



# 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          | 23.57                 | 23.92      | 38.5        | PASS    |
|           |           | MCH          | 23.57                 | 23.92      | 38.5        | PASS    |
|           |           | HCH          | 23.43                 | 23.78      | 38.5        | PASS    |
| Test Band | Test Mode | Test Channel | Conducted Power [dBm] | EIRP [dBm] | Limit [dBm] | Verdict |
| WCDMA1900 | UMTS/TM1  | LCH          | 23.18                 | 25.68      | 33          | PASS    |
|           |           | MCH          | 23.18                 | 25.68      | 33          | PASS    |
|           |           | HCH          | 23.02                 | 25.52      | 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:

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

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

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

$$\text{SET Sweep time} = \text{auto} - \text{couple.}$$

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          | 2.97         | 13         | PASS    |
|           |           | MCH          | 2.64         | 13         | PASS    |
|           |           | HCH          | 2.77         | 13         | PASS    |
| Test Band | Test Mode | Test Channel | Measured[dB] | Limit [dB] | Verdict |
| WCDMA1900 | UMTS/TM1  | LCH          | 2.66         | 13         | PASS    |
|           |           | MCH          | 2.85         | 13         | PASS    |
|           |           | HCH          | 2.8          | 13         | PASS    |

## 3Appendix\_C: Modulation Characteristics

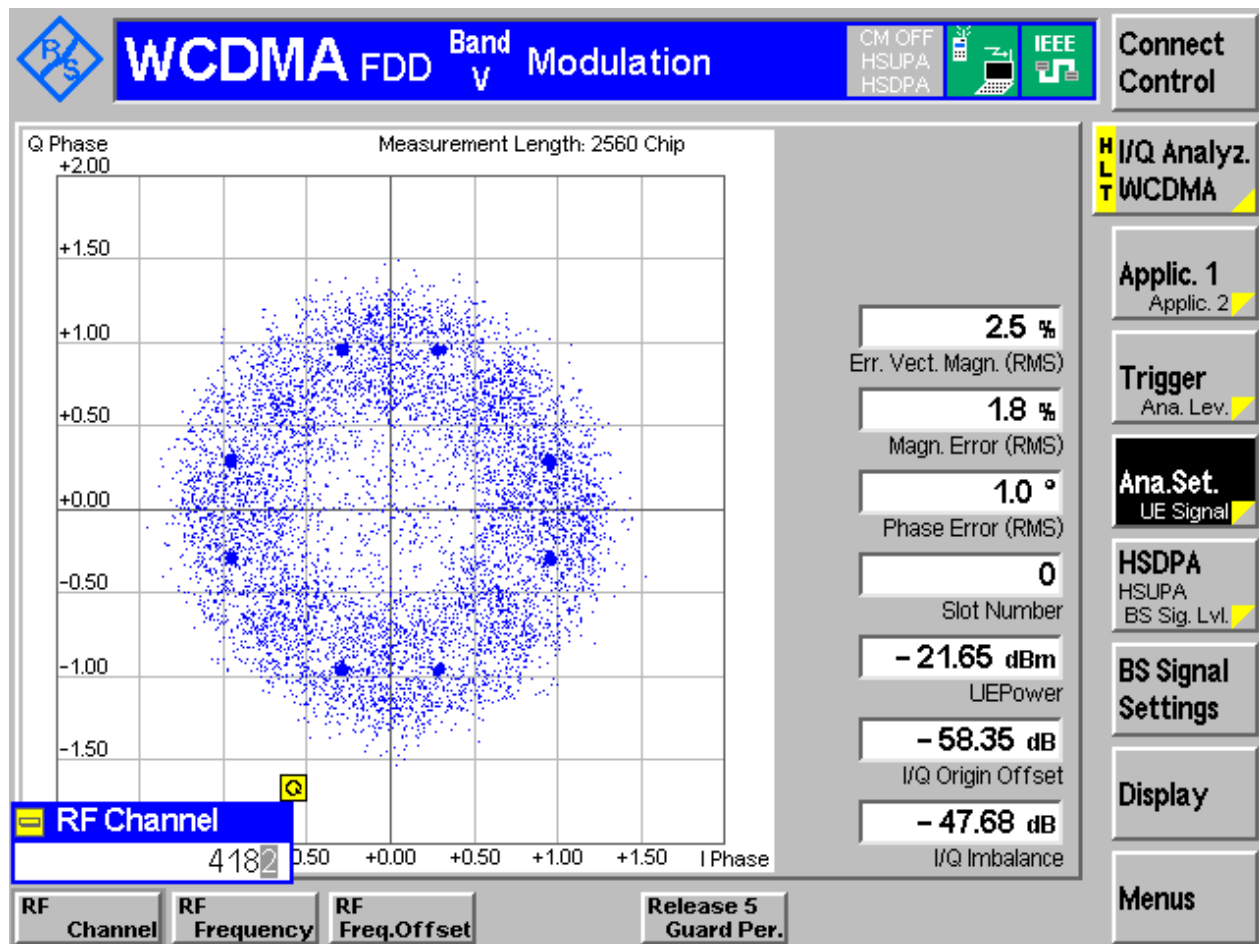
### Part I - Test Plots

#### 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

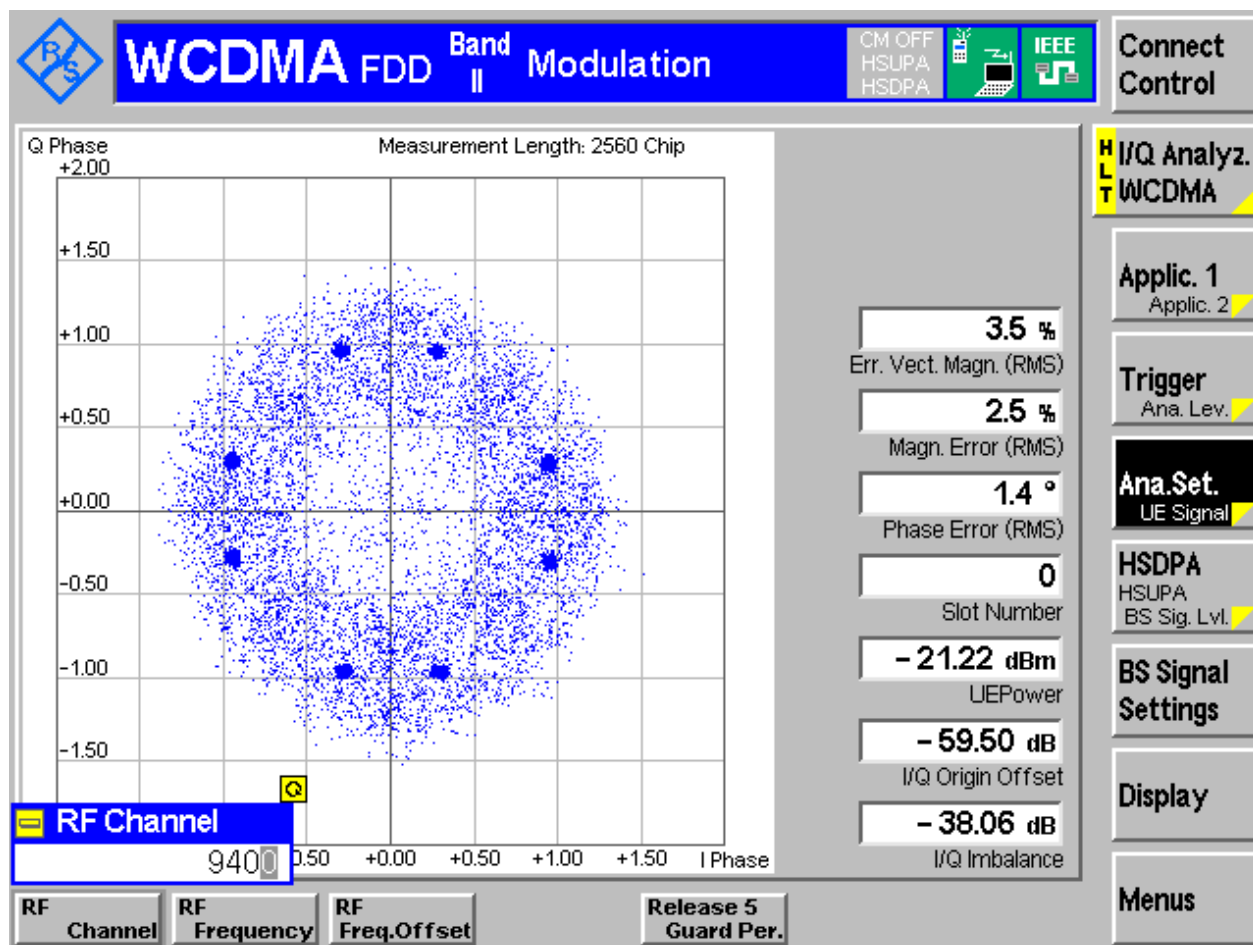


### 3.2 For UMTS

#### 3.2.1 Test Band = WCDMA1900

##### 3.2.1.1 Test Mode = UMTS/TM1

##### 3.2.1.1.1 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          | 4.16                     | 4.68                     | Pass    |
|           |           | MCH          | 4.16                     | 4.72                     | Pass    |
|           |           | HCH          | 4.16                     | 4.71                     | Pass    |
| Test Band | Test Mode | Test Channel | Occupied Bandwidth [MHz] | Emission Bandwidth [MHz] | Verdict |
| WCDMA1900 | UMTS/TM1  | LCH          | 4.15                     | 4.70                     | Pass    |
|           |           | MCH          | 4.15                     | 4.70                     | Pass    |
|           |           | HCH          | 4.15                     | 4.70                     | Pass    |

