# FCC CFR47 PART 22H, 24E, 27L, AND 90S
# CERTIFICATION TEST REPORT

**FOR**

**CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS**

**MODEL NUMBER: A1634, A1687, A1690 AND A1699**

**FCC ID: BCG-E2944A**

**REPORT NUMBER: 15U20162-E7, REVISION A**

**ISSUE DATE: JULY 27, 2015**

*Prepared for*
**APPLE, INC.**
**1 INFINITE LOOP**
**CUPERTINO, CA 95014, U.S.A.**

*Prepared by*
**UL VERIFICATION SERVICES INC.**
**47173 BENICIA STREET**
**FREMONT, CA 94538, U.S.A.**
**TEL: (510) 771-1000**
**FAX: (510) 661-0888**

NVLAP LAB CODE 200065-0

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | 07/23/2015 | Initial Review | C. Pang |
| A | 07/27/2015 | Revised report to address TCB's question | T. Chu |

# TABLE OF CONTENTS

# 1. ATTESTATION OF TEST RESULTS

| | |
|---|---|
| **COMPANY NAME:** | APPLE<br>1 INFINITE LOOP<br>CUPERTINO, CA 95014, U.S.A. |
| **EUT DESCRIPTION:** | CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS |
| **MODEL:** | A1634, A1687, A1690 AND A1699 |
| **SERIAL NUMBER:** | A1634:<br>C39PV005GQ77 (CONDUCTED); C39PL01EGLJW (RADIATED)<br>A1687:<br>C39PV05MGQ6N (CONDUCTED); C39PV014GQ6Q (RADIATED) |
| **DATE TESTED:** | MAY 01 – JUNE 27, 2015 |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 22H, 24E, 27L, AND 90S | Pass |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

CHIN PANG
SENIOR ENGINNER
UL VERIFICATION SERVICES INC.

Tested By:

TINA CHU
LAB ENGINEER
UL VERIFICATION SERVICES INC

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, FCC Part 27 and FCC KDB 971168 D01 v02r02.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 47173 Benicia Street | 47266 Benicia Street |
|---|---|
| ☐ Chamber A | ☒ Chamber D |
| ☐ Chamber B | ☒ Chamber E |
| ☐ Chamber C | ☒ Chamber F |
| | ☒ Chamber G |
| | ☒ Chamber H |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---|---|
| Conducted Disturbance, 0.15 to 30 MHz | ± 3.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | ± 4.94 dB |
| Radiated Disturbance, 1 to 6 GHz | ± 3.86 dB |
| Radiated Disturbance, 6 to 18 GHz | ± 4.23 dB |
| Radiated Disturbance, 18 to 26 GHz | ± 5.30 dB |
| Radiated Disturbance, 26 to 40 GHz | ± 5.23 dB |

Uncertainty figures are valid to a confidence level of 95%.

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT, Model A1634 and 1687 are a mobile phone with multimedia functions (music, application support, and video), cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/CDMA/EVDO/LTE radio, IEEE 802.11a/b/g/n/ac, NFC, Bluetooth and GPS radio. The rechargeable battery is not user accessible.

## 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted and ERP / EIRP output powers as follows:

### 5.2.1. MODEL: A1634 (LAT)

**GSM MODES**

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824- 849 | GPRS | 33.5 | 2238.7 | 28.7 | 732.8 |
| | EGPRS | 29.0 | 794.3 | 24.3 | 266.1 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 - 1910 | GPRS | 30.5 | 1122.0 | 32.0 | 1581.2 |
| | EGPRS | 28.0 | 631.0 | 28.5 | 706.3 |

## CDMA2000 MODES

**Part 90 800MHz SECONDARY Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 816 – 824 | CDMA 2000 1xRTT | 25.0 | 316.2 | 20.0 | 99.1 |
| | CDMA 2000 EVDO-Rev A | 25.0 | 316.2 | 20.0 | 99.3 |

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | CDMA 2000 1xRTT | 25.0 | 316.2 | 20.2 | 103.5 |
| | CDMA 2000 EVDO-Rev A | 25.0 | 316.2 | 20.2 | 103.8 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | CDMA 2000 1xRTT | 25.0 | 316.2 | 25.5 | 353.2 |
| | CDMA 2000 EVDO-Rev A | 25.0 | 316.2 | 25.5 | 354.8 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710 – 1755 | CDMA 2000 1xRTT | 25.0 | 316.2 | 22.5 | 175.8 |
| | CDMA 2000 EVDO-Rev A | 25.0 | 316.2 | 22.5 | 177.4 |

## UMTS MODES

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | REL 99 | 25.0 | 316.2 | 20.2 | 103.5 |
| | HSDPA REL 5 | 24.0 | 251.2 | 19.4 | 86.1 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | REL 99 | 24.9 | 309.0 | 25.5 | 354.0 |
| | HSDPA REL 5 | 24.0 | 251.2 | 24.5 | 281.8 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710– 1755 | REL 99 | 25.0 | 316.2 | 22.7 | 184.1 |
| | HSDPA REL 5 | 24.0 | 251.2 | 21.8 | 149.6 |

## 5.2.2. MODEL: A1634 (UAT)

### GSM MODES

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824- 849 | GPRS | 31.4 | 1380.4 | 24.0 | 248.3 |
| | EGPRS | 26.9 | 489.8 | 19.5 | 88.1 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 - 1910 | GPRS | 27.2 | 524.8 | 27.4 | 548.3 |
| | EGPRS | 24.9 | 309.0 | 25.2 | 334.2 |

### CDMA2000 MODES

**Part 90 800MHz SECONDARY Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 816 – 824 | CDMA 2000 1xRTT | 23.0 | 199.5 | 14.3 | 26.9 |
| | CDMA 2000 EVDO-Rev A | 23.0 | 199.5 | 14.4 | 27.5 |

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | CDMA 2000 1xRTT | 23.0 | 199.5 | 15.5 | 35.2 |
| | CDMA 2000 EVDO-Rev A | 23.0 | 199.5 | 15.5 | 35.5 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | CDMA 2000 1xRTT | 18.3 | 67.6 | 18.5 | 70.1 |
| | CDMA 2000 EVDO-Rev A | 18.3 | 67.6 | 18.5 | 70.5 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710 – 1755 | CDMA 2000 1xRTT | 20.0 | 100.0 | 21.1 | 127.6 |
| | CDMA 2000 EVDO-Rev A | 20.0 | 100.0 | 21.1 | 128.8 |

## UMTS MODES

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | REL 99 | 23.0 | 199.5 | 15.5 | 35.2 |
| | HSDPA REL 5 | 22.0 | 158.5 | 14.6 | 28.6 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | REL 99 | 18.3 | 67.6 | 18.6 | 71.6 |
| | HSDPA REL 5 | 17.3 | 53.7 | 17.7 | 58.9 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710– 1755 | REL 99 | 20.0 | 100.0 | 21.1 | 129.7 |
| | HSDPA REL 5 | 19.0 | 79.4 | 20.2 | 105.4 |

## 5.2.3. MODEL: A1687 (LAT)

**GSM MODES**

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824- 849 | GPRS | 33.4 | 2187.8 | 28.6 | 716.1 |
| | EGPRS | 28.8 | 758.6 | 24.2 | 260.0 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 - 1910 | GPRS | 30.4 | 1096.5 | 31.9 | 1545.3 |
| | EGPRS | 27.9 | 616.6 | 28.4 | 690.2 |

## CDMA2000 MODES

**Part 90 800MHz SECONDARY Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 816 – 824 | CDMA 2000 1xRTT | 24.9 | 309.0 | 19.9 | 97.9 |
| | CDMA 2000 EVDO-Rev A | 24.9 | 309.0 | 19.9 | 98.6 |

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | CDMA 2000 1xRTT | 24.9 | 309.0 | 20.1 | 103.3 |
| | CDMA 2000 EVDO-Rev A | 24.9 | 309.0 | 20.2 | 103.8 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | CDMA 2000 1xRTT | 24.8 | 302.0 | 25.4 | 345.1 |
| | CDMA 2000 EVDO-Rev A | 24.8 | 302.0 | 25.4 | 346.7 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710 – 1755 | CDMA 2000 1xRTT | 24.9 | 309.0 | 22.4 | 173.8 |
| | CDMA 2000 EVDO-Rev A | 24.9 | 309.0 | 22.4 | 174.6 |

## UMTS MODES

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | REL 99 | 24.9 | 309.0 | 20.1 | 101.2 |
| | HSDPA REL 5 | 23.9 | 245.5 | 19.2 | 82.2 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | REL 99 | 24.8 | 302.0 | 25.4 | 345.9 |
| | HSDPA REL 5 | 23.9 | 245.5 | 24.5 | 281.2 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710– 1755 | REL 99 | 24.9 | 309.0 | 22.6 | 179.9 |
| | HSDPA REL 5 | 23.9 | 245.5 | 21.7 | 146.2 |

## 5.2.4. MODEL: A1687 (UAT)

### GSM MODES

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824- 849 | GPRS | 31.2 | 1318.3 | 23.9 | 242.7 |
| | EGPRS | 26.7 | 467.7 | 19.4 | 86.1 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 - 1910 | GPRS | 27.2 | 524.8 | 27.3 | 535.8 |
| | EGPRS | 24.6 | 288.4 | 25.1 | 326.6 |

### CDMA2000 MODES

**Part 90 800MHz SECONDARY Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 816 – 824 | CDMA 2000 1xRTT | 22.8 | 190.5 | 14.2 | 26.4 |
| | CDMA 2000 EVDO-Rev A | 22.8 | 190.5 | 14.2 | 26.5 |

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | CDMA 2000 1xRTT | 22.8 | 190.5 | 15.5 | 35.2 |
| | CDMA 2000 EVDO-Rev A | 22.9 | 195.0 | 15.5 | 35.5 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | CDMA 2000 1xRTT | 18.2 | 66.1 | 18.5 | 70.1 |
| | CDMA 2000 EVDO-Rev A | 18.2 | 66.1 | 18.5 | 70.8 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710 – 1755 | CDMA 2000 1xRTT | 19.9 | 97.7 | 21.0 | 124.7 |
| | CDMA 2000 EVDO-Rev A | 19.9 | 97.7 | 21.0 | 124.5 |

## UMTS MODES

**Part 22 850MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | ERP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 824 – 849 | REL 99 | 22.9 | 195.0 | 15.4 | 34.4 |
| | HSDPA REL 5 | 21.9 | 154.9 | 14.5 | 27.9 |

**Part 24 1900MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1850 – 1910 | REL 99 | 18.1 | 64.6 | 18.5 | 70.1 |
| | HSDPA REL 5 | 17.2 | 52.5 | 17.6 | 57.0 |

**Part 27 1700MHz Band**

| Frequency range (MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
|---|---|---|---|---|---|
| | | dBm | mW | dBm | mW |
| 1710– 1755 | REL 99 | 19.9 | 97.7 | 21.0 | 126.8 |
| | HSDPA REL 5 | 18.9 | 77.6 | 20.1 | 103.0 |

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

| Frequency Range (MHz) | Gain (dBi) | |
|---|---|---|
| | LAT | UAT |
| 816 - 824 | -3.72 | -5.97 |
| 824- 849 | -2.57 | -5.41 |
| 1850 -1910 | 0.70 | 0.17 |
| 1710 -1755 | -2.12 | 1.06 |

## 5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 13A283 Baseband 0.31.02.
The EUT is linked with Agilent 8960 and CMW500 Communication Test Sets.

## 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case is EUT on the highest power. Based on Peak Power measurement investigations, the following modes should be considered as worst-case scenario for all other measurements.

Worst-case modes:
- GSM GPRS
- GSM EGPRS
- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A
- UMTS REL 99
- UMTS HSDPA

The fundamental of the EUT was investigated in three orthogonal orientations X/Y/Z, it was determined that Portrait orientation was worst-case orientation for cell bands; Flatbed orientation was worst-case orientation for pcs bands without AC/DC adapter and headset.

For simultaneous transmission of multiple channels from the same antenna in BT/BLE 2.4 GHz, 5GHz and Cellular bands; or WLAN 2.4GHz and Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

Based on the manufacturer's statement Model A1687, A1690 and A1699 are exactly same, except for marketing reasons.

| Delta Items | A1634 | A1687 | A1690 | A1699 |
|---|---|---|---|---|
| Band 30 | Yes | No | No | No |

## 5.6. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | |
|---|---|---|---|
| Description | Manufacturer | Model | Serial Number |
| AC/DC adapter | Dell | Latitude D630 | N/A |
| Laptop | Dell | PA-1900-02D | N/A |
| DC power supply | Sorensen | XHR 60-18 | N/A |

**I/O CABLES (RF Conducted Test)**

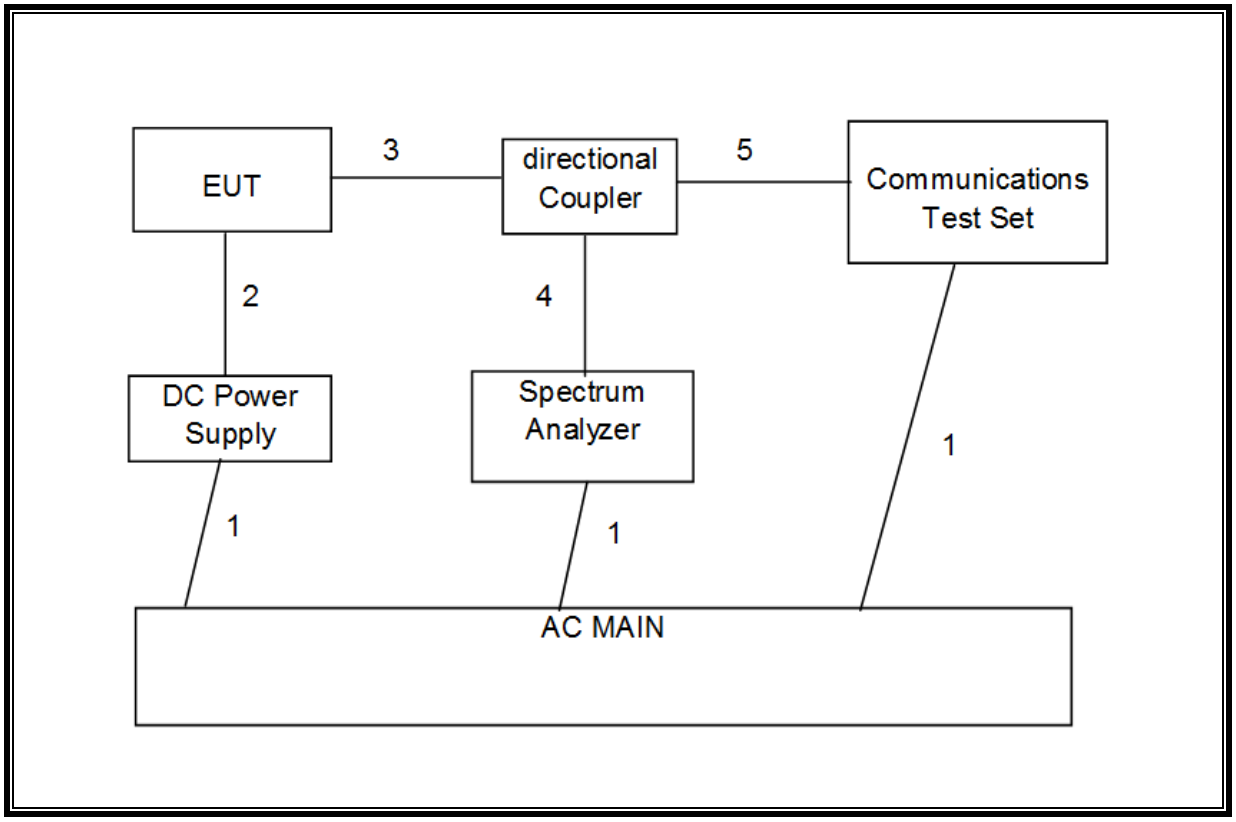
| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | AC | 1 | US 115V | Un-shielded | 2m | N/A |
| 2 | DC | 1 | DC | Un-shielded | 1.4m | N/A |
| 3 | RF In/Out | 1 | EUT | Un-shielded | 0.4m | N/A |
| 4 | RF In/Out | 1 | Barrel | N/A | N/A | N/A |
| 5 | RF In/Out | 1 | Communication Test Set | Un-shielded | 1m | N/A |

**I/O CABLES (RF Radiated Test)**

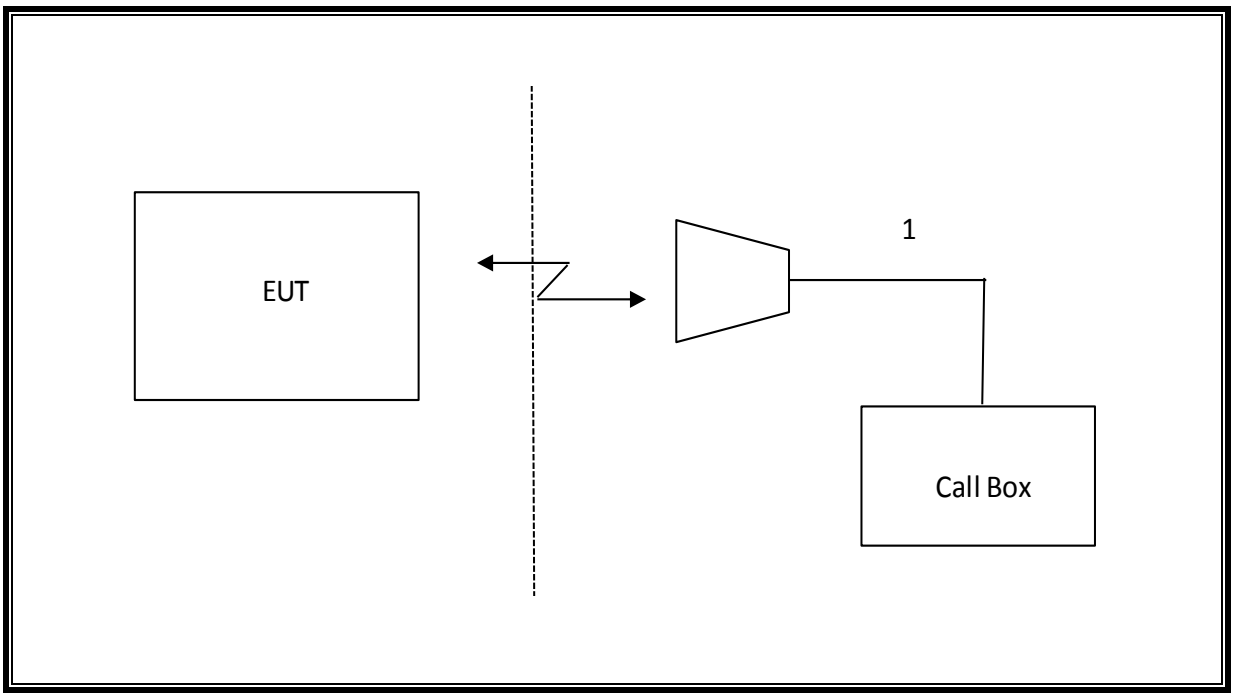
| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | RF In/Out | 1 | Antenna | Un-shielded | 5m | NA |

**TEST SETUP**

**CONDUCTED SETUP**




**RADIATED SETUP**



# 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| TEST EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **T No.** | **Cal Due** |
| 8960 series 10 wireless communications | Agilent | E5515C | T211 | 11/25/15 |
| Spectrum Analyzer, PSA, 3Hz-44GHz | Agilent | E4440A | T198 | 02/06/16 |
| Wideband Radio Communication Tester | R & S | CMW500 | T978 | 07/28/15 |
| Temperature / Humidity Chamber | CSZ | ZPHS-8-3.5-SCT/WC | T754 | 09/18/15 |
| Directional Coupler | Krytar | Directional Coupler | T923 | 03/06/16 |
| Wideband Radio Communication Tester | R & S | CMW500 | T953 | 04/06/16 |
| Spectrum Analyzer, PXA, 44GHz | Agilent | N9030A | T339 | 01/21/16 |
| Spectrum Analyzer, PSA, 3Hz-26.5GHz | Agilent | E4446A | T123 | 10/21/15 |
| Antenna, Horn 1-18GHz | ETS Lindgren | 3117 | T119 | 01/15/16 |
| Amplifier, 1 to 18GHz | Miteq | AFS42-00101800-25-S-42 | T742 | 01/31/16 |
| Amplifier 10KHz-1GHz | Sonoma | 310N | T286 | 05/07/16 |
| Amplifier 10KHz-1GHz | Sonoma | 310N | T173 | 06/09/16 |
| Antenna, Biconolog, 30MHz-2 GHz | Sunol Sciences | JB1 | T122 | 02/13/16 |
| Highpass Filter, 3.0 GHz | Micro-Tronics | HPM17543 | T427 | 01/31/16 |
| Highpass Filter, 1.0 GHz | Micro-Tronics | HPM18129 | T889 | 09/03/15 |
| Antenna, Horn, 18 GHz | EMCO | 3115 | T59 | 01/15/16 |
| Power Meter | Agilent | N1911A | T379 | 10/13/15 |
| Power Sensor | Agilent | N1921A | T750 | 10/06/15 |
| Spectrum Analyzer, PXA, 44GHz | Agilent | N9030A | T341 | 11/12/15 |

# 7. RF POWER OUTPUT VERIFICATION

## 7.1. GSM

**Using CMU200 Communication Test Set**

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press **Connection control** to choose the different menus
Press **RESET** > choose all to reset all settings

| | | |
|---|---|---|
| Connection | Press **Signal Off** to turn off the signal and change settings<br>Network Support > GSM+GPRS or GSM+EGPRS<br>Main Service > Packet Data<br>Service selection > Test Mode A – Auto Slot Config. off | |
| MS Signal | Press Slot Config bottom on the right twice to select and change the number of time slots and power setting | |
| | > Slot configuration | > Uplink/Gamma<br>> 33 dBm for GPRS 850/900<br>> 27 dBm for EGPRS 850/900<br>> 30 dBm for GPRS1800/1900<br>> 26 dBm for EGPRS1800/1900 |
| BS Signal | Enter the same channel number for TCH channel (test channel) and BCCH channel | |
| | Frequency Offset > | + 0 Hz |
| | Mode > | BCCH and TCH |
| | BCCH Level > | -85 dBm (May need to adjust if link is not stable) |
| | BCCH Channel > | choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] |
| | Channel Type > | Off |
| | P0> | 4 dB |
| | Slot Config > | Unchanged (if already set under MS Signal) |
| | TCH > | choose desired test channel |
| | Hopping > | Off |
| | Main Timeslot > | 3 (Default) |
| Network | Coding Scheme > | CS 4 (GPRS) and MCS5-9 (EGPRS) |
| | Bit Stream > | 2E9-1PSR Bit Pattern |
| AF/RF | Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input | |
| Connection | Press **Signal On** to turn on the signal and change settings | |

**Using Agilent 8960A Communication Test Set**

| | | |
|---|---|---|
| **System Config:** | GSM/GPRS Mobile Test | |
| | E1968A | A.06.31 |
| **Call Parms:** | BCH ➔ | Cell Band: GSM850/PCS |
| | TCH ➔ | Traffic Band: GSM850/PCS |
| | | Traffic Channel: 128/192/251 or 512/661/810 |
| | | MS Tx Level: 0 |
| | PDTCH ➔ | Traffic Band: GSM850/PCS |
| | | Traffic Channel: 128/192/251 512/661/810 |
| | | MS Tx Level: 0 |
| | | Coding Scheme: CS-4 (GPRS) |
| | | Coding Scheme: MCS-5 to 9 (EGPRS) |
| | | MultiSlot Config: 1up, 1 down (Assuming that the highest conducted power) |
| **Control:** | Active Cell ➔ | GSM/GPRS |

### 7.1.1. GPRS AND EGPRS MODEL: A1634 (LAT)

| Mode | Ch. | f (MHz) | 1 time slot | | 2 time slots | |
|---|---|---|---|---|---|---|
| | | | Peak (dBm) | Average (dBm) | Peak (dBm) | Average (dBm) |
| GPRS | 128 | 824.2 | 33.5 | 33.3 | 32.5 | 32.2 |
| | 190 | 836.6 | **33.7** | **33.5** | 32.6 | 32.4 |
| | 251 | 848.8 | 33.6 | 33.3 | 32.6 | 32.3 |
| EGPRS | 128 | 824.2 | 32.2 | 28.9 | 32.2 | 28.8 |
| | 190 | 836.6 | **32.3** | **29.0** | 31.9 | 28.7 |
| | 251 | 848.8 | 32.2 | 28.8 | 32.2 | 28.7 |
| GPRS | 512 | 1850.2 | 30.6 | 30.4 | 29.5 | 29.3 |
| | 661 | 1880.0 | **30.7** | **30.5** | 29.6 | 29.4 |
| | 810 | 1909.8 | 30.5 | 30.3 | 29.7 | 29.5 |
| EGPRS | 512 | 1850.2 | 31.0 | 27.9 | 31.1 | 27.9 |
| | 661 | 1880.0 | **31.1** | **28.0** | 31.1 | 28.0 |
| | 810 | 1909.8 | 30.9 | 27.8 | 30.9 | 27.9 |

### 7.1.2. GPRS AND EGPRS MODEL: A1634 (UAT)

| Mode | Ch. | f (MHz) | 1 time slot | | 2 time slots | |
|---|---|---|---|---|---|---|
| | | | Peak (dBm) | Average (dBm) | Peak (dBm) | Average (dBm) |
| GPRS | 128 | 824.2 | **31.6** | **31.4** | 30.7 | 30.5 |
| | 190 | 836.6 | 31.5 | 31.3 | 30.6 | 30.4 |
| | 251 | 848.8 | 31.5 | 31.3 | 30.4 | 30.2 |
| EGPRS | 128 | 824.2 | **30.1** | **26.9** | 30.0 | 26.8 |
| | 190 | 836.6 | 29.9 | 26.8 | 29.9 | 26.7 |
| | 251 | 848.8 | 30.0 | 26.8 | 29.9 | 26.7 |
| GPRS | 512 | 1850.2 | 27.4 | 27.1 | 25.3 | 25.0 |
| | 661 | 1880.0 | **27.5** | **27.2** | 25.5 | 25.2 |
| | 810 | 1909.8 | 27.4 | 27.1 | 25.3 | 25.0 |
| EGPRS | 512 | 1850.2 | 27.9 | 24.8 | 27.3 | 24.1 |
| | 661 | 1880.0 | 27.9 | 24.8 | 27.3 | 24.1 |
| | 810 | 1909.8 | **28.1** | **24.9** | 27.4 | 24.2 |

### 7.1.3. GPRS AND EGPRS MODEL: 1687 (LAT)

**LAT**

| Mode | Ch. | f (MHz) | 1 time slot | | 2 time slots | |
|---|---|---|---|---|---|---|
| | | | Peak (dBm) | Average (dBm) | Peak (dBm) | Average (dBm) |
| GPRS | 128 | 824.2 | 33.5 | 33.3 | 32.4 | 32.1 |
| | 190 | 836.6 | **33.6** | **33.4** | 32.5 | 32.2 |
| | 251 | 848.8 | 33.5 | 33.3 | 32.4 | 32.1 |
| EGPRS | 128 | 824.2 | 31.9 | 28.7 | 31.9 | 28.6 |
| | 190 | 836.6 | **32.1** | **28.8** | 31.7 | 28.6 |
| | 251 | 848.8 | 31.8 | 28.7 | 31.8 | 28.5 |
| GPRS | 512 | 1850.2 | 30.4 | 30.2 | 29.3 | 29.1 |
| | 661 | 1880.0 | **30.6** | **30.4** | 29.4 | 29.2 |
| | 810 | 1909.8 | 30.5 | 30.3 | 29.5 | 29.3 |
| EGPRS | 512 | 1850.2 | 30.9 | 27.7 | 31.0 | 27.8 |
| | 661 | 1880.0 | **31.0** | **27.9** | 31.0 | 27.8 |
| | 810 | 1909.8 | 30.8 | 27.7 | 31.0 | 27.8 |

### 7.1.4. GPRS AND EGPRS MODEL: 1687 (UAT)

**UAT**

| Mode | Ch. | f (MHz) | 1 time slot | | 2 time slots | |
|---|---|---|---|---|---|---|
| | | | Peak (dBm) | Average (dBm) | Peak (dBm) | Average (dBm) |
| GPRS | 128 | 824.2 | **31.4** | **31.2** | 30.6 | 30.4 |
| | 190 | 836.6 | 31.3 | 31.1 | 30.4 | 30.3 |
| | 251 | 848.8 | 31.4 | 31.1 | 30.3 | 30.1 |
| EGPRS | 128 | 824.2 | **29.9** | **26.7** | 29.8 | 26.7 |
| | 190 | 836.6 | 29.7 | 26.6 | 29.8 | 26.6 |
| | 251 | 848.8 | 29.6 | 26.7 | 29.5 | 26.5 |
| GPRS | 512 | 1850.2 | 27.2 | 26.9 | 25.4 | 25.0 |
| | 661 | 1880.0 | **27.3** | **27.2** | 25.3 | 24.9 |
| | 810 | 1909.8 | 27.2 | 27.0 | 25.2 | 24.9 |
| EGPRS | 512 | 1850.2 | 27.8 | 24.6 | 27.1 | 24.0 |
| | 661 | 1880.0 | 27.8 | 24.5 | 27.2 | 24.0 |
| | 810 | 1909.8 | **27.9** | **24.6** | 27.2 | 24.1 |

## 7.2. CDMA

Maximum output power is verified on the Low, Middle and High channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E for 1xRTT, section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rel. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A

**CDMA2000 1xRTT**

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

| Application | Rev, License |
|---|---|
| CDMA2000 Mobile Test | B.15.18, L |

- Protocol Rev > 6 (IS-2000-0)
- System ID: 18; NID: 65535, Reg. Ch. #.: 610 for Cell, 600 for PCS & 450 for AWS
- Radio Config (RC) > RC1 or RC3
- Service Option (SO) Setup > SO55 or SO32
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

**RESULT**

## 7.2.1. 1xRTT MODEL: A1634 (LAT)

**CDMA 1xRTT, BC10, SECONDARY 800**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 450 - 817.25MHz | | CH 560 - 820MHz | | CH 670 - 822.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 30.5 | 24.9 | 30.5 | 24.9 | 30.4 | 24.9 |
| | 55 (Loopback) | 30.6 | 24.9 | 30.6 | 24.9 | 30.5 | 25.0 |
| RC2 | 9 (Loopback) | **30.8** | **25.0** | 30.3 | 24.9 | 30.5 | 25.0 |
| | 55 (Loopback) | 30.5 | 24.9 | 30.5 | 24.9 | 30.5 | 25.0 |
| RC3 | 2 (Loopback) | 30.0 | 24.8 | 29.9 | 24.8 | 29.9 | 24.9 |
| | 55 (Loopback) | 30.0 | 24.9 | 29.8 | 24.9 | 29.9 | 24.9 |
| | 32 (+ F-SCH) | 30.0 | 24.9 | 29.8 | 24.9 | 29.9 | 25.0 |
| | 32 (+ SCH) | 30.0 | 24.9 | 29.8 | 24.9 | 29.9 | 25.0 |
| RC4 | 2 (Loopback) | 30.0 | 24.9 | 29.9 | 24.9 | 29.8 | 24.9 |
| | 55 (Loopback) | 29.9 | 24.9 | 29.8 | 24.9 | 29.8 | 25.0 |
| | 32 (+ F-SCH) | 30.1 | 25.0 | 29.9 | 24.9 | 29.9 | 25.0 |
| | 32 (+ SCH) | 30.5 | 24.9 | 29.9 | 25.0 | 30.8 | 25.0 |
| RC5 | 9 (Loopback) | 29.9 | 24.9 | 29.9 | 24.9 | 29.9 | 24.9 |
| | 55 (Loopback) | 29.9 | 24.9 | 29.8 | 24.9 | 30.0 | 24.9 |
| RC11 | 2 (Loopback) | 29.8 | 25.0 | 29.9 | 25.0 | 29.7 | 24.9 |
| | 75 (Loopback) | 30.0 | 24.9 | 29.9 | 25.0 | 29.8 | 25.0 |
| | 32 (+ F-SCH) | 30.0 | 24.9 | 30.0 | 24.9 | 30.1 | 25.0 |
| | 32 (+ SCH) | 30.1 | 24.9 | 29.8 | 24.9 | 30.1 | 25.0 |

**CDMA 1xRTT, BC0, CELL BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 1013 - 824.7MHz | | CH 384 - 836.52MHz | | CH 777 - 848.31MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 30.7 | 24.9 | 30.8 | 24.8 | 29.6 | 24.7 |
| | 55 (Loopback) | 30.6 | 24.8 | 30.8 | 24.8 | 29.6 | 24.8 |
| RC2 | 9 (Loopback) | **30.9** | **25.0** | 30.5 | 24.9 | 29.6 | 24.8 |
| | 55 (Loopback) | 30.6 | 24.7 | 30.6 | 24.9 | 29.6 | 24.7 |
| RC3 | 2 (Loopback) | 30.1 | 24.8 | 30.1 | 24.8 | 29.4 | 24.7 |
| | 55 (Loopback) | 30.1 | 24.7 | 30.2 | 24.7 | 29.5 | 24.7 |
| | 32 (+ F-SCH) | 30.2 | 24.8 | 30.1 | 24.8 | 29.5 | 24.8 |
| | 32 (+ SCH) | 30.2 | 24.9 | 30.0 | 24.8 | 29.5 | 24.8 |
| RC4 | 2 (Loopback) | 30.2 | 24.9 | 30.2 | 24.9 | 29.5 | 24.7 |
| | 55 (Loopback) | 30.2 | 24.9 | 30.3 | 24.9 | 29.4 | 24.8 |
| | 32 (+ F-SCH) | 30.3 | 24.8 | 30.2 | 24.8 | 29.5 | 24.8 |
| | 32 (+ SCH) | 30.8 | 24.9 | 30.6 | 24.8 | 29.7 | 24.8 |
| RC5 | 9 (Loopback) | 30.2 | 24.9 | 30.1 | 24.9 | 29.5 | 24.8 |
| | 55 (Loopback) | 30.1 | 24.7 | 30.0 | 24.8 | 29.5 | 24.7 |
| RC11 | 2 (Loopback) | 30.2 | 24.8 | 30.4 | 24.9 | 29.5 | 24.8 |
| | 75 (Loopback) | 30.2 | 24.8 | 30.2 | 24.9 | 29.5 | 24.8 |
| | 32 (+ F-SCH) | 30.4 | 24.9 | 30.3 | 24.8 | 29.5 | 24.8 |
| | 32 (+ SCH) | 30.3 | 24.9 | 30.4 | 24.9 | 29.5 | 24.8 |

**CDMA2000 1xRTT, BC1, PCS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1851.25MHz | | CH 600 - 1880MHz | | CH 1175 - 1908.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 29.7 | 24.7 | 29.8 | 24.7 | 29.9 | 24.7 |
| | 55 (Loopback) | 29.7 | 24.8 | 29.9 | 24.7 | 30.3 | 24.8 |
| RC2 | 9 (Loopback) | 29.7 | 24.8 | **30.4** | **25.0** | 30.3 | 24.9 |
| | 55 (Loopback) | 29.6 | 24.8 | 29.8 | 24.7 | 30.3 | 24.8 |
| RC3 | 2 (Loopback) | 29.5 | 24.9 | 29.7 | 24.7 | 29.8 | 24.7 |
| | 55 (Loopback) | 29.5 | 24.8 | 29.9 | 24.7 | 29.6 | 24.8 |
| | 32 (+ F-SCH) | 29.6 | 24.8 | 29.8 | 24.8 | 29.7 | 24.8 |
| | 32 (+ SCH) | 29.7 | 24.8 | 29.8 | 24.7 | 29.8 | 24.8 |
| RC4 | 2 (Loopback) | 29.6 | 24.7 | 29.9 | 24.8 | 29.5 | 24.8 |
| | 55 (Loopback) | 29.6 | 24.8 | 29.9 | 24.8 | 29.7 | 24.8 |
| | 32 (+ F-SCH) | 29.7 | 24.8 | 29.8 | 24.7 | 29.8 | 24.8 |
| | 32 (+ SCH) | 29.7 | 24.9 | 30.0 | 24.8 | 30.2 | 24.8 |
| RC5 | 9 (Loopback) | 29.7 | 24.8 | 29.8 | 24.7 | 29.6 | 24.8 |
| | 55 (Loopback) | 29.5 | 24.9 | 29.6 | 24.7 | 29.9 | 24.8 |
| RC11 | 2 (Loopback) | 29.6 | 24.9 | 29.7 | 24.9 | 30.0 | 24.8 |
| | 75 (Loopback) | 29.6 | 24.8 | 29.8 | 24.8 | 30.2 | 24.9 |
| | 32 (+ F-SCH) | 29.7 | 24.8 | 29.8 | 24.9 | 29.9 | 24.9 |
| | 32 (+ SCH) | 29.7 | 24.9 | 29.9 | 24.8 | 29.7 | 24.8 |

**CDMA2000 1xRTT, BC15, AWS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1711.25MHz | | CH 450 - 1732.5MHz | | CH 875 - 1753.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 30.0 | 25.0 | 30.5 | 24.9 | 30.5 | 24.9 |
| | 55 (Loopback) | 30.0 | 25.0 | 30.4 | 24.9 | 30.3 | 24.9 |
| RC2 | 9 (Loopback) | 30.0 | 24.9 | **30.6** | **25.0** | 30.3 | 24.9 |
| | 55 (Loopback) | 30.0 | 25.0 | 30.2 | 24.9 | 30.3 | 24.9 |
| RC3 | 2 (Loopback) | 29.8 | 25.0 | 29.8 | 24.9 | 30.1 | 25.0 |
| | 55 (Loopback) | 29.9 | 24.9 | 29.9 | 24.9 | 30.0 | 24.9 |
| | 32 (+ F-SCH) | 29.8 | 25.0 | 29.8 | 24.9 | 30.2 | 25.0 |
| | 32 (+ SCH) | 29.9 | 24.9 | 29.7 | 24.9 | 30.0 | 24.9 |
| RC4 | 2 (Loopback) | 29.8 | 25.0 | 30.0 | 24.9 | 30.1 | 25.0 |
| | 55 (Loopback) | 29.8 | 25.0 | 29.9 | 24.9 | 30.0 | 25.0 |
| | 32 (+ F-SCH) | 29.9 | 24.9 | 29.8 | 24.9 | 30.2 | 24.9 |
| | 32 (+ SCH) | 29.9 | 24.9 | 29.9 | 24.9 | 30.1 | 24.9 |
| RC5 | 9 (Loopback) | 29.8 | 24.9 | 29.9 | 24.9 | 30.0 | 24.9 |
| | 55 (Loopback) | 29.8 | 24.9 | 29.9 | 24.9 | 30.0 | 24.9 |
| *RC11 | 2 (Loopback) | 29.9 | 24.9 | 30.0 | 25.0 | 30.1 | 25.0 |
| | 75 (Loopback) | 29.9 | 25.0 | 29.9 | 24.9 | 30.2 | 25.0 |
| | 32 (+ F-SCH) | 29.9 | 24.9 | 29.9 | 24.9 | 30.0 | 24.9 |
| | 32 (+ SCH) | 29.9 | 25.0 | 29.7 | 25.0 | 30.0 | 25.0 |

## 7.2.2. 1xRTT MODEL: A1634 (UAT)

**CDMA 1xRTT, BC10, SECONDARY 800**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 450 - 817.25MHz | | CH 560 - 820MHz | | CH 670 - 822.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 27.3 | 22.8 | 27.4 | 22.7 | 27.6 | 22.8 |
| | 55 (Loopback) | 27.4 | 22.8 | 27.4 | 22.8 | 27.3 | 22.8 |
| RC2 | 9 (Loopback) | 27.4 | 22.8 | 27.3 | 22.7 | **27.7** | **23.0** |
| | 55 (Loopback) | 27.4 | 22.8 | 27.2 | 22.8 | 27.6 | 22.8 |
| RC3 | 2 (Loopback) | 26.4 | 22.8 | 26.5 | 22.7 | 26.6 | 22.9 |
| | 55 (Loopback) | 26.4 | 22.8 | 26.6 | 22.8 | 26.6 | 22.9 |
| | 32 (+ F-SCH) | 26.5 | 22.8 | 26.4 | 22.8 | 26.9 | 22.9 |
| | 32 (+ SCH) | 27.5 | 22.9 | 27.5 | 22.8 | 26.6 | 22.9 |
| RC4 | 2 (Loopback) | 26.5 | 22.8 | 26.5 | 22.8 | 26.6 | 22.9 |
| | 55 (Loopback) | 26.4 | 22.8 | 26.5 | 22.8 | 26.6 | 22.9 |
| | 32 (+ F-SCH) | 26.5 | 22.8 | 26.5 | 22.8 | 26.6 | 22.9 |
| | 32 (+ SCH) | 26.5 | 22.8 | 26.5 | 22.8 | 26.7 | 22.9 |
| RC5 | 9 (Loopback) | 26.4 | 22.8 | 26.5 | 22.8 | 26.6 | 22.9 |
| | 55 (Loopback) | 26.4 | 22.8 | 26.4 | 22.7 | 26.5 | 22.9 |
| RC11 | 2 (Loopback) | 26.5 | 22.9 | 26.6 | 22.9 | 26.7 | 22.9 |
| | 75 (Loopback) | 26.4 | 22.9 | 26.5 | 22.9 | 26.7 | 22.9 |
| | 32 (+ F-SCH) | 26.5 | 22.9 | 26.6 | 22.9 | 26.7 | 22.9 |
| | 32 (+ SCH) | 26.5 | 22.9 | 26.5 | 22.9 | 26.7 | 22.9 |

**CDMA 1xRTT, BC0, CELL BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 1013 - 824.7MHz | | CH 384 - 836.52MHz | | CH 777 - 848.31MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 27.6 | 22.8 | 27.4 | 22.9 | 27.3 | 22.8 |
| | 55 (Loopback) | 27.8 | 22.7 | 27.5 | 22.8 | 27.3 | 22.8 |
| RC2 | 9 (Loopback) | **28.0** | **23.0** | 27.5 | 22.8 | 27.4 | 22.8 |
| | 55 (Loopback) | 27.5 | 22.7 | 27.2 | 22.9 | 27.4 | 22.8 |
| RC3 | 2 (Loopback) | 26.5 | 22.8 | 26.6 | 22.9 | 26.5 | 22.9 |
| | 55 (Loopback) | 26.5 | 22.8 | 26.5 | 22.9 | 26.5 | 22.8 |
| | 32 (+ F-SCH) | 26.5 | 22.8 | 26.6 | 22.9 | 26.6 | 22.9 |
| | 32 (+ SCH) | 27.8 | 22.9 | 26.7 | 23.0 | 26.6 | 22.9 |
| RC4 | 2 (Loopback) | 26.6 | 22.8 | 26.6 | 23.0 | 26.6 | 22.9 |
| | 55 (Loopback) | 26.5 | 22.8 | 26.5 | 22.9 | 26.8 | 22.8 |
| | 32 (+ F-SCH) | 26.6 | 22.8 | 26.6 | 23.0 | 26.6 | 22.9 |
| | 32 (+ SCH) | 27.7 | 22.9 | 26.6 | 22.9 | 26.6 | 22.9 |
| RC5 | 9 (Loopback) | 26.5 | 22.8 | 26.6 | 23.0 | 26.6 | 22.9 |
| | 55 (Loopback) | 26.6 | 22.8 | 26.5 | 23.0 | 26.6 | 22.9 |
| RC11 | 2 (Loopback) | 26.7 | 22.9 | 26.6 | 22.9 | 26.7 | 22.9 |
| | 75 (Loopback) | 26.5 | 22.9 | 26.6 | 22.9 | 26.6 | 23.0 |
| | 32 (+ F-SCH) | 26.6 | 22.9 | 26.6 | 22.9 | 26.7 | 23.0 |
| | 32 (+ SCH) | 26.4 | 22.9 | 26.6 | 23.0 | 26.6 | 23.0 |

**CDMA2000 1xRTT, BC1, PCS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1851.25MHz | | CH 600 - 1880MHz | | CH 1175 - 1908.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 22.5 | 17.9 | 22.4 | 18.0 | 22.7 | 18.2 |
| | 55 (Loopback) | 22.7 | 17.9 | 22.5 | 18.0 | 22.6 | 18.2 |
| RC2 | 9 (Loopback) | 22.7 | 18.0 | 22.4 | 18.0 | **22.8** | **18.3** |
| | 55 (Loopback) | 22.6 | 18.0 | 22.4 | 18.0 | 22.5 | 18.2 |
| RC3 | 2 (Loopback) | 22.5 | 18.0 | 22.2 | 18.1 | 22.5 | 18.2 |
| | 55 (Loopback) | 22.4 | 18.0 | 22.2 | 18.1 | 22.5 | 18.2 |
| | 32 (+ F-SCH) | 22.3 | 18.0 | 22.2 | 18.1 | 22.6 | 18.3 |
| | 32 (+ SCH) | 22.4 | 18.0 | 22.2 | 18.1 | 22.7 | 18.3 |
| RC4 | 2 (Loopback) | 22.1 | 18.0 | 22.1 | 18.1 | 22.5 | 18.3 |
| | 55 (Loopback) | 22.1 | 18.0 | 22.3 | 18.1 | 22.4 | 18.3 |
| | 32 (+ F-SCH) | 22.3 | 18.0 | 22.2 | 18.1 | 22.4 | 18.2 |
| | 32 (+ SCH) | 22.1 | 18.0 | 22.1 | 18.1 | 22.5 | 18.3 |
| RC5 | 9 (Loopback) | 22.1 | 18.0 | 22.1 | 18.1 | 22.7 | 18.3 |
| | 55 (Loopback) | 22.1 | 18.1 | 22.2 | 18.1 | 22.6 | 18.2 |
| RC11 | 2 (Loopback) | 22.0 | 18.1 | 22.3 | 18.1 | 22.7 | 18.3 |
| | 75 (Loopback) | 21.9 | 18.0 | 22.2 | 18.1 | 22.7 | 18.3 |
| | 32 (+ F-SCH) | 22.1 | 18.1 | 22.2 | 18.2 | 22.6 | 18.3 |
| | 32 (+ SCH) | 22.0 | 18.0 | 22.2 | 18.1 | 22.5 | 18.3 |

**CDMA2000 1xRTT, BC15, AWS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1711.25MHz | | CH 450 - 1732.5MHz | | CH 875 - 1753.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 23.9 | 19.7 | 23.8 | 19.9 | 23.8 | 19.8 |
| | 55 (Loopback) | 23.8 | 19.7 | 23.8 | 19.9 | 23.7 | 19.8 |
| RC2 | 9 (Loopback) | **24.1** | **20.0** | 23.8 | 19.8 | 23.8 | 19.9 |
| | 55 (Loopback) | 23.9 | 19.6 | 23.7 | 19.8 | 23.8 | 19.9 |
| RC3 | 2 (Loopback) | 23.6 | 19.8 | 23.8 | 19.9 | 23.7 | 19.9 |
| | 55 (Loopback) | 23.6 | 19.8 | 24.0 | 20.0 | 23.9 | 20.0 |
| | 32 (+ F-SCH) | 23.6 | 19.7 | 23.8 | 19.9 | 23.9 | 20.0 |
| | 32 (+ SCH) | 23.7 | 19.7 | 23.8 | 19.9 | 23.9 | 20.0 |
| RC4 | 2 (Loopback) | 23.7 | 19.8 | 23.7 | 19.9 | 23.8 | 20.0 |
| | 55 (Loopback) | 23.5 | 19.8 | 23.9 | 19.9 | 23.7 | 19.9 |
| | 32 (+ F-SCH) | 23.6 | 19.8 | 23.8 | 19.9 | 23.8 | 20.0 |
| | 32 (+ SCH) | 23.6 | 19.8 | 23.9 | 19.9 | 23.9 | 20.0 |
| RC5 | 9 (Loopback) | 23.7 | 19.8 | 23.8 | 19.9 | 23.9 | 20.0 |
| | 55 (Loopback) | 23.7 | 19.8 | 23.8 | 19.9 | 23.8 | 19.9 |
| *RC11 | 2 (Loopback) | 23.6 | 19.8 | 23.7 | 20.0 | 23.9 | 20.0 |
| | 75 (Loopback) | 23.8 | 19.8 | 23.8 | 20.0 | 23.8 | 20.0 |
| | 32 (+ F-SCH) | 23.7 | 19.8 | 23.8 | 20.0 | 23.9 | 20.0 |
| | 32 (+ SCH) | 23.8 | 19.8 | 23.8 | 20.0 | 23.8 | 19.9 |

## 7.2.3. 1xRTT MODEL: A1687 (LAT)

**CDMA 1xRTT, BC10, SECONDARY 800**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 450 - 817.25MHz | | CH 560 - 820MHz | | CH 670 - 822.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 30.4 | 24.8 | 30.3 | 24.8 | 30.2 | 24.7 |
| | 55 (Loopback) | 30.3 | 24.8 | 30.3 | 24.7 | 30.2 | 24.7 |
| RC2 | 9 (Loopback) | **30.6** | **24.9** | 30.1 | 24.8 | 30.3 | 24.8 |
| | 55 (Loopback) | 30.3 | 24.7 | 30.3 | 24.7 | 30.2 | 24.7 |
| RC3 | 2 (Loopback) | 29.8 | 24.6 | 29.7 | 24.6 | 29.7 | 24.7 |
| | 55 (Loopback) | 29.6 | 24.5 | 29.4 | 24.5 | 29.5 | 24.5 |
| | 32 (+ F-SCH) | 29.7 | 24.7 | 29.6 | 24.7 | 29.6 | 24.7 |
| | 32 (+ SCH) | 29.7 | 24.7 | 29.6 | 24.7 | 29.7 | 24.7 |
| RC4 | 2 (Loopback) | 29.7 | 24.7 | 29.7 | 24.7 | 29.5 | 24.7 |
| | 55 (Loopback) | 29.8 | 24.7 | 29.7 | 24.7 | 29.7 | 24.5 |
| | 32 (+ F-SCH) | 29.9 | 24.7 | 29.7 | 24.7 | 29.7 | 24.8 |
| | 32 (+ SCH) | 30.2 | 24.7 | 29.7 | 24.7 | 30.5 | 24.7 |
| RC5 | 9 (Loopback) | 29.7 | 24.7 | 29.7 | 24.7 | 29.6 | 24.7 |
| | 55 (Loopback) | 29.7 | 24.7 | 29.6 | 24.7 | 29.8 | 24.7 |
| RC11 | 2 (Loopback) | 29.4 | 24.8 | 29.5 | 24.7 | 29.4 | 24.8 |
| | 75 (Loopback) | 29.7 | 24.7 | 29.6 | 24.7 | 29.6 | 24.7 |
| | 32 (+ F-SCH) | 29.8 | 24.7 | 29.8 | 24.7 | 29.9 | 24.7 |
| | 32 (+ SCH) | 29.9 | 24.7 | 29.6 | 24.7 | 29.8 | 24.7 |

**CDMA 1xRTT, BC0, CELL BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 1013 - 824.7MHz | | CH 384 - 836.52MHz | | CH 777 - 848.31MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 30.6 | 24.8 | 30.6 | 24.8 | 29.5 | 24.7 |
| | 55 (Loopback) | 30.4 | 24.6 | 30.6 | 24.6 | 29.4 | 24.8 |
| RC2 | 9 (Loopback) | **30.7** | **24.9** | 30.6 | 24.8 | 29.4 | 24.8 |
| | 55 (Loopback) | 30.3 | 24.8 | 30.4 | 24.8 | 29.4 | 24.8 |
| RC3 | 2 (Loopback) | 29.9 | 24.6 | 29.9 | 24.6 | 29.2 | 24.7 |
| | 55 (Loopback) | 29.7 | 24.8 | 29.8 | 24.8 | 29.1 | 24.7 |
| | 32 (+ F-SCH) | 30.0 | 24.6 | 29.8 | 24.6 | 29.3 | 24.5 |
| | 32 (+ SCH) | 30.0 | 24.8 | 29.8 | 24.8 | 29.3 | 24.7 |
| RC4 | 2 (Loopback) | 30.0 | 24.7 | 29.9 | 24.7 | 29.2 | 24.5 |
| | 55 (Loopback) | 30.1 | 24.7 | 30.1 | 24.7 | 29.3 | 24.6 |
| | 32 (+ F-SCH) | 30.1 | 24.8 | 29.9 | 24.8 | 29.3 | 24.8 |
| | 32 (+ SCH) | 30.6 | 24.7 | 30.4 | 24.6 | 29.4 | 24.6 |
| RC5 | 9 (Loopback) | 30.0 | 24.7 | 29.9 | 24.7 | 29.2 | 24.5 |
| | 55 (Loopback) | 29.9 | 24.5 | 29.8 | 24.6 | 29.3 | 24.5 |
| RC11 | 2 (Loopback) | 29.8 | 24.8 | 30.0 | 24.8 | 29.1 | 24.7 |
| | 75 (Loopback) | 29.9 | 24.7 | 30.0 | 24.8 | 29.2 | 24.7 |
| | 32 (+ F-SCH) | 30.2 | 24.7 | 30.1 | 24.6 | 29.3 | 24.6 |
| | 32 (+ SCH) | 30.0 | 24.7 | 30.1 | 24.7 | 29.3 | 24.6 |

**CDMA2000 1xRTT, BC1, PCS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1851.25MHz | | CH 600 - 1880MHz | | CH 1175 - 1908.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 29.6 | 24.6 | 29.7 | 24.6 | 29.8 | 24.6 |
| | 55 (Loopback) | 29.4 | 24.6 | 29.7 | 24.5 | 30.1 | 24.5 |
| RC2 | 9 (Loopback) | 29.4 | 24.6 | **30.2** | **24.8** | 30.0 | 24.6 |
| | 55 (Loopback) | 29.4 | 24.6 | 29.6 | 24.5 | 30.0 | 24.5 |
| RC3 | 2 (Loopback) | 29.3 | 24.7 | 29.5 | 24.5 | 29.6 | 24.5 |
| | 55 (Loopback) | 29.1 | 24.4 | 29.5 | 24.3 | 29.2 | 24.4 |
| | 32 (+ F-SCH) | 29.3 | 24.6 | 29.6 | 24.5 | 29.4 | 24.5 |
| | 32 (+ SCH) | 29.4 | 24.6 | 29.6 | 24.5 | 29.5 | 24.6 |
| RC4 | 2 (Loopback) | 29.4 | 24.5 | 29.7 | 24.5 | 29.3 | 24.6 |
| | 55 (Loopback) | 29.5 | 24.7 | 29.8 | 24.6 | 29.5 | 24.7 |
| | 32 (+ F-SCH) | 29.5 | 24.5 | 29.5 | 24.5 | 29.6 | 24.6 |
| | 32 (+ SCH) | 29.5 | 24.7 | 29.7 | 24.6 | 30.0 | 24.6 |
| RC5 | 9 (Loopback) | 29.4 | 24.6 | 29.6 | 24.5 | 29.3 | 24.6 |
| | 55 (Loopback) | 29.3 | 24.7 | 29.4 | 24.5 | 29.7 | 24.6 |
| RC11 | 2 (Loopback) | 29.2 | 24.5 | 29.3 | 24.5 | 29.6 | 24.4 |
| | 75 (Loopback) | 29.3 | 24.6 | 29.5 | 24.6 | 30.0 | 24.7 |
| | 32 (+ F-SCH) | 29.5 | 24.6 | 29.6 | 24.7 | 29.7 | 24.7 |
| | 32 (+ SCH) | 29.4 | 24.6 | 29.6 | 24.6 | 29.5 | 24.6 |

**CDMA2000 1xRTT, BC15, AWS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1711.25MHz | | CH 450 - 1732.5MHz | | CH 875 - 1753.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 29.9 | 24.8 | 30.4 | 24.8 | 30.4 | 24.8 |
| | 55 (Loopback) | 29.8 | 24.7 | 30.1 | 24.7 | 30.1 | 24.7 |
| RC2 | 9 (Loopback) | 29.8 | 24.8 | **30.5** | **24.9** | 30.0 | 24.7 |
| | 55 (Loopback) | 29.8 | 24.7 | 30.0 | 24.6 | 30.1 | 24.7 |
| RC3 | 2 (Loopback) | 29.6 | 24.8 | 29.6 | 24.7 | 29.9 | 24.8 |
| | 55 (Loopback) | 29.5 | 24.5 | 29.5 | 24.5 | 29.6 | 24.5 |
| | 32 (+ F-SCH) | 29.6 | 24.7 | 29.6 | 24.7 | 30.0 | 24.7 |
| | 32 (+ SCH) | 29.7 | 24.7 | 29.5 | 24.7 | 29.8 | 24.7 |
| RC4 | 2 (Loopback) | 29.6 | 24.7 | 29.8 | 24.7 | 29.8 | 24.7 |
| | 55 (Loopback) | 29.7 | 24.5 | 29.7 | 24.8 | 29.9 | 24.5 |
| | 32 (+ F-SCH) | 29.7 | 24.7 | 29.6 | 24.7 | 29.9 | 24.7 |
| | 32 (+ SCH) | 29.6 | 24.7 | 29.7 | 24.7 | 29.9 | 24.7 |
| RC5 | 9 (Loopback) | 29.6 | 24.7 | 29.7 | 24.7 | 29.8 | 24.7 |
| | 55 (Loopback) | 29.7 | 24.8 | 29.8 | 24.8 | 29.9 | 24.8 |
| *RC11 | 2 (Loopback) | 29.5 | 24.5 | 29.6 | 24.6 | 29.7 | 24.6 |
| | 75 (Loopback) | 29.8 | 24.5 | 29.8 | 24.8 | 30.1 | 24.5 |
| | 32 (+ F-SCH) | 29.7 | 24.7 | 29.7 | 24.7 | 29.8 | 24.7 |
| | 32 (+ SCH) | 29.6 | 24.7 | 29.4 | 24.7 | 29.7 | 24.7 |

## 7.2.4. 1xRTT MODEL: A1687 (UAT)

**CDMA 1xRTT, BC10, SECONDARY 800**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 450 - 817.25MHz | | CH 560 - 820MHz | | CH 670 - 822.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 27.1 | 22.6 | 27.2 | 22.5 | 27.5 | 22.7 |
| | 55 (Loopback) | 27.0 | 22.4 | 27.0 | 22.4 | 27.1 | 22.6 |
| RC2 | 9 (Loopback) | 27.5 | 22.6 | **27.6** | **22.8** | 27.6 | 22.8 |
| | 55 (Loopback) | 27.2 | 22.5 | 27.0 | 22.5 | 27.4 | 22.6 |
| RC3 | 2 (Loopback) | 26.2 | 22.6 | 26.2 | 22.5 | 26.4 | 22.7 |
| | 55 (Loopback) | 26.3 | 22.7 | 26.4 | 22.7 | 26.2 | 22.5 |
| | 32 (+ F-SCH) | 26.3 | 22.6 | 26.2 | 22.6 | 26.6 | 22.6 |
| | 32 (+ SCH) | 27.3 | 22.6 | 27.3 | 22.6 | 26.4 | 22.7 |
| RC4 | 2 (Loopback) | 26.3 | 22.6 | 26.3 | 22.6 | 26.4 | 22.7 |
| | 55 (Loopback) | 26.2 | 22.6 | 26.3 | 22.6 | 26.5 | 22.6 |
| | 32 (+ F-SCH) | 26.1 | 22.4 | 26.1 | 22.4 | 26.4 | 22.7 |
| | 32 (+ SCH) | 26.2 | 22.6 | 26.2 | 22.6 | 26.5 | 22.7 |
| RC5 | 9 (Loopback) | 26.2 | 22.6 | 26.3 | 22.6 | 26.4 | 22.7 |
| | 55 (Loopback) | 26.2 | 22.6 | 26.2 | 22.5 | 26.4 | 22.6 |
| RC11 | 2 (Loopback) | 26.4 | 22.6 | 26.5 | 22.6 | 26.3 | 22.5 |
| | 75 (Loopback) | 26.2 | 22.6 | 26.3 | 22.7 | 26.6 | 22.6 |
| | 32 (+ F-SCH) | 26.2 | 22.7 | 26.4 | 22.7 | 26.5 | 22.7 |
| | 32 (+ SCH) | 26.3 | 22.7 | 26.3 | 22.7 | 26.4 | 22.6 |

**CDMA 1xRTT, BC0, CELL BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 1013 - 824.7MHz | | CH 384 - 836.52MHz | | CH 777 - 848.31MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 27.4 | 22.6 | 27.2 | 22.7 | 27.1 | 22.6 |
| | 55 (Loopback) | 27.6 | 22.8 | 27.1 | 22.4 | 27.1 | 22.6 |
| RC2 | 9 (Loopback) | **27.6** | **22.8** | 27.2 | 22.6 | 27.0 | 22.4 |
| | 55 (Loopback) | 27.3 | 22.5 | 26.9 | 22.7 | 27.1 | 22.6 |
| RC3 | 2 (Loopback) | 26.2 | 22.6 | 26.3 | 22.6 | 26.2 | 22.6 |
| | 55 (Loopback) | 26.2 | 22.6 | 26.3 | 22.7 | 26.3 | 22.6 |
| | 32 (+ F-SCH) | 26.4 | 22.7 | 26.4 | 22.7 | 26.5 | 22.7 |
| | 32 (+ SCH) | 27.6 | 22.6 | 26.4 | 22.7 | 26.3 | 22.7 |
| RC4 | 2 (Loopback) | 26.4 | 22.6 | 26.4 | 22.7 | 26.3 | 22.7 |
| | 55 (Loopback) | 26.3 | 22.6 | 26.3 | 22.7 | 26.6 | 22.6 |
| | 32 (+ F-SCH) | 26.4 | 22.6 | 26.2 | 22.6 | 26.4 | 22.7 |
| | 32 (+ SCH) | 27.3 | 22.5 | 26.4 | 22.7 | 26.2 | 22.5 |
| RC5 | 9 (Loopback) | 26.3 | 22.6 | 26.4 | 22.8 | 26.4 | 22.6 |
| | 55 (Loopback) | 26.4 | 22.6 | 26.3 | 22.7 | 26.4 | 22.7 |
| RC11 | 2 (Loopback) | 26.4 | 22.7 | 26.5 | 22.8 | 26.4 | 22.7 |
| | 75 (Loopback) | 26.4 | 22.8 | 26.4 | 22.7 | 26.5 | 22.7 |
| | 32 (+ F-SCH) | 26.4 | 22.7 | 26.3 | 22.7 | 26.5 | 22.8 |
| | 32 (+ SCH) | 26.2 | 22.6 | 26.4 | 22.8 | 26.4 | 22.8 |

**CDMA2000 1xRTT, BC1, PCS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1851.25MHz | | CH 600 - 1880MHz | | CH 1175 - 1908.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 22.4 | 17.7 | 22.3 | 17.9 | 22.5 | 18.0 |
| | 55 (Loopback) | 22.6 | 17.7 | 22.2 | 17.8 | 22.5 | 18.0 |
| RC2 | 9 (Loopback) | 22.4 | 17.6 | 22.2 | 17.8 | **22.7** | **18.2** |
| | 55 (Loopback) | 22.5 | 17.7 | 22.2 | 17.8 | 22.3 | 18.0 |
| RC3 | 2 (Loopback) | 21.5 | 17.7 | 22.1 | 17.9 | 22.4 | 18.0 |
| | 55 (Loopback) | 21.8 | 17.8 | 22.0 | 17.7 | 22.4 | 17.8 |
| | 32 (+ F-SCH) | 22.3 | 17.9 | 22.1 | 17.9 | 22.4 | 18.0 |
| | 32 (+ SCH) | 22.3 | 17.8 | 22.1 | 17.9 | 22.3 | 18.0 |
| RC4 | 2 (Loopback) | 22.0 | 17.8 | 21.9 | 17.8 | 22.3 | 18.0 |
| | 55 (Loopback) | 22.0 | 17.8 | 22.0 | 18.0 | 22.4 | 18.1 |
| | 32 (+ F-SCH) | 22.2 | 17.8 | 22.1 | 17.9 | 22.3 | 18.0 |
| | 32 (+ SCH) | 22.0 | 17.6 | 22.0 | 17.9 | 22.3 | 18.0 |
| RC5 | 9 (Loopback) | 22.0 | 17.8 | 20.9 | 17.9 | 22.4 | 18.1 |
| | 55 (Loopback) | 22.0 | 17.9 | 22.0 | 18.0 | 22.4 | 18.1 |
| RC11 | 2 (Loopback) | 21.9 | 17.8 | 22.2 | 18.0 | 22.3 | 17.9 |
| | 75 (Loopback) | 21.7 | 17.9 | 22.1 | 18.0 | 22.3 | 18.0 |
| | 32 (+ F-SCH) | 22.0 | 17.9 | 22.1 | 17.9 | 22.3 | 18.1 |
| | 32 (+ SCH) | 21.9 | 17.8 | 22.0 | 17.8 | 22.3 | 18.0 |

**CDMA2000 1xRTT, BC15, AWS BAND**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | CH 25 - 1711.25MHz | | CH 450 - 1732.5MHz | | CH 875 - 1753.75MHz | |
| | | Peak | Average | Peak | Average | Peak | Average |
| RC1 | 2 (Loopback) | 23.7 | 19.5 | 23.6 | 19.7 | 23.7 | 19.8 |
| | 55 (Loopback) | 23.6 | 19.4 | 23.5 | 19.7 | 23.6 | 19.6 |
| RC2 | 9 (Loopback) | **23.9** | **19.9** | 23.6 | 19.8 | 23.5 | 19.7 |
| | 55 (Loopback) | 23.5 | 19.4 | 23.5 | 19.6 | 23.6 | 19.7 |
| RC3 | 2 (Loopback) | 23.5 | 19.4 | 23.4 | 19.5 | 23.5 | 19.5 |
| | 55 (Loopback) | 23.8 | 19.6 | 23.3 | 19.5 | 23.5 | 19.5 |
| | 32 (+ F-SCH) | 23.5 | 19.5 | 23.5 | 19.7 | 23.5 | 19.8 |
| | 32 (+ SCH) | 23.5 | 19.6 | 23.5 | 19.8 | 23.2 | 19.5 |
| RC4 | 2 (Loopback) | 23.4 | 19.5 | 23.5 | 19.7 | 23.4 | 19.7 |
| | 55 (Loopback) | 23.4 | 19.6 | 23.5 | 19.7 | 23.4 | 19.7 |
| | 32 (+ F-SCH) | 23.5 | 19.6 | 23.6 | 19.7 | 23.5 | 19.8 |
| | 32 (+ SCH) | 23.5 | 19.6 | 23.3 | 19.7 | 23.2 | 19.5 |
| RC5 | 9 (Loopback) | 23.6 | 19.6 | 23.1 | 19.7 | 23.4 | 19.8 |
| | 55 (Loopback) | 23.6 | 19.6 | 23.2 | 19.8 | 23.4 | 19.7 |
| *RC11 | 2 (Loopback) | 23.5 | 19.4 | 22.8 | 19.6 | 23.5 | 19.6 |
| | 75 (Loopback) | 23.6 | 19.5 | 23.1 | 19.8 | 23.4 | 19.7 |
| | 32 (+ F-SCH) | 23.5 | 19.6 | 23.1 | 19.8 | 23.5 | 19.8 |
| | 32 (+ SCH) | 23.5 | 19.6 | 23.1 | 19.7 | 23.5 | 19.7 |

**CDMA2000 1xEV-DO - Release 0 (REV 0)**

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

**RESULTS**

## 7.2.5. 1xEV-DO - REV 0, MODEL: A1634 (LAT)

**CDMA2000 EVDO REV. 0 800MHz SECONDARY BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 450 | 817.25 | **30.4** | **24.3** |
| | | 560 | 820.00 | 30.2 | 24.0 |
| | | 670 | 822.75 | 30.3 | 24.1 |

**CDMA2000 EVDO REV 0 850MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 1013 | 824.70 | 30.8 | 24.9 |
| | | 384 | 836.52 | **31.0** | **25.0** |
| | | 777 | 848.31 | 30.9 | 24.9 |

**CDMA2000 EVDO REV 0 1900MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 25 | 1851.25 | **29.7** | **24.8** |
| | | 600 | 1880.00 | 29.3 | 24.7 |
| | | 1175 | 1908.75 | 29.2 | 24.7 |

**CDMA2000 EVDO REV. 0 1700MHz BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 25 | 1711.25 | 30.2 | 24.7 |
| | | 450 | 1732.50 | **30.4** | **24.8** |
| | | 875 | 1753.75 | 30.3 | 24.8 |

## 7.2.6. 1xEV-DO - REV 0, MODEL: A1634 (UAT)

**CDMA2000 EVDO REV. 0 800MHz SECONDARY BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 450 | 817.25 | 27.9 | 22.8 |
| | | 560 | 820.00 | 28.1 | 22.8 |
| | | 670 | 822.75 | **28.3** | **22.9** |

**CDMA2000 EVDO REV 0 850MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 1013 | 824.70 | 28.0 | 22.8 |
| | | 384 | 836.52 | **28.2** | **22.9** |
| | | 777 | 848.31 | 27.9 | 22.9 |

**CDMA2000 EVDO REV 0 1900MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 25 | 1851.25 | 22.6 | 18.1 |
| | | 600 | 1880.00 | 22.6 | 18.1 |
| | | 1175 | 1908.75 | **22.9** | **18.2** |

**CDMA2000 EVDO REV. 0 1700MHz BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 25 | 1711.25 | 24.0 | 19.5 |
| | | 450 | 1732.50 | 24.4 | 19.7 |
| | | 875 | 1753.75 | **24.5** | **19.8** |

