

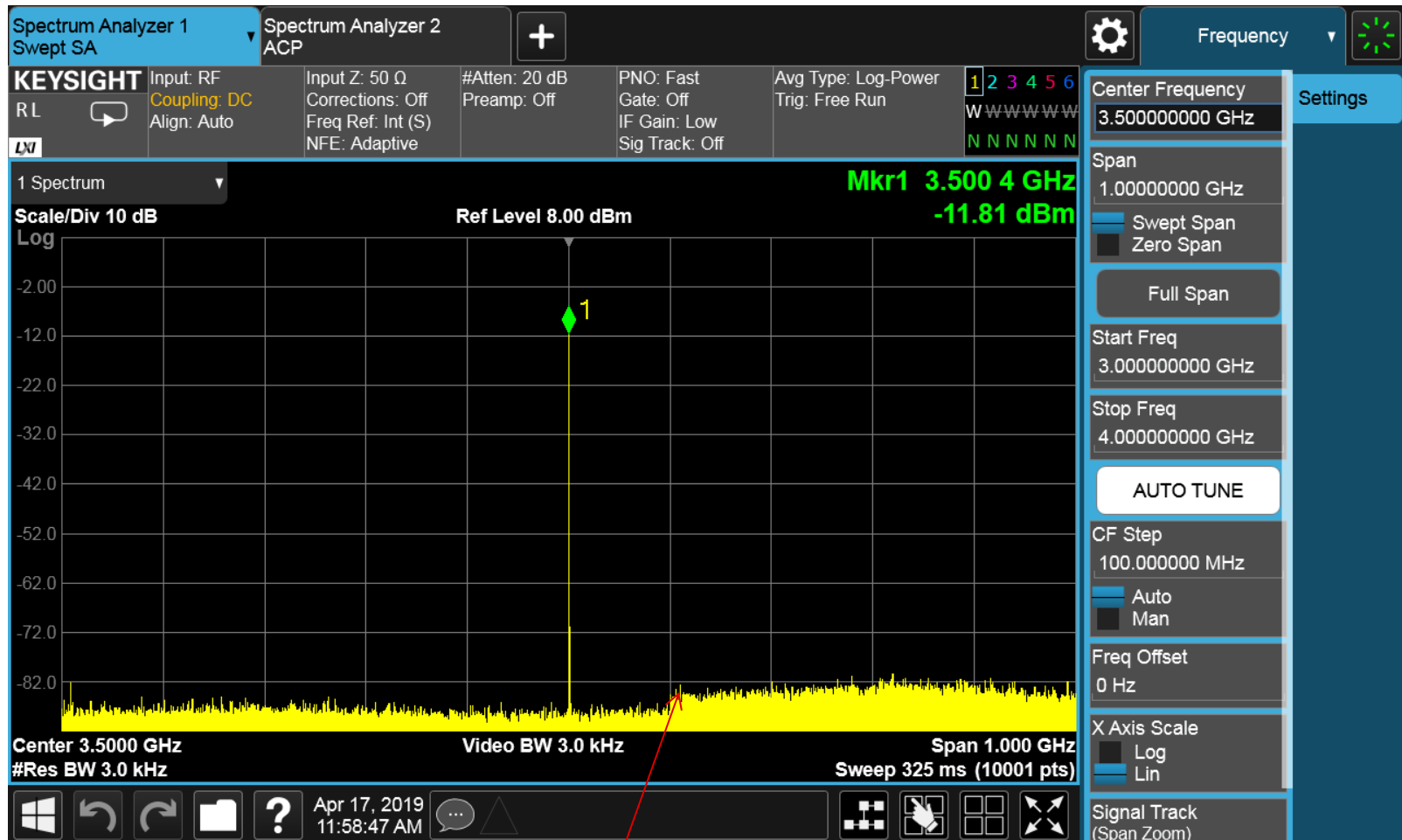
# 3.5Ghz + 2.6ghz Test report

# Setup Details

- TX: 983.04 M data rate, 8b/10b 12bit mode , lane rate = 14.7457G.
- RX: 491.52M data rate , 2lanes for 4RX ,12bit mode , lane rate = 14.7456G.
- FB: 983.04M ,8B/10B 12bit more, lane rate = 14.7456G, share lane with RX.
- Band – 3.5G

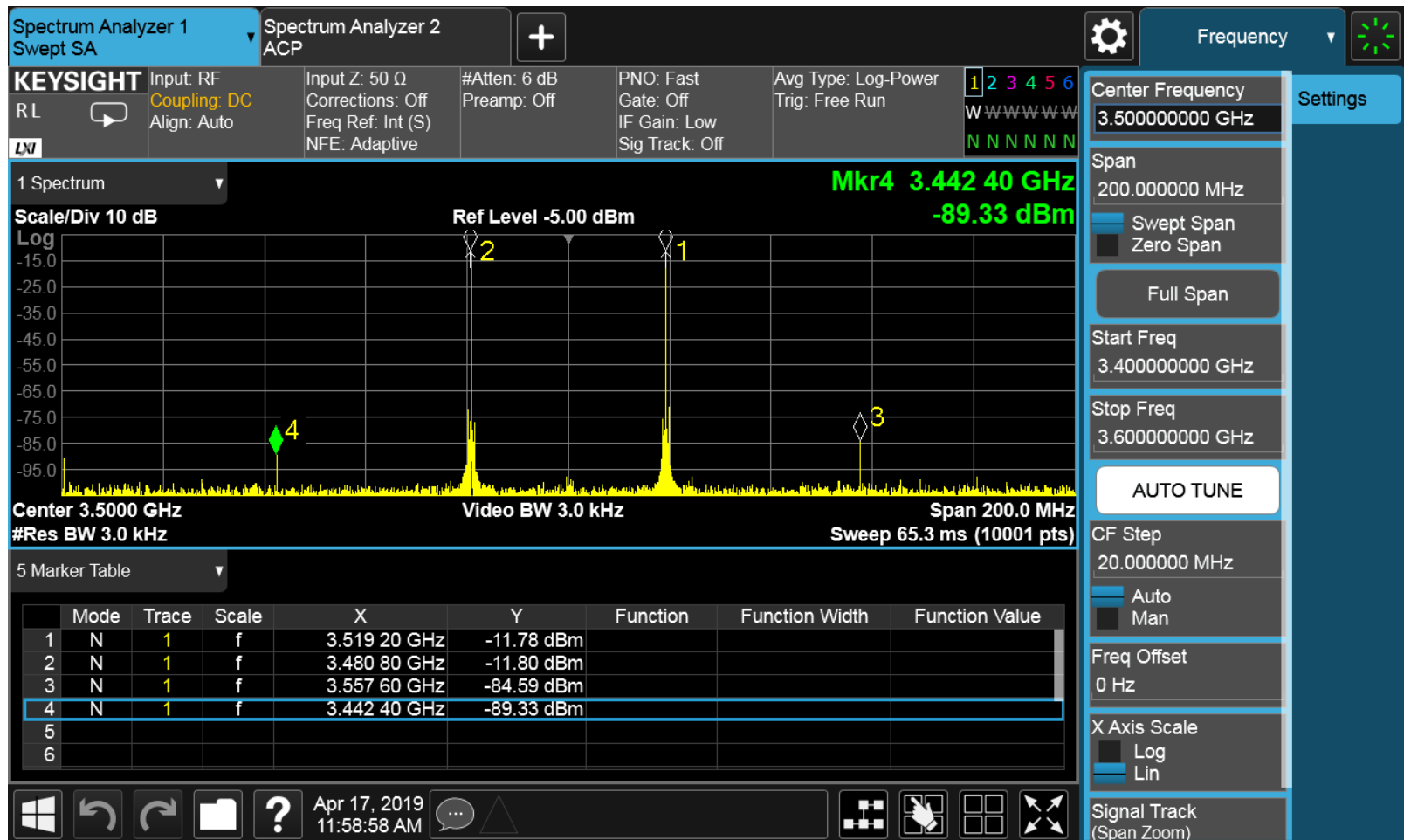
# **TXB Performance 983IQ, 3.5G Band**

# TX Full Scale

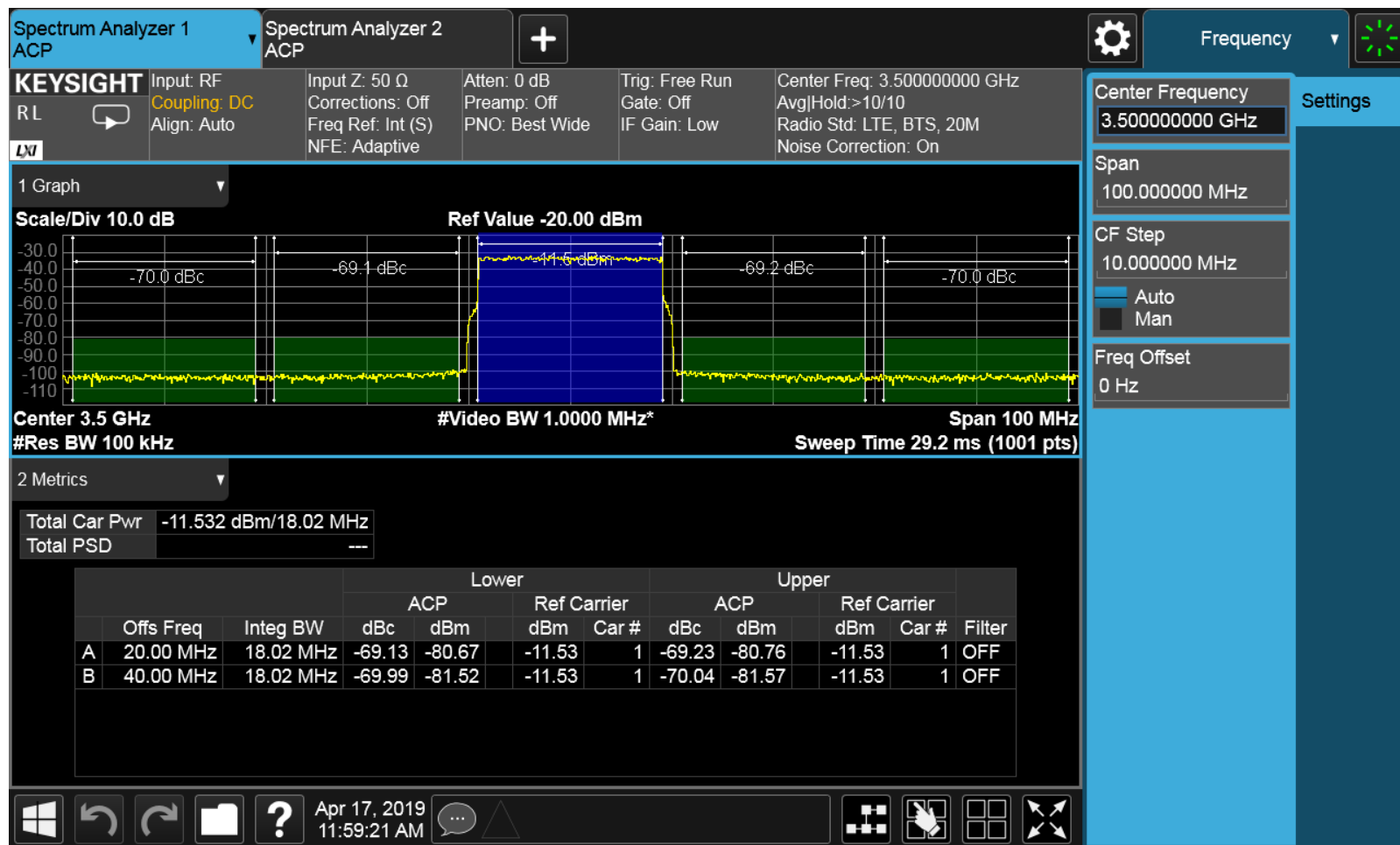


The noise higher is due to the spectrum analyzer mixer noise for >3.6GHz

# TX IMD3

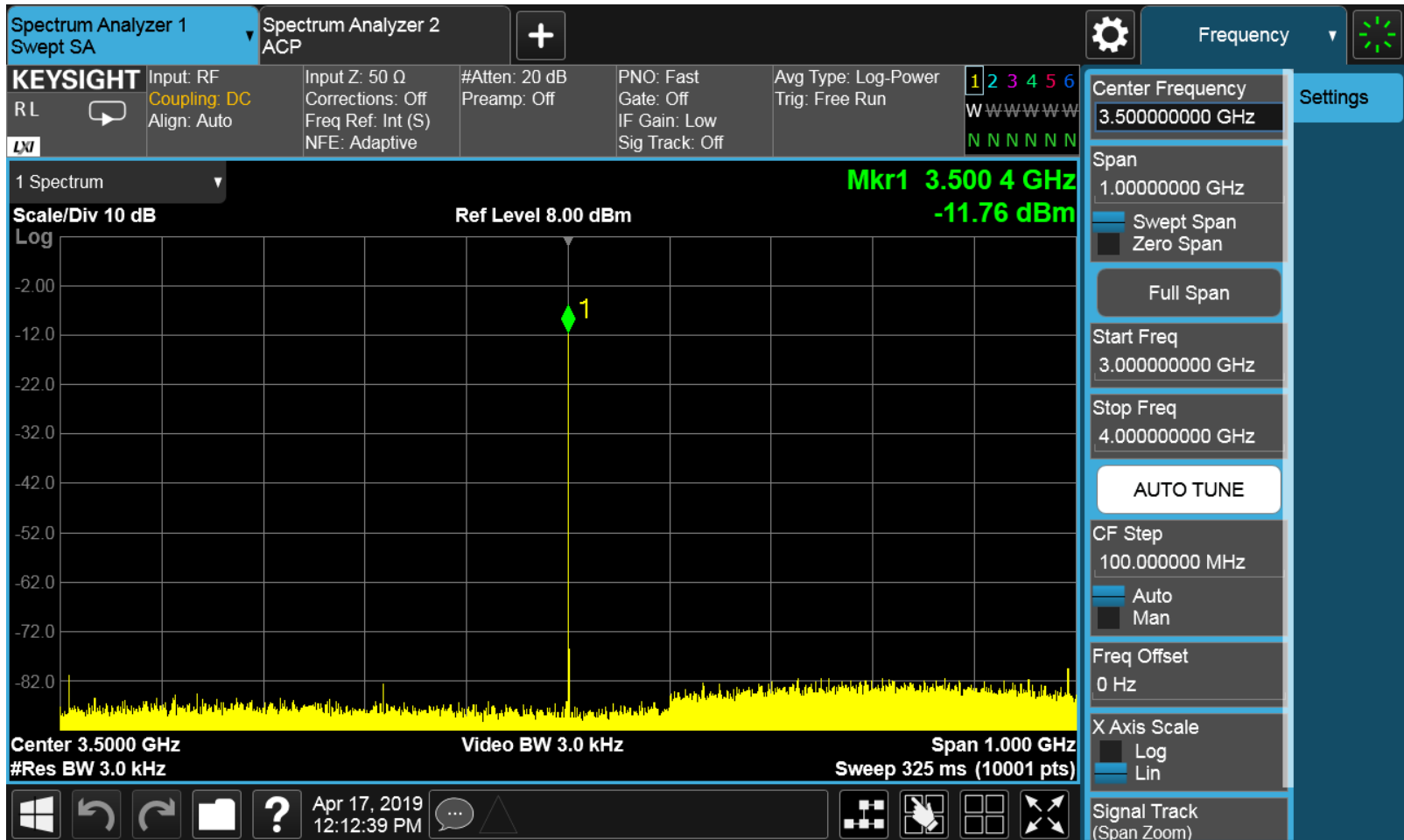


# ACPR

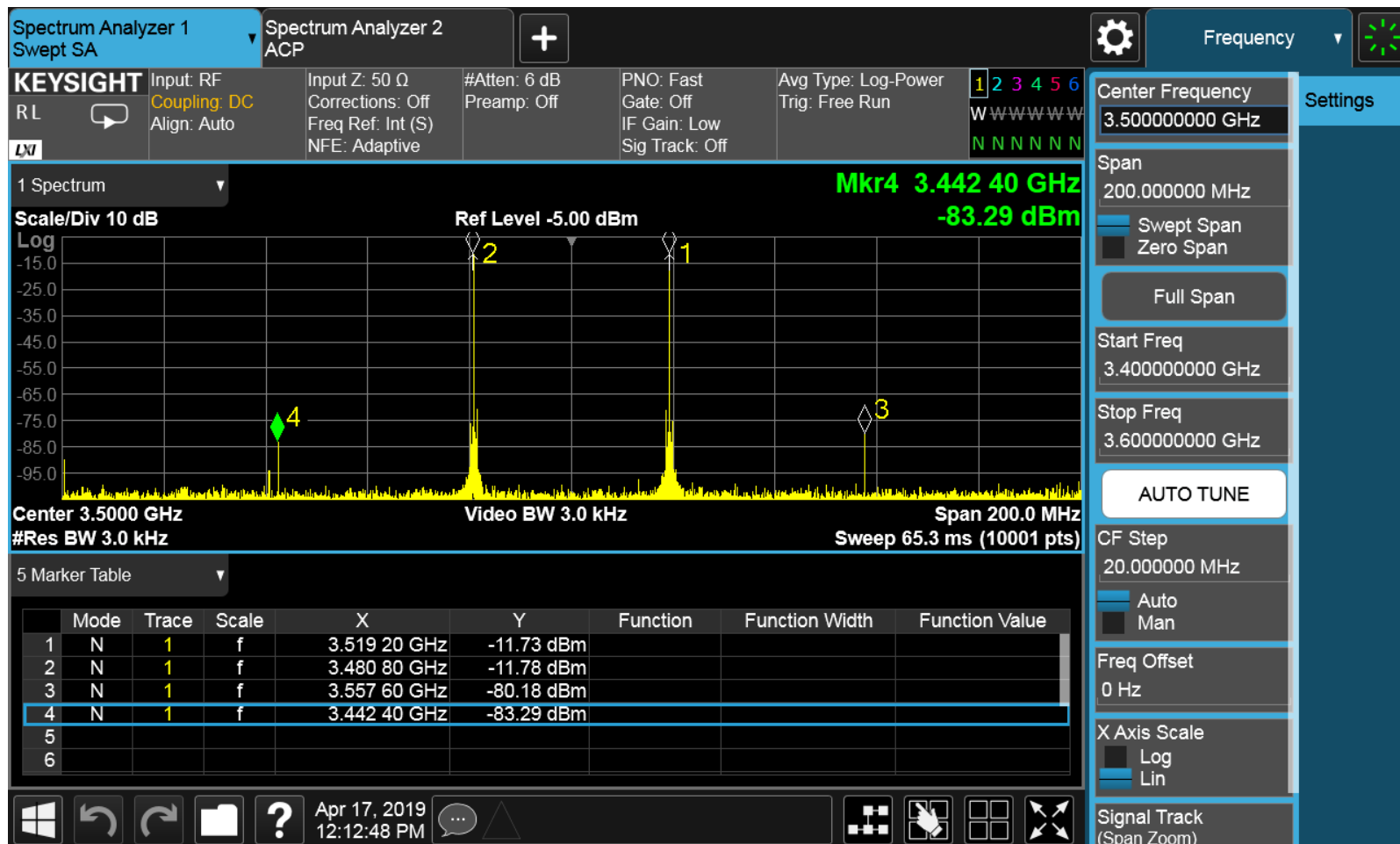


# **TXC Performance 983IQ, 3.5G Band**

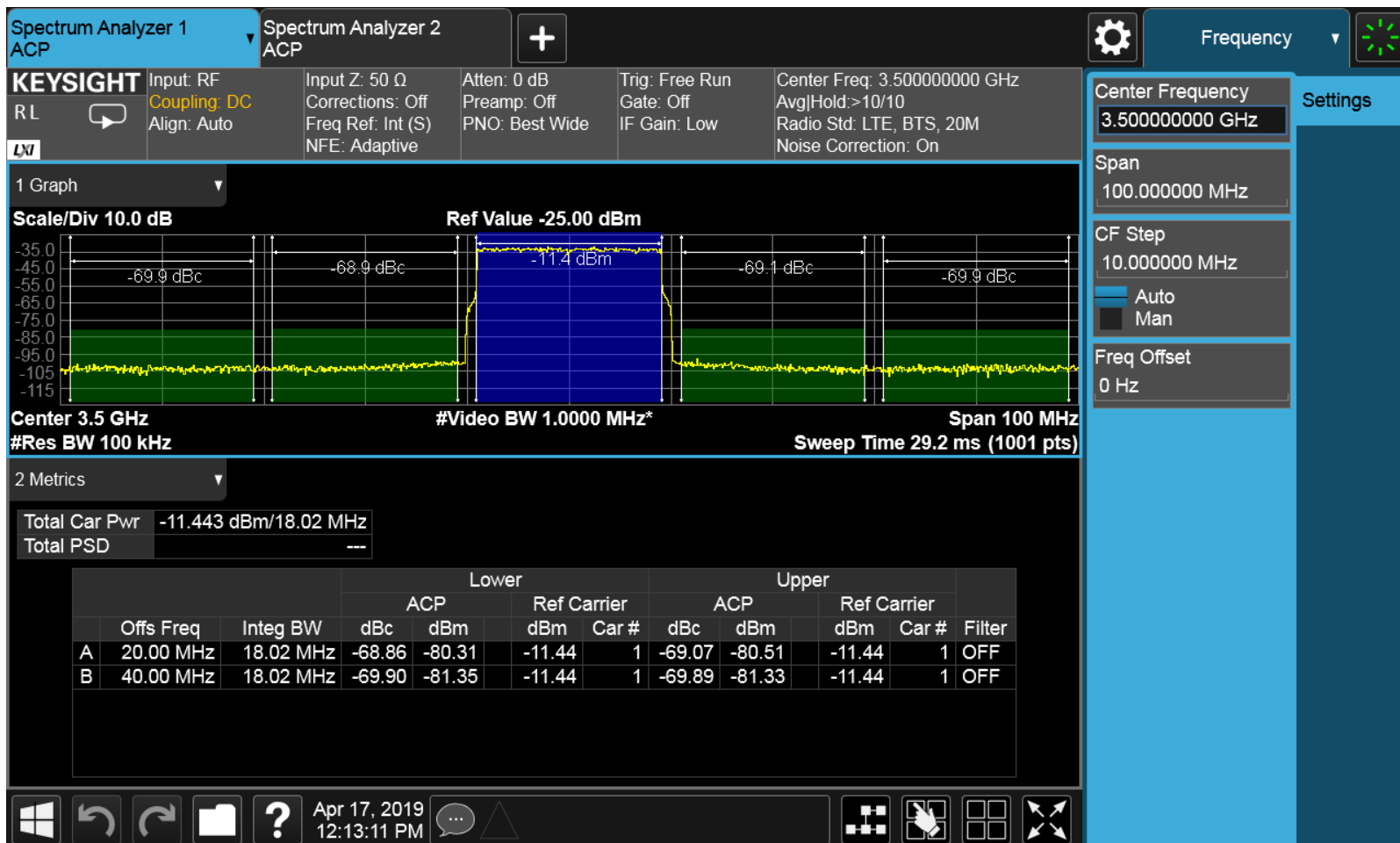
# TX Full Scale



# TX IMD3

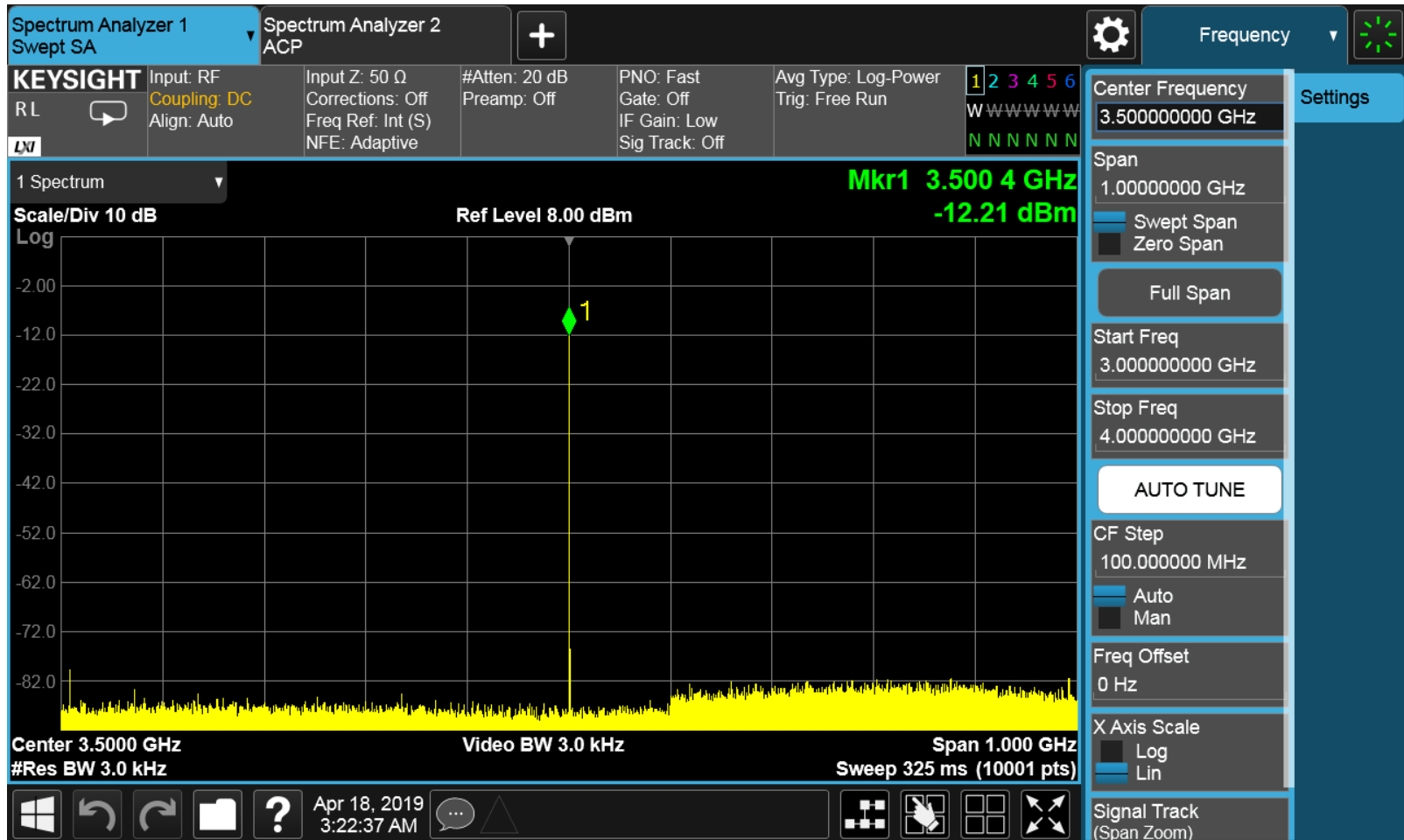


# ACPR

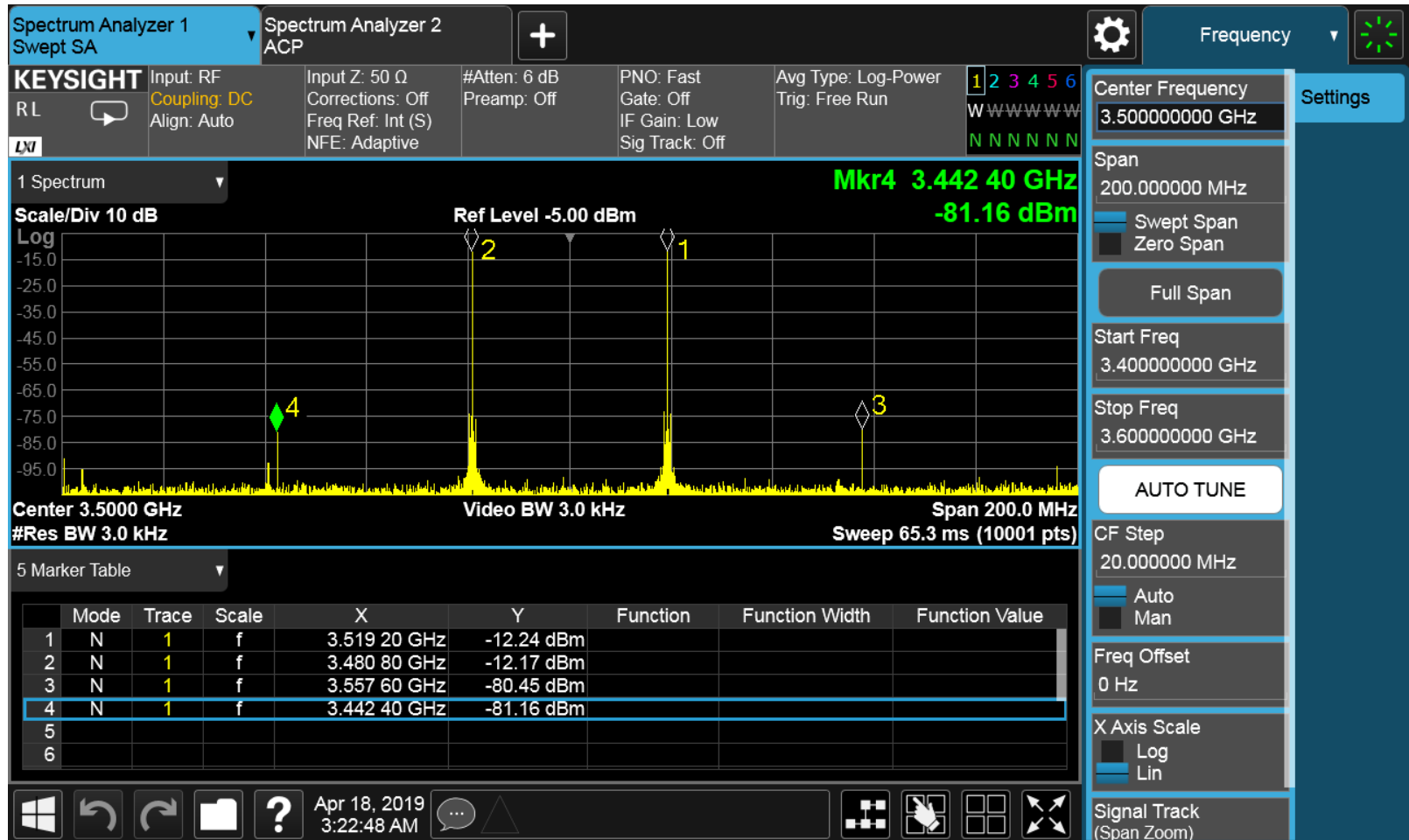


# **TXA Performance 983IQ, 3.5G Band**

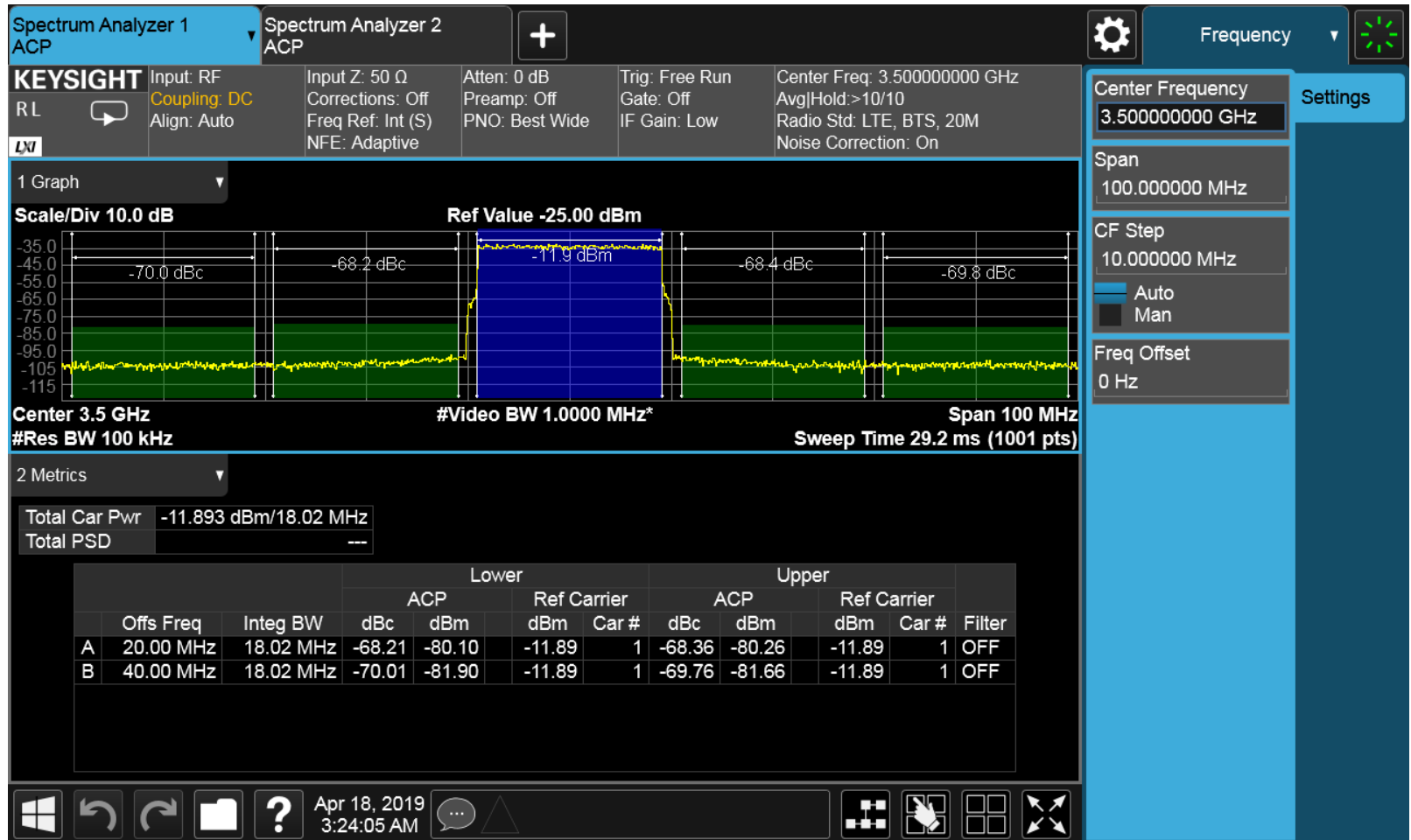
# TX A : Full Scale (-13dBFS input)



# TX A : IMD3

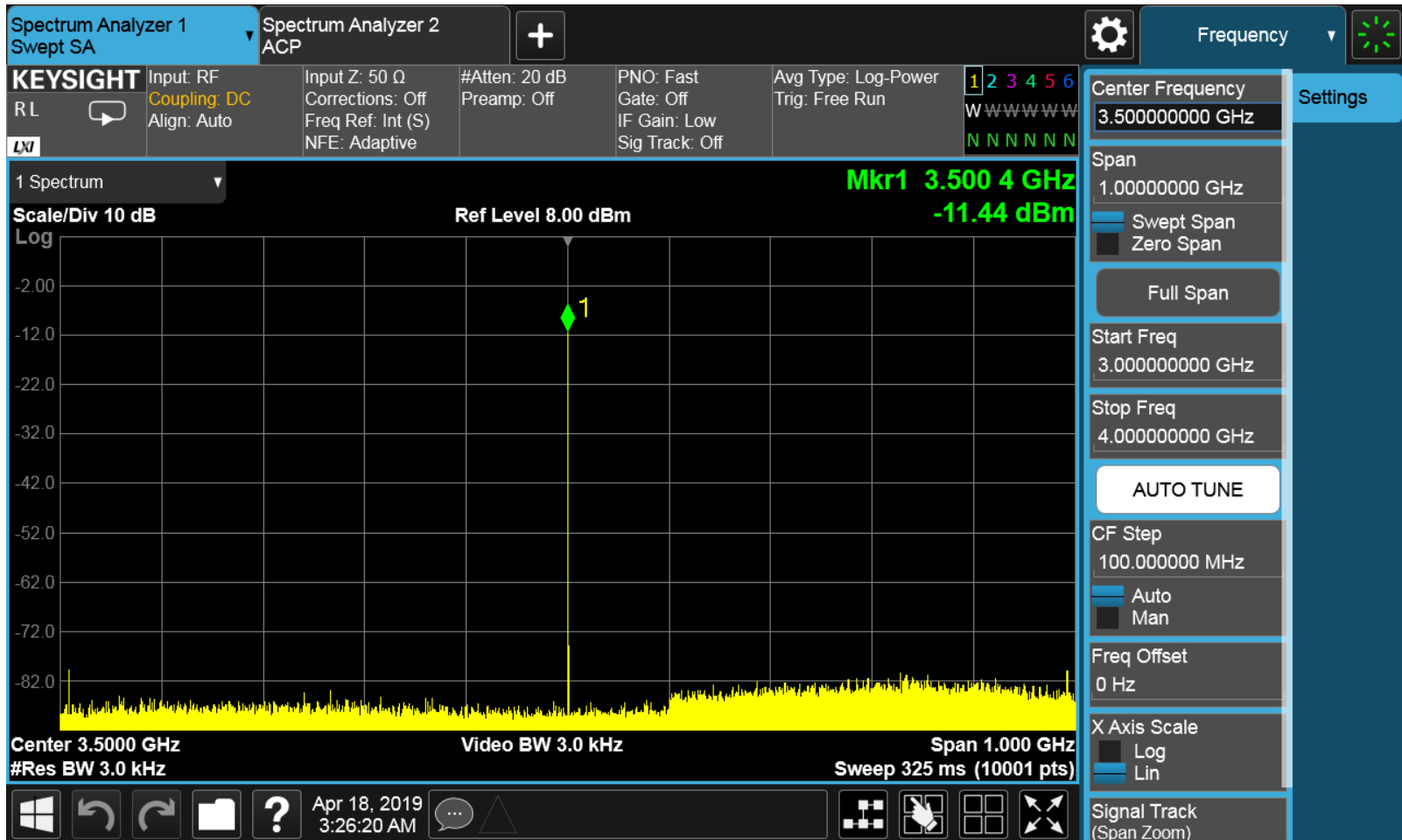


# TX A : ACPR

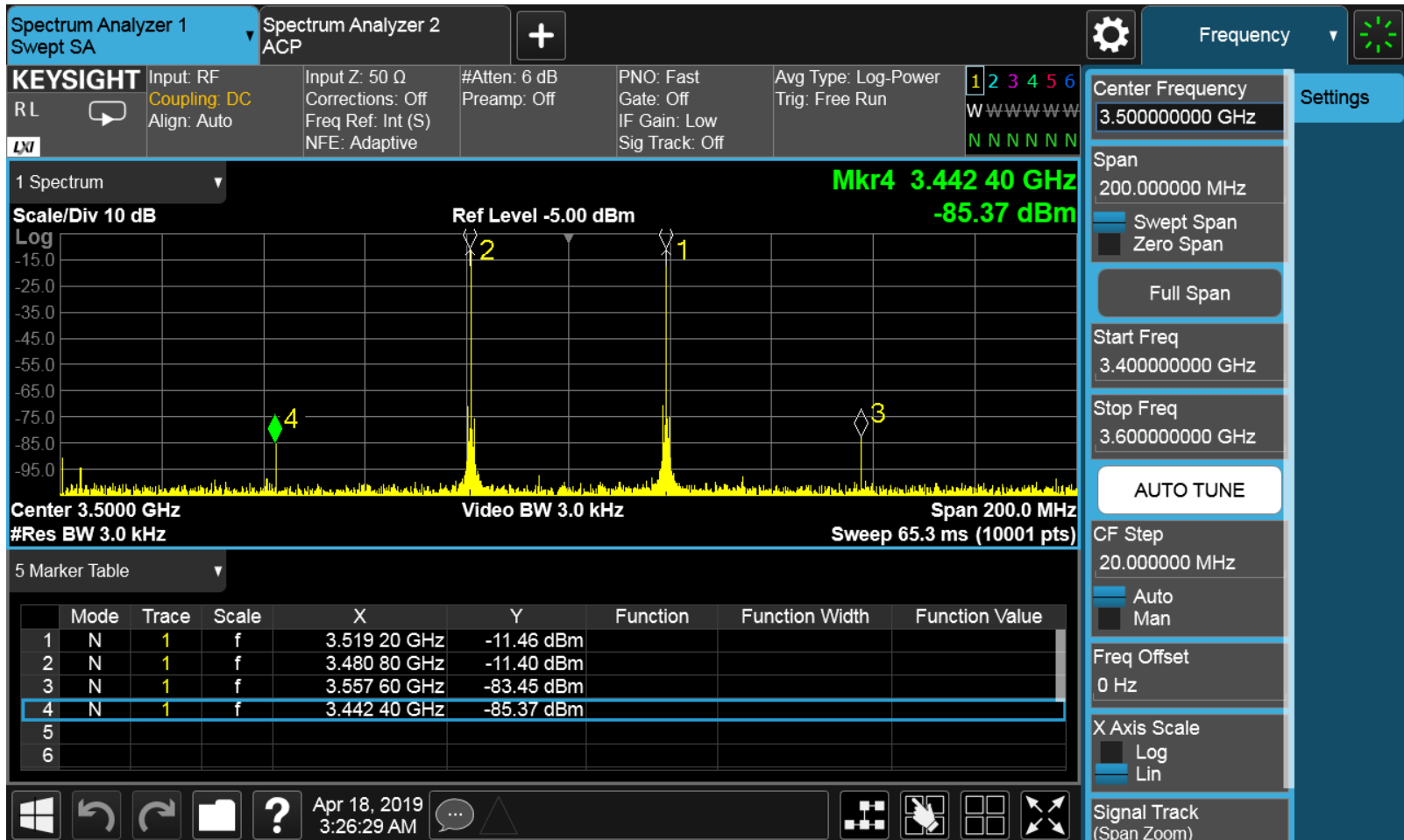


# **TXD Performance 983IQ, 3.5G Band**

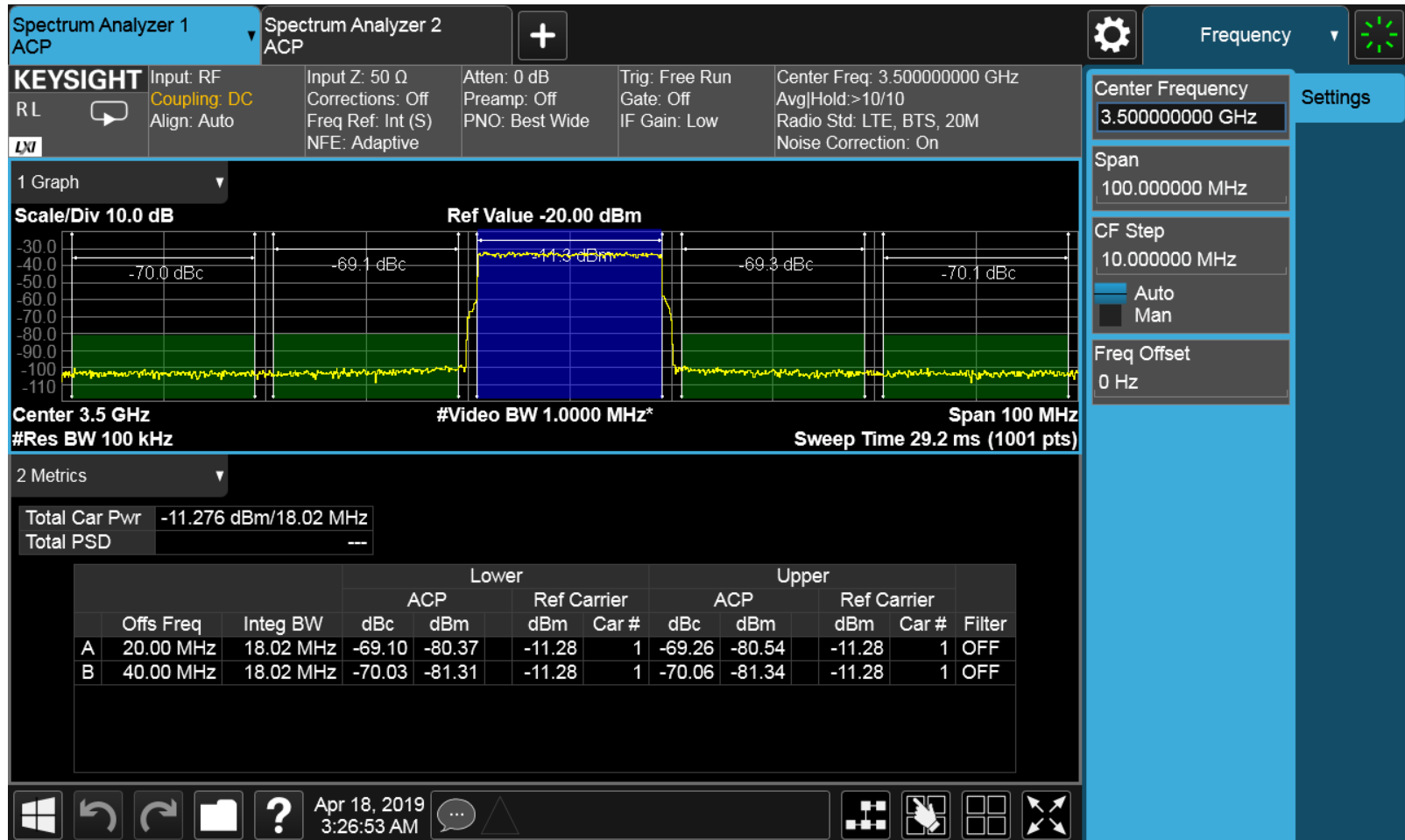
# TX D : Full Scale (-13dBFS input)



# TX D : IMD3

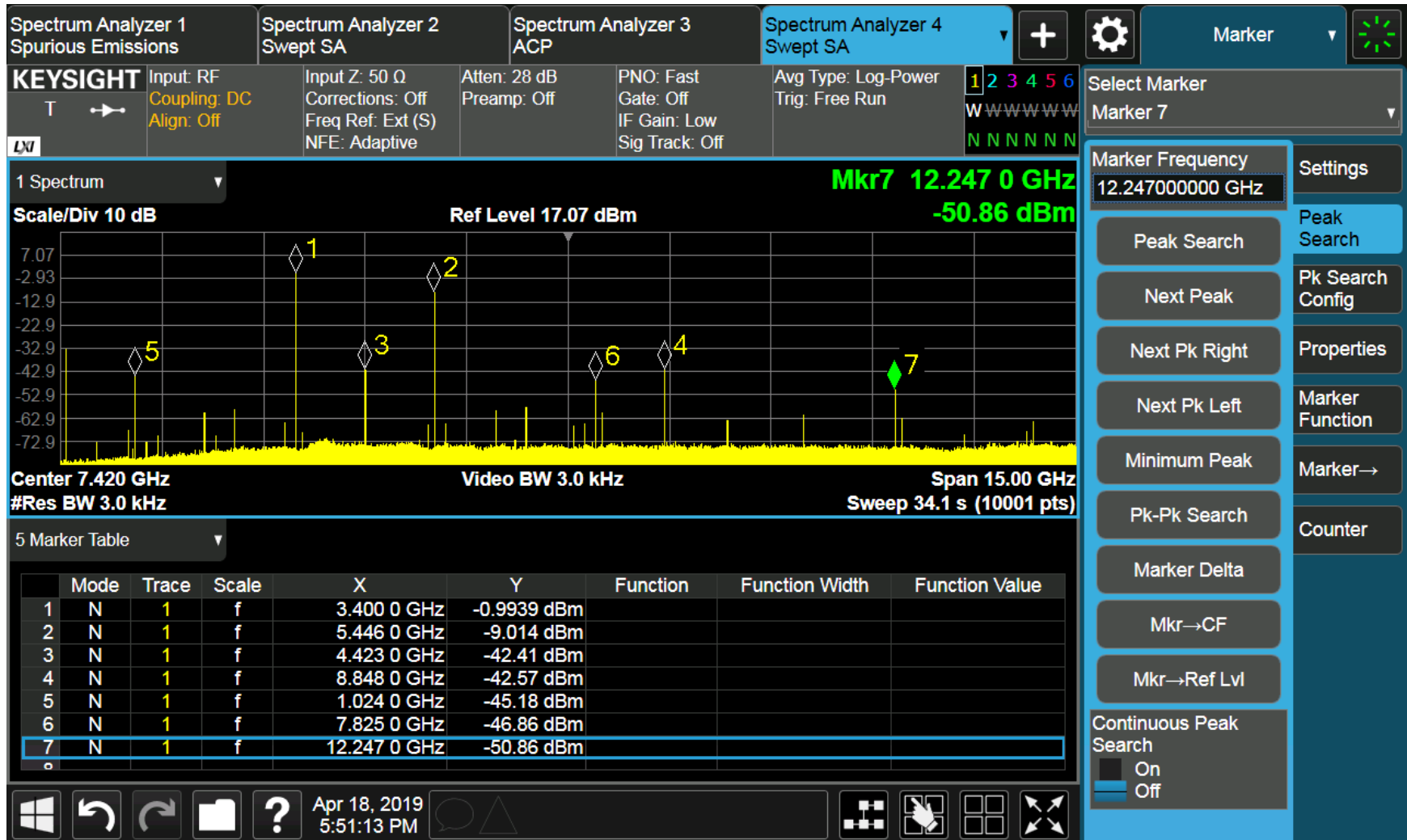


# TX D : ACPR

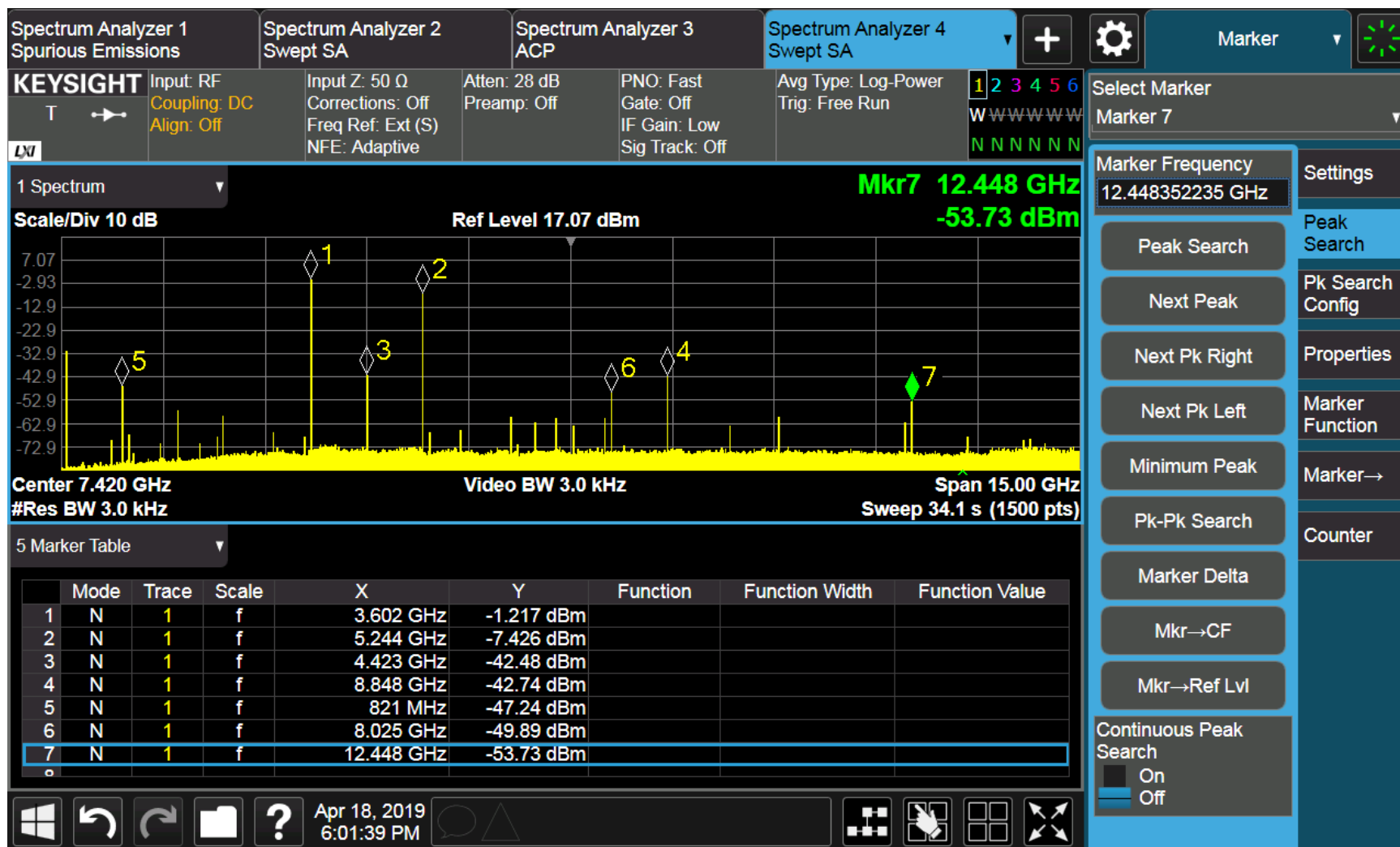


# 0-15Ghz Tx full spectrum

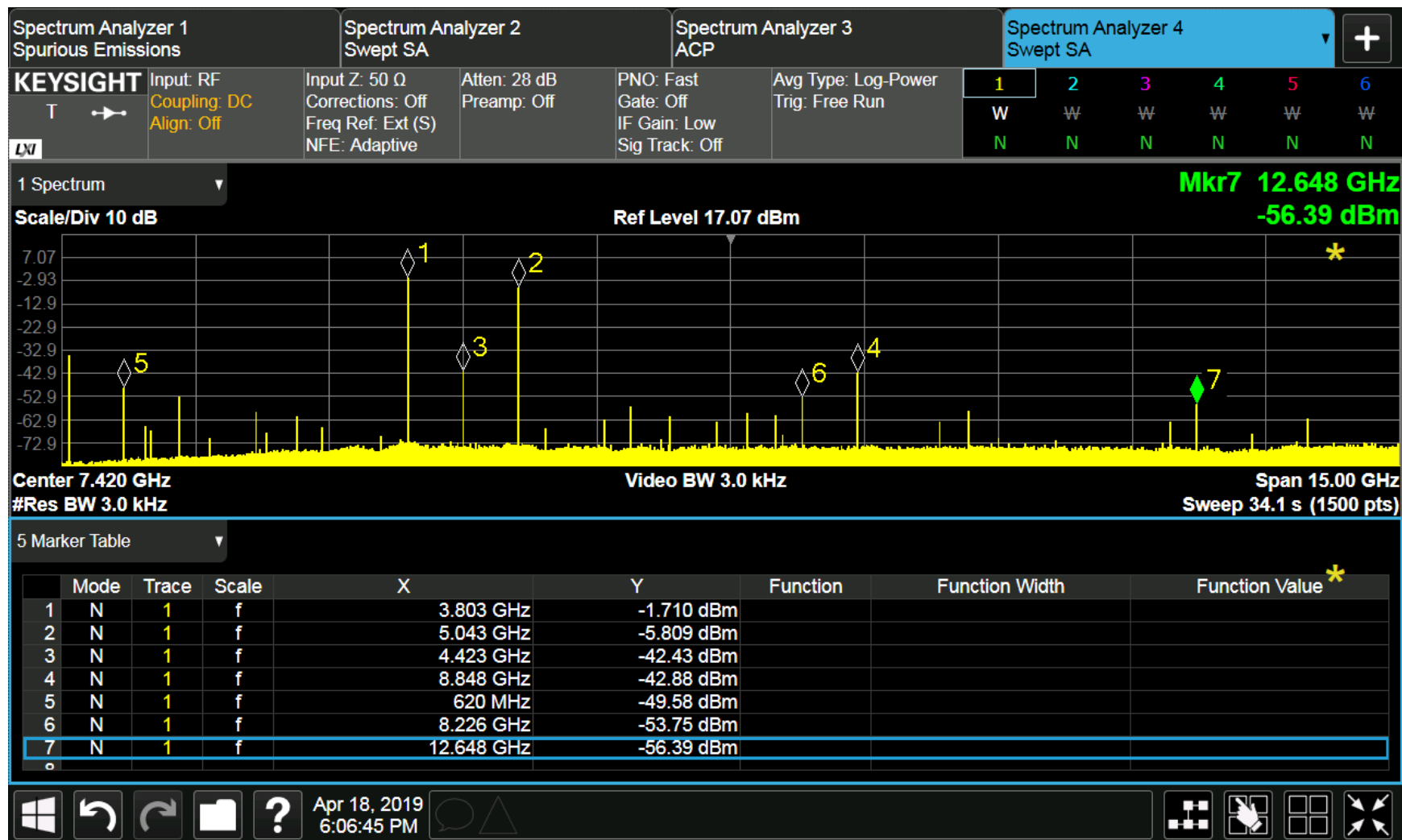
# Nco – 3400Mhz



# Nco – 3600Mhz



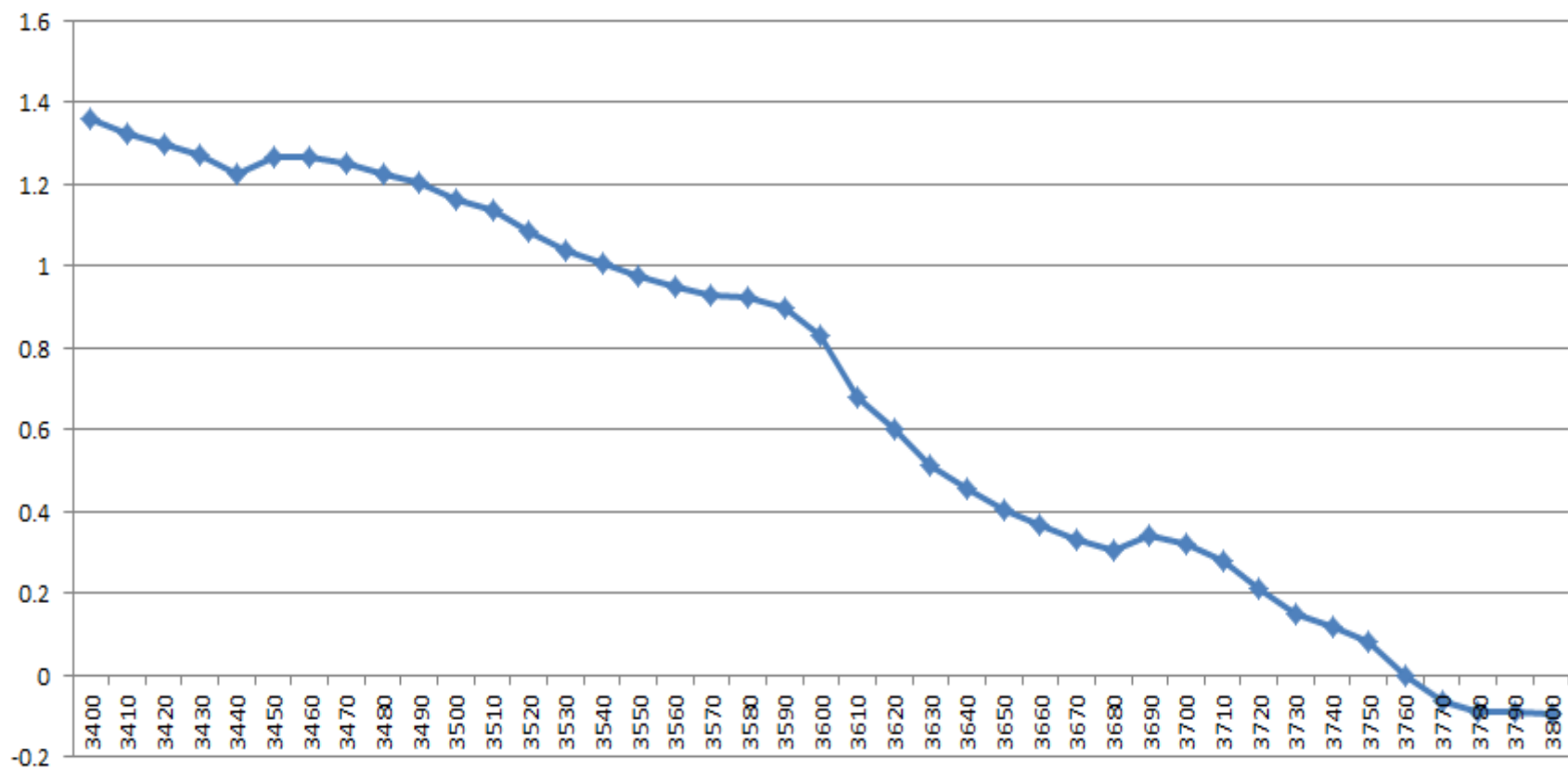
# Nco – 3800Mhz



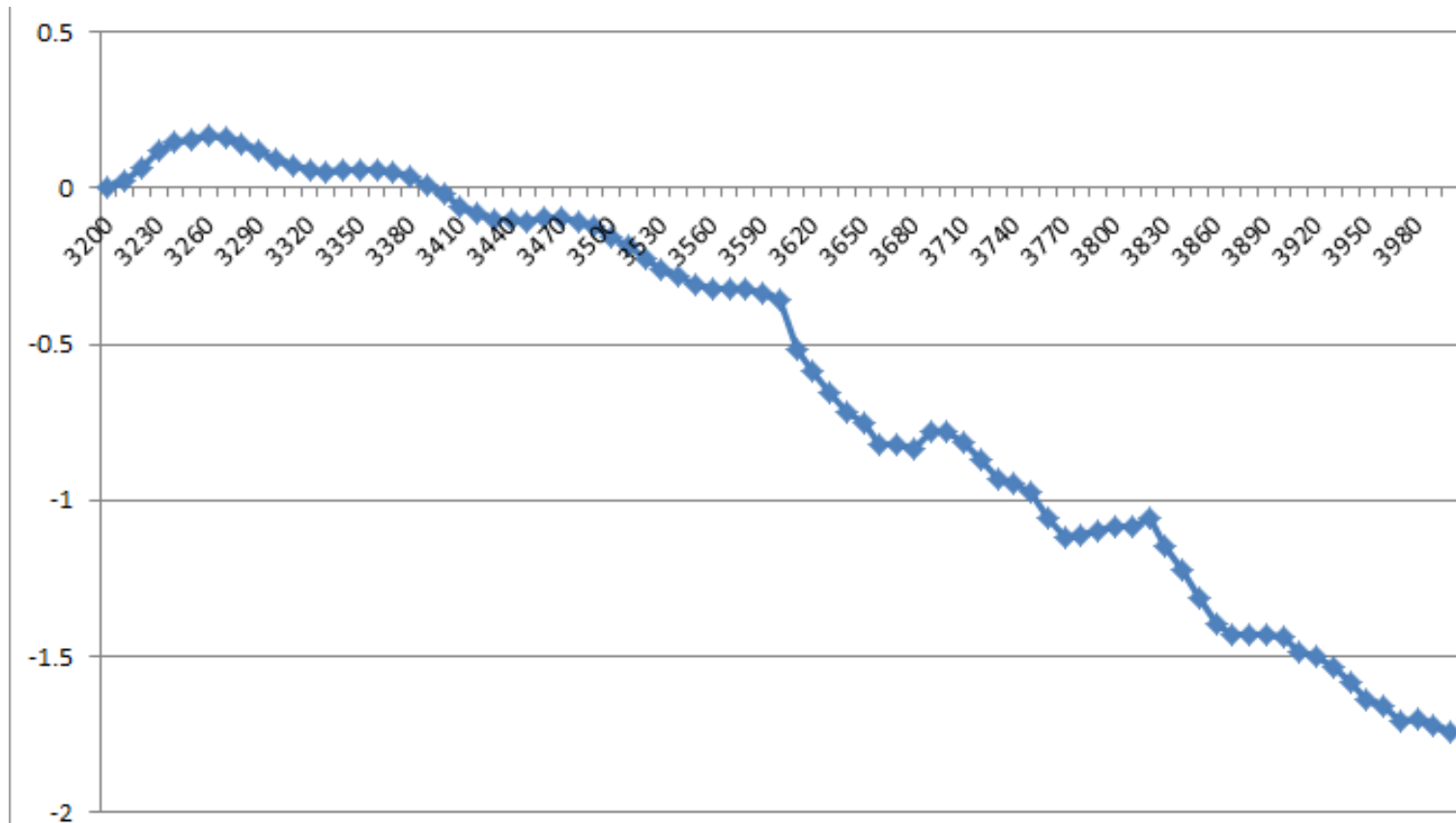
# Marker details in spectrum plots

| Marker Number | Marker details |
|---------------|----------------|
| Marker - 1    | Tone           |
| Marker - 2    | Fs-tone        |
| Marker - 3    | Fs/2           |
| Marker - 4    | Fs             |
| Marker – 5    | Fs/2-tone      |
| Marker – 6    | Fs/2+tone      |
| Marker – 7    | Fs+tone        |

