*Full*

# TEST REPORT

## No. ECIT-2013-0076-RF

*For*

**Client : Micron Electronics LLC**

**Production : 3G GPS tracker**

**Model Name : VL3000**

**FCC ID: ZKQ-0508201300001**

**Hardware Version: VL3000_V1.02**

**Software Version: VL3000B01V03**

**Issued date: 2013-08-13**



**Test Laboratory:**

ECIT Shanghai, East China Institute of Telecommunications

Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn.

# CONTENTS

# 1. Test Laboratory

## 1.1. Testing Location

| | |
|---|---|
| Company Name: | ECIT Shanghai, East China Institute of Telecommunications |
| Address: | 7F, G Area,No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China |
| Postal Code: | 200001 |
| Telephone: | 00862163843300 |
| Fax: | 00862163843301 |
| FCC Registration NO.: | 489729 |

## 1.2. Testing Environment

| | |
|---|---|
| Normal Temperature: | 15-35℃ |
| Extreme Temperature: | -30/+50℃ |
| Relative Humidity: | 20-75% |

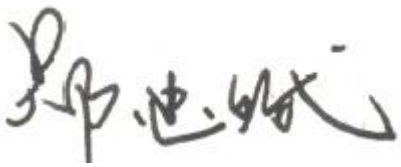
## 1.3. Project data

| | |
|---|---|
| Project Leader: | Liu jianquan |
| Testing Start Date: | 05,16,2013 |
| Testing End Date: | 08,13,2013 |

## 1.4. Signature

**Wang daming**
**(Testing Engineer)**

**Yu Naiping**
**(Reviewed this test report)**



**Zheng Zhongbin**
**Director of the laboratory**
**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | Micron Electronics LLC |
| Address /Post: | 601 N. Congress Ave, Suite 439 Florida, USA |
| Country: | USA |
| Telephone: | 561-450-5022 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | Shanghai SIMCOM LTD., |
| Address /Post: | Building A, SIM Technology Building,No.633 Jinzhong Road, Changning District, Shanghai, China |
| Country: | China |
| Telephone: | +86 21 32523134 |

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

## 3.1. About EUT

| | |
|---|---|
| EUT Description | 3G GPS tracker |
| Model name | VL3000 |
| FCC ID | ZKQ-0508201300001 |
| Frequency | GSM850/900/1800/1900；<br>WCDMA Band II; WCDMA Band V |
| Extreme Temperature | -30/+50℃ |
| Nominal Voltage | 3.8 V |
| Extreme High Voltage | 4.2 V |
| Extreme Low Voltage | 3.65 V |

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* | SN or IMEI | HW Version | SW Version | Date of receipt |
|---|---|---|---|---|
| N10 | 012813000559048 | VL3000_V1.02 | VL3000B01V03 | 203-04-12 |

*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 | Dummy Battery | --- |

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

## 3.4. Statements

The product VL3000 , supporting WCDMA/HSPA/HSUPA/GPRS/GSM, manufactured by Shanghai SIMCOM LTD., 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 | V 10.1.09 |
| FCC Part 22 | PUBLIC MOBILE SERVICES | V 10.1.09 |
| ANSI-TIA-603-C | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards | 2004 |
| ANSI C63.4 | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2003 |
| KDB971168 | Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems | 2010 |

## 5. SUMMARY OF TEST RESULTS

| Item | Test items | FCC rules | result |
|---|---|---|---|
| 1 | Output Power | 22.913(a)/24.232(c) | Pass |
| 2 | Emission Limit | 2.1051/22.917/24.238 | Pass |
| 3 | Conducted Emission | 15.107/15.207 | Pass |
| 4 | 99%Occupied Bandwidth | 2.1049(h)(i) | Pass |
| 5 | -26dB Emission Bandwidth | 22.917(b)/§24.238(b) | Pass |
| 6 | Band Edge at antenna terminals | 22.917(b)/24.238(b) | Pass |
| 7 | Frequency stability | 2.1055/24.235 | Pass |
| 8 | Conducted Spurious mission | 2.1057/22.917/24.238 | Pass |

# 6. Test Equipments Utilized

### Climate chamber

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration Due date |
|---|---|---|---|---|---|
| 1 | Climate chamber | SH-641 | 92012011 | ESPEC | 2013-08-13 |

### Radiated emission test system

The test equipments and ancillaries used are as follows.

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration Due date |
|---|---|---|---|---|---|
| 1 | Universal Radio Communication Tester | CMU200 | 123102 | R&S | 2013-09-10 |
| 2 | Test Receiver | ESU40 | 100307 | R&S | 2013-11-07 |
| 3 | Trilog Antenna | VULB9163 | 19-162515 | Schwarzbeck | 2014-11-11 |
| 4 | Double Ridged Guide Antenna | ETS-3117 | 00135885 | ETS | 2014-04-29 |
| 5 | Double Ridged Guide Antenna | ETS-3117 | 00135890 | ETS | 2014-04-28 |
| 6 | Test receiver | ESCI | 101235 | R&S | 2013-11-07 |
| 7 | 2-Line V-Network | ENV216 | 101380 | R&S | 2013-11-07 |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Biconical VHF-UHF broad band antenna | SWB-VUBA9117 | 9117-266 | SCHWARZBECK | 2013/11/11 |
| 9 | Horn antenna(18.0-26.5GHz) | 3160_09 | LM6321 | ETS-LINDGREN | 2013/11/22 |
| 10 | Signal conditioning unit(0.1-18GHz) | SCU18 | 10155 | R/S | 2013/11/03 |
| 11 | Signal conditioning unit(0.1-18GHz) | SCU18 | 10146 | R/S | 2013/11/03 |
| 12 | Horn antenna(18.0-26.5GHz) | 3160_09 | 00086671 | ETS-LINDGREN | 2014/06/15 |
| 13 | Amplifier | AFS4-00102650-42-8P-4 | 1405286 | MITEQ | 2014/06/09 |
| 14 | Amplifier | SCV26 | 10025 | R&S | 2013/11/09 |

**Conducted test system**

| No. | Name | Type | SN | Manufacture | Cal. Due Date |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | FSQ26 | 101096 | R&S | 2013-10-17 |
| 2 | Universal Radio Communication Tester | CMU200 | 123102 | R&S | 2013-09-10 |
| 3 | DC Power Supply | ZUP60-14 | LOC-220Z006-0007 | TDL-Lambda | 2013-11-30 |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Weinschel power spliter | 1870A | 10264 | Weinschel | 2013-12-15 |

## 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. = 30 ℃ |
| Relative humidity | Min. = 30 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Ground system resistance | < 0.5 Ω |
| Uniformity of field strength | Between 0 and 6 dB, from 80MHz to 3000 MHz |

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

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. =30 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |

**Fully-anechoic chamber1** (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 30 ℃ |
| Relative humidity | Min. = 30 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |
| Uniformity of field strength | Between 0 and 6 dB, from 80MHz to 3000 MHz |

**Fully-anechoic chamber2** (Tapered Section: 8.75 meters×3.66 meters×3.66 meters, Rectangular Section: 7.32 meters×3.97 meters×3.66 meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 30 ℃ |

| | |
|---|---|
| Relative humidity | Min. = 35 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |
| Uniformity of field strength | Between 0 and 6 dB, from 30MHz to 40000MHz |

# ANNEX A: MEASUREMENT RESULTS

## A.1 OUTPUT POWER (§22.913(a)/§24.232(c))

### 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

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; 824.4MHz, 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).

**Limit:**

| GSM850 | Power step | Nominal Peak output power (dBm) |
|---|---|---|
| GSM | 5 | 33 |
| GPRS | 3 | 33 |
| EDGE | 6 | 27 |

| GSM1900 | Power step | Nominal Peak output power (dBm) |
|---|---|---|
| GSM | 0 | 30 |
| GPRS | 3 | 30 |
| EDGE | 5 | 26 |

**WCDMA Limit:**

22.913(a) Mobile stations are limited to 7watts.

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

**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.

**GSM Test Condition:**

| RBW | VBW | Sweep time | Span |
|---|---|---|---|
| 1MHz | 1MHz | 300ms | 10MHz |

**WCDMA Test Condition:**

| RBW | VBW | Sweep time | Span |
|---|---|---|---|
| 10MHz | 10MHz | 800ms | 50MHz |

**Measurement results:**

| GSM 850 (GMSK) | | |
|---|---|---|
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 189/836.4 | 32.6 | 32.5 |
| Low 128/824.2 | 32.7 | 32.6 |
| High 251/848.8 | 32.7 | 32.6 |
| GPRS 850 (GMSK 1 Slot) | | |
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 189/836.4 | 32.6 | 32.4 |
| Low 128/824.2 | 32.7 | 32.6 |
| High 251/848.8 | 32.7 | 32.6 |
| EDGE 850 (8PSK 1 Slot) | | |
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 189/836.4 | 26.8 | 26.7 |
| Low 128/824.2 | 25.9 | 25.8 |
| High 251/848.8 | 26.2 | 26.0 |

| GSM 1900(GMSK) | | |
|---|---|---|
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 661/1880 | 30.0 | 29.9 |
| Low 512/1850.2 | 29.9 | 29.8 |
| High 810/1909.8 | 30.0 | 29.8 |
| GPRS 1900 (GMSK 1 Slot) | | |
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 661/1880 | 30.3 | 30.2 |
| Low 512/1850.2 | 30.2 | 30.1 |
| High 810/1909.8 | 30.2 | 30.1 |
| EDGE 1900 ( 8PSK1 Slot) | | |
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 661/1880 | 25.9 | 25.7 |
| Low 512/1850.2 | 25.5 | 25.4 |
| High 810/1909.8 | 26.2 | 26.0 |

| WCDMA II | | |
|---|---|---|
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 9400 /1880 | 22.62 | 22.56 |
| Low 9262/1852.4 | 23.03 | 23.00 |
| High 9538/1907.6 | 21.76 | 21.71 |
| WCDMA BAND V | | |
| Channel/fc(MHz) | Peak power (dBm) | AV power (dBm) |
| Mid 4183/836.6 | 22.72 | 22.66 |
| Low 4132/826.4 | 23.17 | 23.06 |
| High 4233/846.6 | 23.26 | 23.21 |

**Conclusion: PASS**

## A.2 99%Occupied Bandwidth (§2.1049(h)(i))

### A.2.1 Occupied Bandwidth Results

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.

**Test Procedure:**

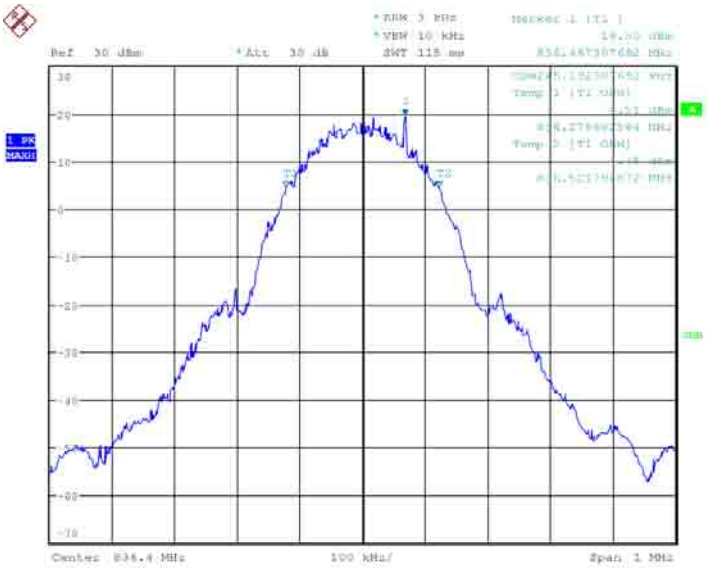
The EUT output RF connector was connected with a short cable to the signal analyzer, RBW was set to about 1% of emission BW, VBW >= 3 times RBW, 99% bandwidth were measured, the occupied bandwidth is delta frequency between the two points where the display line intersects the signal trace.

Test result:

| GSM850 | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(KHz) |
| Mid 189 | 836.4 | 245.192 |
| Low 128 | 824.2 | 245.192 |
| High 251 | 848.8 | 245.192 |
| GPRS850 | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(KHz) |
| Mid 189 | 836.4 | 245.192 |
| Low 128 | 824.2 | 243.590 |
| High 251 | 848.8 | 243.590 |
| EDGE850 | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(KHz) |
| Mid 189 | 836.4 | 246.795 |
| Low 128 | 824.2 | 246.795 |
| High 251 | 848.8 | 243.590 |

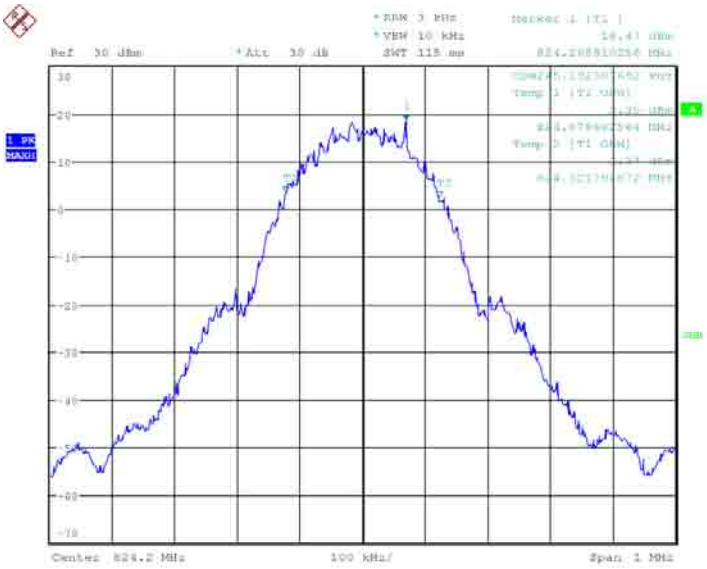
**Conclusion: PASS**

**GSM 850**




Date: 30.MAY.2013 18:55:22

**Channel 189-Occupied Bandwidth (99%)**

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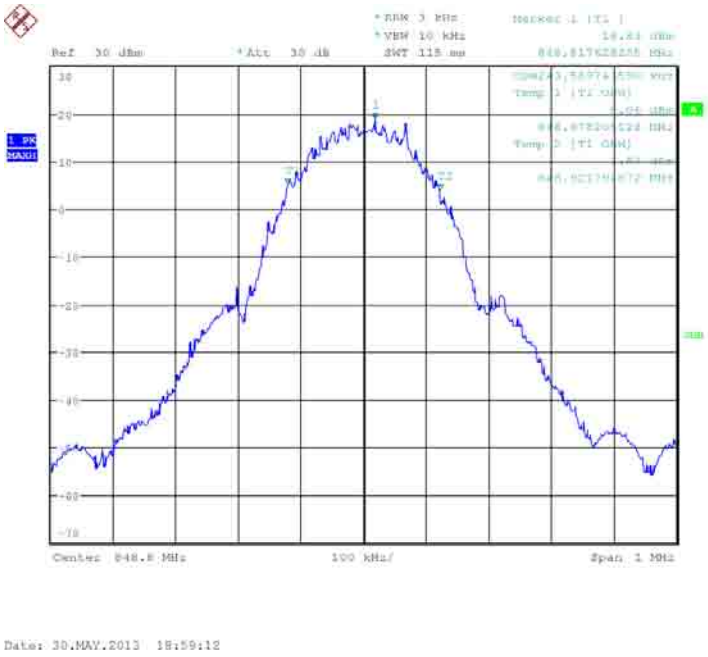
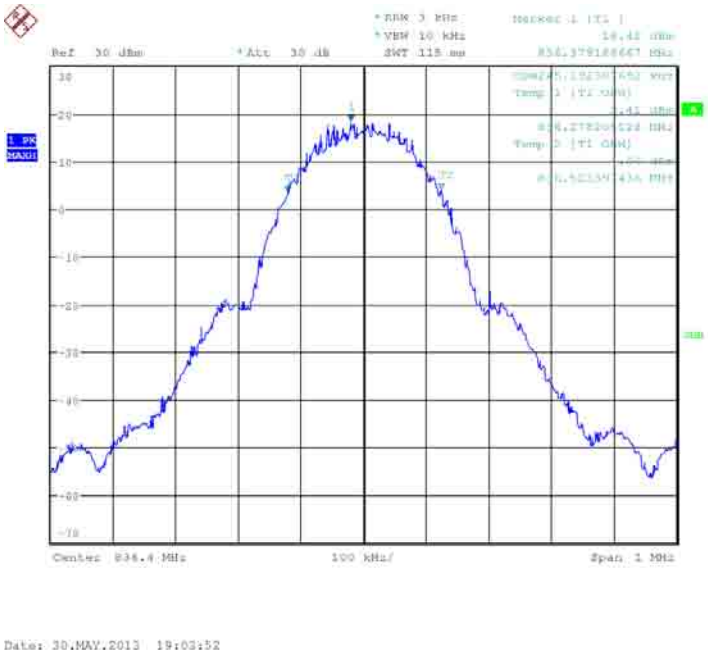
**Channel 128-Occupied Bandwidth (99%)**

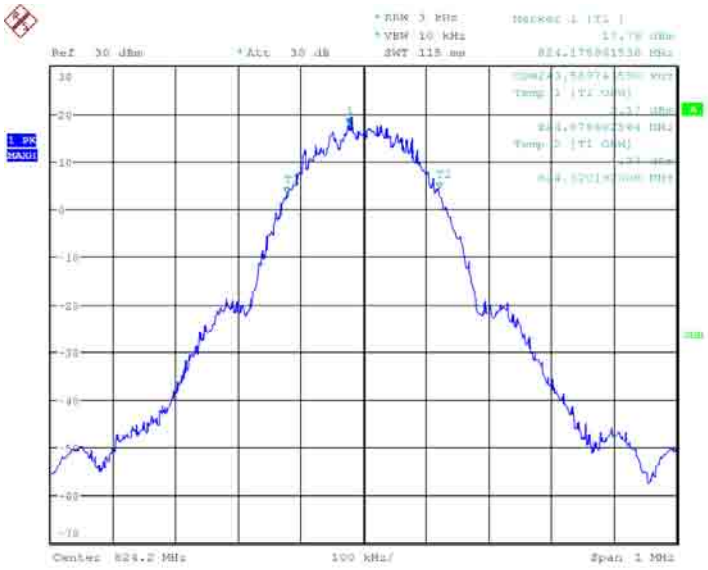



**Channel 251-Occupied Bandwidth (99%)**

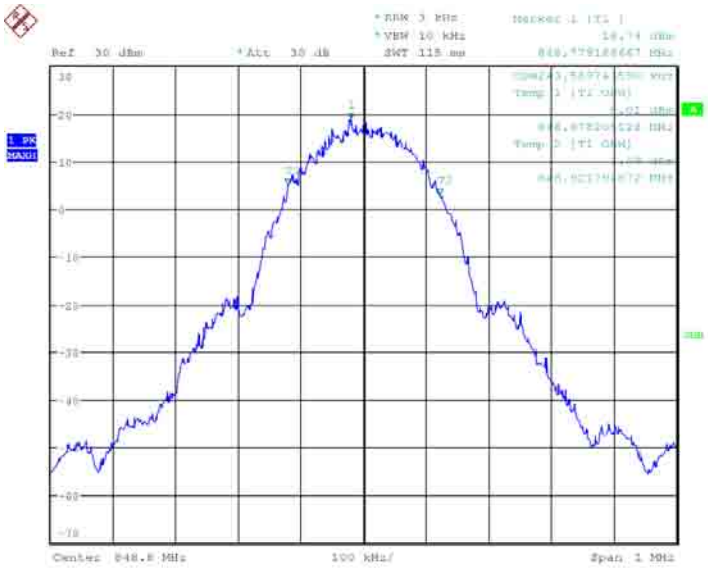
**GPRS 850**




**Channel 189-Occupied Bandwidth (99%)**

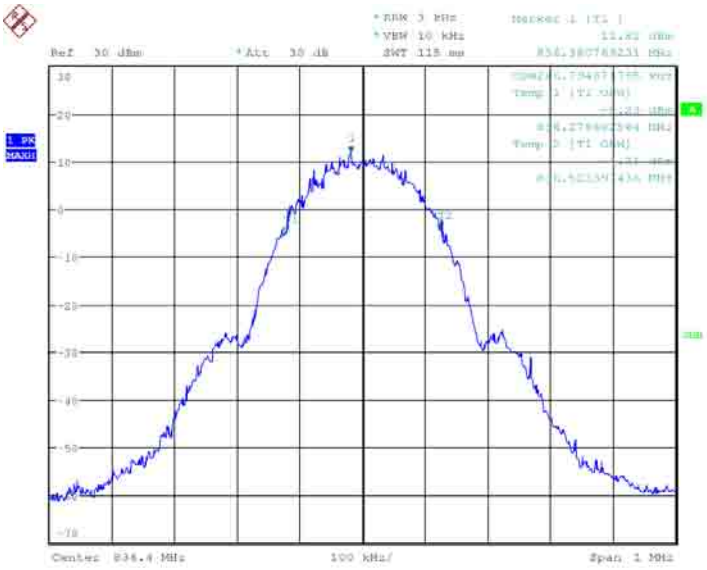



**Channel 128-Occupied Bandwidth (99%)**

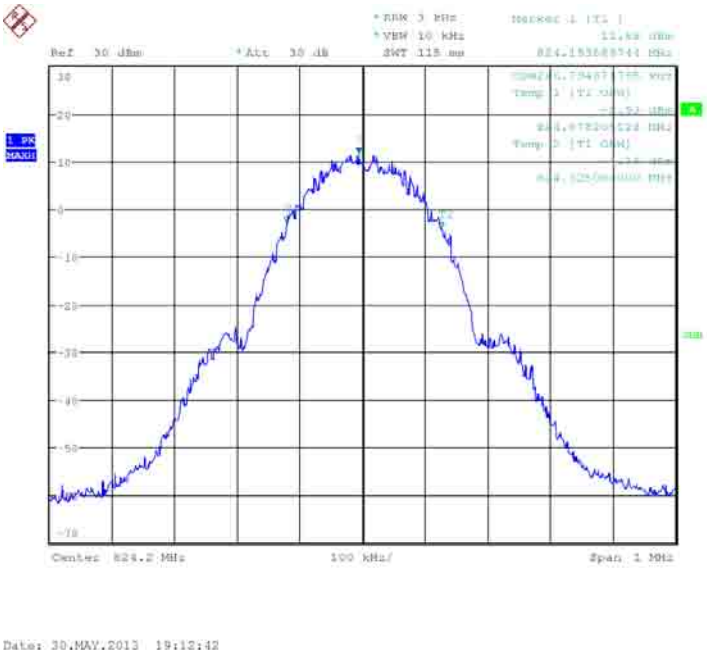



**Channel 251-Occupied Bandwidth (99%)**

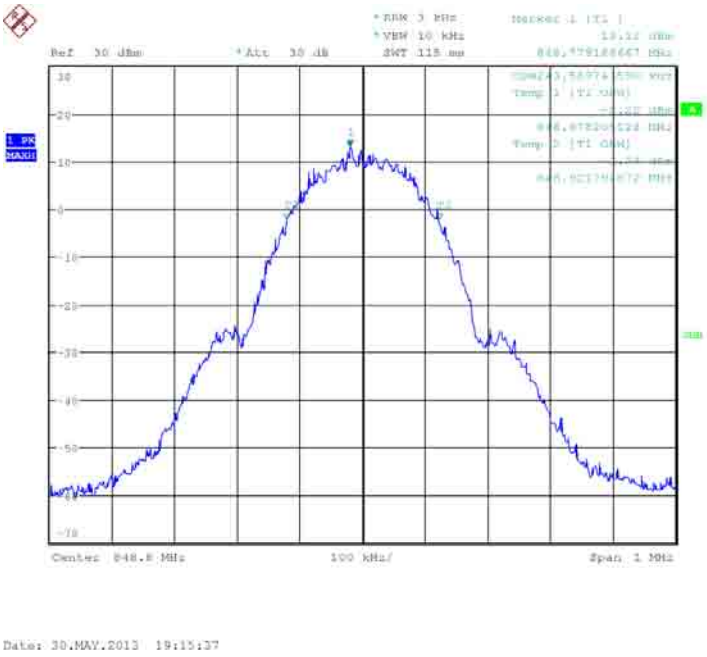
**EDGE 850**




**Channel 189-Occupied Bandwidth (99%)**




**Channel 128-Occupied Bandwidth (99%)**

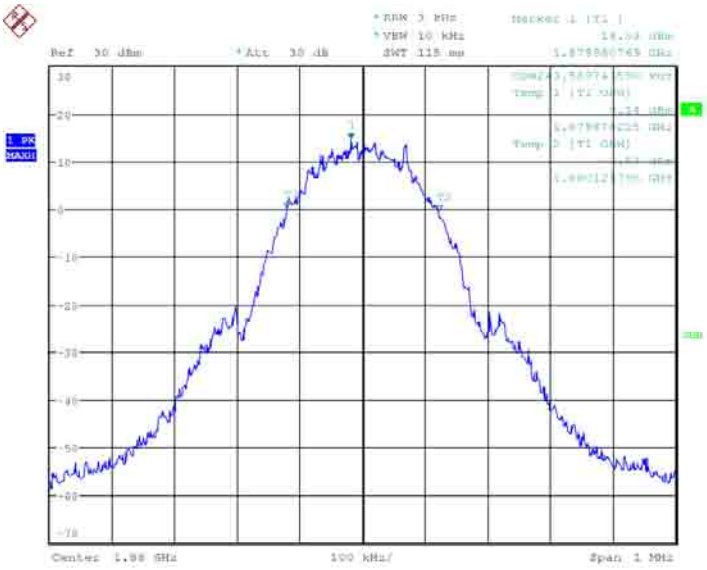


**Channel 251-Occupied Bandwidth (99%)**

| GSM 1900 | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(KHz) |
| Mid 661 | 1880 | 314.103 |
| Low 512 | 1850.2 | 312.500 |
| High 810 | 1909.8 | 314.103 |
| GPRS1900 | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(KHz) |
| Mid 661 | 1880 | 306.090 |
| Low 512 | 1850.2 | 312.500 |
| High 810 | 1909.8 | 314.103 |
| EDGE1900 | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(KHz) |
| Mid 661 | 1880 | 317.308 |
| Low 512 | 1850.2 | 318.910 |
| High 810 | 1909.8 | 318.910 |

**Conclusion: PASS**

**GSM 1900**

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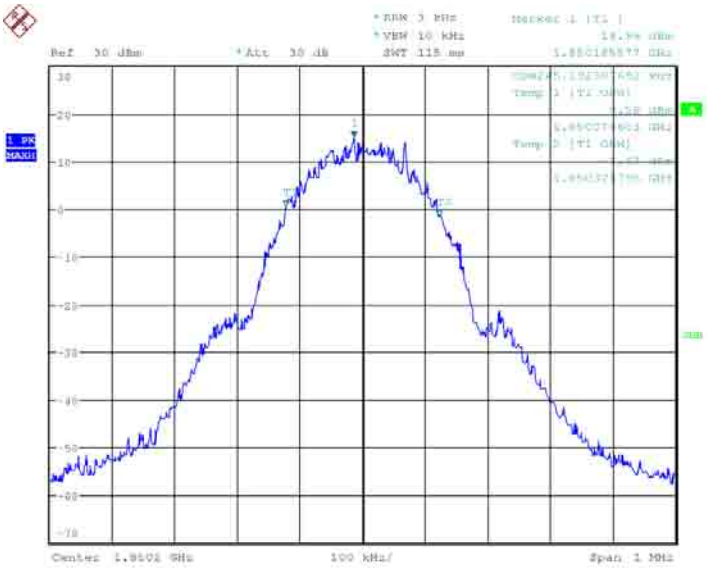
**Channel 661-Occupied Bandwidth**

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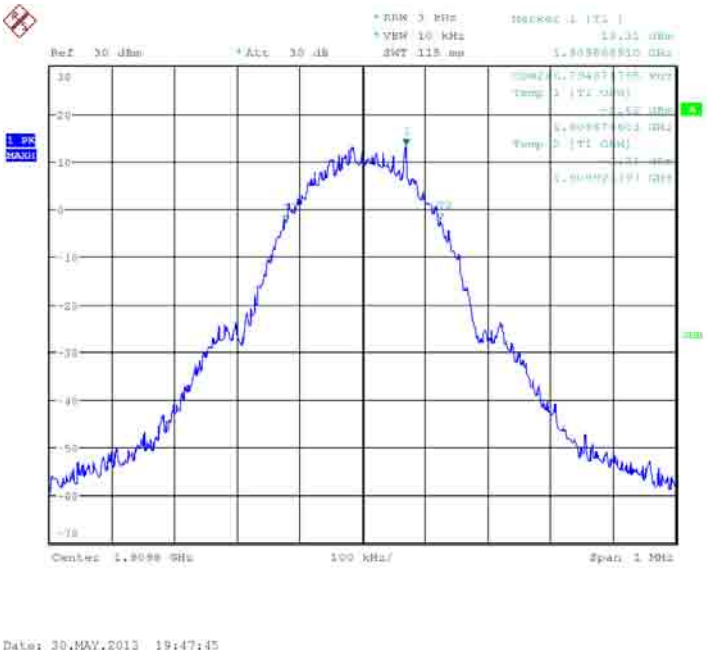
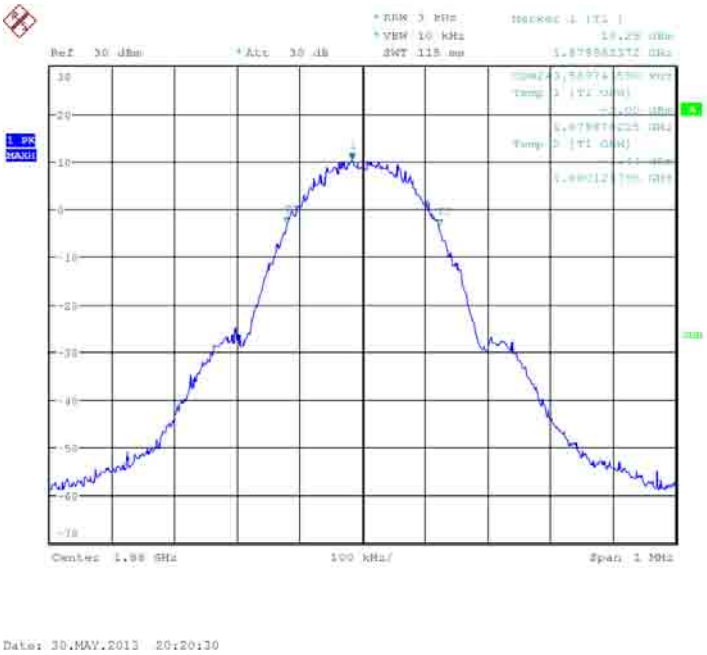
**Channel 512-Occupied Bandwidth**

