# 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 | 24.38 | 17.15 | 38.5 | PASS |
| | | MCH | 24.38 | 17.15 | 38.5 | PASS |
| | | HCH | 24.31 | 17.08 | 38.5 | PASS |
| **Test Band** | **Test Mode** | **Test Channel** | **Conducted Power [dBm]** | **EIRP [dBm]** | **Limit [dBm]** | **Verdict** |
| WCDMA1700 | UMTS/TM1 | LCH | 23.71 | 24.85 | 30 | PASS |
| | | MCH | 23.75 | 24.89 | 30 | PASS |
| | | HCH | 23.72 | 24.86 | 30 | PASS |
| WCDMA1900 | UMTS/TM1 | LCH | 23.70 | 23.93 | 33 | PASS |
| | | MCH | 23.68 | 23.91 | 33 | PASS |
| | | HCH | 23.57 | 23.80 | 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,

ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]

EIRP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBi]

b, SGP = Signal Generator Level

Note2:

SET Span = 1.5 * OBW

SET RBW = 1% of the OBW,not to exceed 1MHz

SET VBW >= 3 * 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 | 2.990 | 13 | PASS |
| | | MCH | 2.820 | 13 | PASS |
| | | HCH | 3.070 | 13 | PASS |
| WCDMA1700 | UMTS/TM1 | LCH | 2.880 | 13 | PASS |
| | | MCH | 3.050 | 13 | PASS |
| | | HCH | 3.270 | 13 | PASS |
| WCDMA1900 | UMTS/TM1 | LCH | 2.880 | 13 | PASS |
| | | MCH | 3.150 | 13 | PASS |
| | | HCH | 3.080 | 13 | PASS |

# 3Appendix_C: Modulation Characteristics

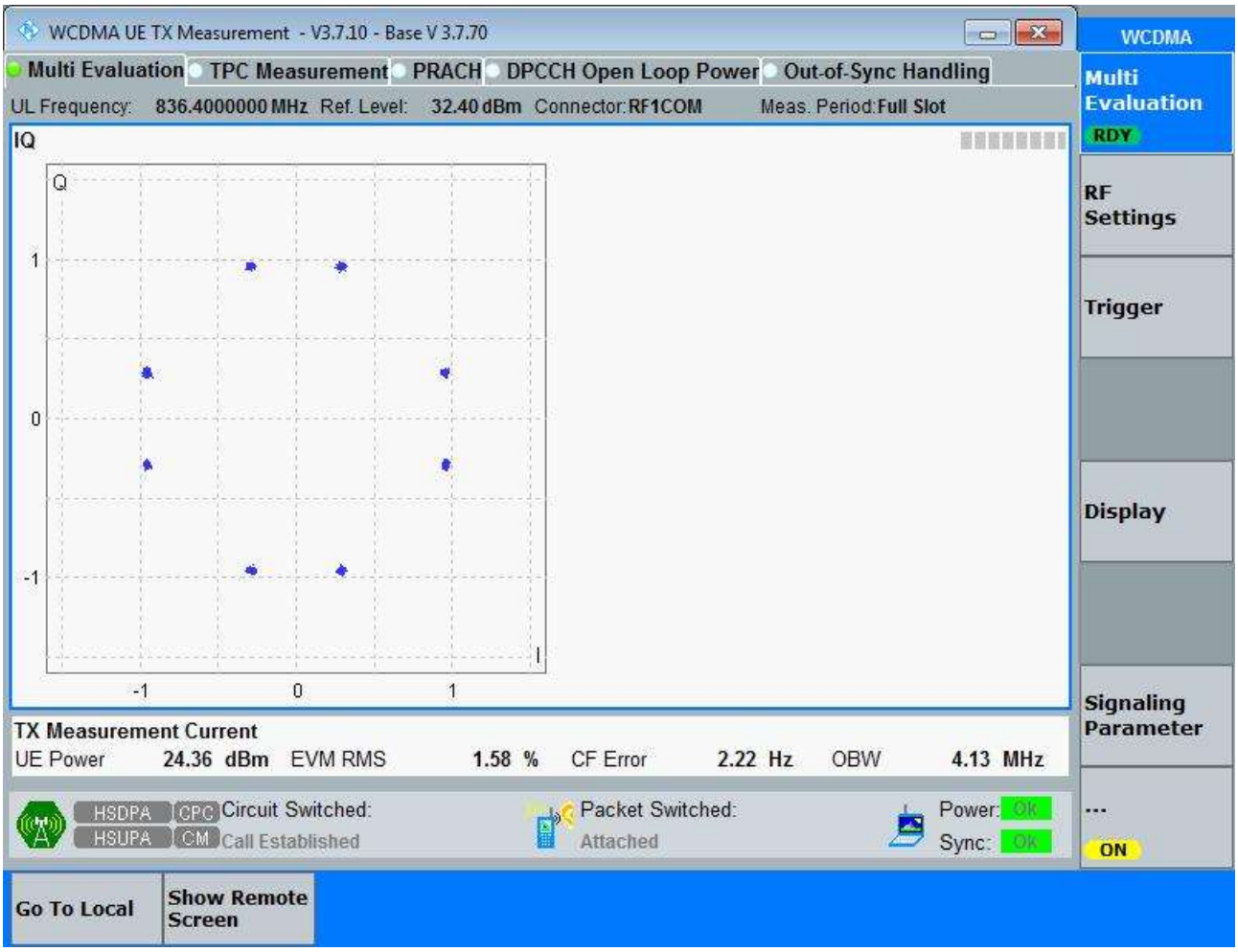
**Part I - Test Plots**

**3.1 For UMTS**

**3.1.1 Test Band = WCDMA850**

**3.1.1.1 Test Mode = UMTS/TM1**

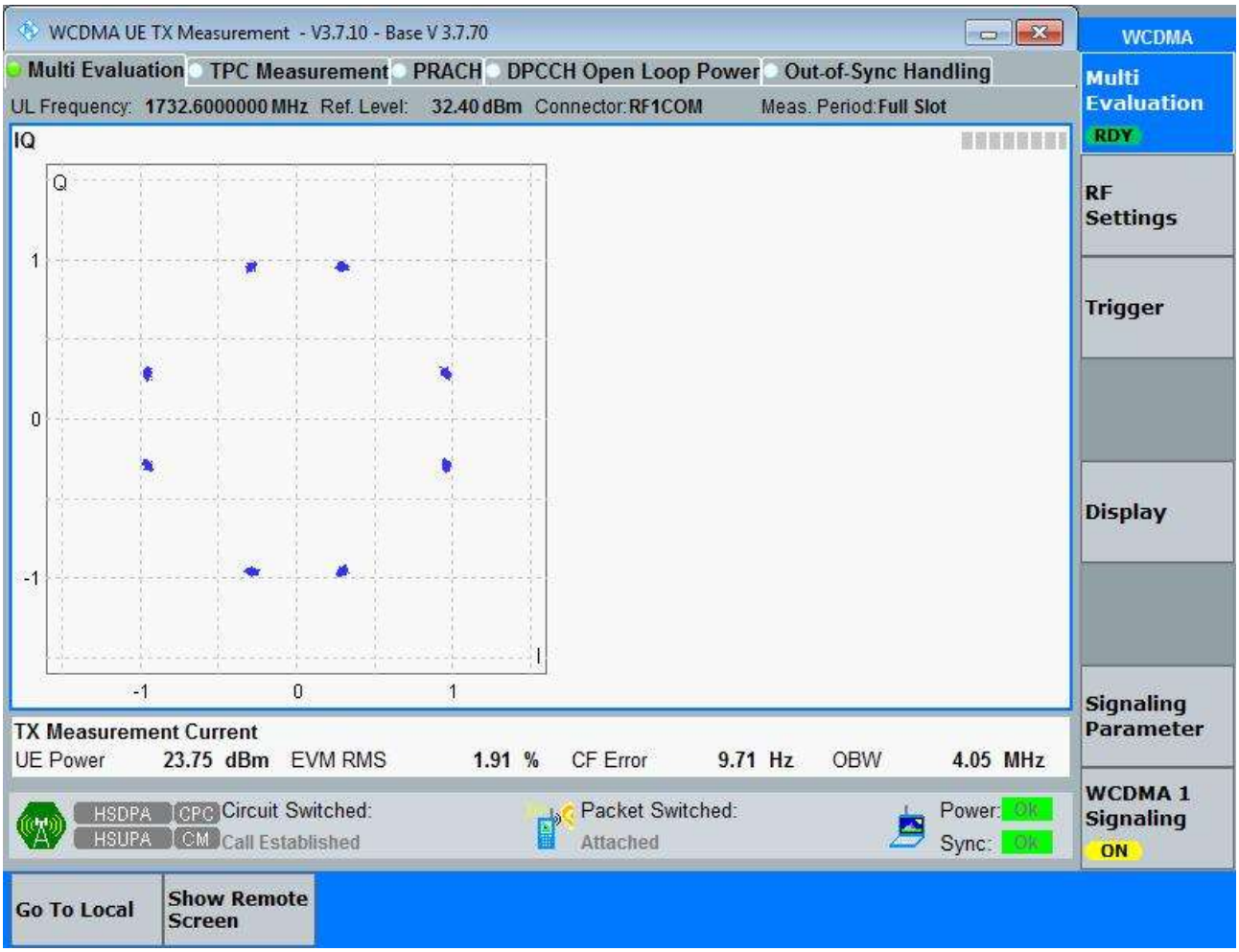
**3.1.1.1.1 Test Channel = MCH**



### 3.1.2 Test Band = WCDMA1700

#### 3.1.2.1 Test Mode = UMTS/TM1

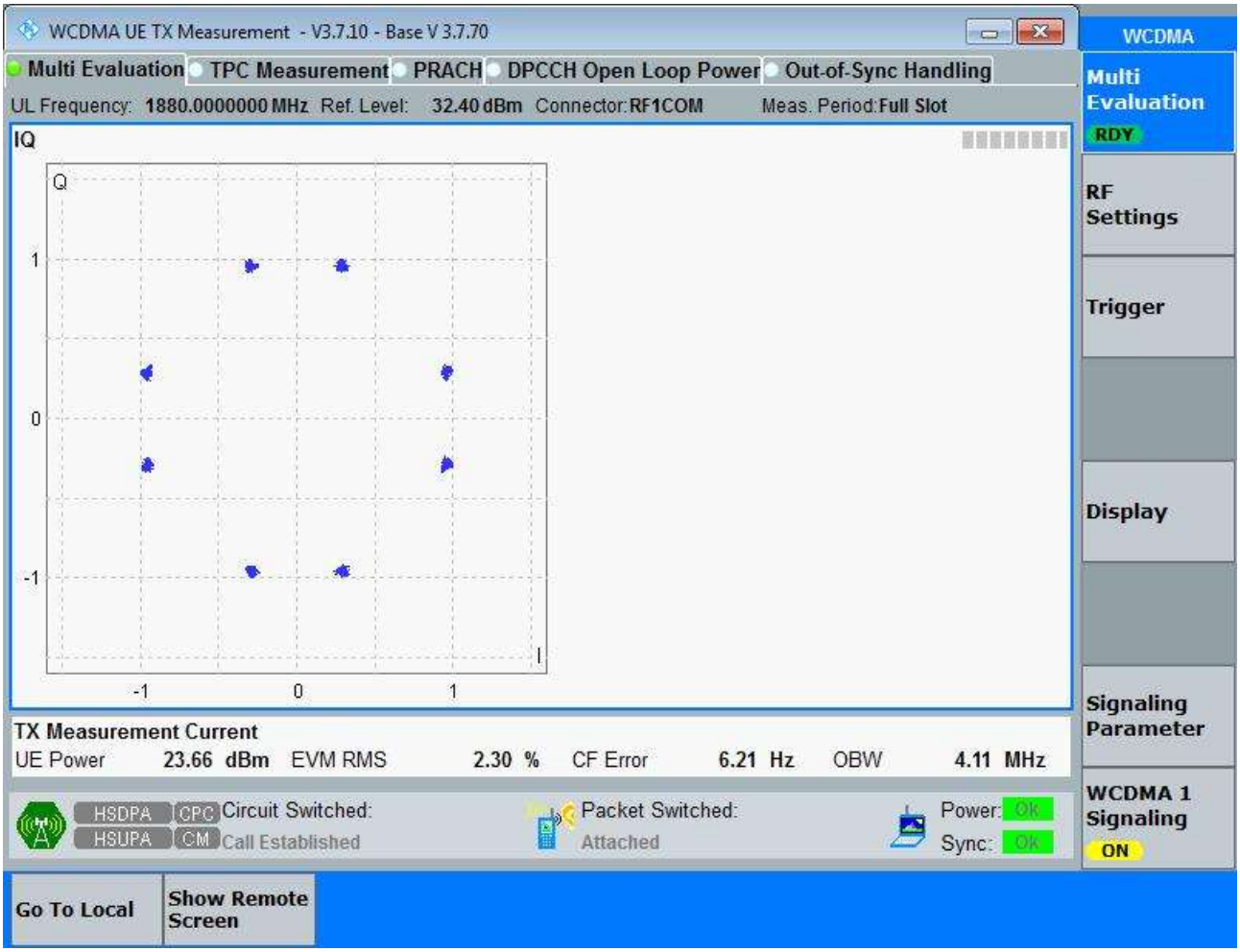
##### 3.1.2.1.1 Test Channel = MCH



### 3.1.3 Test Band = WCDMA1900

#### 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 | 4.16 | 4.68 | Pass |
| | | MCH | 4.18 | 4.70 | Pass |
| | | HCH | 4.16 | 4.69 | Pass |
| WCDMA1700 | UMTS/TM1 | LCH | 4.17 | 4.70 | Pass |
| | | MCH | 4.17 | 4.68 | Pass |
| | | HCH | 4.17 | 4.71 | Pass |
| WCDMA1900 | UMTS/TM1 | LCH | 4.17 | 4.72 | Pass |
| | | MCH | 4.16 | 4.69 | Pass |
| | | HCH | 4.16 | 4.69 | Pass |

