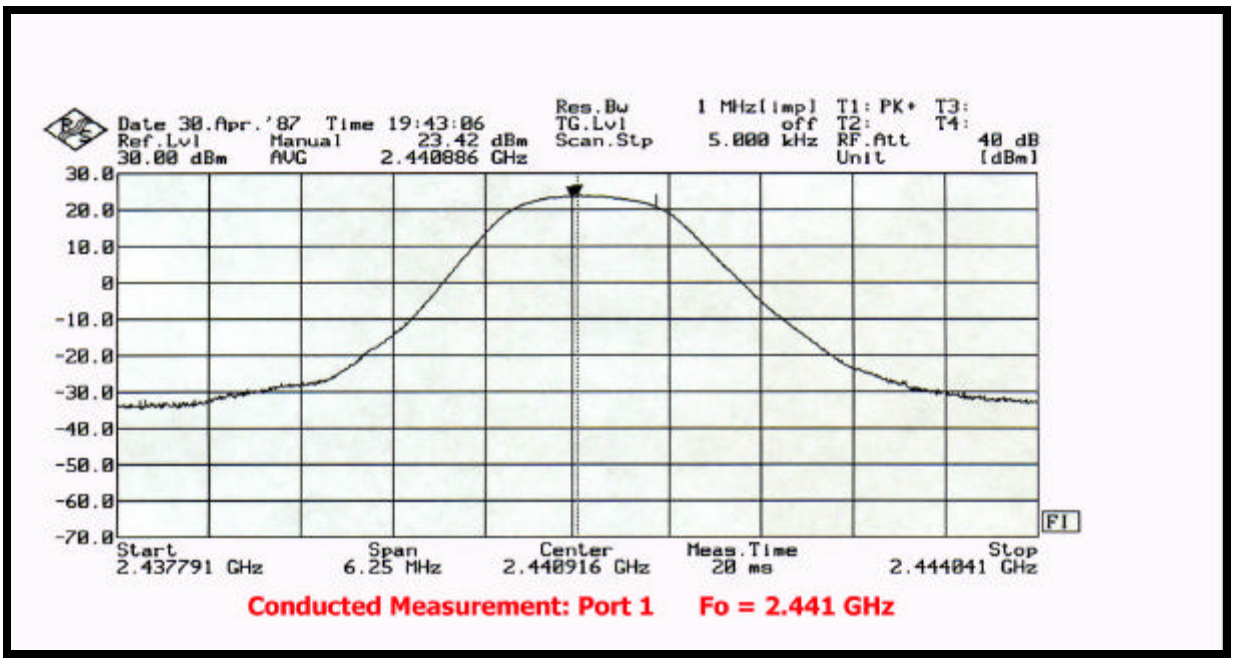
Test Data : Port 0 - 2.4405 GHz (Middle)



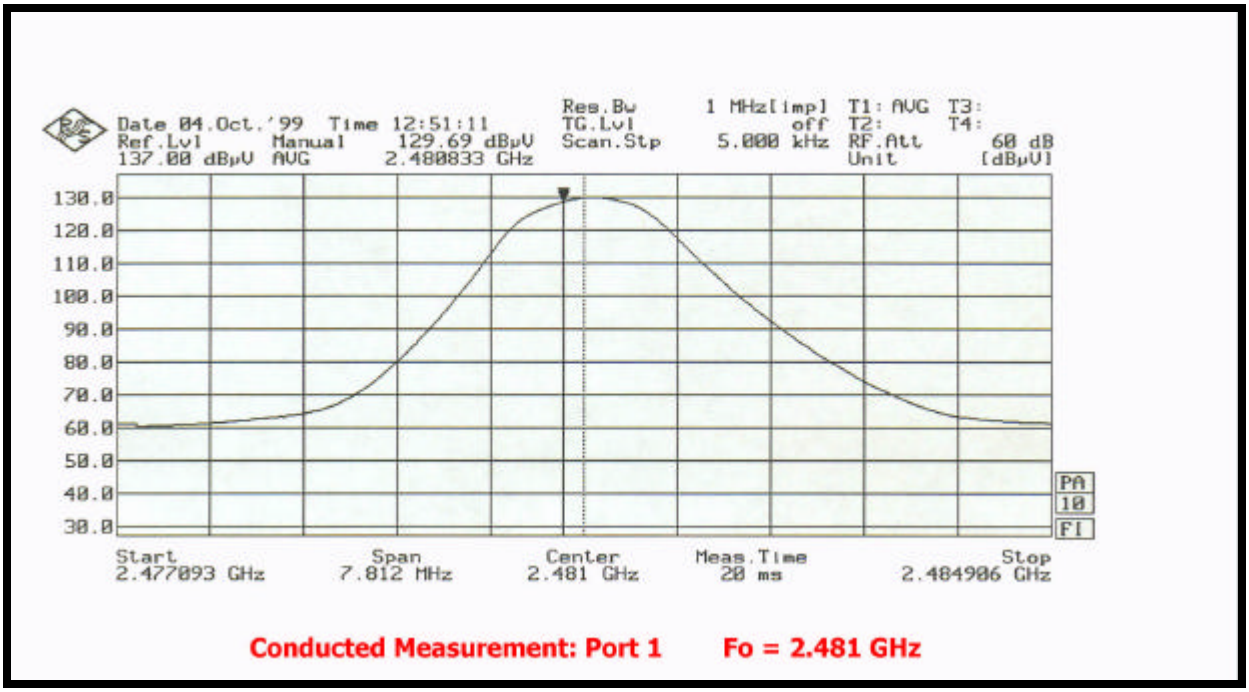
Test Data : Port 0 - 2.4820 GHz (Top)



Test Data : Port 1 - 2.4010 GHz (Bottom)



Test Data : Port 1 - 2.441 GHz (Middle)



Test Data : Port 1 - 2.481 GHz (Top)

7.2.5 Test Results – Supply Voltage Variations

Test Date: October 11, 1999
Equipment Under Test: OverAir Solutions OS2400
Manufacturer: Locus Incorporated

TEST PARAMATERS
The manufacturer specifications require a 5.0 Vdc supply voltage for the module.
Consequently, the supply voltage shall be varied from 4.25 Volts to 5.75 Volts (from 85% to 115%).

Voltage Level (Vdc)	Port 0 – Output Power (dBm)			Port 1 – Output Power (dBm)		
	2.4005 (GHz)	2.4405 (GHz)	2.4820 (GHz)	2.4010 (GHz)	2.4410 (GHz)	2.4810 (GHz)
4.25	21.8	22.1	21.9	21.7	22.5	21.0
4.40	22.1	22.3	22.3	22.0	22.7	21.2
4.60	22.4	22.4	22.6	22.4	22.8	21.4
4.80	22.6	22.9	22.8	22.7	23.0	21.9
5.00	**22.9**	**23.0**	**23.1**	**22.9**	**23.2**	**22.7**
5.20	23.2	23.4	23.3	23.2	23.4	22.9
5.40	23.4	23.6	23.5	23.4	23.6	23.4
5.60	23.6	23.6	23.6	23.6	23.8	23.7
5.75	23.8	23.8	23.8	23.7	24.0	24.0

Port 0 : Software Power Code : 40
Port 1 : Software Power Code : 56

(Software Power Code can be changed from 10 to 63)

The manufacturer shall individually calibrate each module so that varying the supply voltage does not allow the module to transmit above 24 dBm. The end user cannot change the power code set by the manufacturer.