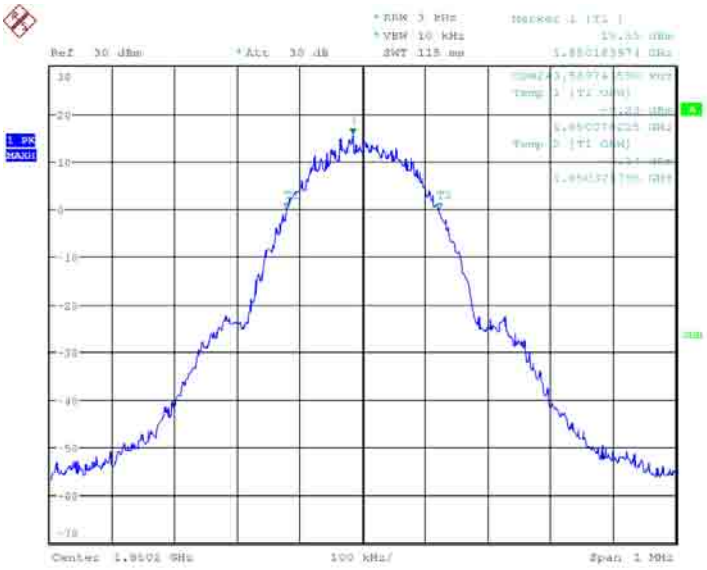



**Channel 810-Occupied Bandwidth**

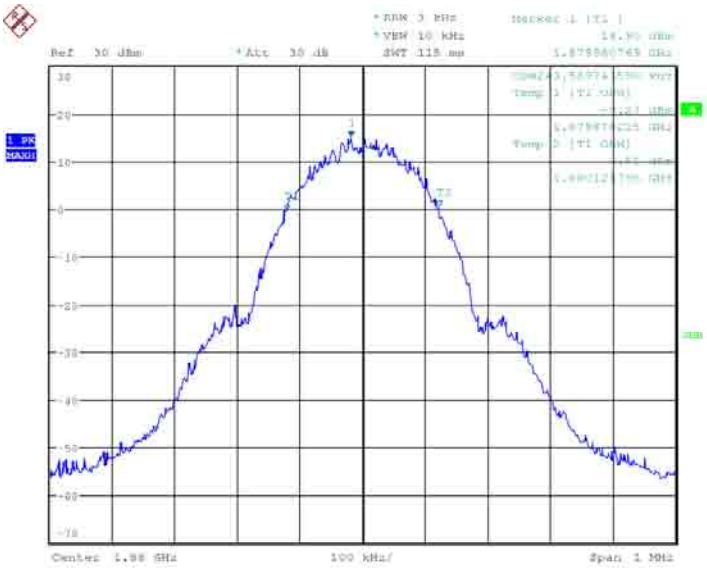
**GPRS 1900**




**Channel 661-Occupied Bandwidth**

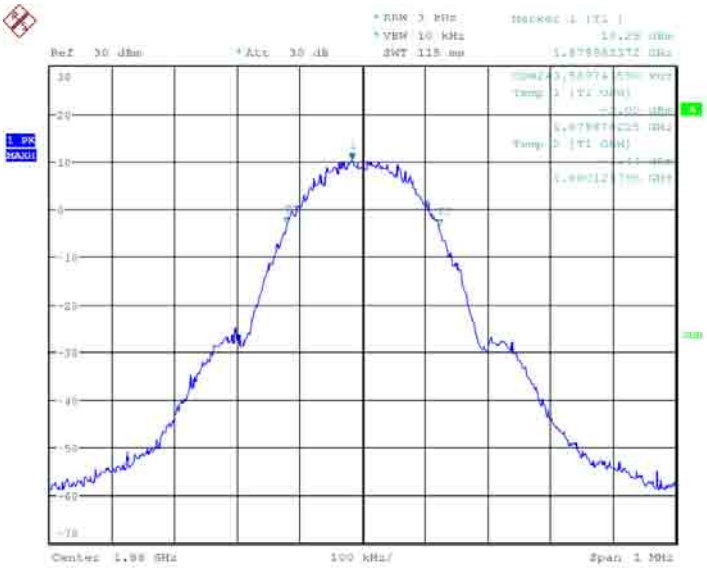



**Channel 512-Occupied Bandwidth**




**Channel 810-Occupied Bandwidth**

**EDGE 1900**

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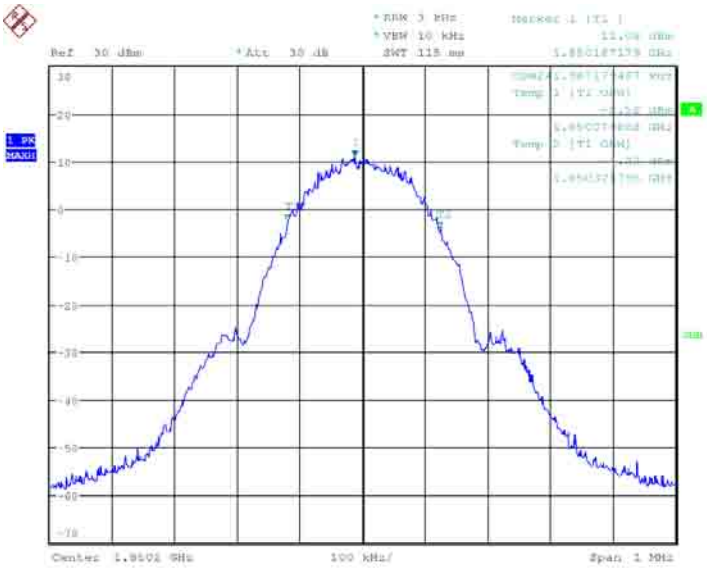
**Channel 661-Occupied Bandwidth**

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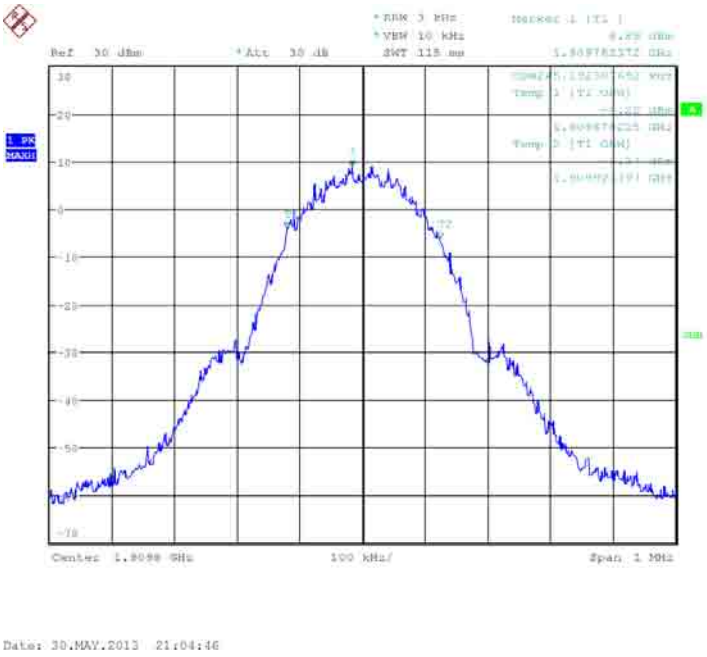
**Channel 512-Occupied Bandwidth**

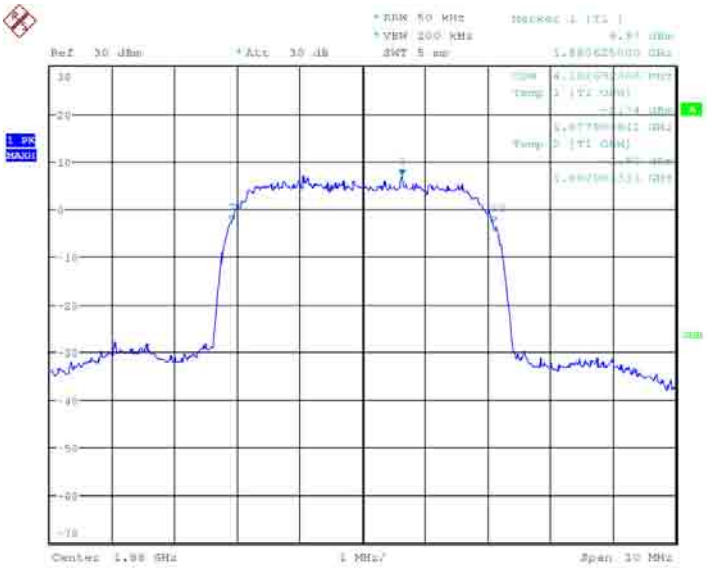


**Channel 810-Occupied Bandwidth**

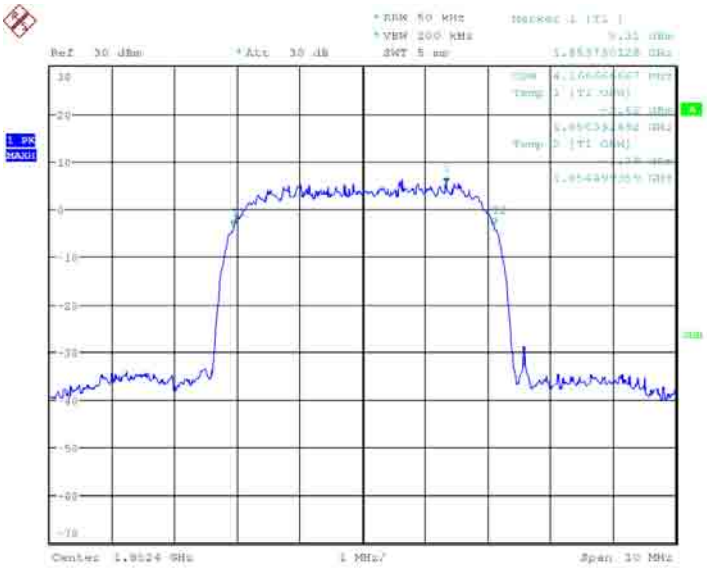
| WCDMA BAND II | | |
|---|---|---|
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(MHz) |
| Mid 9400 | 1880 | 4.18 |
| Low 9262 | 1852.4 | 4.17 |
| High 9538 | 1907.6 | 4.18 |
| WCDMA BAND V | | |
| Test channel | Frequency (MHz) | 99% Occupied Bandwidth(MHz) |
| Mid 4183 | 836.6 | 4.17 |
| Low 4132 | 826.4 | 4.18 |
| High 4233 | 846.6 | 4.17 |

**Conclusion: PASS**

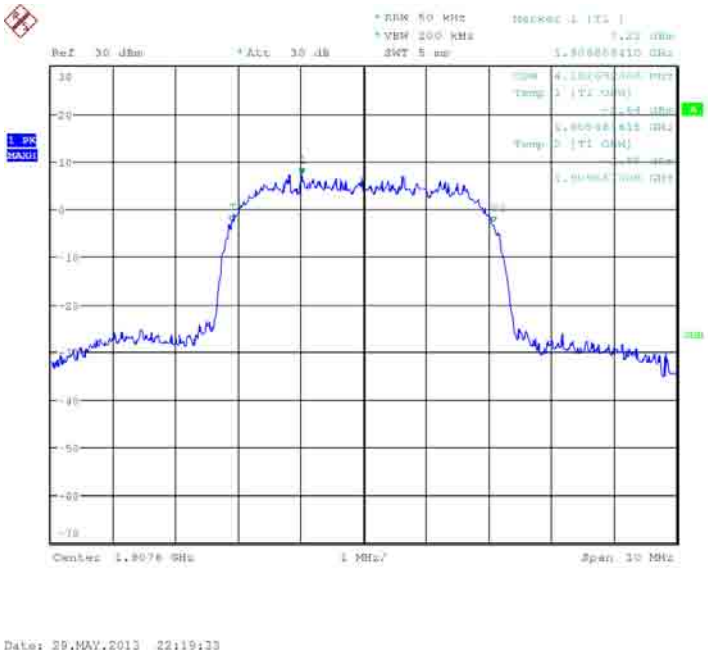
**WCDMA BAND II**




**Channel 9400-Occupied Bandwidth**

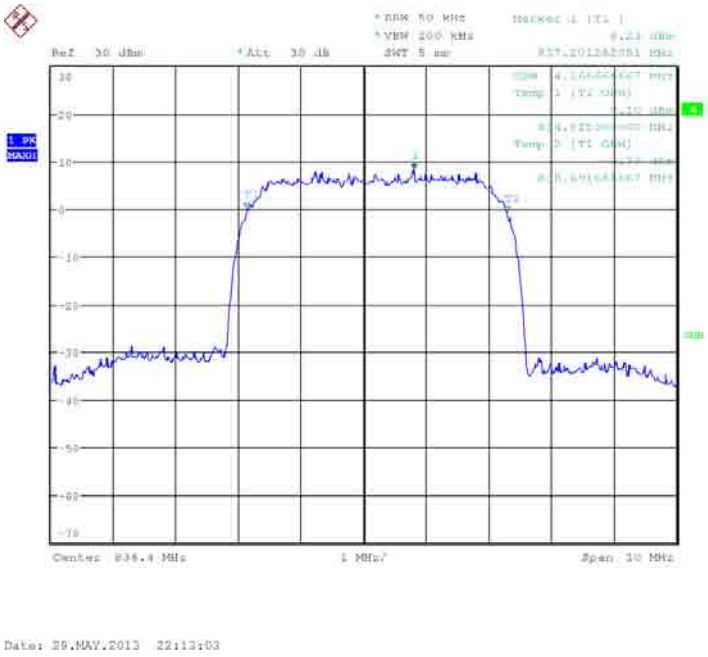



**Channel 9262-Occupied Bandwidth**

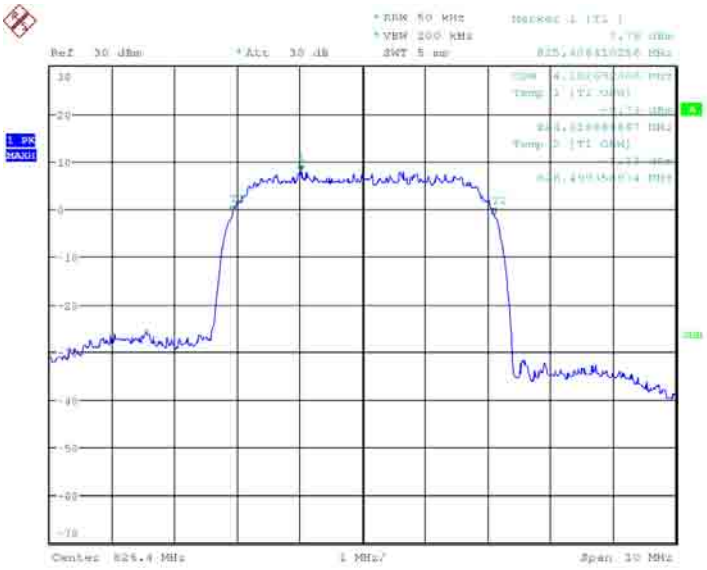



**Channel 9538-Occupied Bandwidth**

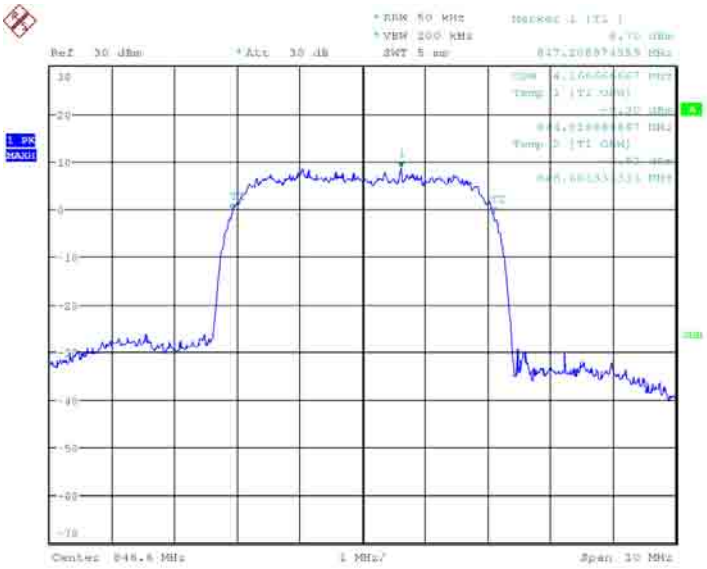
**WCDMA BAND V**




**Channel 4183-Occupied Bandwidth**




**Channel 4132-Occupied Bandwidth**




**Channel 4233-Occupied Bandwidth**

## A.3 -26dB Emission Bandwidth (§22.917(b)/§24.238(b))

### A.3.1 -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 BAND V.

**Test Procedure:**

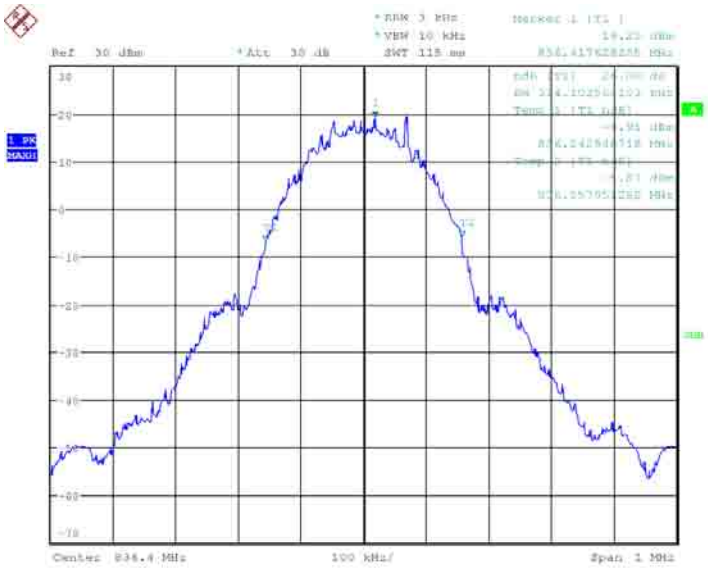
The table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

Test results:

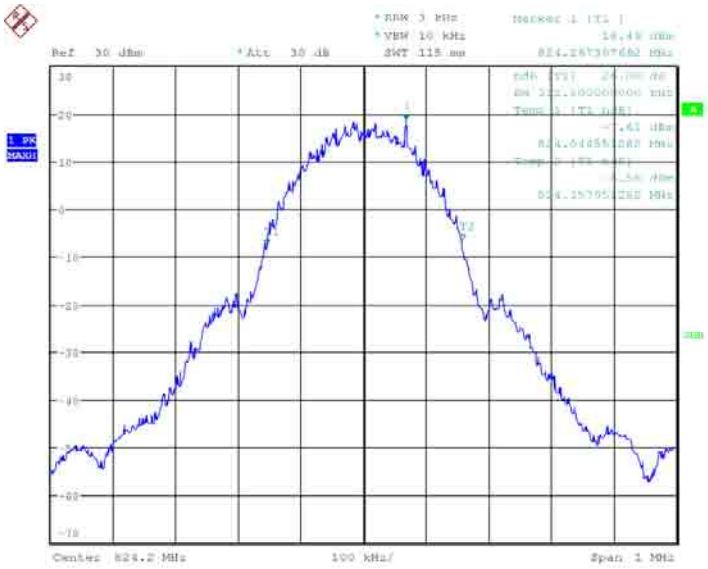
| GSM850 | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(KHz) |
| Mid 189 | 836.4 | 314.103 |
| Low 128 | 824.2 | 312.500 |
| High 251 | 848.8 | 314.103 |
| GPRS850 | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(KHz) |
| Mid 189 | 836.4 | 306.090 |
| Low 128 | 824.2 | 312.500 |
| High 251 | 848.8 | 314.103 |
| EDGE850 | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(KHz) |
| Mid 189 | 836.4 | 317.308 |
| Low 128 | 824.2 | 318.910 |
| High 251 | 848.8 | 318.910 |

