

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

### INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H & PART 24 SUBPART E

OF

|                          |  |
|--------------------------|--|
| <b>Product Name:</b>     | <b>Base Station</b>  |
| <b>Marketing Name:</b>   | <b>Y-Gate 3.0</b>  |
| <b>Brand Name:</b>       | <b>Dyzle</b>   |
| <b>Model No.:</b>        | <b>Y-Gate 3.0 GPRS/UMTS / 010 1701 001</b>   |
| <b>Model Difference:</b> | <b>N/A</b>   |
| <b>FCC ID:</b>           | <b>2ADBY0101701</b>  |
| <b>Report No.:</b>       | <b>EH/2014/C0008</b>   |
| <b>Issue Date:</b>       | <b>Jan. 30, 2015</b>   |
| <b>FCC Rule Part:</b>    | <b>2, 22H &amp; 24E</b>  |
| <b>Prepared for:</b>     | <b>Dyzle<br/>Transistorstraat 2d, 1322 CE Almere, The<br/>Netherlands</b>  |
| <b>Prepared by:</b>      | <b>SGS Taiwan Ltd.<br/>Electronics &amp; Communication Laboratory<br/>No.134, Wu Kung Road, New Taipei Industrial<br/>Park, Wuku District, New Taipei City, Taiwan<br/>24803</b> |

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**VERIFICATION OF COMPLIANCE**

**Applicant:** Dyzle  
Transistorstraat 2d, 1322 CE Almere, The Netherlands

**Product Name:** Base Station

**Marketing Name:** Y-Gate 3.0

**Brand Name:** Dyzle

**Model No.:** Y-Gate 3.0 GPRS/UMTS / 010 1701 001

**Model Difference:** N/A

**FCC ID:** 2ADBY0101701

**File Number:** EH/2014/C0008

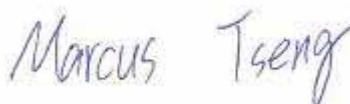
**Date of test:** Dec. 31, 2014 ~ Jan. 21, 2015

**Date of EUT Received:** Dec. 31, 2014

**We hereby certify that:**

The above equipment was tested by SGS Lionwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule PART 22 subpart H, PART 24 subpart E.

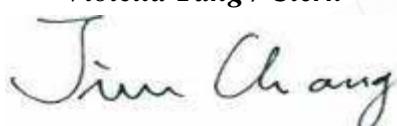
The test results of this report relate only to the tested sample identified in this report.

**Test By:****Date:**

Jan. 30, 2015

*Marcus Tseng / Engineer***Prepared By:****Date:**

Jan. 30, 2015

*Violetta Tang / Clerk***Approved By:****Date:**

Jan. 30, 2015

*Jim Chang / Asst. Manager*

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## Version

| Version No. | Date          | Description                  |
|-------------|---------------|------------------------------|
| 00          | Jan. 30, 2015 | Initial creation of document |
|             |               |                              |
|             |               |                              |

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## Table of Contents

|  |           |
|--|-----------|
| <b>1. GENERAL PRODUCT INFORMATION .....</b>              | <b>6</b>  |
| 1.1. Related Submittal(s) / Grant (s) .....              | 8         |
| 1.2. Test Methodology .....                              | 8         |
| 1.3. Test Facility .....                                 | 8         |
| 1.4. Special Accessories .....                           | 8         |
| 1.5. Equipment Modifications .....                       | 8         |
| <b>2. SYSTEM TEST CONFIGURATION .....</b>                | <b>9</b>  |
| 2.1. EUT Configuration .....                             | 9         |
| 2.2. EUT Exercise .....                                  | 9         |
| 2.3. Test Procedure .....                                | 9         |
| 2.4. Measurement Equipment Used: .....                   | 10        |
| 2.5. Configuration of Tested System .....                | 13        |
| <b>3. SUMMARY OF TEST RESULTS .....</b>                  | <b>14</b> |
| <b>4. DESCRIPTION OF TEST MODES .....</b>                | <b>15</b> |
| <b>5. MEASUREMENT UNCERTAINTY .....</b>                  | <b>16</b> |
| <b>6. RF POWER OUTPUT MEASUREMENT .....</b>              | <b>17</b> |
| 6.1. Standard Applicable: .....                          | 17        |
| 6.2. Test Set-up: .....                                  | 18        |
| 6.3. Measurement Procedure: .....                        | 18        |
| 6.4. Measurement Equipment Used: .....                   | 18        |
| 6.5. Measurement Result: .....                           | 19        |
| <b>7. PEAK TO AVERAGE RATIO .....</b>                    | <b>27</b> |
| 7.1. Standard Applicable: .....                          | 27        |
| 7.2. Test SET-UP (Block Diagram of Configuration): ..... | 27        |
| 7.3. Measurement Procedure: .....                        | 27        |
| 7.4. Measurement Equipment Used: .....                   | 27        |
| 7.5. Measurement Result: .....                           | 27        |
| <b>8. ERP, EIRP MEASUREMENT .....</b>                    | <b>43</b> |
| 8.1. Standard Applicable: .....                          | 43        |
| 8.2. Test SET-UP (Block Diagram of Configuration): ..... | 43        |
| 8.3. Measurement Procedure: .....                        | 45        |
| 8.4. Measurement Equipment Used: .....                   | 46        |
| 8.5. Measurement Result: .....                           | 47        |

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|   |            |
|---|------------|
| <b>9. OCCUPIED BANDWIDTH MEASUREMENT .....</b>                    | <b>51</b>  |
| 9.1. Standard Applicable: .....                                   | 51         |
| 9.2. Test Set-up:.....  | 51         |
| 9.3. Measurement Procedure:.....                                  | 51         |
| 9.4. Measurement Equipment Used: .....                            | 51         |
| 9.5. Measurement Result:.....                                     | 52         |
| <b>10. OUT OF BAND EMISSION AT ANTENNA TERMINALS .....</b>        | <b>69</b>  |
| 10.1. Standard Applicable: .....                                  | 69         |
| 10.2. Test SET-UP:.....   | 69         |
| 10.3. Measurement Procedure:.....                                 | 70         |
| 10.4. Measurement Equipment Used: .....                           | 70         |
| 10.5. Measurement Result:.....                                    | 71         |
| <b>11. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT.....</b>  | <b>111</b> |
| 11.1. Standard Applicable: .....                                  | 111        |
| 11.2. EUT Setup (Block Diagram of Configuration):.....            | 112        |
| 11.3. Measurement Procedure:.....                                 | 113        |
| 11.4. Measurement Equipment Used: .....                           | 113        |
| 11.5. Measurement Result:.....                                    | 114        |
| <b>12. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT .....</b> | <b>138</b> |
| 12.1. Standard Applicable: .....                                  | 138        |
| 12.2. Test Set-up:.....   | 138        |
| 12.3. Measurement Procedure:.....                                 | 138        |
| 12.4. Measurement Equipment Used: .....                           | 138        |
| 12.5. Measurement Result:.....                                    | 139        |
| <b>13. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT .....</b>     | <b>141</b> |
| 13.1. Standard Applicable: .....                                  | 141        |
| 13.2. Test Set-up:.....   | 141        |
| 13.3. Measurement Procedure:.....                                 | 141        |
| 13.4. Measurement Equipment Used: .....                           | 141        |
| 13.5. Measurement Result:.....                                    | 142        |

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## 1. GENERAL PRODUCT INFORMATION

General:

|                   |                                     |   |
|-------------------|-------------------------------------|---|
| Product Name:     | Base Station                        |   |
| Marketing Name:   | Y-Gate 3.0                          |   |
| Brand Name:       | Dyzle                               |   |
| Model No.:        | Y-Gate 3.0 GPRS/UMTS / 010 1701 001 |   |
| Model difference: | N/A                                 |   |
| Hardware Version: | 3.0                                 |   |
| Software Version: | 2.04                                |   |
| Power Supply:     | 12V from AC Power Adapter           |   |
|                   | Adapter:                            | Model No.: KSAS0061200050D5D, Supplier: N/A |

GRPS / WCDMA:

| Cellular Phone Standards Frequency Range: | Operating Frequency              |                       | Rated Power |
|---|----------------------------------|-----------------------|-------------|
|   | GPRS 850, Class 12               | 824.2 MHz– 848.8 MHz  | 32dBm       |
|   | EDGE 850, Class 12               | 824.2 MHz– 848.8 MHz  | 26dBm       |
|   | GPRS 1900, Class 12              | 1850.2MHz – 1909.8MHz | 29dBm       |
|   | EDGE 1900, Class 12              | 1850.2MHz – 1909.8MHz | 25dBm       |
|   | WCDMA/HSUPA/HSDPA /HSPA+ Band II | 1852.4MHz – 1907.6MHz | 23dBm       |
|   | WCDMA/HSUPA/HSDPA /HSPA+ Band V  | 826.4MHz - 846.6MHz   | 23dBm       |
| IMEI:                                     | 359998041586639                  |                       |             |

This test report applies for 850 / 1900 GPRS / EDGE, WCDMA / HSDPA / HSUPA / HSPA+ Band II / V.

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## Final Amplifier Voltage and Current Information:

| Test Mode | DC voltage (V) | DC current (mA) |
|-----------|----------------|-----------------|
| GPRS 850  | 12Vdc          | 153             |
| GPRS 1900 | 12Vdc          | 164             |
| EDGE 850  | 12Vdc          | 171             |
| EDGE 1900 | 12Vdc          | 188             |
| WCDMA B2  | 12Vdc          | 347             |
| WCDMA B5  | 12Vdc          | 265             |
| HSUPA B2  | 12Vdc          | 353             |
| HSUPA B5  | 12Vdc          | 284             |
| HSDPA B2  | 12Vdc          | 371             |
| HSDPA B5  | 12Vdc          | 291             |

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## 1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2ADBY0101701** filing to comply with Section Part 22 subpart H, Part 24 subpart E and Section Part 27 subpart C of the FCC CFR 47 Rules.

## 1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures document of TIA/EIA 603C and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

TS 151 010-1 is used to set, and measure the output power.

The Output power Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, WCDMA / HSPA) was used for EUT and Base station setting.

KDB971168 D01 Power Meas license Digital System v01 as the supplemental guideline to conduct the measurement, including Peak to Power Average Ratio, Average Power over the fundamental signal BW (EIRP/ERP) and Signal Bandwidth.

## 1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009. FCC Registration Numbers are: 990257, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 & 10 meters) and FCC Registration Number: 455997.

All equipment is calibrated externally and traceable to SI (International System of Unit).

## 1.4. Special Accessories

Not available for this EUT intended for grant.

## 1.5. Equipment Modifications

Not available for this EUT intended for grant.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT (Transmitter) was utilized in base-station simulator to fixate the Tx frequency of default test, and establish the communication for the purpose of the measurements.

### 2.3. Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

#### 2.3.2 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C, The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 of ANSI C63.4:2009.

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**2.4. Measurement Equipment Used:**

| Conducted Emission (measured at antenna port) Test Site |               |              |               |            |            |
|---|---------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE  | MFR           | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Power Meter   | Anritsu       | ML2495A      | 1005007       | 01/13/2014 | 01/12/2015 |
| Power Sensor  | Anritsu       | MA2411B      | 917032        | 01/13/2014 | 01/12/2015 |
| Spectrum Analyzer                                       | Agilent       | E4446A       | MY51100003    | 05/19/2014 | 05/18/2015 |
| Spectrum Analyzer                                       | Agilent       | E4440A       | US41160416    | 03/08/2014 | 03/07/2015 |
| Radio Communication Analyzer                            | R & S         | CMU200       | 116097        | 03/11/2014 | 03/10/2015 |
| Radio Communication Analyzer                            | Anritsu       | MT8820C      | 6200995019    | 10/08/2014 | 10/09/2015 |
| Temperature Chamber                                     | TERCHY        | MHG-120LF    | 911009        | 05/07/2014 | 05/06/2015 |
| DC Block  | Mini-Circuits | BLK-18-S+    | 1             | 02/27/2014 | 02/26/2015 |
| Attenuator  | Mini-Circuit  | BW-S10W2+    | 002           | 02/27/2014 | 02/26/2015 |
| Splitter  | Agilent       | 11636B       | N/A           | 02/27/2014 | 02/26/2015 |
| DC Power Supply   | Agilent       | E3640A       | MY52410006    | 11/10/2014 | 11/09/2015 |

Please refer to next page for the plots.

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## ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber

| EQUIPMENT TYPE               | MFR                   | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|------------------------------|-----------------------|--------------|---------------|------------|------------|
| Spectrum Analyzer            | Agilent               | E4446A       | MY51100003    | 05/19/2014 | 05/18/2015 |
| EXA Spectrum Analyzer        | Agilent               | N9010A       | MY50420195    | 12/22/2014 | 12/21/2015 |
| Spectrum Analyzer            | R&S                   | FSV-30       | 101398        | 10/07/2014 | 10/06/2015 |
| Bilog Antenna                | SCHWAZBECK            | VULB9168     | 378           | 12/23/2014 | 12/22/2015 |
| Bilog Antenna                | SCHWAZBECK            | VULB9160     | 3158          | 10/31/2014 | 10/30/2015 |
| Horn antenna                 | ETS.LINDGREN          | 3117         | 123995        | 05/19/2014 | 05/18/2015 |
| Horn antenna                 | ETS.LINDGREN          | 3117         | 123991        | 12/19/2014 | 12/18/2015 |
| Horn Antenna                 | Schwarzbeck           | BBHA9170     | 184           | 01/23/2014 | 01/22/2015 |
| Horn Antenna                 | Schwarzbeck           | BBHA9170     | 185           | 07/29/2014 | 07/28/2015 |
| Network Analyze              | Anritsu               | MS4644A      | 1216312       | 05/24/2014 | 05/23/2015 |
| Signal Generator             | Agilent               | E4438C       | MY45093613    | 08/06/2014 | 08/05/2015 |
| Pre-Amplifier                | Agilent               | 8447D        | 1937A02834    | 01/03/2014 | 01/02/2015 |
| Pre-Amplifier                | Agilent               | 8449B        | 3008A00578    | 01/03/2014 | 01/02/2015 |
| Pre-Amplifier                | EMC Instruments Corp. | EMC184045    | 980135        | 01/24/2014 | 01/23/2015 |
| Attenuator                   | Mini-Circuit          | BW-S10W2+    | 004           | 02/27/2014 | 02/26/2015 |
| Radio Communication Analyzer | R & S                 | CMU200       | 116097        | 03/11/2014 | 03/10/2015 |
| Radio Communication Analyzer | Anritsu               | MT8820C      | 6200995019    | 10/08/2014 | 10/09/2015 |
| Turn Table                   | HD                    | DT420        | N/A           | N.C.R      | N.C.R      |
| Antenna Tower                | HD                    | MA240-N      | 240/657       | N.C.R      | N.C.R      |
| Controller                   | HD                    | HD100        | N/A           | N.C.R      | N.C.R      |
| Low Loss Cable               | HUBER+SUHNER          | 966_Tx       | 10m           | 01/03/2014 | 01/02/2015 |
| Low Loss Cable               | HUBER+SUHNER          | 966_Rx       | 3m            | 01/03/2014 | 01/02/2015 |
| Filter 800-1000              | Micro-Tronics         | EWT          | M2            | 02/27/2014 | 02/26/2015 |
| Filter 1800-2000             | Micro-Tronics         | EWT          | M2            | 02/27/2014 | 02/26/2015 |
| Filter 1700-1800             | Micro-Tronics         | BRC15751     | 001           | 02/27/2014 | 02/26/2015 |
| 1GHz High Pass Filter        | Micro-Tronics         | HPM50108     | 32            | 02/27/2014 | 02/26/2015 |
| 2GHz High Pass Filter        | Micro-Tronics         | HPM50110     | 36            | 02/27/2014 | 02/26/2015 |
| 3m Site NSA                  | SGS                   | 966 chamber  | N/A           | 07/15/2014 | 07/14/2015 |

N.C.R denotes non-calibrated require.

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| ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber |               |              |               |            |            |
|--|---------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE                                   | MFR           | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Pre-Amplifier                                    | Agilent       | 8447D        | 1937A02834    | 01/02/2015 | 01/01/2016 |
| Pre-Amplifier                                    | Agilent       | 8449B        | 3008A00578    | 01/02/2015 | 01/01/2016 |
| Attenuator                                       | Mini-Circuit  | BW-S10W2+    | 004           | 01/02/2015 | 01/01/2016 |
| Low Loss Cable                                   | HUBER+SUHNER  | 966_Tx       | 10m           | 01/02/2015 | 01/01/2016 |
| Low Loss Cable                                   | HUBER+SUHNER  | 966_Rx       | 3m            | 01/02/2015 | 01/01/2016 |
| Filter 800-1000                                  | Micro-Tronics | EWT          | M2            | 01/02/2015 | 01/01/2016 |
| Filter 1800-2000                                 | Micro-Tronics | EWT          | M2            | 01/02/2015 | 01/01/2016 |
| Filter 1700-1800                                 | Micro-Tronics | BRC15751     | 001           | 01/02/2015 | 01/01/2016 |
| 1GHz High Pass Filter                            | Micro-Tronics | HPM50108     | 32            | 01/02/2015 | 01/01/2016 |
| 2GHz High Pass Filter                            | Micro-Tronics | HPM50110     | 36            | 01/02/2015 | 01/01/2016 |

*Note: The measurement was taken place with the long duration of the time, and additional equipment list as shown above indicate those equipment of which has been subject to undertake the calibration in intermediate period of time of the measurement.*

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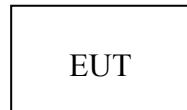
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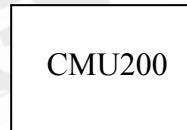
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## 2.5. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System (Fixed Channel)**



**Remote Side**



**Table 2-1 Equipment Used in Tested System**

| Item | Equipment                    | Mfr/Brand | Model/<br>Type No. | Series No. | Data Cable | Power Cord  |
|------|------------------------------|-----------|--------------------|------------|------------|-------------|
| 1.   | Radio Communication Analyzer | R&S       | CMU200             | 102189     | shielded   | Un-shielded |

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### 3. SUMMARY OF TEST RESULTS

| FCC Rules                                 | Description Of Test  | Result    |
|---|--|-----------|
| §2.1046(a)                                | RF Power Output  | Compliant |
| §2.1046(a)<br>§22.913(a)(2)<br>§24.232(c) | ERP/ EIRP measurement  | Compliant |
| §2.1049(h)                                | 99% Occupied Bandwidth   | Compliant |
| §2.1051<br>§22.917(a)<br>§24.238(a)       | Out of Band Emissions at Antenna<br>Terminals and<br>Band Edge | Compliant |
| §2.1053<br>§22.917(a)<br>§24.238(a)       | Field Strength of Spurious Radiation                           | Compliant |
| §24.232(d)                                | Peak to Average Ratio  | Compliant |
| §2.1055(a)(1)<br>§22.355<br>§24.235       | Frequency Stability vs. Temperature                            | Compliant |
| §2.1055(d)(1)<br>§22.355<br>§24.235       | Frequency Stability vs. Voltage                                | Compliant |

Max ERP/EIRP measurement result:

|                | dBm   | W          |
|----------------|-------|------------|
| GPRS 850 Band  | 17.65 | ERP 0.058  |
| GPRS 1900 Band | 28.38 | EIRP 0.689 |
| EDGE 850 Band  | 16.49 | ERP 0.045  |
| EDGE 1900 Band | 25.86 | EIRP 0.385 |
| WCDMA Band II  | 25.62 | EIRP 0.365 |
| WCDMA Band V   | 15.33 | ERP 0.034  |
| HSDPA Band II  | 23.38 | EIRP 0.218 |
| HSDPA Band V   | 17.23 | ERP 0.053  |
| HSUPA Band II  | 18.64 | EIRP 0.073 |
| HSUPA Band V   | 16.72 | ERP 0.047  |

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#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition with continuous transmitting mode, linking to simulator.

Channel Low, Mid and High is set to test against each supported band with rated data rate that yields the highest emission.

The list of channel selected to conduct the measurements

GRPS/EDGE 850:

Channel Low: AFRCN 128 at 824.2MHz, Channel Mid: AFRCN 190 at 836.6MHz, Channel High: AFRCN 251 at 848.8MHz.

GRPS/EDGE 1900:

Channel Low: AFRCN 512 at 1850.2MHz, Channel Mid: AFRCN 661 at 1880.0MHz, Channel High AFRCN 810 at 1909.8MHz

WCDMA/HSPA BII:

Channel Low: UAFRCN 9262 at 1852.4MHz, Channel Mid: UAFRCN 9400 at 1880.0MHz, Channel High: UAFRCN 9538 at 1907.6MHz.

WCDMA/HSPA BV:

Channel Low: UAFRCN 4132 at 826.4MHz, Channel Mid: UAFRCN 4183 at 836.6MHz, Channel High: UAFRCN 4233 at 846.6MHz.

The field strength of spurious radiation emission was measured as stand-up position (E2 mode as defined in Lab) and lie down position with 90 degrees angle apart (H, E1 mode as defines in Lab) for GPRS/EDGE and WCDMA Band II and V. The worst-case position in E2 is placed to conduct all applicable measurement test cases for all supported modulation, transmission bandwidth, and frequency band.

#### The evaluation of Test Mode as configured in UE presented on the Test Report:

**GRPS/WCDMA/HSPA:**

**Radiated Spurious Emission**

The Measurement Data of field strength of spurious emission with respect to supported configuration of given application (Transmission Band, Modulation Scheme, Resource Block) have been pre-scanned, and the result that yields in the highest emission close to the limit are presented on the test report.

GRPS, HSPA is the worst-case found in the pre-scanned measurement, and only data that yields the worst case is revealed on the test report.

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## 5. MEASUREMENT UNCERLIONNTY

| Test Items   | Uncertainty  |
|--|--|
| RF Power Output  | +/- 1.42 dB  |
| ERP/ EIRP measurement                                    | Vertical Polarization = +/- 4.74dB<br>Horizontal Polarization = +/- 4.62dB |
| 99% Occupied Bandwidth                                   | +/- 123.36 Hz  |
| Out of Band Emissions at Antenna Terminals and Band Edge | +/- 1.55 dB  |
| Peak to Average Ratio                                    | +/- 1.55 dB  |
| Frequency Stability vs. Temperature                      | +/- 123.36 Hz  |
| Frequency Stability vs. Voltage                          | +/- 123.36 Hz  |
| Temperature  | +/- 0.8 °C   |
| Humidity   | +/- 4.7 %  |
| DC / AC Power Source                                     | DC= +/- 1%, AC=+/- 0.2%  |

### Radiated Spurious Emission:

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Vertical</b> ) | 30MHz - 180MHz: +/- 3.37dB |
|  | 180MHz -417MHz: +/- 3.19dB |
|  | 0.417GHz-1GHz: +/- 3.19dB  |
|  | 1GHz - 18GHz: +/- 4.04dB   |
|  | 18GHz - 40GHz: +/- 4.04dB  |

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Horizontal</b> ) | 30MHz - 167MHz: +/- 4.22dB |
|  | 167MHz -500MHz: +/- 3.44dB |
|  | 0.5GHz-1GHz: +/- 3.39dB    |
|  | 1GHz - 18GHz: +/- 4.08dB   |
|  | 18GHz - 40GHz: +/- 4.08dB  |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

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## 6. RF POWER OUTPUT MEASUREMENT

### 6.1. Standard Applicable:

According to FCC §2.1046

3GPP Power limitation for HSDPA and HSUPA

#### Maximum Output Powers for HSDPA

| Sub-test in table C.10.1.4 | Power Class 3 |           | Power Class 4 |           |
|----------------------------|---------------|-----------|---------------|-----------|
|                            | Power (dBm)   | Tol (dB)  | Power (dBm)   | Tol (dB)  |
| 1                          | +24           | +1.7/-3.7 | +21           | +2.7/-2.7 |
| 2                          | +24           | +1.7/-3.7 | +21           | +2.7/-2.7 |
| 3                          | +23.5         | +2.2/-3.7 | +20.5         | +3.2/-2.7 |
| 4                          | +23.5         | +2.2/-3.7 | +20.5         | +3.2/-2.7 |

#### Maximum Output Powers for HSUPA

| Sub-test in table C.11.1.3 | Power Class 3 |           | Power Class 4 |           |
|----------------------------|---------------|-----------|---------------|-----------|
|                            | Power (dBm)   | Tol (dB)  | Power (dBm)   | Tol (dB)  |
| 1                          | +24           | +1.7/-6.7 | +21           | +2.7/-5.7 |
| 2                          | +22           | +3.7/-5.2 | +19           | +4.7/-4.2 |
| 3                          | +23           | +2.7/-5.2 | +20           | +3.7/-4.2 |
| 4                          | +22           | +3.7/-5.2 | +19           | +4.7/-4.2 |
| 5                          | +24           | +1.7/-6.7 | +21           | +2.7/-5.7 |

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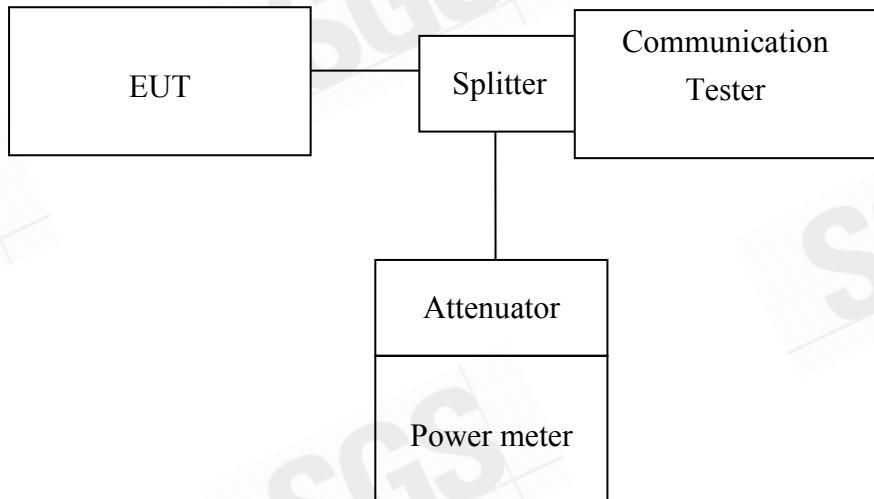
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## 6.2. Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

## 6.3. Measurement Procedure:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

Necessary Communication complying with 24.232 (c)

Set CMU200 (base-station simulator) MS Signal with packet data submenu; SLOT Configuration

Set appropriate level to verify if or not power on mobile station's link with simulator still exists.

## 6.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**6.5. Measurement Result:****6.5.1. RF Conducted Output Power****6.5.1.1.: GPRS/EDGE (GMSK; 8-PSK)****Result:**

| EUT Mode | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 1UP)<br>class 8<br>(dBm) | Average<br>Burst Power<br>(1DN 1UP)<br>Class 8<br>(dBm) | Peak Power<br>(1DN 2UP)<br>Class 10<br>(dBm) | Average<br>Burst Power<br>(1DN 2UP)<br>Class 10<br>(dBm) |
|----------|--------------------|-----|---|---|--|--|
| GPRS 850 | 824.2              | 128 | 32.60                                       | 32.40   | 29.40  | 29.30  |
|          | 836.6              | 190 | 32.80                                       | 32.60   | 29.40  | 29.40  |
|          | 848.8              | 251 | 32.90                                       | 32.70   | 29.90  | 29.80  |

| EUT Mode | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 3UP)<br>Class 11<br>(dBm) | Average<br>Burst Power<br>(1DN 3UP)<br>Cass 11<br>(dBm) | Peak Power<br>(1DN 4UP)<br>Class 12<br>(dBm) | Average<br>Burst Power<br>(1DN 4UP)<br>Class 12<br>(dBm) |
|----------|--------------------|-----|--|---|--|--|
| GPRS 850 | 824.2              | 128 | 27.50  | 27.30   | 26.10  | 26.00  |
|          | 836.6              | 190 | 27.40  | 27.30   | 25.90  | 25.80  |
|          | 848.8              | 251 | 27.30  | 27.20   | 25.90  | 25.70  |

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| EUT Mode  | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 1UP)<br>class 8<br>(dBm) | Average<br>Burst Power<br>(1DN 1UP)<br>Class 8<br>(dBm) | Peak Power<br>(1DN 2UP)<br>Class 10<br>(dBm) | Average<br>Burst Power<br>(1DN 2UP)<br>Class 10<br>(dBm) |
|-----------|--------------------|-----|---|---|--|--|
| GPRS 1900 | 1850.2             | 512 | 29.00                                       | 28.80   | 25.50  | 25.40  |
|           | 1880.0             | 661 | 29.20                                       | 29.00   | 25.80  | 25.70  |
|           | 1909.8             | 810 | 29.60                                       | 29.40   | 26.50  | 26.30  |

| EUT Mode  | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 3UP)<br>Class 11<br>(dBm) | Average<br>Burst Power<br>(1DN 3UP)<br>Cass 11<br>(dBm) | Peak Power<br>(1DN 4UP)<br>Class 12<br>(dBm) | Average<br>Burst Power<br>(1DN 4UP)<br>Class 12<br>(dBm) |
|-----------|--------------------|-----|--|---|--|--|
| GPRS 1900 | 1850.2             | 512 | 23.60  | 23.40   | 22.10  | 22.00  |
|           | 1880.0             | 661 | 23.70  | 23.60   | 22.30  | 22.10  |
|           | 1909.8             | 810 | 24.20  | 24.10   | 23.00  | 22.80  |

| EUT Mode | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 1UP)<br>class 8<br>(dBm) | Average<br>Burst Power<br>(1DN 1UP)<br>Class 8<br>(dBm) | Peak Power<br>(1DN 2UP)<br>Class 10<br>(dBm) | Average<br>Burst Power<br>(1DN 2UP)<br>Class 10<br>(dBm) |
|----------|--------------------|-----|---|---|--|--|
| EDGE 850 | 824.2              | 128 | 29.60                                       | 26.50   | 26.50  | 23.30  |
|          | 836.6              | 190 | 29.60                                       | 26.40   | 26.40  | 23.30  |
|          | 848.8              | 251 | 29.60                                       | 26.40   | 26.50  | 23.20  |

| EUT Mode | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 3UP)<br>Class 11<br>(dBm) | Average<br>Burst Power<br>(1DN 3UP)<br>Cass 11<br>(dBm) | Peak Power<br>(1DN 4UP)<br>Class 12<br>(dBm) | Average<br>Burst Power<br>(1DN 4UP)<br>Class 12<br>(dBm) |
|----------|--------------------|-----|--|---|--|--|
| EDGE 850 | 824.2              | 128 | 24.60  | 21.40   | 23.70  | 20.40  |
|          | 836.6              | 190 | 24.50  | 21.30   | 23.50  | 20.20  |
|          | 848.8              | 251 | 24.40  | 21.20   | 23.30  | 20.00  |

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| EUT Mode  | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 1UP)<br>class 8<br>(dBm) | Average<br>Burst Power<br>(1DN 1UP)<br>Class 8<br>(dBm) | Peak Power<br>(1DN 2UP)<br>Class 10<br>(dBm) | Average<br>Burst Power<br>(1DN 2UP)<br>Class 10<br>(dBm) |
|-----------|--------------------|-----|---|---|--|--|
| EDGE 1900 | 1850.2             | 512 | 27.80                                       | 24.60   | 24.60  | 21.30  |
|           | 1880.0             | 661 | 28.00                                       | 24.80   | 24.80  | 21.50  |
|           | 1909.8             | 810 | 28.50                                       | 25.20   | 25.30  | 22.00  |

| EUT Mode  | Frequency<br>(MHz) | CH  | Peak Power<br>(1DN 3UP)<br>Class 11<br>(dBm) | Average<br>Burst Power<br>(1DN 3UP)<br>Class 11<br>(dBm) | Peak Power<br>(1DN 4UP)<br>Class 12<br>(dBm) | Average<br>Burst Power<br>(1DN 4UP)<br>Class 12<br>(dBm) |
|-----------|--------------------|-----|--|--|--|--|
| EDGE 1900 | 1850.2             | 512 | 23.10  | 19.70  | 21.60  | 18.20  |
|           | 1880.0             | 661 | 23.20  | 19.80  | 21.80  | 18.40  |
|           | 1909.8             | 810 | 23.90  | 20.40  | 22.50  | 19.00  |

Cable loss offset Low Band (Low Band): 13.2dBm

Cable loss offset High Band (High Band): 13.2dBm

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### 6.5.1.2.: WCDMA mode

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

#### Results:

| EUT Mode      | Frequency (MHz) | CH   | Peak Power (dBm) | Avg. Power (dBm) |
|---------------|-----------------|------|------------------|------------------|
| WCDMA Band II | 1852.4          | 9262 | 26.80            | 23.71            |
|               | 1880.0          | 9400 | 26.55            | 23.21            |
|               | 1907.6          | 9538 | 26.30            | 23.13            |

| EUT Mode     | Frequency (MHz) | CH   | Peak Power (dBm) | Avg. Power (dBm) |
|--------------|-----------------|------|------------------|------------------|
| WCDMA Band V | 826.4           | 4132 | 27.13            | 23.62            |
|              | 836.6           | 4183 | 27.45            | 23.80            |
|              | 846.6           | 4233 | 26.86            | 23.52            |

Offset: b2: 13.2dBm b5: 13.2dBm

Note: The results above reflect max power with all up bits.

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### 6.5.1.3.: HSDPA Release 6 mode

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing.

#### HSDPA SUB-TEST Setting

Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$<br>(Note1,<br>Note 2) | CM (dB)<br>(Note 3) | MPR<br>(dB)<br>(Note 3) | RMC<br>(Kbps) |
|----------|-------------------|-------------------|-------------------|-------------------|------------------------------------|---------------------|-------------------------|---------------|
| 1        | 2/15              | 15/15             | 64                | 2/15              | 4/15                               | 0.0                 | 0.0                     | 12.2          |
| 2        | 12/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 12/15<br>(Note 4) | 24/15                              | 1.0                 | 0.0                     | 12.2          |
| 3        | 15/15             | 8/15              | 64                | 15/8              | 30/15                              | 1.5                 | 0.5                     | 12.2          |
| 4        | 15/15             | 4/15              | 64                | 15/4              | 30/15                              | 1.5                 | 0.5                     | 12.2          |

**Note: The recommended HSDPA MPRs are implemented as per following sub-tests.**

#### Results:

| Mode          | Sub-test | Avg. Power (dBm)<br>Channel |       |       | Power Class 3 Limita-<br>tion (dBm) | Comments |
|---------------|----------|-----------------------------|-------|-------|-------------------------------------|----------|
|               |          | 9262                        | 9400  | 9538  |                                     |          |
| HSDPA<br>(B2) | 1        | 23.93                       | 23.46 | 23.32 | 20.3dBm – 25.7dBm                   | Pass     |
|               | 2        | 23.64                       | 23.10 | 23.00 | 20.3dBm – 25.7dBm                   | Pass     |
|               | 3        | 23.47                       | 22.98 | 22.83 | 19.8dBm – 25.7dBm                   | Pass     |
|               | 4        | 23.52                       | 23.02 | 22.89 | 19.8dBm – 25.7dBm                   | Pass     |

| Mode          | Sub-test | Avg. Power (dBm)<br>Channel |       |       | Power Class 3 Limita-<br>tion (dBm) | Comments |
|---------------|----------|-----------------------------|-------|-------|-------------------------------------|----------|
|               |          | 4132                        | 4183  | 4233  |                                     |          |
| HSDPA<br>(B5) | 1        | 23.84                       | 24.05 | 23.71 | 20.3dBm – 25.7dBm                   | Pass     |
|               | 2        | 23.55                       | 23.69 | 23.69 | 20.3dBm – 25.7dBm                   | Pass     |
|               | 3        | 23.38                       | 23.57 | 23.22 | 19.8dBm – 25.7dBm                   | Pass     |
|               | 4        | 23.43                       | 23.61 | 23.28 | 19.8dBm – 25.7dBm                   | Pass     |

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**6.5.1.4.: HSPA (HSDPA & HSUPA) Release 6 mode**

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing.

**HSPA SUB-TEST Setting**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ | $\beta_{ec}$ | $\beta_{ed}$                                 | $\beta_{ed}$<br>(SF) | $\beta_{ed}$<br>(Codes) | CM<br>(dB) | MPR<br>(dB) | AG<br>Index | E-TFCI | RMC<br>(Kbps) |
|----------|-------------------|-------------------|-------------------|-------------------|--------------|--------------|--|----------------------|-------------------------|------------|-------------|-------------|--------|---------------|
| 1        | 11/15<br>(Note 3) | 15/15<br>(Note 3) | 64                | 11/15<br>(Note 3) | 22/15        | 209/225      | 1309/225                                     | 4                    | 1                       | 1.0        | 0.0         | 20          | 75     | 12.2          |
| 2        | 6/15              | 15/15             | 64                | 6/15              | 12/15        | 12/15        | 94/75  | 4                    | 1                       | 3.0        | 2.0         | 12          | 67     | 12.2          |
| 3        | 15/15             | 9/15              | 64                | 15/9              | 30/15        | 30/15        | $\beta_{ed1}: 47/15$<br>$\beta_{ed2}: 47/15$ | 4<br>4               | 2                       | 2.0        | 1.0         | 15          | 92     | 12.2          |
| 4        | 2/15              | 15/15             | 64                | 2/15              | 4/15         | 2/15         | 56/75  | 4                    | 1                       | 3.0        | 2.0         | 17          | 71     | 12.2          |
| 5        | 15/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 15/15<br>(Note 4) | 30/15        | 24/15        | 134/15                                       | 4                    | 1                       | 1.0        | 0.0         | 21          | 81     | 12.2          |

**Note: The recommended HSUPA MPRs are implemented as per following sub-tests.**

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**Results:**

| Mode      | Sub-test | Avg. Power (dBm)<br>Channel |       |       | Power Class 3 Limita-<br>tion (dBm) | Comments |
|-----------|----------|-----------------------------|-------|-------|-------------------------------------|----------|
|           |          | 9262                        | 9400  | 9538  |                                     |          |
| HSUPA(B2) | 1        | 23.67                       | 23.14 | 23.04 | 18.8dBm – 25.7dBm                   | Pass     |
|           | 2        | 21.73                       | 21.22 | 21.08 | 16.8dBm – 25.7dBm                   | Pass     |
|           | 3        | 22.64                       | 22.20 | 22.07 | 17.8dBm – 25.7dBm                   | Pass     |
|           | 4        | 21.78                       | 21.28 | 21.16 | 16.8dBm – 25.7dBm                   | Pass     |
|           | 5        | 23.53                       | 22.97 | 22.93 | 18.8dBm – 25.7dBm                   | Pass     |

| Mode      | Sub-test | Avg. Power (dBm)<br>Channel |       |       | Power Class 3 Limita-<br>tion (dBm) | Comments |
|-----------|----------|-----------------------------|-------|-------|-------------------------------------|----------|
|           |          | 4132                        | 4183  | 4233  |                                     |          |
| HSUPA(B5) | 1        | 23.58                       | 23.73 | 23.43 | 18.8dBm – 25.7dBm                   | Pass     |
|           | 2        | 21.64                       | 21.81 | 21.47 | 16.8dBm – 25.7dBm                   | Pass     |
|           | 3        | 22.55                       | 22.79 | 22.46 | 17.8dBm – 25.7dBm                   | Pass     |
|           | 4        | 21.69                       | 21.87 | 21.55 | 16.8dBm – 25.7dBm                   | Pass     |
|           | 5        | 23.44                       | 23.56 | 23.32 | 18.8dBm – 25.7dBm                   | Pass     |

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### 6.5.2. Minimum Communications Power Measurement PCS 1900 band

N/A, the device didn't support GSM function.

### WCDMA/HSDPA/HSUPA band II, V

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key “UE Power Control” and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm then record the read (see page 23 for measurement data) . The min. power was measures by a function key “minimum power” then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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## 7. PEAK TO AVERAGE RATIO

### 7.1. Standard Applicable:

According FCC 24.232(d) – The peak-to-average ration (PAR) of the transmission may not exceed 13dB.

### 7.2. Test SET-UP (Block Diagram of Configuration):

Refer to section 2.4 in this report

### 7.3. Measurement Procedure:

KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:

Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth; & internal =1ms

Set the number of counts to a value that stabilizes the measured CCDF curve.

### 7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

### 7.5. Measurement Result:

Refer to next page for plot.

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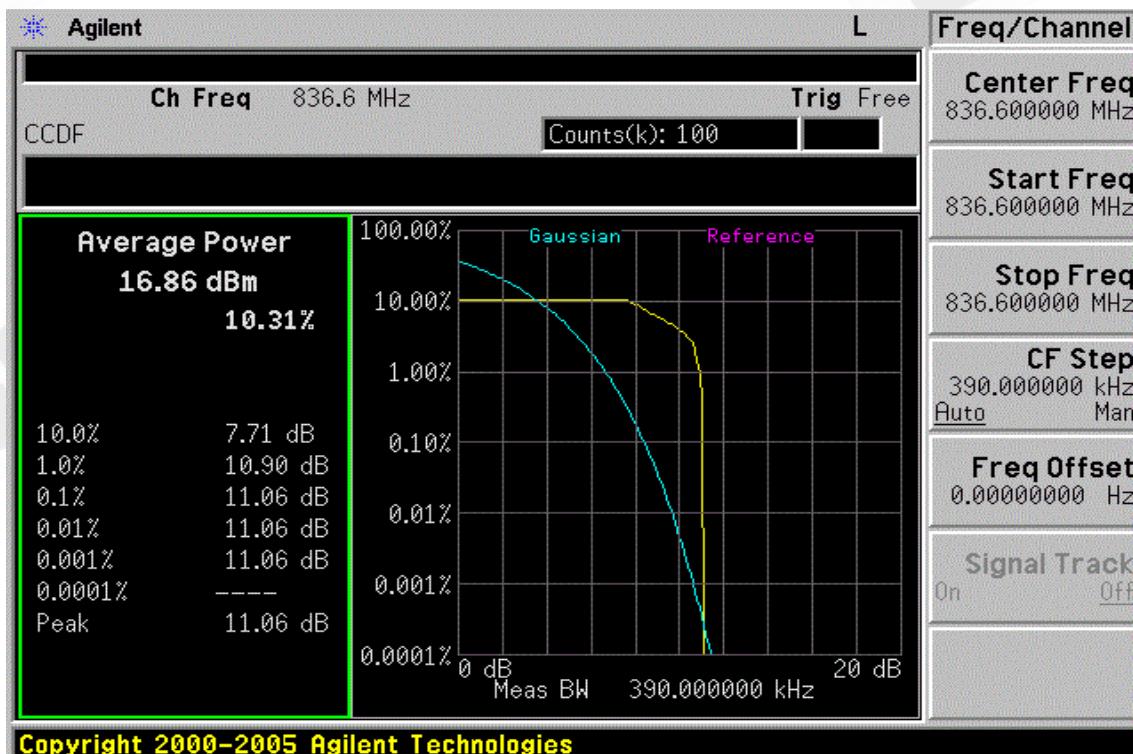
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**GPRS 850 Channel Low****GPRS 850 Channel Mid**

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## GPRS 850 Channel High



## EDGE 850 Channel Low



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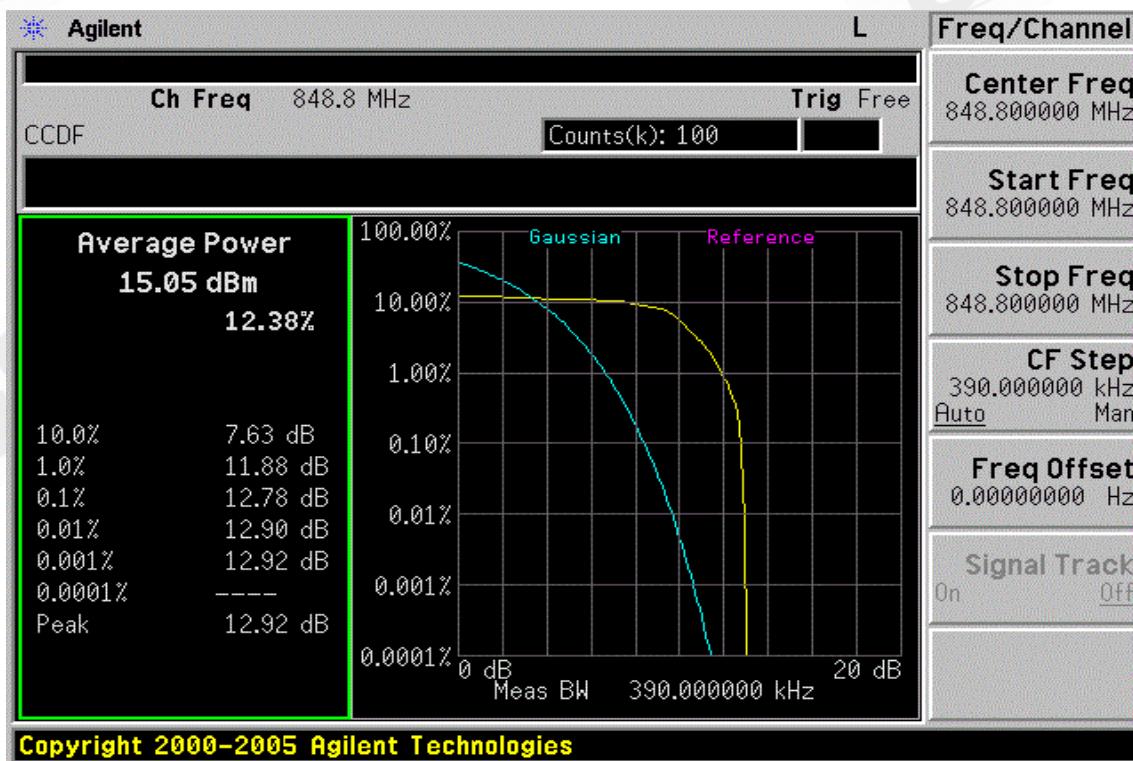
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## EDGE 850 Channel Mid



## EDGE 850 Channel High



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**GPRS 1900 Channel Low****GPRS 1900 Channel Mid**

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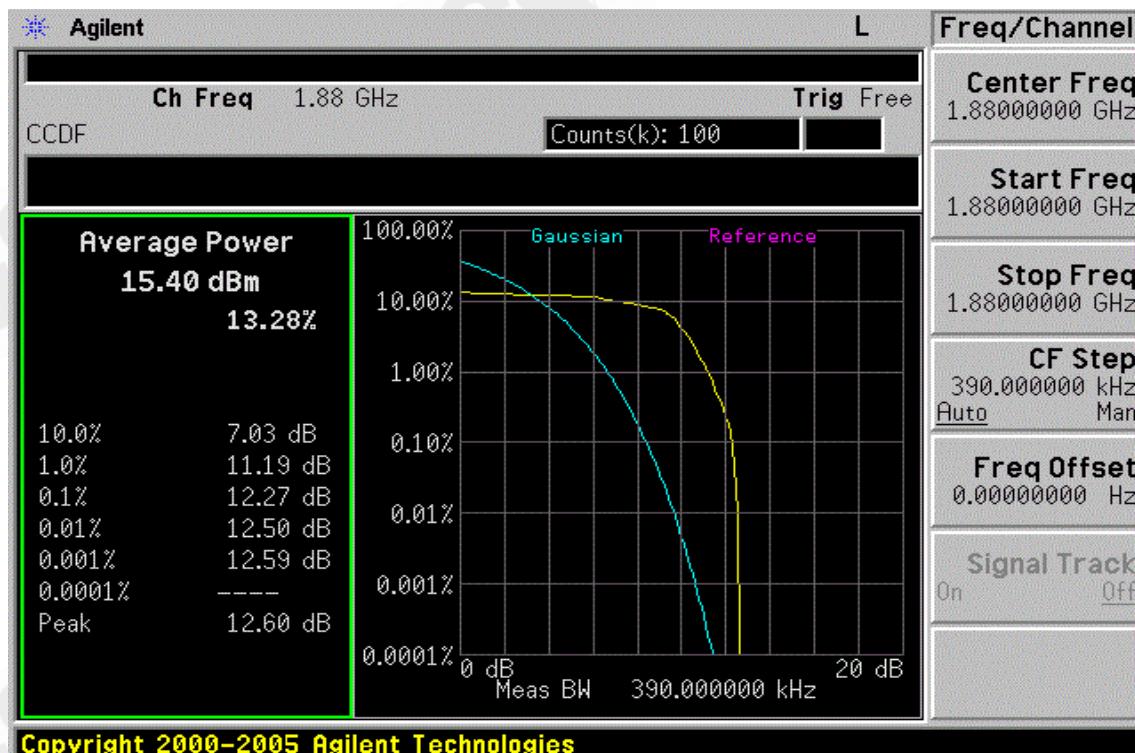
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**GPRS 1900 Channel High****EDGE 1900 Channel Low**

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**EDGE 1900 Channel Mid****EDGE 1900 Channel High**

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## WCDMA BII Channel Low



## WCDMA BII Channel Mid



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**WCDMA BII Channel High****HSDPA BII Channel Low**

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**HSDPA BII Channel Mid****HSDPA BII Channel High**

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## HSUPA BII Channel Low



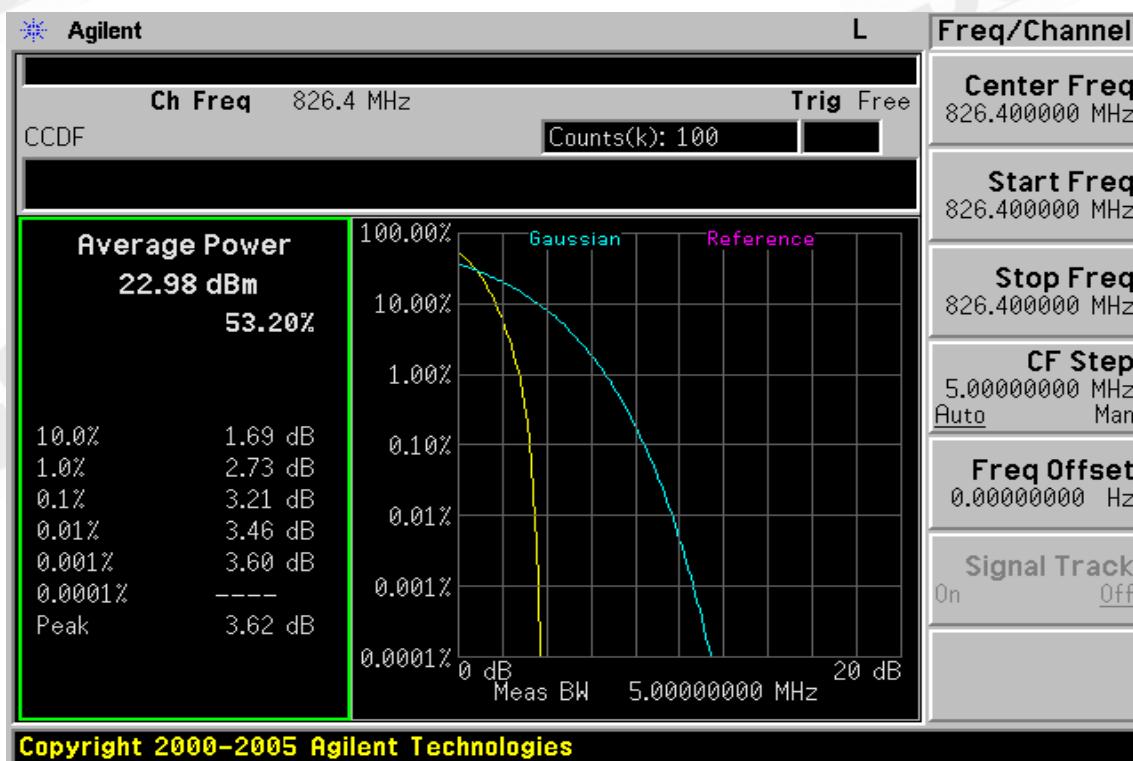
## HSUPA BII Channel Mid



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**HSUPA BII Channel High****WCDMA BV Channel Low**

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## WCDMA BV Channel Mid



## WCDMA BV Channel High



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## HSDPA BV Channel Low



## HSDPA BV Channel Mid



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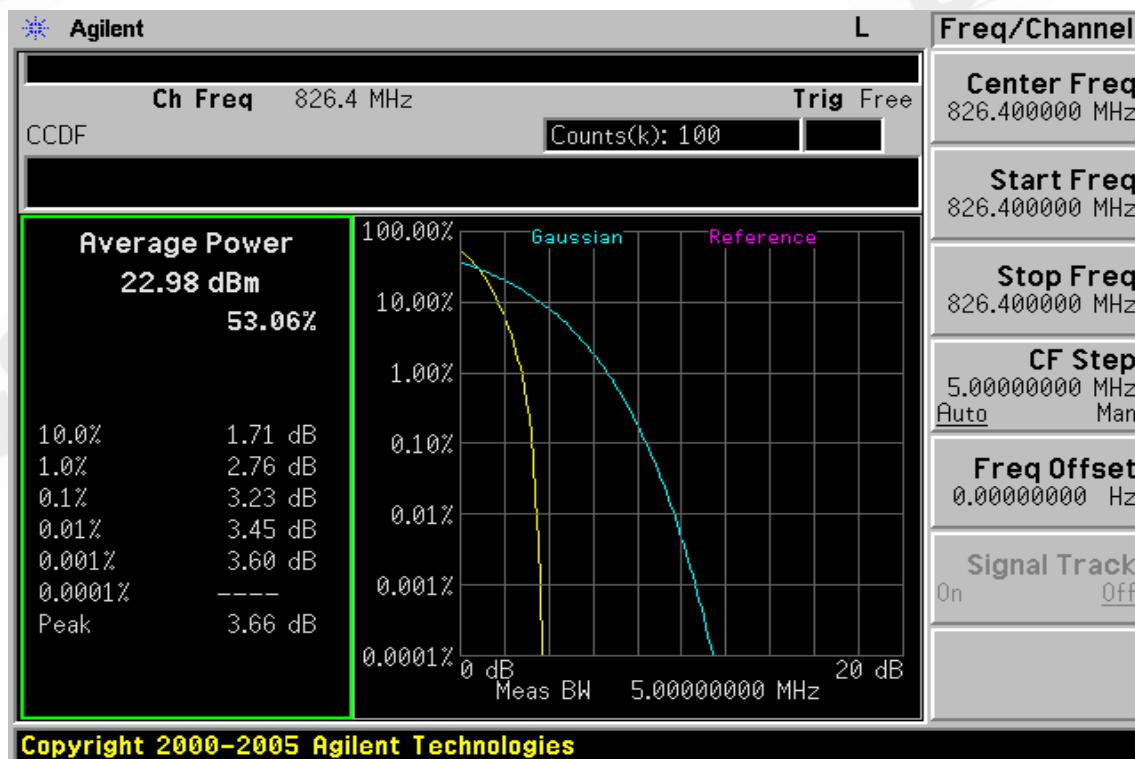
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**HSDPA BV Channel High****HSUPA BV Channel Low**

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**HSUPA BV Channel Mid****HSUPA BV Channel High**

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## 8. ERP, EIRP MEASUREMENT

### 8.1. Standard Applicable:

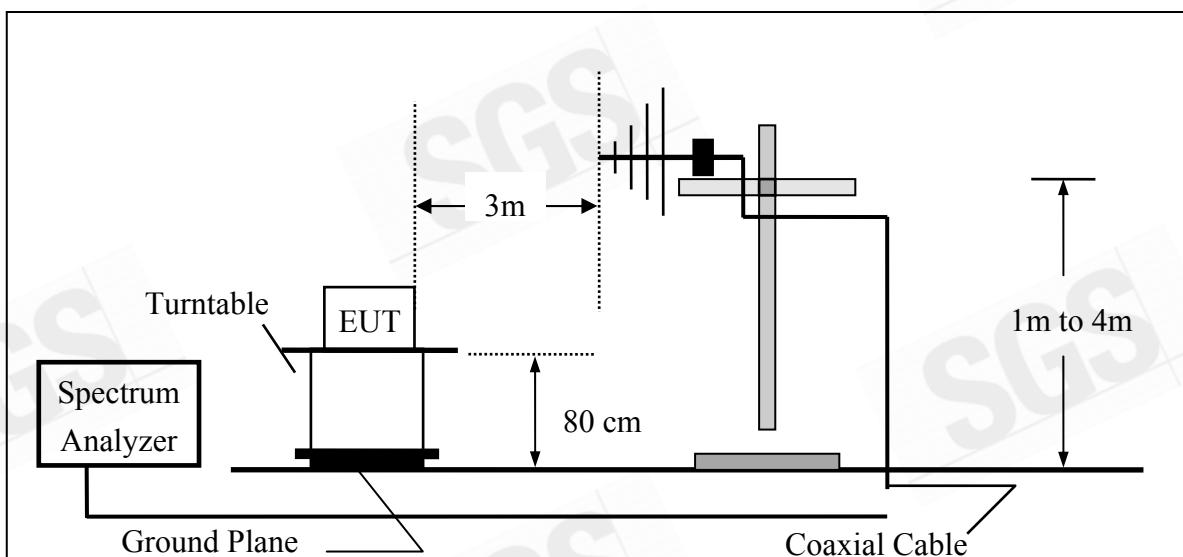
According to FCC §2.1046

FCC 22.913(a) Mobile station is limited to 7W ERP.