## 7.2.7. 1xEV-DO - REV 0, MODEL: A1687 (LAT)

**CDMA2000 EVDO REV. 0 800MHz SECONDARY BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 450 | 817.25 | **30.2** | **24.2** |
| | | 560 | 820.00 | 29.9 | 23.8 |
| | | 670 | 822.75 | 30.1 | 23.8 |

**CDMA2000 EVDO REV 0 850MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 1013 | 824.70 | 30.7 | 24.8 |
| | | 384 | 836.52 | **30.8** | **24.8** |
| | | 777 | 848.31 | 30.8 | 24.8 |

**CDMA2000 EVDO REV 0 1900MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 25 | 1851.25 | **29.6** | **24.7** |
| | | 600 | 1880.00 | 29.1 | 24.6 |
| | | 1175 | 1908.75 | 28.9 | 24.6 |

**CDMA2000 EVDO REV. 0 1700MHz BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 25 | 1711.25 | 30.1 | 24.6 |
| | | 450 | 1732.50 | **30.3** | **24.7** |
| | | 875 | 1753.75 | 30.1 | 24.6 |

## 7.2.8. 1xEV-DO - REV 0, MODEL: A1687 (UAT)

**CDMA2000 EVDO REV. 0 800MHz SECONDARY BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 450 | 817.25 | 27.8 | 22.7 |
| | | 560 | 820.00 | 28.0 | **22.7** |
| | | 670 | 822.75 | **28.1** | 22.7 |

**CDMA2000 EVDO REV 0 850MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 1013 | 824.70 | **27.8** | **22.7** |
| | | 384 | 836.52 | 27.7 | 22.5 |
| | | 777 | 848.31 | 27.8 | 22.7 |

**CDMA2000 EVDO REV 0 1900MHz BAND**

| FTAP Rate | RTAP Rate | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2 Kbps (2 slot QPSK) | 153.6 Kbps | 25 | 1851.25 | 22.5 | 18.0 |
| | | 600 | 1880.00 | 22.5 | 18.0 |
| | | 1175 | 1908.75 | **22.7** | **18.0** |

**CDMA2000 EVDO REV. 0 1700MHz BAND**

| FTAP Rate | RTAP Rate | Channel | f (MHz) | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|
| | | | | Peak | Average |
| 307.2 kbps (2 Slot QPSK) | 153.6 kbps | 25 | 1711.25 | 24.0 | 19.4 |
| | | 450 | 1732.50 | 24.3 | 19.5 |
| | | 875 | 1753.75 | **24.4** | **19.7** |

**CDMA2000 1xEV-DO - Revision A (REV A)**

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

| Application | Rev, License |
|---|---|
| 1xEV-DO Terminal Test | A.09.13 |

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2 > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000: 00000000: 00000000: 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2 > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000: 00000000: 00000000: 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

**RESULTS**

## 7.2.9. 1xEV-DO - REV A, MODEL: 1634(LAT)

**CDMA2000 EVDO REV A 800MHz SECONDARY BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 450 | 817.25 | **31.1** | **25.0** |
| | | 560 | 820.00 | 31.0 | 24.9 |
| | | 670 | 822.75 | 31.0 | 24.8 |

**CDMA2000 EVDO REV A 850MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 1013 | 824.70 | 30.9 | 24.9 |
| | | 384 | 836.52 | **31.1** | **25.0** |
| | | 777 | 848.31 | 31.0 | 25.0 |

**CDMA2000 EVDO REV A 1900MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1851.25 | **29.9** | **25.0** |
| | | 600 | 1880.00 | 29.6 | 24.8 |
| | | 1175 | 1908.75 | 29.7 | 24.9 |

**CDMA2000 EVDO REV A 1700MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1711.25 | **30.8** | **25.0** |
| | | 450 | 1732.50 | 30.7 | 24.9 |
| | | 875 | 1753.75 | 30.7 | 24.8 |

## 7.2.10. 1xEV-DO - REV A, MODEL: 1634(UAT)

**CDMA2000 EVDO REV A 800MHz SECONDARY BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 450 | 817.25 | 28.5 | 22.9 |
| | | 560 | 820.00 | 28.7 | 22.9 |
| | | 670 | 822.75 | **28.7** | **23.0** |

**CDMA2000 EVDO REV A 850MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 1013 | 824.70 | 28.7 | 23.0 |
| | | 384 | 836.52 | **28.7** | **23.0** |
| | | 777 | 848.31 | 28.2 | 22.9 |

**CDMA2000 EVDO REV A 1900MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1851.25 | 23.1 | 18.2 |
| | | 600 | 1880.00 | 23.0 | 18.2 |
| | | 1175 | 1908.75 | **23.3** | **18.3** |

**CDMA2000 EVDO REV A 1700MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1711.25 | 24.7 | 19.8 |
| | | 450 | 1732.50 | 24.8 | 19.9 |
| | | 875 | 1753.75 | **25.0** | **20.0** |

## 7.2.11. 1xEV-DO - REV A, MODEL: 1687(LAT)

**CDMA2000 EVDO REV A 800MHz SECONDARY BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 450 | 817.25 | **31.0** | **24.9** |
| | | 560 | 820.00 | 30.9 | 24.8 |
| | | 670 | 822.75 | 30.9 | 24.7 |

**CDMA2000 EVDO REV A 850MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 1013 | 824.70 | 30.8 | 24.8 |
| | | 384 | 836.52 | **31.0** | **24.9** |
| | | 777 | 848.31 | 30.8 | 24.8 |

**CDMA2000 EVDO REV A 1900MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1851.25 | **29.8** | **24.8** |
| | | 600 | 1880.00 | 29.5 | 24.7 |
| | | 1175 | 1908.75 | 29.5 | 24.7 |

**CDMA2000 EVDO REV A 1700MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1711.25 | **30.7** | **24.9** |
| | | 450 | 1732.50 | 30.6 | 24.8 |
| | | 875 | 753.75 | 30.4 | 24.6 |

## 7.2.12. 1xEV-DO - REV A, MODEL: 1687(UAT)

**CDMA2000 EVDO REV A 800MHz SECONDARY BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 450 | 817.25 | 28.4 | 22.8 |
| | | 560 | 820.00 | **28.5** | **22.8** |
| | | 670 | 822.75 | 28.5 | 22.7 |

**CDMA2000 EVDO REV A 850MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 1013 | 824.70 | 28.6 | 22.8 |
| | | 384 | 836.52 | **28.6** | **22.9** |
| | | 777 | 848.31 | 28.0 | 22.7 |

**CDMA2000 EVDO REV A 1900MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1851.25 | 22.9 | 18.0 |
| | | 600 | 1880.00 | 22.8 | 18.0 |
| | | 1175 | 1908.75 | **23.1** | **18.2** |

**CDMA2000 EVDO REV A 1700MHz BAND**

| FETAP Traffic Format | RETAP Data Payload Size | Channel | Frequency (MHz) | Peak Conducted Power (dBm) | Average Conducted Power (dBm) |
|---|---|---|---|---|---|
| 307.2k, QPSK / ACK channel is transmitted at all the slots | 4096 | 25 | 1711.25 | 24.6 | 19.7 |
| | | 450 | 1732.50 | 24.5 | 19.7 |
| | | 875 | 1753.75. | **24.9** | **19.9** |

## 7.3. UMTS

**TEST PROCEDURE**

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW.≥ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

**UMTS REL99**

The following summary of these settings are illustrated below:

| | Mode | Rel99 |
|---|---|---|
| | Subtest | - |
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | HSDPA FRC | Not Applicable |
| | HSUPA Test | Not Applicable |
| | Power Control Algorithm | Algorithm2 |
| | βc | Not Applicable |
| | βd | Not Applicable |
| | βec | Not Applicable |
| | βc/βd | 8/15 |
| | βhs | Not Applicable |
| | βed | Not Applicable |

**RESULTS**

## 7.3.1. UMTS REL99 MODEL: A1634 (LAT)

**REL 99**

**Part 22 850MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 850MHz | 4132 | 4357 | 826.4 | 29.5 | 25.0 |
| | 4183 | 4408 | 836.6 | **29.5** | **25.0** |
| | 4233 | 4458 | 846.6 | 29.1 | 25.0 |

**Part 24 1900MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1900MHz | 9262 | 9662 | 1852.4 | **29.4** | **24.9** |
| | 9400 | 9800 | 1880.0 | 29.3 | 24.9 |
| | 9538 | 9938 | 1907.6 | 29.4 | 24.9 |

**Part 27 1700MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1700MHz | 1312 | 1537 | 1712.4 | 29.2 | 25.0 |
| | 1413 | 1638 | 1732.6 | **29.3** | **25.0** |
| | 1513 | 1738 | 1752.6 | 29.1 | 24.9 |

## 7.3.2. UMTS REL99 MODEL: A1634 (UAT)

**REL99**

**Part 22 850MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 850MHz | 4132 | 4357 | 826.4 | 27.5 | 23.0 |
| | 4183 | 4408 | 836.6 | **27.7** | **23.0** |
| | 4233 | 4458 | 846.6 | 27.3 | 23.0 |

**Part 24 1900MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1900MHz | 9262 | 9662 | 1852.4 | 22.3 | 18.3 |
| | 9400 | 9800 | 1880.0 | 22.2 | 18.3 |
| | 9538 | 9938 | 1907.6 | **22.4** | **18.3** |

**Part 27 1700MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1700MHz | 1312 | 1537 | 1712.4 | **24.0** | **20.0** |
| | 1413 | 1638 | 1732.6 | 23.9 | 20.0 |
| | 1513 | 1738 | 1752.6 | 23.9 | 20.0 |

## 7.3.3. UMTS REL99 MODEL: A1687 (LAT)

**REL 99**

**Part 22 850MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 850MHz | 4132 | 4357 | 826.4 | **29.4** | **24.9** |
| | 4183 | 4408 | 836.6 | 29.3 | 24.8 |
| | 4233 | 4458 | 846.6 | 29.1 | 24.8 |

**Part 24 1900MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1900MHz | 9262 | 9662 | 1852.4 | 29.1 | 24.8 |
| | 9400 | 9800 | 1880.0 | 29.0 | 24.6 |
| | 9538 | 9938 | 1907.6 | **29.3** | **24.8** |

**Part 27 1700MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1700MHz | 1312 | 1537 | 1712.4 | 29.1 | 24.8 |
| | 1413 | 1638 | 1732.6 | **29.2** | **24.9** |
| | 1513 | 1738 | 1752.6 | 29.0 | 24.8 |

## 7.3.4. UMTS REL99 MODEL: A1687 (UAT)

**REL99**

**Part 22 850MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 850MHz | 4132 | 4357 | 826.4 | 27.4 | 22.9 |
| | 4183 | 4408 | 836.6 | **27.5** | 22.8 |
| | 4233 | 4458 | 846.6 | 27.2 | **22.9** |

**Part 24 1900MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1900MHz | 9262 | 9662 | 1852.4 | **22.3** | **18.1** |
| | 9400 | 9800 | 1880.0 | 22.0 | 18.1 |
| | 9538 | 9938 | 1907.6 | 22.2 | 17.9 |

**Part 27 1700MHz Band**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|
| UMTS Rel. 99 1700MHz | 1312 | 1537 | 1712.4 | **23.9** | **19.9** |
| | 1413 | 1638 | 1732.6 | 23.7 | 19.8 |
| | 1513 | 1738 | 1752.6 | 23.7 | 19.8 |

**HSDPA REL 5**

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

| | Mode | Rel5 HSDPA | | | |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 12/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 15/8 | 15/4 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR (dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs =βhs/βc | 30/15 | | | |

**Result**

## 7.3.5. HSDPA REL 5, MODEL: A1634 (LAT)

**HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | 28.4 | 24.0 |
| | | 4183 | 4408 | 836.6 | 28.4 | 24.0 |
| | | 4233 | 4458 | 846.6 | **28.6** | **24.0** |
| | 2 | 4132 | 4357 | 826.4 | 28.5 | 24.0 |
| | | 4183 | 4408 | 836.6 | 28.5 | 24.0 |
| | | 4233 | 4458 | 846.6 | 28.6 | 24.0 |
| | 3 | 4132 | 4357 | 826.4 | 28.0 | 23.3 |
| | | 4183 | 4408 | 836.6 | 28.1 | 23.3 |
| | | 4233 | 4458 | 846.6 | 28.1 | 23.3 |
| | 4 | 4132 | 4357 | 826.4 | 28.0 | 23.3 |
| | | 4183 | 4408 | 836.6 | 28.1 | 23.3 |
| | | 4233 | 4458 | 846.6 | 28.2 | 23.3 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | **28.6** | **24.0** |
| | | 9400 | 9800 | 1880.0 | 28.3 | 24.0 |
| | | 9538 | 9938 | 1907.6 | 28.5 | 24.0 |
| | 2 | 9262 | 9662 | 1852.4 | 27.9 | 23.8 |
| | | 9400 | 9800 | 1880.0 | 28.0 | 23.9 |
| | | 9538 | 9938 | 1907.6 | 28.0 | 23.9 |
| | 3 | 9262 | 9662 | 1852.4 | 28.0 | 23.5 |
| | | 9400 | 9800 | 1880.0 | 28.2 | 23.5 |
| | | 9538 | 9938 | 1907.6 | 28.2 | 23.4 |
| | 4 | 9262 | 9662 | 1852.4 | 28.2 | 23.4 |
| | | 9400 | 9800 | 1880.0 | 28.1 | 23.3 |
| | | 9538 | 9938 | 1907.6 | 28.1 | 23.3 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | **28.6** | **24.0** |
| | | 1413 | 1638 | 1732.6 | 28.4 | 24.0 |
| | | 1513 | 1738 | 1752.6 | 28.2 | 24.0 |
| | 2 | 1312 | 1537 | 1712.4 | 28.5 | 23.9 |
| | | 1413 | 1638 | 1732.6 | 28.6 | 23.8 |
| | | 1513 | 1738 | 1752.6 | 28.5 | 23.8 |
| | 3 | 1312 | 1537 | 1712.4 | 28.2 | 23.5 |
| | | 1413 | 1638 | 1732.6 | 28.2 | 23.5 |
| | | 1513 | 1738 | 1752.6 | 28.1 | 23.5 |
| | 4 | 1312 | 1537 | 1712.4 | 28.0 | 23.5 |
| | | 1413 | 1638 | 1732.6 | 28.1 | 23.6 |
| | | 1513 | 1738 | 1752.6 | 28.0 | 23.5 |

## 7.3.6. HSDPA REL 5, MODEL: A1634 (UAT)

**HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | 26.6 | 22.0 |
| | | 4183 | 4408 | 836.6 | 26.5 | 22.0 |
| | | 4233 | 4458 | 846.6 | **26.7** | **22.0** |
| | 2 | 4132 | 4357 | 826.4 | 26.7 | 21.6 |
| | | 4183 | 4408 | 836.6 | 26.6 | 21.6 |
| | | 4233 | 4458 | 846.6 | 26.7 | 21.6 |
| | 3 | 4132 | 4357 | 826.4 | 26.5 | 21.5 |
| | | 4183 | 4408 | 836.6 | 26.6 | 21.5 |
| | | 4233 | 4458 | 846.6 | 26.6 | 21.5 |
| | 4 | 4132 | 4357 | 826.4 | 26.7 | 21.5 |
| | | 4183 | 4408 | 836.6 | 26.7 | 21.5 |
| | | 4233 | 4458 | 846.6 | 26.6 | 21.6 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 21.6 | 17.3 |
| | | 9400 | 9800 | 1880.0 | 21.4 | 17.3 |
| | | 9538 | 9938 | 1907.6 | **21.6** | **17.3** |
| | 2 | 9262 | 9662 | 1852.4 | 21.5 | 17.3 |
| | | 9400 | 9800 | 1880.0 | 21.5 | 17.3 |
| | | 9538 | 9938 | 1907.6 | 21.5 | 16.9 |
| | 3 | 9262 | 9662 | 1852.4 | 21.5 | 16.7 |
| | | 9400 | 9800 | 1880.0 | 21.4 | 16.7 |
| | | 9538 | 9938 | 1907.6 | 21.5 | 16.8 |
| | 4 | 9262 | 9662 | 1852.4 | 21.5 | 16.7 |
| | | 9400 | 9800 | 1880.0 | 21.5 | 16.8 |
| | | 9538 | 9938 | 1907.6 | 21.5 | 16.9 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | 23.0 | 19.0 |
| | | 1413 | 1638 | 1732.6 | 23.3 | **19.0** |
| | | 1513 | 1738 | 1752.6 | **23.3** | 18.9 |
| | 2 | 1312 | 1537 | 1712.4 | 23.1 | 18.7 |
| | | 1413 | 1638 | 1732.6 | 23.1 | 18.6 |
| | | 1513 | 1738 | 1752.6 | 23.1 | 18.6 |
| | 3 | 1312 | 1537 | 1712.4 | 23.3 | 18.5 |
| | | 1413 | 1638 | 1732.6 | 23.3 | 18.5 |
| | | 1513 | 1738 | 1752.6 | 23.1 | 18.5 |
| | 4 | 1312 | 1537 | 1712.4 | 23.3 | 18.5 |
| | | 1413 | 1638 | 1732.6 | 23.3 | 18.4 |
| | | 1513 | 1738 | 1752.6 | 23.1 | 18.5 |

## 7.3.7. HSDPA REL 5, MODEL: A1687 (LAT)

**HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | 28.4 | 23.9 |
| | | 4183 | 4408 | 836.6 | **28.6** | **23.9** |
| | | 4233 | 4458 | 846.6 | 28.5 | 23.8 |
| | 2 | 4132 | 4357 | 826.4 | 28.4 | 23.8 |
| | | 4183 | 4408 | 836.6 | 28.3 | 23.6 |
| | | 4233 | 4458 | 846.6 | 28.6 | 23.8 |
| | 3 | 4132 | 4357 | 826.4 | 28.5 | 23.1 |
| | | 4183 | 4408 | 836.6 | 28.6 | 23.2 |
| | | 4233 | 4458 | 846.6 | 28.2 | 23.0 |
| | 4 | 4132 | 4357 | 826.4 | 28.3 | 23.2 |
| | | 4183 | 4408 | 836.6 | 28.4 | 23.1 |
| | | 4233 | 4458 | 846.6 | 28.4 | 23.2 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 28.4 | 23.8 |
| | | 9400 | 9800 | 1880.0 | 27.9 | 23.6 |
| | | 9538 | 9938 | 1907.6 | **28.4** | **23.9** |
| | 2 | 9262 | 9662 | 1852.4 | 28.1 | 23.6 |
| | | 9400 | 9800 | 1880.0 | 28.4 | 23.8 |
| | | 9538 | 9938 | 1907.6 | 28.3 | 23.7 |
| | 3 | 9262 | 9662 | 1852.4 | 28.3 | 23.4 |
| | | 9400 | 9800 | 1880.0 | 28.3 | 23.3 |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.3 |
| | 4 | 9262 | 9662 | 1852.4 | 28.2 | 23.2 |
| | | 9400 | 9800 | 1880.0 | 28.2 | 23.2 |
| | | 9538 | 9938 | 1907.6 | 28.1 | 22.9 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | **28.4** | **23.9** |
| | | 1413 | 1638 | 1732.6 | 28.2 | 23.8 |
| | | 1513 | 1738 | 1752.6 | 28.1 | 23.9 |
| | 2 | 1312 | 1537 | 1712.4 | 28.3 | 23.7 |
| | | 1413 | 1638 | 1732.6 | 28.4 | 23.7 |
| | | 1513 | 1738 | 1752.6 | 28.1 | 23.4 |
| | 3 | 1312 | 1537 | 1712.4 | 28.3 | 23.3 |
| | | 1413 | 1638 | 1732.6 | 28.3 | 23.3 |
| | | 1513 | 1738 | 1752.6 | 28.3 | 23.3 |
| | 4 | 1312 | 1537 | 1712.4 | 28.4 | 23.4 |
| | | 1413 | 1638 | 1732.6 | 28.3 | 23.3 |
| | | 1513 | 1738 | 1752.6 | 28.3 | 23.3 |

## 7.3.8. HSDPA REL 5, MODEL: A1687 (UAT)

**HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | **26.5** | **21.9** |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.9 |
| | | 4233 | 4458 | 846.6 | 26.2 | 21.8 |
| | 2 | 4132 | 4357 | 826.4 | 26.2 | 21.4 |
| | | 4183 | 4408 | 836.6 | 26.2 | 21.2 |
| | | 4233 | 4458 | 846.6 | 26.4 | 21.4 |
| | 3 | 4132 | 4357 | 826.4 | 26.3 | 21.3 |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.4 |
| | | 4233 | 4458 | 846.6 | 26.4 | 21.2 |
| | 4 | 4132 | 4357 | 826.4 | 26.2 | 21.3 |
| | | 4183 | 4408 | 836.6 | 26.2 | 21.3 |
| | | 4233 | 4458 | 846.6 | 26.4 | 21.5 |

**Part 24 / RSS 133 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | **21.4** | **17.2** |
| | | 9400 | 9800 | 1880.0 | 21.2 | 17.1 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 17.1 |
| | 2 | 9262 | 9662 | 1852.4 | 21.3 | 17.1 |
| | | 9400 | 9800 | 1880.0 | 21.1 | 16.9 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 16.7 |
| | 3 | 9262 | 9662 | 1852.4 | 21.3 | 16.5 |
| | | 9400 | 9800 | 1880.0 | 21.3 | 16.6 |
| | | 9538 | 9938 | 1907.6 | 21.3 | 16.5 |
| | 4 | 9262 | 9662 | 1852.4 | 21.4 | 16.6 |
| | | 9400 | 9800 | 1880.0 | 21.3 | 16.6 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 16.8 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | 22.9 | 18.9 |
| | | 1413 | 1638 | 1732.6 | **23.2** | **18.9** |
| | | 1513 | 1738 | 1752.6 | 23.1 | 18.7 |
| | 2 | 1312 | 1537 | 1712.4 | 22.9 | 18.5 |
| | | 1413 | 1638 | 1732.6 | 22.7 | 18.2 |
| | | 1513 | 1738 | 1752.6 | 22.9 | 18.5 |
| | 3 | 1312 | 1537 | 1712.4 | 23.1 | 18.3 |
| | | 1413 | 1638 | 1732.6 | 23.2 | 18.3 |
| | | 1513 | 1738 | 1752.6 | 22.9 | 18.3 |
| | 4 | 1312 | 1537 | 1712.4 | 23.1 | 18.4 |
| | | 1413 | 1638 | 1732.6 | 23.1 | 18.2 |
| | | 1513 | 1738 | 1752.6 | 23.0 | 18.4 |

## HSPA REL 6 (HSDPA & HSUPA)

## TEST PROCEDURE

The following summary of these settings are illustrated below:

| | Mode | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | βc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | βd | 15/15 | 15/15 | 9/15 | 15/15 | 0 |
| | βec | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | βc/βd | 11/15 | 6/15 | 15/9 | 2/15 | 15/1 |
| | βhs | 22/15 | 12/15 | 30/15 | 4/15 | 5/15 |
| | βed | 1309/225 | 94/75 | 47/15 | 56/75 | 47/15 |
| | CM (dB) | 1 | 3 | 2 | 3 | 1 |
| | MPR (dB) | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | D E-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 12 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 67 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_TFCIs | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO 23<br>E-TFCI 75<br>E-TFCI PO 26<br>E-TFCI 81<br>E-TFCI PO 27 | | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 92<br>E-TFCI PO 18 | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO 23<br>E-TFCI 75<br>E-TFCI PO 26<br>E-TFCI 81<br>E-TFCI PO 27 | |

## RESULTS

## 7.3.9. HSPA REL 6 (HSDPA & HSUPA), MODEL: A1634 (LAT)

**HSUPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 850MHz | 1 | 4132 | 4357 | 826.4 | **28.4** | 23.9 |
| | | 4183 | 4408 | 836.6 | 28.3 | 23.9 |
| | | 4233 | 4458 | 846.6 | 28.1 | **23.9** |
| | 2 | 4132 | 4357 | 826.4 | 27.4 | 22.9 |
| | | 4183 | 4408 | 836.6 | 27.4 | 23.0 |
| | | 4233 | 4458 | 846.6 | 27.3 | 23.0 |
| | 3 | 4132 | 4357 | 826.4 | 28.0 | 23.9 |
| | | 4183 | 4408 | 836.6 | 27.8 | 23.9 |
| | | 4233 | 4458 | 846.6 | 27.9 | 23.9 |
| | 4 | 4132 | 4357 | 826.4 | 27.0 | 22.9 |
| | | 4183 | 4408 | 836.6 | 27.1 | 22.9 |
| | | 4233 | 4458 | 846.6 | 27.0 | 22.9 |
| | 5 | 4132 | 4357 | 826.4 | 28.0 | 23.9 |
| | | 4183 | 4408 | 836.6 | 28.0 | 23.9 |
| | | 4233 | 4458 | 846.6 | 27.9 | 23.9 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Ch | DL Ch | Frequency | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|---|
| | | | | | Peak | Average |
| UMTS HSUPA 1900MHz (Band 2) | 1 | 9262 | 9662 | 1852.4 | 28.4 | 23.9 |
| | | 9400 | 9800 | 1880.0 | **28.5** | **23.9** |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.9 |
| | 2 | 9262 | 9662 | 1852.4 | 27.4 | 22.8 |
| | | 9400 | 9800 | 1880.0 | 27.3 | 22.9 |
| | | 9538 | 9938 | 1907.6 | 27.4 | 22.8 |
| | 3 | 9262 | 9662 | 1852.4 | 28.4 | 23.9 |
| | | 9400 | 9800 | 1880.0 | 28.4 | 23.9 |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.9 |
| | 4 | 9262 | 9662 | 1852.4 | 27.5 | 22.9 |
| | | 9400 | 9800 | 1880.0 | 27.4 | 23.0 |
| | | 9538 | 9938 | 1907.6 | 27.5 | 22.9 |
| | 5 | 9262 | 9662 | 1852.4 | 28.4 | 23.9 |
| | | 9400 | 9800 | 1880.0 | 28.4 | 23.9 |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.9 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | 28.4 | 23.9 |
| | | 1413 | 1638 | 1732.6 | **28.5** | **24.0** |
| | | 1513 | 1738 | 1752.6 | 28.4 | 23.9 |
| | 2 | 1312 | 1537 | 1712.4 | 27.5 | 22.9 |
| | | 1413 | 1638 | 1732.6 | 27.3 | 22.9 |
| | | 1513 | 1738 | 1752.6 | 27.1 | 22.9 |
| | 3 | 1312 | 1537 | 1712.4 | 28.5 | 23.9 |
| | | 1413 | 1638 | 1732.6 | 28.4 | 23.9 |
| | | 1513 | 1738 | 1752.6 | 28.4 | 23.9 |
| | 4 | 1312 | 1537 | 1712.4 | 27.3 | 22.8 |
| | | 1413 | 1638 | 1732.6 | 27.3 | 22.9 |
| | | 1513 | 1738 | 1752.6 | 27.2 | 22.9 |
| | 5 | 1312 | 1537 | 1712.4 | 28.4 | 23.9 |
| | | 1413 | 1638 | 1732.6 | 28.4 | 23.9 |
| | | 1513 | 1738 | 1752.6 | 28.5 | 23.9 |

## 7.3.10. HSPA REL 6 (HSDPA & HSUPA), MODEL: A1634 (UAT)

**HSUPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 850MHz | 1 | 4132 | 4357 | 826.4 | 26.4 | 21.9 |
| | | 4183 | 4408 | 836.6 | **26.5** | **21.9** |
| | | 4233 | 4458 | 846.6 | 26.4 | 21.9 |
| | 2 | 4132 | 4357 | 826.4 | 25.0 | 20.5 |
| | | 4183 | 4408 | 836.6 | 25.1 | 20.6 |
| | | 4233 | 4458 | 846.6 | 25.2 | 20.5 |
| | 3 | 4132 | 4357 | 826.4 | 26.4 | 21.9 |
| | | 4183 | 4408 | 836.6 | 26.5 | 21.9 |
| | | 4233 | 4458 | 846.6 | 26.3 | 21.9 |
| | 4 | 4132 | 4357 | 826.4 | 25.1 | 20.5 |
| | | 4183 | 4408 | 836.6 | 25.1 | 20.5 |
| | | 4233 | 4458 | 846.6 | 25.0 | 20.5 |
| | 5 | 4132 | 4357 | 826.4 | 26.4 | 21.9 |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.9 |
| | | 4233 | 4458 | 846.6 | 26.4 | 21.9 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Ch | DL Ch | Frequency | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|---|
| | | | | | Peak | Average |
| UMTS HSUPA 1900MHz (Band 2) | 1 | 9262 | 9662 | 1852.4 | 21.5 | 17.2 |
| | | 9400 | 9800 | 1880.0 | 21.5 | 17.2 |
| | | 9538 | 9938 | 1907.6 | **21.5** | **17.2** |
| | 2 | 9262 | 9662 | 1852.4 | 20.7 | 16.2 |
| | | 9400 | 9800 | 1880.0 | 20.7 | 16.2 |
| | | 9538 | 9938 | 1907.6 | 20.6 | 16.2 |
| | 3 | 9262 | 9662 | 1852.4 | 21.5 | 17.2 |
| | | 9400 | 9800 | 1880.0 | 21.5 | 17.2 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 17.2 |
| | 4 | 9262 | 9662 | 1852.4 | 20.3 | 16.2 |
| | | 9400 | 9800 | 1880.0 | 20.5 | 16.2 |
| | | 9538 | 9938 | 1907.6 | 20.5 | 16.1 |
| | 5 | 9262 | 9662 | 1852.4 | 21.4 | 17.2 |
| | | 9400 | 9800 | 1880.0 | 21.4 | 17.2 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 17.2 |

**Part 27_1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | **23.2** | **18.9** |
| | | 1413 | 1638 | 1732.6 | 23.2 | 18.9 |
| | | 1513 | 1738 | 1752.6 | 23.1 | 18.9 |
| | 2 | 1312 | 1537 | 1712.4 | 22.6 | 17.9 |
| | | 1413 | 1638 | 1732.6 | 22.6 | 17.8 |
| | | 1513 | 1738 | 1752.6 | 22.6 | 17.8 |
| | 3 | 1312 | 1537 | 1712.4 | 23.1 | 18.9 |
| | | 1413 | 1638 | 1732.6 | 23.2 | 18.9 |
| | | 1513 | 1738 | 1752.6 | 23.1 | 18.9 |
| | 4 | 1312 | 1537 | 1712.4 | 22.1 | 17.9 |
| | | 1413 | 1638 | 1732.6 | 22.2 | 17.9 |
| | | 1513 | 1738 | 1752.6 | 22.1 | 17.9 |
| | 5 | 1312 | 1537 | 1712.4 | 23.1 | 18.8 |
| | | 1413 | 1638 | 1732.6 | 23.1 | 18.9 |
| | | 1513 | 1738 | 1752.6 | 23.2 | 18.9 |

## 7.3.11. HSPA REL 6 (HSDPA & HSUPA), MODEL: A1687 (LAT)

**HSUPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 850MHz | 1 | 4132 | 4357 | 826.4 | 28.3 | 23.8 |
| | | 4183 | 4408 | 836.6 | **28.4** | **23.8** |
| | | 4233 | 4458 | 846.6 | 28.2 | 23.7 |
| | 2 | 4132 | 4357 | 826.4 | 27.3 | 22.6 |
| | | 4183 | 4408 | 836.6 | 27.2 | 22.5 |
| | | 4233 | 4458 | 846.6 | 27.4 | 22.7 |
| | 3 | 4132 | 4357 | 826.4 | 28.3 | 23.7 |
| | | 4183 | 4408 | 836.6 | 28.2 | 23.8 |
| | | 4233 | 4458 | 846.6 | 28.2 | 23.6 |
| | 4 | 4132 | 4357 | 826.4 | 27.3 | 22.6 |
| | | 4183 | 4408 | 836.6 | 27.3 | 22.6 |
| | | 4233 | 4458 | 846.6 | 27.4 | 22.7 |
| | 5 | 4132 | 4357 | 826.4 | 28.3 | 23.7 |
| | | 4183 | 4408 | 836.6 | 28.3 | 23.6 |
| | | 4233 | 4458 | 846.6 | 28.1 | 23.5 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Ch | DL Ch | Frequency | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|---|
| | | | | | Peak | Average |
| UMTS HSUPA 1900MHz (Band 2) | 1 | 9262 | 9662 | 1852.4 | 28.4 | 23.8 |
| | | 9400 | 9800 | 1880.0 | **28.4** | **23.8** |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.7 |
| | 2 | 9262 | 9662 | 1852.4 | 27.2 | 22.5 |
| | | 9400 | 9800 | 1880.0 | 26.9 | 22.4 |
| | | 9538 | 9938 | 1907.6 | 27.3 | 22.6 |
| | 3 | 9262 | 9662 | 1852.4 | 28.3 | 23.7 |
| | | 9400 | 9800 | 1880.0 | 28.3 | 23.8 |
| | | 9538 | 9938 | 1907.6 | 28.3 | 23.6 |
| | 4 | 9262 | 9662 | 1852.4 | 27.3 | 22.7 |
| | | 9400 | 9800 | 1880.0 | 27.2 | 22.7 |
| | | 9538 | 9938 | 1907.6 | 27.4 | 22.7 |
| | 5 | 9262 | 9662 | 1852.4 | 28.4 | 23.7 |
| | | 9400 | 9800 | 1880.0 | 28.3 | 23.8 |
| | | 9538 | 9938 | 1907.6 | 28.1 | 23.5 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | 28.2 | 23.7 |
| | | 1413 | 1638 | 1732.6 | **28.4** | **23.8** |
| | | 1513 | 1738 | 1752.6 | 28.2 | 23.6 |
| | 2 | 1312 | 1537 | 1712.4 | 27.3 | 22.7 |
| | | 1413 | 1638 | 1732.6 | 27.0 | 22.6 |
| | | 1513 | 1738 | 1752.6 | 26.9 | 22.7 |
| | 3 | 1312 | 1537 | 1712.4 | 28.3 | 23.7 |
| | | 1413 | 1638 | 1732.6 | 28.3 | 23.8 |
| | | 1513 | 1738 | 1752.6 | 28.0 | 23.5 |
| | 4 | 1312 | 1537 | 1712.4 | 27.2 | 22.7 |
| | | 1413 | 1638 | 1732.6 | 27.1 | 22.7 |
| | | 1513 | 1738 | 1752.6 | 27.0 | 22.6 |
| | 5 | 1312 | 1537 | 1712.4 | 28.3 | 23.8 |
| | | 1413 | 1638 | 1732.6 | 28.2 | 23.7 |
| | | 1513 | 1738 | 1752.6 | 28.2 | 23.7 |

## 7.3.12. HSPA REL 6 (HSDPA & HSUPA), MODEL: A1687 (UAT)

**HSUPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 850MHz | 1 | 4132 | 4357 | 826.4 | 26.4 | 21.8 |
| | | 4183 | 4408 | 836.6 | **26.5** | **21.8** |
| | | 4233 | 4458 | 846.6 | 26.2 | 21.7 |
| | 2 | 4132 | 4357 | 826.4 | 24.7 | 20.2 |
| | | 4183 | 4408 | 836.6 | 24.6 | 20.1 |
| | | 4233 | 4458 | 846.6 | 25.0 | 20.3 |
| | 3 | 4132 | 4357 | 826.4 | 26.2 | 21.7 |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.8 |
| | | 4233 | 4458 | 846.6 | 26.3 | 21.6 |
| | 4 | 4132 | 4357 | 826.4 | 25.3 | 20.8 |
| | | 4183 | 4408 | 836.6 | 25.3 | 20.6 |
| | | 4233 | 4458 | 846.6 | 25.2 | 20.8 |
| | 5 | 4132 | 4357 | 826.4 | 26.4 | 21.7 |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.8 |
| | | 4233 | 4458 | 846.6 | 26.0 | 21.5 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Ch | DL Ch | Frequency | Conducted Output Power (dBm) | |
|---|---|---|---|---|---|---|
| | | | | | Peak | Average |
| UMTS HSUPA 1900MHz (Band 2) | 1 | 9262 | 9662 | 1852.4 | **21.5** | **17.1** |
| | | 9400 | 9800 | 1880.0 | 21.4 | 17.0 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 17.0 |
| | 2 | 9262 | 9662 | 1852.4 | 20.4 | 15.5 |
| | | 9400 | 9800 | 1880.0 | 20.2 | 15.3 |
| | | 9538 | 9938 | 1907.6 | 20.4 | 15.6 |
| | 3 | 9262 | 9662 | 1852.4 | 21.3 | 17.0 |
| | | 9400 | 9800 | 1880.0 | 21.3 | 17.1 |
| | | 9538 | 9938 | 1907.6 | 21.2 | 16.9 |
| | 4 | 9262 | 9662 | 1852.4 | 20.2 | 16.0 |
| | | 9400 | 9800 | 1880.0 | 20.3 | 16.0 |
| | | 9538 | 9938 | 1907.6 | 20.4 | 16.0 |
| | 5 | 9262 | 9662 | 1852.4 | 21.3 | 17.0 |
| | | 9400 | 9800 | 1880.0 | 21.4 | 17.0 |
| | | 9538 | 9938 | 1907.6 | 21.1 | 16.8 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSUPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | **23.2** | 18.7 |
| | | 1413 | 1638 | 1732.6 | 22.8 | 18.5 |
| | | 1513 | 1738 | 1752.6 | 23.0 | **18.8** |
| | 2 | 1312 | 1537 | 1712.4 | 22.0 | 17.3 |
| | | 1413 | 1638 | 1732.6 | 22.1 | 17.3 |
| | | 1513 | 1738 | 1752.6 | 21.9 | 17.2 |
| | 3 | 1312 | 1537 | 1712.4 | 23.1 | 18.7 |
| | | 1413 | 1638 | 1732.6 | 23.0 | 18.7 |
| | | 1513 | 1738 | 1752.6 | 23.0 | 18.8 |
| | 4 | 1312 | 1537 | 1712.4 | 22.0 | 17.7 |
| | | 1413 | 1638 | 1732.6 | 22.1 | 17.7 |
| | | 1513 | 1738 | 1752.6 | 21.7 | 17.5 |
| | 5 | 1312 | 1537 | 1712.4 | 22.9 | 18.6 |
| | | 1413 | 1638 | 1732.6 | 23.0 | 18.7 |
| | | 1513 | 1738 | 1752.6 | 23.0 | 18.6 |

**DUAL CARRIER HSDPA**

**DC-HSDPA (Rel 8, CAT 24)**

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

**Table E.5.0: Levels for HSDPA connection setup**

| Parameter During Connection setup | Unit | Value |
|---|---|---|
| P-CPICH_Ec/Ior | dB | -10 |
| P-CCPCH and SCH_Ec/Ior | dB | -12 |
| PICH _Ec/Ior | dB | -15 |
| HS-PDSCH | dB | off |
| HS-SCCH_1 | dB | off |
| DPCH_Ec/Ior | dB | -5 |
| OCNS_Ec/Ior | dB | -3.1 |

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

| Parameter | Unit | Value |
|---|---|---|
| Nominal Avg. Inf. Bit Rate | kbps | 60 |
| Inter-TTI Distance | TTI's | 1 |
| Number of HARQ Processes | Processes | 6 |
| Information Bit Payload ( $N_{INF}$ ) | Bits | 120 |
| Number Code Blocks | Blocks | 1 |
| Binary Channel Bits Per TTI | Bits | 960 |
| Total Available SML's in UE | SML's | 19200 |
| Number of SML's per HARQ Proc. | SML's | 3200 |
| Coding Rate | | 0.15 |
| Number of Physical Channel Codes | Codes | 1 |
| Modulation | | QPSK |
| Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. | | |
| Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used. | | |

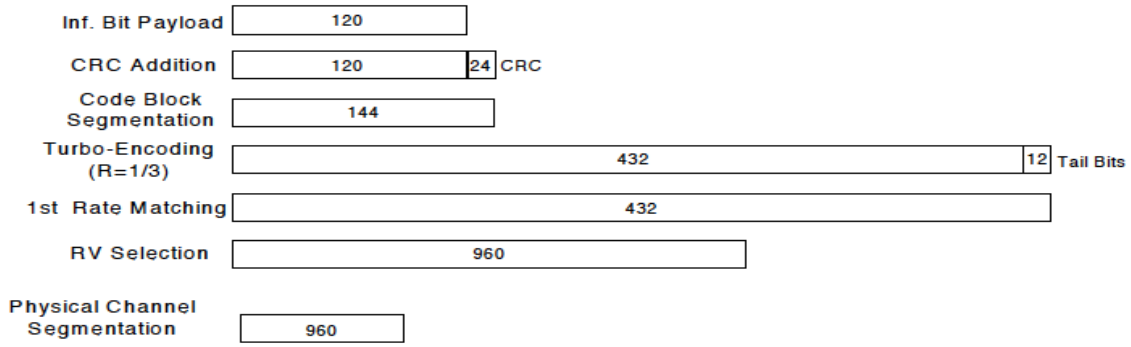



**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**

The following 4 Sub-tests for HSDPA were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

| | Mode | Rel6 HSDPA | Rel6 HSDPA | Rel6 HSDPA | Rel6 HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1A | | | |
| | Power Control Algorithm | Algorithm2 | | | |
| | βc | 2/15 | 12/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | βd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 15/8 | 15/4 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | DACK | 8 | | | |
| | DNAK | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack Repetition factor | 3 | | | |
| | CQI Feedback | 4ms | | | |
| | CQI Repetition Factor | 2 | | | |
| | Ahs = βhs/ βc | 30/15 | | | |

**RESULT**

## 7.3.13. DUAL CARRIER HSDPA, MODEL: A1634 (LAT)

**DC-HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | 28.5 | 23.9 |
| | | 4183 | 4408 | 836.6 | **28.7** | **23.9** |
| | | 4233 | 4458 | 846.6 | 28.6 | 23.8 |
| | 2 | 4132 | 4357 | 826.4 | 28.6 | 23.8 |
| | | 4183 | 4408 | 836.6 | 28.6 | 23.8 |
| | | 4233 | 4458 | 846.6 | 28.6 | 23.9 |
| | 3 | 4132 | 4357 | 826.4 | 28.5 | 23.2 |
| | | 4183 | 4408 | 836.6 | 28.5 | 23.3 |
| | | 4233 | 4458 | 846.6 | 28.5 | 23.3 |
| | 4 | 4132 | 4357 | 826.4 | 28.2 | 23.3 |
| | | 4183 | 4408 | 836.6 | 28.6 | 23.3 |
| | | 4233 | 4458 | 846.6 | 28.4 | 23.3 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 28.5 | 23.8 |
| | | 9400 | 9800 | 1880.0 | 28.4 | 23.8 |
| | | 9538 | 9938 | 1907.6 | **28.5** | **23.9** |
| | 2 | 9262 | 9662 | 1852.4 | 28.5 | 23.8 |
| | | 9400 | 9800 | 1880.0 | 28.5 | 23.8 |
| | | 9538 | 9938 | 1907.6 | 28.5 | 23.8 |
| | 3 | 9262 | 9662 | 1852.4 | 28.4 | 23.4 |
| | | 9400 | 9800 | 1880.0 | 28.4 | 23.3 |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.3 |
| | 4 | 9262 | 9662 | 1852.4 | 28.3 | 23.3 |
| | | 9400 | 9800 | 1880.0 | 28.3 | 23.3 |
| | | 9538 | 9938 | 1907.6 | 28.4 | 23.3 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | **28.5** | 23.9 |
| | | 1413 | 1638 | 1732.6 | 28.4 | 23.9 |
| | | 1513 | 1738 | 1752.6 | 28.4 | **23.9** |
| | 2 | 1312 | 1537 | 1712.4 | 28.5 | 23.9 |
| | | 1413 | 1638 | 1732.6 | 28.4 | 23.9 |
| | | 1513 | 1738 | 1752.6 | 28.5 | 23.9 |
| | 3 | 1312 | 1537 | 1712.4 | 28.4 | 23.5 |
| | | 1413 | 1638 | 1732.6 | 28.4 | 23.5 |
| | | 1513 | 1738 | 1752.6 | 28.4 | 23.5 |
| | 4 | 1312 | 1537 | 1712.4 | 28.5 | 23.2 |
| | | 1413 | 1638 | 1732.6 | 28.5 | 23.3 |
| | | 1513 | 1738 | 1752.6 | 28.4 | 23.4 |

## 7.3.14. DUAL CARRIER HSDPA, MODEL: A1634 (UAT)

**DC-HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | **26.5** | **21.9** |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.8 |
| | | 4233 | 4458 | 846.6 | 26.4 | 21.9 |
| | 2 | 4132 | 4357 | 826.4 | 26.5 | 21.9 |
| | | 4183 | 4408 | 836.6 | 25.9 | 21.8 |
| | | 4233 | 4458 | 846.6 | 26.1 | 21.8 |
| | 3 | 4132 | 4357 | 826.4 | 26.4 | 21.5 |
| | | 4183 | 4408 | 836.6 | 26.4 | 21.5 |
| | | 4233 | 4458 | 846.6 | 26.3 | 21.5 |
| | 4 | 4132 | 4357 | 826.4 | 26.3 | 21.5 |
| | | 4183 | 4408 | 836.6 | 26.0 | 21.4 |
| | | 4233 | 4458 | 846.6 | 26.1 | 21.5 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 21.5 | 17.2 |
| | | 9400 | 9800 | 1880.0 | **21.6** | **17.3** |
| | | 9538 | 9938 | 1907.6 | 21.4 | 17.2 |
| | 2 | 9262 | 9662 | 1852.4 | 21.6 | 17.2 |
| | | 9400 | 9800 | 1880.0 | 21.5 | 17.2 |
| | | 9538 | 9938 | 1907.6 | 21.5 | 17.2 |
| | 3 | 9262 | 9662 | 1852.4 | 21.3 | 16.7 |
| | | 9400 | 9800 | 1880.0 | 21.4 | 16.8 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 16.8 |
| | 4 | 9262 | 9662 | 1852.4 | 21.4 | 16.7 |
| | | 9400 | 9800 | 1880.0 | 21.4 | 16.7 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 16.8 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | 23.1 | 18.9 |
| | | 1413 | 1638 | 1732.6 | **23.6** | **18.9** |
| | | 1513 | 1738 | 1752.6 | 23.5 | 18.9 |
| | 2 | 1312 | 1537 | 1712.4 | 23.5 | 18.9 |
| | | 1413 | 1638 | 1732.6 | 23.3 | 18.9 |
| | | 1513 | 1738 | 1752.6 | 23.5 | 18.9 |
| | 3 | 1312 | 1537 | 1712.4 | 23.4 | 18.4 |
| | | 1413 | 1638 | 1732.6 | 23.4 | 18.5 |
| | | 1513 | 1738 | 1752.6 | 23.5 | 18.5 |
| | 4 | 1312 | 1537 | 1712.4 | 23.4 | 18.4 |
| | | 1413 | 1638 | 1732.6 | 23.5 | 18.5 |
| | | 1513 | 1738 | 1752.6 | 23.5 | 18.5 |

## 7.3.15. DUAL CARRIER HSDPA, MODEL: A1687 (LAT)

**DC-HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | 28.4 | 23.7 |
| | | 4183 | 4408 | 836.6 | **28.5** | **23.8** |
| | | 4233 | 4458 | 846.6 | 28.4 | 23.6 |
| | 2 | 4132 | 4357 | 826.4 | 28.4 | 23.6 |
| | | 4183 | 4408 | 836.6 | 28.2 | 23.4 |
| | | 4233 | 4458 | 846.6 | 28.5 | 23.7 |
| | 3 | 4132 | 4357 | 826.4 | 28.3 | 23.0 |
| | | 4183 | 4408 | 836.6 | 28.3 | 23.2 |
| | | 4233 | 4458 | 846.6 | 28.2 | 23.0 |
| | 4 | 4132 | 4357 | 826.4 | 28.1 | 23.1 |
| | | 4183 | 4408 | 836.6 | 28.4 | 23.1 |
| | | 4233 | 4458 | 846.6 | 28.3 | 23.2 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 28.3 | 23.6 |
| | | 9400 | 9800 | 1880.0 | 28.0 | 23.4 |
| | | 9538 | 9938 | 1907.6 | **28.4** | **23.7** |
| | 2 | 9262 | 9662 | 1852.4 | 28.3 | 23.6 |
| | | 9400 | 9800 | 1880.0 | 28.3 | 23.7 |
| | | 9538 | 9938 | 1907.6 | 28.2 | 23.6 |
| | 3 | 9262 | 9662 | 1852.4 | 28.3 | 23.3 |
| | | 9400 | 9800 | 1880.0 | 28.2 | 23.1 |
| | | 9538 | 9938 | 1907.6 | 28.3 | 23.2 |
| | 4 | 9262 | 9662 | 1852.4 | 28.1 | 23.1 |
| | | 9400 | 9800 | 1880.0 | 28.2 | 23.2 |
| | | 9538 | 9938 | 1907.6 | 28.0 | 22.9 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | **28.4** | 23.8 |
| | | 1413 | 1638 | 1732.6 | 28.2 | 23.7 |
| | | 1513 | 1738 | 1752.6 | 28.3 | **23.8** |
| | 2 | 1312 | 1537 | 1712.4 | 28.3 | 23.7 |
| | | 1413 | 1638 | 1732.6 | 28.3 | 23.8 |
| | | 1513 | 1738 | 1752.6 | 28.3 | 23.7 |
| | 3 | 1312 | 1537 | 1712.4 | 28.3 | 23.3 |
| | | 1413 | 1638 | 1732.6 | 28.0 | 23.1 |
| | | 1513 | 1738 | 1752.6 | 28.1 | 23.2 |
| | 4 | 1312 | 1537 | 1712.4 | 28.3 | 23.0 |
| | | 1413 | 1638 | 1732.6 | 28.2 | 23.1 |
| | | 1513 | 1738 | 1752.6 | 28.3 | 23.2 |

## 7.3.16. DUAL CARRIER HSDPA, MODEL: A1687 (UAT)

**DC-HSDPA**

**Part 22 850MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | **26.4** | **21.8** |
| | | 4183 | 4408 | 836.6 | 26.2 | 21.7 |
| | | 4233 | 4458 | 846.6 | 26.2 | 21.7 |
| | 2 | 4132 | 4357 | 826.4 | 26.3 | 21.7 |
| | | 4183 | 4408 | 836.6 | 25.5 | 21.4 |
| | | 4233 | 4458 | 846.6 | 26.0 | 21.7 |
| | 3 | 4132 | 4357 | 826.4 | 26.2 | 21.3 |
| | | 4183 | 4408 | 836.6 | 26.3 | 21.3 |
| | | 4233 | 4458 | 846.6 | 26.1 | 21.2 |
| | 4 | 4132 | 4357 | 826.4 | 26.2 | 21.4 |
| | | 4183 | 4408 | 836.6 | 25.8 | 21.2 |
| | | 4233 | 4458 | 846.6 | 26.0 | 21.4 |

**Part 24 1900MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 21.4 | 17.1 |
| | | 9400 | 9800 | 1880.0 | **21.5** | **17.2** |
| | | 9538 | 9938 | 1907.6 | 21.2 | 17.0 |
| | 2 | 9262 | 9662 | 1852.4 | 21.4 | 17.0 |
| | | 9400 | 9800 | 1880.0 | 21.1 | 16.8 |
| | | 9538 | 9938 | 1907.6 | 21.4 | 17.1 |
| | 3 | 9262 | 9662 | 1852.4 | 21.1 | 16.5 |
| | | 9400 | 9800 | 1880.0 | 21.3 | 16.6 |
| | | 9538 | 9938 | 1907.6 | 21.1 | 16.5 |
| | 4 | 9262 | 9662 | 1852.4 | 21.3 | 16.6 |
| | | 9400 | 9800 | 1880.0 | 21.2 | 16.5 |
| | | 9538 | 9938 | 1907.6 | 21.2 | 16.7 |

**Part 27 1700MHz Band**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|---|---|---|---|---|---|---|
| UMTS HSDPA 1700MHz | 1 | 1312 | 1537 | 1712.4 | 22.9 | 18.8 |
| | | 1413 | 1638 | 1732.6 | **23.5** | **18.8** |
| | | 1513 | 1738 | 1752.6 | 23.3 | 18.7 |
| | 2 | 1312 | 1537 | 1712.4 | 23.3 | 18.7 |
| | | 1413 | 1638 | 1732.6 | 22.9 | 18.5 |
| | | 1513 | 1738 | 1752.6 | 23.3 | 18.7 |
| | 3 | 1312 | 1537 | 1712.4 | 23.2 | 18.2 |
| | | 1413 | 1638 | 1732.6 | 23.3 | 18.4 |
| | | 1513 | 1738 | 1752.6 | 23.3 | 18.2 |
| | 4 | 1312 | 1537 | 1712.4 | 23.3 | 18.3 |
| | | 1413 | 1638 | 1732.6 | 23.3 | 18.3 |
| | | 1513 | 1738 | 1752.6 | 23.3 | 18.4 |

# 8. CONDUCTED TEST RESULTS

## 8.1. OCCUPIED BANDWIDTH (MODEL: A1634)

**RULE PART(S)**

FCC: §2.1049

**LIMITS**

For reporting purposes only

**TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

**RESULTS**

**GSM-GPRS MODE PART 22 AND**

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| CELL | GPRS | 128 | 824.2 | 245.6276 | 308.413 |
| | | 190 | 836.6 | 245.5902 | 314.459 |
| | | 251 | 848.8 | **248.8810** | **321.558** |

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| PCS | GPRS | 512 | 1850.2 | 238.6057 | **309.314** |
| | | 661 | 1880.0 | **239.4803** | 303.939 |
| | | 810 | 1909.8 | 238.0105 | 305.618 |

**GSM-EGPRS MODE PART 22 AND 24**

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| CELL | EGPRS | 128 | 824.2 | 243.2166 | 299.612 |
| | | 190 | 836.6 | **246.6878** | 302.994 |
| | | 251 | 848.8 | 244.0650 | **309.950** |

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| PCS | EGPRS | 512 | 1850.2 | **242.8572** | 289.632 |
| | | 661 | 1880.0 | 235.6254 | **308.372** |
| | | 810 | 1909.8 | 238.9103 | 302.570 |

**CDMA2000 1xRTT, PART 22, 24, 27 AND 90**

| Band | Mode | Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| CELL | CDMA 2000 1xRTT | 1013 | 824.70 | **1.2845** | 1.396 |
| | | 384 | 836.52 | 1.2451 | 1.412 |
| | | 777 | 848.31 | 1.2777 | 1.389 |
| PCS | | 25 | 1851.25 | 1.2783 | 1.385 |
| | | 600 | 1880.00 | 1.2540 | 1.395 |
| | | 1175 | 1908.75 | **1.2808** | 1.378 |
| AWS | | 25 | 1711.25 | 1.2805 | 1.387 |
| | | 450 | 1732.50 | 1.2292 | 1.406 |
| | | 875 | 1753.75 | **1.2843** | 1.390 |
| 800 MHz Secondary | | 450 | 817.25 | **1.2758** | 1.378 |
| | | 560 | 820.00 | 1.2741 | 1.388 |
| | | 670 | 822.75 | 1.2597 | 1.370 |

**CDMA2000 EVDO REV A, PART 22, 24, 27 AND 90**

| | | | | | |
|---|---|---|---|---|---|
| CELL | CDMA 2000 EVDO Rev. A | 1013 | 824.70 | **1.2795** | 1.374 |
| | | 384 | 836.52 | 1.2519 | 1.380 |
| | | 777 | 848.31 | 1.2576 | 1.406 |
| PCS | | 25 | 1851.25 | 1.2540 | 1.408 |
| | | 600 | 1880.00 | **1.2927** | 1.372 |
| | | 1175 | 1908.75 | 1.2797 | 1.390 |
| AWS | | 25 | 1711.25 | 1.2711 | 1.397 |
| | | 450 | 1732.50 | **1.2872** | 1.399 |
| | | 875 | 1753.75 | 1.2685 | 1.388 |
| 800 MHz Secondary | | 450 | 817.25 | 1.2605 | 1.401 |
| | | 560 | 820.00 | 1.2603 | 1.400 |
| | | 670 | 822.75 | **1.2778** | 1.404 |

**UMTS REL99 MODE PART 22, 24, AND 27**

| PART 22, 24, AND 27 | | | | | |
|---|---|---|---|---|---|
| Band | Mode | DL Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
| 850MHz | UMTS Rel. 99 | 4357 | 826.40 | **4.1732** | 4.547 |
| | | 4408 | 836.60 | 4.1033 | **4.655** |
| | | 4458 | 846.60 | 4.1307 | 4.652 |
| 1900MHz | | 9662 | 1852.40 | 4.1155 | 4.595 |
| | | 9800 | 1880.00 | 4.0898 | 4.563 |
| | | 9938 | 1907.60 | **4.1837** | **4.707** |
| 1700MHz | | 1537 | 1712.40 | 4.1758 | **4.629** |
| | | 1638 | 1732.60 | **4.1889** | 4.511 |
| | | 1738 | 1752.60 | 4.1246 | 4.622 |

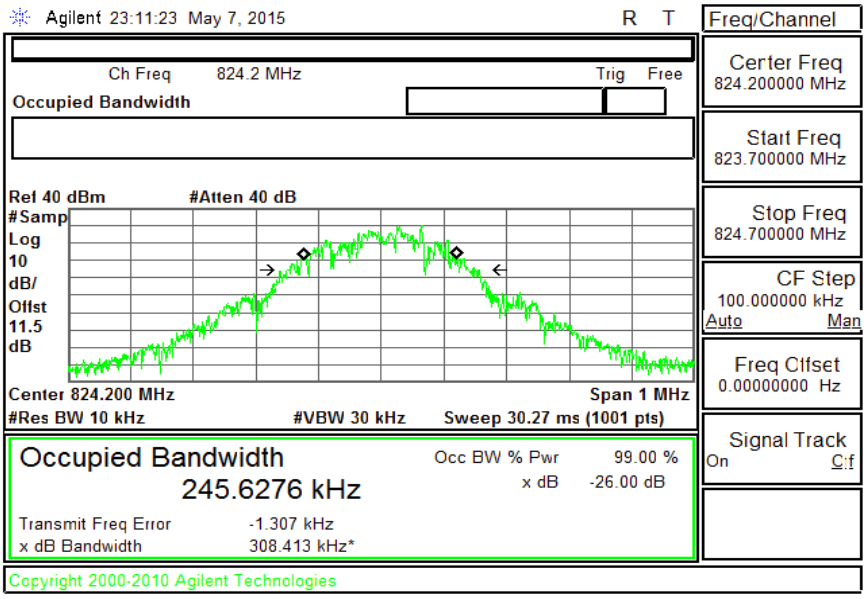
**UMTS HSDPA MODE PART 22, 24, AND 27**

| PART 22, 24, AND 27 | | | | | |
|---|---|---|---|---|---|
| Band | Mode | DL Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
| 850MHz | UMTS HSDPA | 4357 | 826.40 | 4.0554 | **4.65** |
| | | 4408 | 836.60 | **4.1941** | 4.57 |
| | | 4458 | 846.60 | 4.1891 | 4.551 |
| 1900MHz | | 9662 | 1852.40 | 4.2507 | **4.708** |
| | | 9800 | 1880.00 | 4.1973 | 4.576 |
| | | 9938 | 1907.60 | **4.2770** | 4.61 |
| 1700MHz | | 1537 | 1712.40 | 4.1231 | 4.664 |
| | | 1638 | 1732.60 | **4.1273** | 4.609 |
| | | 1738 | 1752.60 | 4.1071 | **4.669** |