**Conclusion: PASS**

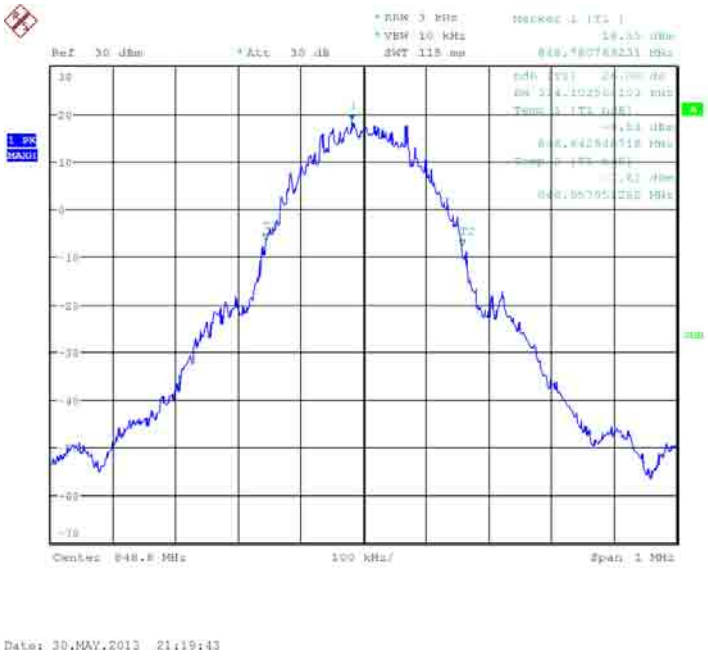
**GSM 850**




**Channel 189- Emission Bandwidth (-26dBc BW)**

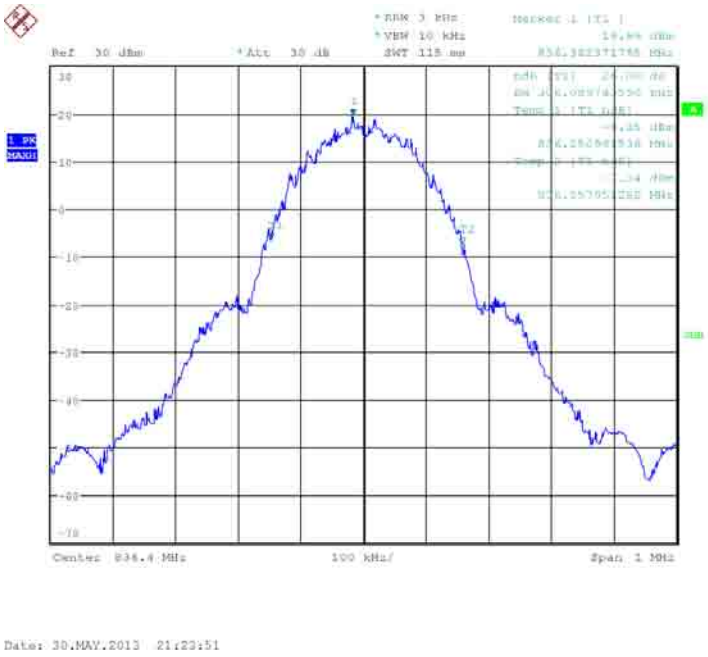



**Channel 128- Emission Bandwidth (-26dBc BW)**



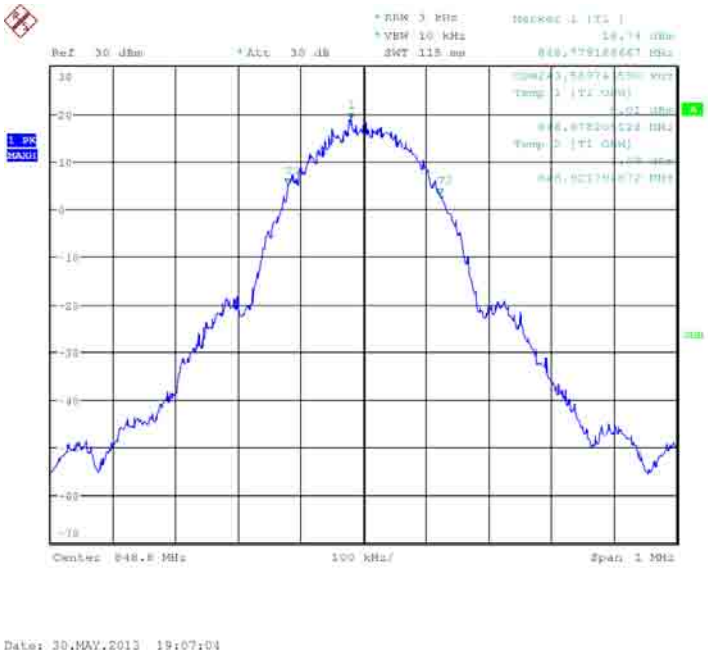

**Channel 251- Emission Bandwidth (-26dBc BW)**

**GPRS 850**



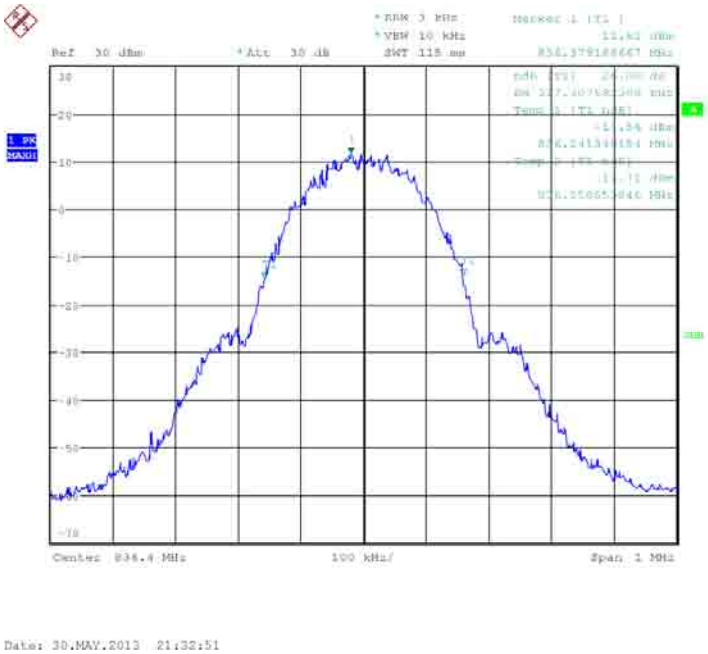

**Channel 189- Emission Bandwidth (-26dBc BW)**


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

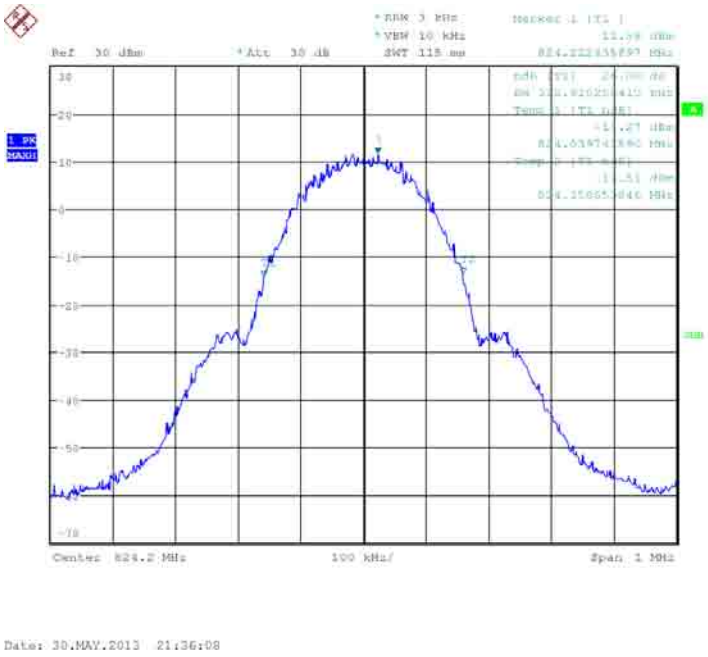



**Channel 251- Emission Bandwidth (-26dBc BW)**

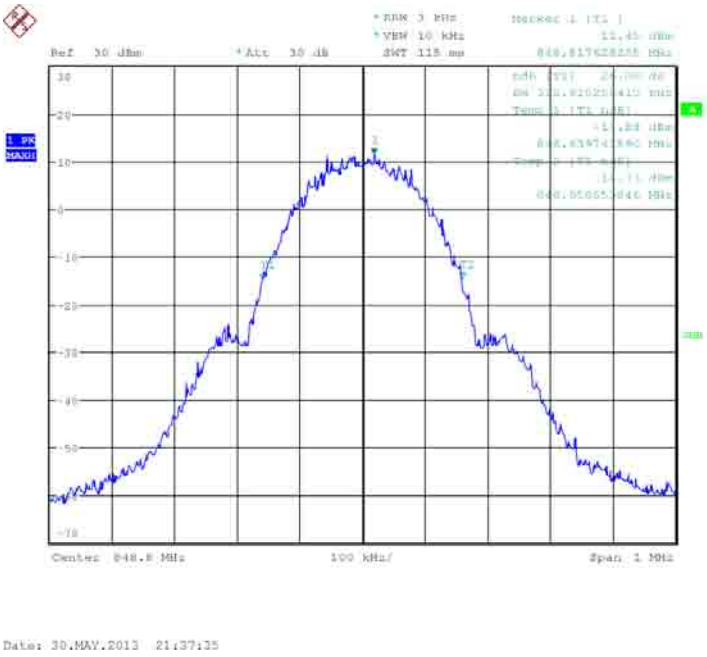
**EDGE 850**




**Channel 189- Emission Bandwidth (-26dBc BW)**




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

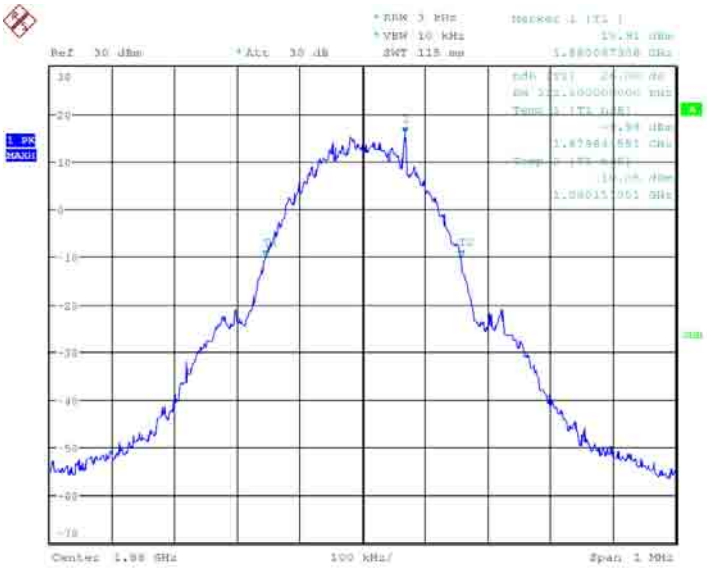



**Channel 251- Emission Bandwidth (-26dBc BW)**

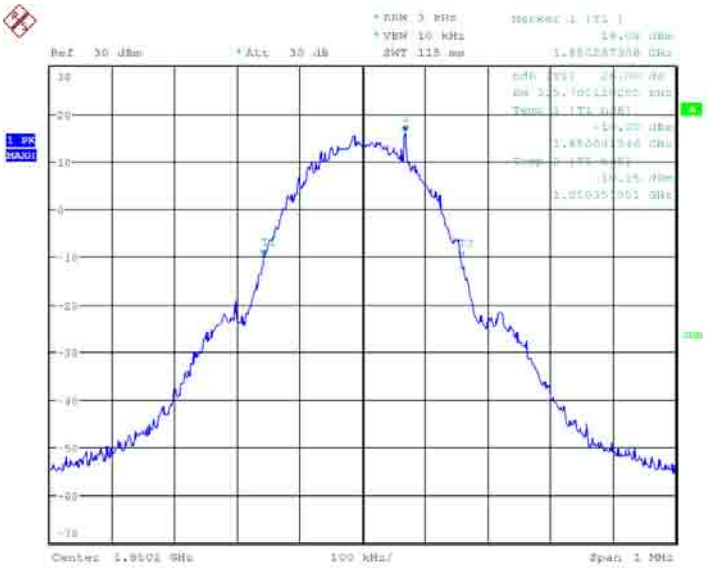
| GSM 1900 | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(KHz) |
| Mid 661 | 1880 | 312.500 |
| Low 512 | 1850.2 | 315.705 |
| High 810 | 1909.8 | 315.705 |
| GPRS1900 | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(KHz) |
| Mid 661 | 1880 | 318.910 |
| Low 512 | 1850.2 | 317.308 |
| High 810 | 1909.8 | 315.705 |
| EDGE1900 | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(KHz) |
| Mid 661 | 1880 | 312.500 |
| Low 512 | 1850.2 | 314.103 |
| High 810 | 1909.8 | 317.308 |

**Conclusion: PASS**

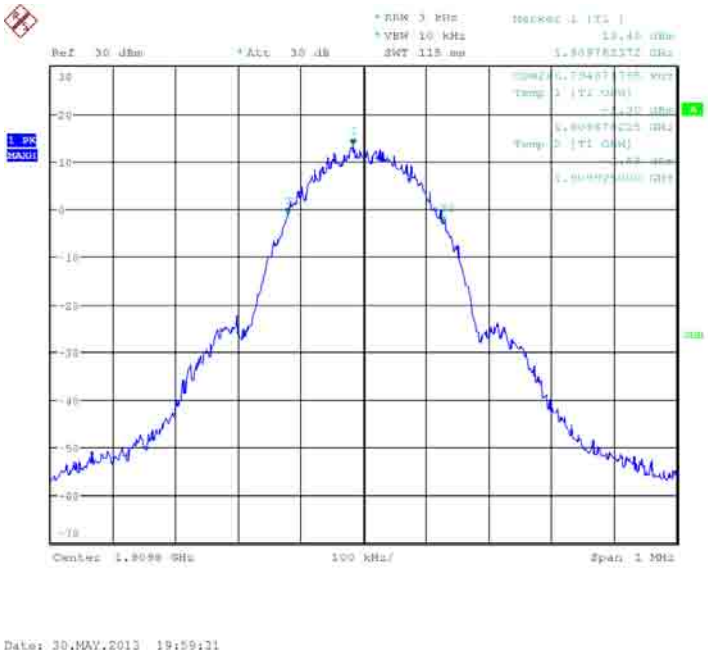
**GSM 1900**




**Channel 661- Emission Bandwidth (-26dBc BW)**

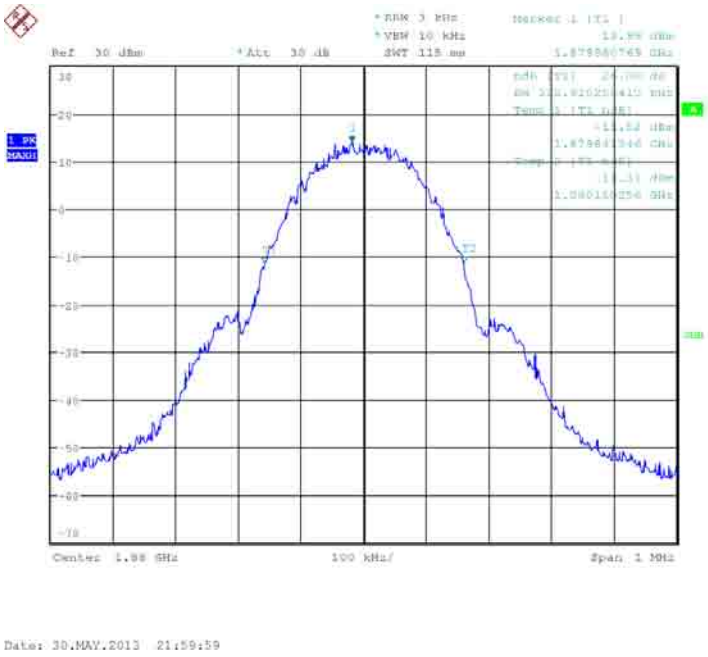



**Channel 512- Emission Bandwidth (-26dBc BW)**

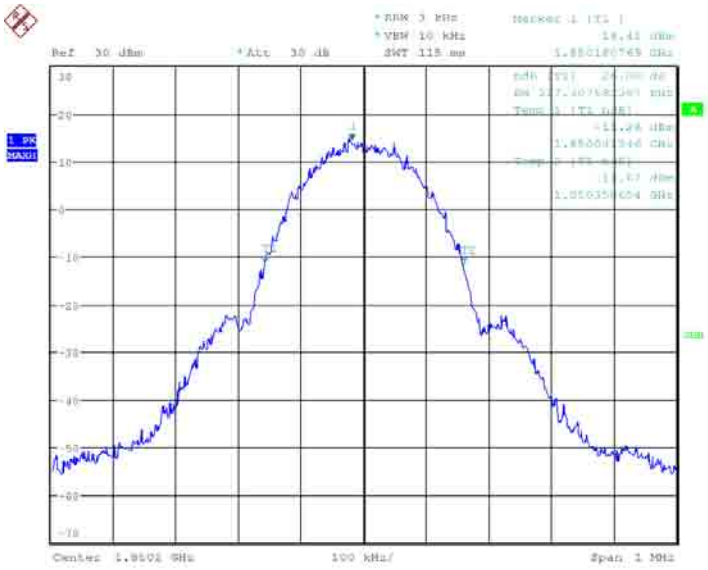



**Channel 810- Emission Bandwidth (-26dBc BW)**

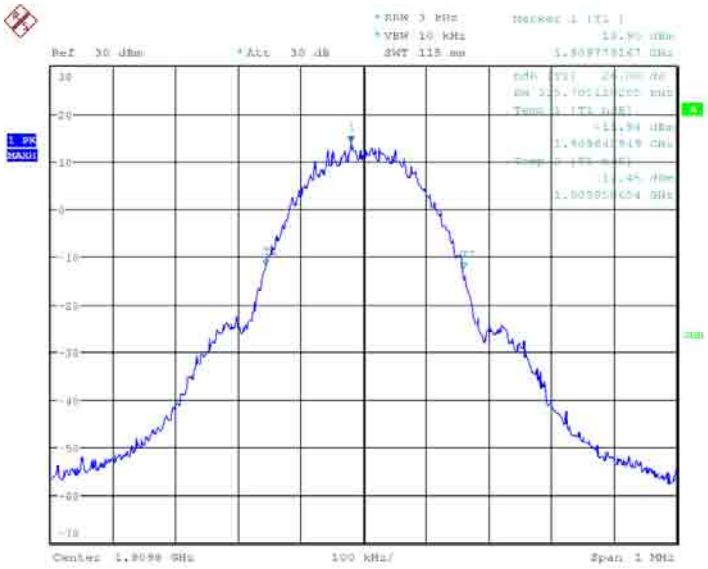
**GPRS 1900**




**Channel 661- Emission Bandwidth (-26dBc BW)**

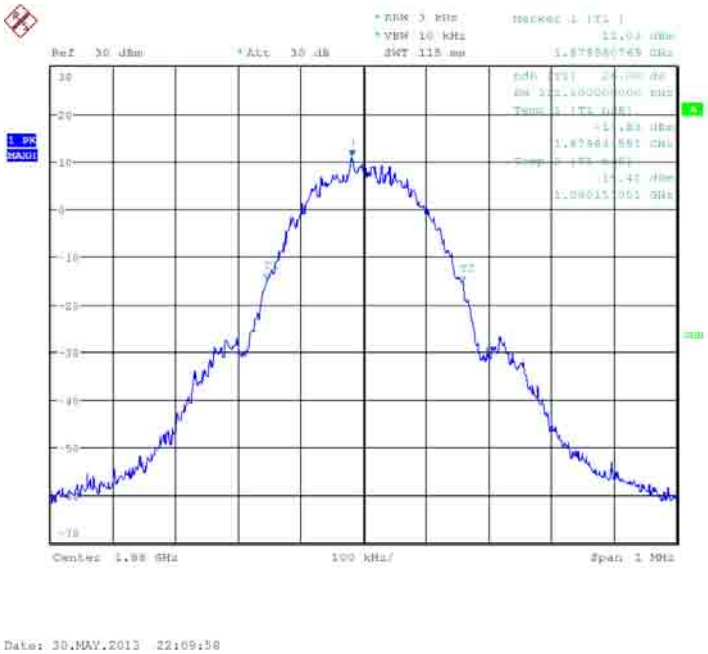



**Channel 512- Emission Bandwidth (-26dBc BW)**

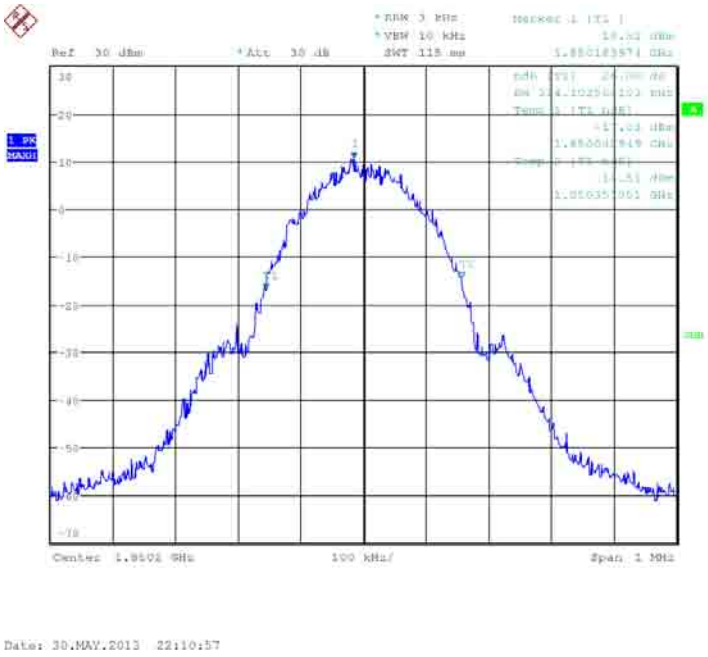



**Channel 810- Emission Bandwidth (-26dBc BW)**

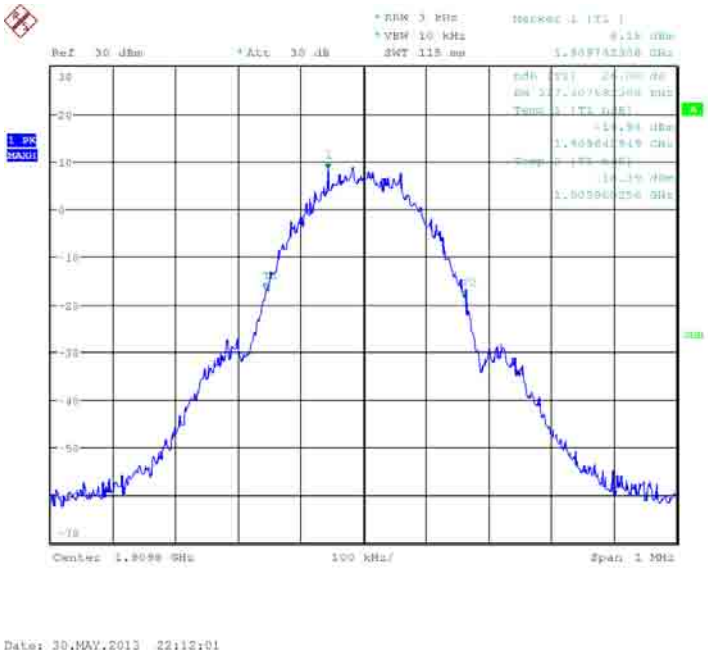
**EDGE 1900**




**Channel 661- Emission Bandwidth (-26dBc BW)**




**Channel 512- Emission Bandwidth (-26dBc BW)**

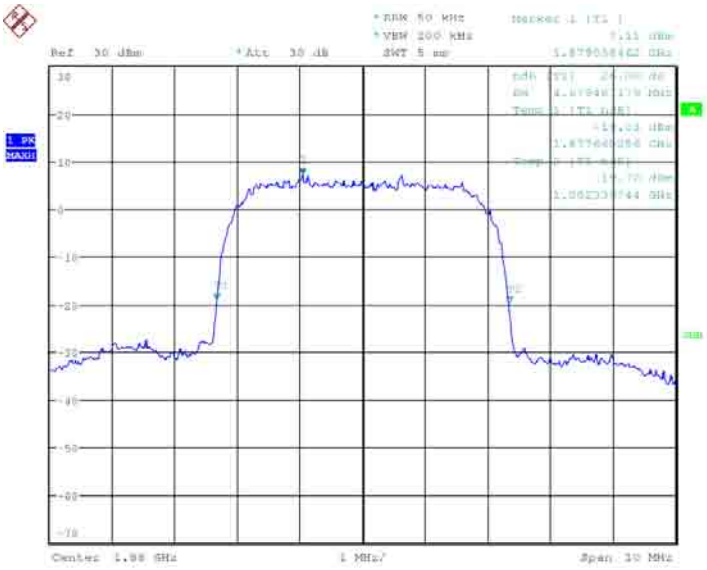


**Channel 810- Emission Bandwidth (-26dBc BW)**

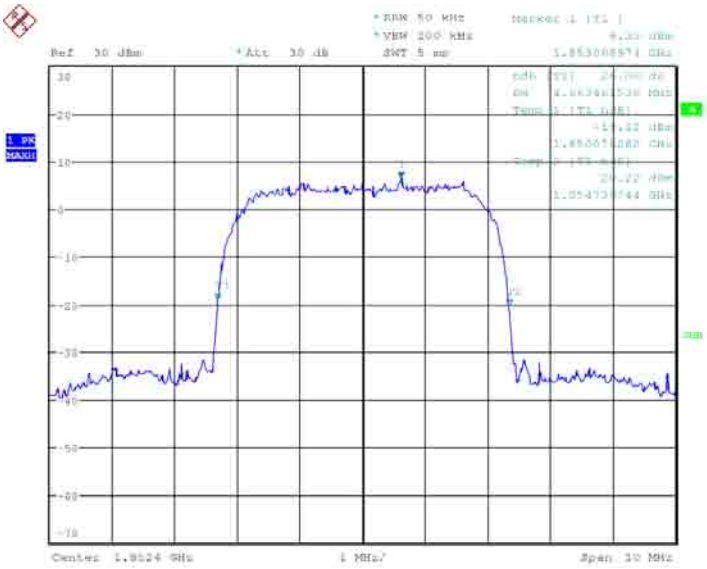
| WCDMA BAND II | | |
|---|---|---|
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(MHz) |
| Mid 9400 | 1880 | 4.68 |
| Low 9262 | 1852.4 | 4.66 |
| High 9538 | 1907.6 | 4.71 |
| WCDMA BAND V | | |
| Test channel | Frequency (MHz) | –26dBc Emission Bandwidth(MHz) |
| Mid 4183 | 836.6 | 4.65 |
| Low 4132 | 826.4 | 4.66 |
| High 4233 | 846.6 | 4.66 |

**Conclusion: PASS**

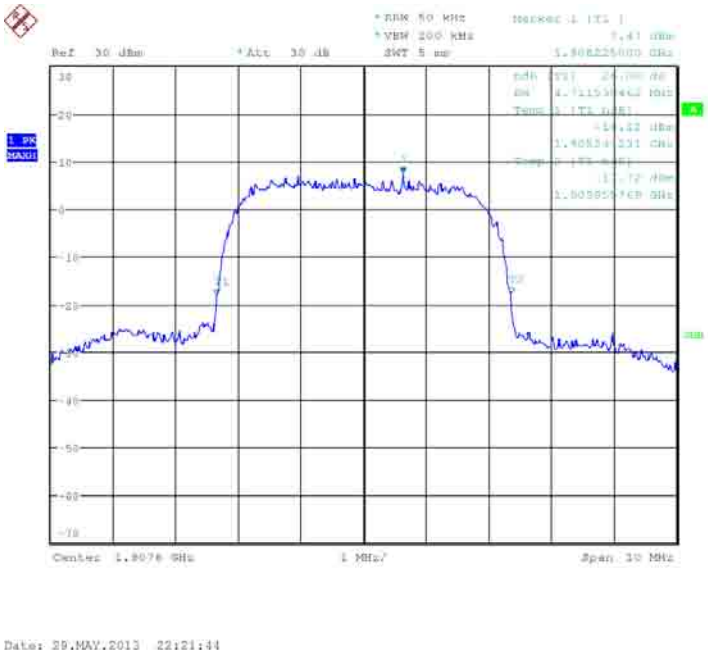
**WCDMA BAND II**




**Channel 9400- Emission Bandwidth (-26dBc BW)**

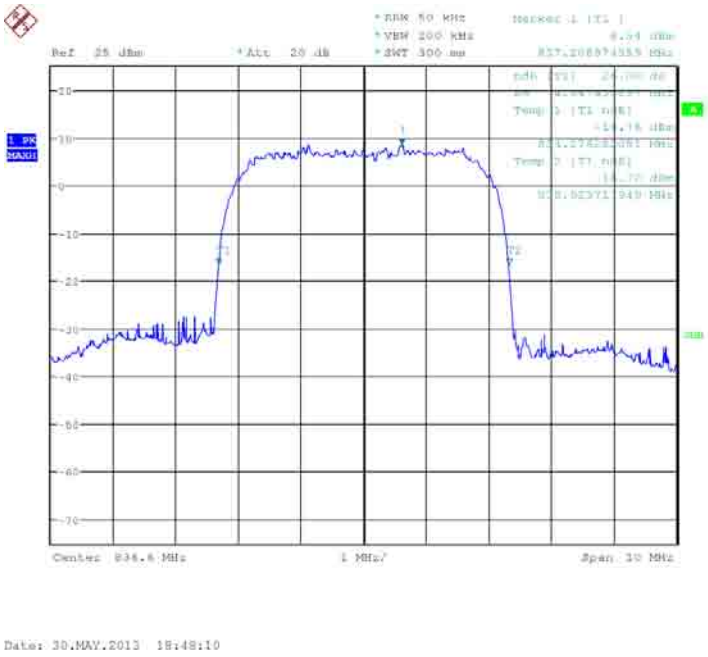



**Channel 9262- Emission Bandwidth (-26dBc BW)**

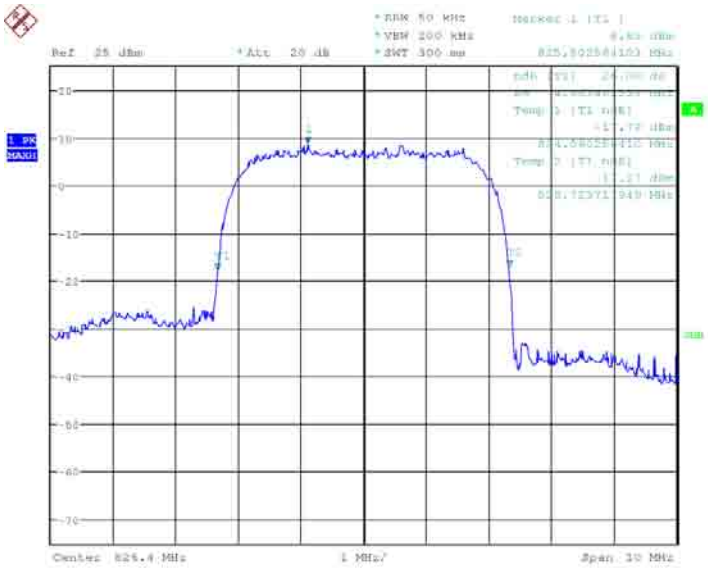



**Channel 9538- Emission Bandwidth (-26dBc BW)**

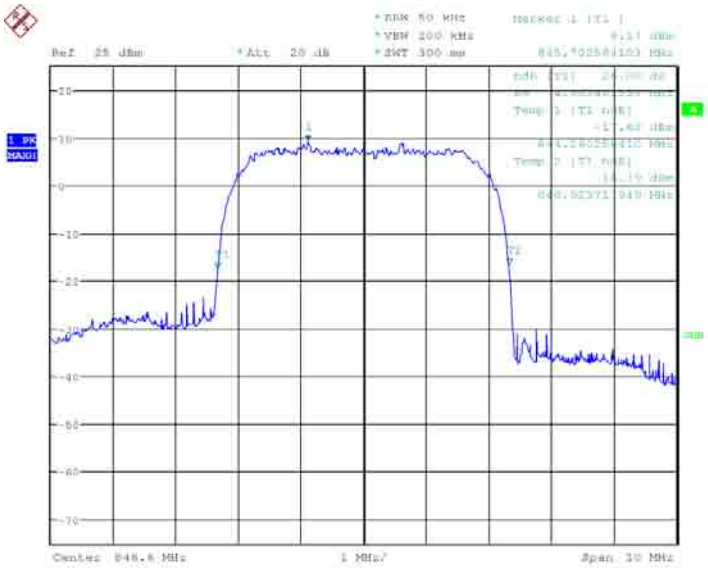
**WCDMA BAND V**




**Channel 4183- Emission Bandwidth (-26dBc BW)**




**Channel 4132- Emission Bandwidth (-26dBc BW)**




**Channel 4233- Emission Bandwidth (-26dBc BW)**

## A.4 Band Edge at antenna terminals (§22.917(b)/§24.238(b))

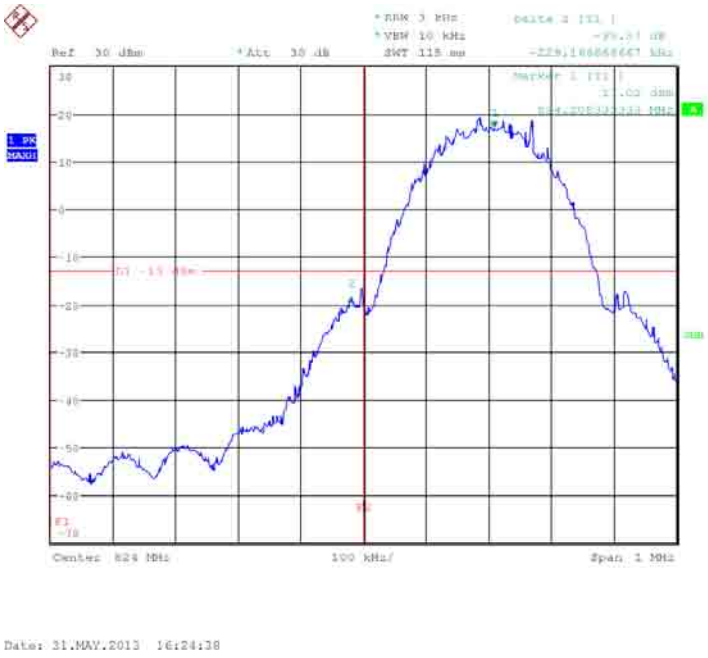
**Limit:**

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).

**Test procedure:**

The RF output of the transceiver was connected to a signal analyzer through appropriate attenuation. 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.

