

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                          |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|-----------|------------------|---------------------|------|---------------|---------------------------|------------------|----|-----------------------------|------|--|-----------------------------------------------------|
| <b>FCC TEST REPORT</b><br><b>FCC 47 CFR Part 22H</b><br><b>Industry Canada RSS-132, Issue 3</b><br><b>Cellular Telephones Operating in the Bands 824-849MHz and 869-894MHz</b><br><b>FCC 47 CFR Part 24E</b><br><b>Industry Canada RSS-133, Issue 6</b><br><b>2GHz Personal Communication Services</b>                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                          |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Report Reference No.</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | G0M-1502-4503-TFC224GS-V01                                                                                                                                                                                                                                                                                               |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Testing Laboratory</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Eurofins Product Service GmbH                                                                                                                                                                                                                                                                                            |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Address</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Storkower Str. 38c<br>15526 Reichenwalde<br>Germany                                                                                                                                                                                                                                                                      |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Accreditation</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  <br>A2LA Accredited Testing Laboratory, Certificate No.: 1983.01<br>FCC Filed Test Laboratory, Reg.-No.: 96970<br>IC OATS Filing assigned code: 3470A |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Applicant's name</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SMT & Hybrid GmbH                                                                                                                                                                                                                                                                                                        |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Address</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | An der Priessnitzau 22<br>01328 Dresden<br>GERMANY                                                                                                                                                                                                                                                                       |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Test specification:</b><br>Standard ..... 47 CFR Part 22H, 47 CFR Part 24E<br>RSS-132, Issue 3 : 2013-01, RSS-133, Issue 6 : 2013-01<br>SRSP-503 Issue 7 : 2008-09, SRSP-510 Issue 5 : 2009-02<br>RSS-Gen, Issue 4, 2014-11, ANSI/TIA-603-C-2004                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                          |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Equipment under test (EUT):</b><br><table border="0"> <tr> <td>Product description</td> <td>Datenlogger</td> </tr> <tr> <td>Model No.</td> <td>data link sensor</td> </tr> <tr> <td>Additional Model(s)</td> <td>None</td> </tr> <tr> <td>Brand Name(s)</td> <td>MONI LOG data link sensor</td> </tr> <tr> <td>Hardware version</td> <td>R3</td> </tr> <tr> <td>Firmware / Software version</td> <td>0.90</td> </tr> <tr> <td></td> <td>FCC-ID: 2AELT-08MONILOG    Contains IC: 5131A-HE910</td> </tr> </table> |                                                                                                                                                                                                                                                                                                                          | Product description | Datenlogger | Model No. | data link sensor | Additional Model(s) | None | Brand Name(s) | MONI LOG data link sensor | Hardware version | R3 | Firmware / Software version | 0.90 |  | FCC-ID: 2AELT-08MONILOG    Contains IC: 5131A-HE910 |
| Product description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Datenlogger                                                                                                                                                                                                                                                                                                              |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| Model No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | data link sensor                                                                                                                                                                                                                                                                                                         |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| Additional Model(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | None                                                                                                                                                                                                                                                                                                                     |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| Brand Name(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MONI LOG data link sensor                                                                                                                                                                                                                                                                                                |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| Hardware version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | R3                                                                                                                                                                                                                                                                                                                       |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| Firmware / Software version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.90                                                                                                                                                                                                                                                                                                                     |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FCC-ID: 2AELT-08MONILOG    Contains IC: 5131A-HE910                                                                                                                                                                                                                                                                      |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |
| <b>Test result</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Passed</b>                                                                                                                                                                                                                                                                                                            |                     |             |           |                  |                     |      |               |                           |                  |    |                             |      |  |                                                     |

**Possible test case verdicts:**

- neither assessed nor tested .....: N/N
- required by standard but not appl. to test object.....: N/A
- required by standard but not tested.....: N/T
- not required by standard for the test object .....: N/R
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

**Testing:**

Test Lab Temperature.....: 20 – 23 °C

Test Lab Humidity .....: 32 – 38 %

Date of receipt of test item .....: 2015-03-23

Date (s) of performance of tests .....: 2015-06-08 - 2015-06-11

Compiled by .....: Matthias Handrik

Tested by (+ signature).....: Matthias Handrik  
(Responsible for Test) 

Approved by (+ signature) .....: Christian Weber  
(Head of Lab) 

Date of issue .....: 2015-06-18

Total number of pages .....: 28

**General remarks:**

**The test results presented in this report relate only to the object tested.**

**The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.**

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

**Additional comments:**

---

## Version History

| Version | Issue Date | Remarks         | Revised by |
|---------|------------|-----------------|------------|
| 01      | 2015-06-18 | Initial Release |            |

## REPORT INDEX

|          |                                                                                              |           |
|----------|----------------------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>EQUIPMENT (TEST ITEM) DESCRIPTION</b>                                                     | <b>5</b>  |
| 1.1      | Photos – Equipment External                                                                  | 7         |
| 1.2      | Photos – Equipment internal                                                                  | 8         |
| 1.3      | Photos – Test setup                                                                          | 10        |
| 1.4      | Supporting Equipment Used During Testing                                                     | 11        |
| 1.5      | Test Modes                                                                                   | 12        |
| 1.6      | Test Equipment Used During Testing                                                           | 13        |
| 1.7      | Sample emission level calculation                                                            | 14        |
| <b>2</b> | <b>RESULT SUMMARY</b>                                                                        | <b>15</b> |
| <b>3</b> | <b>TEST CONDITIONS AND RESULTS</b>                                                           | <b>16</b> |
| 3.1      | Test Conditions and Results – Occupied Bandwidth                                             | 16        |
| 3.2      | Test Conditions and Results – Effective radiated power / Equivalent isotropic radiated power | 23        |
| 3.3      | Test Conditions and Results – Transmitter radiated emissions                                 | 25        |
| 3.4      | Test Conditions and Results – Receiver radiated emissions                                    | 27        |

## 1 Equipment (Test item) Description

|                               |                                                                                                                |                                 |                         |
|-------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------|
| Description                   | Datenlogger                                                                                                    |                                 |                         |
| Model                         | data link sensor                                                                                               |                                 |                         |
| Additional Model(s)           | None                                                                                                           |                                 |                         |
| Brand Name(s)                 | MONI LOG data link sensor                                                                                      |                                 |                         |
| Serial number                 | 20158xxx                                                                                                       |                                 |                         |
| Hardware version              | R3                                                                                                             |                                 |                         |
| Software / Firmware version   | 0.90                                                                                                           |                                 |                         |
| FCC-ID                        | 2AELT-08MONILOG                                                                                                |                                 |                         |
| Contains IC                   | 5131A-HE910                                                                                                    |                                 |                         |
| Equipment type                | End product                                                                                                    |                                 |                         |
| Equipment classification      | Mobile Device (Human Body distance > 20 cm)                                                                    |                                 |                         |
| Radio type                    | Transceiver                                                                                                    |                                 |                         |
| Radio technology              | GSM850 / GSM1900                                                                                               |                                 |                         |
| Operating frequency range     | GSM850 : TX = 824 - 849 MHz, RX = 869 - 894 MHz<br>GSM1900 : TX = 1850 - 1910 MHz, RX = 1930 - 1990 MHz        |                                 |                         |
| Assigned frequency band       | Cell. Service Block A & B : 824 - 849 MHz & 869 - 894 MHz<br>Broadband PCS : 1850 - 1910 MHz & 1930 - 1990 MHz |                                 |                         |
| Main test frequencies GSM850  | F <sub>LOW</sub>                                                                                               | CH : 128 UL: 824.2 MHz          | CH : 128 DL: 869.2 MHz  |
|                               | F <sub>MID</sub>                                                                                               | CH : 188 UL: 836.2 MHz          | CH : 188 DL: 881.2 MHz  |
|                               | F <sub>HIGH</sub>                                                                                              | CH : 251 UL: 848.8 MHz          | CH : 251 DL: 893.8 MHz  |
| Main test frequencies GSM1900 | F <sub>LOW</sub>                                                                                               | CH : 512 UL: 1850.2 MHz         | CH : 512 DL: 1930.2 MHz |
|                               | F <sub>MID</sub>                                                                                               | CH : 661 UL: 1880.0 MHz         | CH : 661 DL: 1960.0 MHz |
|                               | F <sub>HIGH</sub>                                                                                              | CH : 810 UL: 1909.8 MHz         | CH : 810 DL: 1989.8 MHz |
| Supported transmission modes  | GSM, GPRS                                                                                                      |                                 |                         |
| Modulations                   | GSM, GPRS : GMSK                                                                                               |                                 |                         |
| Multislot class               | 10                                                                                                             |                                 |                         |
| Number of antennas            | 1                                                                                                              |                                 |                         |
| Radio module                  | Type                                                                                                           | GSM/GPRS module                 |                         |
|                               | Model                                                                                                          | HE910-G                         |                         |
|                               | Manufacturer                                                                                                   | Telit Wireless Solutions        |                         |
|                               | HW Version                                                                                                     | 00                              |                         |
|                               | SW Version                                                                                                     | 12.00.xx5                       |                         |
|                               | FCC-ID                                                                                                         | RI7HE910                        |                         |
|                               | IC                                                                                                             | 5131A-HE910                     |                         |
| Antenna                       | Type                                                                                                           | external dedicated              |                         |
|                               | Model                                                                                                          | TG 22.0111                      |                         |
|                               | Manufacturer                                                                                                   | Taoglas                         |                         |
|                               | Gain                                                                                                           | 2.14 dBi (customer declaration) |                         |