7.3 Bandwidth (20dB) & Adjacent Channel Separation

7.3.1 Controlling FCC Regulation - §15.247(a)(1)

Operation under the provisions of §15.247 is limited to frequency hopping and direct sequence spread spectrum intentional radiators that comply with the following provisions:

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, **whichever is greater**. [§15.247(a)(1)];

- The maximum 20dB bandwidth of the hopping channel is 1 MHz; [§15.247(a)(1)(ii)];

Consequently, one must determine the transmitter's 20dB bandwidth to determine if the transmitter complies with the channel separation requirements of §15.247.

7.3.2 Test Procedure

The following Test Procedures / Measurement Standards were followed:

- Direct Connection
  The EUT's antenna port was connected directly to the input of a Rohde & Swartz EMI analyzer via a short Cable. The EUT has two antenna ports labeled Port 0 and Port 1. Each port was tested.
- Hopping Turned Off - **§ 15.31(c)**
  For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported.

- **Bandwidth Measurement Only**
  Number of Test Frequencies - **§ 15.31(m)**
  Measurements at three different frequencies are required on intentional radiators or receivers, other than TV broadcast receivers, that have a frequency range of operation of more than 10 MHz: (1) one near the top, (2) one near the middle, (3) one near the bottom.

  The EUT in this report transmits over a frequency range of approximately 80 MHz (2.4005 GHz to 2.4820 GHz). **Consequently, the output power will be measured at the following frequencies: (1) 2.482 GHz, (2) 2.4405 GHz, (3) 2.4005 GHz.**

- **Channel Separation Measurement Only**
  The EUT was setup to transmit continuously for the frequency corresponding to Channel One. Next, the transmitter frequency was manually stepped up one Channel to Channel Two.

7.3.3 Test Setup Block Diagram

The test setup block diagram is identical to the test setup block diagram presented on Page 51 of this exhibit.

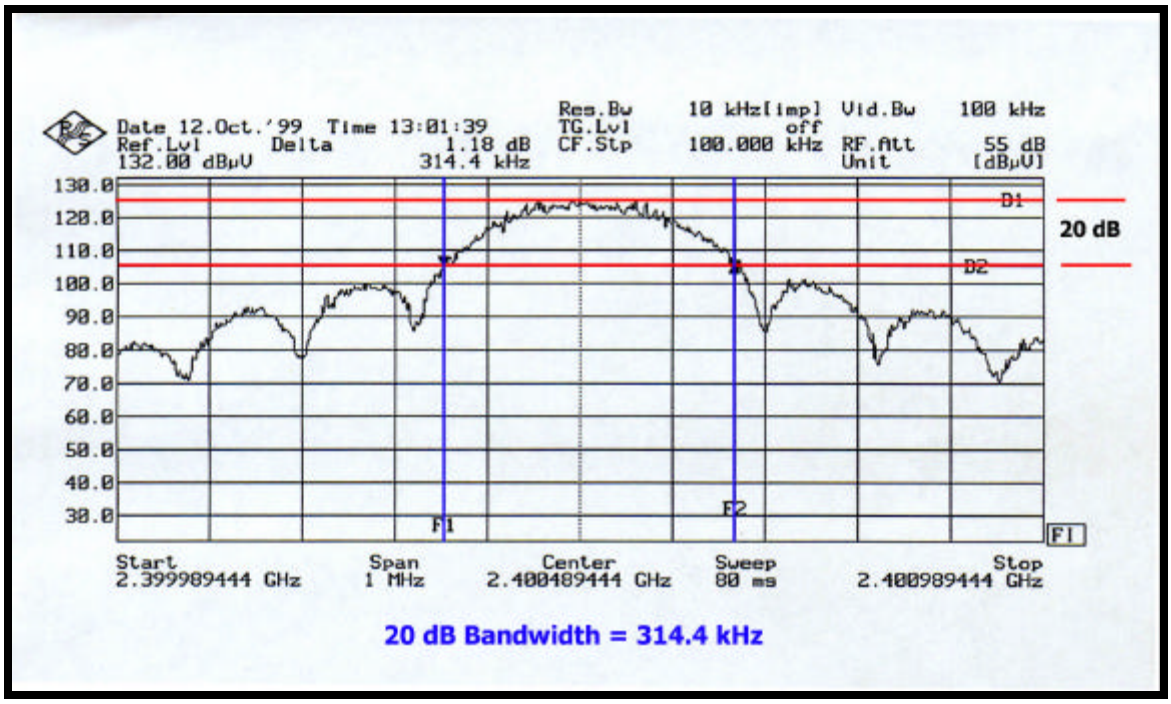
7.3.4 Test Results – Bandwidth (20dB)

Test Date: October 11, 1999
Equipment Under Test: OverAir Solutions OS2400
Manufacturer: Locus Incorporated

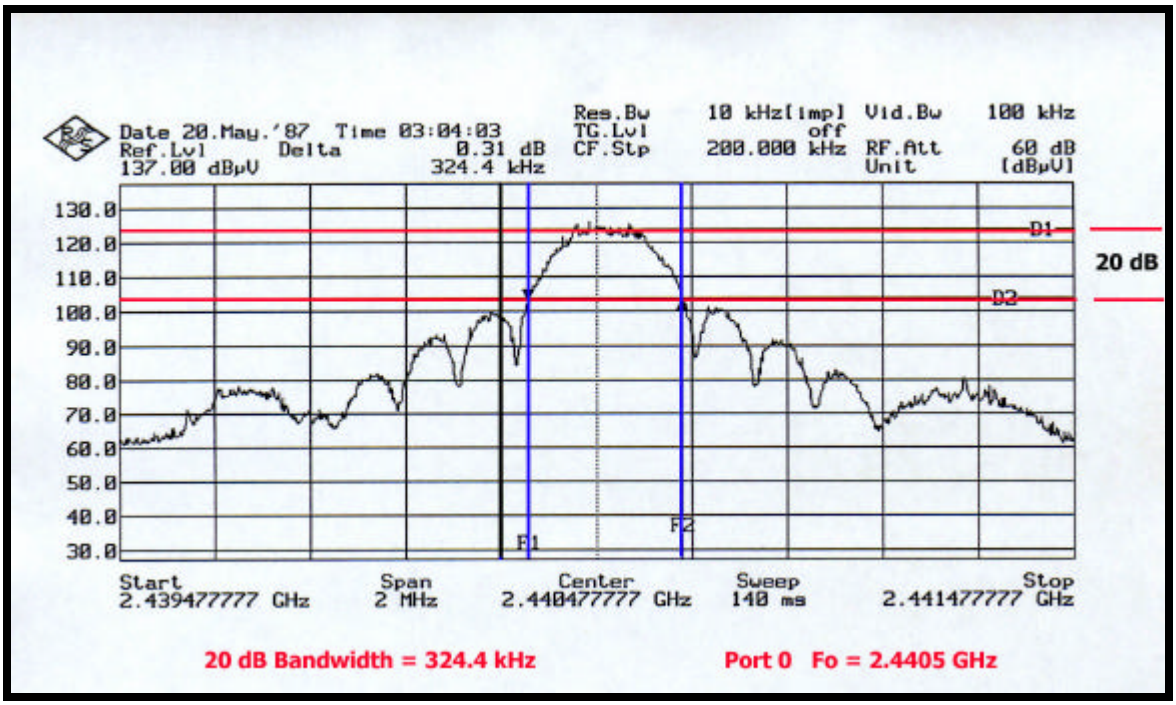
Note: The resolution bandwidth of the test receiver was set to 10 kHz over a frequency span of 1 MHz to 3 MHz.