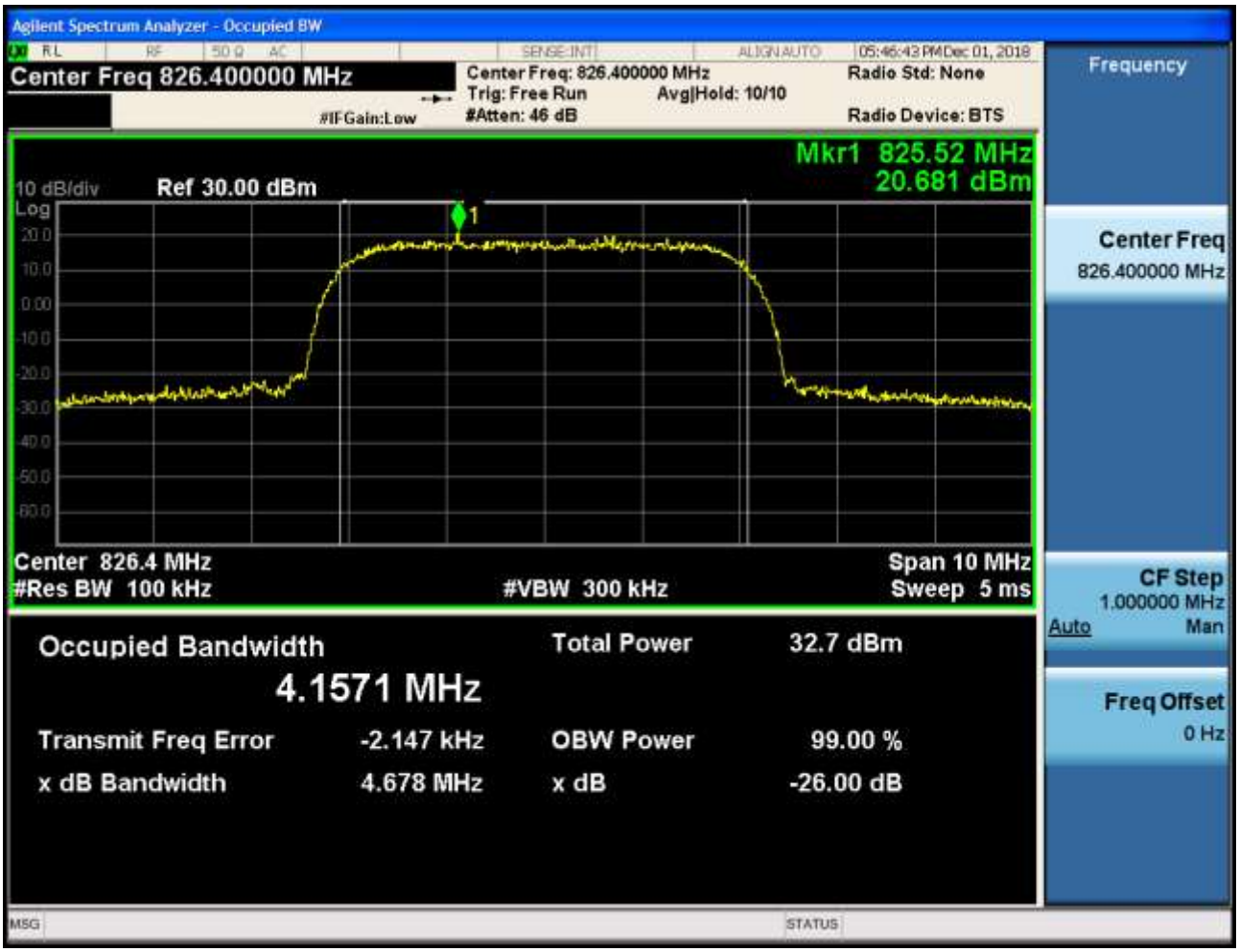
**Part II - Test Plots**

**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**



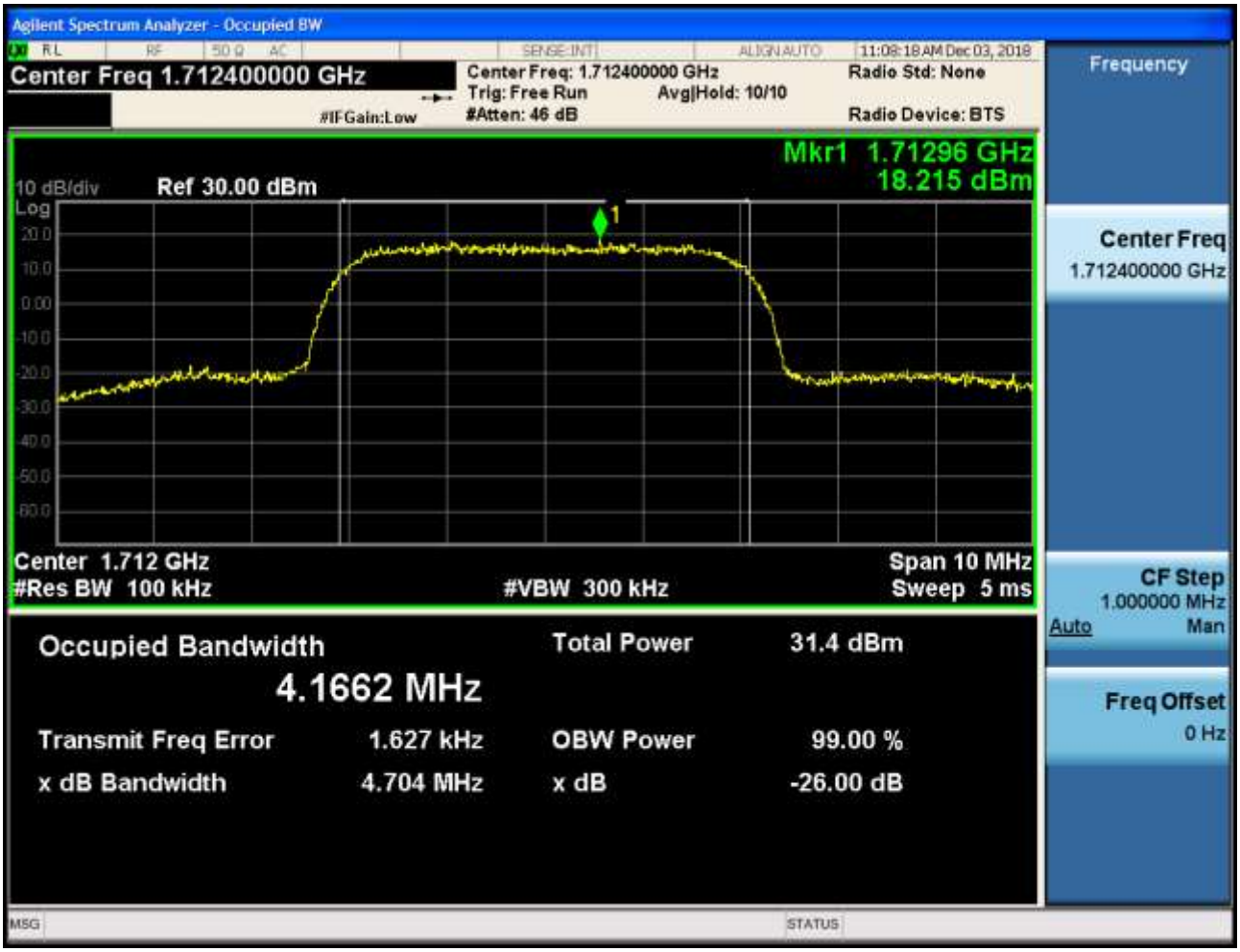
#### 4.1.1.1.2 Test Channel = MCH

#### 4.1.1.1.3 Test Channel = HCH

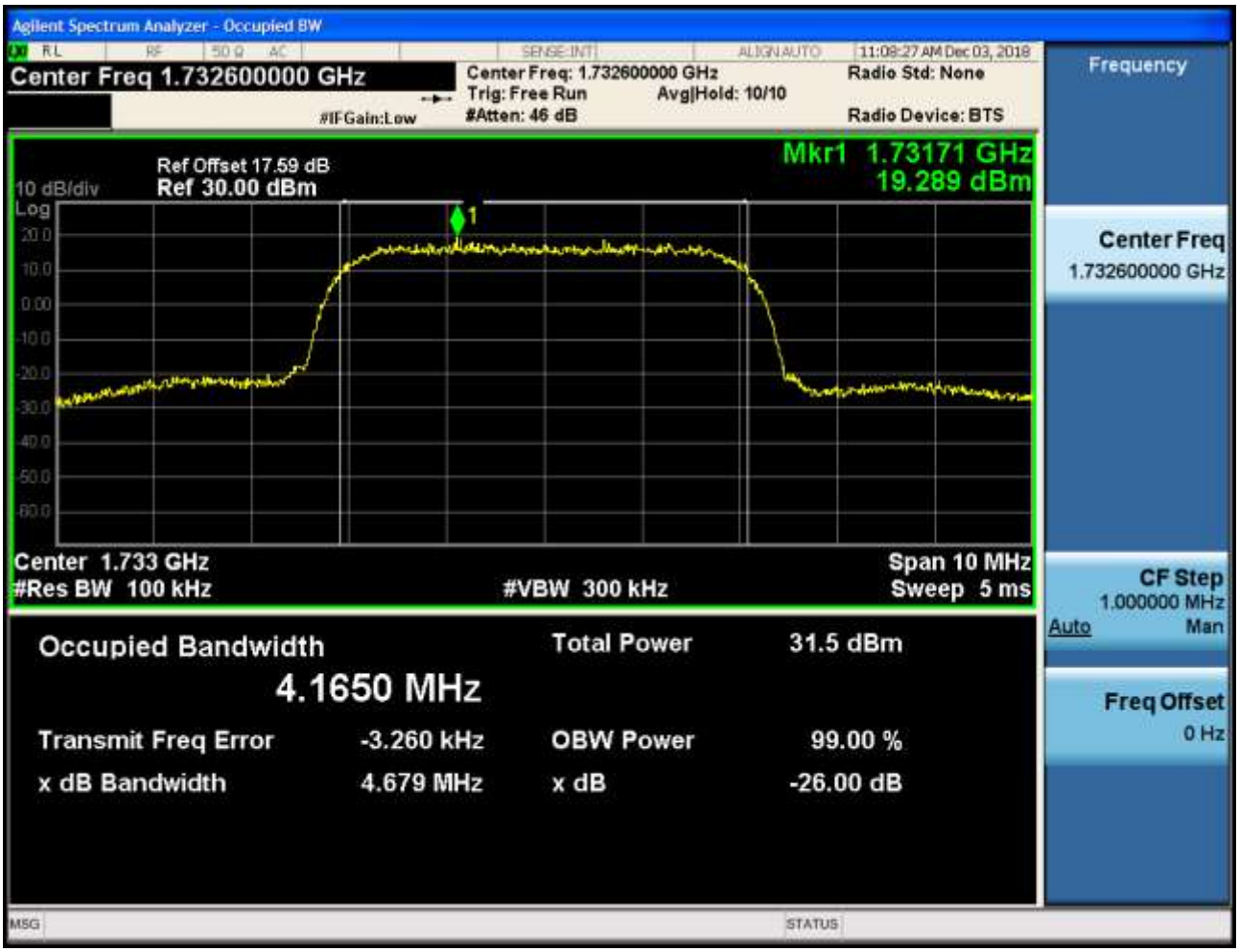
#### 4.1.2 Test Band = WCDMA1700

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

###### 4.1.2.1.1 Test Channel = LCH



#### 4.1.2.1.2 Test Channel = MCH

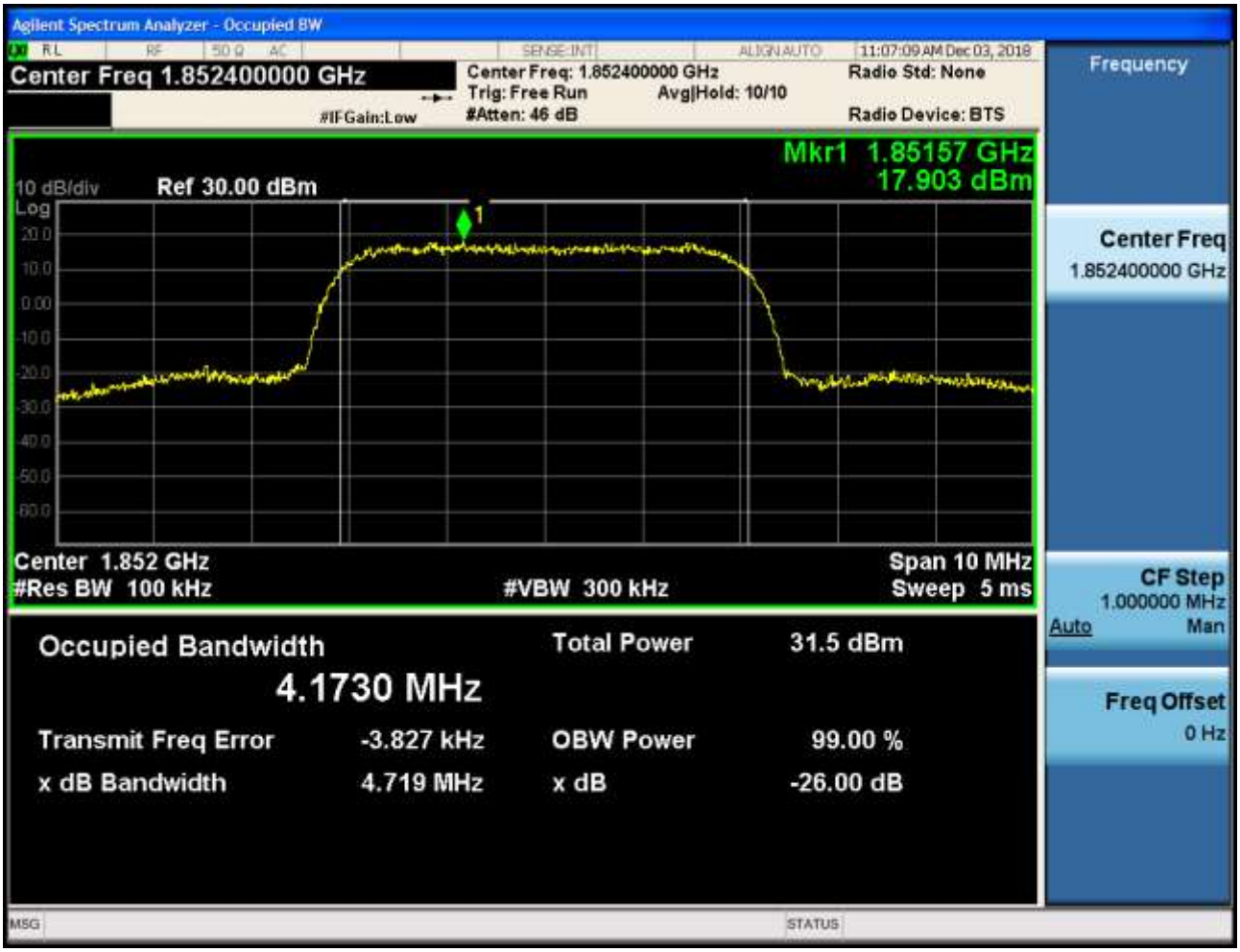


#### 4.1.2.1.3 Test Channel = HCH

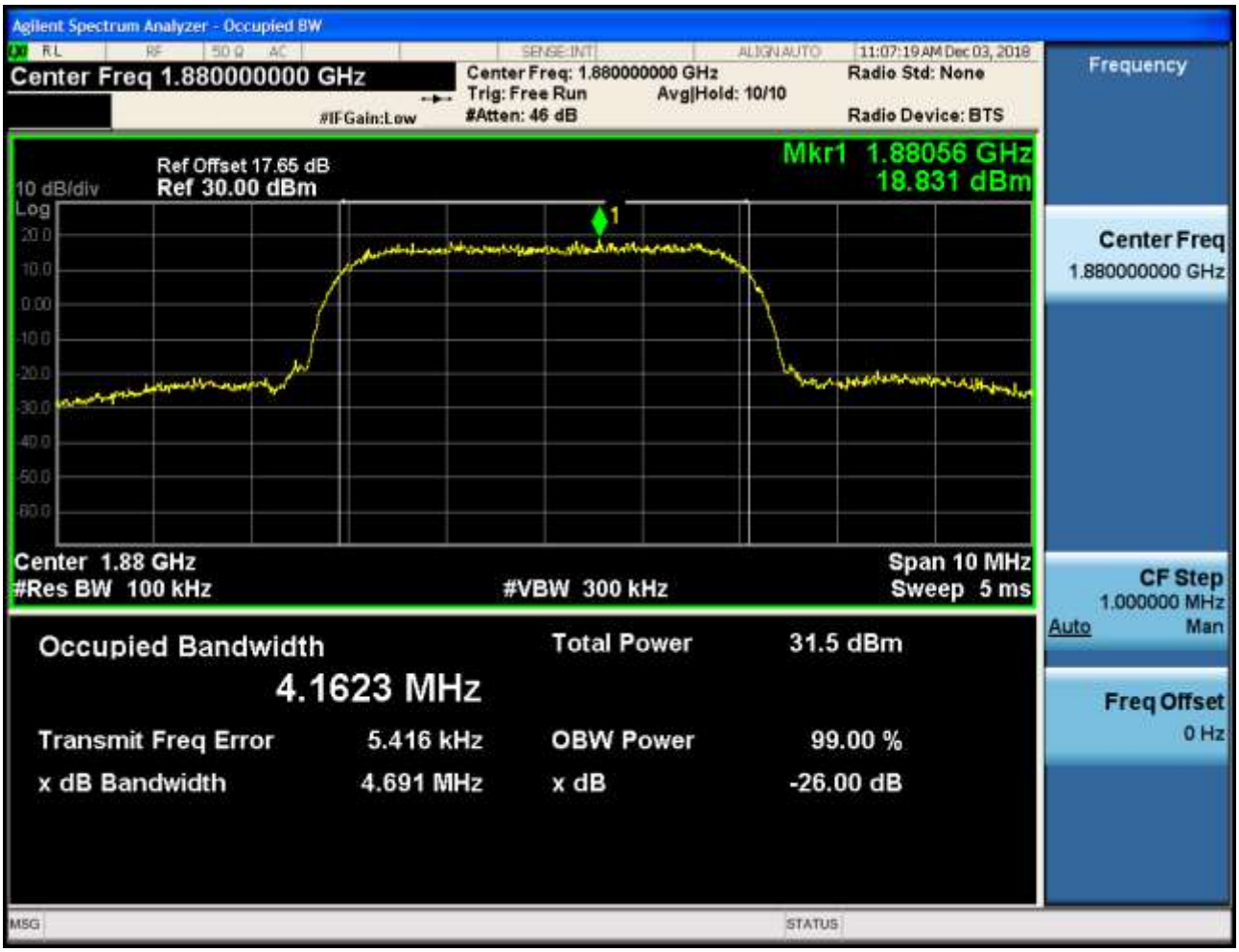
#### 4.1.3 Test Band = WCDMA1900

##### 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 = 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 = WCDMA1900