Test Report No.: G0M-1502-4503-TFC224GS-V01

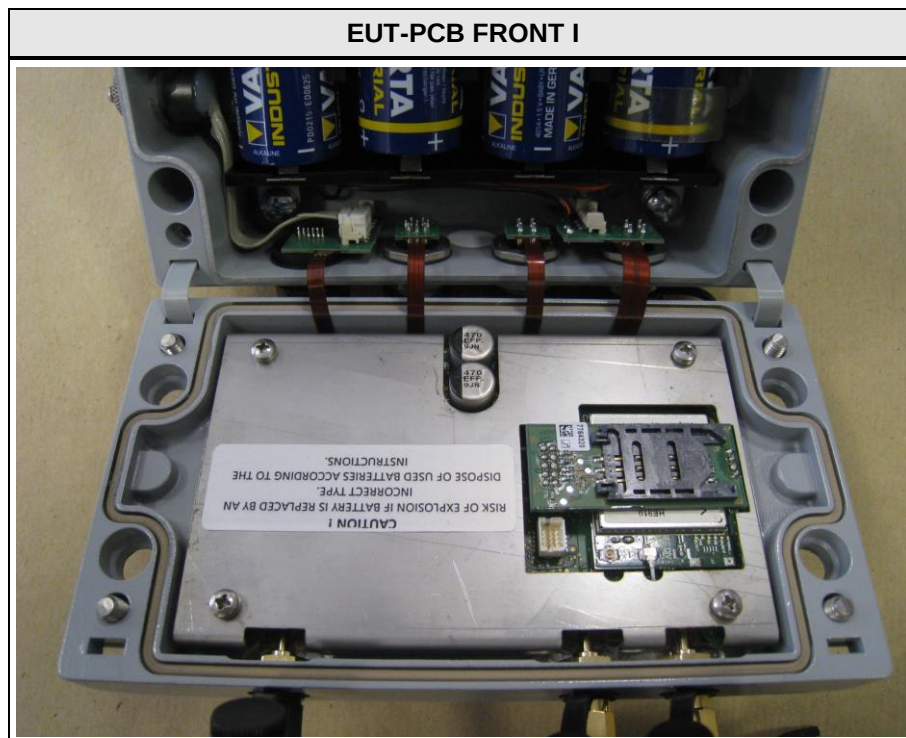
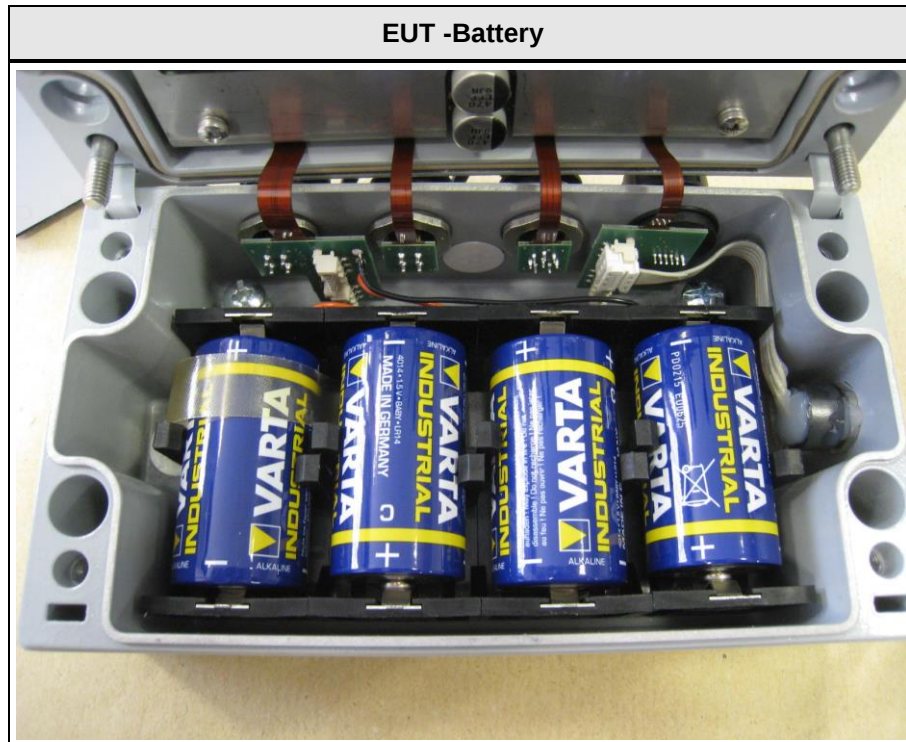
Eurofins Product Service GmbH  
Storkower Str. 38c, D-15526 Reichenwalde, Germany

|                      |                                                                         |             |
|----------------------|-------------------------------------------------------------------------|-------------|
| <b>Manufacturer</b>  | SMT & Hybrid GmbH<br>An der Priessnitzau 22<br>01328 Dresden<br>GERMANY |             |
|                      | $V_{NOM}$                                                               | 6 or 12 VDC |
|                      | $V_{MIN}$                                                               | N/A         |
|                      | $V_{MIN}$                                                               | N/A         |
| <b>AC/DC-Adaptor</b> | Model                                                                   | N/A         |
|                      | Vendor                                                                  | N/A         |
|                      | Input                                                                   | N/A         |
|                      | Output                                                                  | N/A         |

