

Report No	ED0522-1
Client	Seimac Limited 271 Brownlow Avenue Dartmouth, Nova Scotia Canada B3B 1W6
Phone	902-468-3007
Fax	902-468-3009
FRN	0008719288
Model	SS2400S
FCC ID	RHB45904004
Equipment Type Equipment Code	Spread Spectrum Transmitter DSS
Results	As detailed within this report
Prepared by	 Evan Gould – Test Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	8/14/03
Conditions of issue	This Test Report is issued subject to the conditions stated in ‘terms and conditions’ section of this report.

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Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247. The product is Seimac's Solid Link spread spectrum industrial radio modem (Model SS2400S). It is a frequency hopper that operates in the range 2400-2483.5MHz. It utilizes a hopping table of 83 channels between channel 2 and channel 204 inclusively. Three different types of antennas can be used with this device: omnidirectional, yagi, and parabolic. When the yagi and parabolic antennas are employed, the application is exclusively point-to-point.

The antenna model numbers and gains are:

Omnidirectional	MHW2400C	2dBi
	MMO24005PTRPC	5.5dBi
Yagi	HG2412Y	12dBi
	PAWVA24-16	16dBi
Parabolic	18T-2400	18dBi
	26T-2400	24dBi

Test Methodology

Radiated emissions testing is performed according to the procedures specified in ANSI C63.4 (2000). Public Notice DA 00-705 "*Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems*" was followed for testing as well.

Frequency range investigated: 0.15MHz – 25GHz

Measurement distance:	0.15 - 30MHz	Conducted
	30 - 1000MHz	3m
	1 – 7GHz	3m
	7 – 18GHz	1m
	18 – 25GHz	1m

AC Line conducted emissions testing was performed with a 50Ω/50μH LISN.

Statement of Conformity

The Seimac Solid Link has been found to conform with the following parts of the 47 CFR as detailed below:

Part 2	Part 15	Comments
	15.15(b)	The controls that adjust the power level on this device are not accessible to the user. The professional installer of the device will adjust the power level at the time of installation.
2.925	15.19	The label is shown in the label exhibit.
	15.21	Information to the user is shown in the instruction manual exhibit.
	15.27	No special accessories are required for compliance.
	15.203	This product is professionally installed.
	15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
	15.207	The unit meets the AC conducted emissions requirements of 15.207.
	15.247	The unit complies with the frequency hopper requirements of 15.247