#### 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.

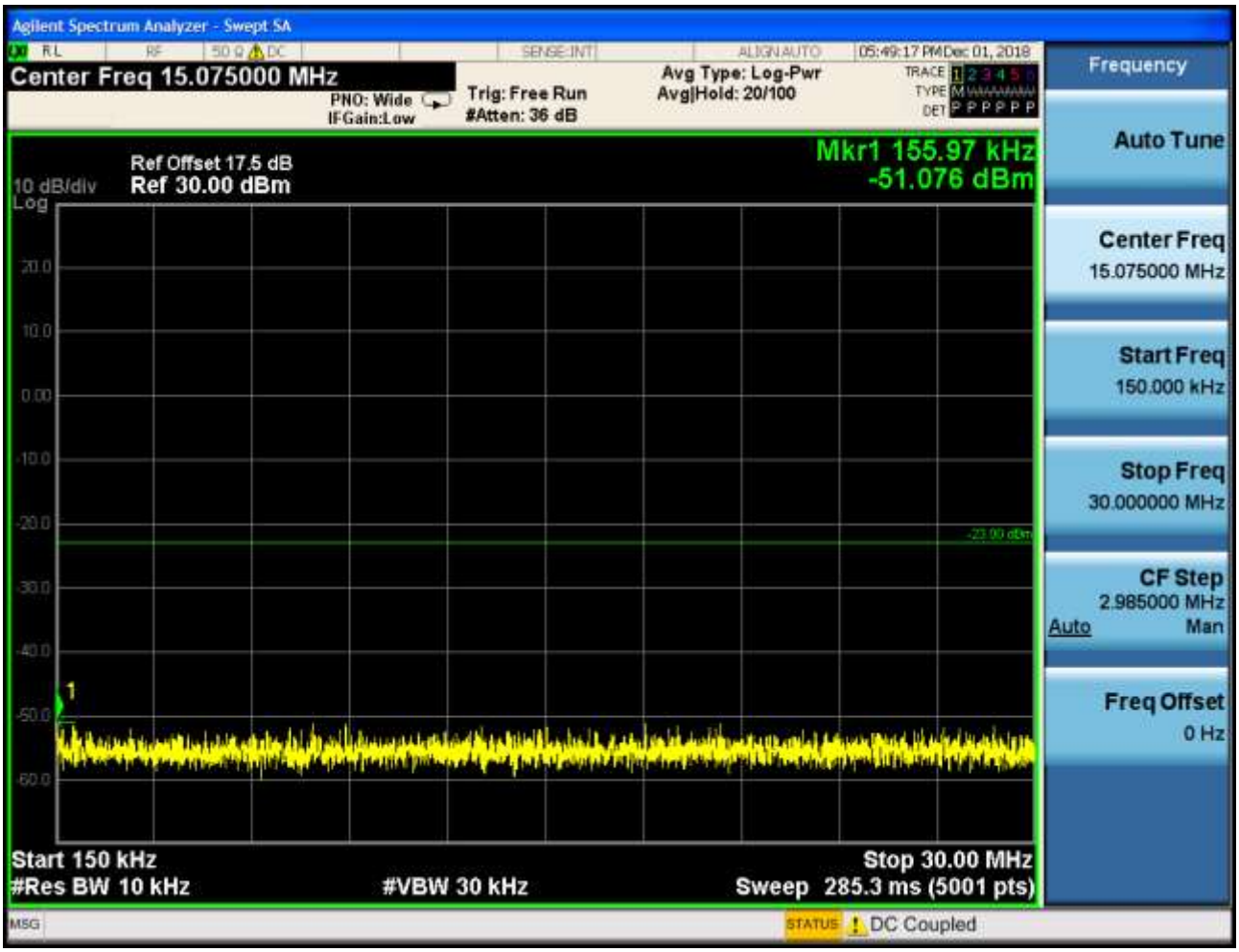
**Part I - Test Plots**

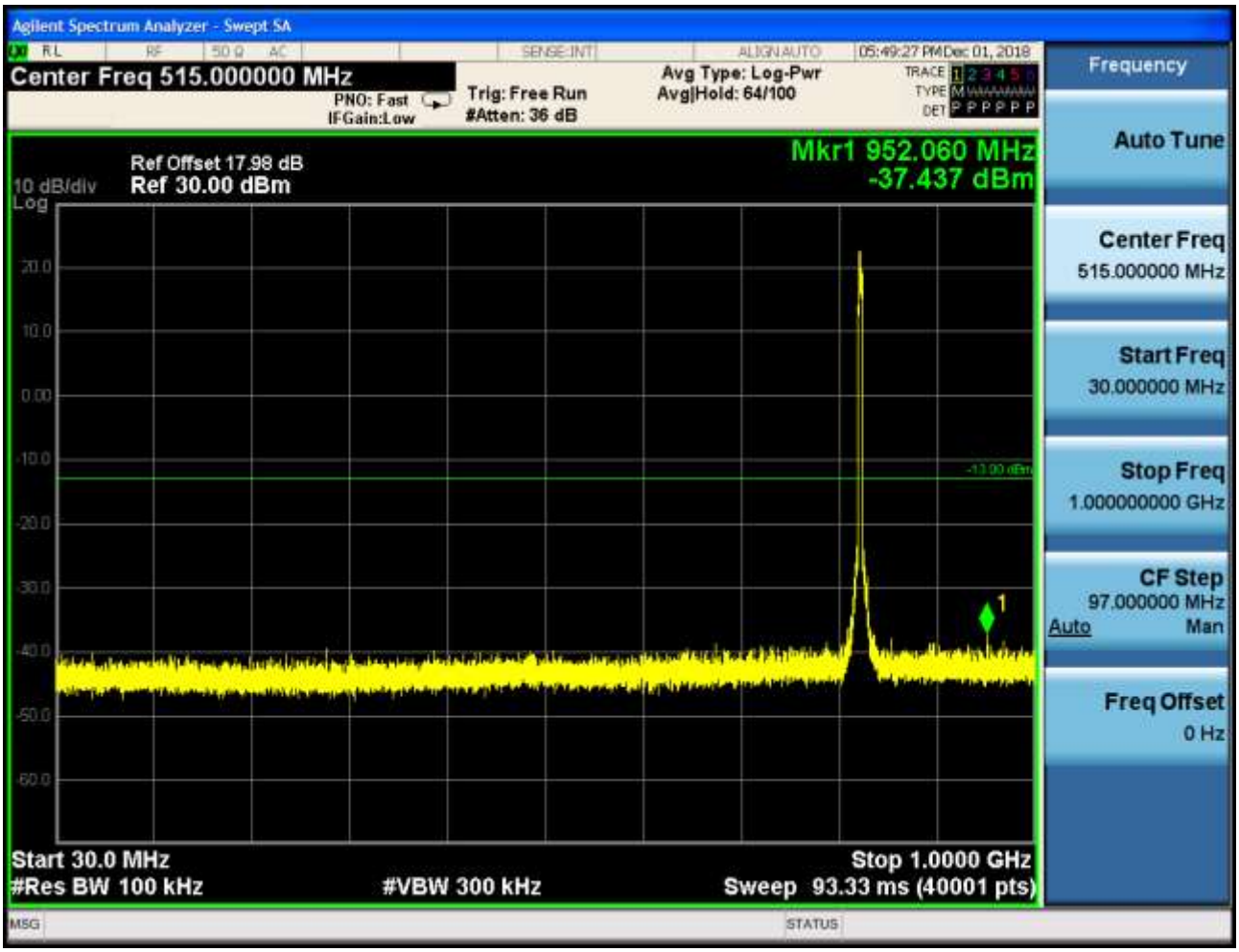
**6.1 For UMTS**

**6.1.1 Test Band = WCDMA850**

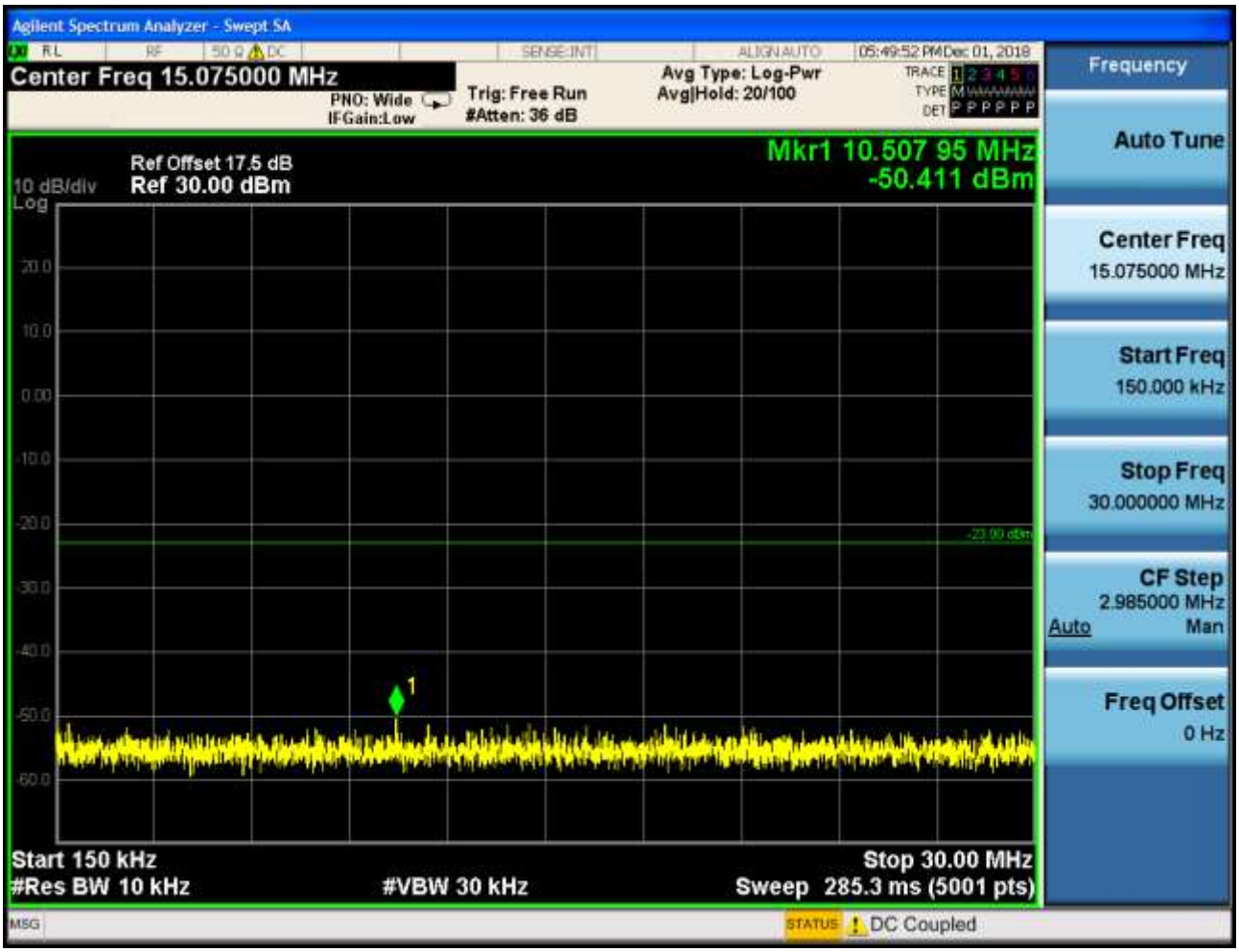
**6.1.1.1 Test Mode = UMTS/TM1**

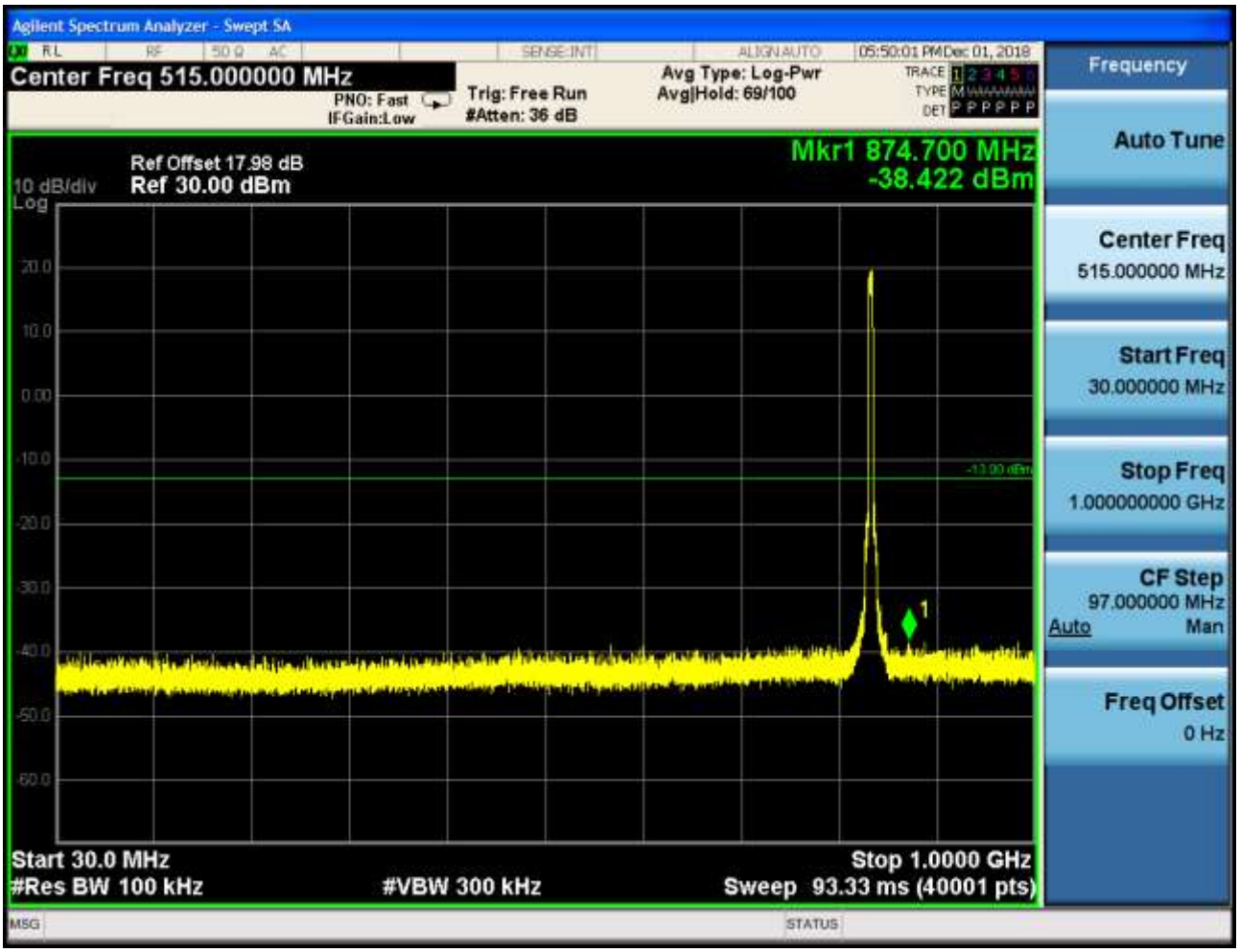
**6.1.1.1.1 Test Channel = LCH**



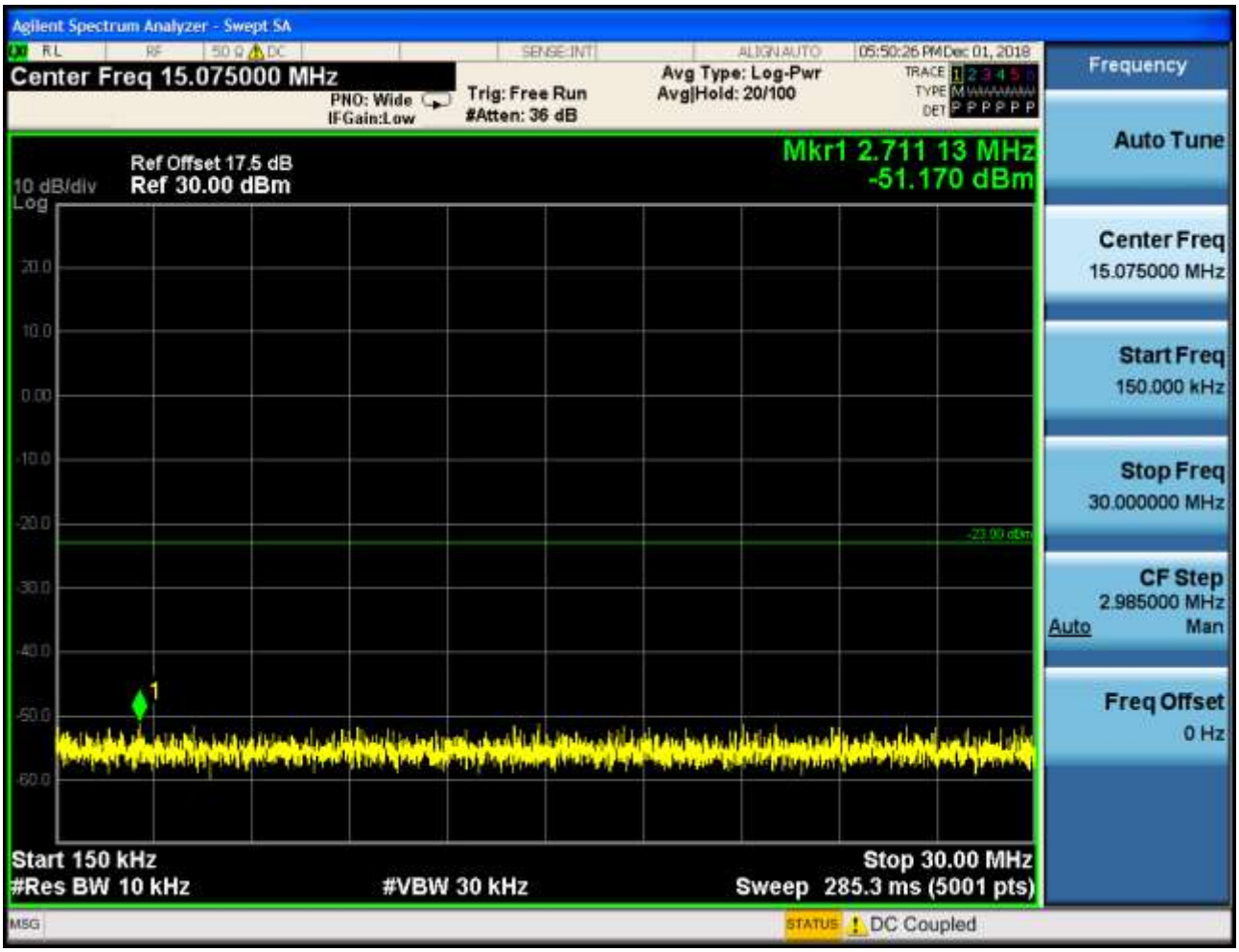


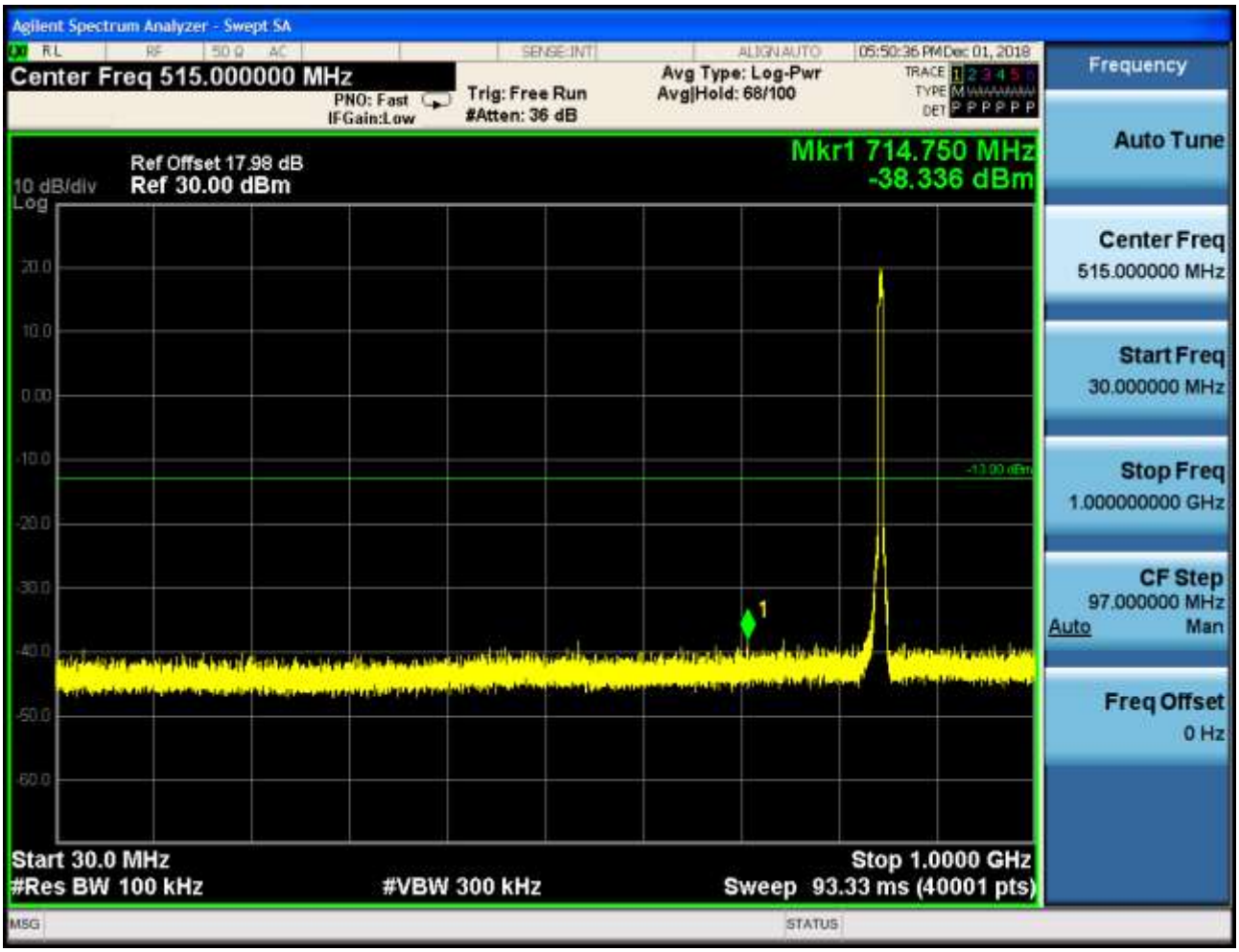
