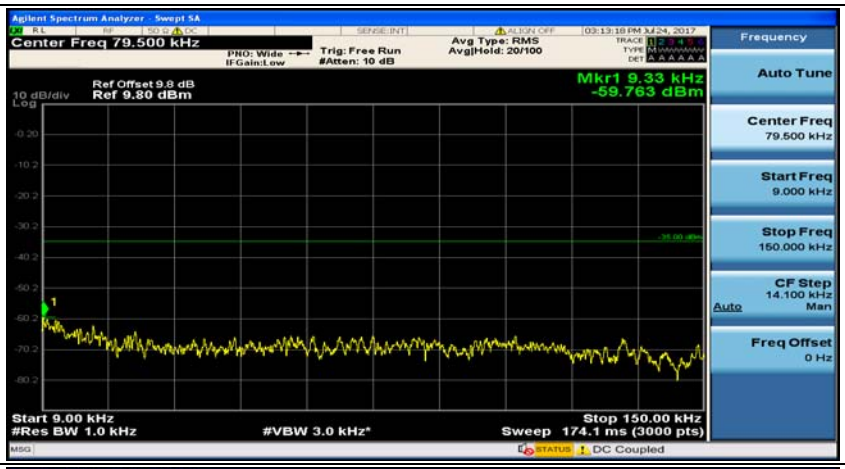
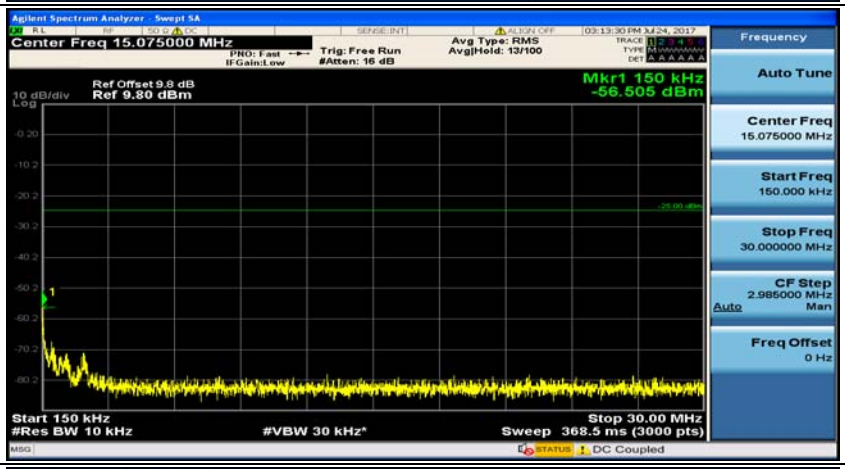
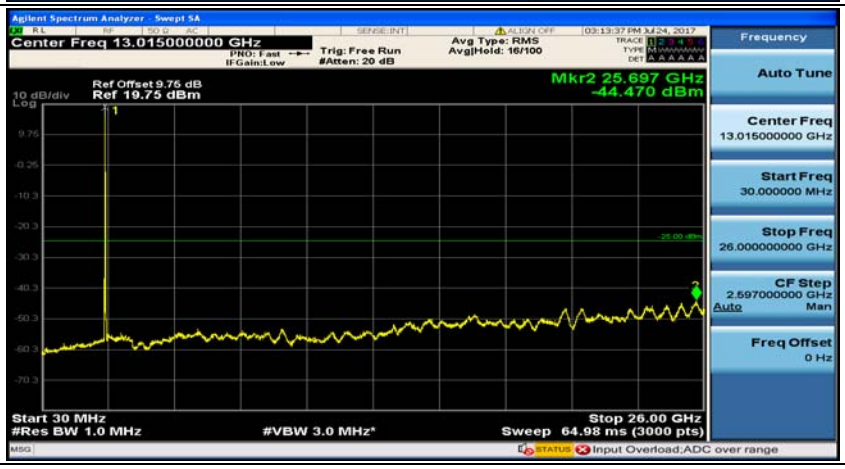
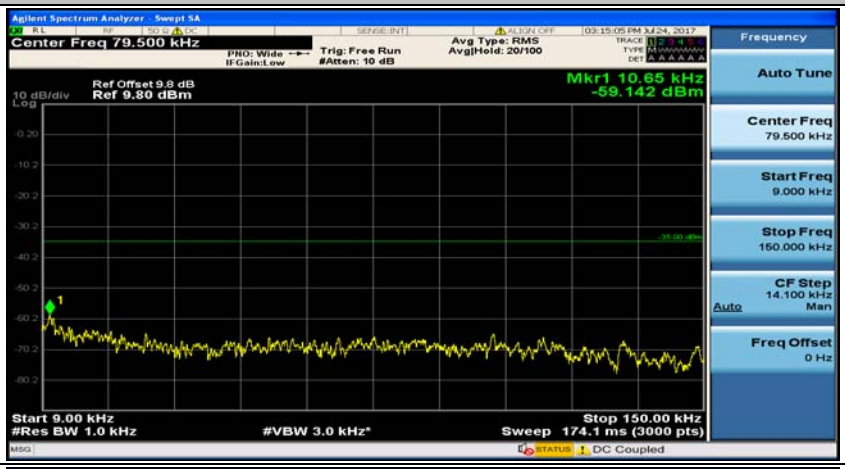
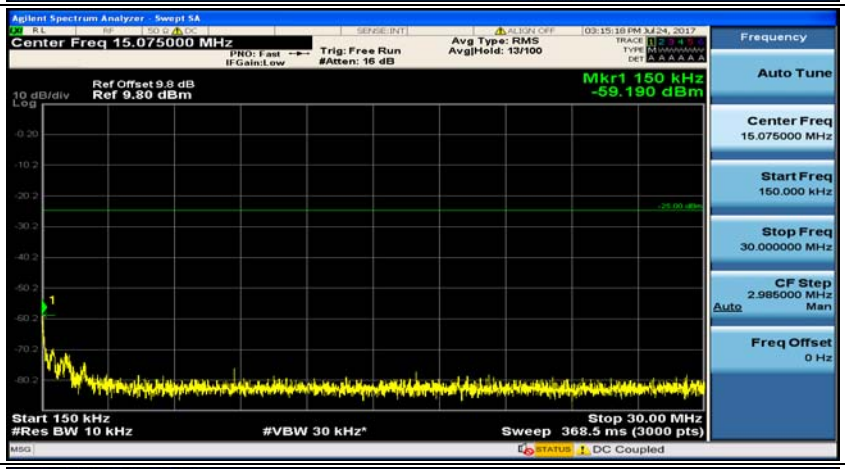

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 20/100
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 9.33 kHz
-59.763 dBm
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.1 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz

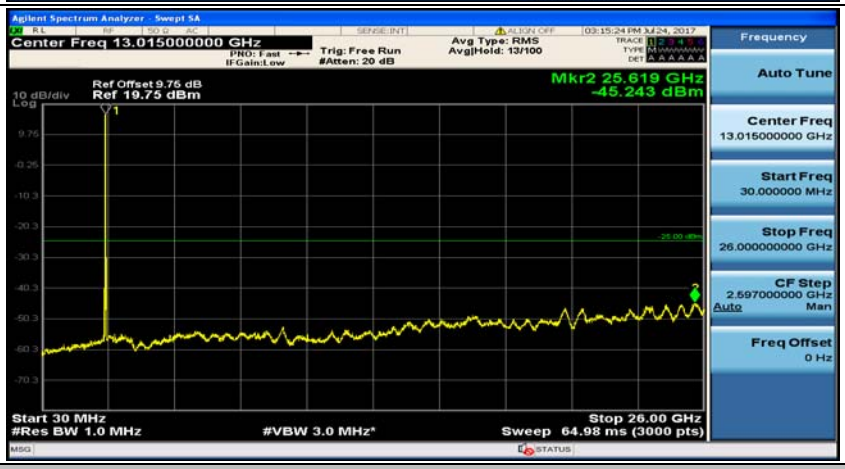

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 150 kHz
-56.505 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.5 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 16/100
Ref Offset 9.75 dB
10 dB/div
Ref 19.75 dBm
Mkr2 25.697 GHz
-44.470 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.98 ms (3000 pts)
Input Overload;ADC over range
Frequency
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz

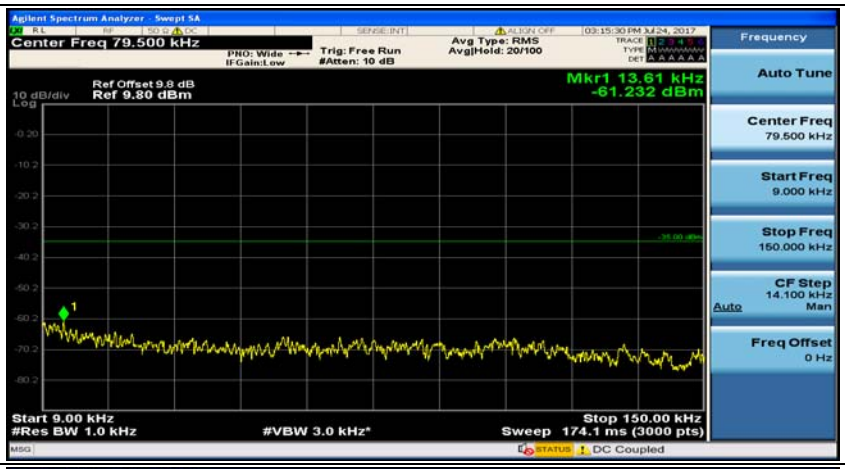
(Channel Bandwidth:20 MHz)_MCH_QPSK_1RB#0