FCC 24.232(b) Mobile station is limited to 2W EIRP.

### 8.2. Test SET-UP (Block Diagram of Configuration):

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz

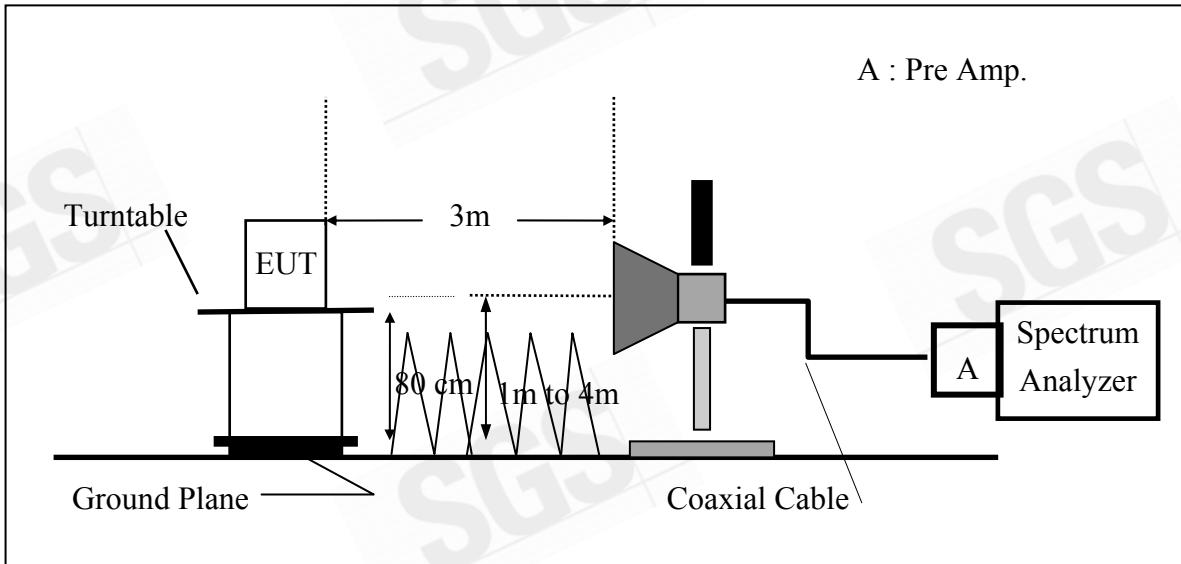


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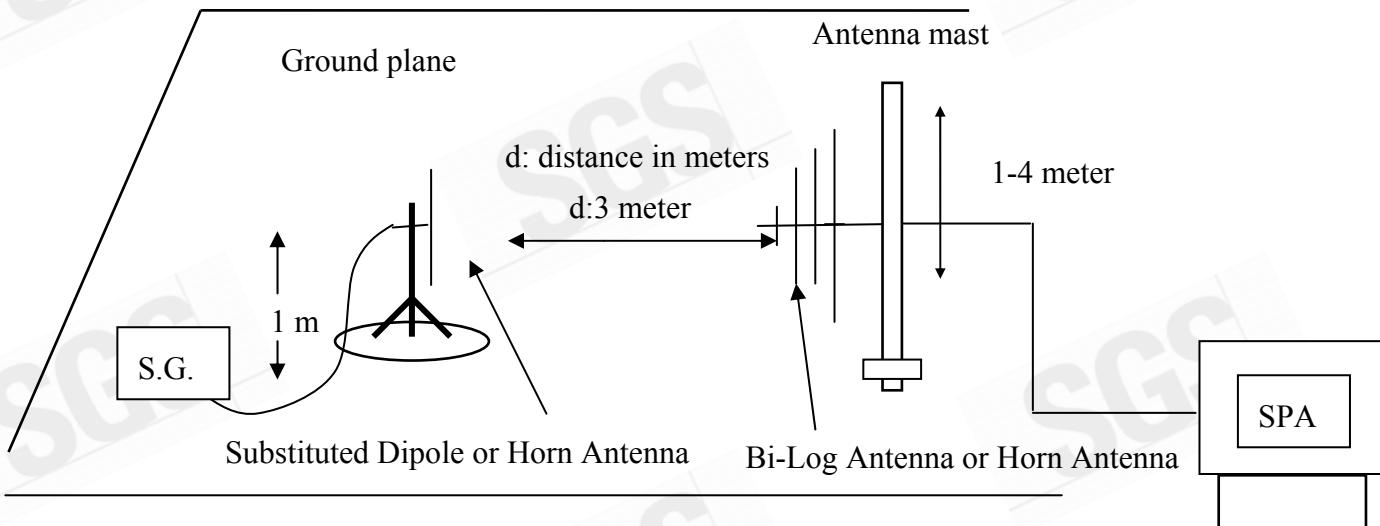
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## (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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### 8.3. Measurement Procedure:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated and converted.

ERP in frequency band 824.2 –848.80MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows

EIRP in frequency band 1850.2-1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

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Spectrum setting:

1. Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and  $VBW \geq 3 \times RBW$ .

Or,

2. KDB 971168 D01 Power Meas License Digital Systems v01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.

Set frequency = nominal signal center frequency;

Set span = 2 X occupied BW;

Set RBW  $\approx 1\text{--}5\%$  of the span, not to exceed 1 MHz

Set  $VBW = 3 \times RBW$ ;

Select average power (RMS) detector

Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt integration time (ex. Point = 601points, then sweep time =  $601 \times 10^{-3} = 6\text{s}$ ).

Activate trace averaging routine over a minimum of 10 sweeps;

Activate marker/span pair and set span = signal or channel bandwidth;

Activate the band/interval power marker function;

Record the band power level;

Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.

The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of  $10 \times \log(TBW/RBW)$ , where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

#### 8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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## 8.5. Measurement Result:

| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |     | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| GPRS 850       | 824.2                 | 128 | V            | 14.75       | 3.75         | -3.03      | 15.48        | 38.45 |
|                |                       |     | H            | 16.92       | 3.75         | -3.03      | <b>17.65</b> | 38.45 |
|                | 836.6                 | 190 | V            | 14.09       | 3.76         | -3.07      | 14.78        | 38.45 |
|                |                       |     | H            | 16.92       | 3.76         | -3.07      | 17.61        | 38.45 |
|                | 848.8                 | 251 | V            | 13.70       | 3.77         | -3.11      | 14.36        | 38.45 |
|                |                       |     | H            | 16.39       | 3.77         | -3.11      | 17.05        | 38.45 |

| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |     | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| EDGE 850       | 824.2                 | 128 | V            | 13.22       | 3.75         | -3.03      | 13.95        | 38.45 |
|                |                       |     | H            | 8.84        | 3.75         | -3.03      | 9.57         | 38.45 |
|                | 836.6                 | 190 | V            | 12.62       | 3.76         | -3.07      | 13.31        | 38.45 |
|                |                       |     | H            | 15.80       | 3.76         | -3.07      | <b>16.49</b> | 38.45 |
|                | 848.8                 | 251 | V            | 12.64       | 3.77         | -3.11      | 13.30        | 38.45 |
|                |                       |     | H            | 15.10       | 3.77         | -3.11      | 15.76        | 38.45 |

## Remark :

(1) The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |     | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| GPRS 1900      | 1850.2                | 512 | V            | 26.76       | 5.22         | -4.67      | 27.32        | 33.00 |
|                |                       |     | H            | 18.89       | 5.22         | -4.67      | 19.44        | 33.00 |
|                | 1880.0                | 661 | V            | 27.38       | 5.16         | -4.70      | 27.83        | 33.00 |
|                |                       |     | H            | 18.87       | 5.16         | -4.70      | 19.32        | 33.00 |
|                | 1909.8                | 810 | V            | 28.03       | 5.09         | -4.74      | <b>28.38</b> | 33.00 |
|                |                       |     | H            | 20.57       | 5.09         | -4.74      | 20.92        | 33.00 |

| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |     | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| EDGE 1900      | 1850.2                | 512 | V            | 25.30       | 5.22         | -4.67      | <b>25.86</b> | 33.00 |
|                |                       |     | H            | 17.52       | 5.22         | -4.67      | 18.08        | 33.00 |
|                | 1880.0                | 661 | V            | 24.78       | 5.16         | -4.70      | 25.23        | 33.00 |
|                |                       |     | H            | 17.45       | 5.16         | -4.70      | 17.90        | 33.00 |
|                | 1909.8                | 810 | V            | 24.26       | 5.09         | -4.74      | 24.61        | 33.00 |
|                |                       |     | H            | 19.12       | 5.09         | -4.74      | 19.47        | 33.00 |

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW=300K, VBW=1MHz

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| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
| WCDMA B2       | MHz                   |      | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
|                | 1852.4                | 9262 | V            | 25.07       | 5.22         | -4.67      | <b>25.62</b> | 33.01 |
|                |                       |      | H            | 17.69       | 5.22         | -4.67      | 18.24        | 33.01 |
|                | 1880.0                | 9400 | V            | 21.46       | 5.16         | -4.70      | 21.91        | 33.01 |
|                |                       |      | H            | 17.05       | 5.16         | -4.70      | 17.50        | 33.01 |
|                | 1907.6                | 9538 | V            | 20.07       | 5.10         | -4.74      | 20.43        | 33.01 |
|                |                       |      | H            | 16.06       | 5.09         | -4.74      | 16.42        | 33.01 |

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
| HSDPA B2       | MHz                   |      | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
|                | 1852.4                | 9262 | V            | 22.83       | 5.22         | -4.67      | <b>23.38</b> | 33.01 |
|                |                       |      | H            | 21.28       | 5.22         | -4.67      | 21.83        | 33.01 |
|                | 1880.0                | 9400 | V            | 15.46       | 5.22         | -4.67      | 16.01        | 33.01 |
|                |                       |      | H            | 13.94       | 5.22         | -4.67      | 14.49        | 33.01 |
|                | 1907.6                | 9538 | V            | 21.45       | 5.16         | -4.70      | 21.91        | 33.01 |
|                |                       |      | H            | 20.77       | 5.16         | -4.70      | 21.22        | 33.01 |

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
| HSUPA B2       | MHz                   |      | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
|                | 1852.4                | 9262 | V            | 13.95       | 5.16         | -4.70      | 14.40        | 33.01 |
|                |                       |      | H            | 12.80       | 5.16         | -4.71      | 13.25        | 33.01 |
|                | 1880.0                | 9400 | V            | 17.82       | 5.10         | -4.74      | 18.18        | 33.01 |
|                |                       |      | H            | 18.27       | 5.10         | -4.74      | <b>18.64</b> | 33.01 |
|                | 1907.6                | 9538 | V            | 13.84       | 5.10         | -4.74      | 14.20        | 33.01 |
|                |                       |      | H            | 13.98       | 5.10         | -4.74      | 14.34        | 33.01 |

### Remark :

(1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |      | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| WCDMA B5       | 826.4                 | 4132 | V            | 9.96        | 3.76         | -3.03      | 10.68        | 38.45 |
|                |                       |      | H            | 14.27       | 3.76         | -3.04      | 14.99        | 38.45 |
|                | 836.6                 | 4183 | V            | 9.73        | 3.76         | -3.07      | 10.43        | 38.45 |
|                |                       |      | H            | 14.64       | 3.76         | -3.07      | <b>15.33</b> | 38.45 |
|                | 846.6                 | 4233 | V            | 10.65       | 3.77         | -3.10      | 11.32        | 38.45 |
|                |                       |      | H            | 14.56       | 3.77         | -3.10      | 15.23        | 38.45 |

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |      | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| HSDPA B5       | 826.4                 | 4132 | V            | 11.57       | 3.76         | -3.03      | 12.29        | 38.45 |
|                |                       |      | H            | 16.25       | 3.76         | -3.03      | 16.97        | 38.45 |
|                | 836.6                 | 4183 | V            | 11.11       | 3.76         | -3.07      | 11.80        | 38.45 |
|                |                       |      | H            | 16.53       | 3.76         | -3.07      | <b>17.23</b> | 38.45 |
|                | 846.6                 | 4233 | V            | 12.42       | 3.77         | -3.10      | 13.09        | 38.45 |
|                |                       |      | H            | 15.50       | 3.77         | -3.10      | 16.16        | 38.45 |

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |      | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| HSUPA B5       | 826.4                 | 4132 | V            | 11.37       | 3.76         | -3.03      | 12.09        | 38.45 |
|                |                       |      | H            | 16.00       | 3.76         | -3.03      | <b>16.72</b> | 38.45 |
|                | 836.6                 | 4183 | V            | 11.04       | 3.76         | -3.07      | 11.73        | 38.45 |
|                |                       |      | H            | 15.98       | 3.76         | -3.07      | 16.68        | 38.45 |
|                | 846.6                 | 4233 | V            | 12.13       | 3.77         | -3.10      | 12.80        | 38.45 |
|                |                       |      | H            | 15.17       | 3.77         | -3.10      | 15.84        | 38.45 |

### Remark :

(1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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## 9. OCCUPIED BANDWIDTH MEASUREMENT

### 9.1. Standard Applicable:

According to §FCC 2.1049 (99%)

### 9.2. Test Set-up:

Refer to section 5.2 in this report

### 9.3. Measurement Procedure:

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 \* Signal BW, set % Power = 99%.

**NOTE: For the plot of bandwidth measurement, the marker of the 99% bandwidth is diamond-shape while the marker of the 20dB BW is arrow-mark**

### 9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**9.5. Measurement Result:****99% Bandwidth**

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| GPRS 850        | 824.20                 | 128       | 0.240                      |
|                 | 836.60                 | 190       | 0.247                      |
|                 | 848.80                 | 251       | 0.243                      |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| GPRS 1900       | 1850.20                | 512       | 0.244                      |
|                 | 1880.00                | 661       | 0.241                      |
|                 | 1909.80                | 810       | 0.237                      |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| EDGE 850        | 824.20                 | 128       | 0.239                      |
|                 | 836.60                 | 190       | 0.245                      |
|                 | 848.80                 | 251       | 0.246                      |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| EDGE 1900       | 1850.20                | 512       | 0.250                      |
|                 | 1880.00                | 661       | 0.243                      |
|                 | 1909.80                | 810       | 0.250                      |

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| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| WCDMA II        | 1852.40                | 9262      | 4.1347                     |
|                 | 1880.00                | 9400      | 4.1368                     |
|                 | 1907.60                | 9538      | 4.1497                     |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| WCDMA V         | 826.40                 | 4132      | 4.1387                     |
|                 | 836.00                 | 4180      | 4.1321                     |
|                 | 846.60                 | 4233      | 4.1233                     |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| HSDPA II        | 1852.4                 | 9262      | 4.1362                     |
|                 | 1880.0                 | 9400      | 4.1273                     |
|                 | 1907.6                 | 9538      | 4.1475                     |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| HSDPA V         | 826.40                 | 4132      | 4.1256                     |
|                 | 836.60                 | 4183      | 4.1127                     |
|                 | 846.60                 | 4233      | 4.1237                     |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| HSUPA II        | 1852.4                 | 9262      | 4.1266                     |
|                 | 1880.0                 | 9400      | 4.1460                     |
|                 | 1907.6                 | 9538      | 4.1425                     |

| <b>EUT Mode</b> | <b>Frequency (MHz)</b> | <b>CH</b> | <b>99% Bandwidth (MHz)</b> |
|-----------------|------------------------|-----------|----------------------------|
| HSUPA V         | 826.40                 | 4132      | 4.1371                     |
|                 | 836.60                 | 4183      | 4.1185                     |
|                 | 846.60                 | 4233      | 4.1088                     |

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## 99% Bandwidth Test Data

Figure 9-1: GPRS 850 Channel Low

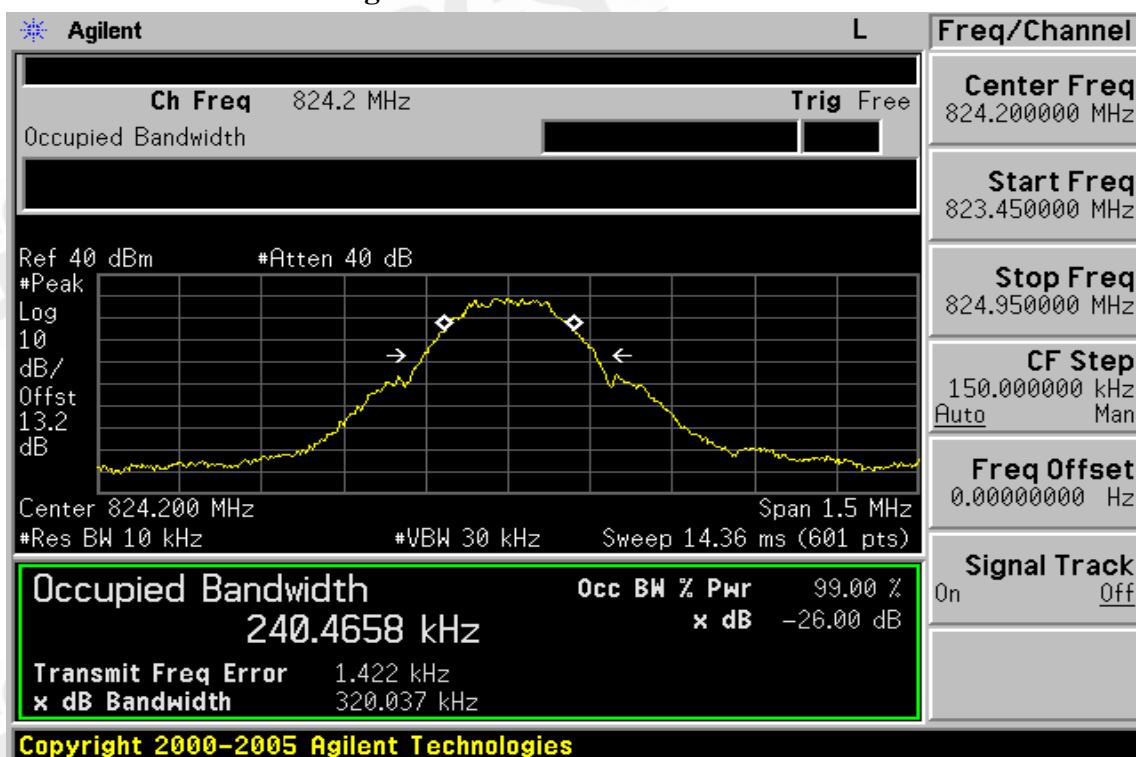
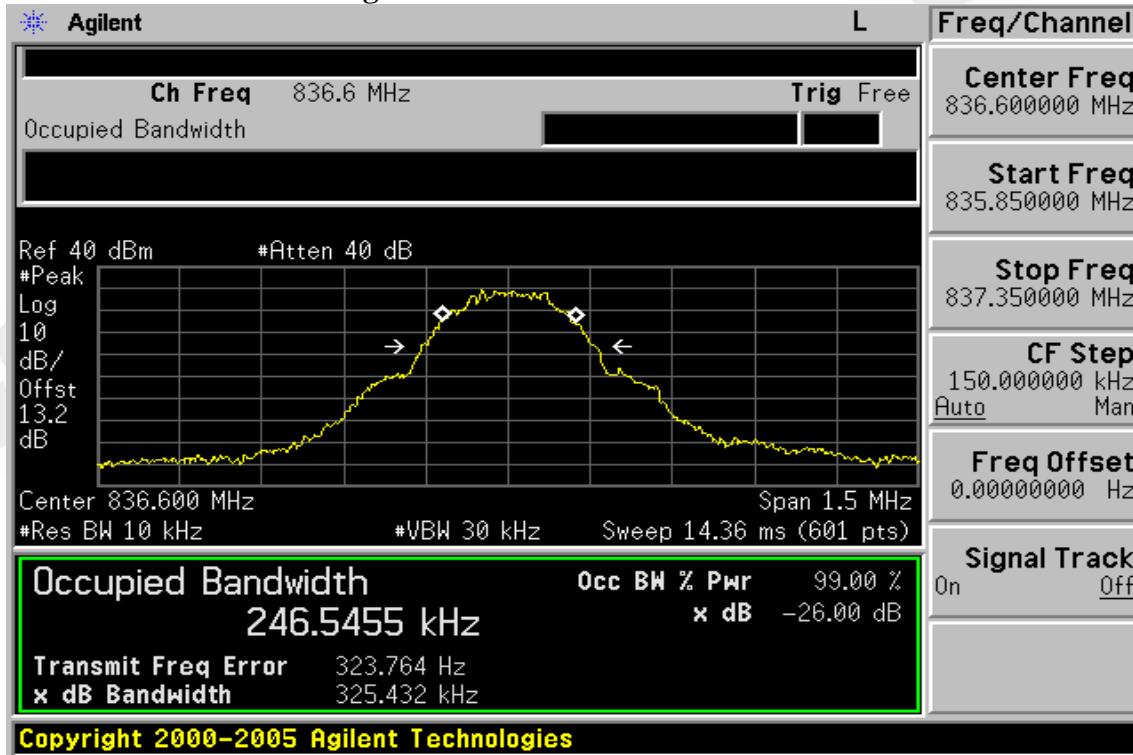


Figure 9-2: GPRS 850 Channel Mid



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Figure 9-3: GPRS 850 Channel High

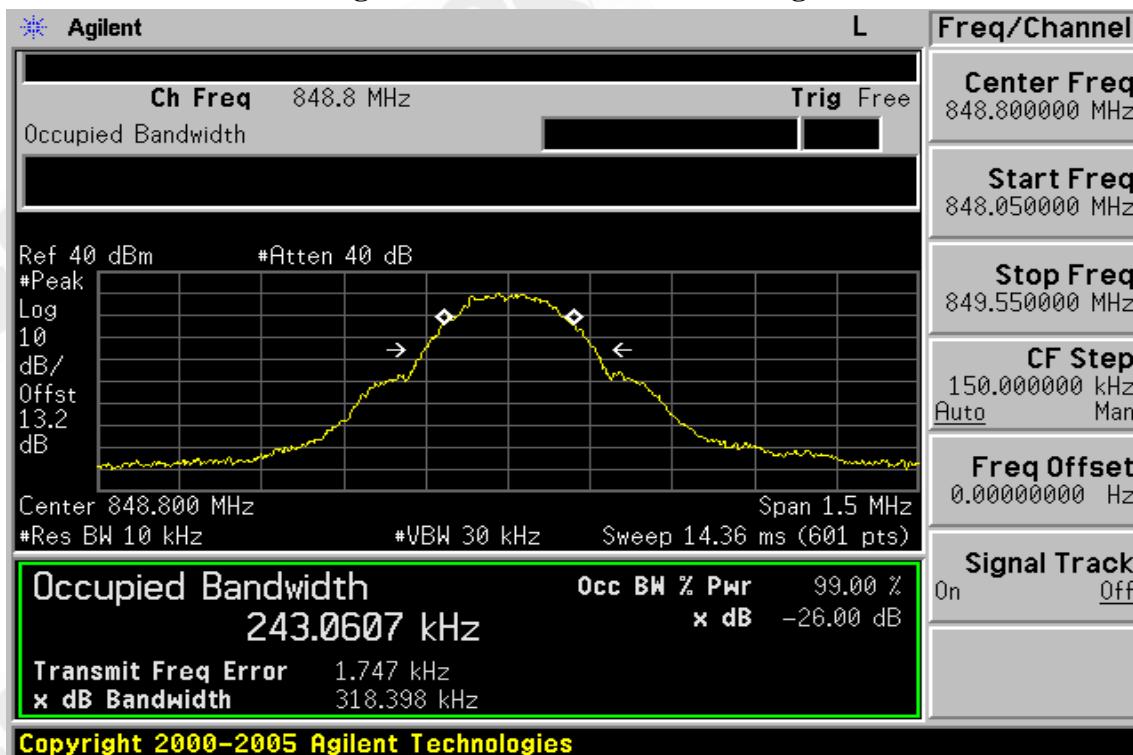
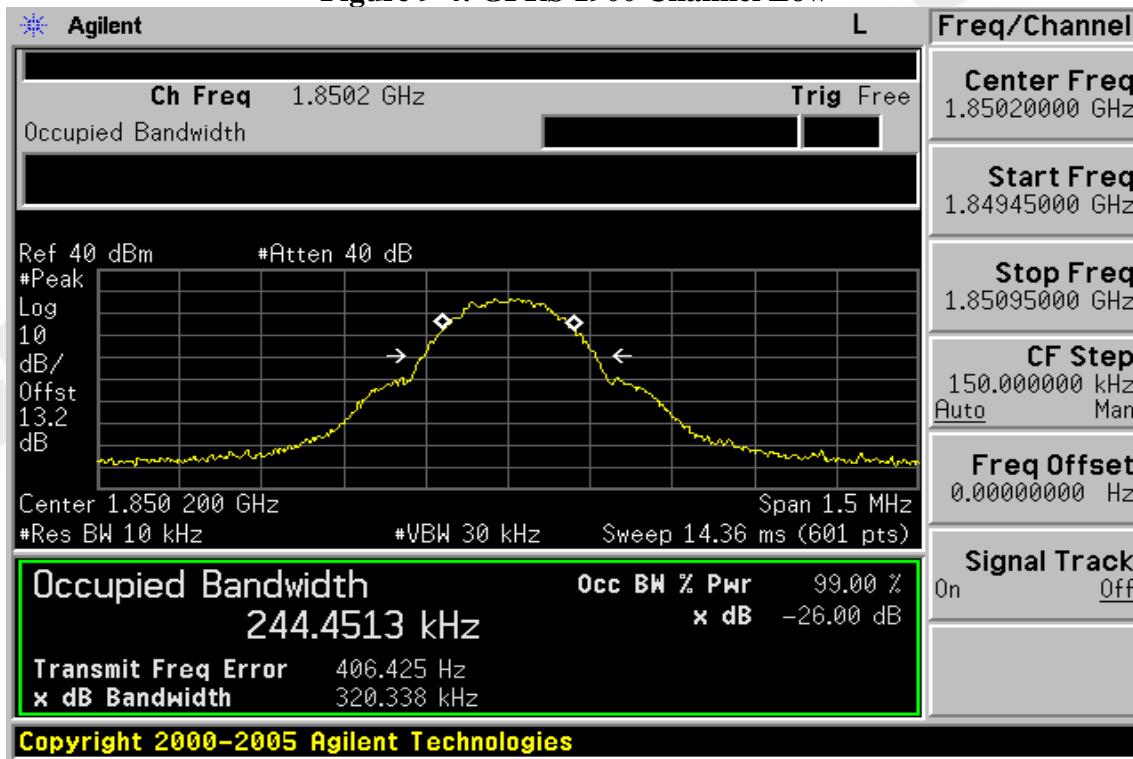


Figure 9-4: GPRS 1900 Channel Low



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Figure 9-5: GPRS 1900 Channel Mid

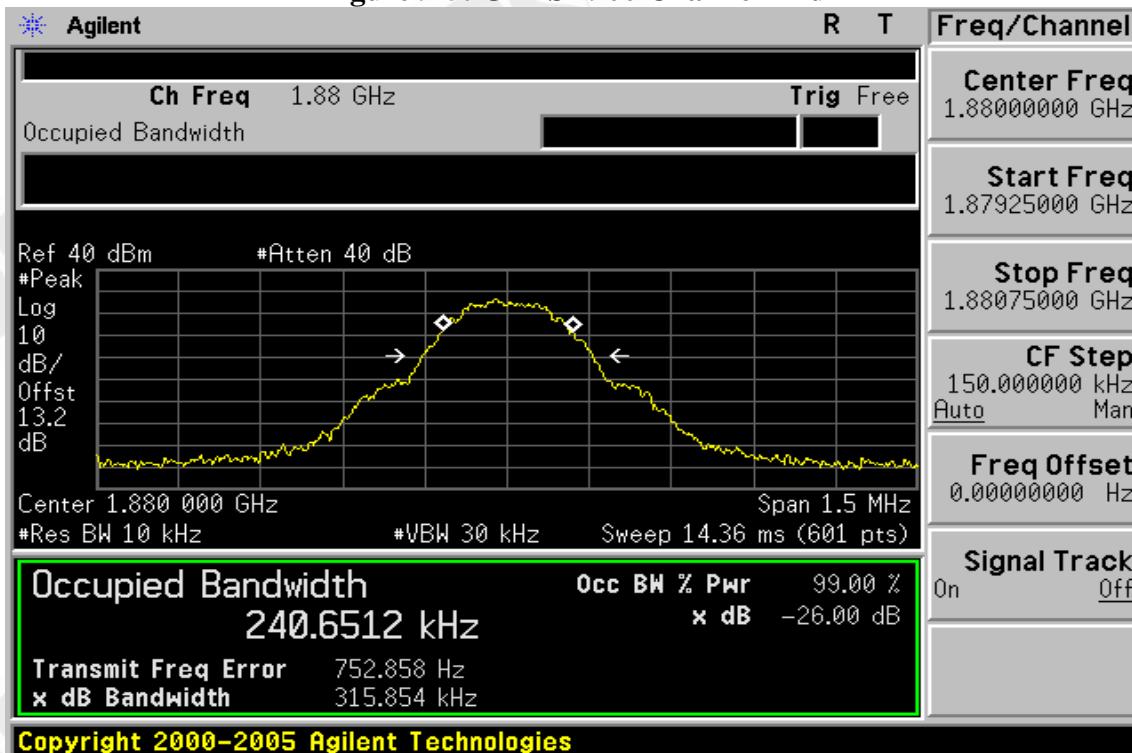
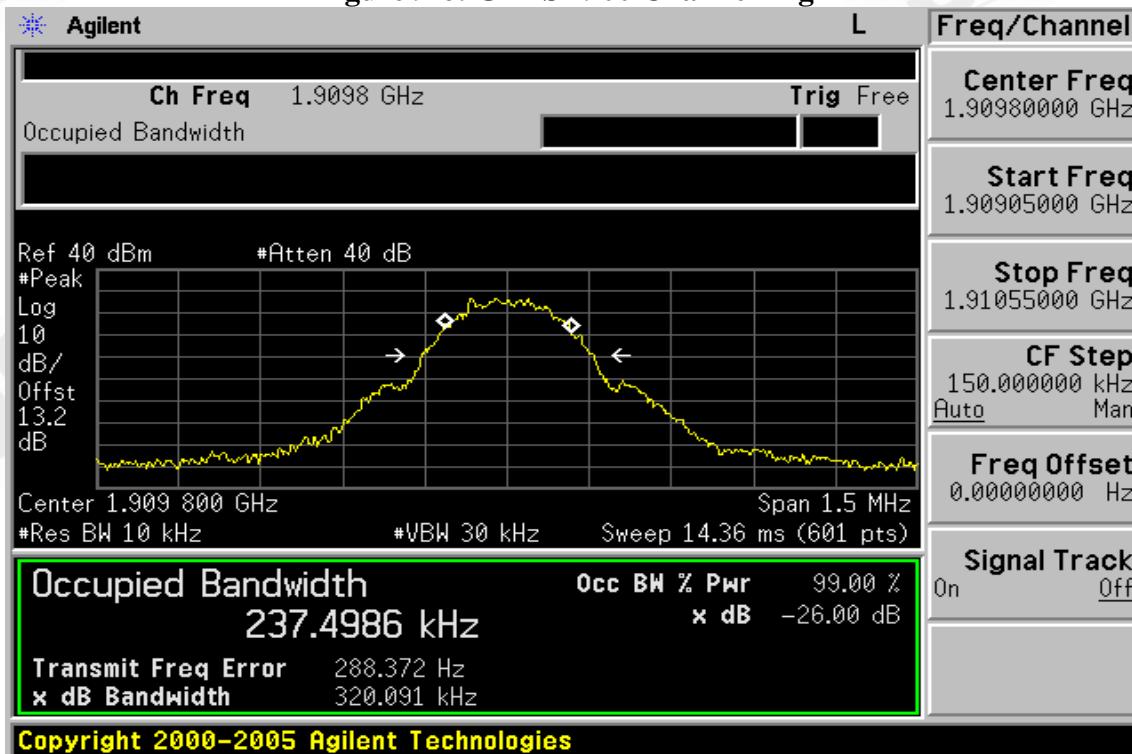


Figure 9-6: GPRS 1900 Channel High



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Figure 9-7: EDGE 850 Channel Low

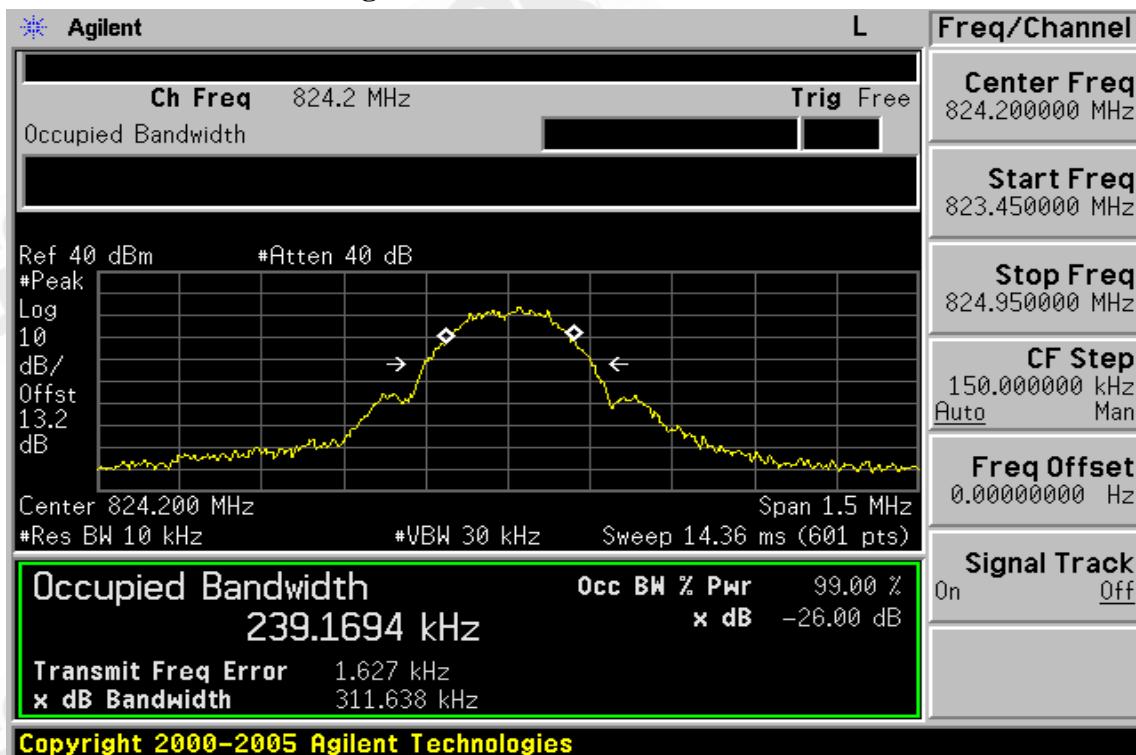
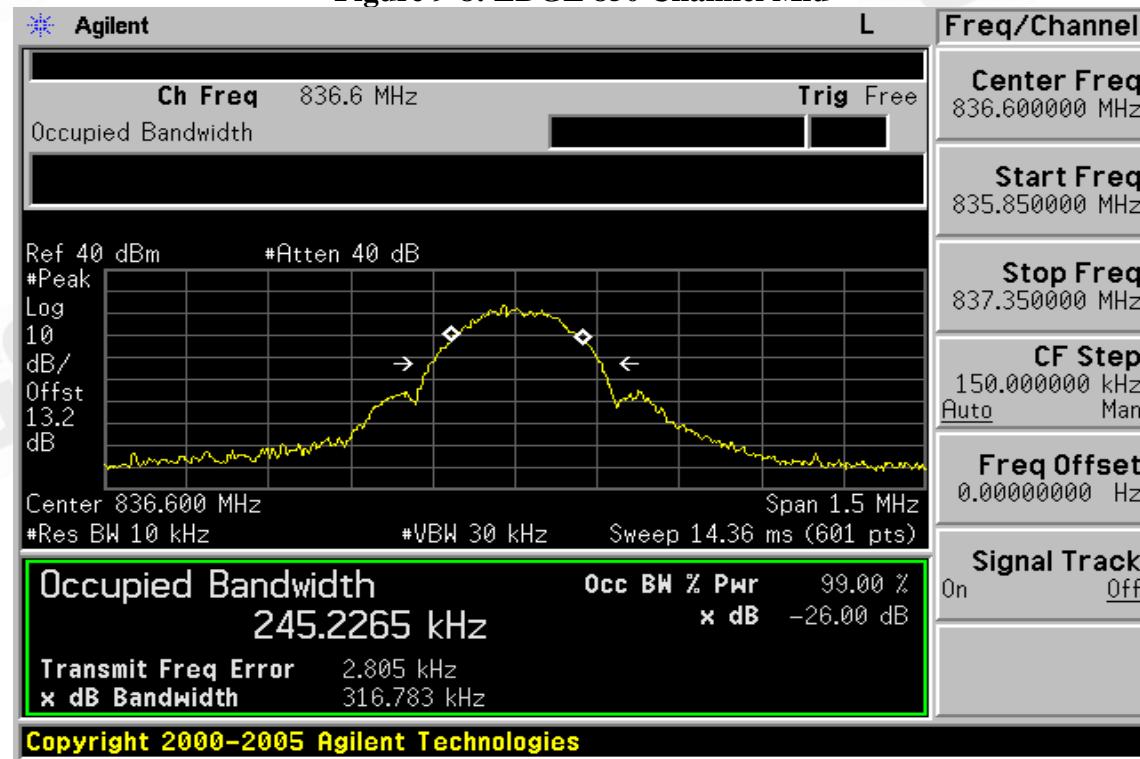


Figure 9-8: EDGE 850 Channel Mid



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Figure 9-9: EDGE 850 Channel High

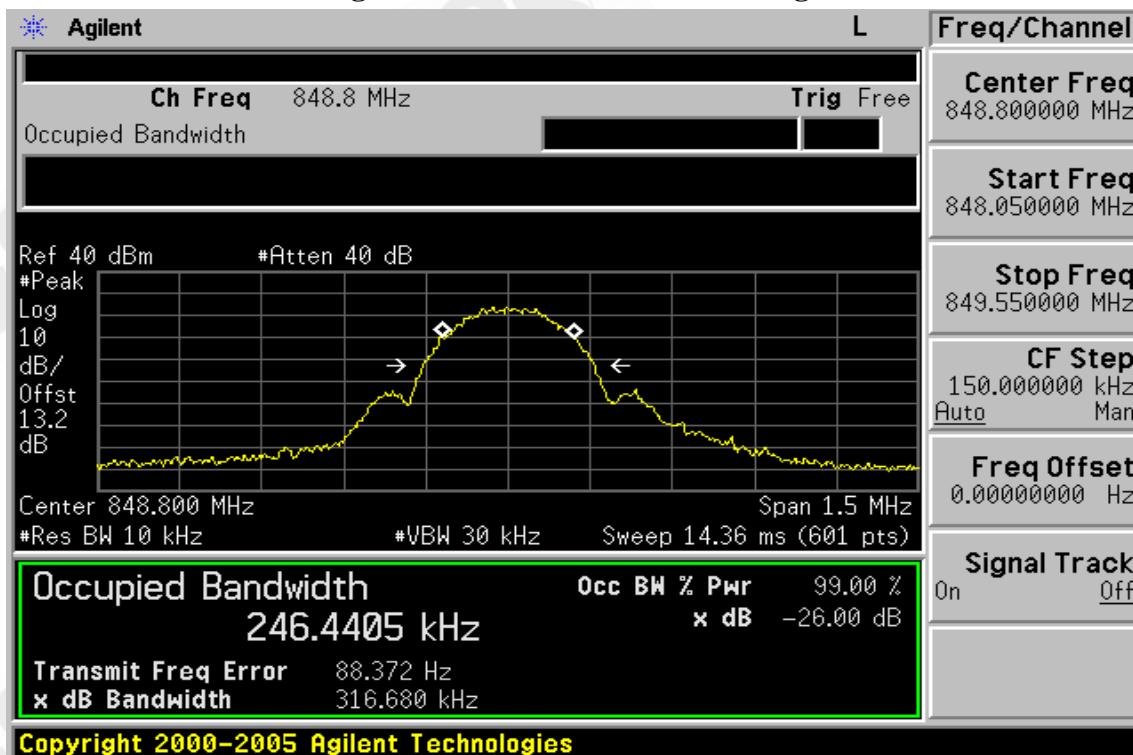
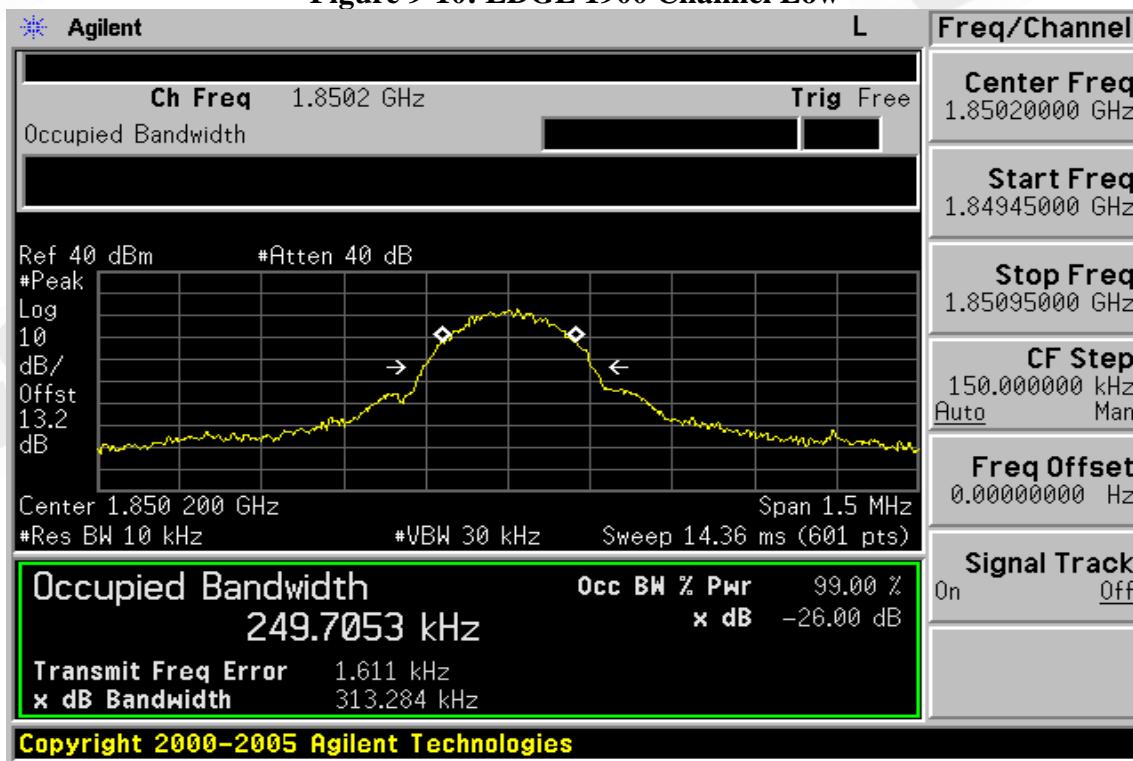


Figure 9-10: EDGE 1900 Channel Low



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Figure 9-11: EDGE 1900 Channel Mid

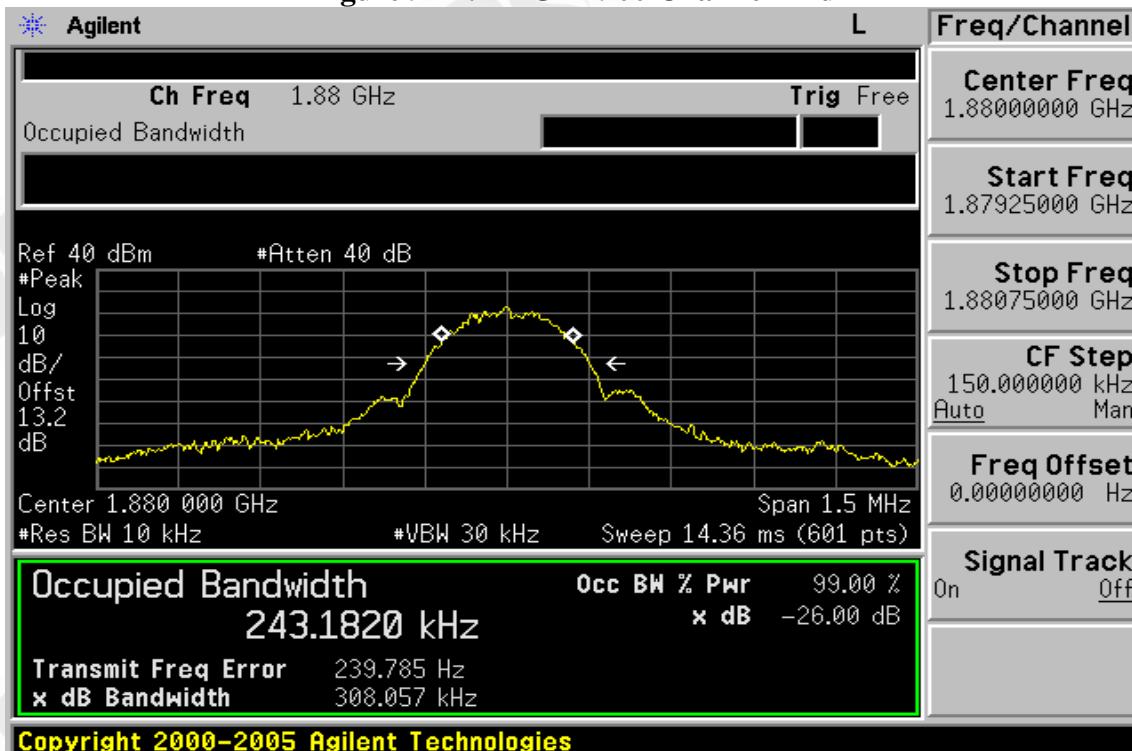
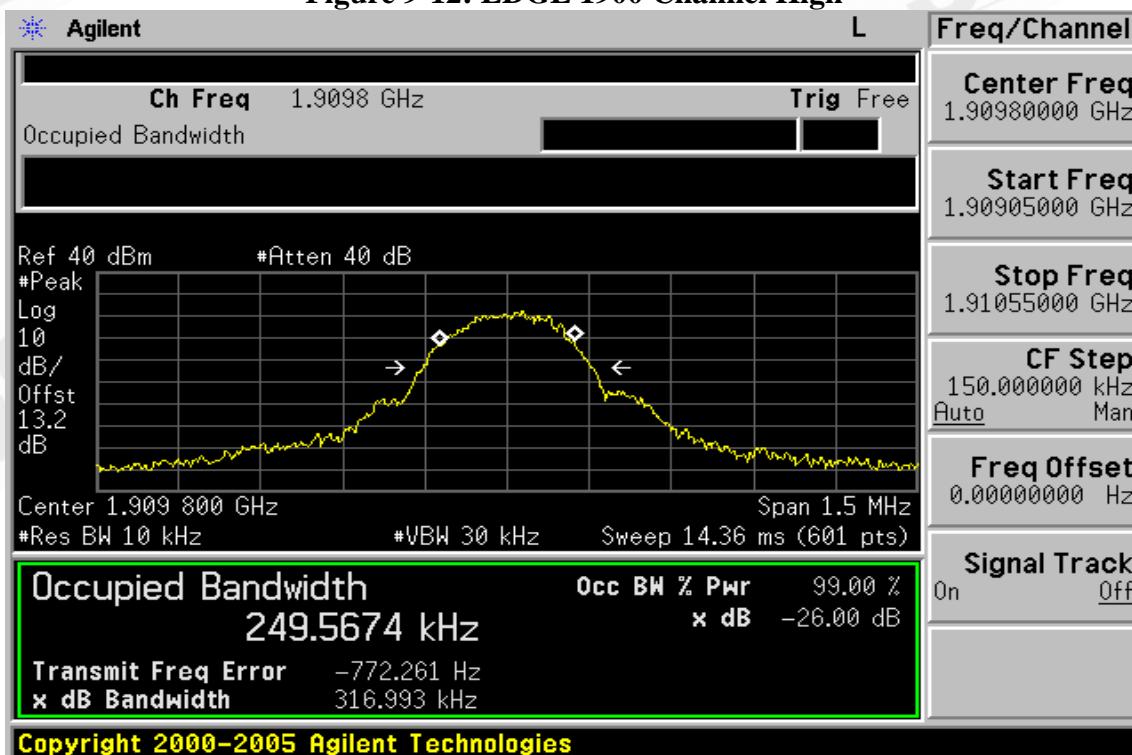


Figure 9-12: EDGE 1900 Channel High



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Figure 9-13: WCDMA II Channel Low