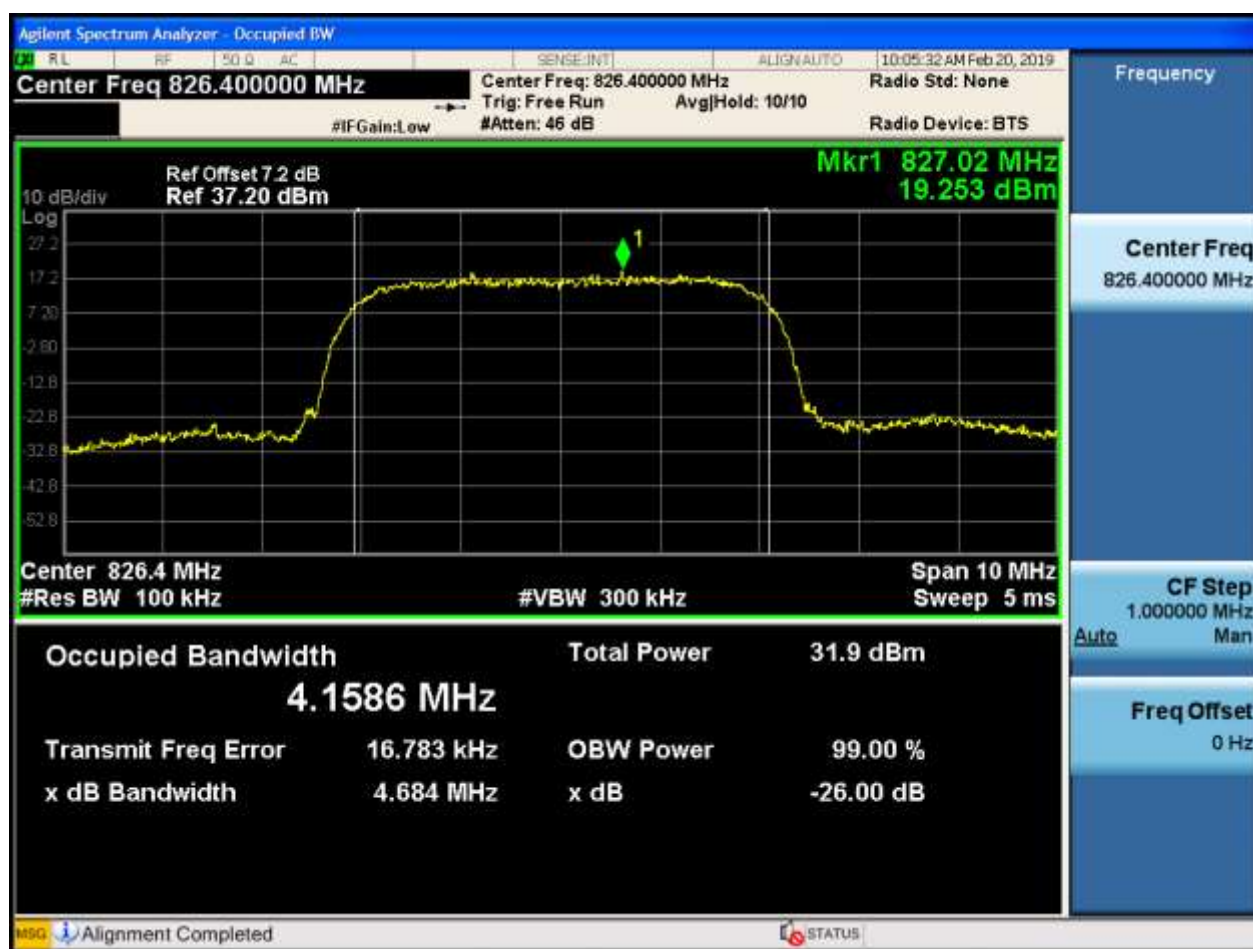
## Part II - Test Plots

### 4.1 For UMTS

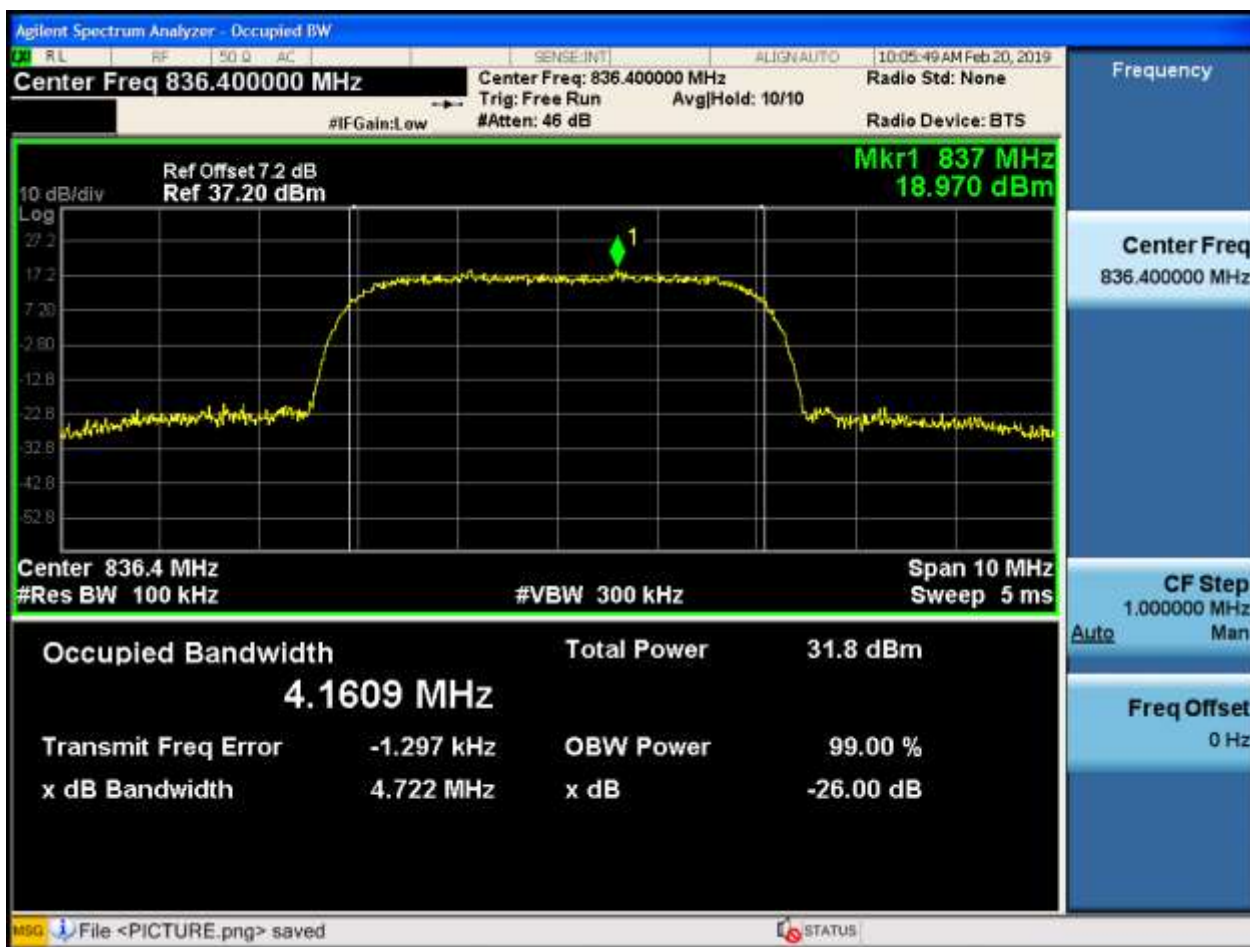
#### 4.1.1 Test Band = WCDMA850

##### 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

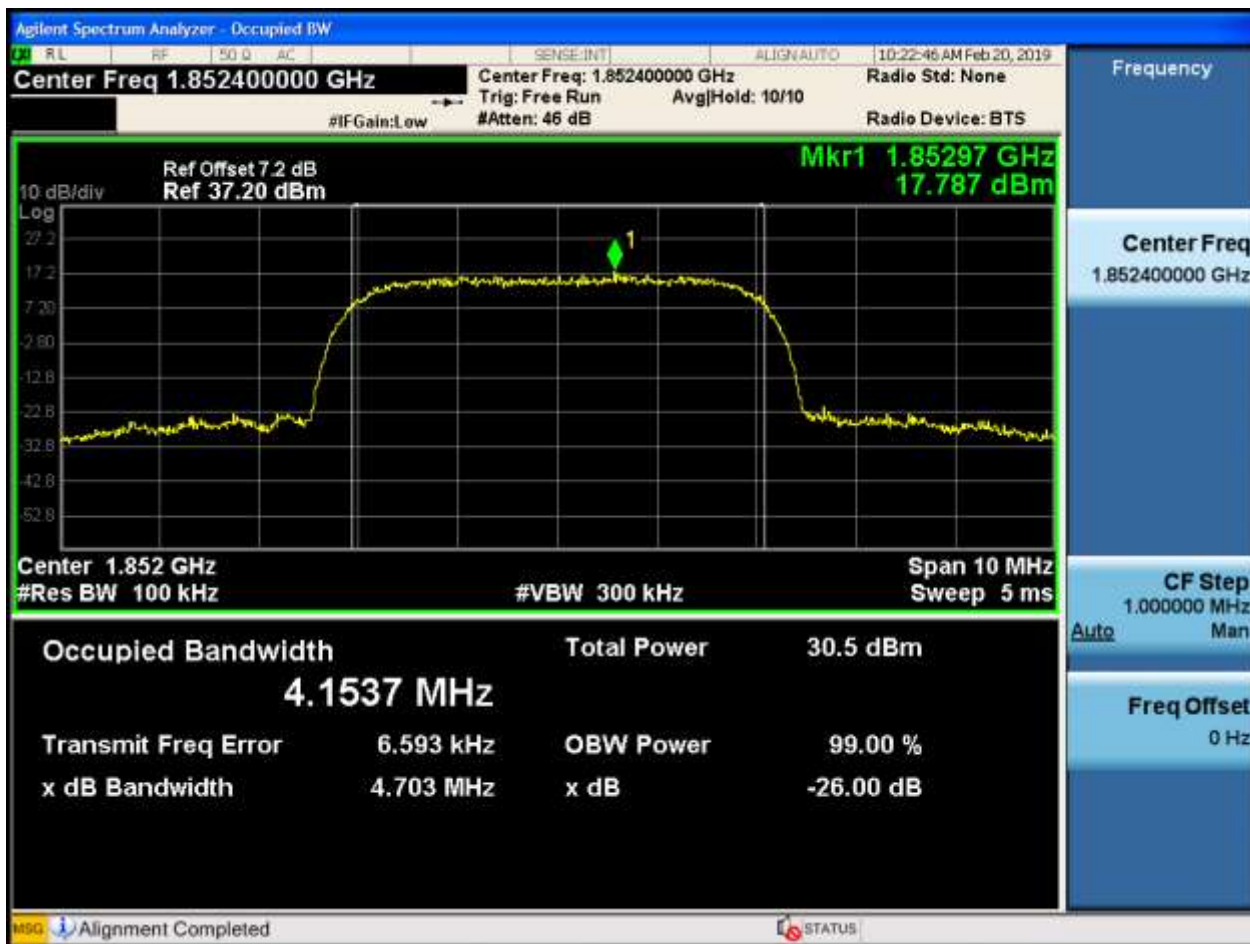


## 4.2 For UMTS

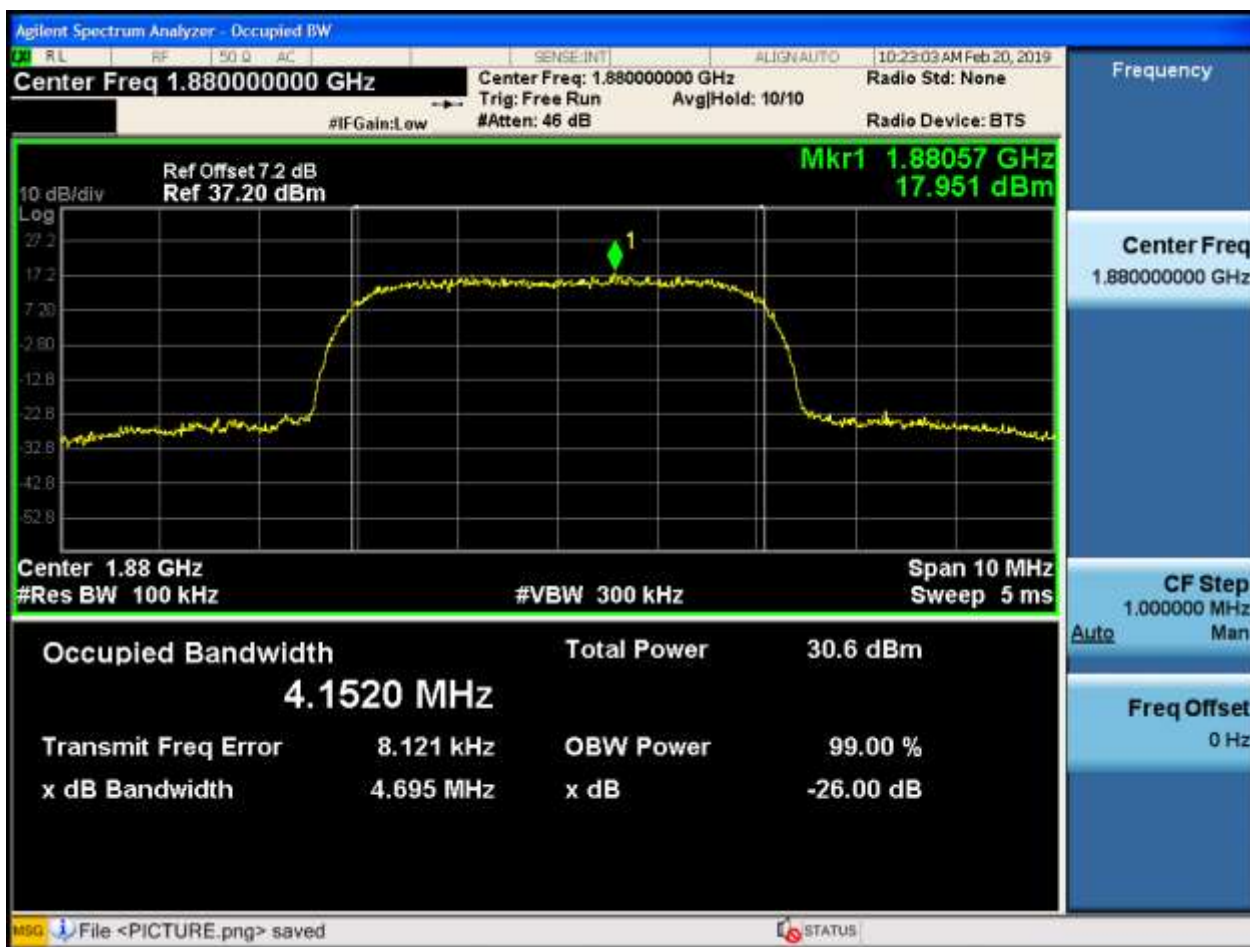
### 4.2.2 Test Band = WCDMA1900

#### 4.2.2.1 Test Mode = UMTS/TM1

##### 4.2.2.1.1 Test Channel = LCH



#### 4.2.2.1.2 Test Channel = MCH



#### 4.2.2.1.3 Test Channel = HCH



## 5Appendix\_E: Band Edges Compliance

### Part I - Test Plots

#### 5.1 For UMTS

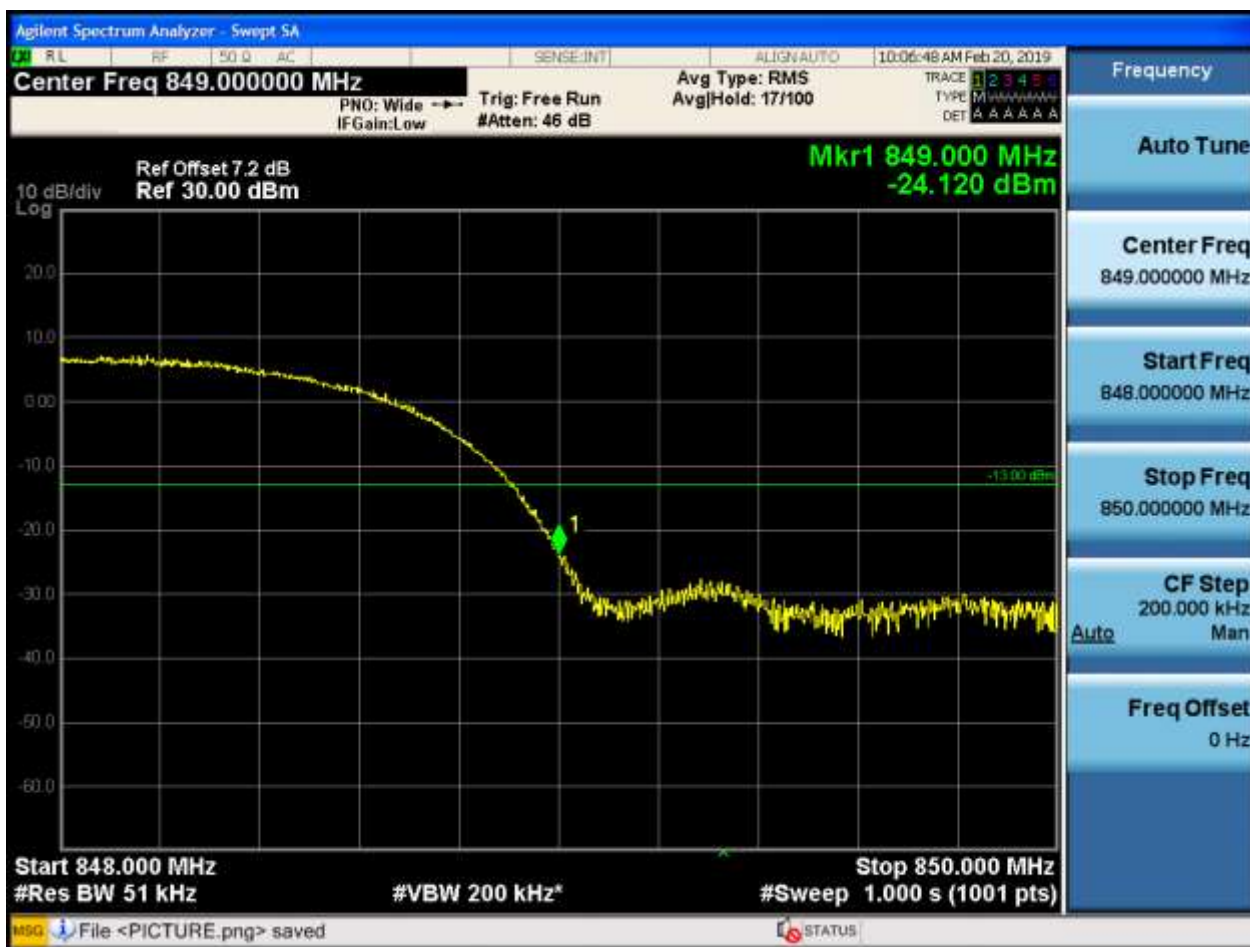
##### 5.1.1 Test Band = WCDMA850

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

##### 5.1.1.1.1 Test Channel = LCH



### 5.1.1.1.2 Test Channel = HCH



## 5.2 For UMTS

### 5.2.1 Test Band = WCDMA1900

#### 5.2.1.1 Test Mode = UMTS/TM1

##### 5.2.1.1.1 Test Channel = LCH



### 5.2.1.1.2 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  $< \text{RBW}/2$  so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points =  $k * (\text{Span} / \text{RBW})$ " with  $k$  between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

