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# FCC Test Report

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Report No.: AGC00850141002FE04

**FCC ID** : UOSAM208  
**APPLICATION PURPOSE** : Original Equipment  
**PRODUCT DESIGNATION** : mobile phone  
**BRAND NAME** : AMGOO  
**MODEL NAME** : AM208  
**CLIENT** : Amgoo Telecom (Shenzhen) Co., Ltd.  
**DATE OF ISSUE** : Nov.17, 2014  
**STANDARD(S)** : FCC Part 22H & 24E Rules  
**TEST PROCEDURE(S)**  
**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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### Report Revise Record

| Report Version | Revise Time | Issued Date  | Valid Version | Notes           |
|----------------|-------------|--------------|---------------|-----------------|
| V1.0           | /           | Nov.17, 2014 | Valid         | Original Report |

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## 1. VERIFICATION OF COMPLIANCE

|                                 |  |
|---------------------------------|--|
| <b>Applicant</b>                | Amgoo Telecom (Shenzhen) Co., Ltd.   |
| <b>Address</b>                  | 3/F, Block R2-A(North), Gaoxin S. Ave. 4th, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China |
| <b>Manufacturer</b>             | Amgoo Telecom (Shenzhen) Co., Ltd.   |
| <b>Address</b>                  | 3/F, Block R2-A(North), Gaoxin S. Ave. 4th, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China |
| <b>Product Designation</b>      | mobile phone   |
| <b>Brand name</b>               | AMGOO  |
| <b>Test Model</b>               | AM208  |
| <b>Date of Test</b>             | Nov.08,2014 to Nov.14,2014   |
| <b>Deviation</b>                | None   |
| <b>Condition of Test Sample</b> | Normal   |
| <b>Report Template</b>          | AGCRT-US-2.5G/RF   |

### WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003 and TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 22H and 24E.

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

Tested By :



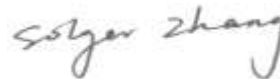
\_\_\_\_\_  
Bart Xie                      Nov.17, 2014

Reviewed By :



\_\_\_\_\_  
Kidd Yang                      Nov.17, 2014

Approved By:



\_\_\_\_\_  
Solger Zhang                      Nov.17, 2014

## 2. GENERAL INFORMATION

### 2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

|  |  |
|--|--|
| Product Designation:   | mobile phone   |
| Hardware Version:  | S7011B_MB_V1_1   |
| Software Version:  | N/A  |
| Frequency Bands:   | <input checked="" type="checkbox"/> GSM 850 <input checked="" type="checkbox"/> PCS 1900 (U.S. Bands)<br><input checked="" type="checkbox"/> GSM 900 <input checked="" type="checkbox"/> DCS 1800 (Non-U.S. Bands) |
| Antenna:   | PIFA Antenna   |
| Antenna gain:  | -1.0dBi  |
| Battery parameter:   | DC3.7V/1200mAh   |
| Adapter Input:   | AC100-240V, 50-60Hz, 0.15A   |
| Adapter Output:  | DC5.0V, 500mA  |
| Output Power:  | 30.79dBm Maximum ERP measured for GSM 850<br>31.84dBm Maximum Average Burst Power for GSM 850<br>27.52dBm Maximum EIRP measured for PCS 1900<br>28.67dBm Maximum Average Burst Power for PCS 1900                  |
| Dual SIM Card:   | The result for SIM1 is the worst case which was only recorded  |
| GPRS Class:  | 12   |
| Extreme Vol. Limits:   | DC 3.4 V to DC4.2 V (Nominal DC 3.7 V)   |
| Extreme Temp. Tolerance:   | -10°C to +50°C   |
| <p>** Note: The High Voltage DC 4.2V and Low Voltage DC 3.4V were declared by manufacturer, The EUT could not operate normally with higher or lower voltage.<br/>Other functions have been performed according to verification procedure except for MS function.</p> |  |

## 2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: UOSAM208** filing to comply with the FCC Part 22H and 24E requirements.

## 2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI C 63.4: 2003; TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

KDB 971168 D01 Power Meas License Digital Systems v02r01

## 2.4 TEST FACILITY

The test site used to collect the radiated data is located at:

Attestation of Global Compliance (Shenzhen) Co., Ltd.

2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.

FCC register No.: 259865

## 2.5 MEASUREMENT INSTRUMENTS

| NAME OF EQUIPMENT         | MANUFACTURER      | MODEL       | Calibration Date | Calibration Due. |
|---------------------------|-------------------|-------------|------------------|------------------|
| SPECTRUM ANALYZER         | AGILENT           | E4440A      | Feb.17,2014      | Feb.16,2015      |
| TEST RECEIVER             | R&S               | ESCI        | July 25, 2014    | July 24, 2015    |
| COMMUNICATION TESTER      | AGILENT           | 8960        | July 25, 2014    | July 24, 2015    |
| COMMUNICATION TESTER      | R&S               | CMU200      | July 25, 2014    | July 24, 2015    |
| SIGNAL GENERATOR          | AGILENT           | E4438C      | Feb.23,2014      | Feb. 22,2015     |
| LISN                      | R&S               | ESH3-Z5     | July 25, 2014    | July 24, 2015    |
| CLIMATE CHAMBER           | ALBATROSS         | --          | July 25, 2014    | July 24, 2015    |
| Loop Antenna              | A.H.              | SAS-562B    | May 10, 2014     | May 09, 2015     |
| WIDEBAND REQUENCY ANTENNA | SCHWARZBECK       | VULB9168    | Aug.16, 2014     | Aug.15, 2015     |
| Substitution Antenna      | EMCO              | 3142C       | Aug.16, 2014     | Aug.15, 2015     |
| Substitution Antenna      | EM                | EM-AH-10180 | Apr.19, 2014     | Apr.18, 2015     |
| Horn Antenna              | EM                | EM-AH-10180 | Feb.17,2014      | Feb.16,2015      |
| Horn Antenna              | A.H. Systems Inc. | SAS-574     | June 6, 2014     | June 5, 2015     |
| Radiation Cable 1         | Sat               | RE1         | June 4, 2014     | June 3, 2015     |
| Radiation Cable 2         | Sat               | RE2         | June 4, 2014     | June 3, 2015     |
| Conduction Cable          | Sat               | CE1         | June 4, 2014     | June 3, 2015     |

## 2.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

## 2.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.



### 3. SYSTEM TEST CONFIGURATION

#### 3.1 EUT CONFIGURATION

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

#### 3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

#### 3.3 GENERAL TECHNICAL REQUIREMENTS

| Item Number | Item Description         |                             | FCC Rules                |
|-------------|--------------------------|-----------------------------|--------------------------|
| 1           | Output Power             | Conducted                   | 22.913(a) / 24.232 (b)   |
|             |                          | Radiated                    |                          |
| 2           | Peak-to-Average Ratio    | Peak-to-Average Ratio       | 24.232(d)                |
| 3           | Spurious Emission        | Conducted Spurious Emission | 2.1051 / 22.917 / 24.238 |
|             |                          | Radiated Spurious Emission  |                          |
| 4           | Mains Conducted Emission |                             | 15.107 / 15.207          |
| 5           | Frequency Stability      |                             | 2.1055 /24.235           |
| 6           | Occupied Bandwidth       |                             | 2.1049 (h)(i)            |
| 7           | Emission Bandwidth       |                             | 22.917(b) / 24.238 (b)   |
| 8           | Band Edge                |                             | 22.917(b) / 24.238 (b)   |

### 3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

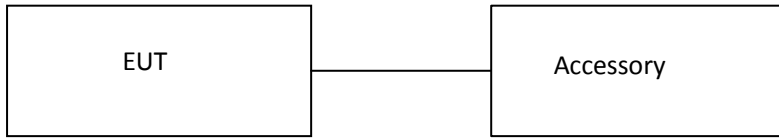


Table 2-1 Equipment Used in EUT System

| Item | Equipment    | Model No. | ID or Specification | Note      |
|------|--------------|-----------|---------------------|-----------|
| 1    | Mobile phone | AM208     | FCC ID:             | EUT       |
| 2    | Adapter      | CH4       | DC5V / 500mA        | Accessory |
| 3    | Battery      | AM-4U     | DC3.7V/ 1200mAh     | Accessory |
| 4    | Earphone     | AM208     | N/A                 | Accessory |
| 5    | USB Cable    | AM208     | N/A                 | Accessory |

**Note:** All the accessories have been used during the test. The following “EUT” in setup diagram means EUT system.

#### 4. SUMMARY OF TEST RESULTS

| Item Number | Item Description         |                             | FCC Rules              | Result |
|-------------|--------------------------|-----------------------------|------------------------|--------|
| 1           | Output Power             | Conducted Output Power      | 22.913(a) / 24.232 (b) | Pass   |
|             |                          | Radiated Output Power       |                        |        |
| 2           | Peak-to-Average Ratio    | Peak-to-Average Ratio       | 24.232(d)              | Pass   |
| 3           | Spurious Emission        | Conducted Spurious Emission | 2.1051/22.917/ 24.238  | Pass   |
|             |                          | Radiated Spurious Emission  |                        |        |
| 4           | Mains Conducted Emission |                             | 15.107 / 15.207        | Pass   |
| 5           | Frequency Stability      |                             | 2.1055 /24.235         | Pass   |
| 6           | Occupied Bandwidth       |                             | 2.1049 (h)(i)          | Pass   |
| 7           | Emission Bandwidth       |                             | 22.917(b) / 24.238 (b) | Pass   |
| 8           | Band Edge                |                             | 22.917(b) / 24.238 (b) | Pass   |

#### 5. DESCRIPTION OF TEST MODES

During the testing, the EUT (Quad-band GSM / GPRS Mobile Phone) was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GSM and PCS frequency band.

**Note:** GSM and GPRS modes have been tested during the test. The worst condition (GSM) be recorded in the test report if no other modes test data.

## 6. OUTPUT POWER

### 6.1 CONDUCTED OUTPUT POWER

#### 6.1.1 MEASUREMENT METHOD

The transmitter output port was connected to base station.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Measure the maximum burst average power and average power for other modulation signal.

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes(GSM, GPRS,) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for both GSM band and PCS band.

#### 6.1.2 PROVISIONS APPLICABLE

| Conducted Output Power Limits for GSM 850 MHz |            |                    |               |
|---|------------|--------------------|---------------|
| Mode  | Power Step | Nominal Peak Power | Tolerance(dB) |
| GSM   | 5          | 33 dBm (2W)        | -2            |
| GPRS  | 3          | 33 dBm (2W)        | -2            |

| Conducted Output Power Limits for PCS 1900 MHz |            |                    |               |
|--|------------|--------------------|---------------|
| Mode   | Power Step | Nominal Peak Power | Tolerance(dB) |
| GSM  | 0          | 30 dBm (1W)        | -2            |
| GPRS   | 3          | 30 dBm (1W)        | -2            |

### 6.1.3 MEASUREMENT RESULT

#### Test Result of Conducted Output Power for GSM 850 MHZ (SIM1)

| Mode                | Frequency (MHz) | Reference Power | Peak Power   | Tolerance | Avg.Burst Power | Duty cycle Factor(dB) | Frame Power(dBm) |
|---------------------|-----------------|-----------------|--------------|-----------|-----------------|-----------------------|------------------|
| GSM                 | 824.2           | 33              | <b>32.49</b> | -0.51     | 31.84           | -9                    | 22.84            |
|                     | 836.6           | 33              | 32.44        | -0.56     | 31.75           | -9                    | 22.75            |
|                     | 848.8           | 33              | 32.38        | -0.62     | 31.73           | -9                    | 22.73            |
| GPRS850<br>(1 Slot) | 824.2           | 33              | 32.34        | -0.66     | 31.58           | -9                    | 22.58            |
|                     | 836.6           | 33              | 32.31        | -0.69     | 31.52           | -9                    | 22.52            |
|                     | 848.8           | 33              | 32.28        | -0.72     | 31.44           | -9                    | 22.44            |
| GPRS850<br>(2 Slot) | 824.2           | 30              | 29.61        | -0.39     | 28.87           | -6                    | 22.87            |
|                     | 836.6           | 30              | 29.57        | -0.43     | 28.78           | -6                    | 22.78            |
|                     | 848.8           | 30              | 29.53        | -0.47     | 28.73           | -6                    | 22.73            |
| GPRS850<br>(3 Slot) | 824.2           | 28.23           | 27.59        | -0.64     | 26.76           | -4.26                 | 22.5             |
|                     | 836.6           | 28.23           | 27.55        | -0.68     | 26.69           | -4.26                 | 22.43            |
|                     | 848.8           | 28.23           | 27.52        | -0.71     | 26.74           | -4.26                 | 22.48            |
| GPRS850<br>(4 Slot) | 824.2           | 27              | 26.66        | -0.34     | 25.88           | -3                    | 22.88            |
|                     | 836.6           | 27              | 26.72        | -0.28     | 25.94           | -3                    | 22.94            |
|                     | 848.8           | 27              | 26.56        | -0.44     | 25.76           | -3                    | 22.76            |

**Test Result of Conducted Output Power for PCS 1900 MHZ (SIM1)**

| Mode                 | Frequency (MHz) | Reference Power | Peak Power   | Tolerance | Avg.Burst Power | Duty cycle Factor(dB) | Frame Power(dBm) |
|----------------------|-----------------|-----------------|--------------|-----------|-----------------|-----------------------|------------------|
| GSM                  | 1850.2          | 30              | <b>29.29</b> | -0.71     | 28.67           | -9                    | 19.67            |
|                      | 1880            | 30              | 29.26        | -0.74     | 28.65           | -9                    | 19.65            |
|                      | 1909.8          | 30              | 29.21        | -0.79     | 28.57           | -9                    | 19.57            |
| GPRS1900<br>(1 Slot) | 1850.2          | 30              | 29.18        | -0.82     | 28.34           | -9                    | 19.34            |
|                      | 1880            | 30              | 29.15        | -0.85     | 28.31           | -9                    | 19.31            |
|                      | 1909.8          | 30              | 29.13        | -0.87     | 28.28           | -9                    | 19.28            |
| GPRS1900<br>(2 Slot) | 1850.2          | 27              | 26.69        | -0.31     | 25.88           | -6                    | 19.88            |
|                      | 1880            | 27              | 26.65        | -0.35     | 25.85           | -6                    | 19.85            |
|                      | 1909.8          | 27              | 26.54        | -0.46     | 25.79           | -6                    | 19.79            |
| GPRS1900<br>(3 Slot) | 1850.2          | 25.23           | 24.66        | -0.57     | 23.89           | -4.26                 | 19.63            |
|                      | 1880            | 25.23           | 24.55        | -0.68     | 23.75           | -4.26                 | 19.49            |
|                      | 1909.8          | 25.23           | 24.53        | -0.7      | 23.71           | -4.26                 | 19.45            |
| GPRS1900<br>(4 Slot) | 1850.2          | 24              | 23.68        | -0.32     | 22.89           | -3                    | 19.89            |
|                      | 1880            | 24              | 23.59        | -0.41     | 22.83           | -3                    | 19.83            |
|                      | 1909.8          | 24              | 23.52        | -0.48     | 22.68           | -3                    | 19.68            |

## 6.2 RADIATED OUTPUT POWER

### 6.2.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603C-2004 were applied.

- 1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power ( $P_{in}$ ) is applied to the input of the dipole, and the power received ( $P_r$ ) at the chamber's probe antenna is recorded.
- 2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as  $AR_{pl} = P_{in} + 2.15 - P_r$ . The  $AR_{pl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below:  $Power = P_{Mea} + AR_{pl}$
- 3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
- 4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
- 5 The EUT is then put into continuously transmitting mode at its maximum power level.
- 6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.
- 7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power ( $P_{in}$ ).
- 8 ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15dBi$ .

### 6.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage." Rule Part 22.913(a) specifies "Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

| <b>Radiated Power Limits for GSM 850 MHZ (ERP)</b> |                   |                           |
|--|-------------------|---------------------------|
| <b>Mode</b>  | <b>Power Step</b> | <b>Nominal Peak Power</b> |
| GSM  | 5                 | $\leq 38.45$ dBm (7W)     |
| GPRS   | 3                 | $\leq 38.45$ dBm (7W)     |

| <b>Radiated Power Limits for PCS 1900 MHZ (E.I.R.P.)</b> |                   |                           |
|--|-------------------|---------------------------|
| <b>Mode</b>  | <b>Power Step</b> | <b>Nominal Peak Power</b> |
| GSM  | 0                 | $\leq 33$ dBm (2W)        |
| GPRS   | 3                 | $\leq 33$ dBm (2W)        |



**6.2.3 MEASUREMENT RESULT**

| <b>Radiated Power (ERP) for GSM 850 MHZ</b> |                  |                   |                            |                                 |                   |
|---|------------------|-------------------|----------------------------|---------------------------------|-------------------|
| <b>Mode</b>                                 | <b>Frequency</b> | <b>Power Step</b> | <b>Result</b>              |                                 | <b>Conclusion</b> |
|   |                  |                   | <b>Max. Peak ERP (dBm)</b> | <b>Polarization Of Max. ERP</b> |                   |
| GSM   | 824.2            | 5                 | <b>30.79</b>               | Horizontal                      | Pass              |
|   | 836.6            | 5                 | 30.62                      | Horizontal                      | Pass              |
|   | 848.8            | 5                 | 30.57                      | Horizontal                      | Pass              |
| GPRS<br>1 slot                              | 824.2            | 3                 | 30.53                      | Horizontal                      | Pass              |
|   | 836.6            | 3                 | 30.51                      | Horizontal                      | Pass              |
|   | 848.8            | 3                 | 30.44                      | Horizontal                      | Pass              |
| GPRS<br>2 slots                             | 824.2            | 3                 | Less than<br>27 dBm        | Horizontal                      | Pass              |
|   | 836.6            | 3                 |                            | Horizontal                      | Pass              |
|   | 848.8            | 3                 |                            | Horizontal                      | Pass              |
| GPRS<br>3 slots                             | 824.2            | 2                 |                            | Horizontal                      | Pass              |
|   | 836.6            | 2                 |                            | Horizontal                      | Pass              |
|   | 848.8            | 2                 |                            | Horizontal                      | Pass              |
| GPRS<br>4 slots                             | 824.2            | 2                 |                            | Horizontal                      | Pass              |
|   | 836.6            | 2                 |                            | Horizontal                      | Pass              |
|   | 848.8            | 2                 |                            | Horizontal                      | Pass              |

| Radiated Power (E.I.R.P) for PCS 1900 MHZ |           |            |                         |                               |            |
|---|-----------|------------|-------------------------|-------------------------------|------------|
| Mode                                      | Frequency | Power Step | Result                  |                               | Conclusion |
|   |           |            | Max. Peak E.I.R.P.(dBm) | Polarization Of Max. E.I.R.P. |            |
| GSM                                       | 1850.2    | 0          | 27.52                   | Horizontal                    | Pass       |
|   | 1880.0    | 0          | 27.48                   | Horizontal                    | Pass       |
|   | 1909.8    | 0          | 27.42                   | Horizontal                    | Pass       |
| GPRS<br>1slot                             | 1850.2    | 3          | 27.43                   | Horizontal                    | Pass       |
|   | 1880.0    | 3          | 27.35                   | Horizontal                    | Pass       |
|   | 1909.8    | 3          | 27.31                   | Horizontal                    | Pass       |
| GPRS<br>2 slots                           | 1850.2    | 3          | Less than<br>27 dBm     | Horizontal                    | Pass       |
|   | 1880.0    | 3          |                         | Horizontal                    | Pass       |
|   | 1909.8    | 3          |                         | Horizontal                    | Pass       |
| GPRS<br>3 slots                           | 1850.2    | 2          |                         | Horizontal                    | Pass       |
|   | 1880.0    | 2          |                         | Horizontal                    | Pass       |
|   | 1909.8    | 2          |                         | Horizontal                    | Pass       |
| GPRS<br>4 slots                           | 1850.2    | 2          |                         | Horizontal                    | Pass       |
|   | 1880.0    | 2          |                         | Horizontal                    | Pass       |
|   | 1909.8    | 2          |                         | Horizontal                    | Pass       |

## 7. PEAK-TO-AVERAGE RATIO AND MODULATION CHARACTERISTICS

### 7.1 MEASUREMENT METHOD

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

### 7.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

**7.3 MEASUREMENT RESULT**

| <b>Modes</b>                          | <b>GSM850(GSM)</b> |              |               |
|---------------------------------------|--------------------|--------------|---------------|
| <b>Channel</b>                        | <b>128</b>         | <b>190</b>   | <b>251</b>    |
|                                       | <b>(Low)</b>       | <b>(Mid)</b> | <b>(High)</b> |
| <b>Frequency<br/>(MHz)</b>            | <b>824.2</b>       | <b>836.6</b> | <b>848.8</b>  |
| <b>Peak-To-Average Ratio (dB)/GSM</b> | 0.65               | 0.69         | 0.65          |

| <b>Modes</b>                          | <b>PCS 1900 (GSM)</b> |              |               |
|---------------------------------------|-----------------------|--------------|---------------|
| <b>Channel</b>                        | <b>512</b>            | <b>661</b>   | <b>810</b>    |
|                                       | <b>(Low)</b>          | <b>(Mid)</b> | <b>(High)</b> |
| <b>Frequency<br/>(MHz)</b>            | <b>1850.2</b>         | <b>1880</b>  | <b>1909.8</b> |
| <b>Peak-To-Average Ratio (dB)/GSM</b> | 0.62                  | 0.61         | 0.64          |

**APPENDIX A: MODULATION CHARACTERISTICS**

| Test Mode | Test Modes description          |
|-----------|---------------------------------|
| GSM/TM1   | GSM system,GSM,GMSK modulation  |
| GSM/TM2   | GSM system,GPRS,GMSK modulation |

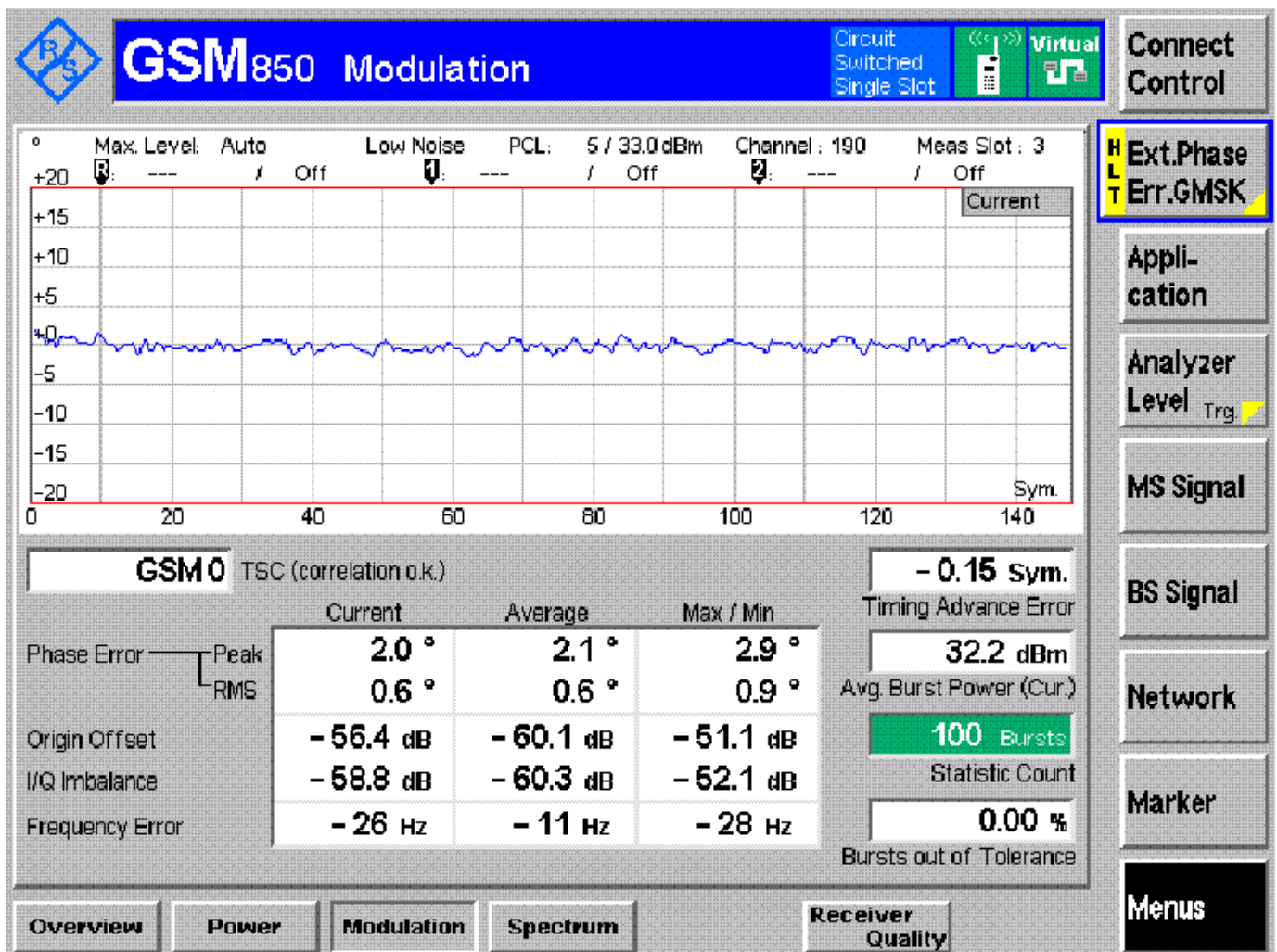
**Test Results**

**For GSM**

**Test Band=GSM850**

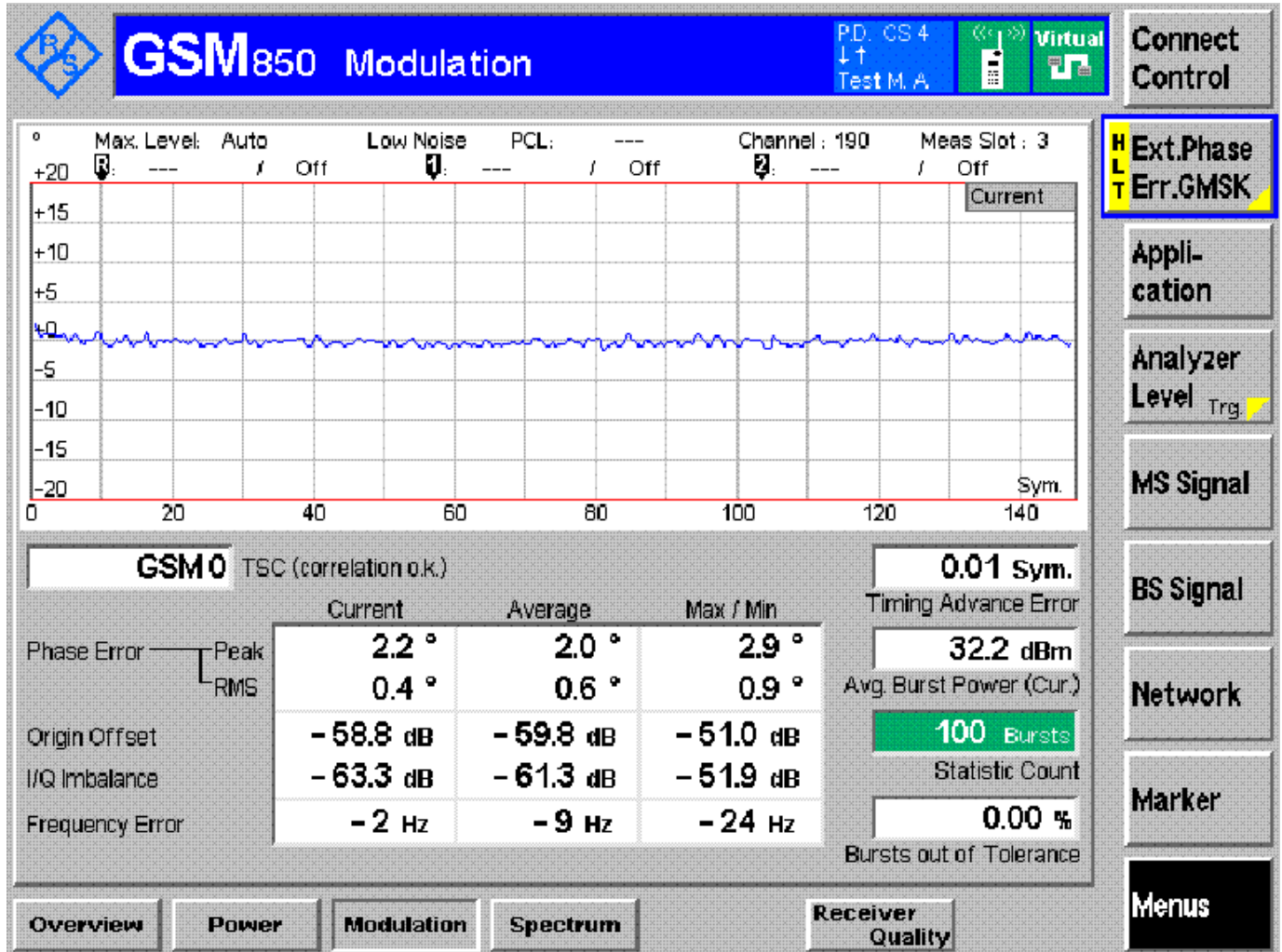
**Test Mode=GSM/TM1**

**Test Channel=MCH**



Test Mode=GSM/TM2

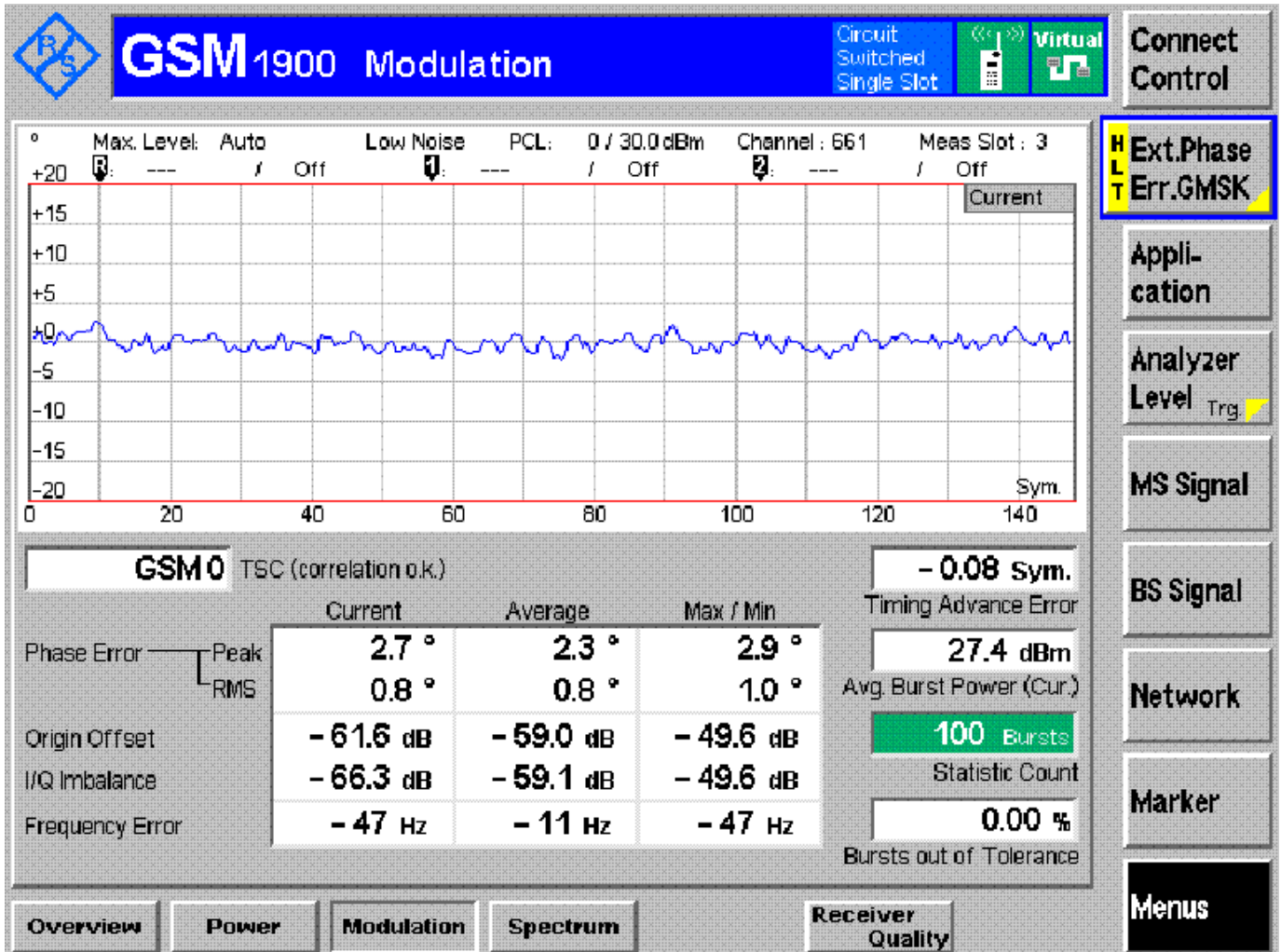
Test Channel=MCH



Test Band=GSM1900

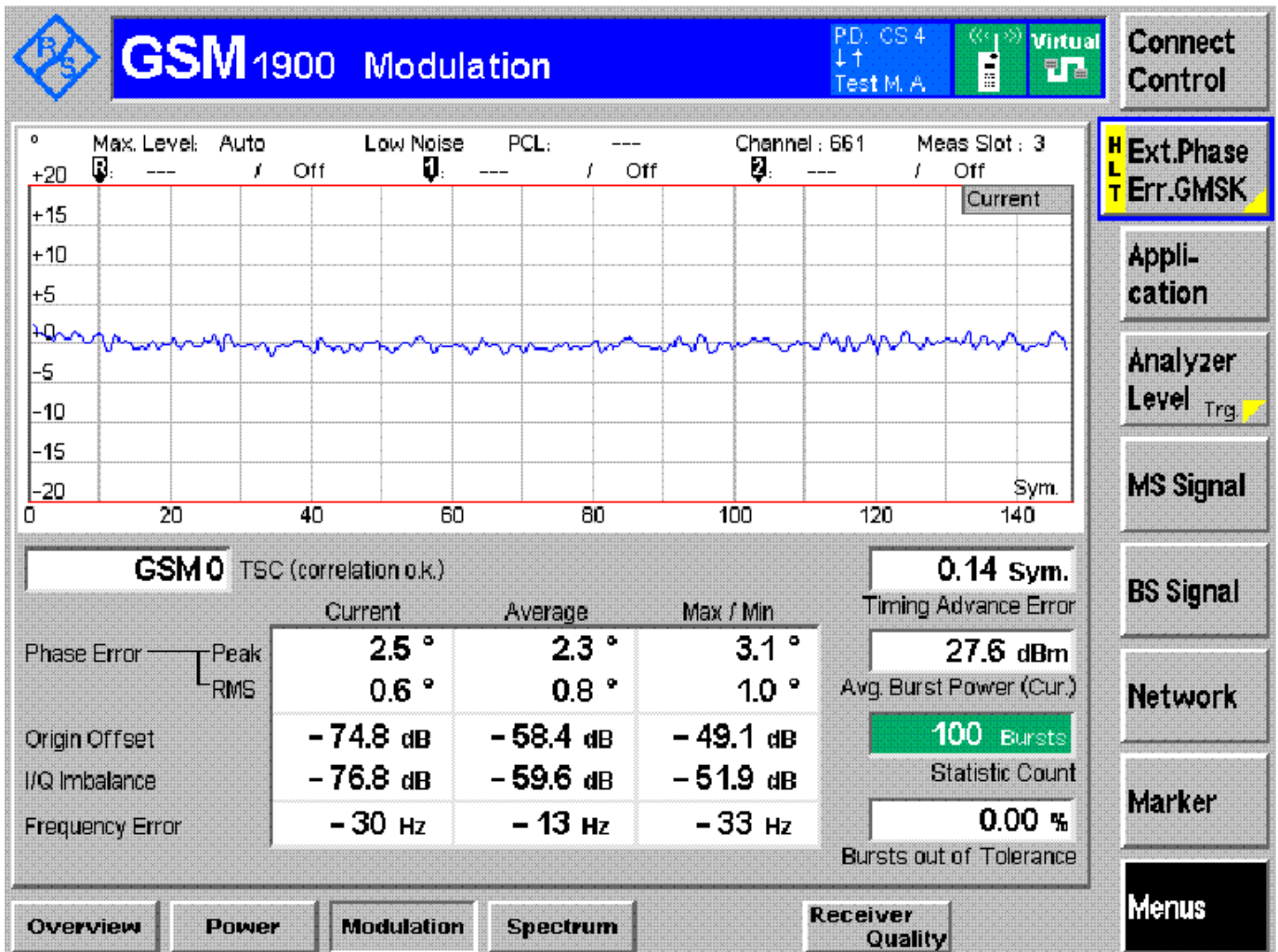
Test Mode=GSM/TM1

Test Channel=MCH



Test Mode=GSM/TM2

Test Channel=MCH





## 8. OCCUPIED BANDWIDTH

### 8.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

### 8.2 PROVISIONS APPLICABLE

The occupied bandwidth (99%) shall not exceed 300 KHz.

