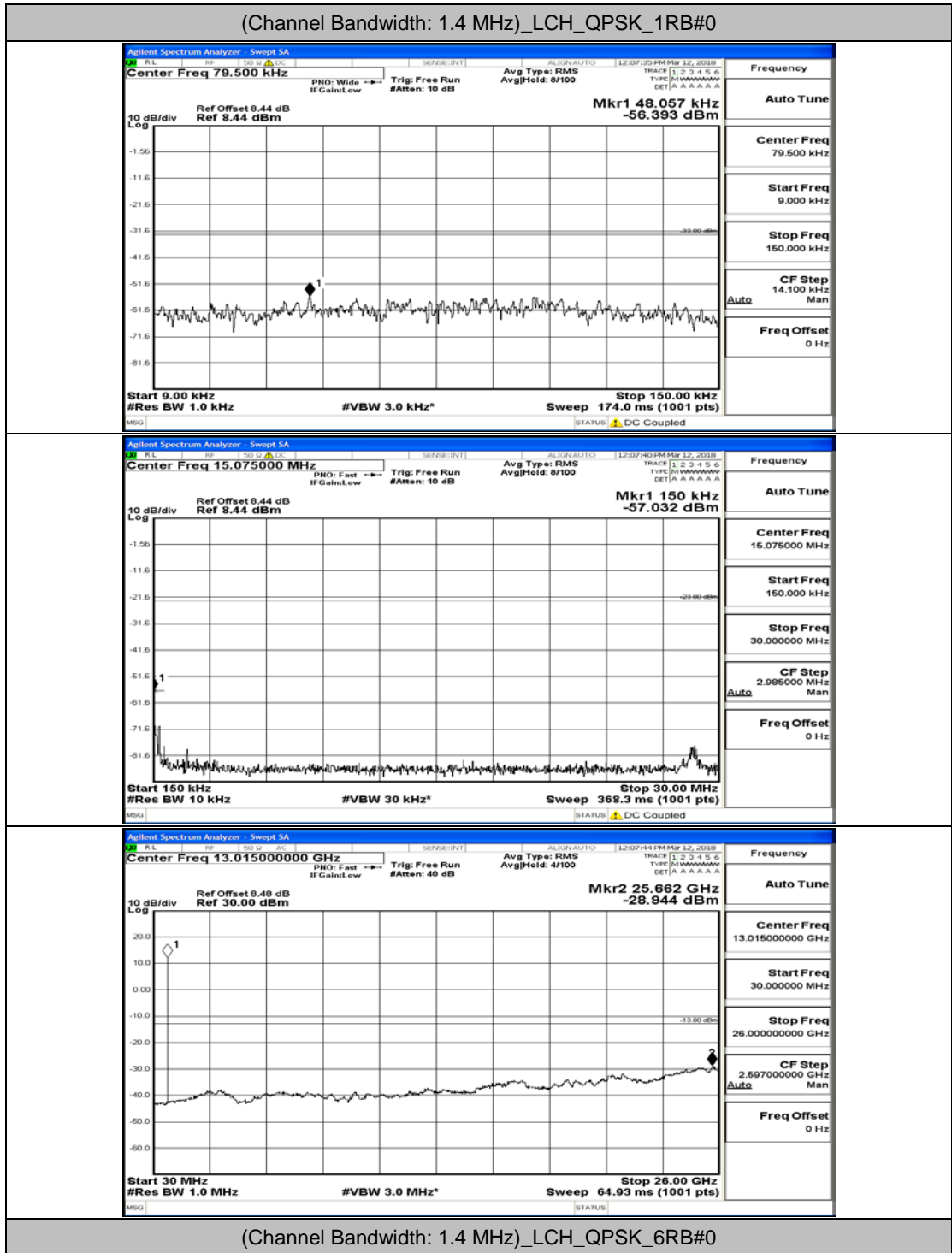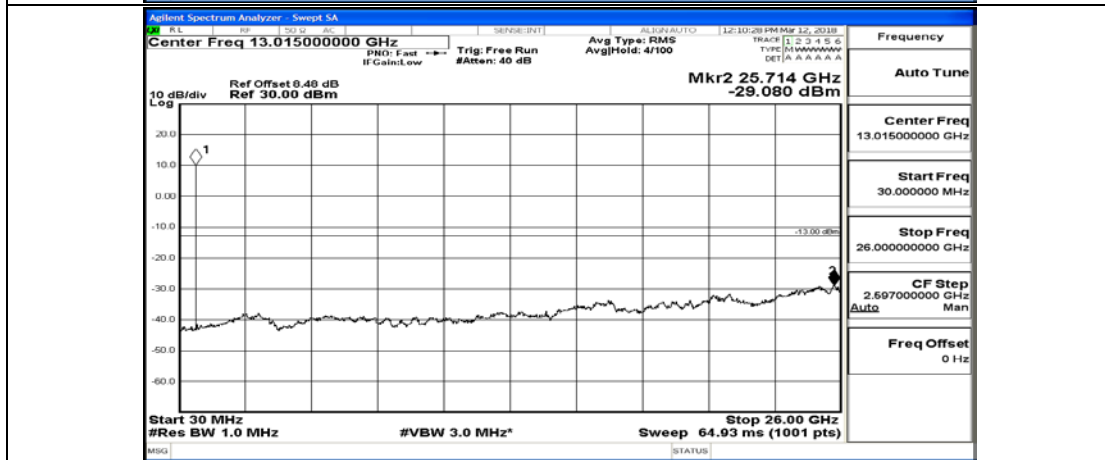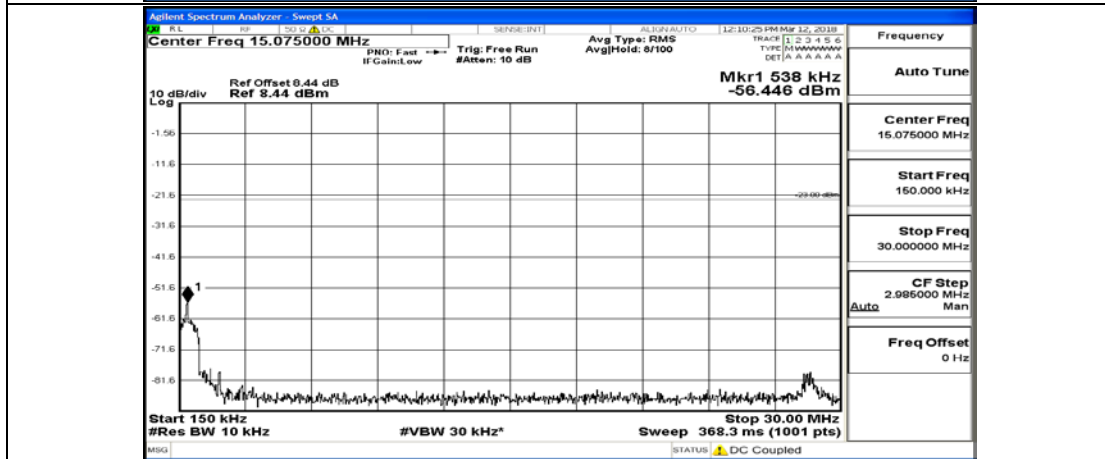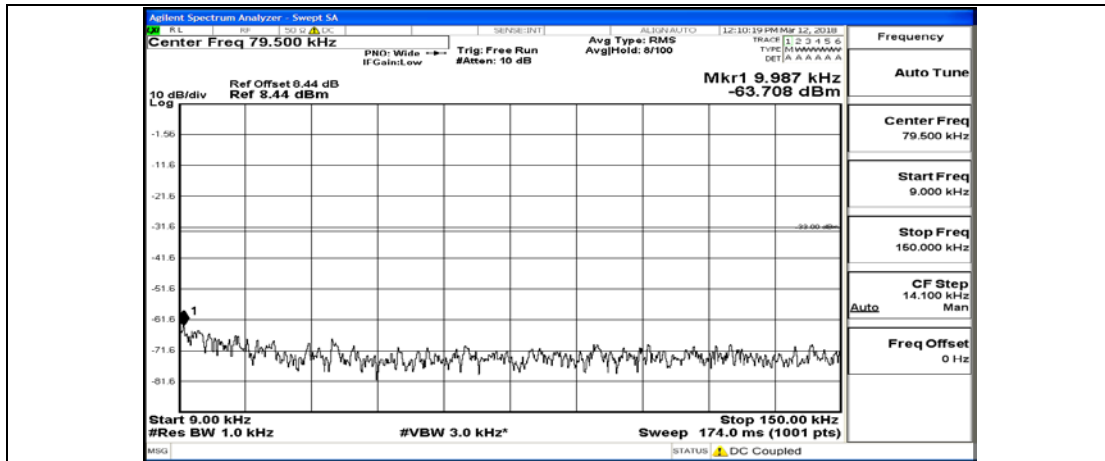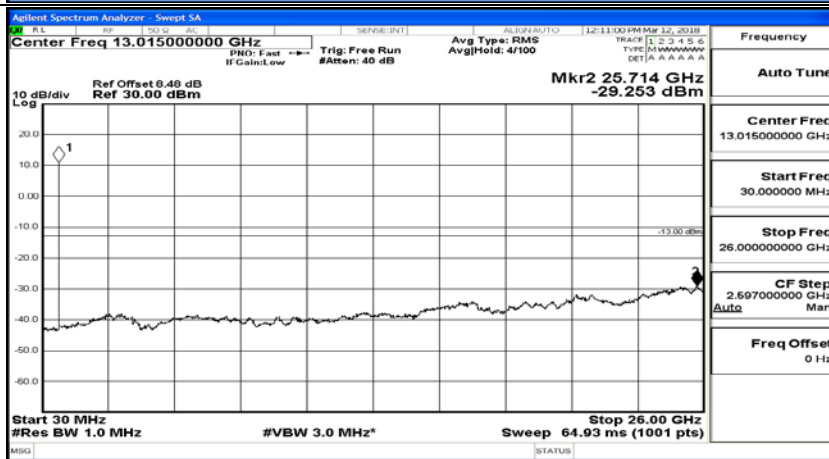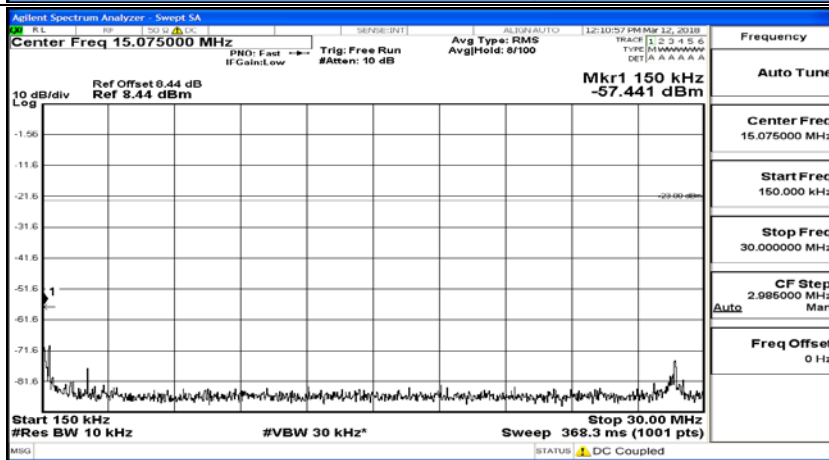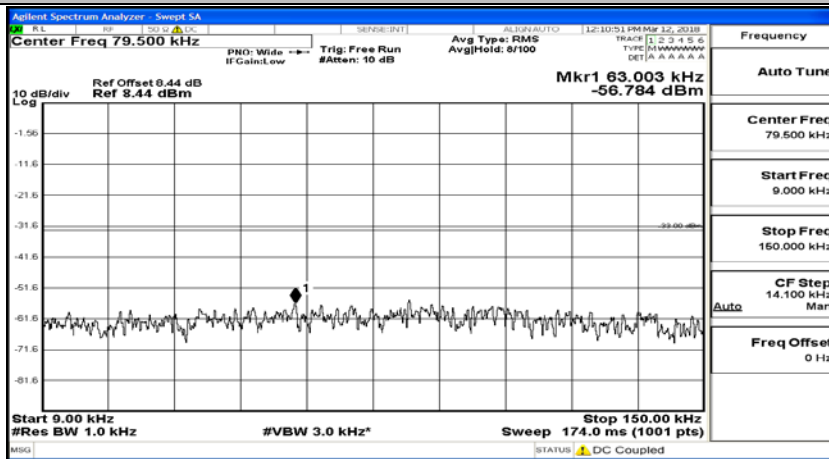# D.5: Conducted Spurious Emission

Test Graphs

Channel Bandwidth: 1.4 MHz
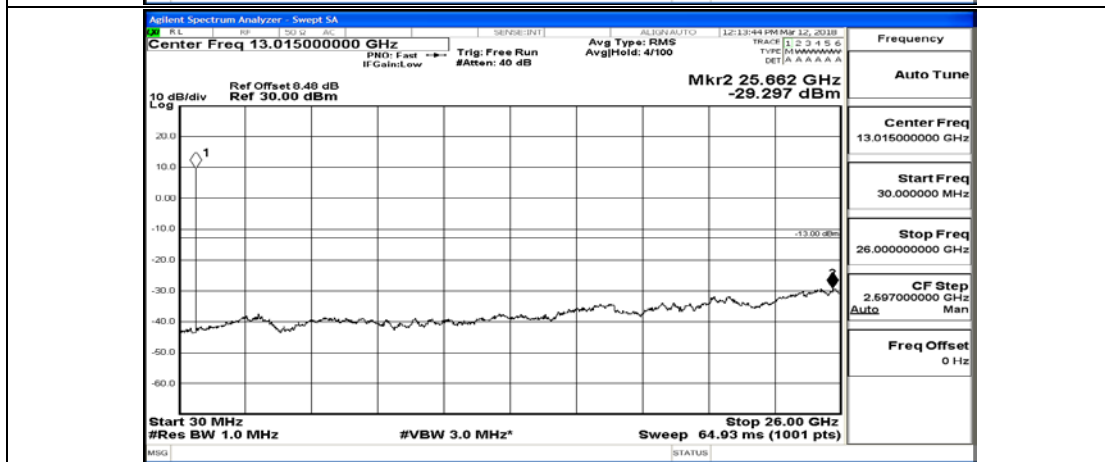
(Channel Bandwidth: 1.4 MHz)_LCH_QPSK_1RB#0
(Channel Bandwidth: 1.4 MHz)_LCH_QPSK_6RB#0

Plot 1:

Agilent Spectrum Analyzer - Swept SA

Center Freq 79.500 kHz

PNO: Wide
IF Gain:Low
Trig: Free Run
#Atten: 10 dB

Avg Type: RMS
Avg|Hold: 8/100

SENSE:INT   ALIGN AUTO   12:10:19 PM Mar 12, 2018

Mkr1 9.987 kHz
-63.708 dBm

Ref Offset 8.44 dB
Ref 8.44 dBm
10 dB/div Log

Start 9.00 kHz   Stop 150.00 kHz
#Res BW 1.0 kHz   #VBW 3.0 kHz*   Sweep 174.0 ms (1001 pts)
MSG   STATUS 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