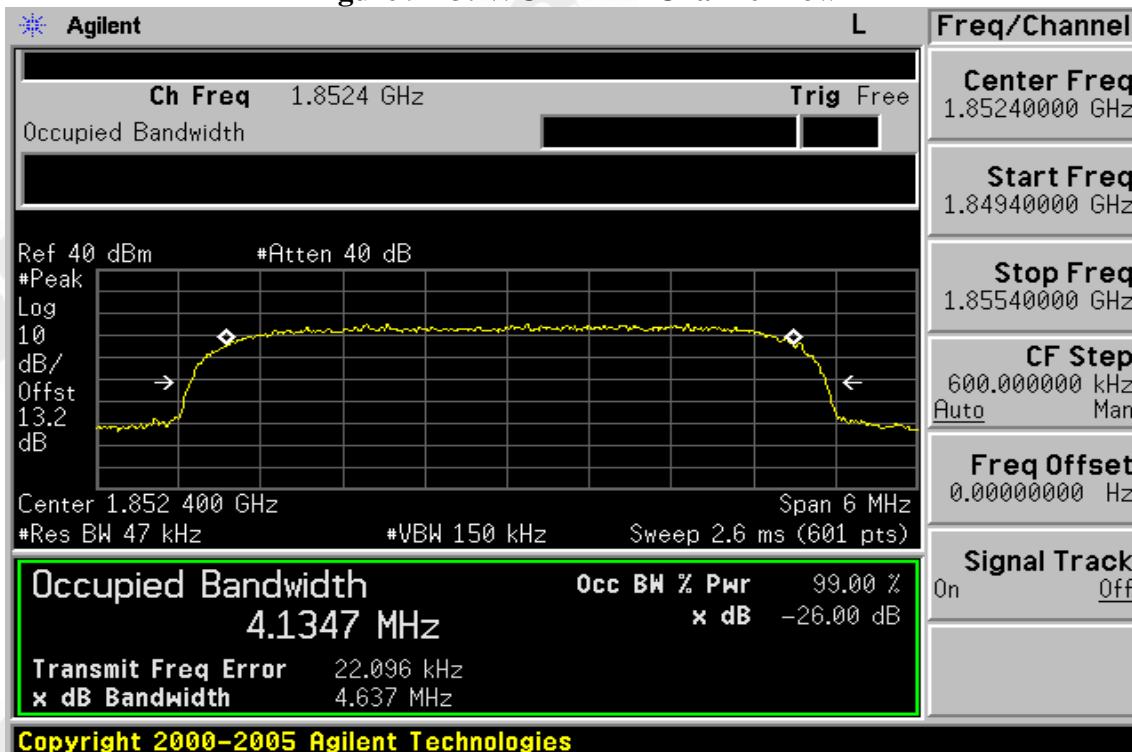
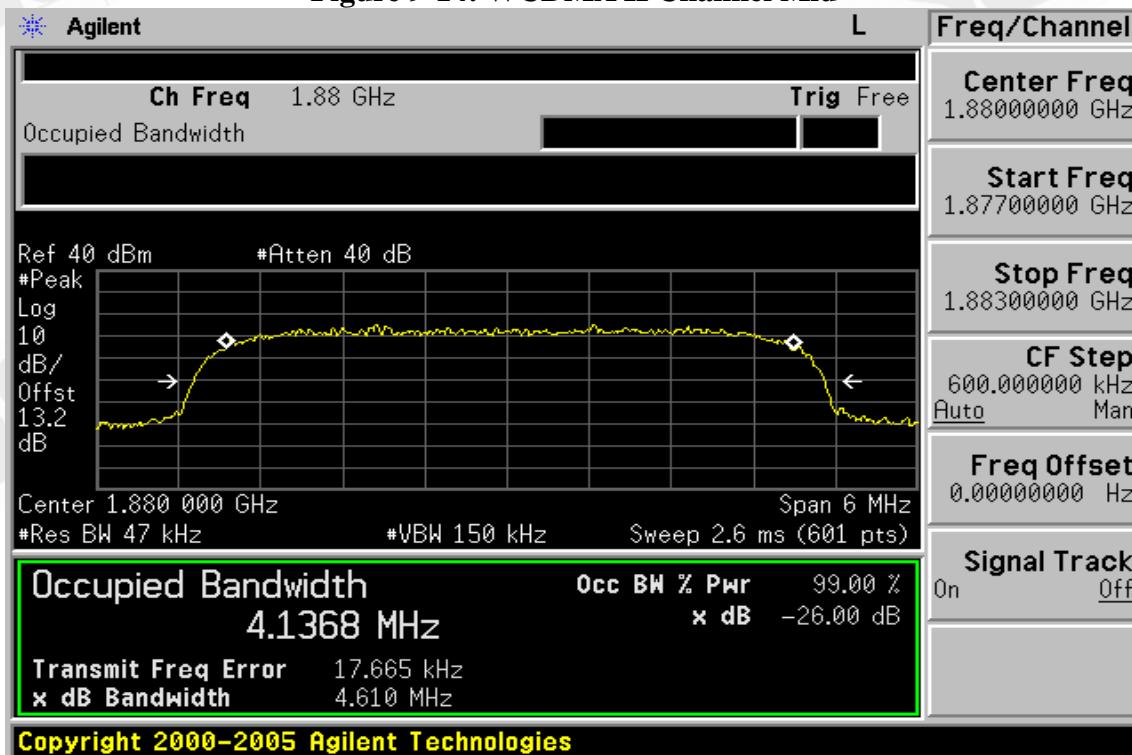


Figure 9-14: WCDMA II Channel Mid



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Figure 9-15: WCDMA II Channel High

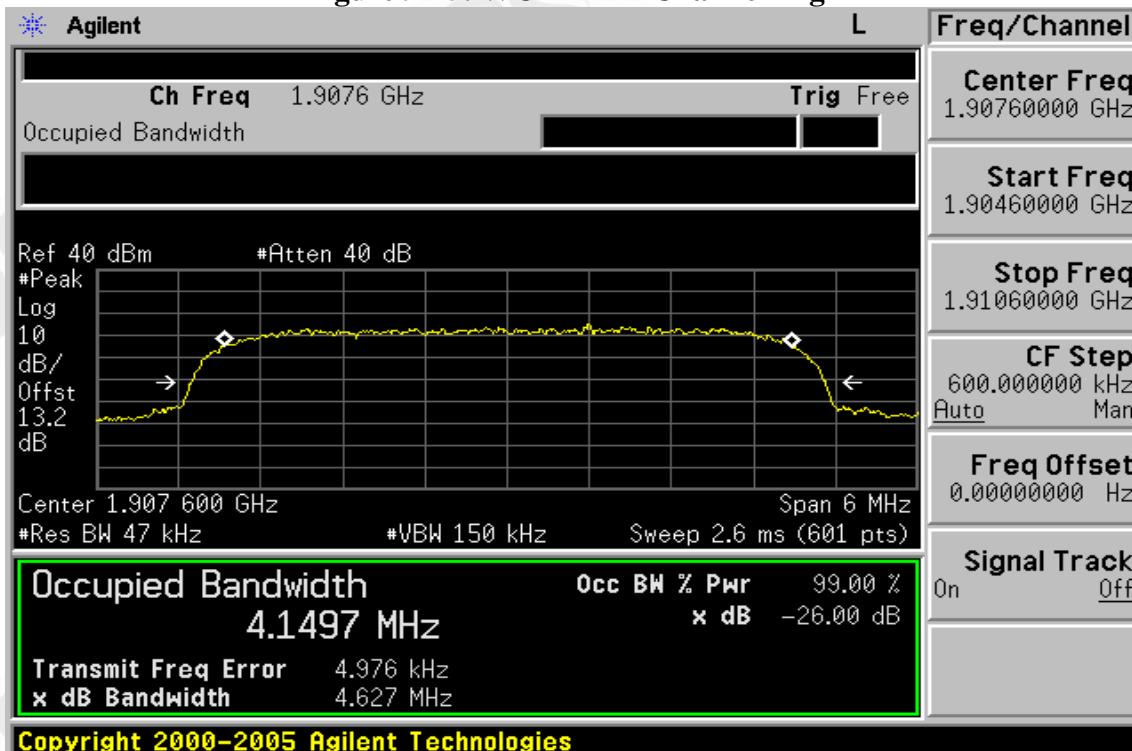
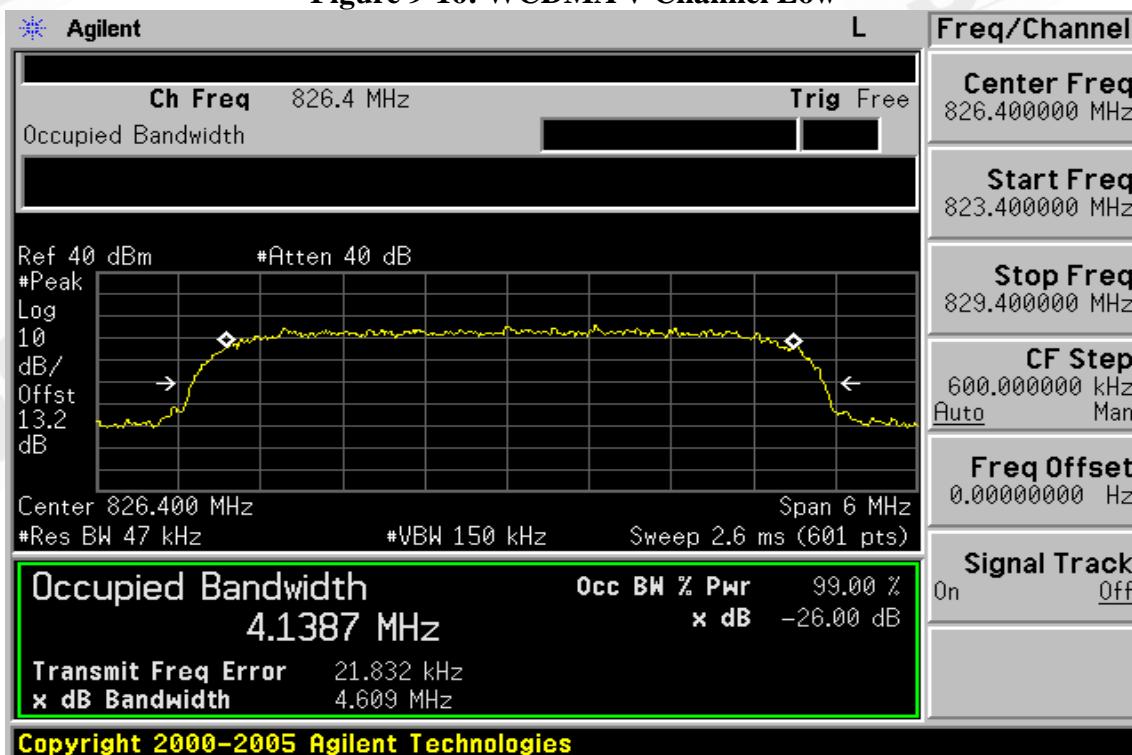


Figure 9-16: WCDMA V Channel Low



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Figure 9-17: WCDMA V Channel Mid

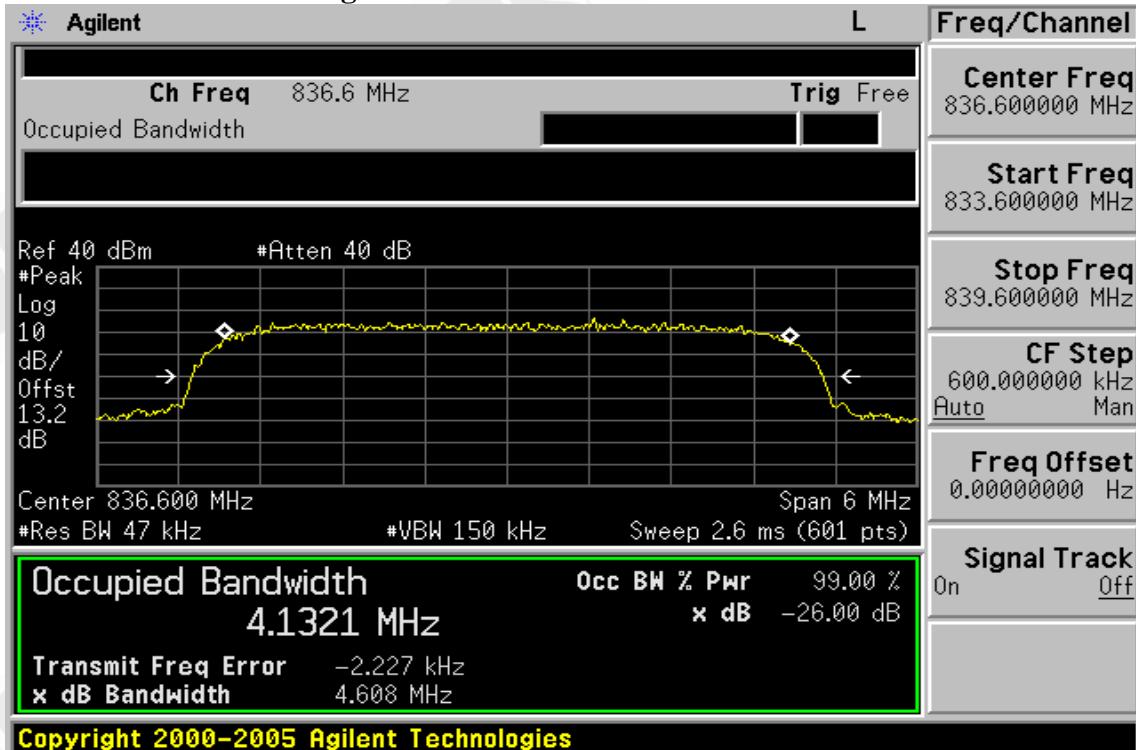
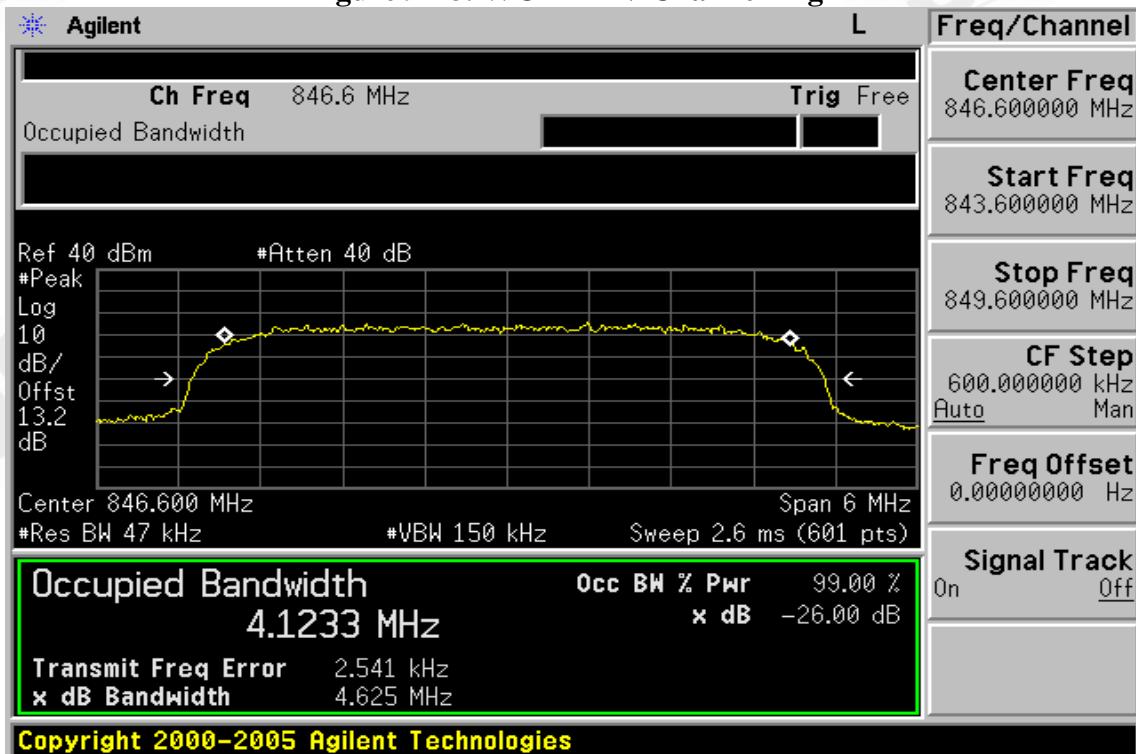


Figure 9-18: WCDMA V Channel High



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Figure 9-19: HSDPA II Channel Low

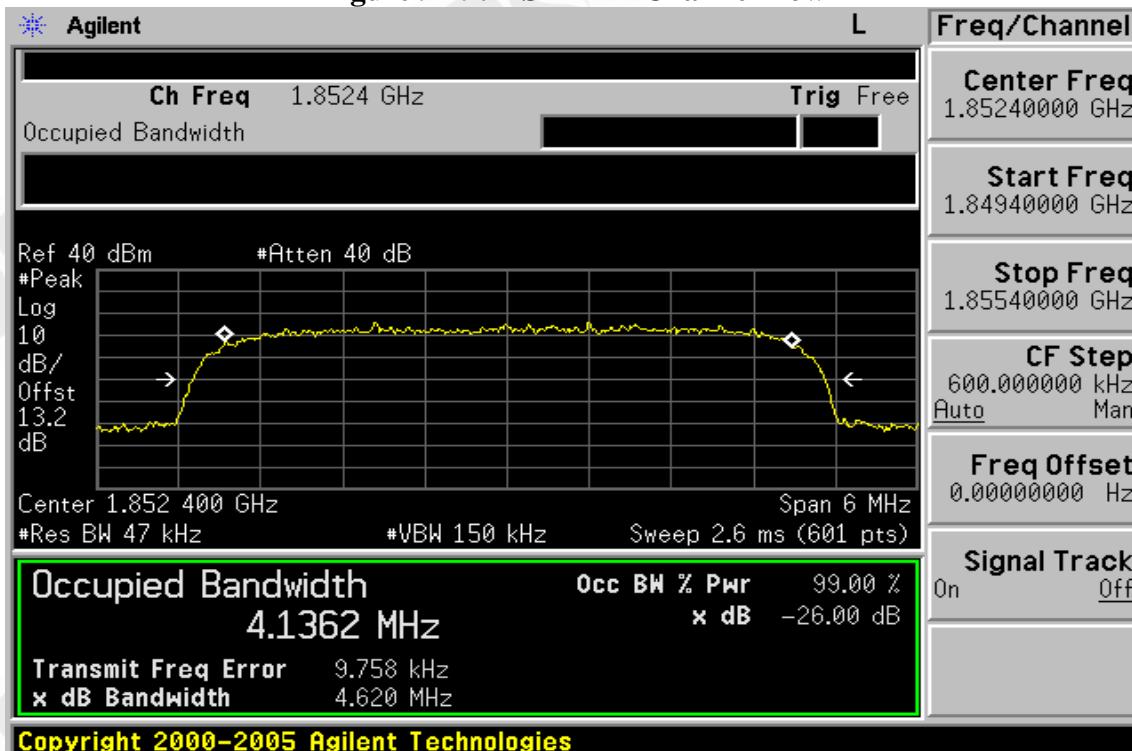
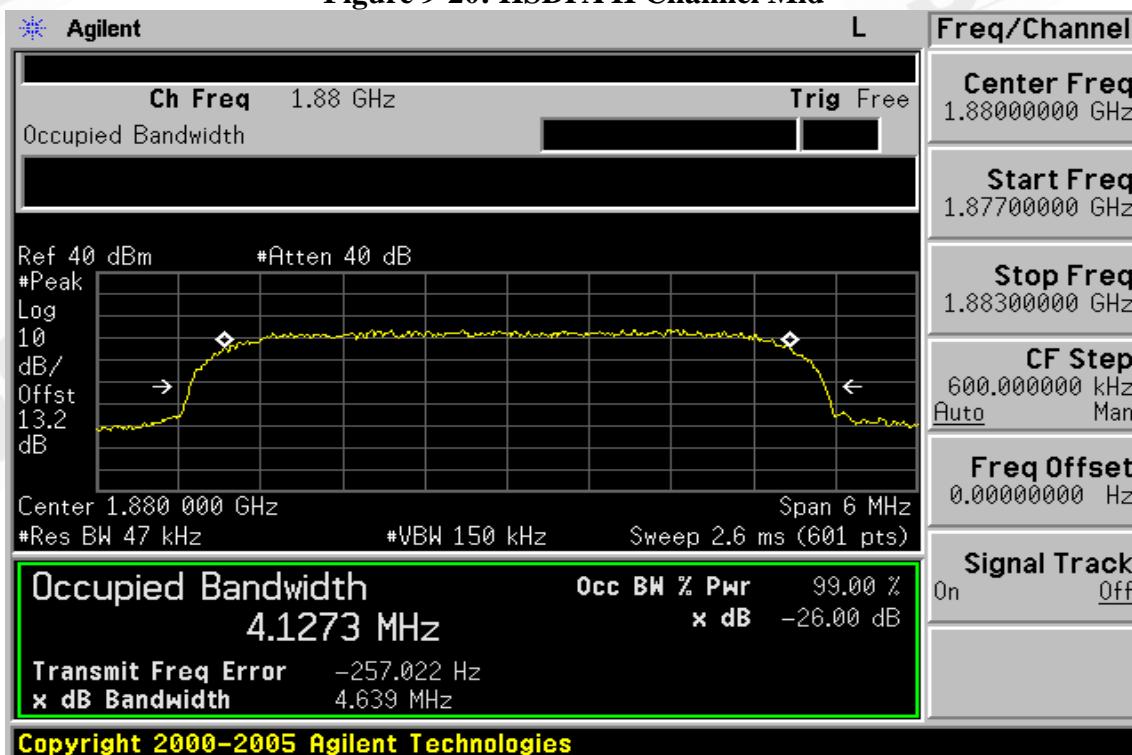


Figure 9-20: HSDPA II Channel Mid



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Figure 9-21: HSDPA II Channel High

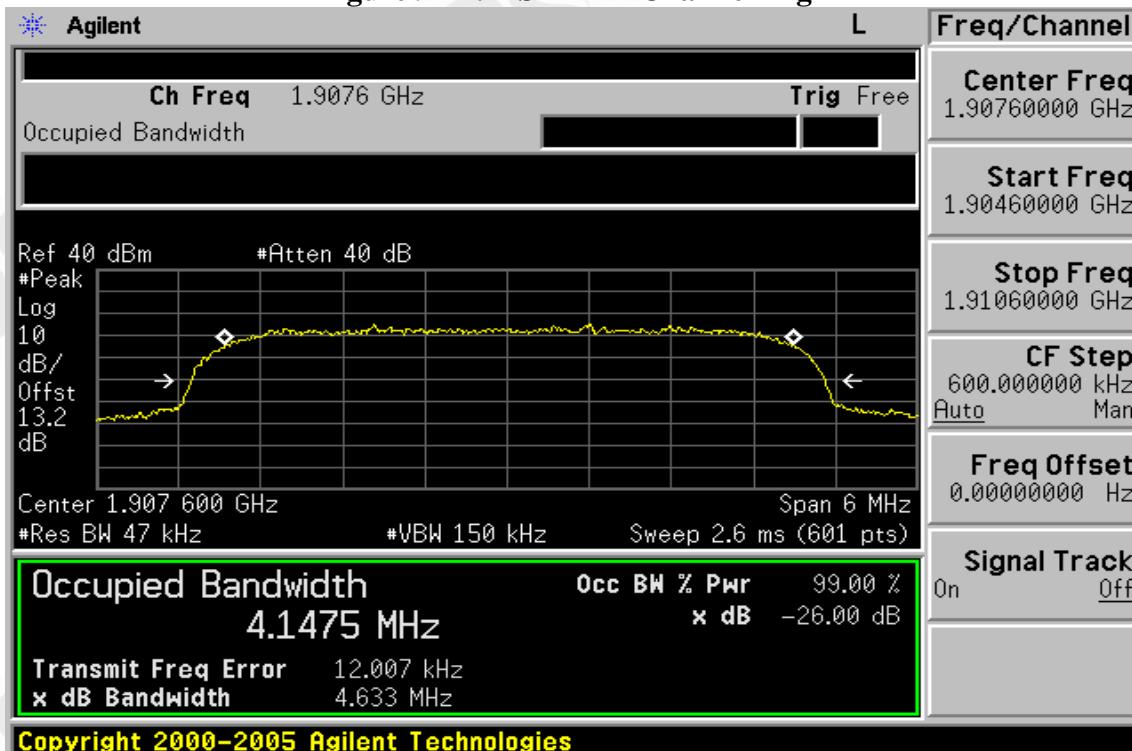
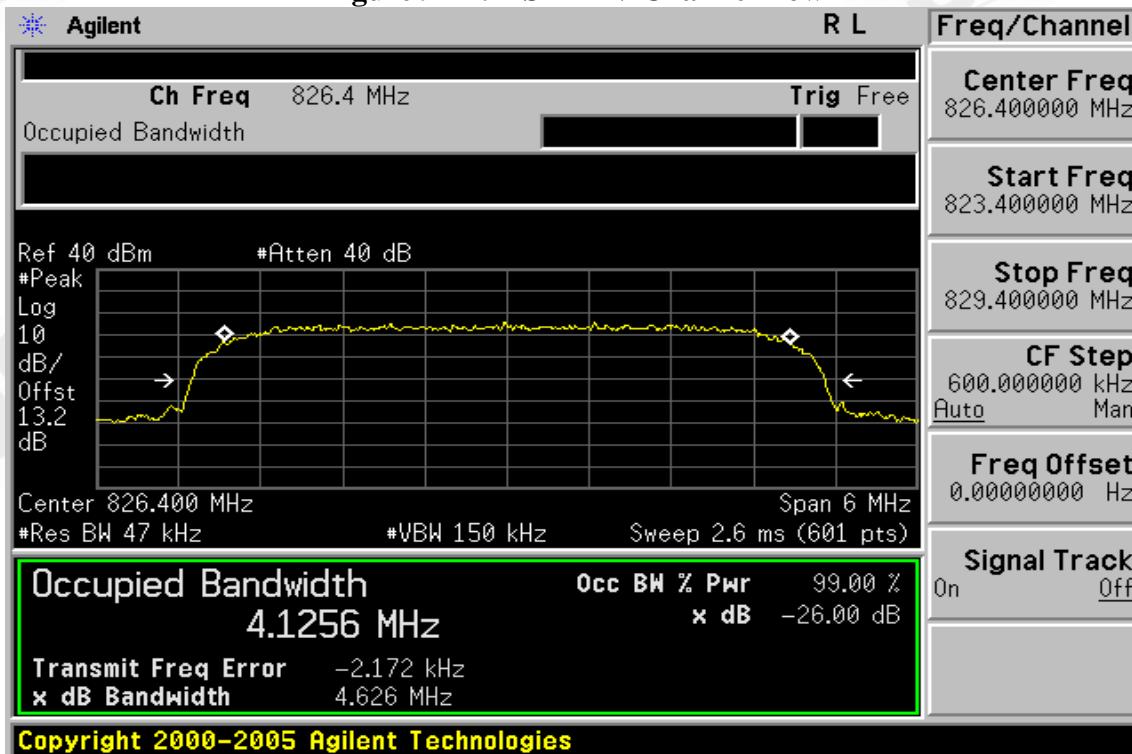


Figure 9-22: HSDPA V Channel Low



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Figure 9-23: HSDPA V Channel Mid

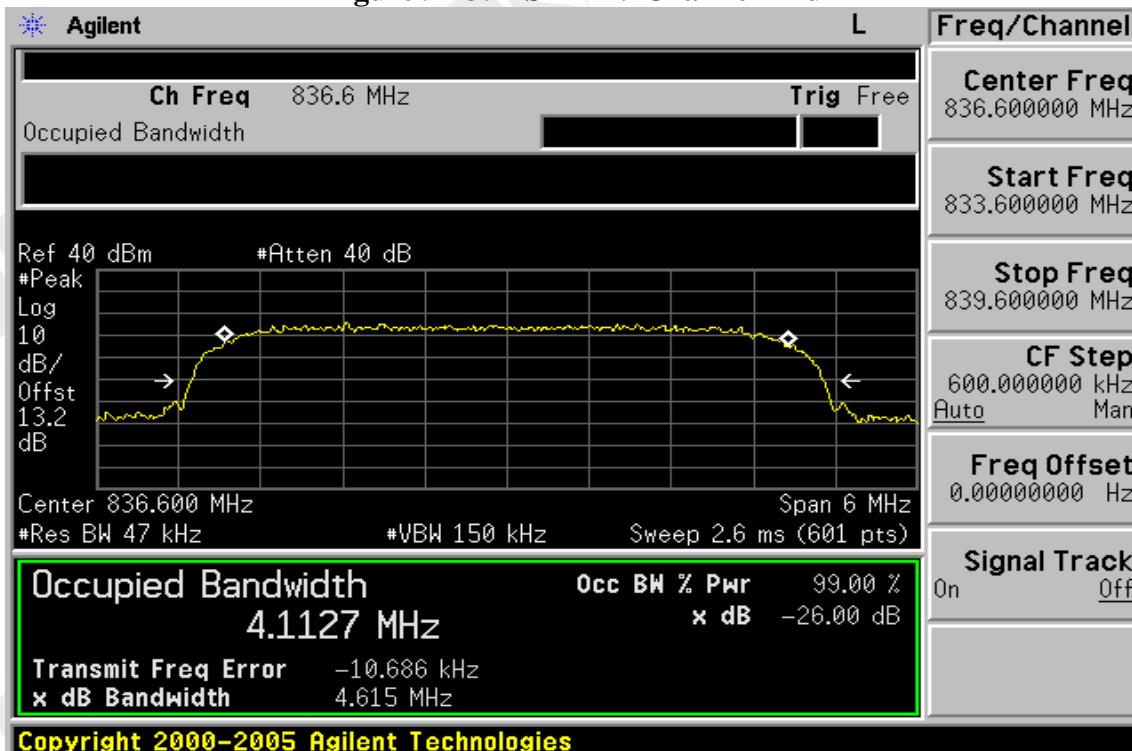
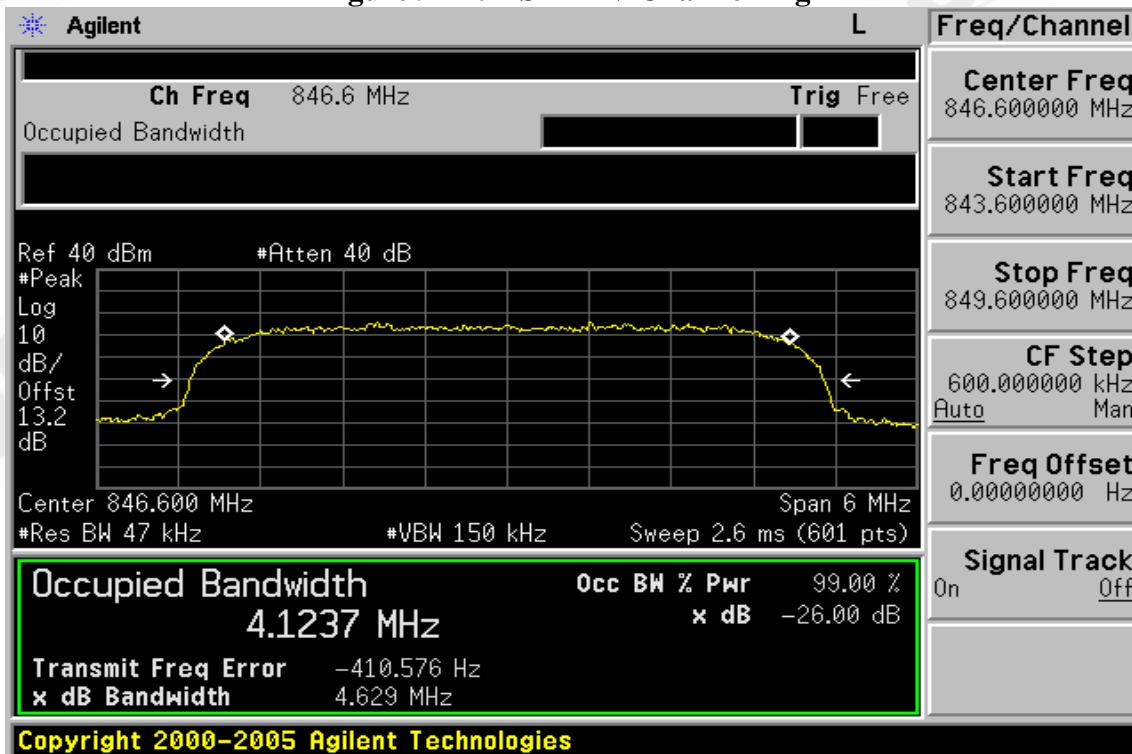


Figure 9-24: HSDPA V Channel High



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Figure 9-25: HSUPA II Channel Low

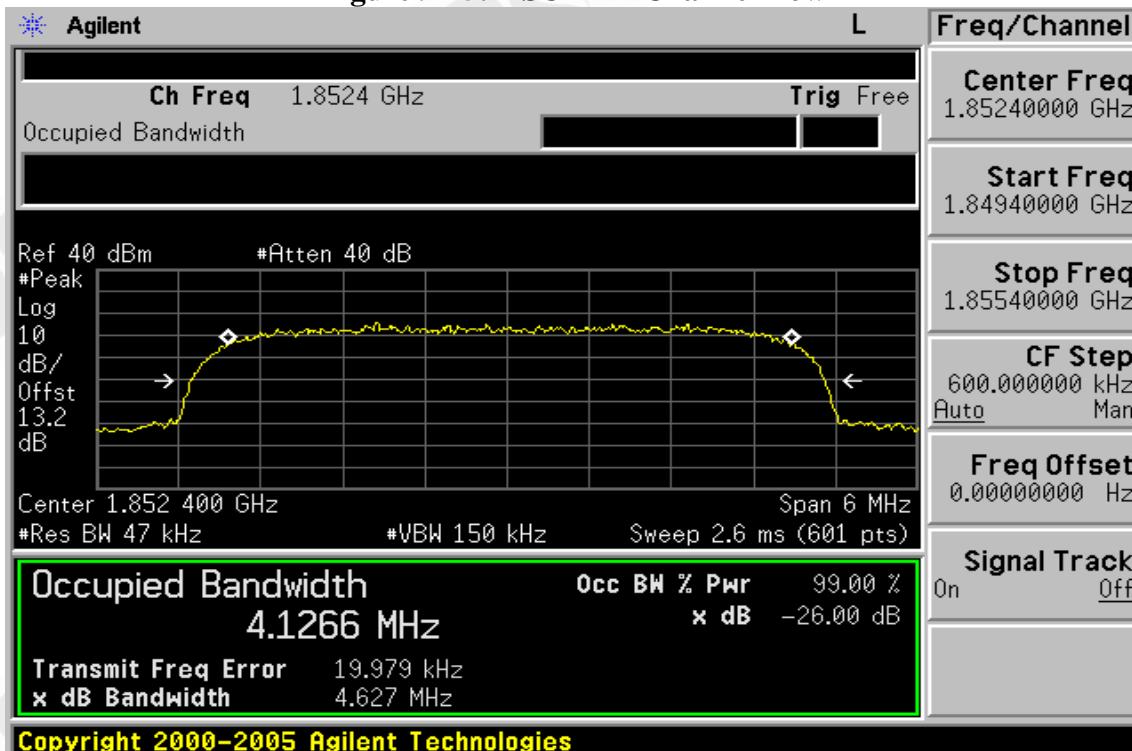
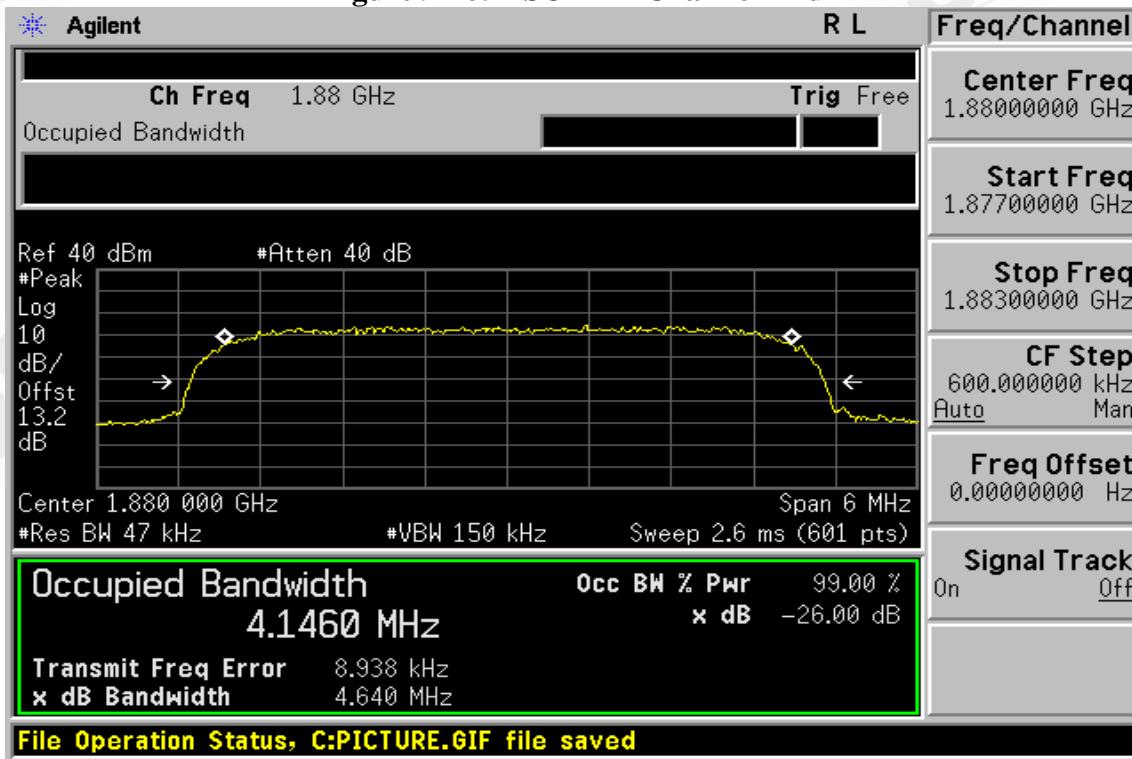


Figure 9-26: HSUPA II Channel Mid



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Figure 9-27: HSUPA II Channel High

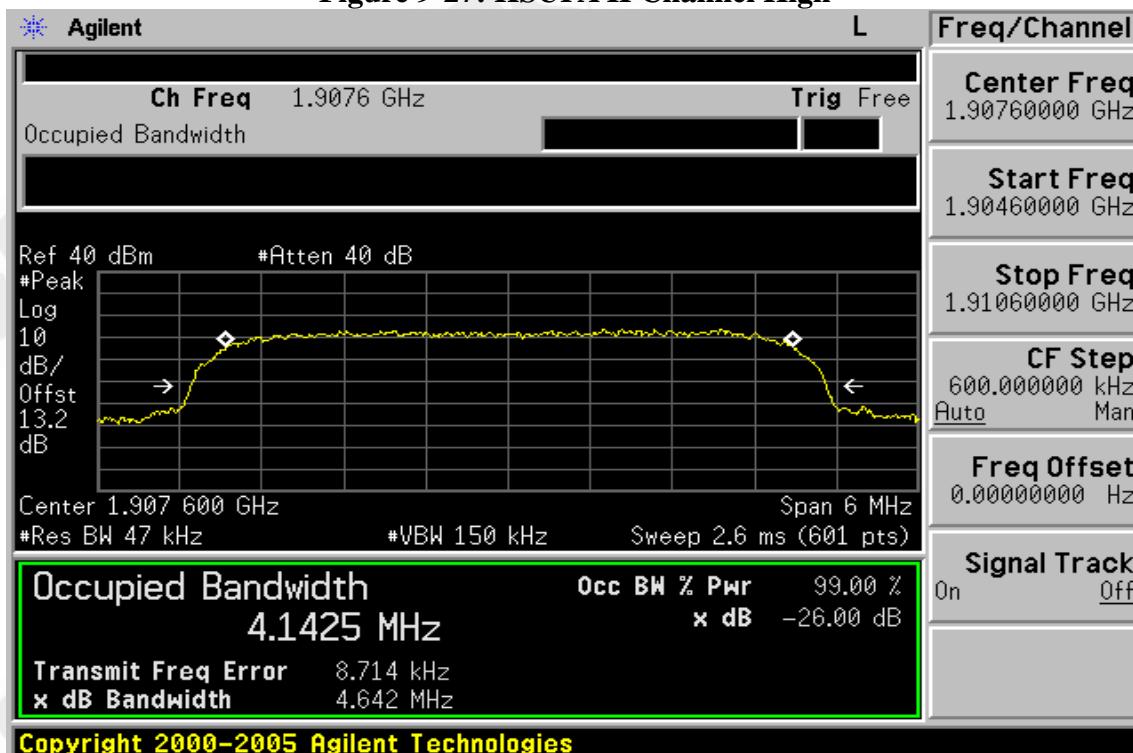
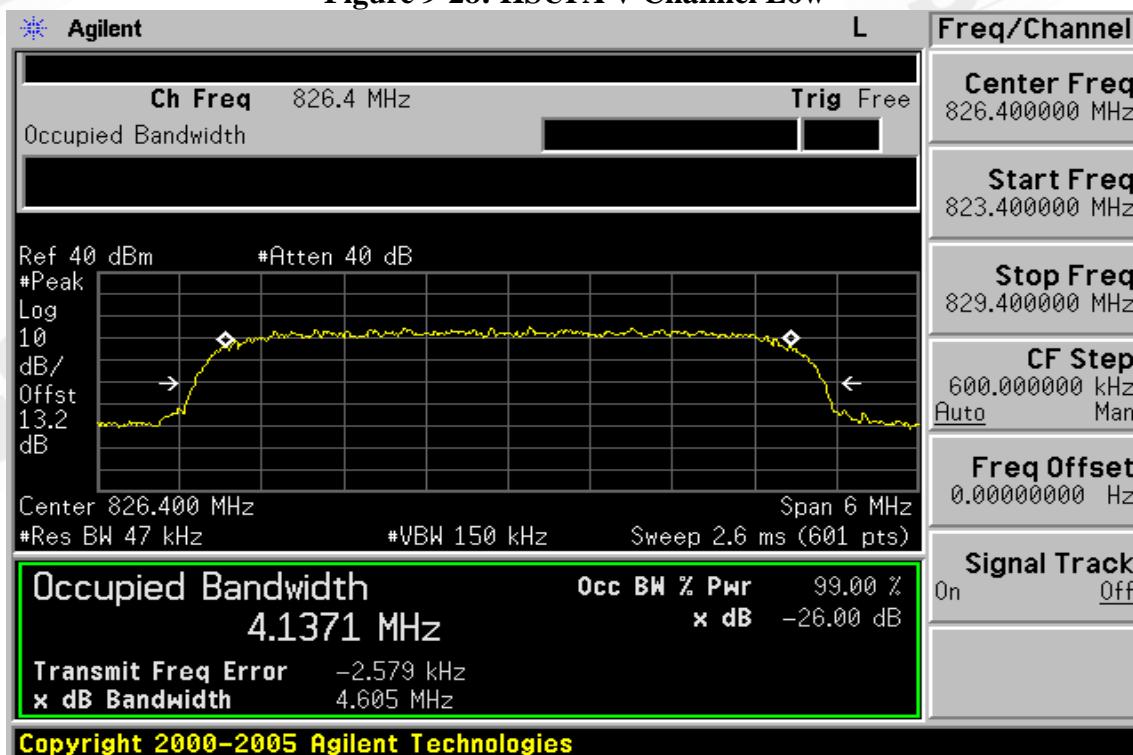


Figure 9-28: HSUPA V Channel Low



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Figure 9-29: HSUPA V Channel Mid

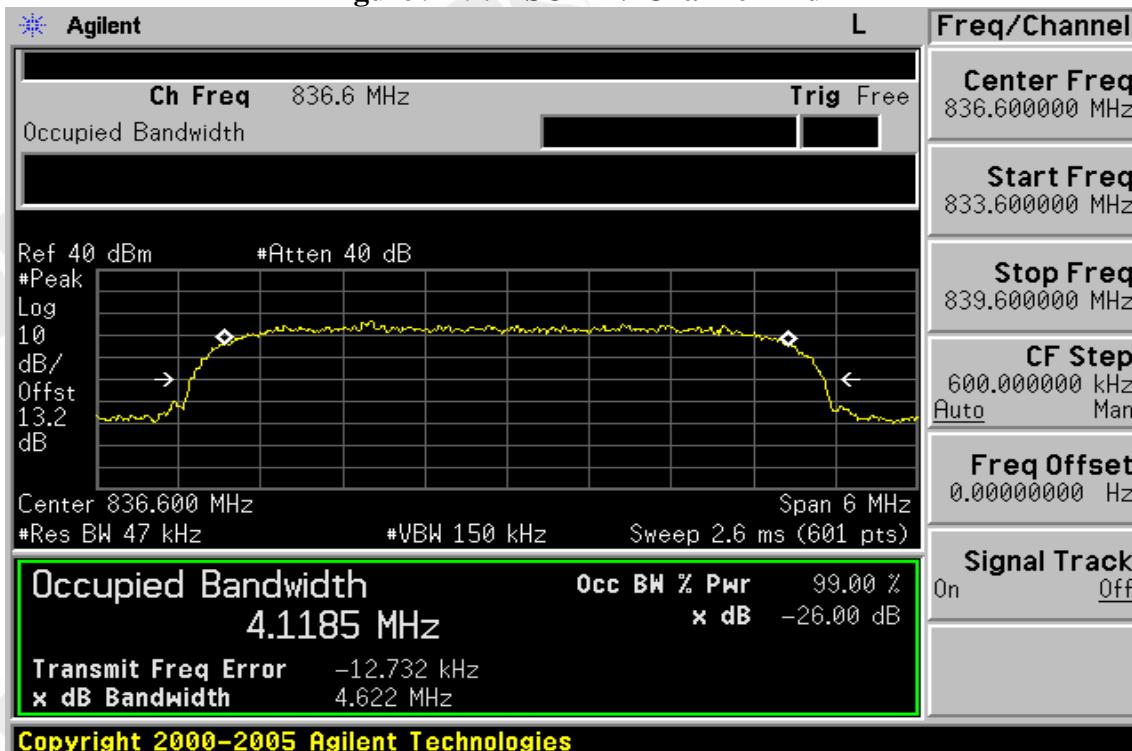
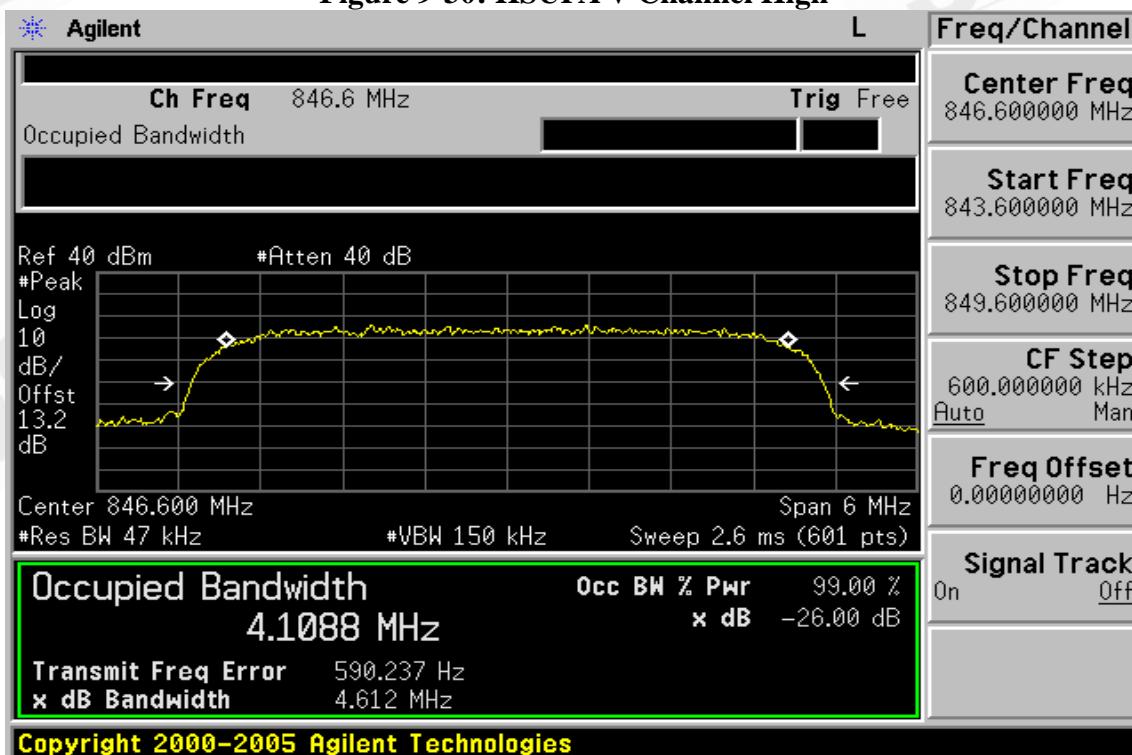


Figure 9-30: HSUPA V Channel High



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## 10. OUT OF BAND EMISSION AT ANTENNA TERMINALS

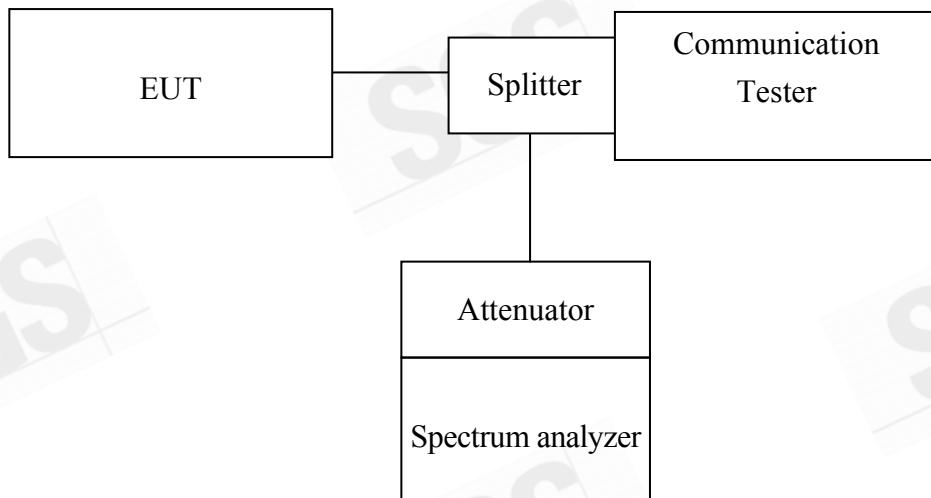
### 10.1. Standard Applicable:

According to FCC §2.1051.

FCC §22.917(a), §24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

### 10.2. Test SET-UP:

#### Out of band emission & Band edge



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### 10.3. Measurement Procedure:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm.

