



## Appendix for test report

## 1Appendix\_A: Effective (Isotropic) Radiated Power Output Data

### Part I - Test Results

| Test Band | Test Mode | Test Channel | Conducte<br>d Power<br>[dBm] | ERP/EIRP [dBm] | Limit [dBm] | Verdict |
|-----------|-----------|--------------|------------------------------|----------------|-------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | 23.05                        | 20.05          | 33          | PASS    |
|           |           | MCH          | 23.21                        | 20.21          | 33          | PASS    |
|           |           | HCH          | 23.18                        | 20.18          | 33          | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | 23.86                        | 20.66          | 30          | PASS    |
|           |           | MCH          | 23.77                        | 20.57          | 30          | PASS    |
|           |           | HCH          | 23.82                        | 20.62          | 30          | PASS    |
| WCDMA850  | UMTS/TM1  | LCH          | 23.93                        | 15.03          | 38.5        | PASS    |
|           |           | MCH          | 23.74                        | 14.84          | 38.5        | PASS    |
|           |           | HCH          | 23.72                        | 14.82          | 38.5        | PASS    |

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

Note2: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

## 2Appendix\_B: Peak-to-Average Ratio

### Part I - Test Results

| Test Band | Test Mode | Test Channel | Measured[dB] | Limit [dB] | Verdict |
|-----------|-----------|--------------|--------------|------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | 2.88         | 13         | PASS    |
|           |           | MCH          | 3.11         | 13         | PASS    |
|           |           | HCH          | 3.3          | 13         | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | 3.13         | 13         | PASS    |
|           |           | MCH          | 2.68         | 13         | PASS    |
|           |           | HCH          | 3.29         | 13         | PASS    |
| WCDMA850  | UMTS/TM1  | LCH          | 2.73         | 13         | PASS    |
|           |           | MCH          | 2.65         | 13         | PASS    |
|           |           | HCH          | 2.67         | 13         | PASS    |

## 3Appendix\_C: Modulation Characteristics

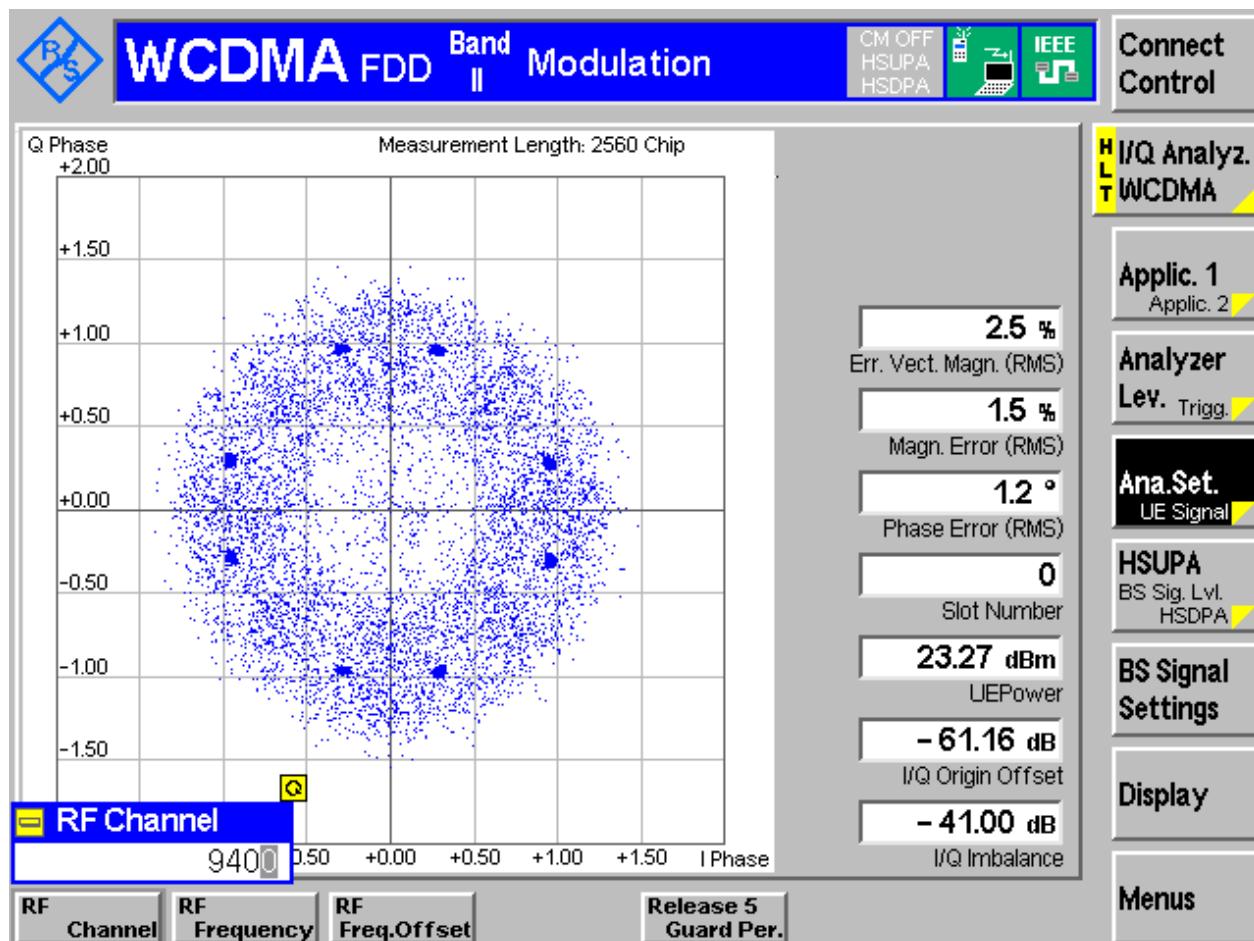
### Part I - Test Plots

#### 3.1 For UMTS

##### 3.1.1 Test Band = WCDMA1900

##### 3.1.1.1 Test Mode = UMTS/TM1

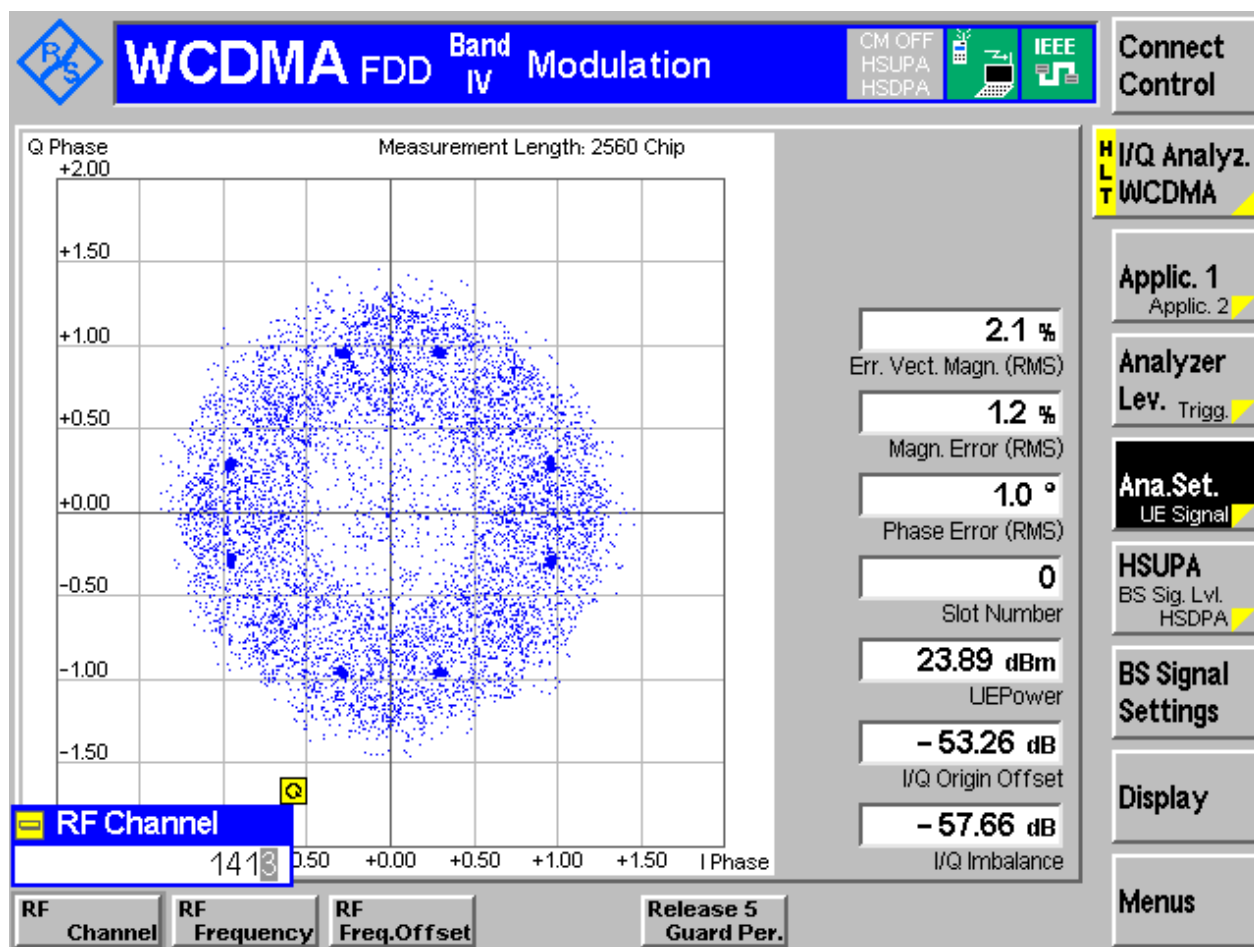
##### 3.1.1.1.1 Test Channel = MCH



### 3.1.2 Test Band = WCDMA1700

#### 3.1.2.1 Test Mode = UMTS/TM1

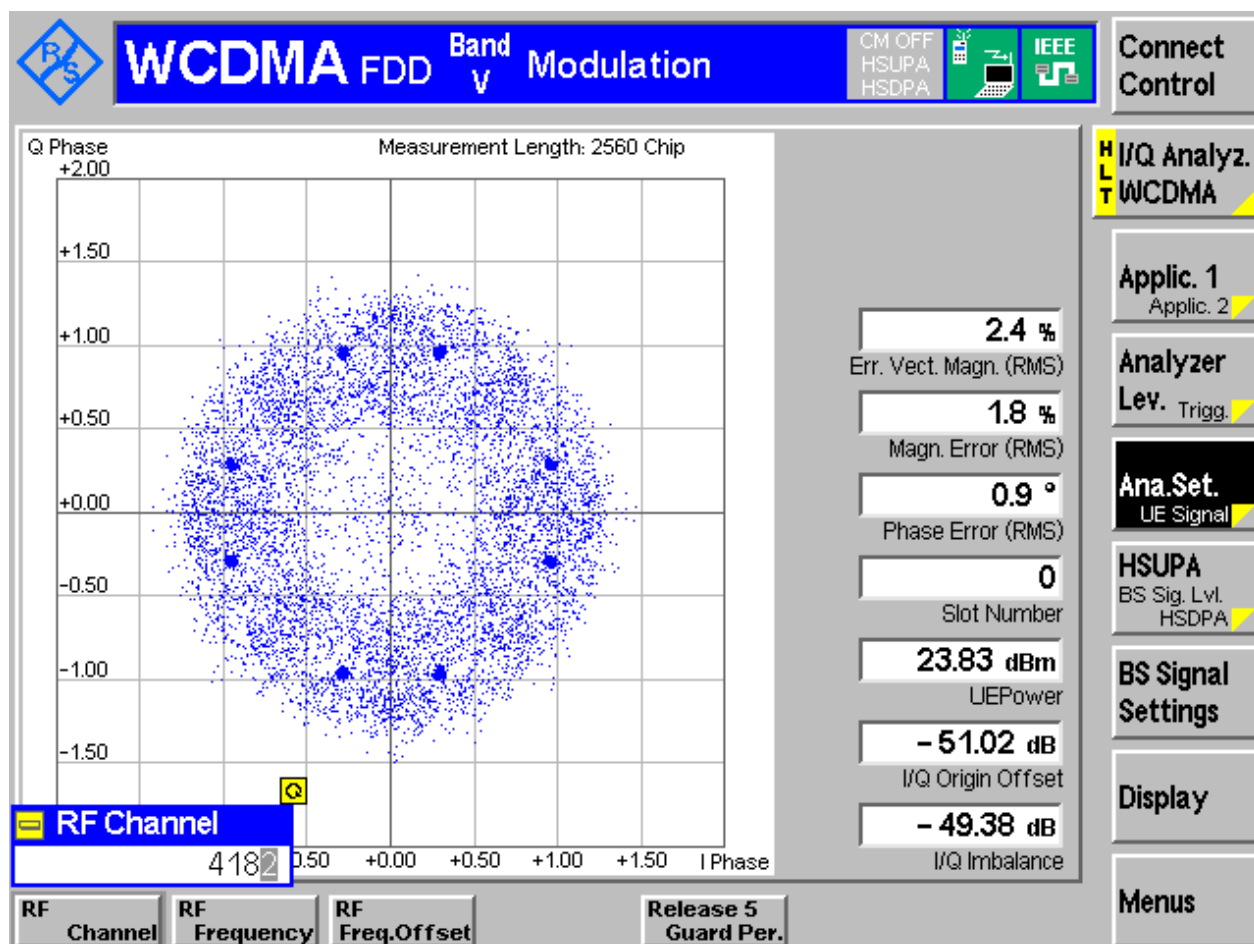
##### 3.1.2.1.1 Test Channel = MCH



### 3.1.3 Test Band = WCDMA850

#### 3.1.3.1 Test Mode = UMTS/TM1

##### 3.1.3.1.1 Test Channel = MCH



## 4Appendix\_D: Bandwidth

### Part I - Test Results

| Test Band | Test Mode | Test Channel | Occupied Bandwidth [MHz] | Emission Bandwidth [MHz] | Verdict |
|-----------|-----------|--------------|--------------------------|--------------------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | 4.16                     | 4.71                     | Pass    |
|           |           | MCH          | 4.15                     | 4.70                     | Pass    |
|           |           | HCH          | 4.15                     | 4.71                     | Pass    |
| WCDMA1700 | UMTS/TM1  | LCH          | 4.15                     | 4.71                     | Pass    |
|           |           | MCH          | 4.17                     | 4.74                     | Pass    |
|           |           | HCH          | 4.16                     | 4.70                     | Pass    |
| WCDMA850  | UMTS/TM1  | LCH          | 4.16                     | 4.72                     | Pass    |
|           |           | MCH          | 4.16                     | 4.72                     | Pass    |
|           |           | HCH          | 4.16                     | 4.72                     | Pass    |

