



## 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] | EIRP [dBm] | Limit [dBm] | Verdict |
|-----------|-----------|--------------|-----------------------|------------|-------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | 22.83                 | 20.15      | 33          | PASS    |
|           |           | MCH          | 22.88                 | 20.20      | 33          | PASS    |
|           |           | HCH          | 22.93                 | 20.11      | 33          | PASS    |
| Test Band | Test Mode | Test Channel | Conducted Power [dBm] | ERP [dBm]  | Limit [dBm] | Verdict |
| WCDMA850  | UMTS/TM1  | LCH          | 23.35                 | 18.41      | 38.5        | PASS    |
|           |           | MCH          | 23.35                 | 18.43      | 38.5        | PASS    |
|           |           | HCH          | 23.36                 | 18.26      | 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:

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

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

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

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 |
|-----------|-----------|--------------|--------------|------------|---------|
| WCDMA850  | UMTS/TM1  | LCH          | 2.52         | 13         | PASS    |
|           |           | MCH          | 2.66         | 13         | PASS    |
|           |           | HCH          | 2.58         | 13         | PASS    |
| WCDMA1900 | UMTS/TM1  | LCH          | 2.67         | 13         | PASS    |
|           |           | MCH          | 2.55         | 13         | PASS    |
|           |           | HCH          | 2.57         | 13         | PASS    |

## 3Appendix\_C: Modulation Characteristics

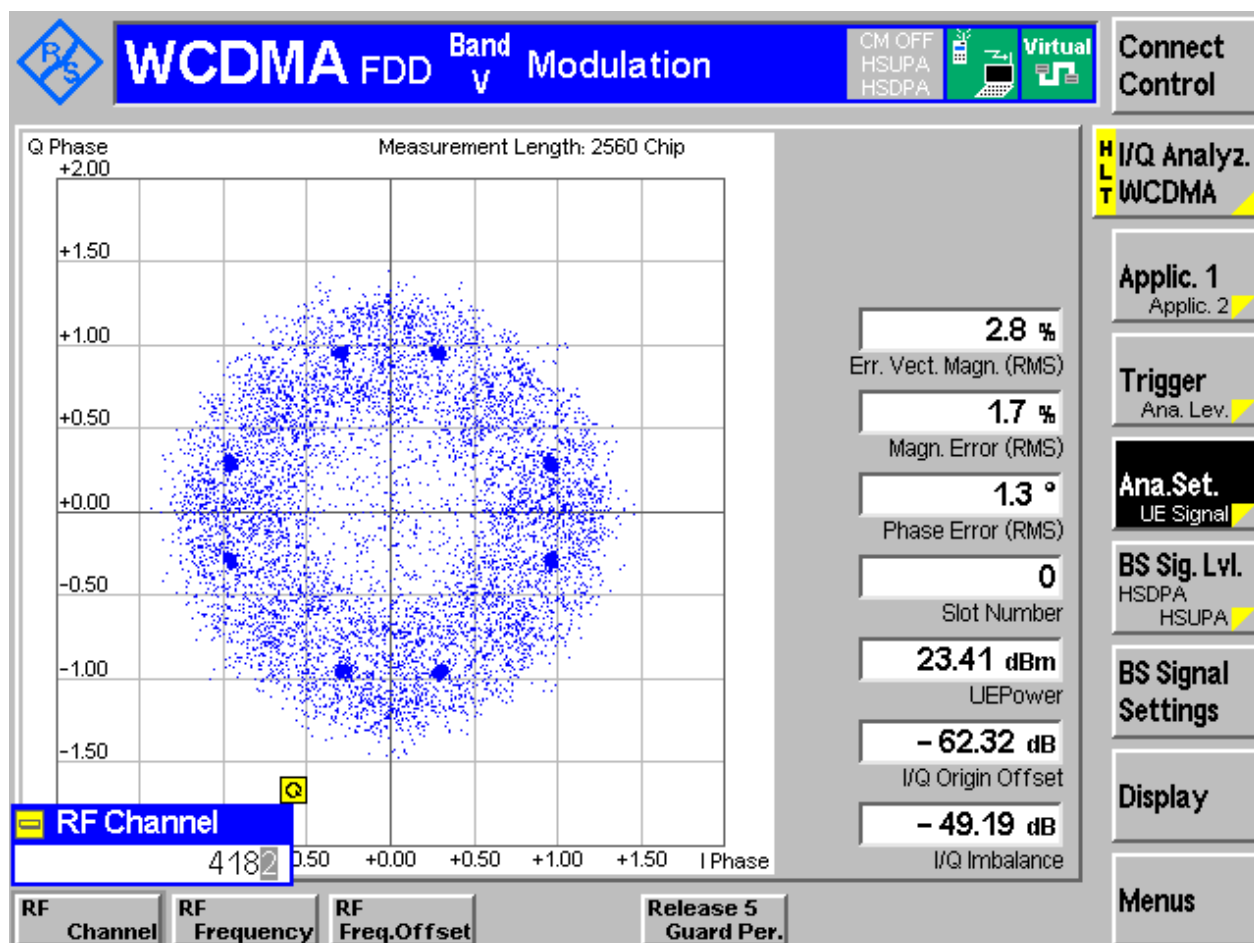
### Part I - Test Plots

#### 3.1 For UMTS

##### 3.1.1 Test Band = WCDMA850

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

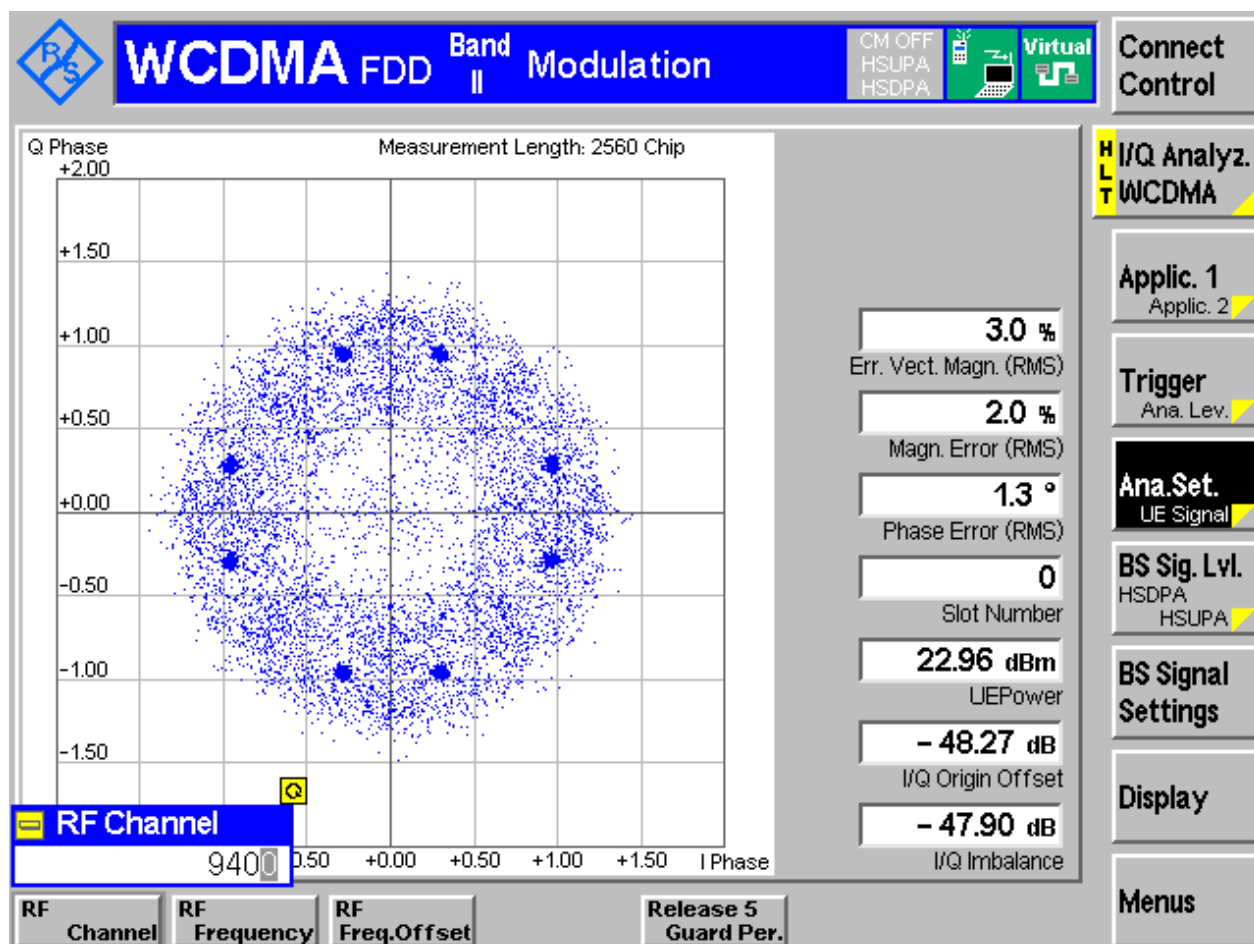
##### 3.1.1.1.1 Test Channel = MCH



### 3.1.2 Test Band = WCDMA1900

#### 3.1.2.1 Test Mode = UMTS/TM1

##### 3.1.2.1.1 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          | 4.15                     | 4.72                     | Pass    |
|           |           | MCH          | 4.14                     | 4.72                     | Pass    |
|           |           | HCH          | 4.15                     | 4.72                     | Pass    |
| WCDMA1900 | UMTS/TM1  | LCH          | 4.15                     | 4.73                     | Pass    |
|           |           | MCH          | 4.15                     | 4.72                     | Pass    |
|           |           | HCH          | 4.15                     | 4.73                     | Pass    |

