*Full*

# TEST REPORT

## No. I18D00207-SRD04

*For*

**Client : Shanghai Sunmi Technology Co.,Ltd.**

**Production : Wireless data ordering system**

**Model Name : T7821**

**Brand Name : SUNMI**

**FCC ID : 2AH25M2**

**Hardware Version: 2DD021_V2.01**

**Software Version: M2_V1.8**

**Issued date: 2019-02-19**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

The standards accredited by A2LA except ANSI/TIA-603-E and KDB 971168 D01.

**Test Laboratory:**

ECIT Shanghai, East China Institute of Telecommunications

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**Revision Version**

| Report Number | Revision | Date | Memo |
|---|---|---|---|
| I18D00207-SRD04 | 00 | 2019-02-19 | Initial creation of test report |

# CONTENTS

# 1. Test Laboratory

## 1.1. Testing Location

| | |
|---|---|
| Company Name: | ECIT Shanghai, East China Institute of Telecommunications |
| Address: | 7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China |
| Postal Code: | 200001 |
| Telephone: | (+86)-021-63843300 |
| Fax: | (+86)-021-63843301 |
| FCC registration No | 958356 |

## 1.2. Testing Environment

| | |
|---|---|
| Normal Temperature: | 15-35℃ |
| Extreme Temperature: | -30/+50℃ |
| Relative Humidity: | 25-75% |

## 1.3. Project data

| | |
|---|---|
| Project Leader: | Chen Minfei |
| Testing Start Date: | 2018-10-23 |
| Testing End Date: | 2019-02-18 |

## 1.4. Signature

**Yang Dejun**
**(Prepared this test report)**

**Shi Hongqi**
**(Reviewed this test report)**

**Zheng Zhongbin**
**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | Shanghai Sunmi Technology Co.,Ltd. |
| Address: | Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China |
| Telephone: | 86-18721763396 |
| Postcode: | 200433 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | Shanghai Sunmi Technology Co.,Ltd. |
| Address: | Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China |
| Telephone: | 86-18721763396 |
| Postcode: | 200433 |

# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

## 3.1. About EUT

| | |
|---|---|
| EUT Description | Wireless data ordering system |
| Model name | T7821 |
| FCC ID | 2AH25M2 |
| GSM Frequency Band | GSM850/GSM900/GSM1800/GSM1900 |
| UMTS Frequency Band | Band 1/2/4/5 |
| CDMA Frequency Band | BC0/BC1 |
| LTE Frequency Band | Band 2/4/7/17/28 |
| Additional Communication Function | BT/BLE/2.4G WLAN 802.11 b/g/n20/n40/5G WLAN 802.11 a/n20/n40 |
| Extreme Temperature | -30/+50℃ |
| Nominal Voltage | 3.8V |
| Extreme High Voltage | 4.35V |
| Extreme Low Voltage | 3.6V |

Note: Photographs of EUT are shown in ANNEX A of this test report.

## 3.2. Internal Identification of EUT used during the test

| EUT ID* | Model Name | SN or IMEI | HW Version | SW Version | Date of receipt |
|---|---|---|---|---|---|
| N05 | T7821 | NA | 2DD021_V2.01 | M2_V1.8 | 2018-10-16 |
| N03 | T7821 | NA | 2DD021_V2.01 | M2_V1.8 | 2018-10-16 |

*EUT ID: is used to identify the test sample in the lab internally.

## 3.3. Internal Identification of AE used during the test

| AE ID* | Description | SN |
|---|---|---|
| AE1 | RF cable | --- |
| AE2 | --- | --- |

*AE ID: is used to identify the test sample in the lab internally.

## 3.4. Statements

The T7821, supporting GPRS/EDGE/WCDMA/CDMA/LTE/BT/BLE/WLAN, manufactured by Shanghai Sunmi Technology Co.,Ltd. , which is a new product for testing.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

# 4. Reference Documents

## 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|---|---|---|
| FCC Part 24 | PERSONAL COMMUNICATIONS SERVICES | 2018/10/1 |
| FCC Part 22 | PUBLIC MOBILE SERVICES | 2018/10/1 |
| FCC Part 2 | FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS | 2018/10/1 |
| ANSI-TIA-603-E | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards | 2016 |
| ANSI C63.26 | American National Standard of Procedures for Compliance Testing of Licensed Transmitters Used in Licensed Radio | 2015 |
| KDB 971168 D01 | Measurement Guidance for Certification of Licensed Digital Transmitters | v03r01 |

# 5. SUMMARY OF TEST RESULTS

| Item | Test items | FCC rules | IC rules | result |
|---|---|---|---|---|
| 1 | Output Power | 2.1046/22.913(a)/24.23 | / | Pass |
| 2 | Peak-to-Average | 24.232(d) | / | Pass |
| 3 | 99%Occupied | 2.1049(h)(i)/ 22.917(b) | / | Pass |
| 4 | -26dB Emission | 22.917(b)/§24.238(b) | / | Pass |
| 5 | Band Edge at antenna terminals | 22.917(a)/24.238(a) | / | Pass |
| 6 | Frequency stability | 2.1055/24.235 | / | Pass |
| 7 | Conducted Spurious mission | 2.1053/22.917(a)/24.23 | / | Pass |
| 8 | Emission Limit | 2.1051/22.917/24.238/ | / | Pass |

# 6. Test Equipment Utilized

**Climate chamber**

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration date | Cal.interval |
|---|---|---|---|---|---|---|
| 1 | Climate chamber | SH-641 | 92012011 | ESPEC | 2017-12-25 | 2 Year |

**Radiated emission test system**

The test equipment and ancillaries used are as follows.

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration date | Cal.interval |
|---|---|---|---|---|---|---|
| 1 | Universal Radio Communication Tester | CMU200 | 123123 | R&S | 2018-05-11 | 1 Year |
| 2 | EMI Test Receiver | ESU40 | 100307 | R&S | 2018-05-11 | 1 Year |
| 3 | TRILOG Broadband Antenna | VULB9163 | VULB9163-515 | Schwarzbeck | 2017-02-25 | 3 Year |
| 4 | Double-ridged Waveguide Antenna | ETS-3117 | 00135890 | ETS | 2017-01-11 | 3 Year |
| 5 | 2-Line V-Network | ENV216 | 101380 | R&S | 2018-05-11 | 1 Year |
| 6 | Substitution Antenna | ETS-3117 | 00135890 | ETS | 2017-01-11 | 3 Year |
| 7 | RF Signal Generator | SMF100A | 102314 | R&S | 2018-05-11 | 1 Year |
| 8 | Substitution Antenna | VUBA9117 | 9117-266 | Schwarzbeck | 2017-11-18 | 3 Year |
| 9 | Amplifier | SCU08 | 10146 | R&S | 2018-05-11 | 1 Year |

**Conducted test system**

| No. | Name | Type | SN | Manufacture | Calibration date | Cal.interval |
|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | FSQ26 | 101096 | R&S | 2018-05-11 | 1 Year |
| 2 | Universal Radio Communicat | CMU200 | 123124 | R&S | 2018-05-11 | 1 Year |
| 3 | DC Power Supply | ZUP60-14 | LOC-220Z006-0007 | TDL-Lambda | 2018-05-11 | 1 Year |

# 7. Test Environment

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | > 100 dB |
| Ground system resistance | < 0.5 Ω |

**Control room** did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. =25 %, Max. = 75 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 25 %, Max. = 75 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |
| VSWR | Between 0 and 6 dB, from 1GHz to 18GHz |
| Site Attenuation Deviation | Between -4 and 4 dB,30MHz to 1GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80MHz to 3000 MHz |

# 8. Test Environment

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents. The detailed measurement uncertainty to see the column, k=2

| Measurement Items | Range | Confidence Level | Calculated Uncertainty |
|---|---|---|---|
| Maximum Peak Output Power | 30MHz-3600MHz | 95% | ±0.544dB |
| EBW and VBW | 30MHz-3600MHz | 95% | ±62.04Hz |
| Transmitter Spurious Emission-Conducted | 30MHz-2GHz | 95% | ±0.90dB |
| Transmitter Spurious Emission-Conducted | 2GHz-3.6GHz | 95% | ±0.88dB |
| Transmitter Spurious Emission-Conducted | 3.6GHz-8GHz | 95% | ±0.96dB |
| Transmitter Spurious Emission-Conducted | 8GHz-20GHz | 95% | ±0.94dB |
| Transmitter Spurious Emission-Radiated | 9KHz-30MHz | 95% | ±5.66dB |
| Transmitter Spurious Emission-Radiated | 30MHz-1000MHz | 95% | ±4.98dB |
| Transmitter Spurious Emission-Radiated | 1000MHz -18000MHz | 95% | ±5.06dB |
| Transmitter Spurious Emission-Radiated | 18000MHz -40000MHz | 95% | ±5.20dB |
| Frequency stability | 1MHz-16GHz | 95% | ±62.04Hz |

# ANNEX A. MEASUREMENT RESULTS

## ANNEX A.1. OUTPUT POWER

### A.1.1. Summary

During the process of testing, the EUT was controlled Rhode & Schwarz Digital Radio. Communication tester (CMU-200) to ensure max power transmission and proper modulation. This result contains peak output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

### A.1.2. Conducted

#### A.1.2.1. Method of Measurements

Method of measurements please refer to KDB971168 D01 v03 clause 5.
The EUT was set up for the max output power with pseudo random data modulation.
The power was measured with Rhode & Schwarz Spectrum Analyzer FSQ(peak).
These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0MHz and 1909.8MHz for PCS1900 band; 824.2MHz, 836.6MHz and 848.8MHz for GSM850 band. (bottom, middle and top of operational frequency range).
These measurements were done at 3 frequencies, 1852.4 MHz, 1880.0MHz and 1907.6MHz for WCDMA Band II; 826.4MHz, 836.6MHz and 846.6MHz for WCDMA Band V. (bottom, middle and top of operational frequency range).

**A.1.2.2 Test procedures:**

1. The transmitter output port was connected to base station.
2. Set the EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

**A.1.2.3 Limit:**

22.913(a) Mobile stations are limited to 7watts.
24.232(c) Mobile and portable stations are limited to 2 watts.

**A.1.2.4 Test Procedure:**

The transmitter output power was connected to calibrated attenuator, the other end of which was connected to signal analyzer. Transmitter output power was read off the power in dBm. The power outputs at the transmitter antenna port was determined by adding the value of attenuator to the signal analyzer reading.

**A.1.2.5 GSM Test Condition:**

| RBW | VBW | Sweep time | Span |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 3MHz | 10MHz | Auto | 50MHz |

**A.1.2.6 WCDMA Test Condition:**

| RBW | VBW | Sweep time | Span |
|---|---|---|---|
| 10MHz | 30MHz | Auto | 50MHz |

**A.1.2.7 Measurement results:**

| GPRS 850 (GMSK 1 Slot) | |
|---|---|
| Channel/fc(MHz) | AV power (dBm) |
| Mid 189/836.4 | 32.57 |
| Low 128/824.2 | 32.67 |
| High 251/848.8 | 32.65 |
| EDGE 850 (8PSK 1 Slot) | |
| Channel/fc(MHz) | AV power (dBm) |
| Mid 189/836.4 | 24.94 |
| Low 128/824.2 | 25.04 |
| High 251/848.8 | 25.07 |

| GPRS 1900 (GMSK 1 Slot) | |
|---|---|
| Channel/fc(MHz) | AV power (dBm) |
| Mid 661/1880 | 29.51 |
| Low 512/1850.2 | 29.6 |
| High 810/1909.8 | 29.55 |
| EDGE 1900 (8PSK 1 Slot) | |
| Channel/fc(MHz) | AV power (dBm) |
| Mid 661/1880 | 24.71 |
| Low 512/1850.2 | 24.79 |
| High 810/1909.8 | 24.73 |

| WCDMA II | |
|---|---|
| Channel/fc(MHz) | AV power (dBm) |
| Mid 9400 /1880 | 23.58 |
| Low 9262/1852.4 | 23.6 |
| High 9538/1907.6 | 23.51 |
| WCDMA BAND IV | |
| Channel/fc(MHz) | AV power (dBm) |
| Mid 1413 /1732.6 | 23.28 |
| Low 1312/1712.4 | 23.42 |
| High 1513/1752.6 | 23.06 |
| WCDMA BAND V | |
| Channel/fc(MHz) | AV power (dBm) |
| Mid 4183/836.6 | 23.45 |
| Low 4132/826.4 | 23.52 |
| High 4233/846.6 | 23.41 |

**Conclusion: PASS**

## ANNEX A.2. Peak-to-Average Power Ratio

Method of test measurements please refer to KDB971168 D01 v03 clause 5.7.

