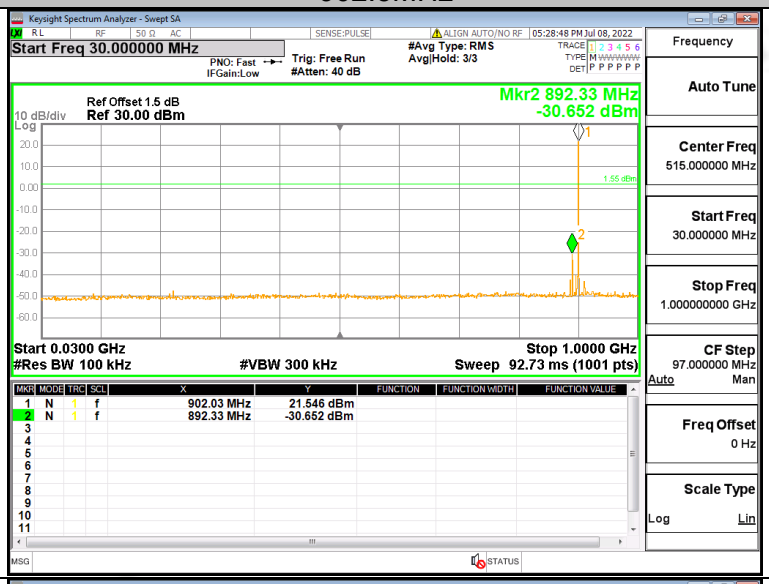
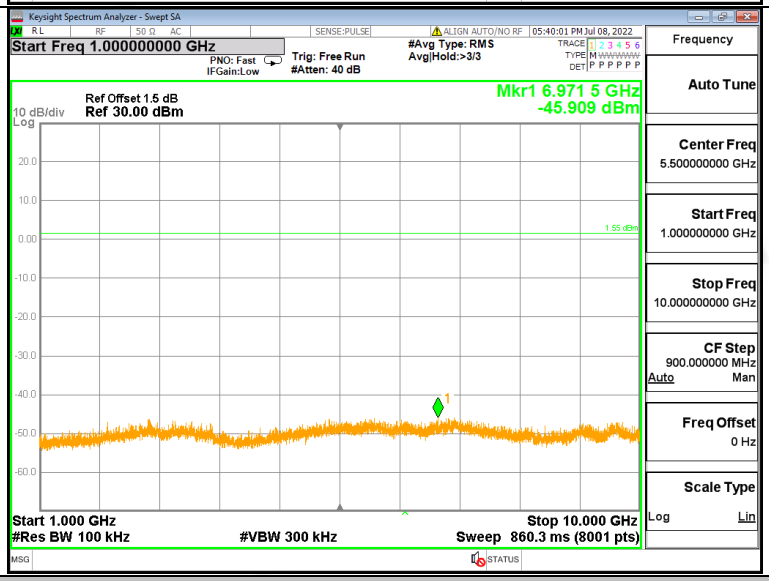
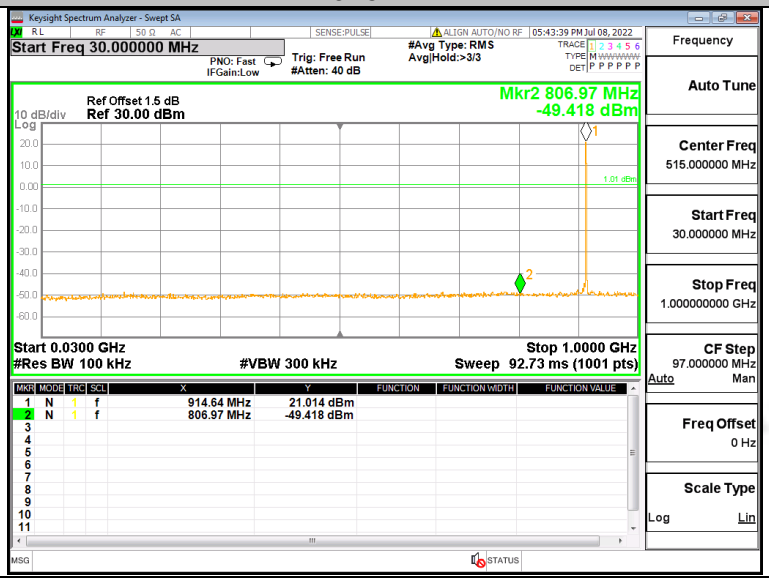
Antenna 2

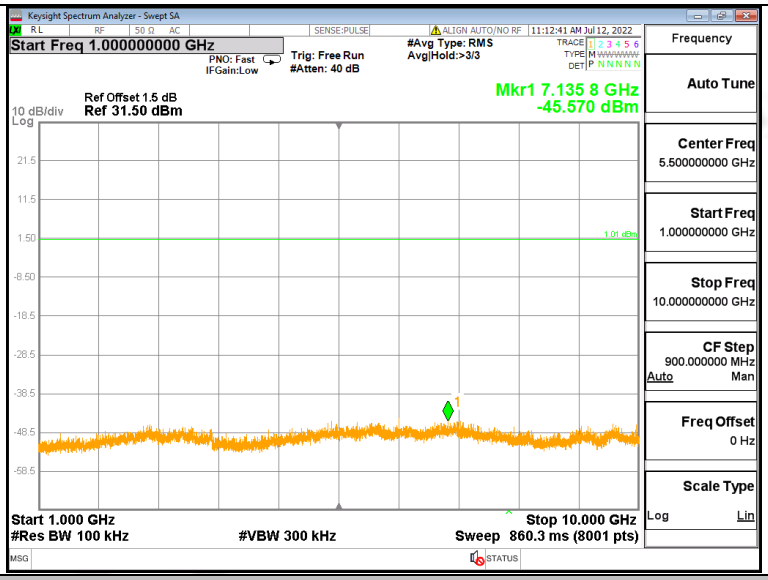
902.5MHz



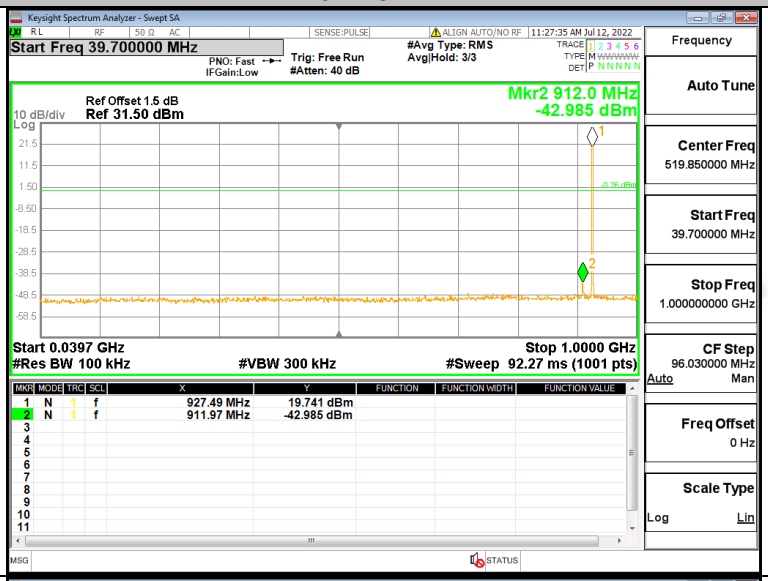


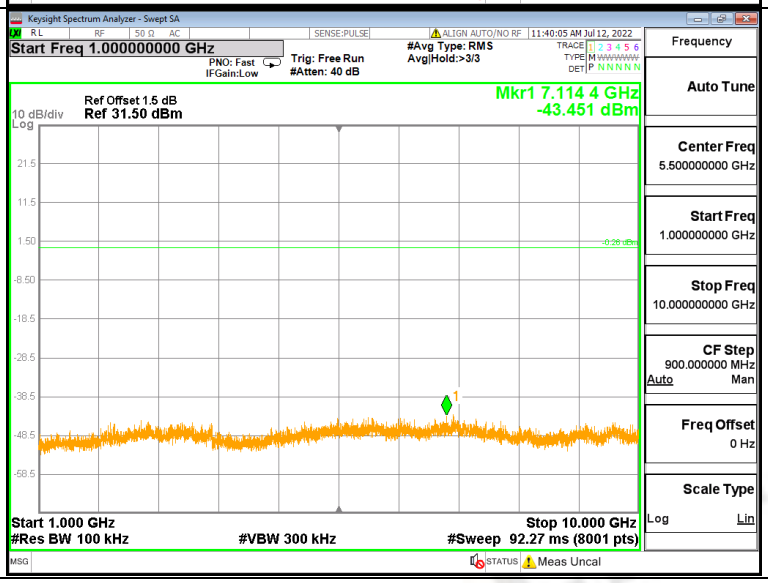
915MHz




Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:12:41 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 7.135 8 GHz
-45.570 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

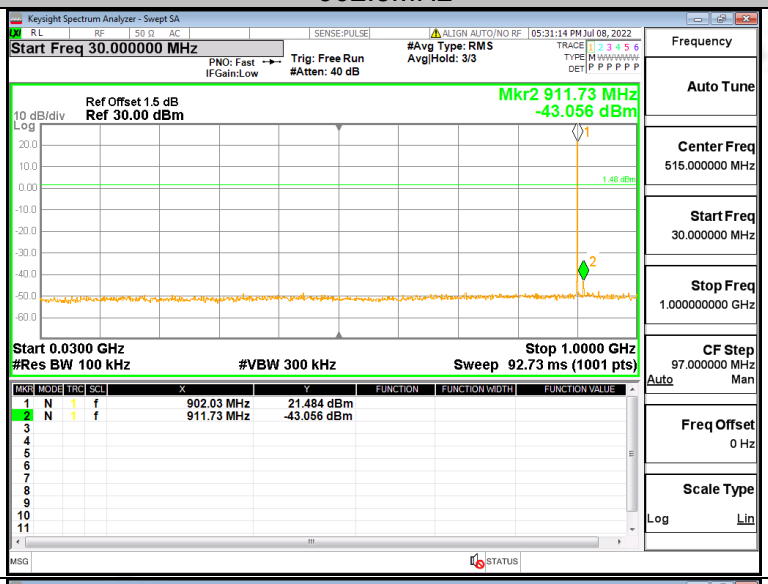
927.5MHz

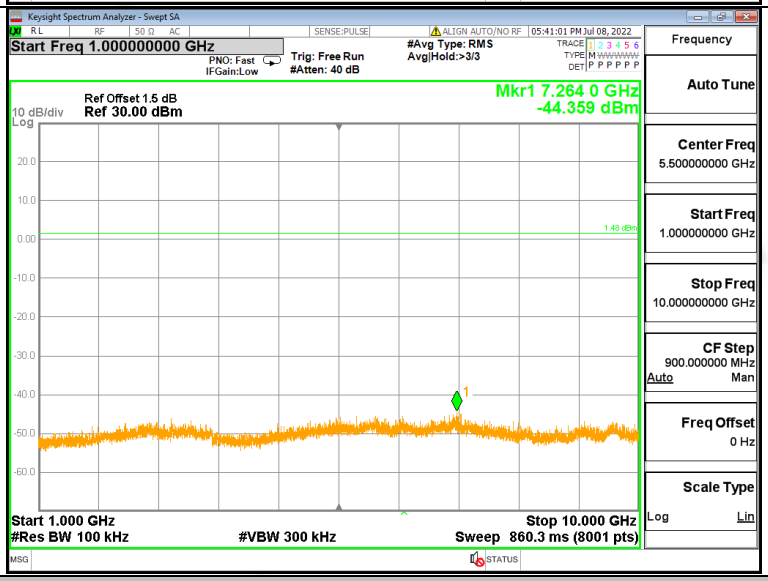

Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:27:35 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 912.0 MHz
-42.985 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 19.741 dBm
2 N 1 f 911.97 MHz -42.985 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:40:05 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 7.114 4 GHz
-43.451 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

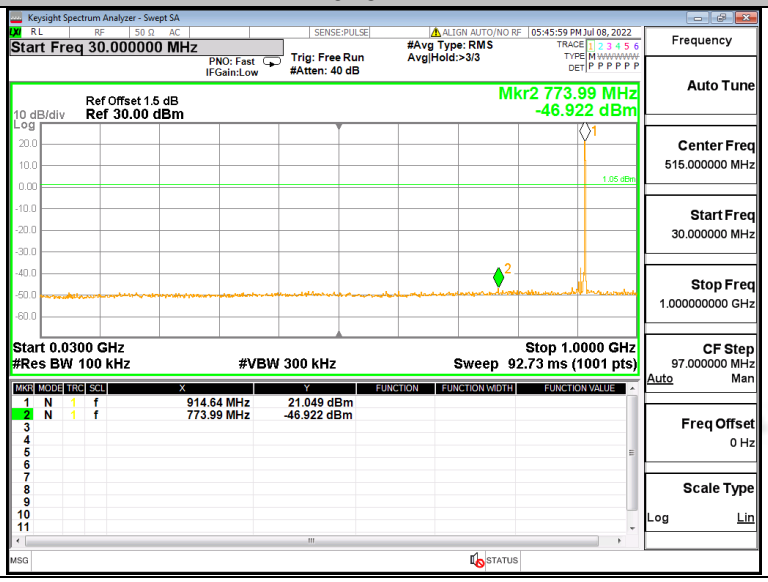
Antenna 3

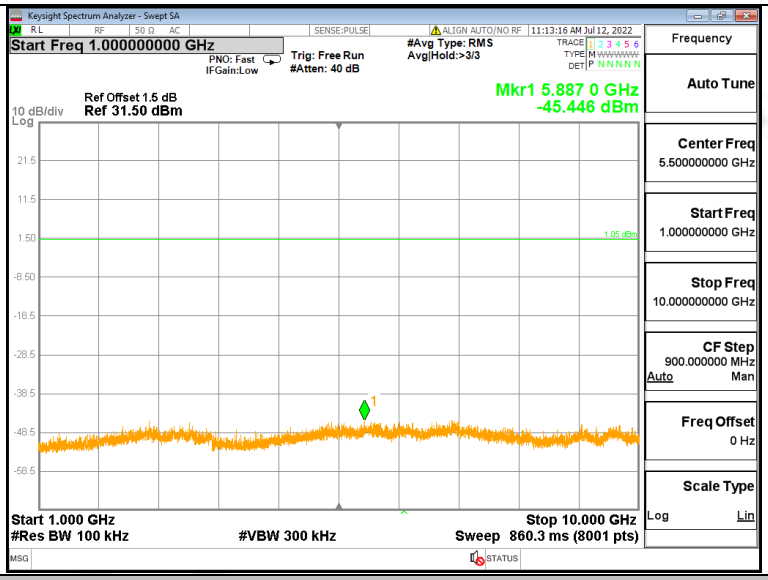
902.5MHz



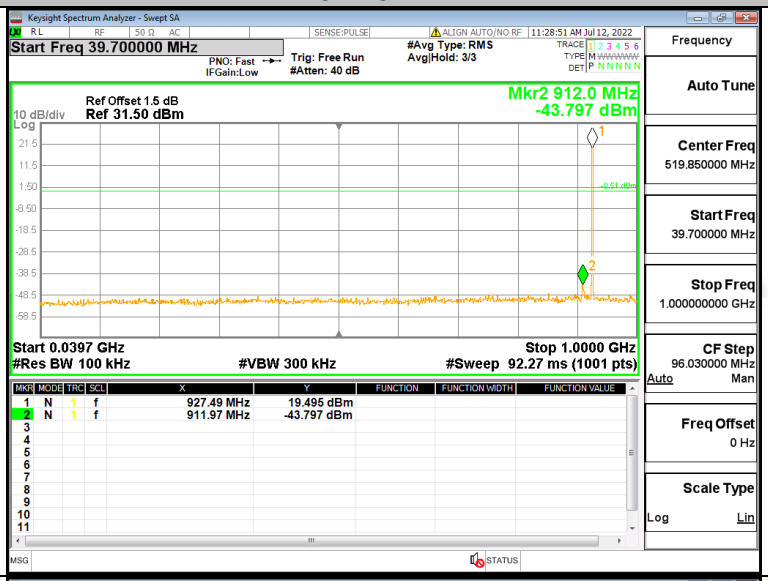


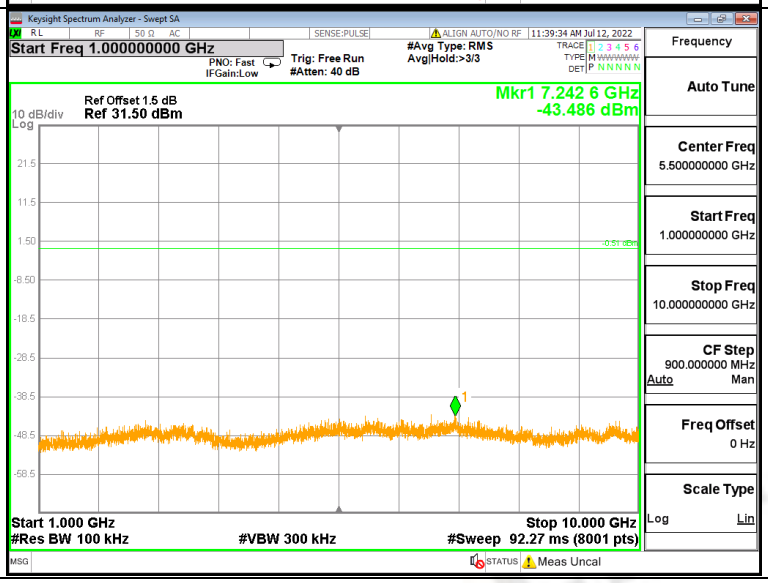
915MHz




Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:13:16 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 5.887 0 GHz
-45.446 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