# Full Scale – 3400 Mhz to 3800Mhz



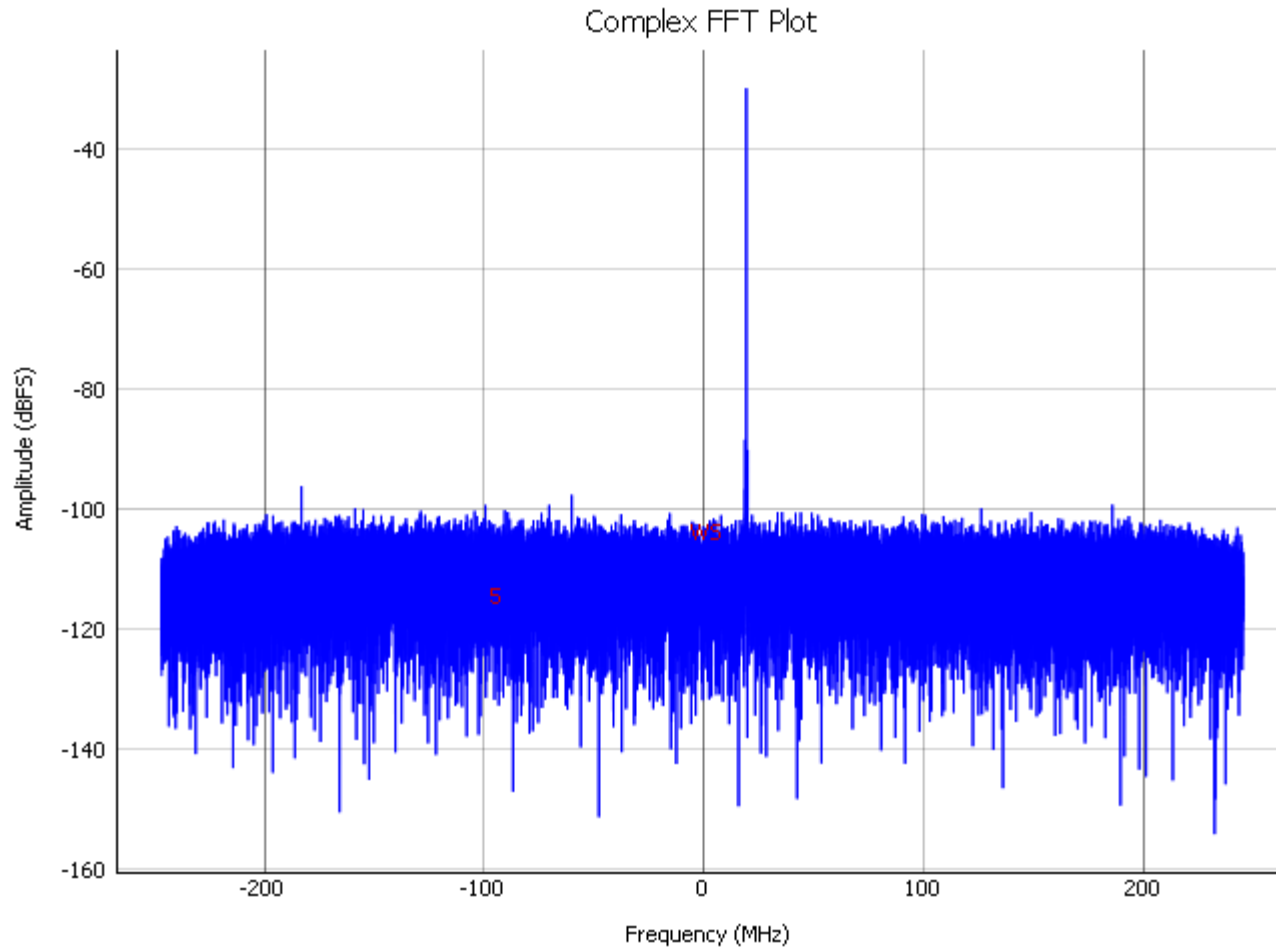
# Flatness Scale – 3200Mhz to 4000Mhz –(low pass matching)



# **RxA Performance 491.52Mhz IQ, 3.5G Band**

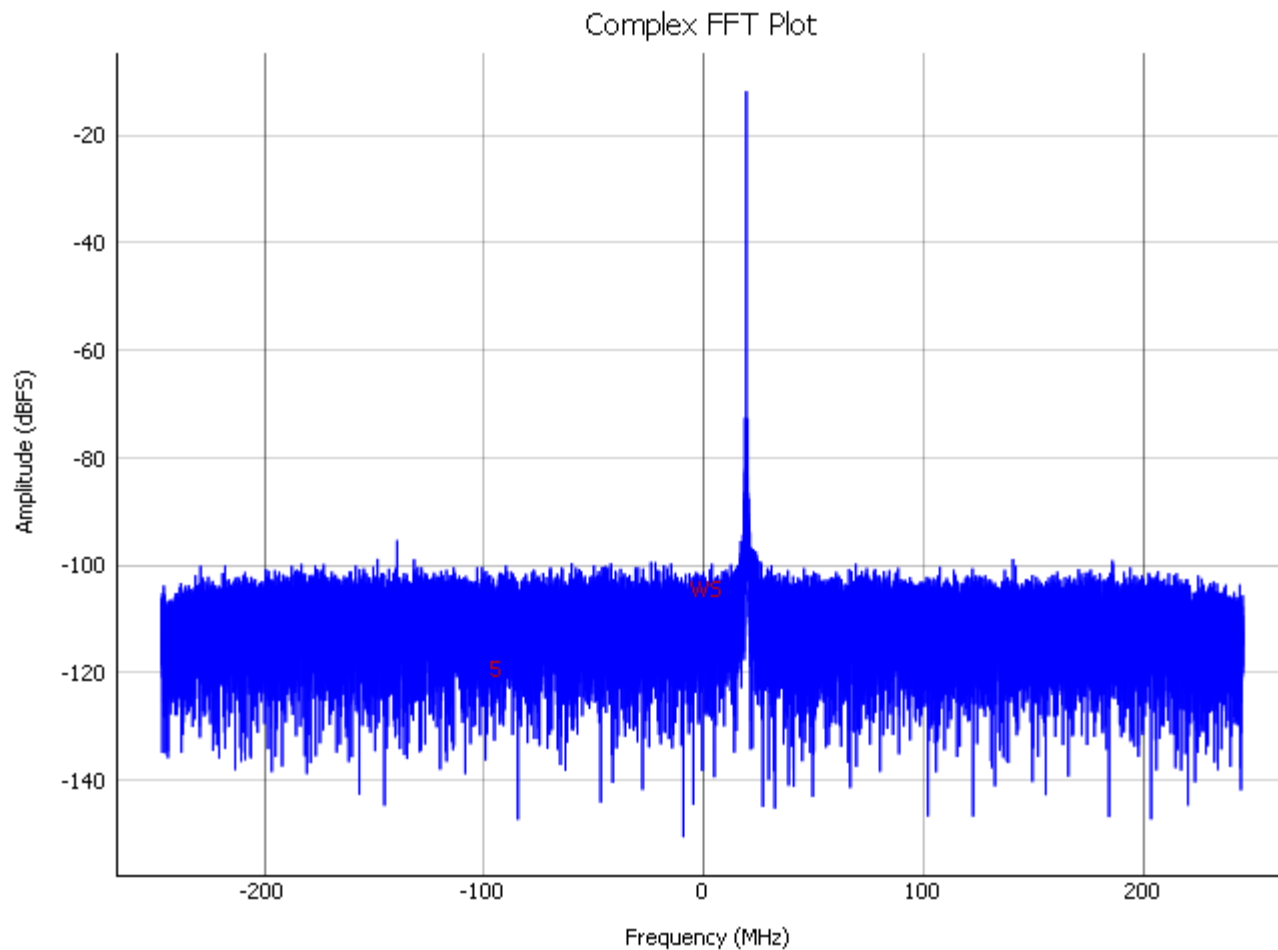
# RX A : SNR at -30dBFS input

SNR = 65.048dBFS ; NSD = 151.963dBFS/sqrt(Hz)



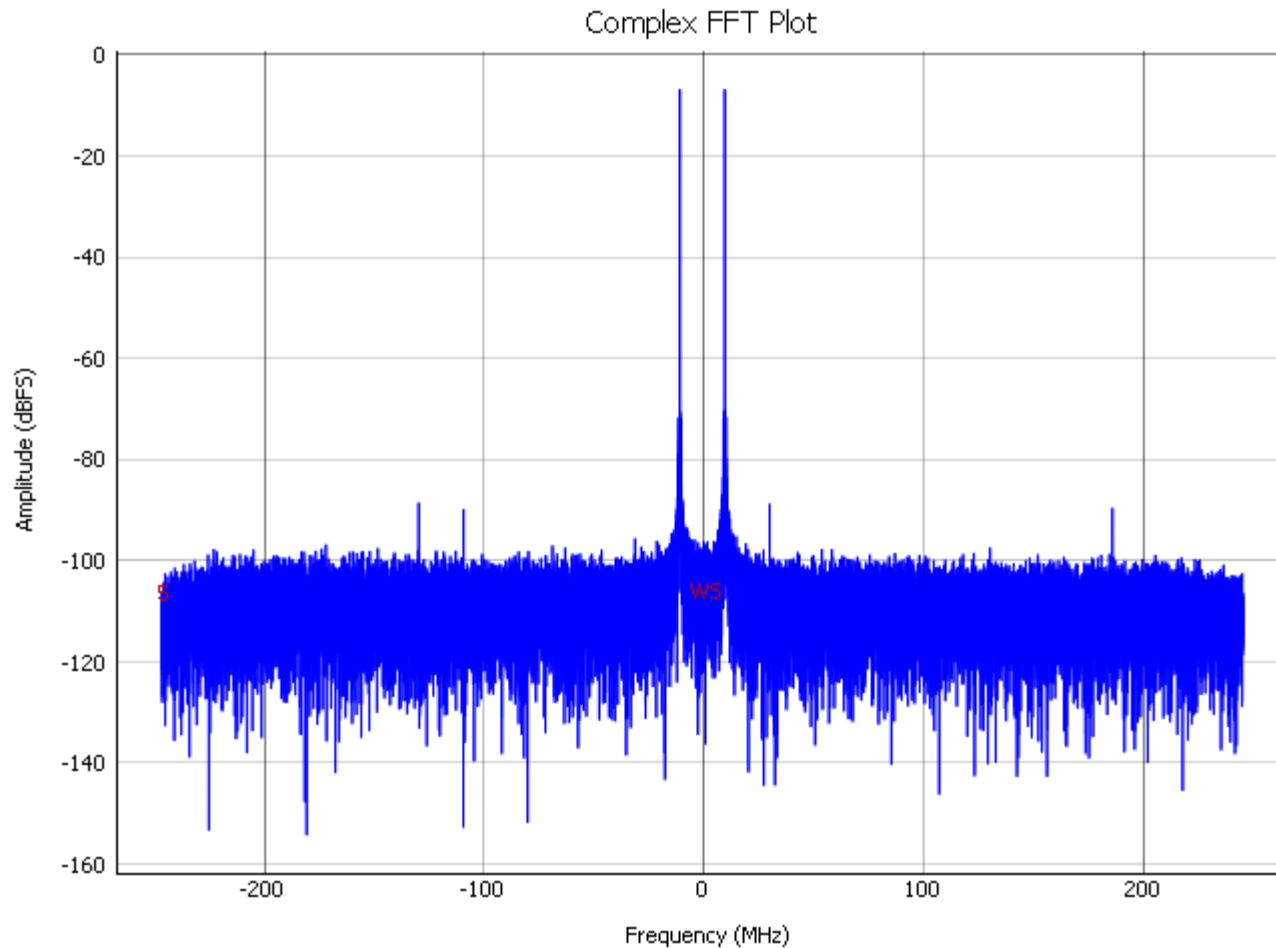
# RX A : SNR at -12dBFS input

SNR = 64.502dBFS ; NSD = 151.417dBFS/sqrt(Hz)



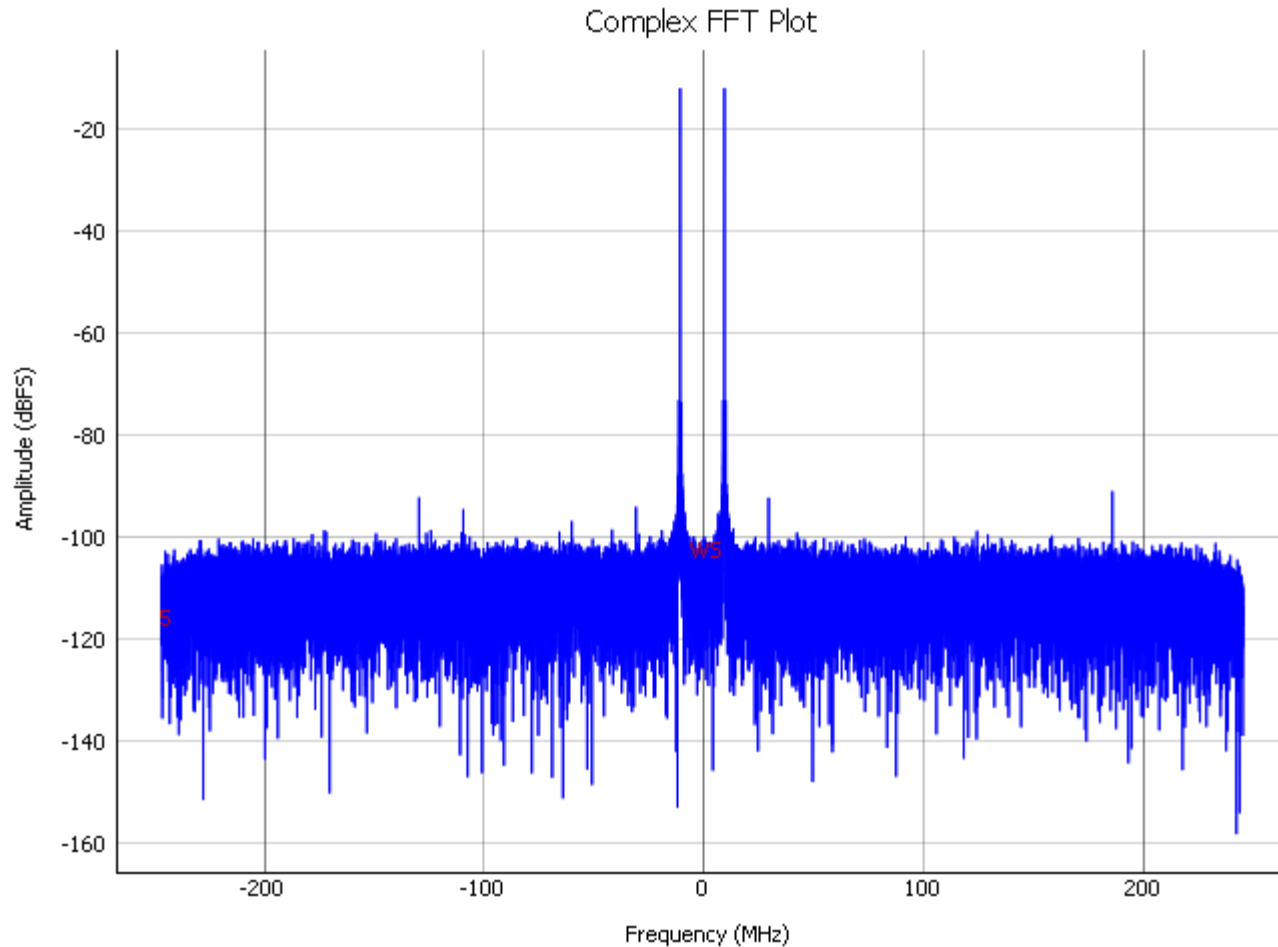
# RX A : IMD3 at -7dBFS input +/-10MHz

IMD3 = -89.018dBFS = -82.018dBc



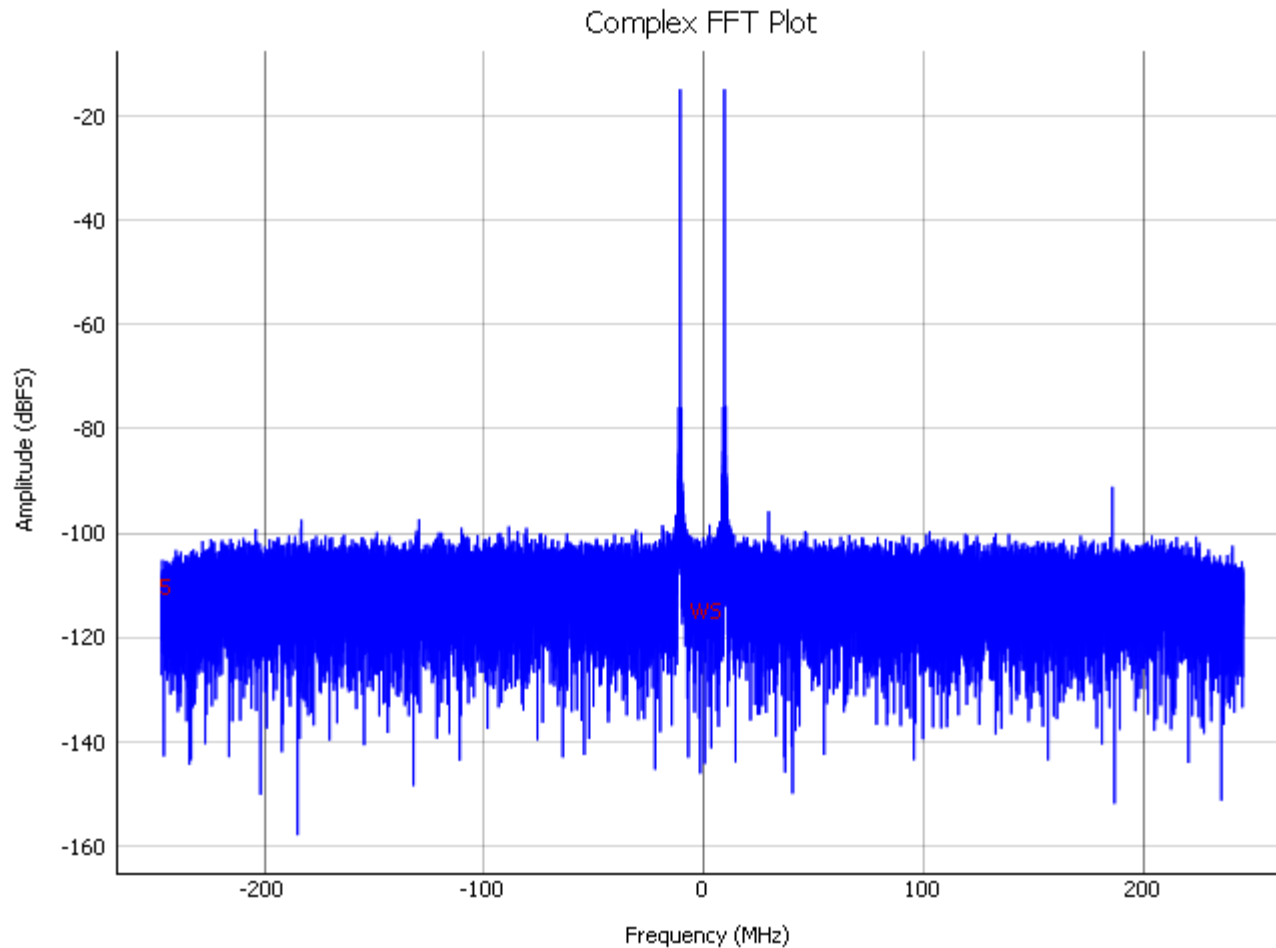
# RX A : IMD3 at -12dBFS input +/-10MHz

IMD3 = -92.322dBFS = -80.322dBc



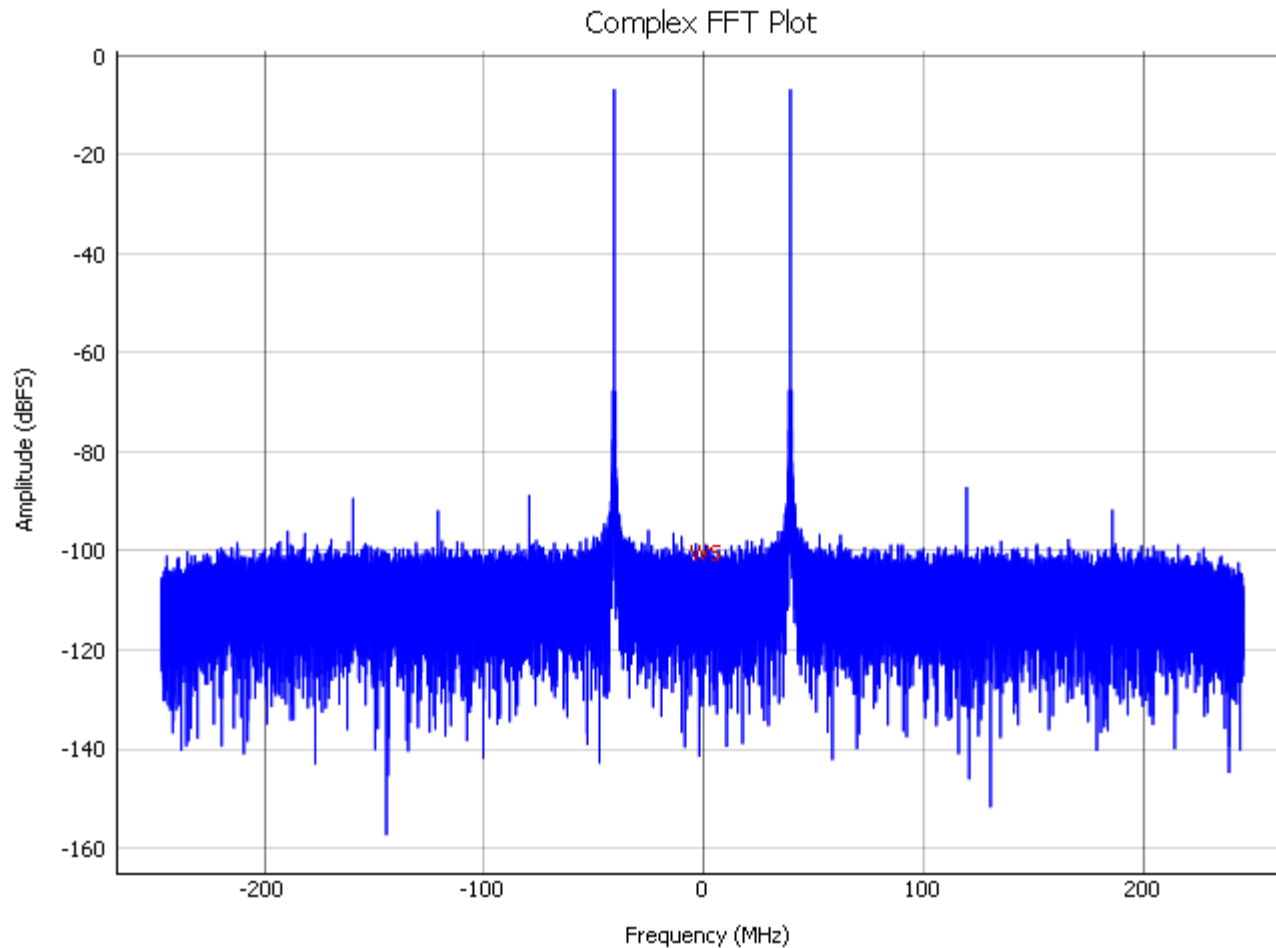
# RX A : IMD3 at -15dBFS input +/-10MHz

$$\text{IMD3} = -95.992\text{dBFS} = -80.992\text{dBc}$$



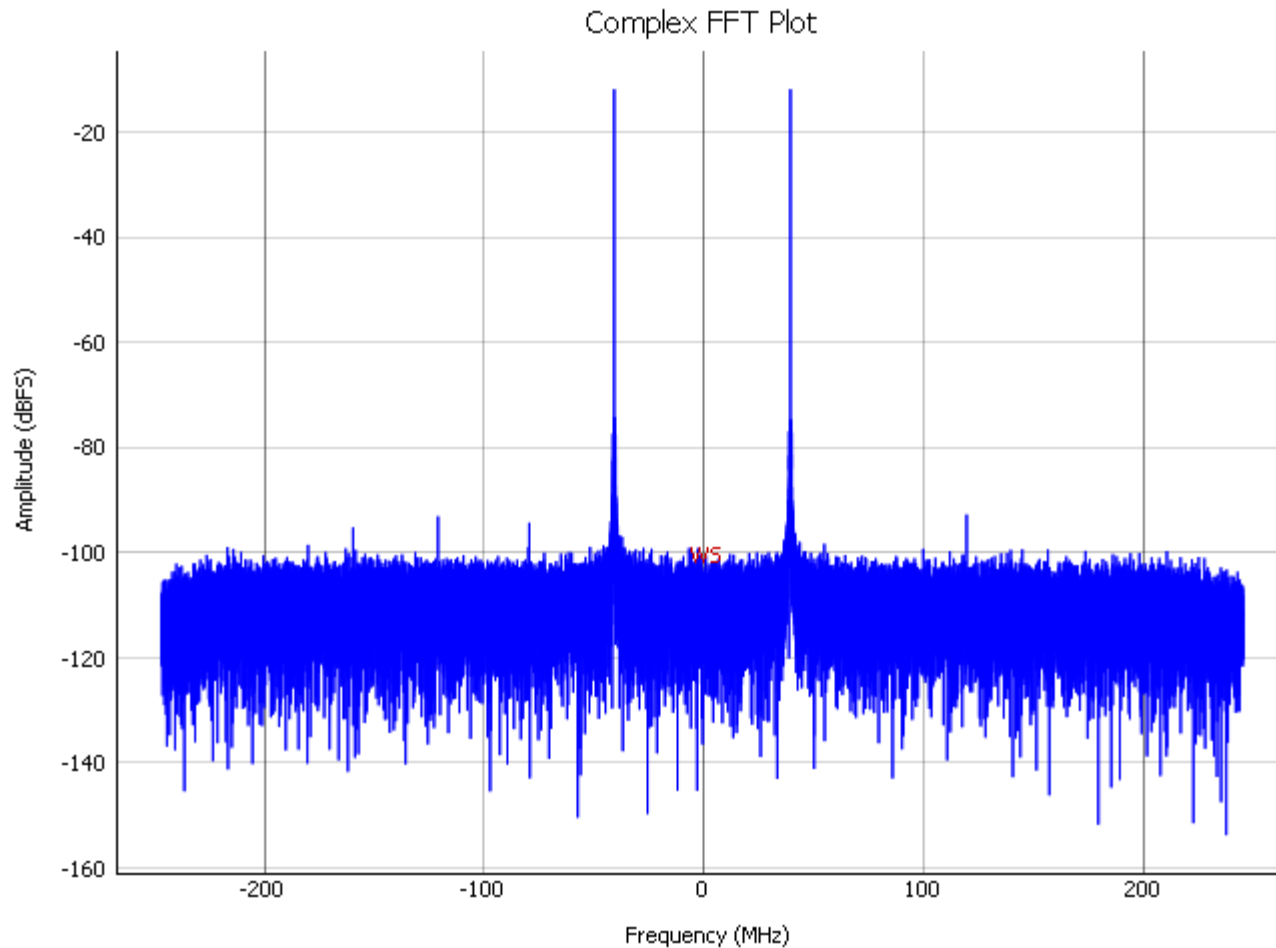
# RX A : IMD3 at -7dBFS input +/-40MHz

IMD3 = -87.295dBFS = -80.295dBc



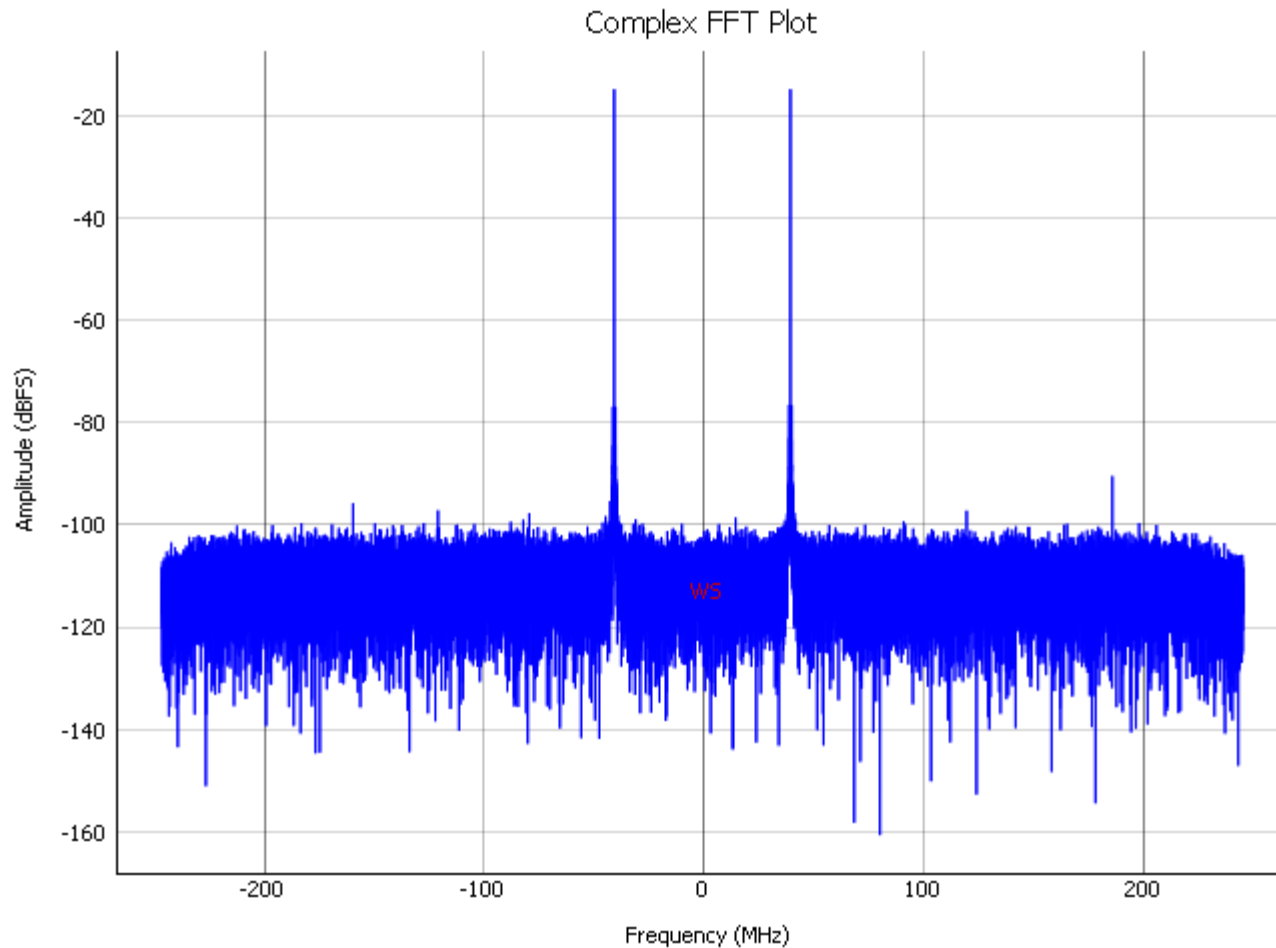
# RX A : IMD3 at -12dBFS input +/-40MHz

IMD3 = -92.967dBFS = -80.967dBc



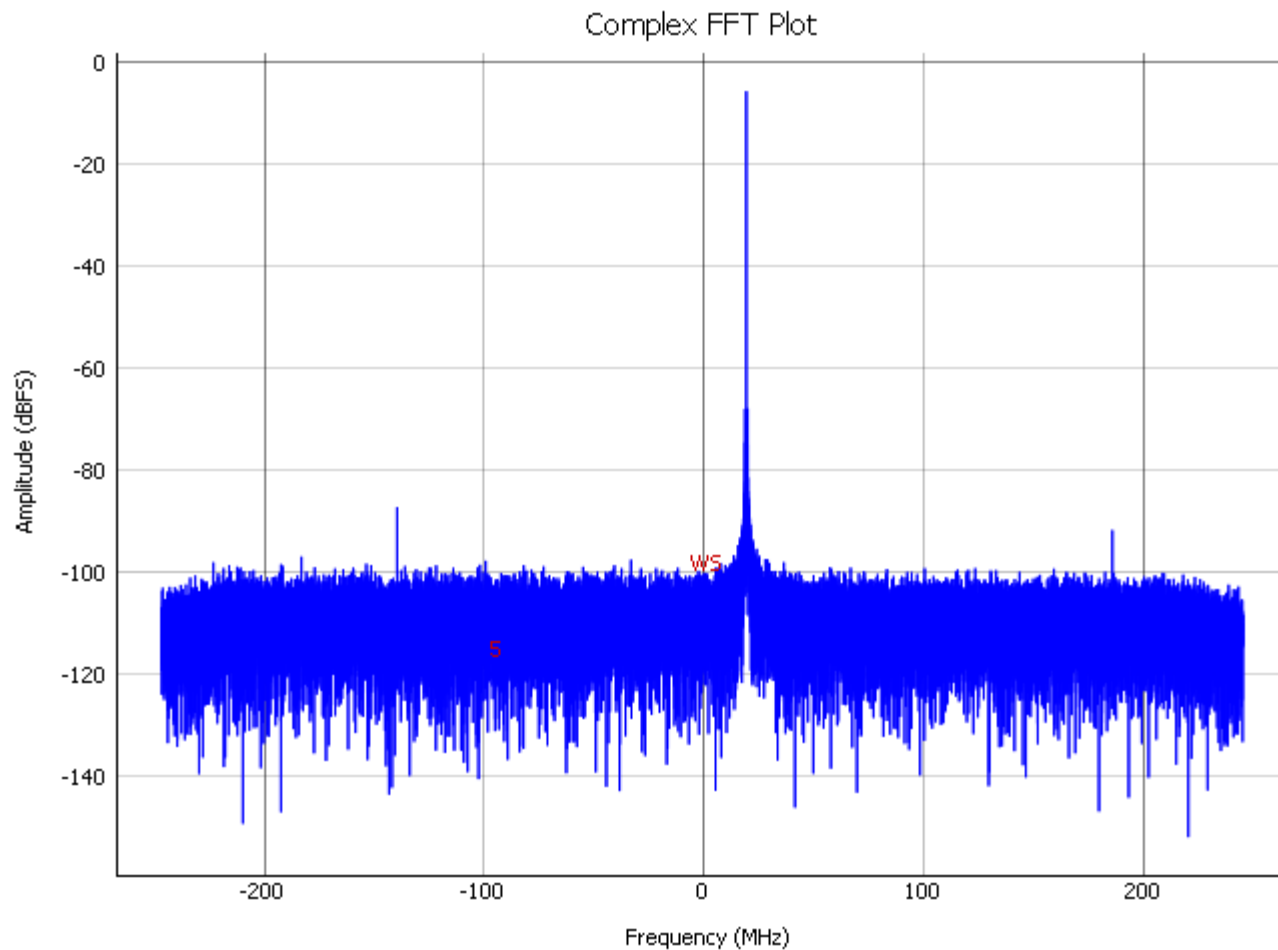
# RX A : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -97.355\text{dBFS} = -82.355\text{dBc}$$



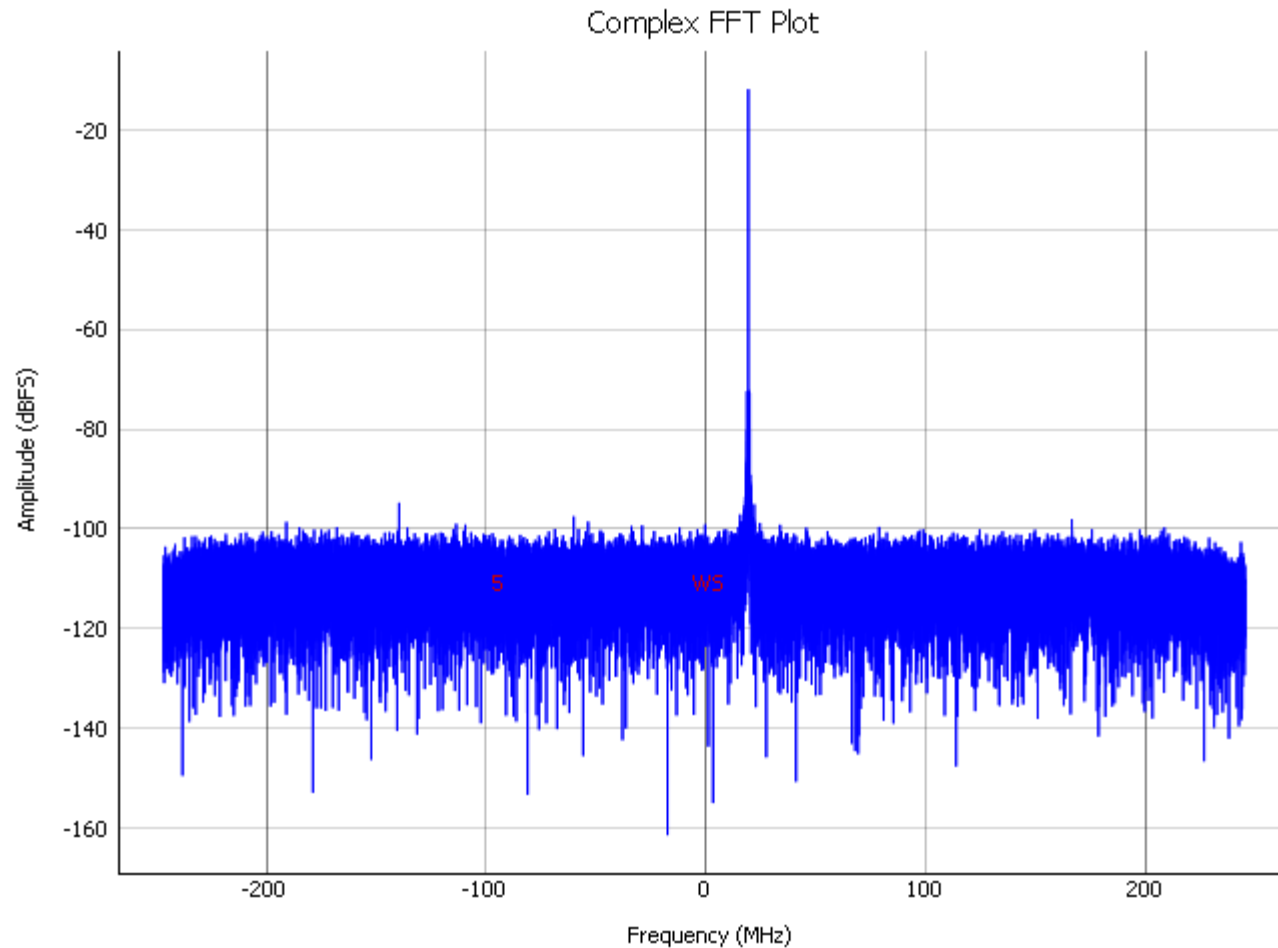
# RX A : SFDR at -6dBFS input

$$\text{SFDR} = 87.45\text{dBFS} = 81.45\text{dBc}$$



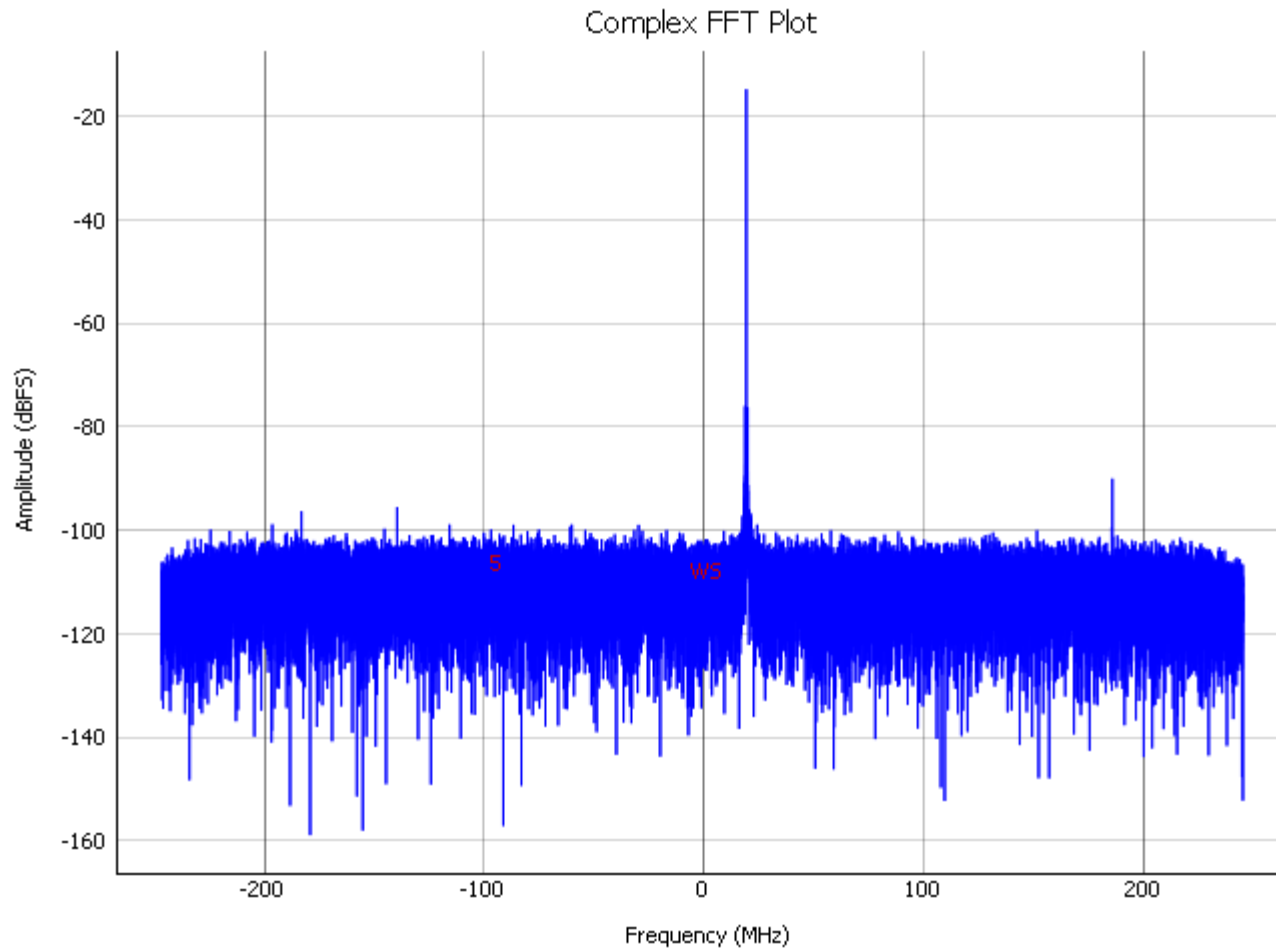
# RX A : SFDR at -12dBFS input

$$\text{SFDR} = 94.999\text{dBFS} = 82.999\text{dBc}$$

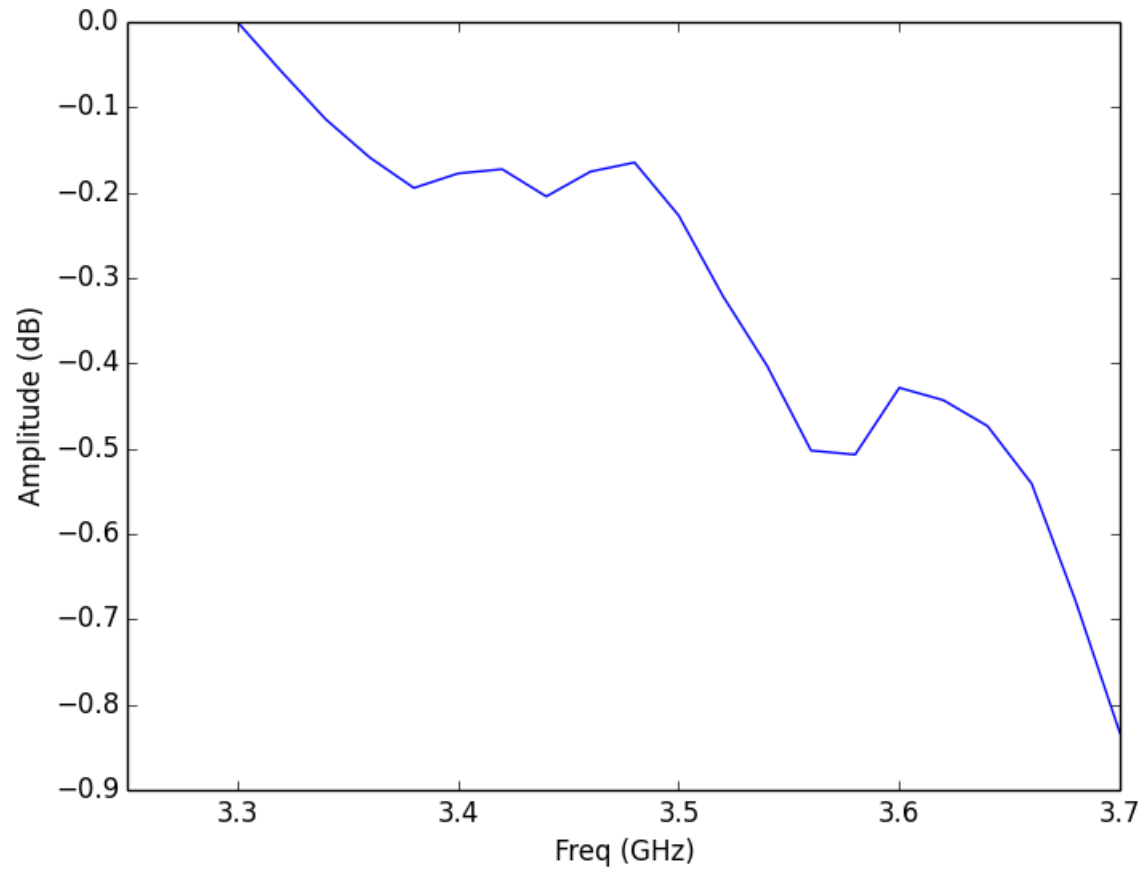


# RX A : SFDR at -15dBFS input

$$\text{SFDR} = 90.257\text{dBFS} = 75.257\text{dBc}$$



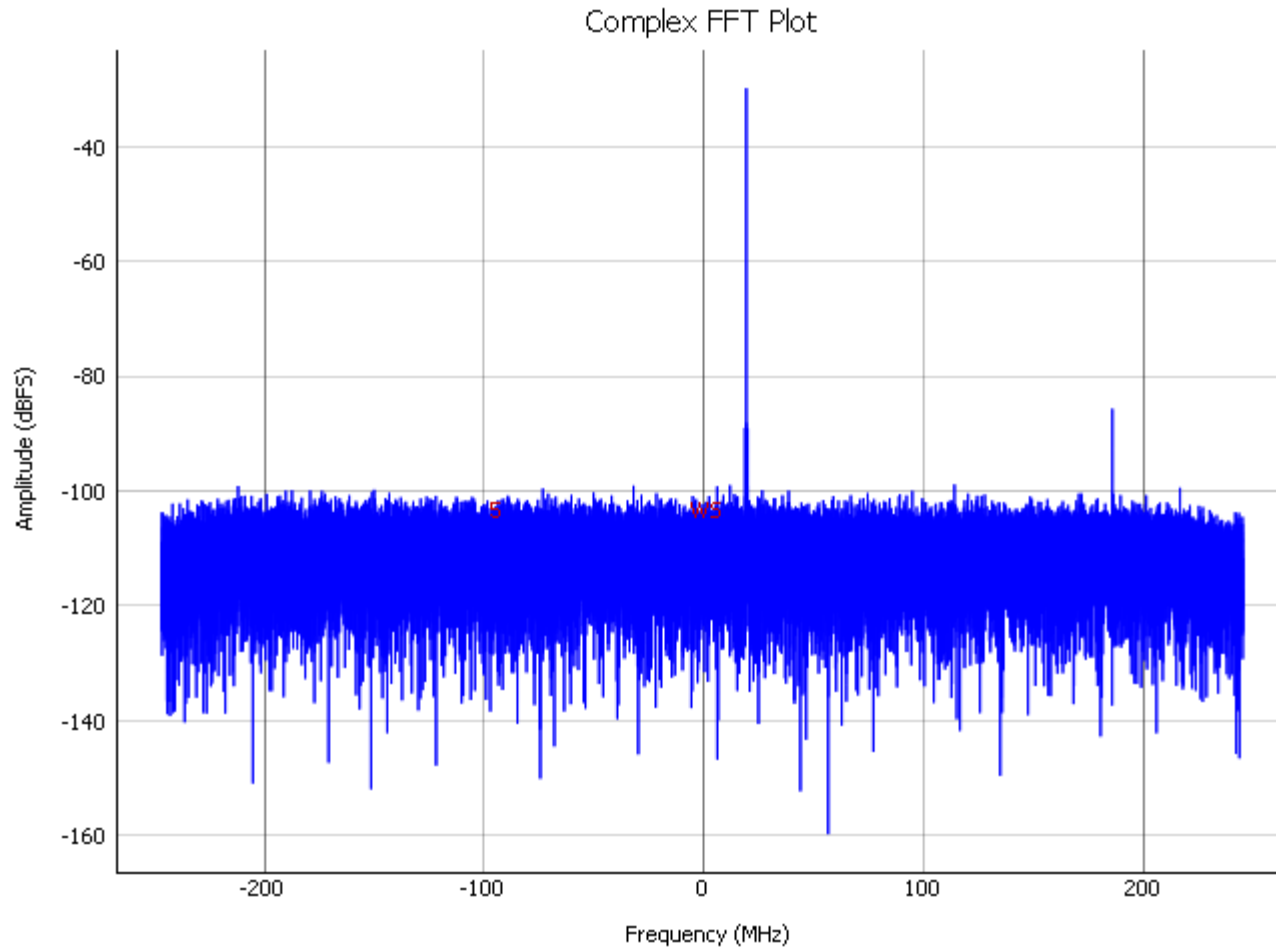
# RX A Flatness



# **RxB Performance 491.52Mhz IQ, 3.5G Band**

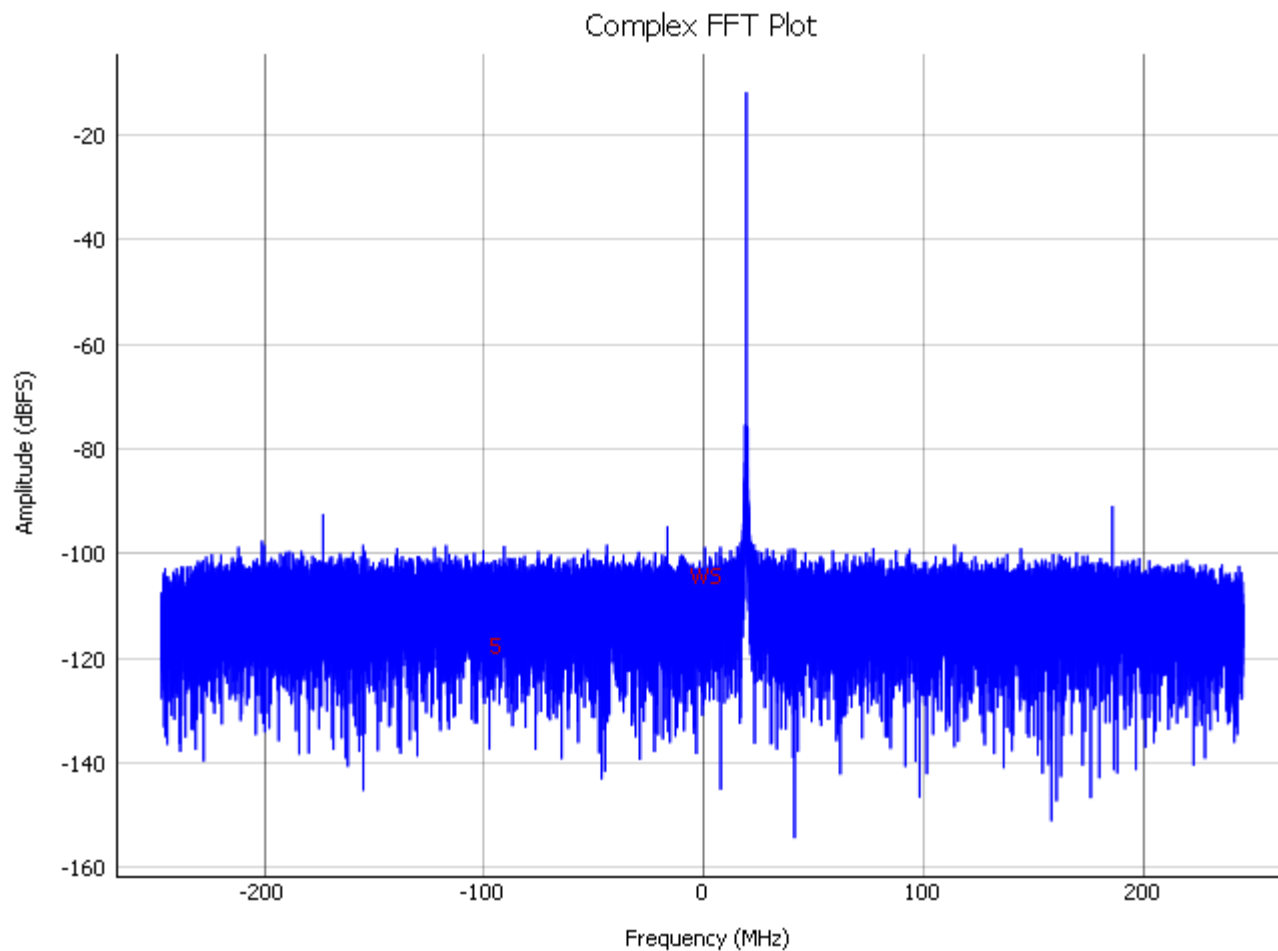
# RX B : SNR at -30dBFS input

SNR = 64.442dBFS ; NSD = 151.357dBFS/sqrt(Hz)