### A.2.1 PAPR Limit

The peak-to-average power ratio (PAPR) of the transmission may not exceed 13dB

### A.2.2 Test procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. 
   1) Select the spectrum analyzer CCDF function.
   2) Set RBW≥signal's occupied bandwidth.
   3) Set the number of counts to a value that stabilizes the measured CCDF cure;
   4) Sweep time ≥ 1s.
3. Record the maximum PAPR level associated with a probability of 0.1%.

### A.2.3 Test results:

| GPRS850 | | | |
|---|---|---|---|
| Channel | 128 | 189 | 251 |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| PAPR(dB) | 10.8 | 7.85 | 10.77 |
| **EDGE850** | | | |
| Channel | 128 | 189 | 251 |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| PAPR(dB) | 10.13 | 7.88 | 10.69 |

| GPRS1900 | | | |
|---|---|---|---|
| Channel | 512 | 661 | 810 |
| Frequency (MHz) | 1850.2 | 1880 | 1909.8 |
| PAPR(dB) | 10.74 | 10.8 | 10.8 |
| **EDGE1900** | | | |
| Channel | 512 | 661 | 810 |
| Frequency (MHz) | 1850.2 | 1880 | 1909.8 |
| PAPR(dB) | 10.79 | 10.8 | 10.82 |

| WCDMA Band II | | | |
|---|---|---|---|
| Channel | 9262 | 9400 | 9538 |
| Frequency (MHz) | 1852.4 | 1880 | 1907.6 |
| PAPR(dB) | 5.51 | 5.16 | 5.13 |
| **WCDMA Band IV** | | | |
| Channel | 1312 | 1413 | 1513 |
| Frequency (MHz) | 1712.4 | 1732.6 | 1752.6 |
| PAPR(dB) | 4.78 | 5.22 | 5.22 |

| WCDMA Band V | | | |
|---|---|---|---|
| Channel | 4132 | 4183 | 4233 |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| PAPR(dB) | 4.29 | 4.1 | 4.26 |

**Conclusion: PASS**

## ANNEX A.3. Occupied Bandwidth

Method of test please refer to KDB971168 D01 v03 clause 4.0.

### A.3.1. Occupied Bandwidth

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of GSM850, PCS1900, WCDMA BANDII and WCDMA BANDV.

### A.3.2 Test Procedure:

1. The EUT output RF connector was connected with a short cable to the signal analyzer.
2. RBW was set to about 1% of emission BW, VBW >= 3 times RBW,.
3. 99% bandwidth were measured, the occupied bandwidth is delta frequency between the two points where the display line intersects the signal trace.

### A.3.3 Test result:

| GPRS850 | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(kHz) |
| Mid 189 | 836.4 | 243.59 |
| Low 128 | 824.2 | 245.192 |
| High 251 | 848.8 | 245.192 |
| EDGE850 | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(kHz) |
| Mid 189 | 836.4 | 241.987 |
| Low 128 | 824.2 | 241.987 |

| | | |
|---|---|---|
| High 251 | 848.8 | 241.987 |

**Conclusion: PASS**

**GPRS 850**

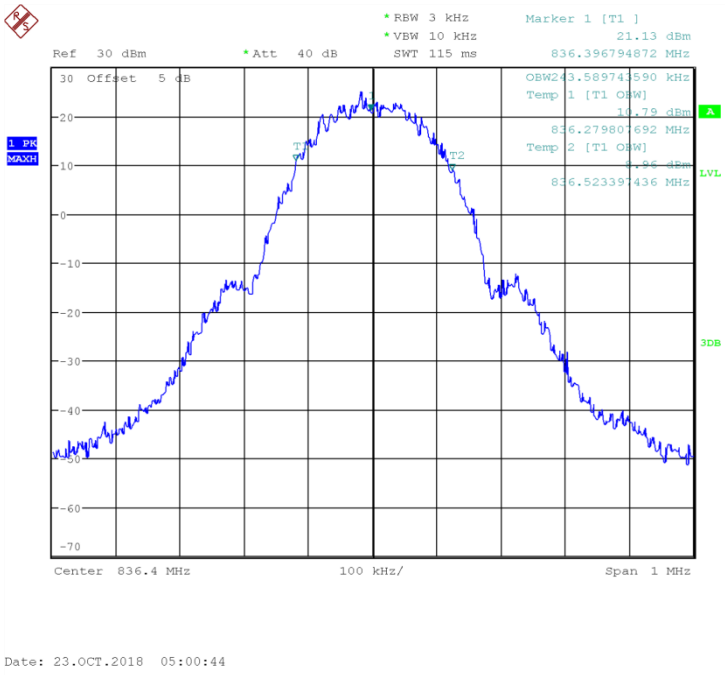


Fig.1 **Channel 189-Occupied Bandwidth (99%)**

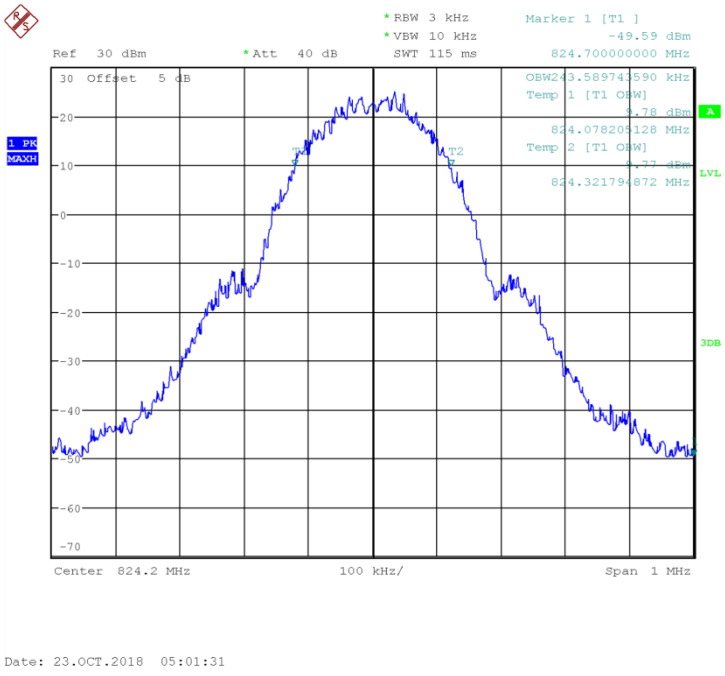


Fig.2 **Channel 128-Occupied Bandwidth (99%)**

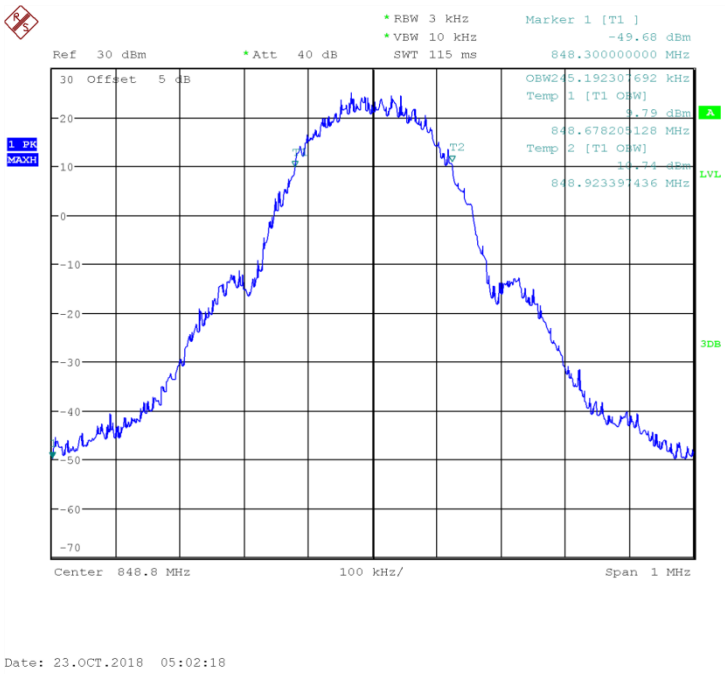


Fig.3 **Channel 251-Occupied Bandwidth (99%)**

**EDGE 850**

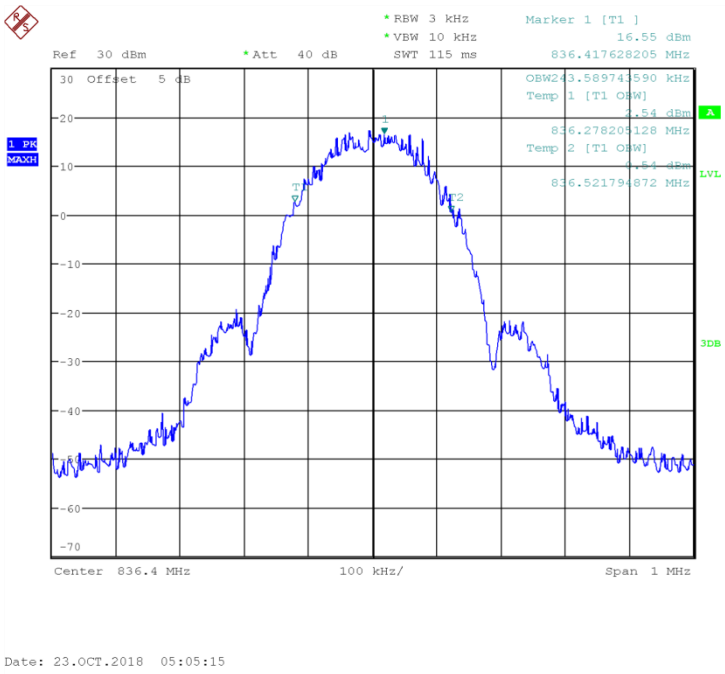


Fig.4 **Channel 189-Occupied Bandwidth (99%)**

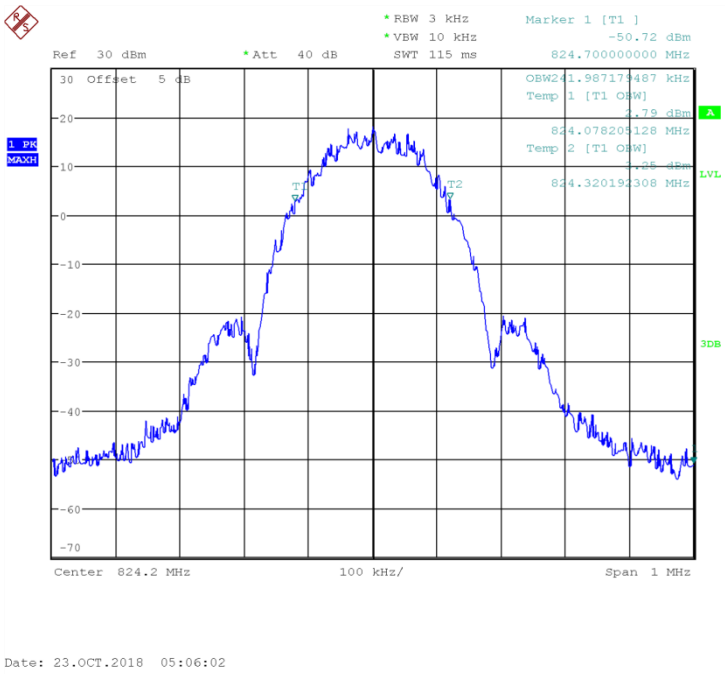


Fig.5 **Channel 128-Occupied Bandwidth (99%)**

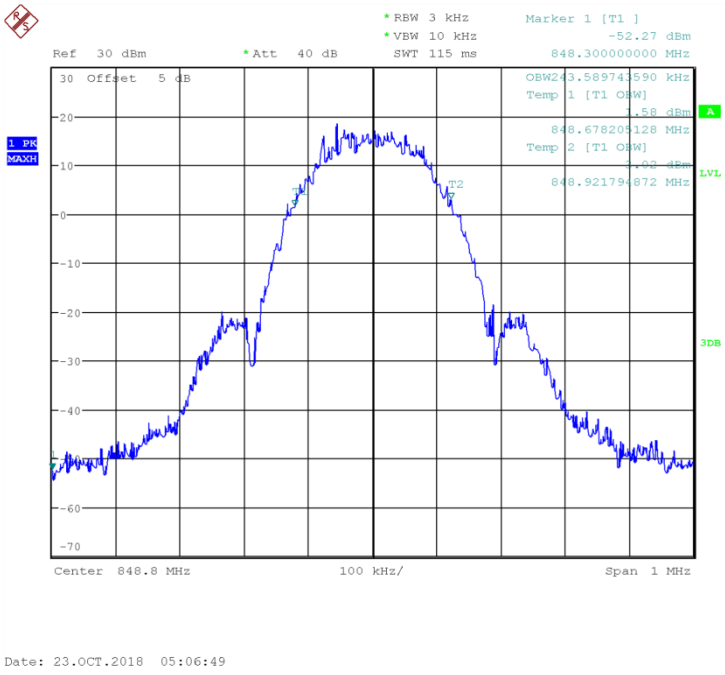


Fig.6 **Channel 251-Occupied Bandwidth (99%)**

| GPRS1900 | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(kHz) |
| Mid 661 | 1880 | 248.397 |
| Low 512 | 1850.2 | 245.192 |

| | | |
|---|---|---|
| High 810 | 1909.8 | 245.192 |
| EDGE1900 | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(kHz) |
| Mid 661 | 1880 | 246.795 |
| Low 512 | 1850.2 | 245.192 |
| High 810 | 1909.8 | 245.192 |