Plot 2:

Agilent Spectrum Analyzer - Swept SA

Center Freq 15.075000 MHz

PNO: Fast
IF Gain:Low
Trig: Free Run
#Atten: 10 dB

Avg Type: RMS
Avg|Hold: 8/100

SENSE:INT   ALIGN AUTO   12:10:25 PM Mar 12, 2018

Mkr1 538 kHz
-56.446 dBm

Ref Offset 8.44 dB
Ref 8.44 dBm
10 dB/div Log

Start 150 kHz   Stop 30.00 MHz
#Res BW 10 kHz   #VBW 30 kHz*   Sweep 368.3 ms (1001 pts)
MSG   STATUS 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

Plot 3:

Agilent Spectrum Analyzer - Swept SA

Center Freq 13.015000000 GHz

PNO: Fast
IF Gain:Low
Trig: Free Run
#Atten: 40 dB

Avg Type: RMS
Avg|Hold: 4/100

SENSE:INT   ALIGN AUTO   12:10:28 PM Mar 12, 2018

Mkr2 25.714 GHz
-29.080 dBm

Ref Offset 8.48 dB
Ref 30.00 dBm
10 dB/div Log

Start 30 MHz   Stop 26.00 GHz
#Res BW 1.0 MHz   #VBW 3.0 MHz*   Sweep 64.93 ms (1001 pts)
MSG   STATUS

Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
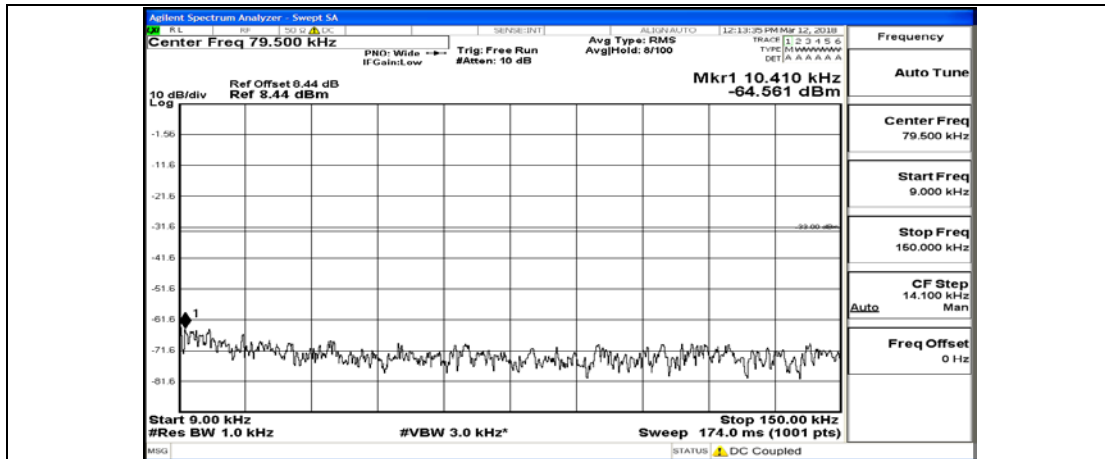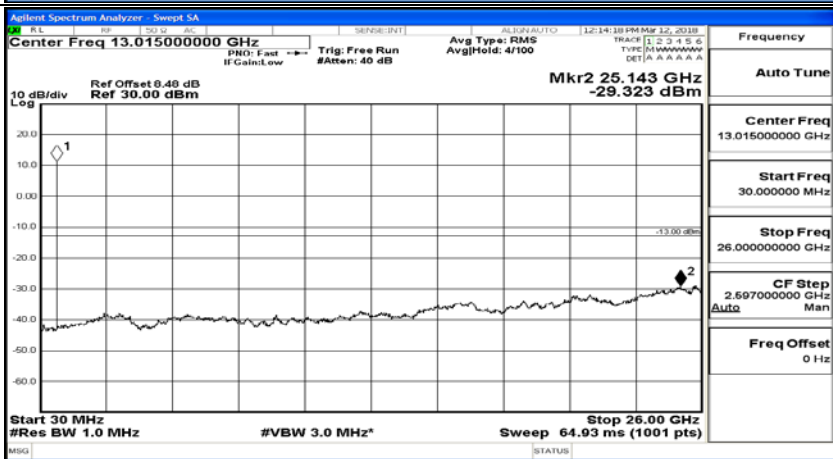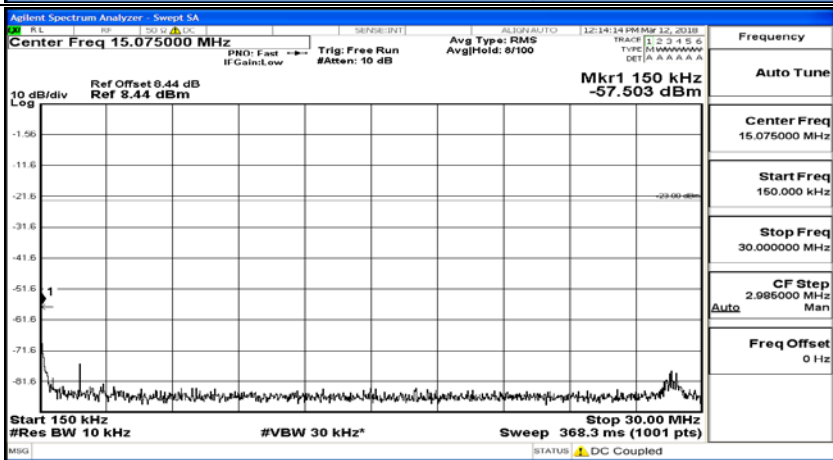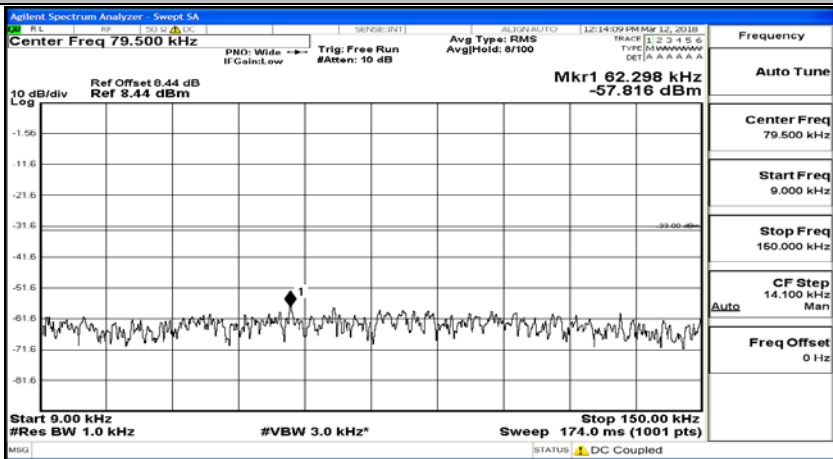CF Step 2.697000000 GHz   Auto Man
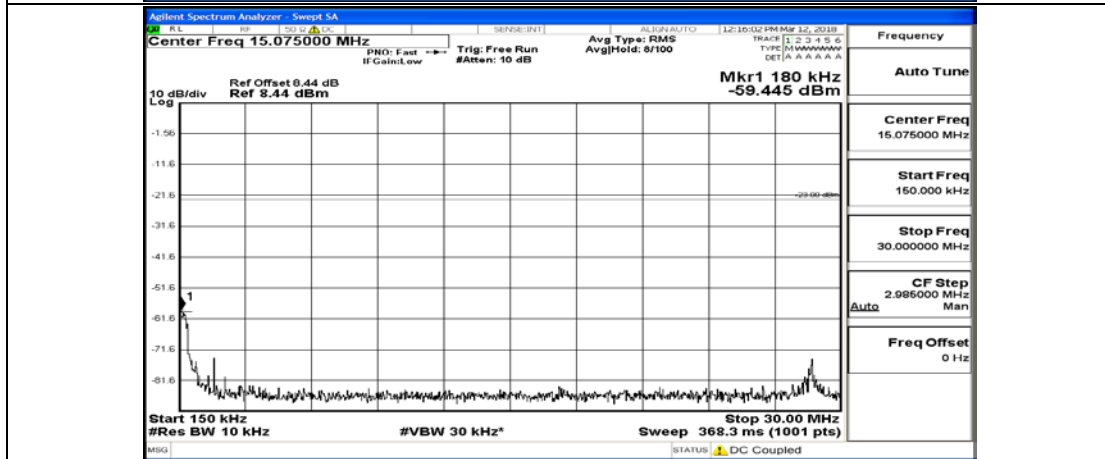Freq Offset 0 Hz
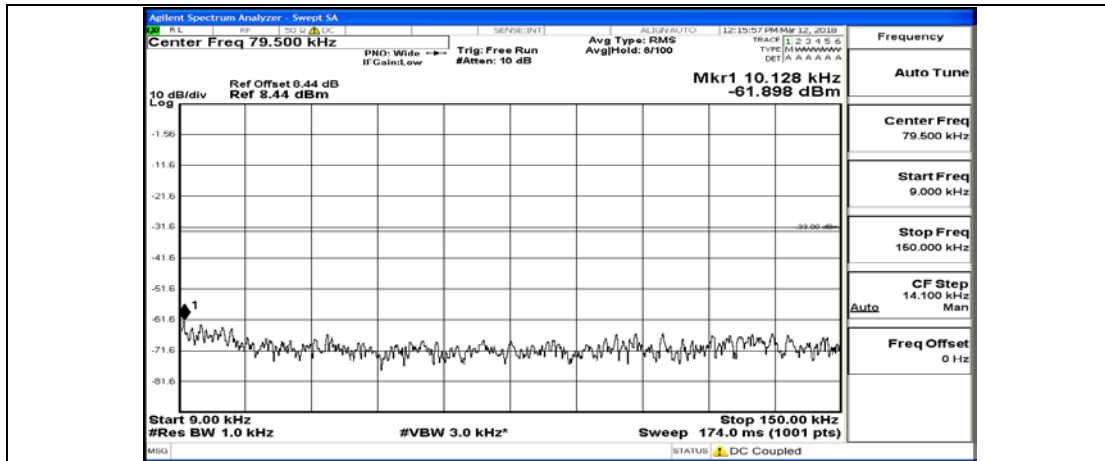
(Channel Bandwidth: 1.4 MHz)_MCH_QPSK_1RB#0
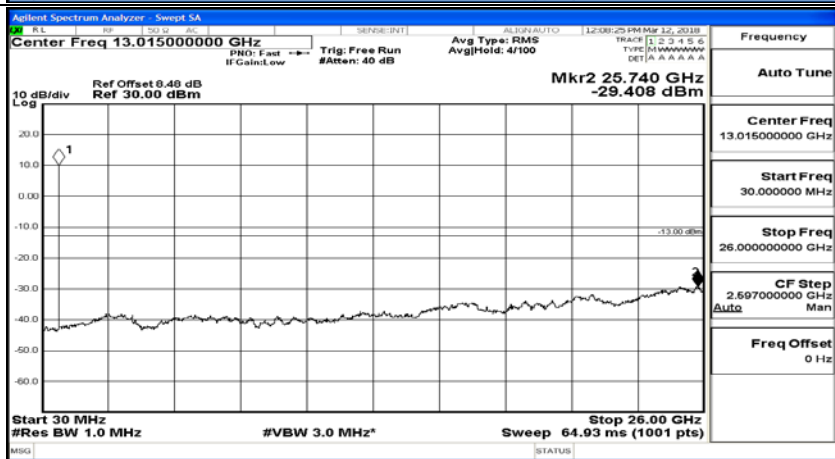

