

|                                  |                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Report No                        | ED0522-1                                                                                                              |
| Client                           | Seimac Limited<br>271 Brownlow Avenue<br>Dartmouth, Nova Scotia<br>Canada B3B 1W6                                     |
| Phone                            | 902-468-3007                                                                                                          |
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| FRN                              | 0008719288                                                                                                            |
| Model                            | SS2400S                                                                                                               |
| FCC ID                           | RHB45904004                                                                                                           |
| Equipment Type<br>Equipment Code | Spread Spectrum Transmitter<br>DSS                                                                                    |
| Results                          | As detailed within this report                                                                                        |
| Prepared by                      | <br>Evan Gould – Test Engineer     |
| Authorized by                    | <br>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.         |

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.

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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 50 $\Omega$ /50 $\mu$ H 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<br>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**

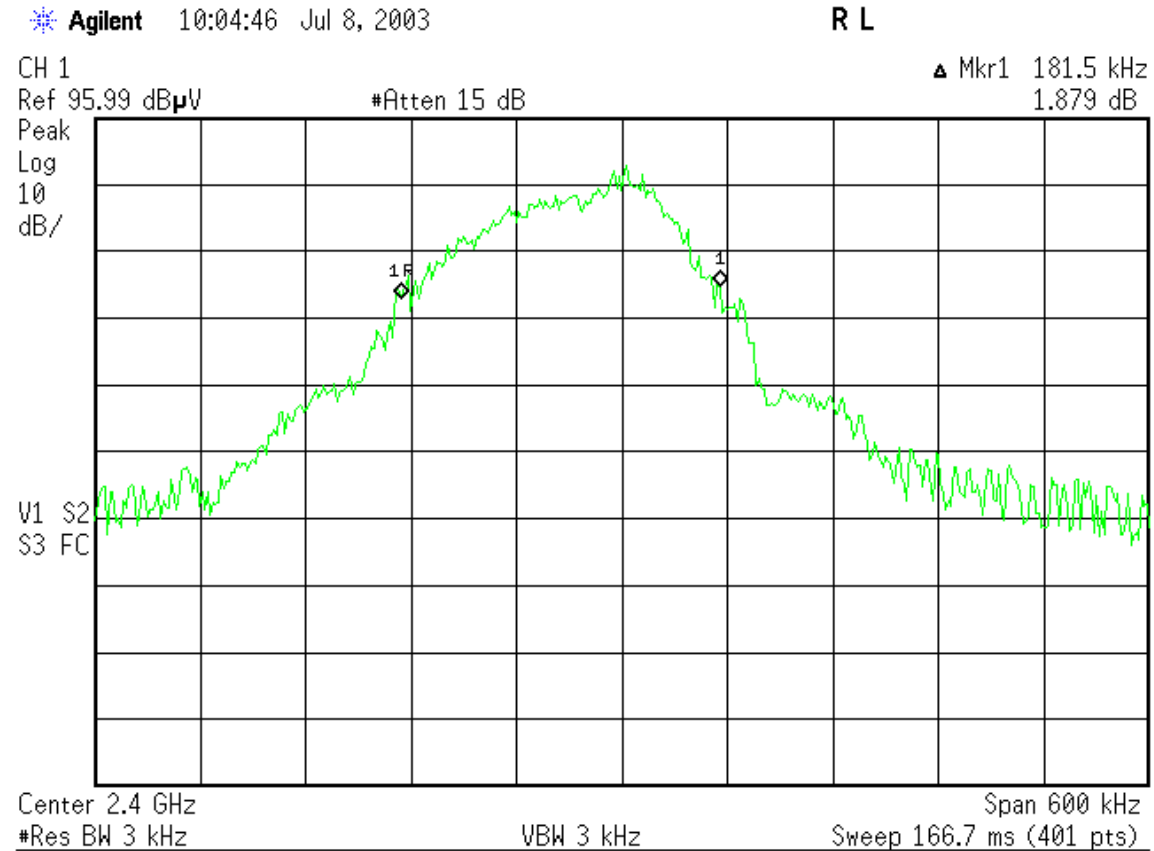
| <b>EUT Configuration</b>                                                                                                      |              |                  |                   |                 |
|-------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|-------------------|-----------------|
| <b>Work Order:</b> D0522                                                                                                      |              |                  |                   |                 |
| <b>Company:</b> Seimac Limited                                                                                                |              |                  |                   |                 |
| <b>Company Address:</b> 271 Brownlow Avenue<br>Dartmouth, Nova Scotia<br>Canada B3B 1W6                                       |              |                  |                   |                 |
| <b>Contact:</b> Howard Hart                                                                                                   |              |                  |                   |                 |
| <b>Persons Present:</b> Bernie Clement and Bob Haagensen                                                                      |              |                  |                   |                 |
| <hr/>                                                                                                                         |              |                  |                   |                 |