**Conclusion: PASS**

**GPRS 1900**

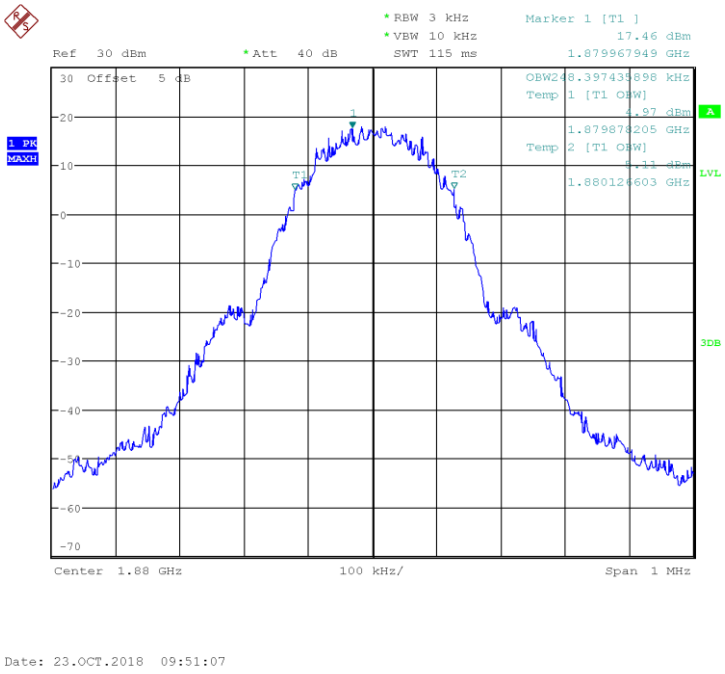


Fig.7 **Channel 661-Occupied Bandwidth (99%)**

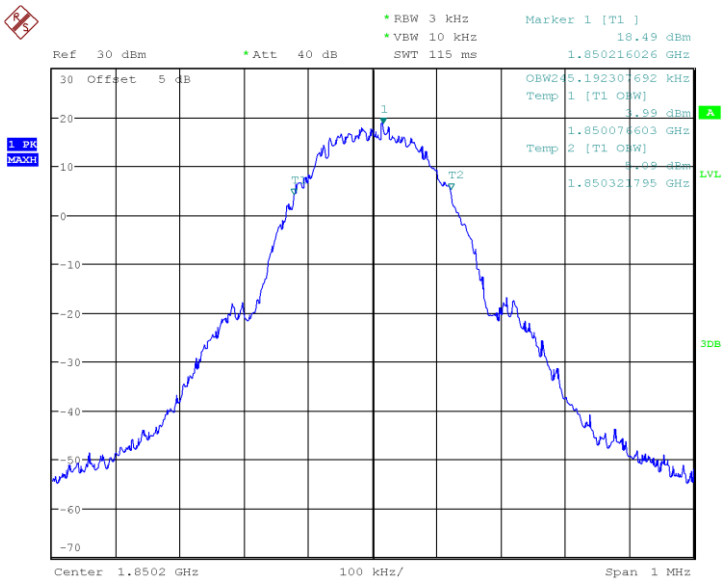


Fig.8 **Channel 512-Occupied Bandwidth (99%)**

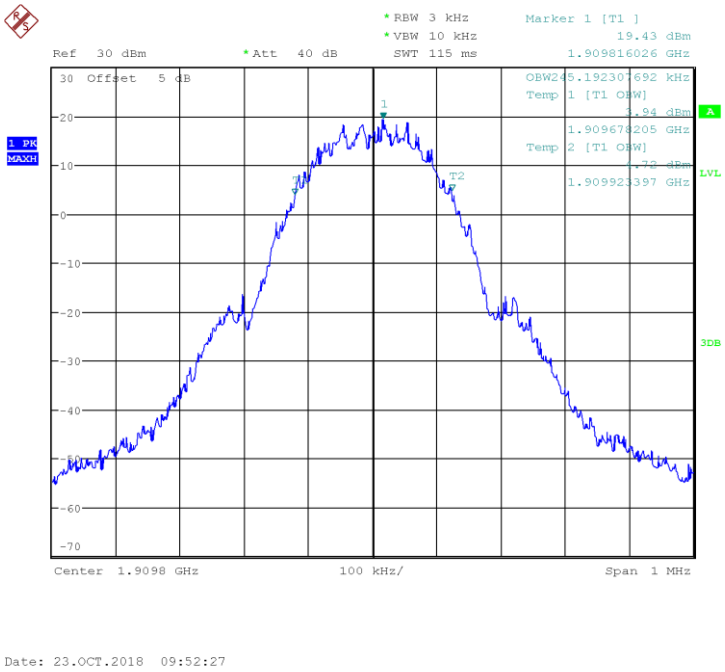


Fig.9 **Channel 810-Occupied Bandwidth (99%)**

**EDGE 1900**

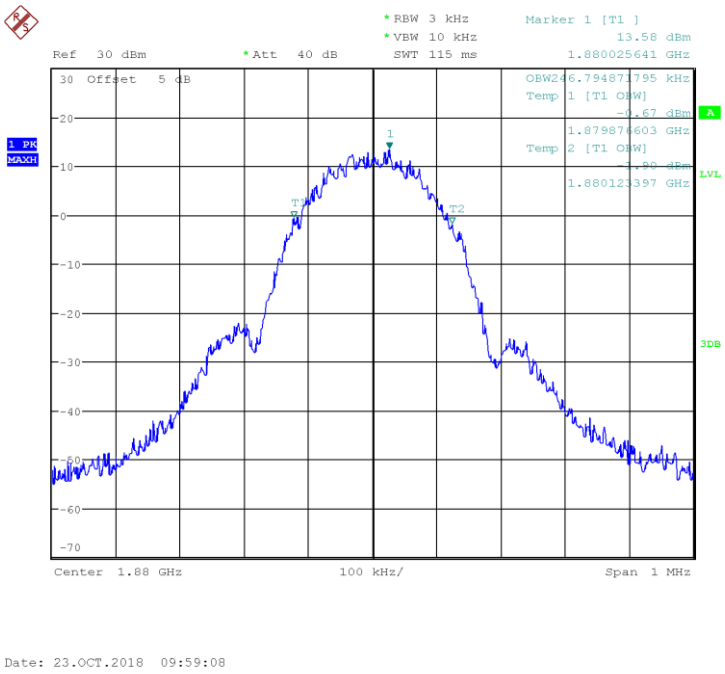


Fig.10 **Channel 661-Occupied Bandwidth (99%)**

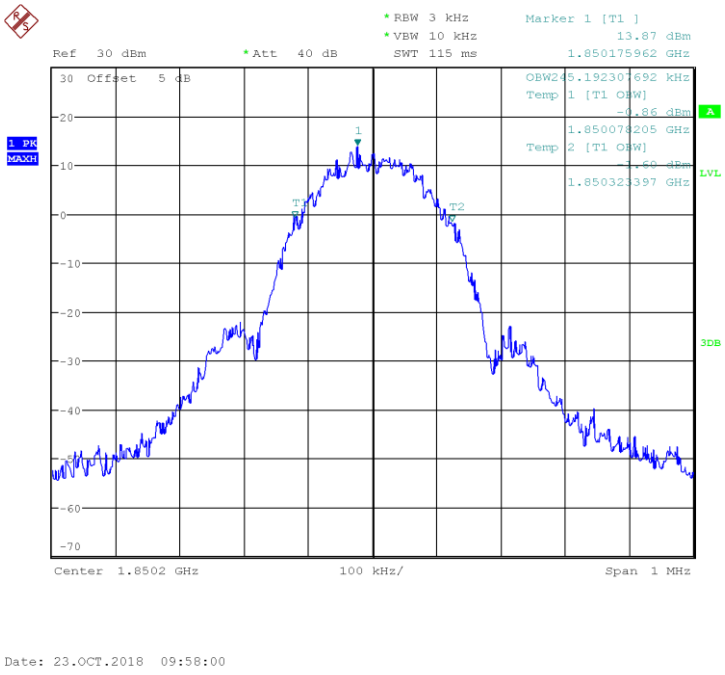


Fig.11 **Channel 512-Occupied Bandwidth (99%)**

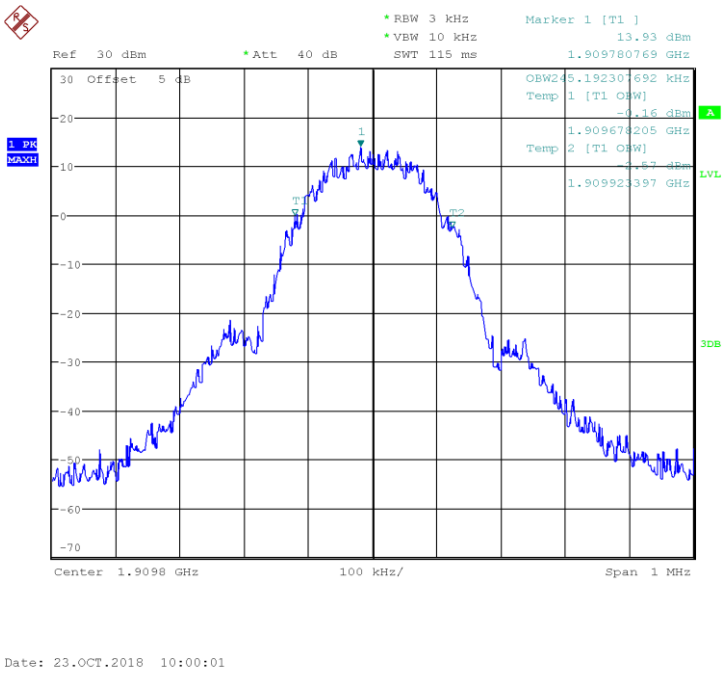


Fig.12 **Channel 810-Occupied Bandwidth (99%)**

| WCDMA BAND II | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(MHz) |
| Mid 9400 | 1880 | 4.135 |
| Low 9262 | 1852.4 | 4.151 |
| High 9538 | 1907.6 | 4.135 |