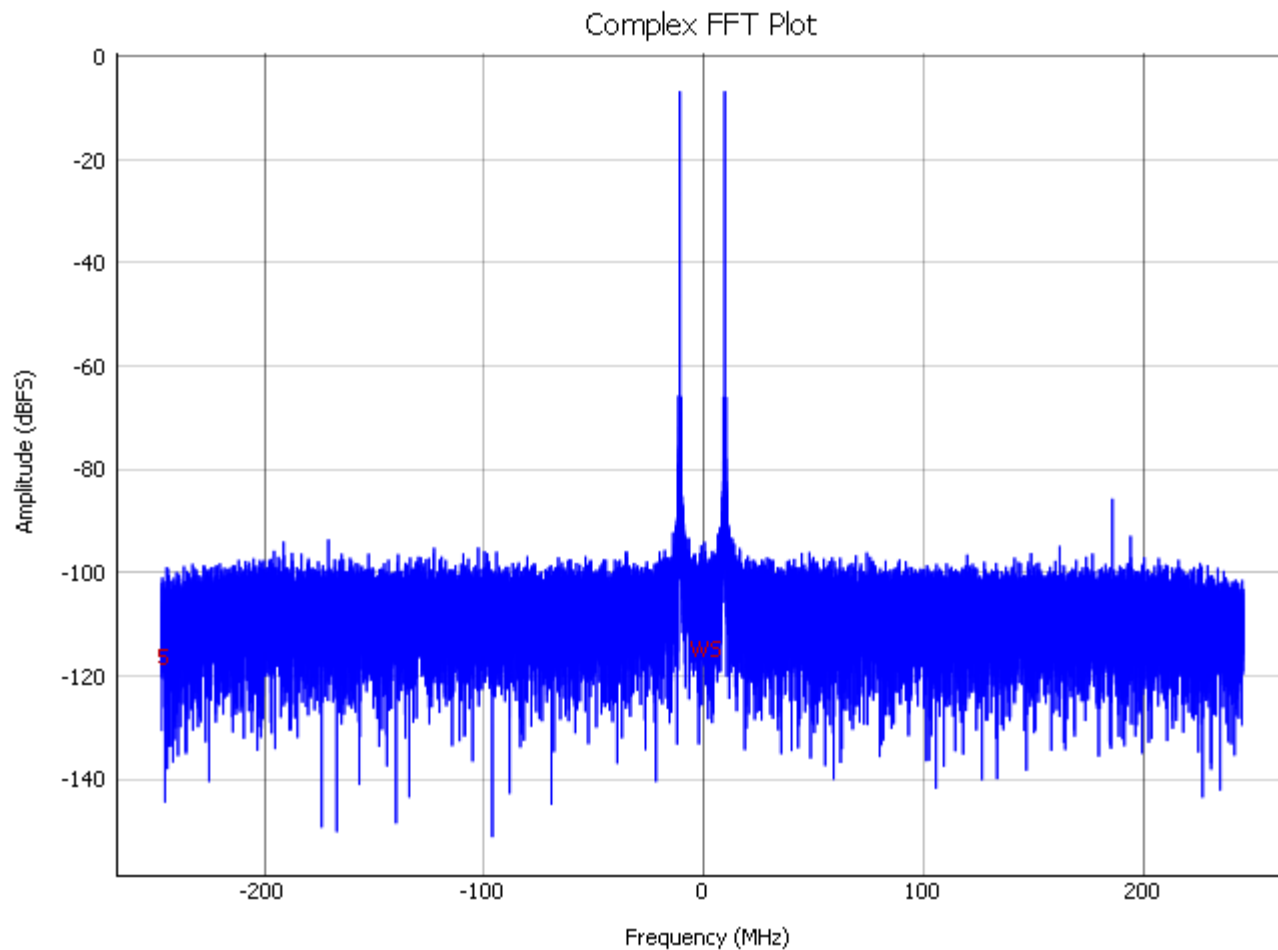
# RX B : SNR at -12dBFS input

SNR = 63.725dBFS ; NSD = 150.64dBFS/sqrt(Hz)



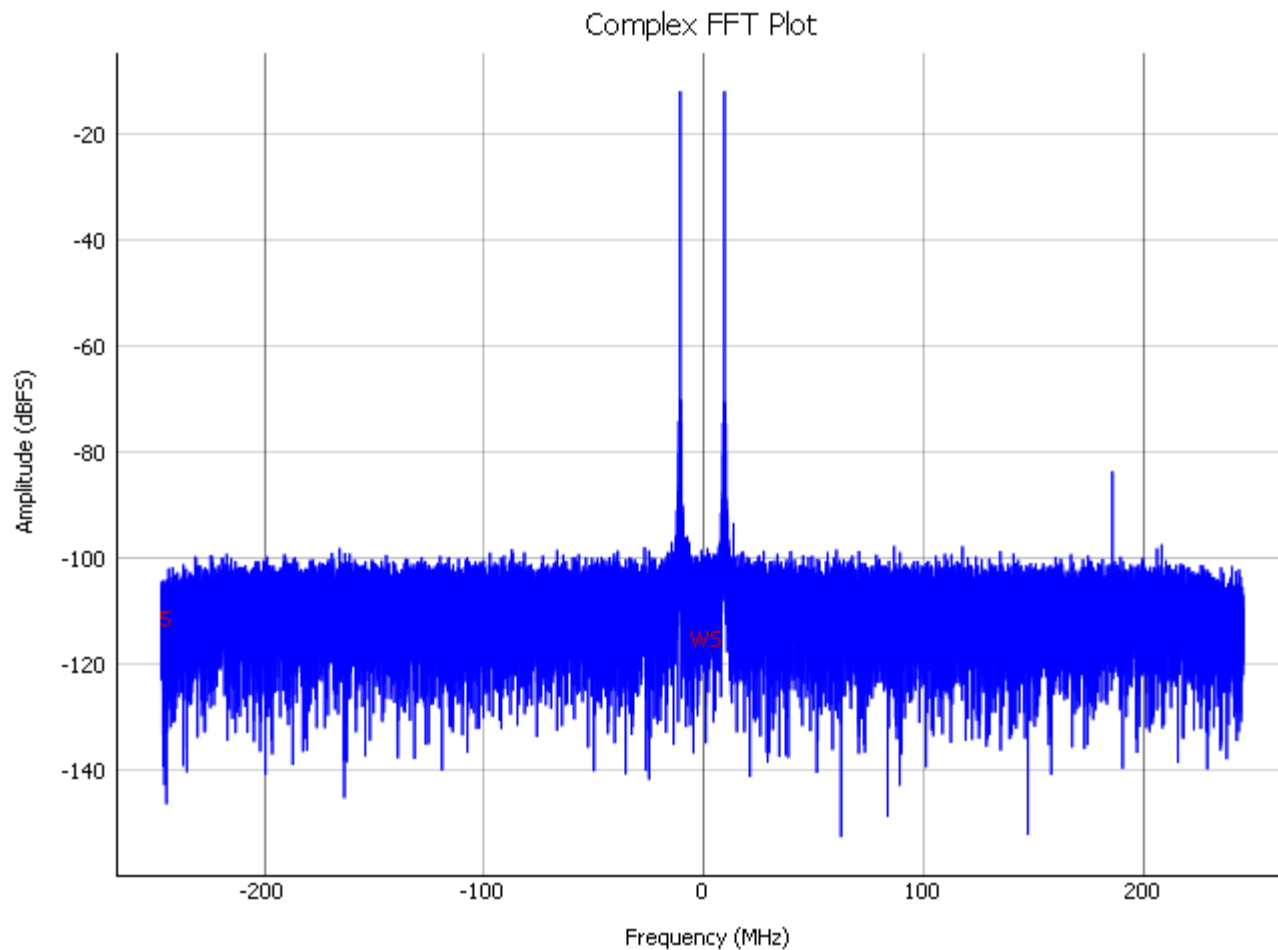
# RX B : IMD3 at -7dBFS input +/-10MHz

$$\text{IMD3} = -101.307\text{dBFS} = -94.307\text{dBc}$$



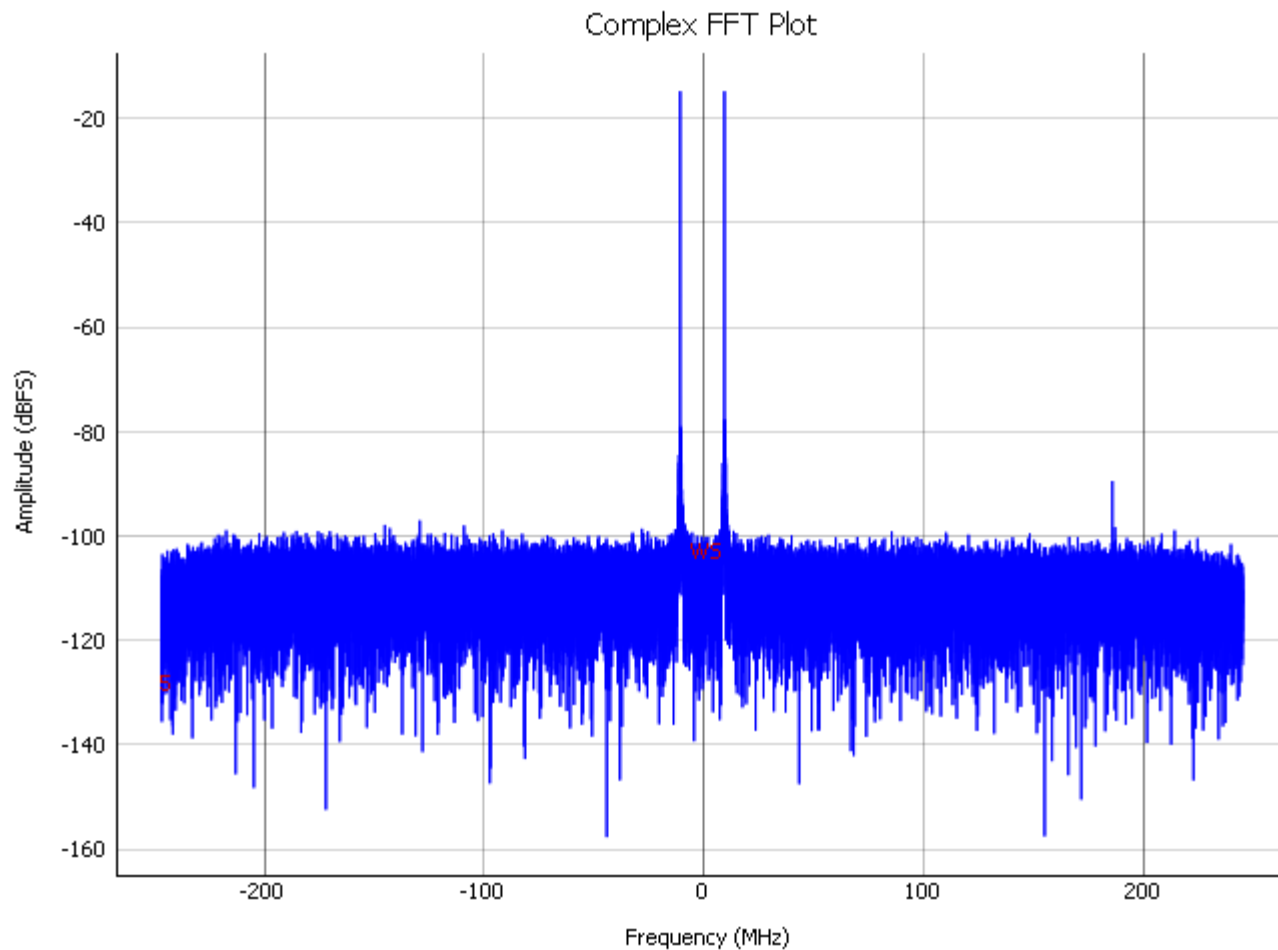
# RX B : IMD3 at -12dBFS input +/-10MHz

$$\text{IMD3} = -105.827\text{dBFS} = -93.827\text{dBc}$$



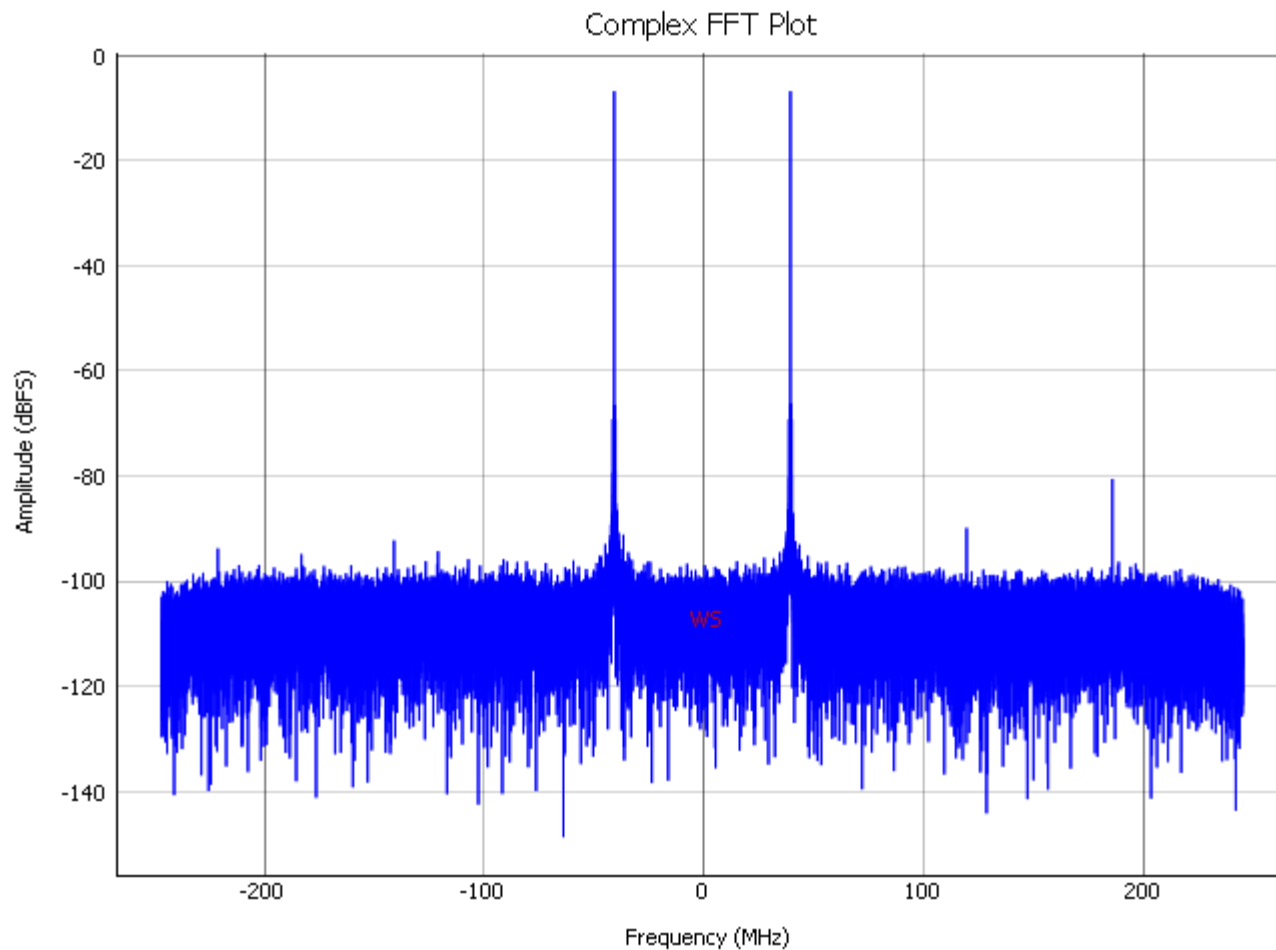
# RX B : IMD3 at -15dBFS input +/-10MHz

IMD3 = -104.043dBFS = -89.043dBc



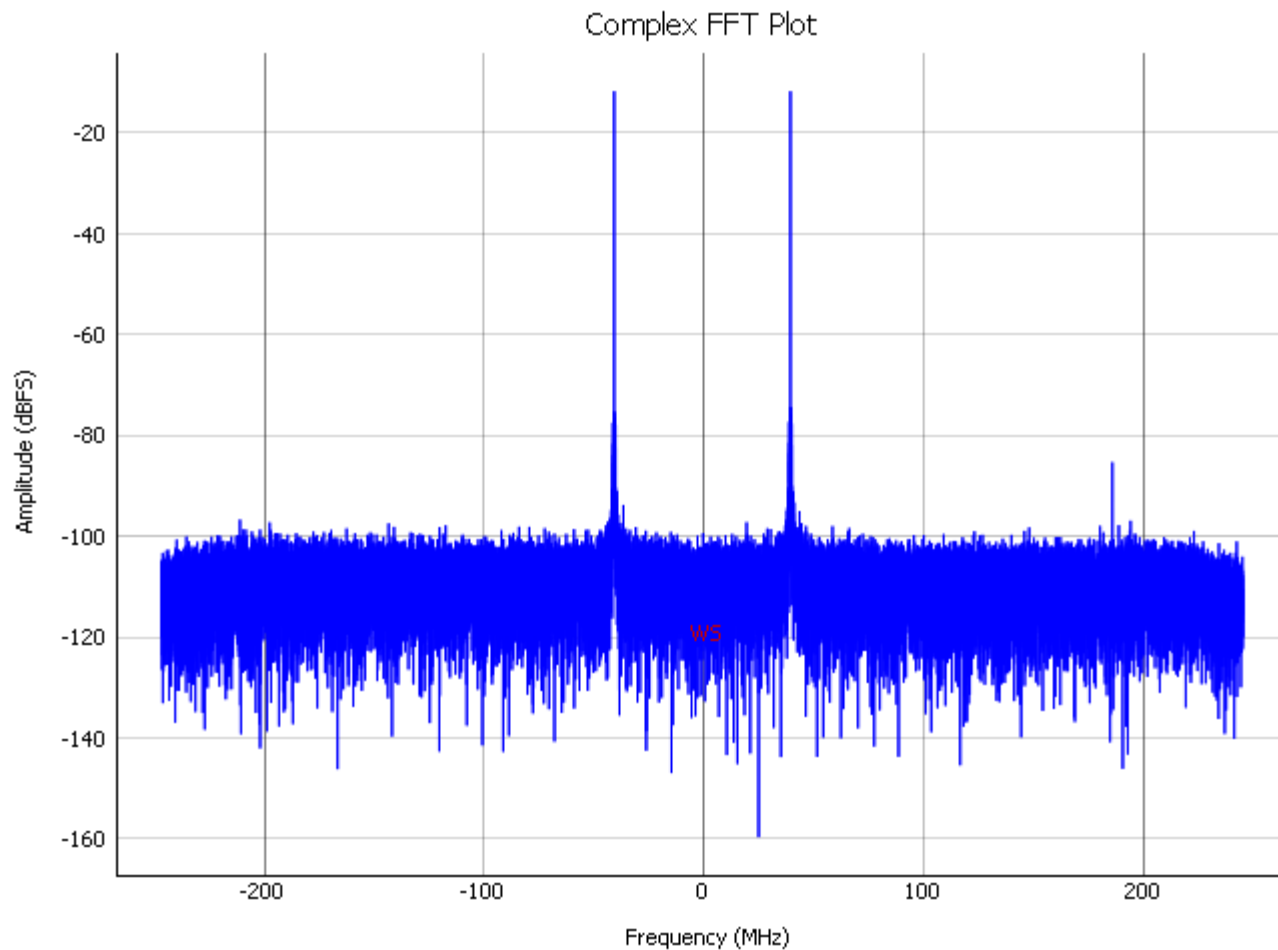
# RX B : IMD3 at -7dBFS input +/-40MHz

IMD3 = -90.076dBFS = -83.076dBc



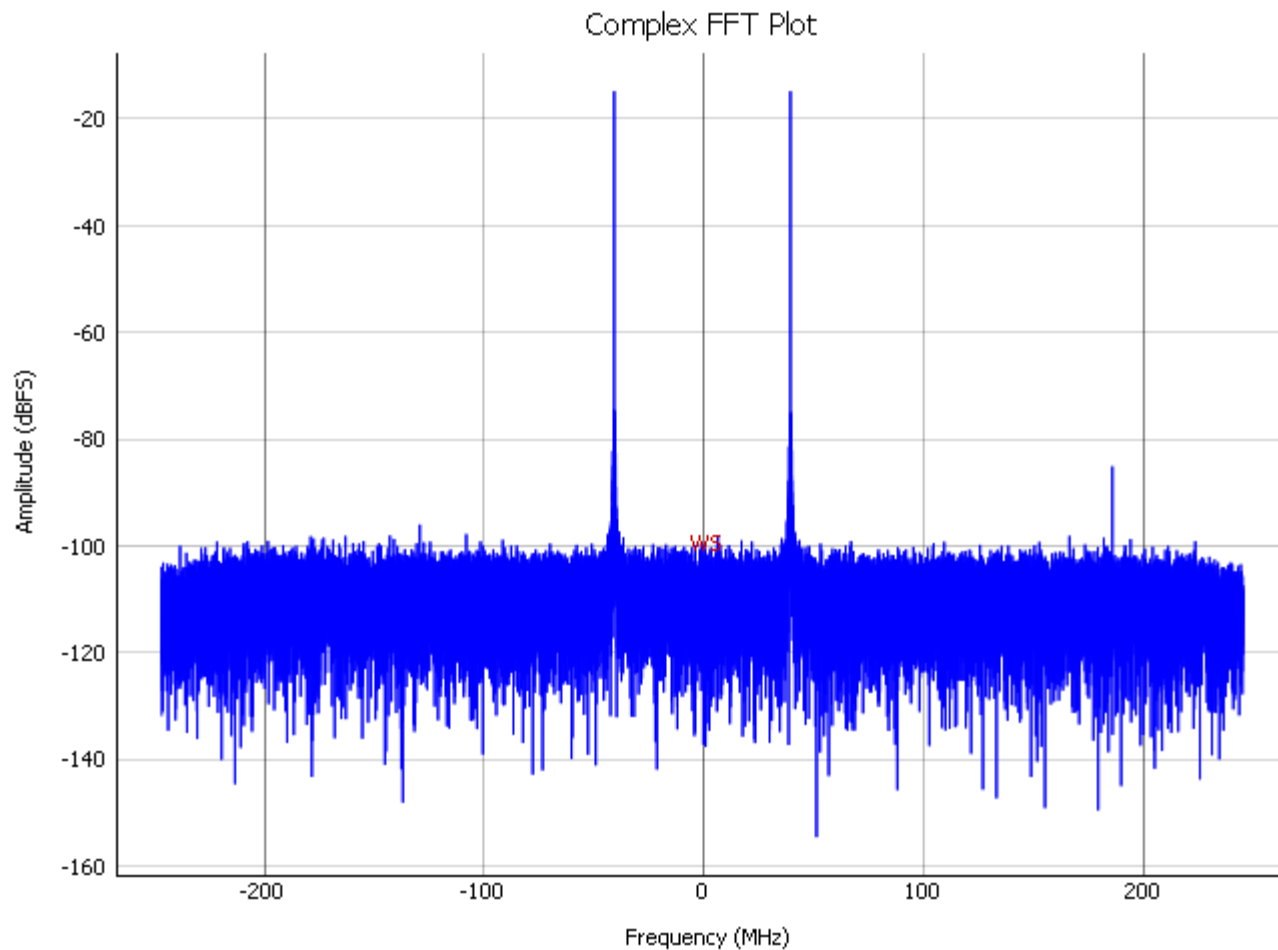
# RX B : IMD3 at -12dBFS input +/-40MHz

$$\text{IMD3} = -103.567\text{dBFS} = -91.567\text{dBc}$$



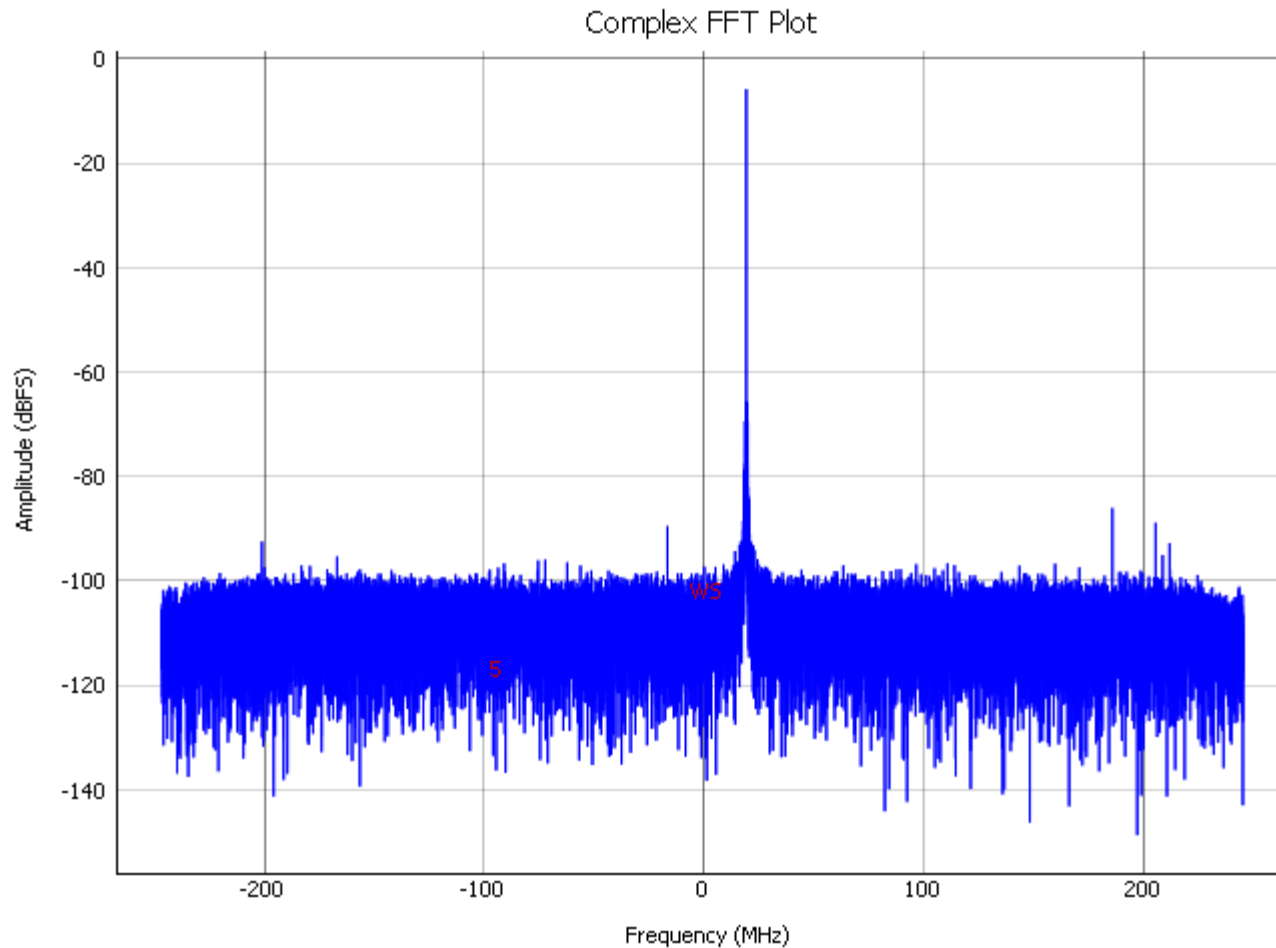
# RX B : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -105.292\text{dBFS} = -90.292\text{dBc}$$



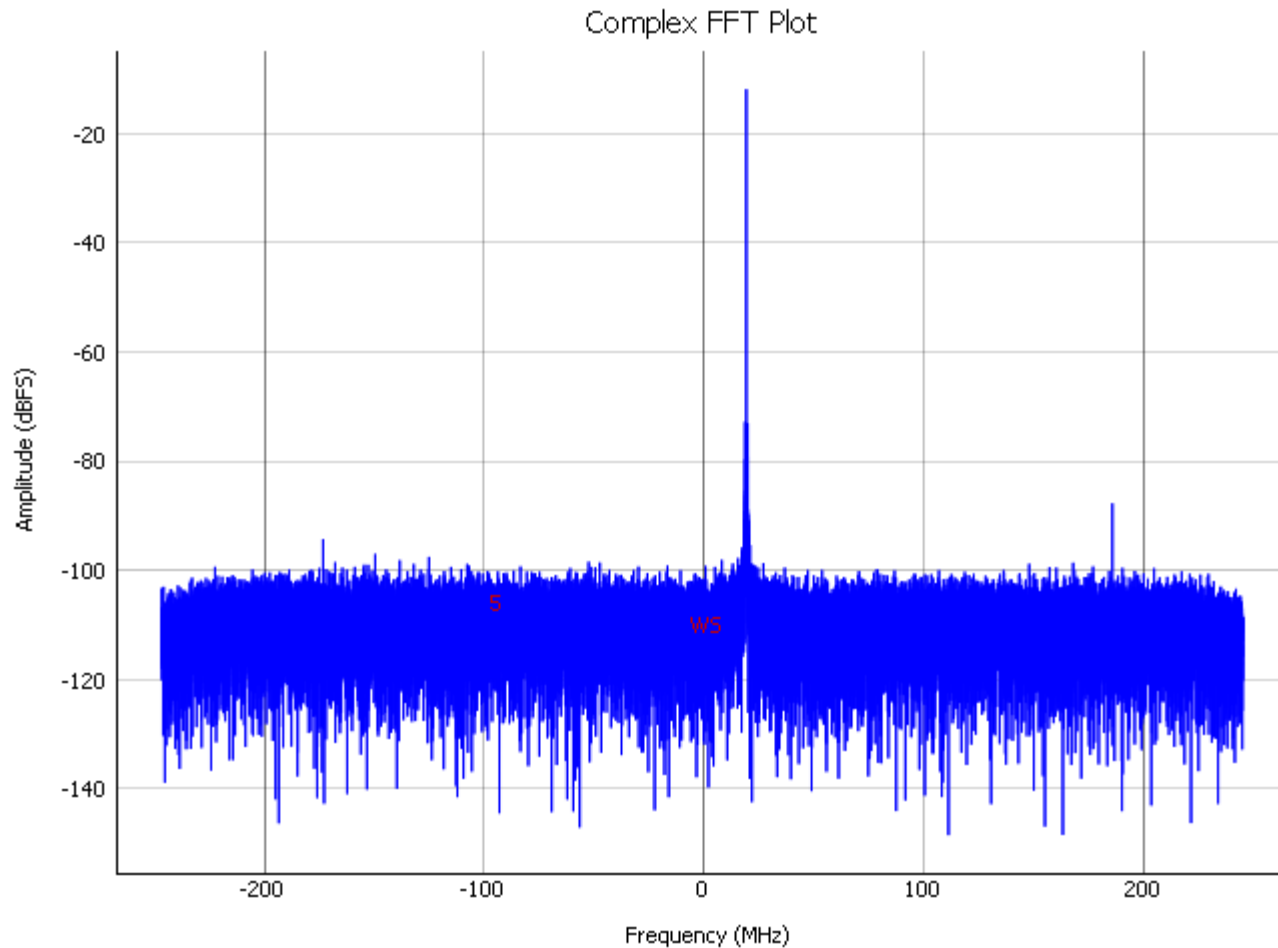
# RX B : SFDR at -6dBFS input

$$\text{SFDR} = 86.247\text{dBFS} = 80.247\text{dBc}$$



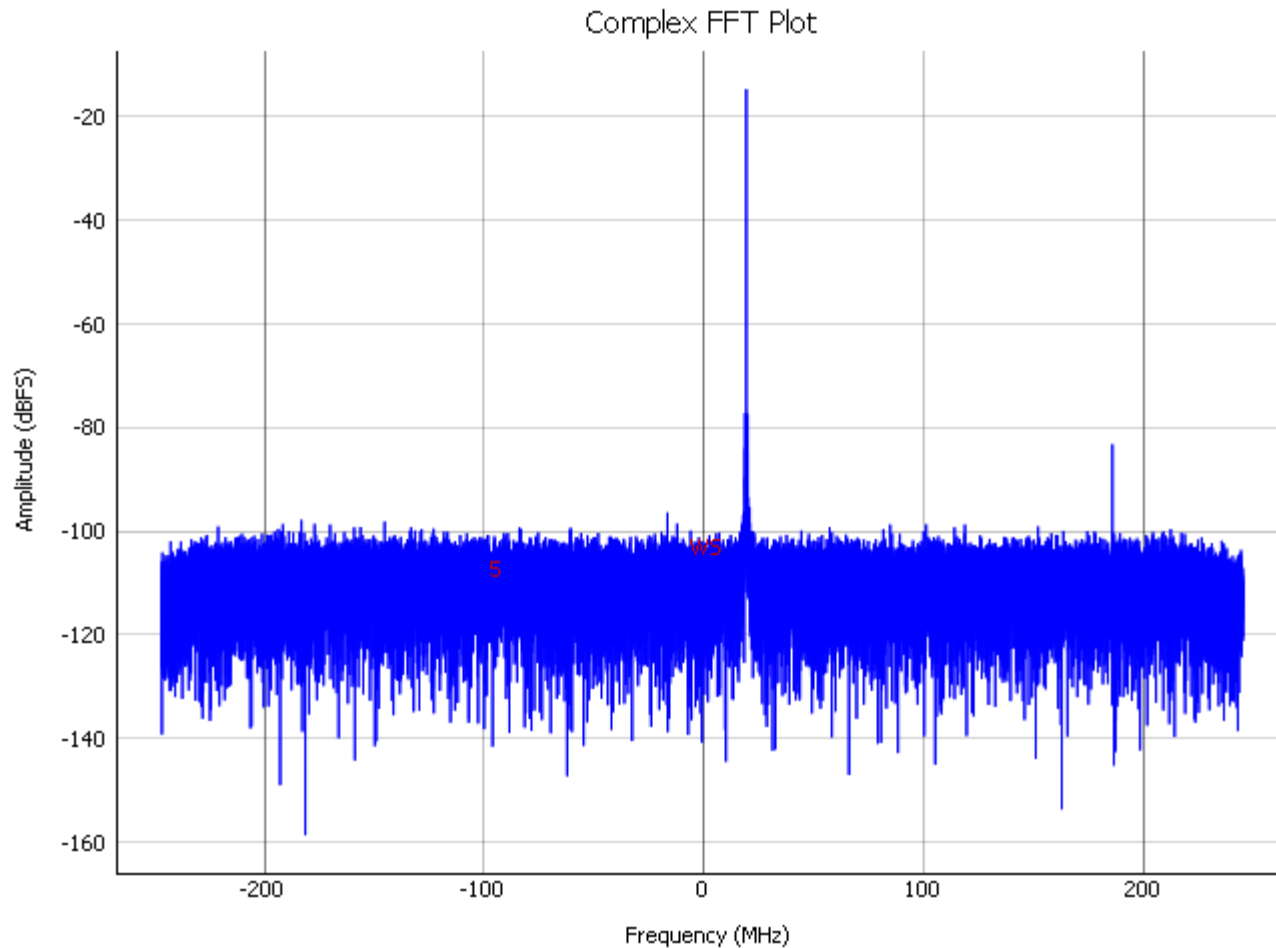
# RX B : SFDR at -12dBFS input

$$\text{SFDR} = 87.882\text{dBFS} = 75.882\text{dBc}$$

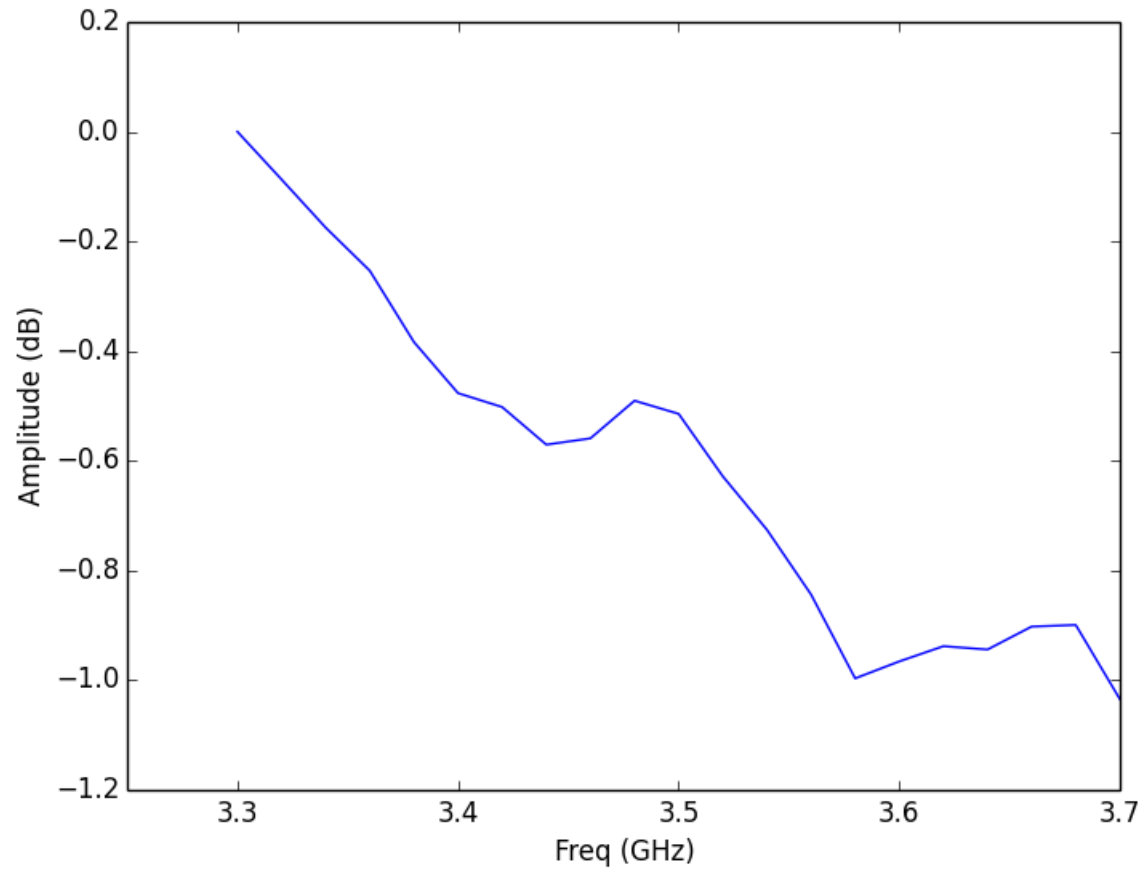


# RX B : SFDR at -15dBFS input

$$\text{SFDR} = 83.464\text{dBFS} = 68.464\text{dBc}$$



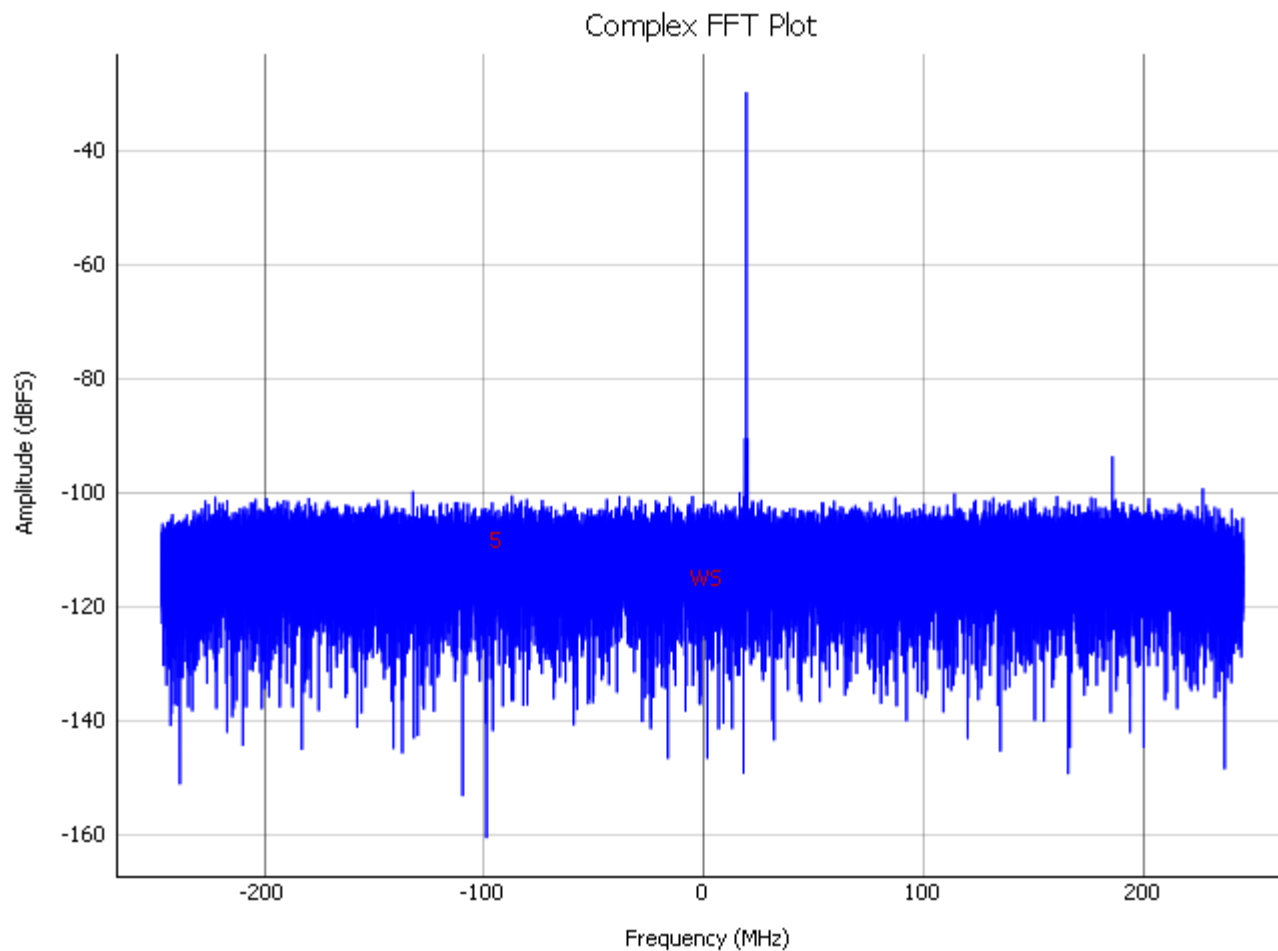
# RX B Flatness



# **RxC Performance 491.52Mhz IQ, 3.5G Band**

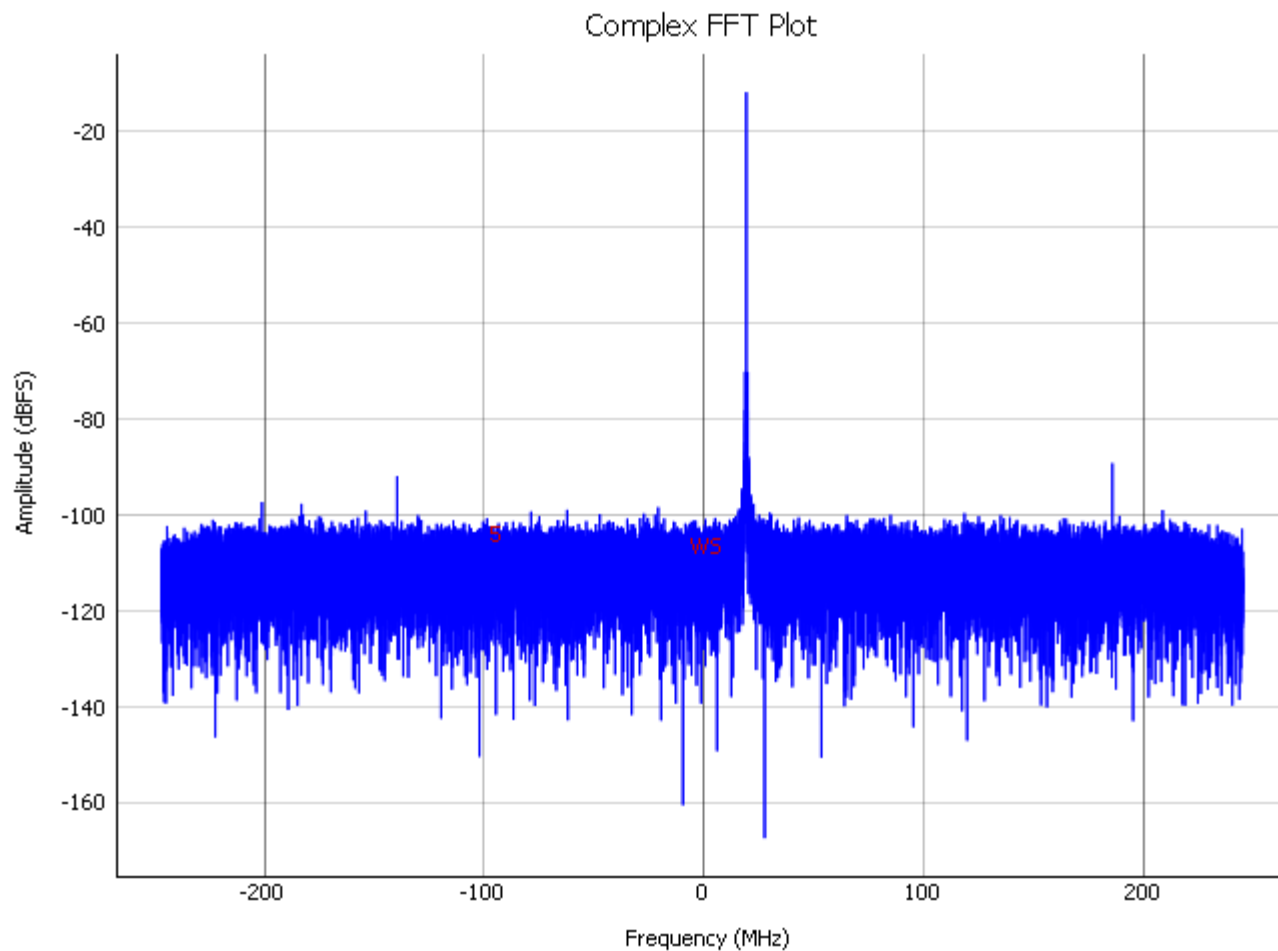
# RX C : SNR at -30dBFS input

SNR = 65.457dBFS ; NSD = 152.372dBFS/sqrt(Hz)



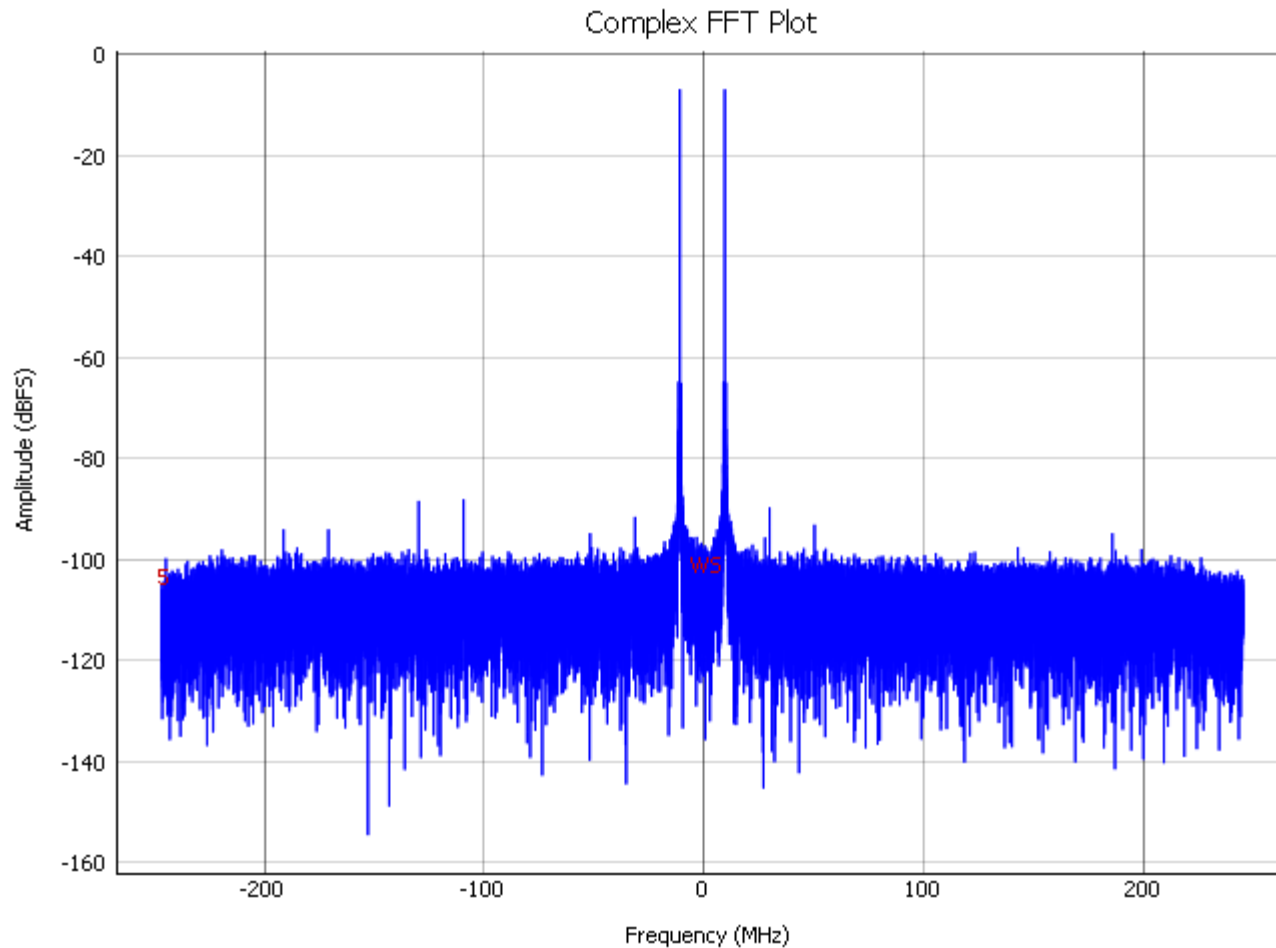
# RX C : SNR at -12dBFS input

SNR = 64.664dBFS ; NSD = 151.579dBFS/sqrt(Hz)



