

## **Appendix for Band 13**

Product Name: Intelligent Two Way Radio  
Model No: T640A

## Appendix A: Average Power Output Data

### Test Result

**Channel Bandwidth: 5 MHz**

| Modulation | Channel | RB Configuration |        | Average Power [dBm] | Verdict |
|------------|---------|------------------|--------|---------------------|---------|
|            |         | Size             | Offset |                     |         |
| QPSK       | LCH     | 1                | 0      | 23.47               | PASS    |
|            |         | 1                | 12     | 23.78               | PASS    |
|            |         | 1                | 24     | 23.5                | PASS    |
|            |         | 12               | 0      | 22.34               | PASS    |
|            |         | 12               | 6      | 22.5                | PASS    |
|            |         | 12               | 13     | 22.37               | PASS    |
|            |         | 25               | 0      | 22.38               | PASS    |
|            | MCH     | 1                | 0      | 23.45               | PASS    |
|            |         | 1                | 12     | 23.8                | PASS    |
|            |         | 1                | 24     | 23.54               | PASS    |
|            |         | 12               | 0      | 22.61               | PASS    |
|            |         | 12               | 6      | 22.6                | PASS    |
|            |         | 12               | 13     | 22.44               | PASS    |
|            |         | 25               | 0      | 22.53               | PASS    |
|            | HCH     | 1                | 0      | 23.57               | PASS    |
|            |         | 1                | 12     | 23.86               | PASS    |
|            |         | 1                | 24     | 23.6                | PASS    |
|            |         | 12               | 0      | 22.59               | PASS    |
|            |         | 12               | 6      | 22.61               | PASS    |
|            |         | 12               | 13     | 22.6                | PASS    |
|            |         | 25               | 0      | 22.65               | PASS    |
| 16QAM      | LCH     | 1                | 0      | 22.65               | PASS    |
|            |         | 1                | 12     | 22.89               | PASS    |
|            |         | 1                | 24     | 22.7                | PASS    |
|            |         | 12               | 0      | 21.44               | PASS    |
|            |         | 12               | 6      | 21.68               | PASS    |
|            |         | 12               | 13     | 21.53               | PASS    |
|            |         | 25               | 0      | 21.44               | PASS    |
|            | MCH     | 1                | 0      | 22.58               | PASS    |
|            |         | 1                | 12     | 22.78               | PASS    |
|            |         | 1                | 24     | 22.76               | PASS    |
|            |         | 12               | 0      | 21.86               | PASS    |
|            |         | 12               | 6      | 21.84               | PASS    |

|  |     |    |    |       |      |
|--|-----|----|----|-------|------|
|  |     | 12 | 13 | 21.68 | PASS |
|  |     | 25 | 0  | 21.66 | PASS |
|  | HCH | 1  | 0  | 22.68 | PASS |
|  |     | 1  | 12 | 22.67 | PASS |
|  |     | 1  | 24 | 22.74 | PASS |
|  |     | 12 | 0  | 21.74 | PASS |
|  |     | 12 | 6  | 21.74 | PASS |
|  |     | 12 | 13 | 21.78 | PASS |
|  |     | 25 | 0  | 21.83 | PASS |
|  |     |    |    |       |      |

**Channel Bandwidth: 10 MHz**

| Modulation | Channel | RB Configuration |        | Average Power [dBm] | Verdict |
|------------|---------|------------------|--------|---------------------|---------|
|            |         | Size             | Offset |                     |         |
| QPSK       | MCH     | 1                | 0      | 23.47               | PASS    |
|            |         | 1                | 24     | 23.82               | PASS    |
|            |         | 1                | 49     | 23.56               | PASS    |
|            |         | 25               | 0      | 22.48               | PASS    |
|            |         | 25               | 12     | 22.54               | PASS    |
|            |         | 25               | 25     | 22.51               | PASS    |
|            |         | 50               | 0      | 22.49               | PASS    |
| 16QAM      | MCH     | 1                | 0      | 22.63               | PASS    |
|            |         | 1                | 24     | 22.89               | PASS    |
|            |         | 1                | 49     | 22.80               | PASS    |
|            |         | 25               | 0      | 21.58               | PASS    |
|            |         | 25               | 12     | 21.64               | PASS    |
|            |         | 25               | 25     | 21.67               | PASS    |
|            |         | 50               | 0      | 21.57               | PASS    |

## Appendix B: Peak-to-Average Ratio

### Test Result

#### Channel Bandwidth: 5 MHz

| Channel Bandwidth: 5 MHz |         |                  |        |                               |               |         |
|--------------------------|---------|------------------|--------|-------------------------------|---------------|---------|
| Modulation               | Channel | RB Configuration |        | Peak-to-Average Ratio<br>[dB] | Limit<br>[dB] | Verdict |
|                          |         | Size             | Offset |                               |               |         |
| QPSK                     | LCH     | 1                | 0      | 4.09                          | <13           | PASS    |
|                          |         | 1                | 12     | 3.54                          | <13           | PASS    |
|                          |         | 1                | 24     | 4.62                          | <13           | PASS    |
|                          |         | 12               | 0      | 4.55                          | <13           | PASS    |
|                          |         | 12               | 6      | 4.32                          | <13           | PASS    |
|                          |         | 12               | 13     | 4.79                          | <13           | PASS    |
|                          |         | 25               | 0      | 4.82                          | <13           | PASS    |
|                          | MCH     | 1                | 0      | 3.78                          | <13           | PASS    |
|                          |         | 1                | 12     | 4.49                          | <13           | PASS    |
|                          |         | 1                | 24     | 5.09                          | <13           | PASS    |
|                          |         | 12               | 0      | 4.83                          | <13           | PASS    |
|                          |         | 12               | 6      | 5.31                          | <13           | PASS    |
|                          |         | 12               | 13     | 5.67                          | <13           | PASS    |
|                          |         | 25               | 0      | 5.28                          | <13           | PASS    |
|                          | HCH     | 1                | 0      | 5.12                          | <13           | PASS    |
|                          |         | 1                | 12     | 5.18                          | <13           | PASS    |
|                          |         | 1                | 24     | 4.57                          | <13           | PASS    |
|                          |         | 12               | 0      | 5.68                          | <13           | PASS    |
|                          |         | 12               | 6      | 5.62                          | <13           | PASS    |
|                          |         | 12               | 13     | 5.47                          | <13           | PASS    |
|                          |         | 25               | 0      | 5.54                          | <13           | PASS    |
| 16QAM                    | LCH     | 1                | 0      | 5.04                          | <13           | PASS    |
|                          |         | 1                | 12     | 4.5                           | <13           | PASS    |
|                          |         | 1                | 24     | 5.57                          | <13           | PASS    |
|                          |         | 12               | 0      | 5.37                          | <13           | PASS    |
|                          |         | 12               | 6      | 5.21                          | <13           | PASS    |
|                          |         | 12               | 13     | 5.64                          | <13           | PASS    |
|                          |         | 25               | 0      | 5.6                           | <13           | PASS    |
|                          | MCH     | 1                | 0      | 4.74                          | <13           | PASS    |
|                          |         | 1                | 12     | 5.42                          | <13           | PASS    |
|                          |         | 1                | 24     | 6.24                          | <13           | PASS    |
|                          |         | 12               | 0      | 5.57                          | <13           | PASS    |

|  |     |    |    |      |     |      |
|--|-----|----|----|------|-----|------|
|  |     | 12 | 6  | 6.07 | <13 | PASS |
|  |     | 12 | 13 | 6.53 | <13 | PASS |
|  |     | 25 | 0  | 5.96 | <13 | PASS |
|  | HCH | 1  | 0  | 5.88 | <13 | PASS |
|  |     | 1  | 12 | 6.04 | <13 | PASS |
|  |     | 1  | 24 | 5.45 | <13 | PASS |
|  |     | 12 | 0  | 6.6  | <13 | PASS |
|  |     | 12 | 6  | 6.52 | <13 | PASS |
|  |     | 12 | 13 | 6.32 | <13 | PASS |
|  |     | 25 | 0  | 6.27 | <13 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10 MHz |         |                  |        |                               |               |         |
|---------------------------|---------|------------------|--------|-------------------------------|---------------|---------|
| Modulation                | Channel | RB Configuration |        | Peak-to-Average Ratio<br>[dB] | Limit<br>[dB] | Verdict |
|                           |         | Size             | Offset |                               |               |         |
| QPSK                      | MCH     | 1                | 0      | 3.9                           | <13           | PASS    |
|                           |         | 1                | 24     | 4.61                          | <13           | PASS    |
|                           |         | 1                | 49     | 4.52                          | <13           | PASS    |
|                           |         | 25               | 0      | 4.74                          | <13           | PASS    |
|                           |         | 25               | 12     | 5.25                          | <13           | PASS    |
|                           |         | 25               | 25     | 5.59                          | <13           | PASS    |
|                           |         | 50               | 0      | 5.11                          | <13           | PASS    |
| 16QAM                     | MCH     | 1                | 0      | 4.89                          | <13           | PASS    |
|                           |         | 1                | 24     | 5.43                          | <13           | PASS    |
|                           |         | 1                | 49     | 5.38                          | <13           | PASS    |
|                           |         | 25               | 0      | 5.58                          | <13           | PASS    |
|                           |         | 25               | 12     | 6.14                          | <13           | PASS    |
|                           |         | 25               | 25     | 6.42                          | <13           | PASS    |
|                           |         | 50               | 0      | 5.93                          | <13           | PASS    |

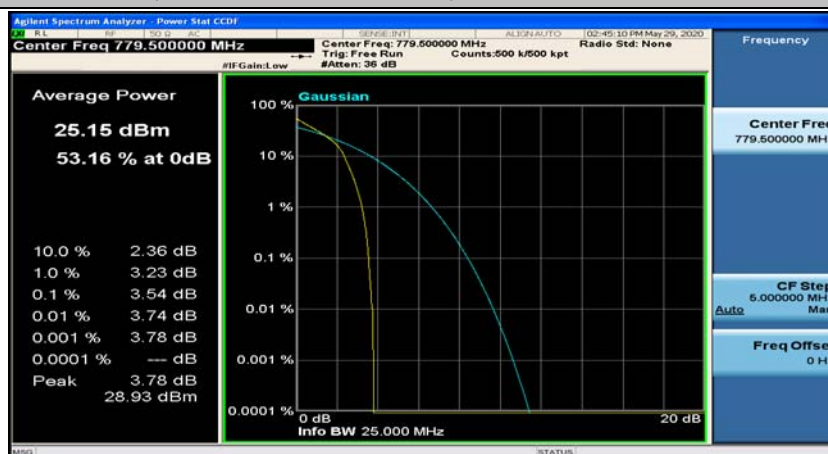
## Test Graphs

### Channel Bandwidth: 5 MHz

(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_1RB#0



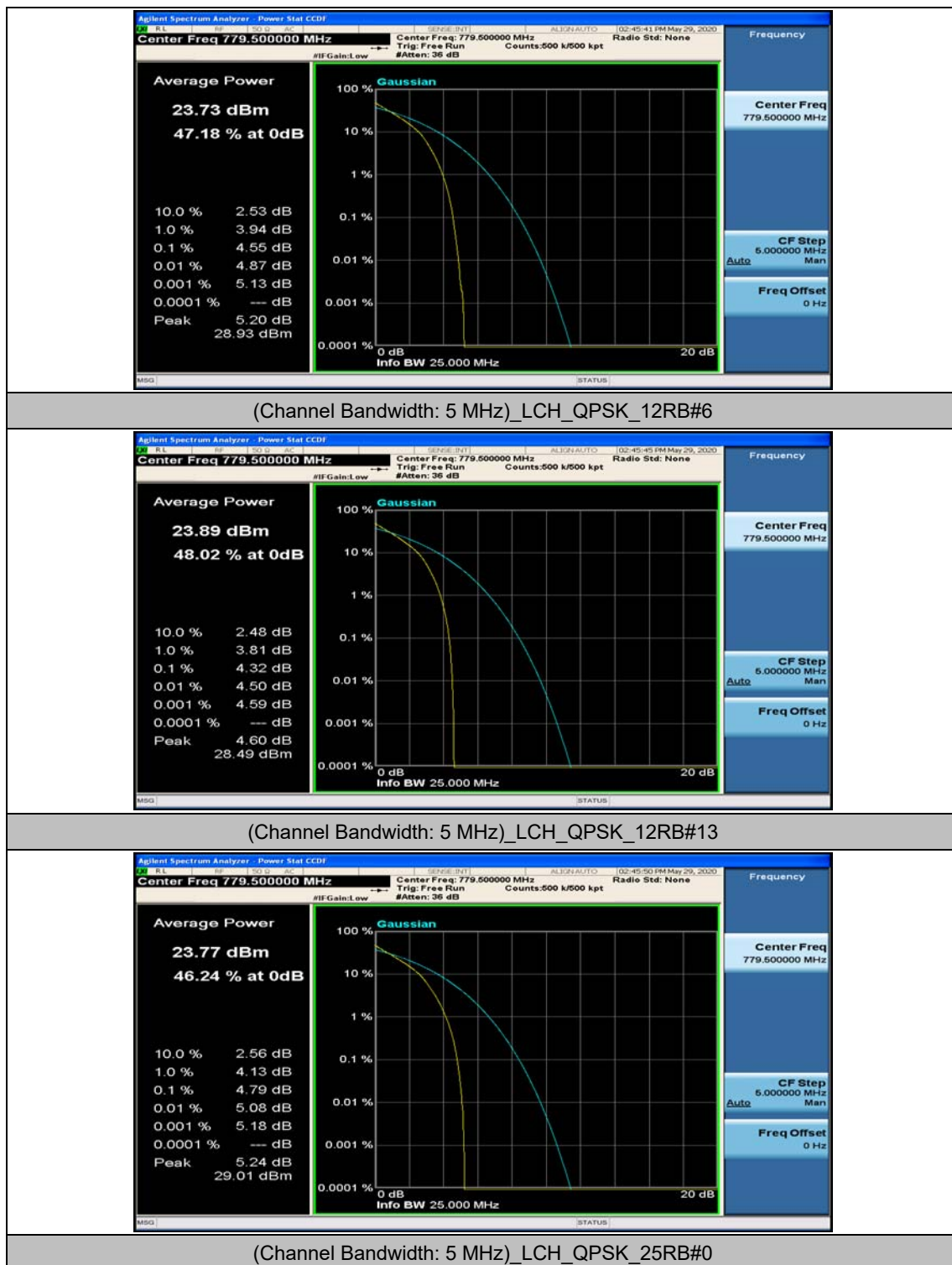
(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_1RB#12

