



Engineering and Testing for EMC and Safety Compliance

CERTIFICATION APPLICATION REPORT  
FCC PART 15.247 CERTIFICATION

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<b>FCC ID:</b>	GU69460IPLA3021	<b>GRANTEE FRN NUMBER:</b>	0003583150
<b>PLAT FORM:</b>	94xx Series	<b>RTL WORK ORDER NUMBER:</b>	2002190
<b>MODEL(S):</b>	9460IP	<b>RTL QUOTE NUMBER:</b>	QRTL02-593
<b>DATE OF TEST REPORT:</b>	April 17, 2003		
<b>American National Standard Institute:</b>	ANSI C63.4: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz		
<b>FCC Classification:</b>	DSS – Part 15 Spread Spectrum Transmitter Frequency Hopping		
<b>FCC Rule Part(s):</b>	Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Frequency Hopping System		
<b>Industry Canada Standard:</b>	RSS-210: Low Power License-Exempt Radio Communication Devices (All Frequency Bands)		
<b>Digital Interface Information</b>	Digital Interface was found to be compliant		
<b>Receiver Information</b>	Receiver was found to be compliant		
<b>Frequency Range (MHz)</b>	<b>Output Power* (W)</b>	<b>Frequency Tolerance</b>	<b>Emission Designator</b>
2402-2480	0.112	N/A	N/A

\* output power is maximum peak conducted

We, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report.

Furthermore, there was no deviation from, additions to, or exclusions from the FCC Part 2, FCC Part 15, Industry Canada RSS-210, ANSI C63.4, ANSI/TIA/EIA603, and ANSI/TIA/EIA 603-1.

Signature: 

Date: April 17, 2003

Typed/Printed Name: Desmond A. Fraser

Position: President

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## 1 GENERAL INFORMATION

### 1.1 SCOPE

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

IC RSS-210 Section 6.2.2(o): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

A direct sequence (DS) system is a spread spectrum (SS) system in which the carrier has been modulated by a high speed spreading code and an information data stream. The high-speed code sequence dominates the “modulating function” and is the direct cause of the wide spreading of the transmitted signal.

### 1.2 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

### 1.3 RELATED SUBMITTAL(S)/GRANT(S)

This is an original application for Certification for Paxar Americas, Inc., Model Name: Sierra Sport2™, Model Number: 9460IP, FCC ID: GU69460IPLA3021. The IF and LO’s were investigated and tested.

### 1.4 MODIFICATIONS

The gain of the dipole antenna originally supplied with the EUT caused the EUT to fail FCC/Industry Canada emission requirements. In order to meet FCC/Industry Canada requirements, this antenna was replaced with a redesigned dipole antenna with the following characteristics:

Antenna	Rparallel Ohms	Series Resistor Ohms	Without Attenuation Measured dB	With Attenuation Measured dB	Gain DBi	Calculated Attenuation DB	Measured Attenuation dB
5	220	33	-30.4	-34.0	-3.6	3.3	3.6

## 2 TEST INFORMATION

### 2.1 TEST JUSTIFICATION

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. 2402 MHz, 2440 MHz and 2480 MHz were tested and investigated from 9 kHz to 24 GHz. Data for all three channels is presented in this report.

The EUT contains an internal dipole antenna mounted within a plastic case. The antenna transmits, receives, and is connected to the PCMCIA WLAN internal antenna port.

The worst-case data taken in this report represents the highest data rate at 2 Mbps. The data rate of 1 Mbps was also investigated and found to be in compliance. The change in envelope did not cause the EUT to be non-compliant in any of the aforementioned modes.

### 2.2 EXERCISING THE EUT

The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted.

### 2.3 TEST RESULT SUMMARY

**TABLE 2-1: TEST RESULT SUMMARY FOR FCC RULES AND REGULATIONS**

STANDARD	TEST	PASS/FAIL OR N/A
FCC 15.205	Compliance with the Restricted Band Edge	Pass
FCC 15.207	Conducted Emissions	Pass
FCC 15.209	Radiated Emissions	Pass
FCC 15.247(a)(2)	Modulated Bandwidth	Pass
FCC 15.247(b)	Power Output	Pass
FCC 15.247(c)	Antenna Conducted Spurious Emissions	Pass
FCC 15.247(d)	Power Spectral Density	Pass

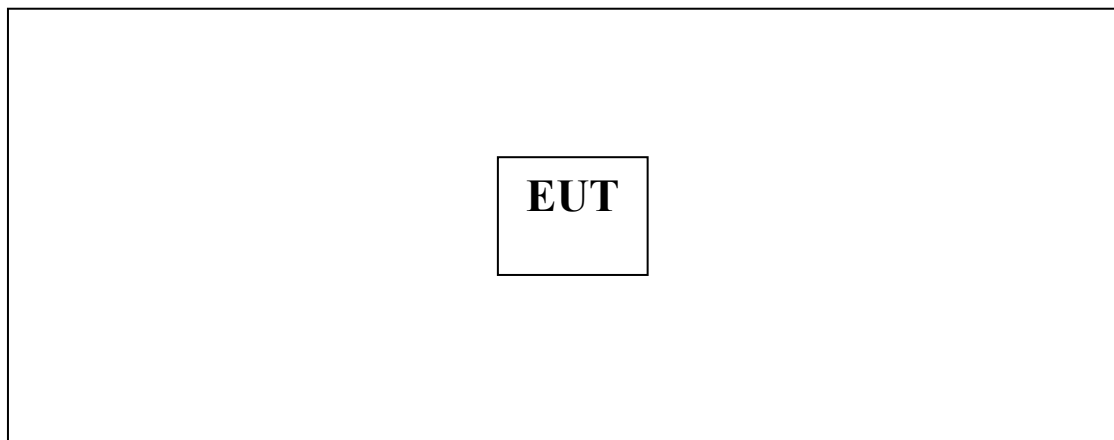
## 2.4 TEST SYSTEM DETAILS

The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system, are identified in Table 2-2.

**TABLE 2-2: EQUIPMENT UNDER TEST (EUT)**

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION	RTL BAR CODE
Printer	Paxar Americas, Inc.	M0946002	00A0F8A02A46	GU69460IPLA3021	Unshielded	14757
WLAN PCMCIA Card	Symbol Technologies	LA-3021-100M-US	00A97V388	H9PLA3021-100	N/A	N/A
Battery	Paxar Americas, Inc.	120095	N/A	N/A	N/A	14761
Battery Adapter Pack	Paxar Americas, Inc.	120096	X9080080	N/A	N/A	14758
Antenna	Paxar Americas, Inc.	124897 AA	5	N/A	Shielded I/O	14948

## 2.5 CONFIGURATION OF TESTED SYSTEM



**FIGURE 1: WORST CASE CONFIGURATION OF SYSTEM UNDER TEST**

### 3 COMPLIANCE WITH THE RESTRICTED BAND EDGE – FCC §15.205; IC RSS-210 §6.3

#### 3.1 TEST PROCEDURE

Compliance with the band edges was performed using the FCC’s “Radiated Measurement at a Band Edge” guidance document. The data taken in this report represents the worst case at 2 Mbps. The data rate at 1 Mbps was also investigated and found to be in compliance.

#### 3.2 BAND EDGE TEST EQUIPMENT

**TABLE 3-1: BAND EDGE TEST EQUIPMENT**

RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
900913	Hewlett Packard	85462A	EMI Receiver RF Section, (9 kHz - 6.5 GHz)	3325A00159	12/5/03
900914	Hewlett Packard	85460A	RF Filter Section, (100 kHz to 6.5 GHz)	3330A00107	12/5/03
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridged Guide Antenna (1-18 GHz)	2310	2/26/03
901231	IW Microwave Products	KPS-1503- 2400-KPS	High Frequency RF Cables	240"	1/30/04
901235	IW Microwave Products	KPS-1503-360- KPS	High Frequency RF Cables	36"	1/30/04
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	5/10/03

#### 3.3 COMPLIANCE WITH THE RESTRICTED BAND EDGE TEST DATA

##### Calculation of Lower Band Edge

The level 112.4 dBuV/m is the peak Field Strength measurement (worst case), from which the delta measurement of 63.8 dB is subtracted (reference plots), which is equivalent to a level of 48.6 dB. This level has a margin of 5.4 dB below the limit of 54 dBuV/m

Calculation:  $112.4 \text{ dBuV/m} - 63.8 \text{ dB} - 54 \text{ dBuV/m} = -5.4 \text{ dB}$

##### Calculation of Upper Band Edge

The level 113.7 dBuV/m is the peak Field Strength measurement (worst case), from which the delta measurement of 61.0 dB is subtracted (reference plots), which is equivalent to a level of 52.7 dB. This level has a margin of 1.3 dB below the limit of 54 dBuV/m.