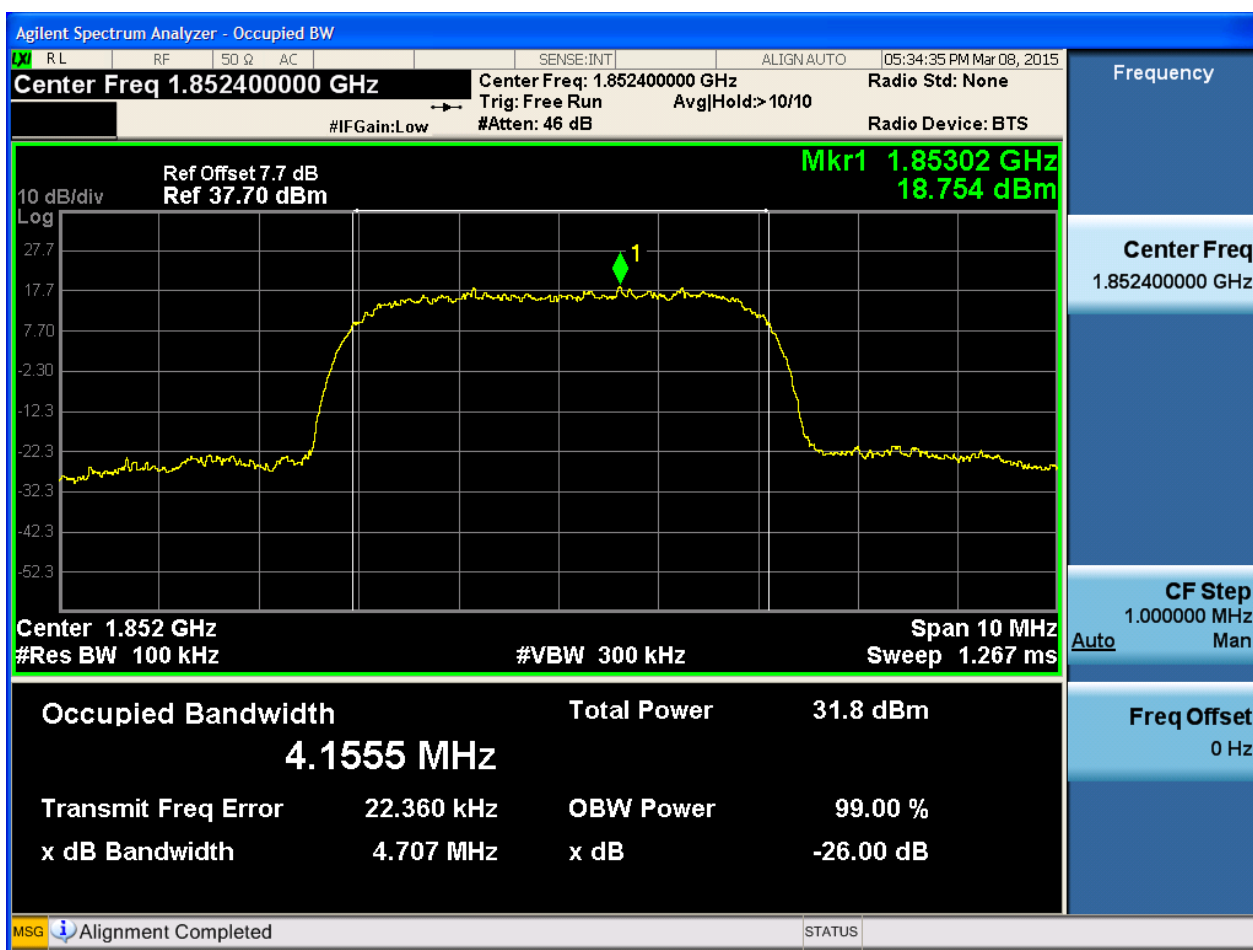
## Part II - Test Plots

### 4.1 For UMTS

#### 4.1.1 Test Band = WCDMA1900

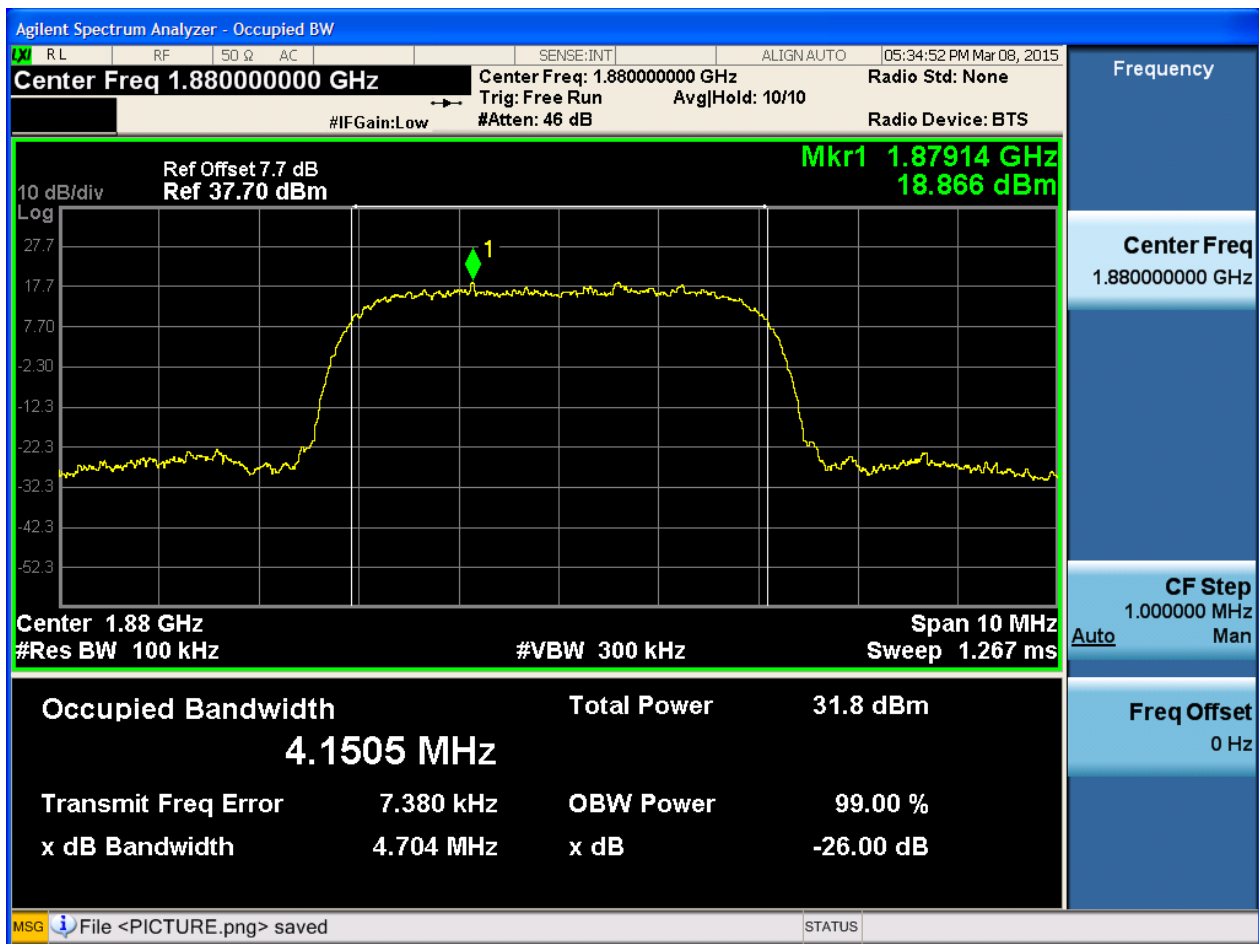
##### 4.1.1.1 Test Mode = UMTS/TM1

##### 4.1.1.1.1 Test Channel = LCH



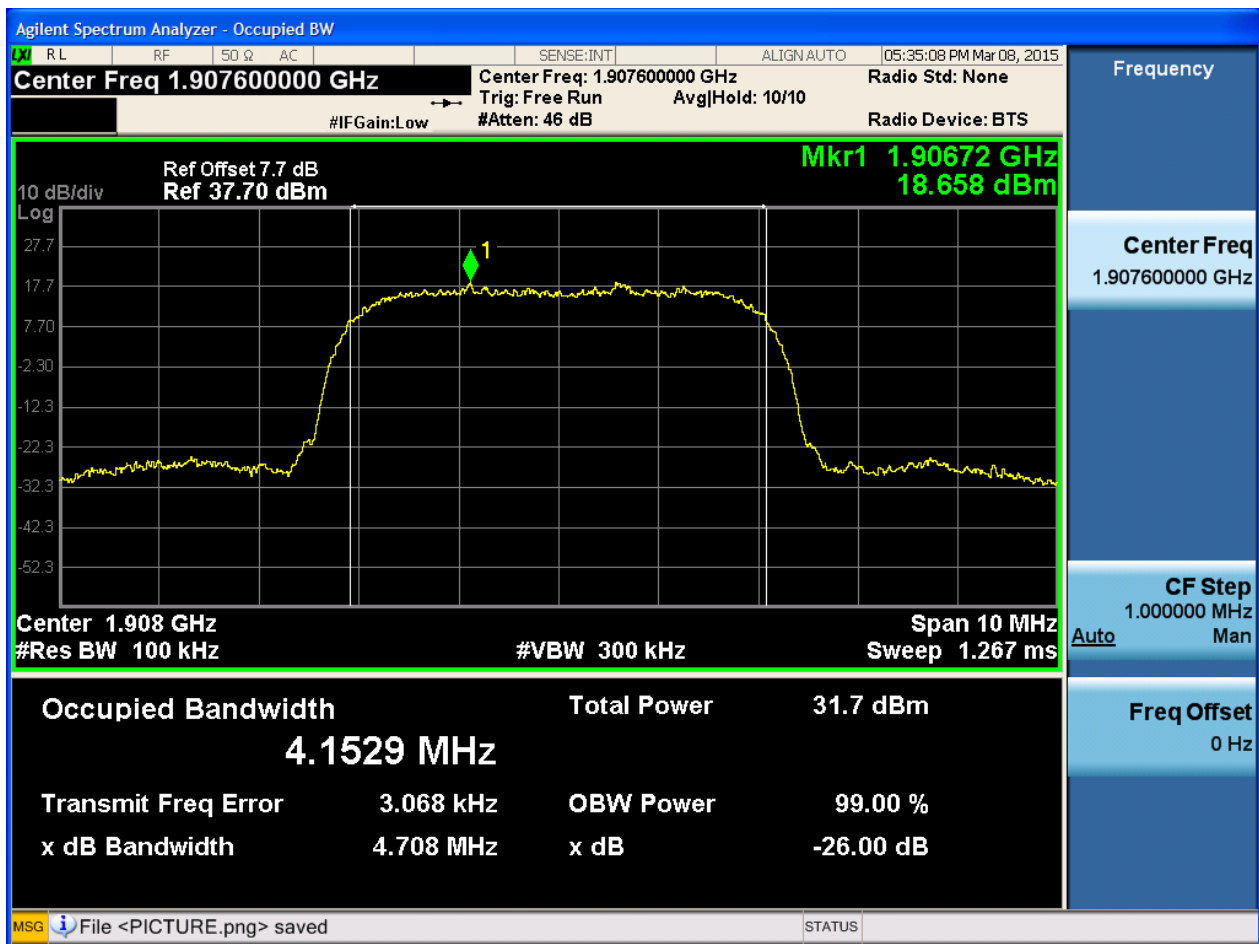


## 4.1.1.1.2 Test Channel = MCH





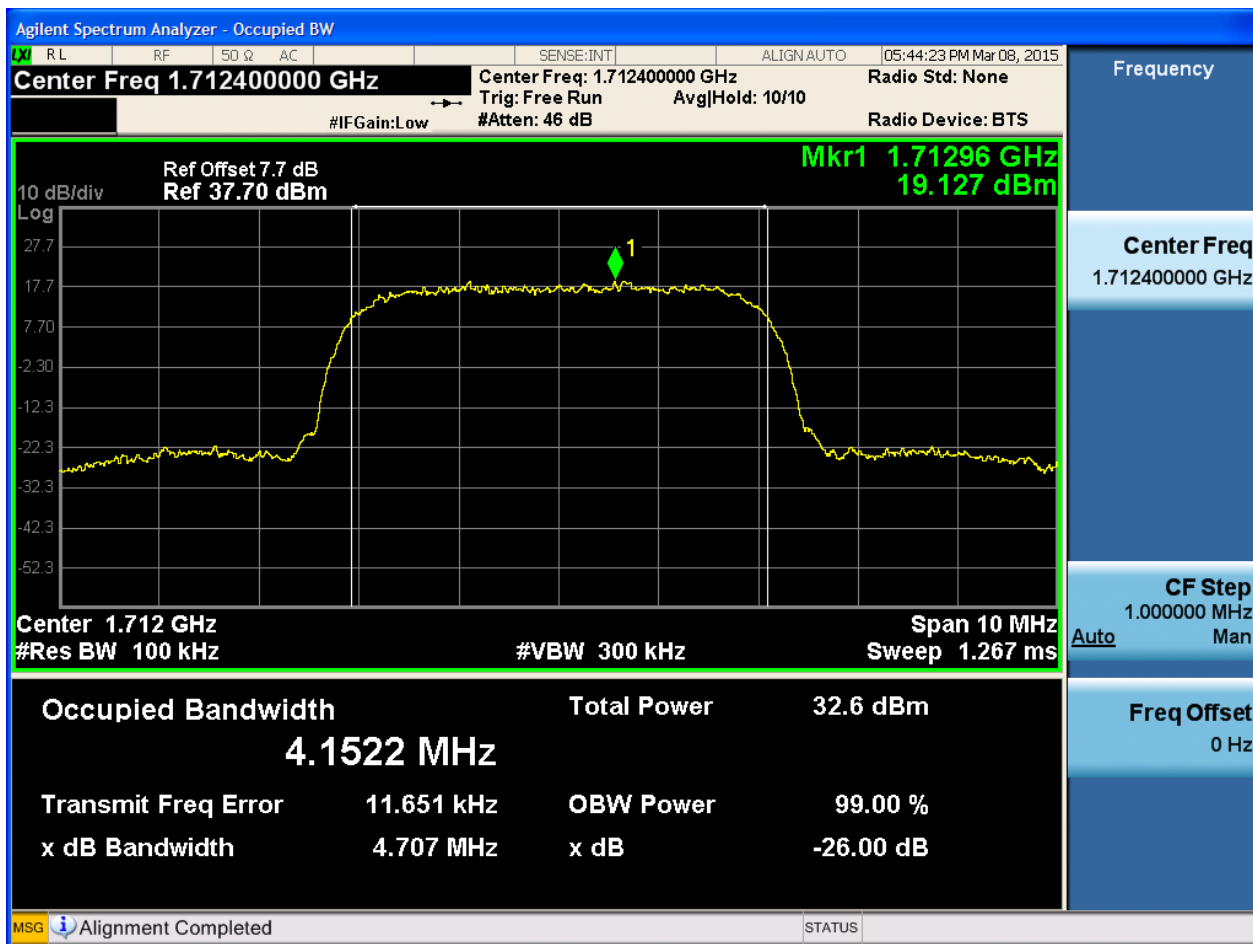
## 4.1.1.1.3 Test Channel = HCH



#### 4.1.2 Test Band = WCDMA1700

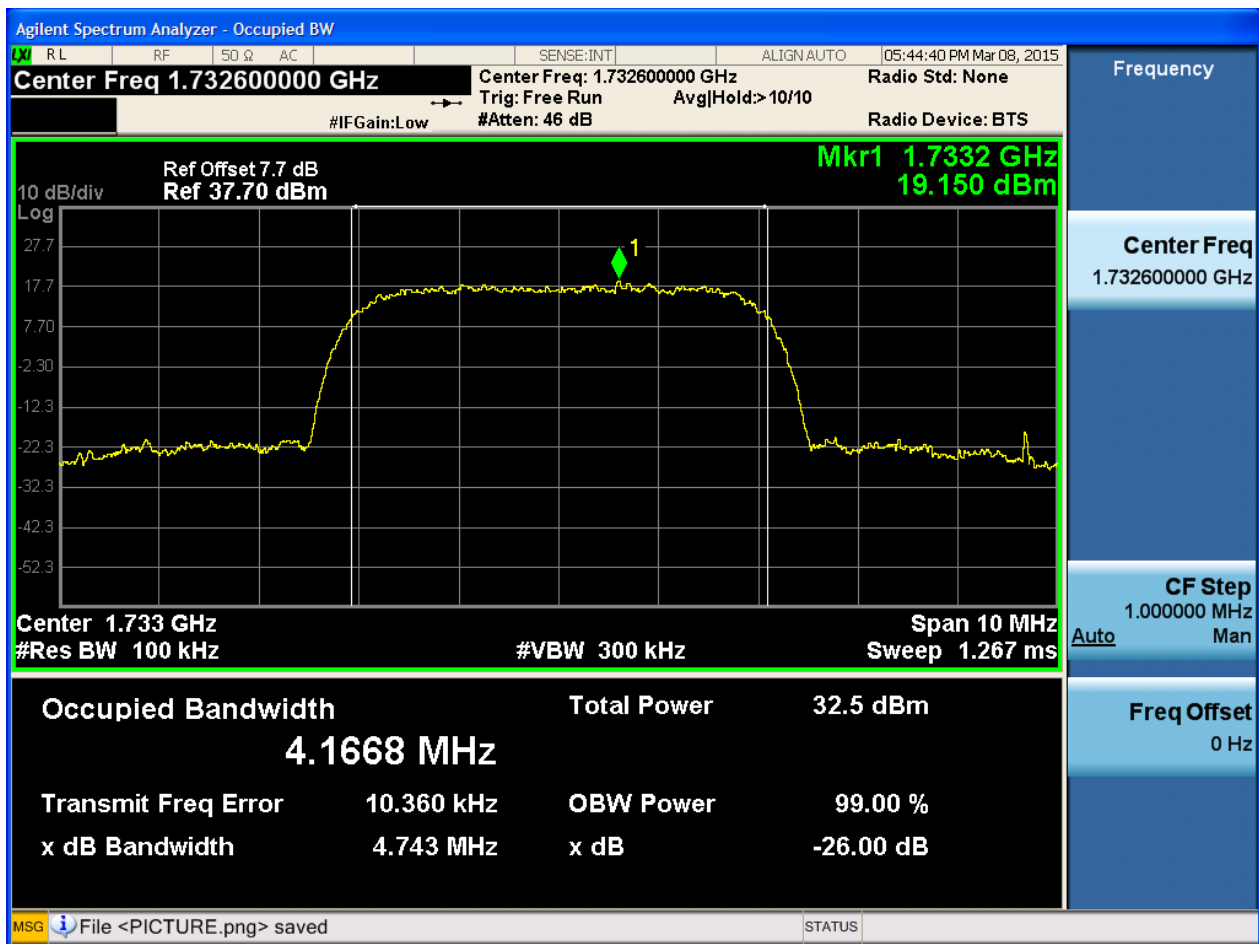
##### 4.1.2.1 Test Mode = UMTS/TM1

##### 4.1.2.1.1 Test Channel = LCH



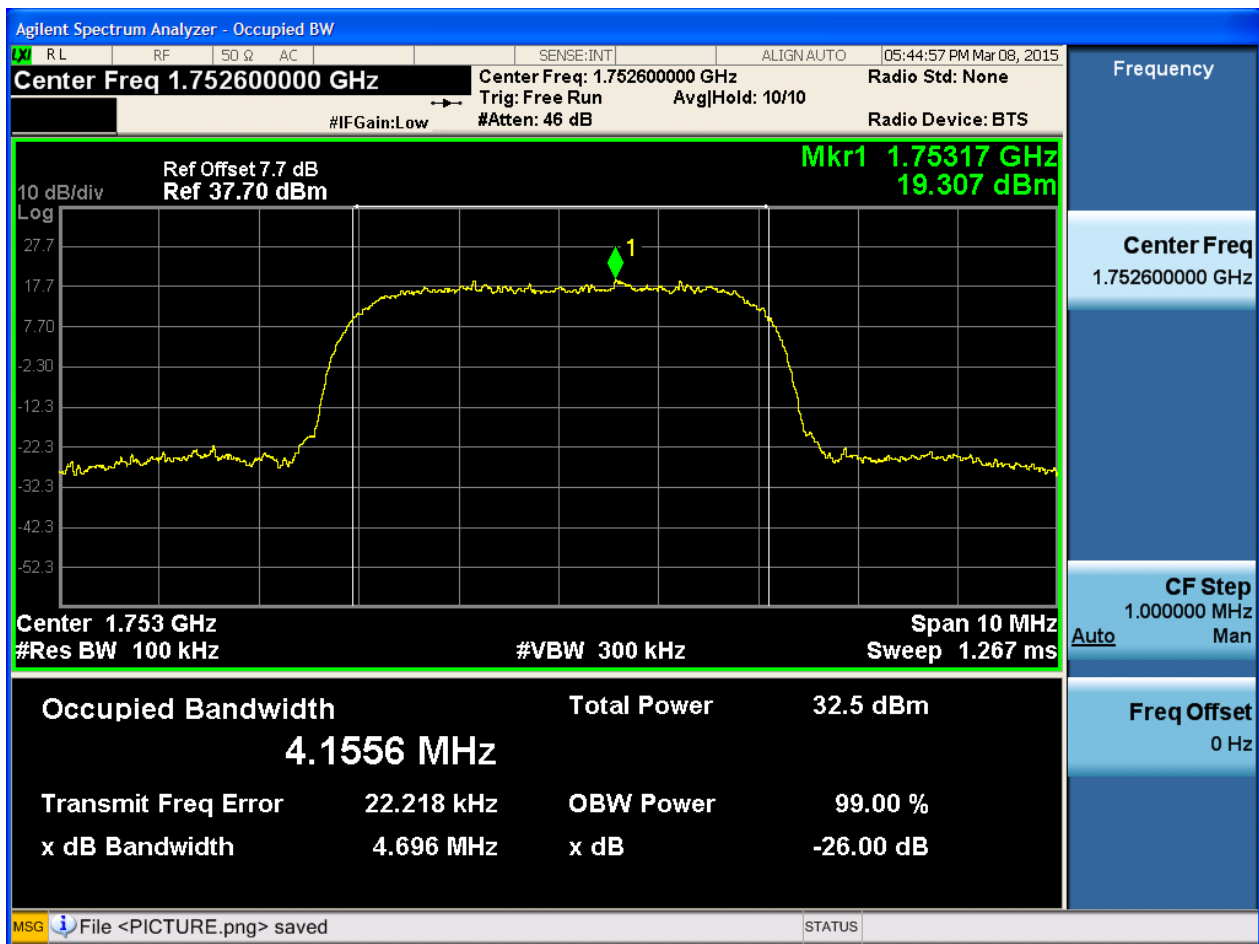


## 4.1.2.1.2 Test Channel = MCH





## 4.1.2.1.3 Test Channel = HCH

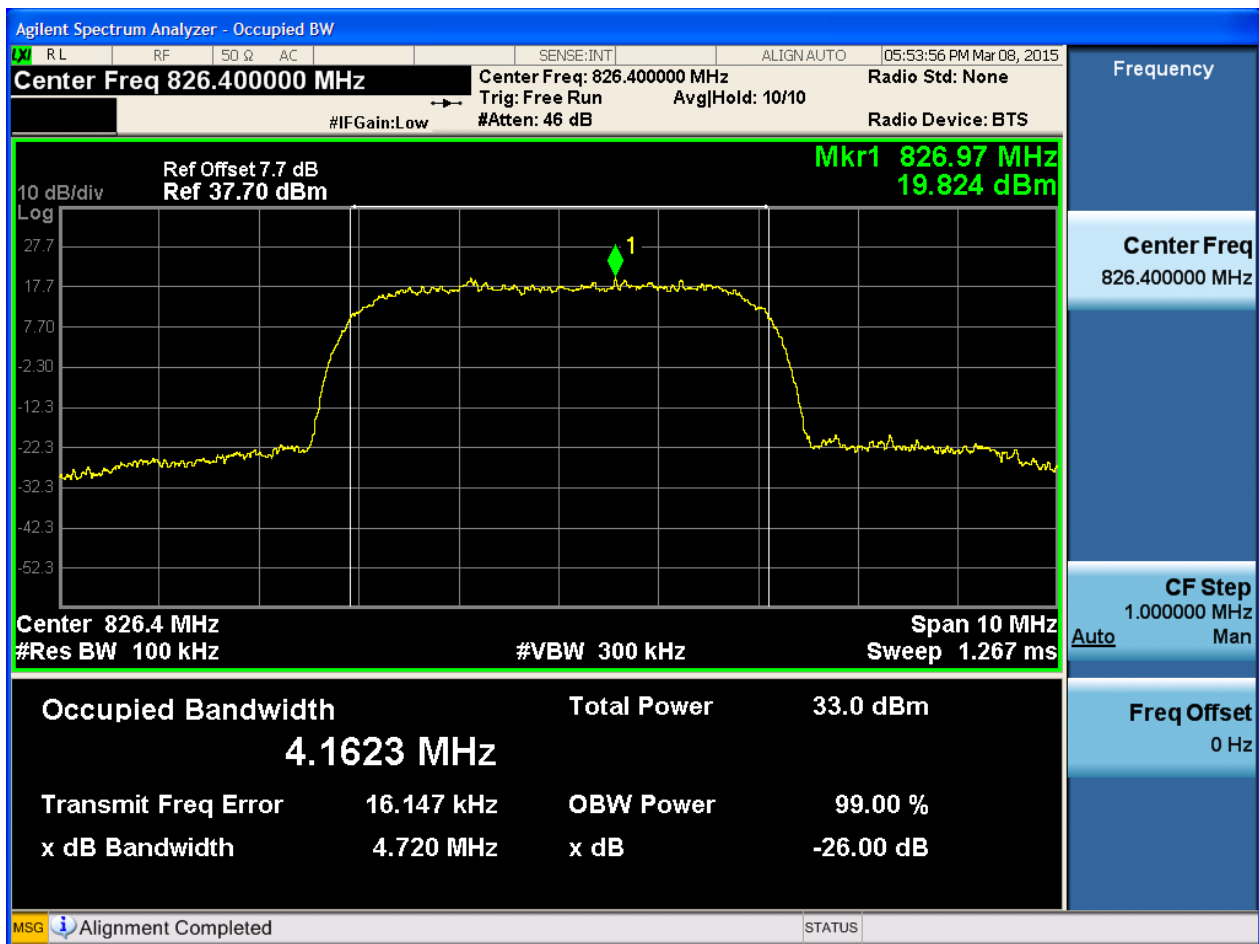




## 4.1.3 Test Band = WCDMA850

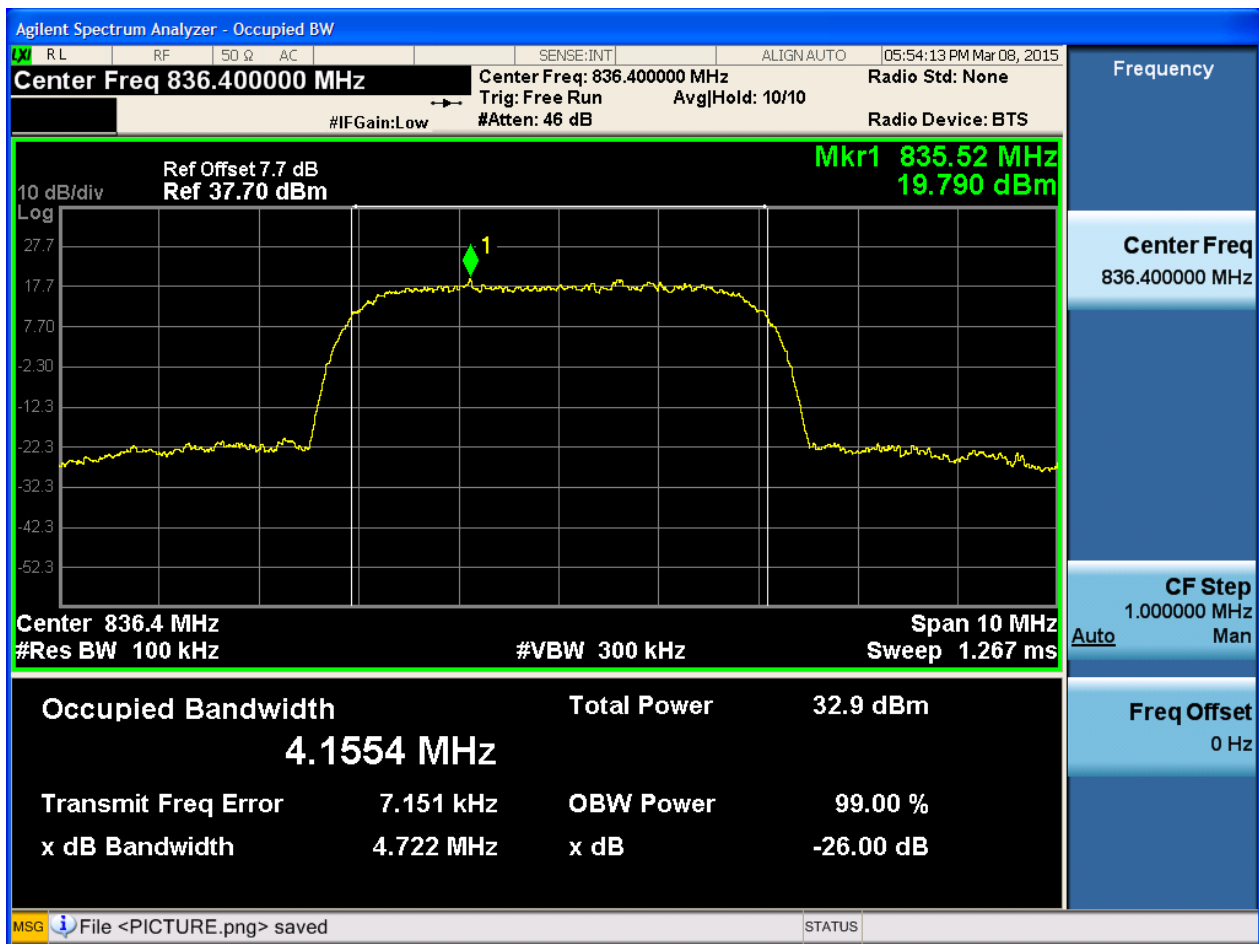
## 4.1.3.1 Test Mode = UMTS/TM1

## 4.1.3.1.1 Test Channel = LCH



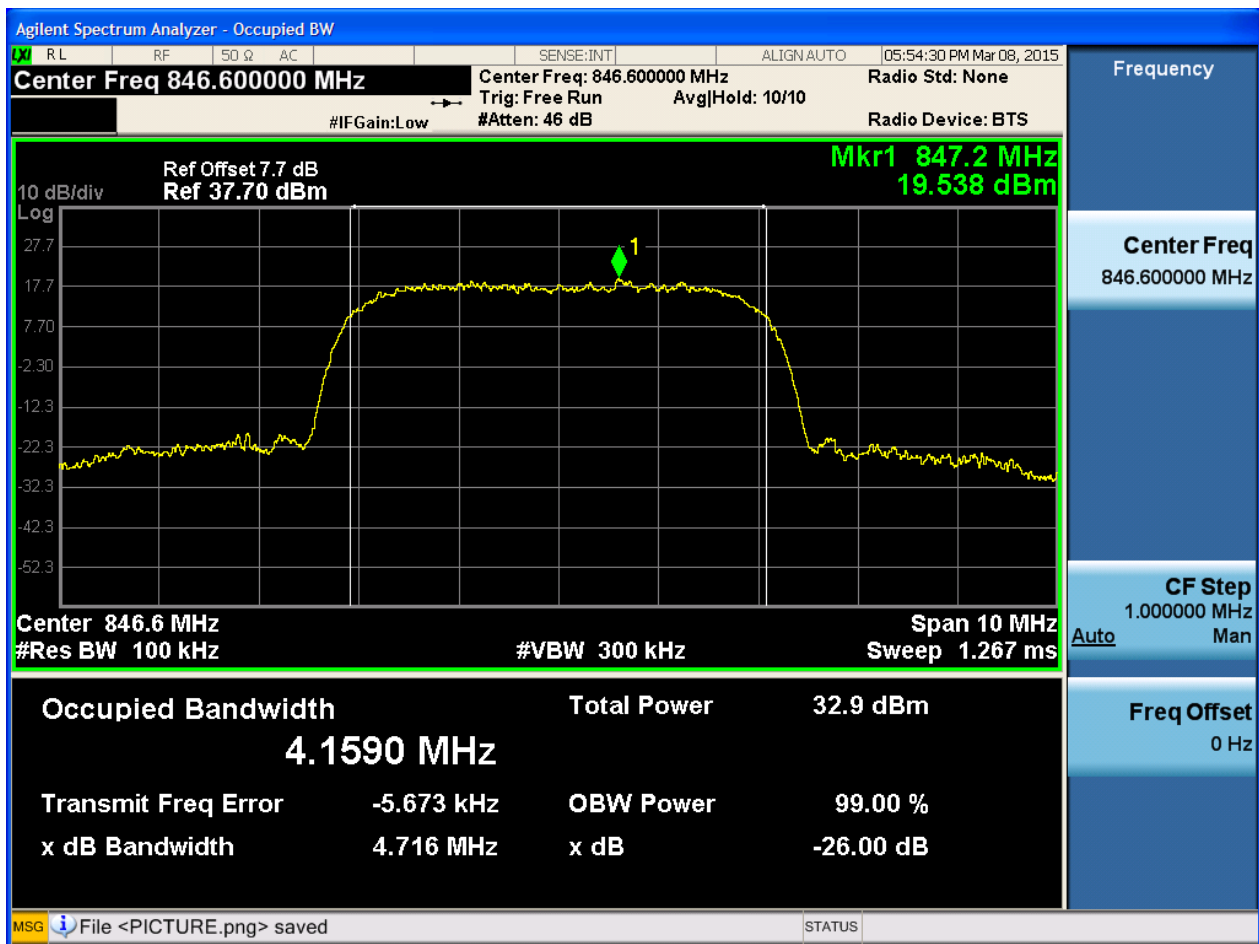


## 4.1.3.1.2 Test Channel = MCH





## 4.1.3.1.3 Test Channel = HCH



## 5Appendix\_E: Band Edges Compliance

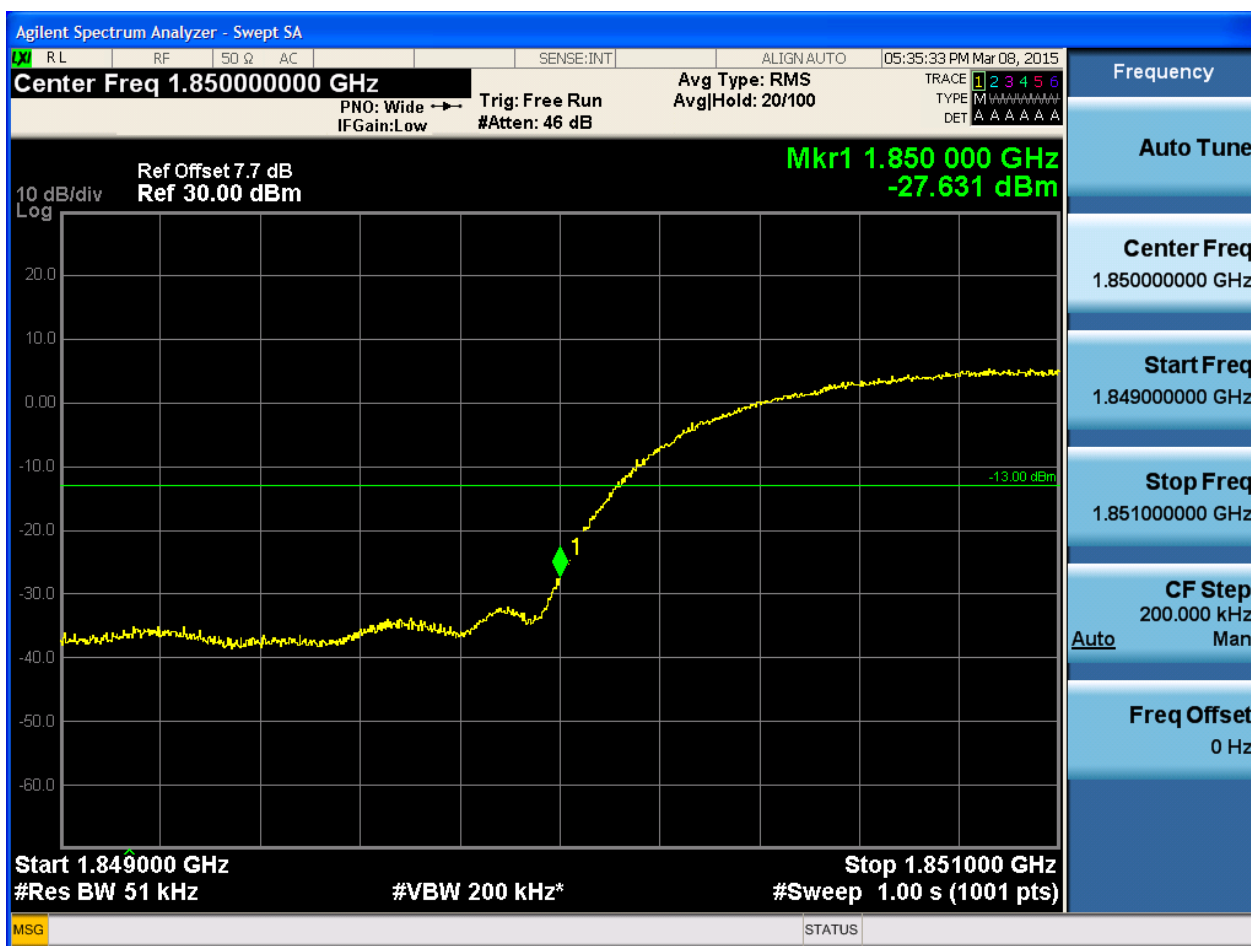