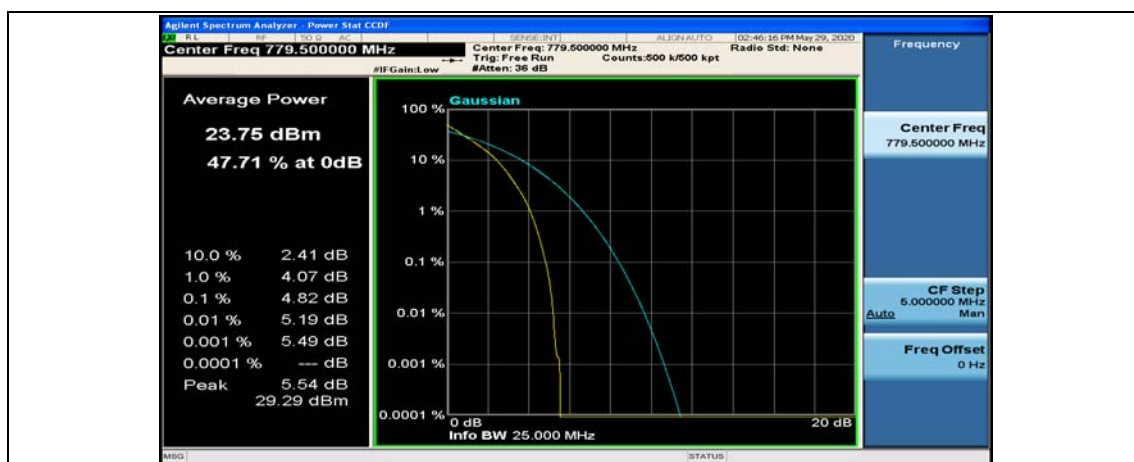


(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_1RB#24



(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_12RB#0





(Channel Bandwidth: 5 MHz)\_MCH\_QPSK\_1RB#0

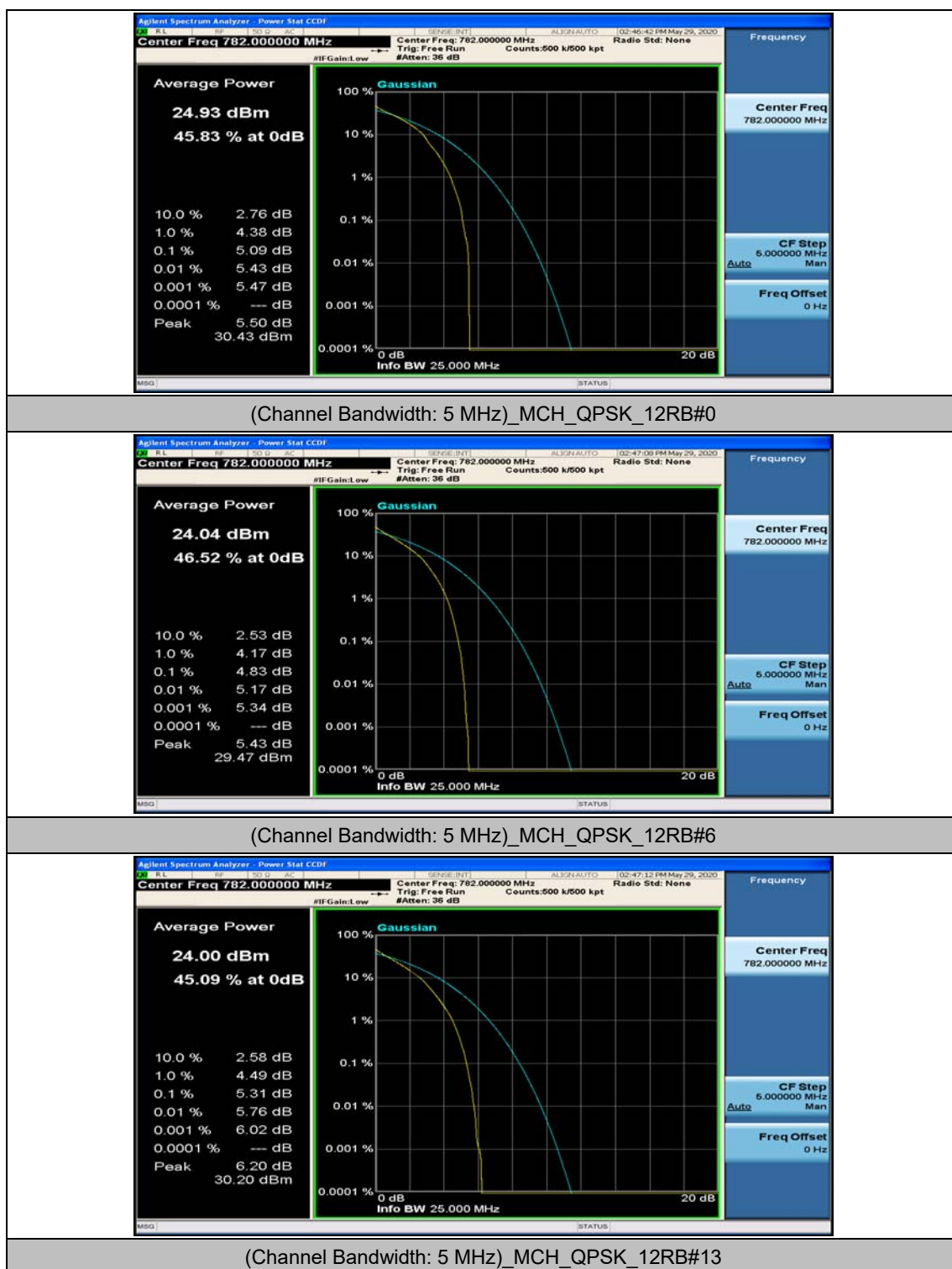


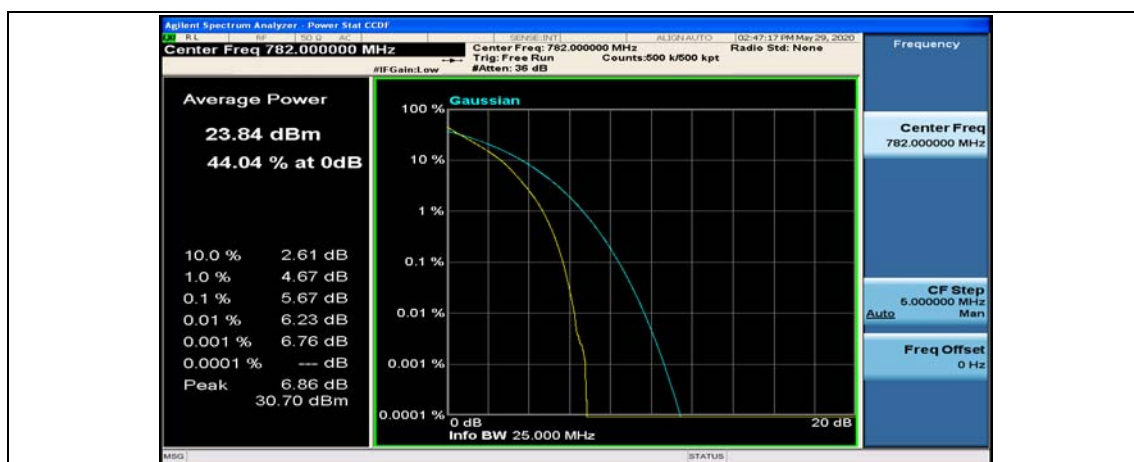
(Channel Bandwidth: 5 MHz)\_MCH\_QPSK\_1RB#12



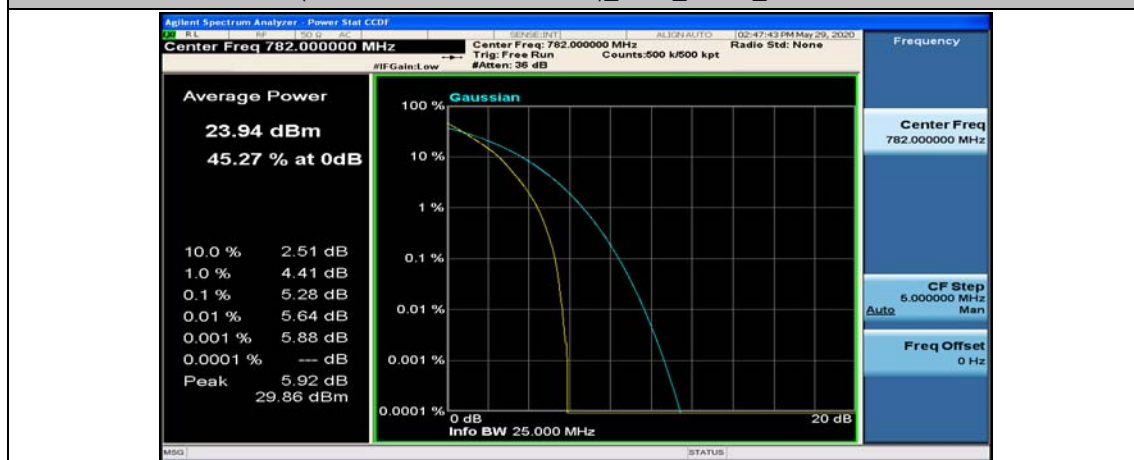
(Channel Bandwidth: 5 MHz)\_MCH\_QPSK\_1RB#24







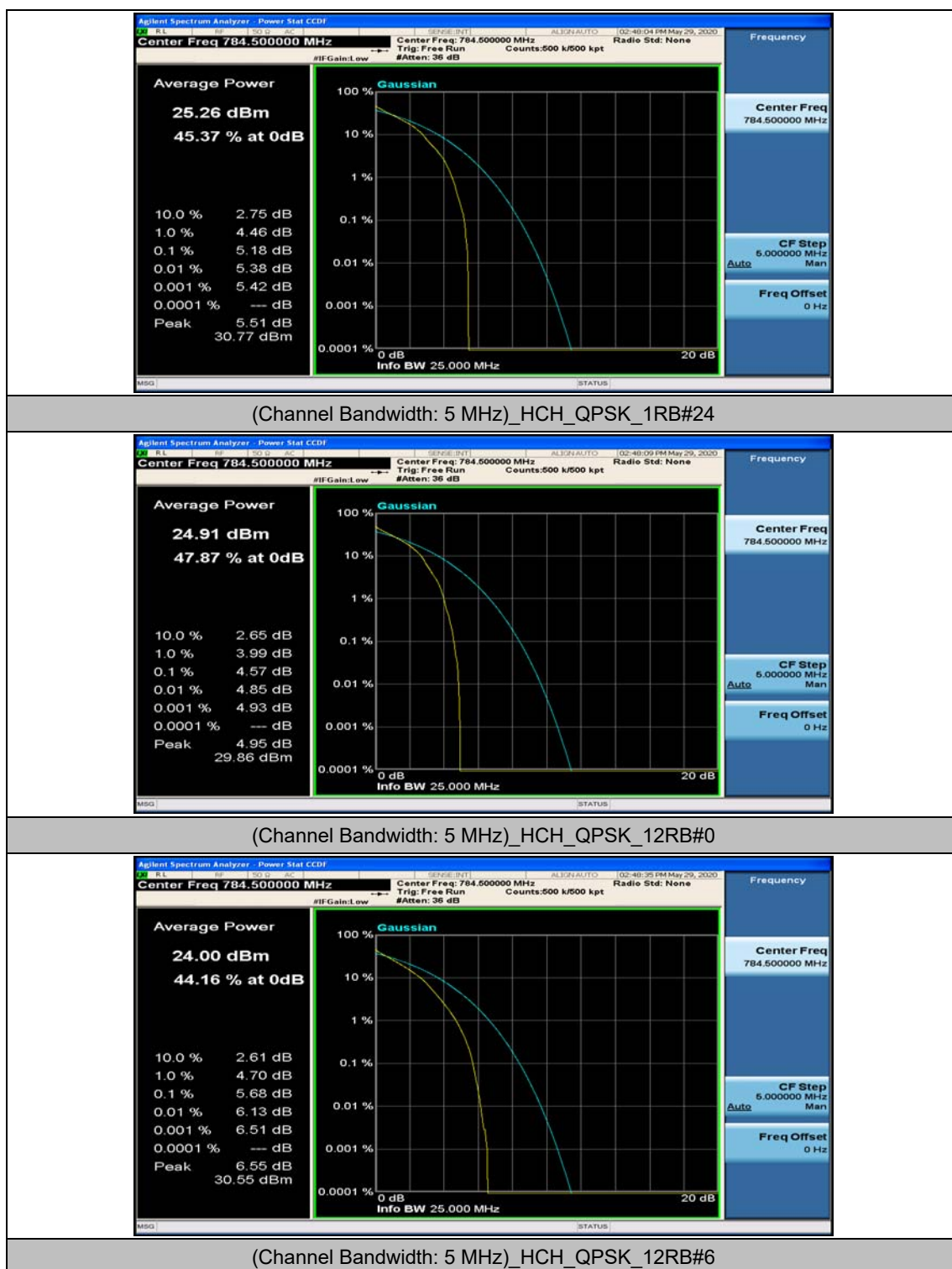
(Channel Bandwidth: 5 MHz)\_MCH\_QPSK\_25RB#0

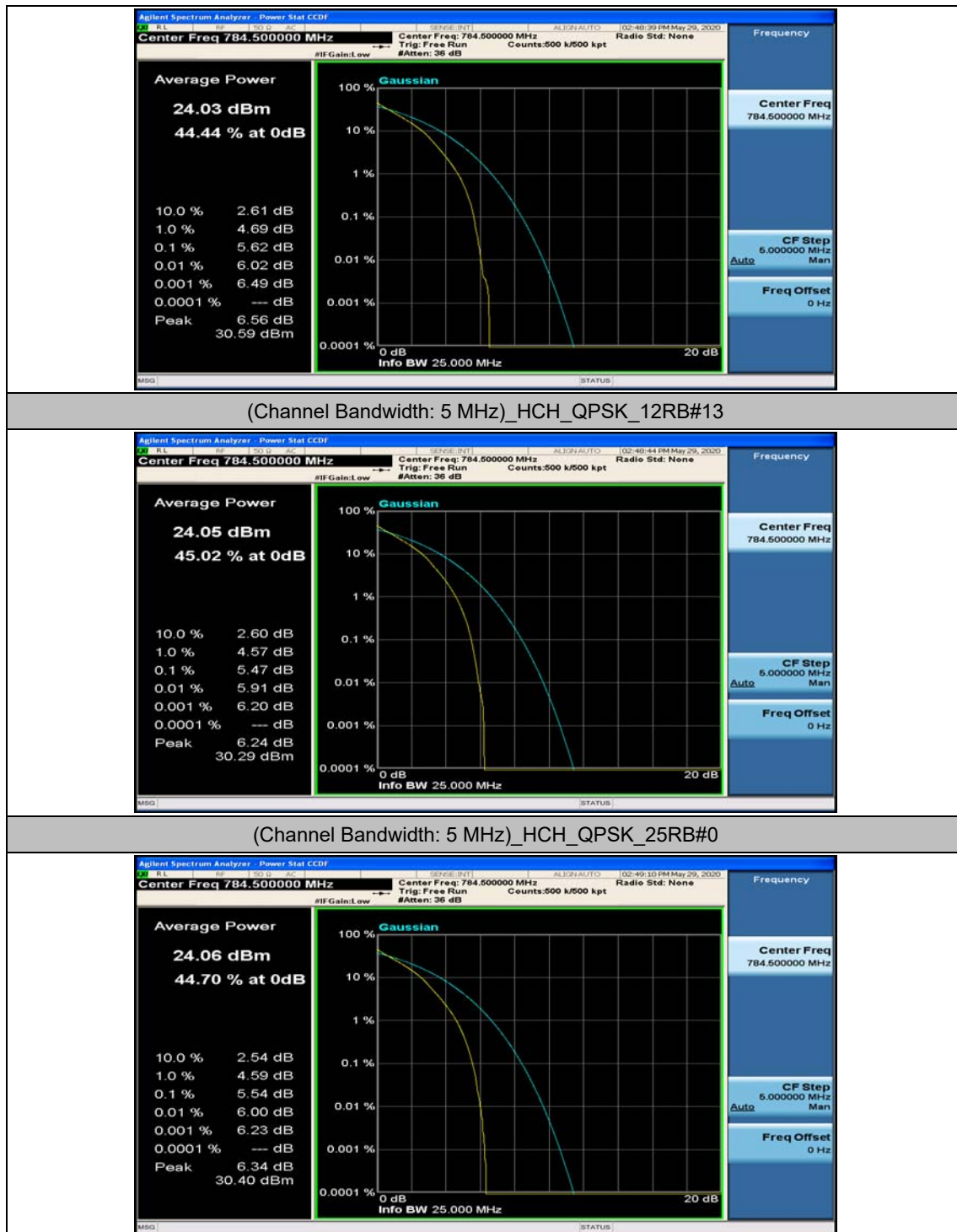


(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_1RB#0



(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_1RB#12

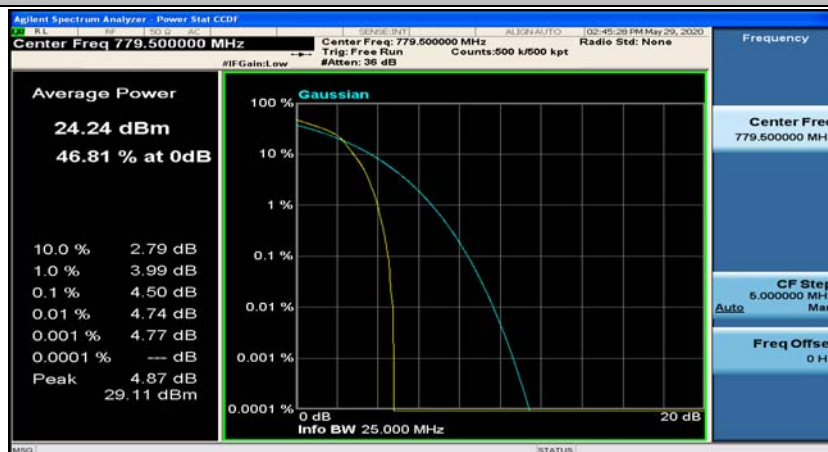




(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_1RB#0



(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_1RB#12

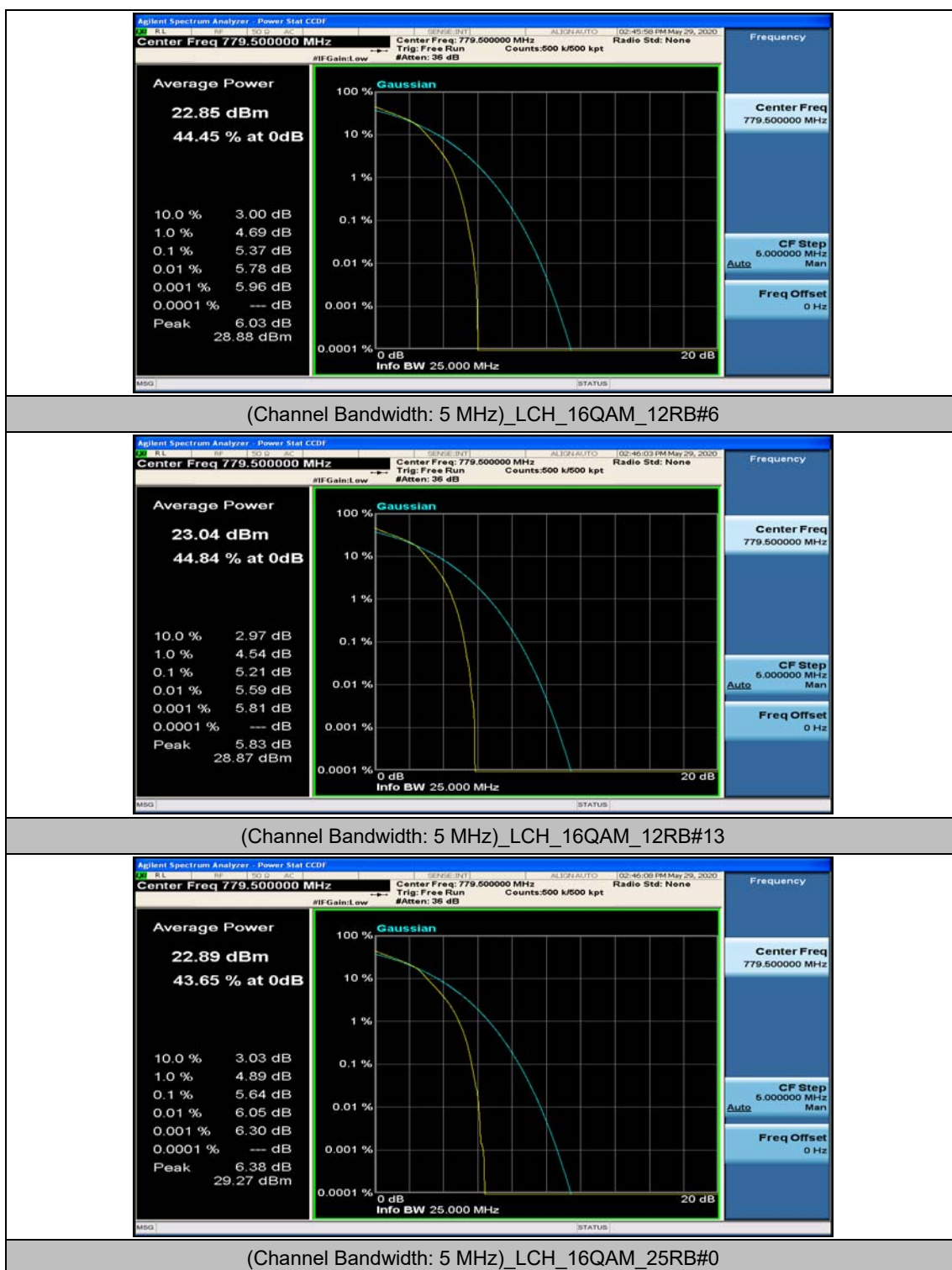


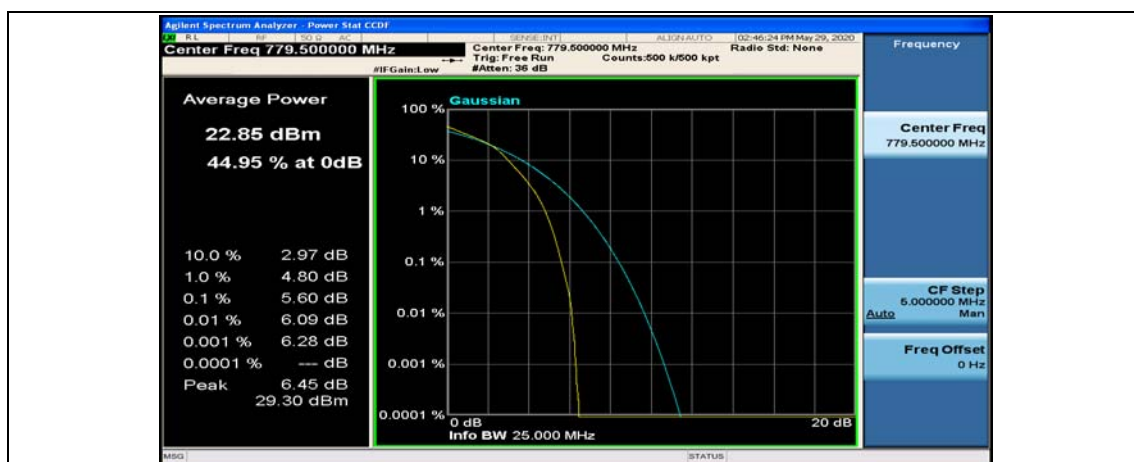
(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_1RB#24