Fundamental Frequency (GHz)	EUT Transmitter Port	Measured 20dB Bandwidth (MHz)	FCC Limit[2] (MHz)	Measured Bandwidth Complies (Y/N)
2.4005	0	0.3144	1.0	YES
2.4405	0	0.3244	1.0	YES
2.4820	0	0.3222	1.0	YES
2.4010	1	0.3125	1.0	YES
2.4410	1	0.3194	1.0	YES
2.4810	1	0.3229	1.0	YES

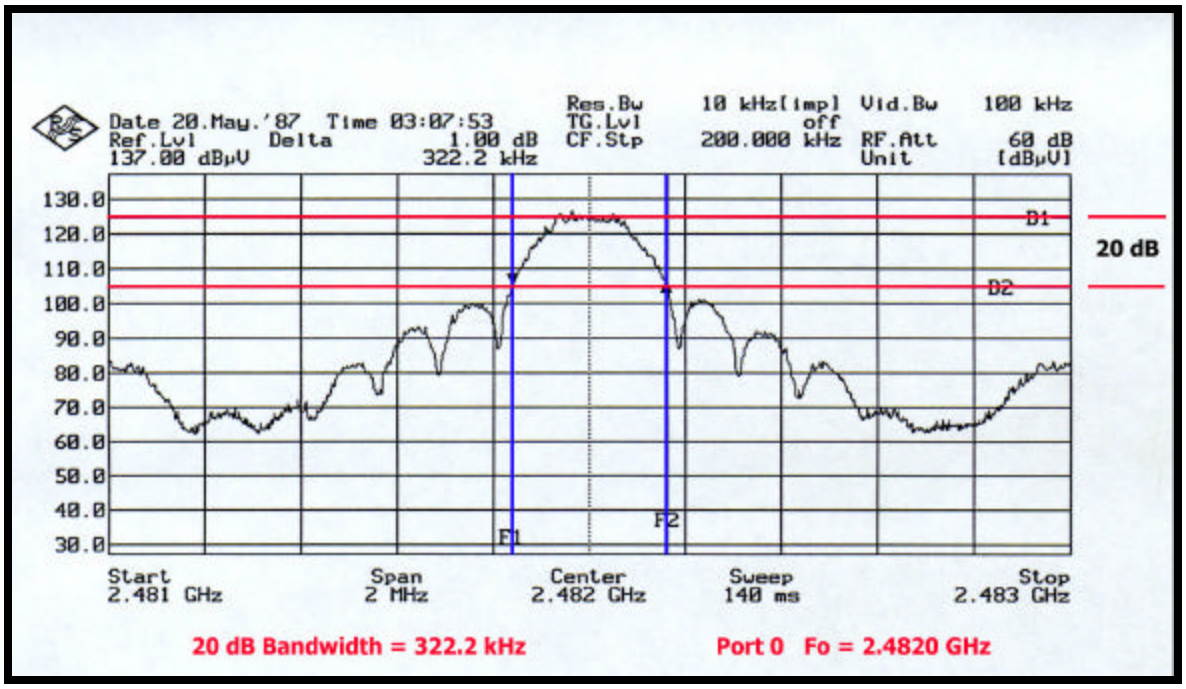
[2] *See* 47 CFR §15.247(a)(1)(ii)



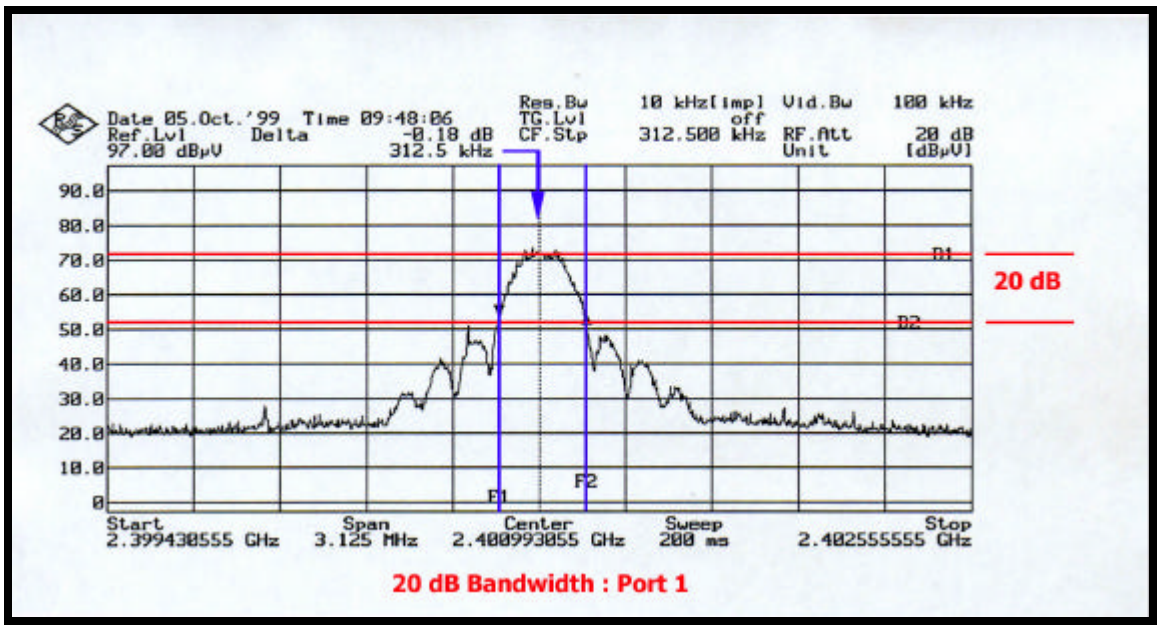
Test Data : Plot – Port 0: Fo = 2.4005 GHz



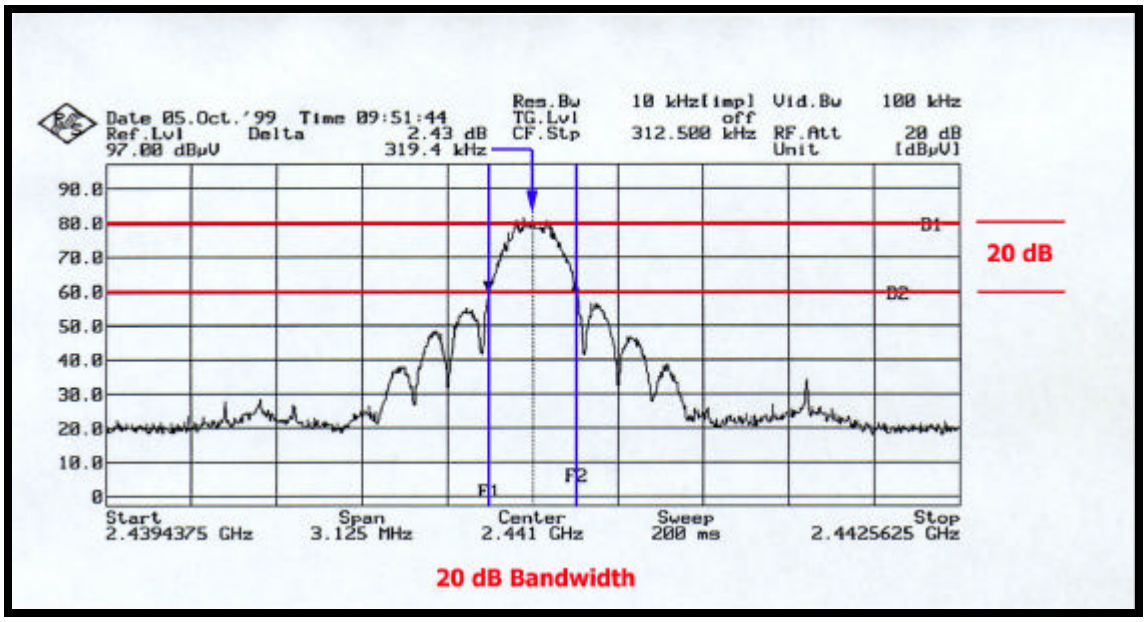
Test Data : Plot – Port 0: Fo = 2.4405 GHz