**Conclusion: PASS**

**WCDMA BAND II**

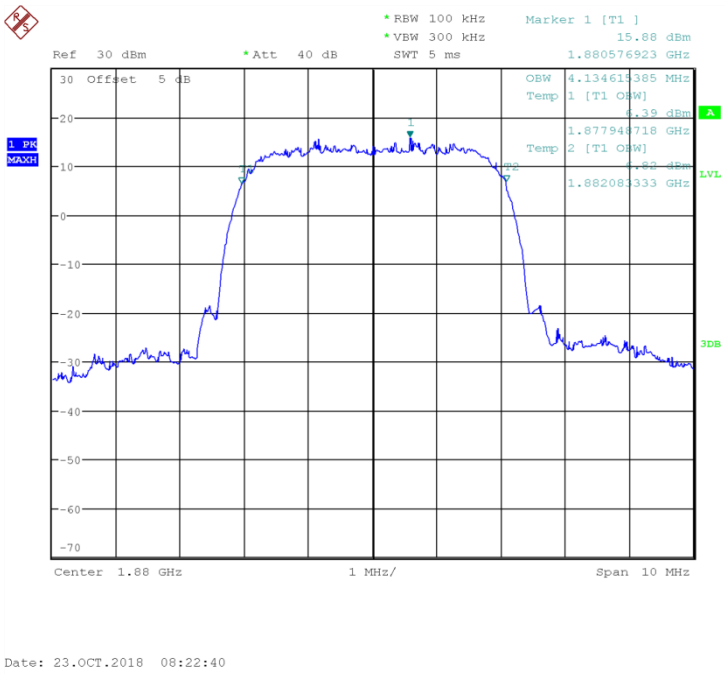


Fig.13 **Channel 9400-Occupied Bandwidth (99%)**

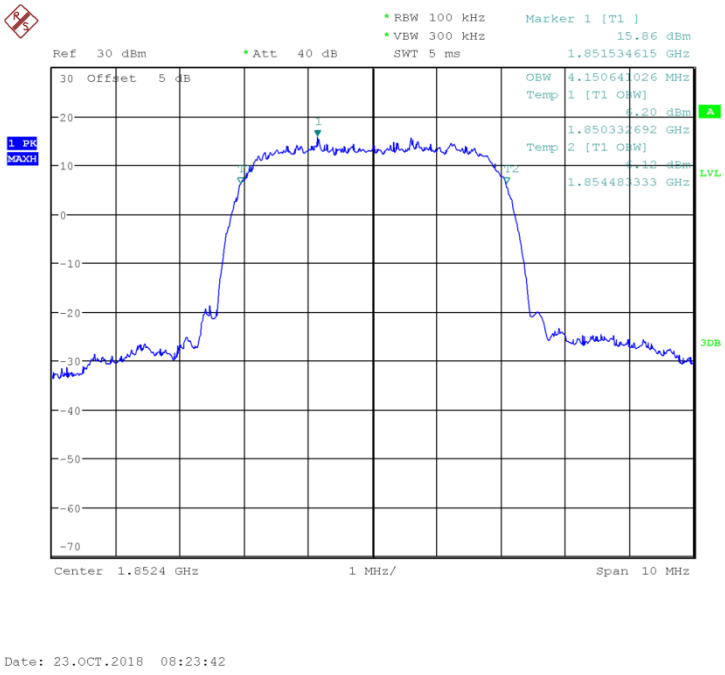


Fig.14 **Channel 9262-Occupied Bandwidth (99%)**

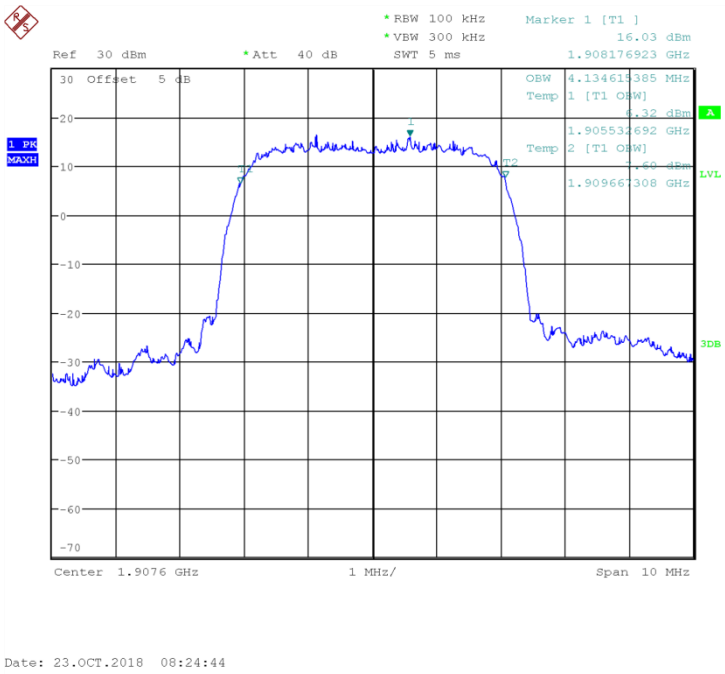


Fig.15 **Channel 9538-Occupied Bandwidth (99%)**

| WCDMA BAND IV | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(MHz) |
| Mid 1413 | 1732.6 | 4.118 |
| Low 1312 | 1712.4 | 4.135 |
| High 1513 | 1752.6 | 4.135 |

**Conclusion: PASS**

**WCDMA BAND IV**

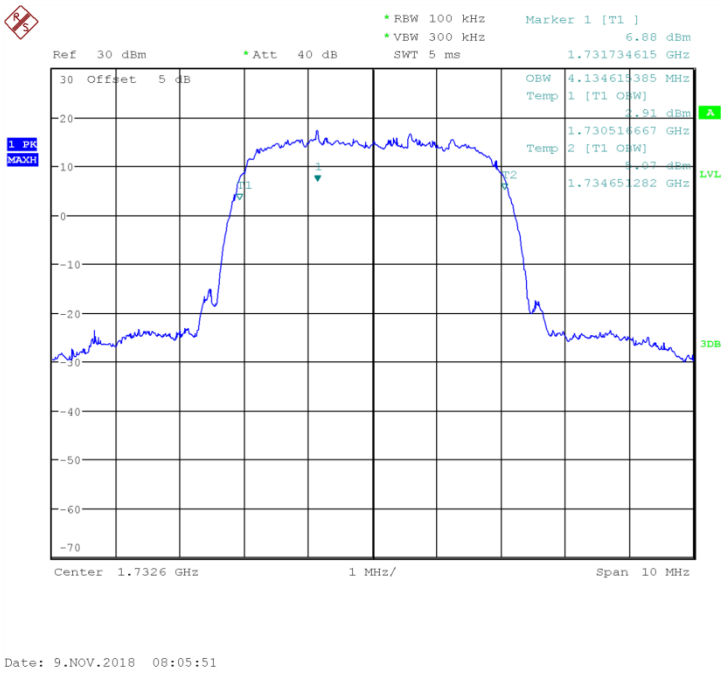


Fig.16 **Channel 1413-Occupied Bandwidth (99%)**

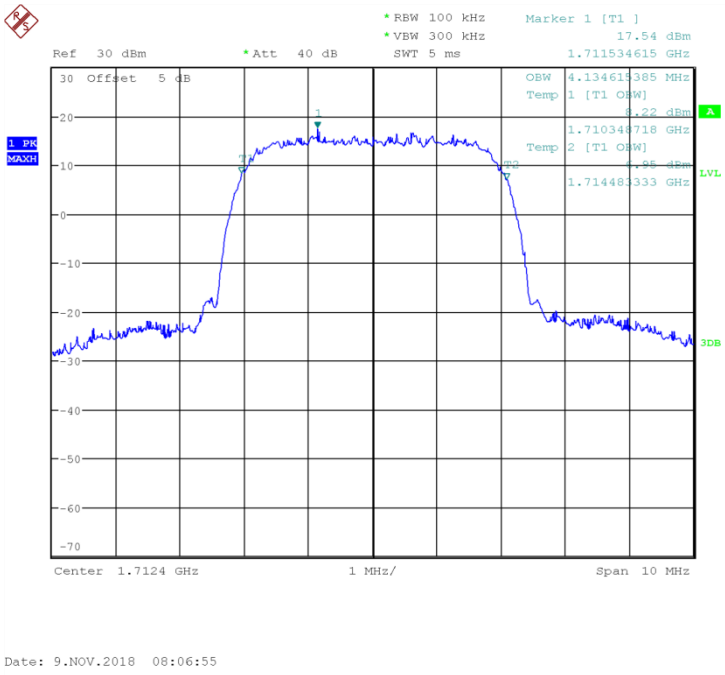


Fig.17 **Channel 1312-Occupied Bandwidth (99%)**

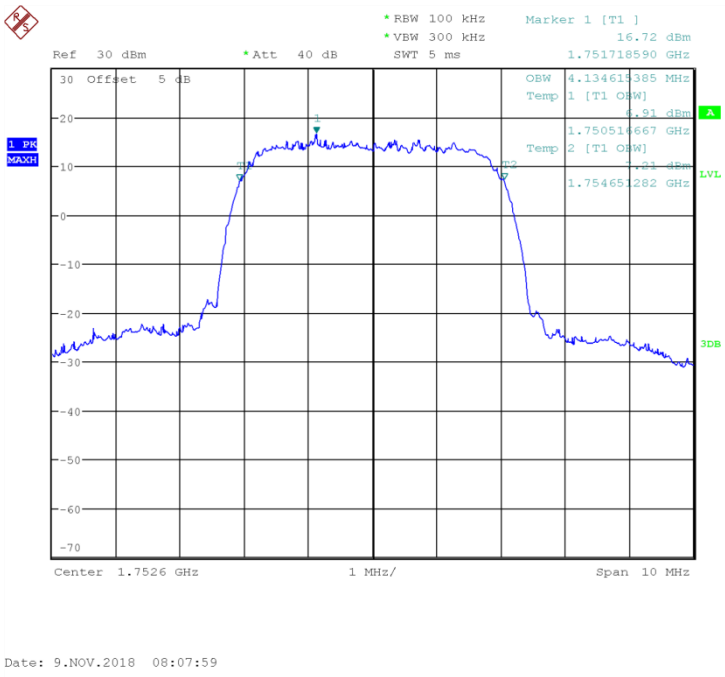


Fig.18 **Channel 1513-Occupied Bandwidth (99%)**

| WCDMA BAND V | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(MHz) |
| Mid 4183 | 836.6 | 4.135 |
| Low 4132 | 826.4 | 4.135 |
| High 4233 | 846.6 | 4.151 |