(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_12RB#0







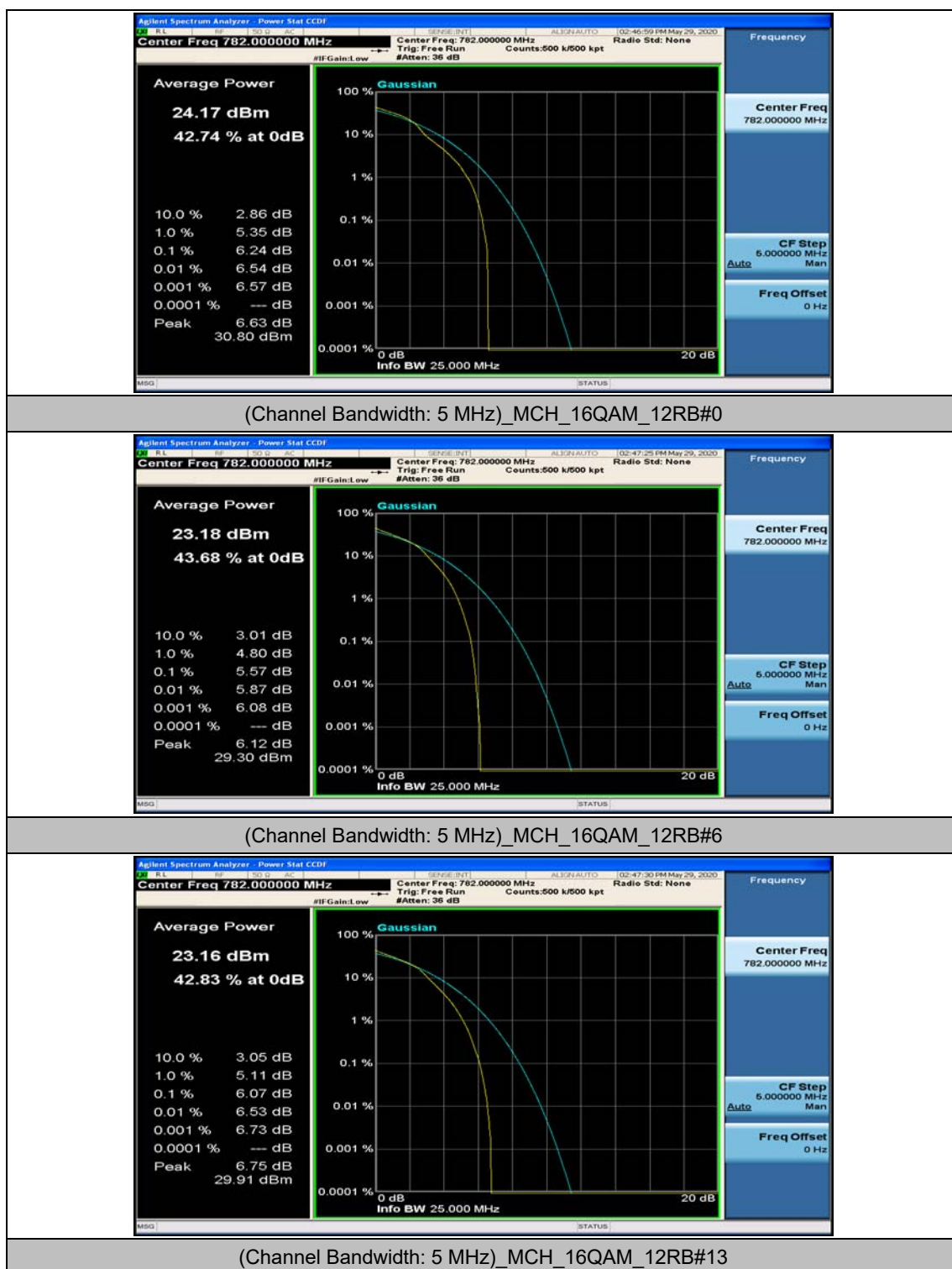
(Channel Bandwidth: 5 MHz)\_MCH\_16QAM\_1RB#0



(Channel Bandwidth: 5 MHz)\_MCH\_16QAM\_1RB#12



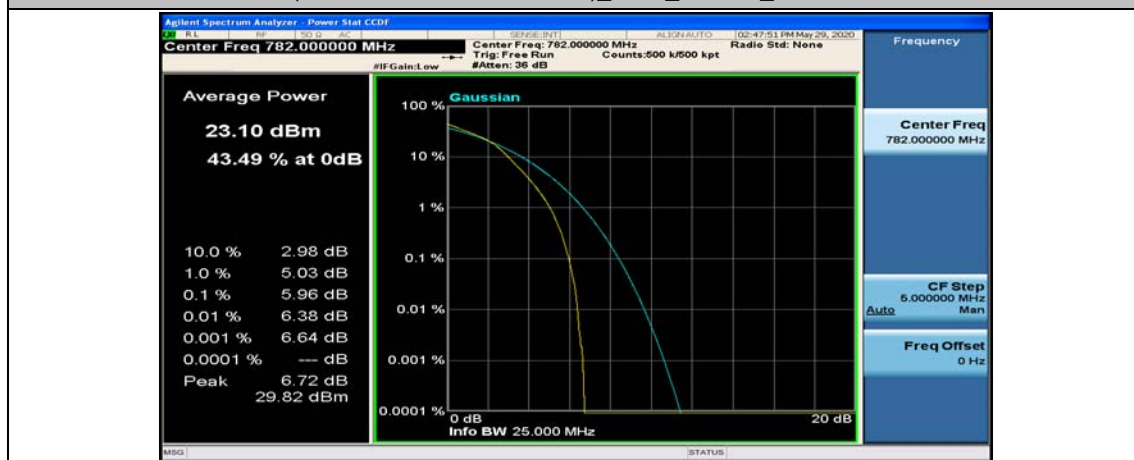
(Channel Bandwidth: 5 MHz)\_MCH\_16QAM\_1RB#24







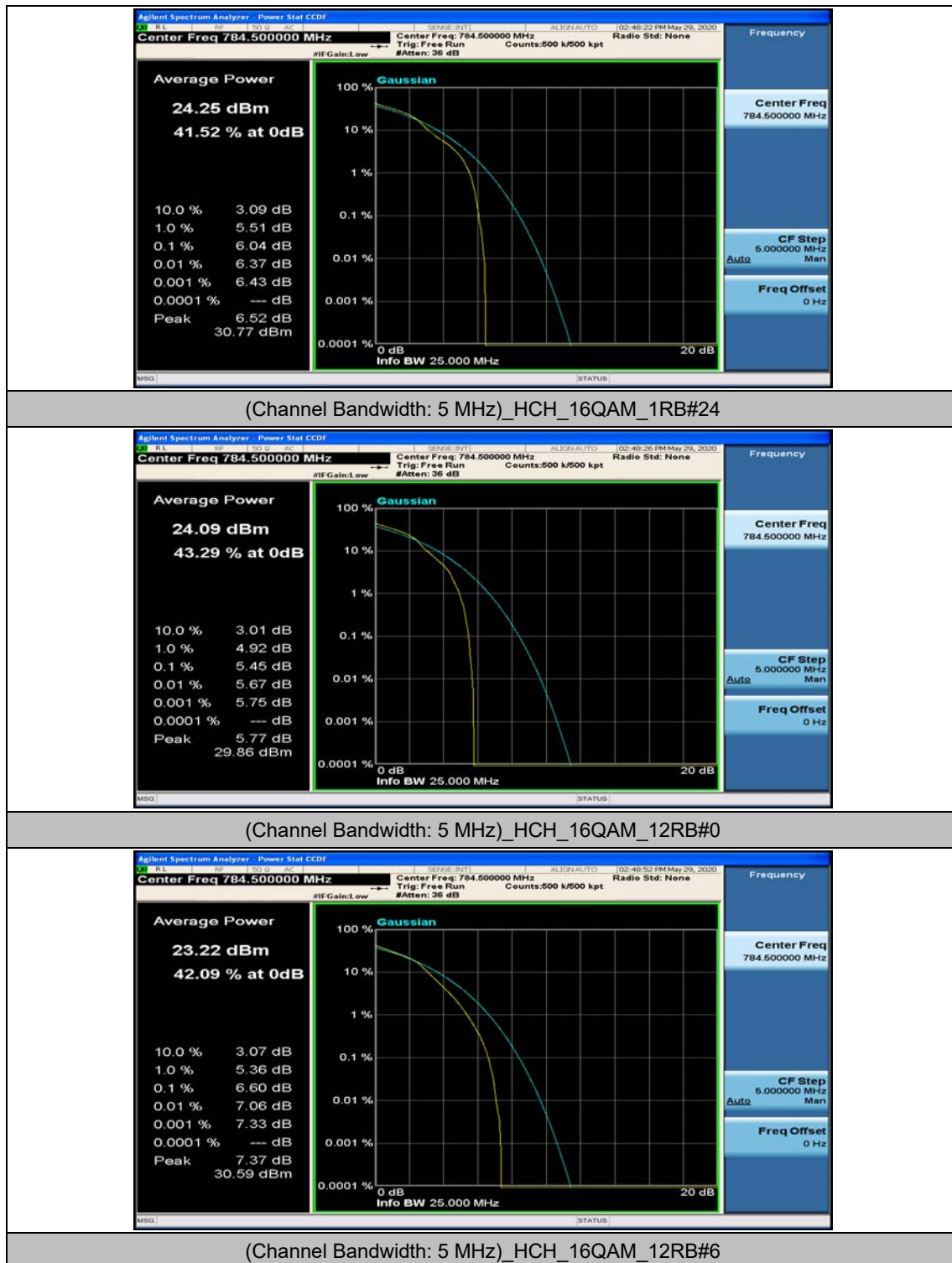
(Channel Bandwidth: 5 MHz)\_MCH\_16QAM\_25RB#0