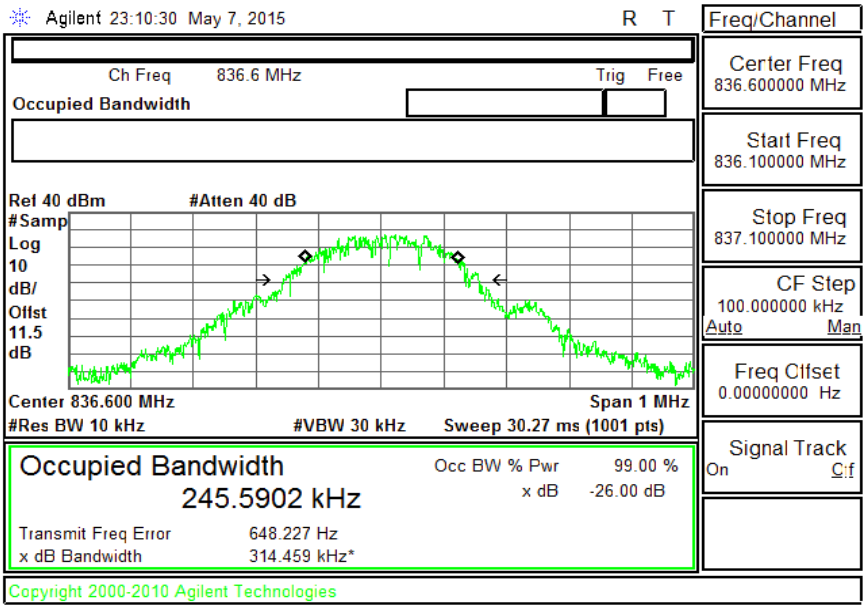
### 8.1.1. GSM GPRS

**850MHz BAND**

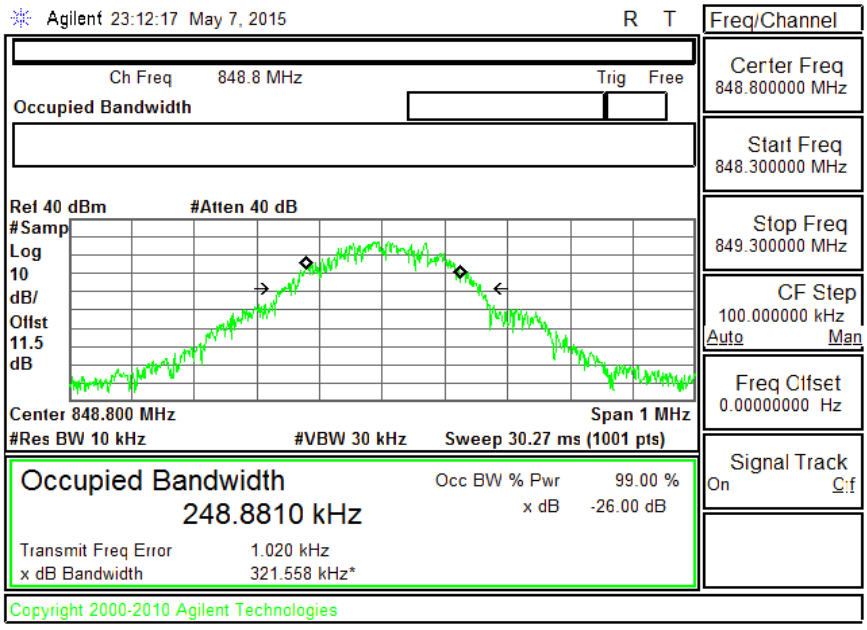
LOW CH




MID CH

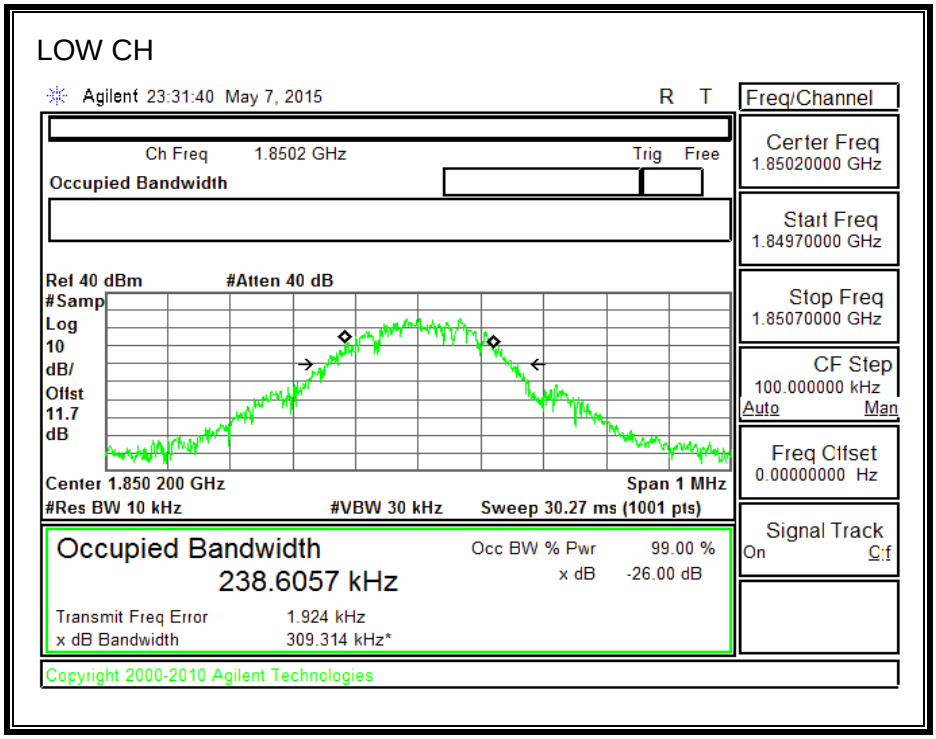


HIGH CH

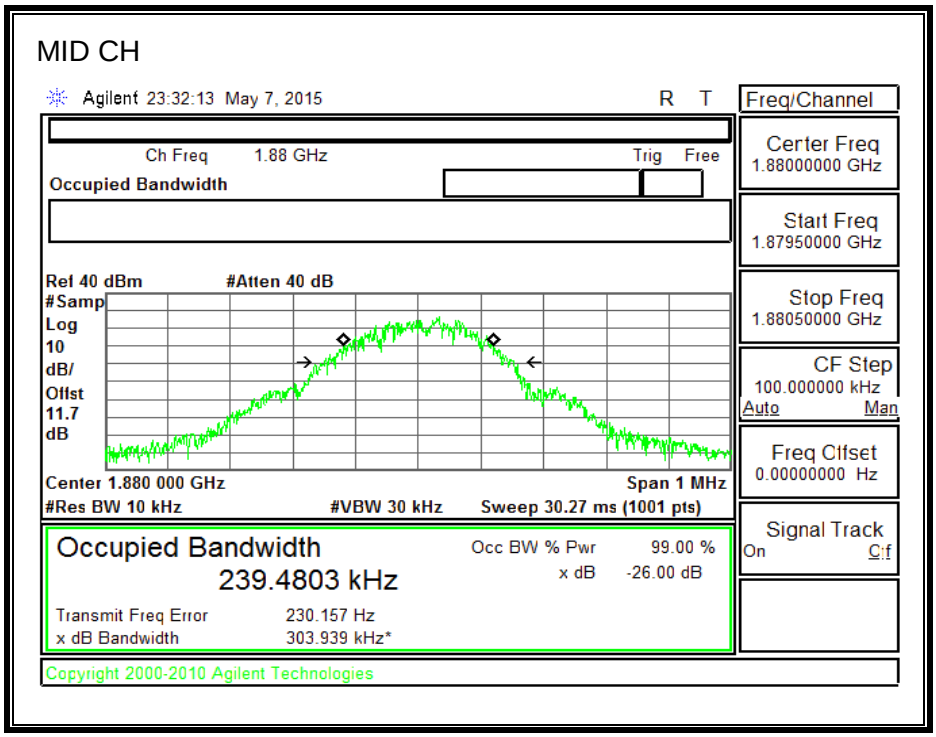



**1900MHz BAND**

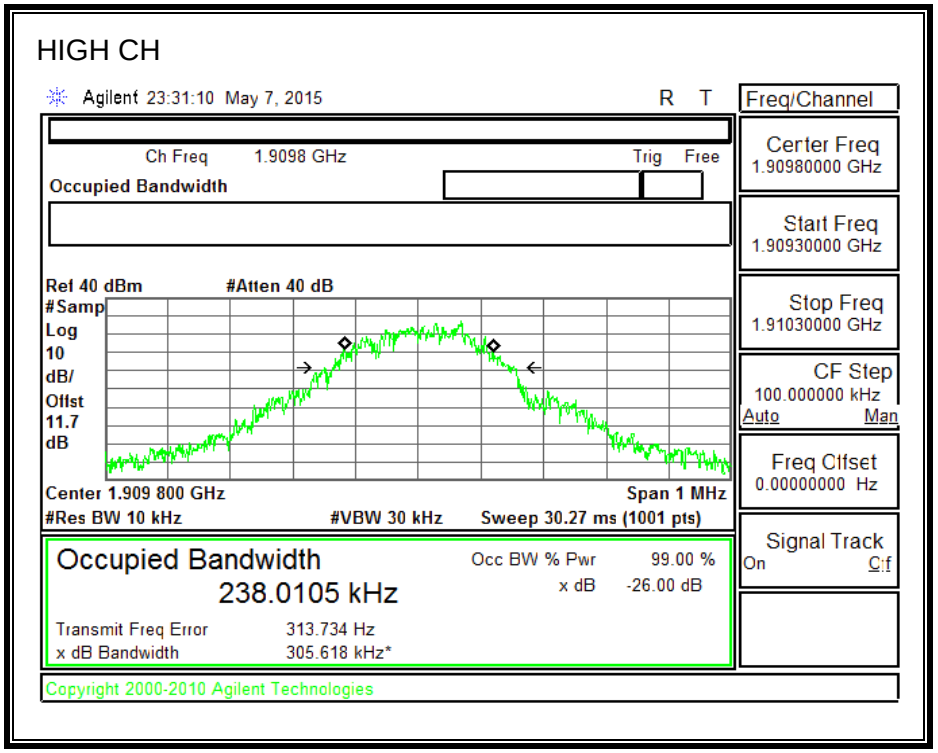
LOW CH



MID CH



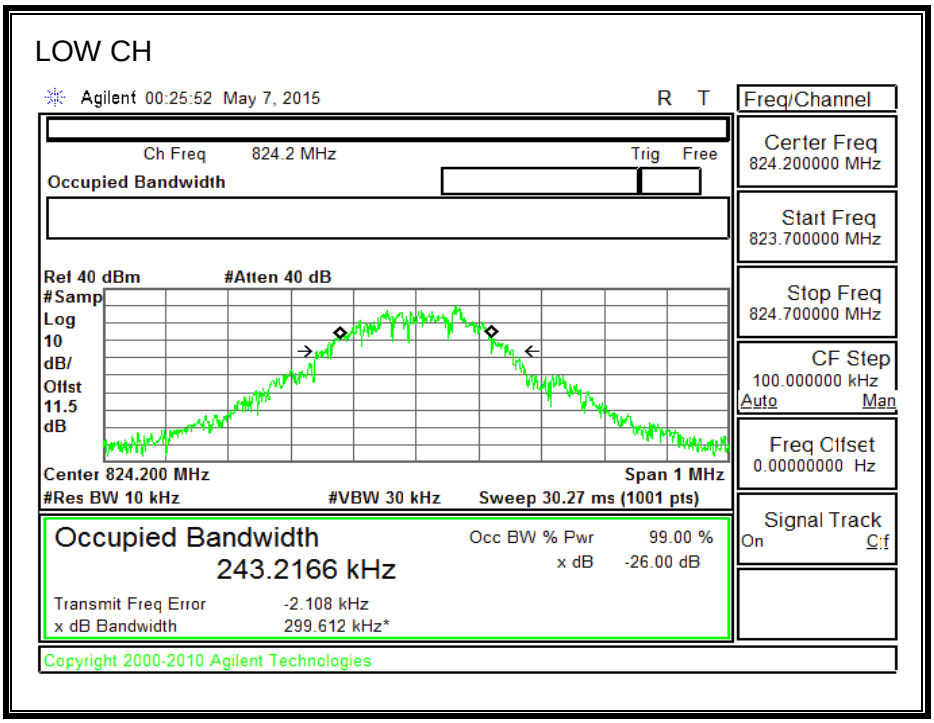

HIGH CH



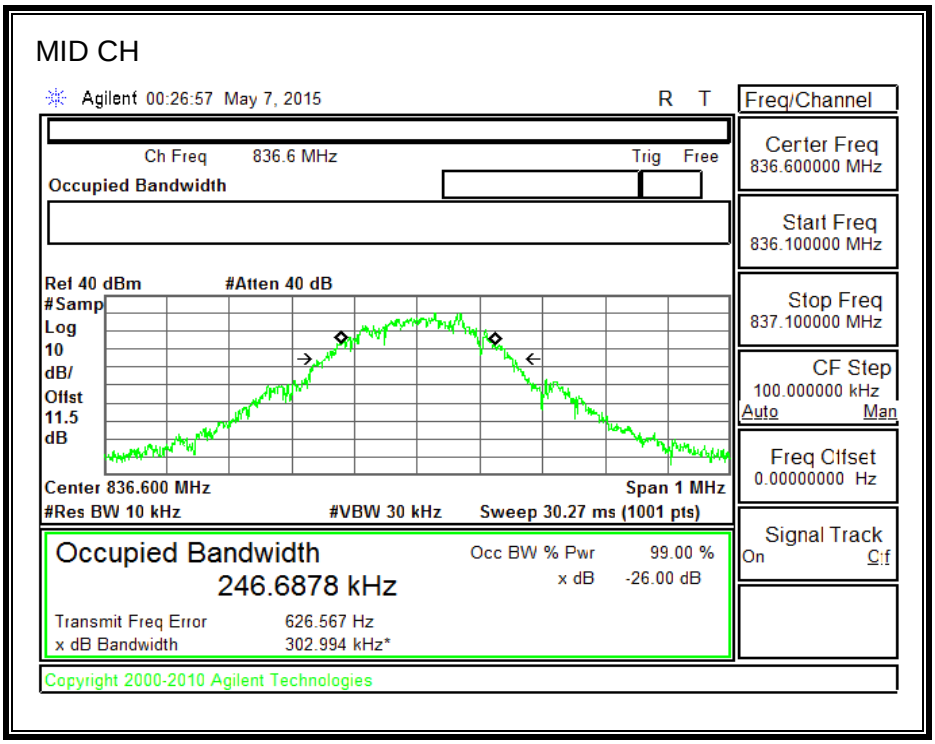
## 8.1.2. GSM EGPRS

**850MHz BAND**

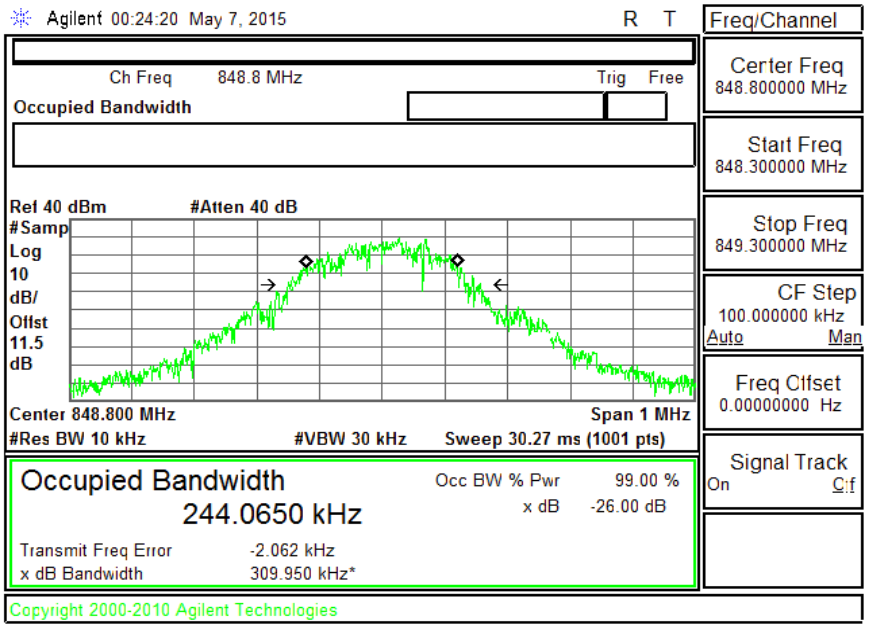
LOW CH




MID CH

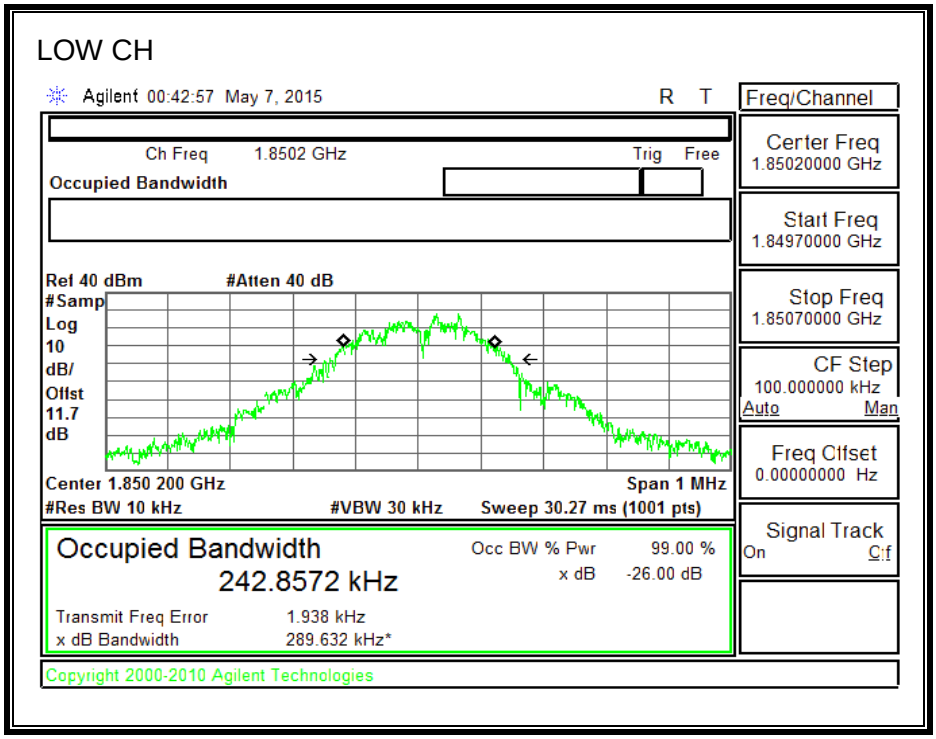


HIGH CH

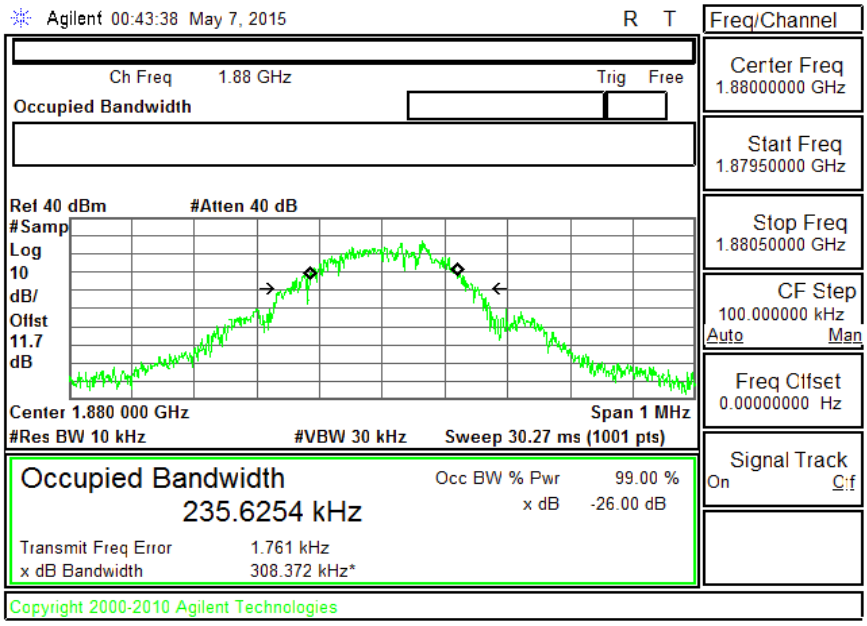



**1900MHz BAND**

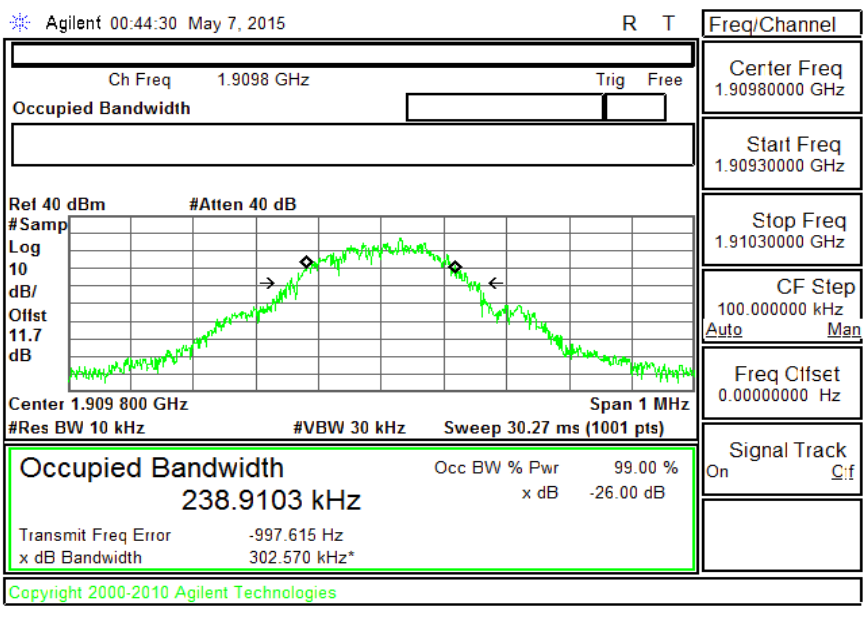
LOW CH



MID CH



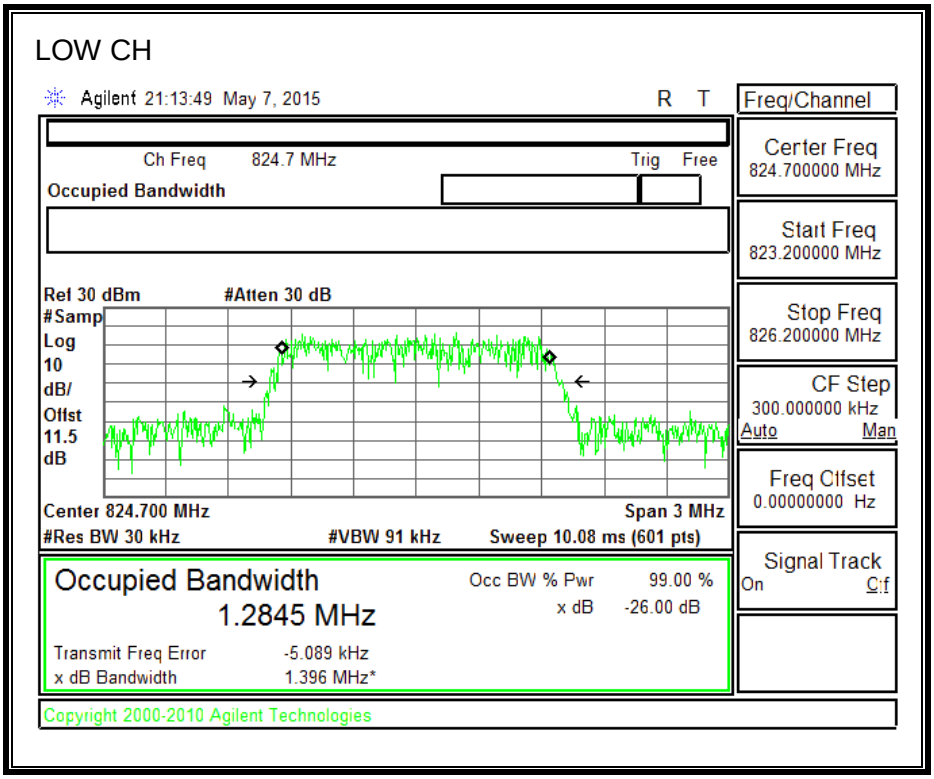

HIGH CH



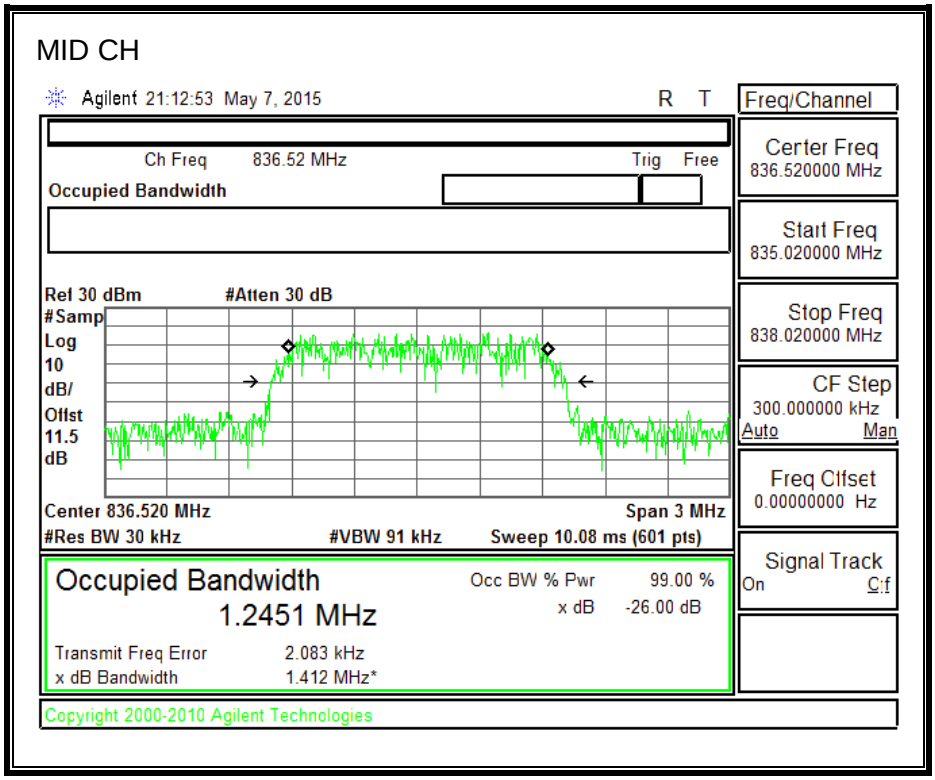
## 8.1.3. CDMA2000 1xRTT

**850MHz BAND**

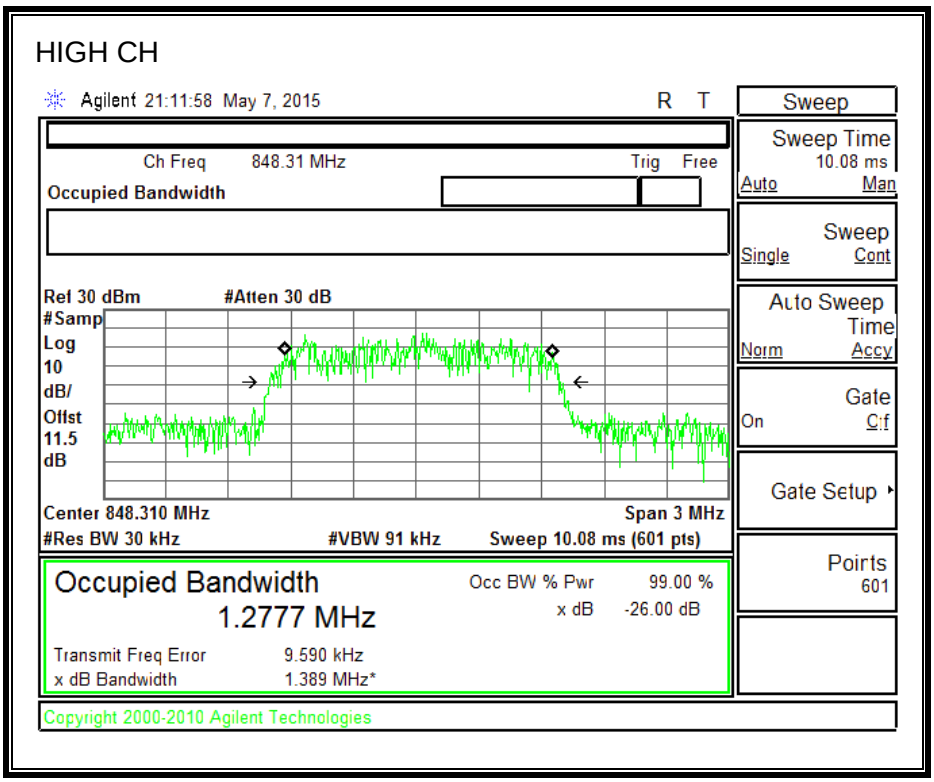
LOW CH



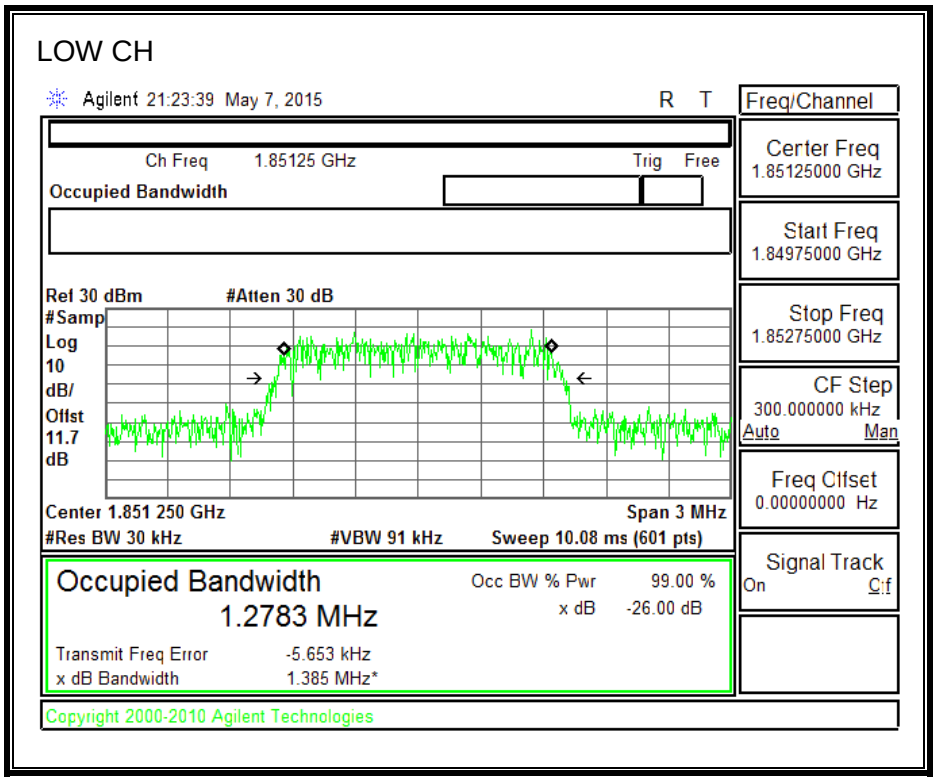

MID CH

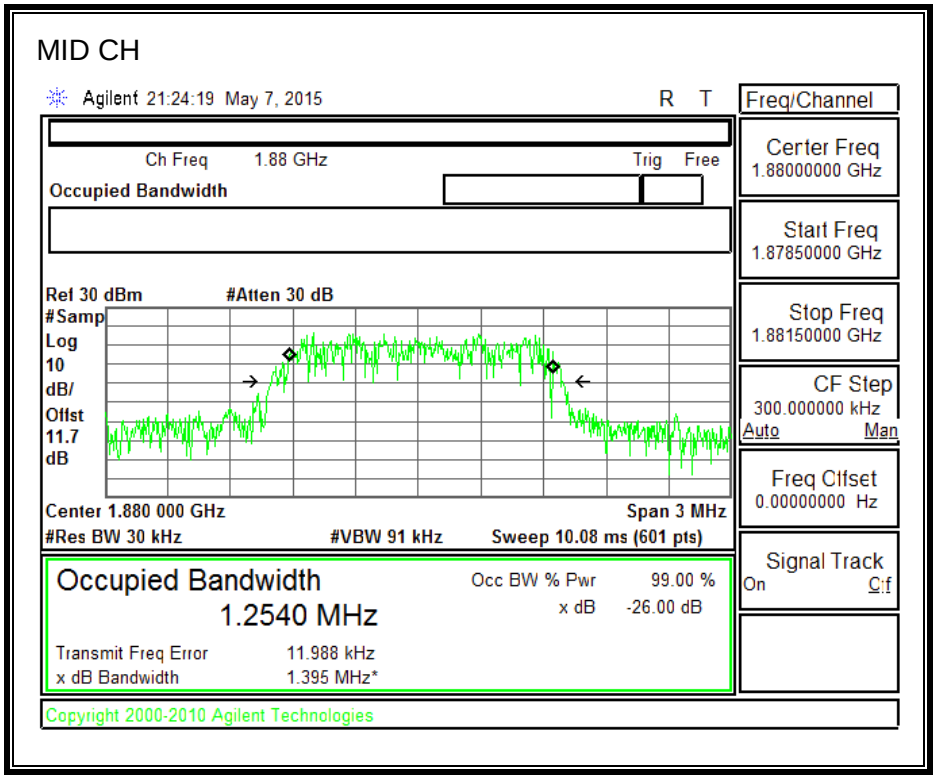


HIGH CH

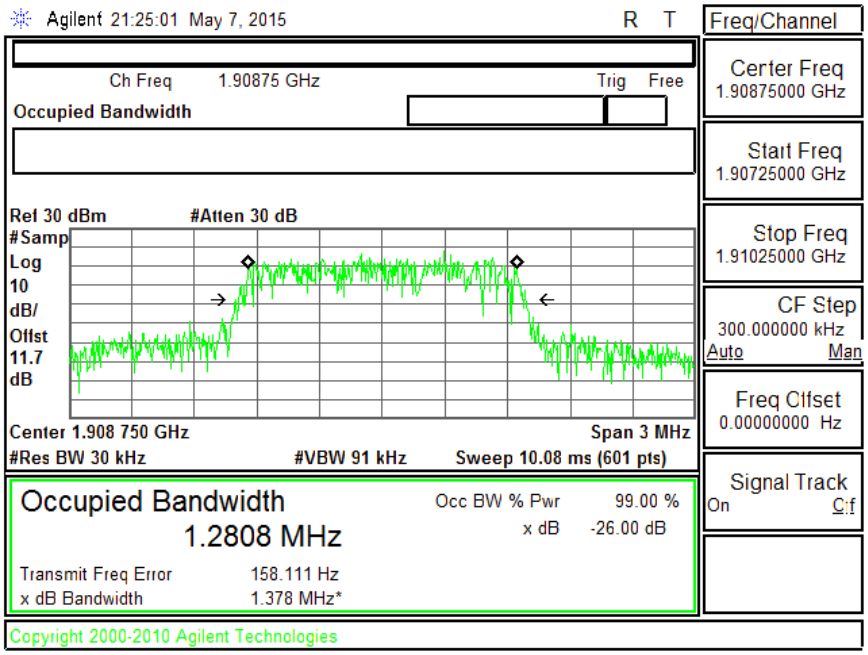


**1900MHz BAND**



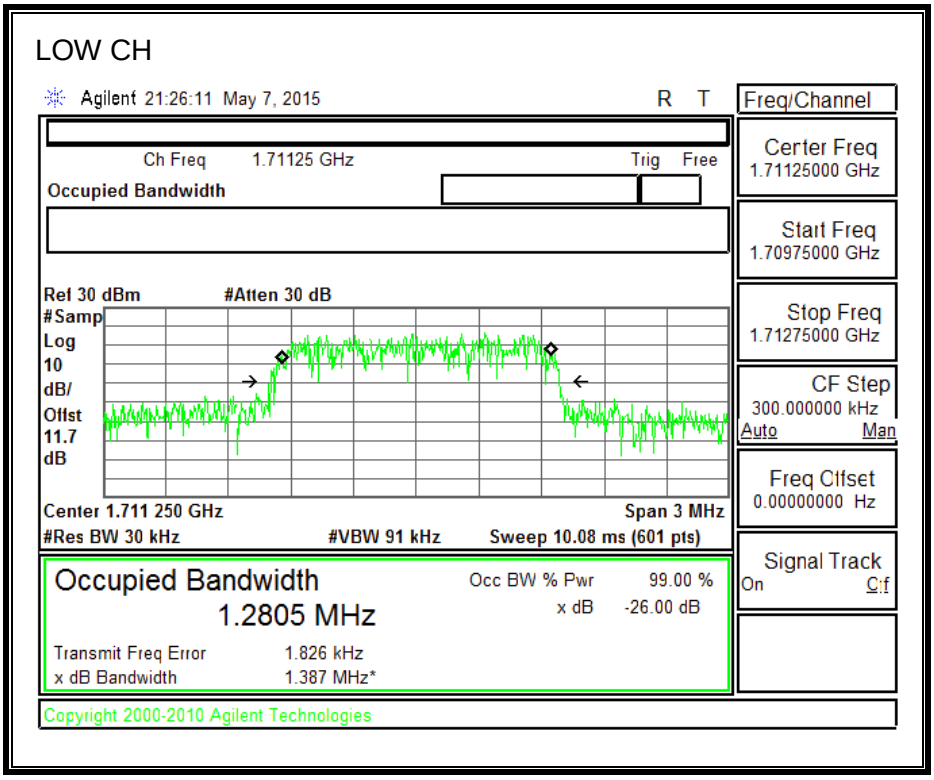



HIGH CH

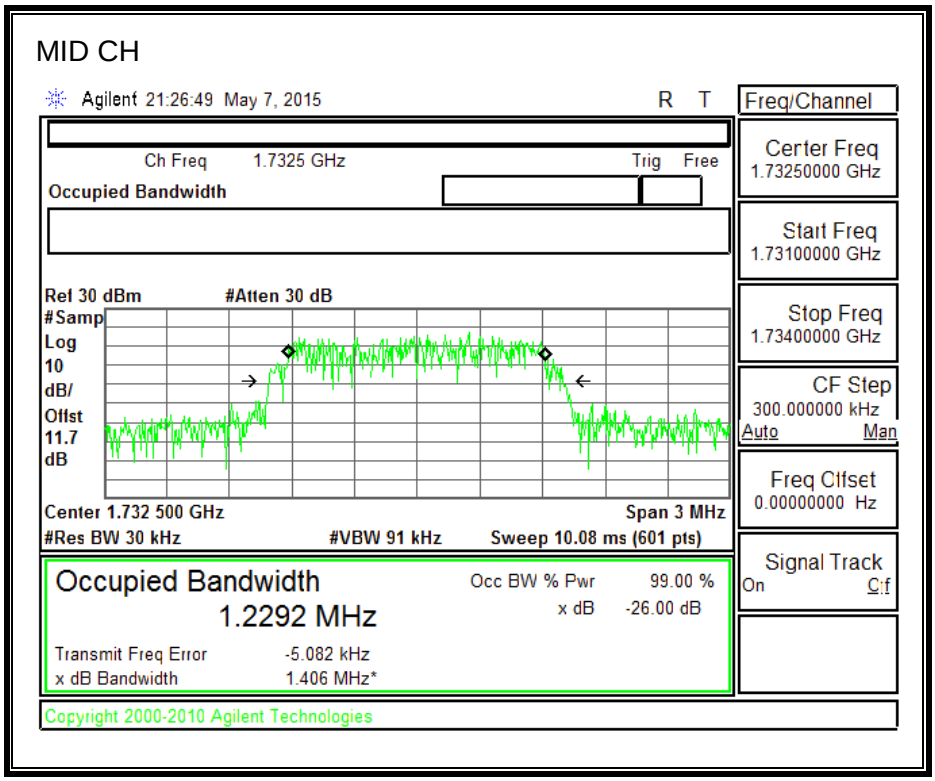


**1700MHz BAND**

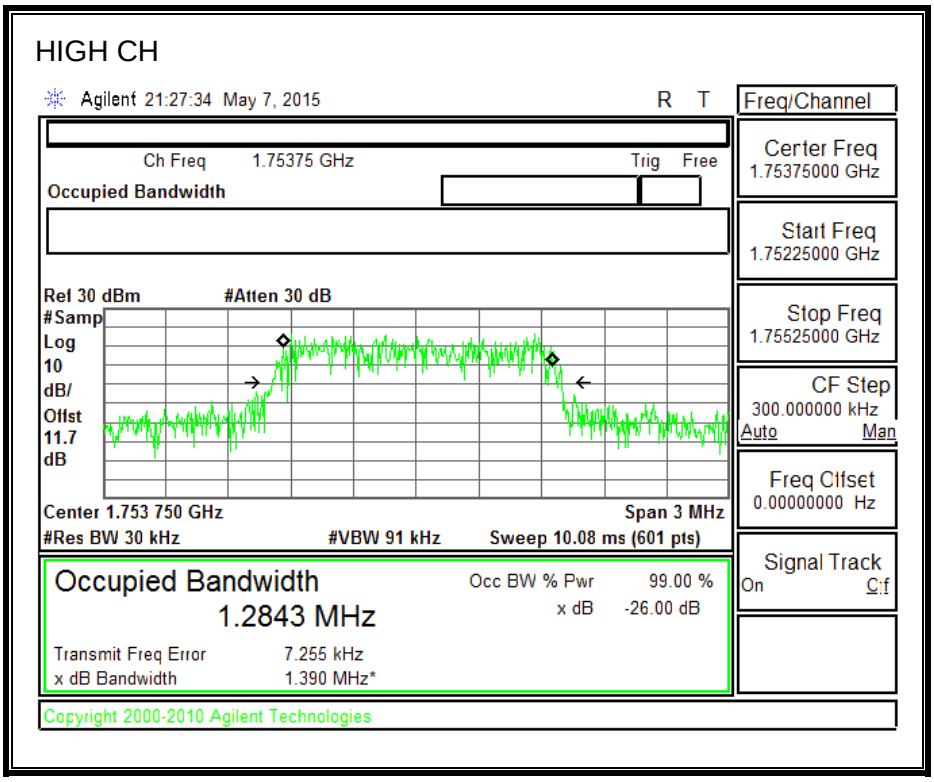
LOW CH




MID CH

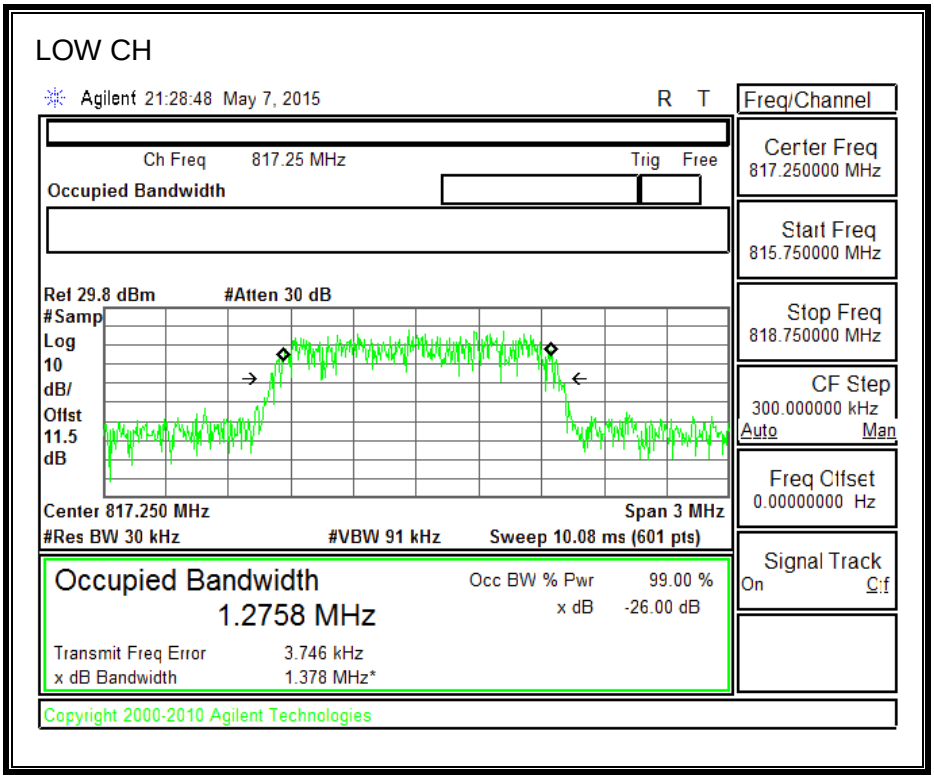


HIGH CH

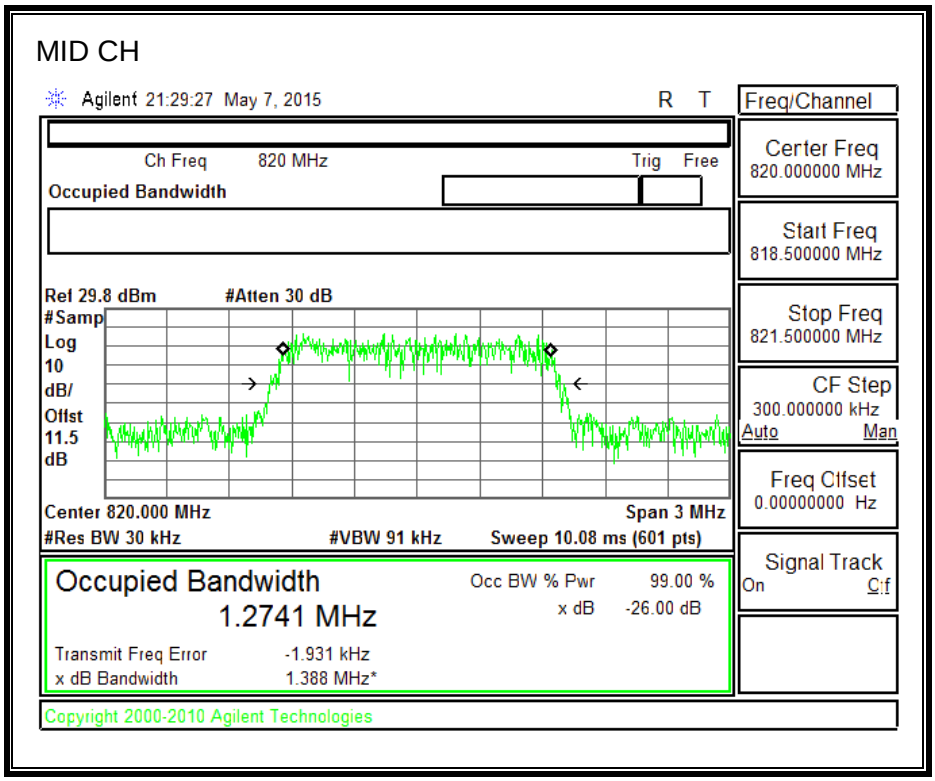


**800MHz SECONDARY BAND**

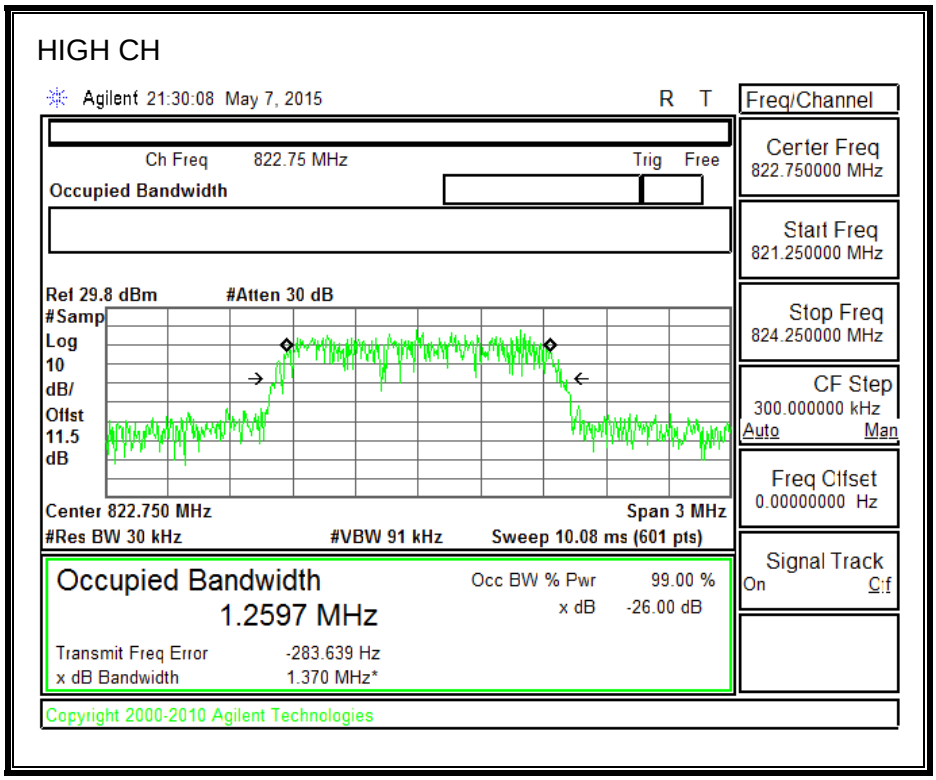
LOW CH




MID CH



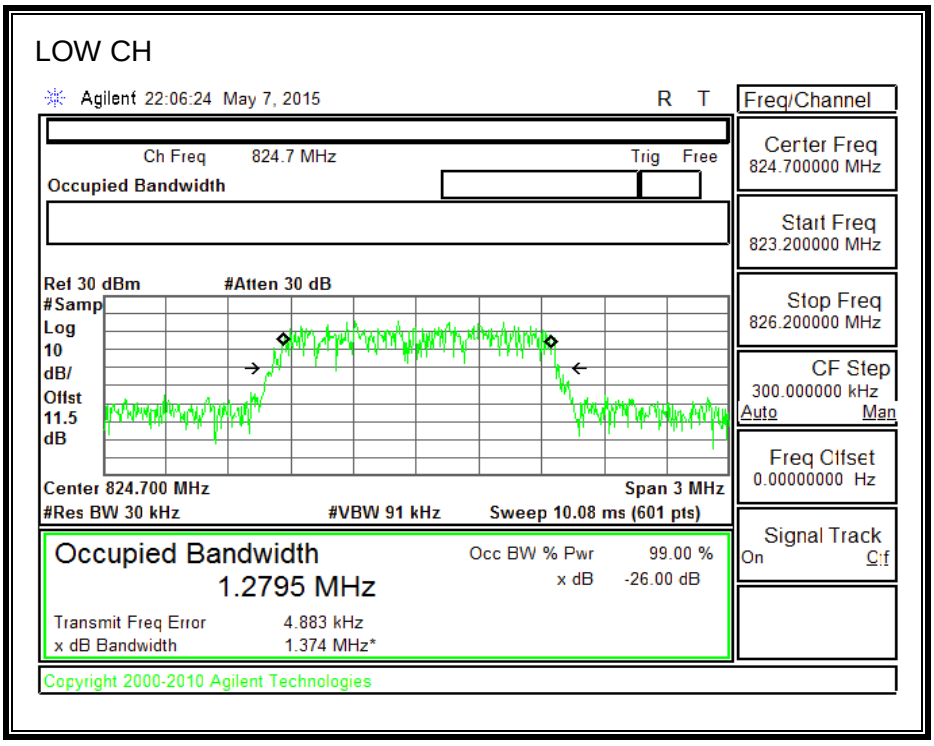
HIGH CH



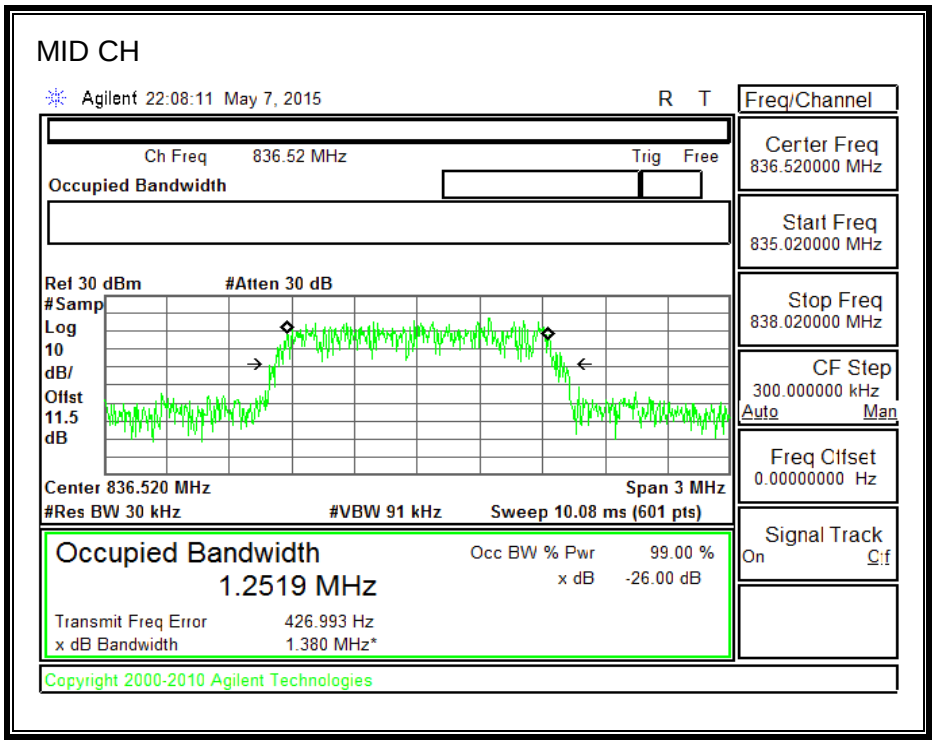
### 8.1.4. CDMA2000 EVDO Rev. A

**850MHz BAND**

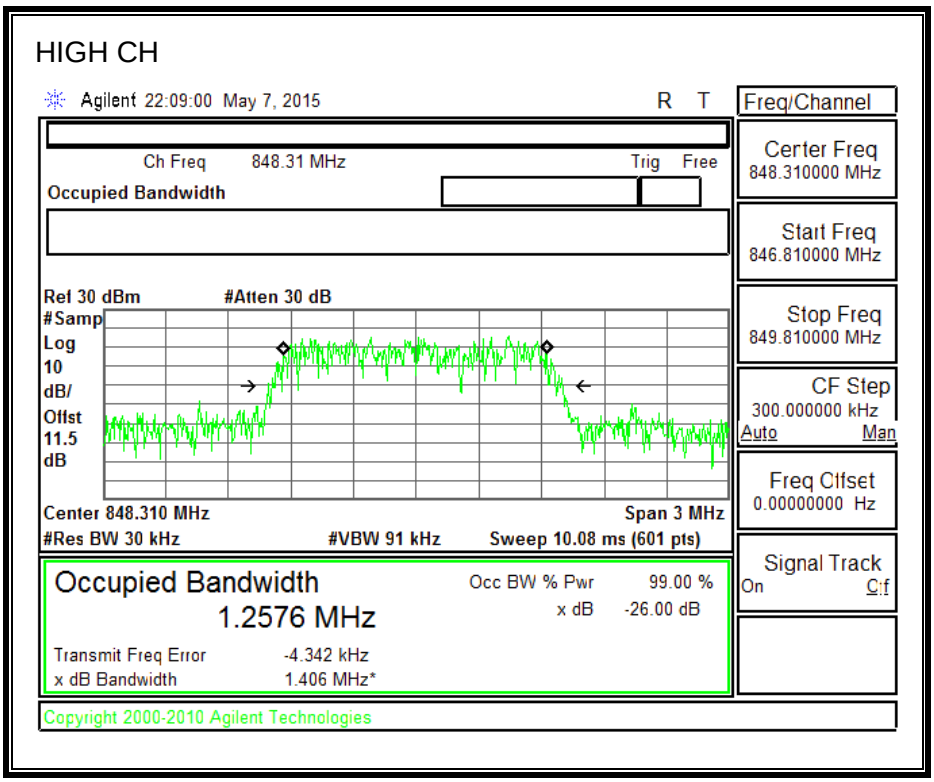
LOW CH




MID CH

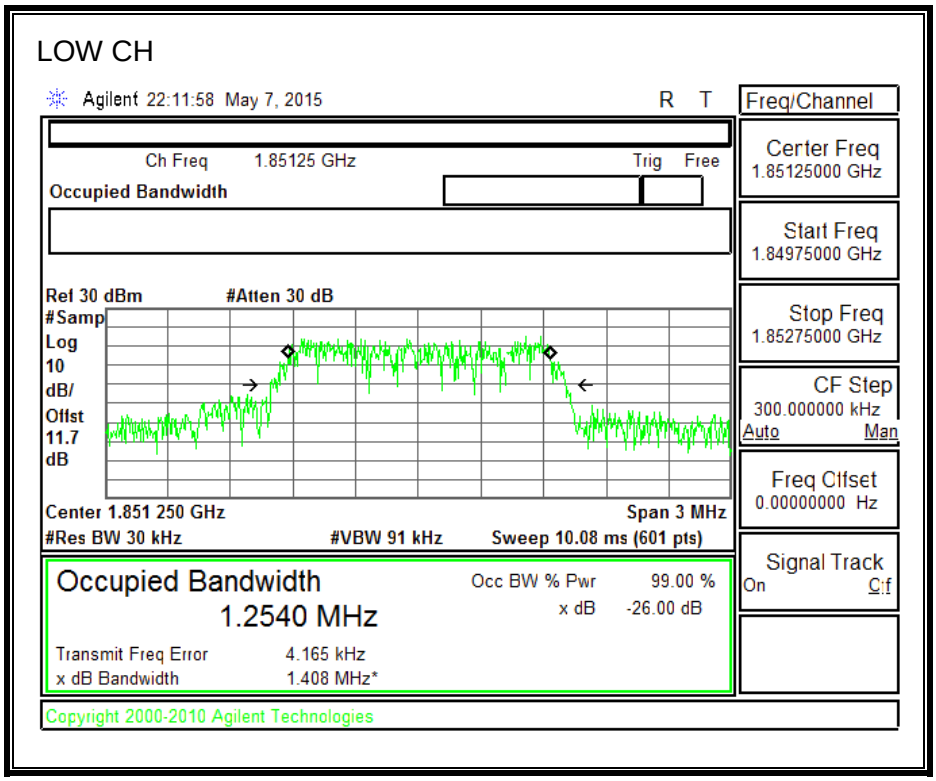


HIGH CH

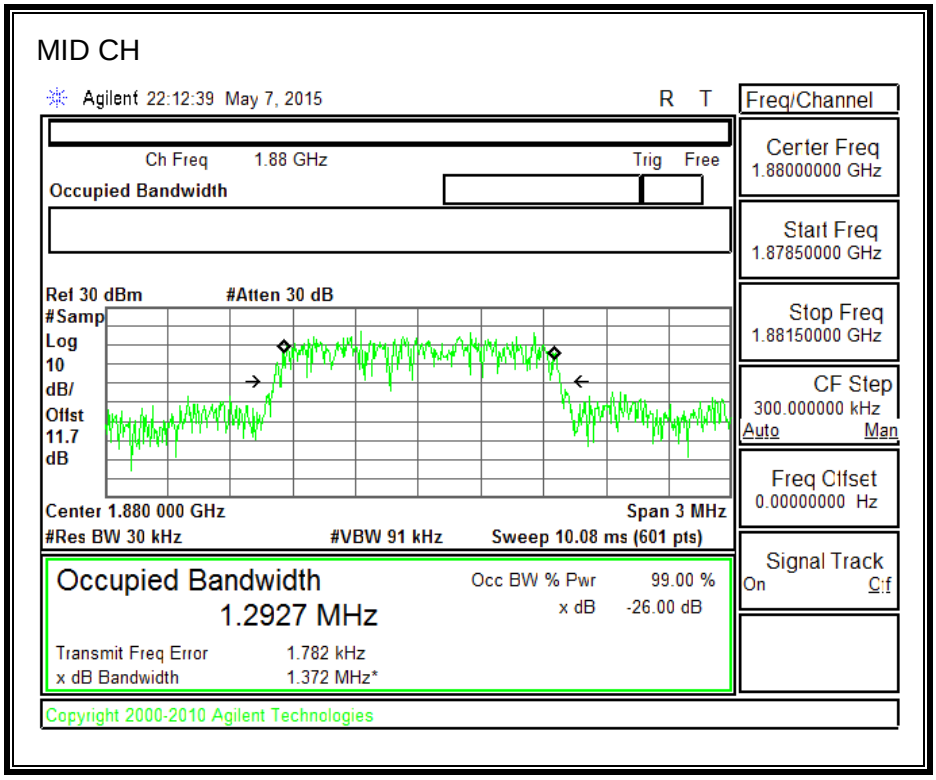


**1900MHz BAND**

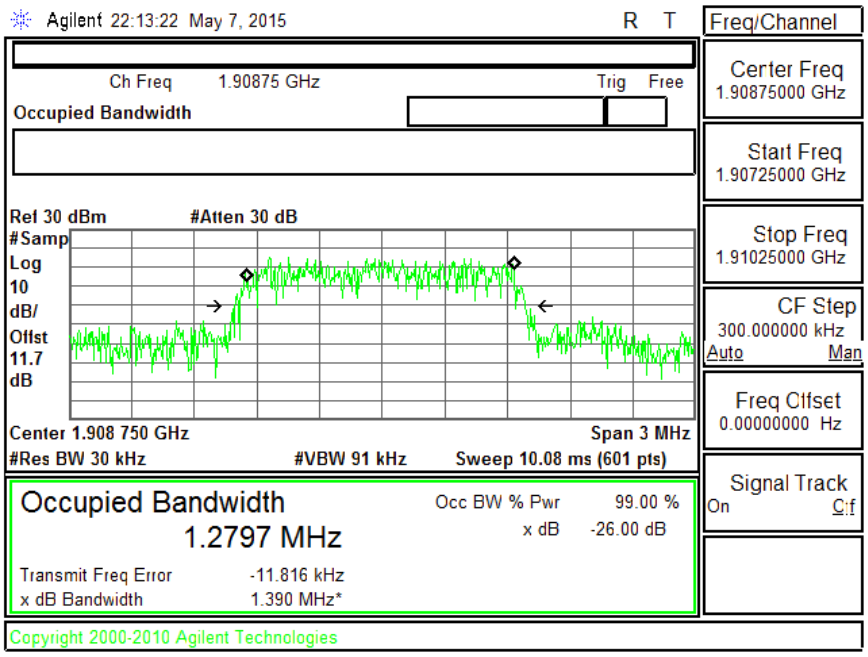
LOW CH




MID CH

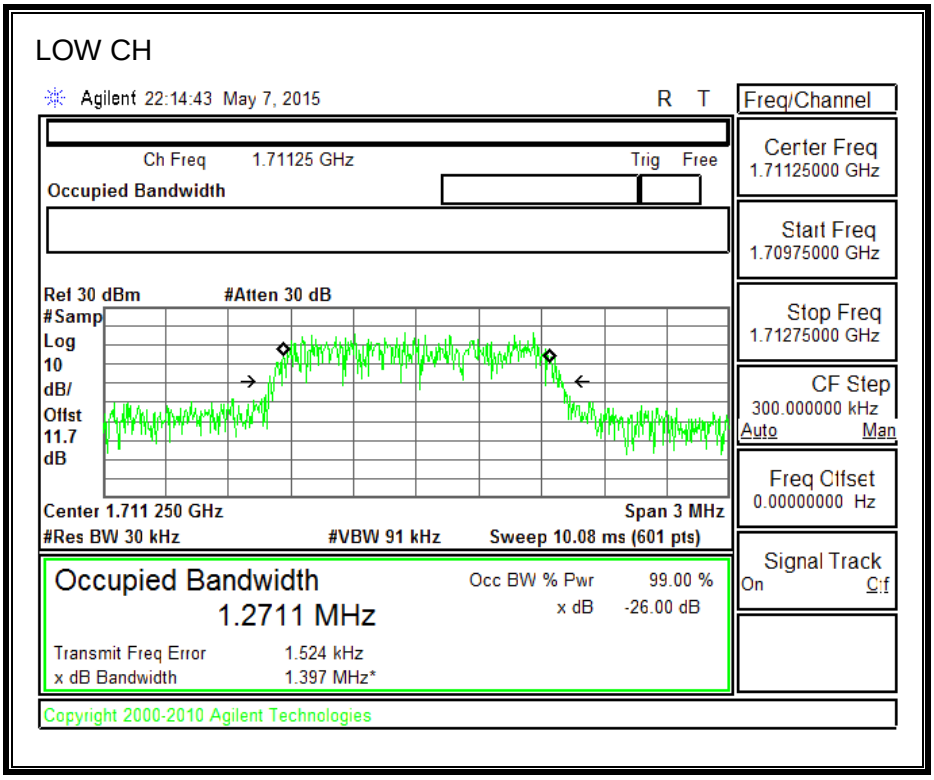


HIGH CH

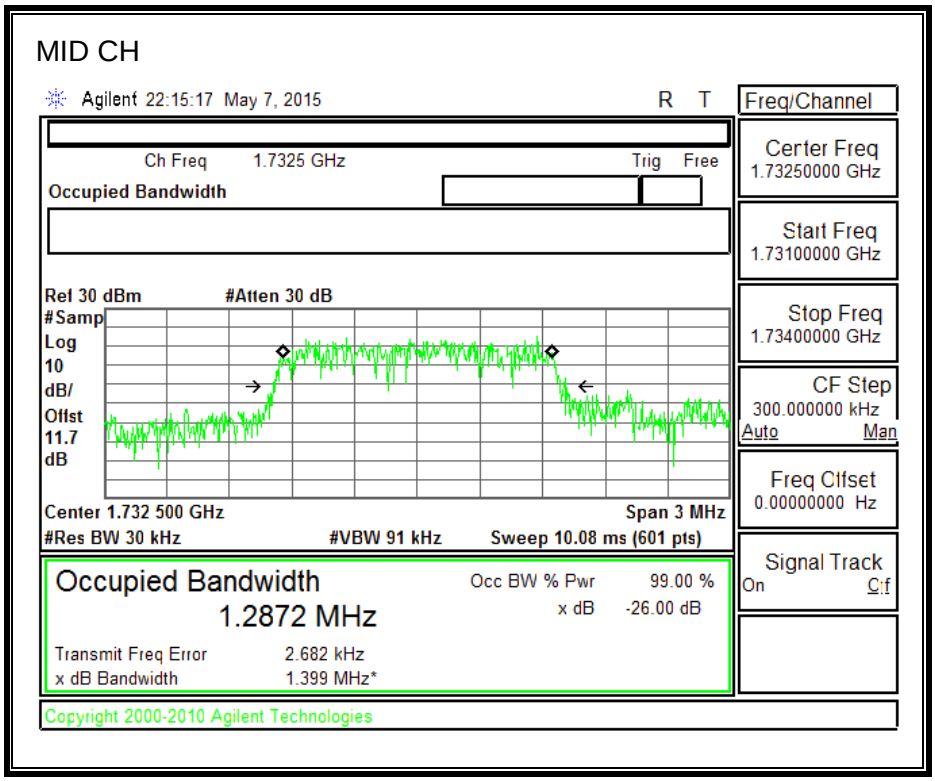


**1700MHz BAND**

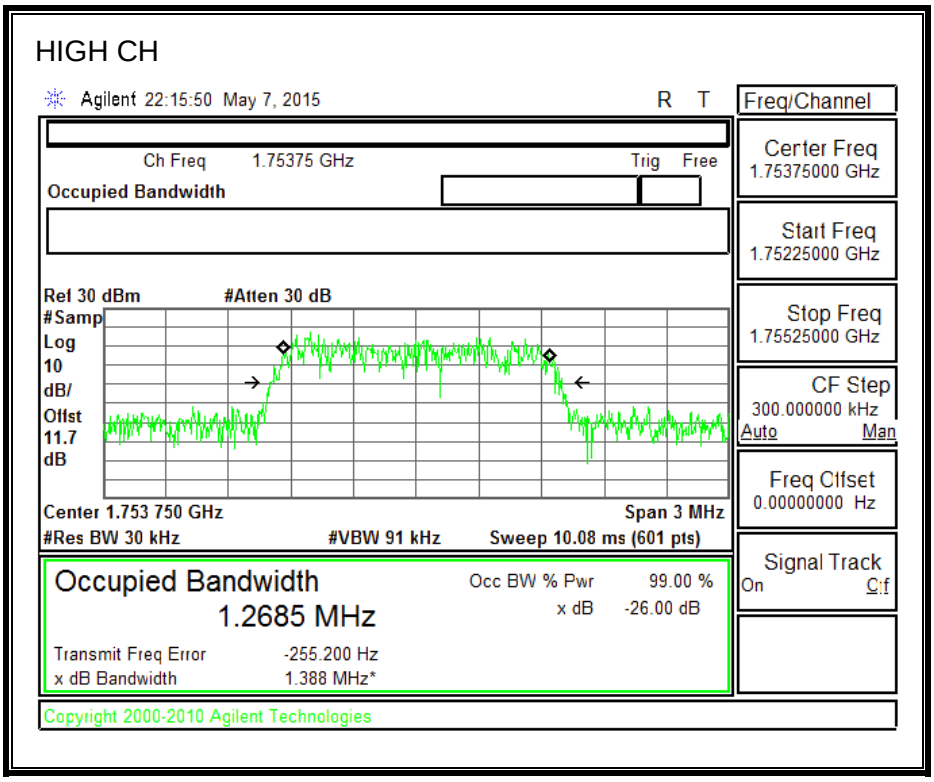
LOW CH




MID CH

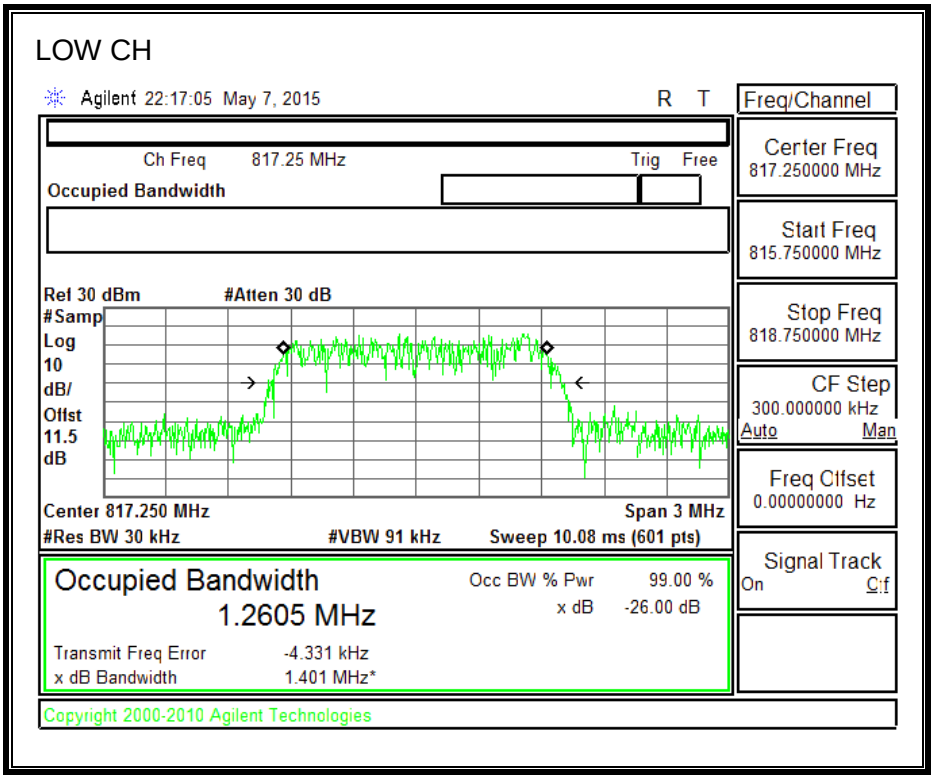


HIGH CH

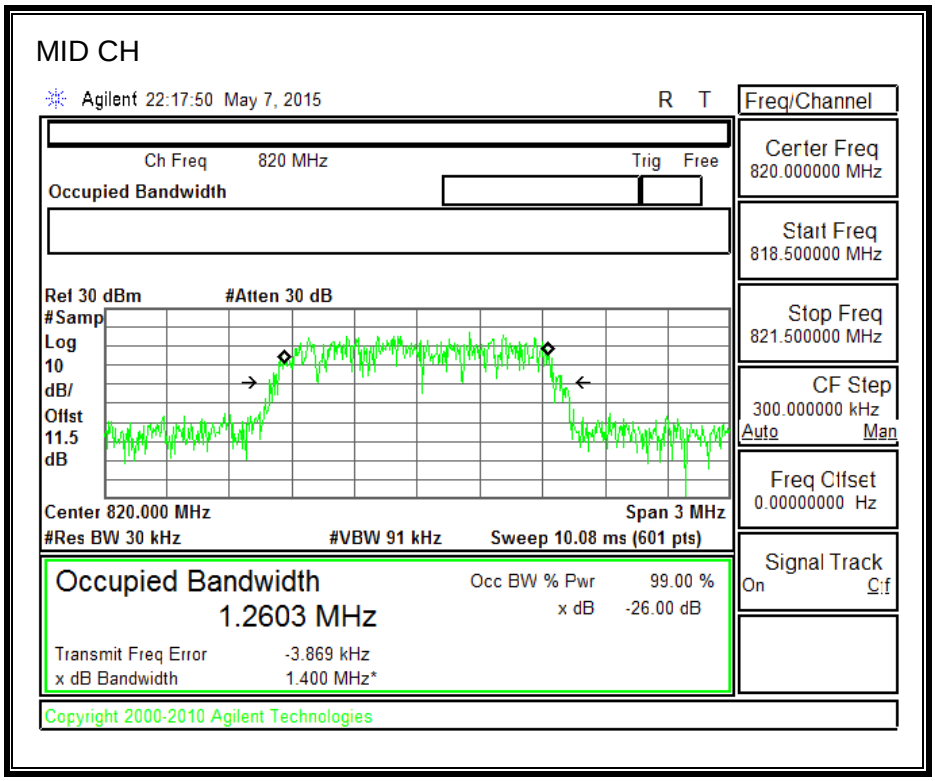


**800MHz SECONDARY BAND**

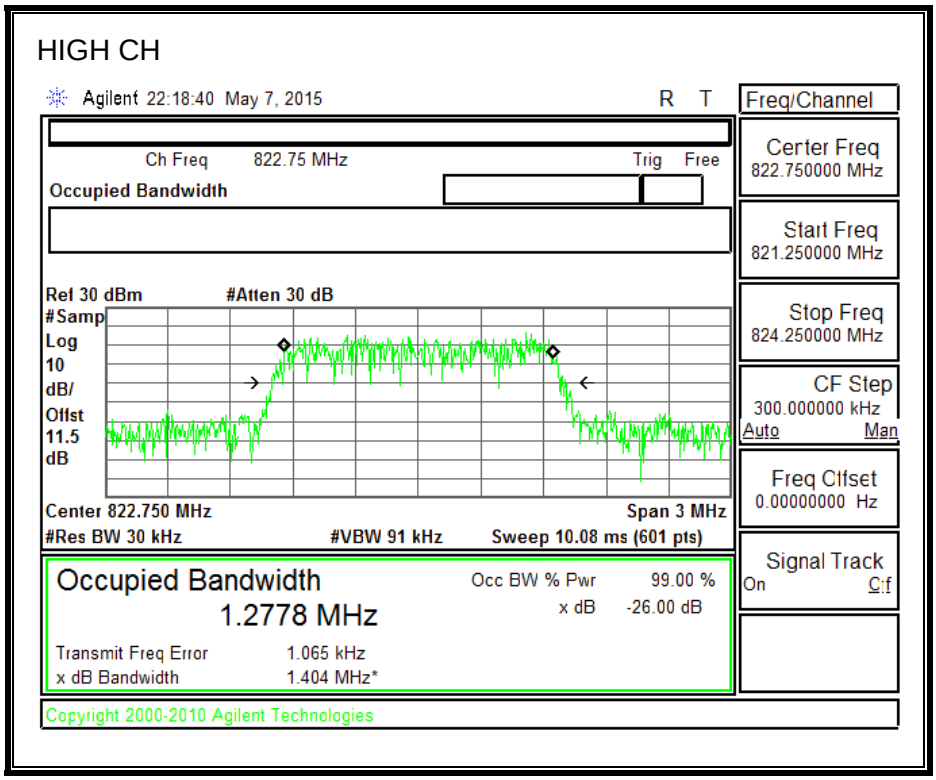
LOW CH




MID CH



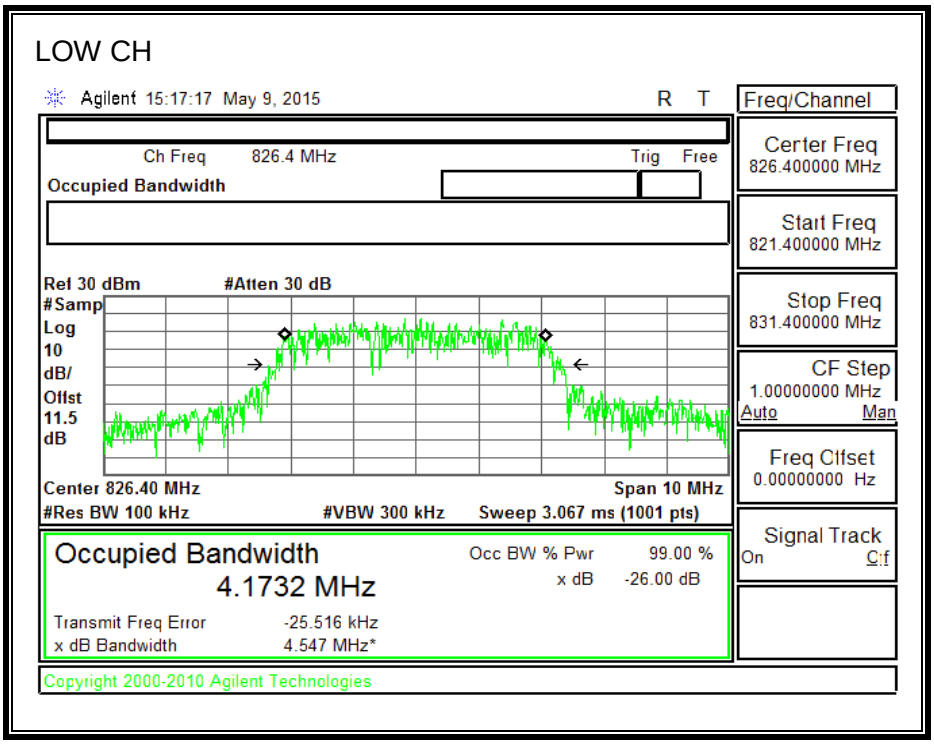
HIGH CH



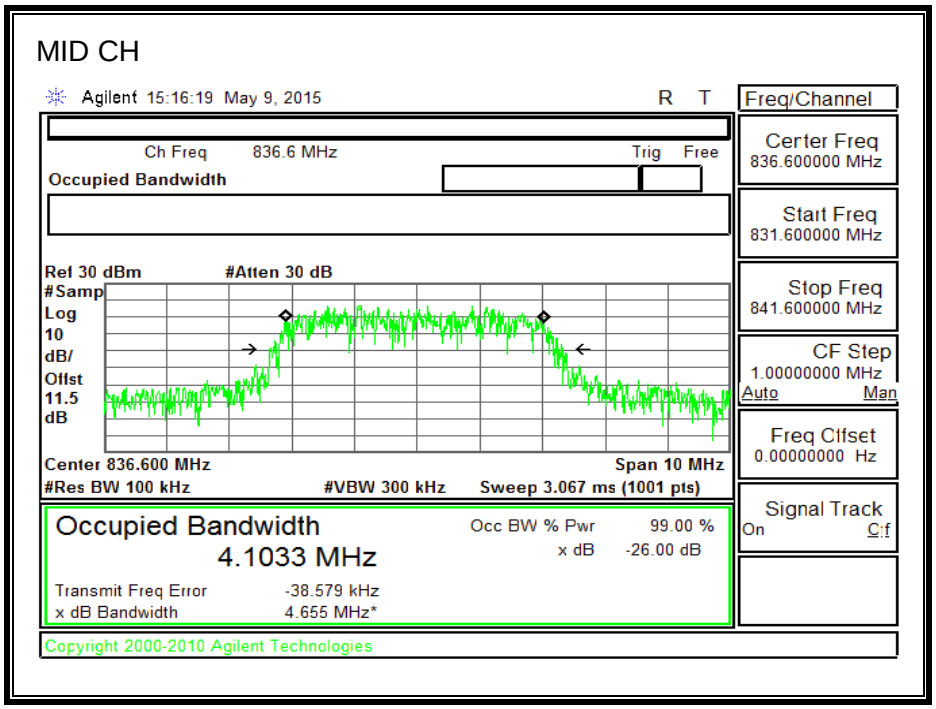
### 8.1.5. UMTS REL 99

**850MHz BAND**

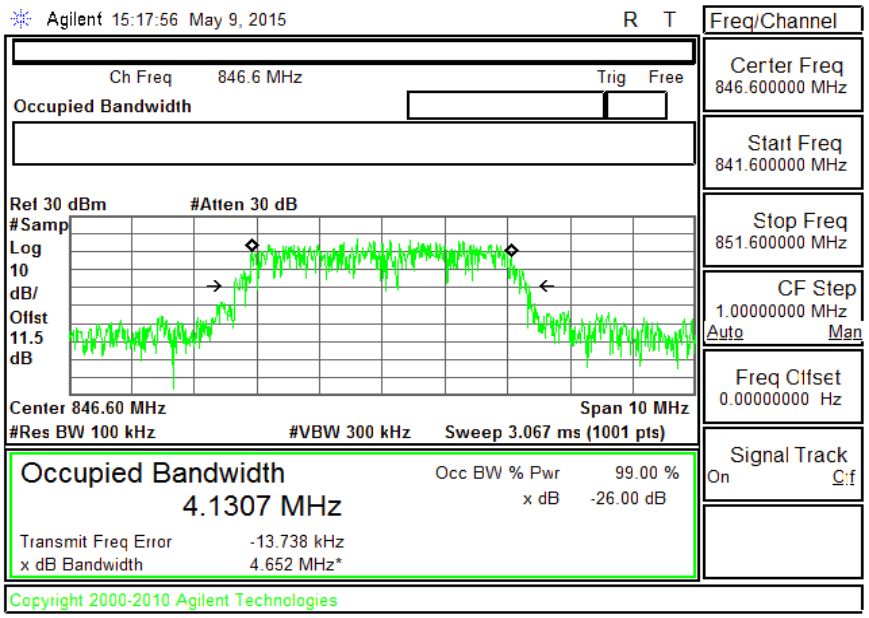
LOW CH




MID CH

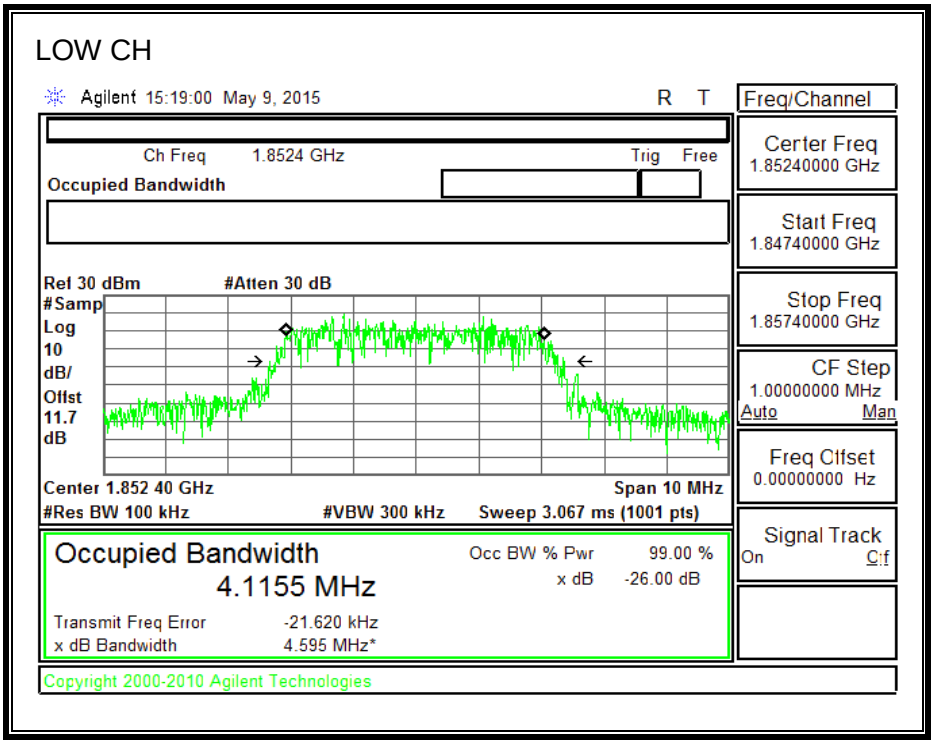


HIGH CH

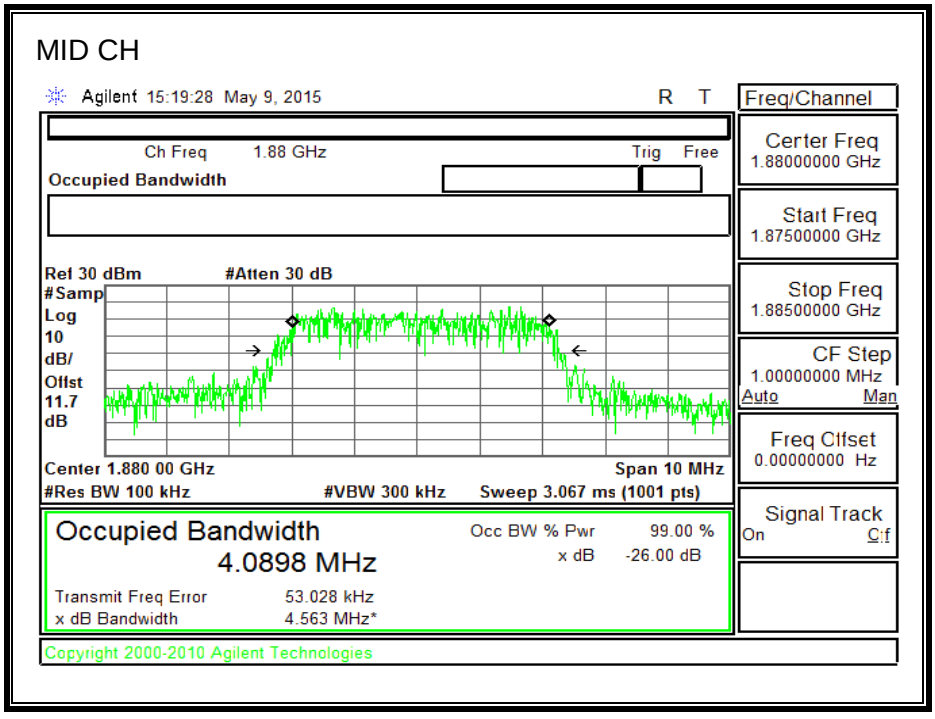


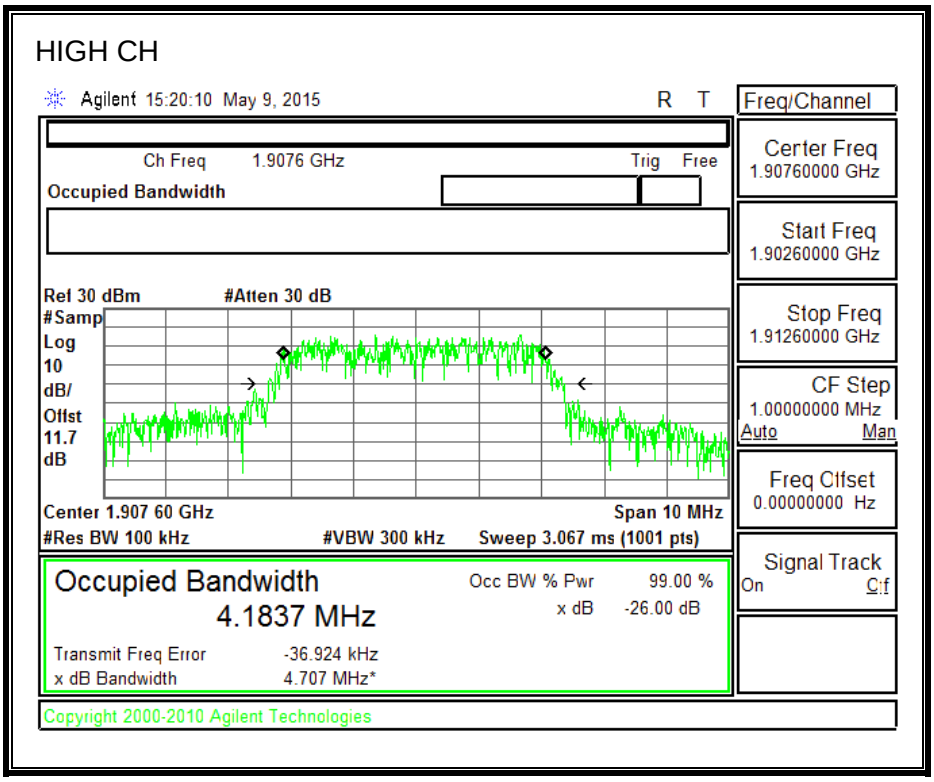
**1900MHz BAND**

LOW CH



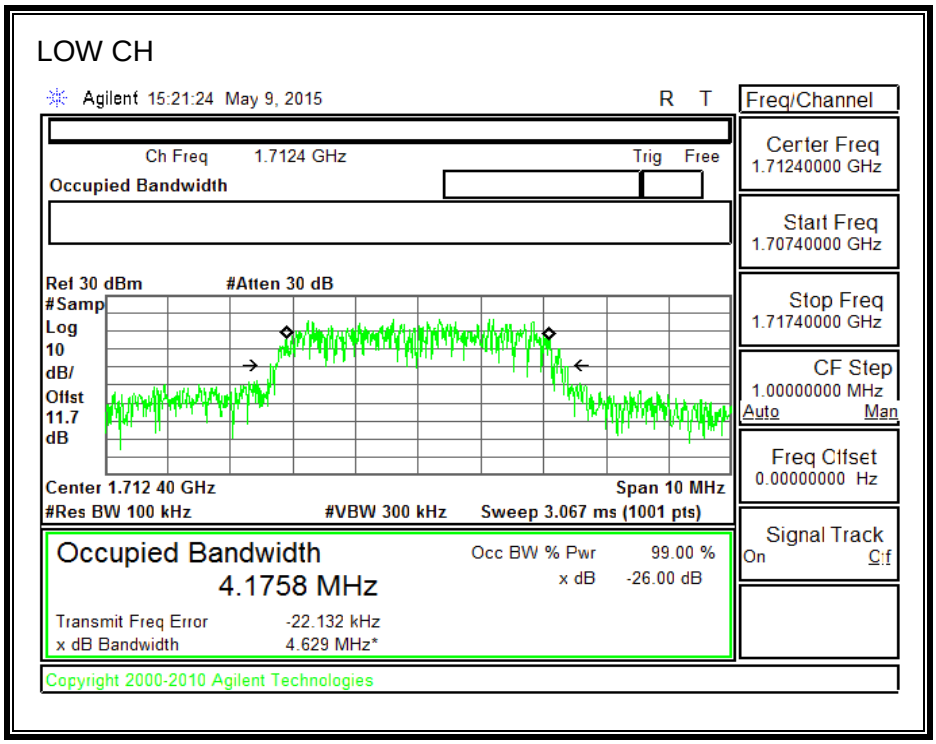

MID CH



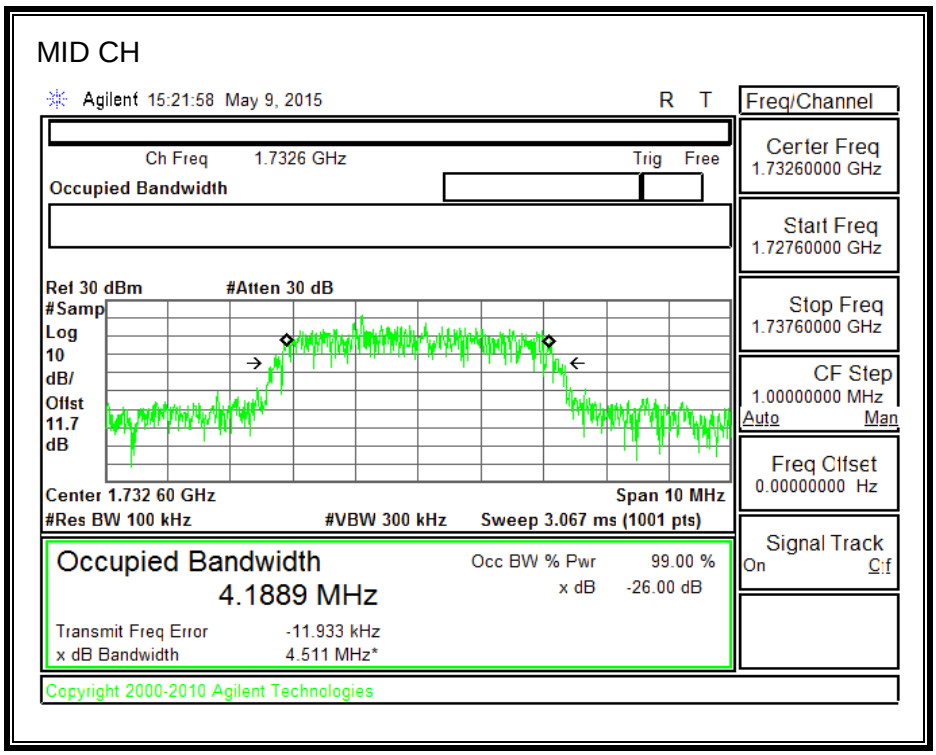


**1700MHz BAND**

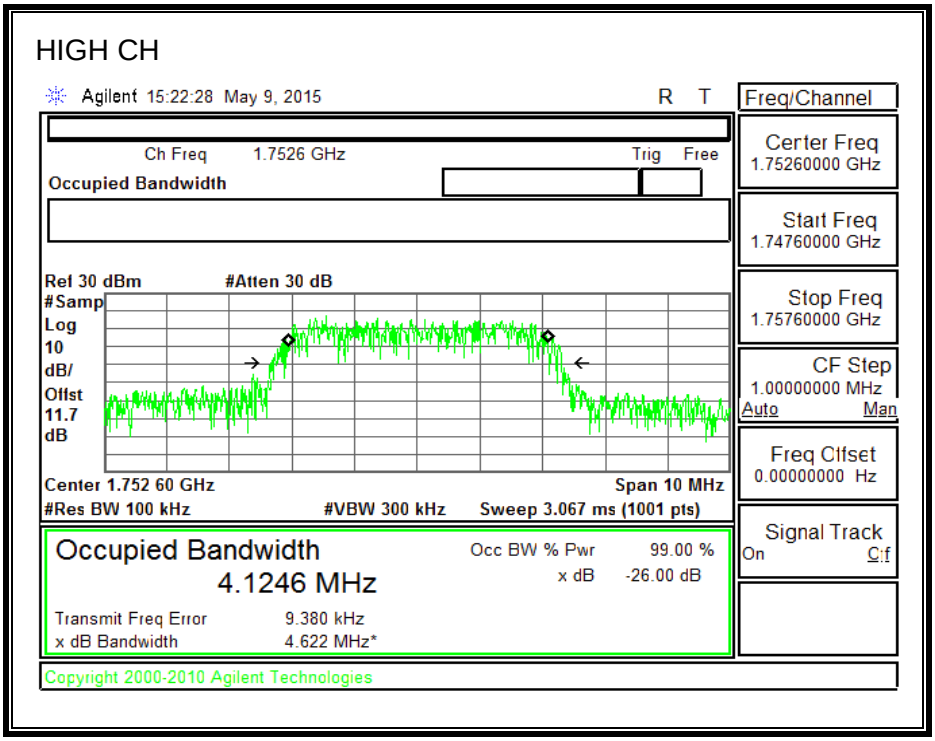
LOW CH




MID CH



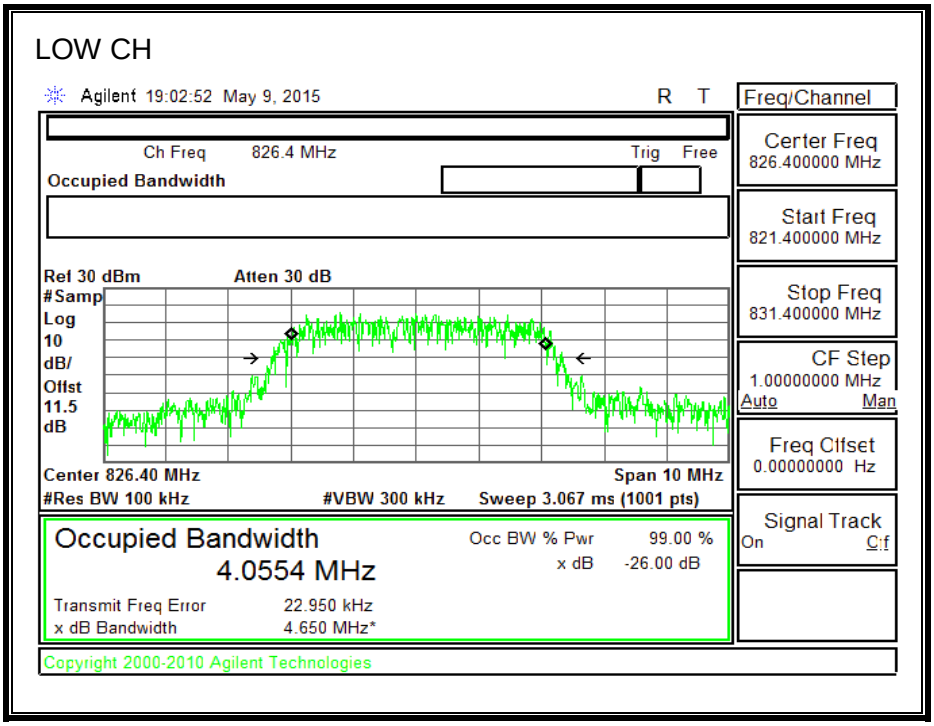
HIGH CH



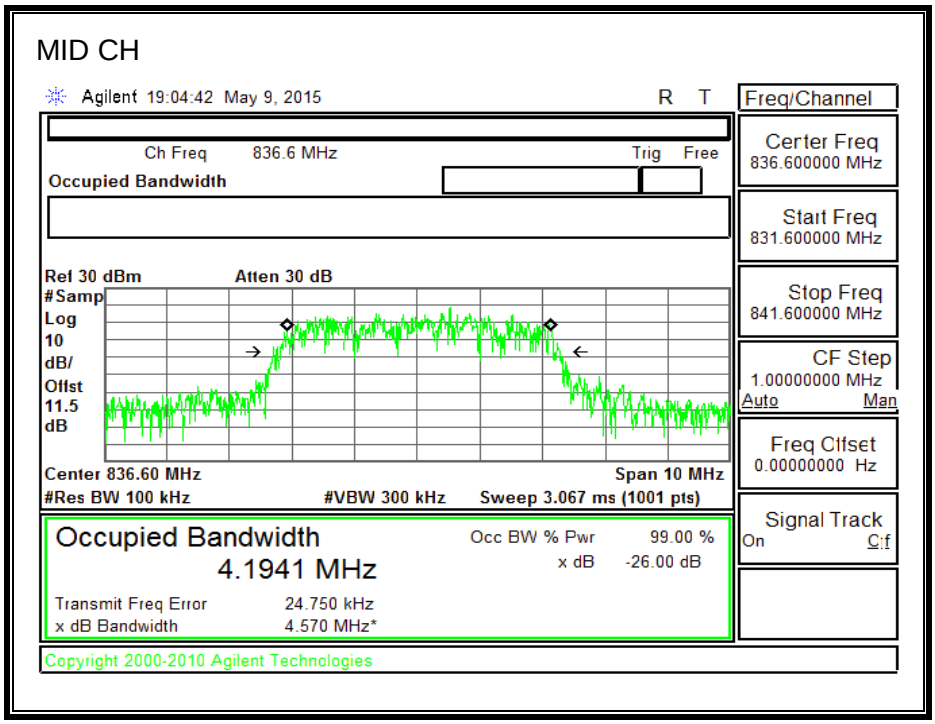
## 8.1.6. UMTS HSDPA

**850MHz BAND**

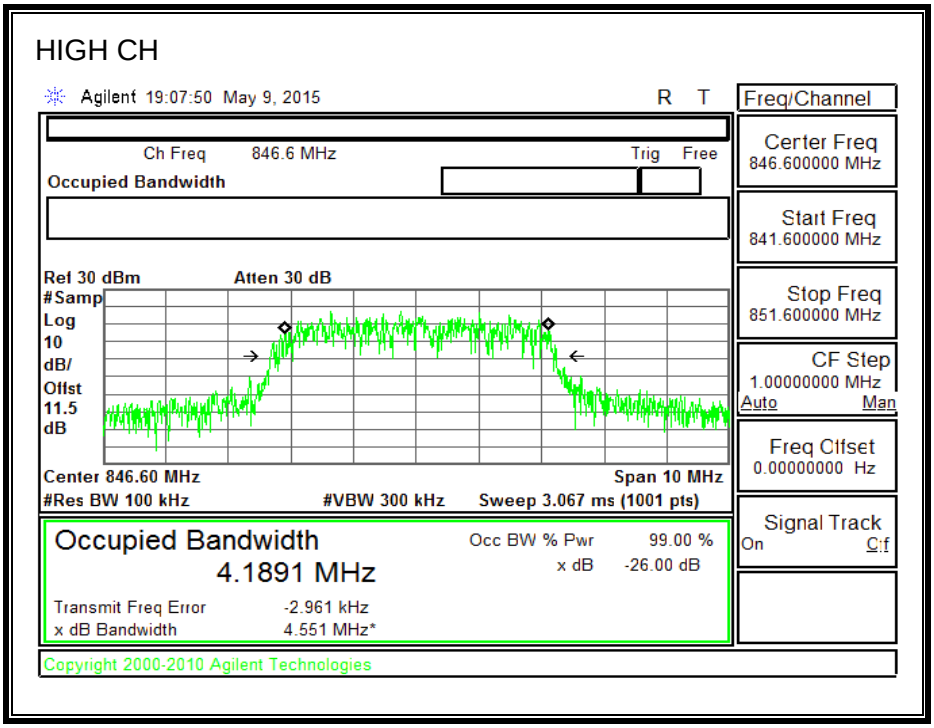
LOW CH




MID CH

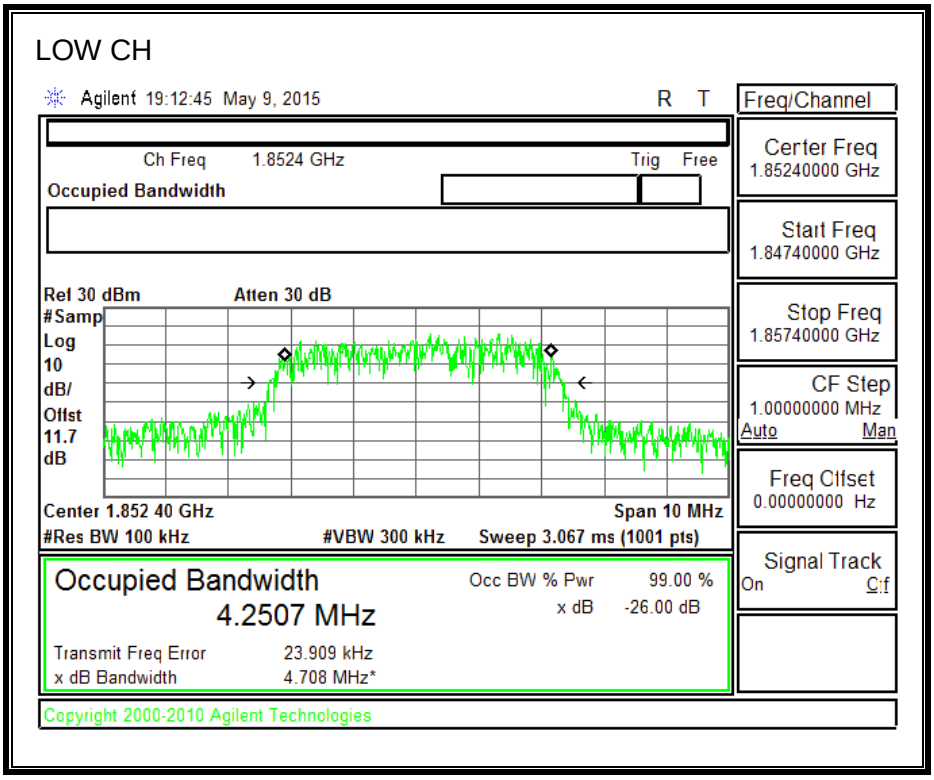


HIGH CH

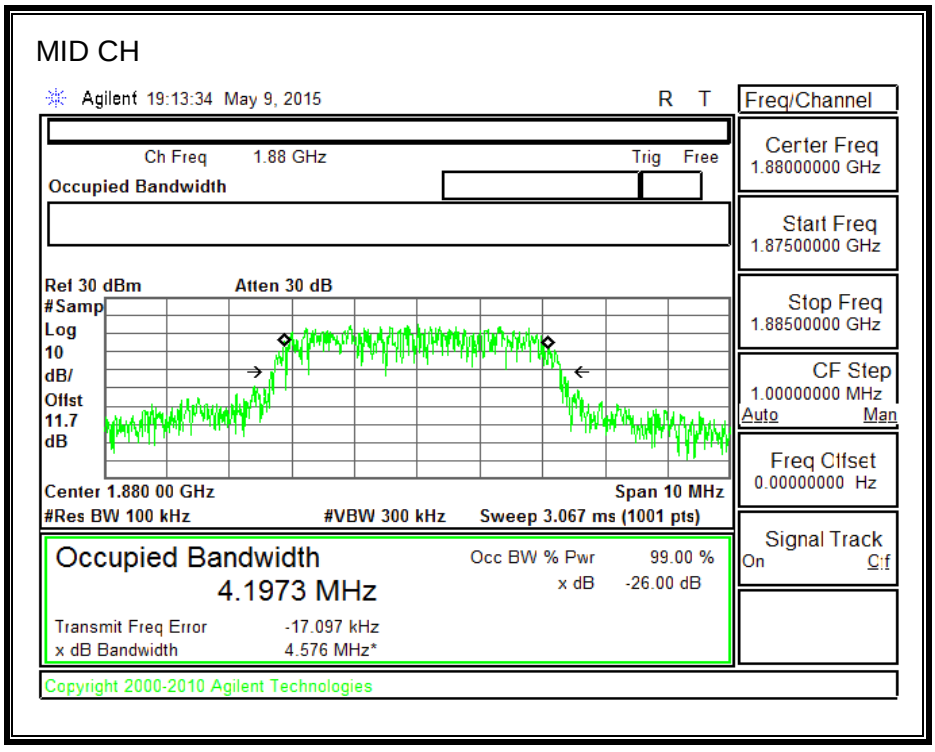


**1900MHz BAND**

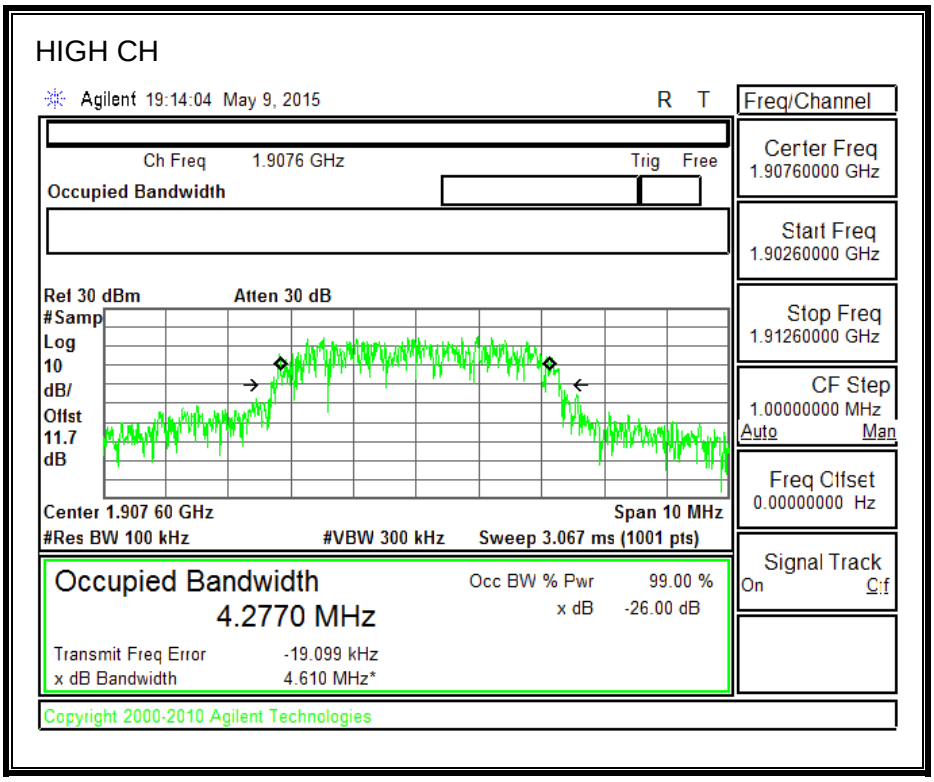
LOW CH




MID CH

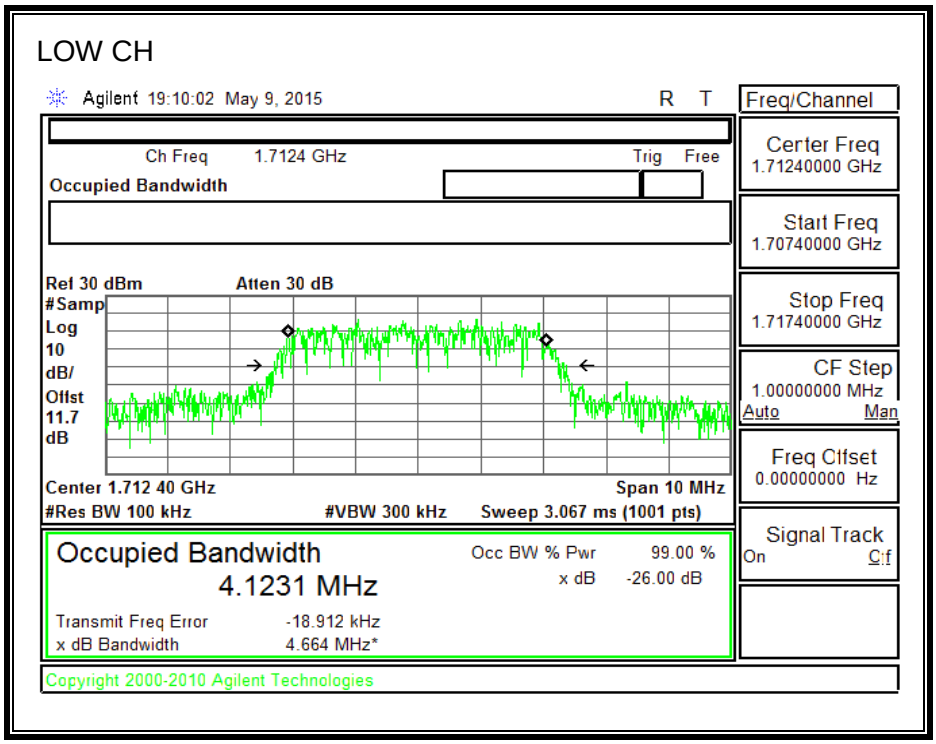


HIGH CH

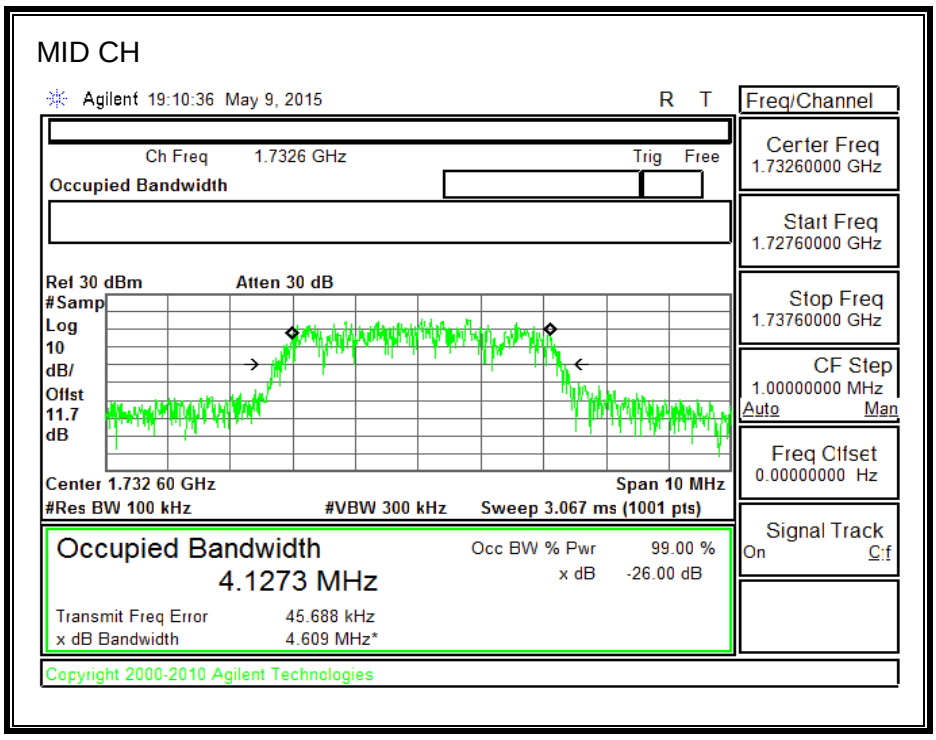


**1700MHz BAND**

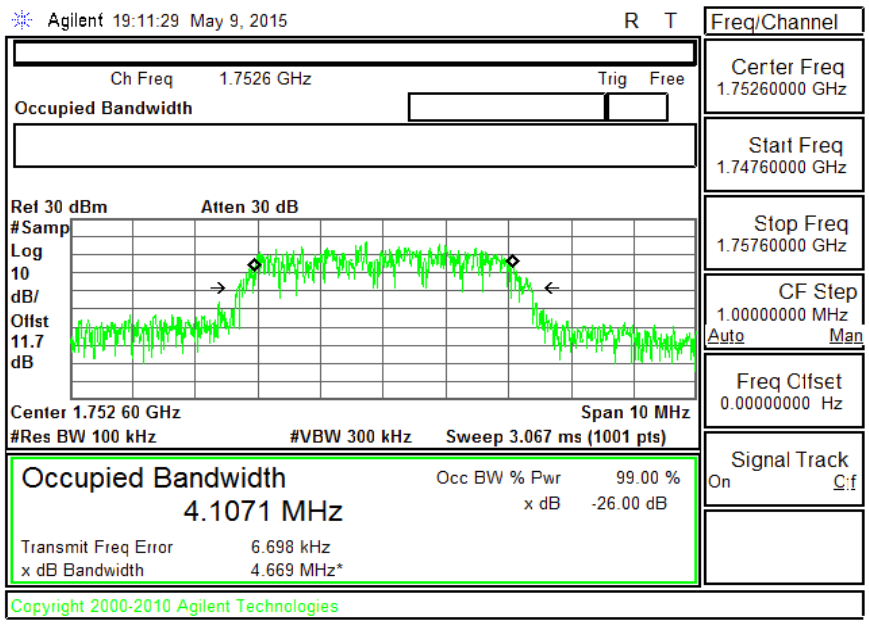
LOW CH




MID CH



HIGH CH



## 8.2. OCCUPIED BANDWIDTH (MODEL: A1687)

**RULE PART(S)**

FCC: §2.1049

**LIMITS**

For reporting purposes only

**TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

**RESULTS**

**GSM-GPRS MODE PART 22 AND 24**

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| CELL | GPRS | 128 | 824.2 | **243.2874** | 293.010 |
| | | 190 | 836.6 | 242.7390 | **303.251** |
| | | 251 | 848.8 | 239.6120 | 299.404 |

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| PCS | GPRS | 512 | 1850.2 | 238.3196 | 297.952 |
| | | 661 | 1880.0 | **245.8043** | 305.135 |
| | | 810 | 1909.8 | 241.8449 | **309.270** |

**GSM-EGPRS MODE PART 22 AND 24**

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| CELL | EGPRS | 128 | 824.2 | **242.8461** | **321.391** |
| | | 190 | 836.6 | 240.4323 | 308.066 |
| | | 251 | 848.8 | 238.2123 | 293.268 |

| Band | Mode | Channel | f (MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| PCS | EGPRS | 512 | 1850.2 | 245.2558 | **320.808** |
| | | 661 | 1880.0 | **247.5452** | 315.550 |
| | | 810 | 1909.8 | 244.9034 | 299.347 |

**CDMA2000 1xRTT, PART 22, 24, 27 AND 90**

| Band | Mode | Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| CELL | CDMA 2000 1xRTT | 1013 | 824.70 | 1.2603 | 1.387 |
| | | 384 | 836.52 | **1.2716** | 1.415 |
| | | 777 | 848.31 | 1.2618 | 1.393 |
| PCS | | 25 | 1851.25 | 1.2370 | 1.411 |
| | | 600 | 1880.00 | 1.2572 | 1.382 |
| | | 1175 | 1908.75 | **1.2818** | 1.402 |
| AWS | | 25 | 1711.25 | 1.2638 | 1.399 |
| | | 450 | 1732.50 | **1.2837** | 1.401 |
| | | 875 | 1753.75 | 1.2665 | 1.339 |
| 800 MHz Secondary | | 450 | 817.25 | **1.2730** | 1.393 |
| | | 560 | 820.00 | 1.2631 | 1.398 |
| | | 670 | 822.75 | 1.2620 | 1.388 |

**CDMA2000 EVDO REV A, PART 22, 24, 27 AND 90**

| Band | Mode | Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| CELL | CDMA 2000 EVDO Rev. A | 1013 | 824.70 | 1.2842 | 1.399 |
| | | 384 | 836.52 | 1.2501 | 1.372 |
| | | 777 | 848.31 | **1.2864** | 1.390 |
| PCS | | 25 | 1851.25 | 1.2663 | 1.396 |
| | | 600 | 1880.00 | **1.2851** | 1.398 |
| | | 1175 | 1908.75 | 1.2753 | 1.440 |
| AWS | | 25 | 1711.25 | 1.2714 | 1.395 |
| | | 450 | 1732.50 | **1.2858** | 1.407 |
| | | 875 | 1753.75 | 1.2627 | 1.401 |
| 800 MHz Secondary | | 450 | 817.25 | 1.2534 | 1.387 |
| | | 560 | 820.00 | **1.2998** | 1.404 |
| | | 670 | 822.75 | 1.2858 | 1.393 |

**UMTS REL99 MODE PART 22, 24, AND 27**

| PART 22, 24, AND 27 | | | | | |
|---|---|---|---|---|---|
| Band | Mode | DL Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
| 850MHz | UMTS Rel. 99 | 4357 | 826.40 | **4.2474** | 4.668 |
| | | 4408 | 836.60 | 4.2203 | **4.695** |
| | | 4458 | 846.60 | 4.1393 | 4.625 |
| 1900MHz | | 9662 | 1852.40 | 4.0761 | **4.690** |
| | | 9800 | 1880.00 | **4.2137** | 4.620 |
| | | 9938 | 1907.60 | 4.128 | 4.579 |
| 1700MHz | | 1537 | 1712.40 | 4.1403 | **4.63** |
| | | 1638 | 1732.60 | **4.1834** | 4.584 |
| | | 1738 | 1752.60 | 4.0628 | 4.58 |

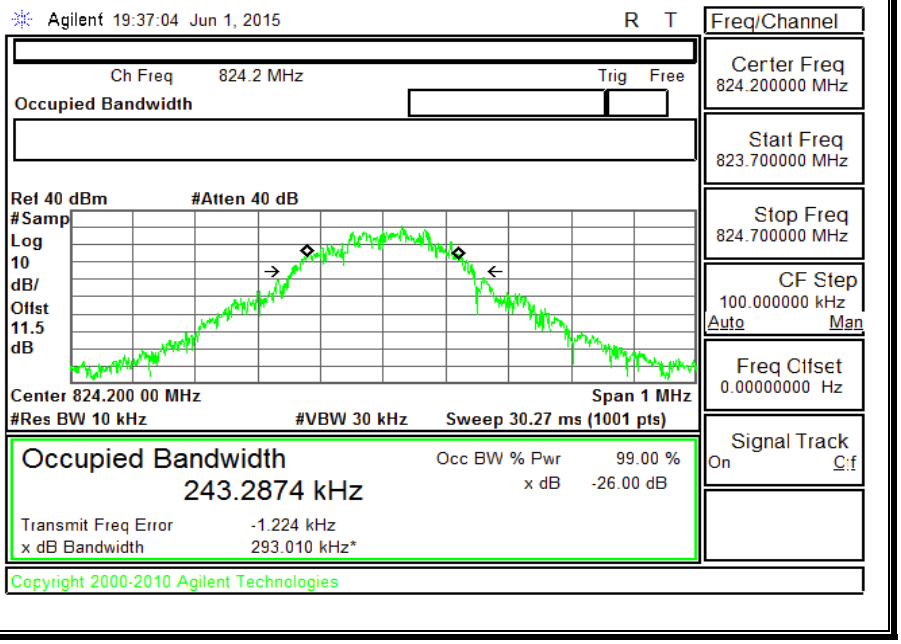
**UMTS HSDPA MODE PART 22, 24, AND 27**

| PART 22, 24, AND 27 | | | | | |
|---|---|---|---|---|---|
| Band | Mode | DL Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
| 850MHz | UMTS HSDPA | 4357 | 826.40 | 4.1551 | 4.622 |
| | | 4408 | 836.60 | **4.2401** | **4.625** |
| | | 4458 | 846.60 | 4.1291 | 4.613 |
| 1900MHz | | 9662 | 1852.40 | 4.175 | 4.598 |
| | | 9800 | 1880.00 | 4.1991 | 4.591 |
| | | 9938 | 1907.60 | **4.1995** | **4.615** |
| 1700MHz | | 1537 | 1712.40 | **4.1542** | **4.642** |
| | | 1638 | 1732.60 | 4.1023 | 4.580 |
| | | 1738 | 1752.60 | 4.1344 | 4.581 |