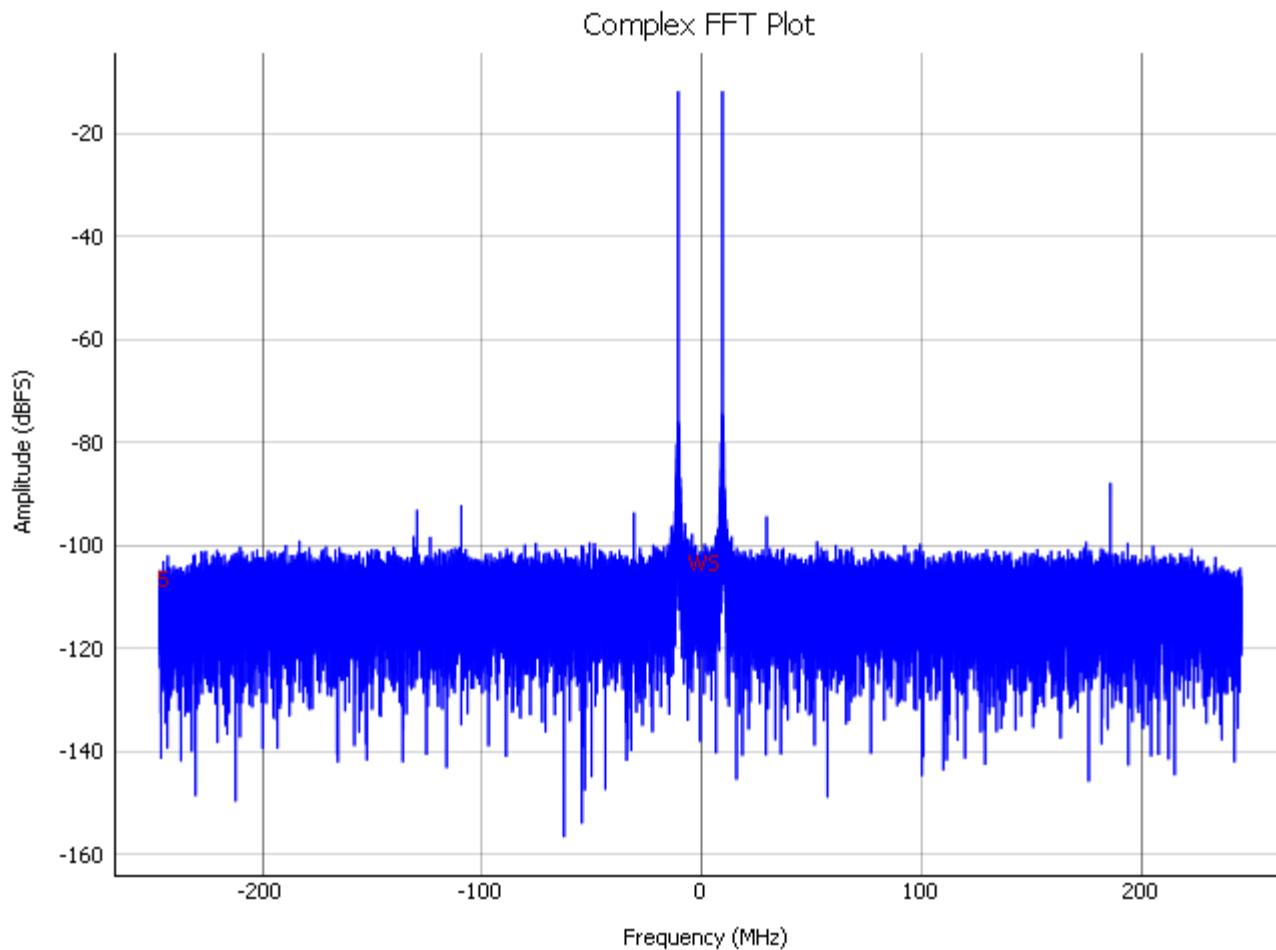
# RX C : IMD3 at -7dBFS input +/-10MHz

IMD3 = -89.897dBFS = -82.897dBc



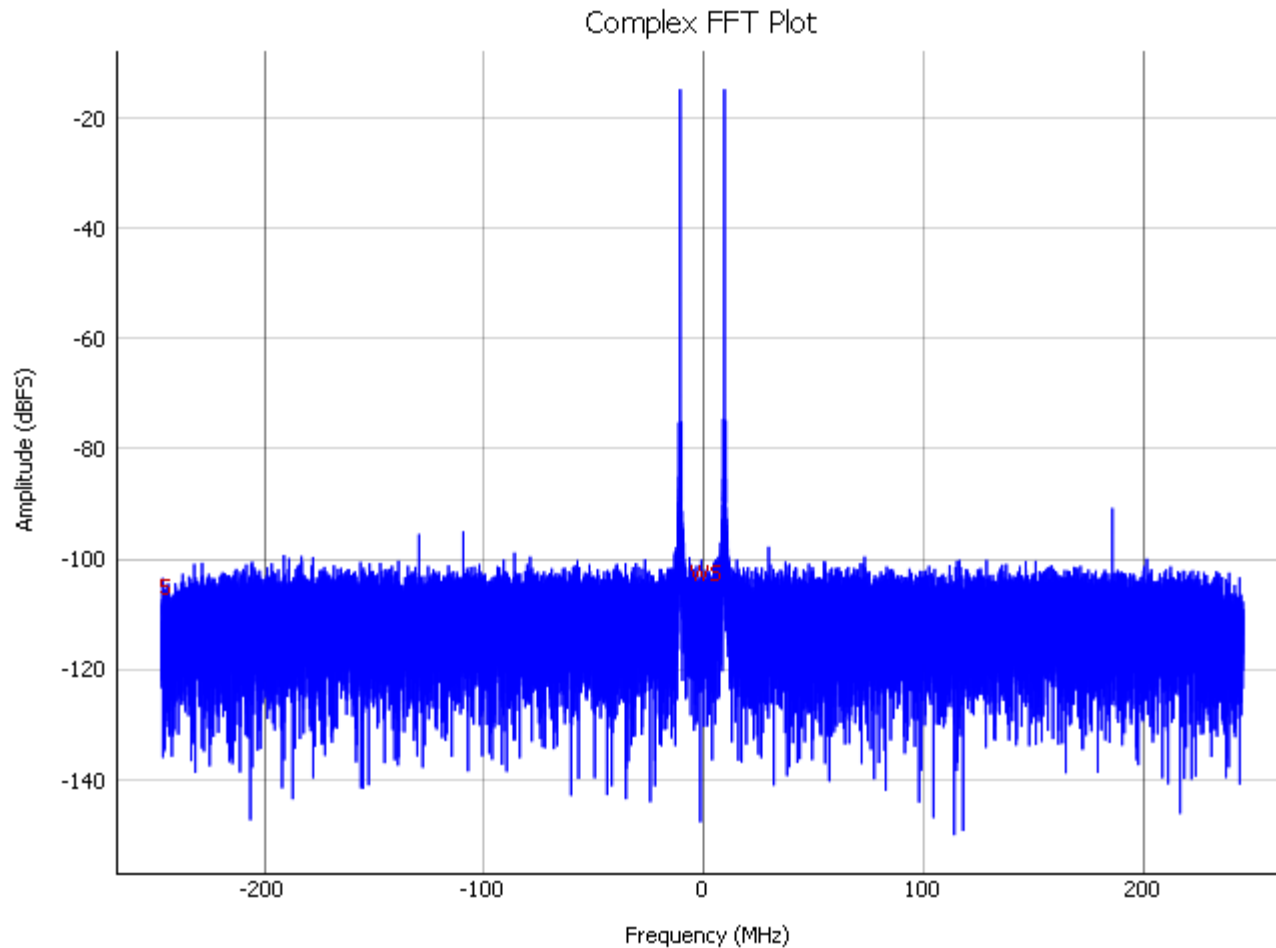
# RX C : IMD3 at -12dBFS input +/-10MHz

IMD3 = -93.863dBFS = -81.863dBc



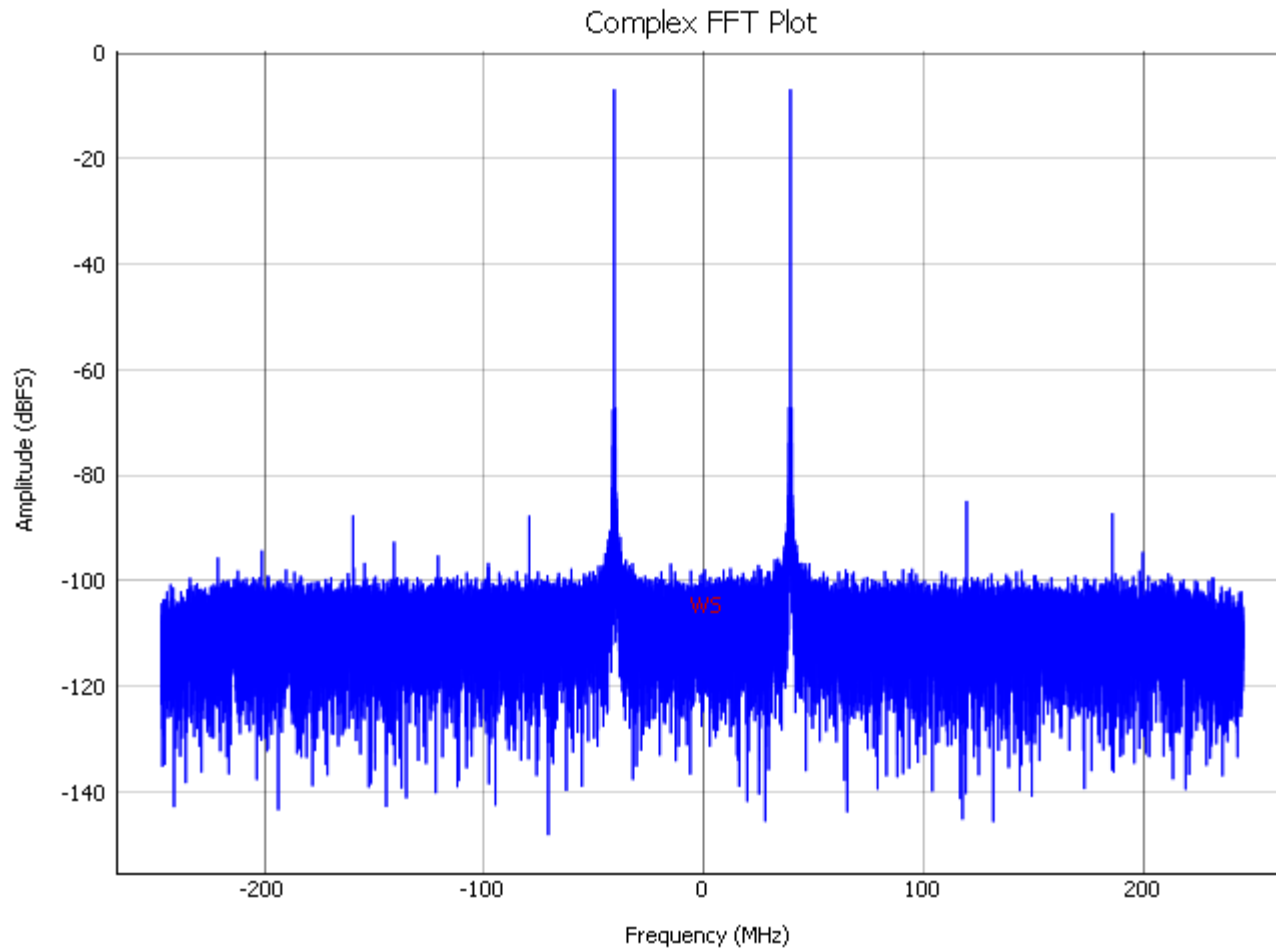
# RX C : IMD3 at -15dBFS input +/-10MHz

IMD3 = -97.951dBFS = -82.951dBc



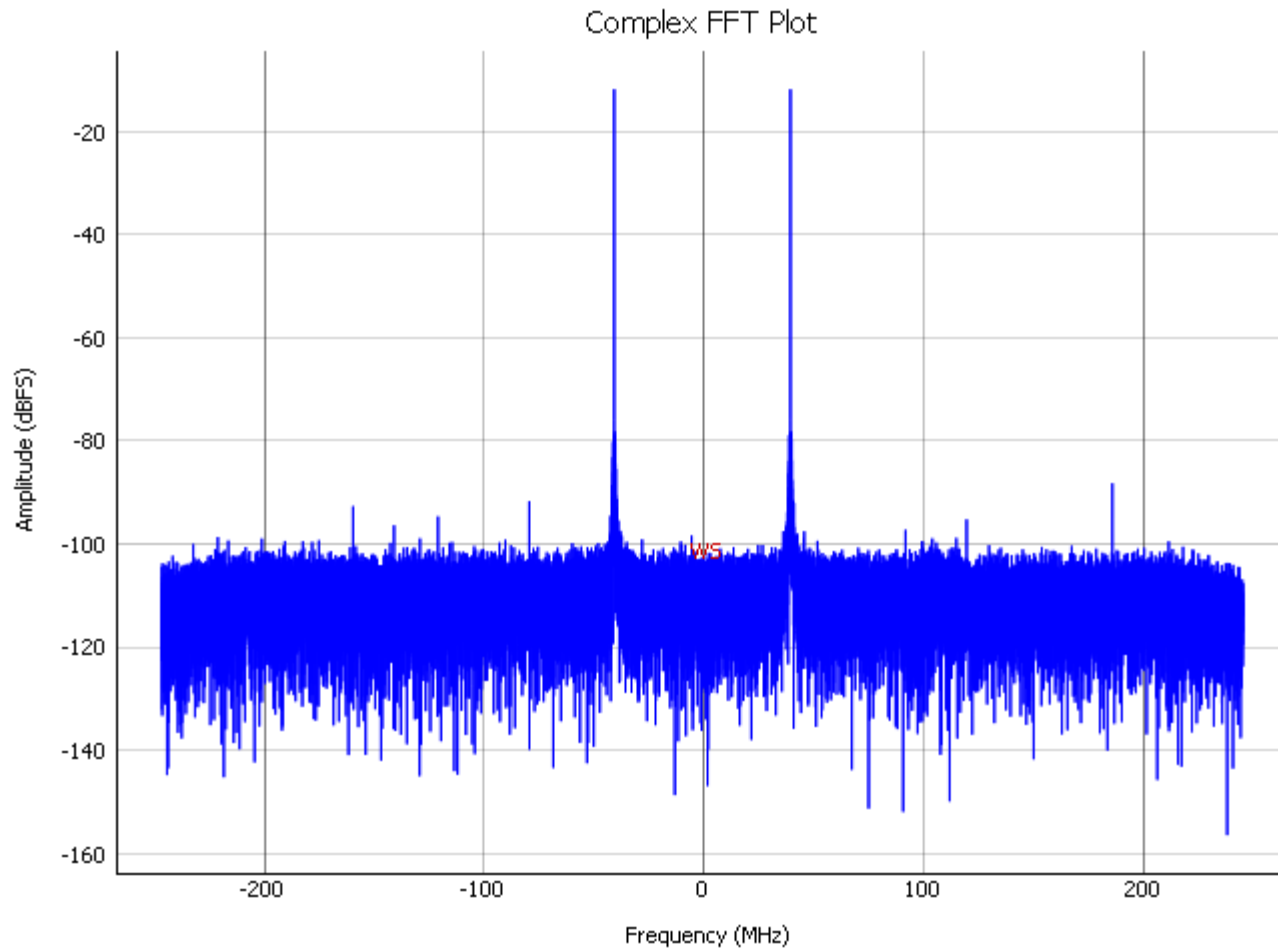
# RX C : IMD3 at -7dBFS input +/-40MHz

IMD3 = -85.068dBFS = -78.068dBc



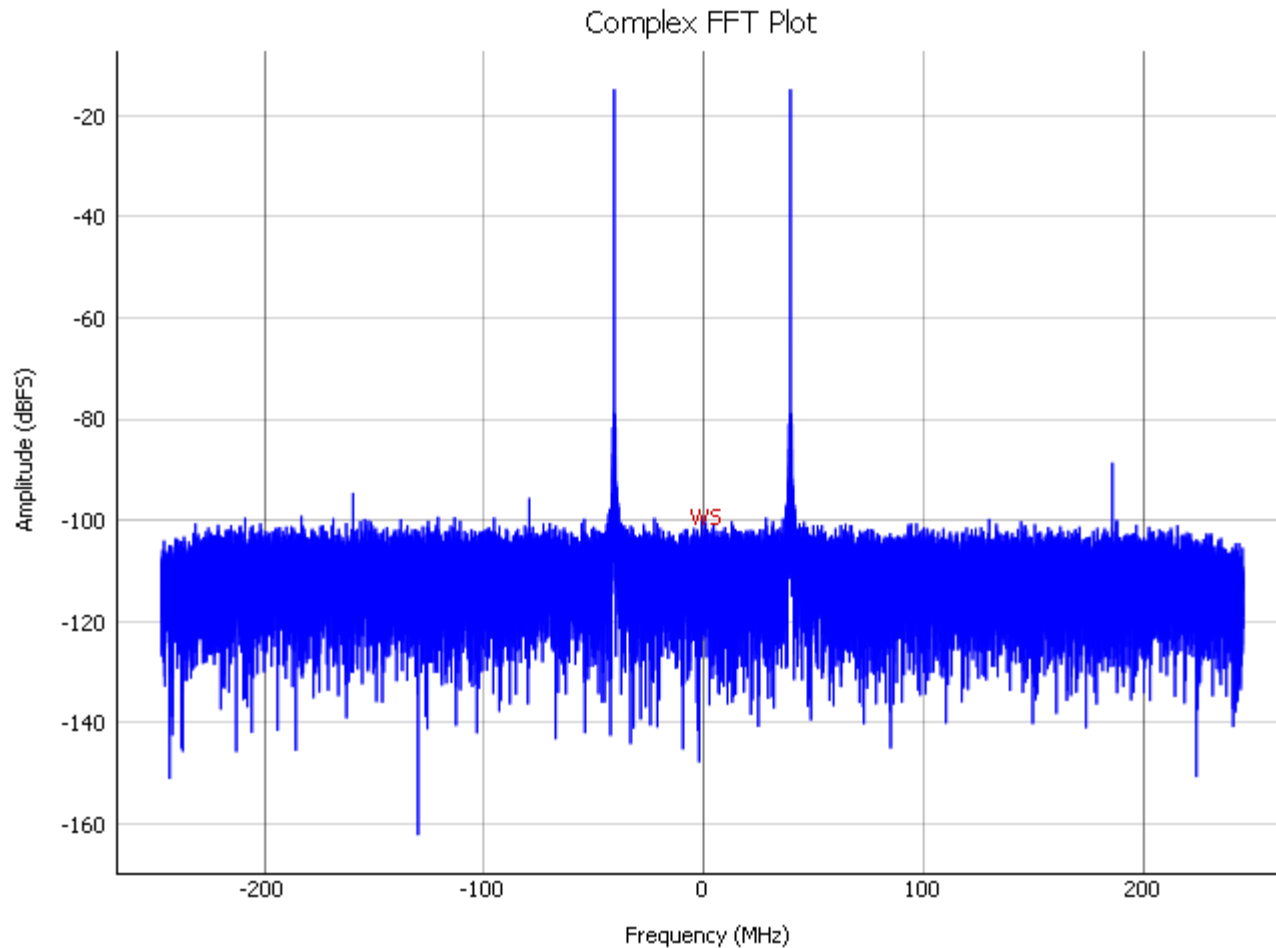
# RX C : IMD3 at -12dBFS input +/-40MHz

IMD3 = -94.824dBFS = -82.824dBc



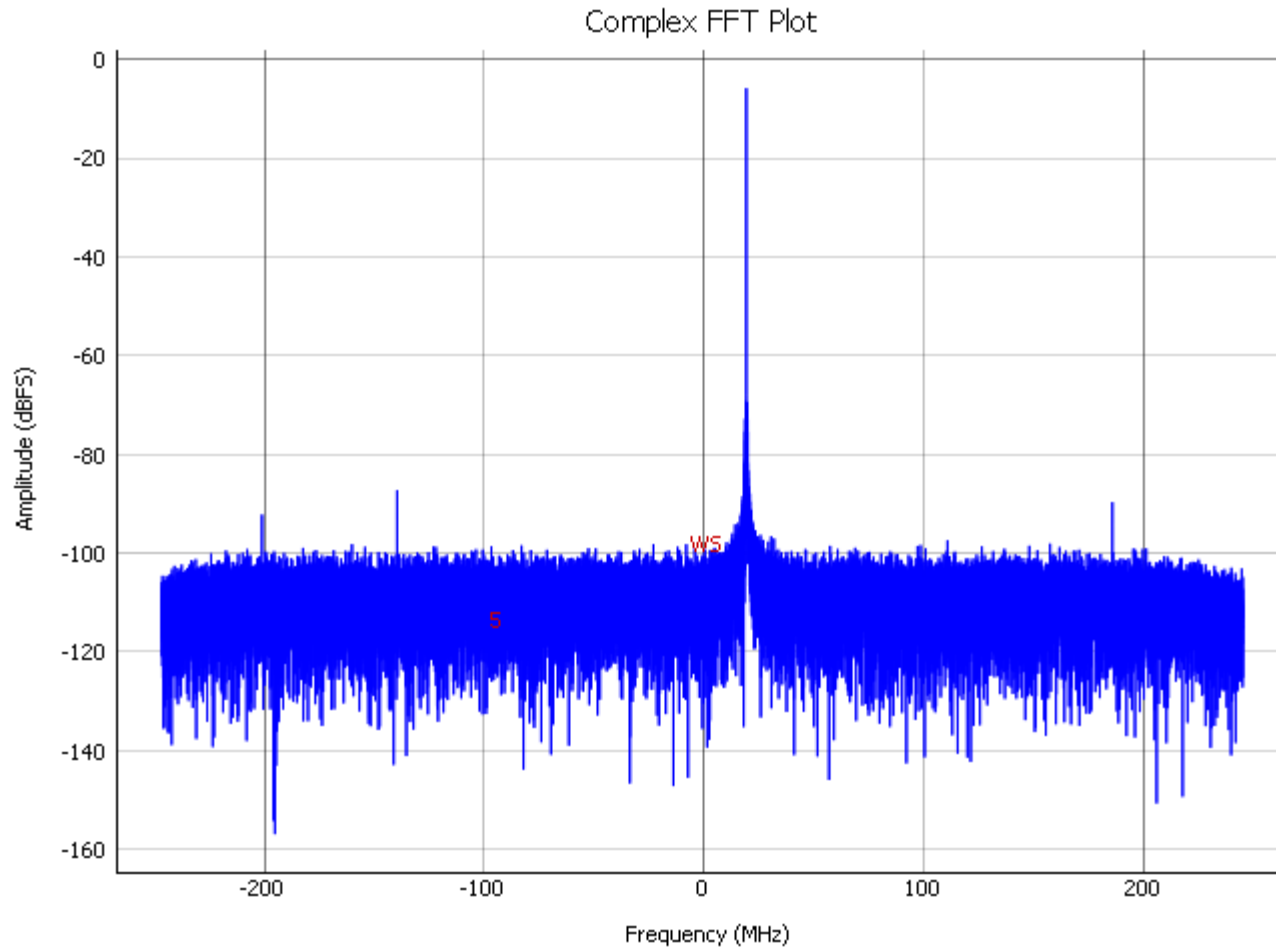
# RX C : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -99.474\text{dBFS} = -84.474\text{dBc}$$



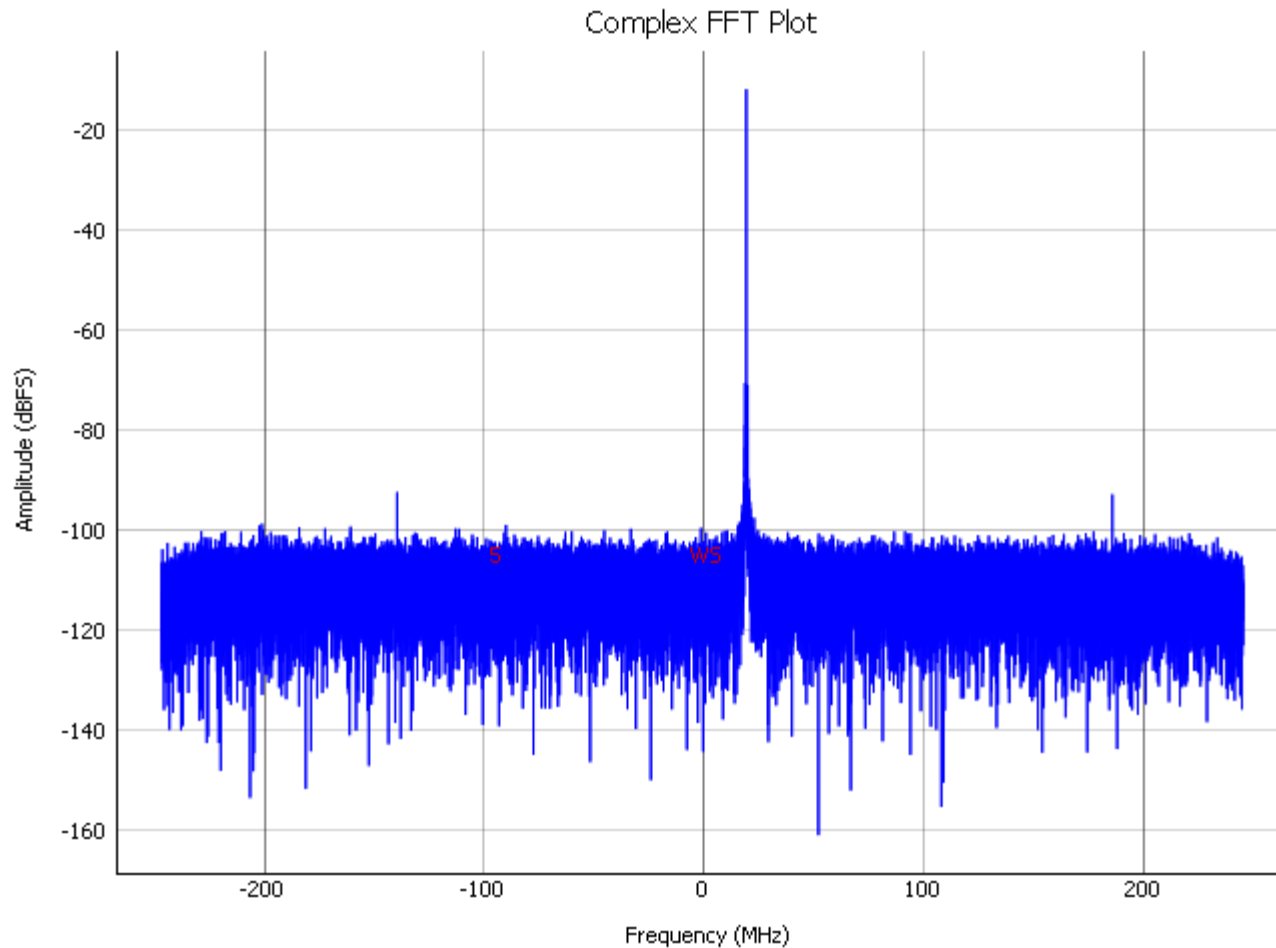
# RX C : SFDR at -6dBFS input

$$\text{SFDR} = 87.438\text{dBFS} = 81.438\text{dBc}$$



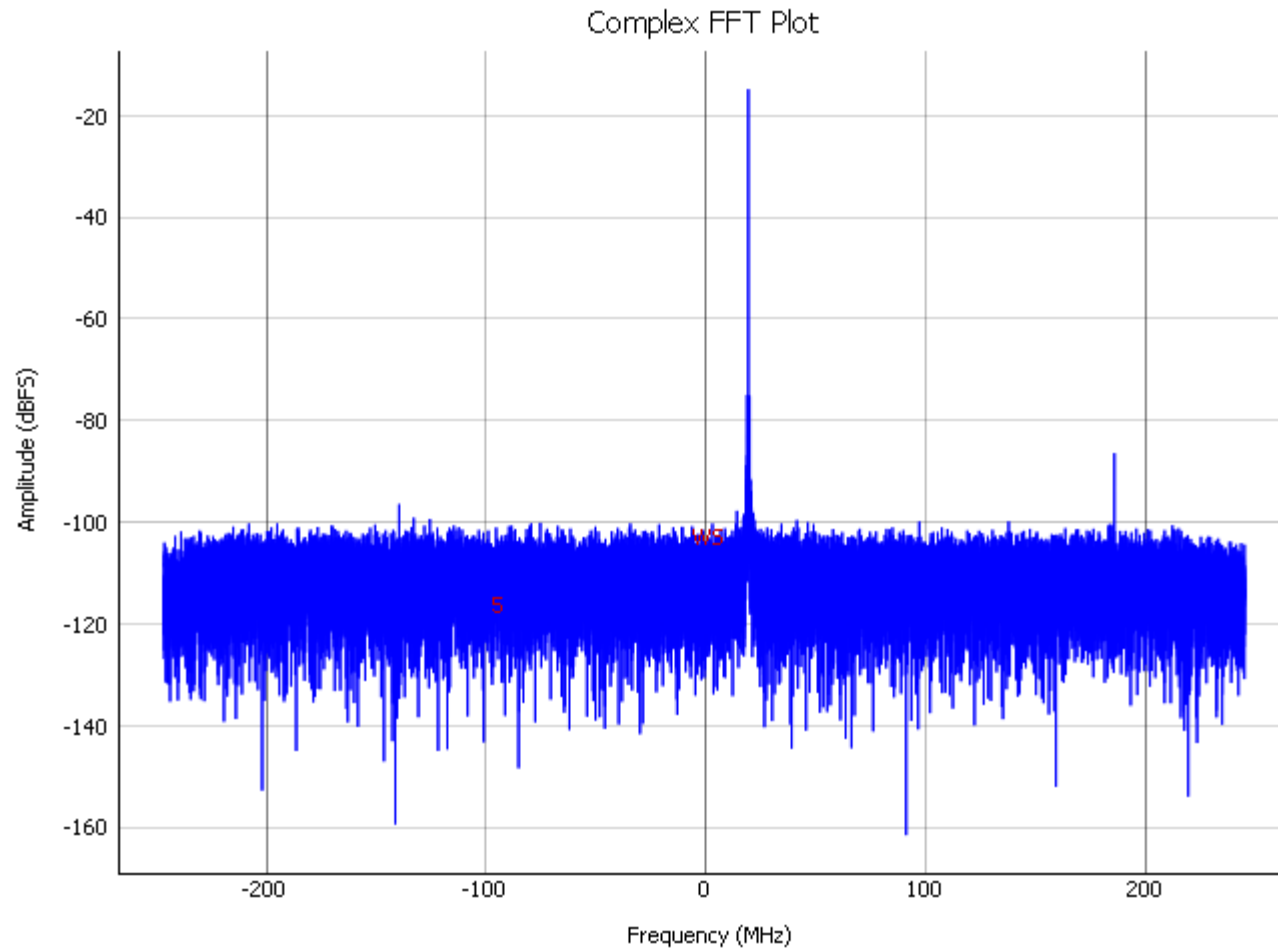
# RX C : SFDR at -12dBFS input

$$\text{SFDR} = 92.64\text{dBFS} = 80.64\text{dBc}$$

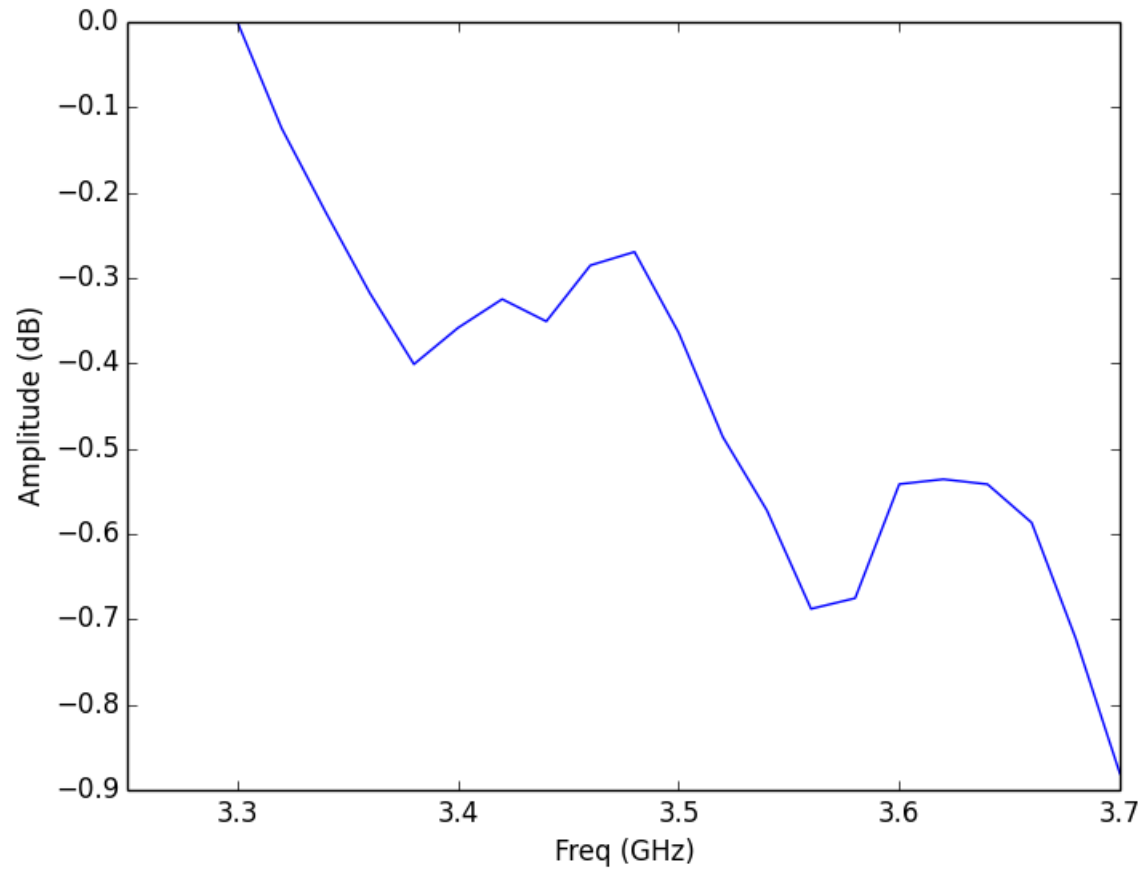


# RX C : SFDR at -15dBFS input

$$\text{SFDR} = 86.605\text{dBFS} = 71.605\text{dBc}$$



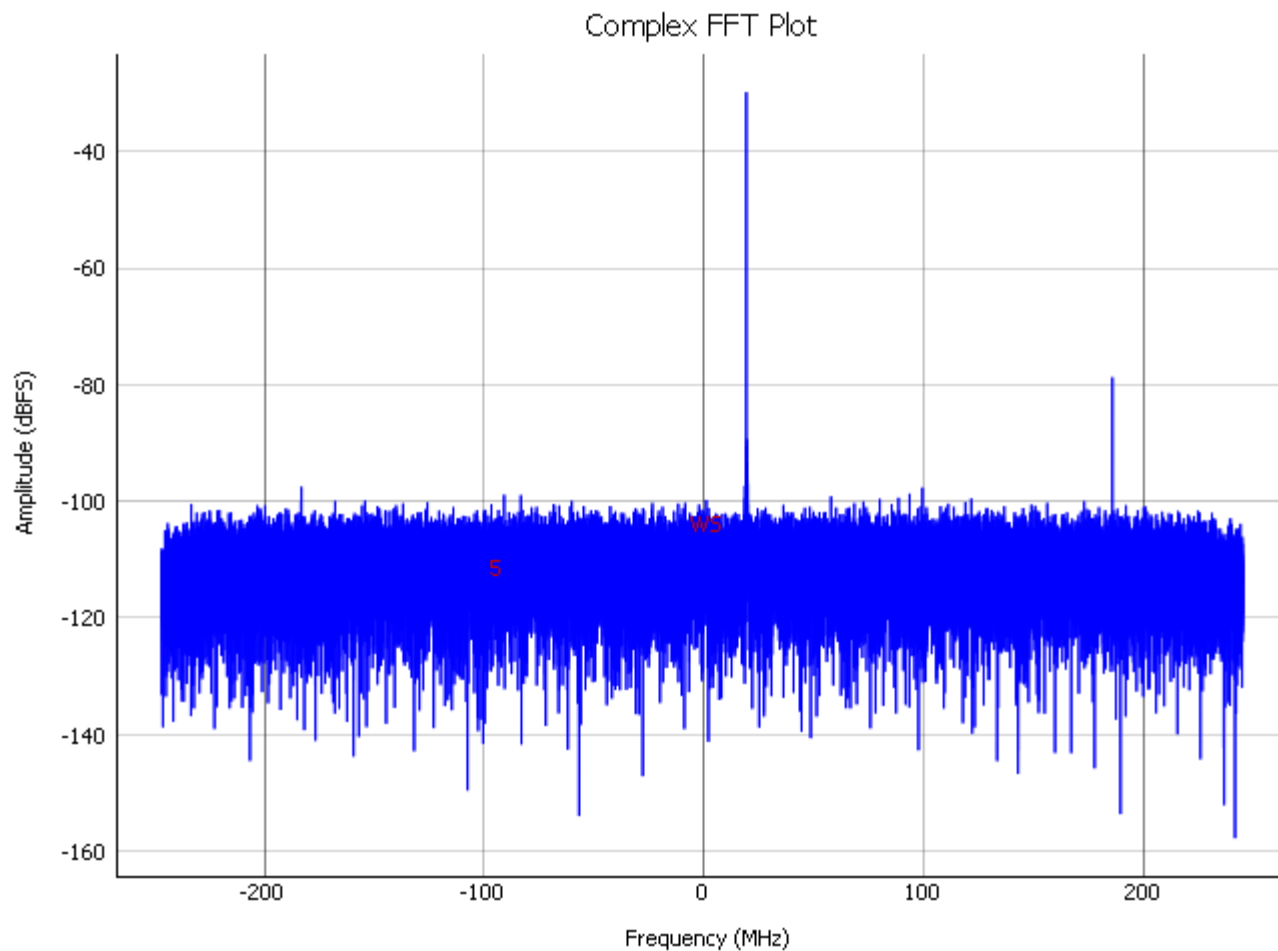
# RX C Flatness



# **RxD Performance 491.52Mhz IQ, 3.5G Band**

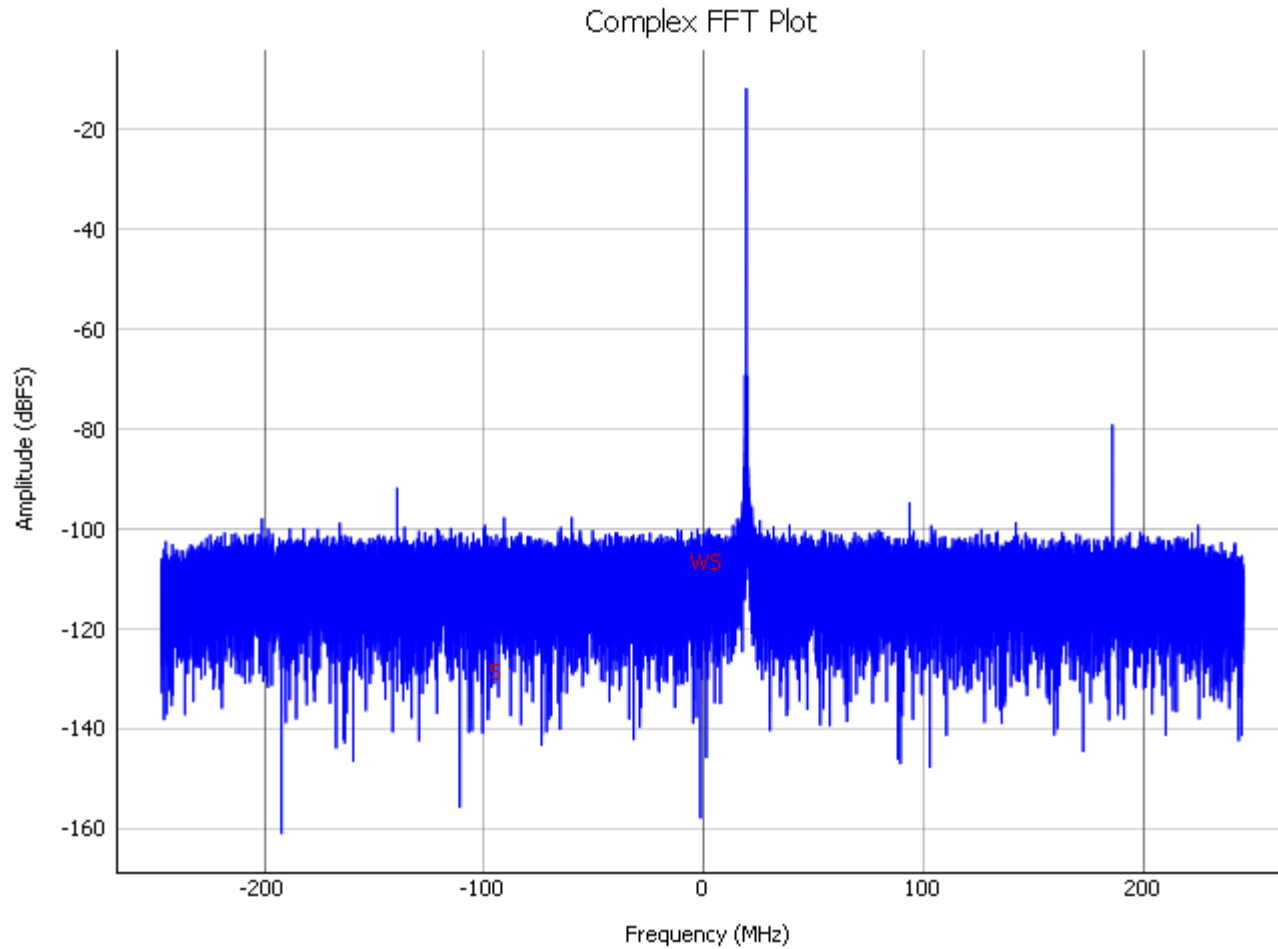
# RX D : SNR at -30dBFS input

SNR = 64.622dBFS ; NSD = 151.537dBFS/sqrt(Hz)



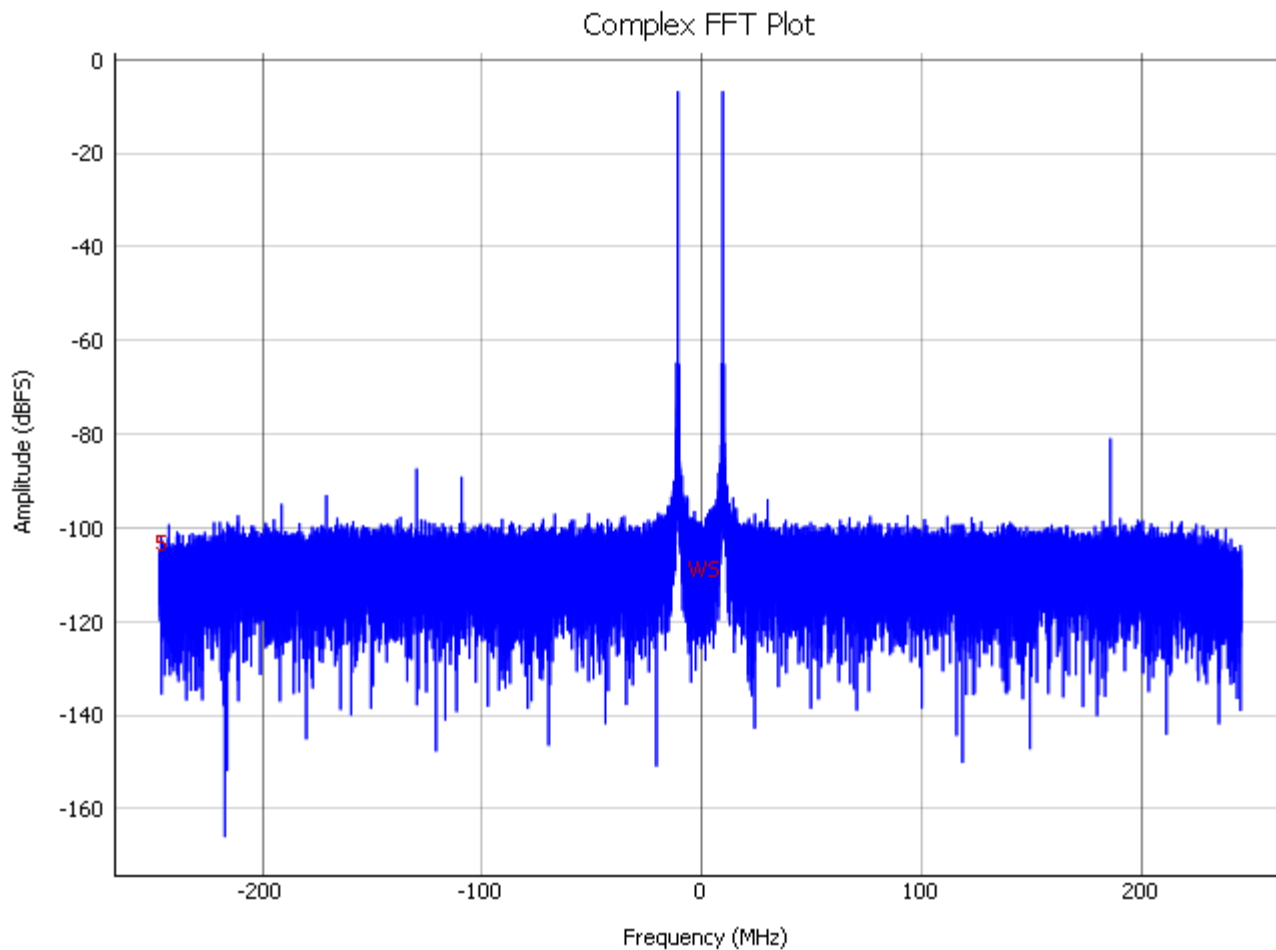
# RX D : SNR at -12dBFS input

SNR = 64.374dBFS ; NSD = 151.289dBFS/sqrt(Hz)