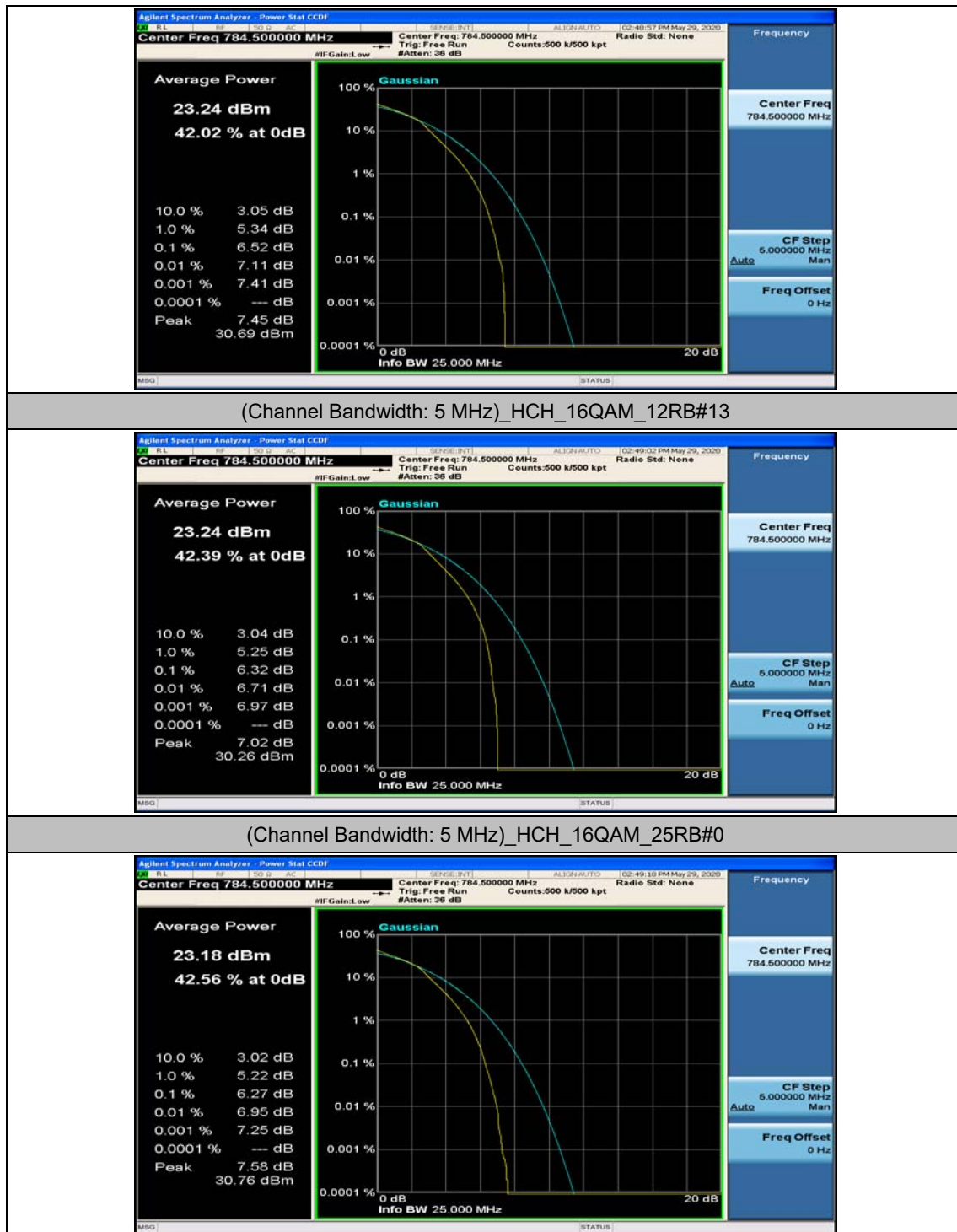


(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_1RB#0

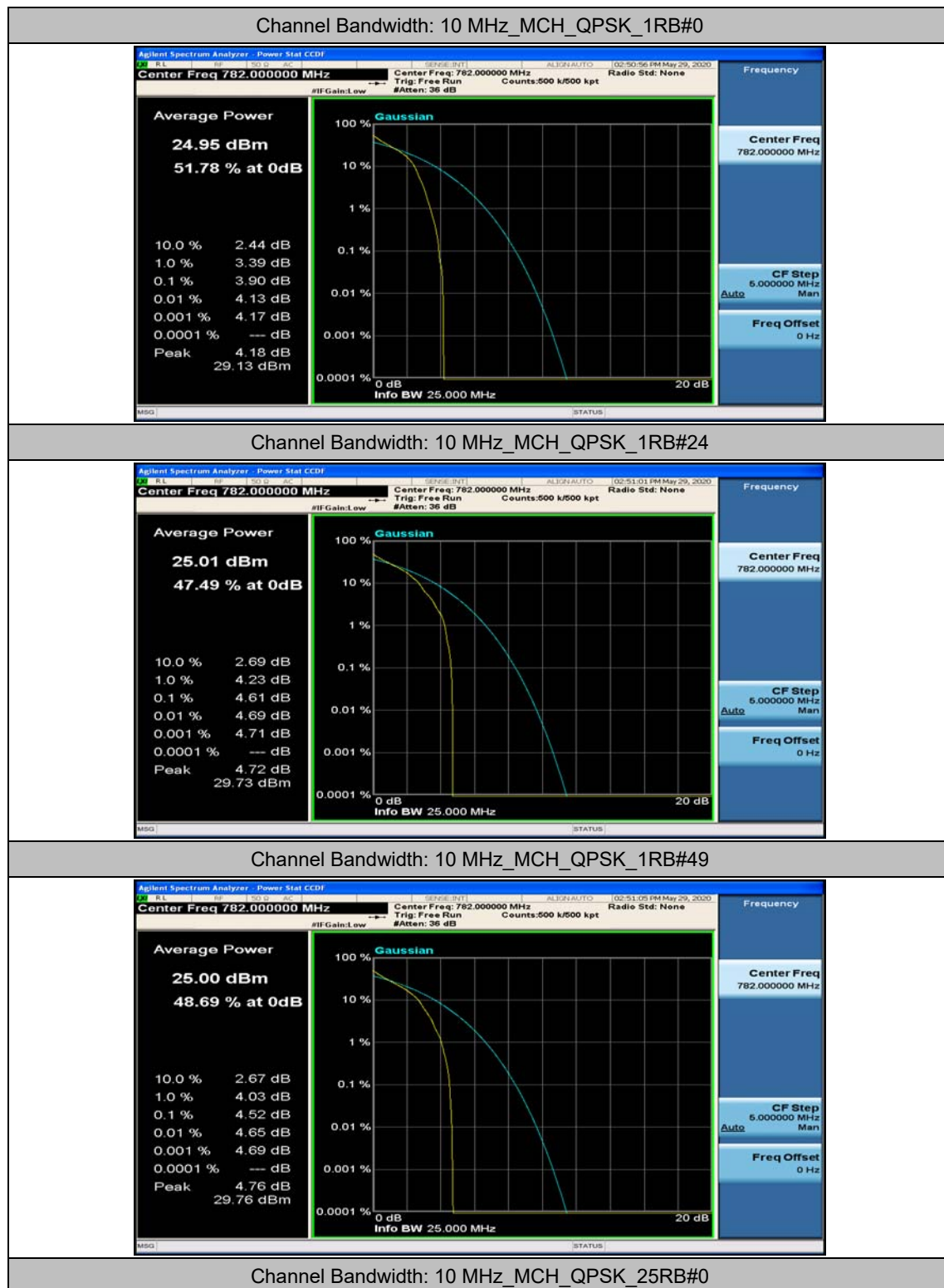


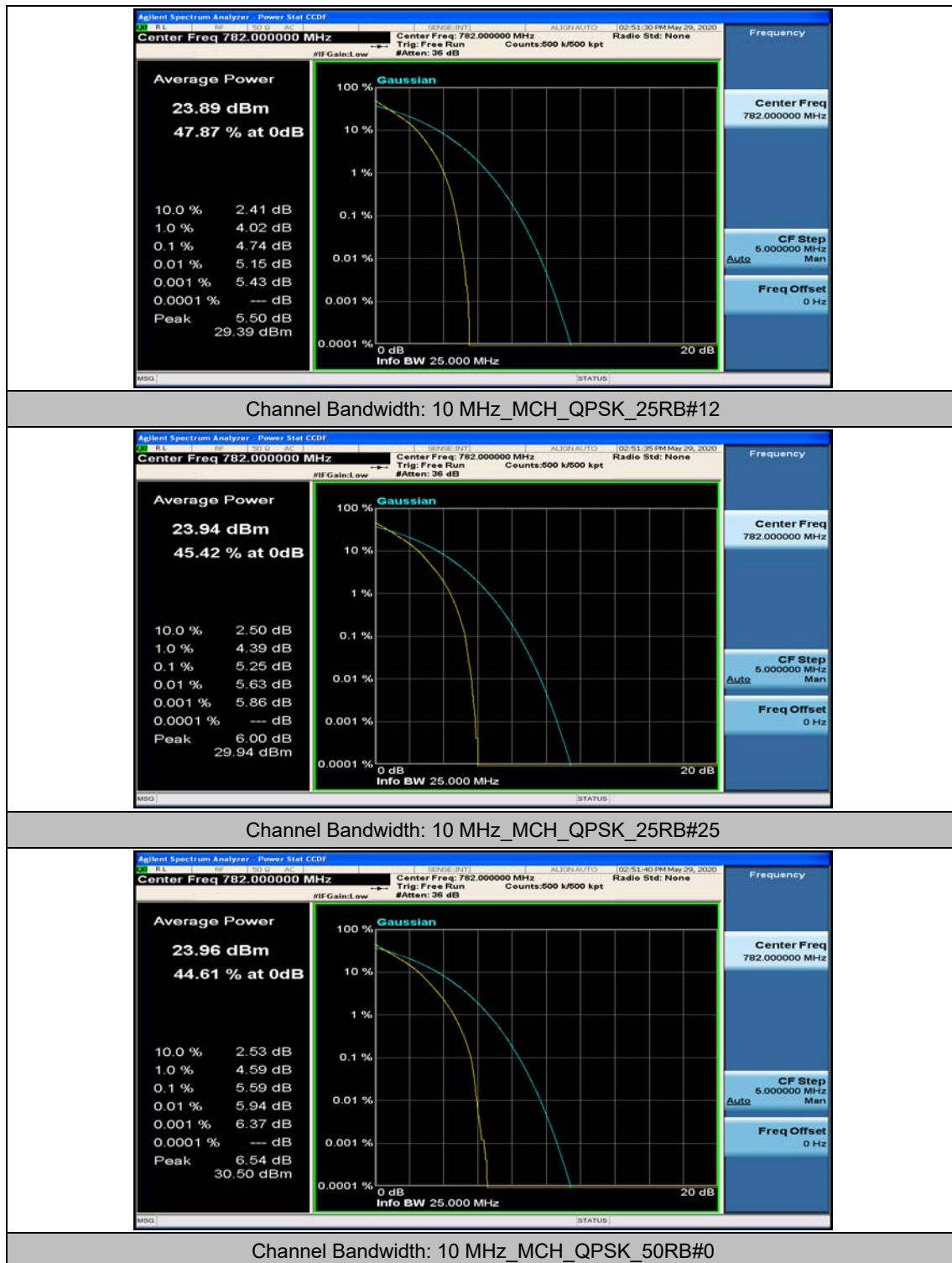
(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_1RB#12



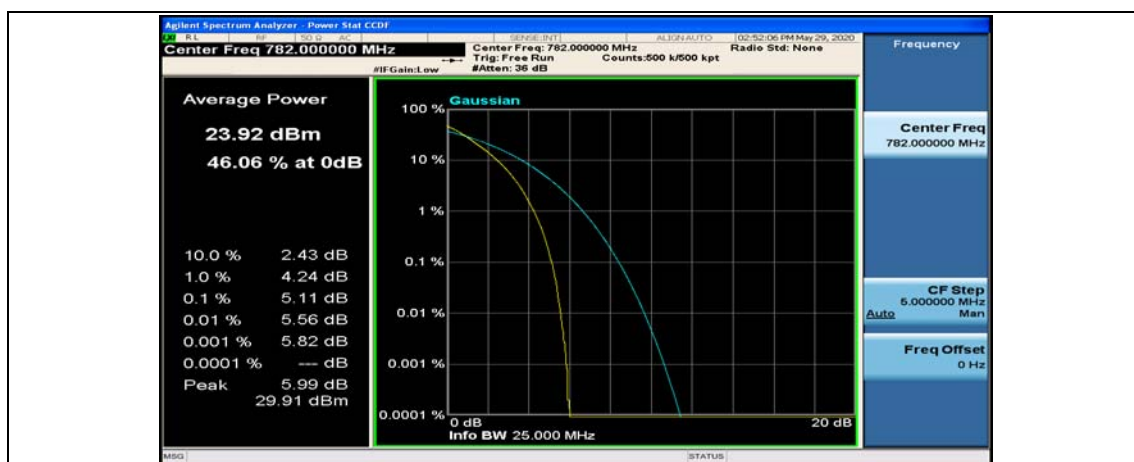


## Channel Bandwidth: 10 MHz









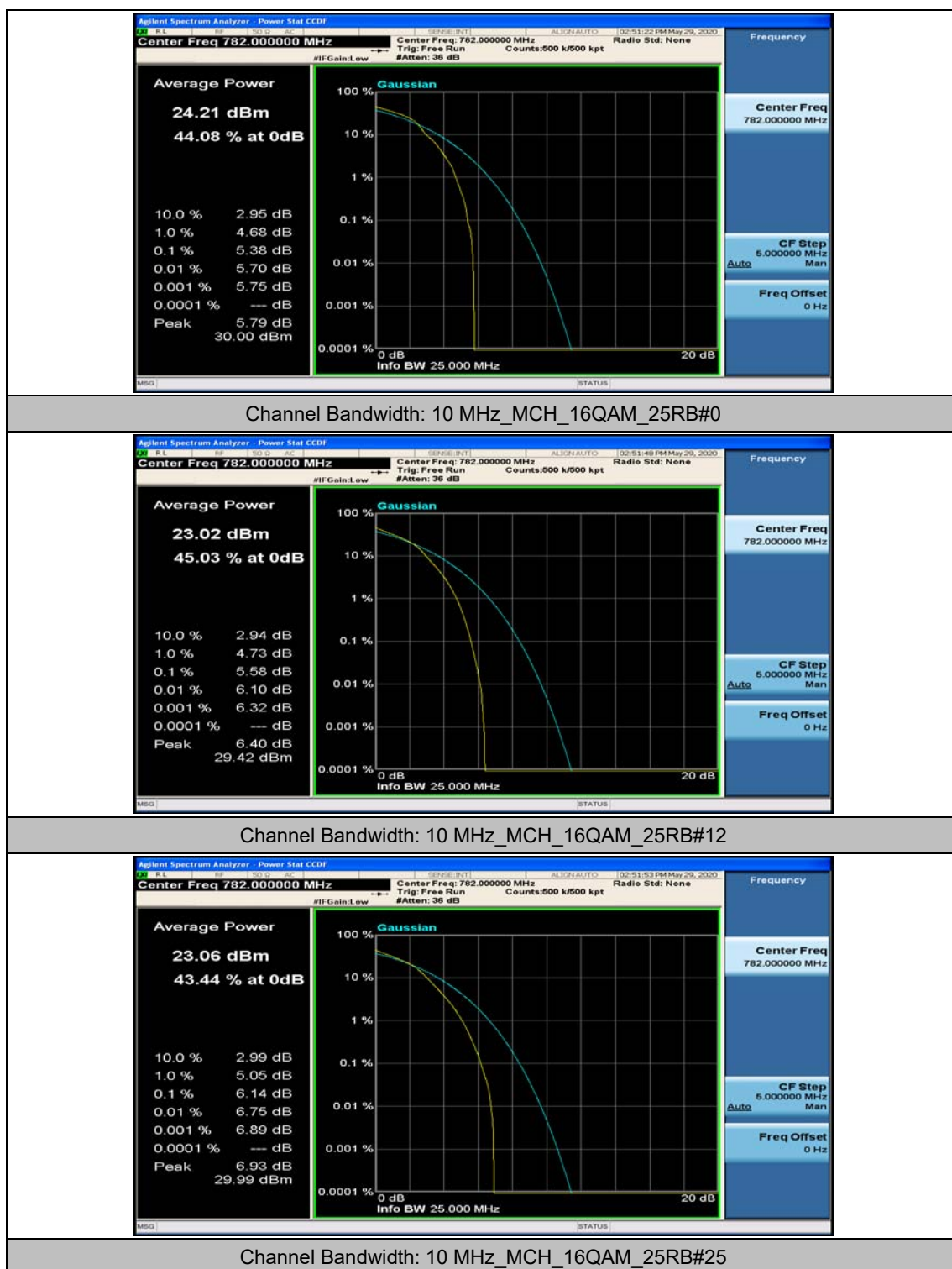
Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#0



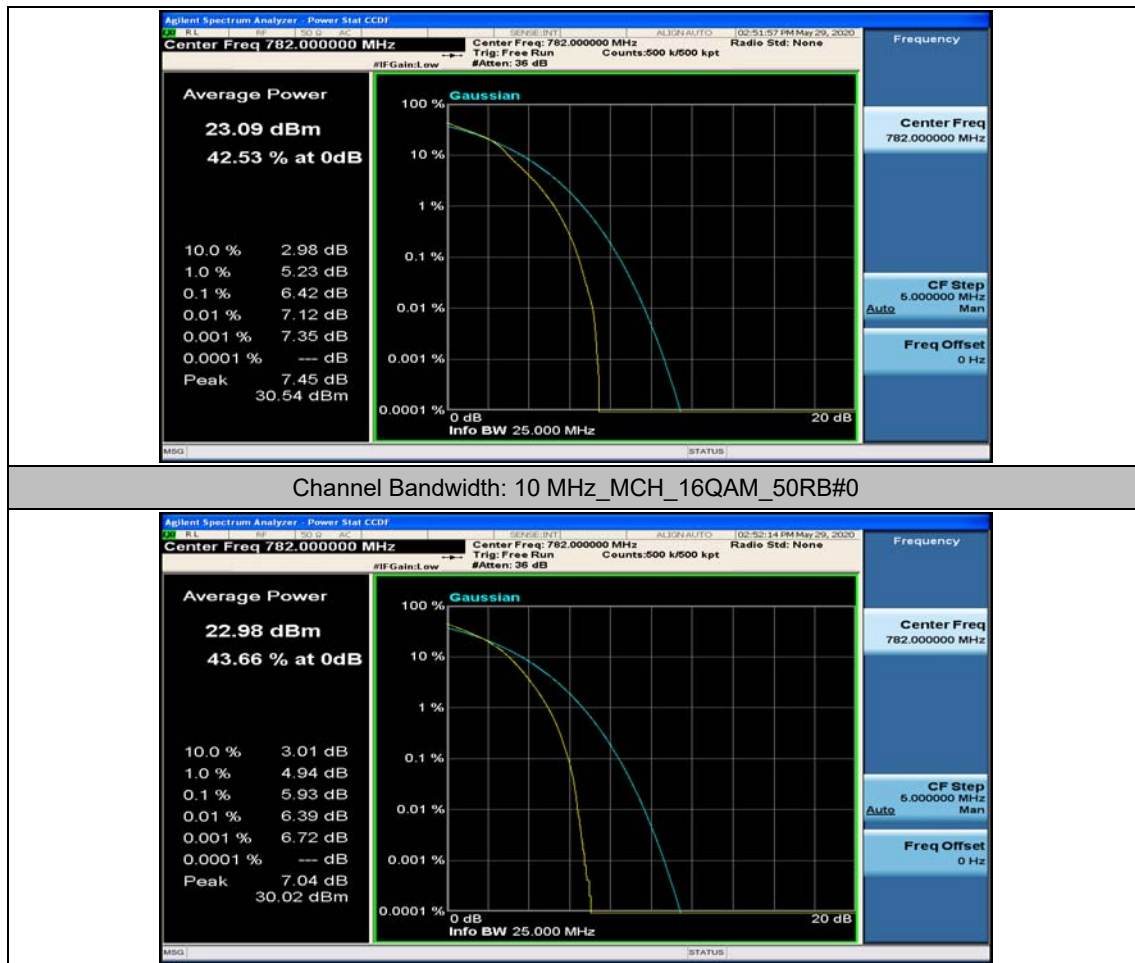
Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#24



Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#49







## Appendix C: 26dB Bandwidth and Occupied Bandwidth

### Test Result

#### Channel Bandwidth: 5 MHz

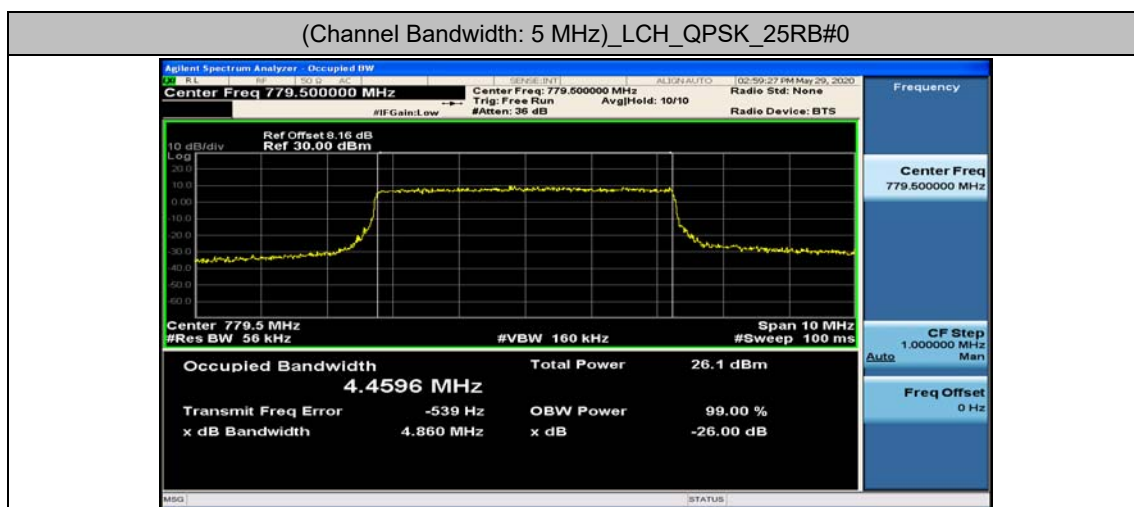
| Channel Bandwidth: 5 MHz |         |                  |        |                             |                         |         |
|--------------------------|---------|------------------|--------|-----------------------------|-------------------------|---------|
| Modulation               | Channel | RB Configuration |        | Occupied Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) | Verdict |
|                          |         | Size             | Offset |                             |                         |         |
| QPSK                     | LCH     | 25               | 0      | 4.4596                      | 4.860                   | PASS    |
|                          | MCH     | 25               | 0      | 4.4861                      | 4.804                   | PASS    |
|                          | HCH     | 25               | 0      | 4.4829                      | 4.896                   | PASS    |
| 16QAM                    | LCH     | 25               | 0      | 4.4734                      | 4.794                   | PASS    |
|                          | MCH     | 25               | 0      | 4.4808                      | 4.883                   | PASS    |
|                          | HCH     | 25               | 0      | 4.4956                      | 4.878                   | PASS    |