Calculation:  $113.7 \text{ dBuV/m} - 61.0 \text{ dB} - 54 \text{ dBuV/m} = -1.3 \text{ dB}$

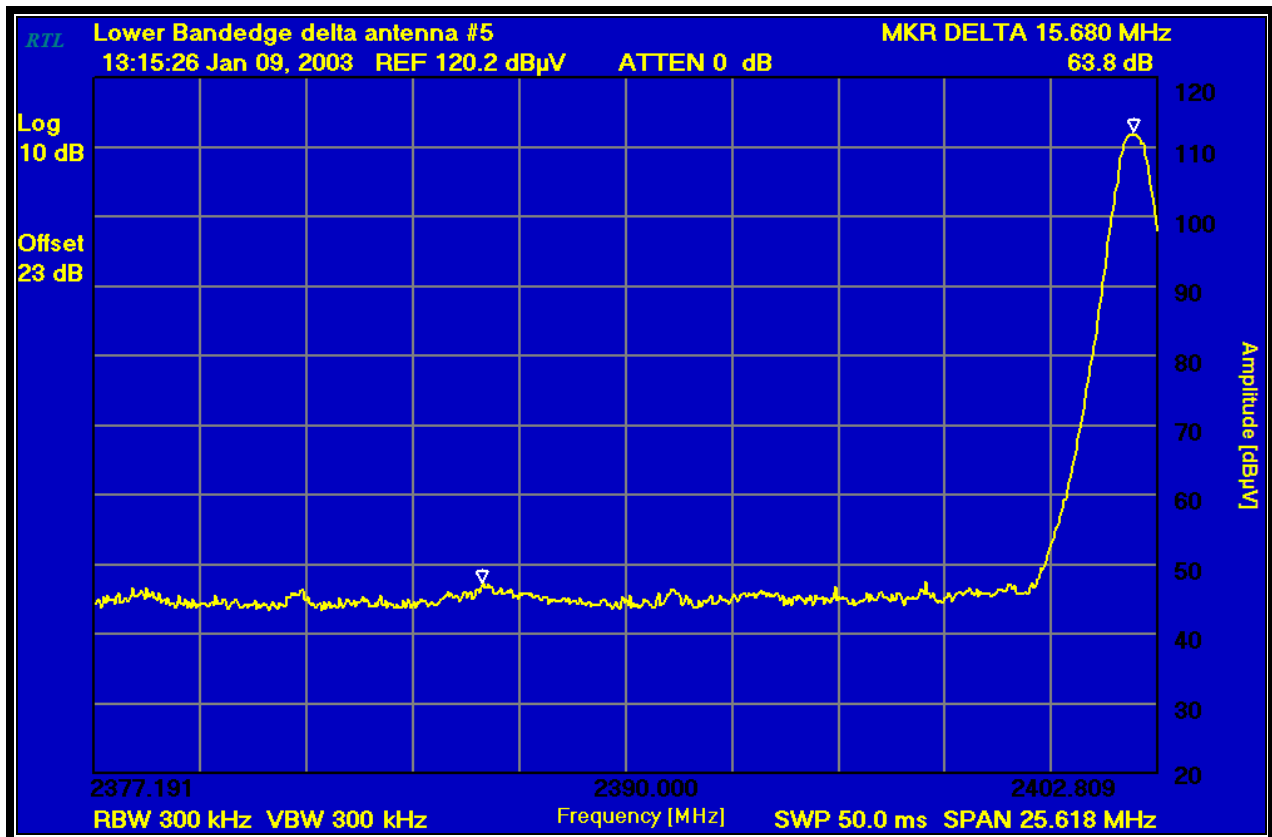


Frequency (MHz): 2402  
Resolution Bandwidth (kHz): 300  
Video Bandwidth (kHz): 300  
Sweep Time (ms): 50

**PLOT 3-1: LOWER BAND EDGE: DELTA MEASUREMENT (2402 MHZ)**

Peak field strength of Channel 2 (1 MHz RBW/1 MHz VBW) = 112.37 dBuV/m  
Average field strength of Channel 2 (1 MHz RBW/10 Hz VBW) = 111.87 dBuV/m

Delta measurement: 63.8 dB



**TEST PERSONNEL:**

Daniel W. Baltzell  
EMC Test Engineer

Signature

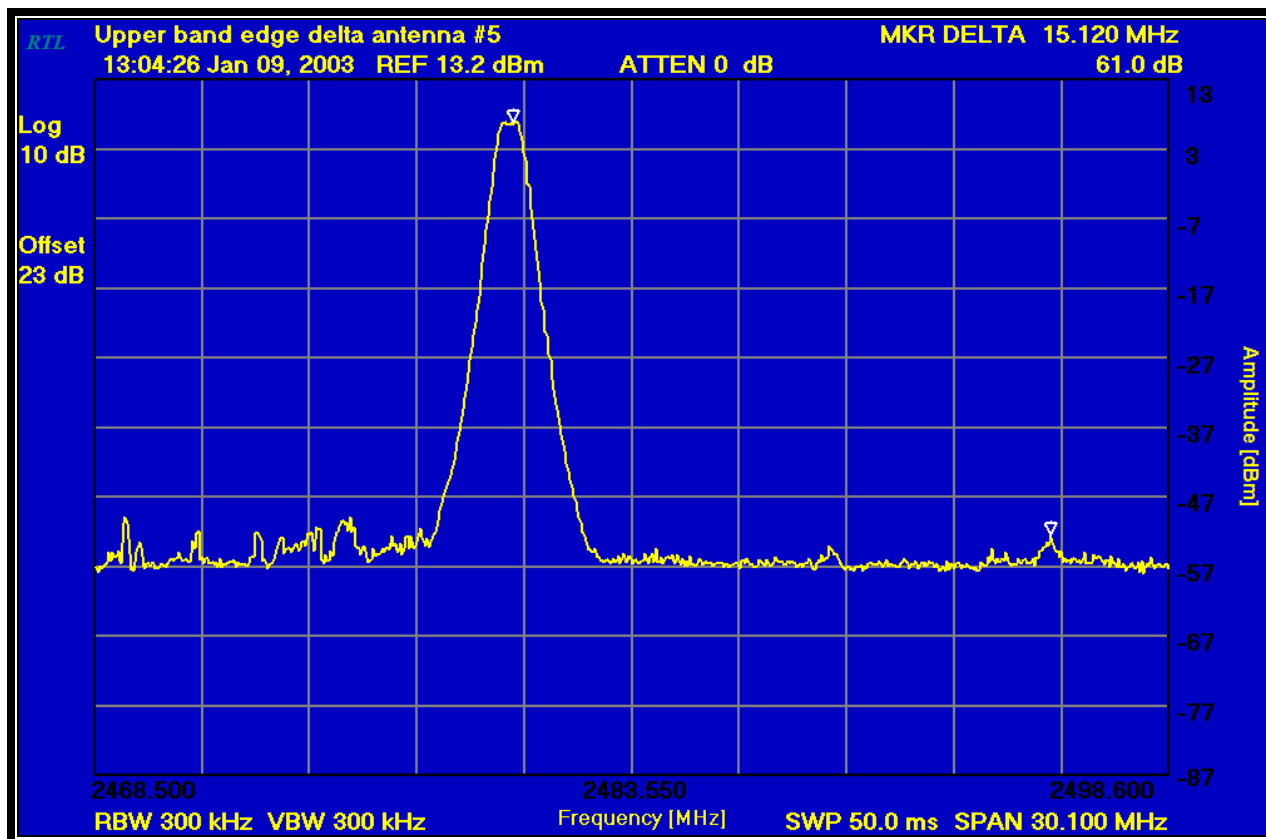
January 9, 2003  
Date Of Test

Frequency (MHz): 2480  
Resolution Bandwidth (kHz): 300  
Video Bandwidth (kHz): 300  
Sweep Time (ms): 50

**PLOT 3-2: UPPER BAND EDGE: DELTA MEASUREMENT (2480 MHz)**

Peak field strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 113.7 dBuV/m  
Average field strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 113.2 dBuV/m

Delta measurement = 61.0 dB



**TEST PERSONNEL:**

Daniel W. Baltzell  
EMC Test Engineer

*Daniel W. Baltzell*  
Signature

January 9, 2003  
Date Of Test

Rhein Tech Laboratories  
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Client: Paxar Americas, Inc.  
FCC: Part 15.247  
Industry Canada: RSS-210  
FCC ID: GU69460IPLA3021  
Model #: 9460IP

#### **4 CONDUCTED LIMITS – FCC §15.207; IC RSS-210 §6.6 AND 7.4**

Because the EUT is battery operated, no conducted emissions tests were performed.

## 5 RADIATED EMISSION LIMITS RECEIVER/DIGITAL INTERFACE – FCC §15.209; IC RSS-210 §7.3

### 5.1 RECEIVER/DIGITAL INTERFACE RADIATED EMISSION LIMITS TEST PROCEDURE

Emissions from the digital portion of the EUT were tested and found to comply with the requirements of FCC Part 15.209.

### 5.2 RECEIVER/DIGITAL INTERFACE RADIATED EMISSIONS TEST EQUIPMENT

**TABLE 5-1: RECEIVER/DIGITAL INTERFACE RADIATED EMISSIONS TEST EQUIPMENT**

RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
900889	Hewlett Packard	85685A	RF Preselector for HP 8566B or 8568B (20 Hz-2 GHz)	3146A01309	11/21/03
900905	Rhein Tech Labs	PR-1040	Amplifier	900905	7/10/03
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	5/10/03
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	5/10/03
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	5/22/03

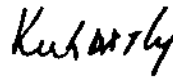
### 5.3 RECEIVER/DIGITAL INTERFACE RADIATED EMISSION LIMITS TEST DATA

**TABLE 5-2: RECEIVER/DIGITAL INTERFACE RADIATED EMISSIONS**

		Temperature: 69°F			Humidity: 84%				
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
120.004	Qp	H	215	4.0	40.7	-11.1	29.6	43.5	-13.9
180.004	Qp	H	215	2.0	41.7	-12.5	29.2	43.5	-14.3
280.001	Qp	V	325	2.0	39.7	-7.3	32.4	46.0	-13.6
300.001	Qp	V	360	2.0	48.6	-6.8	41.8	46.0	-4.2
320.001	Qp	V	315	1.8	42.0	-6.1	35.9	46.0	-10.1
340.001	Qp	V	360	2.0	50.0	-5.2	44.8	46.0	-1.2
366.996	Qp	H	125	1.0	38.7	-3.8	34.9	46.0	-11.1
380.001	Qp	V	360	1.6	38.9	-3.3	35.6	46.0	-10.4
400.001	Qp	V	215	1.6	44.6	-3.3	41.3	46.0	-4.7
700.012	Qp	H	180	1.4	37.9	4.5	42.4	46.0	-3.6

QP: RES. =100 kHz, VID= 100 kHz; AV: RES. = 1 MHz, VID = 10 Hz

**TEST PERSONNEL:**




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Kinh Ly	Signature	October 1, 2002
EMC Test Engineer		Date Of Test

## 6 RADIATED EMISSION LIMITS; SPURIOUS AND HARMONICS – FCC §15.247; IC RSS-210 §6.3

### 6.1 RADIATED SPURIOUS EMISSION LIMITS TEST PROCEDURE

Radiated Spurious Emissions applies to harmonics and spurious emissions that fall in the restricted and non-restricted bands. The restricted bands are listed in Part 15.205. The maximum permitted average field strength for the restricted band is listed in Part 15.209. The EUT was tested in the X-Y, X-Z and Y-Z orthogonal planes.