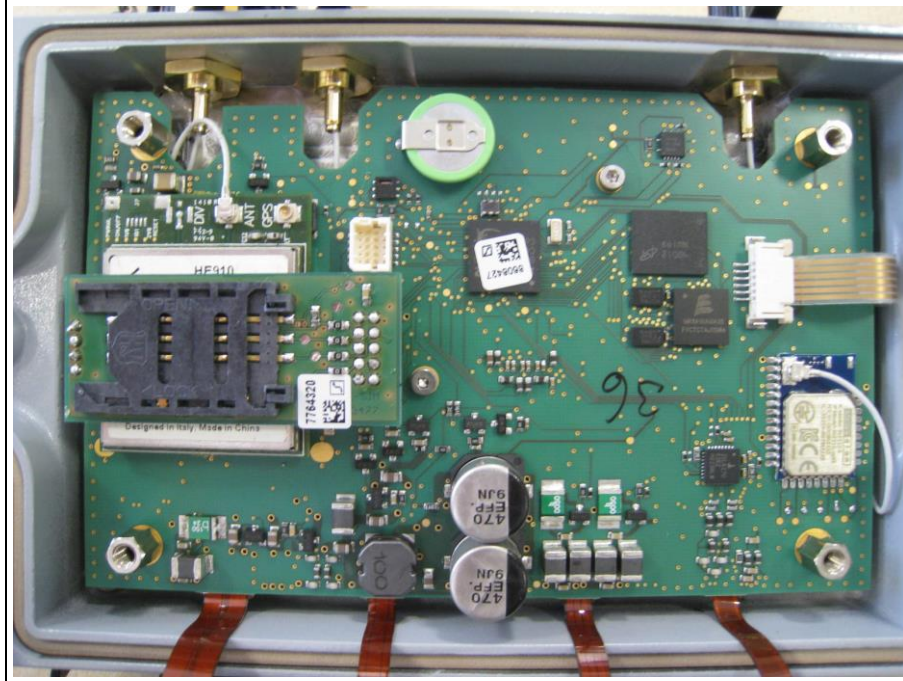
## 1.1 Photos – Equipment External



## 1.2 Photos – Equipment internal



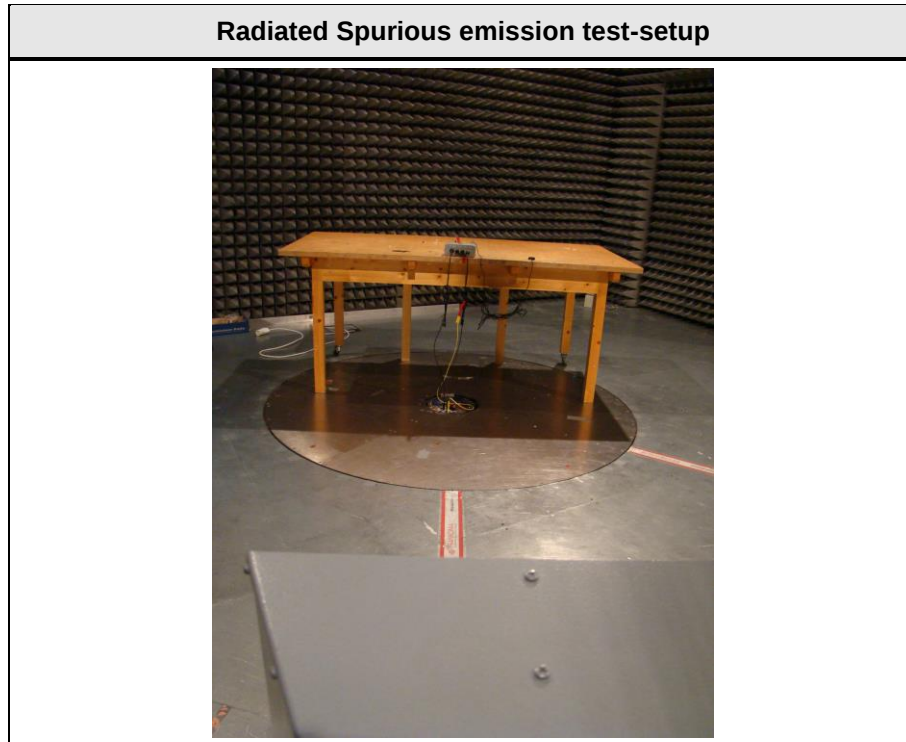
EUT-PCB FRONT II



EUT-PCB BACK



### 1.3 Photos – Test setup



#### 1.4 Supporting Equipment Used During Testing

| Product Type*                           | Device                     | Manufacturer | Model No. | Comments |
|-----------------------------------------|----------------------------|--------------|-----------|----------|
| SIM                                     | Radio communication tester | R&S          | CMU200    |          |
| SIM : Simulator (Not Subjected to Test) |                            |              |           |          |

## 1.5 Test Modes

| Mode #  | Description         |                                                                                                                                           |
|---------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| GSM850  | General conditions: | EUT powered by laboratory power supply. External GSM and GPS antenna connected. Active data call to communication tester.                 |
|         | Radio conditions:   | Mode = transmit<br>Connection = Packet data<br>Modulation = GMSK<br>Slot configuration = 1 up / 1 down<br>Power level = Maximum (Gamma 3) |
| GSM1900 | General conditions: | EUT powered by laboratory power supply. External GSM and GPS antenna connected. Active data call to communication tester.                 |
|         | Radio conditions:   | Mode = transmit<br>Connection = Packat data<br>Modulation = GMSK<br>Slot configuration = 1 up / 1 down<br>Power level = Maximum (Gamma 3) |

## 1.6 Test Equipment Used During Testing

| Measurement Software |                  |            |           |
|----------------------|------------------|------------|-----------|
| Description          | Manufacturer     | Name       | Version   |
| EMC Test Software    | Dare Instruments | Radimation | 2014.1.15 |

| Occupied Bandwidth |              |         |            |           |          |
|--------------------|--------------|---------|------------|-----------|----------|
| Description        | Manufacturer | Model   | Identifier | Cal. Date | Cal. Due |
| Spectrum Analyzer  | R&S          | FSIQ 26 | EF00242    | 2015-04   | 2016-04  |

| Radiated power         |              |            |            |           |          |
|------------------------|--------------|------------|------------|-----------|----------|
| Description            | Manufacturer | Model      | Identifier | Cal. Date | Cal. Due |
| Fully-anechoic chamber | Frankonia    | AC 3       | EF00199    | -         | -        |
| Spectrum Analyzer      | R&S          | FSIQ 26    | EF00242    | 2015-04   | 2016-04  |
| Biconical Antenna      | R&S          | HK 116     | EF00012    | 2013-02   | 2016-02  |
| LPD Antenna            | R&S          | HL 223     | EF00187    | 2014-03   | 2017-03  |
| Horn antenna           | Schwarzbeck  | BBHA 9120D | EF00019    | 2014-03   | 2016-03  |

| Radiated spurious emissions |              |            |            |           |          |
|-----------------------------|--------------|------------|------------|-----------|----------|
| Description                 | Manufacturer | Model      | Identifier | Cal. Date | Cal. Due |
| Semi-anechoic chamber       | Frankonia    | AC 1       | EF00062    | -         | -        |
| Spectrum Analyzer           | R&S          | FSEK 30    | EF00168    | 2015-01   | 2016-01  |
| Biconical Antenna           | R&S          | HK 116     | EF00012    | 2013-02   | 2016-02  |
| LPD Antenna                 | R&S          | HL 223     | EF00212    | 2013-02   | 2016-02  |
| Horn antenna                | Schwarzbeck  | BBHA 9120D | EF00019    | 2014-03   | 2016-03  |

## 1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBμV/m). The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log (\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

|           |   |       |   |             |   |                           |   |         |
|-----------|---|-------|---|-------------|---|---------------------------|---|---------|
| Reading   | + | AF    | = | Net Reading | : | Net reading - FCC limit   | = | Margin  |
| 21.5 dBμV | + | 26 dB | = | 47.5 dBμV/m | : | 47.5 dBμV/m - 57.0 dBμV/m | = | -9.5 dB |

## 2 Result Summary

| FCC 47 CFR Part 22H, 24E, IC RSS-132, 133                                  |                                      |                                                                            |        |                                                                          |
|----------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------|--------|--------------------------------------------------------------------------|
| Product Specific Standard Section                                          | Requirement – Test                   | Reference Method                                                           | Result | Remarks                                                                  |
| RSS-Gen 6.6                                                                | Occupied Bandwidth                   | RSS-Gen 6.6                                                                |        | Informational only                                                       |
| FCC § 24.235<br>FCC § 22.355<br>IC RSS-132 § 4.3<br>IC RSS-133 § 6.3       | Frequency stability                  | FCC § 24.235<br>FCC § 22.355<br>IC RSS-132 § 4.3<br>IC RSS-133 § 6.3       | N/R    | Conducted results of licensed radio unaffected. See module radio report. |
| FCC § 22.913(a)                                                            | Effective radiated power             | ANSI/TIA-603-C                                                             | PASS   |                                                                          |
| FCC § 24.232(c)<br>IC RSS-132 § 4.4<br>IC RSS-133 § 6.4                    | Equivalent isotropic radiated power  | ANSI/TIA-603-C                                                             | PASS   |                                                                          |
| FCC § 24.232(d)<br>IC RSS-133 § 6.4                                        | Peak to average ratio                | FCC § 24.232(d)<br>IC RSS-133 § 6.4                                        | N/R    | Conducted results of licensed radio unaffected. See module radio report  |
| FCC § 22.917(b)<br>FCC § 24.238(b)<br>IC RSS-132 § 4.5<br>IC RSS-133 § 6.5 | Band-edge compliance                 | FCC § 22.917(b)<br>FCC § 24.238(b)<br>IC RSS-132 § 4.5<br>IC RSS-133 § 6.5 | N/R    | Conducted results of licensed radio unaffected. See module radio report  |
| FCC § 22.917(a)<br>FCC § 24.238(a)<br>IC RSS-132 § 4.5<br>IC RSS-133 § 6.5 | Conducted out-of-band emissions      | FCC § 22.917(a)<br>FCC § 24.238(a)<br>IC RSS-132 § 4.5<br>IC RSS-133 § 6.5 | N/R    | Conducted results of licensed radio unaffected. See module radio report  |
| FCC § 22.917(a)<br>FCC § 24.238(a)<br>IC RSS-132 § 4.5<br>IC RSS-133 § 6.5 | Radiated out-of-band emissions       | ANSI/TIA-603-C                                                             | PASS   |                                                                          |
| IC RSS-132 § 4.6<br>IC RSS-133 § 6.6<br>IC RSS-Gen 7.1                     | Receiver radiated spurious emissions | IC RSS-132 § 4.6<br>IC RSS-133 § 6.6<br>IC RSS-Gen 7.1                     | PASS   |                                                                          |
| Remarks:                                                                   |                                      |                                                                            |        |                                                                          |