**Conclusion: PASS**

**WCDMA BAND V**

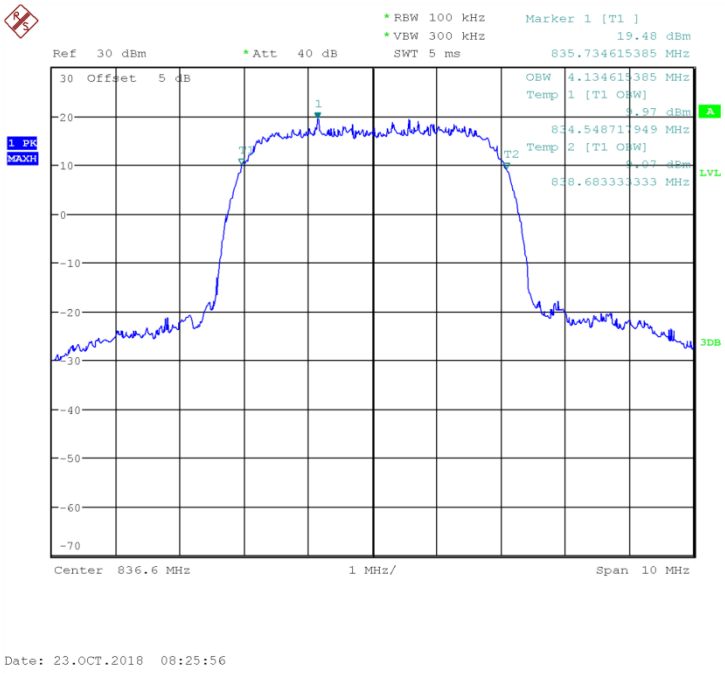


Fig.19 **Channel 4183-Occupied Bandwidth (99%)**

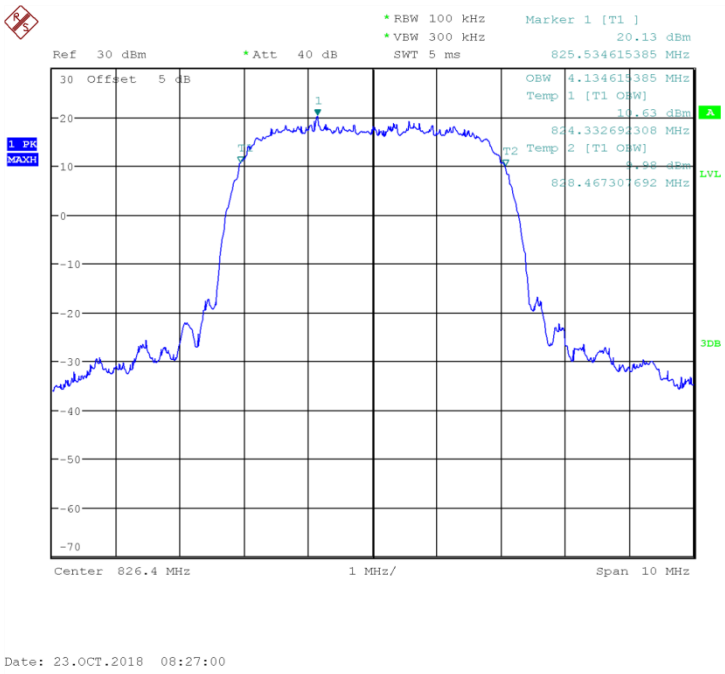


Fig.20 **Channel 4132-Occupied Bandwidth (99%)**

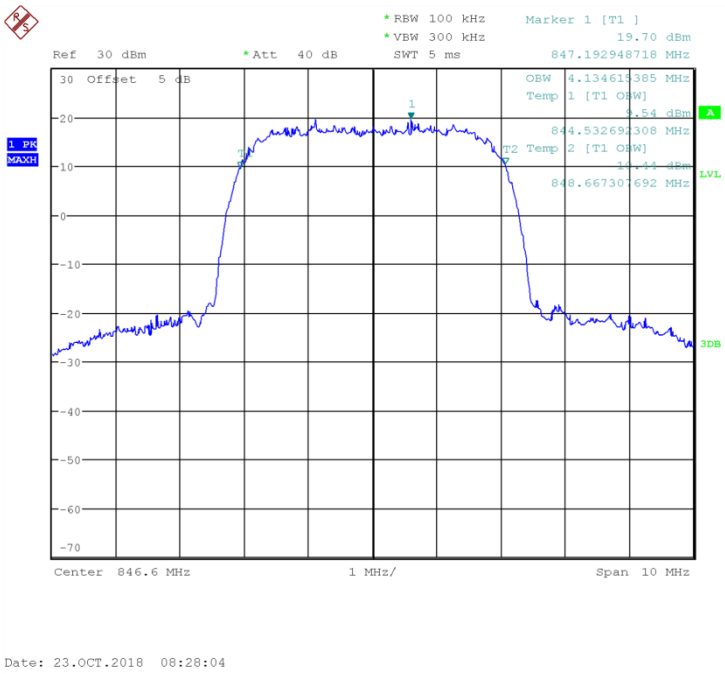


Fig.21 **Channel 4233-Occupied Bandwidth (99%)**

## ANNEX A.4. -26dB Emission Bandwidth

Method of test please refer to KDB971168 D01 v03 clause 4.0.

### A.4.1. -26dB Emission Bandwidth

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of GSM850, PCS1900, WCDMA BANDII and WCDMA BANDV.

### A.4.2 Test Procedure:

1. The EUT output RF connector was connected with a short cable to the signal analyzer.
2. RBW was set to about 1% of emission BW, VBW >= 3 times RBW,.
3. 26dB bandwidth were measured, the occupied bandwidth is delta frequency between the two points where the display line intersects the signal trace.

### A.4.3 Measurement methods:

For GSM: signal analyzer setting as: RBW=3KHz;VBW=10KHz;Span=1MHz.
For WCDMA: signal analyzer setting as: RBW=50KHz;VBW=200KHz;Span=10MHz.

### A.4.4 Test results:

| GPRS 850 | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(kHz) |
| Mid 189 | 836.4 | 312.5 |
| Low 128 | 824.2 | 314.103 |
| High 251 | 848.8 | 307.692 |
| EDGE 850 | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(kHz) |
| Mid 189 | 836.4 | 304.487 |
| Low 128 | 824.2 | 307.692 |
| High 251 | 848.8 | 302.885 |

