



**CONFORMANCE TEST REPORT  
FOR  
FCC Part 15, subpart D**

**Report No.: 14-11-MAS-010-02**

Client: **Lightspeed Technologies Inc.**  
Product: **Flexcat Pod**  
Model: **FCP**  
FCC ID: **ORV-FCGS**

Manufacturer/supplier: **REOR ELECTRONICS CO., LTD.**

Date test item received: 2014/11/03  
Date test campaign completed: 2014/12/04  
Date of issue: 2014/12/17

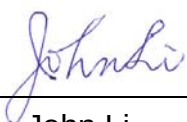
**The test result only corresponds to the tested sample. It is not permitted to copy this report, in part or in full, without the permission of the test laboratory.**

*Total number of pages of this test report: 51 pages*

*Total number of pages of photos: External photos 3 pages*

*Internal photos 5 pages*

*Setup photos 3 pages*

| Test Engineer                                                                       | Checked By                                                                          | Approved By                                                                           |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| John Li                                                                             | Perry Lin                                                                           | James Cheng                                                                           |

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## 1 GENERAL INFORMATION

### 1.1 Testing Laboratory

Name: Electronic Testing Center, Taiwan  
Address: No. 8, Lane 29, Wenming Rd., Leshan Tsuen, Guishan Shiang,  
Taoyuan Country, 33383, Taiwan, R.O.C.  
Telephone: 886-3-3280026  
Fax: 886-3-3276188  
NVLAP lab registration #: 200133-0  
IC OATS registration #: IC 2949-1  
E-Mail: [jamescheng@etc.org.tw](mailto:jamescheng@etc.org.tw)

### 1.2 Client Information

Name: Lightspeed Technologies Inc.  
Address: 11509 SW Herman Road, Tualatin, OR 97062 USA  
Telephone: 800-732-8999  
Contact person: Michael A. Frost

### 1.3 Manufacturer

Name: REOR ELECTRONICS CO., LTD.  
Address: 5F., No. 122, Cioahe Rd., Jhonghe Dist., New Taipei City  
23558, Taiwan.

## 2 TEST INFORMATION

### 2.1 Description of Tested Device(s)

The tested equipment is a DECT Handset that complies with ETSI EN 300175. The frequencies have been reprogrammed to comply with the FCC and IC requirements to an Isochronous UPCS device after FCC Part 15D and Industry Canada RSS-213 Issue 2.

The EUT is a responding device as described in ANSI C63.17 and is designed to operate together with a DECT base station, which is then the initiating device.

| Frequency Channel | Frequency    | Test Frequency |
|-------------------|--------------|----------------|
| CH4               | 1921.536 MHz | F <sub>L</sub> |
| CH3               | 1923.264 MHz | -              |
| CH2               | 1924.992 MHz | F <sub>M</sub> |
| CH1               | 1926.720 MHz | -              |
| CH0               | 1928.448 MHz | F <sub>H</sub> |

### 2.2 Test Environment

#### Normal test condition

|                    |            |
|--------------------|------------|
| Temperature:       | 20 - 25 °C |
| Relative humidity: | 55 - 75%   |

#### Extreme test condition (declared by manufacturer)

Please see the manufacturer declaration form.

**3 TEST REPORT SUMMARY****3.1 Test Summary**

| Requirement                               | FCC Paragraph #      | Required                            | Customer Declaration                | Test Pass                                 |
|-------------------------------------------|----------------------|-------------------------------------|-------------------------------------|-------------------------------------------|
| Coordination with fixed microwave         | 15.307               | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                  |
| Cross Reference                           | 15.33 (a), 15.309(b) | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> Note1 |
| Labeling requirements                     | 15.311,15.19(a)(3)   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                  |
| Power line Conducted Emission             | 15.315,15.207        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>       |
| Antenna Requirement                       | 15.317, 15.203       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                  |
| Digital Modulation Techniques             | 15.319(b)            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                  |
| Peak transmit Power                       | 15.319(c)            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>       |
| Power Spectral Density                    | 15.319(d)            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>       |
| Antenna gain                              | 15.319(e)            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                  |
| Automatic discontinuation of transmission | 15.319(f)            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                  |
| Safety exposure levels                    | 15.319(i)            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>       |
| Emission Bandwidth                        | 15.323(a)            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>       |
| Monitoring time                           | 15.323(c)(1)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Monitoring threshold                      | 15.323(c)(2)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Maximum transmit period                   | 15.323(c)(3)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| System acknowledgement                    | 15.323(c)(4)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Least Interfered Channel, LIC             | 15.323(c)(5)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Random waiting                            | 15.323(c)(6)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Monitoring bandwidth and reaction time    | 15.323(c)(7)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Monitoring antenna                        | 15.323(c)(8)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Monitoring threshold relaxation           | 15.323(c)(9)         | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Duplex system LBT                         | 15.323(c)(10)        | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Co-located device LBT                     | 15.323(c)(11)        | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Fair access                               | 15.323(c)(12)        | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Emissions inside and outside the subband  | 15.323(d)            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>       |
| Frame period and jitter                   | 15.323(e)            | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |
| Carrier frequency stability               | 15.323(f)            | <input type="checkbox"/> Note2      | <input type="checkbox"/>            | <input type="checkbox"/>                  |

Note1 : For test results, see the EMC report as attached.

Note2 : Not require for C2PC.

### 3.2 Other Comments

All measurements are traceable to national standards.

The tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR47 Part 15, Paragraph 15.323 for Isochronous UPCS Devices and Industry Canada RSS-213 Issue 2.

The conducted test methods have been in accordance with ANSI C63.17-1998 and ANSI C63.17-2013 where applicable. Radiated tests were conducted in accordance with ANSI C63.4-2003.

Where a test method specified in this Standard cannot be followed, a test method given in ANSI C63.17 may be used by quoting the test section number. An equivalent alternative method may also be used provided that it is fully described in the test report.

Where a test is not practicable (e.g. the test for an access protocol of Section 4.3.4), the certification applicant may submit to Industry Canada the manufacturer's declaration that the access protocol has nevertheless been met in the design and prototype tests. Full justification as to why testing is not practicable should be given for Industry Canada's consideration.

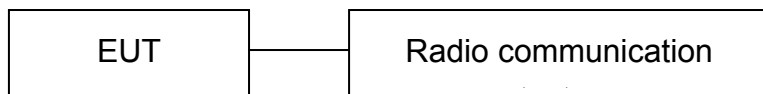
A mid-band carrier frequency should normally be used for tests.

When an antenna conducted measurement is used to determine the RF output power of the device, the effective gain of the antenna intended for the device must be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 3 dBi (3 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in this standard.

Accessories and peripheral equipment that are normally required to be connected to the device in actual use, shall be so connected with representative cable lengths for the tests. Only one test using representative peripherals and accessories is required. The emission tests shall be performed with the device and accessories configured in a manner which tends to produce the maximum level of emissions within the range of variations that can be expected under normal operating conditions.

## 4 TEST SETUP

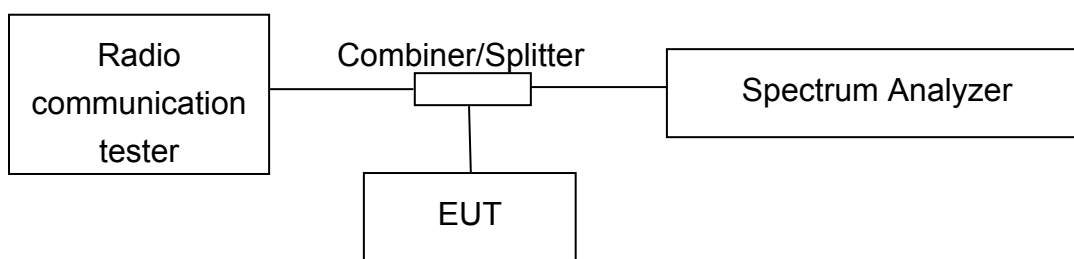
### 4.1 Frequency and Timing Measurements



#### Test Set-up 1

This setup is used for measuring Frame repetition stability, Jitter, Carrier frequency stability at normal and extreme temperatures.

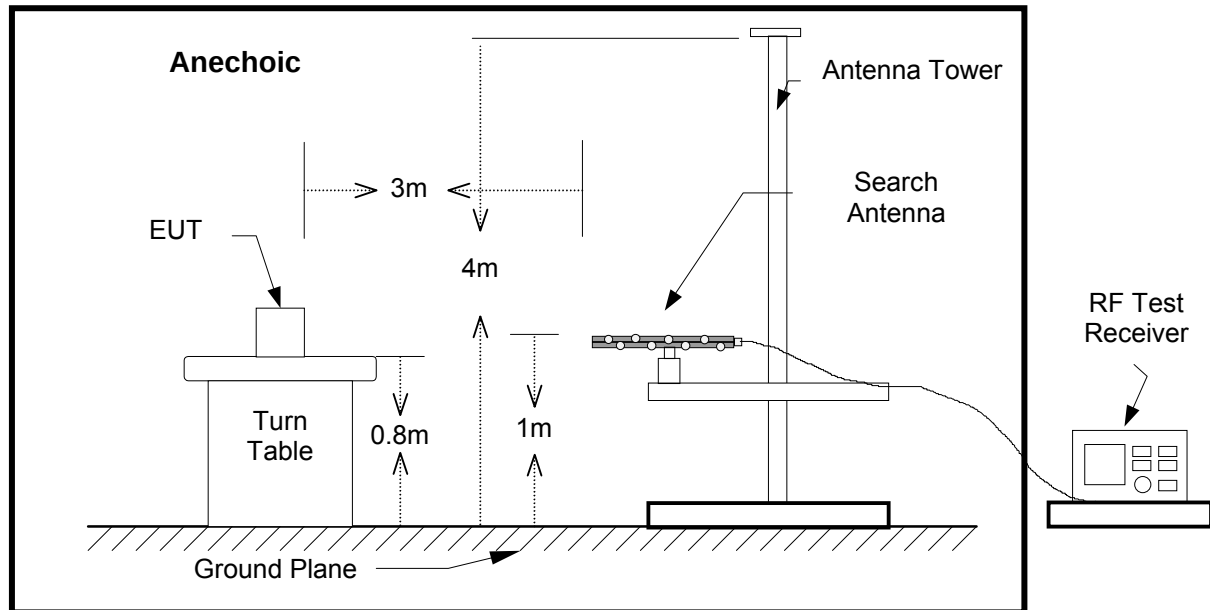
### 4.2 Conducted Emission Tests



#### Test Set-up 2

This setup is used for all conducted emission tests.

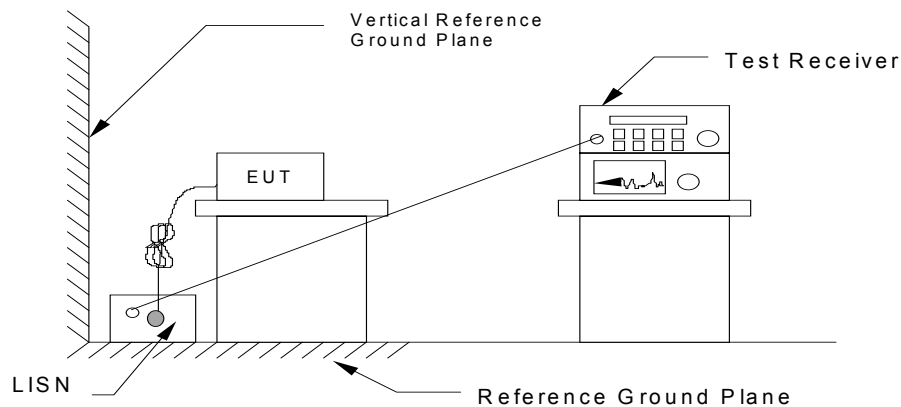
### 4.3 Radiated Emission Tests



#### Test Set-Up 3

This test setup is used for all radiated emissions tests. For frequencies below 30 MHz the measuring distance is 10 m, for all other frequencies it is 3 m. Emissions above 1 GHz were measured with the Spectrum Analyzer, Horn Antenna and the preamplifier after the antenna.

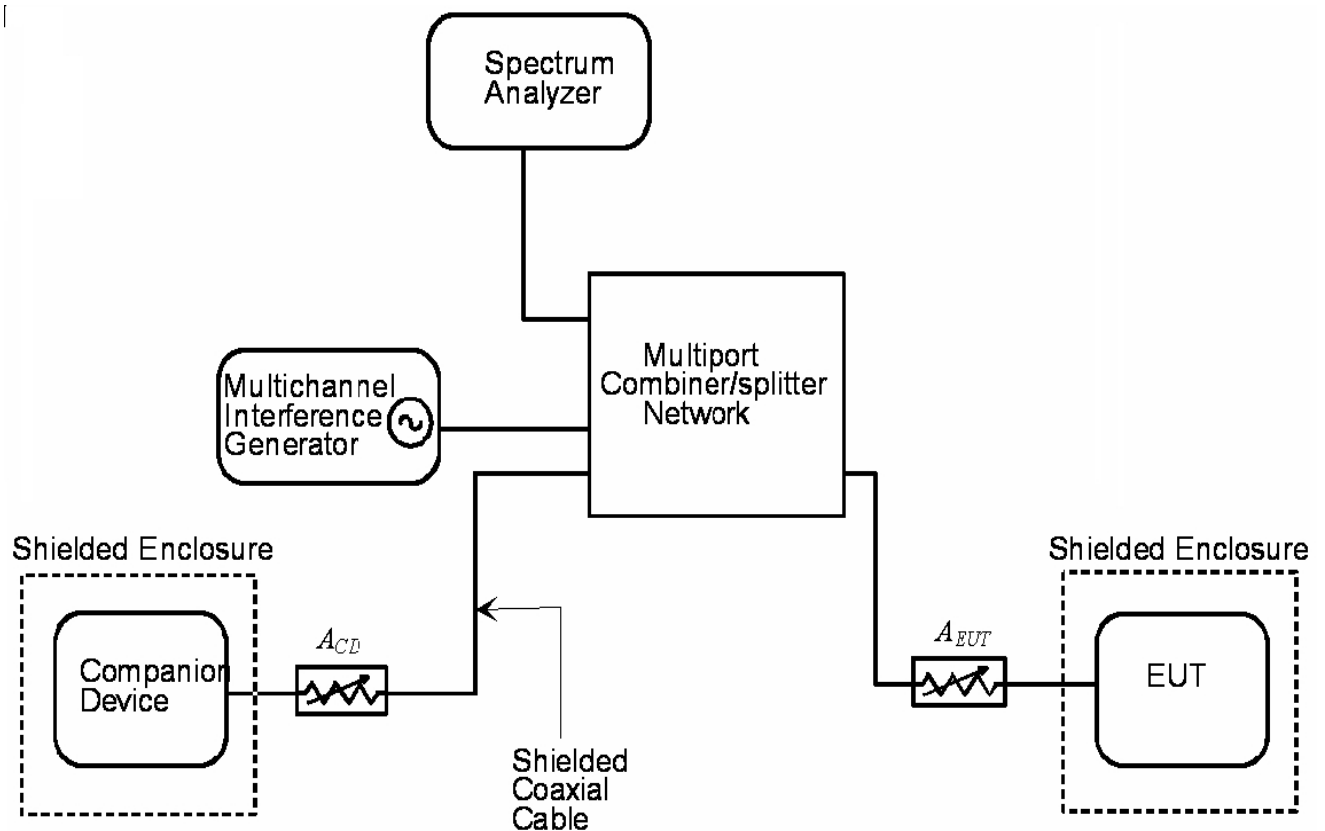
### 4.4 Power line Conducted Tests



#### Test Set-Up 4



## 4.5 Monitoring Tests



### Test Set-Up 5

This test setup is used for all Monitoring and Time and Spectrum Access Procedure tests.