### 6.2 RADIATED SPURIOUS TEST EQUIPMENT

**TABLE 6-1: RADIATED SPURIOUS EMISSIONS TEST EQUIPMENT**

RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	3/15/04
900323	EMCO	3160-7	Horn Antennas (8.2 - 12.4 GHz)	9605-1054	6/10/04
900356	EMCO	3160-08	Horn Antennas (12.4 – 18 GHz)	9607-1044	6/10/04
900321	EMCO	3161-03	Horn Antenna (4.0-8.2 GHz)	9508-1020	4/10/04
901053	Schaffner & Chase	CBL6112B	Bilog Antenna (20 MHz - 2 GHz)	2648	5/24/03
900905	Rhein Tech Laboratories, Inc.	PR-1040	Pre Amplifier 40dB (10 MHz – 2 GHz)	1006	7/10/03
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	7/30/04
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridged Guide Antenna (1 - 18 GHz)	2310	2/26/03
900889	Hewlett Packard	85685A	RF Preselector for HP 8566B or 8568B (20 Hz-2 GHz)	3146A01309	11/21/03
900905	Rhein Tech Labs	PR-1040	Amplifier	900905	7/10/03
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	5/10/03
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	5/10/03
900932	Hewlett Packard	8449B	Microwave Preamplifier, (1 to 26.5 GHz)	3008A00505	7/15/03
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	5/10/03

### 6.3 RADIATED EMISSIONS HARMONICS/SPURIOUS TEST DATA

Operating Frequency (MHz): 2402  
 Measured Level at 100kHz (dBuV/m): 113.1  
 Limit (dBuV/m): 93.1

**TABLE 6-2: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 2; 2402 MHZ)**

Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
371.000	Qp	V	42.1	-7.4	34.7	93.1	-58.4
460.000	Qp	V	41.5	-6.8	34.7	93.1	-58.4
591.446	Qp	V	39.6	-5.9	33.7	93.1	-59.4
4804.000	Pk	V	42.8	13.8	56.6	64.0	-7.4
4804.000	Av	V	35.2	13.8	49.0	54.0	-5.0

QUASI-PEAK: RES: 100K, VID: 100K; PEAK: RES. =1 MHz, VID= 1MHz; AVERAGE: RES. =1 MHz, VID= 10HZ

Operating Frequency (MHz): 2440  
 Measured Level at 100kHz (dBuV/m): 114.1  
 Limit (dBuV/m): 94.1

**TABLE 6-3: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 40, 2440 MHZ)**

Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
371.000	Qp	V	42.1	-7.4	34.7	94.1	-59.4
460.000	Qp	V	41.5	-6.8	34.7	94.1	-59.4
591.446	Qp	V	39.6	-5.9	33.7	94.1	-60.4
4880.000	Pk	V	43.0	13.5	56.5	64.0	-7.5
4880.000	Av	V	33.8	13.5	47.3	54.0	-6.7
7320.000	Av	V	32.3	11.7	44.0	54.0	-10.0
12200.000	Av	V	27.6	16.5	44.1	54.0	-9.9

QUASI-PEAK: RES: 100K, VID: 100K; PEAK: RES. =1 MHz, VID= 1MHz; AVERAGE: RES. =1 MHz, VID= 10HZ


**Operating Frequency (MHz):** 2480  
**Measured Level at 100kHz (dBuV/m):** 113.4  
**Limit (dBuV/m):** 93.4

**TABLE 6-4: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 80; 2480 MHZ)**

Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
371.000	Qp	V	42.1	-7.4	34.7	93.4	-58.7
460.000	Qp	V	41.5	-6.8	34.7	93.4	-58.7
591.446	Qp	V	39.6	-5.9	33.7	93.4	-59.7
4960.000	Pk	V	45.7	13.8	59.5	64.0	-4.5
4960.000	Av	V	39.0	13.8	52.8	54.0	-1.2
7440.000	Av	V	35.0	12.2	47.2	54.0	-6.8
12400.000	Av	V	30.2	16.8	47.0	54.0	-7.0

QUASI-PEAK: RES: 100K, VID: 100K; PEAK: RES. =1 MHz, VID= 1MHz; AVERAGE: RES. =1 MHz, VID= 10Hz

**TEST PERSONNEL:**

Daniel W. Baltzell EMC Test Engineer	 Signature	January 9, 2003 Date Of Test
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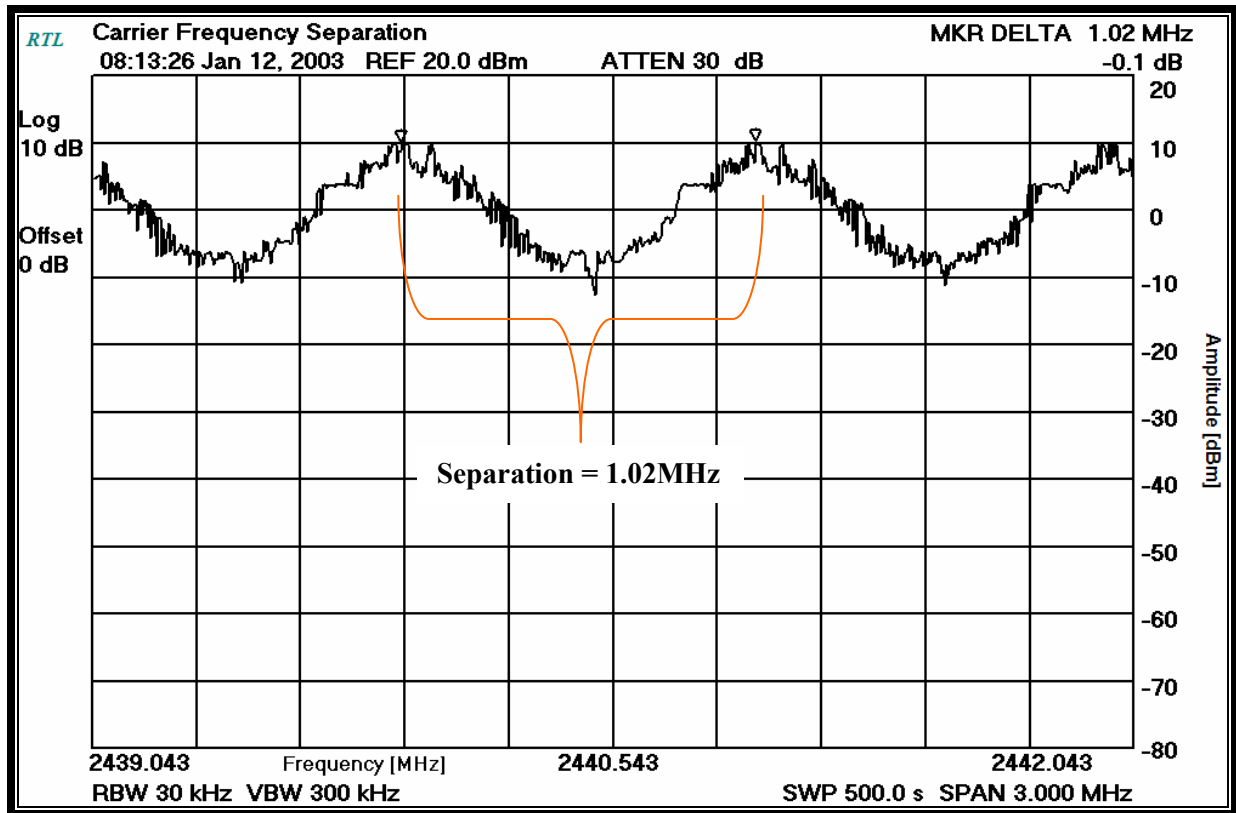


## 7 CARRIER FREQUENCY SEPARATION - §15.247 (A)(1)

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.