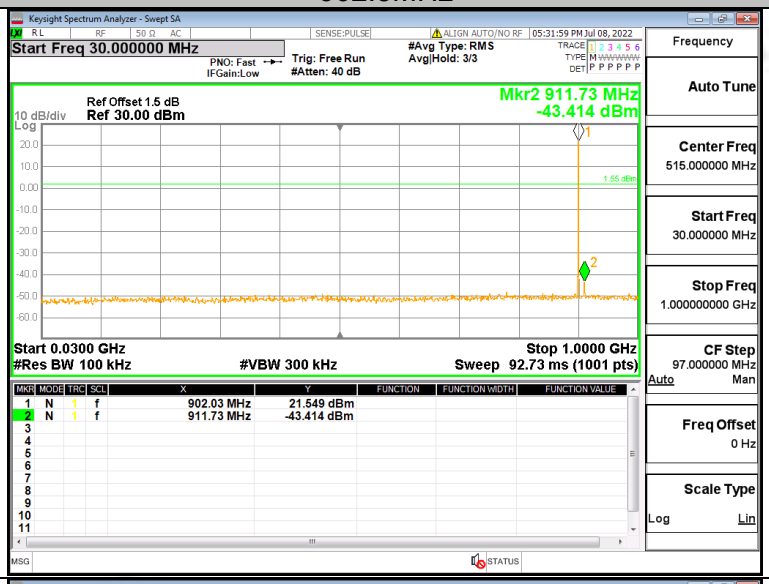
927.5MHz

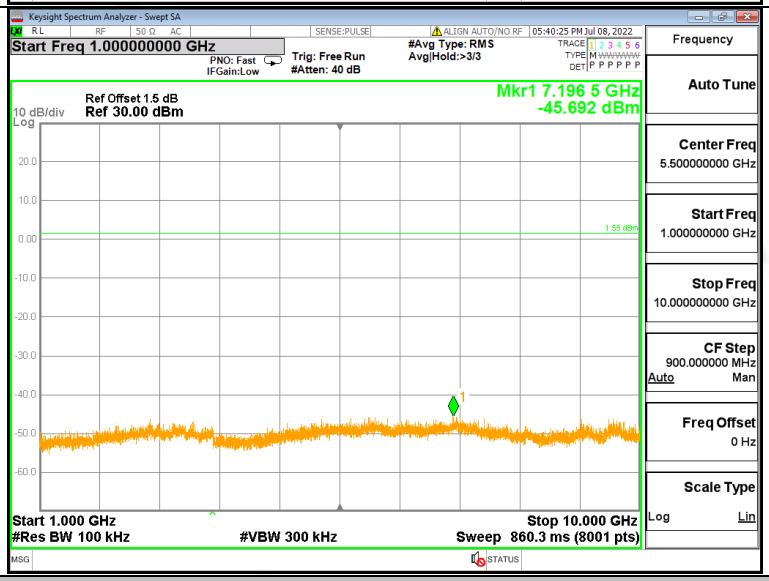

Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:28:51 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 912.0 MHz
-43.797 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 19.495 dBm
2 N 1 f 911.97 MHz -43.797 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:39:34 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 7.242 6 GHz
-43.486 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

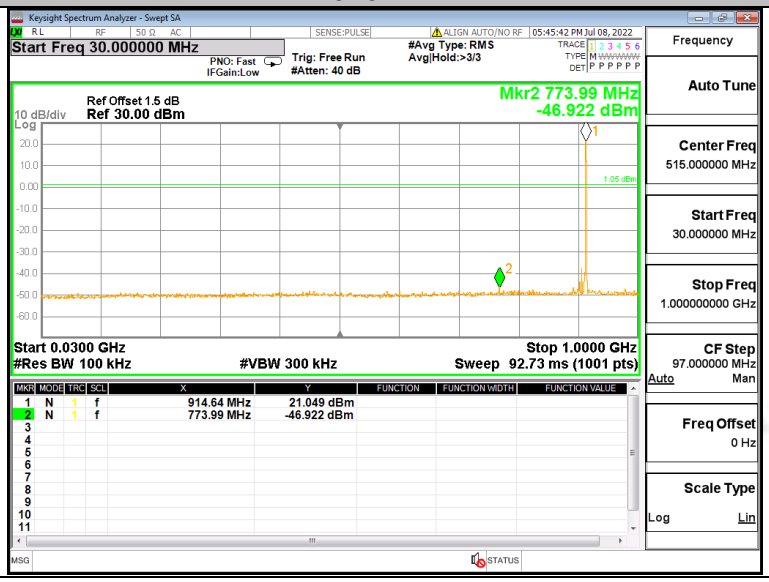
Antenna 4

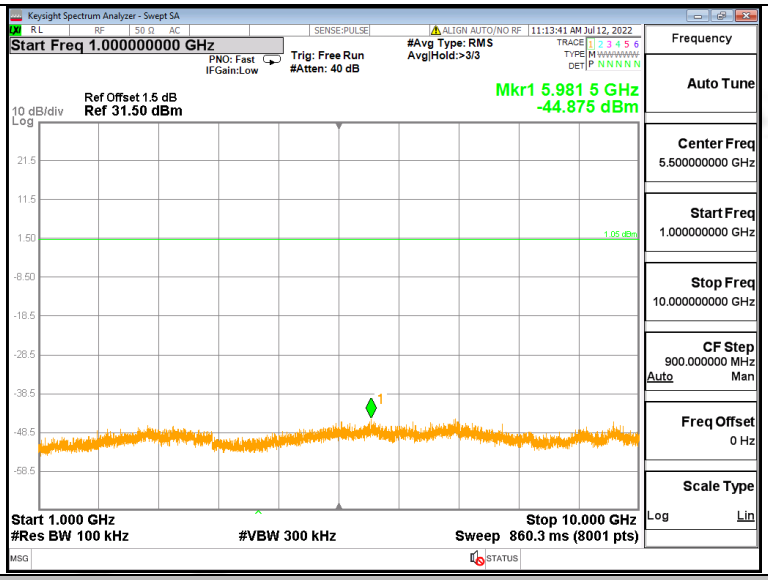
902.5MHz



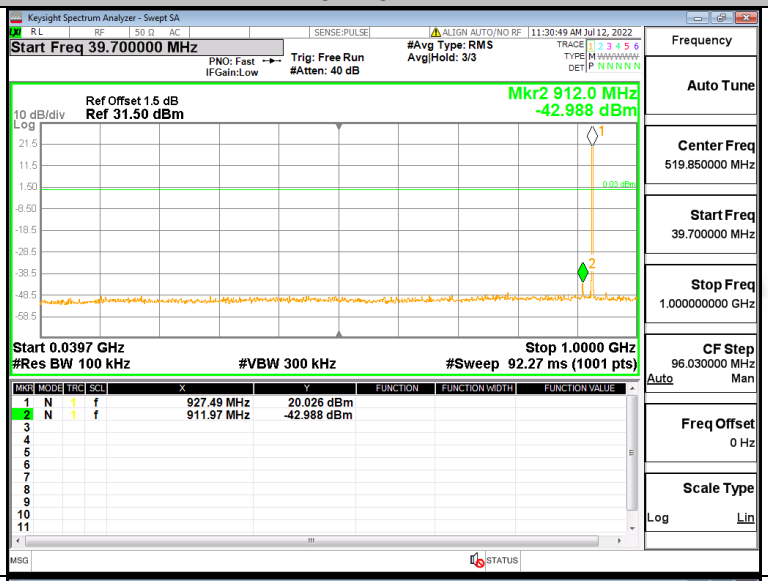


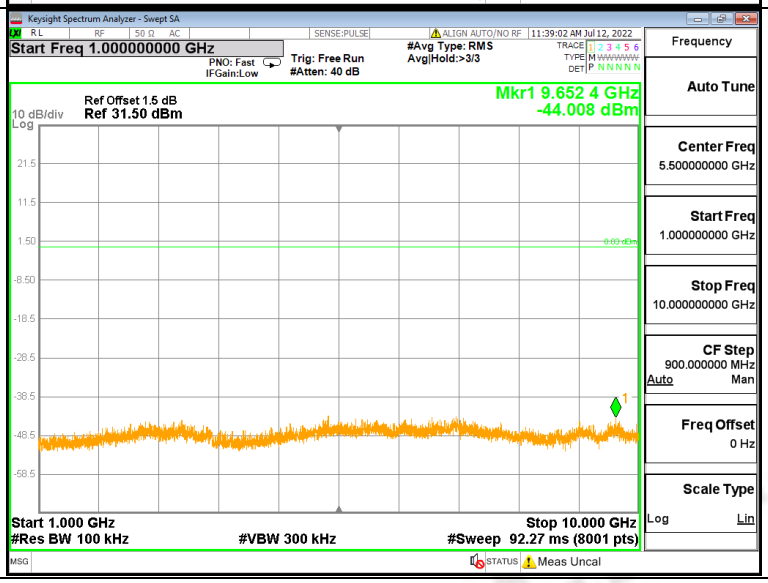
915MHz




Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:13:41 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 5.981 5 GHz
-44.875 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

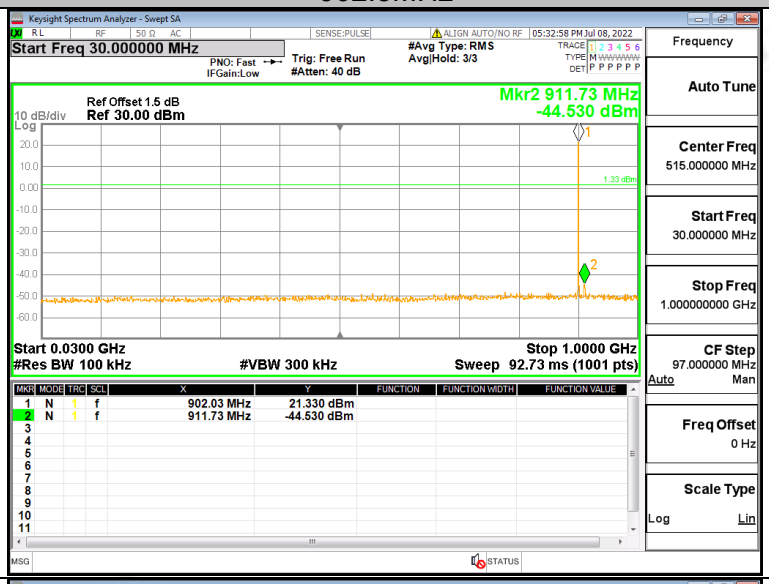
927.5MHz

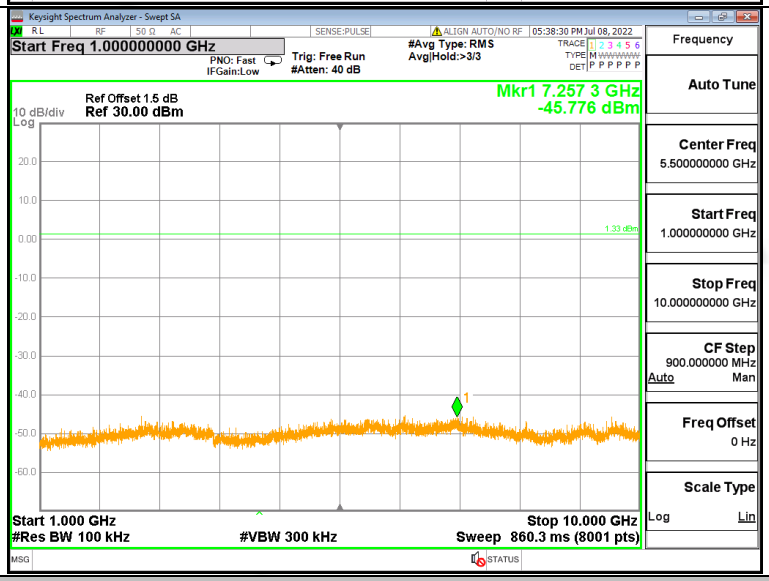

Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:30:49 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 912.0 MHz
-42.988 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 20.026 dBm
2 N 1 f 911.97 MHz -42.988 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:39:02 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 9.652 4 GHz
-44.008 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