### 3 Test Conditions and Results

#### 3.1 Test Conditions and Results – Occupied Bandwidth

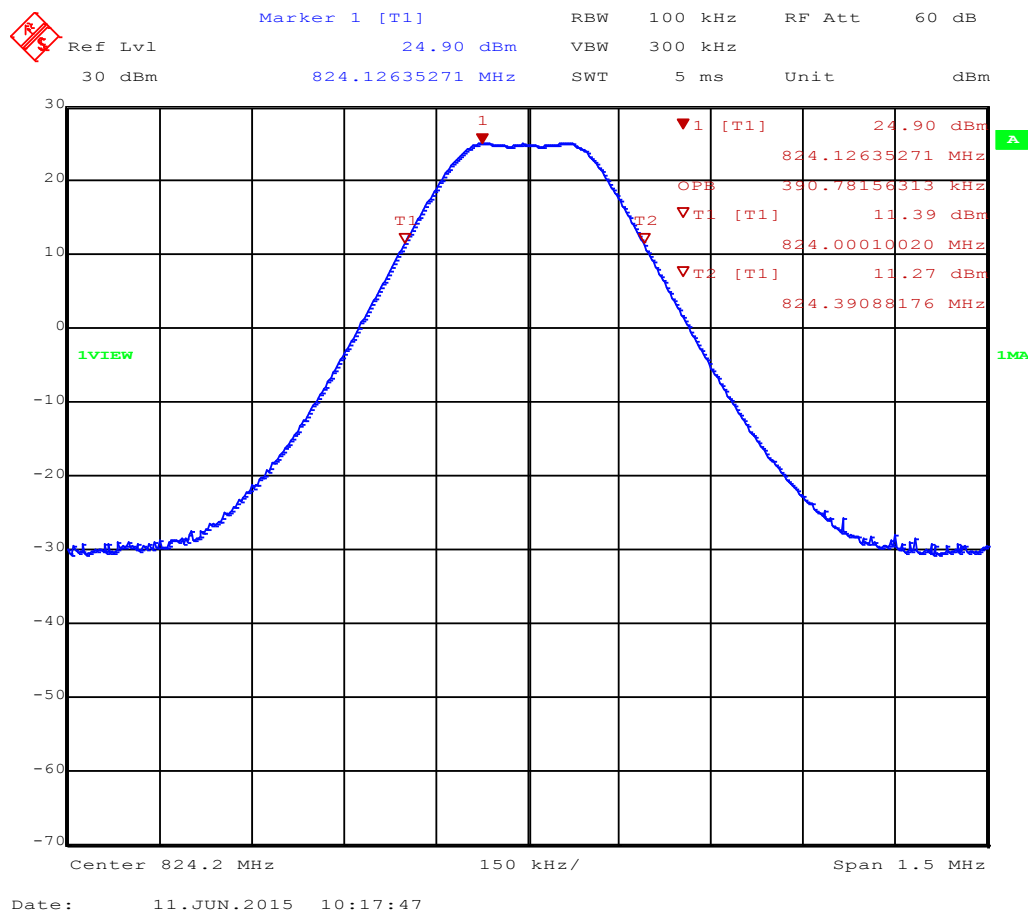
| Occupied Bandwidth acc. to IC RSS-Gen                                                                                                                                                                                                                                                                     |                 |                                                         |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------|--------------------------|
| Test according to measurement reference                                                                                                                                                                                                                                                                   |                 | Reference Method                                        |                          |
|                                                                                                                                                                                                                                                                                                           |                 | RSS-Gen 6.6                                             |                          |
| Test frequency range                                                                                                                                                                                                                                                                                      |                 | Tested frequencies                                      |                          |
|                                                                                                                                                                                                                                                                                                           |                 | F <sub>LOW</sub> / F <sub>MID</sub> / F <sub>HIGH</sub> |                          |
| Limits                                                                                                                                                                                                                                                                                                    |                 |                                                         |                          |
| None (Informational only)                                                                                                                                                                                                                                                                                 |                 |                                                         |                          |
| Test setup                                                                                                                                                                                                                                                                                                |                 |                                                         |                          |
| <div><div>Spectrum Analyzer</div><div>EUT</div></div>                                                                                                                                                                                                                                                     |                 |                                                         |                          |
| Test procedure                                                                                                                                                                                                                                                                                            |                 |                                                         |                          |
| <div>1. EUT set to test mode (Communication tester is used if needed)</div> <div>2. Span set to at least twice the emission spectrum</div> <div>3. Resolution bandwidth set to 1 % of span</div> <div>4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function</div> |                 |                                                         |                          |
| Test results – GSM850                                                                                                                                                                                                                                                                                     |                 |                                                         |                          |
| Channel                                                                                                                                                                                                                                                                                                   | Frequency [MHz] | Mode                                                    | Occupied Bandwidth [kHz] |
| F <sub>LOW</sub>                                                                                                                                                                                                                                                                                          | 824.2           | GPRS 850                                                | 390.782                  |
| F <sub>MID</sub>                                                                                                                                                                                                                                                                                          | 836.2           | GPRS 850                                                | 390.782                  |
| F <sub>HIGH</sub>                                                                                                                                                                                                                                                                                         | 848.8           | GPRS 850                                                | 390.782                  |
| Test results – GSM1900                                                                                                                                                                                                                                                                                    |                 |                                                         |                          |
| Channel                                                                                                                                                                                                                                                                                                   | Frequency [MHz] | Mode                                                    | Occupied Bandwidth [kHz] |
| F <sub>LOW</sub>                                                                                                                                                                                                                                                                                          | 1850.2          | GPRS 1900                                               | 393.788                  |
| F <sub>MID</sub>                                                                                                                                                                                                                                                                                          | 1880            | GPRS 1900                                               | 396.794                  |
| F <sub>HIGH</sub>                                                                                                                                                                                                                                                                                         | 1909.8          | GPRS 1900                                               | 393.788                  |
| Comments:                                                                                                                                                                                                                                                                                                 |                 |                                                         |                          |

# Occupied Bandwidth – GPRS850 F<sub>Low</sub>

## Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH  
EUT Name: Datenlogger  
Model: data link sensor  
Test Site: Eurofins Product Service GmbH  
Operator: Handrik  
Test Conditions: Tnom / Vnom  
Mode: GPRS 850, CH 128, UL 1x Slot, Gamma 3  
Test Date: 2015-06-11  
Verdict: NONE (INFORMATION ONLY)  
Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used