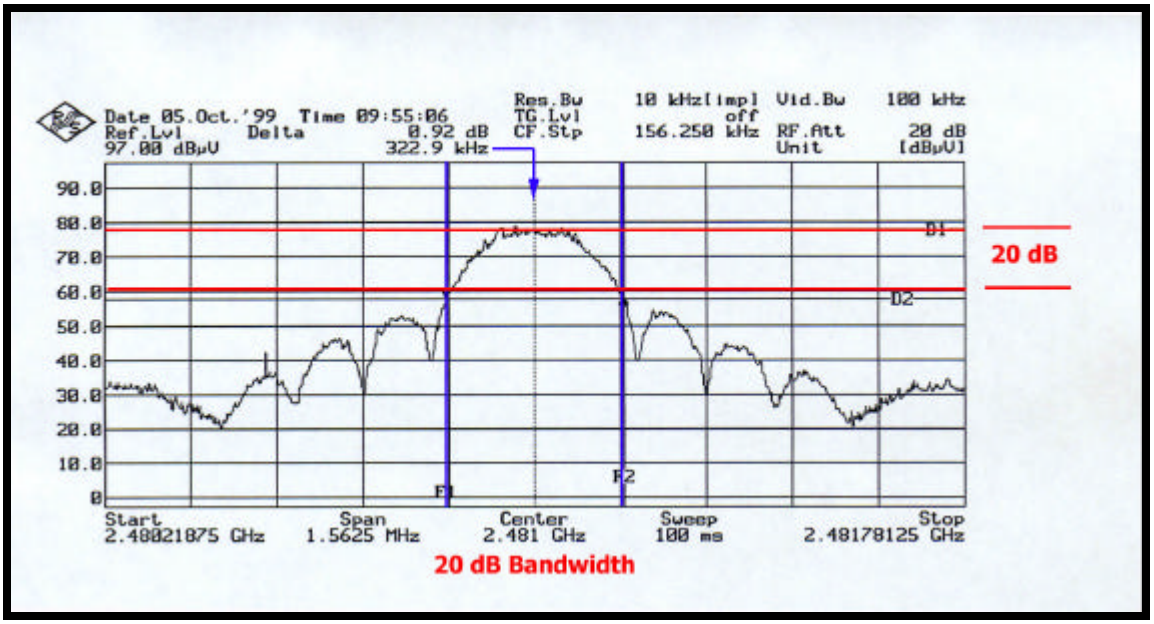
Test Data : Plot – Port 0: Fo = 2.4820 GHz



Test Data : Plot – Port 1: Fo = 2.4001 GHz



Test Data : Plot – Port 1: Fo = 2.4410 GHz



Test Data : Plot – Port 1: Fo = 2.4810 GHz

7.3.5 Test Results – Adjacent Channel Separation

Test Date: October 11, 1999
Equipment Under Test: OverAir Solutions OS2400
Manufacturer: Locus Incorporated

Note: The resolution bandwidth of the test receiver was set to 10 kHz over a frequency span of 1 MHz to 2 MHz. [See next page for Plots]

Test Results - Port 0

For Port 0, the adjacent channel separation was measured to be 504.4 kHz;

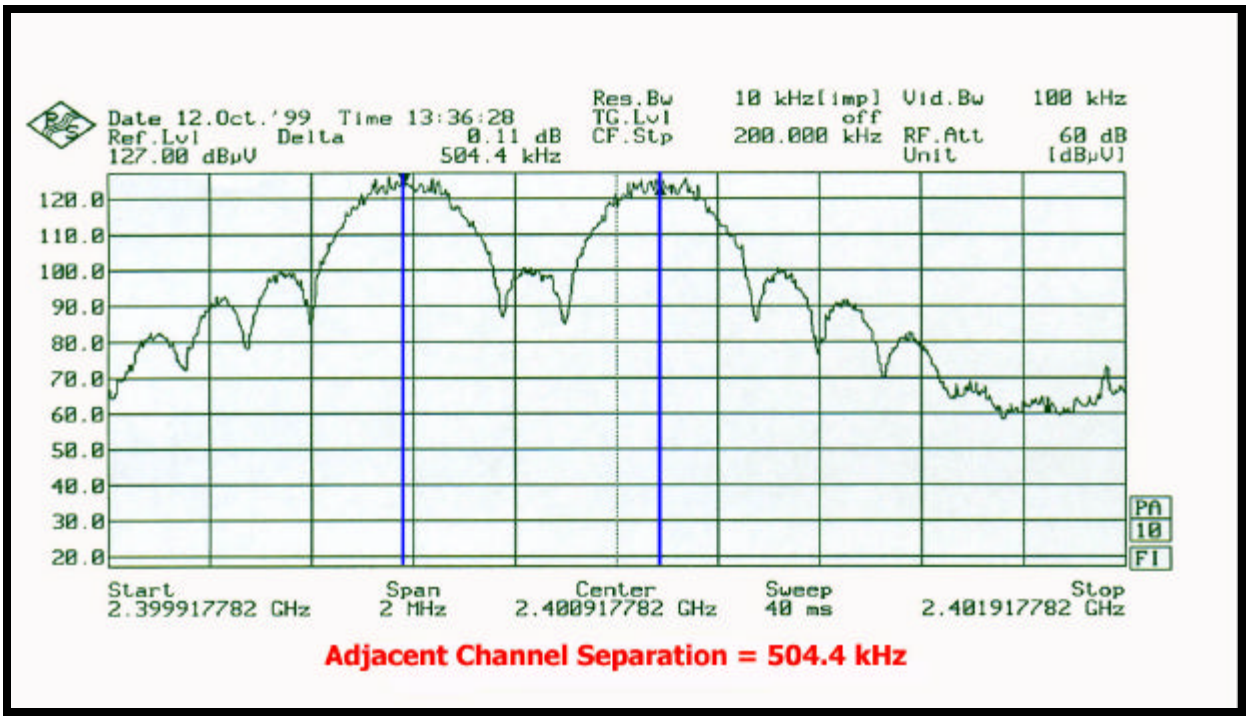
Test Results – Port 1

For Port 1, the adjacent channel separation was measured to be 495.4 kHz;