Measured frequency separation = 1.02 MHz

**PLOT 7-1: CARRIER FREQUENCY SEPARATION**



**TEST PERSONNEL:**

Daniel W. Baltzell  
 EMC Test Engineer

Signature

January 12, 2003  
 Date Of Test

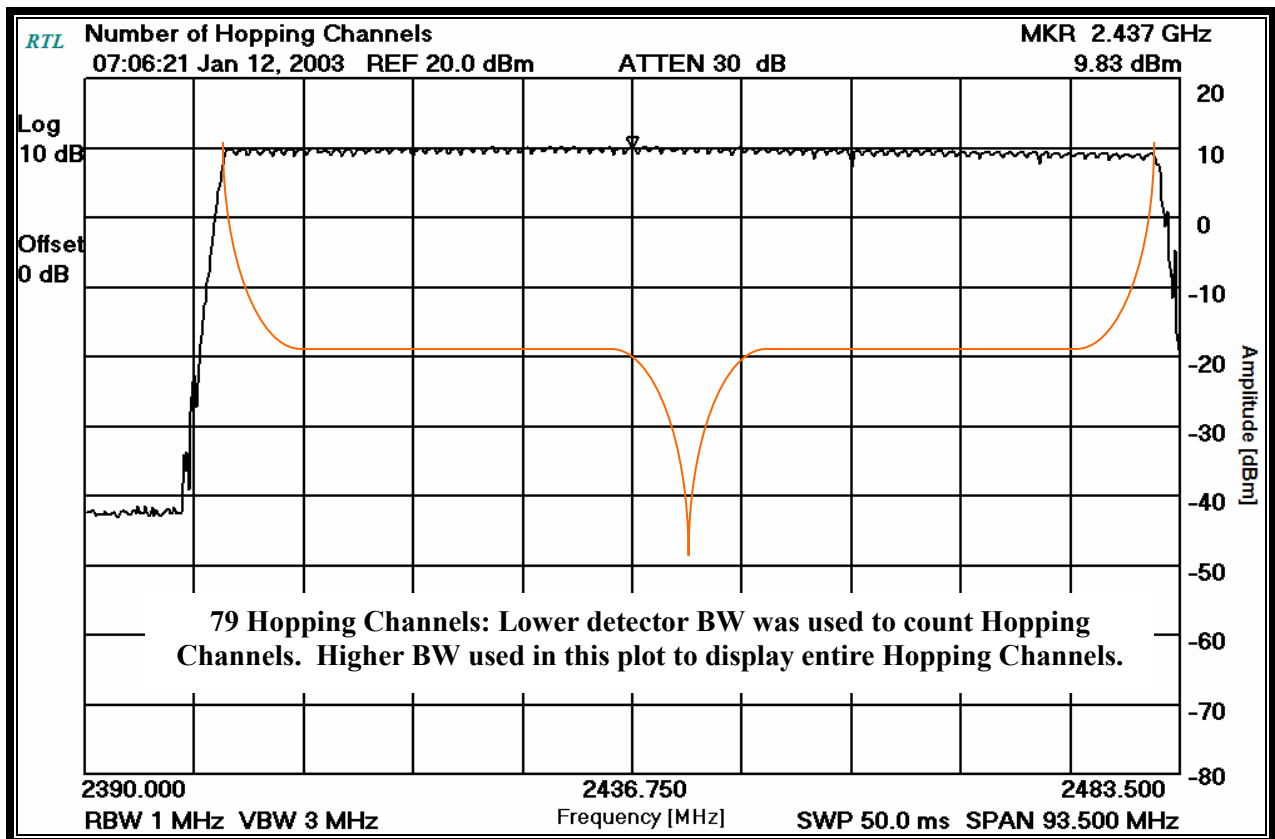
## 8 HOPPING CHARACTERISTICS – FCC §15.247 (A)(1)(II); IC RSS-210 §6.2.2(O)

Frequency hopping systems operating in the 2400–2483.5 MHz and 5725–5850 MHz bands shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

### 8.1 NUMBER OF HOPPING FREQUENCIES

Measured number of hopping frequencies = 79

**PLOT 8-1: NUMBER OF HOPPING FREQUENCIES**



### TEST PERSONNEL:

Daniel W. Baltzell  
 EMC Test Engineer

Signature

January 12, 2003  
 Date Of Test

**8.2 20 DB BANDWIDTH TEST PROCEDURE – FCC §15.247 (a)(1)(i); IC RSS-210 §5.9.1**

The minimum 20 dB bandwidths per RSS-210 were measured using a 50 ohm spectrum analyzer. The carrier was adjusted on the analyzer so that it was displayed entirely on the Spectrum Analyzer. The sweep time was set to 10 seconds and allowed through several sweeps with the max hold function used in peak detector mode. The resolution bandwidth was set to 100 kHz, and the video bandwidth set at 300 kHz. The minimum 20 dB bandwidths were measured using the spectrum analyzer delta marker set 20 dB down from the peak of the carrier and modulated with a 2 Mbps data rate. The table below contains the bandwidth measurement results.

**TABLE 8-1 20 DB BANDWIDTH TEST EQUIPMENT**


RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
900931	Hewlett Packard	8566B	Spectrum Analyzer (100Hz – 22 GHz)	3138A07771	5/10/03

**TABLE 8-2 MODULATED BANDWIDTH TEST DATA**

**Minimum 20 dB bandwidths**

CHANNEL	20 dB BANDWIDTH (kHz)
2	930
40	915
80	923

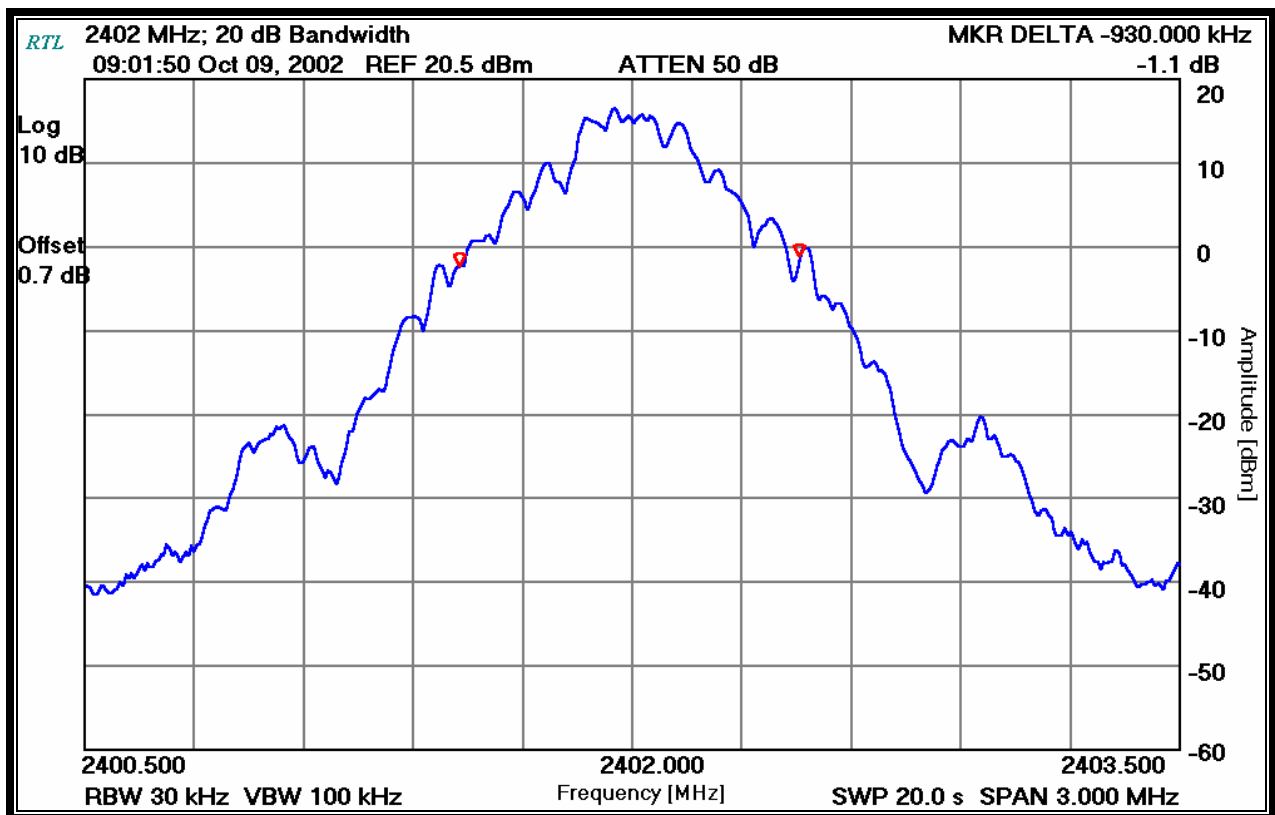
**TEST PERSONNEL:**

Daniel W. Baltzell EMC Test Engineer	 Signature	October 9, 2002 Date Of Test
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### 20 dB Bandwidth Plots

Channel: 2  
Channel Frequency (MHz): 2402  
Resolution Bandwidth (kHz): 30  
Video Bandwidth (kHz): 100  
Span (MHz): 3

PLOT 8-2: 20 DB BANDWIDTH CHANNEL 2



### TEST PERSONNEL:

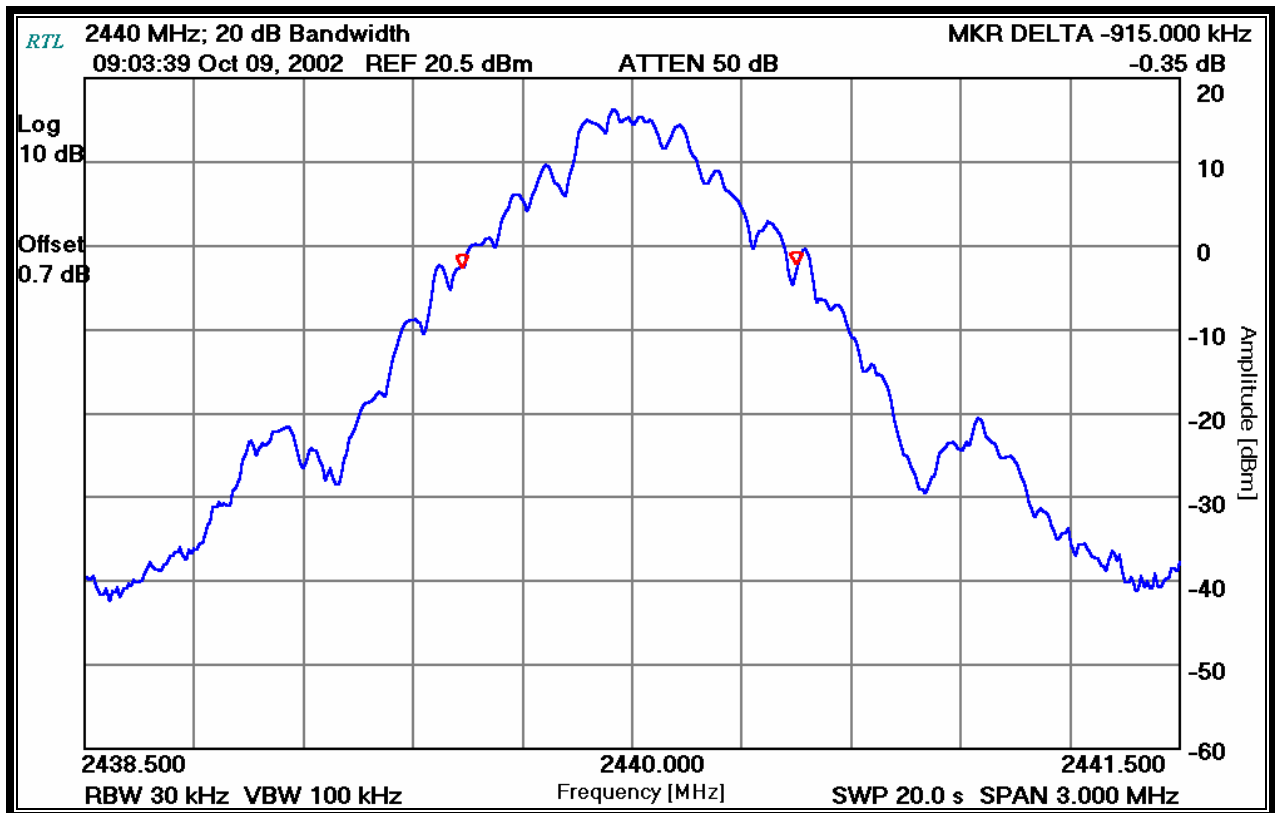
Daniel W. Baltzell  
EMC Test Engineer

Signature

October 9, 2002  
Date Of Test

Channel: 40  
 Channel Frequency (MHz): 2440  
 Resolution Bandwidth (kHz): 30  
 Video Bandwidth (kHz): 100  
 Span (MHz): 3