EUT Configuration

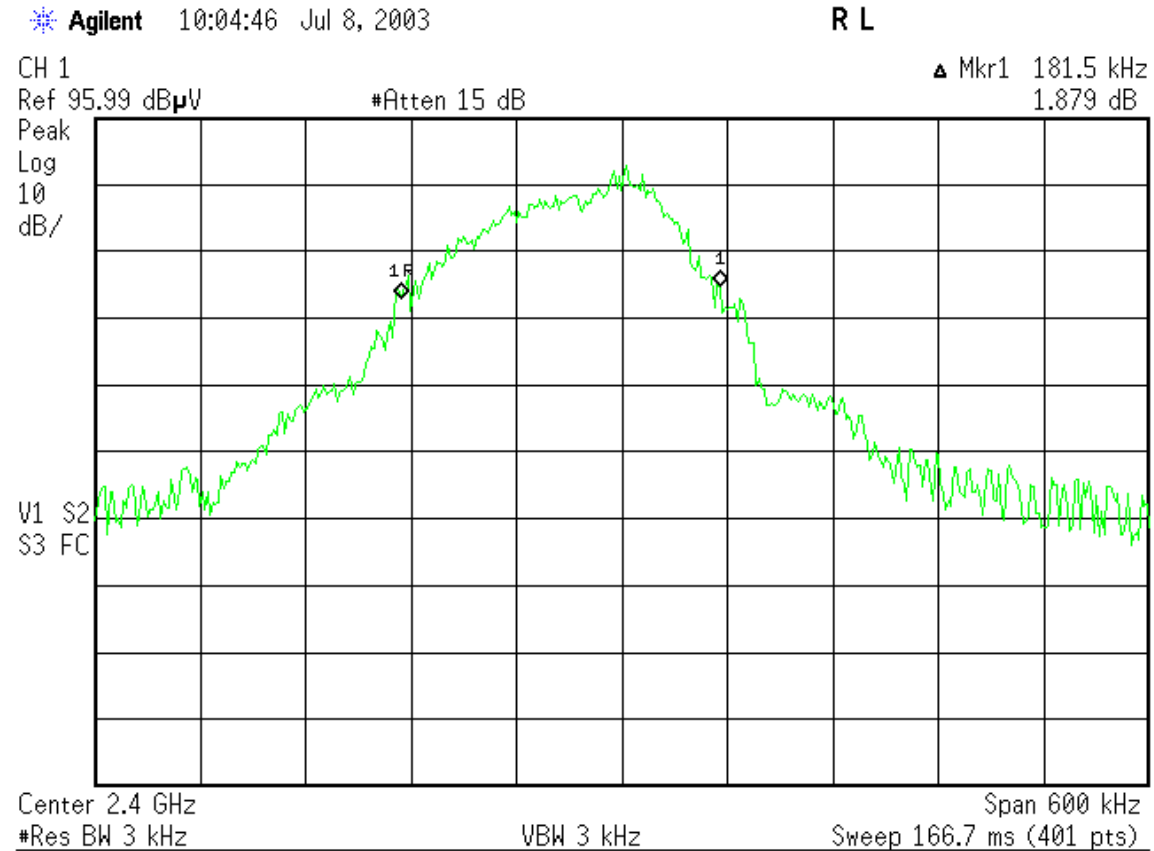
EUT Configuration				
Work Order: D0522				
Company: Seimac Limited				
Company Address: 271 Brownlow Avenue Dartmouth, Nova Scotia Canada B3B 1W6				
Contact: Howard Hart				
Persons Present: Bernie Clement and Bob Haagensen				
MN	SN	FCC ID		
EUT: SS2400S	FCC 1	RHB45904004		
EUT Description: Solid Link - Spread spectrum industrial radio modem				
EUT Max Frequency: 2483.5MHz				
Support Equipment:	MN	SN	FCC ID	
IBM laptop	ThinkPad 600	78-P4540	-	
HON-KWANG 12VDC adaptor	D12-10-1000	66-000-118-01	-	
EUT Cables:	Qty	Shielded?	Length	Ferrites
serial/DC power	1	No	3m	No
antenna cable	1	Yes	varies w/ antenna	No
Unpopulated EUT Ports:	Qty	Reason		
none				
Software / Operating Mode Description:				
HyperTerminal: was able to vary the output power level, channel number, modulation, and control the hopping function (on/off)				

20dB Bandwidth MEASUREMENT

The 20dB bandwidths were measured for Channels 1, 100, and 209. The maximum 20dB bandwidth measured was **195kHz**. This value was used as the limit for the channel separation requirement.

