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# Appendix for test report

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

### Part I - Test Results

| Test Band | Test Mode | Test Channel | Conducted Power[dBm] | ERP [dBm]  | Limit [dBm] | Verdict |
|-----------|-----------|--------------|----------------------|------------|-------------|---------|
| WCDMA850  | UMTS/TM1  | LCH          | 24.04                | 20.49      | 38.5        | PASS    |
|           |           | MCH          | 24.12                | 20.57      | 38.5        | PASS    |
|           |           | HCH          | 24.08                | 20.53      | 38.5        | PASS    |
| Test Band | Test Mode | Test Channel | Conducted Power      | EIRP [dBm] | Limit [dBm] | Verdict |
| WCDMA1700 | UMTS/TM1  | LCH          | 23.9                 | 21.7       | 30          | PASS    |
|           |           | MCH          | 23.84                | 21.64      | 30          | PASS    |
|           |           | HCH          | 23.76                | 21.56      | 30          | PASS    |
| WCDMA1900 | UMTS/TM1  | LCH          | 24.11                | 23.81      | 33          | PASS    |
|           |           | MCH          | 24.07                | 23.77      | 33          | PASS    |
|           |           | HCH          | 23.94                | 23.64      | 33          | 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:

$$\text{SET Span} = 1.5 * \text{OBW}$$

$$\text{SET RBW} = 1\% \text{ of the OBW, not to exceed } 1\text{MHz}$$

$$\text{SET VBW} \geq 3 * \text{RBW}$$

SET Sweep time = auto - couple.

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          | 3.28         | 13         | PASS    |
|           |           | MCH          | 3.26         | 13         | PASS    |
|           |           | HCH          | 3.31         | 13         | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | 3.4          | 13         | PASS    |
|           |           | MCH          | 3.4          | 13         | PASS    |
|           |           | HCH          | 3.58         | 13         | PASS    |
| WCDMA850  | UMTS/TM1  | LCH          | 3.34         | 13         | PASS    |
|           |           | MCH          | 3.34         | 13         | PASS    |
|           |           | HCH          | 3.48         | 13         | PASS    |

## 3Appendix\_C: Modulation Characteristics

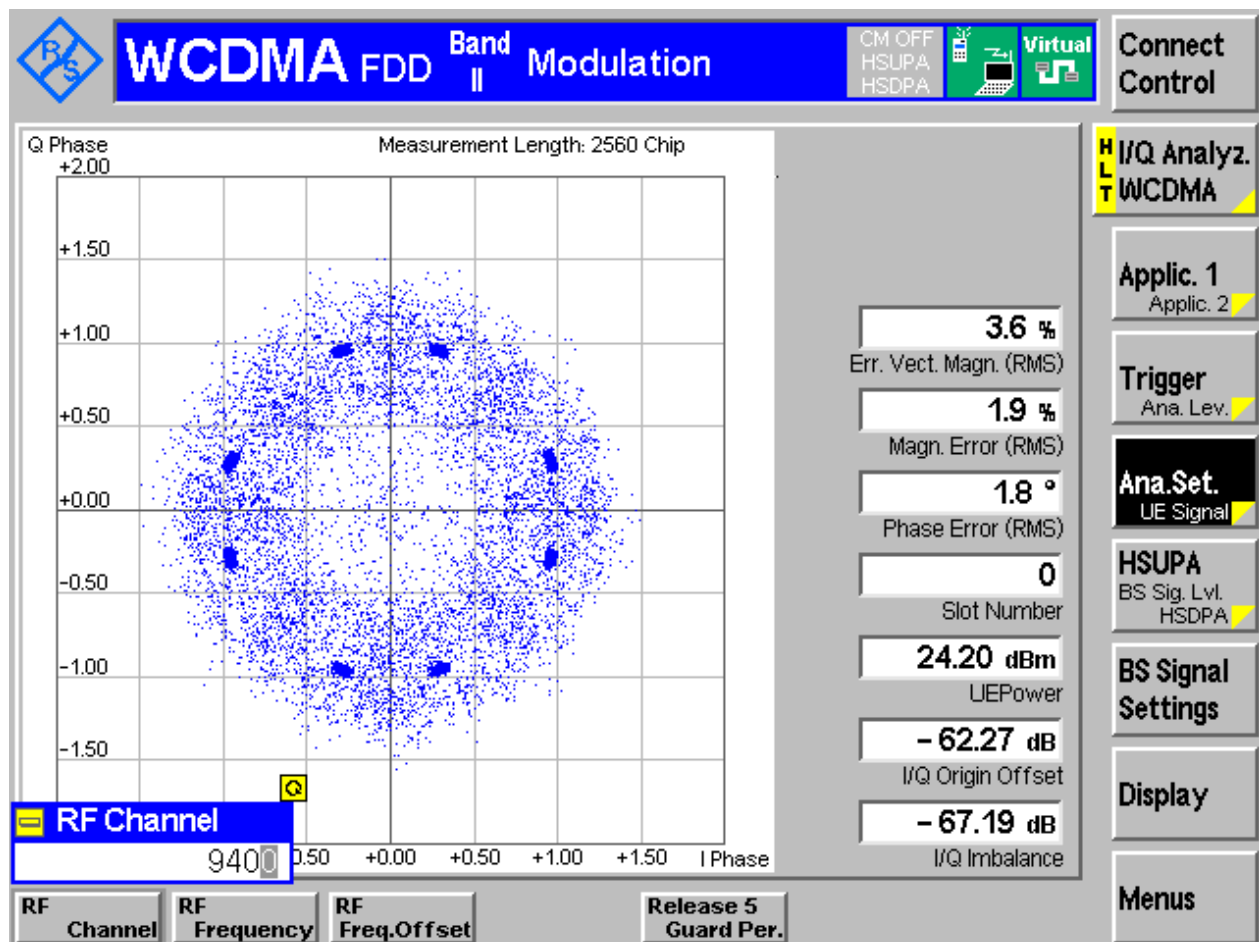
### Part I - Test Plots

#### 3.1 For UMTS

##### 3.1.1 Test Band = WCDMA1900

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

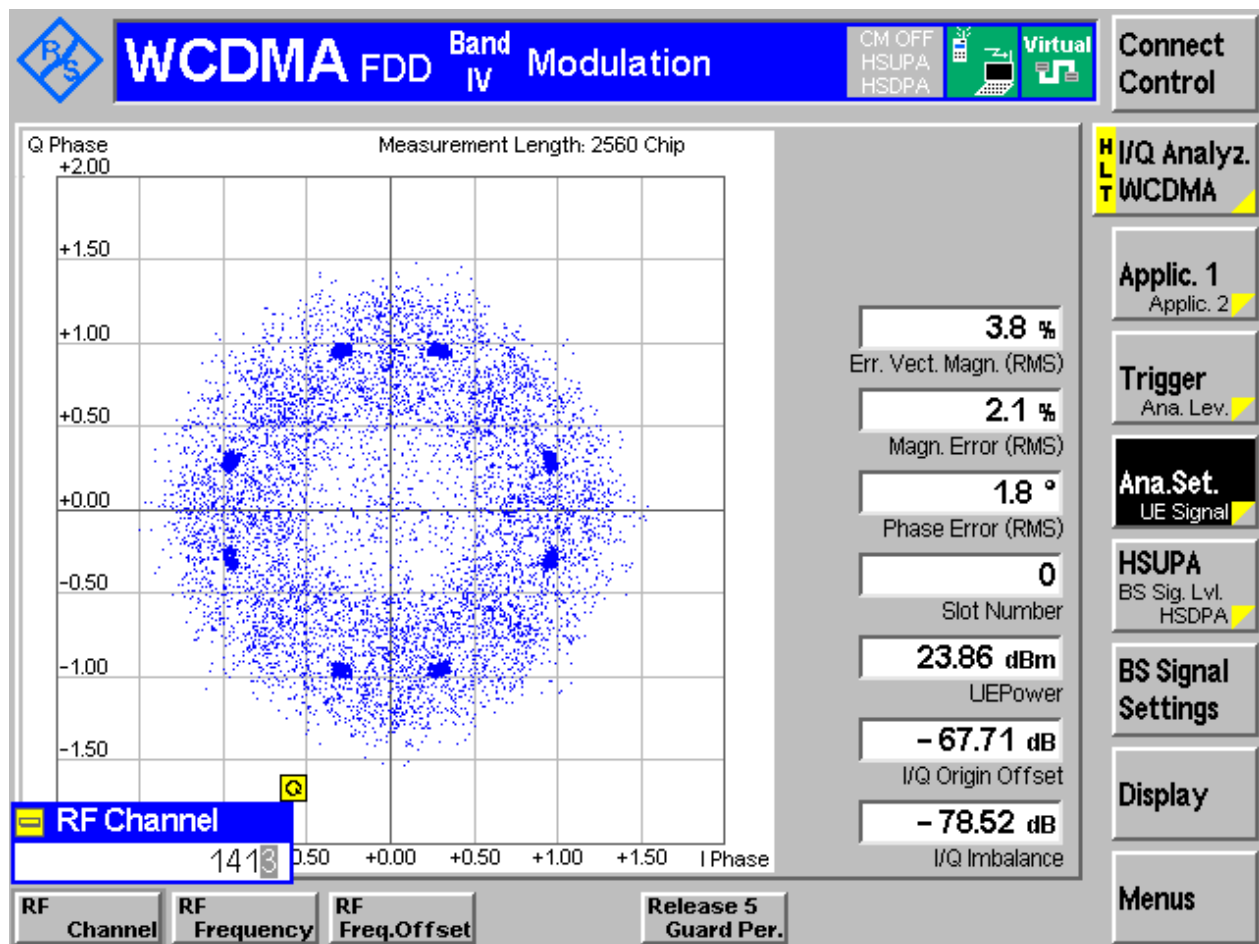
##### 3.1.1.1.1 Test Channel = MCH



### 3.1.2 Test Band = WCDMA1700

#### 3.1.2.1 Test Mode = UMTS/TM1

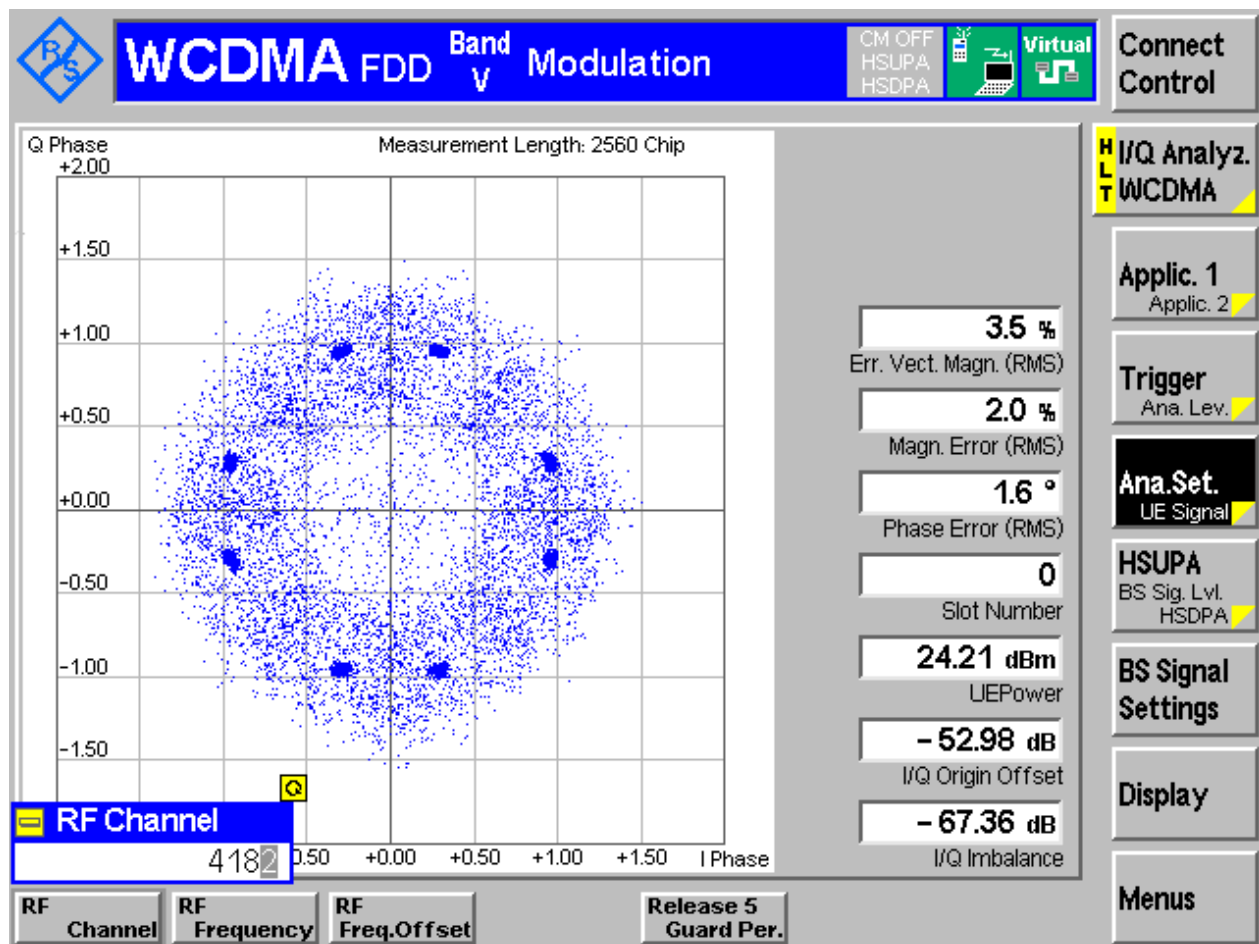
##### 3.1.2.1.1 Test Channel = MCH



### 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 |
|-----------|-----------|--------------|--------------------------|--------------------------|---------|
| WCDMA850  | UMTS/TM1  | LCH          | 4.12                     | 4.69                     | Pass    |
|           |           | MCH          | 4.11                     | 4.69                     | Pass    |
|           |           | HCH          | 4.10                     | 4.67                     | Pass    |
| WCDMA1900 | UMTS/TM1  | LCH          | 4.14                     | 4.65                     | Pass    |
|           |           | MCH          | 4.11                     | 4.68                     | Pass    |
|           |           | HCH          | 4.11                     | 4.69                     | Pass    |
| WCDMA1700 | UMTS/TM1  | LCH          | 4.11                     | 4.69                     | Pass    |
|           |           | MCH          | 4.11                     | 4.69                     | Pass    |
|           |           | HCH          | 4.11                     | 4.68                     | Pass    |