Test Report No.: G0M-1502-4503-TFC224GS-V01

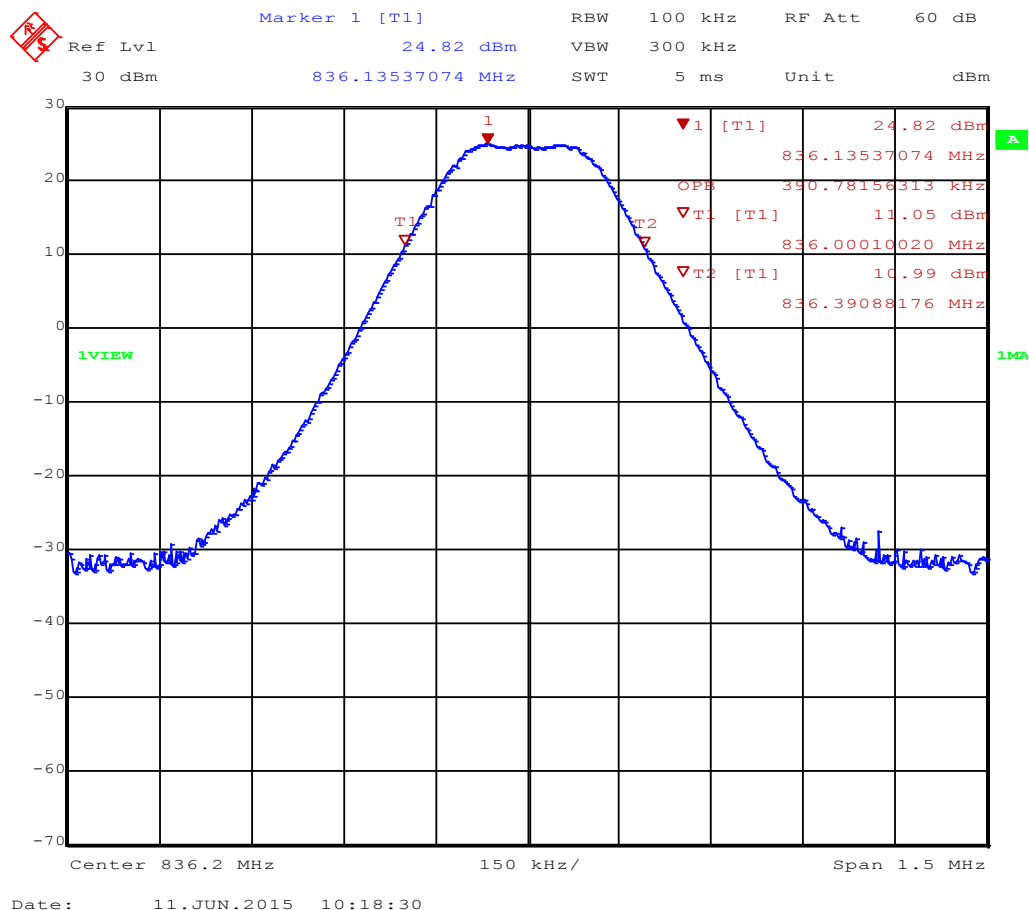
Eurofins Product Service GmbH  
Storkower Str. 38c, D-15526 Reichenwalde, Germany

# Occupied Bandwidth – GPRS850 F<sub>MID</sub>

## Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH  
EUT Name: Datenlogger  
Model: data link sensor  
Test Site: Eurofins Product Service GmbH  
Operator: Handrik  
Test Conditions: Tnom / Vnom  
Mode: GPRS 850, CH 188, UL 1x Slot, Gamma 3  
Test Date: 2015-06-11  
Verdict: NONE (INFORMATION ONLY)  
Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used



Test Report No.: G0M-1502-4503-TFC224GS-V01

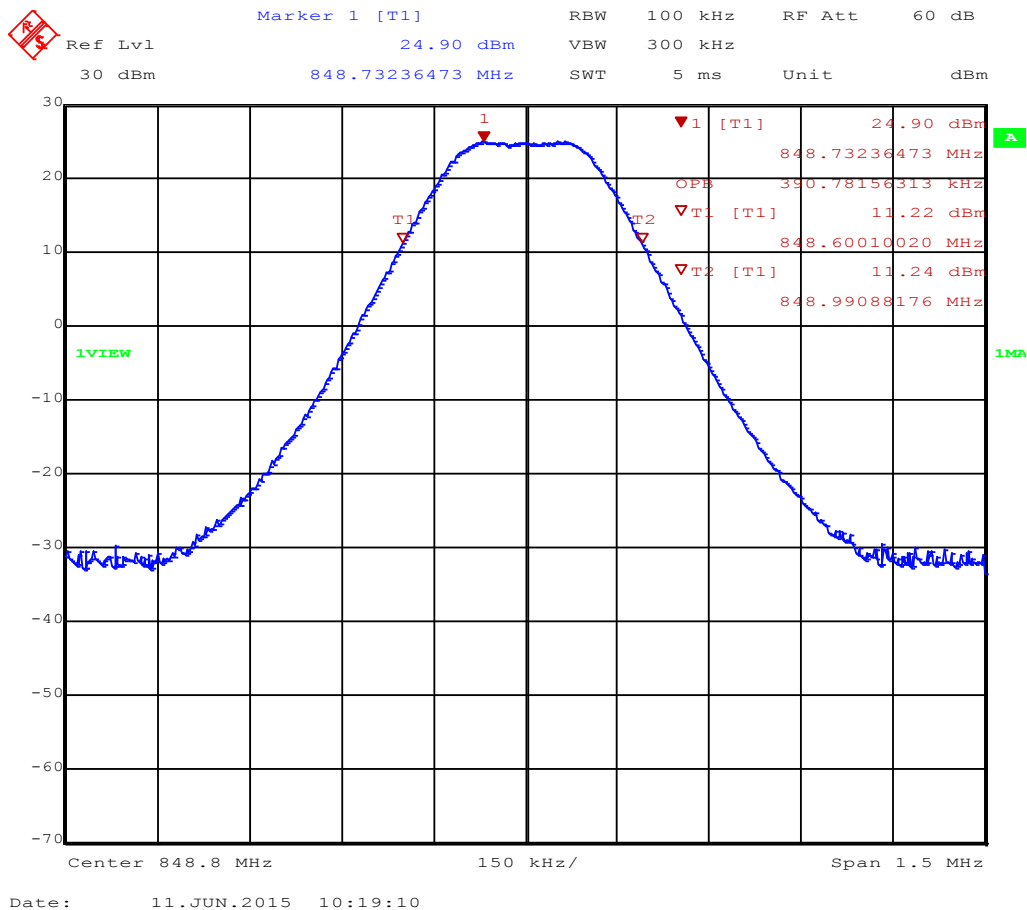
Eurofins Product Service GmbH  
Storkower Str. 38c, D-15526 Reichenwalde, Germany

# Occupied Bandwidth – GPRS850 F<sub>HIGH</sub>

## Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH  
EUT Name: Datenlogger  
Model: data link sensor  
Test Site: Eurofins Product Service GmbH  
Operator: Handrik  
Test Conditions: Tnom / Vnom  
Mode: GPRS 850, CH 251, UL 1x Slot, Gamma 3  
Test Date: 2015-06-11  
Verdict: NONE (INFORMATION ONLY)  
Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used

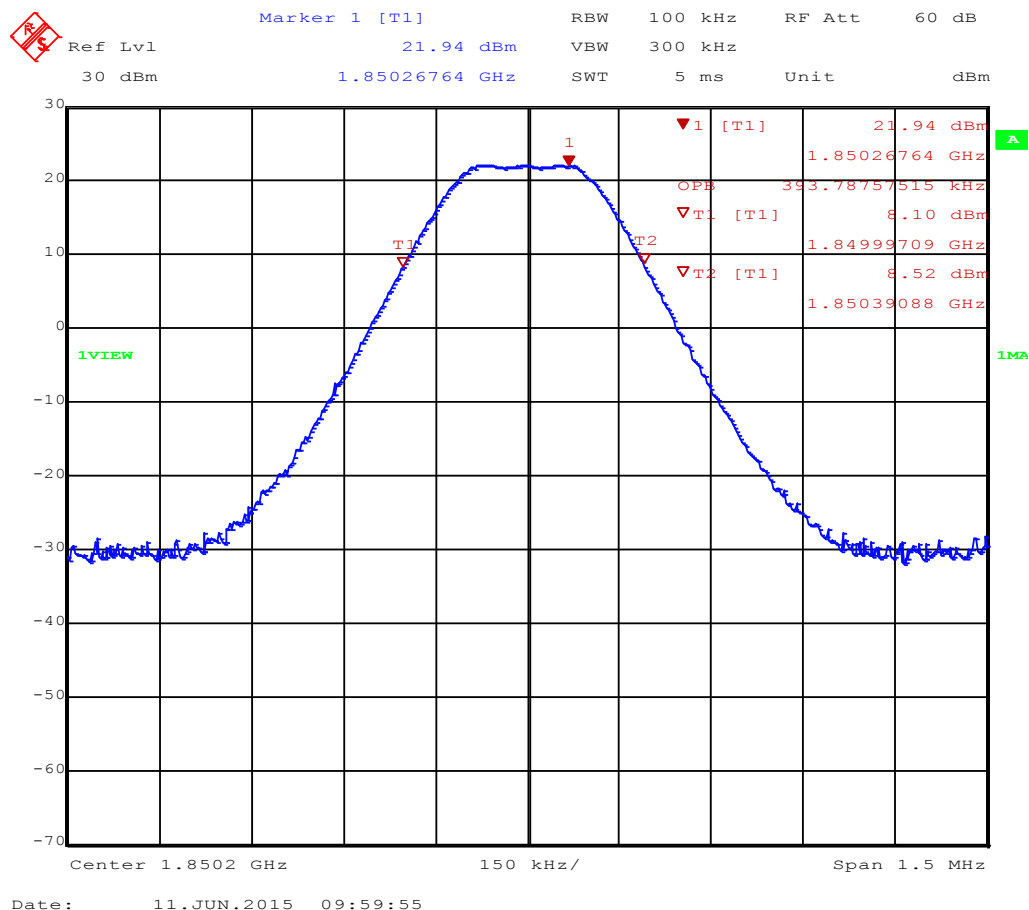


# Occupied Bandwidth – GPRS1900 F<sub>Low</sub>

## Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH  
EUT Name: Datenlogger  
Model: data link sensor  
Test Site: Eurofins Product Service GmbH  
Operator: Handrik  
Test Conditions: Tnom / Vnom  
Mode: GPRS 1900, CH 512, UL 1x Slot, Gamma 3  
Test Date: 2015-06-11  
Verdict: NONE (INFORMATION ONLY)  
Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used