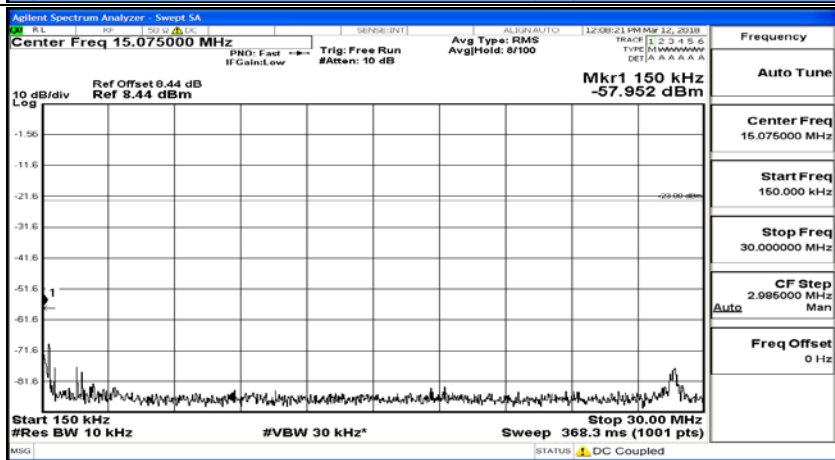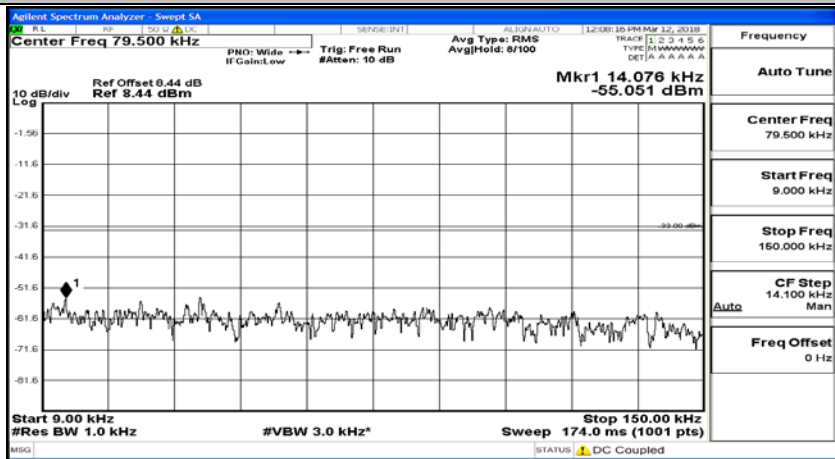## (Channel Bandwidth: 1.4 MHz)_MCH_QPSK_6RB#0
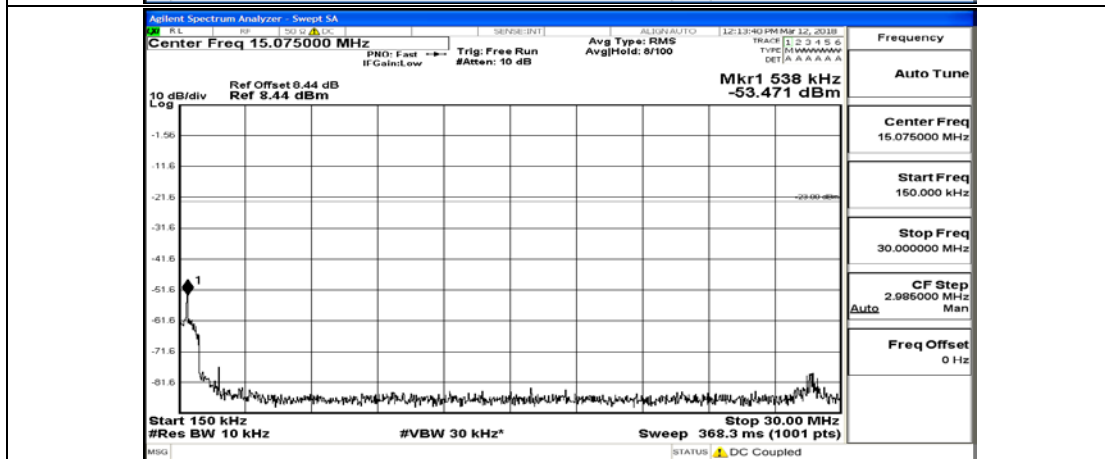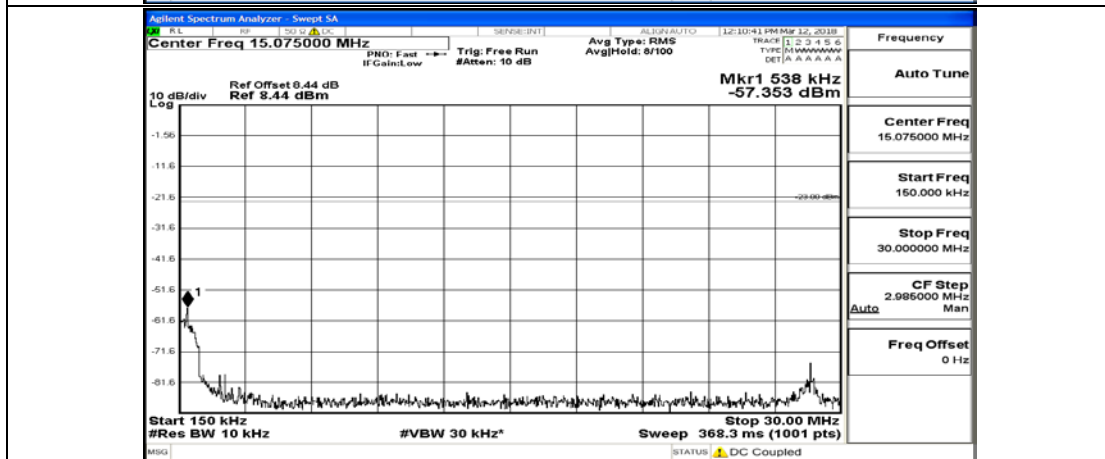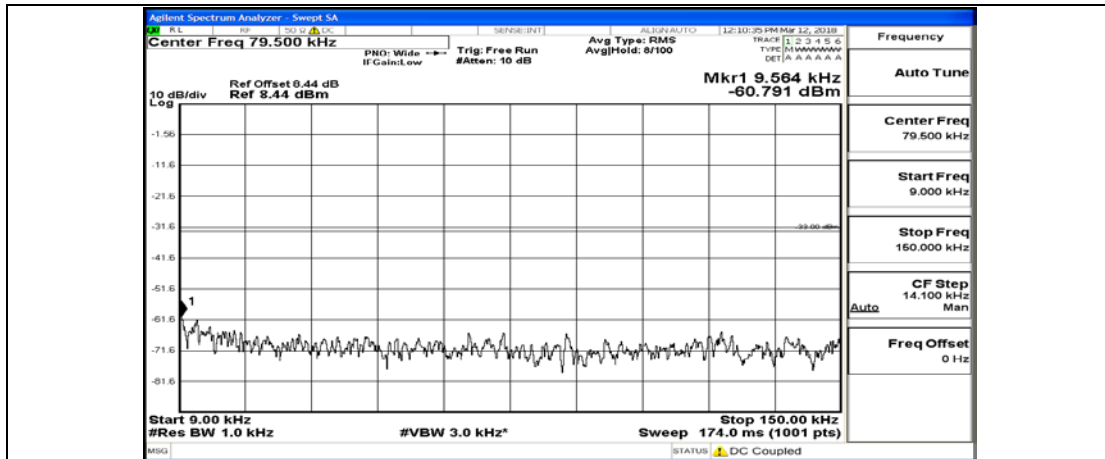
(Channel Bandwidth: 1.4 MHz)_HCH_QPSK_1RB#0

(Channel Bandwidth: 1.4 MHz)_HCH_QPSK_6RB#0

Agilent Spectrum Analyzer - Swept SA

LXI RL RF 50Ω DC SENSE:INT ALIGN AUTO 12:15:57 PM Mar 12, 2018

Center Freq 79.500 kHz PNO: Wide Trig: Free Run Avg Type: RMS TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 10 dB Avg|Hold: 8/100 TYPE M W W W W W DET A A A A A A

Ref Offset 8.44 dB Mkr1 10.128 kHz
10 dB/div Ref 8.44 dBm -61.898 dBm
Log

-1.56
-11.6
-21.6
-31.6 -23.00 dBm
-41.6
-51.6
-61.6 1
-71.6
-81.6

Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 3.0 kHz* Sweep 174.0 ms (1001 pts)
MSG STATUS 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

LXI RL RF 50Ω DC SENSE:INT ALIGN AUTO 12:16:02 PM Mar 12, 2018

Center Freq 15.075000 MHz PNO: Fast Trig: Free Run Avg Type: RMS TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 10 dB Avg|Hold: 8/100 TYPE M W W W W W DET A A A A A A

Ref Offset 8.44 dB Mkr1 180 kHz
10 dB/div Ref 8.44 dBm -59.445 dBm
Log

-1.56
-11.6
-21.6 -23.00 dBm
-31.6
-41.6
-51.6
-61.6 1
-71.6
-81.6

Start 150 kHz Stop 30.00 MHz
#Res BW 10 kHz #VBW 30 kHz* Sweep 368.3 ms (1001 pts)
MSG STATUS 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

LXI RL RF 50Ω AC SENSE:INT ALIGN AUTO 12:16:05 PM Mar 12, 2018

Center Freq 13.015000000 GHz PNO: Fast Trig: Free Run Avg Type: RMS TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 40 dB Avg|Hold: 4/100 TYPE M W W W W W DET A A A A A A

Ref Offset 8.48 dB Mkr2 25.766 GHz
10 dB/div Ref 30.00 dBm -28.758 dBm
Log

20.0
10.0 1
0.00
-10.0 -13.00 dBm
-20.0
-30.0 2
-40.0
-50.0
-60.0

Start 30 MHz Stop 26.00 GHz
#Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 64.93 ms (1001 pts)
MSG STATUS

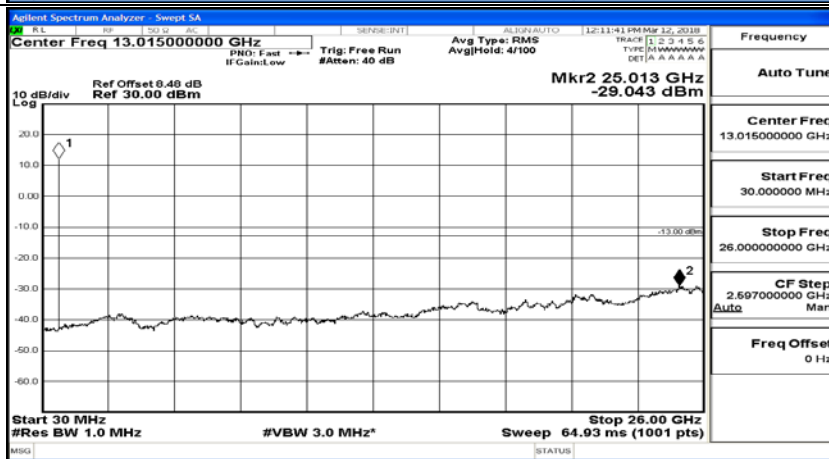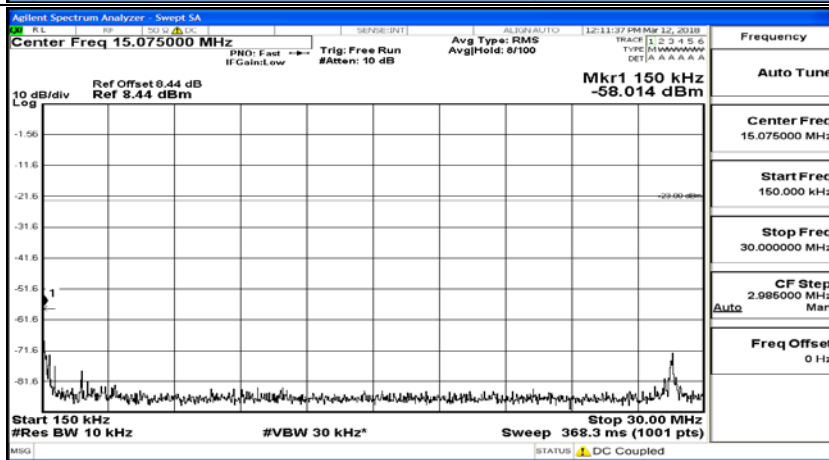Frequency | Auto Tune | Center Freq 13.015000000 GHz | Start Freq 30.000000 MHz | Stop Freq 26.000000000 GHz | CF Step 2.597000000 GHz Auto Man | Freq Offset 0 Hz
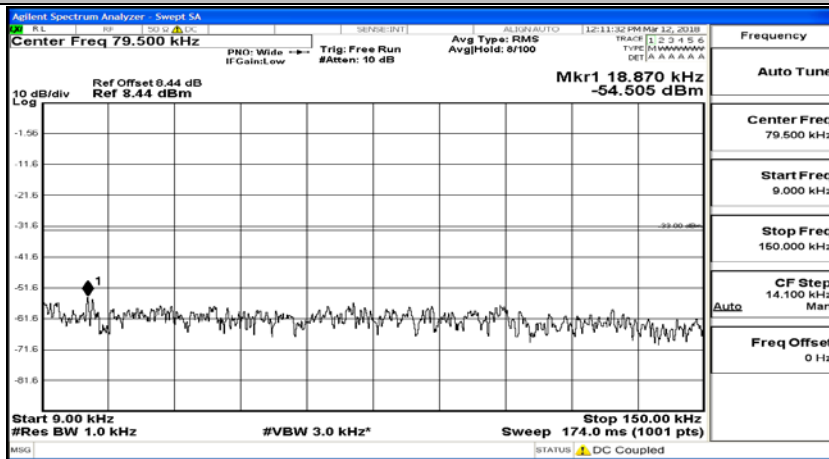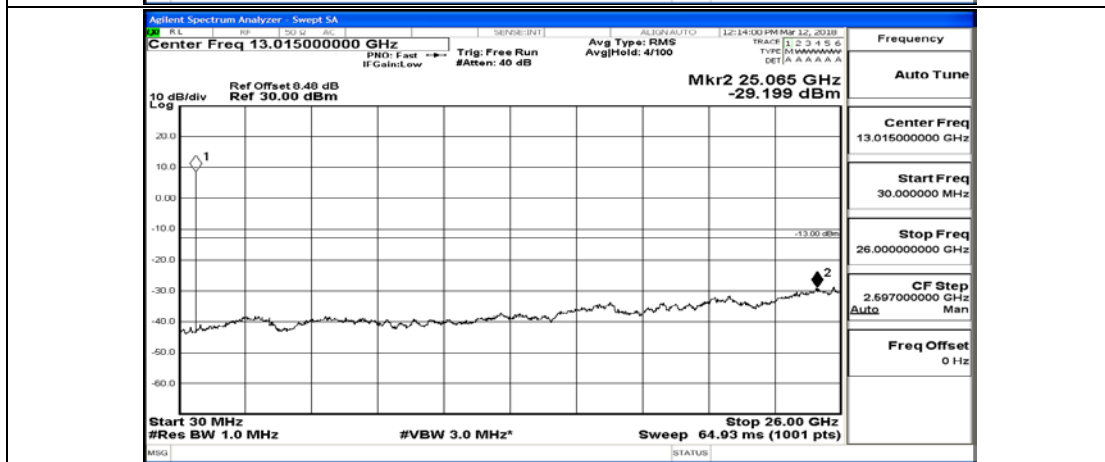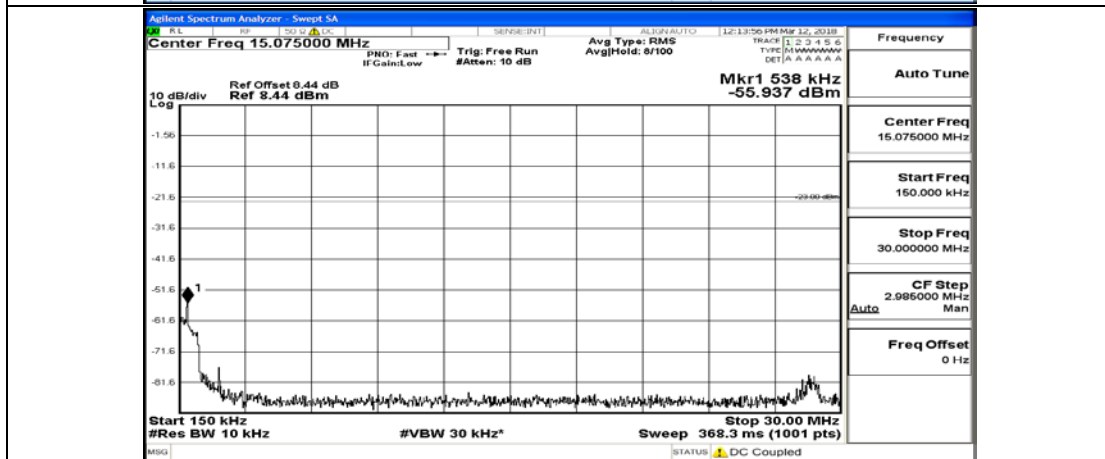
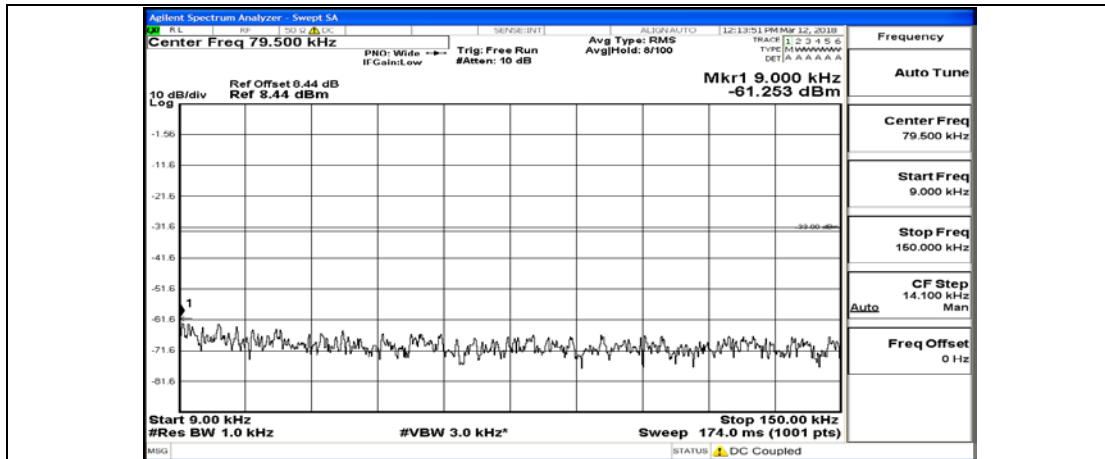| (Channel Bandwidth: 1.4 MHz)_LCH_16QAM_1RB#0 |
|---|