### 8.3 MEASUREMENT RESULT

#### Appendix B: BandWidth

##### Test Results

| Test Band | Test Mode   | Test Channel | Occupied Bandwidth (KHZ) | Emission Bandwidth (KHZ) | Verdict |
|-----------|-------------|--------------|--------------------------|--------------------------|---------|
| GSM850    | GSM/TM<br>1 | LCH          | 245.94                   | 315.84                   | PASS    |
|           |             | MCH          | 244.58                   | 316.71                   | PASS    |
|           |             | HCH          | 245.80                   | 323.33                   | PASS    |
|           | GSM/TM<br>2 | LCH          | 241.68                   | 312.61                   | PASS    |
|           |             | MCH          | 244.55                   | 318.45                   | PASS    |
|           |             | HCH          | 246.87                   | 324.03                   | PASS    |

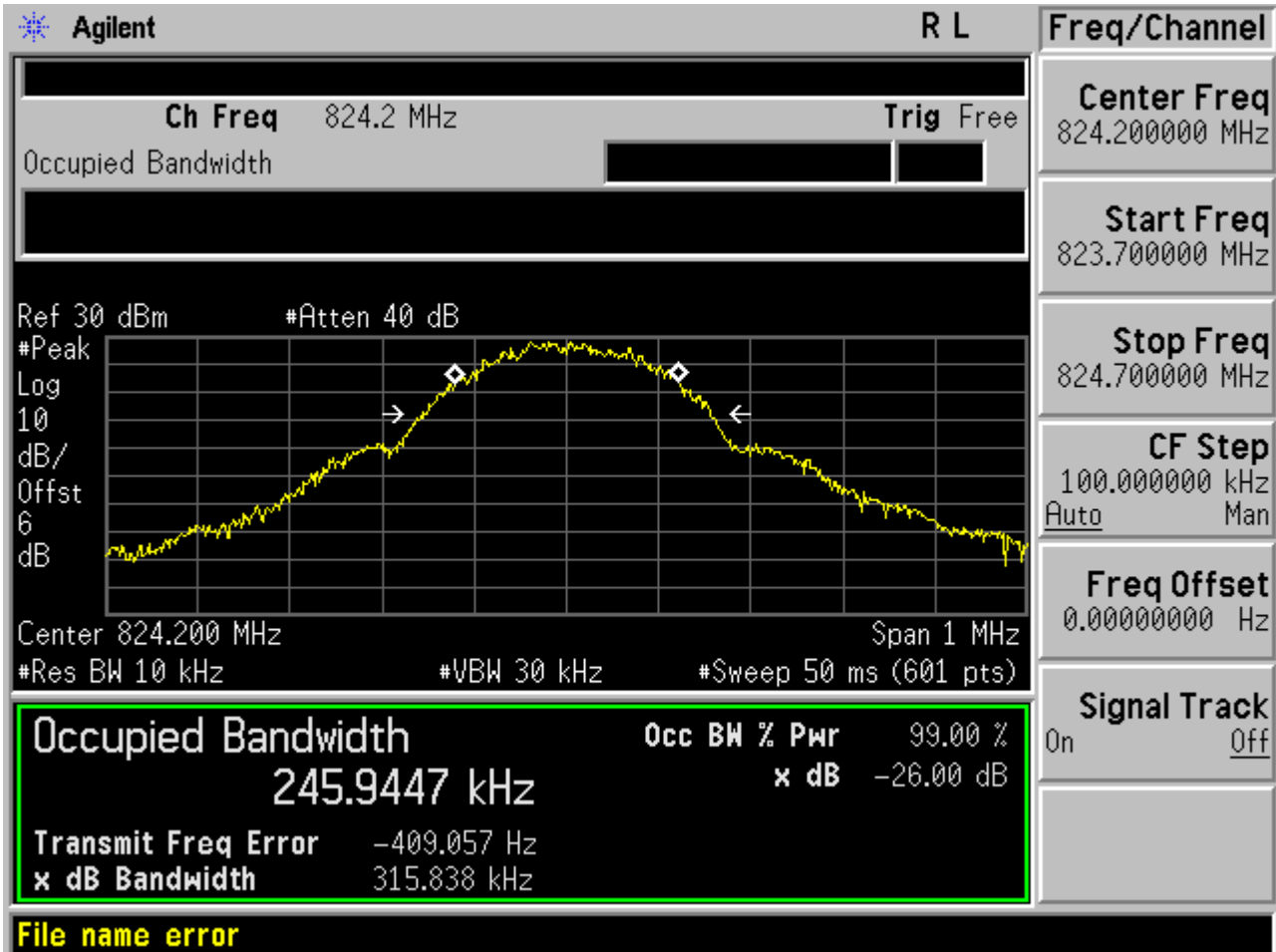
| Test Band | Test Mode   | Test Channel | Occupied Bandwidth (KHZ) | Emission Bandwidth (KHZ) | Verdict |
|-----------|-------------|--------------|--------------------------|--------------------------|---------|
| GSM1900   | GSM/TM<br>1 | LCH          | 245.23                   | 320.79                   | PASS    |
|           |             | MCH          | 245.51                   | 317.48                   | PASS    |
|           |             | HCH          | 245.65                   | 313.73                   | PASS    |
|           | GSM/TM<br>2 | LCH          | 242.30                   | 317.03                   | PASS    |
|           |             | MCH          | 242.21                   | 310.38                   | PASS    |
|           |             | HCH          | 245.74                   | 319.57                   | PASS    |

For GSM

Test Band=GSM850

Test Mode=GSM/TM1

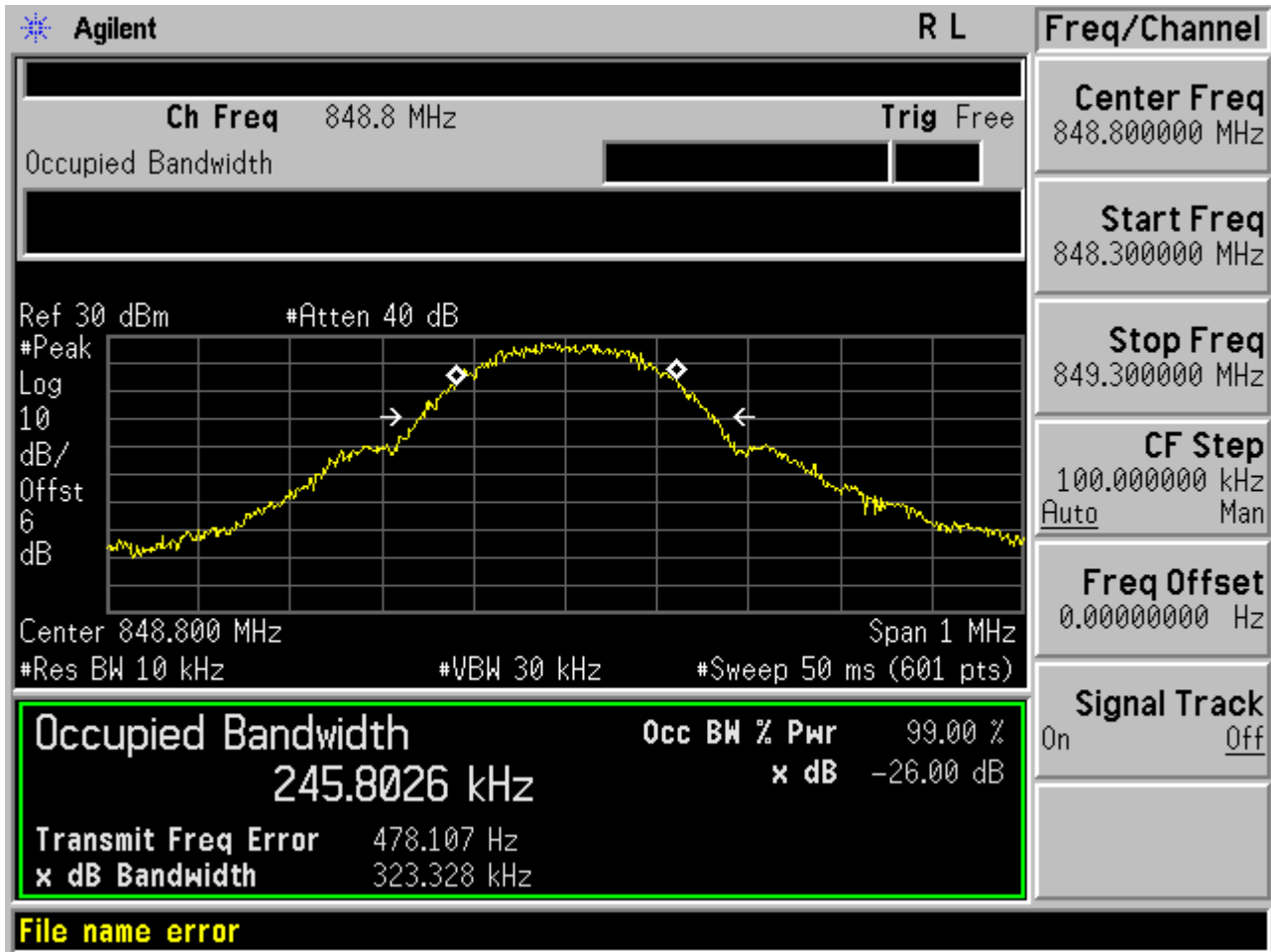
Test Channel=LCH



Test Channel=MCH



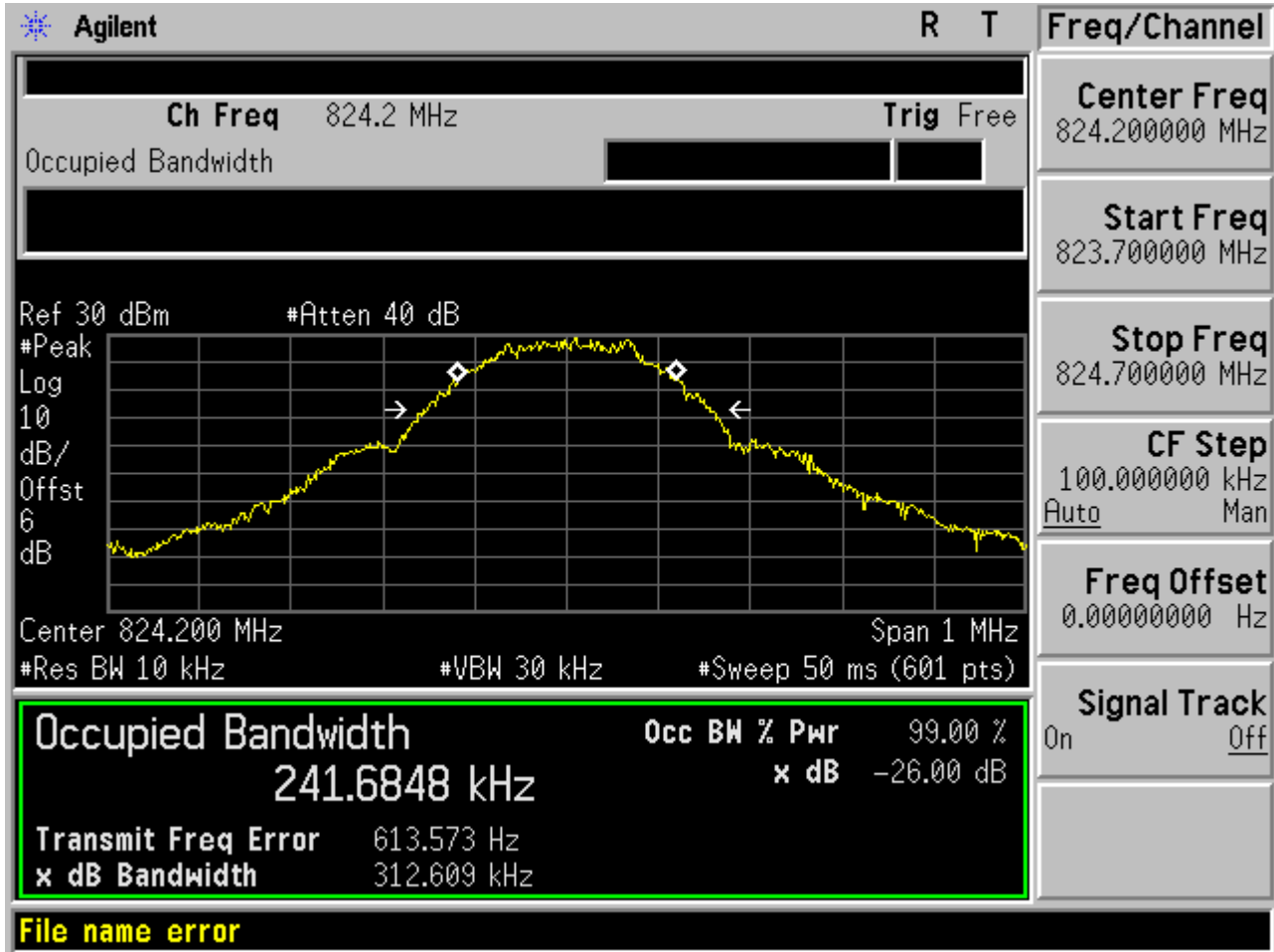
Test Channel=HCH



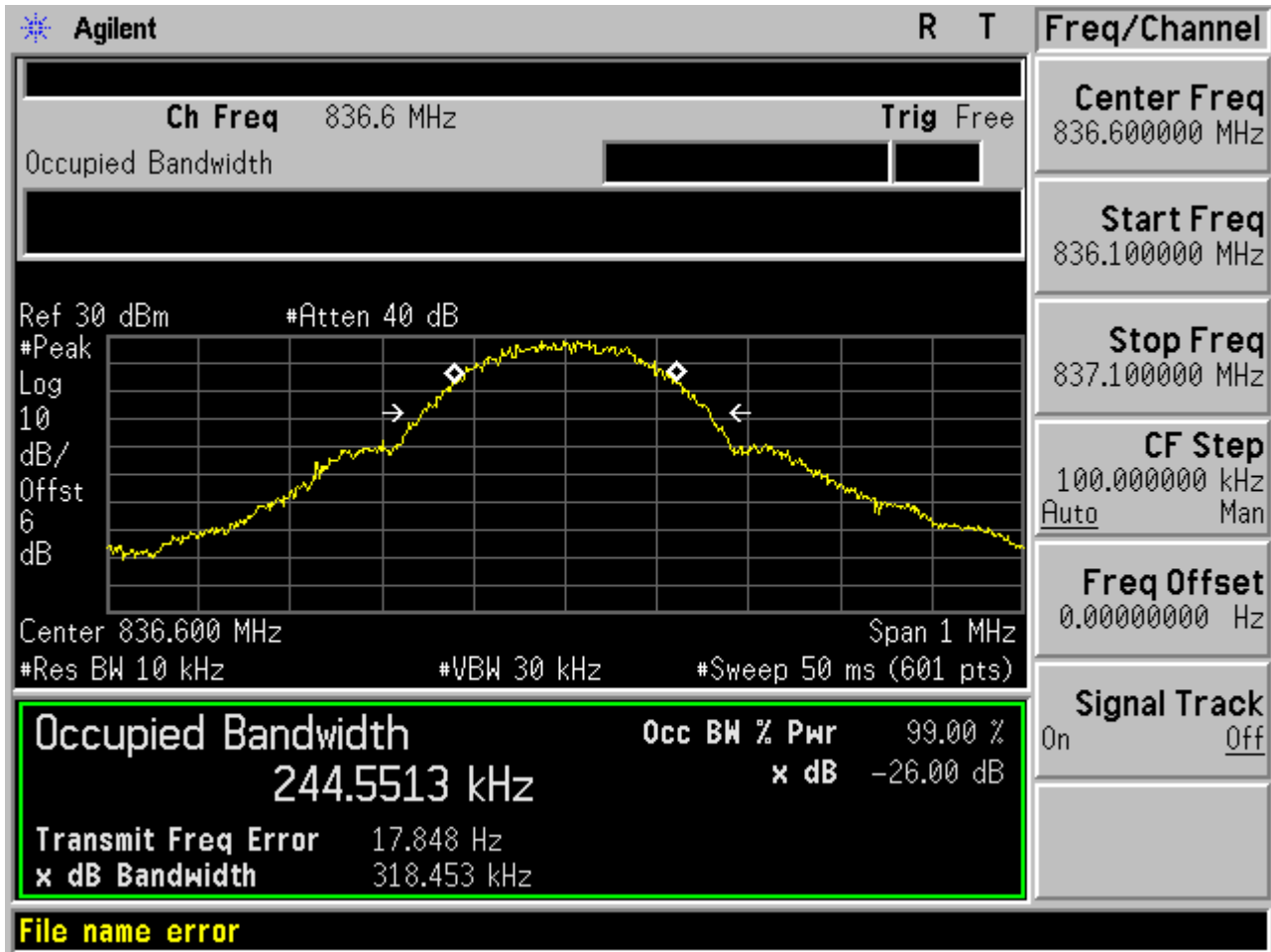
Test Band=GSM850

Test Mode=GSM/TM2

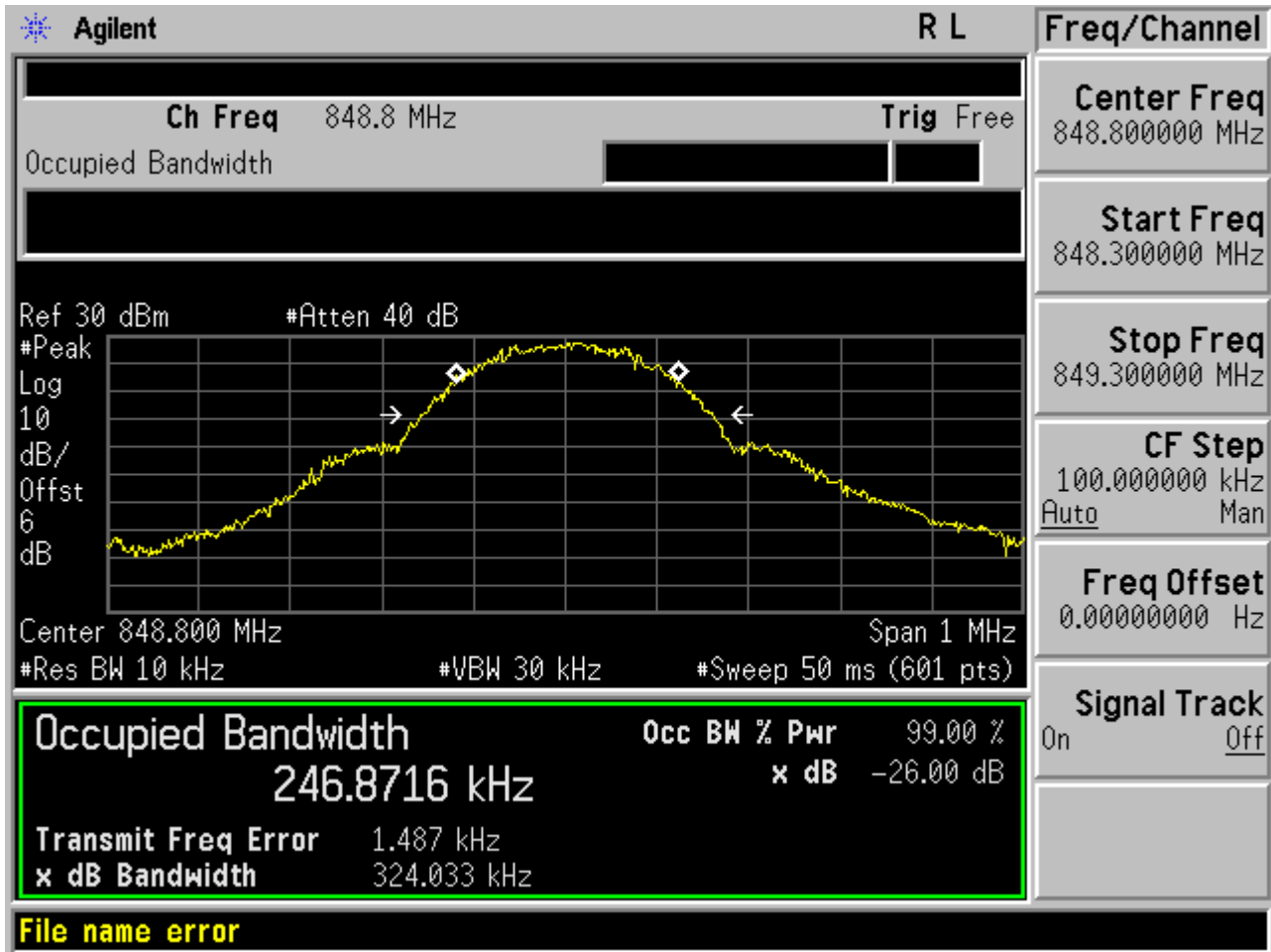
Test Channel=LCH



Test Channel=MCH



Test Channel=HCH

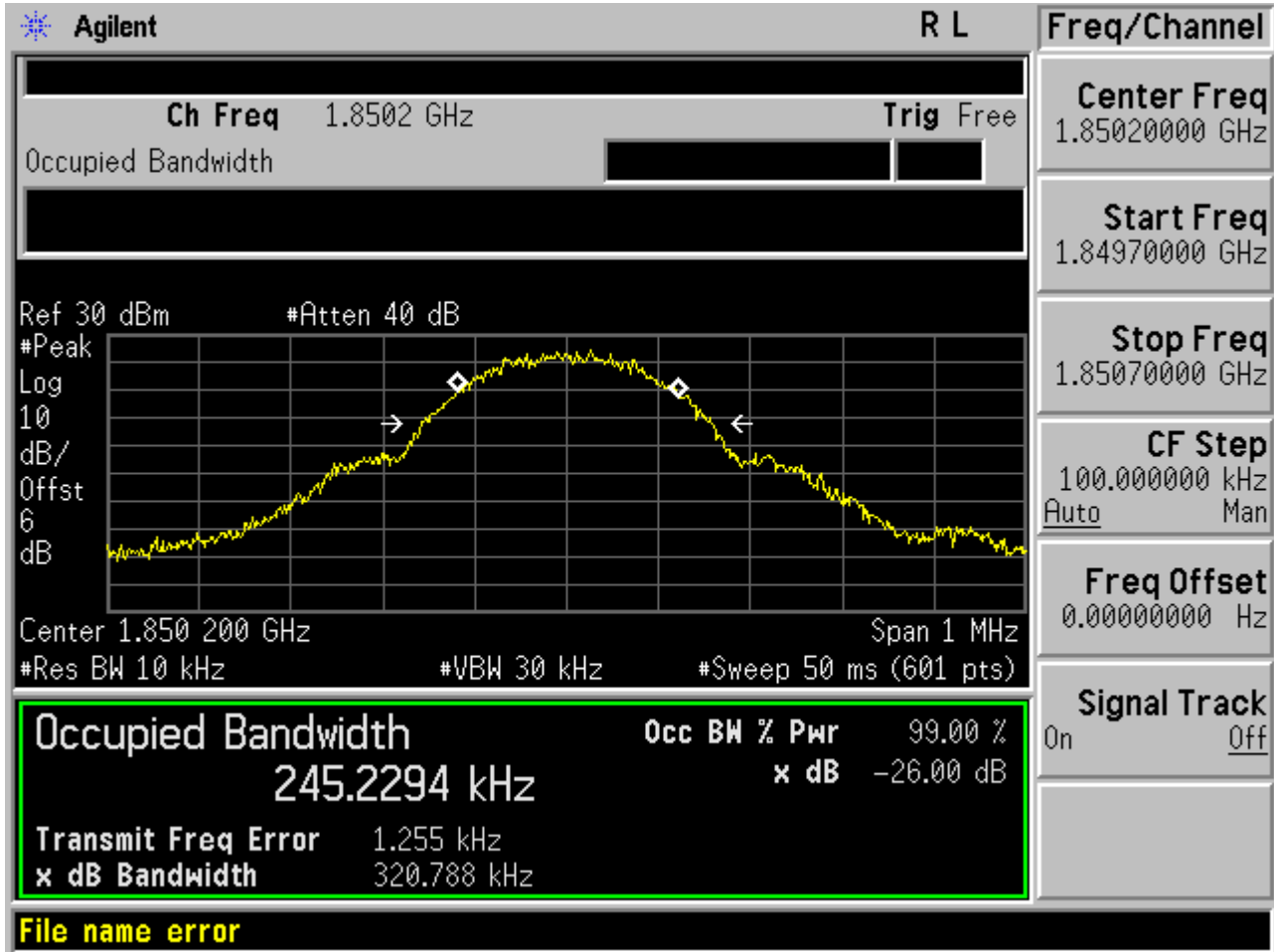




Test Band=GSM1900

Test Mode=GSM/TM1


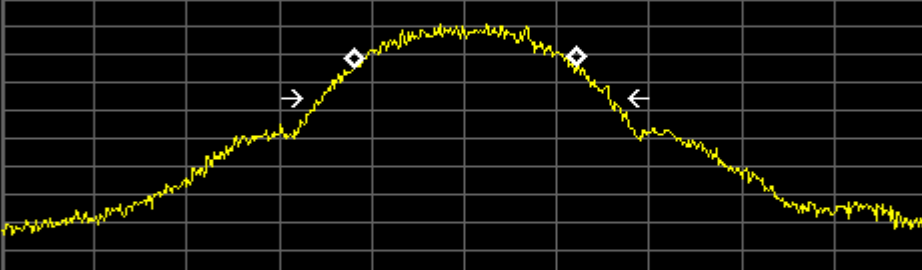
Test Channel=LCH



Test Channel=MCH

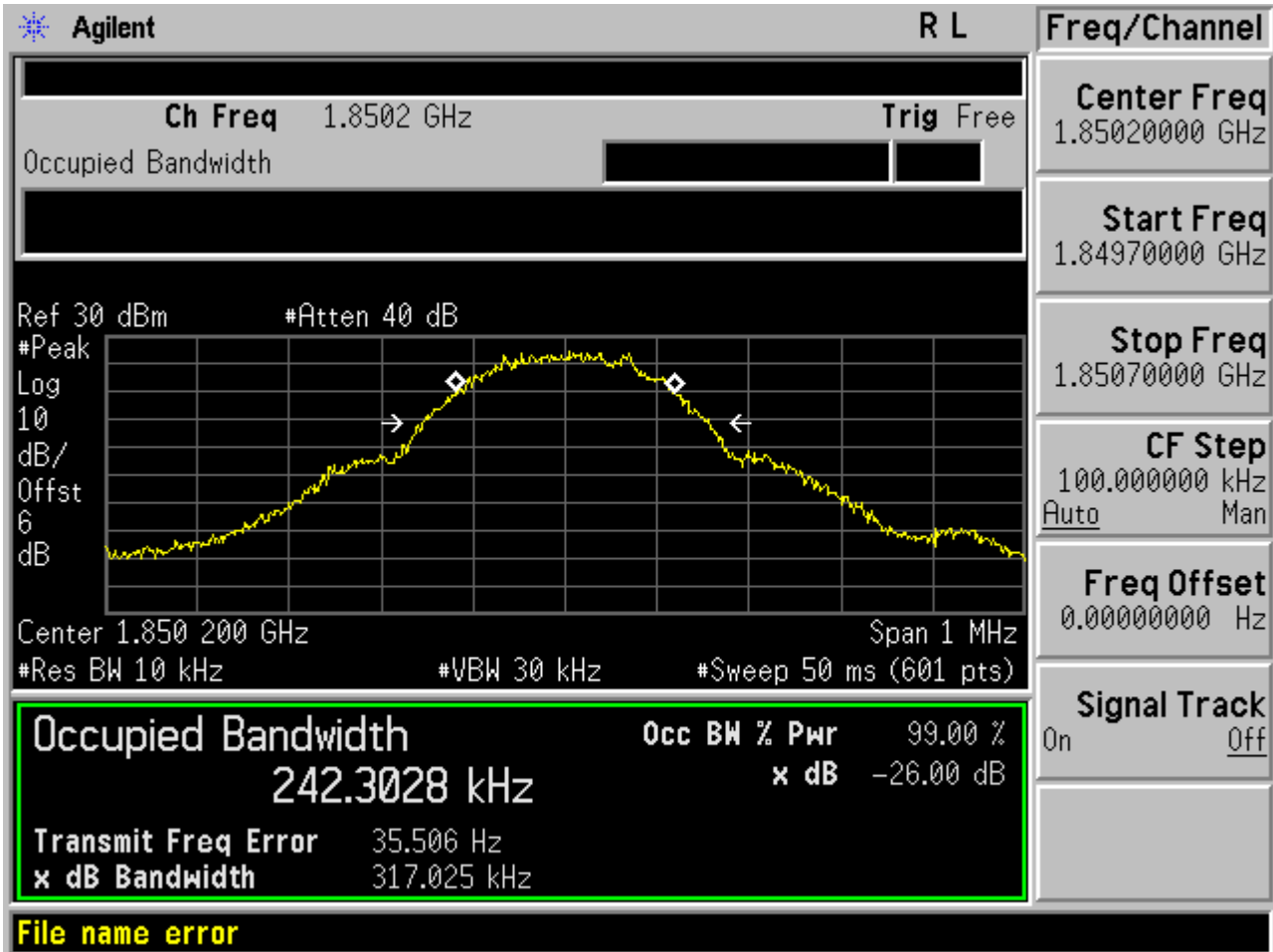
|  |  |  |                                       |
|--|--|--|---------------------------------------|
| Agilent  |  | R L  | Freq/Channel                          |
| Ch Freq 1.88 GHz   |  | Trig Free  | Center Freq<br>1.88000000 GHz         |
| Occupied Bandwidth   |  |  | Start Freq<br>1.87950000 GHz          |
| Ref 30 dBm #Atten 40 dB                                      |  |  | Stop Freq<br>1.88050000 GHz           |
|  |  |  | CF Step<br>100.000000 kHz<br>Auto Man |
| Center 1.880 000 GHz   |  | Span 1 MHz   | Freq Offset<br>0.00000000 Hz          |
| #Res BW 10 kHz #VBW 30 kHz #Sweep 50 ms (601 pts)            |  |  | Signal Track<br>On Off                |
| <b>Occupied Bandwidth</b><br><b>245.5134 kHz</b>             |  | <b>Occ BW % Pwr</b> 99.00 %<br><b>x dB</b> -26.00 dB |                                       |
| Transmit Freq Error -1.092 kHz<br>x dB Bandwidth 317.482 kHz |  |  |                                       |
| File name error  |  |  |                                       |