ANALYZER PLOTS

Channel 1 20dB Bandwidth



Channel 100 20dB Bandwidth

* Agilent 09:58:39 Jul 8, 2003

R L

CH 100; Mod

▲ Mkr1 187.5 kHz

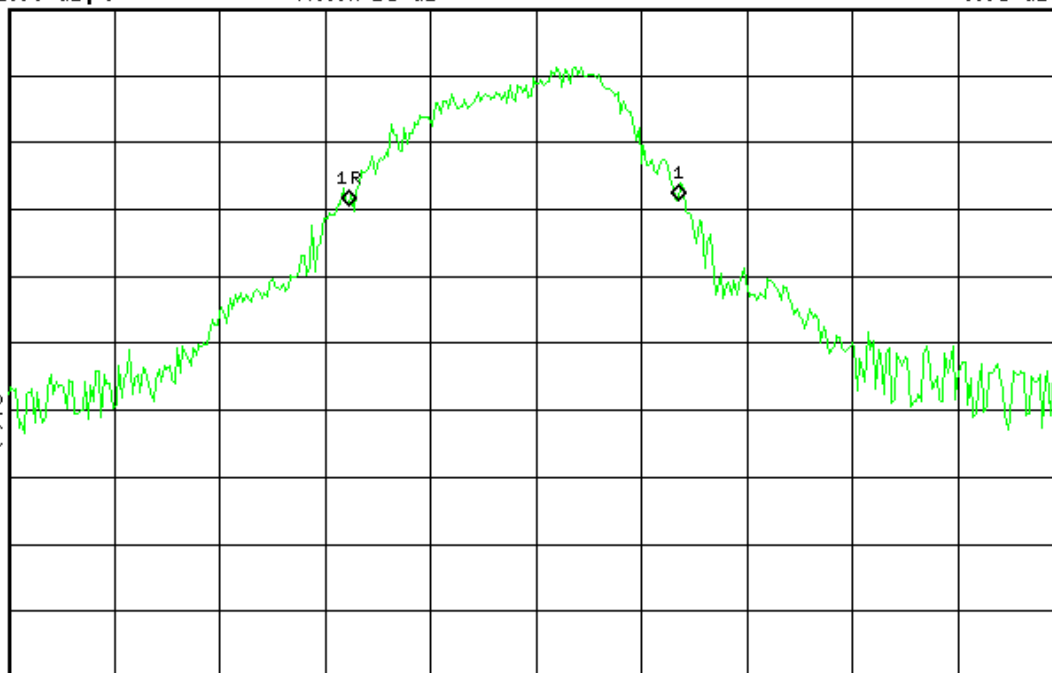
Ref 95.99 dB μ V

#Atten 15 dB

0.65 dB

Peak
Log
10
dB/V1 S2
S3 FCCenter 2.44 GHz
#Res BW 3 kHz

VBW 3 kHz

Span 600 kHz
Sweep 166.7 ms (401 pts)

Channel 209 20dB Bandwidth

* Agilent 10:09:57 Jul 8, 2003

R L

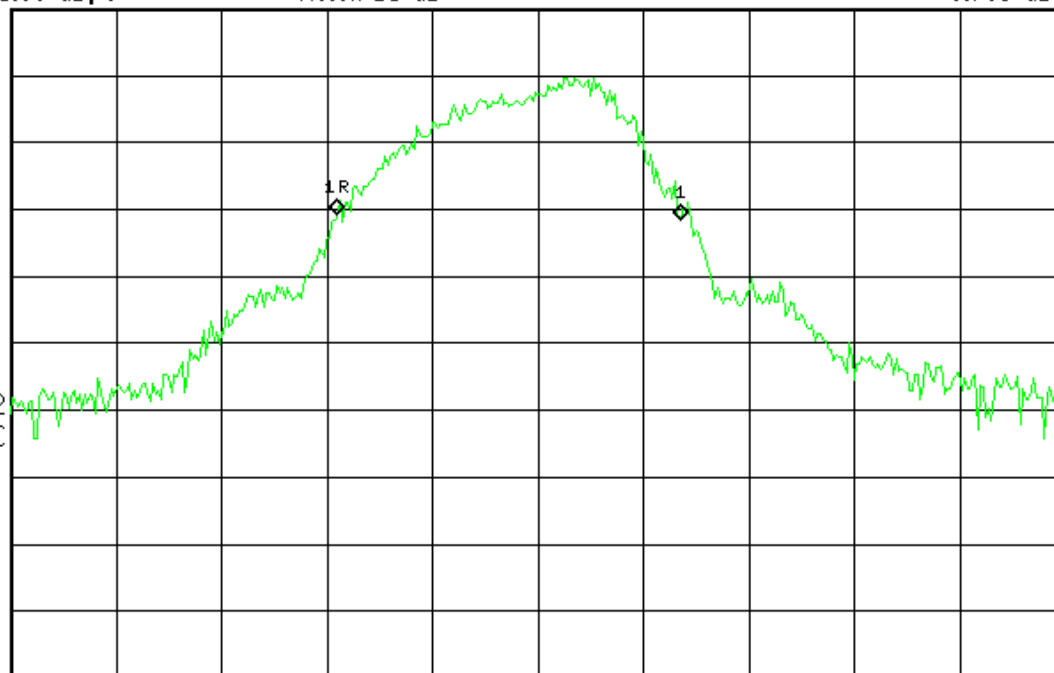
CH 209

▲ Mkr1 195.0 kHz

Ref 95.99 dB μ V

#Atten 15 dB

-0.793 dB

Peak
Log
10
dB/V1 S2
S3 FC

Center 2.483 GHz

Span 600 kHz

#Res BW 3 kHz

VBW 3 kHz

Sweep 166.7 ms (401 pts)