**Band Edge Requirements:** In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. Limit, -13dBm

### Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 2.5G, 2.5G to 7.5G, 7.5G to 10G ,10G to 15G and 15G to 20GHz
4. Via Software, combine 6 spans of frequency range into one plot

### 10.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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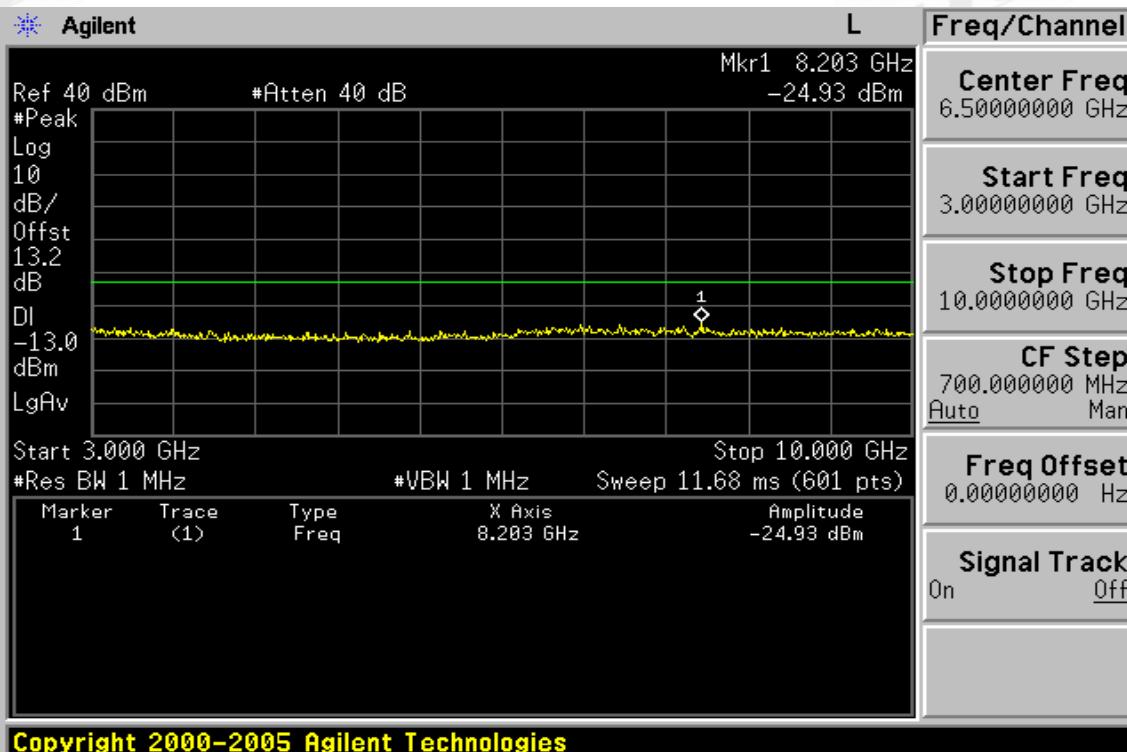
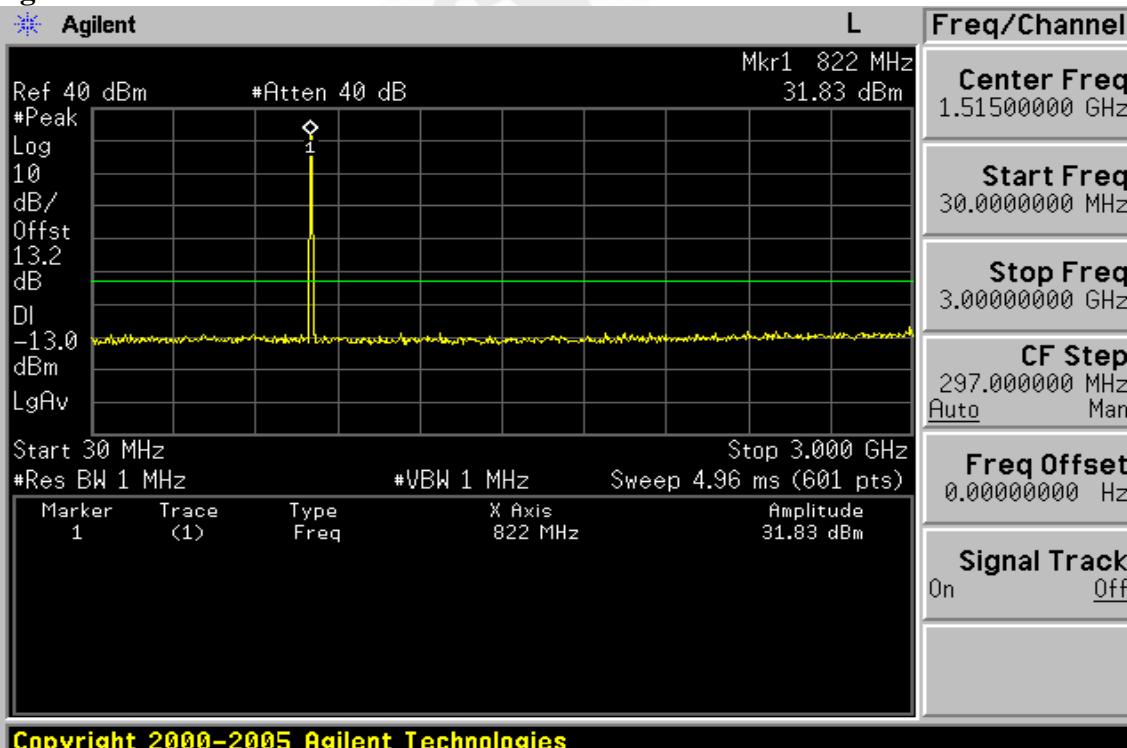
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## 10.5. Measurement Result:

Figure 10-1: Out of Band emission at antenna terminals– GPRS 850 Channel Lowest



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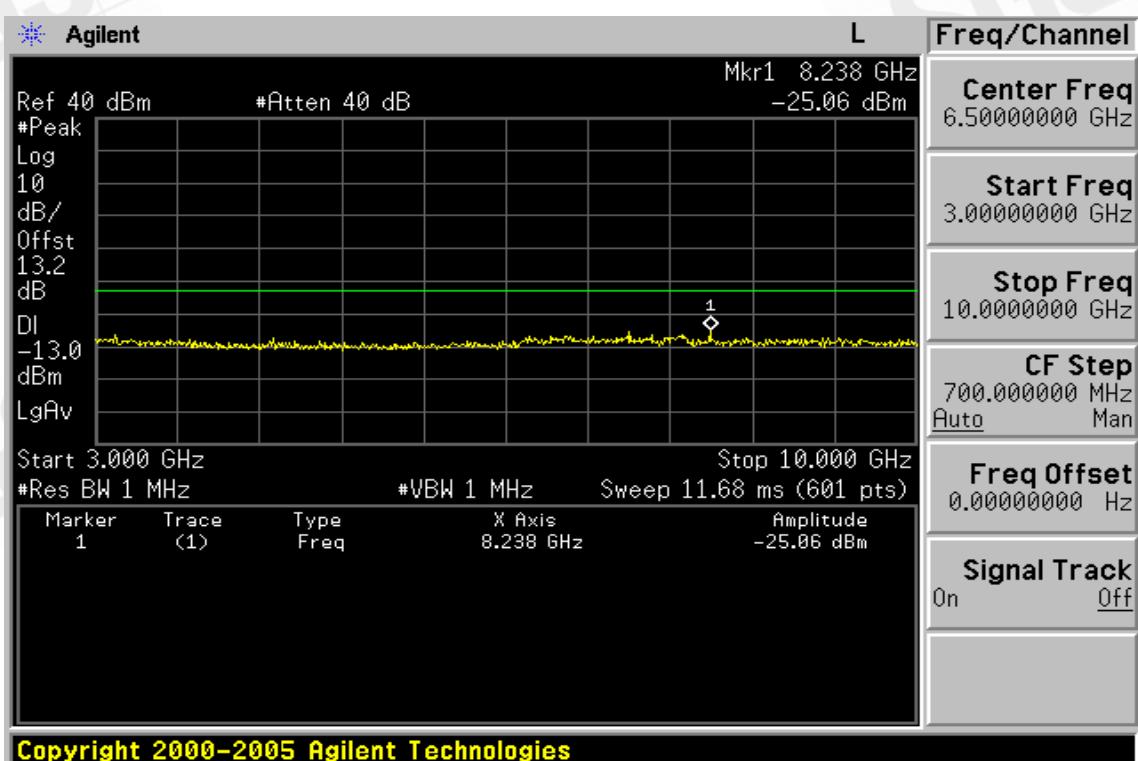
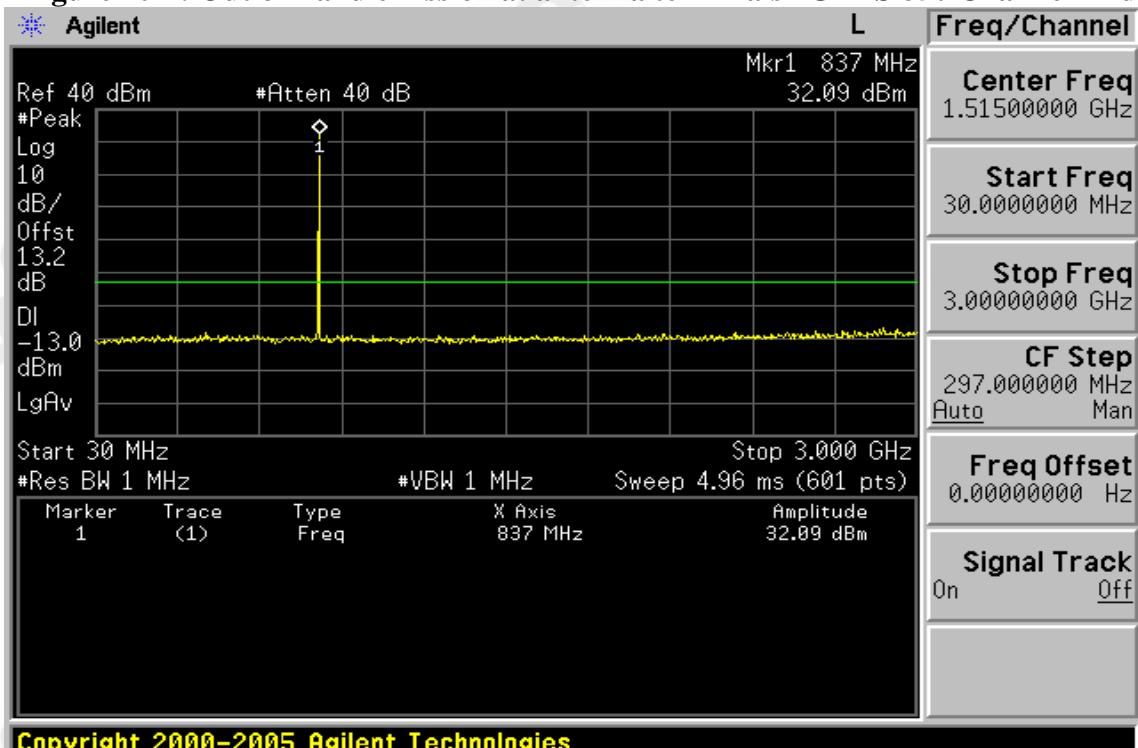
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Figure 10-2: Out of Band emission at antenna terminals –GPRS 850 Channel Mid

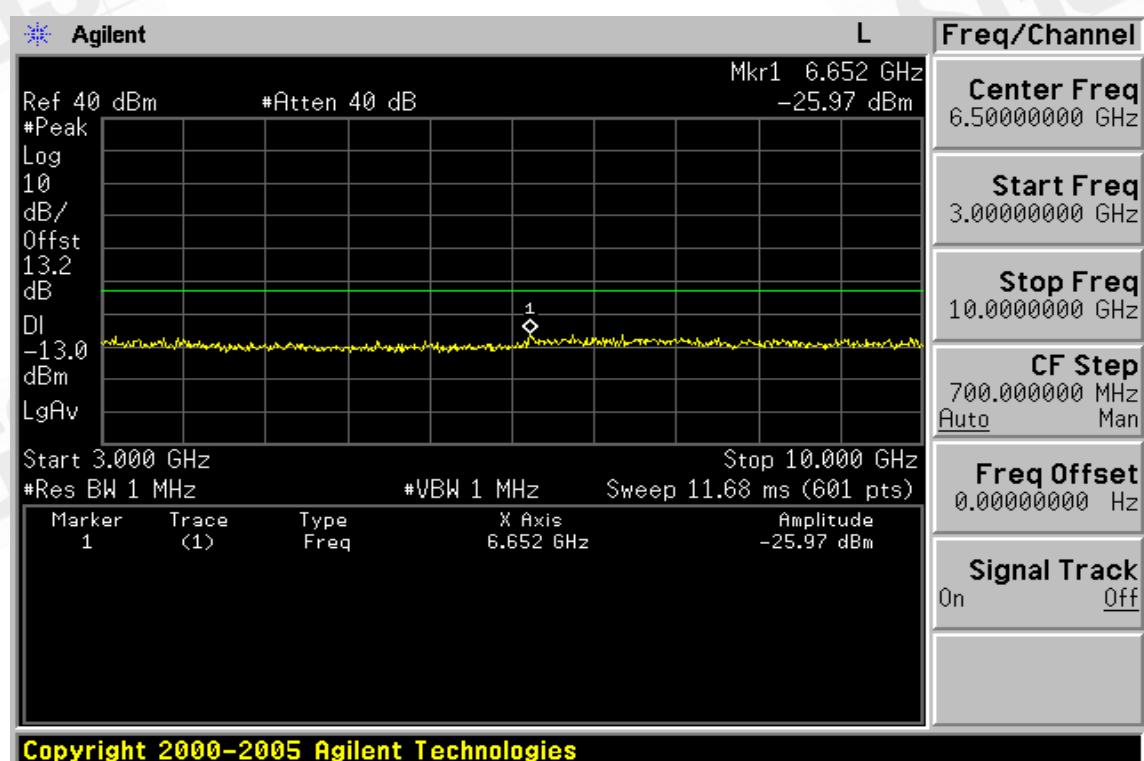
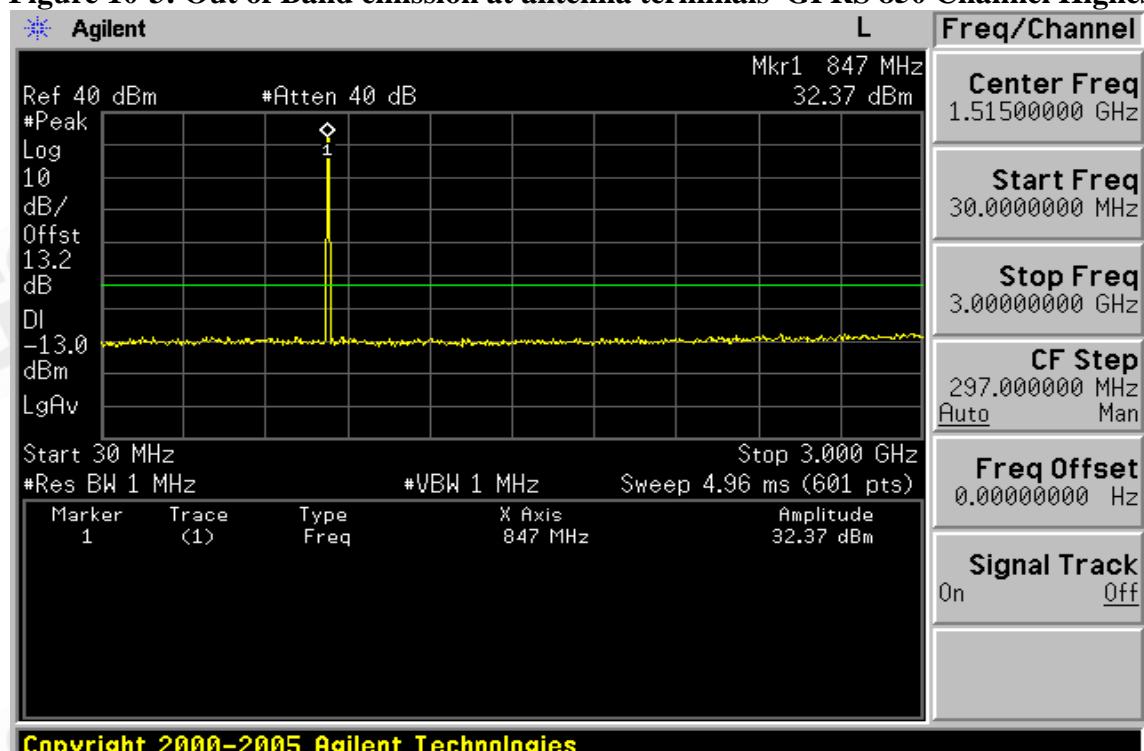


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Figure 10-3: Out of Band emission at antenna terminals—GPRS 850 Channel Highest

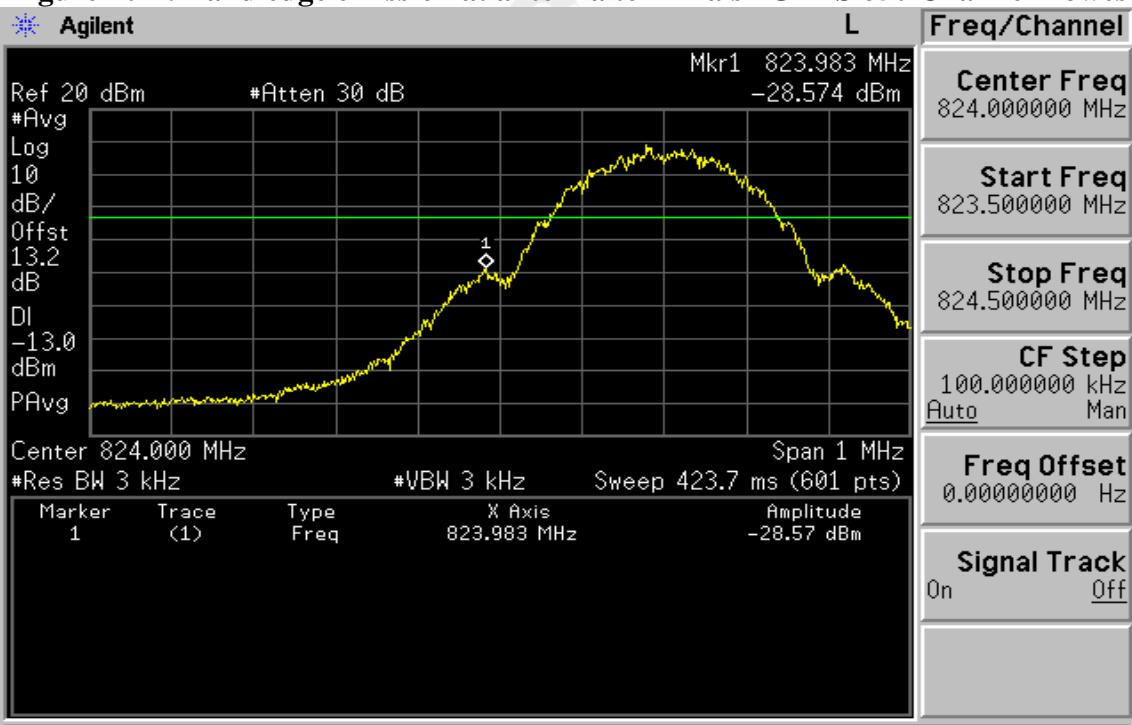


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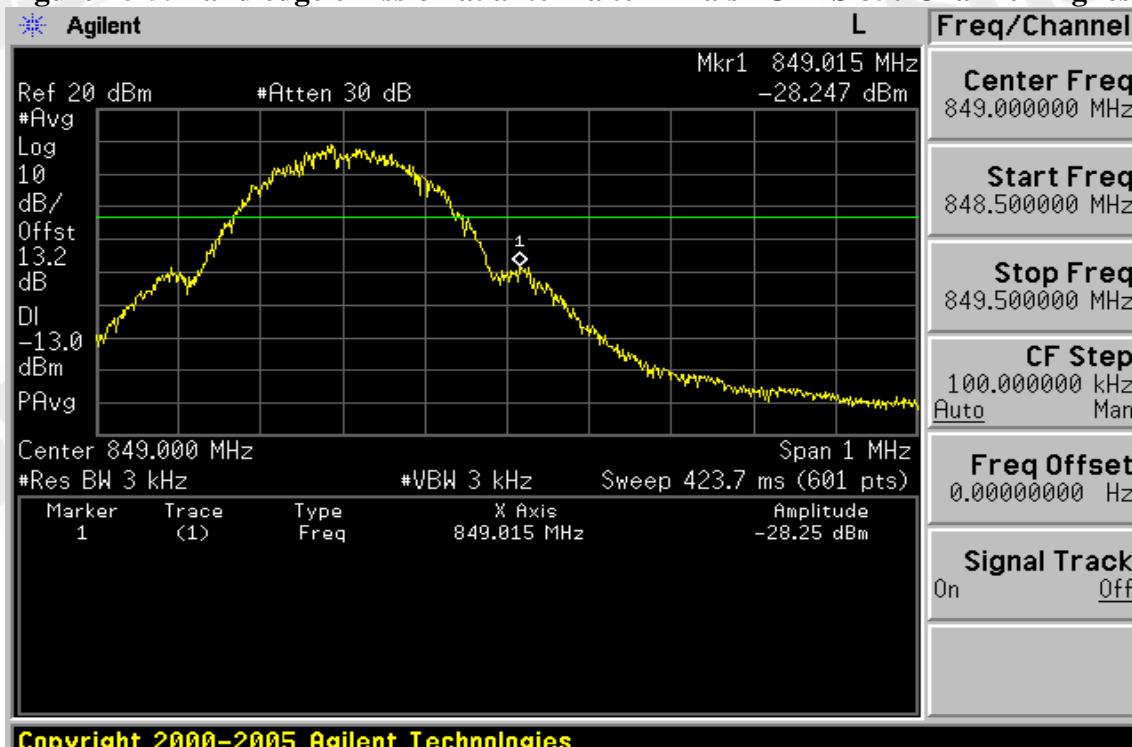
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Figure 10-4: Band edge emission at antenna terminals –GPRS 850 Channel Lowest



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Figure 10-5: Band edge emission at antenna terminals –GPRS 850 Channel Highest



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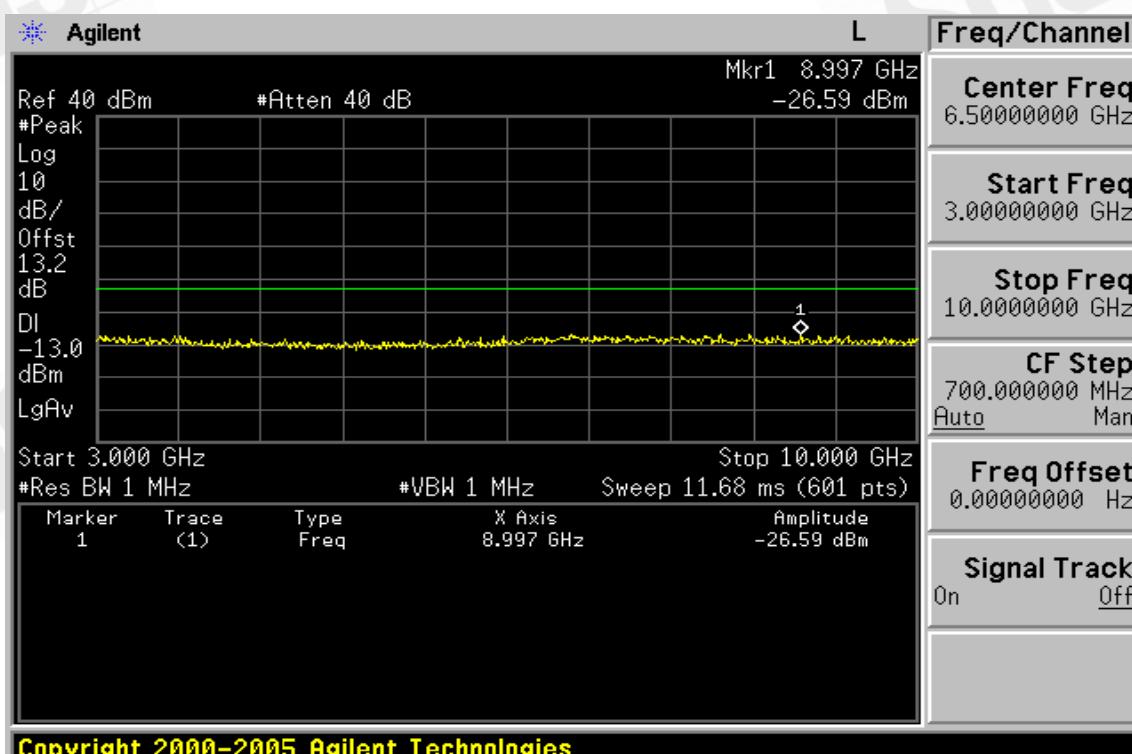
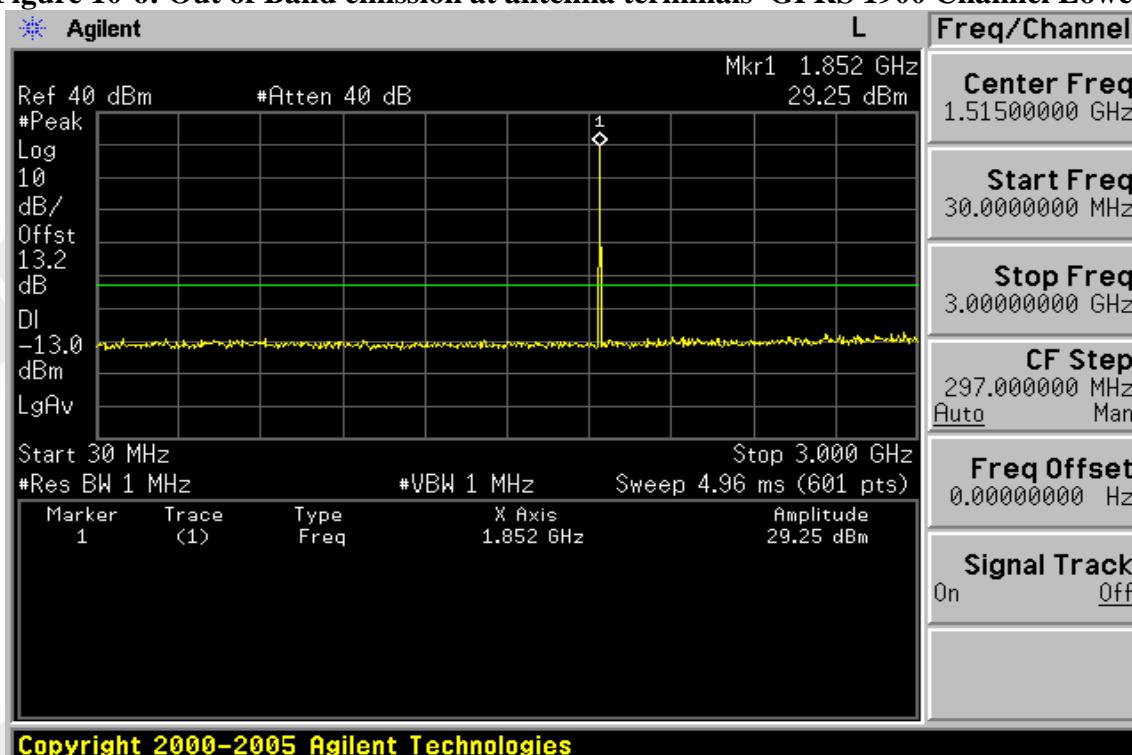
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Figure 10-6: Out of Band emission at antenna terminals—GPRS 1900 Channel Lowest

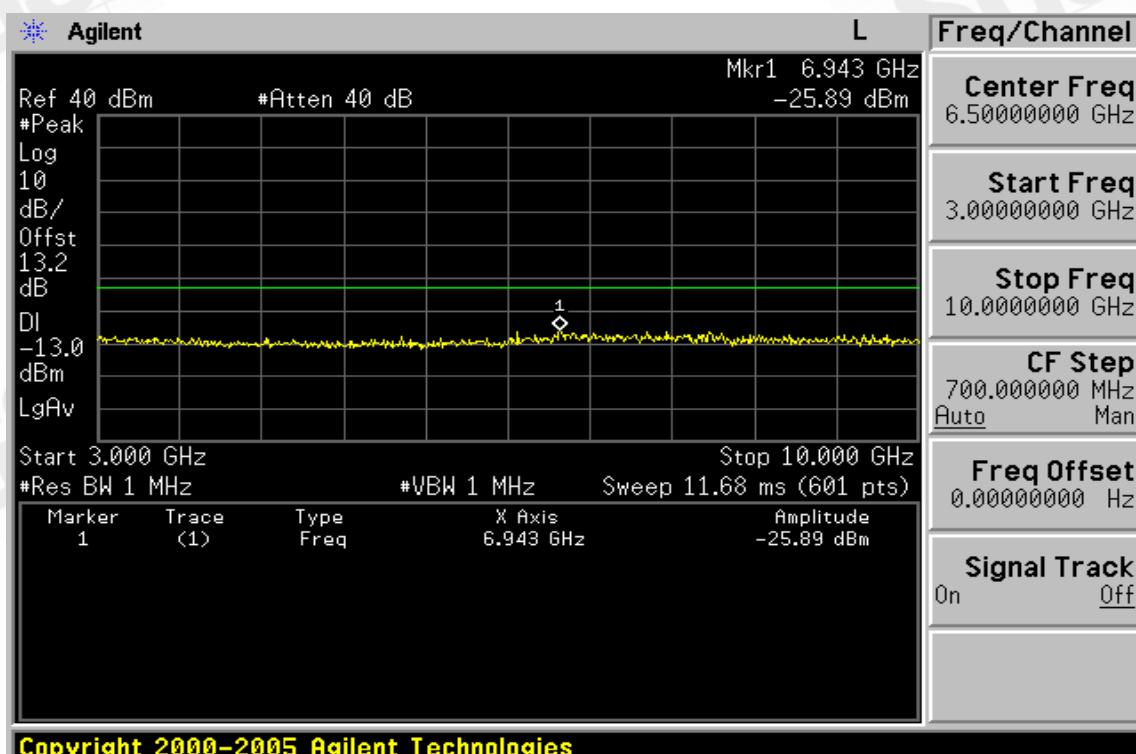
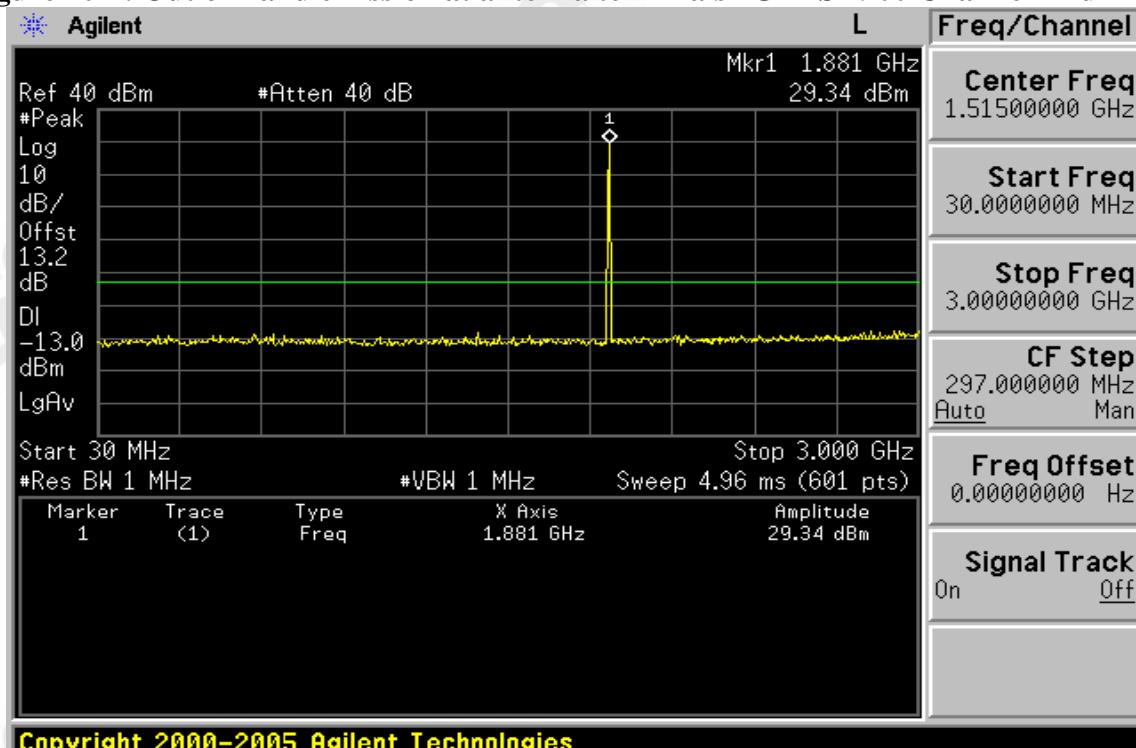


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Figure 10-7: Out of Band emission at antenna terminals –GPRS 1900 Channel Mid

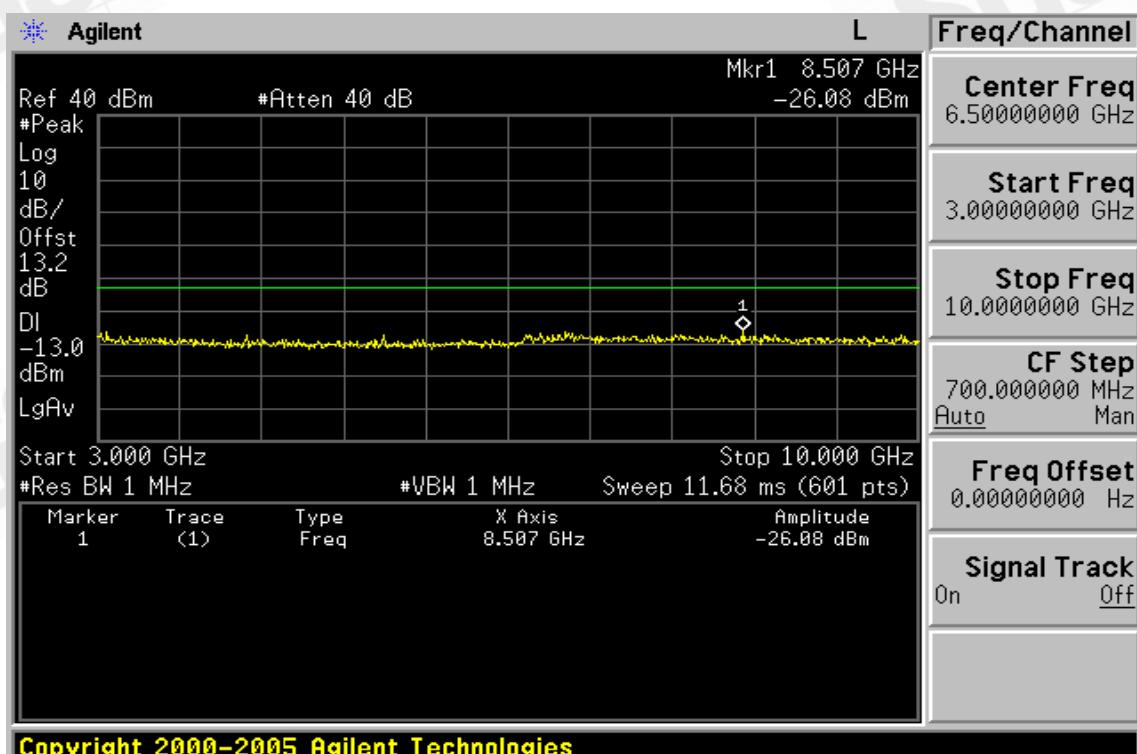
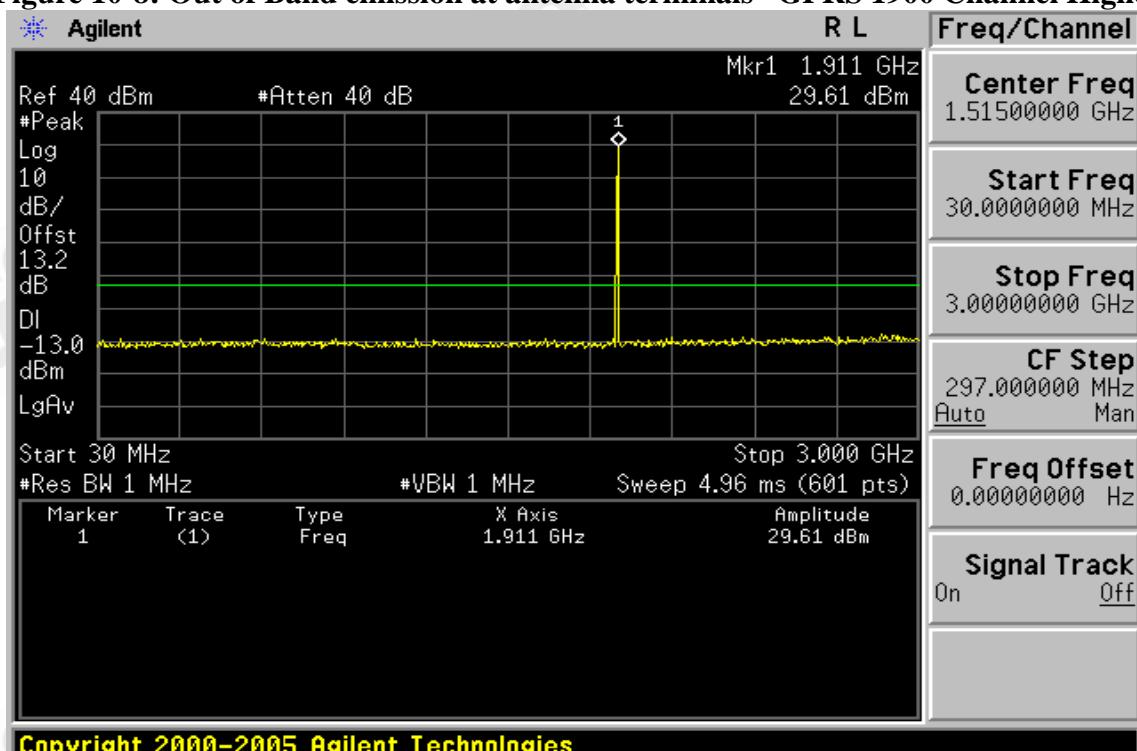


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Figure 10-8: Out of Band emission at antenna terminals –GPRS 1900 Channel Highest

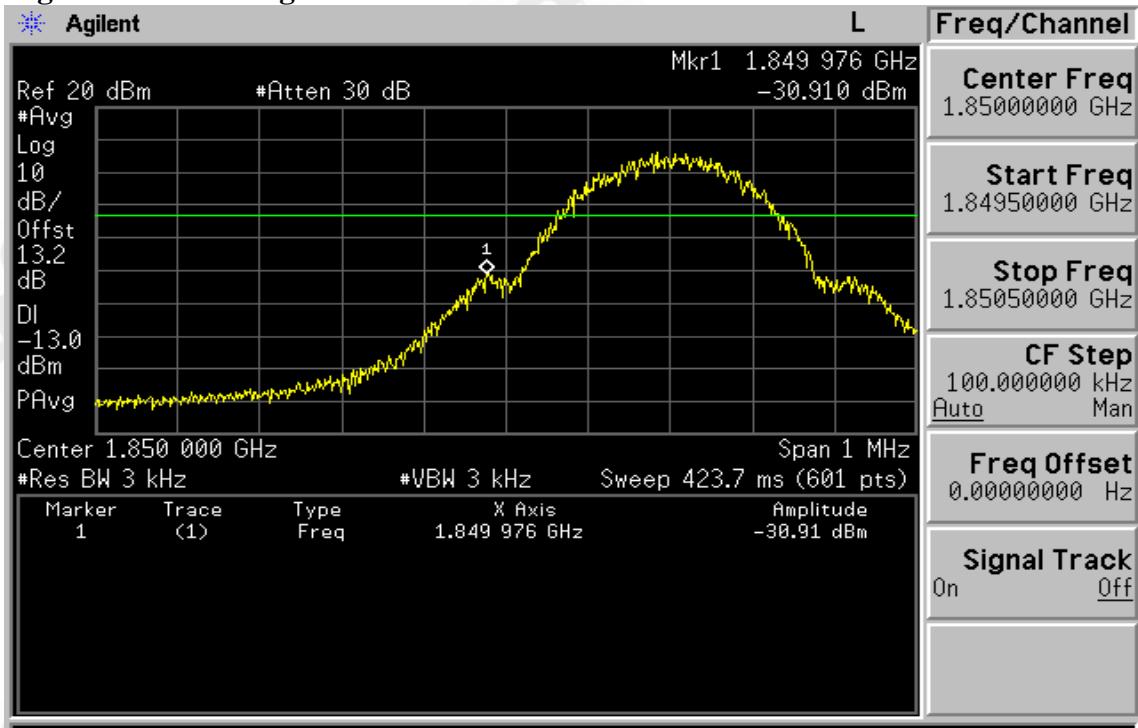


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Figure 10-9: Bad edge emission at antenna terminals –GPRS 1900 Channel Lowest



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Figure 10-10: Band edge emission at antenna terminals –GPRS 1900 Channel Highest



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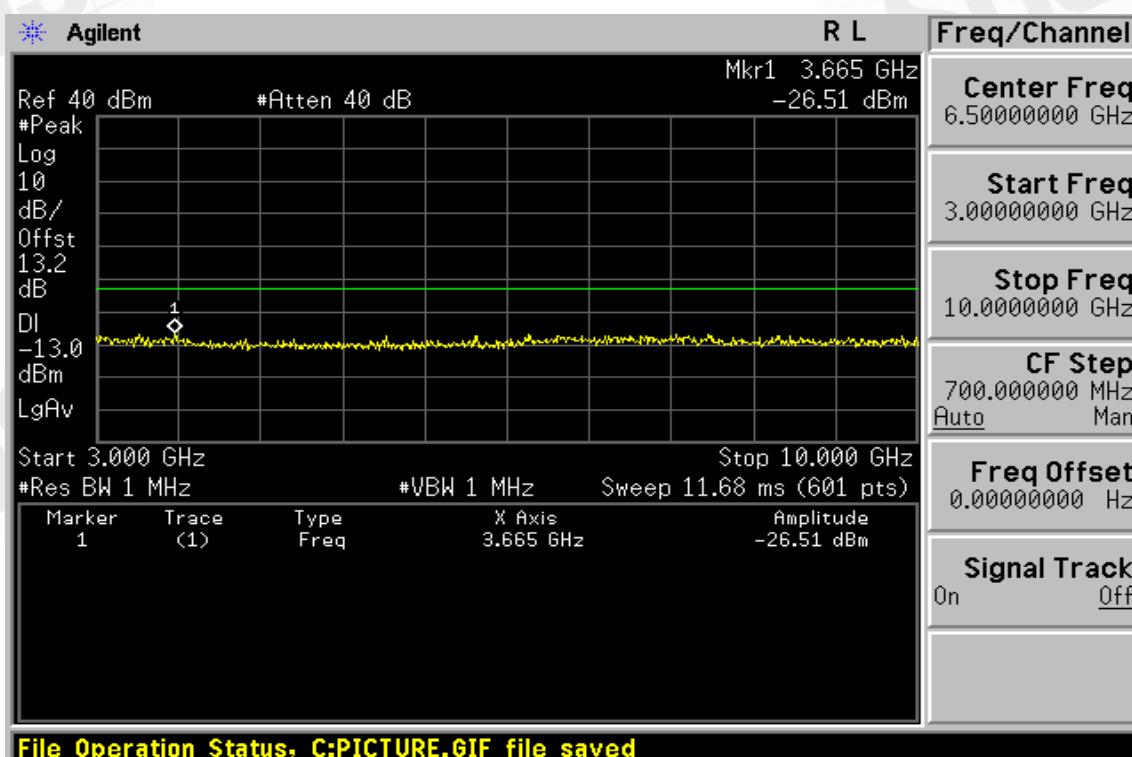
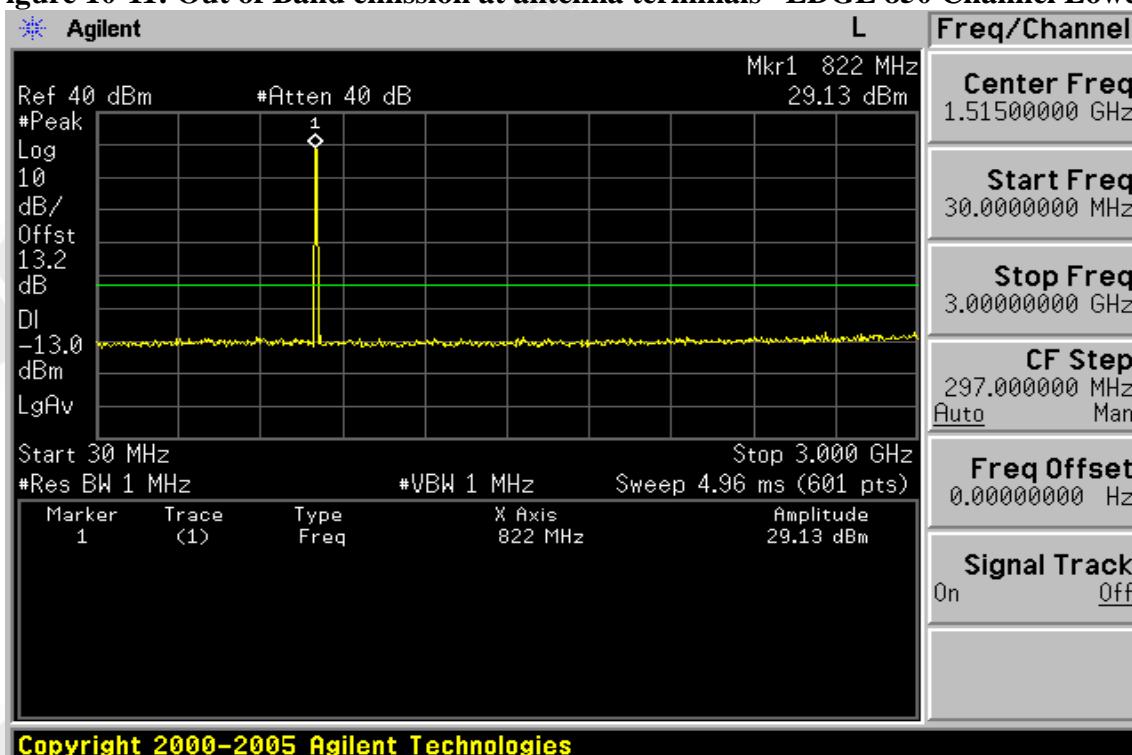
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Figure 10-11: Out of Band emission at antenna terminals—EDGE 850 Channel Lowest



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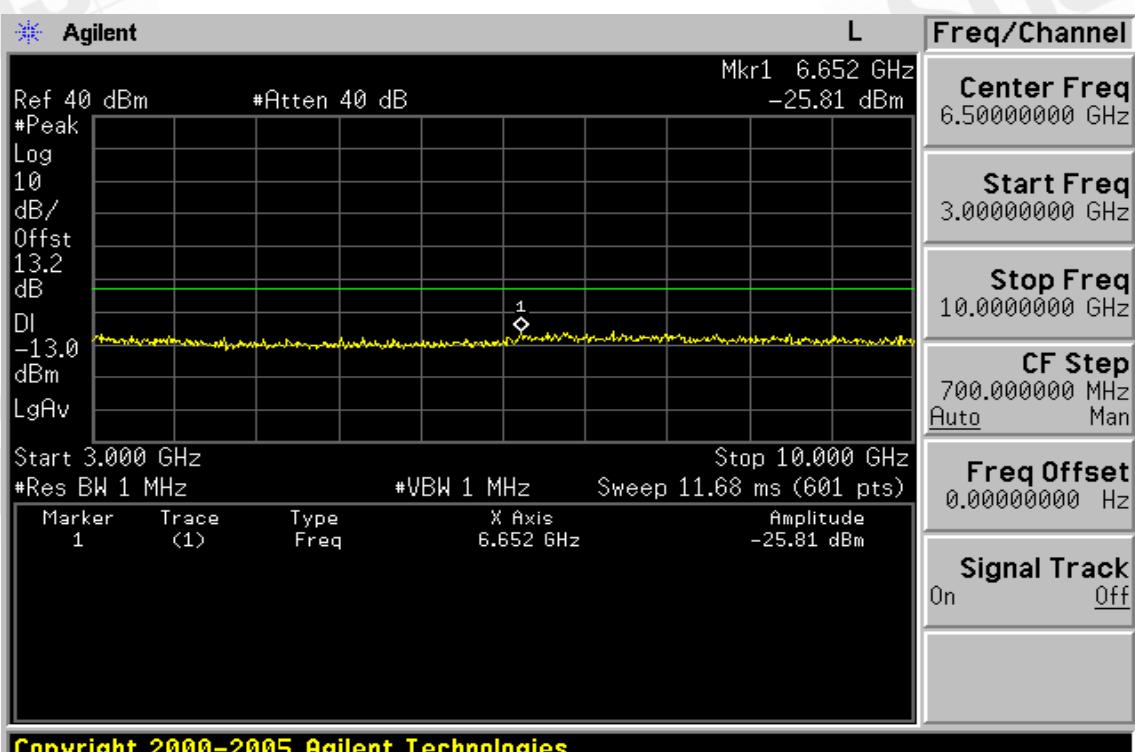
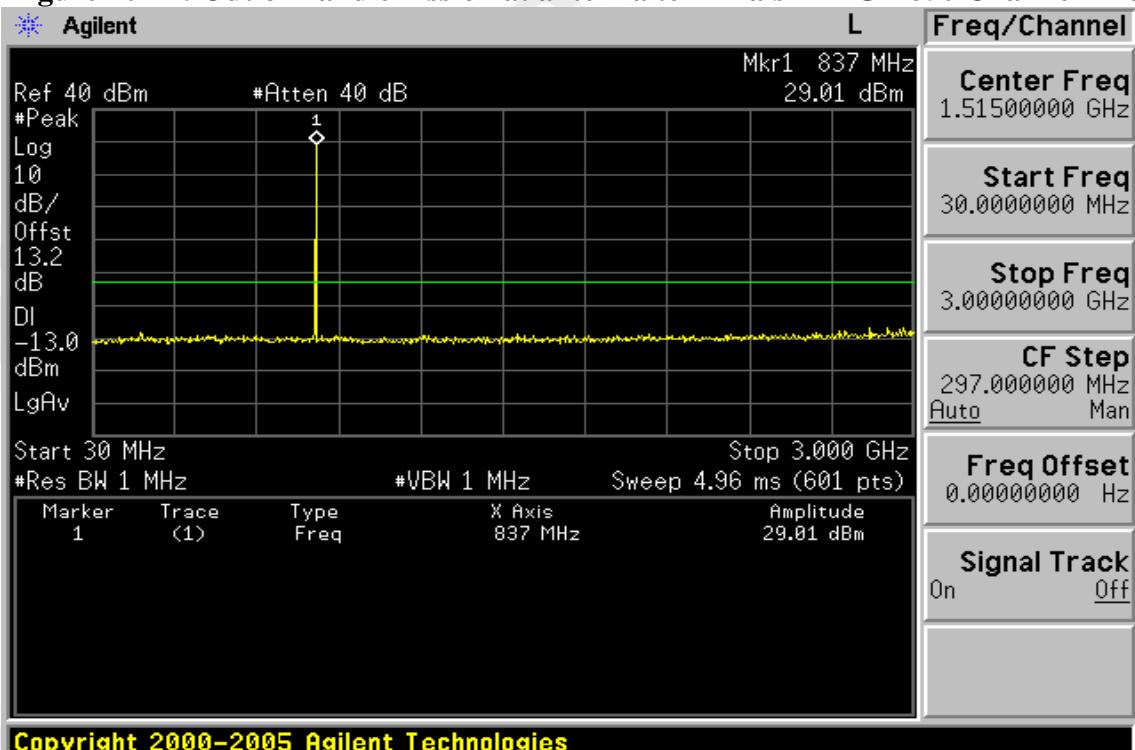
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Figure 10-12: Out of Band emission at antenna terminals –EDGE 850 Channel Mid



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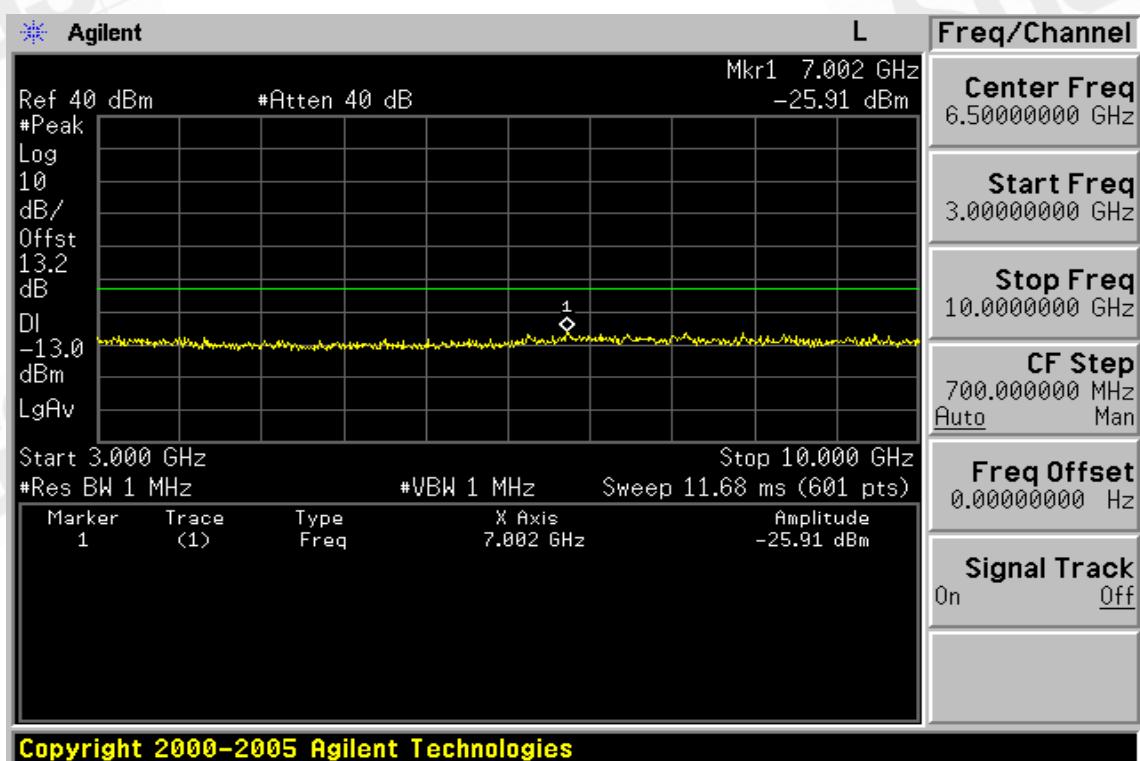
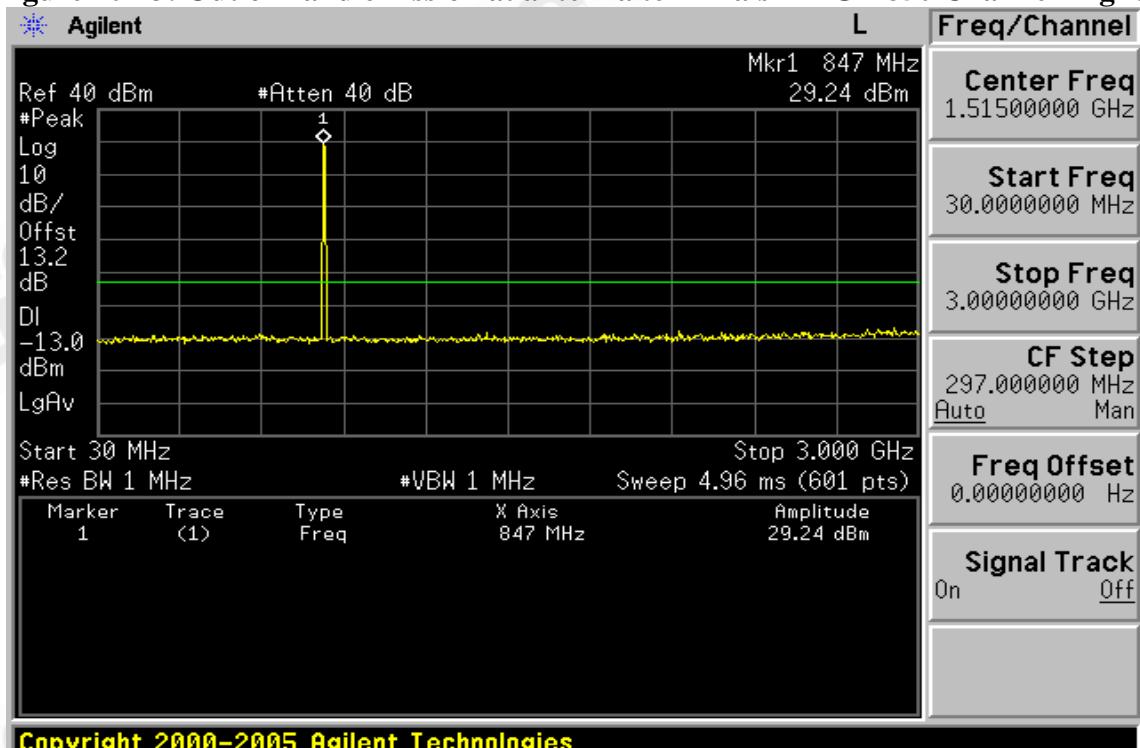
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Figure 10-13: Out of Band emission at antenna terminals—EDGE 850 Channel Highest