### Part I - Test Plots

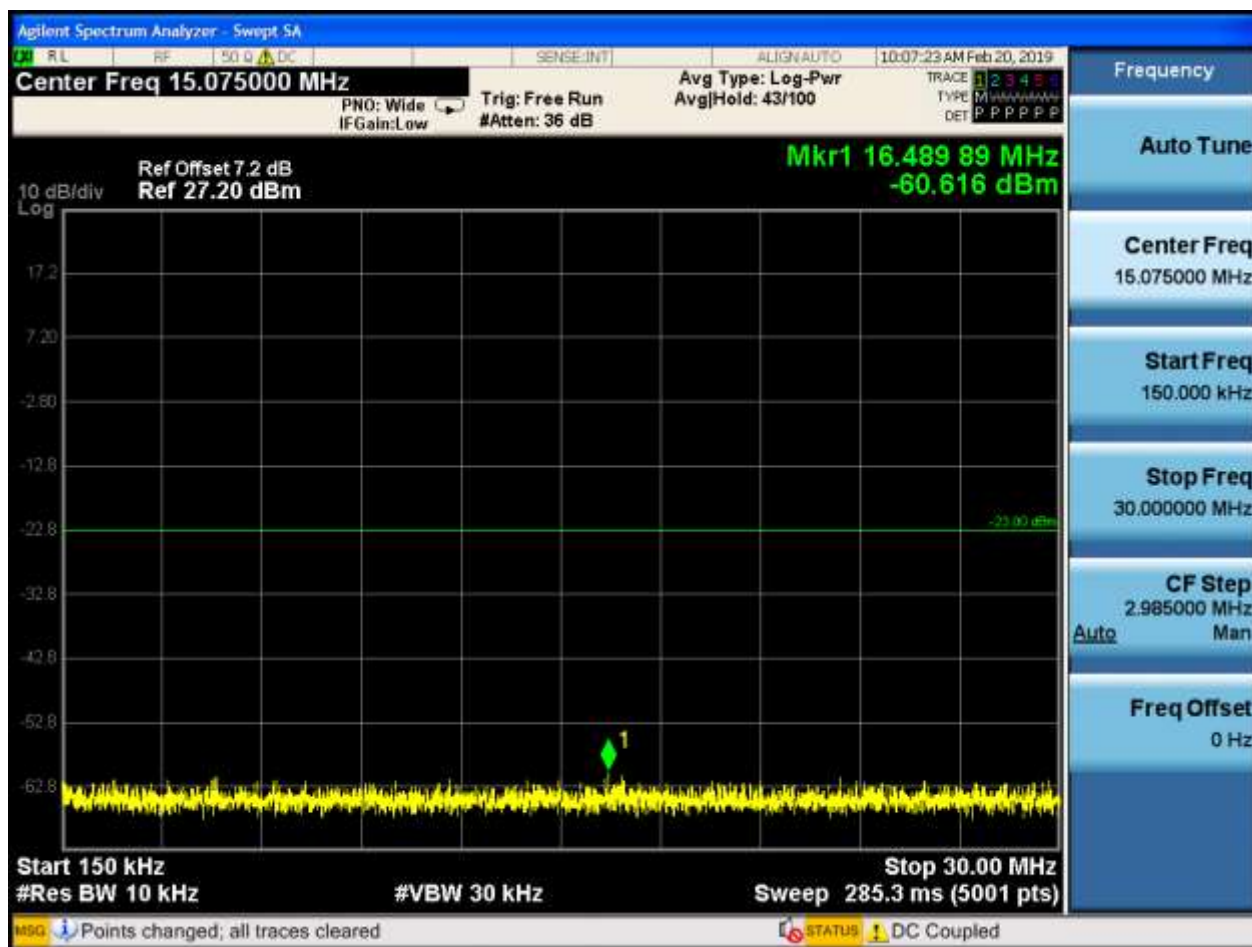
#### 6.1 For UMTS

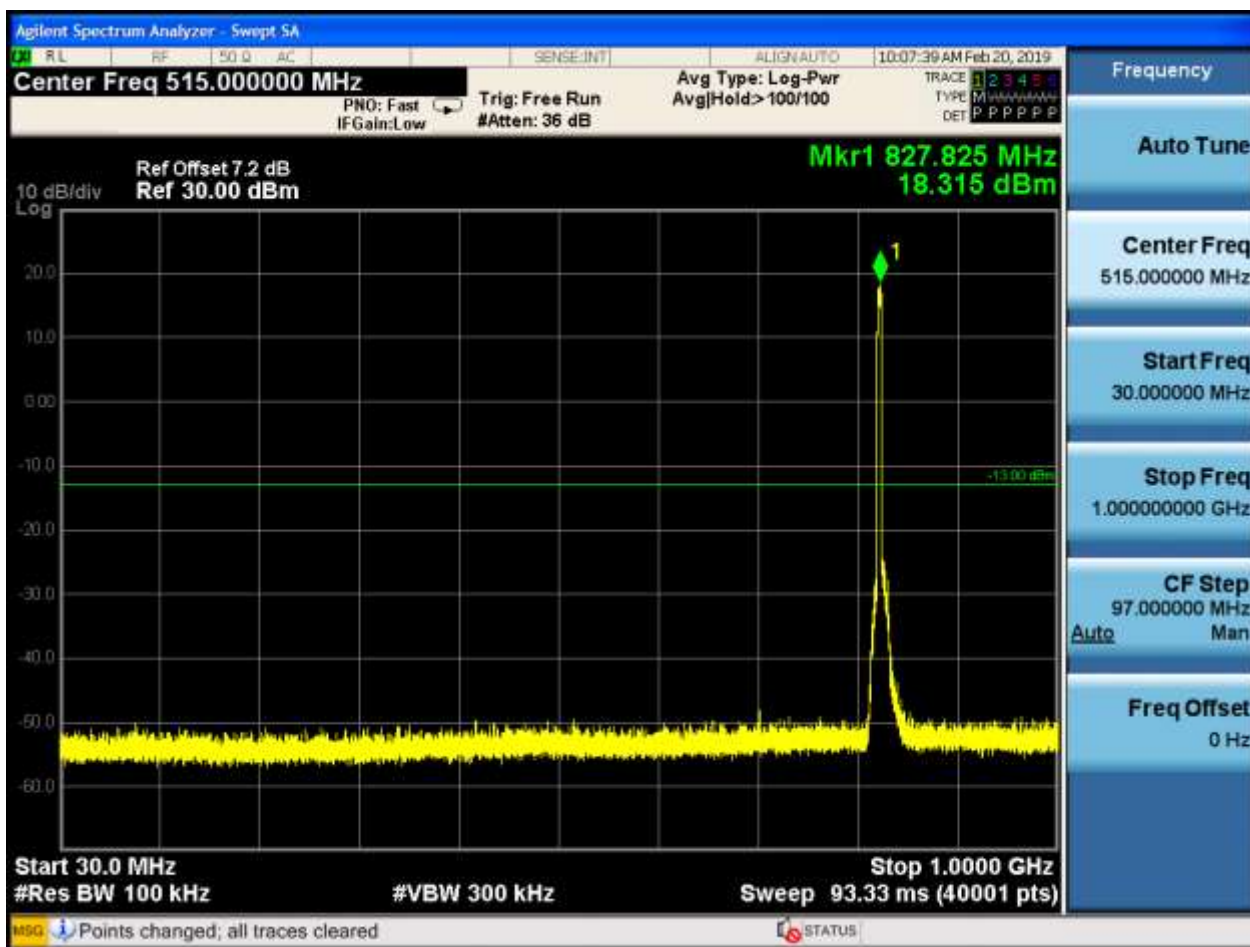
##### 6.1.1 Test Band = WCDMA850

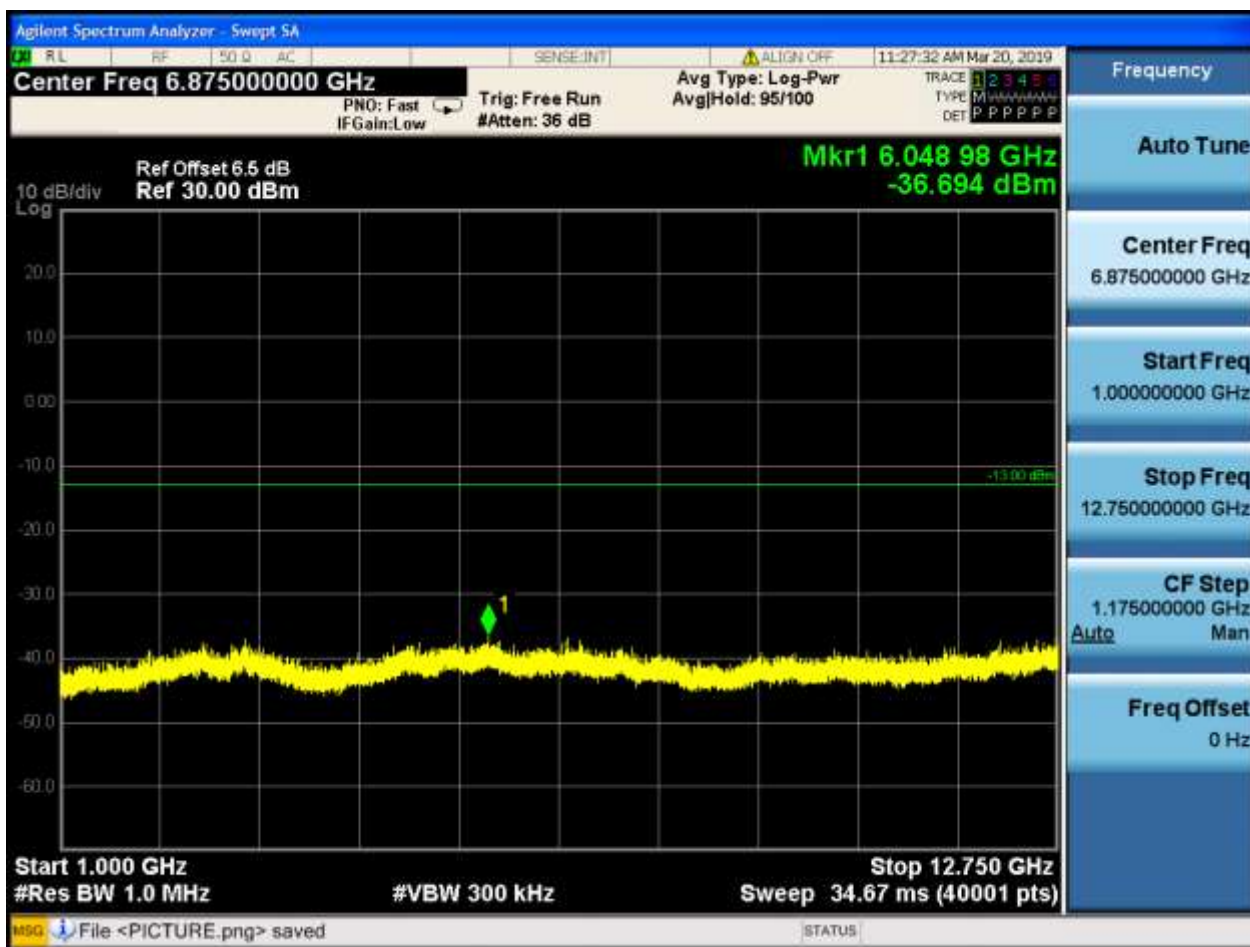
##### 6.1.1.1 Test Mode = UMTS/TM1

##### 6.1.1.1.1 Test Channel = LCH





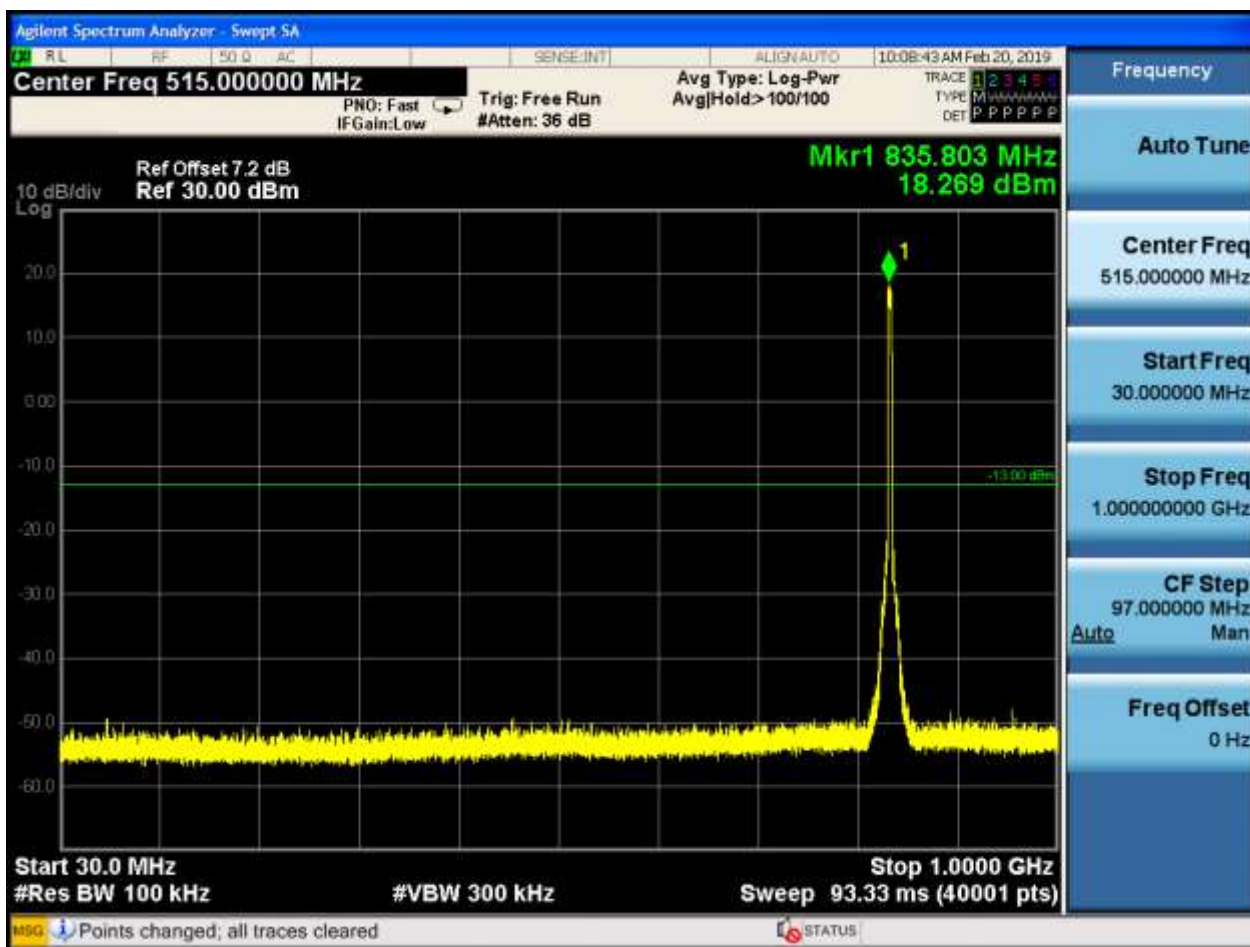