**Conclusion: PASS**

**GPRS 850**

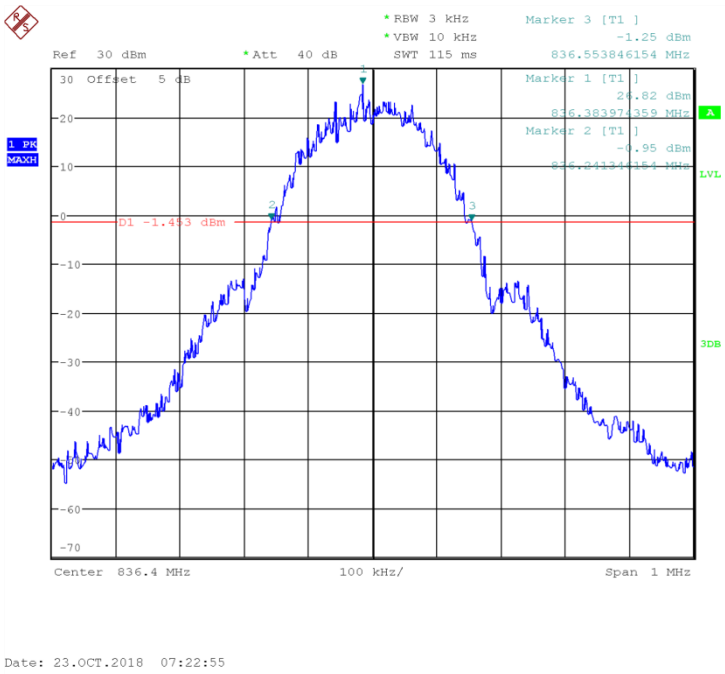


Fig.22 **Channel 189- Emission Bandwidth (-26dBc BW)**

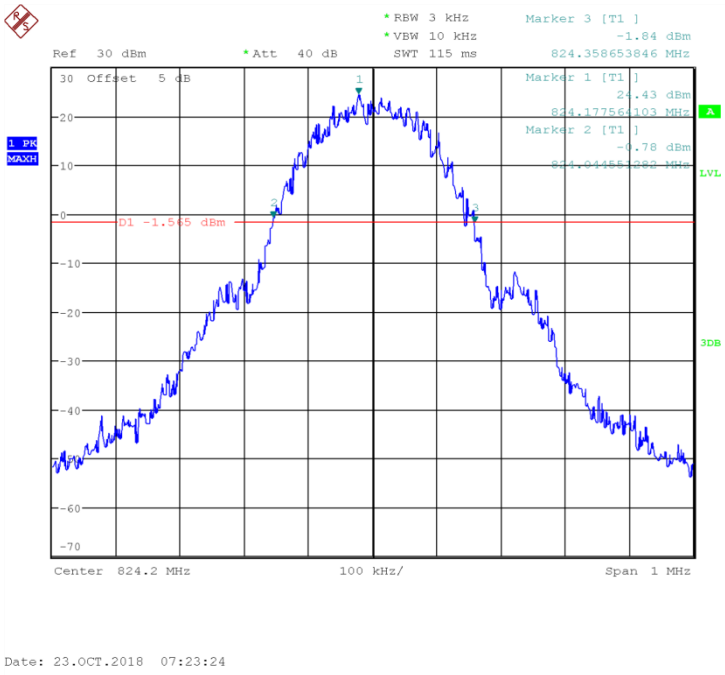


Fig.23 **Channel 128- Emission Bandwidth (-26dBc BW)**

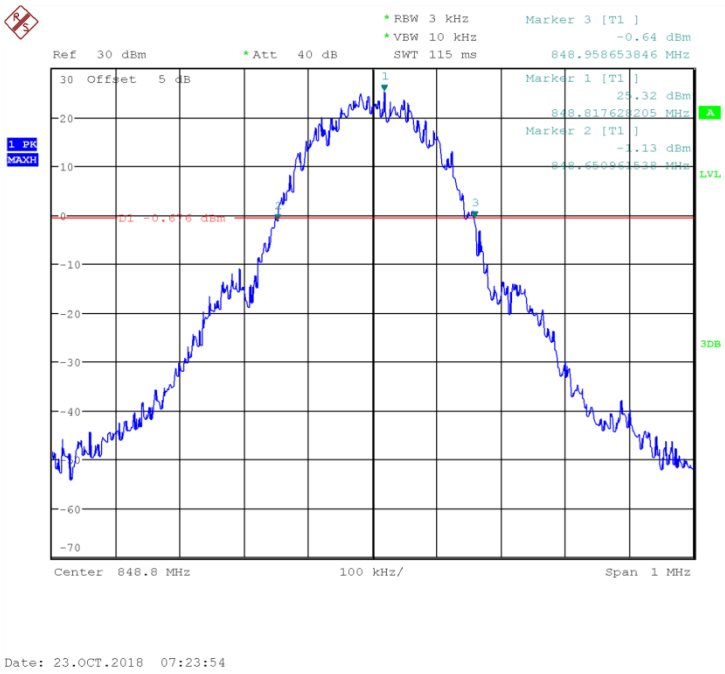


Fig.24 **Channel 251- Emission Bandwidth (-26dBc BW)**

**EDGE 850**

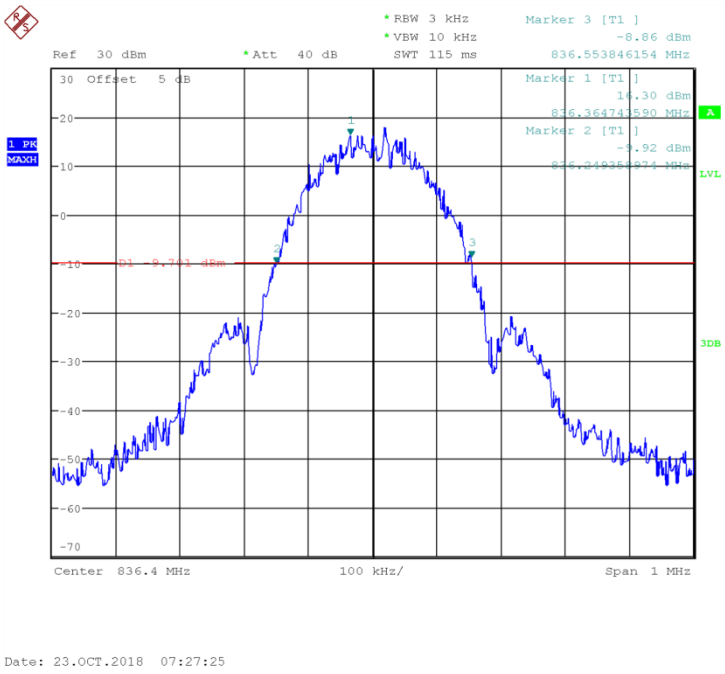


Fig.25 **Channel 189- Emission Bandwidth (-26dBc BW)**

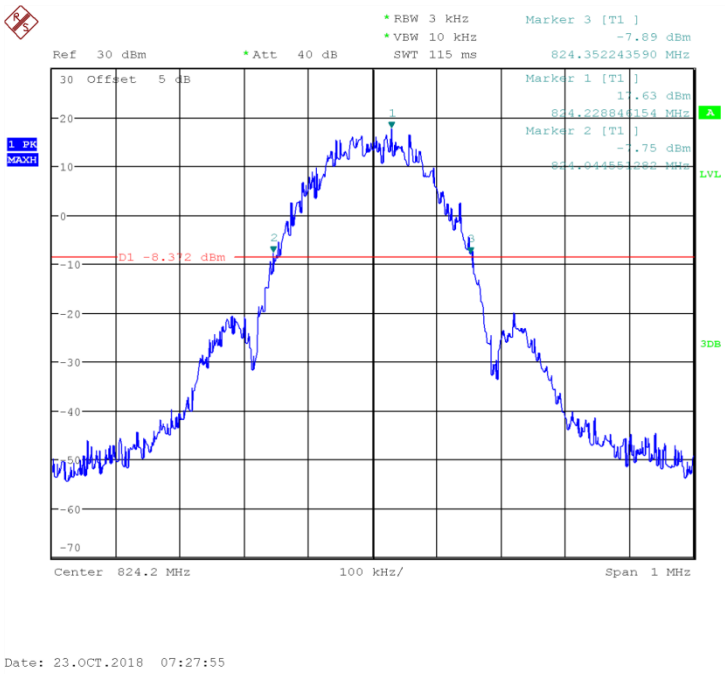


Fig.26 **Channel 128- Emission Bandwidth (-26dBc BW)**

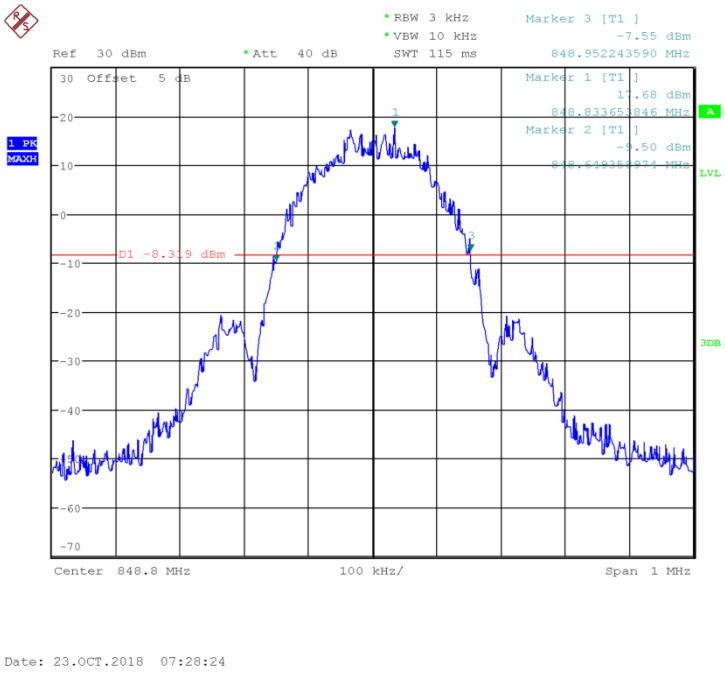


Fig.27 **Channel 251- Emission Bandwidth (-26dBc BW)**

| GPRS1900 | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(kHz) |
| Mid 661 | 1880 | 310.897 |
| Low 512 | 1850.2 | 317.308 |

| | | |
|---|---|---|
| High 810 | 1909.8 | 310.897 |
| EDGE1900 | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(kHz) |
| Mid 661 | 1880 | 307.692 |
| Low 512 | 1850.2 | 306.09 |
| High 810 | 1909.8 | 306.09 |

**Conclusion: PASS**

**GPRS 1900**

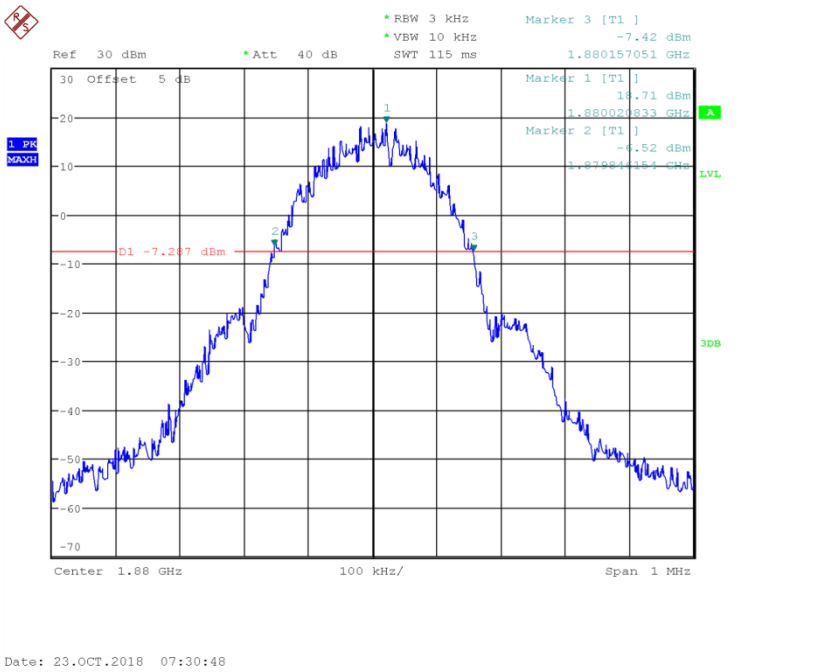


Fig.28 **Channel 661- Emission Bandwidth (-26dBc BW)**

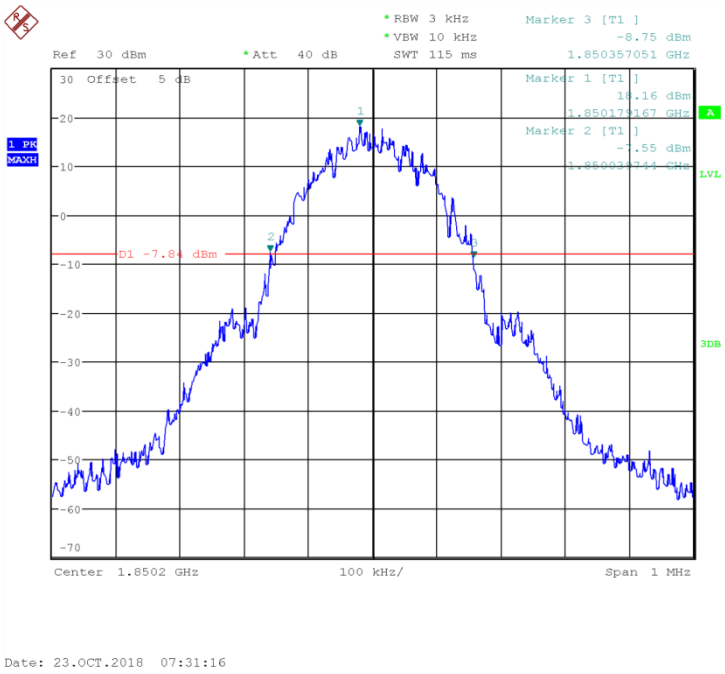


Fig.29 **Channel 512- Emission Bandwidth (-26dBc BW)**

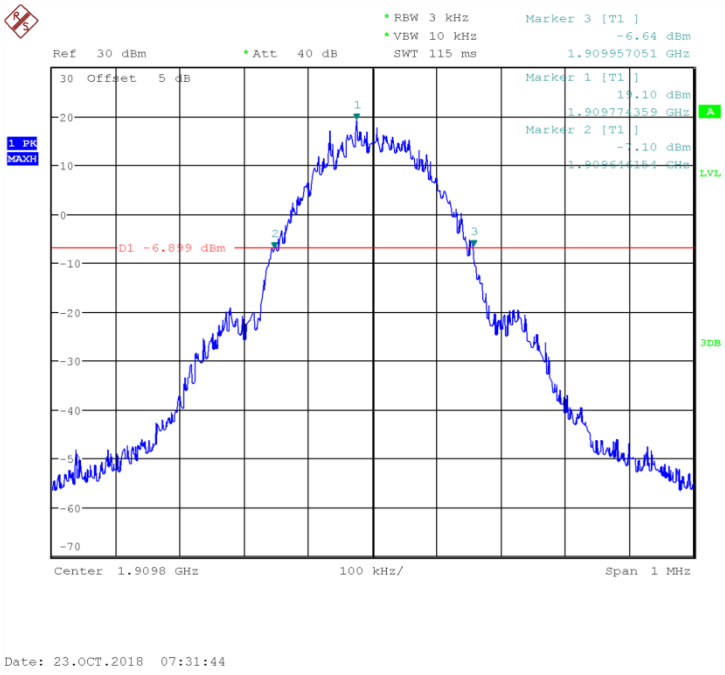


Fig.30 **Channel 810- Emission Bandwidth (-26dBc BW)**

**EDGE 1900**

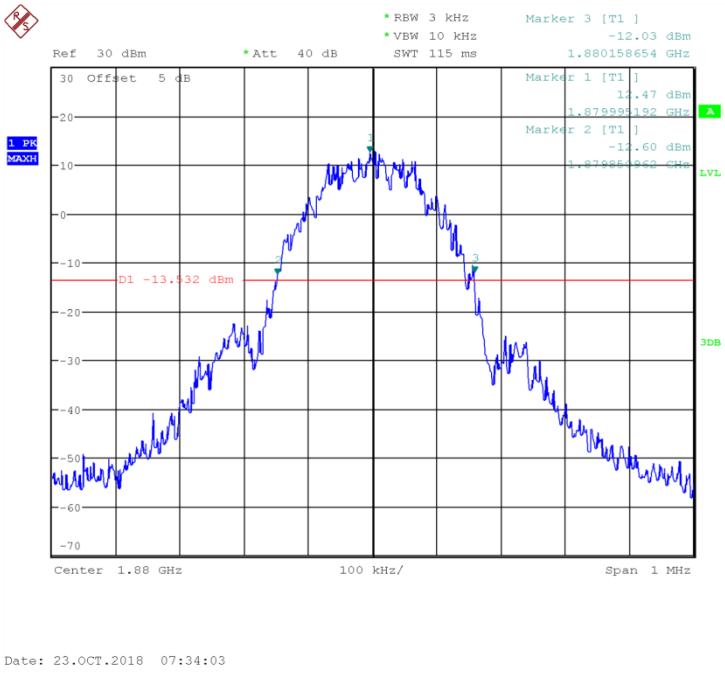


Fig.31 **Channel 661- Emission Bandwidth (-26dBc BW)**

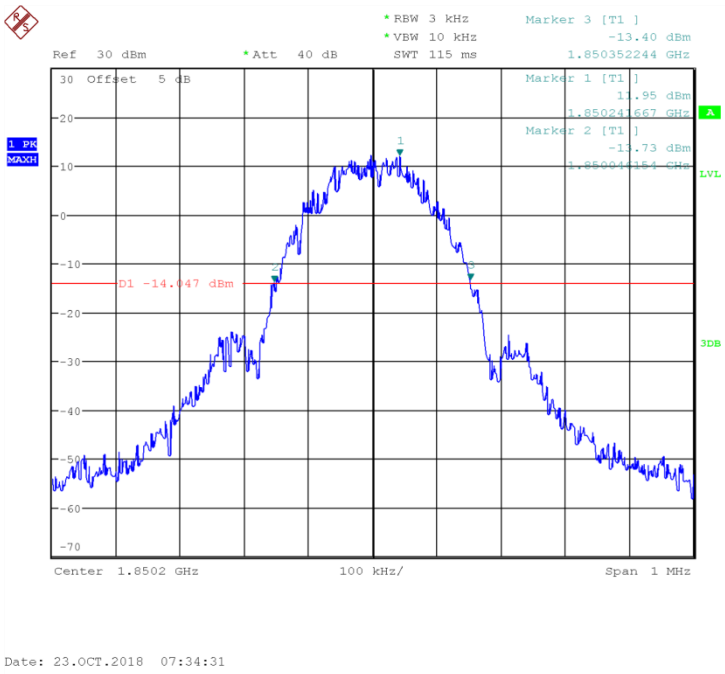


Fig.32 **Channel 512- Emission Bandwidth (-26dBc BW)**

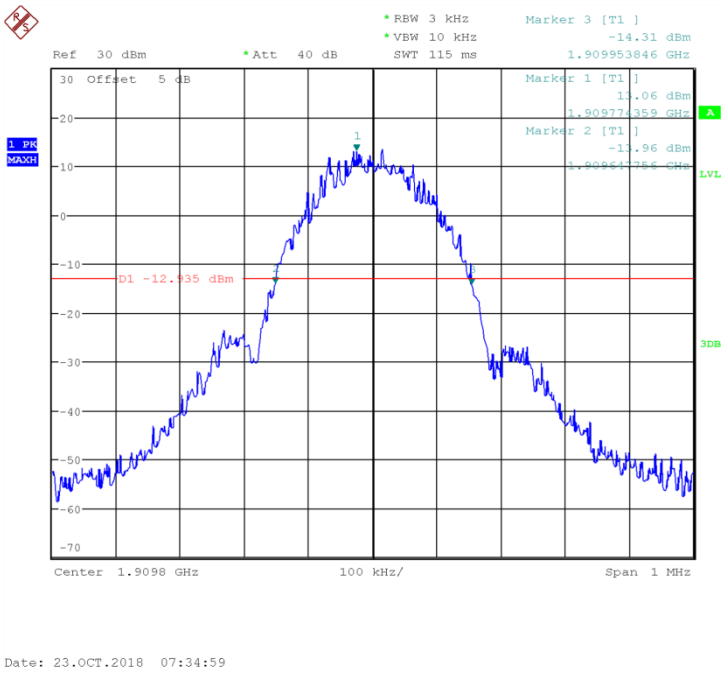


Fig.33 **Channel 810- Emission Bandwidth (-26dBc BW)**

| WCDMA BAND II | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(MHz) |
| Mid 9400 | 1880 | 4.712 |
| Low 9262 | 1852.4 | 4.728 |
| High 9538 | 1907.6 | 4.728 |