| <b>MN</b>                                                                                                                     | <b>SN</b>    | <b>FCC ID</b>    |                   |                 |
| <b>EUT:</b> SS2400S                                                                                                           | FCC 1        | RHB45904004      |                   |                 |
| <b>EUT Description:</b> Solid Link - Spread spectrum industrial radio modem                                                   |              |                  |                   |                 |
| <b>EUT Max Frequency:</b> 2483.5MHz                                                                                           |              |                  |                   |                 |
| <hr/>                                                                                                                         |              |                  |                   |                 |
| <b>Support Equipment:</b>                                                                                                     | <b>MN</b>    | <b>SN</b>        | <b>FCC ID</b>     |                 |
| IBM laptop                                                                                                                    | ThinkPad 600 | 78-P4540         | -                 |                 |
| HON-KWANG 12VDC adaptor                                                                                                       | D12-10-1000  | 66-000-118-01    | -                 |                 |
| <hr/>                                                                                                                         |              |                  |                   |                 |
| <b>EUT Cables:</b>                                                                                                            | <b>Qty</b>   | <b>Shielded?</b> | <b>Length</b>     | <b>Ferrites</b> |
| serial/DC power                                                                                                               | 1            | No               | 3m                | No              |
| antenna cable                                                                                                                 | 1            | Yes              | varies w/ antenna | No              |
| <hr/>                                                                                                                         |              |                  |                   |                 |
| <b>Unpopulated EUT Ports:</b>                                                                                                 | <b>Qty</b>   | <b>Reason</b>    |                   |                 |
| none                                                                                                                          |              |                  |                   |                 |
| <hr/>                                                                                                                         |              |                  |                   |                 |
| <b>Software / Operating Mode Description:</b>                                                                                 |              |                  |                   |                 |
| 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