Test Channel=HCH

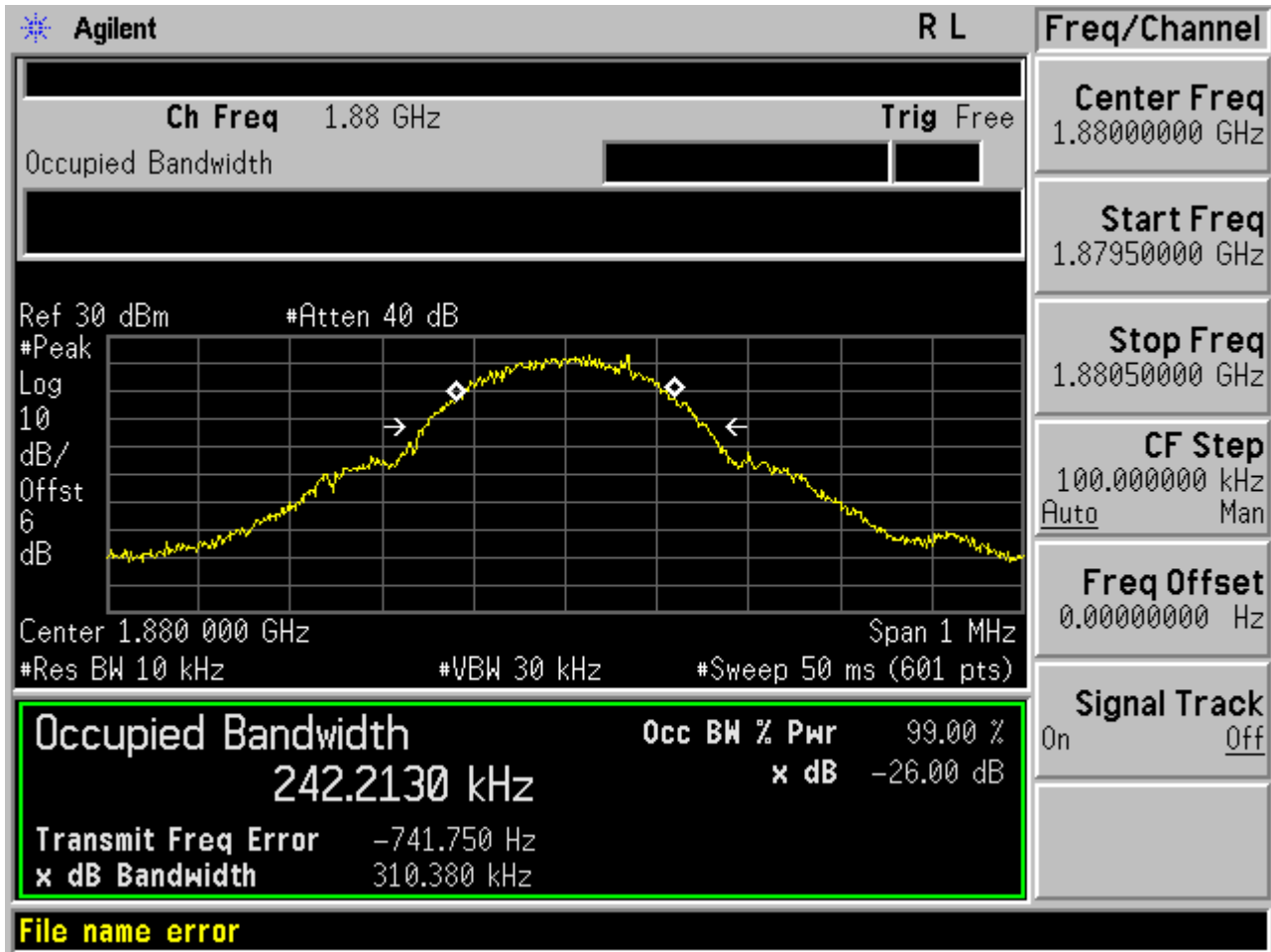
|  |  |  |  |
|--|--|--|--|
|  <b>Agilent</b> |  | R L  | <b>Freq/Channel</b>                          |
| <b>Ch Freq</b> 1.9098 GHz  |  | <b>Trig</b> Free   | <b>Center Freq</b><br>1.90980000 GHz         |
| Occupied Bandwidth   |  |  | <b>Start Freq</b><br>1.90930000 GHz          |
| Ref 30 dBm #Atten 40 dB  |  |  | <b>Stop Freq</b><br>1.91030000 GHz           |
| #Peak<br>Log<br>10<br>dB/<br>Offst<br>6<br>dB  |  |  | <b>CF Step</b><br>100.000000 kHz<br>Auto Man |
| Center 1.909 800 GHz   |  | Span 1 MHz   | <b>Freq Offset</b><br>0.00000000 Hz          |
| #Res BW 10 kHz #VBW 30 kHz #Sweep 50 ms (601 pts)  |  |  | <b>Signal Track</b><br>On Off                |
| <b>Occupied Bandwidth</b><br>245.6523 kHz  |  | <b>Occ BW % Pwr</b> 99.00 %<br><b>x dB</b> -26.00 dB                               |  |
| <b>Transmit Freq Error</b> 1.213 kHz<br><b>x dB Bandwidth</b> 313.726 kHz                        |  |  |  |
| <b>File name error</b>   |  |  |  |

Test Mode=GSM/TM2

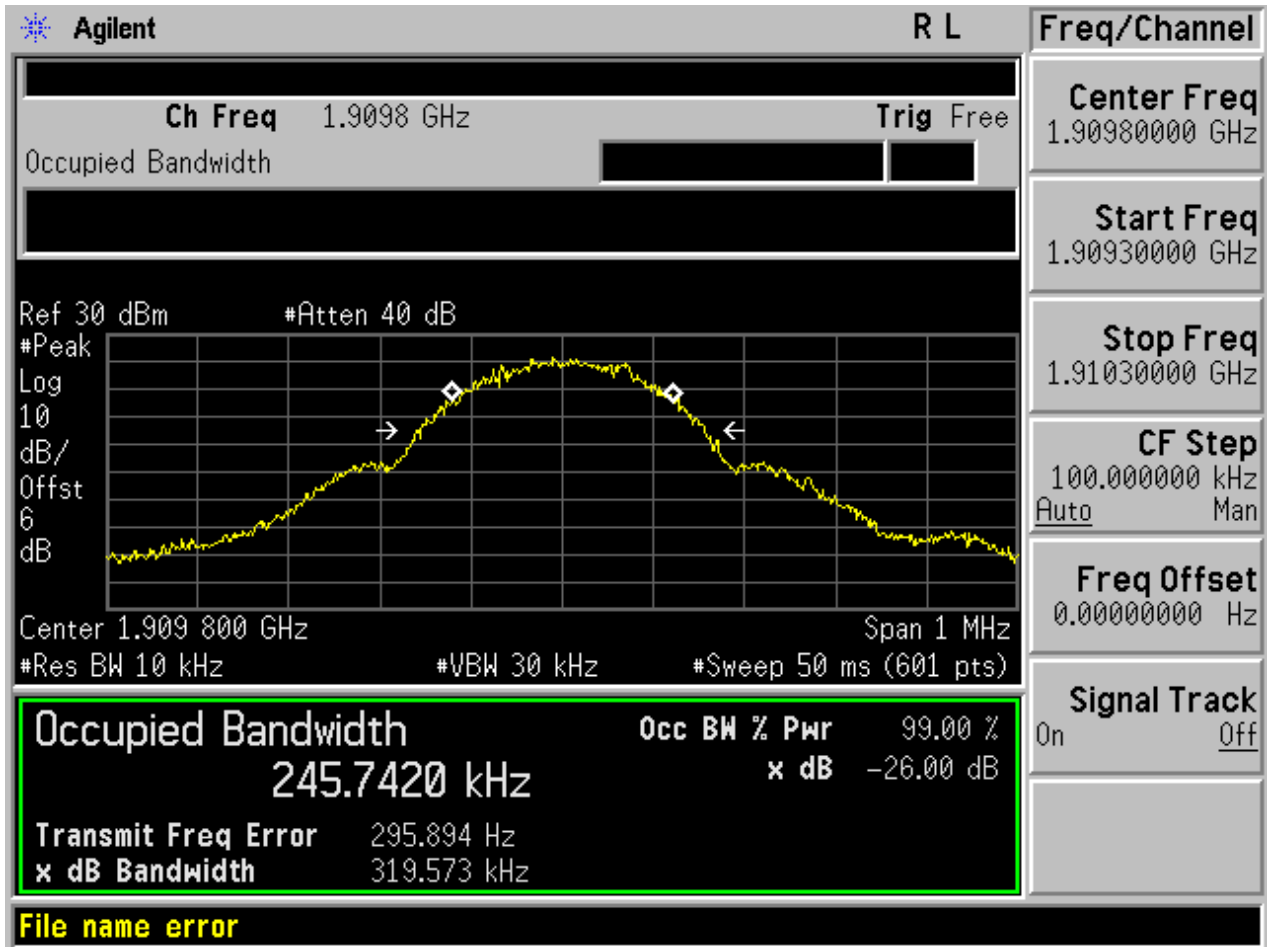
Test Channel=LCH



Test Channel=MCH



Test Channel=HCH



## **9. BAND EDGE**

### **9.1 MEASUREMENT METHOD**

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

### **9.2 PROVISIONS APPLICABLE**

as Specified in FCC rules of 22.917(b) and 24.238(b)

### **9.3 MEASUREMENT RESULT**

## **APPENDIX C: BAND EDGES COMPLIANCE**

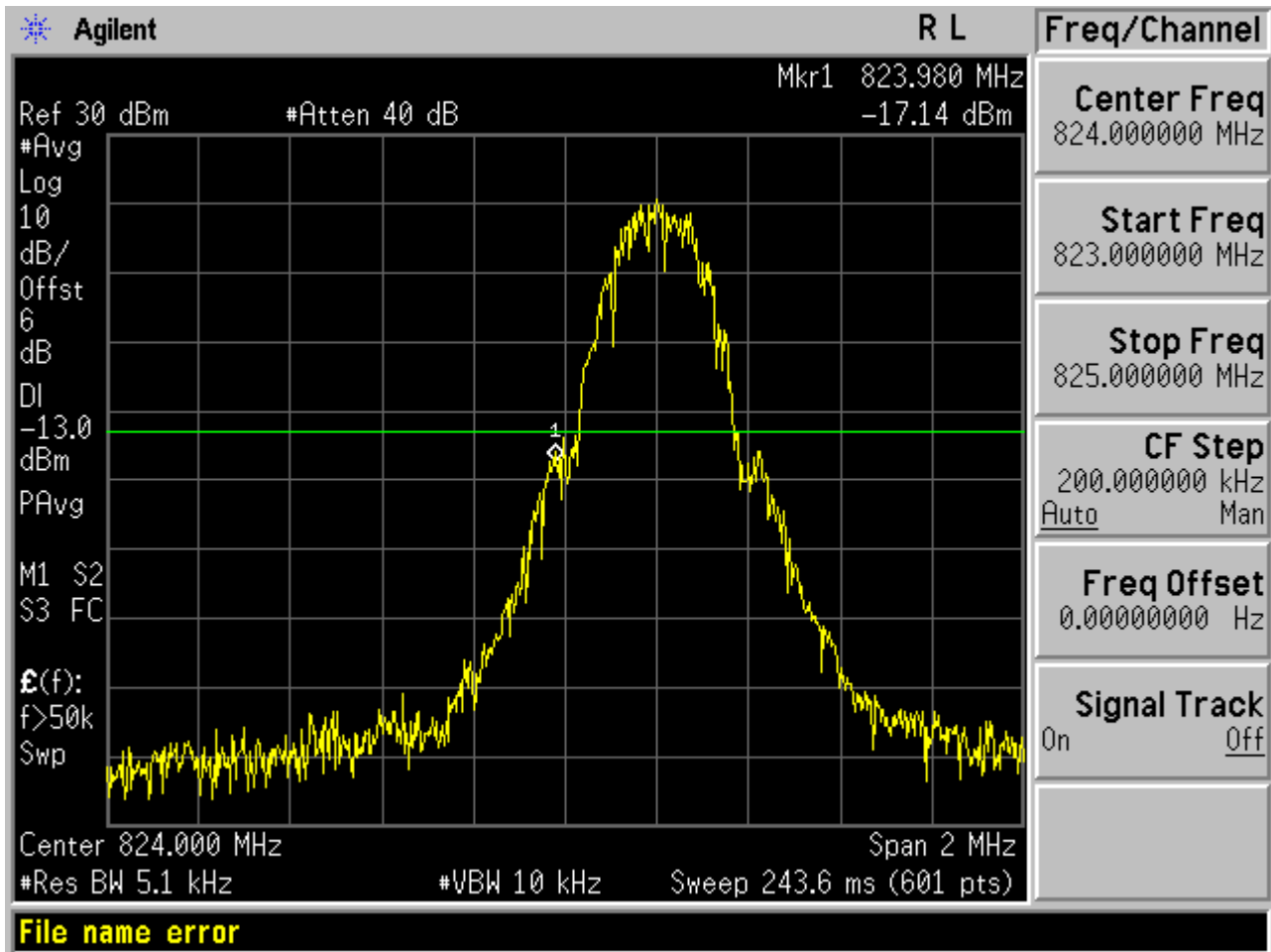
### **Test Results**

#### **For GSM**

**Test Band=GSM850**

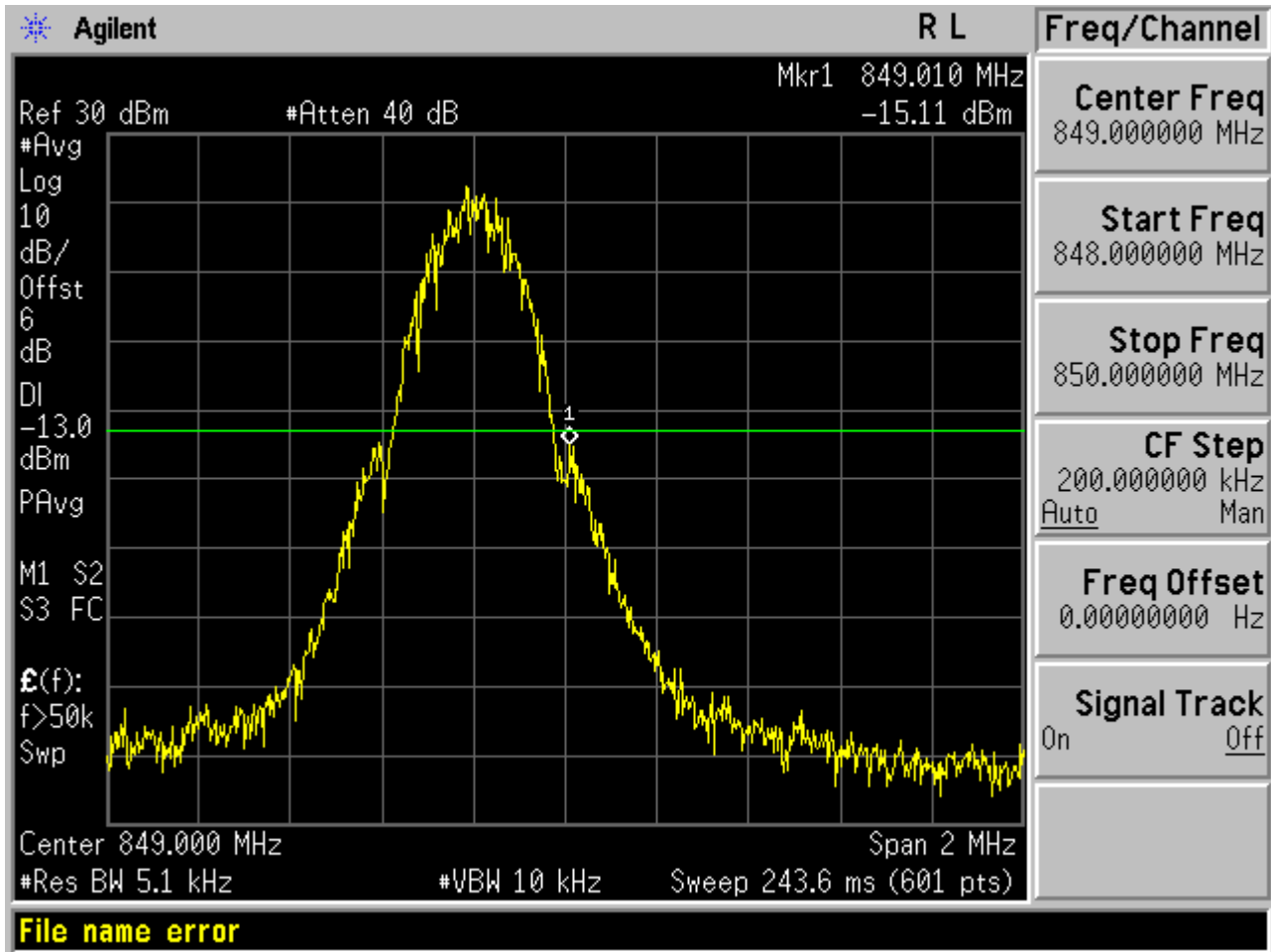
Test Mode=GSM/TM1

Test Channel=LCH



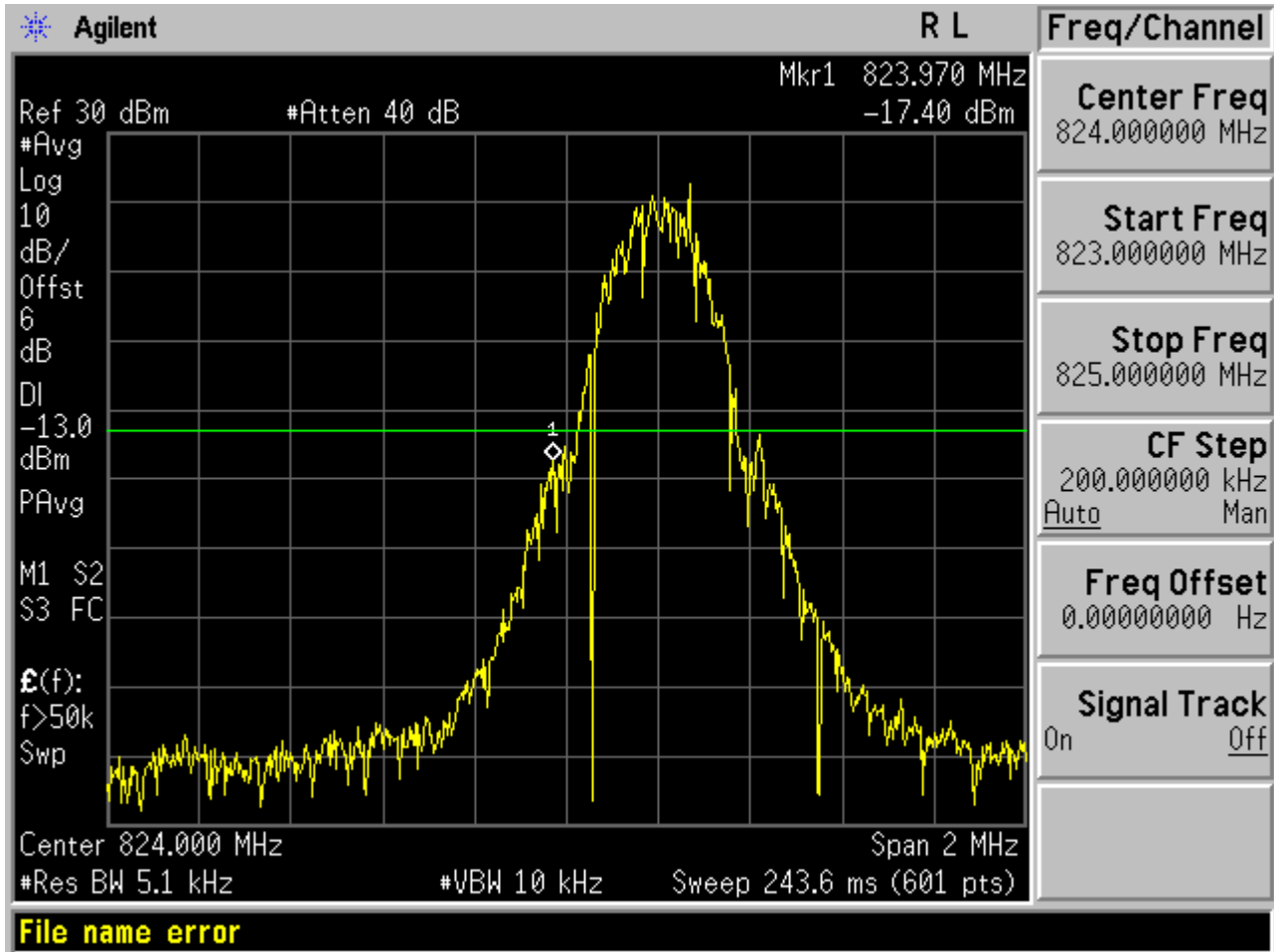


Test Channel=HCH

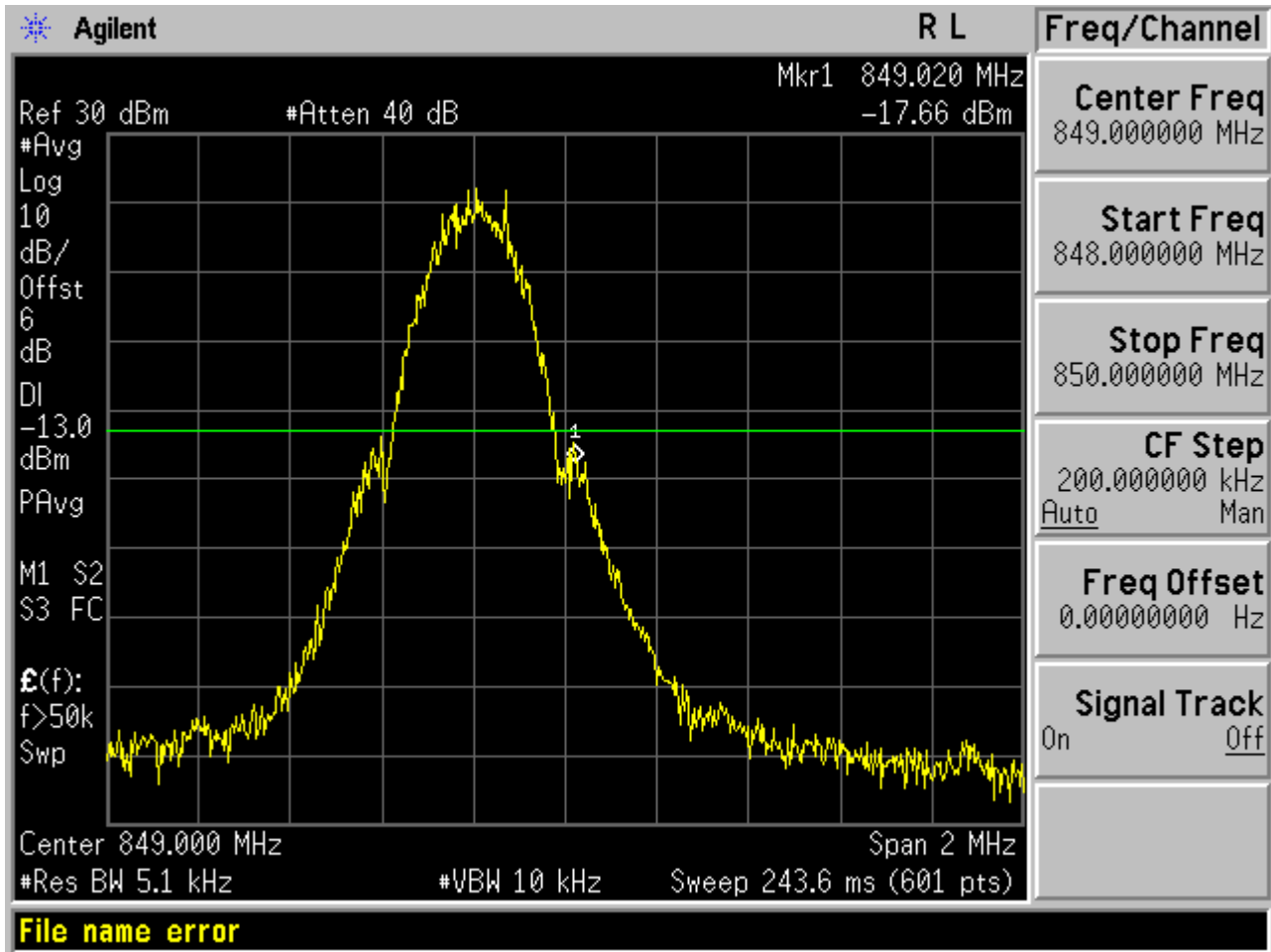


Test Mode=GSM/TM2

Test Channel=LCH



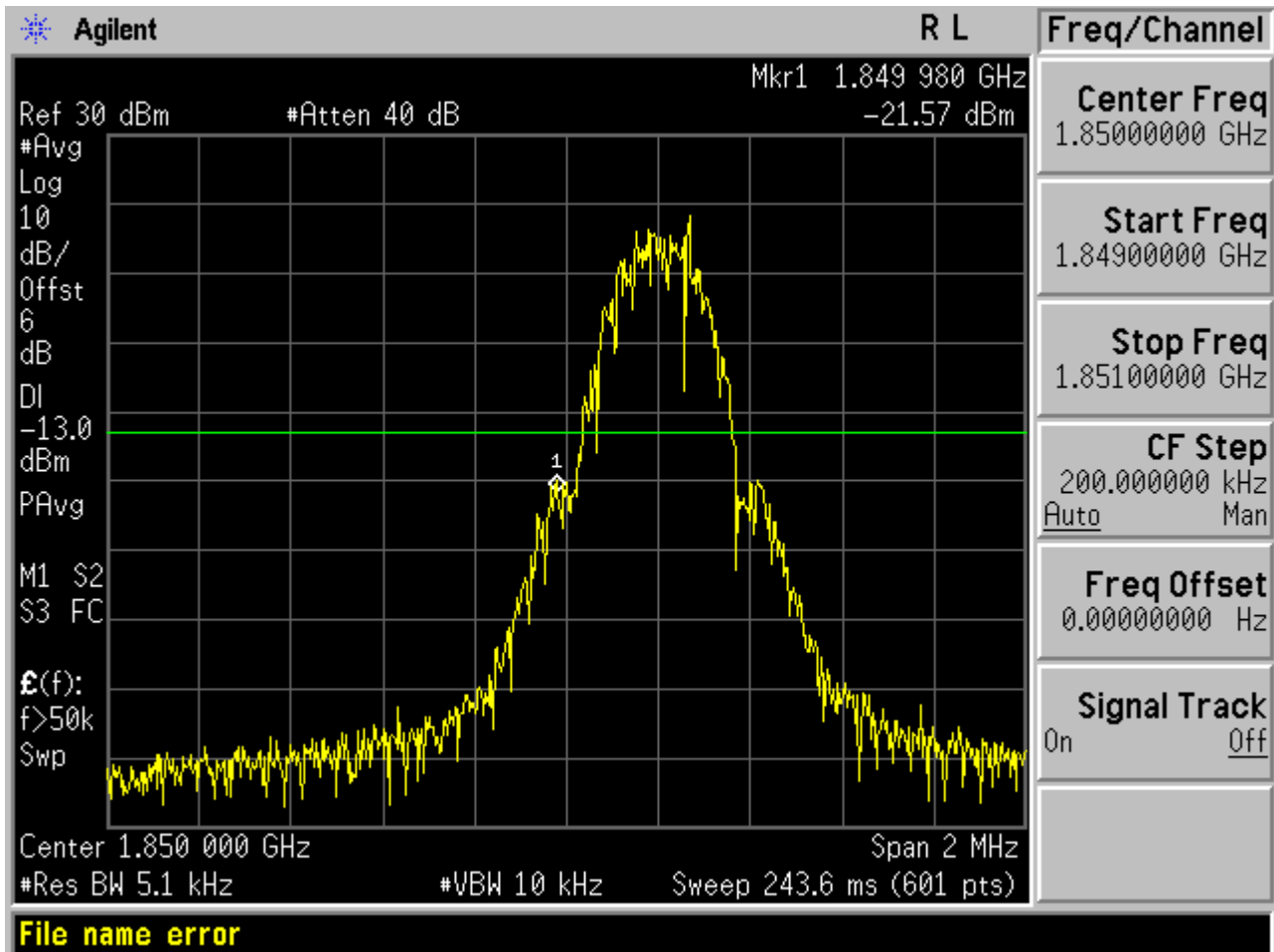
Test Channel=HCH



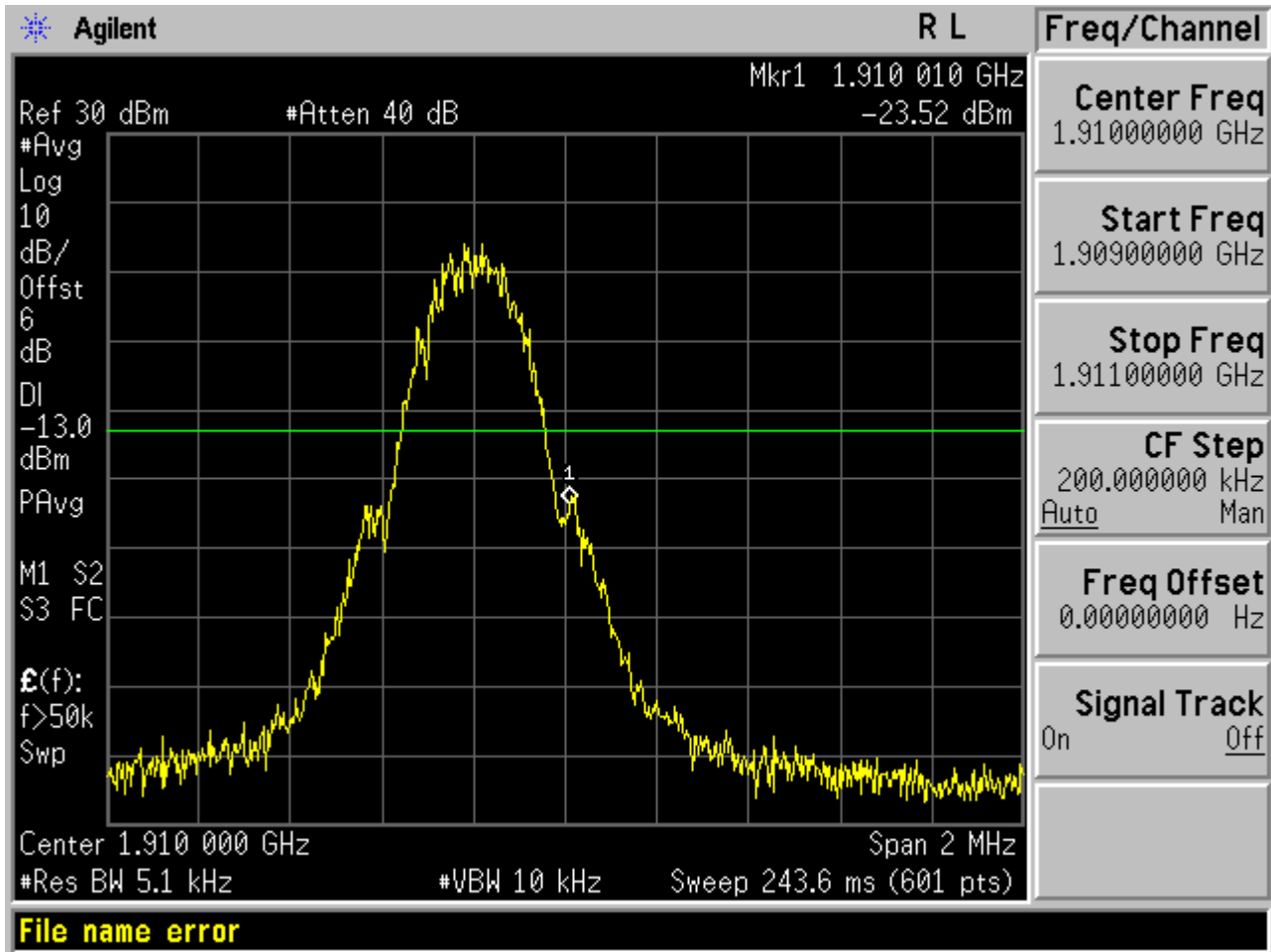
Test Band=GSM1900

Test Mode=GSM/TM1

Test Channel=LCH

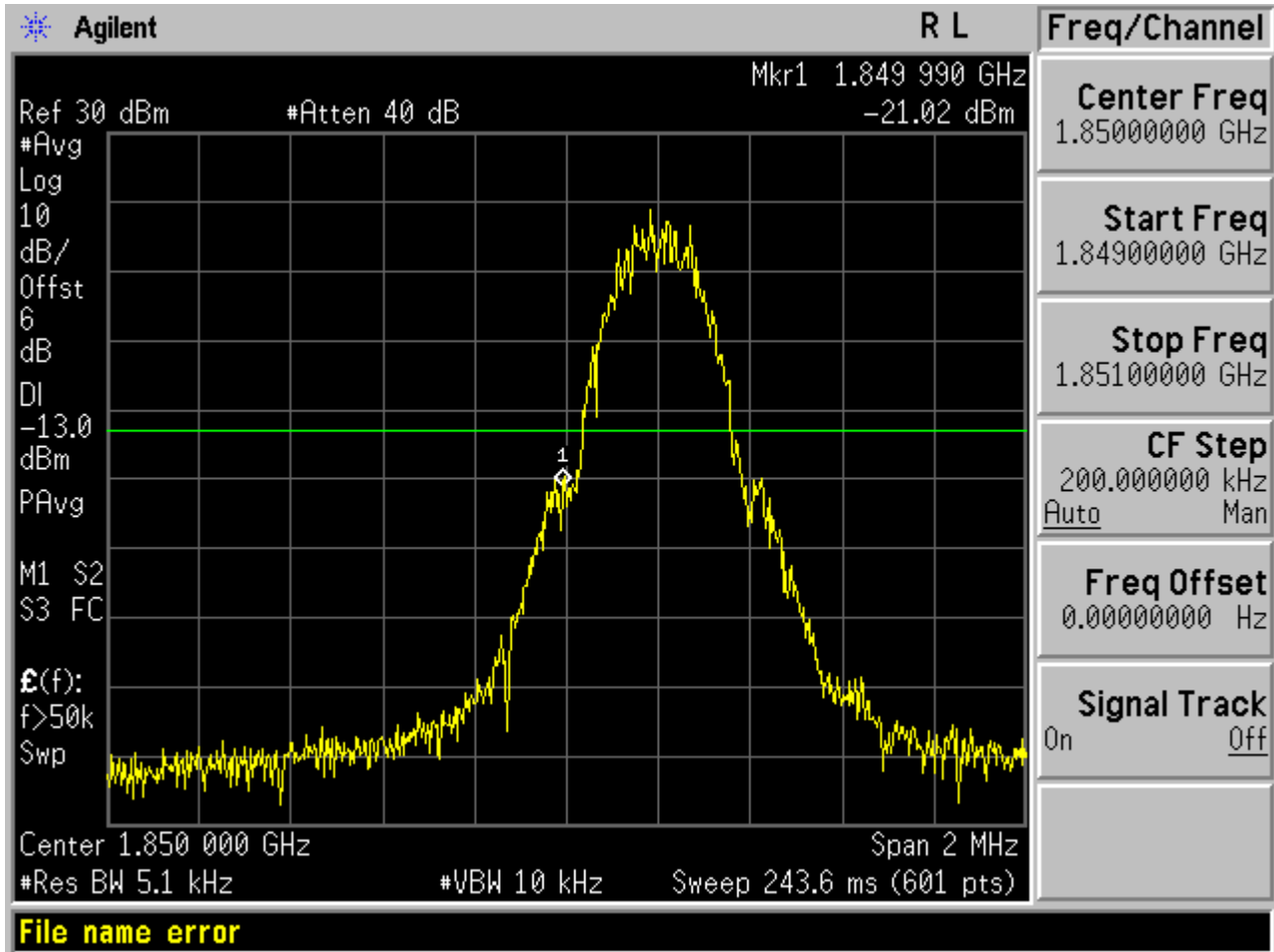


Test Channel=HCH

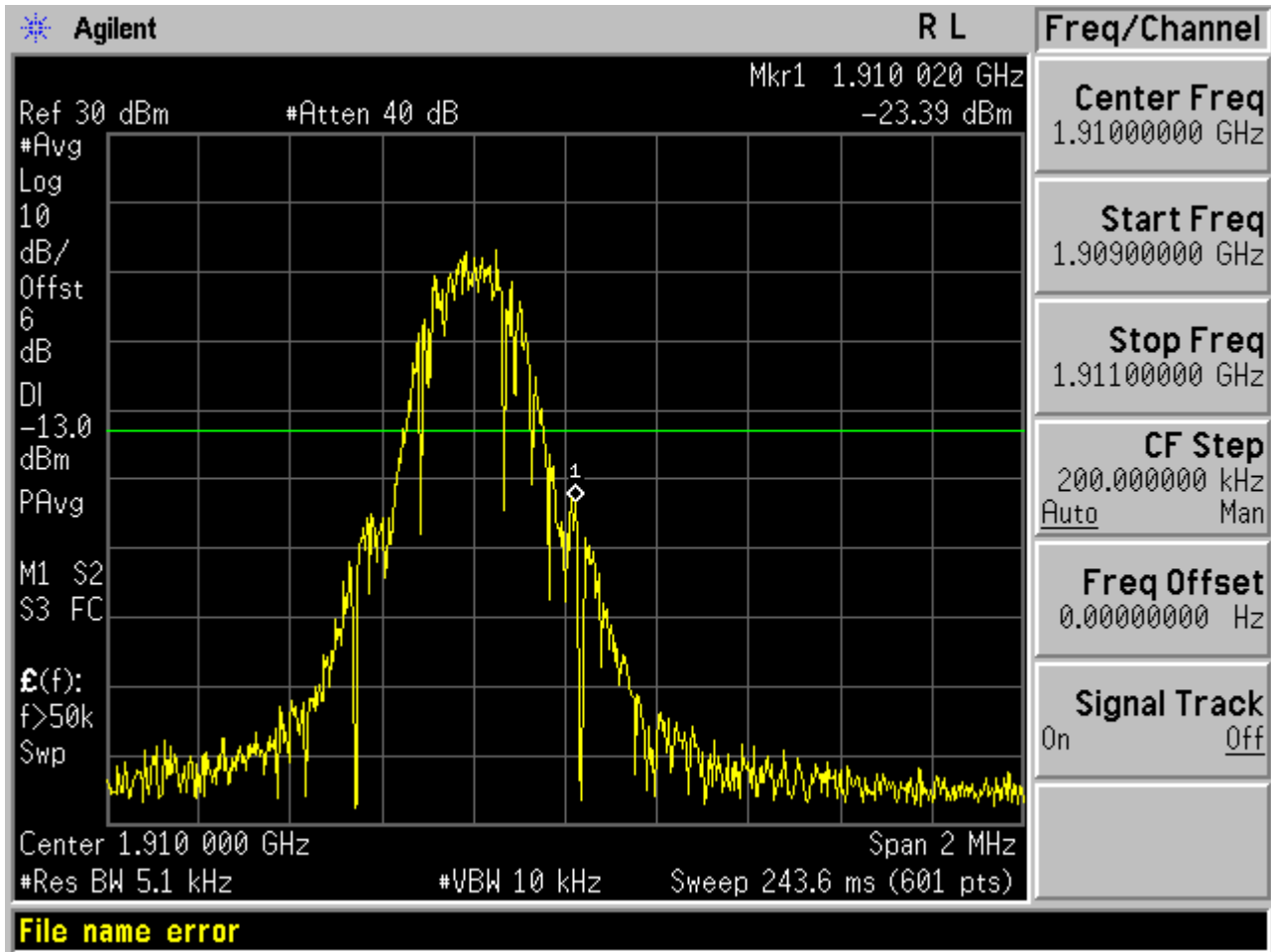


Test Mode=GSM/TM2

Test Channel=LCH



Test Channel=HCH



## 10. SPURIOUS EMISSION

### 10.1 CONDUCTED SPURIOUS EMISSION

#### 10.1.1 MEASUREMENT METHOD

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

1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

| Typical Channels for testing of GSM 850 MHz |                 |
|---|-----------------|
| Channel                                     | Frequency (MHz) |
| 128   | 824.2           |
| 190   | 836.6           |
| 251   | 848.8           |

| Typical Channels for testing of PCS 1900 MHz |                 |
|--|-----------------|
| Channel                                      | Frequency (MHz) |
| 512  | 1850.2          |
| 661  | 1880.0          |
| 810  | 1909.8          |

#### 10.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least  $43+10\text{Log}(P)$  dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.