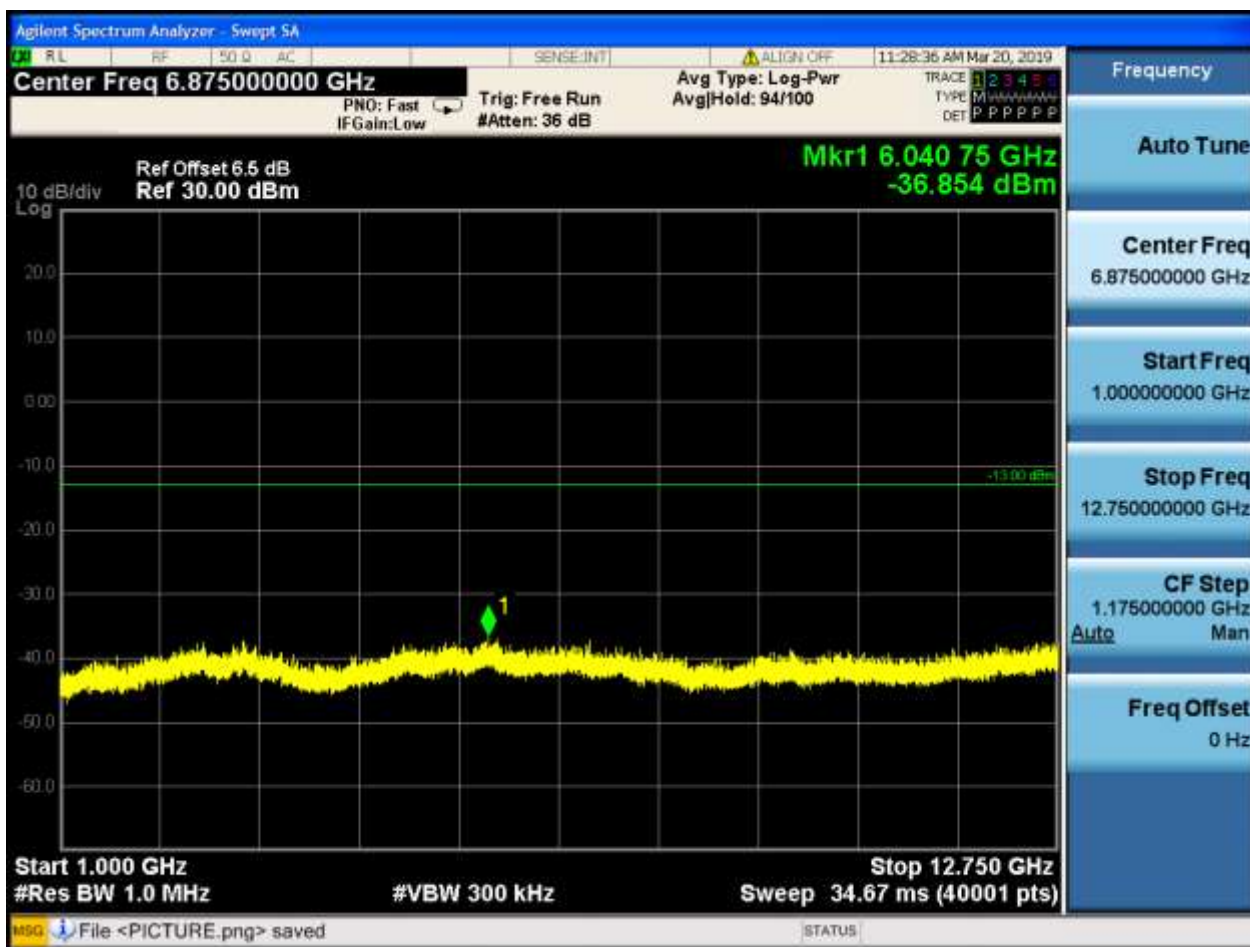


### 6.1.1.1.2 Test Channel = MCH





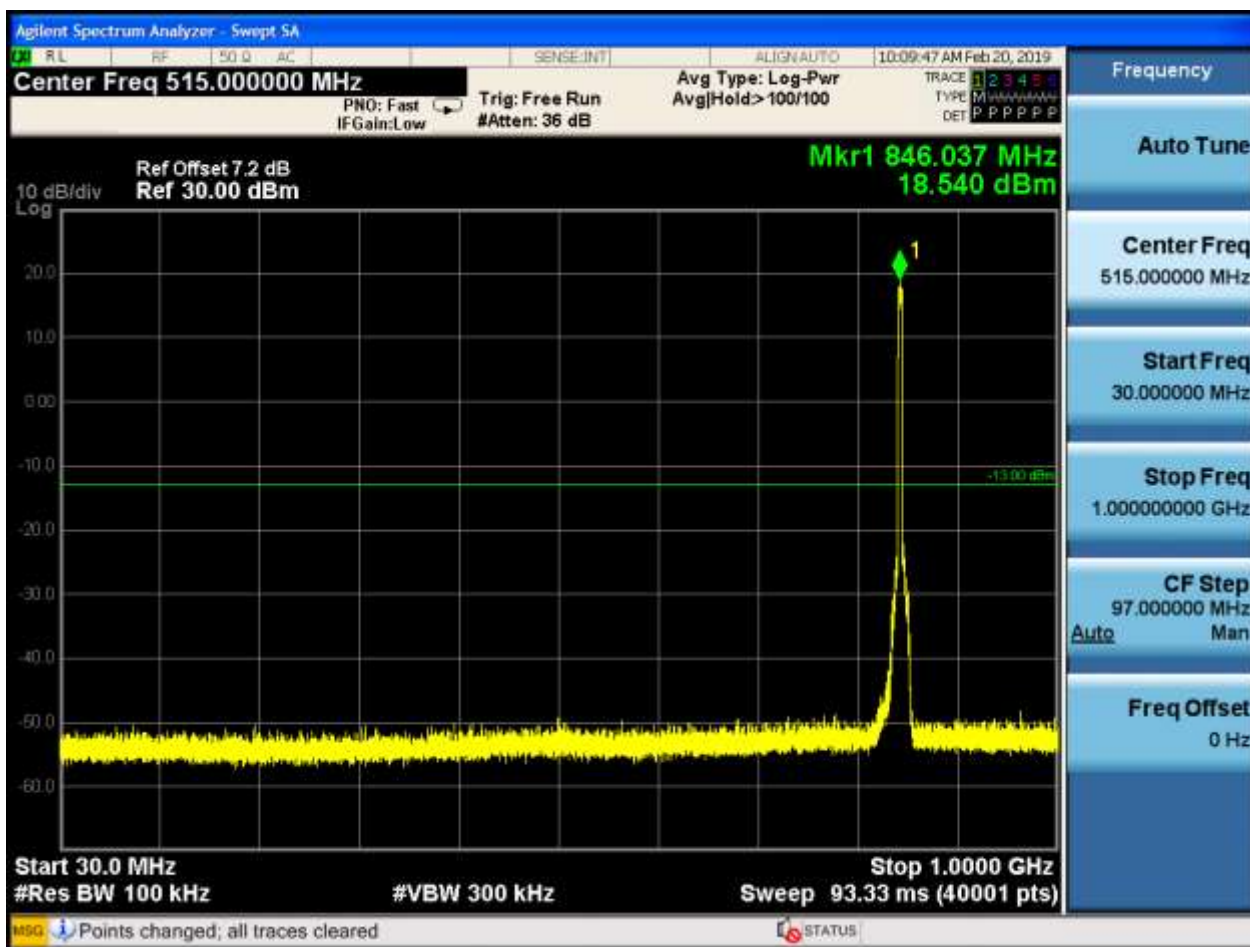


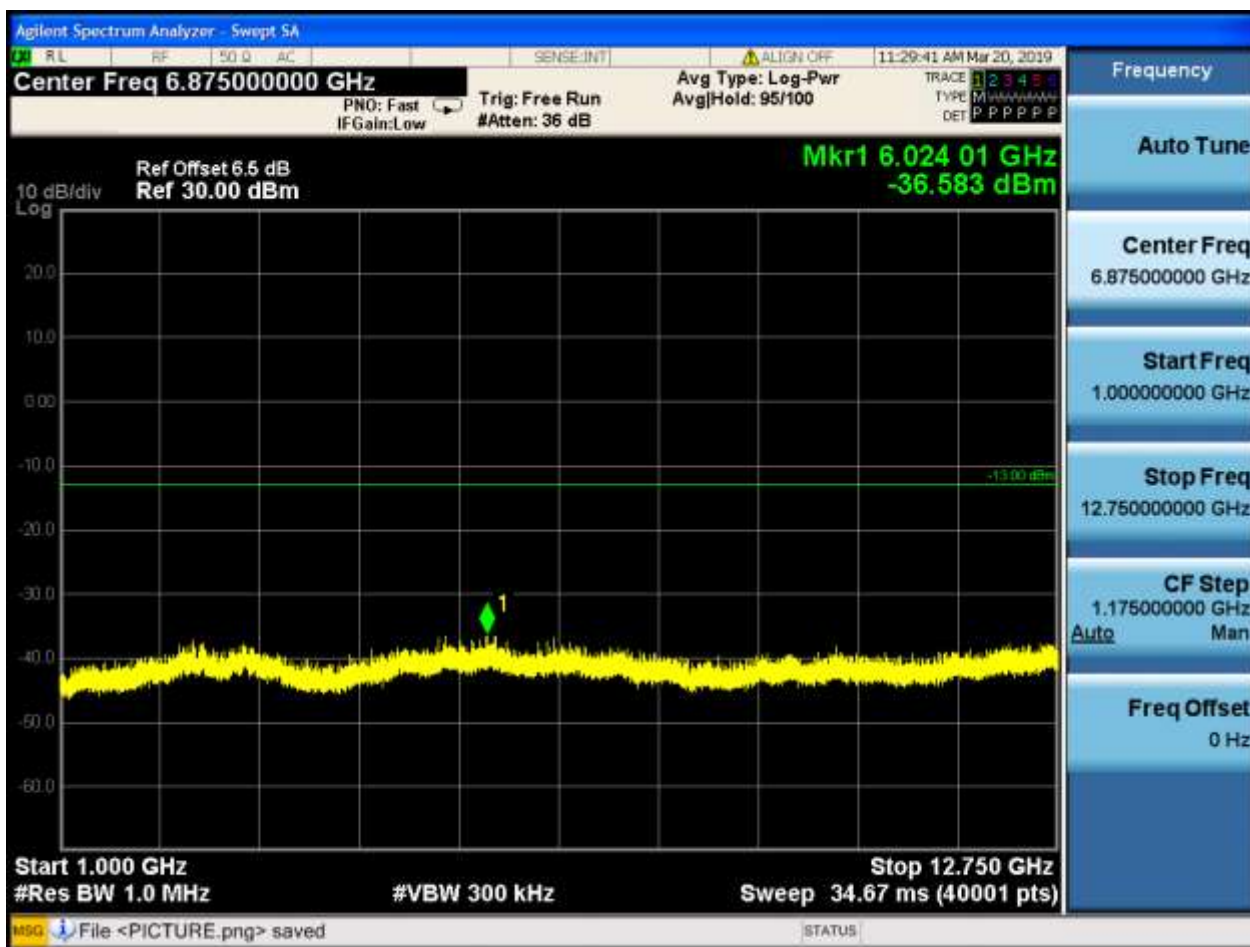


### 6.1.1.1.3 Test Channel = HCH









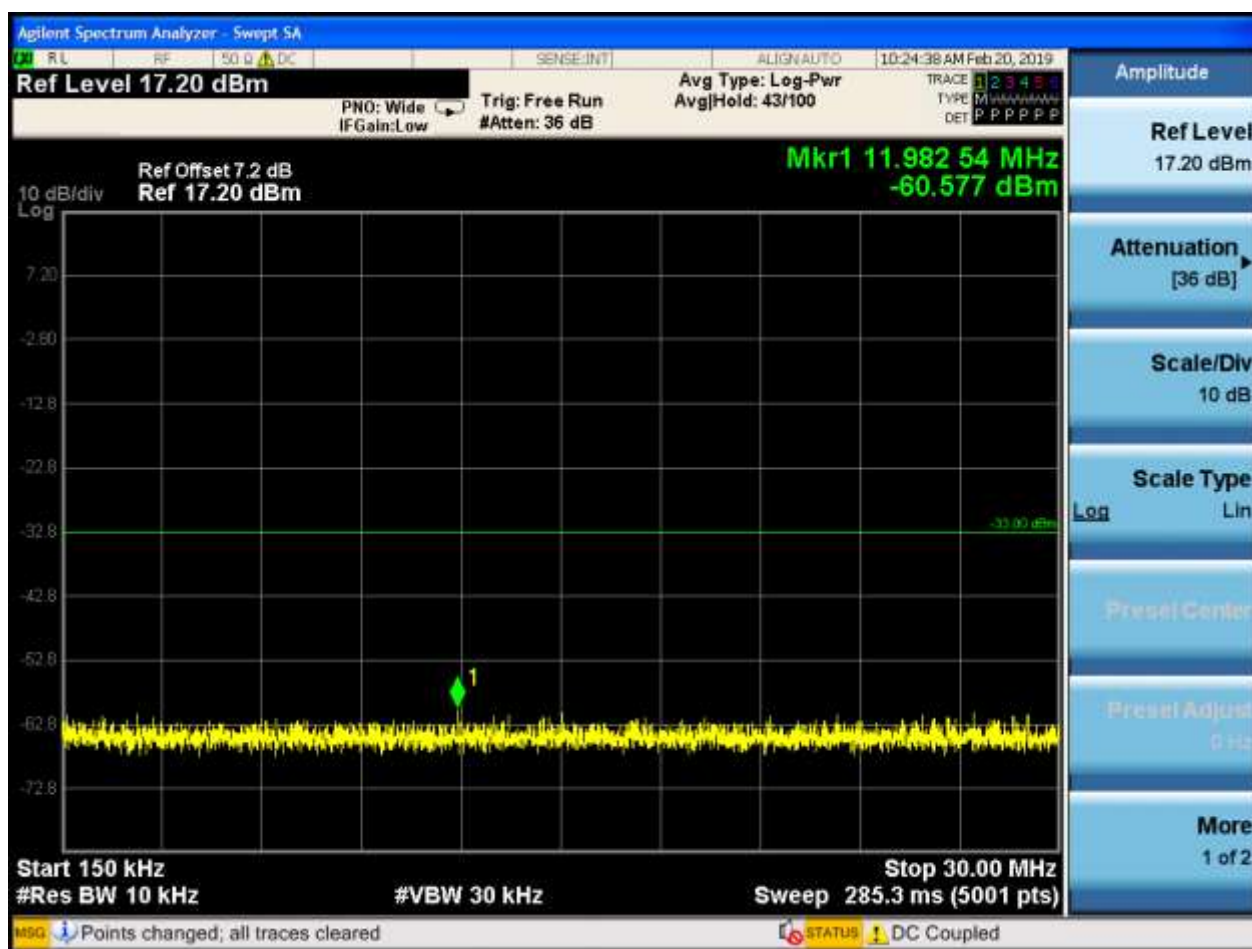
## 6.2 For UMTS

### 6.2.1 Test Band = WCDMA1900

#### 6.2.1.1 Test Mode = UMTS/TM1

##### 6.2.1.1.1 Test