Channel Separation

REQUIREMENT

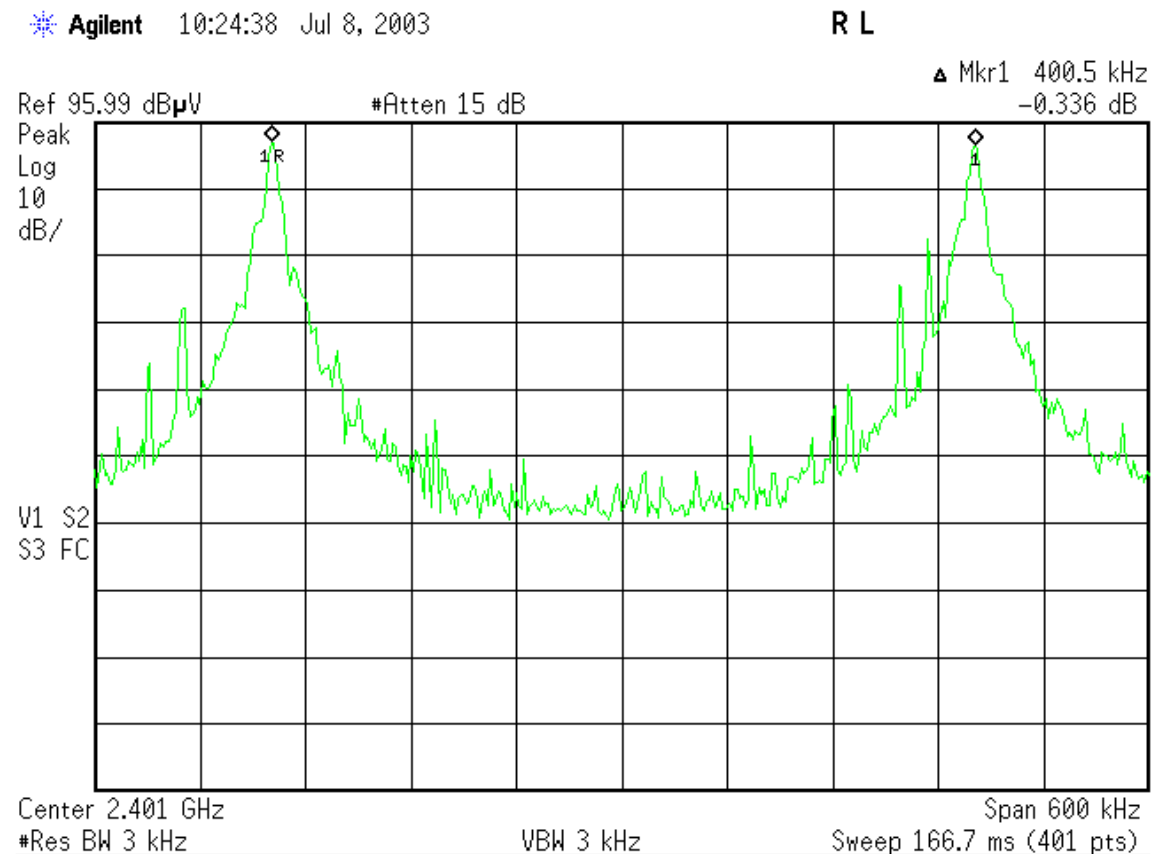
"Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater." [15.247(a)(1)]

20dB bandwidth = 195kHz (see "20dB Bandwidth" section)

MEASUREMENT

Channel separation = 400.5kHz

ANALYZER PLOT



Number of Hopping Frequencies

REQUIREMENT

"Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 non-overlapping channels." [15.247(a)(1)(iii)]

MEASUREMENT

The following four tables show max hold plots of the 2400-2483.5MHz band. They show a total of **83** hopping channels. This value was used to determine the limit for maximum peak output power. The channels are not all evenly spaced because they come from a predetermined pseudorandom hopping list.