**10.1.3 MEASUREMENT RESULT**

| <b>Conducted Spurious Emission for GSM 850 MHz</b> |                           |                |                           |                |                           |                |
|--|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|
| Harmonic   | Tx ch. 128<br>Freq. (MHz) | Level<br>(dBm) | Tx ch. 190<br>Freq. (MHz) | Level<br>(dBm) | Tx ch. Freq.<br>(MHz) 251 | Level<br>(dBm) |
| 2  | 1648.4                    | B.I.N.F        | 1673.2                    | B.I.N.F        | 1697.6                    | B.I.N.F        |
| 3  | 2472.6                    | B.I.N.F        | 2509.8                    | B.I.N.F        | 2546.4                    | B.I.N.F        |
| 4  | 3296.8                    | B.I.N.F        | 3346.4                    | B.I.N.F        | 3395.2                    | B.I.N.F        |
| 5  | 4121                      | B.I.N.F        | 4183                      | B.I.N.F        | 4244                      | B.I.N.F        |
| 6  | 4945.2                    | B.I.N.F        | 5019.6                    | B.I.N.F        | 5092.8                    | B.I.N.F        |
| 7  | 5769.4                    | B.I.N.F        | 5856.2                    | B.I.N.F        | 5941.6                    | B.I.N.F        |
| 8  | 6593.6                    | B.I.N.F        | 6692.8                    | B.I.N.F        | 6790.4                    | B.I.N.F        |
| 9  | 7417.8                    | B.I.N.F        | 7529.4                    | B.I.N.F        | 7639.2                    | B.I.N.F        |
| 10   | 8242                      | B.I.N.F        | 8366                      | B.I.N.F        | 8488                      | B.I.N.F        |
| ● B.I.N.F: Below Instruments Noise floor           |                           |                |                           |                |                           |                |

| <b>Conducted Spurious Emission for PCS 1900 MHz</b> |                           |                |                           |                |                           |                |
|---|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|
| Harmonic  | Tx ch. 512<br>Freq. (MHz) | Level<br>(dBm) | Tx ch. 661<br>Freq. (MHz) | Level<br>(dBm) | Tx ch. 810<br>Freq. (MHz) | Level<br>(dBm) |
| 2   | 3700.4                    | B.I.N.F        | 3760                      | B.I.N.F        | 3819.6                    | B.I.N.F        |
| 3   | 5550.6                    | B.I.N.F        | 5640                      | B.I.N.F        | 5729.4                    | B.I.N.F        |
| 4   | 7400.8                    | B.I.N.F        | 7520                      | B.I.N.F        | 7639.2                    | B.I.N.F        |
| 5   | 9251.0                    | B.I.N.F        | 9400                      | B.I.N.F        | 9549.0                    | B.I.N.F        |
| 6   | 11101.2                   | B.I.N.F        | 11280                     | B.I.N.F        | 11458.8                   | B.I.N.F        |
| 7   | 12951.4                   | B.I.N.F        | 13160                     | B.I.N.F        | 13368.6                   | B.I.N.F        |
| 8   | 14801.6                   | B.I.N.F        | 15040                     | B.I.N.F        | 15278.4                   | B.I.N.F        |
| 9   | 16651.8                   | B.I.N.F        | 16920                     | B.I.N.F        | 17188.2                   | B.I.N.F        |
| 10  | 18502.0                   | B.I.N.F        | 18800                     | B.I.N.F        | 19098.0                   | B.I.N.F        |
| ● B.I.N.F: Below Instruments Noise floor            |                           |                |                           |                |                           |                |

**Note:** Below 30MHZ no Spurious found and The GSM modes is the worst condition.

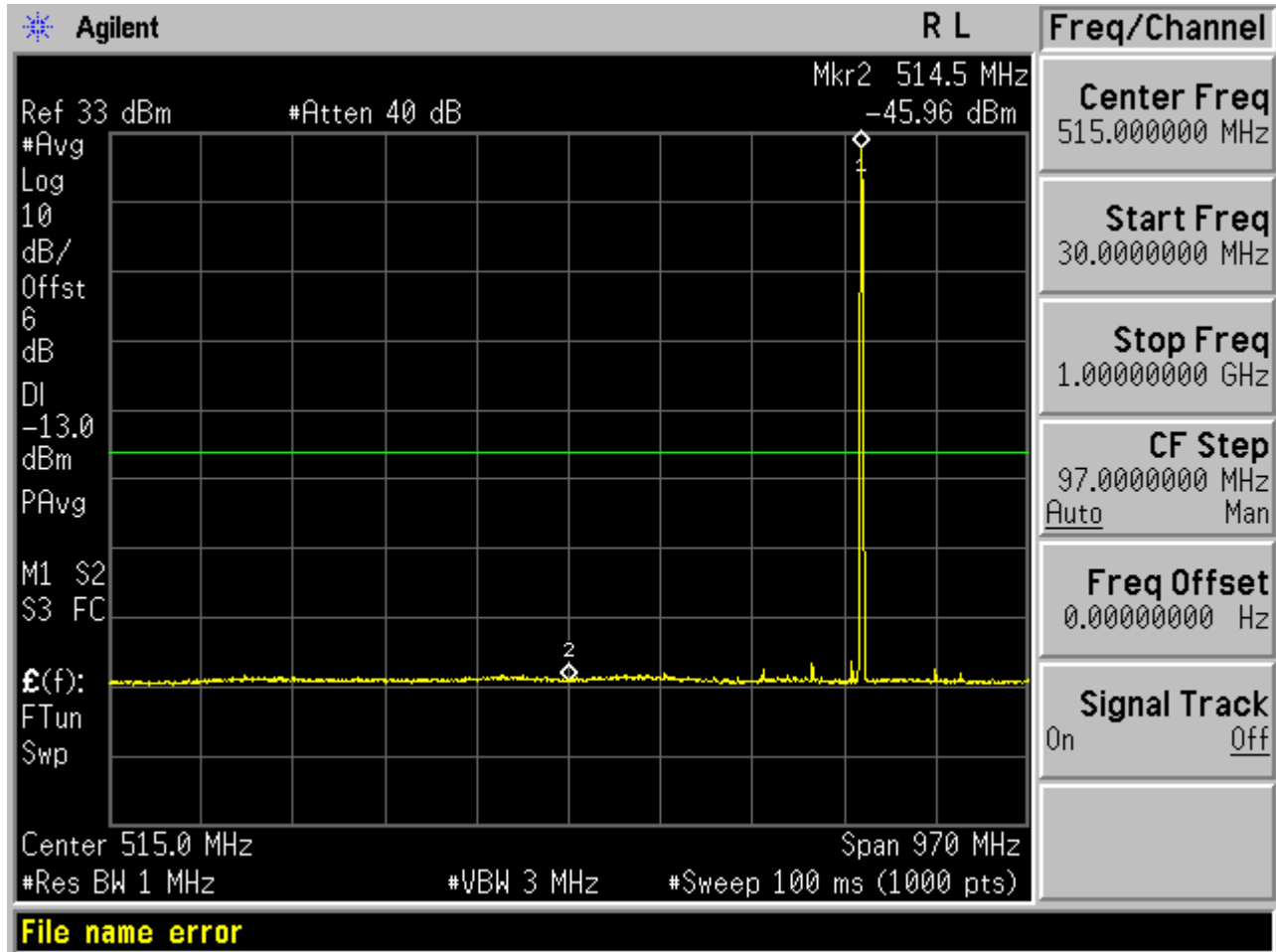
### APPENDIX D: SPURIOUS EMISSION AT ANTENNA TERMINAL