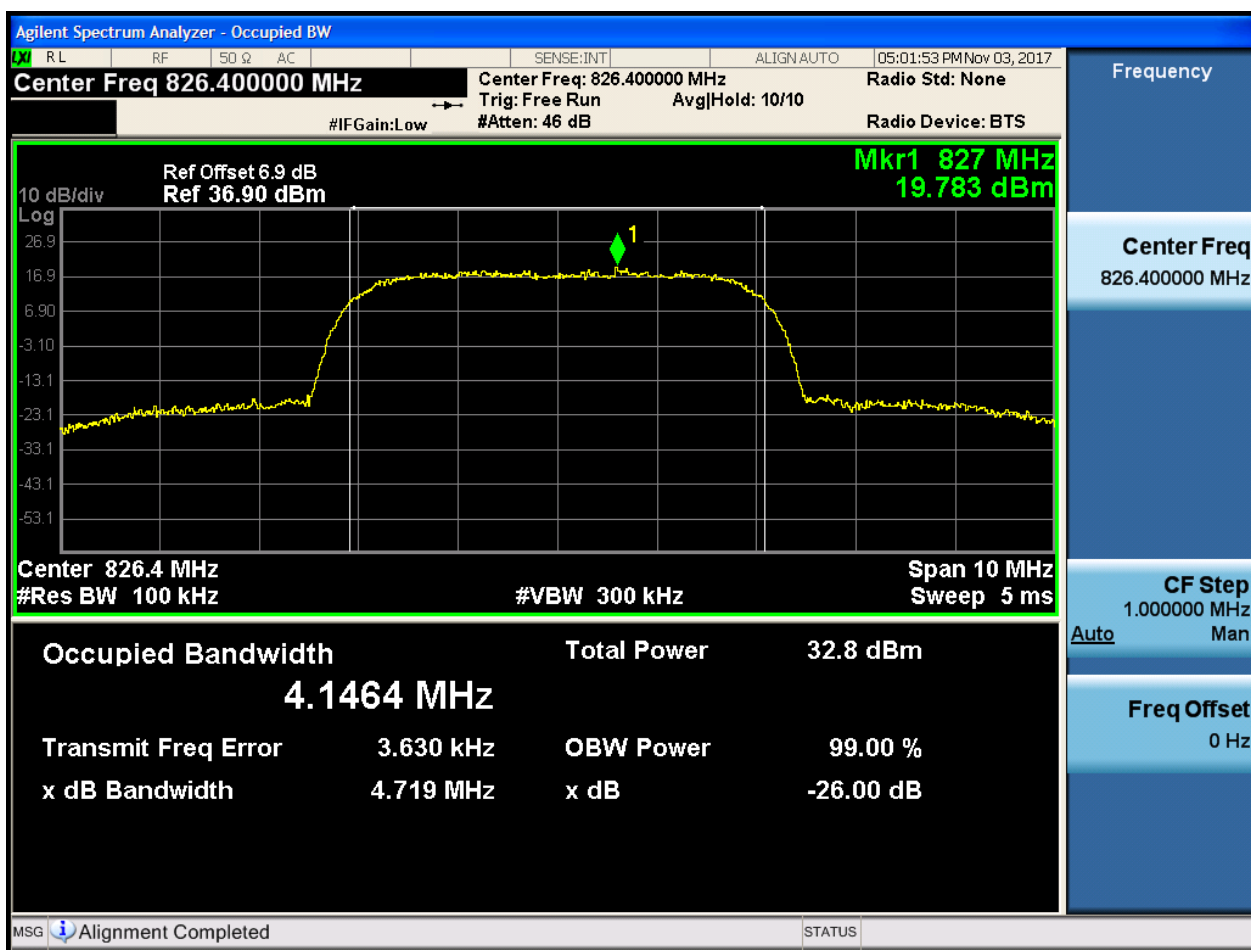
## Part II - Test Plots

### 4.1 For UMTS

#### 4.1.1 Test Band = WCDMA850

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

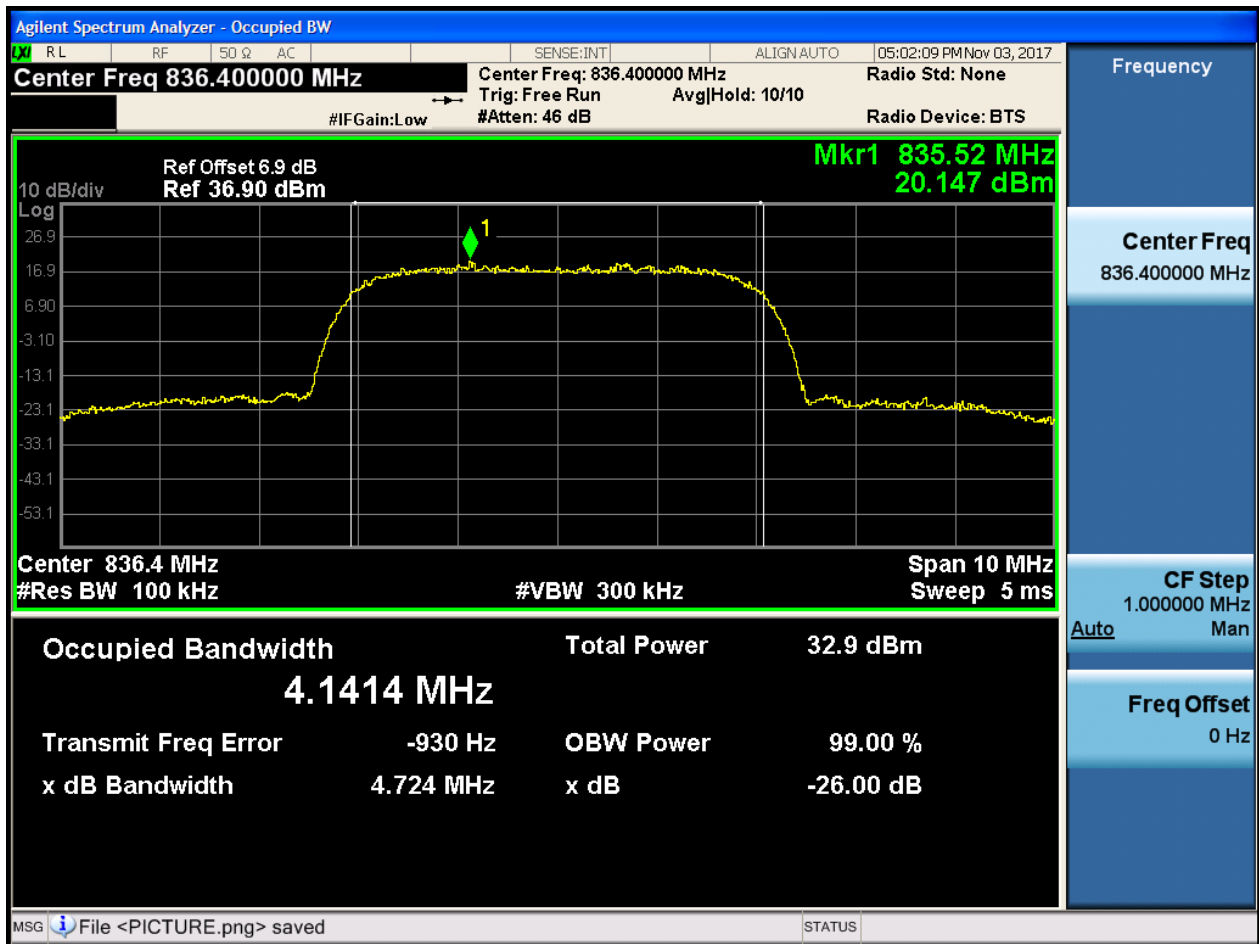
##### 4.1.1.1.1 Test Channel = LCH





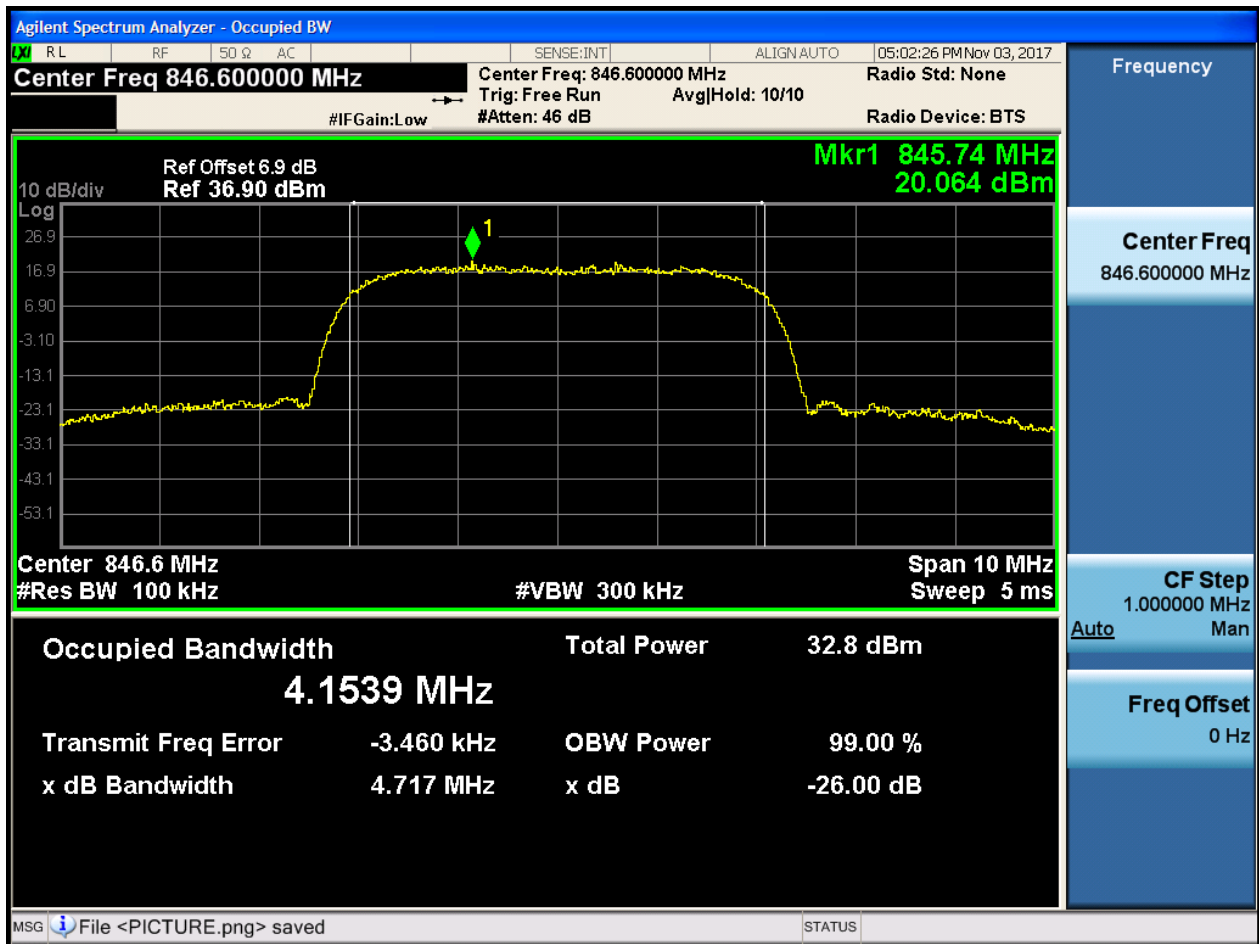


## 4.1.1.1.2 Test Channel = MCH





## 4.1.1.1.3 Test Channel = HCH

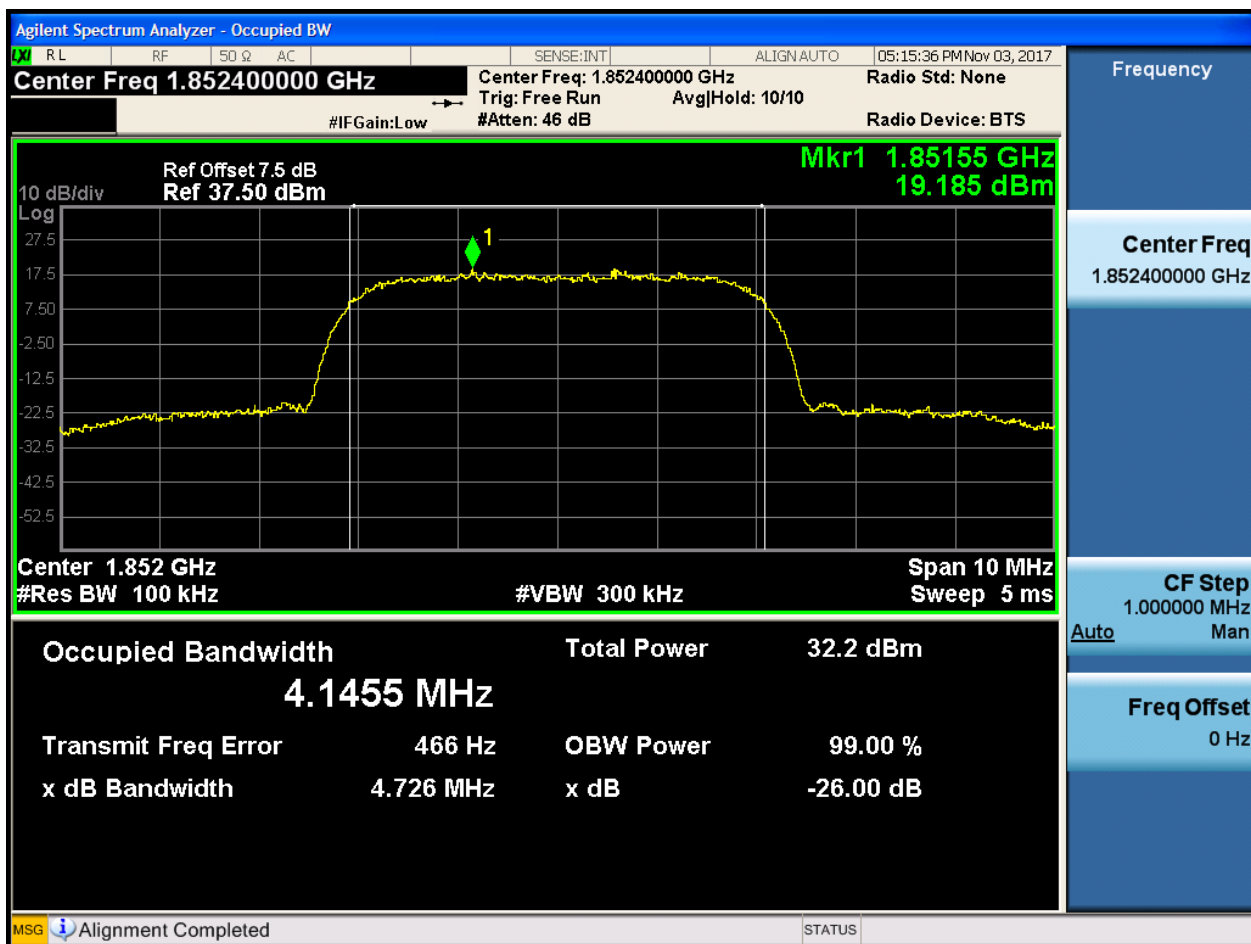




## 4.1.2 Test Band = WCDMA1900

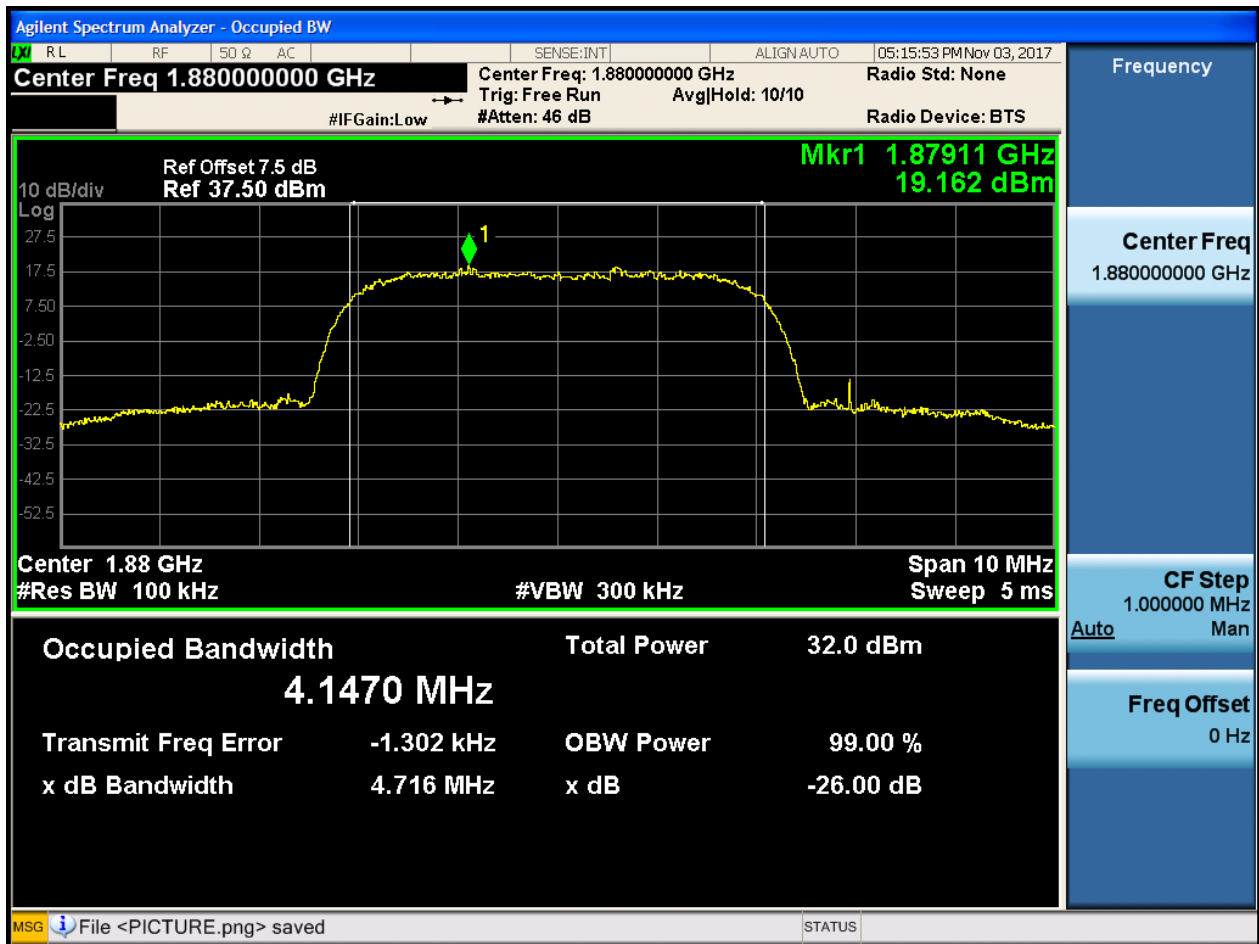
## 4.1.2.1 Test Mode = UMTS/TM1

## 4.1.2.1.1 Test Channel = LCH



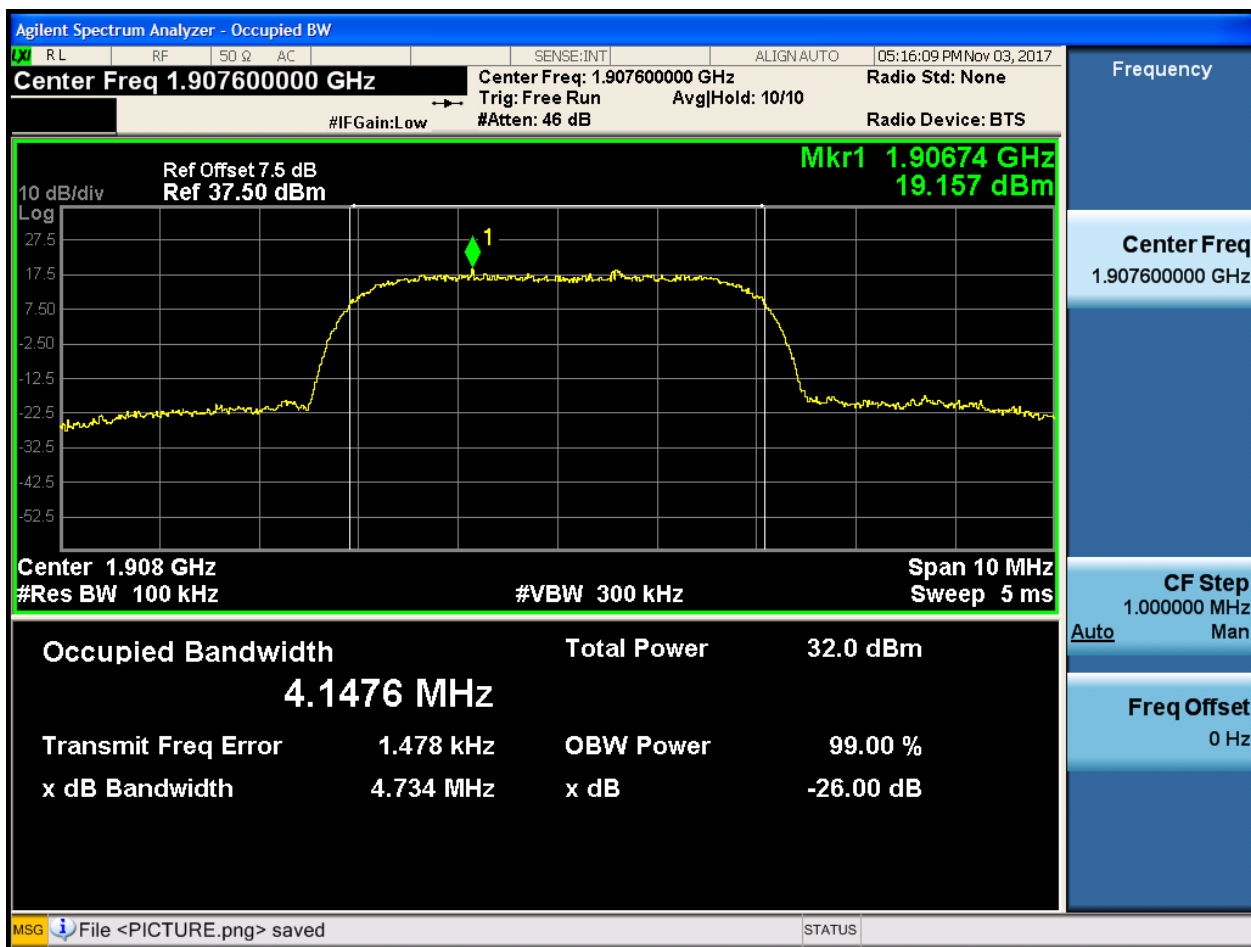