PLOT 8-3: 20 DB BANDWIDTH CHANNEL 40



TEST PERSONNEL:

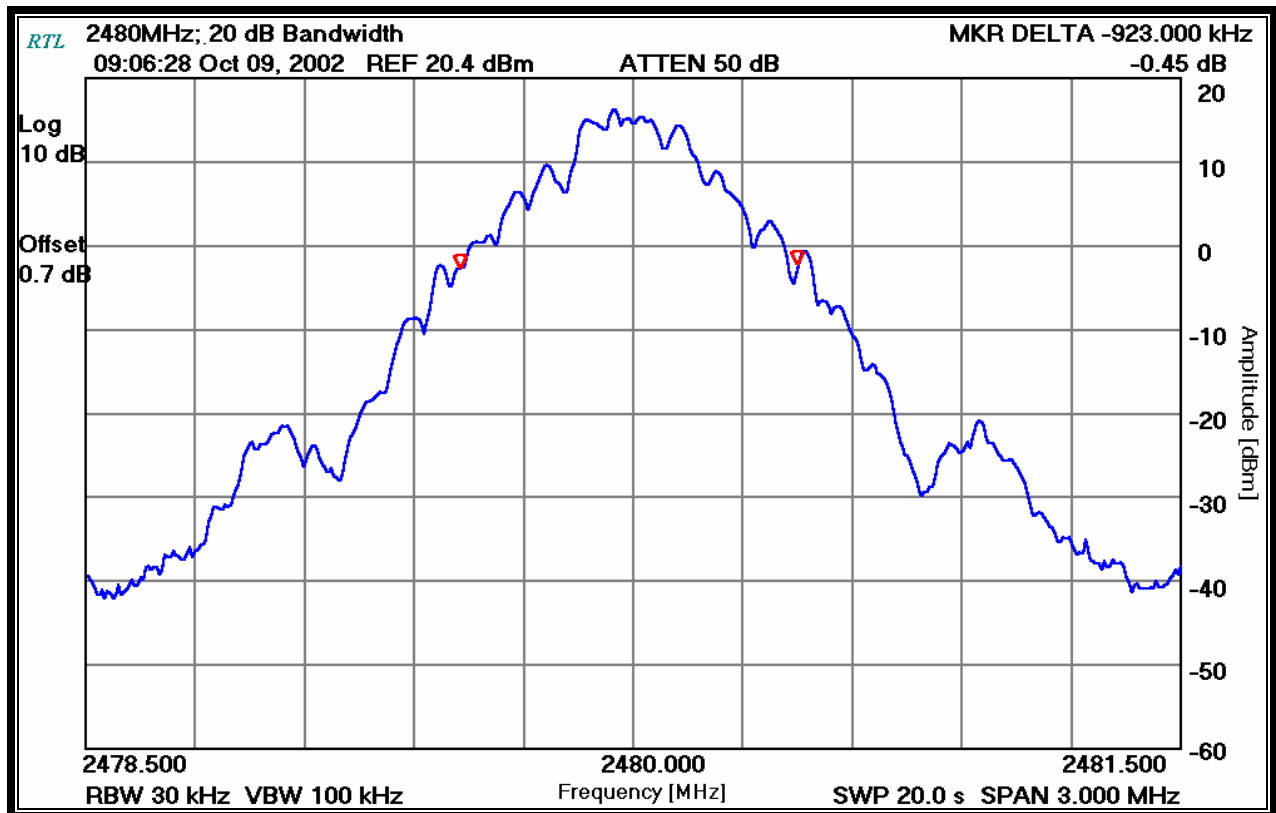
Daniel W. Baltzell  
 EMC Test Engineer

Signature

October 9, 2002  
 Date Of Test

Channel: 80  
Channel Frequency (MHz): 2480  
Resolution Bandwidth (kHz): 30  
Video Bandwidth (kHz): 100  
Span (MHz): 3

PLOT 8-4: 20 DB BANDWIDTH CHANNEL 80



TEST PERSONNEL:

Daniel W. Baltzell  
EMC Test Engineer

Signature

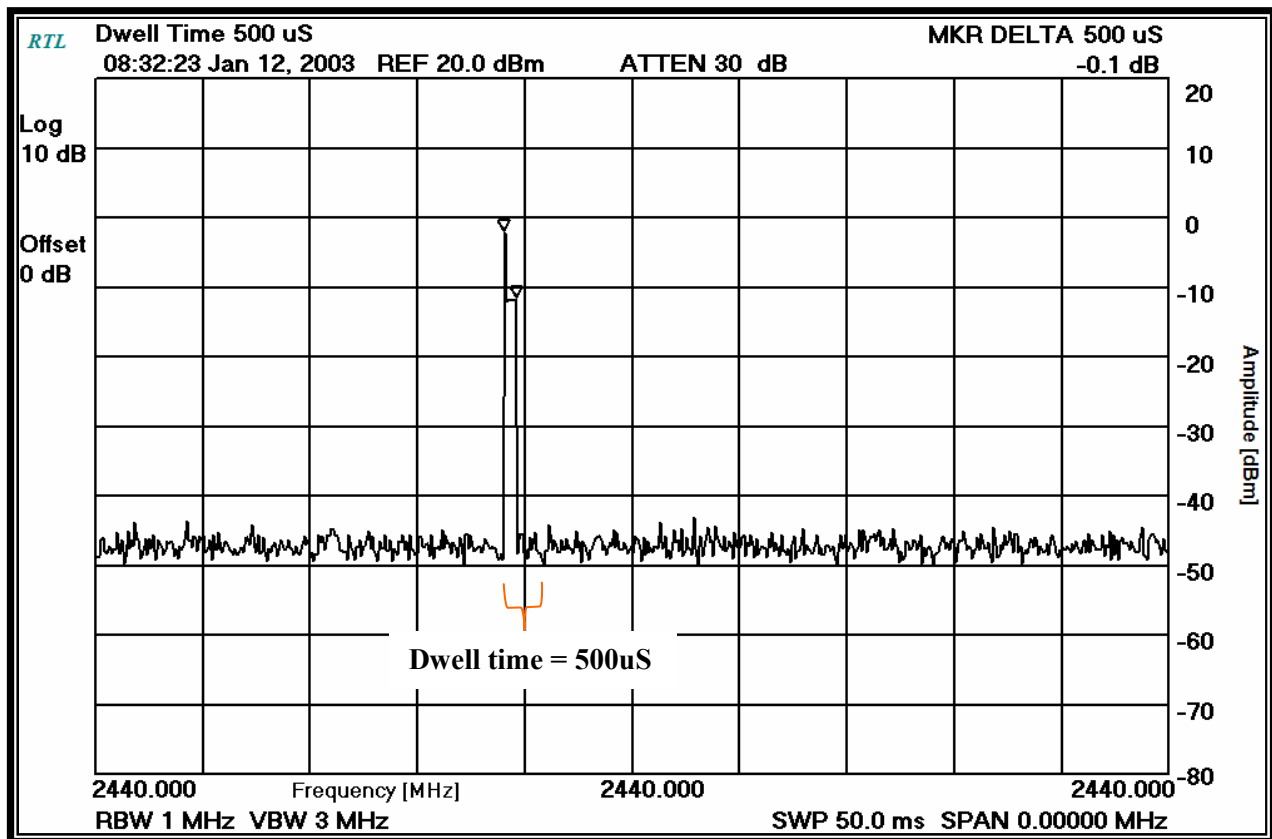
October 9, 2002  
Date Of Test

### 8.3 AVERAGE TIME OF OCCUPANCY

The spectrum analyzer sweep was set to 0.050 second, with a zero span and max hold until a pulse from the device under test was captured. A marker delta was used to measure dwell time for this plot. The sweep was then set to single sweep for 30 seconds for the required average time and the number of pulses counted to calculate the average time of occupancy as:

Number of Pulses in 30 Seconds (23) x Dwell Time Measured (0.500 milliseconds) = 11.5 ms Average Occupancy in 30 seconds.