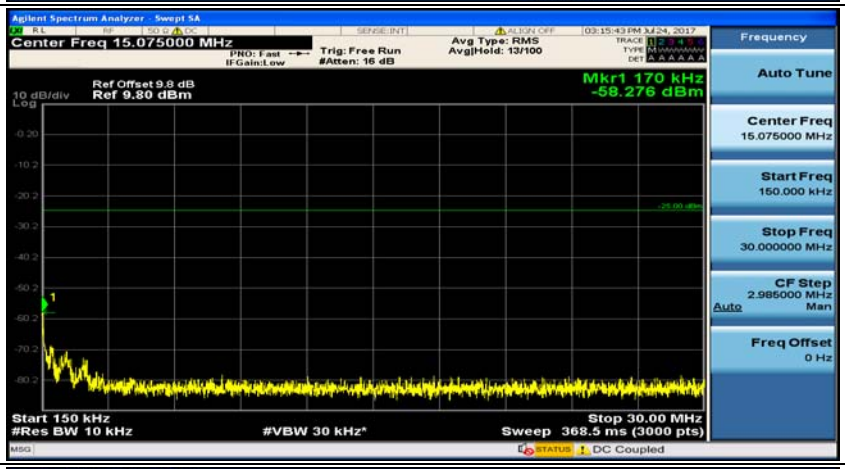


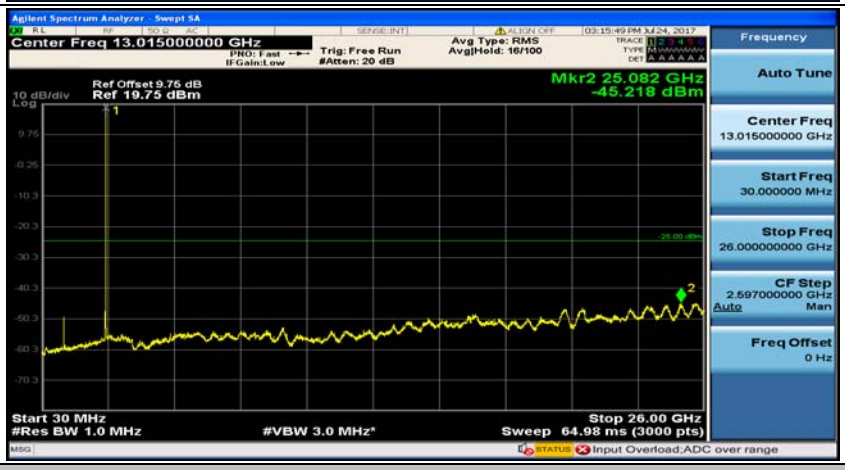



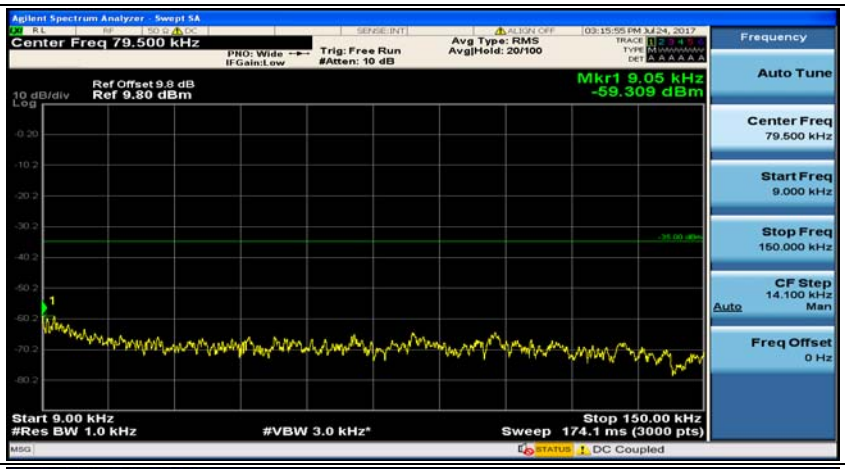

(Channel Bandwidth:20 MHz)_MCH_QPSK_1RB#49

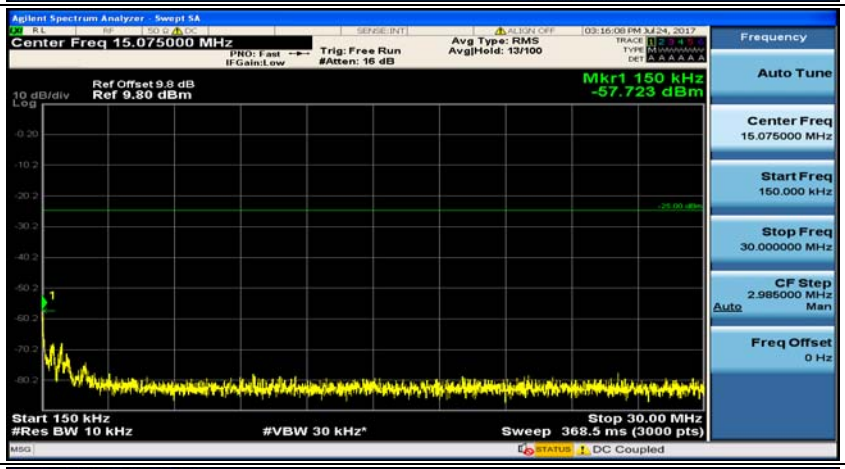


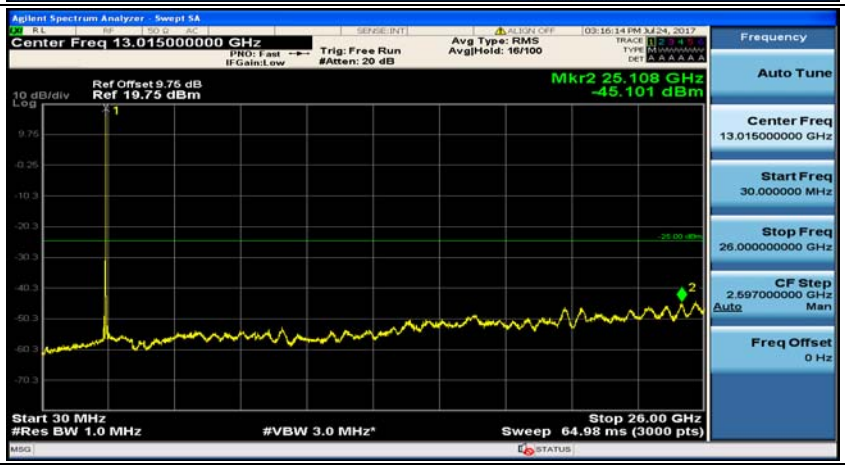



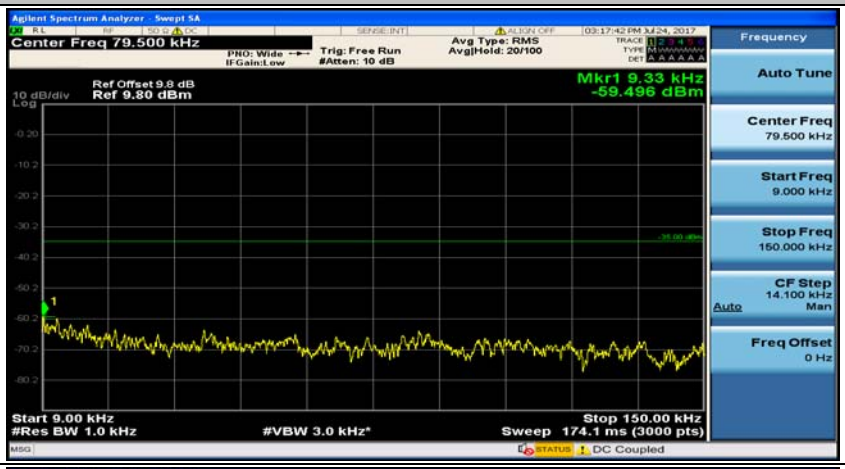

(Channel Bandwidth:20 MHz)_MCH_QPSK_1RB#99

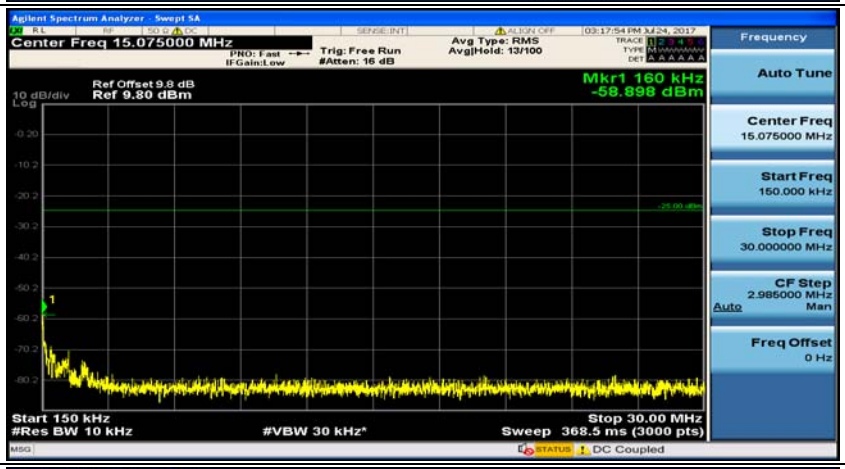

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 20/100
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 9.05 kHz
-59.309 dBm
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.1 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz

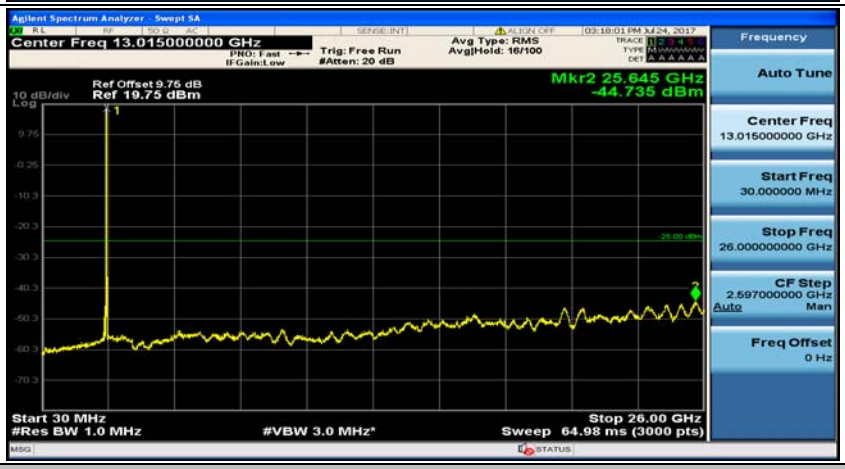

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 150 kHz
-57.723 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.5 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 16/100
Ref Offset 9.75 dB
10 dB/div
Ref 19.75 dBm
Mkr2 25.108 GHz
-45.101 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.98 ms (3000 pts)
Frequency
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz

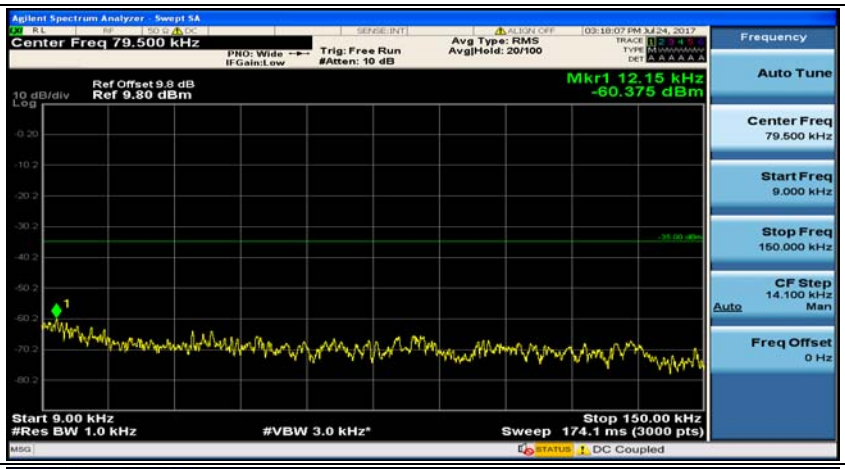
(Channel Bandwidth:20 MHz)_HCH_QPSK_1RB#0