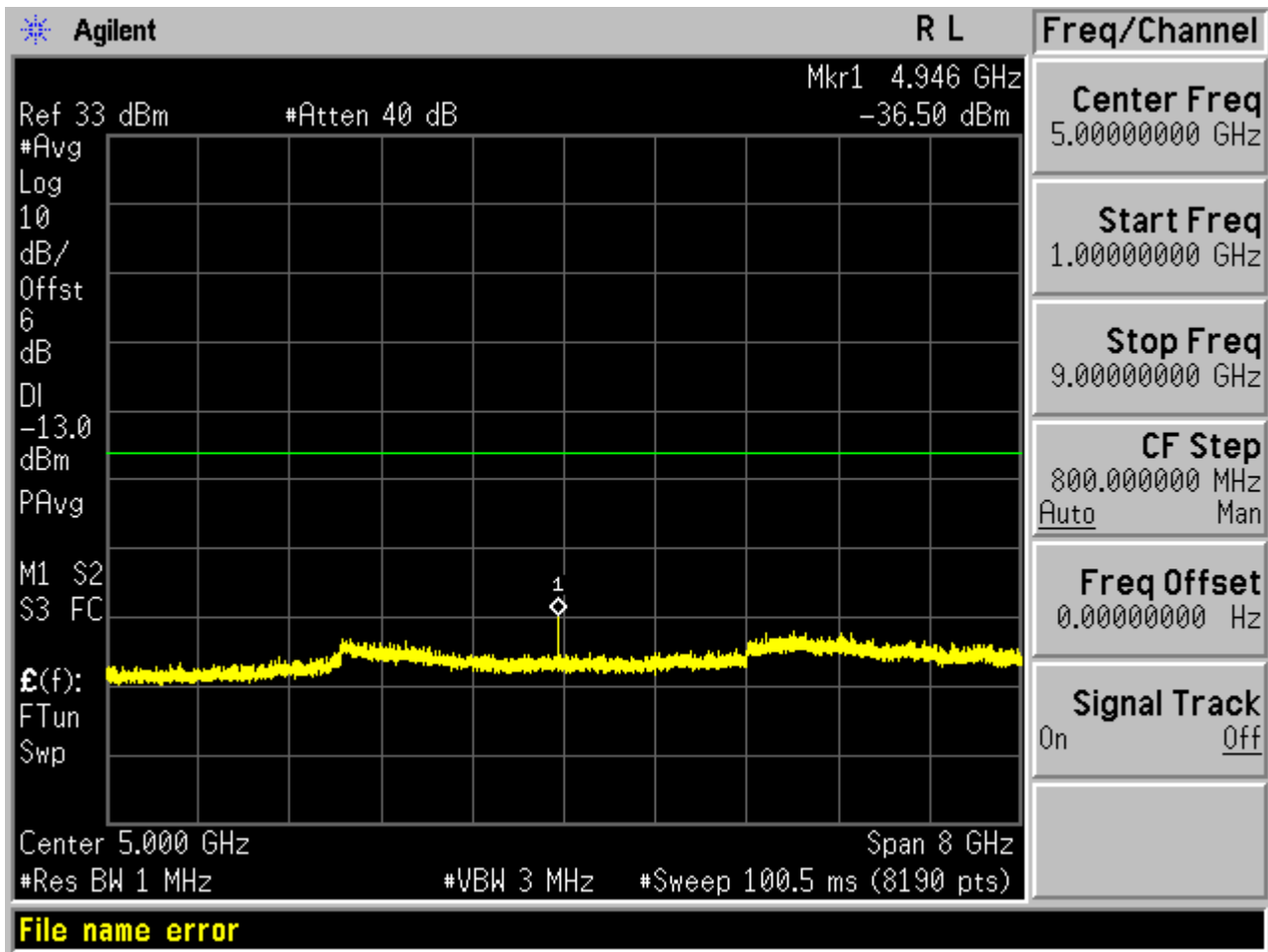
#### Test Results

Test Band=GSM850

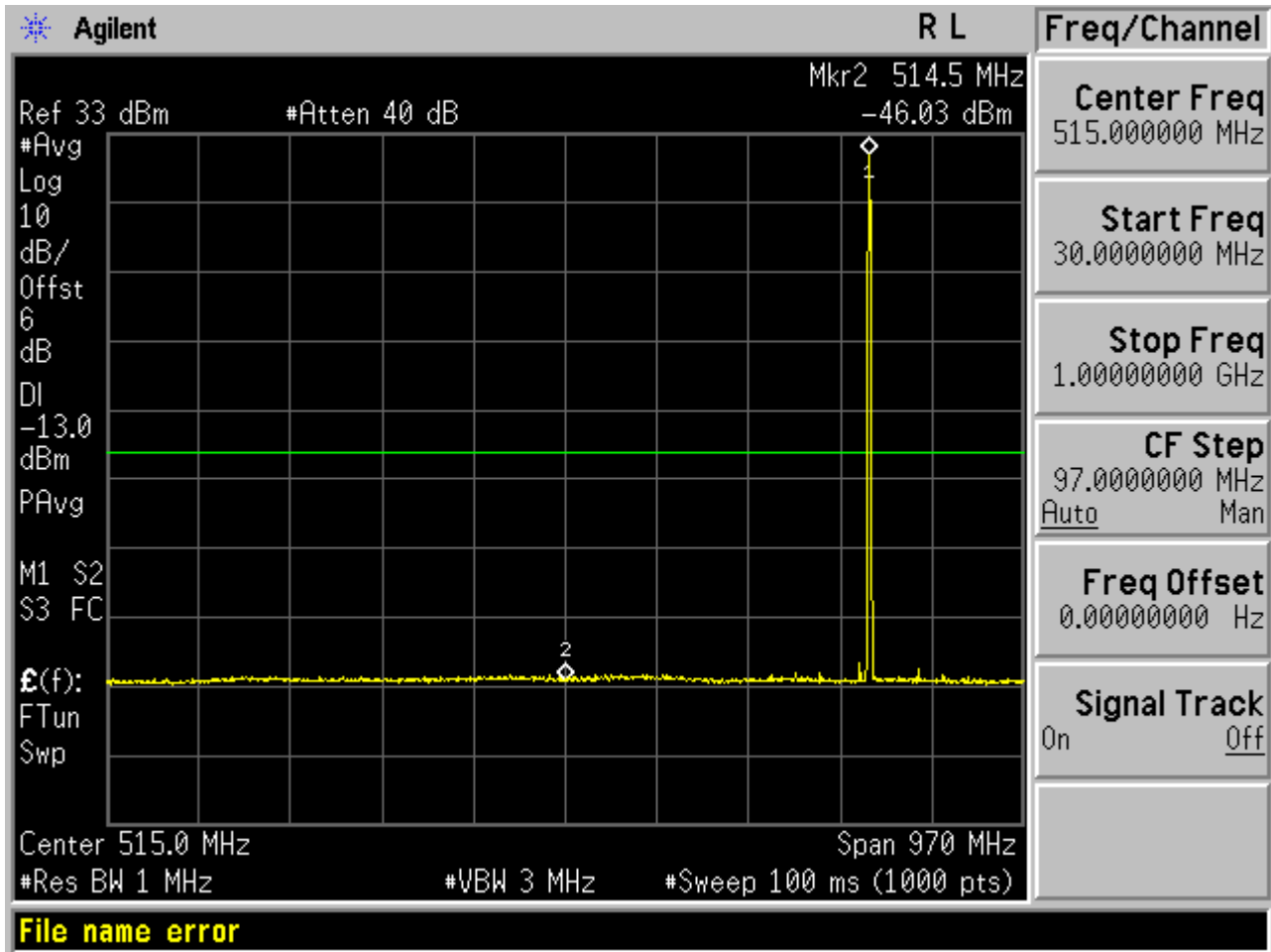
Test Mode=GSM/TM1

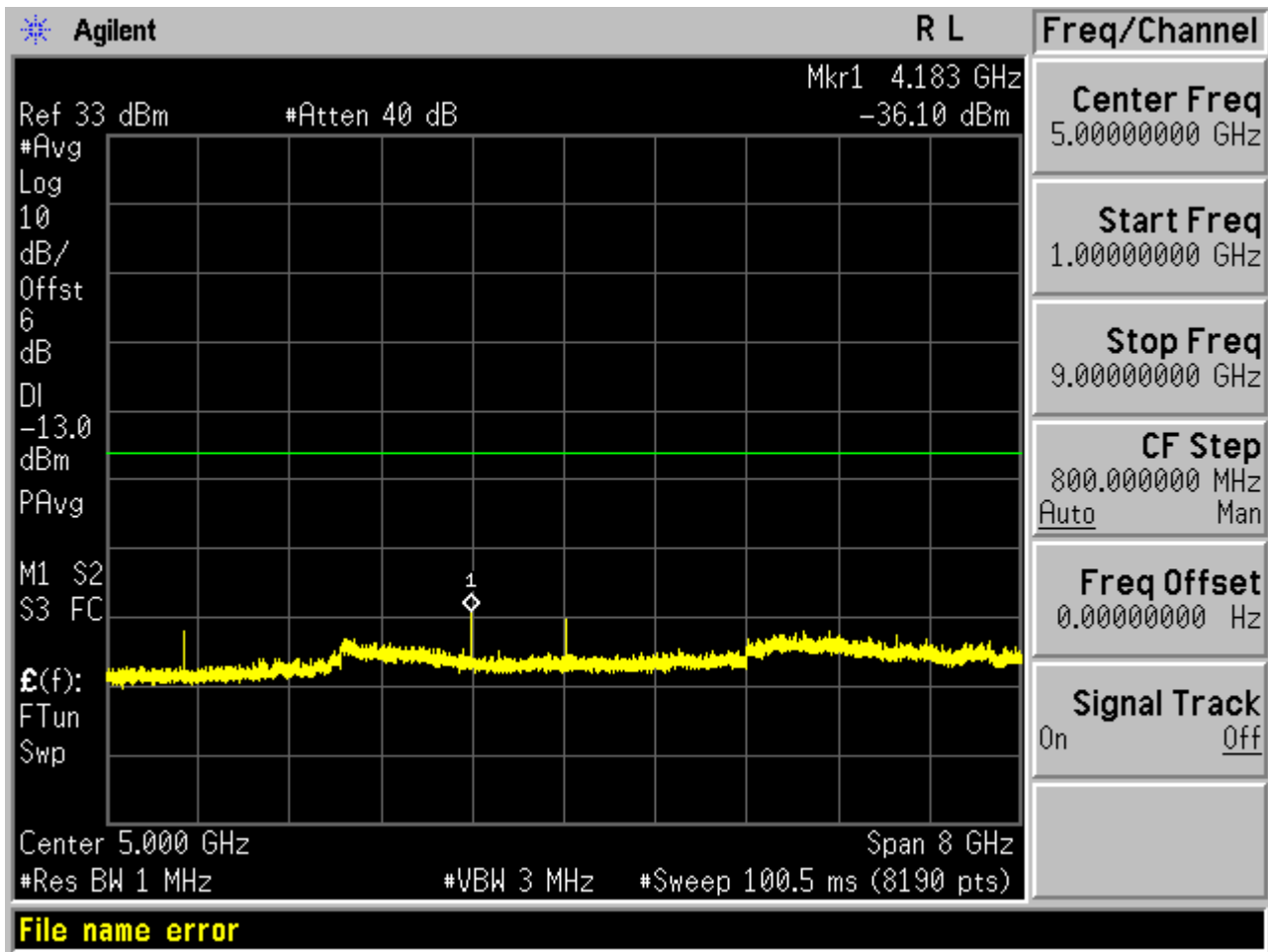
Test Channel=LCH



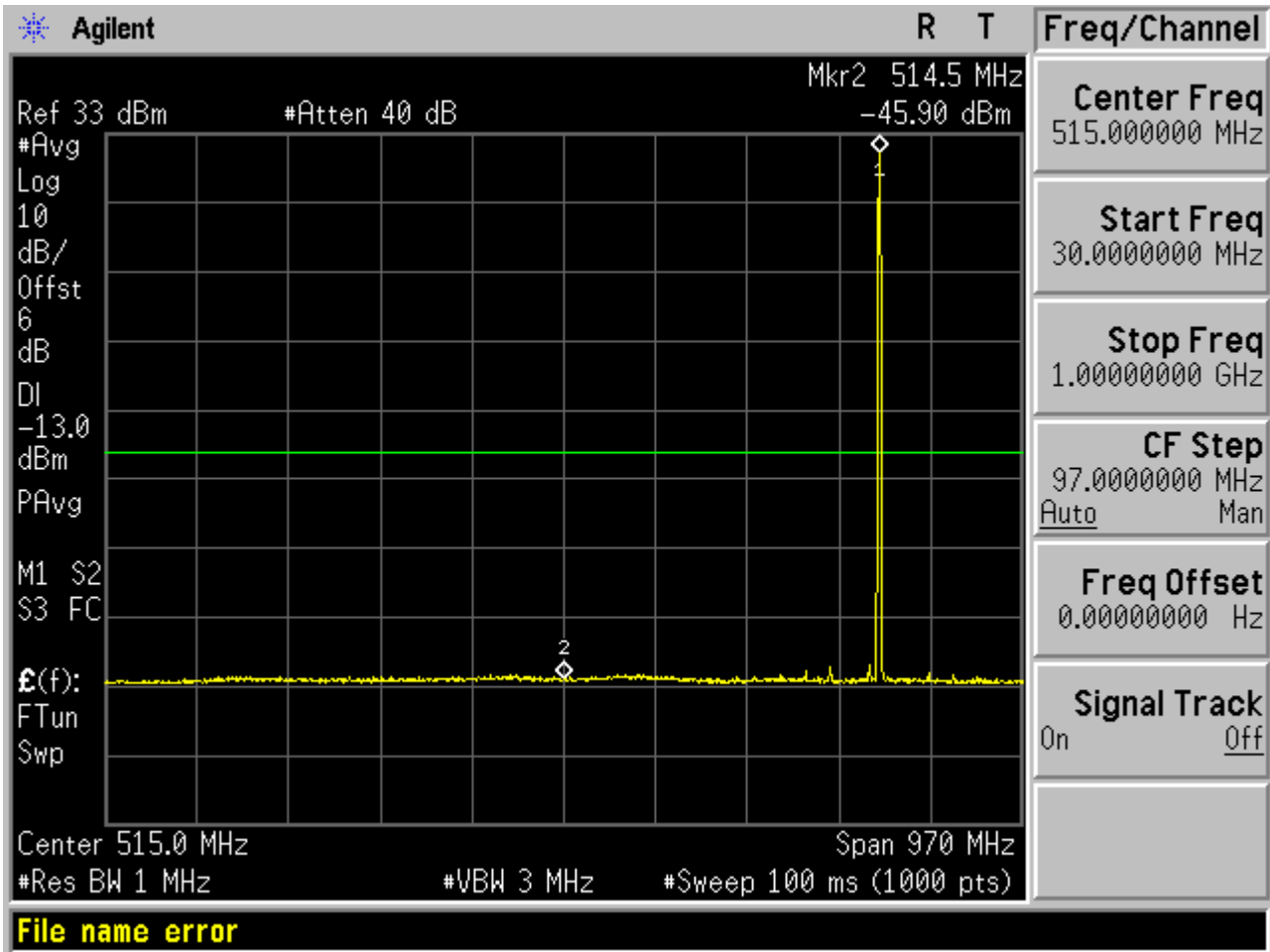


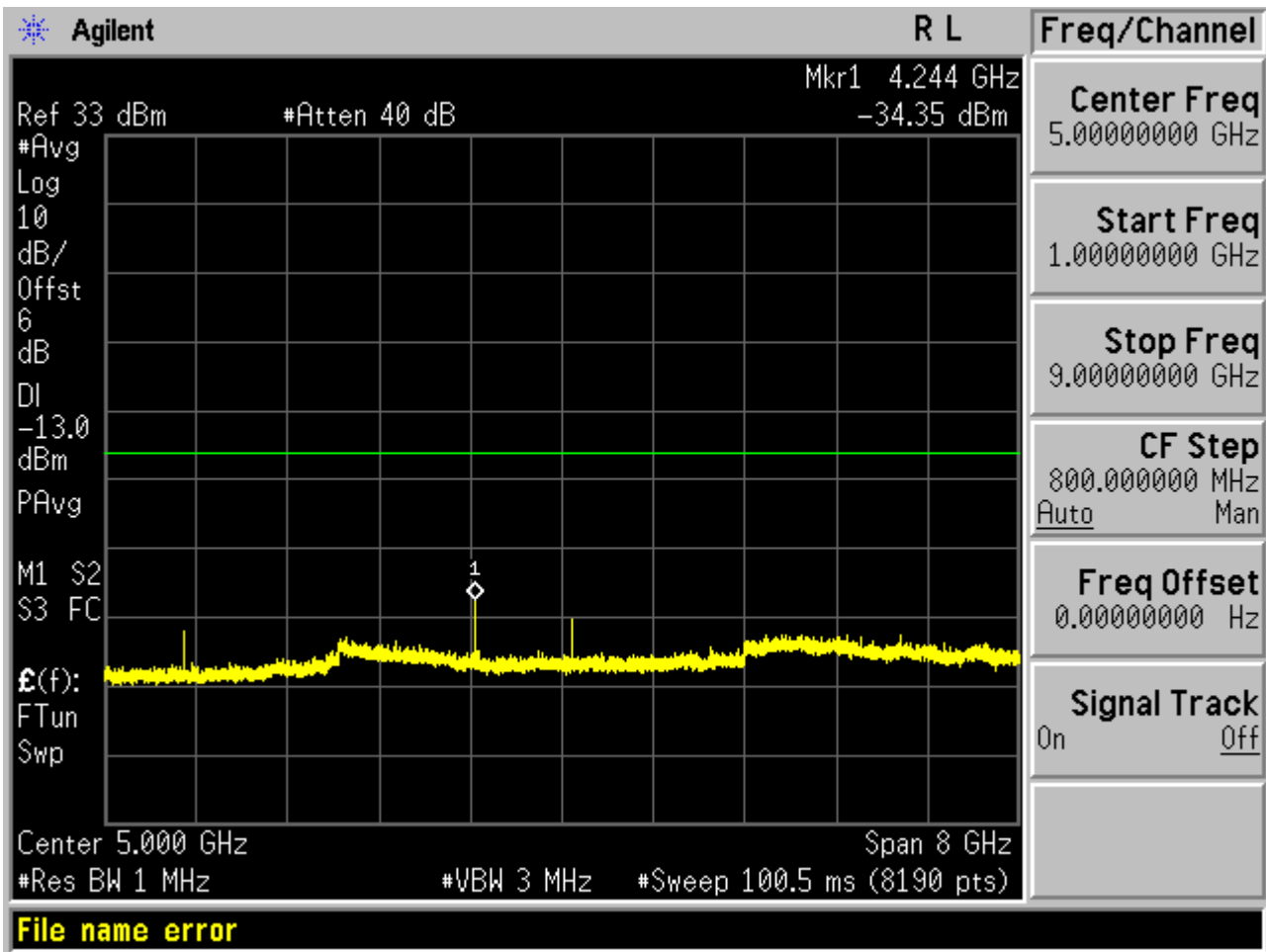
Test Channel=MCH





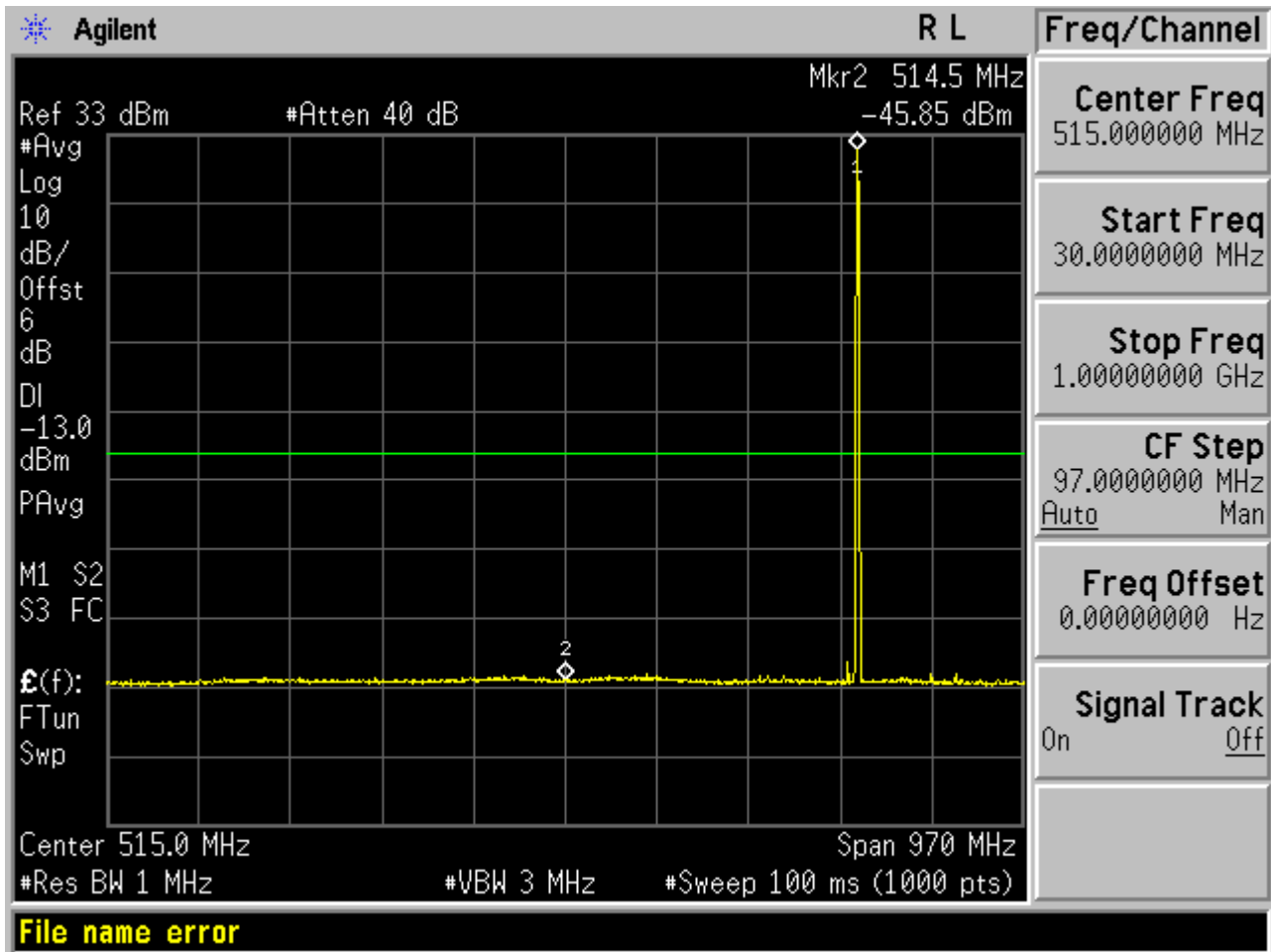
Test Channel=HCH



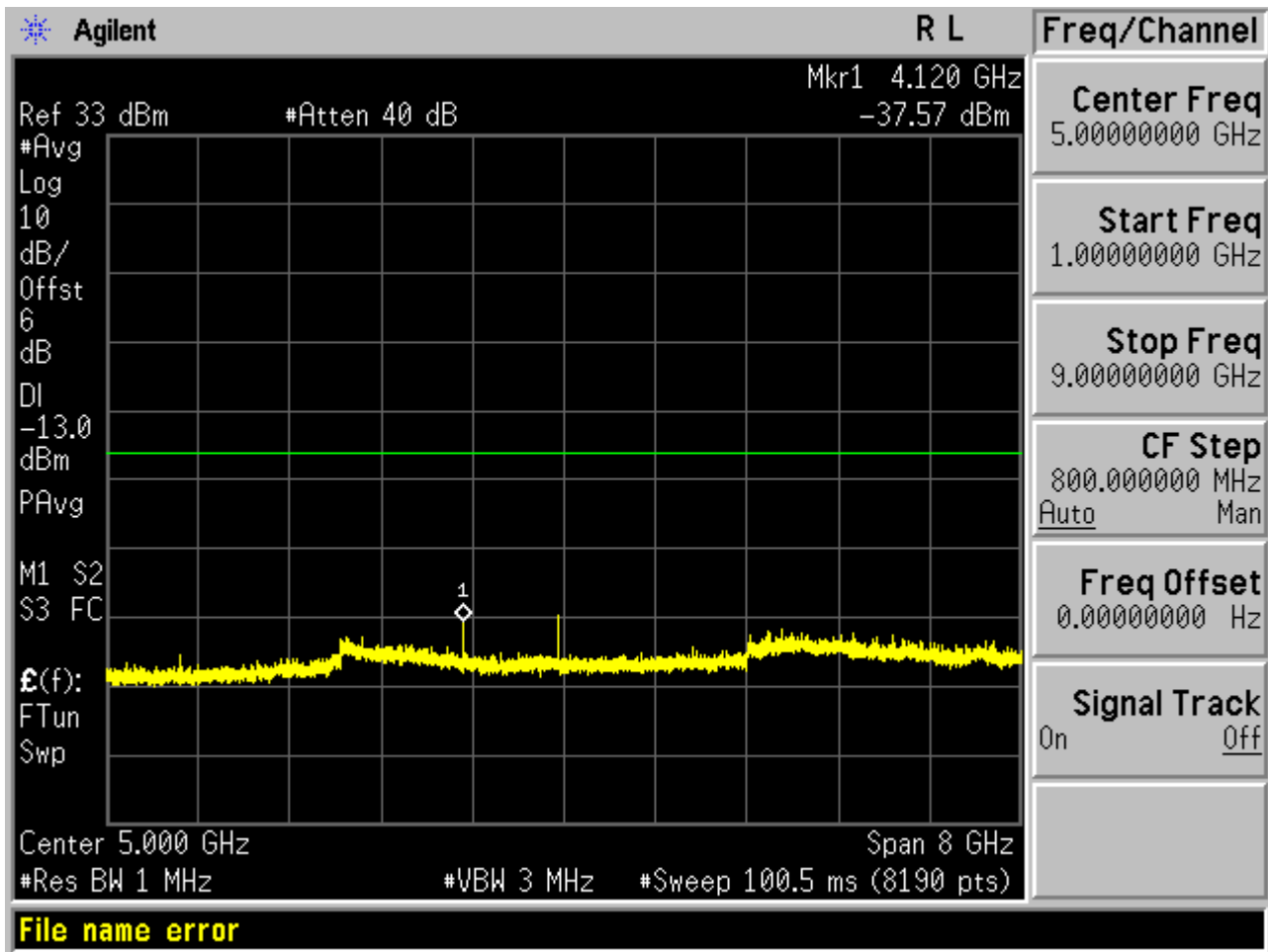


Test Mode=GSM/TM2

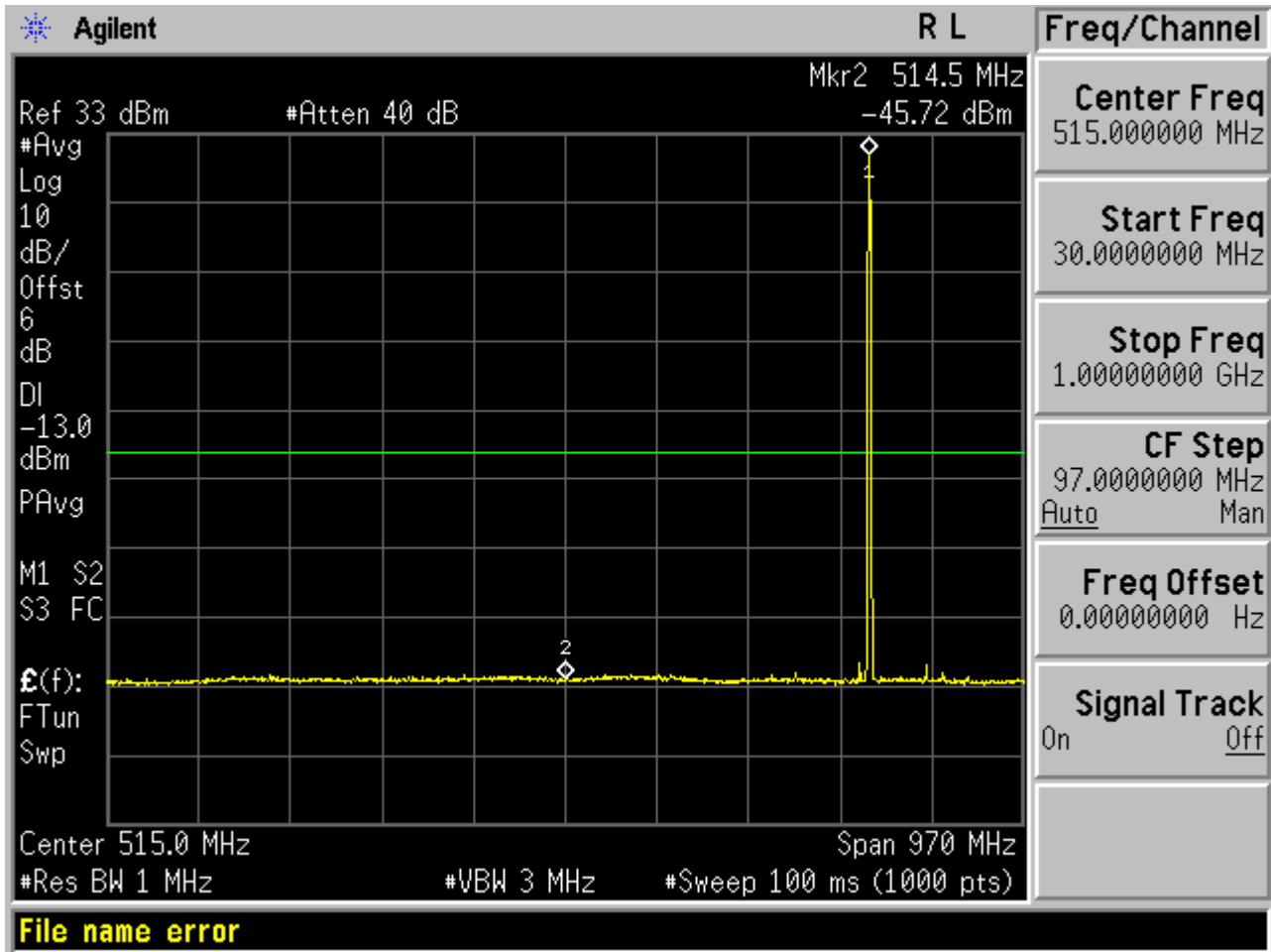
Test Channel=LCH

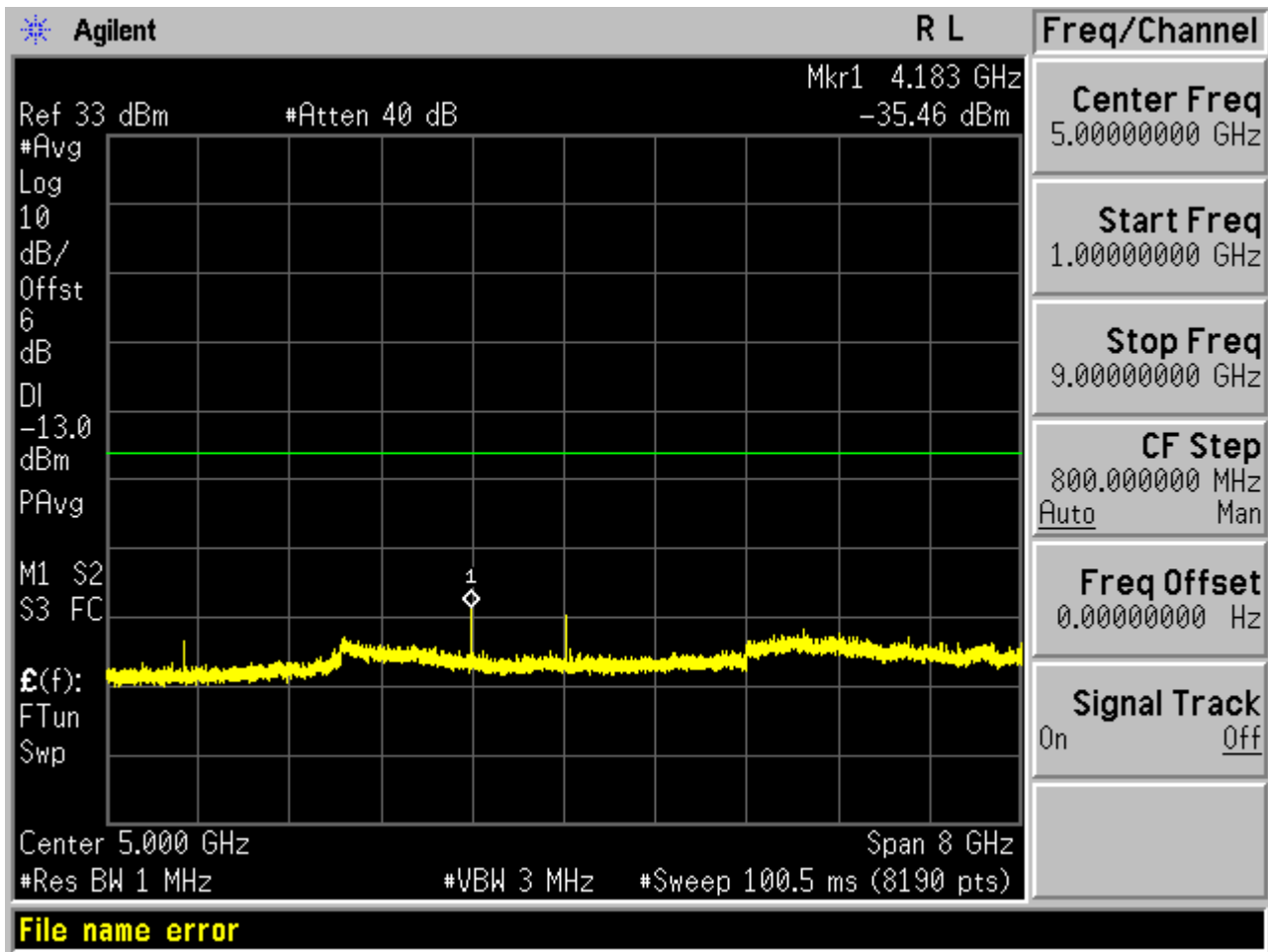




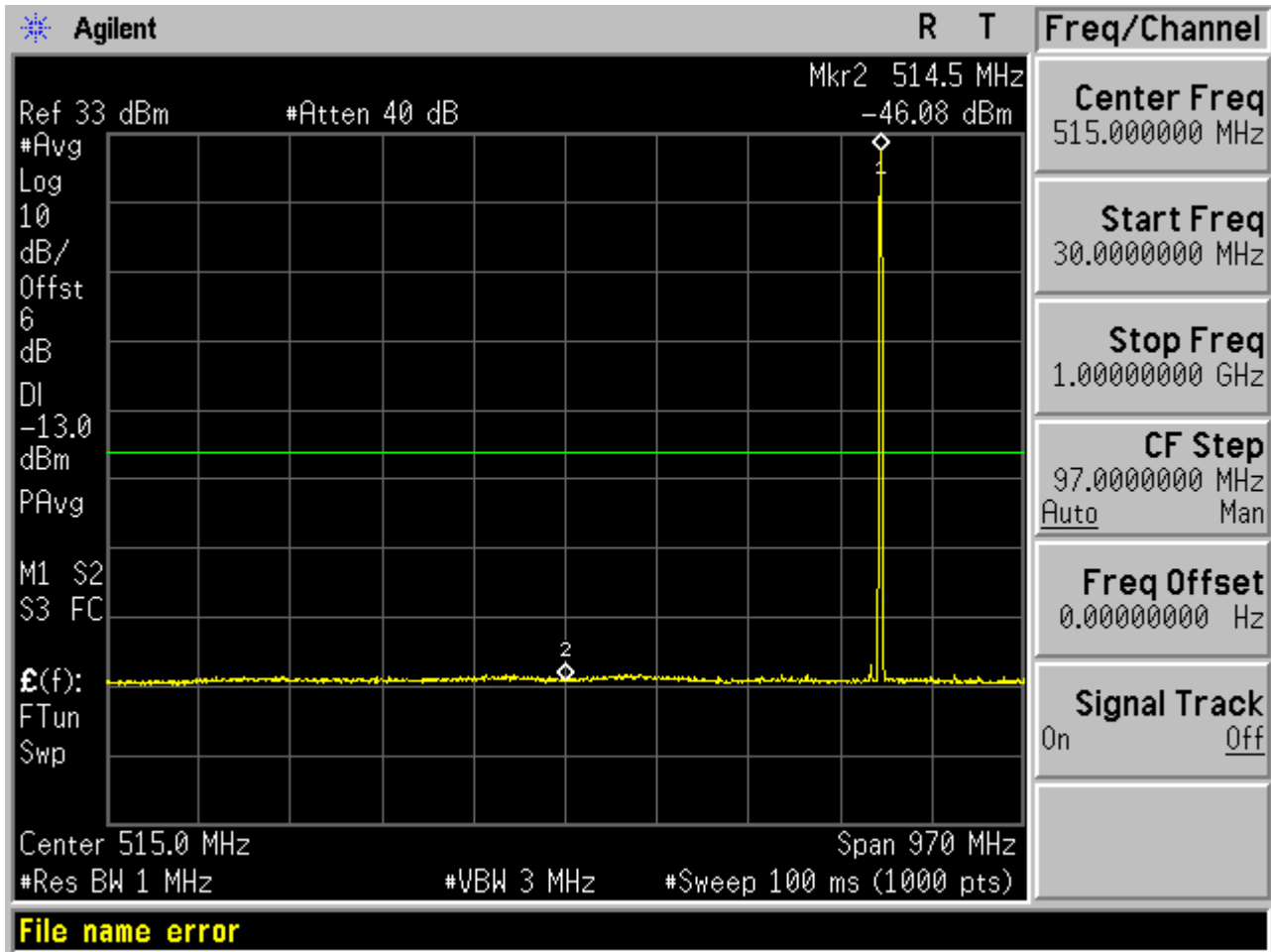


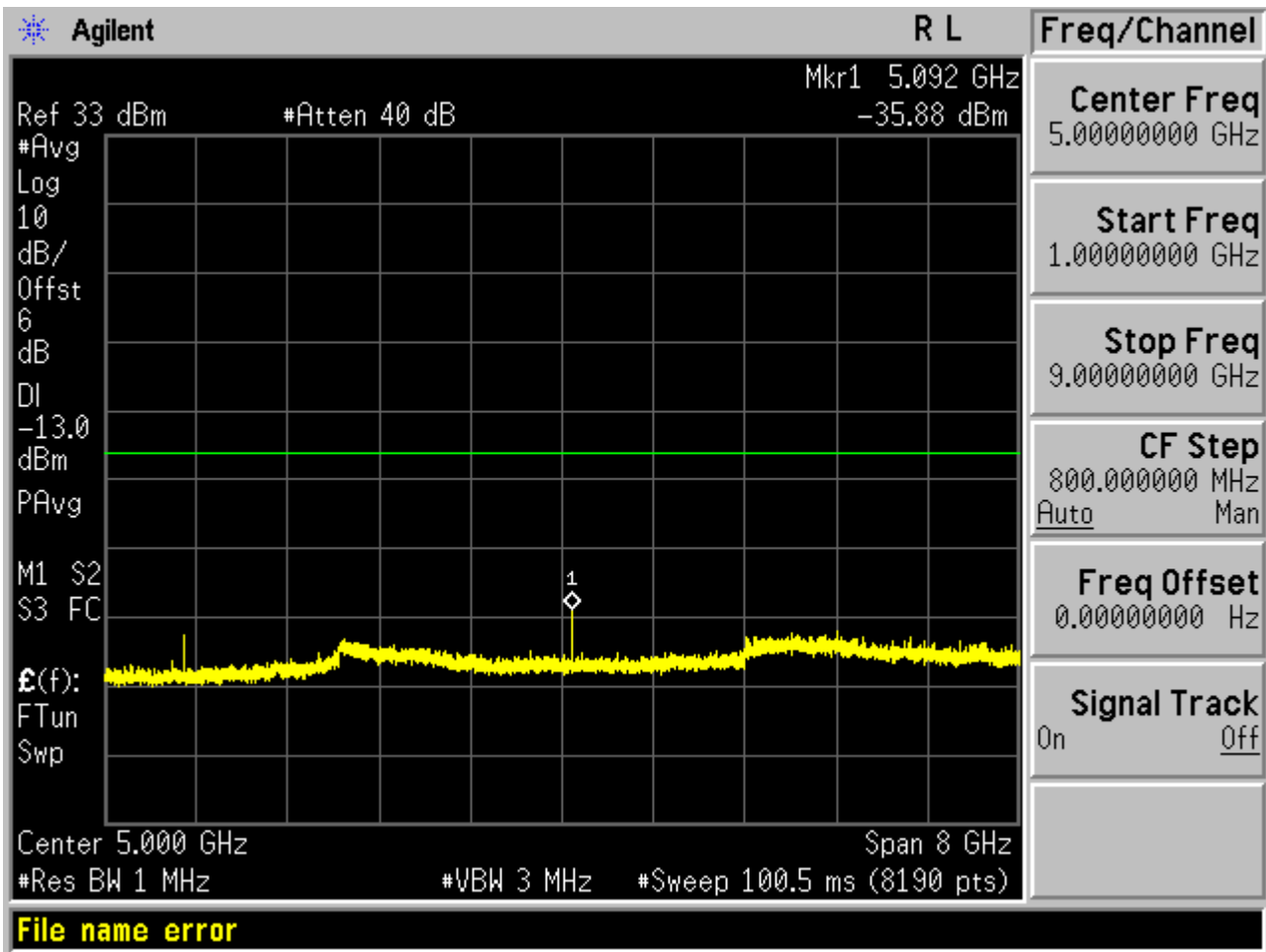
Test Channel=MCH





Test Channel=HCH

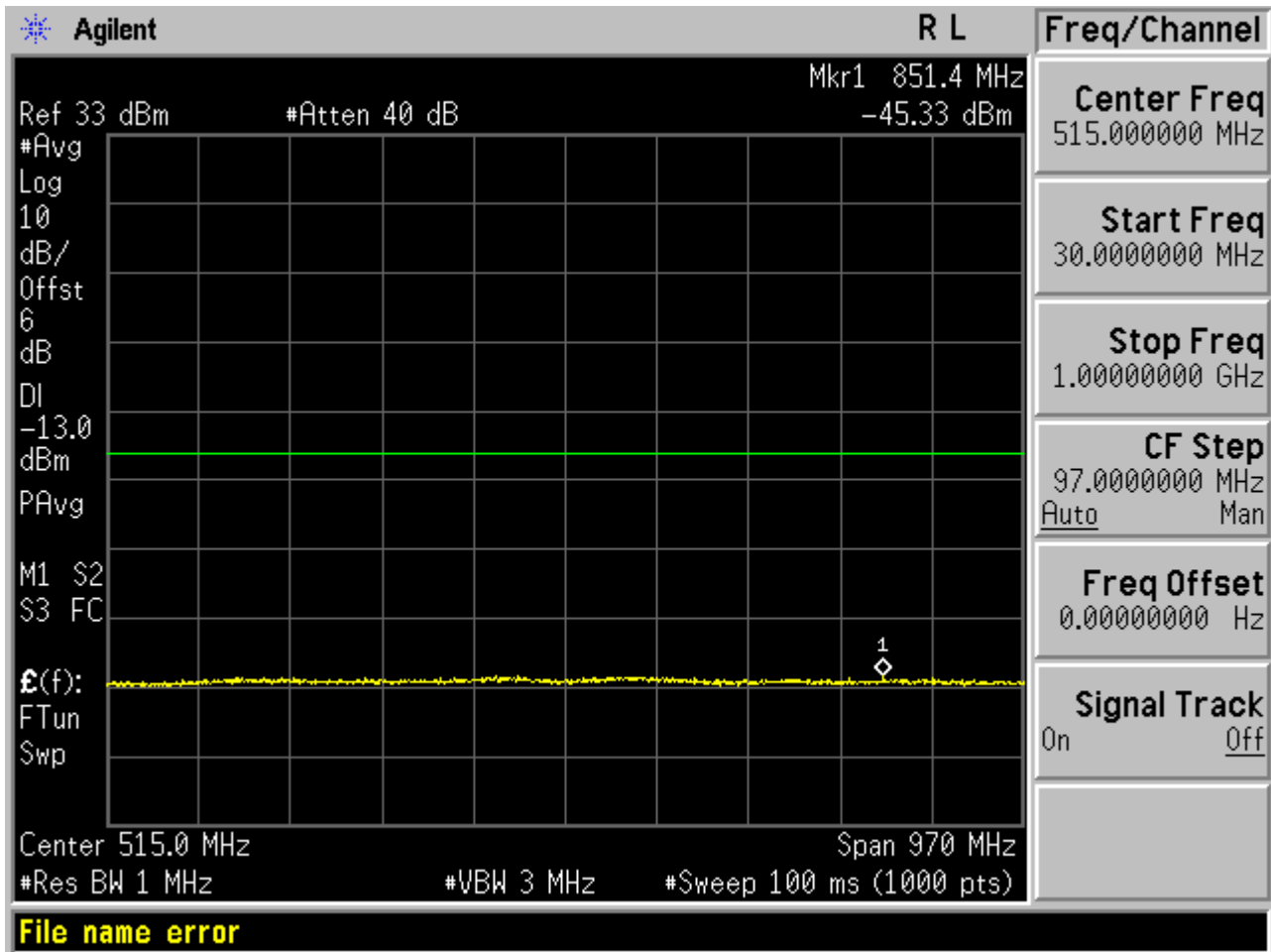


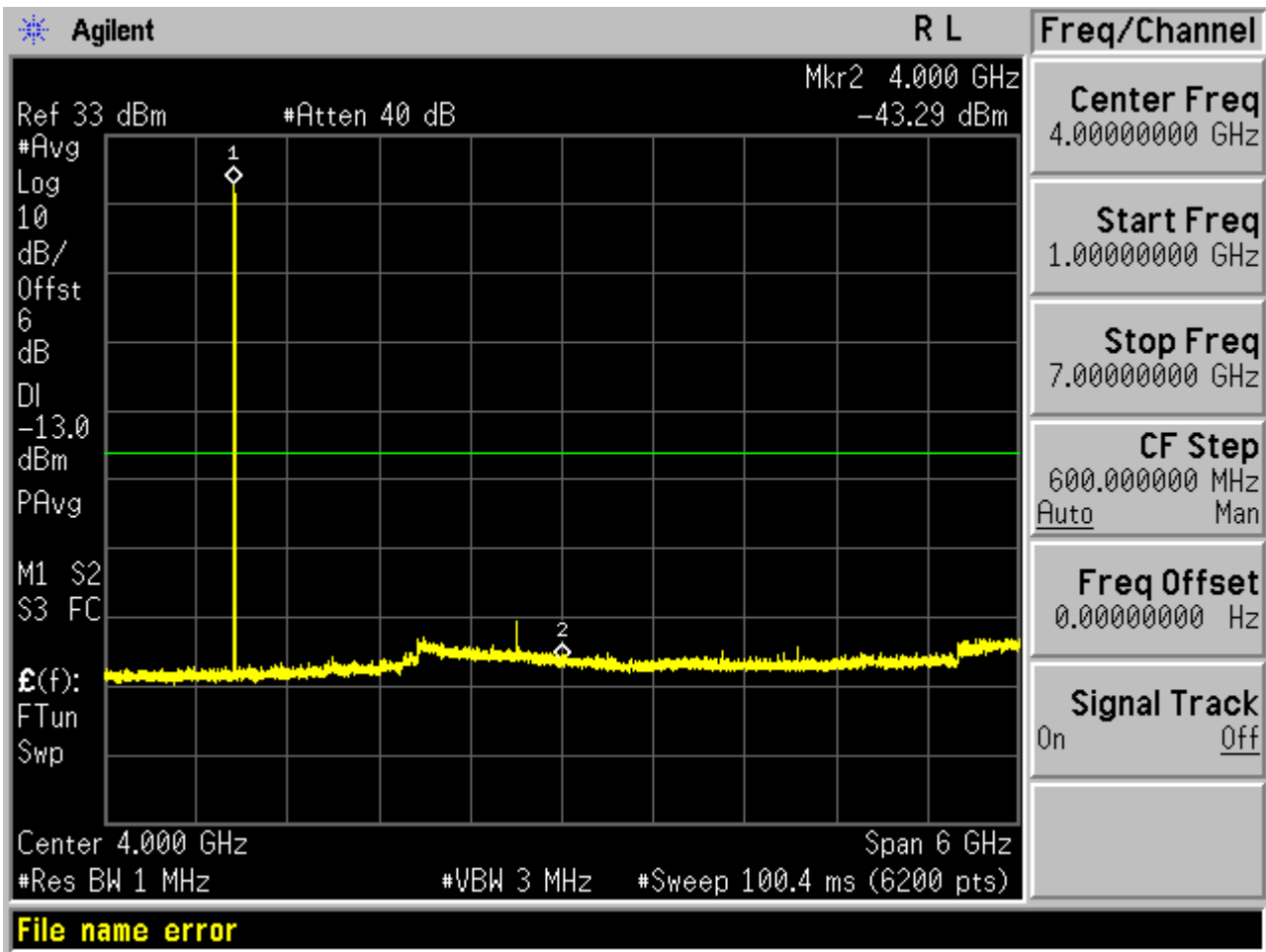


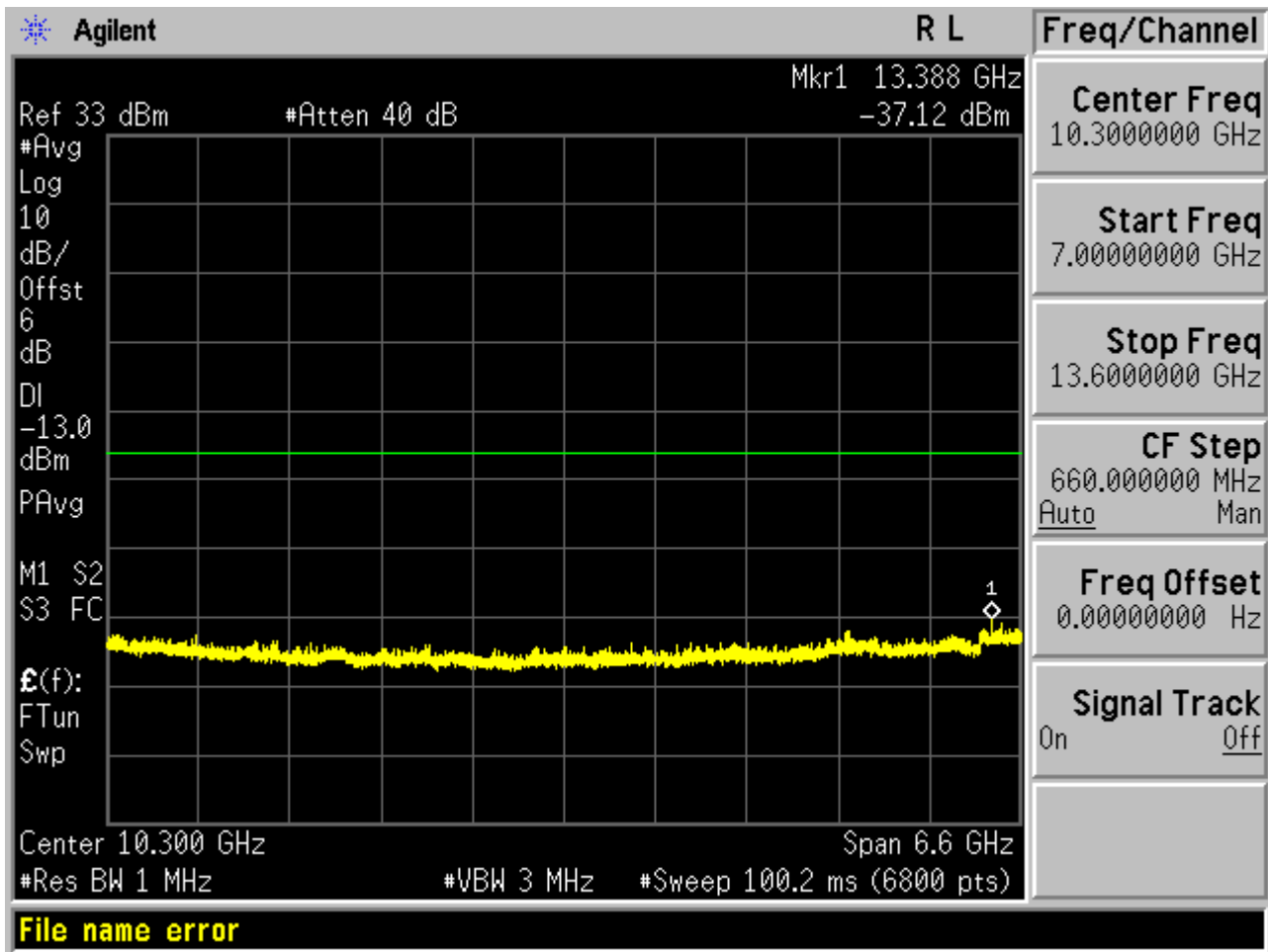
Test Band=GSM1900

Test Mode=GSM/TM1

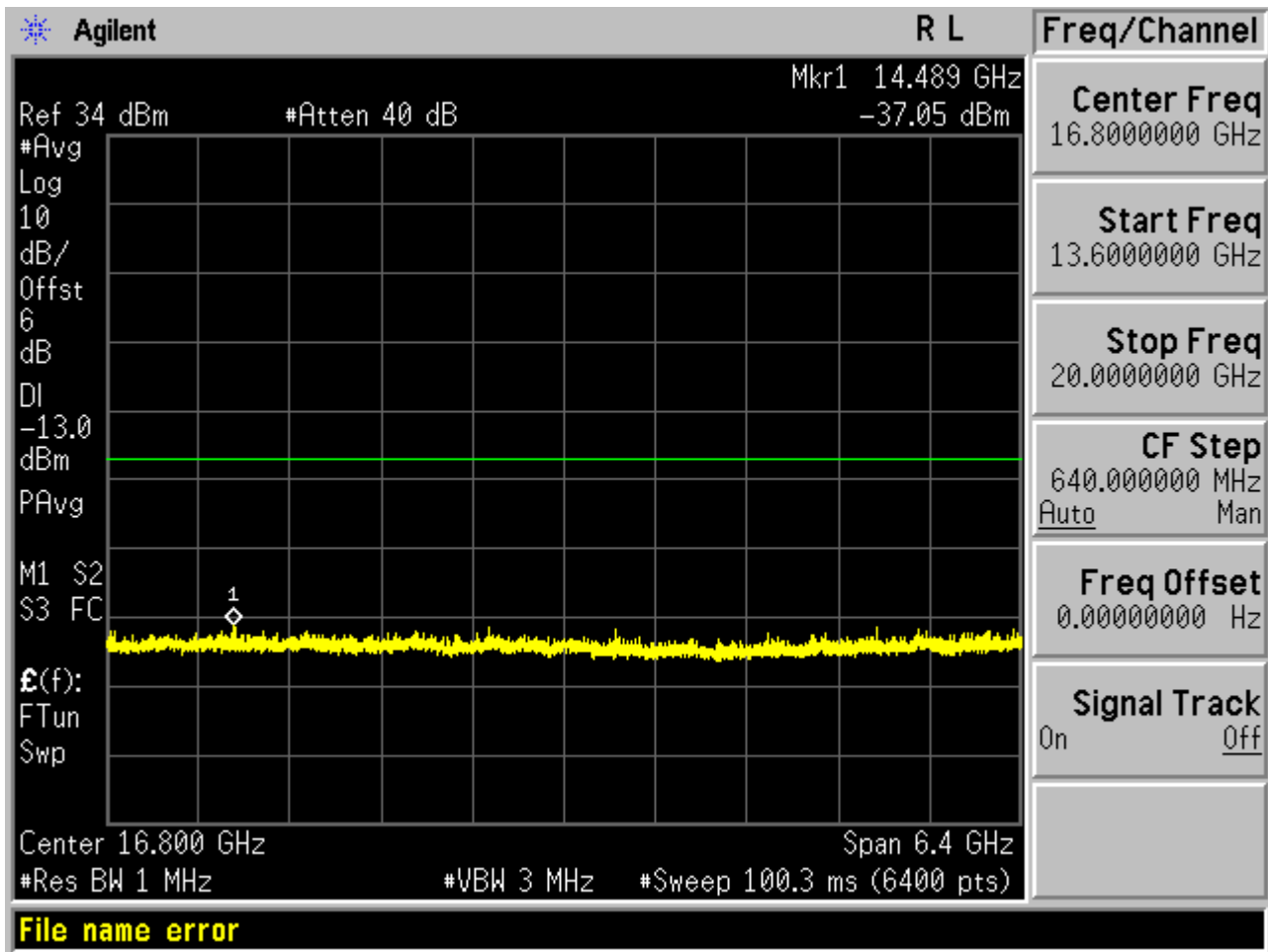
Test Channel=LCH



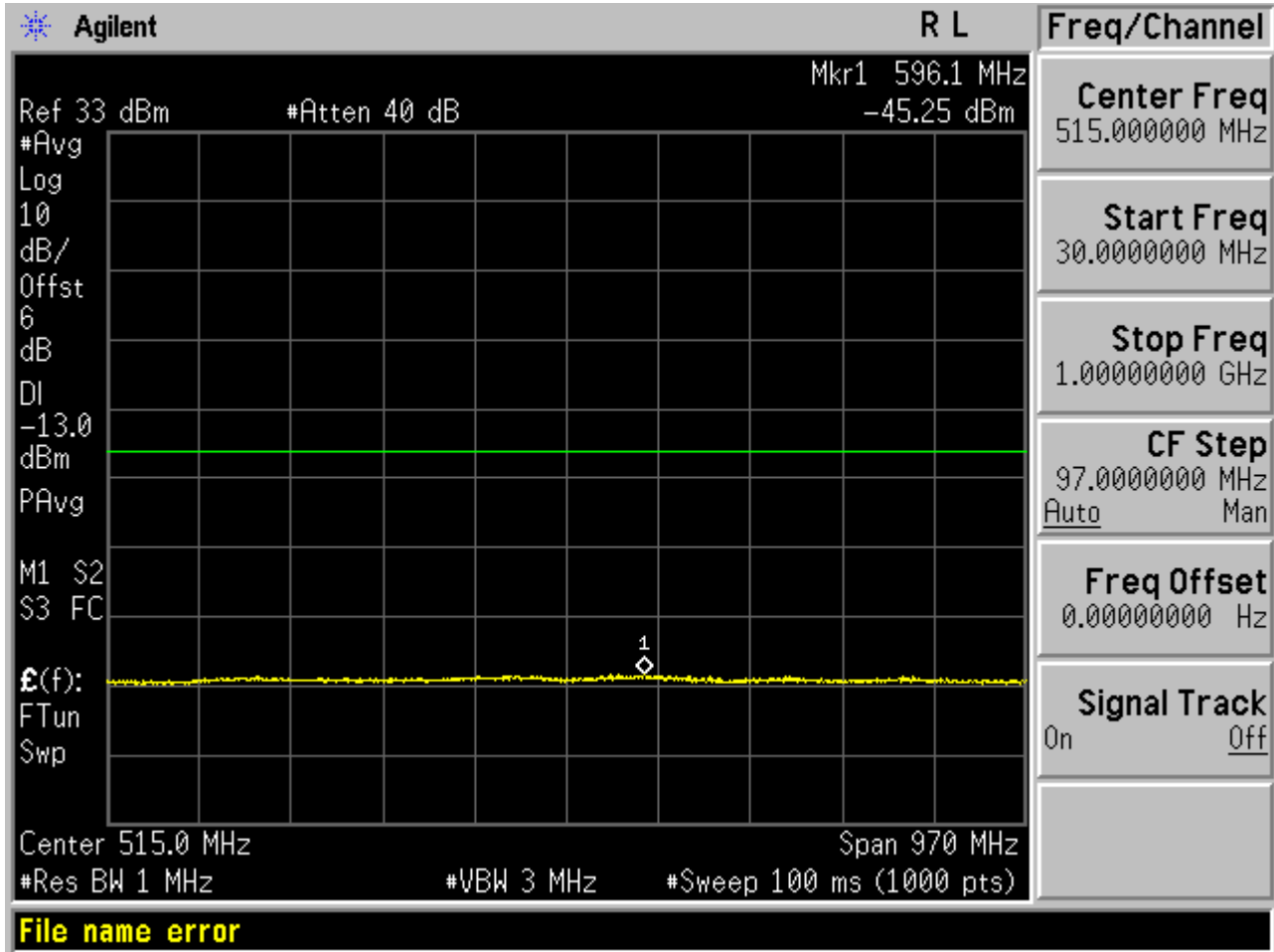


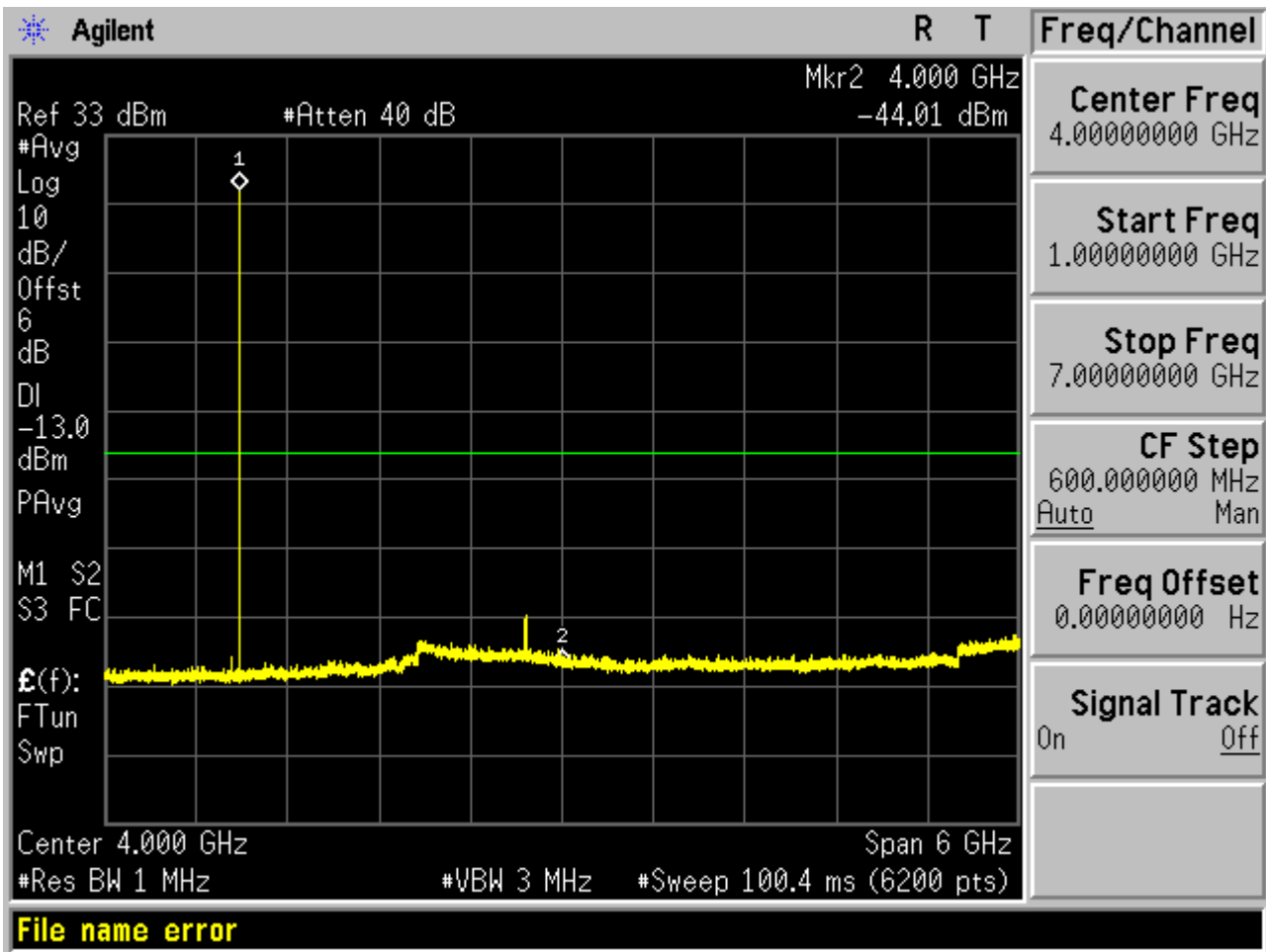


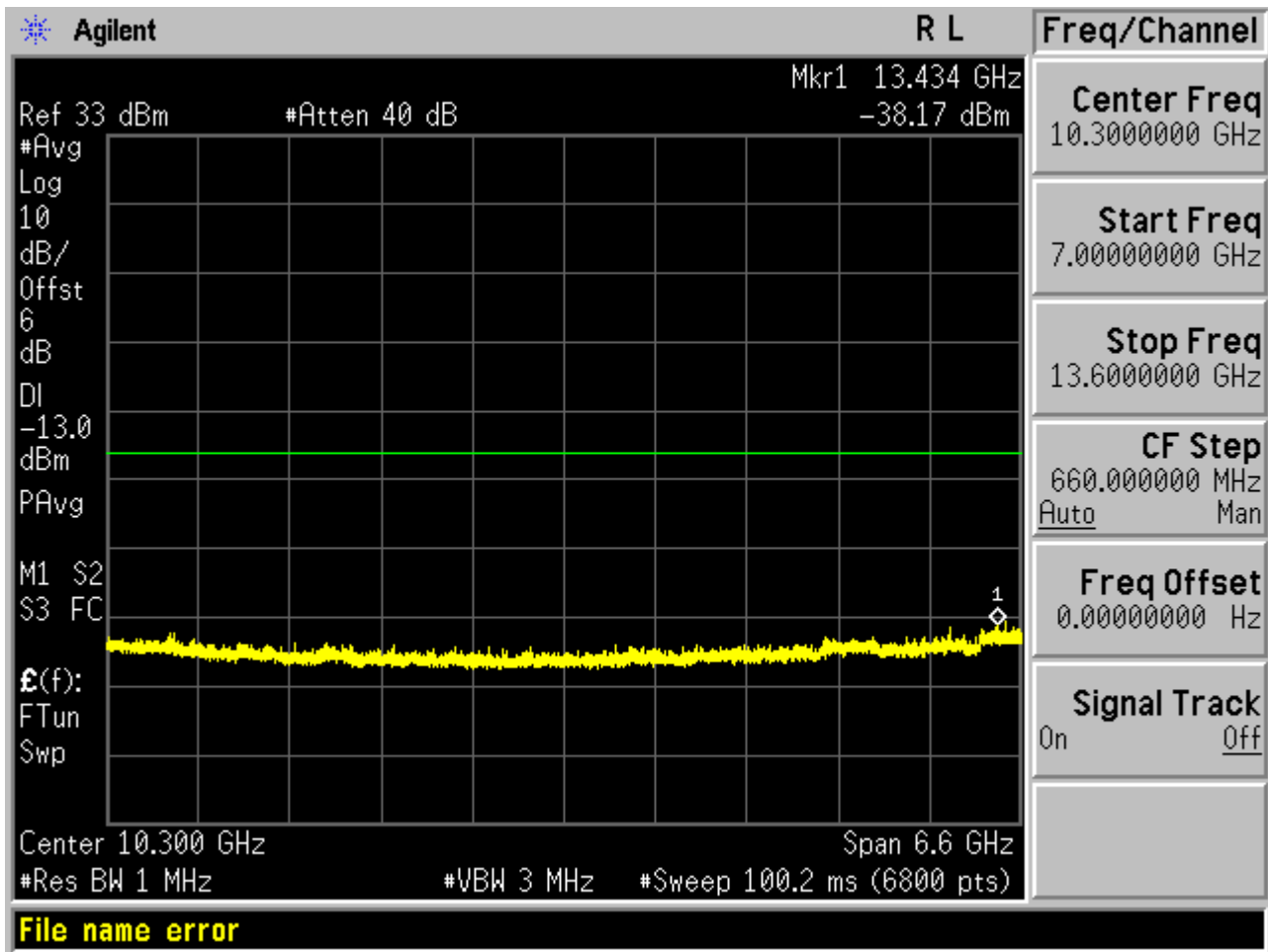


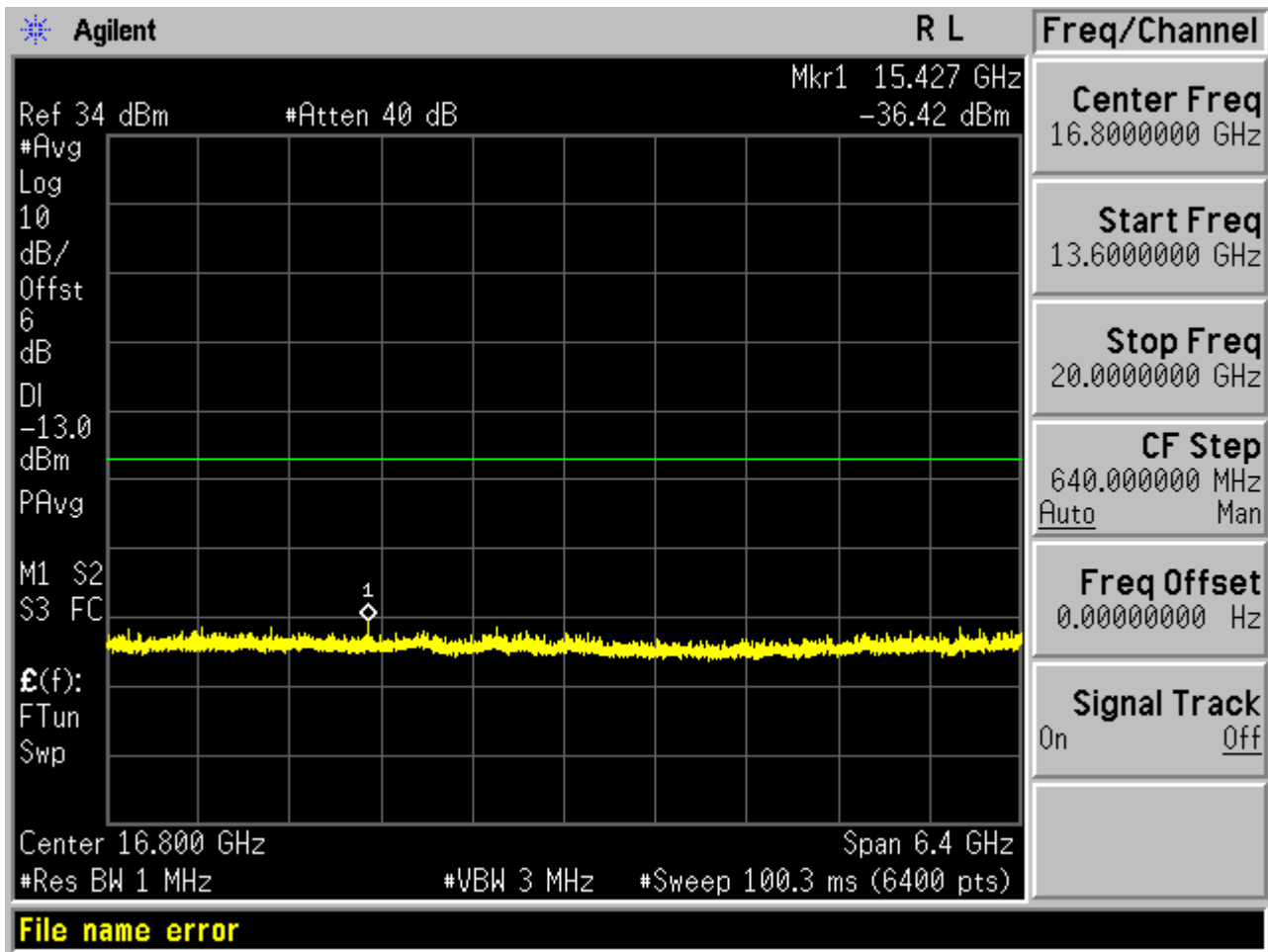


Test Channel=MCH

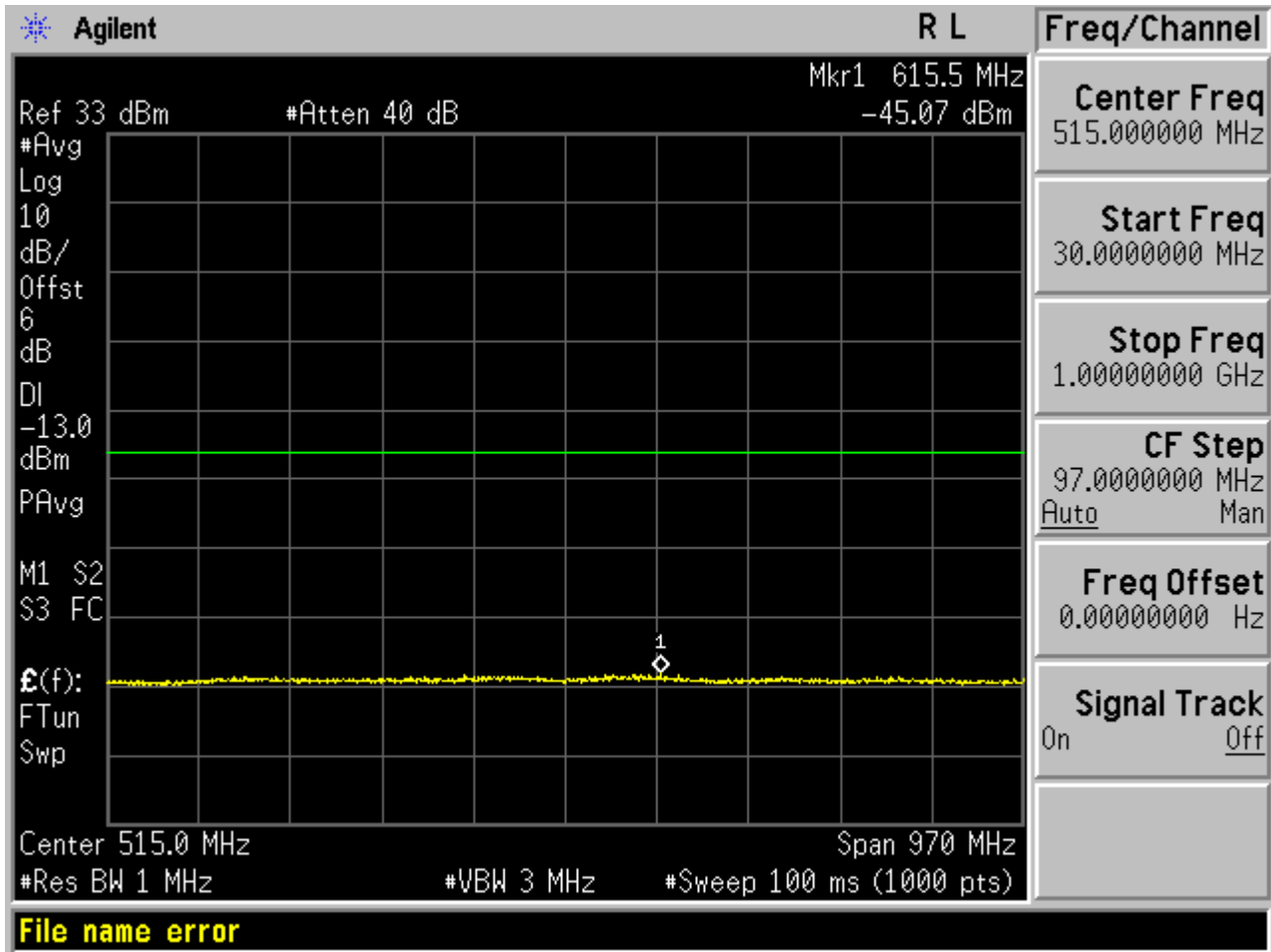


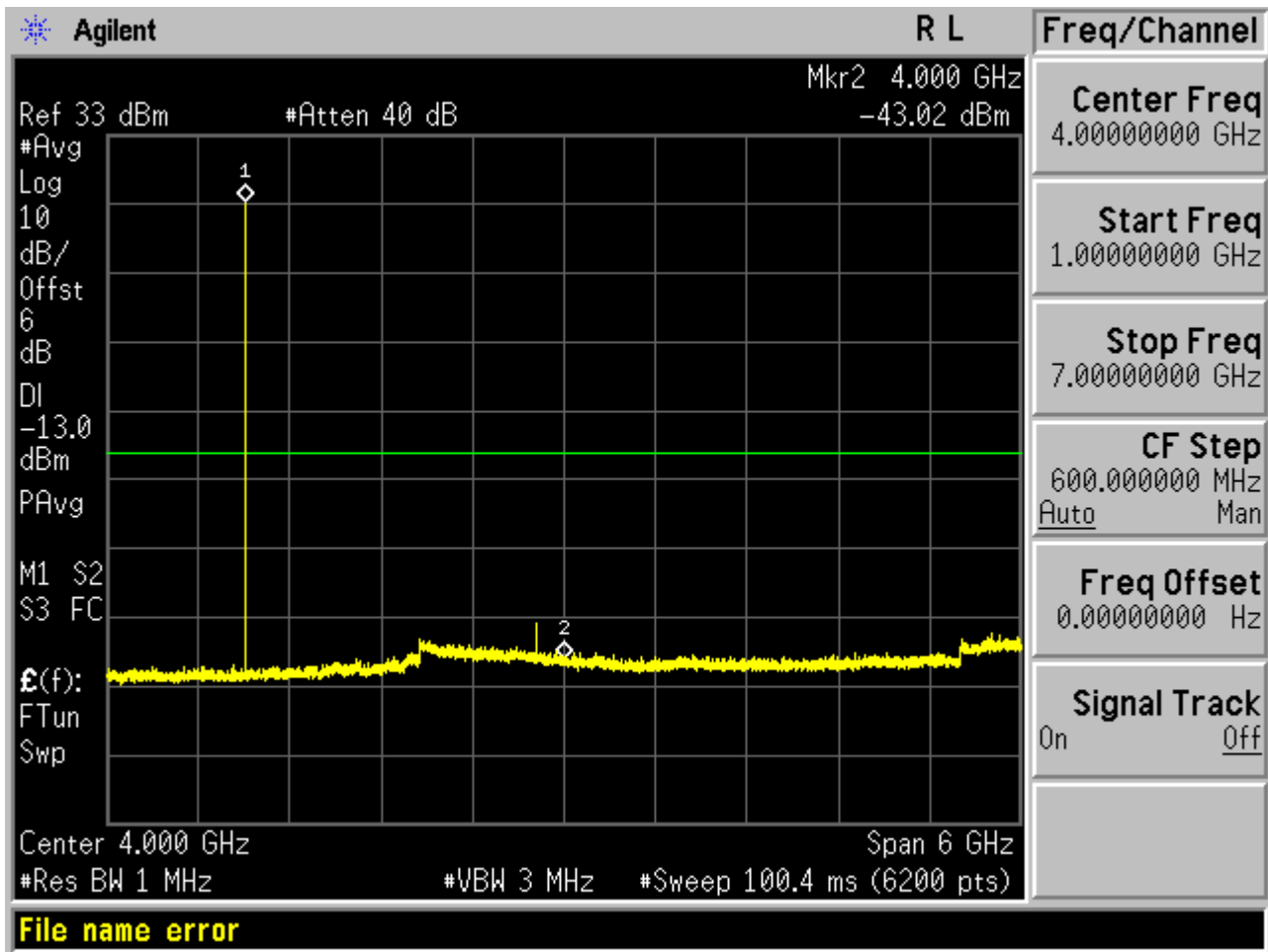


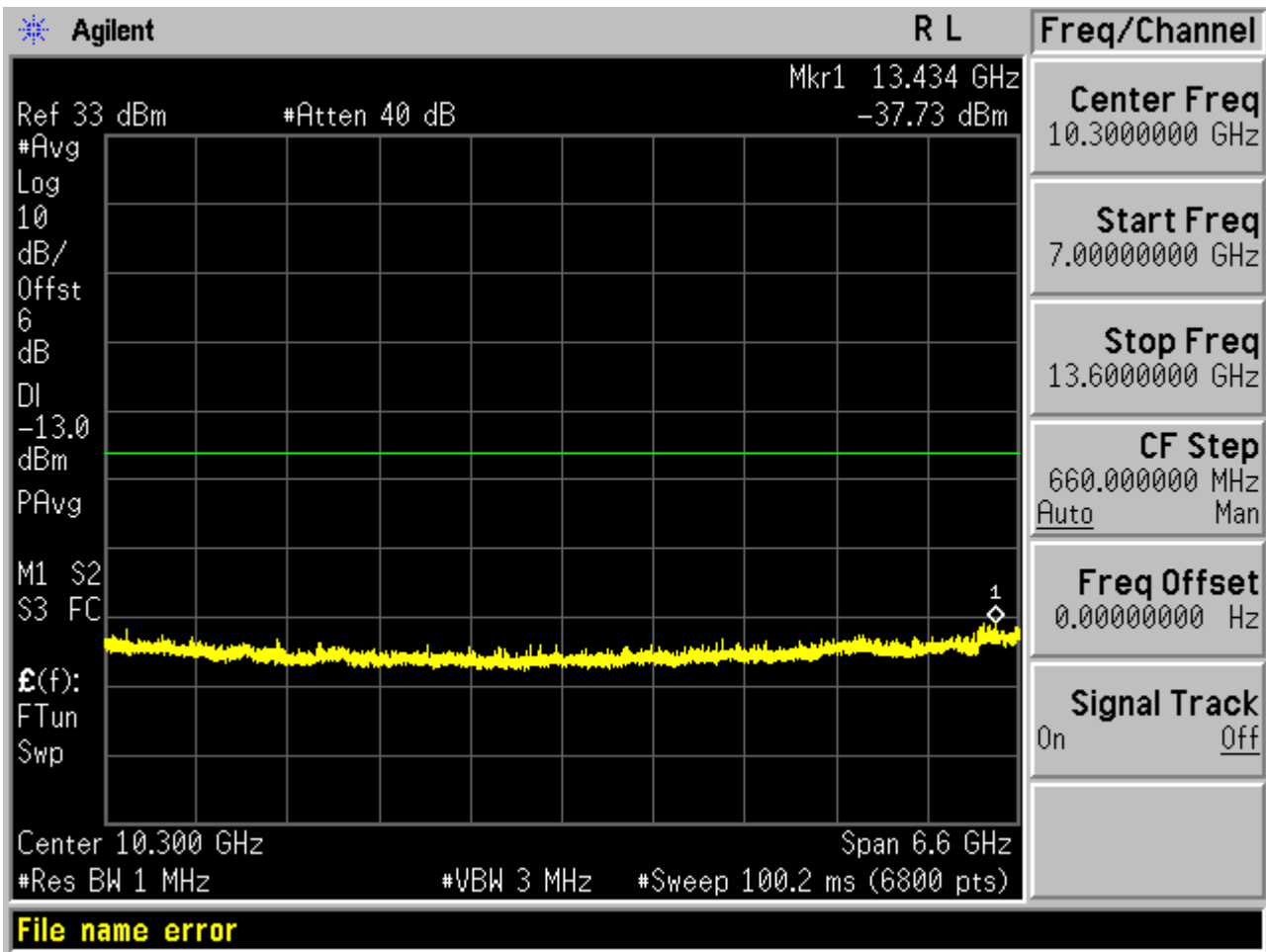




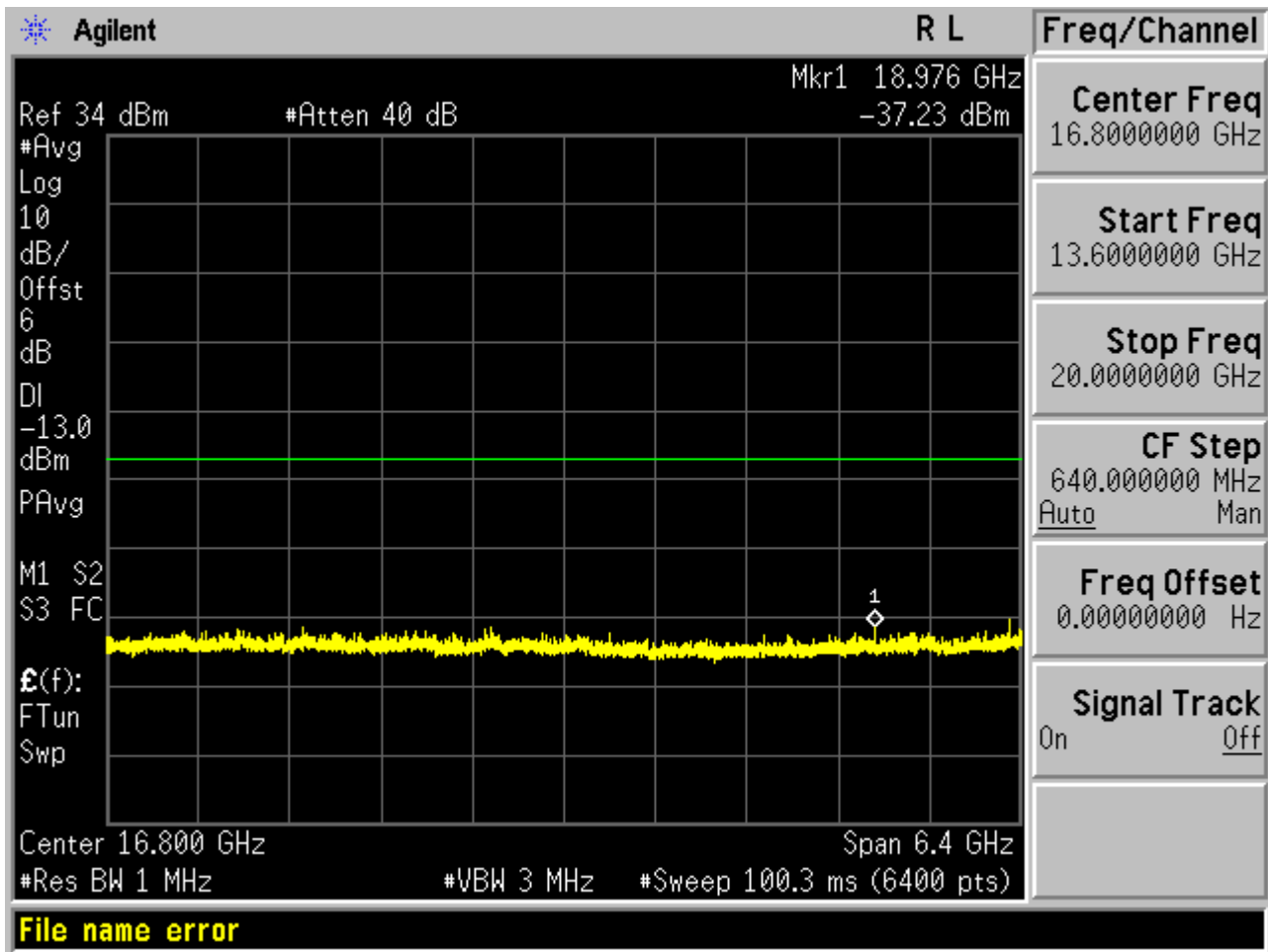
Test Channel=HCH





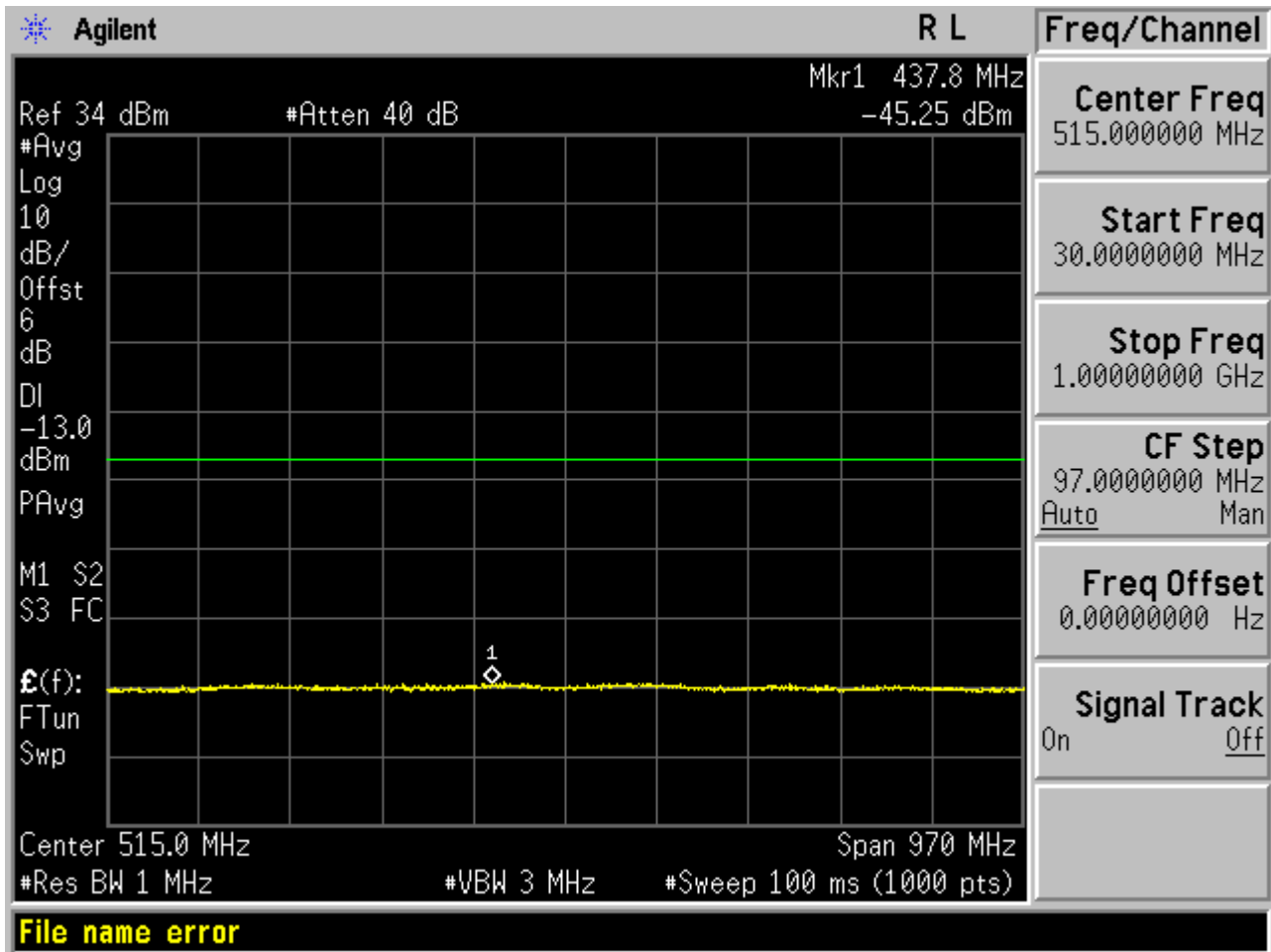


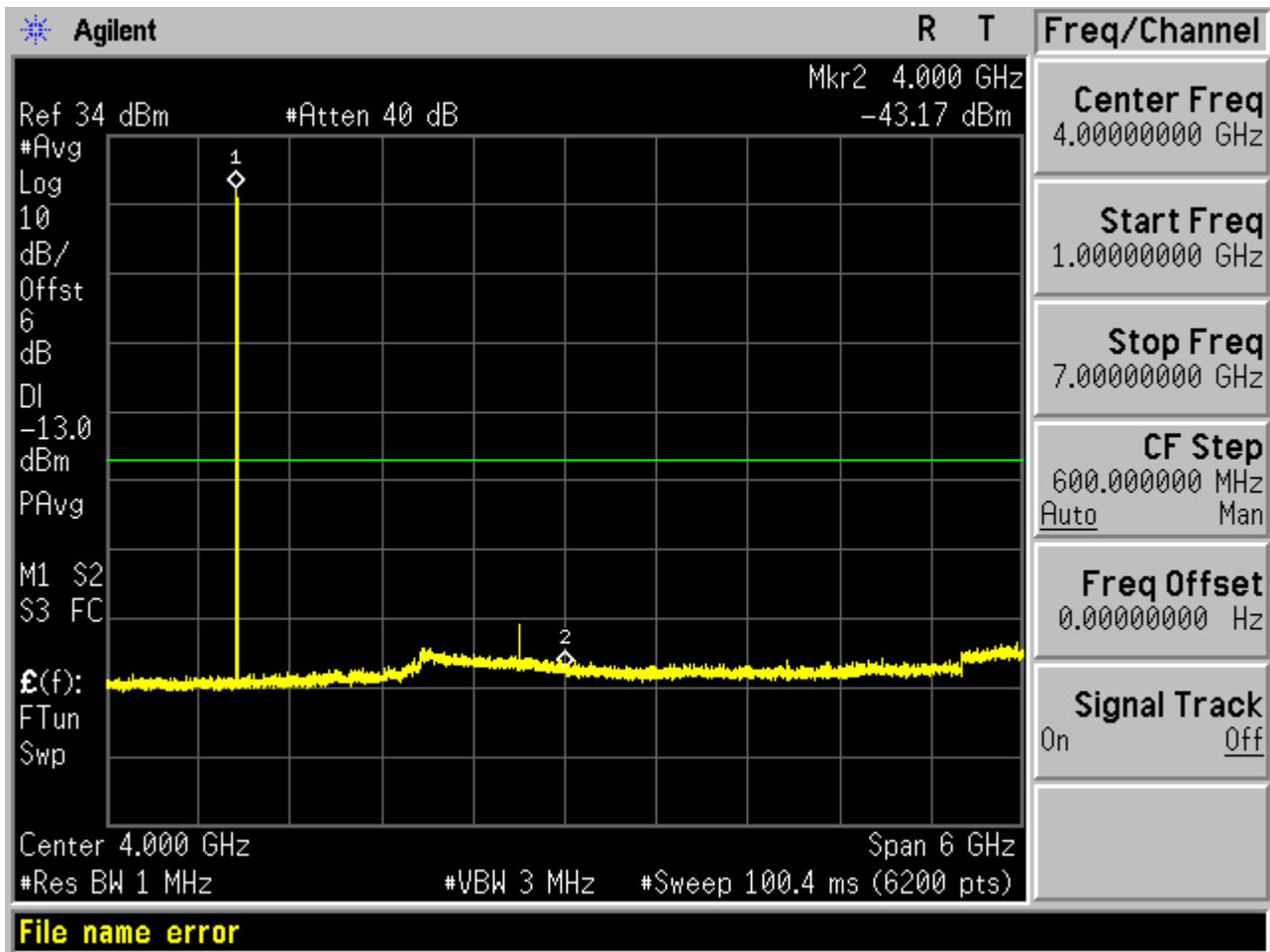


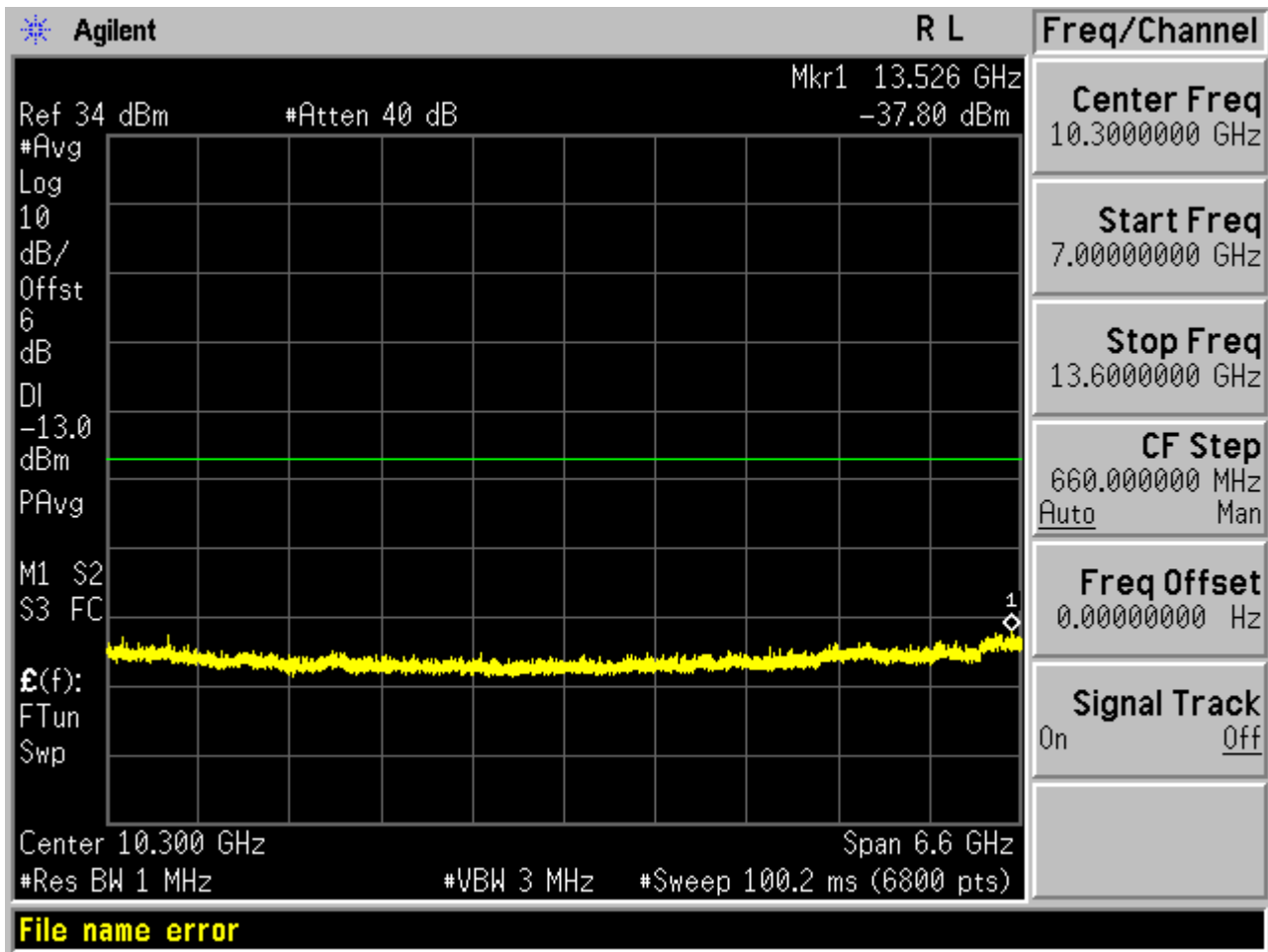


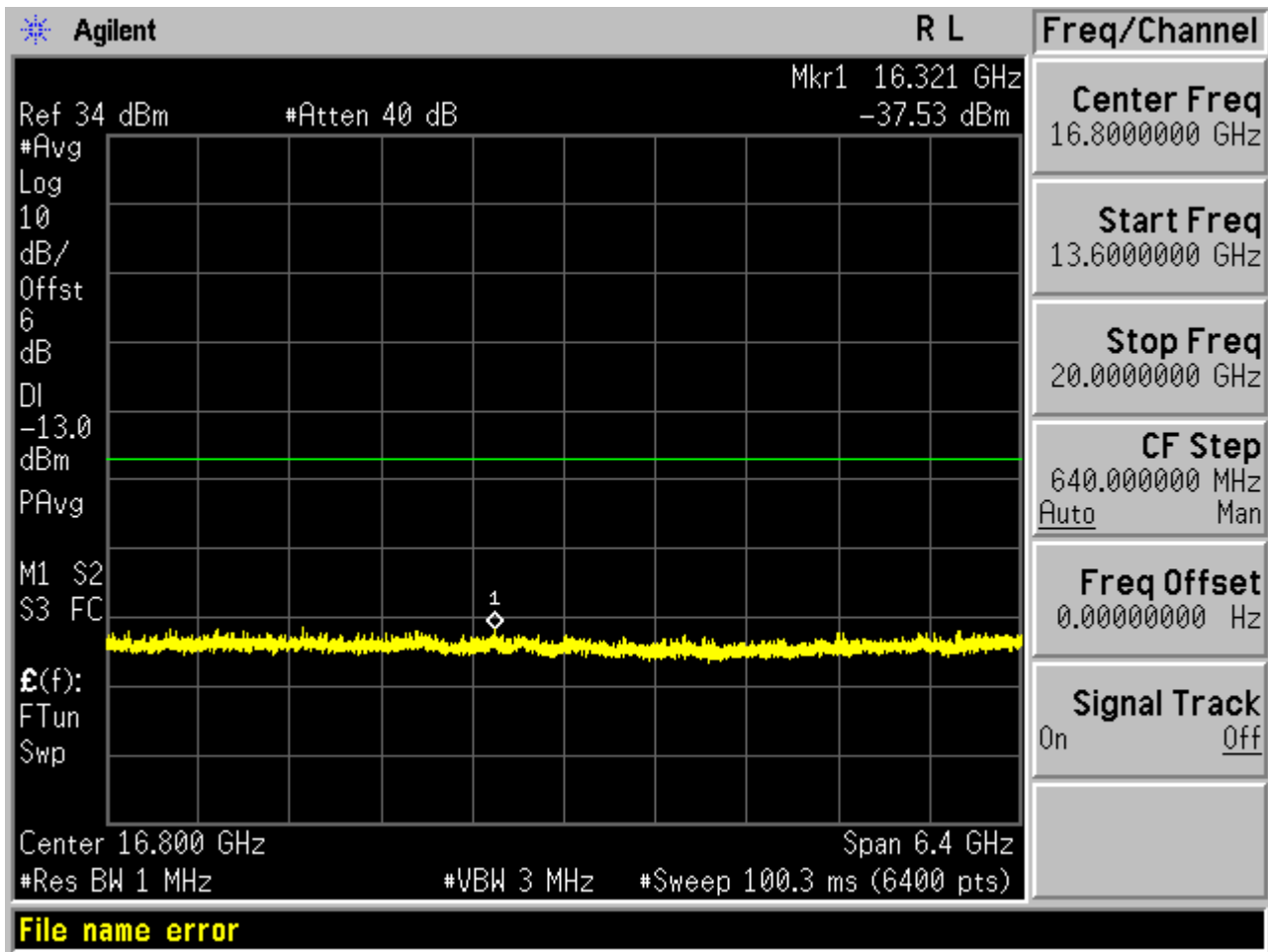
Test Mode=GSM/TM2

Test Channel=LCH

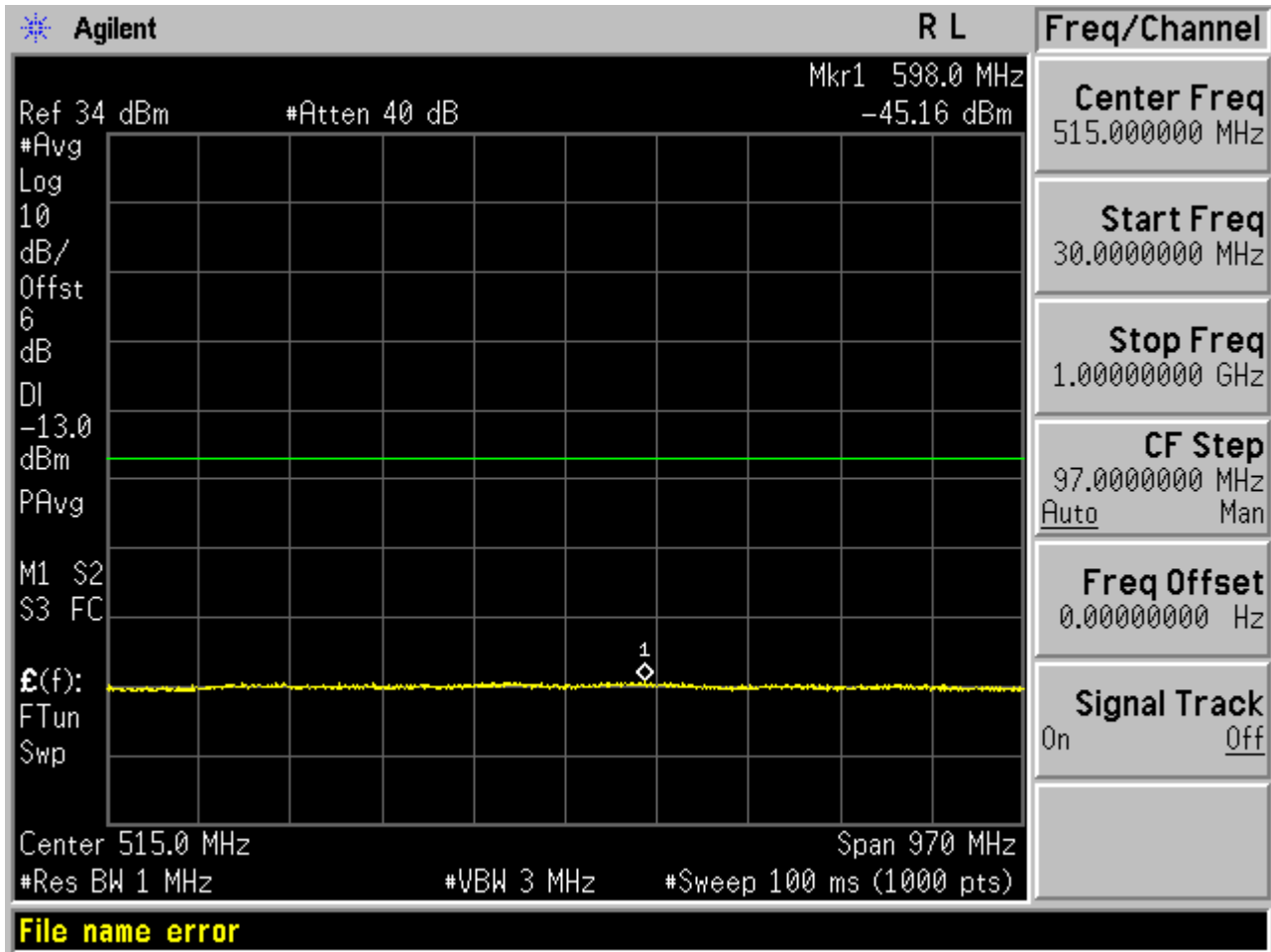


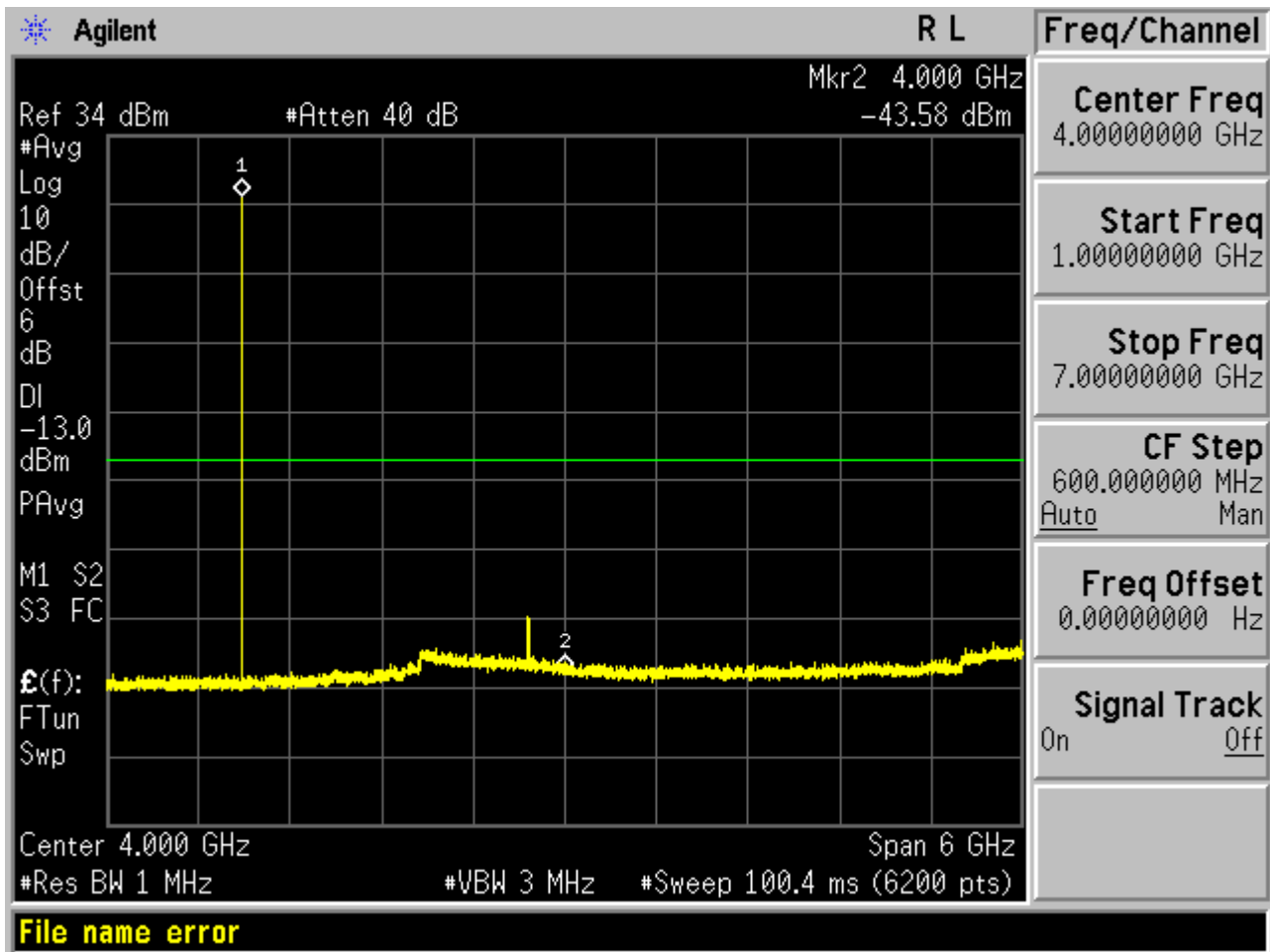


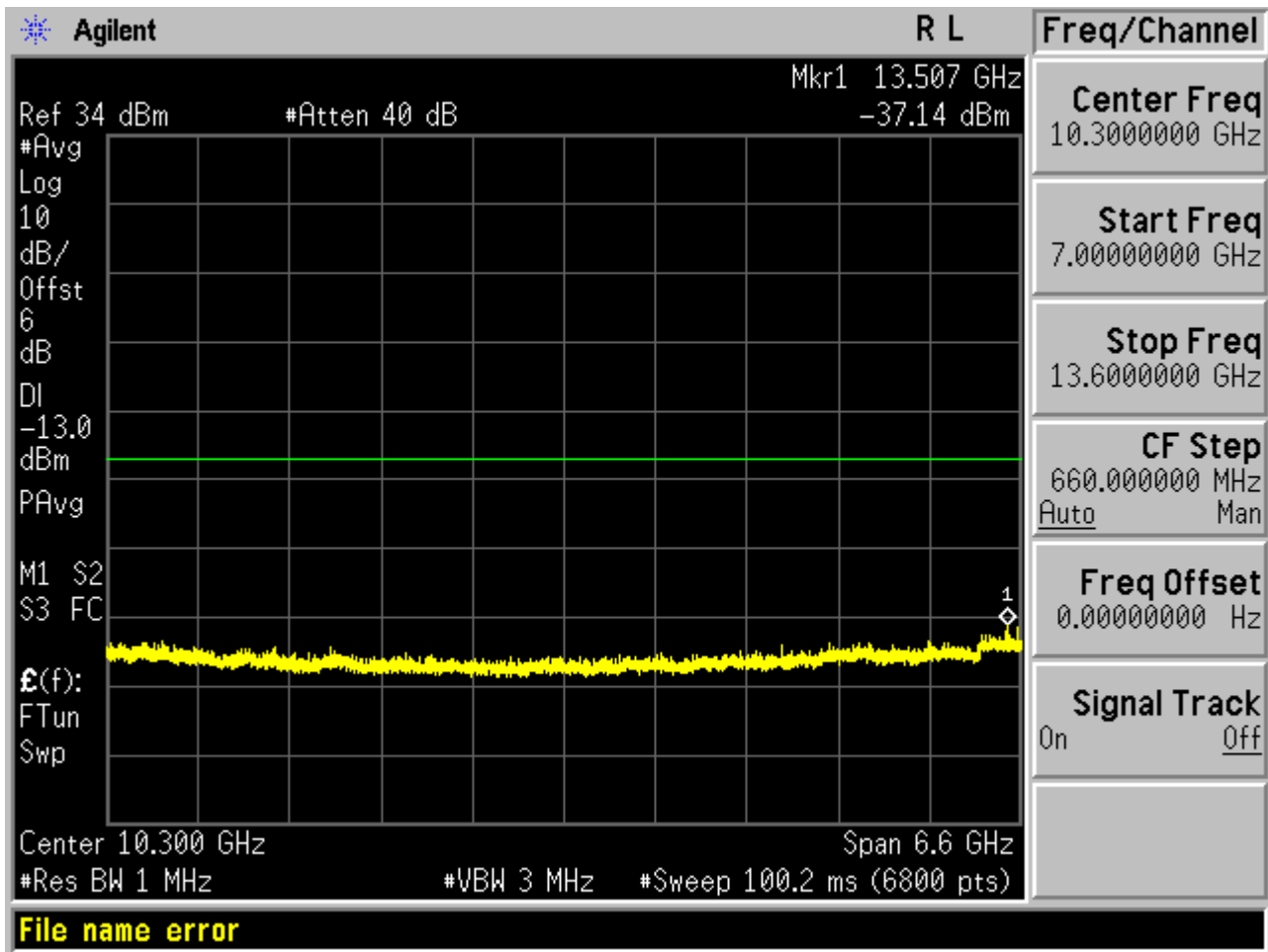




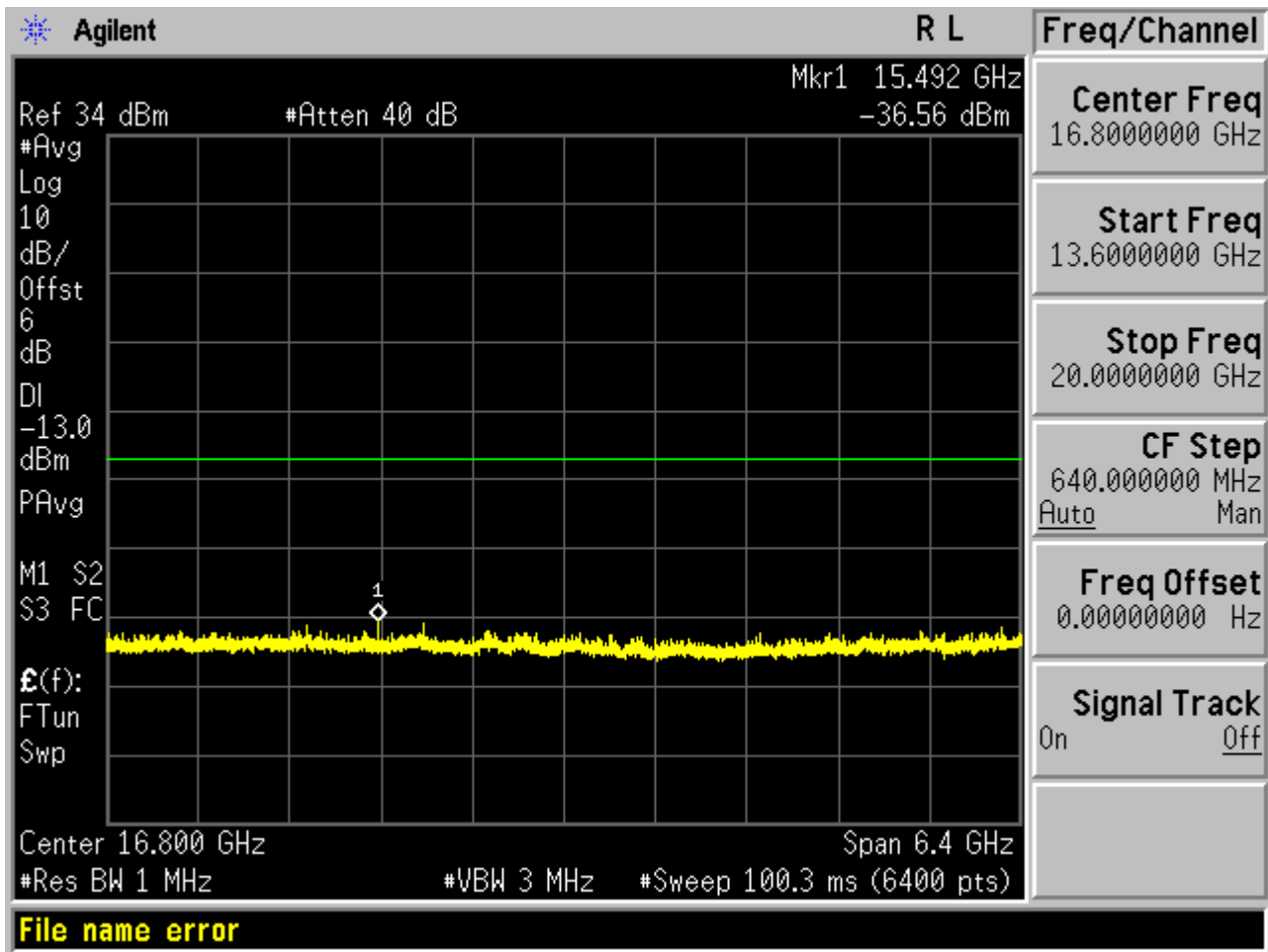
Test Channel=MCH



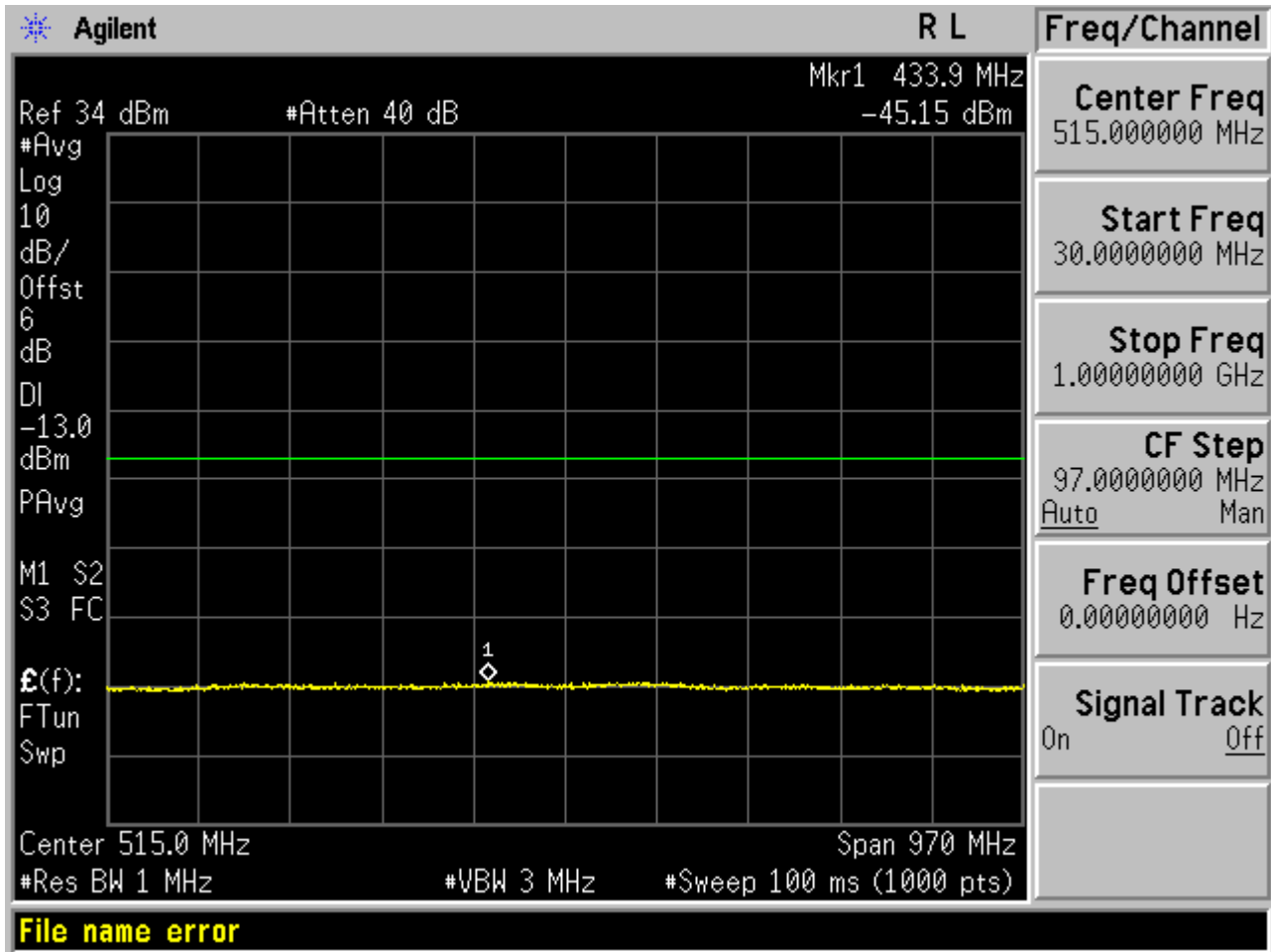


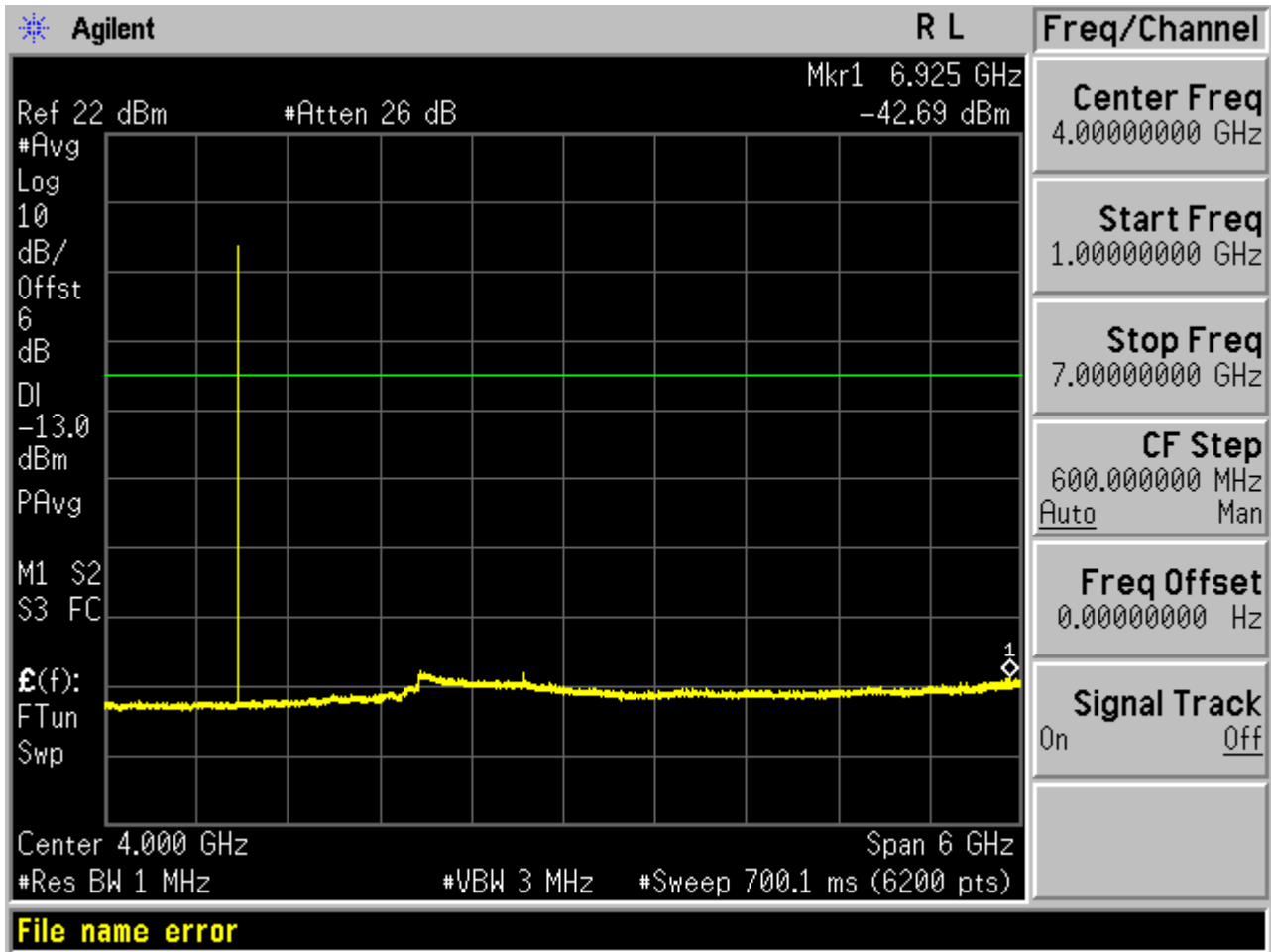


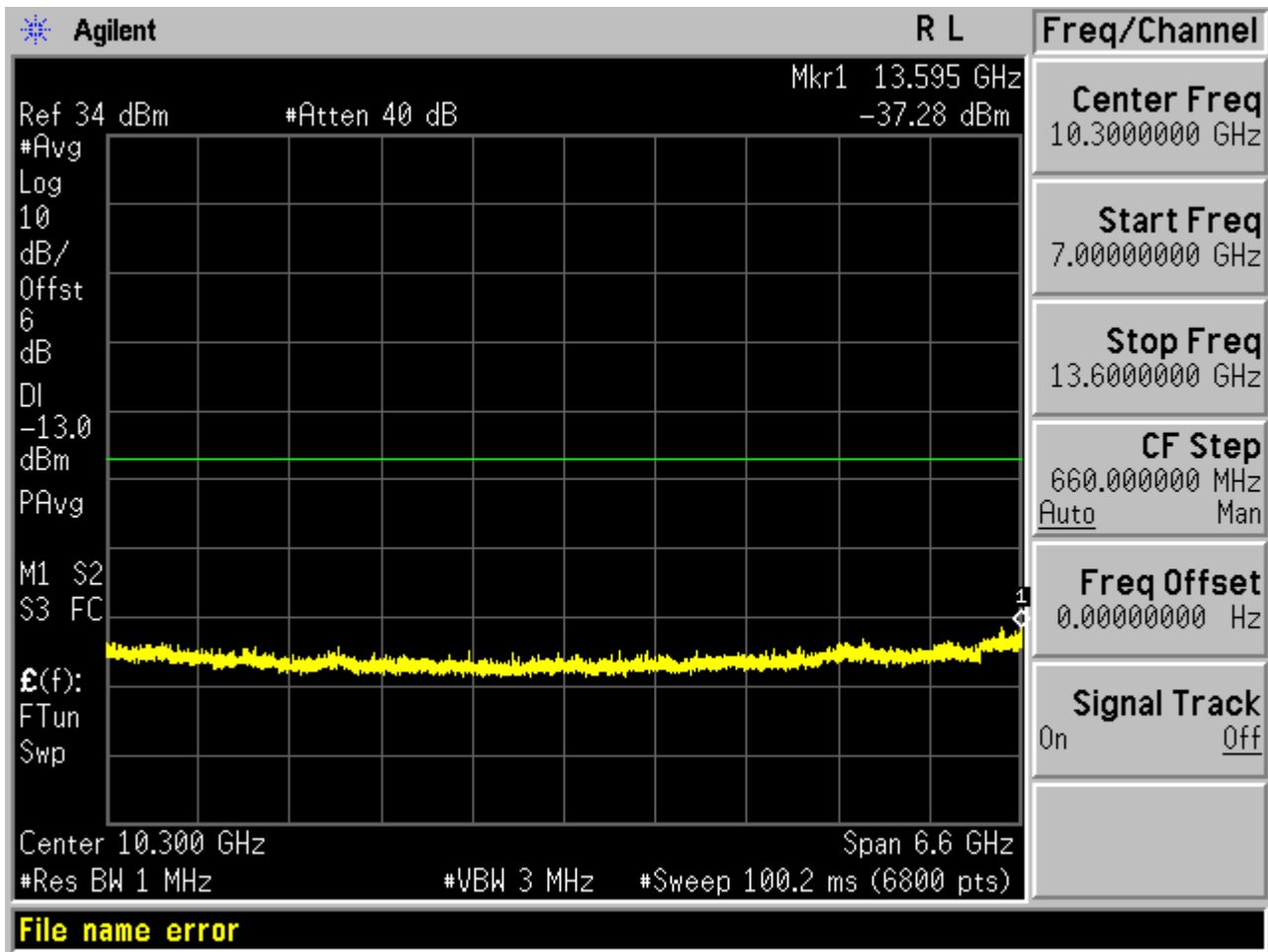


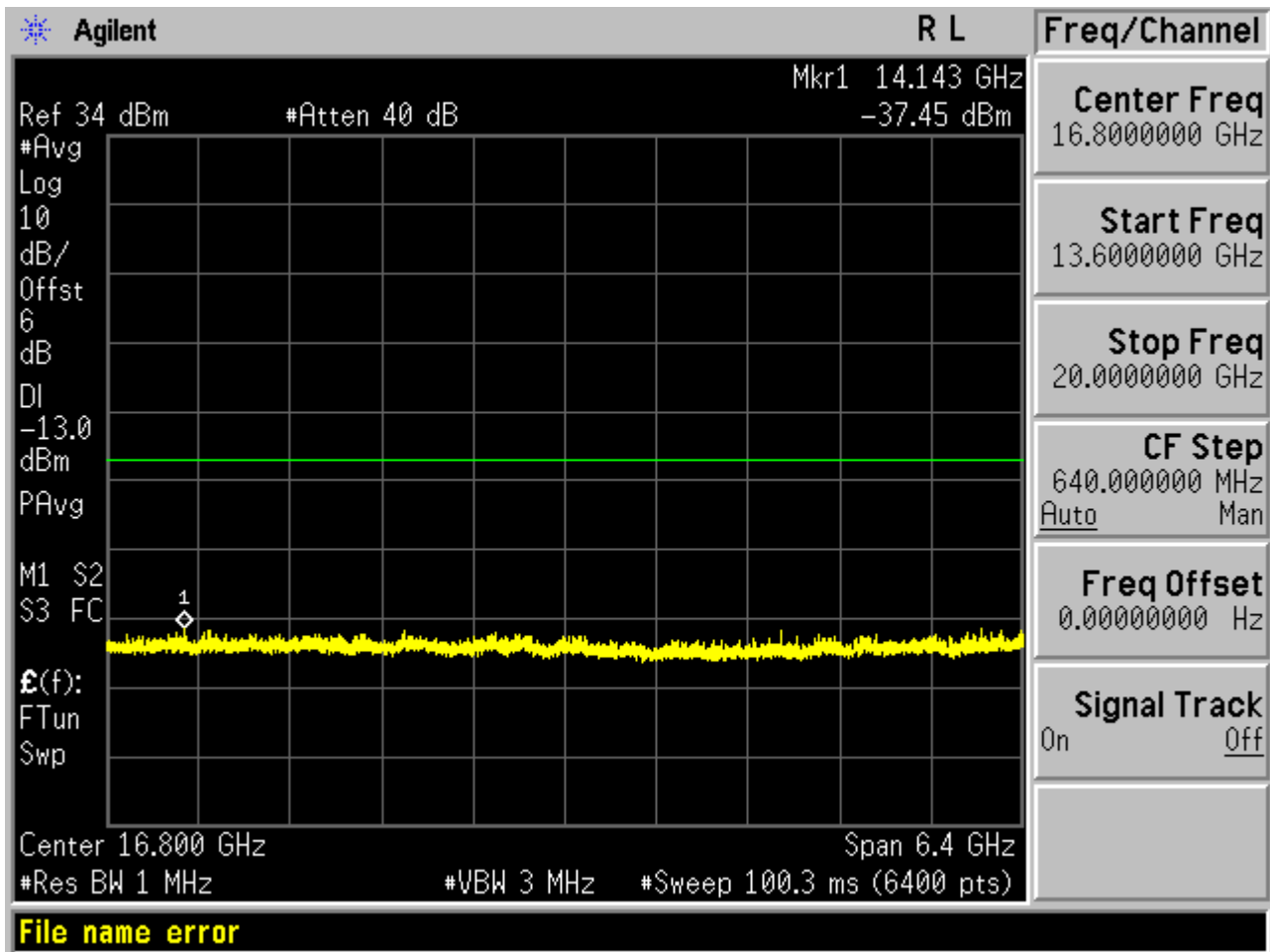


Test Channel=HCH









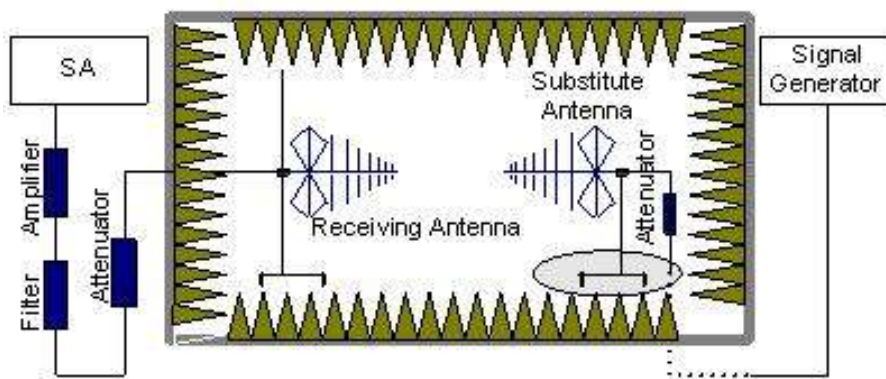
## 10.2 RADIATED SPURIOUS EMISSION

### 10.2.1 MEASUREMENT METHOD

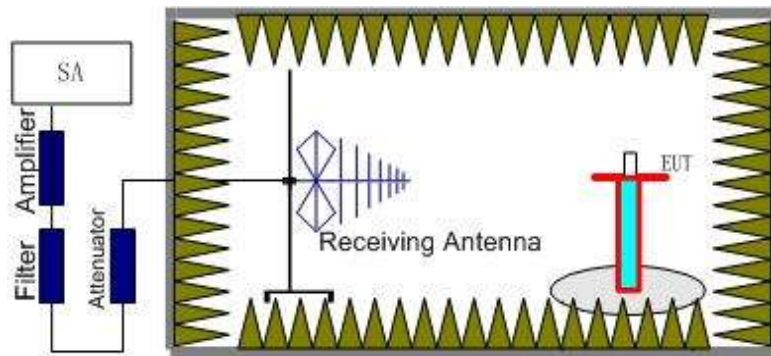
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GSM, GPRS) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for both GSM band and PCS band.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as,  $RSE = R_x (\text{dBuV}) + CL (\text{dB}) + SA (\text{dB}) + \text{Gain} (\text{dBi}) - 107 (\text{dBuV to dBm})$  The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the PCS1900 ,GSM850 into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below:  $Power = P_{Mea} + A_{Rpl}$

### 10.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a IMOBOnsee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least  $43 + 10 \log(P)$  dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**10.2.3 MEASUREMENT RESULT**

| <b>The Worst Test Results for Channel 128 / 824.2 MHz</b> |            |            |           |             |            |
|---|------------|------------|-----------|-------------|------------|
| Frequency(MHz)  | Power(dBm) | ARpl (dBm) | PMea(dBm) | Limit (dBm) | Polarity   |
| 1648.00   | -43.55     | -5.01      | -48.56    | -13.00      | Horizontal |
| 1752.00   | -43.41     | -2.18      | -45.59    | -13.00      | Vertical   |
| 2472.00   | -46.83     | 3.46       | -43.37    | -13.00      | Horizontal |
| 9086.00   | -45.49     | 2.79       | -42.70    | -13.00      | Horizontal |

| <b>The Worst Test Results for Channel 190/836.6 MHz</b> |            |            |           |             |            |
|---|------------|------------|-----------|-------------|------------|
| Frequency(MHz)  | Power(dBm) | ARpl (dBm) | PMea(dBm) | Limit (dBm) | Polarity   |
| 1673.00   | -44.25     | -3.22      | -47.47    | -13.00      | Horizontal |
| 1903.00   | -46.29     | -0.24      | -46.53    | -13.00      | Vertical   |
| 9089.00   | -45.42     | 3.98       | -41.44    | -13.00      | Vertical   |

| <b>The Worst Test Results for Channel 251/848.8 MHz</b> |            |            |           |             |            |
|---|------------|------------|-----------|-------------|------------|
| Frequency(MHz)  | Power(dBm) | ARpl (dBm) | PMea(dBm) | Limit (dBm) | Polarity   |
| 1698.00   | -46.53     | -2.26      | -48.79    | -13.00      | Horizontal |
| 1888.50   | -47.78     | -3.12      | -50.90    | -13.00      | Vertical   |
| 2131.00   | -48.83     | -1.74      | -50.57    | -13.00      | Vertical   |
| 9089.00   | -45.61     | 8.46       | -37.15    | -13.00      | Horizontal |

| <b>The Worst Test Results for Channel 512/1850.2 MHz</b> |            |            |           |             |            |
|--|------------|------------|-----------|-------------|------------|
| Frequency(MHz)   | Power(dBm) | ARpl (dBm) | PMea(dBm) | Limit (dBm) | Polarity   |
| 1999.00  | -53.87     | -1.5       | -55.37    | -13.00      | Horizontal |
| 3700.00  | -57.61     | 8.74       | -48.87    | -13.00      | Horizontal |
| 12950.40   | -55.23     | 11.56      | -43.67    | -13.00      | Vertical   |
| 17919.60   | -52.67     | 17.89      | -34.78    | -13.00      | Vertical   |



| <b>The Worst Test Results for Channel 661/1880.0 MHz</b> |            |            |           |             |            |
|--|------------|------------|-----------|-------------|------------|
| Frequency(MHz)   | Power(dBm) | ARpl (dBm) | PMea(dBm) | Limit (dBm) | Polarity   |
| 2000.50  | -53.26     | 2.7        | -50.56    | -13.00      | Vertical   |
| 9399.00  | -53.29     | 11.6       | -41.69    | -13.00      | Vertical   |
| 13160.40   | -54.64     | 14.89      | -39.75    | -13.00      | Horizontal |
| 15039.60   | -54.61     | 13.87      | -40.74    | -13.00      | Vertical   |
| 17941.20   | -55.38     | 19.76      | -35.62    | -13.00      | Horizontal |
| <b>The Worst Test Results for Channel 810/1909.8 MHz</b> |            |            |           |             |            |
| Frequency(MHz)   | Power(dBm) | ARpl (dBm) | PMea(dBm) | Limit (dBm) | Polarity   |
| 2000.00  | -56.65     | 2.32       | -54.33    | -13.00      | Vertical   |
| 9548.50  | -55.89     | 11.3       | -44.59    | -13.00      | Horizontal |
| 13367.40   | -54.94     | 12.4       | -42.54    | -13.00      | Horizontal |
| 15277.80   | -56.72     | 15.03      | -41.69    | -13.00      | Vertical   |
| 17931.60   | -54.35     | 19         | -35.35    | -13.00      | Horizontal |

**Note:** ARpl= Factor=Antenna Factor+ Cable loss-Amplifier gain.

The "Factor" value can be calculated automatically by software of measurement system.