## Part II - Test Plots

### 4.1 For UMTS

#### 4.1.1 Test Band = WCDMA850

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

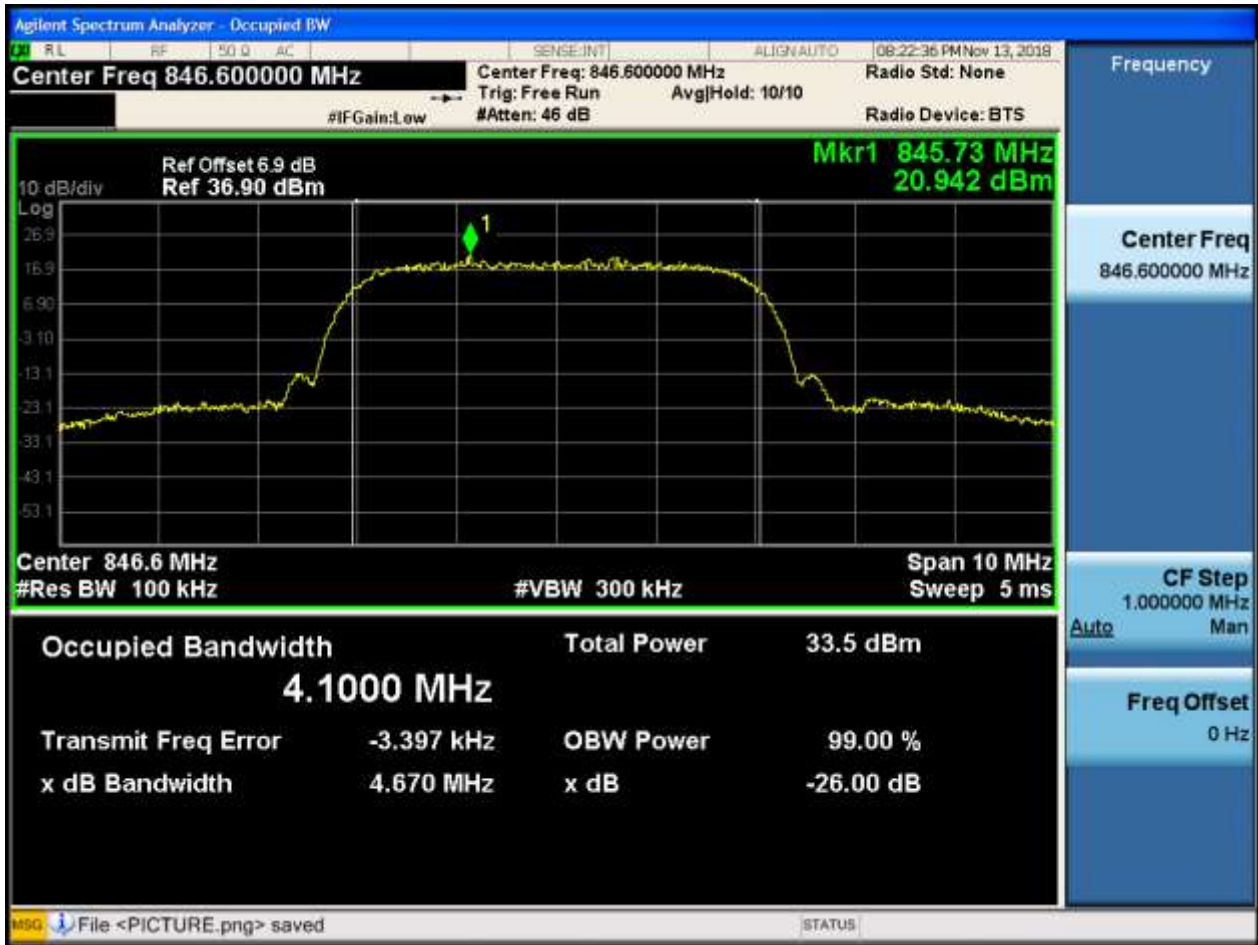
##### 4.1.1.1.1 Test Channel = LCH



#### 4.1.1.1.2 Test Channel = MCH



#### 4.1.1.1.3 Test Channel = HCH



#### 4.1.2 Test Band = WCDMA1900

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

##### 4.1.2.1.1 Test Channel = LCH



#### 4.1.2.1.2 Test Channel = MCH



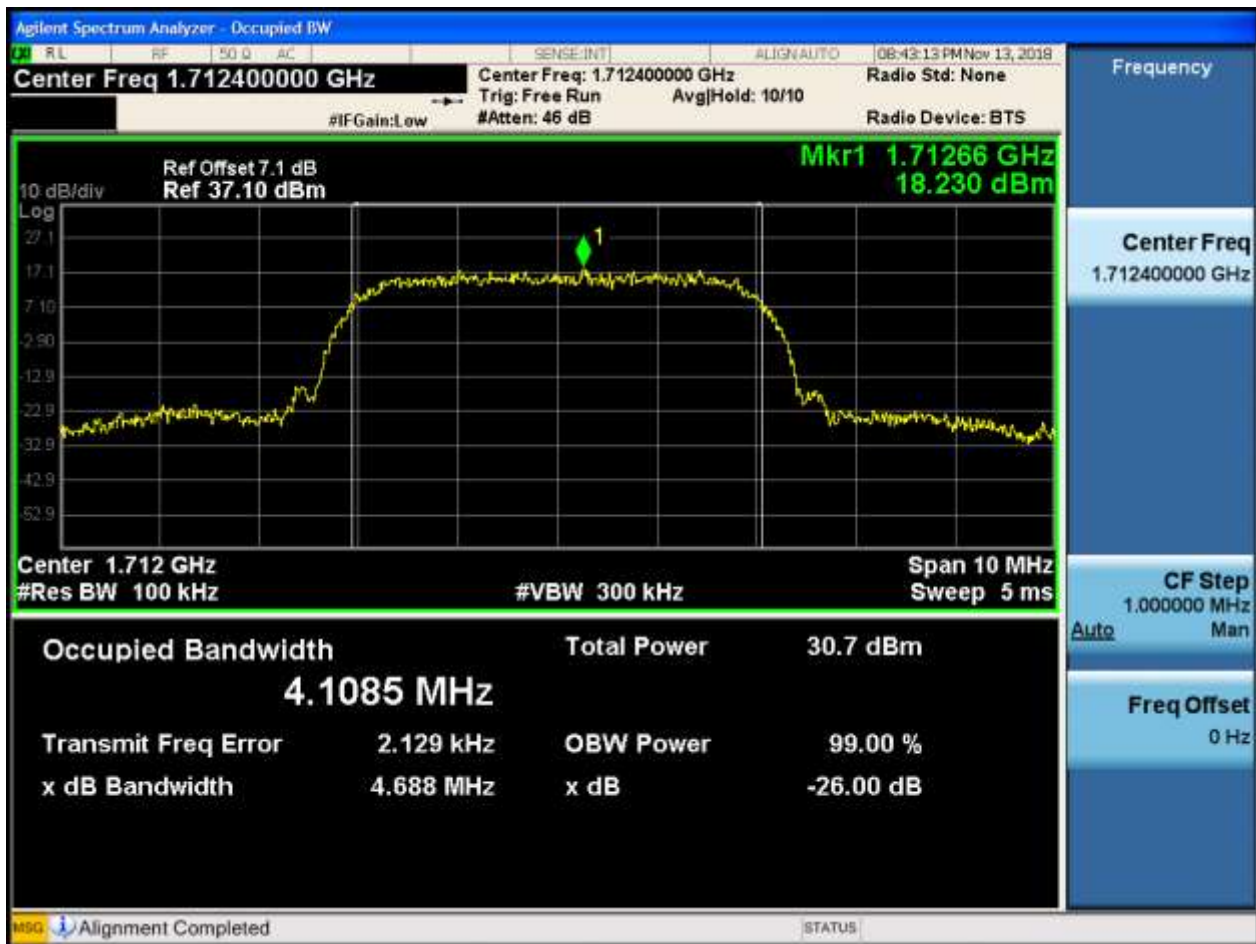
#### 4.1.2.1.3 Test Channel = HCH



### 4.1.3 Test Band = WCDMA1700

#### 4.1.3.1 Test Mode = UMTS/TM1

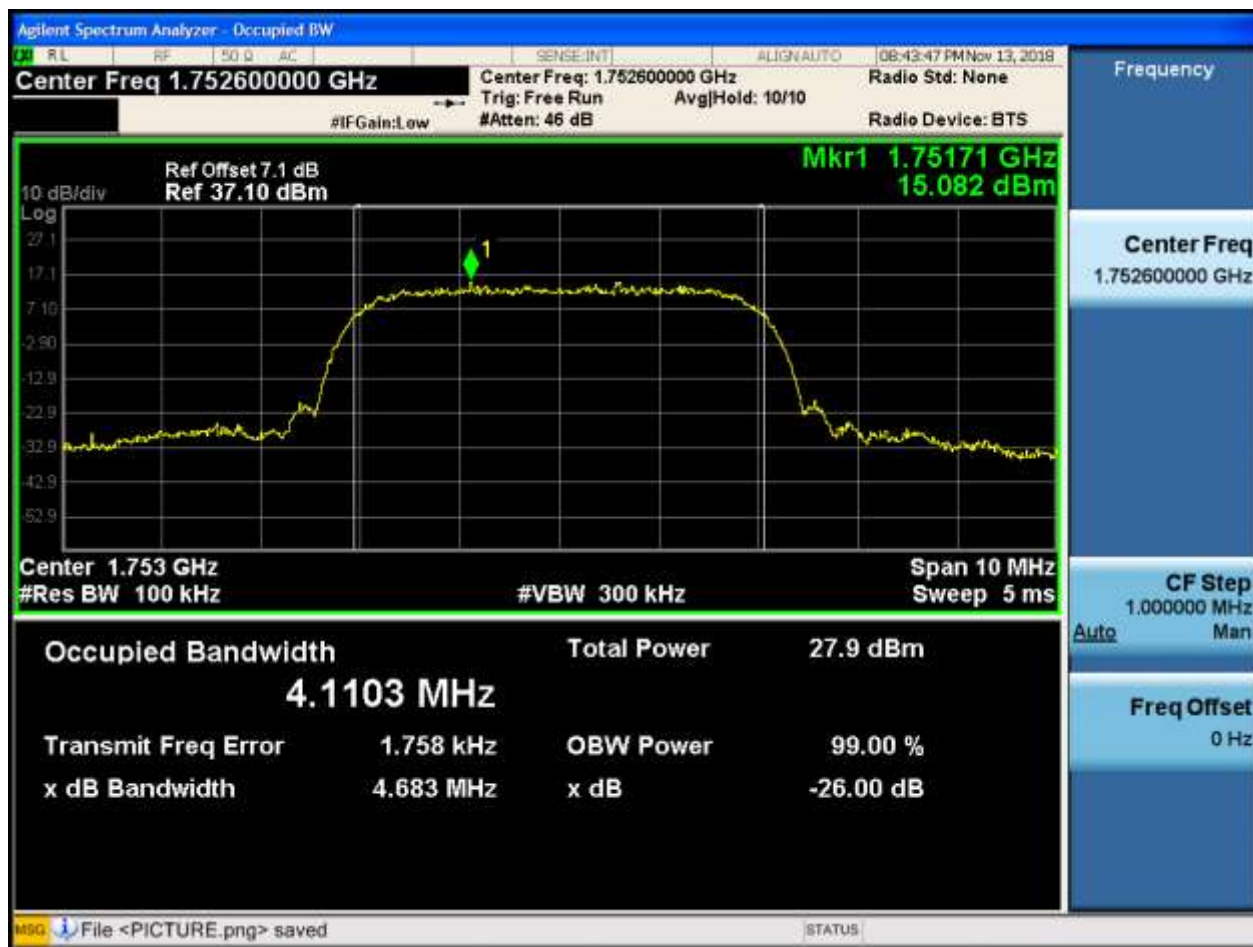
##### 4.1.3.1.1 Test Channel = LCH



#### 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 = WCDMA850

##### 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 = WCDMA1900

### 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 = WCDMA1700

#### 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

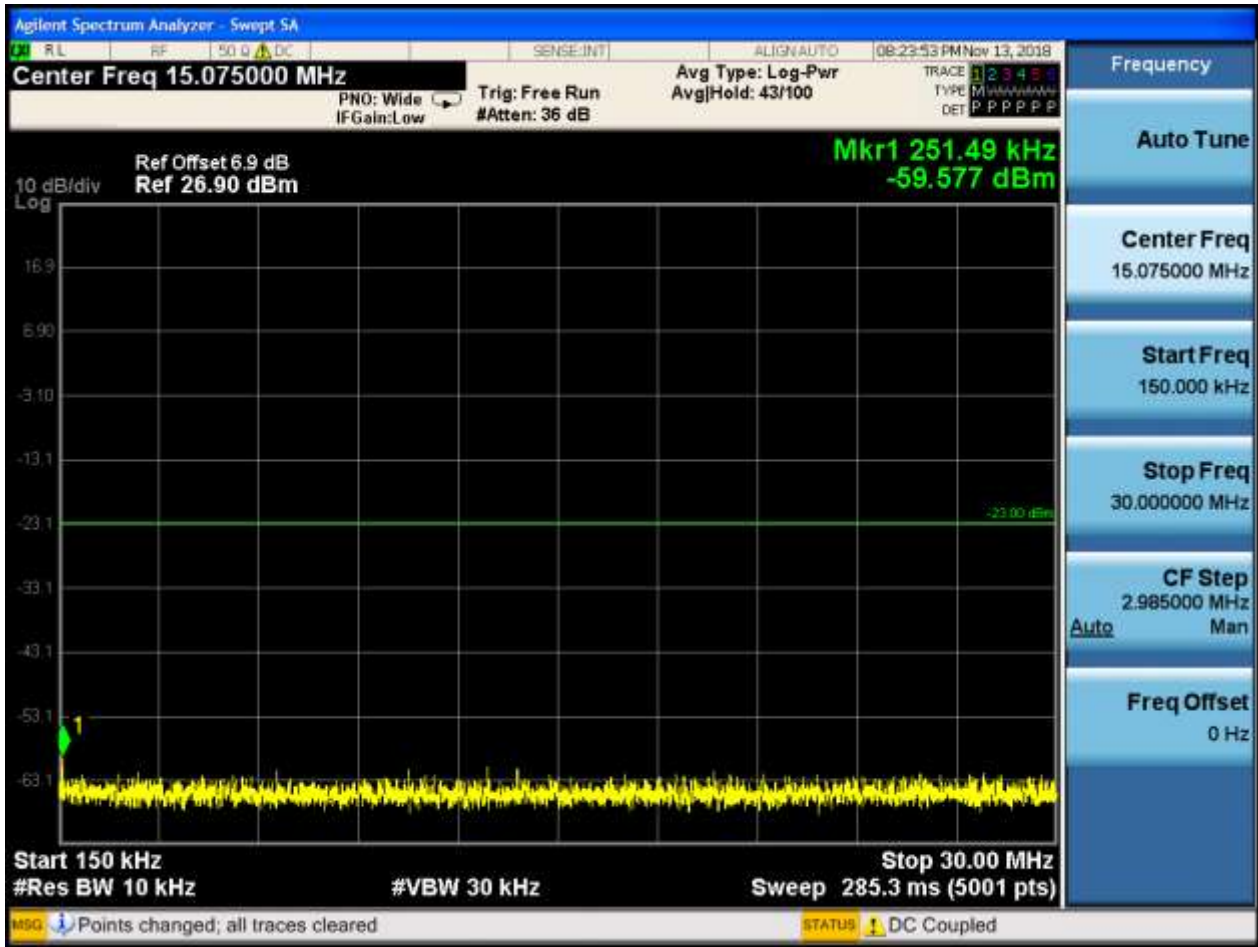
#### 6.1 For UMTS

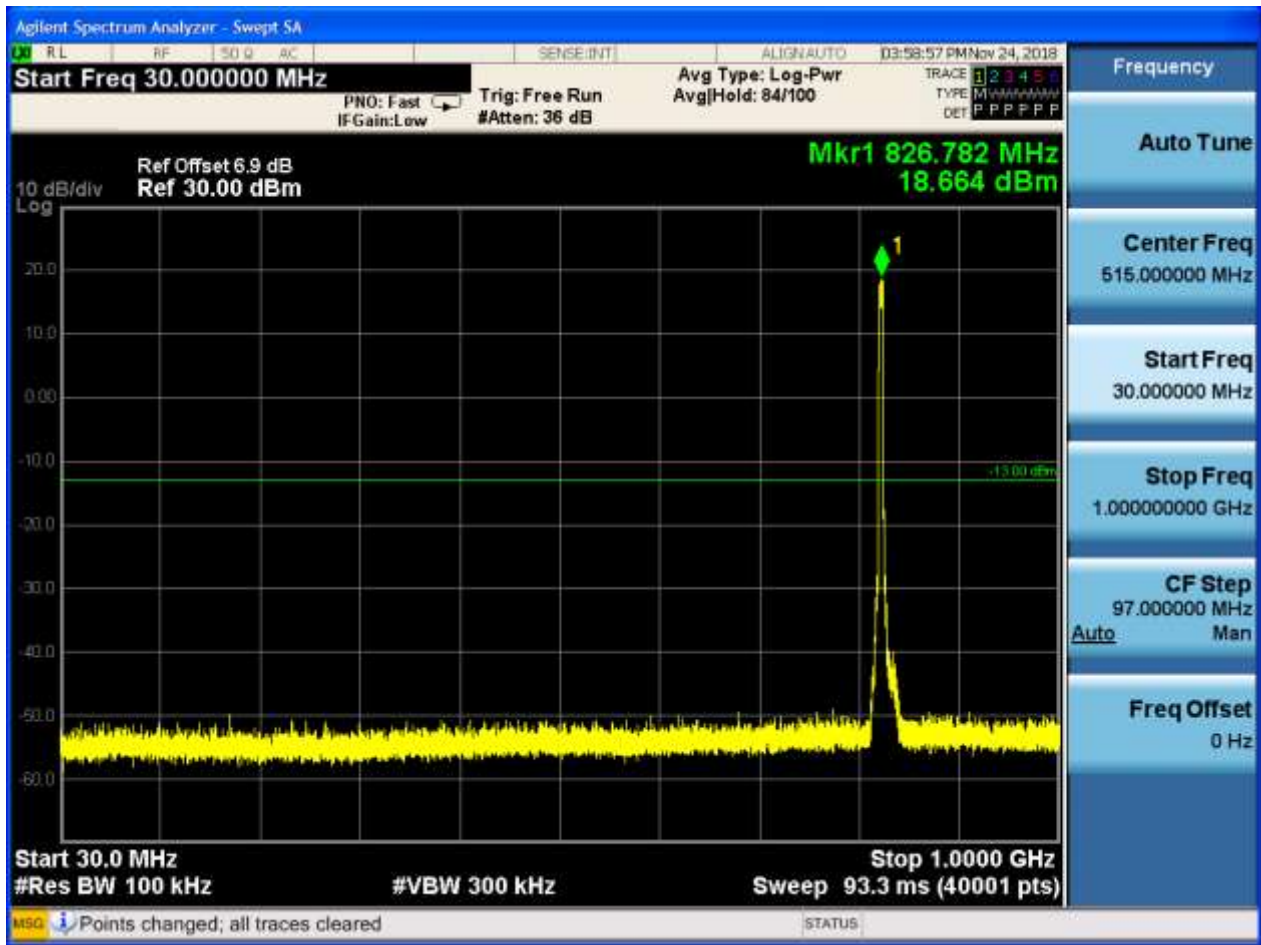
##### 6.1.1 Test Band = WCDMA850

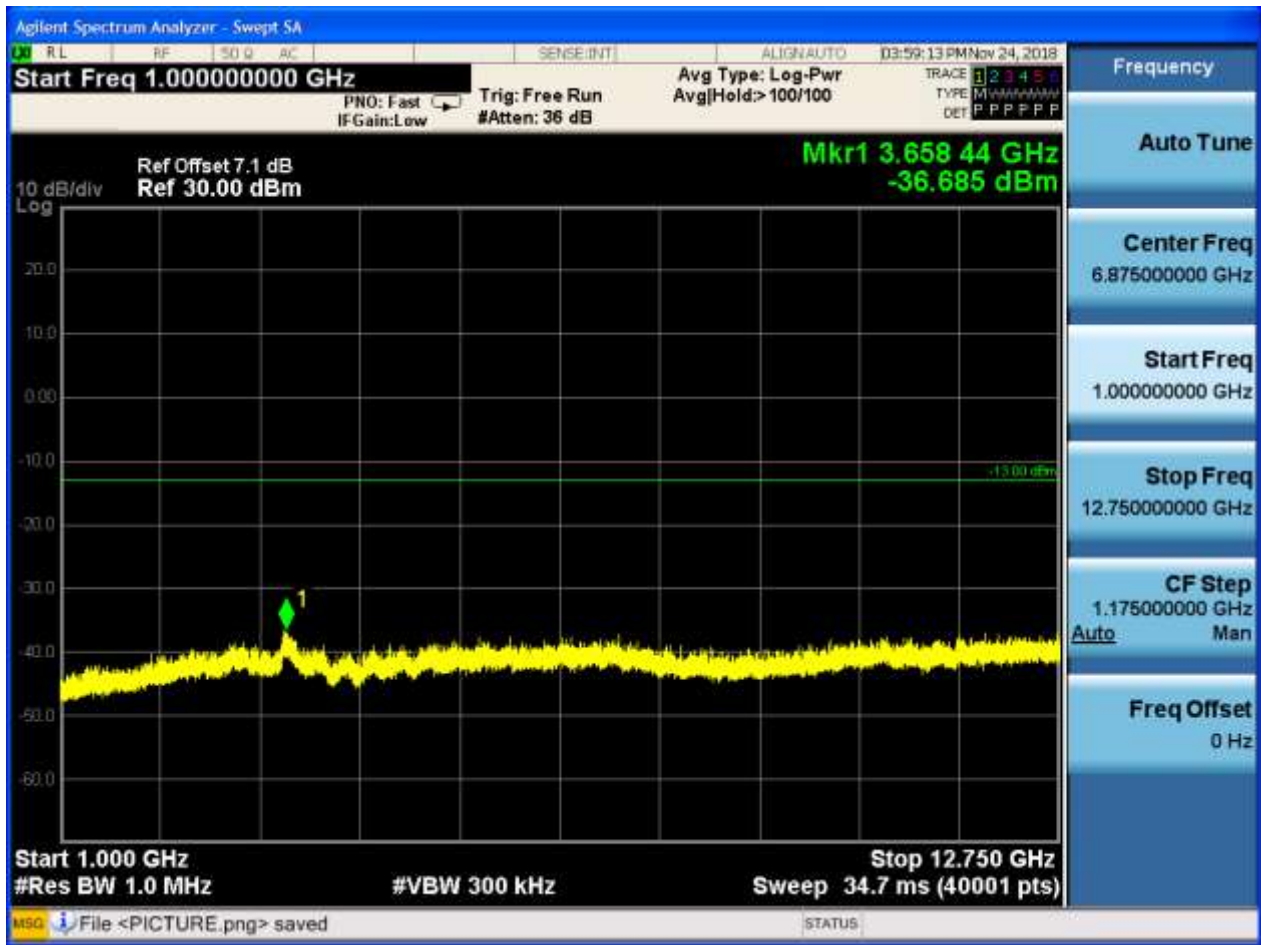
##### 6.1.1.1 Test Mode = UMTS/TM1

##### 6.1.1.1.1 Test Channel = LCH

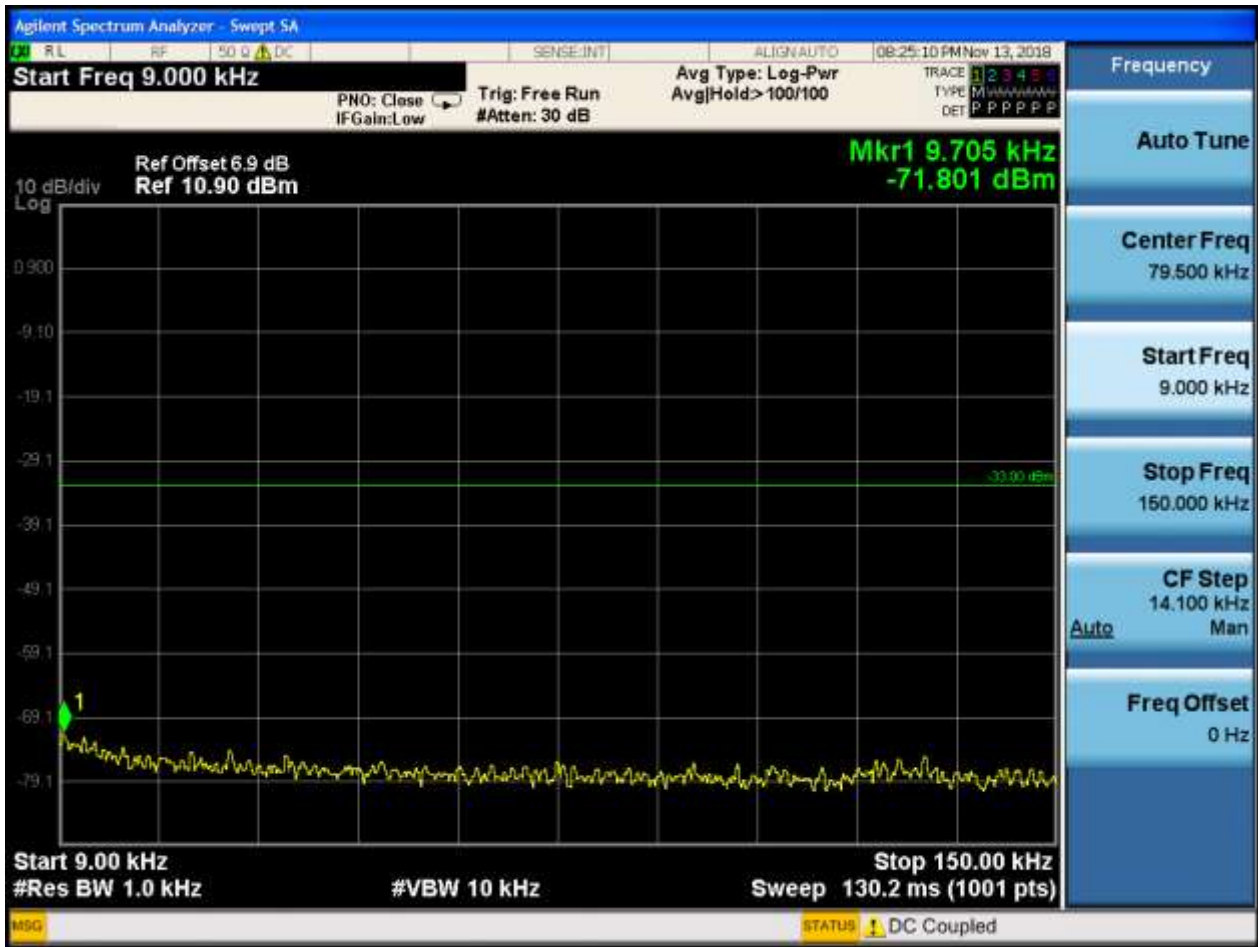


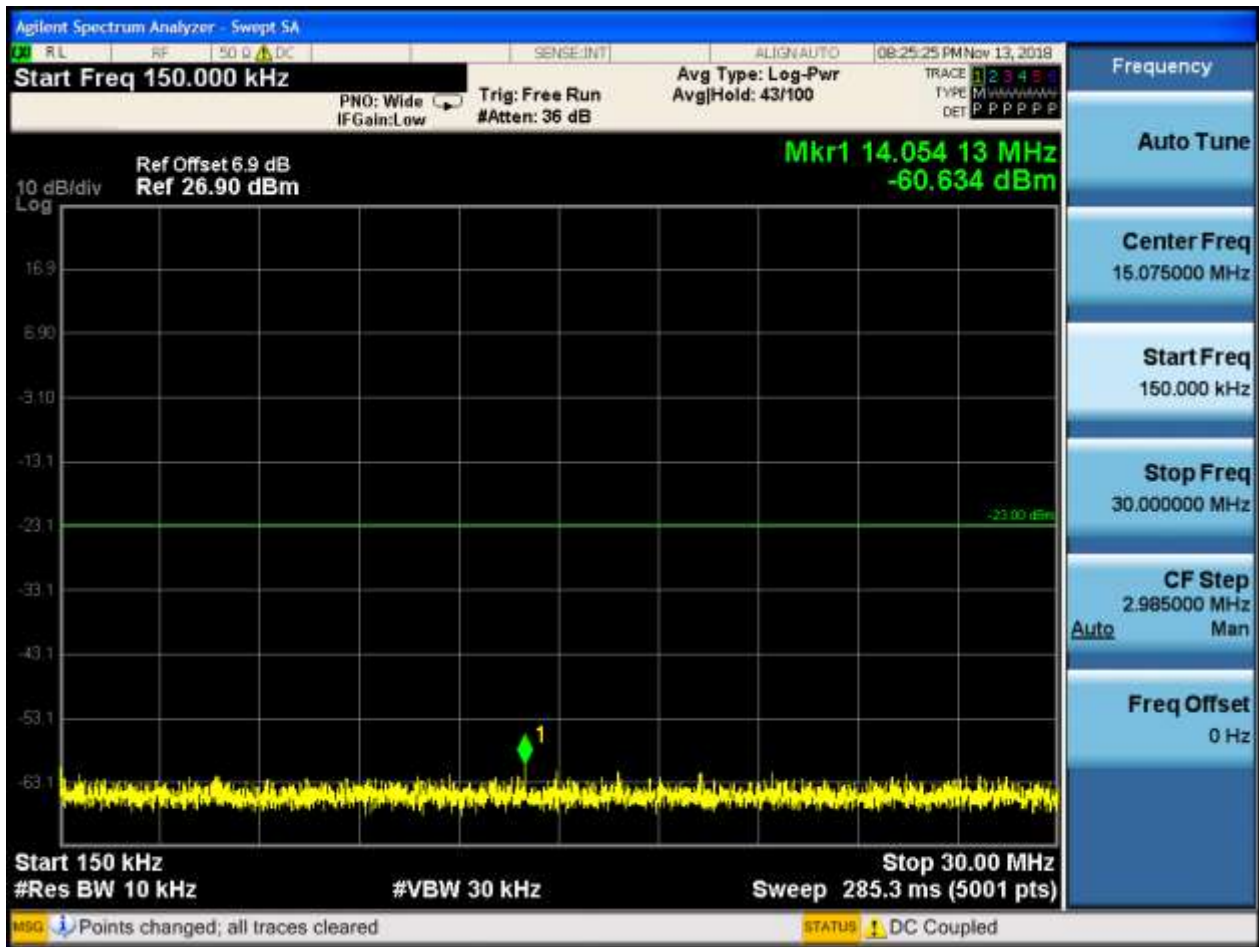


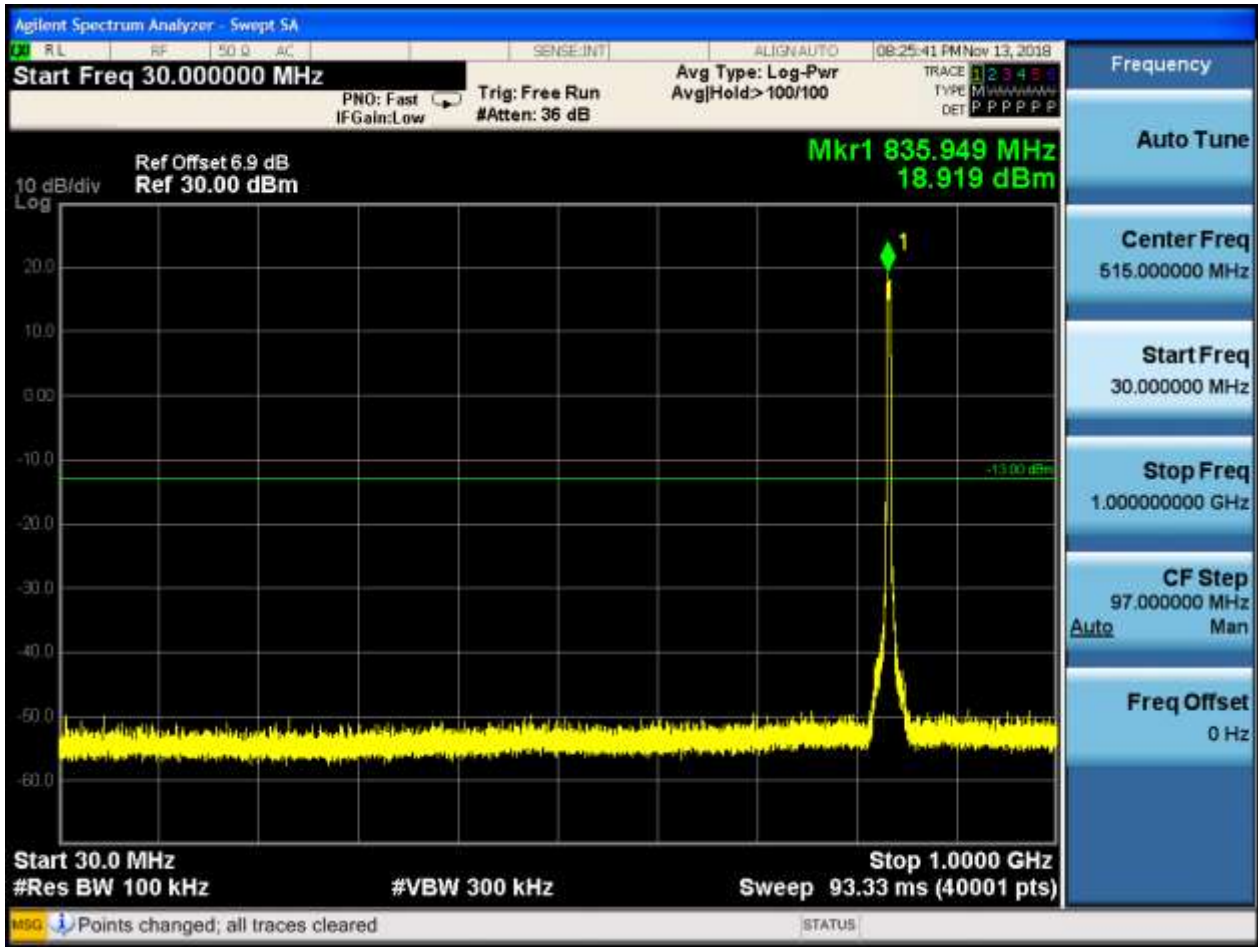


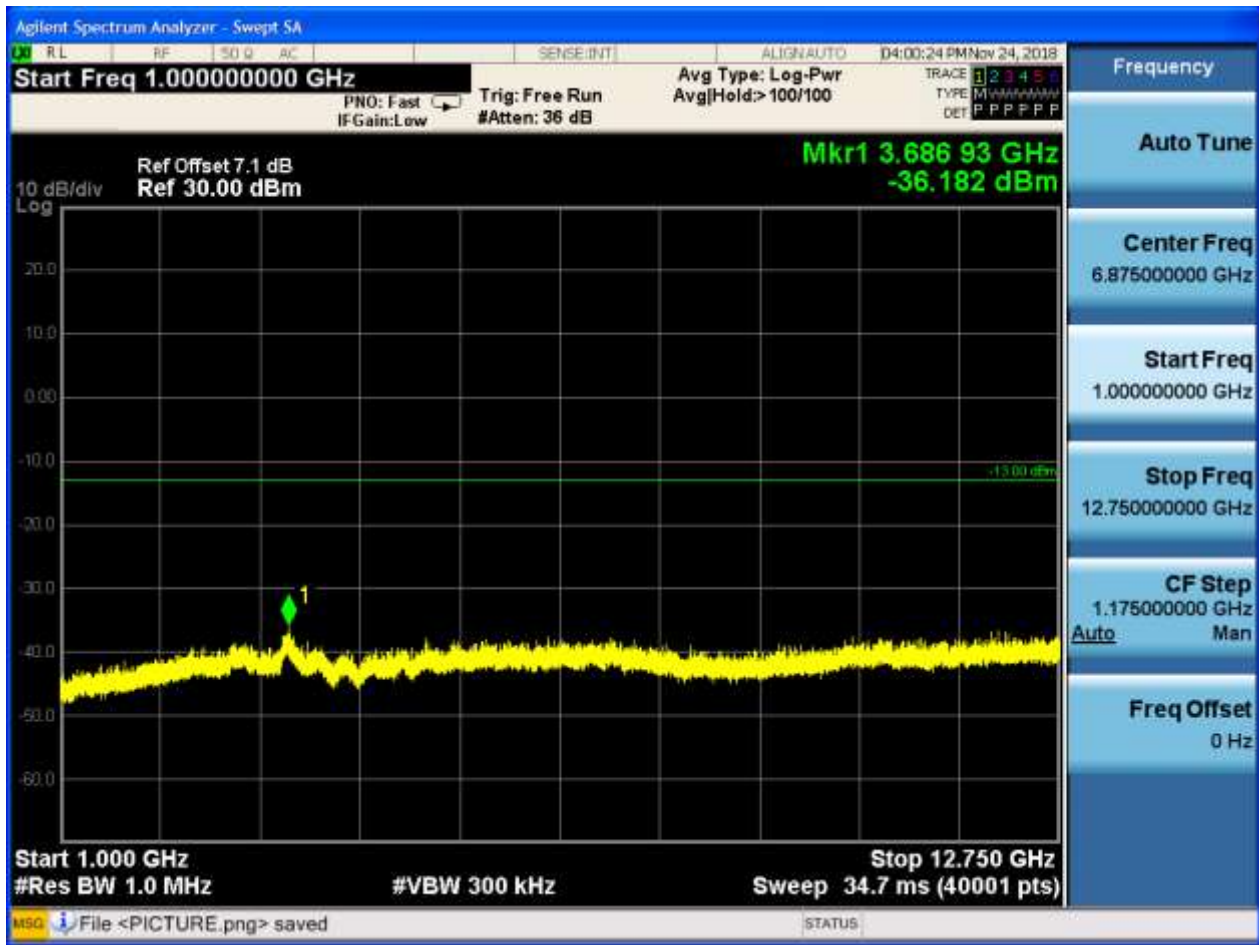


### 6.1.1.1.2 Test Channel = MCH

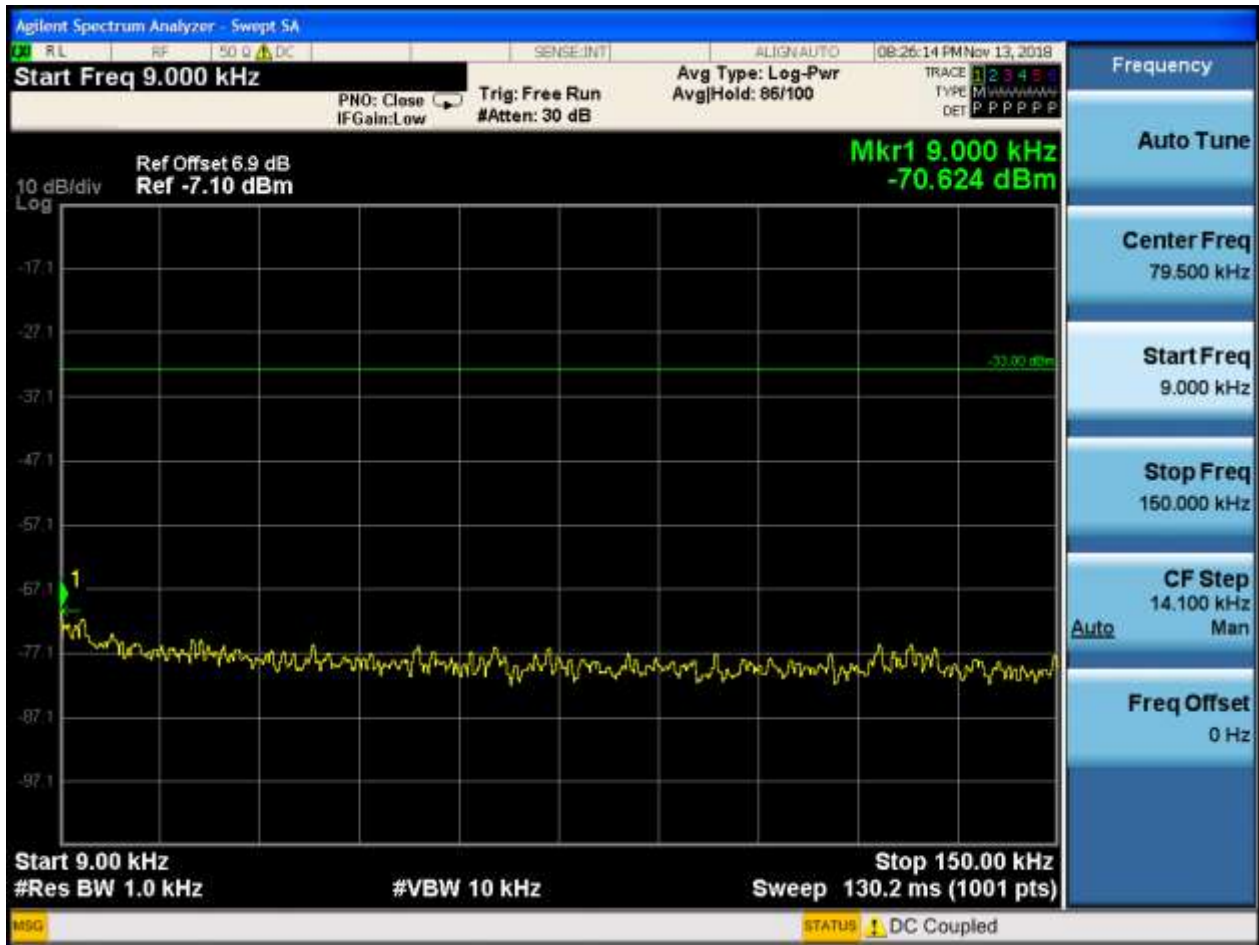


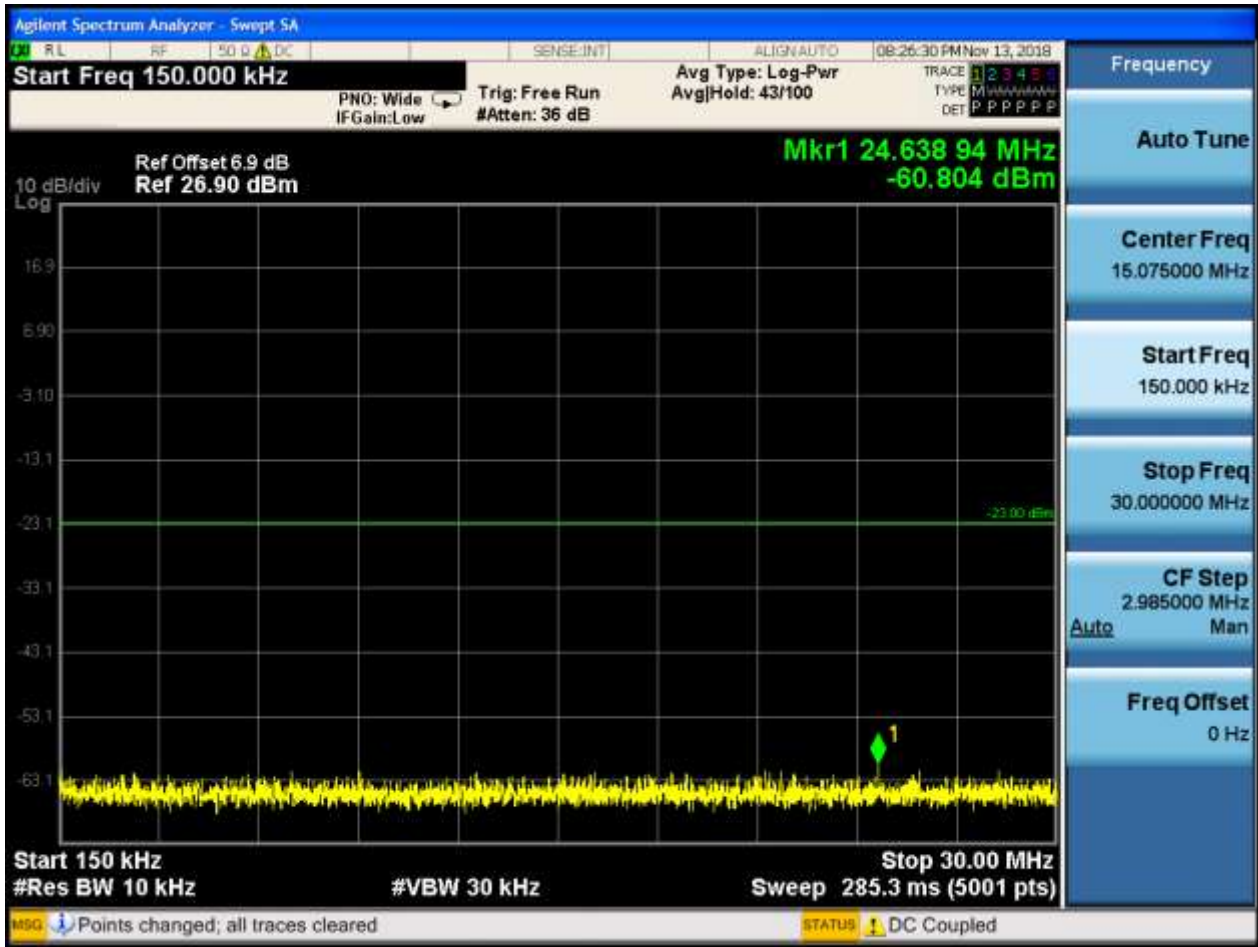


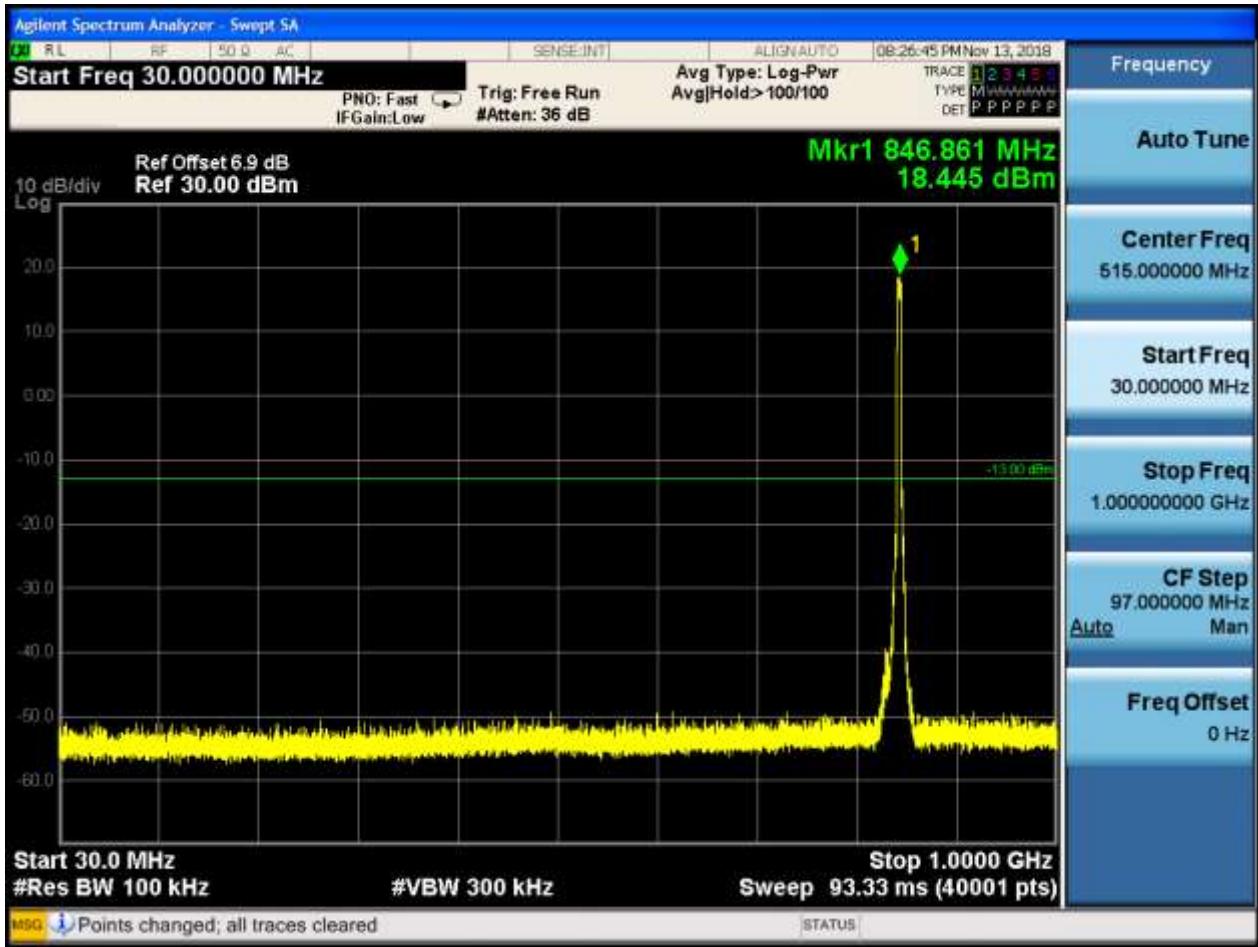


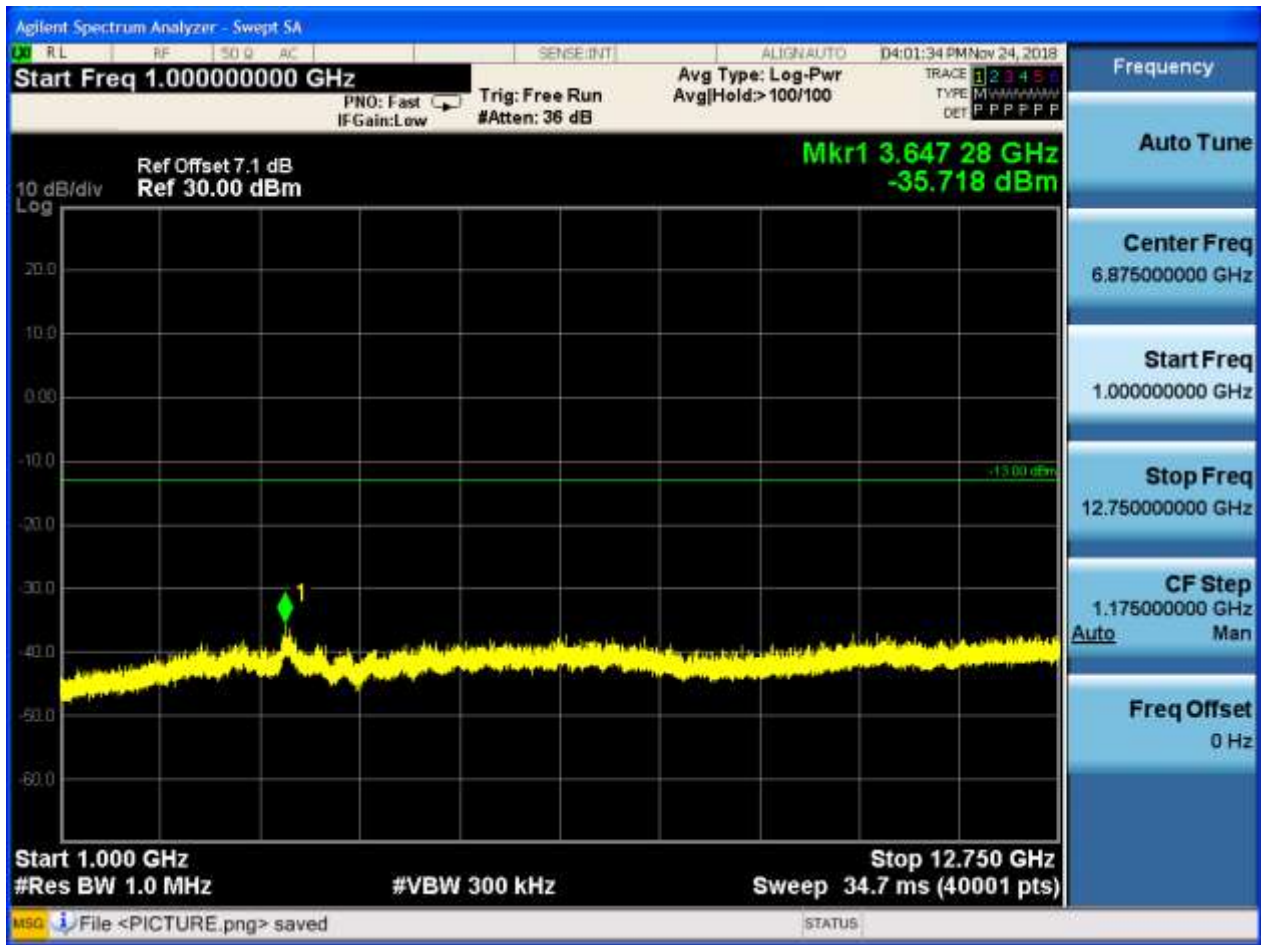


### 6.1.1.1.3 Test Channel = HCH







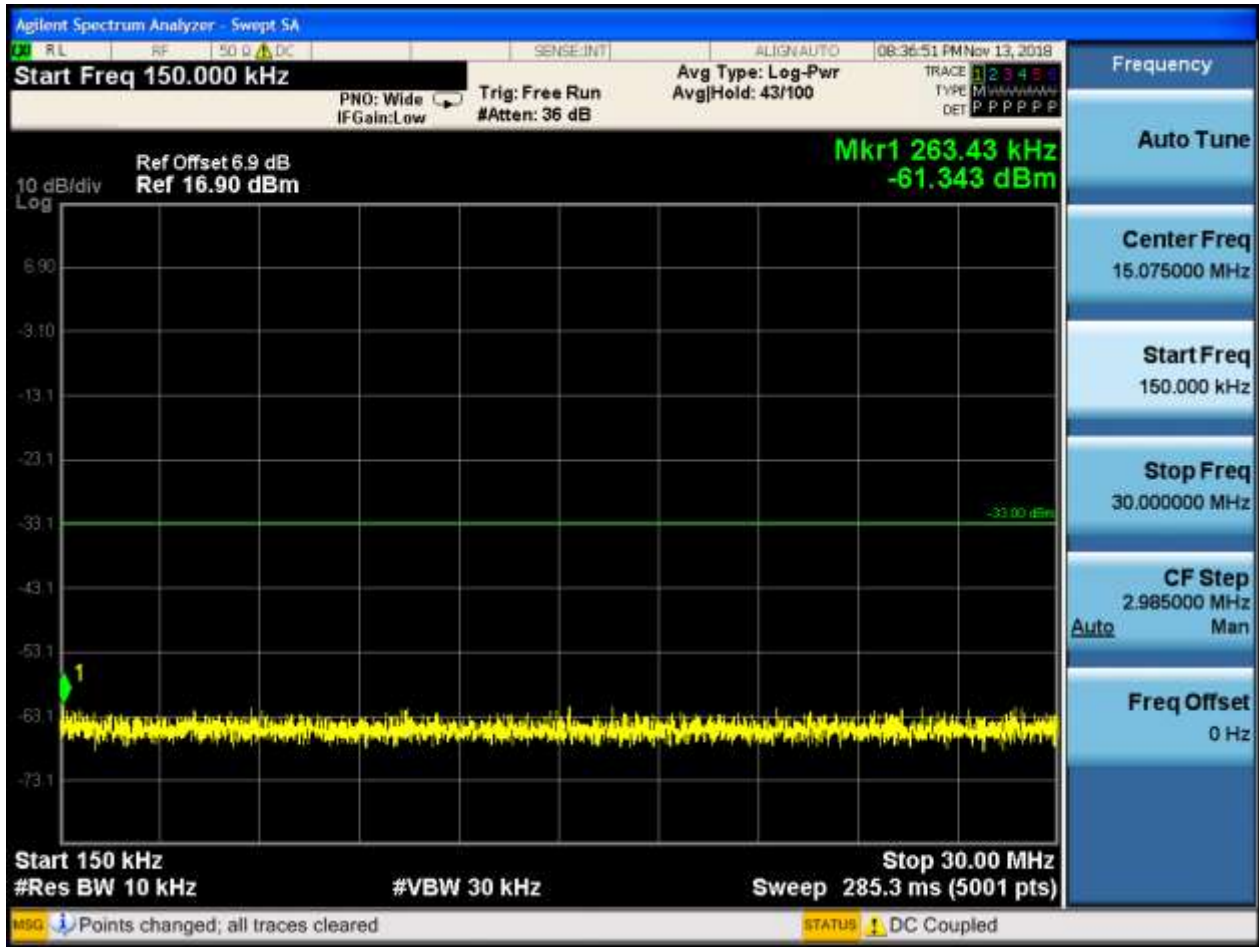


## 6.1.2 Test Band = WCDMA1900

### 6.1.2.1 Test Mode = UMTS/TM1

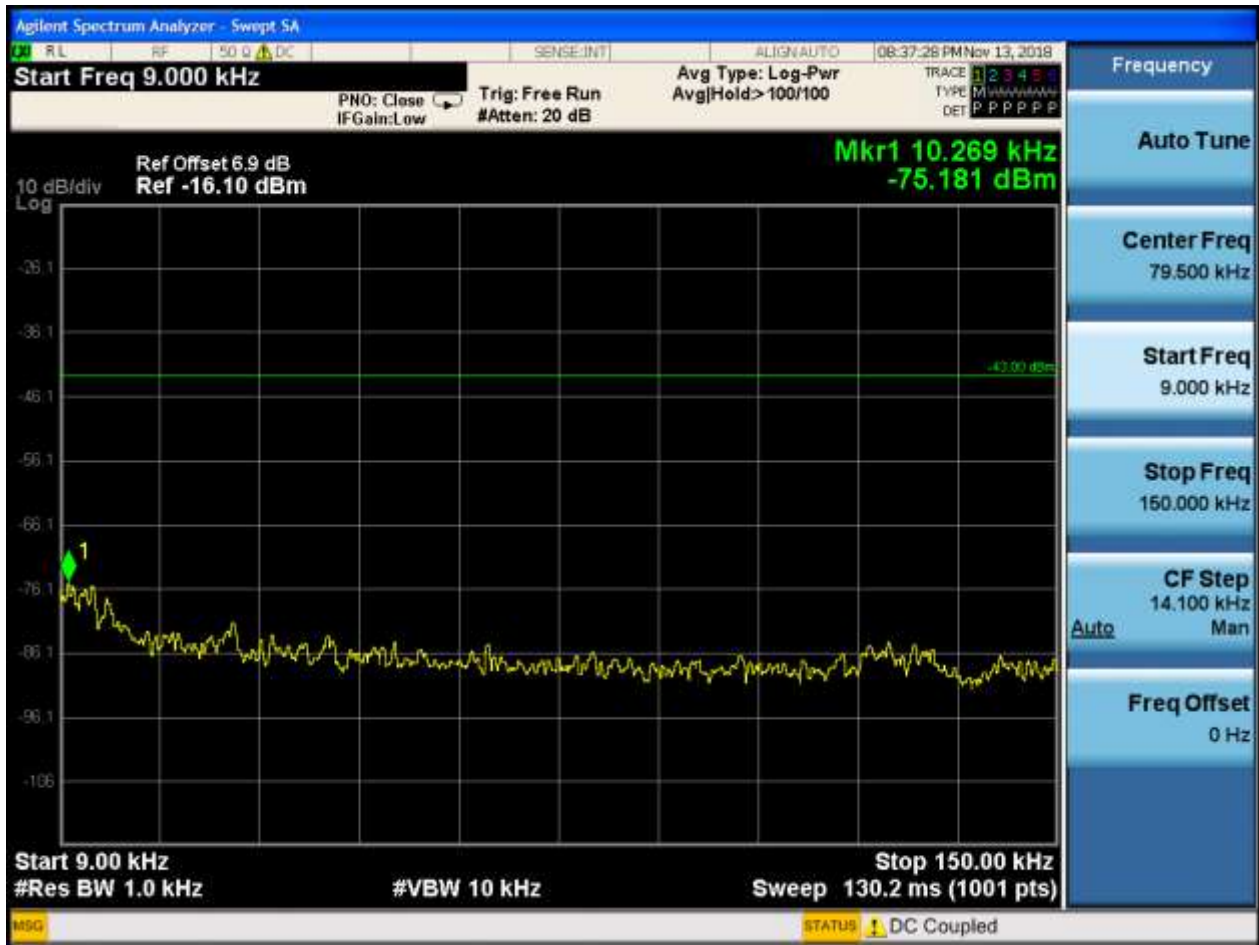
#### 6.1.2.1.1 Test Channel = LCH

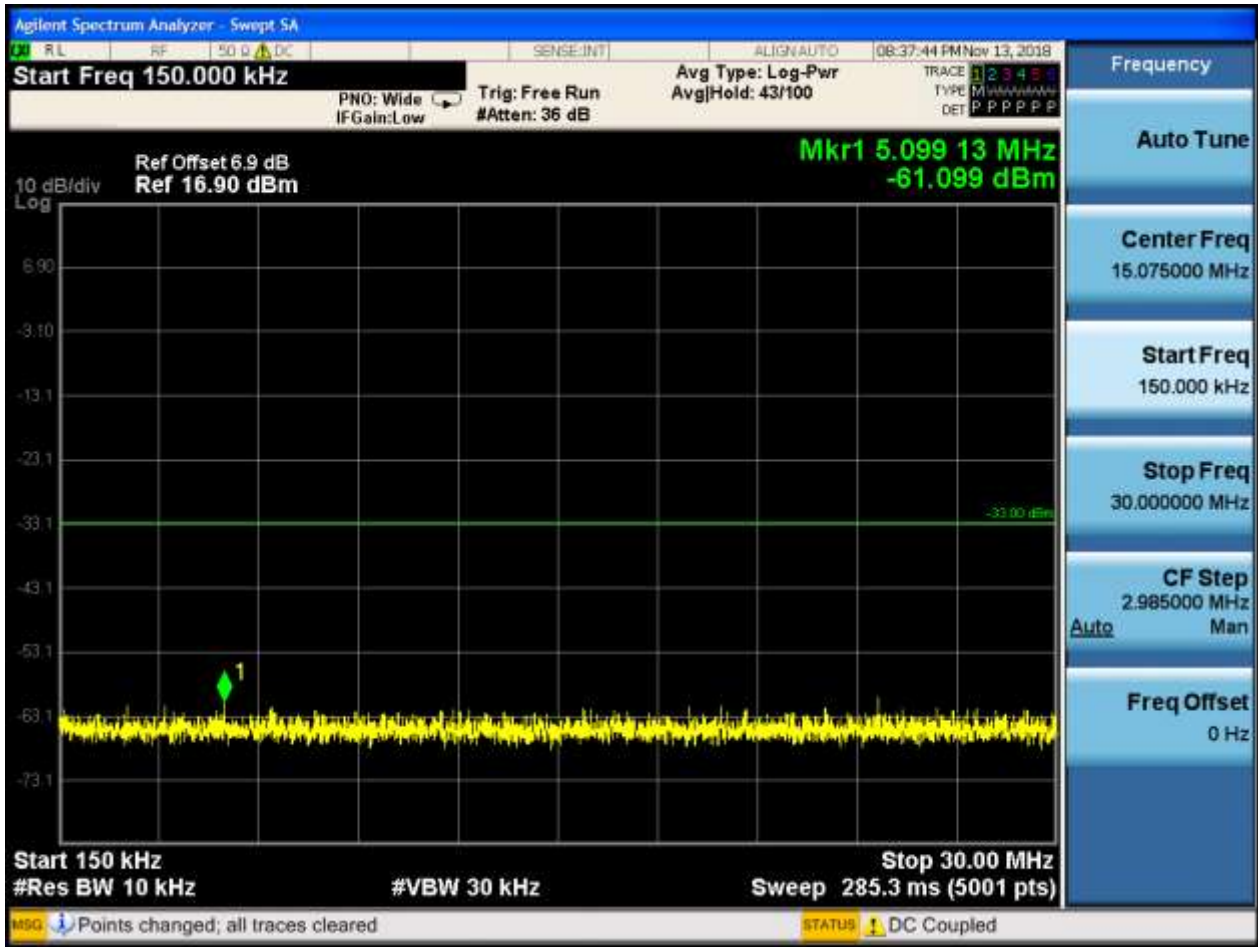






### 6.1.2.1.2 Test Channel = MCH

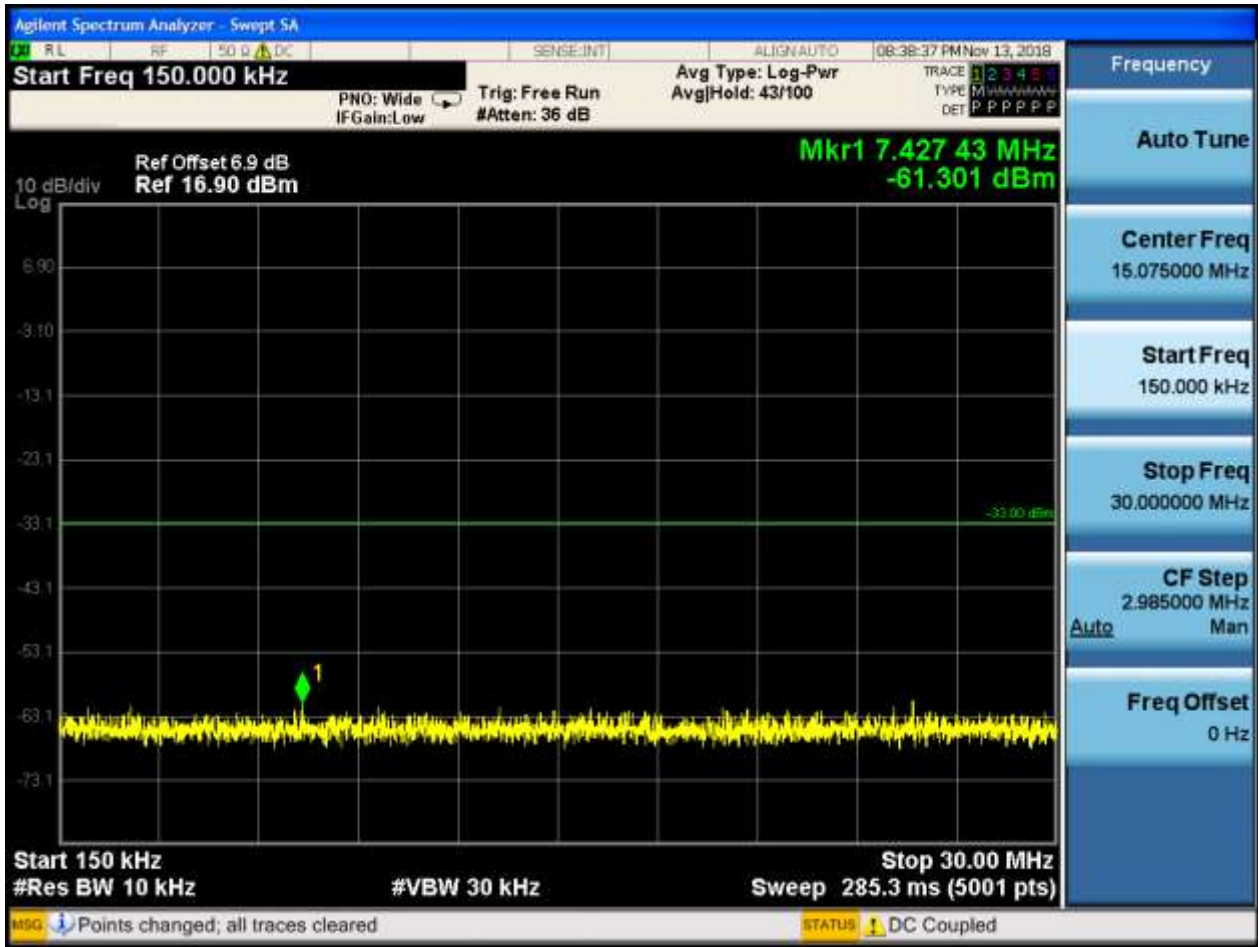