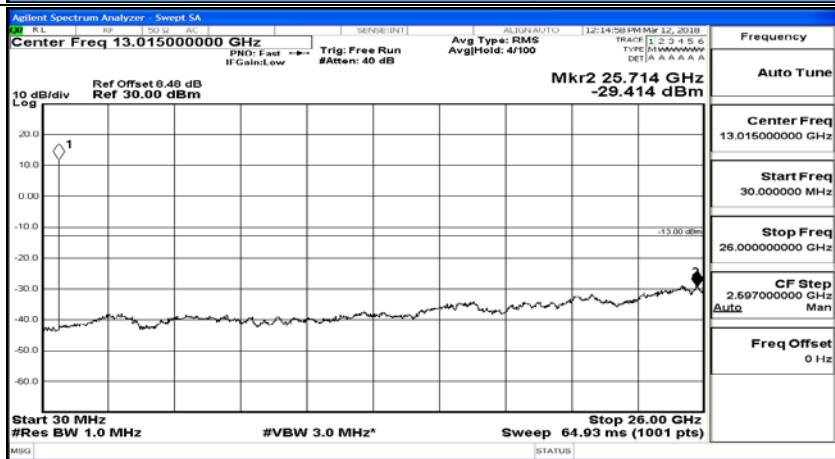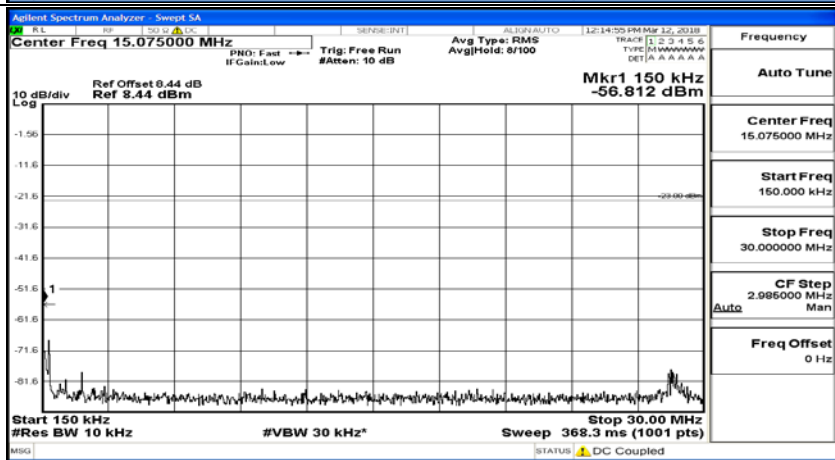| (Channel Bandwidth: 1.4 MHz)_LCH_16QAM_6RB#0 |
|---|

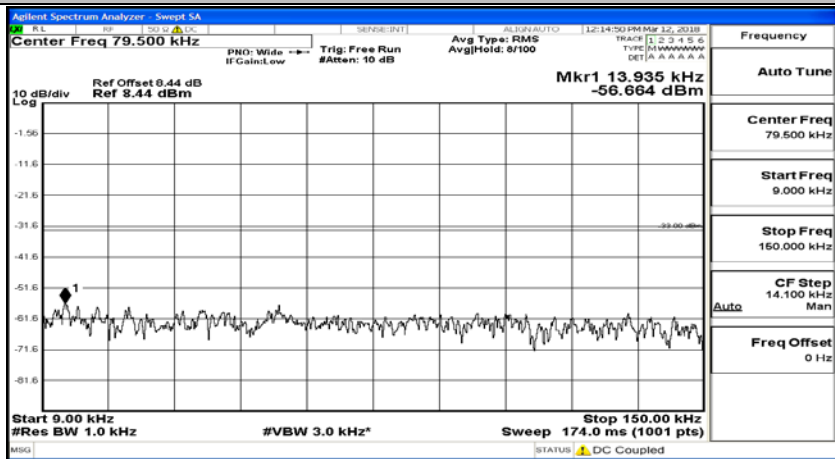| (Channel Bandwidth: 1.4 MHz)_MCH_16QAM_1RB#0 |
|---|

(Channel Bandwidth: 1.4 MHz)_MCH_16QAM_6RB#0

(Channel Bandwidth: 1.4 MHz)_HCH_16QAM_1RB#0

(Channel Bandwidth: 1.4 MHz)_HCH_16QAM_6RB#0

#Img-16QAM-H-1.4-F-L-CSE-

Channel Bandwidth: 3 MHz

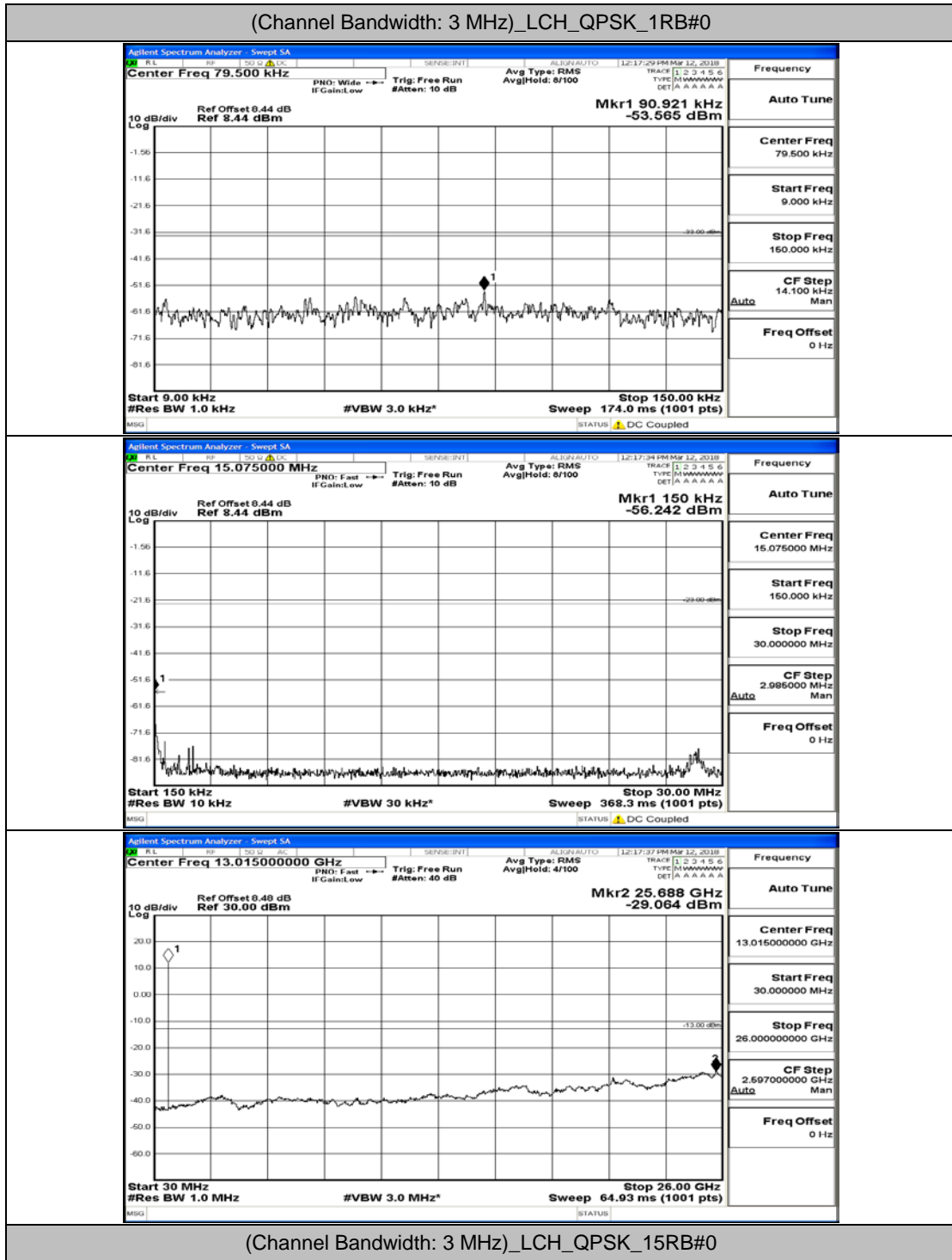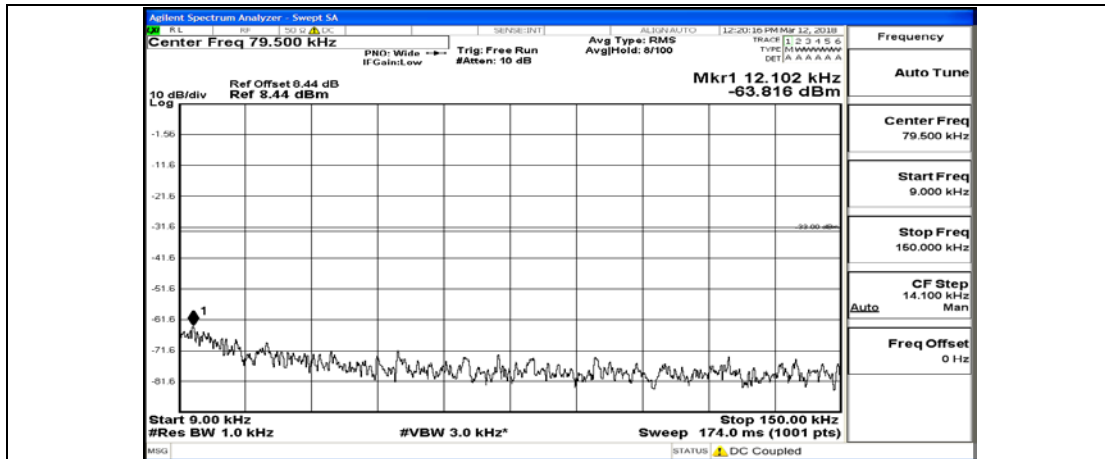| (Channel Bandwidth: 3 MHz)_LCH_QPSK_1RB#0 |
| --- |
| |
| |
| |
| (Channel Bandwidth: 3 MHz)_LCH_QPSK_15RB#0 |

(Channel Bandwidth: 3 MHz)_MCH_QPSK_1RB#0
(Channel Bandwidth: 3 MHz)_MCH_QPSK_15RB#0

Screen 1

Agilent Spectrum Analyzer - Swept SA

SENSE:INT   ALIGN AUTO   12:23:32 PM Mar 12, 2018

Center Freq 79.500 kHz

PNO: Wide   Trig: Free Run   Avg Type: RMS   Avg|Hold: 8/100

IF Gain:Low   #Atten: 10 dB

TRACE 1 2 3 4 5 6

Mkr1 9.000 kHz
−63.826 dBm

10 dB/div Log   Ref Offset 8.44 dB   Ref 8.44 dBm

Start 9.00 kHz   Stop 150.00 kHz
#Res BW 1.0 kHz   #VBW 3.0 kHz*   Sweep 174.0 ms (1001 pts)

MSG   STATUS 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

Screen 2

Agilent Spectrum Analyzer - Swept SA

SENSE:INT   ALIGN AUTO   12:23:37 PM Mar 12, 2018

Center Freq 15.075000 MHz

PNO: Fast   Trig: Free Run   Avg Type: RMS   Avg|Hold: 8/100

IF Gain:Low   #Atten: 10 dB

TRACE 1 2 3 4 5 6

Mkr1 2.240 MHz
−60.905 dBm

10 dB/div Log   Ref Offset 8.44 dB   Ref 8.44 dBm

Start 150 kHz   Stop 30.00 MHz
#Res BW 10 kHz   #VBW 30 kHz*   Sweep 368.3 ms (1001 pts)

MSG   STATUS 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

Screen 3

Agilent Spectrum Analyzer - Swept SA

SENSE:INT   ALIGN AUTO   12:23:41 PM Mar 12, 2018

Center Freq 13.015000000 GHz

PNO: Fast   Trig: Free Run   Avg Type: RMS   Avg|Hold: 4/100

IF Gain:Low   #Atten: 40 dB

TRACE 1 2 3 4 5 6

Mkr2 25.740 GHz
−28.701 dBm

10 dB/div Log   Ref Offset 8.48 dB   Ref 30.00 dBm

Start 30 MHz   Stop 26.00 GHz
#Res BW 1.0 MHz   #VBW 3.0 MHz*   Sweep 64.93 ms (1001 pts)

MSG   STATUS

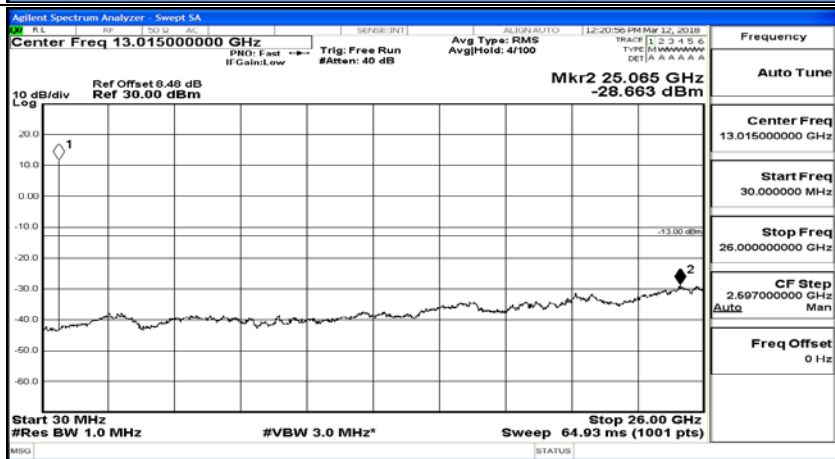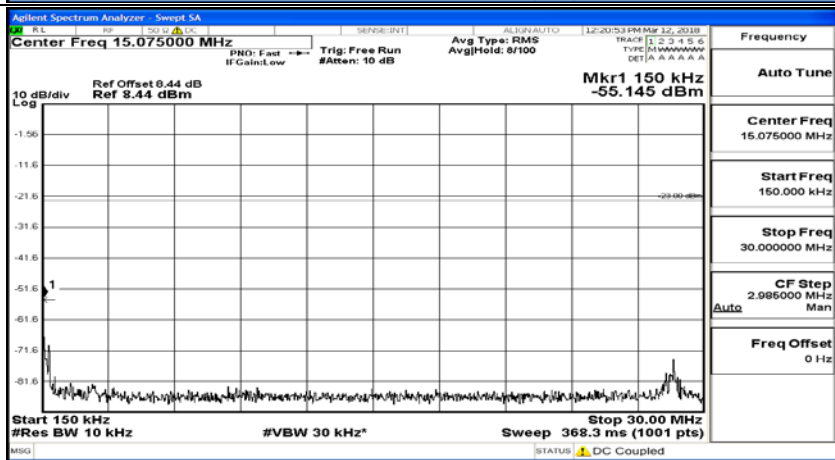Frequency — Auto Tune — Center Freq 13.015000000 GHz — Start Freq 30.000000 MHz — Stop Freq 26.000000000 GHz — CF Step 2.697000000 GHz Auto Man — Freq Offset 0 Hz