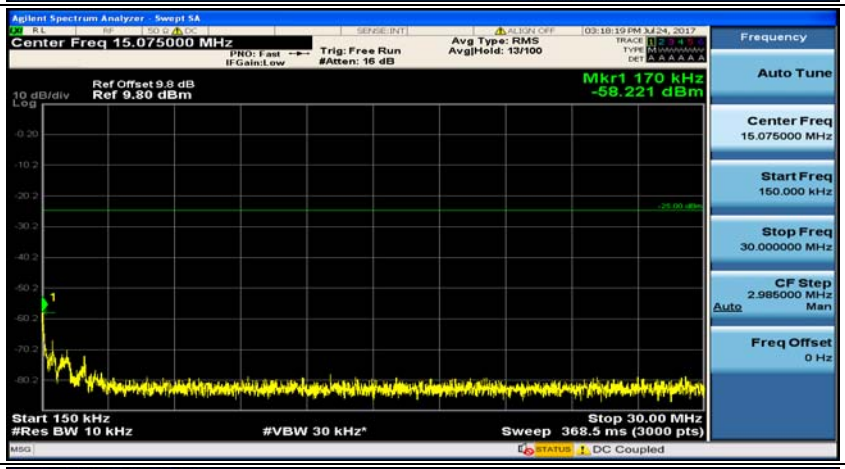


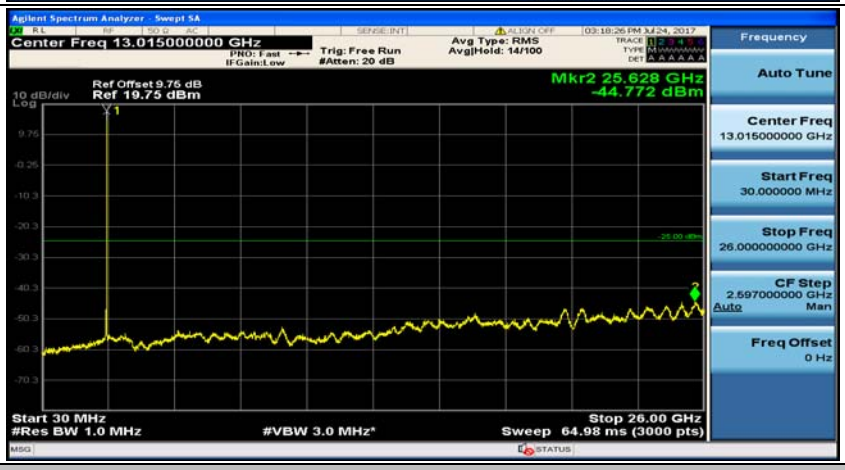



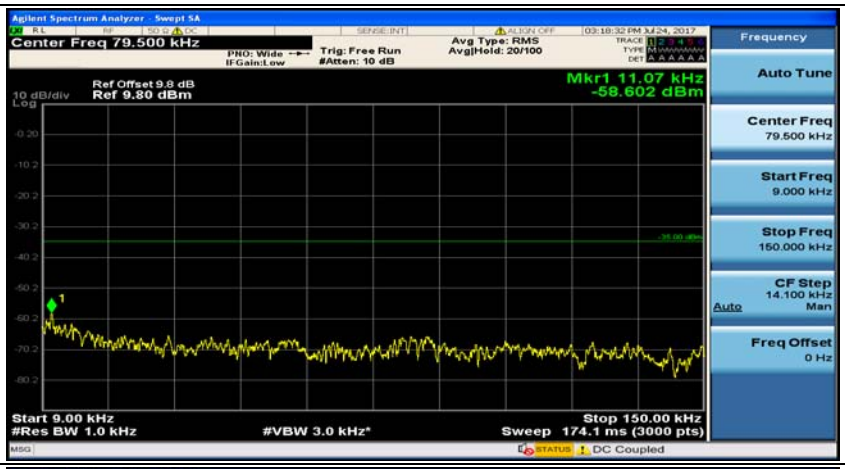

(Channel Bandwidth:20 MHz)_HCH_QPSK_1RB#49

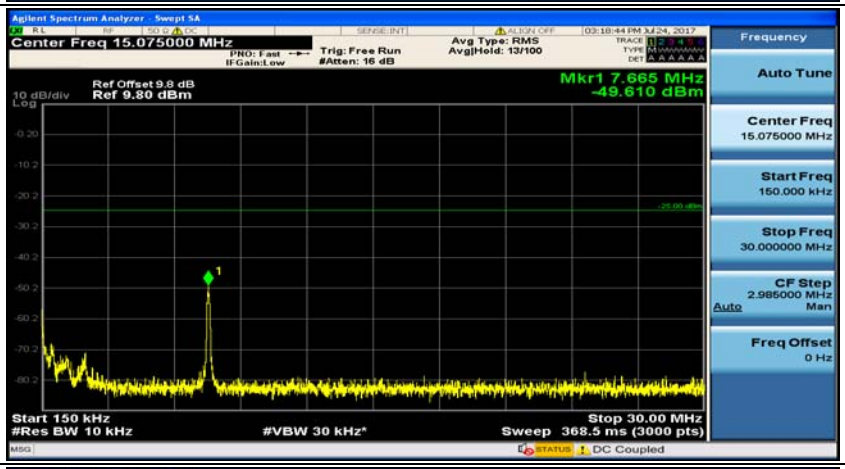


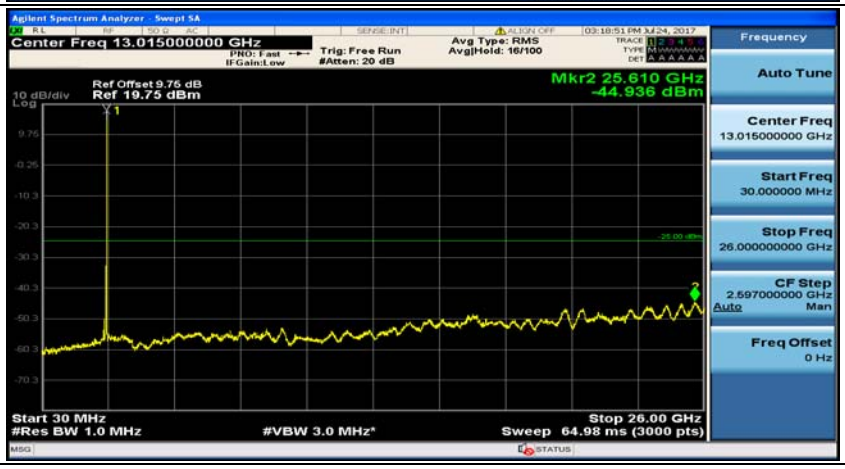



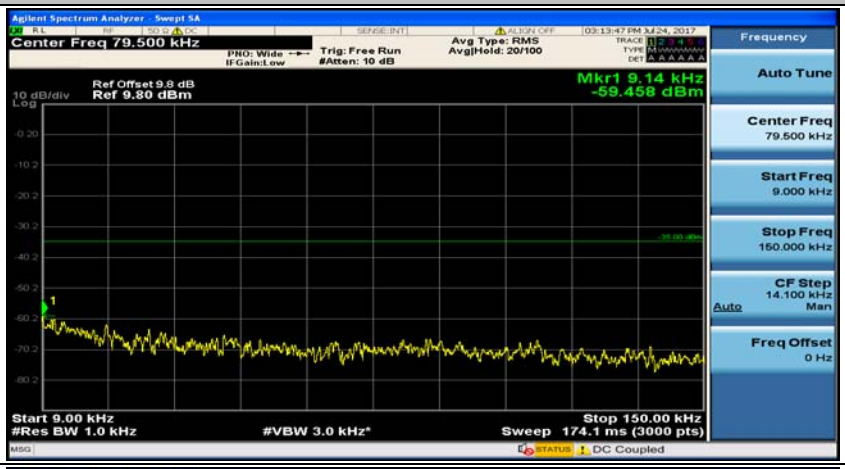

(Channel Bandwidth:20 MHz)_HCH_QPSK_1RB#99

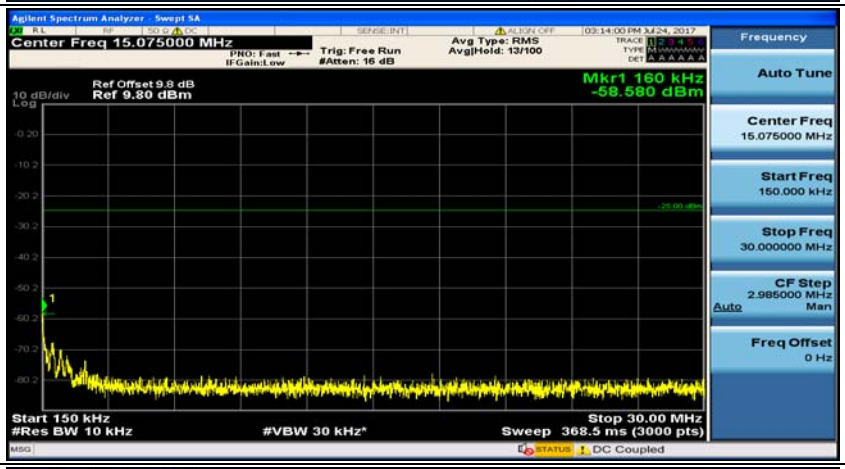

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 20/100
03:18:32 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 11.07 kHz
-58.602 dBm
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.1 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz

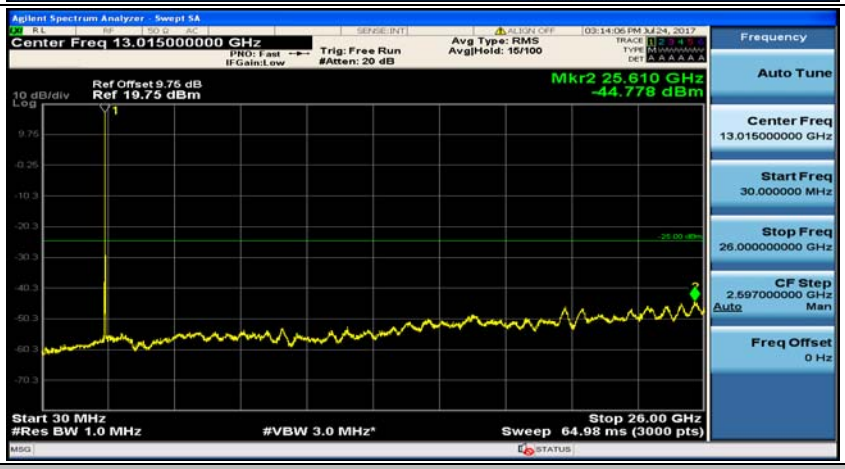

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
03:18:44 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 7.665 MHz
-49.610 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.5 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 16/100
03:18:51 PM Jul 24, 2017
Ref Offset 9.75 dB
10 dB/div
Ref 19.75 dBm
Mkr2 25.610 GHz
-44.936 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.98 ms (3000 pts)
Frequency
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz

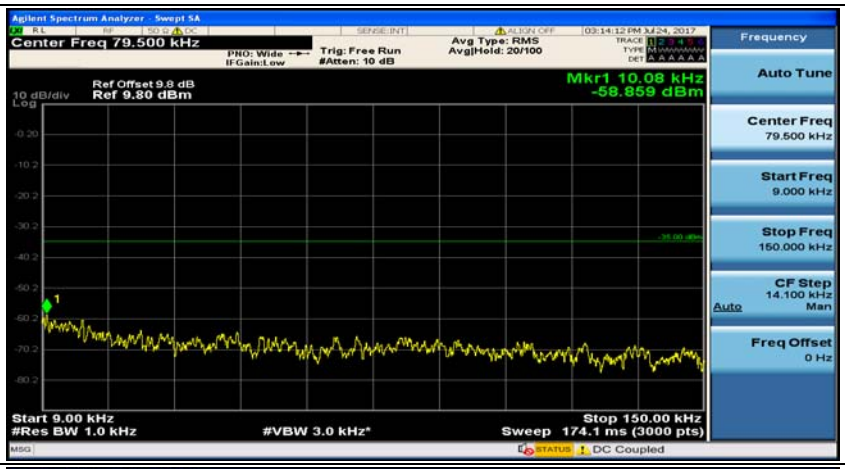
(Channel Bandwidth:20 MHz)_LCH_16QAM_1RB#0