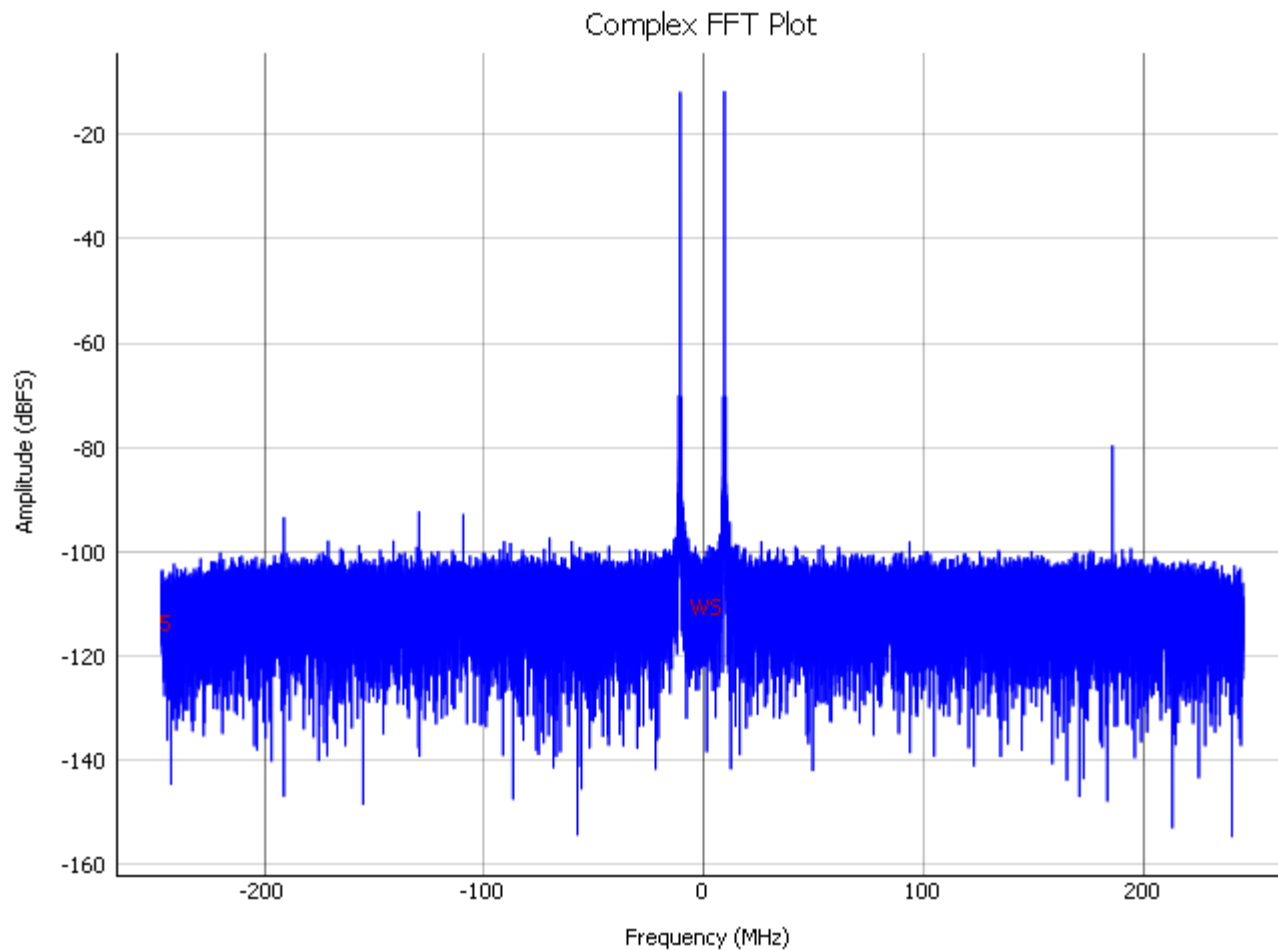
# RX D : IMD3 at -7dBFS input +/-10MHz

$$\text{IMD3} = -94.103\text{dBFS} = -87.103\text{dBc}$$



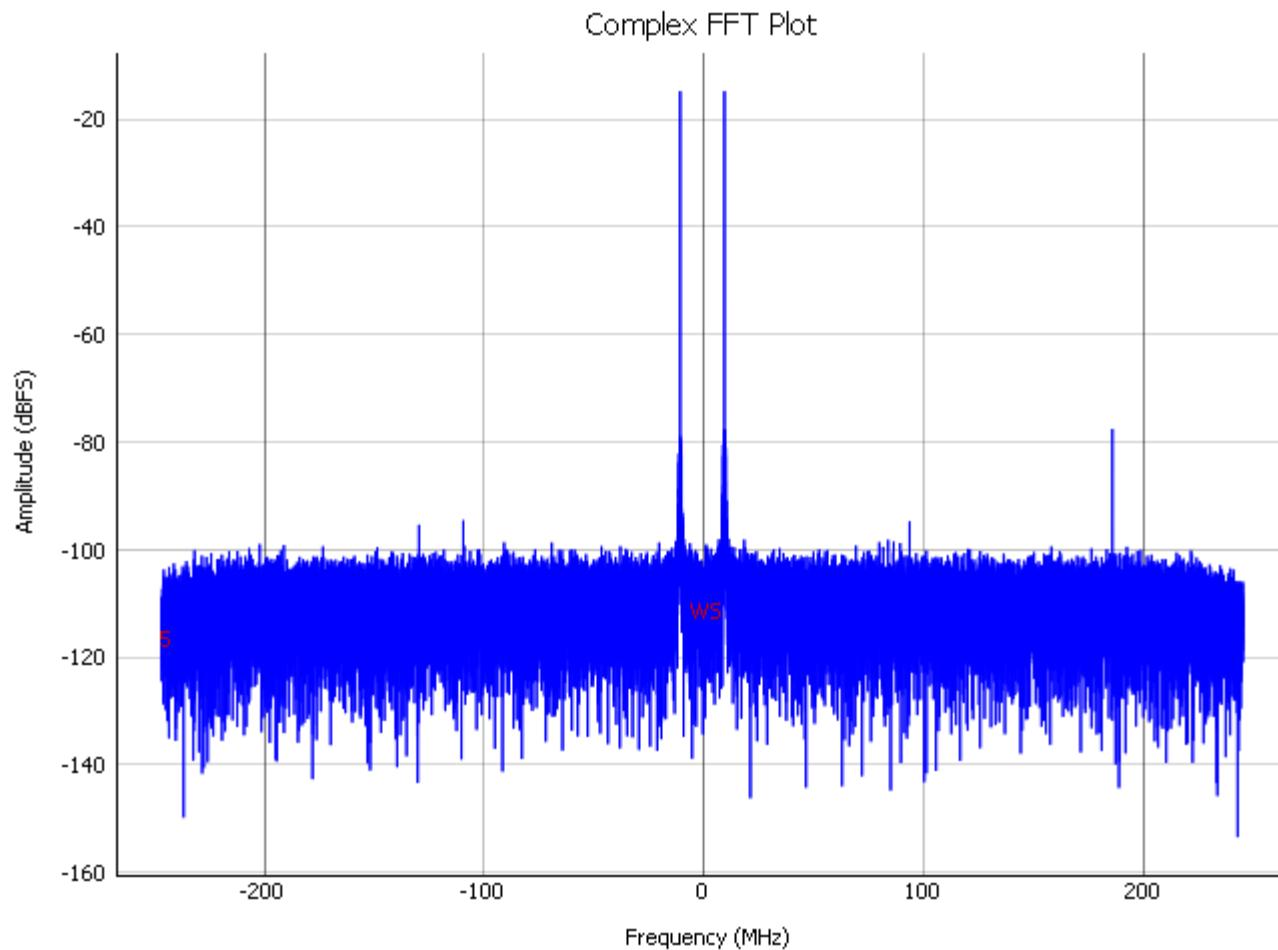
# RX D : IMD3 at -12dBFS input +/-10MHz

$$\text{IMD3} = -99.65\text{dBFS} = -87.65\text{dBc}$$



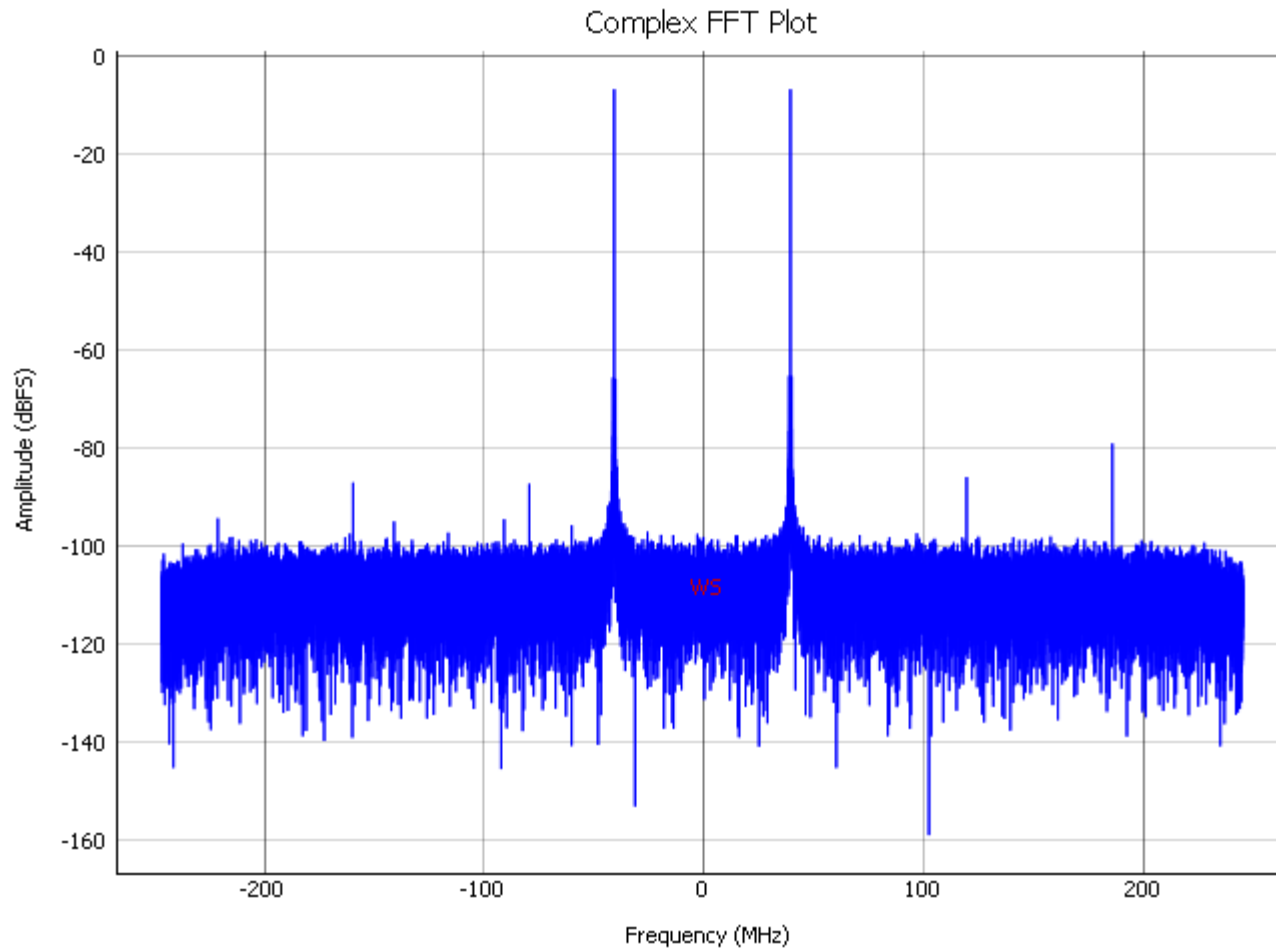
# RX D : IMD3 at -15dBFS input +/-10MHz

$$\text{IMD3} = -101.572\text{dBFS} = -86.572\text{dBc}$$



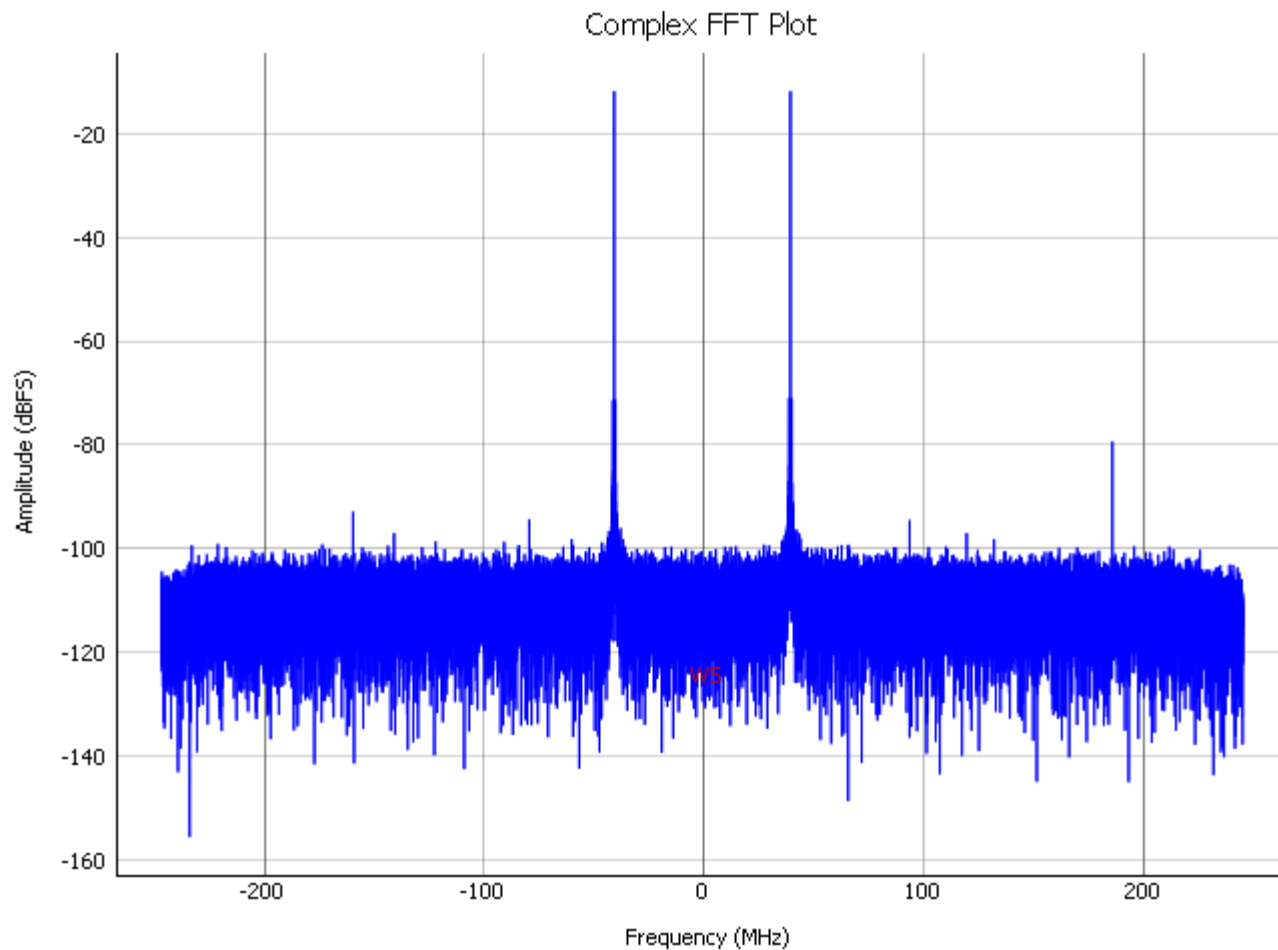
# RX D : IMD3 at -7dBFS input +/-40MHz

IMD3 = -86.053dBFS = -79.053dBc



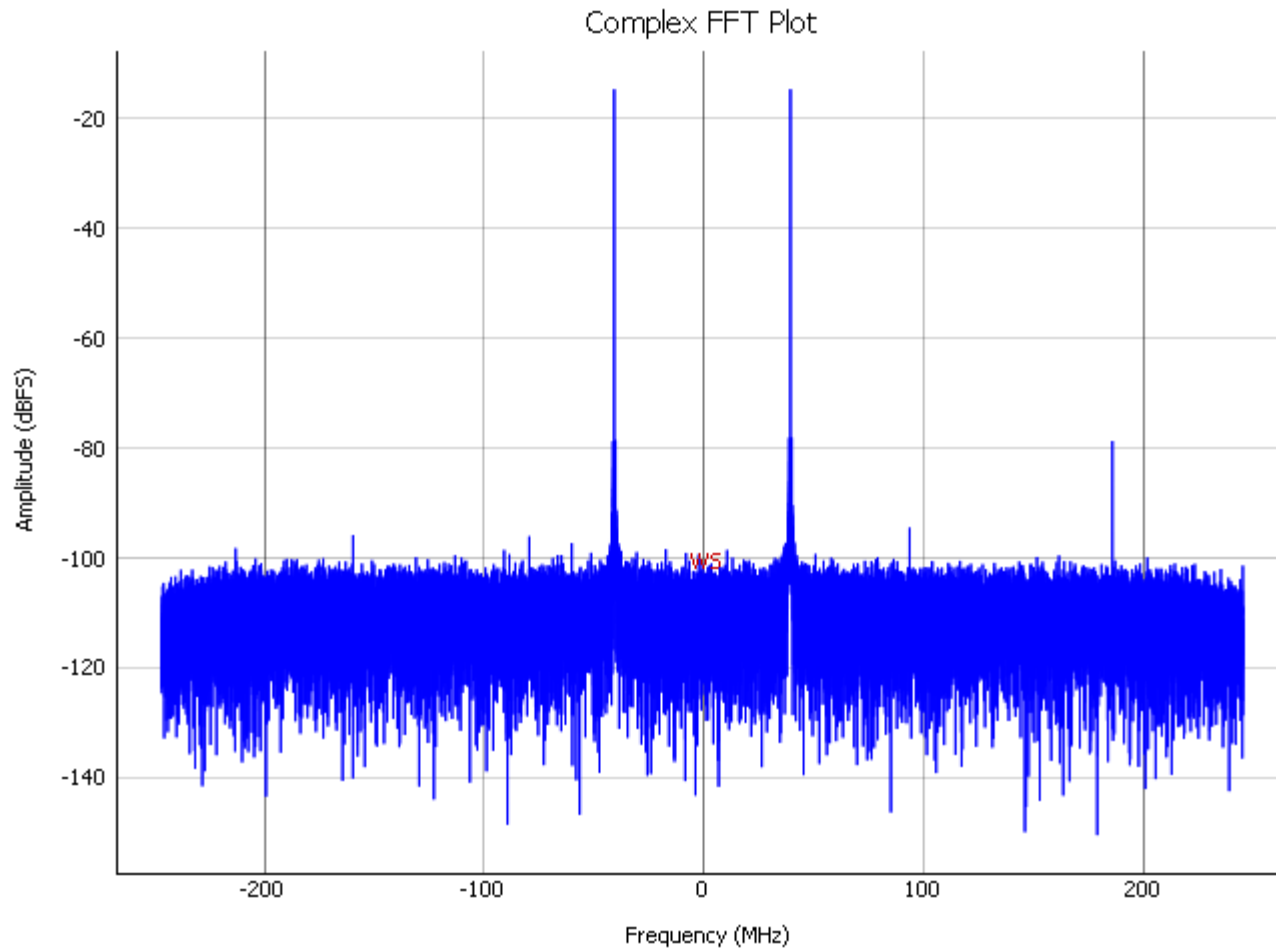
# RX D : IMD3 at -12dBFS input +/-40MHz

IMD3 = -97.182dBFS = -85.182dBc



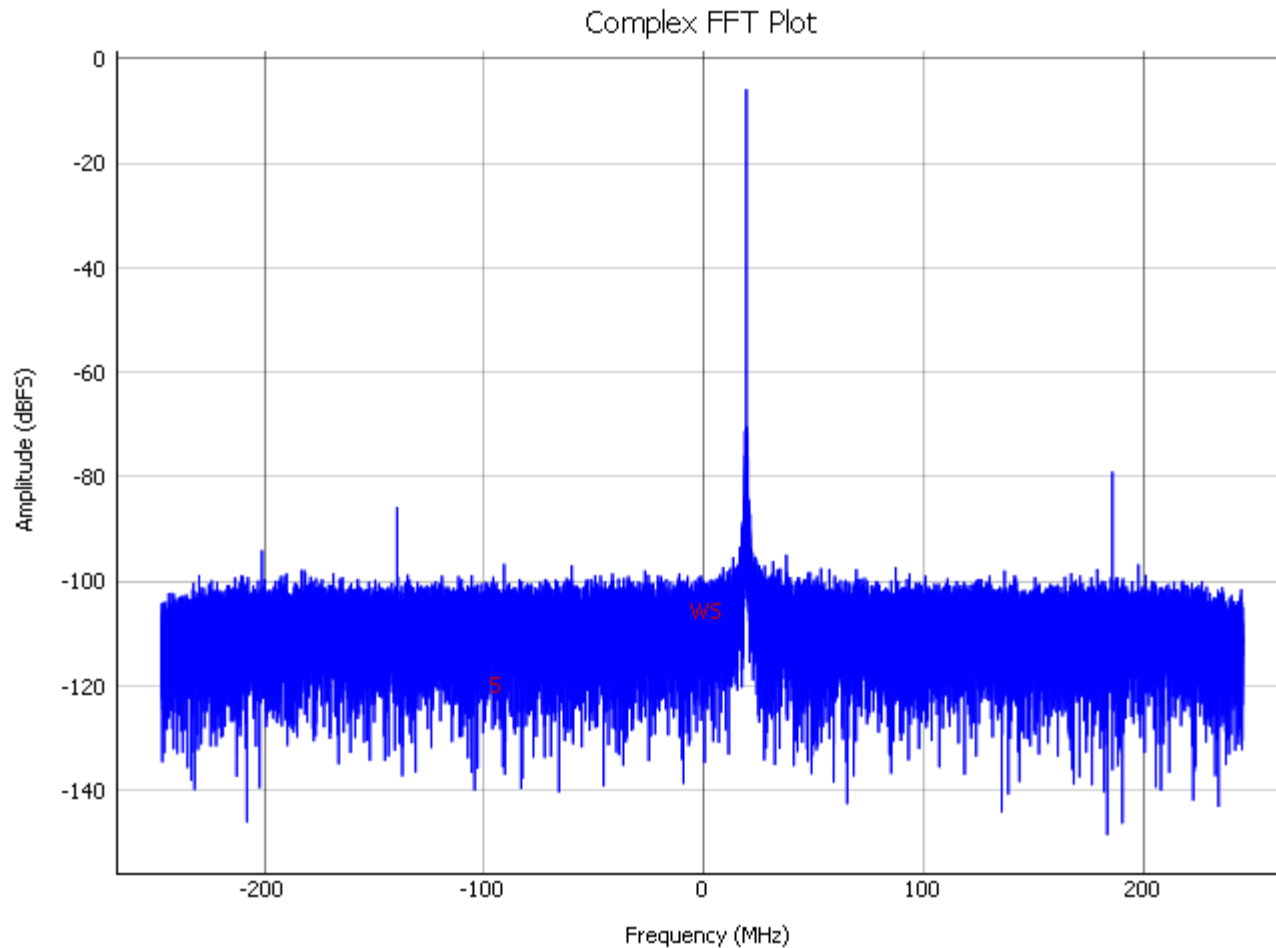
# RX D : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -102.171\text{dBFS} = -87.171\text{dBc}$$



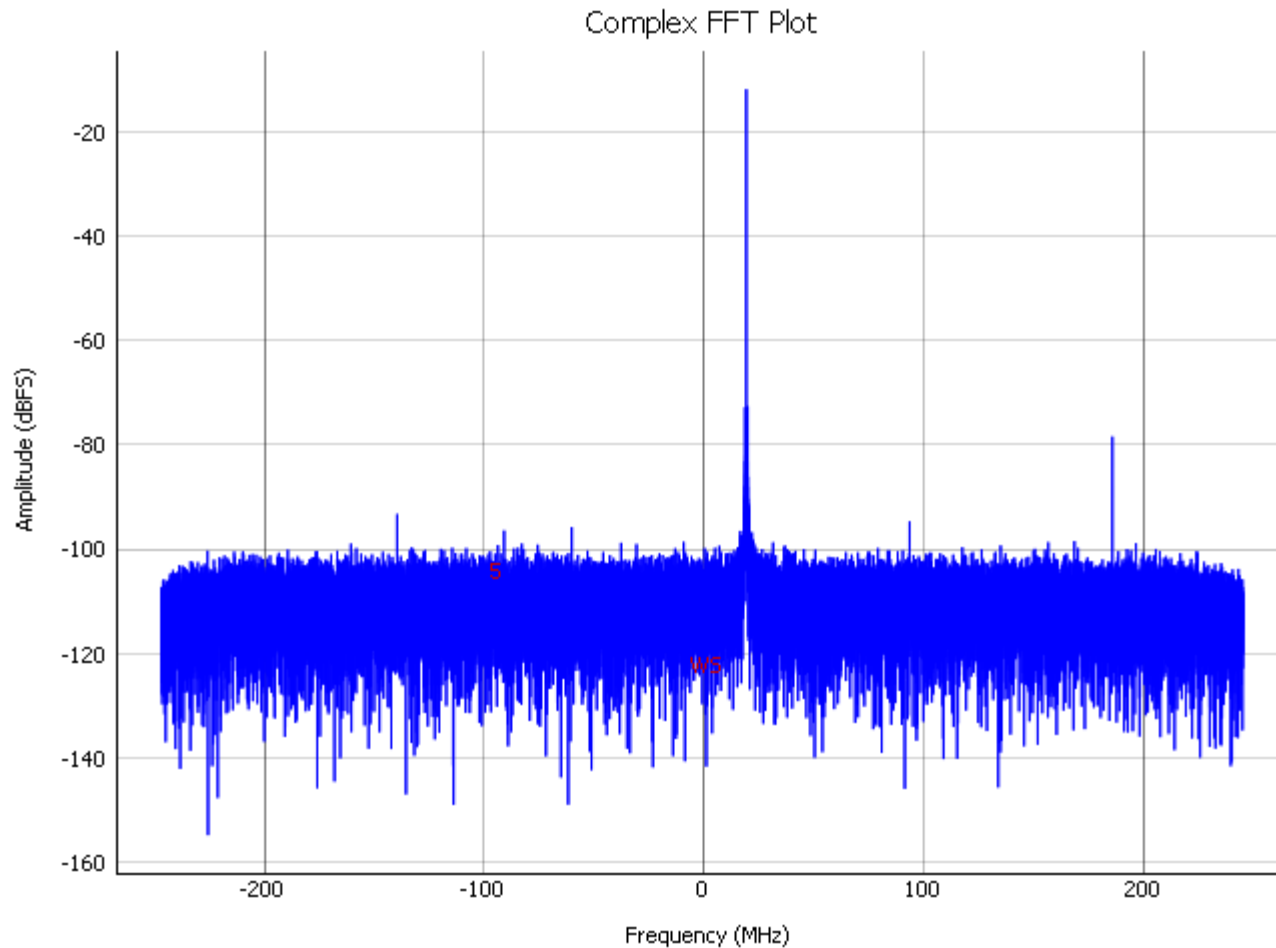
# RX D : SFDR at -6dBFS input

$$\text{SFDR} = 79.241\text{dBFS} = 73.241\text{dBc}$$



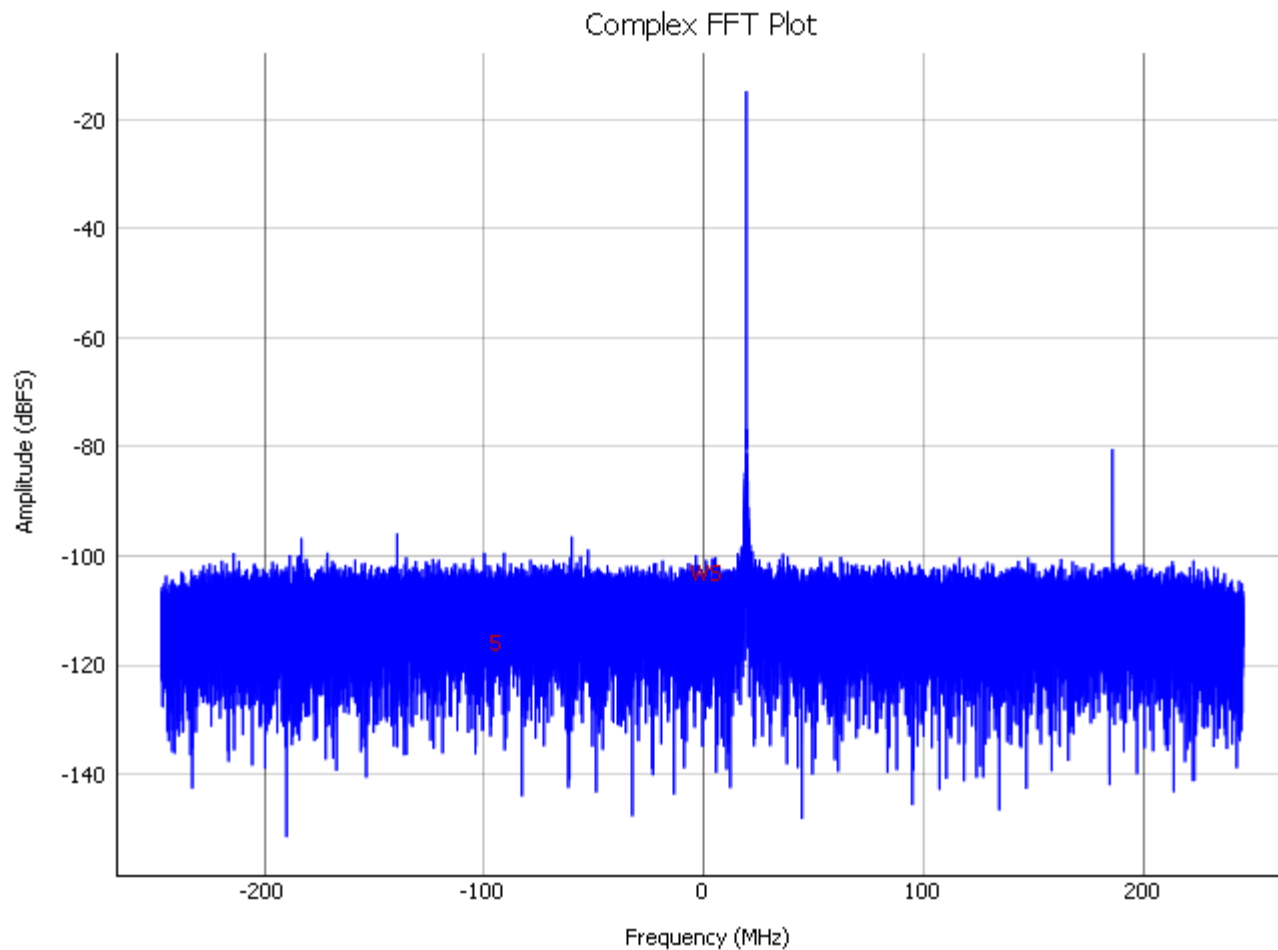
# RX D : SFDR at -12dBFS input

SFDR = 78.576dBFS = 66.576dBc

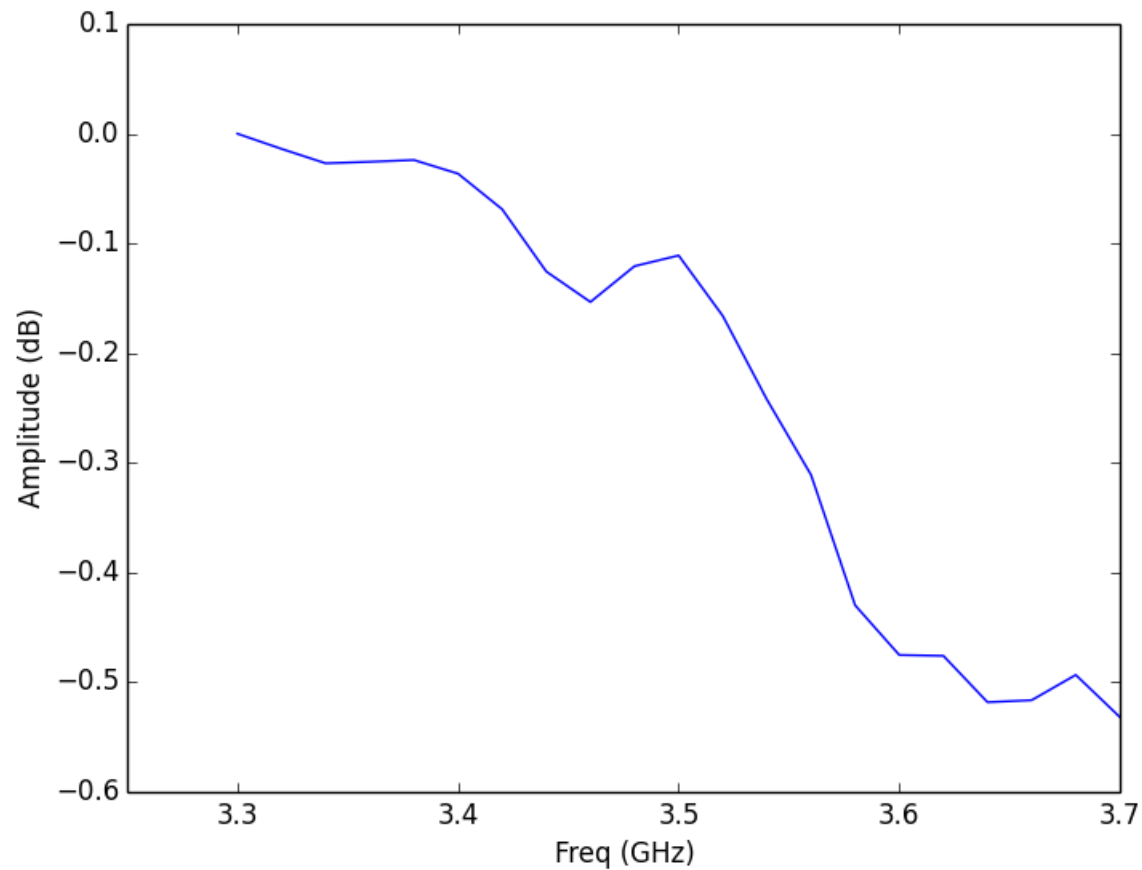


# RX D : SFDR at -15dBFS input

SFDR = 80.6dBFS = 65.6dBc



# RX D Flatness



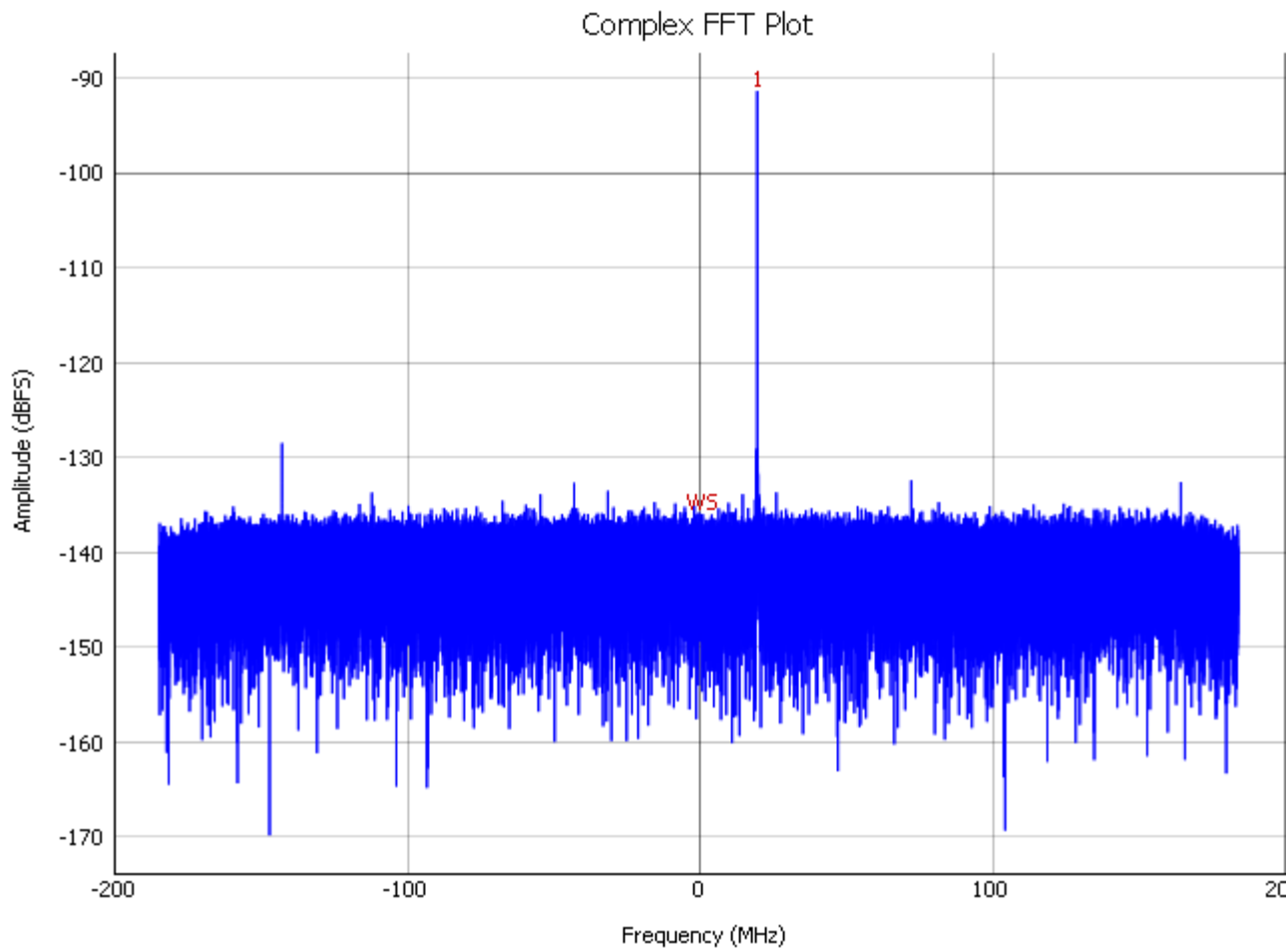
# **AFE79xx RX : 2.6Ghz Band**

# Test Setup

- Freq bands: 2.5~2.7GHz,
- Mode:368.64Mhz IQ
- SNR calculated from I+jQ spectrum
- Decimation filter Rx plots are added
- Flatness, SNR and IMD3 plots added

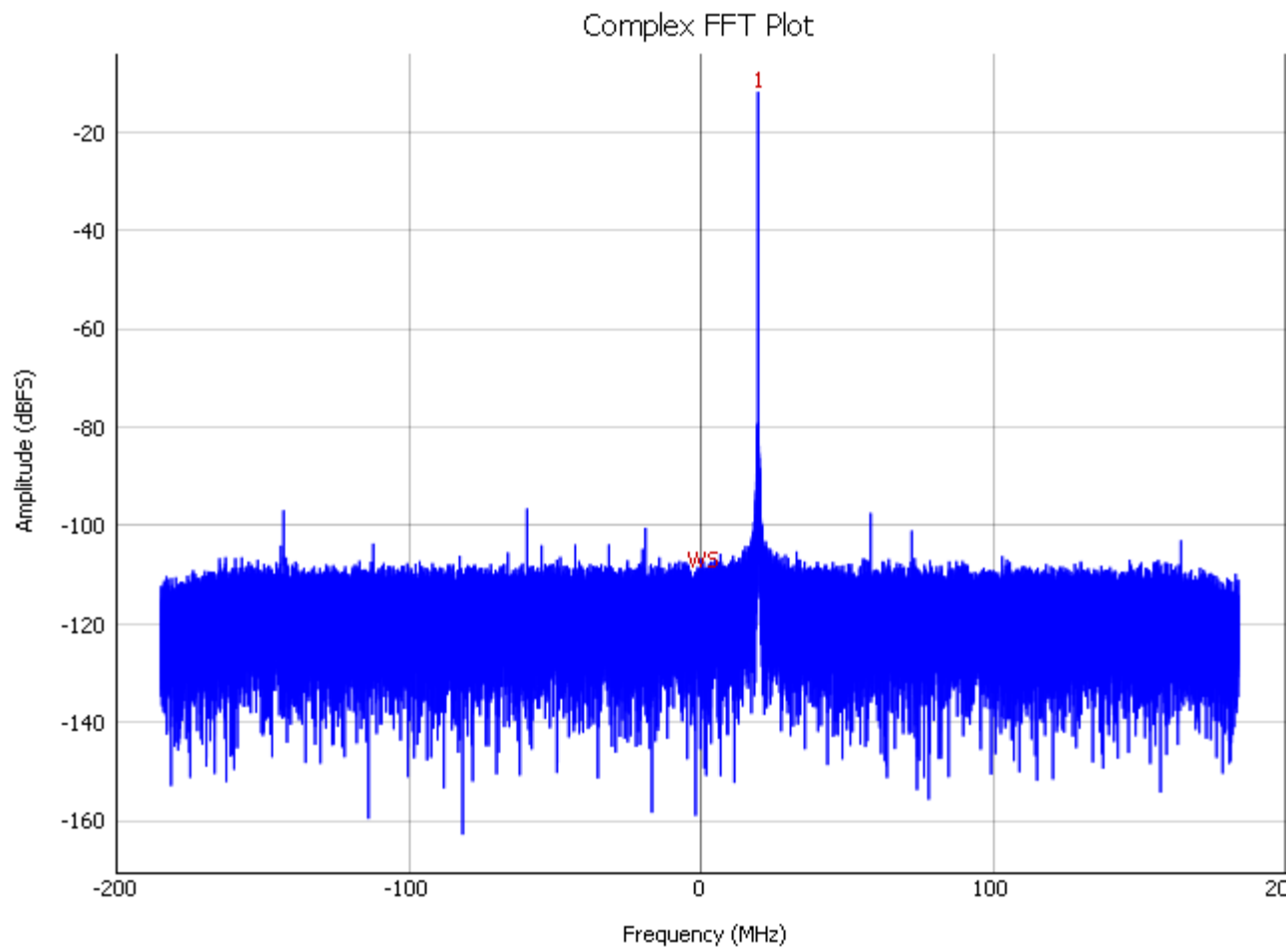
# RX A : SNR at -30dBFS input

SNR = 69.582dBFS ; NSD = 155.248dBFS/sqrt(Hz)



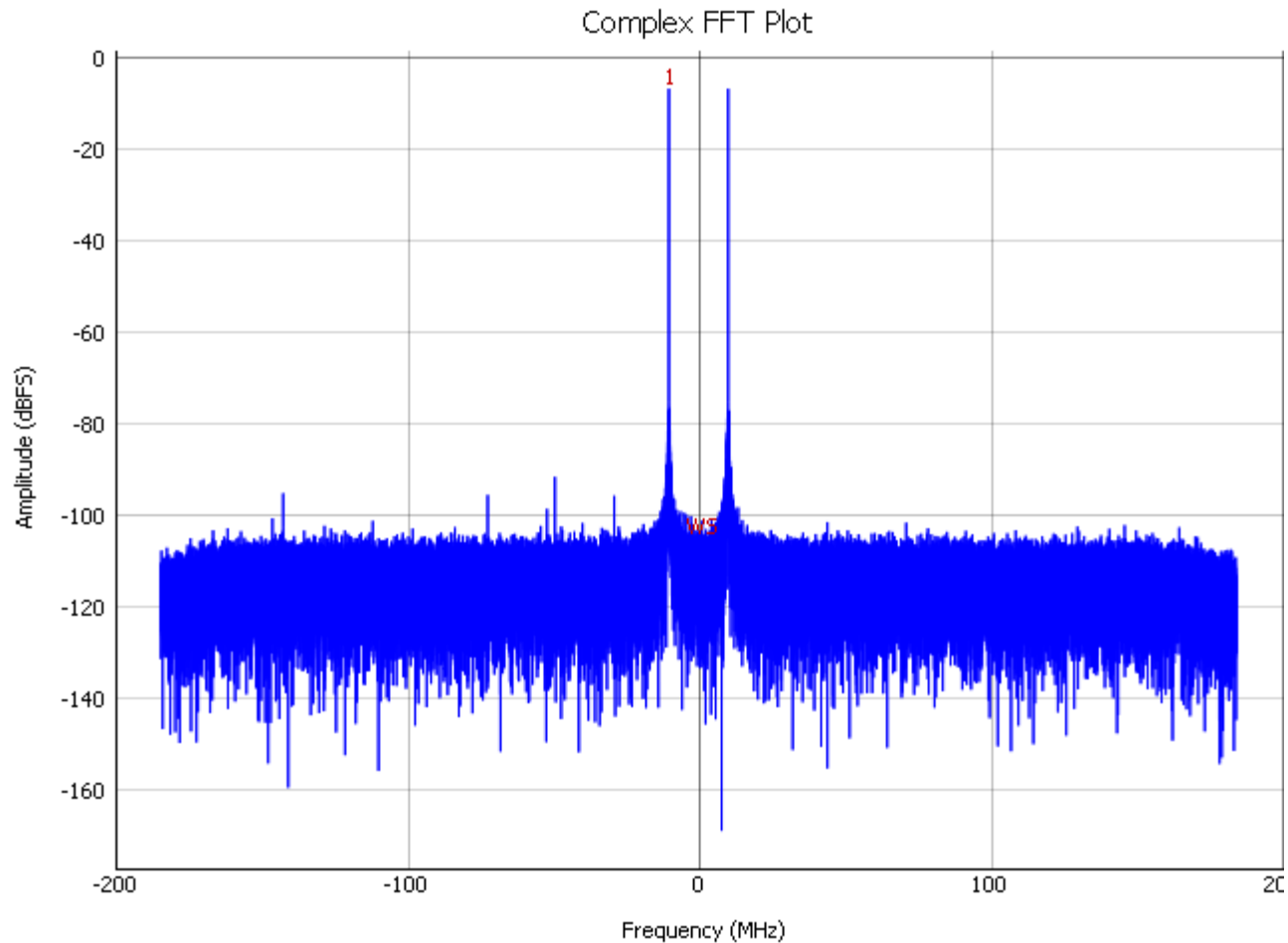
# RX A : SNR at -12dBFS input

SNR = 68.14dBFS ; NSD = 153.806dBFS/sqrt(Hz)