#### Channel Bandwidth: 10 MHz

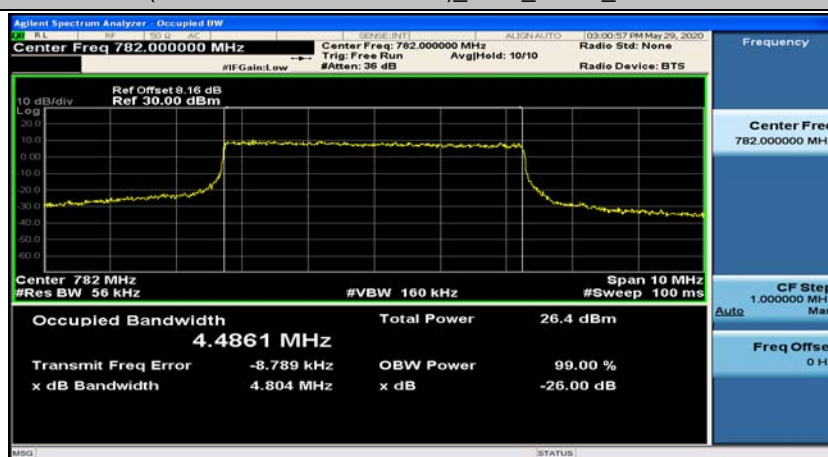
| Channel Bandwidth: 10 MHz |         |                  |        |                             |                         |         |
|---------------------------|---------|------------------|--------|-----------------------------|-------------------------|---------|
| Modulation                | Channel | RB Configuration |        | Occupied Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) | Verdict |
|                           |         | Size             | Offset |                             |                         |         |
| QPSK                      | MCH     | 50               | 0      | 8.9421                      | 9.438                   | PASS    |
| 16QAM                     | MCH     | 50               | 0      | 8.9331                      | 9.500                   | PASS    |

### Test Graphs

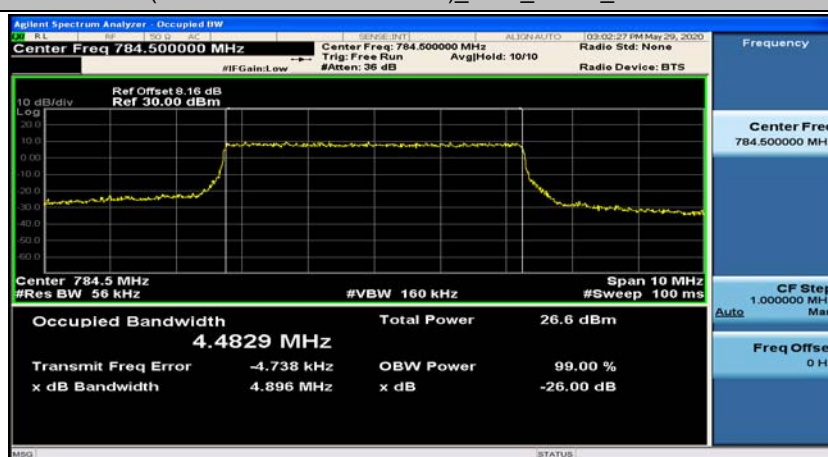
#### Channel Bandwidth: 5 MHz



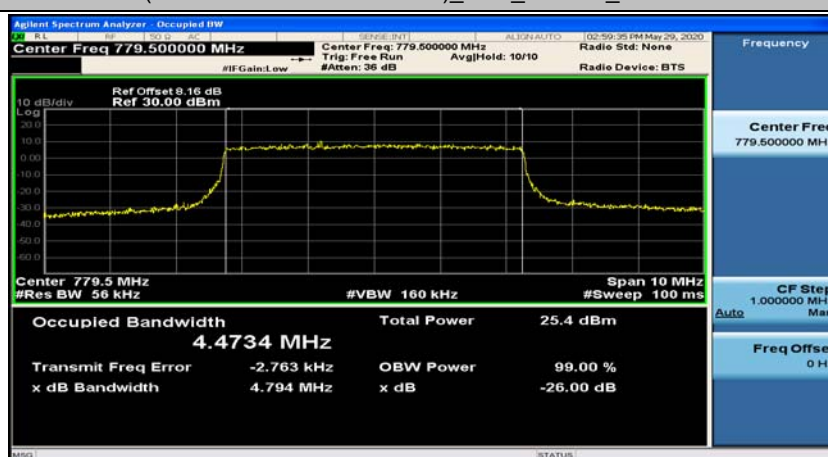
(Channel Bandwidth: 5 MHz)\_MCH\_QPSK\_25RB#0



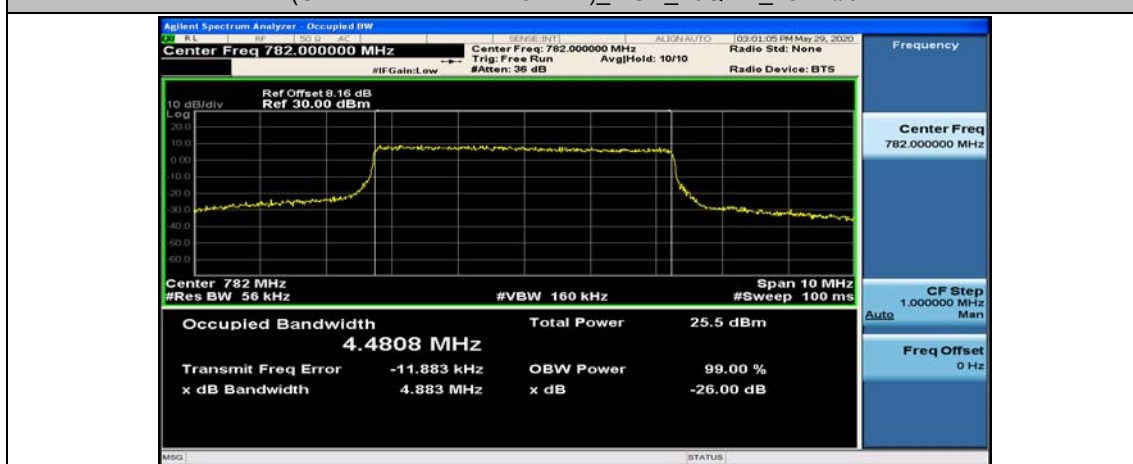
(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_25RB#0



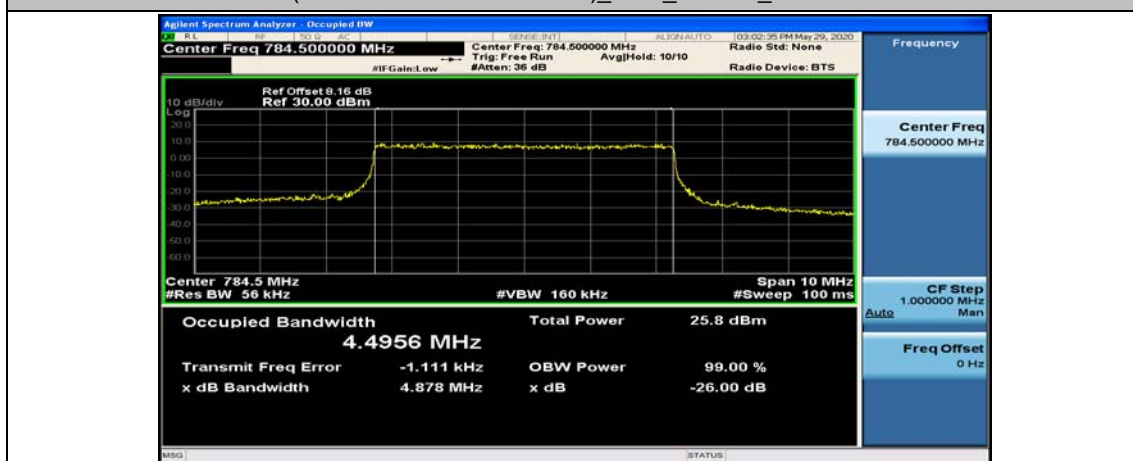
(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_25RB#0



(Channel Bandwidth: 5 MHz)\_MCH\_16QAM\_25RB#0

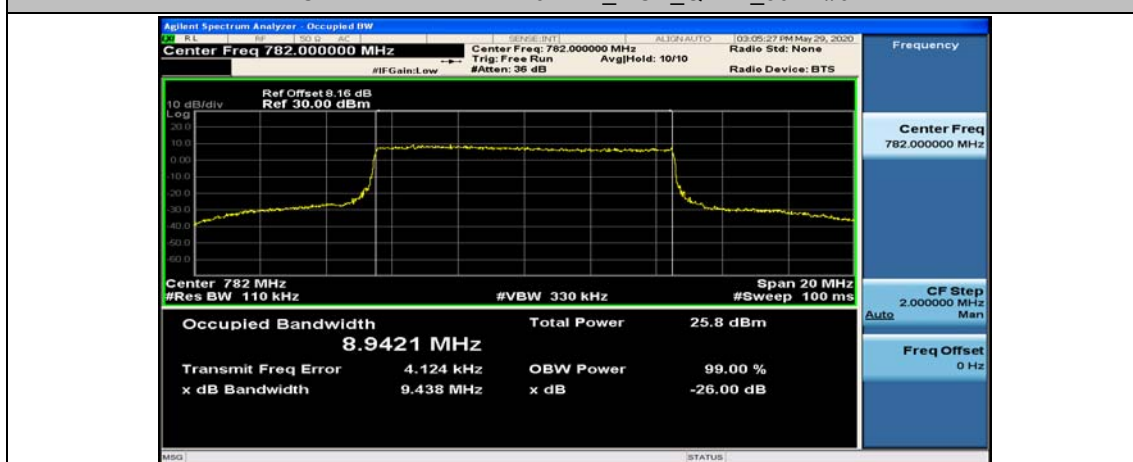


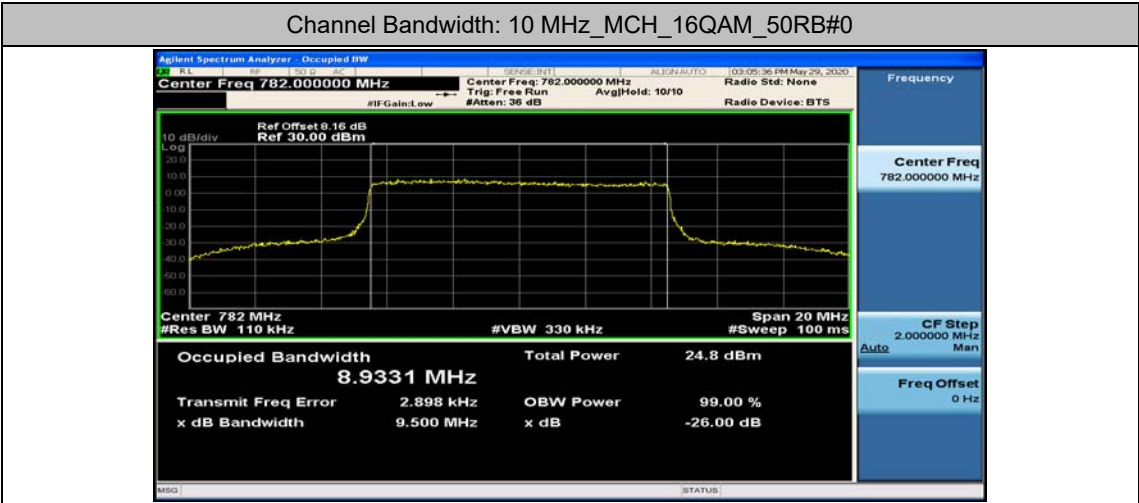
(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_25RB#0



## Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz)\_MCH\_QPSK\_50RB#0



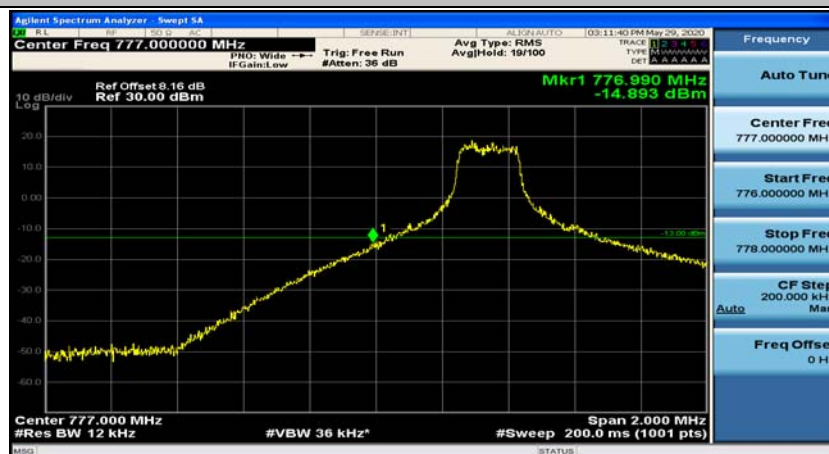


## Appendix D: Band Edge

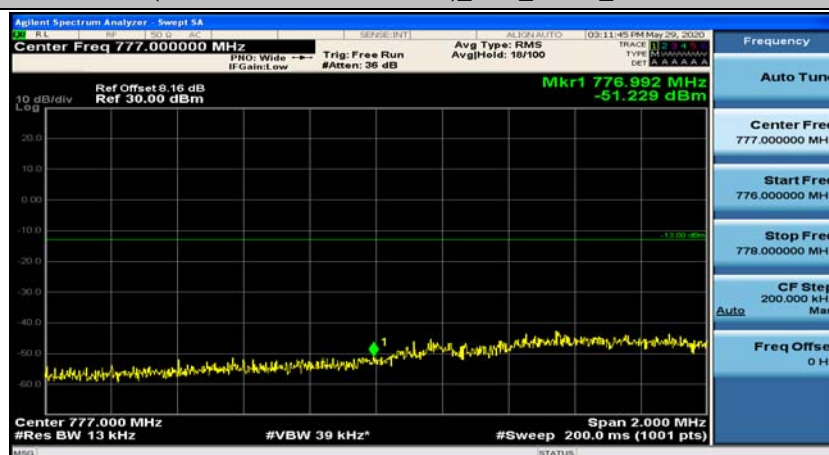
### Test Graphs

Channel Bandwidth: 5 MHz

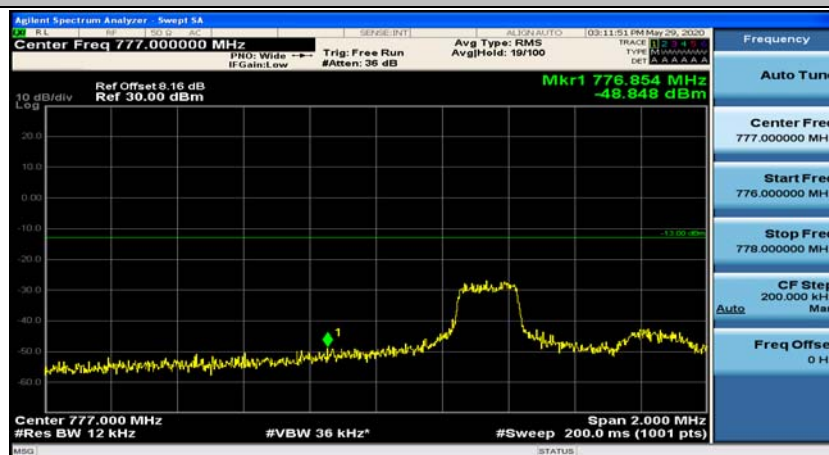
(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_1RB#0



(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_1RB#12

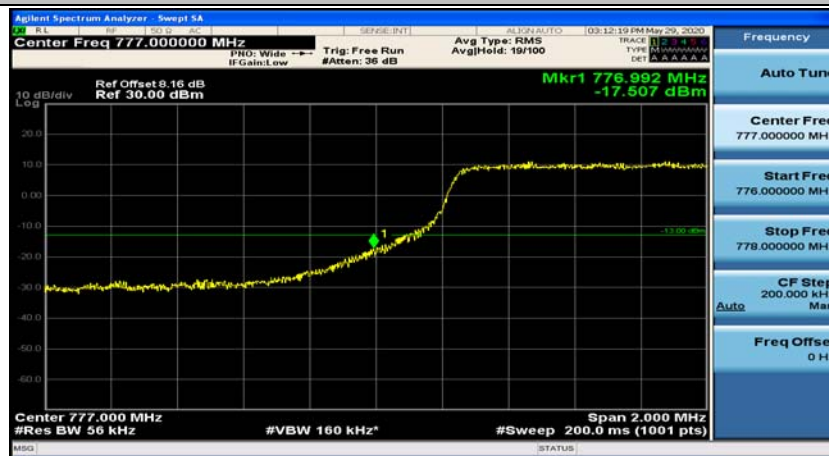


(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_1RB#24

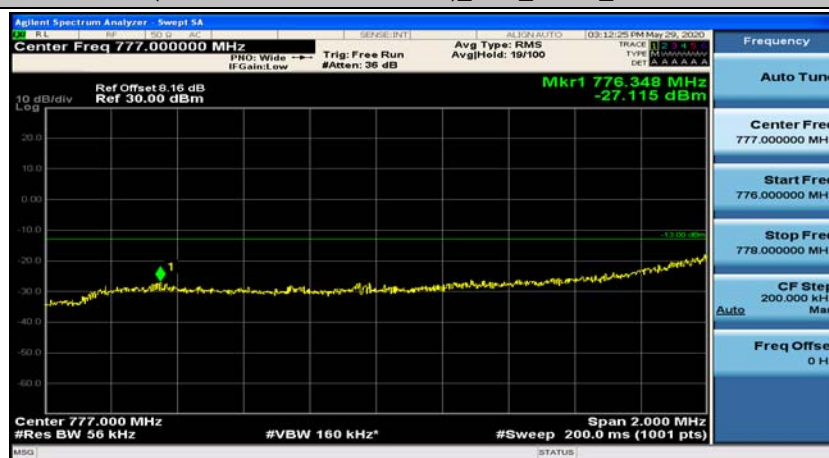




(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_12RB#0



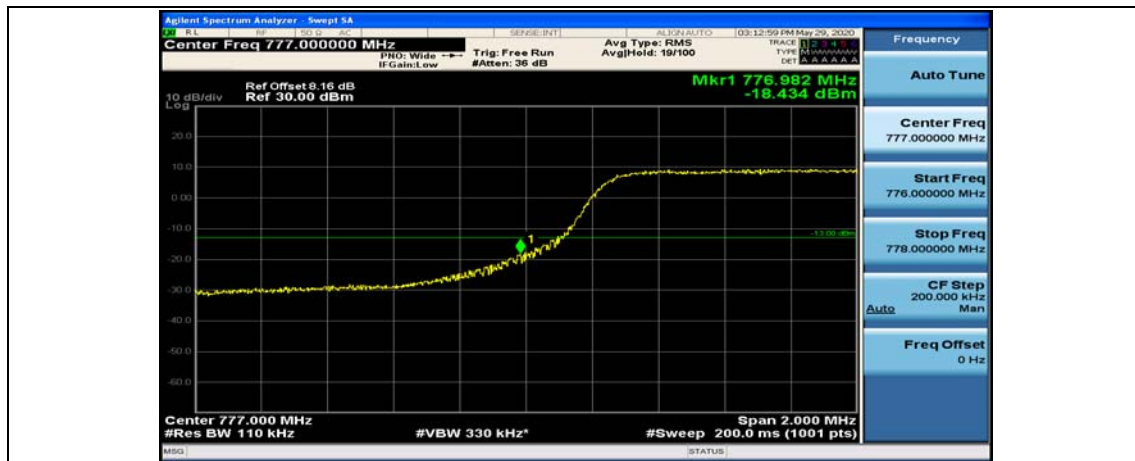
(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_12RB#6