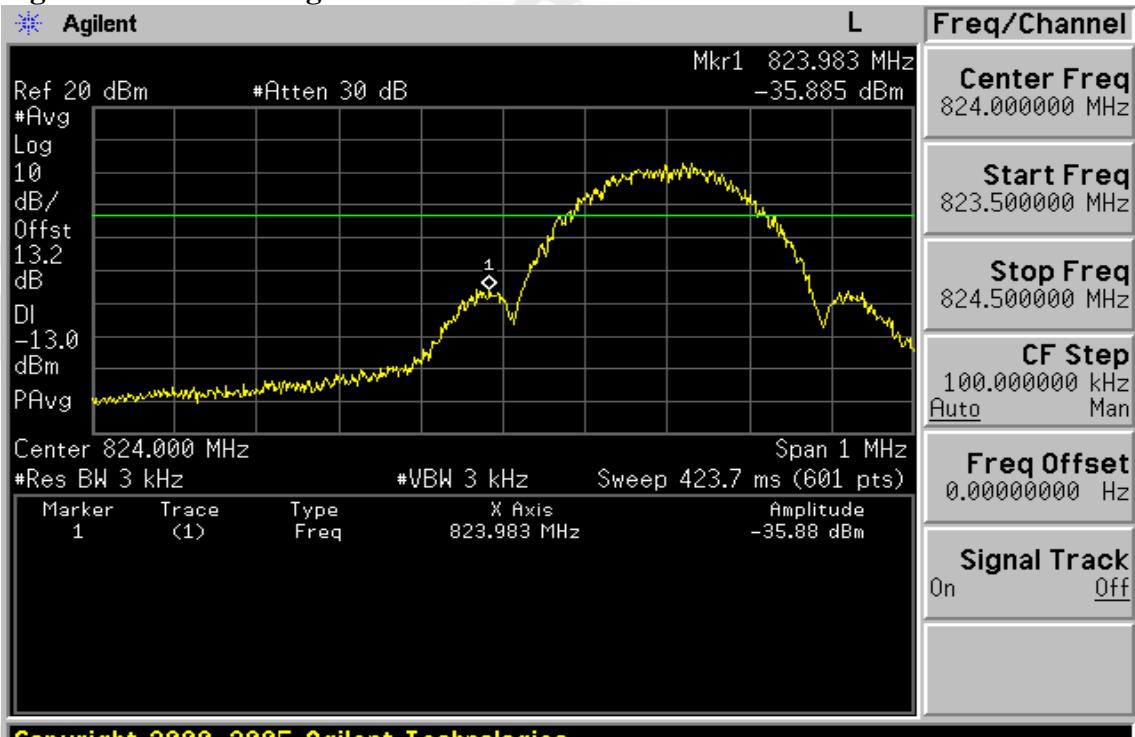
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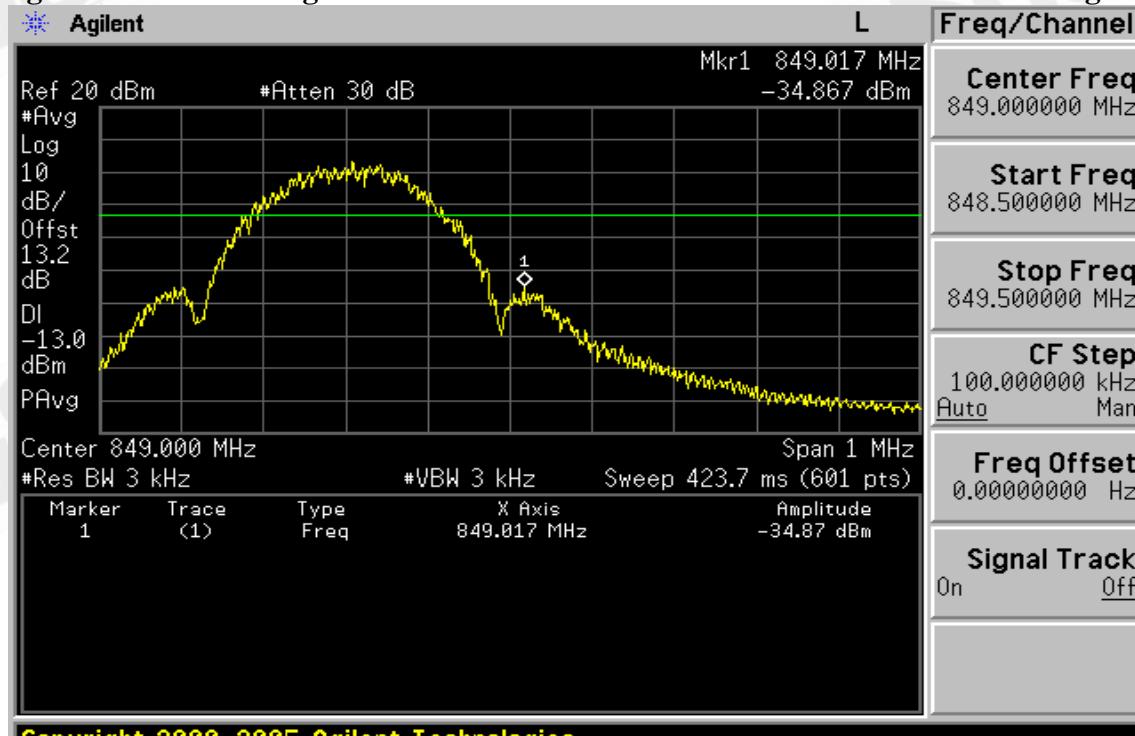
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Figure 10-14: Band edge emission at antenna terminals –EDGE 850 Channel Lowest



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Figure 10-15: Band edge emission at antenna terminals –EDGE 850 Channel Highest



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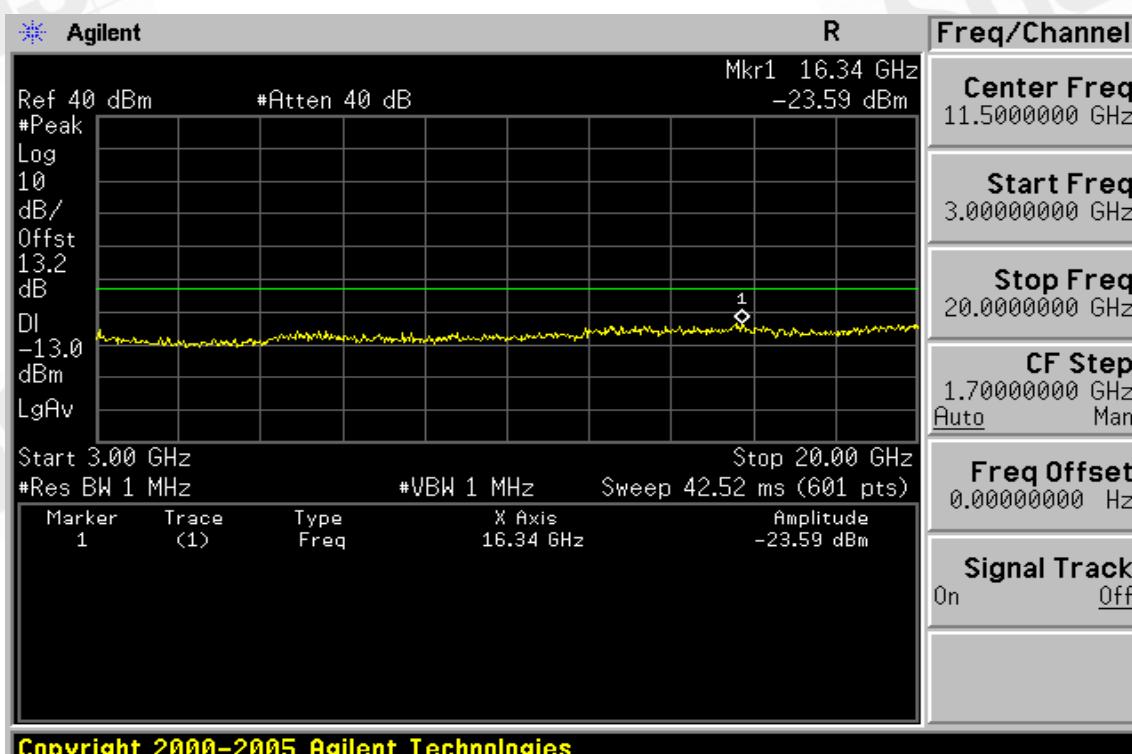
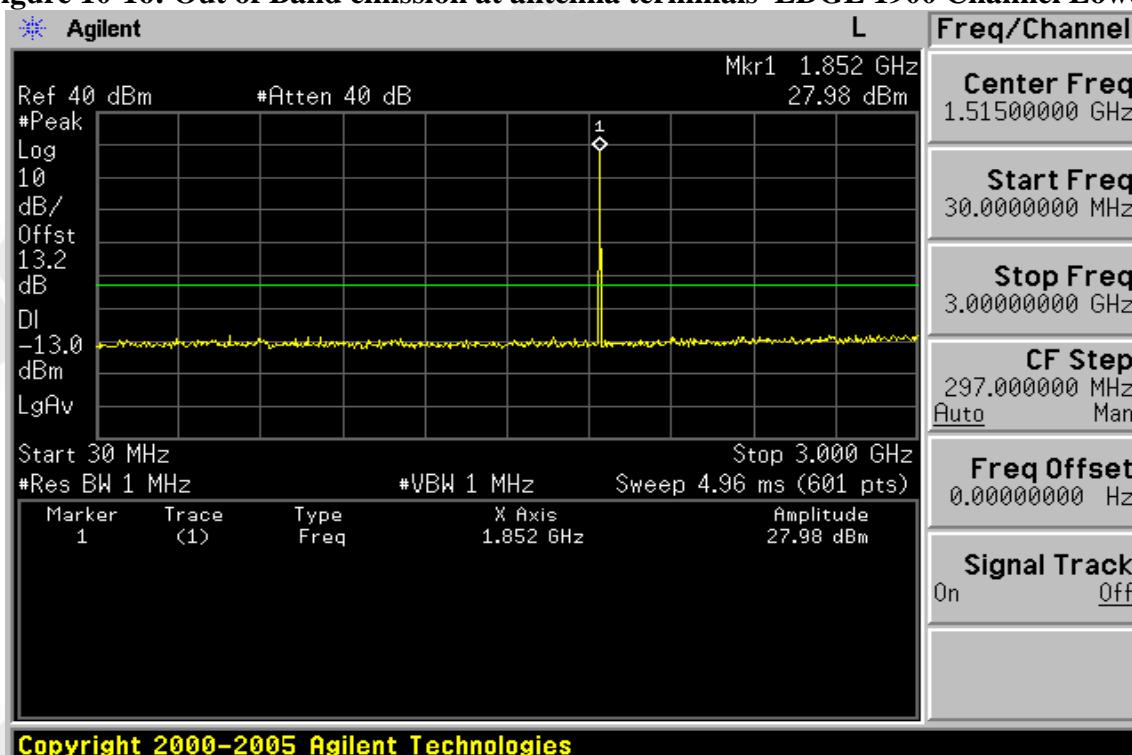
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Figure 10-16: Out of Band emission at antenna terminals—EDGE 1900 Channel Lowest

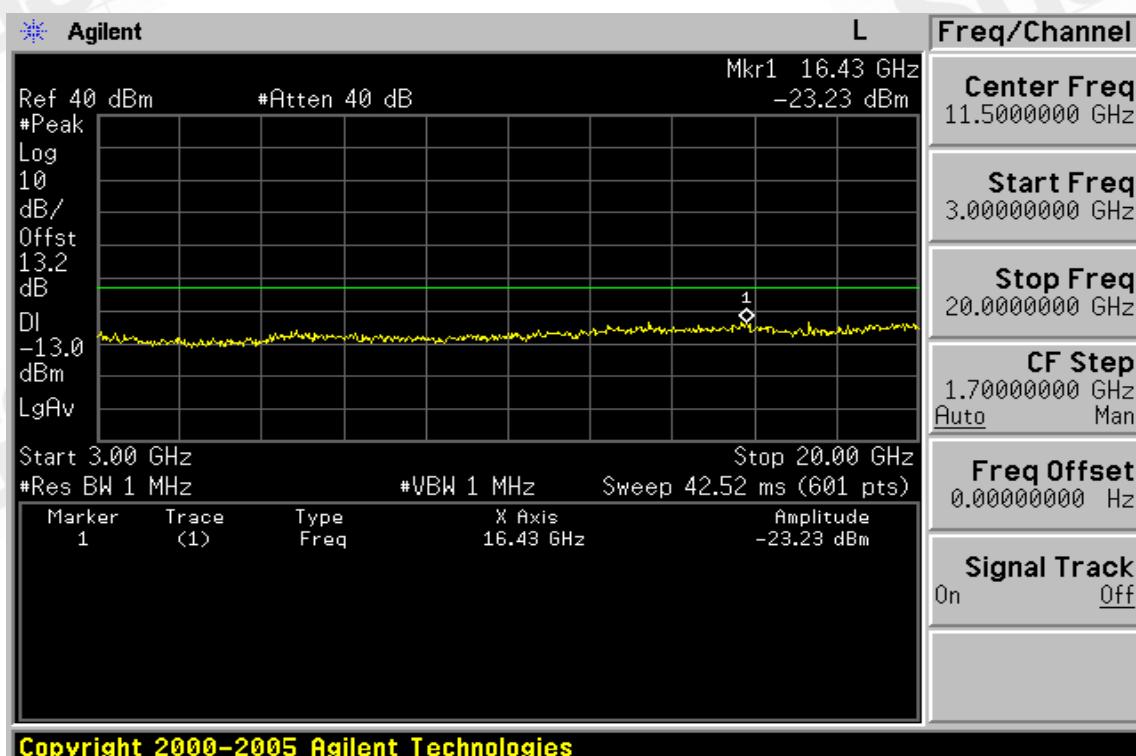
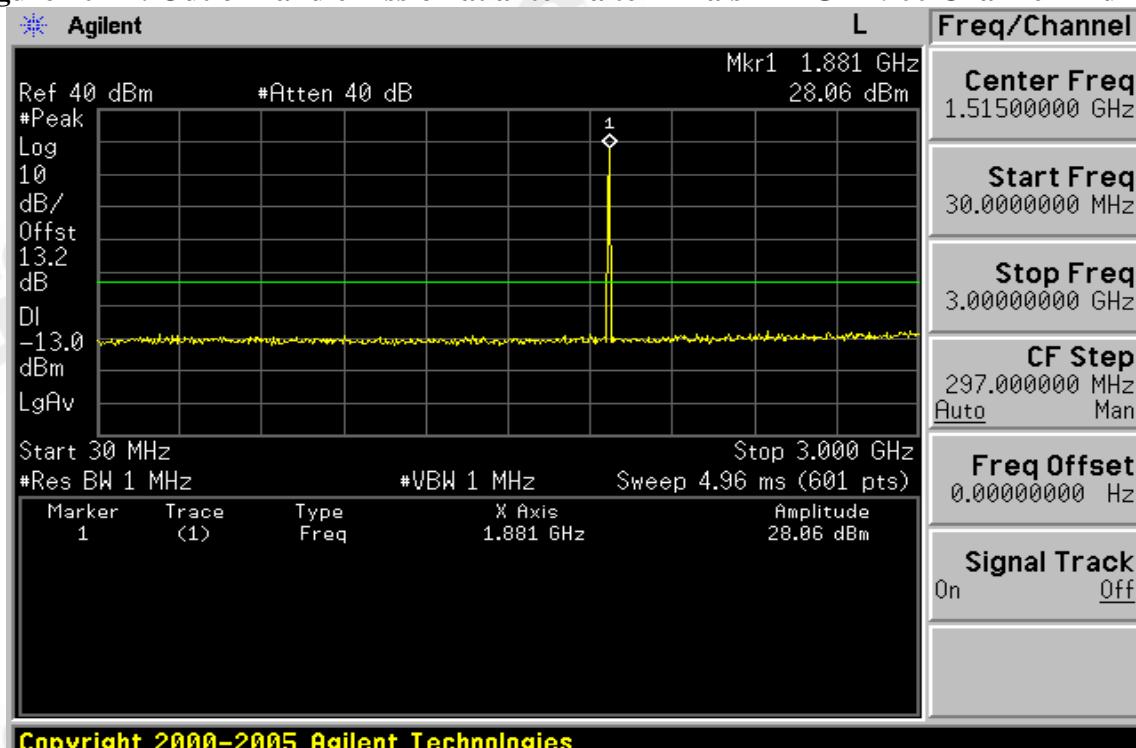


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Figure 10-17: Out of Band emission at antenna terminals –EDGE 1900 Channel Mid

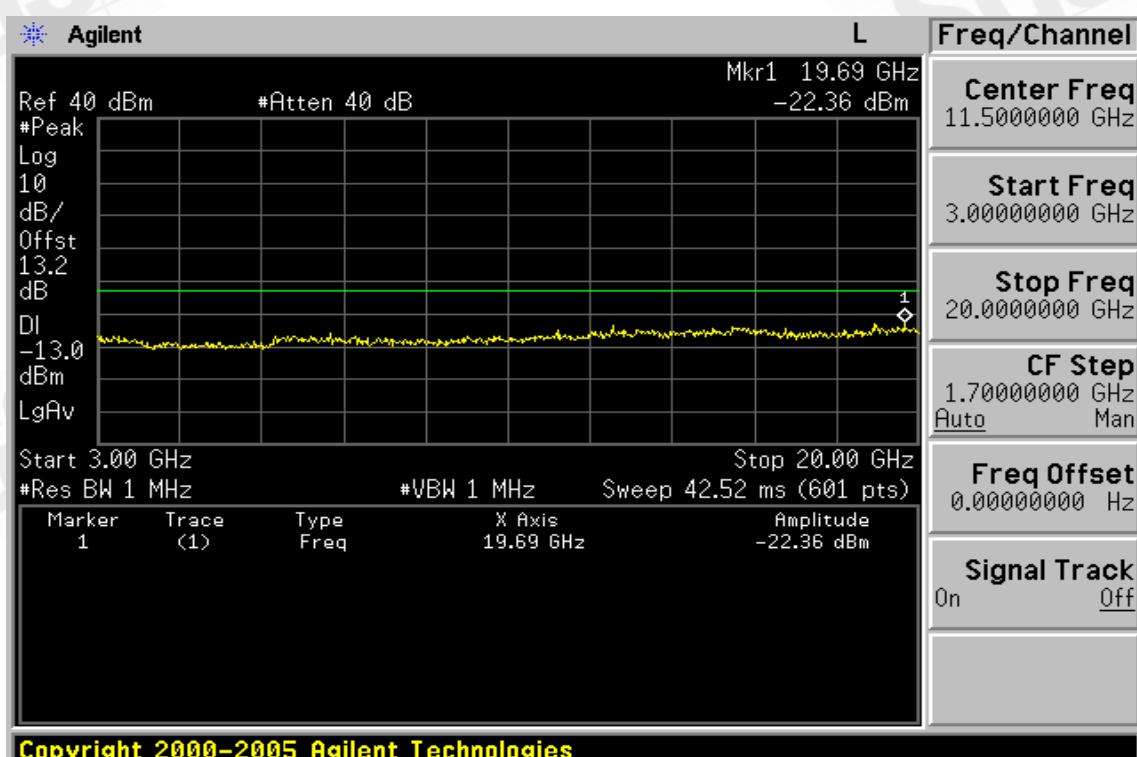
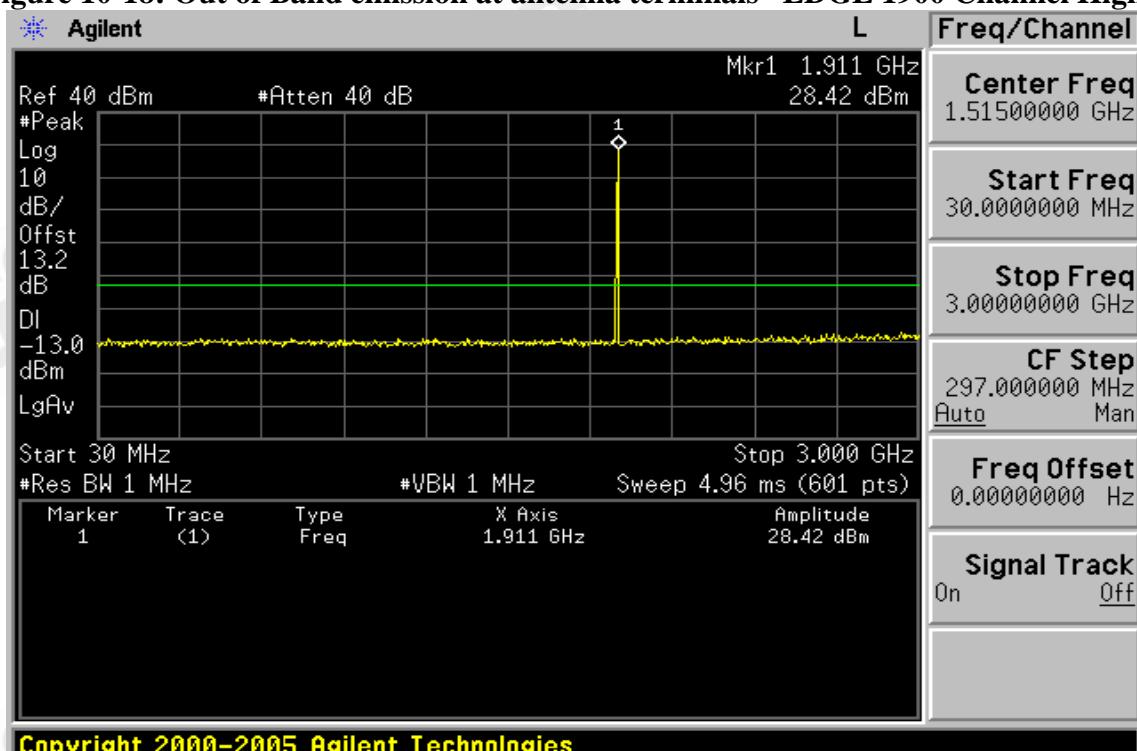


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Figure 10-18: Out of Band emission at antenna terminals –EDGE 1900 Channel Highest

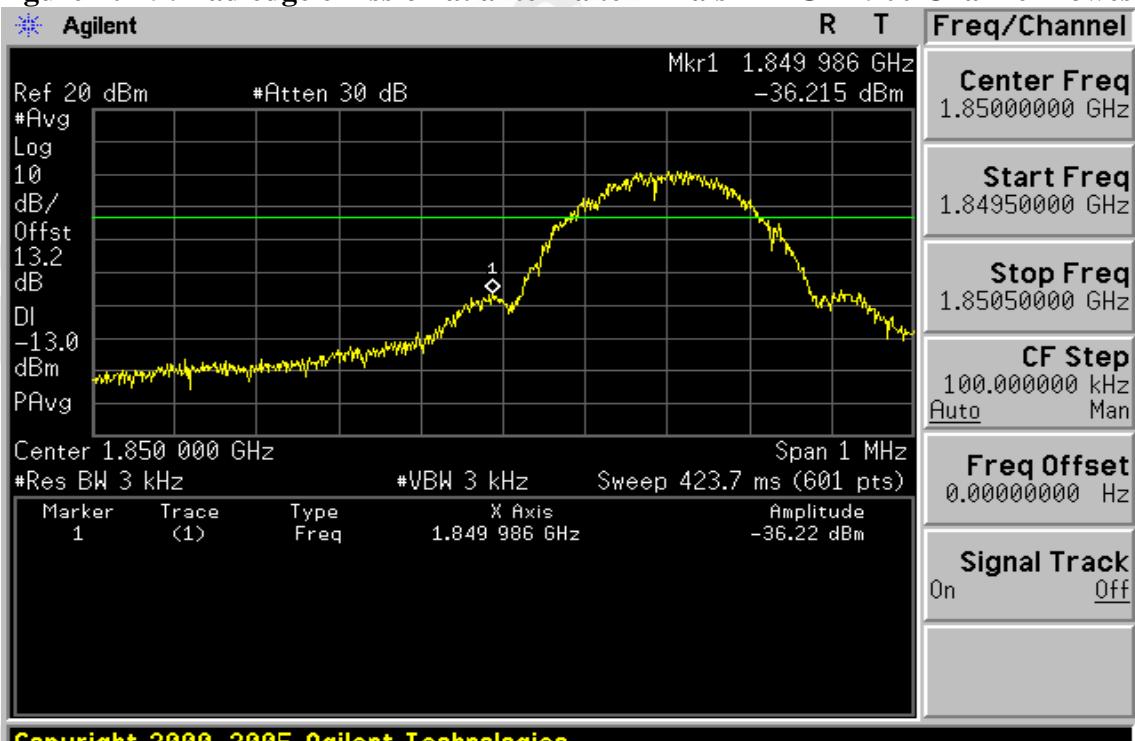


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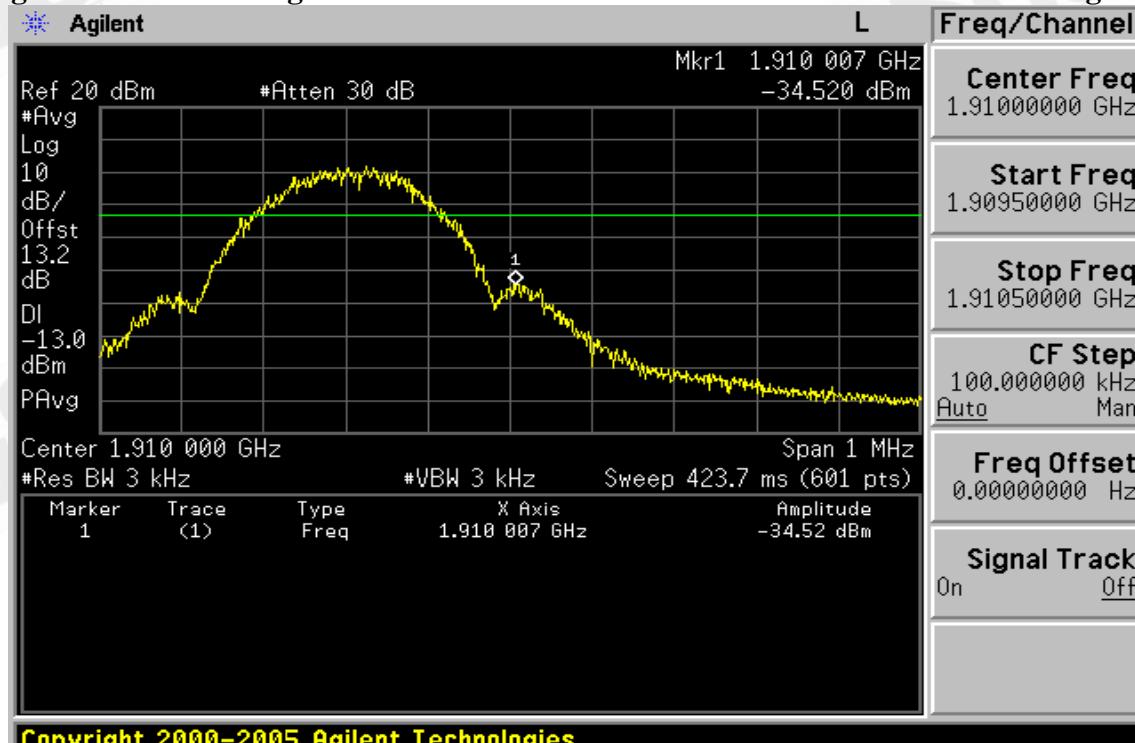
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Figure 10-19: Bad edge emission at antenna terminals –EDGE 1900 Channel Lowest



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Figure 10-20: Band edge emission at antenna terminals –EDGE 1900 Channel Highest



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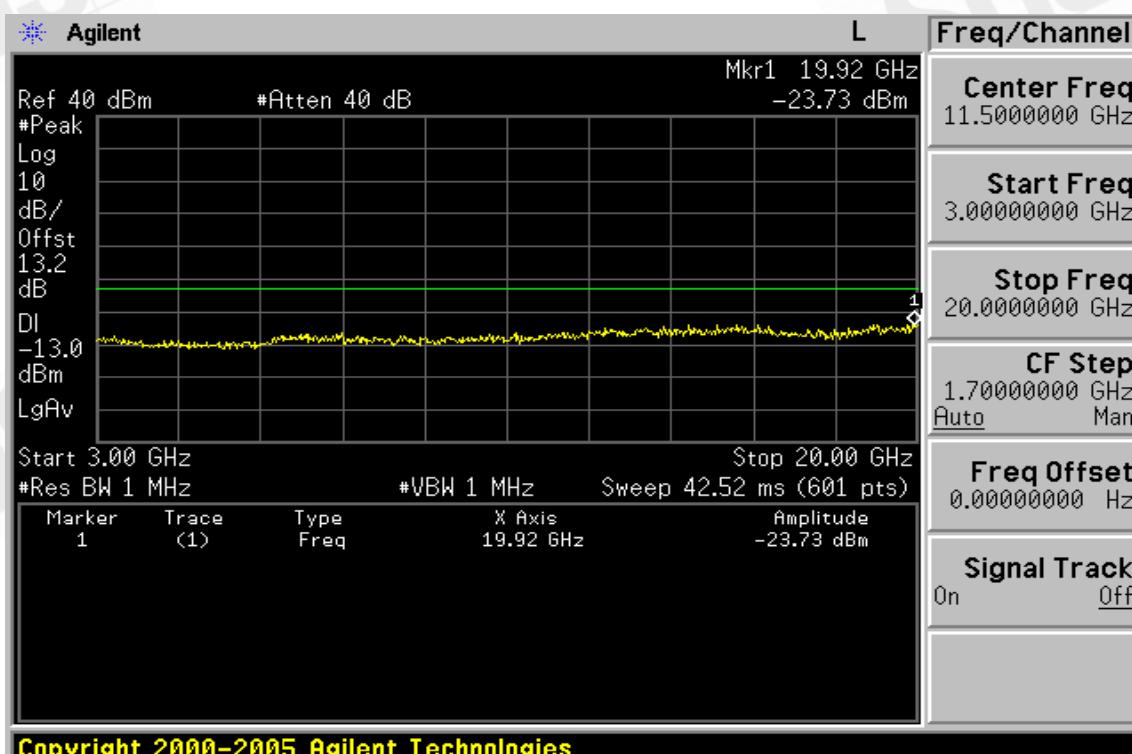
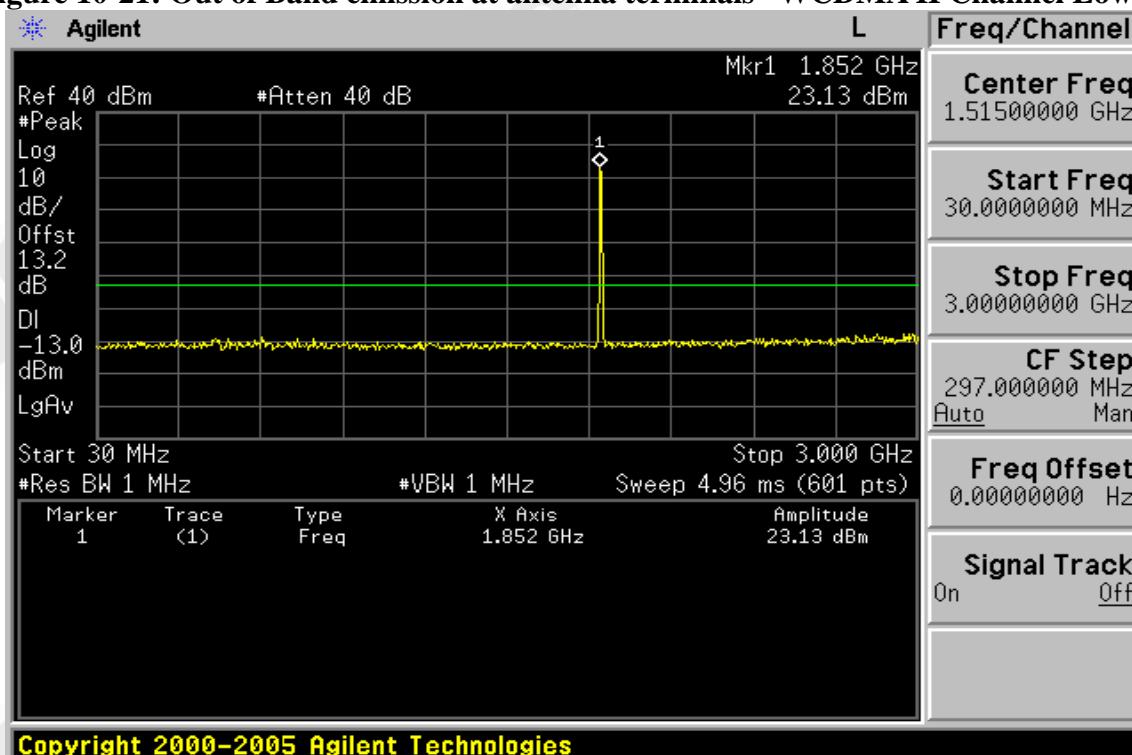
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Figure 10-21: Out of Band emission at antenna terminals—WCDMA II Channel Lowest

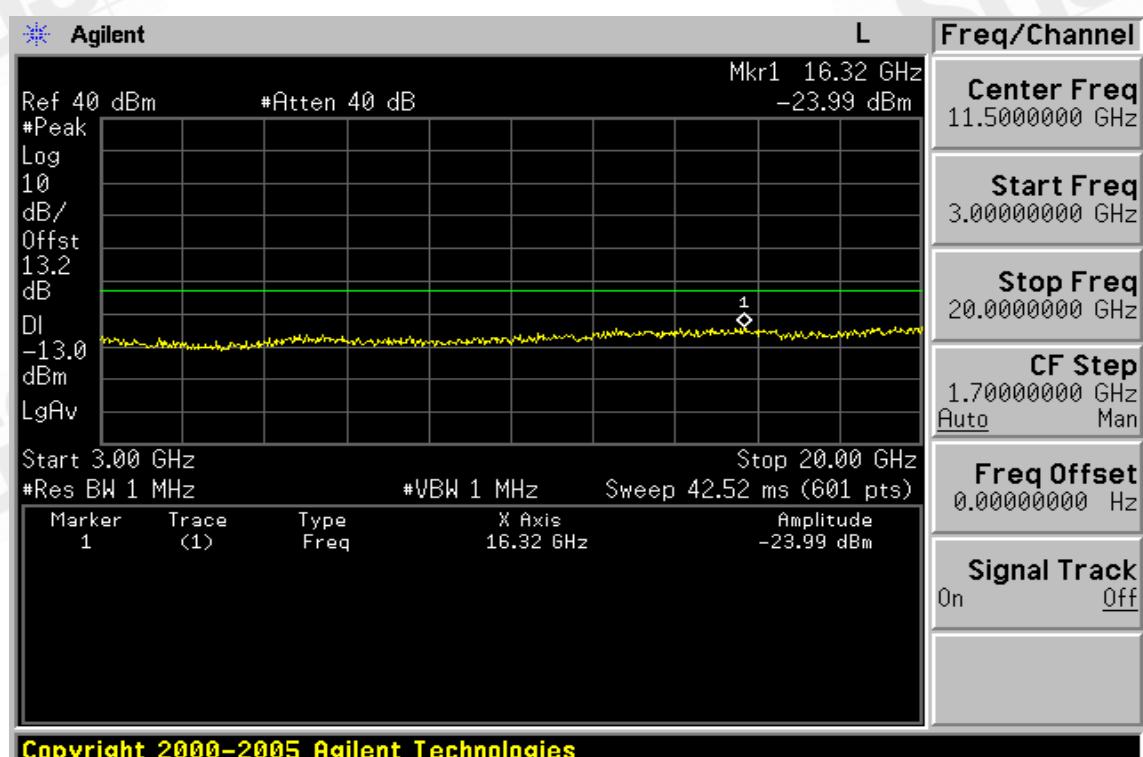
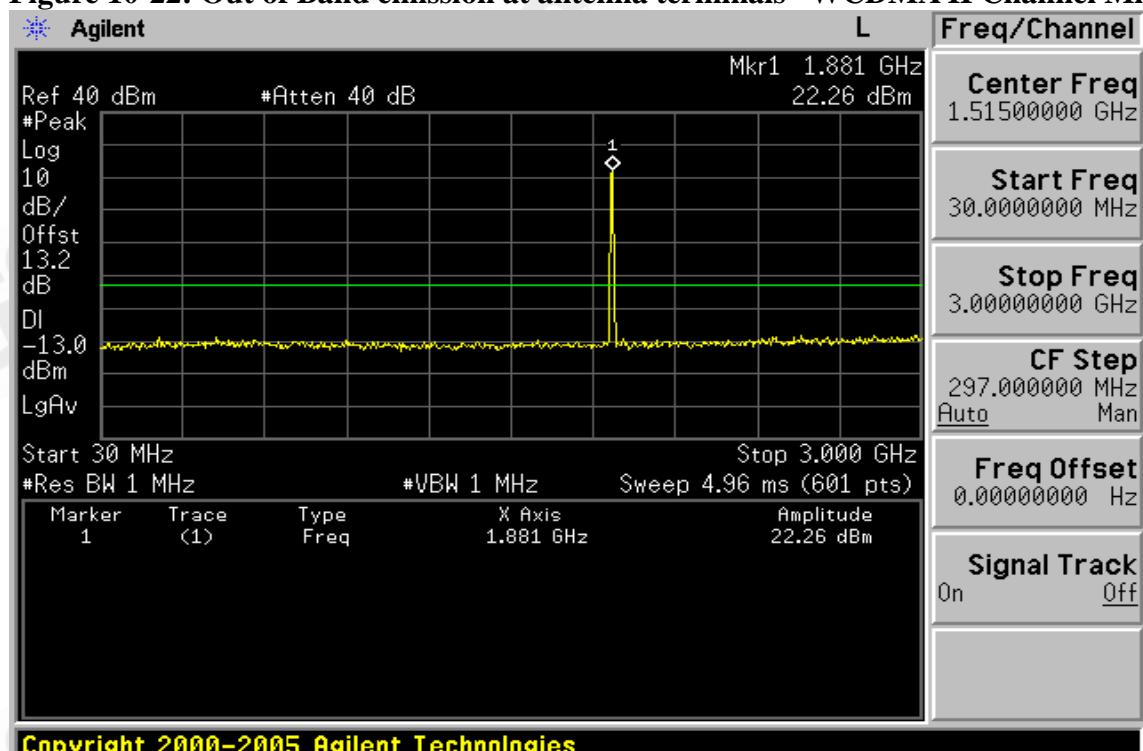


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Figure 10-22: Out of Band emission at antenna terminals –WCDMA II Channel Mid

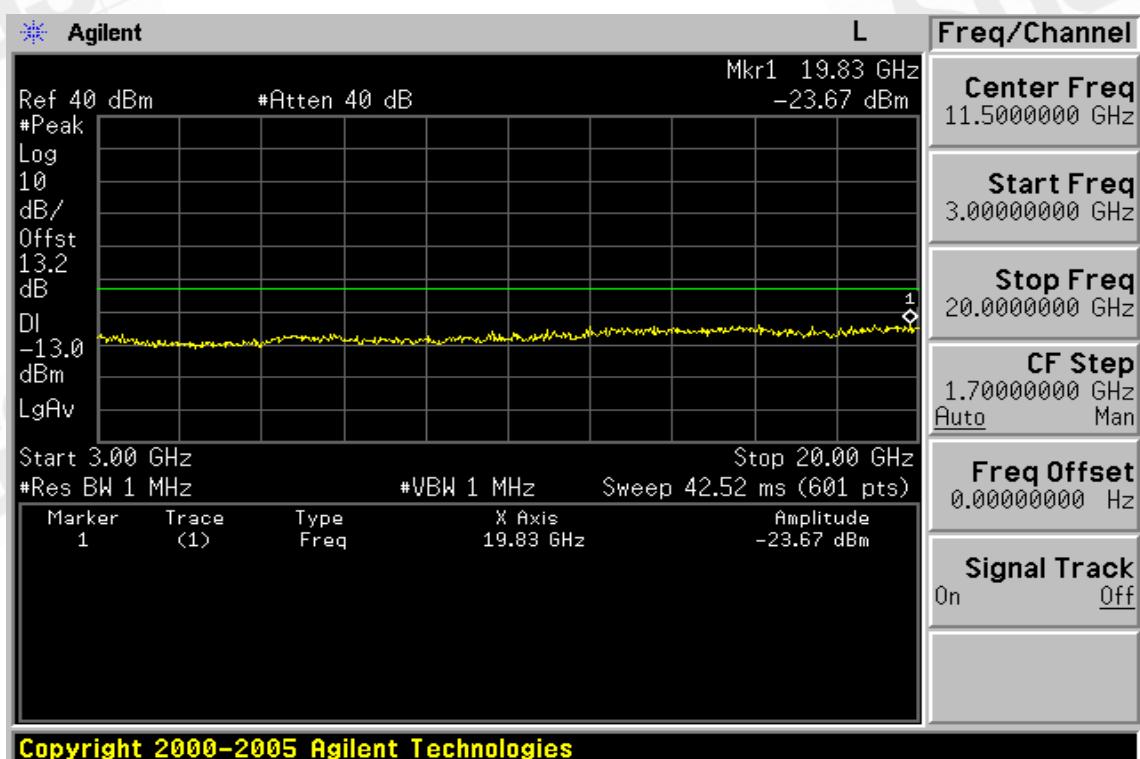
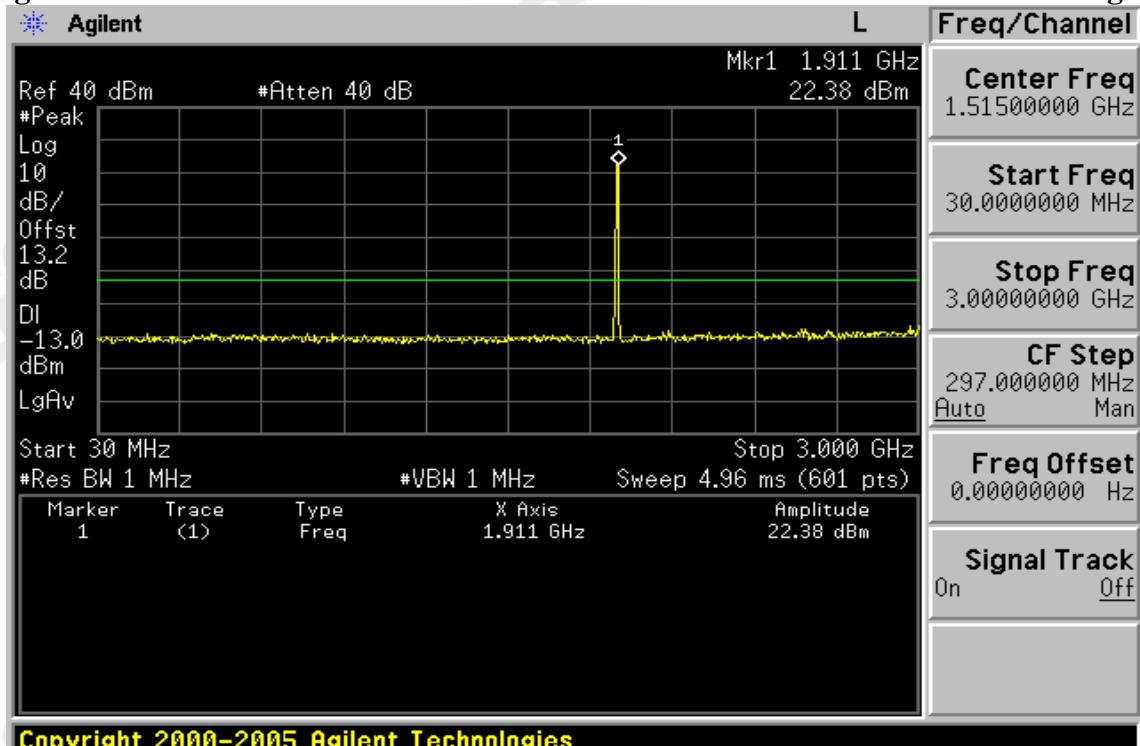


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Figure 10-23: Out of Band emission at antenna terminals—WCDMA II Channel Highest



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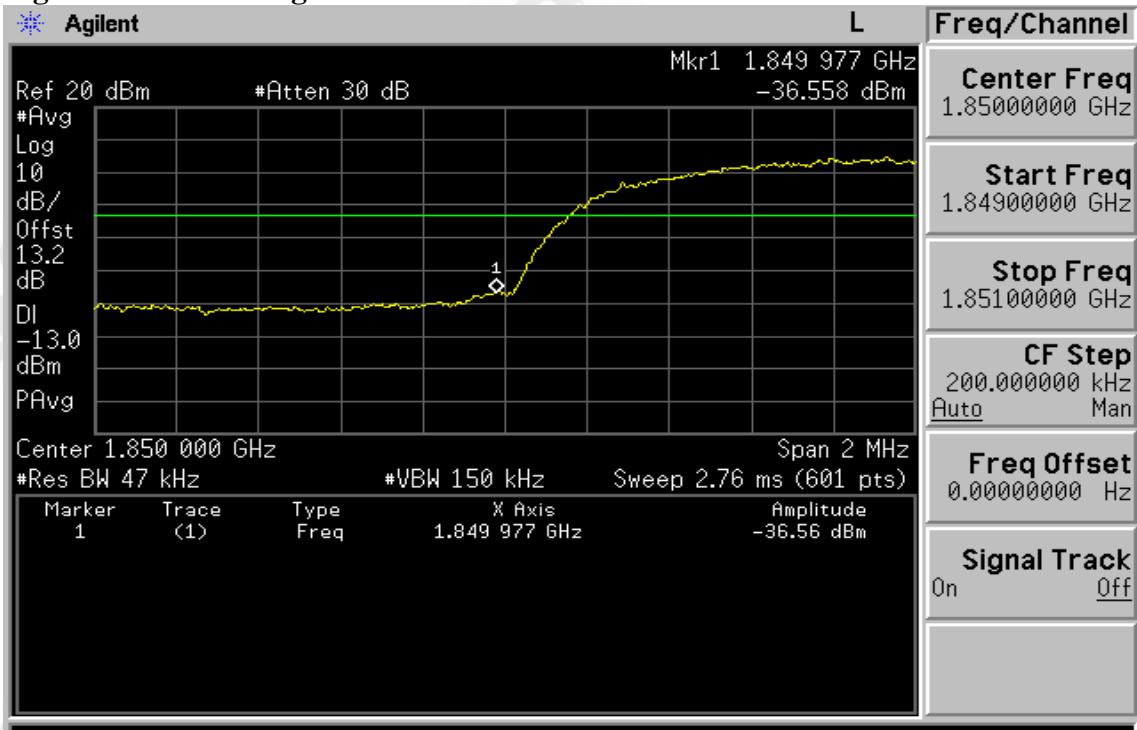
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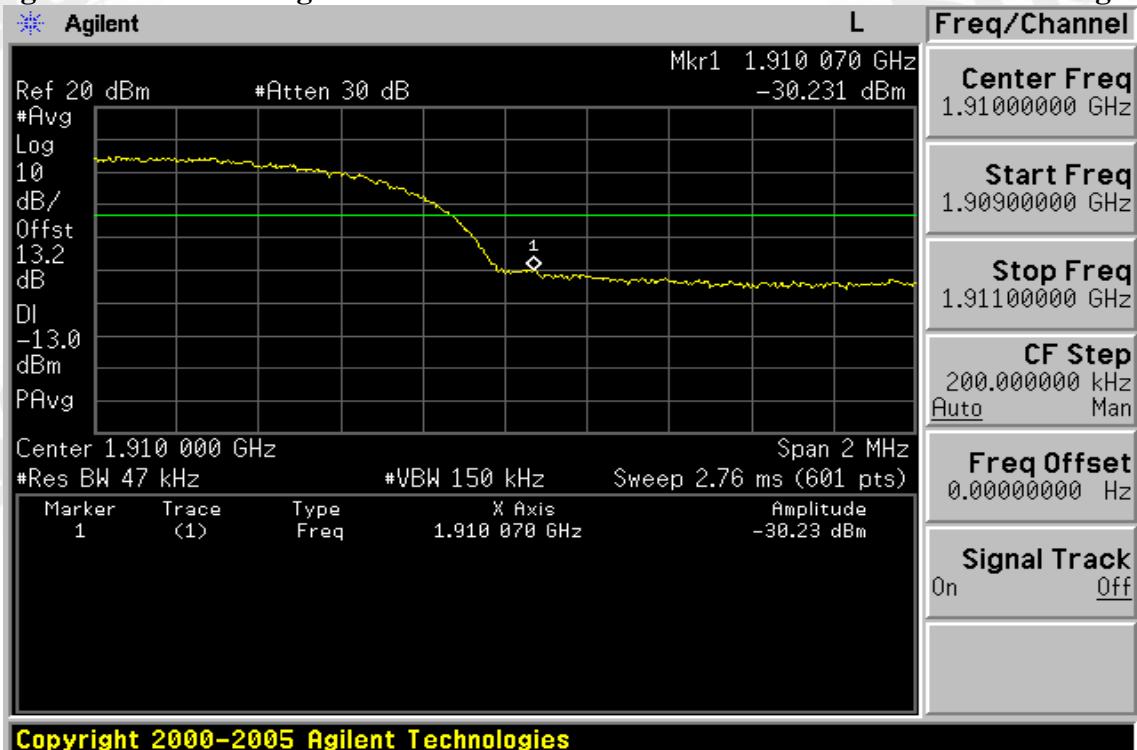
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Figure 10-24: Bad edge emission at antenna terminals –WCDMA II Channel Lowest



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Figure 10-25: Band edge emission at antenna terminals –WCDMA II Channel Highest