ANALYZER PLOTS

2400-2420MHz

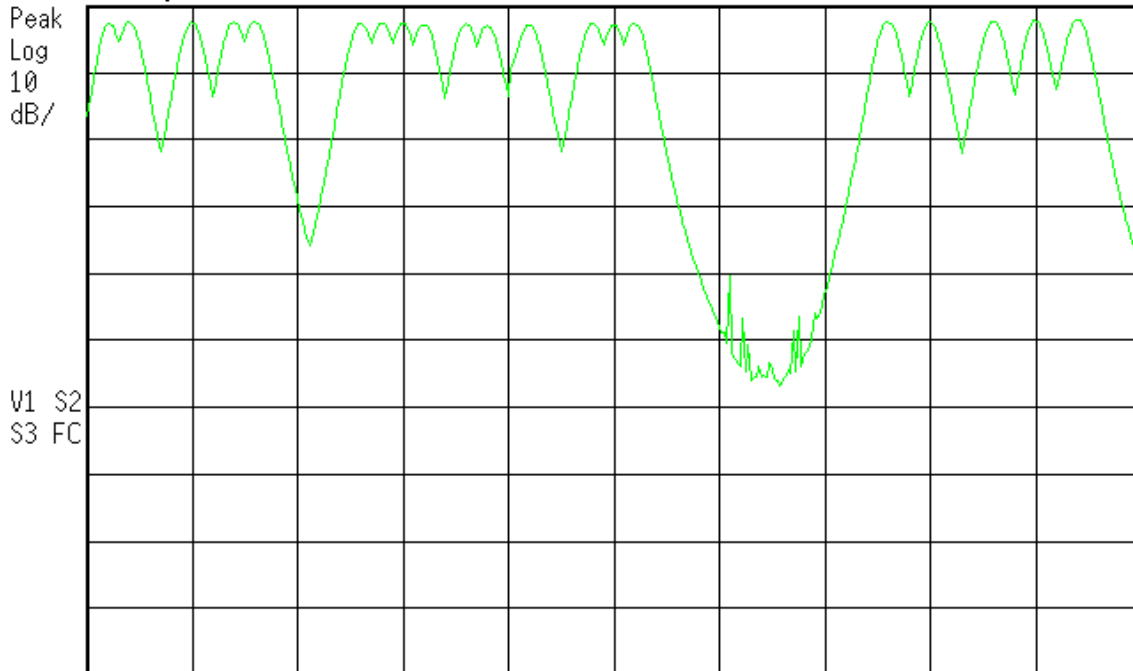
Agilent 10:37:32 Jul 8, 2003

R L

Table 1

Ref 95.99 dBμV

#Atten 15 dB



Center 2.41 GHz

#Res BW 300 kHz

VBW 300 kHz

Span 20 MHz

Sweep 4 ms (401 pts)

2420-2440MHz

* Agilent 10:42:01 Jul 8, 2003

R L

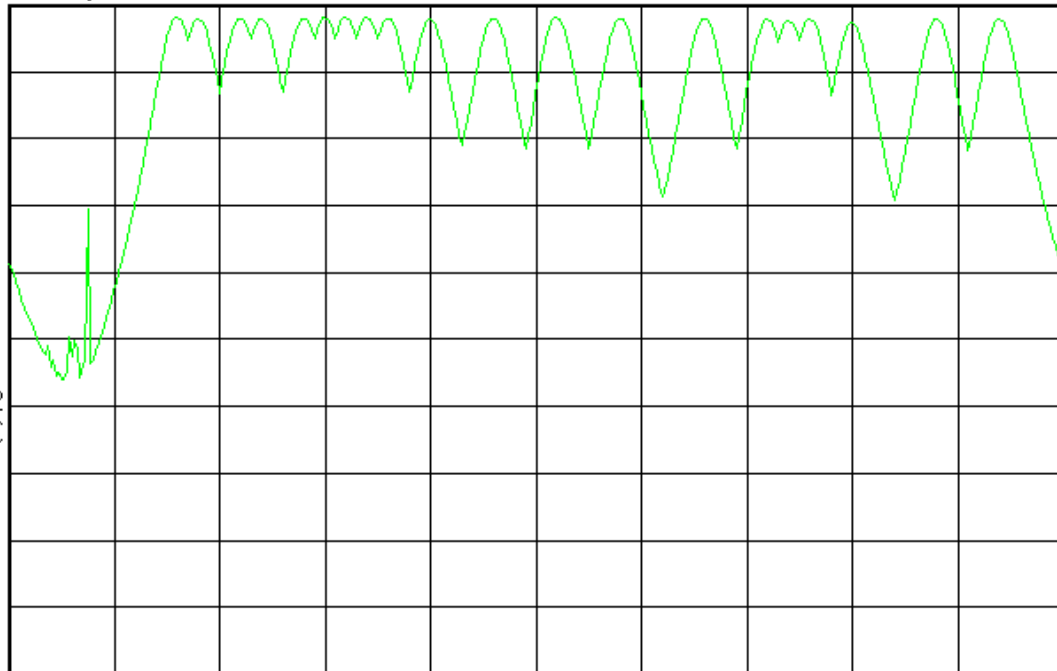
Table 2

Ref 95.99 dBμV

#Atten 15 dB

Peak
Log
10
dB/

V1 S2
S3 FC



Center 2.43 GHz
#Res BW 300 kHz

VBW 300 kHz

Span 20 MHz
Sweep 4 ms (401 pts)