### Part I - Test Plots

#### 5.1 For UMTS

##### 5.1.1 Test Band = WCDMA1900

##### 5.1.1.1 Test Mode = UMTS/TM1

##### 5.1.1.1.1 Test Channel = LCH



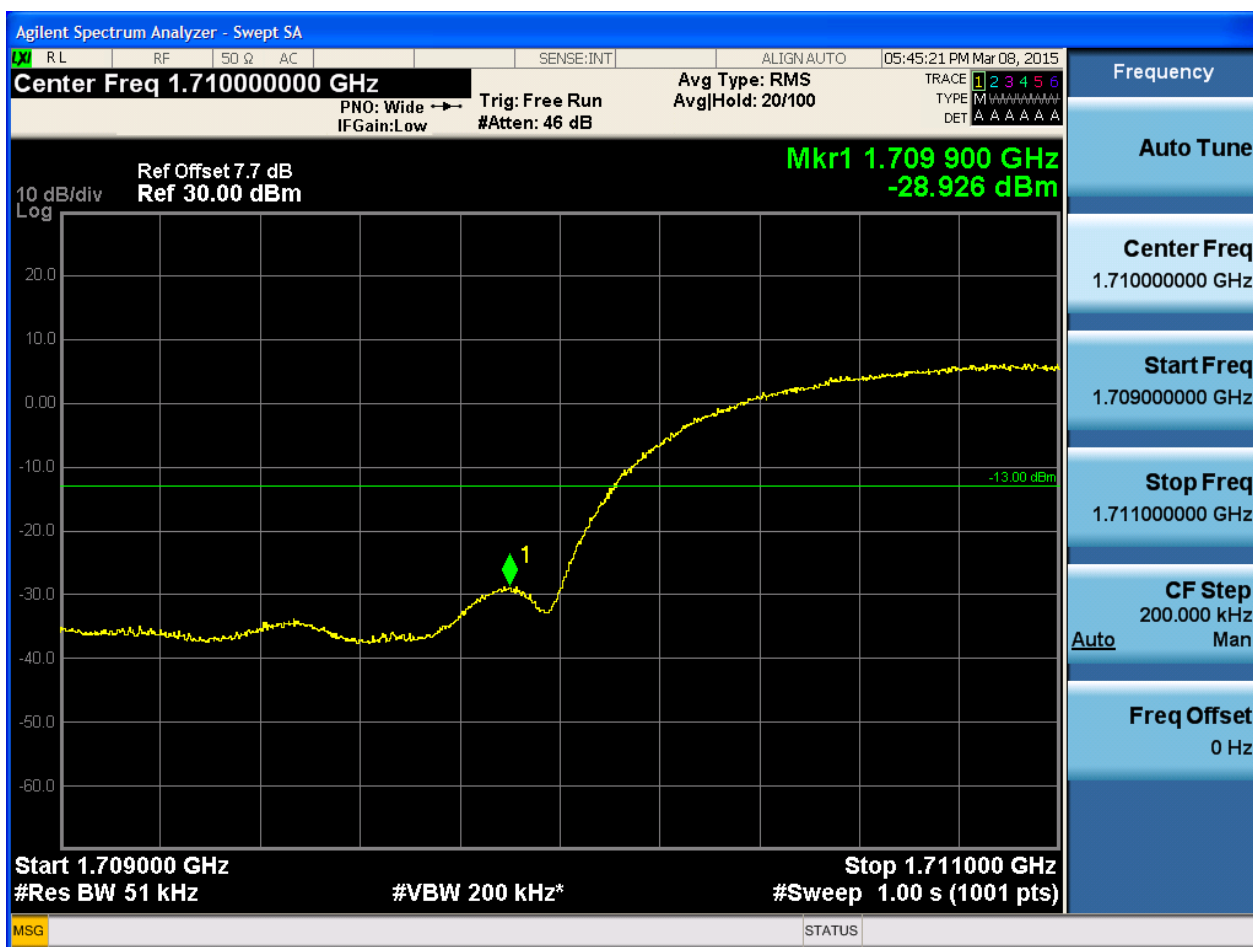
#### 5.1.1.1.2 Test Channel = HCH



## 5.1.2 Test Band = WCDMA1700

### 5.1.2.1 Test Mode = UMTS/TM1

#### 5.1.2.1.1 Test Channel = LCH



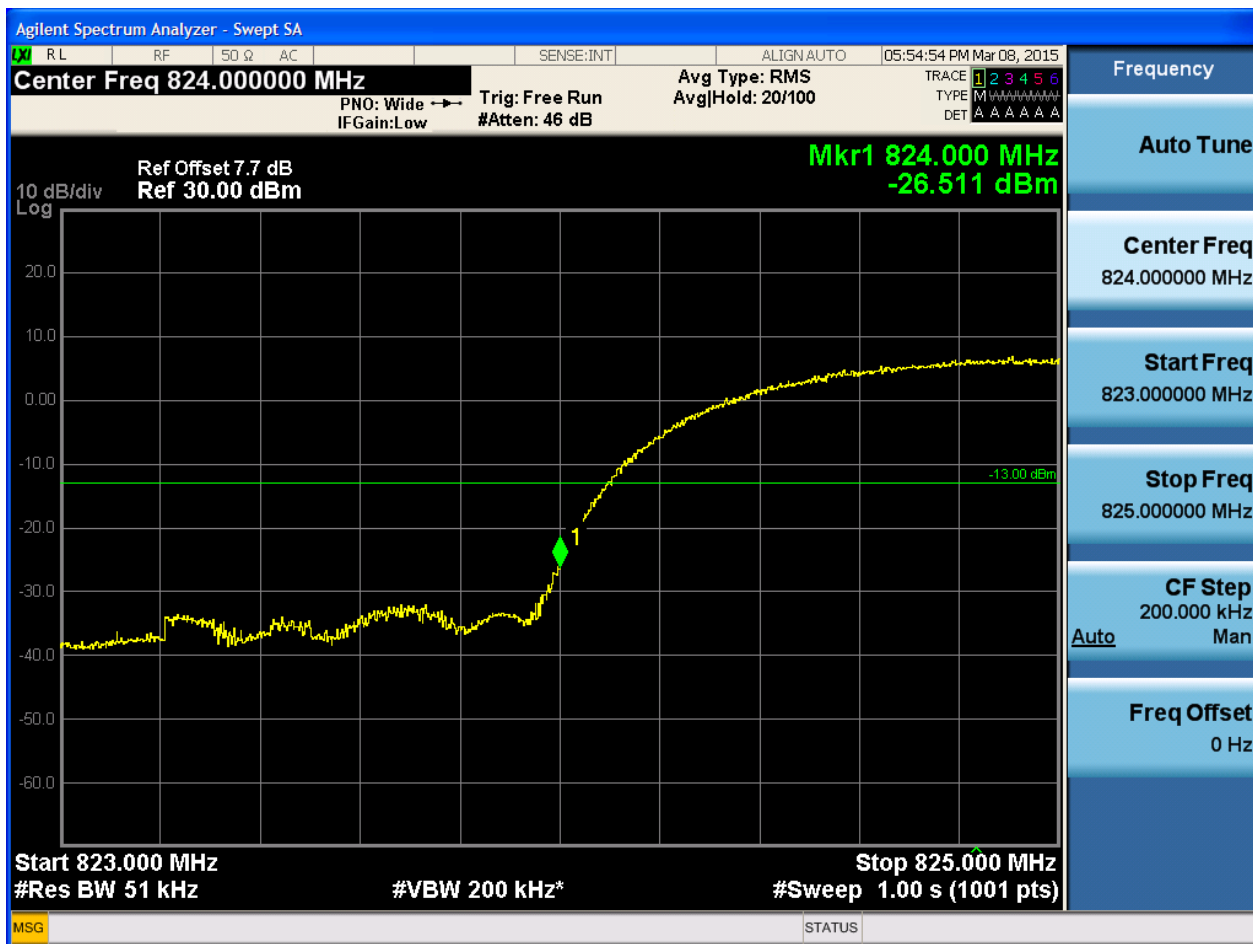
### 5.1.2.1.2 Test Channel = HCH



### 5.1.3 Test Band = WCDMA850

#### 5.1.3.1 Test Mode = UMTS/TM1

##### 5.1.3.1.1 Test Channel = LCH



### 5.1.3.1.2 Test Channel = HCH



## 6Appendix\_F: Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of  $< RBW/2$  so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points =  $k * (Span / RBW)$ " with  $k$  between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

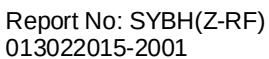
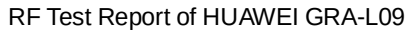
### Part I - Test Plots