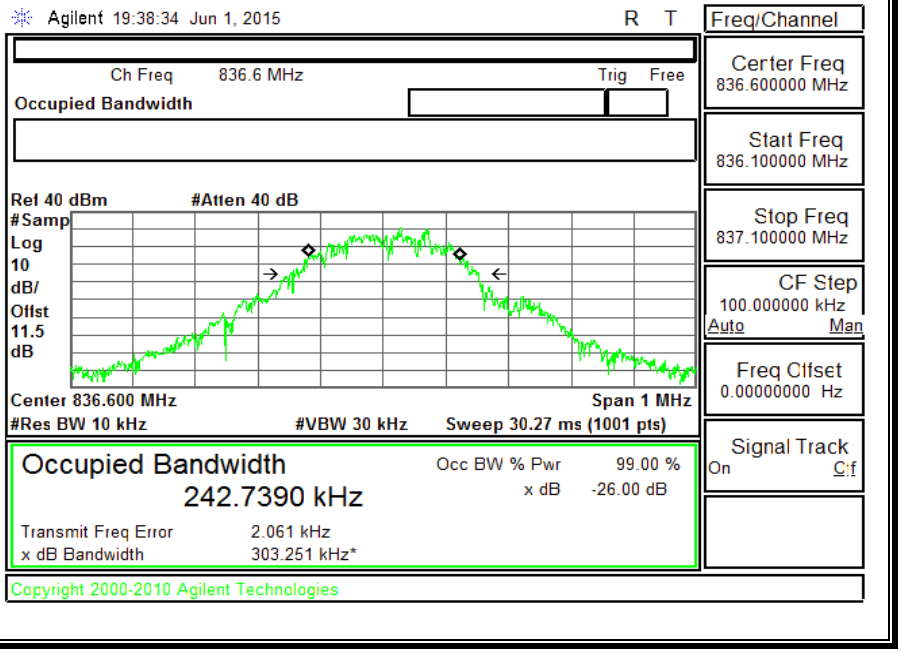
### 8.2.1. GSM GPRS

**850MHz BAND**

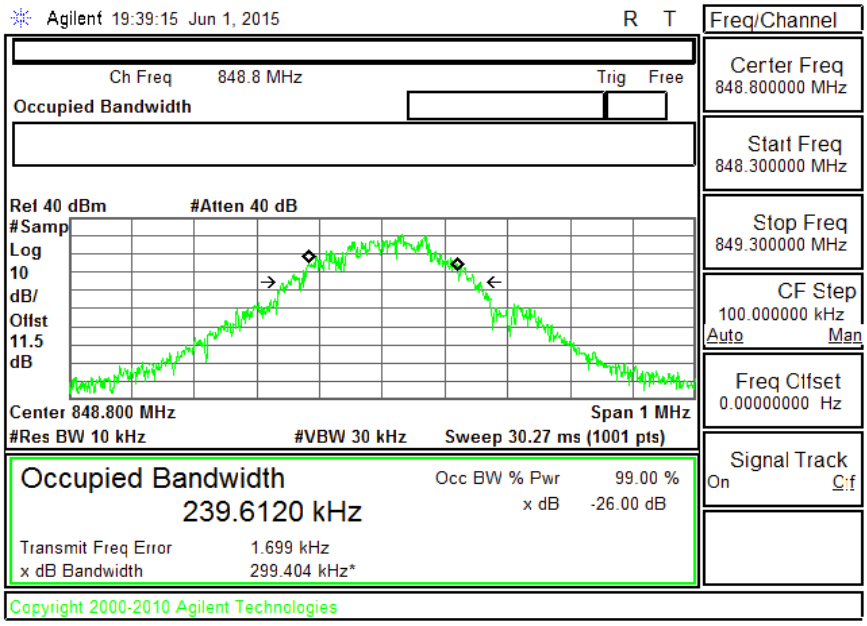
LOW CH




MID CH

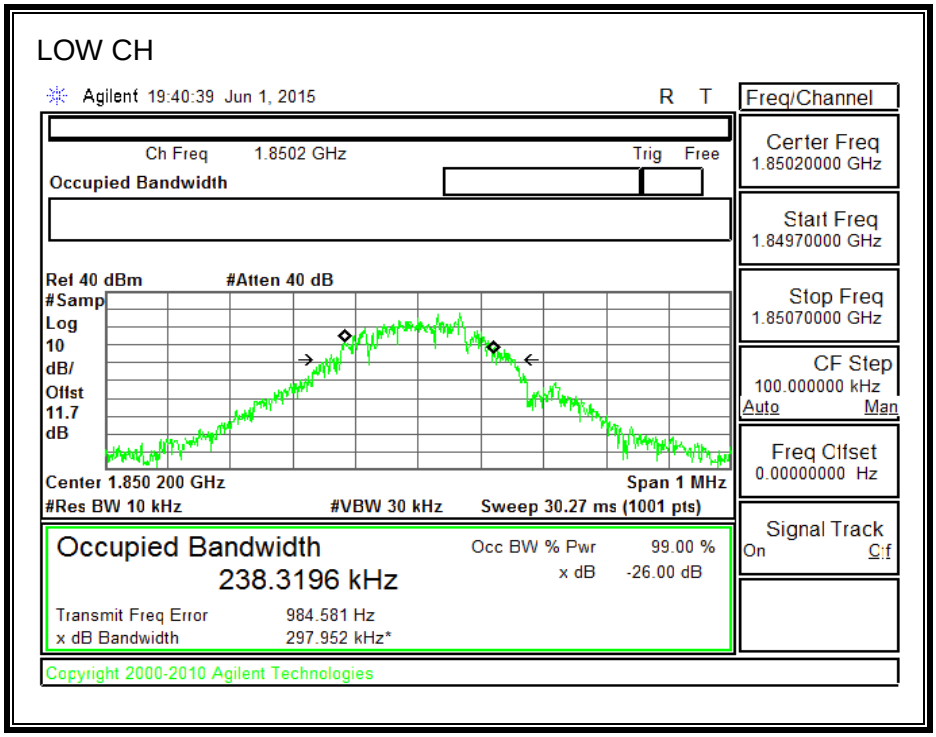


HIGH CH

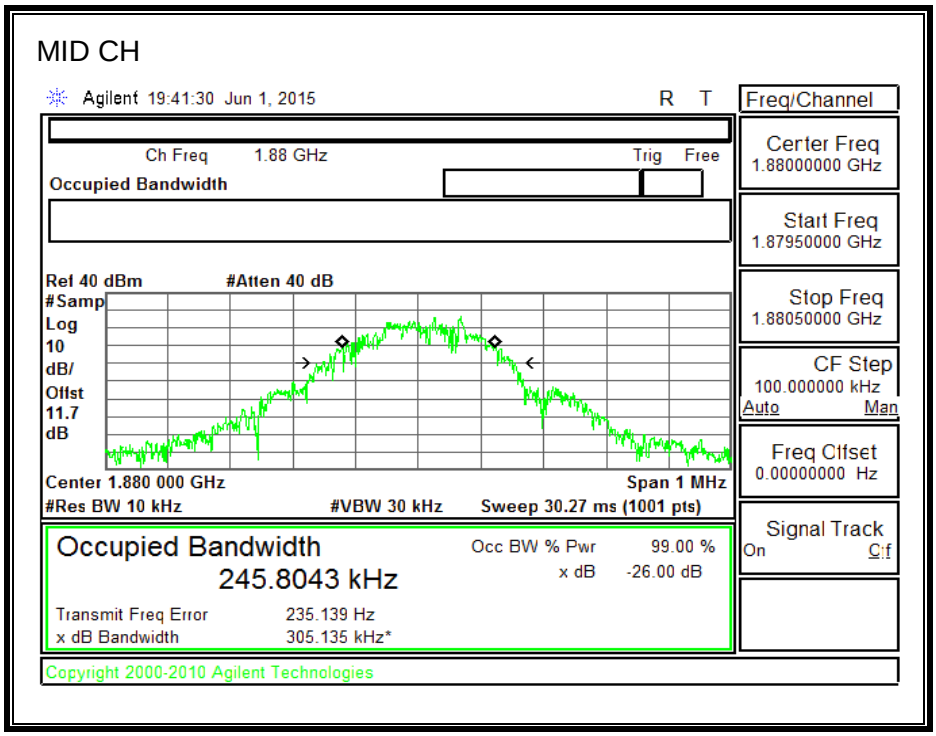



**1900MHz BAND**

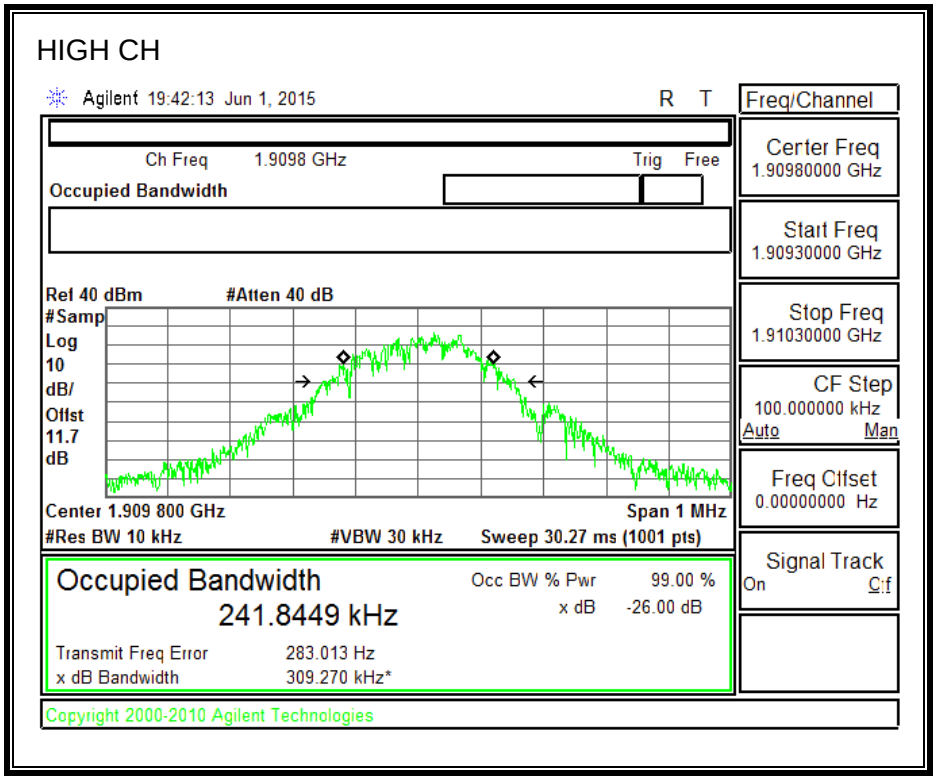
LOW CH



MID CH



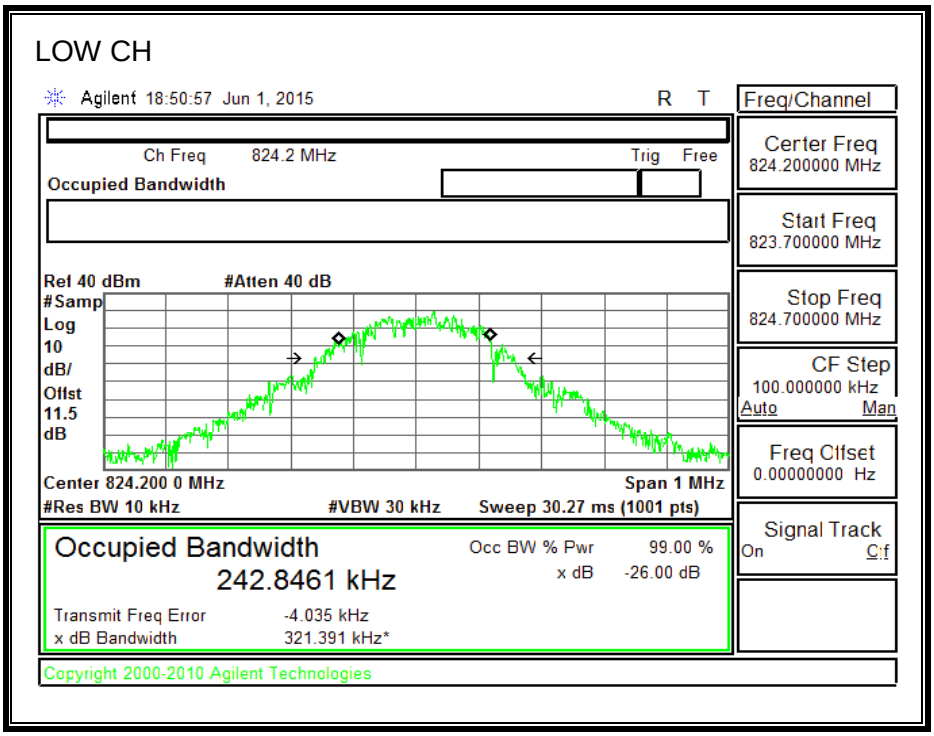

HIGH CH



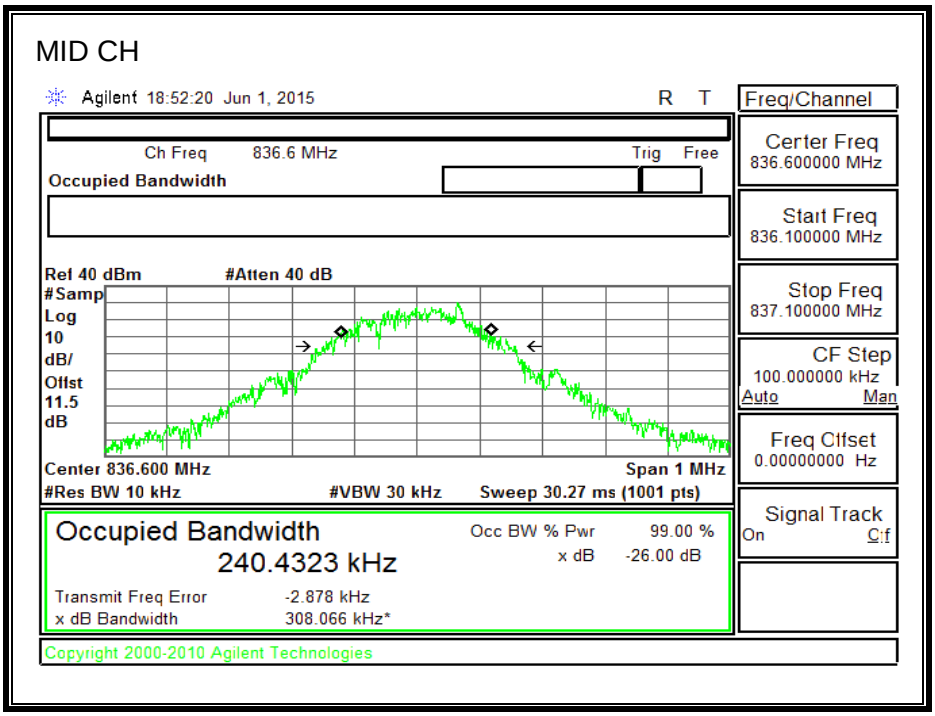
## 8.2.2. GSM EGPRS

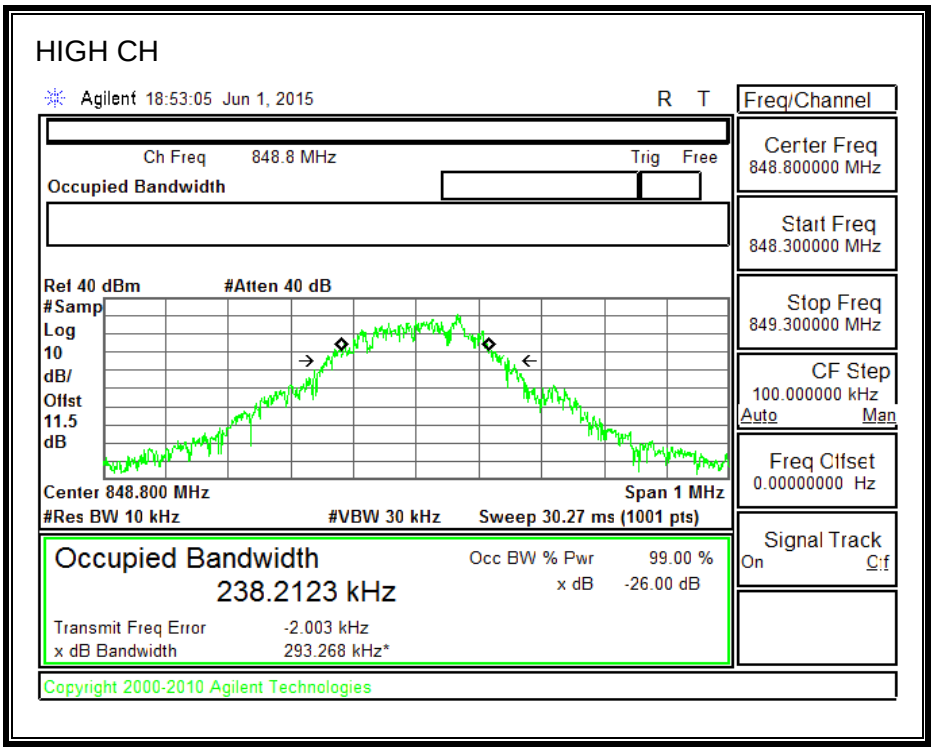
**850MHz BAND**

LOW CH

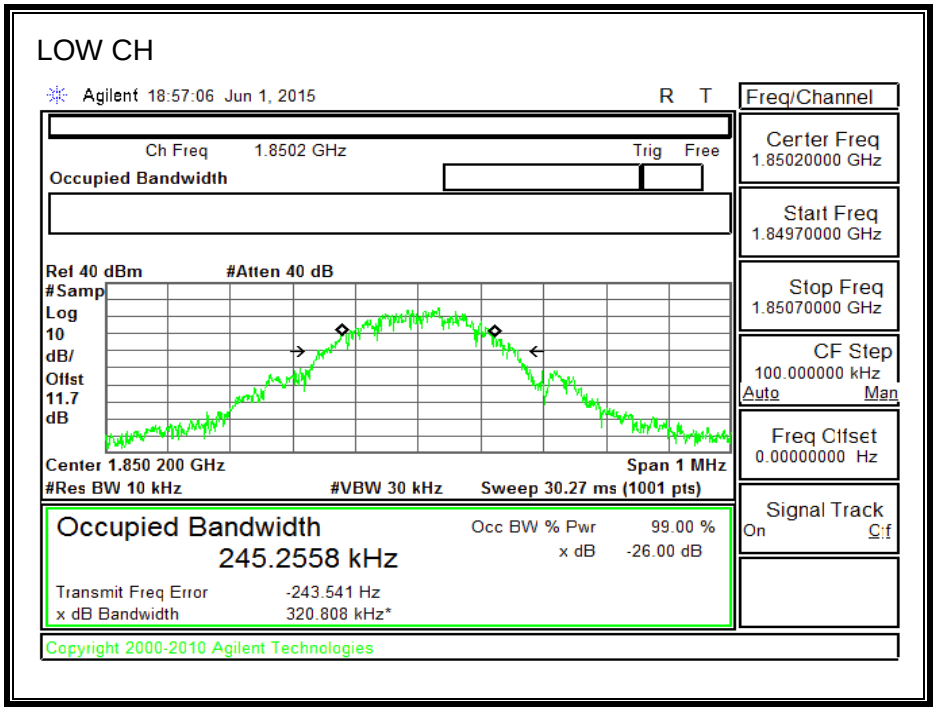



MID CH

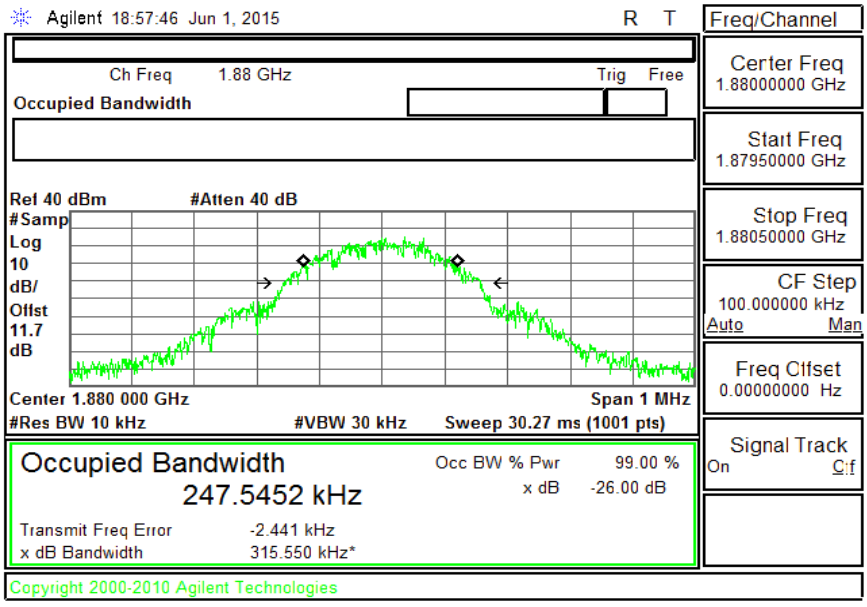




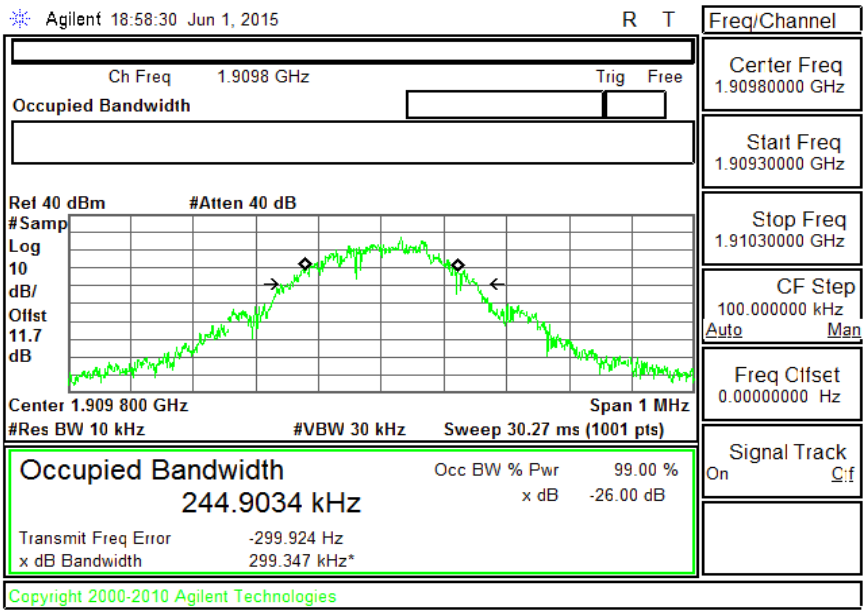

**1900MHz BAND**



MID CH



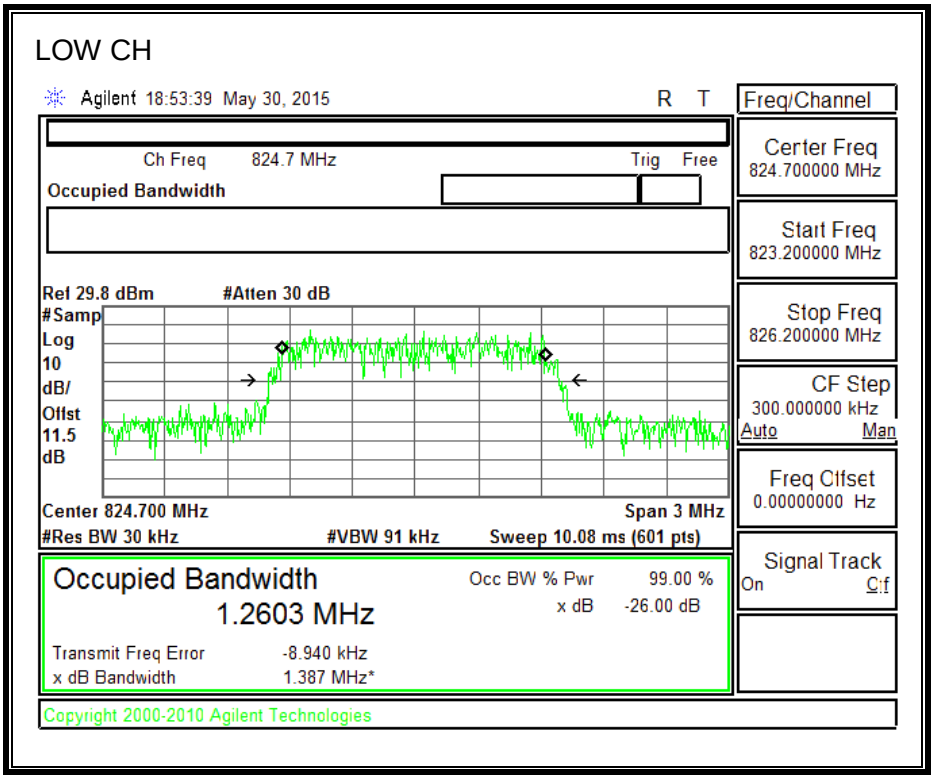

HIGH CH



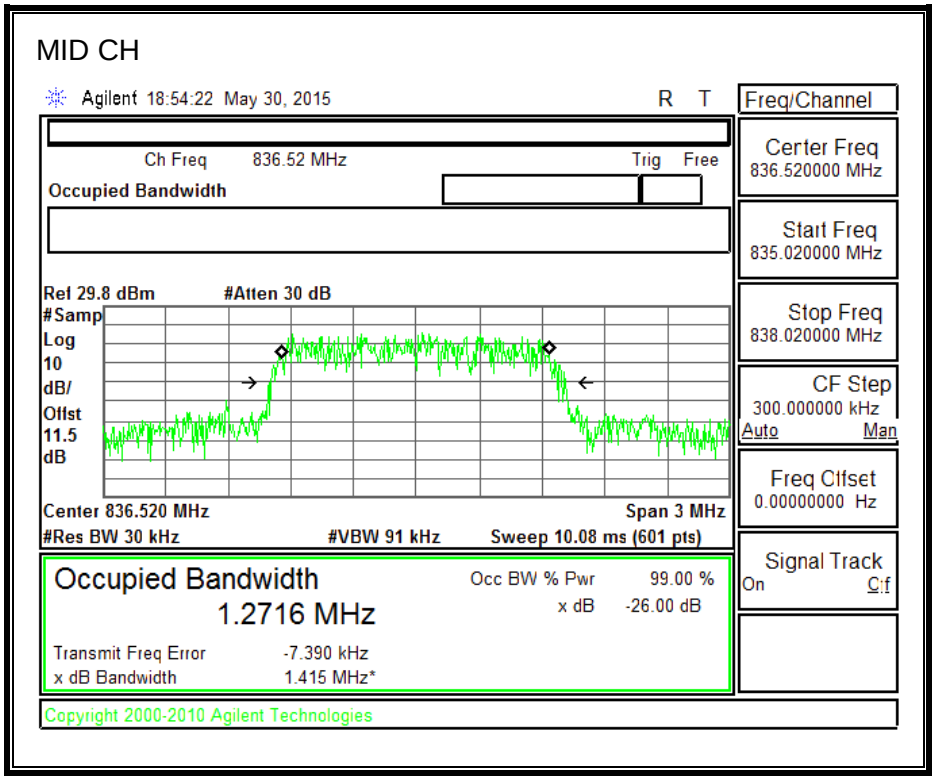
### 8.2.3. CDMA2000 1xRTT

**850MHz BAND**

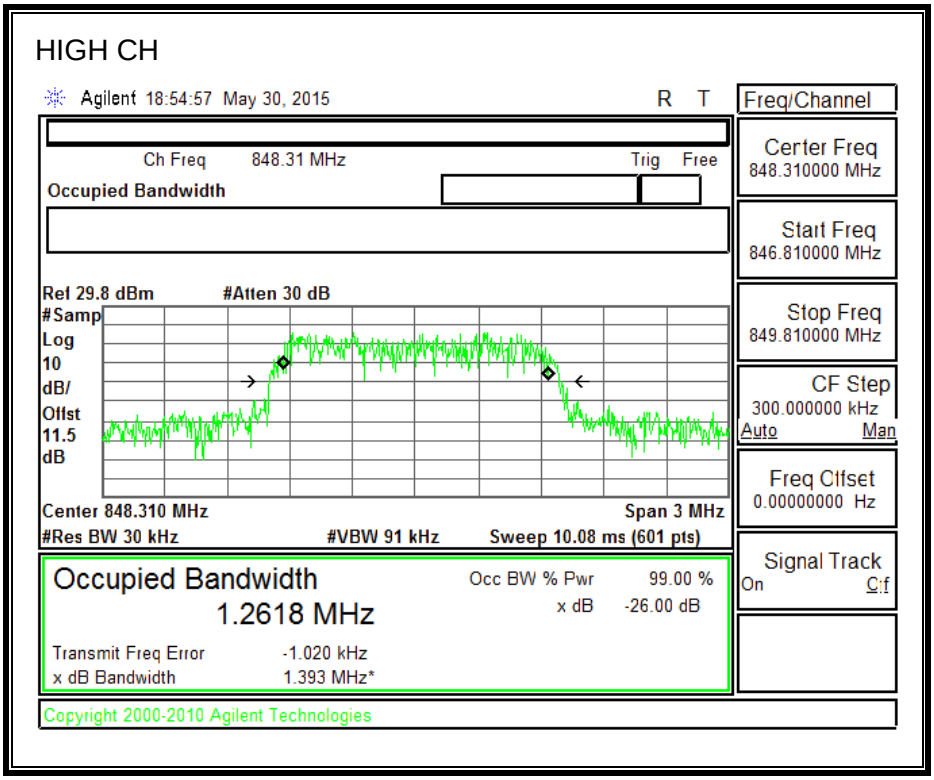
LOW CH




MID CH

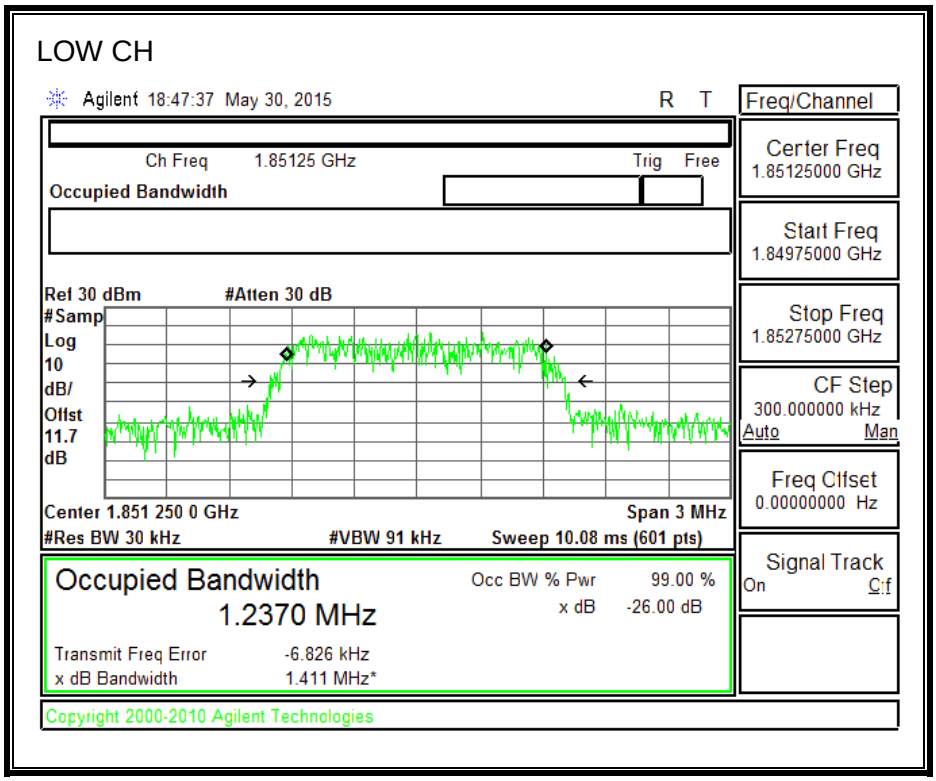


HIGH CH

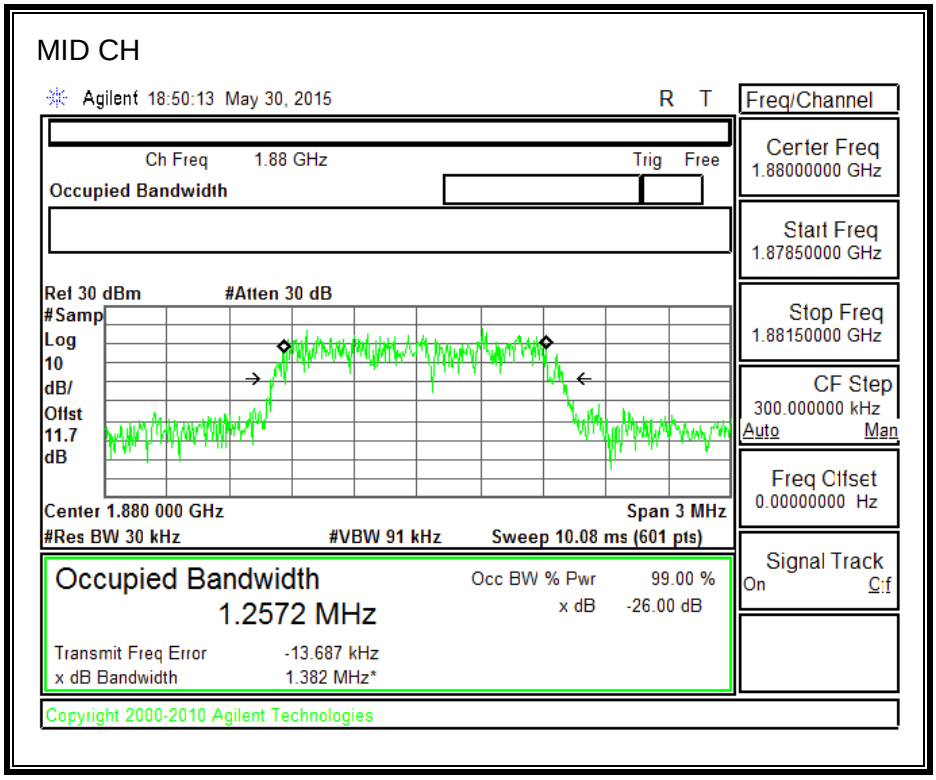


**1900MHz BAND**

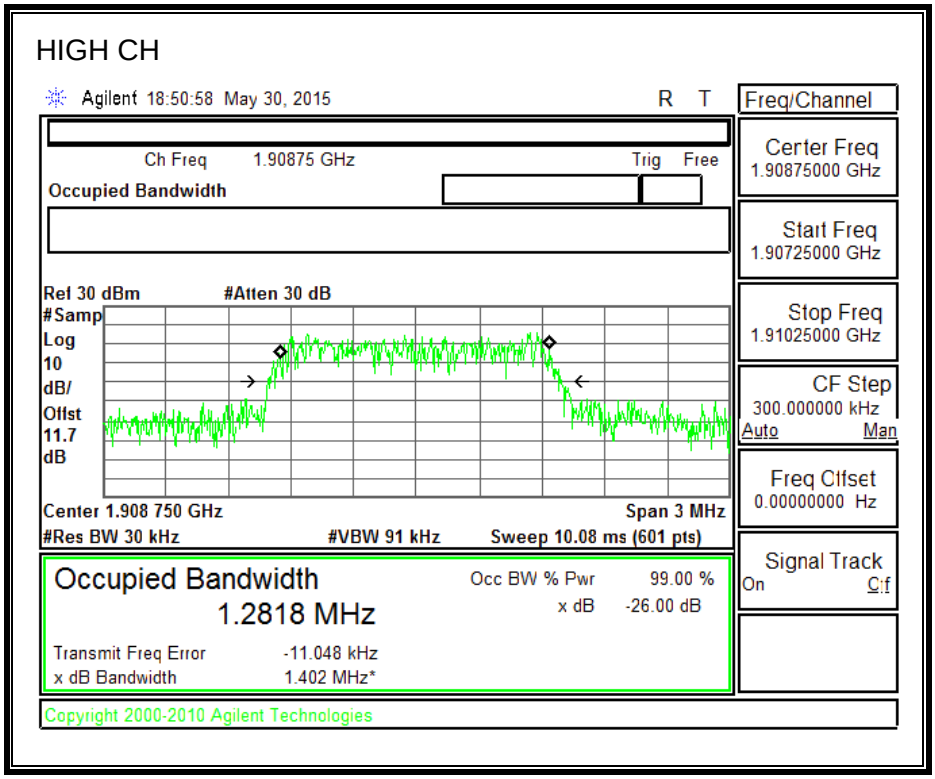
LOW CH




MID CH

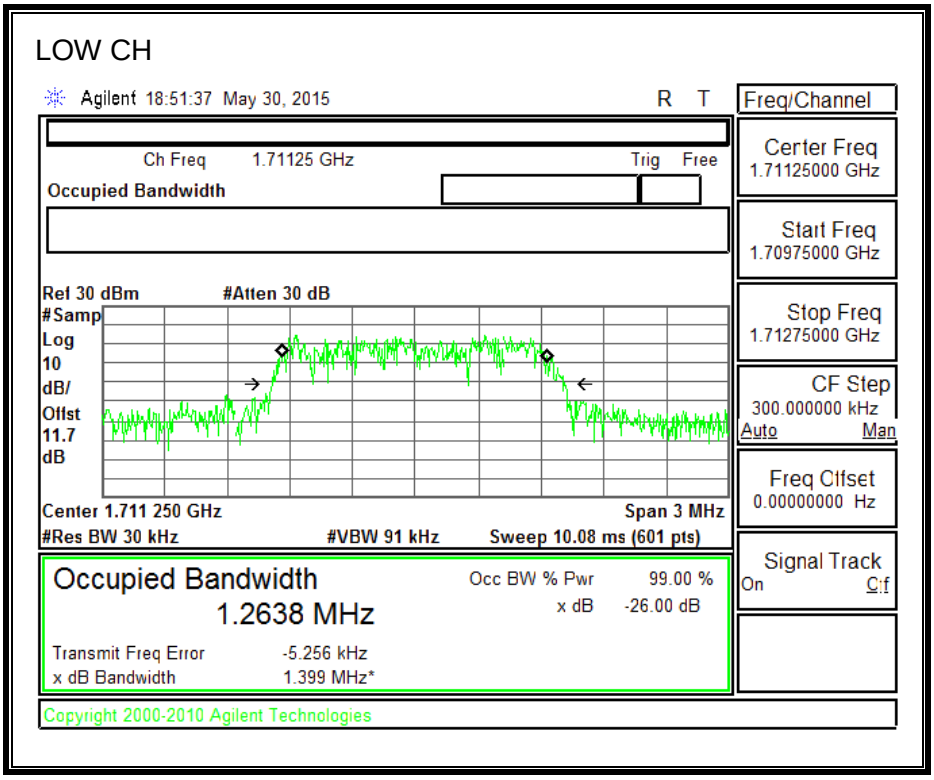


HIGH CH

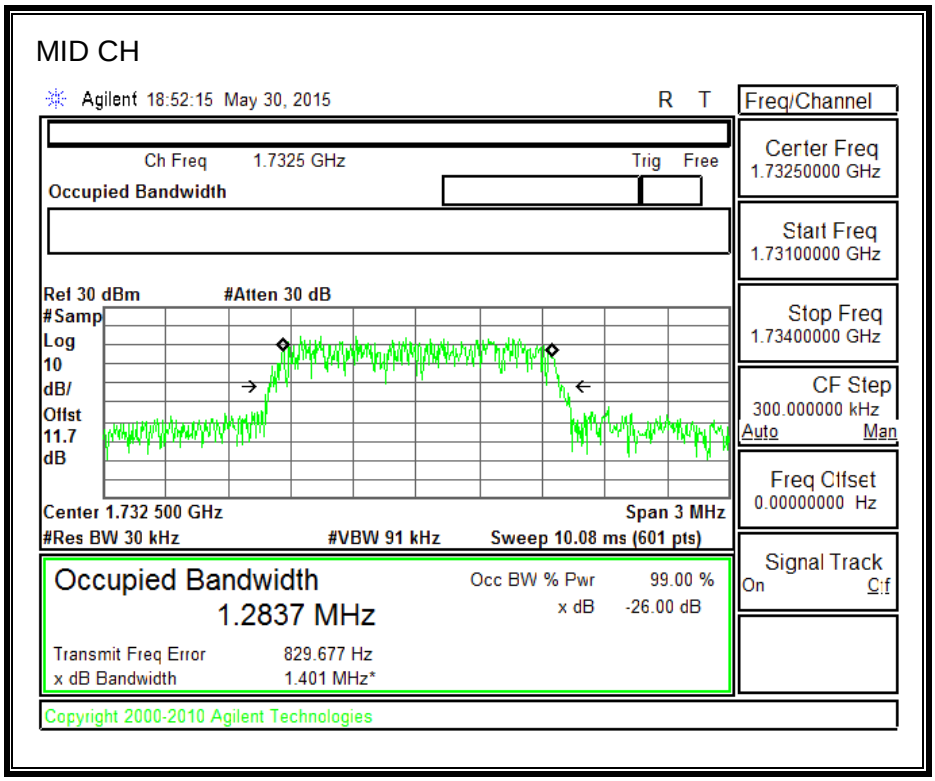


**1700MHz BAND**

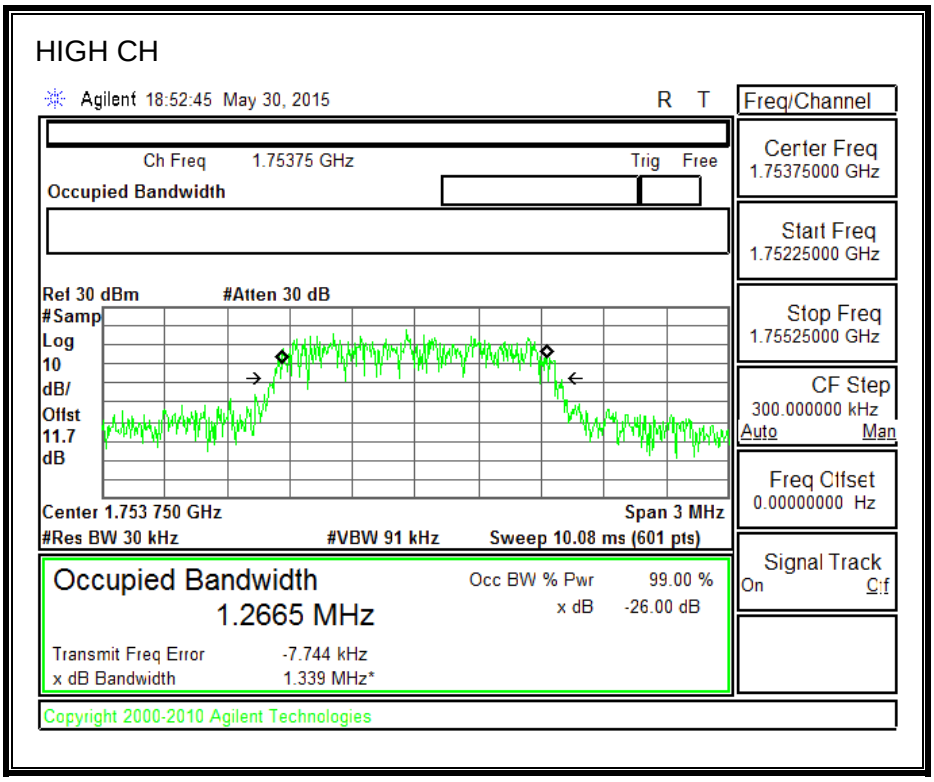
LOW CH




MID CH

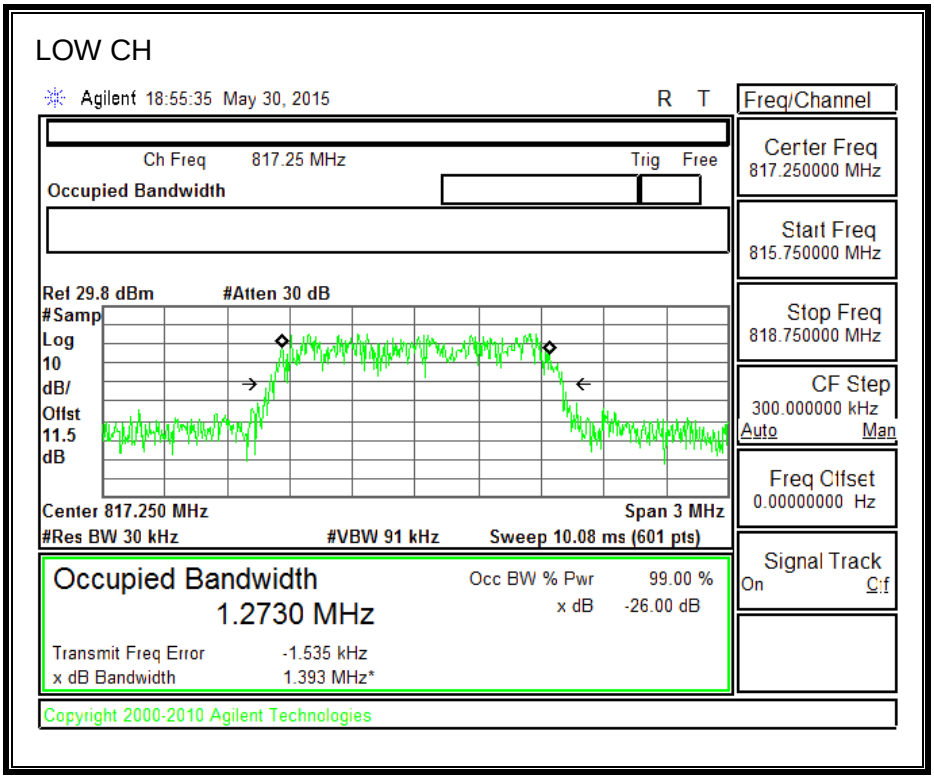


HIGH CH

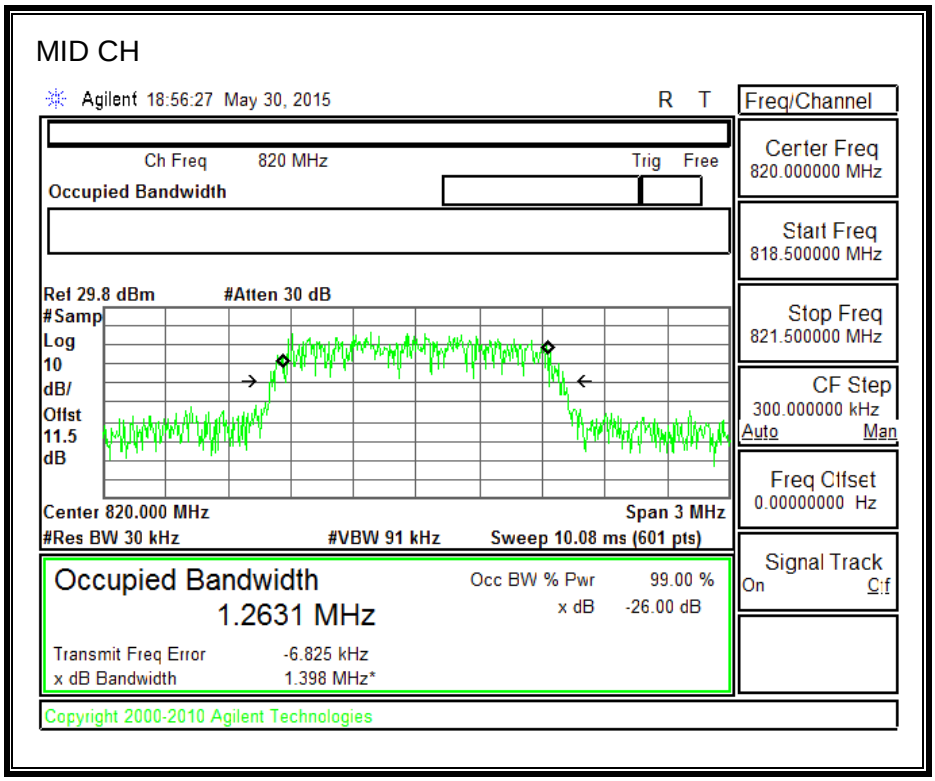


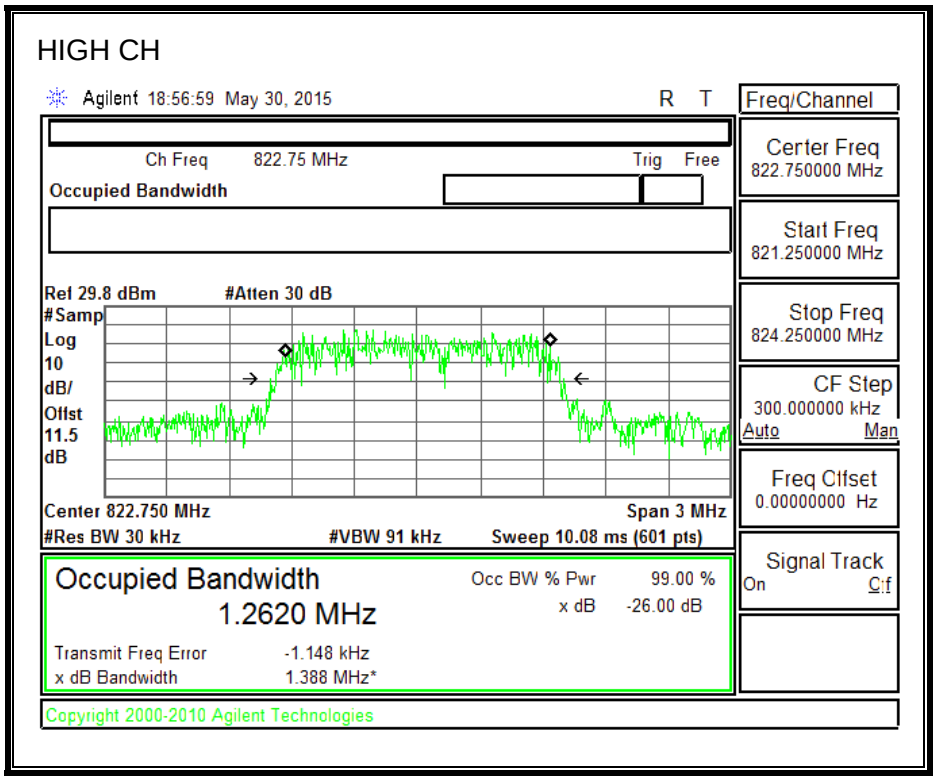
**800MHz SECONDARY BAND**

LOW CH



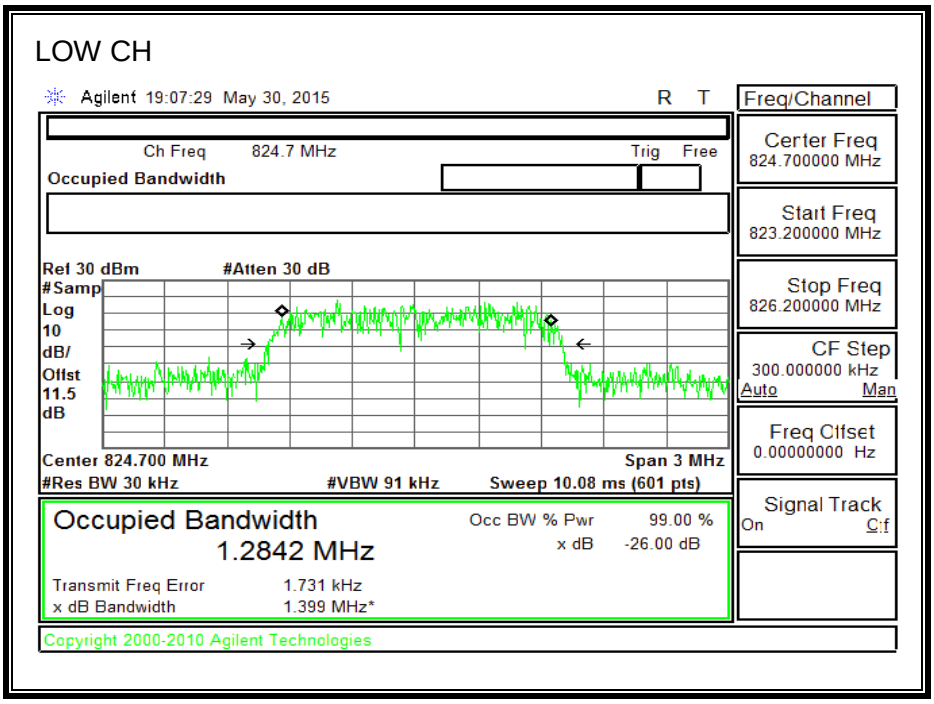

MID CH

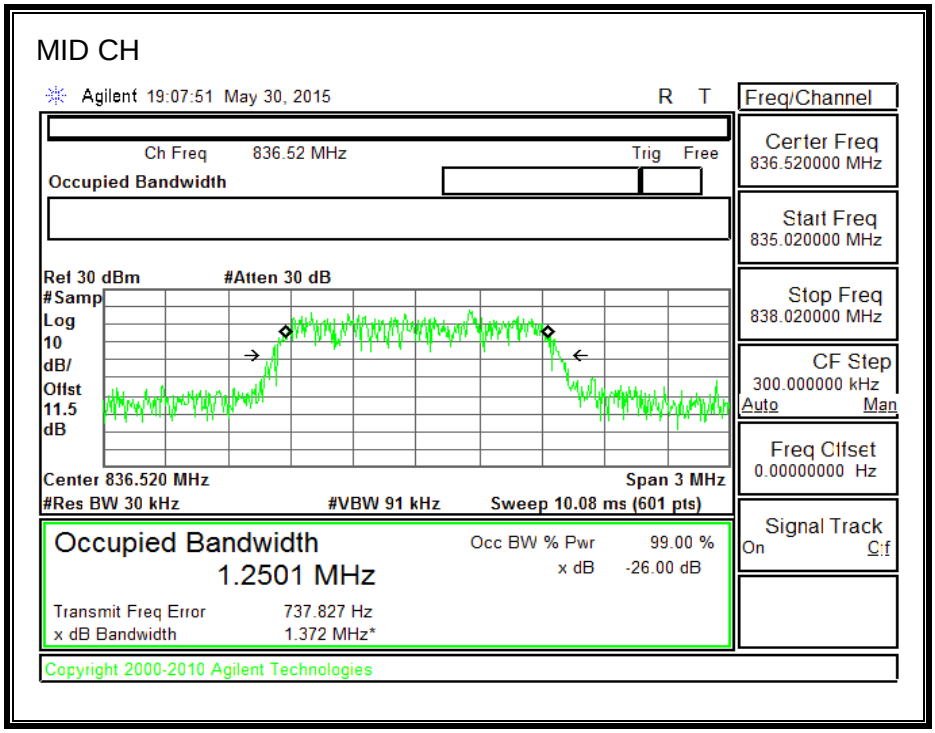




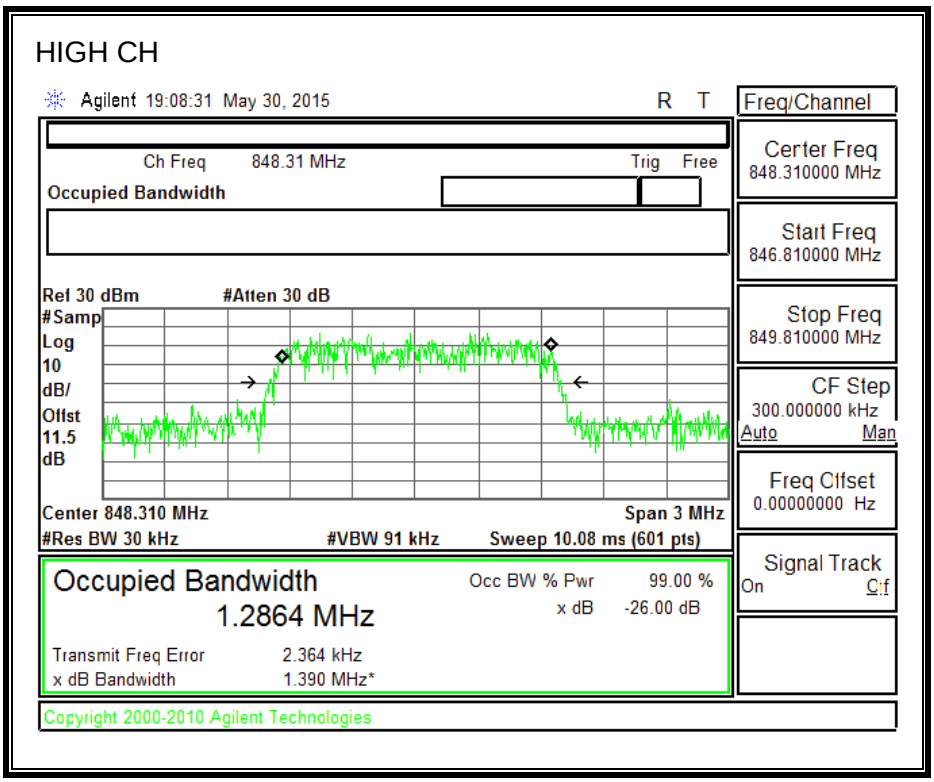
## 8.2.4. CDMA2000 EVDO Rev. A

**850MHz BAND**



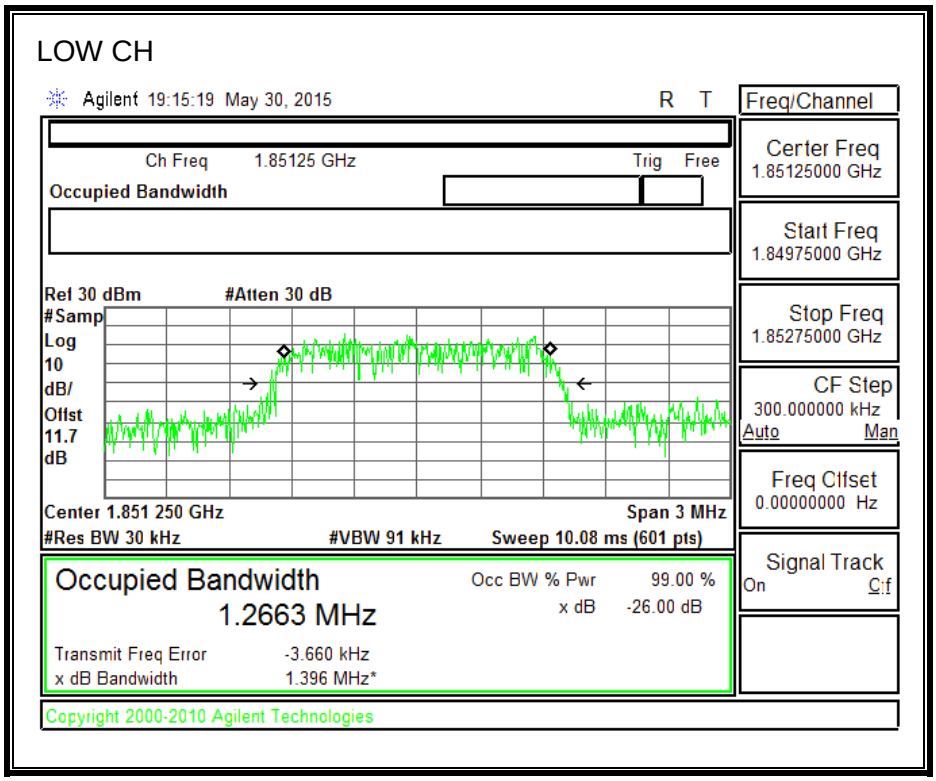



HIGH CH

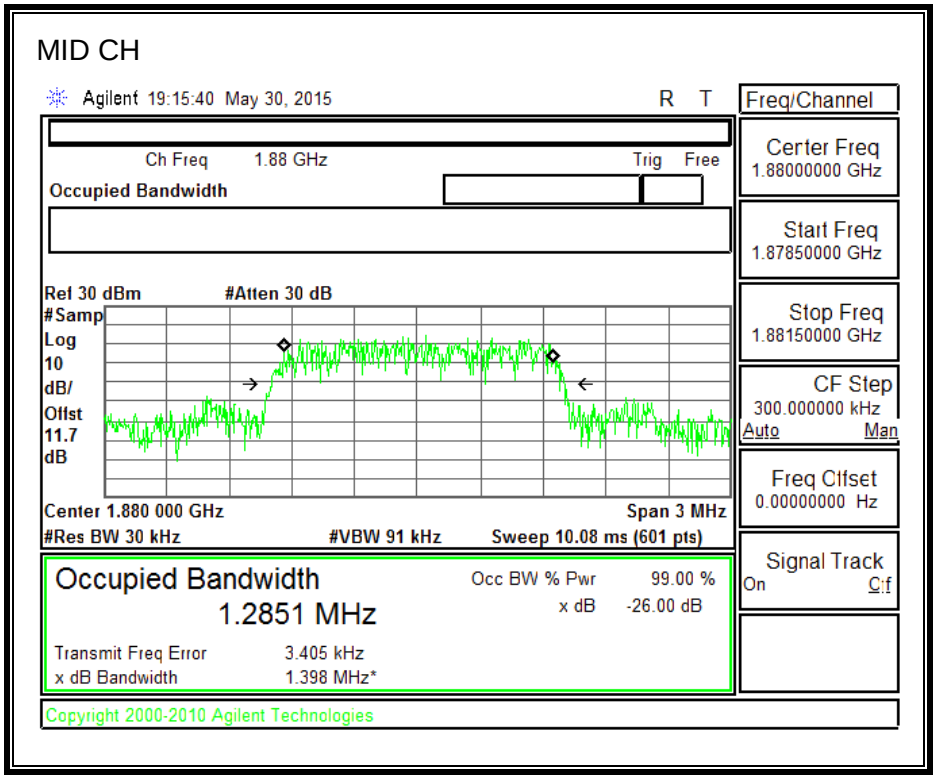


**1900MHz BAND**

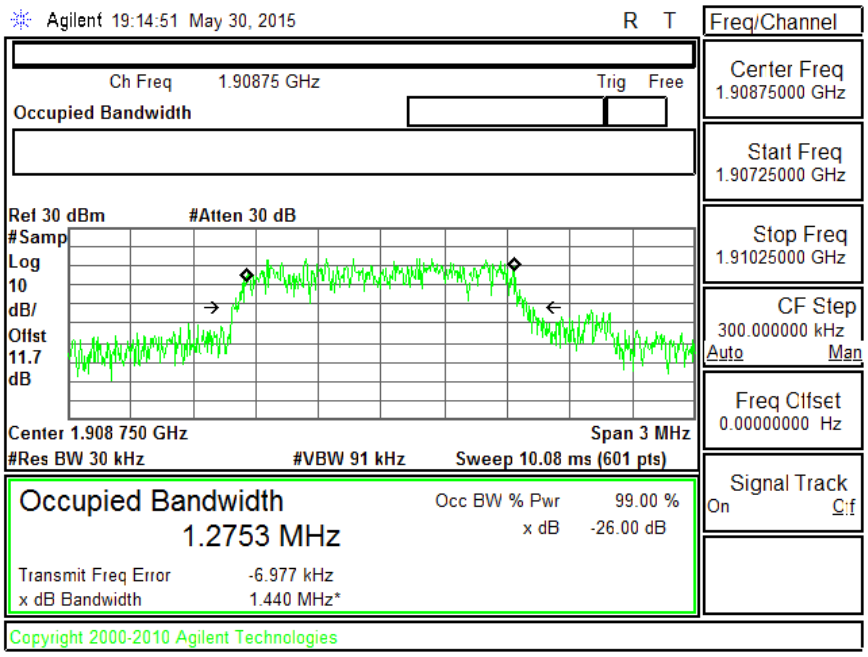
LOW CH




MID CH

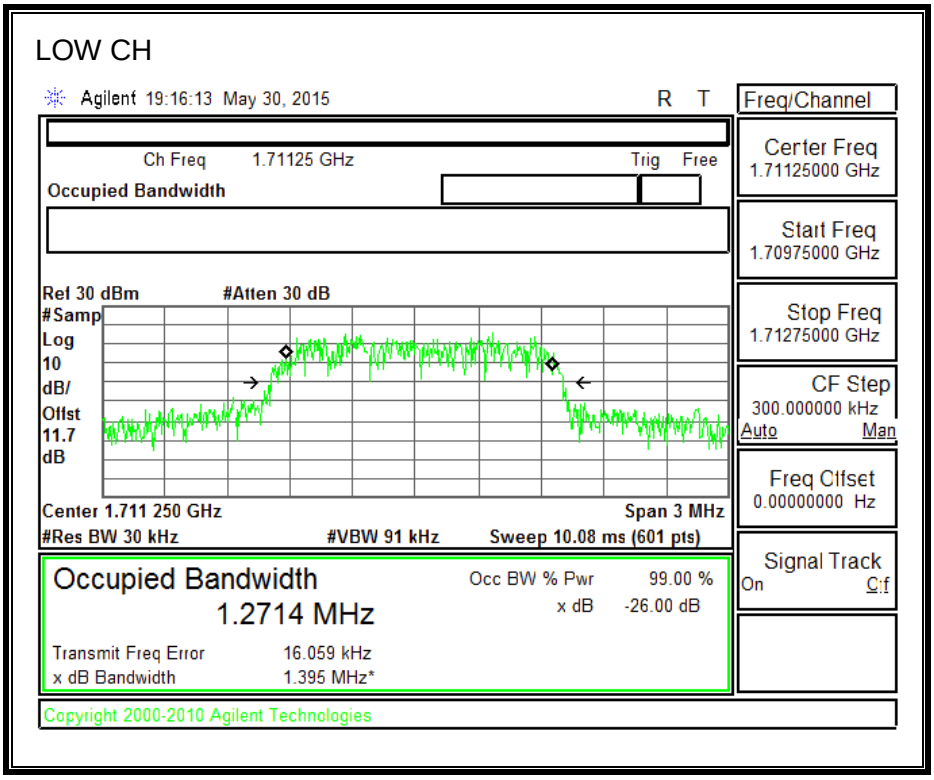


HIGH CH

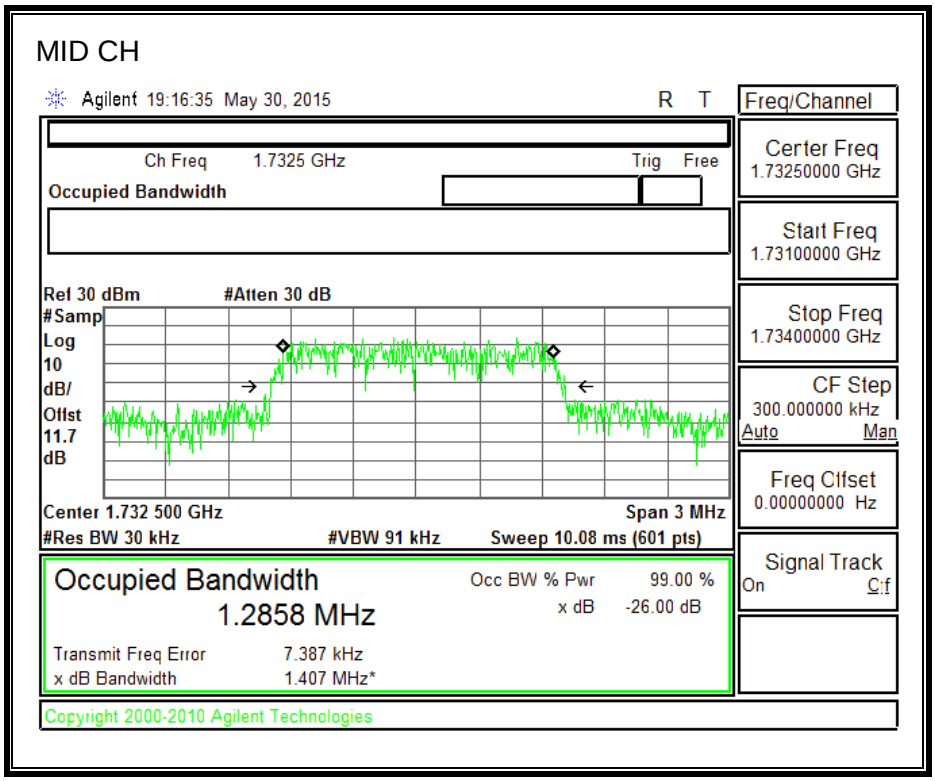


**1700MHz BAND**

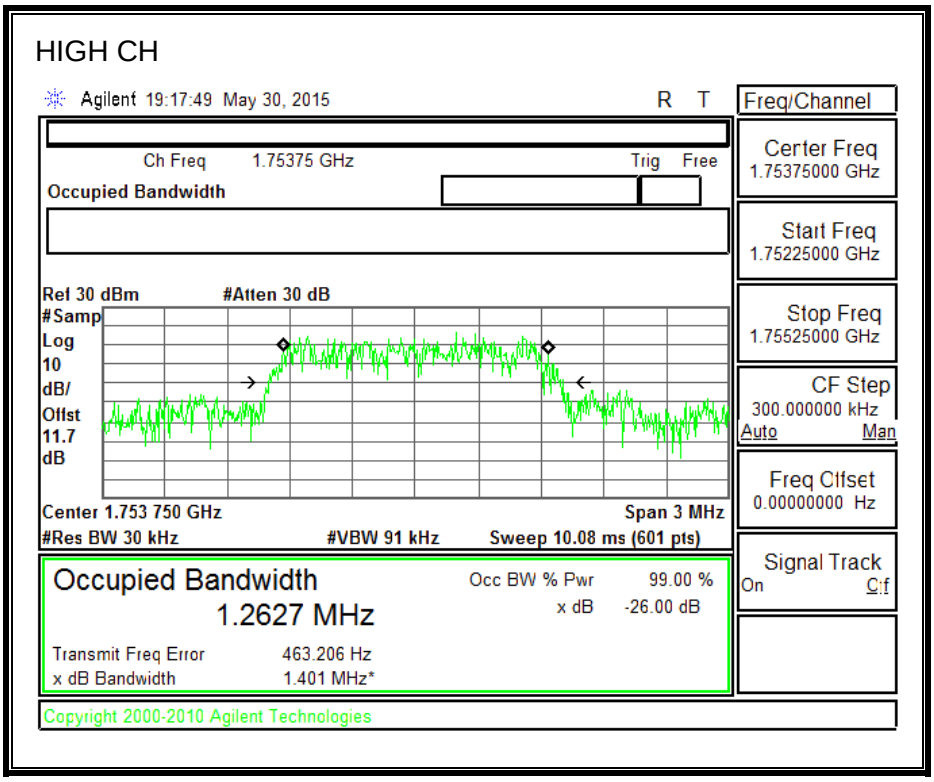
LOW CH




MID CH

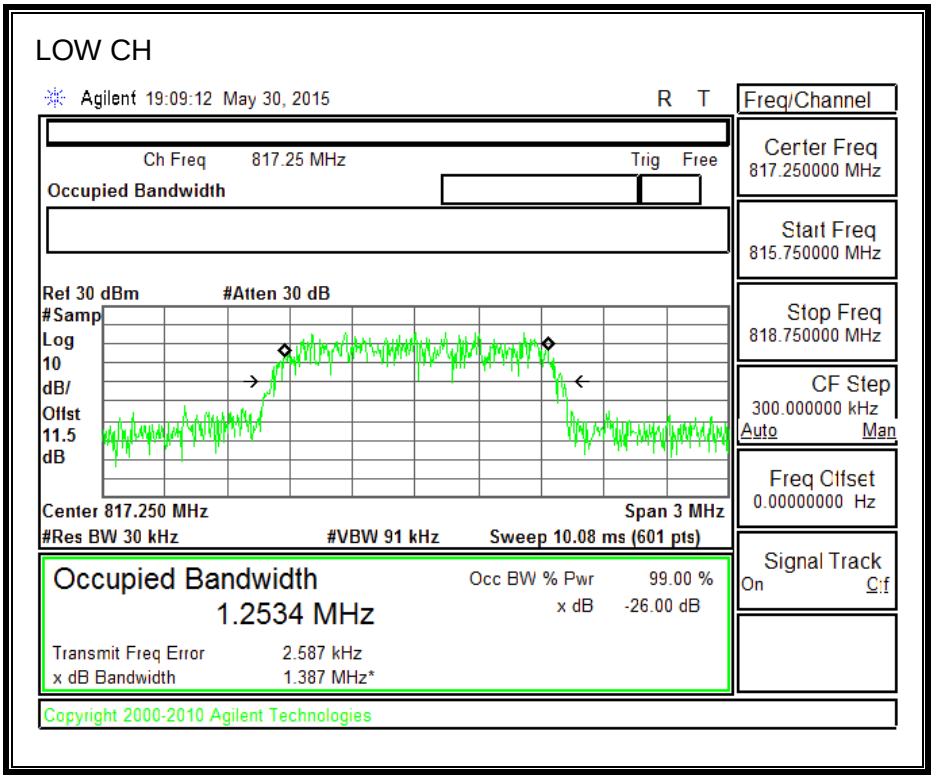


HIGH CH