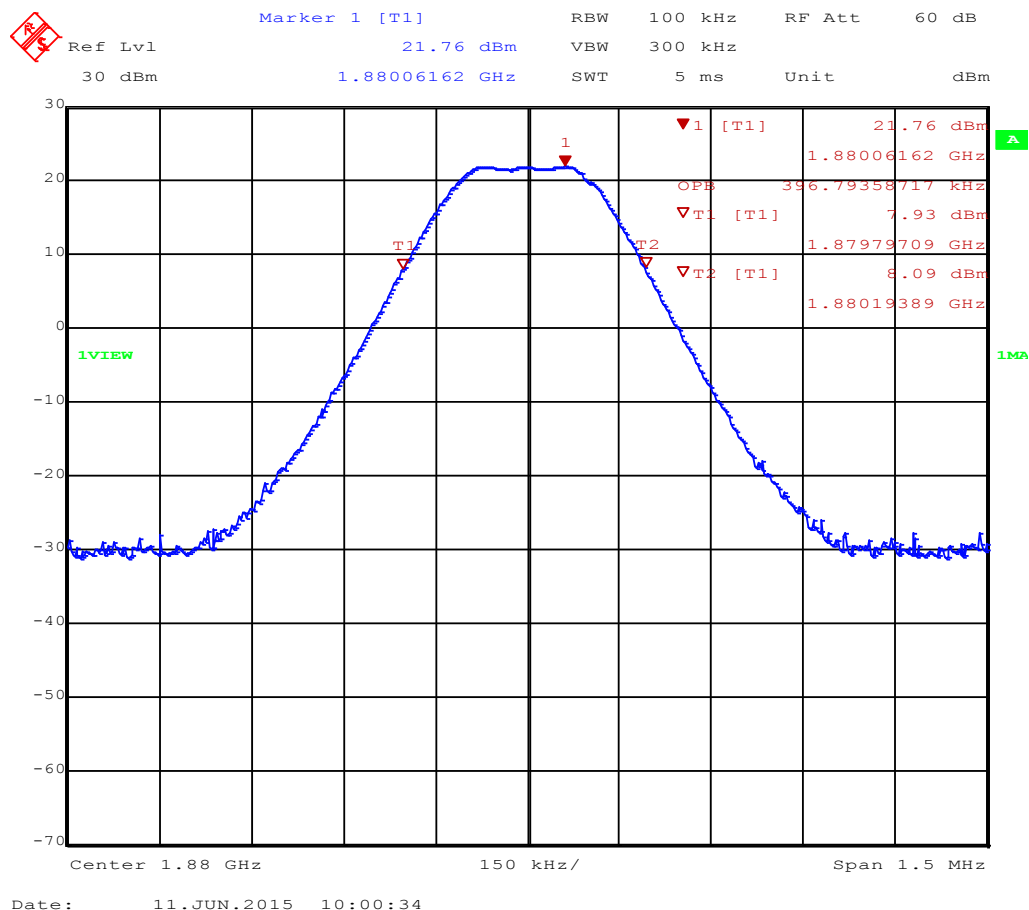


# Occupied Bandwidth – GPRS1900 F<sub>MID</sub>

## Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH  
EUT Name: Datenlogger  
Model: data link sensor  
Test Site: Eurofins Product Service GmbH  
Operator: Handrik  
Test Conditions: Tnom / Vnom  
Mode: GPRS 1900, CH 661, UL 1x Slot, Gamma 3  
Test Date: 2015-06-11  
Verdict: NONE (INFORMATION ONLY)  
Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used



Test Report No.: G0M-1502-4503-TFC224GS-V01

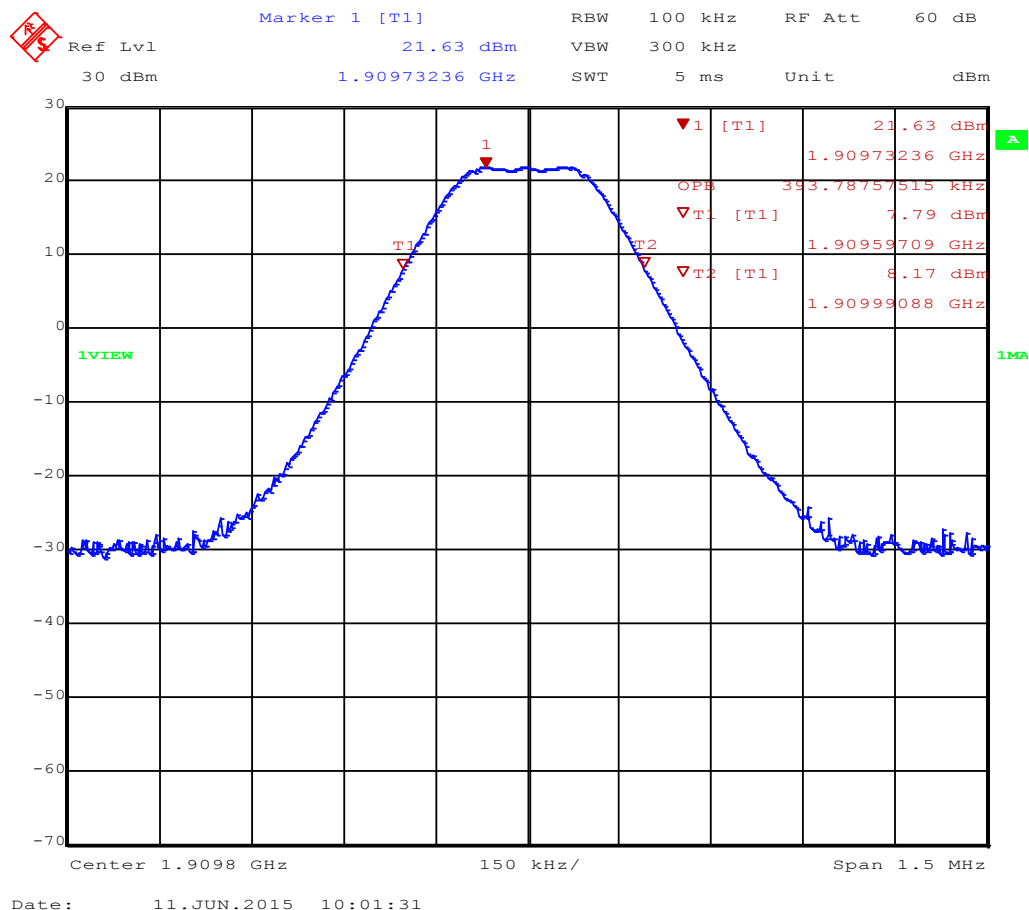
Eurofins Product Service GmbH  
Storkower Str. 38c, D-15526 Reichenwalde, Germany

## Occupied Bandwidth – GPRS1900 F<sub>HIGH</sub>

### Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH  
 EUT Name: Datenlogger  
 Model: data link sensor  
 Test Site: Eurofins Product Service GmbH  
 Operator: Handrik  
 Test Conditions: Tnom / Vnom  
 Mode: GPRS 1900, CH 810, UL 1x Slot, Gamma 3  
 Test Date: 2015-06-11  
 Verdict: NONE (INFORMATION ONLY)  
 Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used