| Companion Device | $A_{CD}$ (dB) | EUT     | $A_{EUT}$ (dB) |
|------------------|---------------|---------|----------------|
| Base             | 50            | Handset | 0              |
| Handset          | 30            | Base    | 0              |

**5 TEST EQUIPMENT LIST**

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

| Equipment                  | Manufacturer         | Model No. | S/N          | Calibration Date<br>(MM/DD/YY) | Next Calibration Date<br>(MM/DD/YY) |
|----------------------------|----------------------|-----------|--------------|--------------------------------|-------------------------------------|
| EMI Test Receiver          | Rohde & Schwarz      | ESIB7     | 13054414-001 | 07/20/2014                     | 07/19/2015                          |
| BiLog Antenna              | ETC                  | MCTD2786  | BL09D01001   | 02/07/2014                     | 02/06/2015                          |
| Horn Antenna               | EMCO                 | 3115      | 13059201-001 | 07/16/2014                     | 07/15/2015                          |
| Horn Antenna               | EMCO                 | 3116      | 13059202-001 | 08/22/2014                     | 08/21/2015                          |
| Preamplifier               | Hewlett-Packard      | 8449B     | 13040709-001 | 11/21/2014                     | 11/20/2015                          |
| Spectrum Analyzer          | Agilent              | E4446A    | 13052013-001 | 10/07/2014                     | 10/06/2015                          |
| Spectrum Analyzer          | Rohde & Schwarz      | FSU46     | 13040904-001 | 01/20/2014                     | 01/19/2015                          |
| EMI Test Receiver          | R&S                  | ESCI      | 13054418-001 | 07/03/2014                     | 07/02/2015                          |
| V-LISN                     | R&S                  | ENV216    | 13057719-001 | 05/07/2014                     | 05/06/2015                          |
| Radio Communication Tester | Rohde & Schwarz      | CTS60     | 13046802-002 | 09/15/2014                     | 09/14/2015                          |
| RF Downconverter           | National Instruments | PXI-5600  | E35372       | 03/23/2014                     | 03/22/2015                          |
| RF Downconverter           | National Instruments | PXI-5600  | E224BD       | 03/23/2014                     | 03/22/2015                          |
| 64 MS/s Digitizer          | National Instruments | PXI-5620  | E34BOB       | 03/23/2014                     | 03/22/2015                          |
| 64 MS/s Digitizer          | National Instruments | PXI-5620  | E22946       | 03/23/2014                     | 03/22/2015                          |
| 100 MS/s AWG OSP           | National Instruments | PXI-5441  | E32987       | 03/23/2014                     | 03/22/2015                          |
| 8-Bit 250 MS/s Digitizer   | National Instruments | PXI-5114  | E41FBC       | 03/23/2014                     | 03/22/2015                          |
| 8-Bit 250 MS/s Digitizer   | National Instruments | PXI-5114  | E41FBE       | 03/23/2014                     | 03/22/2015                          |
| RF Upconverter             | National Instruments | PXI-5610  | E35372       | 03/23/2014                     | 03/22/2015                          |
| Loop Antenna               | EMCO                 | 6512      | 13054104-001 | 07/01/2014                     | 06/30/2017                          |
| PRE-Amplifier              | EMCI                 | PA303N    | 13040720-001 | 07/03/2014                     | 07/02/2015                          |

## 6 TEST RESULT

### 6.1 Coordination with fixed microwave

#### 6.1.1 Standard Applicable: FCC 15.307

Each application for certification of equipment operating under the provisions of this Subpart must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations attendant to participation in UTAM, Inc., the Commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.

#### Result

The affidavit from UTAM, Inc. is included in the documentation supplied by the applicant:

☒ Yes

☐ No

## 6.2 Cross Reference

### 6.2.1 Standard Applicable:

#### 15.309(b)

The requirements of Subpart D apply only to the radio transmitter contained in the PCS device. Other aspects of the operation of a PCS device may be subject to requirements contained elsewhere in this Chapter. In particular, a PCS device that includes digital circuitry not directly associated with the radio transmitter also is subject to the requirements for unintentional radiators in Subpart B.

#### 15.109(a)

For unintentional device, according to **FCC §15.109(a)**, the field strength of radiated emissions from unintentional except for class A digital device radiators at a distance of 3 meters shall not exceed the following values:

| Frequency<br>MHz | Distance<br>Meters | Radiated<br>$\mu\text{V/m}$ | Radiated<br>dB $\mu\text{V/m}$ |
|------------------|--------------------|-----------------------------|--------------------------------|
| 30 - 88          | 3                  | 100                         | 40.0                           |
| 88 - 216         | 3                  | 150                         | 43.5                           |
| 216 - 960        | 3                  | 200                         | 46.0                           |
| above 960        | 3                  | 500                         | 54.0                           |

For intentional radiator device, according to §15.209(a), the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table::

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 - 0.490      | 2400/F(kHz)                          | 300                              |
| 0.490 - 1.705      | 24000/F(kHz)                         | 30                               |
| 1.705 - 30.0       | 30                                   | 30                               |
| 30 - 88            | 100 **                               | 3                                |
| 88 - 216           | 150 **                               | 3                                |
| 216 - 960          | 200 **                               | 3                                |
| Above 960          | 500                                  | 3                                |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

**6.2.2 Test Results:**

|                                                                                                                                                   |                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| This requirement is not applicable because test sample do not include digital circuitry which is not direct associated with the radio transmitter | <input type="checkbox"/>            |
| For test results according to FCC part 15 subpart B, see the EMC report as attached                                                               | <input type="checkbox"/>            |
| For test results according to FCC part 15 subpart B, see the measurement data as follow                                                           | <input checked="" type="checkbox"/> |
| This requirement is covered by results of power line conducted emission test according to FCC 15.315                                              | <input checked="" type="checkbox"/> |
| Radiated measurement to evaluate simultaneous transmission operations                                                                             | <input type="checkbox"/>            |

Note: For radiated test, if EUT is a handset, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission as a worse case.

**Radiated Emission Test****A. 30MHz to 20GHz**

File: c2pc

Data: #5

Date: 2014/11/14

Temperature: 23 °C

Time: PM 09:24:59

Humidity: 58 %

Condition: FCC Part15 RE-Class B\_30-1000MHz Polarization: Horizontal

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 30.0000            | 10.26               | peak     | 20.45             | 30.71              | 40.00             | -9.29          |
| 2   | 37.7755            | 12.58               | peak     | 16.42             | 29.00              | 40.00             | -11.00         |
| 3   | 66.9338            | 14.11               | peak     | 7.28              | 21.39              | 40.00             | -18.61         |
| 4   | 319.6392           | 9.52                | peak     | 18.44             | 27.96              | 46.00             | -18.04         |
| 5   | 665.6512           | 3.59                | peak     | 25.34             | 28.93              | 46.00             | -17.07         |
| 6   | 826.9940           | 3.45                | peak     | 27.29             | 30.74              | 46.00             | -15.26         |

Condition: FCC Part15 RE-Class B\_30-1000MHz Polarization: Vertical

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 30.0000            | 9.79                | peak     | 20.45             | 30.24              | 40.00             | -9.76          |
| 2   | 45.5510            | 14.00               | peak     | 12.60             | 26.60              | 40.00             | -13.40         |
| 3   | 57.2143            | 14.25               | peak     | 8.14              | 22.39              | 40.00             | -17.61         |
| 4   | 185.5110           | 10.42               | peak     | 12.35             | 22.77              | 43.50             | -20.73         |
| 5   | 319.6392           | 7.04                | peak     | 18.44             | 25.48              | 46.00             | -20.52         |
| 6   | 908.6372           | 3.28                | peak     | 28.47             | 31.75              | 46.00             | -14.25         |

**B. below 30MHz**

| Frequency<br>(MHz)                                                                 | Reading<br>(dBuV/m)<br>Peak | Duty<br>(dB) | Factor<br>(dB) | Result @3m (dBuV/m)<br>Peak QP AVG | Limit @3m<br>(dBuV/m)<br>Peak AVG |
|------------------------------------------------------------------------------------|-----------------------------|--------------|----------------|------------------------------------|-----------------------------------|
| Radiated emission frequencies from 9 kHz to 30 MHz<br>were too low to be measured. |                             |              |                |                                    |                                   |

- Note: 1. Place of Measurement: Measuring site of the ETC.
2. The measurements of radiated emission frequencies from 100kHz to 30MHz were greater than 20dB below the limit.
3. The estimated measurement uncertainty of the result measurement is
- ±4.2dB (9kHz ≤ f ≤ 30MHz).
  - ±4.6dB (30MHz ≤ f < 300MHz).
  - ±4.4dB (300MHz ≤ f < 1000MHz).
  - ±4.1dB (1GHz ≤ f < 18GHz).
  - ±4.4dB (18GHz ≤ f ≤ 40GHz).

### 6.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\textbf{Result} = \textbf{Reading} + \textbf{Corrected Factor}$$

where

$$\text{Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

## 6.4 Labeling Requirements

### 6.4.1 Standard Applicable: FCC 15.19, RSS-213 3

The FCC Identifier shall be displayed on the label, and the device(s) shall bear the following statement in a conspicuous location on the device or in the user manual if the device is too small:

*Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

The label itself shall be of a permanent type, not a paper label, and shall last the lifetime of the equipment.

### 6.4.2 Result

See separate documents showing the label design and the placement of the label on the EUT.



## 6.5 Power line Conducted Emissions

### 6.5.1 Standard Applicable:

#### 15.315

An unlicensed PCS device that is designed to be connected to the public utility (AC) power line must meet the limits specified in Section 15.207.

#### 15.207(a)

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency<br>MHz | Quasi Peak<br>dB $\mu$ V | Average<br>dB $\mu$ V |
|------------------|--------------------------|-----------------------|
| 0.15 - 0.5       | 66-56*                   | 56-46*                |
| 0.5 - 5.0        | 56                       | 46                    |
| 5.0 - 30.0       | 60                       | 50                    |

\*Decreases with the logarithm of the frequency.

#### RSS-213 6.3

The limits of AC power line conducted emissions are given in RSS-Gen, Section 7.

### 6.5.2 Measurement Procedure

ANSI C63.4-2003 using 50  $\mu$ H/50 ohms LISN.

### 6.5.3 Test Results: Complies

**Measurement Data: See attached graph, (Peak detector).**

Highest measured value (L1 and N):

All emissions were below the QP and Average limits when measured with Peak detector.

The test was performed with the EUT in standby charging and repeated with the EUT transmitting in speakerphone mode and charging.

## Conducted Emission Test

File: c2pce

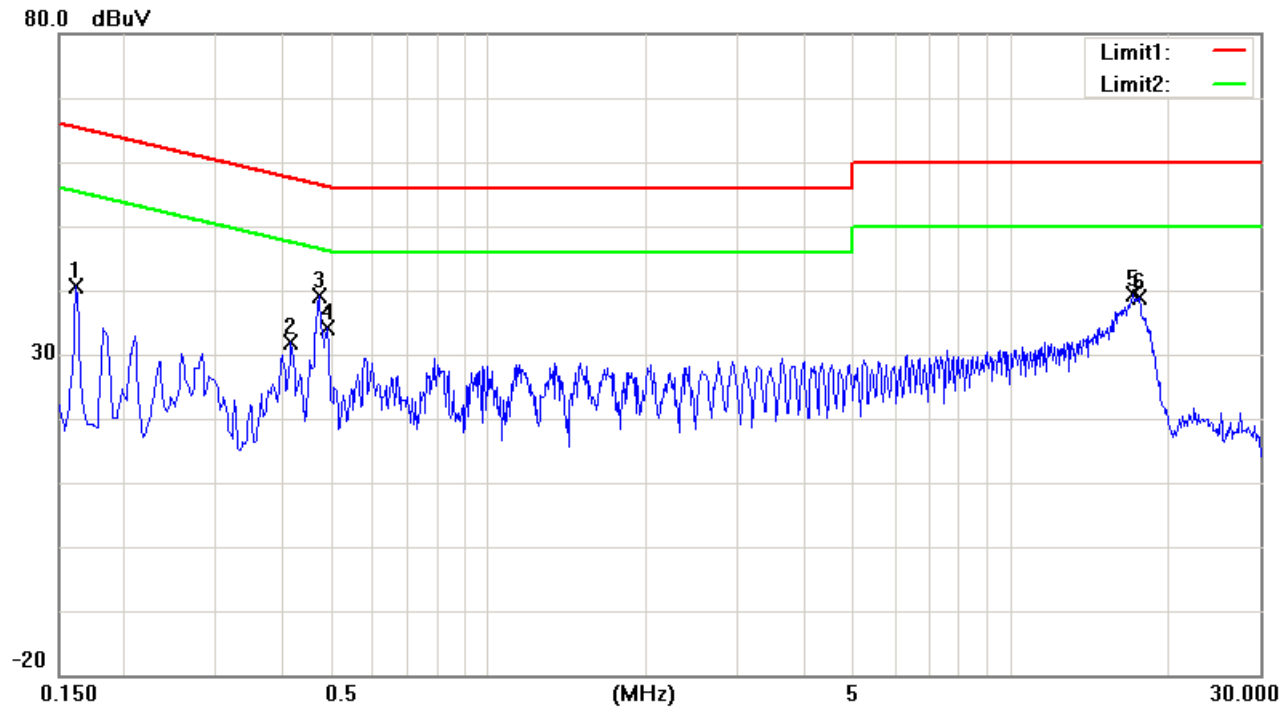
Data: #13

Date: 2014/11/30

Temperature: 21 °C

Time: AM 09:26:00

Humidity: 64 %



Condition:

Phase:

L1

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Detector | Corrected<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) |
|-----|--------------------|-------------------|----------|-------------------|------------------|-----------------|----------------|
| 1   | 0.1620             | 31.14             | peak     | 9.60              | 40.74            | 65.36           | -24.62         |
| 2   | 0.4180             | 22.18             | peak     | 9.61              | 31.79            | 57.49           | -25.70         |
| 3   | 0.4740             | 29.56             | peak     | 9.61              | 39.17            | 56.44           | -17.27         |
| 4   | 0.4900             | 24.63             | peak     | 9.61              | 34.24            | 56.17           | -21.93         |
| 5   | 17.1220            | 29.33             | peak     | 9.95              | 39.28            | 60.00           | -20.72         |
| 6   | 17.6340            | 28.79             | peak     | 9.97              | 38.76            | 60.00           | -21.24         |

Note:

1. "\*\*\*\*" means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. The estimated measurement uncertainty of the result measurement is  $\pm 2.5$ dB.