### 6.1.2.1.3 Test Channel = HCH



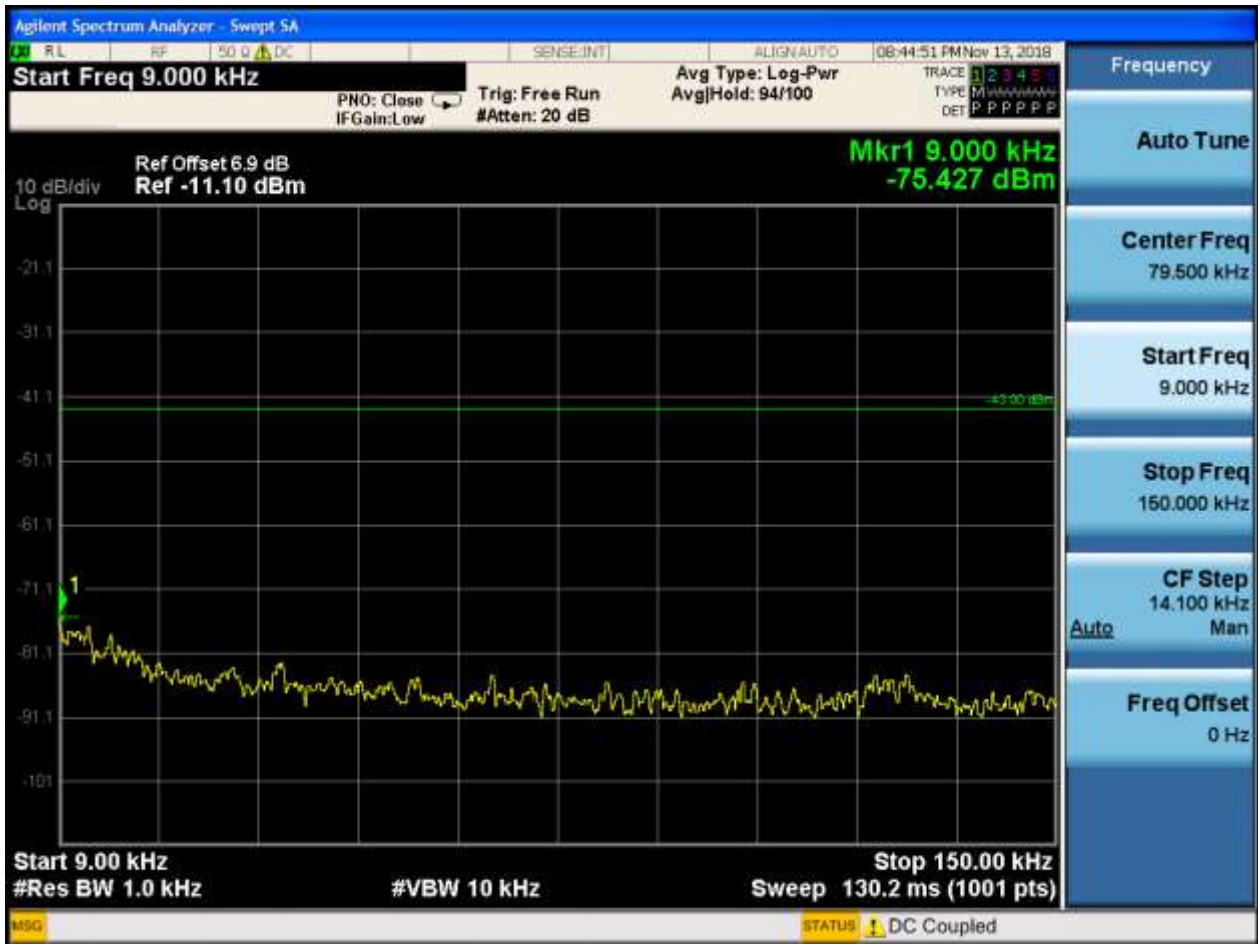


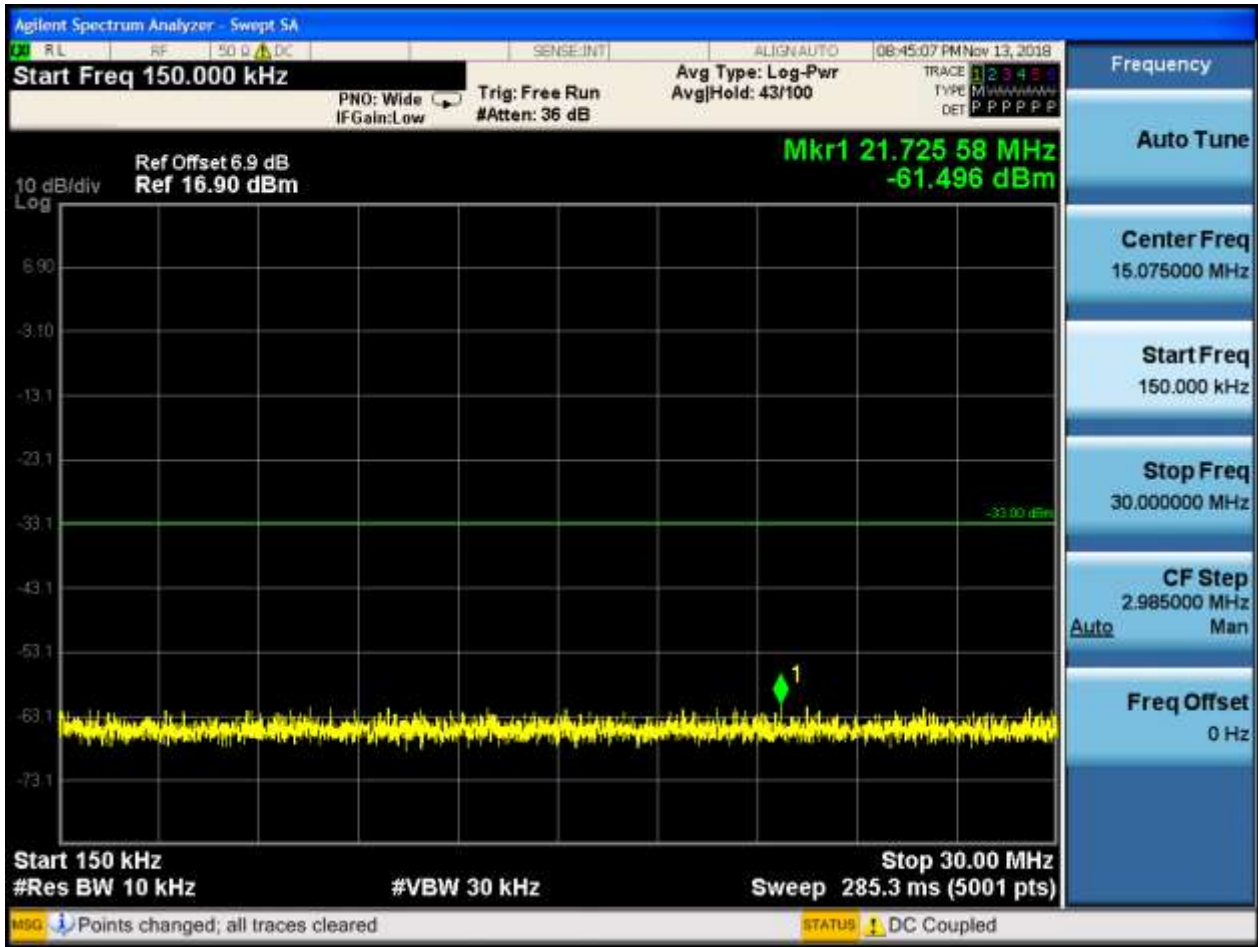


### 6.1.3 Test Band = WCDMA1700

#### 6.1.3.1 Test Mode = UMTS/TM1

##### 6.1.3.1.1 Test Channel = LCH

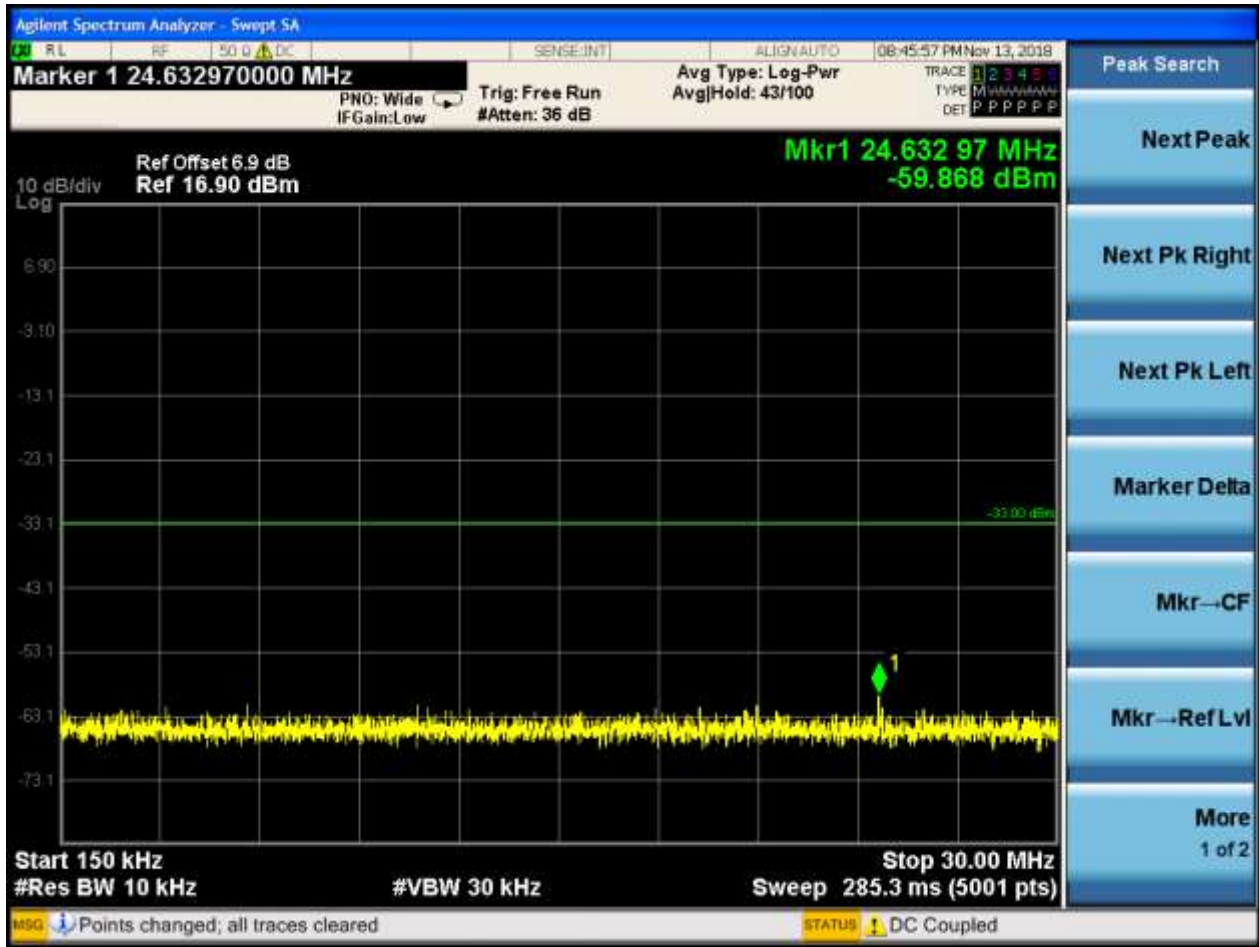






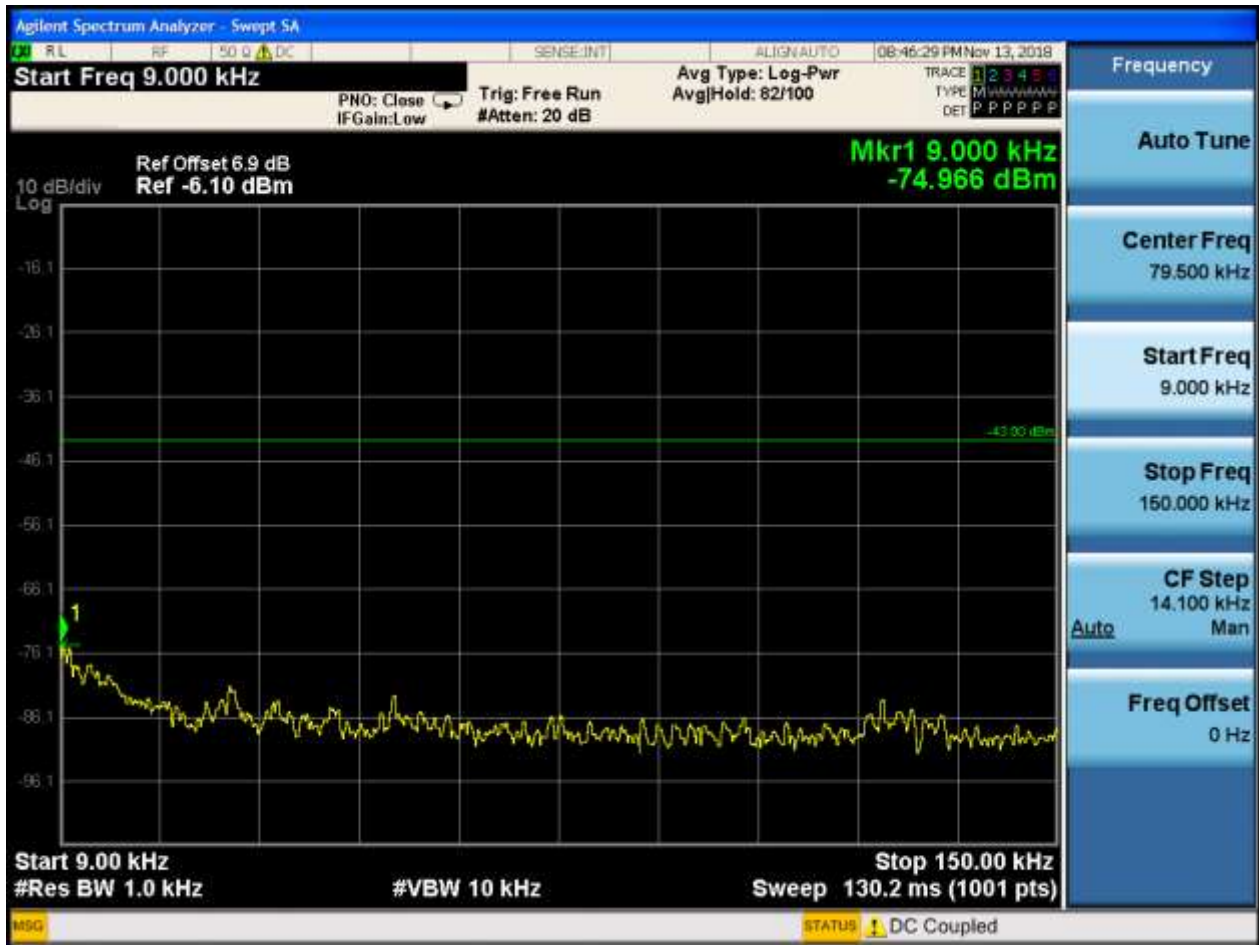
### 6.1.3.1.2 Test Channel = MCH

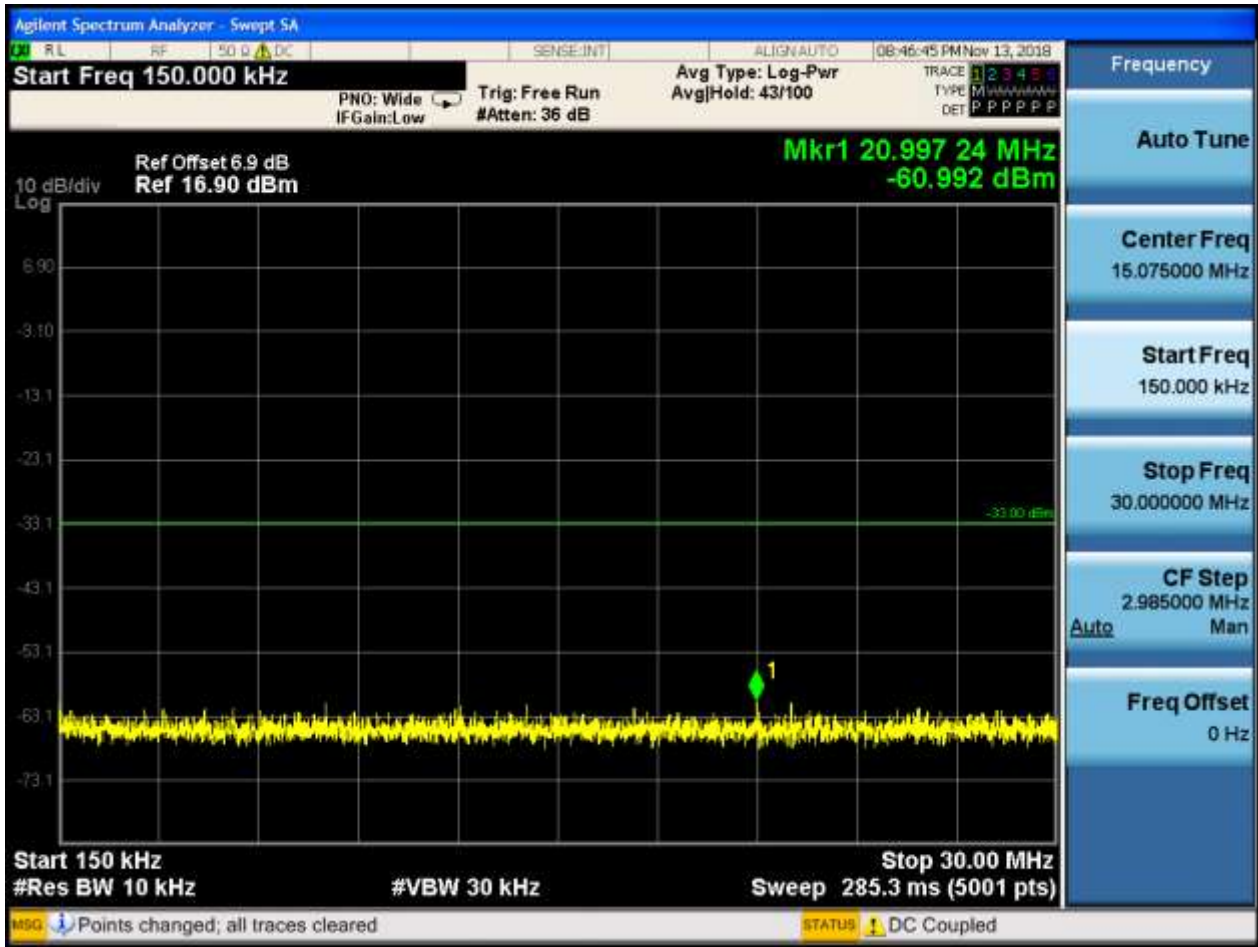






### 6.1.3.1.3 Test Channel = HCH







## 7Appendix\_H: Frequency Stability

### 7.1 For UMTS

#### 7.1.1Frequency Error vs. Voltage:

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| WCDMA850  | UMTS/TM1  | LCH          | TN         | VL         | -1.56            | -0.00189              | PASS    |
|           |           |              |            | VN         | 0.64             | 0.00077               | PASS    |
|           |           |              |            | VH         | -1.36            | -0.00165              | PASS    |
|           |           | MCH          | TN         | VL         | 0.27             | 0.00032               | PASS    |
|           |           |              |            | VN         | -1.37            | -0.00164              | PASS    |
|           |           |              |            | VH         | -0.53            | -0.00063              | PASS    |
|           |           | HCH          | TN         | VL         | -1.75            | -0.00207              | PASS    |
|           |           |              |            | VN         | -3.34            | -0.00395              | PASS    |
|           |           |              |            | VH         | -1.07            | -0.00126              | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | TN         | VL         | 9.25             | 0.0054                | PASS    |
|           |           |              |            | VN         | 11.98            | 0.007                 | PASS    |