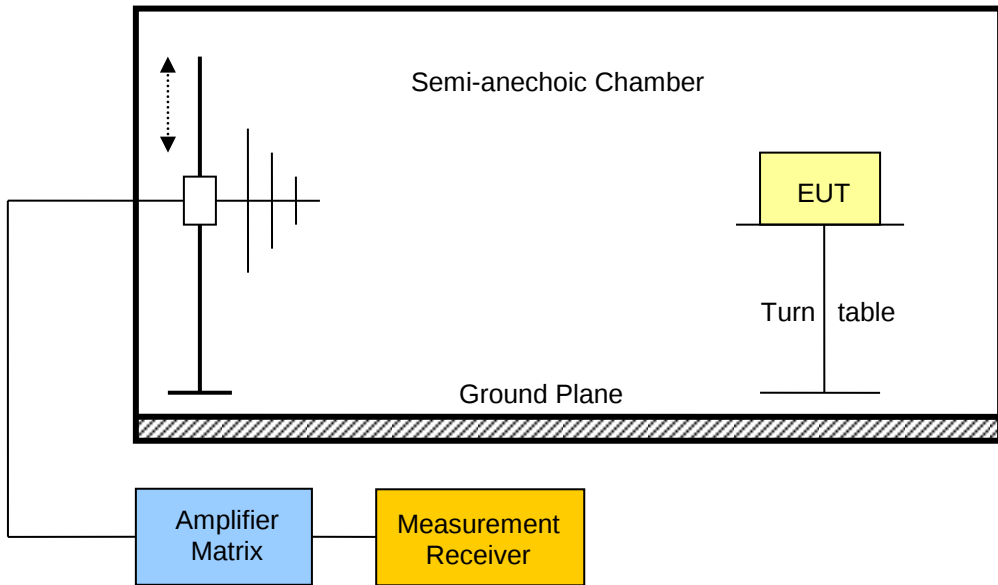


### 3.2 Test Conditions and Results – Effective radiated power / Equivalent isotropic radiated power

| Radiated power acc. to FCC 22H / FCC 24E / IC RSS-132 / IC RSS-133                                                                                                                                                                                                                                                                                     |                                                                                          |                                                                         | Verdict: PASS |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------|
| EUT requirement rule parts and clause                                                                                                                                                                                                                                                                                                                  | Reference                                                                                |                                                                         |               |
|                                                                                                                                                                                                                                                                                                                                                        | FCC § 22.913(a) / FCC § 24.232(c)<br>IC RSS-132 § 4.4 /IC RSS-133 § 6.4                  |                                                                         |               |
| Test according to measurement reference                                                                                                                                                                                                                                                                                                                | Reference Method                                                                         |                                                                         |               |
|                                                                                                                                                                                                                                                                                                                                                        | FCC § 22.913(a) / FCC § 24.232(c) / ANSI/TIA-603-C<br>IC RSS-132 § 4.4 /IC RSS-133 § 6.4 |                                                                         |               |
| Test frequency range                                                                                                                                                                                                                                                                                                                                   | Tested frequencies                                                                       |                                                                         |               |
|                                                                                                                                                                                                                                                                                                                                                        | $F_{\text{LOW}}$ / $F_{\text{MID}}$ / $F_{\text{HIGH}}$                                  |                                                                         |               |
| Limits                                                                                                                                                                                                                                                                                                                                                 |                                                                                          |                                                                         |               |
| Frequency range                                                                                                                                                                                                                                                                                                                                        | Equipment type                                                                           | Power limit                                                             |               |
| 824-849 MHz                                                                                                                                                                                                                                                                                                                                            | Mobile transmitter                                                                       | FCC : 7 Watts (38.45 dBm) e.r.p.<br>IC : 11.5 Watts (40.6 dBm) e.i.r.p. |               |
| 1850-1910 MHz                                                                                                                                                                                                                                                                                                                                          | Mobile transmitter                                                                       | FCC : 2 Watts (33 dBm) e.i.r.p.<br>IC : 2 Watts (33 dBm) e.i.r.p.       |               |
| Test setup                                                                                                                                                                                                                                                                                                                                             |                                                                                          |                                                                         |               |
| <div><div><div>Fully-anechoic Chamber</div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div>EUT</div><div>Turn table</div></div></div><div><div>Amplifier Matrix</div><div>Measurement Receiver</div></div></div>                              |                                                                                          |                                                                         |               |
| Test procedure                                                                                                                                                                                                                                                                                                                                         |                                                                                          |                                                                         |               |
| <div><div>1. EUT set to test mode</div><div>2. The radiated power is measured with a measurement antenna in vertical polarization</div><div>3. To obtain maximum level the EUT is rotated</div><div>4. The EUT is replaced with a half-wave dipole and the power to the dipole is adjusted to obtain same radiated power measurement value</div></div> |                                                                                          |                                                                         |               |

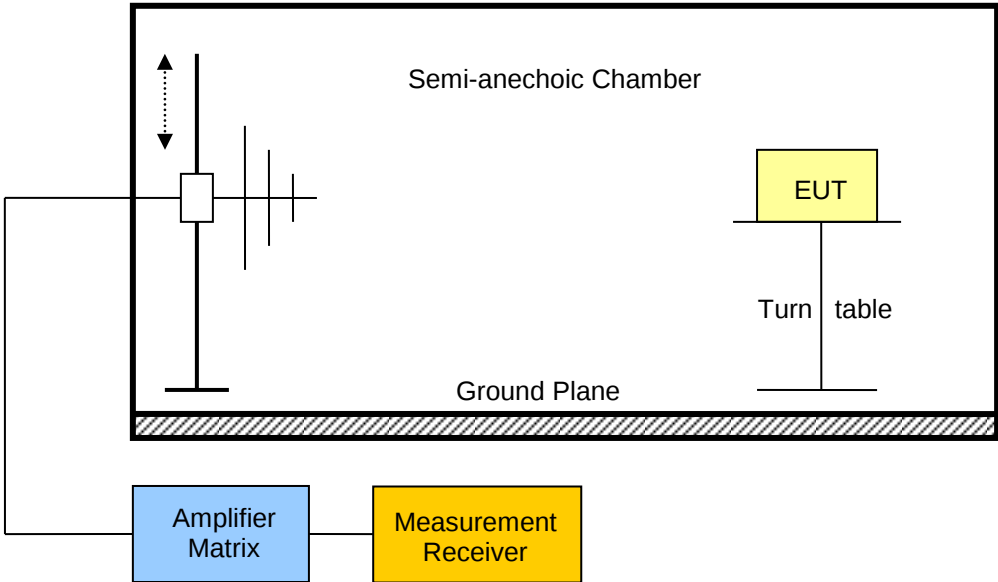
| Test results – GSM850 E.R.P.    |                 |           |      |                     |                     |             |        |
|---------------------------------|-----------------|-----------|------|---------------------|---------------------|-------------|--------|
| Channel                         | Frequency [MHz] | Mode      | Pol. | Power [dBm e.r.p]   | Limit [dBm e.r.p]   | Margin [dB] | Result |
| F <sub>LOW</sub>                | 824.2           | GPRS 850  | ver  | 24.8                | 38.45               | -13.65      | PASS   |
| F <sub>MID</sub>                | 836.2           | GPRS 850  | ver  | 26.3                | 38.45               | -12.15      | PASS   |
| F <sub>HIGH</sub>               | 848.8           | GPRS 850  | ver  | 28.2                | 38.45               | -10.25      | PASS   |
| Test results – GSM850 E.I.R.P.  |                 |           |      |                     |                     |             |        |
| Channel                         | Frequency [MHz] | Mode      | Pol. | Power [dBm e.i.r.p] | Limit [dBm e.i.r.p] | Margin [dB] | Result |
| F <sub>LOW</sub>                | 824.2           | GPRS 850  | ver  | 26.95               | 40.6                | -13.65      | PASS   |
| F <sub>MID</sub>                | 836.2           | GPRS 850  | ver  | 28.45               | 40.6                | -12.15      | PASS   |
| F <sub>HIGH</sub>               | 848.8           | GPRS 850  | ver  | 30.35               | 40.6                | -10.25      | PASS   |
| Test results – GSM1900 E.I.R.P. |                 |           |      |                     |                     |             |        |
| Channel                         | Frequency [MHz] | Mode      | Pol. | Power [dBm e.i.r.p] | Limit [dBm e.i.r.p] | Margin [dB] | Result |
| F <sub>LOW</sub>                | 1850.2          | GPRS 1900 | hor  | 30.4                | 33                  | -02.60      | PASS   |
| F <sub>MID</sub>                | 1880            | GPRS 1900 | hor  | 29.4                | 33                  | -03.60      | PASS   |
| F <sub>HIGH</sub>               | 1909.8          | GPRS 1900 | hor  | 30.4                | 33                  | -02.60      | PASS   |
| Comments:                       |                 |           |      |                     |                     |             |        |