## Conducted Emission Test

File: c2pce

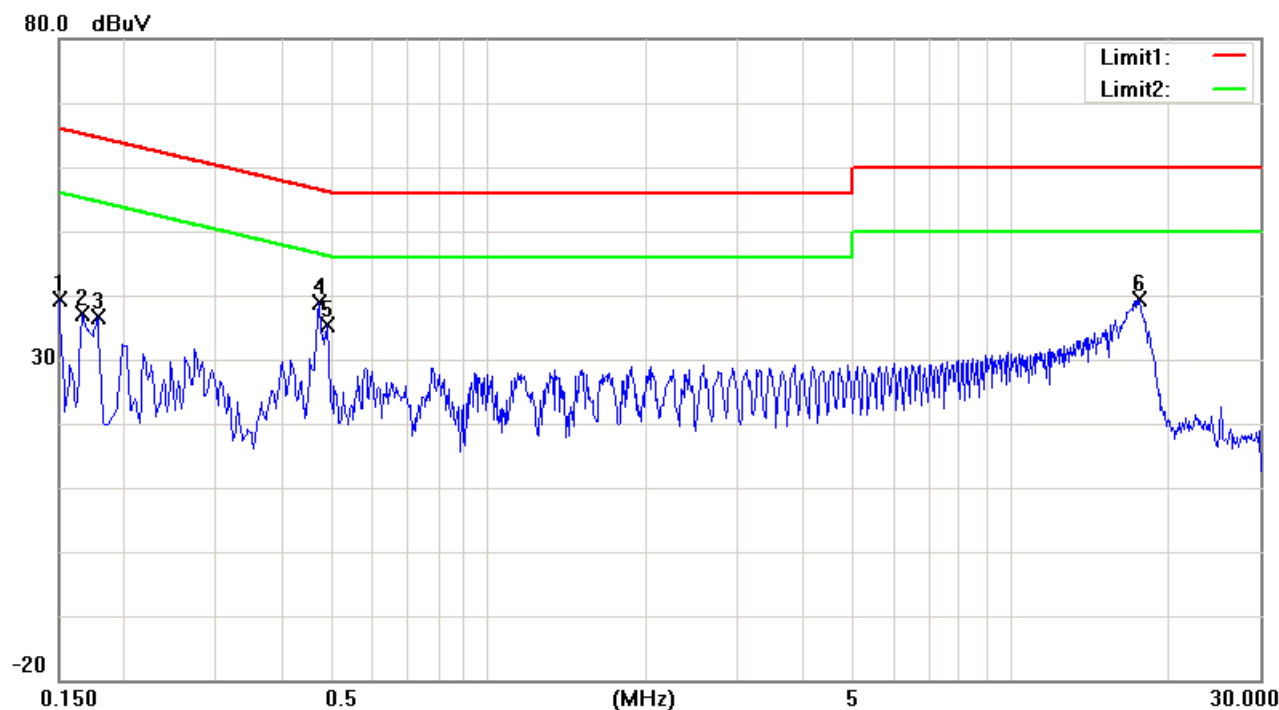
Data: #10

Date: 2014/11/30

Temperature: 21 °C

Time: AM 09:23:07

Humidity: 64 %



Condition:

Phase:

N

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Detector | Corrected<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) |
|-----|--------------------|-------------------|----------|-------------------|------------------|-----------------|----------------|
| 1   | 0.1500             | 29.77             | peak     | 9.60              | 39.37            | 66.00           | -26.63         |
| 2   | 0.1660             | 27.55             | peak     | 9.60              | 37.15            | 65.16           | -28.01         |
| 3   | 0.1780             | 26.92             | peak     | 9.60              | 36.52            | 64.58           | -28.06         |
| 4   | 0.4740             | 29.22             | peak     | 9.61              | 38.83            | 56.44           | -17.61         |
| 5   | 0.4900             | 25.76             | peak     | 9.61              | 35.37            | 56.17           | -20.80         |
| 6   | 17.6260            | 29.50             | peak     | 9.97              | 39.47            | 60.00           | -20.53         |

Note:

1. "\*\*\*\*" means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. The estimated measurement uncertainty of the result measurement is  $\pm 2.5$ dB.

## 6.6 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

$$\textbf{RESULT} = \textbf{READING} + \textbf{LISN FACTOR (Included Cable Loss)}$$

## 6.7 Antenna Requirement

### 6.7.1 Standard Applicable: FCC 15.317, 15.203. RSS-213 4.1(e)

Does the EUT have detachable antenna?

☐ Yes

☒ No

If detachable, is the antenna connector non-standard?

☐ Yes

☐ No

The tested equipment has only integral antennas. The conducted tests were performed on a sample with a temporary antenna connector.

## **6.8 Digital Modulation Techniques**

### **6.8.1 Standard Applicable: FCC 15.319(b), RSS-213 6.1**

All transmissions must use only digital modulation techniques.

### **6.8.2 Result: Meets the requirement**

Please see the declaration provided by applicant.

## 6.9 Peak Transmit Power

### 6.9.1 Standard Applicable: FCC 15.319(c) & (e) same as RSS-213 6.5

(c) Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(e) The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

### RSS-213 4.3.1 Peak Transmit Power

The transmitter shall be modulated with digital sequence(s) representative of those encountered in a real system operation. The peak transmit power shall be measured and recorded.

### 6.9.2 Measurement procedure

Measurement method according to ANSI C63.17 2013 paragraph 6.1.2

### 6.9.3 Test Results: Complies

#### Measurement Data:

Test Date : Nov. 17, 2014

Temperature : 23°C

Humidity : 61%

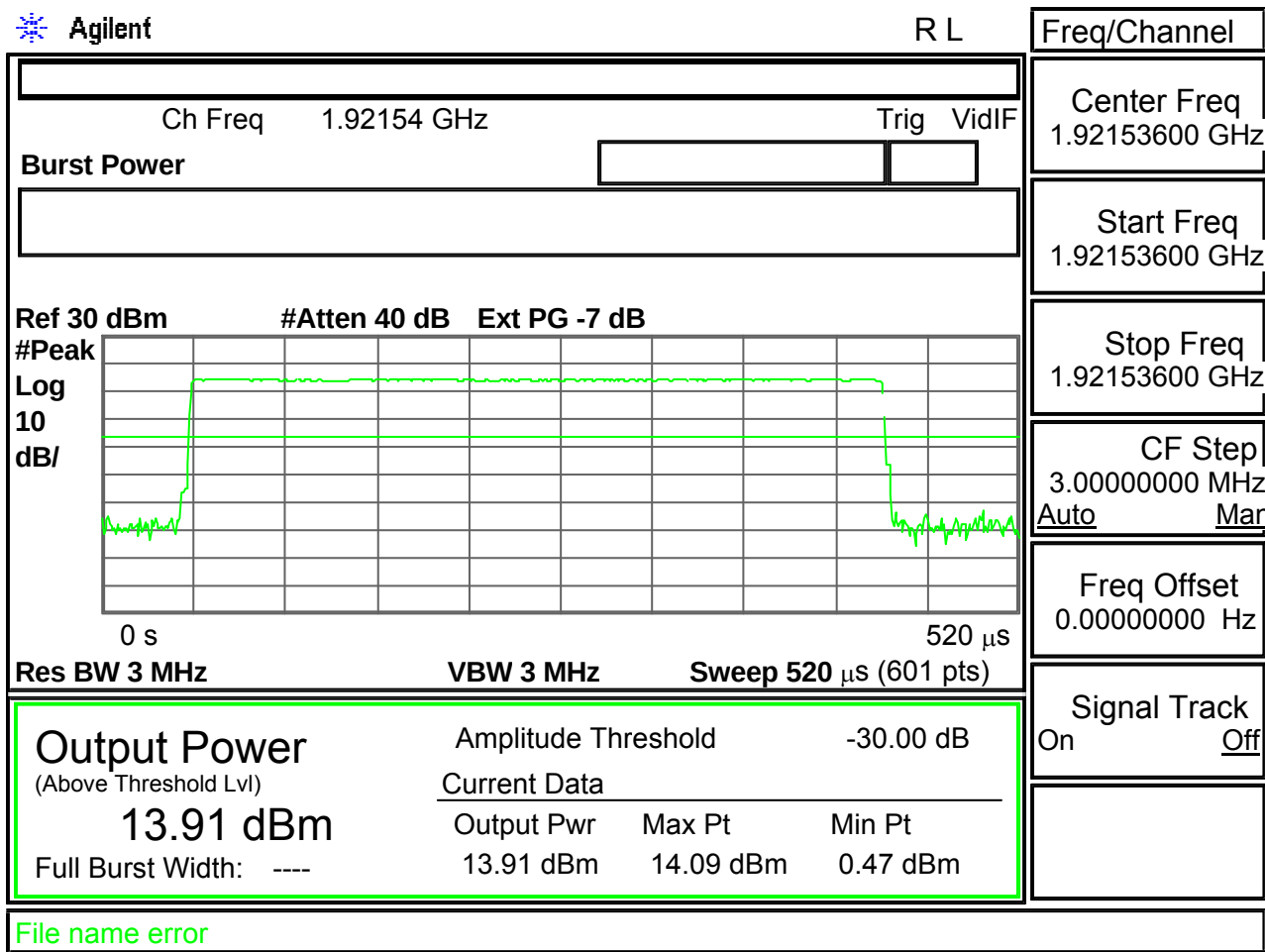
| Channel        | Frequency (MHz) | Maximum Peak Output Power (dBm) | Limit (dBm) |
|----------------|-----------------|---------------------------------|-------------|
| F <sub>L</sub> | 1921.536        | 13.91                           | 20.84       |
| F <sub>M</sub> | 1924.992        | 13.85                           | 20.84       |
| F <sub>H</sub> | 1928.448        | 13.80                           | 20.84       |

#### Limit:

Conducted:  $5 \log(B) - 10 = 20.84 \text{ dBm}$

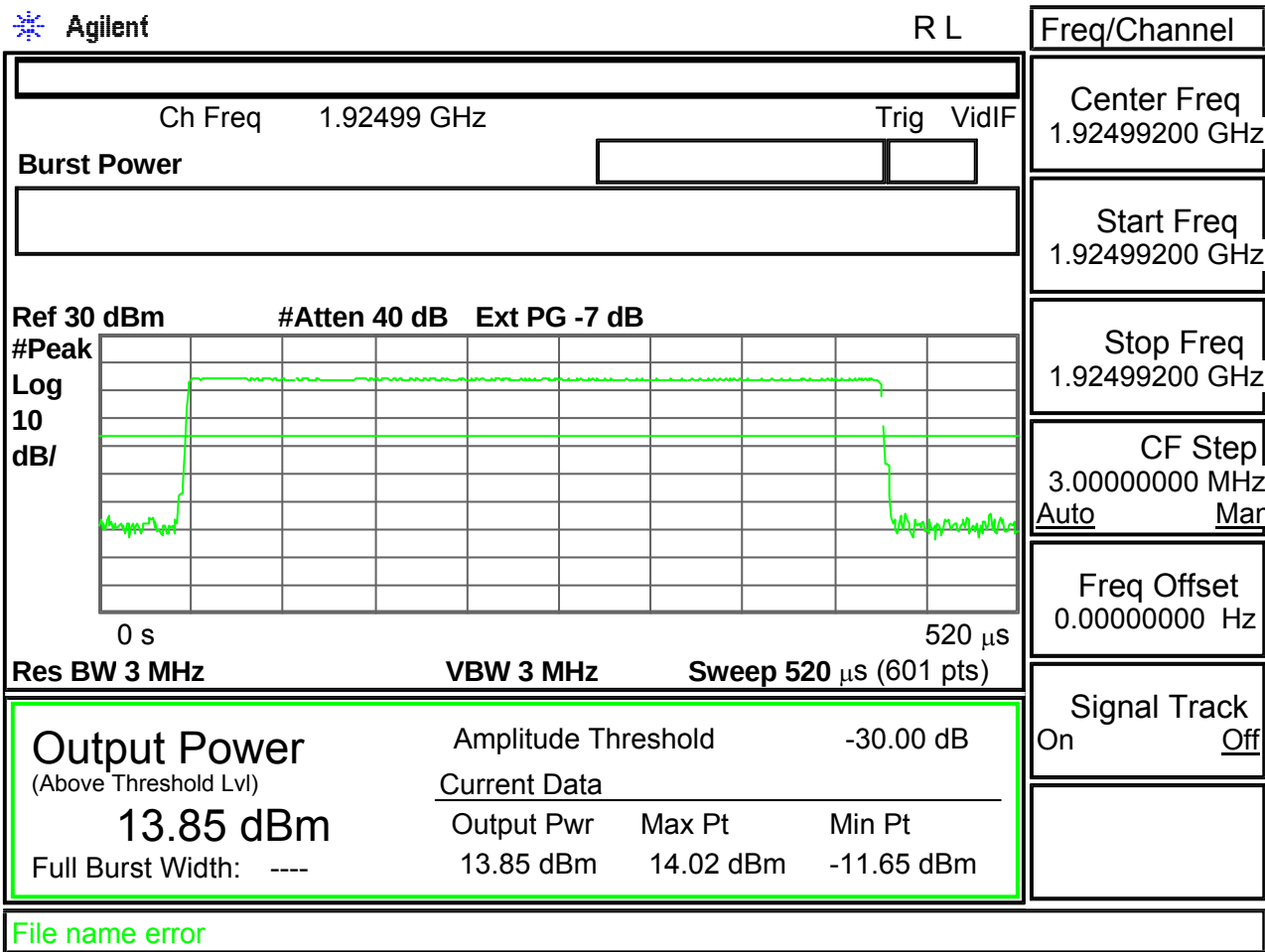
Where B is the emission bandwidth in Hz measured at 26 dBm.