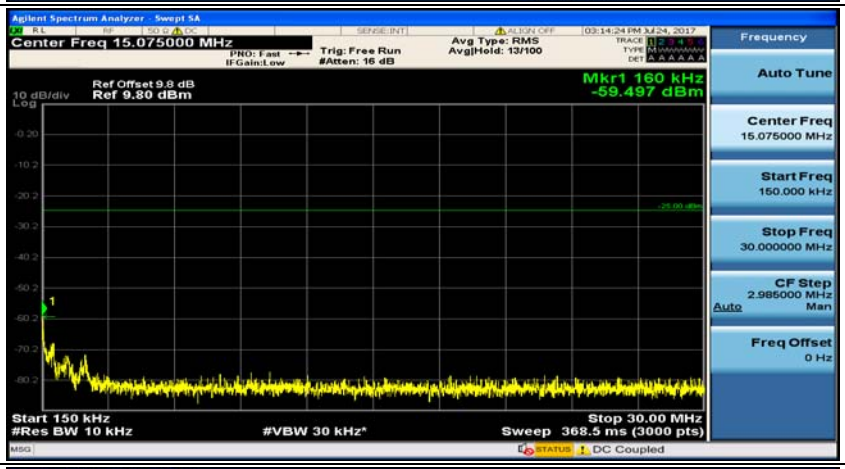


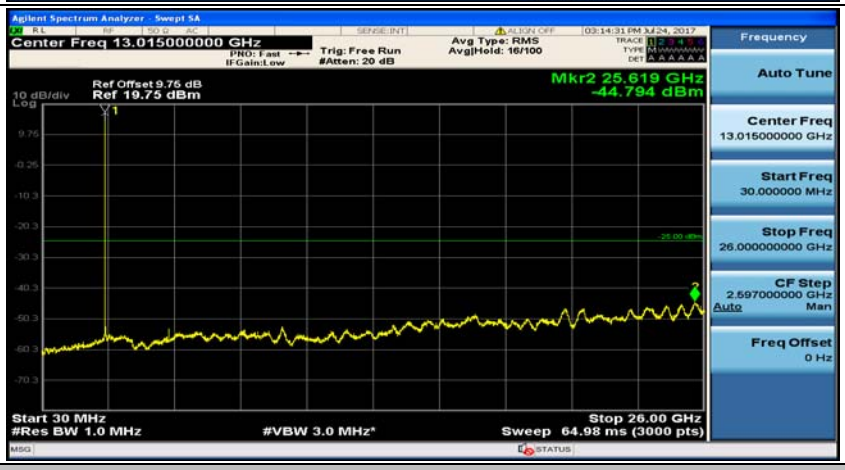



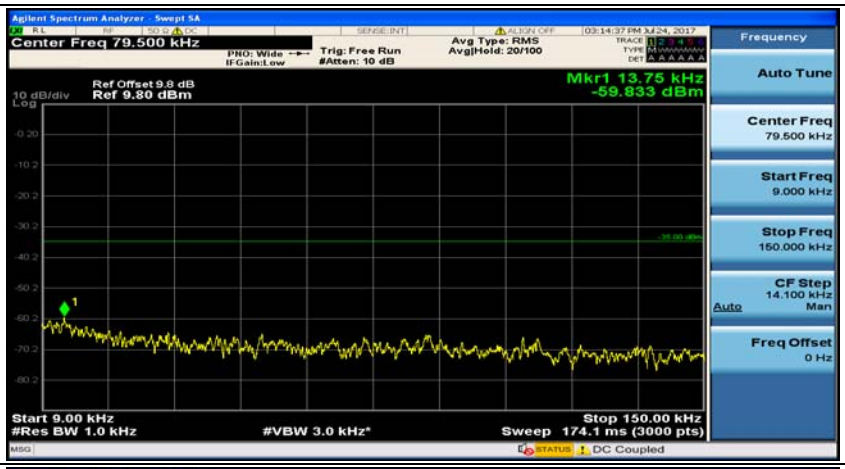

(Channel Bandwidth:20 MHz)_LCH_16QAM_1RB#49

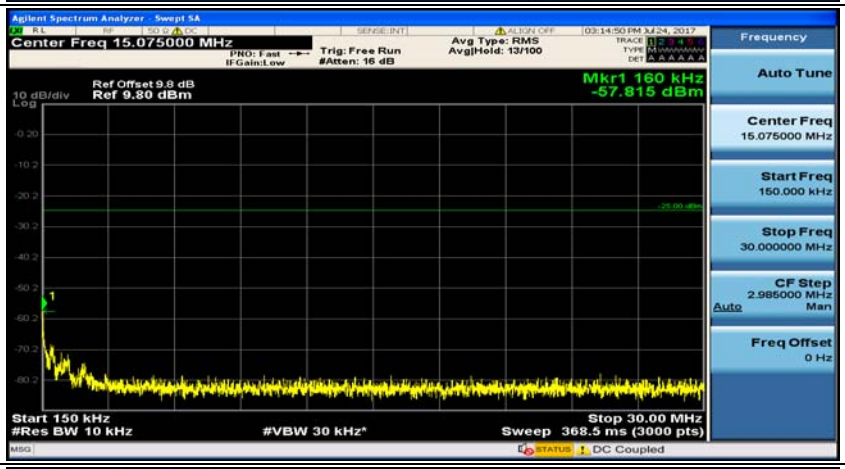


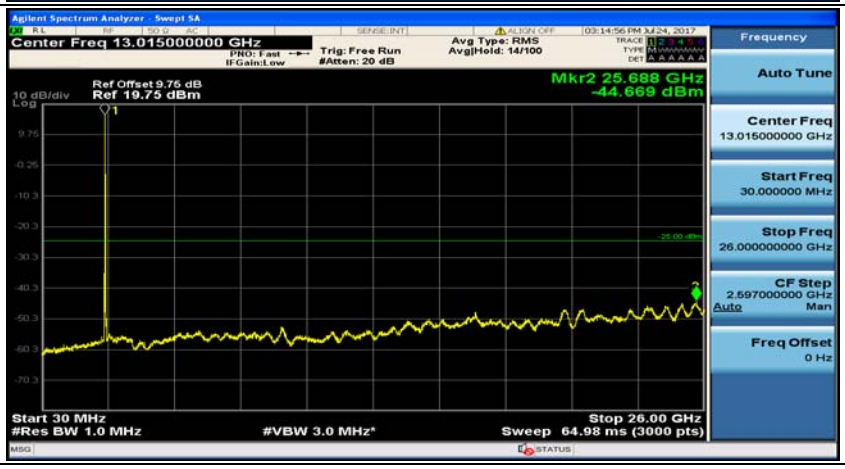



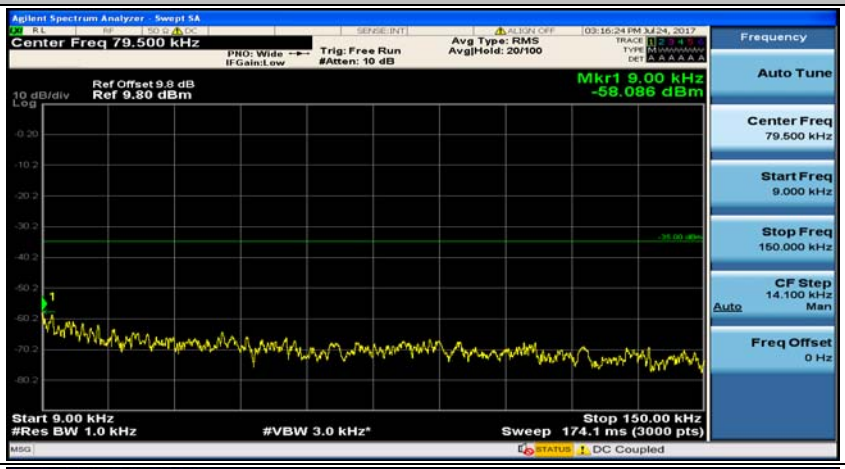
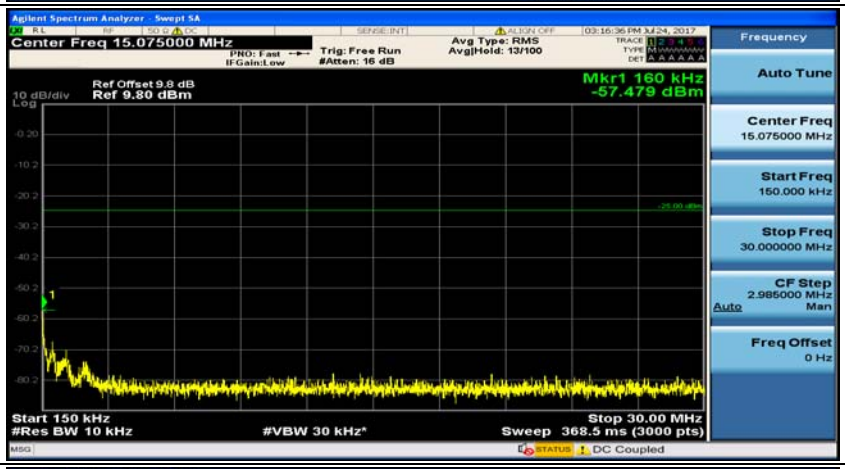
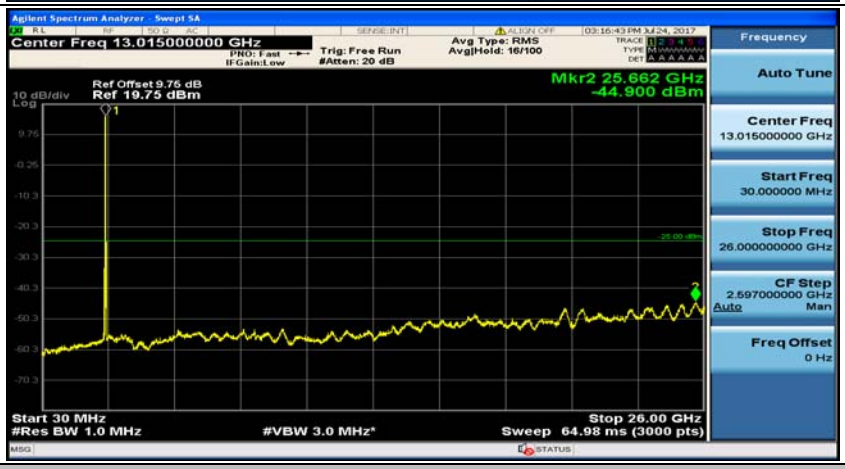



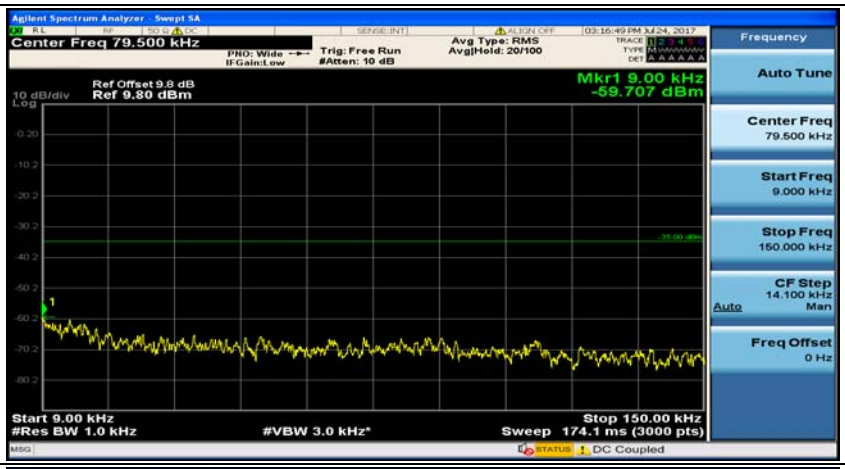

(Channel Bandwidth:20 MHz)_LCH_16QAM_1RB#99

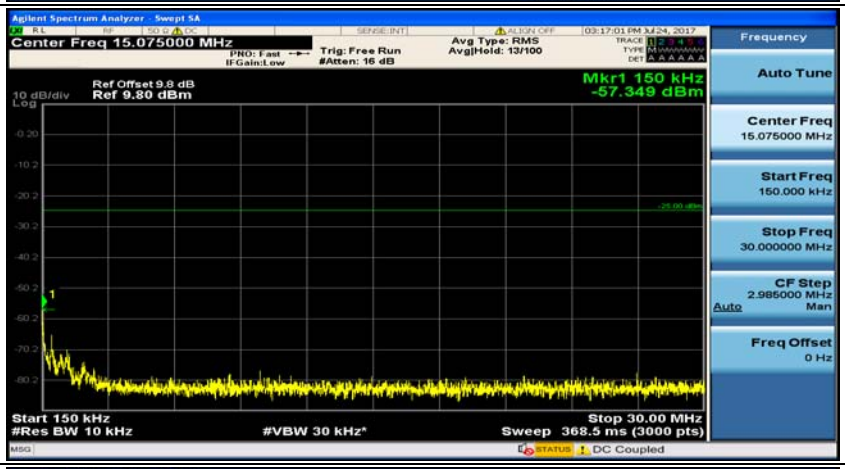

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 20/100
03:14:37 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 13.75 kHz
-59.833 dBm
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.1 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz

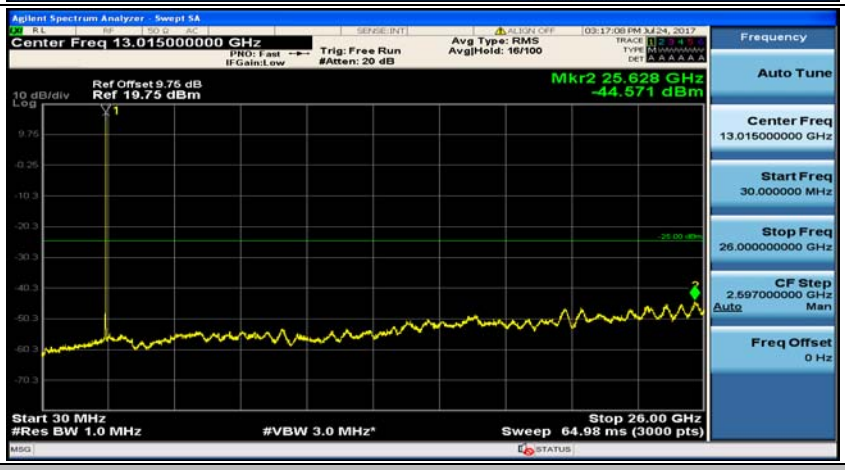

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
03:14:50 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 160 kHz
-57.815 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.5 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 14/100
03:14:56 PM Jul 24, 2017
Ref Offset 9.75 dB
10 dB/div
Ref 19.75 dBm
Mkr2 25.688 GHz
-44.669 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.98 ms (3000 pts)
Frequency
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz

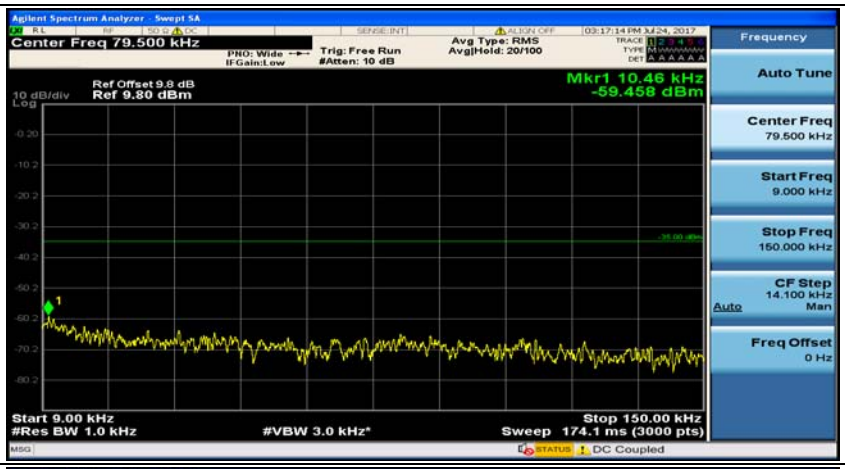
| (Channel Bandwidth:20 MHz)_MCH_16QAM_1RB#0 |
|---|
|   |
|   |
|   |
| (Channel Bandwidth:20 MHz)_MCH_16QAM_1RB#49 |

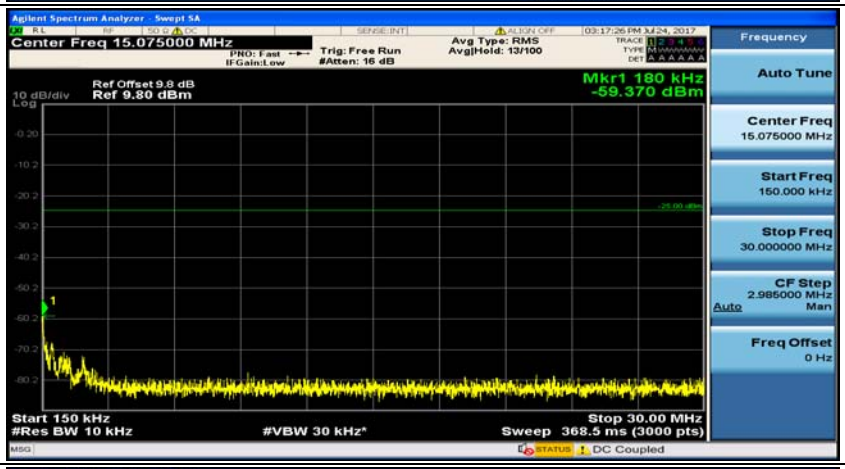


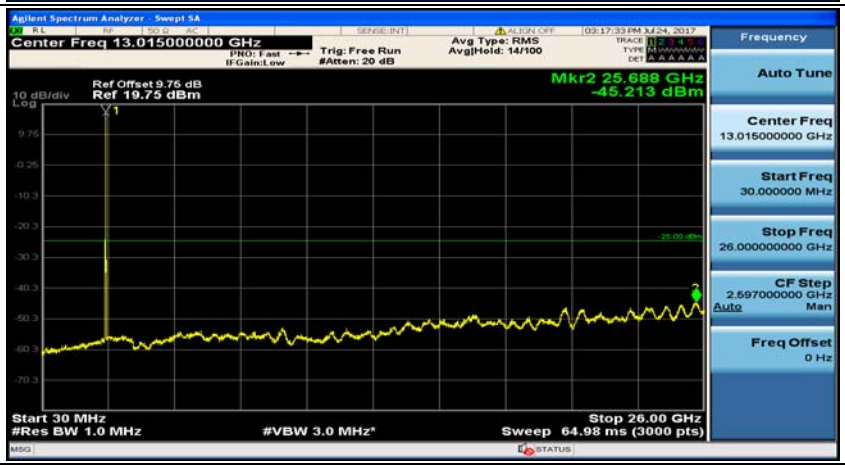



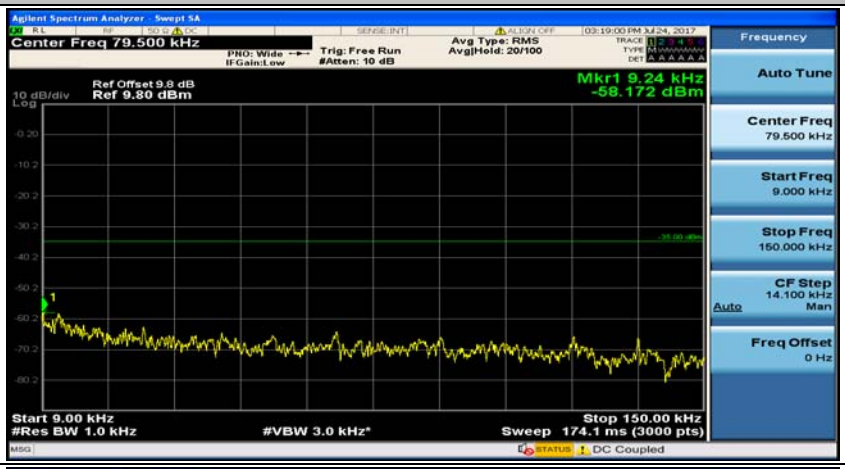

(Channel Bandwidth:20 MHz)_MCH_16QAM_1RB#99

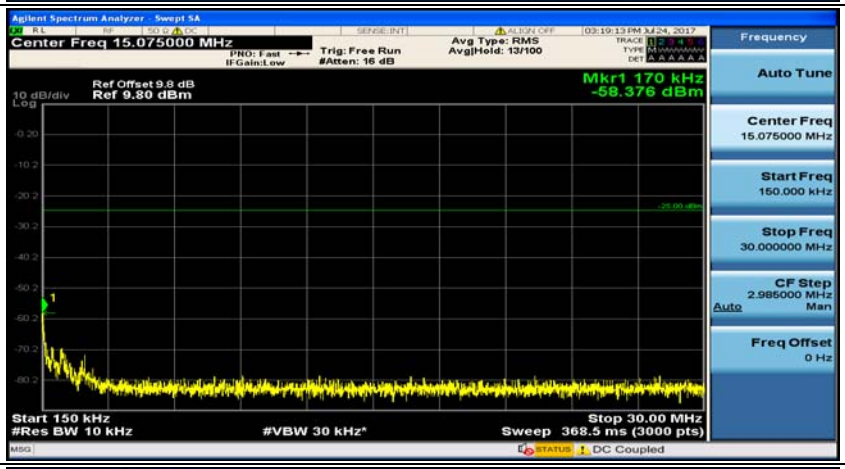

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 20/100
03:17:14 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 10.46 kHz
-59.458 dBm
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.1 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz

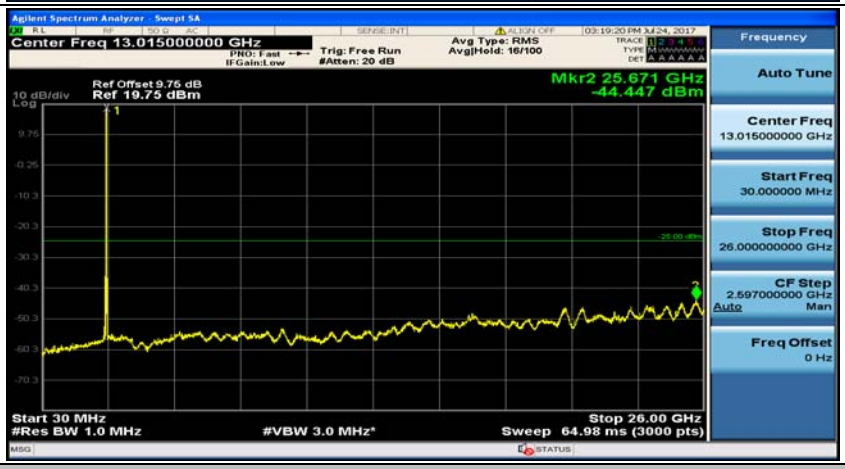

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
03:17:26 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 180 kHz
-59.370 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.5 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 14/100
03:17:33 PM Jul 24, 2017
Ref Offset 9.75 dB
10 dB/div
Ref 19.75 dBm
Mkr2 25.688 GHz
-45.213 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.98 ms (3000 pts)
Frequency
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz

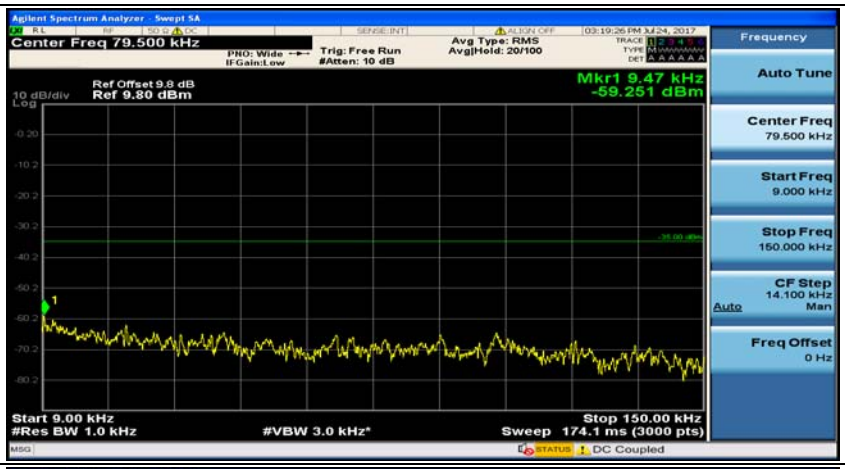
(Channel Bandwidth:20 MHz)_HCH_16QAM_1RB#0