#### 6.1.1.1.2 Test Channel = MCH





#### 6.1.1.1.3 Test Channel = HCH

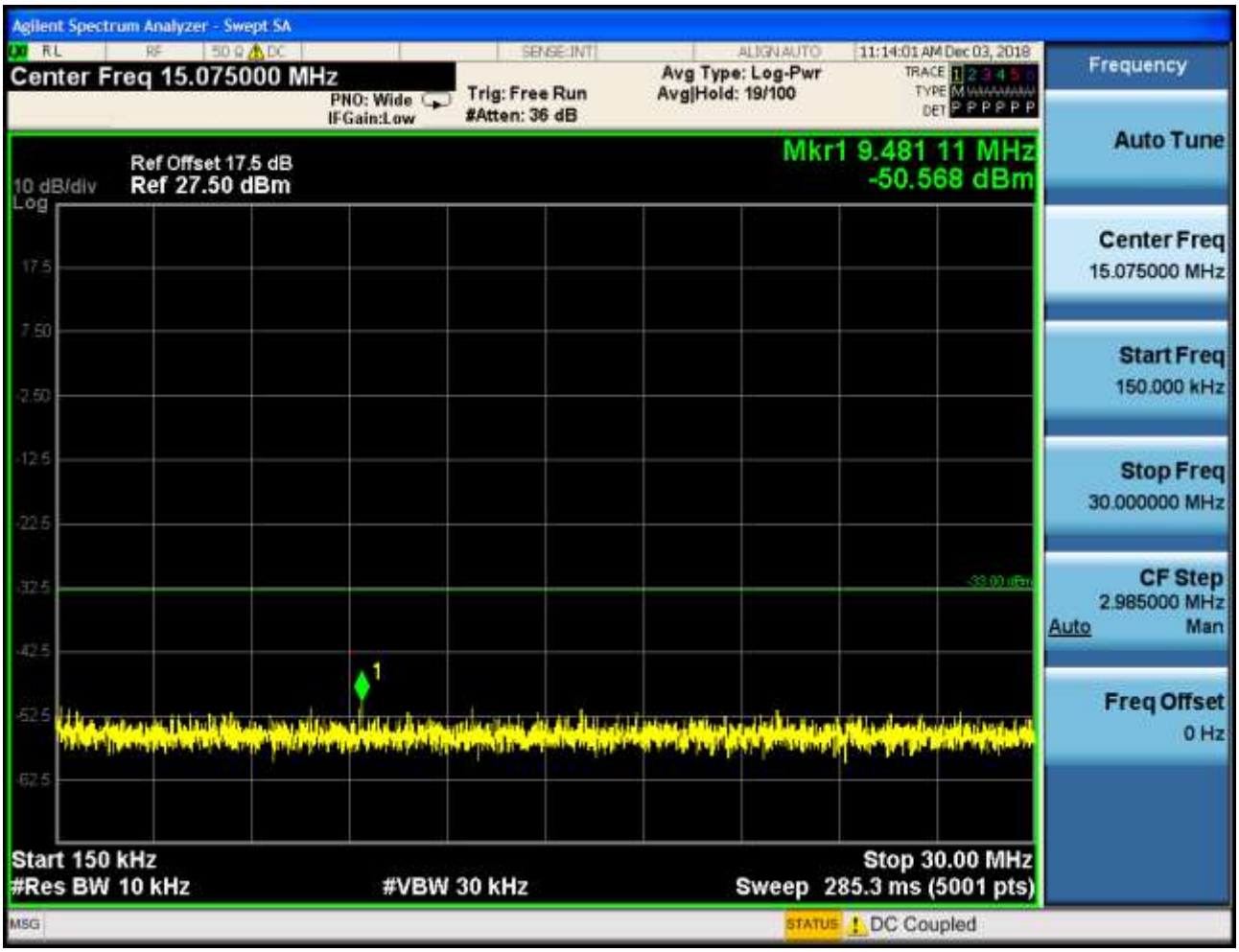




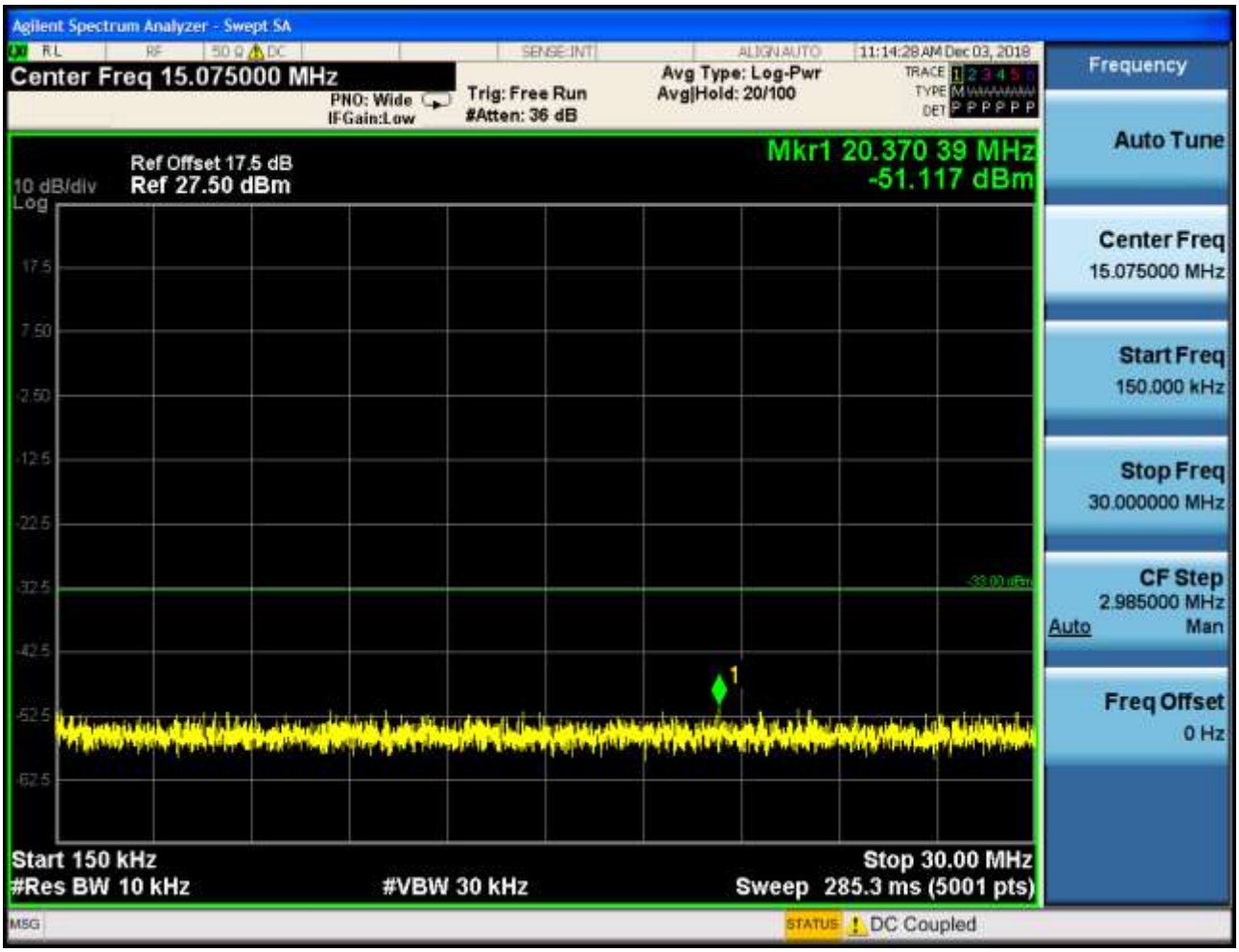
### 6.1.2 Test Band = WCDMA1700

#### 6.1.2.1 Test Mode = UMTS/TM1

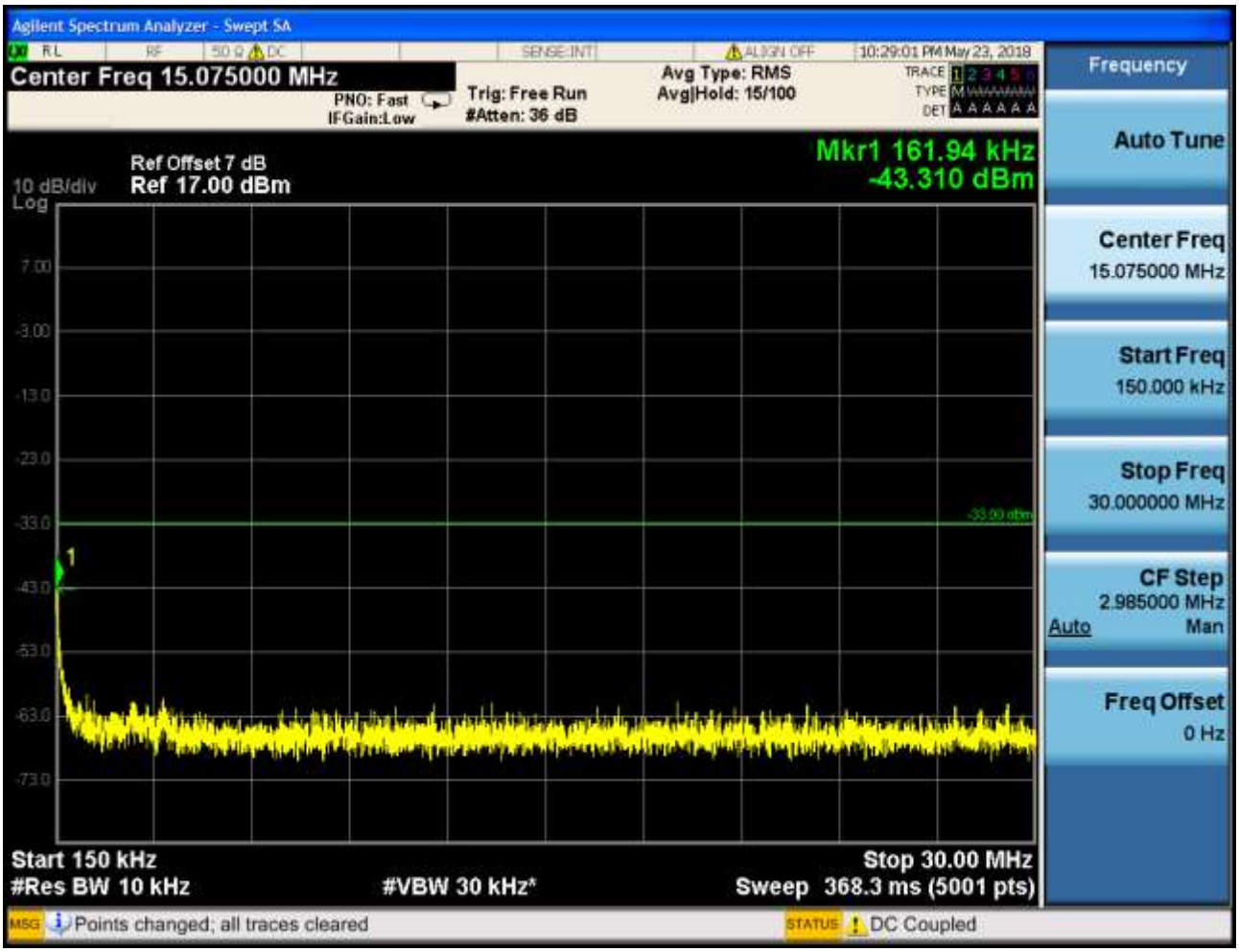
##### 6.1.2.1.1 Test Channel = LCH



#### 6.1.2.1.2 Test Channel = MCH



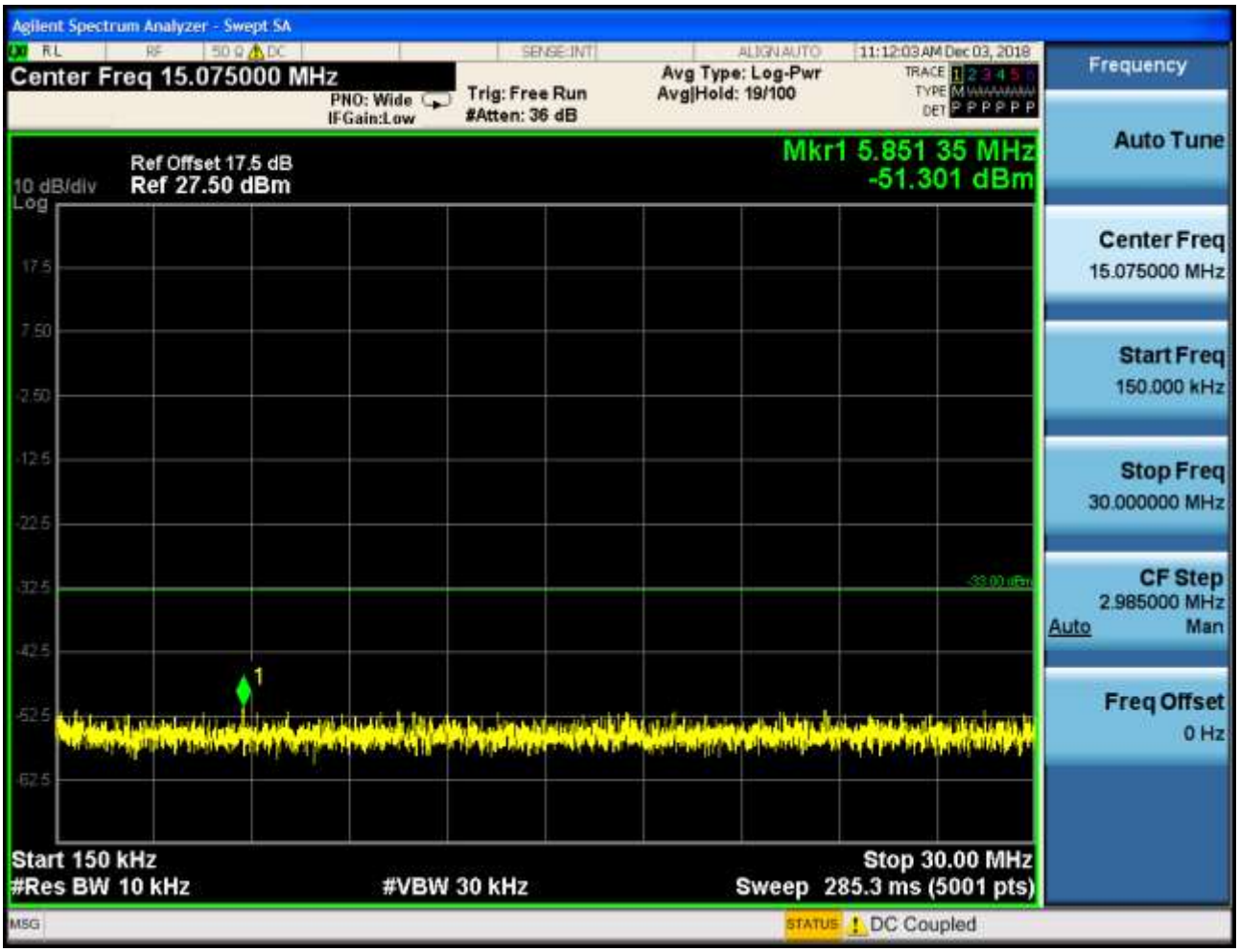
#### 6.1.2.1.3 Test Channel = HCH



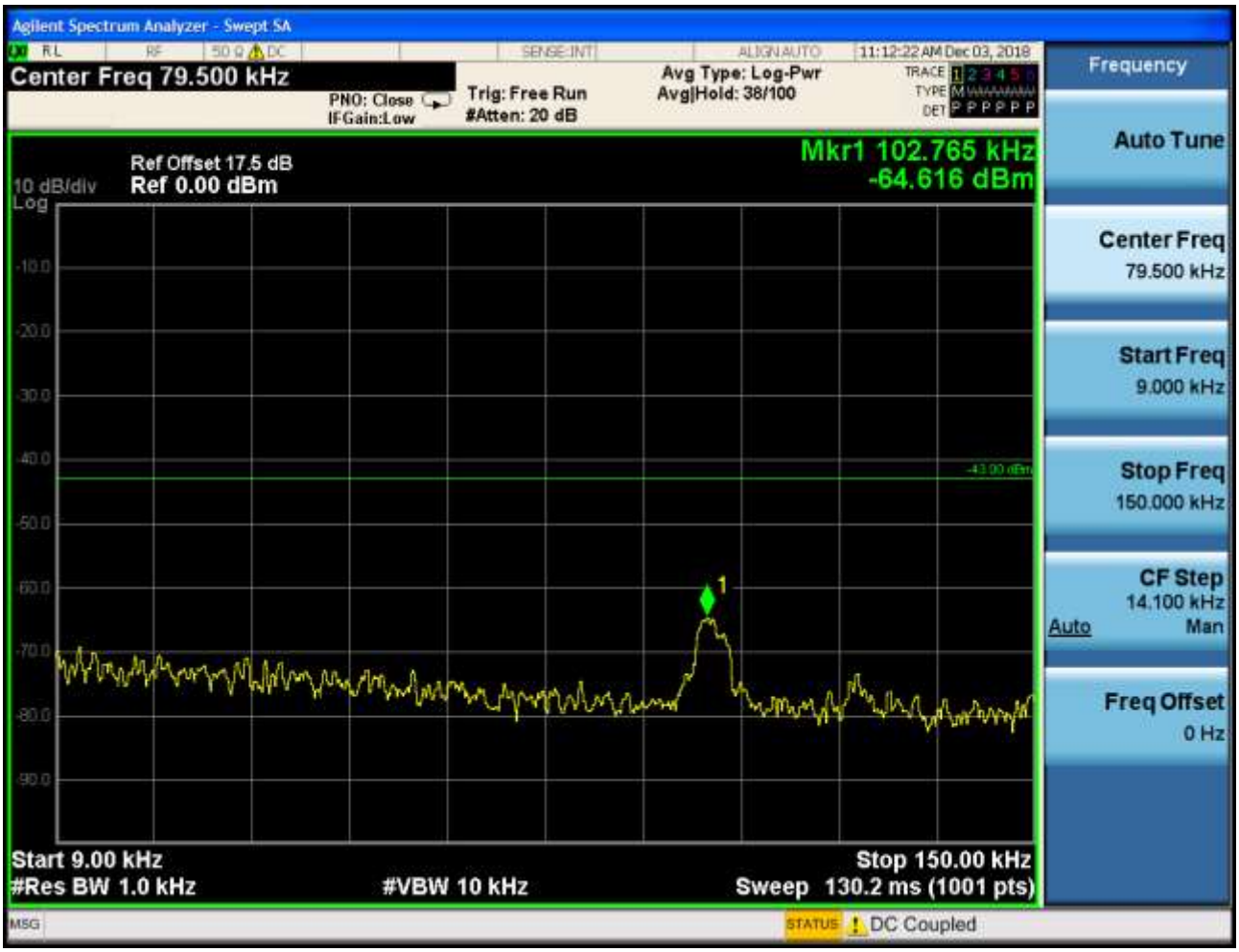
### 6.1.3 Test Band = WCDMA1900

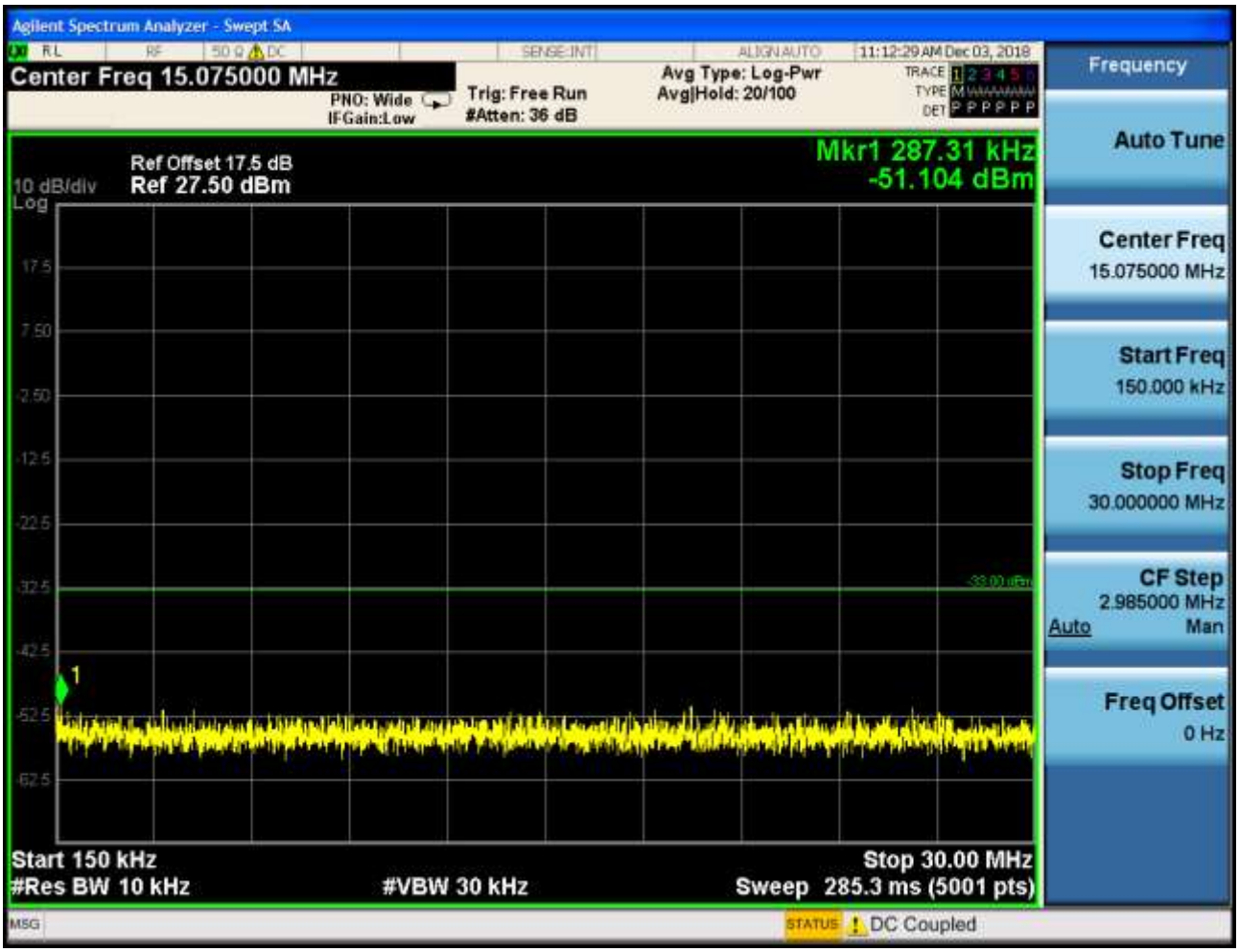