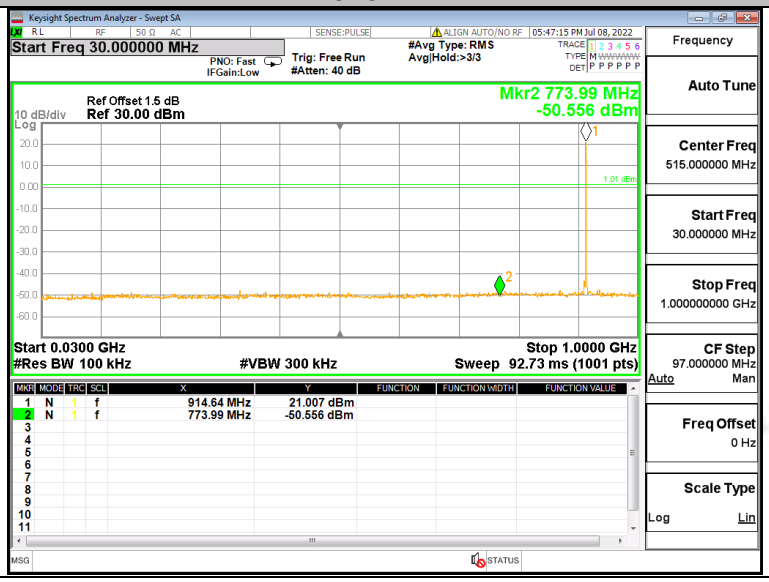
Antenna 5

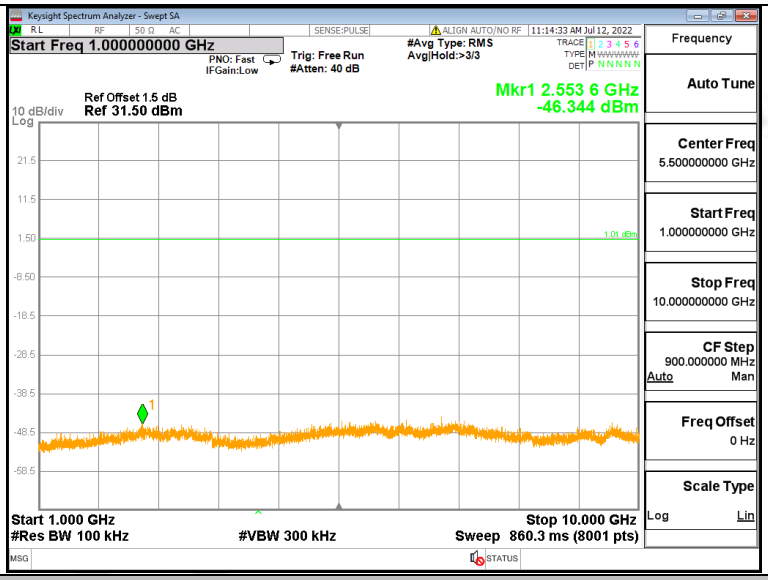
902.5MHz



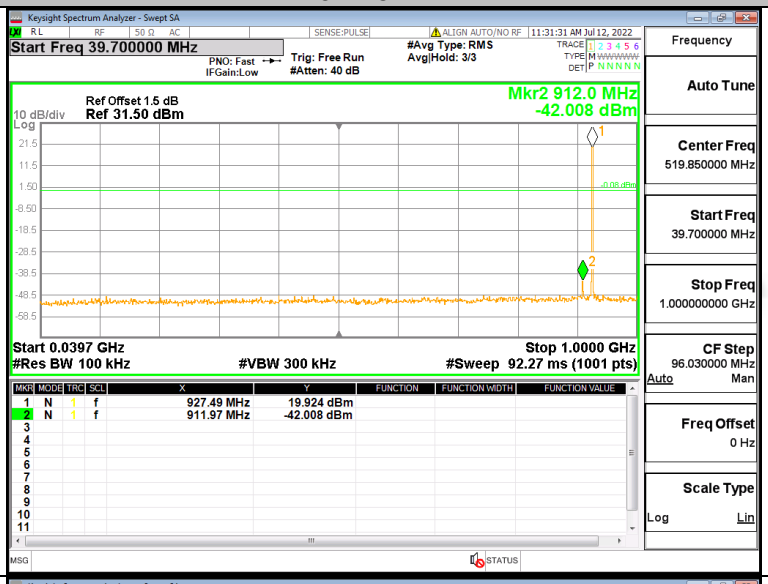


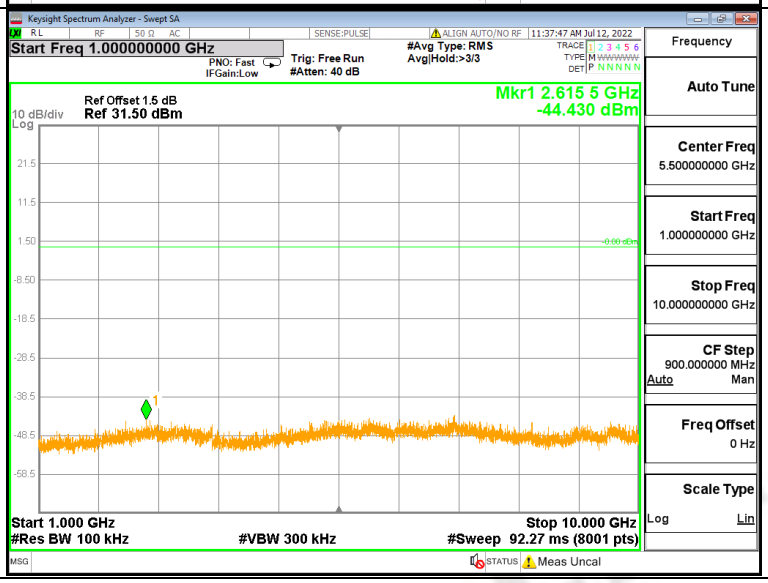
915MHz




Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:14:33 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 2.553 6 GHz
-46.344 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

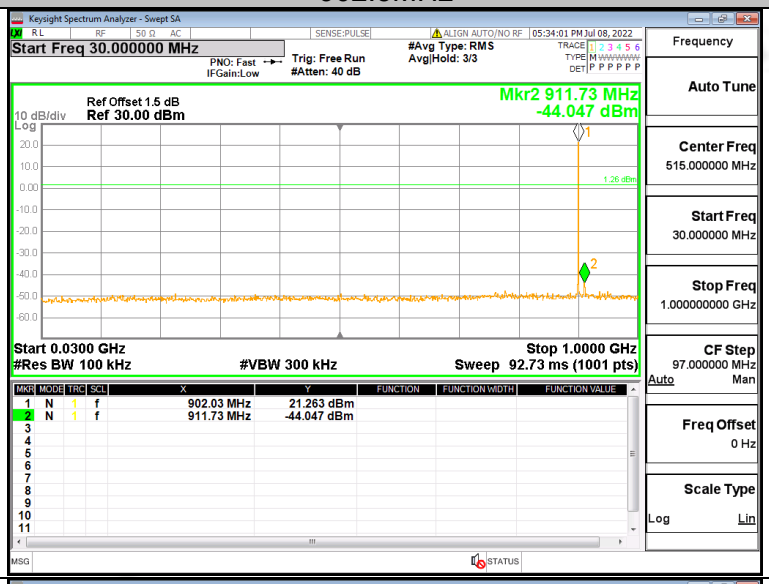
927.5MHz

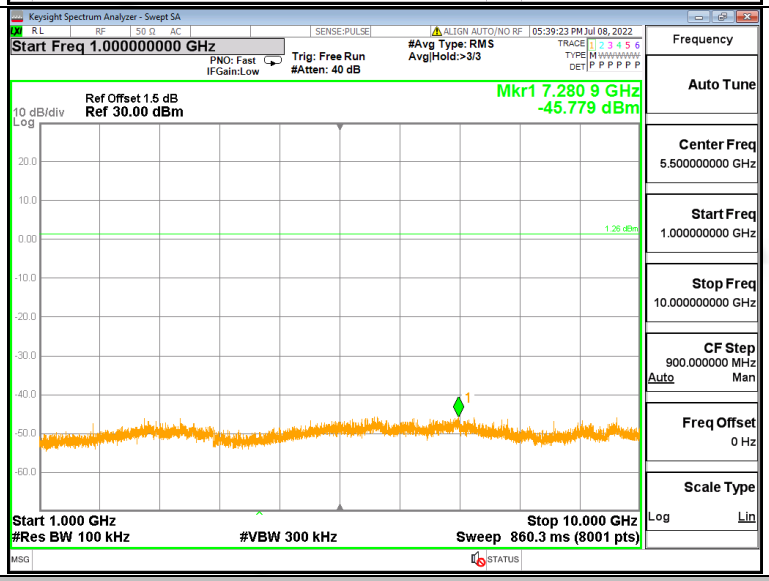

Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:31:31 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 912.0 MHz
-42.008 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 19.924 dBm
2 N 1 f 911.97 MHz -42.008 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:37:47 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 2.615 5 GHz
-44.430 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

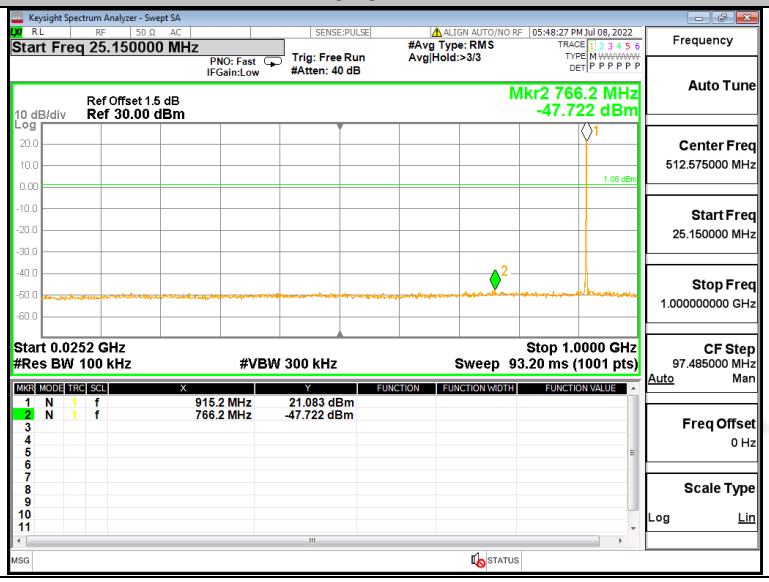
Antenna 6

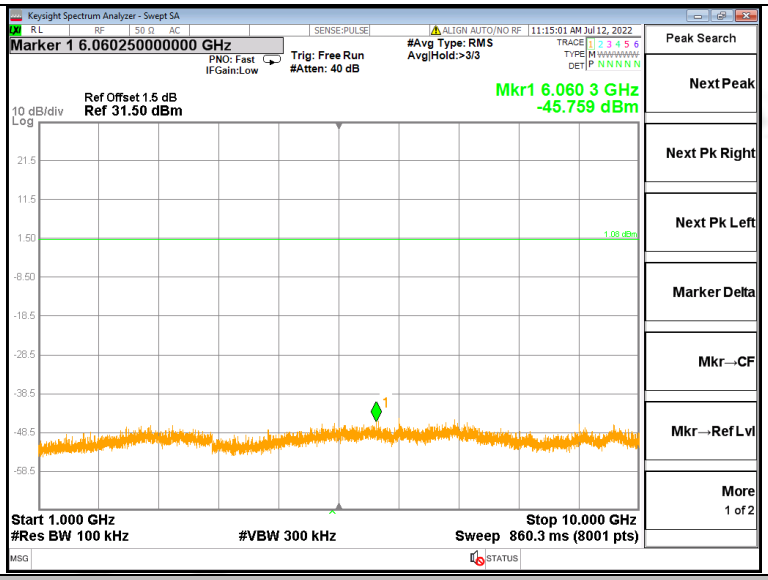
902.5MHz



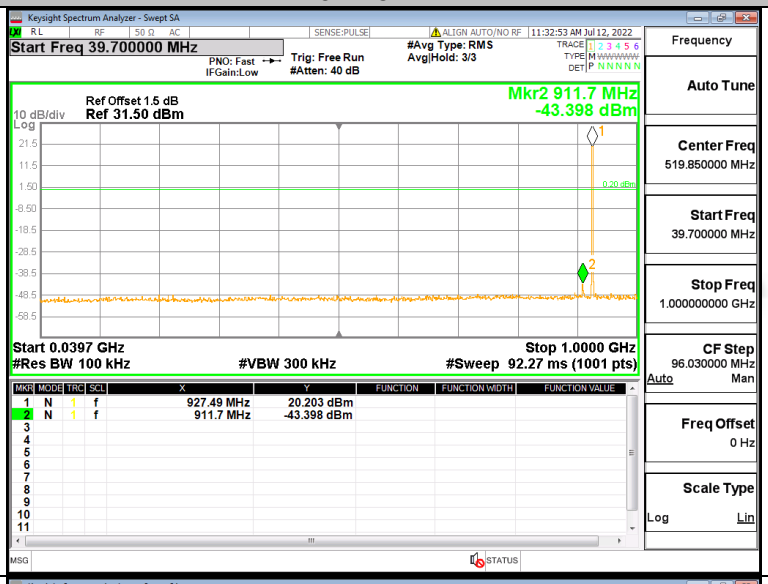


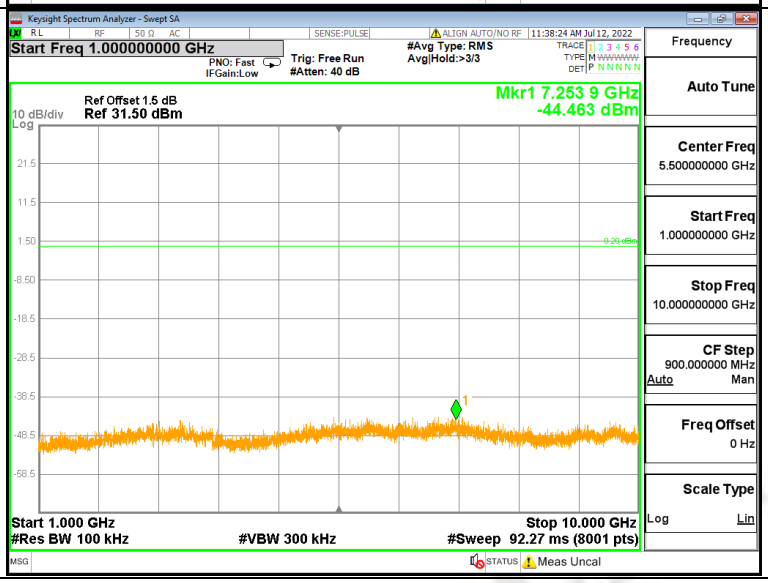
915MHz




Keysight Spectrum Analyzer - Swept SA
Marker 1 6.060250000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:15:01 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 6.060 3 GHz
-45.759 dBm
1.08 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

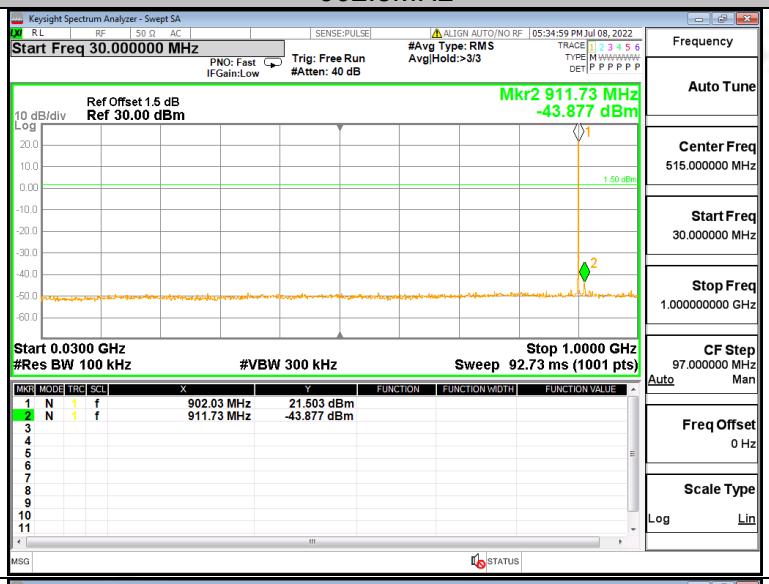
927.5MHz

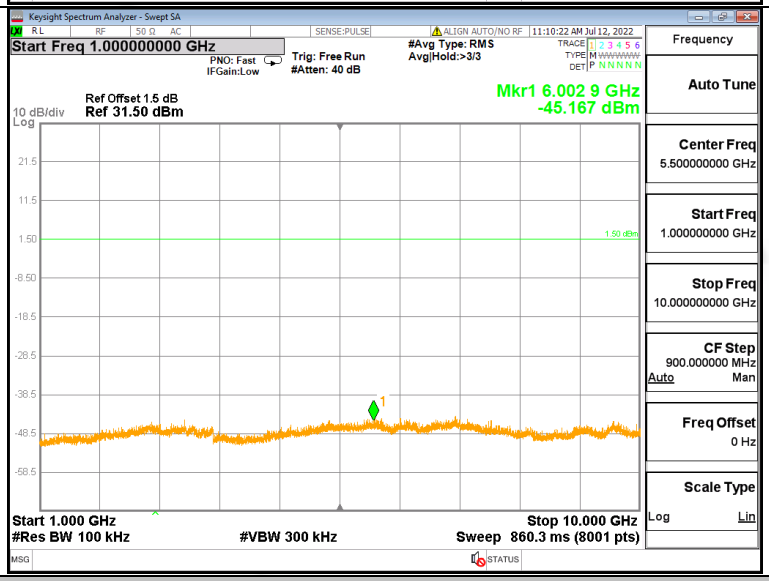

Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:32:53 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 911.7 MHz
-43.398 dBm
0.20 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 20.203 dBm
2 N 1 f 911.7 MHz -43.398 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto Man
Freq Offset
0 Hz
Scale Type
Log Lin