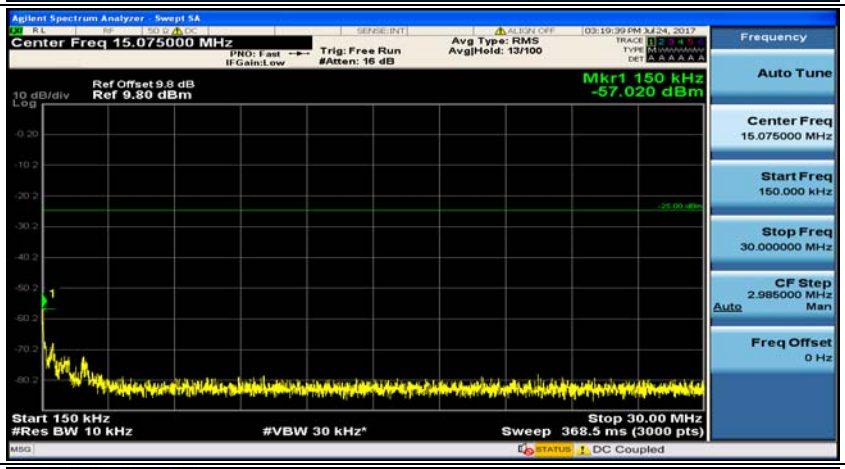


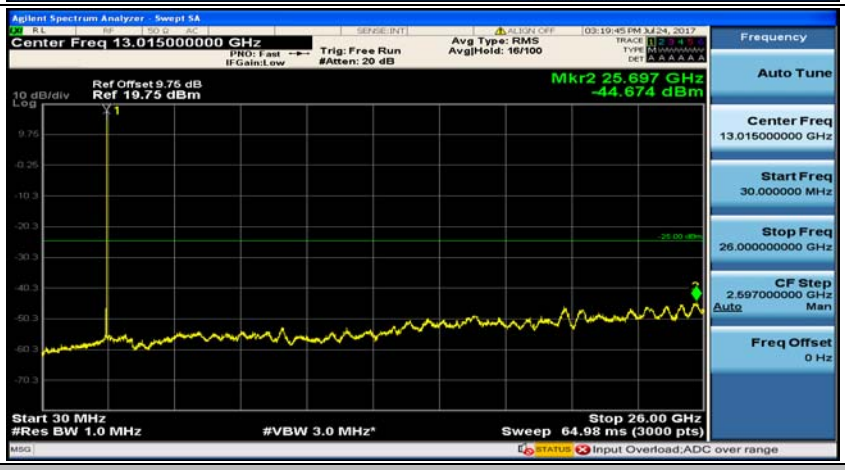



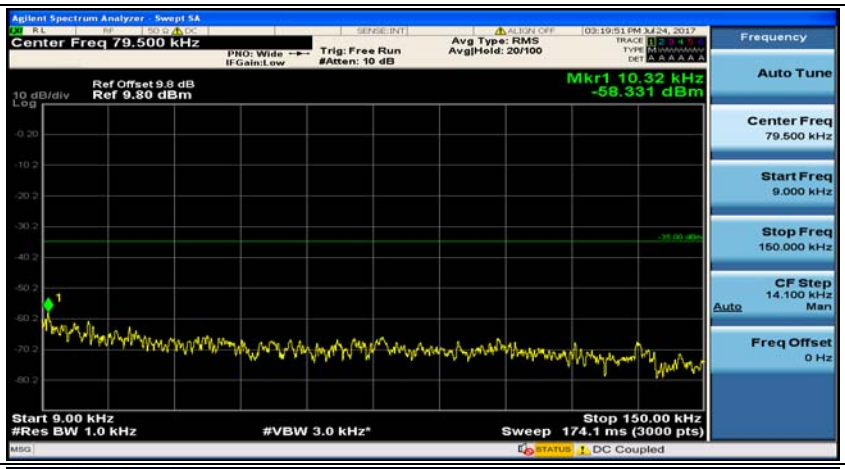

(Channel Bandwidth:20 MHz)_HCH_16QAM_1RB#49

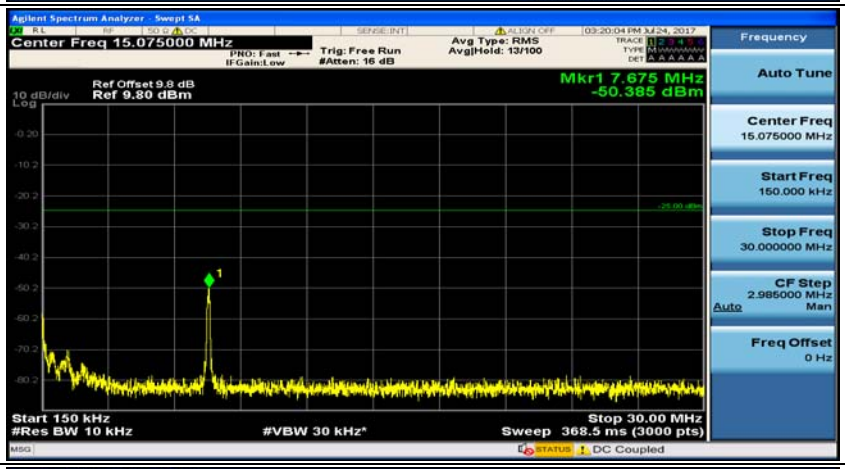


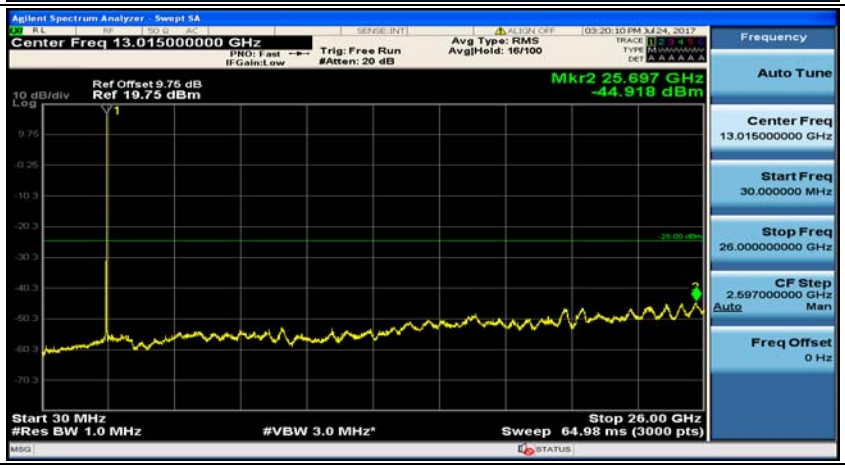




(Channel Bandwidth:20 MHz)_HCH_16QAM_1RB#99


Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 20/100
03:19:51 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 10.32 kHz
-58.331 dBm
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.1 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
03:20:04 PM Jul 24, 2017
Ref Offset 9.8 dB
10 dB/div
Ref 9.80 dBm
Mkr1 7.675 MHz
-50.385 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.5 ms (3000 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 16/100
03:20:10 PM Jul 24, 2017
Ref Offset 9.75 dB
10 dB/div
Ref 19.75 dBm
Mkr2 25.697 GHz
-44.918 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.98 ms (3000 pts)
Frequency
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz

# Appendix F: Frequency Stability

## Test Result

## Channel Bandwidth: 5 MHz

| Channel Bandwidth: 5 MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Voltage | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VL | TN | 3.53 | 0.001406 | ± 2.5 | PASS |
| | | VN | TN | 3.91 | 0.001558 | ± 2.5 | PASS |
| | | VH | TN | 0.55 | 0.000219 | ± 2.5 | PASS |
| | MCH | VL | TN | 0.72 | 0.000284 | ± 2.5 | PASS |
| | | VN | TN | 4.36 | 0.001720 | ± 2.5 | PASS |
| | | VH | TN | 2.13 | 0.000840 | ± 2.5 | PASS |
| | HCH | VL | TN | 3.1 | 0.001211 | ± 2.5 | PASS |
| | | VN | TN | -0.83 | -0.000324 | ± 2.5 | PASS |
| | | VH | TN | -0.1 | -0.000039 | ± 2.5 | PASS |
| 16QAM | LCH | VL | TN | 0.98 | 0.000390 | ± 2.5 | PASS |
| | | VN | TN | 1.97 | 0.000785 | ± 2.5 | PASS |
| | | VH | TN | 3.93 | 0.001566 | ± 2.5 | PASS |
| | MCH | VL | TN | -0.97 | -0.000383 | ± 2.5 | PASS |
| | | VN | TN | 4.46 | 0.001759 | ± 2.5 | PASS |
| | | VH | TN | 4.65 | 0.001834 | ± 2.5 | PASS |
| | HCH | VL | TN | 2.84 | 0.001109 | ± 2.5 | PASS |
| | | VN | TN | 2.51 | 0.000980 | ± 2.5 | PASS |
| | | VH | TN | 2.61 | 0.001020 | ± 2.5 | PASS |
| Temperature | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VN | -30 | #QPSK-L-5-F-L--30-Hz | #QPSK-L-5-F-L--30-ppm | ± 2.5 | PASS |
| | | VN | -20 | #QPSK-L-5-F-L--20-Hz | #QPSK-L-5-F-L--20-ppm | ± 2.5 | PASS |
| | | VN | -10 | #QPSK-L-5-F-L--10-Hz | #QPSK-L-5-F-L--10-ppm | ± 2.5 | PASS |
| | | VN | 0 | #QPSK-L-5-F-L-0-Hz | #QPSK-L-5-F-L-0-ppm | ± 2.5 | PASS |
| | | VN | 10 | #QPSK-L-5-F-L-10-Hz | #QPSK-L-5-F-L-10-ppm | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VN | 20 | #QPSK-L-5-F-L-20-Hz | #QPSK-L-5-F-L-20-ppm | ± 2.5 | PASS |
| | | VN | 30 | #QPSK-L-5-F-L-30-Hz | #QPSK-L-5-F-L-30-ppm | ± 2.5 | PASS |
| | | VN | 40 | #QPSK-L-5-F-L-40-Hz | #QPSK-L-5-F-L-40-ppm | ± 2.5 | PASS |
| | | VN | 50 | #QPSK-L-5-F-L-50-Hz | #QPSK-L-5-F-L-50-ppm | ± 2.5 | PASS |
| | MCH | VN | -30 | #QPSK-M-5-F-L--30-Hz | #QPSK-M-5-F-L--30-ppm | ± 2.5 | PASS |
| | | VN | -20 | #QPSK-M-5-F-L--20-Hz | #QPSK-M-5-F-L--20-ppm | ± 2.5 | PASS |
| | | VN | -10 | #QPSK-M-5-F-L--10-Hz | #QPSK-M-5-F-L--10-ppm | ± 2.5 | PASS |
| | | VN | 0 | #QPSK-M-5-F-L-0-Hz | #QPSK-M-5-F-L-0-ppm | ± 2.5 | PASS |
| | | VN | 10 | #QPSK-M-5-F-L-10-Hz | #QPSK-M-5-F-L-10-ppm | ± 2.5 | PASS |
| | | VN | 20 | #QPSK-M-5-F-L-20-Hz | #QPSK-M-5-F-L-20-ppm | ± 2.5 | PASS |
| | | VN | 30 | #QPSK-M-5-F-L-30-Hz | #QPSK-M-5-F-L-30-ppm | ± 2.5 | PASS |
| | | VN | 40 | #QPSK-M-5-F-L-40-Hz | #QPSK-M-5-F-L-40-ppm | ± 2.5 | PASS |
| | | VN | 50 | #QPSK-M-5-F-L-50-Hz | #QPSK-M-5-F-L-50-ppm | ± 2.5 | PASS |
| | HCH | VN | -30 | #QPSK-H-5-F-L--30-Hz | #QPSK-H-5-F-L--30-ppm | ± 2.5 | PASS |
| | | VN | -20 | #QPSK-H-5-F-L--20-Hz | #QPSK-H-5-F-L--20-ppm | ± 2.5 | PASS |
| | | VN | -10 | #QPSK-H-5-F-L--10-Hz | #QPSK-H-5-F-L--10-ppm | ± 2.5 | PASS |
| | | VN | 0 | #QPSK-H-5-F-L-0-Hz | #QPSK-H-5-F-L-0-ppm | ± 2.5 | PASS |
| | | VN | 10 | #QPSK-H-5-F-L-10-Hz | #QPSK-H-5-F-L-10-ppm | ± 2.5 | PASS |
| | | VN | 20 | #QPSK-H-5-F-L-20-Hz | #QPSK-H-5-F-L-20-ppm | ± 2.5 | PASS |
| | | VN | 30 | #QPSK-H-5-F-L-30-Hz | #QPSK-H-5-F-L-30-ppm | ± 2.5 | PASS |
| | | VN | 40 | #QPSK-H-5-F-L-40-Hz | #QPSK-H-5-F-L-40-ppm | ± 2.5 | PASS |
| | | VN | 50 | #QPSK-H-5-F-L-50-Hz | #QPSK-H-5-F-L-50-ppm | ± 2.5 | PASS |
| 16QAM | LCH | VN | -30 | #16QAM-L-5-F-L--30-Hz | #16QAM-L-5-F-L--30-ppm | ± 2.5 | PASS |
| | | VN | -20 | #16QAM-L-5-F-L--20-Hz | #16QAM-L-5-F-L--20-ppm | ± 2.5 | PASS |
| | | VN | -10 | #16QAM-L-5-F-L--10-Hz | #16QAM-L-5-F-L--10-ppm | ± 2.5 | PASS |
| | | VN | 0 | #16QAM-L-5-F-L-0-Hz | #16QAM-L-5-F-L-0-ppm | ± 2.5 | PASS |
| | | VN | 10 | #16QAM-L-5-F-L-10-Hz | #16QAM-L-5-F-L-10-ppm | ± 2.5 | PASS |
| | | VN | 20 | #16QAM-L-5-F-L-20-Hz | #16QAM-L-5-F-L-20-ppm | ± 2.5 | PASS |
| | | VN | 30 | #16QAM-L-5-F-L-30-Hz | #16QAM-L-5-F-L-30-ppm | ± 2.5 | PASS |
| | | VN | 40 | #16QAM-L-5-F-L-40-Hz | #16QAM-L-5-F-L-40-ppm | ± 2.5 | PASS |
| | | VN | 50 | #16QAM-L-5-F-L-50-Hz | #16QAM-L-5-F-L-50-ppm | ± 2.5 | PASS |
| | MCH | VN | -30 | #16QAM-M-5-F-L--30-Hz | #16QAM-M-5-F-L--30-ppm | ± 2.5 | PASS |
| | | VN | -20 | #16QAM-M-5-F-L--20-Hz | #16QAM-M-5-F-L--20-ppm | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VN | -10 | #16QAM-M-5-F-L--10-Hz | #16QAM-M-5-F-L--10-ppm | ± 2.5 | PASS |
| | | VN | 0 | #16QAM-M-5-F-L-0-Hz | #16QAM-M-5-F-L-0-ppm | ± 2.5 | PASS |
| | | VN | 10 | #16QAM-M-5-F-L-10-Hz | #16QAM-M-5-F-L-10-ppm | ± 2.5 | PASS |
| | | VN | 20 | #16QAM-M-5-F-L-20-Hz | #16QAM-M-5-F-L-20-ppm | ± 2.5 | PASS |
| | | VN | 30 | #16QAM-M-5-F-L-30-Hz | #16QAM-M-5-F-L-30-ppm | ± 2.5 | PASS |
| | | VN | 40 | #16QAM-M-5-F-L-40-Hz | #16QAM-M-5-F-L-40-ppm | ± 2.5 | PASS |
| | | VN | 50 | #16QAM-M-5-F-L-50-Hz | #16QAM-M-5-F-L-50-ppm | ± 2.5 | PASS |
| | HCH | VN | -30 | #16QAM-H-5-F-L--30-Hz | #16QAM-H-5-F-L--30-ppm | ± 2.5 | PASS |
| | | VN | -20 | #16QAM-H-5-F-L--20-Hz | #16QAM-H-5-F-L--20-ppm | ± 2.5 | PASS |
| | | VN | -10 | #16QAM-H-5-F-L--10-Hz | #16QAM-H-5-F-L--10-ppm | ± 2.5 | PASS |
| | | VN | 0 | #16QAM-H-5-F-L-0-Hz | #16QAM-H-5-F-L-0-ppm | ± 2.5 | PASS |
| | | VN | 10 | #16QAM-H-5-F-L-10-Hz | #16QAM-H-5-F-L-10-ppm | ± 2.5 | PASS |
| | | VN | 20 | #16QAM-H-5-F-L-20-Hz | #16QAM-H-5-F-L-20-ppm | ± 2.5 | PASS |
| | | VN | 30 | #16QAM-H-5-F-L-30-Hz | #16QAM-H-5-F-L-30-ppm | ± 2.5 | PASS |
| | | VN | 40 | #16QAM-H-5-F-L-40-Hz | #16QAM-H-5-F-L-40-ppm | ± 2.5 | PASS |
| | | VN | 50 | #16QAM-H-5-F-L-50-Hz | #16QAM-H-5-F-L-50-ppm | ± 2.5 | PASS |