|           |           |              |            | VH         | 10.33            | 0.00603               | PASS    |
|           |           | MCH          | TN         | VL         | -1.79            | -0.00103              | PASS    |
|           |           |              |            | VN         | -2.2             | -0.00127              | PASS    |
|           |           |              |            | VH         | 0.61             | 0.00035               | PASS    |
|           |           | HCH          | TN         | VL         | -10.07           | -0.00575              | PASS    |
|           |           |              |            | VN         | -8.76            | -0.005                | PASS    |
|           |           |              |            | VH         | -10.01           | -0.00571              | PASS    |
| WCDMA1900 | UMTS/TM1  | LCH          | TN         | VL         | -0.58            | -0.00031              | PASS    |
|           |           |              |            | VN         | 1.1              | 0.00059               | PASS    |
|           |           |              |            | VH         | -1.53            | -0.00083              | PASS    |
|           |           | MCH          | TN         | VL         | -3.36            | -0.00179              | PASS    |
|           |           |              |            | VN         | -3.68            | -0.00196              | PASS    |
|           |           |              |            | VH         | -3.51            | -0.00187              | PASS    |
|           |           | HCH          | TN         | VL         | -4.46            | -0.00234              | PASS    |
|           |           |              |            | VN         | -4.68            | -0.00245              | PASS    |
|           |           |              |            | VH         | -4.94            | -0.00259              | PASS    |