#### 6.1.3.1 Test Mode = UMTS/TM1

##### 6.1.3.1.1 Test Channel = LCH

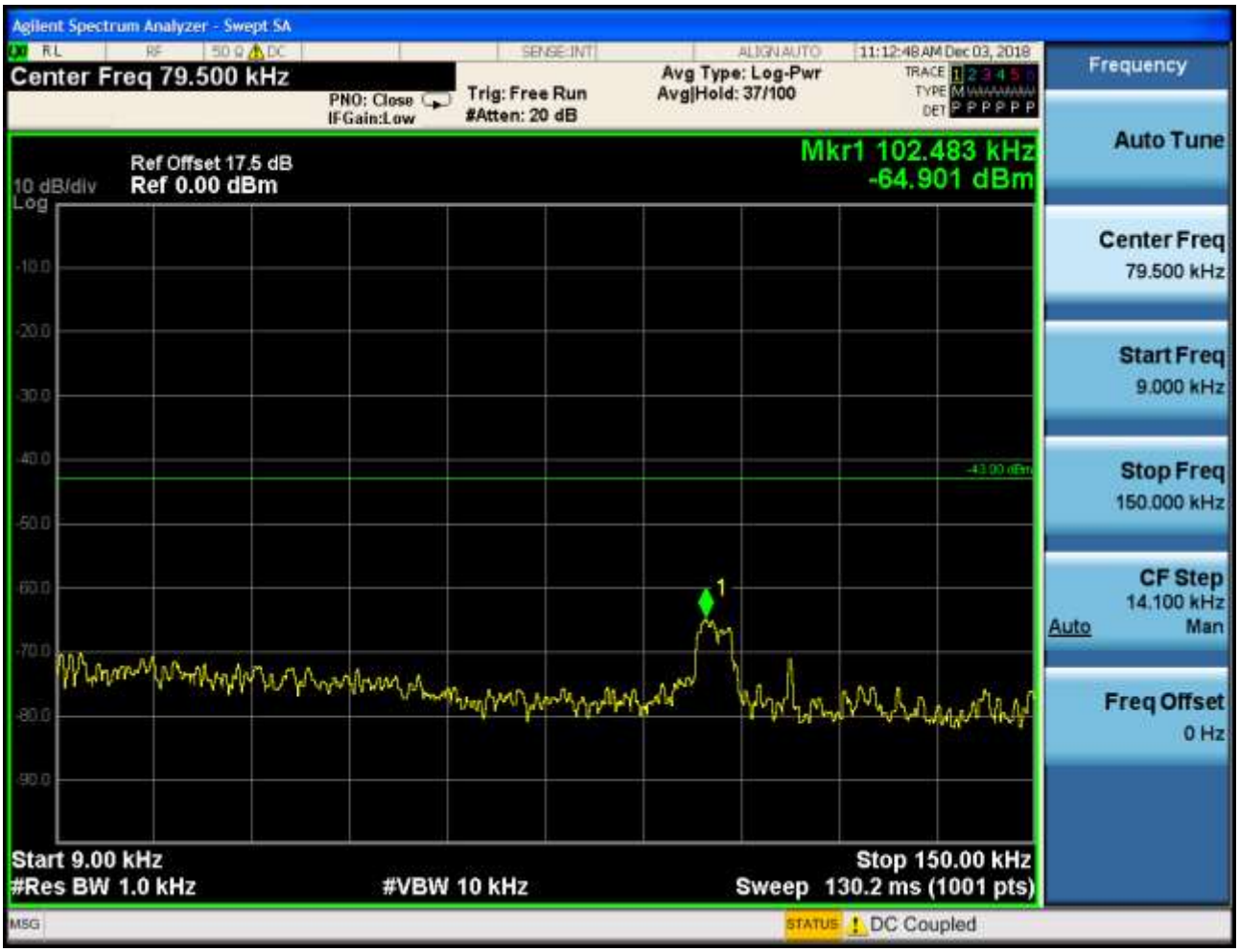


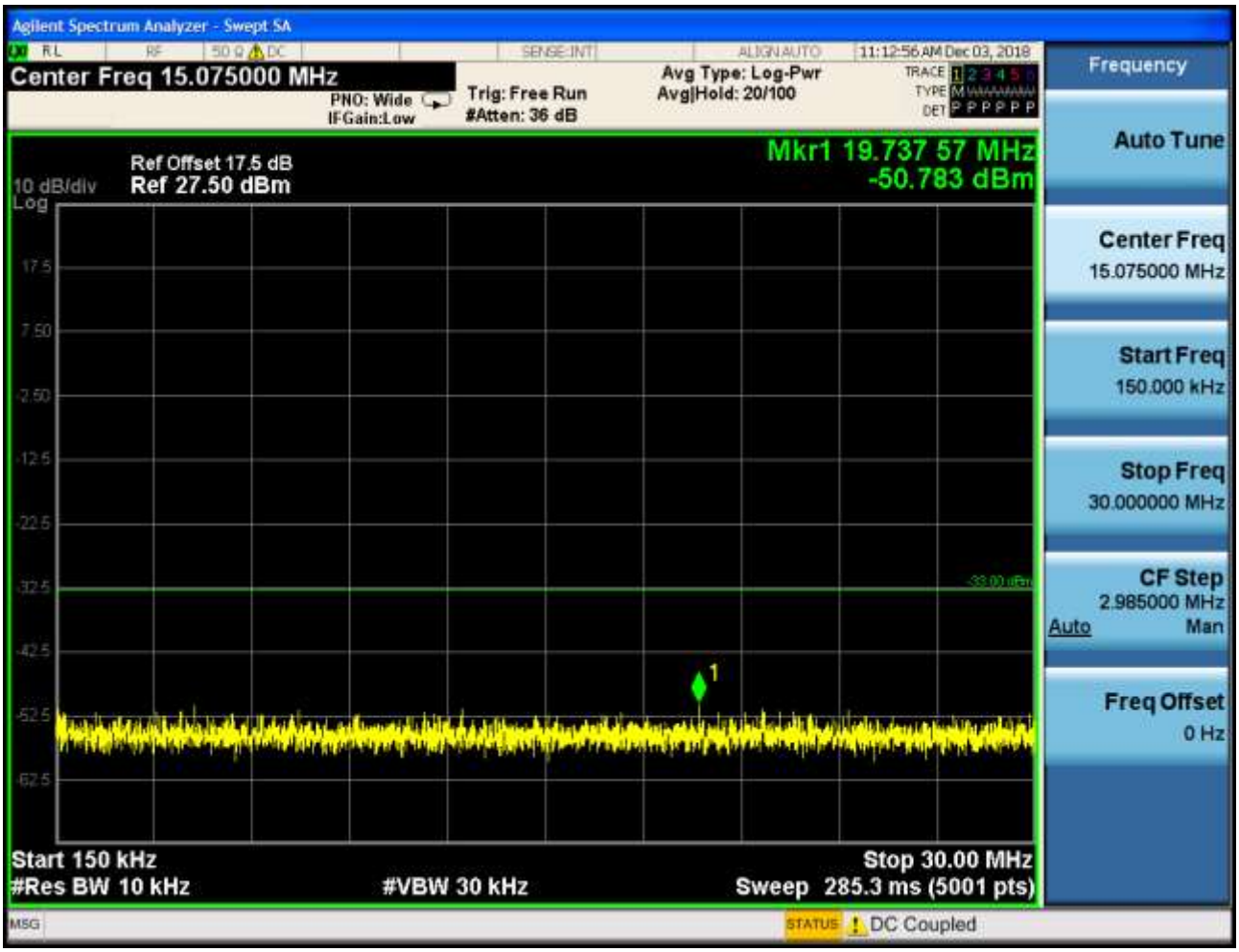
#### 6.1.3.1.2 Test Channel = MCH





#### 6.1.3.1.3 Test Channel = HCH





# 7Appendix_G: Field Strength of Spurious Radiation

Note: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

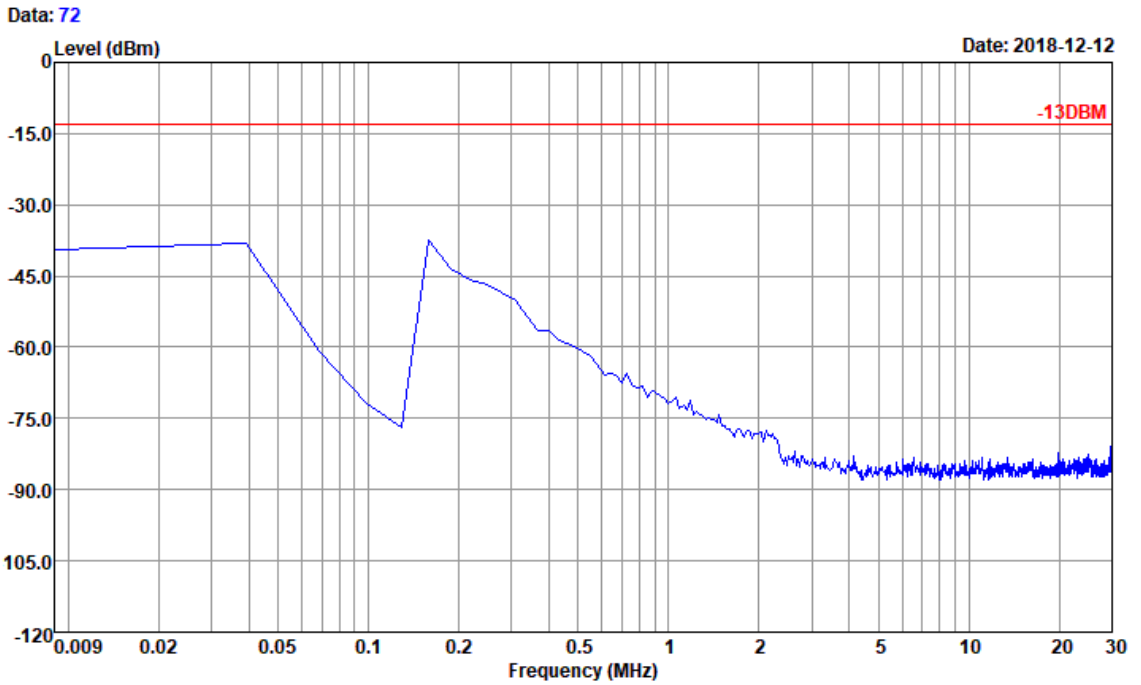
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