## Channel Bandwidth: 10 MHz

| Channel Bandwidth: 10 MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Voltage | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VL | TN | 0.36 | 0.000143 | ± 2.5 | PASS |
| | | VN | TN | 0.64 | 0.000255 | ± 2.5 | PASS |
| | | VH | TN | -0.71 | -0.000283 | ± 2.5 | PASS |
| | MCH | VL | TN | -0.66 | -0.000260 | ± 2.5 | PASS |
| | | VN | TN | 3.46 | 0.001365 | ± 2.5 | PASS |
| | | VH | TN | 4.04 | 0.001594 | ± 2.5 | PASS |
| | HCH | VL | TN | 4.03 | 0.001574 | ± 2.5 | PASS |
| | | VN | TN | 3.29 | 0.001285 | ± 2.5 | PASS |
| | | VH | TN | 1.41 | 0.000551 | ± 2.5 | PASS |
| 16QAM | LCH | VL | TN | -1.5 | -0.000598 | ± 2.5 | PASS |
| | | VN | TN | 0.81 | 0.000323 | ± 2.5 | PASS |
| | | VH | TN | -1.16 | -0.000462 | ± 2.5 | PASS |
| | MCH | VL | TN | 3.12 | 0.001231 | ± 2.5 | PASS |
| | | VN | TN | -1 | -0.000394 | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VH | TN | -0.39 | -0.000154 | ± 2.5 | PASS |
| | HCH | VL | TN | -1.68 | -0.000656 | ± 2.5 | PASS |
| | | VN | TN | -0.04 | -0.000016 | ± 2.5 | PASS |
| | | VH | TN | 3.49 | 0.001363 | ± 2.5 | PASS |
| Temperature | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| 16QAM | LCH | VN | -30 | -0.11 | -0.000044 | ± 2.5 | PASS |
| | | VN | -20 | 0.98 | 0.000390 | ± 2.5 | PASS |
| | | VN | -10 | 2.61 | 0.001040 | ± 2.5 | PASS |
| | | VN | 0 | -0.02 | -0.000008 | ± 2.5 | PASS |
| | | VN | 10 | -1.79 | -0.000713 | ± 2.5 | PASS |
| | | VN | 20 | -1.99 | -0.000793 | ± 2.5 | PASS |
| | | VN | 30 | 2.96 | 0.001179 | ± 2.5 | PASS |
| | | VN | 40 | 3.21 | 0.001279 | ± 2.5 | PASS |
| | | VN | 50 | -1.63 | -0.000649 | ± 2.5 | PASS |
| | MCH | VN | -30 | 1.32 | 0.000521 | ± 2.5 | PASS |
| | | VN | -20 | 2.76 | 0.001089 | ± 2.5 | PASS |
| | | VN | -10 | 0.53 | 0.000209 | ± 2.5 | PASS |
| | | VN | 0 | 3.02 | 0.001191 | ± 2.5 | PASS |
| | | VN | 10 | 4.13 | 0.001629 | ± 2.5 | PASS |
| | | VN | 20 | 4.9 | 0.001933 | ± 2.5 | PASS |
| | | VN | 30 | -0.05 | -0.000020 | ± 2.5 | PASS |
| | | VN | 40 | 2.93 | 0.001156 | ± 2.5 | PASS |
| | | VN | 50 | 3.38 | 0.001333 | ± 2.5 | PASS |
| | HCH | VN | -30 | 1.1 | 0.000430 | ± 2.5 | PASS |
| | | VN | -20 | 4.64 | 0.001813 | ± 2.5 | PASS |
| | | VN | -10 | 4.39 | 0.001715 | ± 2.5 | PASS |
| | | VN | 0 | 0.86 | 0.000336 | ± 2.5 | PASS |
| | | VN | 10 | 1.29 | 0.000504 | ± 2.5 | PASS |
| | | VN | 20 | 1.59 | 0.000621 | ± 2.5 | PASS |
| | | VN | 30 | 4.26 | 0.001664 | ± 2.5 | PASS |
| | | VN | 40 | -1.84 | -0.000719 | ± 2.5 | PASS |
| | | VN | 50 | -1.83 | -0.000715 | ± 2.5 | PASS |
| QPSK | LCH | VN | -30 | 4.53 | 0.001805 | ± 2.5 | PASS |
| | | VN | -20 | 0.56 | 0.000223 | ± 2.5 | PASS |
| | | VN | -10 | 4.8 | 0.001912 | ± 2.5 | PASS |
| | | VN | 0 | -1.58 | -0.000629 | ± 2.5 | PASS |
| | | VN | 10 | 2.93 | 0.001167 | ± 2.5 | PASS |
| | | VN | 20 | 0.36 | 0.000143 | ± 2.5 | PASS |
| | | VN | 30 | -1.89 | -0.000753 | ± 2.5 | PASS |
| | | VN | 40 | 4.05 | 0.001614 | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VN | 50 | 2.69 | 0.001072 | ± 2.5 | PASS |
| | MCH | VN | -30 | 4.99 | 0.001968 | ± 2.5 | PASS |
| | | VN | -20 | 0.91 | 0.000359 | ± 2.5 | PASS |
| | | VN | -10 | 2.33 | 0.000919 | ± 2.5 | PASS |
| | | VN | 0 | 1.69 | 0.000667 | ± 2.5 | PASS |
| | | VN | 10 | 3.12 | 0.001231 | ± 2.5 | PASS |
| | | VN | 20 | 1.78 | 0.000702 | ± 2.5 | PASS |
| | | VN | 30 | 1.99 | 0.000785 | ± 2.5 | PASS |
| | | VN | 40 | -1.53 | -0.000604 | ± 2.5 | PASS |
| | | VN | 50 | -0.61 | -0.000241 | ± 2.5 | PASS |
| | HCH | VN | -30 | 2.07 | 0.000809 | ± 2.5 | PASS |
| | | VN | -20 | 0.75 | 0.000293 | ± 2.5 | PASS |
| | | VN | -10 | 1.07 | 0.000418 | ± 2.5 | PASS |
| | | VN | 0 | -1.12 | -0.000438 | ± 2.5 | PASS |
| | | VN | 10 | 3.65 | 0.001426 | ± 2.5 | PASS |
| | | VN | 20 | 2.2 | 0.000859 | ± 2.5 | PASS |
| | | VN | 30 | -0.2 | -0.000078 | ± 2.5 | PASS |
| | | VN | 40 | -1.89 | -0.000738 | ± 2.5 | PASS |
| | | VN | 50 | 3.58 | 0.001398 | ± 2.5 | PASS |