Channel = LCH

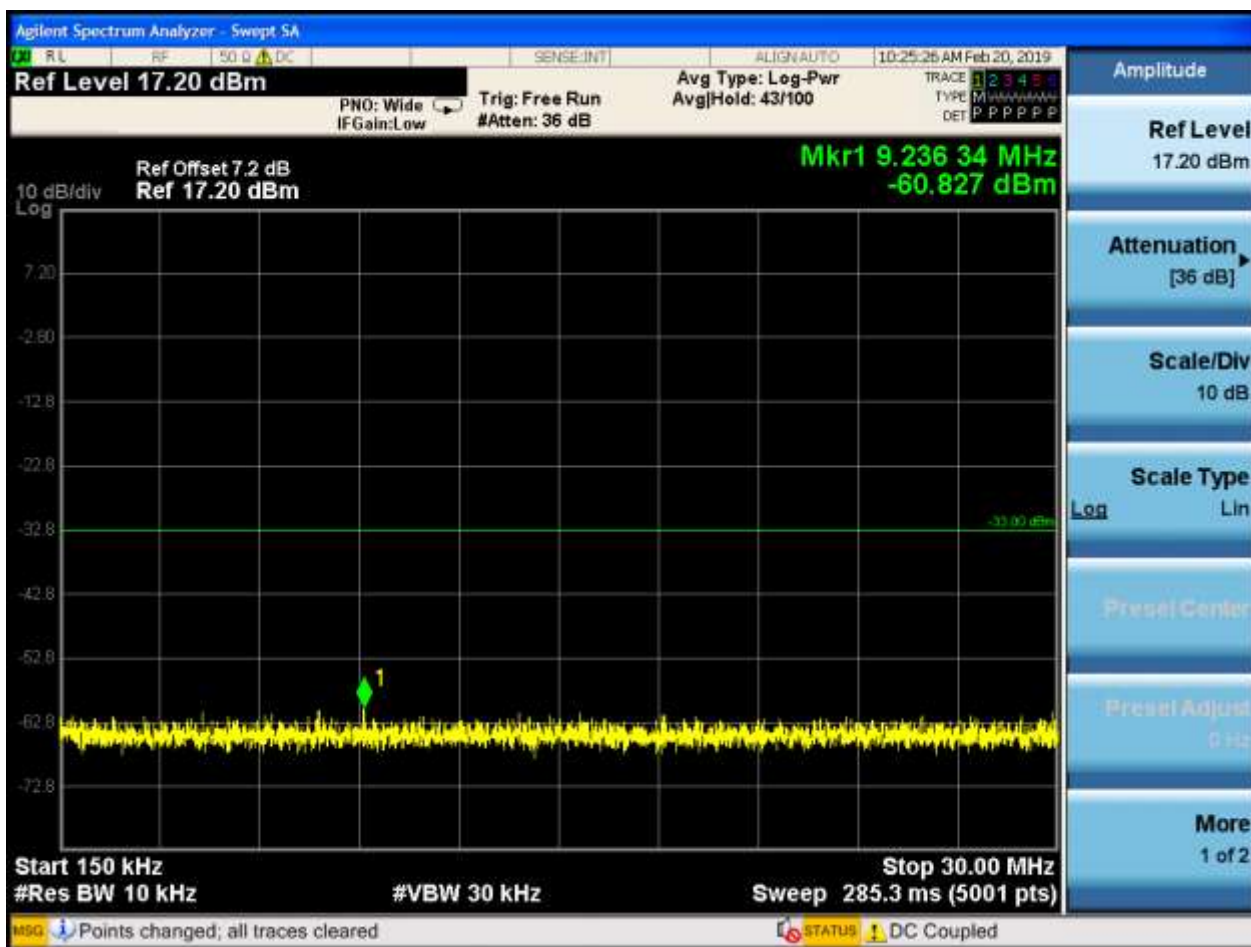






### 6.2.1.1.2 Test Channel = MCH

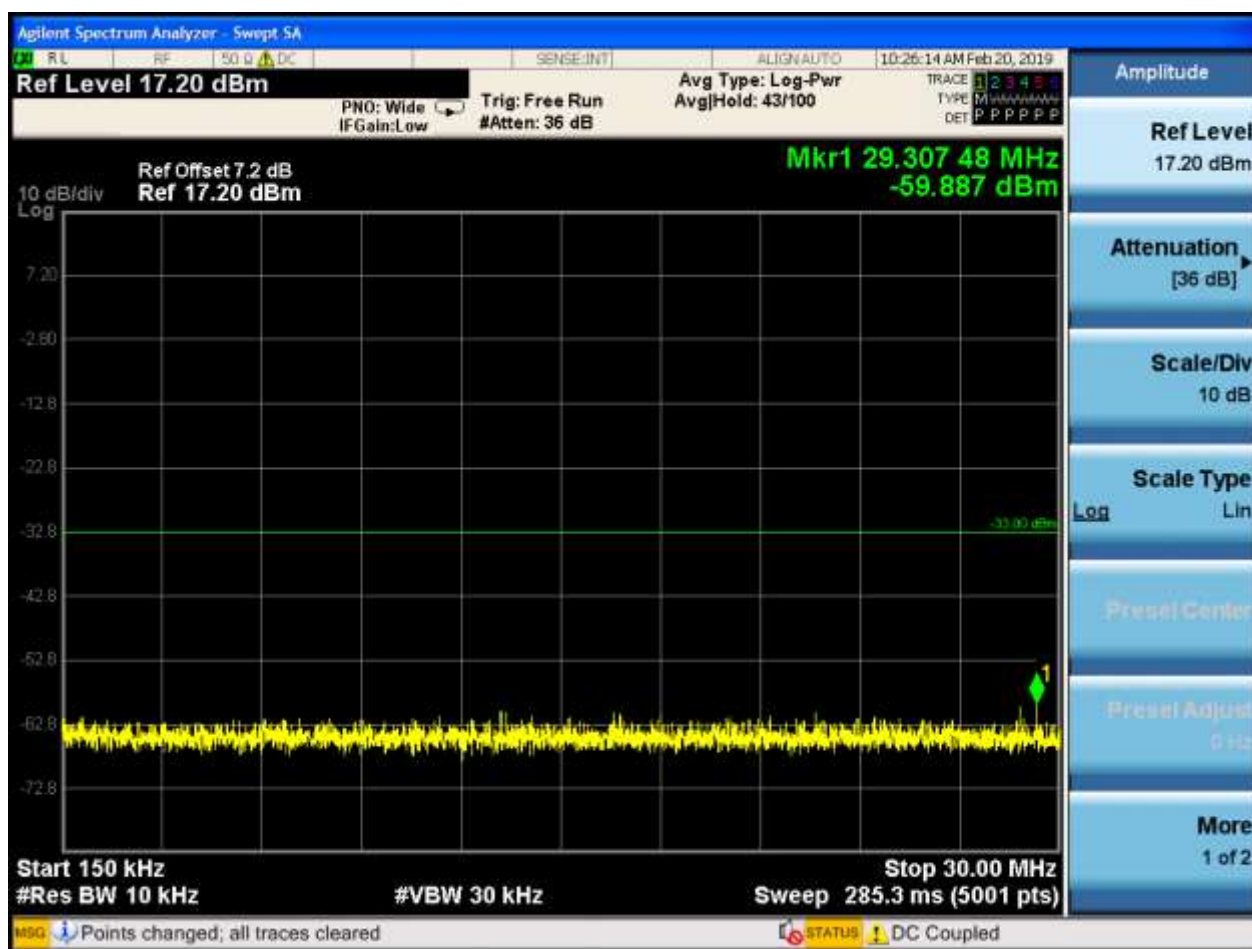






### 6.2.1.1.3 Test Channel = HCH







## 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

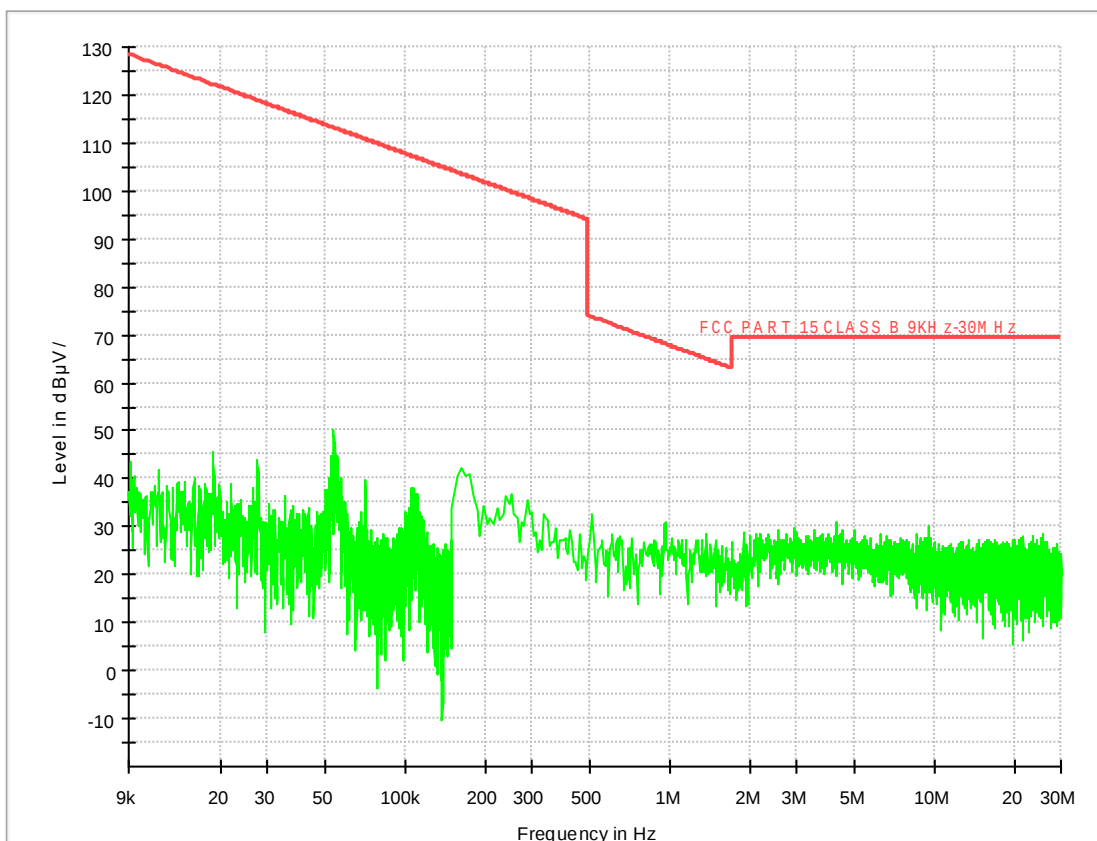
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