**Part I - Test Plots**

**7.1 For UMTS**

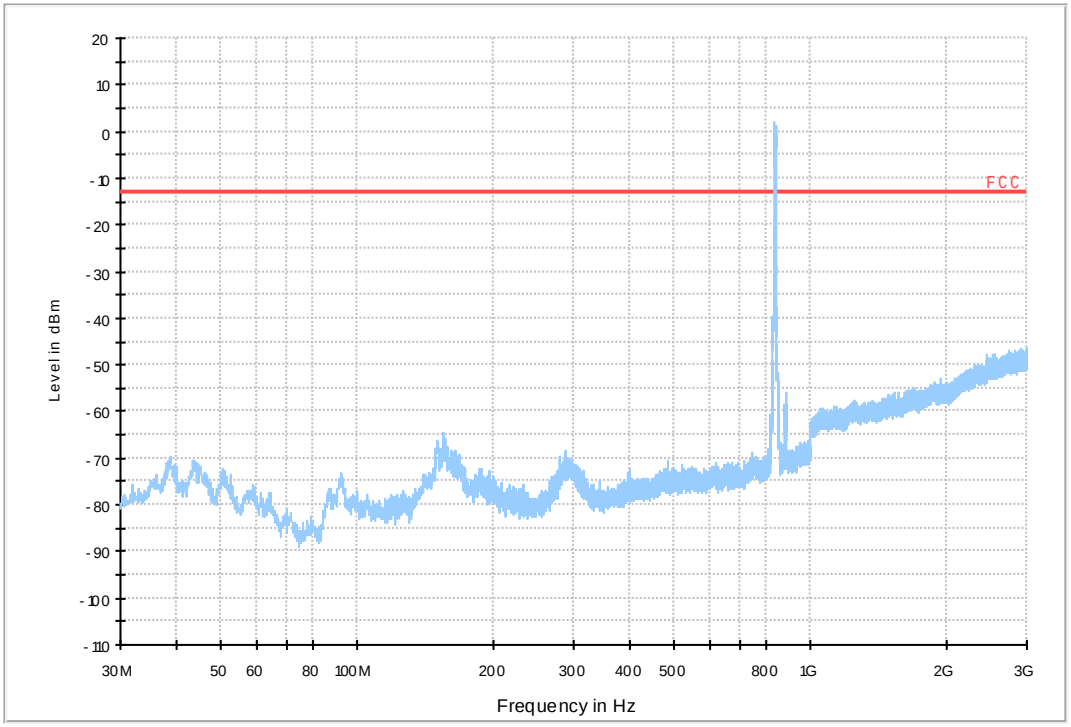
**7.1.1 Test Band = WCDMA850_ANT1**

**7.1.1.1 Test Mode = UMTS/TM1**

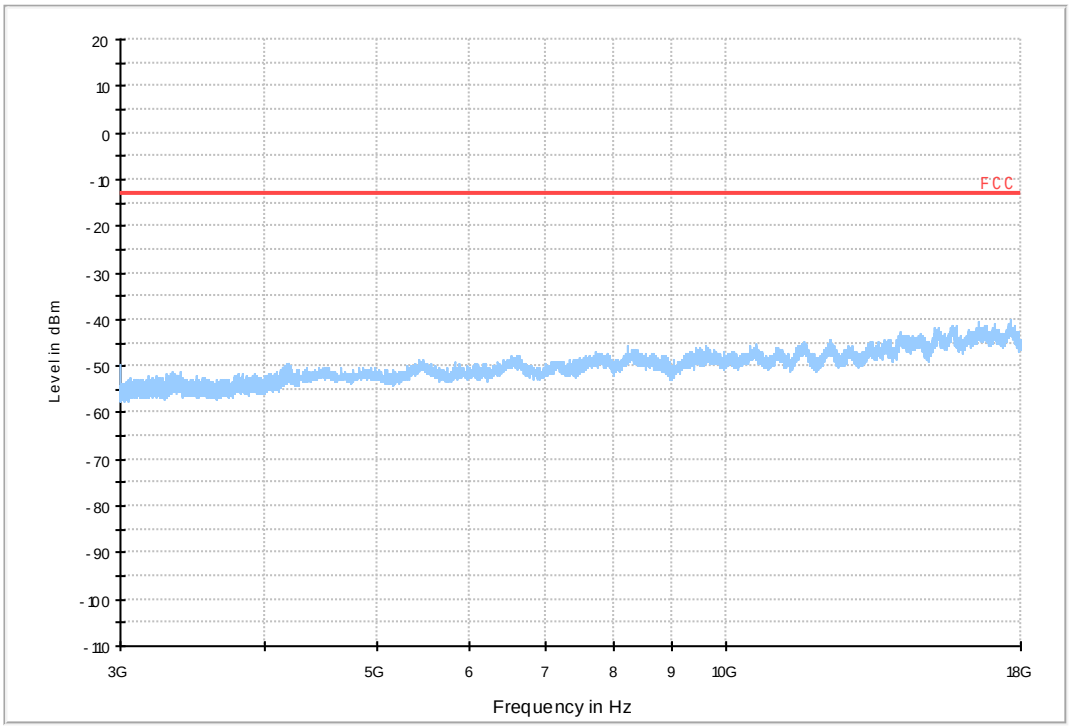



Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

06 FCC PART 22 WCDMA850_L

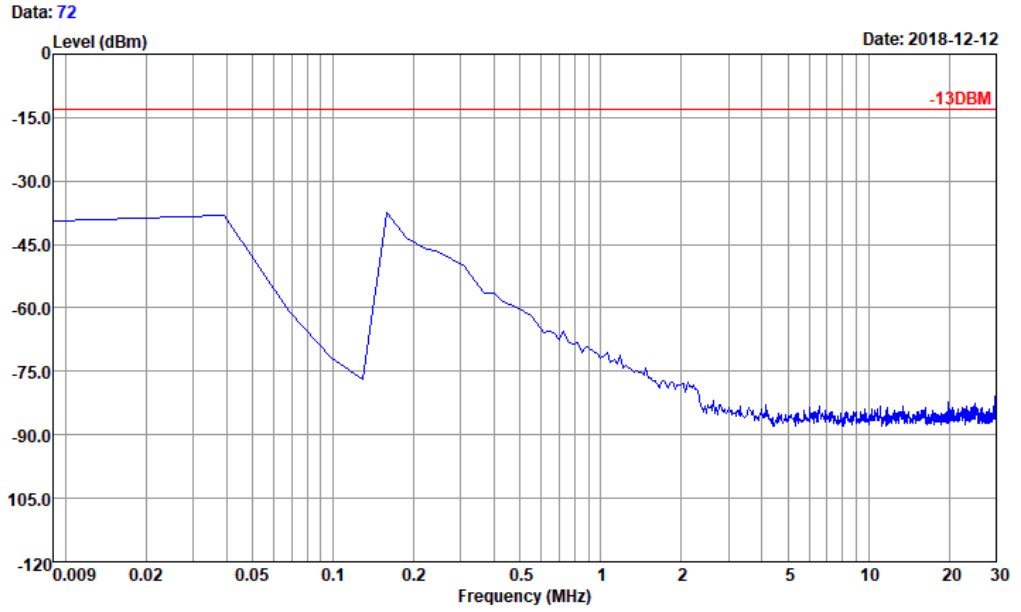



05 FCC PART 22 WCDMA850_H



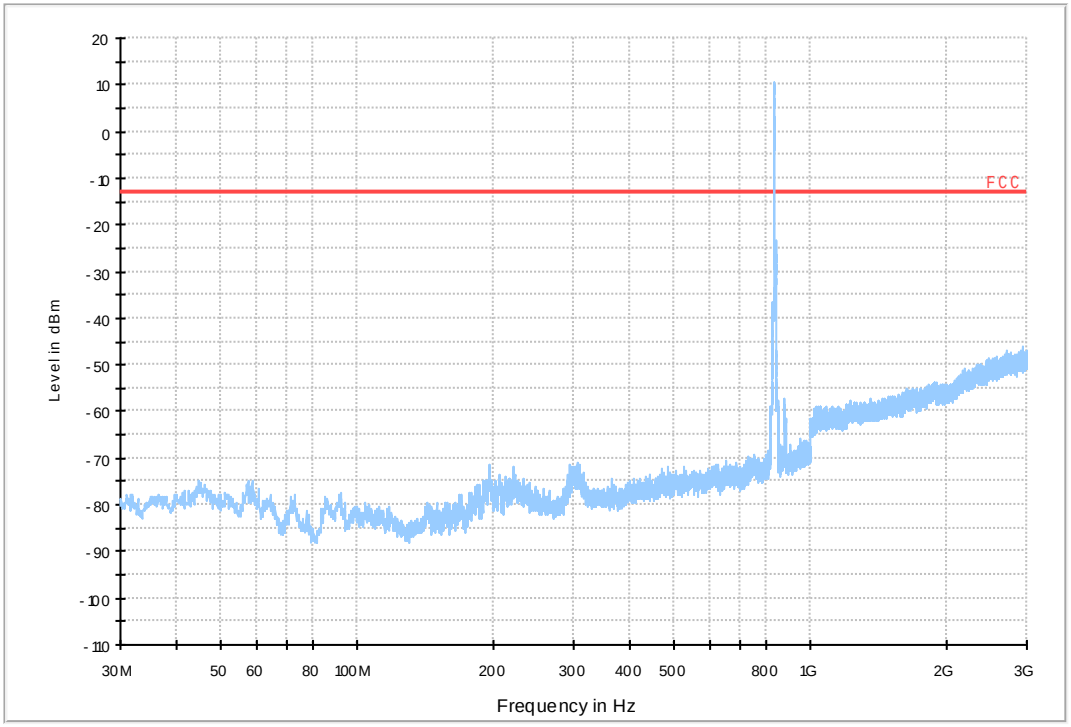
### 7.1.2 Test Band = WCDMA850_ANT2

#### 7.1.2.1 Test Mode = UMTS/TM1

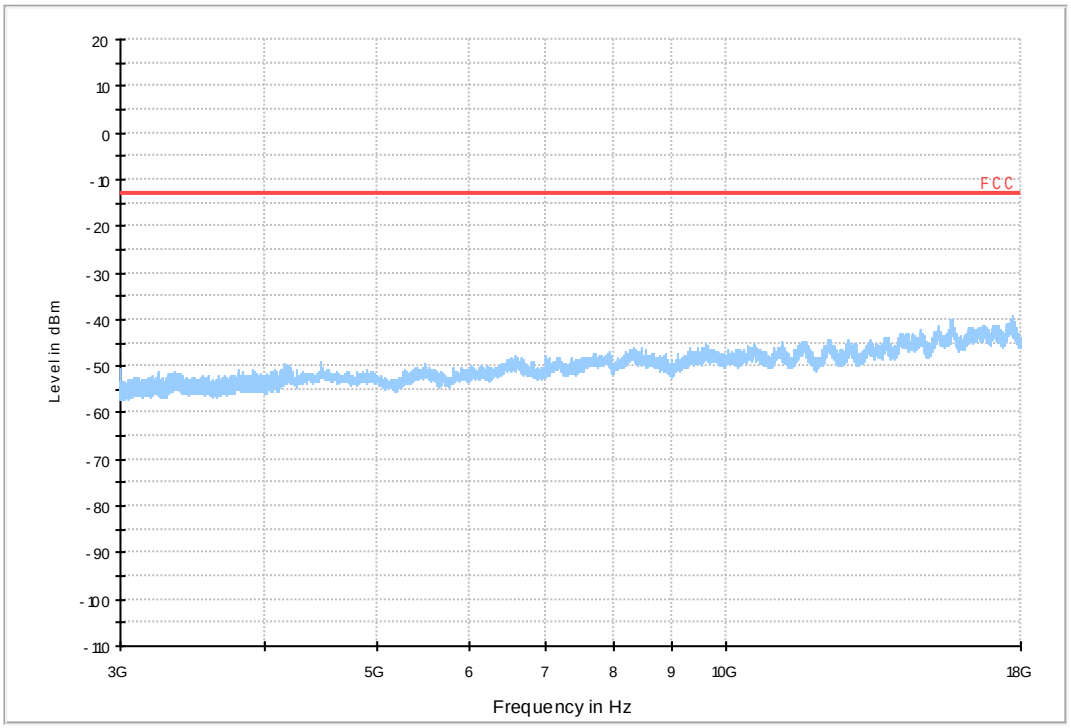



Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

06 FCC PART 22 WCDMA850_L

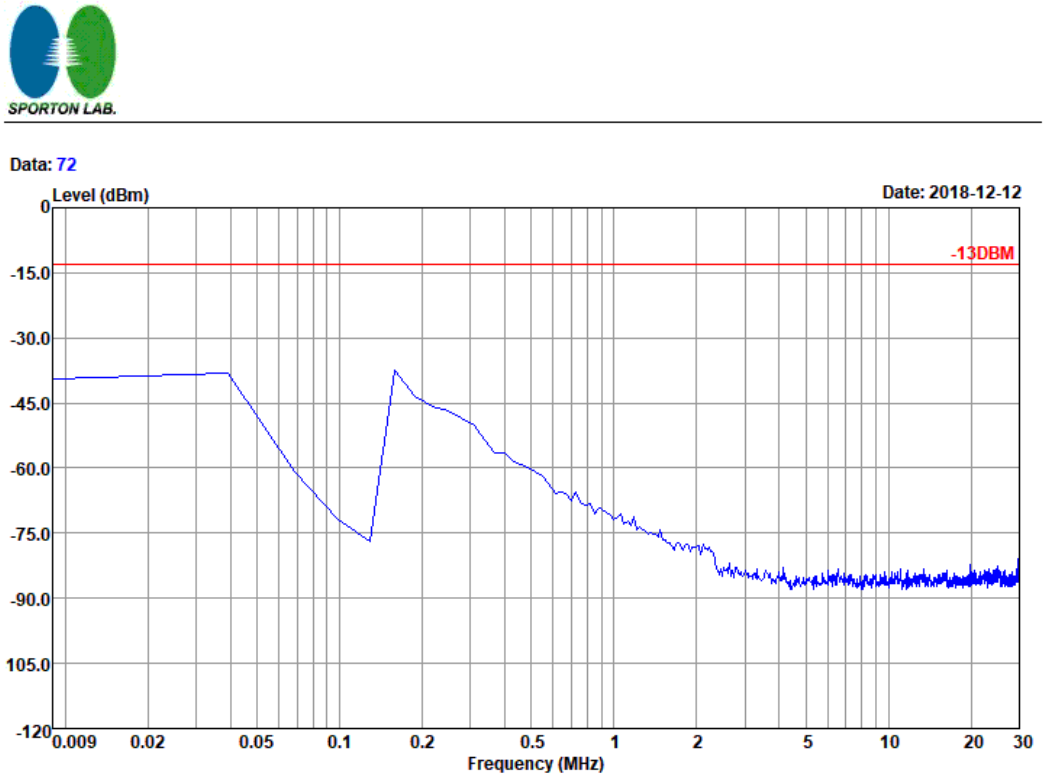



05 FCC PART 22 WCDMA850_H



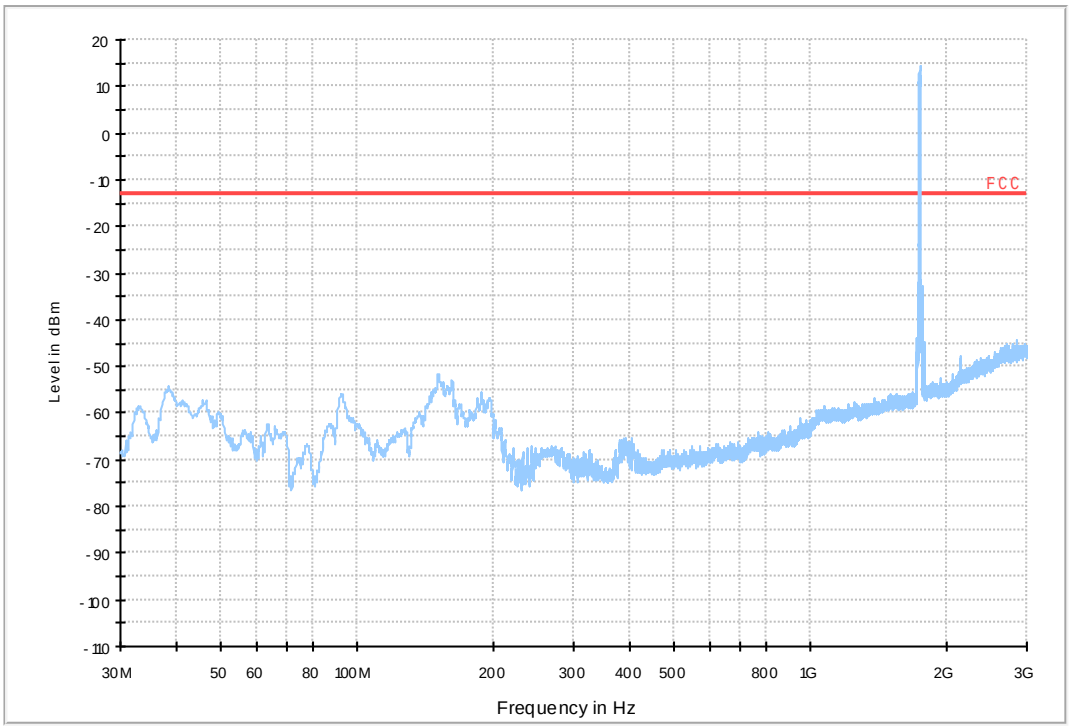
### 7.1.3 Test Band = WCDMA1700_ANT1

#### 7.1.3.1 Test Mode = UMTS/TM1

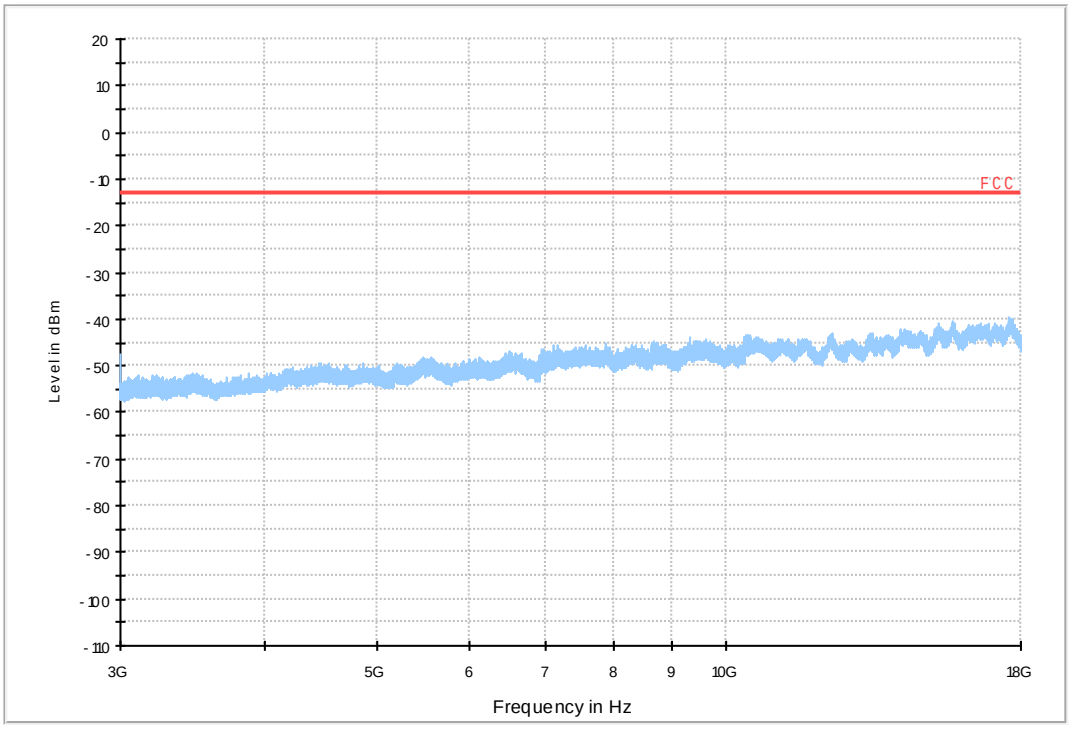



Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

18 FCC PART 27 WCDMA1700_L

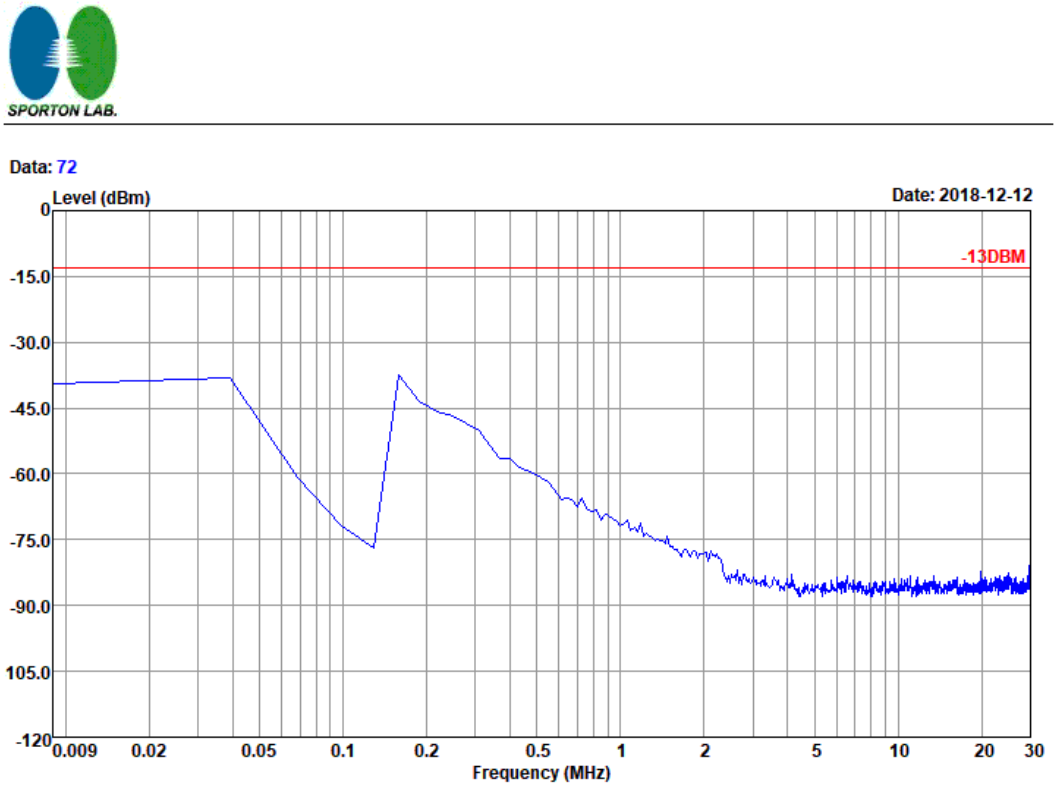



17 FCC PART 27 WCDMA1700_H



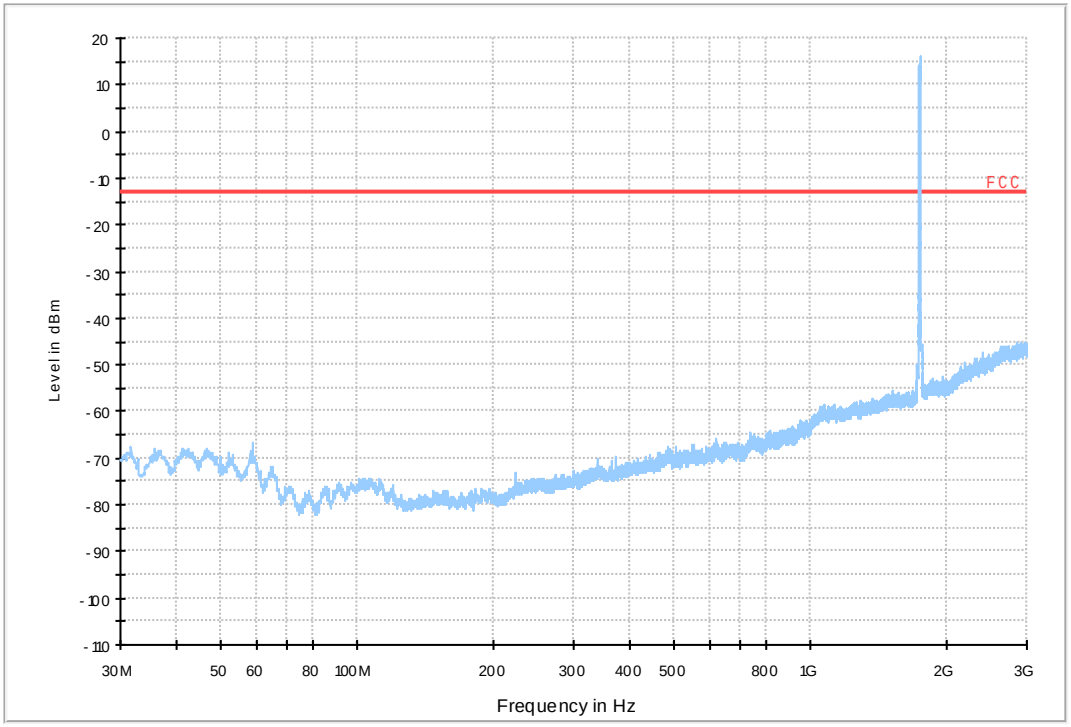
### 7.1.4 Test Band = WCDMA1700_ANT2

#### 7.1.4.1 Test Mode = UMTS/TM1

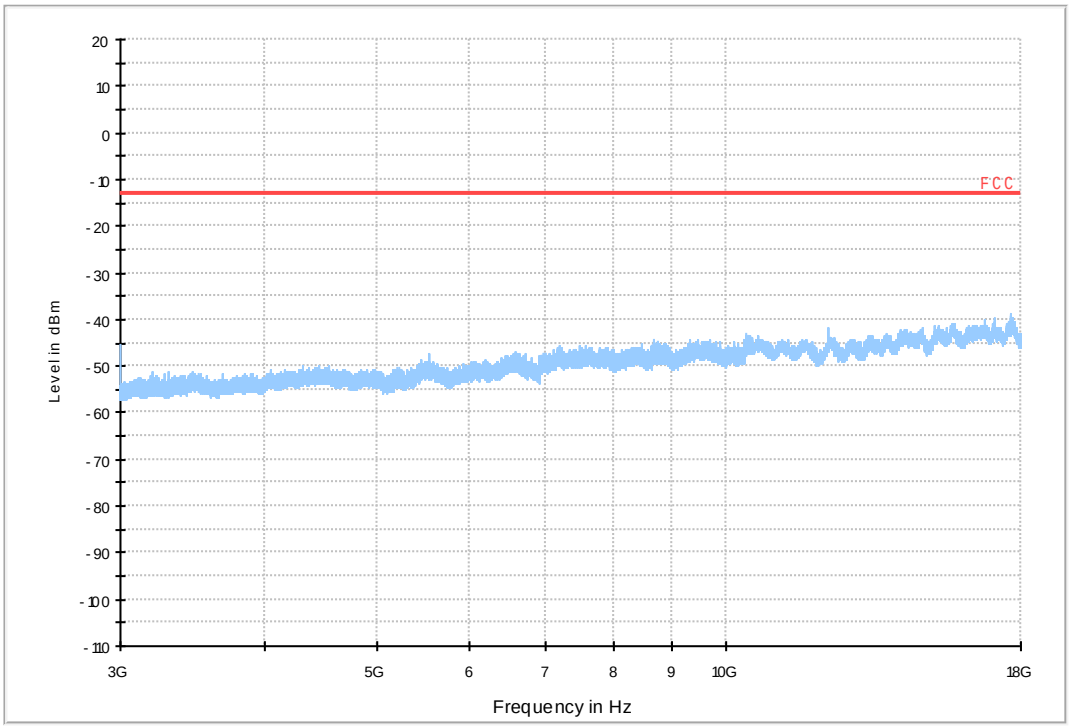



Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

18 FCC PART 27 WCDMA1700_L

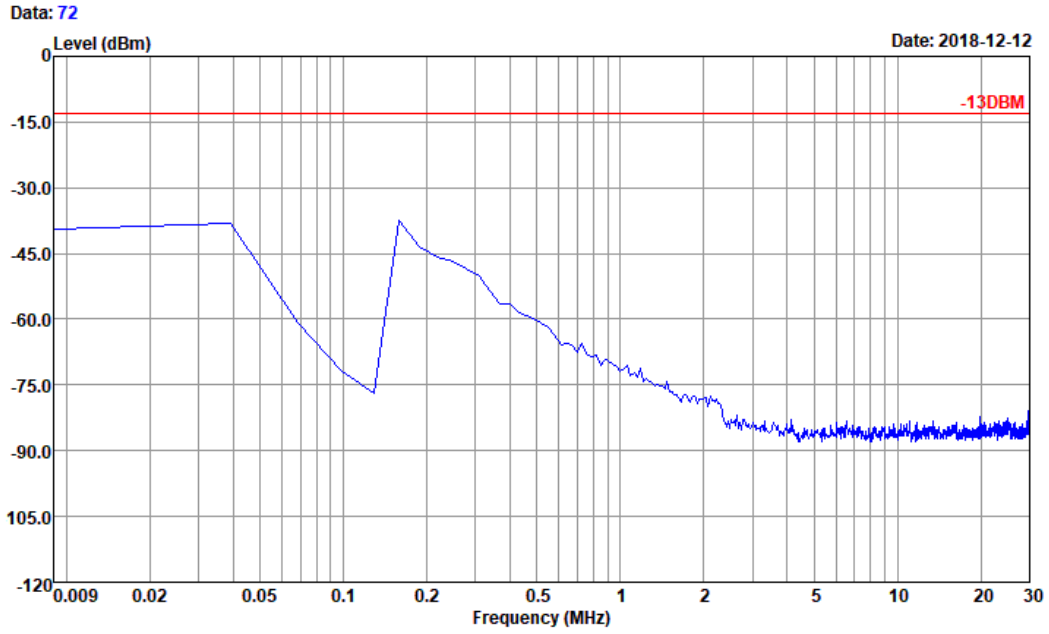



17 FCC PART 27 WCDMA1700_H



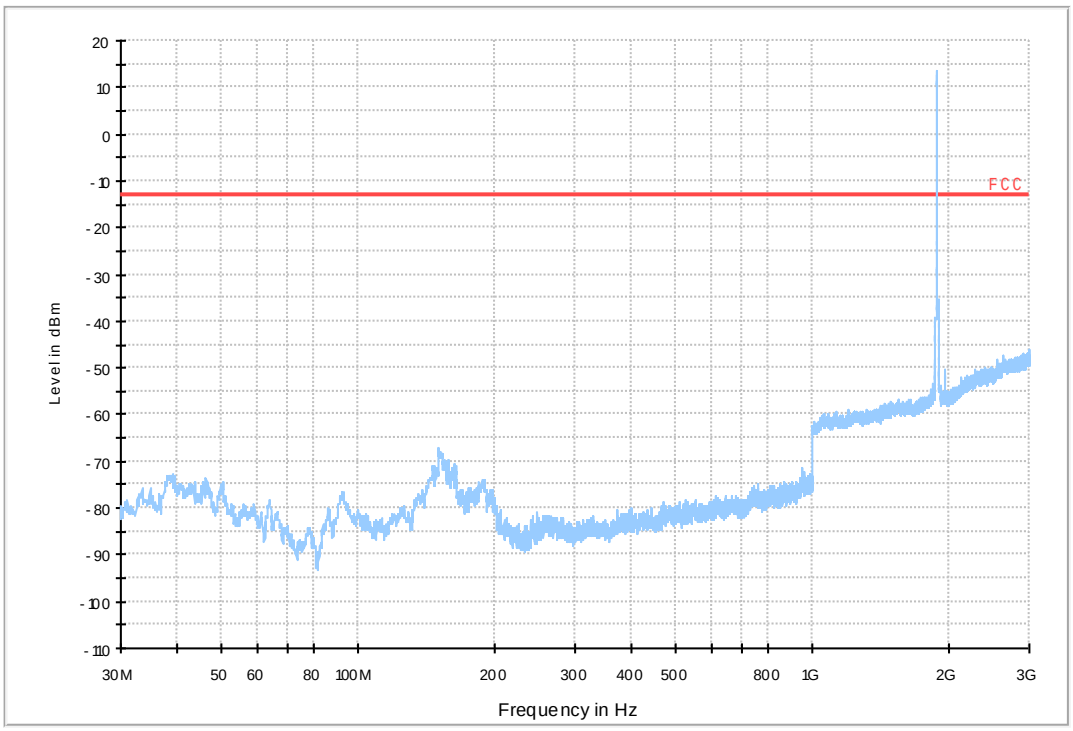
### 7.1.5 Test Band = WCDMA1900_ANT1

#### 7.1.5.1 Test Mode = UMTS/TM1

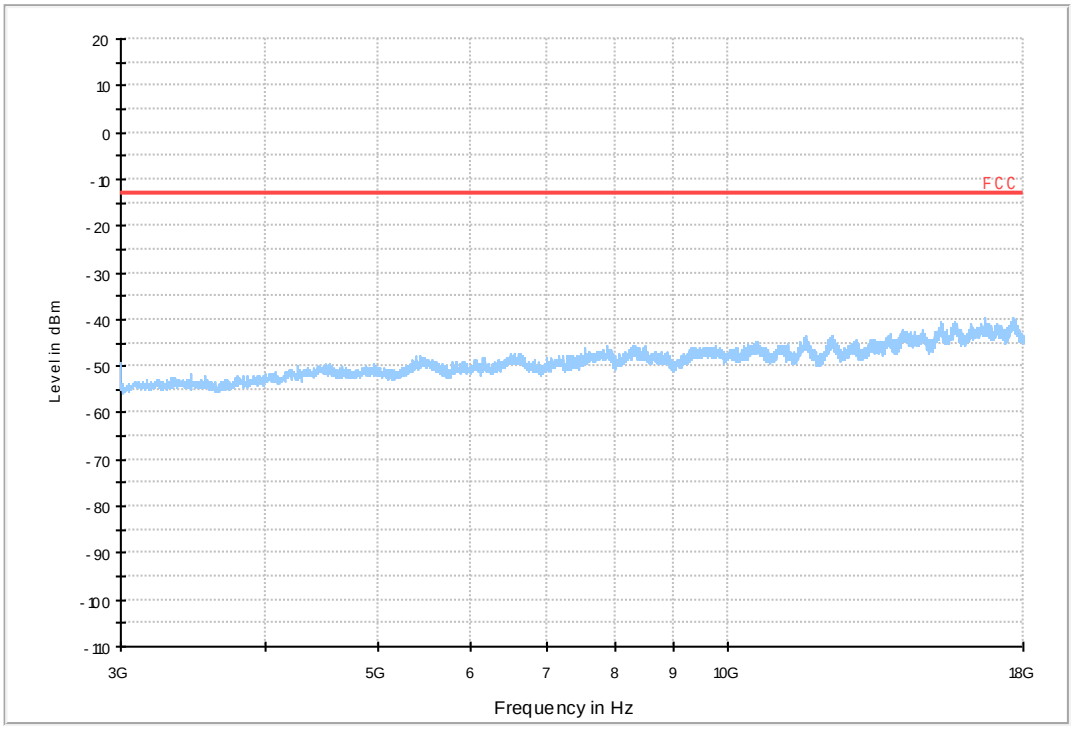



Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

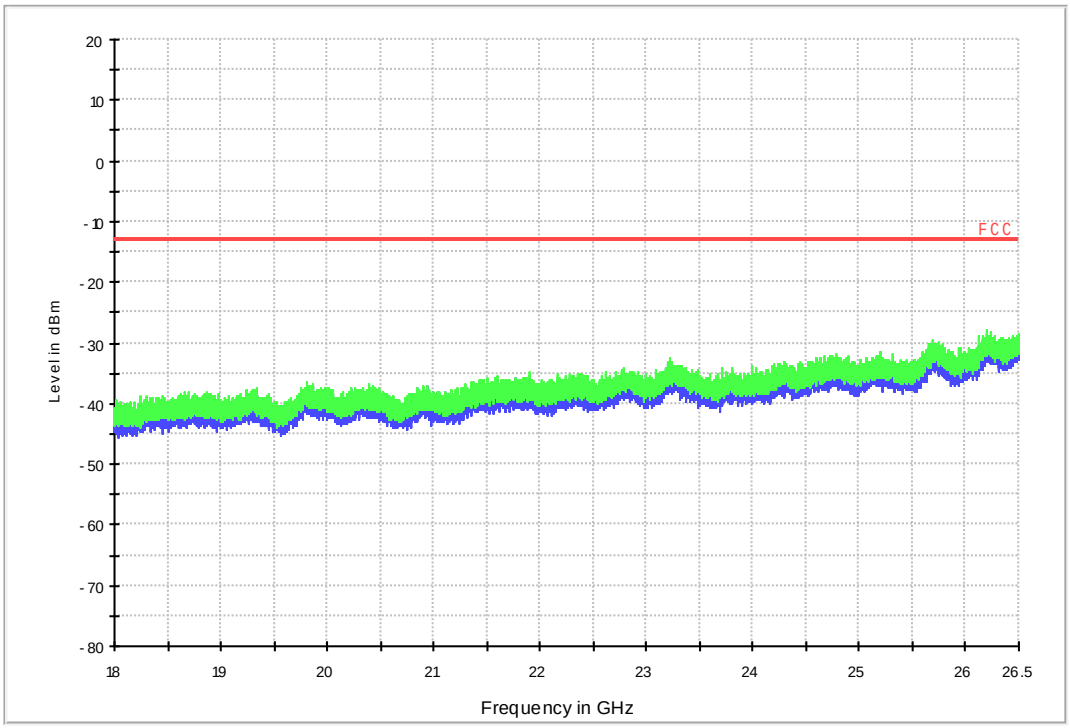
12 FCC PART 24 WCDMA1900_L




11 FCC PART 24 WCDMA1900_H

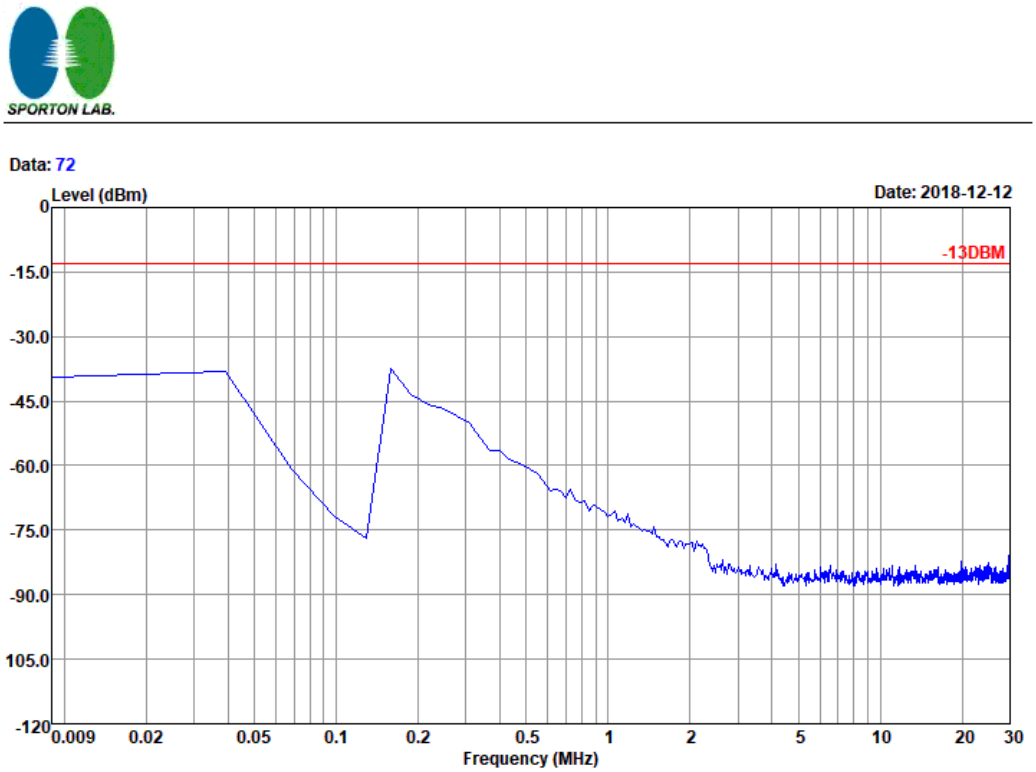


18G~26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK



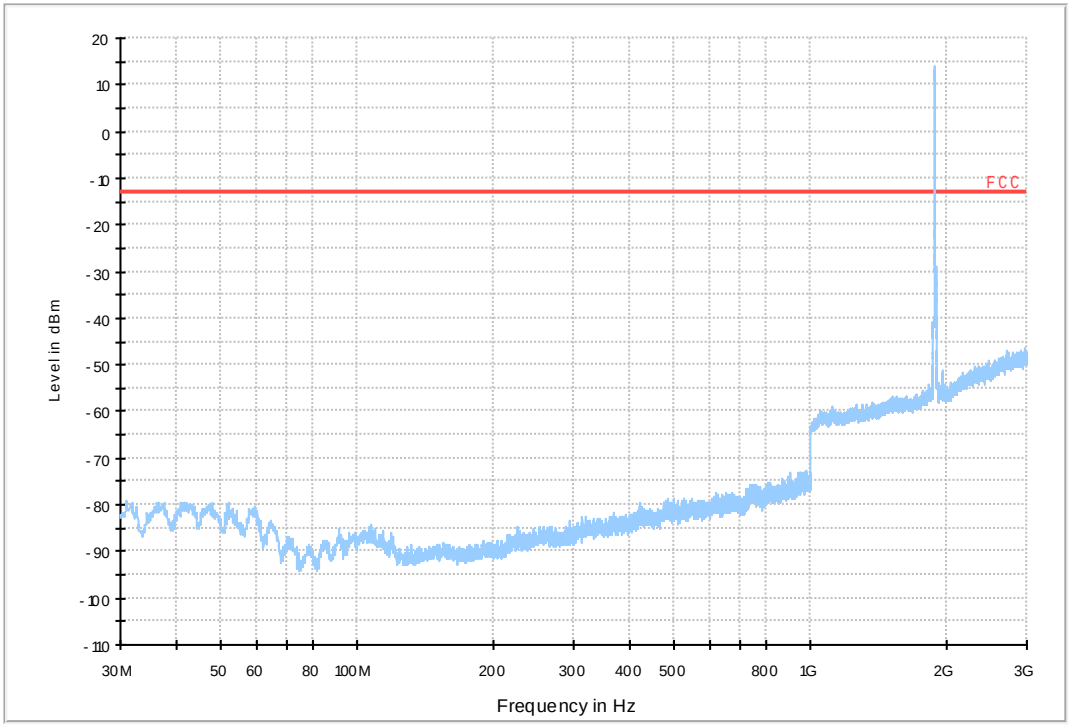
### 7.1.6 Test Band = WCDMA1900_ANT2

#### 7.1.6.1 Test Mode = UMTS/TM1

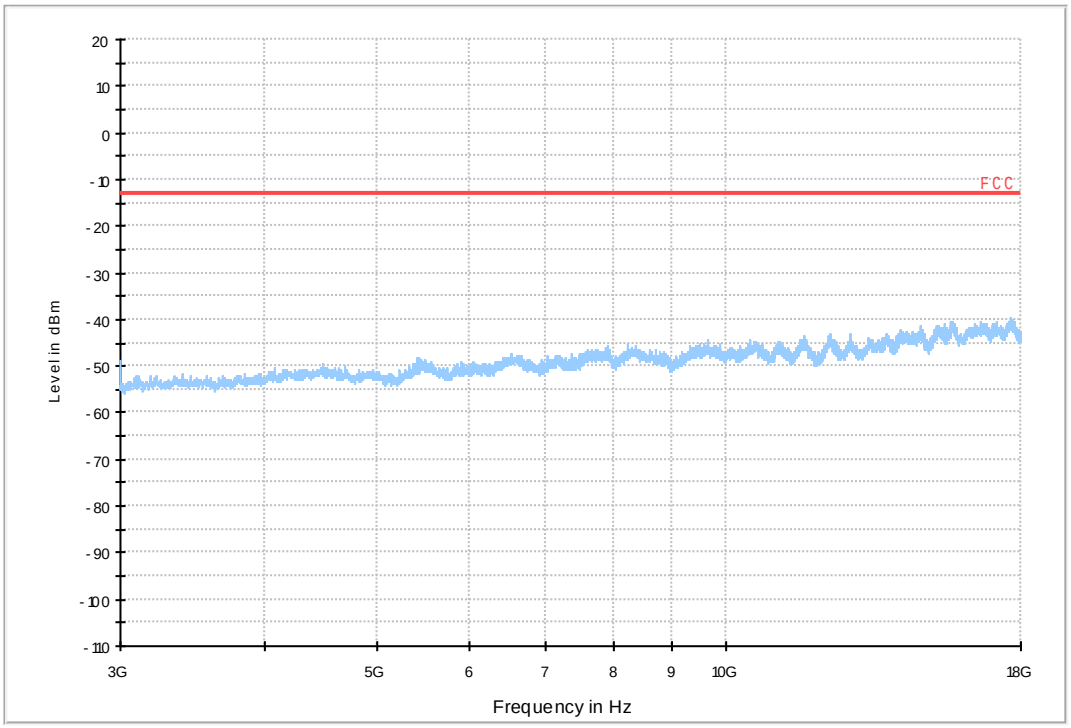



Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

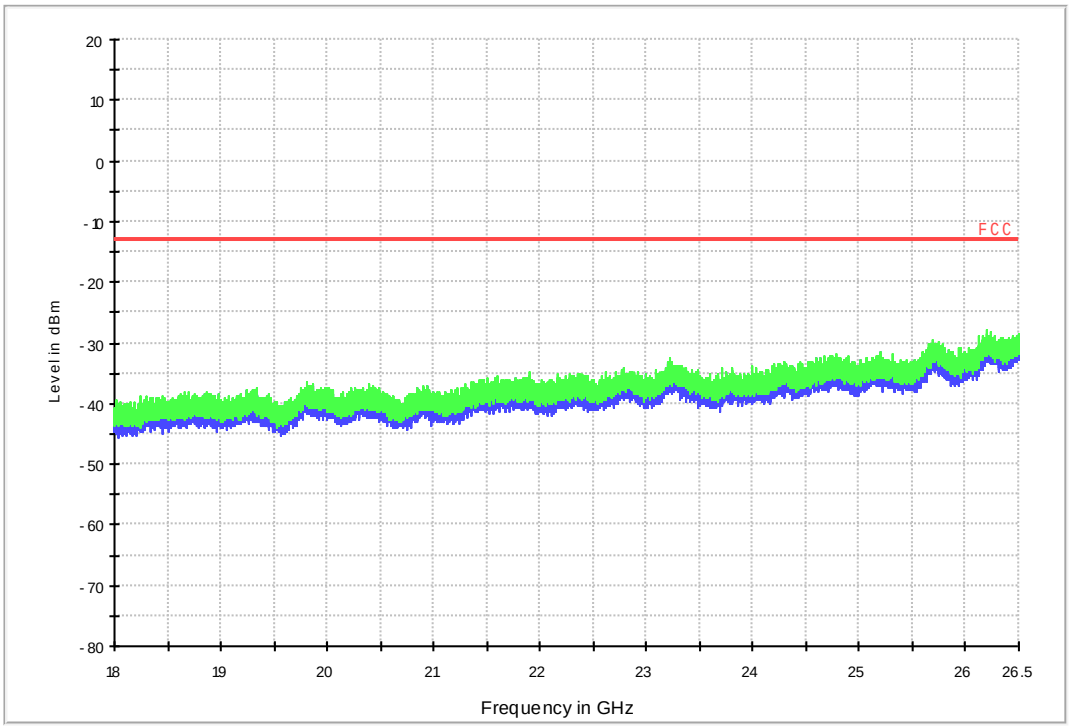
12 FCC PART 24 WCDMA1900_L




11 FCC PART 24 WCDMA1900_H



18G~26.5G RSE-TX-DIRECTOR 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 |
|---|---|---|---|---|---|---|---|
| WCDMA850 | UMTS/TM1 | LCH | TN | VL | 2.38180 | 0.00288 | PASS |
| | | | | VN | -0.93698 | -0.00113 | PASS |
| | | | | VH | 6.82354 | 0.00826 | PASS |
| | | MCH | TN | VL | 8.69751 | 0.01040 | PASS |
| | | | | VN | 6.03676 | 0.00722 | PASS |