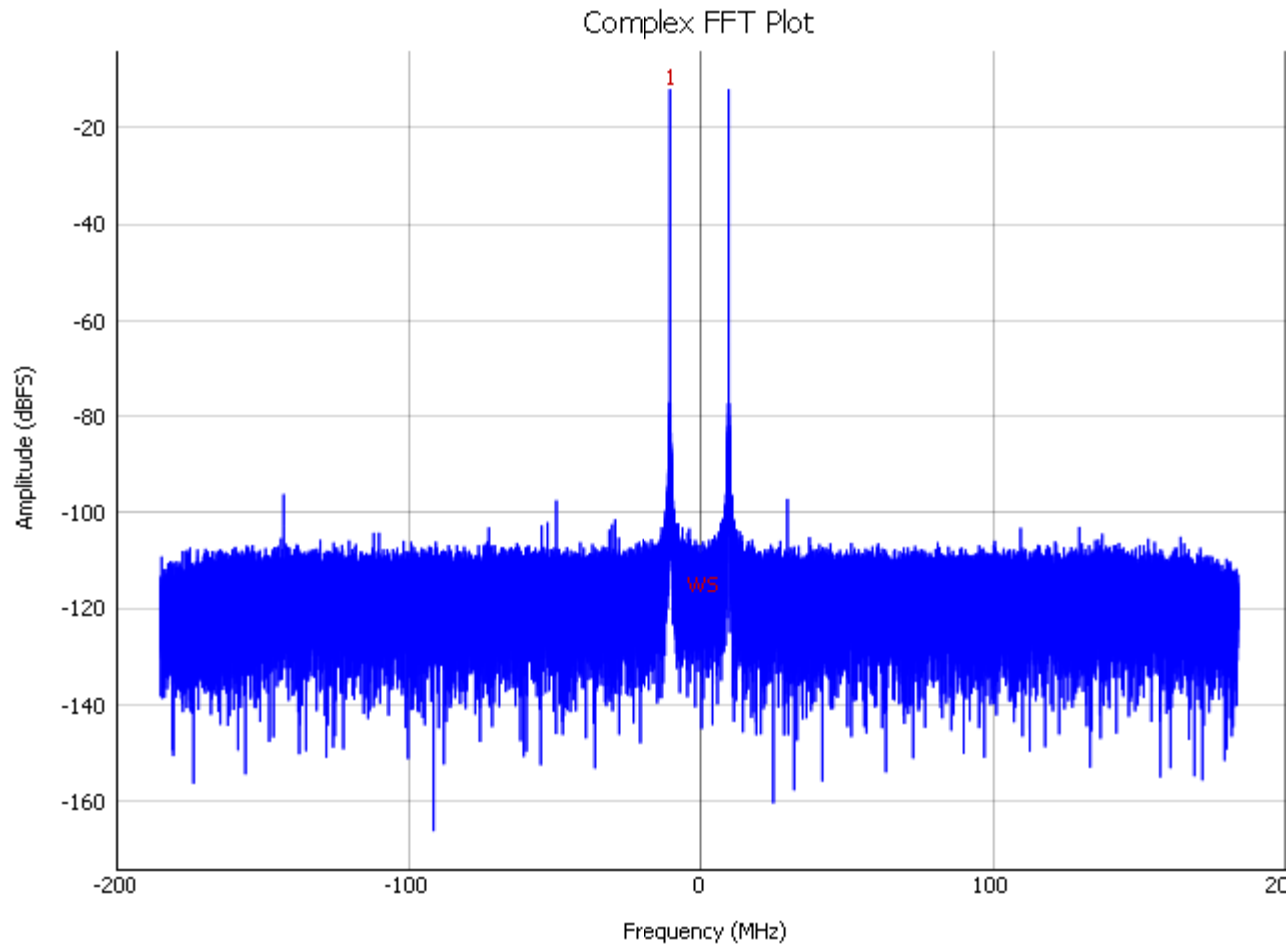
# RX A : IMD3 at -7dBFS input +/-10MHz

$$\text{IMD3} = -104.411\text{dBFS} = -97.411\text{dBc}$$



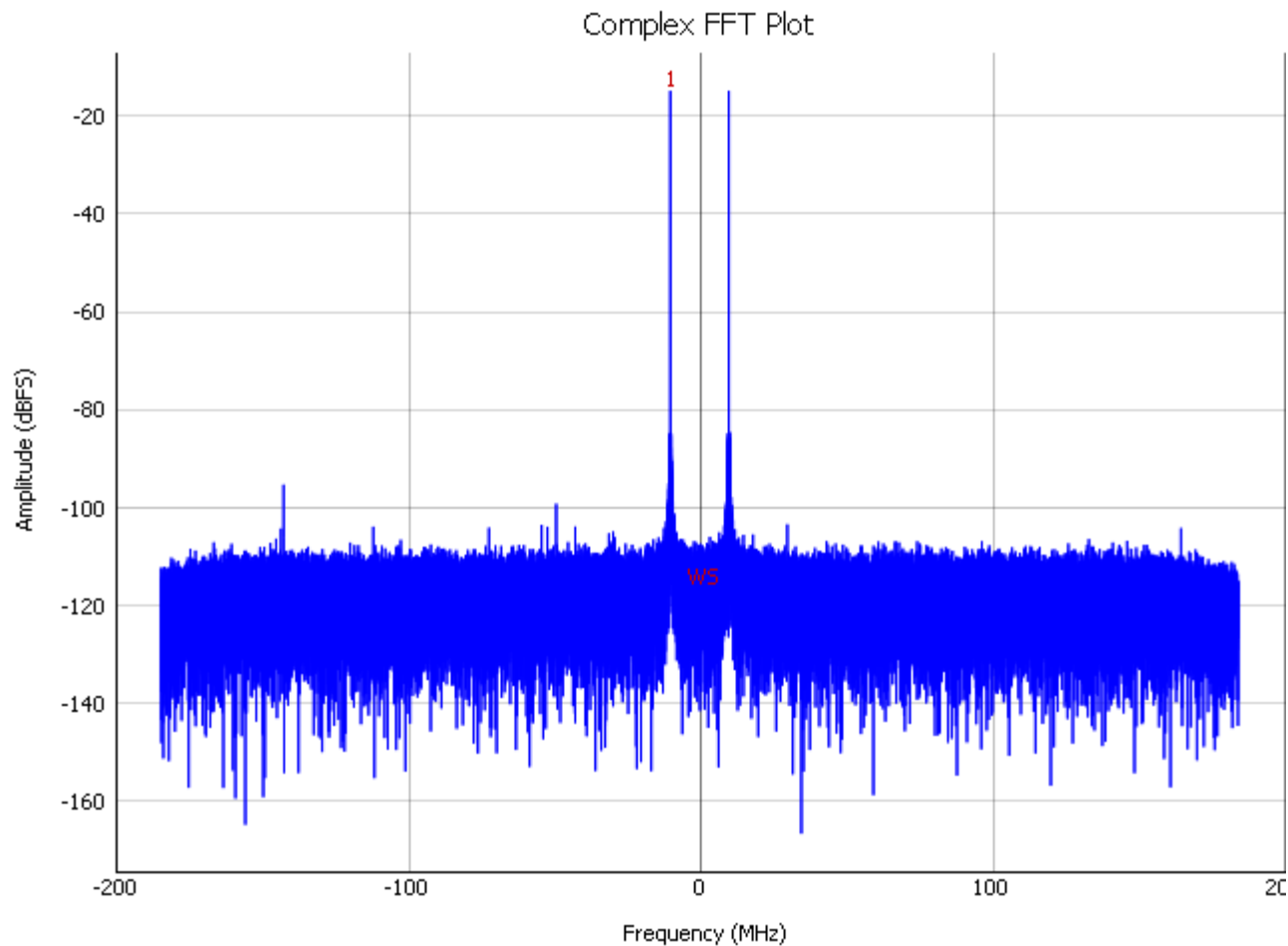
# RX A : IMD3 at -12dBFS input +/-10MHz

IMD3 = -97.365dBFS = -85.365dBc



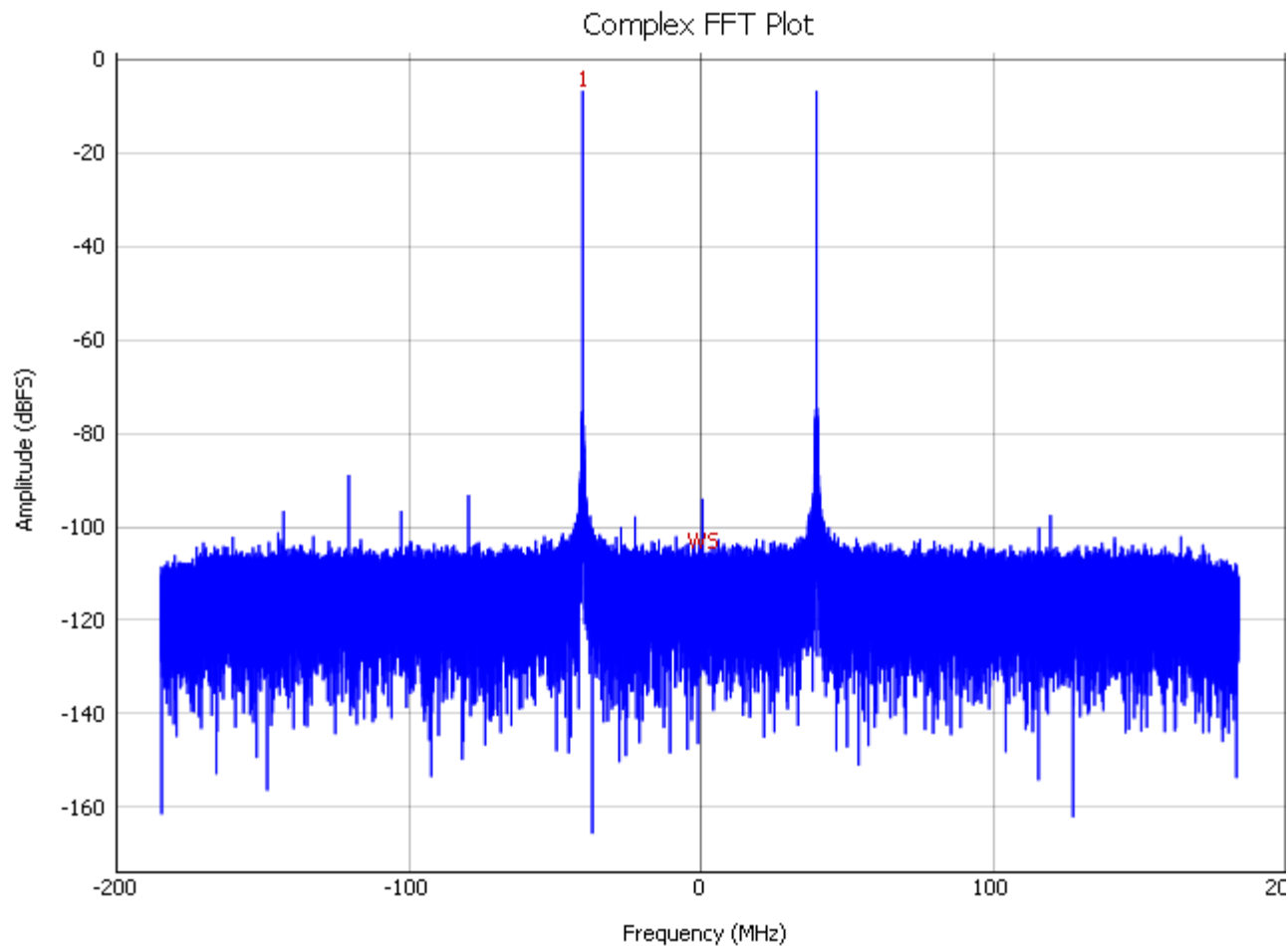
# RX A : IMD3 at -15dBFS input +/-10MHz

IMD3 = -103.662dBFS = -88.662dBc



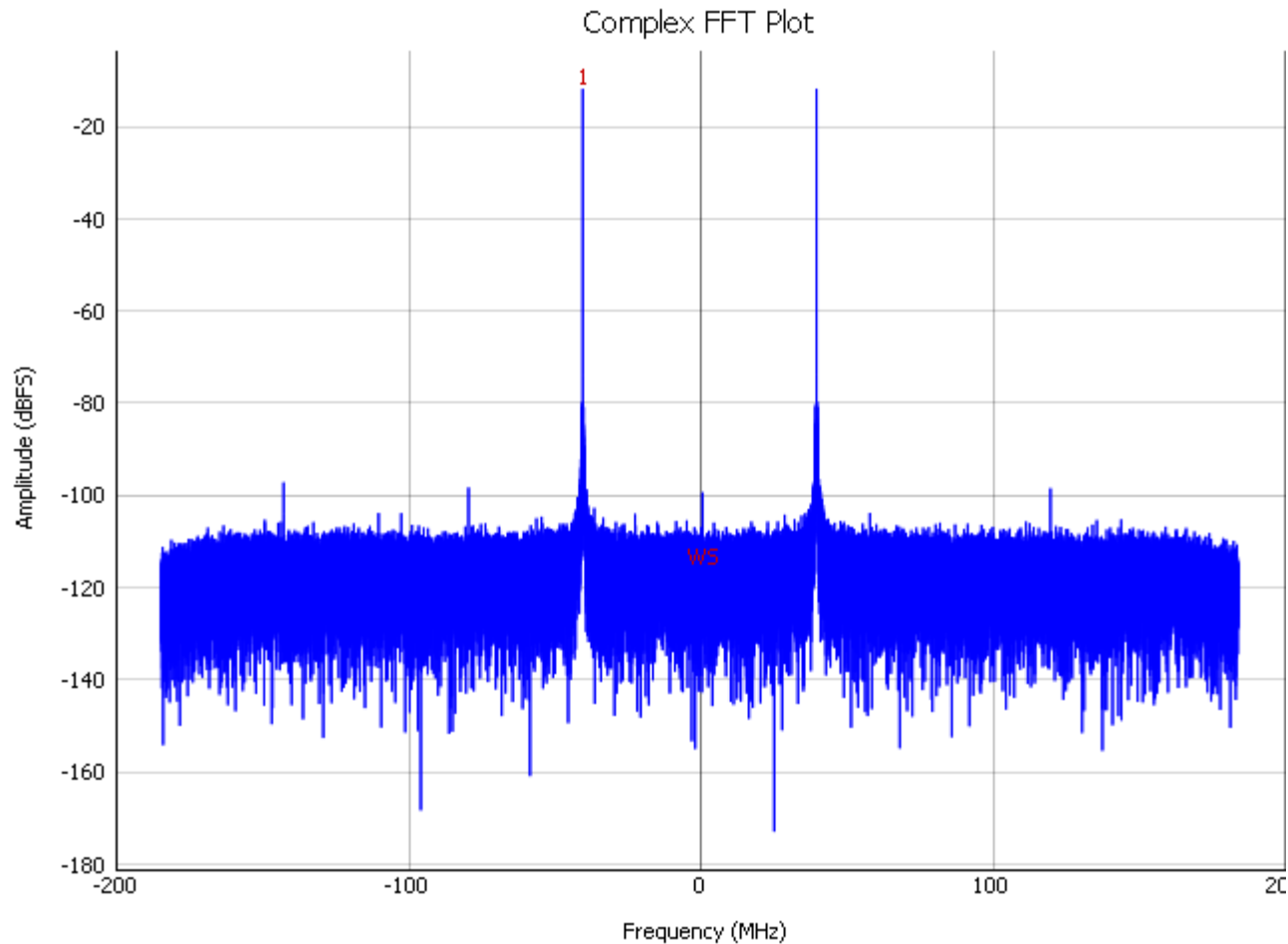
# RX A : IMD3 at -7dBFS input +/-40MHz

IMD3 = -89.123dBFS = -82.123dBc



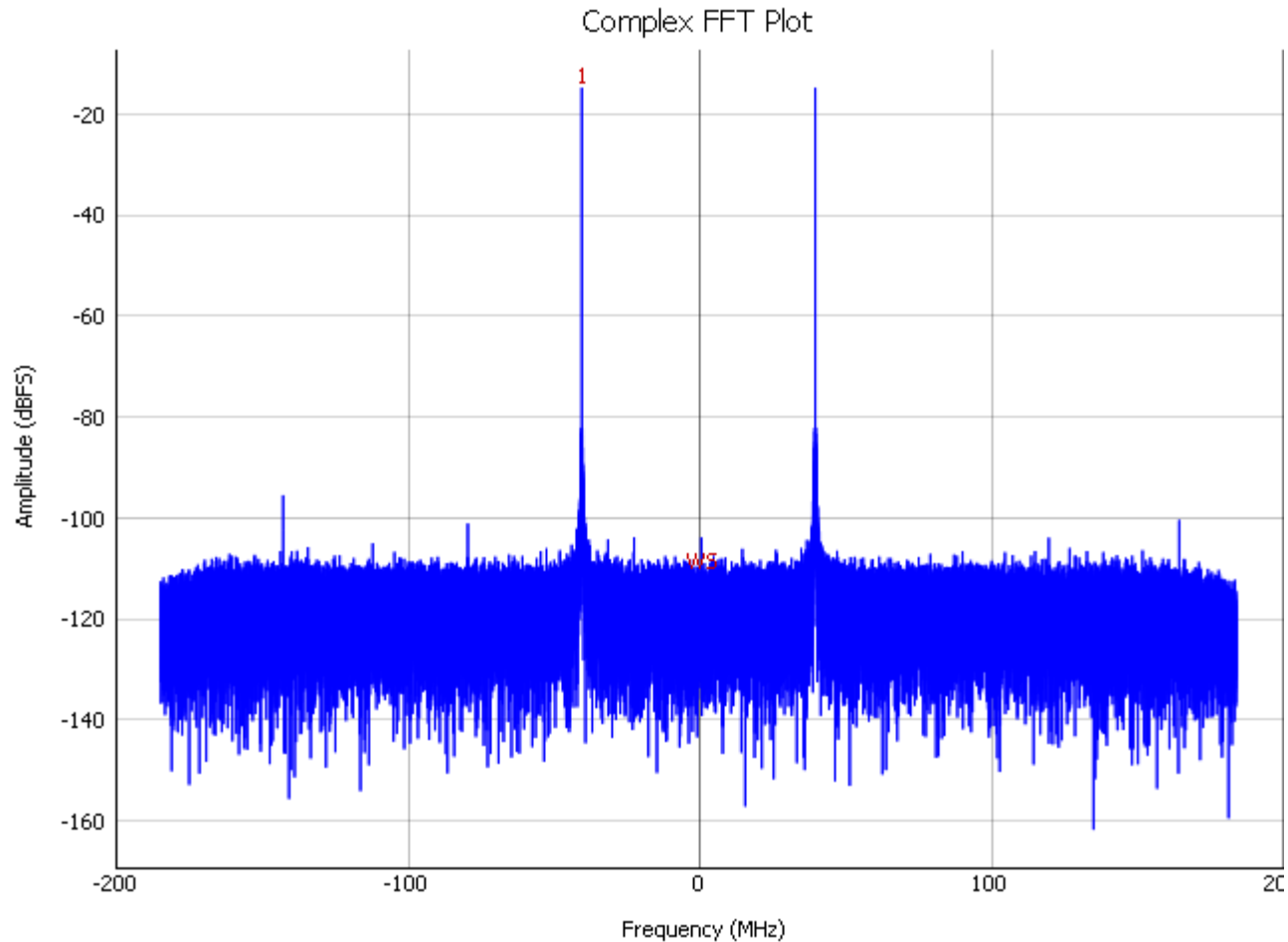
# RX A : IMD3 at -12dBFS input +/-40MHz

IMD3 = -98.705dBFS = -86.705dBc



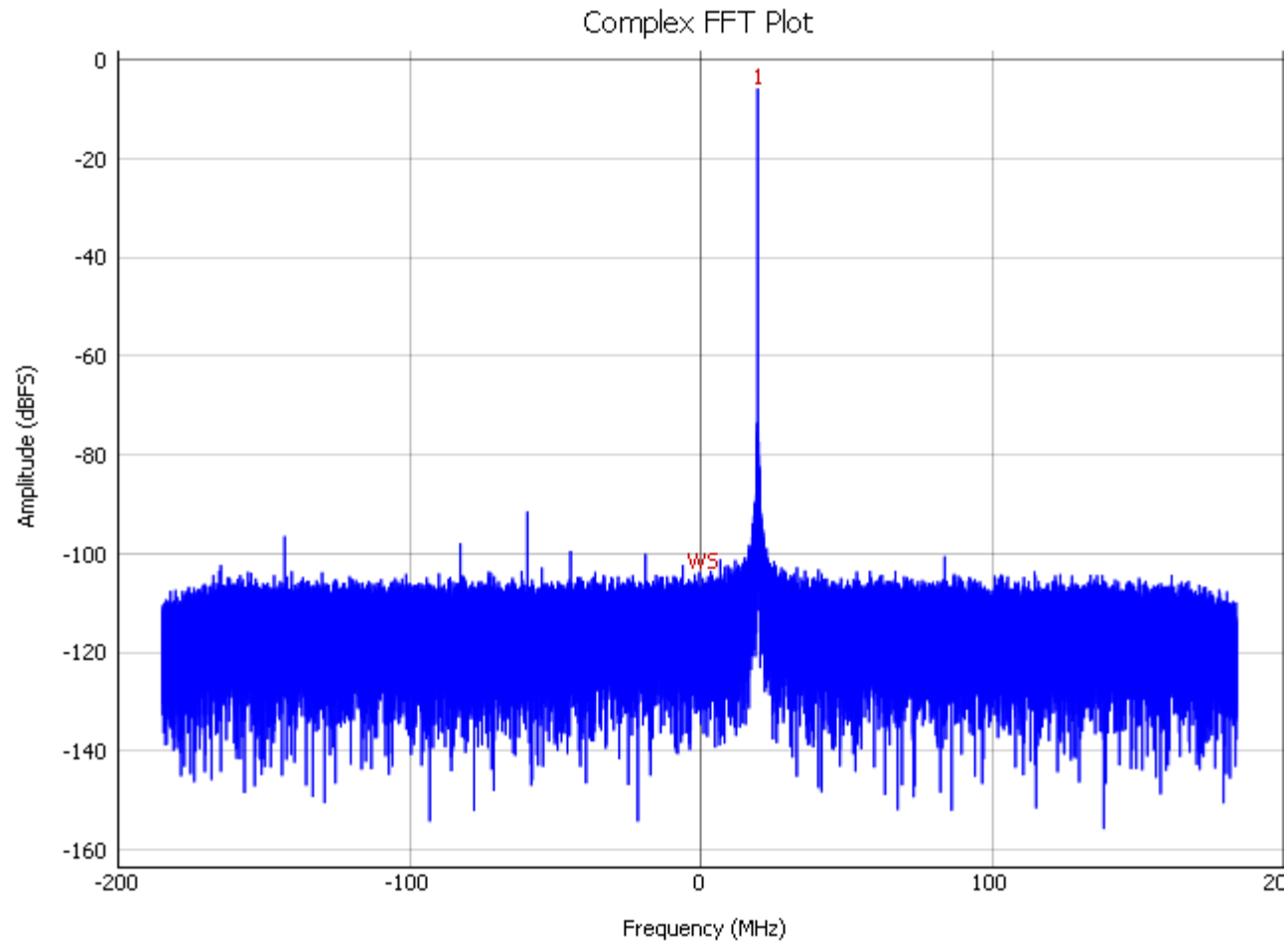
# RX A : IMD3 at -15dBFS input +/-40MHz

IMD3 = -104.106dBFS = -89.106dBc



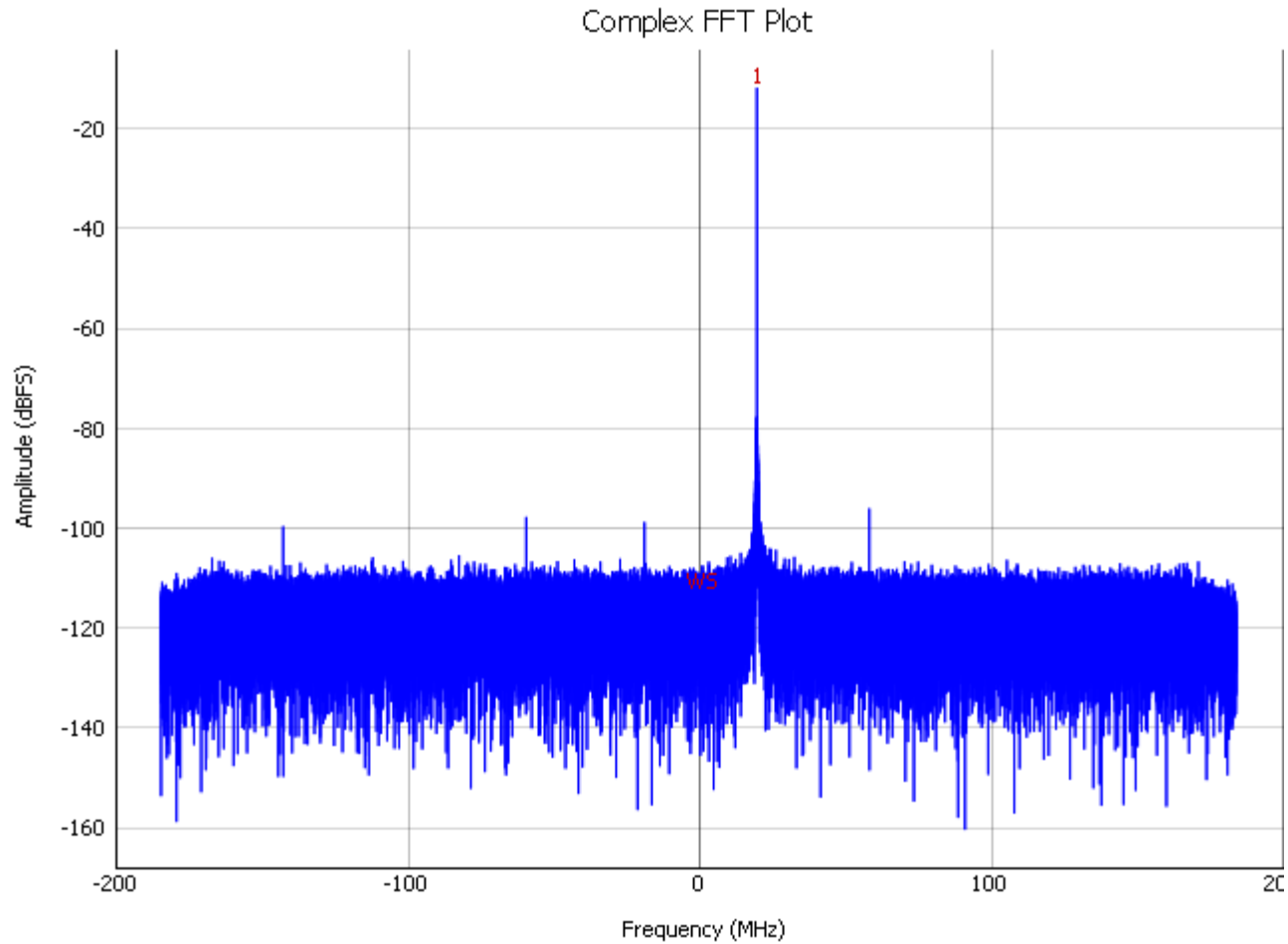
# RX A : SFDR at -6dBFS input

SFDR = 91.681dBFS = 85.681dBc



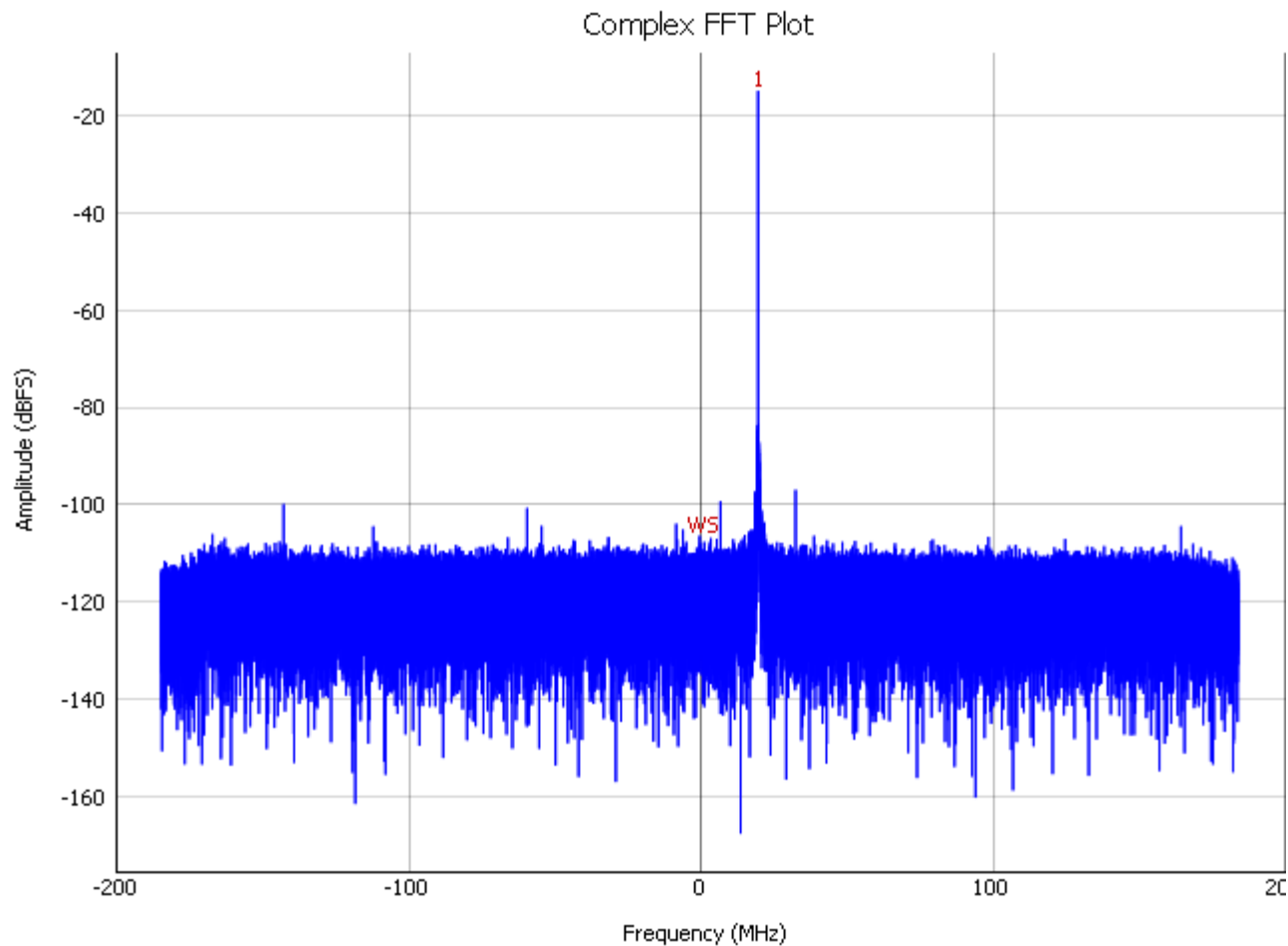
# RX A : SFDR at -12dBFS input

SFDR = 96.269dBFS = 84.269dBc

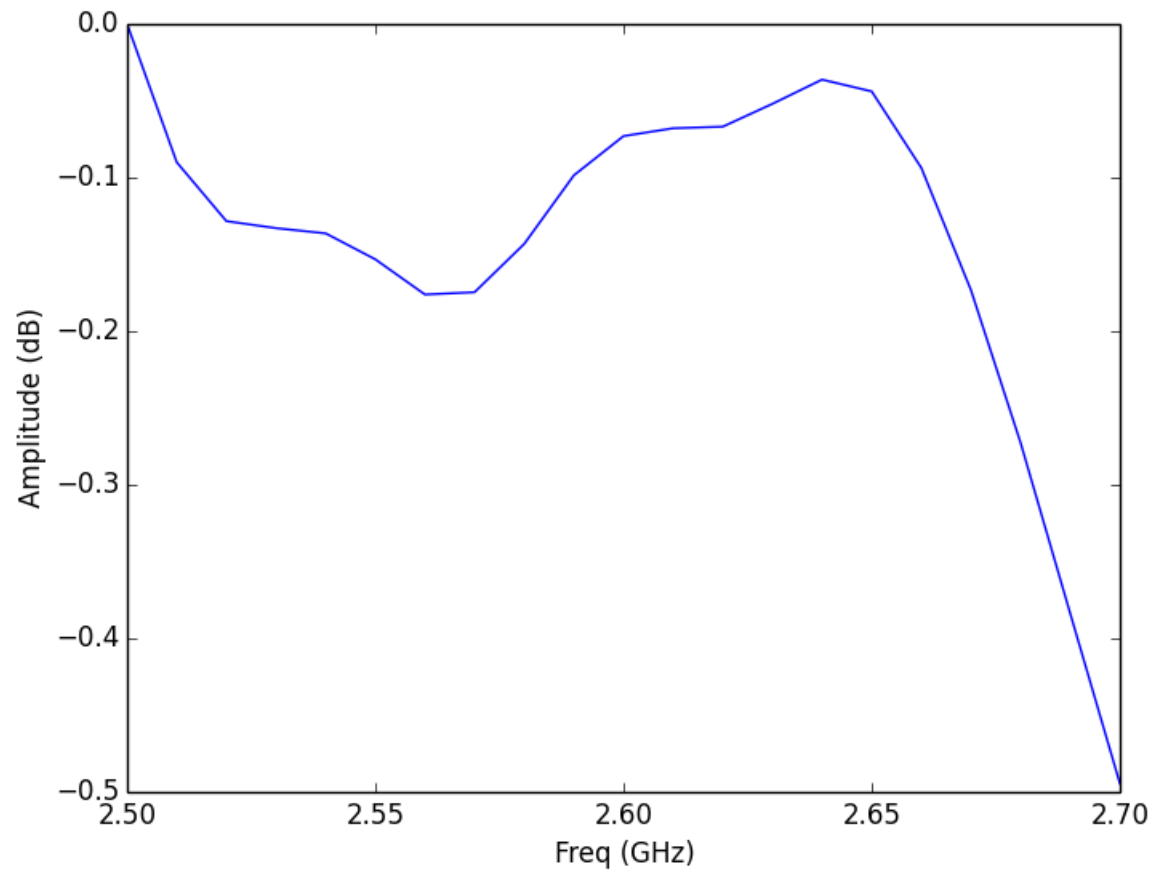


# RX A : SFDR at -15dBFS input

SFDR = 97.132dBFS = 82.132dBc

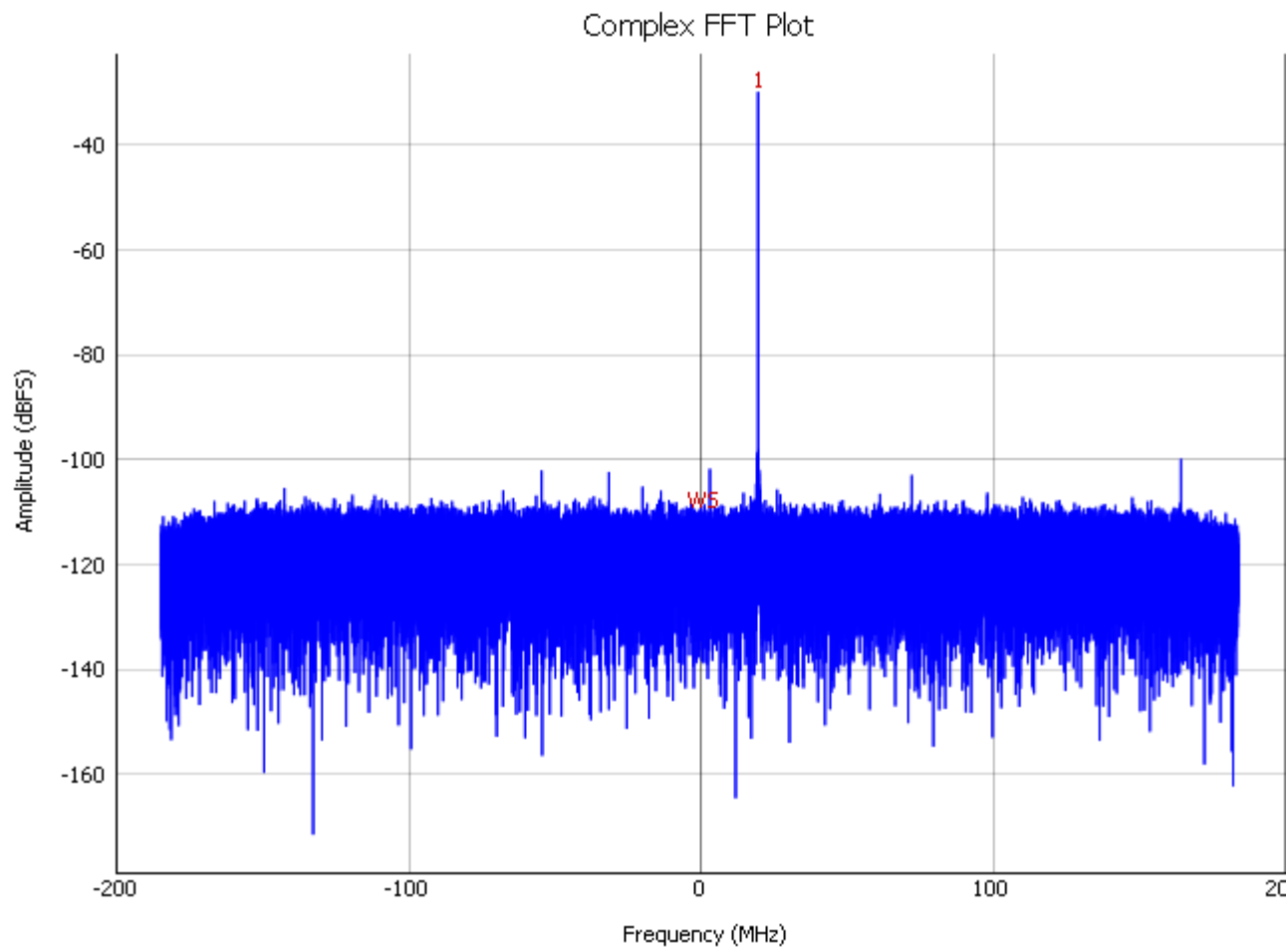


# RX A Flatness



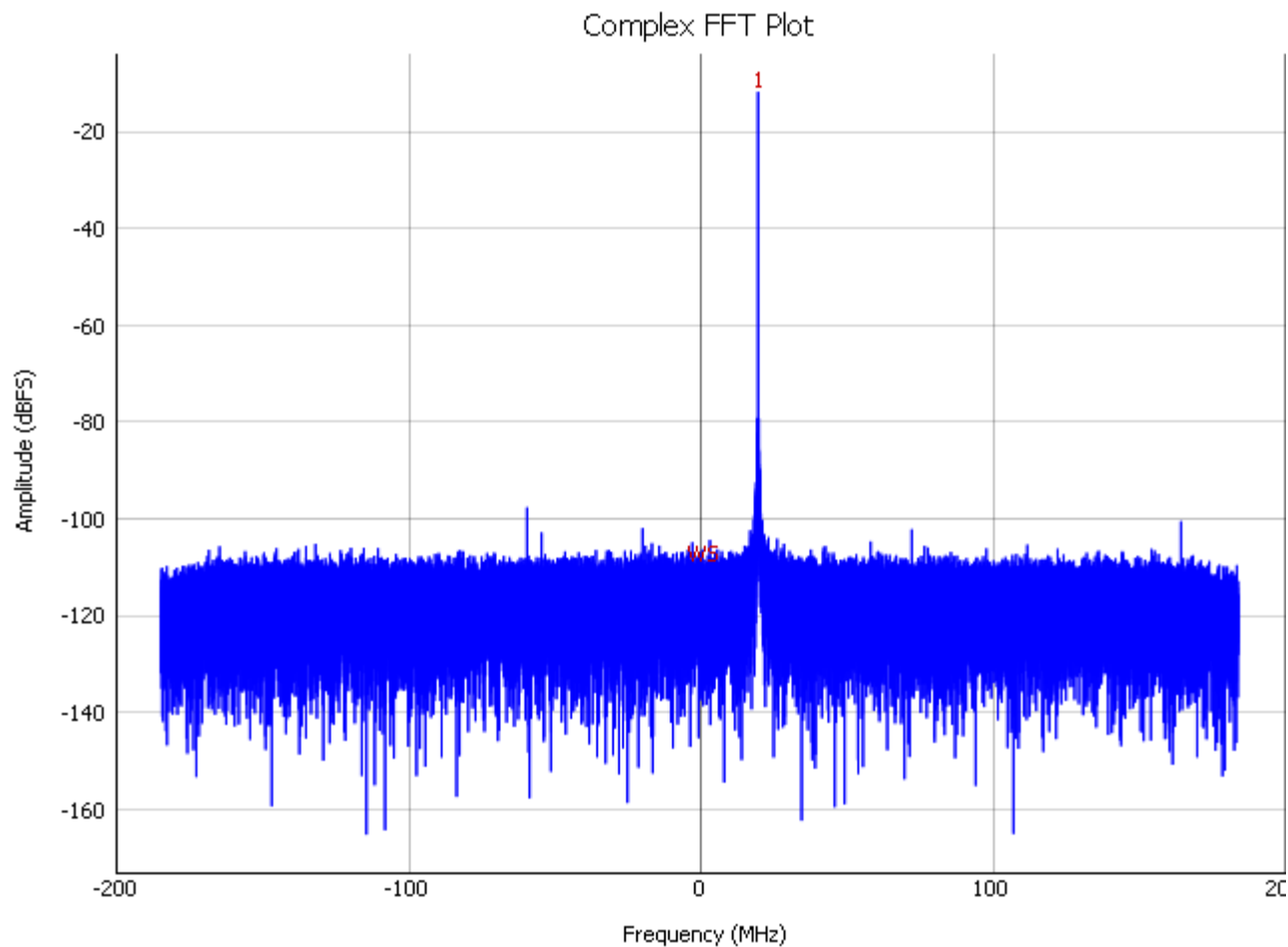
# RX B : SNR at -30dBFS input

SNR = 68.904dBFS ; NSD = 154.57dBFS/sqrt(Hz)



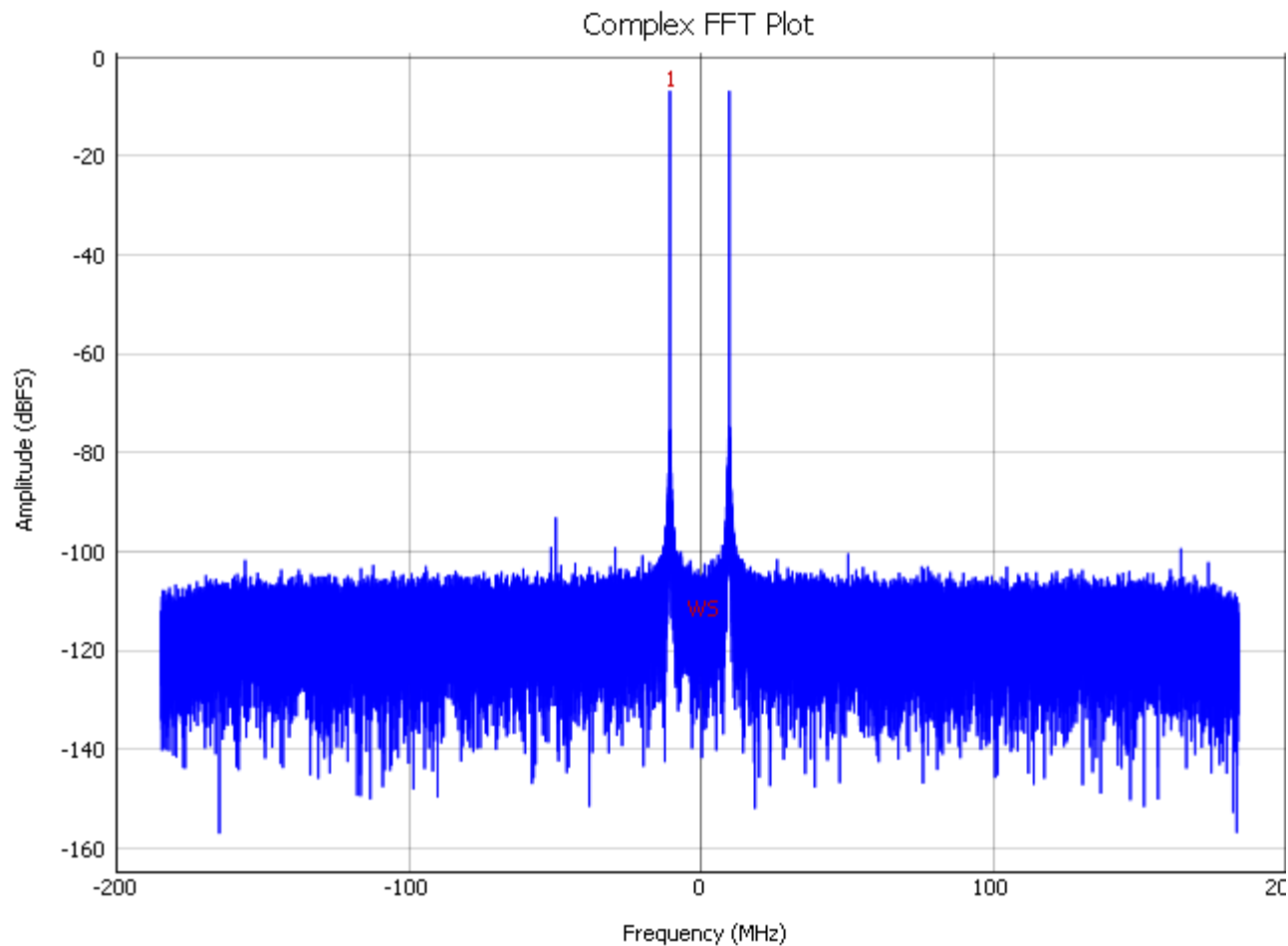
# RX B : SNR at -12dBFS input

SNR = 67.878dBFS ; NSD = 153.544dBFS/sqrt(Hz)



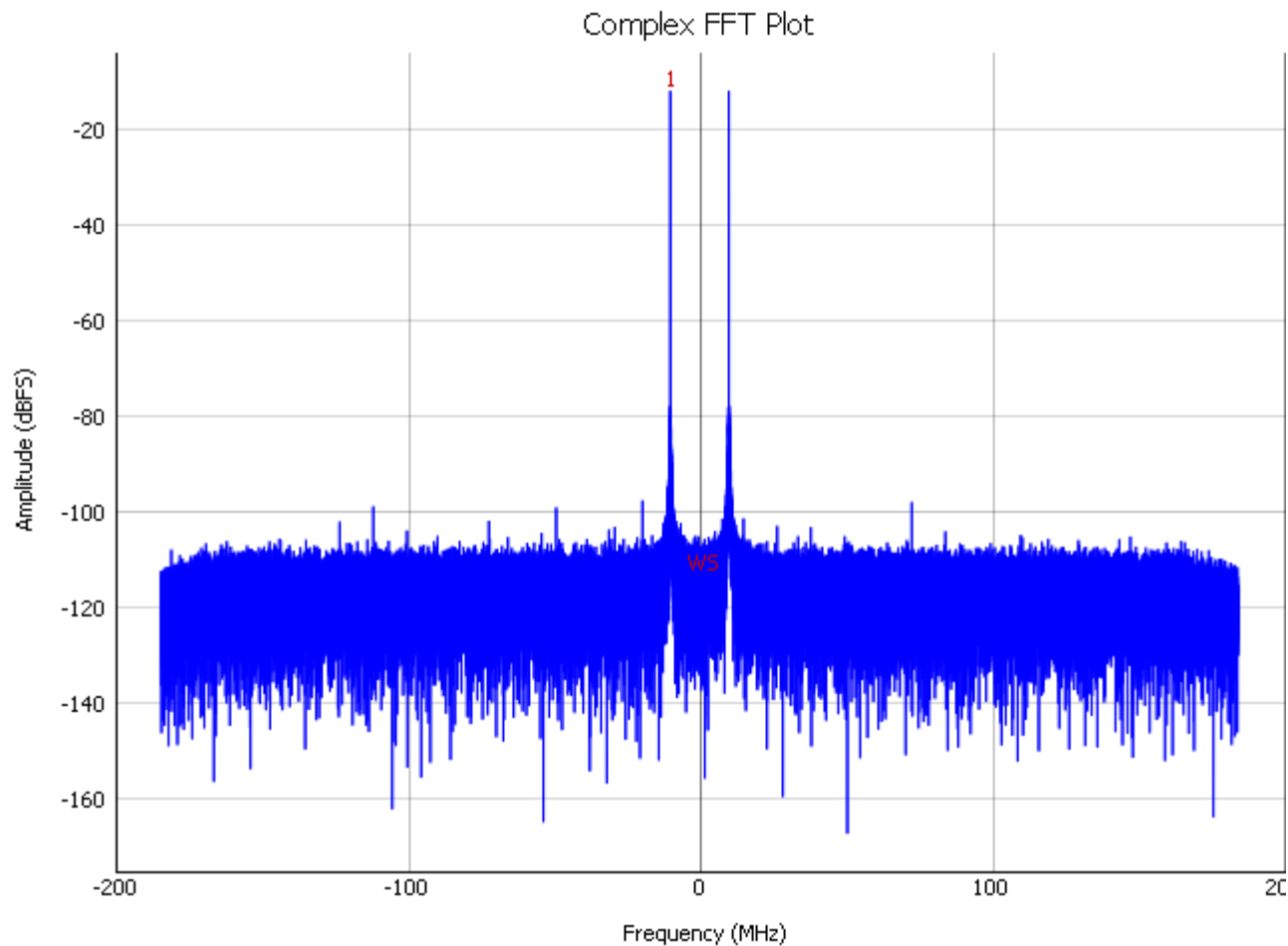
# RX B : IMD3 at -7dBFS input +/-10MHz

$$\text{IMD3} = -103.159\text{dBFS} = -96.159\text{dBc}$$



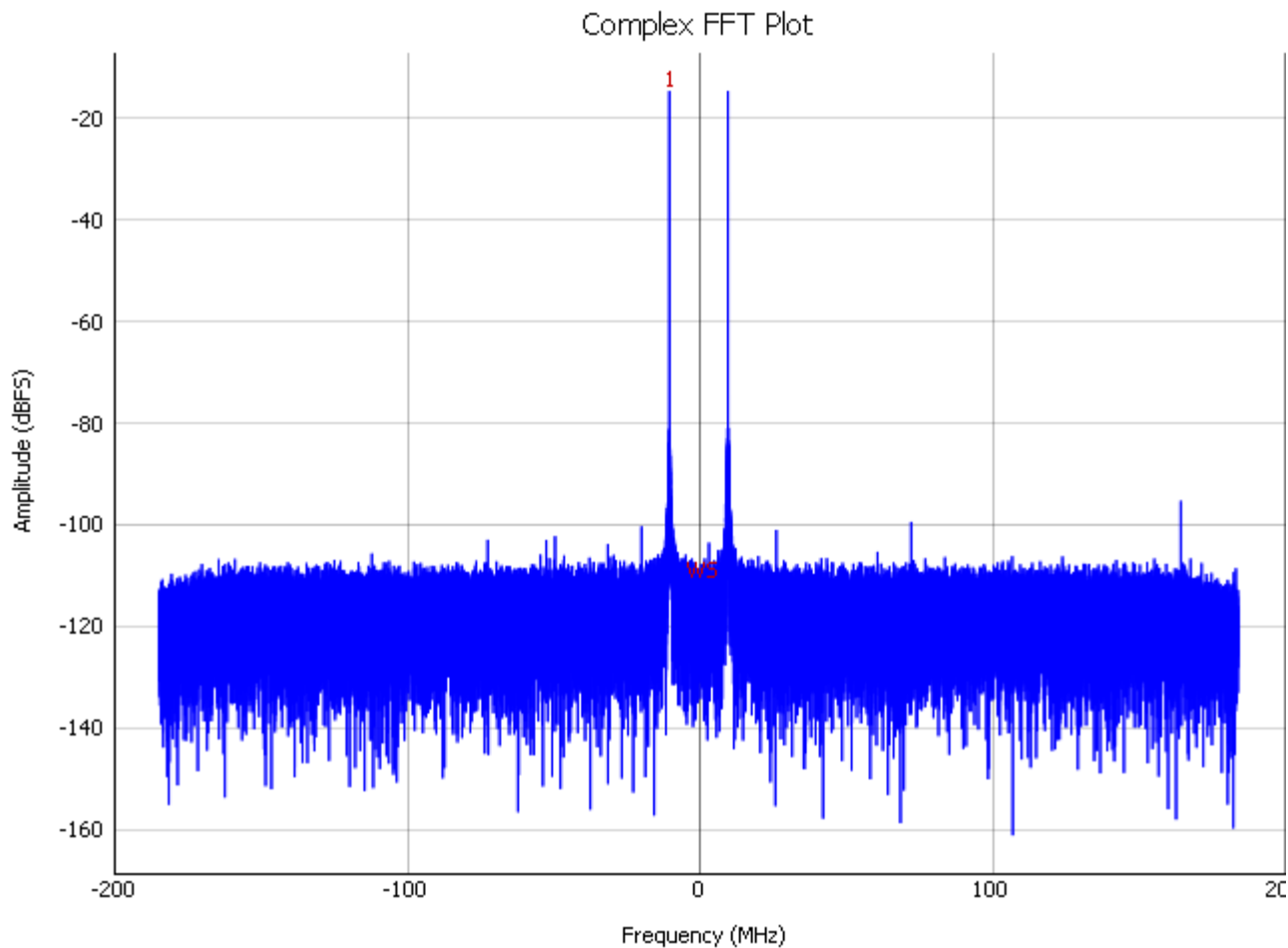
# RX B : IMD3 at -12dBFS input +/-10MHz

IMD3 = -105.717dBFS = -93.717dBc



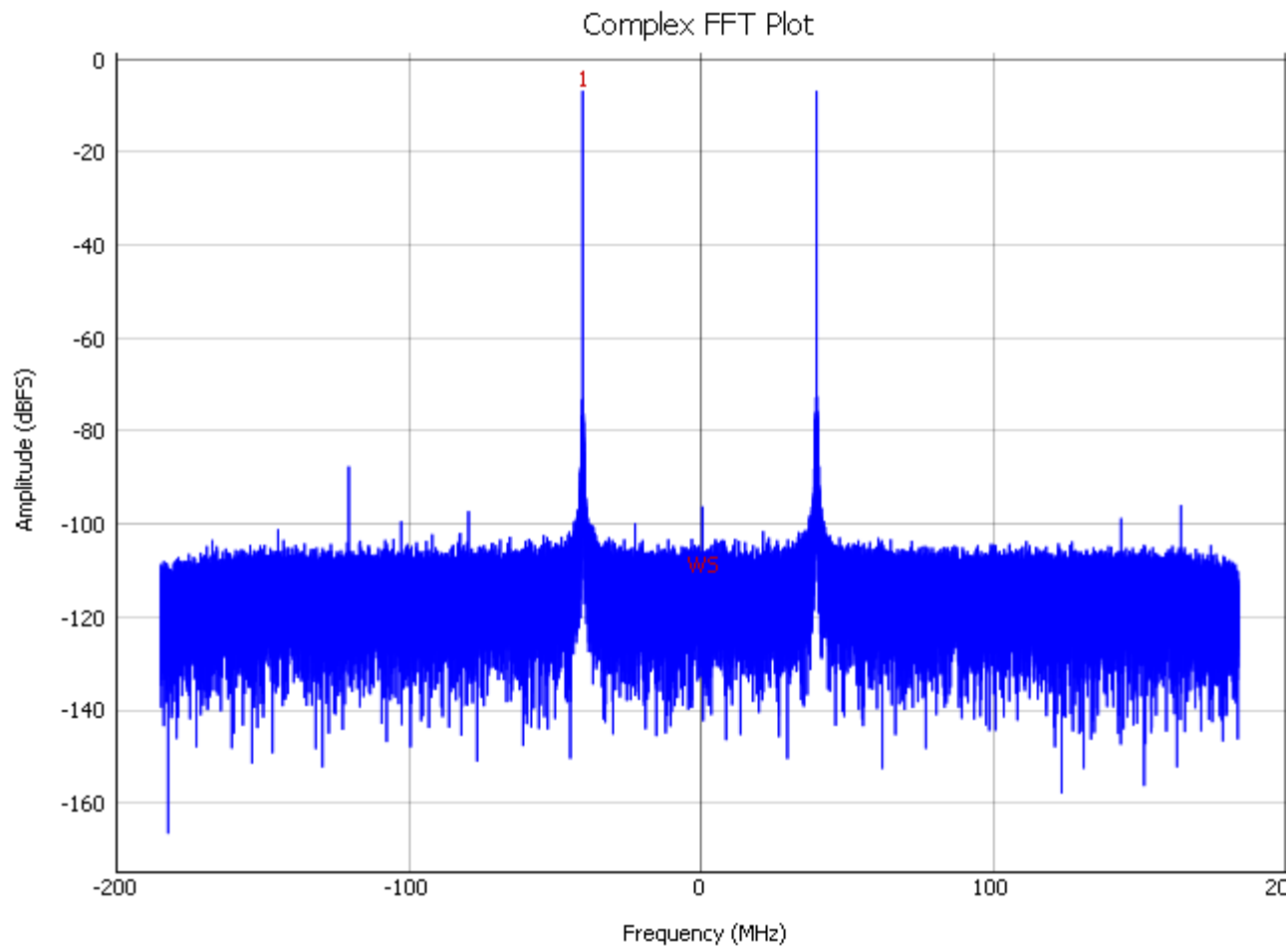
# RX B : IMD3 at -15dBFS input +/-10MHz

$$\text{IMD3} = -106.63\text{dBFS} = -91.63\text{dBc}$$



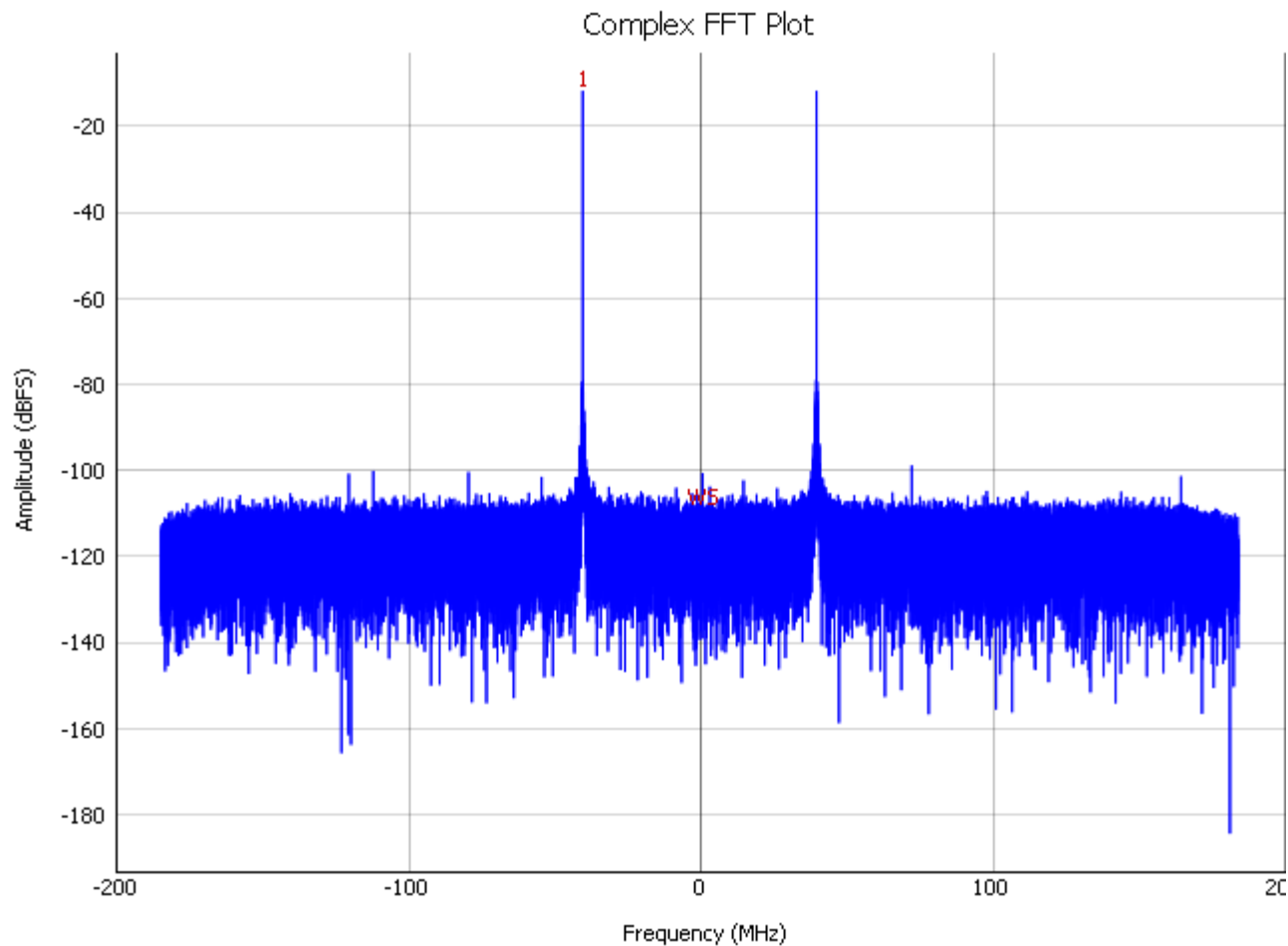
# RX B : IMD3 at -7dBFS input +/-40MHz

IMD3 = -87.799dBFS = -80.799dBc



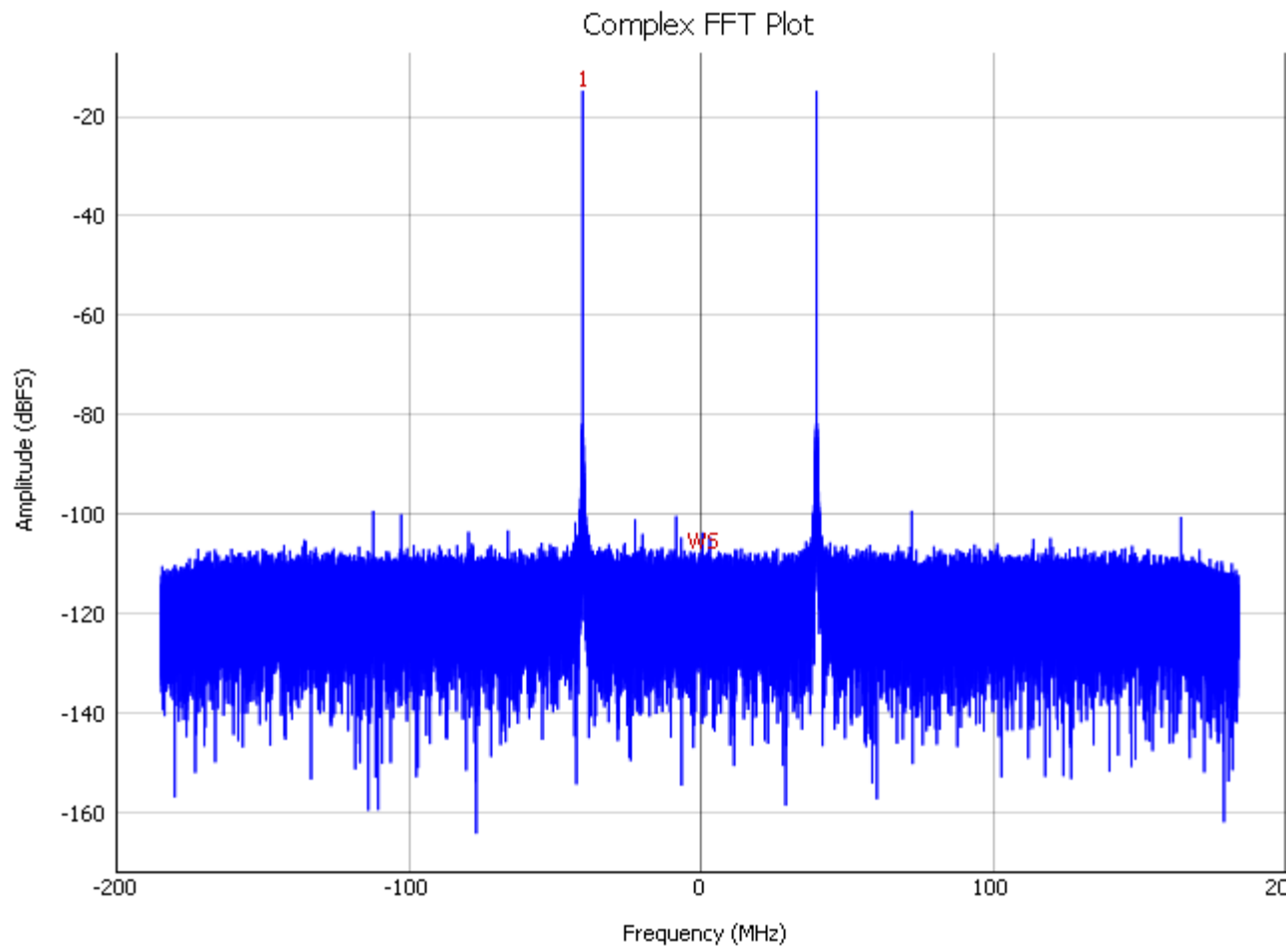
# RX B : IMD3 at -12dBFS input +/-40MHz

$$\text{IMD3} = -101.033\text{dBFS} = -89.033\text{dBc}$$



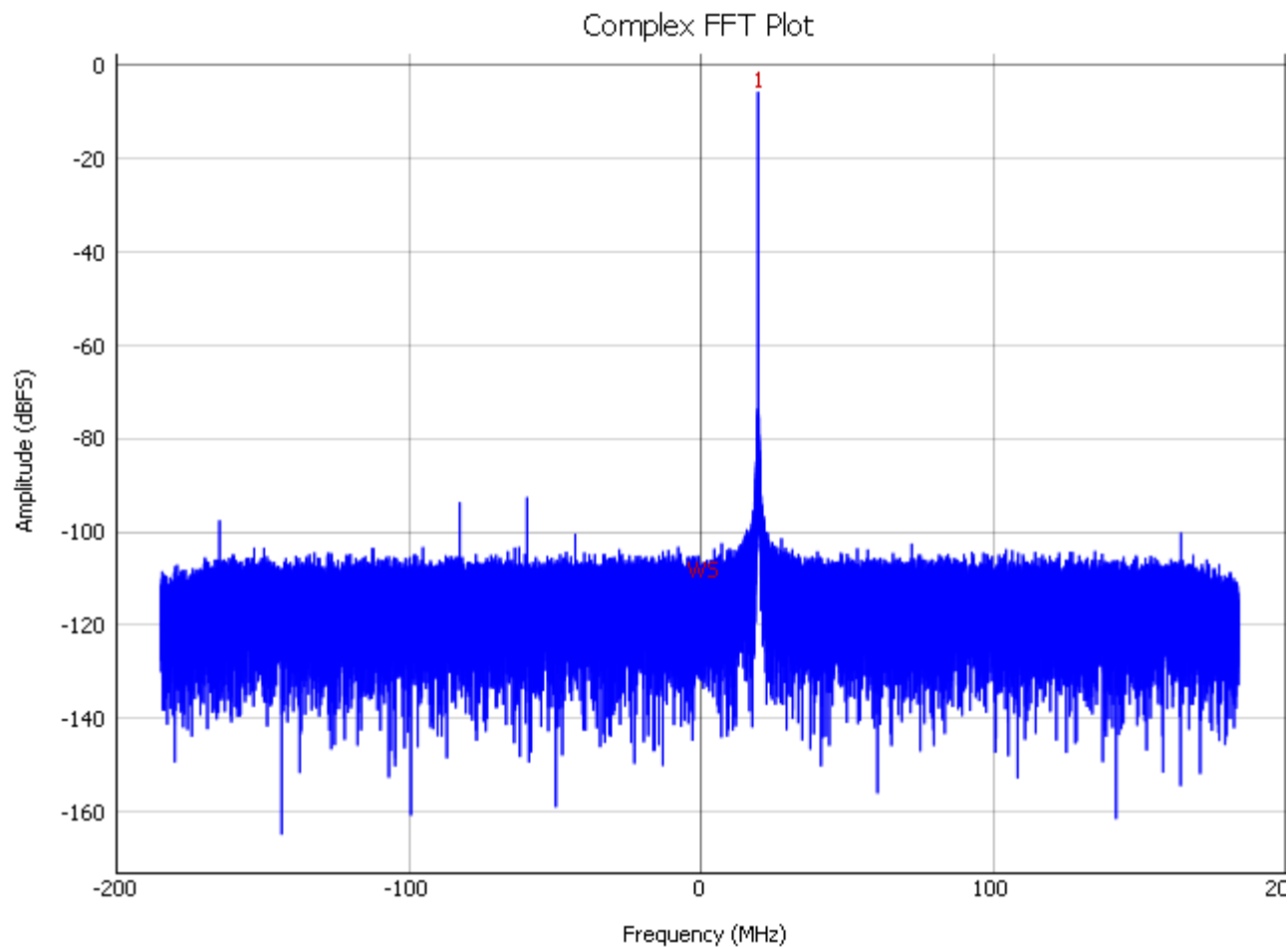
# RX B : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -105.005\text{dBFS} = -90.005\text{dBc}$$



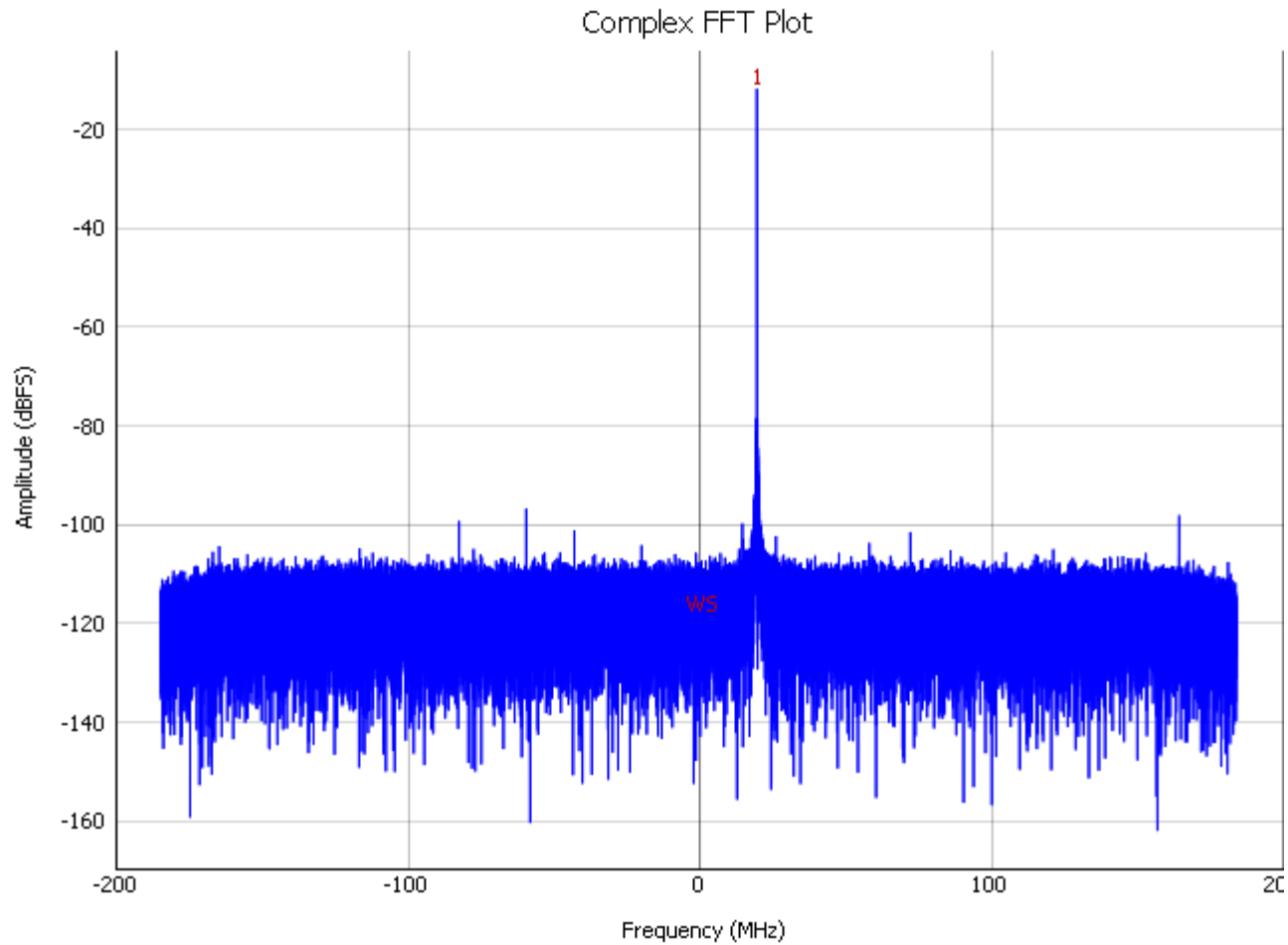
# RX B : SFDR at -6dBFS input

SFDR = 92.8dBFS = 86.8dBc



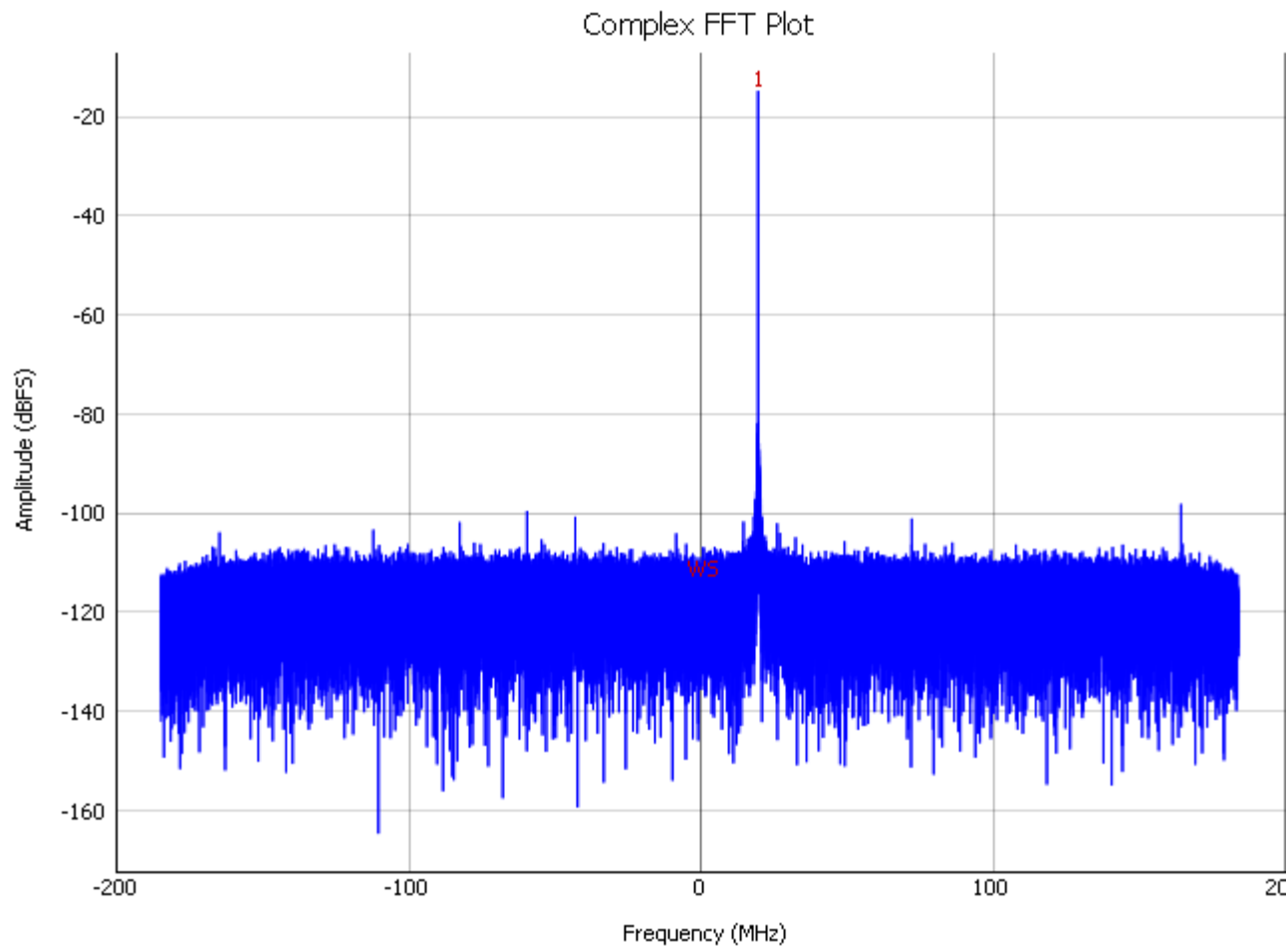
# RX B : SFDR at -12dBFS input

SFDR = 96.95dBFS = 84.95dBc

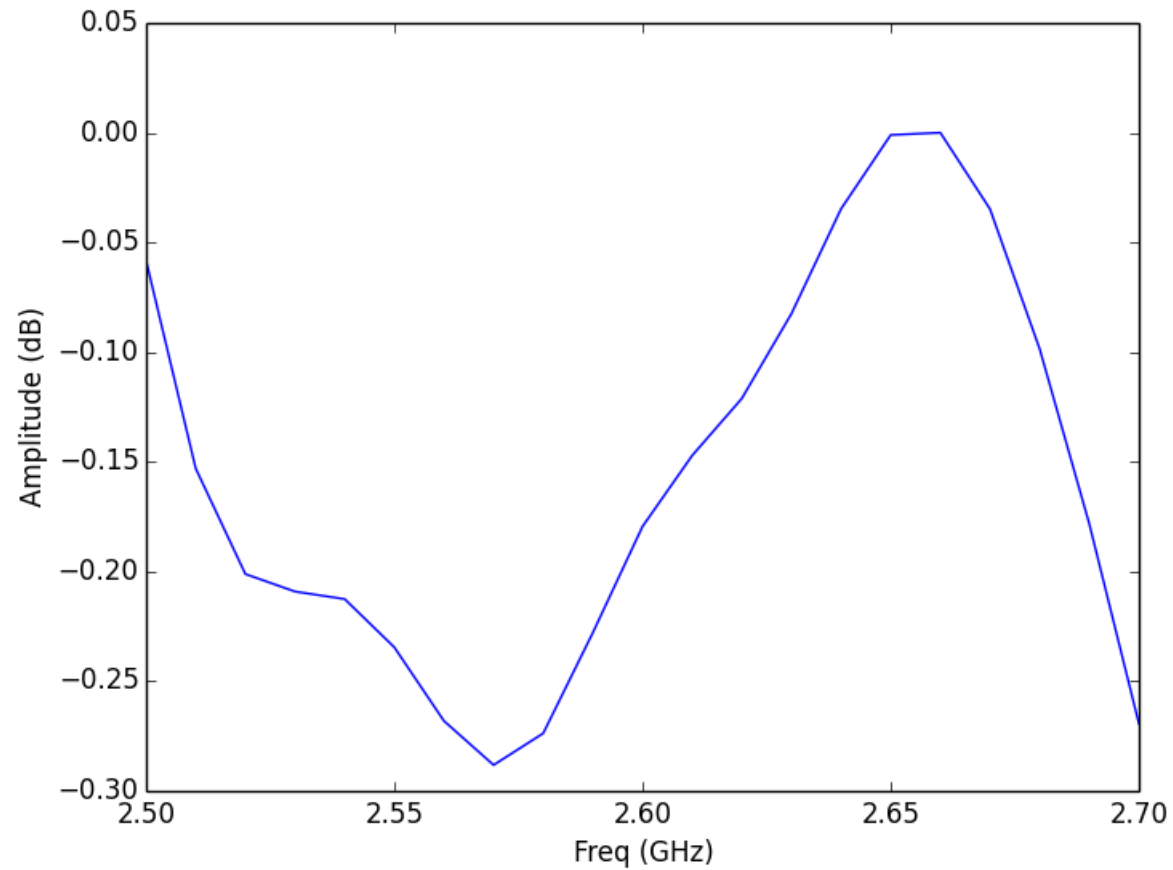


# RX B : SFDR at -15dBFS input

SFDR = 98.381dBFS = 83.381dBc

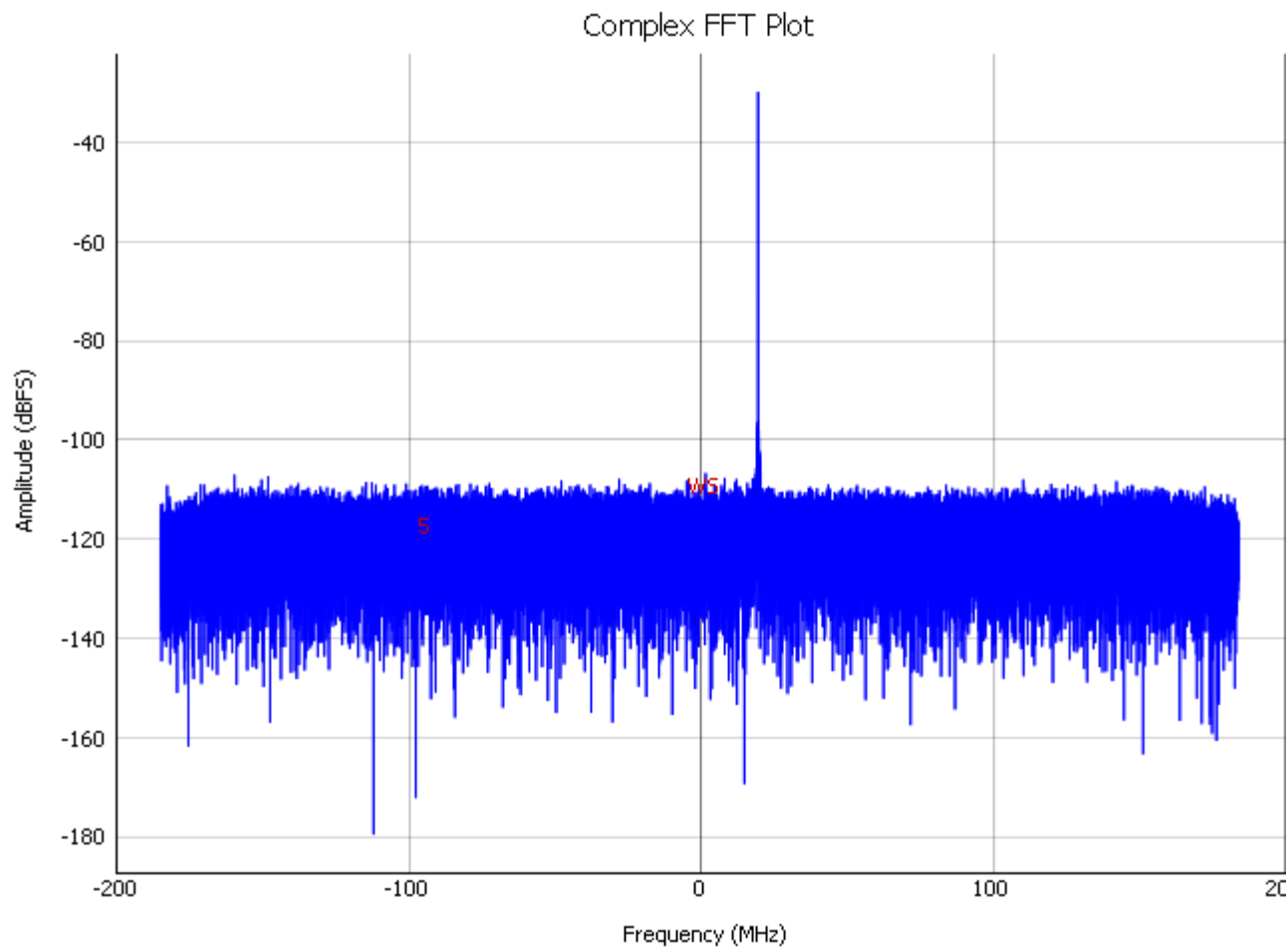


# RX B Flatness



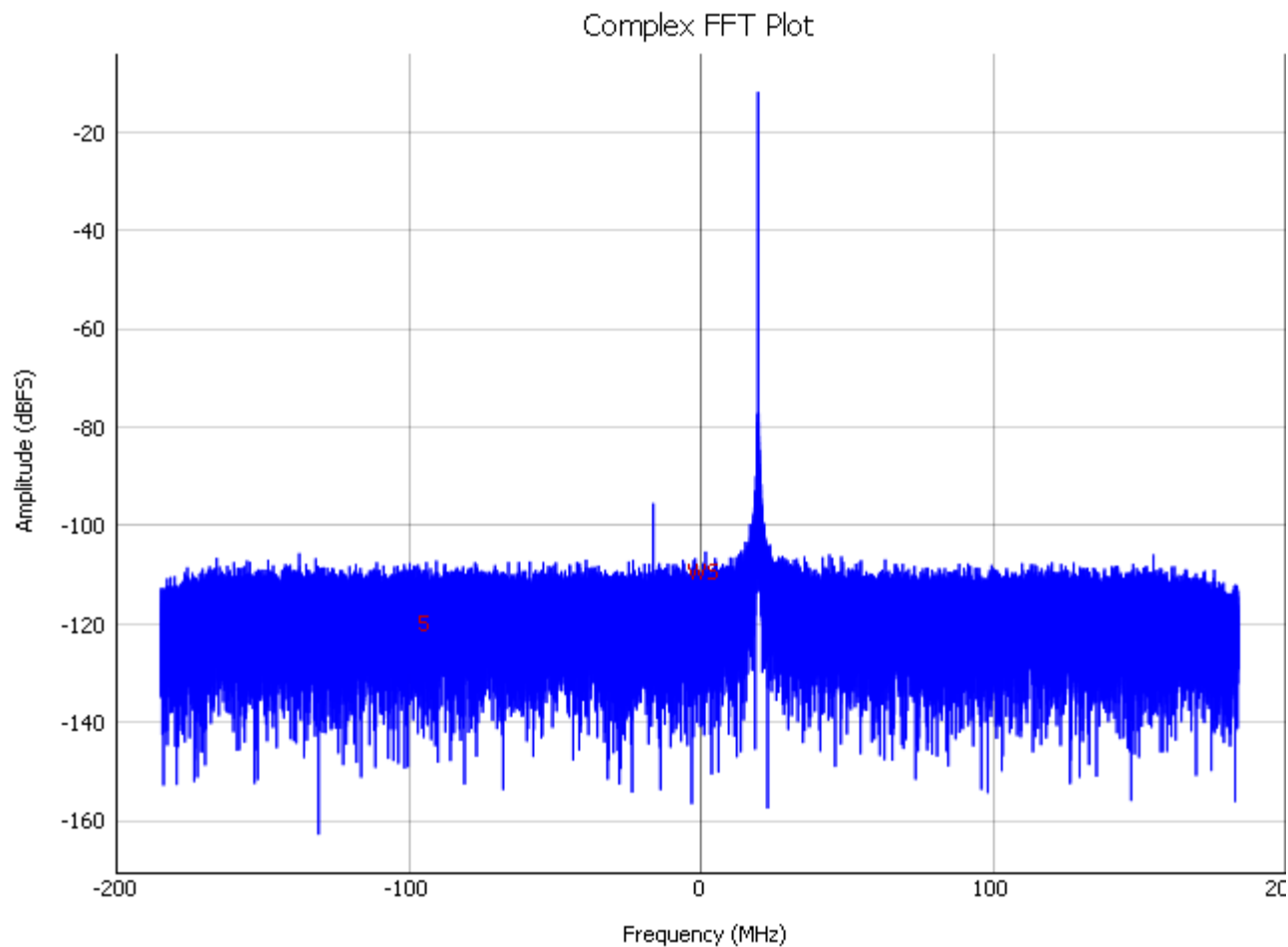
# RX C : SNR at -30dBFS input

SNR = 70.06dBFS ; NSD = 155.726dBFS/sqrt(Hz)