### 7.1.2 Frequency Error vs. Temperature:

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| WCDMA850  | UMTS/TM1  | LCH          | VN         | -30        | -1.89            | -0.00229              | PASS    |
|           |           |              |            | -20        | 0.29             | 0.00035               | PASS    |
|           |           |              |            | -10        | 0.85             | 0.00103               | PASS    |
|           |           |              |            | 0          | -1.22            | -0.00148              | PASS    |
|           |           |              |            | 10         | -0.41            | -0.0005               | PASS    |
|           |           |              |            | 20         | -0.92            | -0.00111              | PASS    |
|           |           |              |            | 30         | -0.96            | -0.00116              | PASS    |
|           |           |              |            | 40         | -1.07            | -0.00129              | PASS    |
|           |           |              |            | 50         | -2.09            | -0.00253              | PASS    |
|           |           | MCH          | VN         | -30        | 0                | 0                     | PASS    |
|           |           |              |            | -20        | -0.56            | -0.00067              | PASS    |
|           |           |              |            | -10        | -1.34            | -0.0016               | PASS    |
|           |           |              |            | 0          | -2.76            | -0.0033               | PASS    |
|           |           |              |            | 10         | -1.37            | -0.00164              | PASS    |
|           |           |              |            | 20         | -0.85            | -0.00102              | PASS    |