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:38:24 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 7.253 9 GHz
-44.463 dBm
0.20 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto Man
Freq Offset
0 Hz
Scale Type
Log Lin

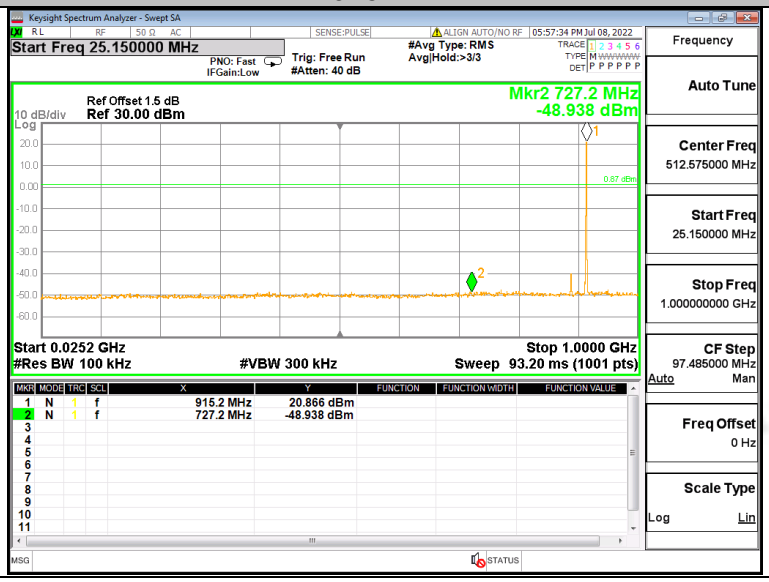
Antenna 7

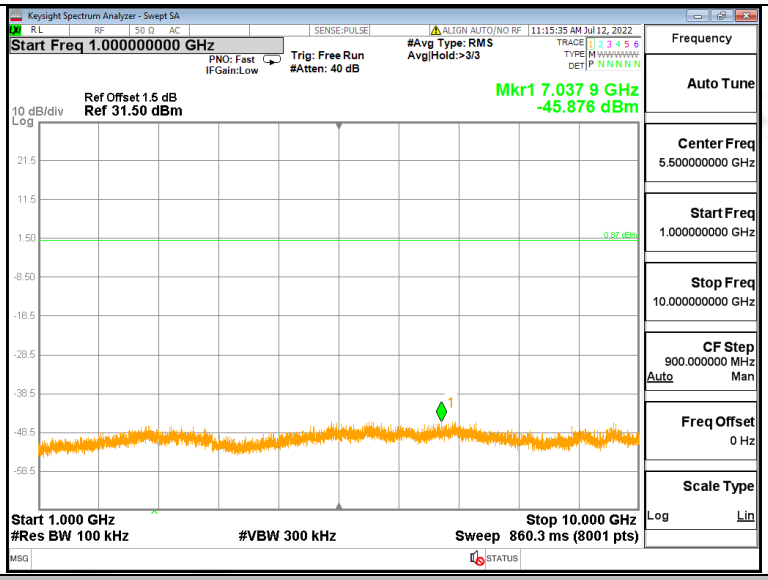
902.5MHz



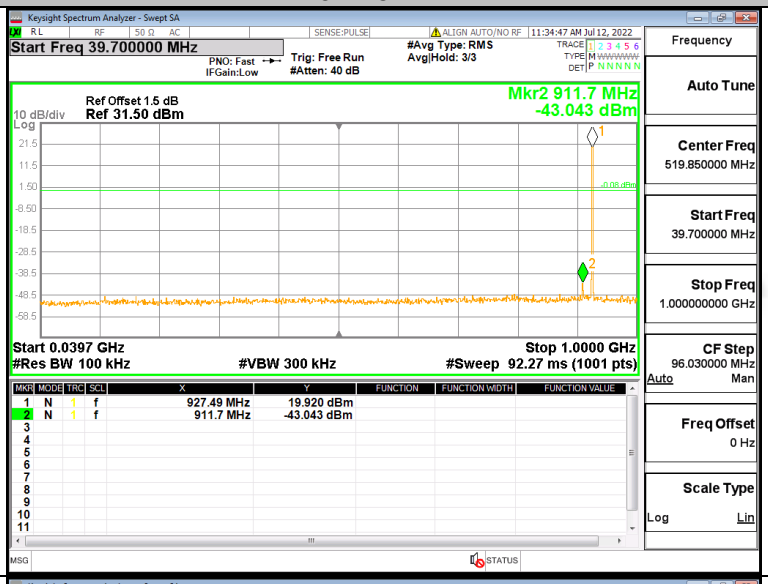


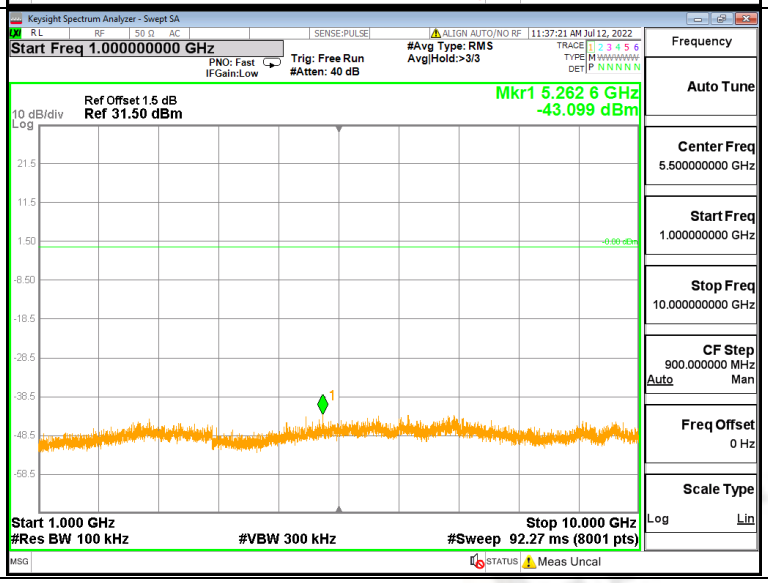
915MHz




Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:15:35 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 7.037 9 GHz
-45.876 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

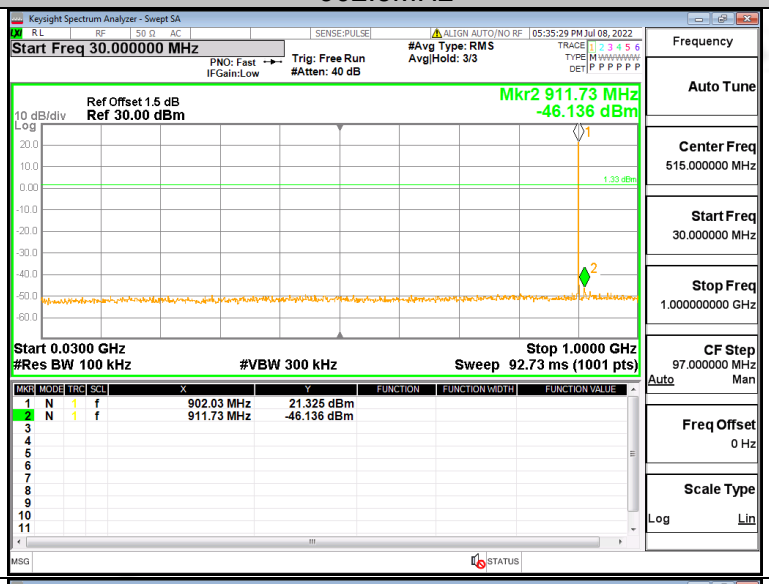
927.5MHz

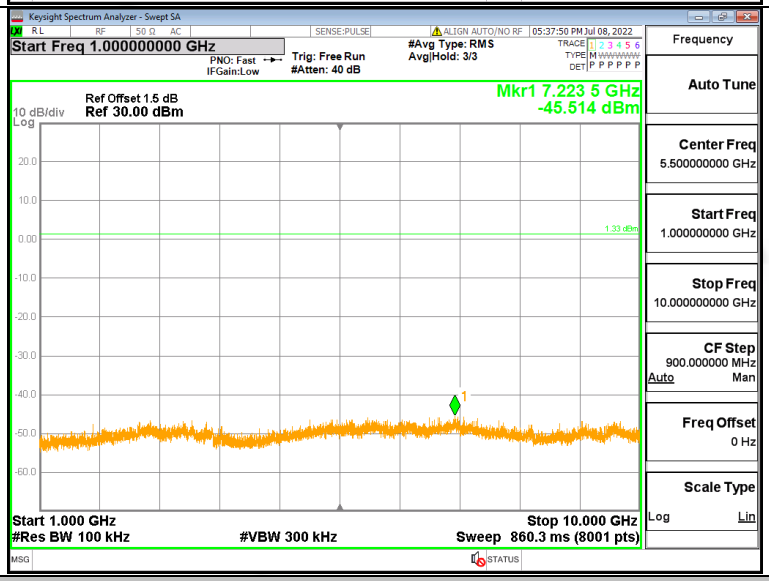

Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:34:47 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 911.7 MHz
-43.043 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 19.920 dBm
2 N 1 f 911.7 MHz -43.043 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:37:21 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 5.262 6 GHz
-43.099 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