## 4.1.2.1.2 Test Channel = MCH





## 4.1.2.1.3 Test Channel = HCH



## 5Appendix\_E: Band Edges Compliance

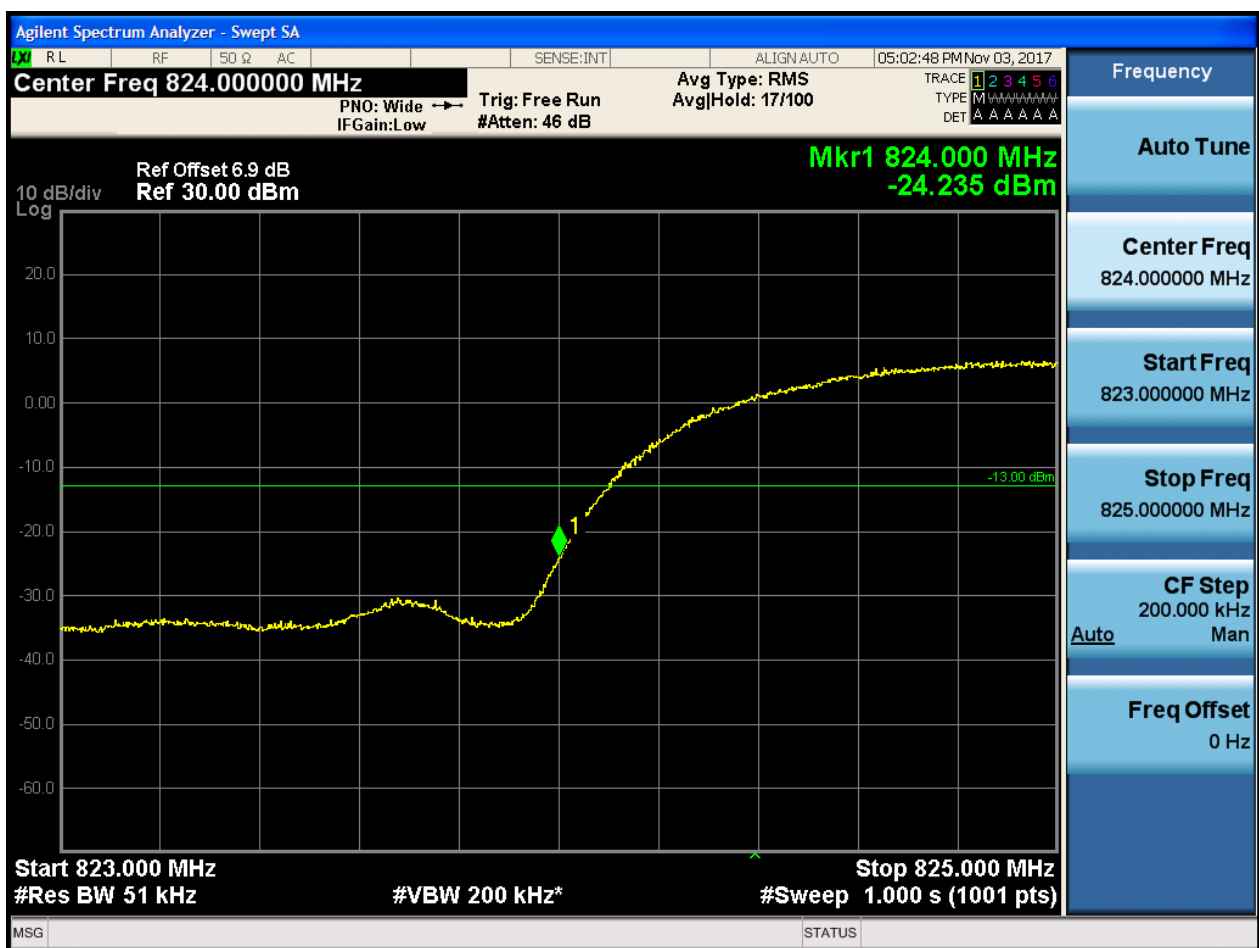
## Part I - Test Plots

### 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



## 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.

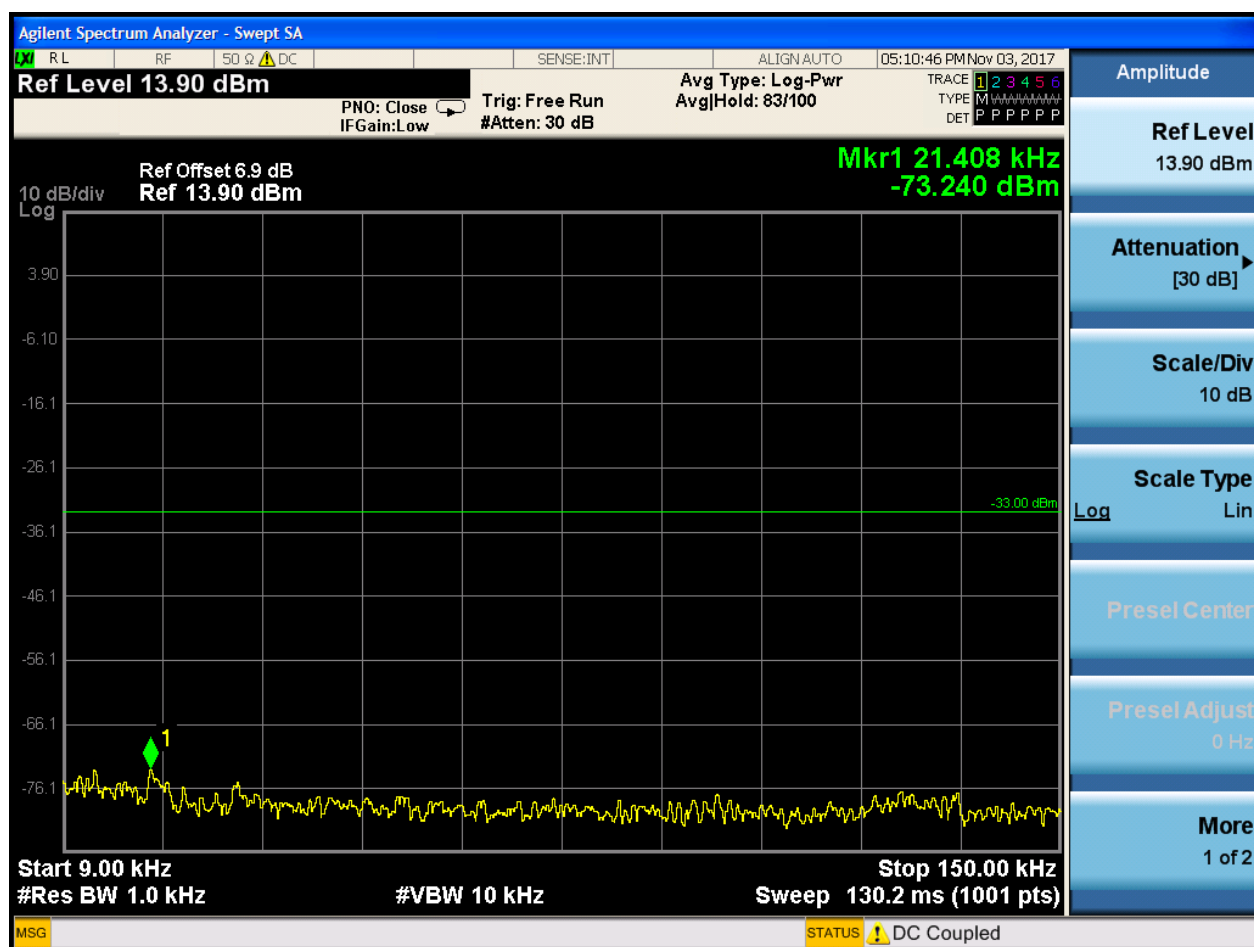
### Part I - Test Plots

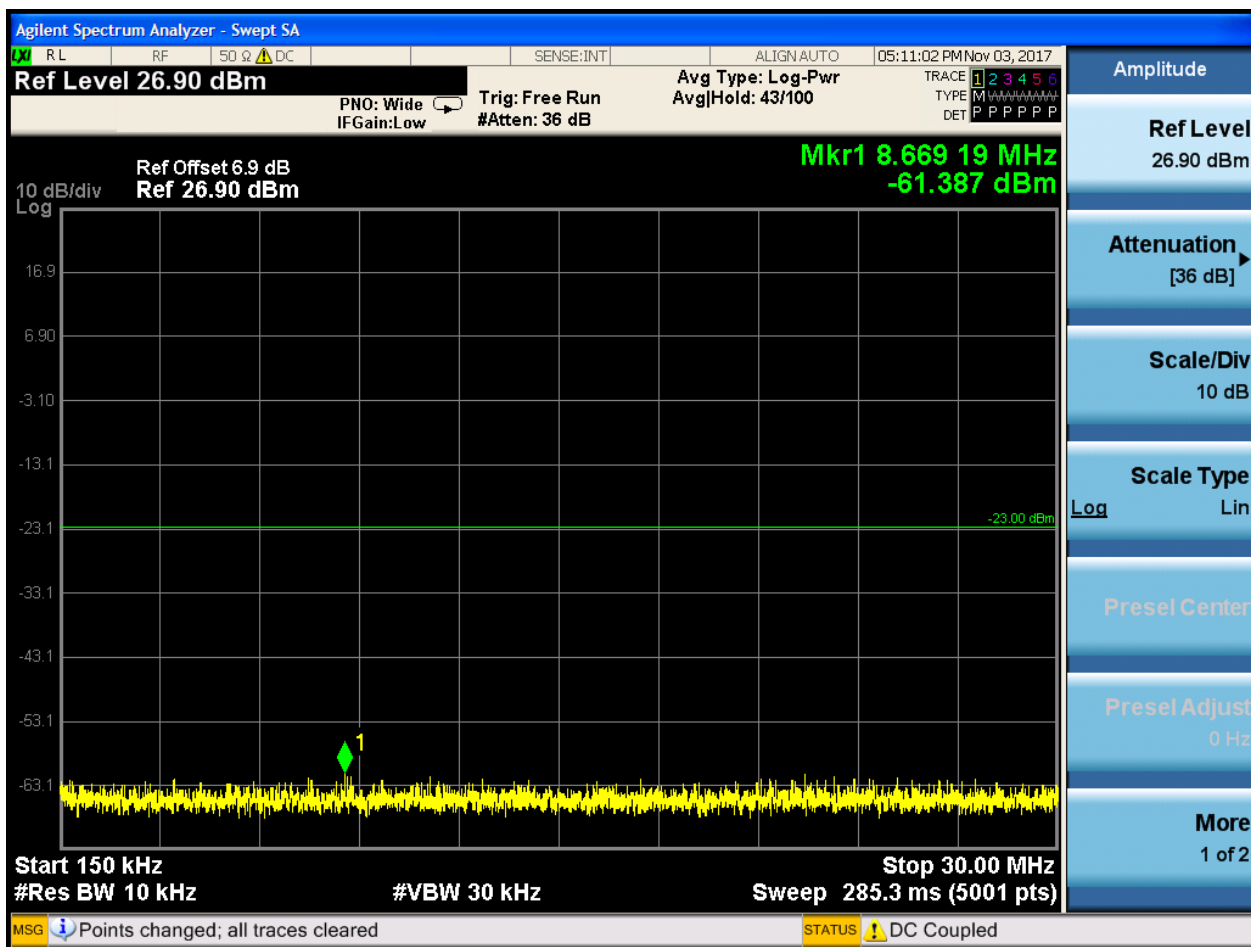
#### 6.1 For UMTS

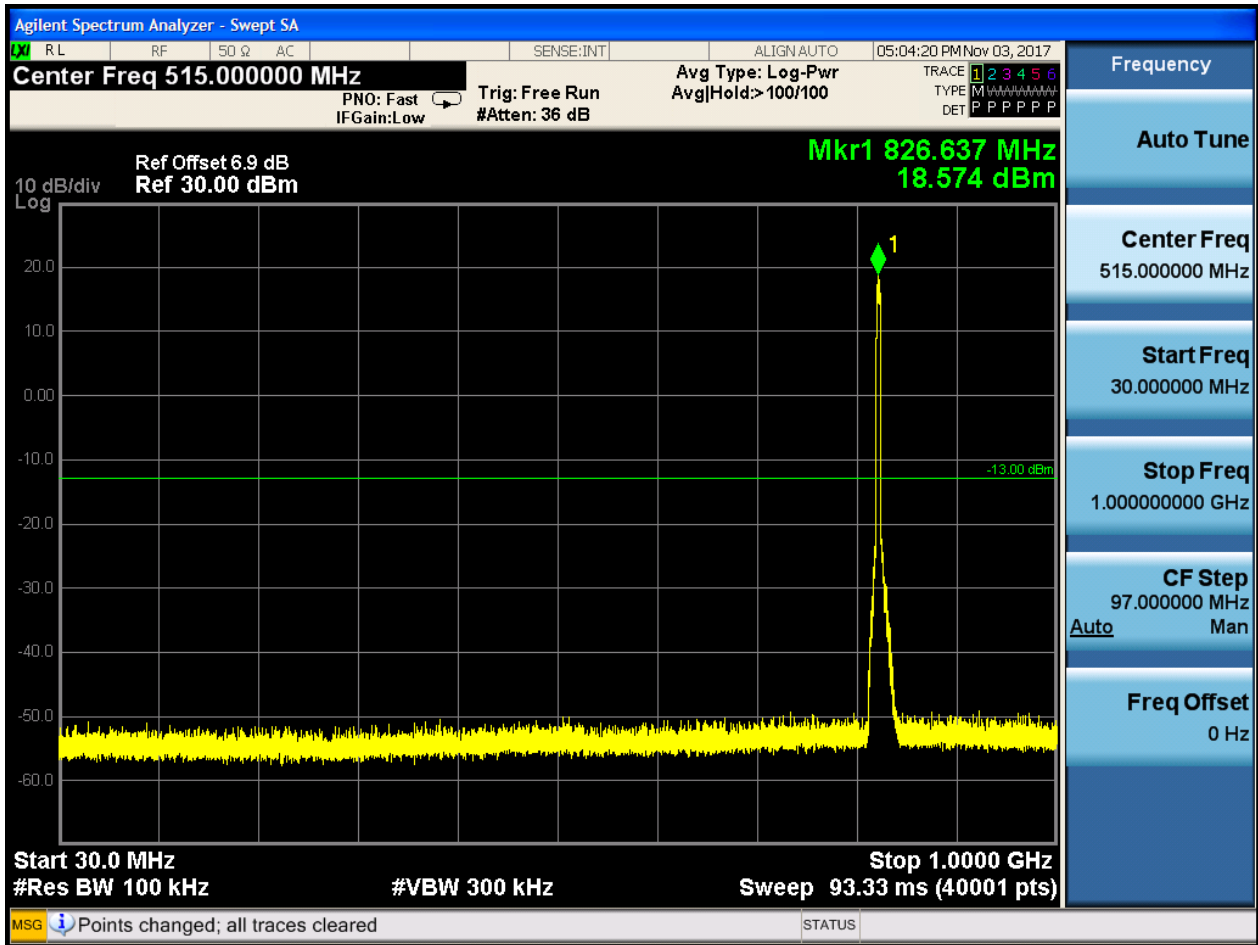
##### 6.1.1 Test Band = WCDMA850

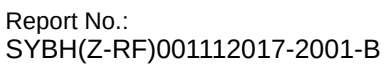