|           |           |              |            | 30         | -0.81            | -0.00097              | PASS    |
|           |           |              |            | 40         | -0.55            | -0.00066              | PASS    |
|           |           |              |            | 50         | 0.21             | 0.00025               | PASS    |
|           |           | HCH          | VN         | -30        | -0.37            | -0.00044              | PASS    |
|           |           |              |            | -20        | -1.4             | -0.00165              | PASS    |
|           |           |              |            | -10        | -0.67            | -0.00079              | PASS    |
|           |           |              |            | 0          | -0.63            | -0.00074              | PASS    |
|           |           |              |            | 10         | -3.54            | -0.00418              | PASS    |
|           |           |              |            | 20         | -1.54            | -0.00182              | PASS    |
|           |           |              |            | 30         | -2.26            | -0.00267              | PASS    |
|           |           |              |            | 40         | -4.03            | -0.00476              | PASS    |
|           |           |              |            | 50         | -2               | -0.00236              | PASS    |
| WCDMA1700 | UMTS/TM1  | LCH          | VN         | -30        | 8.42             | 0.00492               | PASS    |
|           |           |              |            | -20        | 10.56            | 0.00617               | PASS    |
|           |           |              |            | -10        | 9.8              | 0.00572               | PASS    |
|           |           |              |            | 0          | 8.8              | 0.00514               | PASS    |