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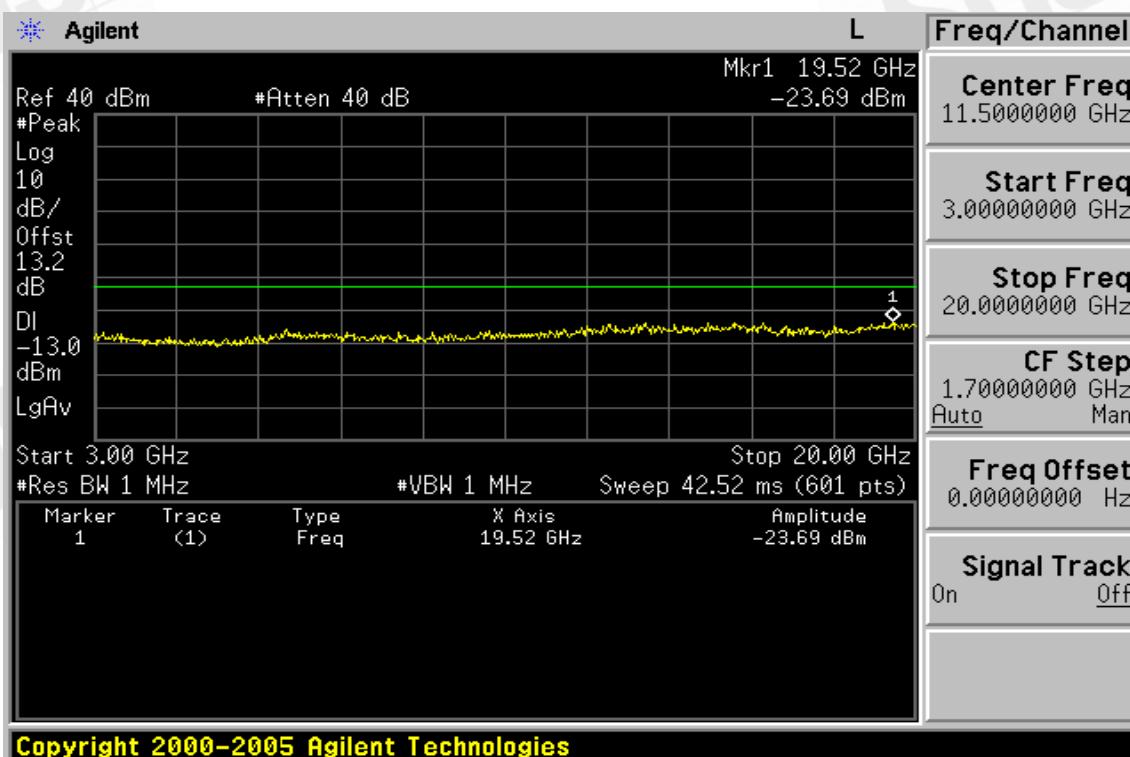
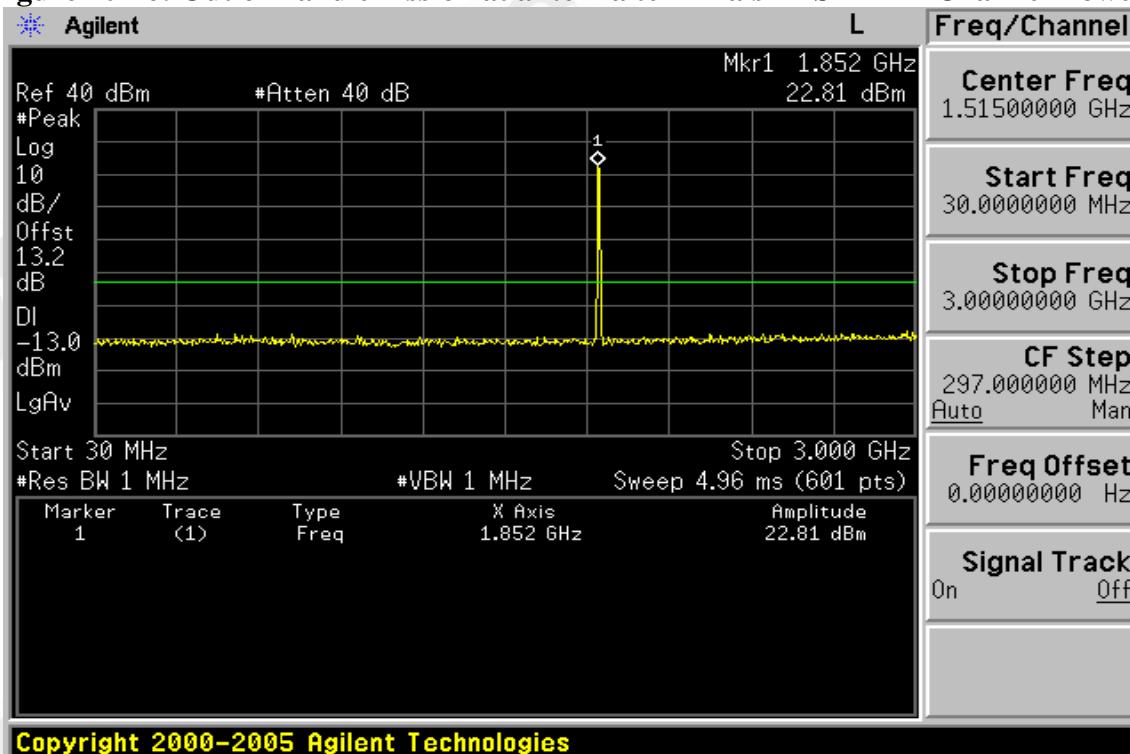
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Figure 10-26: Out of Band emission at antenna terminals—HSDPA II Channel Lowest

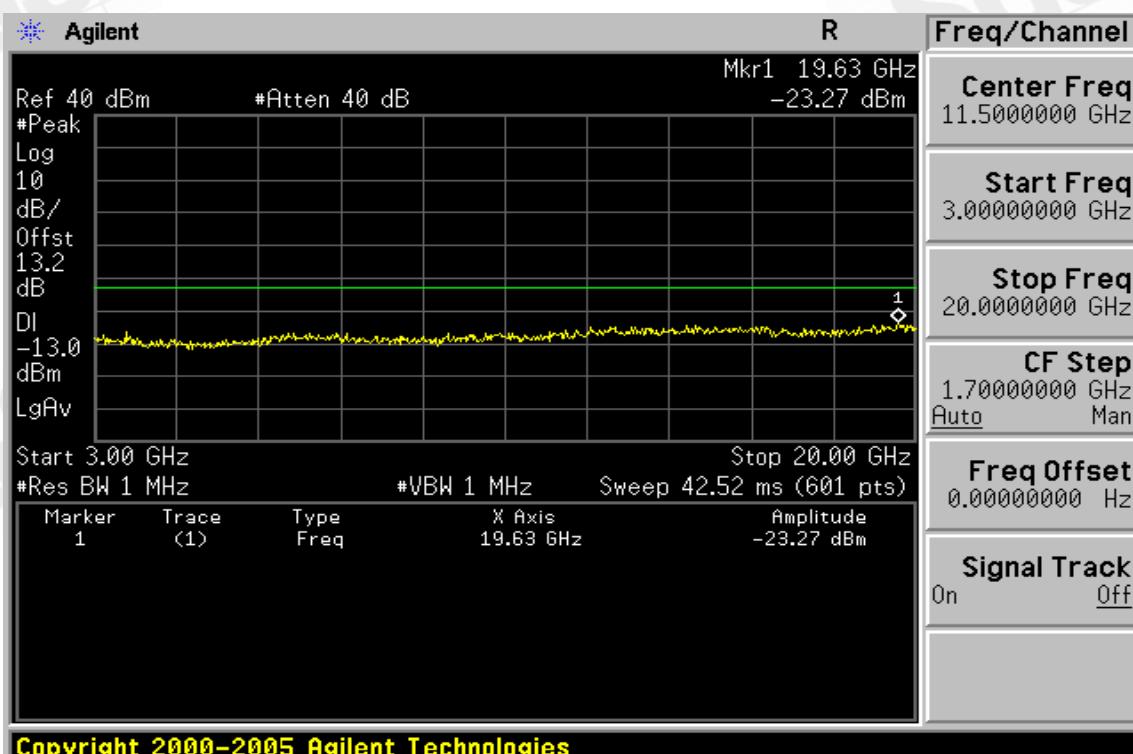
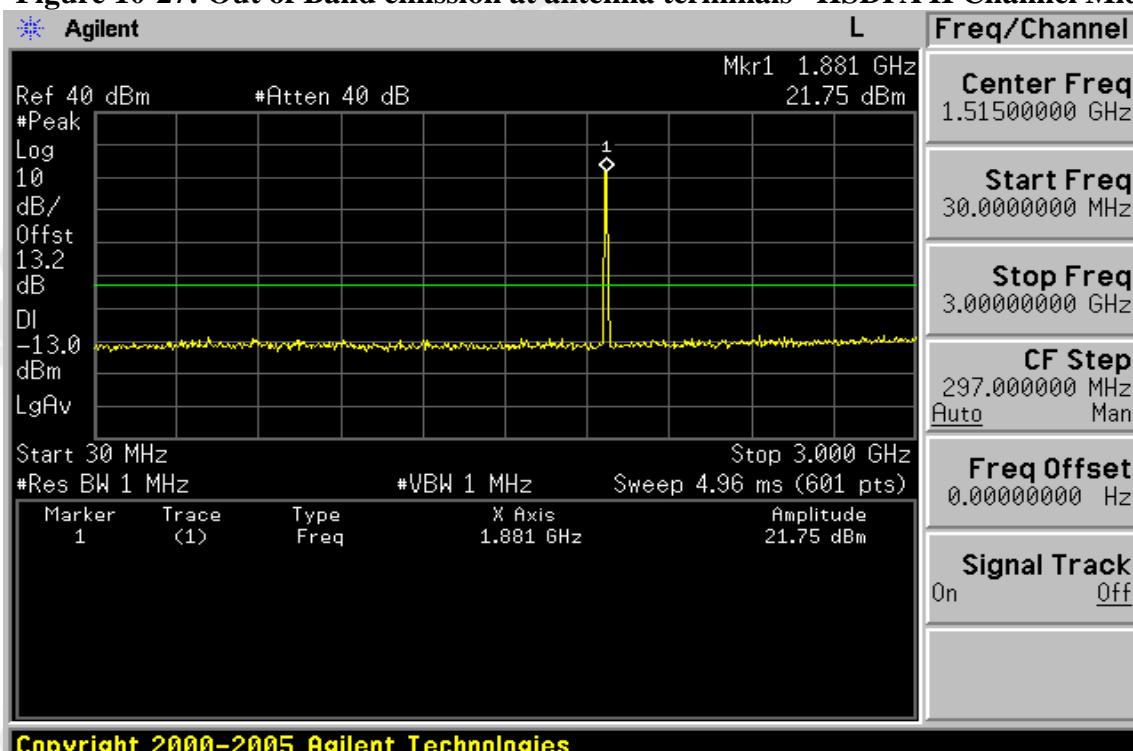


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Figure 10-27: Out of Band emission at antenna terminals –HSDPA II Channel Mid



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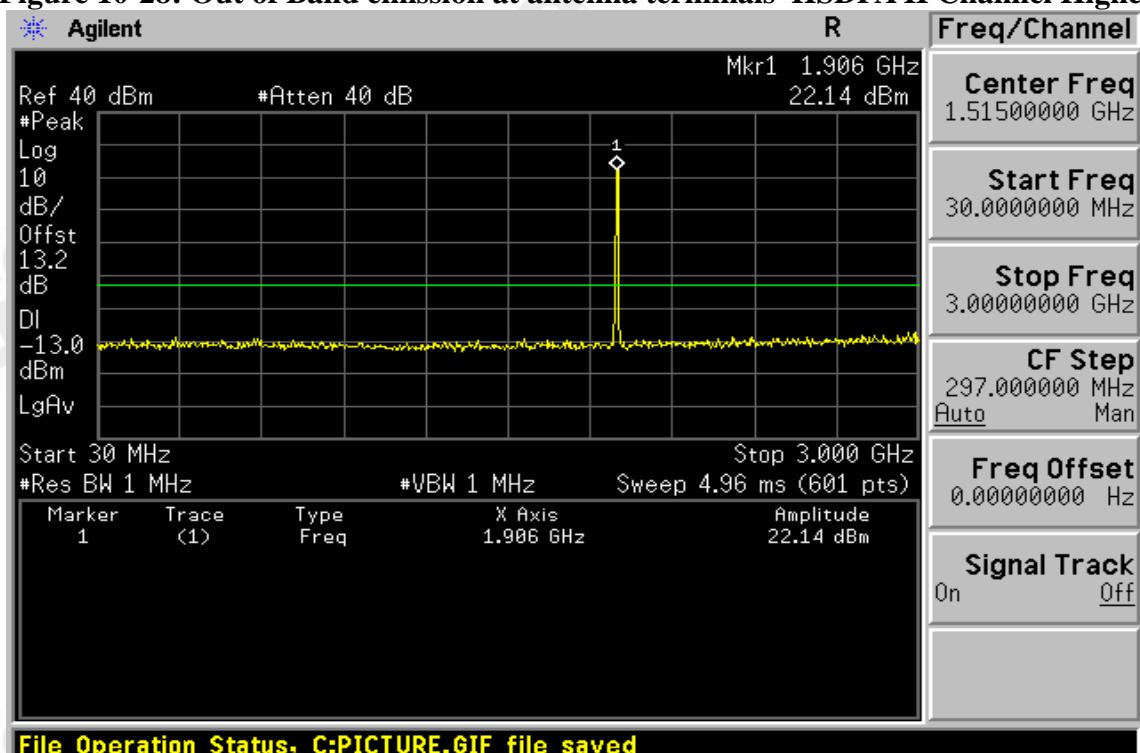
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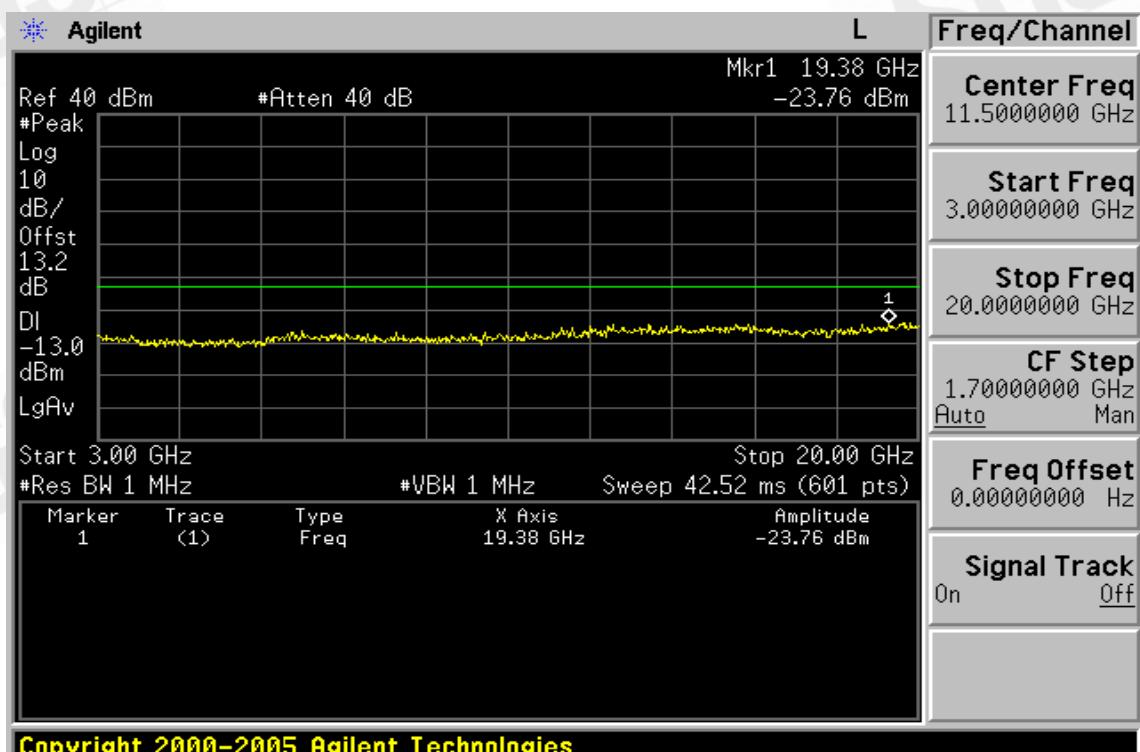
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**Figure 10-28: Out of Band emission at antenna terminals—HSDPA II Channel Highest**



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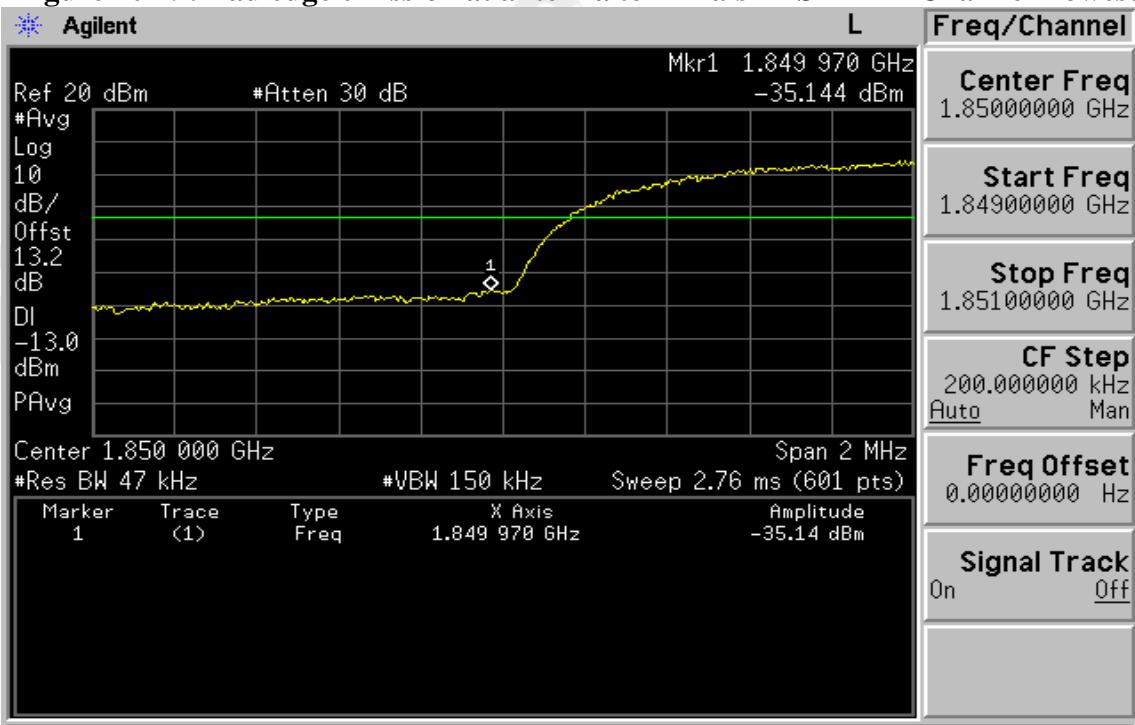
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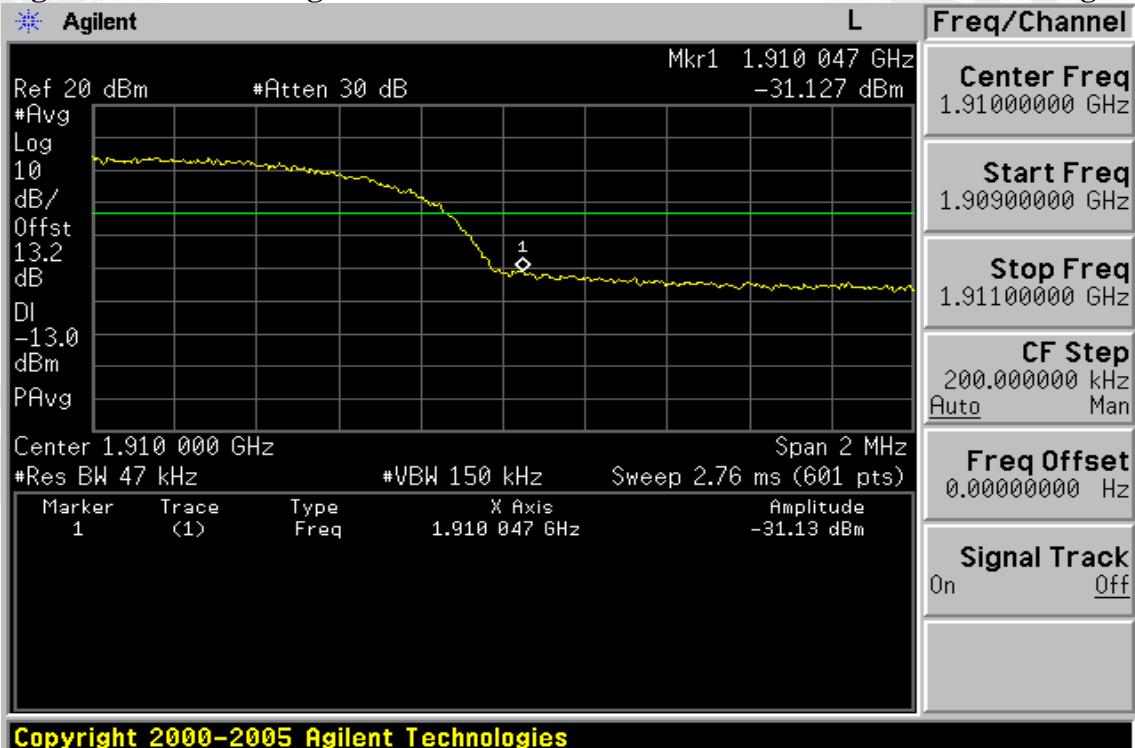
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Figure 10-29: Bad edge emission at antenna terminals –HSDPA II Channel Lowest



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Figure 10-30: Band edge emission at antenna terminals –HSDPA II Channel Highest



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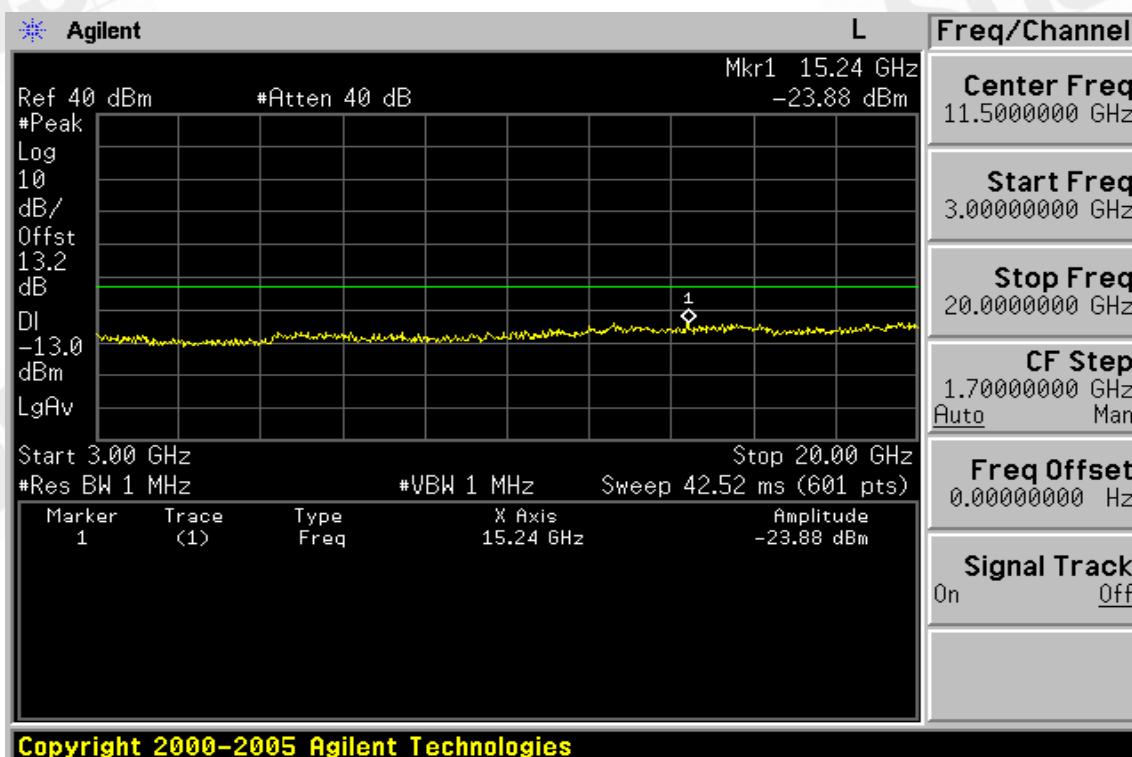
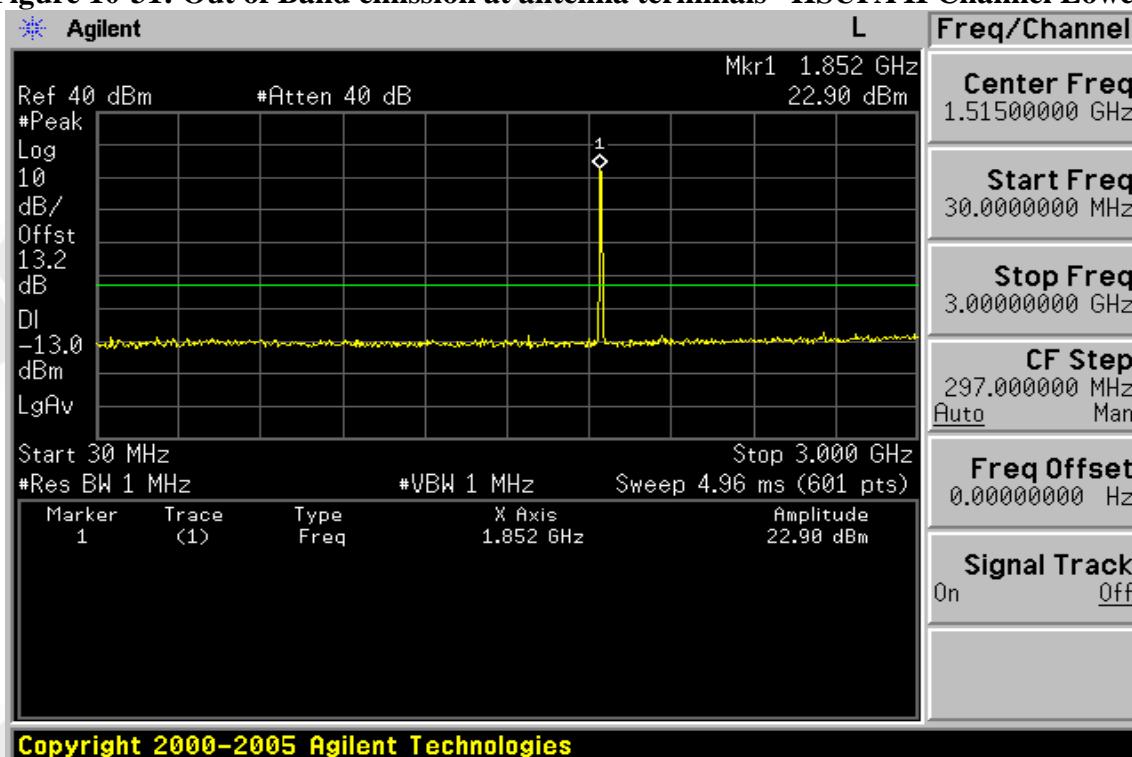
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Figure 10-31: Out of Band emission at antenna terminals— HSUPA II Channel Lowest



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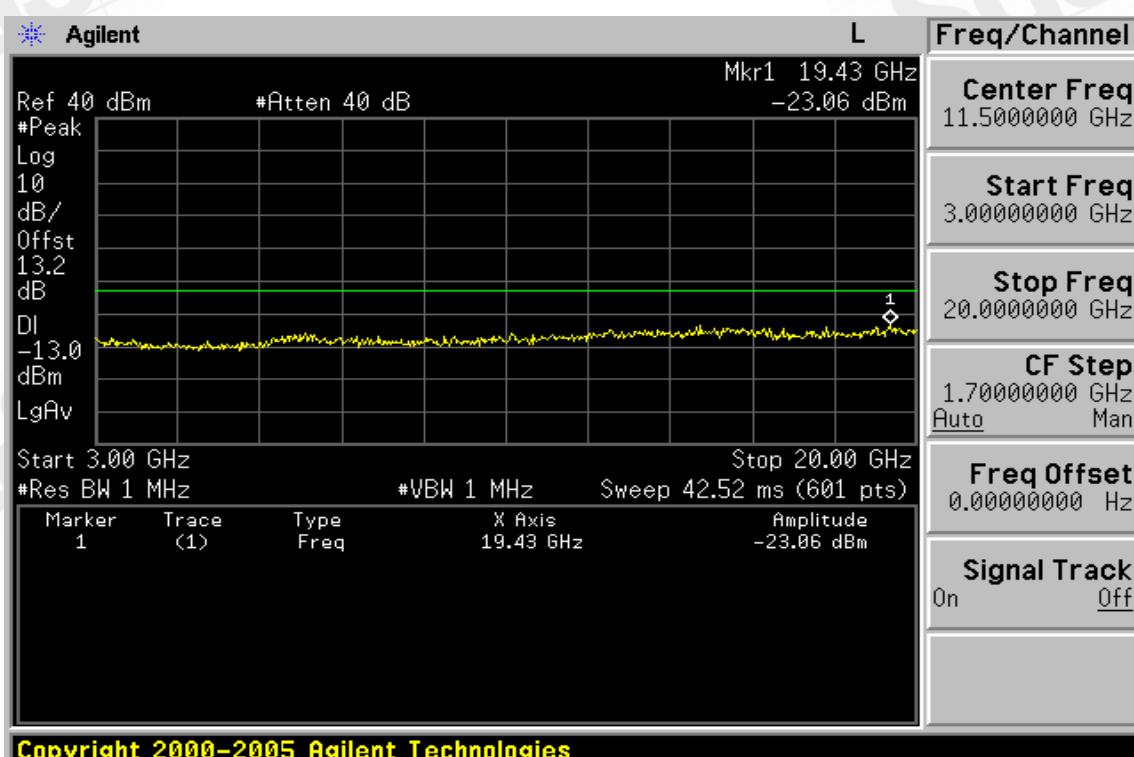
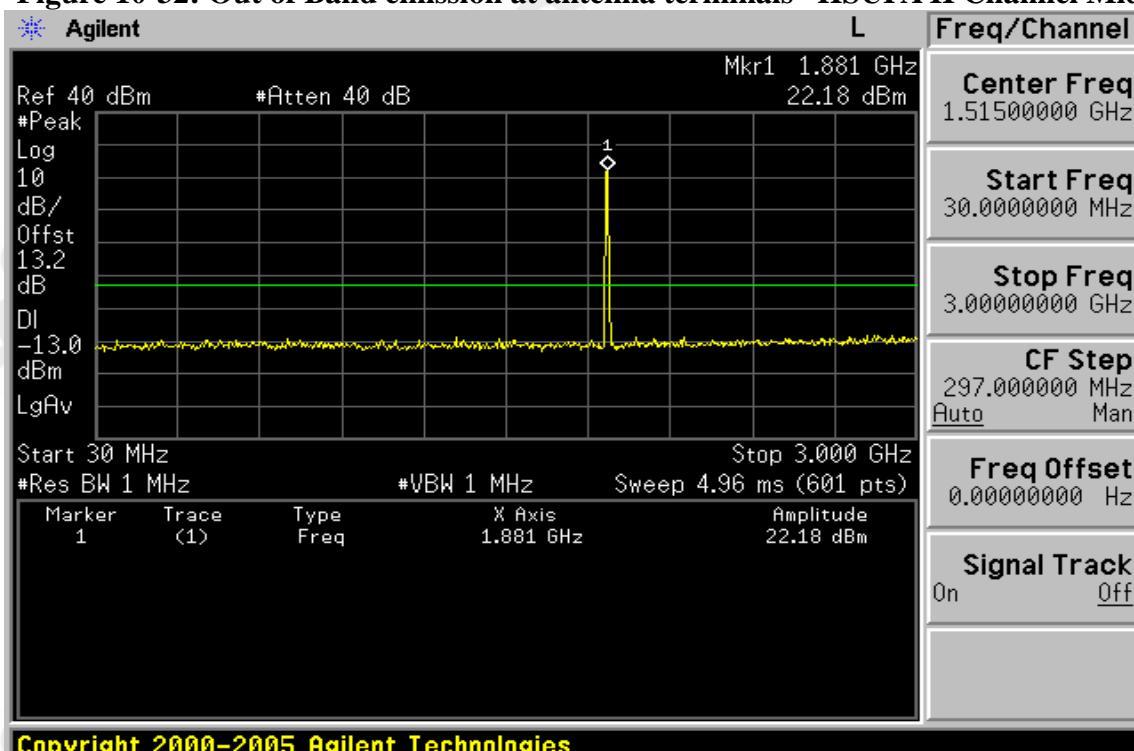
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Figure 10-32: Out of Band emission at antenna terminals –HSUPA II Channel Mid

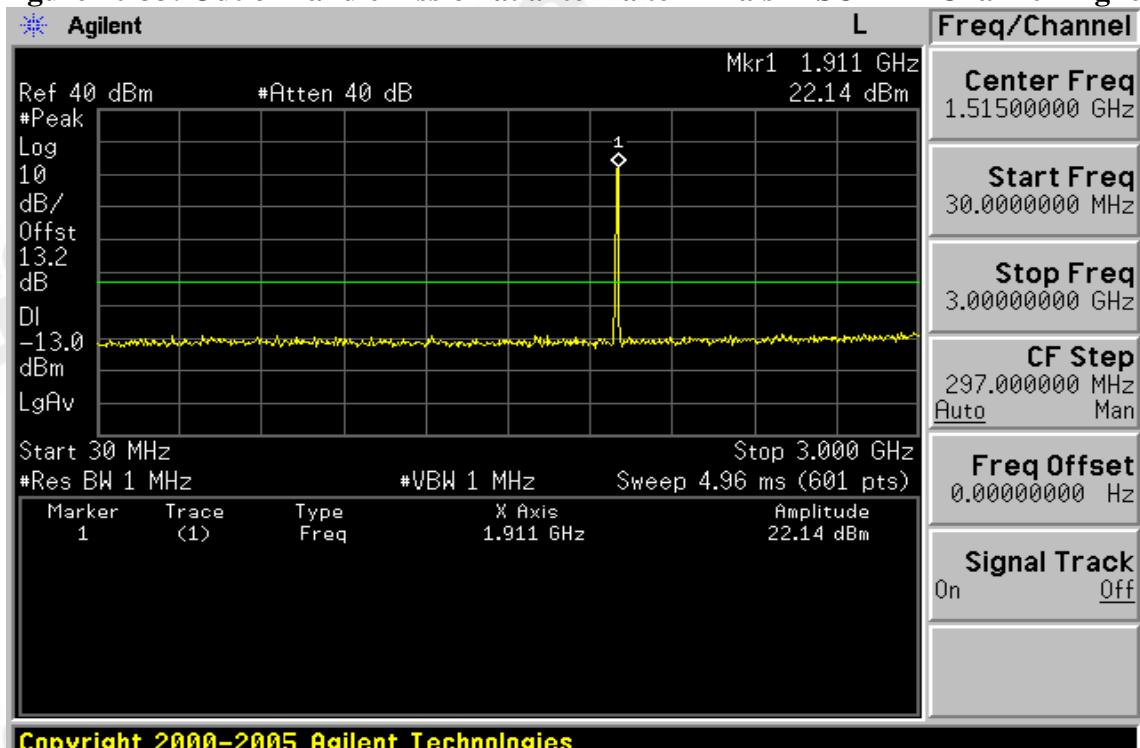


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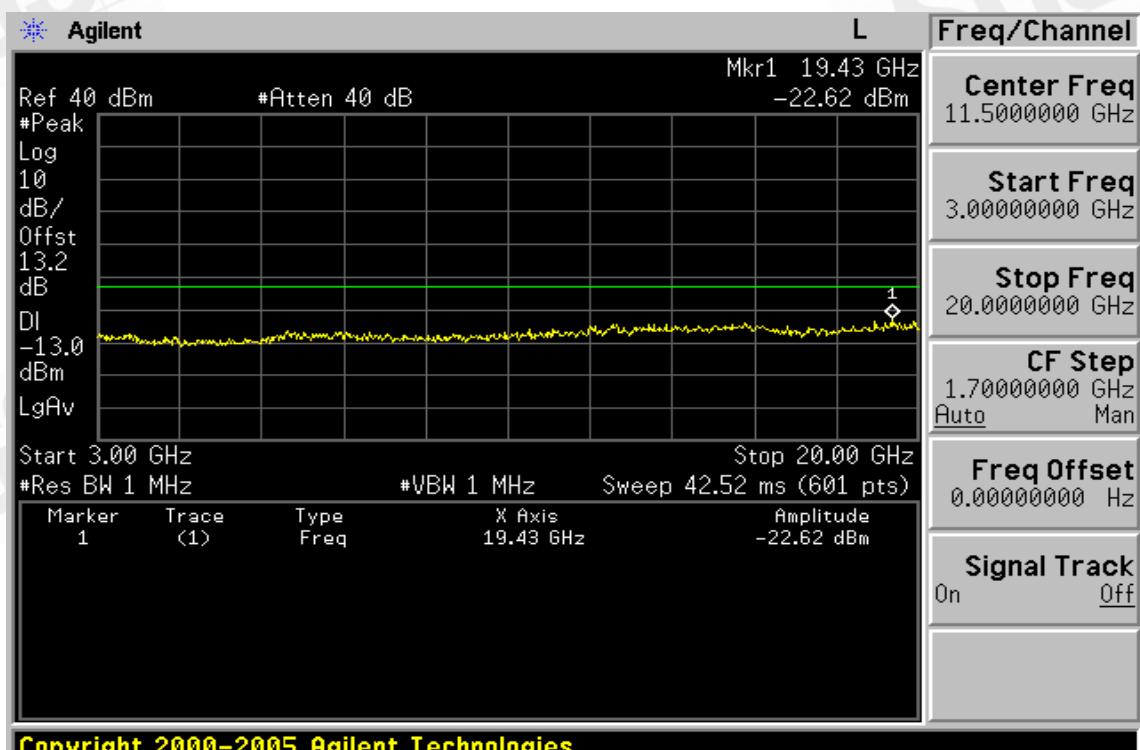
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**Figure 10-33: Out of Band emission at antenna terminals—HSUPA II Channel Highest**



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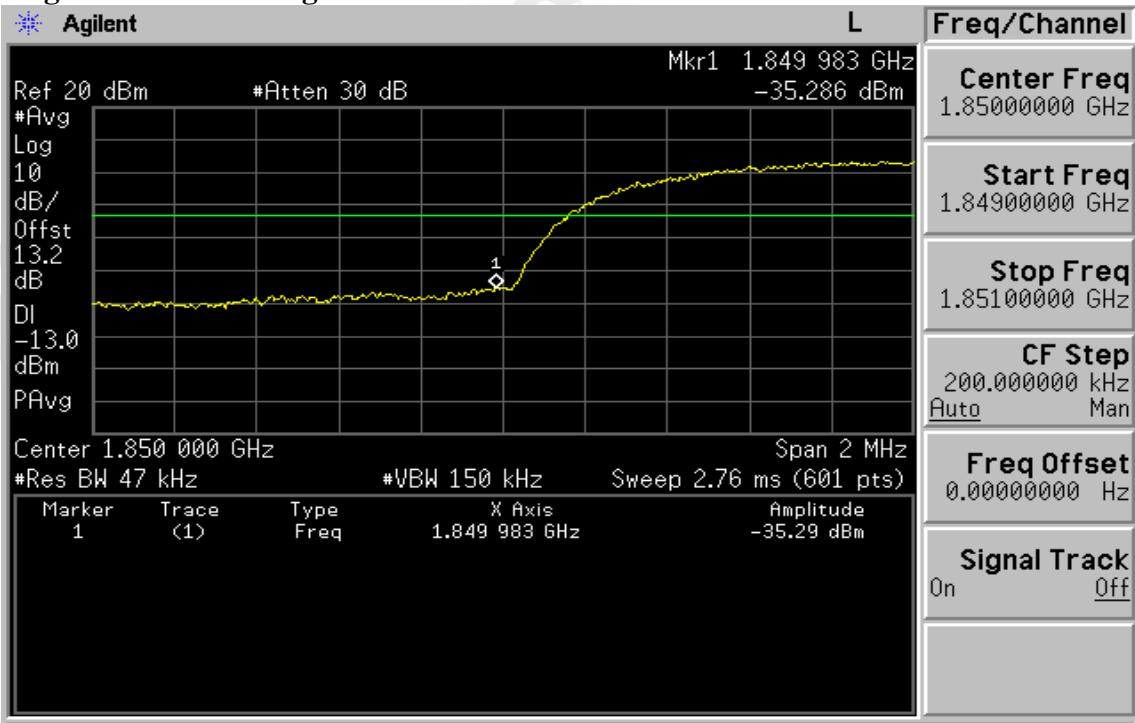
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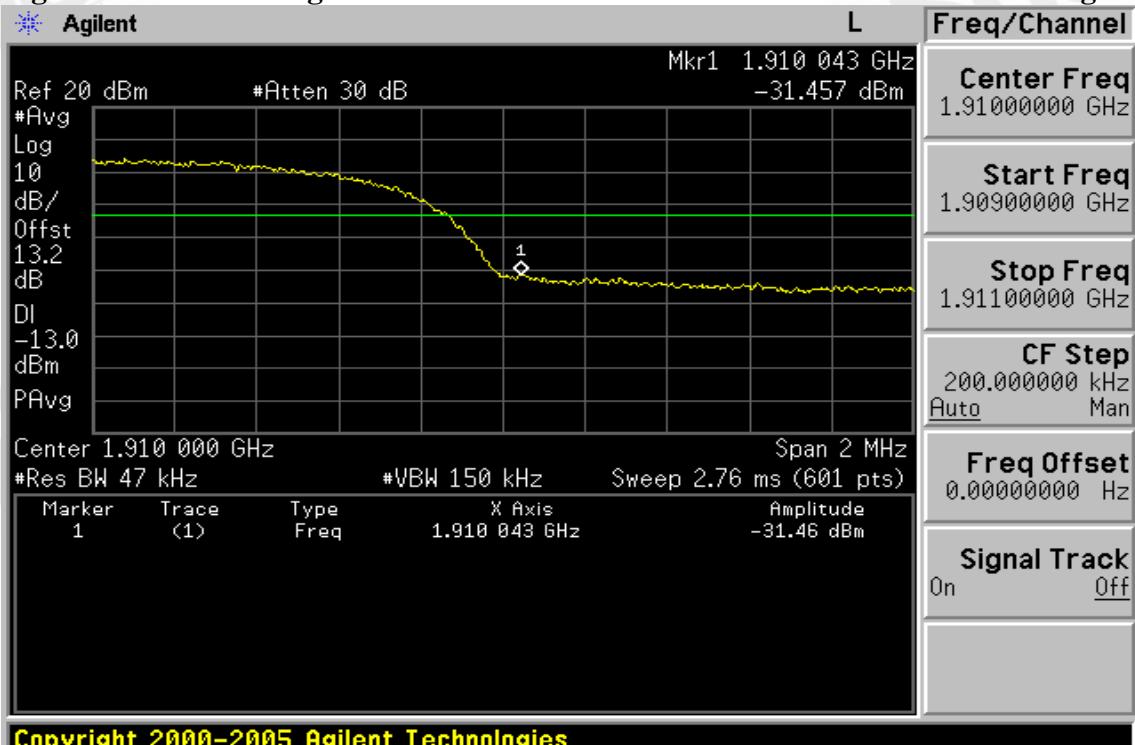
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Figure 10-34: Bad edge emission at antenna terminals –HSUPA II Channel Lowest



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Figure 10-35: Band edge emission at antenna terminals –HSUPA II Channel Highest



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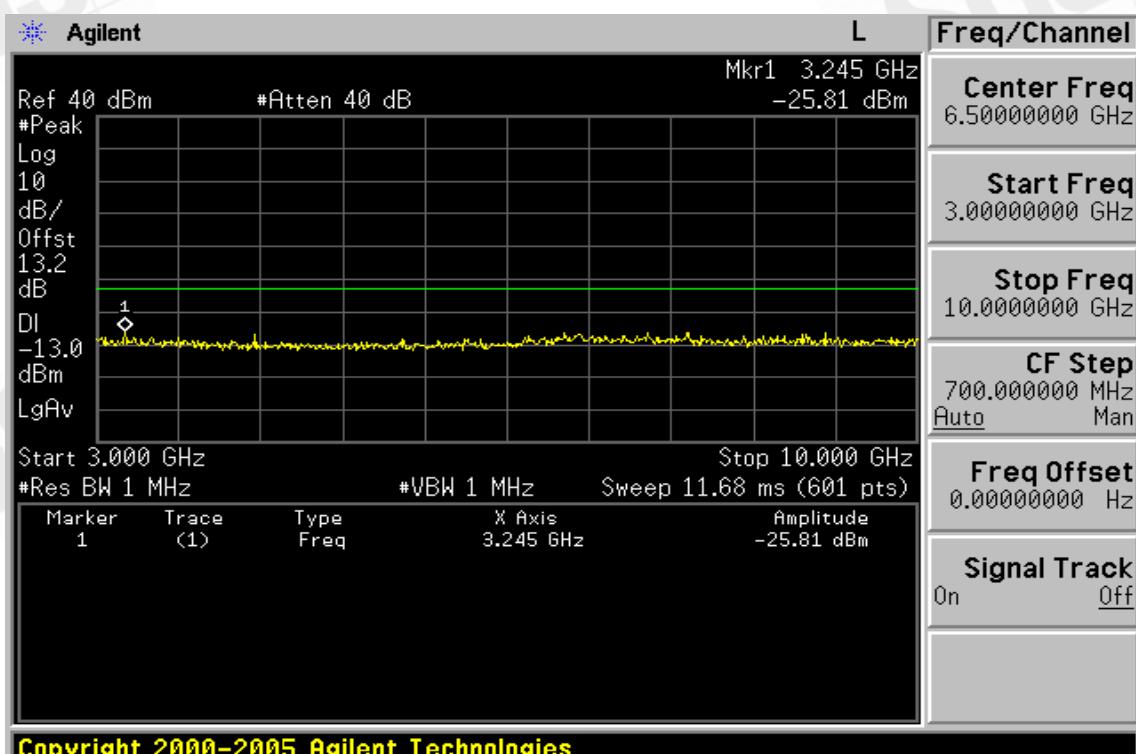
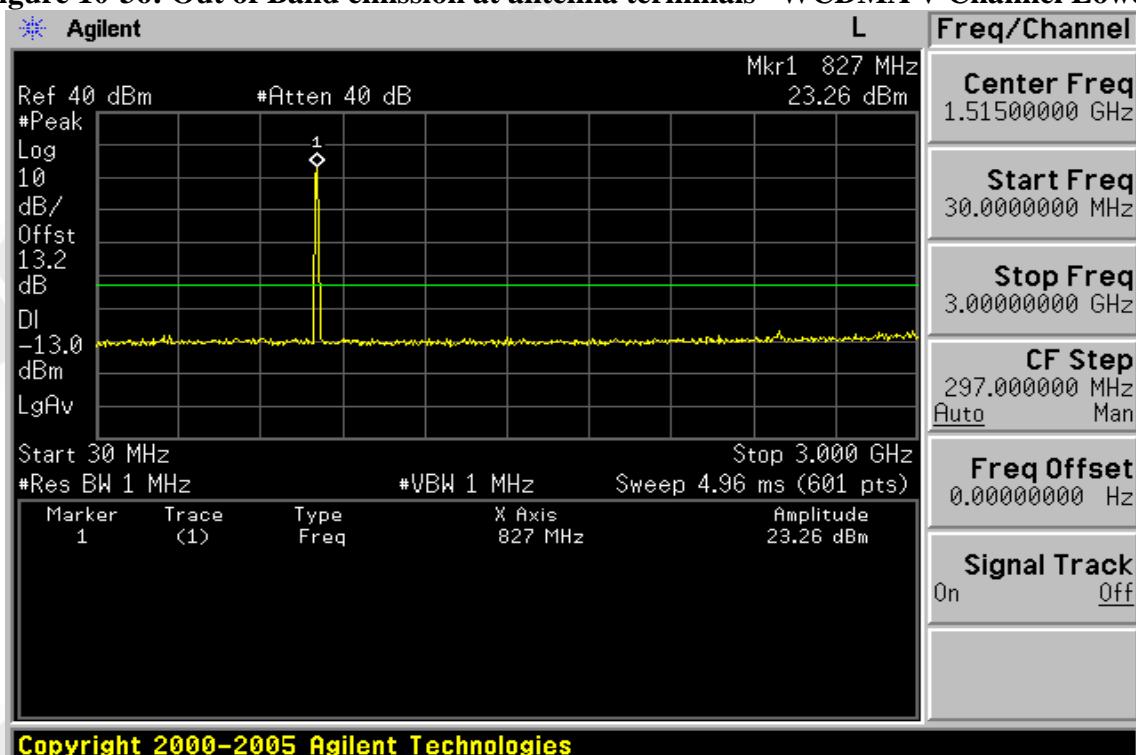
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Figure 10-36: Out of Band emission at antenna terminals—WCDMA V Channel Lowest

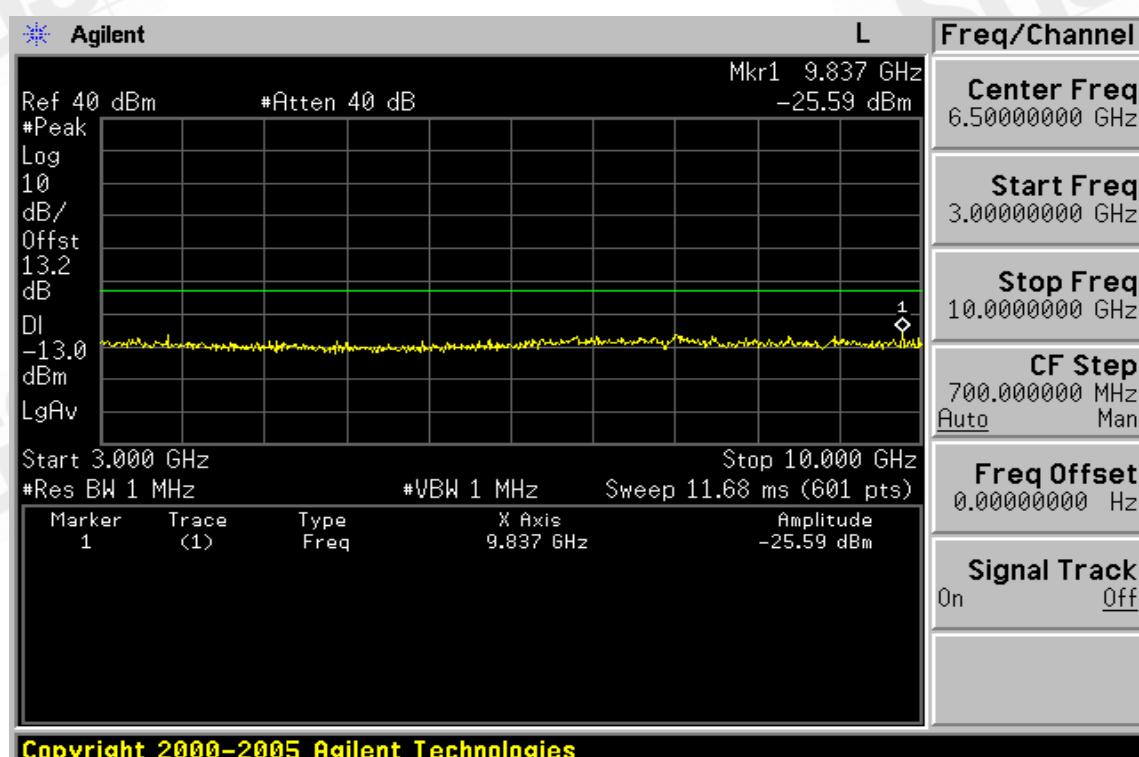
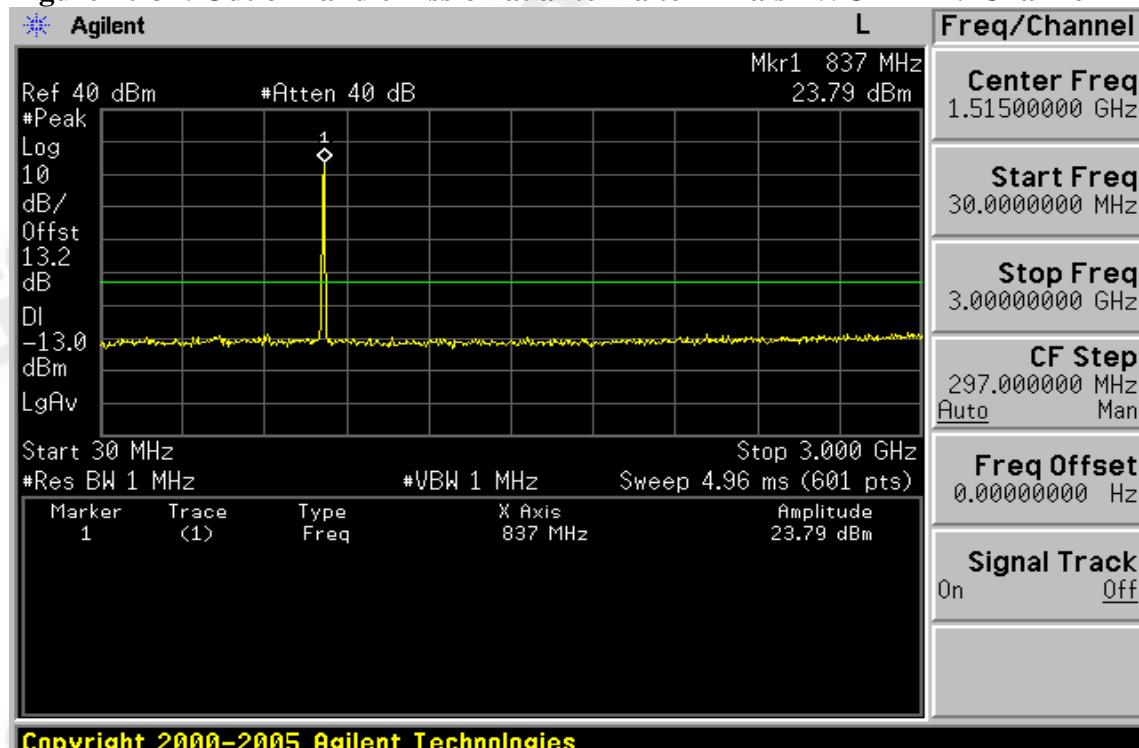