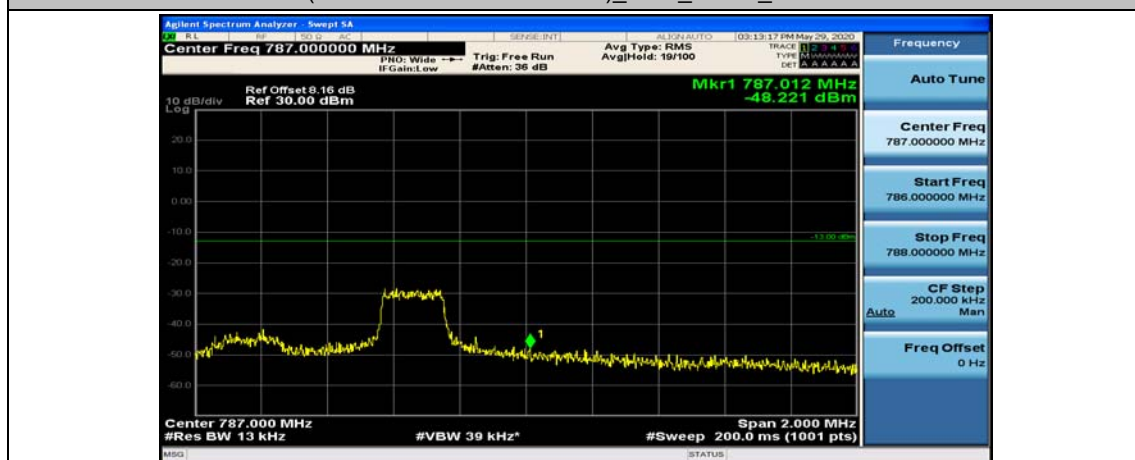
(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_12RB#13



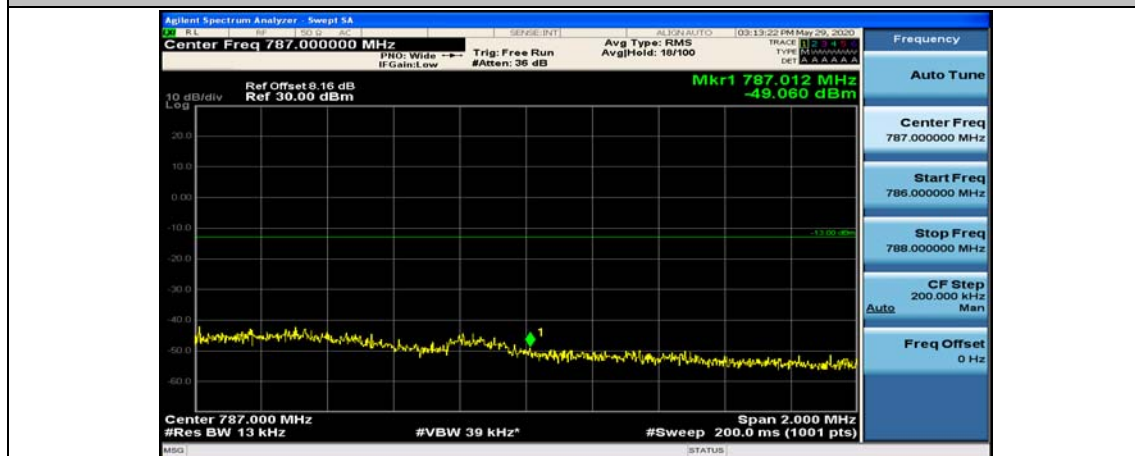
(Channel Bandwidth: 5 MHz)\_LCH\_QPSK\_25RB#0



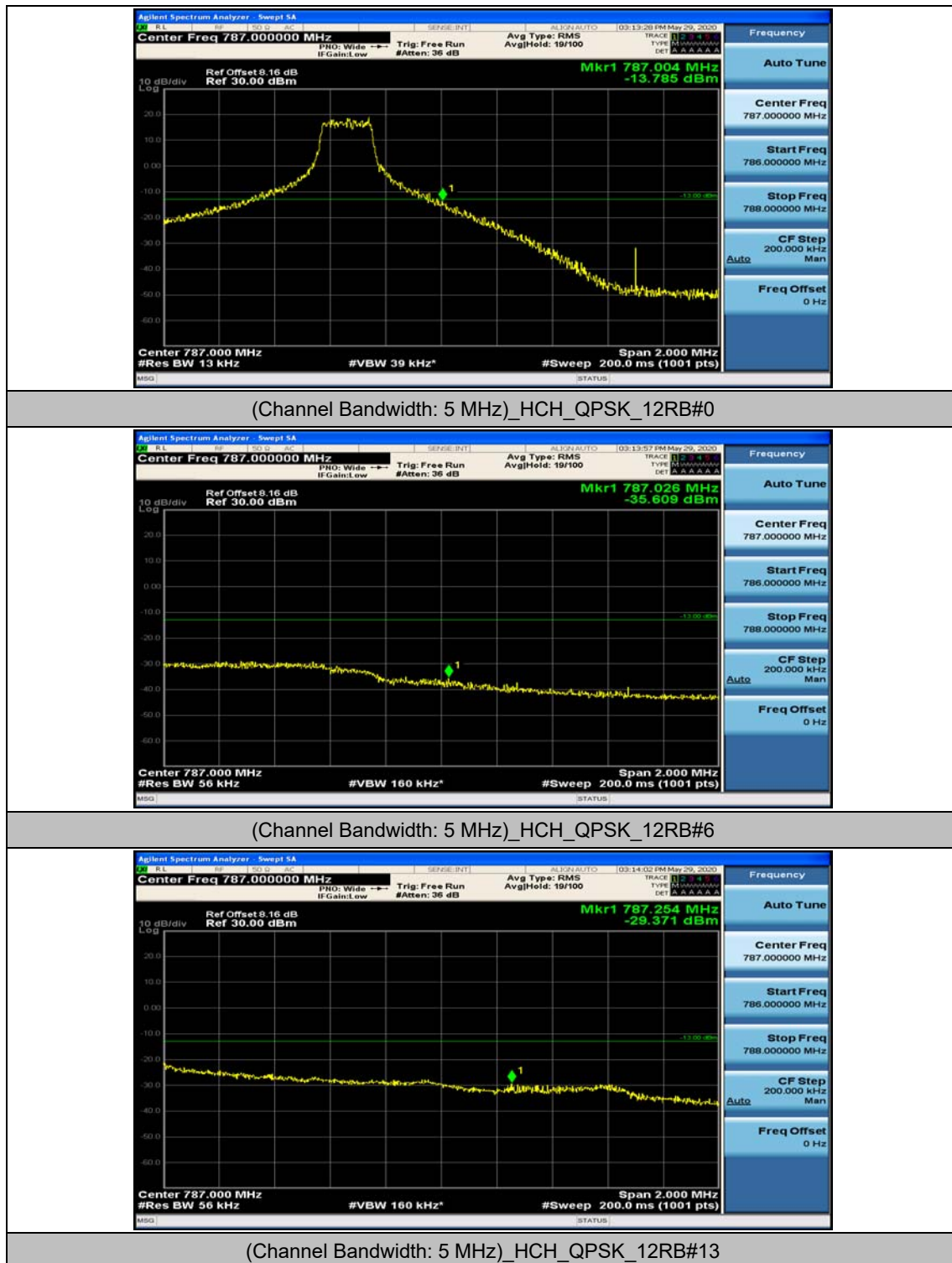
(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_1RB#0



(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_1RB#12



(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_1RB#24





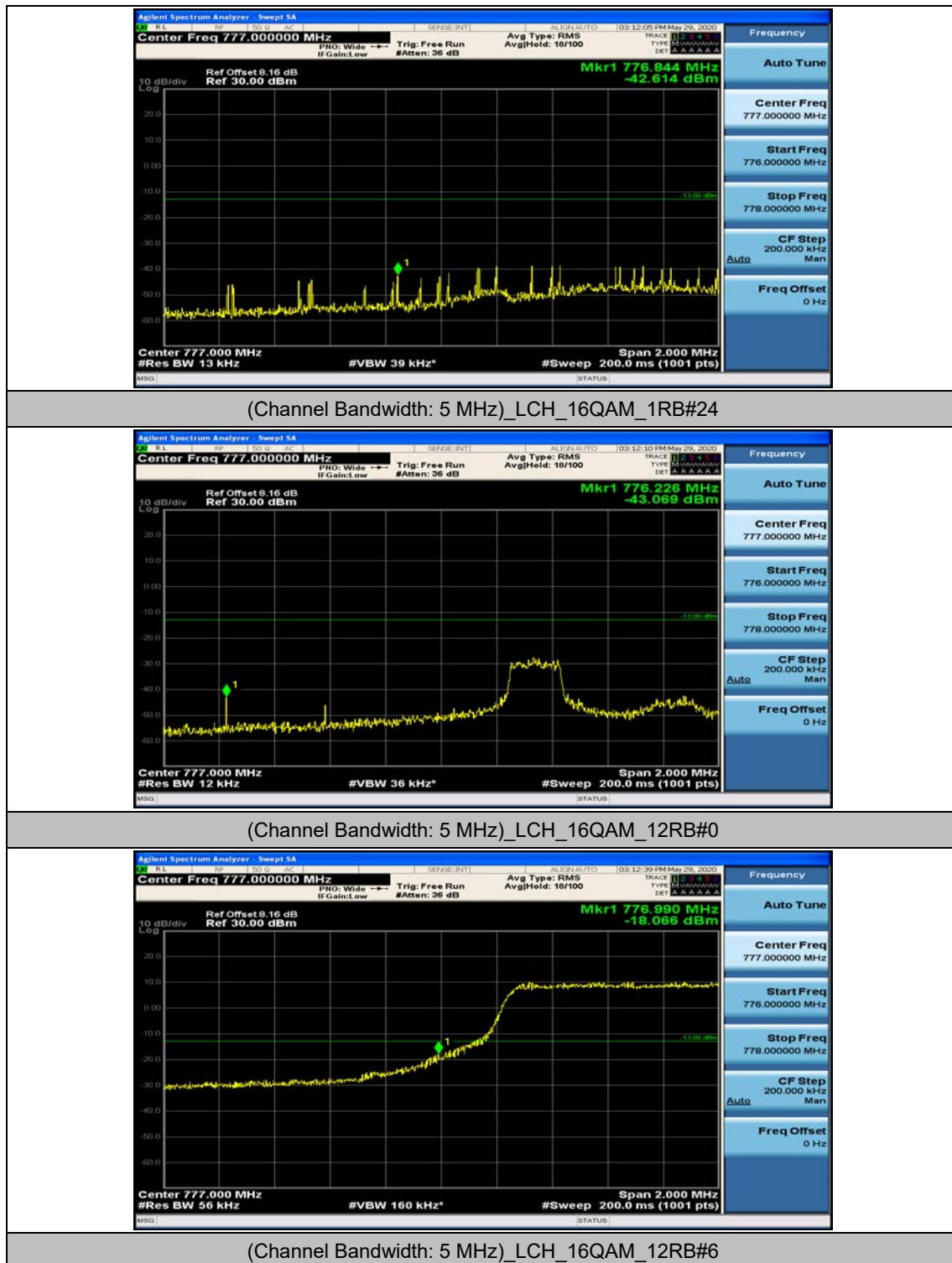
(Channel Bandwidth: 5 MHz)\_HCH\_QPSK\_25RB#0



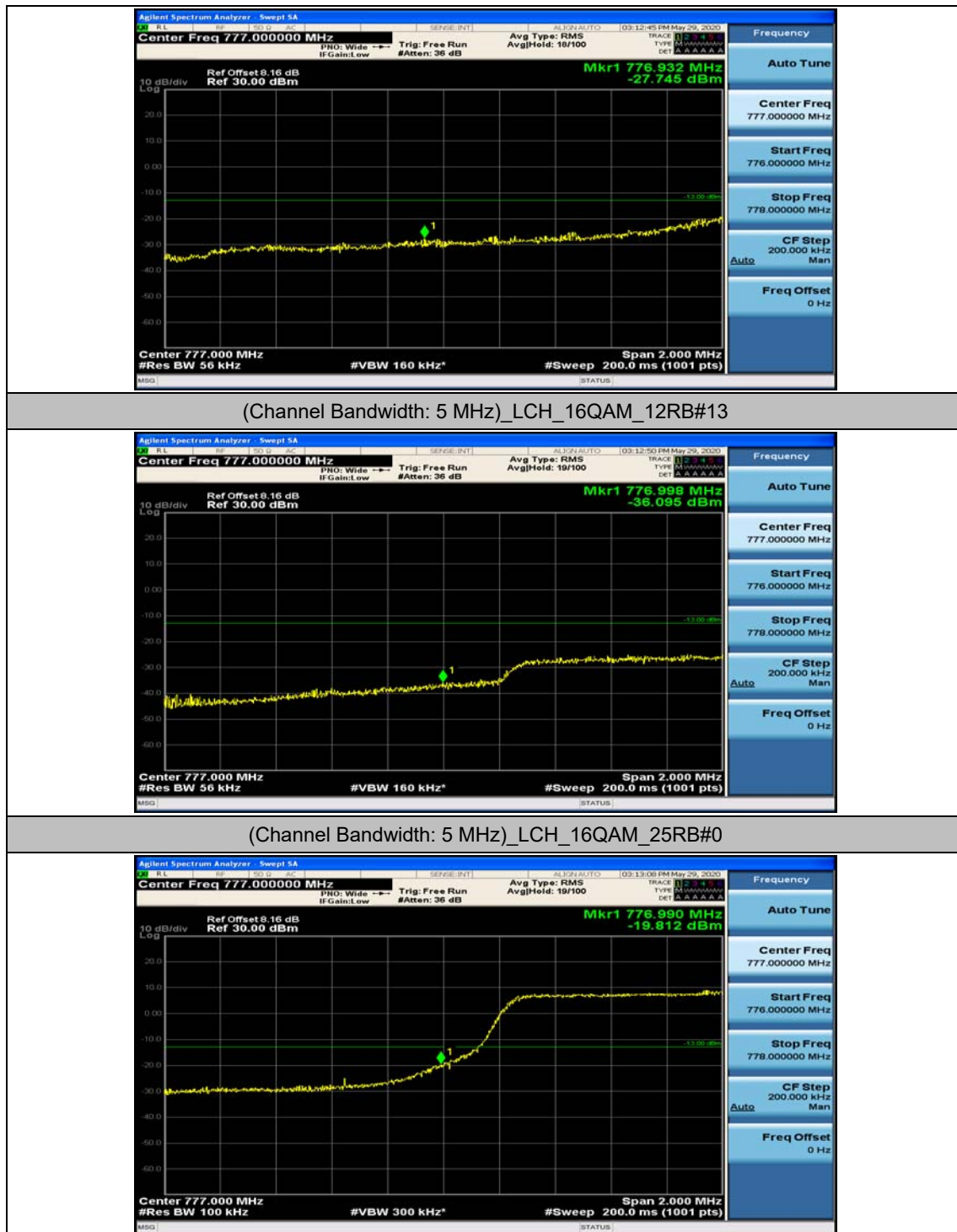
(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_1RB#0