(Channel Bandwidth: 3 MHz)_HCH_QPSK_1RB#0

Screenshot 1:

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide   Trig: Free Run   Avg Type: RMS   12:24:04 PM Mar 12, 2018
IF Gain:Low   #Atten: 10 dB   Avg|Hold: 8/100
Ref Offset 8.44 dB
10 dB/div   Ref 8.44 dBm
Log
Mkr1 90.357 kHz
-57.139 dBm

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

Start 9.00 kHz   Stop 150.00 kHz
#Res BW 1.0 kHz   #VBW 3.0 kHz*   Sweep 174.0 ms (1001 pts)
MSG   STATUS DC Coupled

Screenshot 2:

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast   Trig: Free Run   Avg Type: RMS   12:24:11 PM Mar 12, 2018
IF Gain:Low   #Atten: 10 dB   Avg|Hold: 8/100
Ref Offset 8.44 dB
10 dB/div   Ref 8.44 dBm
Log
Mkr1 150 kHz
-58.244 dBm

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

Start 150 kHz   Stop 30.00 MHz
#Res BW 10 kHz   #VBW 30 kHz*   Sweep 368.3 ms (1001 pts)
MSG   STATUS DC Coupled

Screenshot 3:

Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast   Trig: Free Run   Avg Type: RMS   12:24:14 PM Mar 12, 2018
IF Gain:Low   #Atten: 40 dB   Avg|Hold: 4/100
Ref Offset 8.48 dB
10 dB/div   Ref 30.00 dBm
Log
Mkr2 25.688 GHz
-29.381 dBm

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

Start 30 MHz   Stop 26.00 GHz
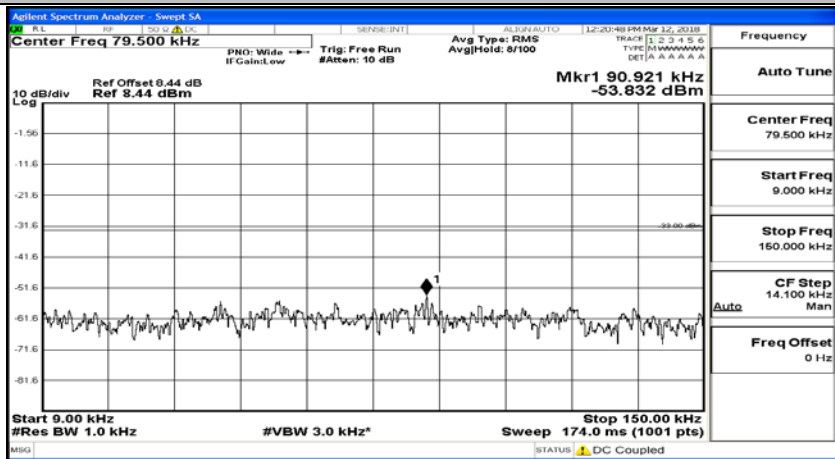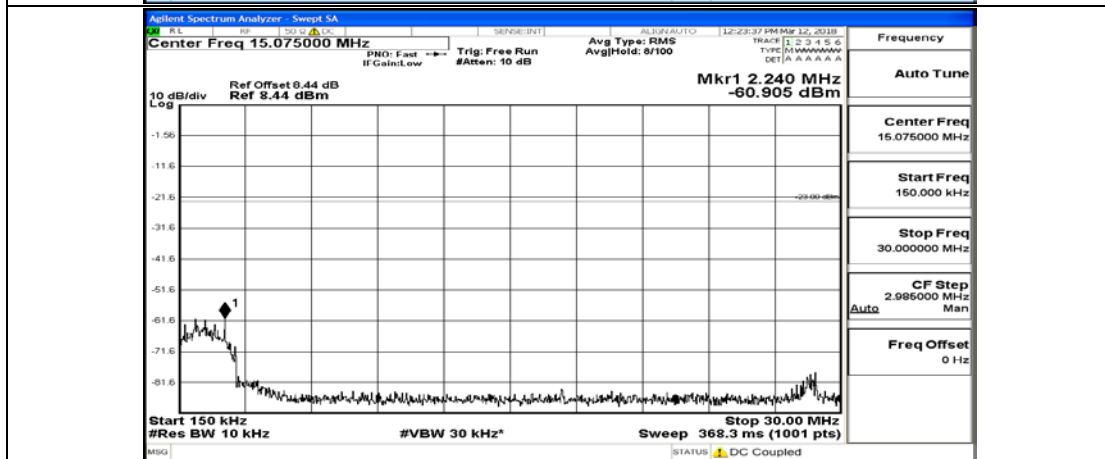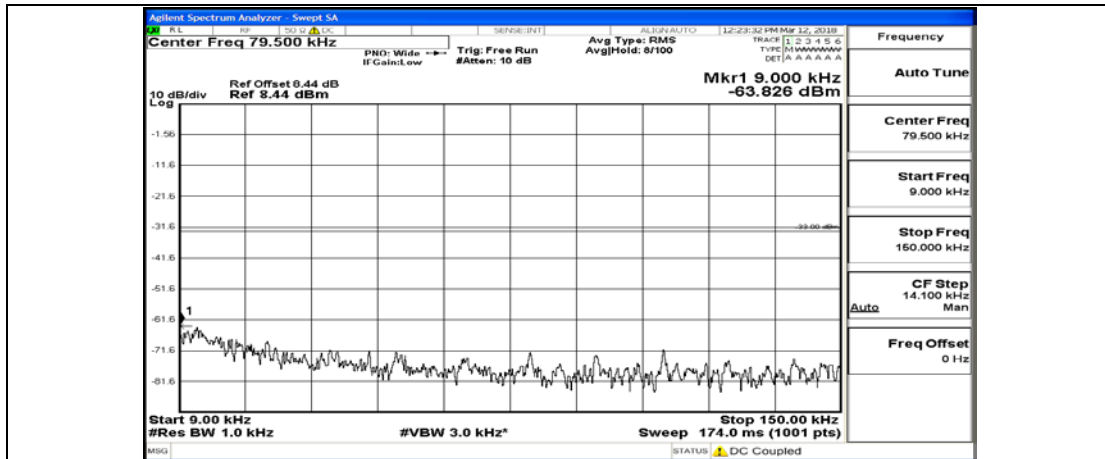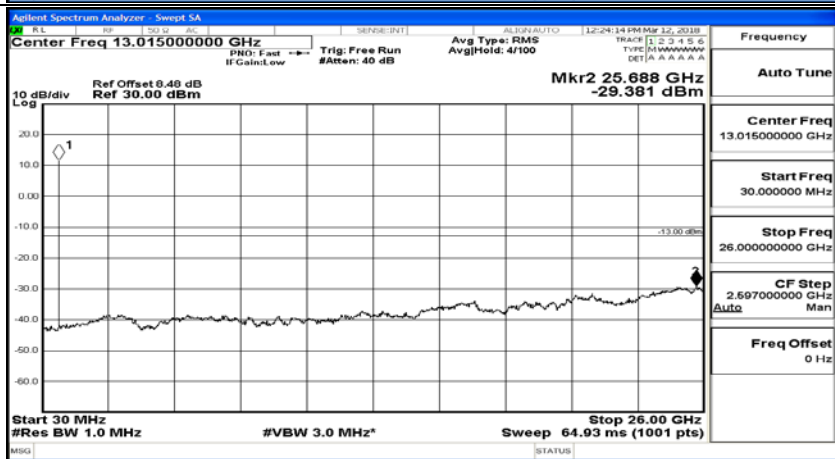#Res BW 1.0 MHz   #VBW 3.0 MHz*   Sweep 64.93 ms (1001 pts)
MSG   STATUS

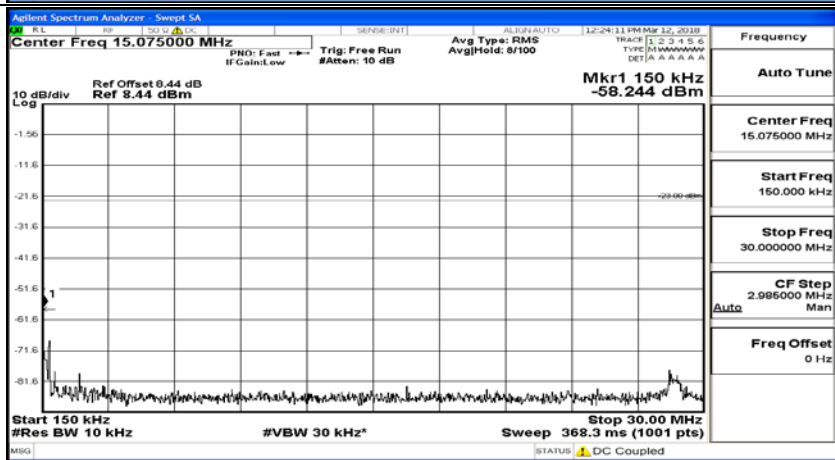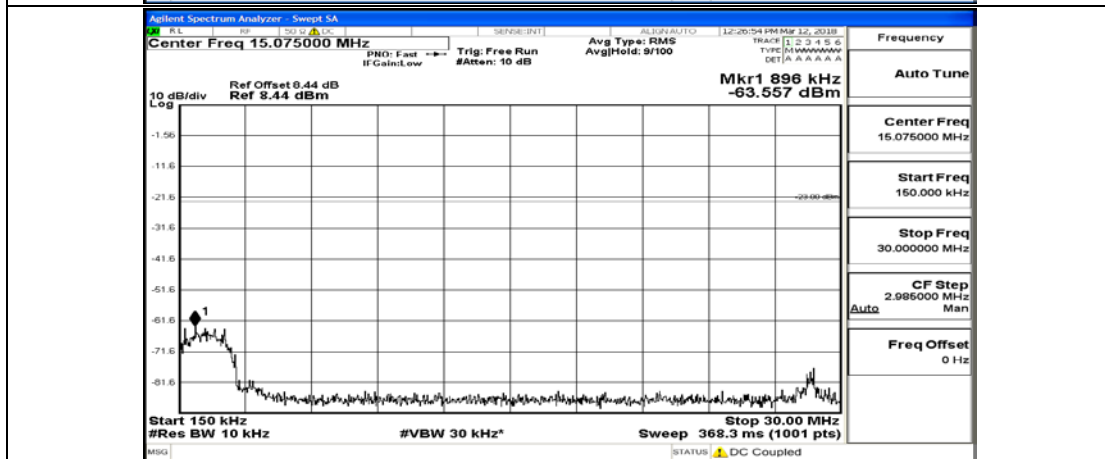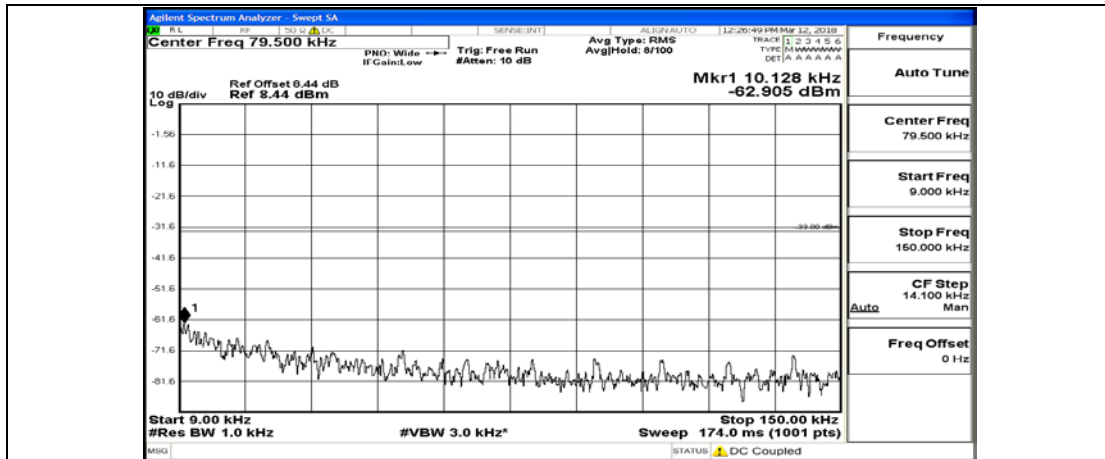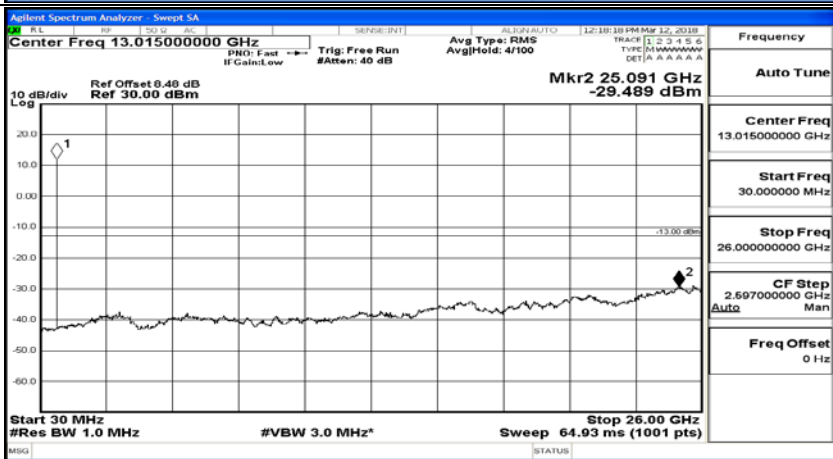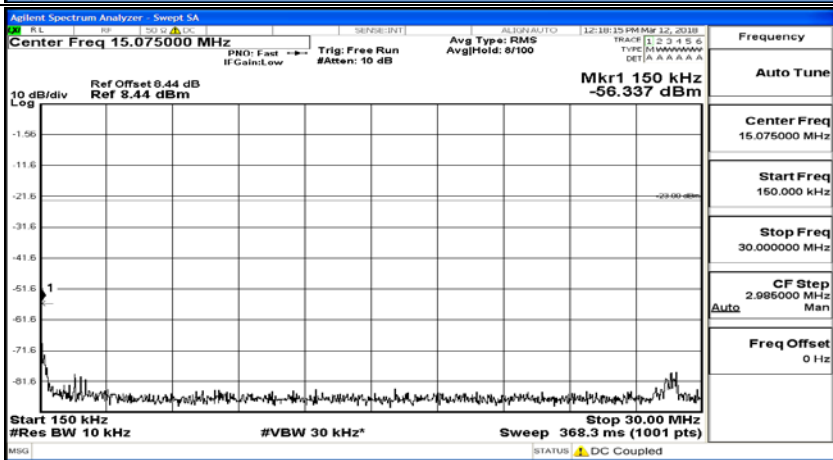| (Channel Bandwidth: 3 MHz)_HCH_QPSK_15RB#0 |
|---|