##### 6.1.1.1 Test Mode = UMTS/TM1

##### 6.1.1.1.1 Test Channel = LCH



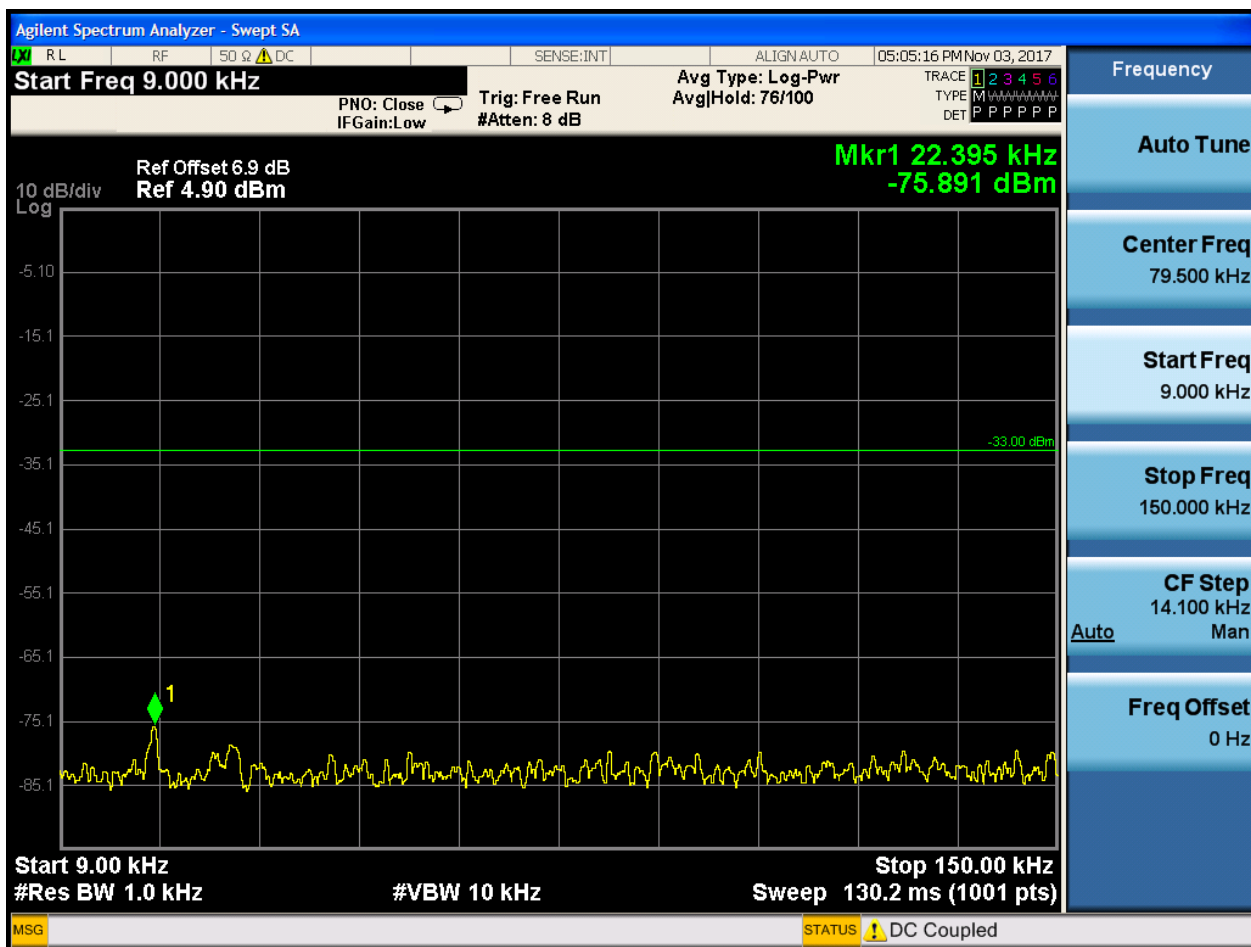


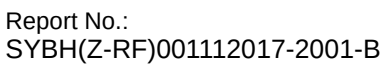


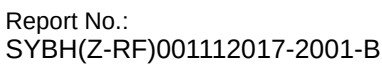




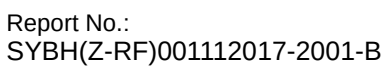
## 6.1.1.1.2 Test Channel = MCH



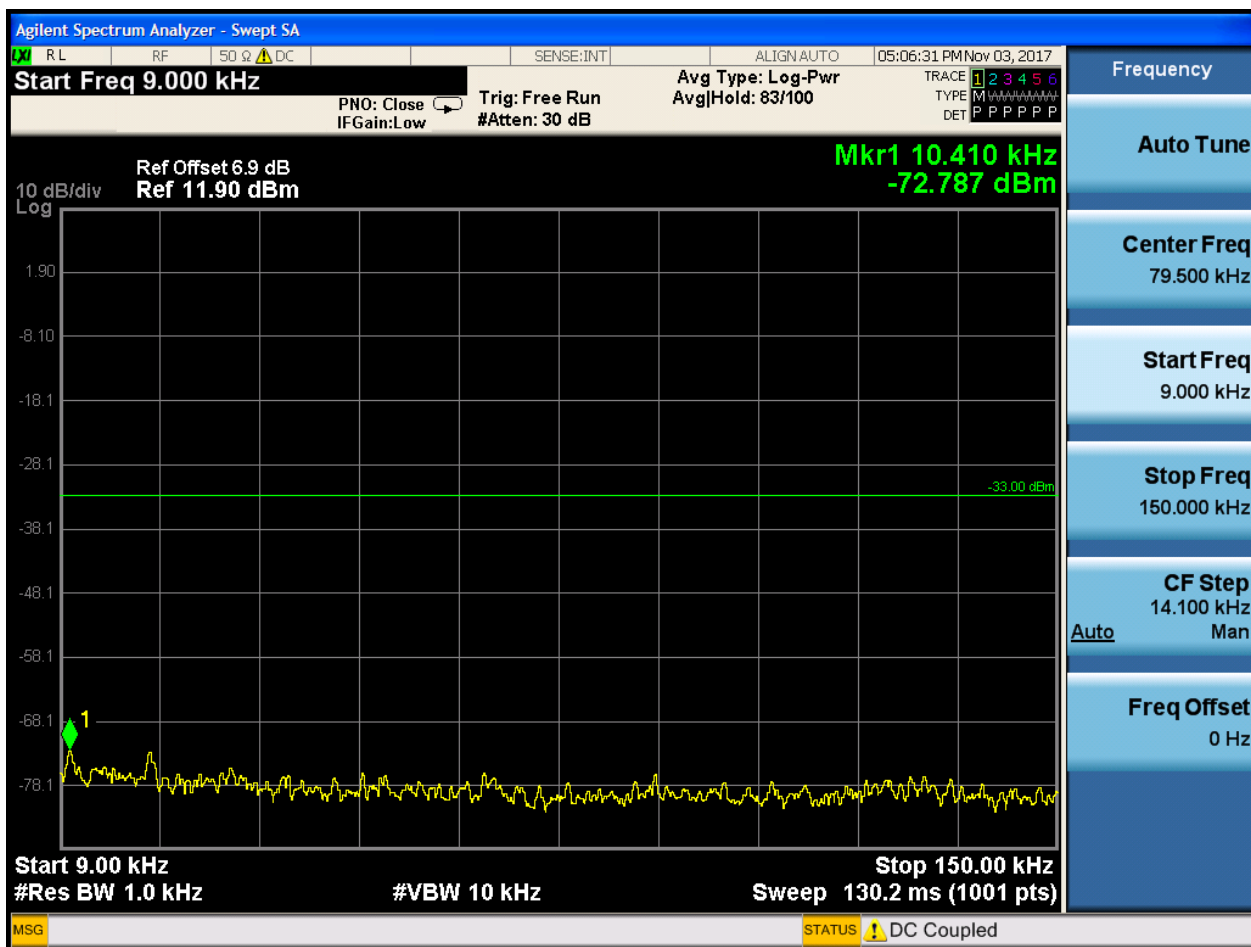


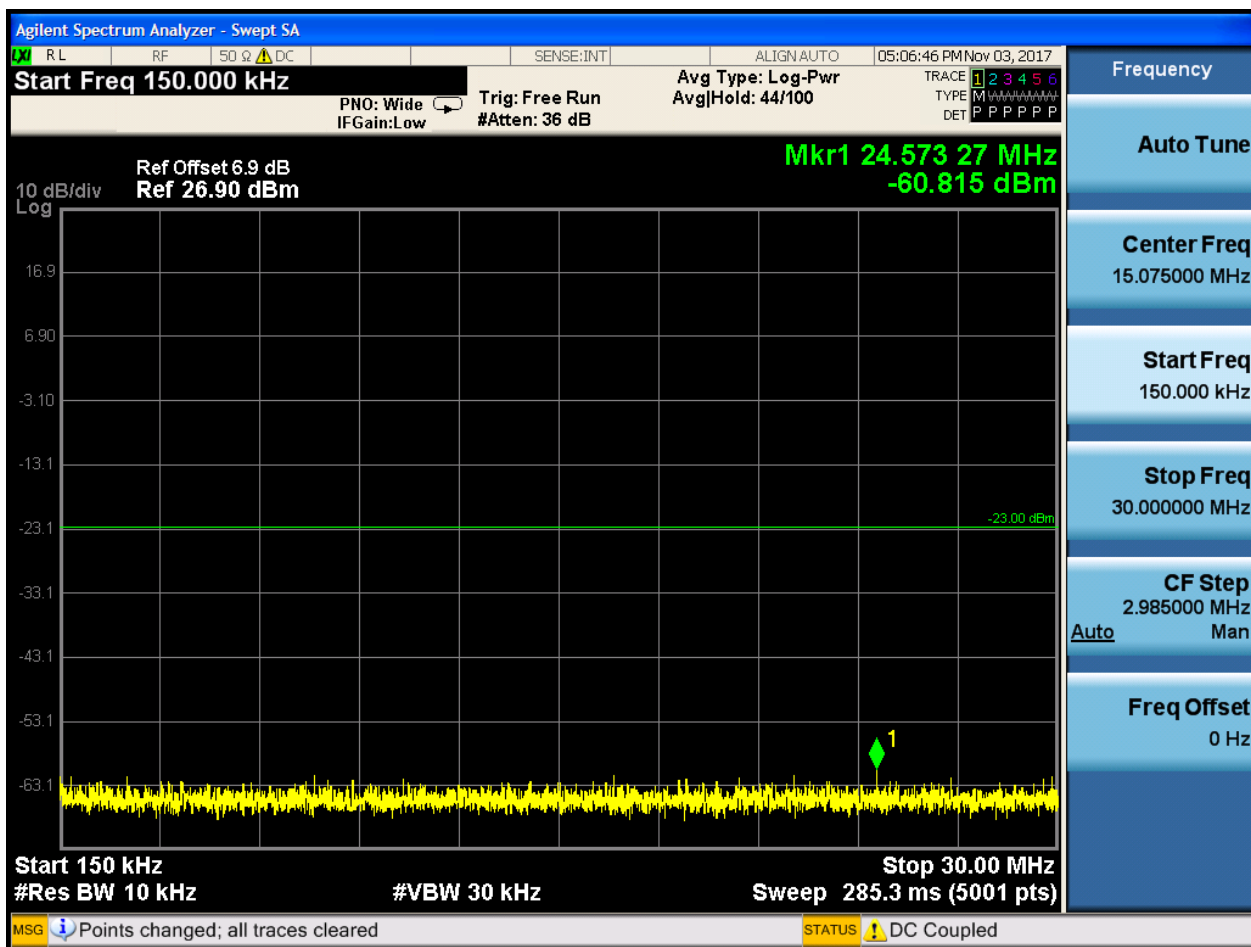


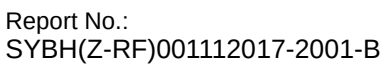


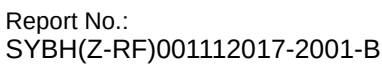


### 6.1.1.1.3 Test Channel = HCH





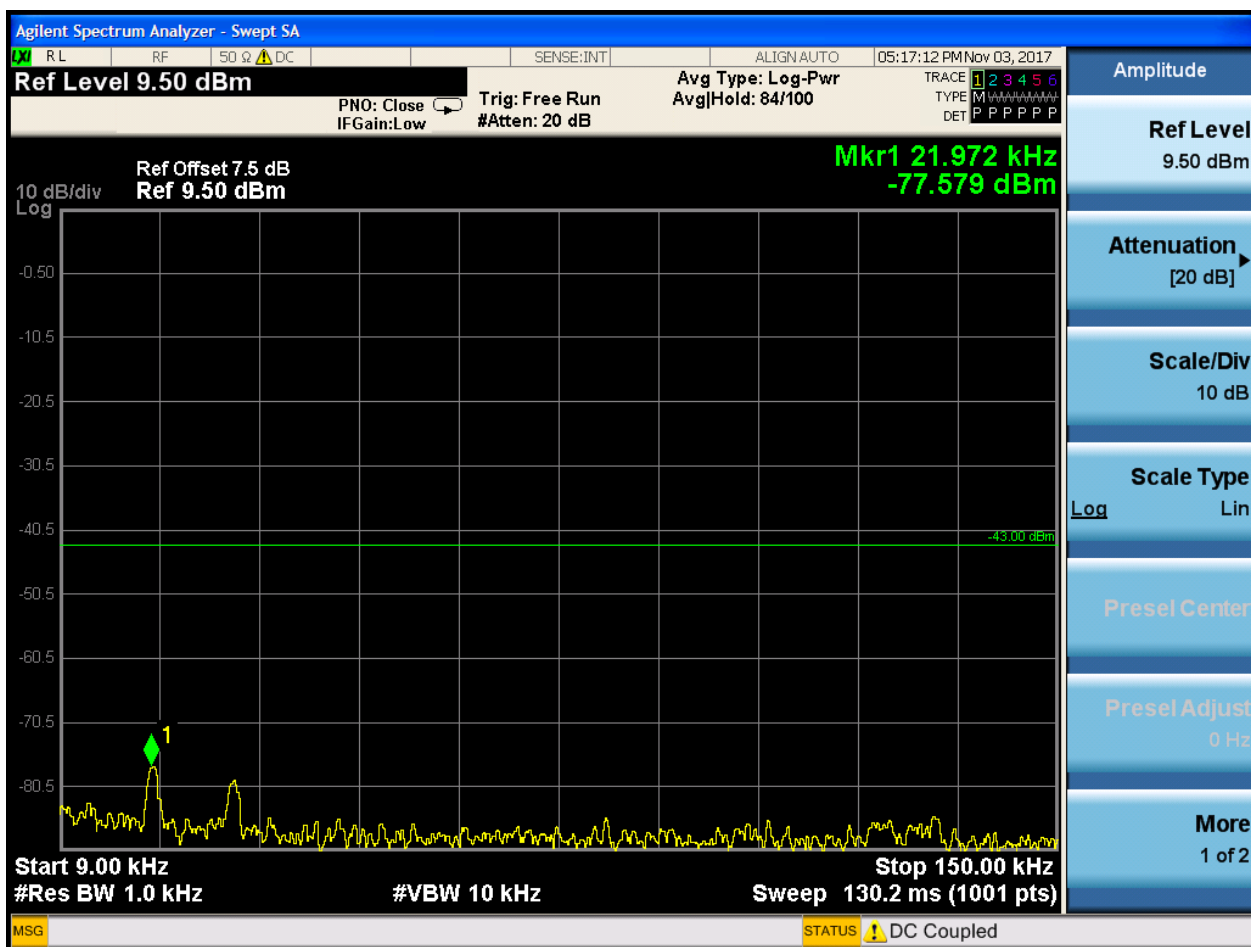