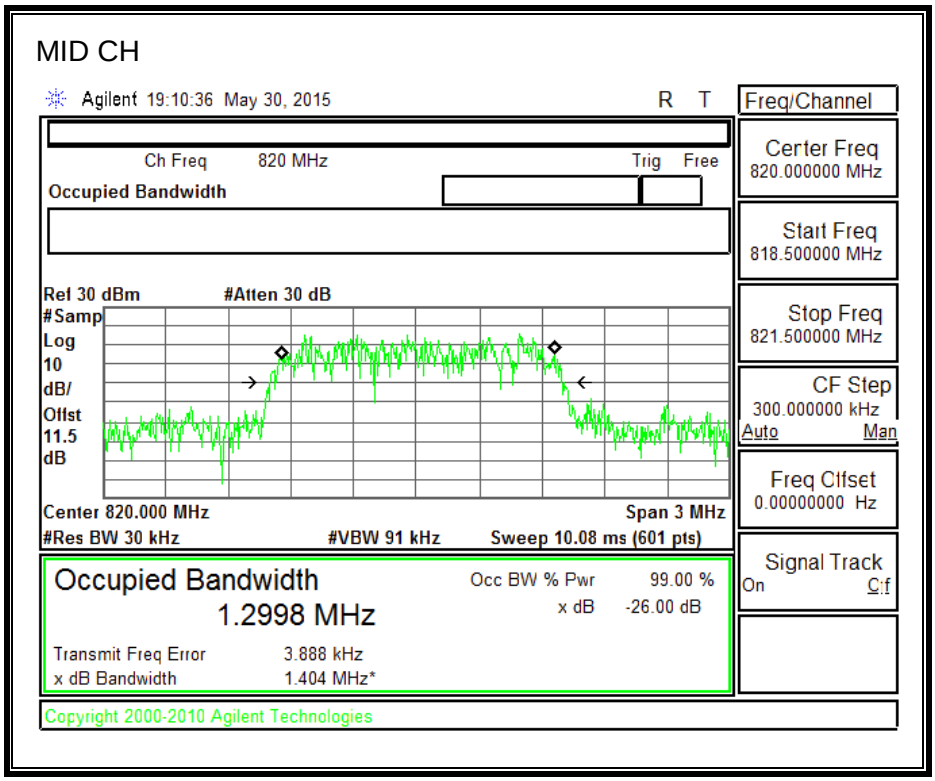


**800MHz SECONDARY BAND**

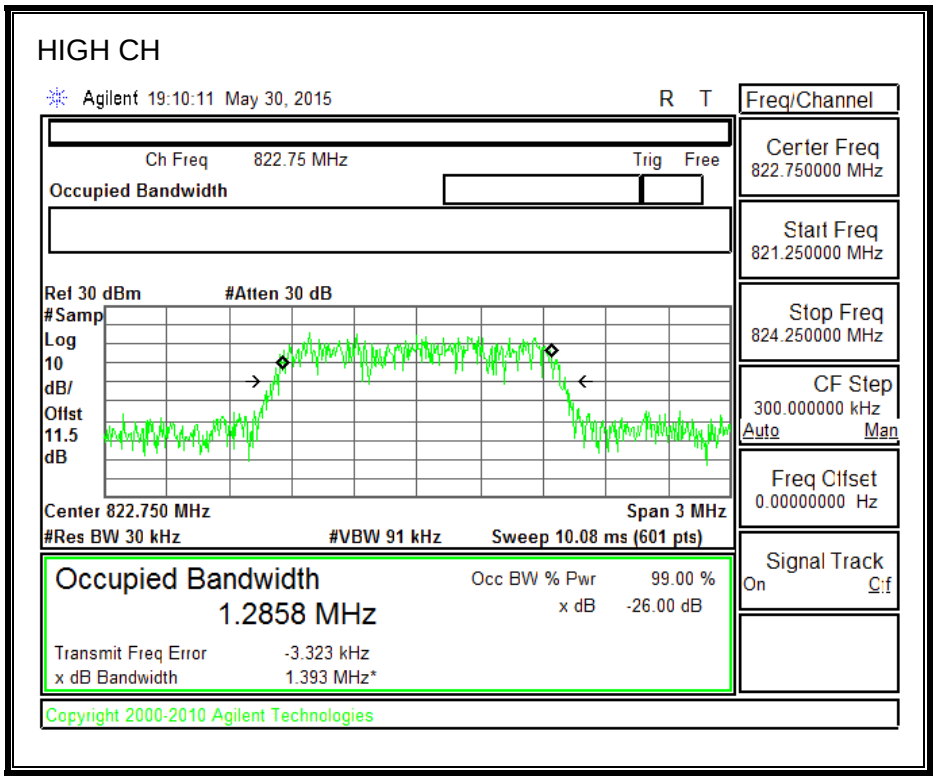
LOW CH




MID CH



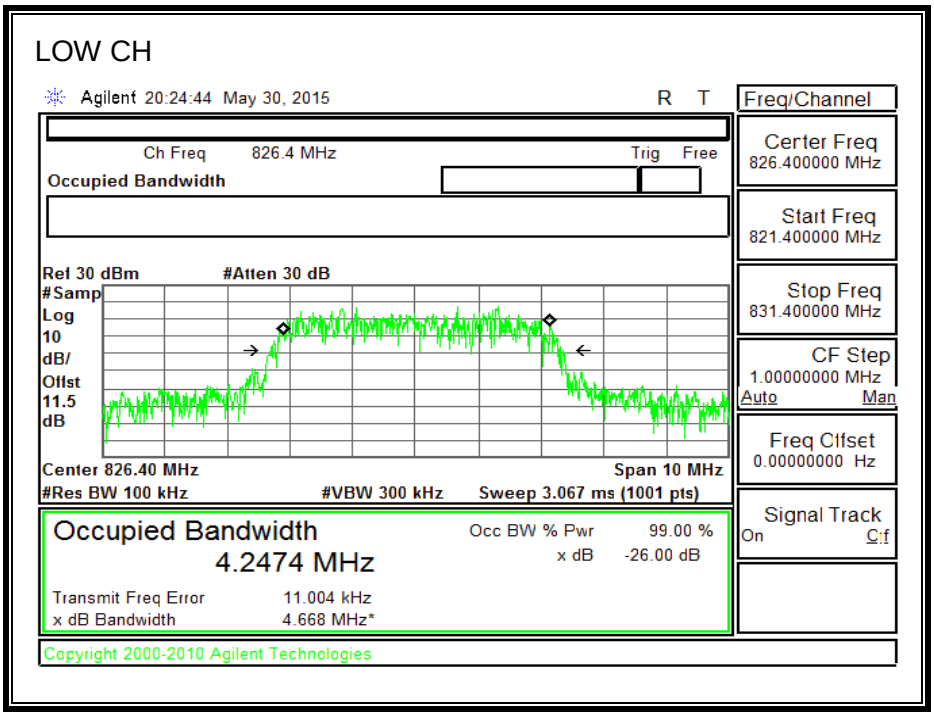
HIGH CH



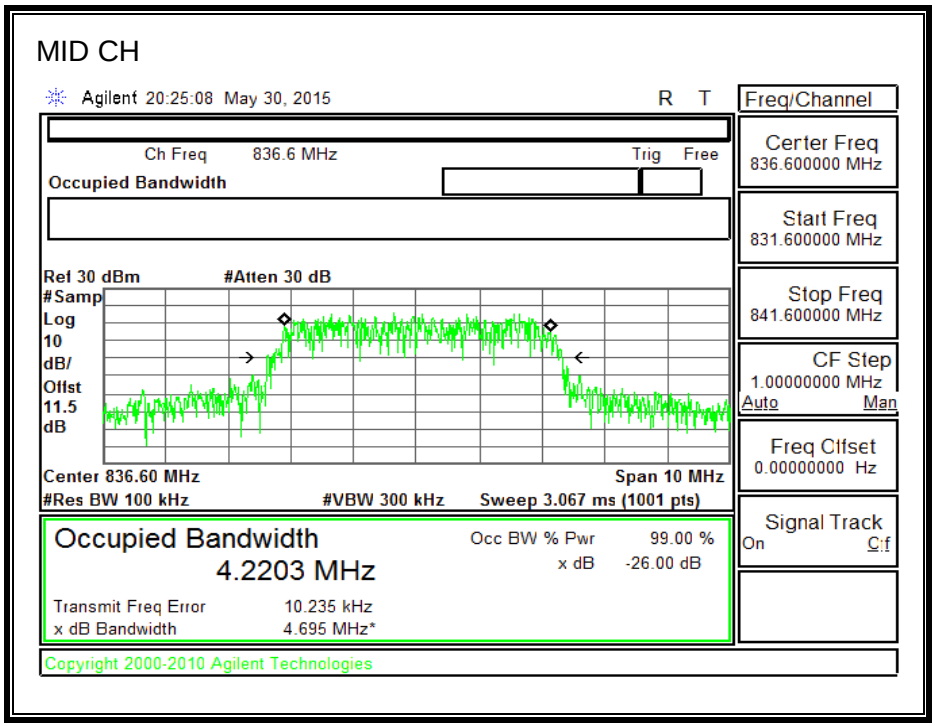
## 8.2.5. UMTS REL 99

**850MHz BAND**

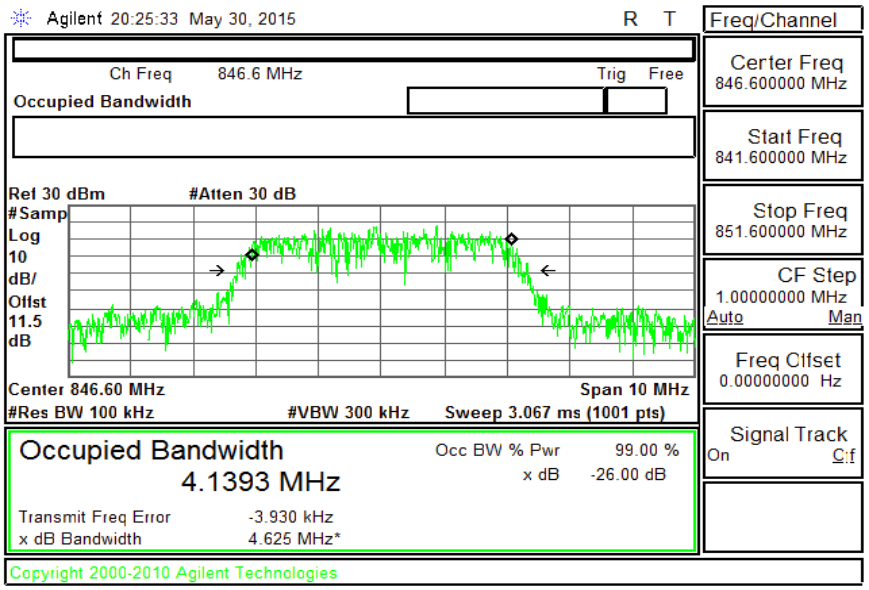
LOW CH



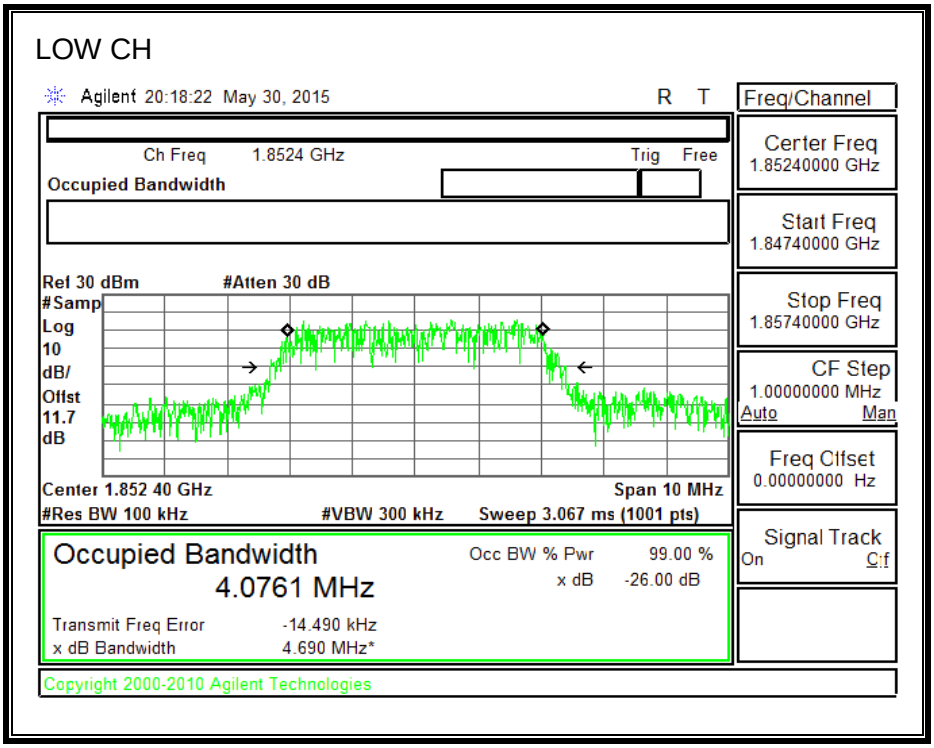

MID CH

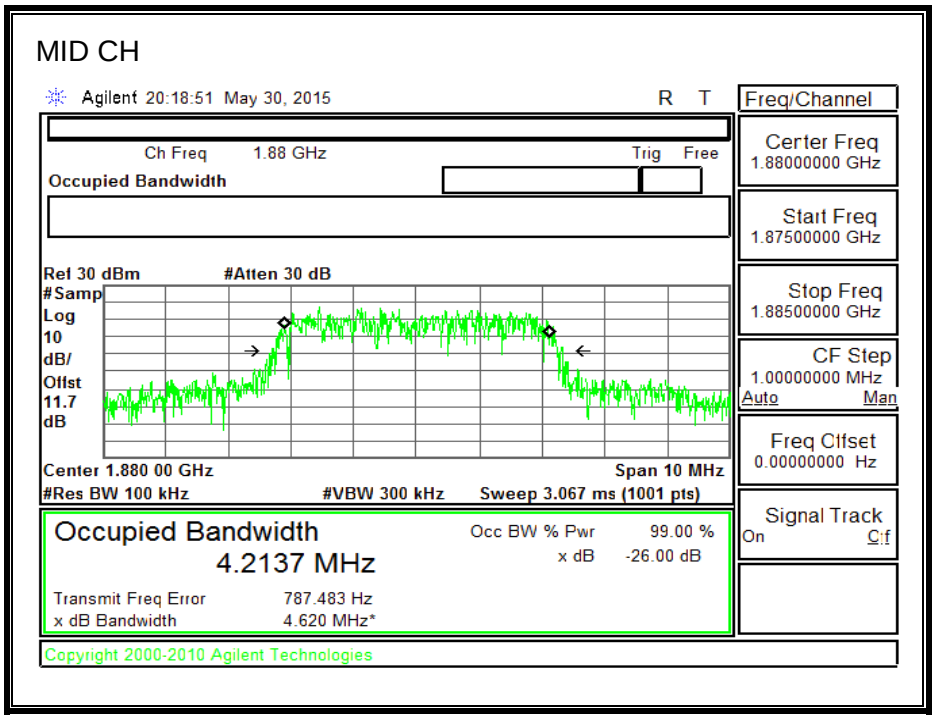


HIGH CH

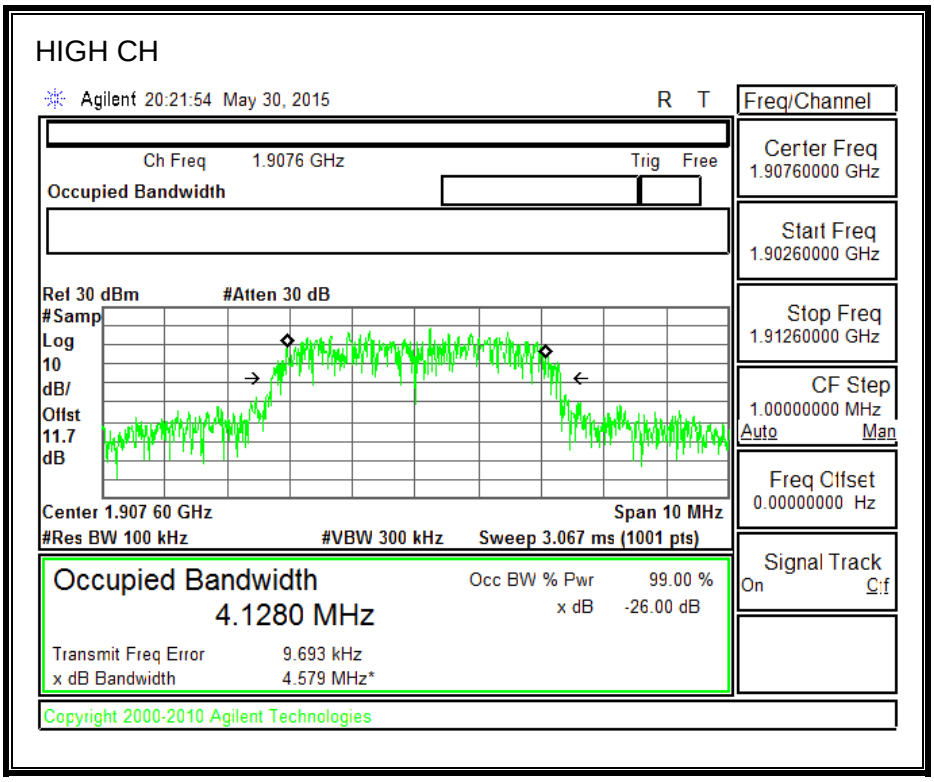


**1900MHz BAND**



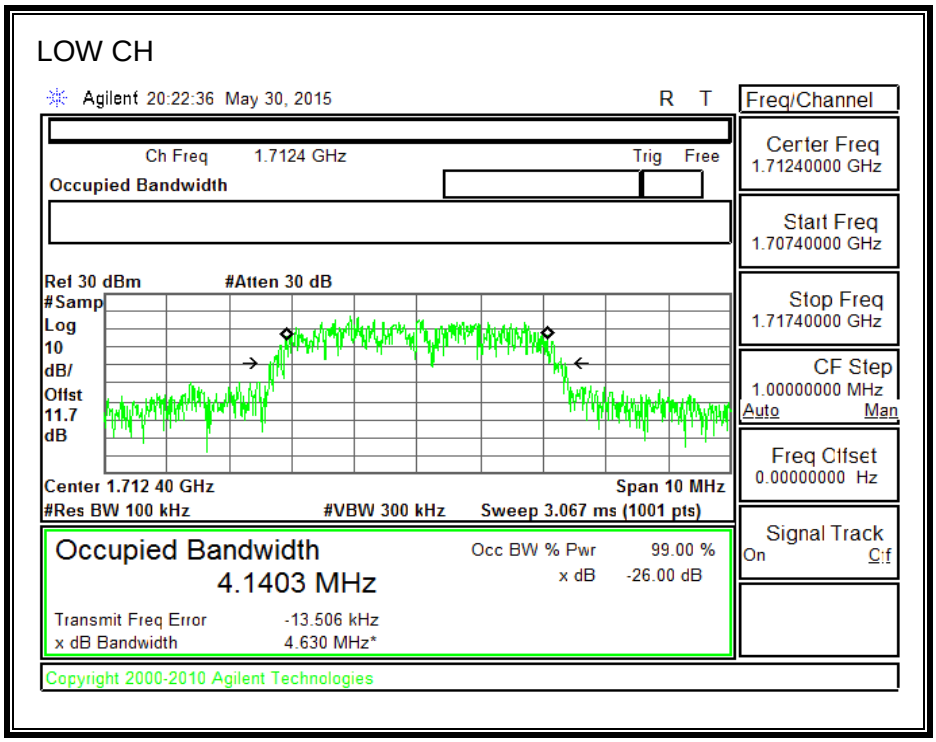



HIGH CH

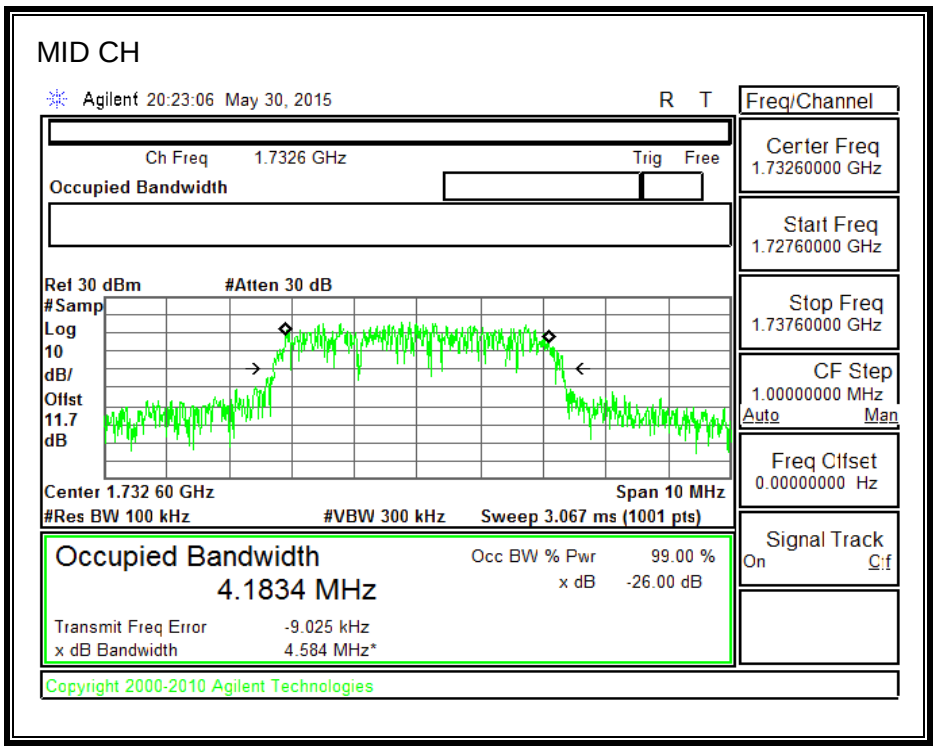


**1700MHz BAND**

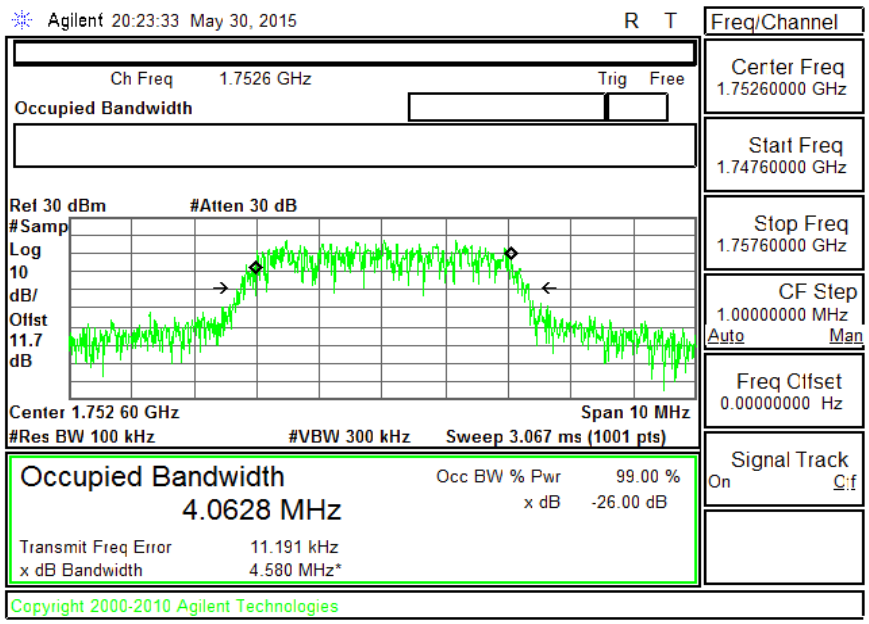
LOW CH




MID CH



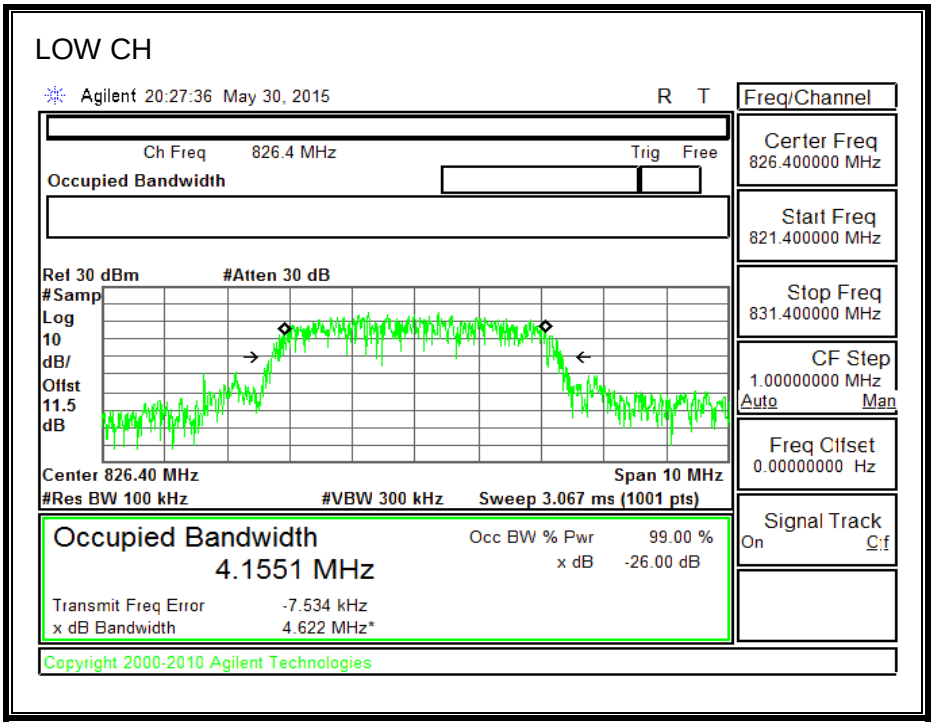
HIGH CH



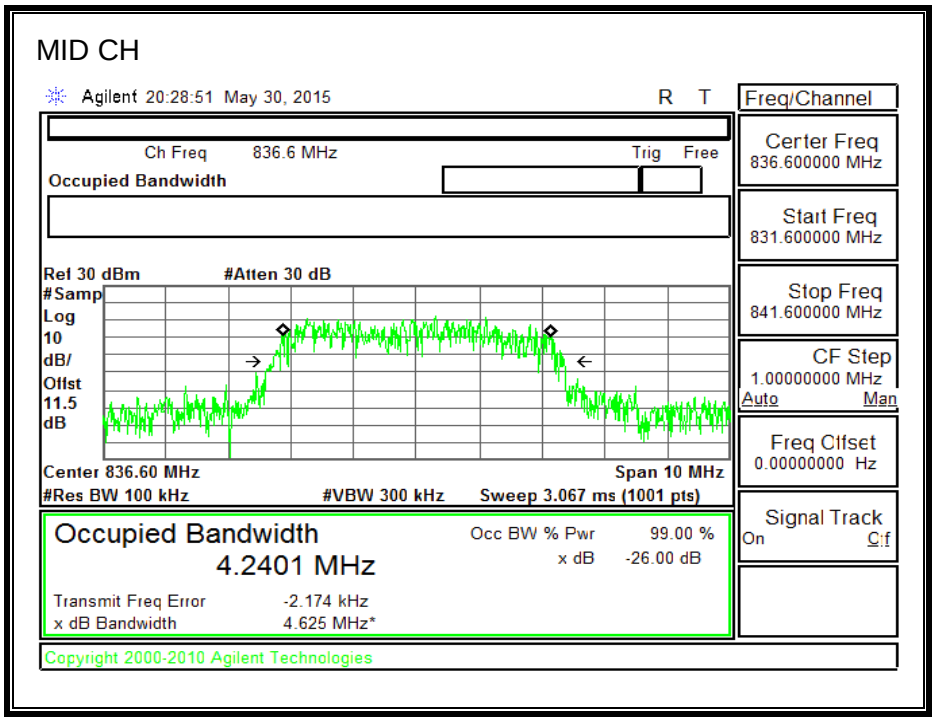
## 8.2.6. UMTS HSDPA

**850MHz BAND**

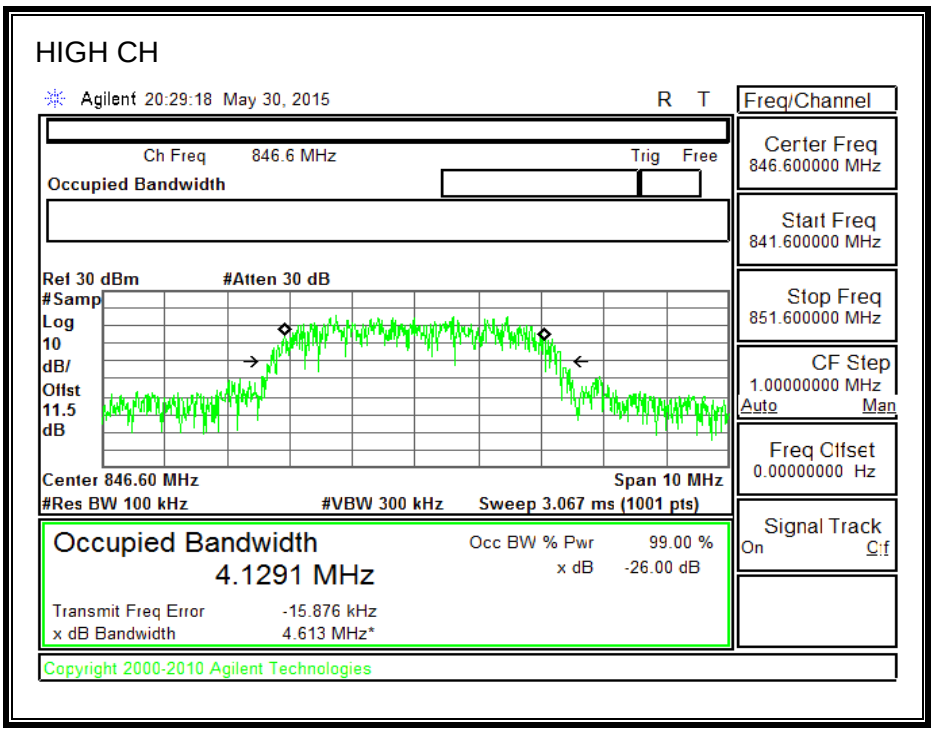
LOW CH




MID CH

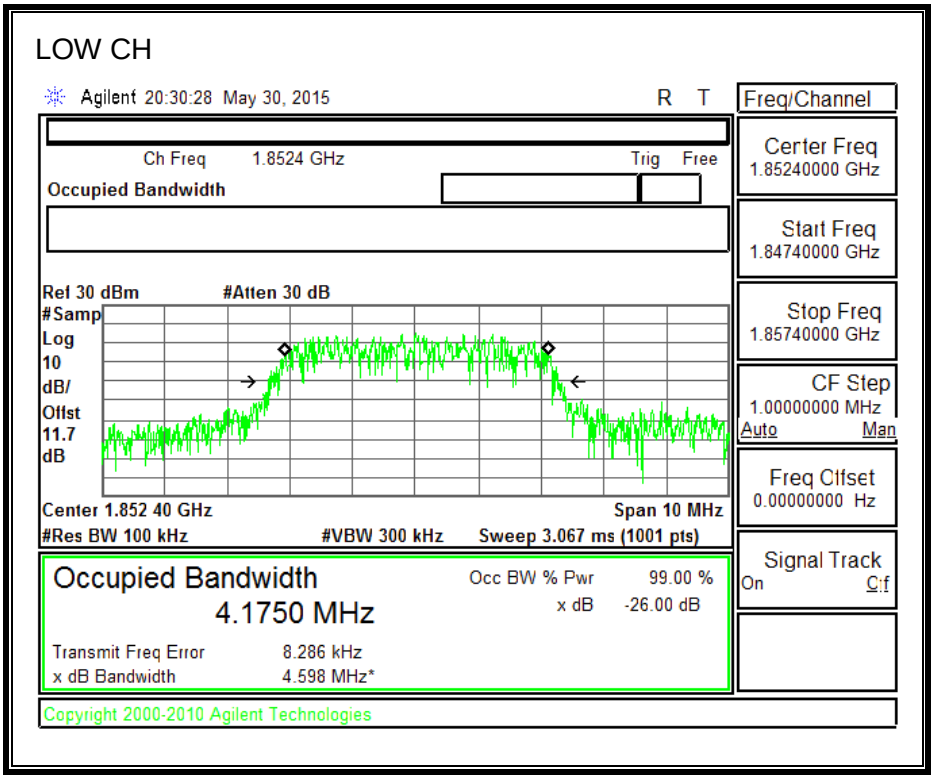


HIGH CH

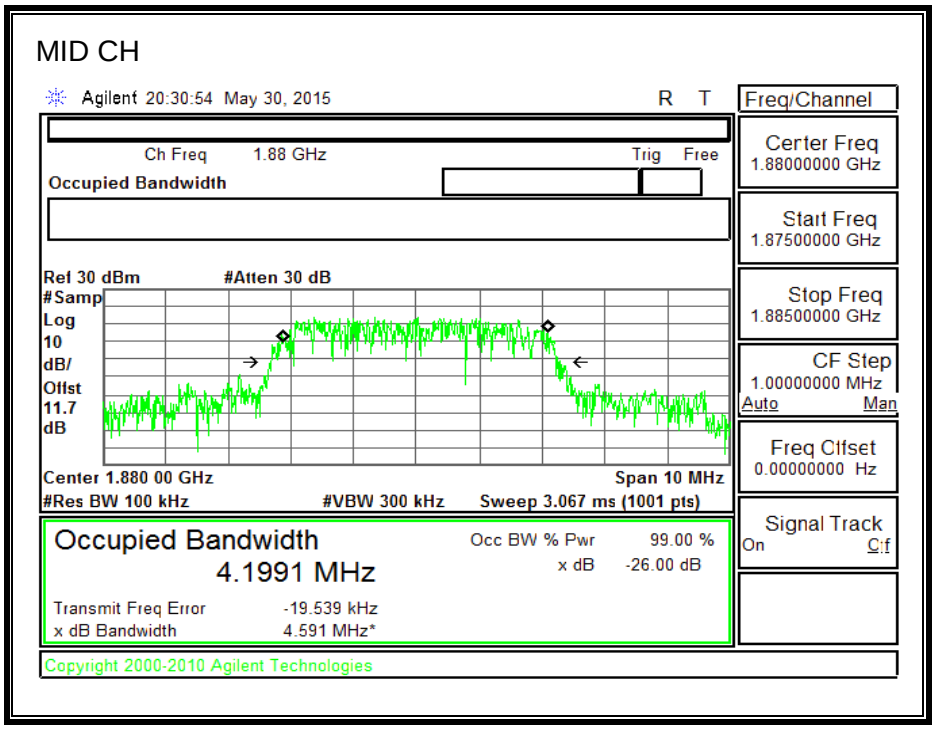


**1900MHz BAND**

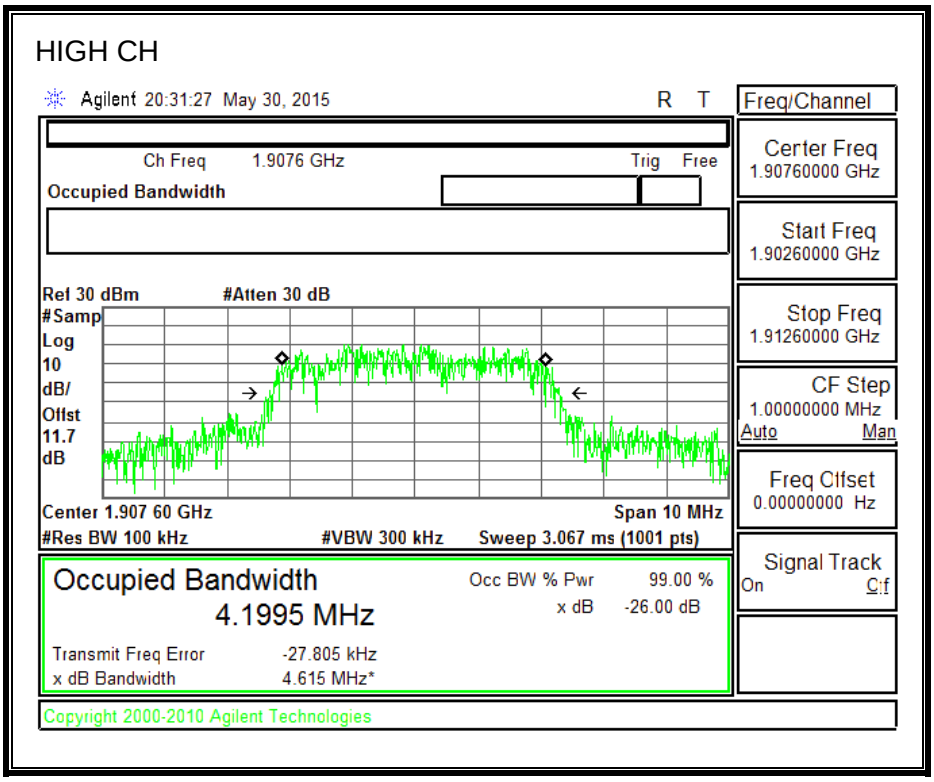
LOW CH




MID CH

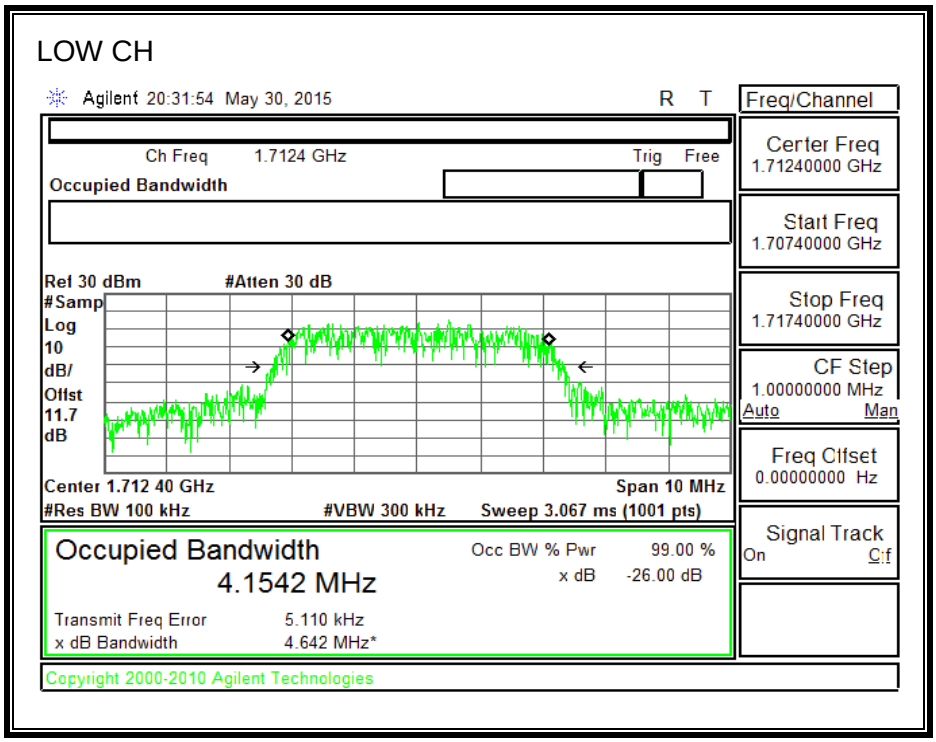


HIGH CH

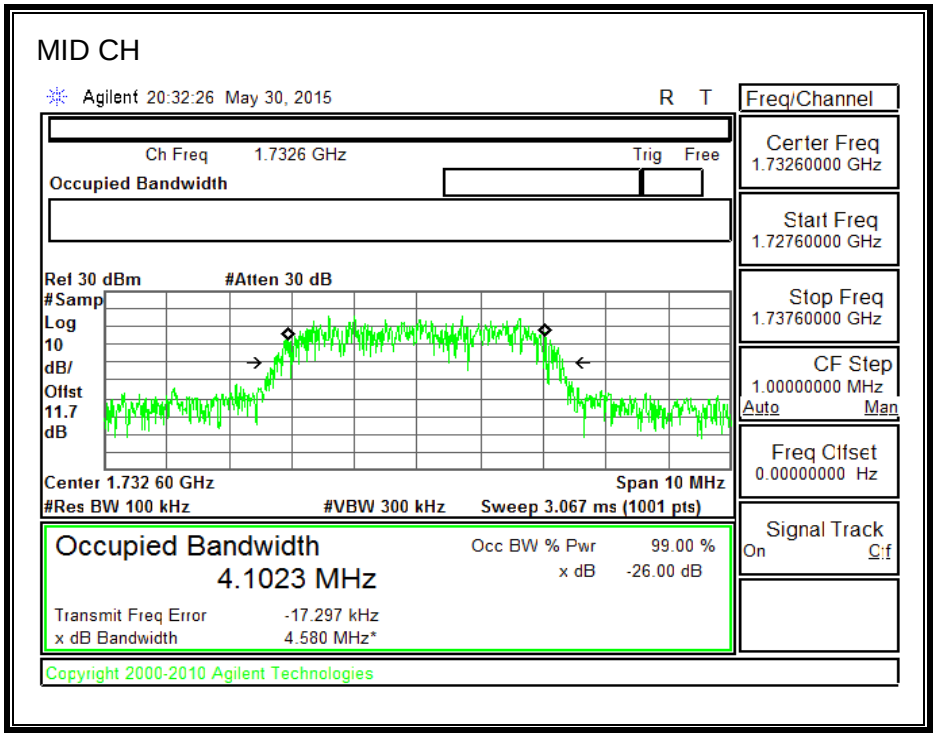


**1700MHz BAND**

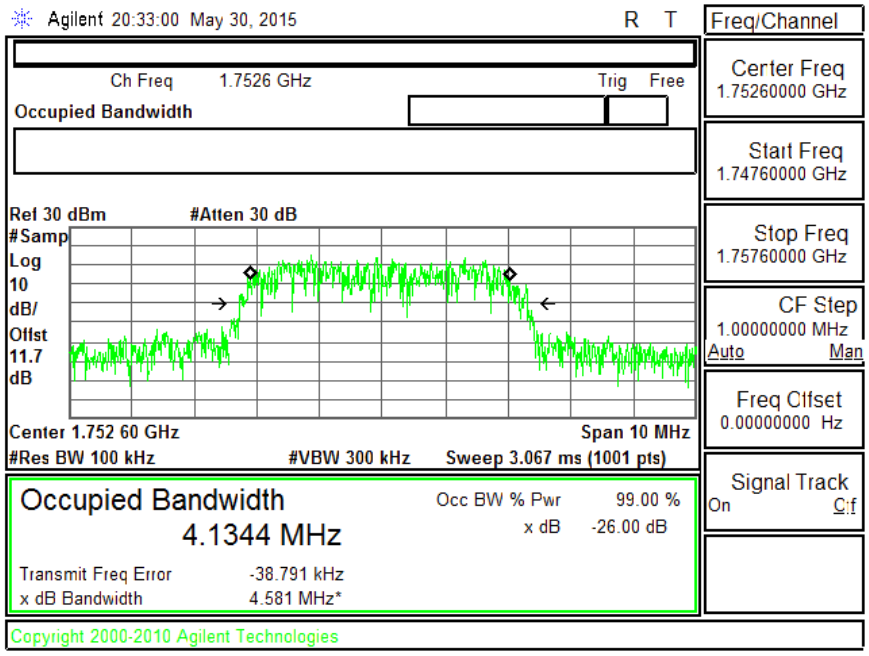
LOW CH




MID CH



HIGH CH



## 8.3. BAND EDGE (MODEL: A1634)

**RULE PART(S)**

FCC: §22.359, 24.238, §27.53 and §90.691

**LIMITS**

§22. 917 & 24.238
Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

§27.53
AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1710-1755 MHz, band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

§90.691 Emission mask requirements for EA-based systems.

Compliance with the provisions of paragraphs above of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

**TEST PROCEDURE**

The transmitter output was connected to a Agilent 8960 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:

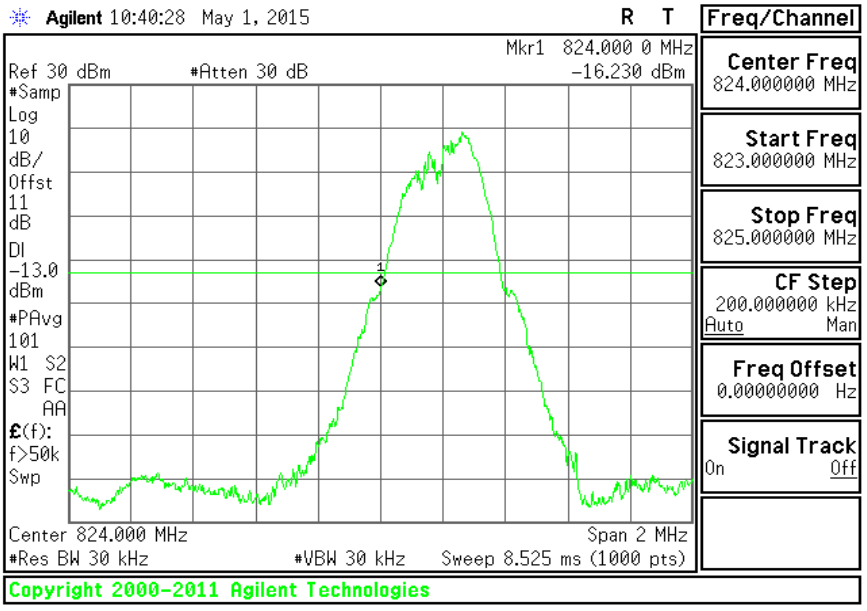
- Set the spectrum analyzer span to include the block edge frequency (824, 849, 1850, 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