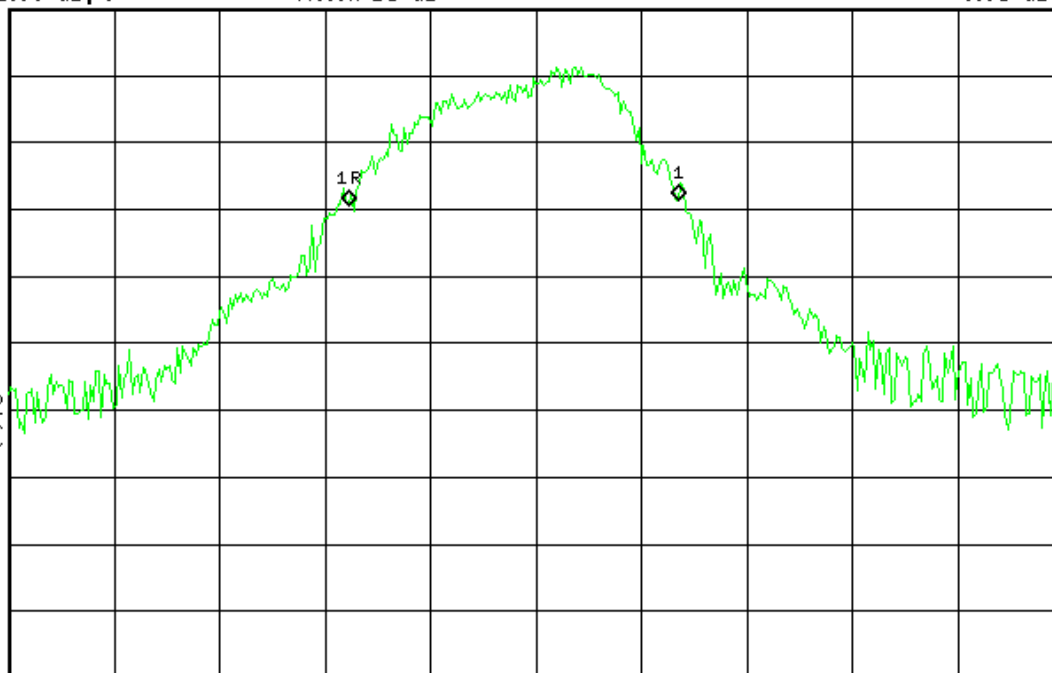
CH 100; Mod

▲ Mkr1 187.5 kHz

Ref 95.99 dB $\mu$ V

#Atten 15 dB

0.65 dB

Peak  
Log  
10  
dB/V1 S2  
S3 FC

Center 2.44 GHz

Span 600 kHz

#Res BW 3 kHz

VBW 3 kHz

Sweep 166.7 ms (401 pts)