**GSM 850**

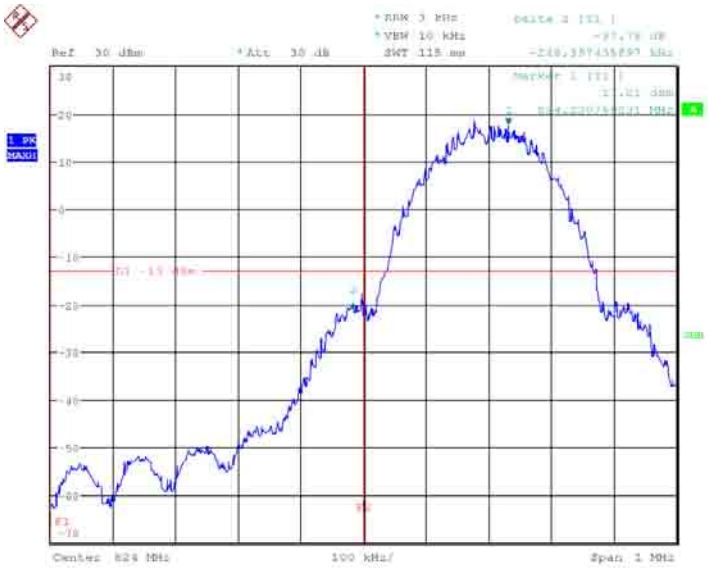



**Channel 128- LOW BAND EDGE BLOCK**


Date: 31.MAY.2013 16:25:45

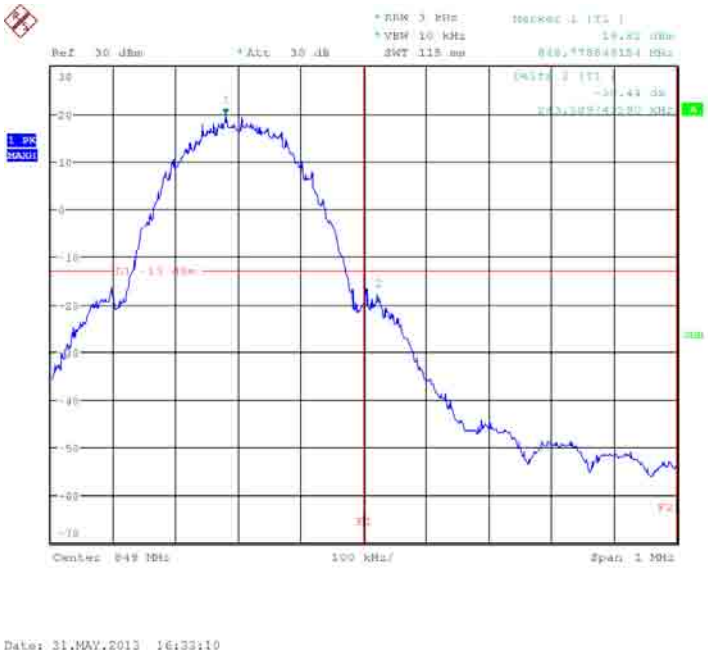
**Channel 251- HIGH BAND EDGE BLOCK**

**GPRS 850**



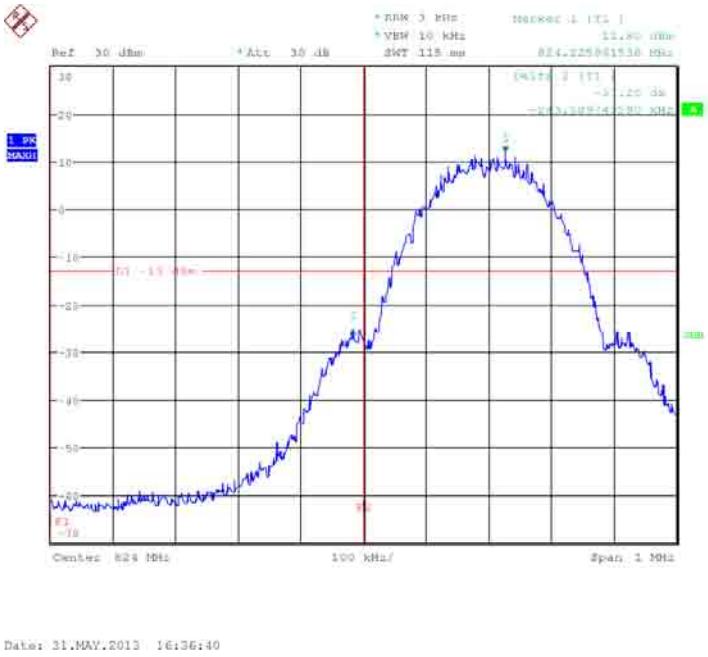

Date: 31.MAY.2013 16:34:12

**Channel 128- LOW BAND EDGE BLOCK**

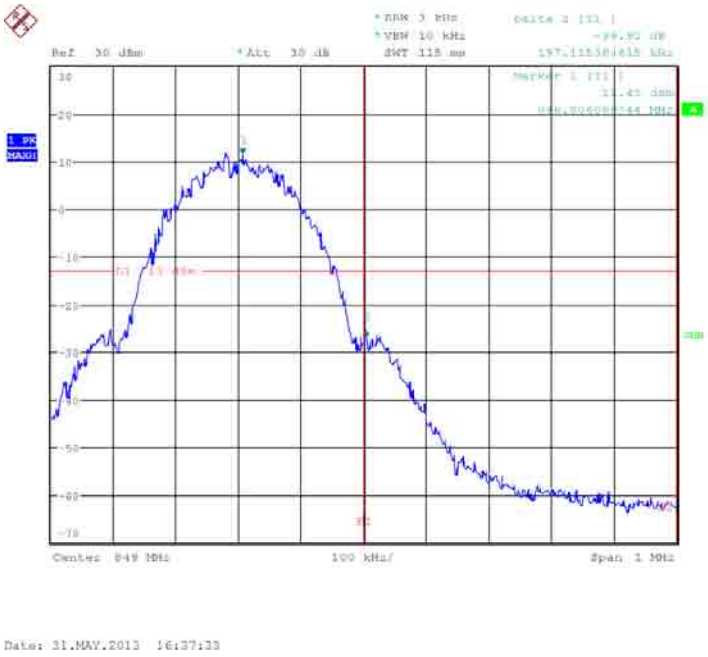



**Channel 251- HIGH BAND EDGE BLOCK**

**EDGE 850**

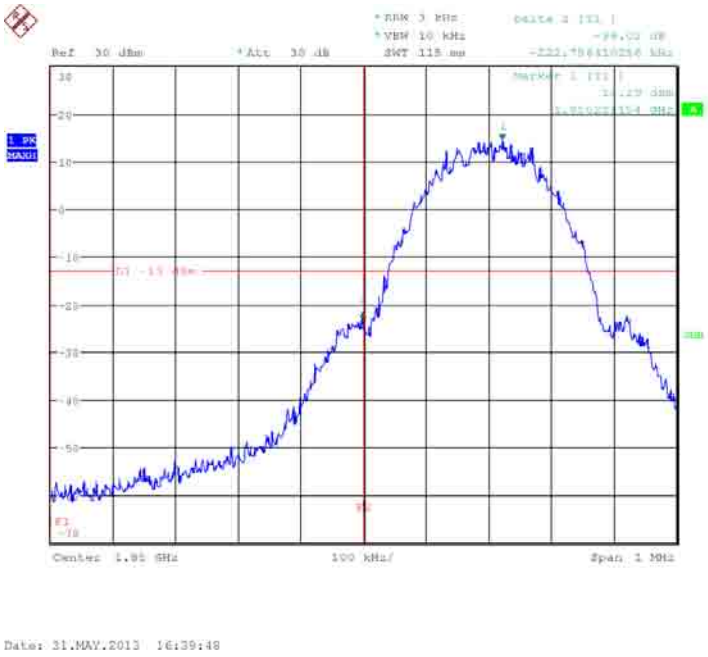



**Channel 128- LOW BAND EDGE BLOCK**

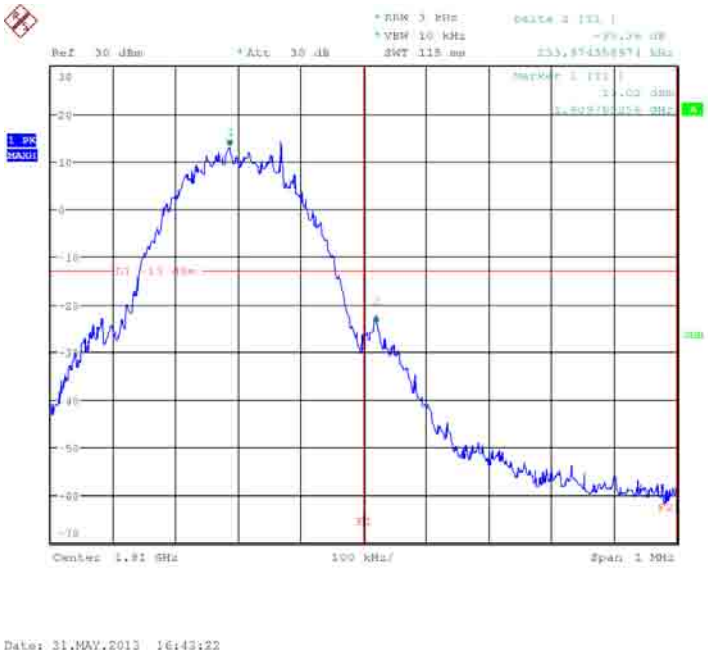



**Channel 251- HIGH BAND EDGE BLOCK**

**GSM 1900**

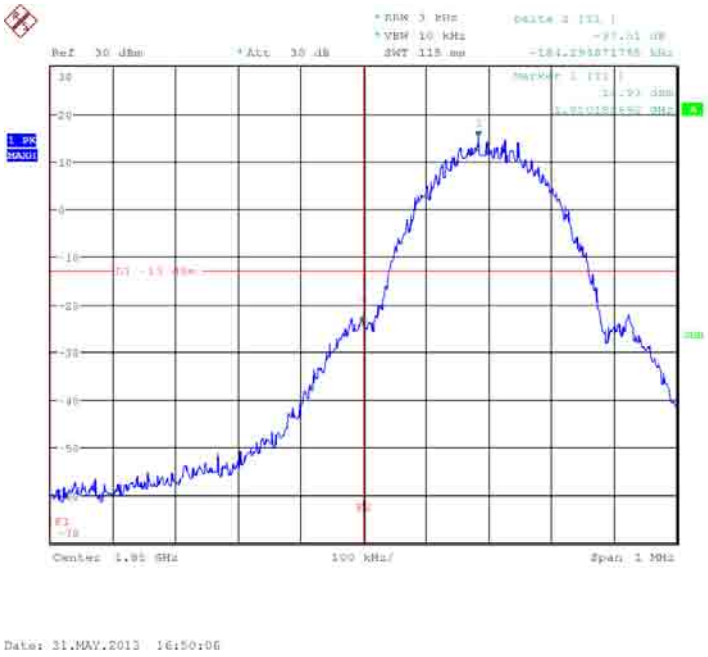



**Channel 512- LOW BAND EDGE BLOCK**

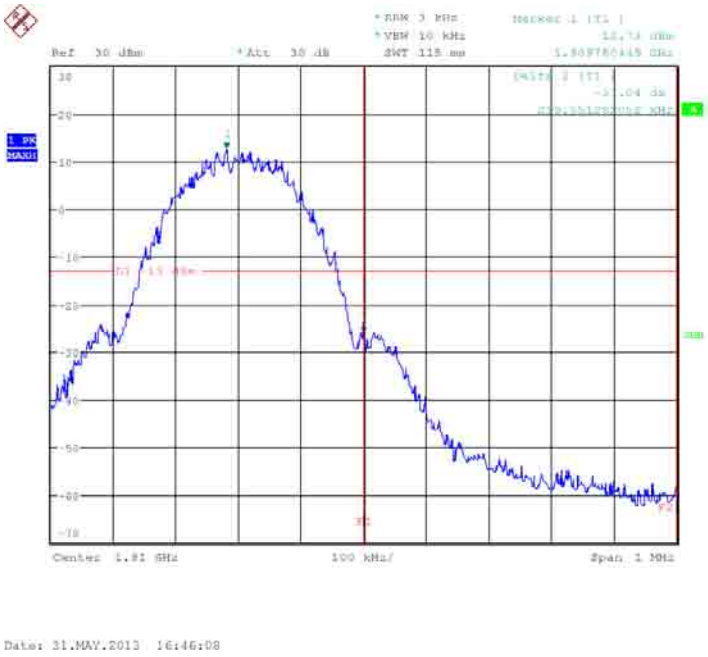



**Channel 810- HIGH BAND EDGE BLOCK**

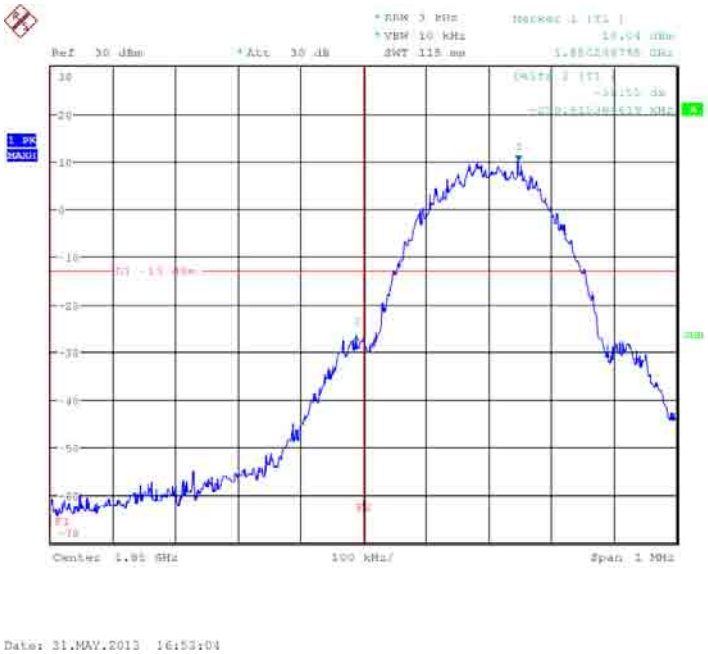
**GPRS 1900**



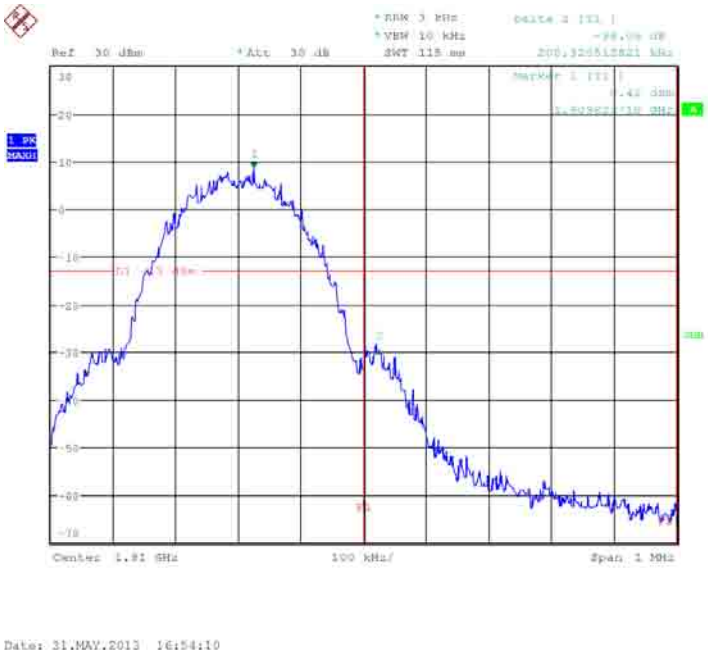

**Channel 512- LOW BAND EDGE BLOCK**




**Channel 810- HIGH BAND EDGE BLOCK EDGE 1900**

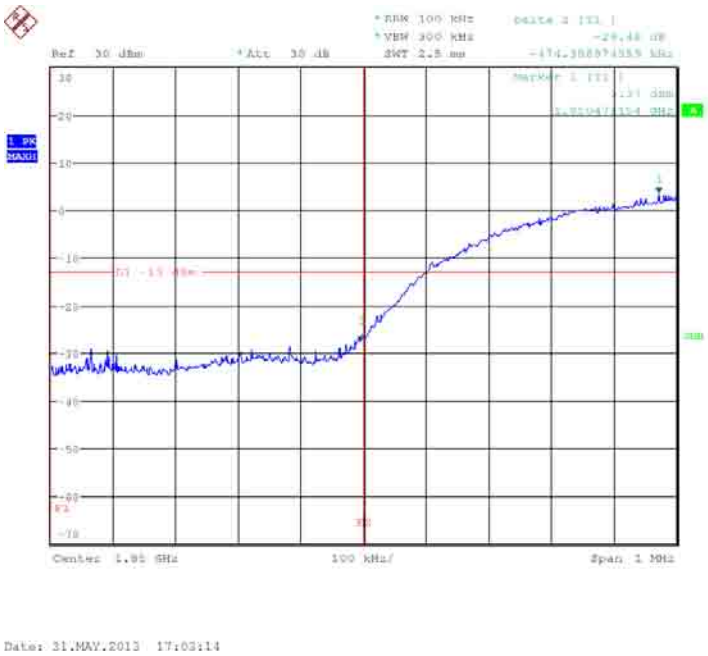



**Channel 512- LOW BAND EDGE BLOCK**

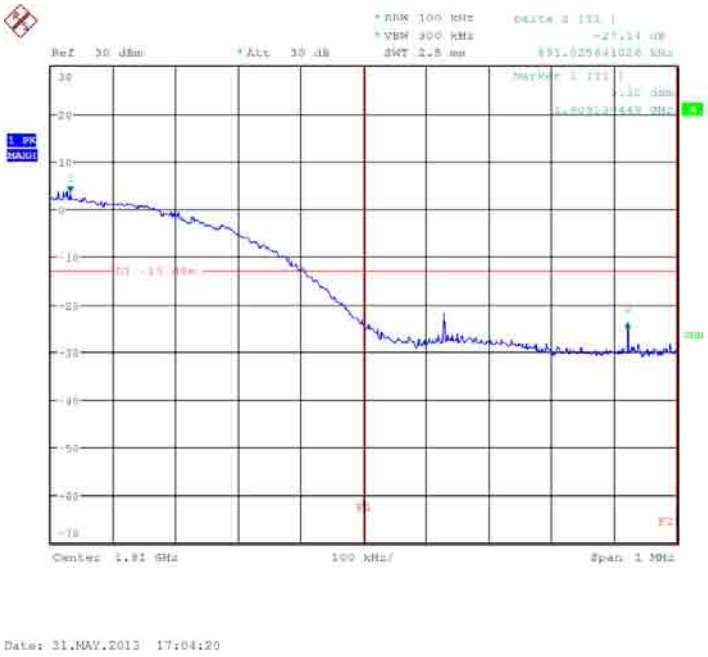



**Channel 810- HIGH BAND EDGE BLOCK**

**WCDMA BAND II**

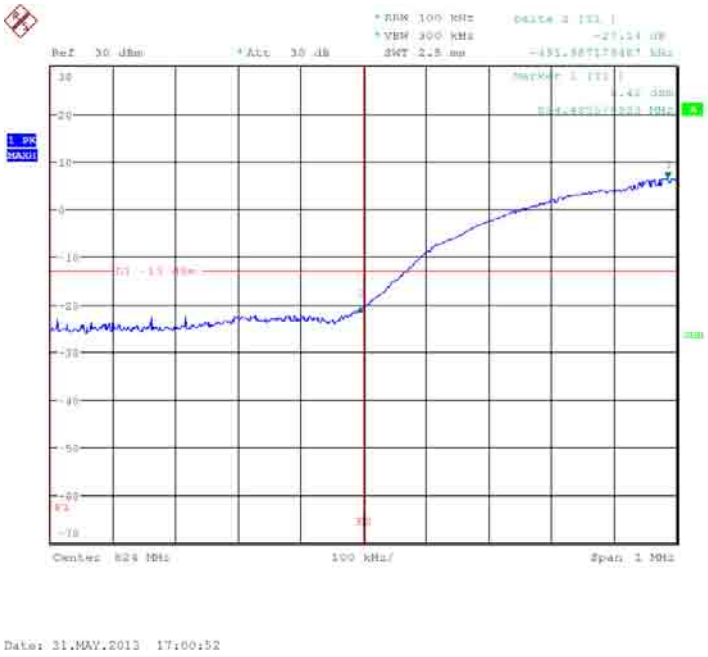



**Channel 9262- LOW BAND EDGE BLOCK**

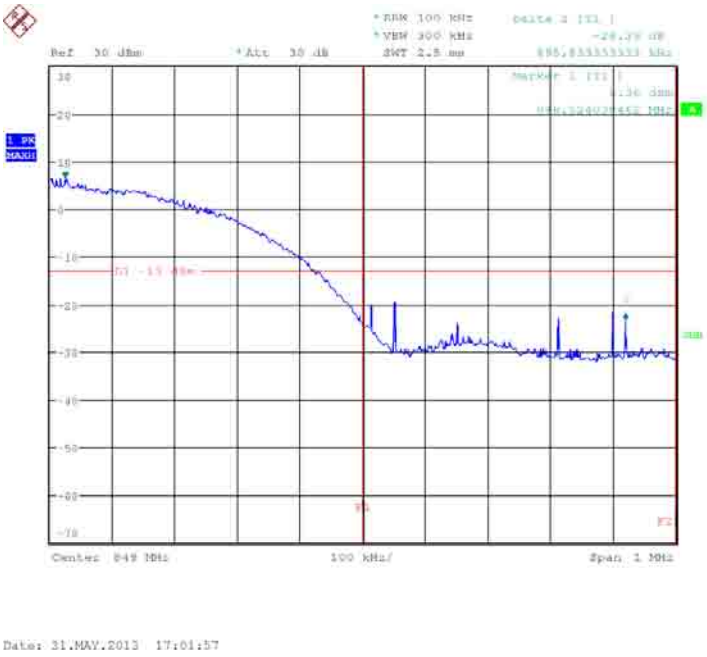



**Channel 9538- HIGH BAND EDGE BLOCK**

**WCDMA BAND V**




**Channel 4132- LOW BAND EDGE BLOCK**




**Channel 4233- HIGH BAND EDGE BLOCK**

**Conclusion: PASS**

## A.5 FREQUENCY STABILITY (§2.1055/§24.235)

### A.5.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on mid channel of GSM850, PCS1900, WCDMA BANDII and WCDMA BANDV, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

### A.5.2 Measurement Limit

### A.5.2.1 For Hand carried battery powered equipment

According to the JTC standard the GSM frequency stability of the carrier shall be accurate to within 0.1ppm of the received frequency from the base station. And the WCDMA is 2.5ppm. This accuracy is sufficient to meet Sec.24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5V DC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

### A.5.2.2 For equipment powered by primary supply voltage

According to the JTC standard the GSM frequency stability of the carrier shall be accurate to within 0.1ppm of the received frequency from the base station. And the WCDMA is 2.5ppm. This accuracy is sufficient to meet Sec.24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

### GSM850 Mid Channel/fc(MHz) 189/836.4

**Frequency Error VS Temperature**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.3 | -30 | -31 | 83.64 |
| 3.3 | -20 | -24 | 83.64 |
| 3.3 | -10 | -27 | 83.64 |
| 3.3 | 0 | -25 | 83.64 |
| 3.3 | 10 | -21 | 83.64 |
| 3.3 | 20 | -25 | 83.64 |
| 3.3 | 30 | -18 | 83.64 |
| 3.3 | 40 | -22 | 83.64 |
| 3.3 | 50 | -17 | 83.64 |

**Frequency Error VS Voltage**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 3.2 | 25 | -30 | 83.64 |
| 3.3 | 25 | -28 | 83.64 |
| 3.6 | 25 | -18 | 83.64 |

**PCS1900 Mid Channel/fc(MHz) 661/1880**

**Frequency Error VS Temperature**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.3 | -30 | -58 | 188 |
| 3.3 | -20 | -48 | 188 |
| 3.3 | -10 | -52 | 188 |
| 3.3 | 0 | -41 | 188 |
| 3.3 | 10 | -31 | 188 |
| 3.3 | 20 | -47 | 188 |
| 3.3 | 30 | -36 | 188 |
| 3.3 | 40 | -28 | 188 |
| 3.3 | 50 | -32 | 188 |

**Frequency Error VS Voltage**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.2 | 25 | -38 | 188 |
| 3.3 | 25 | -32 | 188 |
| 3.6 | 25 | -42 | 188 |

**WCDMA BAND II Mid Channel/fc(MHz) 9400 /1880**

**Frequency Error VS Temperature**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.3 | -30 | -32 | 4700 |
| 3.3 | -20 | -30 | 4700 |
| 3.3 | -10 | -27 | 4700 |
| 3.3 | 0 | -33 | 4700 |

| | | | |
|---|---|---|---|
| 3.3 | 10 | -25 | 4700 |
| 3.3 | 20 | -26 | 4700 |
| 3.3 | 30 | -28 | 4700 |
| 3.3 | 40 | -31 | 4700 |
| 3.3 | 50 | -28 | 4700 |

**Frequency Error VS Voltage**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.2 | 25 | 33 | 4700 |
| 3.3 | 25 | 30 | 4700 |
| 3.6 | 25 | 27 | 4700 |

**WCDMA BAND V Mid Channel/fc(MHz) 4183/836.6**

**Frequency Error VS Temperature**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.3 | -30 | -22 | 2091.5 |
| 3.3 | -20 | -17 | 2091.5 |
| 3.3 | -10 | -18 | 2091.5 |
| 3.3 | 0 | -17 | 2091.5 |
| 3.3 | 10 | -19 | 2091.5 |
| 3.3 | 20 | -17 | 2091.5 |
| 3.3 | 30 | -12 | 2091.5 |
| 3.3 | 40 | -14 | 2091.5 |
| 3.3 | 50 | -13 | 2091.5 |

**Frequency Error VS Voltage**

| Power Supply (VDc) | Environment Temperature(℃) | Frequency error(Hz) | Limit (Hz) |
|---|---|---|---|
| 3.2 | 25 | -18 | 2091.5 |
| 3.3 | 25 | -13 | 2091.5 |
| 3.6 | 25 | -17 | 2091.5 |

**Conclusion: PASS**

## A.6. CONDUCTED SPURIOUS EMISSION

### A.6.1 GSM Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 10 GHz.
2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.
3. The procedure to get the conducted spurious emission is as follows:
The trace mode is set to MaxHold to get the highest signal at each frequency;
Wait 25 seconds;Get the result.
4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

**GSM 850 Transmitter**

| Channel | Frequency(MHz) |
|---|---|
| 128 | 824.2 |
| 190 | 836.6 |
| 251 | 848.8 |

**PCS1900 Transmitter**

| Channel | Frequency(MHz) |
|---|---|
| 512 | 1850.2 |
| 661 | 1880.0 |
| 810 | 1909.8 |

#### A.6.1.1 Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried

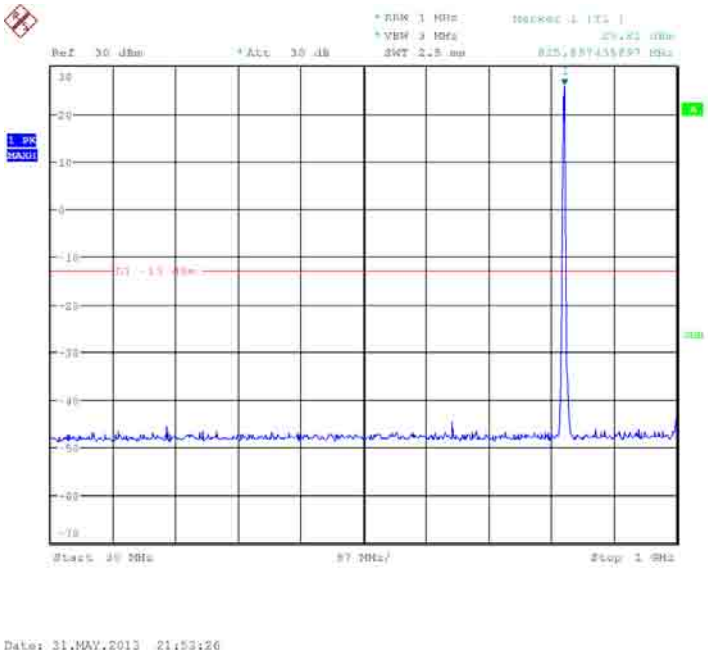
out.