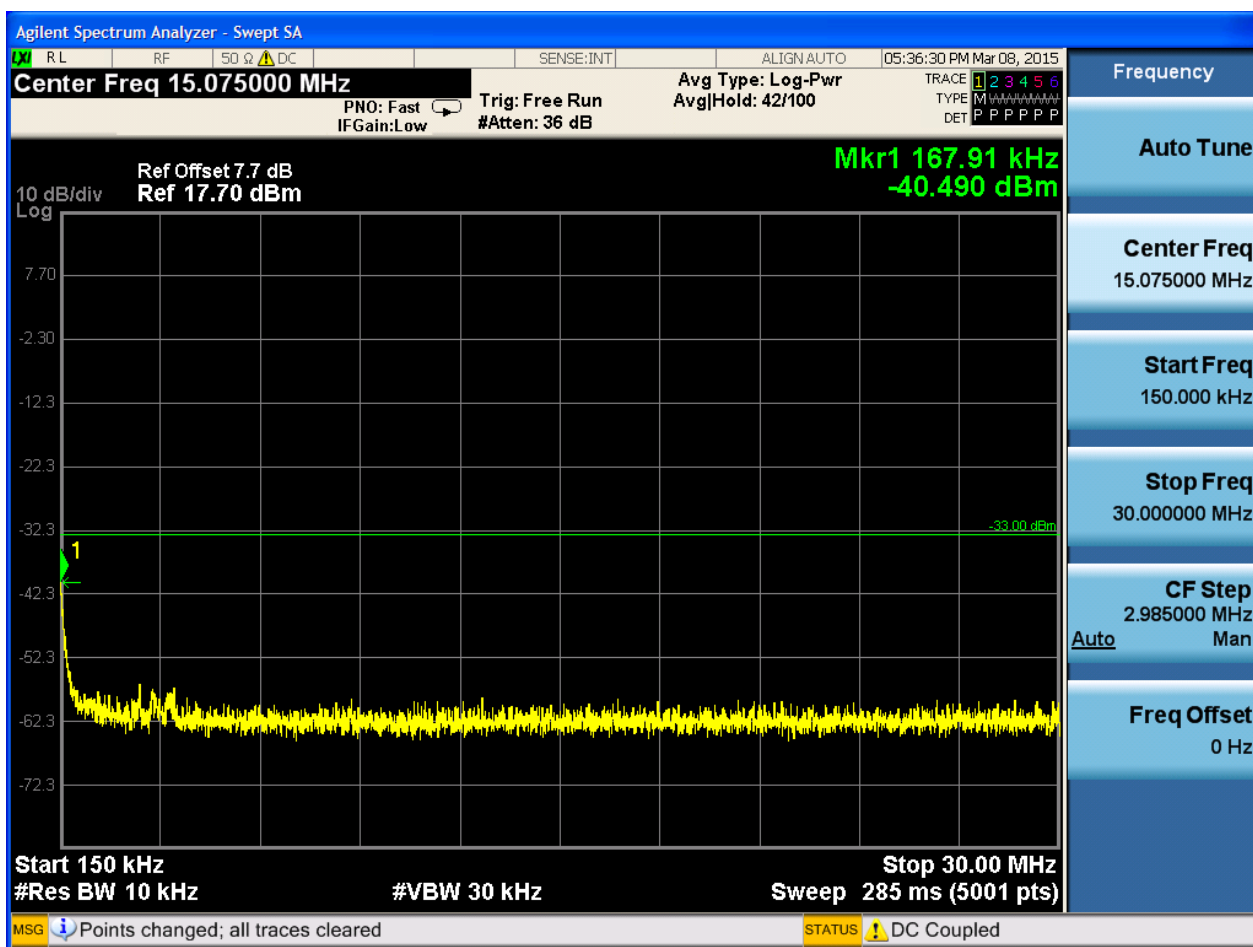
#### 6.1 For UMTS

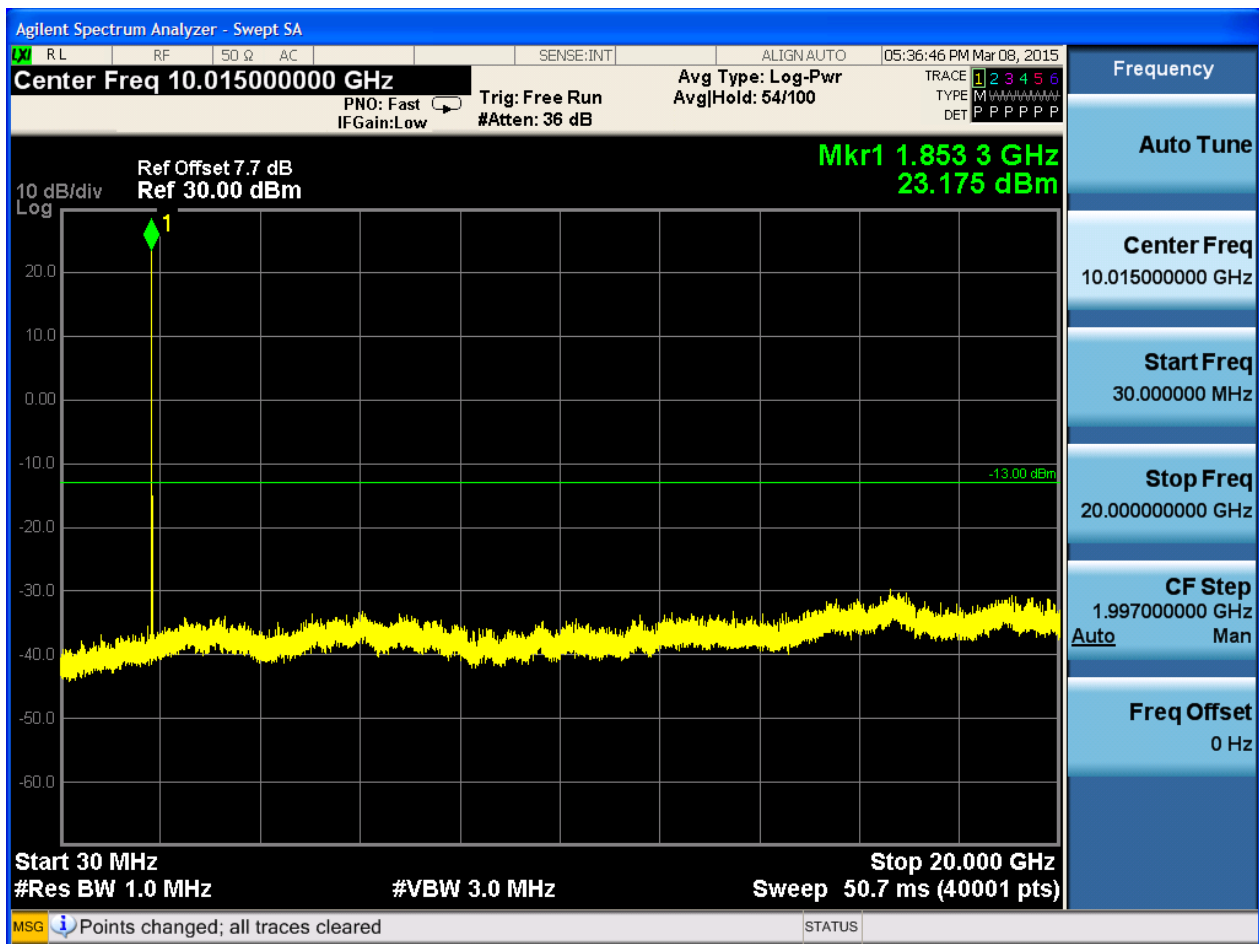
##### 6.1.1 Test Band = WCDMA1900

##### 6.1.1.1 Test Mode = UMTS/TM1

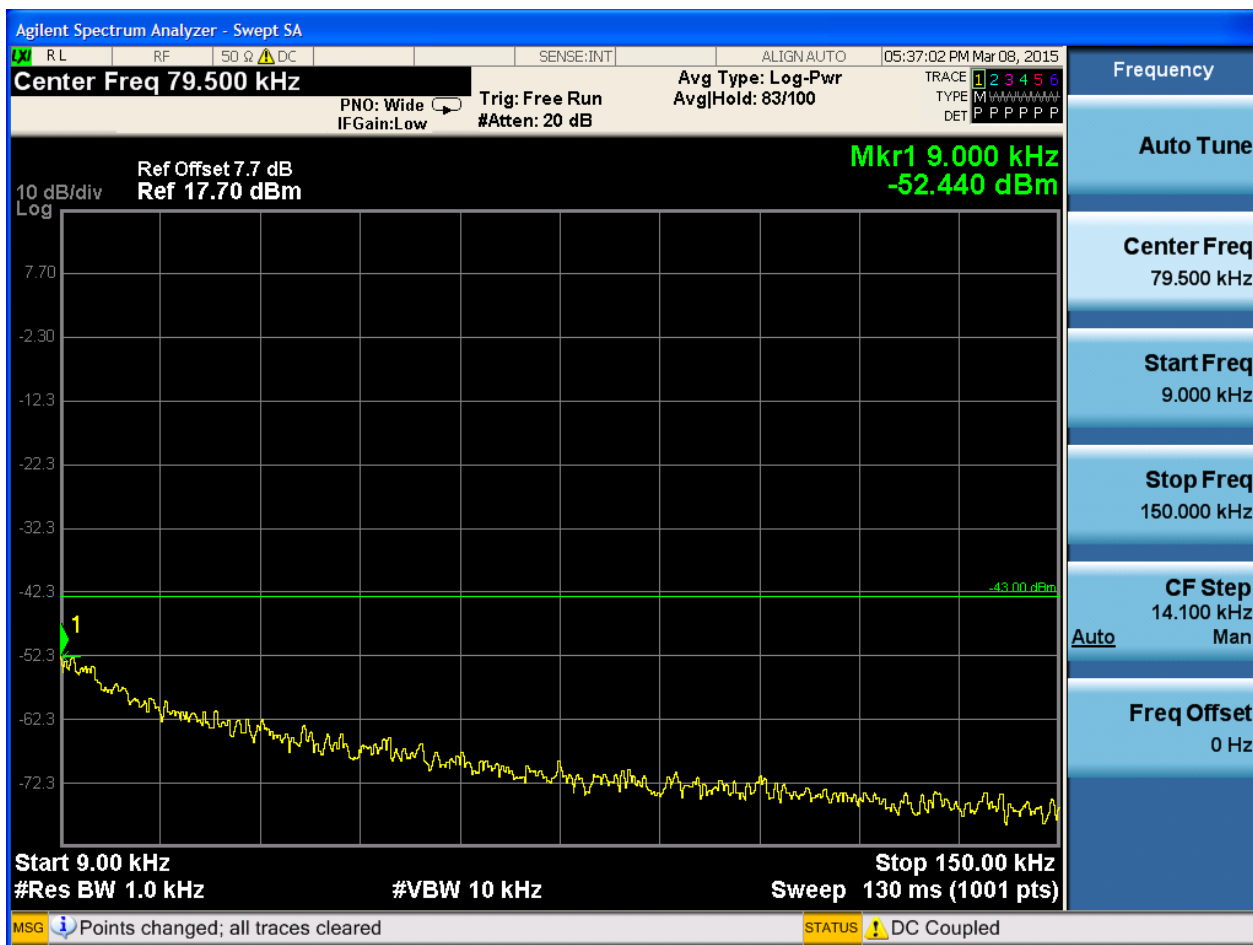
##### 6.1.1.1.1 Test Channel = LCH

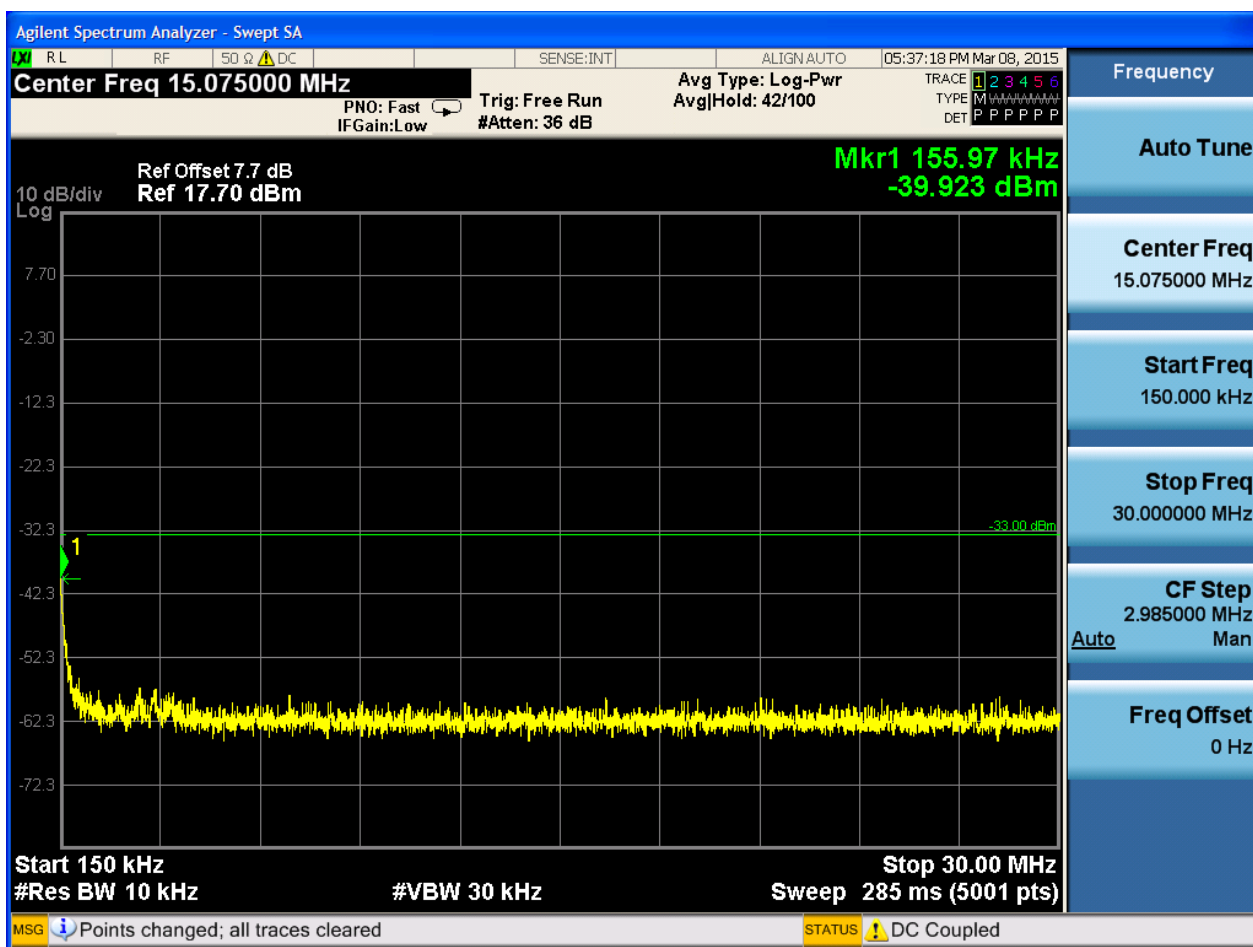


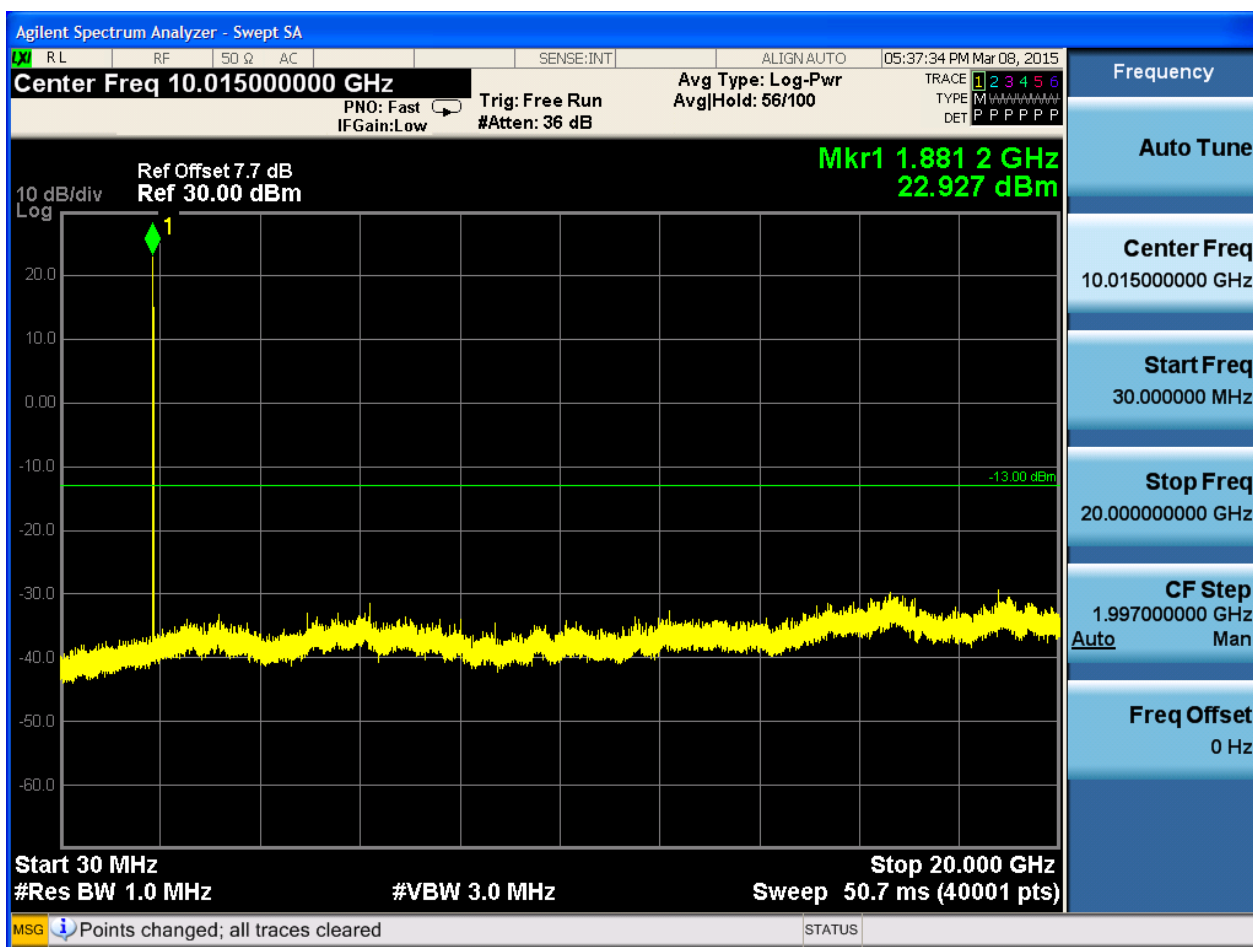




### 6.1.1.1.2 Test Channel = MCH

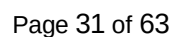
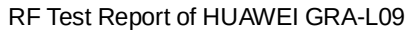