**PLOT 8-5: TIME OF OCCUPANCY (DWEELL TIME)**



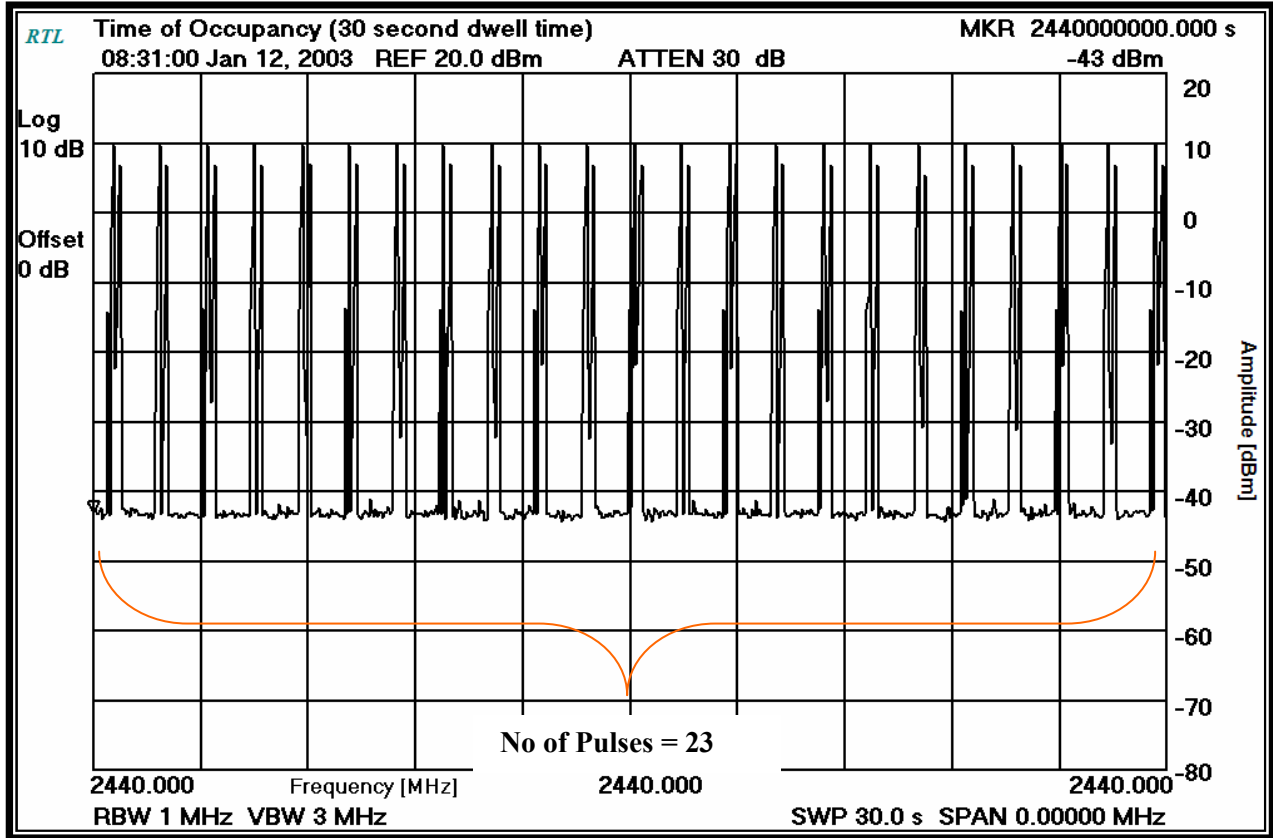
**TEST PERSONNEL:**

Daniel W. Baltzell  
 EMC Test Engineer

Signature

January 12, 2003  
 Date Of Test

**PLOT 8-6: TIME OF OCCUPANCY (DWELL TIME 30 SECOND SWEEP)**



**TEST PERSONNEL:**

Daniel W. Baltzell  
EMC Test Engineer

Signature

January 12, 2003  
Date Of Test



## 9 MODULATED BANDWIDTH - §15.247(A)(2)

### 9.1 MODULATED BANDWIDTH TEST PROCEDURE – MINIMUM 6 DB BANDWIDTH

The minimum 6 dB bandwidths per FCC 15.247 (a)(2) were measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 300 kHz. The device was modulated using the maximum 2 Mbps data rate. The minimum 6 dB bandwidths are presented in Table 9-2.

### 9.2 BANDWIDTH TEST EQUIPMENT

**TABLE 9-1: BANDWIDTH TEST EQUIPMENT**

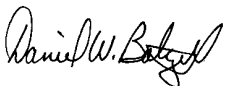
RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
900931	Hewlett Packard	8566B	Spectrum Analyzer (100Hz – 22 GHz)	3138A07771	5/10/03

### 9.3 BANDWIDTH TEST DATA

**TABLE 9-2: MINIMUM 6 DB BANDWIDTH TEST DATA**

CHANNEL	6 dB BANDWIDTH (kHz)
2	339
40	338
80	338

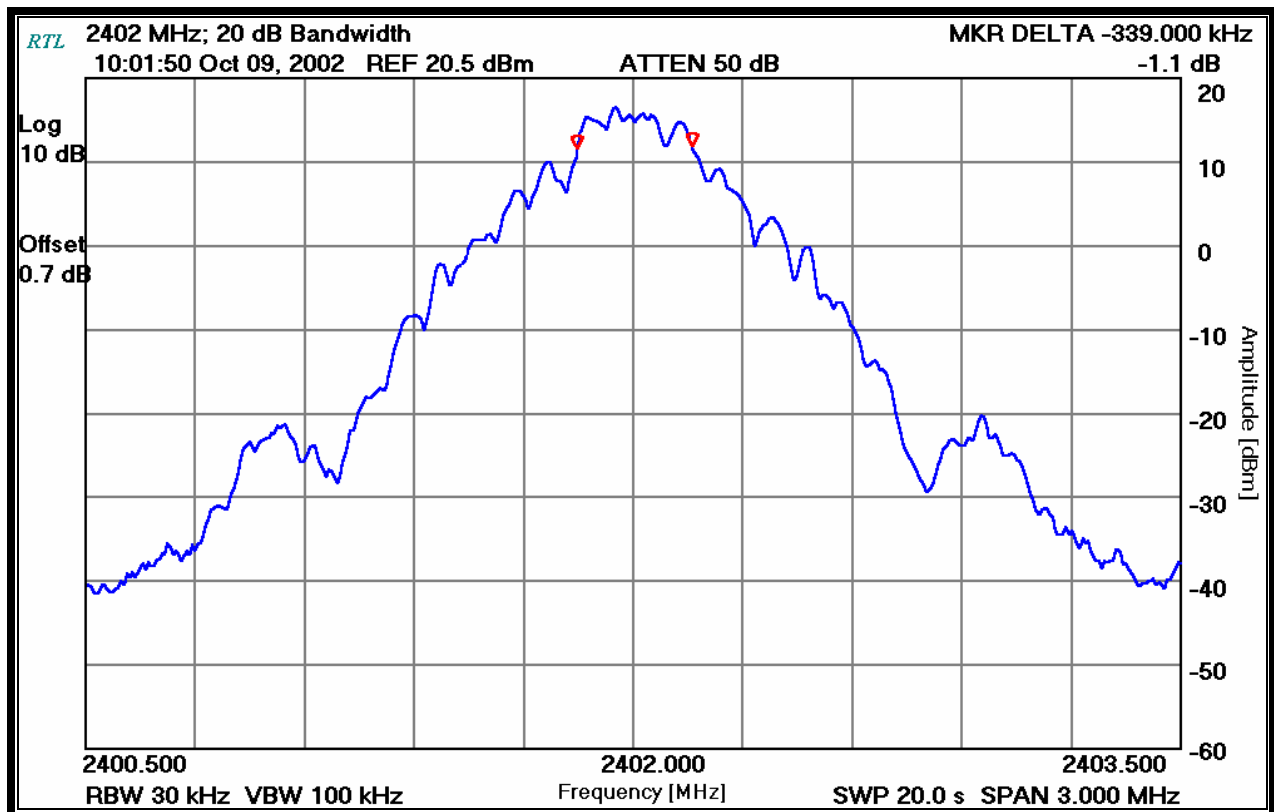
#### TEST PERSONNEL:

Daniel W. Baltzell EMC Test Engineer	 Signature	October 9, 2002 Date Of Test
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## 9.4 MODULATED BANDWIDTH PLOTS

Channel Number: 2  
Frequency (MHz): 2402  
Resolution Bandwidth (kHz): 30  
Video Bandwidth (kHz): 100  
Sweep Time (s): 20