## Channel 209 20dB Bandwidth

\* Agilent 10:09:57 Jul 8, 2003

R L

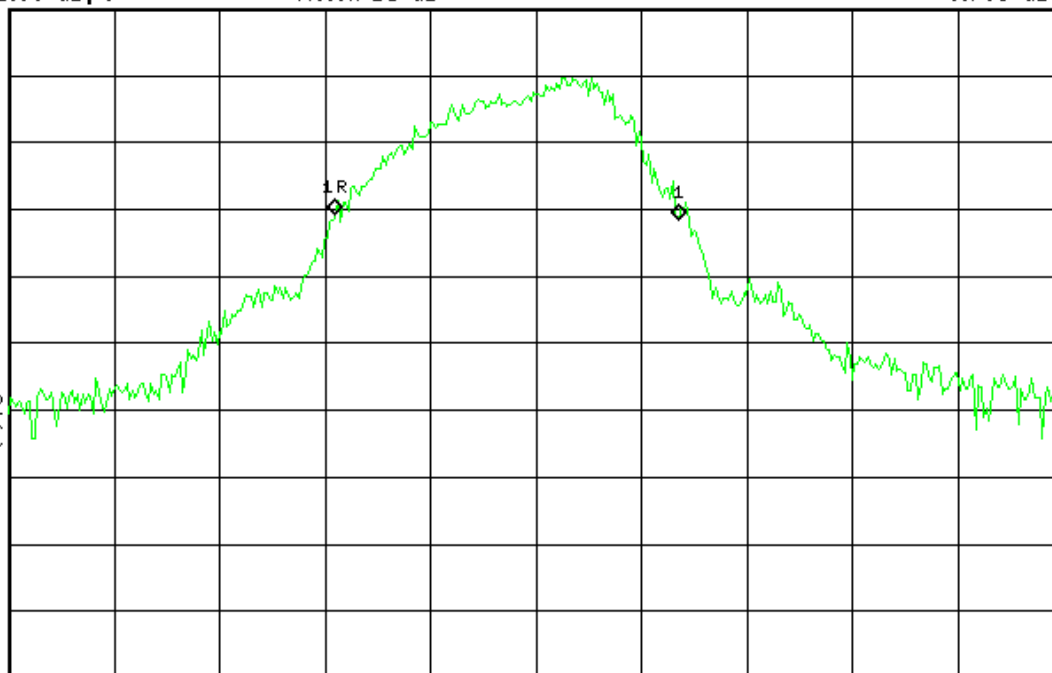
CH 209

▲ Mkr1 195.0 kHz

Ref 95.99 dB $\mu$ 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

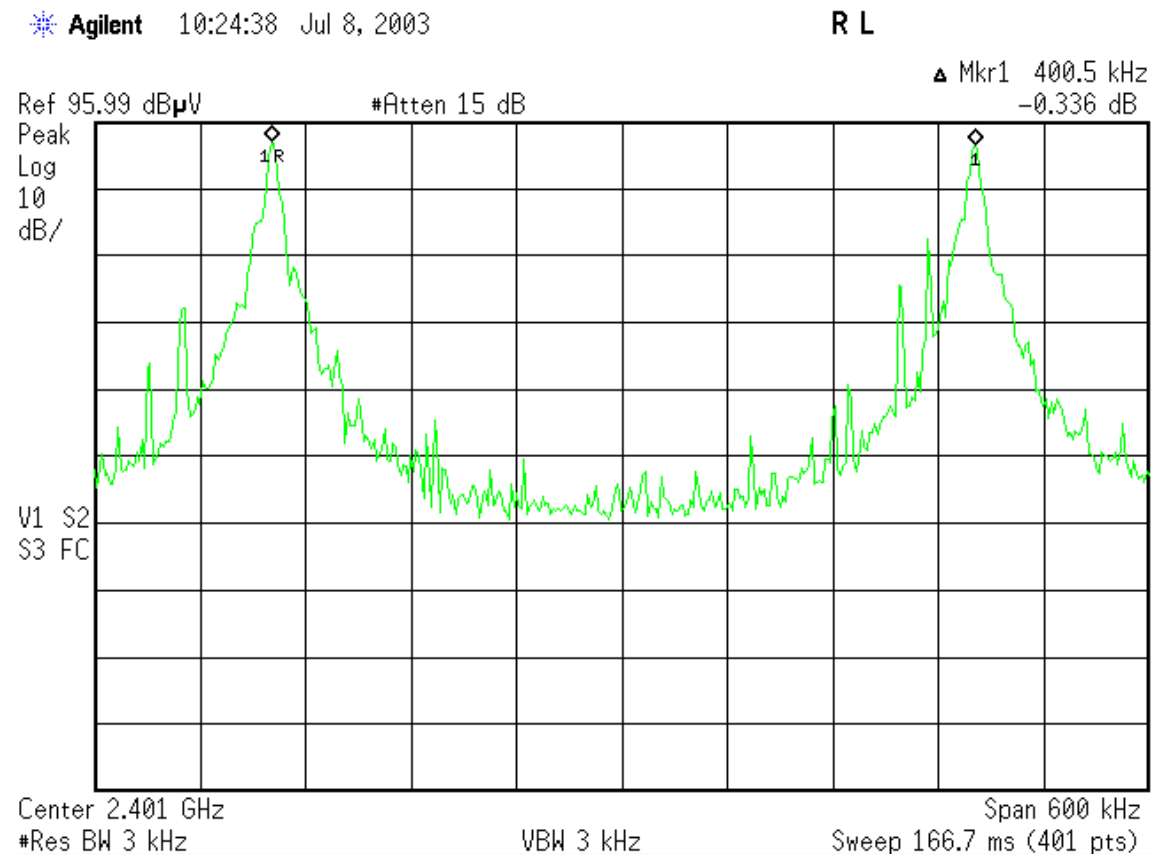
*"Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater."* [15.247(a)(1)]