Below 30MHZ no Spurious found and The GSM modes is the worst condition.

## 11. MAINS CONDUCTED EMISSION

### 11.1 MEASUREMENT METHOD

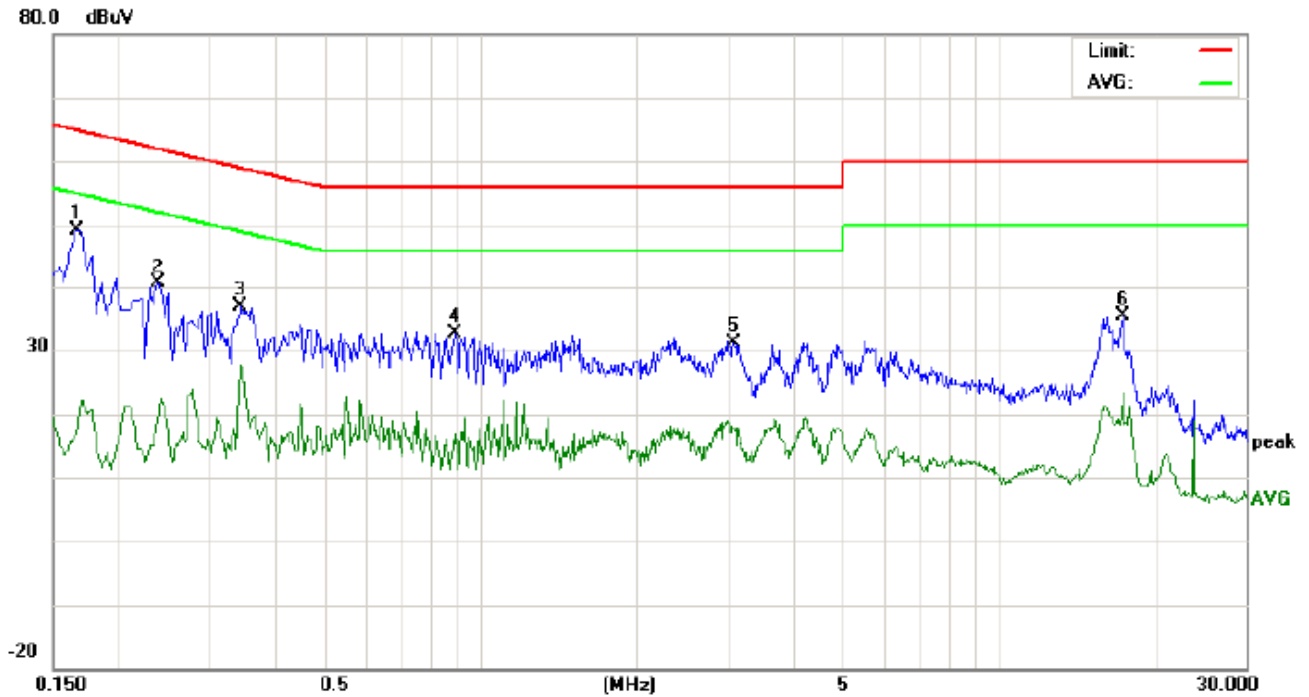
The measurement procedure specified in ANSI C63.4-2003 was used for testing. Conducted Emission was measured with travel charger.

### 11.2 PROVISIONS APPLICABLE

| Frequency of Emission (MHz)  | Conducted Limit(dBuV) |            |
|--|-----------------------|------------|
|  | Quasi-Peak            | Average    |
| 0.15 – 0.5   | 66 to 56 *            | 56 to 46 * |
| 0.5 – 5  | 56                    | 46         |
| 5 – 30   | 60                    | 50         |
| *Decreases with the logarithm of the frequency.<br>*The lower limit shall apply at the transition frequency. |                       |            |

### 11.3 MEASUREMENT RESULT

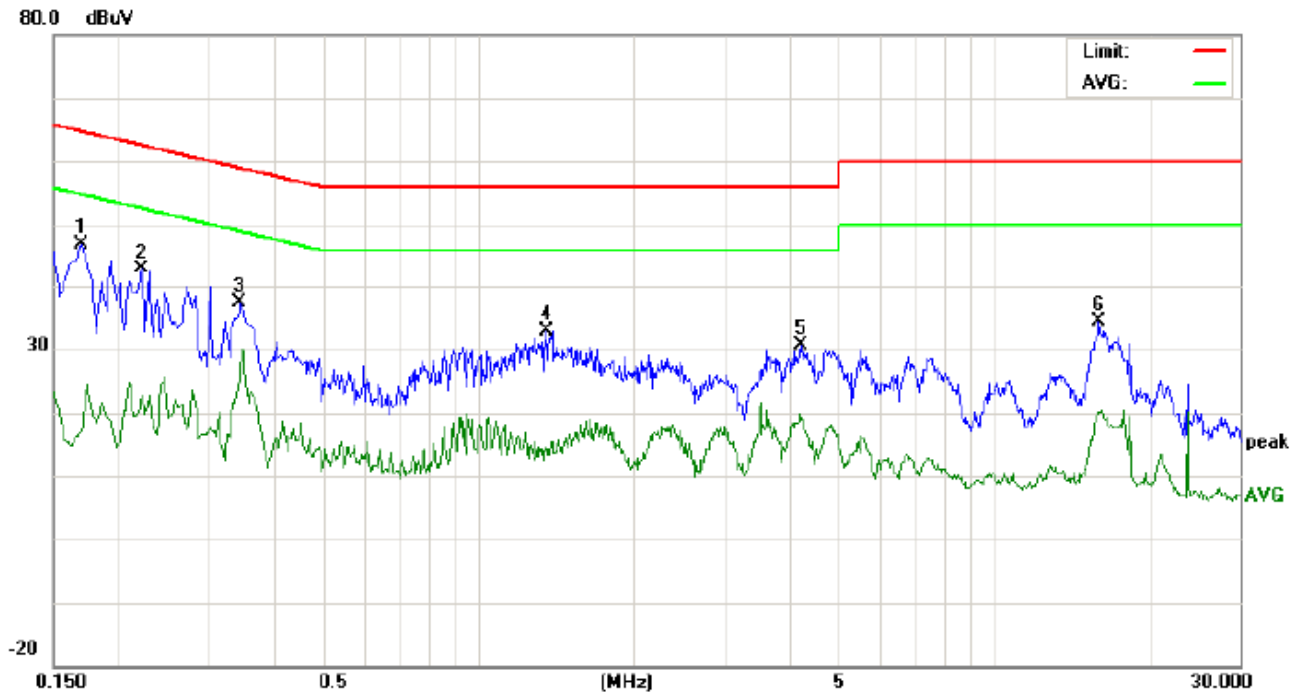
#### LINE CONDUCTED EMISSION – L1



Site: Conduction Phase: **L1** Temperature: 26  
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60 %  
 EUT: mobile phone  
 M/N: AM208  
 Mode: Call  
 Note:

| No. | Freq. (MHz) | Reading_Level (dBuV) |    |       | Correct Factor (dB) | Measurement (dBuV) |       |       | Limit (dBuV) |        | Margin (dB) |     | P/F | Comment |
|-----|-------------|----------------------|----|-------|---------------------|--------------------|-------|-------|--------------|--------|-------------|-----|-----|---------|
|     |             | Peak                 | QP | AVG   |                     | Peak               | QP    | AVG   | QP           | AVG    | QP          | AVG |     |         |
| 1   | 0.1660      | 38.94                |    | 6.78  | 10.18               | 49.12              | 16.96 | 65.15 | 55.15        | -16.03 | -38.19      | P   |     |         |
| 2   | 0.2380      | 30.38                |    | 8.95  | 10.26               | 40.64              | 19.21 | 62.16 | 52.16        | -21.52 | -32.95      | P   |     |         |
| 3   | 0.3460      | 26.57                |    | 17.39 | 10.31               | 36.88              | 27.70 | 59.06 | 49.06        | -22.18 | -21.36      | P   |     |         |
| 4   | 0.8980      | 22.22                |    | 4.99  | 10.41               | 32.63              | 15.40 | 56.00 | 46.00        | -23.37 | -30.60      | P   |     |         |
| 5   | 3.0780      | 20.63                |    | 7.13  | 10.54               | 31.17              | 17.67 | 56.00 | 46.00        | -24.83 | -28.33      | P   |     |         |
| 6   | 17.2979     | 25.26                |    | 13.32 | 10.13               | 35.39              | 23.45 | 60.00 | 50.00        | -24.61 | -26.55      | P   |     |         |

LINE CONDUCTED EMISSION - N



Site: Conduction Phase: **N** Temperature: 26  
Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60 %  
EUT: mobile phone  
M/N: AM208  
Mode: Call  
Note:

| No. | Freq. (MHz) | Reading_Level (dBuV) |    |       | Correct Factor (dB) | Measurement (dBuV) |    |       | Limit (dBuV) |       | Margin (dB) |        | P/F | Comment |
|-----|-------------|----------------------|----|-------|---------------------|--------------------|----|-------|--------------|-------|-------------|--------|-----|---------|
|     |             | Peak                 | QP | AVG   |                     | Peak               | QP | AVG   | QP           | AVG   | QP          | AVG    |     |         |
| 1   | 0.1700      | 36.81                |    | 6.91  | 10.18               | 46.99              |    | 17.09 | 64.96        | 54.96 | -17.97      | -37.87 | P   |         |
| 2   | 0.2220      | 32.74                |    | 12.39 | 10.24               | 42.98              |    | 22.63 | 62.74        | 52.74 | -19.76      | -30.11 | P   |         |
| 3   | 0.3460      | 27.02                |    | 17.43 | 10.31               | 37.33              |    | 27.74 | 59.06        | 49.06 | -21.73      | -21.32 | P   |         |
| 4   | 1.3540      | 22.40                |    | 3.96  | 10.38               | 32.78              |    | 14.34 | 56.00        | 46.00 | -23.22      | -31.66 | P   |         |
| 5   | 4.2380      | 20.37                |    | 8.63  | 10.33               | 30.70              |    | 18.96 | 56.00        | 46.00 | -25.30      | -27.04 | P   |         |
| 6   | 16.0540     | 24.36                |    | 10.08 | 10.11               | 34.47              |    | 20.19 | 60.00        | 50.00 | -25.53      | -29.81 | P   |         |

**Note:** The GSM850 mode is the worst condition.

## 12. FREQUENCY STABILITY

### 12.1 MEASUREMENT METHOD

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

- 1 , Measure the carrier frequency at room temperature.
- 2 , Subject the EUT to overnight soak at -10°C.
- 3 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 , channel 190 for GSM850 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
- 4 , Repeat the above measurements at 10°C increments from -10°C to +50°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
- 5 , Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
- 6 , Subject the EUT to overnight soak at +50°C.
- 7 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
- 8 , Repeat the above measurements at 10°C increments from +50°C to -10°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
- 9 , At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

### 12.2 PROVISIONS APPLICABLE

#### 12.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.4VDC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

**12.2.2 For equipment powered by primary supply voltage**

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

**12.3 MEASUREMENT RESULT**

**Appendix E: Frequency Stability**

**Test Results**

**Frequency Error vs. Voltage:**

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|------------|-----------------|---------------------|-------------|---------|
| GSM 850   | TM1       | LCH          | TN         | VL         | 18.98           | 0.02                | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -22.08          | -0.03               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -20.73          | -0.03               | ±2.5        | PASS    |
|           |           | MCH          | TN         | VL         | -33.90          | -0.04               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -30.93          | -0.04               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -24.15          | -0.03               | ±2.5        | PASS    |