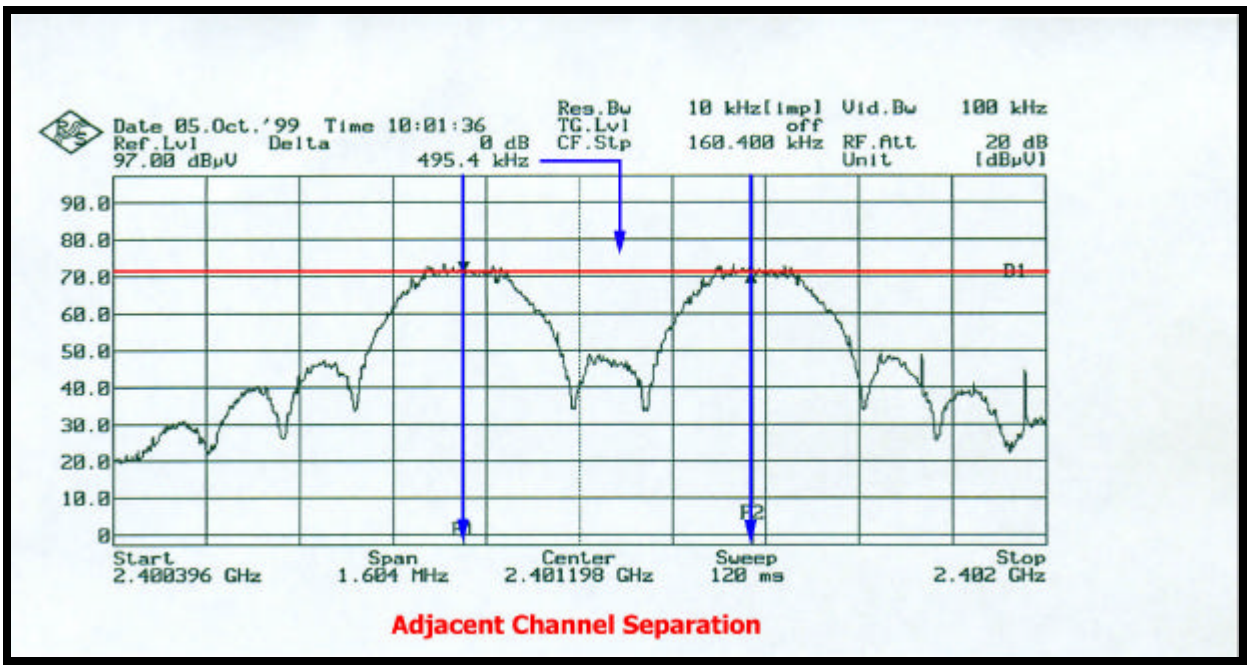
Judgment of Test Results

As stated in Section 7.3.1 of this exhibit, frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, **whichever is greater**. [§15.247(a)(1)]. The 20dB bandwidth proved to be approximately 320kHz, which is less than 495 kHz. In addition, 25 kHz is less than 495 kHz.

The EUT complies with the frequency hopping adjacent channel requirements of §15.247(a)(1).



Test Data : Port 0 – Channels 1 and 2



Test Data : Port 1 – Channels 1 and 2

7.4 Number of Hopping Channels

7.4.1 Controlling FCC Regulation - §15.247(a)(1)(ii)

- Frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 75 hopping frequencies.

7.4.2 Test Procedure

The following Test Procedures / Measurement Standards were followed:

- Direct Connection
  The EUT's antenna port is connected directly to the input of a Rohde & Swartz EMI analyzer via a short Cable. The EUT has two antenna ports labeled Port 0 and Port 1. Both ports shall be tested.

- The EUT is set to transmit in the normal hopping mode.

- The EMI analyzer START frequency is set to approximately 2.395 GHz and STOP frequency set to approximately 2.484 GHz for a frequency span of 89 MHz. The EMI analyzer's peak detector is used in the Max Hold mode.

7.4.3 Test Setup Block Diagram

The test setup block diagram is identical to the test setup block diagram presented on Page 51 of this exhibit.

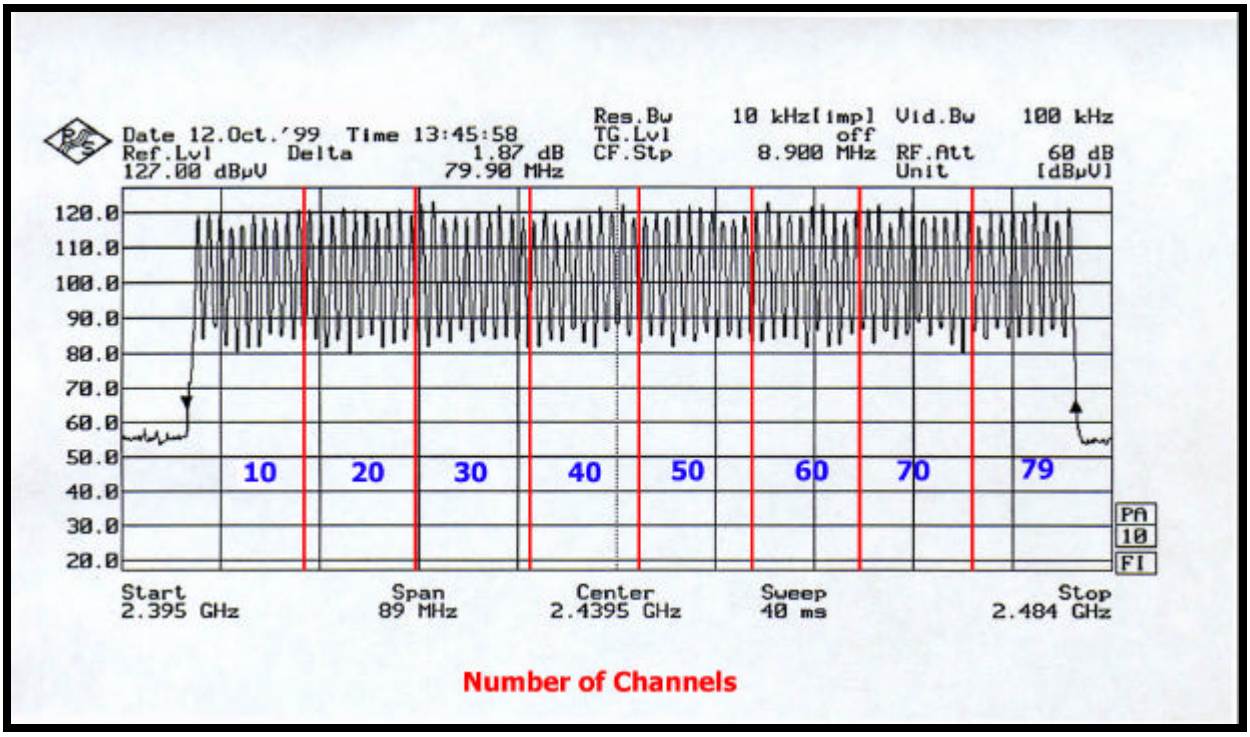
7.4.4 Test Results – Number of Hopping Channels

Test Date: October 11, 1999
Equipment Under Test: OverAir Solutions OS2400
Manufacturer: Locus Incorporated