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Figure 10-37: Out of Band emission at antenna terminals –WCDMA V Channel Mid



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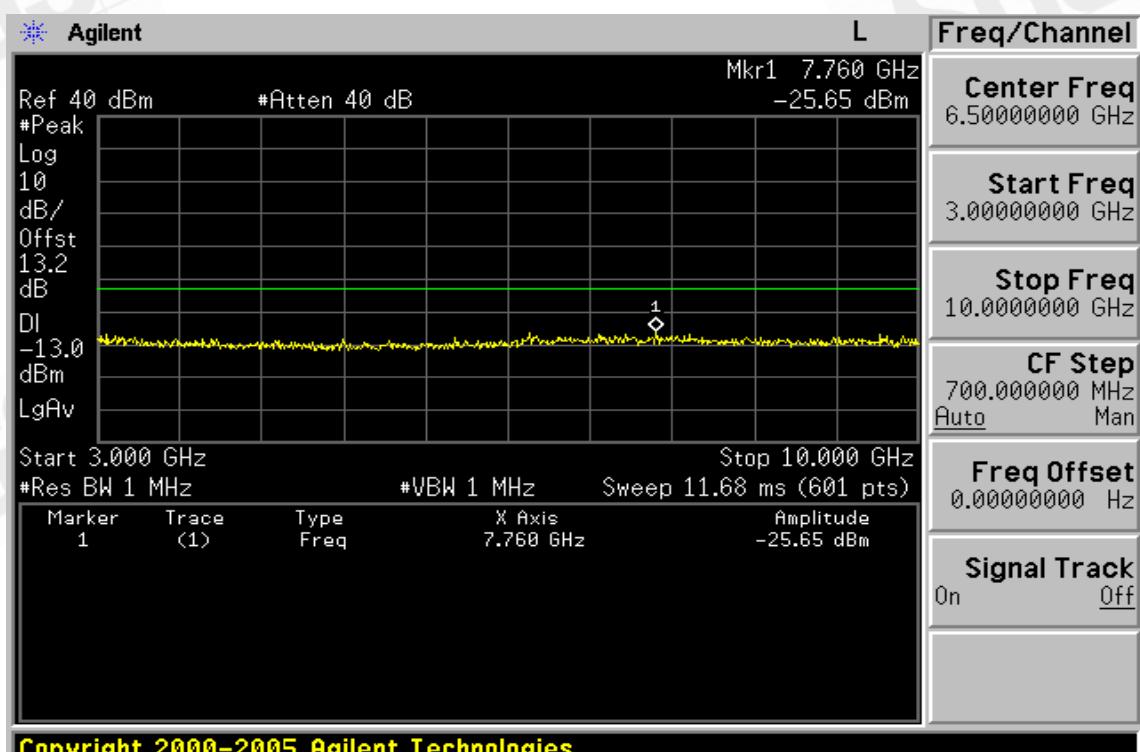
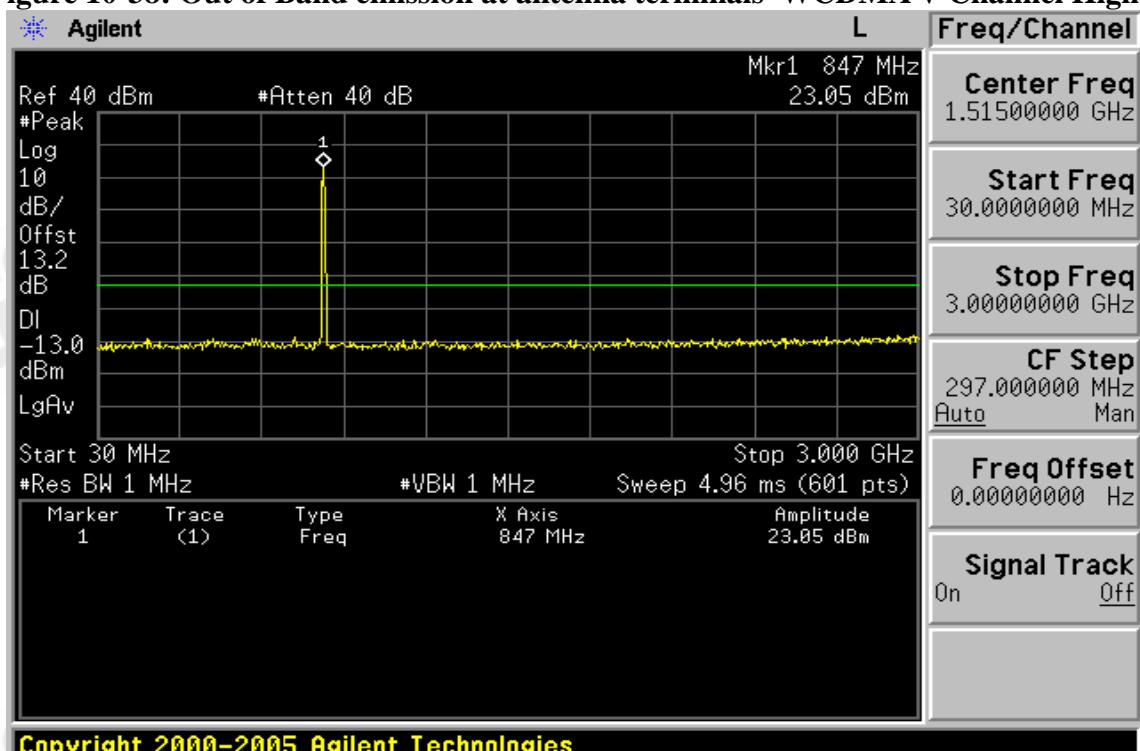
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Figure 10-38: Out of Band emission at antenna terminals—WCDMA V Channel Highest

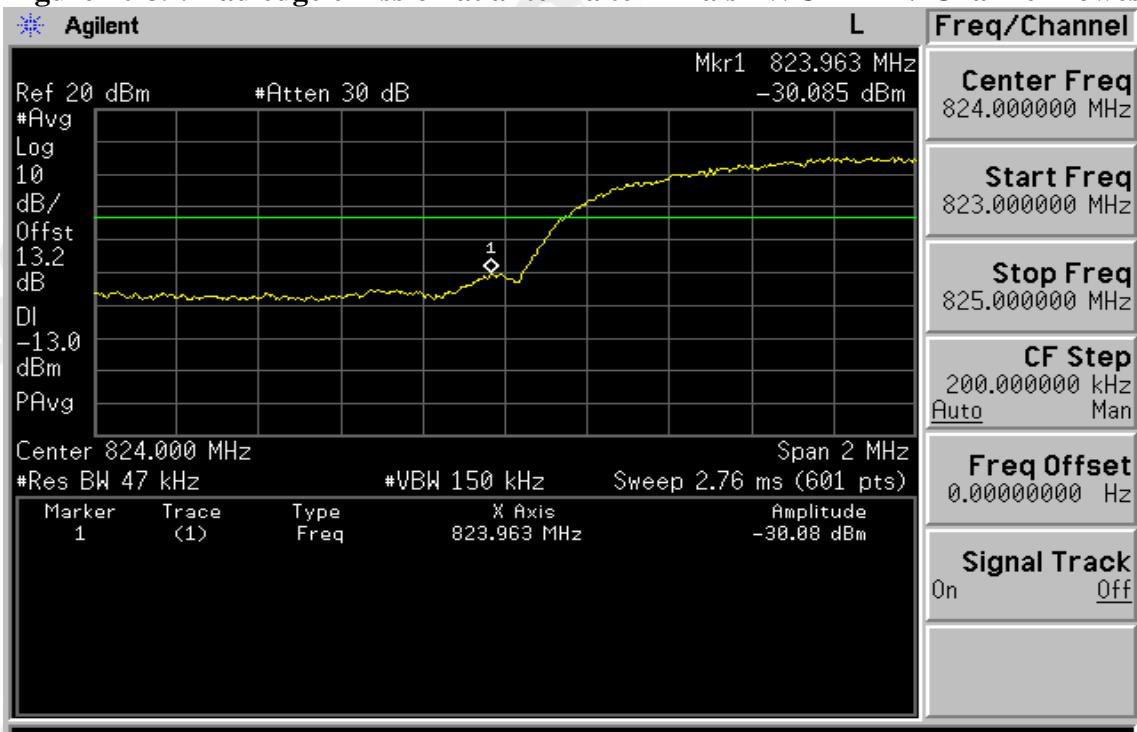


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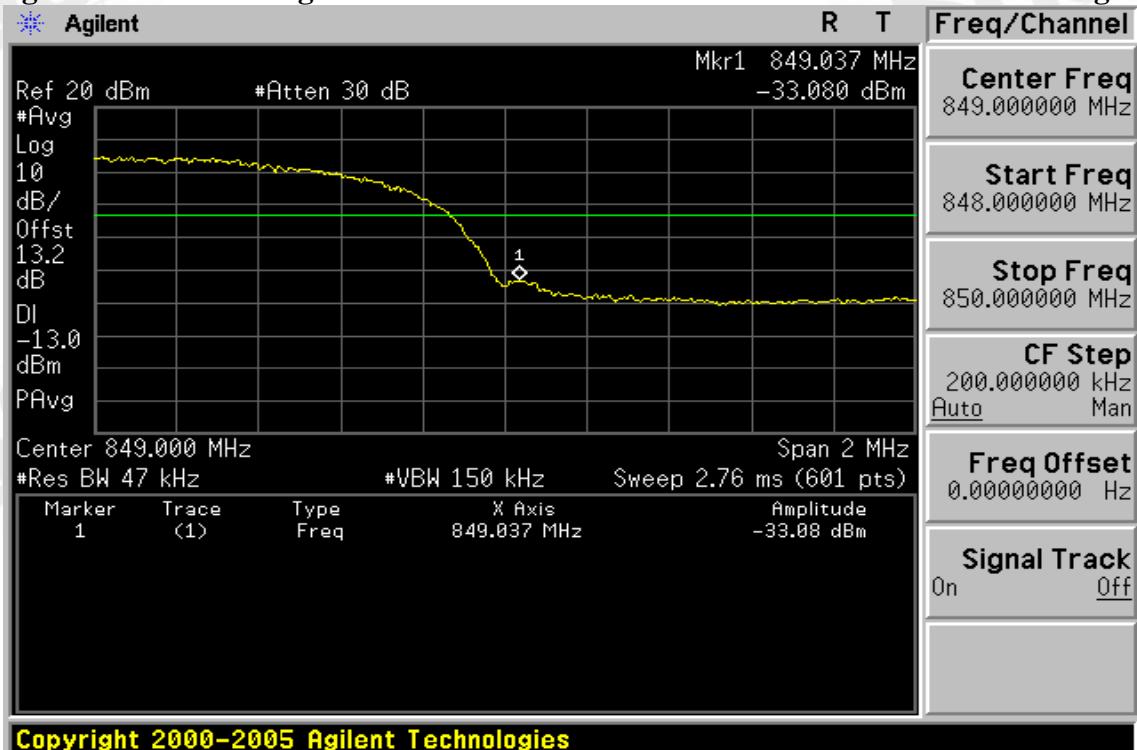
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Figure 10-39: Bad edge emission at antenna terminals –WCDMA V Channel Lowest



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Figure 10-40: Band edge emission at antenna terminals –WCDMA V Channel Highest



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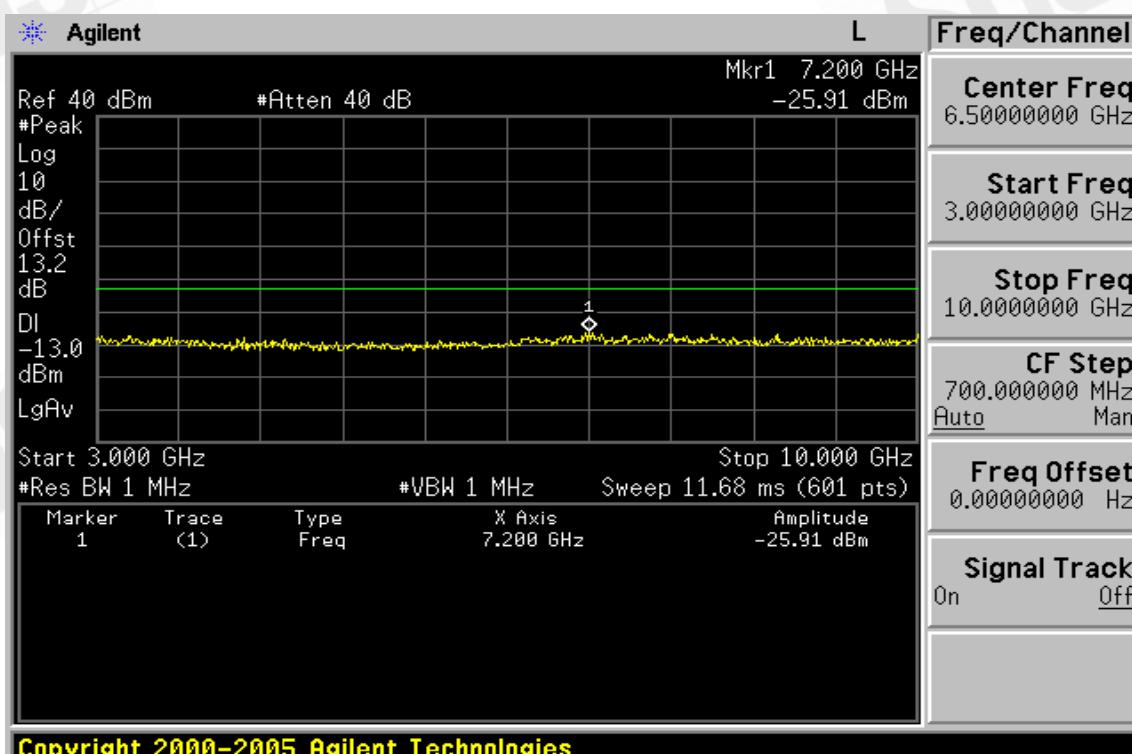
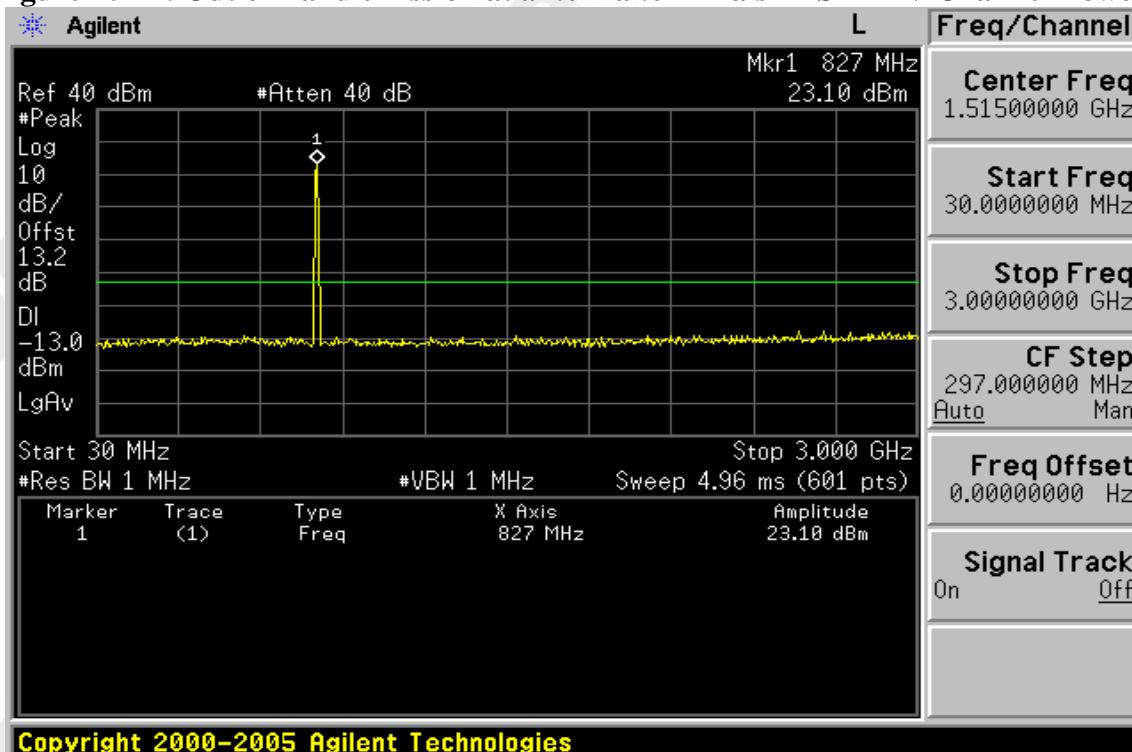
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Figure 10-41: Out of Band emission at antenna terminals—HSDPA V Channel Lowest

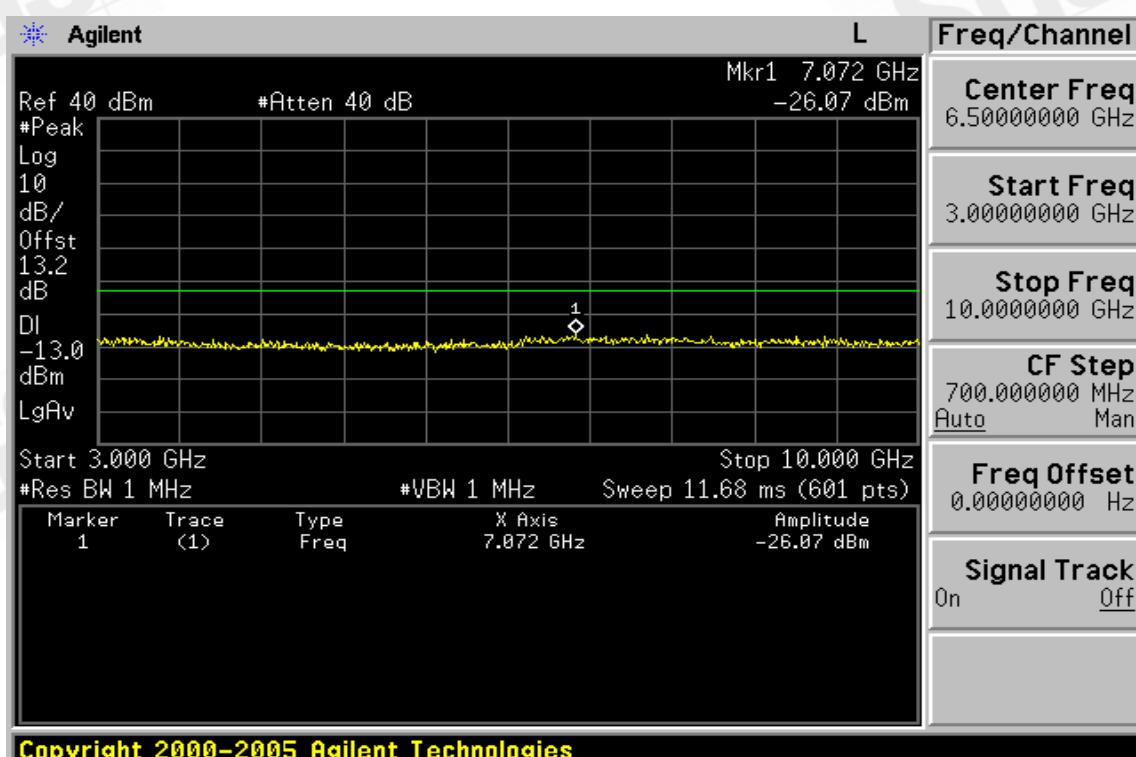
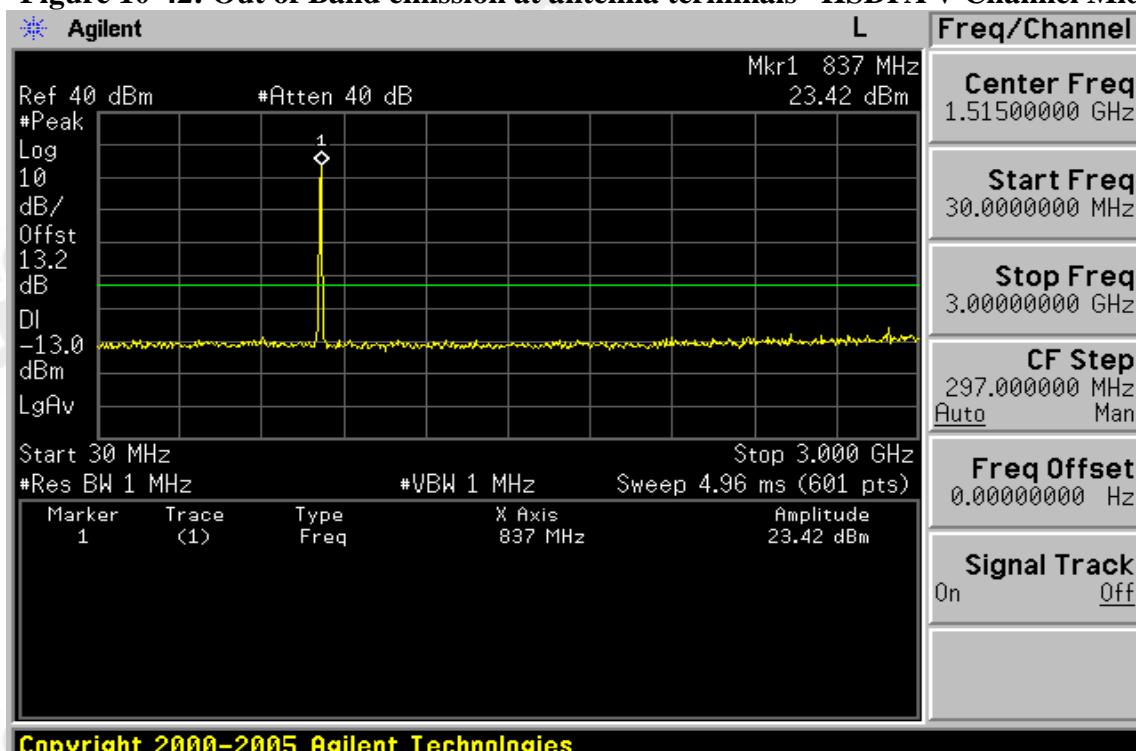


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Figure 10-42: Out of Band emission at antenna terminals –HSDPA V Channel Mid



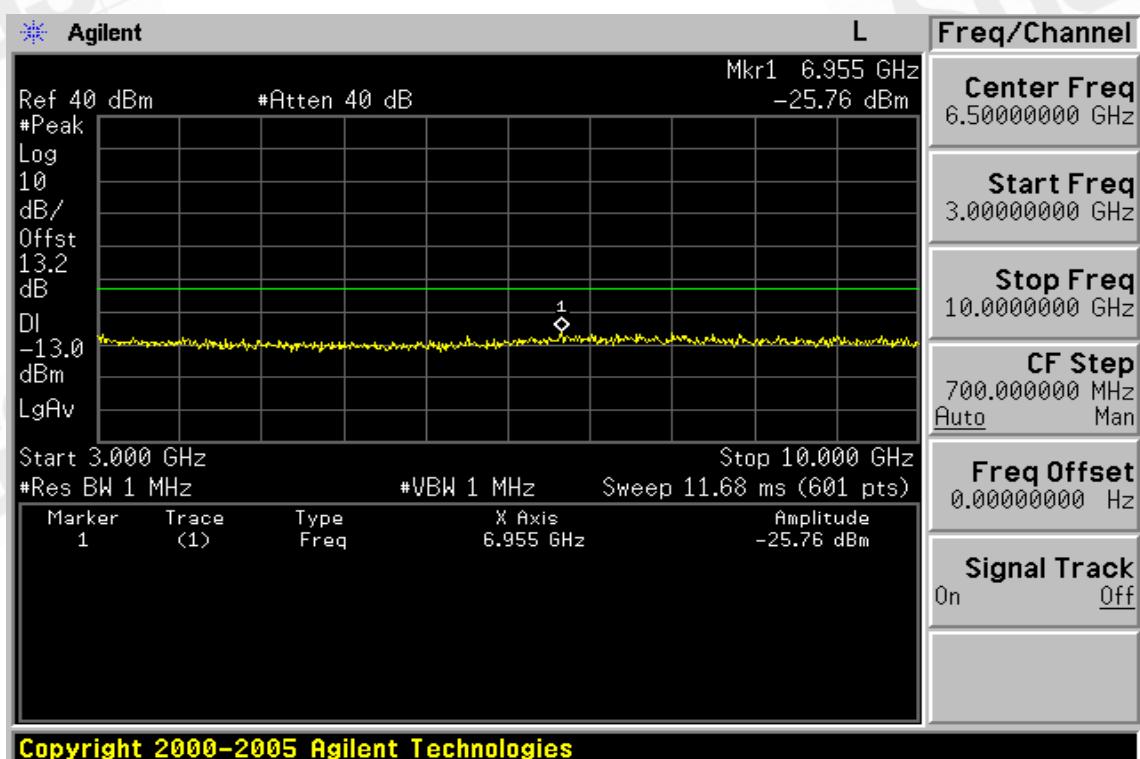
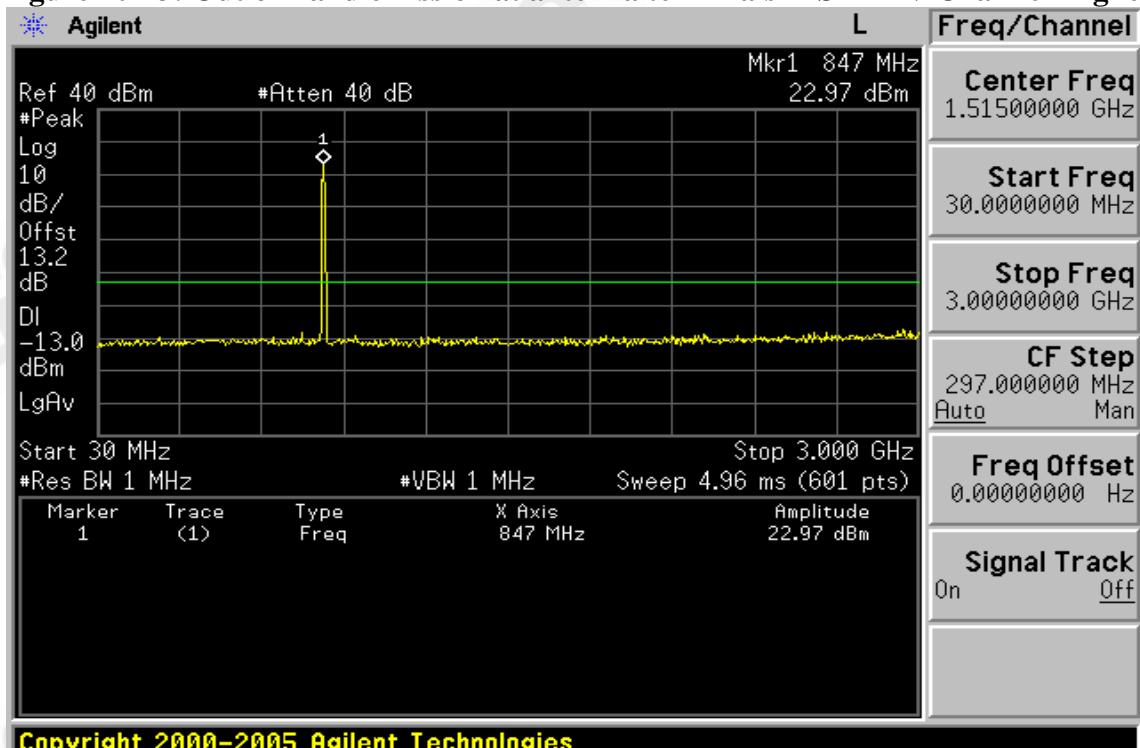
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Figure 10-43: Out of Band emission at antenna terminals—HSDPA V Channel Highest



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Figure 10-44: Bad edge emission at antenna terminals –HSDPA V Channel Lowest

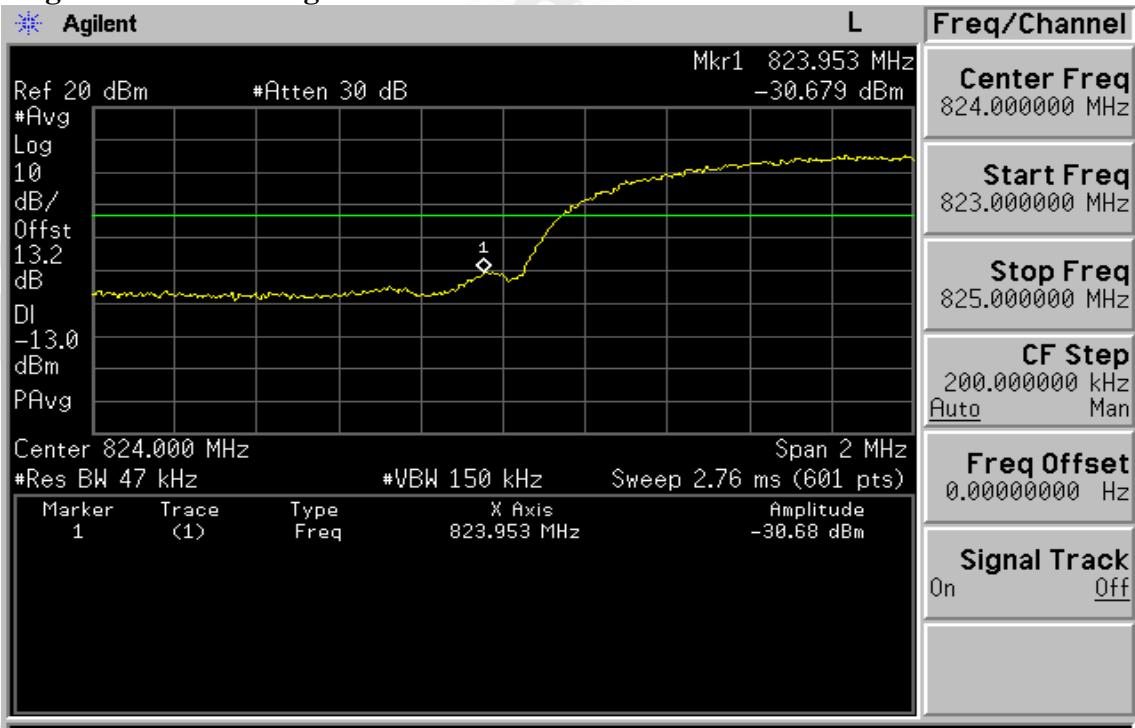
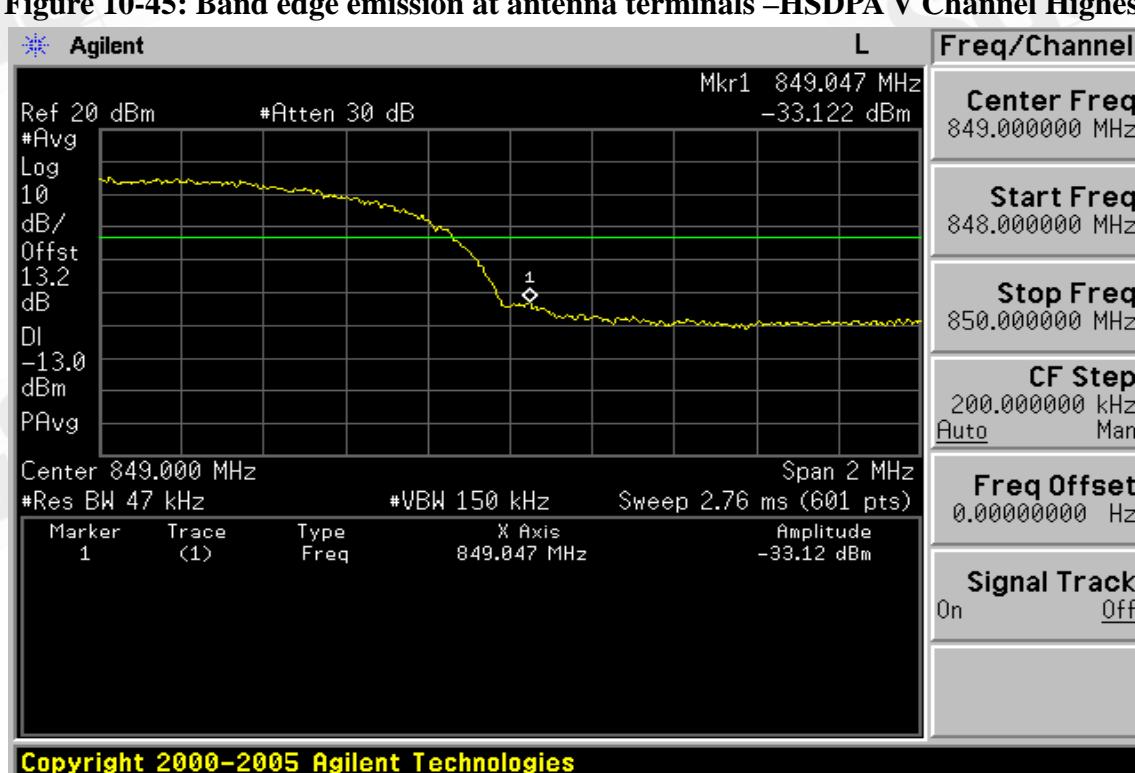


Figure 10-45: Band edge emission at antenna terminals –HSDPA V Channel Highest



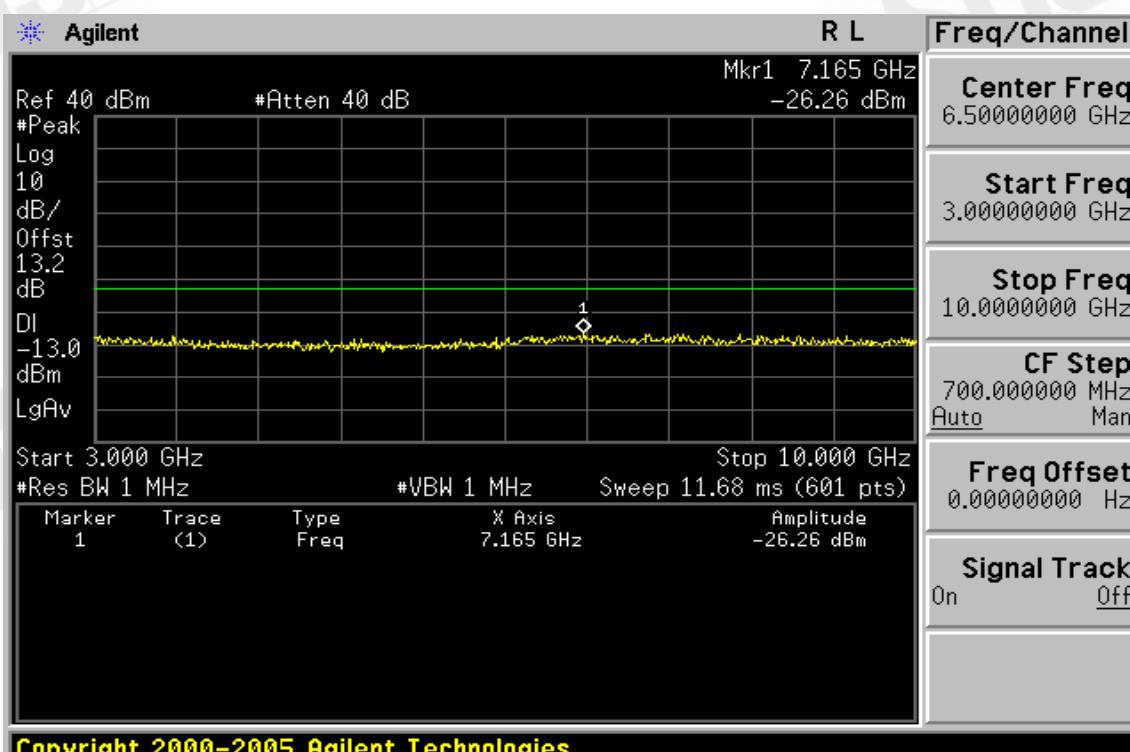
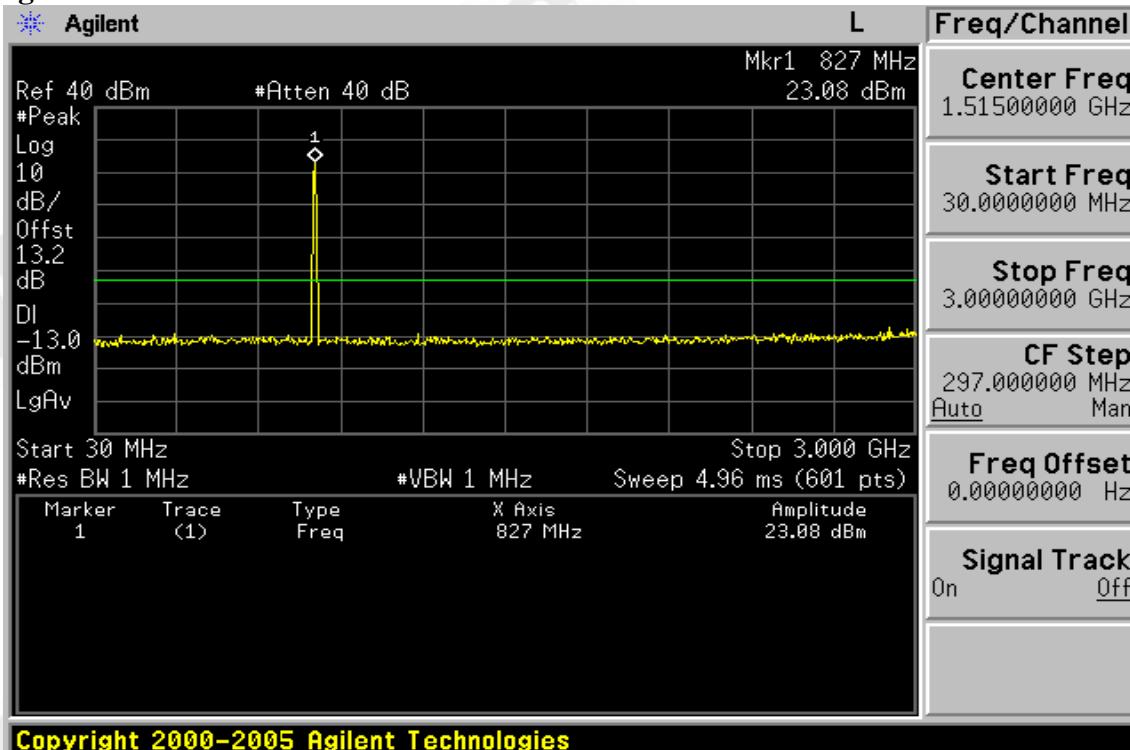
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Figure 10-46: Out of Band emission at antenna terminals— HSUPA V Channel Lowest



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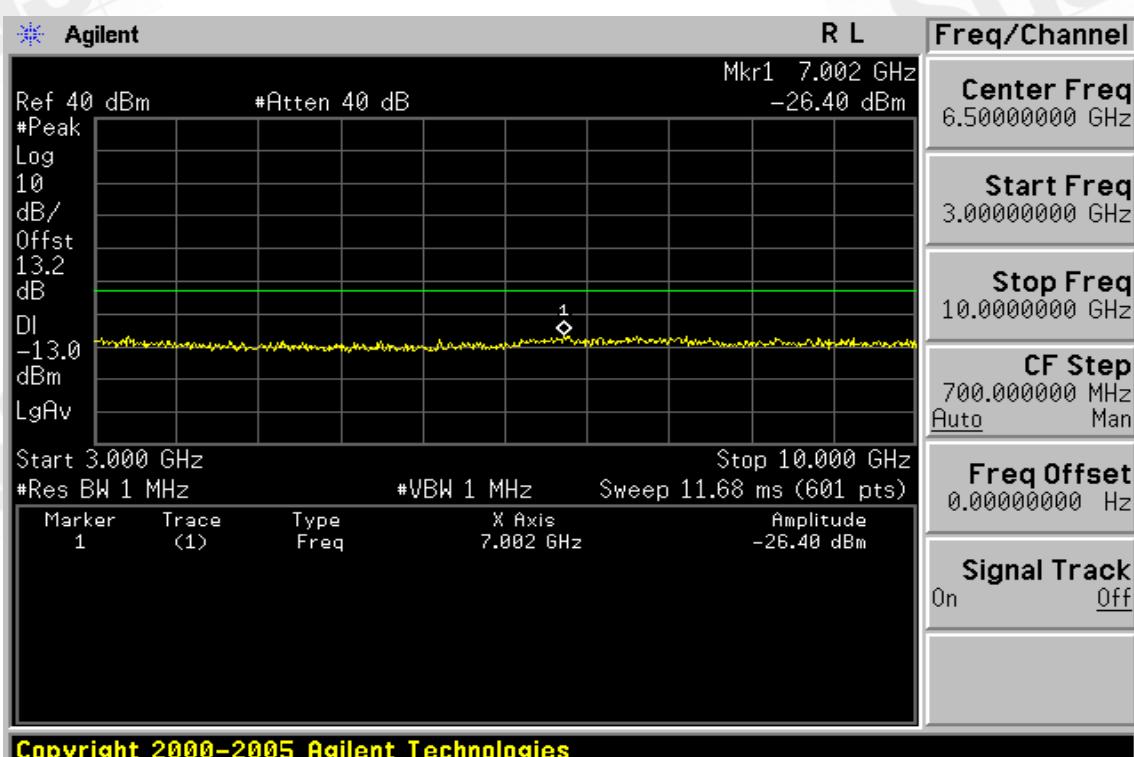
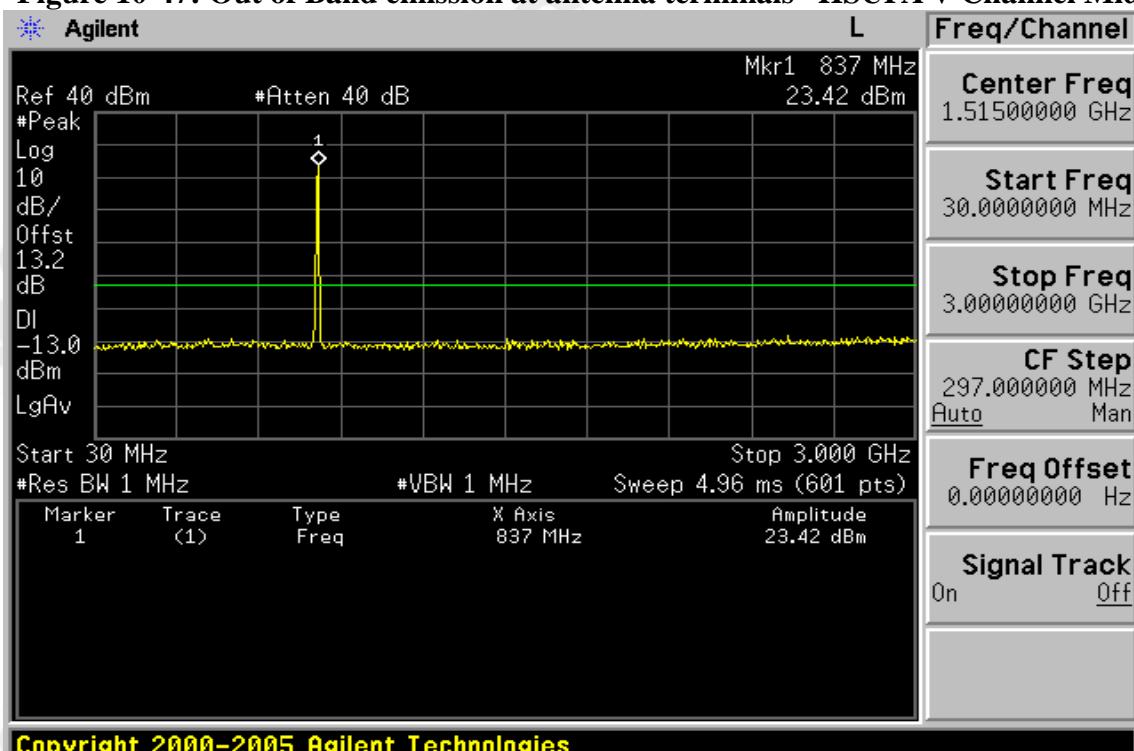
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Figure 10-47: Out of Band emission at antenna terminals –HSUPA V Channel Mid

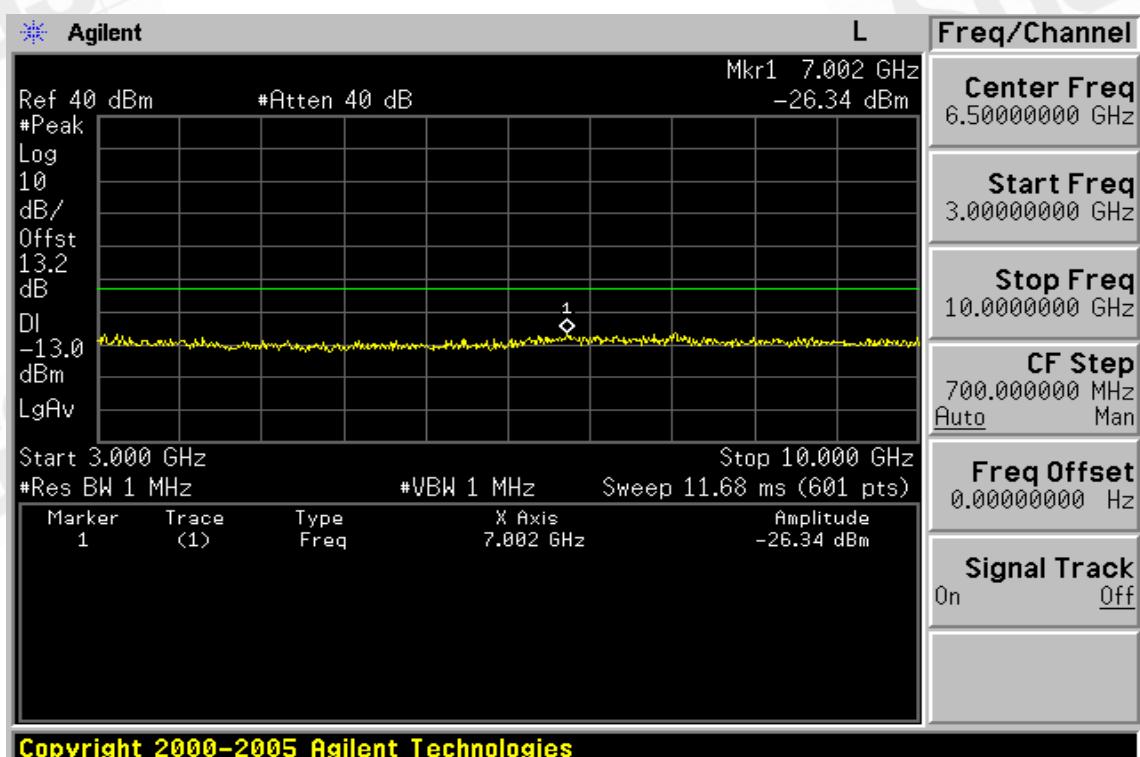
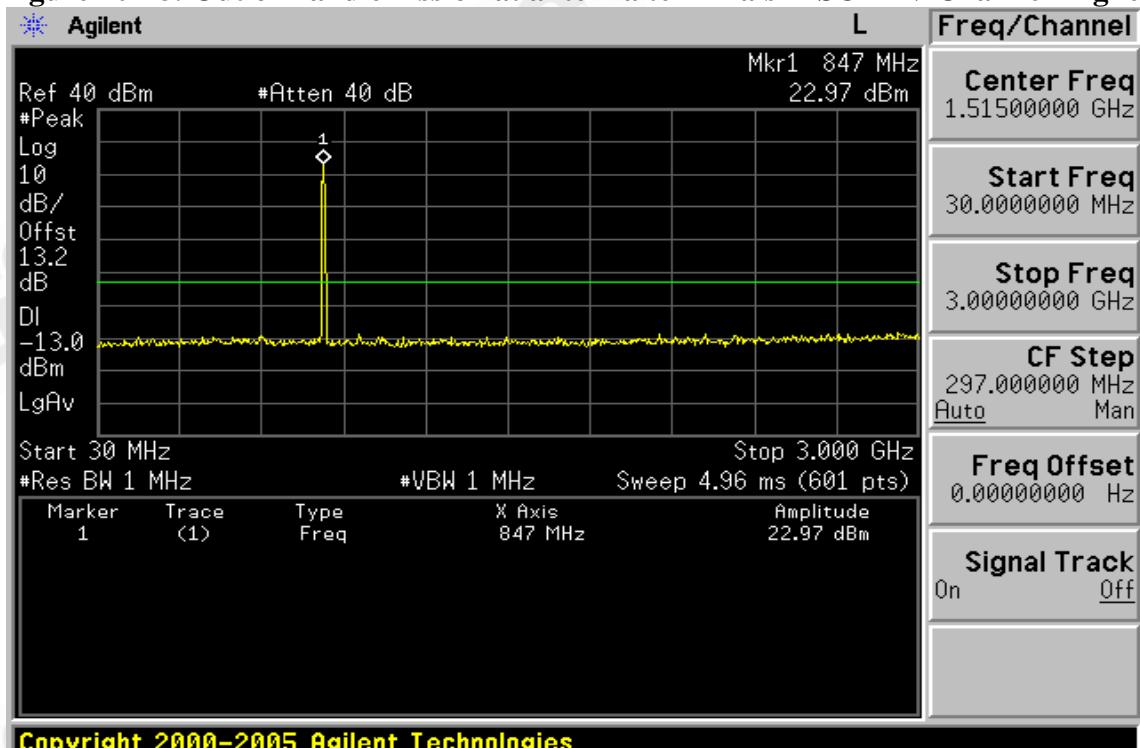


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Figure 10-48: Out of Band emission at antenna terminals—HSUPA V Channel Highest