|           |           | HCH          | TN         | VL         | -21.89          | -0.03               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -32.03          | -0.04               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -25.05          | -0.03               | ±2.5        | PASS    |

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|------------|-----------------|---------------------|-------------|---------|
| GSM 850   | TM2       | LCH          | TN         | VL         | -18.08          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -20.02          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -21.05          | -0.03               | ±2.5        | PASS    |
|           |           | MCH          | TN         | VL         | -34.55          | -0.04               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -31.19          | -0.04               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -30.80          | -0.04               | ±2.5        | PASS    |
|           |           | HCH          | TN         | VL         | -20.08          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -21.05          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -20.53          | -0.02               | ±2.5        | PASS    |

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|------------|-----------------|---------------------|-------------|---------|
| GSM 1900  | TM1       | LCH          | TN         | VL         | -36.61          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -43.65          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -40.87          | -0.02               | ±2.5        | PASS    |
|           |           | MCH          | TN         | VL         | -42.49          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -53.47          | -0.03               | ±2.5        | PASS    |

|  |  |     |    |    |        |       |      |      |
|--|--|-----|----|----|--------|-------|------|------|
|  |  |     | TN | VH | -46.94 | -0.02 | ±2.5 | PASS |
|  |  | HCH | TN | VL | -85.56 | -0.04 | ±2.5 | PASS |
|  |  |     | TN | VN | -69.93 | -0.04 | ±2.5 | PASS |
|  |  |     | TN | VH | -66.51 | -0.03 | ±2.5 | PASS |

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|------------|-----------------|---------------------|-------------|---------|
| GSM 1900  | TM2       | LCH          | TN         | VL         | -24.92          | -0.01               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -42.23          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -35.97          | -0.02               | ±2.5        | PASS    |
|           |           | MCH          | TN         | VL         | -51.46          | -0.03               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -44.17          | -0.02               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -36.03          | -0.02               | ±2.5        | PASS    |
|           |           | HCH          | TN         | VL         | -56.82          | -0.03               | ±2.5        | PASS    |
|           |           |              | TN         | VN         | -63.86          | -0.03               | ±2.5        | PASS    |
|           |           |              | TN         | VH         | -67.28          | -0.04               | ±2.5        | PASS    |



**Frequency Error vs. Temperature:**

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|-----------|-----------------|---------------------|-------------|---------|
| GSM850    | TM1       | LCH          | VN         | -30       | -15.63          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -22.34          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -18.85          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -20.34          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -21.44          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -17.18          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -26.73          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -24.67          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -29.06          | -0.04               | ±2.5        | PASS    |
| GSM850    | TM1       | MCH          | VN         | -30       | -37.71          | -0.05               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -23.12          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -32.03          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -37.58          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -24.28          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -27.25          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -24.15          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -28.41          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -24.99          | -0.03               | ±2.5        | PASS    |
| GSM850    | TM1       | HCH          | VN         | -30       | -27.83          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -27.89          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -20.21          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -24.67          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -28.73          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -28.99          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -24.34          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -25.12          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -22.47          | -0.03               | ±2.5        | PASS    |

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|-----------|-----------------|---------------------|-------------|---------|
| GSM850    | TM2       | LCH          | VN         | -30       | -26.73          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -14.01          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -31.51          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -16.53          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -22.21          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -28.80          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -22.02          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -22.60          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -18.79          | -0.02               | ±2.5        | PASS    |