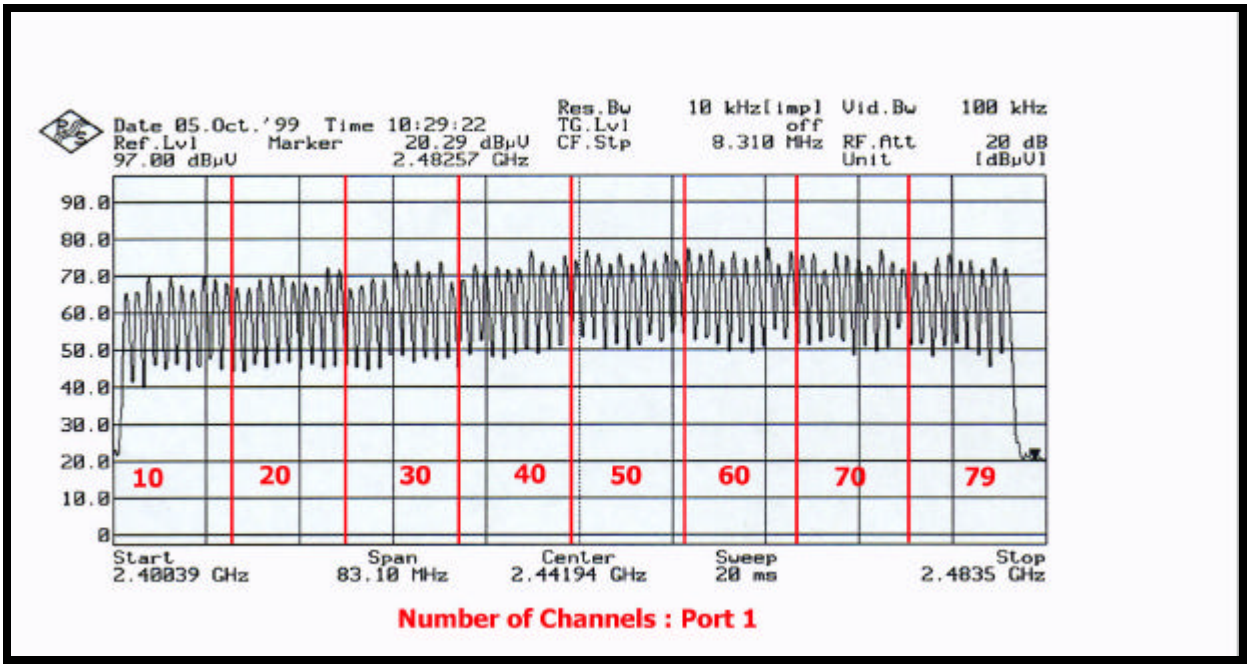
Test Results - Port 0
For Port 0, there were 79 separate hopping channels detected.

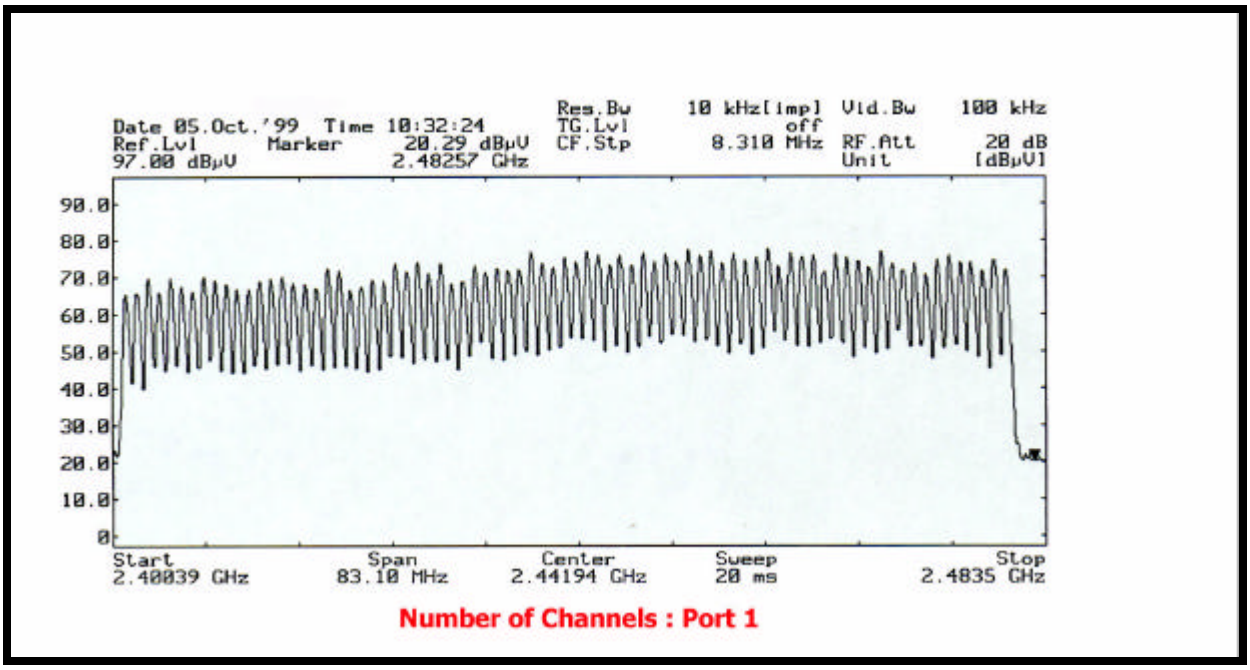
Test Results – Port 1
For Port 1, there were 79 separate hopping channels detected.

Judgment of Test Results
The EUT complies with the §15.247(a)(1)(ii) requirements for the number of hopping channels used by the EUT.



Test Data : Plot - Number of Hopping Channels – Port 0





Test Data : Plot - Number of Hopping Channels – Port 1

7.5 Average Time of Occupancy Per Channel

7.5.1 Controlling FCC Regulation - §15.247(a)(1)(ii)

- The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

7.5.2 Test Procedure

The following Test Procedures / Measurement Standards were followed:

- Direct Connection
  The EUT's antenna port is connected directly to the input of a Rohde & Swartz EMI analyzer via a short Cable. The EUT has two antenna ports labeled Port 0 and Port 1. Both ports shall be tested.

- The EUT is set to transmit in the normal hopping mode;

- **DWELL TIME**: Set the EMI analyzer to a Zero Frequency Span with the center frequency set to the first channel of the EUT's transmitter band;
- Use the EMI analyzer's Peak Detector in the Max Hold mode;
- Set the appropriate sweep time to capture one complete transmission. This measurement will be called the Dwell Time.

- **TIME BETWEEN TRANSMISSIOINS**: Now increase the sweep time so that two consecutive transmissions are captured. Measure the time between the two transmissions. This measurement will be called the Time Between Transmissions;

7.5.3 Test Setup Block Diagram

The test setup block diagram is identical to the test setup block diagram presented on Page 51 of this exhibit.

7.5.4 Test Results – Average Time of Occupancy

Test Date: October 11, 1999
Equipment Under Test: OverAir Solutions OS2400
Manufacturer: Locus Incorporated

Test Results - Port 0

Dwell Time (DT)
The DT on a particular frequency, while transmitting, was measured to be approximately 0.005 seconds.

Time Between Transmissions (TBT)
The TBT was measured to be approximately 0.86444 seconds.