**RESULTS**

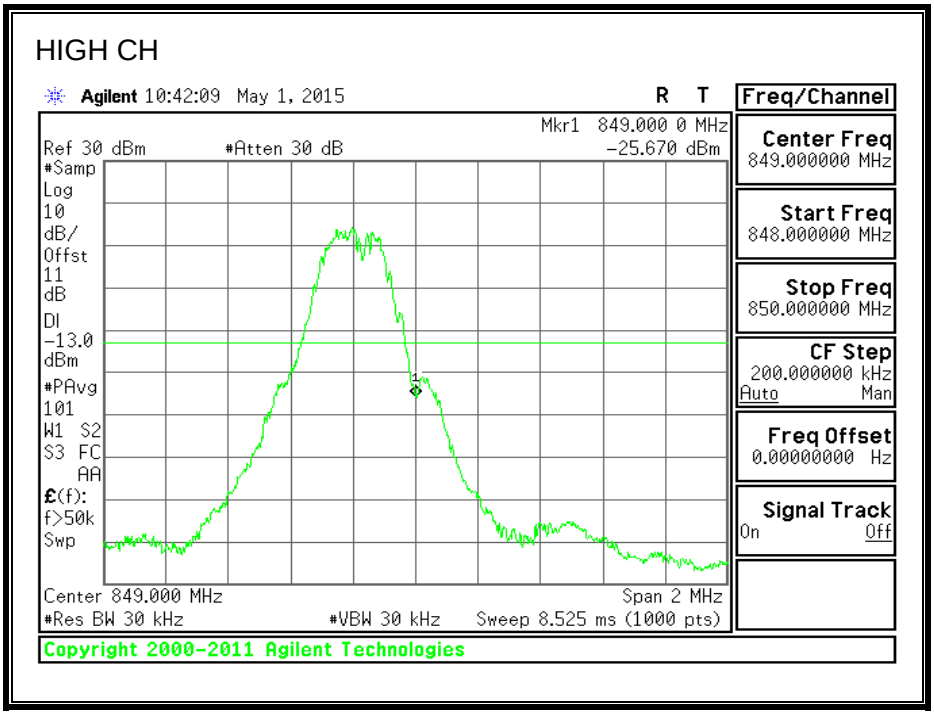
### 8.3.1. GSM-GPRS

**850MHz BAND**

LOW CH

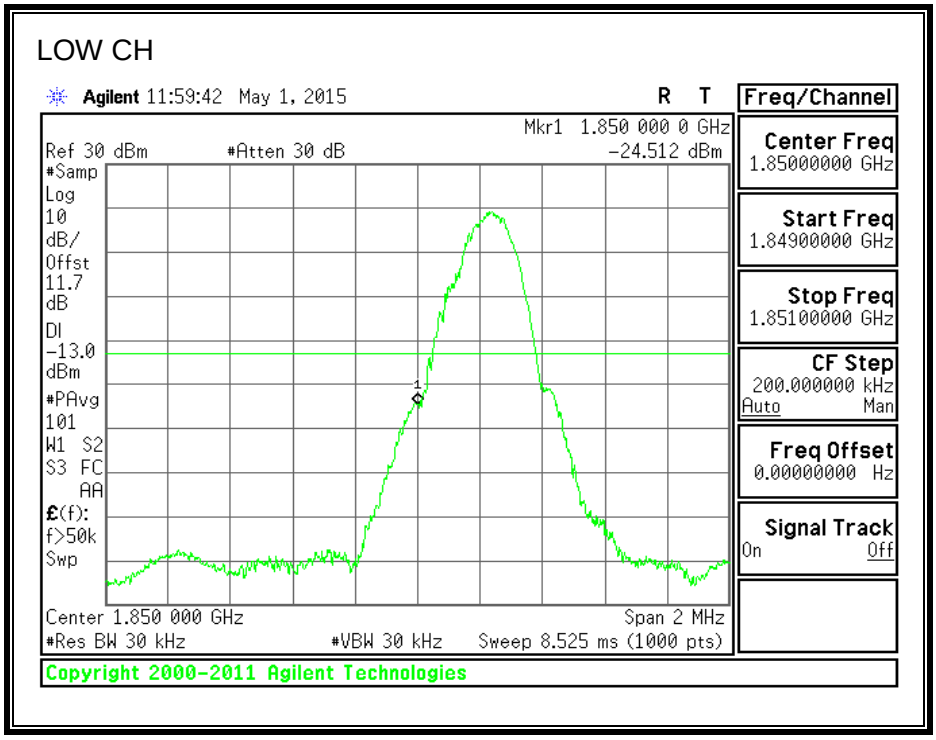



HIGH CH

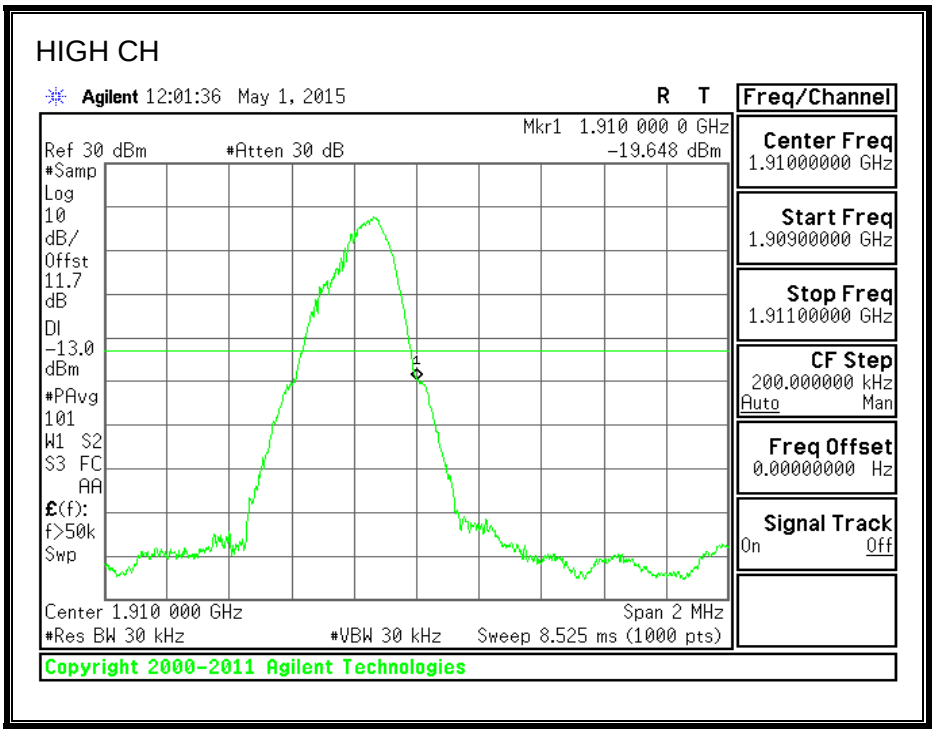


**1900MHz BAND**

LOW CH



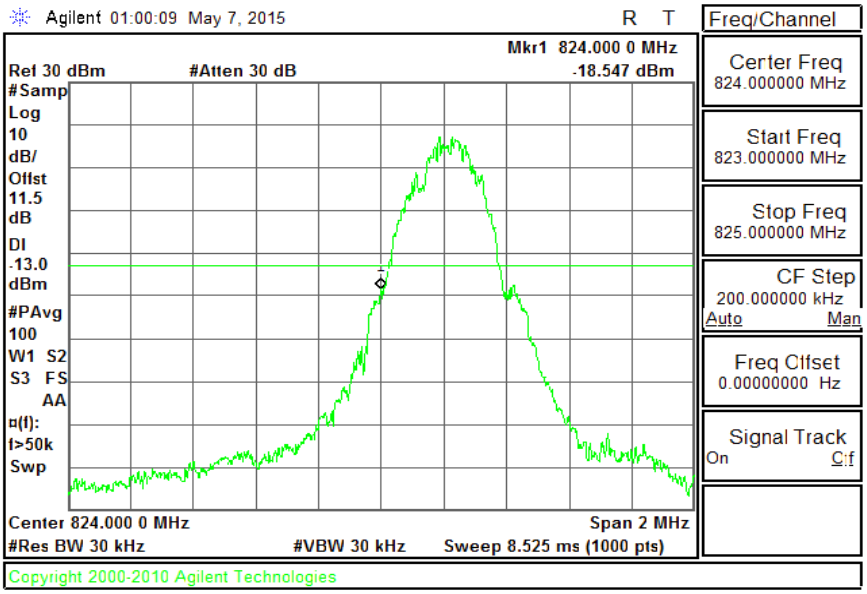

HIGH CH



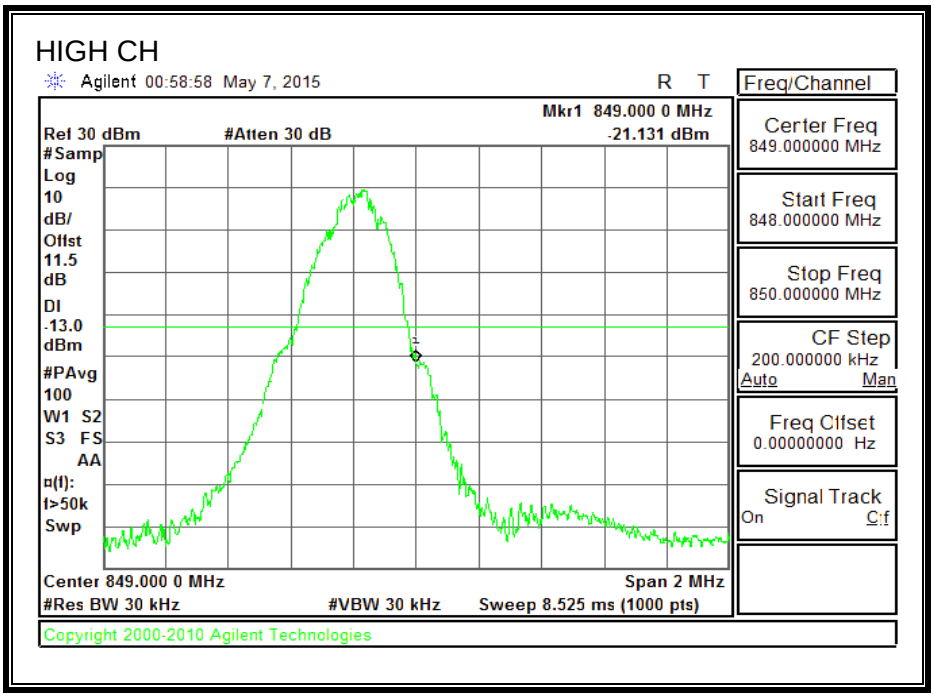
## 8.3.2. GSM-EGPRS

**850MHz BAND**

LOW CH

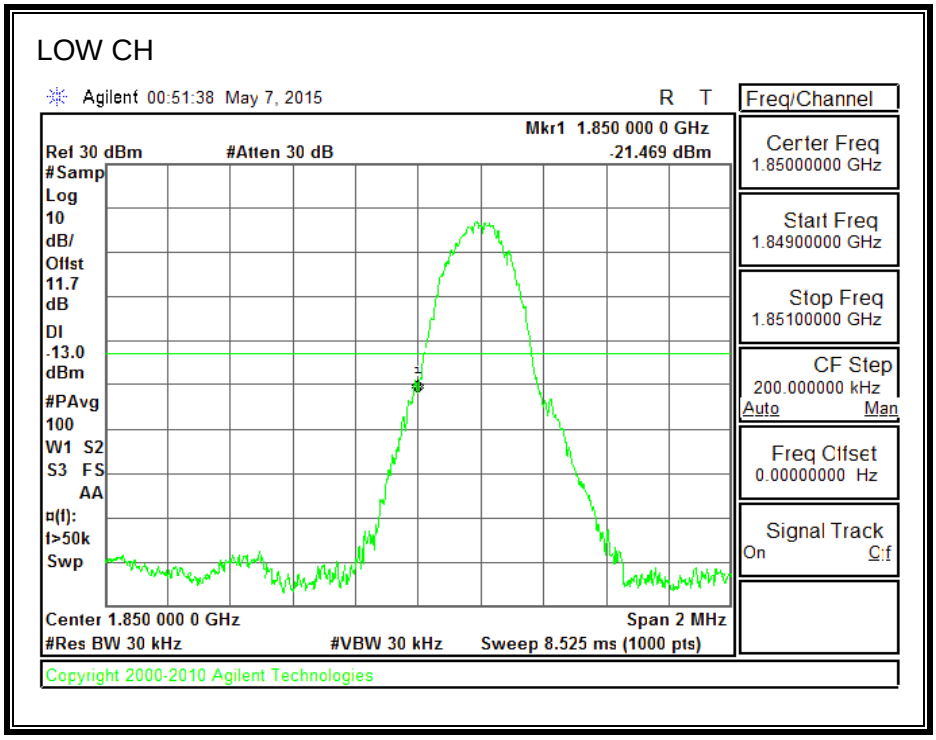



HIGH CH

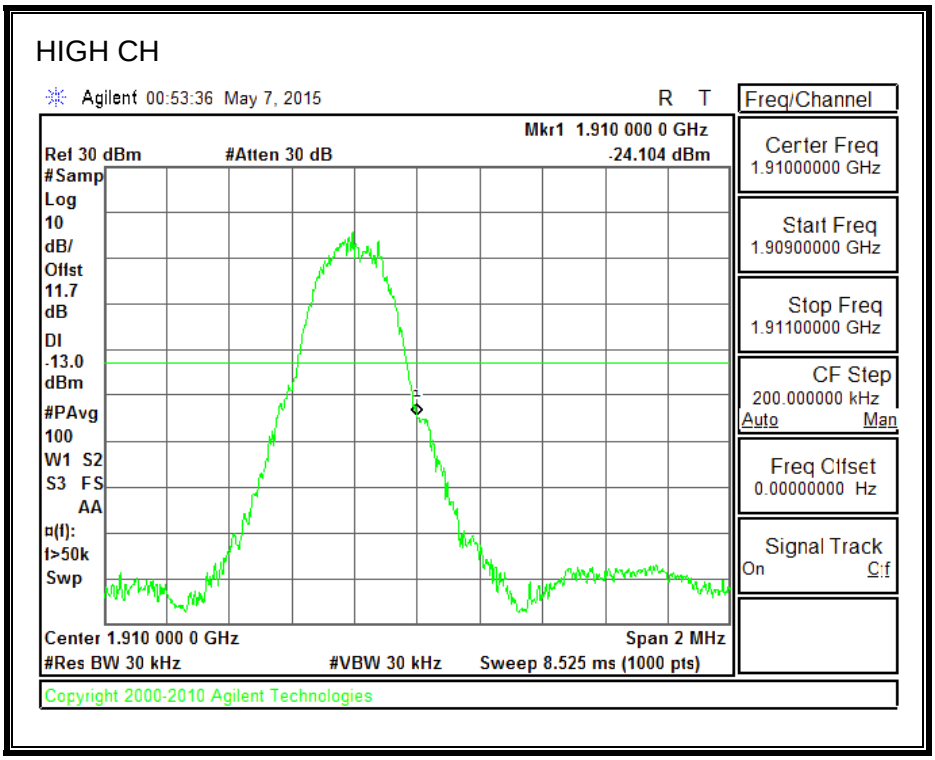


**1900MHz BAND**

LOW CH

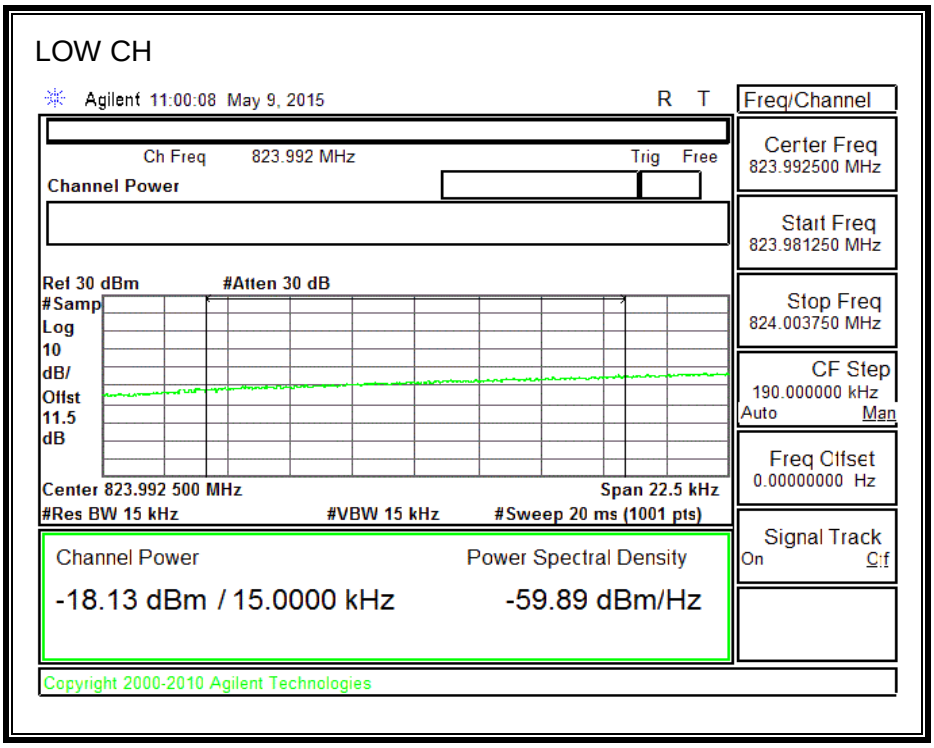


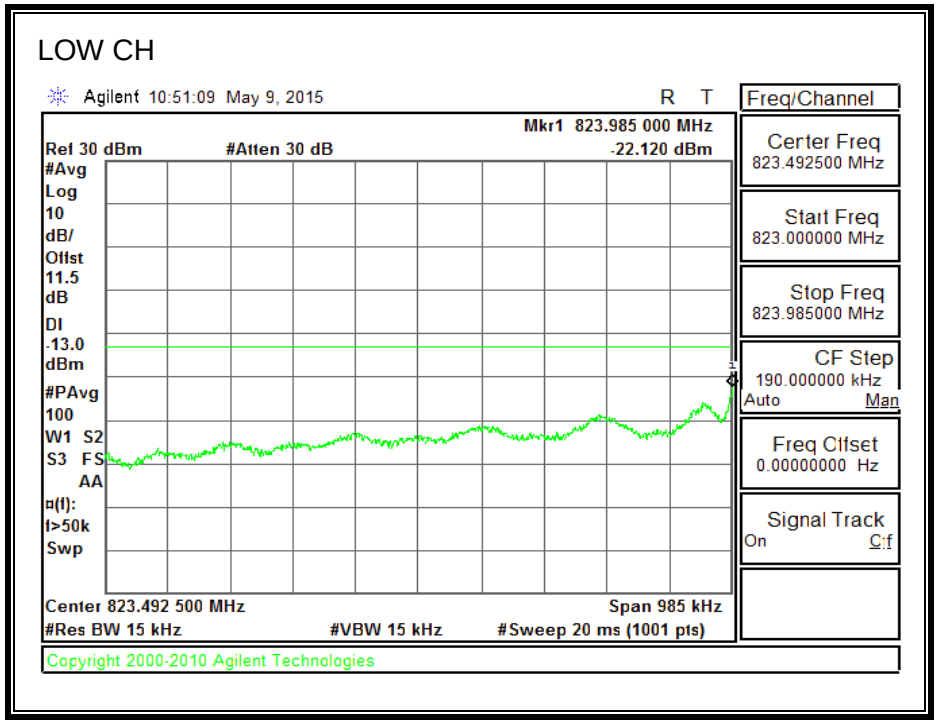

HIGH CH



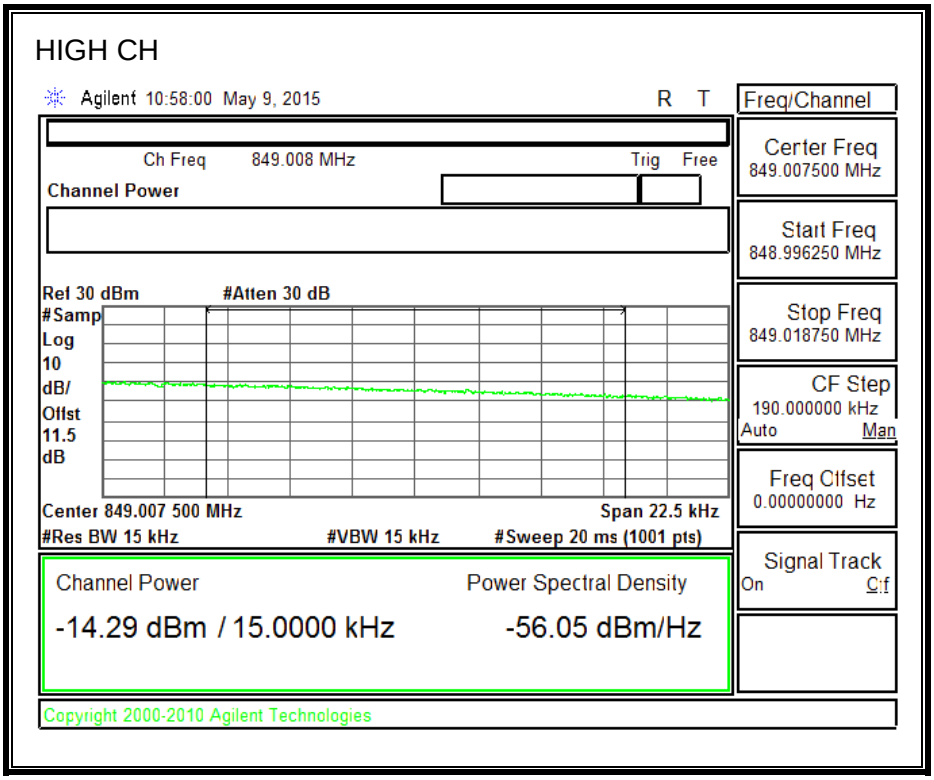
### 8.3.3. CDMA2000 1xRTT

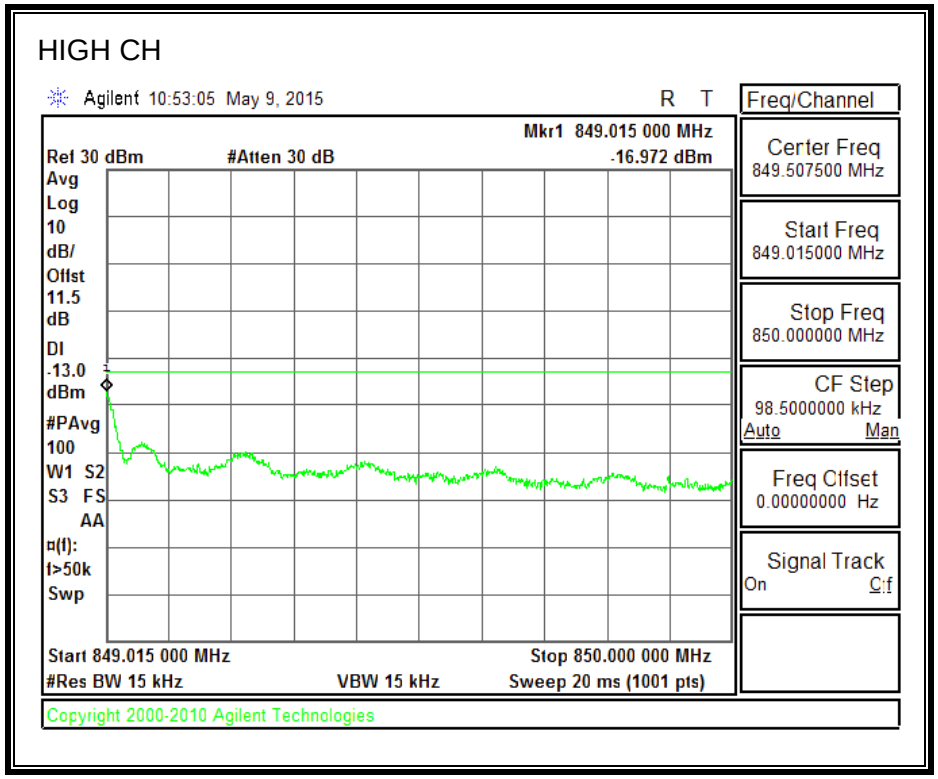
**850MHz BAND**



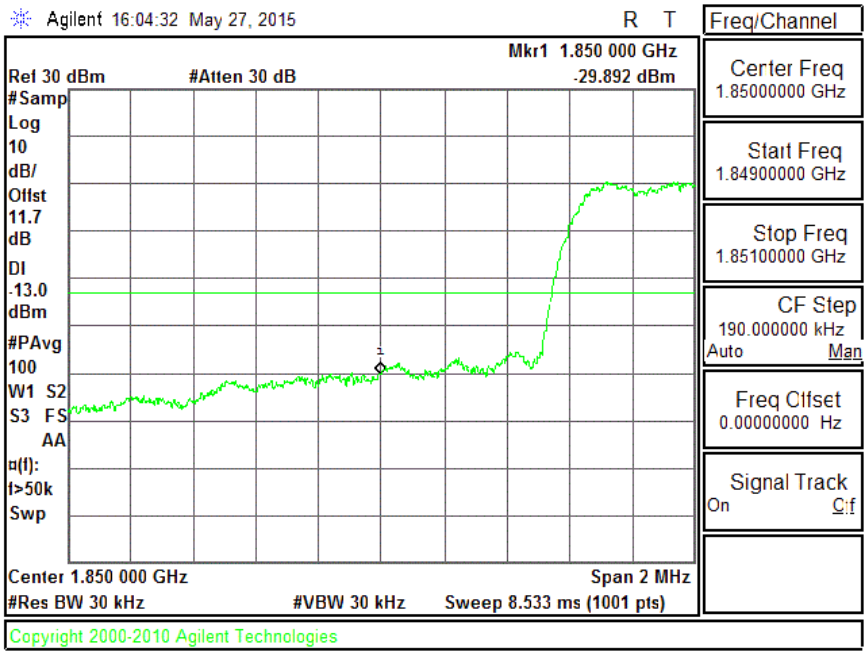
**850MHz BAND**



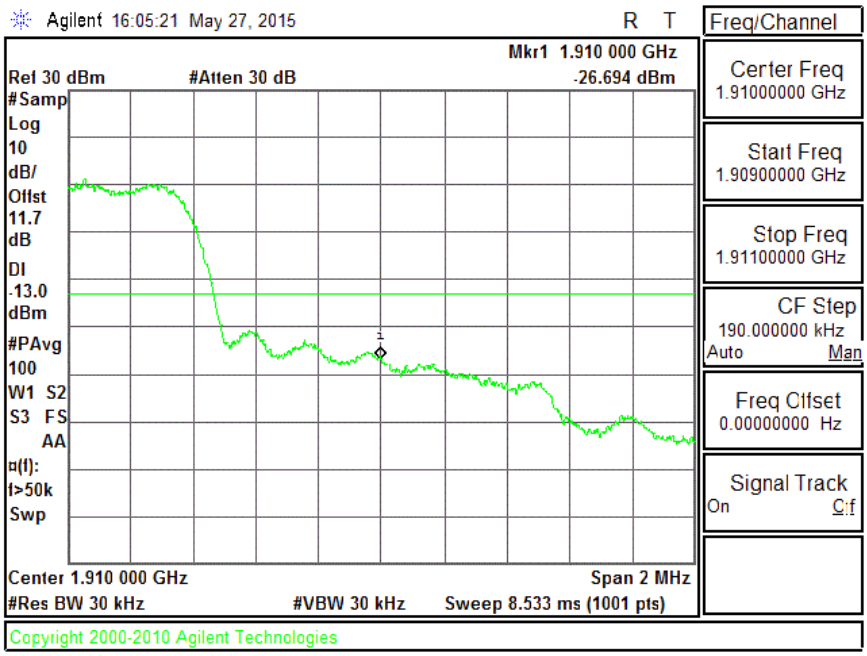



**1900MHz BAND**

LOW CH

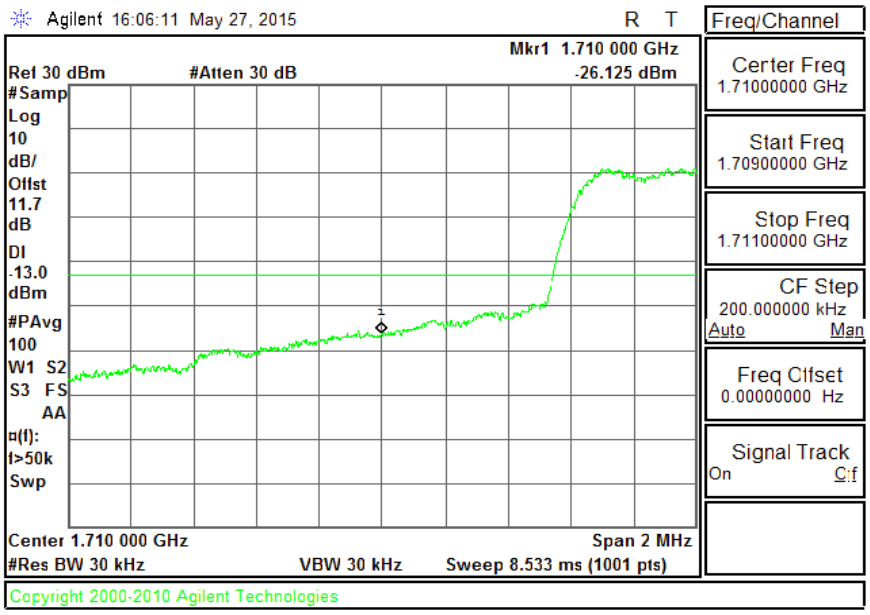



HIGH CH

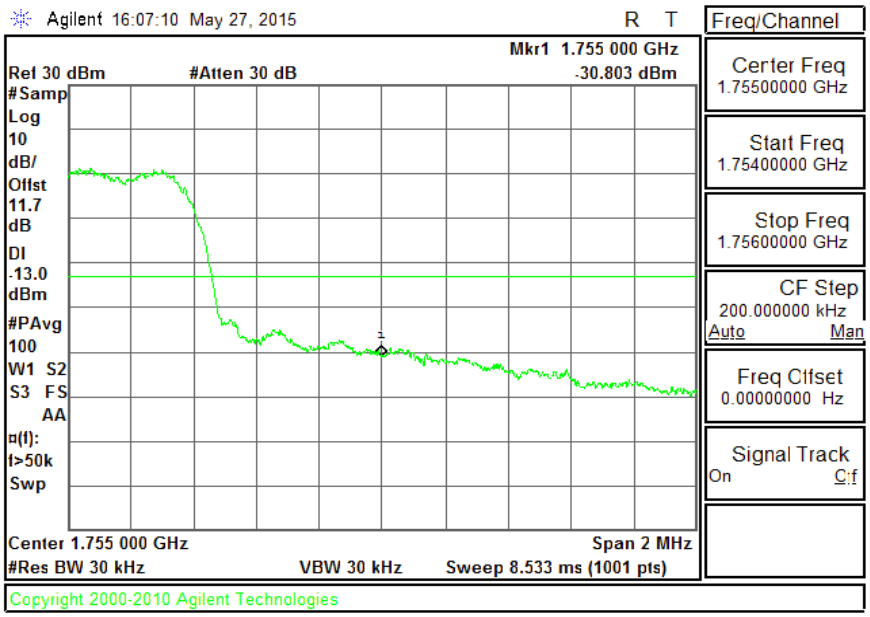


**1700MHz BAND**

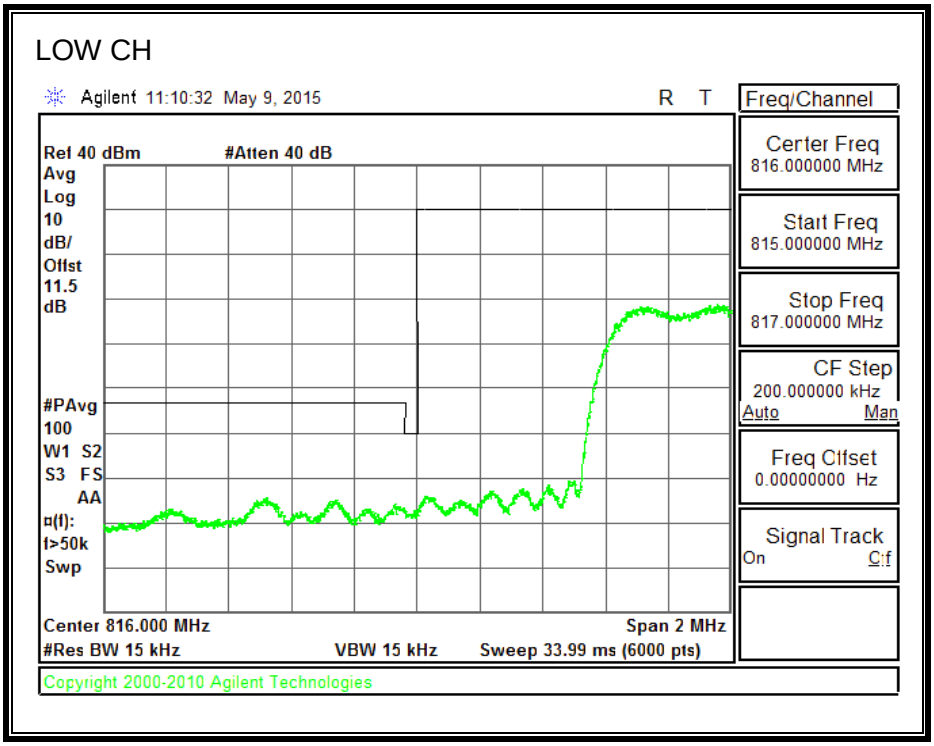
LOW CH



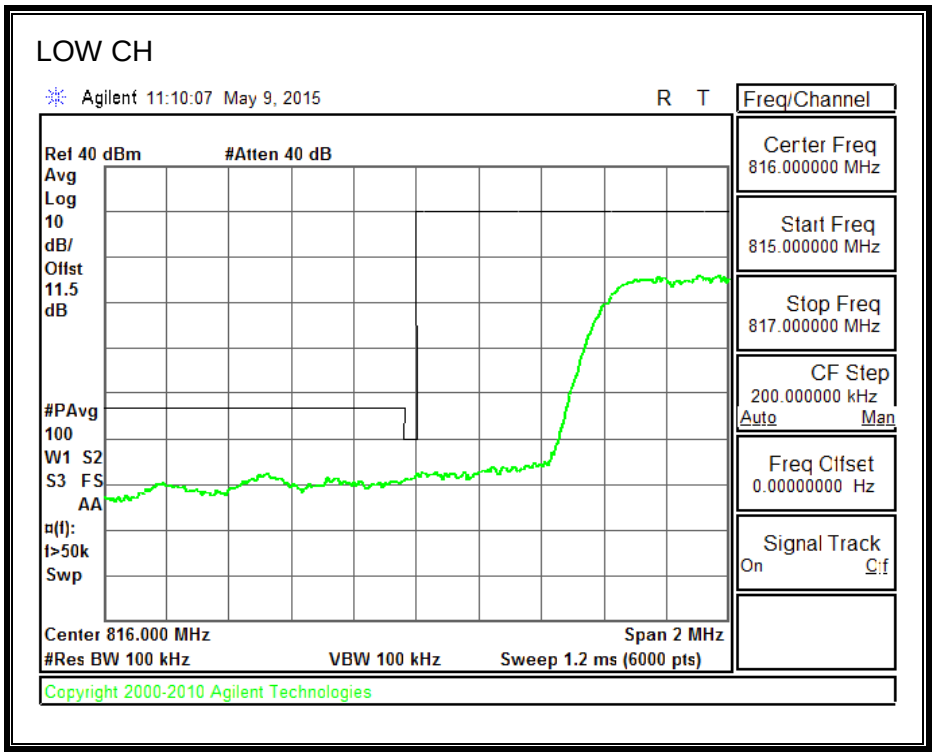

HIGH CH



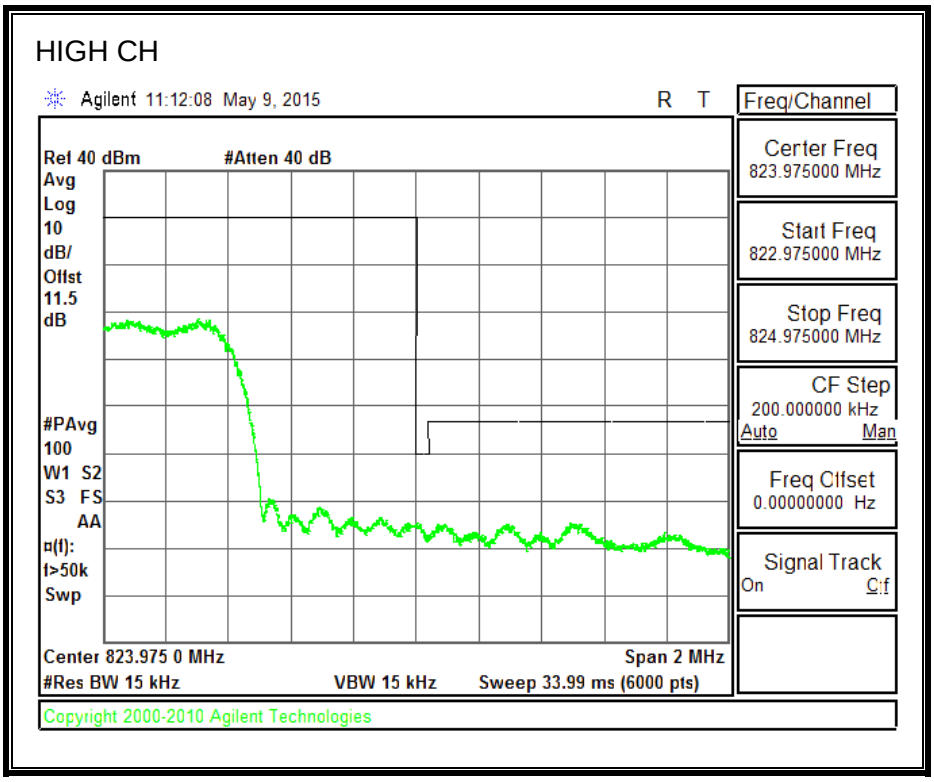
### 8.3.4. CDMA2000 1xRTT BC10 MASK



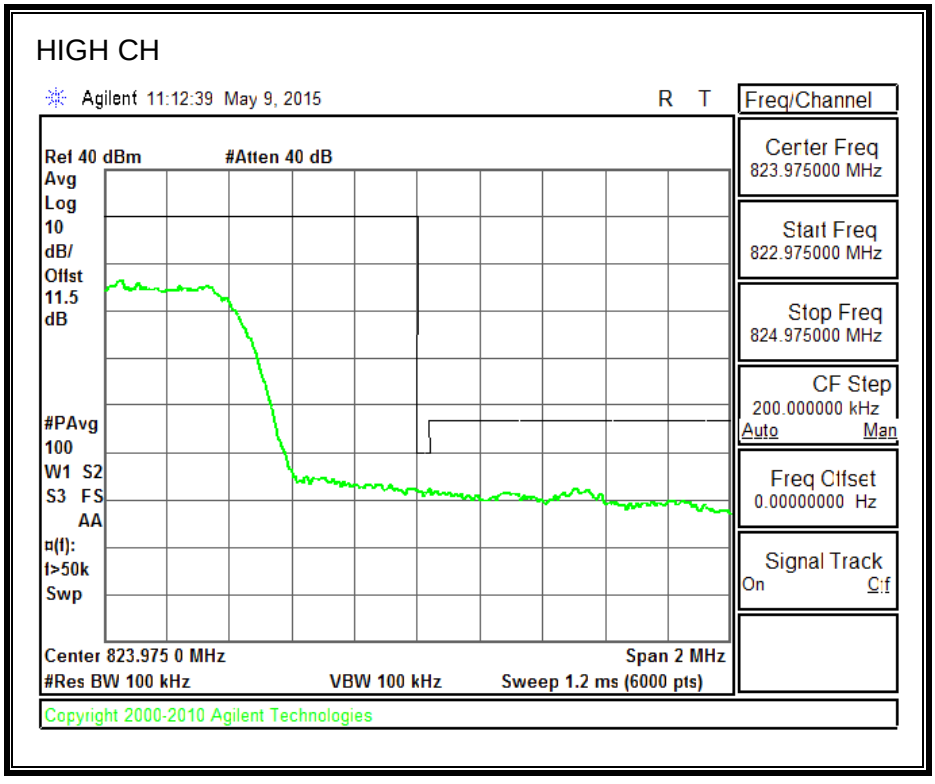

Note: RBW=1% of EBW




Note: RBW of 1% of 37.5KHz of outer channel frequency block



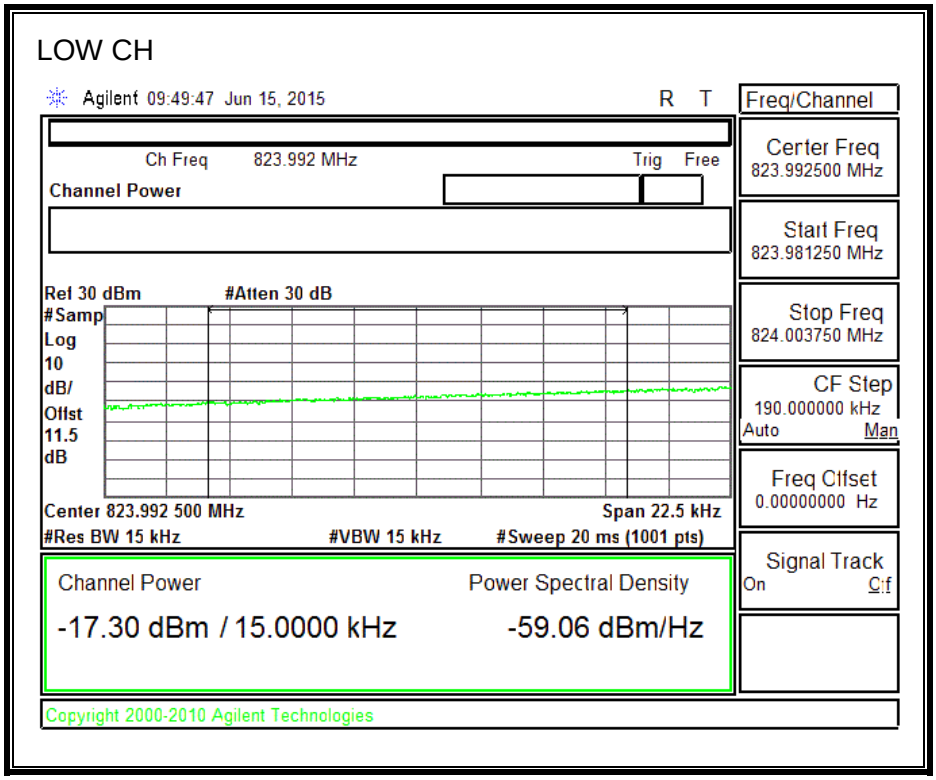

Note: RBW=1% of EBW

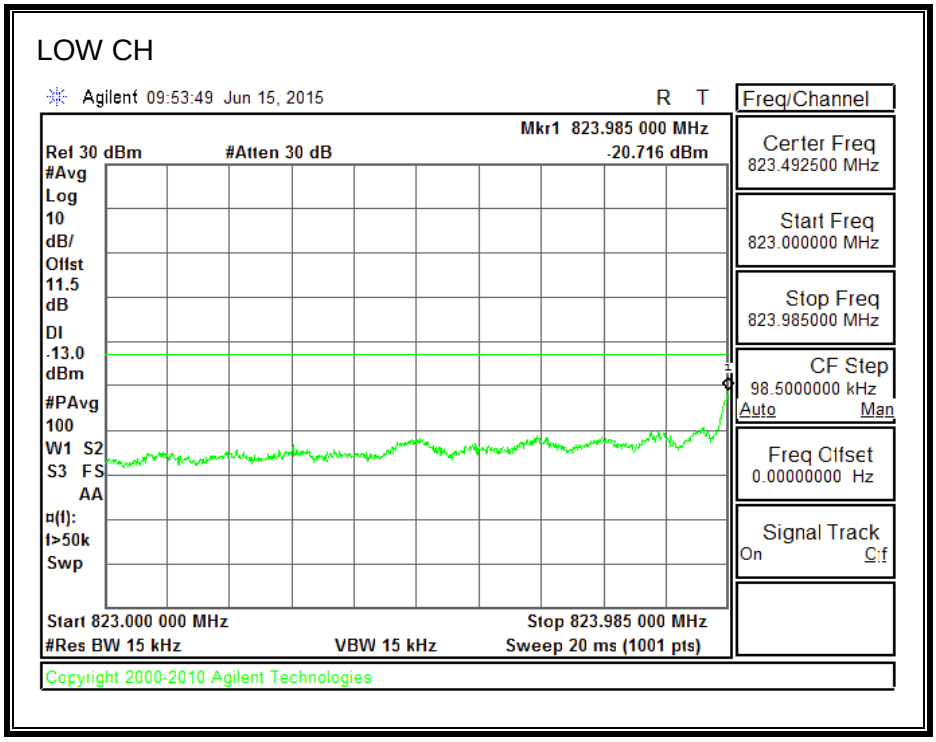



Note: RBW of 1% of 37.5KHz of outer channel frequency block

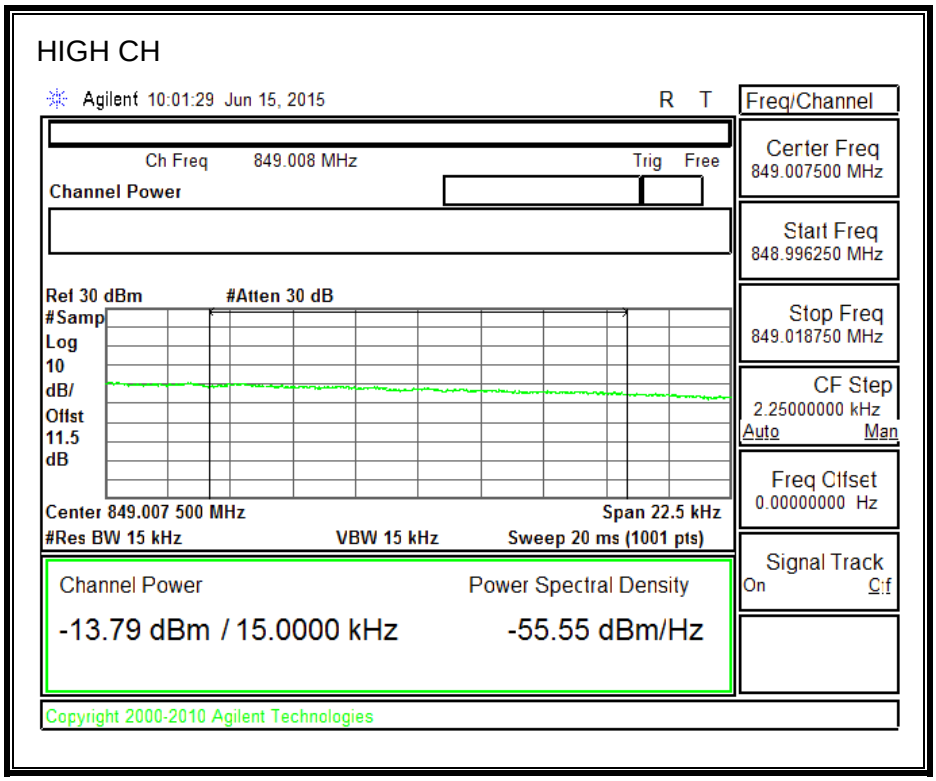
## 8.3.5. CDMA2000 EVDO REV A

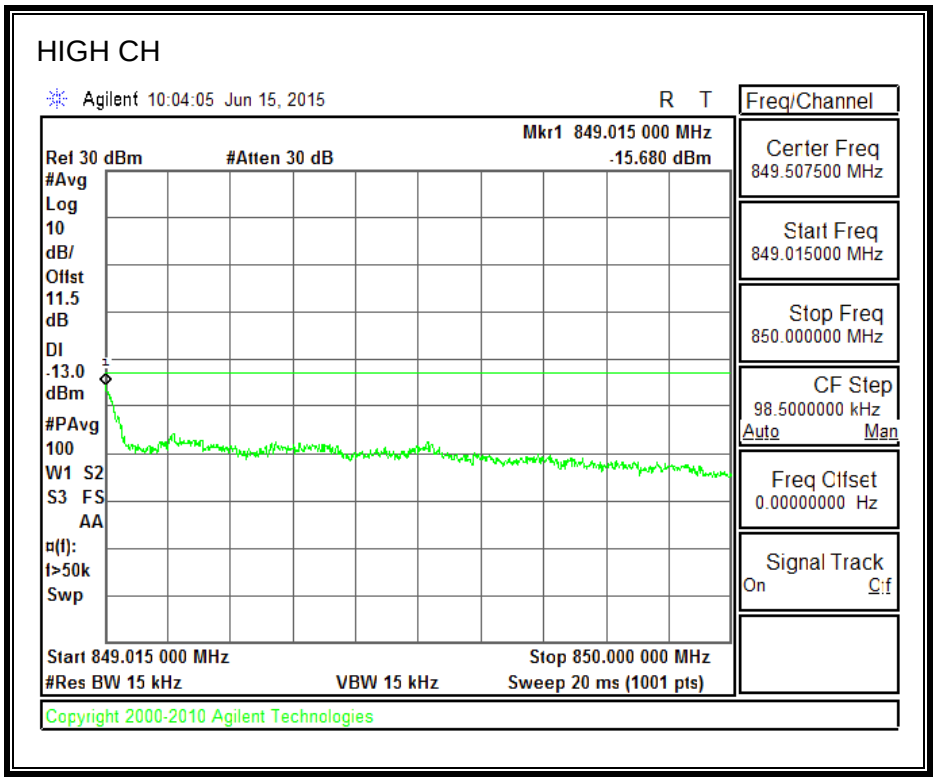
**850MHz BAND**



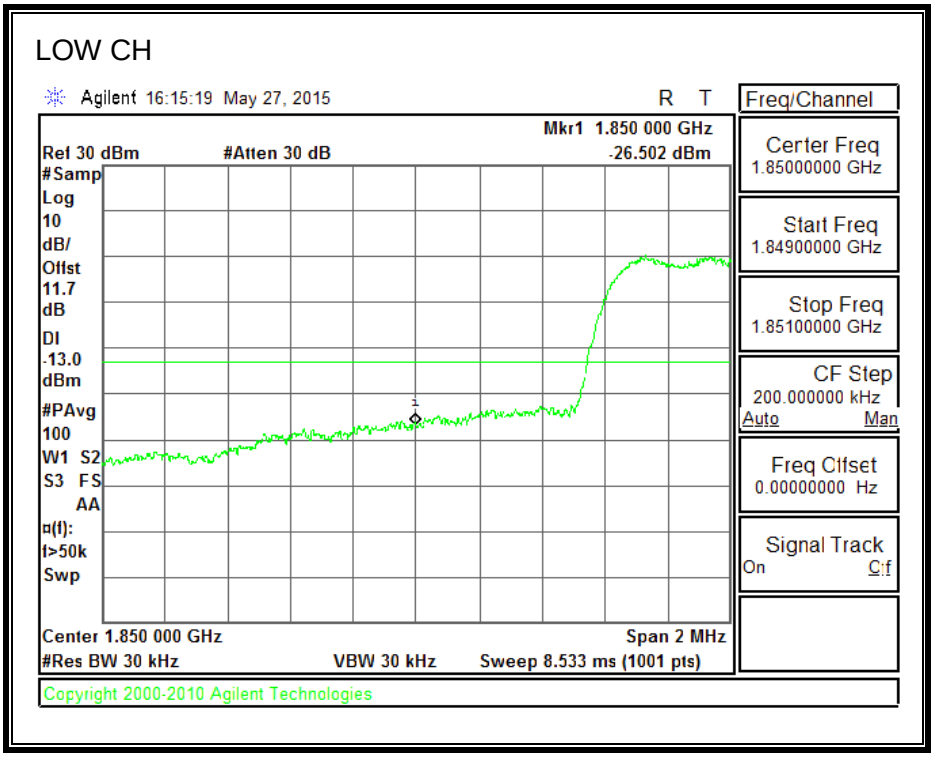
**850MHz BAND**



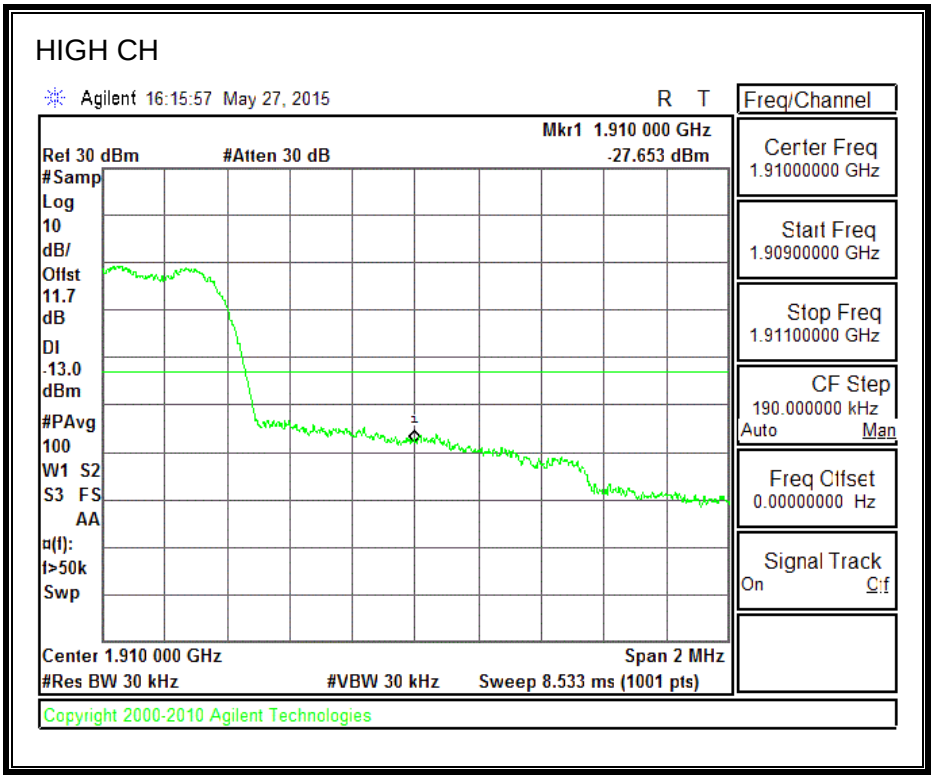



**1900MHz BAND**

LOW CH

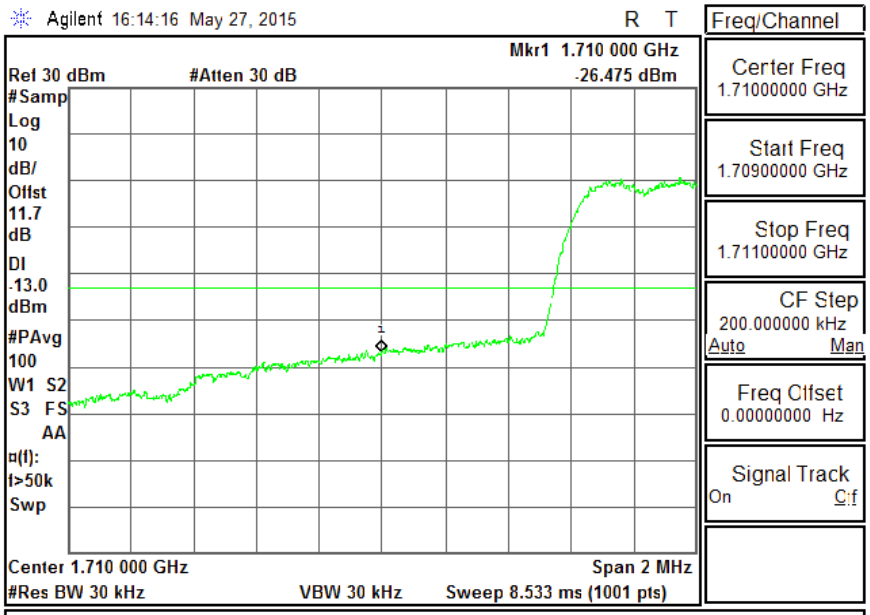



HIGH CH

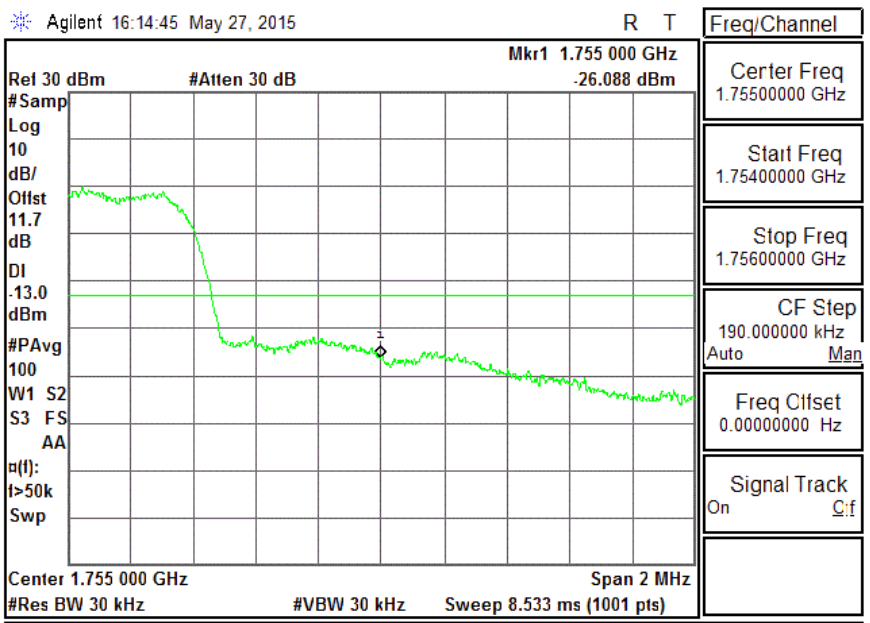


**1700MHz BAND**

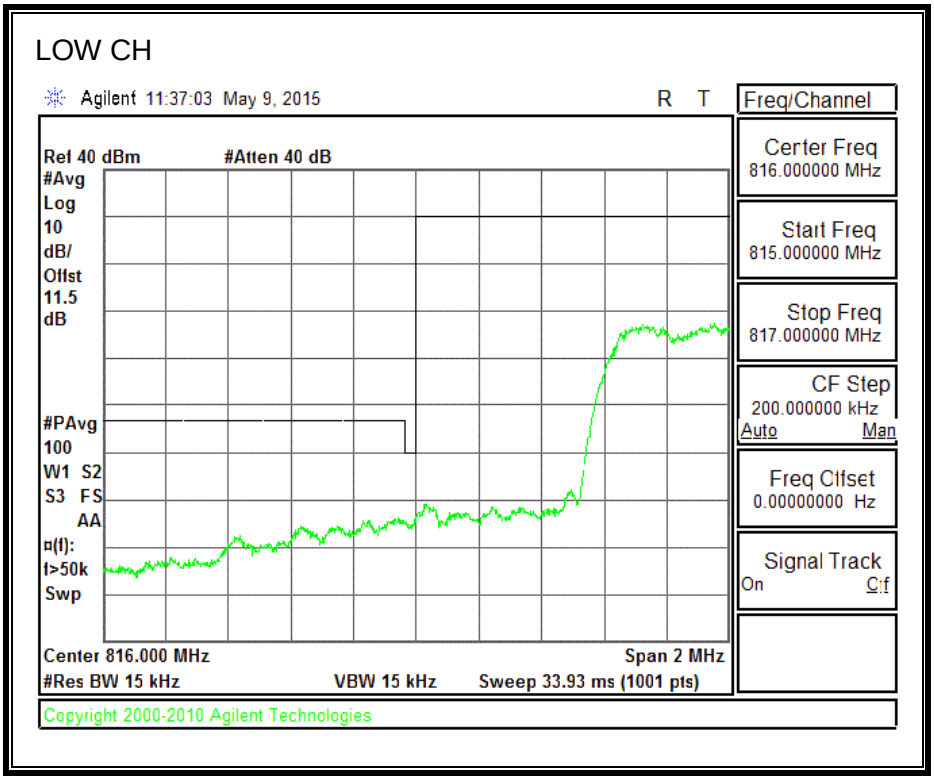
LOW CH



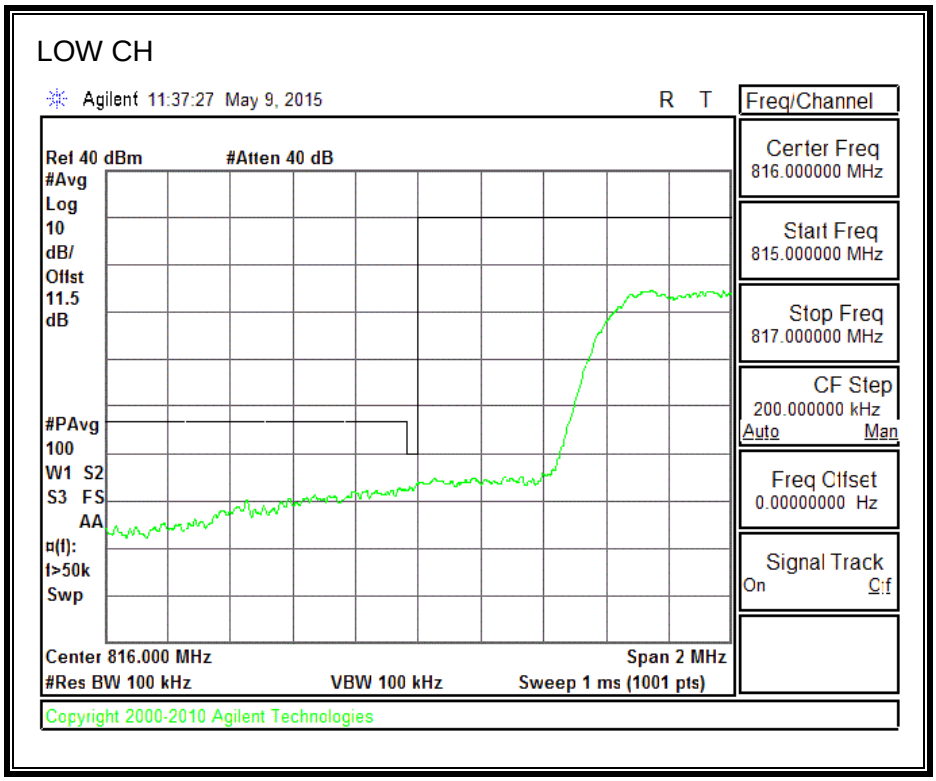

HIGH CH



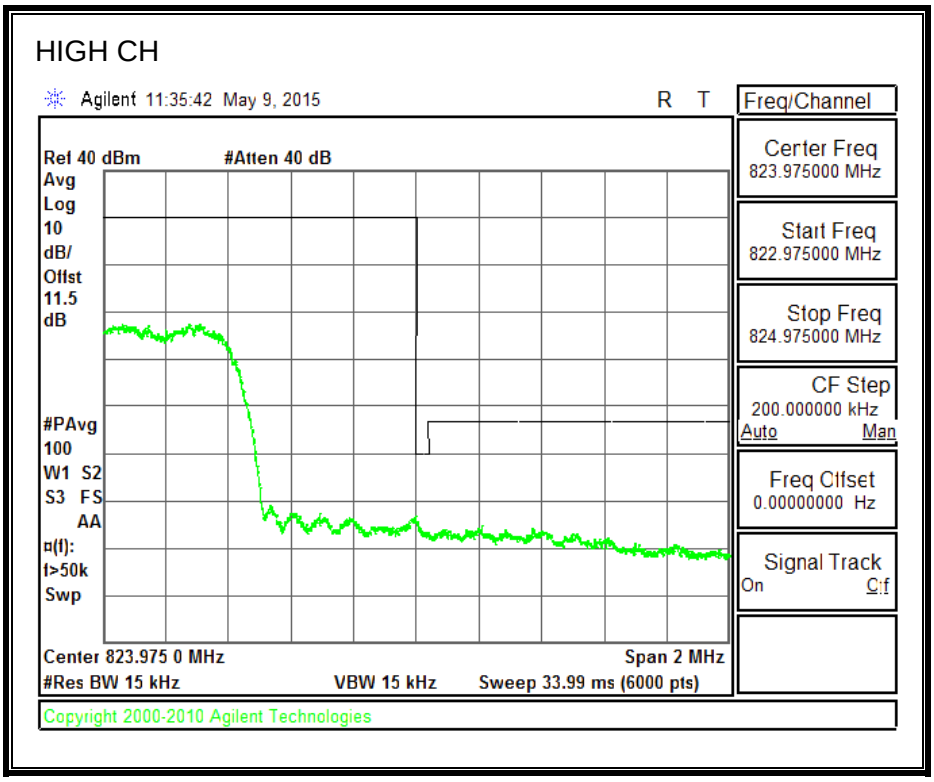
## 8.3.6. CDMA2000 EVDO REV A BC10 MASK



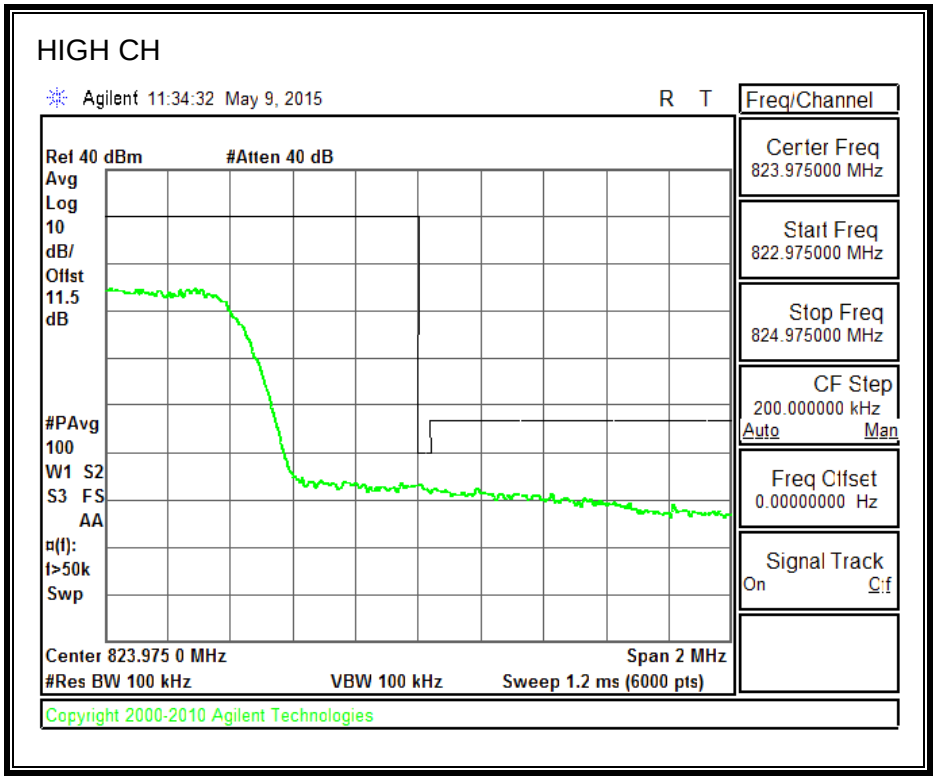

Note: RBW=1% of EBW




Note: RBW of 1% of 37.5KHz of outer channel frequency block




Note: RBW=1% of EBW

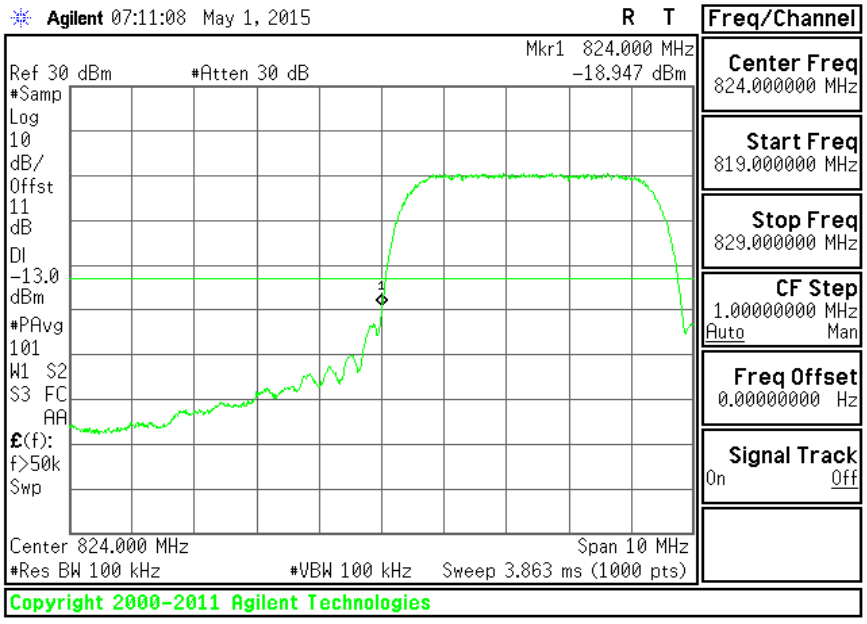



Note: RBW of 1% of 37.5KHz of outer channel frequency block

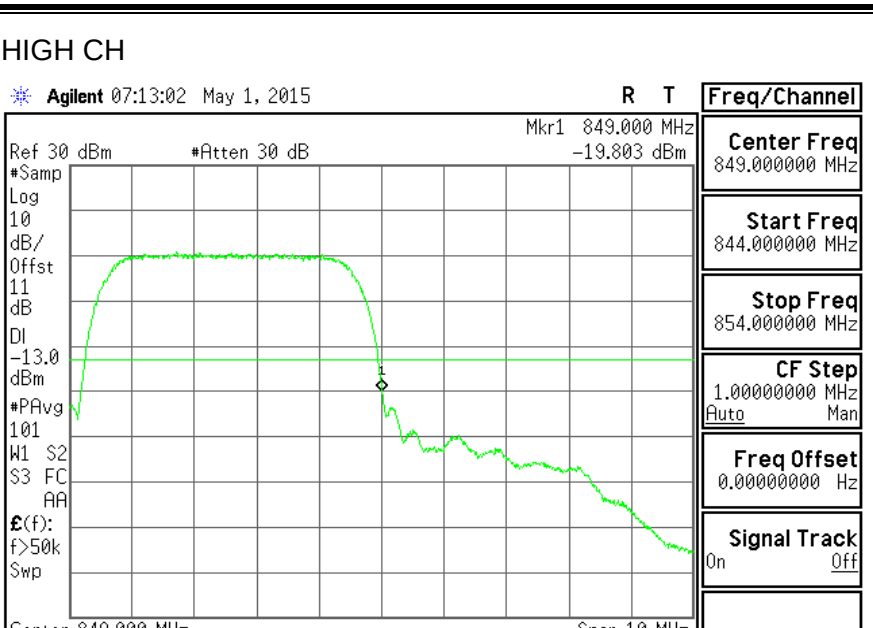
## 8.3.7. UMTS REL 99

**850MHz BAND**

LOW CH

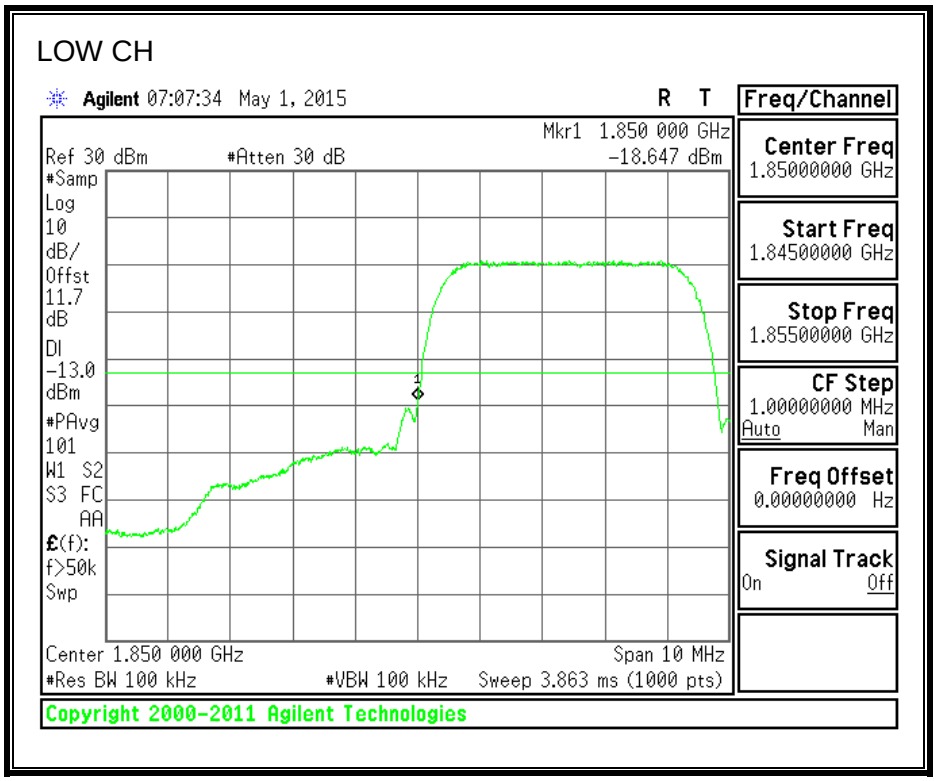



HIGH CH

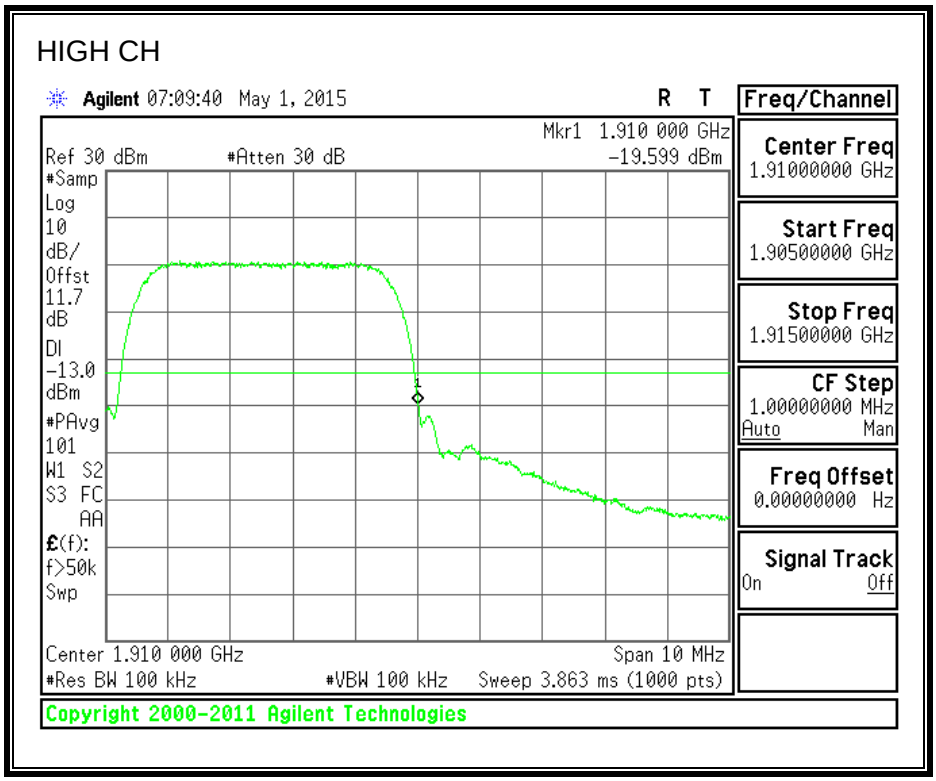


**1900MHz BAND**

LOW CH

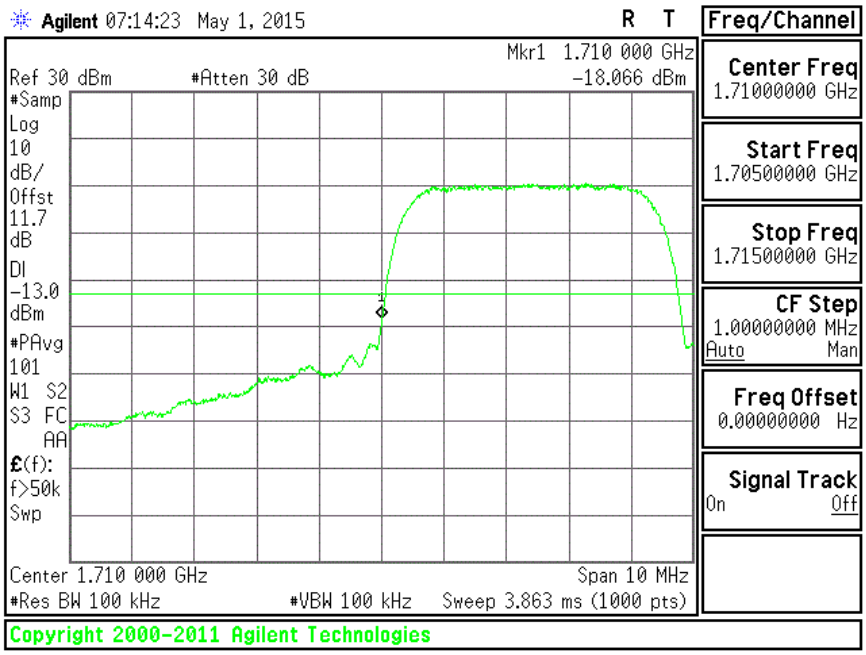



HIGH CH

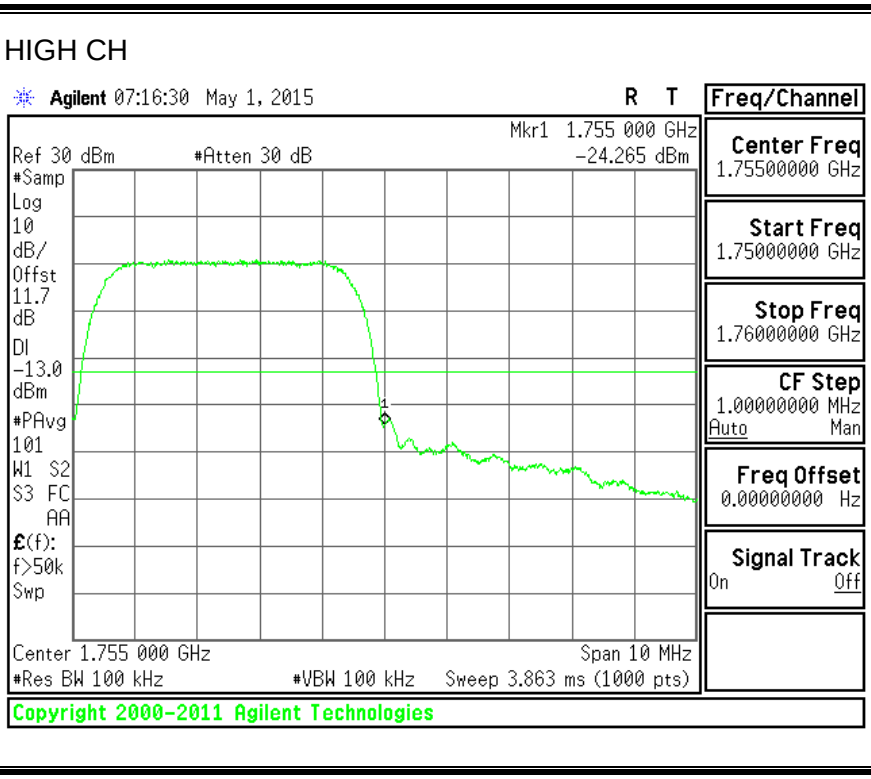


**1700MHz BAND**

LOW CH



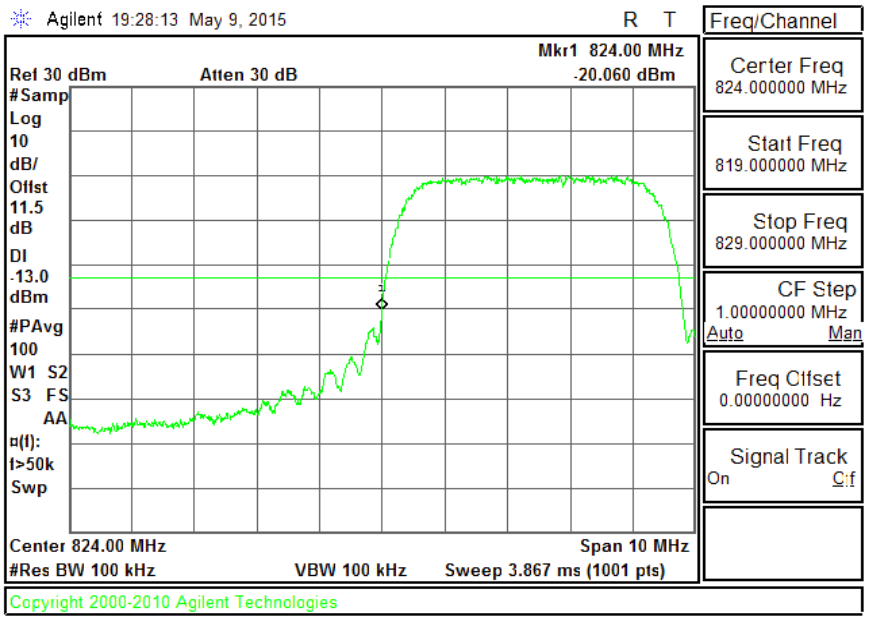

HIGH CH



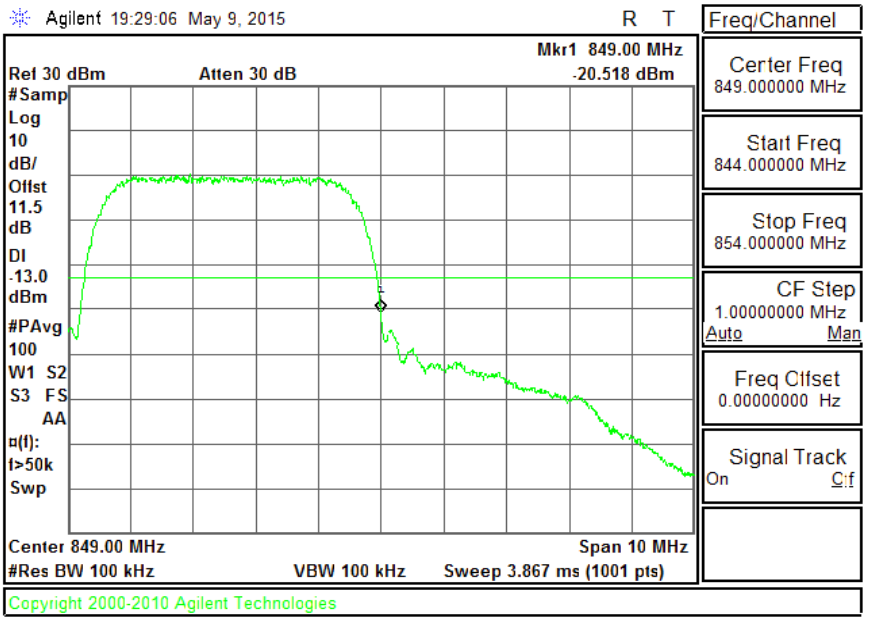
## 8.3.8. UMTS HSDPA

**850MHz BAND**

LOW CH

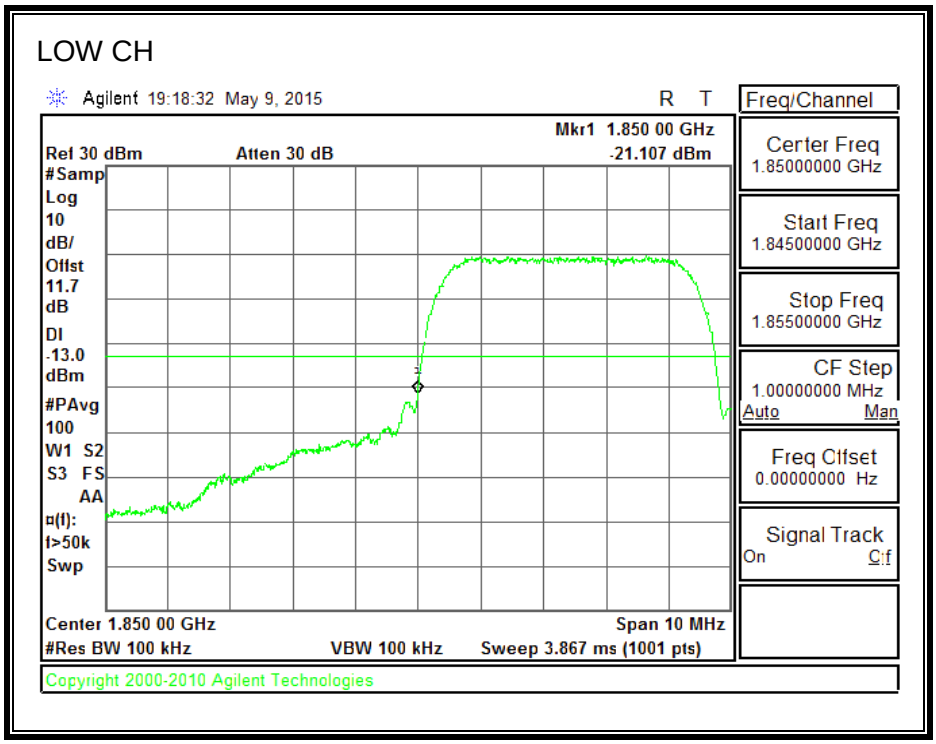



HIGH CH

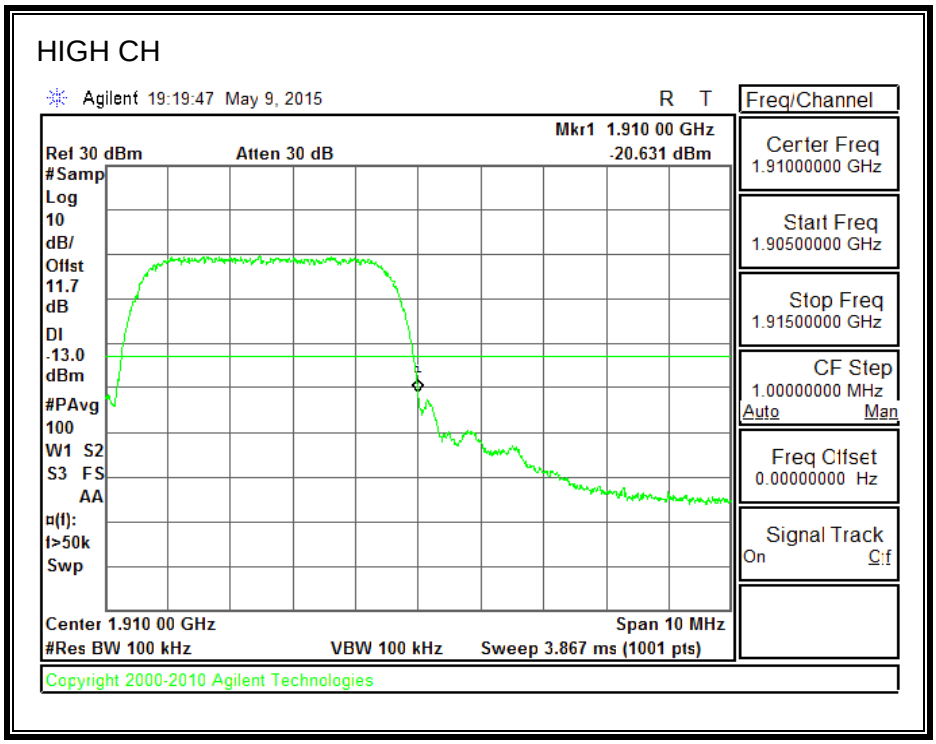


**1900MHz BAND**

LOW CH

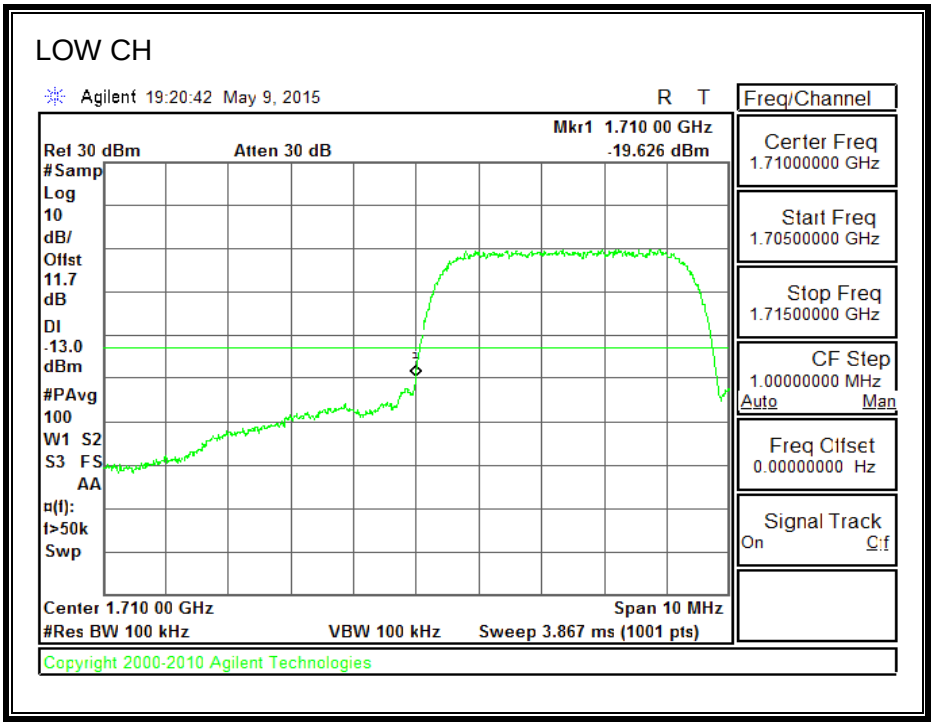



HIGH CH

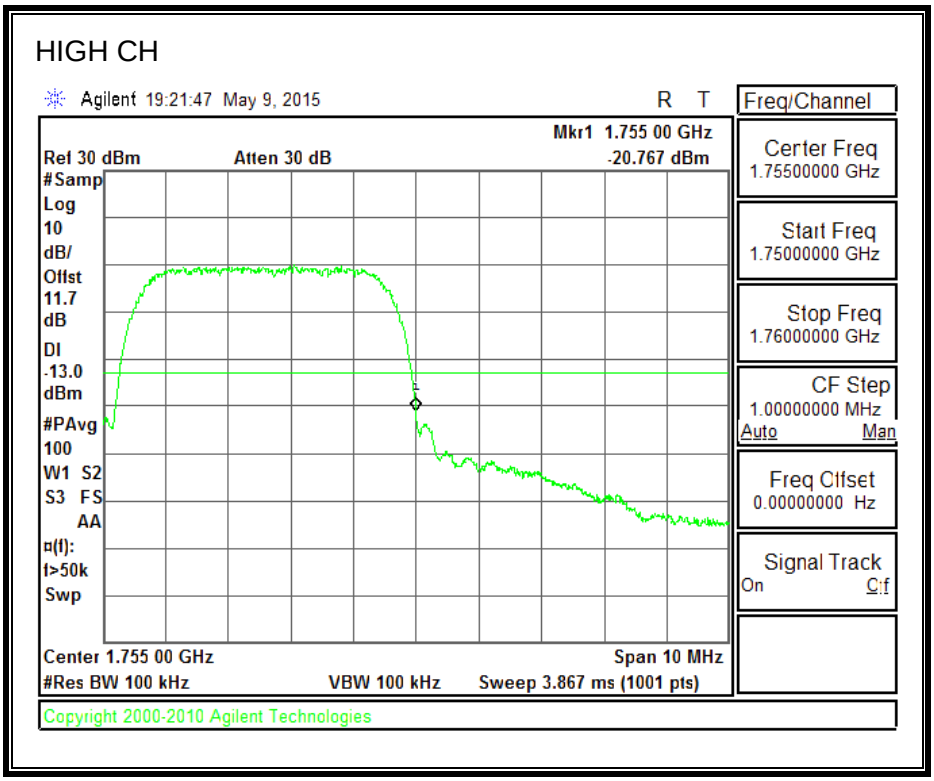


**1700MHz BAND**

LOW CH




HIGH CH



## 8.4. BAND EDGE (MODEL: A1687)

**RULE PART(S)**

FCC: §22.359, 24.238, §27.53 and §90.691

**LIMITS**

§22. 917 & 24.238
Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

§27.53
AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1710-1755 MHz, band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

§90.691 Emission mask requirements for EA-based systems.

Compliance with the provisions of paragraphs above of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

**TEST PROCEDURE**

The transmitter output was connected to a Agilent 8960 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:

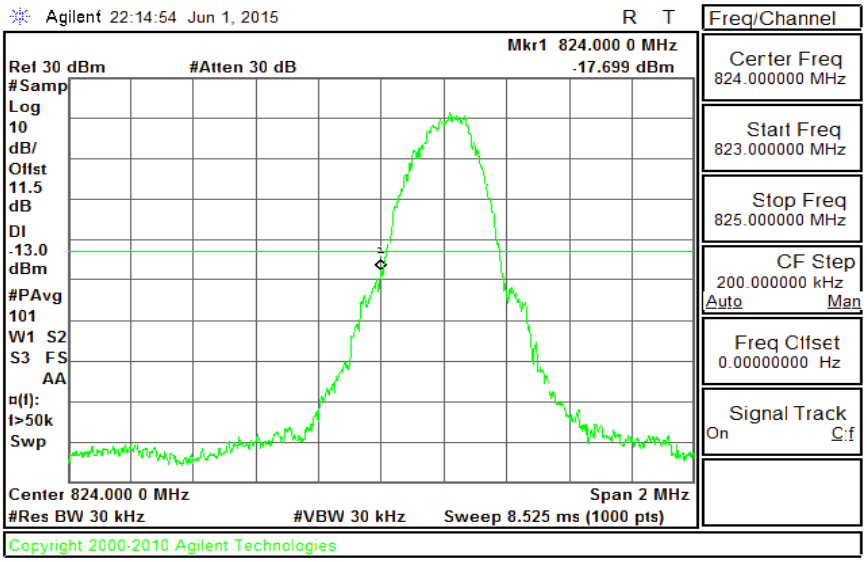
- Set the spectrum analyzer span to include the block edge frequency (824, 849, 1850, 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