### Part I - Test Plots

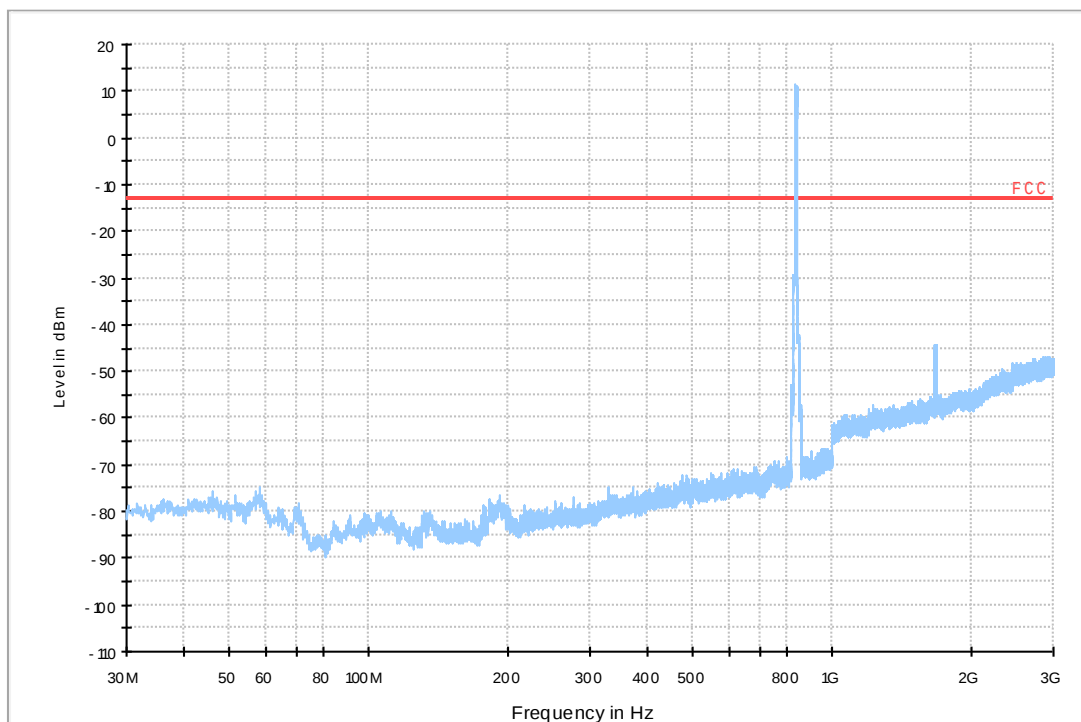
#### 7.1 For UMTS

##### 7.1.1 Test Band = WCDMA850

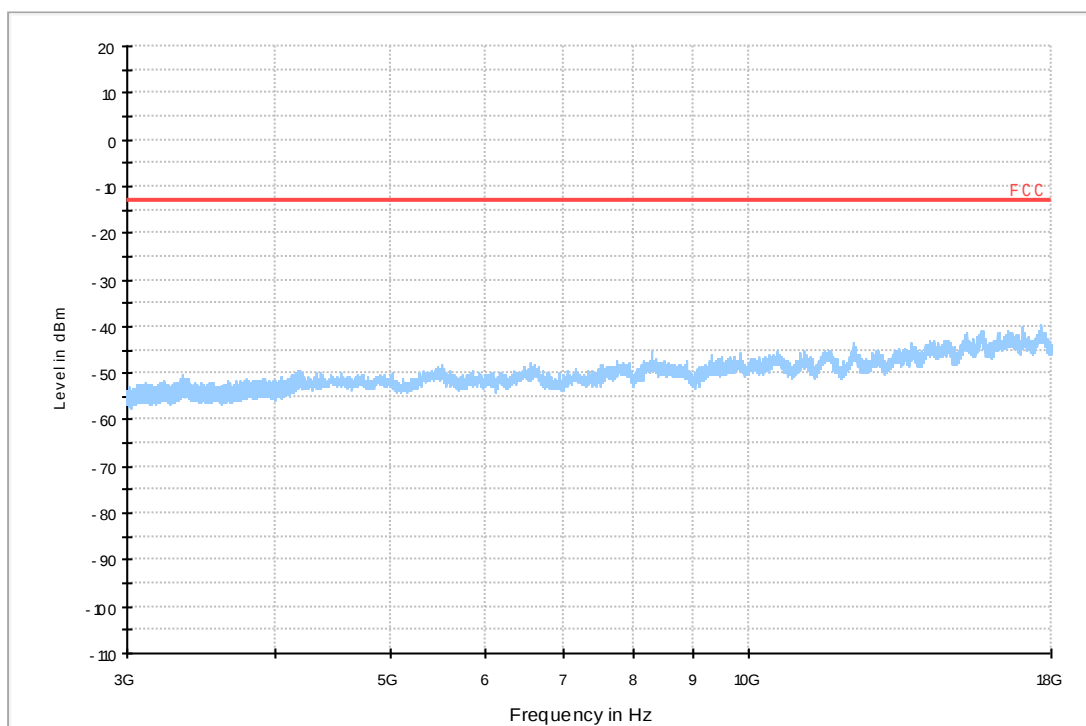
##### 7.1.1.1 Test Mode = UMTS/TM1



06 FCC PART 22 WCDMA850\_L

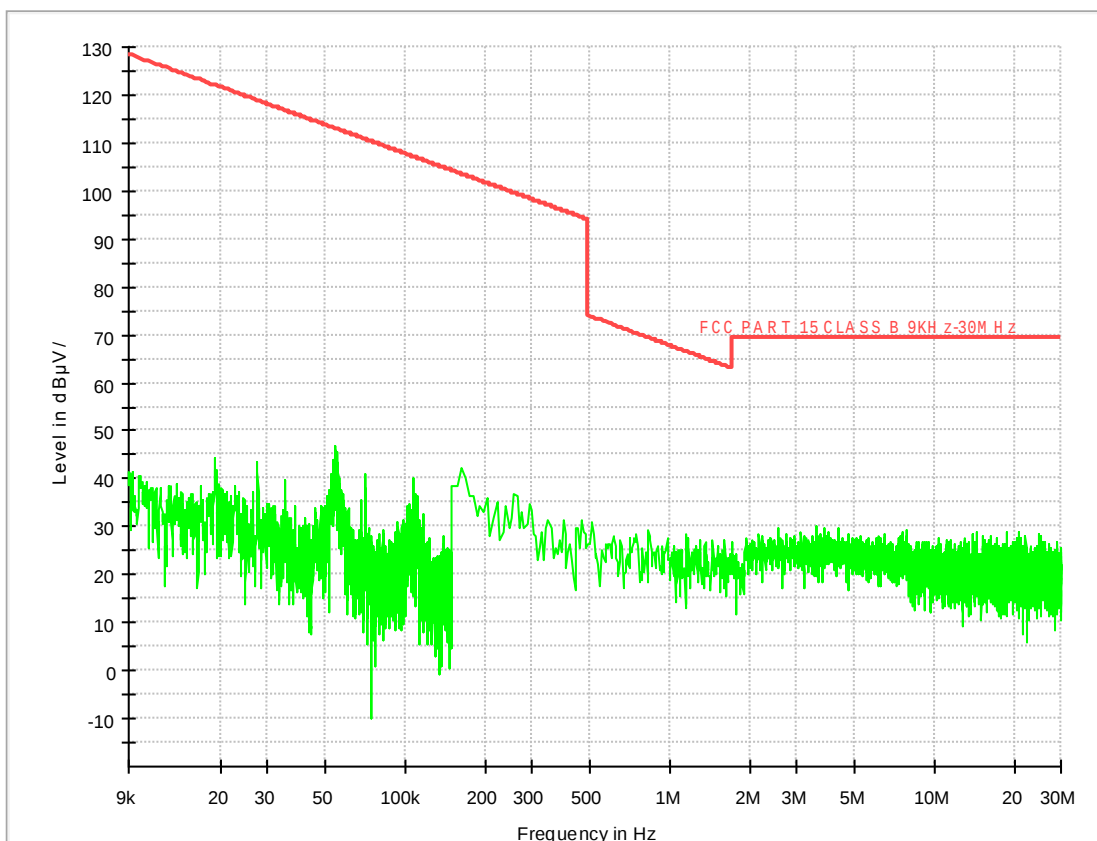


## 05 FCC PART 22 WCDMA850\_H

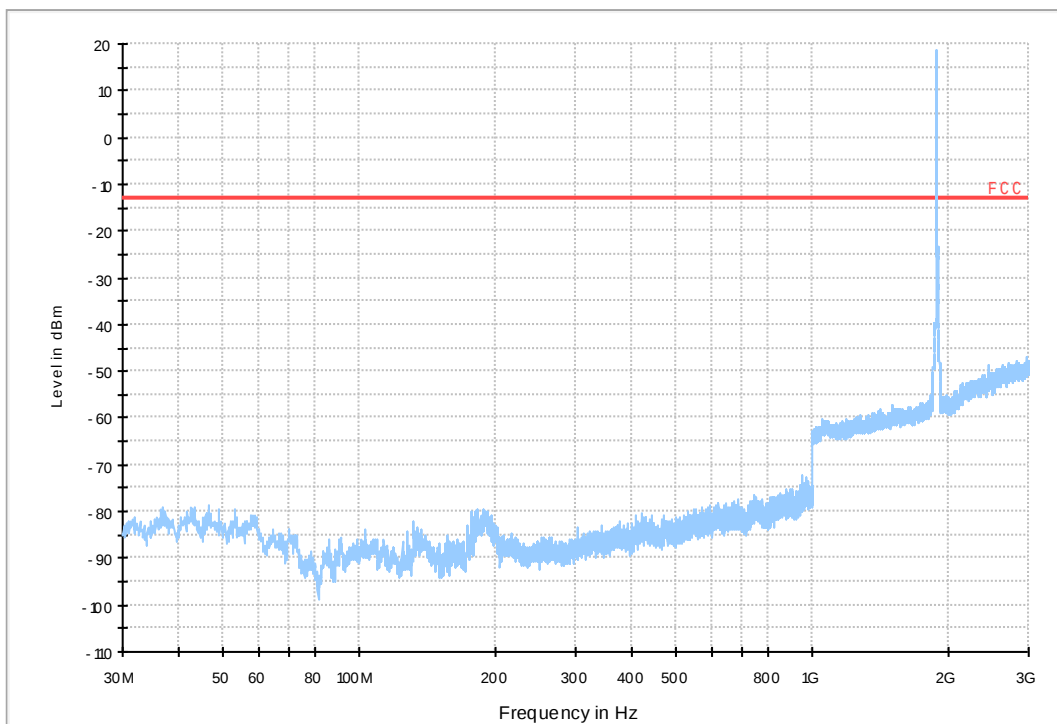


### 7.1.2 Test Band = WCDMA1900\_ANT1

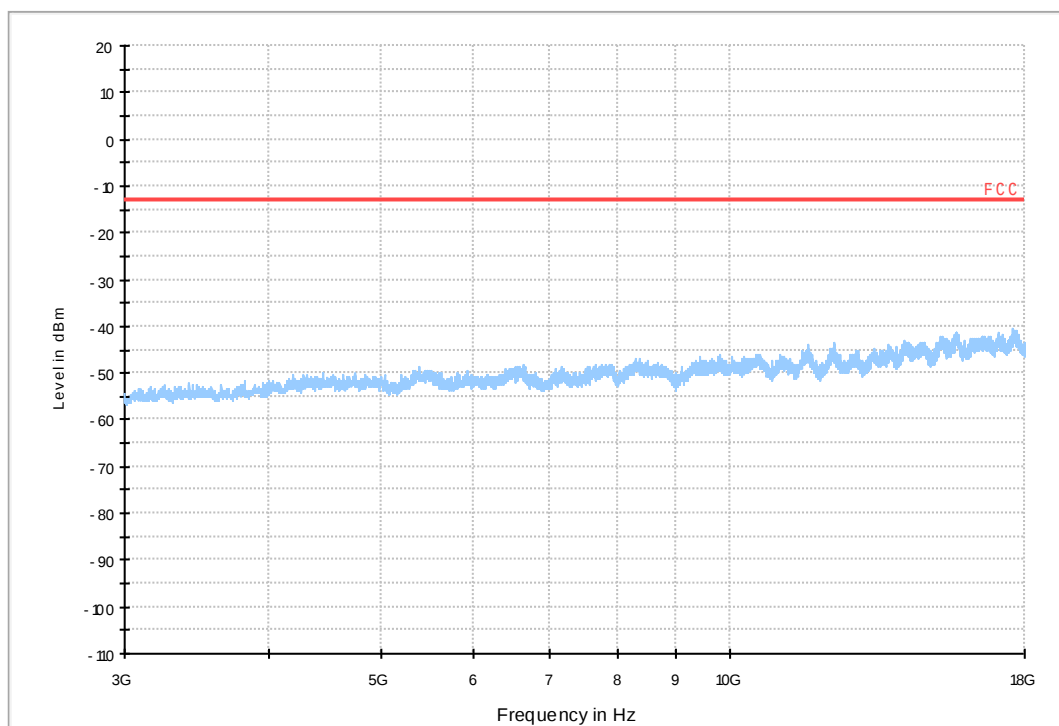
#### 7.1.2.1 Test Mode = UMTS/TM1



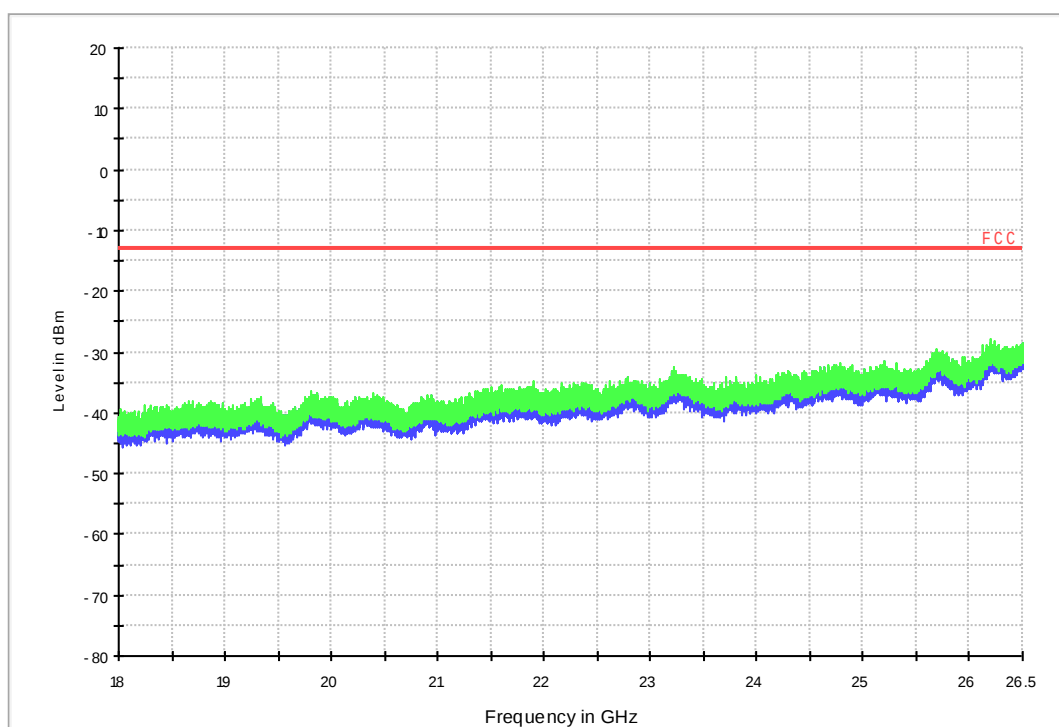
12.FCC PART 24 WCDMA1900\_L



11 FCC PART 24 WCDMA1900\_H



18G~26.5G R SE-TX-DIRECT OR ABOVE 1.5G PK



## 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         | -13.08           | -0.00706              | PASS    |
|           |           |              |            | VN         | -3.95            | -0.00213              | PASS    |
|           |           |              |            | VH         | -7.11            | -0.00384              | PASS    |
|           |           | MCH          | TN         | VL         | -5.29            | -0.00281              | PASS    |
|           |           |              |            | VN         | 1.91             | 0.00102               | PASS    |
|           |           |              |            | VH         | 4.27             | 0.00227               | PASS    |
|           |           | HCH          | TN         | VL         | 1.53             | 0.0008                | PASS    |
|           |           |              |            | VN         | -1.63            | -0.00085              | PASS    |
|           |           |              |            | VH         | -2.72            | -0.00143              | PASS    |
| WCDMA850  | UMTS/TM1  | LCH          | TN         | VL         | -8.19            | -0.00991              | PASS    |
|           |           |              |            | VN         | -0.37            | -0.00045              | PASS    |
|           |           |              |            | VH         | -3.92            | -0.00474              | PASS    |
|           |           | MCH          | TN         | VL         | -7.97            | -0.00953              | PASS    |
|           |           |              |            | VN         | -1.31            | -0.00157              | PASS    |
|           |           |              |            | VH         | -3.01            | -0.0036               | PASS    |
|           |           | HCH          | TN         | VL         | -6.09            | -0.00719              | PASS    |
|           |           |              |            | VN         | -3.04            | -0.00359              | PASS    |
|           |           |              |            | VH         | -4.23            | -0.005                | 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 |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| WCDMA1900 | UMTS/TM1  | LCH          | VN         | -30        | -2.76            | -0.00149              | PASS    |
|           |           |              |            | -20        | -4.67            | -0.00252              | PASS    |
|           |           |              |            | -10        | 7.43             | 0.00401               | PASS    |