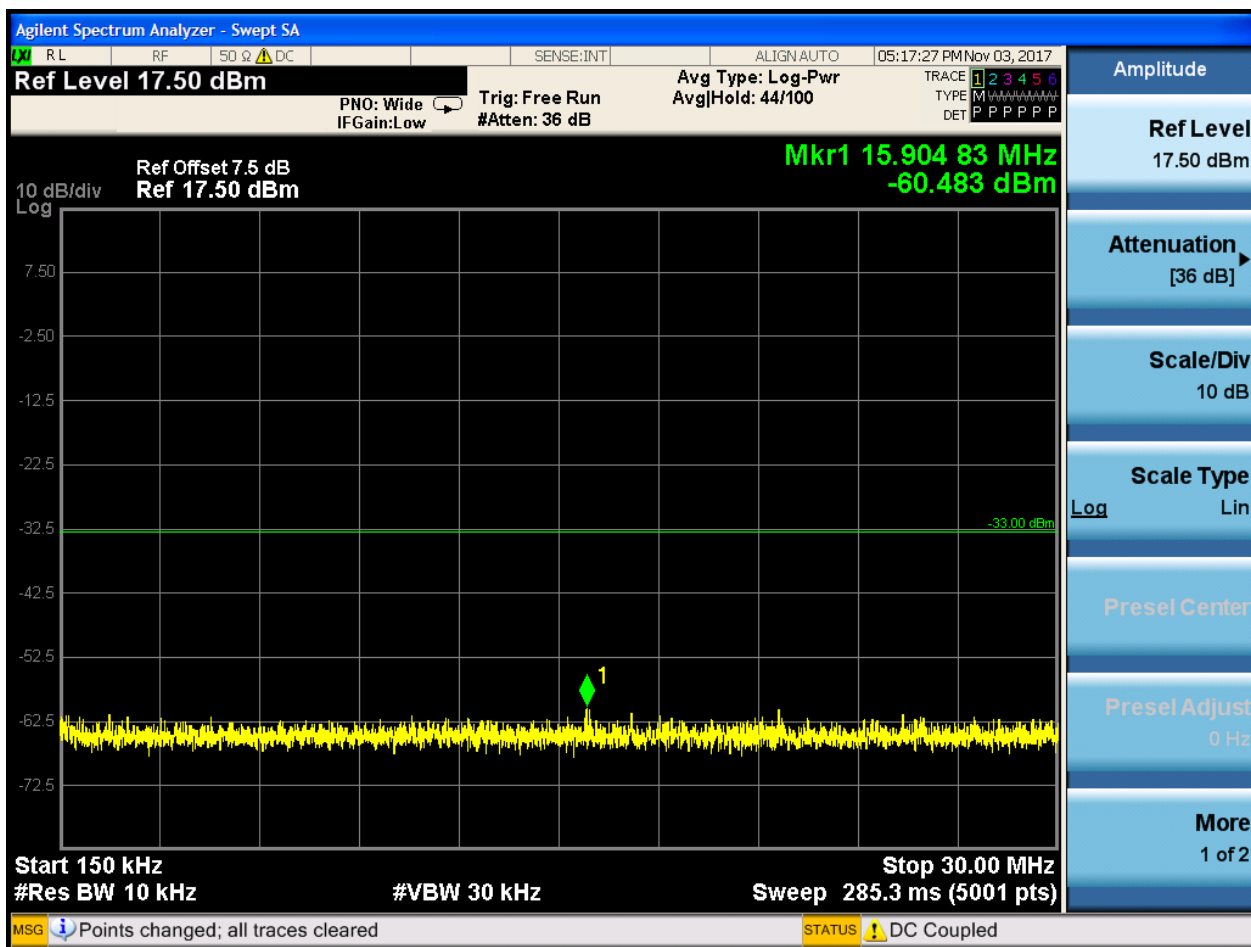


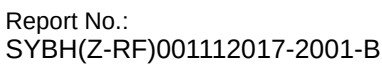
## 6.1.2 Test Band = WCDMA1900

### 6.1.2.1 Test Mode = UMTS/TM1

#### 6.1.2.1.1 Test Channel = LCH



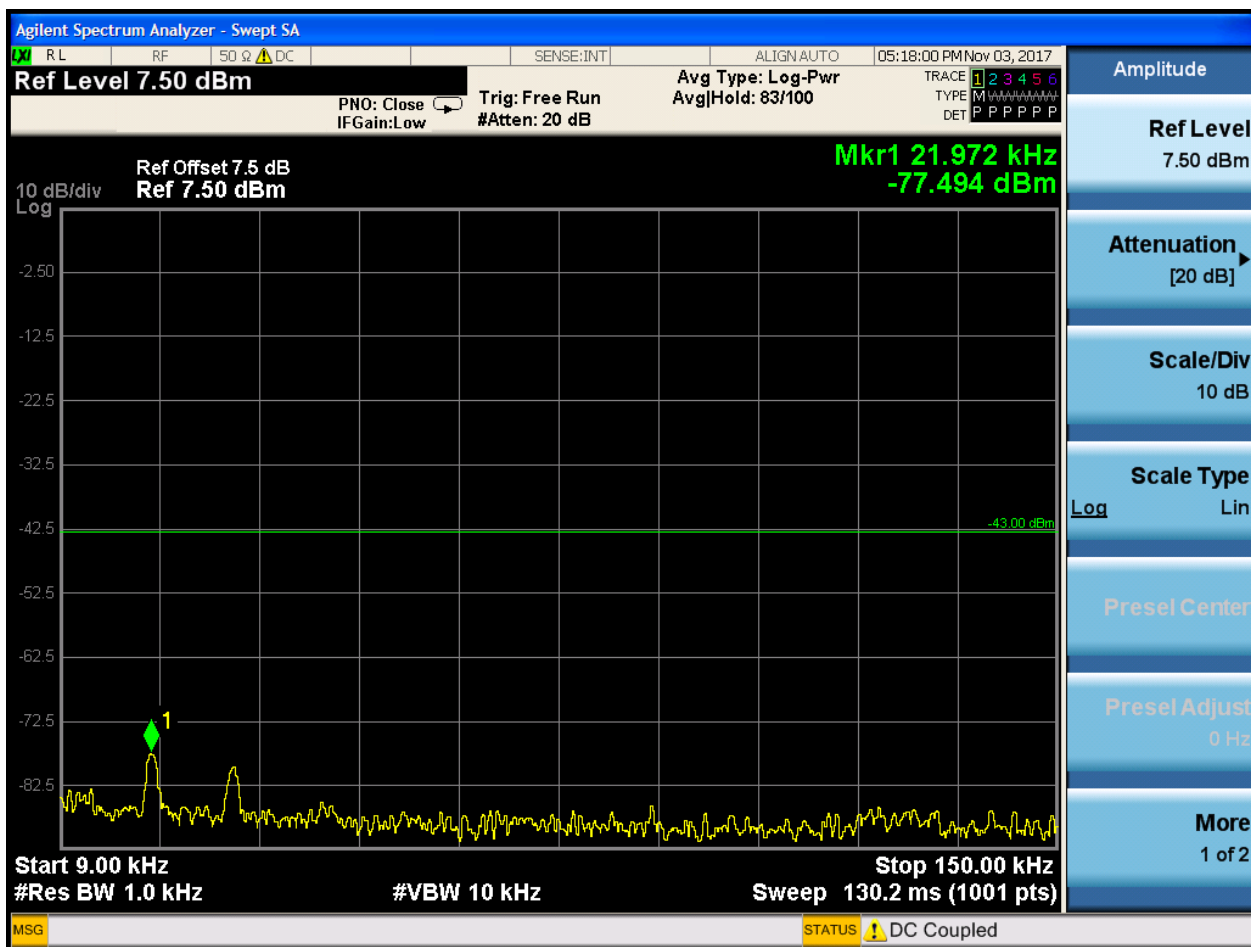


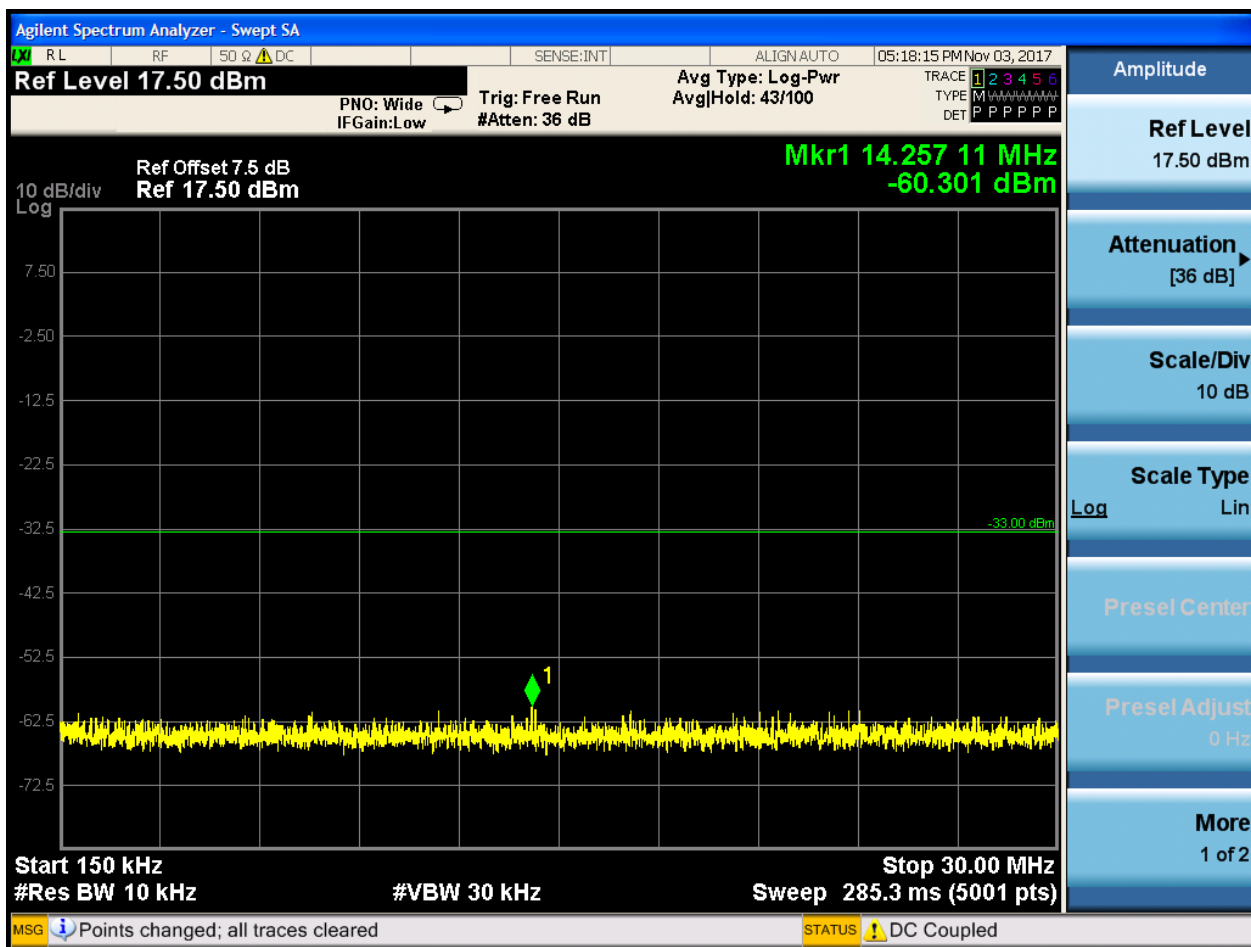






## 6.1.2.1.2 Test Channel = MCH

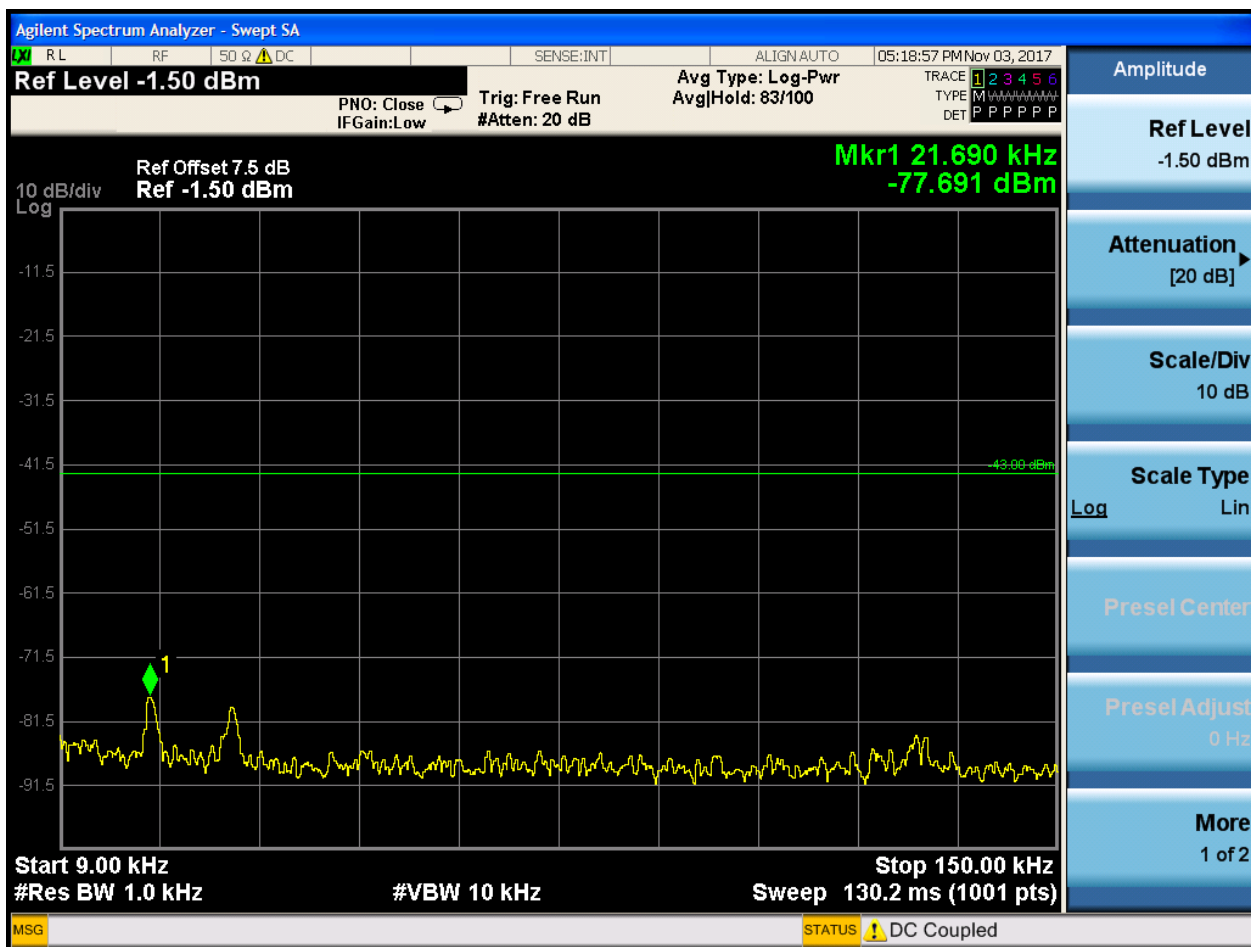


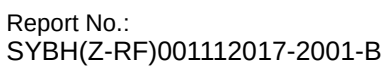


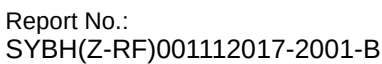




## 6.1.2.1.3 Test Channel = HCH







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