**RESULTS**

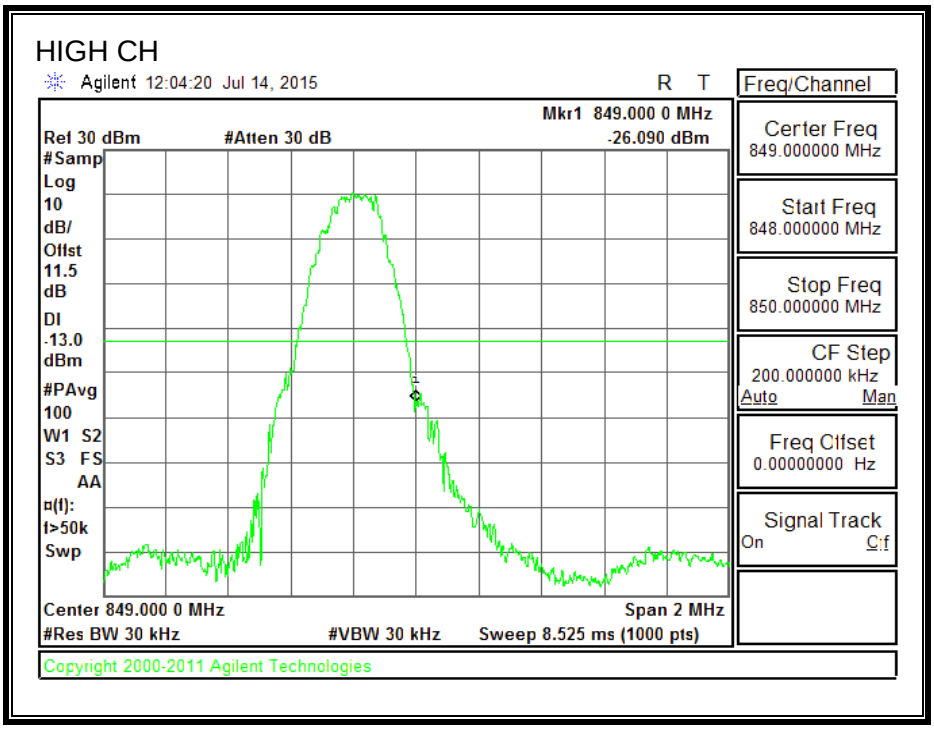
### 8.4.1. GSM-GPRS

**850MHz BAND**

LOW CH

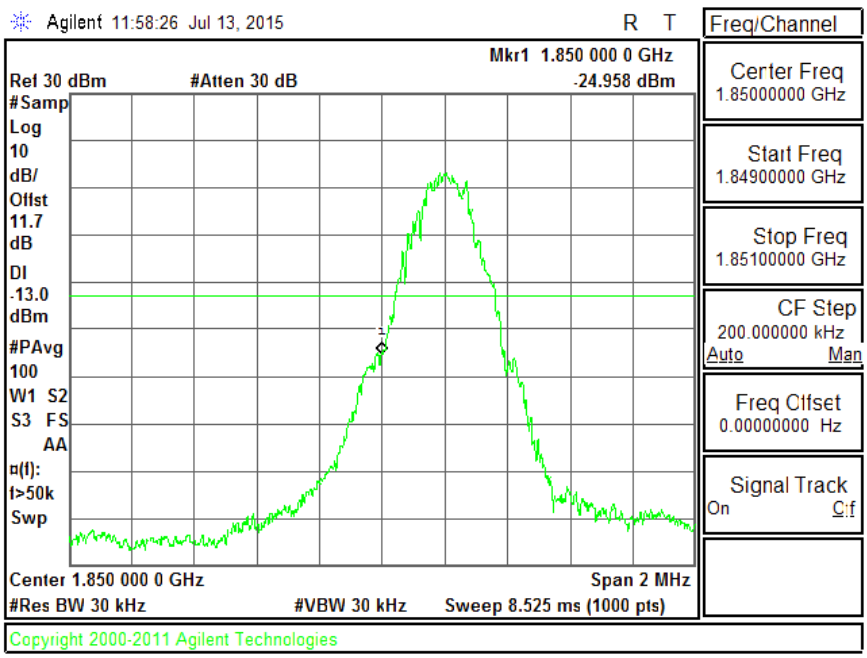



HIGH CH

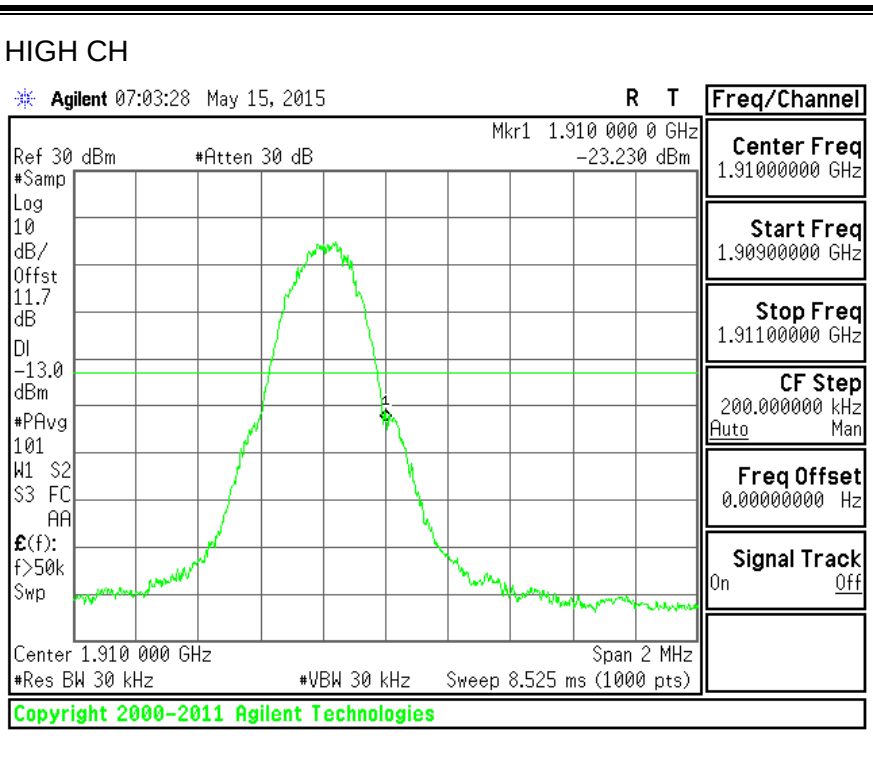


**1900MHz BAND**

LOW CH



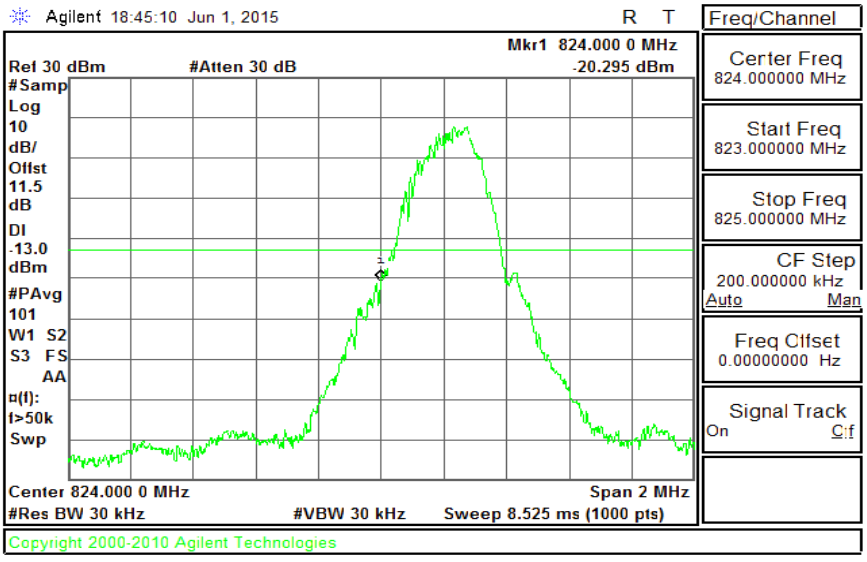

HIGH CH



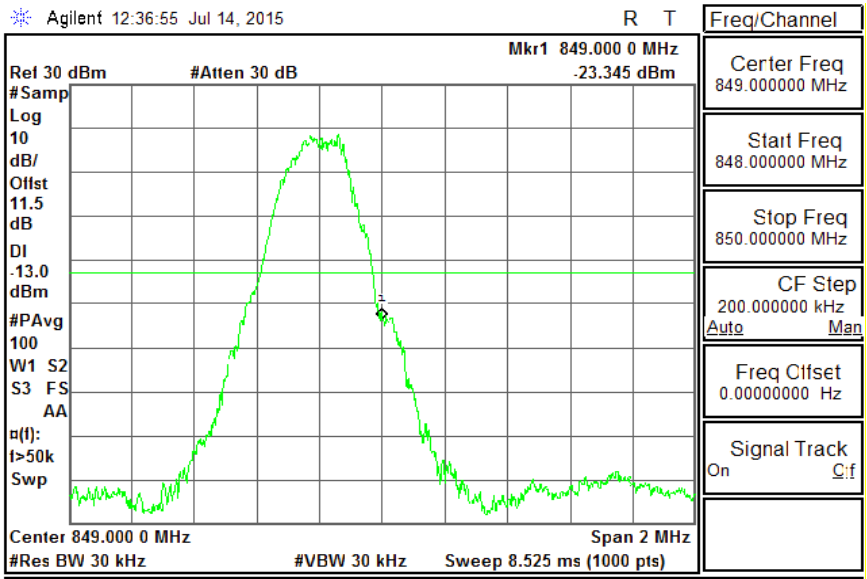
## 8.4.2. GSM-EGPRS

**850MHz BAND**

LOW CH

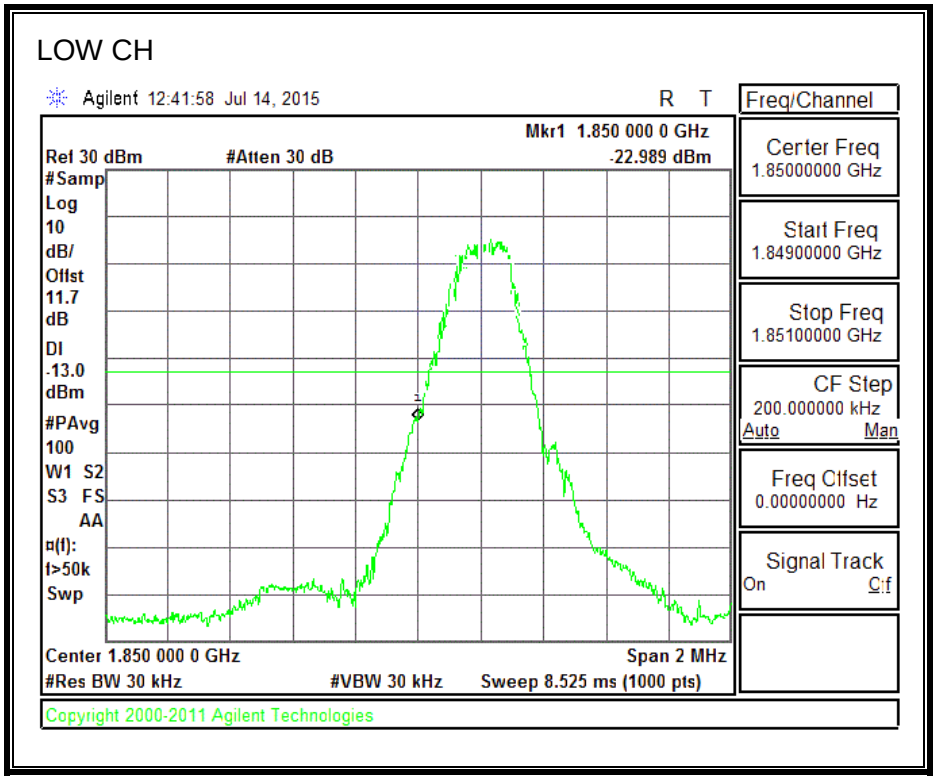



HIGH CH

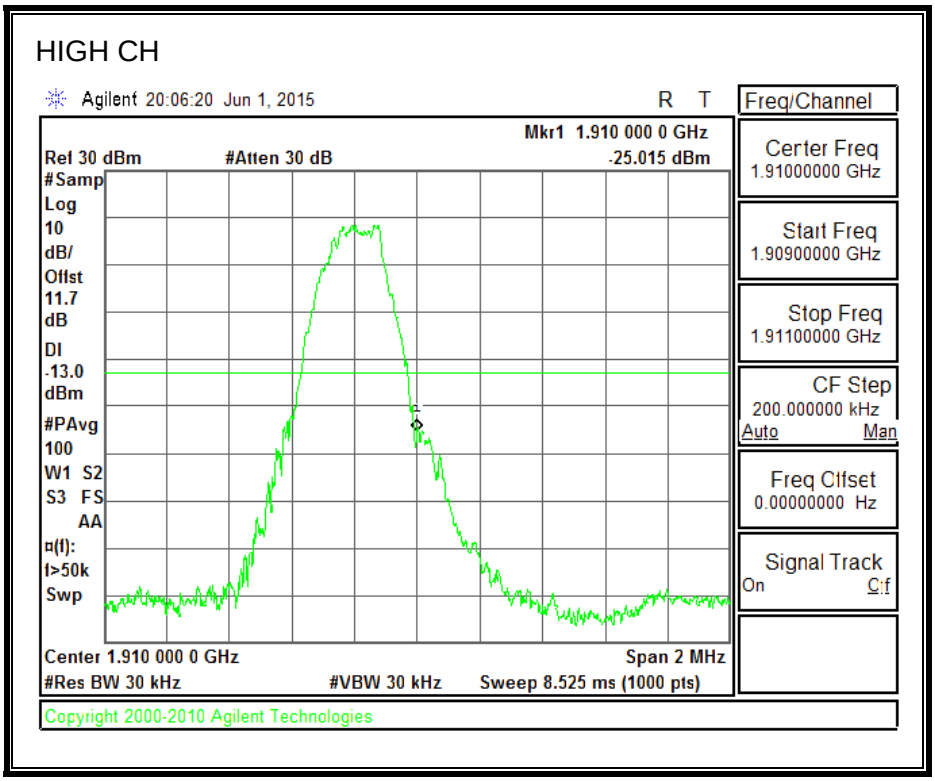


**1900MHz BAND**

LOW CH

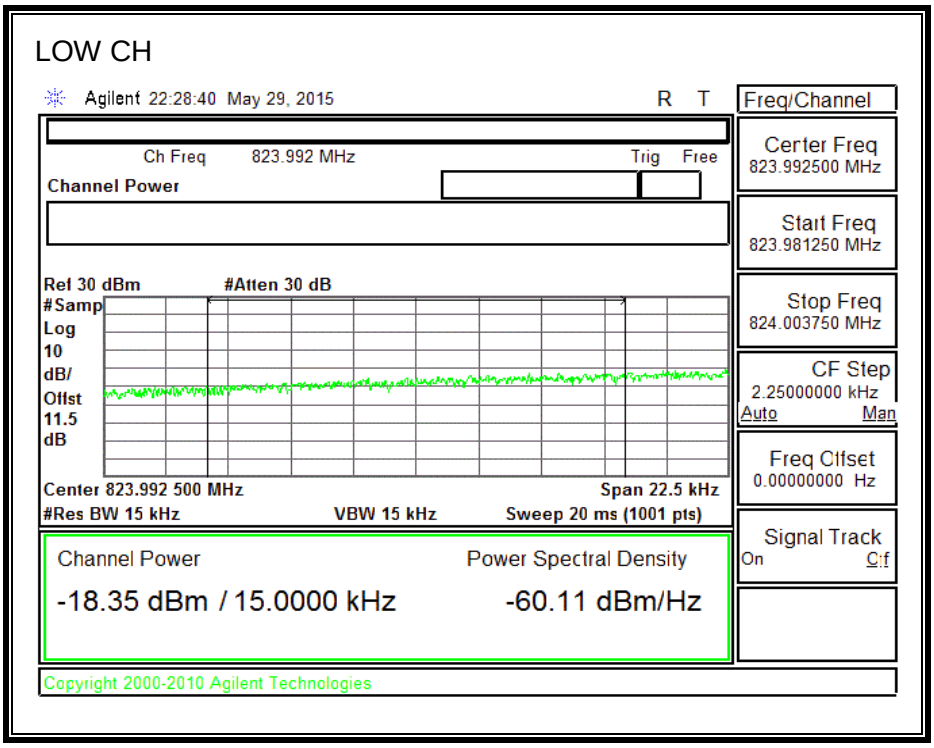


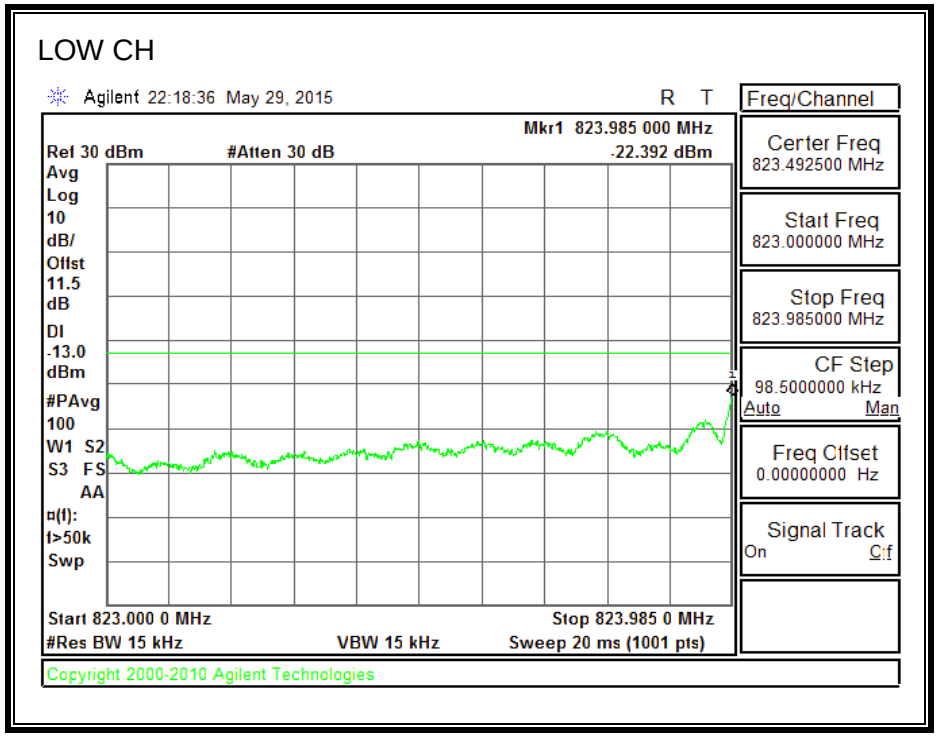

HIGH CH



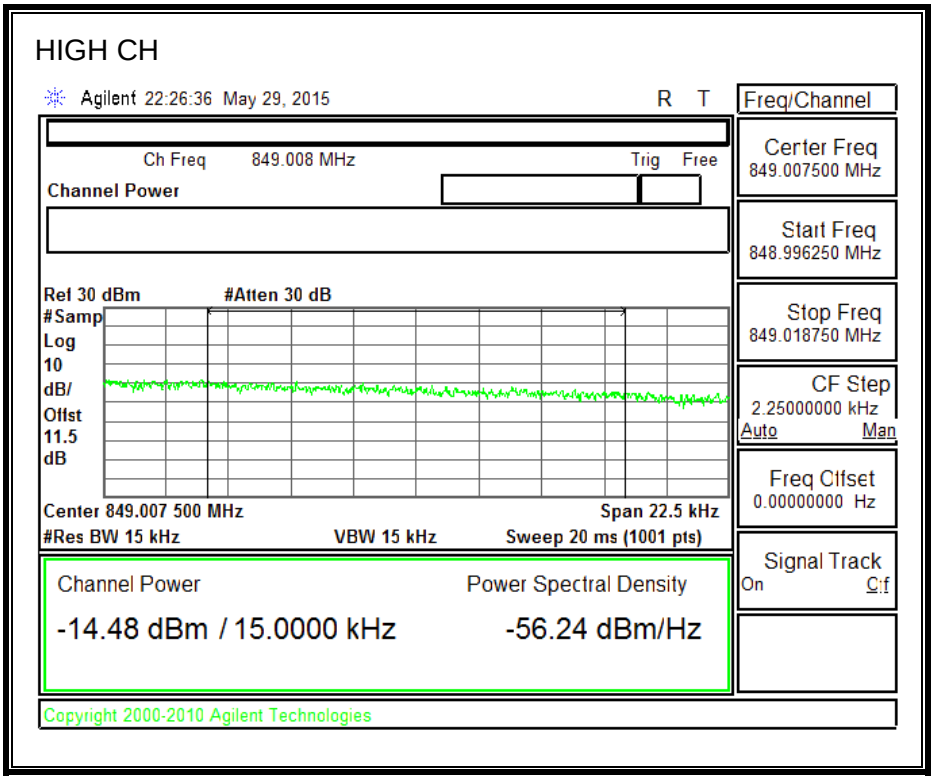
### 8.4.3. CDMA2000 1xRTT

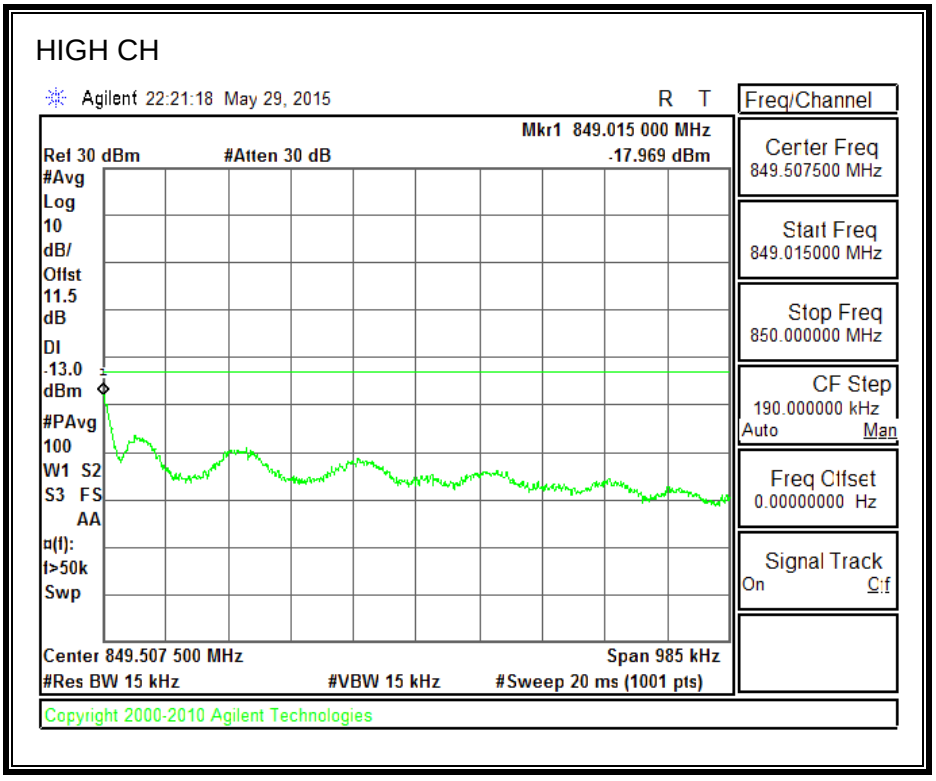
**850MHz BAND**



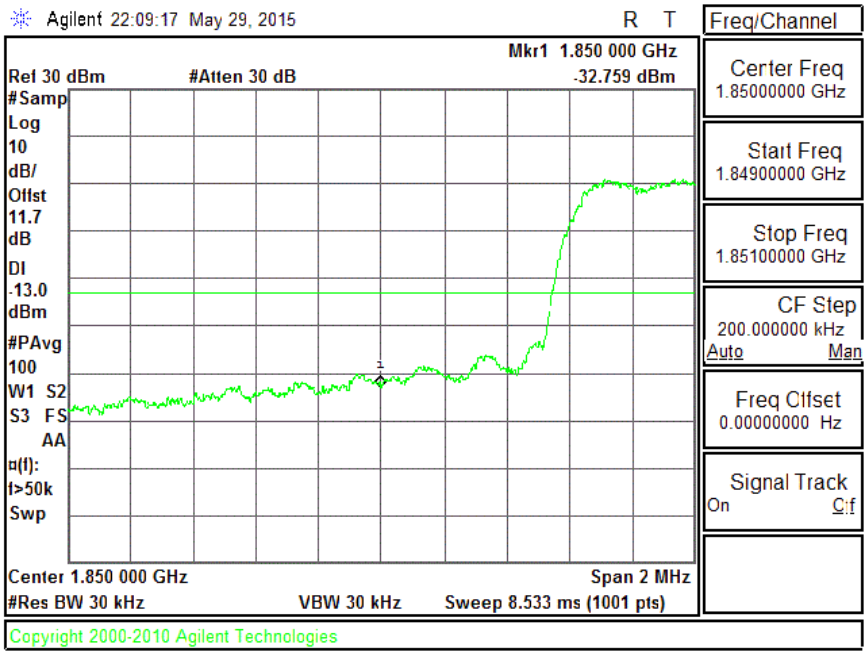
**850MHz BAND**



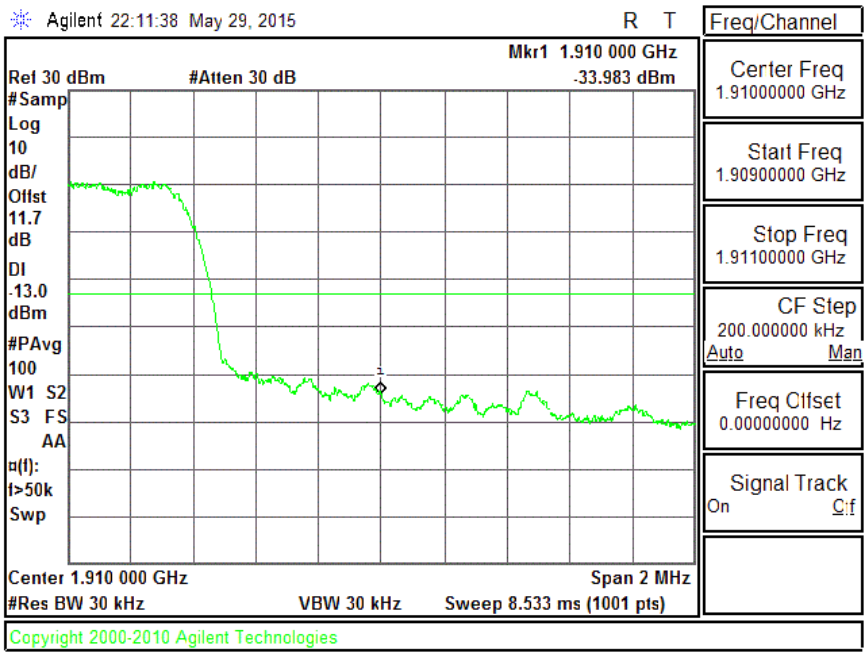



**1900MHz BAND**

LOW CH

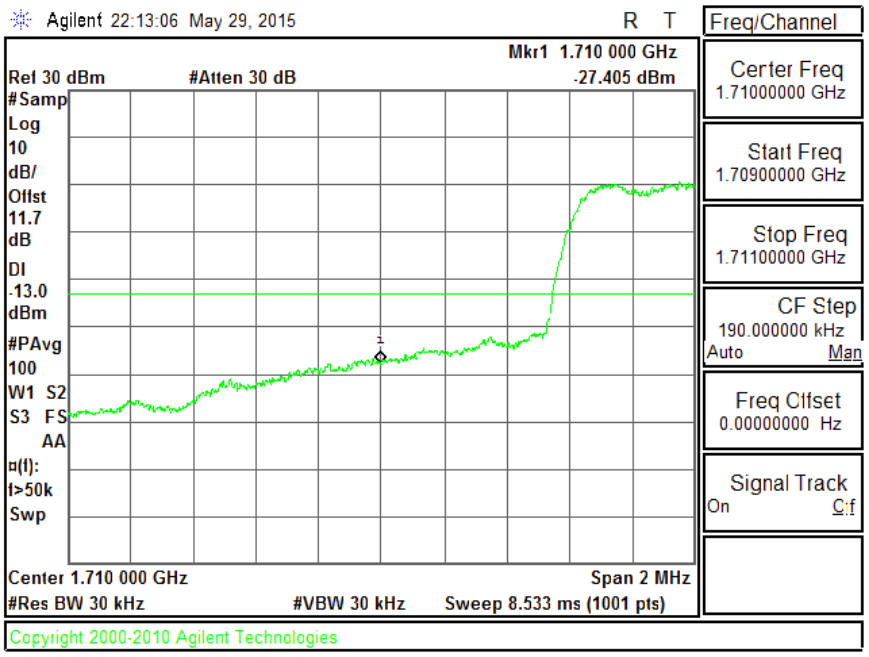



HIGH CH

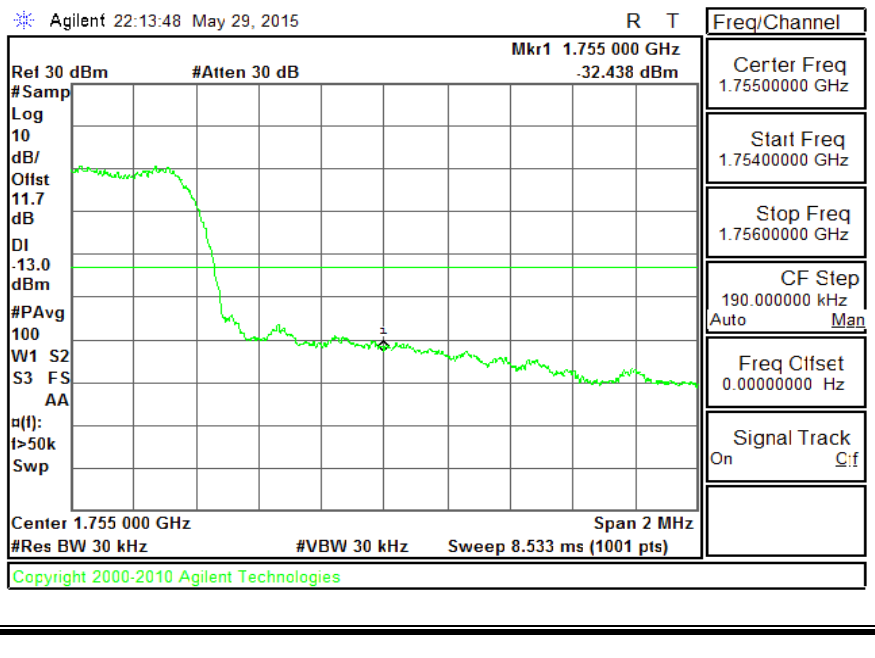


**1700MHz BAND**

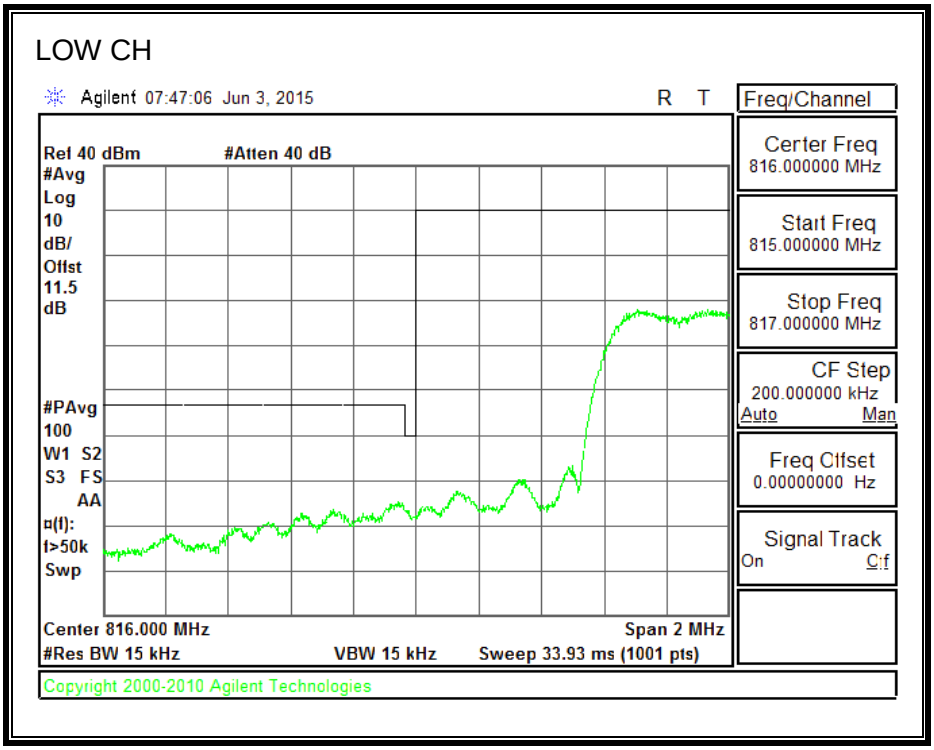
LOW CH



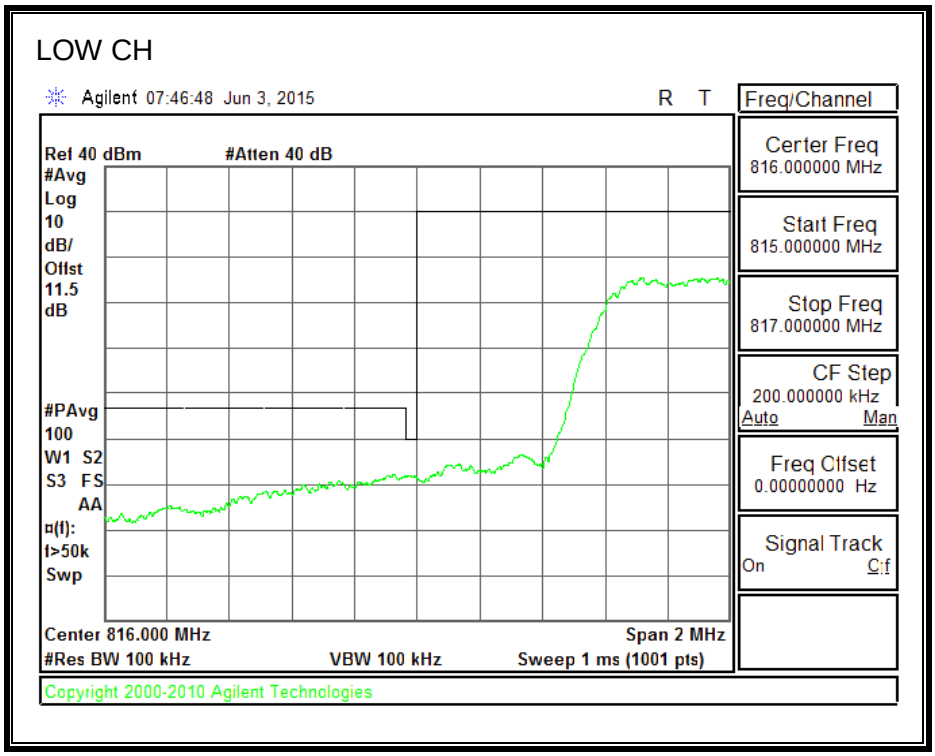

HIGH CH



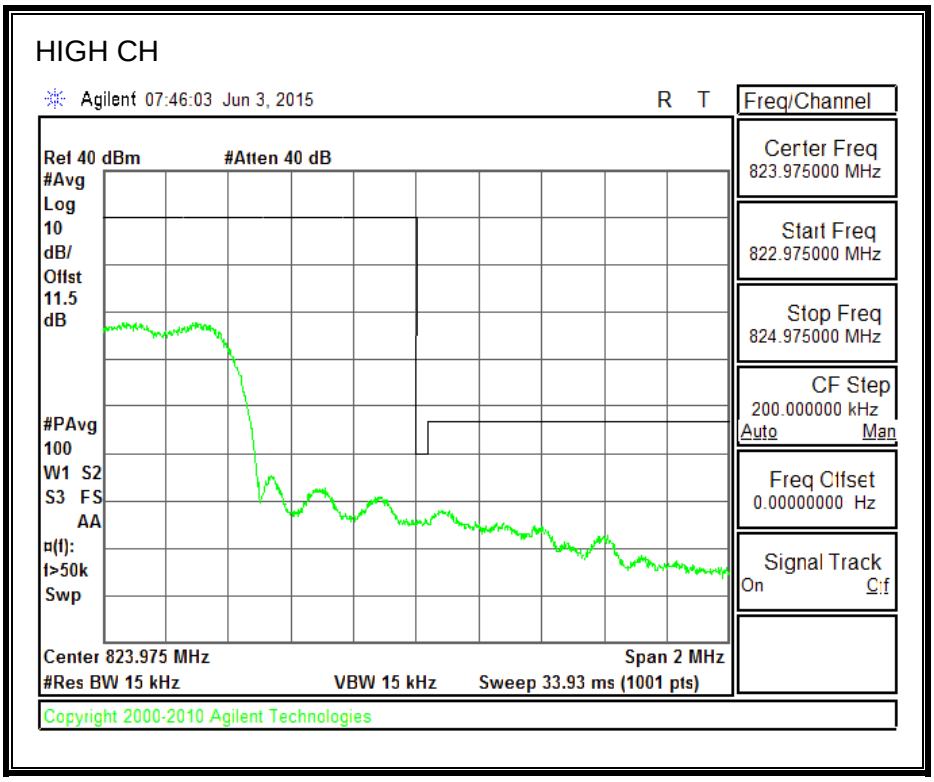
### 8.4.4. CDMA2000 1xRTT BC10 MASK



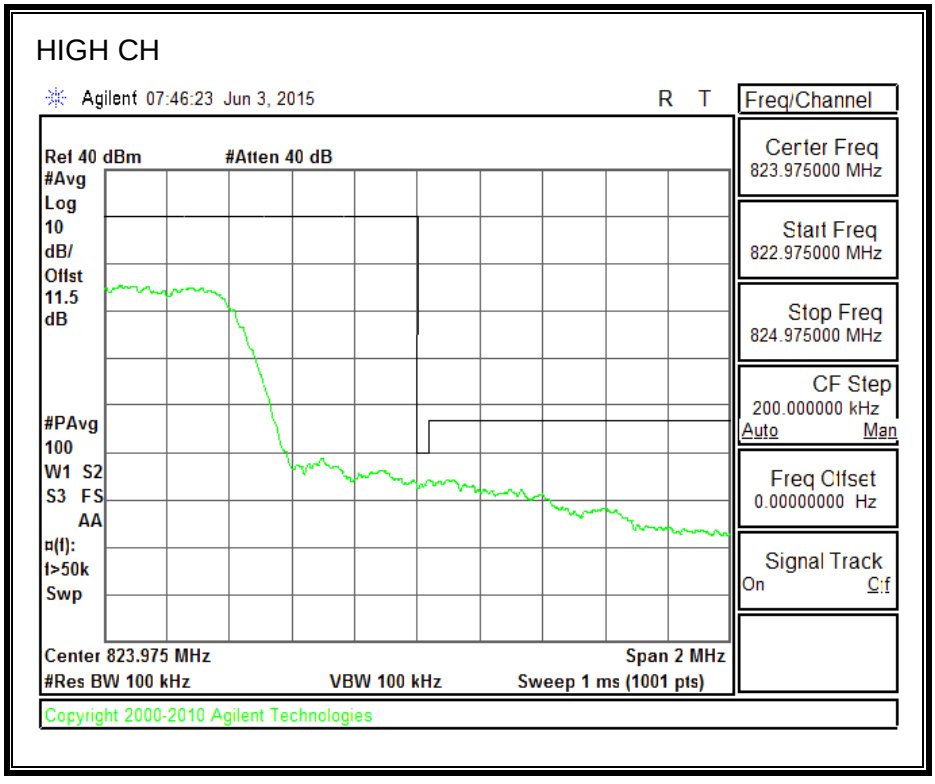

Note: RBW=1% of EBW




Note: RBW of 1% of 37.5KHz of outer channel frequency block



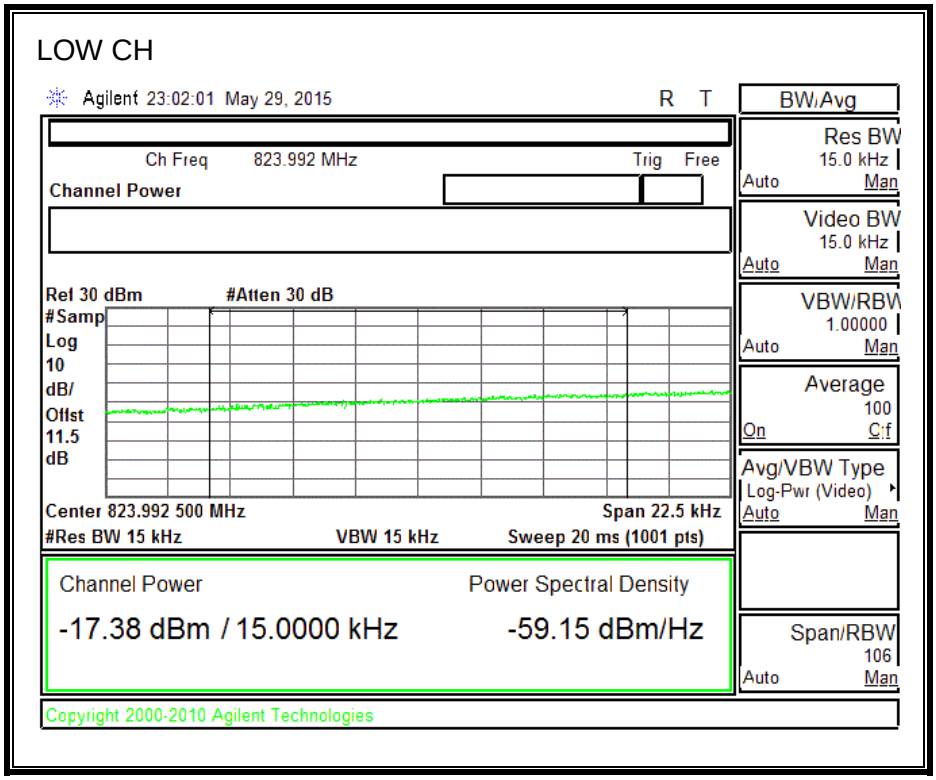

Note: RBW=1% of EBW

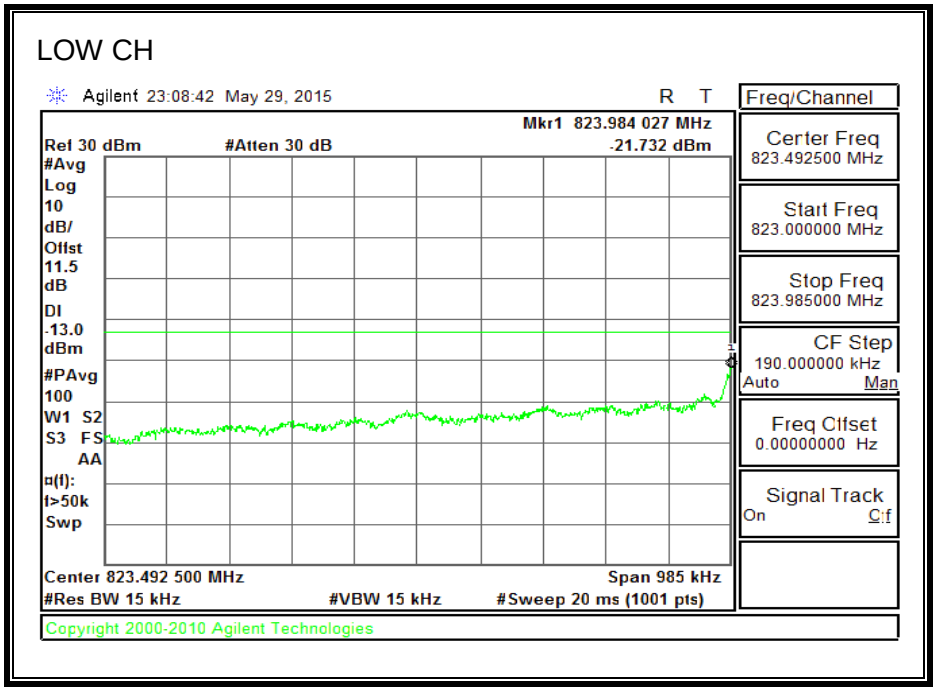



Note: RBW of 1% of 37.5KHz of outer channel frequency block

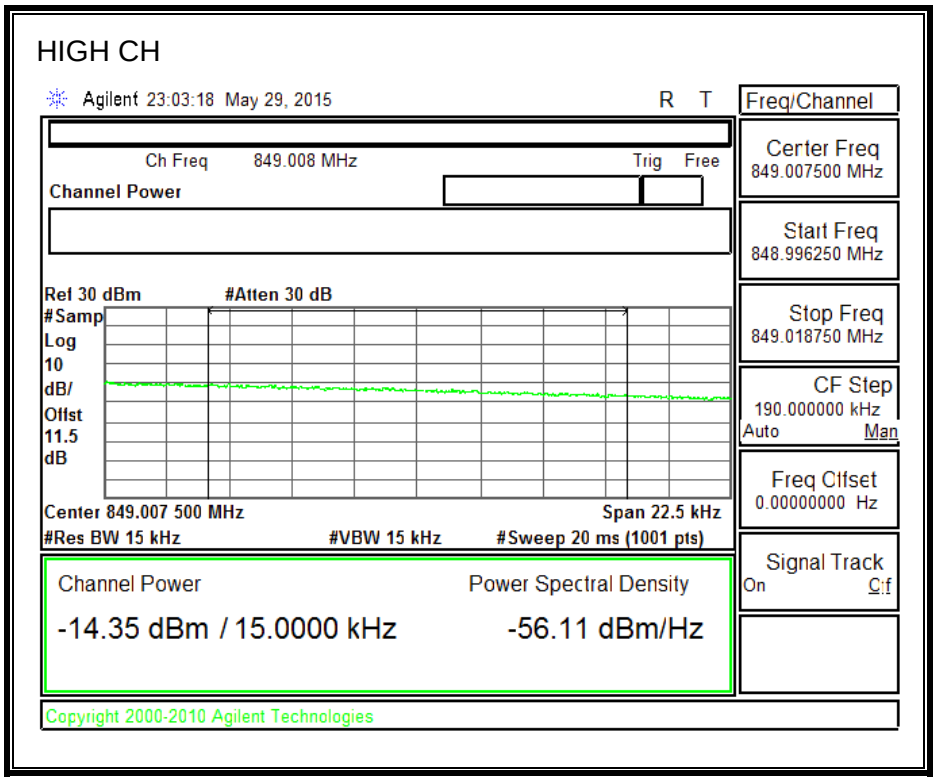
## 8.4.5. CDMA2000 EVDO REV A

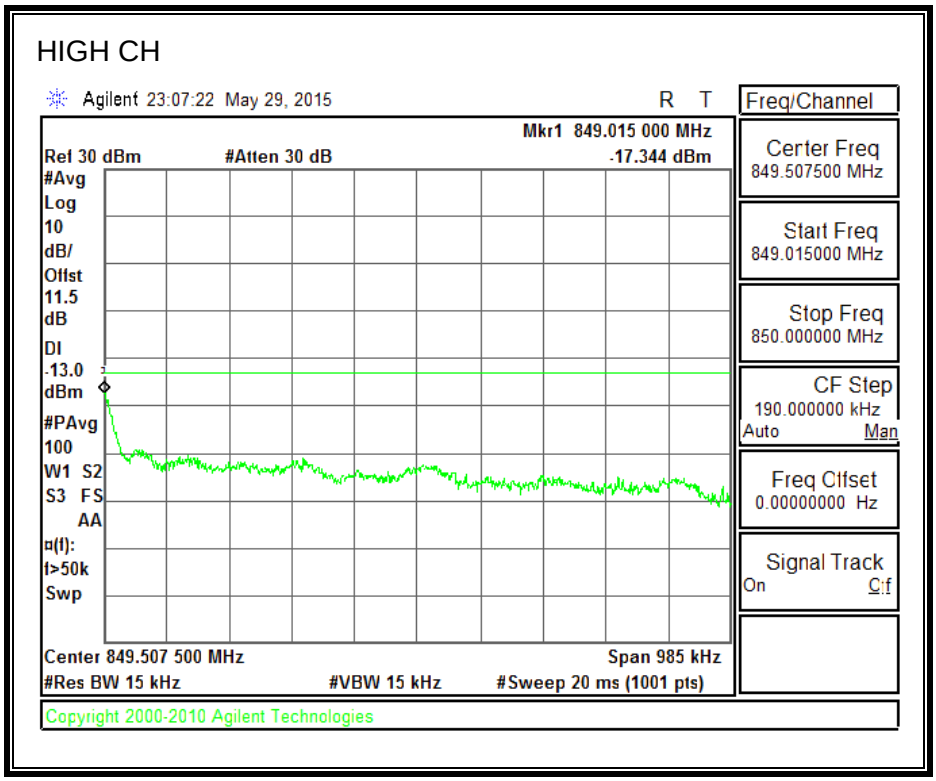
**850MHz BAND**



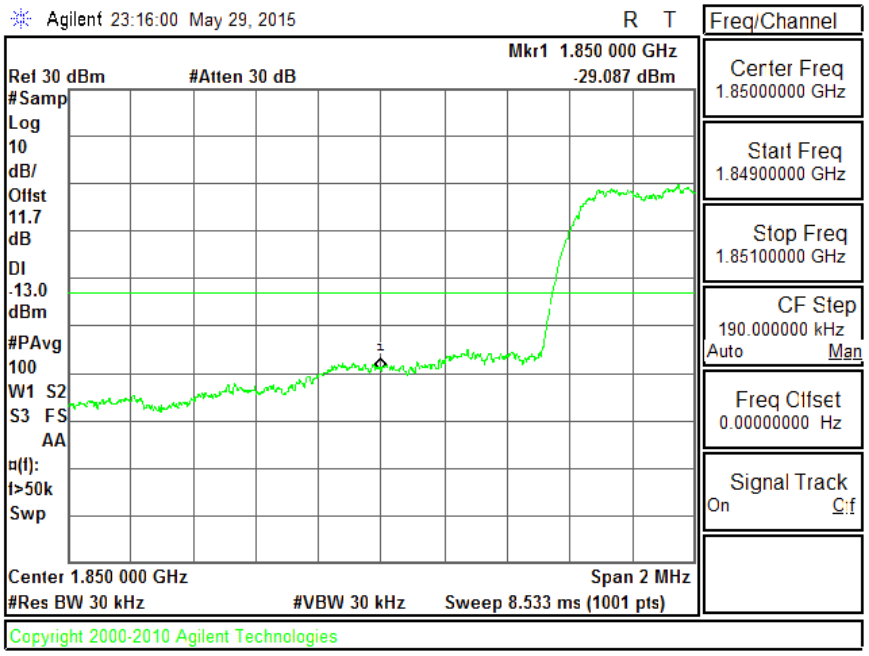
**850MHz BAND**



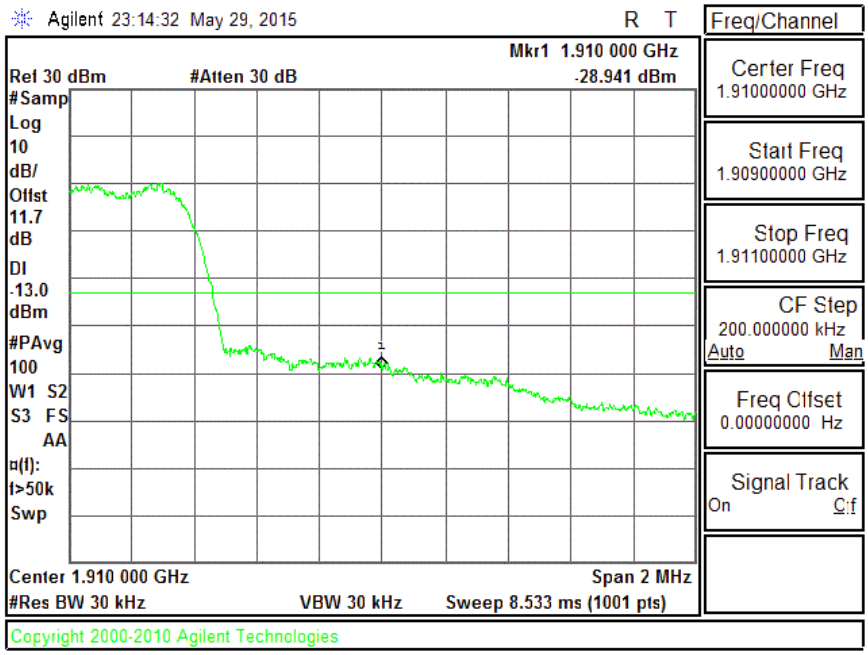



**1900MHz BAND**

LOW CH

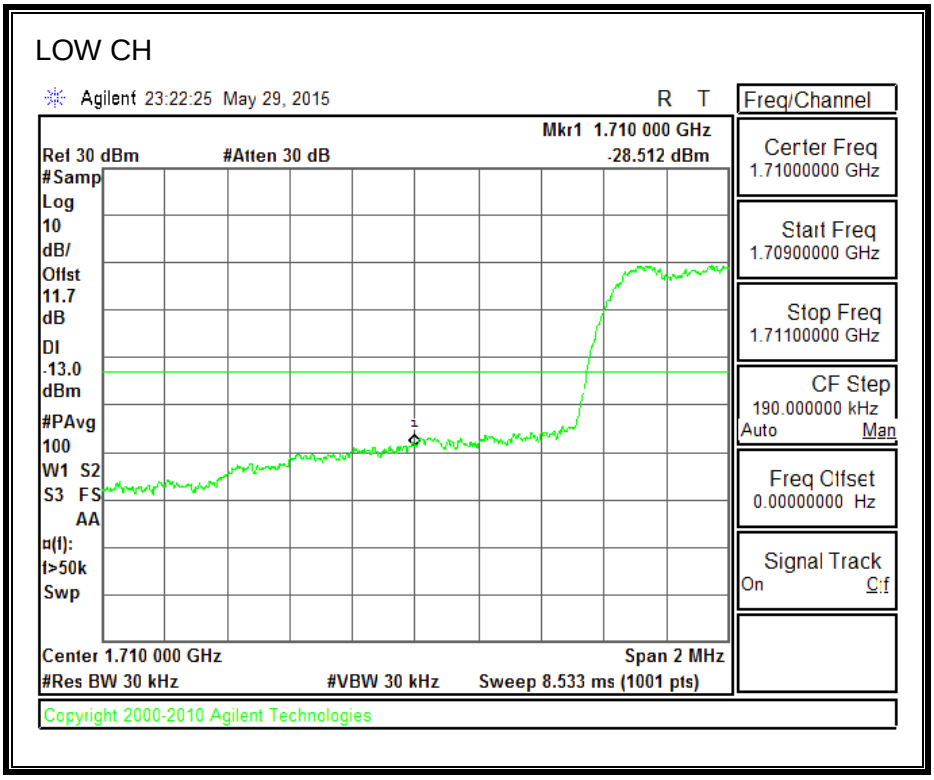



HIGH CH

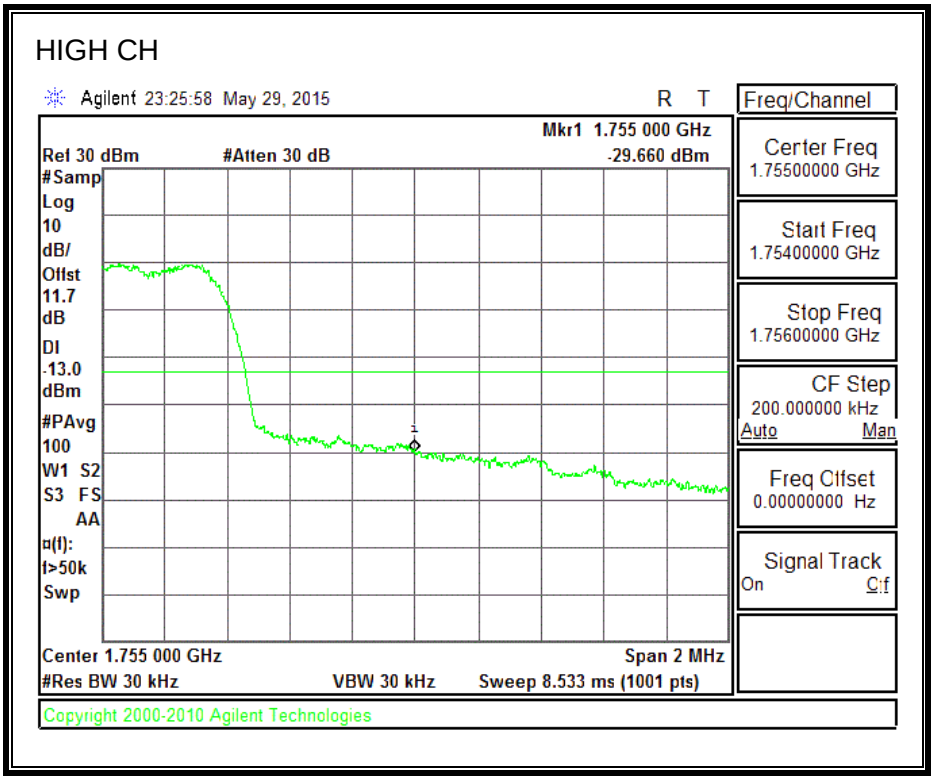


**1700MHz BAND**

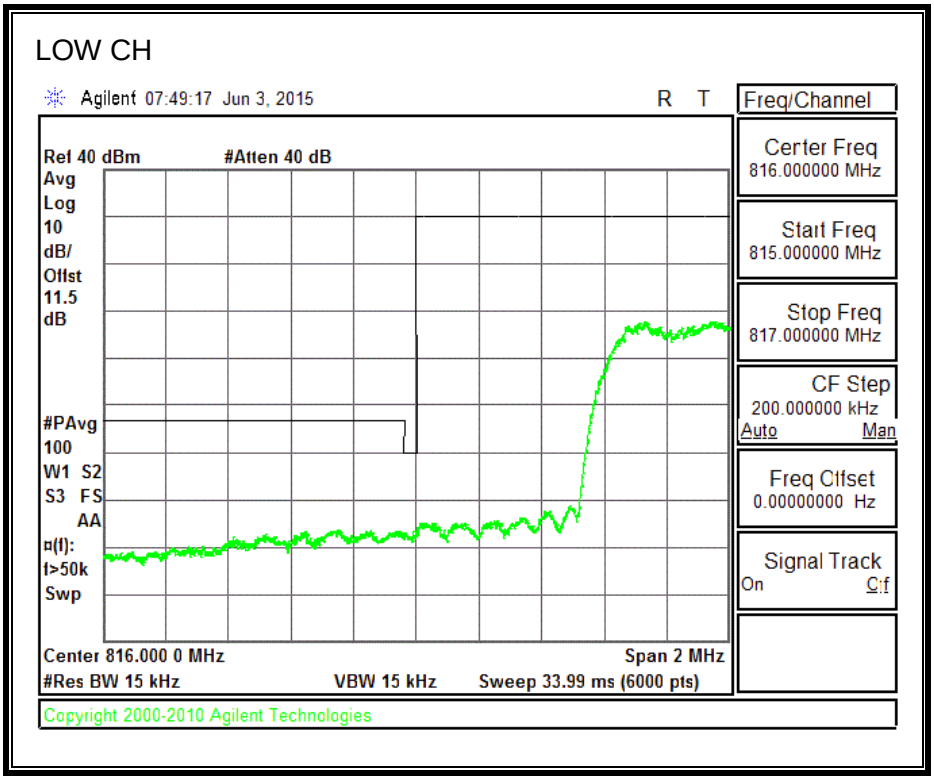
LOW CH



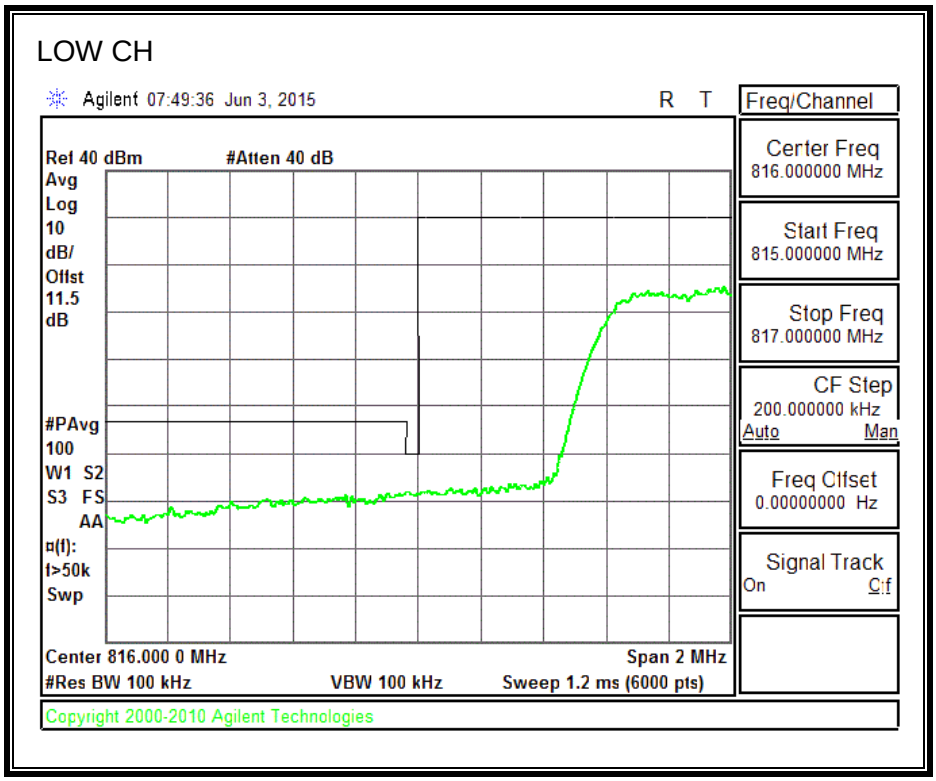

HIGH CH



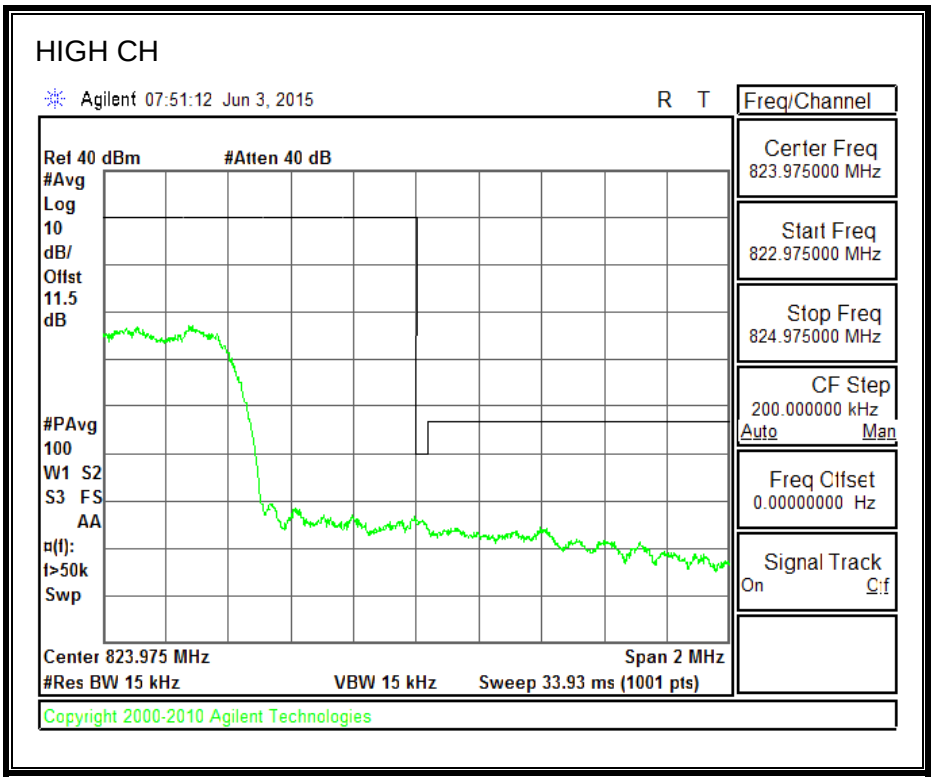
## 8.4.6. CDMA2000 EVDO REV A BC10 MASK



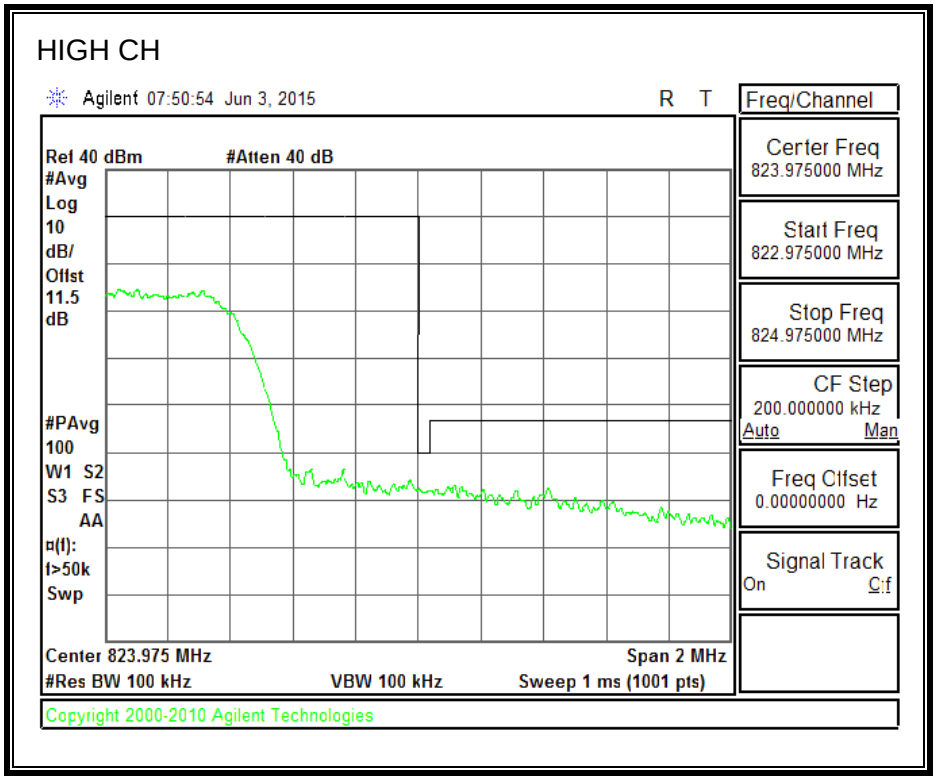

Note: RBW=1% of EBW




Note: RBW of 1% of 37.5KHz of outer channel frequency block




Note: RBW=1% of EBW

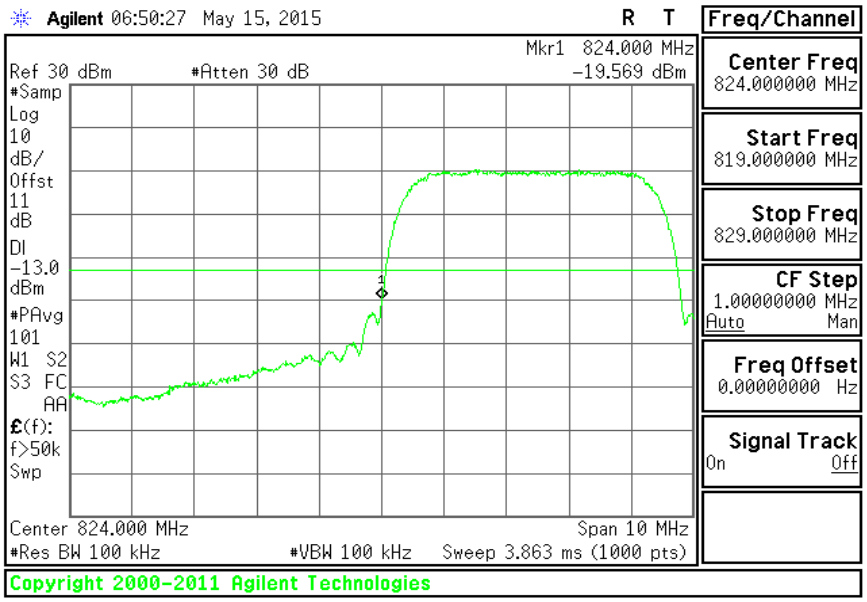



Note: RBW of 1% of 37.5KHz of outer channel frequency block

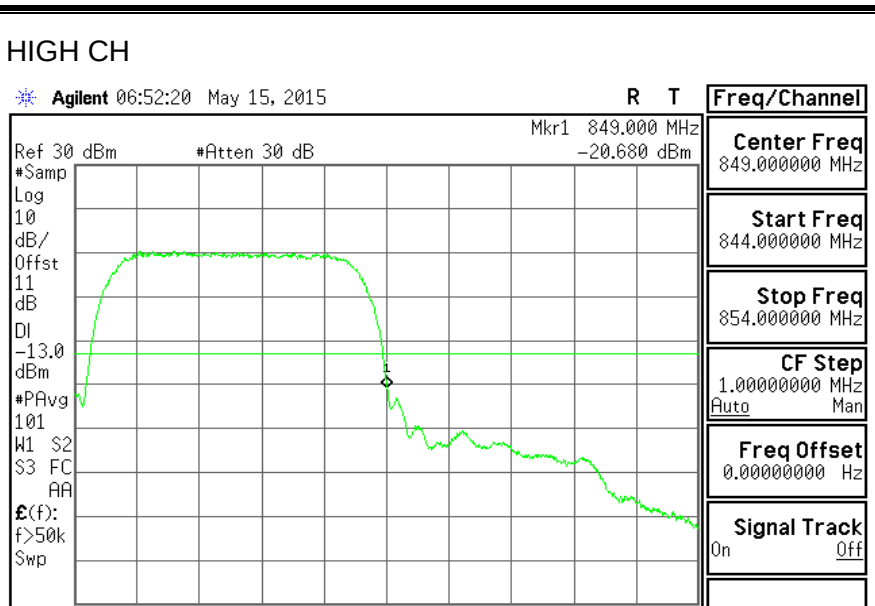
## 8.4.7. UMTS REL 99

**850MHz BAND**

LOW CH

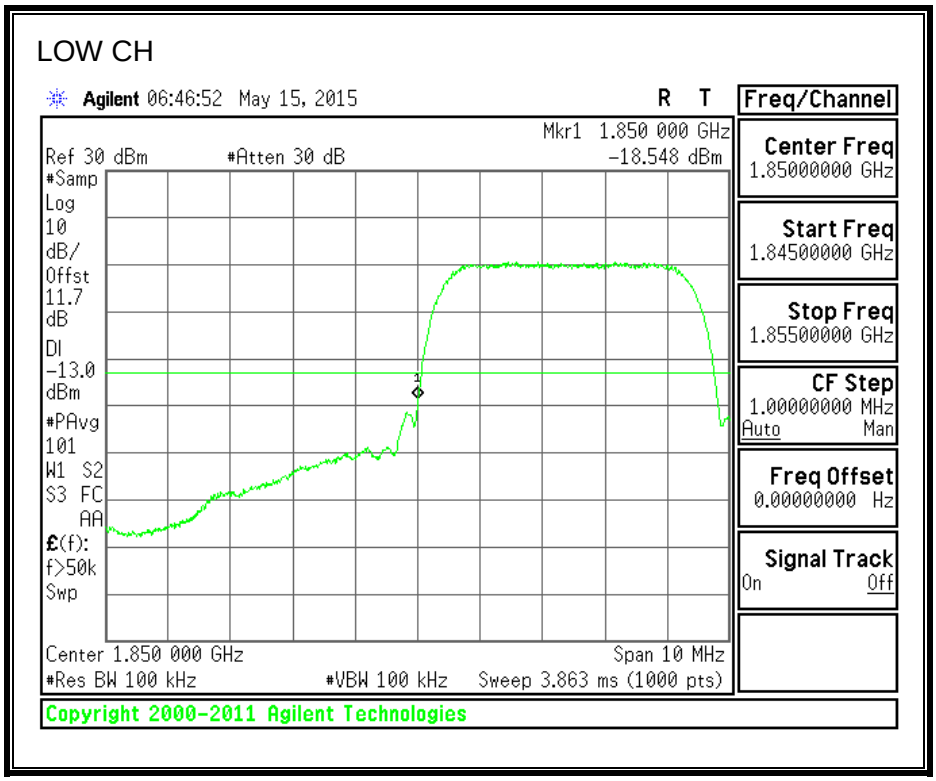



HIGH CH

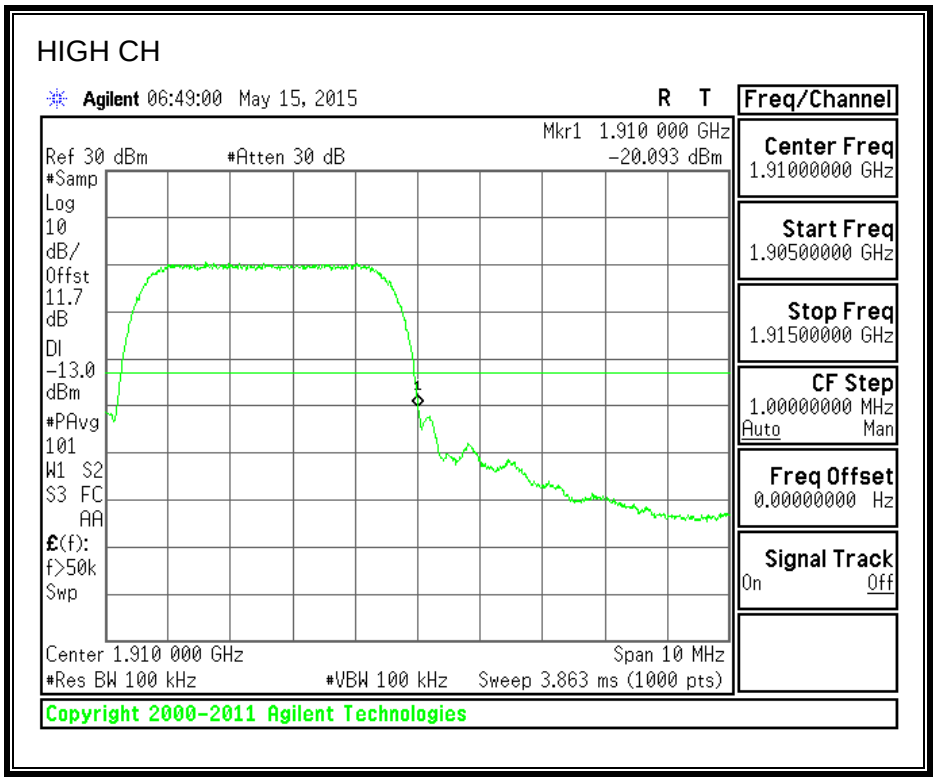


**1900MHz BAND**

LOW CH

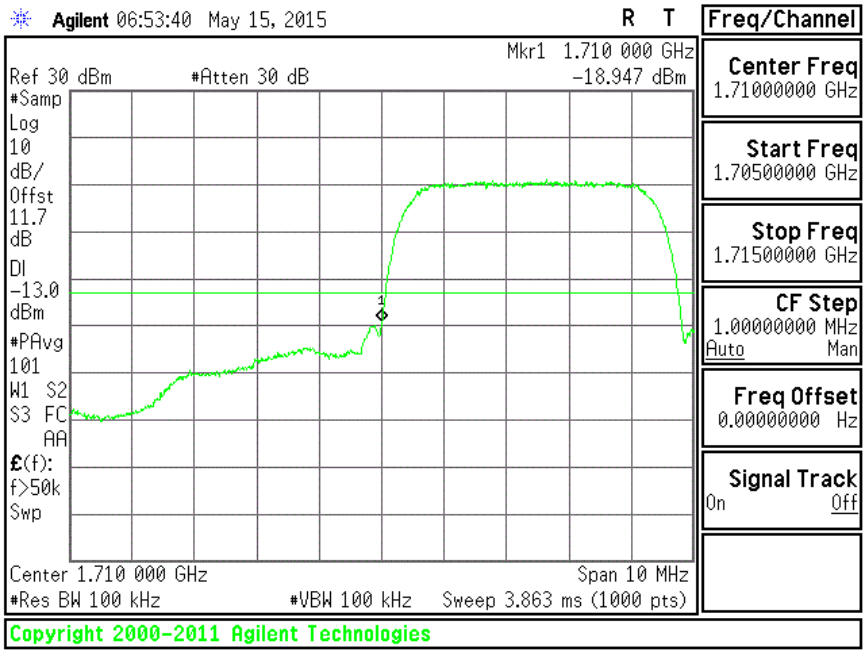



HIGH CH

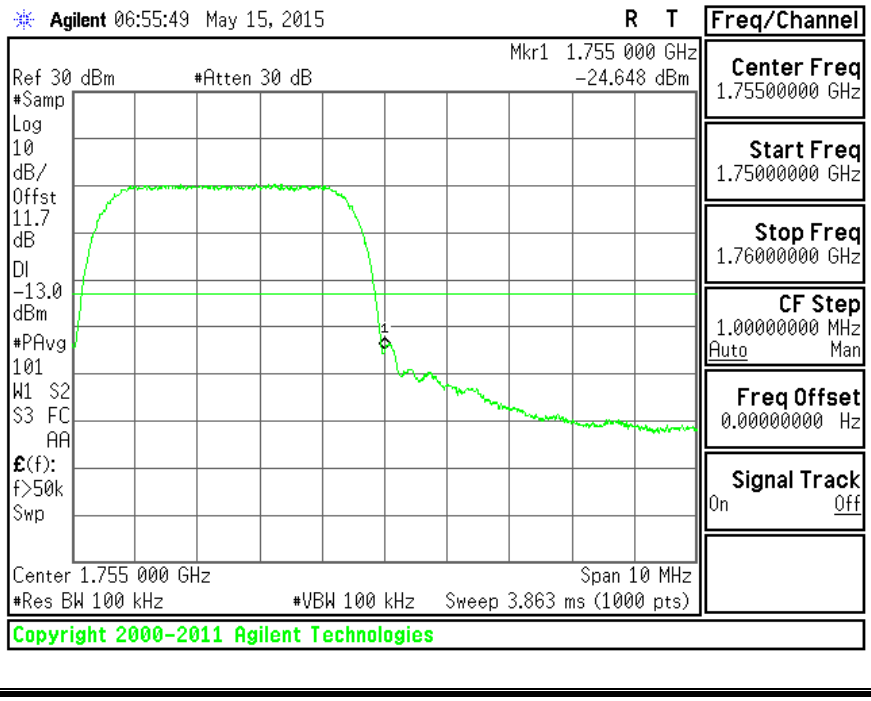


**1700MHz BAND**

LOW CH



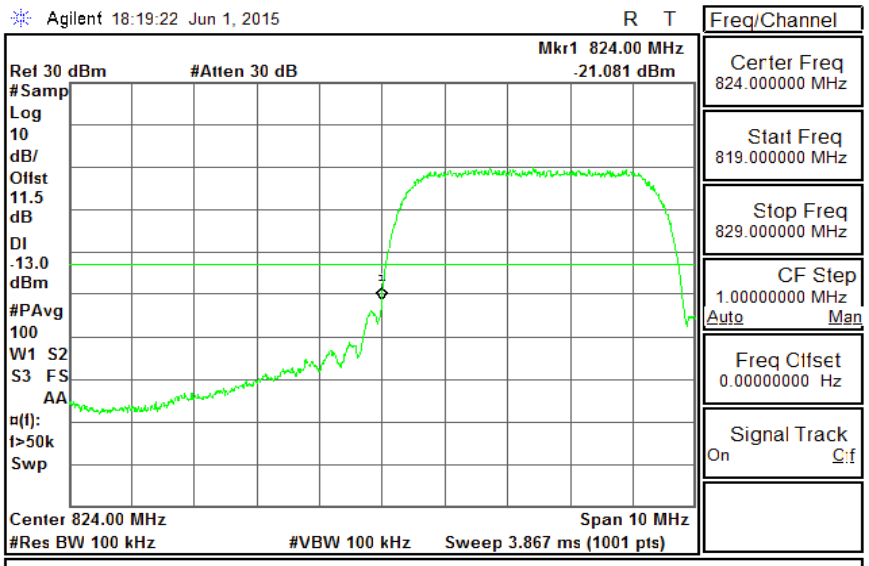

HIGH CH



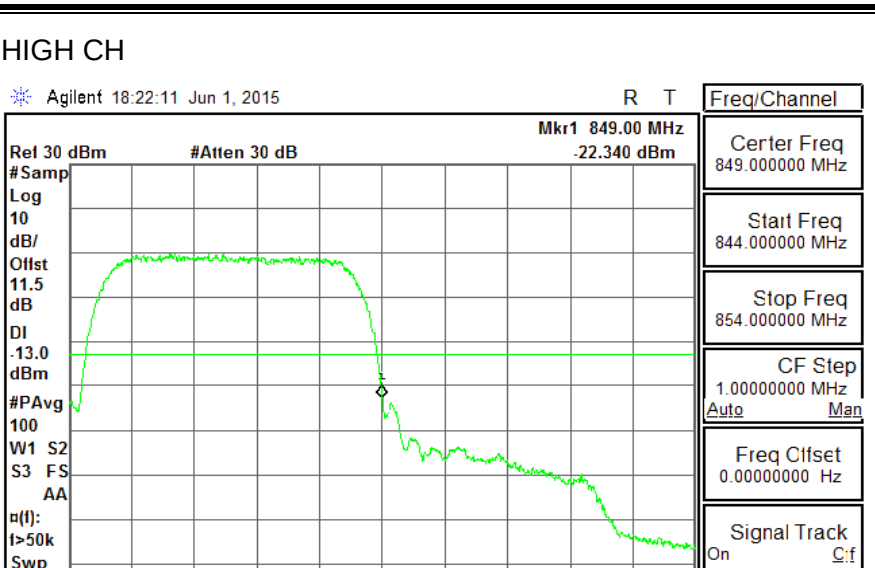
## 8.4.8. UMTS HSDPA

**850MHz BAND**

LOW CH

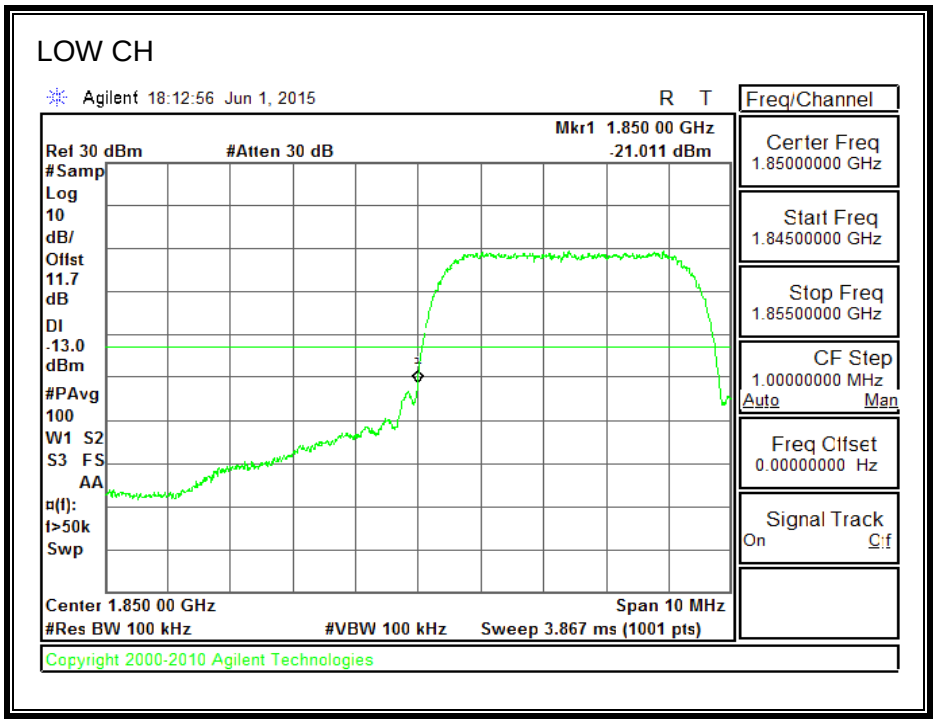



HIGH CH

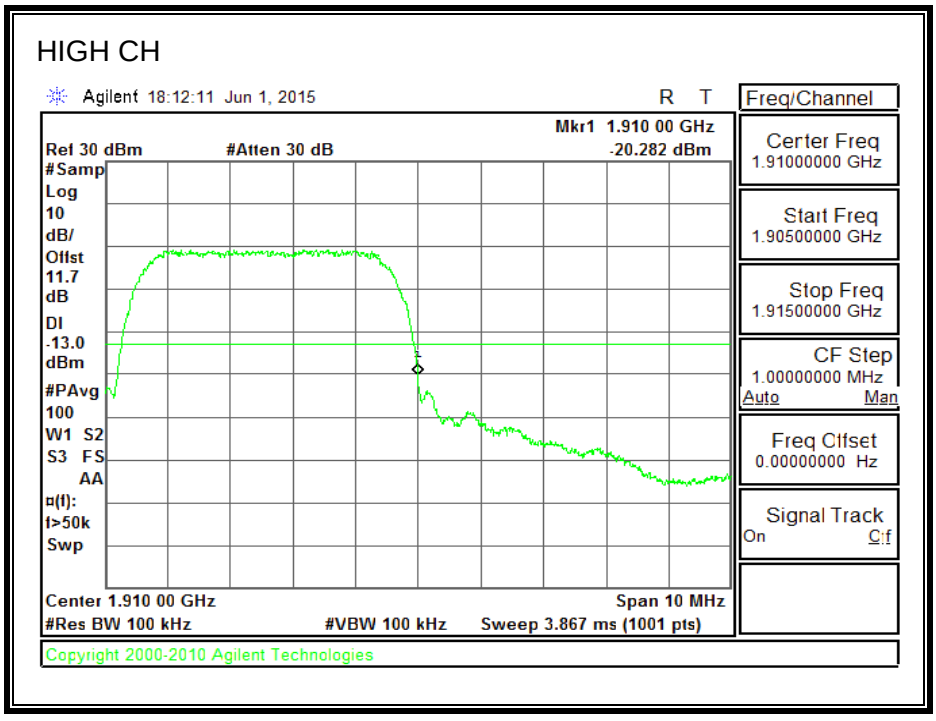


**1900MHz BAND**

LOW CH

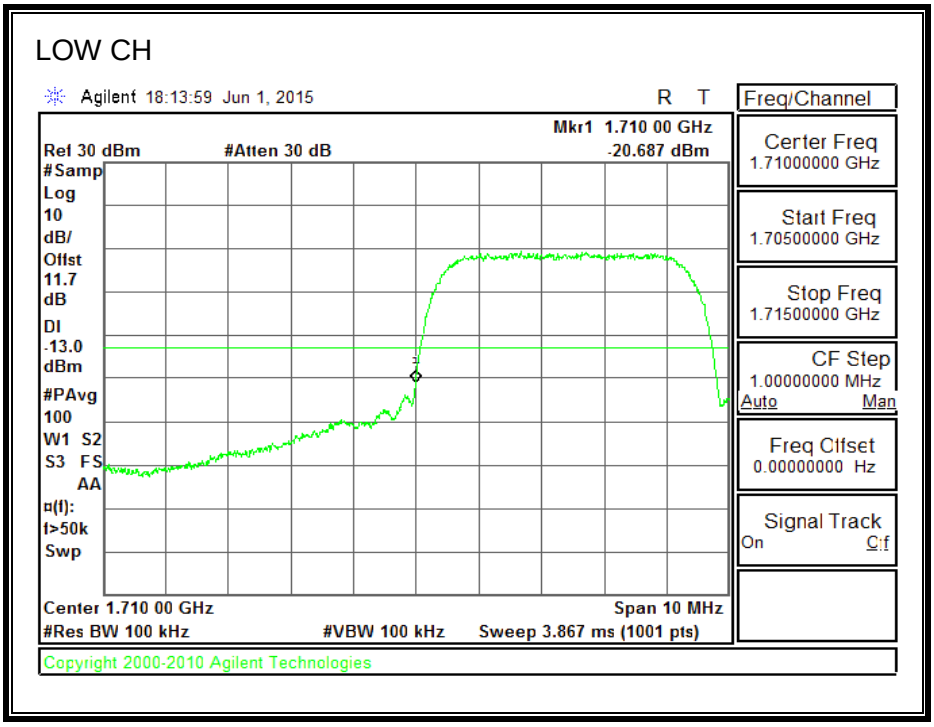



HIGH CH

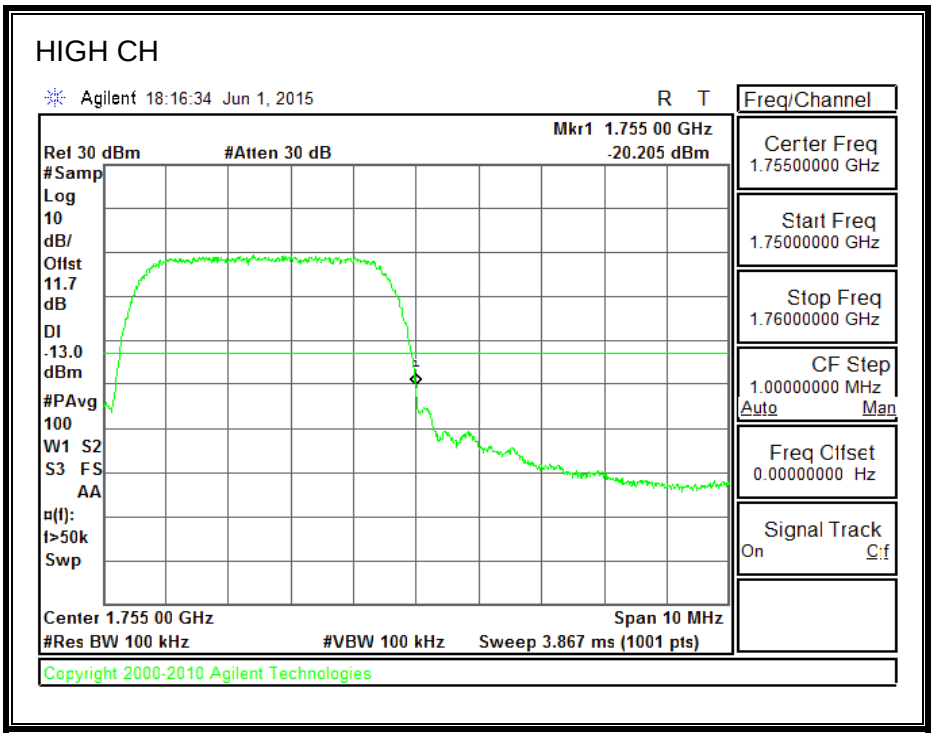


**1700MHz BAND**

LOW CH




HIGH CH



# 8.5. OUT OF BAND EMISSIONS (MODEL: A1634)

**RULE PART(S)**

FCC: §2.1051, §22.901, §22.917, §24.238 and §90.691

**LIMITS**

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

**TEST PROCEDURE**

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

**RESULTS**