(Channel Bandwidth: 5 MHz)\_LCH\_16QAM\_1RB#12





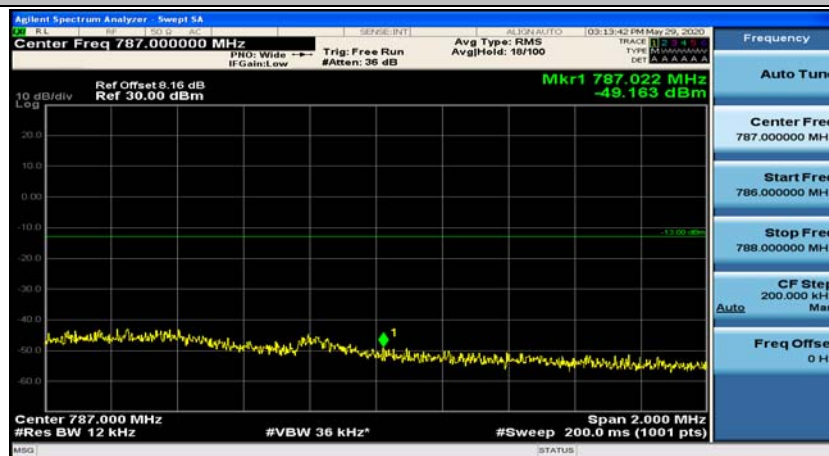




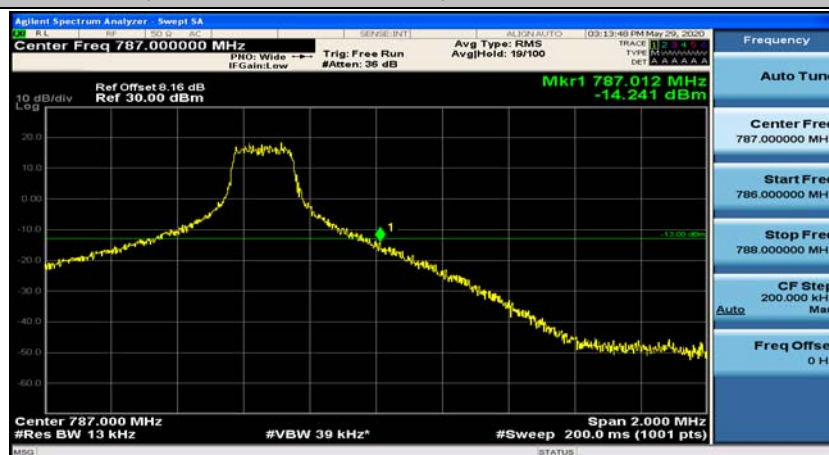
(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_1RB#0



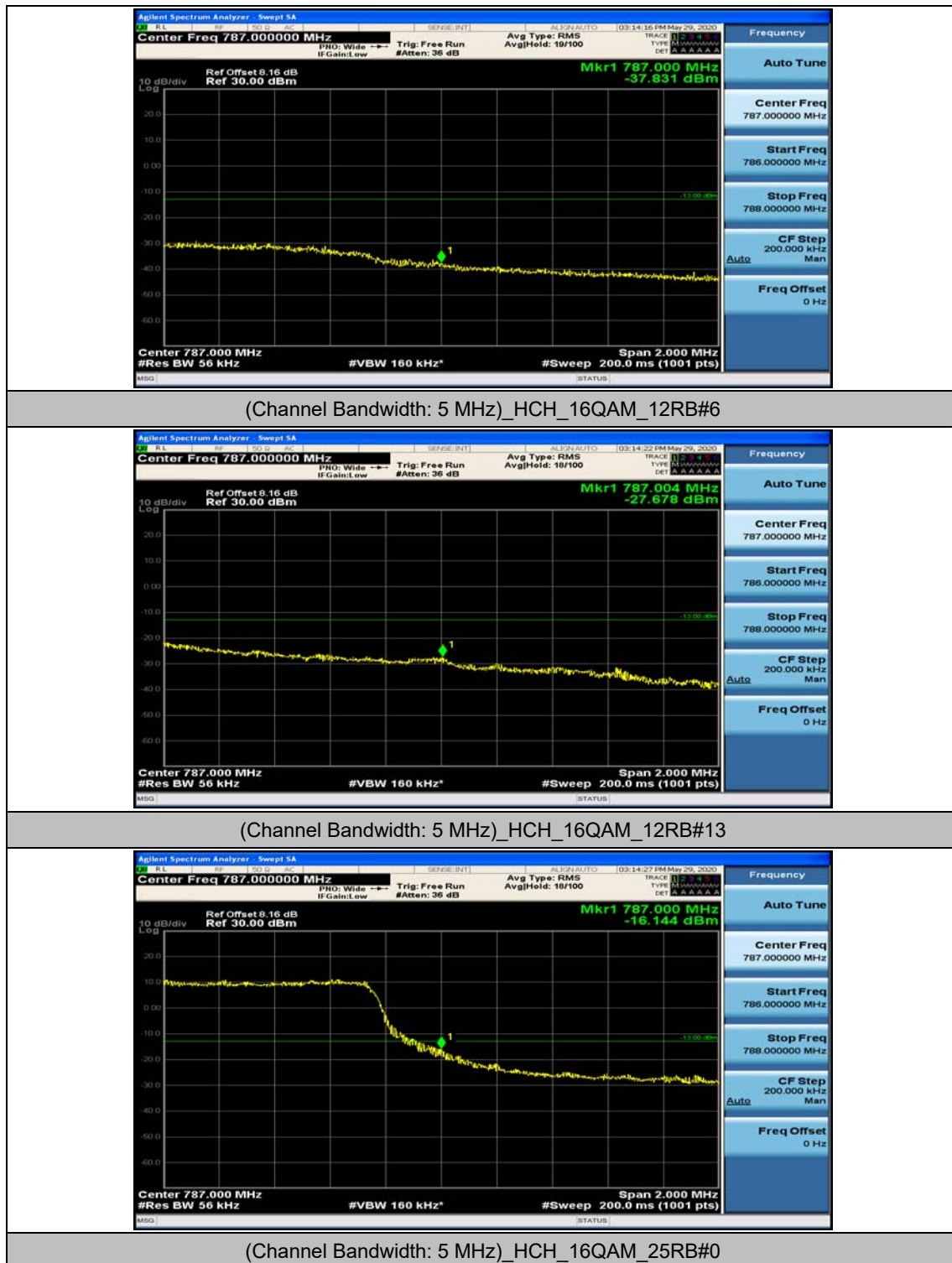
(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_1RB#12

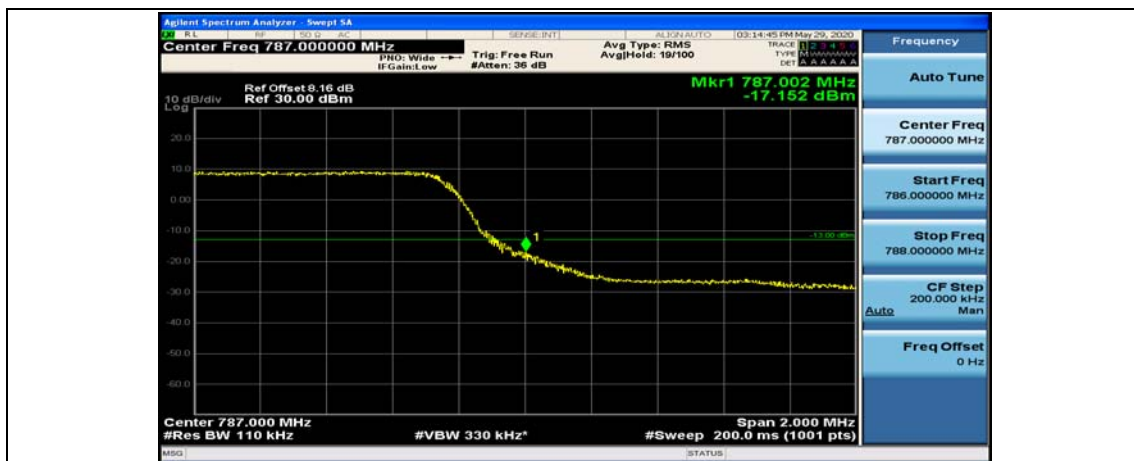


(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_1RB#24

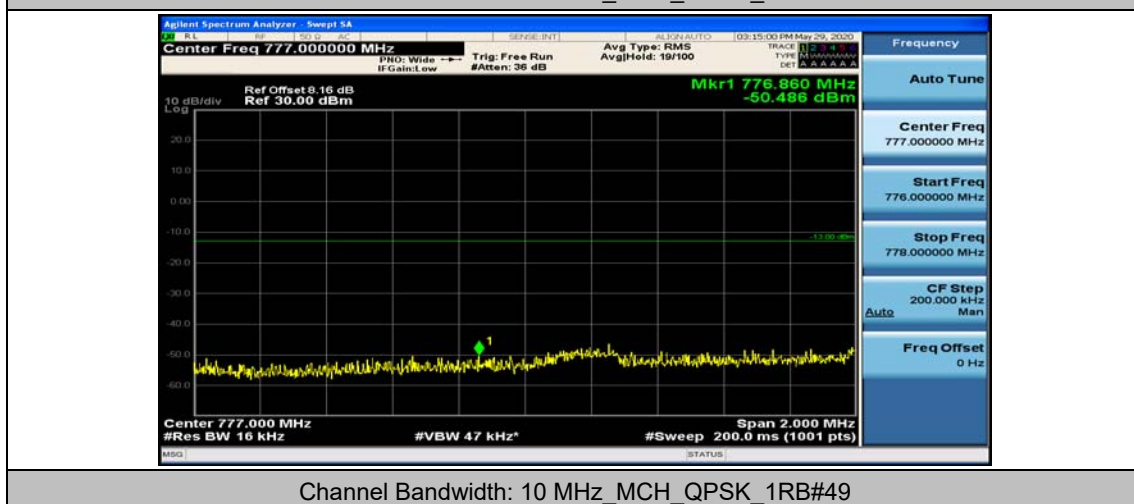
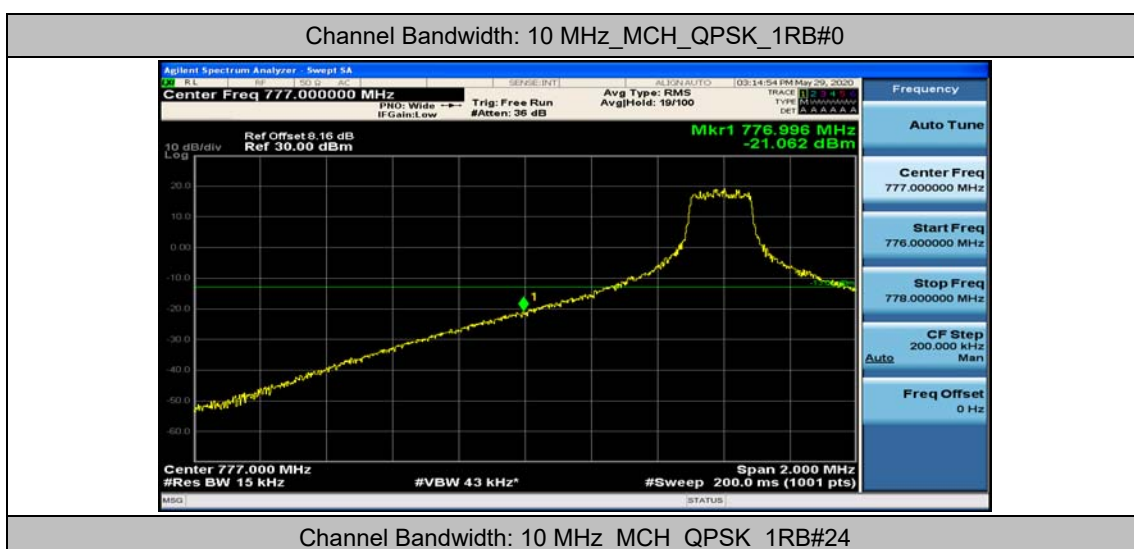


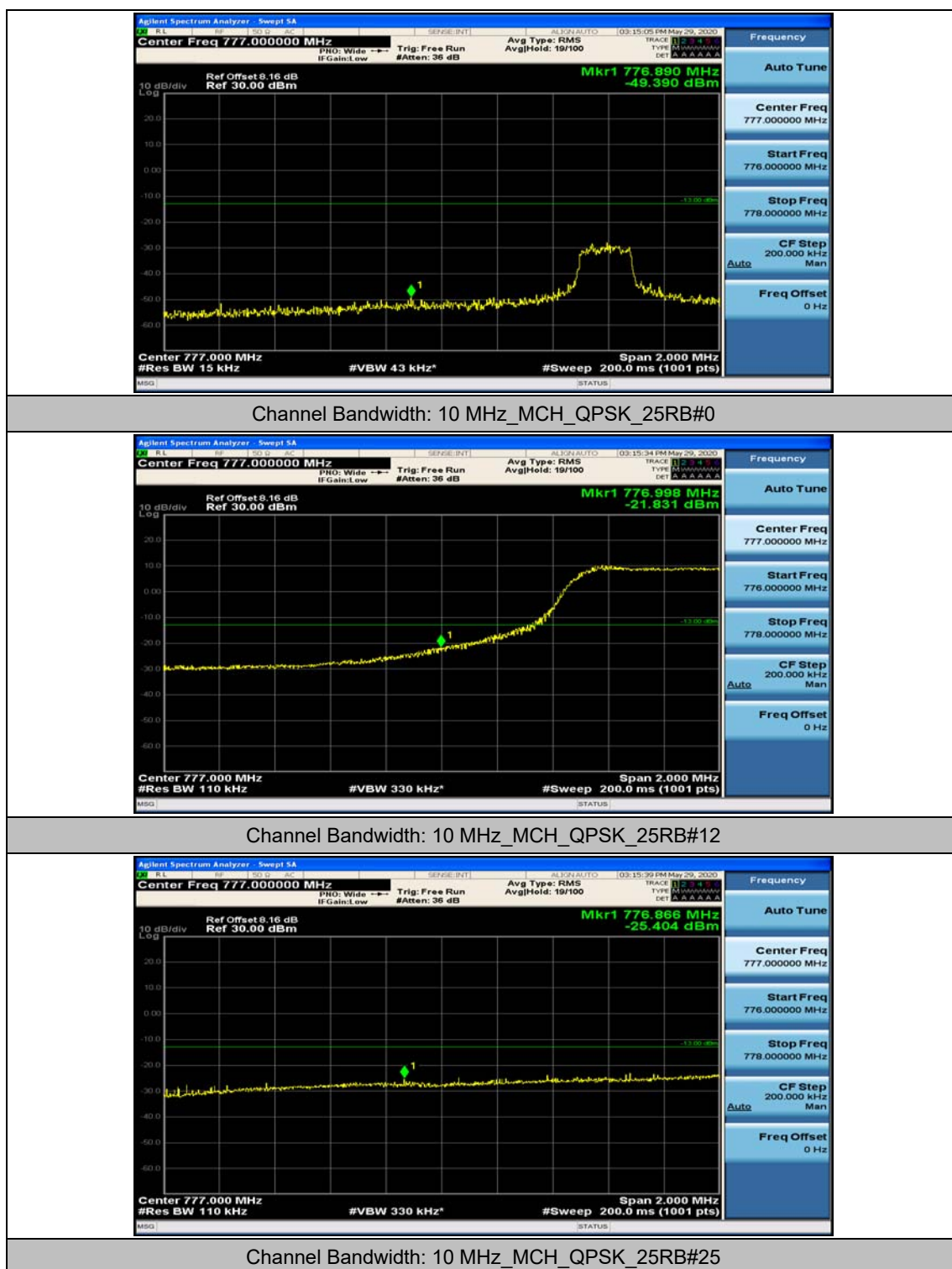
(Channel Bandwidth: 5 MHz)\_HCH\_16QAM\_12RB#0