**A6.1.2 Measurement result**

**Spurious emission limit -13dBm.**

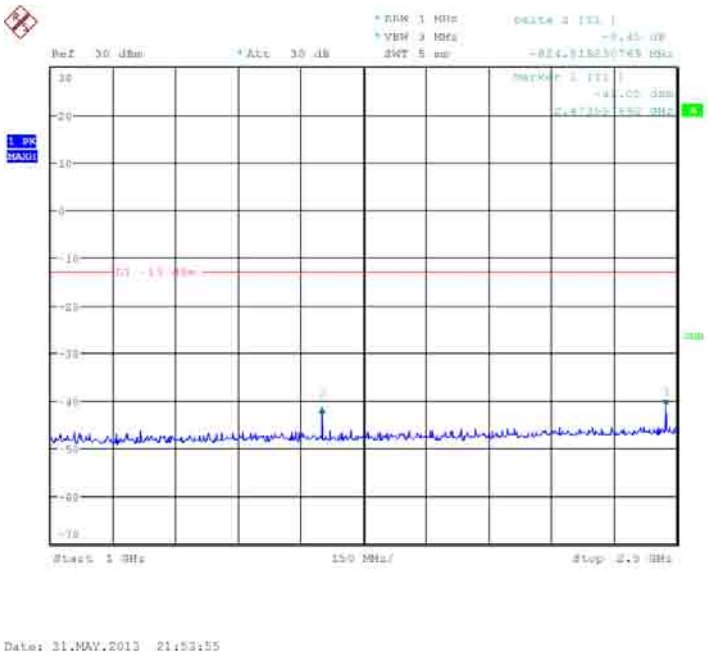
**Note: peak above the limit line is the carrier frequency.**