Maximum Peak Output Power: CH FL

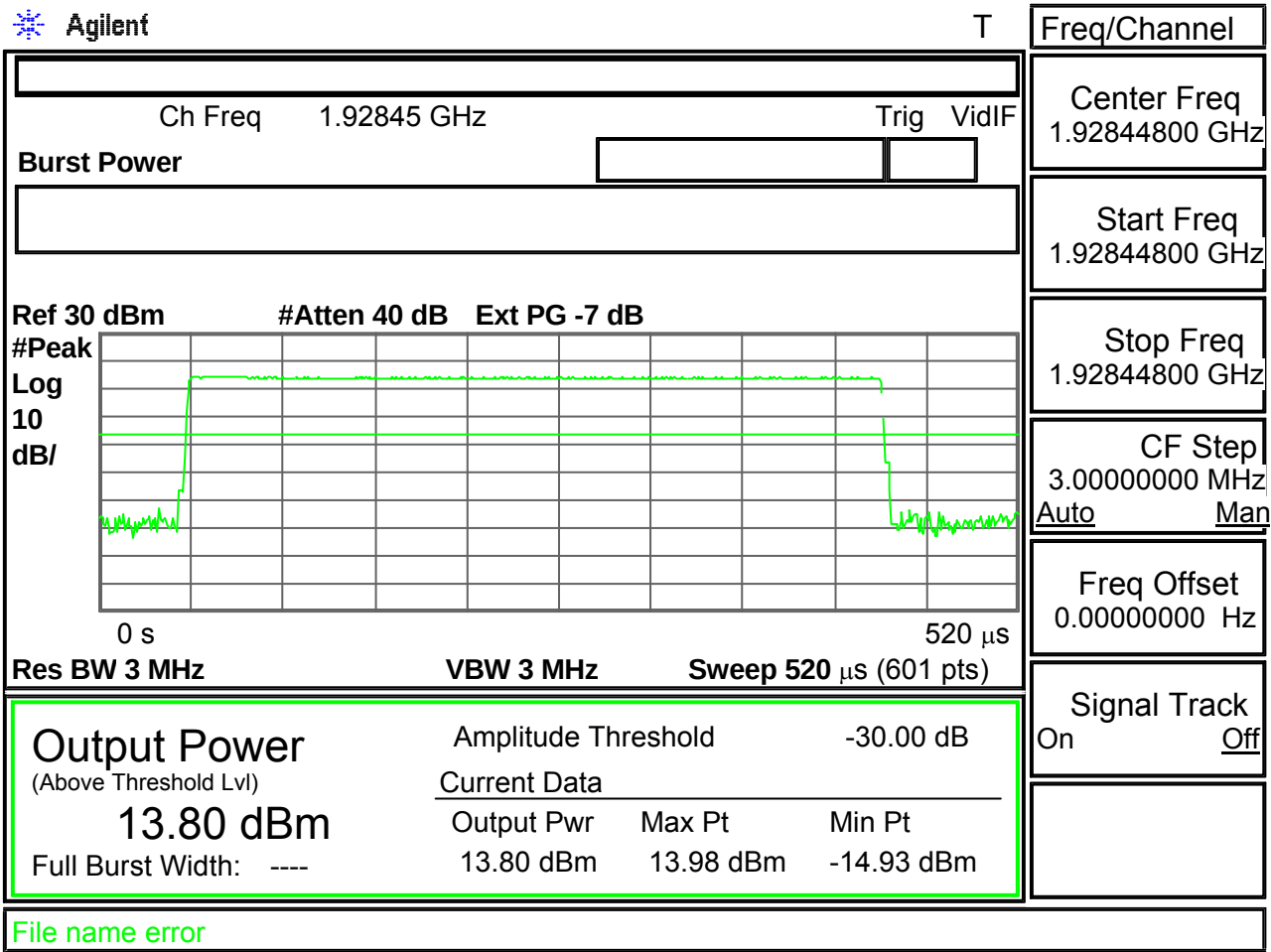




Maximum Peak Output Power: CH Fm



Maximum Peak Output Power: CH F<sub>H</sub>



## 6.10 Power Spectral Density

### 6.10.1 Standard Applicable: FCC 15.319(d)

Power spectral density shall not exceed 3 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

#### RSS-213 4.3.2.1 Peak Power Spectral Density Test

This test is to measure the occupied bandwidth and the maximum power spectral density.

With the transmitter modulated as in Section 4.3.1, obtain spectrum plots.

Record the maximum spectral level of the modulated signal as the reference spectral level (dBs).

Measure and record the 99% bandwidth. Measure and record the power spectral density per 3 kHz.

#### RSS-213 6.6 Power Spectral Density

The peak-hold power spectral density shall not exceed 12 milliwatts per any 3 kHz bandwidth.

As an alternative to the peak-hold power spectral density, the time-averaged power spectral density may be measured and it shall not exceed 3 milliwatts per any 3 kHz bandwidth.

### 6.10.2 Measurement procedure

Measurement method according to ANSI C63.17 2013 paragraph 6.1.5

### 6.10.3 Test Results: Complies

#### Measurement Data:

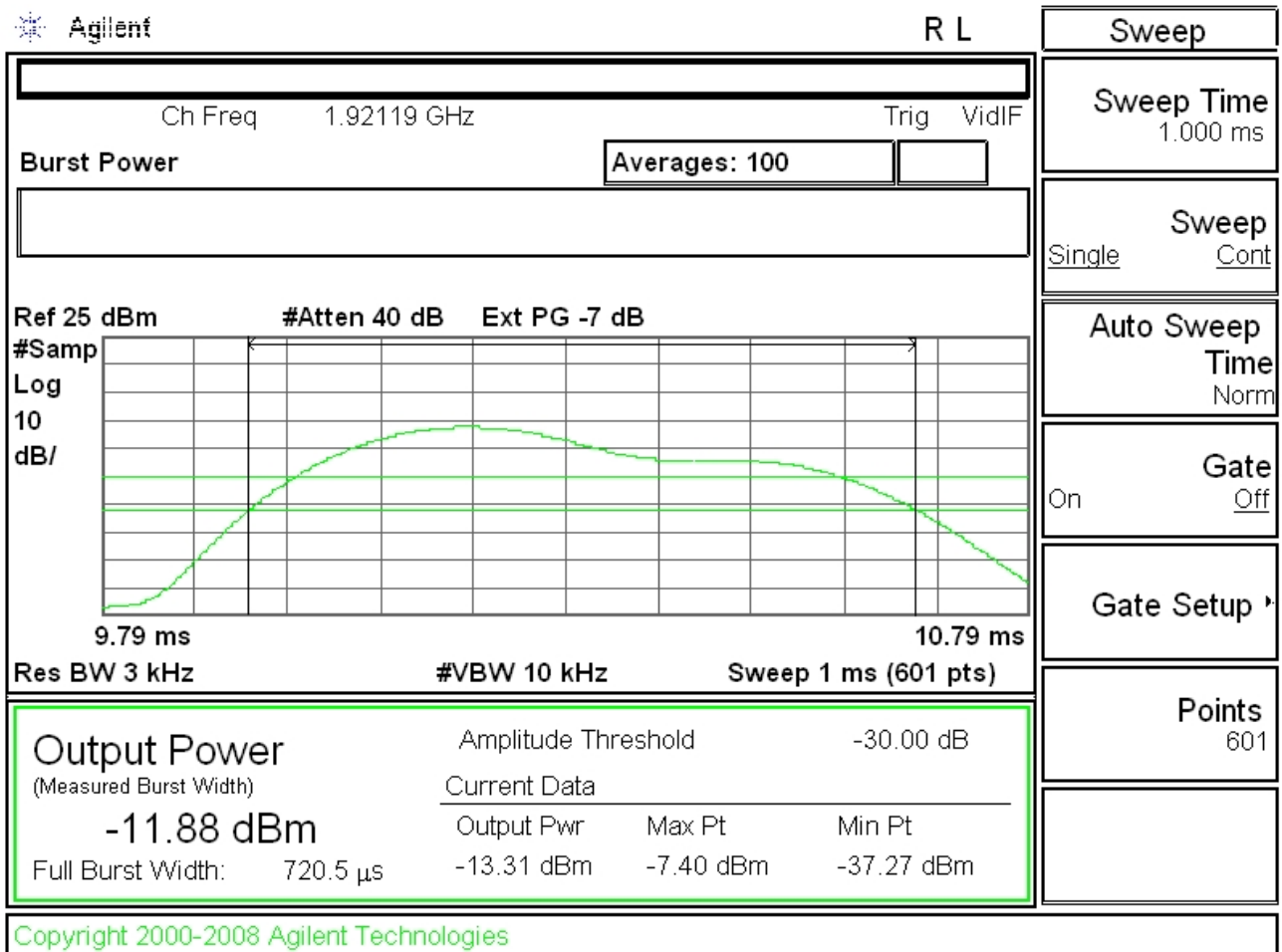
Test Date : Nov. 17, 2014

Temperature : 23°C

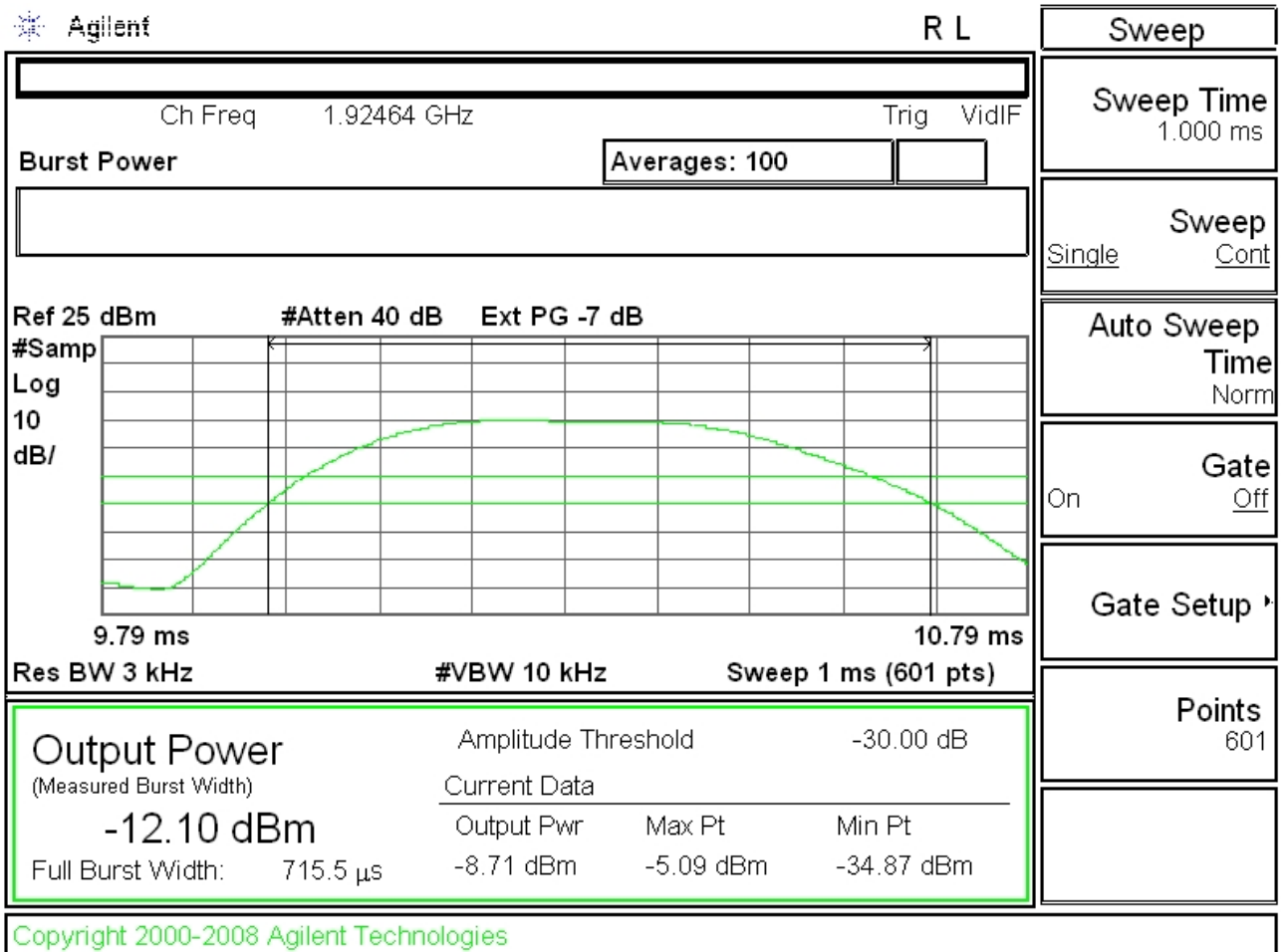
Humidity : 61%

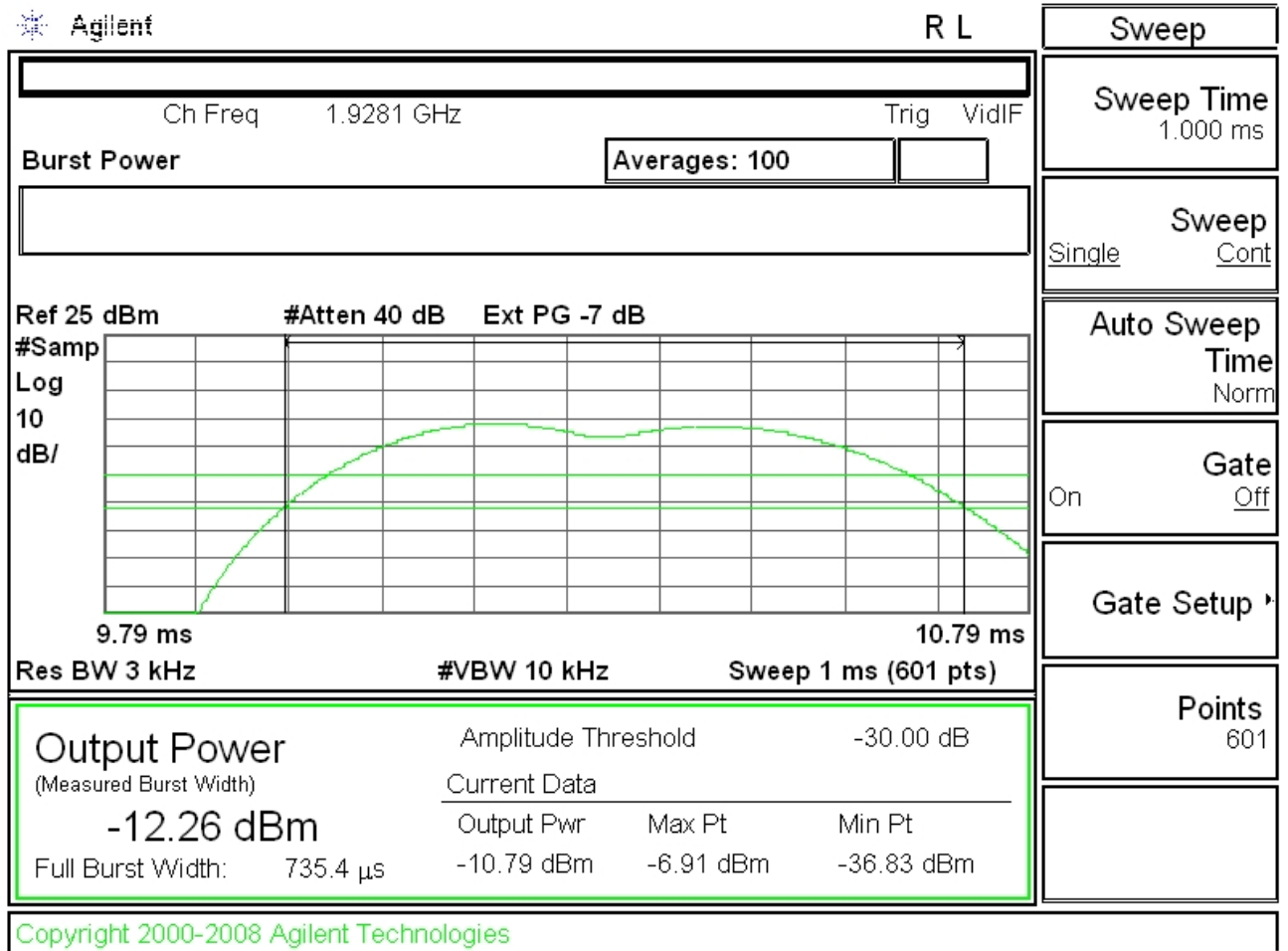
| Channel        | Frequency<br>(MHz) | Power Spectral Density<br>(dBm) | Limit<br>(dBm) |
|----------------|--------------------|---------------------------------|----------------|
| FL             | 1921.524           | -11.88                          | 4.77           |
| F <sub>M</sub> | 1924.998           | -12.10                          | 4.77           |
| FH             | 1928.454           | -12.26                          | 4.77           |

## Power Spectral Density: CH FL



## Power Spectral Density: CH Fm



Power Spectral Density: CH F<sub>H</sub>

## 6.11 Antenna Gain

### 6.11.1 Standard Applicable: FCC 15.323(e)

The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

### 6.11.2 Results: Meets the requirement

The antenna gain value provided by manufacturer is -2 dBi.