**Conclusion: PASS**

**WCDMA BAND II**

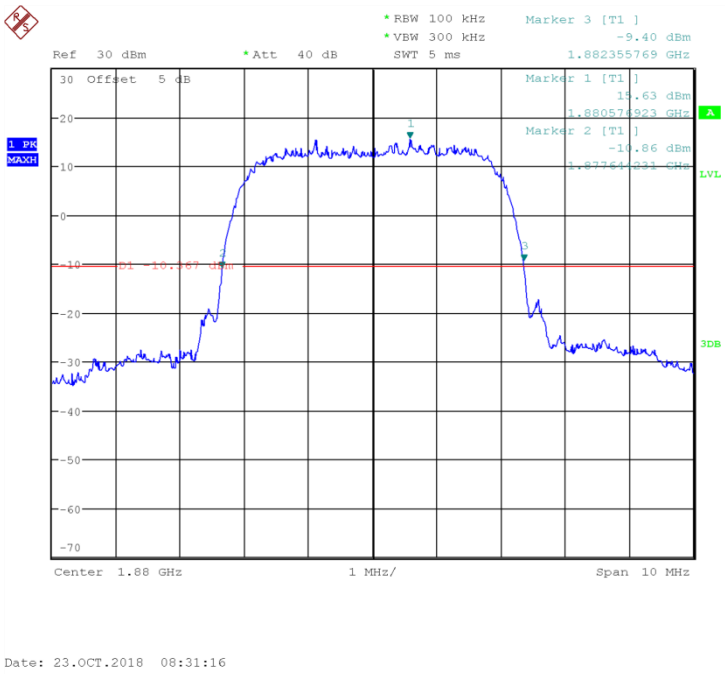


Fig.34 **Channel 9400- Emission Bandwidth (-26dBc BW)**

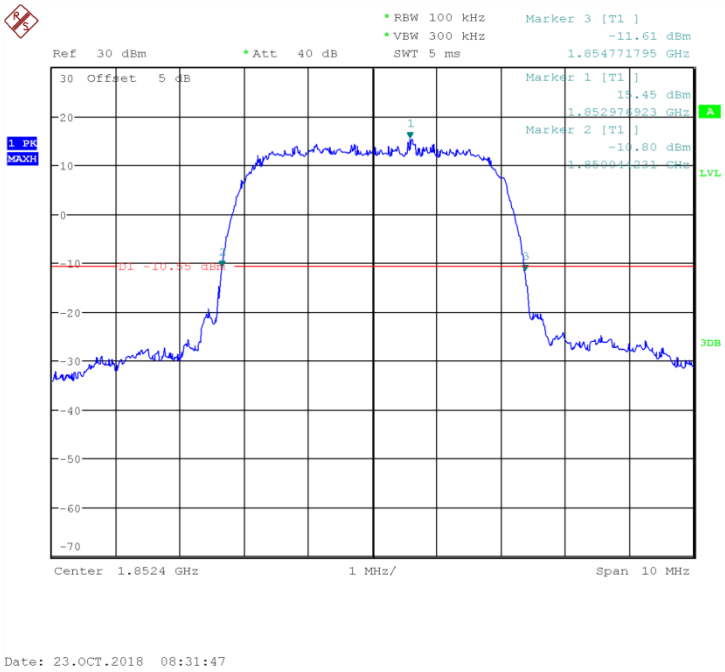


Fig.35 **Channel 9262- Emission Bandwidth (-26dBc BW)**

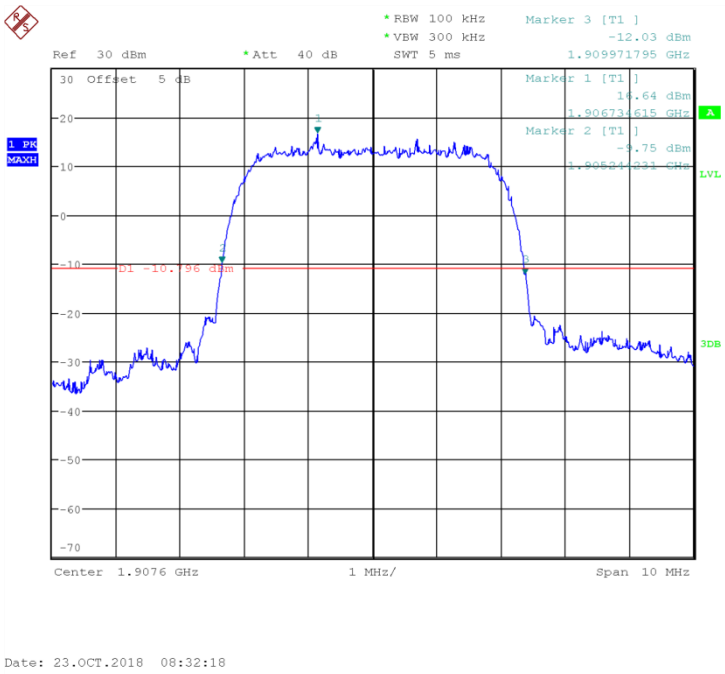


Fig.36 **Channel 9538- Emission Bandwidth (-26dBc BW)**

| WCDMA BAND IV | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(MHz) |
| Mid 1413 | 1732.6 | 4.712 |
| Low 1312 | 1712.4 | 4.728 |
| High 1513 | 1752.6 | 4.712 |

**Conclusion: PASS**

**WCDMA BAND IV**

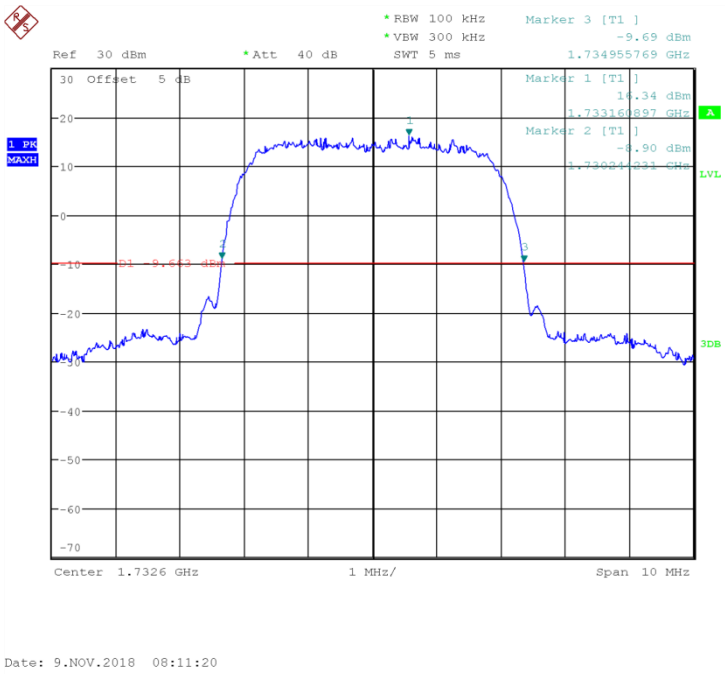


Fig.37 **Channel 1413- Emission Bandwidth (-26dBc BW)**

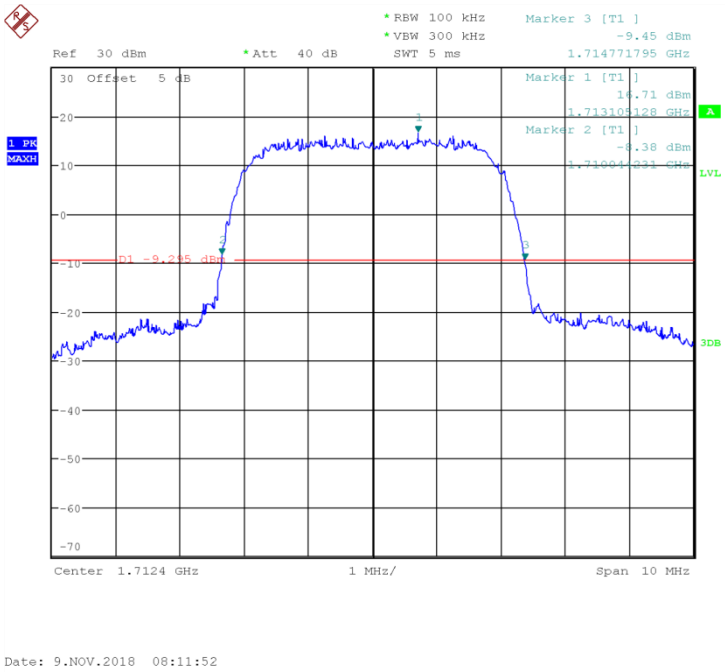


Fig.38 **Channel 1312- Emission Bandwidth (-26dBc BW)**

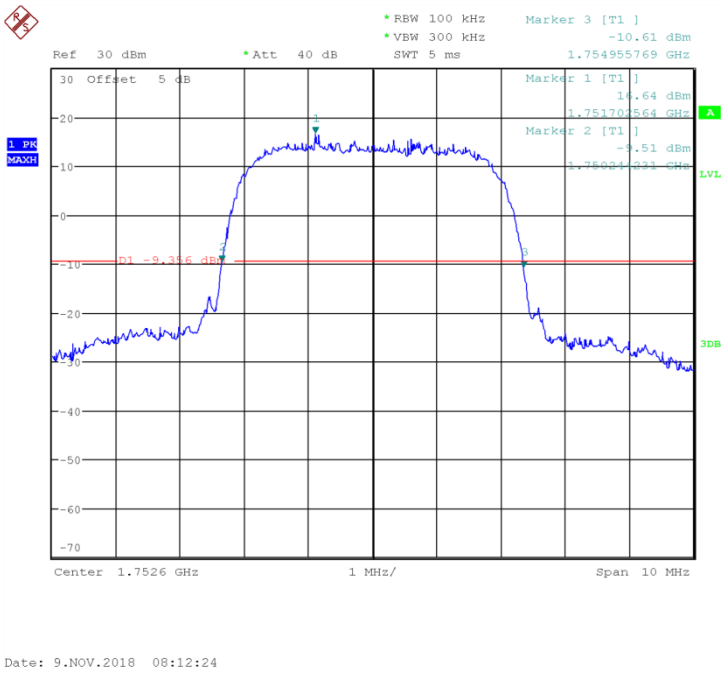


Fig.39 **Channel 1513- Emission Bandwidth (-26dBc BW)**

| WCDMA BAND V | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(MHz) |
| Mid 4183 | 836.6 | 4.728 |
| Low 4132 | 826.4 | 4.728 |
| High 4233 | 846.6 | 4.712 |