**A6.1.2.1 GSM850**



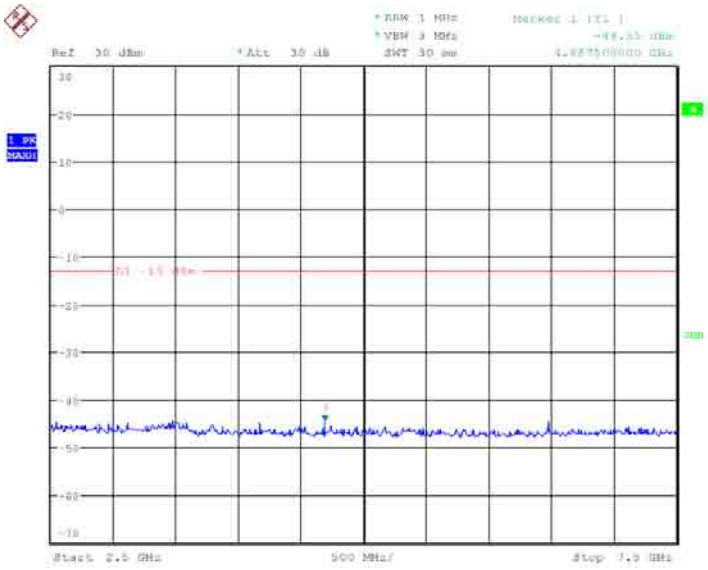
Date: 31.MAY.2013 21:53:26

**Channel 128: 30MHz~1GHz**

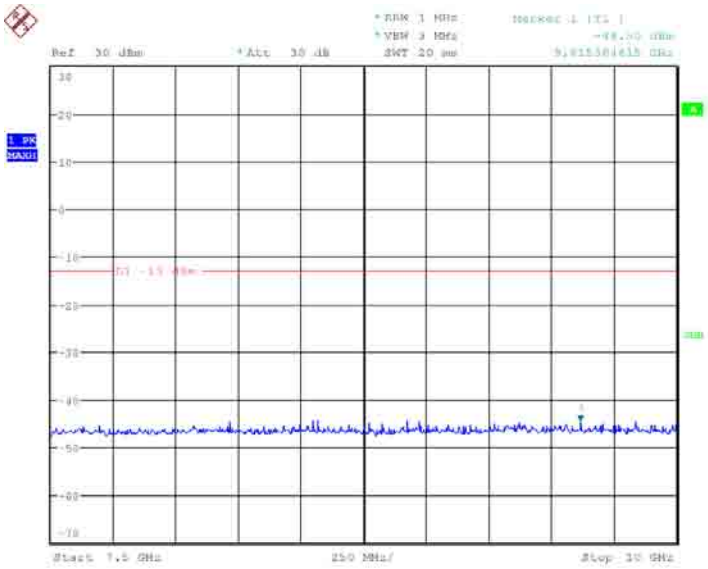


Date: 31.MAY.2013 21:53:55

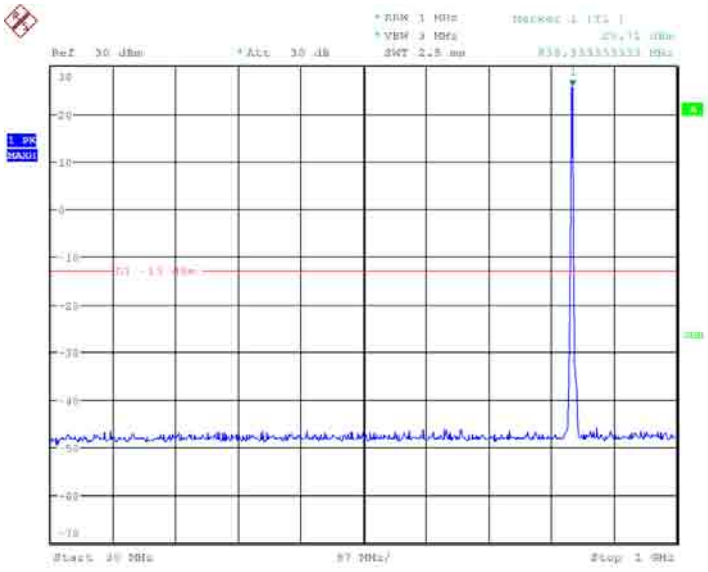
**Channel 128: 1GHz~2.5GHz**




**Channel 128: 2.5GHz~7.5GHz**

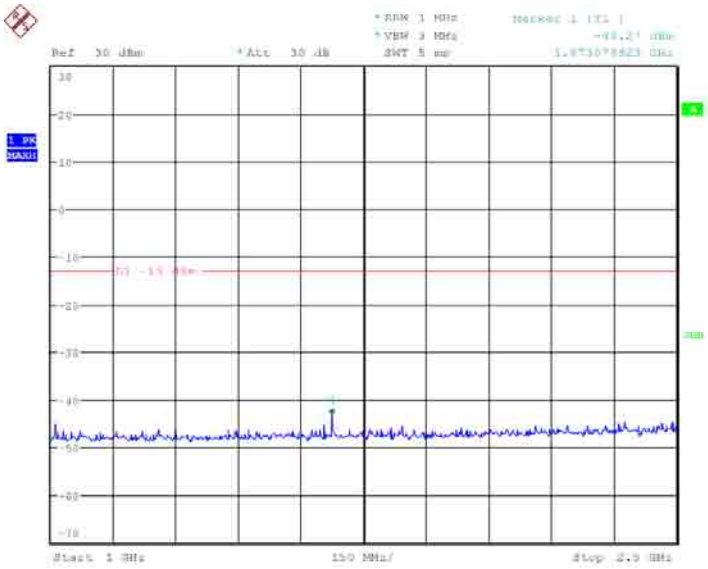



**Channel 128: 7.5GHz~10GHz**



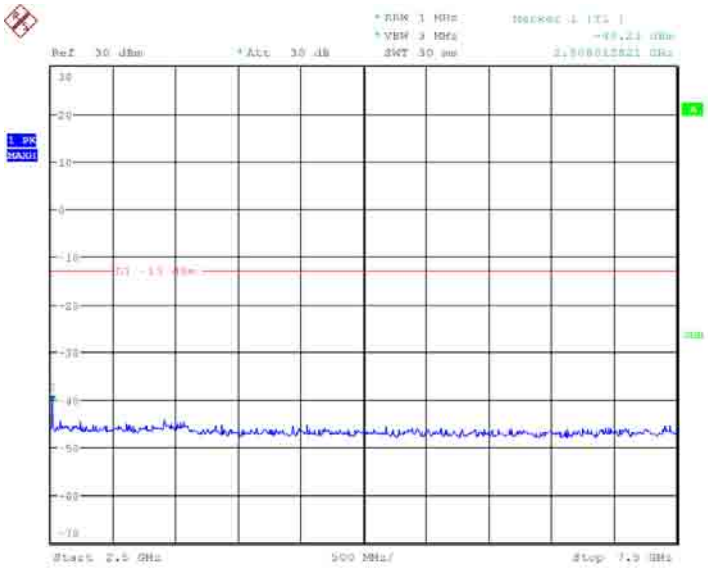

Date: 31.MAY.2013 21:55:43

**Channel 190: 30MHz~1GHz**



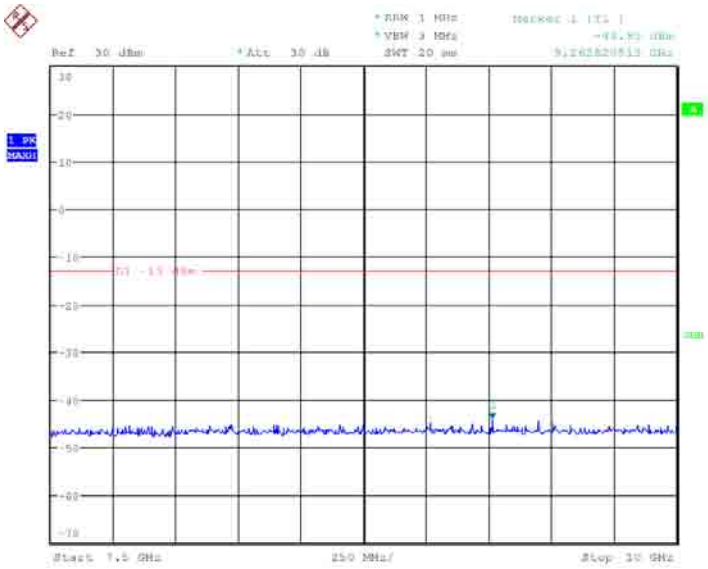

Date: 31.MAY.2013 21:56:17

**Channel 190: 1GHz~2.5GHz**



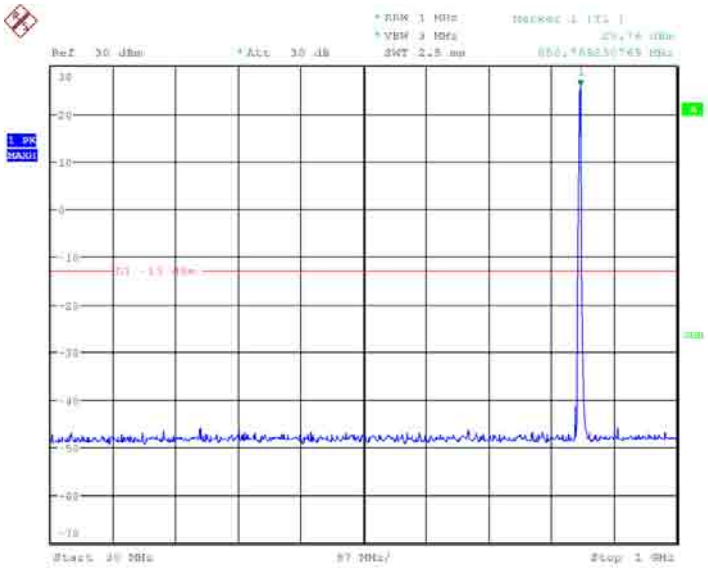

Date: 31.MAY.2013 21:56:44

**Channel 190: 2.5GHz~7.5GHz**

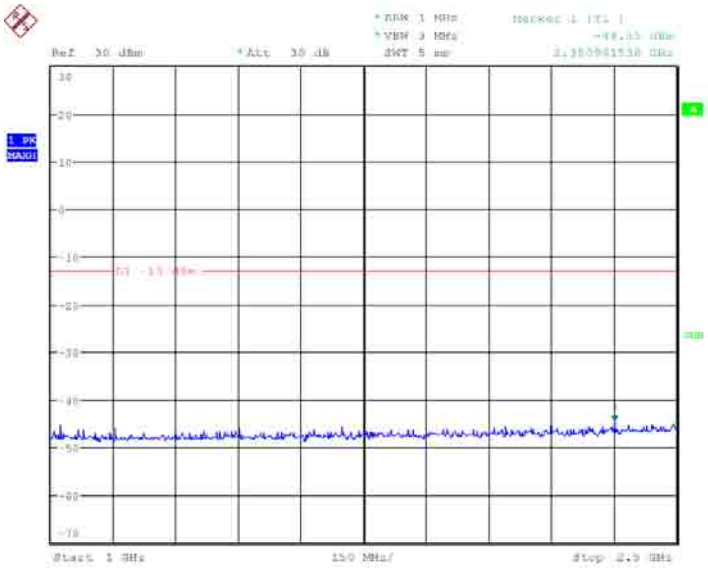



Date: 31.MAY.2013 21:57:06

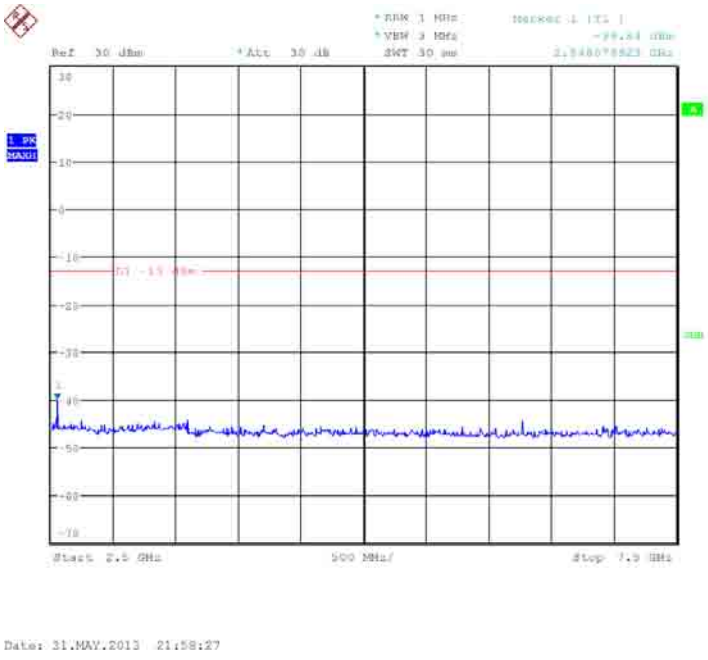
**Channel 190: 7.5GHz~10GHz**



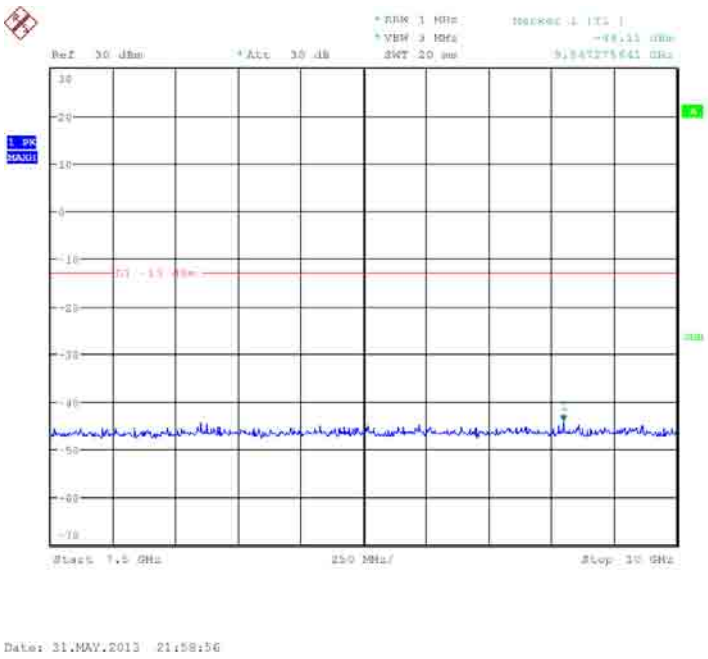

**Channel 251: 30MHz~1GHz**




**Channel 251: 1GHz~2.5GHz**

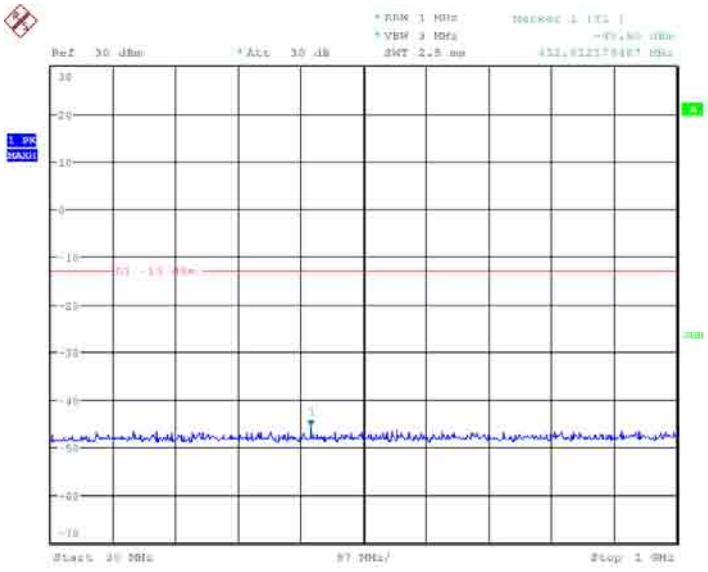



**Channel 251: 2.5GHz~7.5GHz**

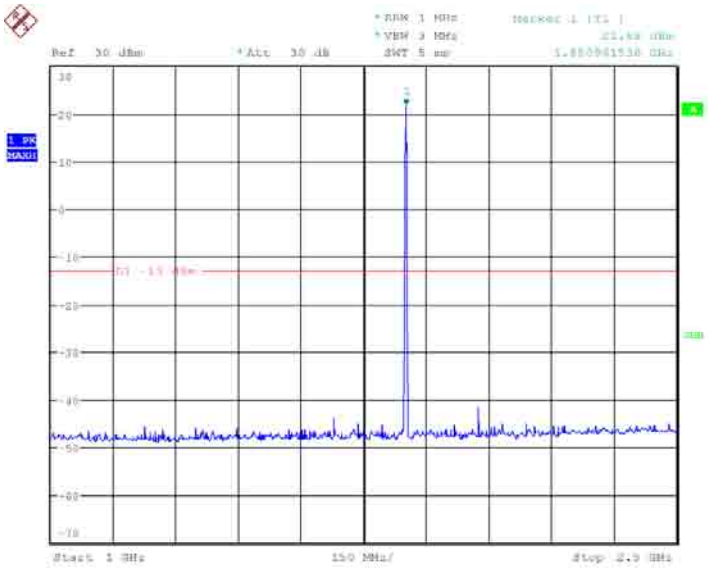



**Channel 251: 7.5GHz~10GHz**

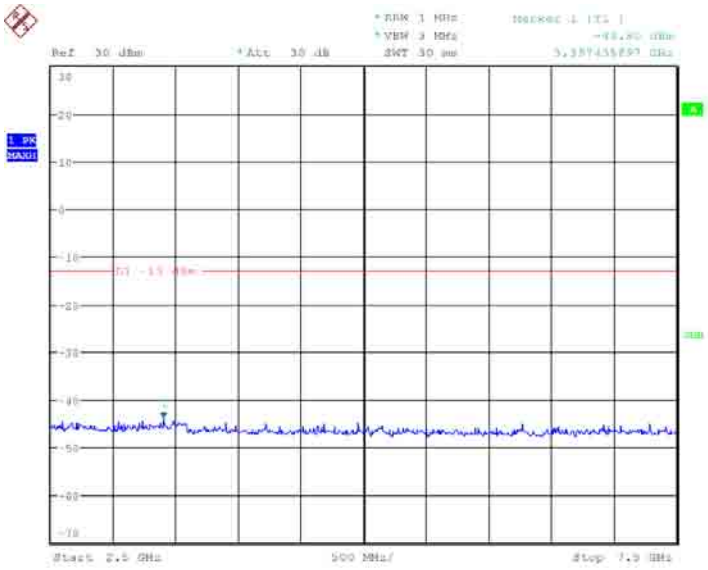
**A6.1.2.2 GSM1900**




**Channel 512: 30MHz~1GHz**

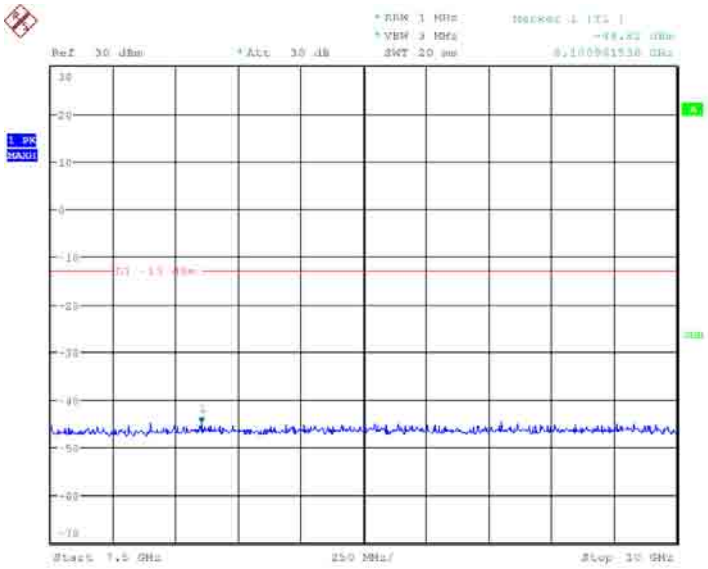



**Channel 512: 1GHz~2.5GHz**



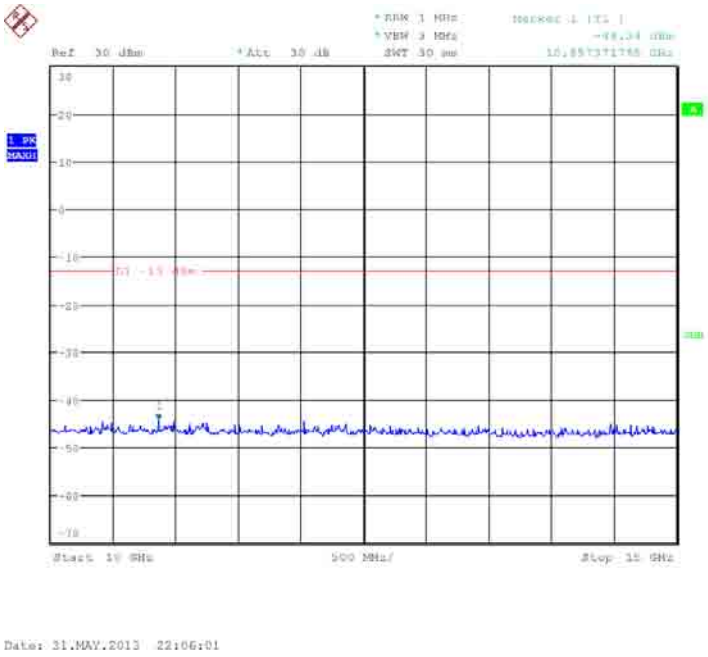

Date: 31.MAY.2013 22:04:59

**Channel 512: 2.5GHz~7.5GHz**

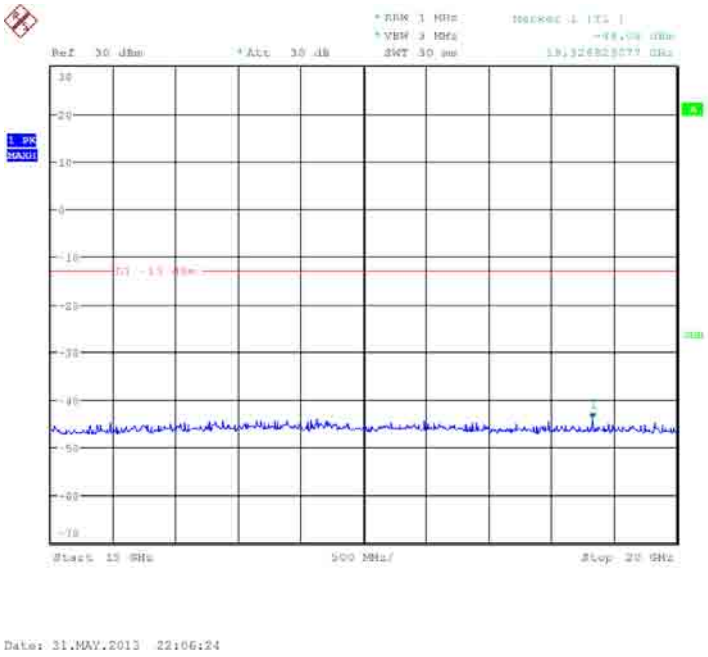



Date: 31.MAY.2013 22:05:29

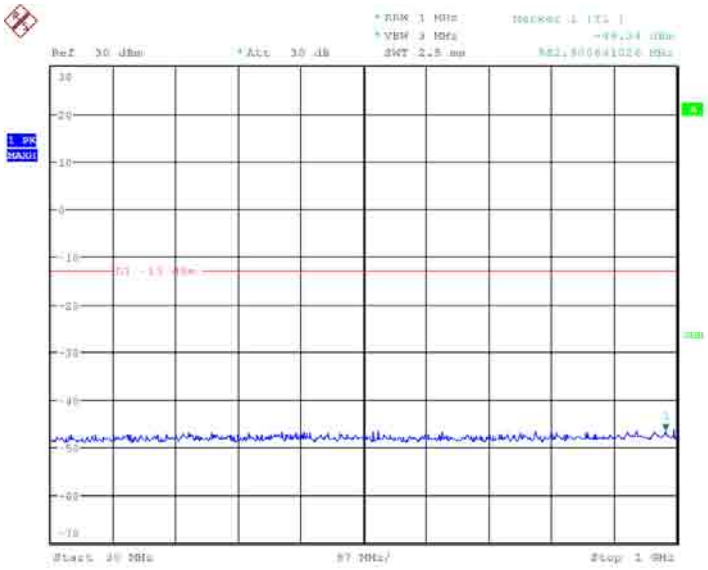
**Channel 512: 7.5GHz~10GHz**



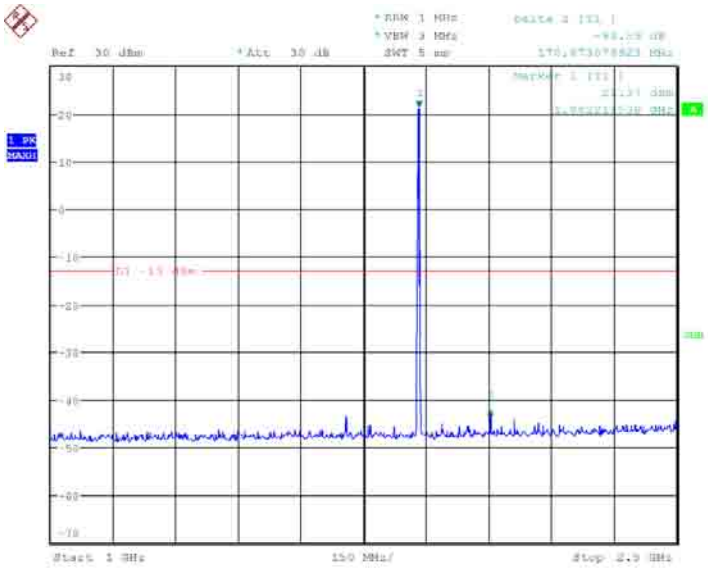

**Channel 512: 10GHz~15GHz**



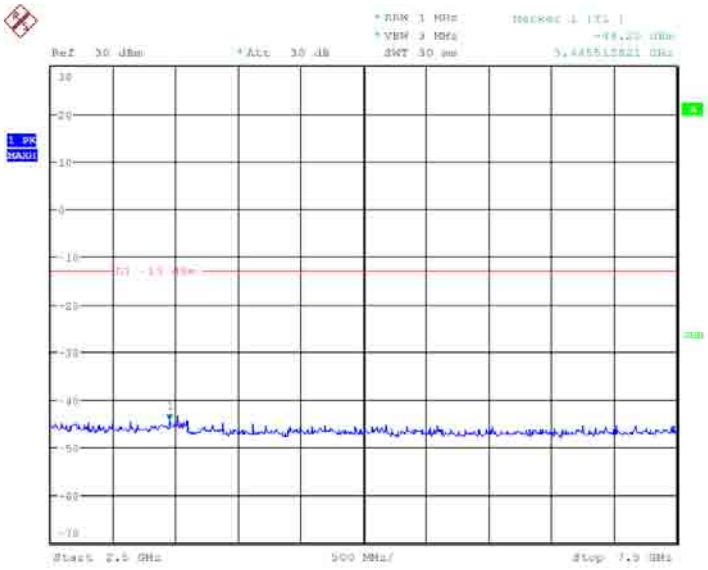

**Channel 512: 15GHz~20GHz**



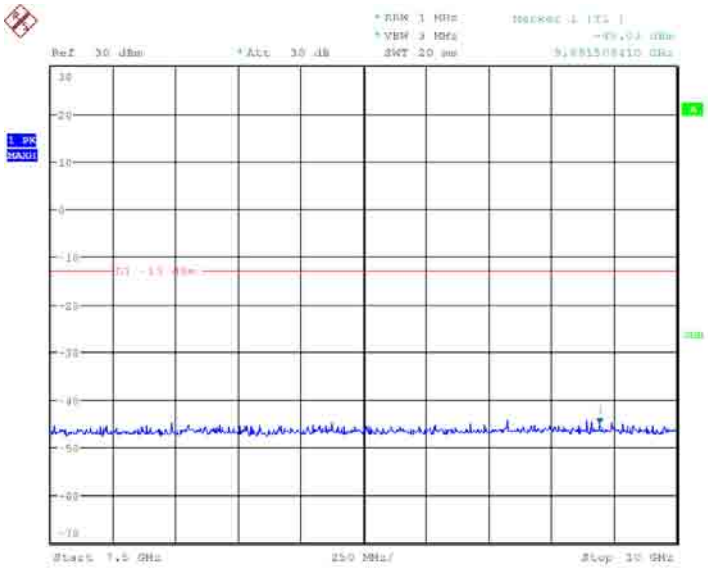

**Channel 661: 30MHz~1GHz**



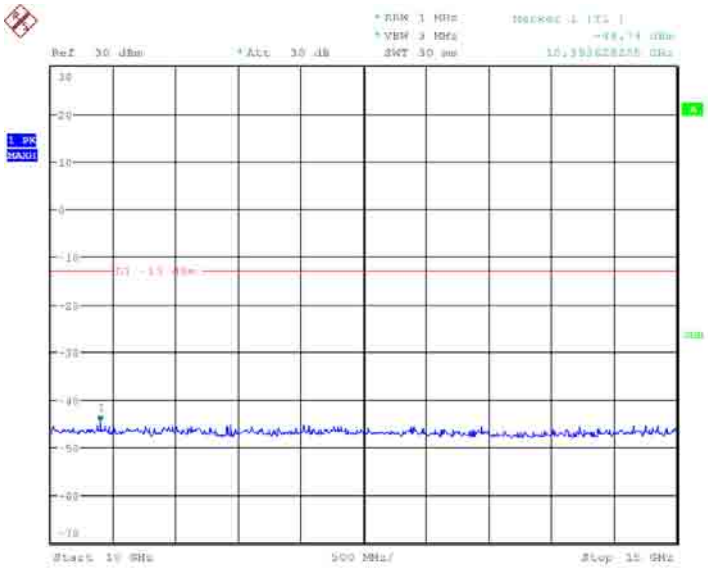

**Channel 661: 1GHz~2.5GHz**



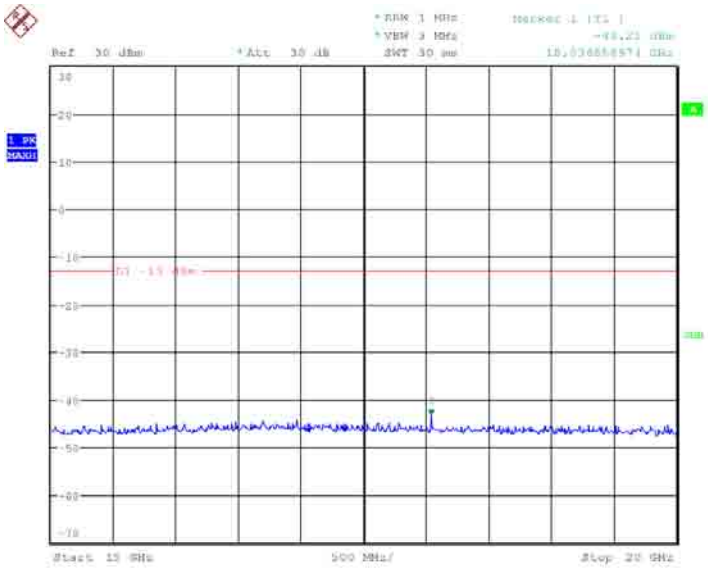

**Channel 661: 2.5GHz~7.5GHz**



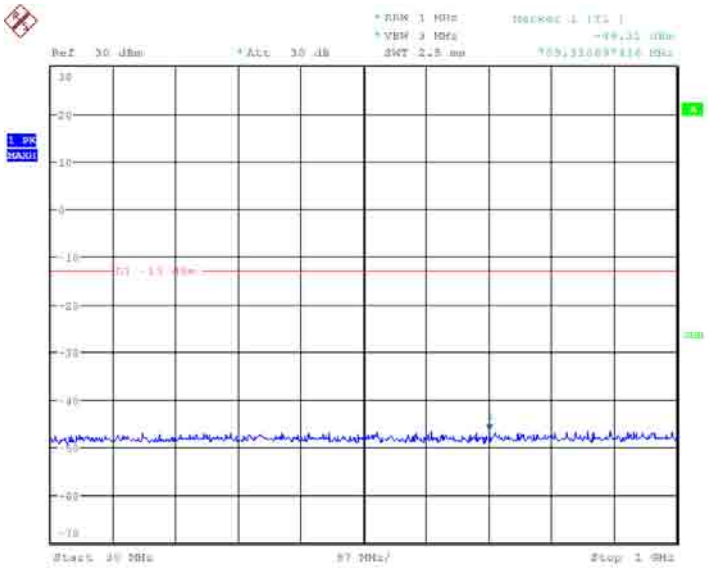

**Channel 661: 7.5GHz~10GHz**



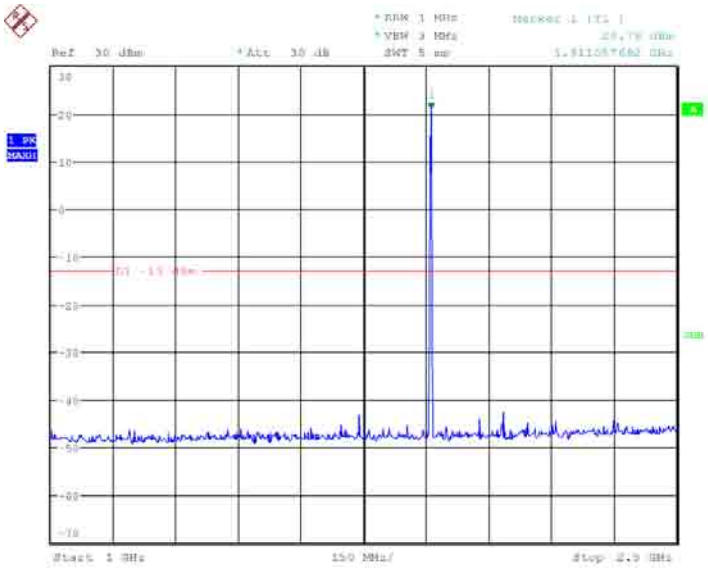

**Channel 661: 10GHz~15GHz**



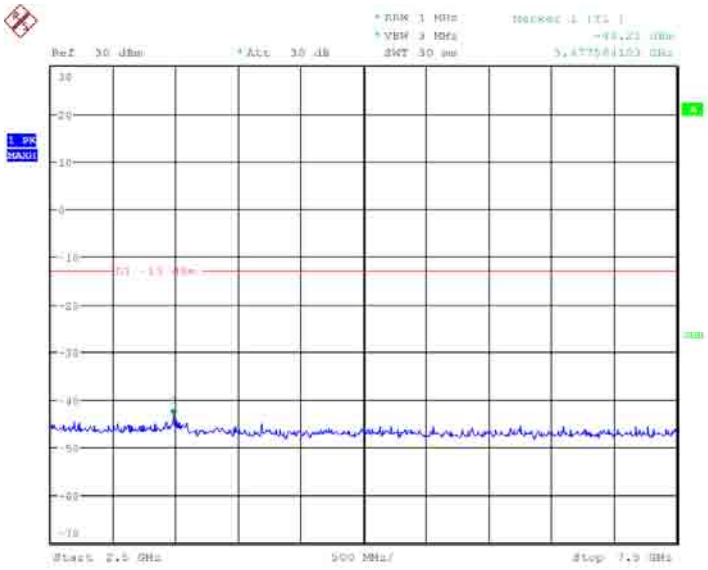

**Channel 661: 15GHz~20GHz**



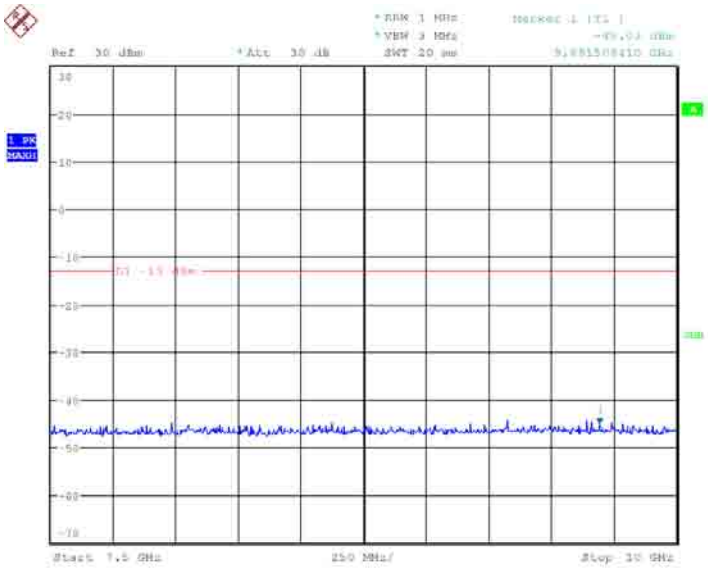

**Channel 810: 30MHz~1GHz**



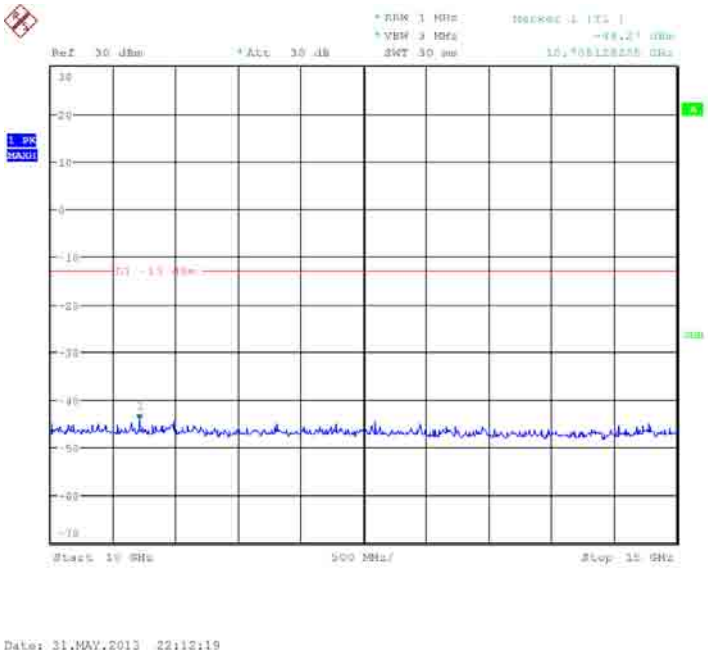

**Channel 810: 1GHz~2.5GHz**



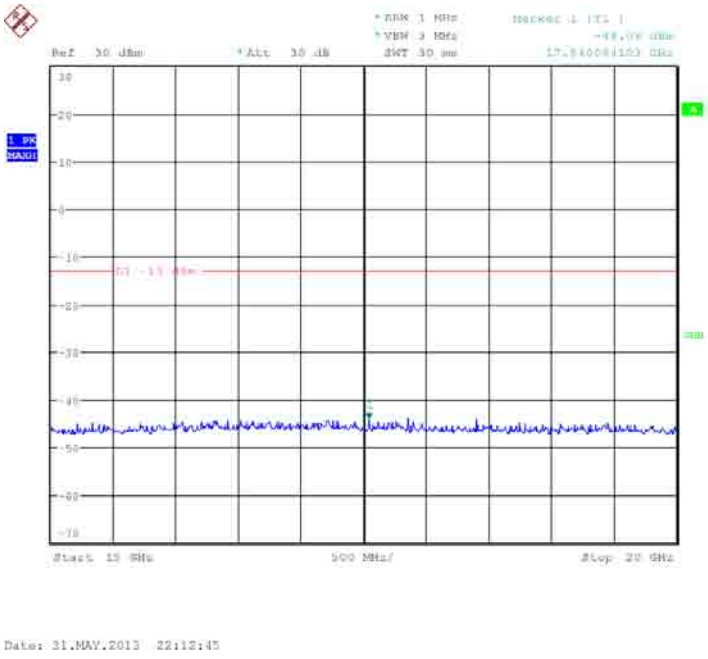

**Channel 810: 2.5GHz~7.5GHz**




**Channel 810: 7.5GHz~10GHz**




**Channel 810: 10GHz~15GHz**




**Channel 810: 15GHz~20GHz**

**Conclusion:PASS**

**A6.2 WCDMA Measurement Method**

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of WCDMA Band II, this equates to

a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For WCDMA Band V, data taken from 30 MHz to 10GHz.

2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.

3. The procedure to get the conducted spurious emission is as follows:

The trace mode is set to MaxHold to get the highest signal at each frequency;

Wait 25 seconds;

Get the result.

4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

**WCDMA Band IITransmitter**

| Channel | Frequency (MHz) |
|---|---|
| 9262 | 1852.40 |
| 9400 | 1880.00 |
| 9538 | 1907.60 |

**WCDMA Band V Transmitter**

| Channel | Frequency (MHz) |
|---|---|
| 4132 | 826.40 |
| 4183 | 836.60 |
| 4233 | 846.60 |

**A 6.2.1 Measurement Limit**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

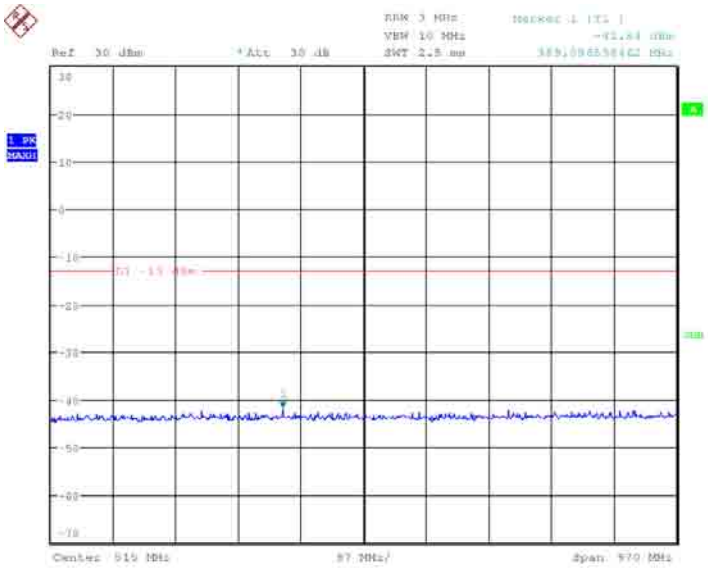
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**A 6.2.2 Measurement result**

**Spurious emission limit -13dBm.**

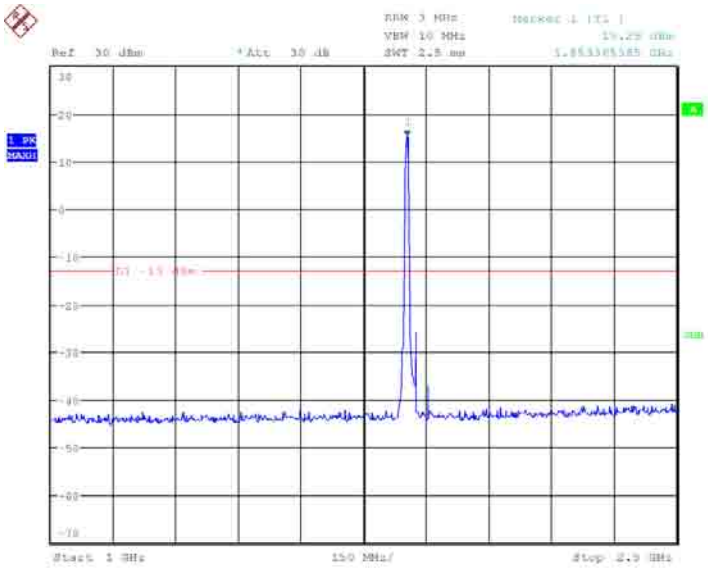
**Note: peak above the limit line is the carrier frequency.**