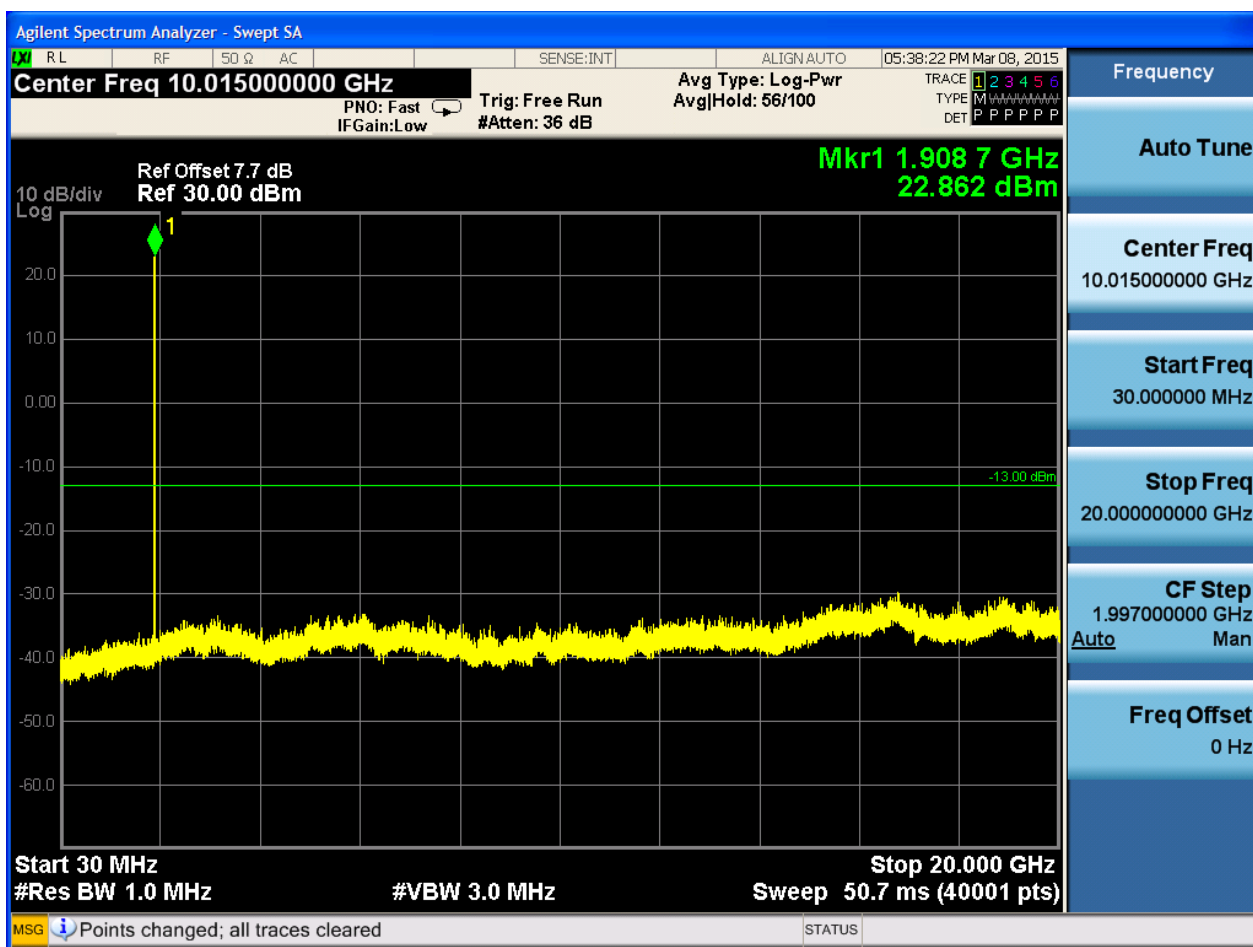




### 6.1.1.1.3 Test Channel = HCH



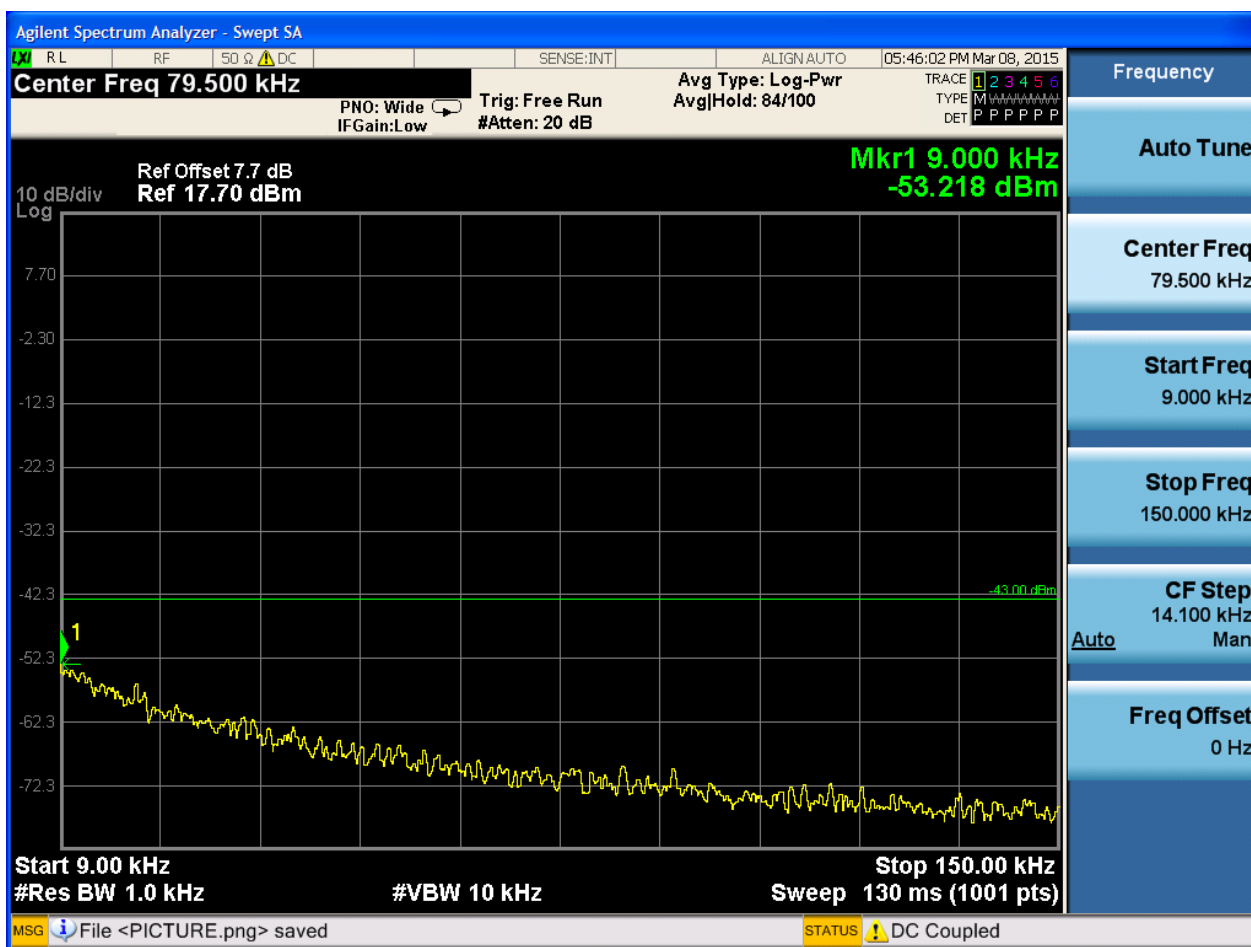


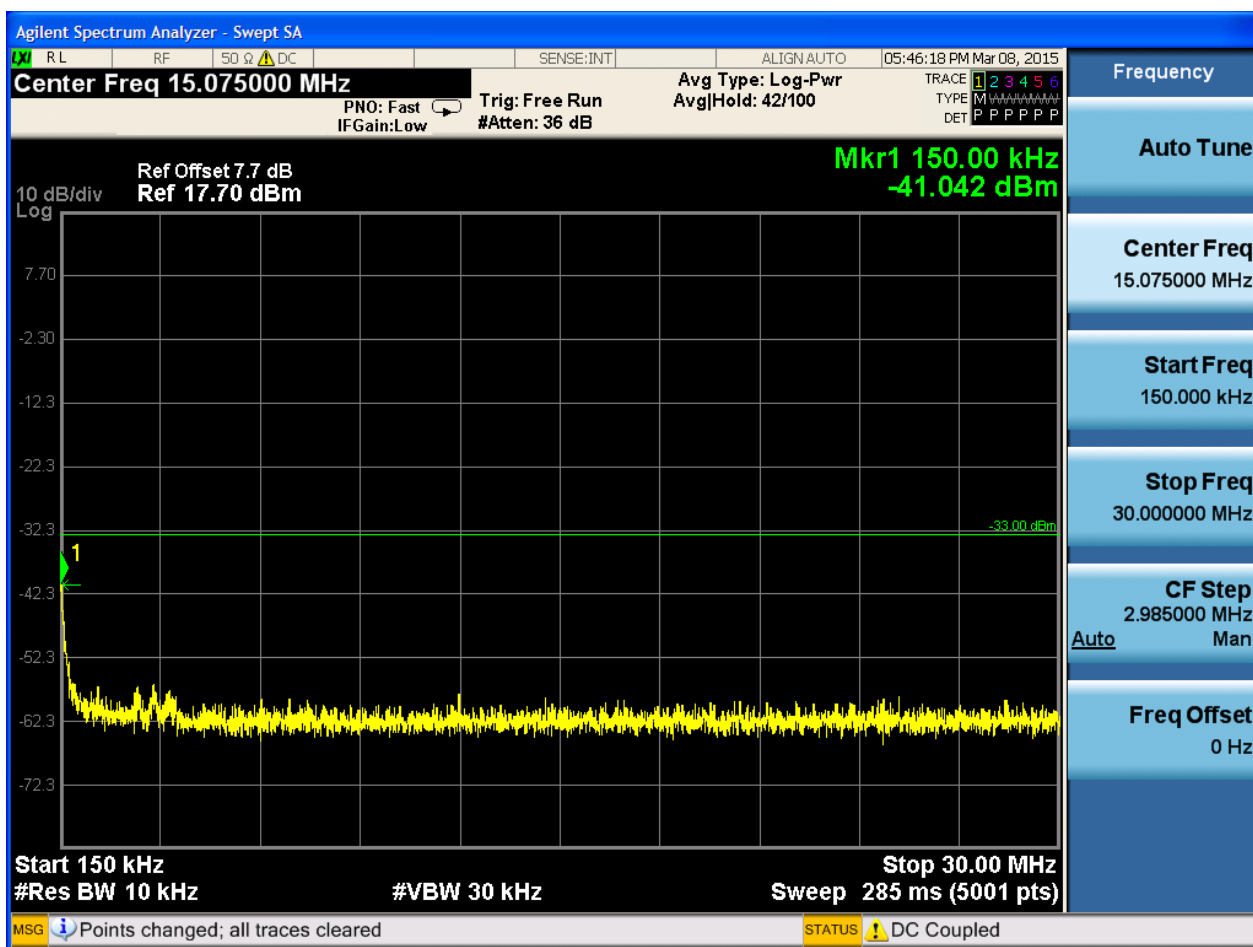


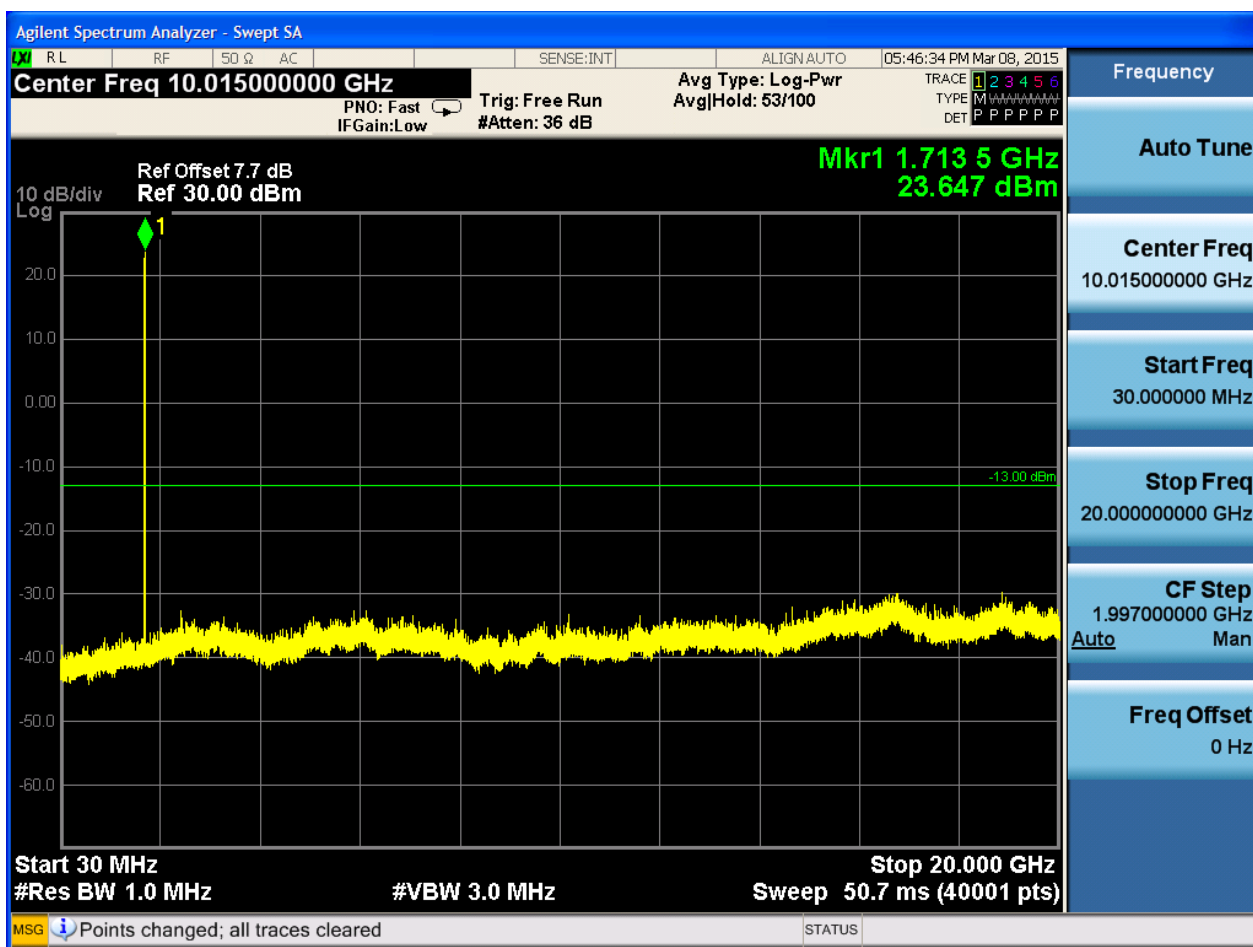
## 6.1.2 Test Band = WCDMA1700

### 6.1.2.1 Test Mode = UMTS/TM1

#### 6.1.2.1.1 Test Channel = LCH

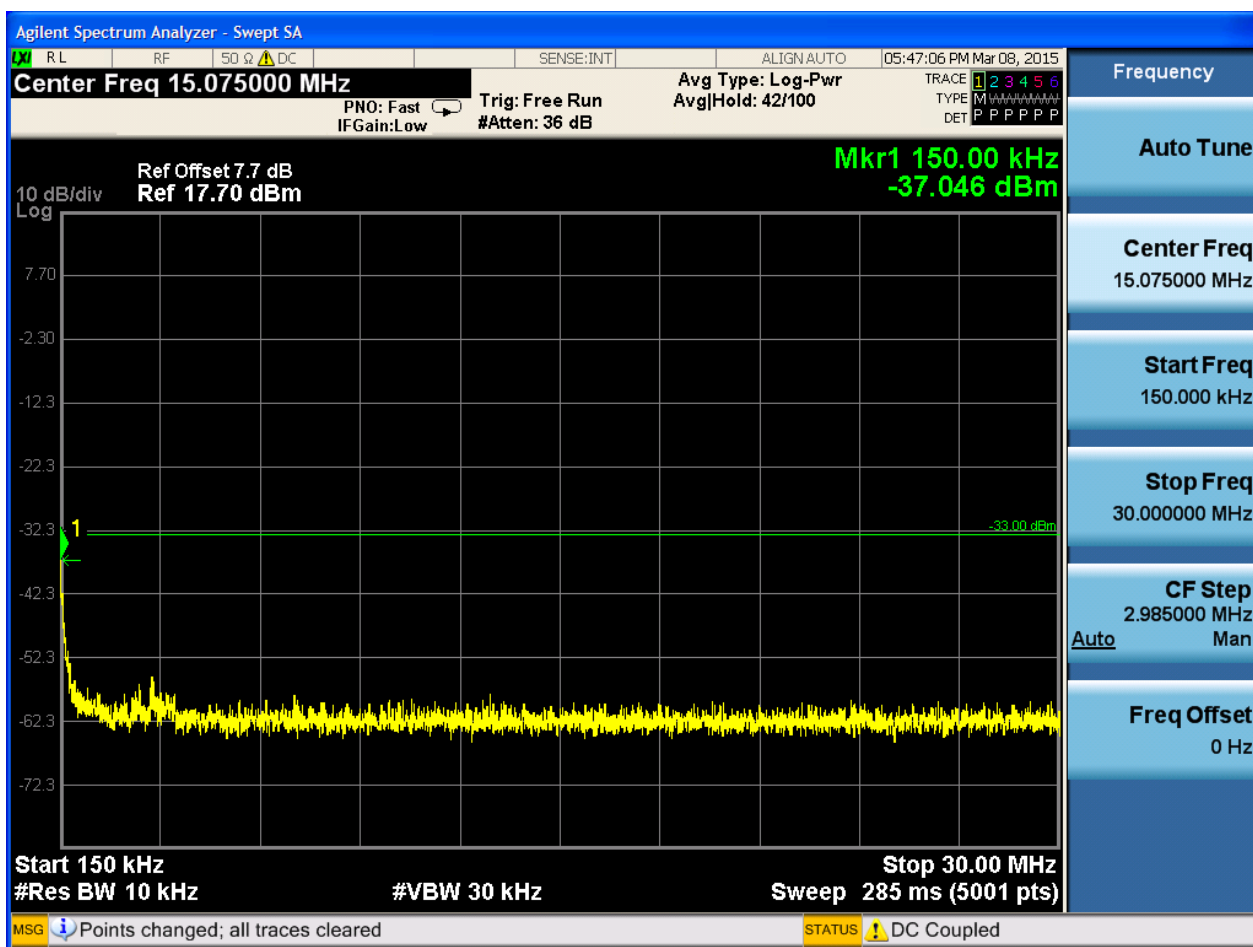


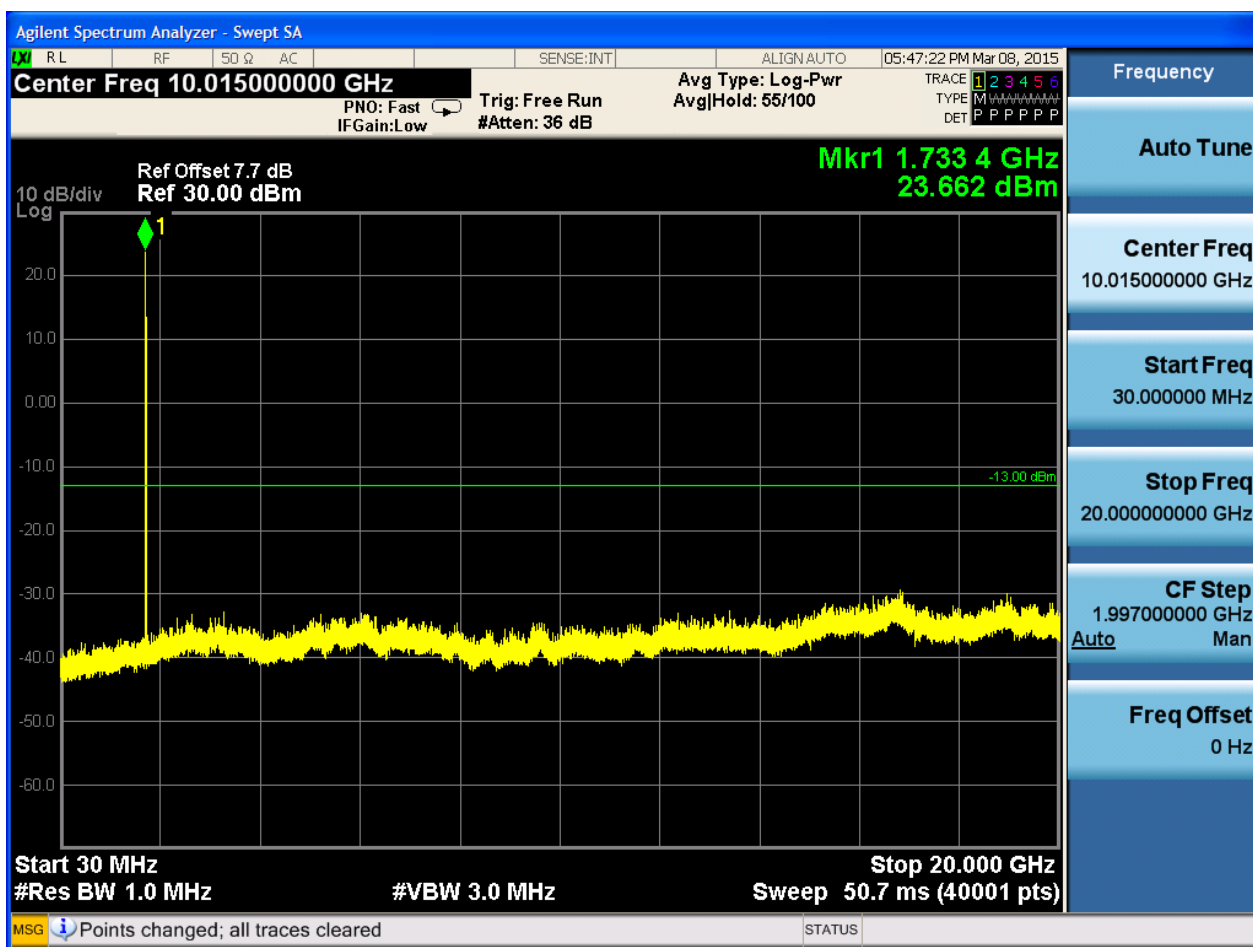




### 6.1.2.1.2 Test Channel = MCH

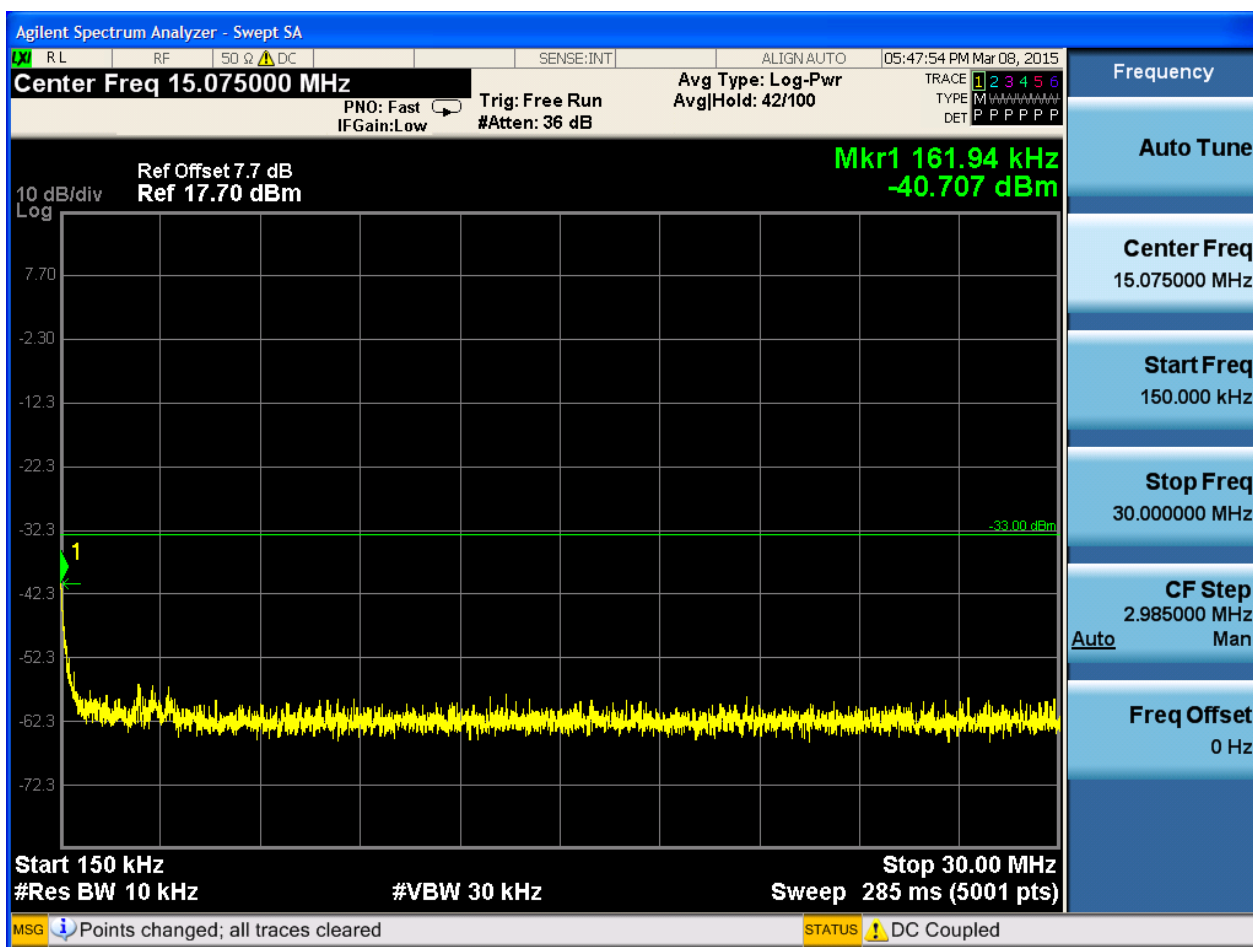


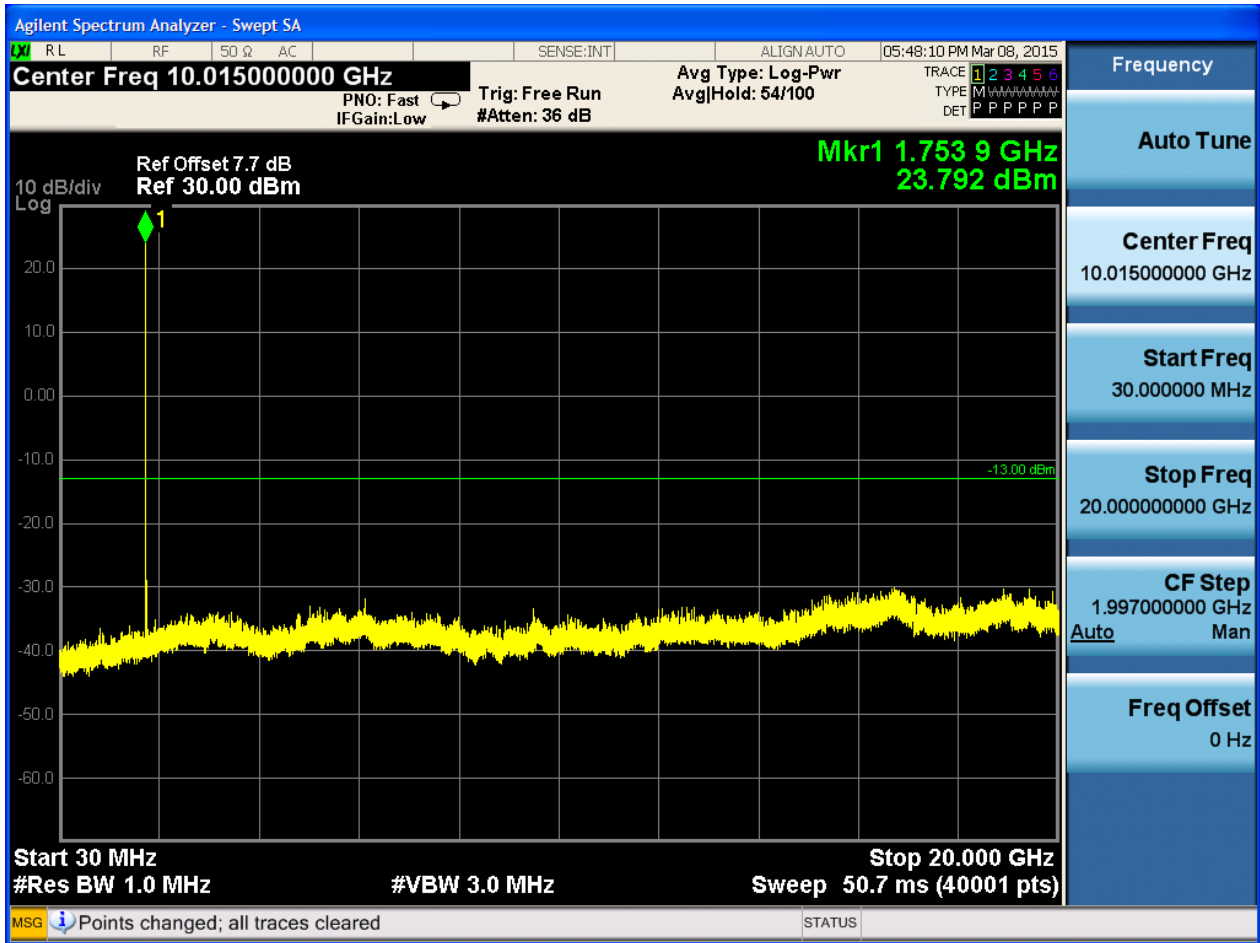