Average Time of Occupancy (ATO)
The ATO, for a 30 second Total Time (TT), can be calculated as follows:

(1) DT + TBT = period = (0.005) + (0.86444) = 0.8694 seconds;

(2) (TT) / period = Number of on/off cycles = (30) / 0.8694 = 34.505 on/off cycles;

(3) # of ON cycles = 34 + 1 (if .505 > DT/Period); DT/Period = 0.0058 seconds

(4) Since (.505 > 0.0058) --- # of ON cycles = 35;

(5) ATO = (DT) x (# of ON cycles) = (0.005 s) x (35) = 175 ms

Judgment of Test Results

The EUT, for Port 0, complies with the Average Time of Occupancy requirement stated in §15.247(a)(1)(ii).

Test Results - Port 1

Dwell Time (DT)
The DT on a particular frequency, while transmitting, was measured to be approximately 0.005 seconds.

Time Between Transmissions (TBT)
The TBT was measured to be approximately 0.86666 seconds.

Average Time of Occupancy (ATO)
The ATO, for a 30 second Total Time (TT), can be calculated as follows:

(1) DT + TBT = period = (0.005) + (0.86666) = 0.8717 seconds;

(2) (TT) / period = Number of on/off cycles = (30) / 0.8717 = 34.417 on/off cycles;

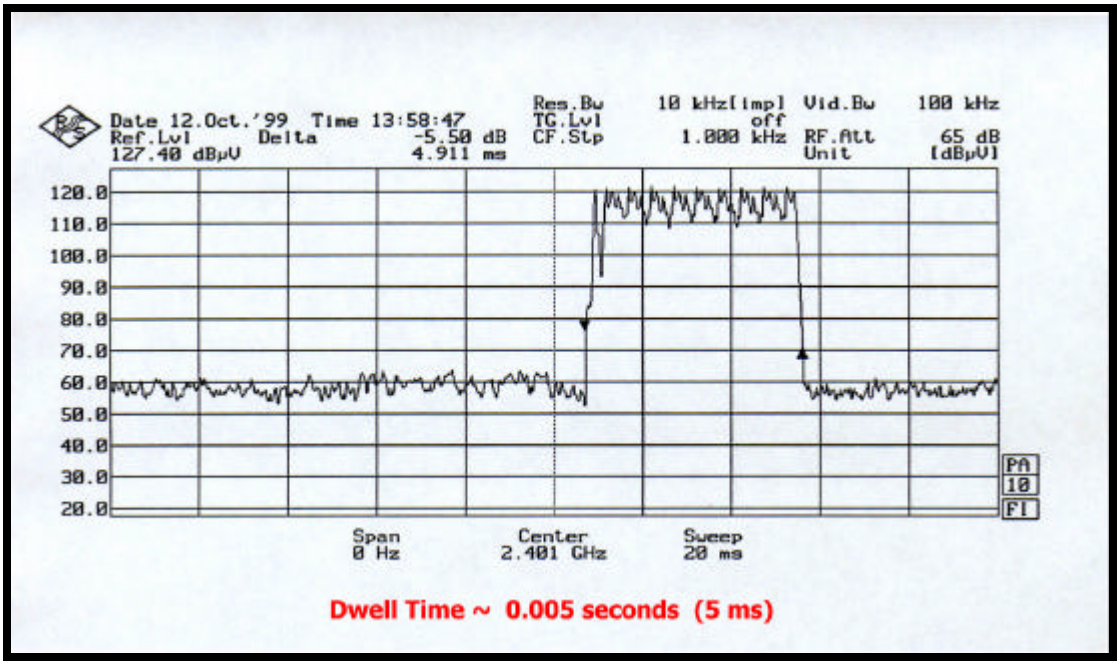
(3) # of ON cycles = 34 + 1 (if .417 > DT/Period); DT/Period = 0.0057 seconds

(4) Since (.417 > 0.0057) ? # of ON cycles = 34 + 1 = 35;

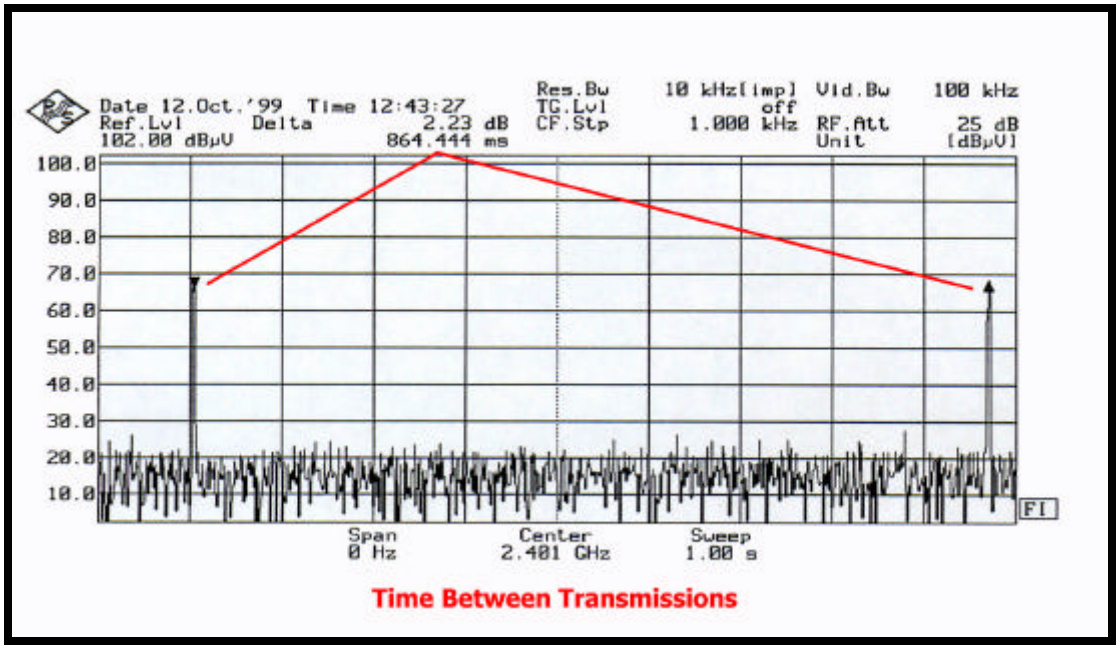
(5) ATO = (DT) x (# of ON cycles) = (0.005 s) x (35) = 175 ms