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

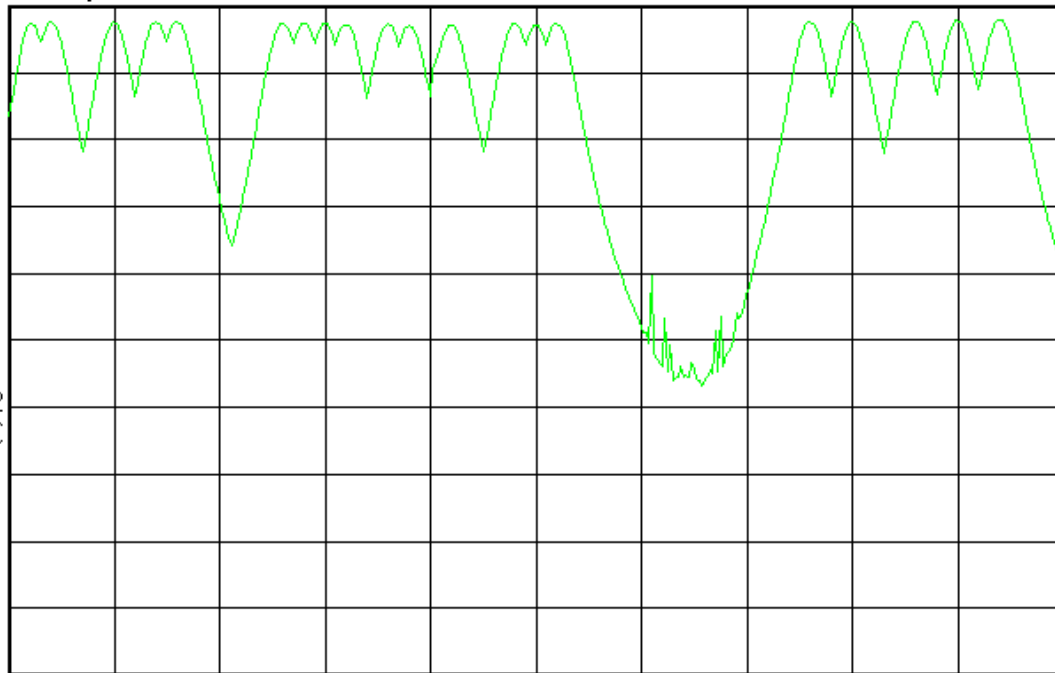
Table 1

Ref 95.99 dBμV

#Atten 15 dB

Peak  
Log  
10  
dB/

V1 S2  
S3 FC



Center 2.41 GHz  
#Res BW 300 kHz

VBW 300 kHz

Span 20 MHz  
Sweep 4 ms (401 pts)

2420-2440MHz

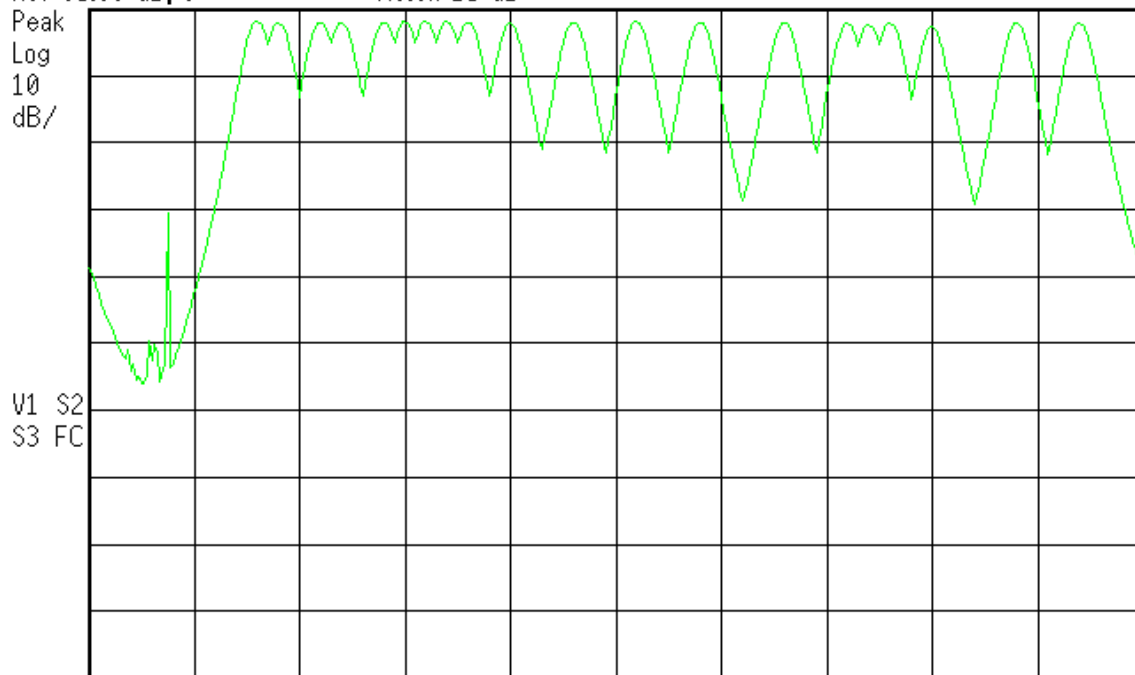
\* Agilent 10:42:01 Jul 8, 2003

R L

Table 2

Ref 95.99 dBμV

#Atten 15 dB



Center 2.43 GHz  
#Res BW 300 kHz

VBW 300 kHz

Span 20 MHz  
Sweep 4 ms (401 pts)