|           |           |              |            | 10         | 6.62             | 0.00387               | PASS    |
|           |           |              |            | 20         | 11.64            | 0.0068                | PASS    |
|           |           |              |            | 30         | 8.22             | 0.0048                | PASS    |
|           |           |              |            | 40         | 9.77             | 0.00571               | PASS    |
|           |           |              |            | 50         | 10.59            | 0.00618               | PASS    |

|           |          |     |    |     |        |          |      |
|-----------|----------|-----|----|-----|--------|----------|------|
|           |          | MCH | VN | -30 | 0.75   | 0.00043  | PASS |
|           |          |     |    | -20 | 2.98   | 0.00172  | PASS |
|           |          |     |    | -10 | 2.64   | 0.00152  | PASS |
|           |          |     |    | 0   | -1.56  | -0.0009  | PASS |
|           |          |     |    | 10  | -1.16  | -0.00067 | PASS |
|           |          |     |    | 20  | -0.29  | -0.00017 | PASS |
|           |          |     |    | 30  | -2.08  | -0.0012  | PASS |
|           |          |     |    | 40  | -1.85  | -0.00107 | PASS |
|           |          |     |    | 50  | 0.41   | 0.00024  | PASS |
|           |          | HCH | VN | -30 | -9.81  | -0.0056  | PASS |
|           |          |     |    | -20 | -9.57  | -0.00546 | PASS |
|           |          |     |    | -10 | -9.95  | -0.00568 | PASS |
|           |          |     |    | 0   | -7.51  | -0.00429 | PASS |
|           |          |     |    | 10  | -8.7   | -0.00496 | PASS |
|           |          |     |    | 20  | -9.48  | -0.00541 | PASS |
|           |          |     |    | 30  | -7.97  | -0.00455 | PASS |
|           |          |     |    | 40  | -11.08 | -0.00632 | PASS |