| | | | | VH | 7.43866 | 0.00889 | PASS |
| | | HCH | TN | VL | 5.87225 | 0.00694 | PASS |
| | | | | VN | -1.10865 | -0.00131 | PASS |
| | | | | VH | 0.86546 | 0.00102 | PASS |
| WCDMA1700 | UMTS/TM1 | LCH | TN | VL | 11.98053 | 0.00700 | PASS |
| | | | | VN | 8.38280 | 0.00490 | PASS |
| | | | | VH | 14.00471 | 0.00818 | PASS |
| | | MCH | TN | VL | 9.33409 | 0.00539 | PASS |
| | | | | VN | 11.96623 | 0.00691 | PASS |
| | | | | VH | 10.72884 | 0.00619 | PASS |
| | | HCH | TN | VL | 6.21557 | 0.00355 | PASS |
| | | | | VN | 4.37737 | 0.00250 | PASS |
| | | | | VH | 12.50267 | 0.00713 | PASS |
| WCDMA1900 | UMTS/TM1 | LCH | TN | VL | 6.66618 | 0.00360 | PASS |
| | | | | VN | 3.41892 | 0.00185 | PASS |
| | | | | VH | 6.47306 | 0.00349 | PASS |
| | | MCH | TN | VL | 10.32829 | 0.00549 | PASS |
| | | | | VN | 4.37021 | 0.00232 | PASS |
| | | | | VH | 11.75880 | 0.00625 | PASS |
| | | HCH | TN | VL | 0.81539 | 0.00360 | PASS |
| | | | | VN | 1.25885 | 0.00185 | PASS |
| | | | | VH | 0.38624 | 0.00349 | 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 | 7.93219 | 0.00960 | PASS |
| | | | | -20 | 3.22580 | 0.00390 | PASS |
| | | | | -10 | 1.63794 | 0.00198 | PASS |
| | | | | 0 | 3.81231 | 0.00461 | PASS |
| | | | | 10 | 3.67641 | 0.00445 | PASS |
| | | | | 20 | -0.93698 | -0.00113 | PASS |
| | | | | 30 | 5.69344 | 0.00689 | PASS |
| | | | | 40 | 4.24147 | 0.00513 | PASS |
| | | | | 50 | 4.04120 | 0.00489 | PASS |
| | | MCH | VN | -30 | 3.16143 | 0.00378 | PASS |
| | | | | -20 | 0.75102 | 0.00090 | PASS |
| | | | | -10 | 5.35011 | 0.00640 | PASS |
| | | | | 0 | 3.60489 | 0.00431 | PASS |
| | | | | 10 | 9.15527 | 0.01095 | PASS |
| | | | | 20 | 6.03676 | 0.00722 | PASS |
| | | | | 30 | 6.51598 | 0.00779 | PASS |
| | | | | 40 | 5.85079 | 0.00700 | PASS |
| | | | | 50 | 7.48873 | 0.00895 | PASS |
| | | HCH | VN | -30 | 5.87225 | 0.00694 | PASS |
| | | | | -20 | 3.93391 | 0.00465 | PASS |
| | | | | -10 | -1.60932 | -0.00190 | PASS |
| | | | | 0 | 5.57899 | 0.00659 | PASS |
| | | | | 10 | 1.18732 | 0.00140 | PASS |
| | | | | 20 | -1.10865 | -0.00131 | PASS |
| | | | | 30 | 0.30041 | 0.00035 | PASS |
| | | | | 40 | 5.09977 | 0.00603 | PASS |
| | | | | 50 | 0.57936 | 0.00068 | PASS |
| WCDMA1700 | UMTS/TM1 | LCH | VN | -30 | 9.55582 | 0.00558 | PASS |
| | | | | -20 | 10.95772 | 0.00640 | PASS |
| | | | | -10 | 7.88212 | 0.00460 | PASS |