(Channel Bandwidth: 3 MHz)_LCH_16QAM_1RB#0

(Channel Bandwidth: 3 MHz)_LCH_16QAM_15RB#0

(Channel Bandwidth: 3 MHz)_MCH_16QAM_1RB#0

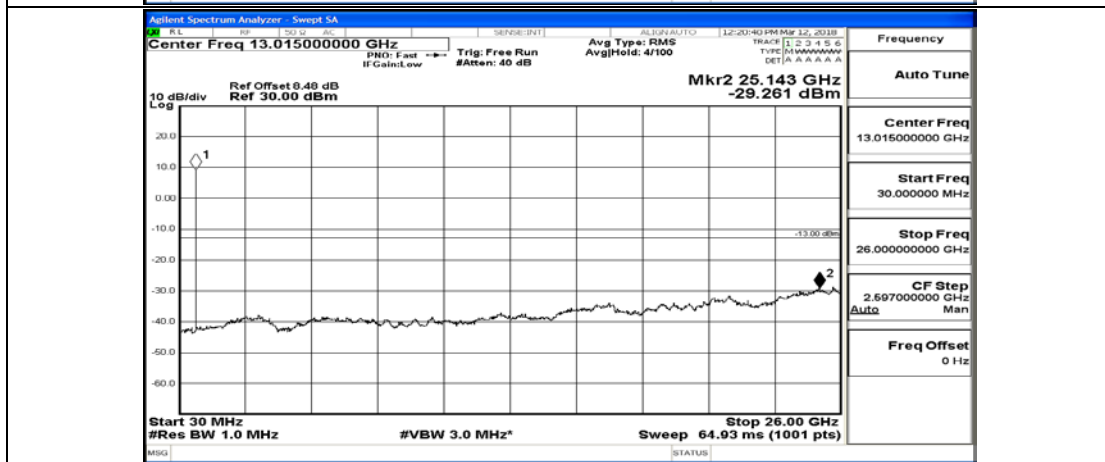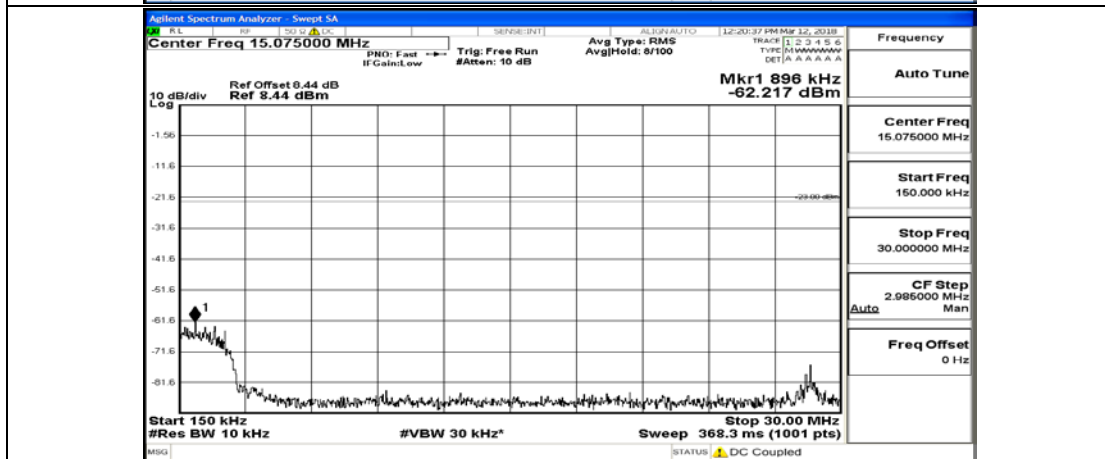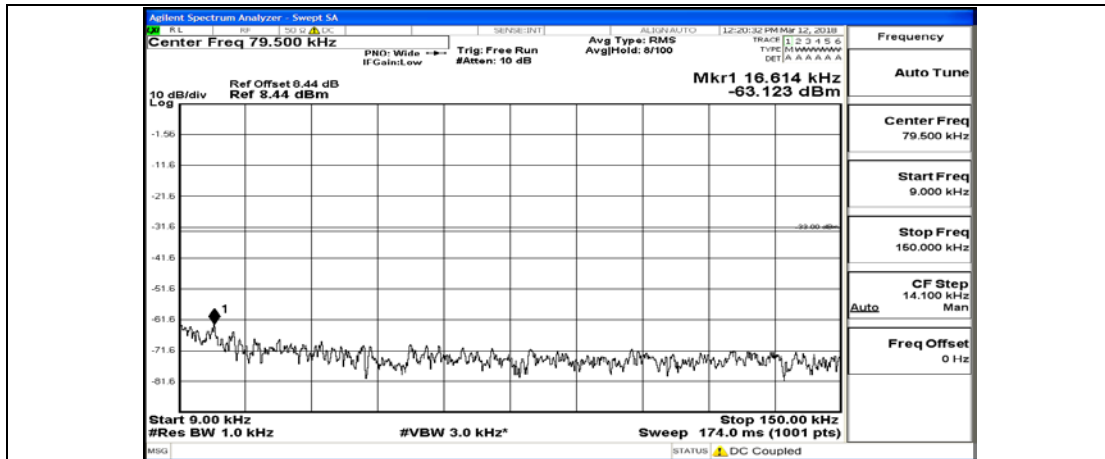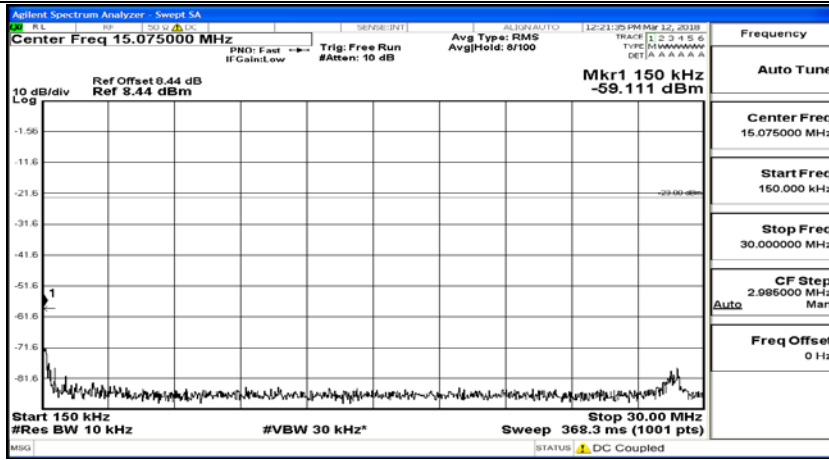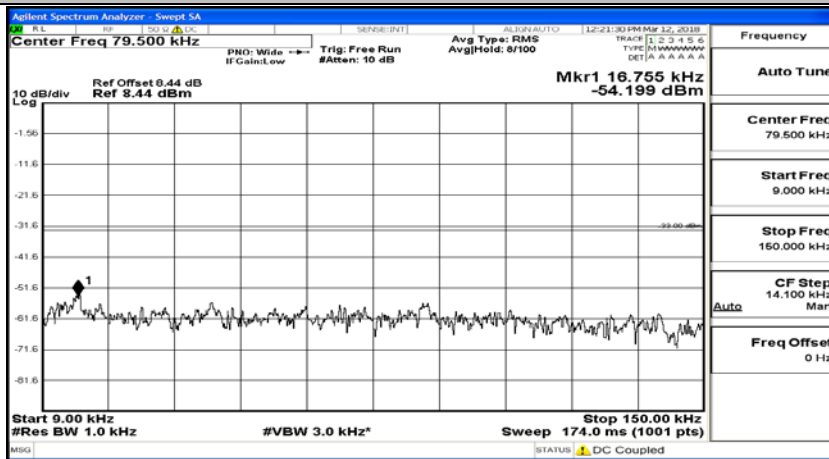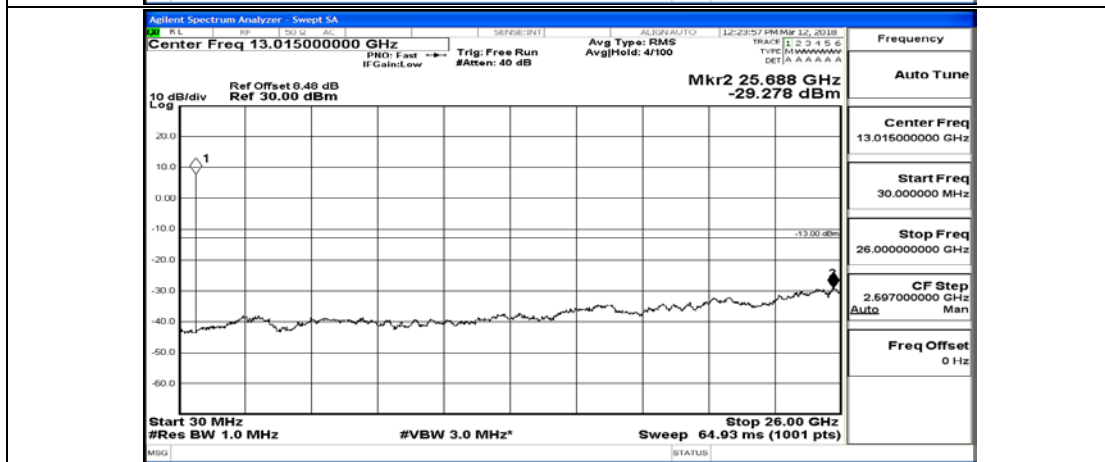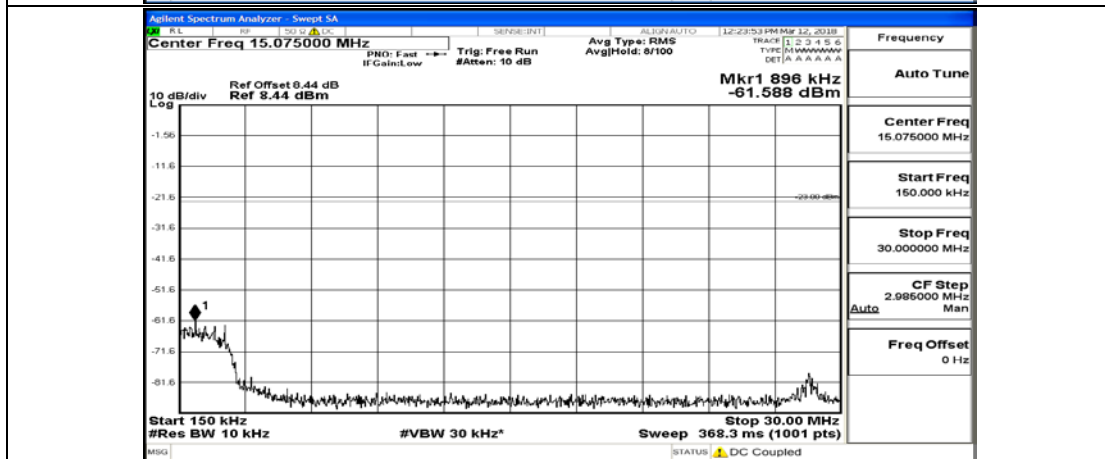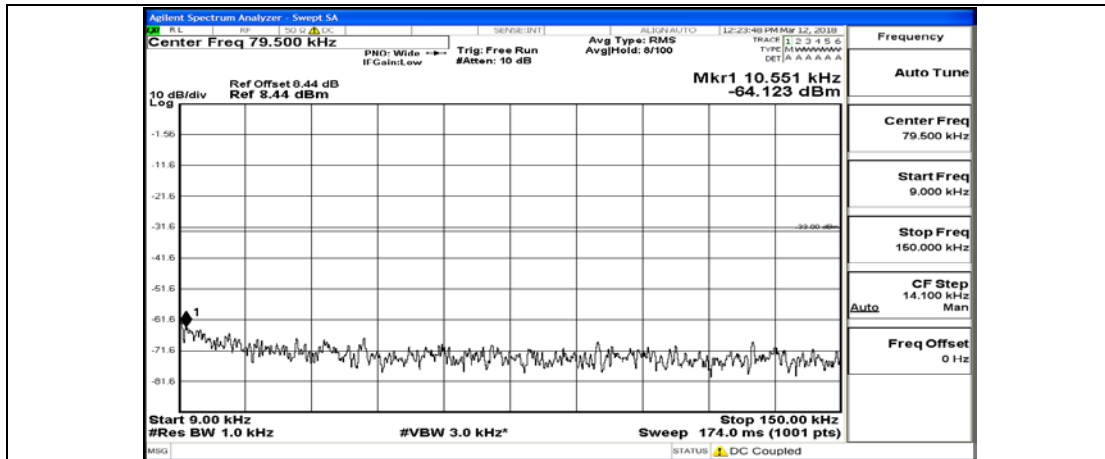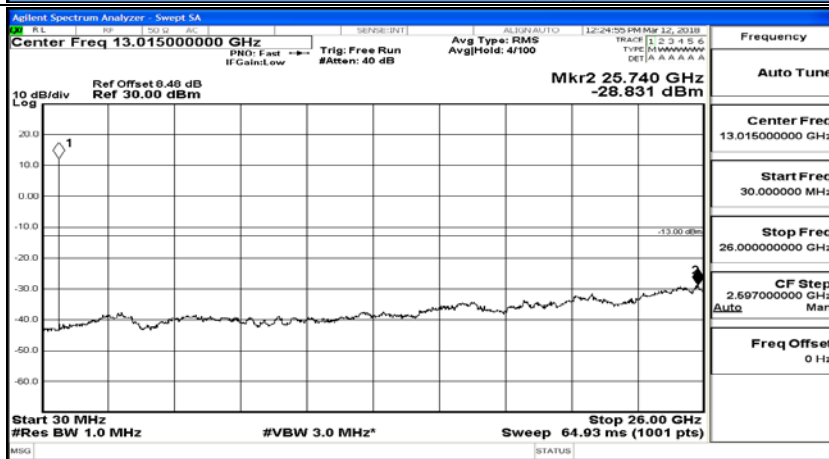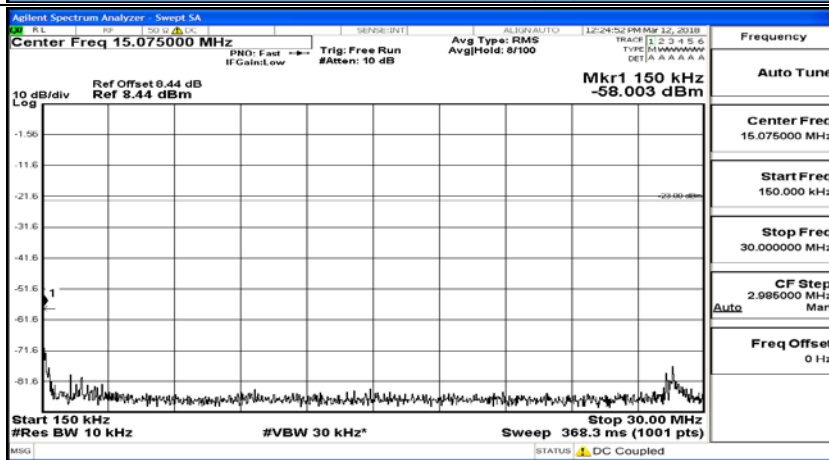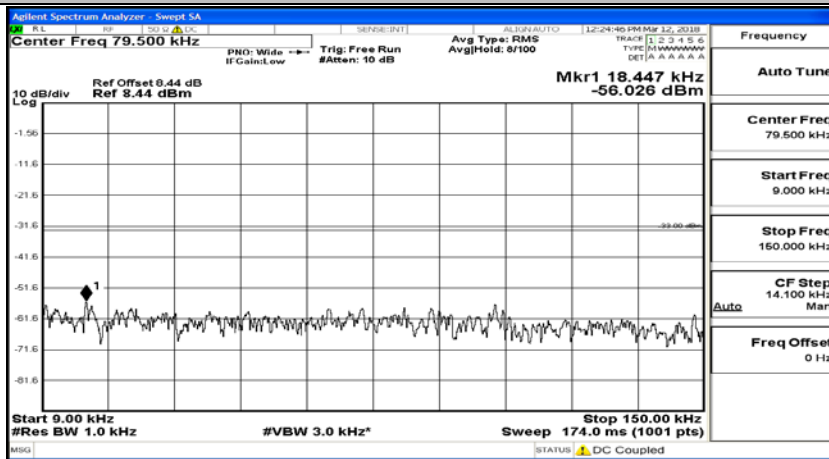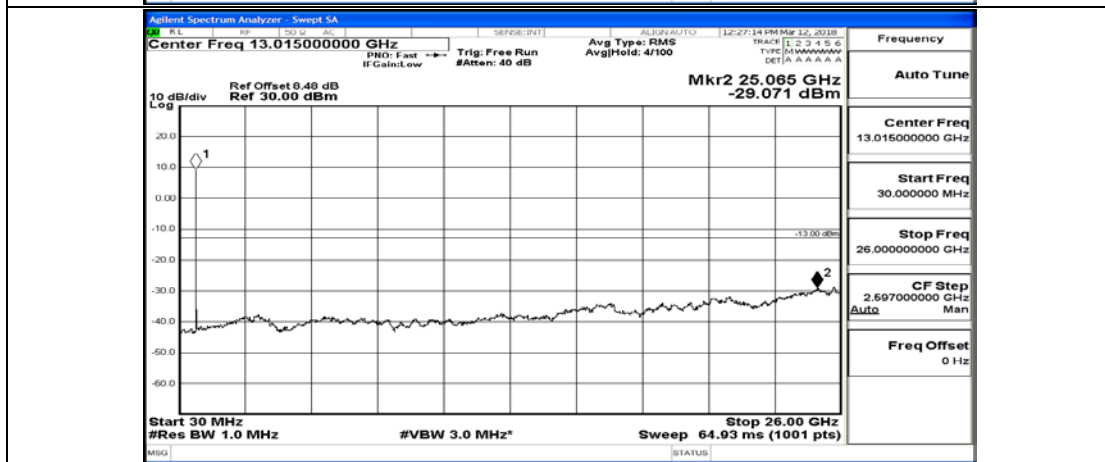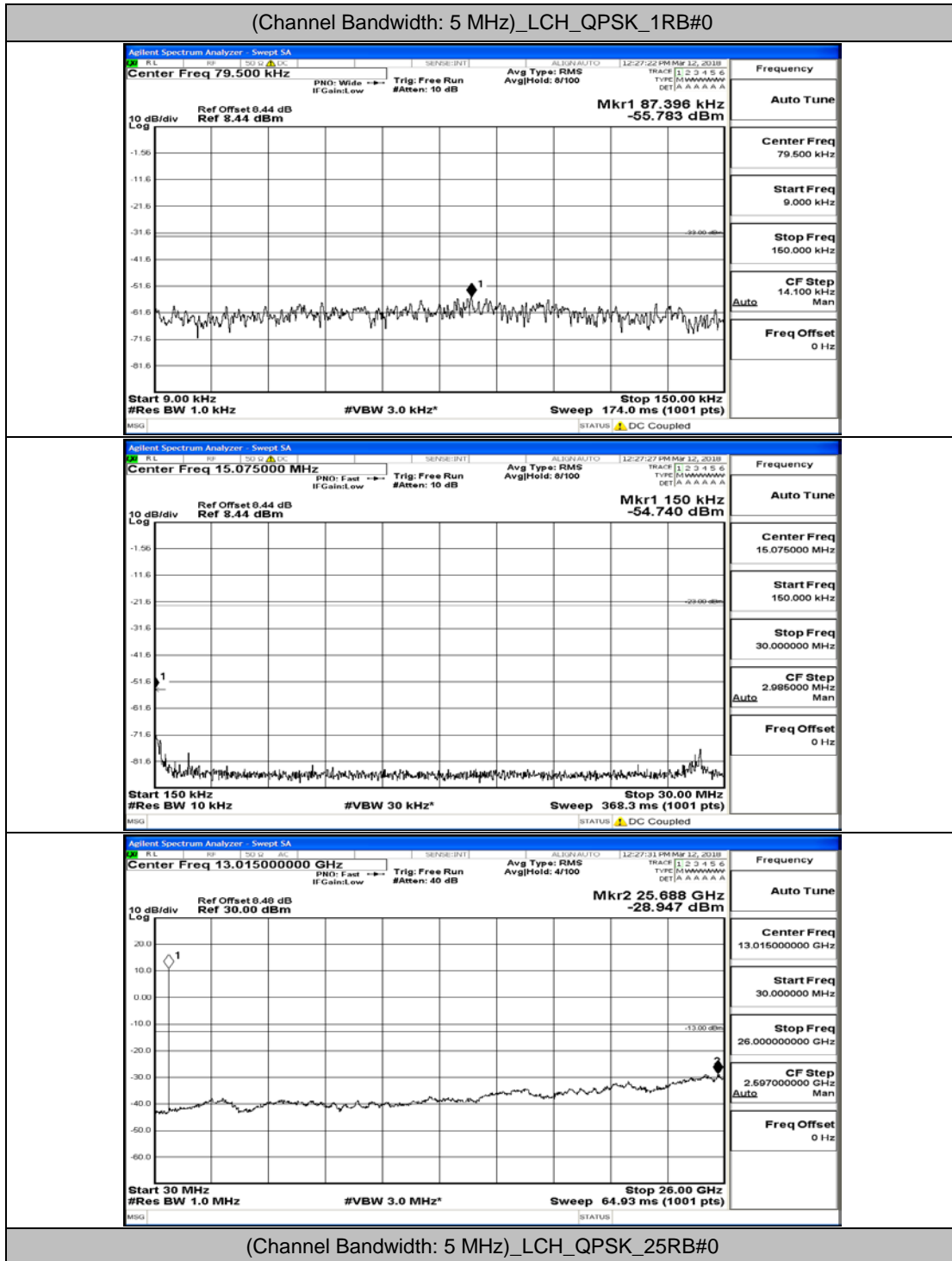| (Channel Bandwidth: 3 MHz)_MCH_16QAM_15RB#0 |
|---|