**A 6.2.2.1 WCDMA Band II**



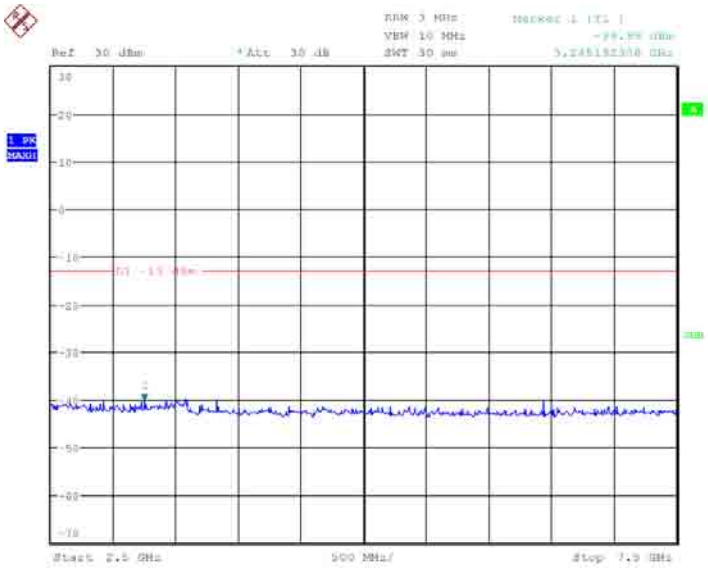

Date: 31.MAY.2013 17:16:01

**Channel 9262: 30MHz~1GHz**

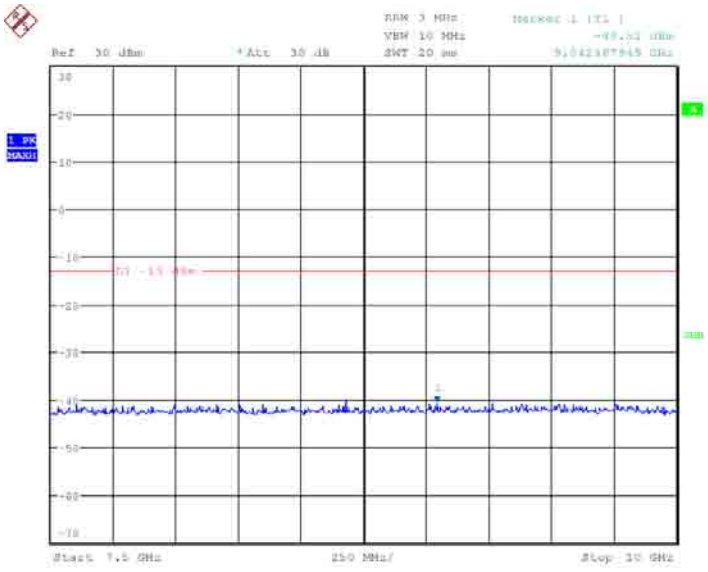



Date: 31.MAY.2013 17:16:33

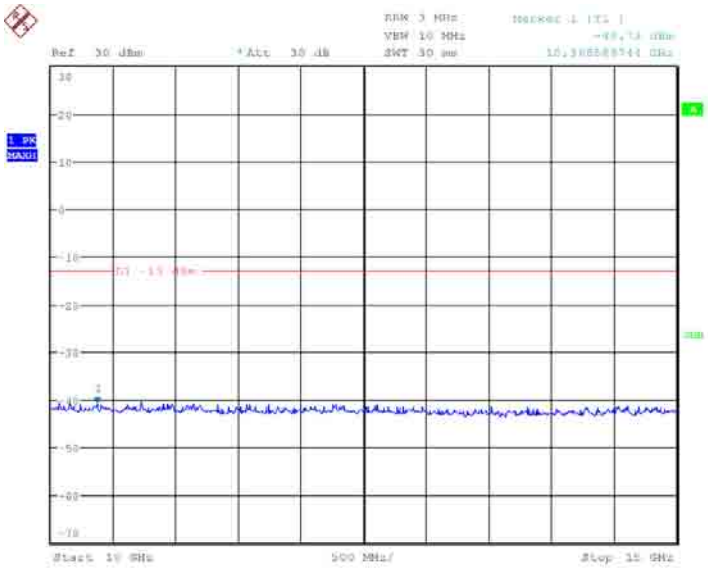
**Channel 9262:1GHz~2.5GHz**



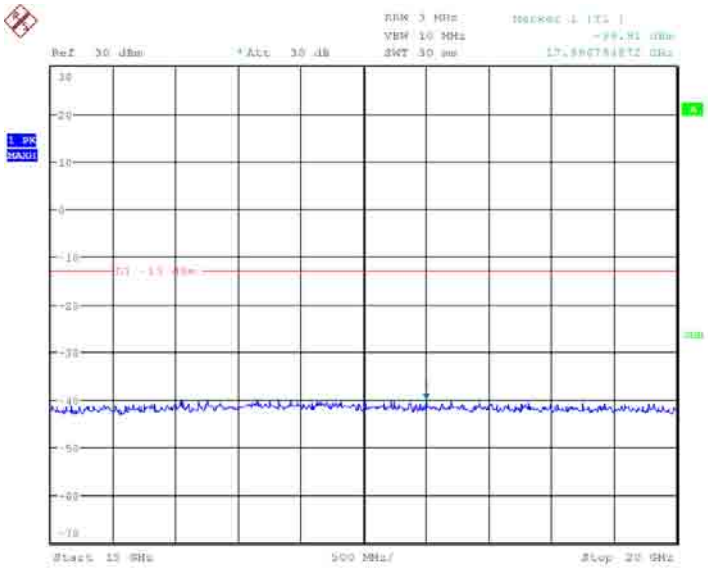

**Channel 9262: 2.5GHz~7.5GHz**



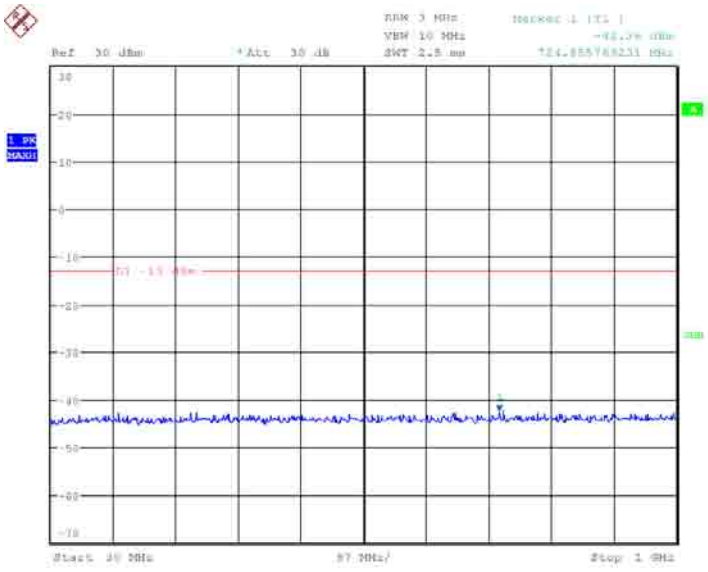

**Channel 9262: 7.5GHz~10GHz**



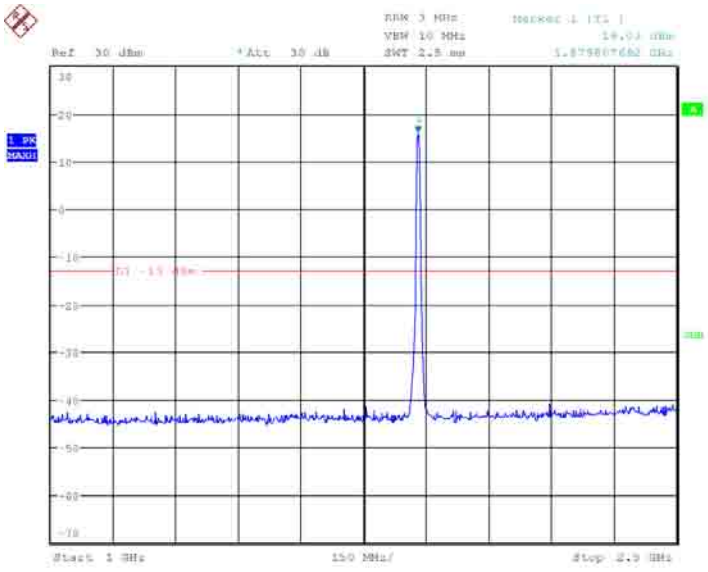

**Channel 9262: 10GHz~15GHz**



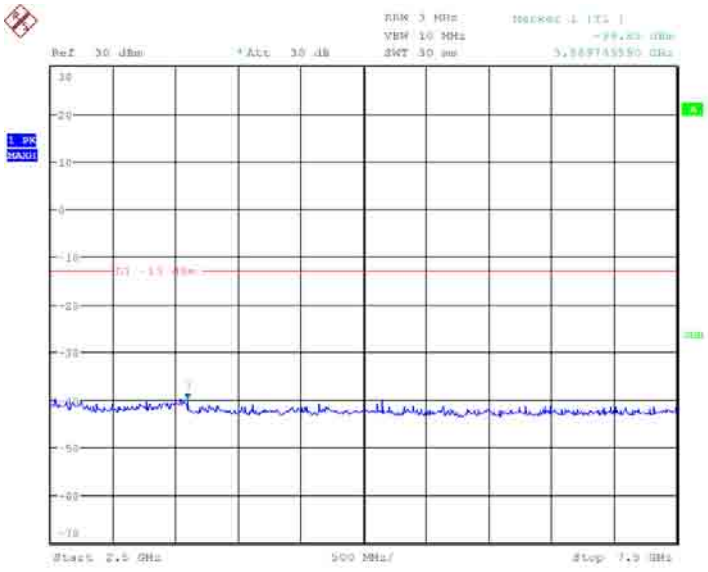

**Channel 9262: 15GHz~20GHz**




**Channel 9400: 30MHz~1GHz**

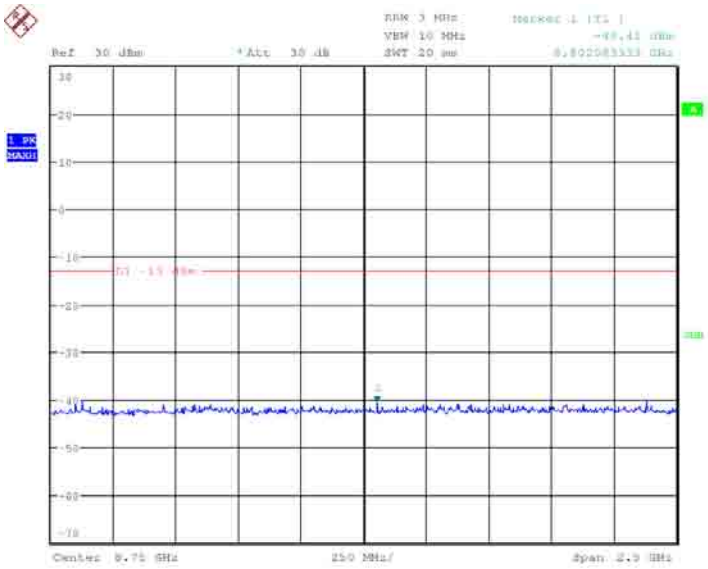



**Channel 9400:1GHz~2.5GHz**



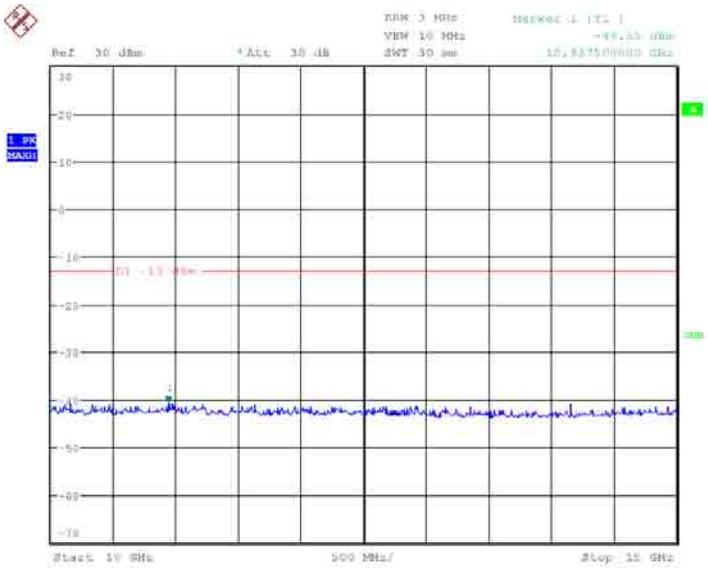

Date: 31.MAY.2013 17:21:31

**Channel 9400: 2.5GHz~7.5GHz**

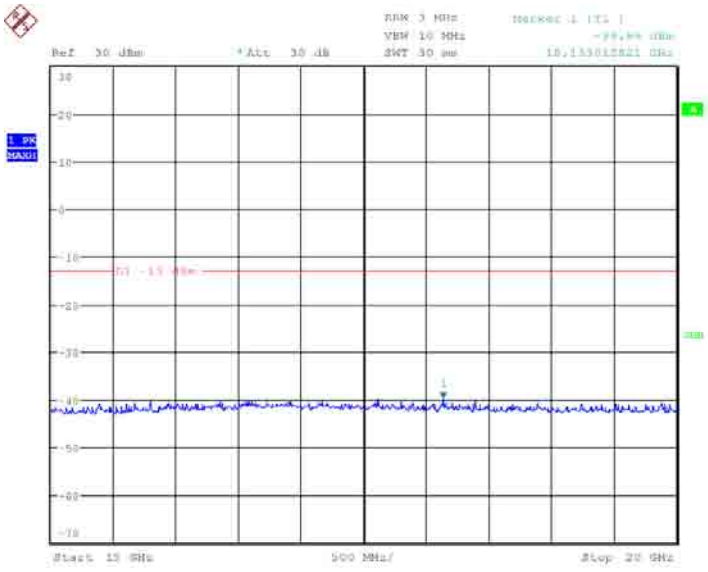



Date: 31.MAY.2013 17:22:05

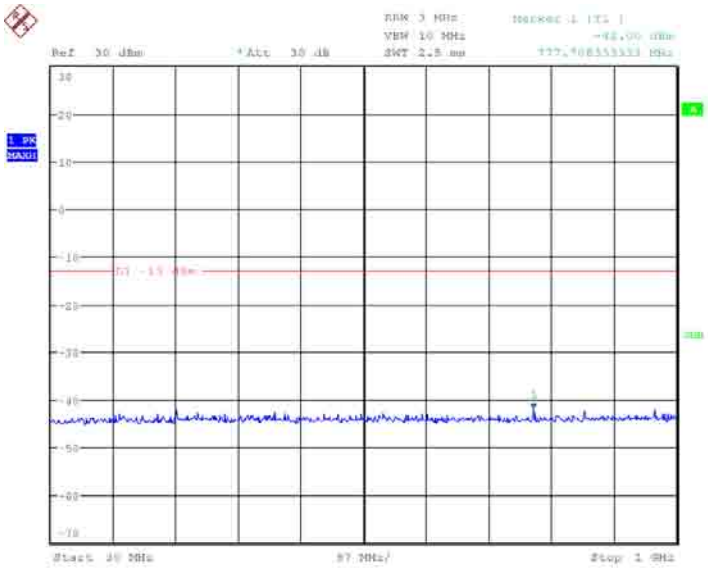
**Channel 9400: 7.5GHz~10GHz**




**Channel 9400: 10GHz~15GHz**

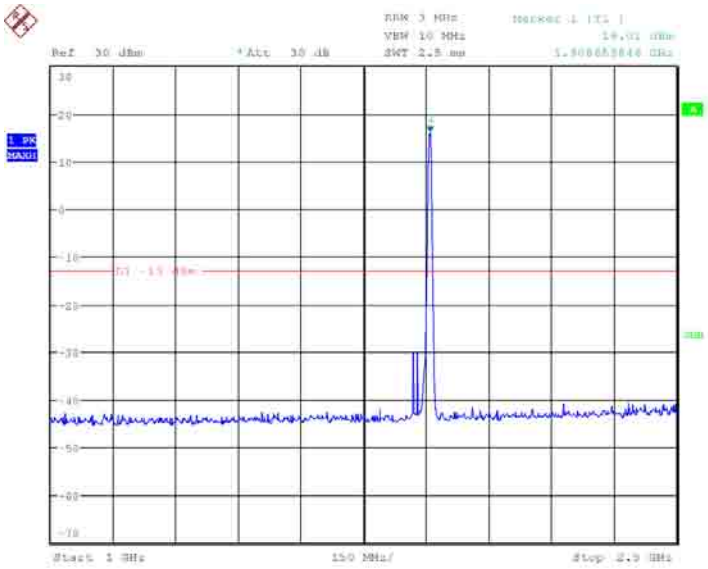



**Channel 9400: 15GHz~20GHz**



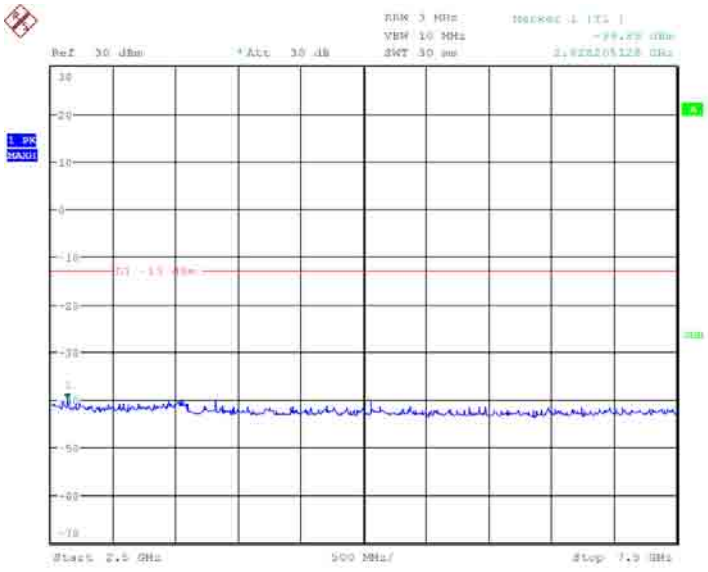

Date: 31.MAY.2013 17:23:45

**Channel 9538: 30MHz~1GHz**



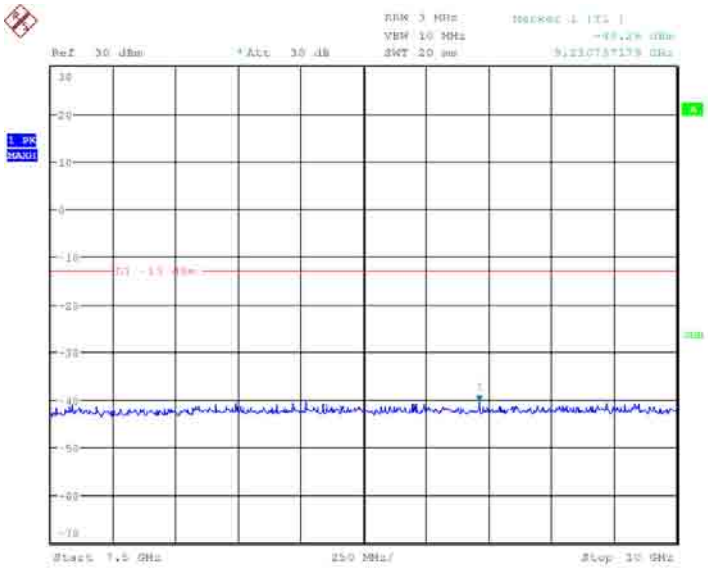

Date: 31.MAY.2013 17:24:13

**Channel 9538:1GHz~2.5GHz**



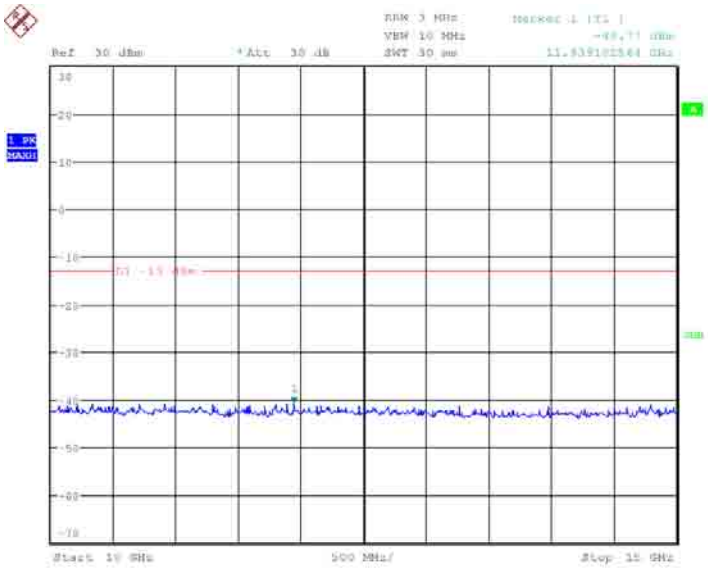

Date: 31.MAY.2013 17:24:56

**Channel 9538: 2.5GHz~7.5GHz**

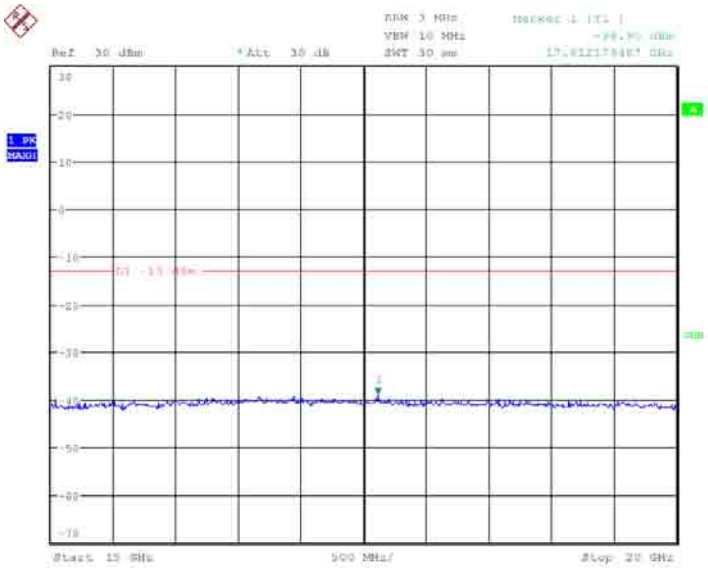



Date: 31.MAY.2013 17:25:24

**Channel 9538: 7.5GHz~10GHz**

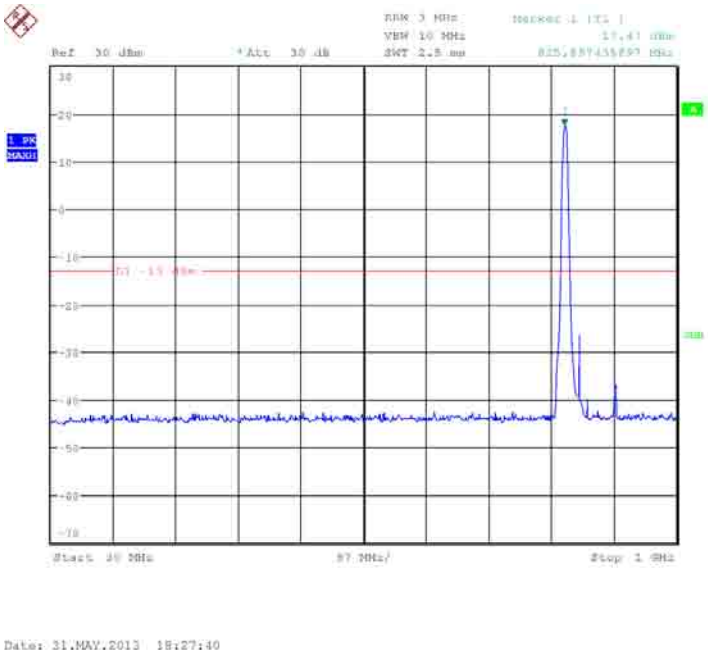



**Channel 9538: 10GHz~15GHz**

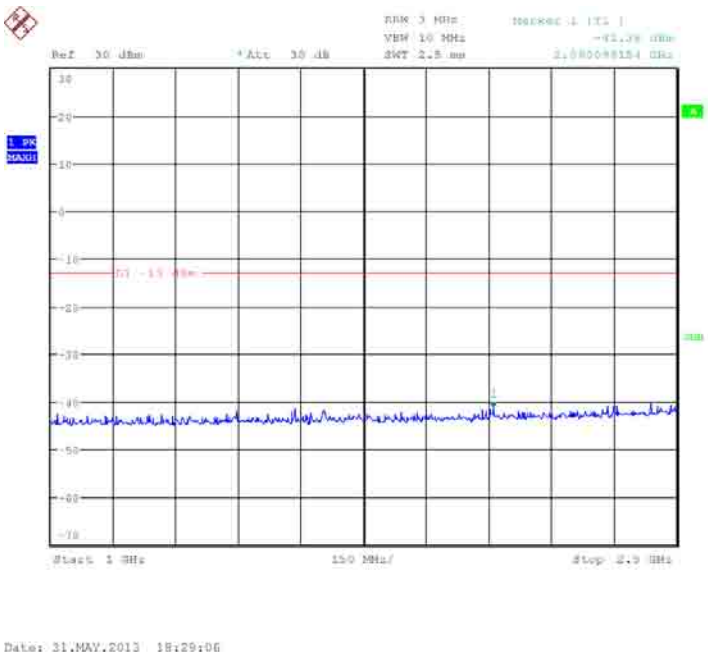



**Channel 9538: 15GHz~20GHz**

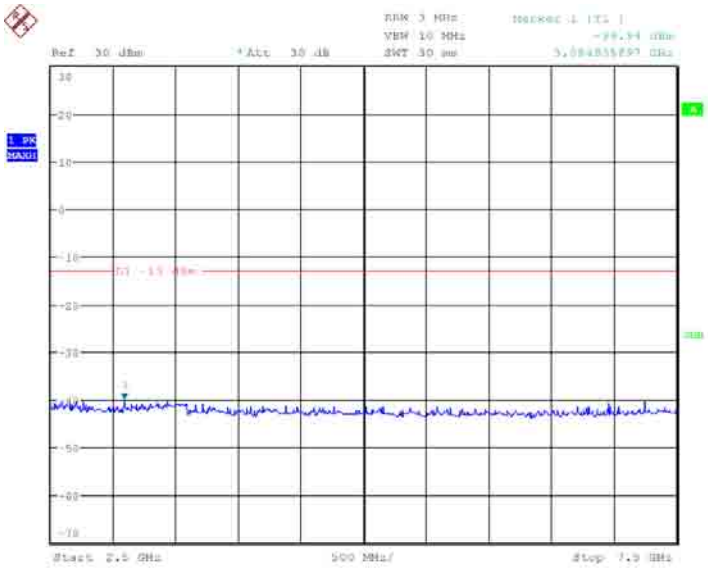
**A 6.2.2.2 WCDMA Band V**



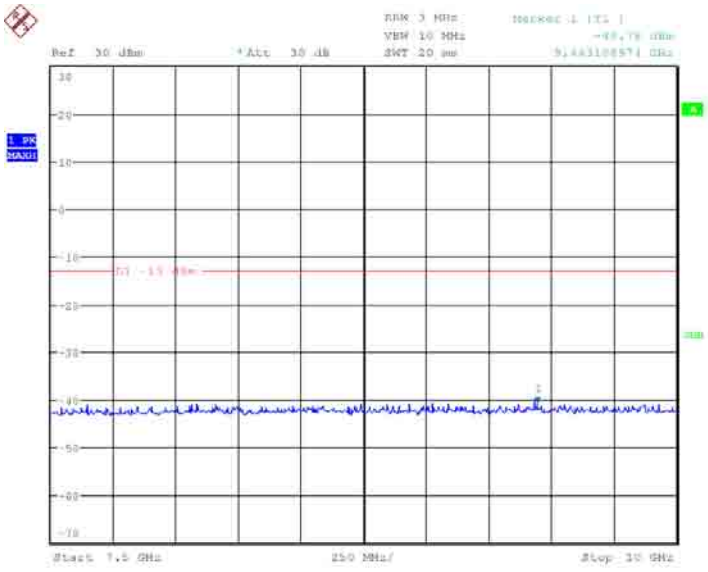

**Channel 4132: 30MHz~1GHz**



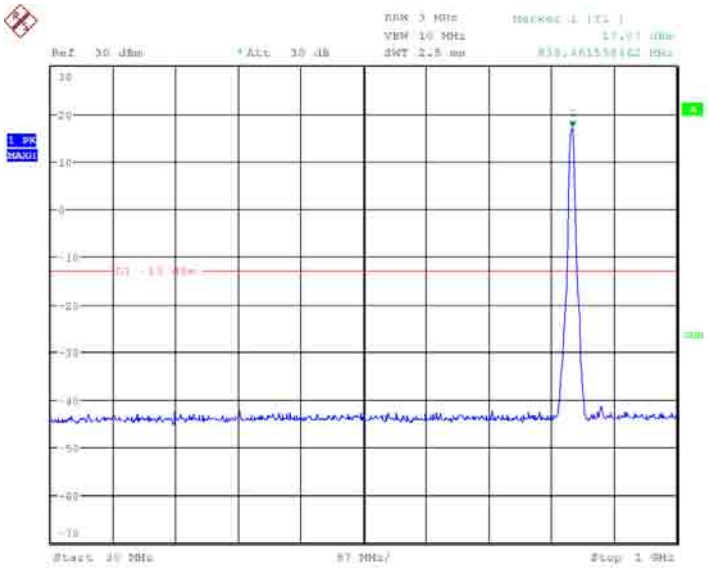

**Channel 4132:1GHz~2.5GHz**




**Channel 4132: 2.5GHz~7.5GHz**

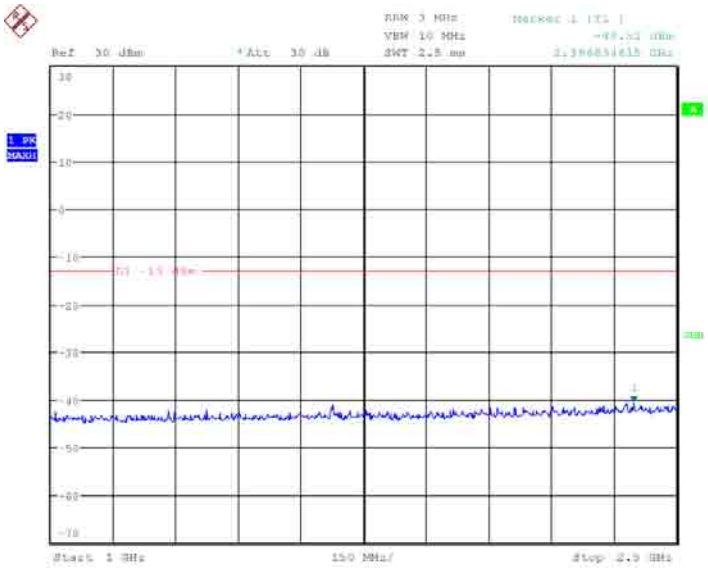



**Channel 4132: 7.5GHz~10GHz**



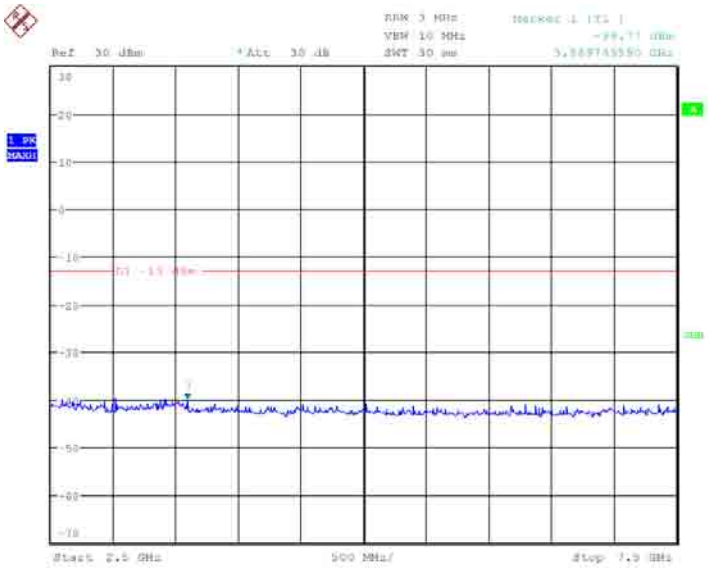

Date: 31.MAY.2013 18:39:09

**Channel 4183: 30MHz~1GHz**

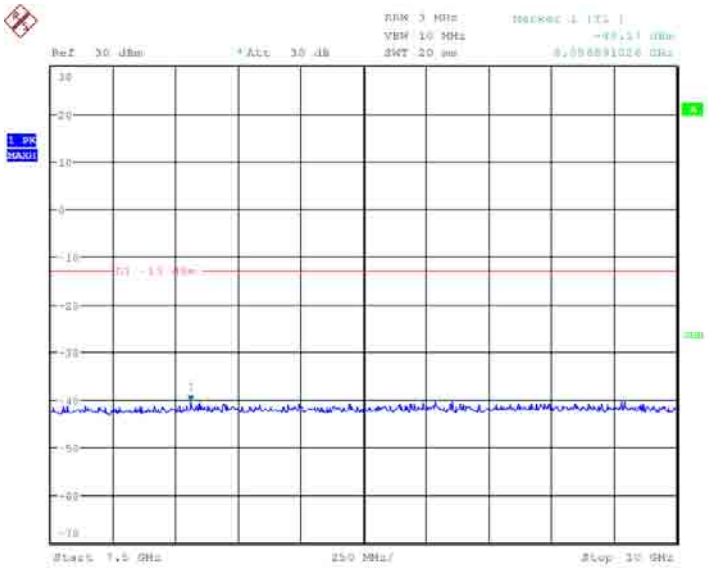



Date: 31.MAY.2013 21:26:09

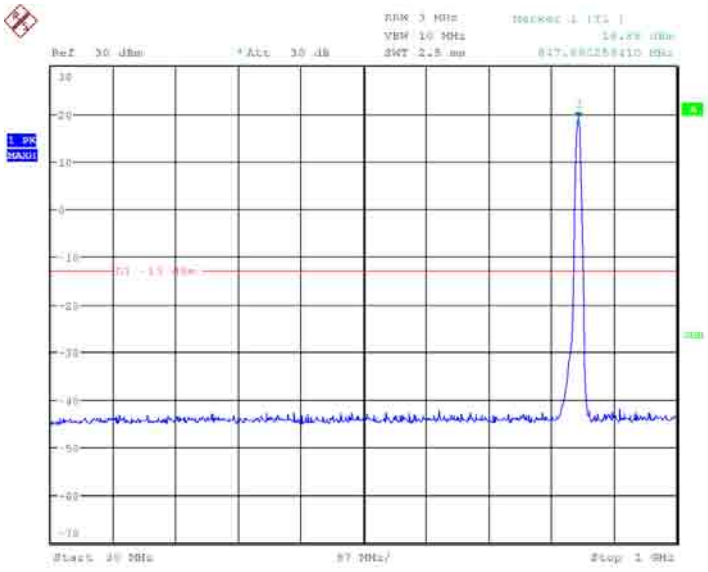
**Channel 4183:1GHz~2.5GHz**



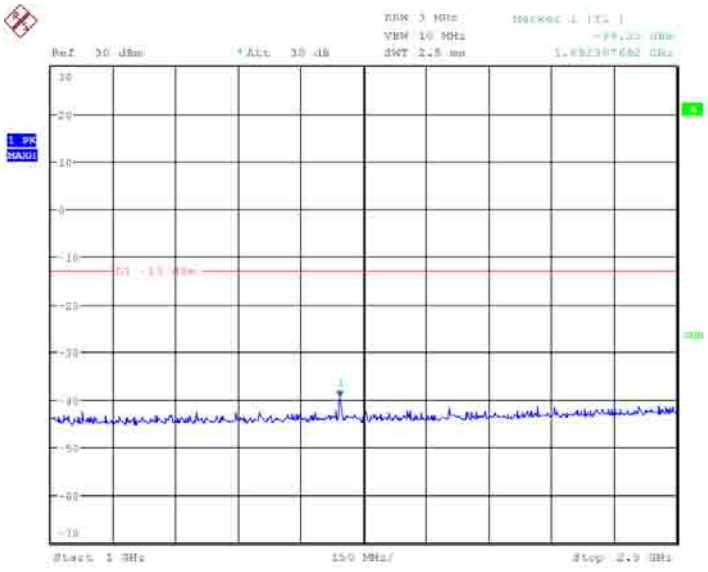

**Channel 4183: 2.5GHz~7.5GHz**



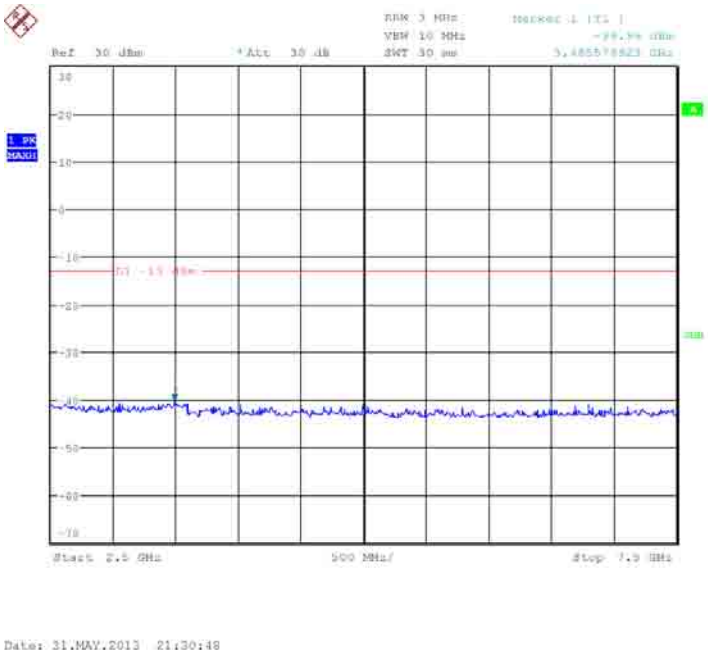

**Channel 4183: 7.5GHz~10GHz**



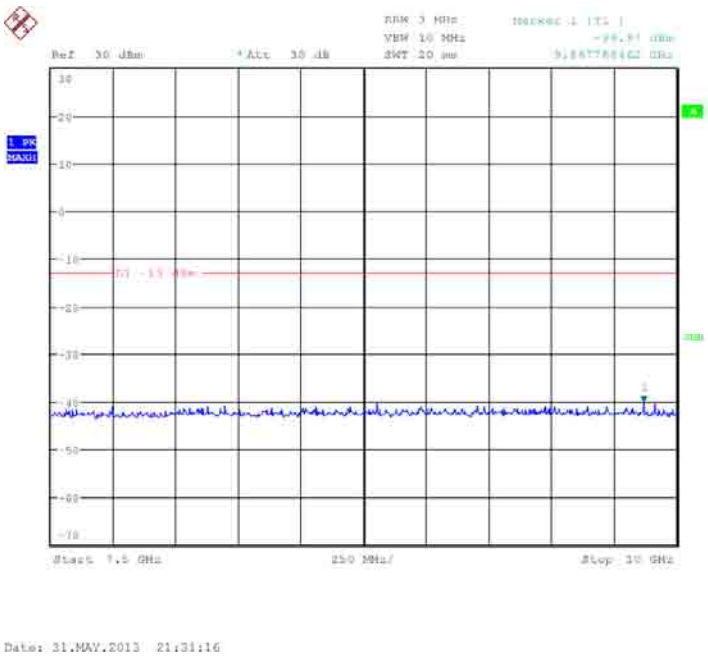

**Channel 4233: 30MHz~1GHz**




**Channel 4233:1GHz~2.5GHz**




**Channel 4233: 2.5GHz~7.5GHz**




**Channel 4233: 7.5GHz~10GHz**

**Conclusion: PASS**

## A.7 RADIATED

### A.7.1 ERP

#### A.7.1.1 GSM ERP

##### A.7.1.1.1 Description

This is the test for the maximum radiated power from the EUT.

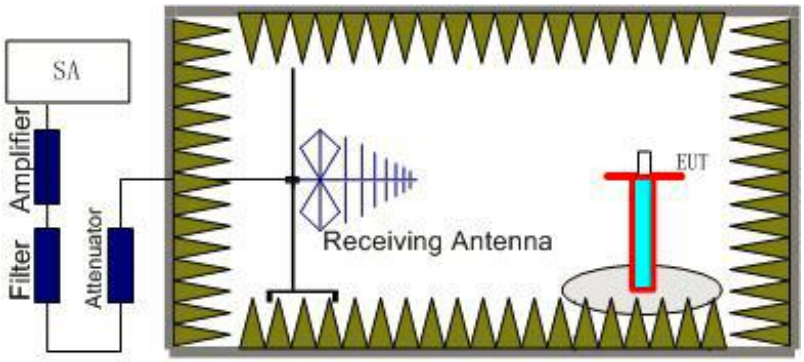
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 22.913(a) specifies ” The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

**A.7.1.1.2 Method of Measurement**

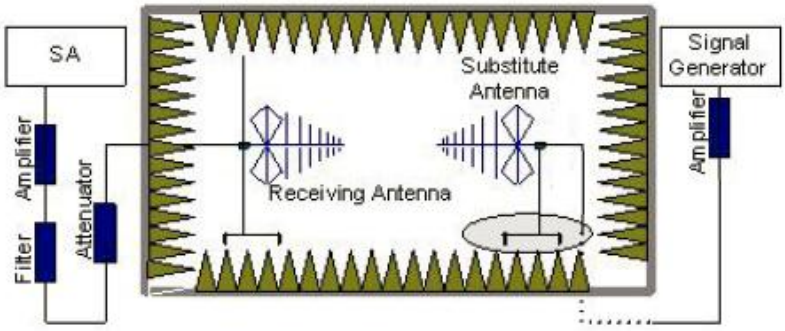
The measurements procedures in TIA-603C-2004 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.




2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.




In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ($P_{Mea}$) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded ($P_r$). The power of signal source ($P_{Mea}$) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna.

The cable loss ($P_{cl}$) ,the Substitution Antenna Gain ($G_a$) and the Amplifier Gain ($P_{Ag}$) should be recorded after test.

The measurement results are obtained as described below:

Power(EIRP)=$P_{Mea}$+ $P_{Ag}$ + $P_{cl}$ + $G_a$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

**GSM 850-ERP 22.913(a)**

**Limits**

| | Power Step | Burst Peak ERP (dBm) |
|---|---|---|
| GSM | 5 | ≤38.45dBm (7W) |
| GPRS | 3 | ≤38.45dBm (7W) |
| EDGE | 6 | ≤38.45dBm (7W) |

**Measurement result**

**GSM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBd) | Peak ERP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 824.2 | -32.64 | 3.05 | -69.40 | 3.11 | 30.6 | V |
| 836.6 | -36.74 | 3.05 | -69.40 | 3.11 | 30.5 | V |
| 848.8 | -34.94 | 3.05 | -69.40 | 3.11 | 29.7 | H |

**GPRS**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBd) | Peak ERP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 824.2 | -33.64 | 3.05 | -69.40 | 3.11 | 29.3 | H |
| 836.6 | -33.54 | 3.05 | -69.40 | 3.11 | 29.7 | V |
| 848.8 | -33.74 | 3.05 | -69.40 | 3.11 | 29.5 | H |

**EDGE**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBd) | Peak ERP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 824.2 | -38.84 | 3.05 | -69.40 | 3.11 | 24.5 | H |
| 836.6 | -39.04 | 3.05 | -69.40 | 3.11 | 24.2 | H |
| 848.8 | -38.74 | 3.05 | -69.40 | 3.11 | 24.5 | V |

Frequency**:** 836.6MHz

Peak ERP(dBm)= $P_{Mea}$(-33.54dBm) - $P_{cl}$(3.05dB) - $P_{Ag}$(-69.4dB) - $G_a$ (3.11dBd)

= 29.7dBm

**ANALYZER SETTINGS: RBW = VBW = 3MHz**

**PCS 1900-EIRP 24.232(c)**

**Limits**

| | Power Step | Burst Peak ERP (dBm) |
|---|---|---|
| GSM | 0 | ≤33dBm (2W) |
| EDGE | 5 | ≤33dBm (2W) |
| GPRS | 3 | ≤33dBm (2W) |

**Measurement result**

**GSM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ AntennaGain(dBi) | Peak EIRP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 1850.2 | -41.89 | 3.54 | -69.40 | -2.9 | 29.02 | H |
| 1880.0 | -41.76 | 3.54 | -69.40 | -2.9 | 29.15 | H |
| 1909.8 | -41.96 | 3.54 | -69.40 | -2.9 | 28.95 | H |

**GPRS**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBi) | Peak EIRP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 1850.2 | -42.68 | 3.54 | -69.40 | -2.9 | 28.23 | H |
| 1880.0 | -42.63 | 3.54 | -69.40 | -2.9 | 28.08 | H |
| 1909.8 | -42.56 | 3.54 | -69.40 | -2.9 | 28.35 | H |

**EDGE**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBi) | Peak EIRP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 1850.2 | -45.84 | 3.54 | -69.40 | -2.9 | 24.47 | H |
| 1880.0 | -46.14 | 3.54 | -69.40 | -2.9 | 24.77 | H |
| 1909.8 | -46.08 | 3.54 | -69.40 | -2.9 | 24.83 | H |

Frequency**:** 1850.2MHz

Peak EIRP(dBm)= $P_{Mea}$(-41.89dBm) - $P_{cl}$(3.54dB) - $P_{Ag}$(-69.4dB) - $G_a$ (-2.9dB)+2.15dBi=29.02dBm

**ANALYZER SETTINGS: RBW = VBW = 3MHz**

**A.7.1.2 WCDMA ERP**

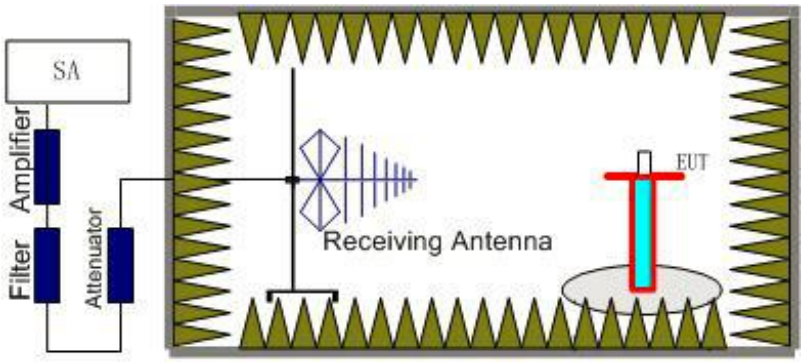
**A.7.1.2.1 Description**

This is the test for the maximum radiated power from the EUT.
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."
Rule Part 22.913(a) specifies ” The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

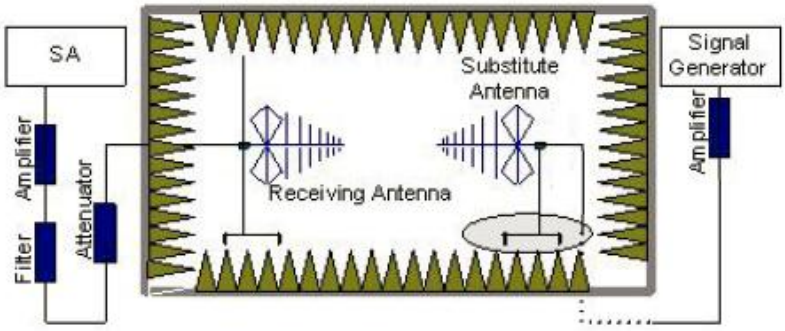
**A.7.1.2.2 Method of Measurement**

The measurements procedures in TIA-603C-2004 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.