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

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

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

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

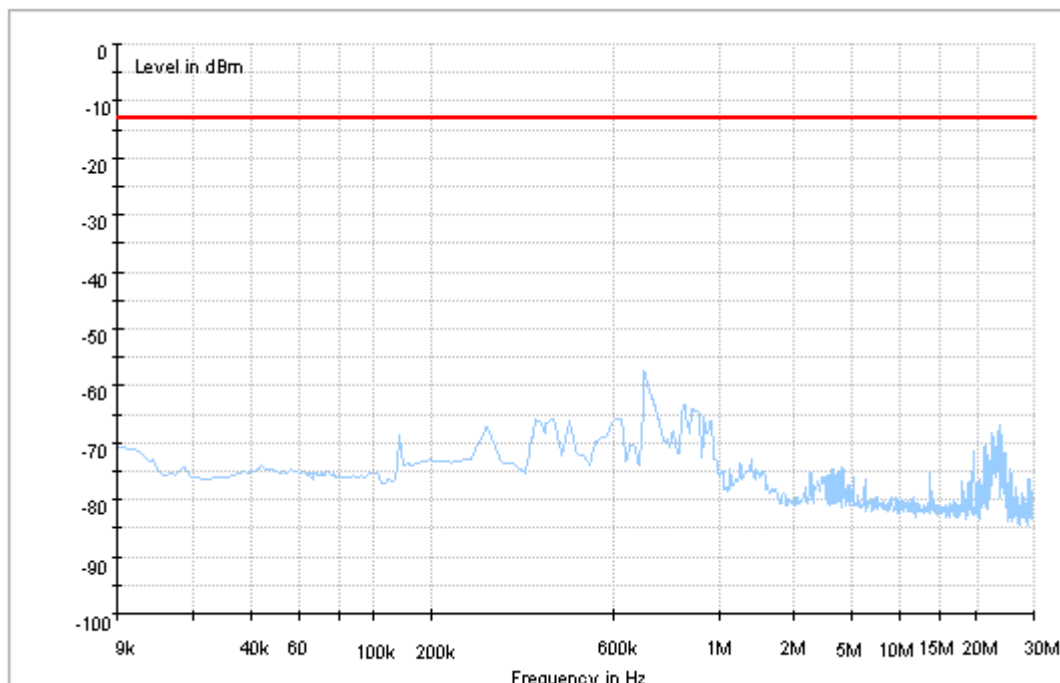
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

### Part I - Test Plots

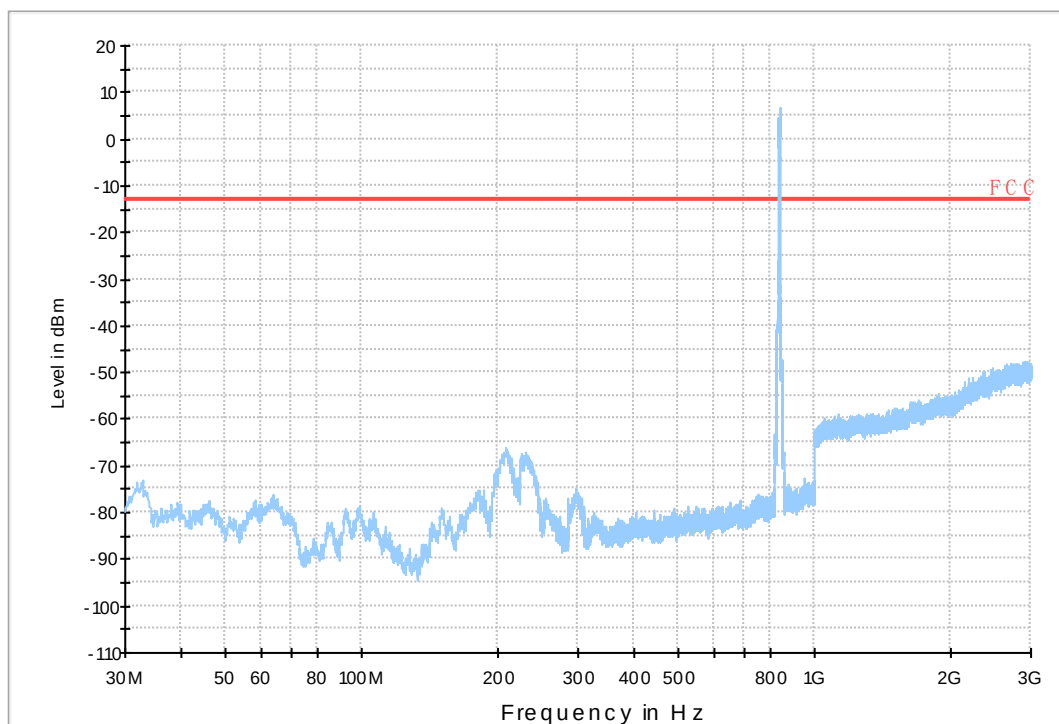
#### 7.1 For UMTS

##### 7.1.1 Test Band = WCDMA850\_ANT1

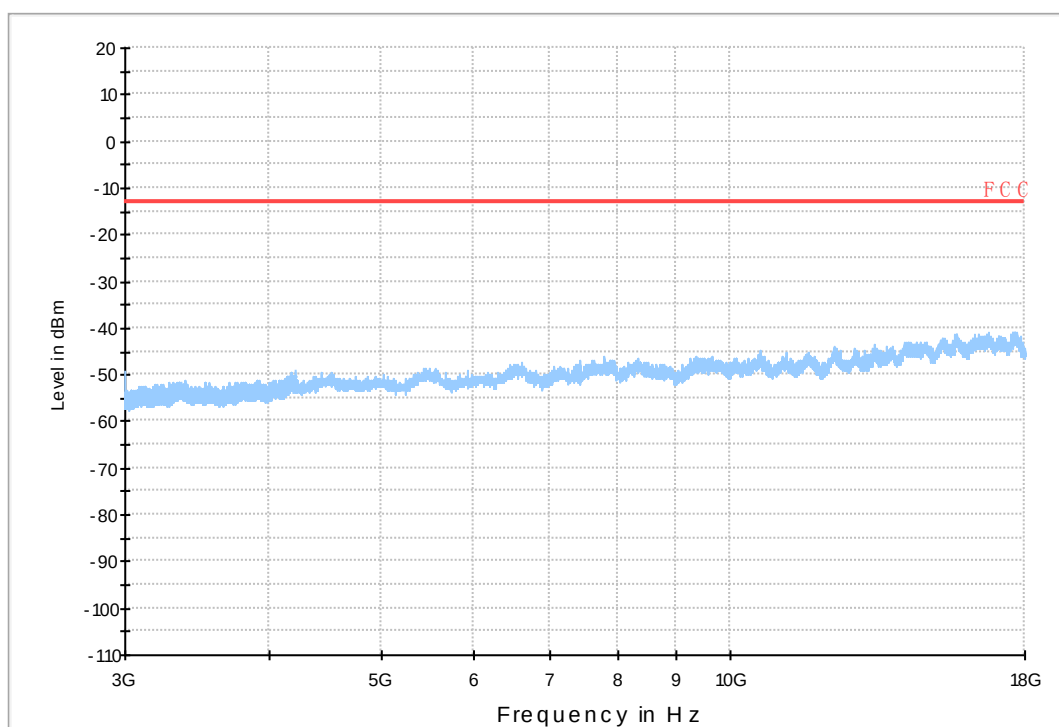
##### 7.1.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDMA850\_L