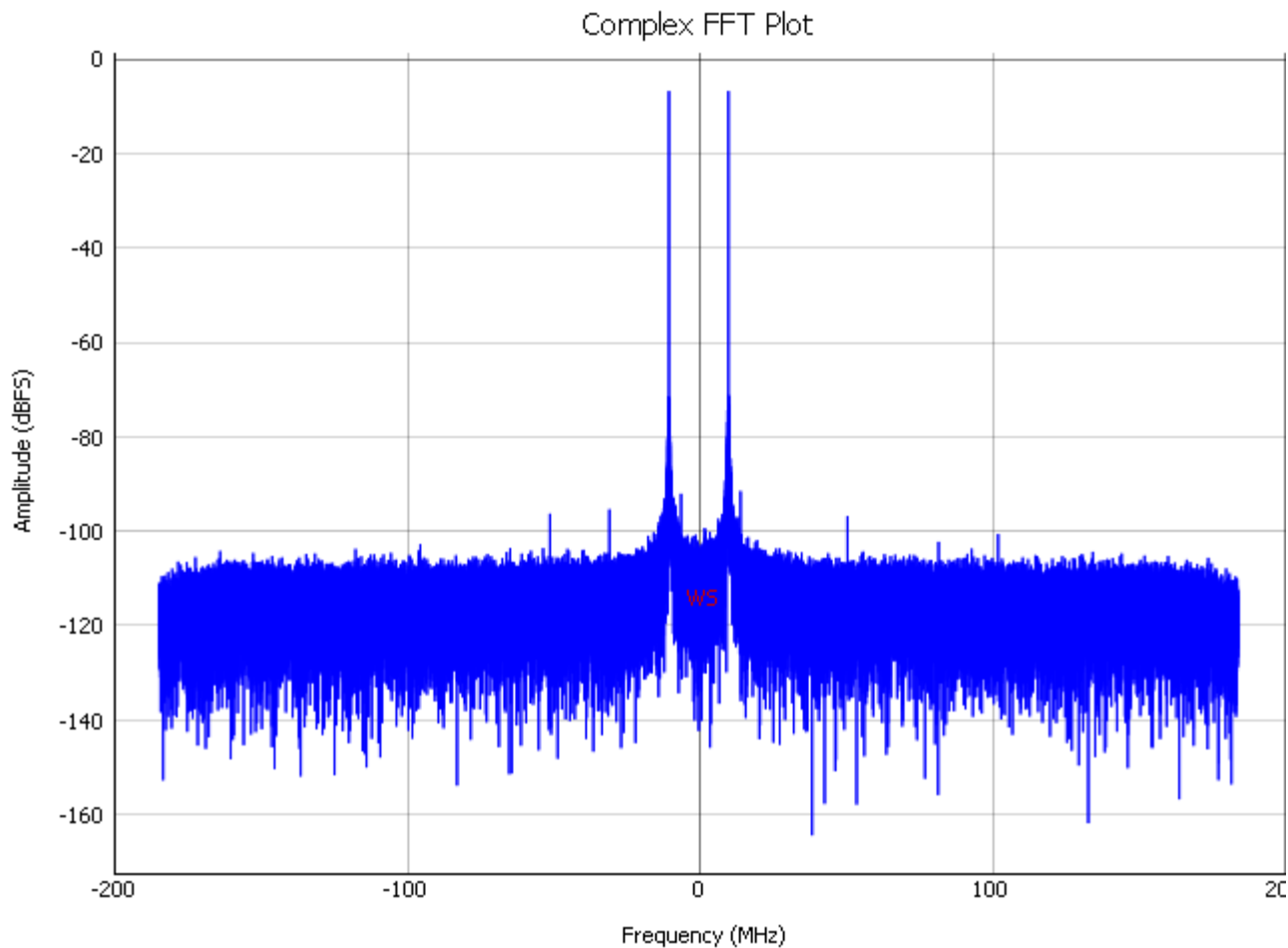
# RX C : SNR at -12dBFS input

SNR = 68.602dBFS ; NSD = 154.268dBFS/sqrt(Hz)



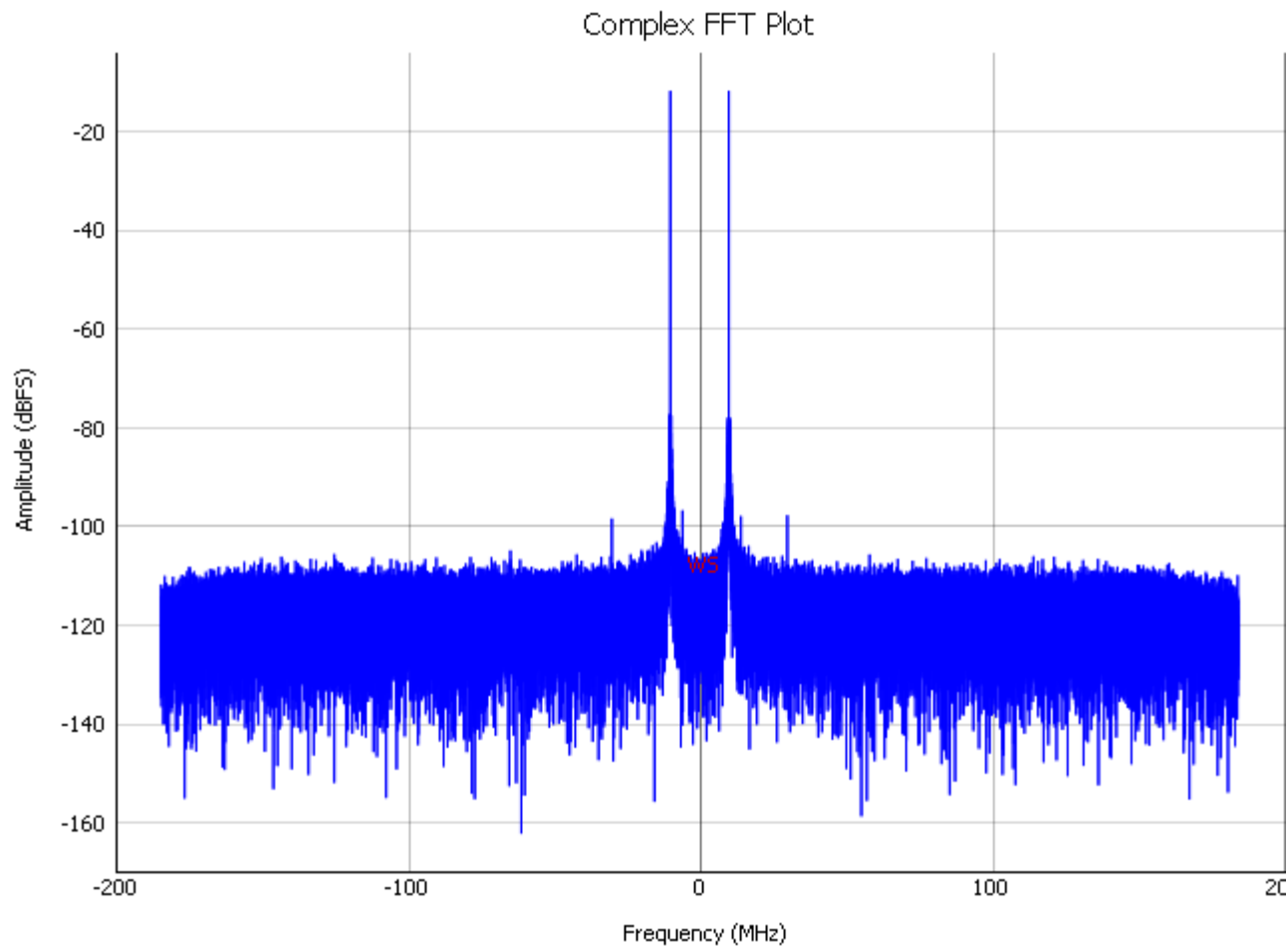
# RX C : IMD3 at -7dBFS input +/-10MHz

IMD3 = -95.586dBFS = -88.586dBc



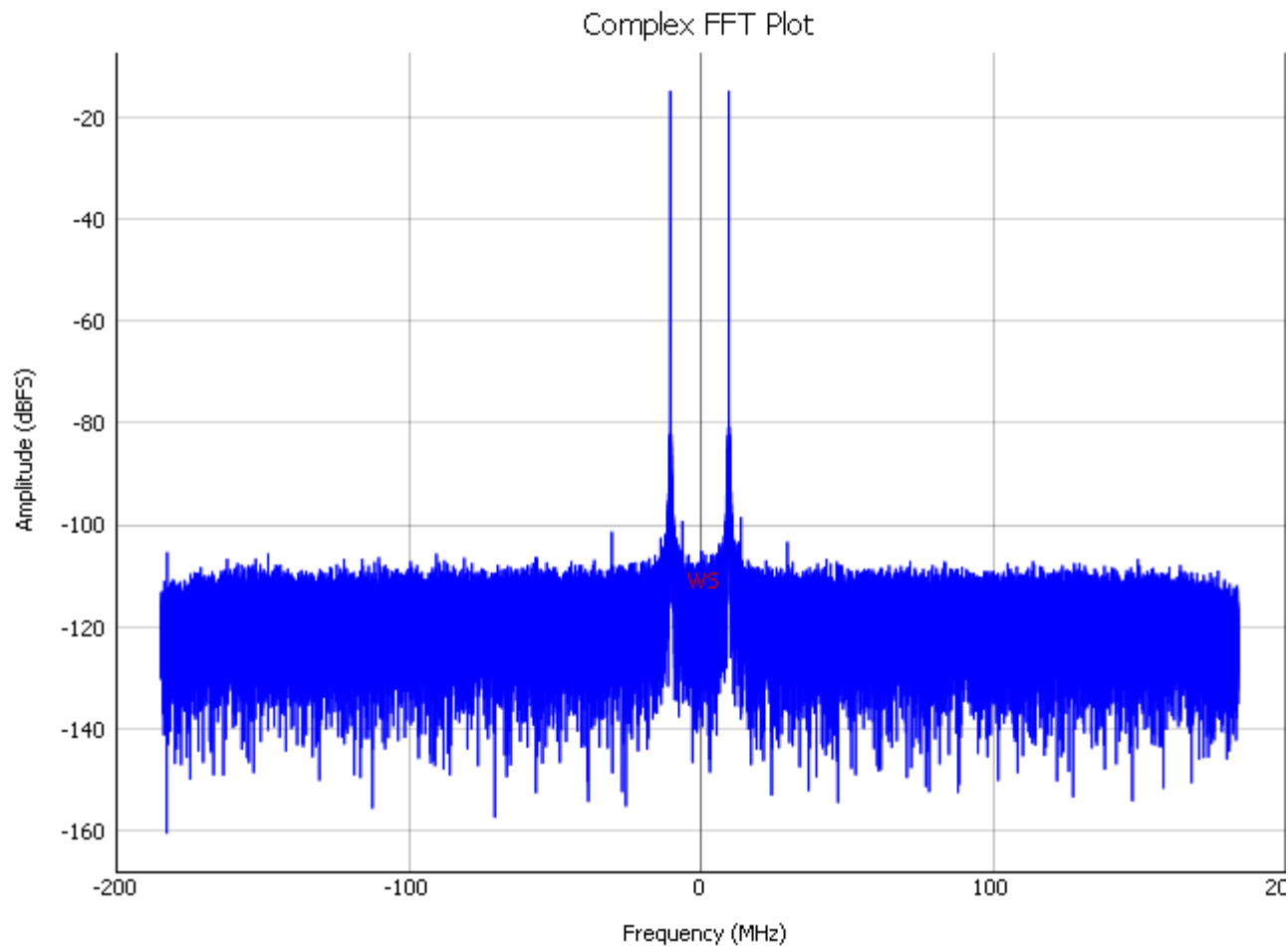
# RX C : IMD3 at -12dBFS input +/-10MHz

IMD3 = -97.908dBFS = -85.908dBc



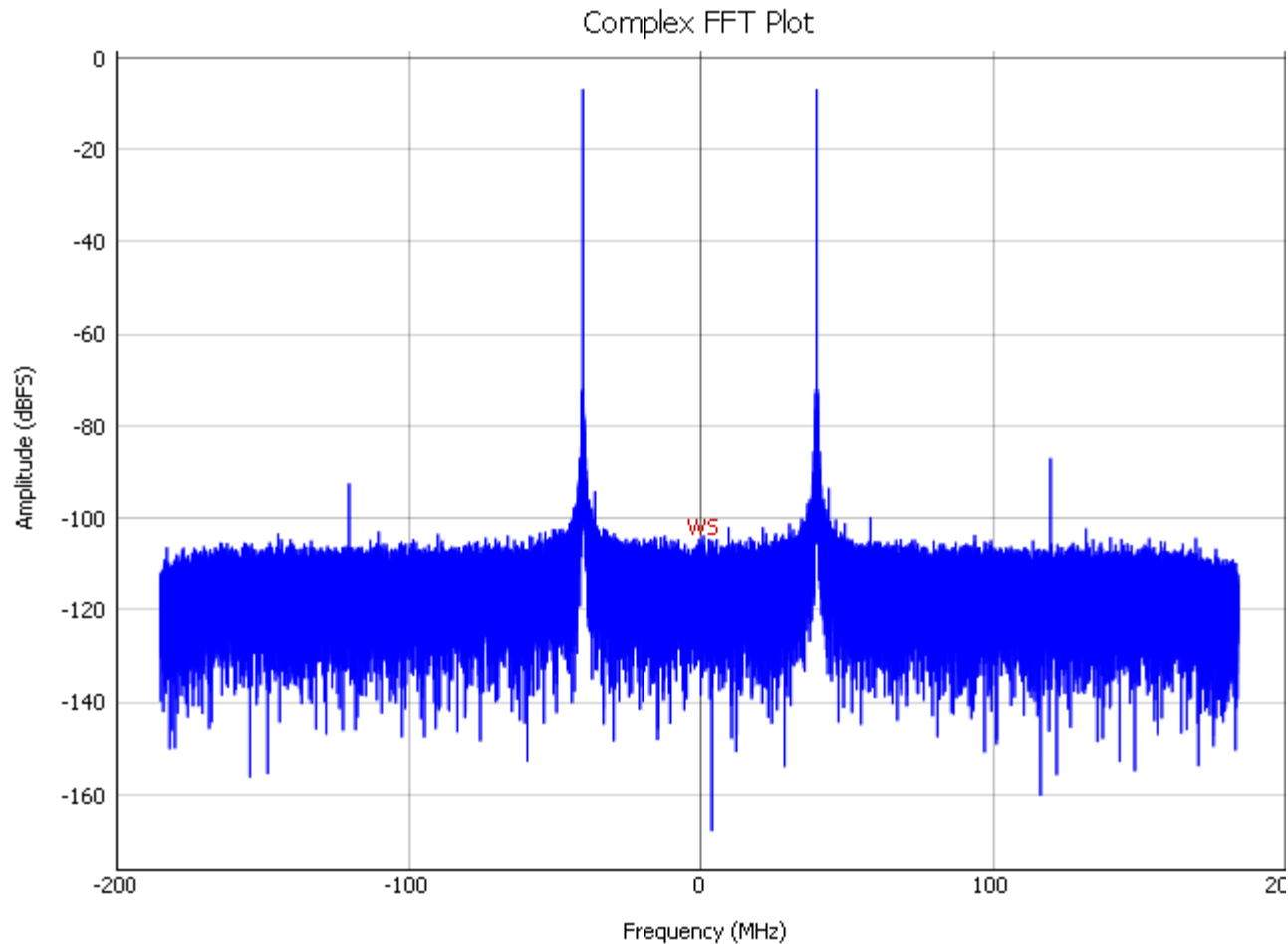
# RX C : IMD3 at -15dBFS input +/-10MHz

IMD3 = -101.502dBFS = -86.502dBc



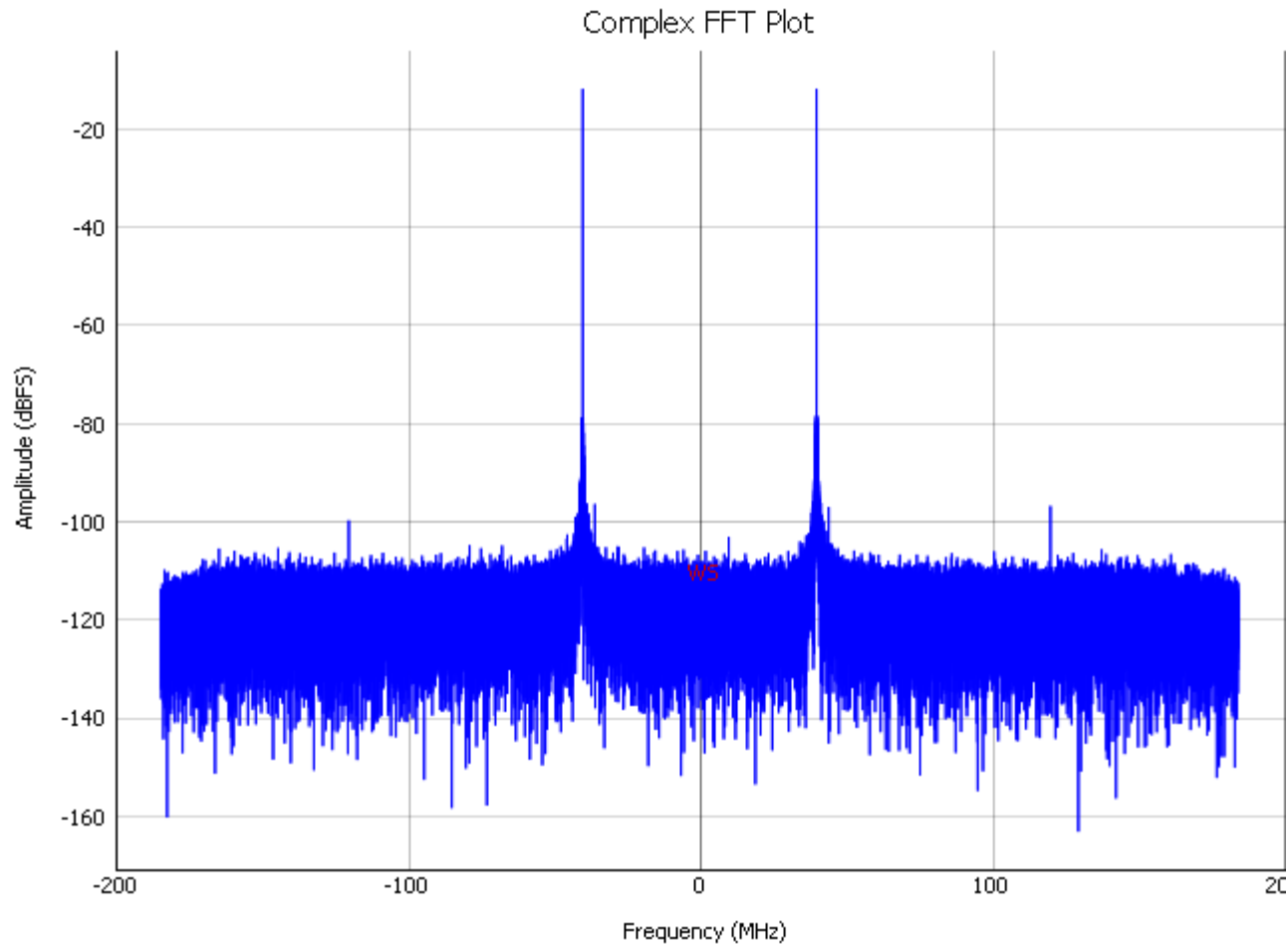
# RX C : IMD3 at -7dBFS input +/-40MHz

IMD3 = -87.241dBFS = -80.241dBc



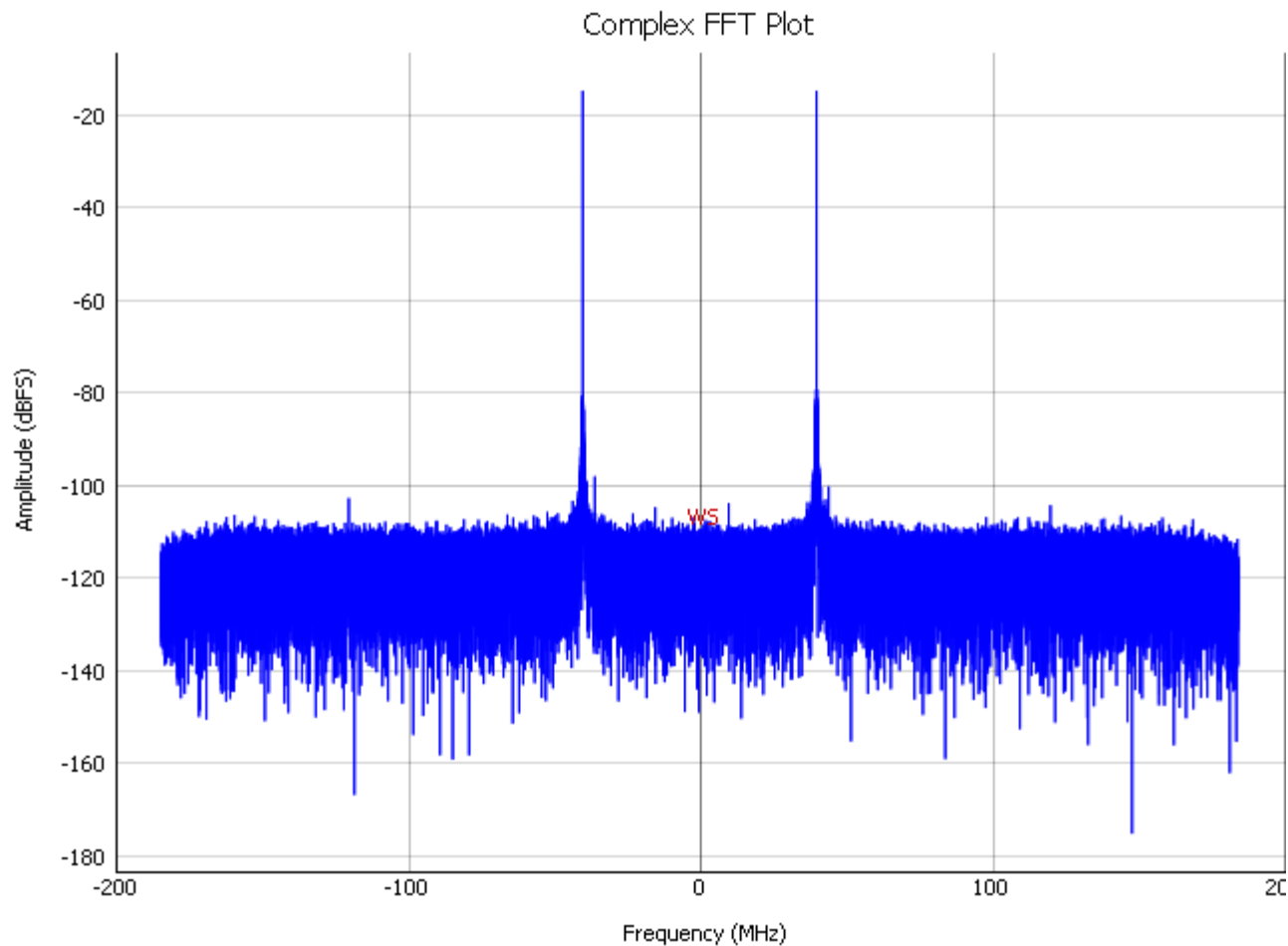
# RX C : IMD3 at -12dBFS input +/-40MHz

IMD3 = -96.982dBFS = -84.982dBc



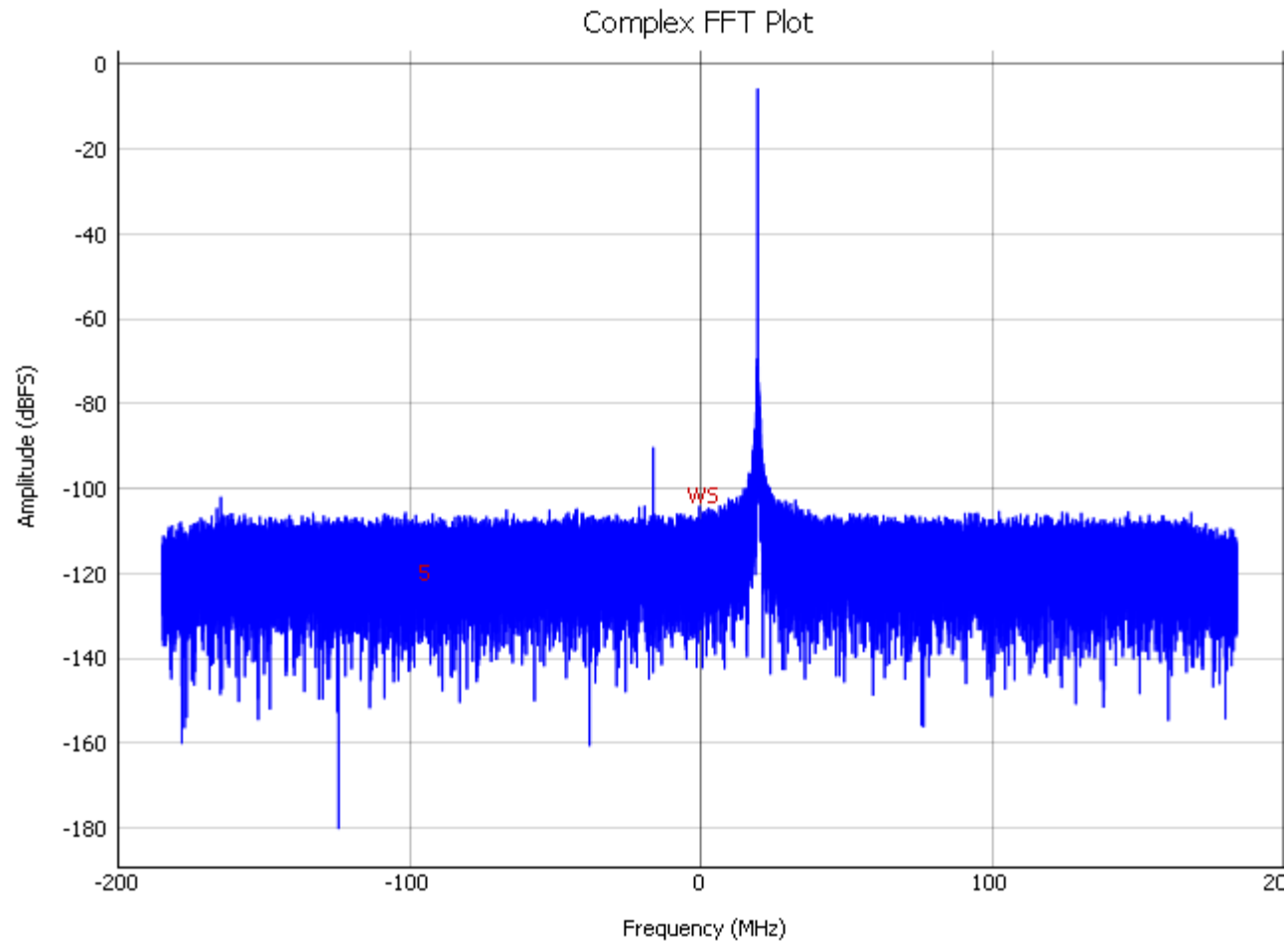
# RX C : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -102.897\text{dBFS} = -87.897\text{dBc}$$



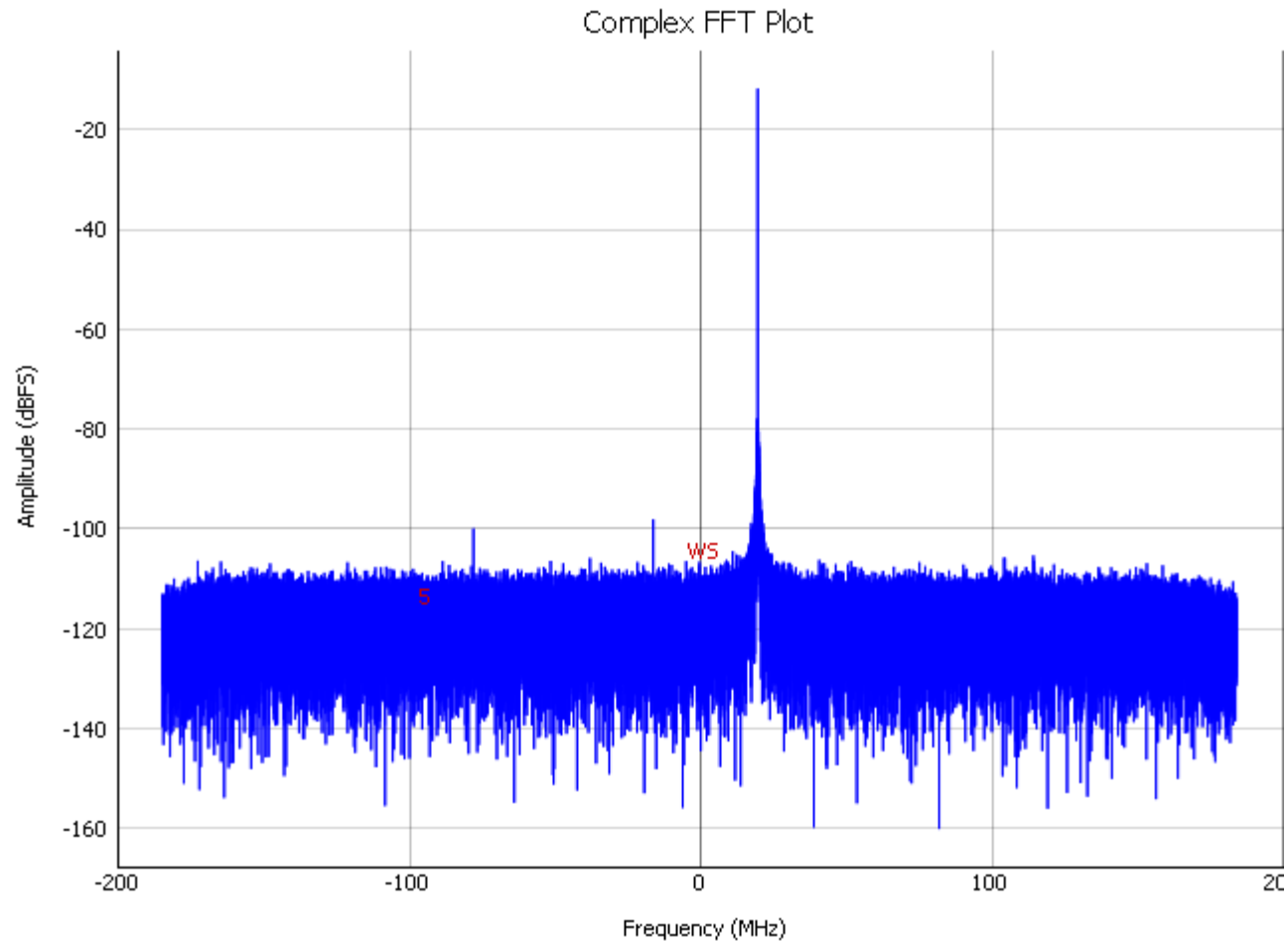
# RX C : SFDR at -6dBFS input

SFDR = 90.5dBFS = 84.5dBc



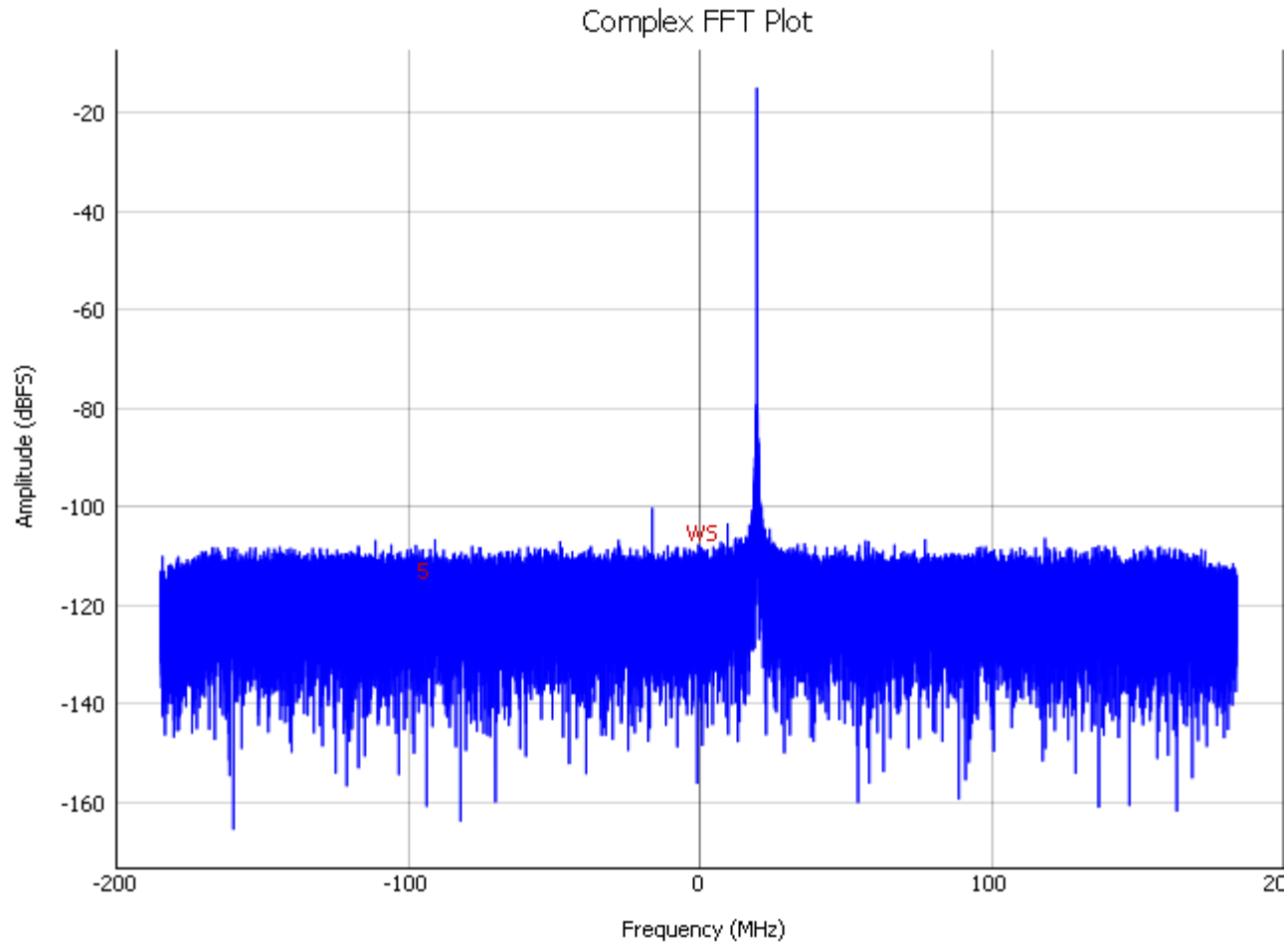
# RX C : SFDR at -12dBFS input

SFDR = 98.265dBFS = 86.265dBc

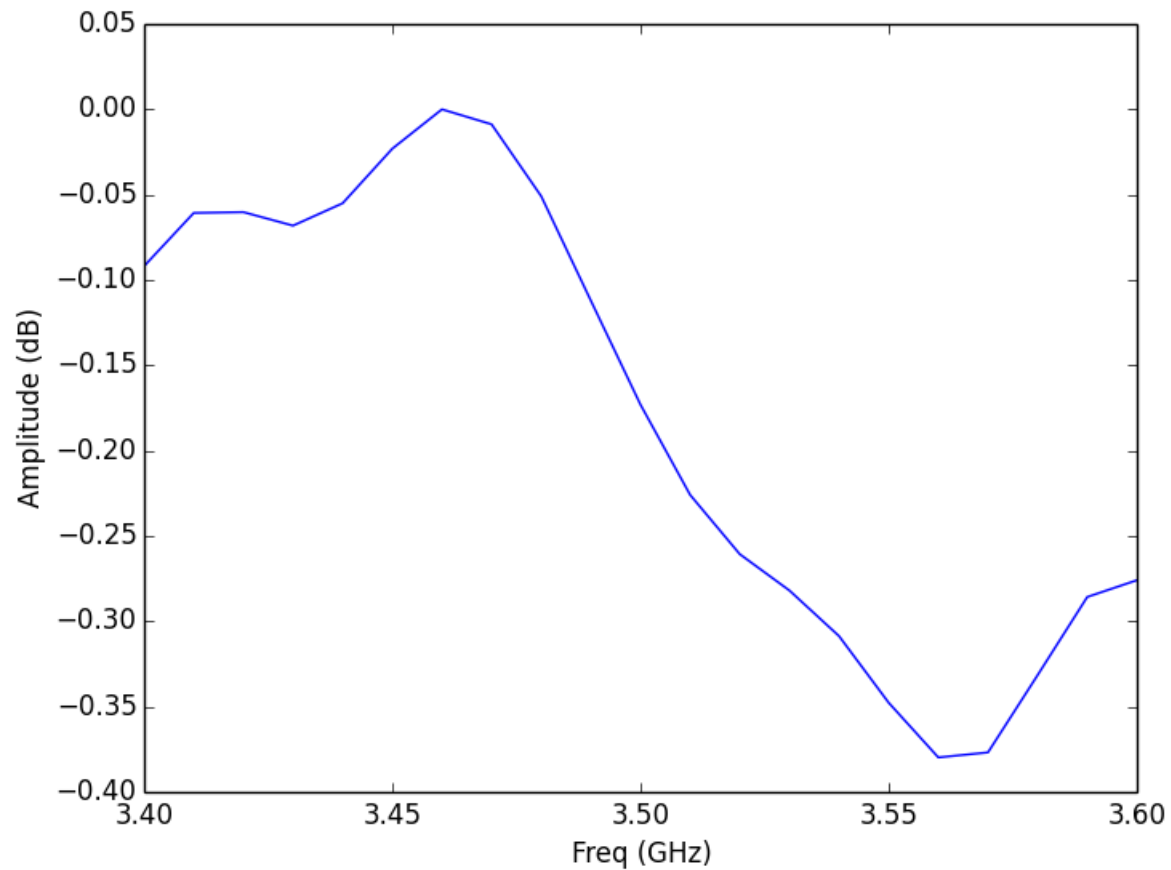


# RX C : SFDR at -15dBFS input

$$\text{SFDR} = 100.385\text{dBFS} = 85.385\text{dBc}$$

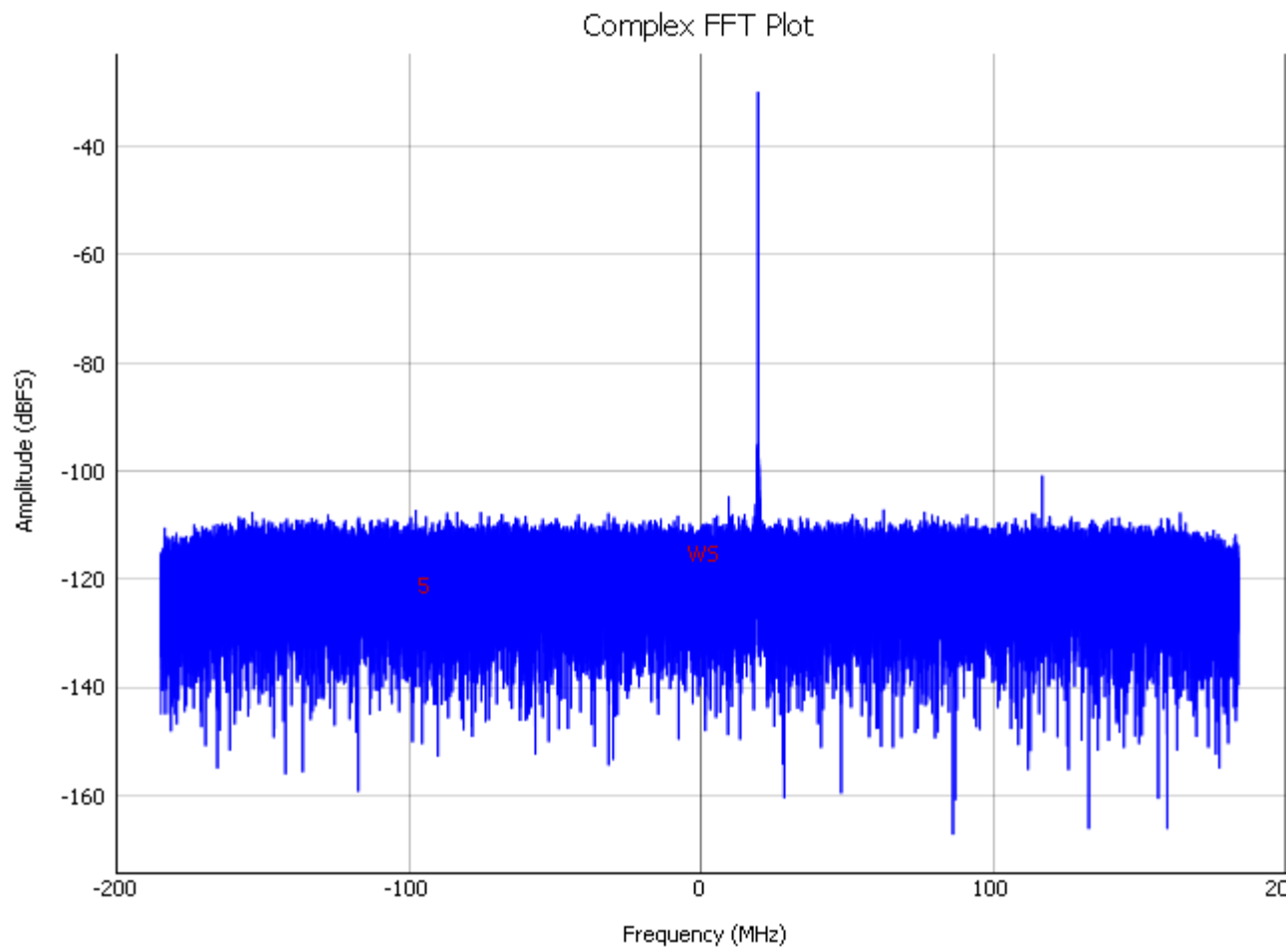


# RX C Flatness



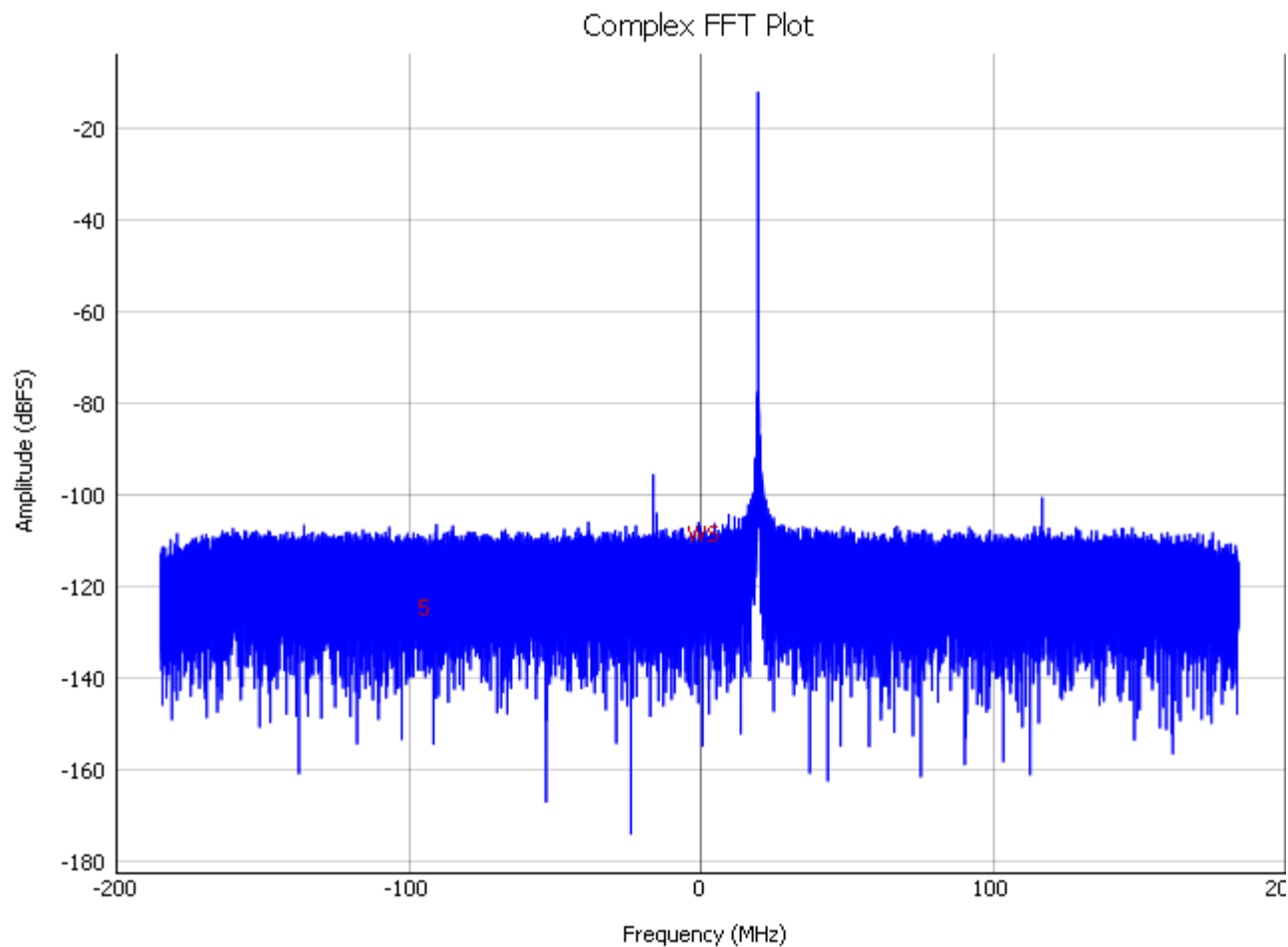
# RX D : SNR at -30dBFS input

SNR = 69.761dBFS ; NSD = 155.427dBFS/sqrt(Hz)



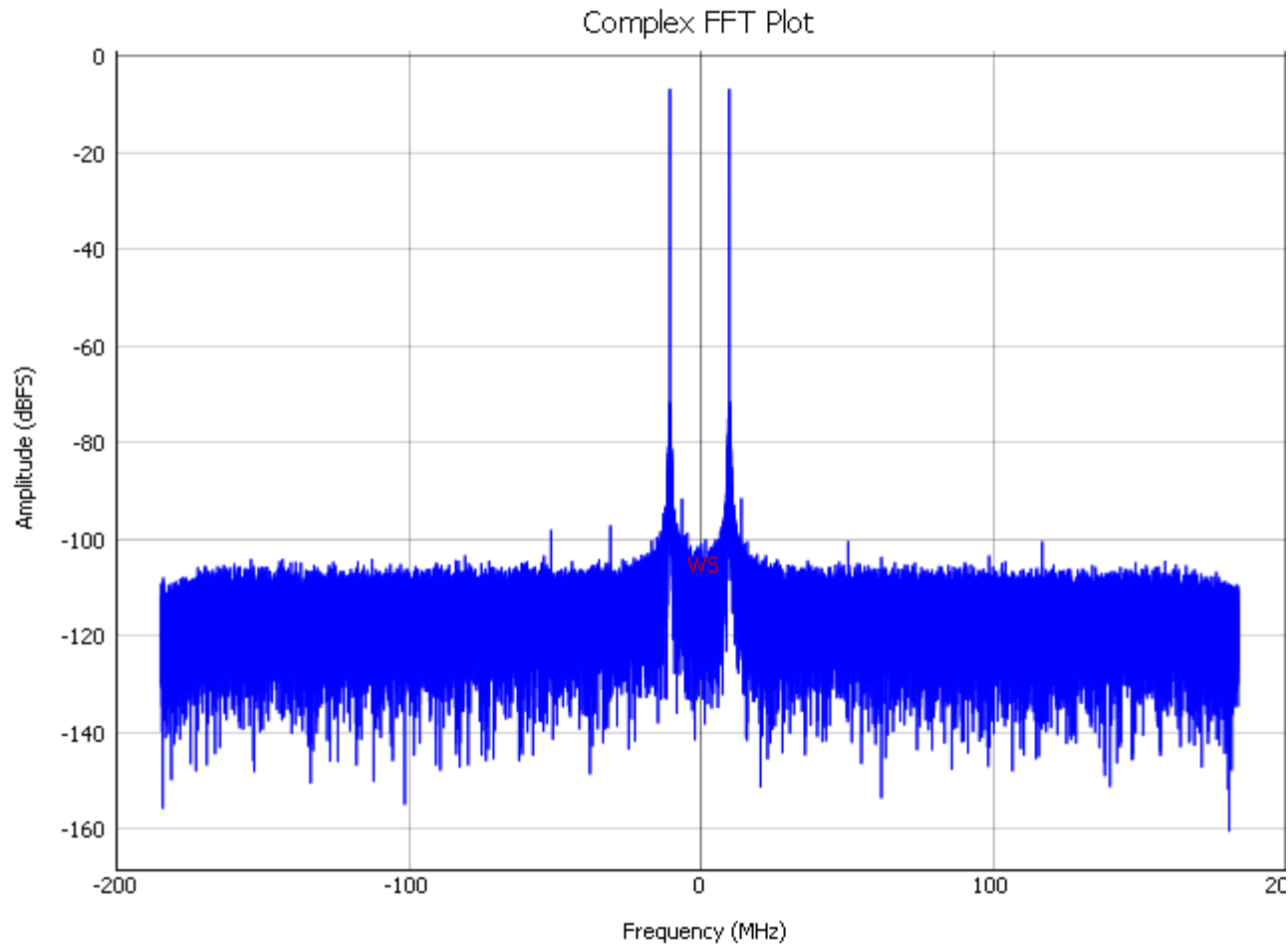
# RX D : SNR at -12dBFS input

SNR = 68.498dBFS ; NSD = 154.164dBFS/sqrt(Hz)