| GSM850    | TM2       | MCH          | VN         | -30       | -31.70          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -36.55          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -32.93          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -28.41          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -18.92          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -18.02          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -29.83          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -31.70          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -33.13          | -0.04               | ±2.5        | PASS    |
| GSM850    | TM2       | HCH          | VN         | -30       | -26.41          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -27.57          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -25.89          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -25.96          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -25.63          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -22.34          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -20.92          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -18.98          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -16.53          | -0.02               | ±2.5        | PASS    |

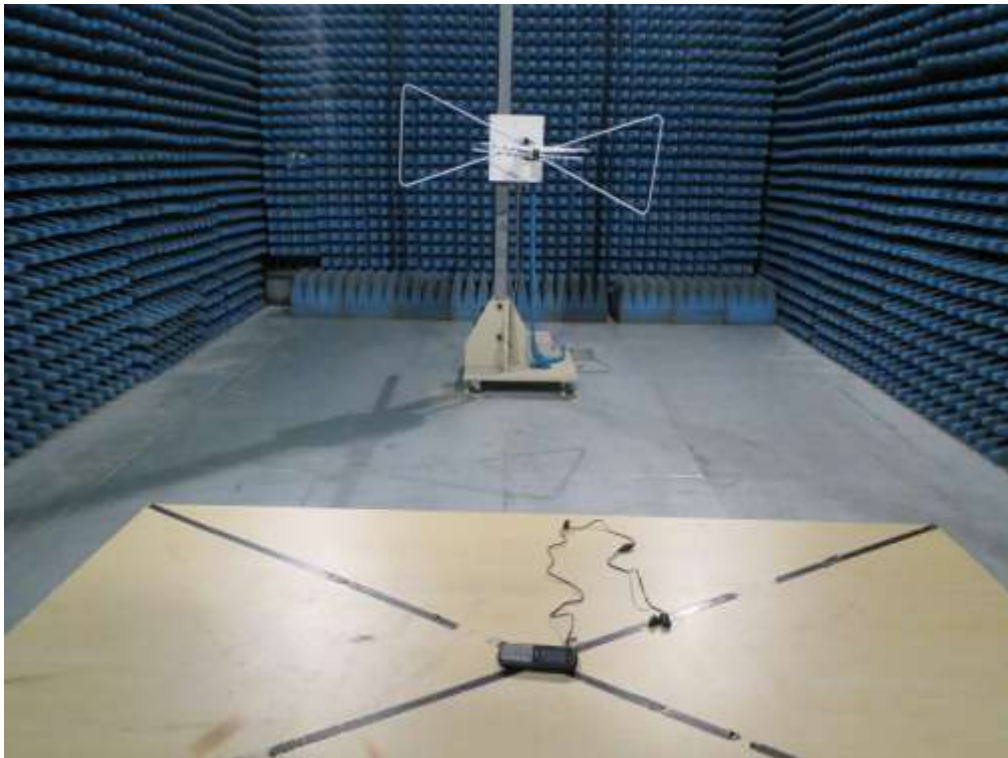
| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|-----------|-----------------|---------------------|-------------|---------|
| GSM 1900  | TM1       | LCH          | VN         | -30       | -38.61          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -50.17          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -37.39          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -49.40          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -36.87          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -41.20          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -36.48          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -42.10          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -46.30          | -0.03               | ±2.5        | PASS    |
| GSM 1900  | TM1       | MCH          | VN         | -30       | -50.50          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -45.85          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -51.40          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -51.92          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -41.46          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -56.11          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -39.00          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -51.66          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -61.73          | -0.03               | ±2.5        | PASS    |
| GSM 1900  | TM1       | HCH          | VN         | -30       | -77.10          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -74.06          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -83.81          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -87.95          | -0.05               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -84.85          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -61.99          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -68.90          | -0.04               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -65.22          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -67.09          | -0.04               | ±2.5        | PASS    |

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp | Freq.Error (Hz) | Freq.vs.rated (ppm) | Limit (ppm) | Verdict |
|-----------|-----------|--------------|------------|-----------|-----------------|---------------------|-------------|---------|
| GSM 1900  | TM2       | LCH          | VN         | -30       | -27.83          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -41.26          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -45.07          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -47.72          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -32.22          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -35.77          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -32.93          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -37.13          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -37.00          | -0.02               | ±2.5        | PASS    |
| GSM 1900  | TM2       | MCH          | VN         | -30       | -40.55          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -47.52          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -42.68          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -45.72          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -39.00          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -33.84          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -41.71          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -42.94          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -41.78          | -0.02               | ±2.5        | PASS    |
| GSM 1900  | TM2       | HCH          | VN         | -30       | -40.59          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | -20       | -47.46          | -0.03               | ±2.5        | PASS    |
|           |           |              | VN         | -10       | -42.52          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 0         | -45.63          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 10        | -39.18          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 20        | -33.73          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 30        | -41.76          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 40        | -42.84          | -0.02               | ±2.5        | PASS    |
|           |           |              | VN         | 50        | -41.65          | -0.02               | ±2.5        | PASS    |

**PHOTOGRAPHS OF TEST SETUP**  
CONDUCTED EMISSION



**RADIATED SPURIOUS EMISSION**





## PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT





BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



OPEN VIEW OF EUT-1



GSM Antenna

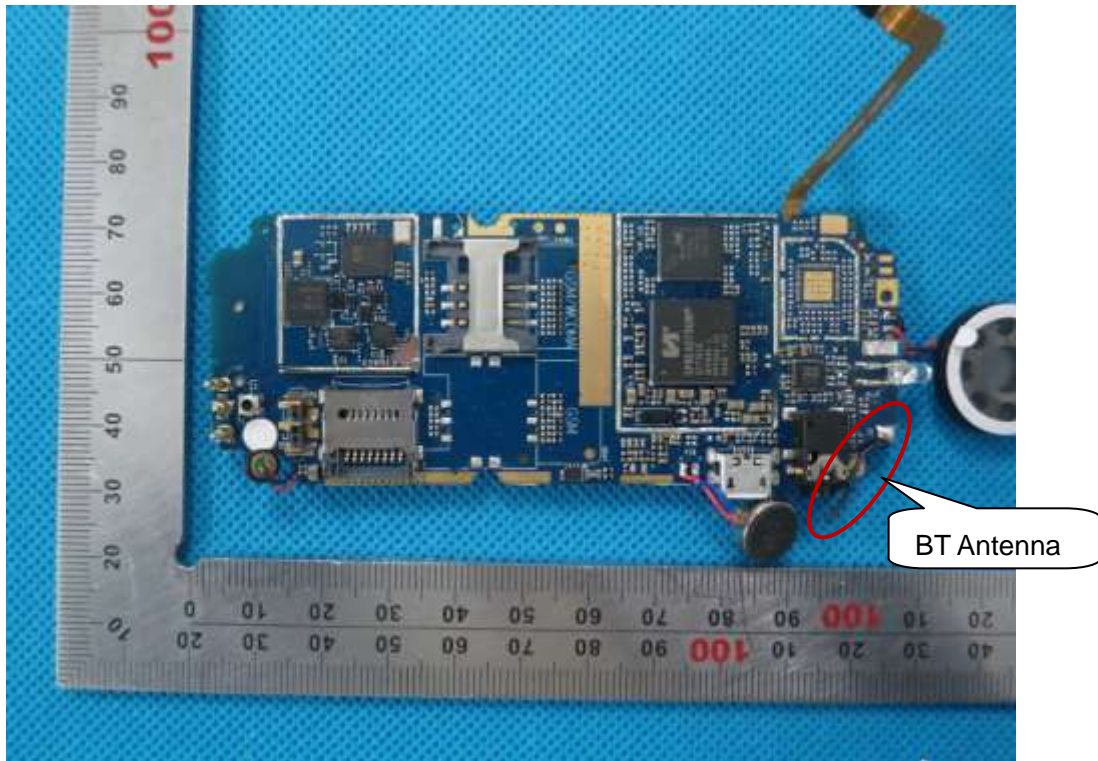
OPEN VIEW OF EUT-2



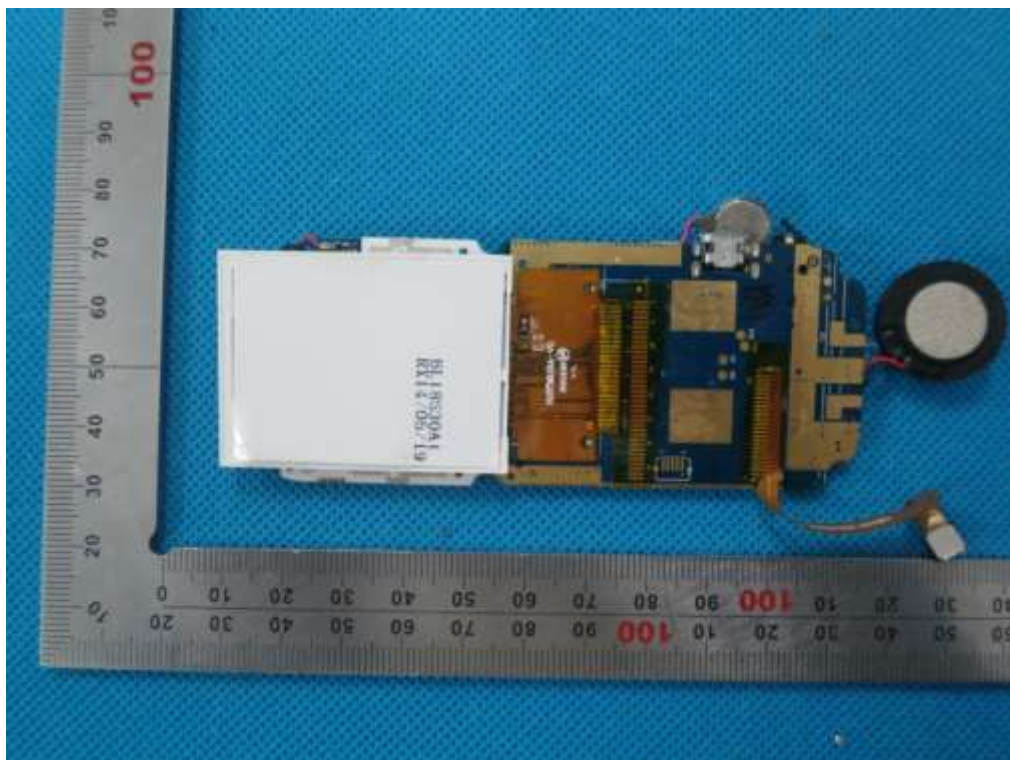
OPEN VIEW OF EUT-3



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----