| | | | | 0 | 10.37121 | 0.00606 | PASS |
| | | | | 10 | 8.94070 | 0.00522 | PASS |
| | | | | 20 | 8.38280 | 0.00490 | PASS |
| | | | | 30 | 11.25813 | 0.00657 | PASS |
| | | | | 40 | 9.42707 | 0.00551 | PASS |
| | | | | 50 | 10.48565 | 0.00612 | PASS |
| | | MCH | VN | -30 | 5.90801 | 0.00341 | PASS |
| | | | | -20 | 11.55853 | 0.00667 | PASS |

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|---|---|---|---|---|---|---|---|
| | | | | -10 | 3.99828 | 0.00231 | PASS |
| | | | | 0 | 7.57456 | 0.00437 | PASS |
| | | | | 10 | 13.98325 | 0.00807 | PASS |
| | | | | 20 | 11.96623 | 0.00691 | PASS |
| | | | | 30 | 8.62598 | 0.00498 | PASS |
| | | | | 40 | 3.46899 | 0.00200 | PASS |
| | | | | 50 | 12.55989 | 0.00725 | PASS |
| | | HCH | VN | -30 | 6.20842 | 0.00354 | PASS |
| | | | | -20 | 8.66890 | 0.00495 | PASS |
| | | | | -10 | 7.18117 | 0.00410 | PASS |
| | | | | 0 | 11.02209 | 0.00629 | PASS |
| | | | | 10 | 6.03676 | 0.00344 | PASS |
| | | | | 20 | 4.37737 | 0.00250 | PASS |
| | | | | 30 | 9.30548 | 0.00531 | PASS |
| | | | | 40 | 6.47306 | 0.00369 | PASS |
| | | | | 50 | 4.00543 | 0.00229 | PASS |
| WCDMA1900 | UMTS/TM1 | LCH | VN | -30 | 9.63449 | 0.00520 | PASS |
| | | | | -20 | 7.70330 | 0.00416 | PASS |
| | | | | -10 | 5.92947 | 0.00320 | PASS |
| | | | | 0 | 6.70195 | 0.00362 | PASS |
| | | | | 10 | 5.29289 | 0.00286 | PASS |
| | | | | 20 | 3.41892 | 0.00185 | PASS |
| | | | | 30 | 14.05478 | 0.00759 | PASS |
| | | | | 40 | 8.08239 | 0.00436 | PASS |
| | | | | 50 | 1.88827 | 0.00102 | PASS |
| | | MCH | VN | -30 | 7.23124 | 0.00385 | PASS |
| | | | | -20 | 12.25948 | 0.00652 | PASS |
| | | | | -10 | 9.74894 | 0.00519 | PASS |
| | | | | 0 | 10.45704 | 0.00556 | PASS |
| | | | | 10 | 10.93626 | 0.00582 | PASS |
| | | | | 20 | 4.37021 | 0.00232 | PASS |
| | | | | 30 | 12.30955 | 0.00655 | PASS |
| | | | | 40 | 4.52757 | 0.00241 | PASS |
| | | | | 50 | 2.56777 | 0.00137 | PASS |
| | | HCH | VN | -30 | 0.85115 | 0.00045 | PASS |
| | | | | -20 | 3.18289 | 0.00167 | PASS |
| | | | | -10 | 7.34568 | 0.00385 | PASS |
| | | | | 0 | -0.11444 | -0.00006 | PASS |
| | | | | 10 | 5.55039 | 0.00291 | PASS |
| | | | | 20 | 1.25885 | 0.00066 | PASS |

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|---|---|---|---|---|---|---|---|
| | | | | 30 | 0.85831 | 0.00045 | PASS |
| | | | | 40 | 0.54359 | 0.00028 | PASS |
| | | | | 50 | 1.29461 | 0.00068 | PASS |

END