## Channel Bandwidth: 10 MHz



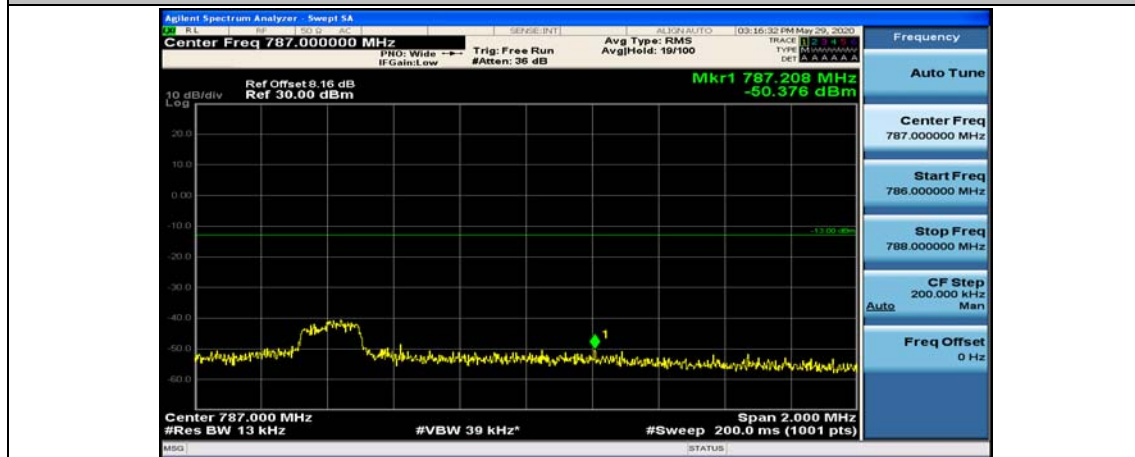




Channel Bandwidth: 10 MHz\_MCH\_QPSK\_50RB#0

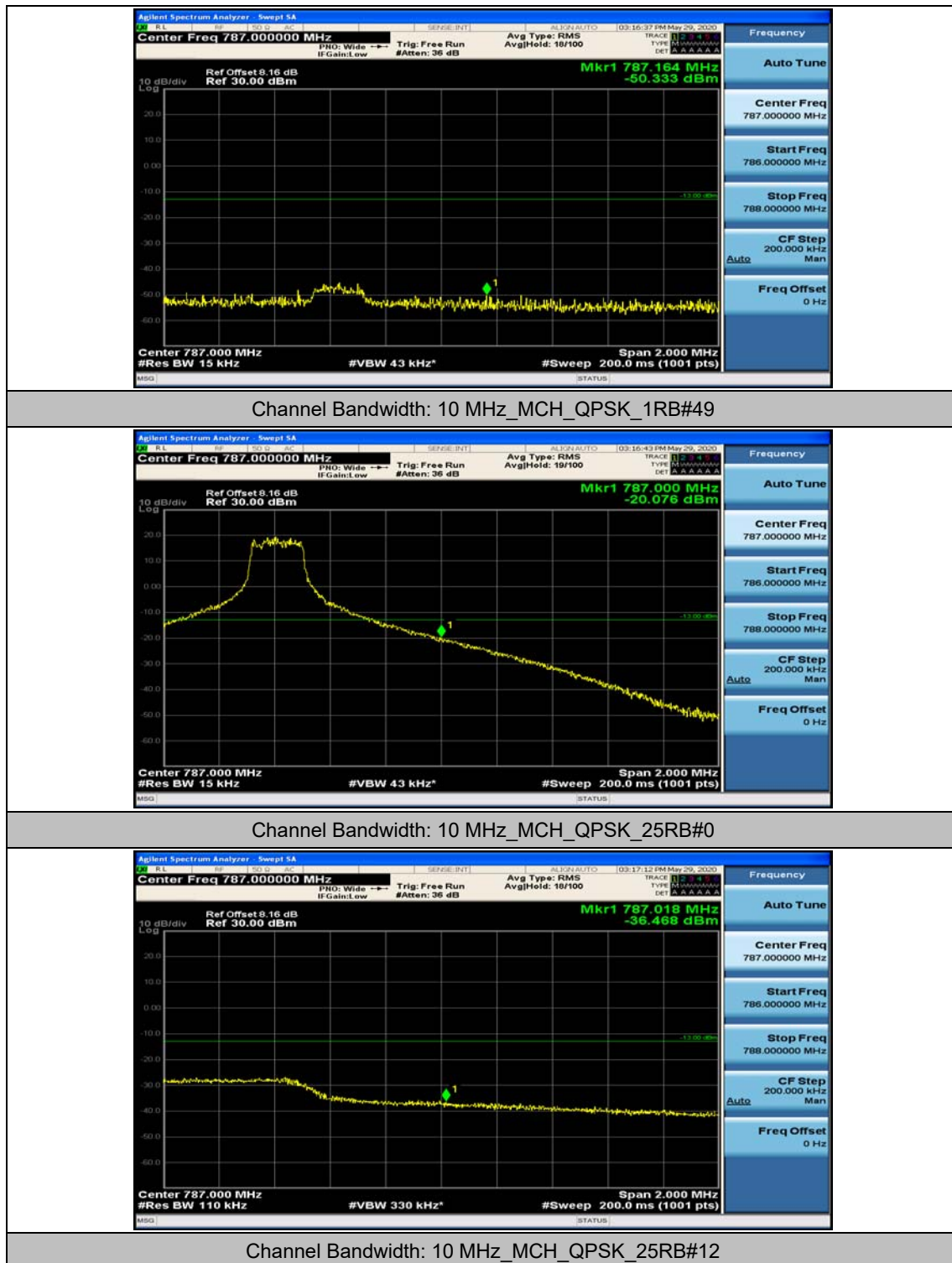


Channel Bandwidth: 10 MHz\_MCH\_QPSK\_1RB#0

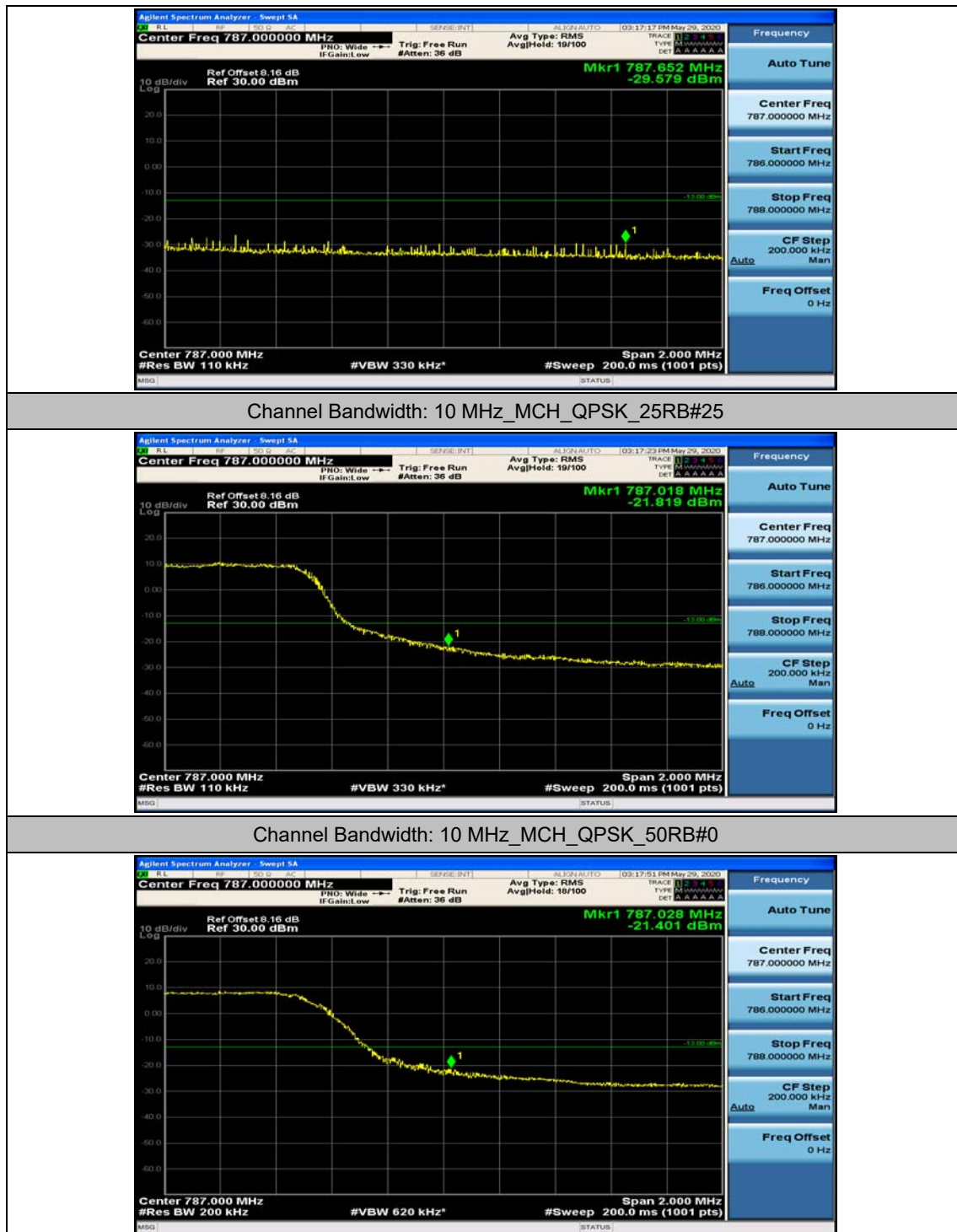


Channel Bandwidth: 10 MHz\_MCH\_QPSK\_1RB#24

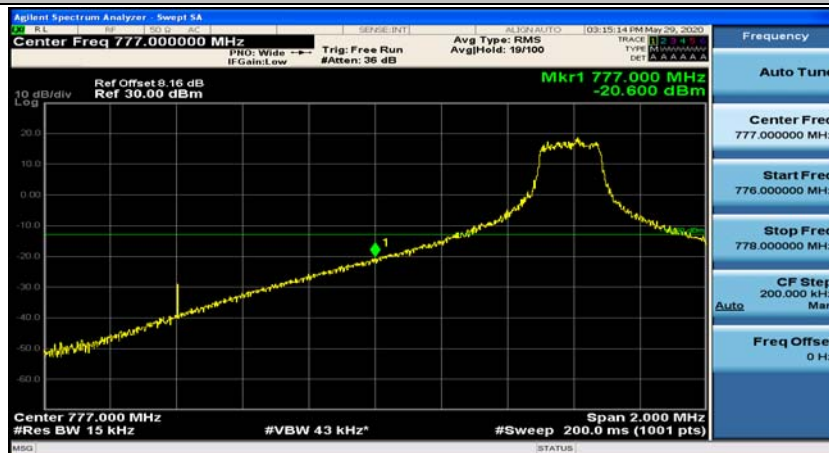




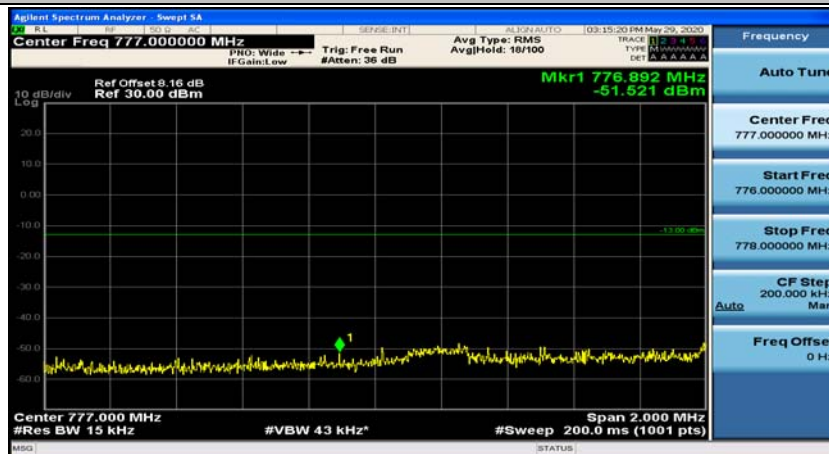




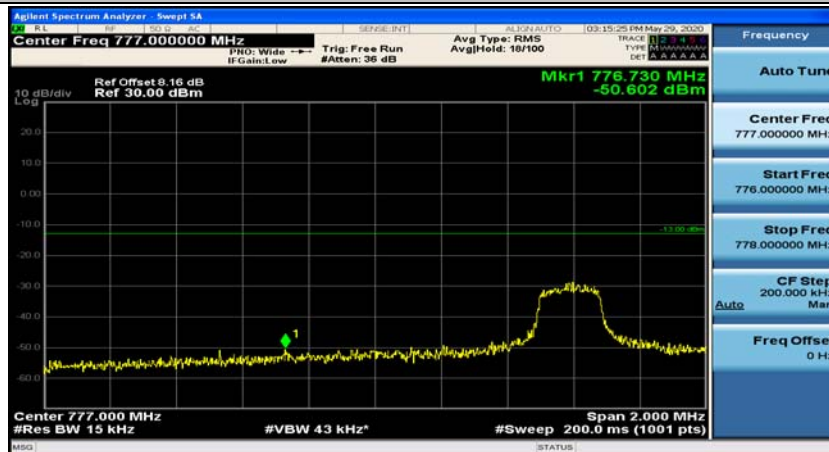
Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#0



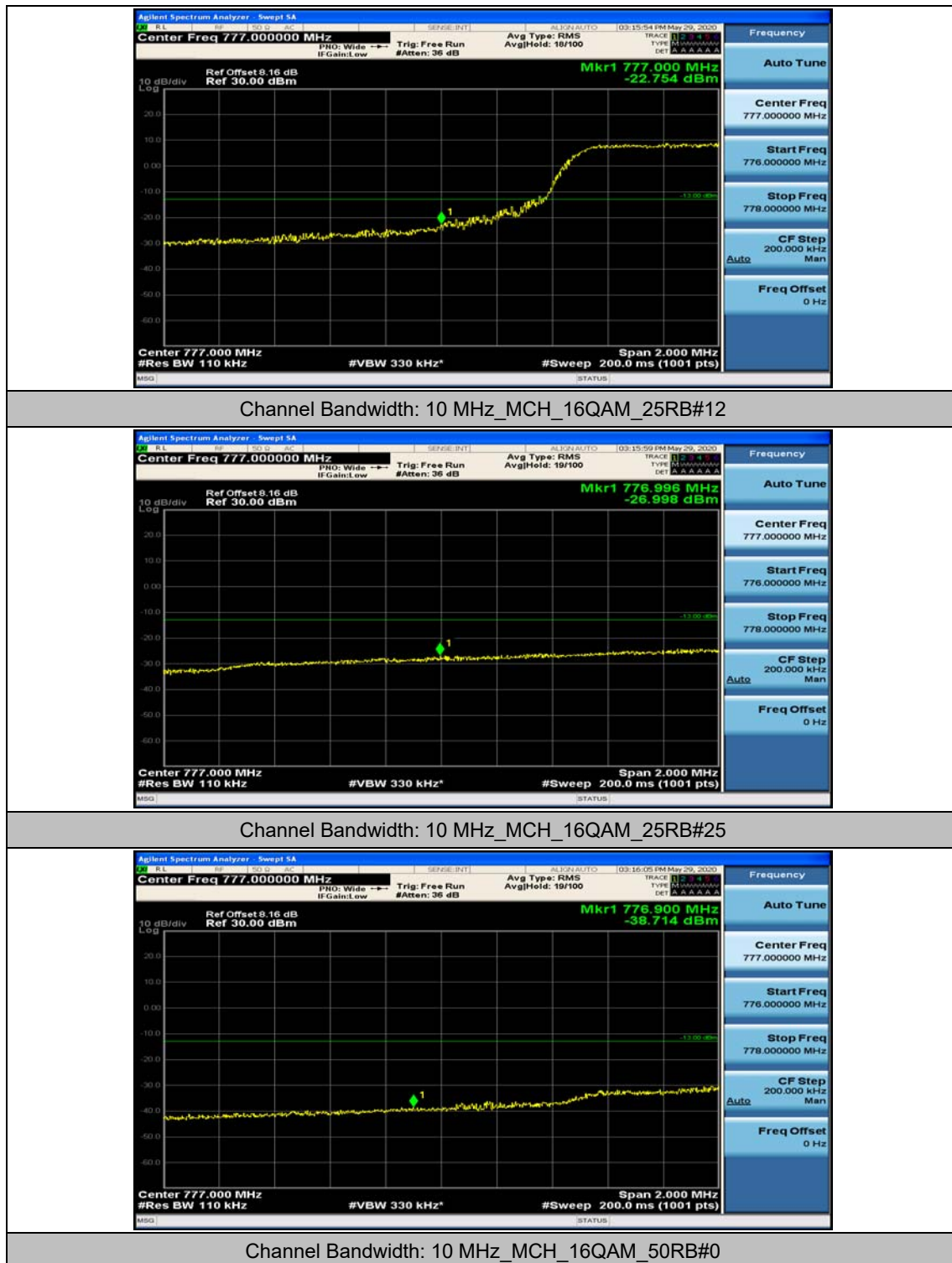
Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#24



Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#49

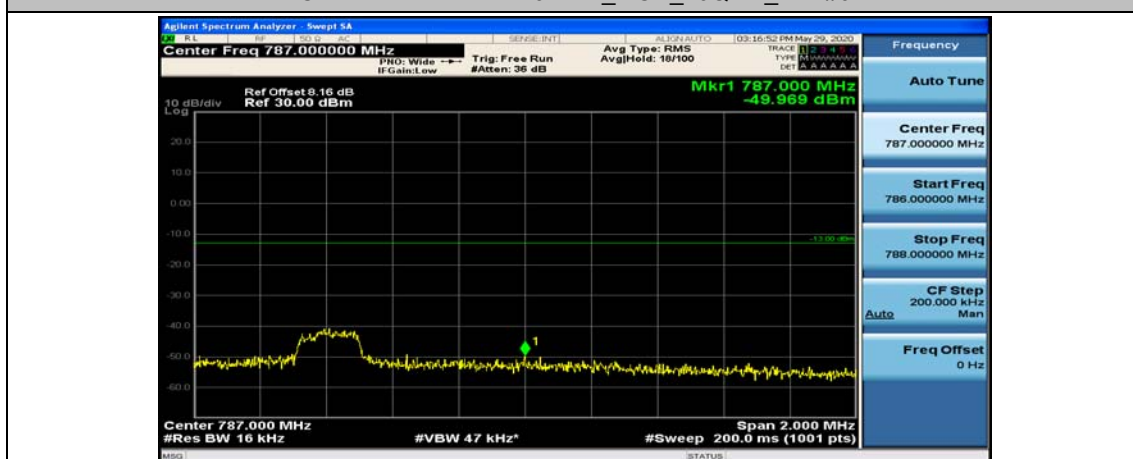


Channel Bandwidth: 10 MHz\_MCH\_16QAM\_25RB#0

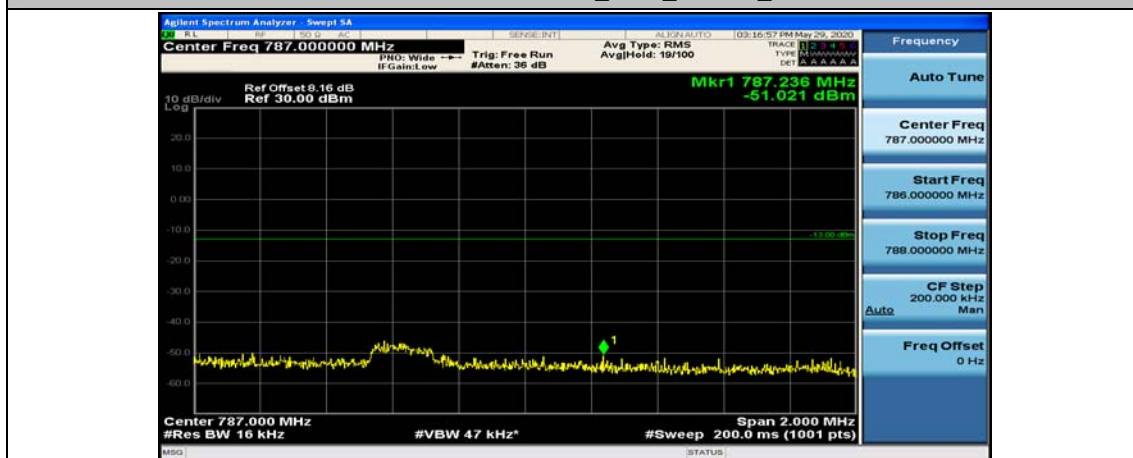




Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#0



Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#24



Channel Bandwidth: 10 MHz\_MCH\_16QAM\_1RB#49