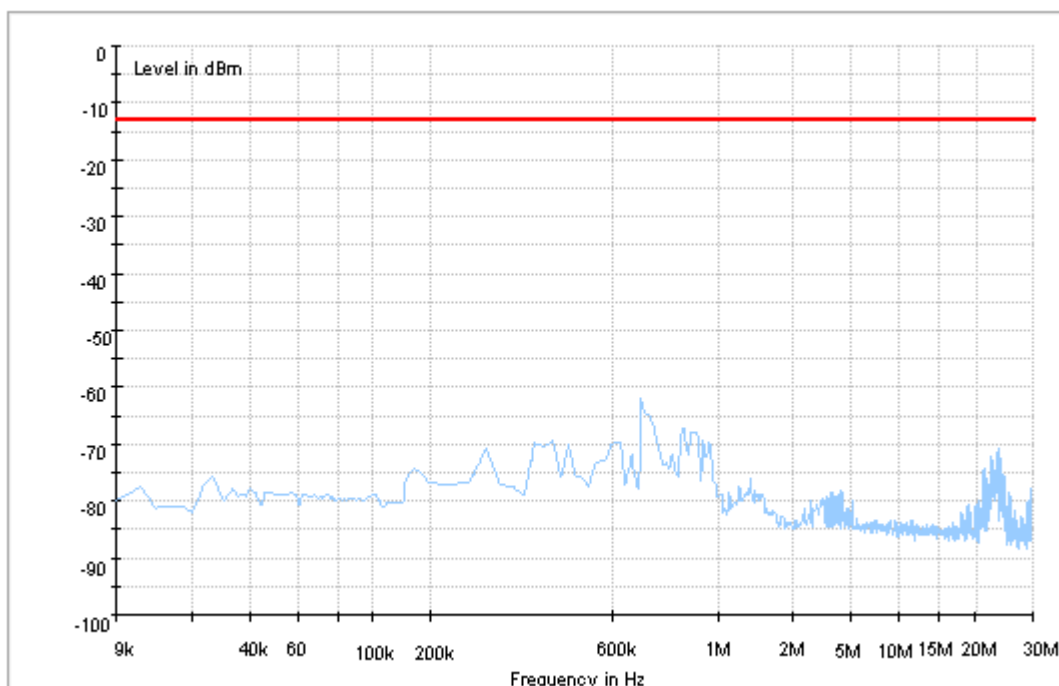
Copy of FCC PART22 W CDMA850\_H



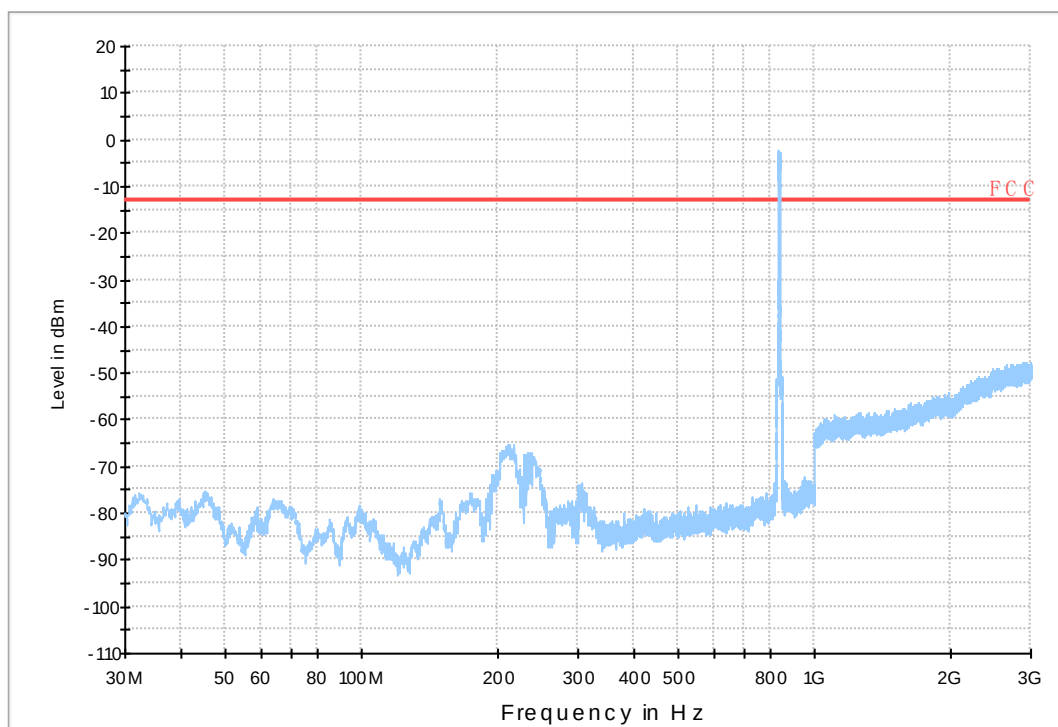
## 7.1.2 Test Band = WCDMA850\_ANT2

### 7.1.2.1 Test Mode = UMTS/TM1

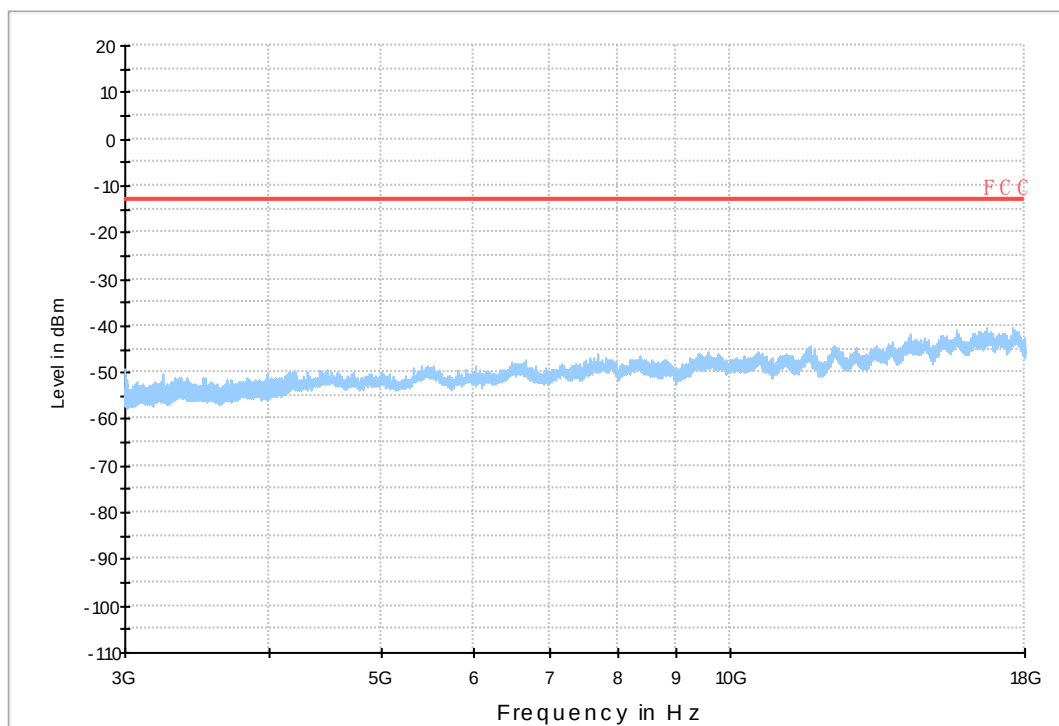




Copy of FCC PART22 W CDMA850\_L

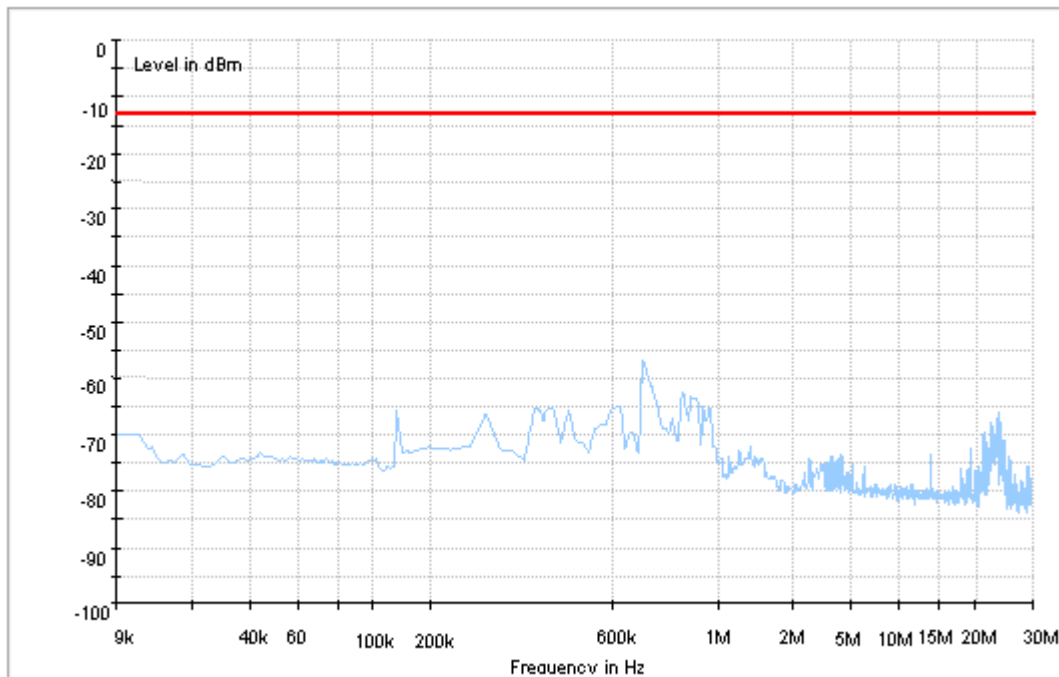


## Copy of FCC PART22 W CDMA850\_H

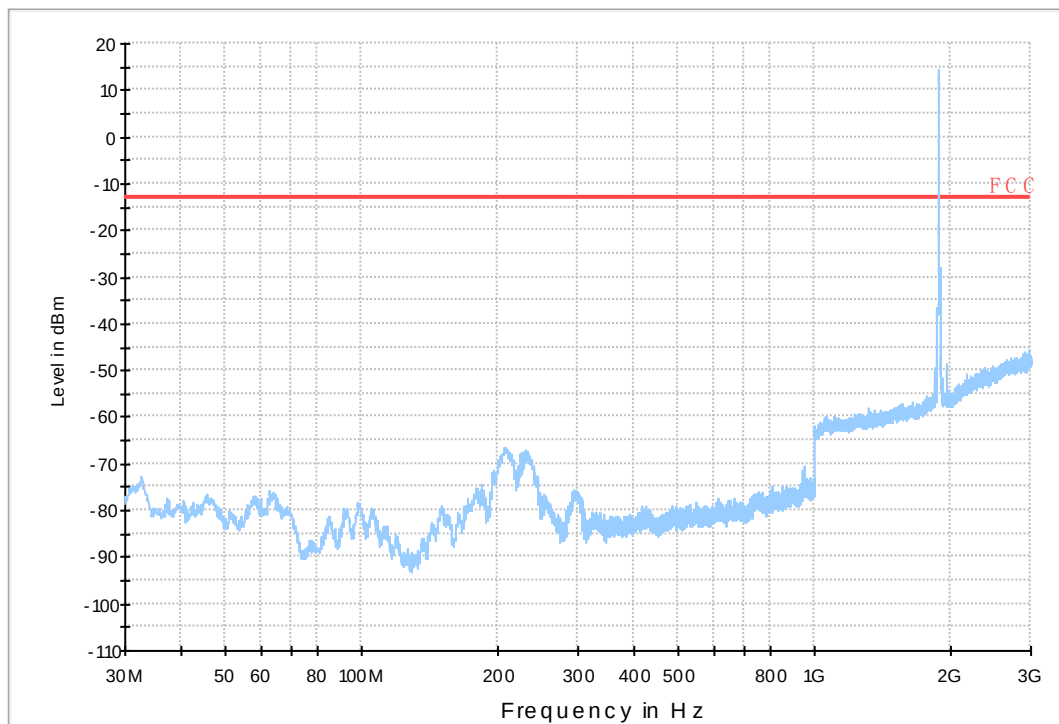


### 7.1.3 Test Band = WCDMA1900\_ANT1

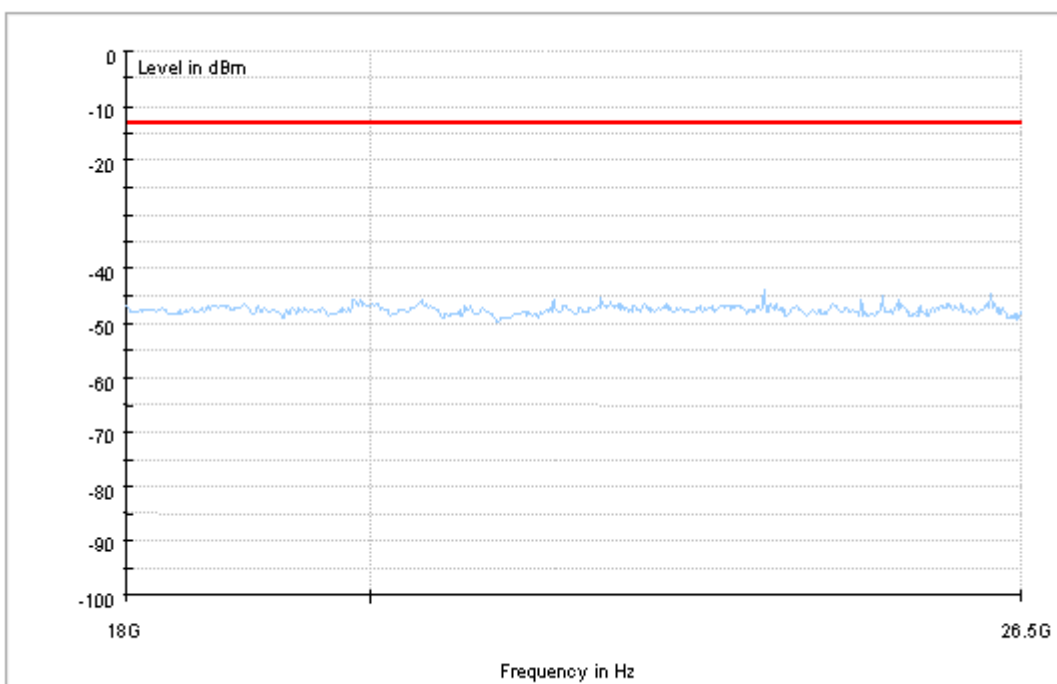
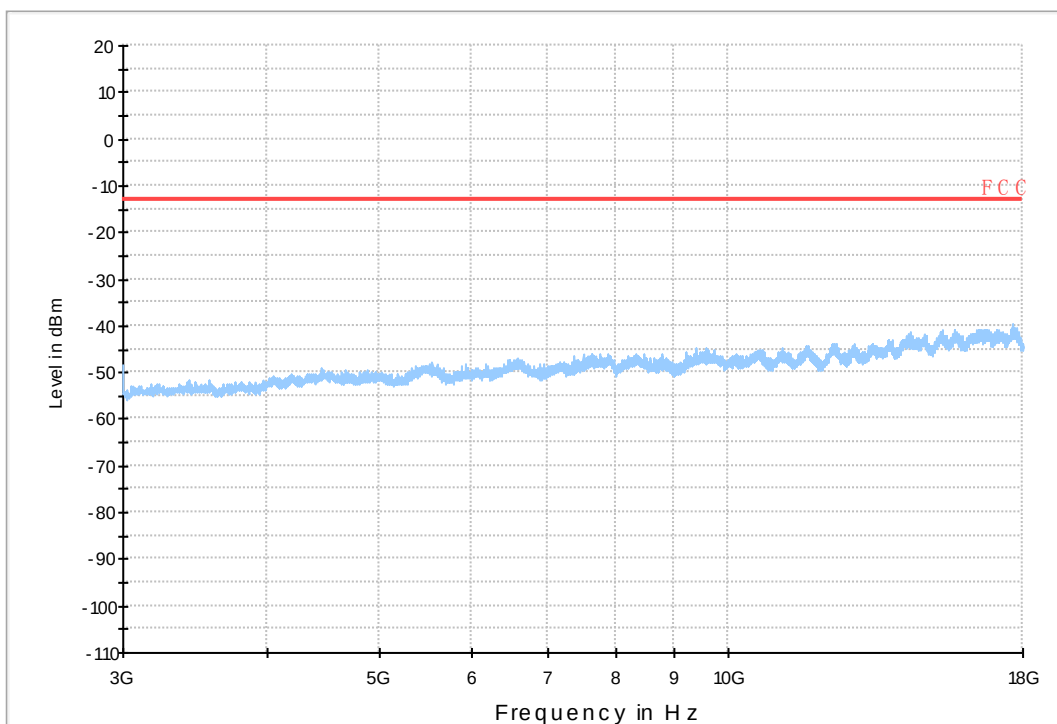
#### 7.1.3.1 Test Mode = UMTS/TM1