## **6.12 Automatic discontinuation of transmission**

### **6.12.1 Standard Applicable: FCC 15.319(f) same as 4.3.4 (a)**

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

### **6.12.2 Procedure**

Please see the declaration provided by applicant.

### **6.12.3 Results: Meets the requirement**



## 6.13 Safety exposure levels

### 6.13.1 Standard Applicable: FCC 15.319(i)

UPCS devices are subject to the radio frequency radiation exposure requirements specified in FCC parts 1.1307 (b), 2.1091 and 2.1093, as appropriate. All equipment shall be considered to operate in a "general population / uncontrolled environment. For portable devices tests according to IEEE 1528 are requested, if applicable.

### 6.13.2 Measurement procedure

Consideration of radio frequency radiation exposure for EUT is done as

|                                                 |                                     |
|-------------------------------------------------|-------------------------------------|
| SAR test according OET65c (for PP)              | <input type="checkbox"/>            |
| MPE calculation as below (for FP, PP, Repeater) | <input checked="" type="checkbox"/> |

SAR test results: See SAR test report.

MPE calculation: not applicable

The EUT is considered as a mobile device according to OET Bulletin 65, Edition -97-01. Therefore distance to human body of min. 20 cm is determined.

The limit of Power density for General Population / Uncontrolled Exposure is 1.0 mW/cm<sup>2</sup>.

Formula:

$$S = \text{EIRP} / 4\pi R^2$$

Calculation:

| Radio Technology | Operation Frequency (MHz) | Distance (cm) | Maximum Peak Output Power (dBm) | Antenna Gain (dBi) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|------------------|---------------------------|---------------|---------------------------------|--------------------|-------------------------------------|-----------------------------|
| DECT             | 1921                      | 20            | 13.91                           | -2                 | 0.003088                            | 1                           |

**Simultaneous Evaluation:**

The formula of calculated MPE is:

$$\text{CPD1/LPD1} + \text{CPD2/LPD2} + \dots \text{etc.} < 1$$

CPD=Calculated Power Density

LPD=Limit of Power Density

| Radio Technology | Worse CPD (mW/cm <sup>2</sup> ) |
|------------------|---------------------------------|
| DECT             | 0.003088                        |

The MPE evaluation is  $0.003088/1=0.003088 < 1$ , which confirm the device comply the MPE limit.

**6.13.3 Results : Complies**

## 6.14 Emission Bandwidth B

### 6.14.1 Standard Applicable: FCC 15.323(a)

The 26 dB Bandwidth B shall be larger than 50 kHz and less than 2.5 MHz.

### 6.14.2 Measurement procedure

Measurement method according to ANSI C63.17 2013 paragraph 6.1.3

### 6.14.2 Results: Complies

#### Measurement Data:

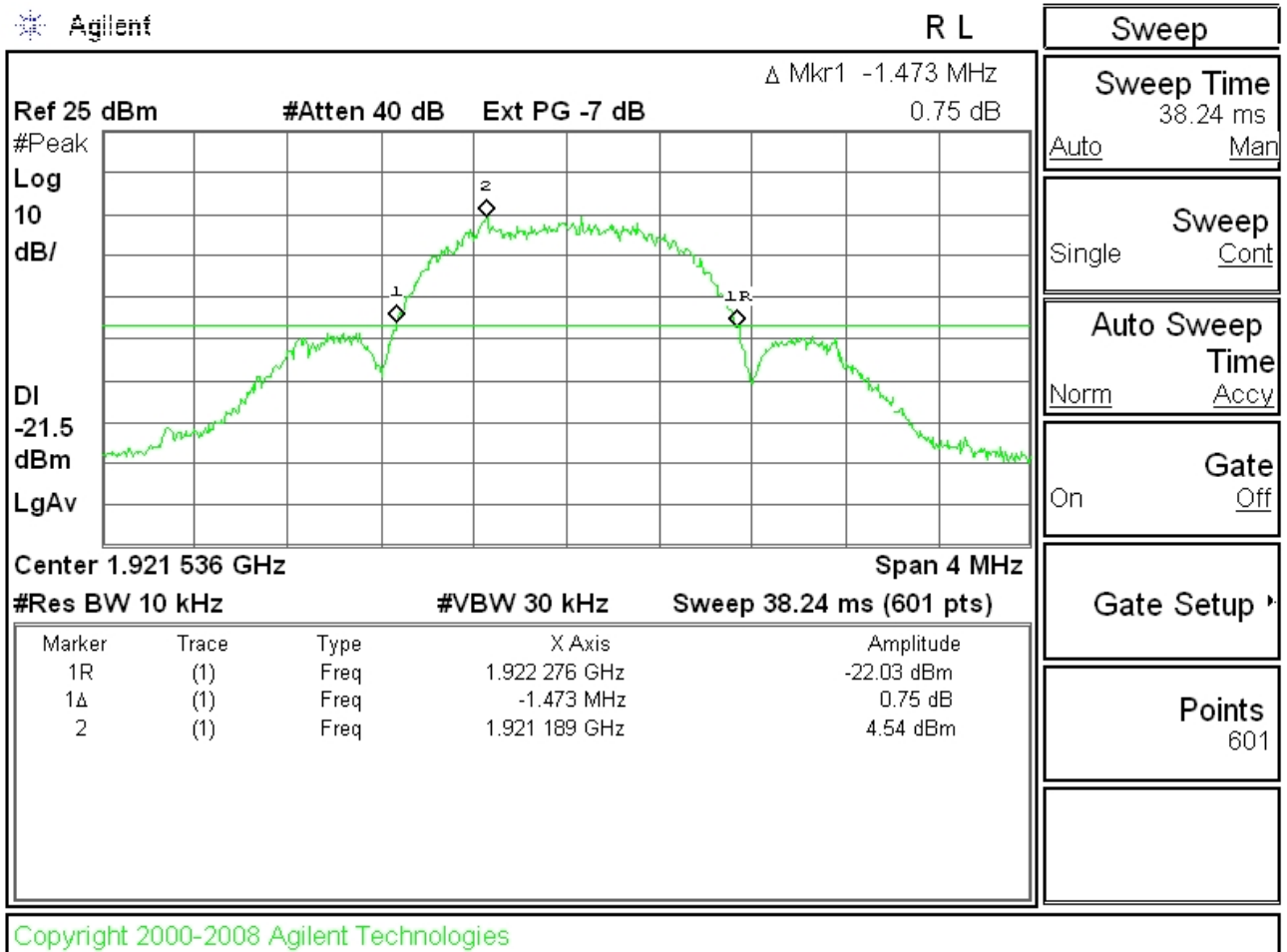
Test Date : Nov. 17, 2014

Temperature : 23°C

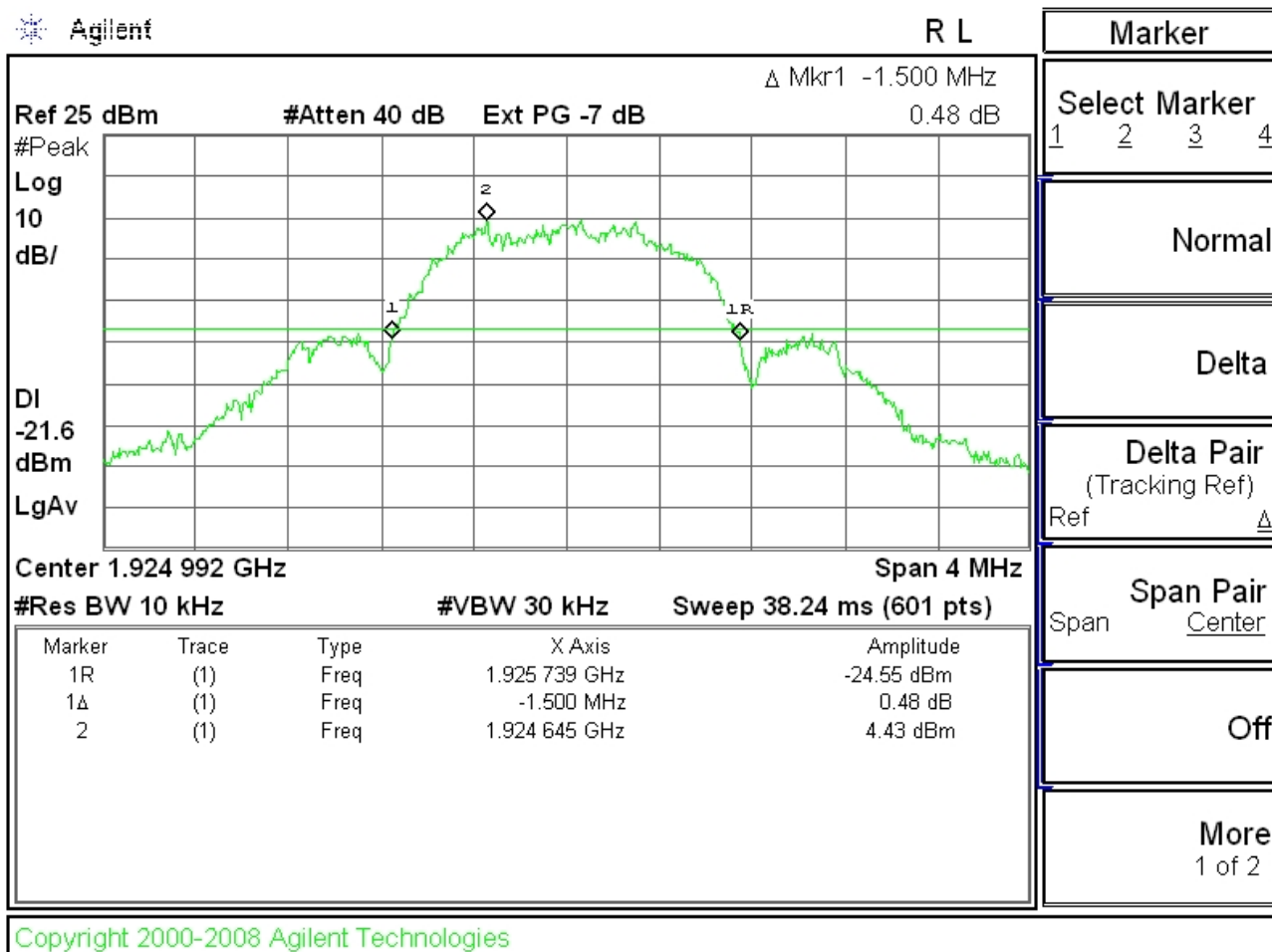
Humidity : 61%

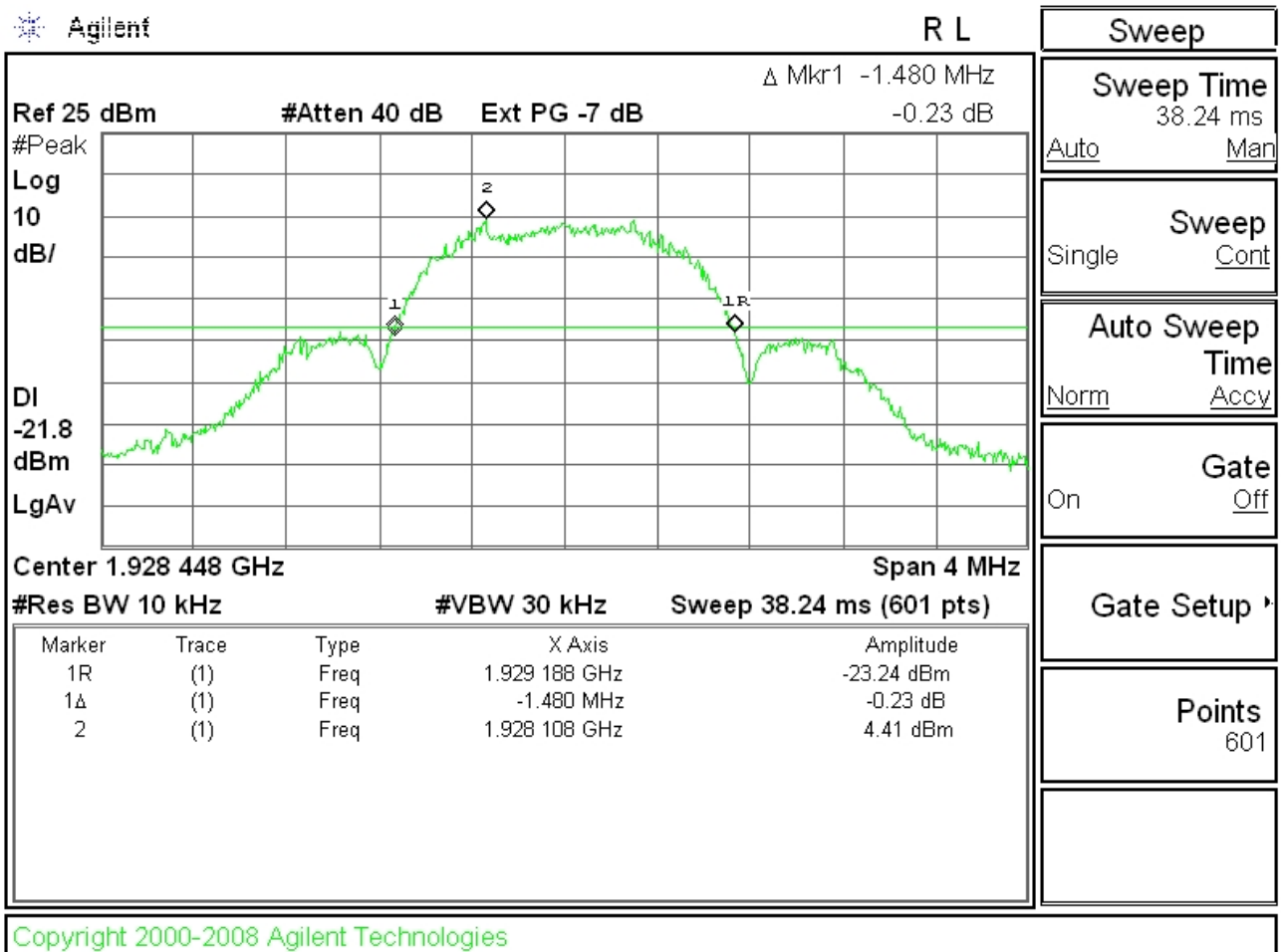
| Channel        | Frequency<br>(MHz) | 26 dB Bandwidth<br>(MHz) |
|----------------|--------------------|--------------------------|
| FL             | 1921.536           | 1.47                     |
| F <sub>M</sub> | 1924.992           | 1.5                      |
| FH             | 1928.448           | 1.48                     |

## 26 dB Bandwidth B: CH FL



## 26 dB Bandwidth B: CH Fm



26 dB Bandwidth B: CH F<sub>H</sub>

## 6.15 Emissions inside and outside the subband

### 6.15.1 Standard Applicable: FCC 15.323(d)

#### Emissions inside the subband same as RSS-213 6.7.2

$B < f \leq 2B$ : less than or equal to 30 dB below the maximum permitted peak power level

$2B < f \leq 3B$ : less than or equal to 50 dB below the maximum permitted peak power level

$3B < f \leq$  UPCS Band Edge: less than or equal to 60 dB below the maximum permitted peak power level

Where B is the occupied bandwidth in hertz.