| (Channel Bandwidth: 3 MHz)_HCH_16QAM_1RB#0 |
|---|

(Channel Bandwidth: 3 MHz)_HCH_16QAM_15RB#0

Screen 1:

Agilent Spectrum Analyzer - Swept SA

L X I   R L   RF   50 Ω   DC   SENSE:INT   ALIGN AUTO   12:27:05 PM Mar 12, 2018

Center Freq 79.500 kHz

PNO: Wide ►   Trig: Free Run   Avg Type: RMS   TRACE 1 2 3 4 5 6
IFGain:Low   #Atten: 10 dB   Avg|Hold: 8/100   TYPE M W W W W W
                                                                        DET A A A A A A

Ref Offset 8.44 dB   Mkr1 11.115 kHz
10 dB/div   Ref 8.44 dBm   -64.787 dBm
Log

-1.56
-11.6
-21.6
-31.6   -33.00 dBm
-41.6
-51.6
-61.6 ◆1
-71.6
-81.6

Start 9.00 kHz   Stop 150.00 kHz
#Res BW 1.0 kHz   #VBW 3.0 kHz*   Sweep 174.0 ms (1001 pts)
MSG   STATUS ⚠ 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

Screen 2:

Agilent Spectrum Analyzer - Swept SA

L X I   R L   RF   50 Ω   DC   SENSE:INT   ALIGN AUTO   12:27:10 PM Mar 12, 2018

Center Freq 15.075000 MHz

PNO: Fast ►   Trig: Free Run   Avg Type: RMS   TRACE 1 2 3 4 5 6
IFGain:Low   #Atten: 10 dB   Avg|Hold: 8/100   TYPE M W W W W W
                                                                        DET A A A A A A

Ref Offset 8.44 dB   Mkr1 896 kHz
10 dB/div   Ref 8.44 dBm   -63.115 dBm
Log

-1.56
-11.6
-21.6   -23.00 dBm
-31.6
-41.6
-51.6
-61.6 ◆1
-71.6
-81.6

Start 150 kHz   Stop 30.00 MHz
#Res BW 10 kHz   #VBW 30 kHz*   Sweep 368.3 ms (1001 pts)
MSG   STATUS ⚠ 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

Screen 3:

Agilent Spectrum Analyzer - Swept SA

L X I   R L   RF   50 Ω   AC   SENSE:INT   ALIGN AUTO   12:27:14 PM Mar 12, 2018

Center Freq 13.015000000 GHz

PNO: Fast ►   Trig: Free Run   Avg Type: RMS   TRACE 1 2 3 4 5 6
IFGain:Low   #Atten: 40 dB   Avg|Hold: 4/100   TYPE M W W W W W
                                                                        DET A A A A A A

Ref Offset 8.48 dB   Mkr2 25.065 GHz
10 dB/div   Ref 30.00 dBm   -29.071 dBm
Log

20.0
10.0 ◇1
0.00
-10.0   -13.00 dBm
-20.0
-30.0   ◆2
-40.0
-50.0
-60.0

Start 30 MHz   Stop 26.00 GHz
#Res BW 1.0 MHz   #VBW 3.0 MHz*   Sweep 64.93 ms (1001 pts)
MSG   STATUS

Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
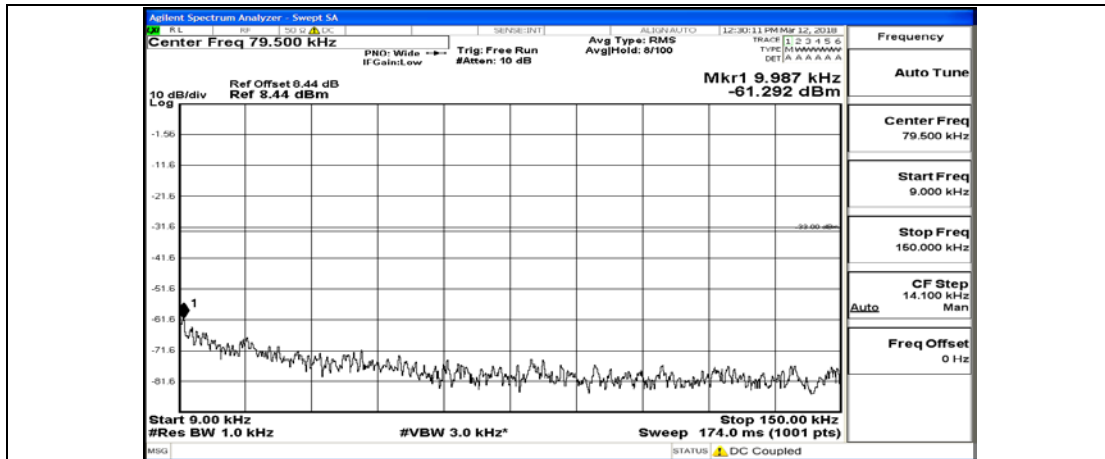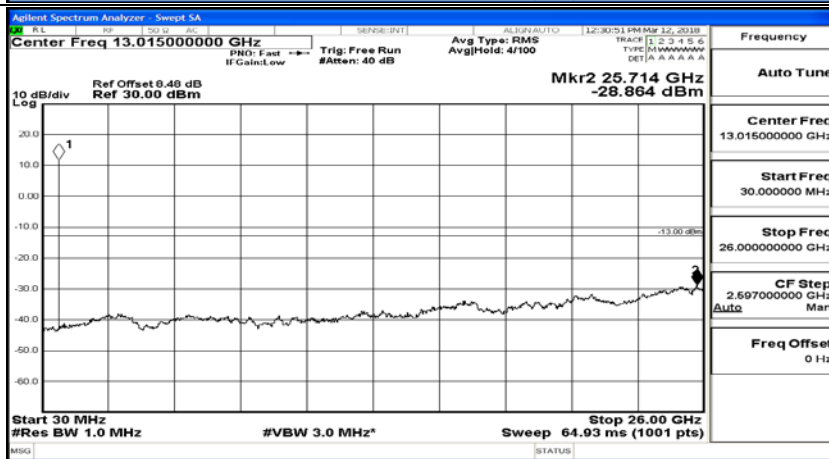CF Step 2.697000000 GHz   Auto Man
Freq Offset 0 Hz