**Conclusion: PASS**

**WCDMA BAND V**

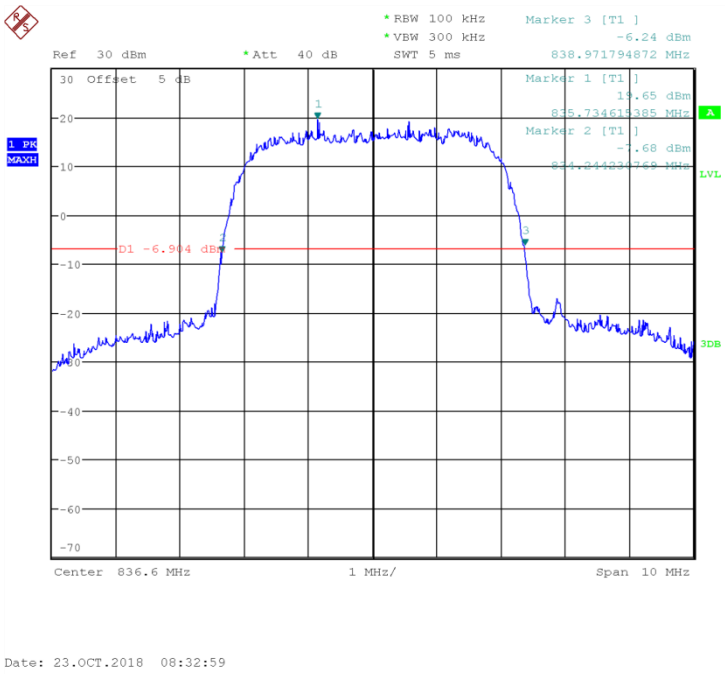


Fig.40 **Channel 4183- Emission Bandwidth (-26dBc BW)**

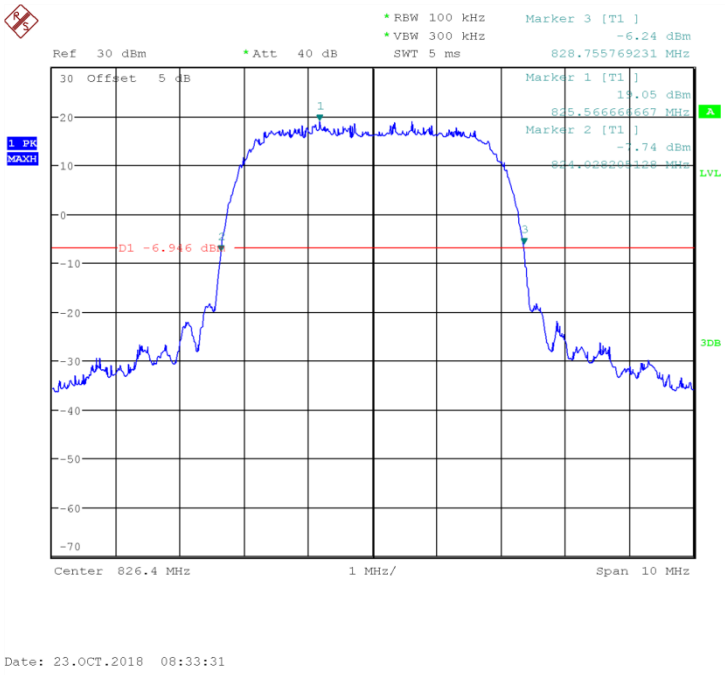


Fig.41 **Channel 4132- Emission Bandwidth (-26dBc BW)**

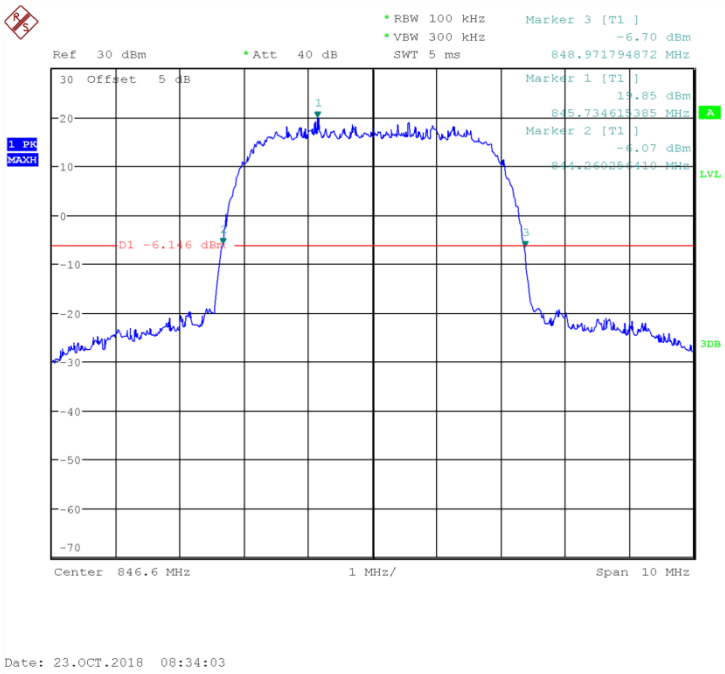


Fig.42 **Channel 4233- Emission Bandwidth (-26dBc BW)**

## ANNEX A.5. Band Edge at antenna terminals

Method of test measurements please refer to KDB971168 D01 v03 clause 6

### A.5.1 Limit:

The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than 43+10log (Mean power in watts) dBc below the mean power output outside a license's frequency block(-13dBm).

### A.5.2 Test procedure:

1. The RF output of the transceiver was connected to a signal analyzer through appropriate attenuation.
2. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band
4. The limit line is derived from 43+10log(P) Db below the transmitter power P(Watts)
   =P(W)-[43+10log(P)](Db)
   =[30+10log(P)](dBm)-[43+10log(P)](Db)
   =-13dBm

### A.5. Test Result:

**GPRS 850**

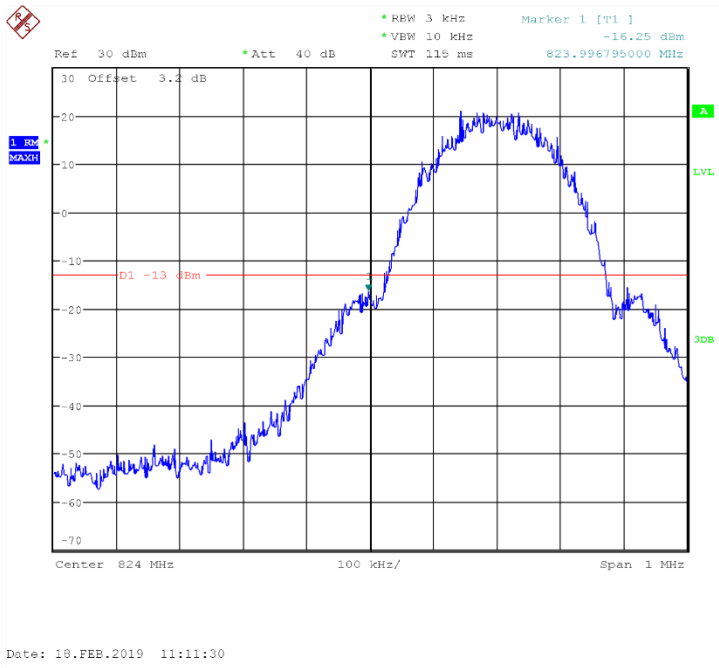


Fig.43 **Channel 128- LOW BAND EDGE BLOCK**

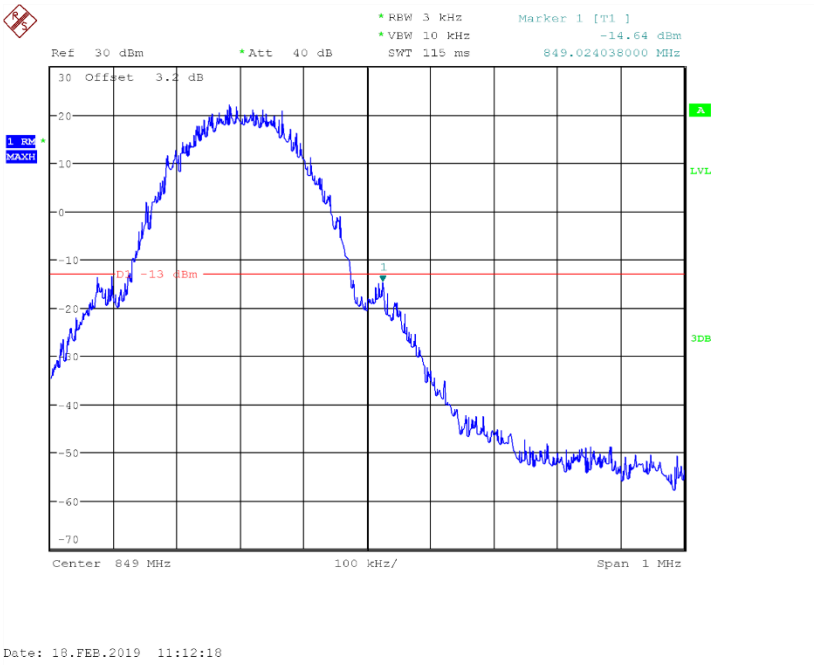


Fig.44 **Channel 251- LOW BAND EDGE BLOCK**

**EDGE 850**


Fig.45 **Channel 128- LOW BAND EDGE BLOCK**

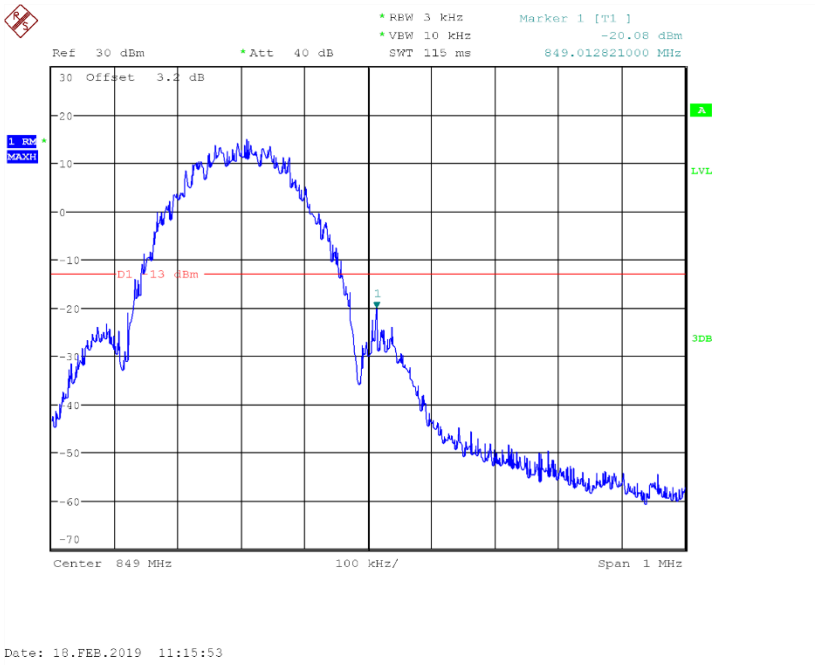


Fig.46 **Channel 251- LOW BAND EDGE BLOCK**

**GPRS 1900**

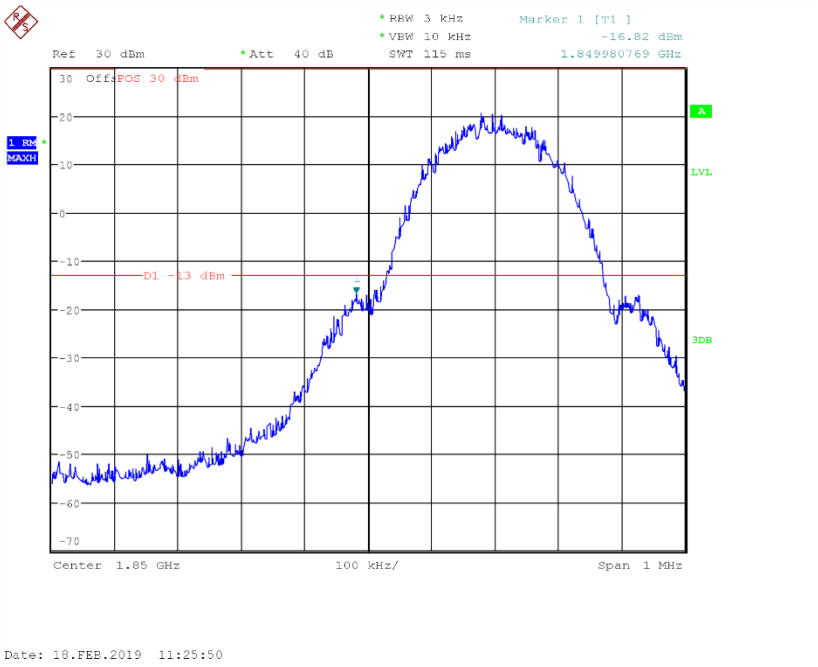


Fig.47 **Channel 512- LOW BAND EDGE BLOCK**