### 3.3 Test Conditions and Results – Transmitter radiated emissions

| Transmitter radiated power acc. to FCC 22H / FCC 24E / IC RSS-132 / IC RSS-133                                                                                                                                                                                                                                                                                                                                |                                                                                      | Verdict: PASS |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|
| Test according referenced standards                                                                                                                                                                                                                                                                                                                                                                           | Reference Method                                                                     |               |
|                                                                                                                                                                                                                                                                                                                                                                                                               | FCC § 22.917(a) / FCC § 24.238(a)<br>IC RSS-132 § 4.5 / IC RSS-133 § 6.5             |               |
| Test according to measurement reference                                                                                                                                                                                                                                                                                                                                                                       | Reference Method                                                                     |               |
|                                                                                                                                                                                                                                                                                                                                                                                                               | ANSI/TIA-603-C                                                                       |               |
| Test frequency range                                                                                                                                                                                                                                                                                                                                                                                          | Tested frequencies                                                                   |               |
|                                                                                                                                                                                                                                                                                                                                                                                                               | 30 MHz – 10 <sup>th</sup> Harmonic                                                   |               |
| Limits                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                      |               |
| Frequency range                                                                                                                                                                                                                                                                                                                                                                                               | Limit                                                                                |               |
| 824-849 MHz                                                                                                                                                                                                                                                                                                                                                                                                   | Attenuation below transmitter power ≥ 43 + 10 · log <sub>10</sub> (P) [dB] = -13 dBm |               |
| 1850-1910 MHz                                                                                                                                                                                                                                                                                                                                                                                                 | Attenuation below transmitter power ≥ 43 + 10 · log <sub>10</sub> (P) [dB] = -13 dBm |               |
| Test setup                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                      |               |
|                                                                                                                                                                                                                                                                                                                           |                                                                                      |               |
| Test procedure                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |               |
| <ol style="list-style-type: none"><li>1. EUT set to test mode</li><li>2. Maximum emission level is measured by rotating the EUT and adjusting the antenna height for vertical polarization</li><li>3. The EUT is replaced by a substitution antenna and generator</li><li>4. The power level is set to obtain the same power reading</li><li>5. Measurement is repeated for horizontal polarization</li></ol> |                                                                                      |               |

| Test results – GSM850                                                                    |                 |           |                                   |             |      |             |             |
|------------------------------------------------------------------------------------------|-----------------|-----------|-----------------------------------|-------------|------|-------------|-------------|
| Channel                                                                                  | Frequency [MHz] | Mode      | Emission [MHz]                    | Level [dBm] | Pol. | Limit [dBm] | Margin [dB] |
| CH. 128                                                                                  | 824.2           | GPRS 850  | 823.996                           | -19.40      | hor  | -13.00      | -06.41      |
| CH. 128                                                                                  | 824.2           | GPRS 850  | 823.998                           | -21.20      | ver  | -13.00      | -08.23      |
| CH. 128                                                                                  | 824.2           | GPRS 850  | 883.5                             | -24.90      | hor  | -13.00      | -11.93      |
| CH. 188                                                                                  | 826.2           | GPRS 850  | No significant spurious emissions |             |      |             |             |
| CH. 251                                                                                  | 848.8           | GPRS 850  | 849.002                           | -18.50      | ver  | -13.00      | -05.49      |
| CH. 251                                                                                  | 848.8           | GPRS 850  | 849.002                           | -18.80      | hor  | -13.00      | -05.81      |
| Test results – GSM1900                                                                   |                 |           |                                   |             |      |             |             |
| Channel                                                                                  | Frequency [MHz] | Mode      | Emission [MHz]                    | Level [dBm] | Pol. | Limit [dBm] | Margin [dB] |
| CH 512                                                                                   | 1850.2          | GPRS 1900 | 1850                              | -22.60      | hor  | -13.00      | -09.65      |
| CH 512                                                                                   | 1850.2          | GPRS 1900 | 1850                              | -26.50      | ver  | -13.00      | -13.50      |
| CH 661                                                                                   | 1880.0          | GPRS 1900 | No significant spurious emissions |             |      |             |             |
| CH.810                                                                                   | 1909.8          | GPRS 1900 | 1910                              | -25.70      | ver  | -13.00      | -12.68      |
| CH 810                                                                                   | 1909.8          | GPRS 1900 | 1910                              | -19.30      | hor  | -13.00      | -06.33      |
| Comments: after check with 6V DC and 12 V DC spurious measurement with 6 V DC worst case |                 |           |                                   |             |      |             |             |

### 3.4 Test Conditions and Results – Receiver radiated emissions

| Receiver radiated emissions acc. to IC RSS-210                                       |                                   |              |                | Verdict: PASS      |
|--------------------------------------------------------------------------------------|-----------------------------------|--------------|----------------|--------------------|
| Test according referenced standards                                                  | Reference Method                  |              |                |                    |
|                                                                                      | IC RSS-132 5.6 / 133 6.6          |              |                |                    |
| Test according to measurement reference                                              | Reference Method                  |              |                |                    |
|                                                                                      | ANSI C63.4                        |              |                |                    |
| Test frequency range                                                                 | Tested frequencies                |              |                |                    |
|                                                                                      | 30 MHz – 5 <sup>th</sup> Harmonic |              |                |                    |
| EUT test mode                                                                        | Receive                           |              |                |                    |
| Limits                                                                               |                                   |              |                |                    |
| Frequency range [MHz]                                                                | Detector                          | Limit [μV/m] | Limit [dBμV/m] | Limit Distance [m] |
| 30 – 88                                                                              | Quasi-Peak                        | 100          | 40             | 3                  |
| 88 – 216                                                                             | Quasi-Peak                        | 150          | 43.5           | 3                  |
| 216 – 960                                                                            | Quasi-Peak                        | 200          | 46             | 3                  |
| 960 – 1000                                                                           | Quasi-Peak                        | 500          | 54             | 3                  |
| > 1000                                                                               | Average                           | 500          | 54             | 3                  |
| Test setup                                                                           |                                   |              |                |                    |
|  |                                   |              |                |                    |

| Test procedure                                                                                                                                                                                                                                                                                                                                                                                        |                 |                |                         |                       |      |              |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|-------------------------|-----------------------|------|--------------|---------------|
| <ol style="list-style-type: none"> <li>1. EUT set to receive mode (Communication tester is used if needed)</li> <li>2. Span it set according to measurement range</li> <li>3. Resolution bandwidth below 1GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1MHz with peak/average detector is used above 1GHz</li> <li>4. Markers are set to peak emission levels</li> </ol> |                 |                |                         |                       |      |              |               |
| Test results GSM 850                                                                                                                                                                                                                                                                                                                                                                                  |                 |                |                         |                       |      |              |               |
| Channel                                                                                                                                                                                                                                                                                                                                                                                               | Frequency [MHz] | Emission [MHz] | Emission Level [dbμV/m] | Emission Level [μV/m] | Det. | Limit [μV/m] | Margin [μV/m] |
| CH 188                                                                                                                                                                                                                                                                                                                                                                                                | 836.2           | 3855           | 43.17                   | 144.05                | pk   | 500          | -355.95       |
| CH 188                                                                                                                                                                                                                                                                                                                                                                                                | 836.2           | 3503           | 42.56                   | 134.28                | pk   | 500          | -365.72       |
| Test results GSM 1900                                                                                                                                                                                                                                                                                                                                                                                 |                 |                |                         |                       |      |              |               |
| Channel                                                                                                                                                                                                                                                                                                                                                                                               | Frequency [MHz] | Emission [MHz] | Emission Level [dbμV/m] | Emission Level [μV/m] | Det. | Limit [μV/m] | Margin [μV/m] |
| CH 661                                                                                                                                                                                                                                                                                                                                                                                                | 1880            | 7032           | 51.02                   | 355.63                | pk   | 500          | -144.37       |
| CH 661                                                                                                                                                                                                                                                                                                                                                                                                | 1880            | 7400           | 51.52                   | 376.70                | pk   | 500          | -123.30       |
| Comments:                                                                                                                                                                                                                                                                                                                                                                                             |                 |                |                         |                       |      |              |               |