PLOT 9-1: MODULATED BANDWIDTH CHANNEL 2



### TEST PERSONNEL:

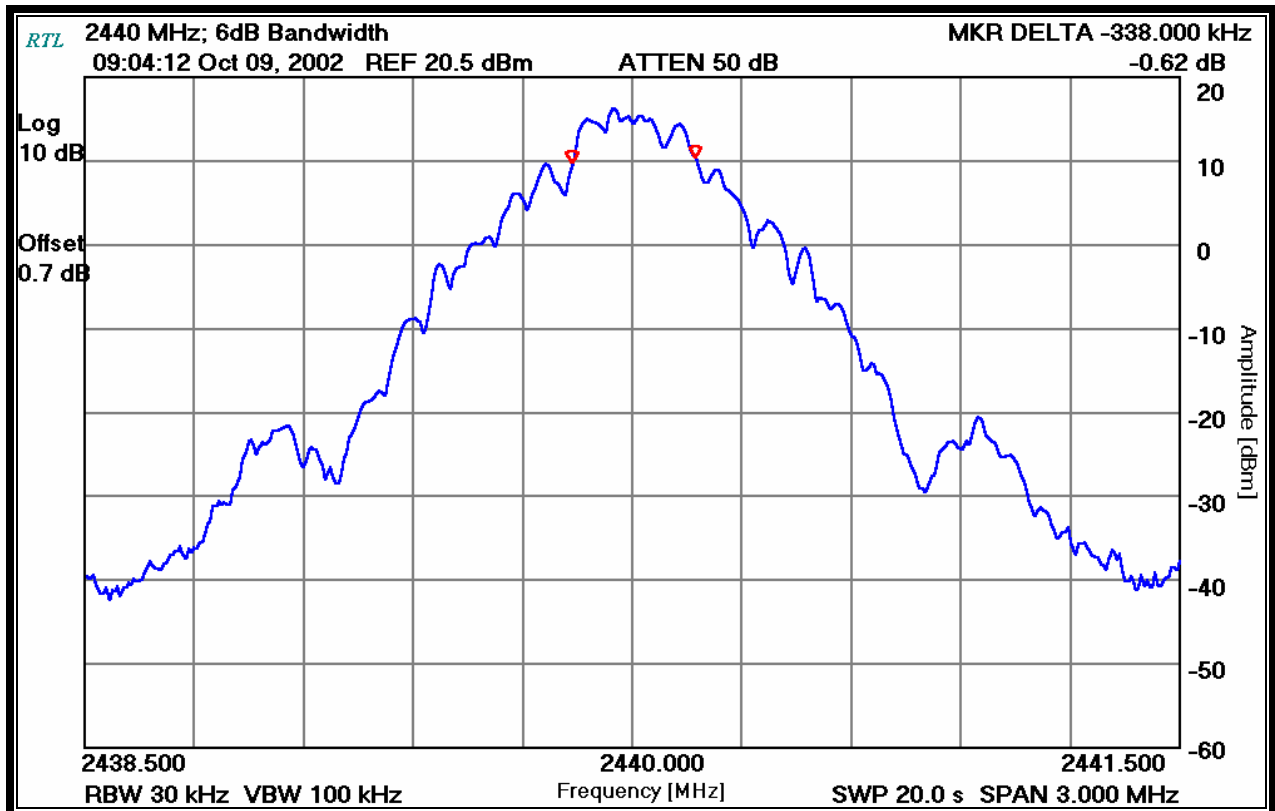
Daniel W. Baltzell  
EMC Test Engineer

Signature

October 9, 2002  
Date Of Test

Channel Number: 40  
Frequency (MHz): 2440  
Resolution Bandwidth (kHz): 30  
Video Bandwidth (kHz): 100  
Sweep Time (s): 20

PLOT 9-2: MODULATED BANDWIDTH CHANNEL 40



TEST PERSONNEL:

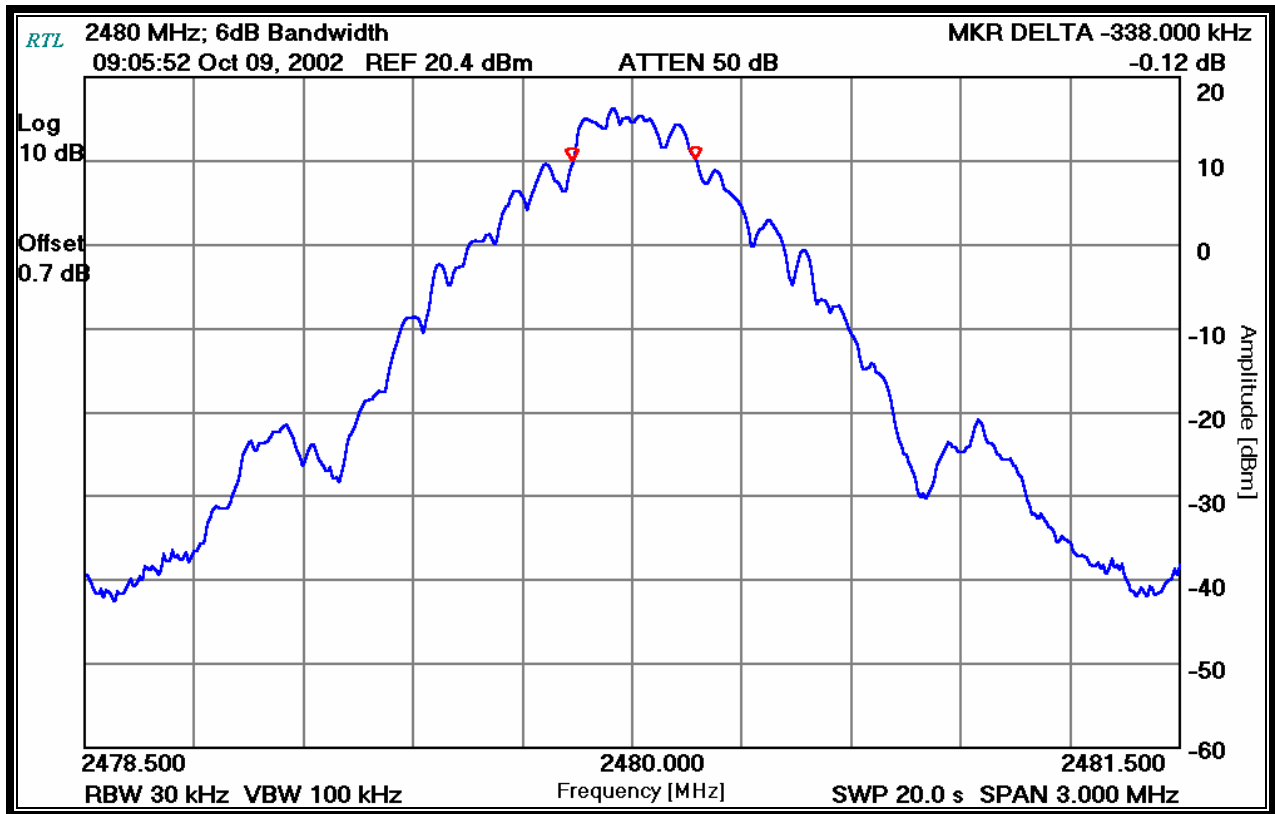
Daniel W. Baltzell  
EMC Test Engineer

Signature

October 9, 2002  
Date Of Test

**Channel Number:** 80  
**Frequency (MHz):** 2480  
**Resolution Bandwidth (kHz):** 30  
**Video Bandwidth (kHz):** 100  
**Sweep Time (s):** 20

**PLOT 9-3: MODULATED BANDWIDTH CHANNEL 80**



**TEST PERSONNEL:**

Daniel W. Baltzell  
EMC Test Engineer

Signature

October 9, 2002  
Date Of Test

## 10 PEAK OUTPUT POWER - FCC §15.247(B)(1); IC RSS-210 §6.2.2(o)(b)

### 10.1 POWER OUTPUT TEST PROCEDURE

A conducted power measurement of the EUT was taken using an Agilent 4416A EPM-P Series Power Meter with a E9323A Peak and Average Power Sensor.

### 10.2 POWER OUTPUT TEST EQUIPMENT

**TABLE 10-1: POWER OUTPUT TEST EQUIPMENT**

RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
901186	Agilent Technologies	E9323A (50 MHz-6 GHz)	Peak & Avg. Power Sensor	US40410380	6/25/03
901184	Agilent Technologies	E4416A	EPM-P Power Meter, Single Channel	GB41050573	7/5/03

### 10.3 POWER OUTPUT TEST DATA

**TABLE 10-2: POWER OUTPUT TEST DATA**

FREQUENCY (MHZ)	CHANNEL	PEAK POWER CONDUCTED OUTPUT (dBm)	PEAK POWER CONDUCTED OUTPUT (mW)
2402	2	20.5	112.2
2440	40	20.5	112.2
2480	80	20.4	109.4

#### TEST PERSONNEL:

Daniel W. Baltzell  
 EMC Test Engineer



Signature

October 8, 2002  
 Date Of Test

## 11 ANTENNA CONDUCTED SPURIOUS EMISSIONS - §15.247(C); IC RSS-210 §6.2.2(o)(e1)

### 11.1 ANTENNA CONDUCTED SPURIOUS EMISSIONS TEST PROCEDURES

Antenna spurious emission per FCC 15.247(c) was measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 300 kHz. The modulated carrier was identified at 2.402 GHz for the low channel, 2.440 GHz for the mid channel and 2.480 GHz for the high channel. No other harmonics or spurs were found within 20 dB of the carrier level from 9kHz to the carrier 10<sup>th</sup> harmonic. See the Antenna Conducted Spurious Noise Table for the test results. The low, middle, and high channels were investigated and tested.

**Note: Conducted plots are presented for the mid channel, while tabular data is presented for the low, mid, and high channels.**

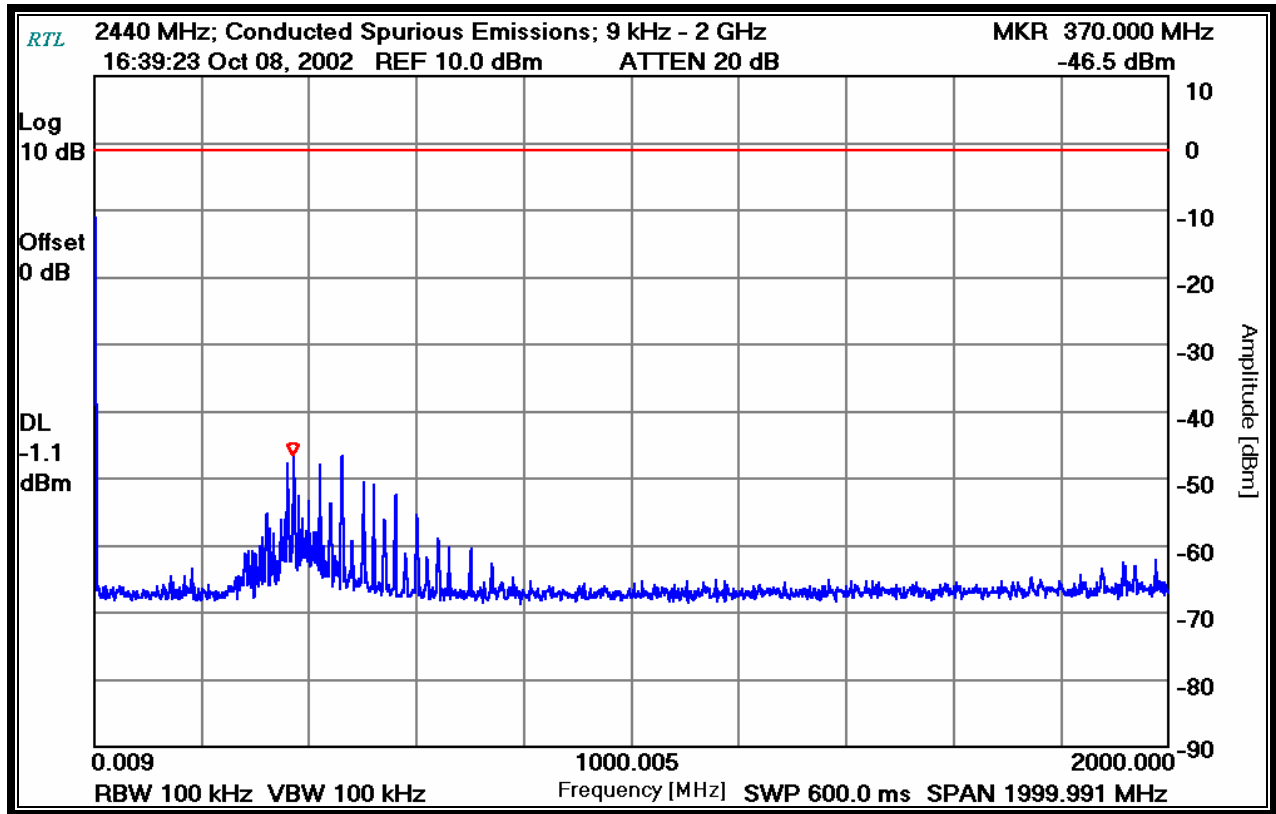
### 11.2 ANTENNA CONDUCTED SPURIOUS TEST EQUIPMENT