#### Emissions outside the subband same as RSS-213 6.7.1

$f \leq 1.25\text{MHz}$  outside UPCS band :  $\leq -9.5\text{dBm}$

$1.25\text{MHz} \leq f \leq 2.5\text{MHz}$  outside UPCS band :  $\leq -29.5\text{ dBm}$

$f \geq 2.5\text{MHz}$  outside UPCS band:  $\leq -39.5\text{ dBm}$

### 6.15.2 Measurement procedure

Measurement method according to ANSI C63.17 2013 paragraph 6.1.6

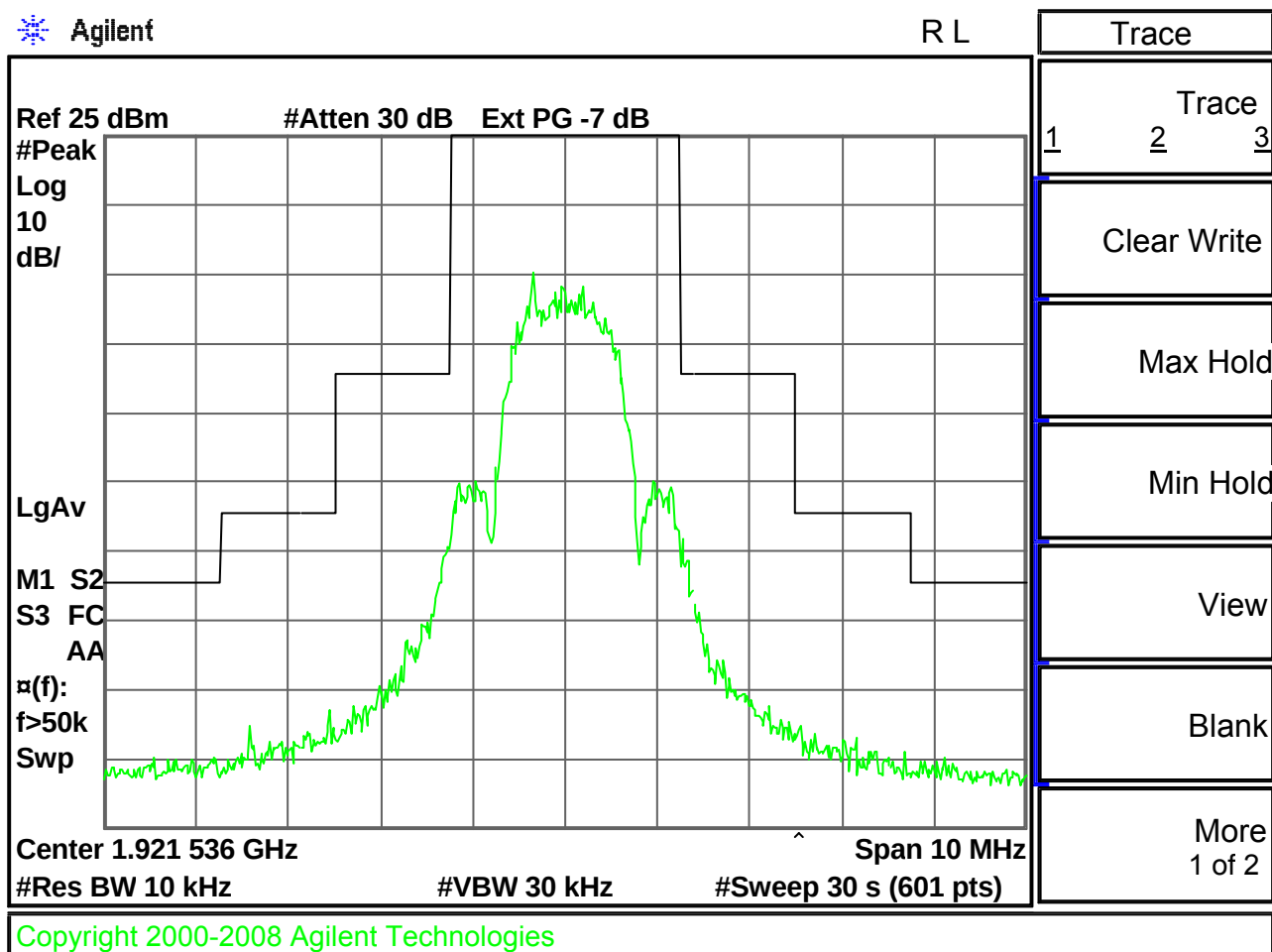
### 6.15.3 Results: Complies

#### Measurement Data:

See plots.

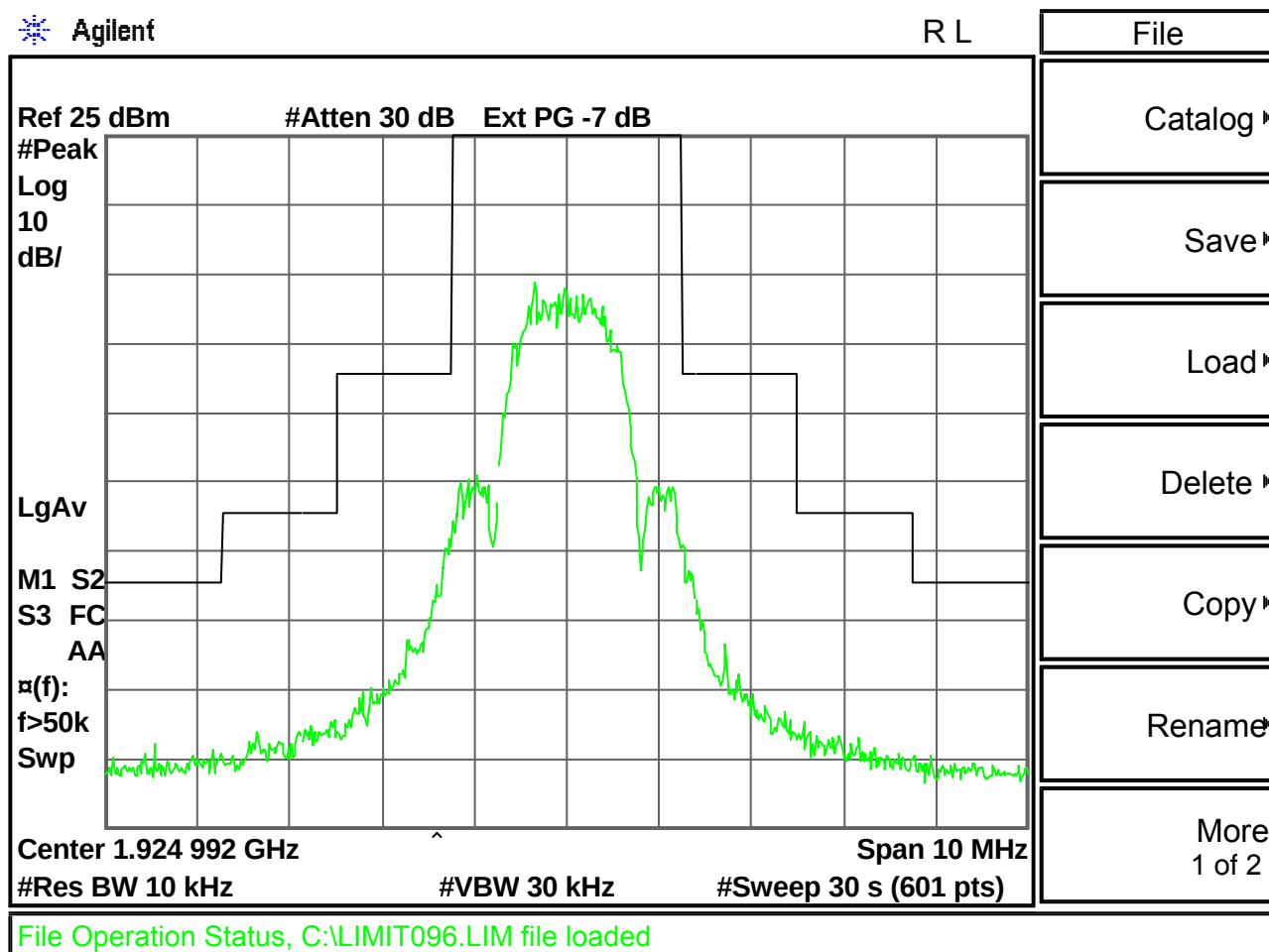
Note: Photos of worst-case display follow:

### In-band Unwanted Emissions: CH FL

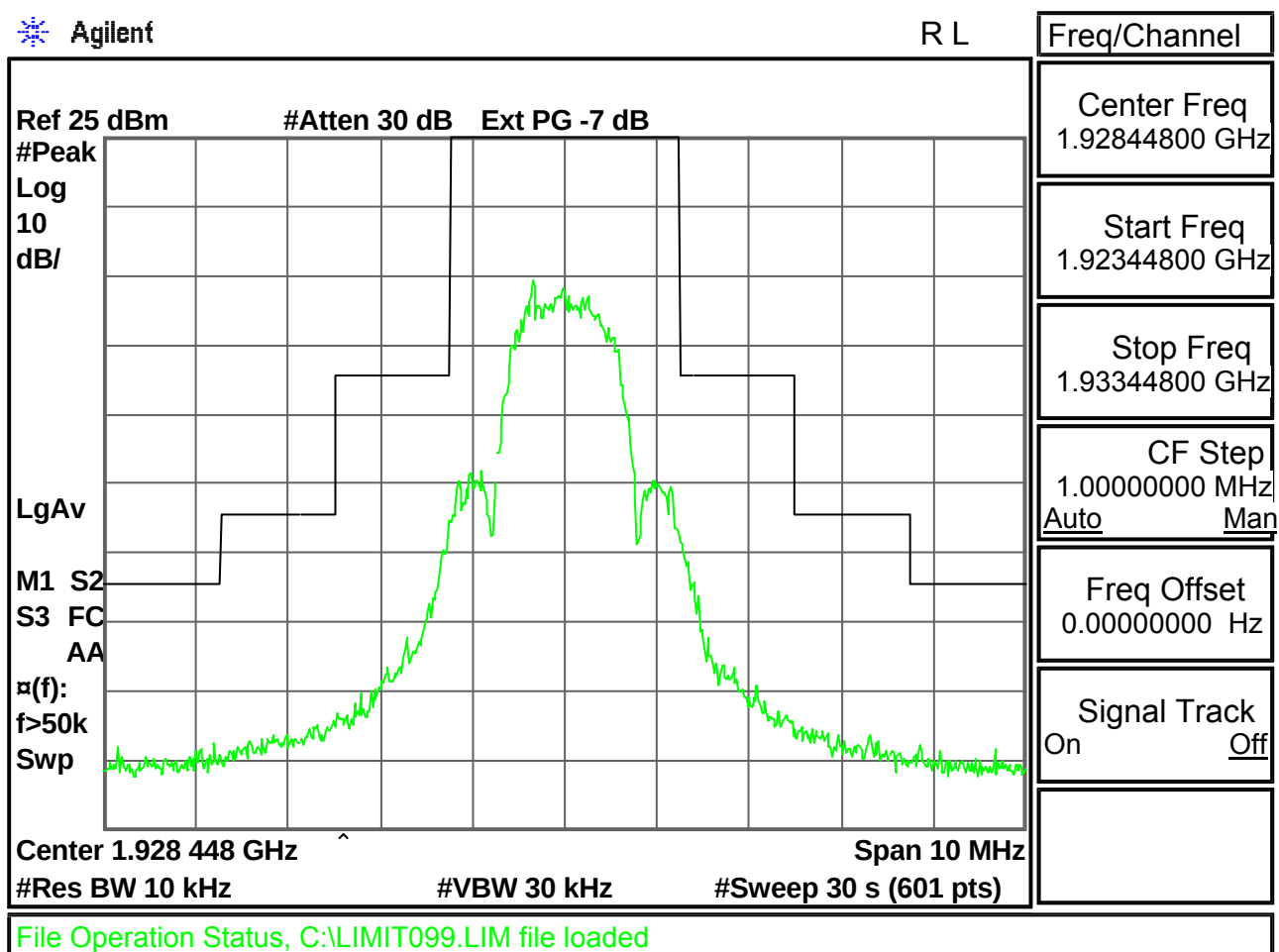




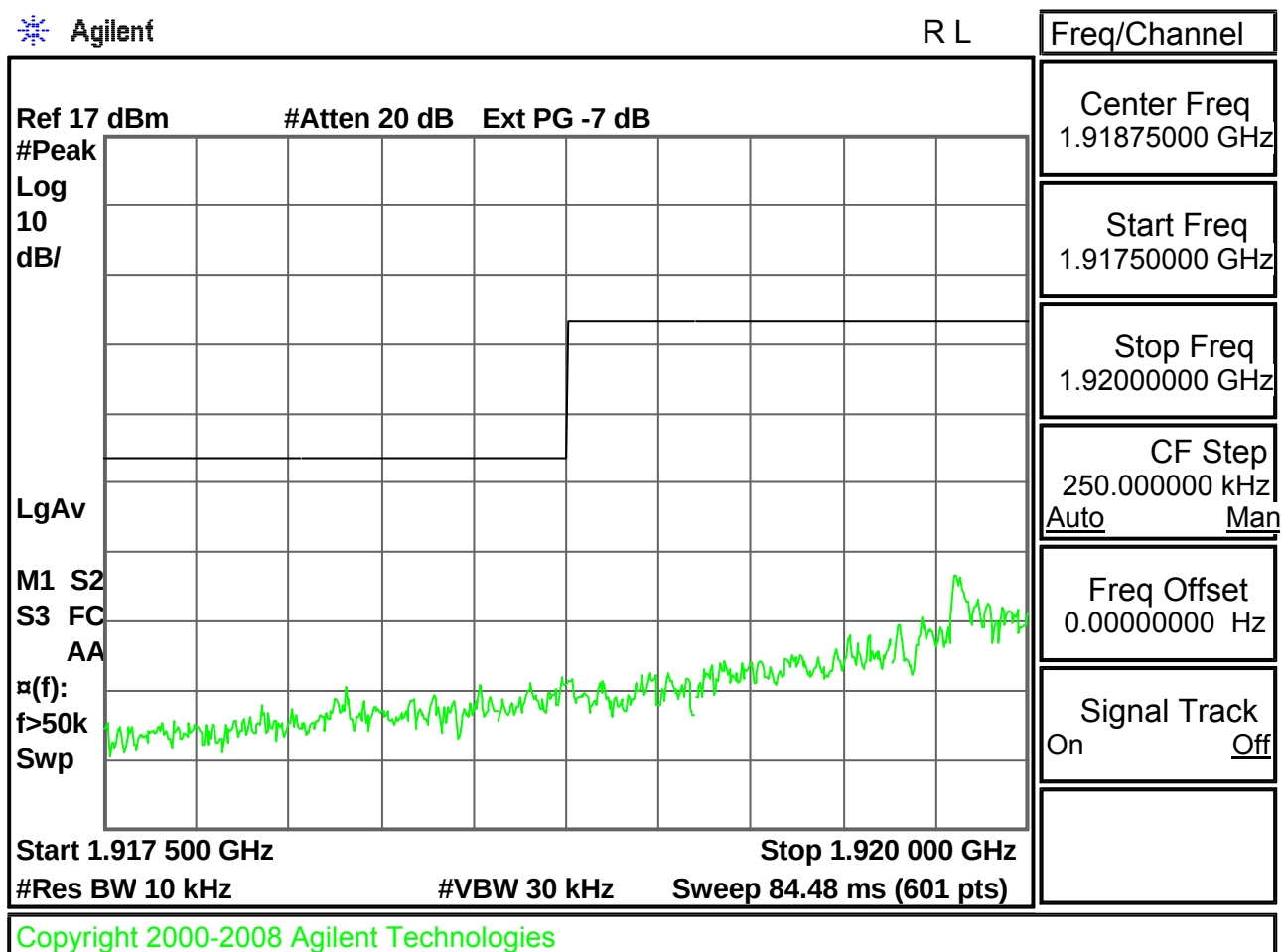
### In-band Unwanted Emissions: CH F<sub>M</sub>



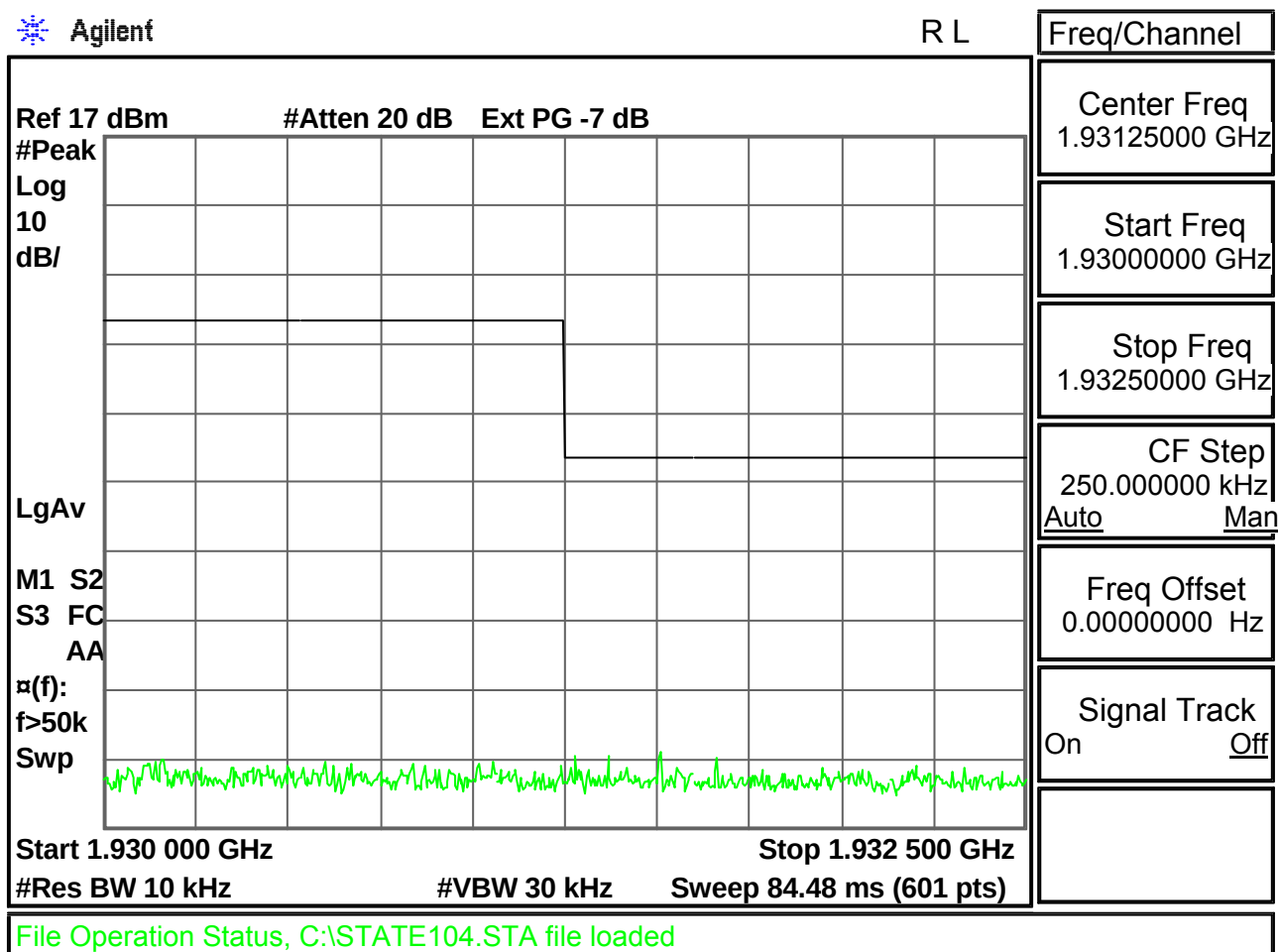
### In-band Unwanted Emissions: CH F<sub>H</sub>



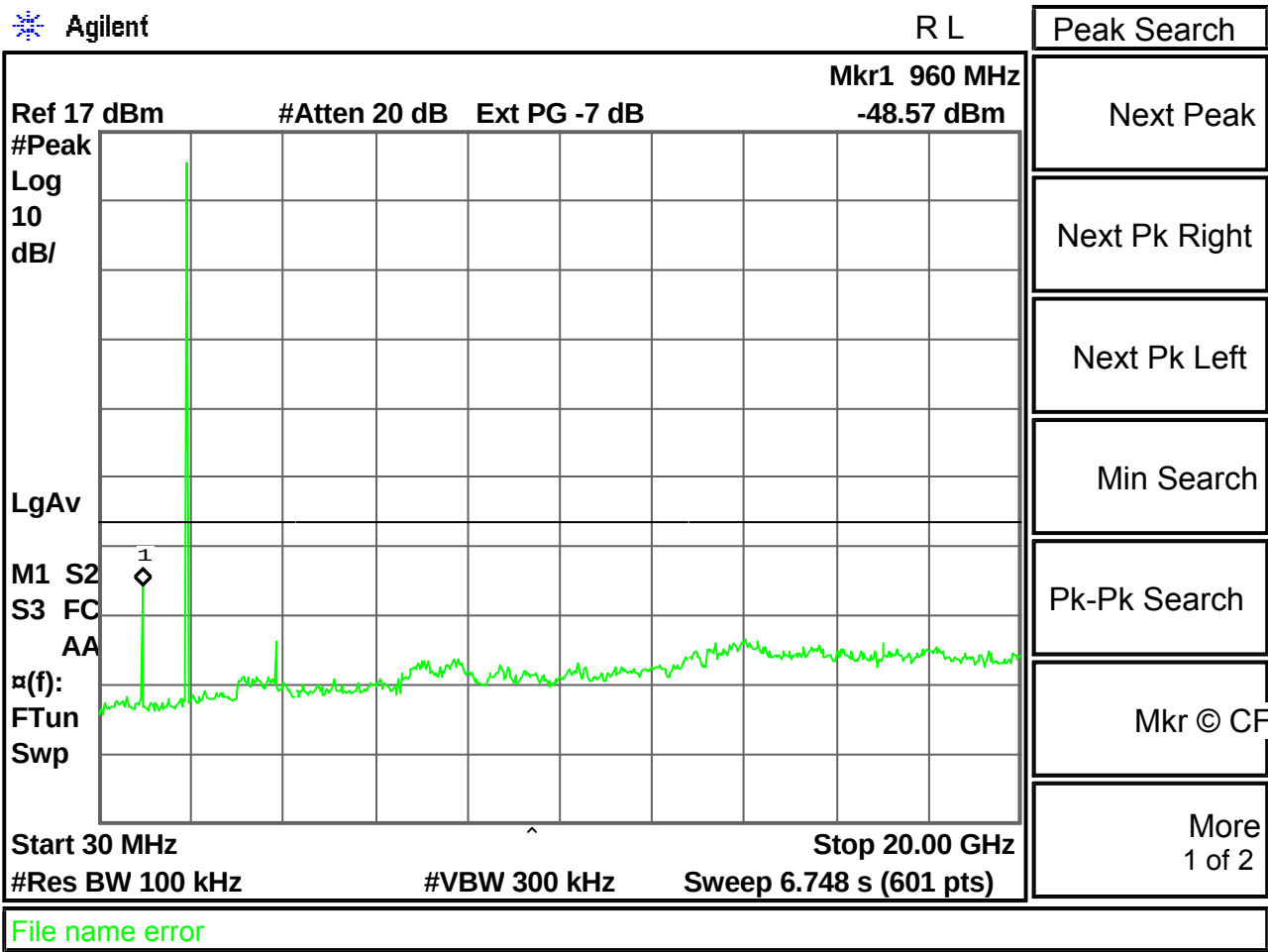
### Out-of-band Unwanted Emissions: CH FL



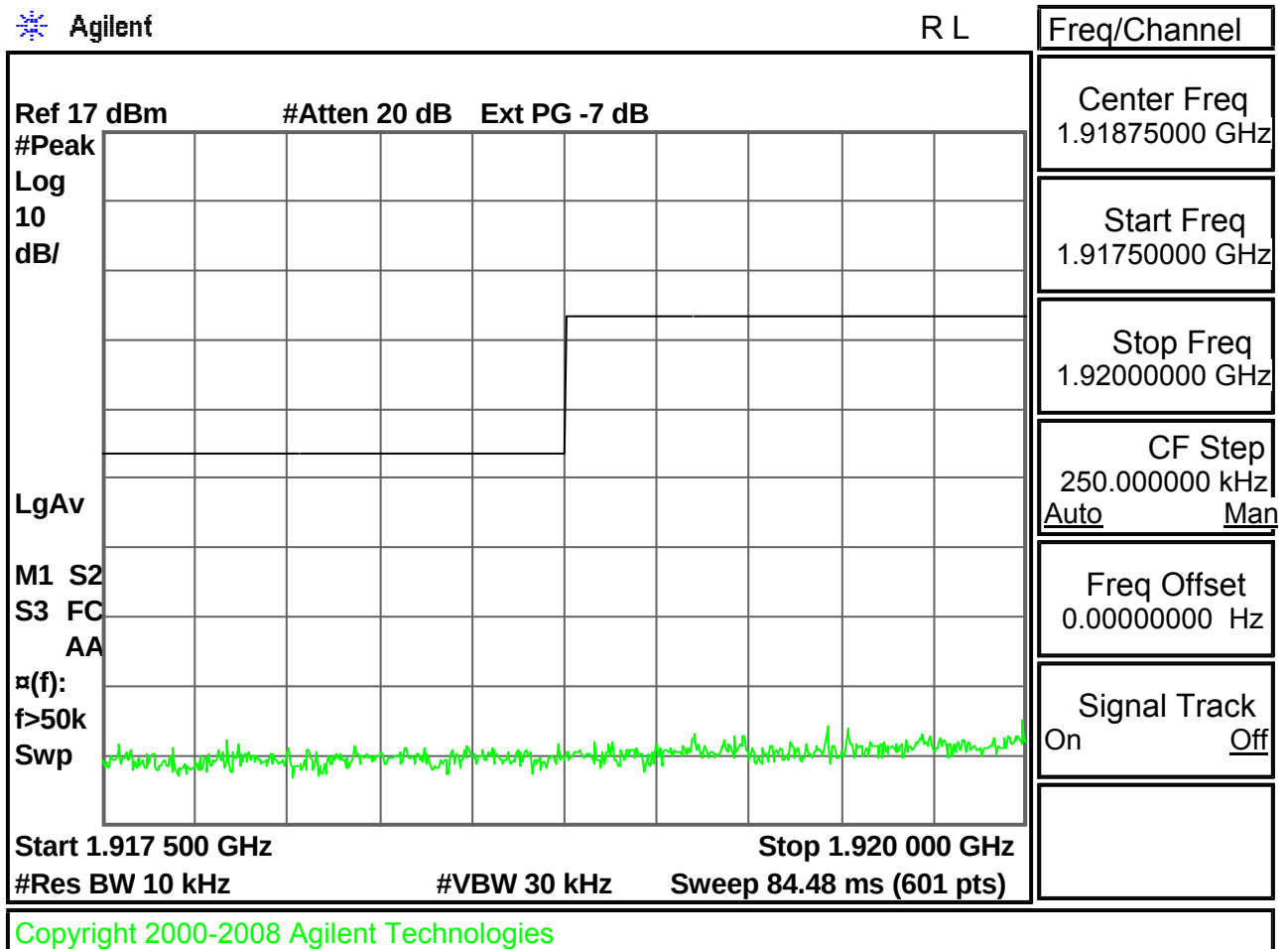
### Out-of-band Unwanted Emissions: CH FL