Channel Bandwidth: 5 MHz

(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#0
(Channel Bandwidth: 5 MHz)_LCH_QPSK_25RB#0
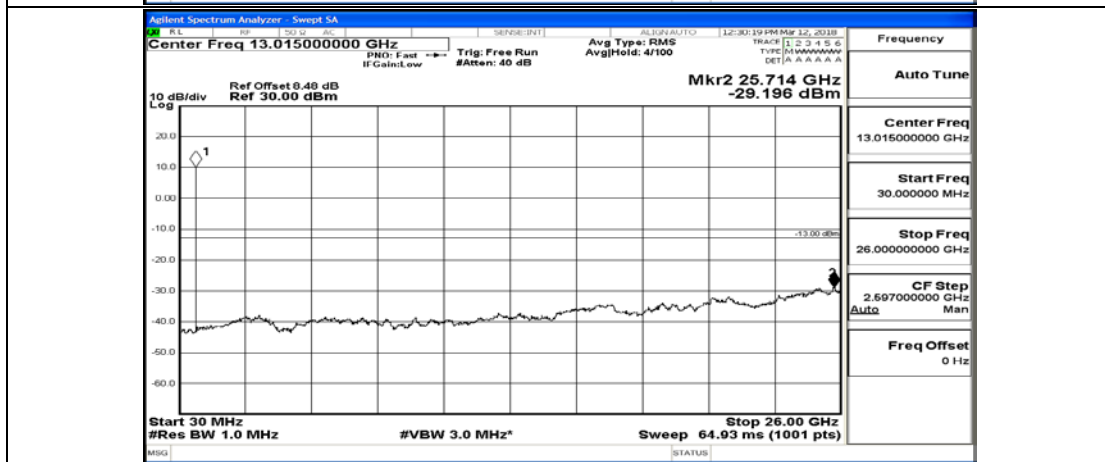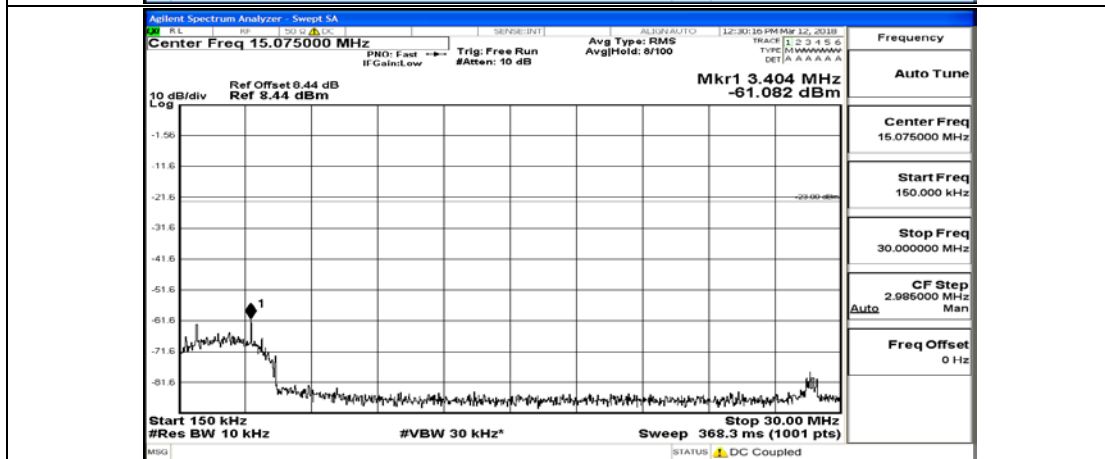
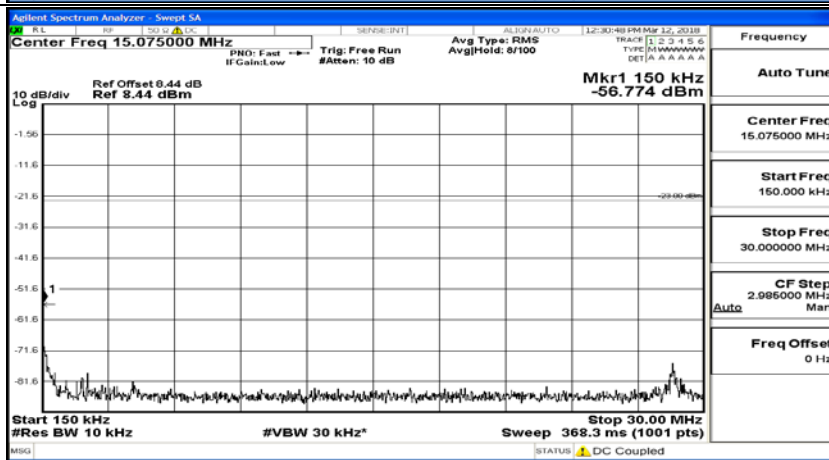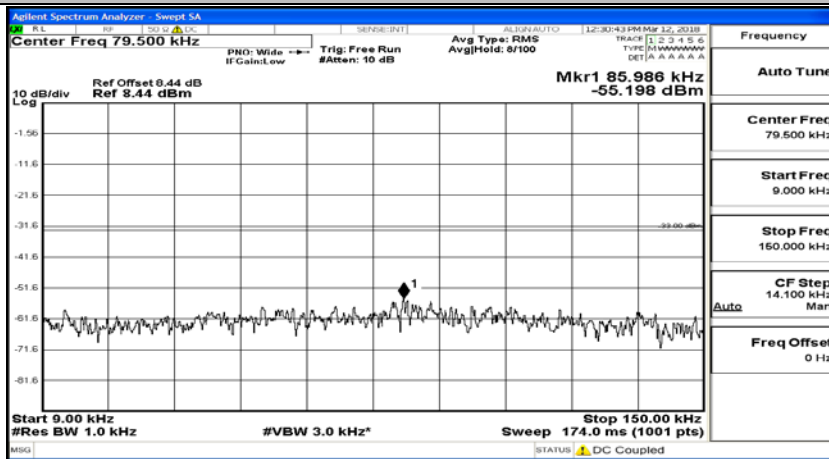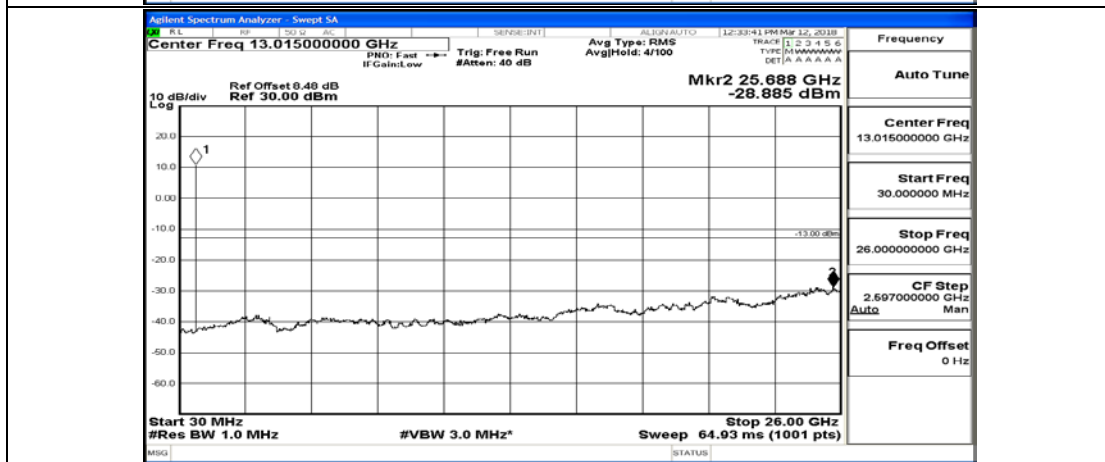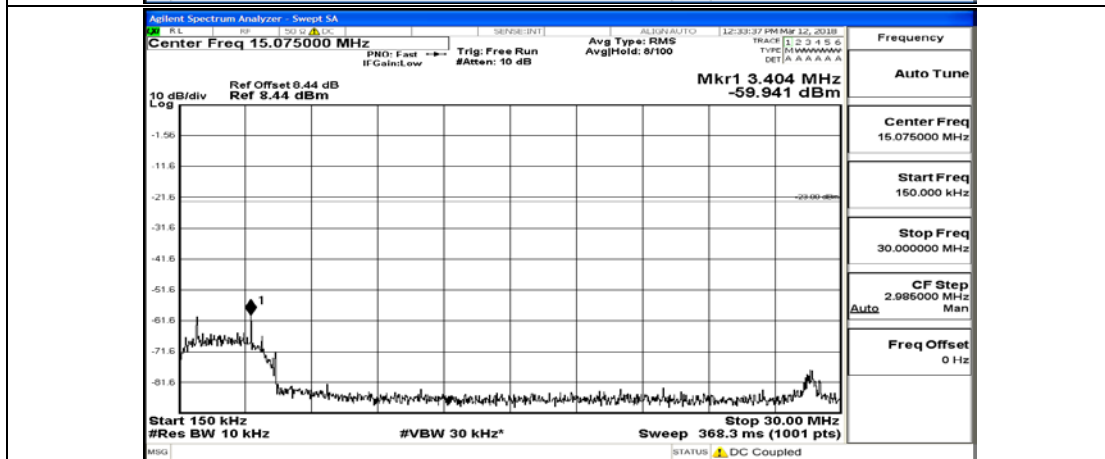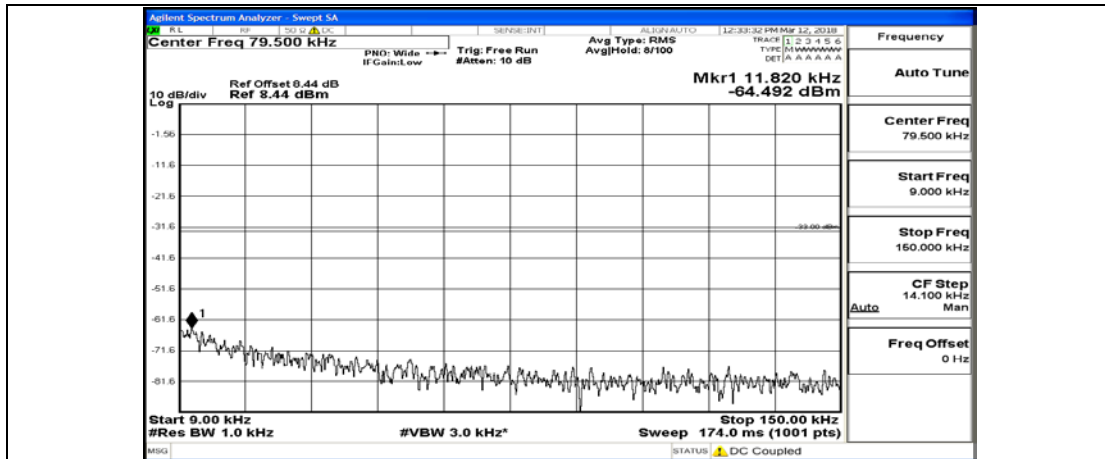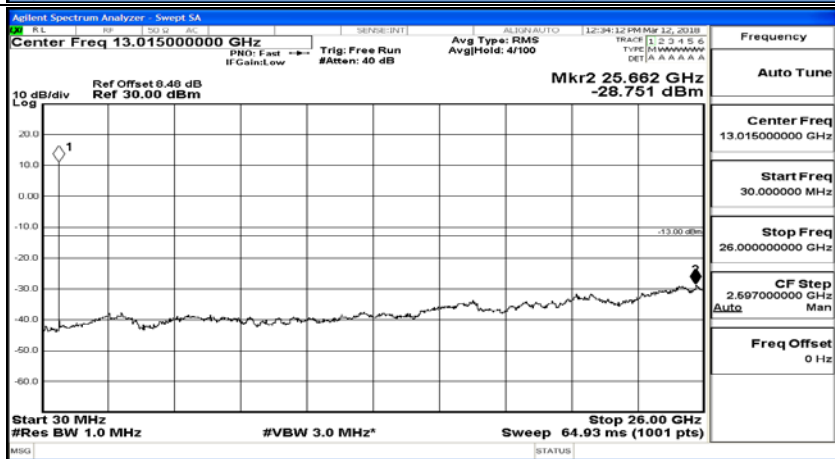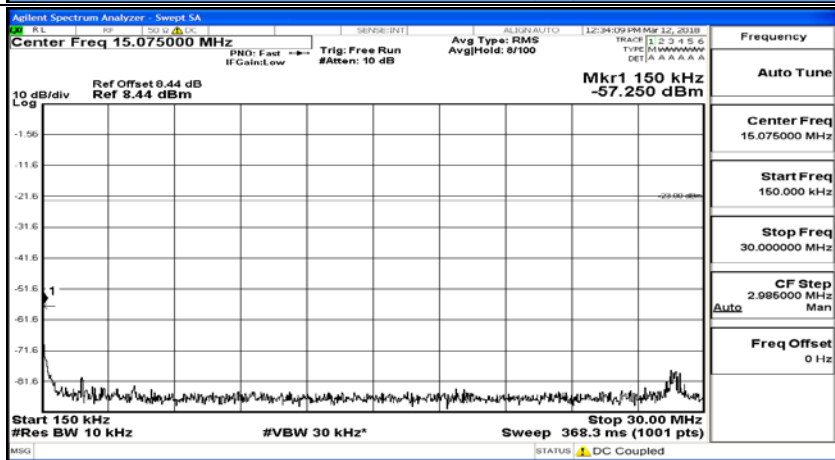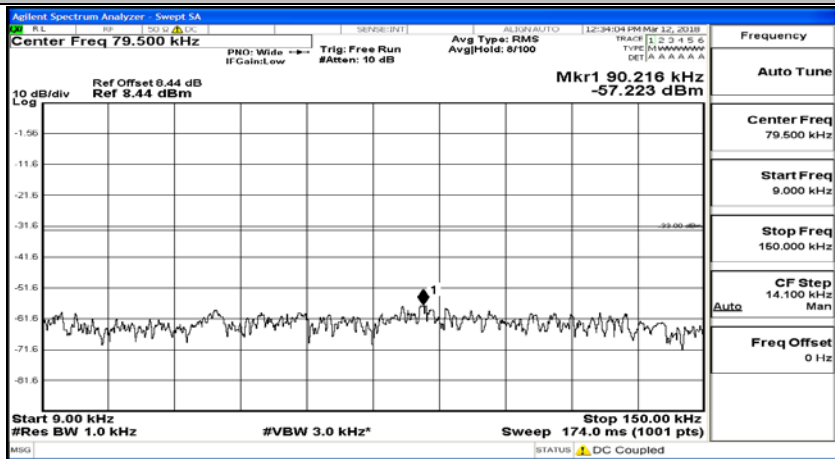| (Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#0 |
|---|

(Channel Bandwidth: 5 MHz)_MCH_QPSK_25RB#0

(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#0

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide Trig: Free Run
IF Gain:Low #Atten: 10 dB
Avg Type: RMS
Avg|Hold: 8/100
Mkr1 90.216 kHz
-57.223 dBm
Ref Offset 8.44 dB
Ref 8.44 dBm
10 dB/div
Log
Start 9.00 kHz
#Res BW 1.0 kHz   #VBW 3.0 kHz*   Stop 150.00 kHz
Sweep 174.0 ms (1001 pts)

Frequency
Auto Tune
Center Freq 79.500 kHz
Start Freq 9.000 kHz
Stop Freq 150.000 kHz
CF Step 14.100 kHz
Freq Offset 0 Hz

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast Trig: Free Run
IF Gain:Low #Atten: 10 dB
Avg Type: RMS
Avg|Hold: 8/100
Mkr1 150 kHz
-57.250 dBm
Ref Offset 8.44 dB
Ref 8.44 dBm
10 dB/div
Log
Start 150 kHz
#Res BW 10 kHz   #VBW 30 kHz*   Stop 30.00 MHz
Sweep 368.3 ms (1001 pts)

Frequency
Auto Tune
Center Freq 15.075000 MHz
Start Freq 150.000 kHz
Stop Freq 30.000000 MHz
CF Step 2.985000 MHz
Freq Offset 0 Hz

Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast Trig: Free Run
IF Gain:Low #Atten: 40 dB
Avg Type: RMS
Avg|Hold: 4/100
Mkr2 25.662 GHz
-28.751 dBm
Ref Offset 8.48 dB
Ref 30.00 dBm
10 dB/div
Log
Start 30 MHz
#Res BW 1.0 MHz   #VBW 3.0 MHz*   Stop 26.00 GHz
Sweep 64.93 ms (1001 pts)

Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz
Freq Offset 0 Hz

(Channel Bandwidth: 5 MHz)_HCH_QPSK_25RB#0