### 6.1.2.1.3 Test Channel = HCH



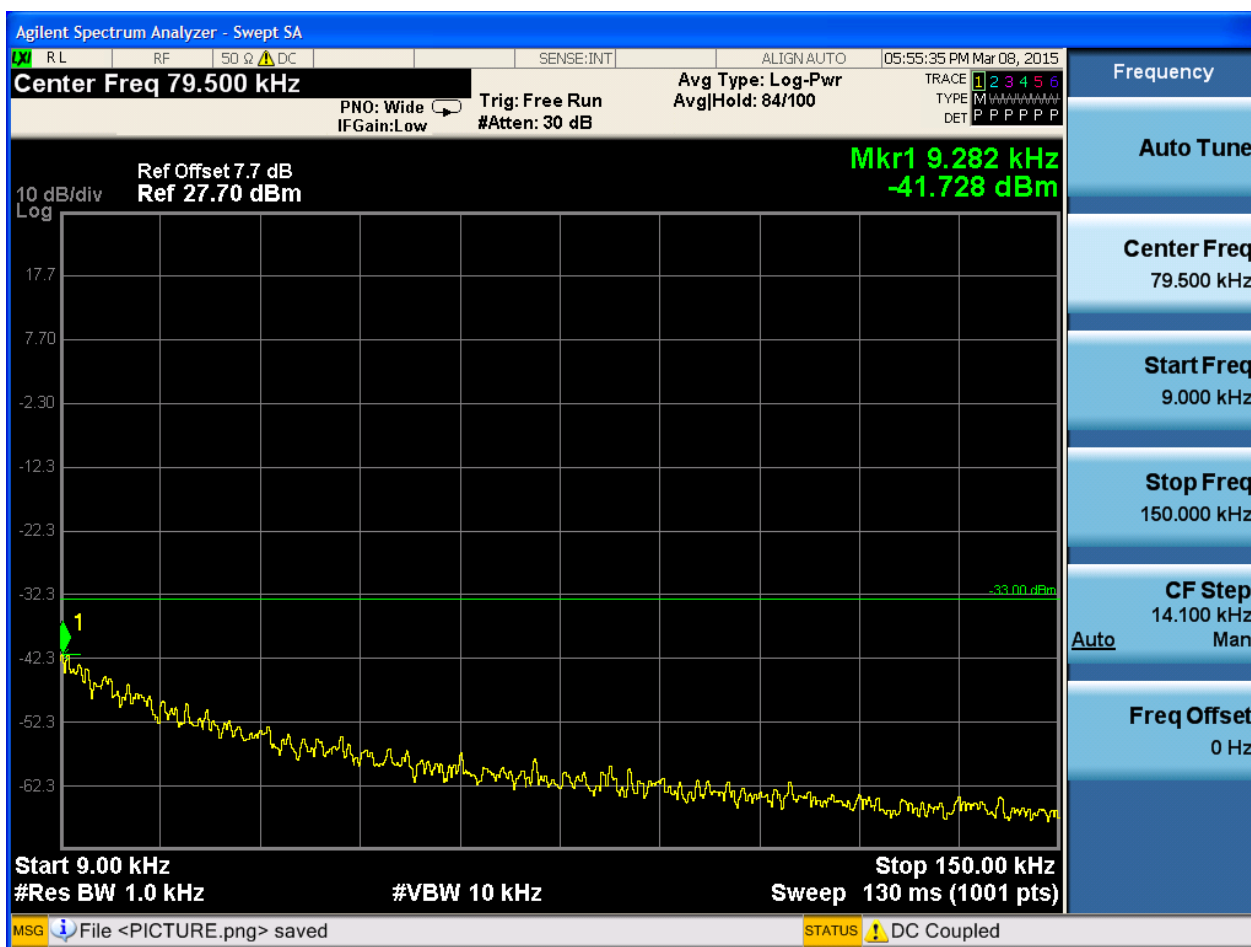


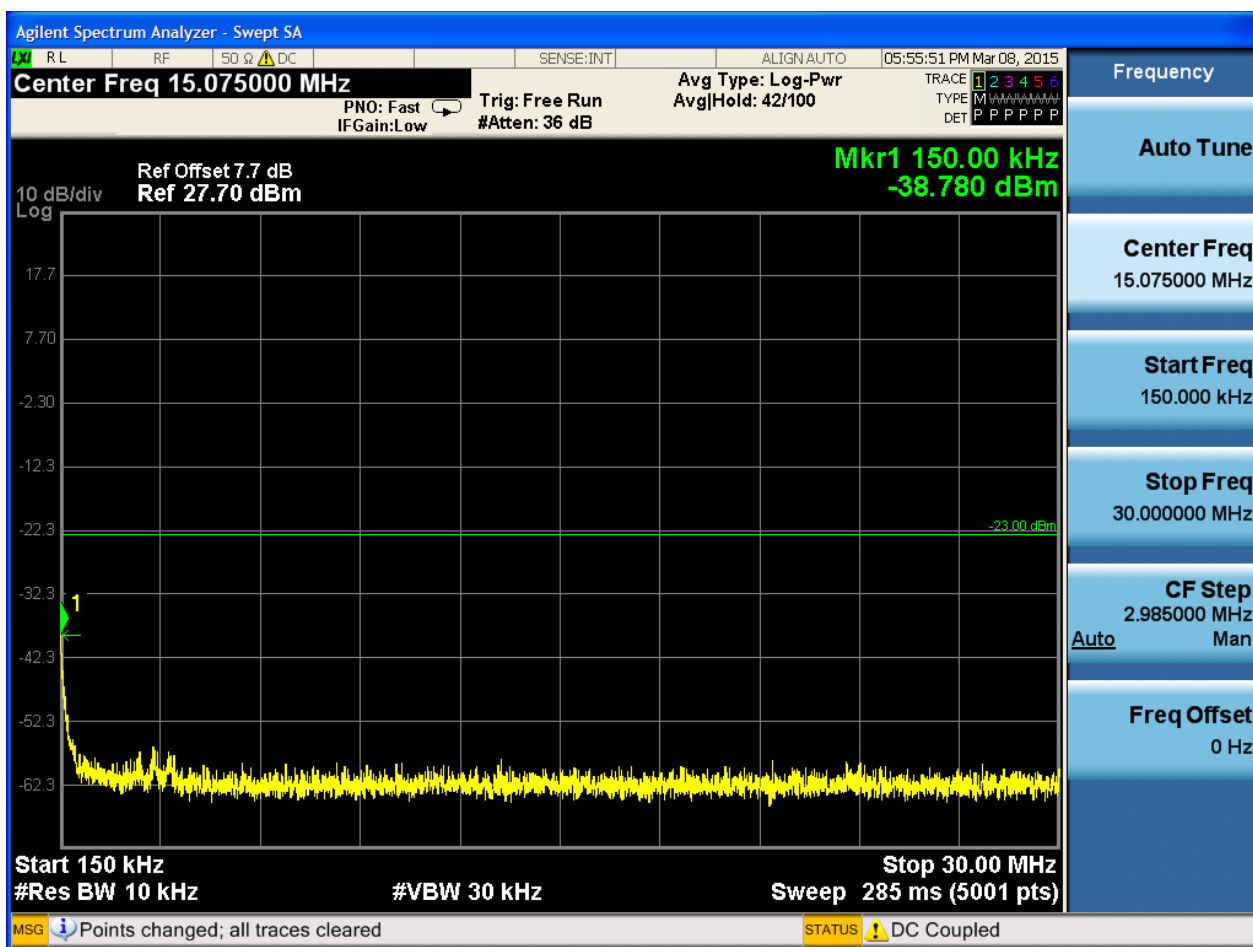


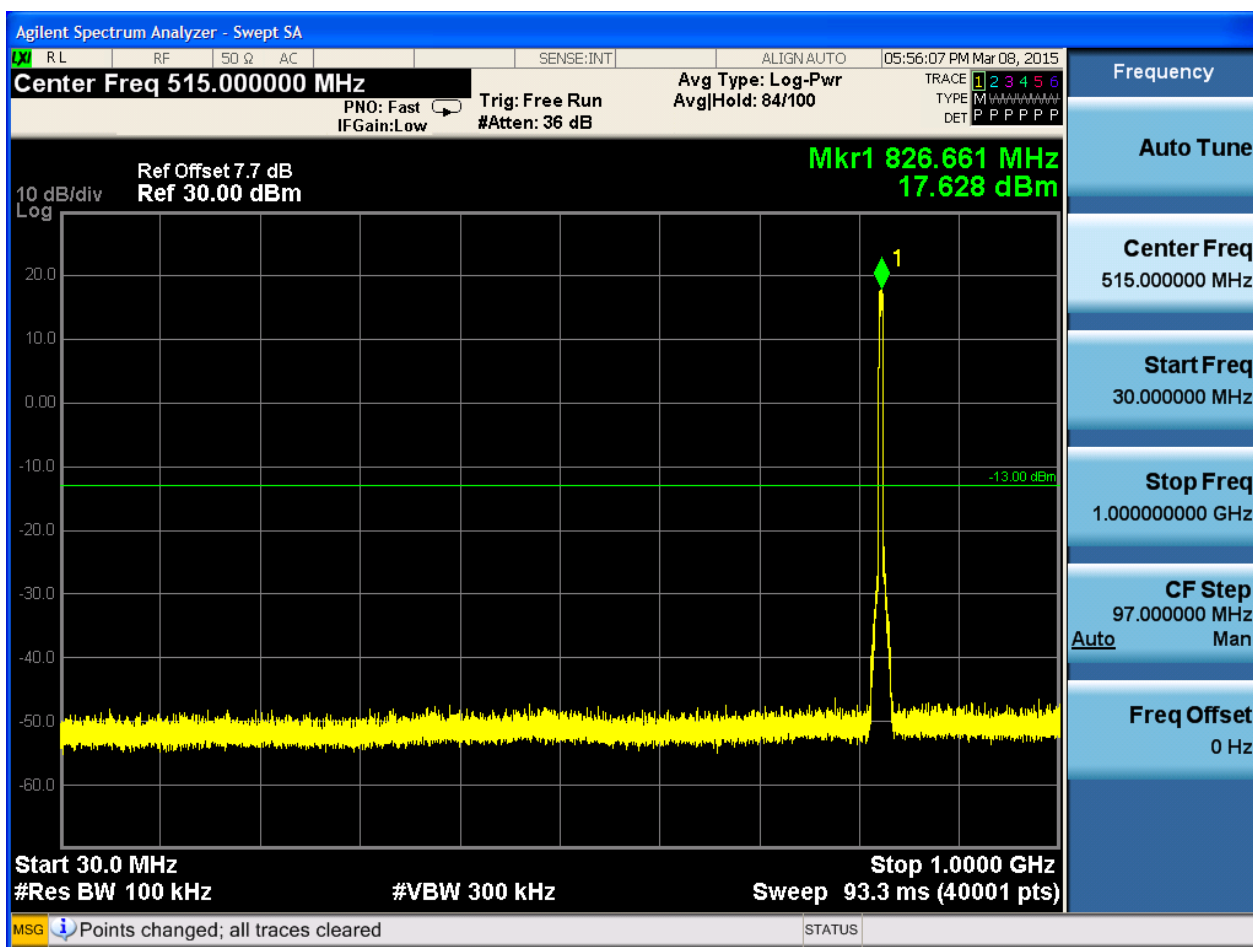
### 6.1.3 Test Band = WCDMA850

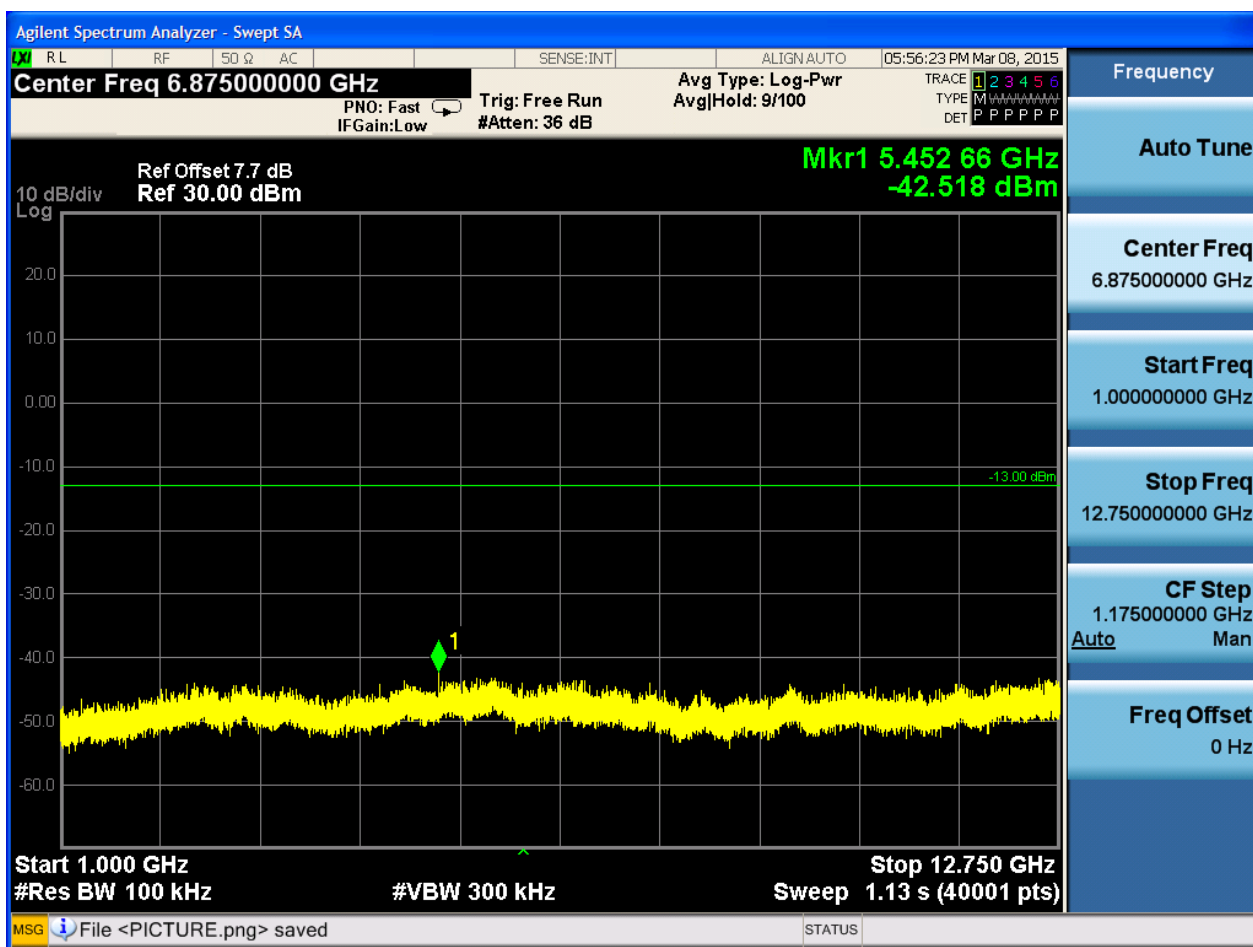
#### 6.1.3.1 Test Mode = UMTS/TM1

##### 6.1.3.1.1 Test Channel = LCH



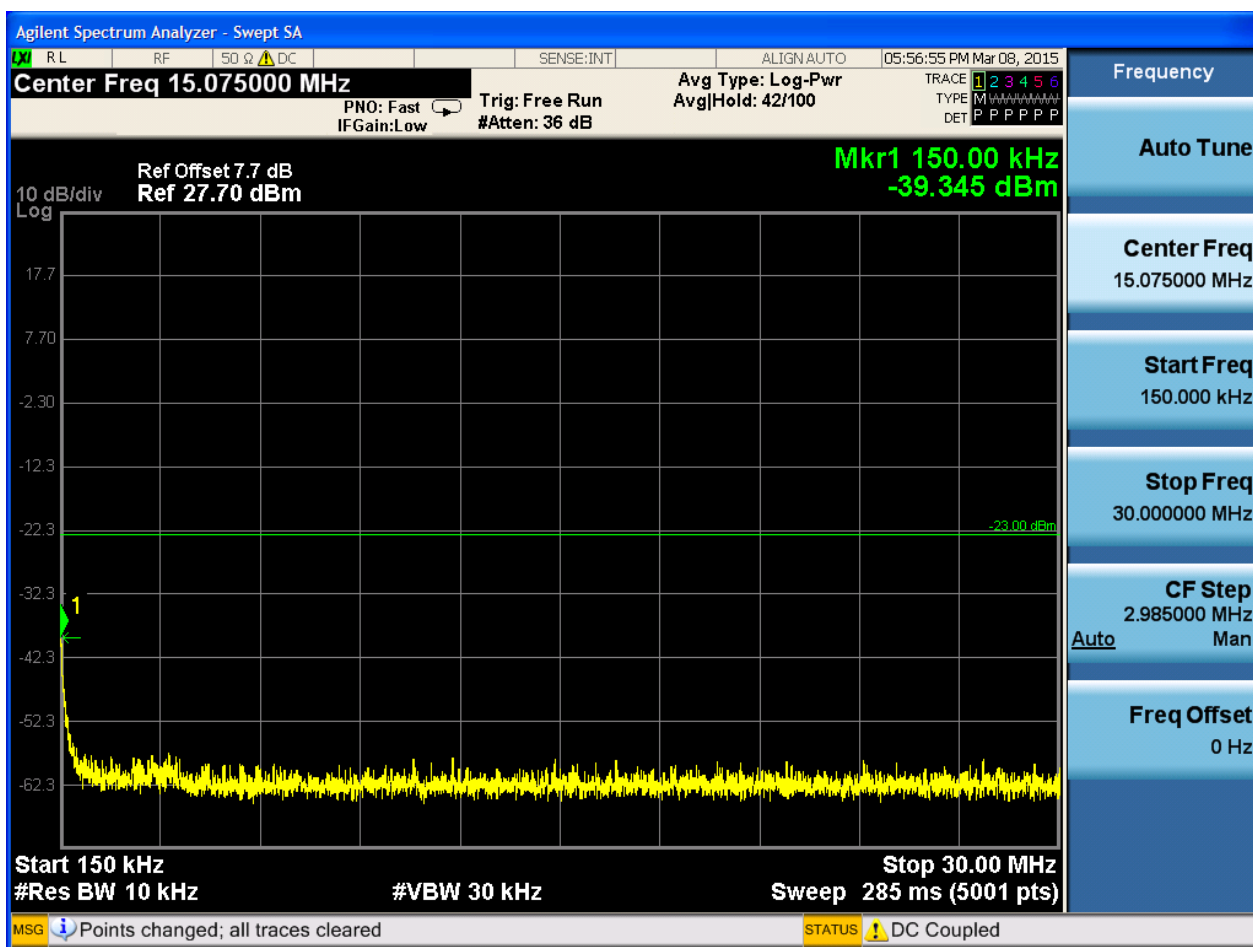


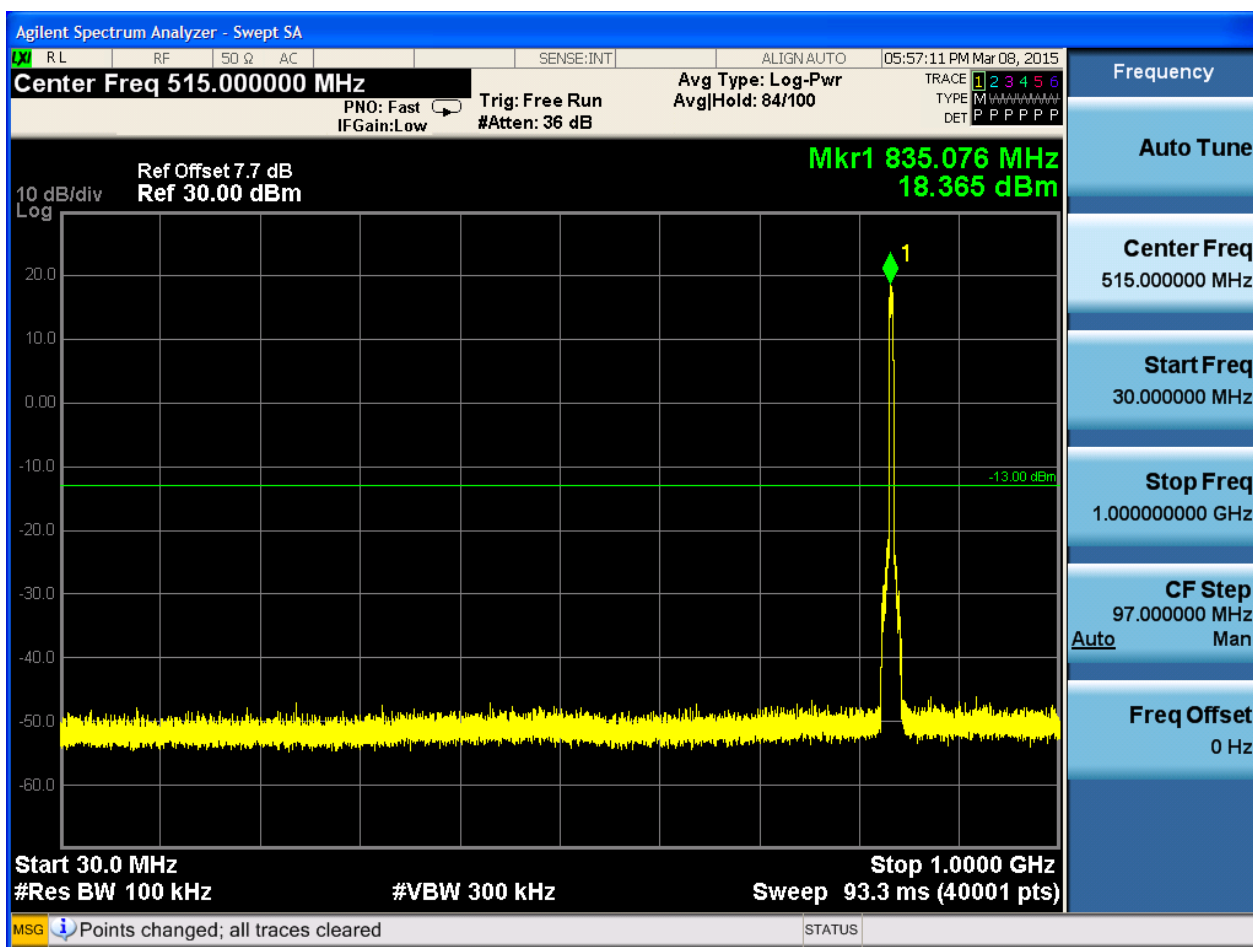


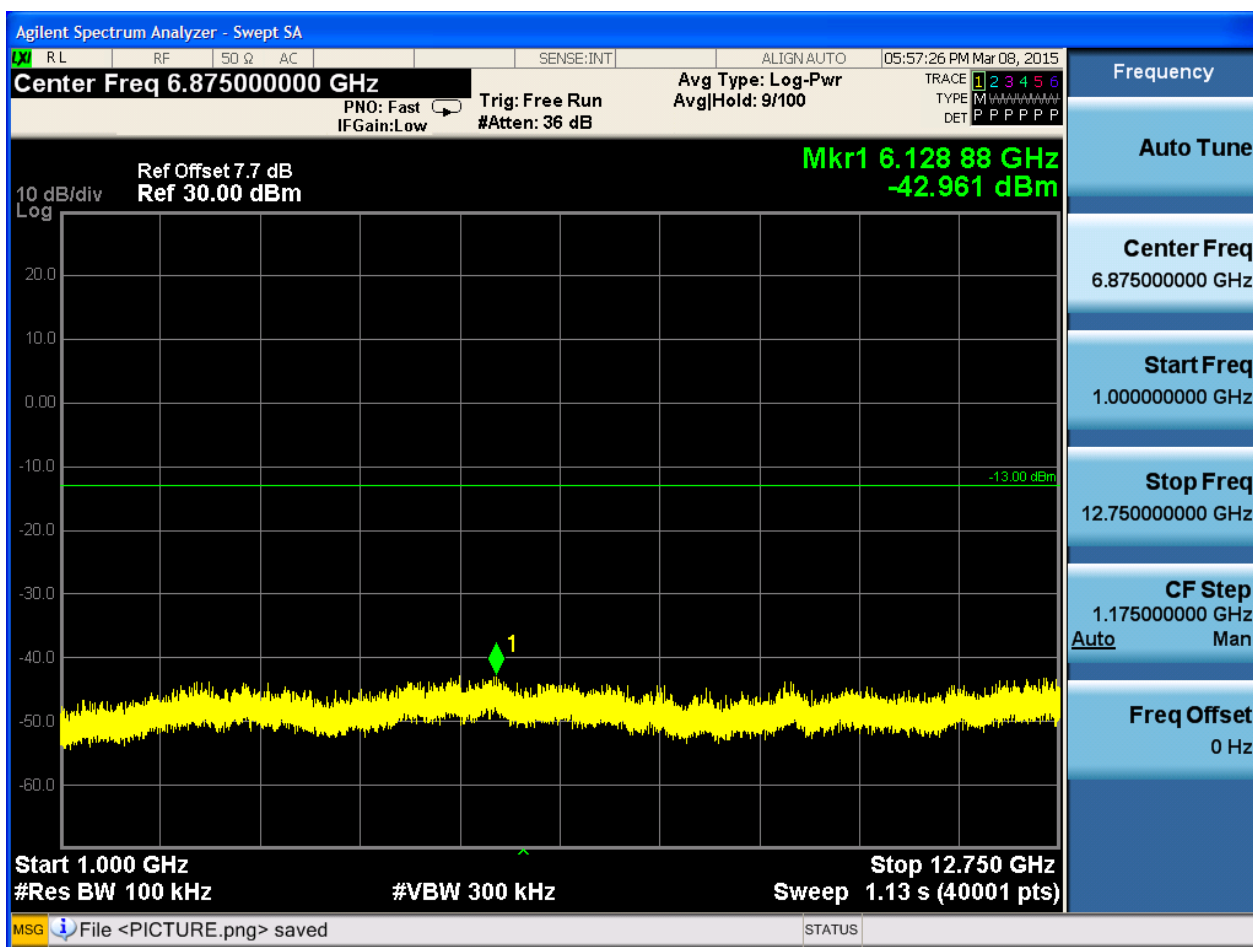


### 6.1.3.1.2 Test Channel = MCH

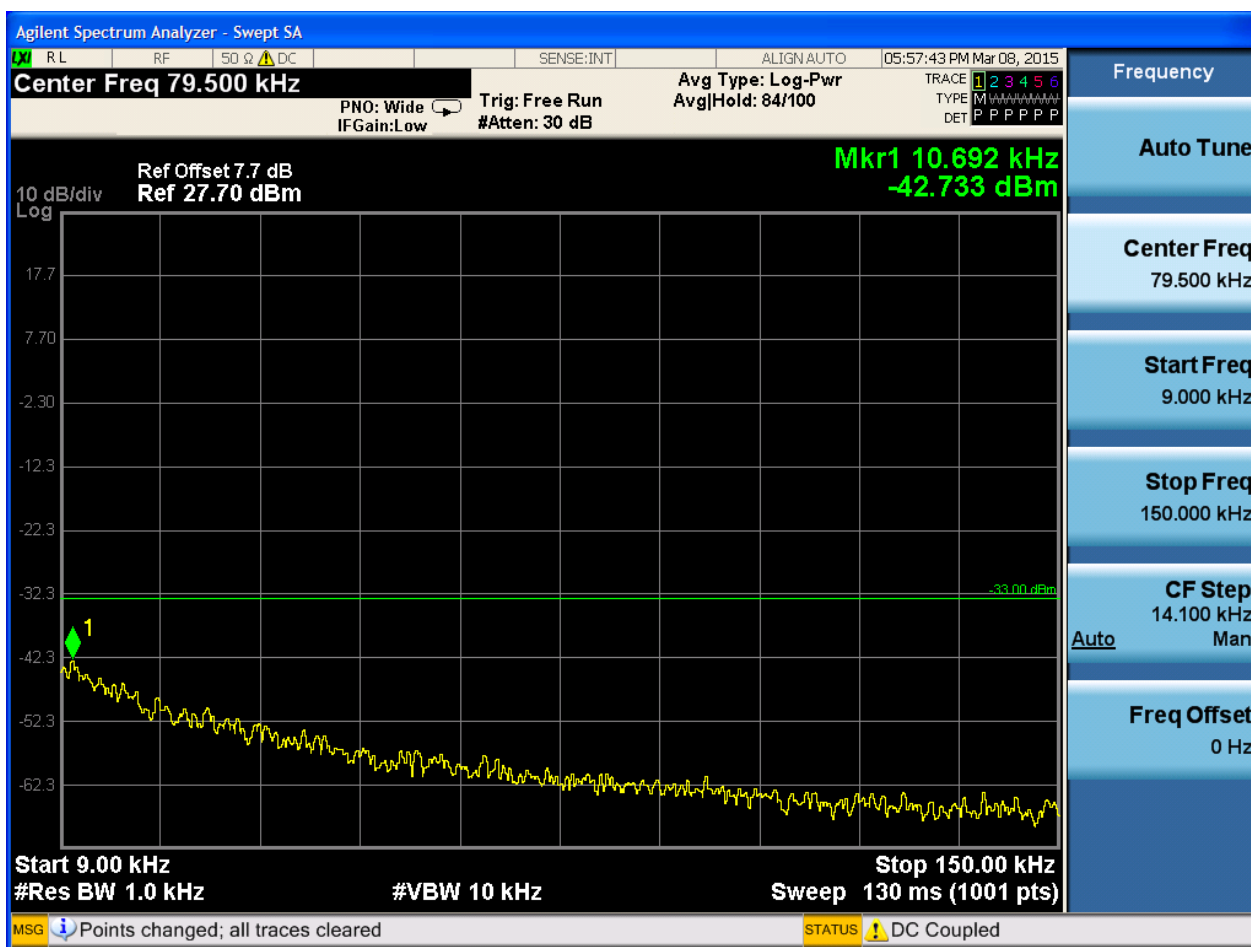