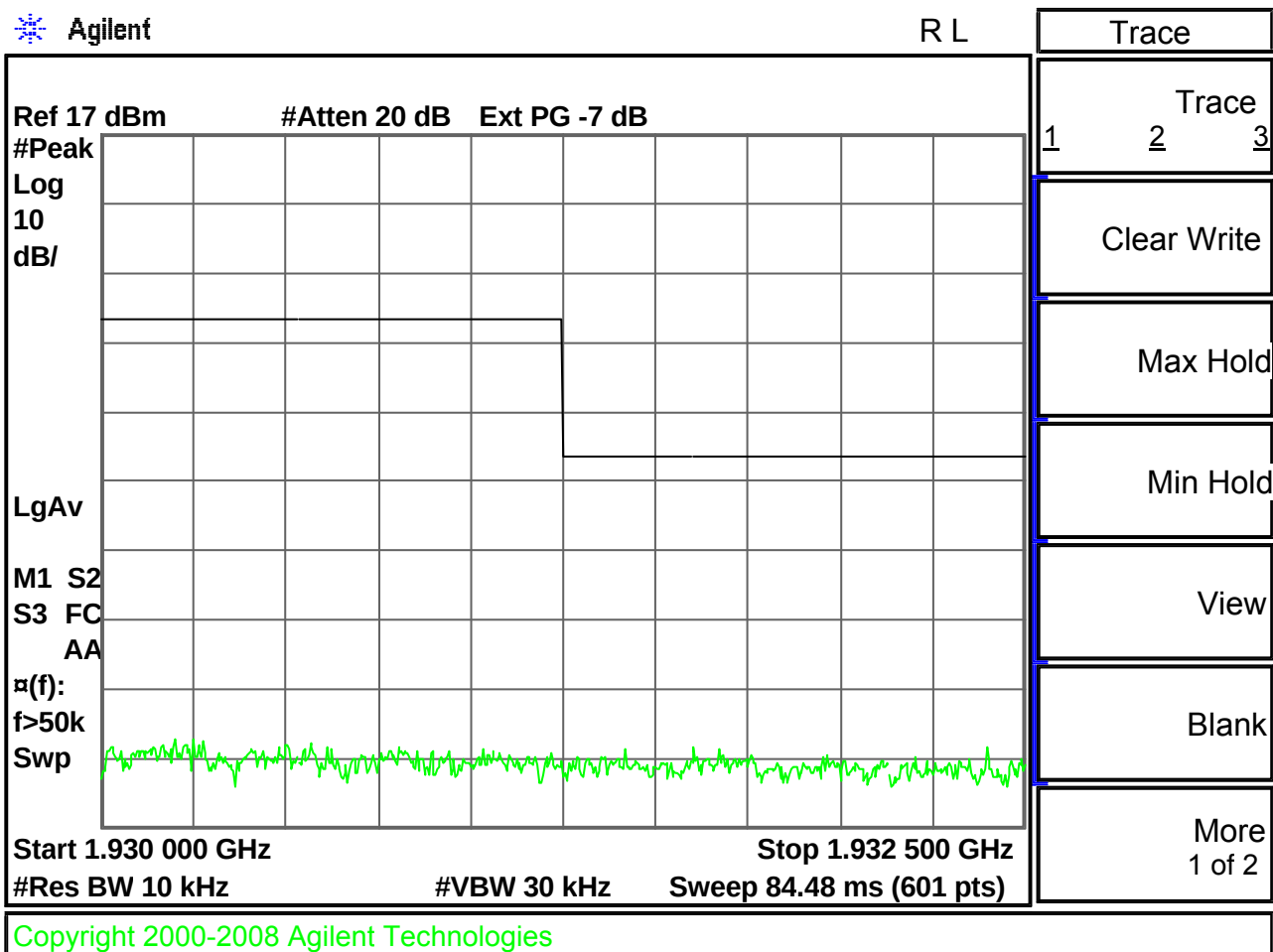
Out-of-band Unwanted Emissions: CH FL



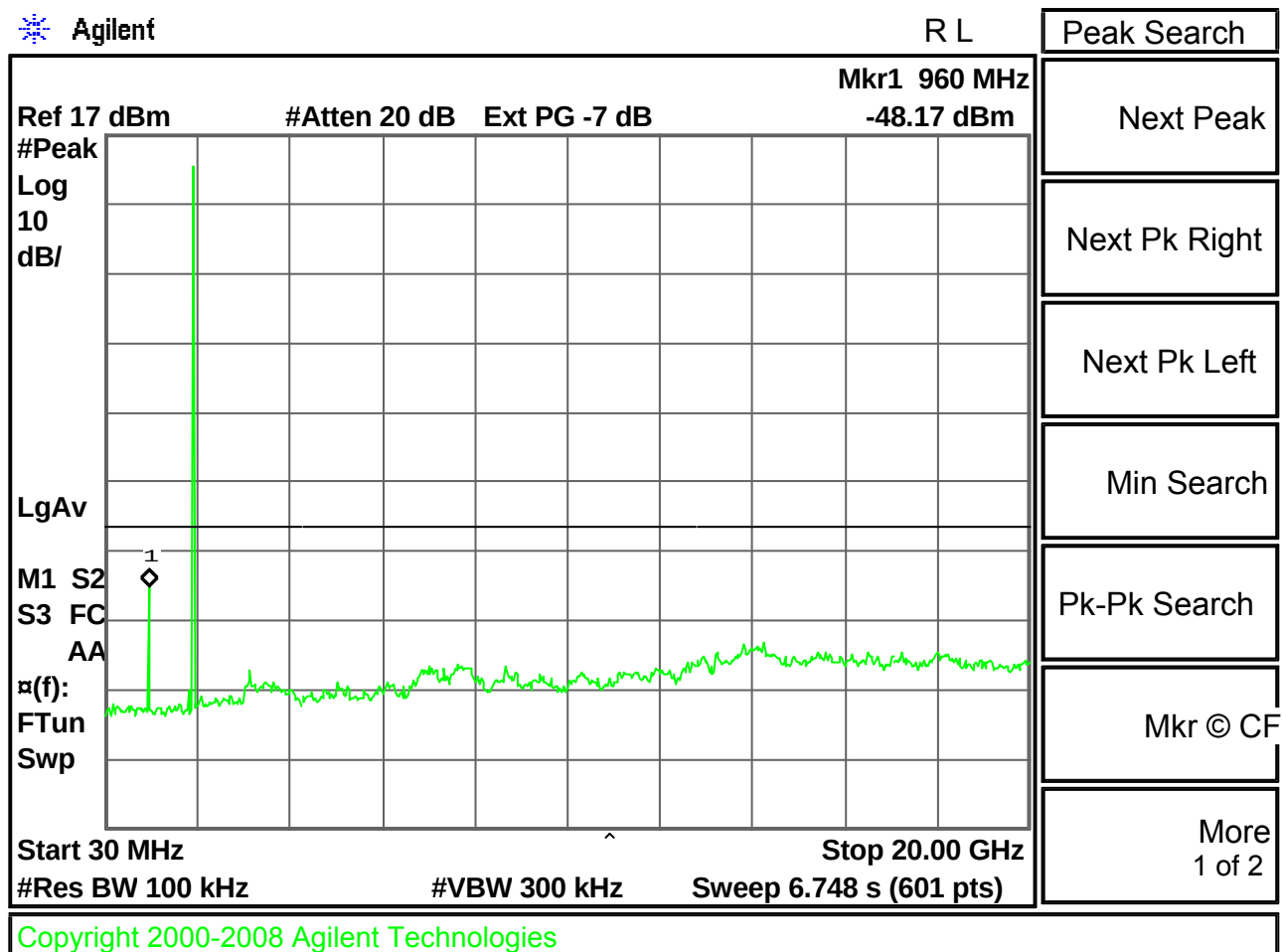
### Out-of-band Unwanted Emissions: CH F<sub>M</sub>



### Out-of-band Unwanted Emissions: CH F<sub>M</sub>

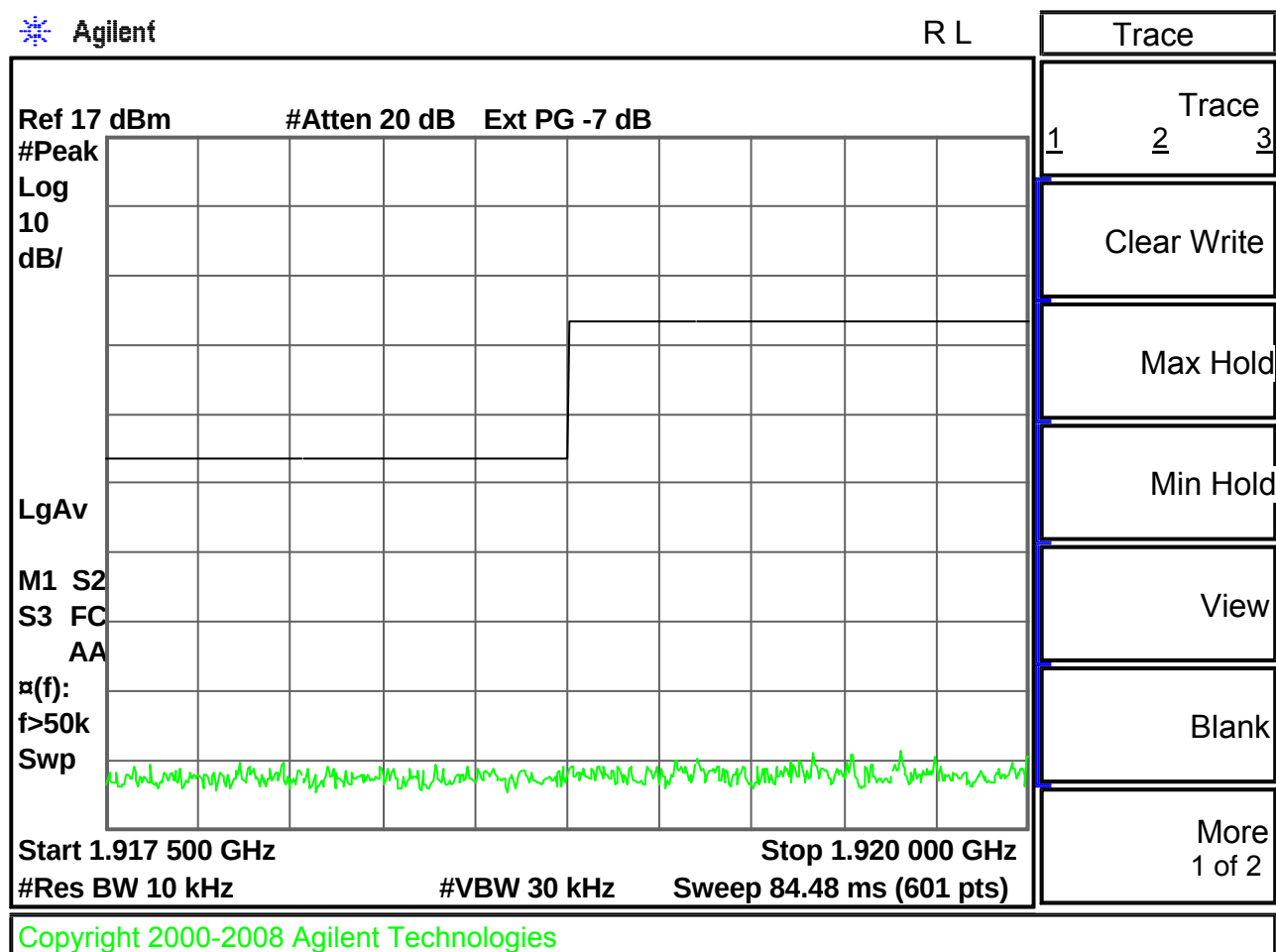


### Out-of-band Unwanted Emissions: CH F<sub>M</sub>

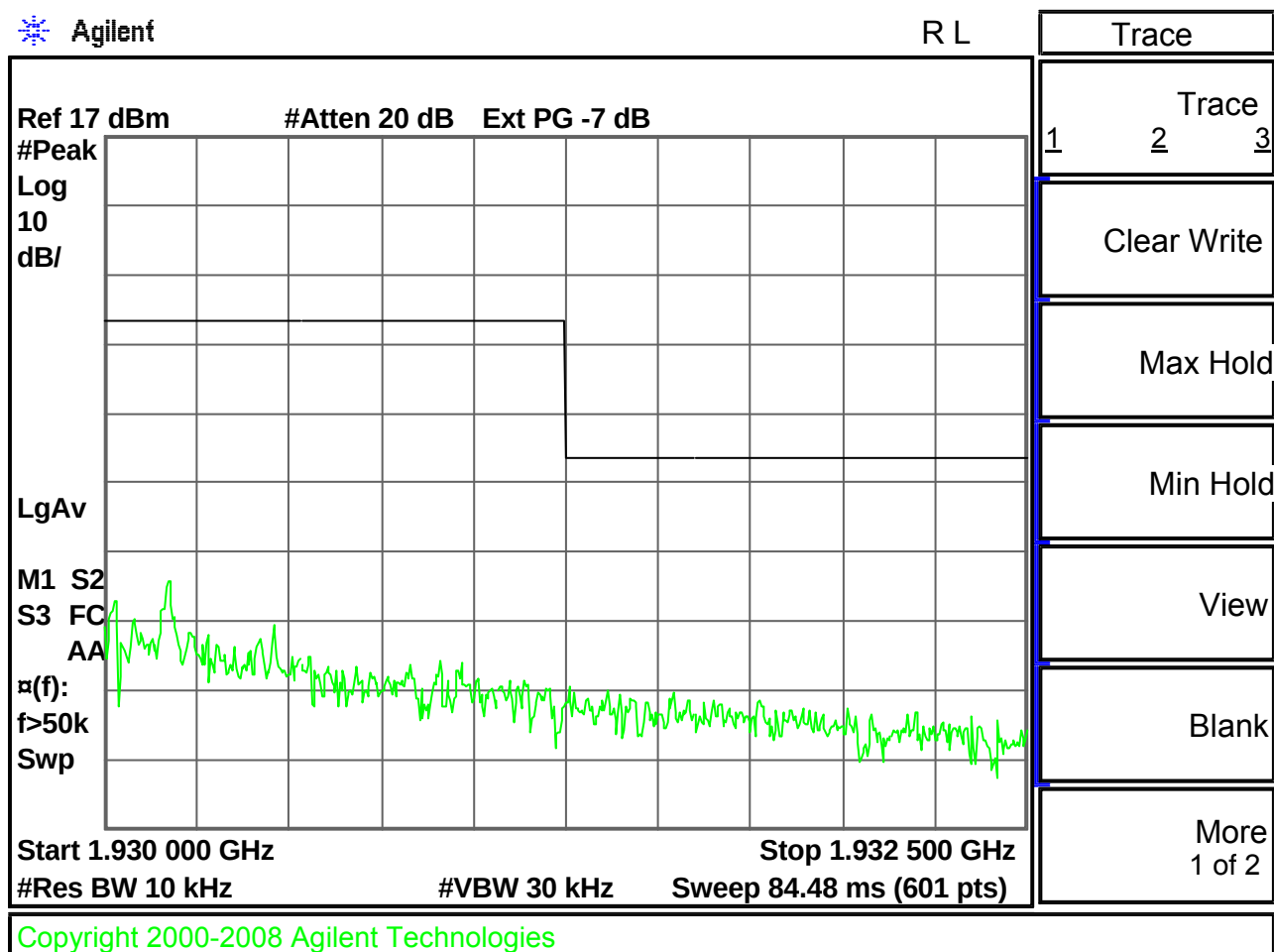




### Out-of-band Unwanted Emissions: CH FH



## Out-of-band Unwanted Emissions: CH FH



## Out-of-band Unwanted Emissions: CH FH