Judgment of Test Results

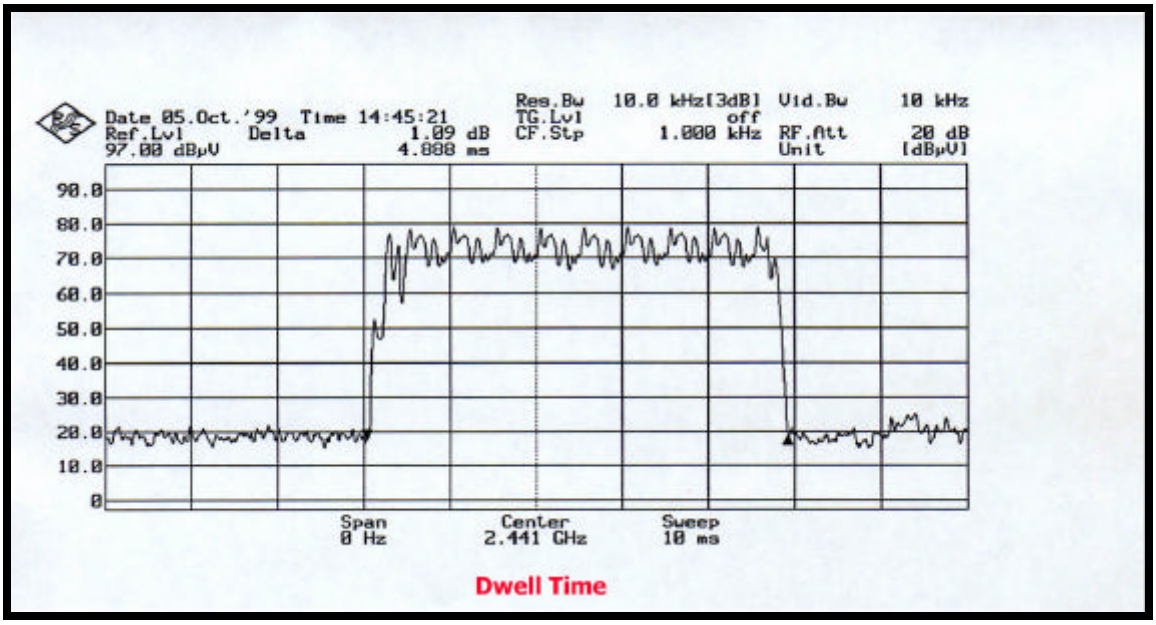
The EUT, for Port 1, complies with the Average Time of Occupancy requirement stated in §15.247(a)(1)(ii).



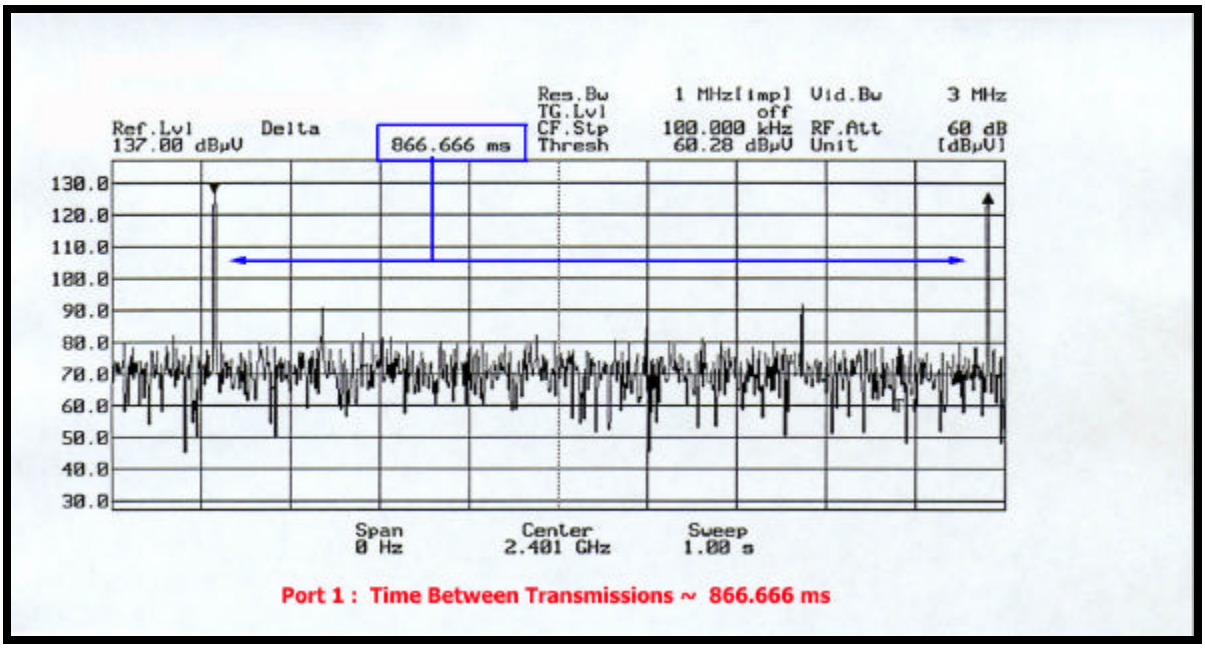
Test Data : Plot – Dwell Time – Port 0



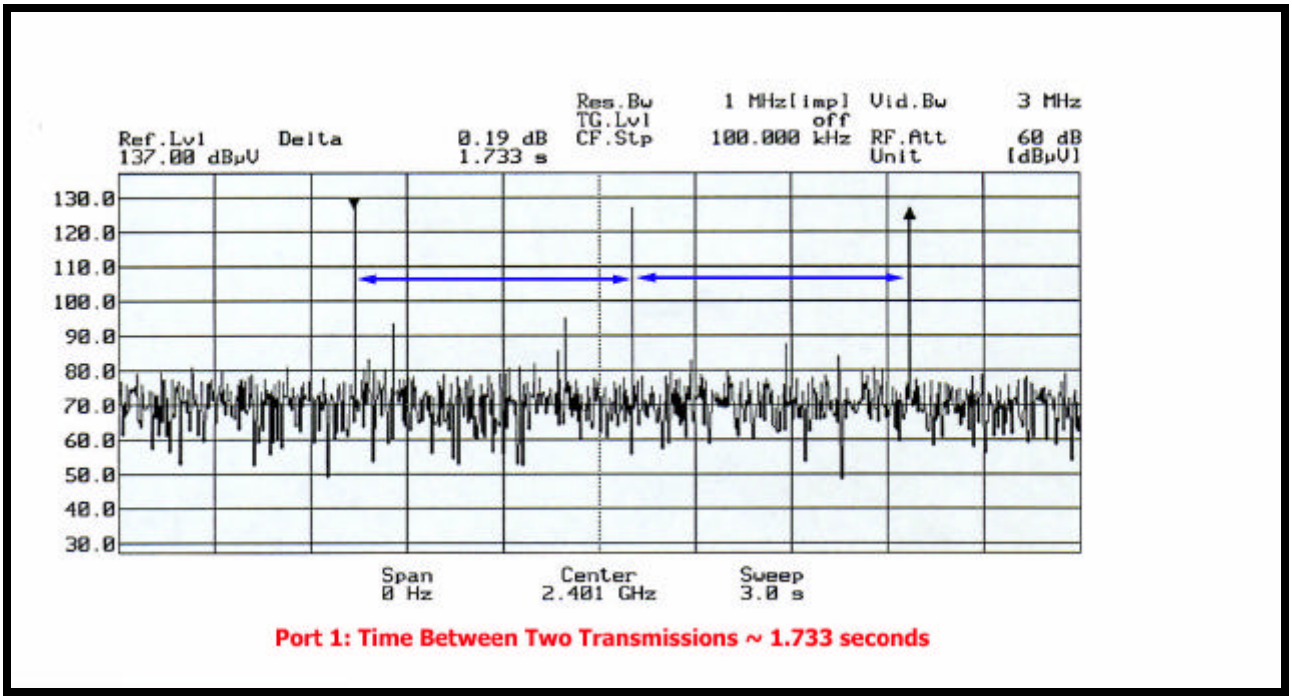
Test Data : Plot – Time Between Transmissions – Port 0



Test Data : Plot – Dwell Time – Port 1



Test Data : Plot – Time Between Transmissions – Port 1



Test Data : Plot – Time Between Transmissions – Port 1