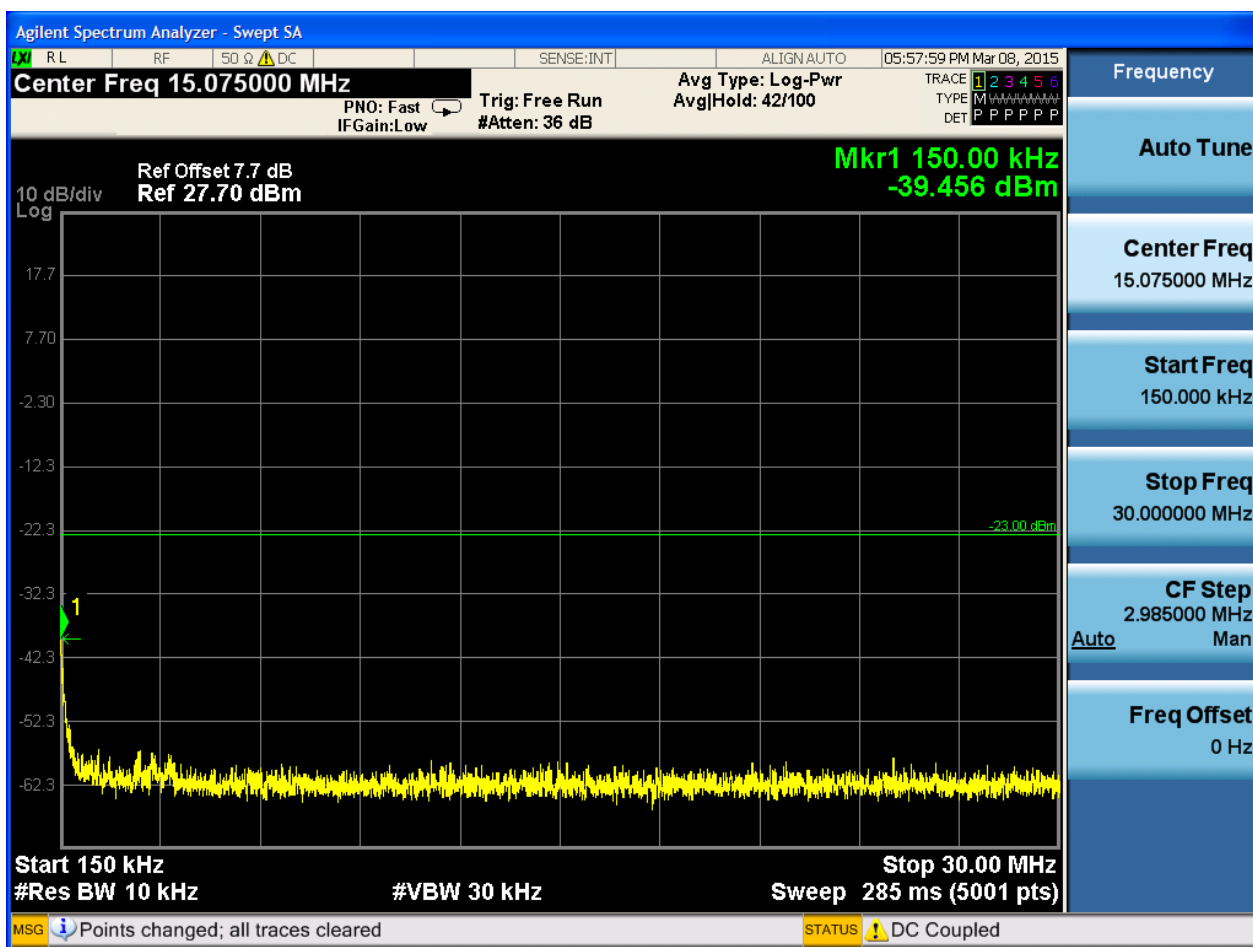


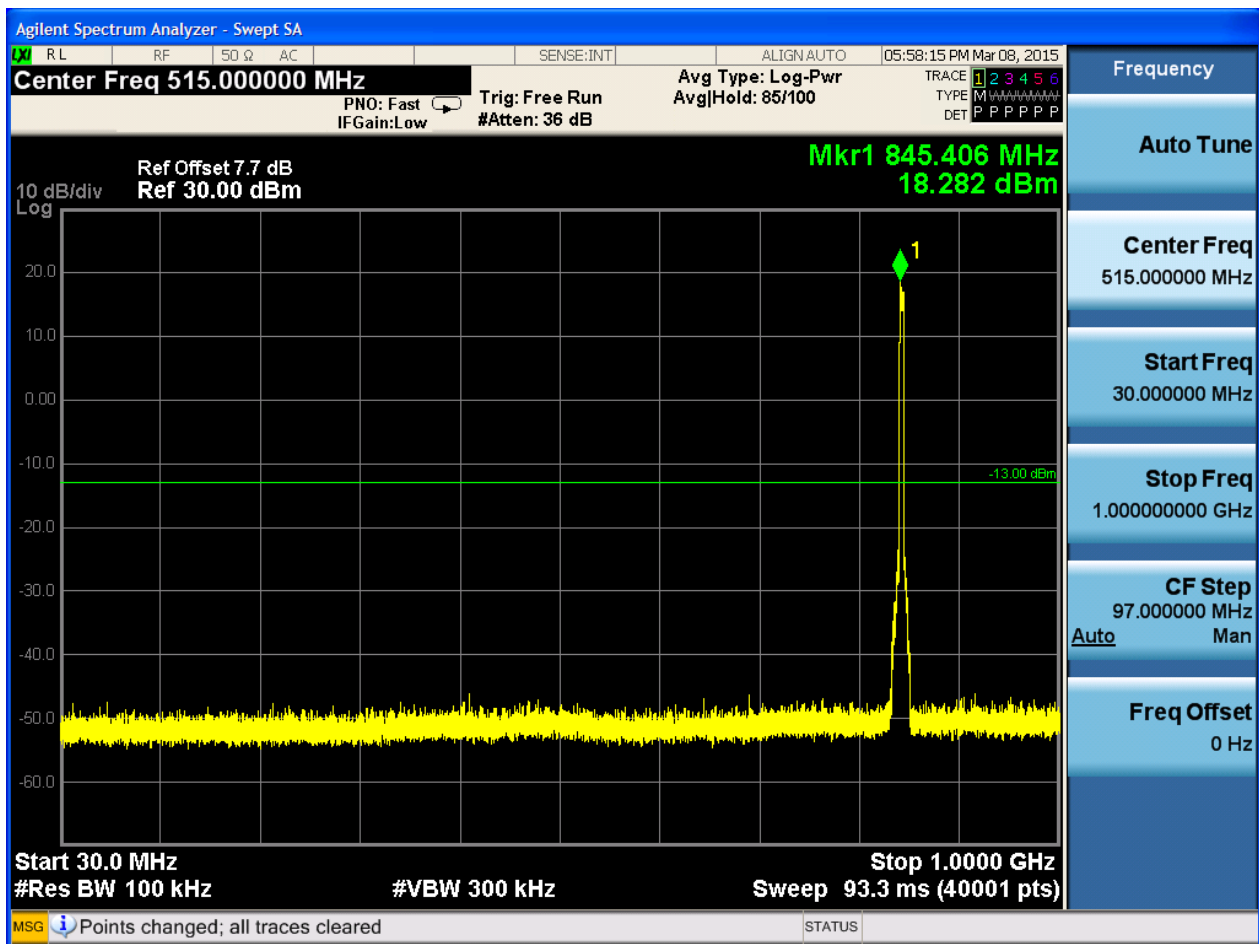


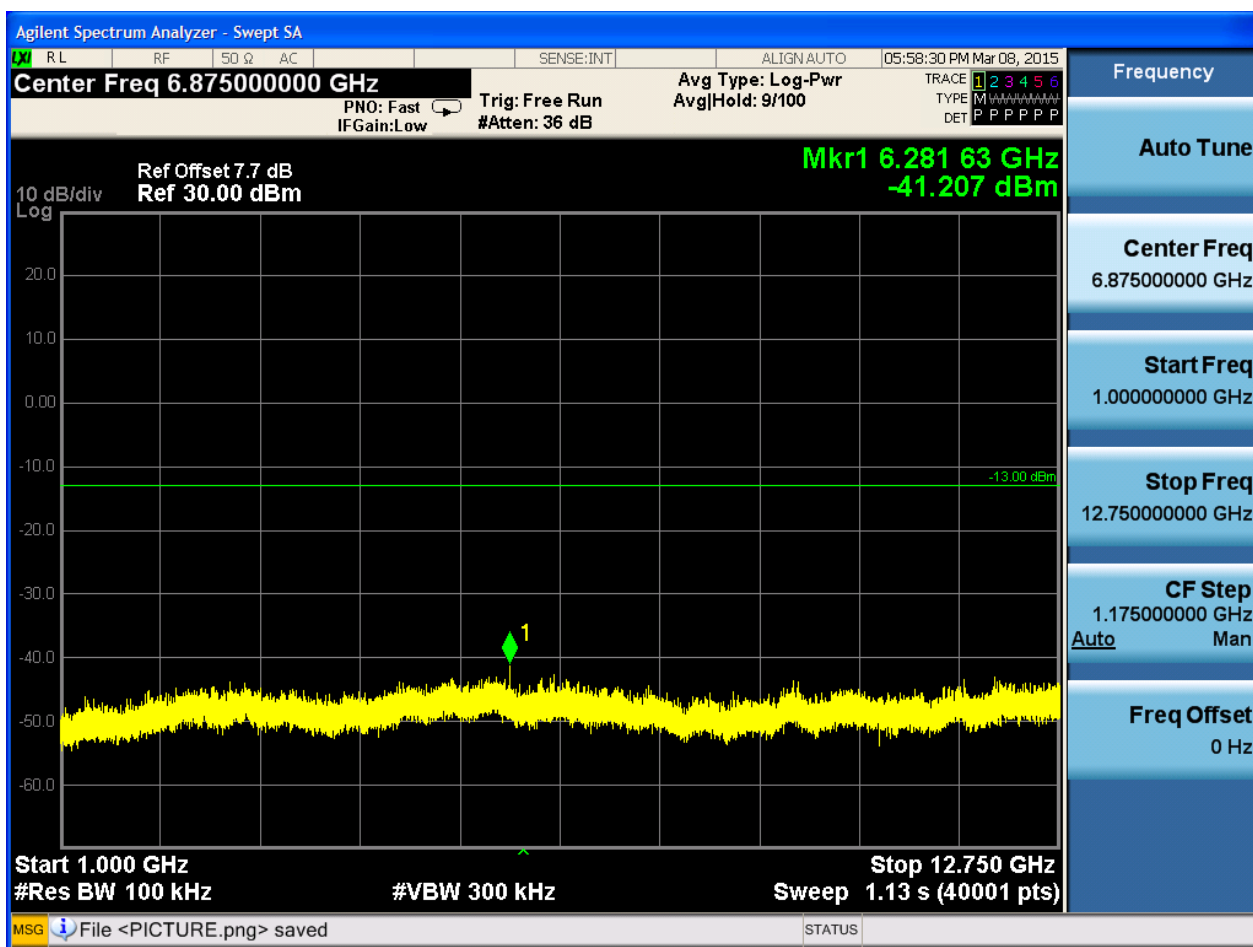


### 6.1.3.1.3 Test Channel = HCH









## 7Appendix\_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, VBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, VBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

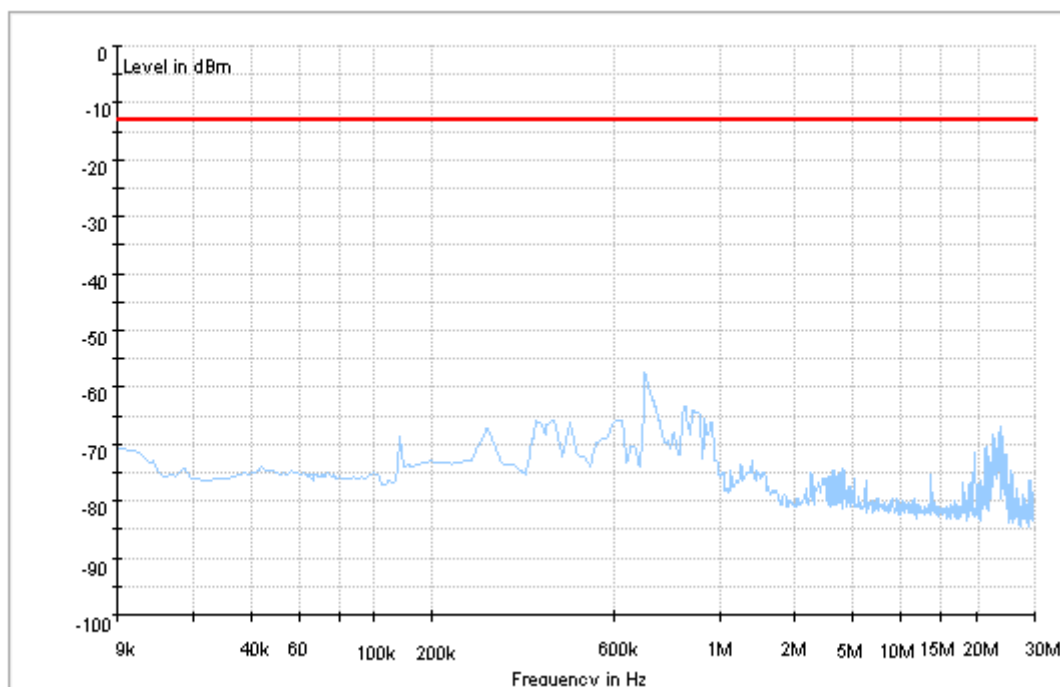
We tested all modes, but the data presented below is the worst case.