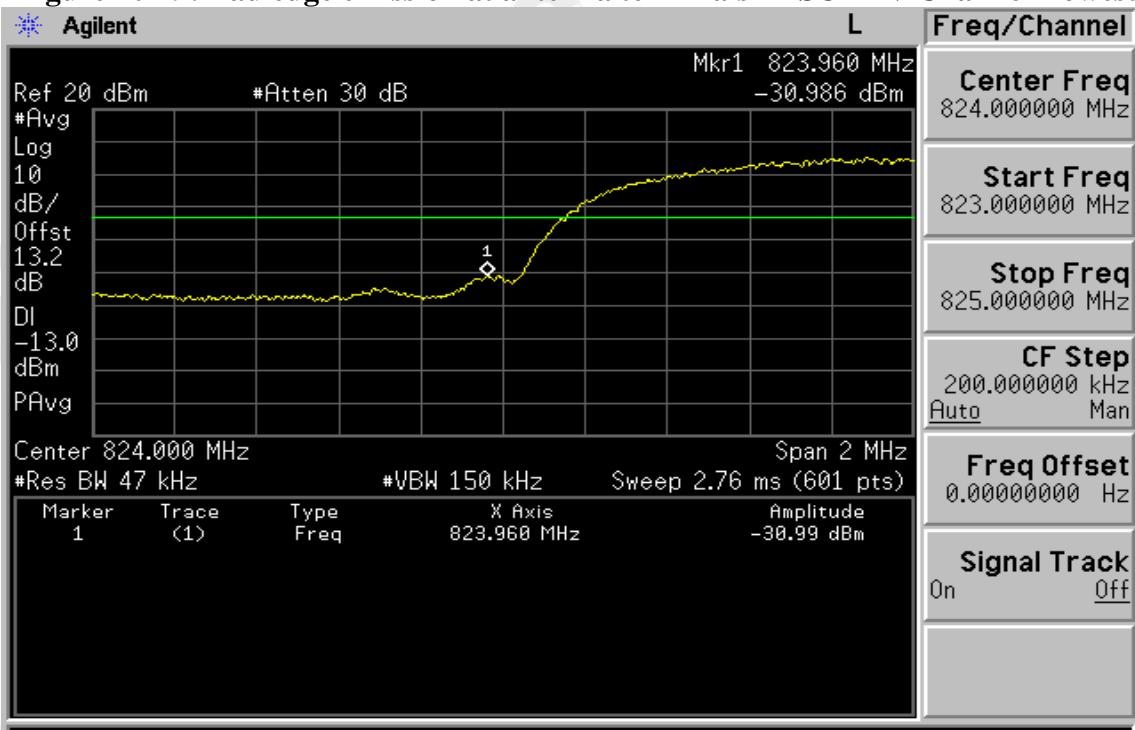


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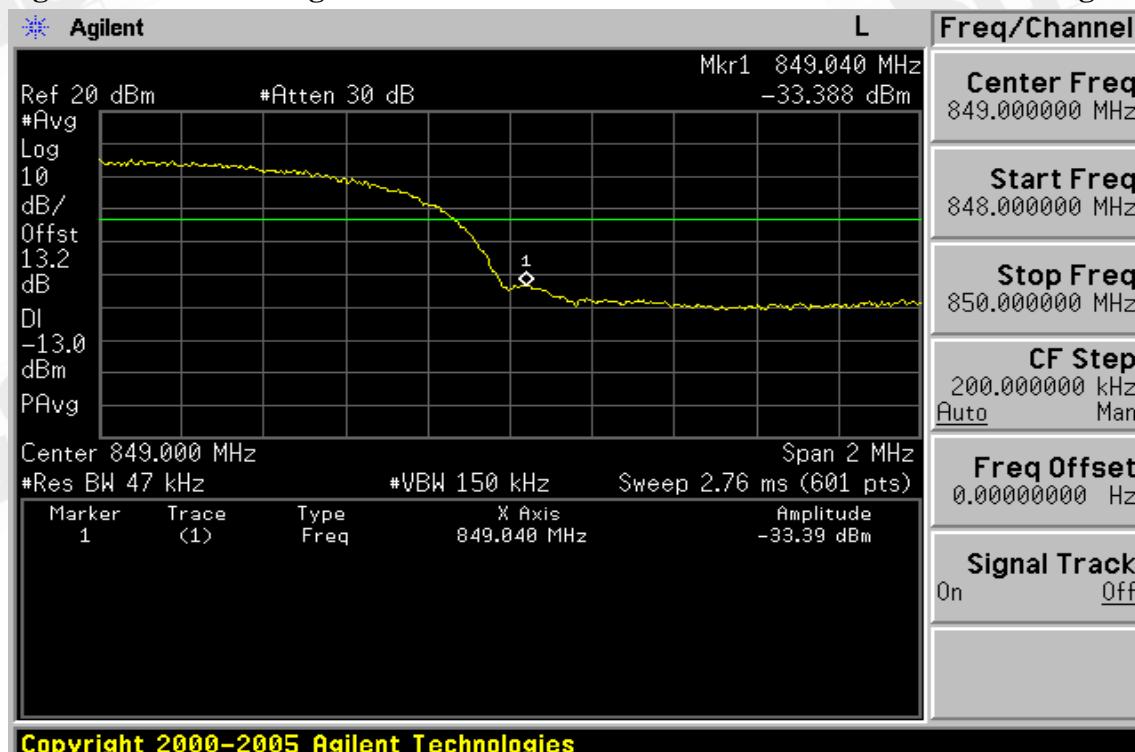
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Figure 10-49: Bad edge emission at antenna terminals –HSUPA V Channel Lowest



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Figure 10-50: Band edge emission at antenna terminals –HSUPA V Channel Highest



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## 11. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### 11.1. Standard Applicable:

According to FCC §2.1053,

FCC §22.917(a),§24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

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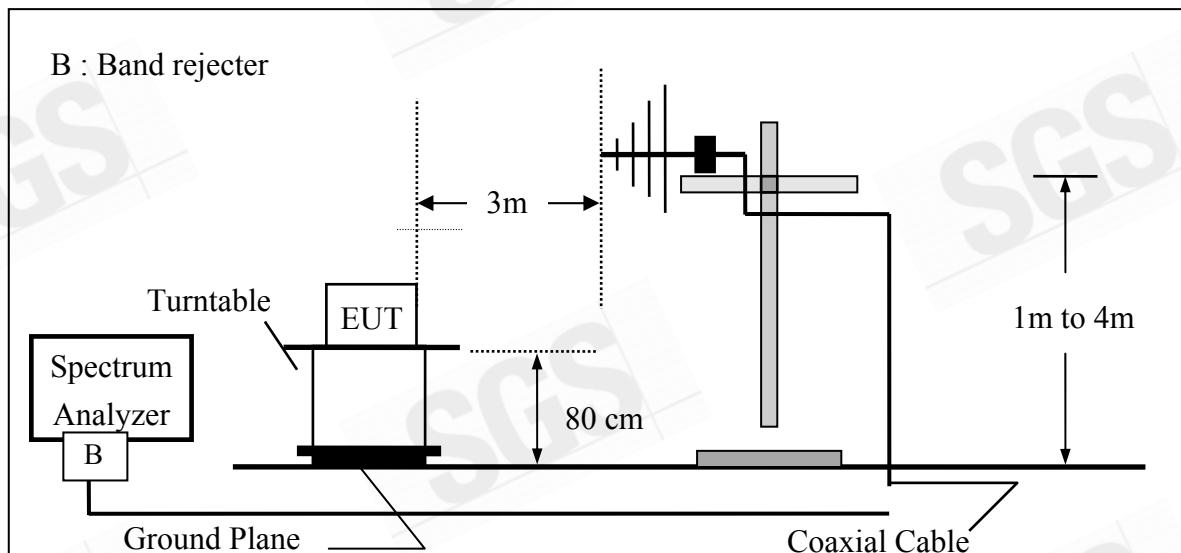
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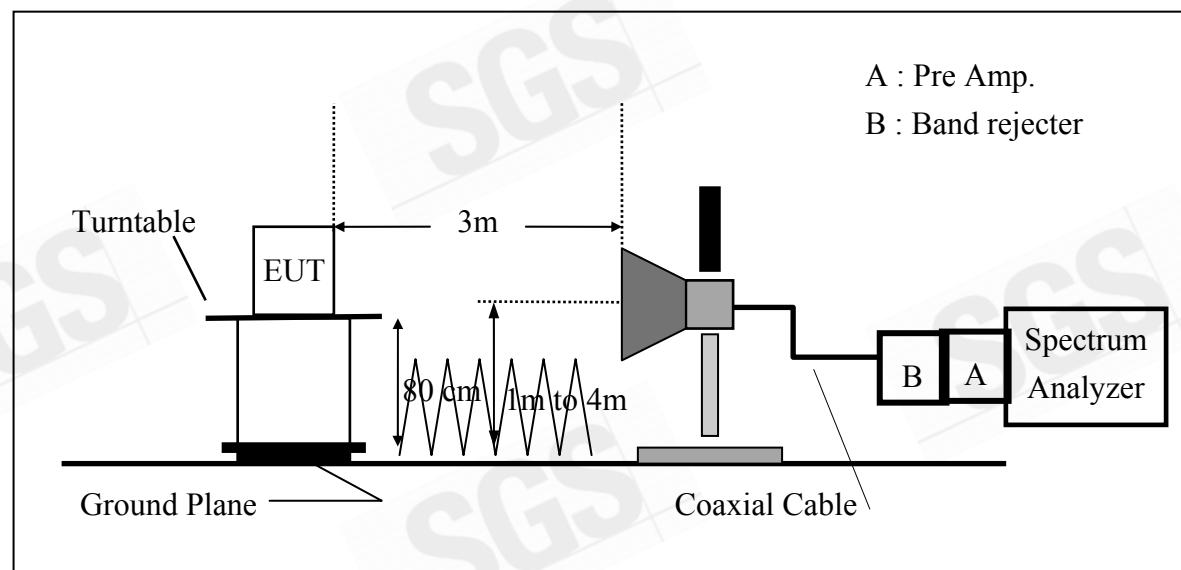
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**11.2. EUT Setup (Block Diagram of Configuration):**

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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### 11.3. Measurement Procedure:

The EUT was placed on a non-conductive; The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss (dB)}$$

### 11.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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### 11.5. Measurement Result:

#### Radiated Spurious Emission Measurement Result: GPRS 850 Mode

|                       |            |                          |                   |
|-----------------------|------------|--------------------------|-------------------|
| Operation Band        | :GPRS 850  | Test Date                | :2015-01-19       |
| ARFCN                 | :CH 128    | Temp./Humi.              | :23 deg_C / 62 RH |
| Fundamental Frequency | :824.2 MHz | Engineer                 | :Tin              |
| Operation Mode        | :TX LOW    |                          |                   |
| EUT Pol.              | :E2 Plane  | Measurement Antenna Pol. | :VERTICAL         |

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 31.94        | S               | -64.71     | -50.03              | -13.87      | -0.80      | -13.00 | -51.71 |
| 247.28       | S               | -63.85     | -65.47              | 3.32        | -1.70      | -13.00 | -50.85 |
| 301.60       | S               | -72.10     | -73.96              | 3.73        | -1.87      | -13.00 | -59.10 |
| 474.26       | S               | -72.36     | -73.97              | 3.90        | -2.28      | -13.00 | -59.36 |
| 701.24       | S               | -67.47     | -68.61              | 3.88        | -2.74      | -13.00 | -54.47 |
| 913.67       | S               | -66.05     | -66.27              | 3.50        | -3.28      | -13.00 | -53.05 |
| 1648.40      | H               | -62.79     | -61.93              | 3.56        | -4.42      | -13.00 | -49.79 |
| 2472.60      | H               | -38.44     | -37.17              | 4.18        | -5.45      | -13.00 | -25.44 |
| 3296.80      | H               | ---        |                     |             |            |        |        |
| 4121.00      | H               | ---        |                     |             |            |        |        |
| 4945.20      | H               | ---        |                     |             |            |        |        |
| 5769.40      | H               | ---        |                     |             |            |        |        |
| 6593.60      | H               | ---        |                     |             |            |        |        |
| 7417.80      | H               | ---        |                     |             |            |        |        |
| 8242.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

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Operation Band :GPRS 850  
 ARFCN :CH 128  
 Fundamental Frequency :824.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 31.94        | S               | -67.71     | -53.04              | -13.87      | -0.80      | -13.00 | -54.71 |
| 231.76       | S               | -65.33     | -67.41              | 3.72        | -1.64      | -13.00 | -52.33 |
| 432.55       | S               | -72.94     | -74.68              | 3.90        | -2.17      | -13.00 | -59.94 |
| 521.79       | S               | -72.42     | -73.93              | 3.93        | -2.41      | -13.00 | -59.42 |
| 706.09       | S               | -70.30     | -71.41              | 3.86        | -2.75      | -13.00 | -57.30 |
| 949.56       | S               | -66.39     | -66.39              | 3.34        | -3.34      | -13.00 | -53.39 |
| 1648.40      | H               | -65.25     | -64.39              | 3.56        | -4.42      | -13.00 | -52.25 |
| 2472.60      | H               | -42.71     | -41.44              | 4.18        | -5.45      | -13.00 | -29.71 |
| 3296.80      | H               | ---        |                     |             |            |        |        |
| 4121.00      | H               | ---        |                     |             |            |        |        |
| 4945.20      | H               | ---        |                     |             |            |        |        |
| 5769.40      | H               | ---        |                     |             |            |        |        |
| 6593.60      | H               | ---        |                     |             |            |        |        |
| 7417.80      | H               | ---        |                     |             |            |        |        |
| 8242.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 850  
 ARFCN :CH 190  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 40.67        | S               | -63.99     | -51.13              | -12.05      | -0.81      | -13.00 | -50.99 |
| 242.43       | S               | -64.22     | -65.84              | 3.30        | -1.68      | -13.00 | -51.22 |
| 425.76       | S               | -72.14     | -73.92              | 3.93        | -2.15      | -13.00 | -59.14 |
| 558.65       | S               | -71.70     | -73.03              | 3.84        | -2.51      | -13.00 | -58.70 |
| 696.39       | S               | -66.62     | -67.77              | 3.89        | -2.74      | -13.00 | -53.62 |
| 955.38       | S               | -65.78     | -65.46              | 3.02        | -3.35      | -13.00 | -52.78 |
| 1673.20      | H               | -63.11     | -62.15              | 3.49        | -4.45      | -13.00 | -50.11 |
| 2509.80      | H               | -36.53     | -35.31              | 4.28        | -5.49      | -13.00 | -23.53 |
| 3346.40      | H               | ---        |                     |             |            |        |        |
| 4183.00      | H               | ---        |                     |             |            |        |        |
| 5019.60      | H               | ---        |                     |             |            |        |        |
| 5856.20      | H               | ---        |                     |             |            |        |        |
| 6692.80      | H               | ---        |                     |             |            |        |        |
| 7529.40      | H               | ---        |                     |             |            |        |        |
| 8366.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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 ARFCN :CH 190  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 62.01        | S               | -67.42     | -58.33              | -8.09       | -1.00      | -13.00 | -54.42 |
| 226.91       | S               | -64.84     | -66.94              | 3.73        | -1.62      | -13.00 | -51.84 |
| 426.73       | S               | -72.76     | -74.53              | 3.92        | -2.15      | -13.00 | -59.76 |
| 466.50       | S               | -72.24     | -73.86              | 3.88        | -2.26      | -13.00 | -59.24 |
| 696.39       | S               | -70.09     | -71.24              | 3.89        | -2.74      | -13.00 | -57.09 |
| 960.23       | S               | -66.57     | -65.95              | 2.73        | -3.35      | -13.00 | -53.57 |
| 1673.20      | H               | -64.93     | -63.97              | 3.49        | -4.45      | -13.00 | -51.93 |
| 2509.80      | H               | -45.98     | -44.76              | 4.28        | -5.49      | -13.00 | -32.98 |
| 3346.40      | H               | ---        |                     |             |            |        |        |
| 4183.00      | H               | ---        |                     |             |            |        |        |
| 5019.60      | H               | ---        |                     |             |            |        |        |
| 5856.20      | H               | ---        |                     |             |            |        |        |
| 6692.80      | H               | ---        |                     |             |            |        |        |
| 7529.40      | H               | ---        |                     |             |            |        |        |
| 8366.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 850  
 ARFCN :CH 251  
 Fundamental Frequency :848.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 41.64        | S               | -63.67     | -50.83              | -12.00      | -0.84      | -13.00 | -50.67 |
| 249.22       | S               | -63.50     | -65.13              | 3.33        | -1.71      | -13.00 | -50.50 |
| 420.91       | S               | -71.98     | -73.79              | 3.94        | -2.13      | -13.00 | -58.98 |
| 540.22       | S               | -71.70     | -73.14              | 3.90        | -2.46      | -13.00 | -58.70 |
| 694.45       | S               | -66.60     | -67.76              | 3.89        | -2.73      | -13.00 | -53.60 |
| 947.62       | S               | -65.79     | -65.81              | 3.35        | -3.33      | -13.00 | -52.79 |
| 1697.60      | H               | -61.28     | -60.23              | 3.43        | -4.48      | -13.00 | -48.28 |
| 2546.40      | H               | -40.06     | -38.89              | 4.37        | -5.54      | -13.00 | -27.06 |
| 3395.20      | H               | ---        |                     |             |            |        |        |
| 4244.00      | H               | ---        |                     |             |            |        |        |
| 5092.80      | H               | ---        |                     |             |            |        |        |
| 5941.60      | H               | ---        |                     |             |            |        |        |
| 6790.40      | H               | ---        |                     |             |            |        |        |
| 7639.20      | H               | ---        |                     |             |            |        |        |
| 8488.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 850  
 ARFCN :CH 251  
 Fundamental Frequency :848.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 39.70        | S               | -68.26     | -55.33              | -12.14      | -0.80      | -13.00 | -55.26 |
| 223.03       | S               | -64.38     | -66.39              | 3.62        | -1.61      | -13.00 | -51.38 |
| 430.61       | S               | -72.39     | -74.14              | 3.91        | -2.16      | -13.00 | -59.39 |
| 510.15       | S               | -71.84     | -73.40              | 3.94        | -2.38      | -13.00 | -58.84 |
| 752.65       | S               | -69.92     | -70.75              | 3.68        | -2.85      | -13.00 | -56.92 |
| 924.34       | S               | -66.36     | -66.52              | 3.45        | -3.30      | -13.00 | -53.36 |
| 1697.60      | H               | -63.44     | -62.39              | 3.43        | -4.48      | -13.00 | -50.44 |
| 2546.40      | H               | -49.46     | -48.29              | 4.37        | -5.54      | -13.00 | -36.46 |
| 3395.20      | H               | ---        |                     |             |            |        |        |
| 4244.00      | H               | ---        |                     |             |            |        |        |
| 5092.80      | H               | ---        |                     |             |            |        |        |
| 5941.60      | H               | ---        |                     |             |            |        |        |
| 6790.40      | H               | ---        |                     |             |            |        |        |
| 7639.20      | H               | ---        |                     |             |            |        |        |
| 8488.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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**Radiated Spurious Emission Measurement Result: GPRS 1900 Mode**

Operation Band :GPRS 1900 Test Date :2015-01-19  
 ARFCN :CH 512 Temp./Humi. :23 deg\_C / 62 RH  
 Fundamental Frequency :1850.2 MHz Engineer :Tin  
 Operation Mode :TX LOW  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 32.91        | S               | -60.73      | -48.45              | -11.48      | -0.80      | -13.00 | -47.73 |
| 241.46       | S               | -61.68      | -65.44              | 5.44        | -1.68      | -13.00 | -48.68 |
| 413.15       | S               | -69.96      | -73.97              | 6.12        | -2.11      | -13.00 | -56.96 |
| 556.71       | S               | -68.72      | -72.21              | 6.00        | -2.51      | -13.00 | -55.72 |
| 687.66       | S               | -64.82      | -68.14              | 6.05        | -2.73      | -13.00 | -51.82 |
| 857.41       | S               | -63.86      | -66.61              | 5.89        | -3.13      | -13.00 | -50.86 |
| 3700.40      | H               | -56.64      | -58.96              | 9.13        | -6.80      | -13.00 | -43.64 |
| 5550.60      | H               | ---         |                     |             |            |        |        |
| 7400.80      | H               | ---         |                     |             |            |        |        |
| 9251.00      | H               | ---         |                     |             |            |        |        |
| 11101.20     | H               | ---         |                     |             |            |        |        |
| 12951.40     | H               | ---         |                     |             |            |        |        |
| 14801.60     | H               | ---         |                     |             |            |        |        |
| 16651.80     | H               | ---         |                     |             |            |        |        |
| 18502.00     | H               | ---         |                     |             |            |        |        |

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 1900 Test Date :2015-01-19  
 ARFCN :CH 512 Temp./Humi. :23 deg\_C / 62 RH  
 Fundamental Frequency :1850.2 MHz Engineer :Tin  
 Operation Mode :TX LOW  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 62.01        | S               | -64.24      | -57.29              | -5.94       | -1.00      | -13.00 | -51.24 |
| 229.82       | S               | -63.59      | -67.91              | 5.96        | -1.63      | -13.00 | -50.59 |
| 423.82       | S               | -70.28      | -74.22              | 6.08        | -2.14      | -13.00 | -57.28 |
| 476.20       | S               | -69.55      | -73.32              | 6.06        | -2.29      | -13.00 | -56.55 |
| 760.41       | S               | -66.60      | -69.58              | 5.84        | -2.87      | -13.00 | -53.60 |
| 911.73       | S               | -64.10      | -66.48              | 5.66        | -3.28      | -13.00 | -51.10 |
| 3700.40      | H               | -58.37      | -60.70              | 9.13        | -6.80      | -13.00 | -45.37 |
| 5550.60      | H               | ---         |                     |             |            |        |        |
| 7400.80      | H               | ---         |                     |             |            |        |        |
| 9251.00      | H               | ---         |                     |             |            |        |        |
| 11101.20     | H               | ---         |                     |             |            |        |        |
| 12951.40     | H               | ---         |                     |             |            |        |        |
| 14801.60     | H               | ---         |                     |             |            |        |        |
| 16651.80     | H               | ---         |                     |             |            |        |        |
| 18502.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 1900  
 ARFCN :CH 661  
 Fundamental Frequency :1880.0 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 32.91        | S               | -59.26      | -46.97              | -11.48      | -0.80      | -13.00 | -46.26 |
| 241.46       | S               | -62.02      | -65.79              | 5.44        | -1.68      | -13.00 | -49.02 |
| 414.12       | S               | -70.41      | -74.42              | 6.12        | -2.11      | -13.00 | -57.41 |
| 490.75       | S               | -69.47      | -73.23              | 6.09        | -2.33      | -13.00 | -56.47 |
| 709.97       | S               | -63.87      | -67.10              | 5.99        | -2.76      | -13.00 | -50.87 |
| 922.40       | S               | -63.97      | -66.28              | 5.61        | -3.30      | -13.00 | -50.97 |
| 3760.00      | H               | -55.98      | -58.29              | 9.16        | -6.85      | -13.00 | -42.98 |
| 5640.00      | H               | ---         |                     |             |            |        |        |
| 7520.00      | H               | ---         |                     |             |            |        |        |
| 9400.00      | H               | ---         |                     |             |            |        |        |
| 11280.00     | H               | ---         |                     |             |            |        |        |
| 13160.00     | H               | ---         |                     |             |            |        |        |
| 15040.00     | H               | ---         |                     |             |            |        |        |
| 16920.00     | H               | ---         |                     |             |            |        |        |
| 18800.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 1900  
 ARFCN :CH 661  
 Fundamental Frequency :1880.0 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 31.94        | S               | -64.96      | -52.44              | -11.72      | -0.80      | -13.00 | -51.96 |
| 227.88       | S               | -63.53      | -67.81              | 5.90        | -1.63      | -13.00 | -50.53 |
| 436.43       | S               | -71.66      | -75.52              | 6.04        | -2.18      | -13.00 | -58.66 |
| 461.65       | S               | -70.23      | -74.00              | 6.02        | -2.25      | -13.00 | -57.23 |
| 692.51       | S               | -68.03      | -71.34              | 6.04        | -2.73      | -13.00 | -55.03 |
| 930.16       | S               | -63.66      | -65.92              | 5.57        | -3.31      | -13.00 | -50.66 |
| 3760.00      | H               | -57.37      | -59.68              | 9.16        | -6.85      | -13.00 | -44.37 |
| 5640.00      | H               | ---         |                     |             |            |        |        |
| 7520.00      | H               | ---         |                     |             |            |        |        |
| 9400.00      | H               | ---         |                     |             |            |        |        |
| 11280.00     | H               | ---         |                     |             |            |        |        |
| 13160.00     | H               | ---         |                     |             |            |        |        |
| 15040.00     | H               | ---         |                     |             |            |        |        |
| 16920.00     | H               | ---         |                     |             |            |        |        |
| 18800.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :GPRS 1900 Test Date :2015-01-19  
 ARFCN :CH 810 Temp./Humi. :23 deg\_C / 62 RH  
 Fundamental Frequency :1909.8 MHz Engineer :Tin  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna<br>Gain<br>dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|-------------|---------------------|------------------------|---------------------|--------------|--------------|
|              |                 |             | Output Level<br>dBm |                        |                     |              |              |
| 30.97        | S               | -58.29      | -45.52              | -11.97                 | -0.80               | -13.00       | -45.29       |
| 249.22       | S               | -62.90      | -66.68              | 5.48                   | -1.71               | -13.00       | -49.90       |
| 424.79       | S               | -70.65      | -74.59              | 6.08                   | -2.15               | -13.00       | -57.65       |
| 528.58       | S               | -69.90      | -73.54              | 6.07                   | -2.43               | -13.00       | -56.90       |
| 703.18       | S               | -63.79      | -67.07              | 6.02                   | -2.75               | -13.00       | -50.79       |
| 912.70       | S               | -63.96      | -66.34              | 5.66                   | -3.28               | -13.00       | -50.96       |
| 3819.60      | H               | -56.02      | -58.31              | 9.20                   | -6.90               | -13.00       | -43.02       |
| 5729.40      | H               | ---         |                     |                        |                     |              |              |
| 7639.20      | H               | ---         |                     |                        |                     |              |              |
| 9549.00      | H               | ---         |                     |                        |                     |              |              |
| 11458.80     | H               | ---         |                     |                        |                     |              |              |
| 13368.60     | H               | ---         |                     |                        |                     |              |              |
| 15278.40     | H               | ---         |                     |                        |                     |              |              |
| 17188.20     | H               | ---         |                     |                        |                     |              |              |
| 19098.00     | H               | ---         |                     |                        |                     |              |              |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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f (886-2) 2298-0488

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Member of SGS Group

Operation Band :GPRS 1900  
 ARFCN :CH 810  
 Fundamental Frequency :1909.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 62.01        | S               | -64.90      | -57.95              | -5.94       | -1.00      | -13.00 | -51.90 |
| 224.97       | S               | -63.60      | -67.81              | 5.82        | -1.61      | -13.00 | -50.60 |
| 428.67       | S               | -70.34      | -74.25              | 6.07        | -2.16      | -13.00 | -57.34 |
| 521.79       | S               | -70.34      | -74.00              | 6.08        | -2.41      | -13.00 | -57.34 |
| 760.41       | S               | -68.07      | -71.04              | 5.84        | -2.87      | -13.00 | -55.07 |
| 915.61       | S               | -63.90      | -66.26              | 5.64        | -3.28      | -13.00 | -50.90 |
| 3819.60      | H               | -57.84      | -60.14              | 9.20        | -6.90      | -13.00 | -44.84 |
| 5729.40      | H               | ---         |                     |             |            |        |        |
| 7639.20      | H               | ---         |                     |             |            |        |        |
| 9549.00      | H               | ---         |                     |             |            |        |        |
| 11458.80     | H               | ---         |                     |             |            |        |        |
| 13368.60     | H               | ---         |                     |             |            |        |        |
| 15278.40     | H               | ---         |                     |             |            |        |        |
| 17188.20     | H               | ---         |                     |             |            |        |        |
| 19098.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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**Radiated Spurious Emission Measurement Result: WCDMA II Mode**

Operation Band :WCDMA B2  
 ARFCN :CH 9262  
 Fundamental Frequency :1852.4 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 30.97        | S               | -57.25      | -44.48              | -11.97      | -0.80      | -13.00 | -44.25 |
| 244.37       | S               | -60.65      | -64.42              | 5.46        | -1.69      | -13.00 | -47.65 |
| 416.06       | S               | -69.66      | -73.65              | 6.11        | -2.12      | -13.00 | -56.66 |
| 559.62       | S               | -68.64      | -72.11              | 5.99        | -2.52      | -13.00 | -55.64 |
| 709.00       | S               | -63.64      | -66.87              | 5.99        | -2.76      | -13.00 | -50.64 |
| 929.19       | S               | -63.36      | -65.63              | 5.58        | -3.31      | -13.00 | -50.36 |
| 3704.80      | H               | -43.52      | -45.85              | 9.13        | -6.80      | -13.00 | -30.52 |
| 5557.20      | H               | ---         |                     |             |            |        |        |
| 7409.60      | H               | ---         |                     |             |            |        |        |
| 9262.00      | H               | ---         |                     |             |            |        |        |
| 11114.40     | H               | ---         |                     |             |            |        |        |
| 12966.80     | H               | ---         |                     |             |            |        |        |
| 14819.20     | H               | ---         |                     |             |            |        |        |
| 16671.60     | H               | ---         |                     |             |            |        |        |
| 18524.00     | H               | ---         |                     |             |            |        |        |

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :WCDMA B2  
 ARFCN :CH 9262  
 Fundamental Frequency :1852.4 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 30.97        | S               | -62.73      | -49.95              | -11.97      | -0.80      | -13.00 | -49.73 |
| 229.82       | S               | -62.35      | -66.67              | 5.96        | -1.63      | -13.00 | -49.35 |
| 430.61       | S               | -70.12      | -74.02              | 6.06        | -2.16      | -13.00 | -57.12 |
| 525.67       | S               | -69.96      | -73.61              | 6.07        | -2.42      | -13.00 | -56.96 |
| 760.41       | S               | -67.54      | -70.52              | 5.84        | -2.87      | -13.00 | -54.54 |
| 953.44       | S               | -64.08      | -66.02              | 5.28        | -3.34      | -13.00 | -51.08 |
| 3704.80      | H               | -53.42      | -55.75              | 9.13        | -6.80      | -13.00 | -40.42 |
| 5557.20      | H               | ---         |                     |             |            |        |        |
| 7409.60      | H               | ---         |                     |             |            |        |        |
| 9262.00      | H               | ---         |                     |             |            |        |        |
| 11114.40     | H               | ---         |                     |             |            |        |        |
| 12966.80     | H               | ---         |                     |             |            |        |        |
| 14819.20     | H               | ---         |                     |             |            |        |        |
| 16671.60     | H               | ---         |                     |             |            |        |        |
| 18524.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :WCDMA B2  
 ARFCN :CH 9400  
 Fundamental Frequency :1880 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 30.97        | S               | -58.32      | -45.55              | -11.97      | -0.80      | -13.00 | -45.32 |
| 241.46       | S               | -62.36      | -66.12              | 5.44        | -1.68      | -13.00 | -49.36 |
| 302.57       | S               | -70.01      | -74.02              | 5.89        | -1.88      | -13.00 | -57.01 |
| 532.46       | S               | -69.81      | -73.43              | 6.06        | -2.44      | -13.00 | -56.81 |
| 709.00       | S               | -64.84      | -68.08              | 5.99        | -2.76      | -13.00 | -51.84 |
| 926.28       | S               | -64.15      | -66.44              | 5.59        | -3.30      | -13.00 | -51.15 |
| 3760.00      | H               | -47.05      | -49.36              | 9.16        | -6.85      | -13.00 | -34.05 |
| 5640.00      | H               | ---         |                     |             |            |        |        |
| 7520.00      | H               | ---         |                     |             |            |        |        |
| 9400.00      | H               | ---         |                     |             |            |        |        |
| 11280.00     | H               | ---         |                     |             |            |        |        |
| 13160.00     | H               | ---         |                     |             |            |        |        |
| 15040.00     | H               | ---         |                     |             |            |        |        |
| 16920.00     | H               | ---         |                     |             |            |        |        |
| 18800.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :WCDMA B2  
 ARFCN :CH 9400  
 Fundamental Frequency :1880 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|-------------|---------------------|-------------|------------|--------|--------|
|              |                 |             | Output Level<br>dBm | Gain<br>dBi | Loss<br>dB | dBm    | dB     |
| 36.79        | S               | -63.92      | -52.53              | -10.59      | -0.80      | -13.00 | -50.92 |
| 227.88       | S               | -63.16      | -67.44              | 5.90        | -1.63      | -13.00 | -50.16 |
| 434.49       | S               | -70.65      | -74.53              | 6.05        | -2.17      | -13.00 | -57.65 |
| 526.64       | S               | -70.01      | -73.66              | 6.07        | -2.43      | -13.00 | -57.01 |
| 709.97       | S               | -67.76      | -70.99              | 5.99        | -2.76      | -13.00 | -54.76 |
| 958.29       | S               | -62.98      | -64.63              | 5.00        | -3.35      | -13.00 | -49.98 |
| 3760.00      | H               | -52.47      | -54.78              | 9.16        | -6.85      | -13.00 | -39.47 |
| 5640.00      | H               | ---         |                     |             |            |        |        |
| 7520.00      | H               | ---         |                     |             |            |        |        |
| 9400.00      | H               | ---         |                     |             |            |        |        |
| 11280.00     | H               | ---         |                     |             |            |        |        |
| 13160.00     | H               | ---         |                     |             |            |        |        |
| 15040.00     | H               | ---         |                     |             |            |        |        |
| 16920.00     | H               | ---         |                     |             |            |        |        |
| 18800.00     | H               | ---         |                     |             |            |        |        |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :WCDMA B2  
 ARFCN :CH 9538  
 Fundamental Frequency :1907.6 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna<br>Gain<br>dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|-------------|---------------------|------------------------|---------------------|--------------|--------------|
|              |                 |             | Output Level<br>dBm |                        |                     |              |              |
| 35.82        | S               | -62.58      | -50.98              | -10.80                 | -0.80               | -13.00       | -49.58       |
| 242.43       | S               | -62.15      | -65.91              | 5.45                   | -1.68               | -13.00       | -49.15       |
| 307.42       | S               | -70.68      | -74.72              | 5.93                   | -1.89               | -13.00       | -57.68       |
| 516.94       | S               | -70.07      | -73.75              | 6.08                   | -2.40               | -13.00       | -57.07       |
| 709.00       | S               | -63.99      | -67.23              | 5.99                   | -2.76               | -13.00       | -50.99       |
| 949.56       | S               | -63.68      | -65.83              | 5.49                   | -3.34               | -13.00       | -50.68       |
| 3815.20      | H               | -46.67      | -48.96              | 9.19                   | -6.90               | -13.00       | -33.67       |
| 5722.80      | H               | -47.86      | -49.82              | 10.50                  | -8.54               | -13.00       | -34.86       |
| 7630.40      | H               | ---         |                     |                        |                     |              |              |
| 9538.00      | H               | ---         |                     |                        |                     |              |              |
| 11445.60     | H               | ---         |                     |                        |                     |              |              |
| 13353.20     | H               | ---         |                     |                        |                     |              |              |
| 15260.80     | H               | ---         |                     |                        |                     |              |              |
| 17168.40     | H               | ---         |                     |                        |                     |              |              |
| 19076.00     | H               | ---         |                     |                        |                     |              |              |

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :WCDMA B2  
 ARFCN :CH 9538  
 Fundamental Frequency :1907.6 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | EIRP<br>dBm | SG                  | Antenna<br>Gain<br>dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB |
|--------------|-----------------|-------------|---------------------|------------------------|---------------------|--------------|--------------|
|              |                 |             | Output Level<br>dBm |                        |                     |              |              |
| 62.01        | S               | -64.74      | -57.79              | -5.94                  | -1.00               | -13.00       | -51.74       |
| 229.82       | S               | -63.09      | -67.41              | 5.96                   | -1.63               | -13.00       | -50.09       |
| 431.58       | S               | -69.90      | -73.79              | 6.06                   | -2.17               | -13.00       | -56.90       |
| 539.25       | S               | -69.78      | -73.37              | 6.05                   | -2.46               | -13.00       | -56.78       |
| 757.50       | S               | -67.42      | -70.40              | 5.84                   | -2.86               | -13.00       | -54.42       |
| 916.58       | S               | -63.83      | -66.18              | 5.64                   | -3.29               | -13.00       | -50.83       |
| 3815.00      | H               | -52.37      | -54.67              | 9.19                   | -6.90               | -13.00       | -39.37       |
| 5722.80      | H               | -52.50      | -54.46              | 10.50                  | -8.54               | -13.00       | -39.50       |
| 7630.40      | H               | ---         |                     |                        |                     |              |              |
| 9538.00      | H               | ---         |                     |                        |                     |              |              |
| 11445.60     | H               | ---         |                     |                        |                     |              |              |
| 13353.20     | H               | ---         |                     |                        |                     |              |              |
| 15260.80     | H               | ---         |                     |                        |                     |              |              |
| 17168.40     | H               | ---         |                     |                        |                     |              |              |
| 19076.00     | H               | ---         |                     |                        |                     |              |              |

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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**Radiated Spurious Emission Measurement Result: HSDPA V Mode**

|                       |            |                          |                   |
|-----------------------|------------|--------------------------|-------------------|
| Operation Band        | :HSDPA B5  | Test Date                | :2015-01-19       |
| ARFCN                 | :CH 4132   | Temp./Humi.              | :23 deg_C / 62 RH |
| Fundamental Frequency | :826.4 MHz | Engineer                 | :Tin              |
| Operation Mode        | :TX LOW    |                          |                   |
| EUT Pol.              | :E2 Plane  | Measurement Antenna Pol. | :VERTICAL         |

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 31.94        | S               | -61.16     | -46.49              | -13.87      | -0.80      | -13.00 | -48.16 |
| 246.31       | S               | -63.38     | -65.00              | 3.32        | -1.69      | -13.00 | -50.38 |
| 415.09       | S               | -71.72     | -73.57              | 3.97        | -2.12      | -13.00 | -58.72 |
| 519.85       | S               | -72.39     | -73.91              | 3.93        | -2.41      | -13.00 | -59.39 |
| 710.94       | S               | -66.87     | -67.95              | 3.84        | -2.76      | -13.00 | -53.87 |
| 945.68       | S               | -66.89     | -66.91              | 3.35        | -3.33      | -13.00 | -53.89 |
| 1652.80      | H               | -57.97     | -57.09              | 3.55        | -4.42      | -13.00 | -44.97 |
| 2479.20      | H               | -49.23     | -47.97              | 4.19        | -5.46      | -13.00 | -36.23 |
| 3305.60      | H               | ---        |                     |             |            |        |        |
| 4132.00      | H               | ---        |                     |             |            |        |        |
| 4958.40      | H               | ---        |                     |             |            |        |        |
| 5784.80      | H               | ---        |                     |             |            |        |        |
| 6611.20      | H               | ---        |                     |             |            |        |        |
| 7437.60      | H               | ---        |                     |             |            |        |        |
| 8264.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :HSDPA B5  
 ARFCN :CH 4132  
 Fundamental Frequency :826.4 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 61.04        | S               | -67.18     | -57.81              | -8.36       | -1.00      | -13.00 | -54.18 |
| 227.88       | S               | -64.56     | -66.69              | 3.75        | -1.63      | -13.00 | -51.56 |
| 430.61       | S               | -73.44     | -75.19              | 3.91        | -2.16      | -13.00 | -60.44 |
| 522.76       | S               | -73.01     | -74.52              | 3.93        | -2.42      | -13.00 | -60.01 |
| 738.10       | S               | -70.39     | -71.29              | 3.73        | -2.82      | -13.00 | -57.39 |
| 924.34       | S               | -66.37     | -66.53              | 3.45        | -3.30      | -13.00 | -53.37 |
| 1652.80      | H               | -63.01     | -62.13              | 3.55        | -4.42      | -13.00 | -50.01 |
| 2479.20      | H               | -55.79     | -54.53              | 4.19        | -5.46      | -13.00 | -42.79 |
| 3305.60      | H               | ---        |                     |             |            |        |        |
| 4132.00      | H               | ---        |                     |             |            |        |        |
| 4958.40      | H               | ---        |                     |             |            |        |        |
| 5784.80      | H               | ---        |                     |             |            |        |        |
| 6611.20      | H               | ---        |                     |             |            |        |        |
| 7437.60      | H               | ---        |                     |             |            |        |        |
| 8264.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :HSDPA B5  
 ARFCN :CH 4183  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 32.91        | S               | -62.32     | -47.88              | -13.63      | -0.80      | -13.00 | -49.32 |
| 248.25       | S               | -62.94     | -64.56              | 3.33        | -1.70      | -13.00 | -49.94 |
| 430.61       | S               | -71.62     | -73.37              | 3.91        | -2.16      | -13.00 | -58.62 |
| 553.80       | S               | -72.03     | -73.40              | 3.87        | -2.50      | -13.00 | -59.03 |
| 704.15       | S               | -67.44     | -68.55              | 3.86        | -2.75      | -13.00 | -54.44 |
| 944.71       | S               | -66.22     | -66.25              | 3.36        | -3.33      | -13.00 | -53.22 |
| 1673.20      | H               | -52.53     | -51.58              | 3.49        | -4.45      | -13.00 | -39.53 |
| 2509.80      | H               | -51.23     | -50.01              | 4.28        | -5.49      | -13.00 | -38.23 |
| 3346.40      | H               | ---        |                     |             |            |        |        |
| 4183.00      | H               | ---        |                     |             |            |        |        |
| 5019.60      | H               | ---        |                     |             |            |        |        |
| 5856.20      | H               | ---        |                     |             |            |        |        |
| 6692.80      | H               | ---        |                     |             |            |        |        |
| 7529.40      | H               | ---        |                     |             |            |        |        |
| 8366.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :HSDPA B5  
 ARFCN :CH 4183  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 30.97        | S               | -63.37     | -48.45              | -14.12      | -0.80      | -13.00 | -50.37 |
| 225.94       | S               | -65.17     | -67.25              | 3.70        | -1.62      | -13.00 | -52.17 |
| 420.91       | S               | -72.89     | -74.70              | 3.94        | -2.13      | -13.00 | -59.89 |
| 523.73       | S               | -72.00     | -73.50              | 3.92        | -2.42      | -13.00 | -59.00 |
| 719.67       | S               | -70.52     | -71.54              | 3.80        | -2.78      | -13.00 | -57.52 |
| 878.75       | S               | -66.35     | -66.80              | 3.65        | -3.20      | -13.00 | -53.35 |
| 1673.20      | H               | -61.25     | -60.29              | 3.49        | -4.45      | -13.00 | -48.25 |
| 2509.80      | H               | -52.30     | -51.08              | 4.28        | -5.49      | -13.00 | -39.30 |
| 3346.40      | H               | ---        |                     |             |            |        |        |
| 4183.00      | H               | ---        |                     |             |            |        |        |
| 5019.60      | H               | ---        |                     |             |            |        |        |
| 5856.20      | H               | ---        |                     |             |            |        |        |
| 6692.80      | H               | ---        |                     |             |            |        |        |
| 7529.40      | H               | ---        |                     |             |            |        |        |
| 8366.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :HSDPA B5  
 ARFCN :CH 4233  
 Fundamental Frequency :846.6 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 30.97        | S               | -59.75     | -44.82              | -14.12      | -0.80      | -13.00 | -46.75 |
| 249.22       | S               | -63.87     | -65.50              | 3.33        | -1.71      | -13.00 | -50.87 |
| 317.12       | S               | -71.37     | -73.31              | 3.84        | -1.91      | -13.00 | -58.37 |
| 523.73       | S               | -71.49     | -73.00              | 3.92        | -2.42      | -13.00 | -58.49 |
| 705.12       | S               | -66.82     | -67.93              | 3.86        | -2.75      | -13.00 | -53.82 |
| 903.97       | S               | -66.64     | -66.92              | 3.55        | -3.27      | -13.00 | -53.64 |
| 1693.20      | H               | -51.32     | -50.29              | 3.44        | -4.48      | -13.00 | -38.32 |
| 2539.80      | H               | -50.70     | -49.52              | 4.35        | -5.53      | -13.00 | -37.70 |
| 3386.40      | H               | ---        |                     |             |            |        |        |
| 4233.00      | H               | ---        |                     |             |            |        |        |
| 5079.60      | H               | ---        |                     |             |            |        |        |
| 5926.20      | H               | ---        |                     |             |            |        |        |
| 6772.80      | H               | ---        |                     |             |            |        |        |
| 7619.40      | H               | ---        |                     |             |            |        |        |
| 8466.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band :HSDPA B5  
 ARFCN :CH 4233  
 Fundamental Frequency :846.6 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E2 Plane

Test Date :2015-01-19  
 Temp./Humi. :23 deg\_C / 62 RH  
 Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | ERP<br>dBm | SG                  | Antenna     | Cable      | Limit  | Margin |
|--------------|-----------------|------------|---------------------|-------------|------------|--------|--------|
|              |                 |            | Output Level<br>dBm | Gain<br>dBd | Loss<br>dB | dBm    | dB     |
| 62.01        | S               | -67.06     | -57.97              | -8.09       | -1.00      | -13.00 | -54.06 |
| 228.85       | S               | -65.16     | -67.31              | 3.78        | -1.63      | -13.00 | -52.16 |
| 450.01       | S               | -72.79     | -74.42              | 3.84        | -2.22      | -13.00 | -59.79 |
| 522.76       | S               | -71.73     | -73.24              | 3.93        | -2.42      | -13.00 | -58.73 |
| 707.06       | S               | -71.04     | -72.14              | 3.85        | -2.76      | -13.00 | -58.04 |
| 922.40       | S               | -66.39     | -66.56              | 3.46        | -3.30      | -13.00 | -53.39 |
| 1693.20      | H               | -58.69     | -57.66              | 3.44        | -4.48      | -13.00 | -45.69 |
| 2539.80      | H               | -58.37     | -57.19              | 4.35        | -5.53      | -13.00 | -45.37 |
| 3386.40      | H               | ---        |                     |             |            |        |        |
| 4233.00      | H               | ---        |                     |             |            |        |        |
| 5079.60      | H               | ---        |                     |             |            |        |        |
| 5926.20      | H               | ---        |                     |             |            |        |        |
| 6772.80      | H               | ---        |                     |             |            |        |        |
| 7619.40      | H               | ---        |                     |             |            |        |        |
| 8466.00      | H               | ---        |                     |             |            |        |        |

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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## 12. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### 12.1. Standard Applicable:

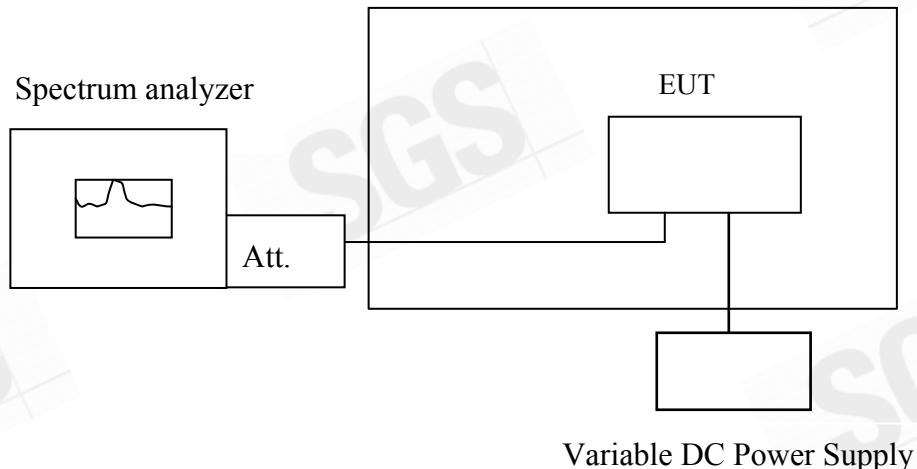
According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

### 12.2. Test Set-up:

Temperature Chamber



**Note :** Measurement setup for testing on Antenna connector

### 12.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

### 12.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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## 12.5. Measurement Result:

### GPRS850

| Reference Frequency: GPRS Mid Channel 836.6 MHz |                 |           |            |            |
|---|-----------------|-----------|------------|------------|
| Limit: +/- 2.5 ppm = 2091 Hz                    |                 |           |            |            |
| Power Supply                                    | Environment     | Frequency | Delta (Hz) | Limit (Hz) |
| Vdc   | Temperature ( ) | (Hz)      |            |            |
| 12.0  | 50              | 836599981 | -8         | 2091       |
| 12.0  | 40              | 836599983 | -6         | 2091       |
| 12.0  | 30              | 836599987 | -2         | 2091       |
| 12.0  | 20              | 836599989 | 0          | 2091       |
| 12.0  | 10              | 836599991 | 2          | 2091       |
| 12.0  | 0               | 836599992 | 3          | 2091       |
| 12.0  | -10             | 836599997 | 8          | 2091       |
| 12.0  | -20             | 836600000 | 11         | 2091       |
| 12.0  | -30             | 836600002 | 13         | 2091       |

### GPRS1900

| Reference Frequency: GPRS Mid Channel 1880 MHz |                 |            |            |            |
|--|-----------------|------------|------------|------------|
| Limit: +/- 2.5 ppm = 4700 Hz                   |                 |            |            |            |
| Power Supply                                   | Environment     | Frequency  | Delta (Hz) | Limit (Hz) |
| Vdc  | Temperature ( ) | (Hz)       |            |            |
| 12.0   | 50              | 1879999981 | -10        | 4700       |
| 12.0   | 40              | 1879999985 | -6         | 4700       |
| 12.0   | 30              | 1879999989 | -2         | 4700       |
| 12.0   | 20              | 1879999991 | 0          | 4700       |
| 12.0   | 10              | 1879999993 | 2          | 4700       |
| 12.0   | 0               | 1879999998 | 7          | 4700       |
| 12.0   | -10             | 1880000001 | 10         | 4700       |
| 12.0   | -20             | 1880000006 | 15         | 4700       |
| 12.0   | -30             | 1880000009 | 18         | 4700       |

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**WCDMA II**

| Reference Frequency: WCDMA Mid Channel 1880 MHz |                 |            |            |            |
|---|-----------------|------------|------------|------------|
| Limit: +/- 2.5 ppm = 4700 Hz                    |                 |            |            |            |
| Power Supply                                    | Environment     | Frequency  | Delta (Hz) | Limit (Hz) |
| Vdc   | Temperature ( ) | (Hz)       |            |            |
| 12.0  | 50              | 1879999978 | -15        | 4700       |
| 12.0  | 40              | 1879999983 | -10        | 4700       |
| 12.0  | 30              | 1879999989 | -4         | 4700       |
| 12.0  | 20              | 1879999993 | 0          | 4700       |
| 12.0  | 10              | 1879999998 | 5          | 4700       |
| 12.0  | 0               | 1880000004 | 11         | 4700       |
| 12.0  | -10             | 1880000005 | 12         | 4700       |
| 12.0  | -20             | 1880000009 | 16         | 4700       |
| 12.0  | -30             | 1880000014 | 21         | 4700       |

**HSDPA V**

| Reference Frequency: WCDMA Mid Channel 836.6 MHz |                 |           |            |            |
|--|-----------------|-----------|------------|------------|
| Limit: +/- 2.5 ppm = 2091 Hz                     |                 |           |            |            |
| Power Supply                                     | Environment     | Frequency | Delta (Hz) | Limit (Hz) |
| Vdc  | Temperature ( ) | (Hz)      |            |            |
| 12.0   | 50              | 836599978 | -14        | 2091       |
| 12.0   | 40              | 836599981 | -11        | 2091       |
| 12.0   | 30              | 836599986 | -6         | 2091       |
| 12.0   | 20              | 836599992 | 0          | 2091       |
| 12.0   | 10              | 836599994 | 2          | 2091       |
| 12.0   | 0               | 836599999 | 7          | 2091       |
| 12.0   | -10             | 836600003 | 11         | 2091       |
| 12.0   | -20             | 836600007 | 15         | 2091       |
| 12.0   | -30             | 836600016 | 24         | 2091       |

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## 13. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### 13.1. Standard Applicable:

According to FCC §2.1055(d) (2)

Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

### 13.2. Test Set-up:

Refer to section 10.2 in this report

### 13.3. Measurement Procedure:

Set chamber temperature to 25 °C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and record the frequency.

Reduce the input voltage to specified extreme-voltage-variation (+/- 15%) and endpoint, record the maximum frequency change.

### 13.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**13.5. Measurement Result:****GPRS850**

| Reference Frequency: GPRS Mid Channel 836.6 MHz |                 |           |            |            |
|---|-----------------|-----------|------------|------------|
| Limit: +/- 2.5 ppm = 2091 Hz                    |                 |           |            |            |
| Power Supply                                    | Environment     | Frequency | Delta (Hz) | Limit (Hz) |
| Vdc   | Temperature ( ) | (Hz)      |            |            |
| 13.2  | 20              | 836599988 | -1         | 2091       |
| 12.0  | 20              | 836599989 | 0          | 2091       |
| 10.8  | 20              | 836599993 | 4          | 2091       |
| shutdown point                                  |                 |           |            |            |
| 7.0   | 20              | 836599984 | -5         | 2091       |

**GPRS1900**

| Reference Frequency: GPRS Mid Channel 1880 MHz |                 |            |            |            |
|--|-----------------|------------|------------|------------|
| Limit: +/- 2.5 ppm = 4700 Hz                   |                 |            |            |            |
| Power Supply                                   | Environment     | Frequency  | Delta (Hz) | Limit (Hz) |
| Vdc  | Temperature ( ) | (Hz)       |            |            |
| 13.2   | 20              | 1879999988 | -3         | 4700       |
| 12.0   | 20              | 1879999991 | 0          | 4700       |
| 10.8   | 20              | 1879999997 | 6          | 4700       |
| shutdown point                                 |                 |            |            |            |
| 7.0  | 20              | 1879999986 | -5         | 4700       |

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**WCDMA II**

| Reference Frequency: WCDMA Mid Channel 1880 MHz |                 |            |            |            |
|---|-----------------|------------|------------|------------|
| Limit: +/- 2.5 ppm = 4700 Hz                    |                 |            |            |            |
| Power Supply                                    | Environment     | Frequency  | Delta (Hz) | Limit (Hz) |
| Vdc   | Temperature ( ) | (Hz)       |            |            |
| 13.2  | 20              | 1879999994 | 1          | 4700       |
| 12.0  | 20              | 1879999993 | 0          | 4700       |
| 10.8  | 20              | 1879999991 | -2         | 4700       |
| shutdown point                                  |                 |            |            |            |
| 7.0   | 20              | 1879999987 | -6         | 4700       |

**HSDPA V**

| Reference Frequency: WCDMA Mid Channel 836.6 MHz |                 |           |            |            |
|--|-----------------|-----------|------------|------------|
| Limit: +/- 2.5 ppm = 2091 Hz                     |                 |           |            |            |
| Power Supply                                     | Environment     | Frequency | Delta (Hz) | Limit (Hz) |
| Vdc  | Temperature ( ) | (Hz)      |            |            |
| 13.2   | 20              | 836599988 | -4         | 2091       |
| 12.0   | 20              | 836599992 | 0          | 2091       |
| 10.8   | 20              | 836599996 | 4          | 2091       |
| shutdown point                                   |                 |           |            |            |
| 7.0  | 20              | 836599990 | -2         | 2091       |

*~ End of Report ~*

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