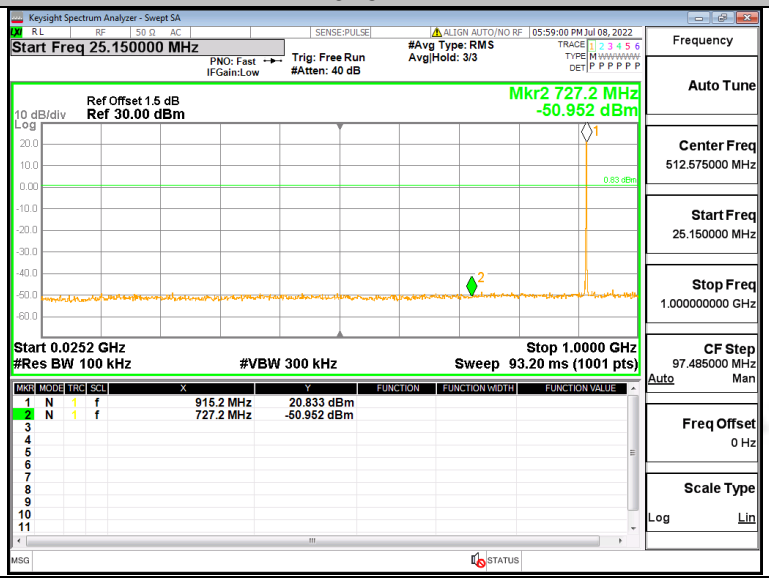
Antenna 8

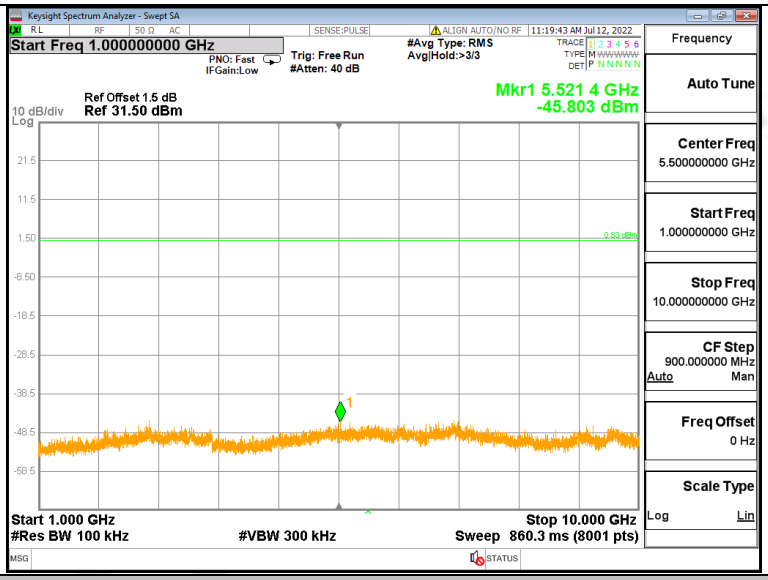
902.5MHz



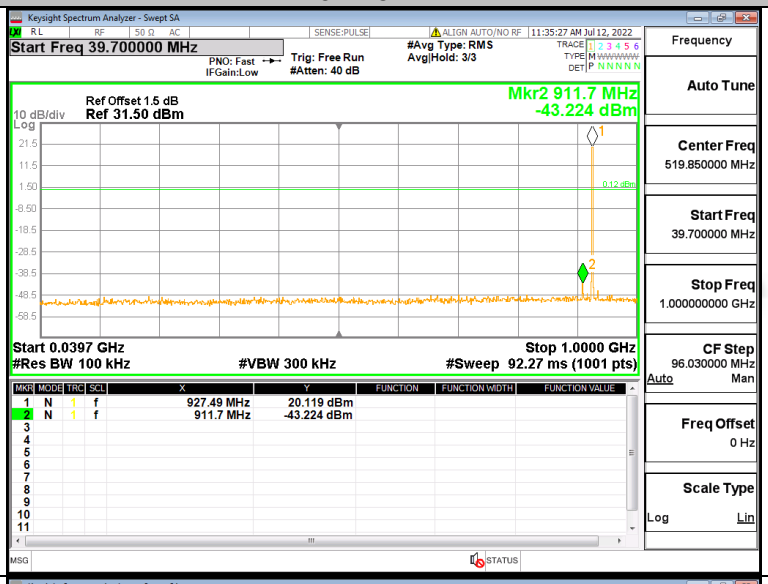


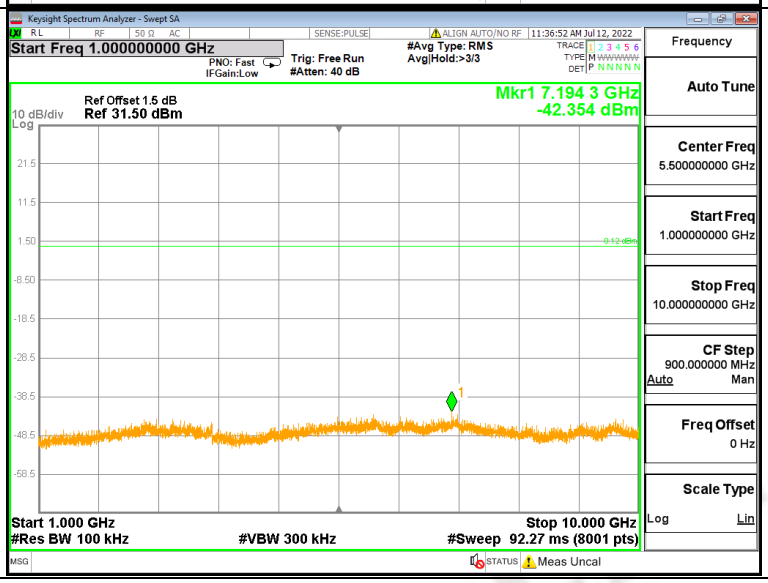
915MHz



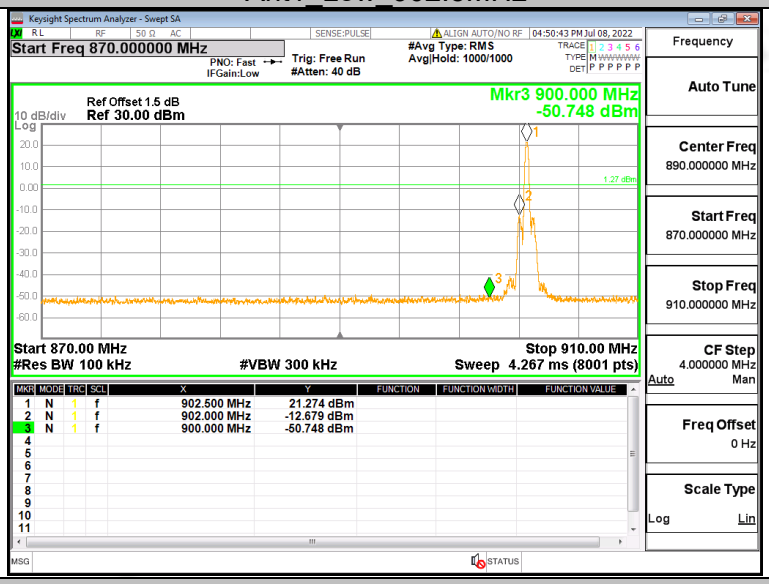
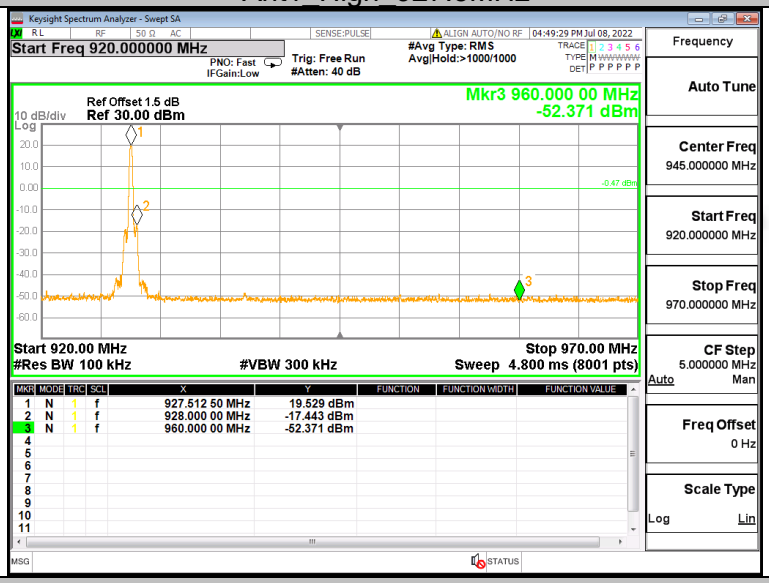
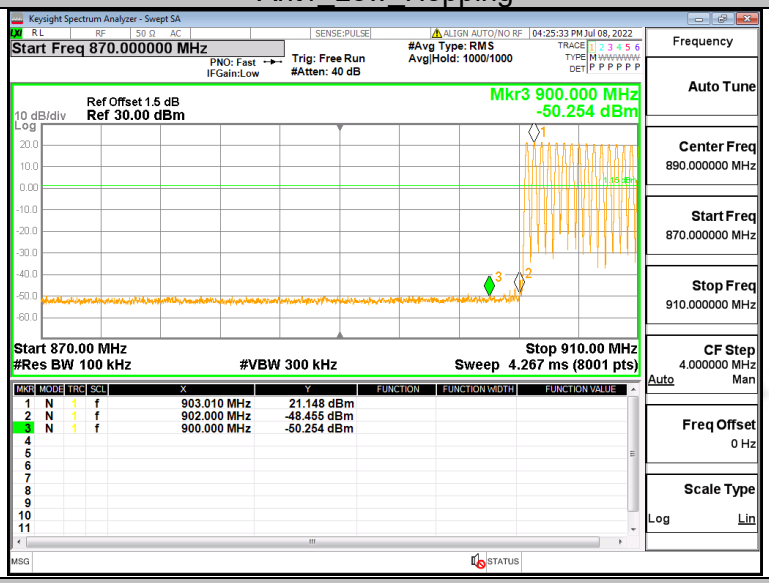

Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:19:43 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 5.521 4 GHz
-45.803 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

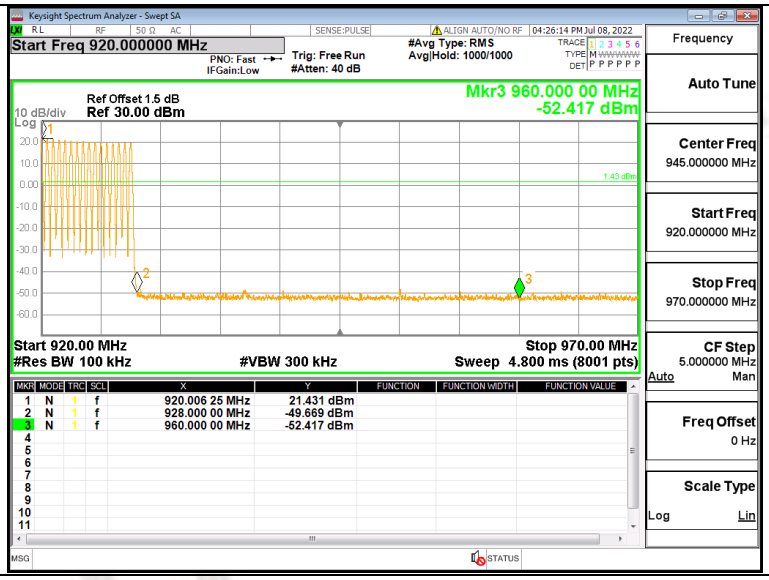
927.5MHz


Keysight Spectrum Analyzer - Swept SA
Start Freq 39.700000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 3/3
11:35:27 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr2 911.7 MHz
-43.224 dBm
Start 0.0397 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
#Sweep 92.27 ms (1001 pts)
1 N 1 f 927.49 MHz 20.119 dBm
2 N 1 f 911.7 MHz -43.224 dBm
Frequency
Auto Tune
Center Freq
519.850000 MHz
Start Freq
39.700000 MHz
Stop Freq
1.000000000 GHz
CF Step
96.030000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

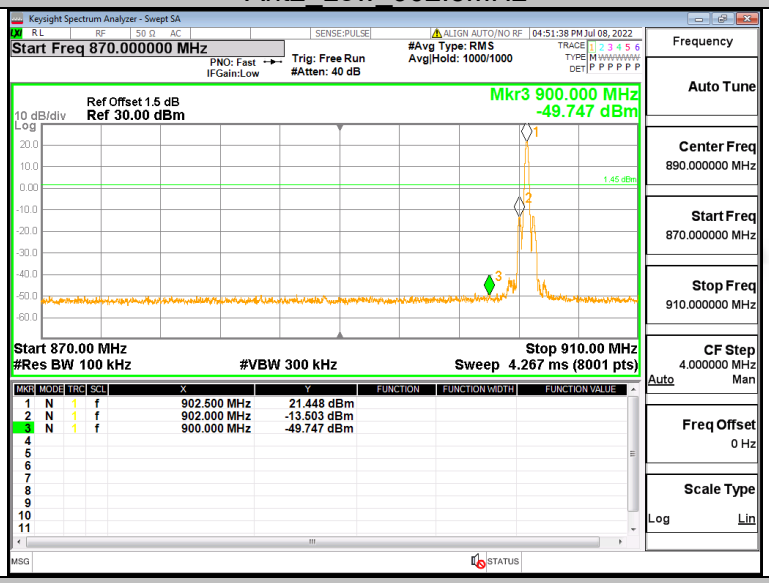

Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>3/3
11:36:52 AM Jul 12, 2022
Ref Offset 1.5 dB
10 dB/div
Ref 31.50 dBm
Log
Mkr1 7.194 3 GHz
-42.354 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 92.27 ms (8001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