|           |          |     |    | 50  | -11.06 | -0.00631 | PASS |
| WCDMA1900 | UMTS/TM1 | LCH | VN | -30 | -0.35  | -0.00019 | PASS |
|           |          |     |    | -20 | 1.04   | 0.00056  | PASS |
|           |          |     |    | -10 | 0.34   | 0.00018  | PASS |
|           |          |     |    | 0   | 0.2    | 0.00011  | PASS |
|           |          |     |    | 10  | -0.49  | -0.00026 | PASS |
|           |          |     |    | 20  | 3.28   | 0.00177  | PASS |
|           |          |     |    | 30  | 2.01   | 0.00109  | PASS |
|           |          |     |    | 40  | 1.71   | 0.00092  | PASS |
|           |          |     |    | 50  | 0.44   | 0.00024  | PASS |
|           |          | MCH | VN | -30 | -2.72  | -0.00145 | PASS |
|           |          |     |    | -20 | 0.11   | 0.00006  | PASS |
|           |          |     |    | -10 | 1.43   | 0.00076  | PASS |
|           |          |     |    | 0   | 0.93   | 0.00049  | PASS |
|           |          |     |    | 10  | -3.08  | -0.00164 | PASS |
|           |          |     |    | 20  | -3.07  | -0.00163 | PASS |
|           |          |     |    | 30  | -0.79  | -0.00042 | PASS |
|           |          |     |    | 40  | -0.53  | -0.00028 | PASS |
|           |          |     |    | 50  | -1.5   | -0.0008  | PASS |
|           |          | HCH | VN | -30 | -3.45  | -0.00181 | PASS |
|           |          |     |    | -20 | -1.95  | -0.00102 | PASS |
|           |          |     |    | -10 | -2.94  | -0.00154 | PASS |
|           |          |     |    | 0   | -2.37  | -0.00124 | PASS |
|           |          |     |    | 10  | -1.65  | -0.00086 | PASS |



|  |  |  |  |    |       |          |      |
|--|--|--|--|----|-------|----------|------|
|  |  |  |  | 20 | -5.19 | -0.00272 | PASS |
|  |  |  |  | 30 | -3.77 | -0.00198 | PASS |
|  |  |  |  | 40 | -3.23 | -0.00169 | PASS |
|  |  |  |  | 50 | -4.87 | -0.00255 | PASS |

END