Copy of FCC PART24 W CDMA1900\_L

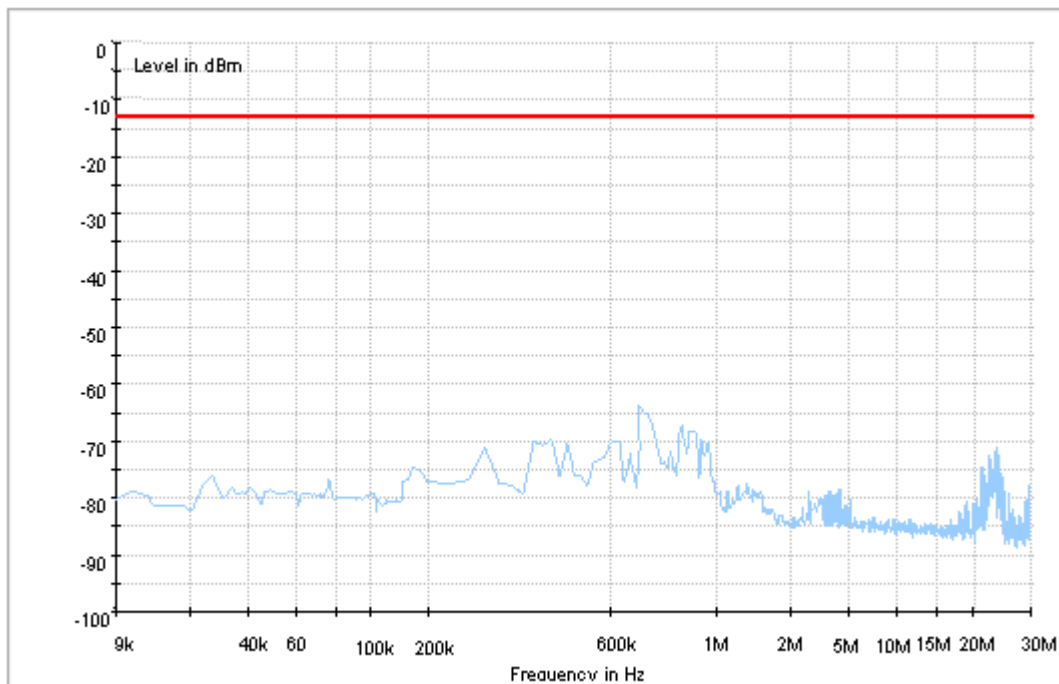


Copy of FCC PART 24 W CDMA1900\_H

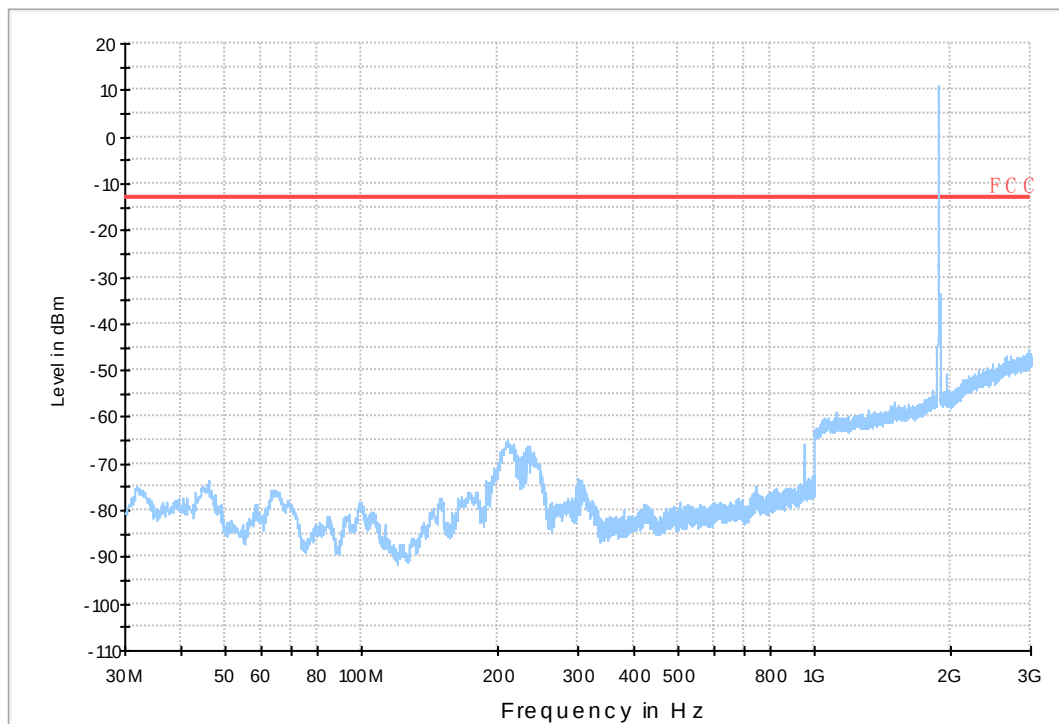


#### 7.1.4 Test Band = WCDMA1900\_ANT2

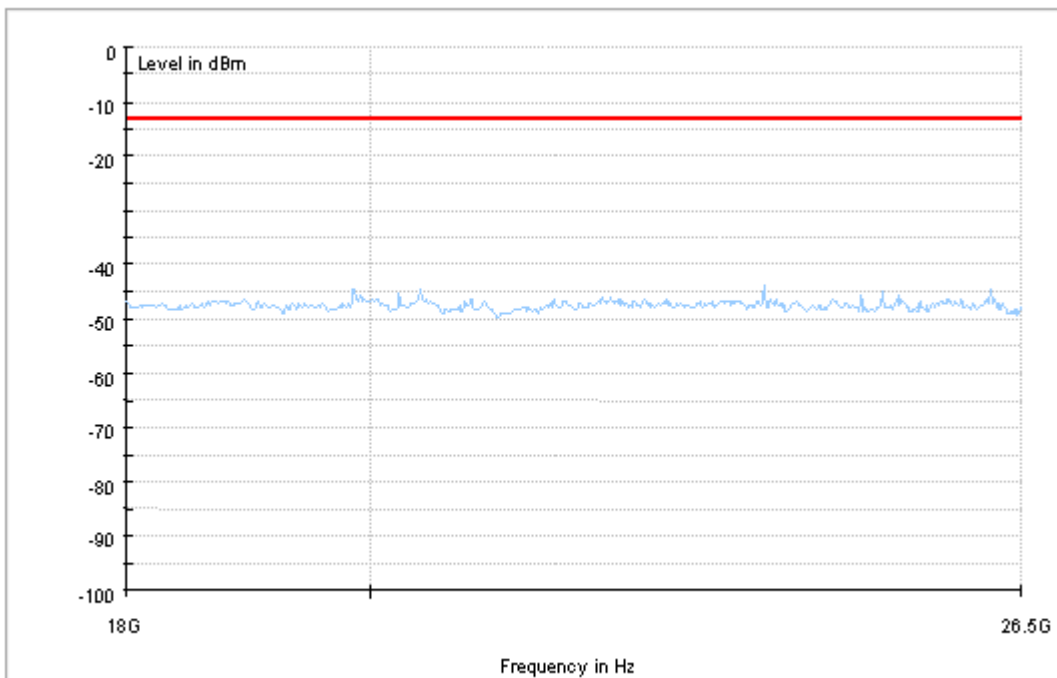
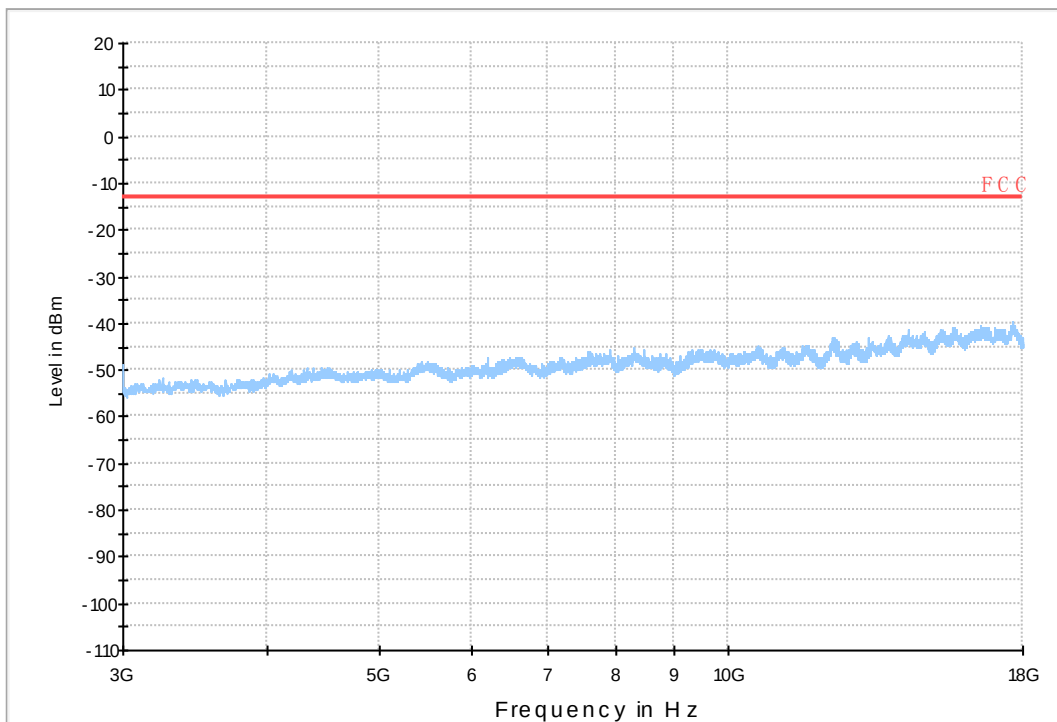
##### 7.1.4.1 Test Mode = UMTS/TM1



Copy of FCC PART 24 W CDMA1900\_L



Copy of FCC PART24 W CDMA1900\_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 |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| WCDMA850  | UMTS/TM1  | LCH          | TN         | VL         | 1.36             | 0.00165               | PASS    |
|           |           |              |            | VN         | 2.12             | 0.00257               | PASS    |
|           |           |              |            | VH         | 0.79             | 0.00096               | PASS    |
|           |           | MCH          | TN         | VL         | 1.97             | 0.00236               | PASS    |
|           |           |              |            | VN         | 7.66             | 0.00916               | PASS    |
|           |           |              |            | VH         | 1.42             | 0.0017                | PASS    |
|           |           | HCH          | TN         | VL         | 4.04             | 0.00477               | PASS    |
|           |           |              |            | VN         | 2.58             | 0.00305               | PASS    |
|           |           |              |            | VH         | 1.98             | 0.00234               | PASS    |
| WCDMA1900 | UMTS/TM1  | LCH          | TN         | VL         | -4.06            | -0.00219              | PASS    |
|           |           |              |            | VN         | -0.08            | -0.00004              | PASS    |
|           |           |              |            | VH         | 1.86             | 0.001                 | PASS    |
|           |           | MCH          | TN         | VL         | -1.05            | -0.00056              | PASS    |
|           |           |              |            | VN         | 4.36             | 0.00232               | PASS    |
|           |           |              |            | VH         | 5.48             | 0.00291               | PASS    |
|           |           | HCH          | TN         | VL         | -5.23            | -0.00274              | PASS    |
|           |           |              |            | VN         | 3.56             | 0.00187               | PASS    |
|           |           |              |            | VH         | 3.08             | 0.00161               | PASS    |

#### 8.1.2Frequency 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        | 3.49             | 0.00422               | PASS    |
|           |           |              |            | -20        | -3.95            | -0.00478              | PASS    |
|           |           |              |            | -10        | 0.37             | 0.00045               | PASS    |
|           |           |              |            | 0          | -0.38            | -0.00046              | PASS    |
|           |           |              |            | 10         | -3.66            | -0.00443              | PASS    |
|           |           |              |            | 20         | 2.2              | 0.00266               | PASS    |
|           |           |              |            | 30         | -0.9             | -0.00109              | PASS    |

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
|           |           |              |            | 40         | 0.5              | 0.00061               | PASS    |
|           |           |              |            | 50         | 0.89             | 0.00108               | PASS    |
|           |           | MCH          | VN         | -30        | 2.56             | 0.00306               | PASS    |
|           |           |              |            | -20        | -1.24            | -0.00148              | PASS    |
|           |           |              |            | -10        | 3.16             | 0.00378               | PASS    |
|           |           |              |            | 0          | -3.52            | -0.00421              | PASS    |
|           |           |              |            | 10         | 6.58             | 0.00787               | PASS    |
|           |           |              |            | 20         | 0.73             | 0.00087               | PASS    |
|           |           |              |            | 30         | -1.34            | -0.0016               | PASS    |
|           |           |              |            | 40         | 3.66             | 0.00438               | PASS    |
|           |           |              |            | 50         | 2.78             | 0.00332               | PASS    |
|           |           | HCH          | VN         | -30        | 1.08             | 0.00128               | PASS    |
|           |           |              |            | -20        | 4.15             | 0.0049                | PASS    |
|           |           |              |            | -10        | 1.56             | 0.00184               | PASS    |
|           |           |              |            | 0          | 3.8              | 0.00449               | PASS    |
|           |           |              |            | 10         | 1.59             | 0.00188               | PASS    |
|           |           |              |            | 20         | 1.89             | 0.00223               | PASS    |
|           |           |              |            | 30         | 4.9              | 0.00579               | PASS    |
|           |           |              |            | 40         | 0.08             | 0.00009               | PASS    |
|           |           |              |            | 50         | 1.21             | 0.00143               | PASS    |
| WCDMA1900 | UMTS/TM1  | LCH          | VN         | -30        | -0.31            | -0.00017              | PASS    |
|           |           |              |            | -20        | 3.52             | 0.0019                | PASS    |
|           |           |              |            | -10        | 4.3              | 0.00232               | PASS    |
|           |           |              |            | 0          | 0.21             | 0.00011               | PASS    |
|           |           |              |            | 10         | -1.3             | -0.0007               | PASS    |
|           |           |              |            | 20         | 1.86             | 0.001                 | PASS    |
|           |           |              |            | 30         | 7.32             | 0.00395               | PASS    |
|           |           |              |            | 40         | 1.94             | 0.00105               | PASS    |
|           |           |              |            | 50         | -4.67            | -0.00252              | PASS    |
|           |           | MCH          | VN         | -30        | 1.01             | 0.00054               | PASS    |
|           |           |              |            | -20        | 1.36             | 0.00072               | PASS    |
|           |           |              |            | -10        | 1.62             | 0.00086               | PASS    |
|           |           |              |            | 0          | 4.79             | 0.00255               | PASS    |
|           |           |              |            | 10         | 1.25             | 0.00066               | PASS    |
|           |           |              |            | 20         | 5.84             | 0.00311               | PASS    |
|           |           |              |            | 30         | 5.2              | 0.00277               | PASS    |
|           |           |              |            | 40         | 1.39             | 0.00074               | PASS    |
|           |           |              |            | 50         | 2.61             | 0.00139               | PASS    |
|           |           | HCH          | VN         | -30        | 0.34             | 0.00018               | PASS    |
|           |           |              |            | -20        | 3.48             | 0.00182               | PASS    |





| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
|           |           |              |            | -10        | 0.76             | 0.0004                | PASS    |
|           |           |              |            | 0          | -1.02            | -0.00053              | PASS    |
|           |           |              |            | 10         | -0.85            | -0.00045              | PASS    |
|           |           |              |            | 20         | -2.55            | -0.00134              | PASS    |
|           |           |              |            | 30         | -0.49            | -0.00026              | PASS    |
|           |           |              |            | 40         | -1.19            | -0.00062              | PASS    |
|           |           |              |            | 50         | -0.6             | -0.00031              | PASS    |

END