Band edge measurements

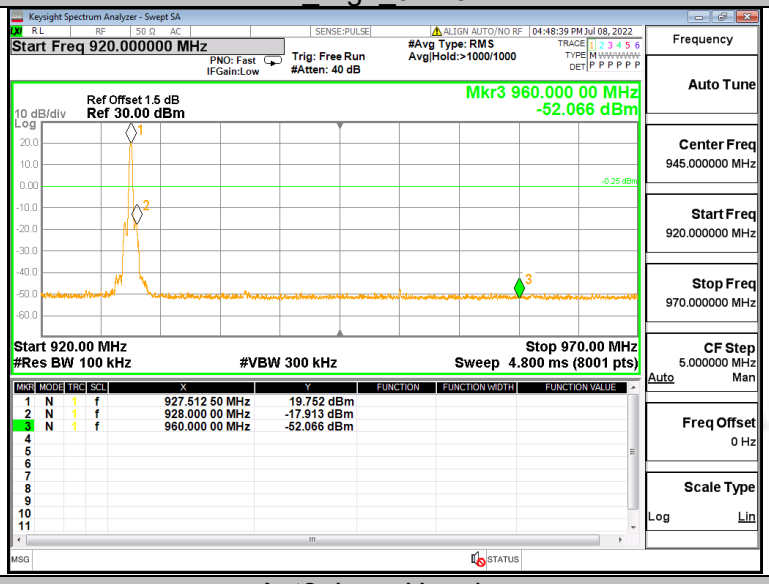
Ant1_Low_902.5MHz

Ant1_High_927.5MHz

Ant1_Low_Hopping

Ant1_ High _Hopping



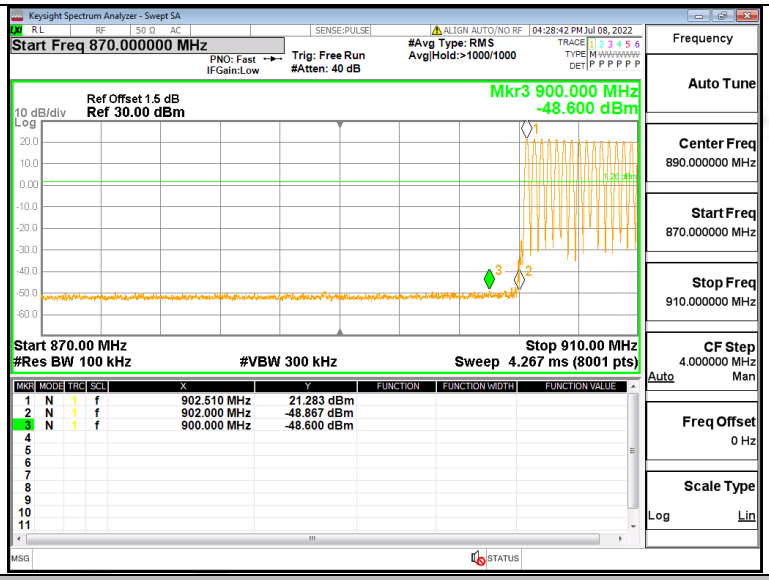
Ant2_Low_902.5MHz



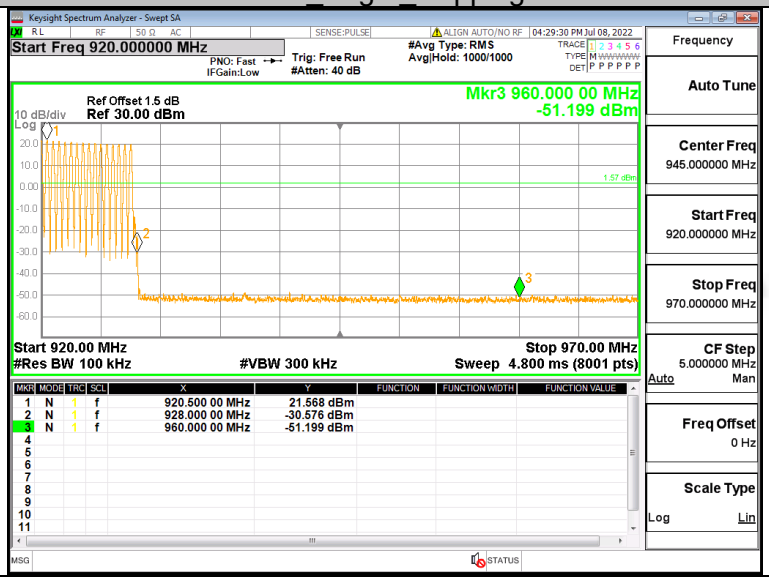
Ant2_High_927.5MHz



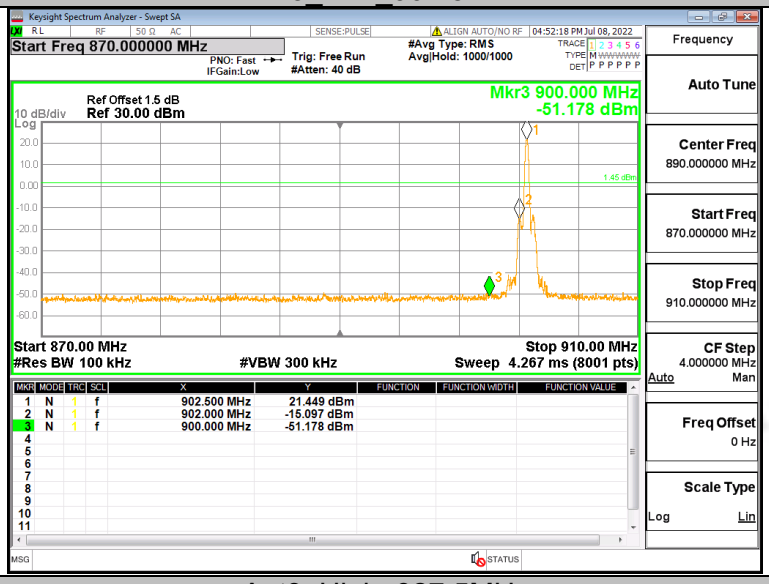
Ant2_Low_Hopping



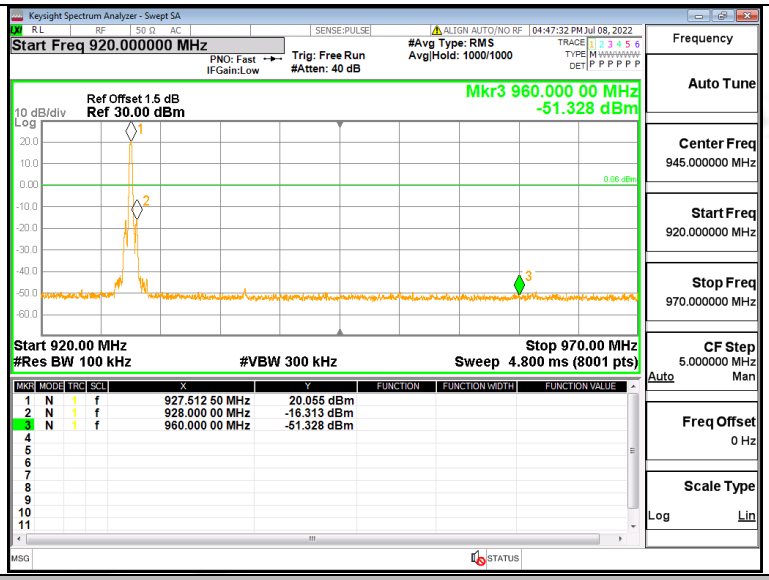
Ant2_ High _Hopping



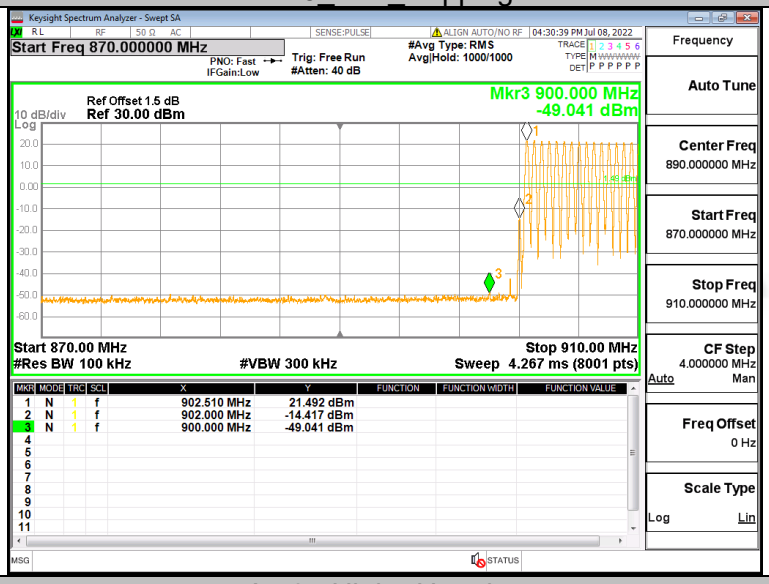
Ant3_Low_902.5MHz



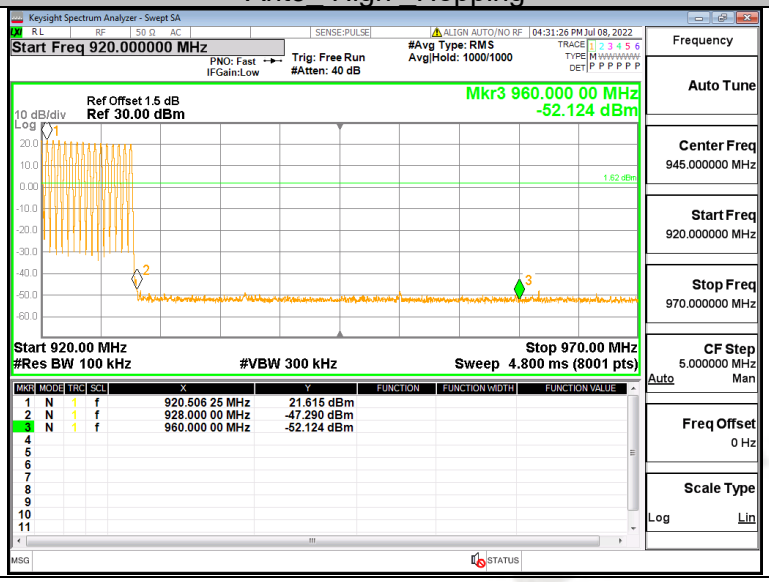
Ant3_High_927.5MHz



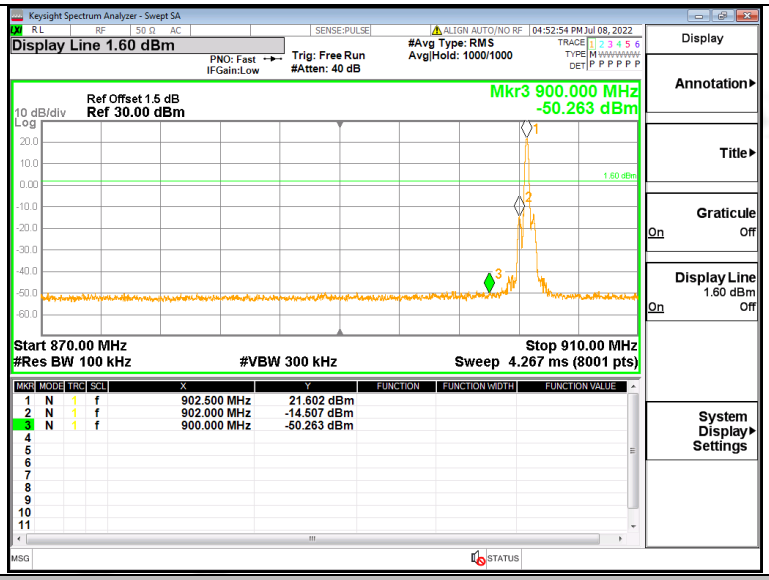
Ant3_Low_Hopping



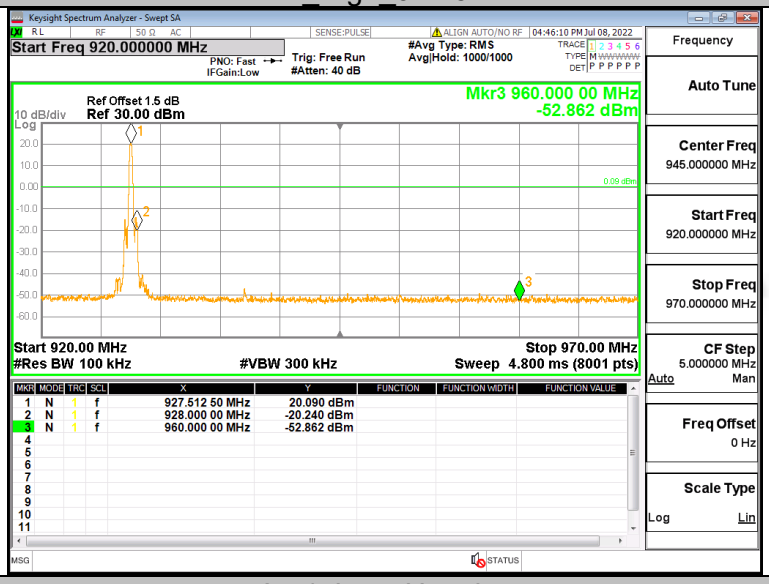
Ant3_High_Hopping



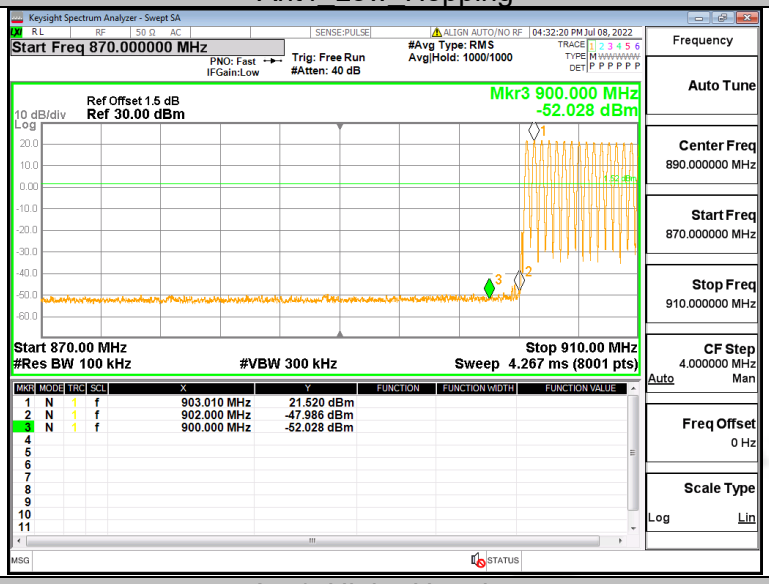
Ant4_Low_902.5MHz



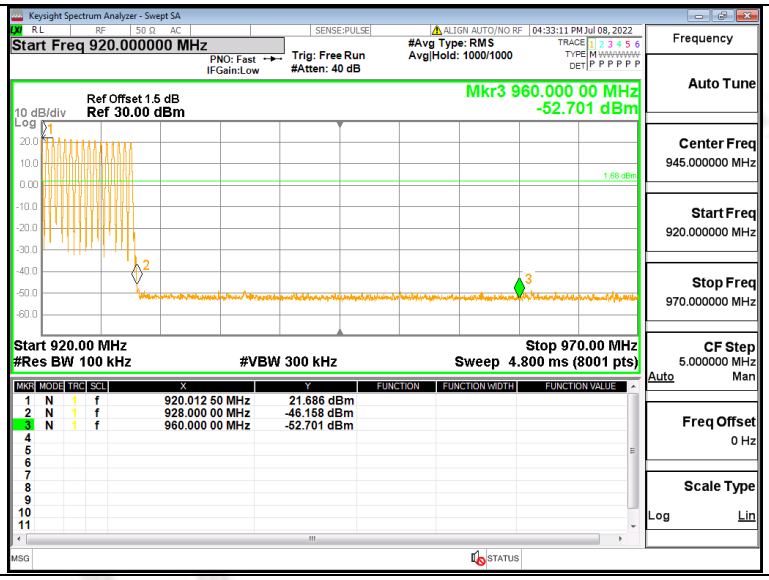
Ant4_High_927.5MHz



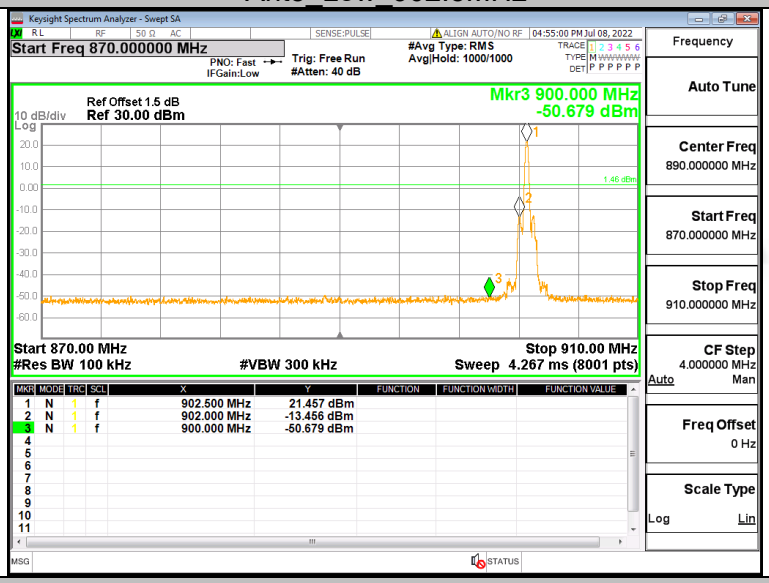
Ant4_Low_Hopping



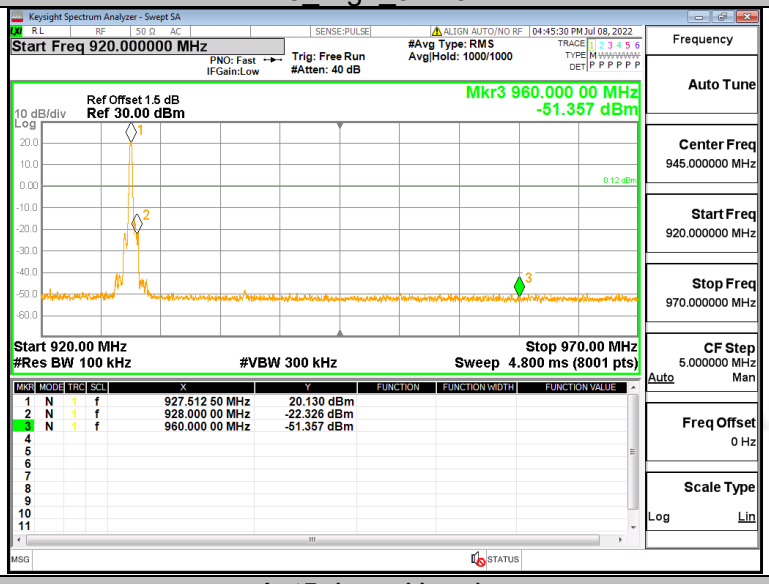
Ant4_High _Hopping



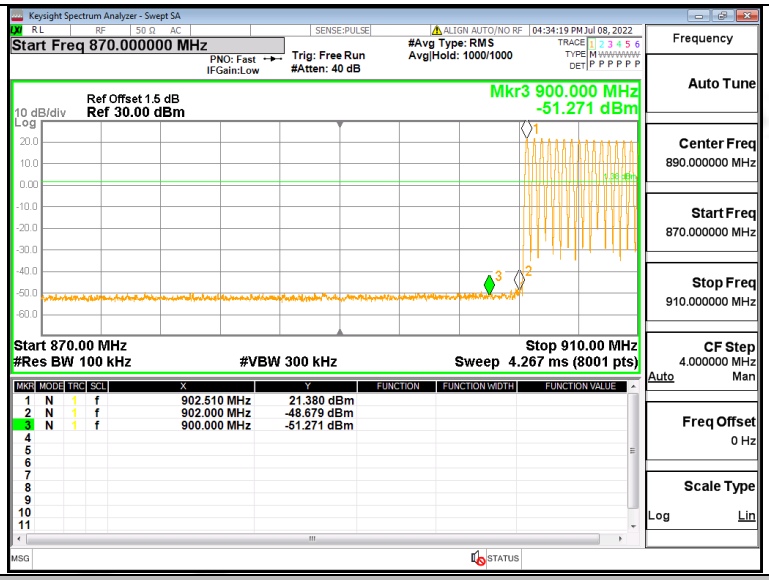
Ant5_Low_902.5MHz



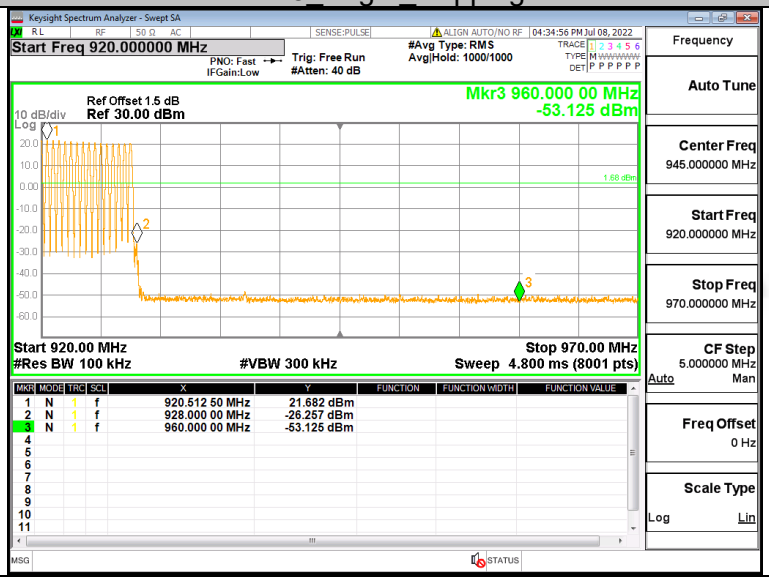