|           |           |              |            | 0          | -0.44            | -0.00024              | PASS    |
|           |           |              |            | 10         | 7.90             | 0.00426               | PASS    |
|           |           |              |            | 20         | -0.24            | -0.00013              | PASS    |
|           |           |              |            | 30         | 9.08             | 0.0049                | PASS    |

|  |  |     |    |     |        |          |      |
|--|--|-----|----|-----|--------|----------|------|
|  |  |     |    | 40  | 7.02   | 0.00379  | PASS |
|  |  |     |    | 50  | 3.33   | 0.0018   | PASS |
|  |  | MCH | VN | -30 | 1.74   | 0.00093  | PASS |
|  |  |     |    | -20 | -0.06  | -0.00003 | PASS |
|  |  |     |    | -10 | -1.13  | -0.0006  | PASS |
|  |  |     |    | 0   | -1.22  | -0.00065 | PASS |
|  |  |     |    | 10  | 0.43   | 0.00023  | PASS |
|  |  |     |    | 20  | 0.87   | 0.00046  | PASS |
|  |  |     |    | 30  | -7.74  | -0.00412 | PASS |
|  |  |     |    | 40  | -2.21  | -0.00118 | PASS |
|  |  |     |    | 50  | 2.04   | 0.00109  | PASS |
|  |  | HCH | VN | -30 | -2.75  | -0.00144 | PASS |
|  |  |     |    | -20 | -6.21  | -0.00326 | PASS |
|  |  |     |    | -10 | -3.83  | -0.00201 | PASS |
|  |  |     |    | 0   | -3.57  | -0.00187 | PASS |
|  |  |     |    | 10  | -3.75  | -0.00197 | PASS |
|  |  |     |    | 20  | -6.39  | -0.00335 | PASS |
|  |  |     |    | 30  | -5.75  | -0.00301 | PASS |
|  |  |     |    | 40  | -3.89  | -0.00204 | PASS |
|  |  |     |    | 50  | -5.42  | -0.00284 | PASS |
|  |  | LCH | VN | -30 | -7.87  | -0.00952 | PASS |
|  |  |     |    | -20 | -1.51  | -0.00183 | PASS |
|  |  |     |    | -10 | 3.74   | 0.00453  | PASS |
|  |  |     |    | 0   | -1.45  | -0.00175 | PASS |
|  |  |     |    | 10  | -11.69 | -0.01415 | PASS |
|  |  |     |    | 20  | -5.43  | -0.00657 | PASS |
|  |  |     |    | 30  | 2.69   | 0.00326  | PASS |
|  |  |     |    | 40  | 3.19   | 0.00386  | PASS |
|  |  |     |    | 50  | -2.27  | -0.00275 | PASS |
|  |  | MCH | VN | -30 | -0.67  | -0.0008  | PASS |
|  |  |     |    | -20 | -6.13  | -0.00733 | PASS |
|  |  |     |    | -10 | 0.32   | 0.00038  | PASS |
|  |  |     |    | 0   | 0.61   | 0.00073  | PASS |
|  |  |     |    | 10  | -9.19  | -0.01099 | PASS |
|  |  |     |    | 20  | 1.51   | 0.00181  | PASS |
|  |  |     |    | 30  | -10.27 | -0.01228 | PASS |
|  |  |     |    | 40  | -0.37  | -0.00044 | PASS |
|  |  |     |    | 50  | -3.77  | -0.00451 | PASS |
|  |  | HCH | VN | -30 | -9.95  | -0.01175 | PASS |
|  |  |     |    | -20 | 0.72   | 0.00085  | PASS |
|  |  |     |    | -10 | -1.01  | -0.00119 | PASS |
|  |  |     |    | 0   | 0.03   | 0.00004  | PASS |



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|  |  |  |  |    |       |          |      |
|--|--|--|--|----|-------|----------|------|
|  |  |  |  | 10 | -1.33 | -0.00157 | PASS |
|  |  |  |  | 20 | -7.05 | -0.00833 | PASS |
|  |  |  |  | 30 | -0.05 | -0.00006 | PASS |
|  |  |  |  | 40 | -7.97 | -0.00941 | PASS |
|  |  |  |  | 50 | -2.52 | -0.00298 | PASS |

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END