**TABLE 11-1: ANTENNA CONDUCTED SPURIOUS TEST EQUIPMENT**

RTL ASSET #	MANUFACTURER	MODEL	PART TYPE	SERIAL NUMBER	CALIBRATION DUE DATE
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	5/10/03

### 11.3 ANTENNA CONDUCTED SPURIOUS DATA PLOTS

PLOT 11-1: ANTENNA CONDUCTED SPURIOUS (9 KHZ-2 GHZ) 2440 MHZ



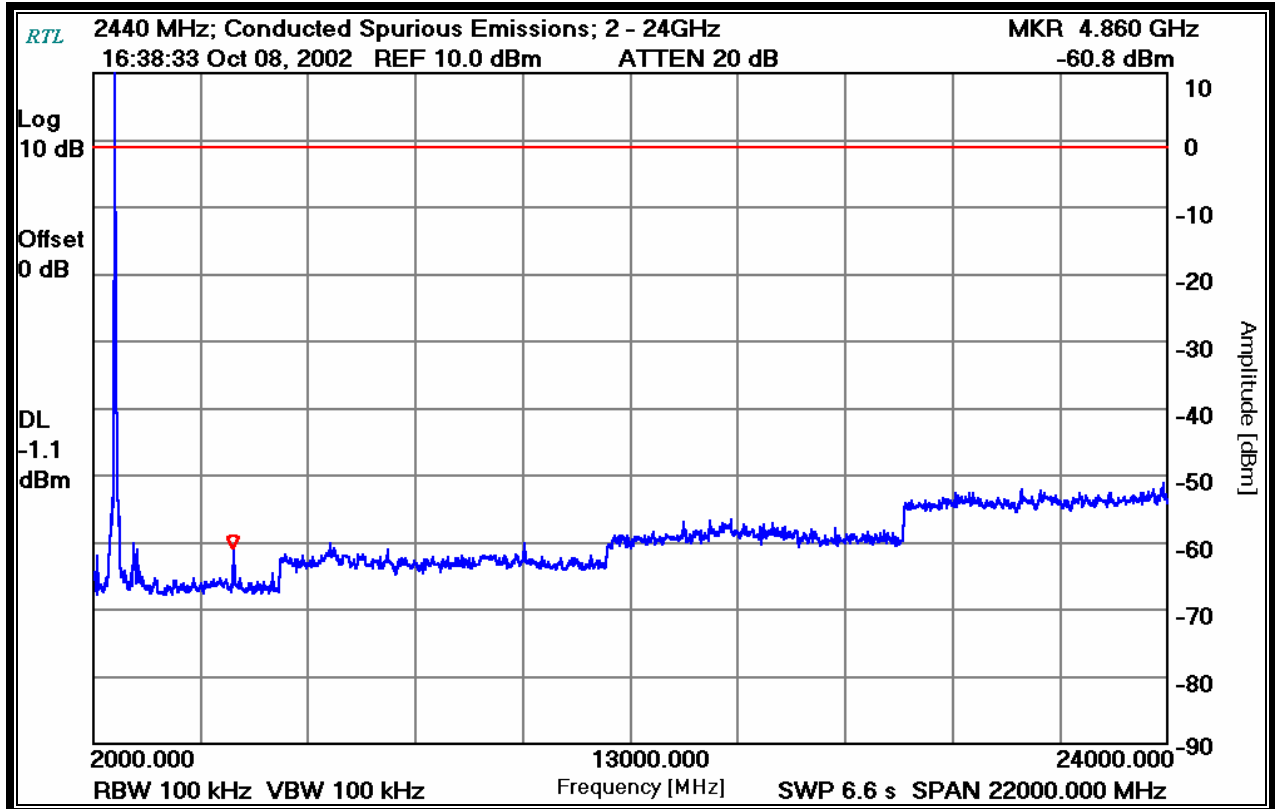
TEST PERSONNEL:

Daniel W. Baltzell  
 EMC Test Engineer

Signature

October 8, 2002  
 Date Of Test

**PLOT 11-2: ANTENNA CONDUCTED SPURIOUS (2-24 GHZ) 2440 MHZ**



**TEST PERSONNEL:**

Daniel W. Baltzell  
EMC Test Engineer

Signature

October 8, 2002  
Date Of Test



#### 11.4 ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 2

Operating Frequency (MHz): 2402  
 Channel: 2  
 Measured Level at 100kHz (dBm): 17.9  
 Limit (dBm): -2.1

**TABLE 11-2: ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 2**

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limit (dBc)	Margin (dB)
371.000	-44.9	62.8	20.0	-42.8
460.000	-46.1	64.0	20.0	-44.0
591.446	-37.7	55.6	20.0	-35.6
4804.000	-49.3	67.2	20.0	-47.2
7206.000	-43.2	61.1	20.0	-41.1
9608.000	-41.7	59.6	20.0	-39.6
12010.000	-43.5	61.4	20.0	-41.4
14412.000	-39.2	57.1	20.0	-37.1
16814.000	-39.8	57.7	20.0	-37.7
19216.000	-35.7	53.6	20.0	-33.6
21618.000	-34.4	52.3	20.0	-32.3
24020.000	-36.0	53.9	20.0	-33.9

**TEST PERSONNEL:**

Franck Schuppius  
 EMC Test Engineer



Signature

October 9, 2002  
 Date Of Test

### 11.5 ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 40

**Operating Frequency (MHz):** 2440  
**Channel:** 40  
**Measured Level at 100kHz (dBm):** 18.9  
**Limit (dBm):** -1.1

**TABLE 11-3: ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 40**

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limit (dBc)	Margin (dB)
371.000	-44.9	62.8	20.0	-42.8
460.000	-45.9	63.8	20.0	-43.8
591.446	-37.7	55.6	20.0	-35.6
4880.000	-58.2	77.1	20.0	-57.1
7320.000	-53.9	72.8	20.0	-52.8
9760.000	-53.8	72.7	20.0	-52.7
12200.000	-54.9	73.8	20.0	-53.8
14640.000	-50.4	69.3	20.0	-49.3
17080.000	-51.4	70.3	20.0	-50.3
19520.000	-45.5	64.4	20.0	-44.4
21960.000	-45.1	64.0	20.0	-44.0
24400.000	-47.3	66.2	20.0	-46.2

**TEST PERSONNEL:**

Franck Schuppius  
 EMC Test Engineer



Signature

October 9, 2002  
 Date Of Test

**11.6 ANTENNA CONDUCTED SPURIOUS EMISSIONS HIGH CHANNEL 80**

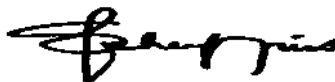
Operating Frequency (MHz): 2480  
 Channel: 80  
 Measured Level at 100kHz (dBm): 18.2  
 Limit (dBm): -1.8

**TABLE 11-4: ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 80**

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limit (dBc)	Margin (dB)
371.000	-44.9	63.1	20.0	-43.1
460.000	-45.9	64.1	20.0	-44.1
591.446	-37.7	55.9	20.0	-35.9
4960.000	-57.1	75.3	20.0	-55.3
7440.000	-54.5	72.7	20.0	-52.7
9920.000	-53.8	72.0	20.0	-52.0
12400.000	-54.8	73.0	20.0	-53.0
14880.000	-48.4	66.6	20.0	-46.6
17360.000	-50.7	68.9	20.0	-48.9
19840.000	-44.7	62.9	20.0	-42.9
22320.000	-46.0	64.2	20.0	-44.2
24800.000	-47.1	65.3	20.0	-45.3

**TEST PERSONNEL:**

Franck Schuppis  
 EMC Test Engineer



Signature

October 9, 2002  
 Date Of Test

Rhein Tech Laboratories  
360 Herndon Parkway  
Suite 1400  
Herndon, VA 20170  
<http://www.rheintech.com>

Client: Paxar Americas, Inc.  
FCC: Part 15.247  
Industry Canada: RSS-210  
FCC ID: GU69460IPLA3021  
Model #: 9460IP

## 12 CONCLUSION

The data in this measurement report shows that the Paxar Americas, Inc., Model Name: Sierra Sport2™, Model Number: 9460IP, FCC ID: GU69460IPLA3021 complies with all the requirements of Parts 2 and 15 of the FCC Rules and Industry Canada RSS-210.