Ant5_High_927.5MHz



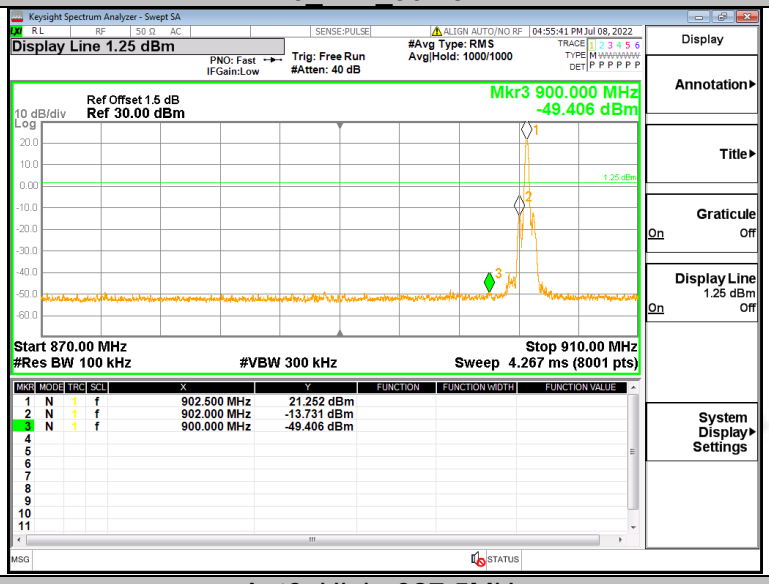
Ant5_Low_Hopping



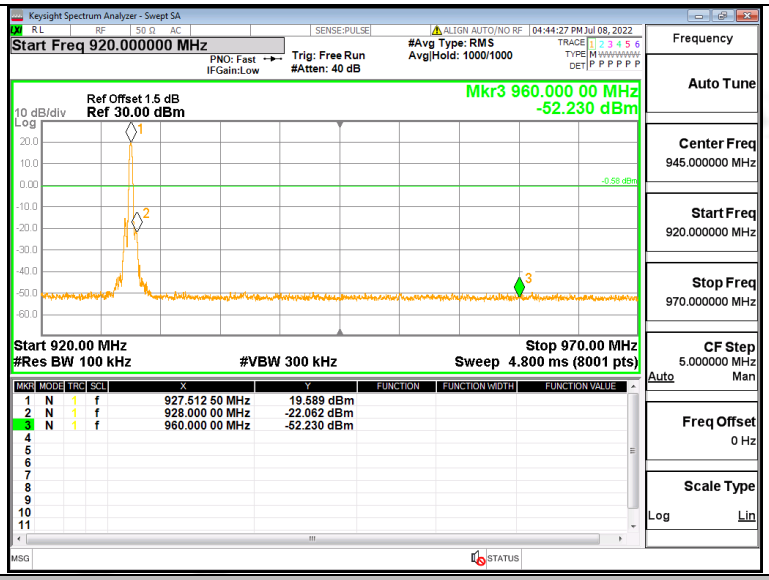
Ant5_ High _Hopping



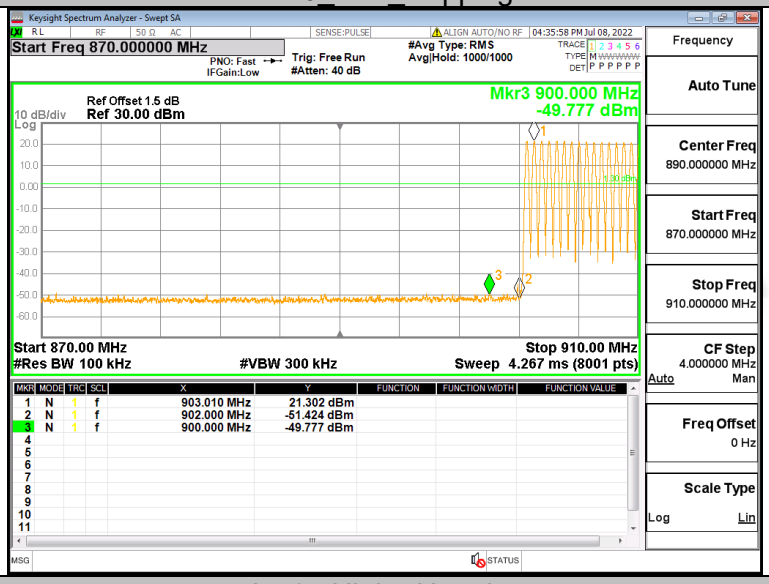
Ant6_Low_902.5MHz



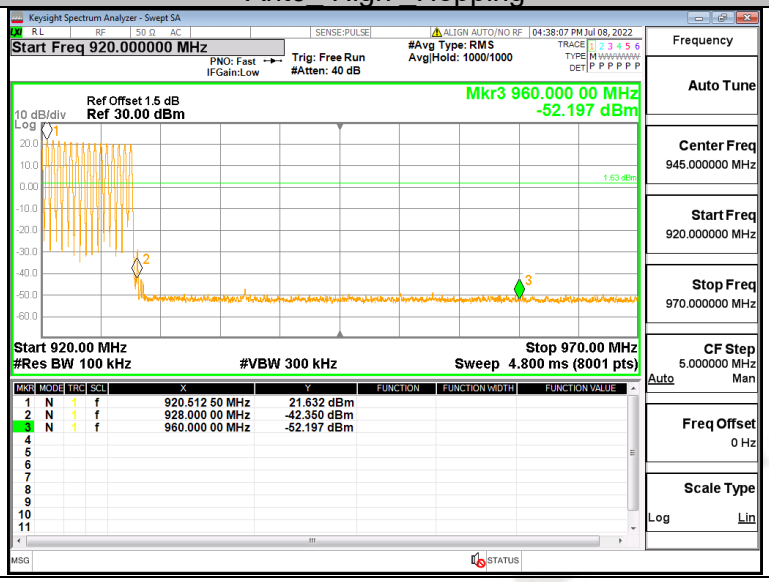
Ant6_High_927.5MHz



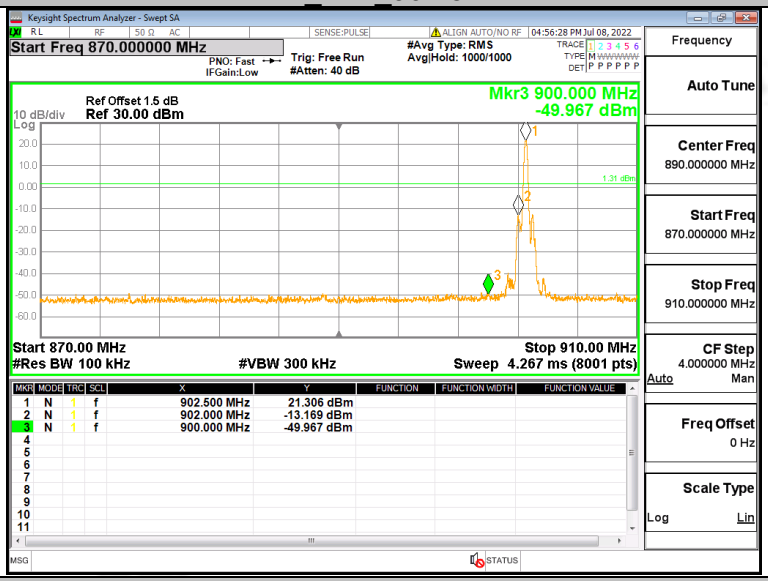
Ant6_Low_Hopping



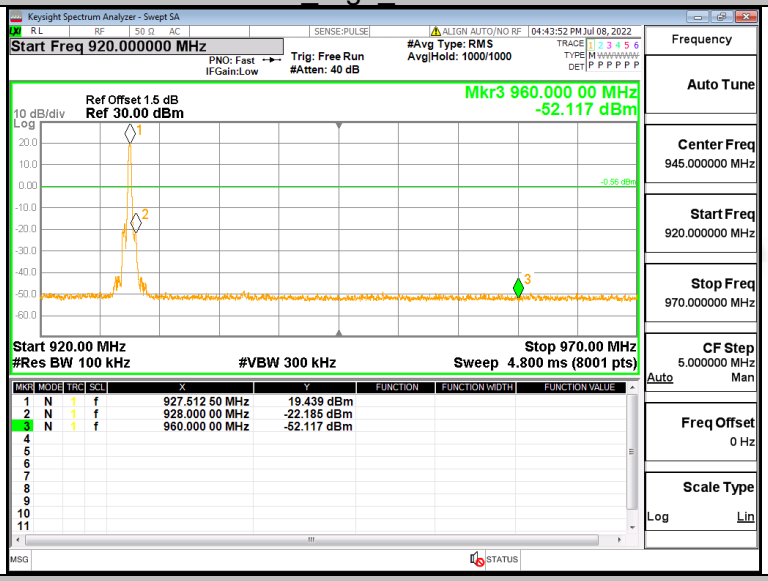
Ant6_High_Hopping



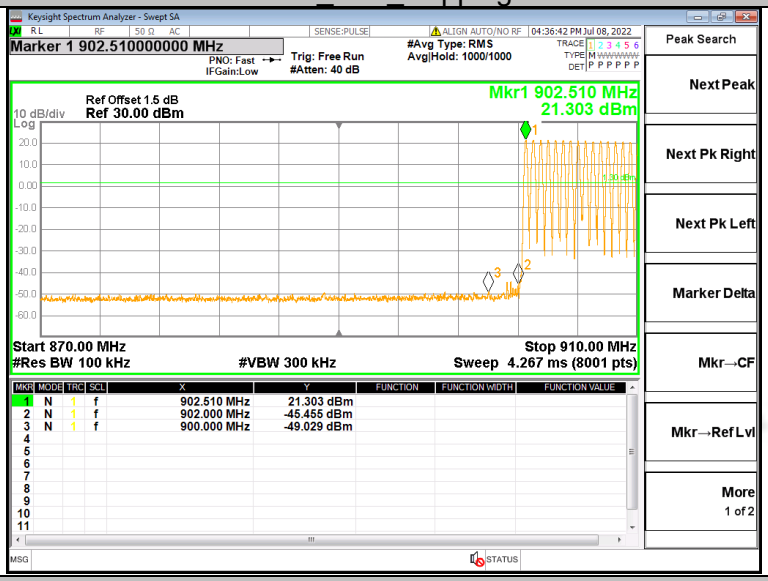
Ant7_Low_902.5MHz



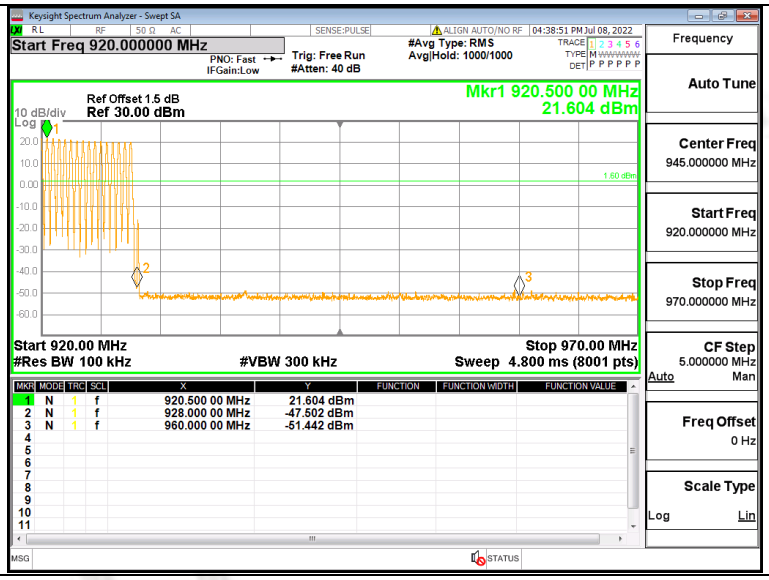
Ant7_High_927.5MHz



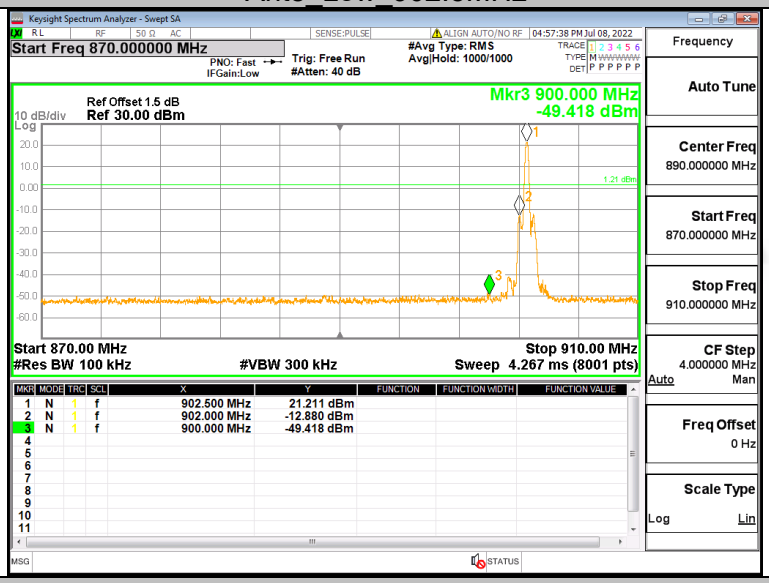
Ant7_Low_Hopping



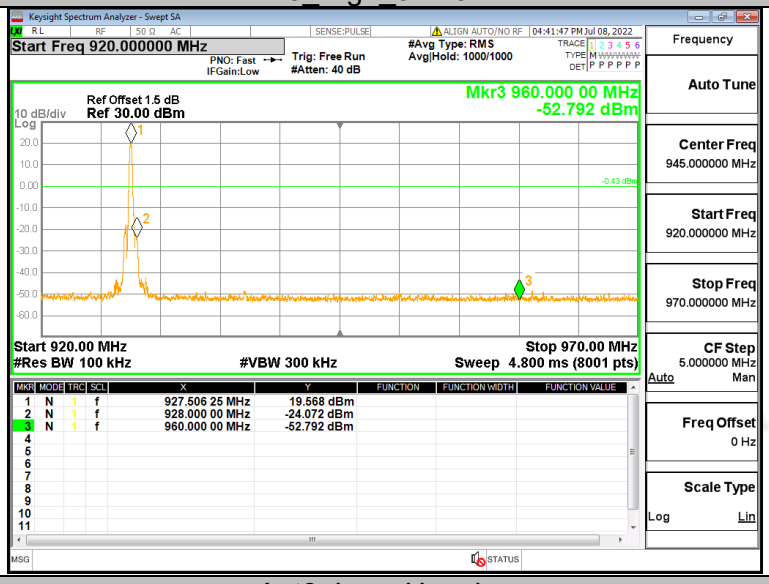
Ant7_ High _Hopping



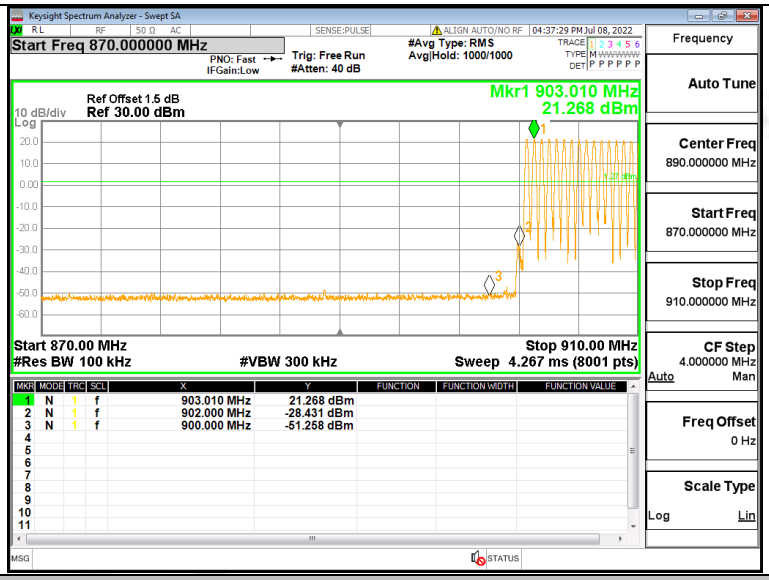
Ant8_Low_902.5MHz



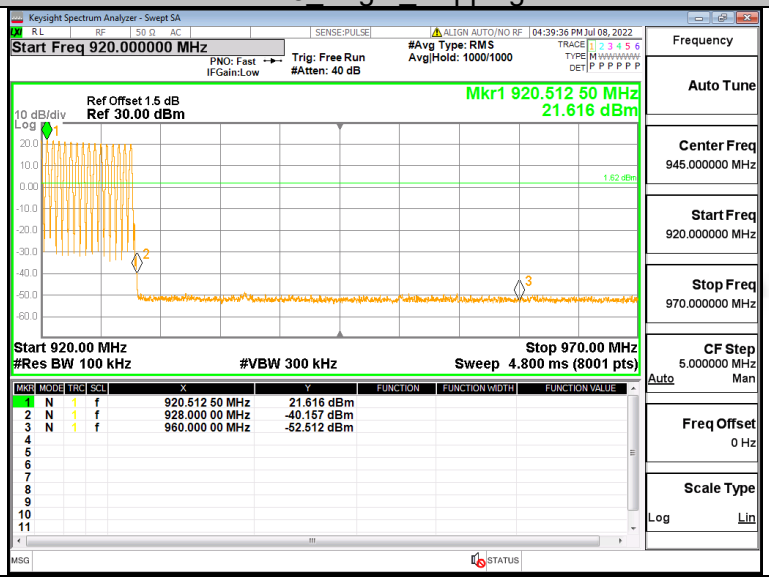
Ant8_High_927.5MHz



Ant8_Low_Hopping



Ant8_ High _Hopping



3.9. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

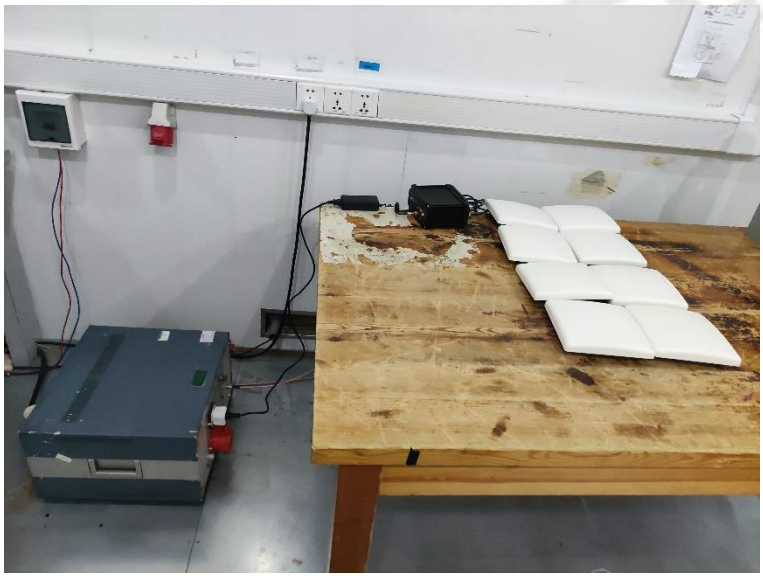
FCC CFR Title 47 Part 15 Subpart C Section 15.247(b)(4):