### Part I - Test Plots

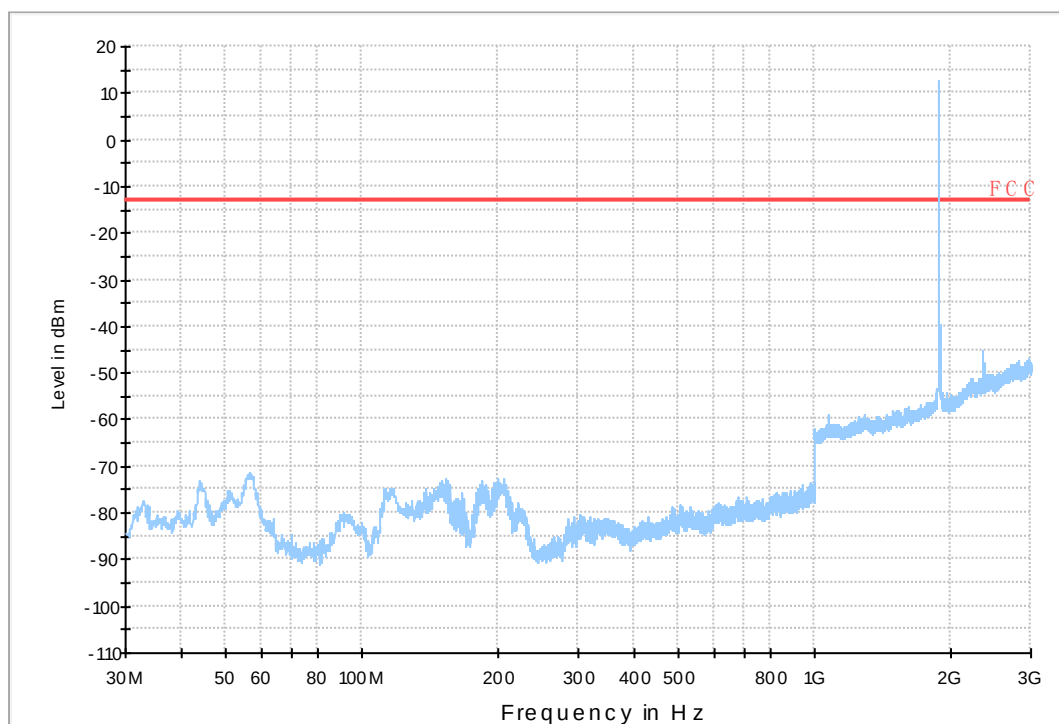
#### 7.1 For UMTS

##### 7.1.1 Test Band = WCDMA1900

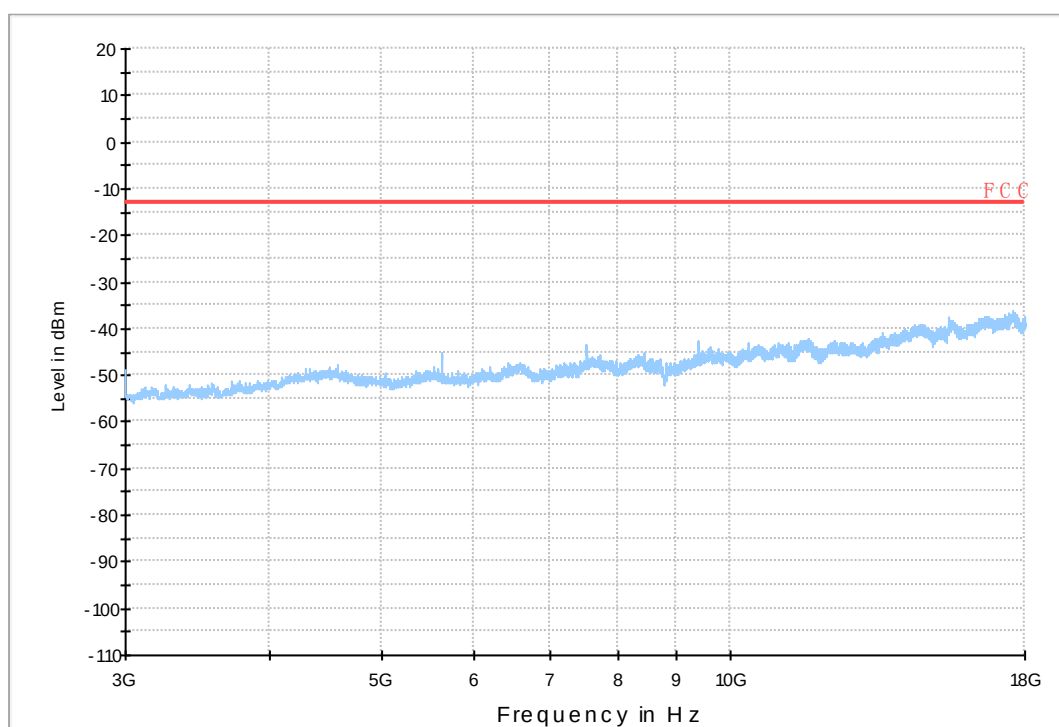
##### 7.1.1.1 Test Mode = UMTS/TM1

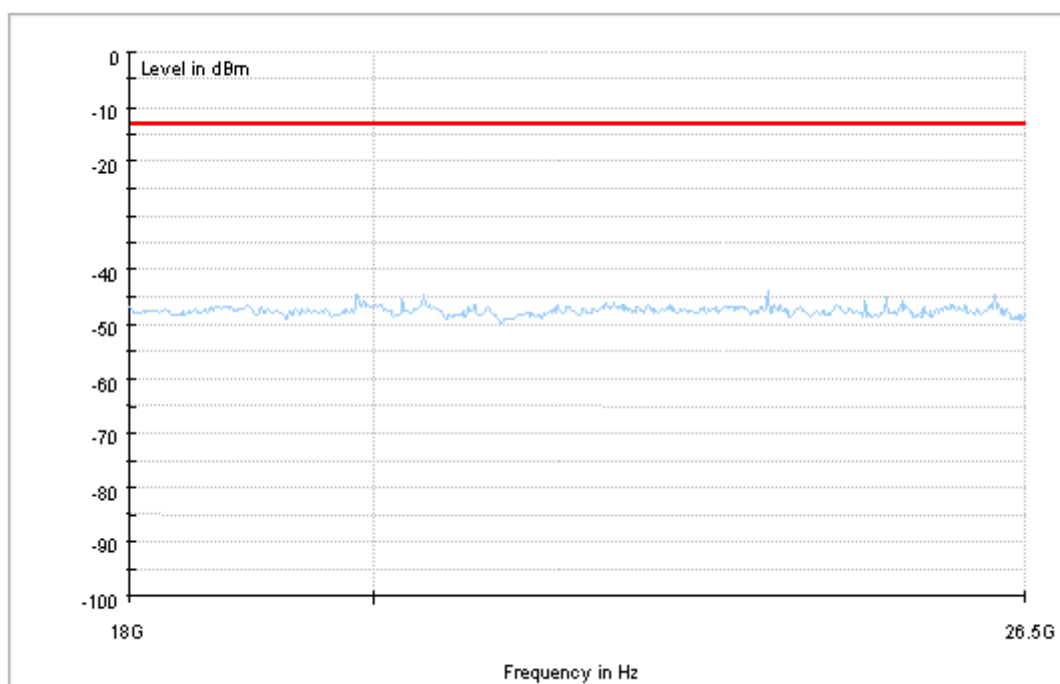


Copy of FCC PART24 W CDMA1900\_L



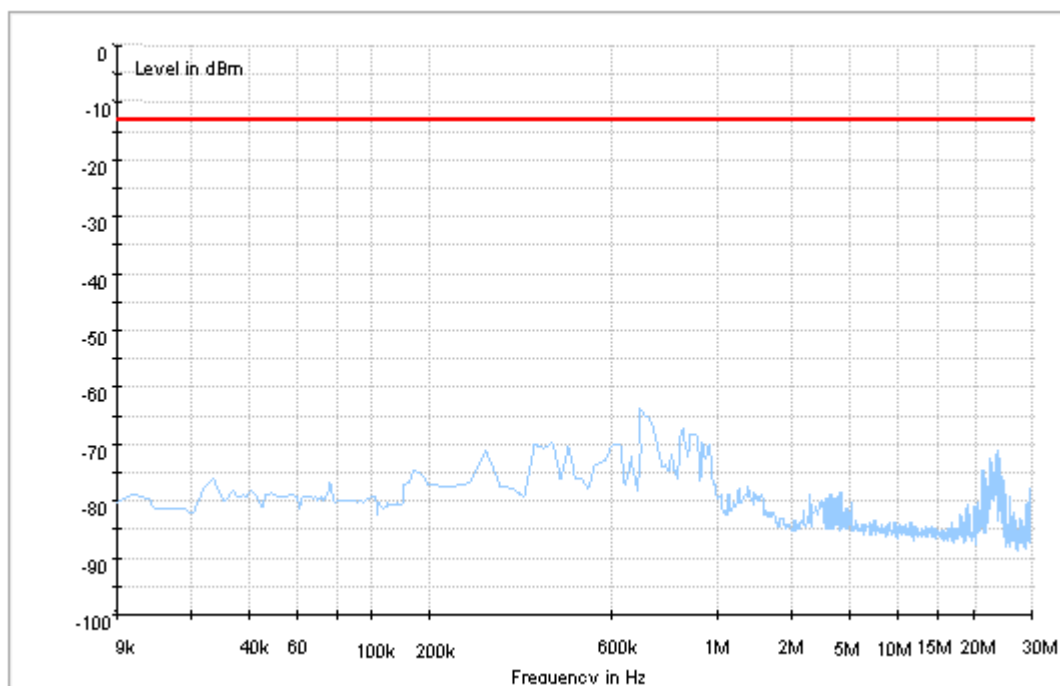
Copy of FCC PART24 W CDMA1900\_H



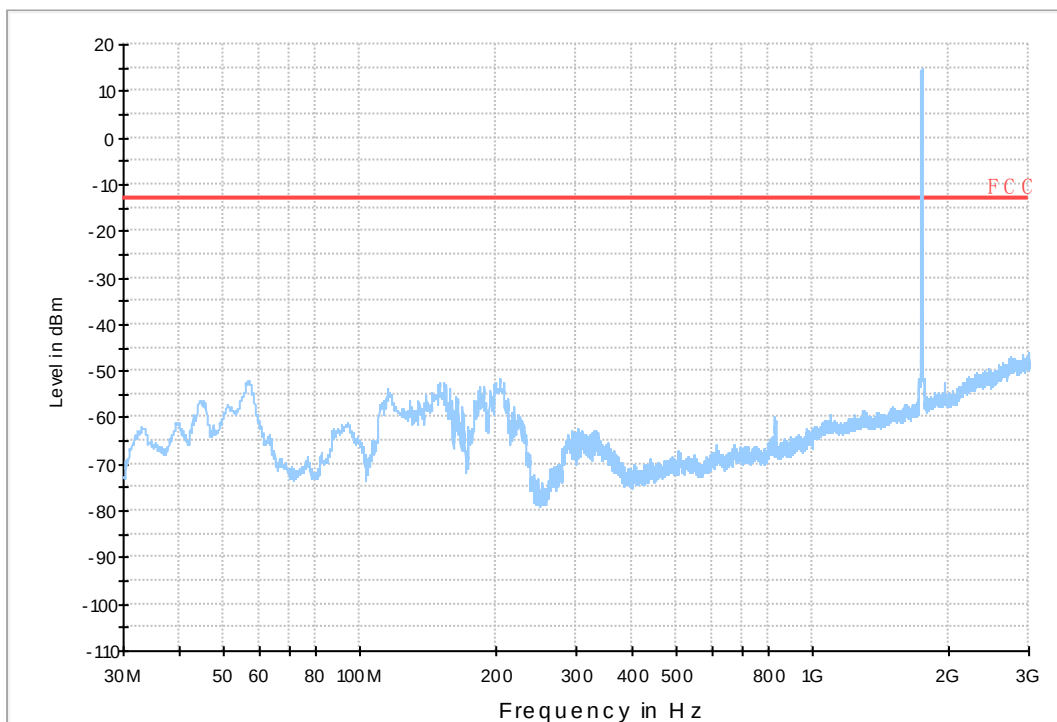


## 7.1.2 Test Band = WCDMA1700

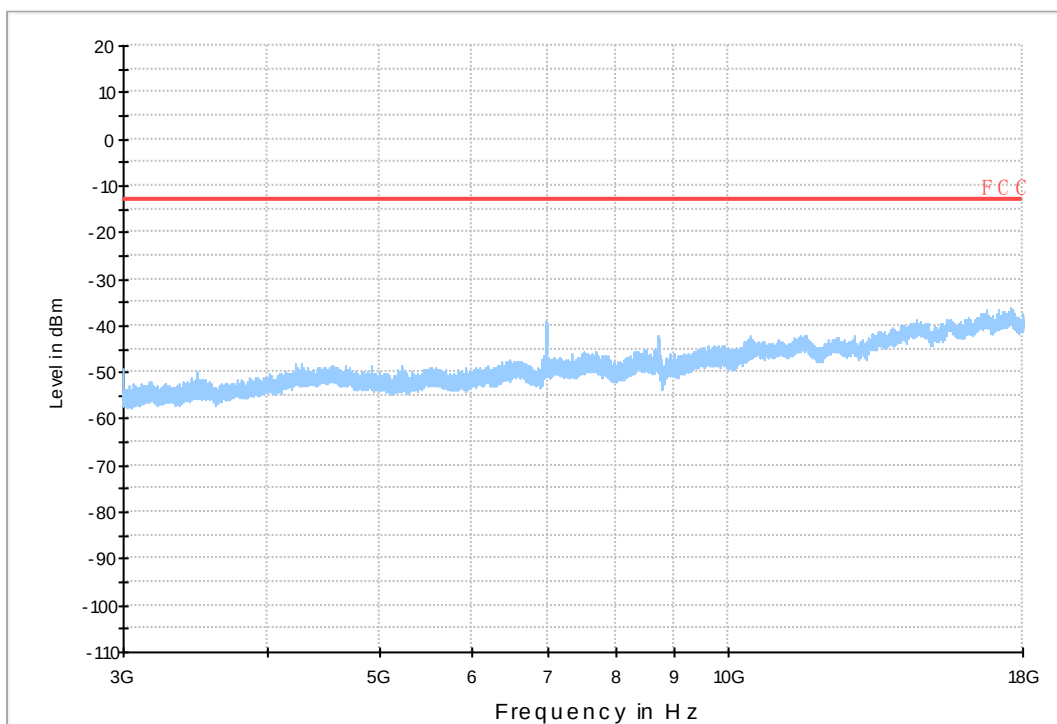
### 7.1.2.1 Test Mode = UMTS/TM1



Copy of FCC PART27 W CDMA1700\_L

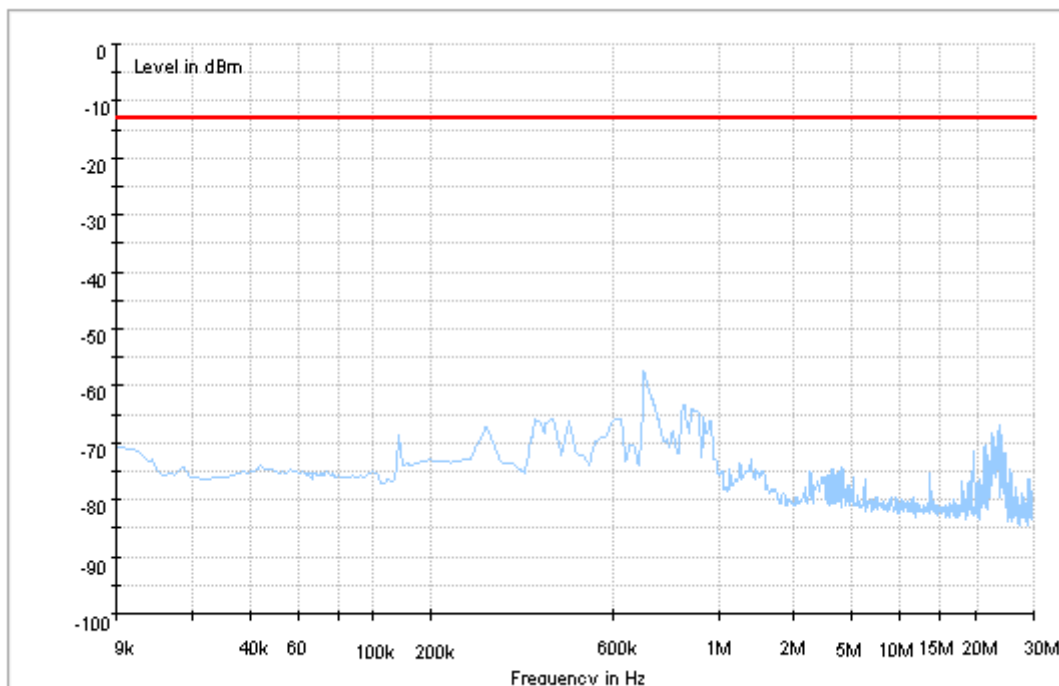


Copy of FCC PART27 W CDMA1700\_H

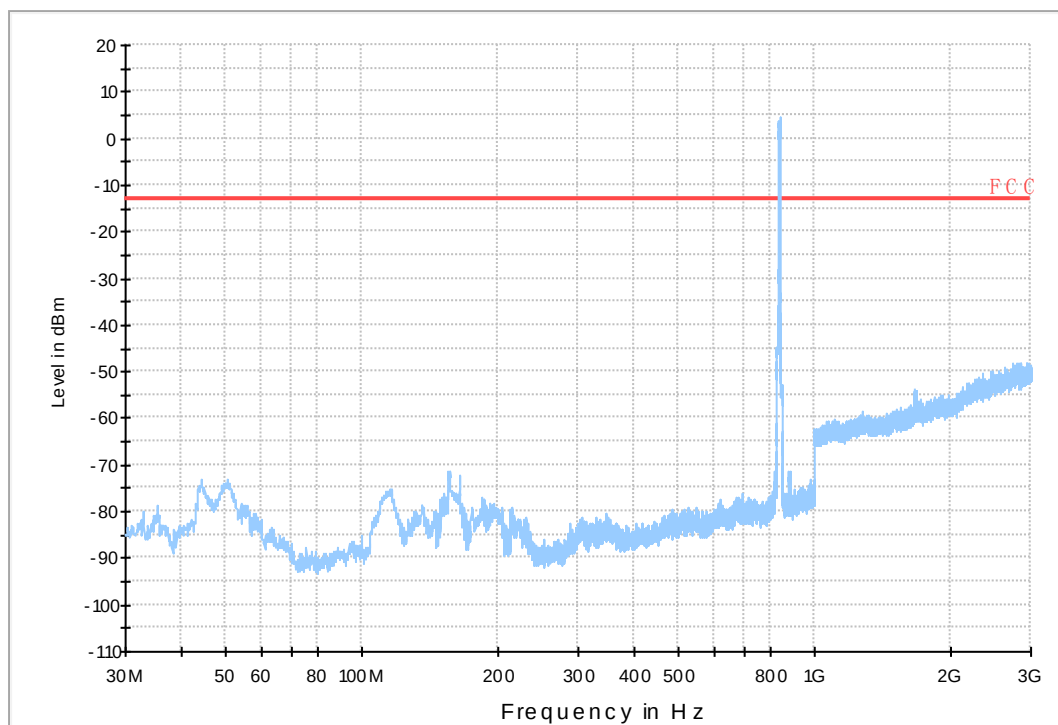


### 7.1.3 Test Band = WCDMA850

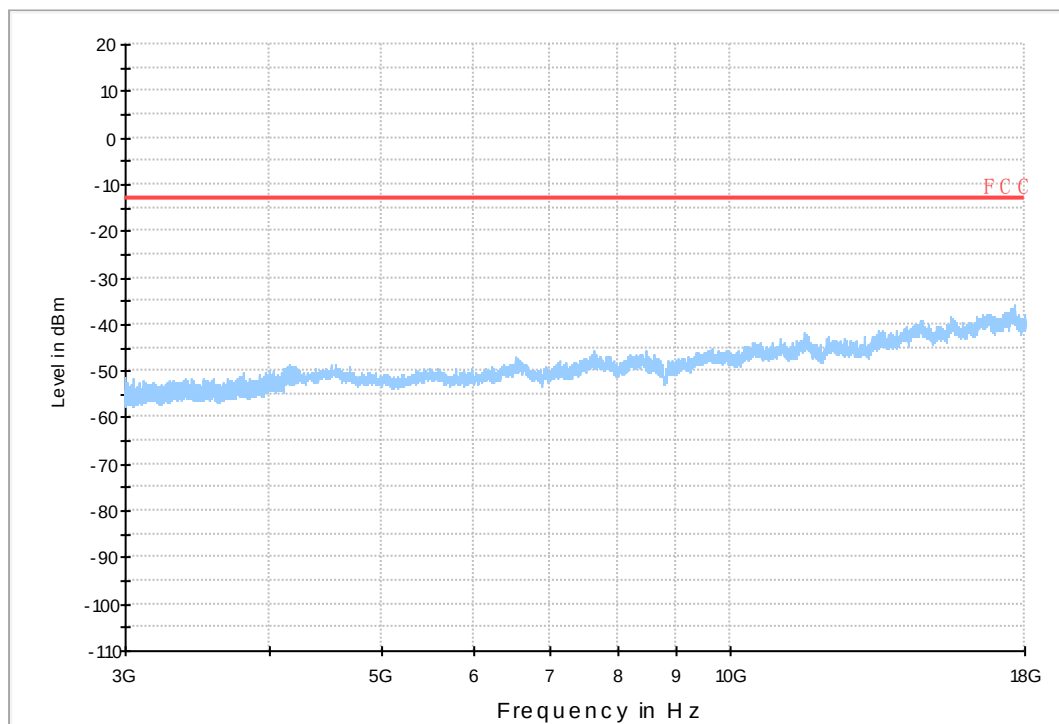
#### 7.1.3.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDMA850\_L



## Copy of FCC PART22 W CDMA850\_H



## 8Appendix\_H: Frequency Stability

### 8.1 For UMTS

#### 8.1.1Frequency Error vs. Voltage:

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | TN         | VL         | 23.39            | 0.01263               | PASS    |
|           |           |              |            | VN         | 1.39             | 0.00075               | PASS    |
|           |           |              |            | VH         | -6.45            | -0.00348              | PASS    |
|           |           | MCH          | TN         | VL         | 1.04             | 0.00055               | PASS    |
|           |           |              |            | VN         | -3.2             | -0.0017               | PASS    |
|           |           |              |            | VH         | -3.98            | -0.00212              | PASS    |
|           |           | HCH          | TN         | VL         | 4.97             | 0.00261               | PASS    |
|           |           |              |            | VN         | 4.41             | 0.00231               | PASS    |
|           |           |              |            | VH         | 3.23             | 0.00169               | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | TN         | VL         | 15.78            | 0.00922               | PASS    |
|           |           |              |            | VN         | 4.91             | 0.00287               | PASS    |
|           |           |              |            | VH         | 2.75             | 0.00161               | PASS    |
|           |           | MCH          | TN         | VL         | 11.4             | 0.00658               | PASS    |
|           |           |              |            | VN         | 4.49             | 0.00259               | PASS    |
|           |           |              |            | VH         | -3.71            | -0.00214              | PASS    |
|           |           | HCH          | TN         | VL         | -4.03            | -0.0023               | PASS    |
|           |           |              |            | VN         | -2.98            | -0.0017               | PASS    |
|           |           |              |            | VH         | 0.67             | 0.00038               | PASS    |
| WCDMA850  | UMTS/TM1  | LCH          | TN         | VL         | -25.83           | -0.03126              | PASS    |
|           |           |              |            | VN         | -7.72            | -0.00934              | PASS    |
|           |           |              |            | VH         | -4.67            | -0.00565              | PASS    |
|           |           | MCH          | TN         | VL         | -25.57           | -0.03057              | PASS    |
|           |           |              |            | VN         | -13              | -0.01554              | PASS    |
|           |           |              |            | VH         | -7.32            | -0.00875              | PASS    |
|           |           | HCH          | TN         | VL         | -21.45           | -0.02534              | PASS    |
|           |           |              |            | VN         | -7.23            | -0.00854              | PASS    |
|           |           |              |            | VH         | 0.95             | 0.00112               | PASS    |

### 8.1.2 Frequency Error vs. Temperature:

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | VN         | -30        | 8.36             | 0.00451               | PASS    |
|           |           |              |            | -20        | -2.78            | -0.0015               | PASS    |
|           |           |              |            | -10        | -5.14            | -0.00277              | PASS    |
|           |           |              |            | 0          | 0.89             | 0.00048               | PASS    |
|           |           |              |            | 10         | -1.65            | -0.00089              | PASS    |
|           |           |              |            | 20         | 16.83            | 0.00909               | PASS    |
|           |           |              |            | 30         | 10.44            | 0.00564               | PASS    |
|           |           |              |            | 40         | -7.55            | -0.00408              | PASS    |
|           |           |              |            | 50         | 1.98             | 0.00107               | PASS    |
|           |           | MCH          | VN         | -30        | -14.63           | -0.00778              | PASS    |
|           |           |              |            | -20        | 1.43             | 0.00076               | PASS    |
|           |           |              |            | -10        | -0.95            | -0.00051              | PASS    |
|           |           |              |            | 0          | -0.64            | -0.00034              | PASS    |
|           |           |              |            | 10         | 1.45             | 0.00077               | PASS    |
|           |           |              |            | 20         | 1.4              | 0.00074               | PASS    |
|           |           |              |            | 30         | 0.06             | 0.00003               | PASS    |
|           |           |              |            | 40         | -8.39            | -0.00446              | PASS    |
|           |           |              |            | 50         | 2.53             | 0.00135               | PASS    |
|           |           | HCH          | VN         | -30        | -2.03            | -0.00106              | PASS    |
|           |           |              |            | -20        | -4.38            | -0.0023               | PASS    |
|           |           |              |            | -10        | 6.3              | 0.0033                | PASS    |
|           |           |              |            | 0          | 4.93             | 0.00258               | PASS    |
|           |           |              |            | 10         | 5.45             | 0.00286               | PASS    |
|           |           |              |            | 20         | 2.88             | 0.00151               | PASS    |
|           |           |              |            | 30         | 1.74             | 0.00091               | PASS    |
|           |           |              |            | 40         | 4.96             | 0.0026                | PASS    |
|           |           |              |            | 50         | 2.43             | 0.00127               | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | VN         | -30        | 14.71            | 0.00859               | PASS    |
|           |           |              |            | -20        | 3.34             | 0.00195               | PASS    |
|           |           |              |            | -10        | 2.81             | 0.00164               | PASS    |
|           |           |              |            | 0          | 6.87             | 0.00401               | PASS    |
|           |           |              |            | 10         | 2.55             | 0.00149               | PASS    |
|           |           |              |            | 20         | 3.68             | 0.00215               | PASS    |
|           |           |              |            | 30         | 7.78             | 0.00454               | PASS    |
|           |           |              |            | 40         | 6.56             | 0.00383               | PASS    |
|           |           |              |            | 50         | 1.24             | 0.00072               | PASS    |
|           |           | MCH          | VN         | -30        | 0.37             | 0.00021               | PASS    |

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
|           |           |              |            | -20        | -2.44            | -0.00141              | PASS    |
|           |           |              |            | -10        | 4.18             | 0.00241               | PASS    |
|           |           |              |            | 0          | -7.42            | -0.00428              | PASS    |
|           |           |              |            | 10         | -6.76            | -0.0039               | PASS    |
|           |           |              |            | 20         | -1.5             | -0.00087              | PASS    |
|           |           |              |            | 30         | 5.89             | 0.0034                | PASS    |
|           |           |              |            | 40         | 6.74             | 0.00389               | PASS    |
|           |           |              |            | 50         | 7.4              | 0.00427               | PASS    |
|           |           | HCH          | VN         | -30        | 22.78            | 0.013                 | PASS    |
|           |           |              |            | -20        | 5.66             | 0.00323               | PASS    |
|           |           |              |            | -10        | 14.14            | 0.00807               | PASS    |
|           |           |              |            | 0          | 8.7              | 0.00496               | PASS    |
|           |           |              |            | 10         | -0.82            | -0.00047              | PASS    |
|           |           |              |            | 20         | 3.43             | 0.00196               | PASS    |
|           |           |              |            | 30         | 6.33             | 0.00361               | PASS    |
|           |           |              |            | 40         | -4.1             | -0.00234              | PASS    |
|           |           |              |            | 50         | 6.45             | 0.00368               | PASS    |
| WCDMA850  | UMTS/TM1  | LCH          | VN         | -30        | -28.52           | -0.03451              | PASS    |
|           |           |              |            | -20        | 2.73             | 0.0033                | PASS    |
|           |           |              |            | -10        | -3.37            | -0.00408              | PASS    |
|           |           |              |            | 0          | 4.12             | 0.00499               | PASS    |
|           |           |              |            | 10         | -11.23           | -0.01359              | PASS    |
|           |           |              |            | 20         | -14.95           | -0.01809              | PASS    |
|           |           |              |            | 30         | -3.86            | -0.00467              | PASS    |
|           |           |              |            | 40         | -11.84           | -0.01433              | PASS    |
|           |           |              |            | 50         | -5.46            | -0.00661              | PASS    |
|           |           | MCH          | VN         | -30        | -23.68           | -0.02831              | PASS    |
|           |           |              |            | -20        | -6.73            | -0.00805              | PASS    |
|           |           |              |            | -10        | -11.31           | -0.01352              | PASS    |
|           |           |              |            | 0          | 1.08             | 0.00129               | PASS    |
|           |           |              |            | 10         | -6.87            | -0.00821              | PASS    |
|           |           |              |            | 20         | -8.62            | -0.01031              | PASS    |
|           |           |              |            | 30         | 0.84             | 0.001                 | PASS    |
|           |           |              |            | 40         | -6.33            | -0.00757              | PASS    |
|           |           |              |            | 50         | -9.51            | -0.01137              | PASS    |
|           |           | HCH          | VN         | -30        | -21.07           | -0.02489              | PASS    |
|           |           |              |            | -20        | -3.89            | -0.00459              | PASS    |
|           |           |              |            | -10        | -4.32            | -0.0051               | PASS    |
|           |           |              |            | 0          | -16.65           | -0.01967              | PASS    |
|           |           |              |            | 10         | -18.86           | -0.02228              | PASS    |



| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
|           |           |              |            | 20         | -7.06            | -0.00834              | PASS    |
|           |           |              |            | 30         | -5.33            | -0.0063               | PASS    |
|           |           |              |            | 40         | -10.85           | -0.01282              | PASS    |
|           |           |              |            | 50         | 0.78             | 0.00092               | PASS    |

END