2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.




In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ($P_{Mea}$) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded ($P_r$). The power of signal source ($P_{Mea}$) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
4. A amplifier should be connected to the Signal Source output port. And the cable should be

connect between the Amplifier and the Substitution Antenna.
The cable loss ($P_{cl}$) ,the Substitution Antenna Gain ($G_a$) and the Amplifier Gain ($P_{Ag}$) should be recorded after test.
The measurement results are obtained as described below:
Power(EIRP)=$P_{Mea}$+ $P_{Ag}$ + $P_{cl}$ + $G_a$
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

**WCDMA Band II-EIRP**

**Limit**

| | Burst Peak EIRP (dBm) |
|---|---|
| WCDMA Band II | ≤33dBm (2W) |

Measurement result

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBi) | Peak EIRP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 1852.4 | -45.88 | 3.54 | -69.4 | -2.9 | 25.03 | V |
| 1880.0 | -45.08 | 3.54 | -69.4 | -2.9 | 25.23 | H |
| 1907.6 | -45.77 | 3.54 | -69.4 | -2.9 | 25.14 | H |

Frequency**:** 1852.40MHz
Peak EIRP(dBm)= $P_{Mea}$(-45.88dBm)- $P_{cl}$(3.54dB)- $P_{Ag}$(-69.4dB)-$G_a$ (-2.9dB)+2.15dBi =25.03dBm
**ANALYZER SETTINGS: RBW = VBW = 5MHz**

**WCDMA Band V-ERP**

**Limits**

| | Burst Peak EIRP (dBm) |
|---|---|
| WCDMA Band V | ≤38.45dBm (7W) |

**Measurement result**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ Antenna Gain(dBd) | Peak ERP (dBm) | Polarization |
|---|---|---|---|---|---|---|
| 826.4 | -46.55 | 3.05 | -69.4 | -2.9 | 22.7 | H |
| 836.6 | -46.45 | 3.05 | -69.4 | -2.9 | 22.8 | H |
| 846.6 | -44.55 | 3.05 | -69.4 | -2.9 | 23.5 | H |

Frequency**:** 846.60 MHz
Peak ERP(dBm)= $P_{Mea}$(-46.55dBm)- $P_{cl}$(3.05dB)- $P_{Ag}$(-69.4dB)-$G_a$ (-2.9dB)=22.7dBm
**ANALYZER SETTINGS: RBW = VBW = 5MHz**

**A.7.2 EMISSION LIMIT (§2.1051/§22.917§24.238)**

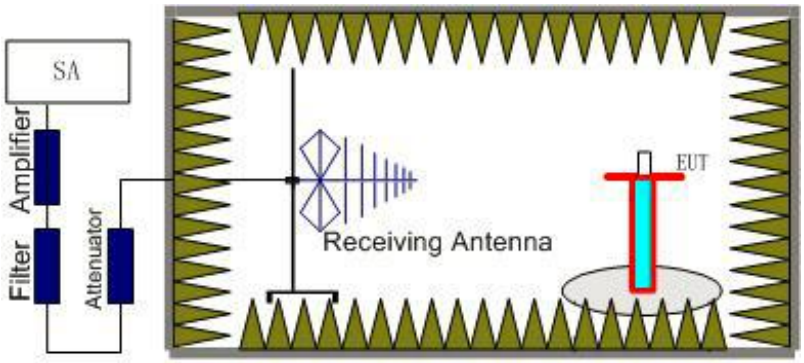
**A.7.2.1 GSM Measurement Method**

The measurement procedures in TIA-603C-2004 are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238 and Part 22.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of PCS1900 and GSM850.

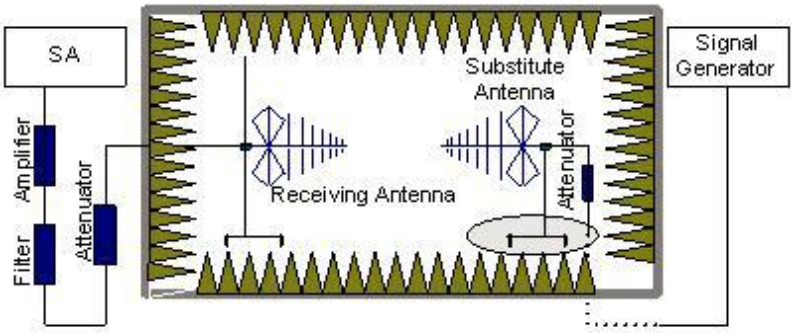
**The procedure of radiated spurious emissions is as follows:**

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10$^{th}$ harmonic were measured with peak detector.




2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.




In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ($P_{Mea}$) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded ($P_r$). The power of signal source ($P_{Mea}$) is recorded. The

test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss ($P_{pl}$) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain ($G_a$) should be recorded after test.

A amplifier should be connected in for the test.

The Path loss ($P_{pl}$) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

Power(EIRP)=$P_{Mea}$+ $P_{pl}$ + $G_a$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi

**A.7.2.1.1 Measurement Limit**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**A.7.2.1.2 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) and GSM850 band (824.2MHz, 836.6MHz, 848.8MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the PCS1900 ,GSM850 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

**A.7.2.1.3 Measurement Results**

**Table:**

| Frequency | Channel | Frequency Range | Result |
|---|---|---|---|
| **GSM850** | Low | 30MHz~10GHz | P |
| | Middle | 30MHz~10GHz | P |
| | High | 30MHz~10GHz | P |
| **GSM1900** | Low | 30MHz~20GHz | P |
| | Middle | 30MHz~20GHz | P |
| | High | 30MHz~20GHz | P |

**GSM Mode Channel 128**

**Final result:**

| Frequency (MHz) | PMea (dBm) | Path Loss | Antenna Gain | Correction dBm | Peak ERP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 824.236 | -27.01 | 3.05 | -3.11 | 2.15 | -29.1 | -13 | H |
| 836.652 | -23.91 | 3.05 | -3.11 | 2.15 | -26 | -13 | H |
| 1648.2 | -37.68 | 3.07 | -3.4 | 2.15 | -39.5 | -13 | H |
| 2472.6 | -38.38 | 3.57 | -3.7 | 2.15 | -40.4 | -13 | H |
| 4120.2 | -44.59 | 4.26 | -7.4 | 2.15 | -43.6 | -13 | H |
| 3296.4 | -49.57 | 4.18 | -4.9 | 2.15 | -51 | -13 | H |

**GSM Mode Channel 190**

**Final result:**

| Frequency (MHz) | PMea (dBm) | Path Loss | Antenna Gain | Correction dBm | Peak ERP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 3346.2 | -29.07 | 4.18 | -4.9 | 2.15 | -30.5 | -13 | V |
| 4183.8 | -26.49 | 4.26 | -7.7 | 2.15 | -25.2 | -13 | H |
| 5019.6 | -41.82 | 4.43 | -9 | 2.15 | -39.4 | -13 | H |
| 6692.8 | -46.32 | 5.83 | -12.3 | 2.15 | -42 | -13 | H |

**GSM Mode Channel 251**

**Final result:**

| Frequency (MHz) | PMea (dBm) | Path Loss | Antenna Gain | Correction dBm | Peak ERP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 3394.8 | -31.41 | 4.24 | -4.9 | 2.15 | -32.9 | -13 | V |
| 4243.8 | -28.85 | 4.4 | -7.7 | 2.15 | -27.7 | -13 | H |
| 5092.8 | -39.22 | 4.83 | -9 | 2.15 | -37.2 | -13 | H |
| 6789.6 | -43.6 | 5.85 | -12.3 | 2.15 | -39.3 | -13 | V |

**GSM Mode Channel 512**

**Final result:**

| Frequency (MHz) | PMea (dBm) | Path Loss | Antenna Gain | Correction dBm | Peak EIRP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 3700.2 | -48.33 | 4.42 | -6.2 | 2.15 | -48.7 | -13 | V |
| 5550.6 | -53.51 | 5.24 | -9.5 | 2.15 | -51.4 | -13 | V |
| 7399.2 | -58.92 | 6.13 | -14.6 | 2.15 | -52.6 | -13 | H |

**GSM Mode Channel 661**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Correction dBm | Peak EIRP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 3759.6 | -48.66 | 4.59 | -6.2 | 2.15 | -49.2 | -13 | V |
| 5640.6 | -48.83 | 5.62 | -9.5 | 2.15 | -47.1 | -13 | H |

**GSM Mode Channel 810**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Correction dBm | Peak EIRP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|---|
| 3819 | -51.15 | 4.3 | -7.2 | 2.15 | -50.4 | -13 | V |
| 5729.4 | -52.14 | 5.71 | -10.5 | 2.15 | -49.5 | -13 | H |

**Conclusion: PASS**

**Note: Testing in several polarization directions, EUT use each surface face the antenna for find the worst case as the test result was shown.**

**A.7.2.2 WCDMA Measurement Method**

The measurements procedures in TIA-603C-2004 are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 24.238 and Part 24.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of WCDMA Band II and WCDMA Band V.

**The procedure of radiated spurious emissions is the same like GSM.**

**A.7.2.2.1 Measurement Limit**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the

specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**A.7.2.2.2 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the WCDMA Band II (1852.4 MHz, 1880.0MHz and 1907.6MHz) and WCDMA Band
V (826.4MHz, 836.6MHz and 846.6MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the WCDMA Band II and WCDMA Band V into any of the other blocks. The
equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

**A.7.2.2.3 Measurement Results Table**

| Frequency | Channel | Frequency Range | Result |
|---|---|---|---|
| **WCDMA Band V** | Low | 30MHz~10GHz | P |
| | Middle | 30MHz~10GHz | P |
| | High | 30MHz~10GHz | P |
| **WCDMA Band II** | Low | 30MHz~20GHz | P |
| | Middle | 30MHz~20GHz | P |
| | High | 30MHz~20GHz | P |

**WCDMA BAND II Mode Channel 9262**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Peak ERP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3703.2 | -44.93 | 4.42 | -6.2 | -45.3 | -13 | V |
| 5554.4 | -54.71 | 5.24 | -9.5 | -52.6 | -13 | V |
| 7405.2 | -69.02 | 6.13 | -14.6 | -62.7 | -13 | H |

**WCDMA BAND II Mode Channel 9400**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Peak ERP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3761.2 | -59.46 | 4.59 | -6.2 | -60 | -13 | H |
| 5642.4 | -63.93 | 5.62 | -9.5 | -62.2 | -13 | H |
| 7522.8 | -69.26 | 6.59 | -14.6 | -63.4 | -13 | H |

**WCDMA BAND II Mode Channel 9538**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Peak ERP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3816.8 | -59.75 | 4.3 | -7.2 | -59 | -13 | V |
| 5720 | -65.44 | 5.71 | -10.5 | -62.8 | -13 | V |
| 7633.2 | -70.03 | 6.42 | -14.9 | -63.7 | -13 | H |

**WCDMA BAND V Mode Channel 4132**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Peak EIRP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 3179.6 | -58.03 | 3.92 | -4.9 | -59.2 | -13 | H |
| 3571.2 | -60.25 | 4.00 | -6 | -60.4 | -13 | H |
| 4570 | -63.25 | 4.6 | -7.3 | -62.7 | -13 | H |
| 5650 | -65.75 | 5.1 | -9.8 | -63.2 | -13 | H |
| 7965.4 | -70.96 | 6.59 | -16.2 | -63.5 | -13 | V |
| 9119.8 | -72.57 | 6.58 | -18.5 | -62.8 | -13 | V |

**WCDMA BAND V Mode Channel 4183**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Peak EIRP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 2964.4 | -62.43 | 3.82 | -4.7 | -63.7 | -13 | H |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3204.8 | -62.25 | 4 | -4.9 | -63.5 | -13 | H |
| 4582 | -65.05 | 4.6 | -7.3 | -64.5 | -13 | H |
| 5397.6 | -66.65 | 5.1 | -8.7 | -65.2 | -13 | V |
| 7934.8 | -72.56 | 6.59 | -16.6 | -64.7 | -13 | V |
| 9809.8 | -72.33 | 7.12 | -18 | -63.6 | -13 | H |

**WCDMA BAND V Mode Channel 4233**

**Final result:**

| Frequency (MHz) | $P_{Mea}$ (dBm) | Path Loss | Antenna Gain | Peak EIRP (dBm) | Limit （dBm） | Polarization |
|---|---|---|---|---|---|---|
| 2961.2 | -59.93 | 3.82 | -4.7 | -61.2 | -13 | V |
| 3201.6 | -61.05 | 4 | -4.9 | -62.3 | -13 | H |
| 4533.6 | -65.25 | 4.6 | -7.3 | -64.7 | -13 | H |
| 5436.4 | -66.55 | 5.1 | -8.7 | -65.1 | -13 | V |
| 7935.4 | -71.06 | 6.59 | -16.6 | -63.2 | -13 | H |
| 9766.6 | -71.43 | 7.12 | -18 | -62.7 | -13 | H |

**Conclusion: PASS**

**Note: Testing in several polarization directions, EUT use each surface face the antenna for find the worst case as the test result was shown.**

## A.8 CONDUCTED EMISSION (§15.107§15.207)

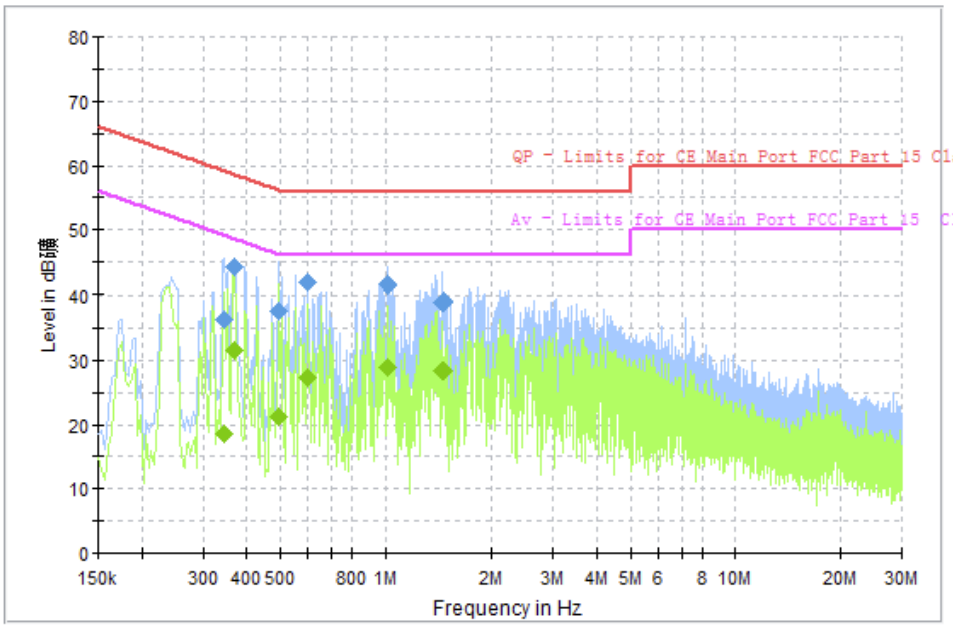
The measurement procedure in ANSI C63.4-1003 is used. Conducted Emission is measured with travel charger.

**A.8.1 Limit**

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-Peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| *Decreases with logarithm of the frequency | | |

**A.8.2 Measurement result**

**GSM850:**



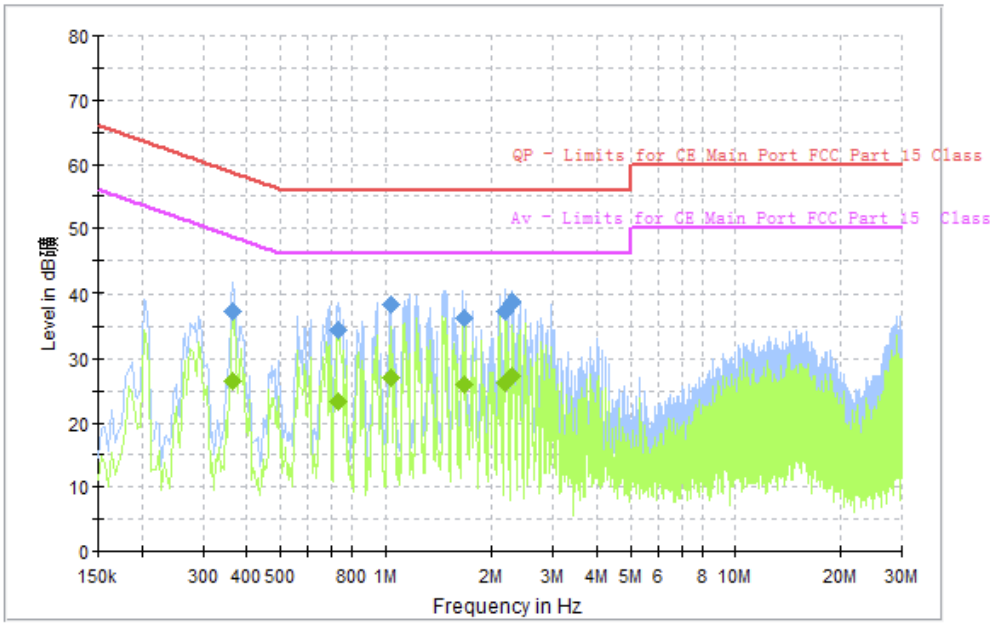

**Final Result1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.676106 | 35.4 | 1000.0 | 9.000 | On | N | 10.0 | 20.6 | 56.0 |
| 1.064156 | 34.2 | 1000.0 | 9.000 | On | L1 | 9.9 | 21.8 | 56.0 |
| 1.347731 | 37.8 | 1000.0 | 9.000 | On | N | 9.9 | 18.2 | 56.0 |
| 1.414894 | 38.4 | 1000.0 | 9.000 | On | N | 9.9 | 17.6 | 56.0 |
| 2.086519 | 36.5 | 1000.0 | 9.000 | On | N | 9.9 | 19.5 | 56.0 |
| 2.306662 | 37.3 | 1000.0 | 9.000 | On | N | 9.9 | 18.7 | 56.0 |

**Final Result2**

| Frequency (MHz) | Average (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.676106 | 24.3 | 1000.0 | 9.000 | On | N | 10.0 | 21.7 | 46.0 |
| 1.064156 | 21.6 | 1000.0 | 9.000 | On | L1 | 9.9 | 24.4 | 46.0 |
| 1.347731 | 26.1 | 1000.0 | 9.000 | On | N | 9.9 | 19.9 | 46.0 |
| 1.414894 | 27.2 | 1000.0 | 9.000 | On | N | 9.9 | 18.8 | 46.0 |
| 2.086519 | 25.2 | 1000.0 | 9.000 | On | N | 9.9 | 20.8 | 46.0 |
| 2.306662 | 25.7 | 1000.0 | 9.000 | On | N | 9.9 | 20.3 | 46.0 |

**PCS1900**



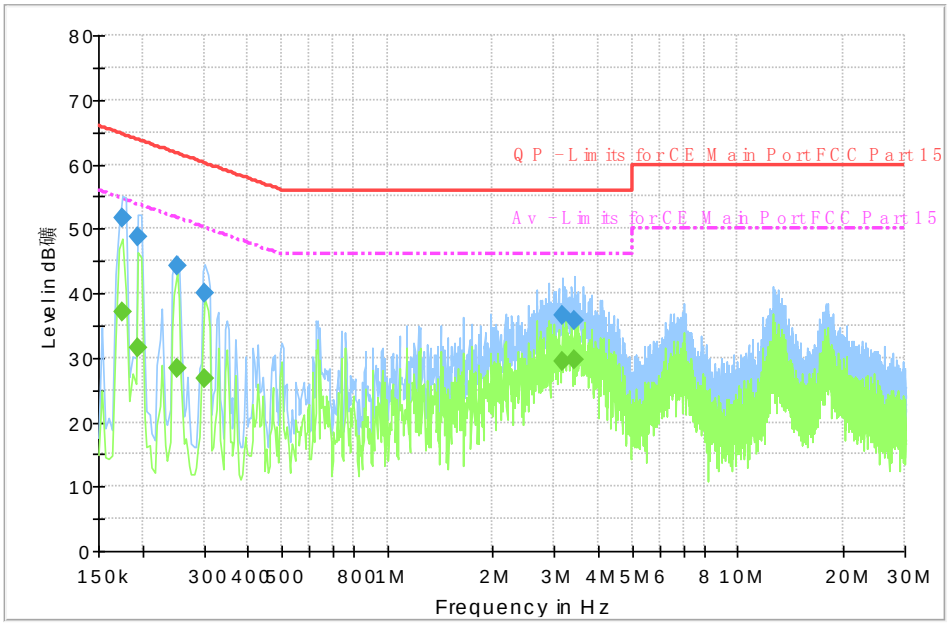
**Final Result1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.366412 | 37.4 | 1000.0 | 9.000 | On | N | 10.1 | 21.2 | 58.6 |
| 0.735806 | 34.3 | 1000.0 | 9.000 | On | N | 10.0 | 21.7 | 56.0 |
| 1.034306 | 38.3 | 1000.0 | 9.000 | On | N | 9.9 | 17.7 | 56.0 |
| 1.661156 | 36.4 | 1000.0 | 9.000 | On | N | 9.9 | 19.6 | 56.0 |
| 2.187262 | 37.3 | 1000.0 | 9.000 | On | N | 9.9 | 18.7 | 56.0 |
| 2.291738 | 38.7 | 1000.0 | 9.000 | On | N | 9.9 | 17.3 | 56.0 |

**Final Result2**

| Frequency (MHz) | Average (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.366412 | 26.5 | 1000.0 | 9.000 | On | N | 10.1 | 22.1 | 48.6 |
| 0.735806 | 23.2 | 1000.0 | 9.000 | On | N | 10.0 | 22.8 | 46.0 |
| 1.034306 | 27.0 | 1000.0 | 9.000 | On | N | 9.9 | 19.0 | 46.0 |
| 1.661156 | 25.9 | 1000.0 | 9.000 | On | N | 9.9 | 20.1 | 46.0 |
| 2.187262 | 26.1 | 1000.0 | 9.000 | On | N | 9.9 | 19.9 | 46.0 |
| 2.291738 | 27.3 | 1000.0 | 9.000 | On | N | 9.9 | 18.7 | 46.0 |

**WCDMA Band II**



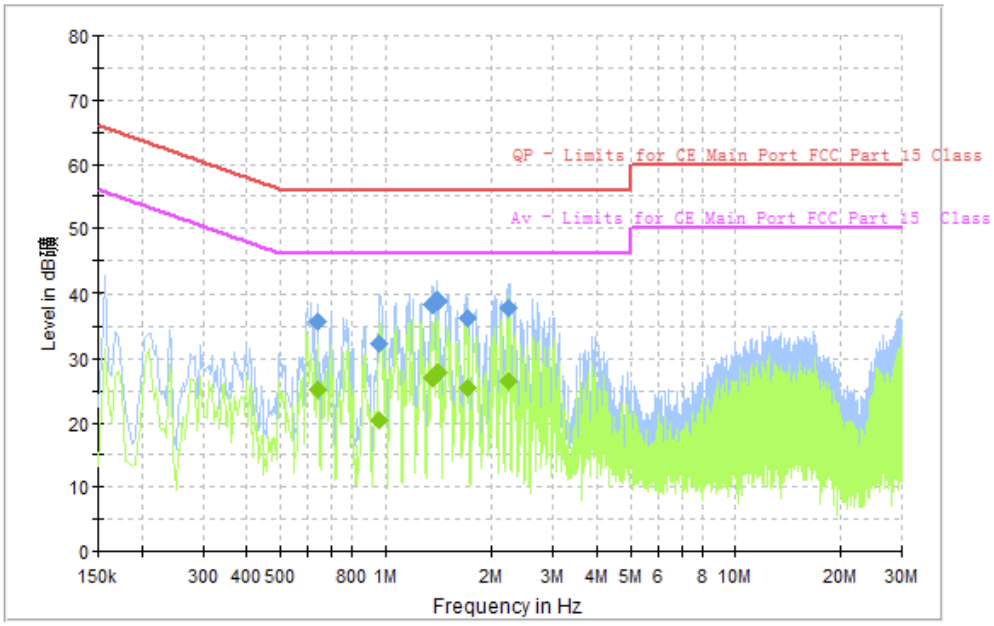

**Final Result1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 1.1350 | 34.3 | 1000.0 | 9.000 | On | L1 | 9.9 | 21.7 | 56.0 |
| 1.4223 | 39.0 | 1000.0 | 9.000 | On | N | 9.9 | 17.0 | 56.0 |
| 1.4745 | 35.8 | 1000.0 | 9.000 | On | L1 | 9.9 | 20.2 | 56.0 |
| 1.7283 | 36.8 | 1000.0 | 9.000 | On | N | 9.9 | 19.2 | 56.0 |
| 2.2432 | 38.5 | 1000.0 | 9.000 | On | N | 9.9 | 17.5 | 56.0 |
| 2.3290 | 36.9 | 1000.0 | 9.000 | On | N | 9.9 | 19.1 | 56.0 |

**Final Result2**

| Frequency (MHz) | Average (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 1.1350 | 21.4 | 1000.0 | 9.000 | On | L1 | 9.9 | 24.6 | 46.0 |
| 1.4223 | 28.0 | 1000.0 | 9.000 | On | N | 9.9 | 18.0 | 46.0 |
| 1.4745 | 22.7 | 1000.0 | 9.000 | On | L1 | 9.9 | 23.3 | 46.0 |
| 1.7283 | 26.1 | 1000.0 | 9.000 | On | N | 9.9 | 19.9 | 46.0 |
| 2.2432 | 26.8 | 1000.0 | 9.000 | On | N | 9.9 | 19.2 | 46.0 |
| 2.3290 | 25.9 | 1000.0 | 9.000 | On | N | 9.9 | 20.1 | 46.0 |

**WCDMA Band V**



**Final Result1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.6387 | 35.8 | 1000.0 | 9.000 | On | N | 10.1 | 20.2 | 56.0 |
| 0.9559 | 32.4 | 1000.0 | 9.000 | On | L1 | 9.9 | 23.6 | 56.0 |
| 1.3589 | 38.5 | 1000.0 | 9.000 | On | N | 9.9 | 17.5 | 56.0 |
| 1.41116 | 38.8 | 1000.0 | 9.000 | On | N | 9.9 | 17.2 | 56.0 |
| 1.6947 | 36.2 | 1000.0 | 9.000 | On | N | 9.9 | 19.8 | 56.0 |
| 2.2357 | 38.0 | 1000.0 | 9.000 | On | N | 9.9 | 18.0 | 56.0 |

**Final Result2**

| Frequency (MHz) | Average (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit(dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.6387 | 25.3 | 1000.0 | 9.000 | On | N | 10.1 | 20.7 | 46.0 |
| 0.9559 | 20.4 | 1000.0 | 9.000 | On | L1 | 9.9 | 25.6 | 46.0 |
| 1.3589 | 27.1 | 1000.0 | 9.000 | On | N | 9.9 | 18.9 | 46.0 |
| 1.41116 | 27.8 | 1000.0 | 9.000 | On | N | 9.9 | 18.2 | 46.0 |
| 1.6947 | 25.5 | 1000.0 | 9.000 | On | N | 9.9 | 20.5 | 46.0 |
| 2.2357 | 26.4 | 1000.0 | 9.000 | On | N | 9.9 | 19.6 | 46.0 |

**Conclusion: PASS**

## ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

************END OF REPORT************