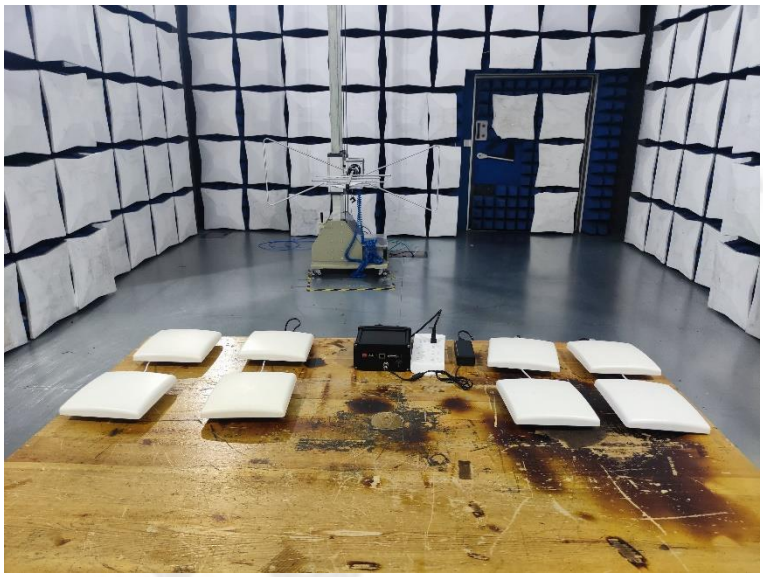
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Result:

The maximum antenna gain is 8dBi.

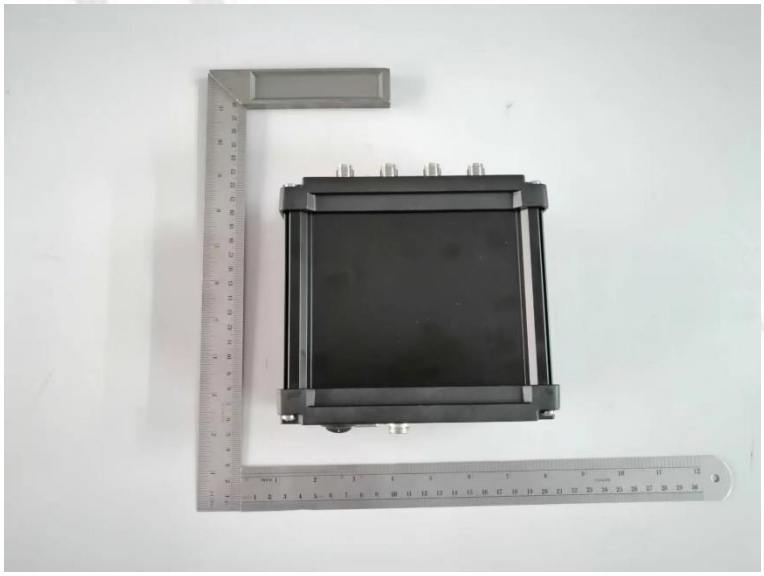
4. Test Setup Photos of the EUT

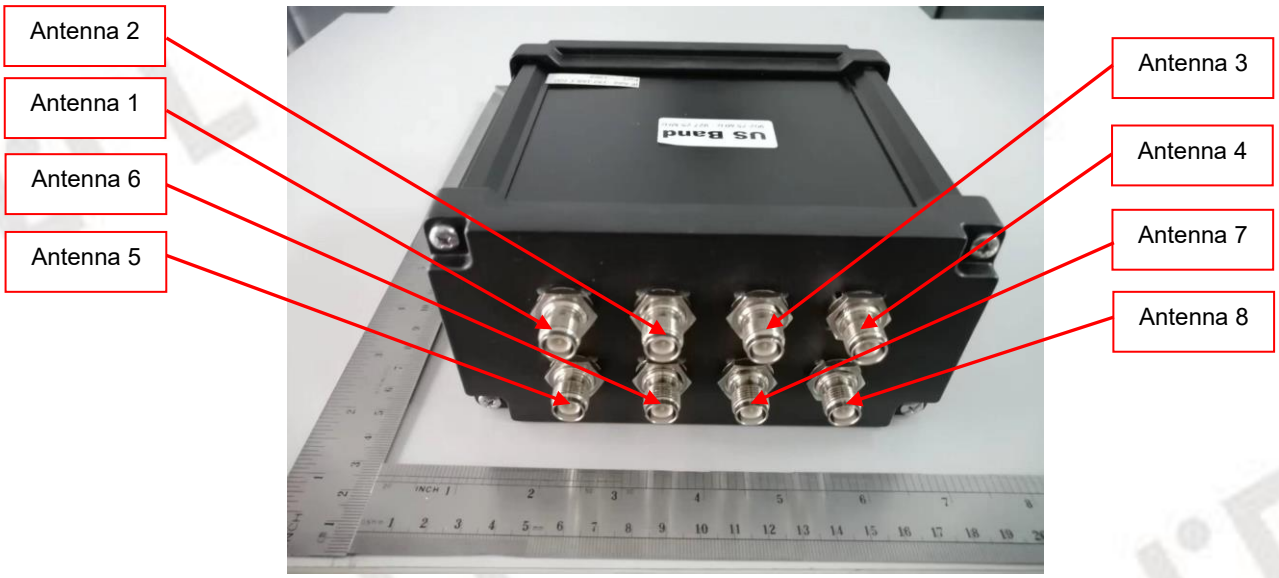




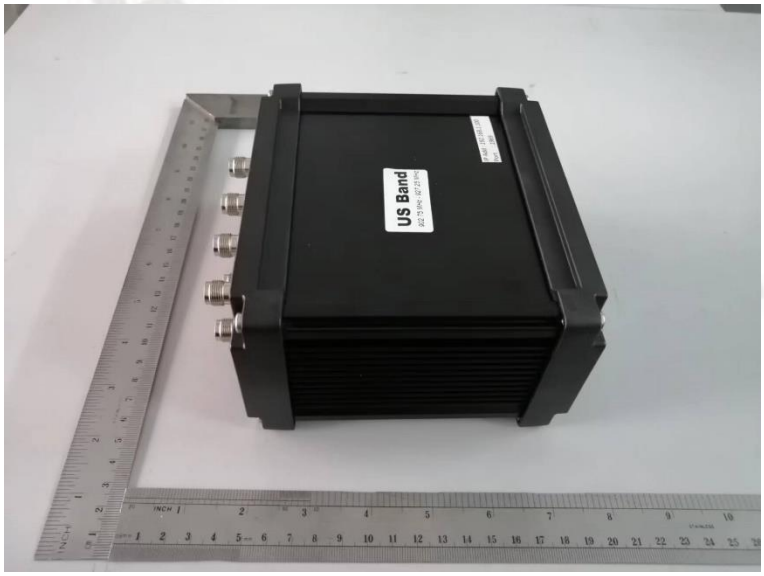
5. Photos of the EUT

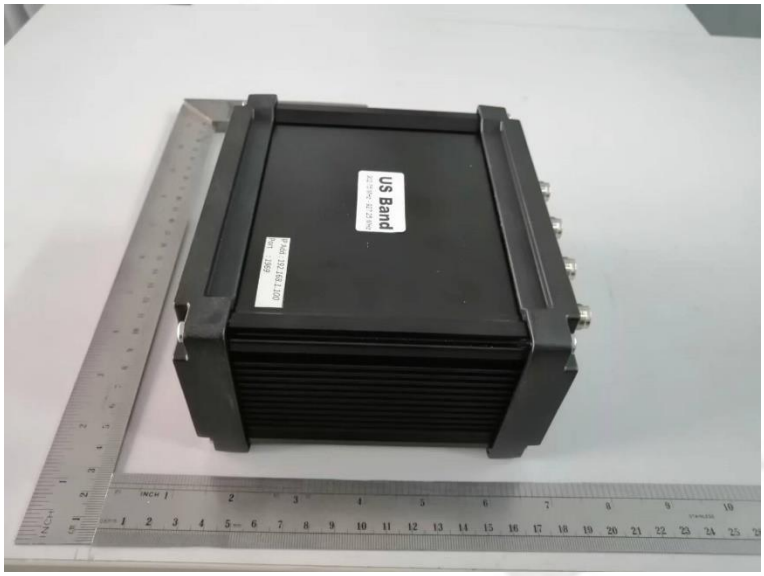
External Photos of EUT



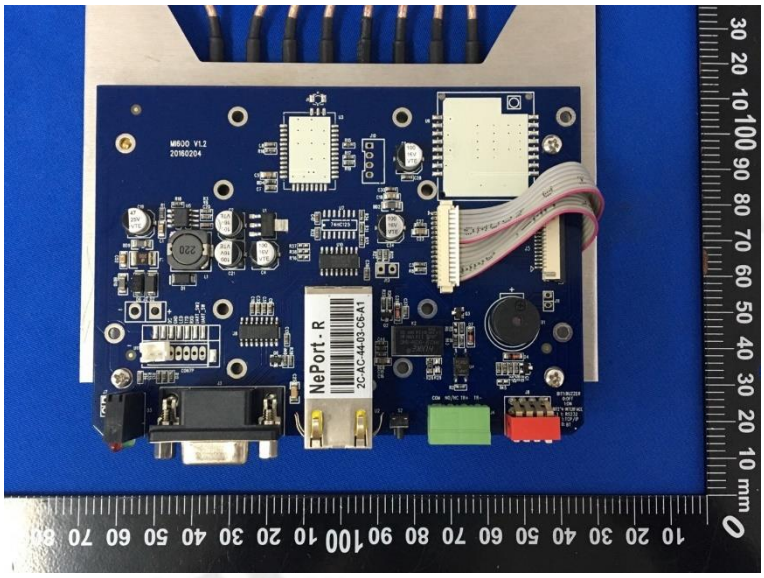

Antenna 2
Antenna 1
Antenna 6
Antenna 5
Antenna 3
Antenna 4
Antenna 7
Antenna 8

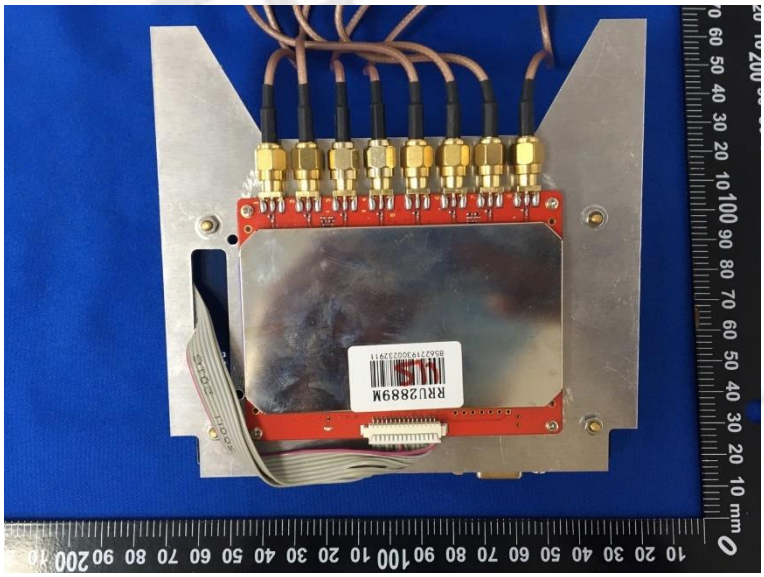

US Band

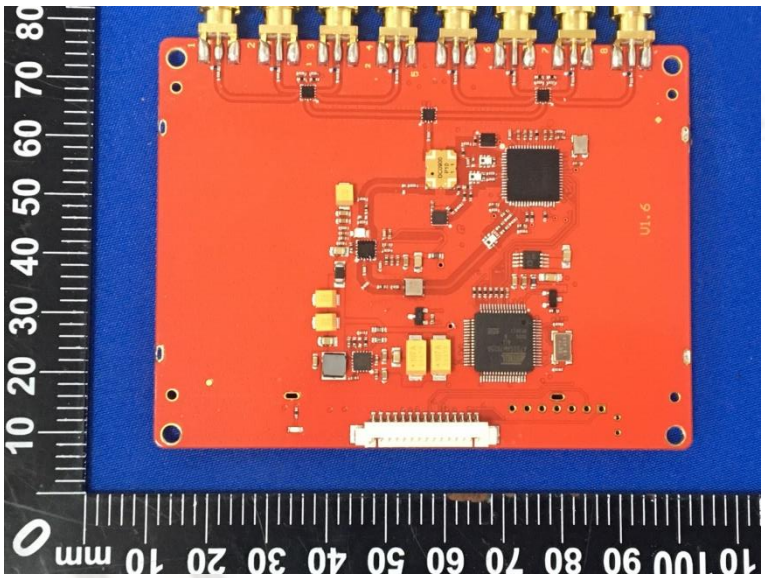

US Band

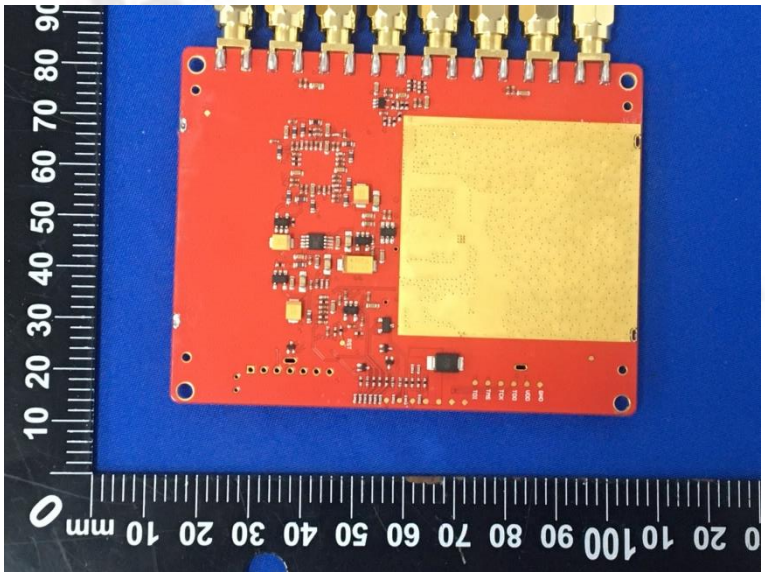

US Band

Internal Photos of EUT









********** End of Report **********