## Channel Bandwidth: 15 MHz

| Channel Bandwidth: 15 MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Voltage | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VL | TN | -1.71 | -0.000681 | ± 2.5 | PASS |
| | | VN | TN | -0.28 | -0.000112 | ± 2.5 | PASS |
| | | VH | TN | 1.3 | 0.000518 | ± 2.5 | PASS |
| | MCH | VL | TN | -0.08 | -0.000032 | ± 2.5 | PASS |
| | | VN | TN | 4.67 | 0.001842 | ± 2.5 | PASS |
| | | VH | TN | 3.04 | 0.001199 | ± 2.5 | PASS |
| | HCH | VL | TN | 1.97 | 0.000770 | ± 2.5 | PASS |
| | | VN | TN | 2.12 | 0.000828 | ± 2.5 | PASS |
| | | VH | TN | -0.04 | -0.000016 | ± 2.5 | PASS |
| 16QAM | LCH | VL | TN | 3.86 | 0.001538 | ± 2.5 | PASS |
| | | VN | TN | 0.95 | 0.000378 | ± 2.5 | PASS |
| | | VH | TN | 3.05 | 0.001215 | ± 2.5 | PASS |
| | MCH | VL | TN | -1.19 | -0.000469 | ± 2.5 | PASS |
| | | VN | TN | -1.96 | -0.000773 | ± 2.5 | PASS |
| | | VH | TN | 2.28 | 0.000899 | ± 2.5 | PASS |
| | HCH | VL | TN | 3.18 | 0.001242 | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VN | TN | -0.86 | -0.000336 | ± 2.5 | PASS |
| | | VH | TN | 4.13 | 0.001613 | ± 2.5 | PASS |
| Temperature | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VN | -30 | 2.95 | 0.001175 | ± 2.5 | PASS |
| | | VN | -20 | -0.68 | -0.000271 | ± 2.5 | PASS |
| | | VN | -10 | 3.15 | 0.001255 | ± 2.5 | PASS |
| | | VN | 0 | 0.67 | 0.000267 | ± 2.5 | PASS |
| | | VN | 10 | 3.73 | 0.001486 | ± 2.5 | PASS |
| | | VN | 20 | -1.42 | -0.000566 | ± 2.5 | PASS |
| | | VN | 30 | -0.66 | -0.000263 | ± 2.5 | PASS |
| | | VN | 40 | 0.26 | 0.000104 | ± 2.5 | PASS |
| | | VN | 50 | 0.49 | 0.000195 | ± 2.5 | PASS |
| | MCH | VN | -30 | 1.19 | 0.000469 | ± 2.5 | PASS |
| | | VN | -20 | -0.84 | -0.000331 | ± 2.5 | PASS |
| | | VN | -10 | 0.11 | 0.000043 | ± 2.5 | PASS |
| | | VN | 0 | 4.17 | 0.001645 | ± 2.5 | PASS |
| | | VN | 10 | -0.68 | -0.000268 | ± 2.5 | PASS |
| | | VN | 20 | 1.58 | 0.000623 | ± 2.5 | PASS |
| | | VN | 30 | -1.56 | -0.000615 | ± 2.5 | PASS |
| | | VN | 40 | 3.16 | 0.001247 | ± 2.5 | PASS |
| | | VN | 50 | -1.31 | -0.000517 | ± 2.5 | PASS |
| | HCH | VN | -30 | 0.28 | 0.000109 | ± 2.5 | PASS |
| | | VN | -20 | -0.96 | -0.000375 | ± 2.5 | PASS |
| | | VN | -10 | 2.91 | 0.001137 | ± 2.5 | PASS |
| | | VN | 0 | -1.04 | -0.000406 | ± 2.5 | PASS |
| | | VN | 10 | 1.38 | 0.000539 | ± 2.5 | PASS |
| | | VN | 20 | 0.36 | 0.000141 | ± 2.5 | PASS |
| | | VN | 30 | 1.3 | 0.000508 | ± 2.5 | PASS |
| | | VN | 40 | 4.07 | 0.001590 | ± 2.5 | PASS |
| | | VN | 50 | -1.07 | -0.000418 | ± 2.5 | PASS |
| QPSK | LCH | VN | -30 | -0.38 | -0.000151 | ± 2.5 | PASS |
| | | VN | -20 | 0.35 | 0.000139 | ± 2.5 | PASS |
| | | VN | -10 | -0.4 | -0.000159 | ± 2.5 | PASS |
| | | VN | 0 | -0.25 | -0.000100 | ± 2.5 | PASS |
| | | VN | 10 | 3.81 | 0.001518 | ± 2.5 | PASS |
| | | VN | 20 | 4.03 | 0.001606 | ± 2.5 | PASS |
| | | VN | 30 | -1.71 | -0.000681 | ± 2.5 | PASS |
| | | VN | 40 | 0.07 | 0.000028 | ± 2.5 | PASS |
| | | VN | 50 | 4.36 | 0.001737 | ± 2.5 | PASS |
| | MCH | VN | -30 | 0.5 | 0.000197 | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VN | -20 | 0.62 | 0.000245 | ± 2.5 | PASS |
| | | VN | -10 | -0.06 | -0.000024 | ± 2.5 | PASS |
| | | VN | 0 | 1.89 | 0.000746 | ± 2.5 | PASS |
| | | VN | 10 | 3.02 | 0.001191 | ± 2.5 | PASS |
| | | VN | 20 | 2.88 | 0.001136 | ± 2.5 | PASS |
| | | VN | 30 | 4.46 | 0.001759 | ± 2.5 | PASS |
| | | VN | 40 | 2.19 | 0.000864 | ± 2.5 | PASS |
| | | VN | 50 | 4.4 | 0.001736 | ± 2.5 | PASS |
| | HCH | VN | -30 | -1.3 | -0.000508 | ± 2.5 | PASS |
| | | VN | -20 | 3.29 | 0.001285 | ± 2.5 | PASS |
| | | VN | -10 | -1.79 | -0.000699 | ± 2.5 | PASS |
| | | VN | 0 | 1.39 | 0.000543 | ± 2.5 | PASS |
| | | VN | 10 | -1.52 | -0.000594 | ± 2.5 | PASS |
| | | VN | 20 | 3.08 | 0.001203 | ± 2.5 | PASS |
| | | VN | 30 | 1.45 | 0.000566 | ± 2.5 | PASS |
| | | VN | 40 | 3.08 | 0.001203 | ± 2.5 | PASS |
| | | VN | 50 | 2.83 | 0.001105 | ± 2.5 | PASS |

## Channel Bandwidth: 20 MHz

| Channel Bandwidth: 20 MHz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Voltage | | | | | | | |
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VL | TN | 3.67 | 0.001462 | ± 2.5 | PASS |
| | | VN | TN | 0.51 | 0.000203 | ± 2.5 | PASS |
| | | VH | TN | -1.66 | -0.000661 | ± 2.5 | PASS |
| | MCH | VL | TN | 1.57 | 0.000619 | ± 2.5 | PASS |
| | | VN | TN | -1.66 | -0.000655 | ± 2.5 | PASS |
| | | VH | TN | 3.23 | 0.001274 | ± 2.5 | PASS |
| | HCH | VL | TN | 4.35 | 0.001699 | ± 2.5 | PASS |
| | | VN | TN | 3.77 | 0.001473 | ± 2.5 | PASS |
| | | VH | TN | 2.91 | 0.001137 | ± 2.5 | PASS |
| 16QAM | LCH | VL | TN | 3.37 | 0.001343 | ± 2.5 | PASS |
| | | VN | TN | -0.88 | -0.000351 | ± 2.5 | PASS |
| | | VH | TN | 1.17 | 0.000466 | ± 2.5 | PASS |
| | MCH | VL | TN | 1.15 | 0.000454 | ± 2.5 | PASS |
| | | VN | TN | 3.36 | 0.001325 | ± 2.5 | PASS |
| | | VH | TN | 1.85 | 0.000730 | ± 2.5 | PASS |
| | HCH | VL | TN | 1.33 | 0.000520 | ± 2.5 | PASS |
| | | VN | TN | 4.1 | 0.001602 | ± 2.5 | PASS |
| | | VH | TN | -1.98 | -0.000773 | ± 2.5 | PASS |

| Temperature | | | | | | | |
|---|---|---|---|---|---|---|---|
| Modulation | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| QPSK | LCH | VN | -30 | -1.55 | -0.000618 | ± 2.5 | PASS |
| | | VN | -20 | 2.77 | 0.001104 | ± 2.5 | PASS |
| | | VN | -10 | 2.12 | 0.000845 | ± 2.5 | PASS |
| | | VN | 0 | 2 | 0.000797 | ± 2.5 | PASS |
| | | VN | 10 | -0.9 | -0.000359 | ± 2.5 | PASS |
| | | VN | 20 | -0.98 | -0.000390 | ± 2.5 | PASS |
| | | VN | 30 | 4.7 | 0.001873 | ± 2.5 | PASS |
| | | VN | 40 | 3.82 | 0.001522 | ± 2.5 | PASS |
| | | VN | 50 | -1.86 | -0.000741 | ± 2.5 | PASS |
| | MCH | VN | -30 | -2 | -0.000789 | ± 2.5 | PASS |
| | | VN | -20 | 1.91 | 0.000753 | ± 2.5 | PASS |
| | | VN | -10 | 4.6 | 0.001815 | ± 2.5 | PASS |
| | | VN | 0 | 2.14 | 0.000844 | ± 2.5 | PASS |
| | | VN | 10 | 4.39 | 0.001732 | ± 2.5 | PASS |
| | | VN | 20 | 2.23 | 0.000880 | ± 2.5 | PASS |
| | | VN | 30 | 1.17 | 0.000462 | ± 2.5 | PASS |
| | | VN | 40 | 4.93 | 0.001945 | ± 2.5 | PASS |
| | | VN | 50 | -1.04 | -0.000410 | ± 2.5 | PASS |
| | HCH | VN | -30 | 0.24 | 0.000094 | ± 2.5 | PASS |
| | | VN | -20 | 1.78 | 0.000695 | ± 2.5 | PASS |
| | | VN | -10 | -1.4 | -0.000547 | ± 2.5 | PASS |
| | | VN | 0 | -1.4 | -0.000547 | ± 2.5 | PASS |
| | | VN | 10 | 0.46 | 0.000180 | ± 2.5 | PASS |
| | | VN | 20 | 1.04 | 0.000406 | ± 2.5 | PASS |
| | | VN | 30 | -1.22 | -0.000477 | ± 2.5 | PASS |
| | | VN | 40 | -1.81 | -0.000707 | ± 2.5 | PASS |
| | | VN | 50 | 2.67 | 0.001043 | ± 2.5 | PASS |
| QPSK | LCH | VN | -30 | -1.69 | -0.000673 | ± 2.5 | PASS |
| | | VN | -20 | 2.43 | 0.000968 | ± 2.5 | PASS |
| | | VN | -10 | 3.84 | 0.001530 | ± 2.5 | PASS |
| | | VN | 0 | -1.28 | -0.000510 | ± 2.5 | PASS |
| | | VN | 10 | 1.01 | 0.000402 | ± 2.5 | PASS |
| | | VN | 20 | 4.18 | 0.001665 | ± 2.5 | PASS |
| | | VN | 30 | 4.9 | 0.001952 | ± 2.5 | PASS |
| | | VN | 40 | 0.25 | 0.000100 | ± 2.5 | PASS |
| | | VN | 50 | 2.87 | 0.001143 | ± 2.5 | PASS |
| | MCH | VN | -30 | -0.85 | -0.000335 | ± 2.5 | PASS |
| | | VN | -20 | 3.39 | 0.001337 | ± 2.5 | PASS |
| | | VN | -10 | 1.48 | 0.000584 | ± 2.5 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | VN | 0 | 2.07 | 0.000817 | ± 2.5 | PASS |
| | | VN | 10 | -1.87 | -0.000738 | ± 2.5 | PASS |
| | | VN | 20 | 2.04 | 0.000805 | ± 2.5 | PASS |
| | | VN | 30 | -1.37 | -0.000540 | ± 2.5 | PASS |
| | | VN | 40 | 1.14 | 0.000450 | ± 2.5 | PASS |
| | | VN | 50 | 3.94 | 0.001554 | ± 2.5 | PASS |
| | HCH | VN | -30 | 2.6 | 0.001016 | ± 2.5 | PASS |
| | | VN | -20 | 4.49 | 0.001754 | ± 2.5 | PASS |
| | | VN | -10 | -1.88 | -0.000734 | ± 2.5 | PASS |
| | | VN | 0 | 1.18 | 0.000461 | ± 2.5 | PASS |
| | | VN | 10 | 4.22 | 0.001648 | ± 2.5 | PASS |
| | | VN | 20 | -1.83 | -0.000715 | ± 2.5 | PASS |
| | | VN | 30 | 3.89 | 0.001520 | ± 2.5 | PASS |
| | | VN | 40 | 4.92 | 0.001922 | ± 2.5 | PASS |
| | | VN | 50 | 1.74 | 0.000680 | ± 2.5 | PASS |