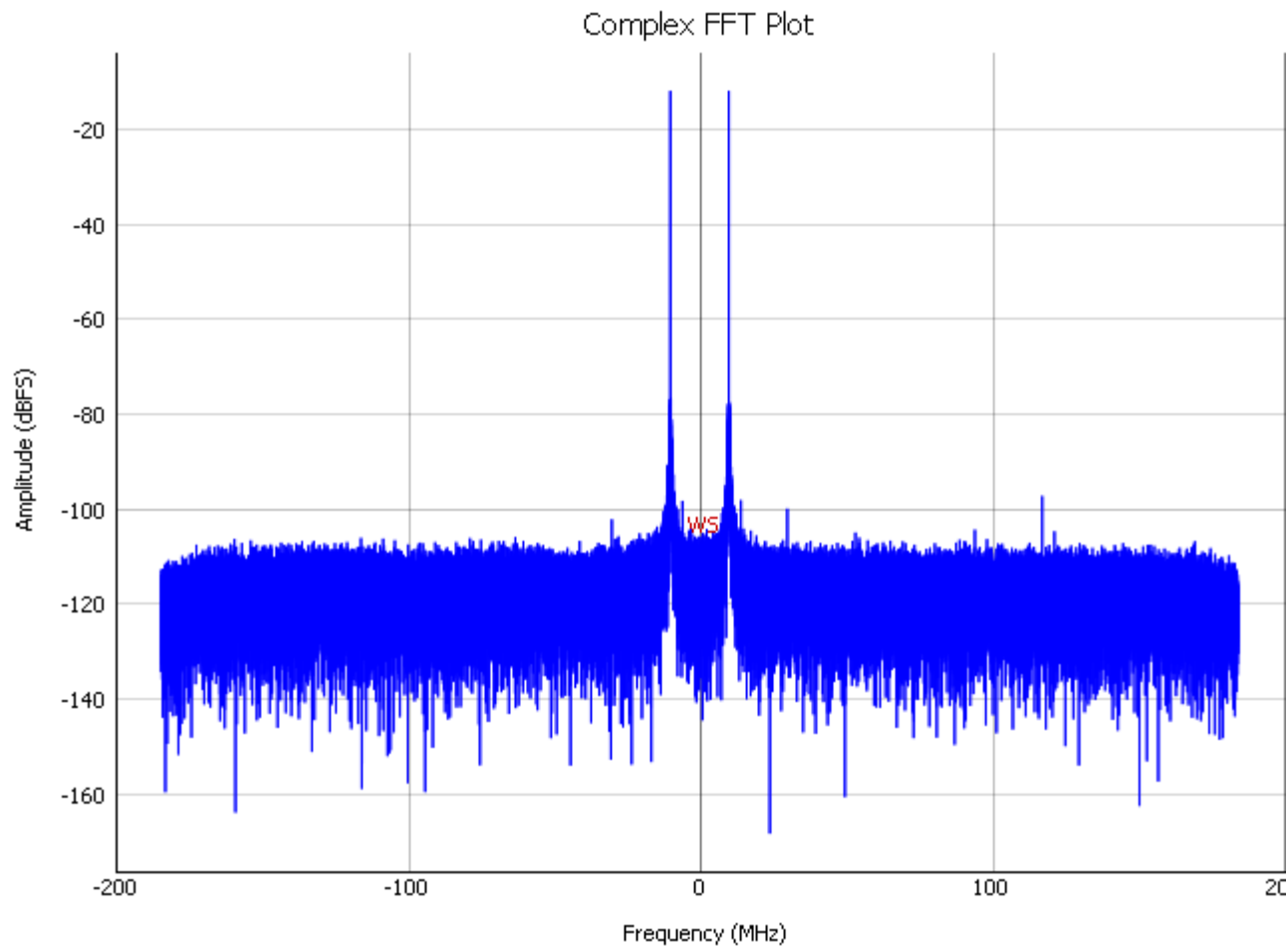
# RX D : IMD3 at -7dBFS input +/-10MHz

IMD3 = -97.331dBFS = -90.331dBc



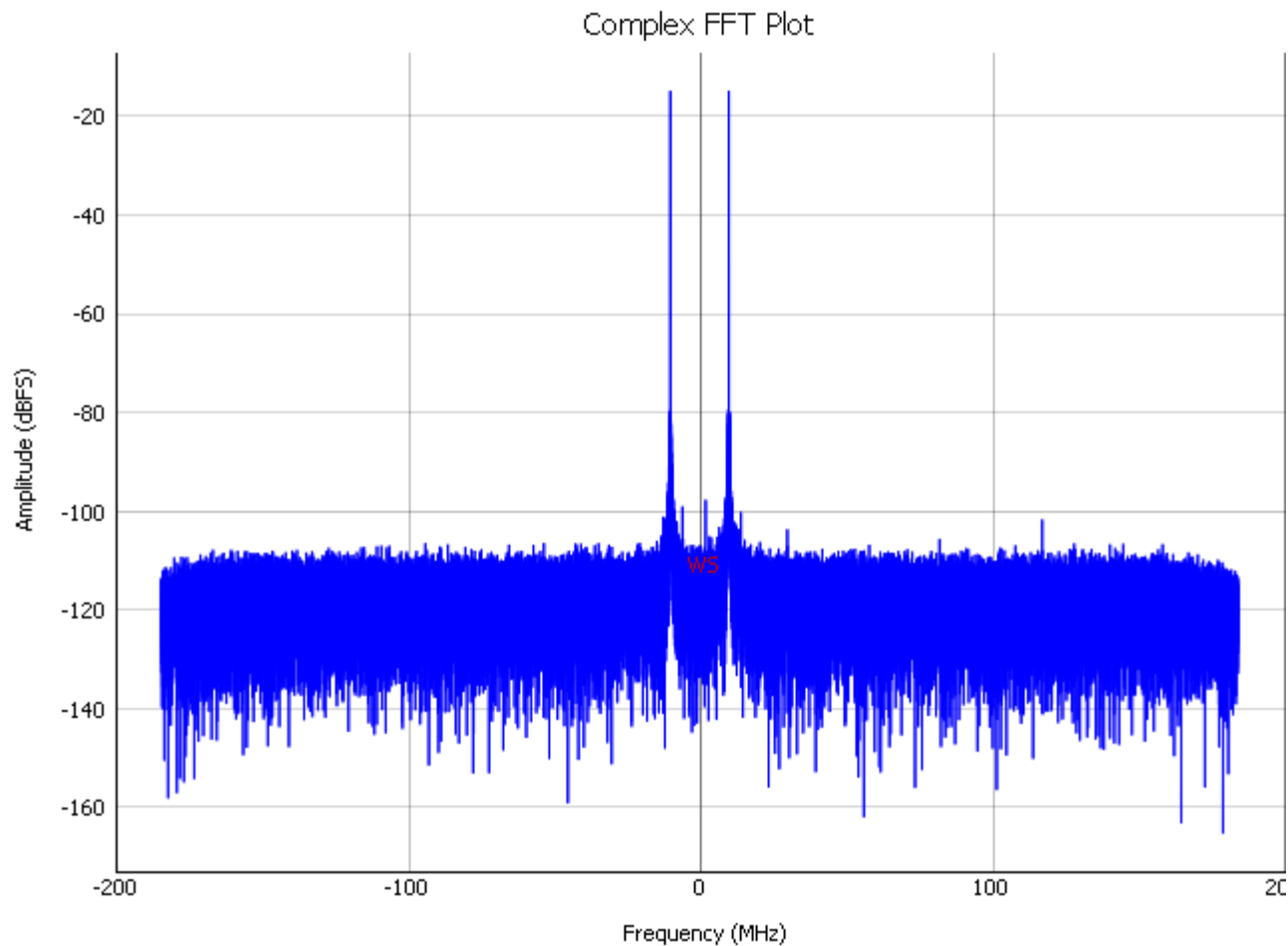
# RX D : IMD3 at -12dBFS input +/-10MHz

$$\text{IMD3} = -100.036\text{dBFS} = -88.036\text{dBc}$$



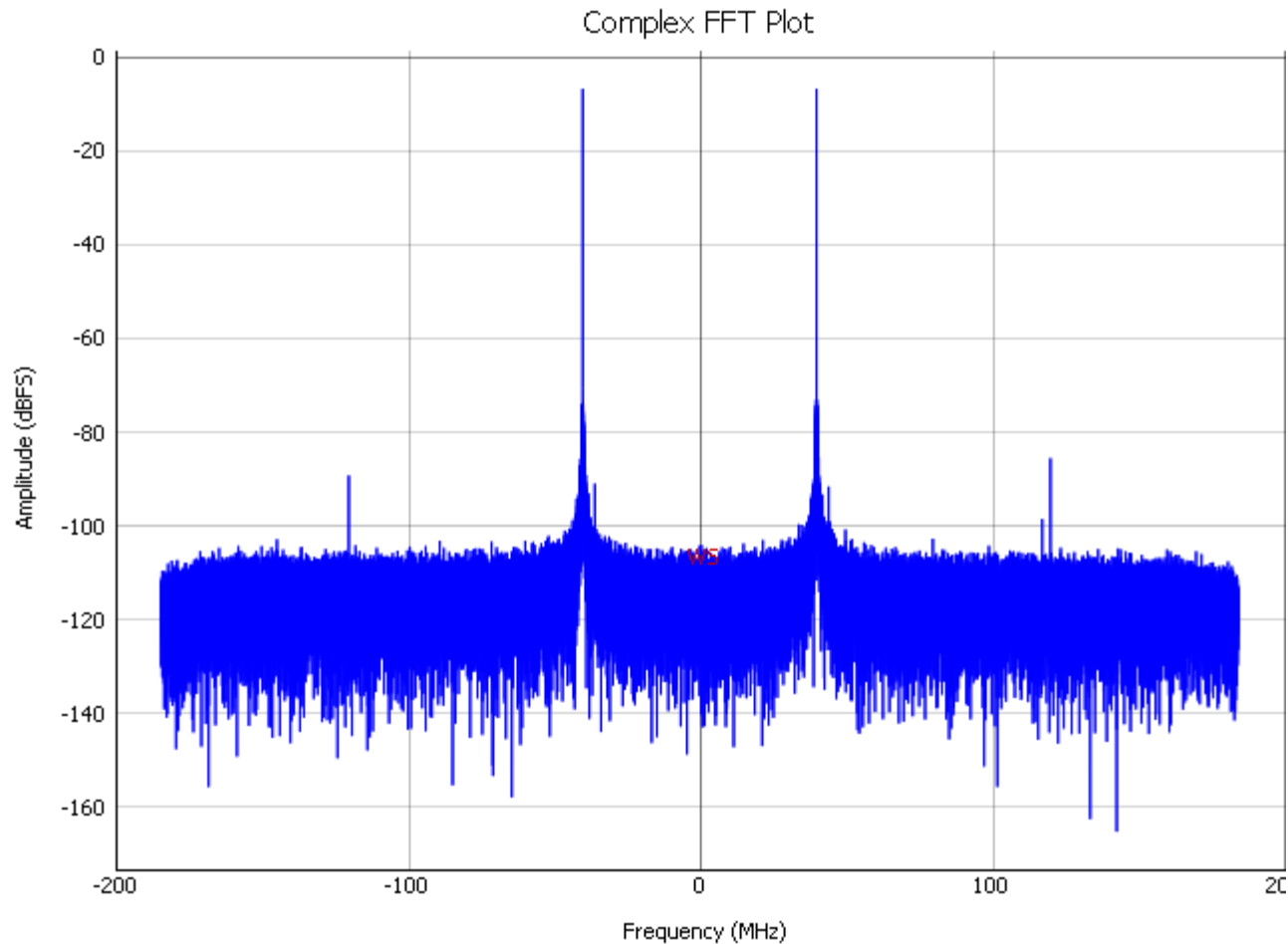
# RX D : IMD3 at -15dBFS input +/-10MHz

IMD3 = -103.858dBFS = -88.858dBc



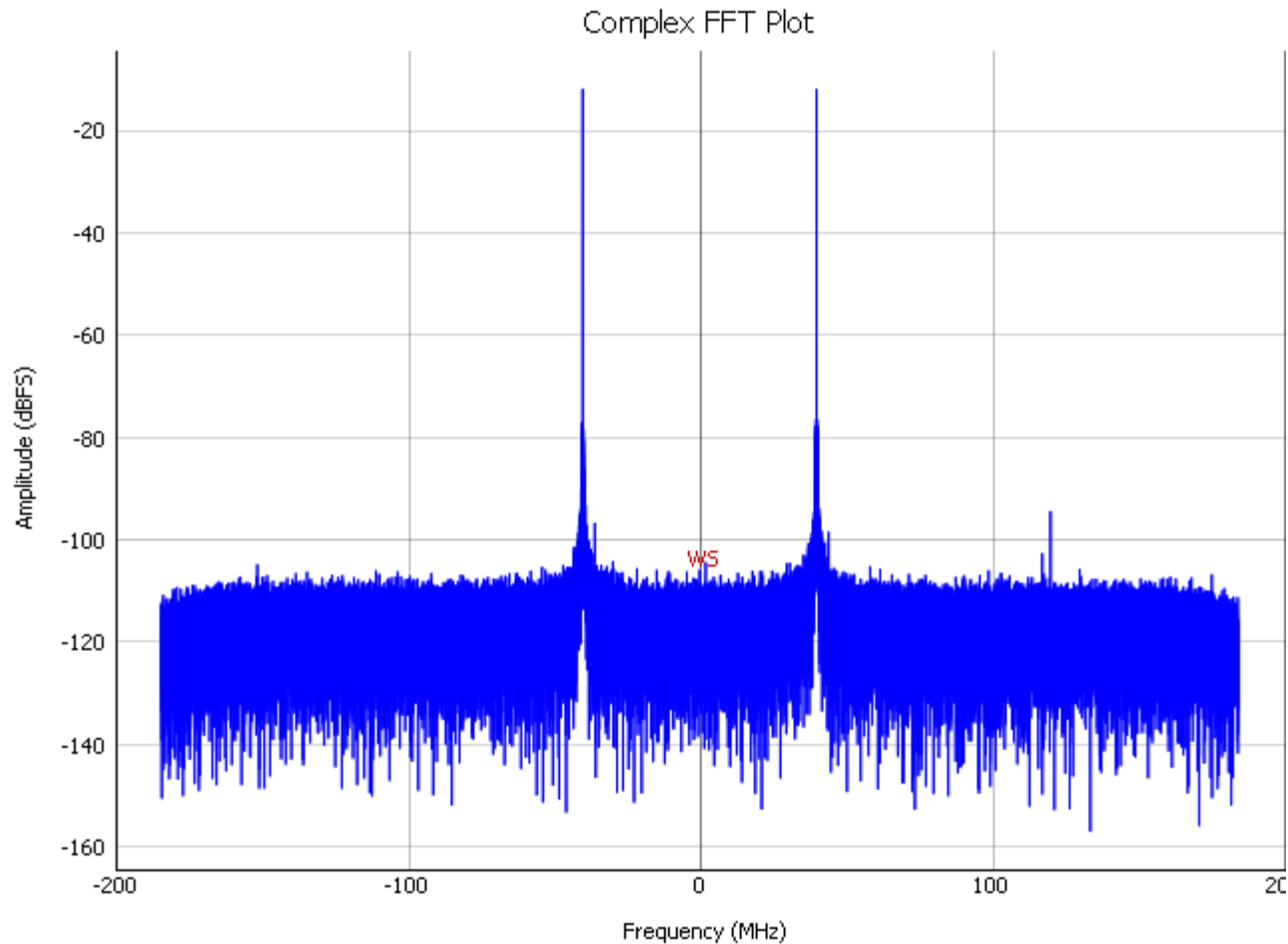
# RX D : IMD3 at -7dBFS input +/-40MHz

IMD3 = -85.893dBFS = -78.893dBc



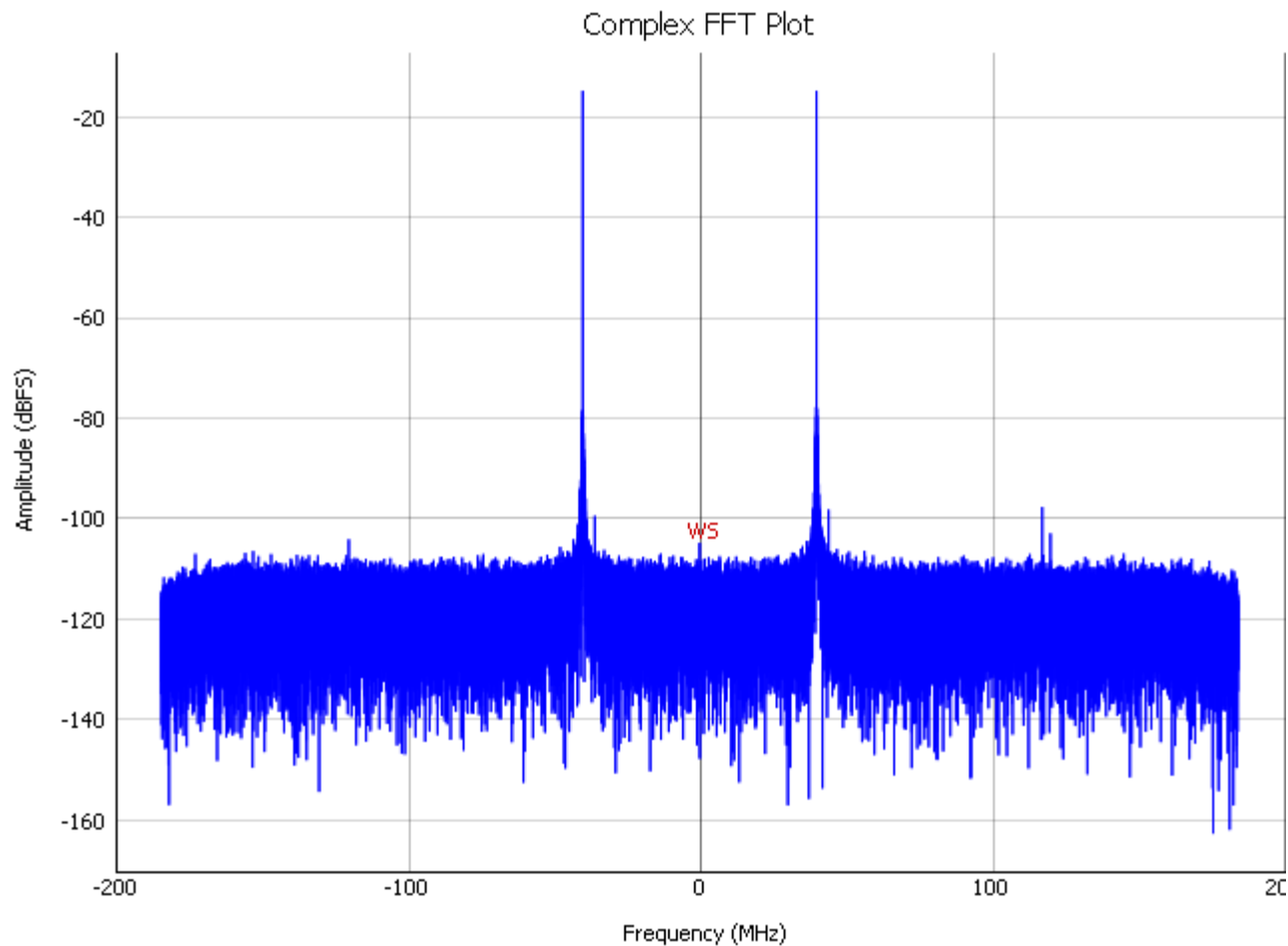
# RX D : IMD3 at -12dBFS input +/-40MHz

IMD3 = -94.594dBFS = -82.594dBc



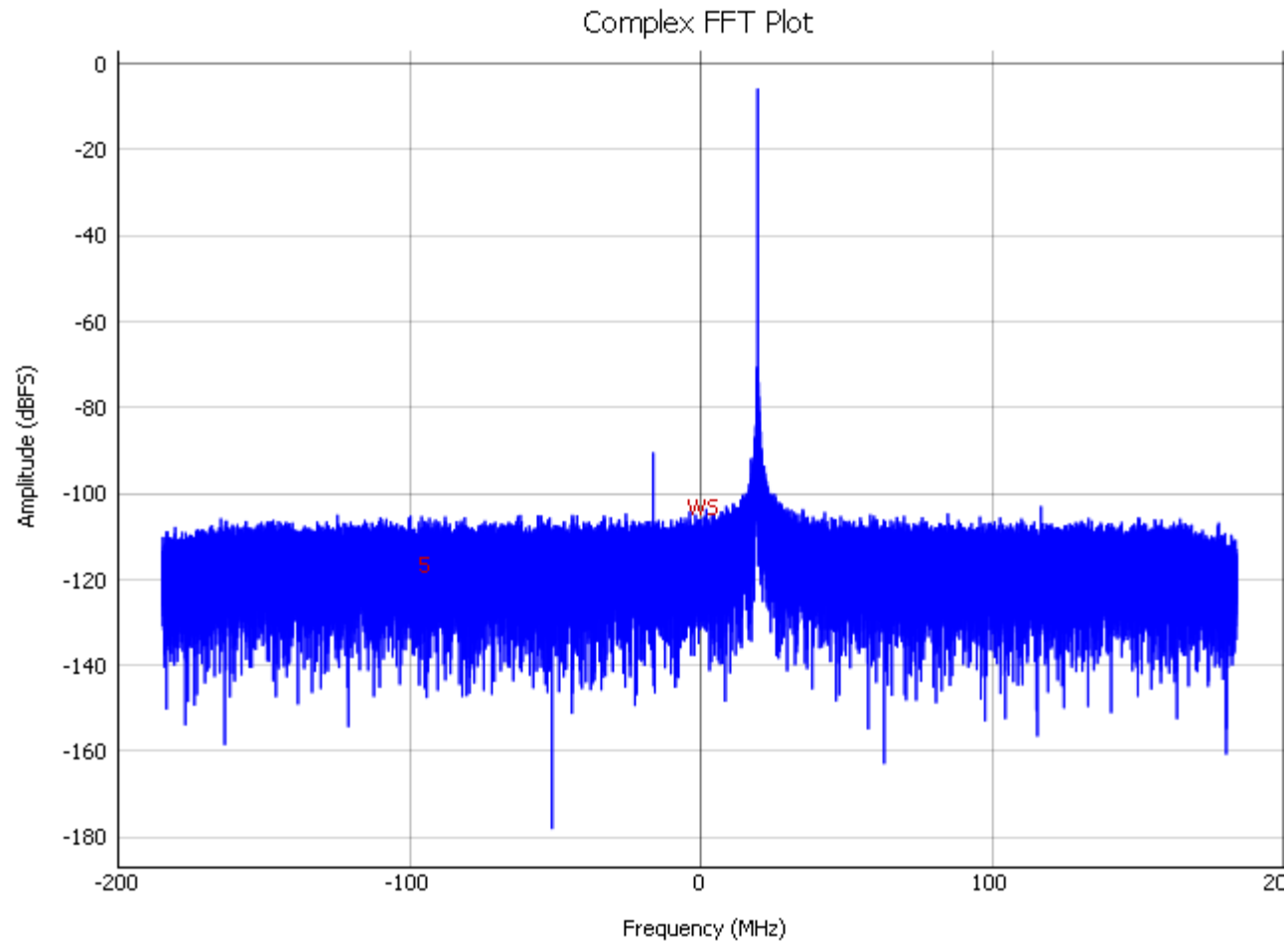
# RX D : IMD3 at -15dBFS input +/-40MHz

$$\text{IMD3} = -103.108\text{dBFS} = -88.108\text{dBc}$$



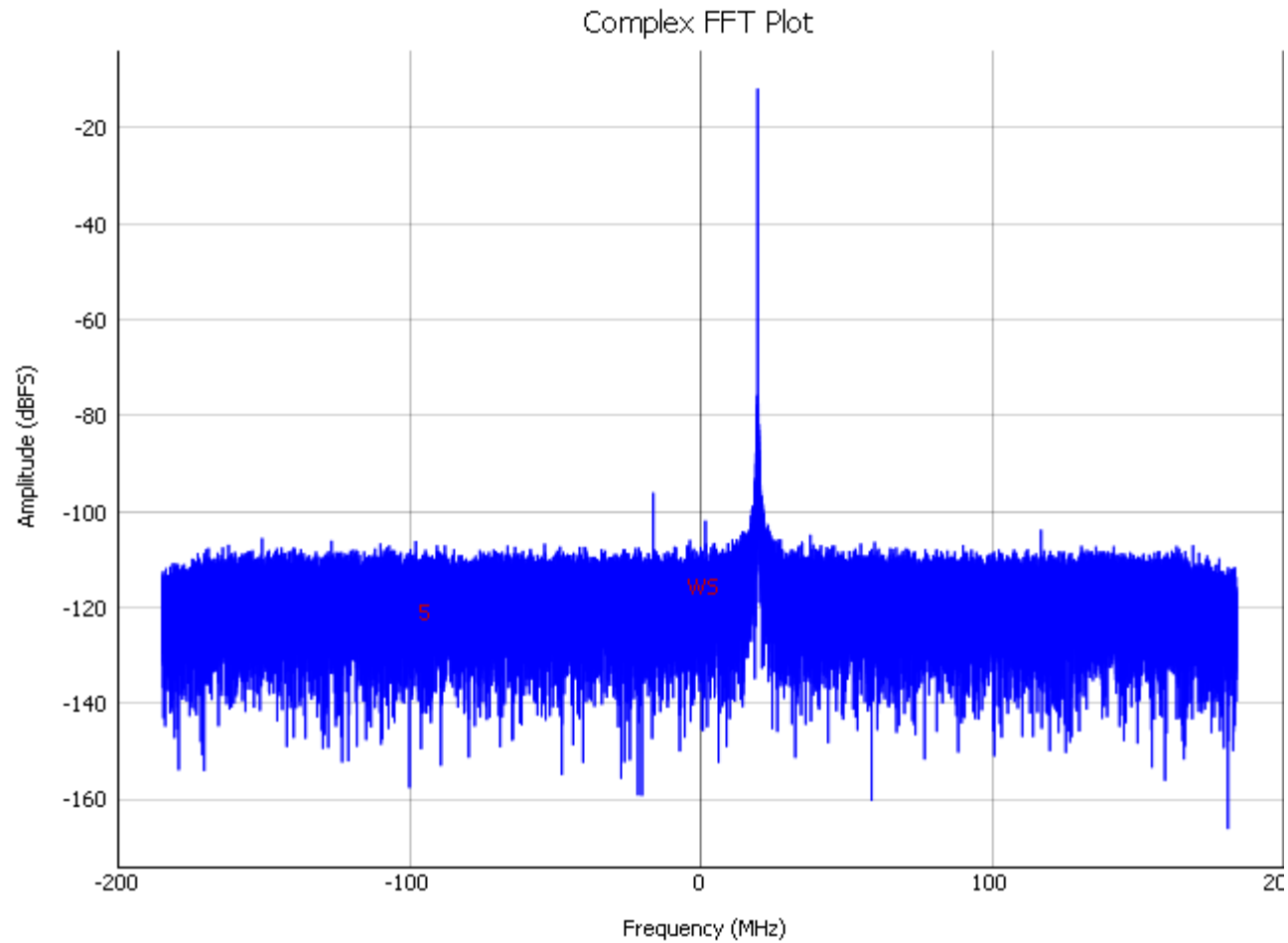
# RX D : SFDR at -6dBFS input

SFDR = 90.724dBFS = 84.724dBc



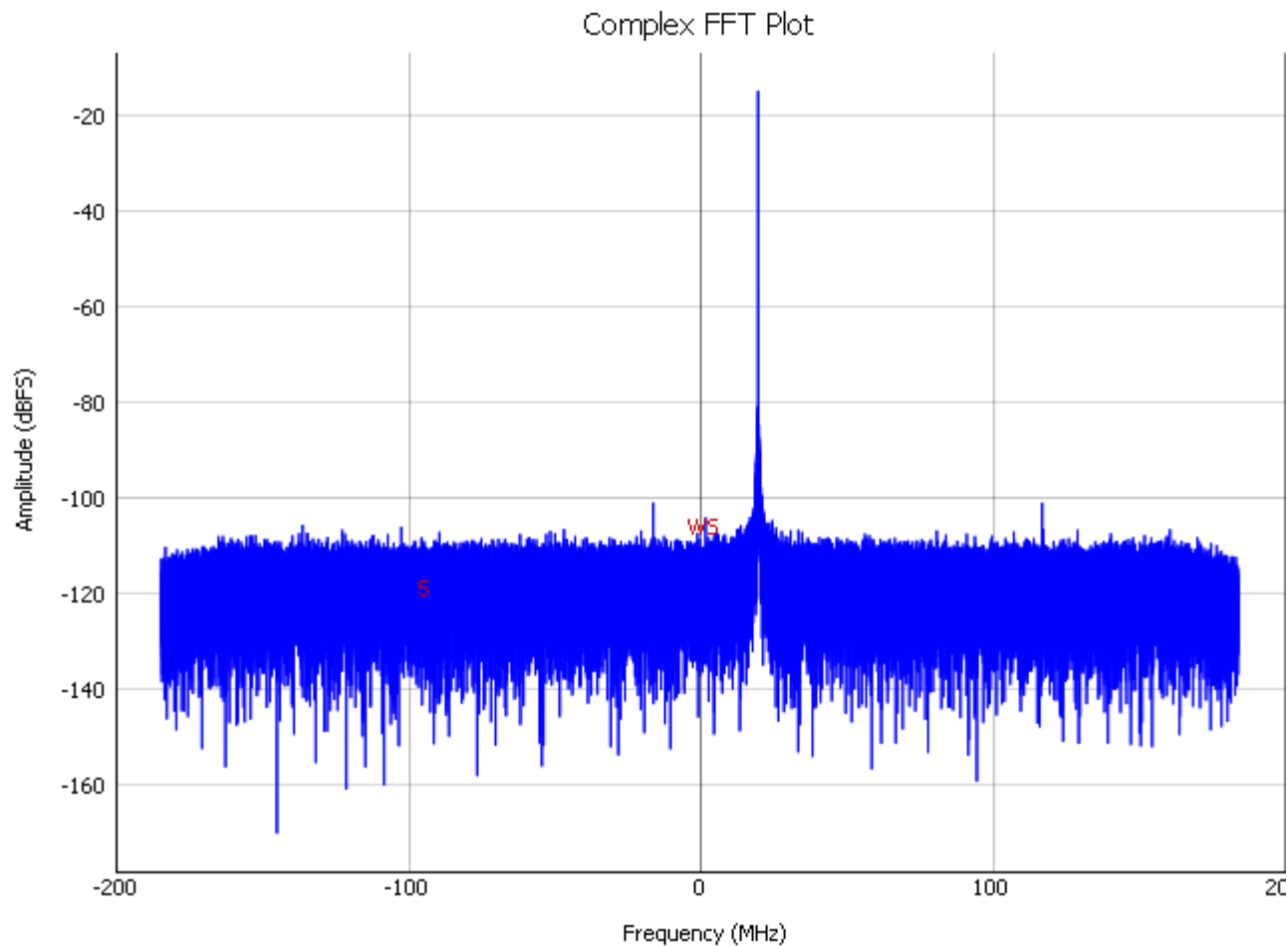
# RX D : SFDR at -12dBFS input

SFDR = 96.266dBFS = 84.266dBc

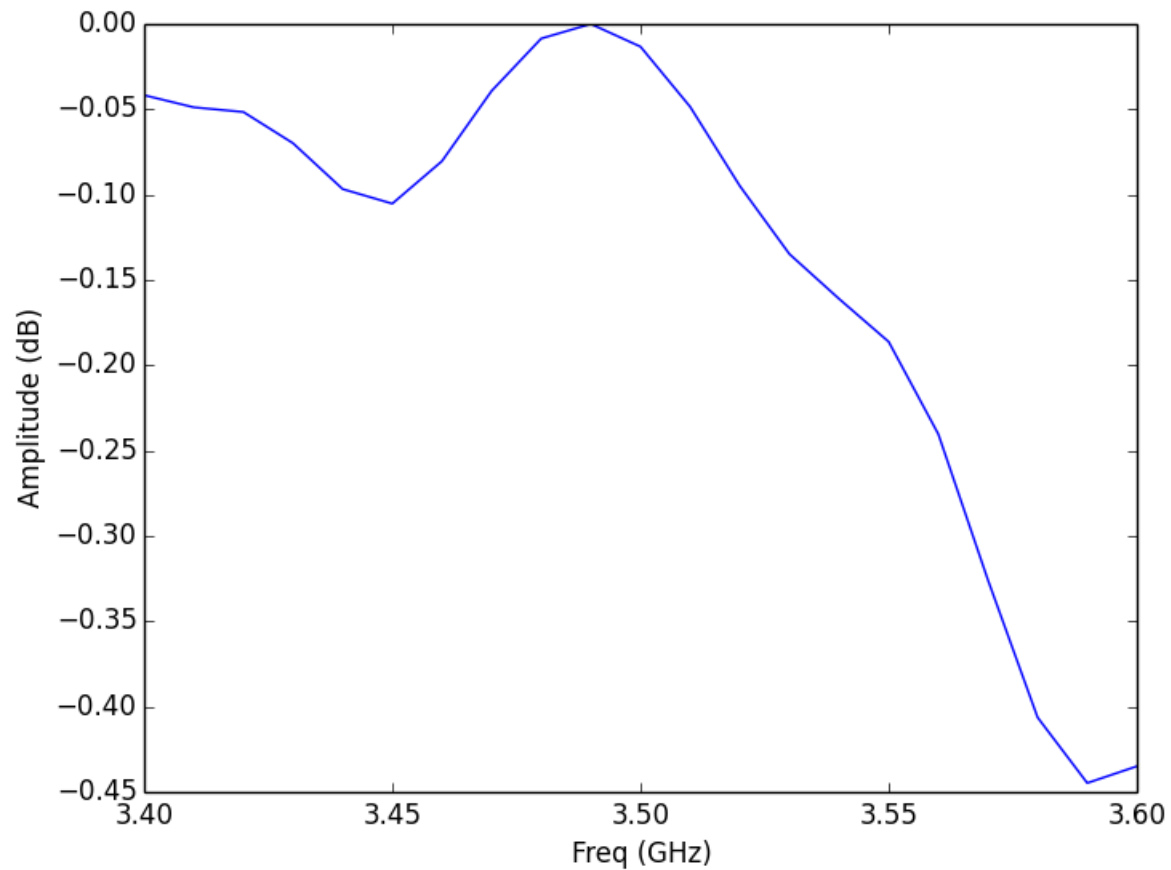


# RX D : SFDR at -15dBFS input

$$\text{SFDR} = 101.071\text{dBFS} = 86.071\text{dBc}$$

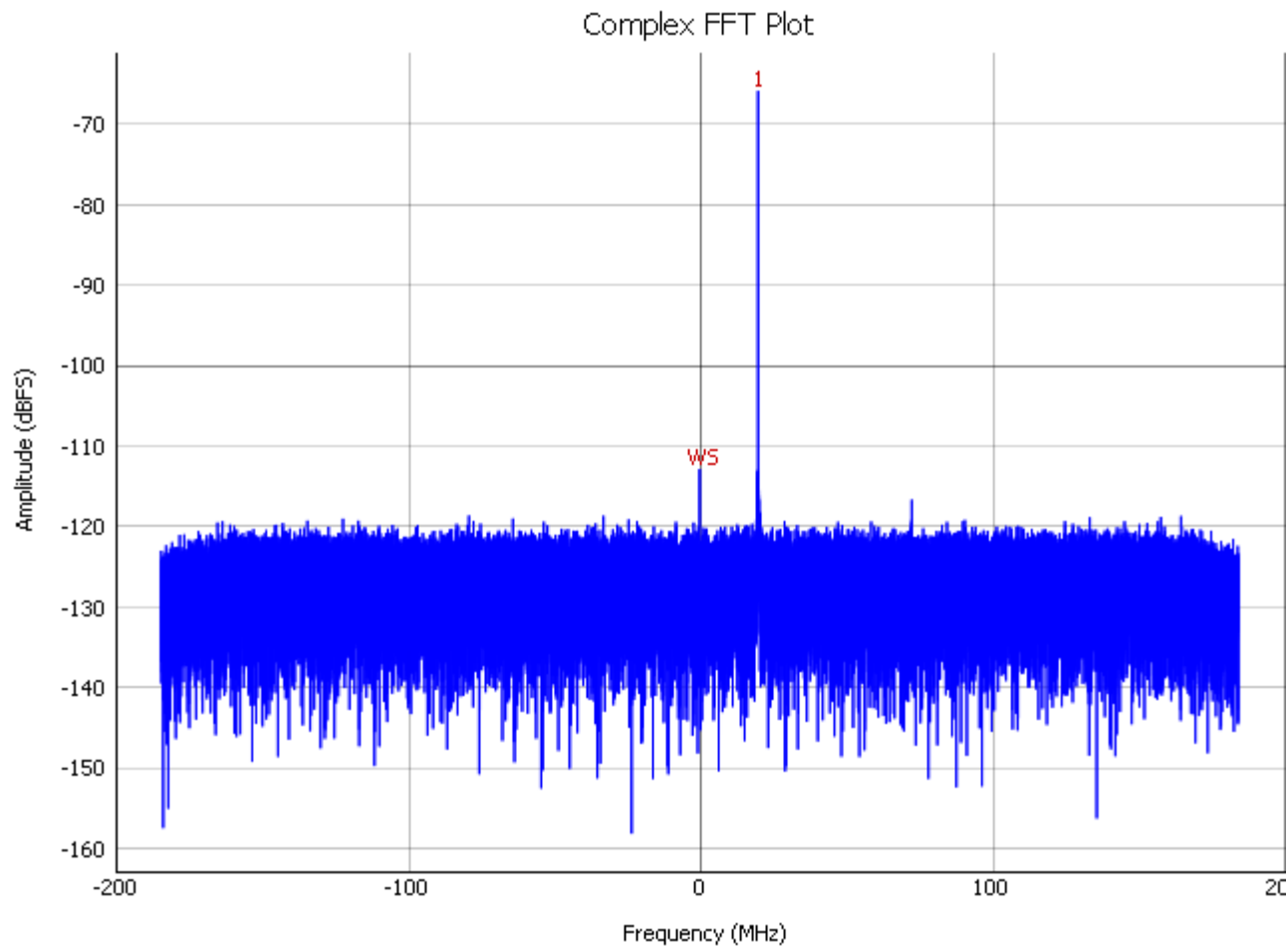


# RX D Flatness



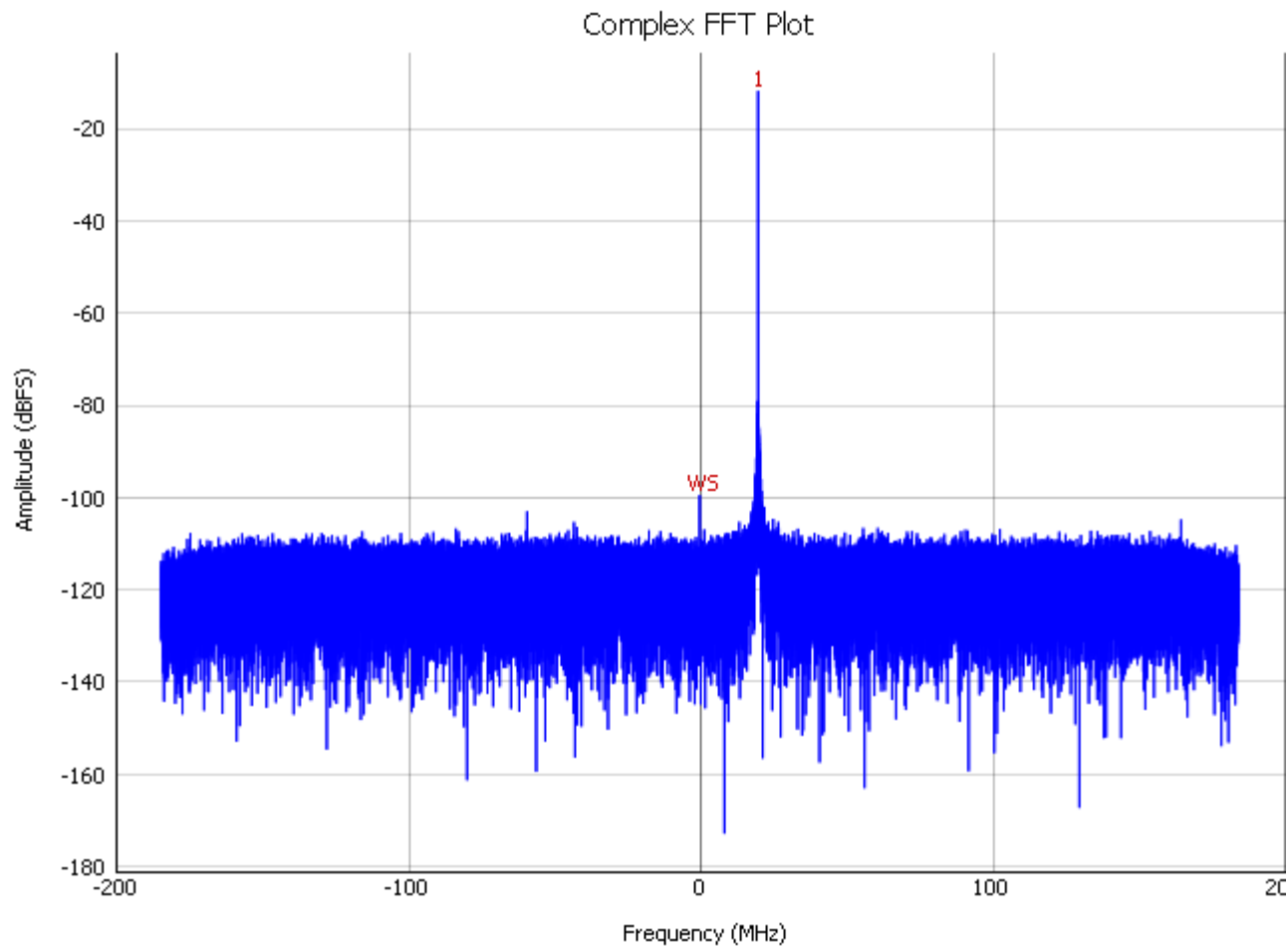
# FB A : SNR at -30dBFS input

SNR = 70.026dBFS ; NSD = 155.692dBFS/sqrt(Hz)



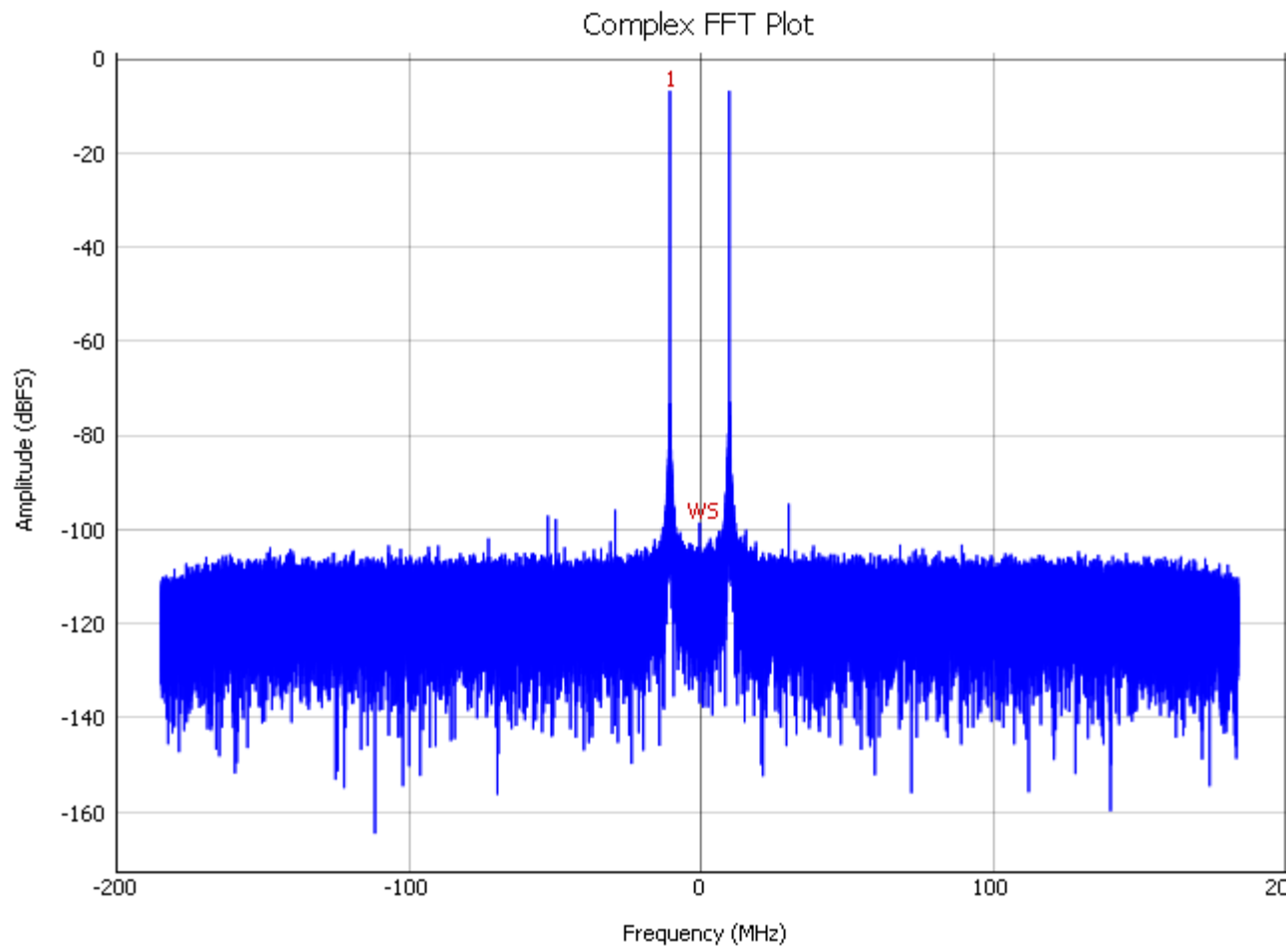
# FB A : SNR at -12dBFS input

SNR = 68.743dBFS ; NSD = 154.409dBFS/sqrt(Hz)



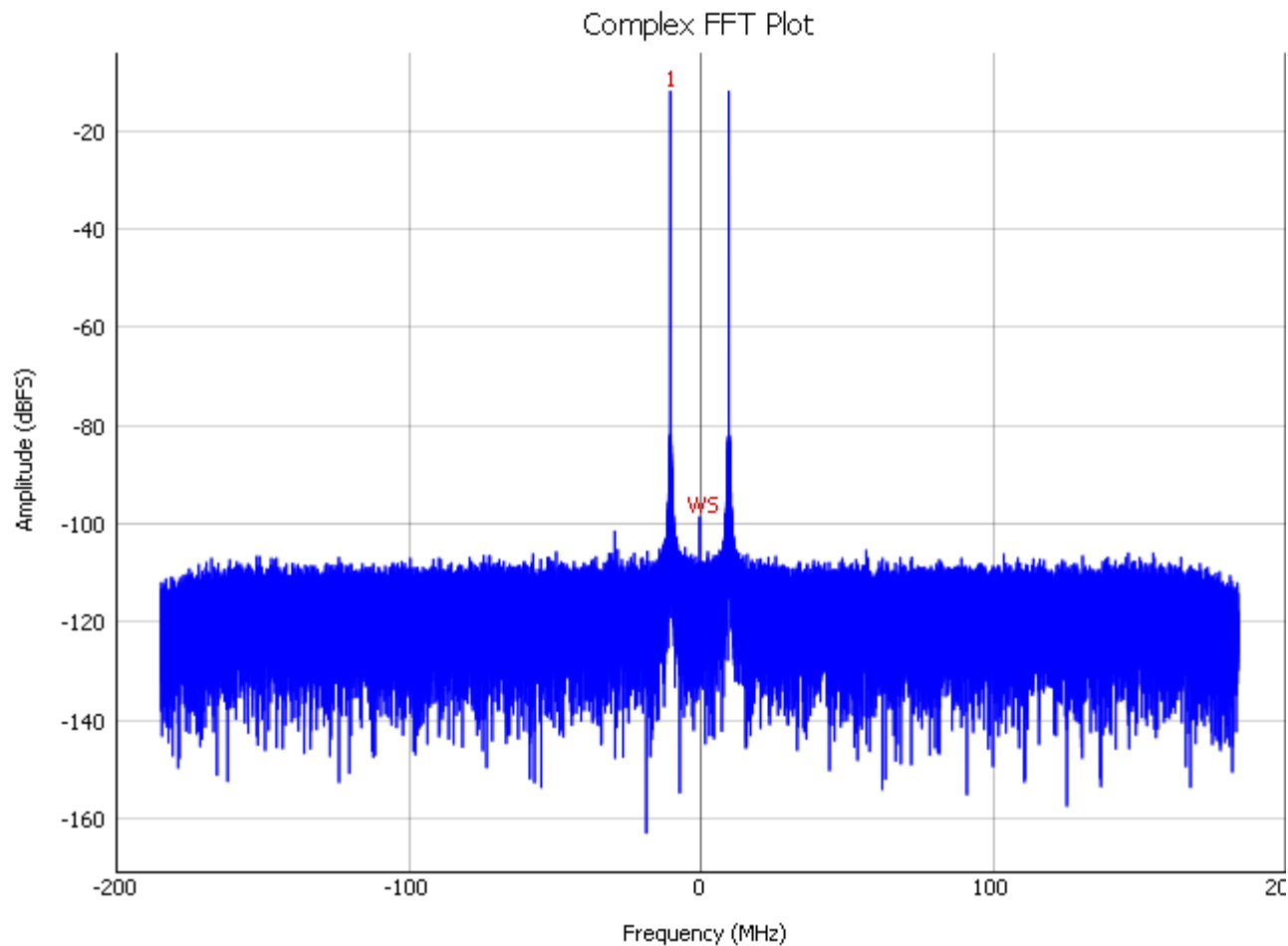
# FB A : IMD3 at -7dBFS input +/-10MHz

IMD3 = -94.721dBFS = -87.721dBc



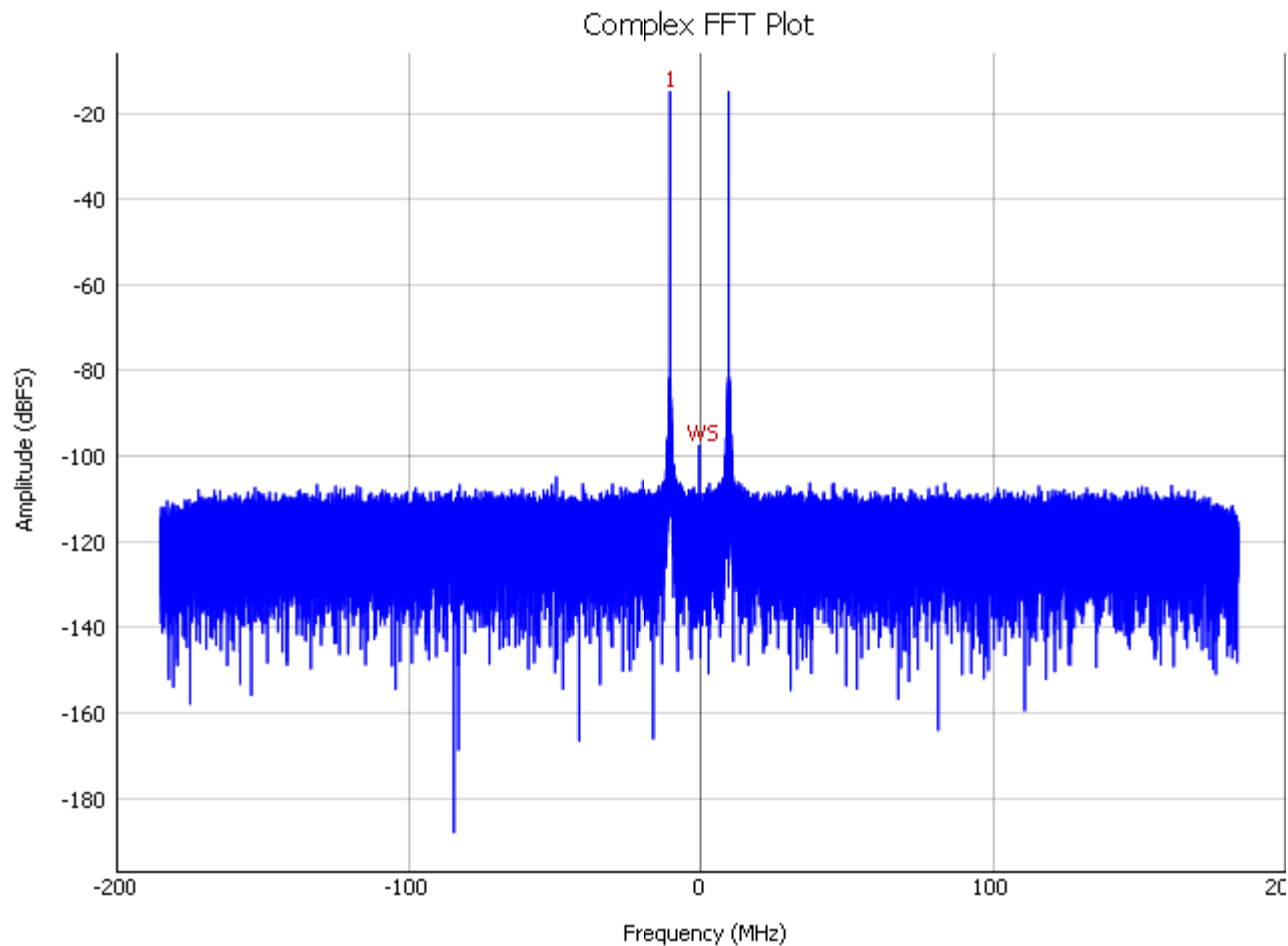
# FB A : IMD3 at -12dBFS input +/-10MHz

$$\text{IMD3} = -106.036\text{dBFS} = -94.036\text{dBc}$$



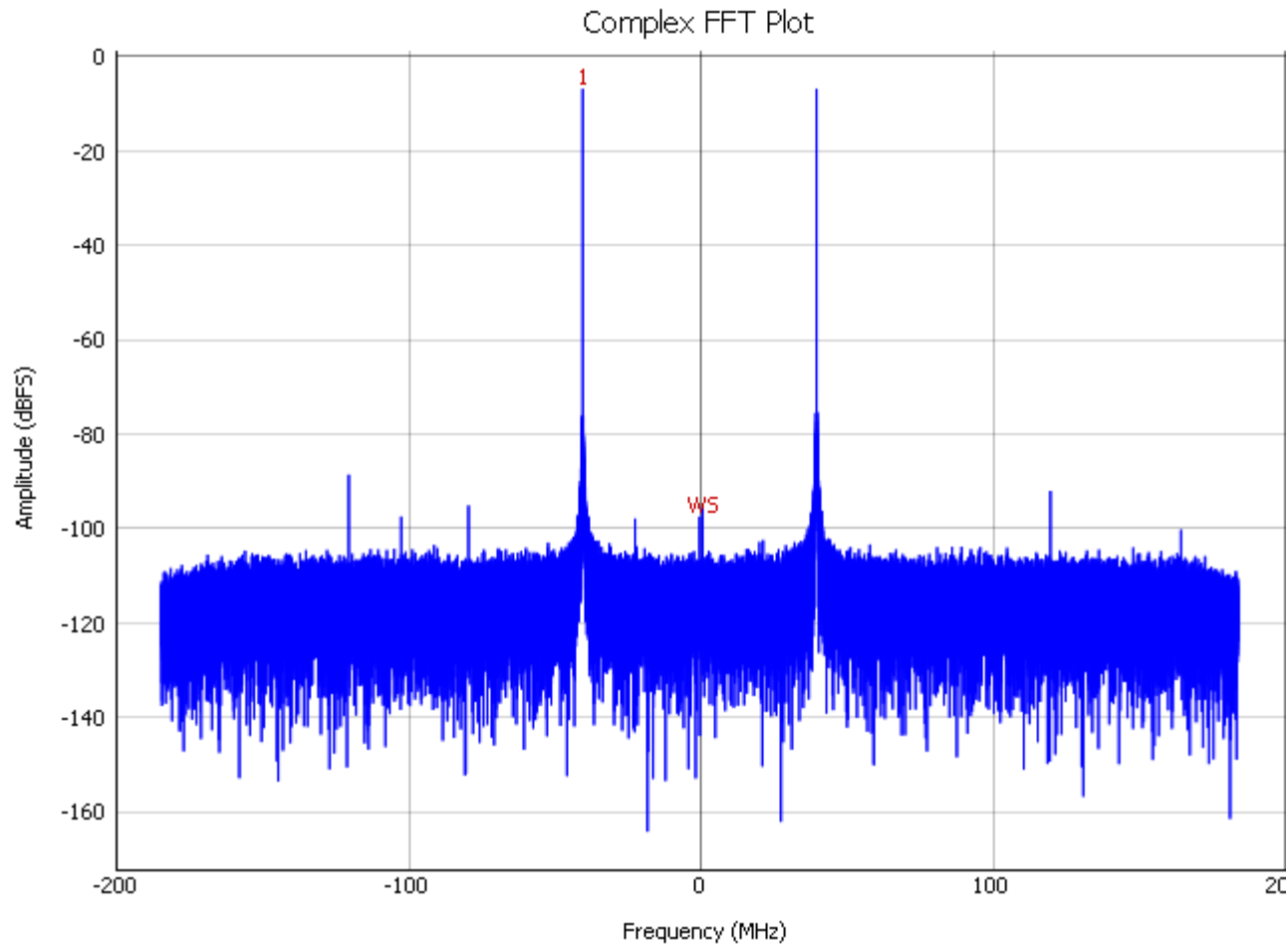
# FB A : IMD3 at -15dBFS input +/-10MHz

$$\text{IMD3} = -112.443\text{dBFS} = -97.443\text{dBc}$$



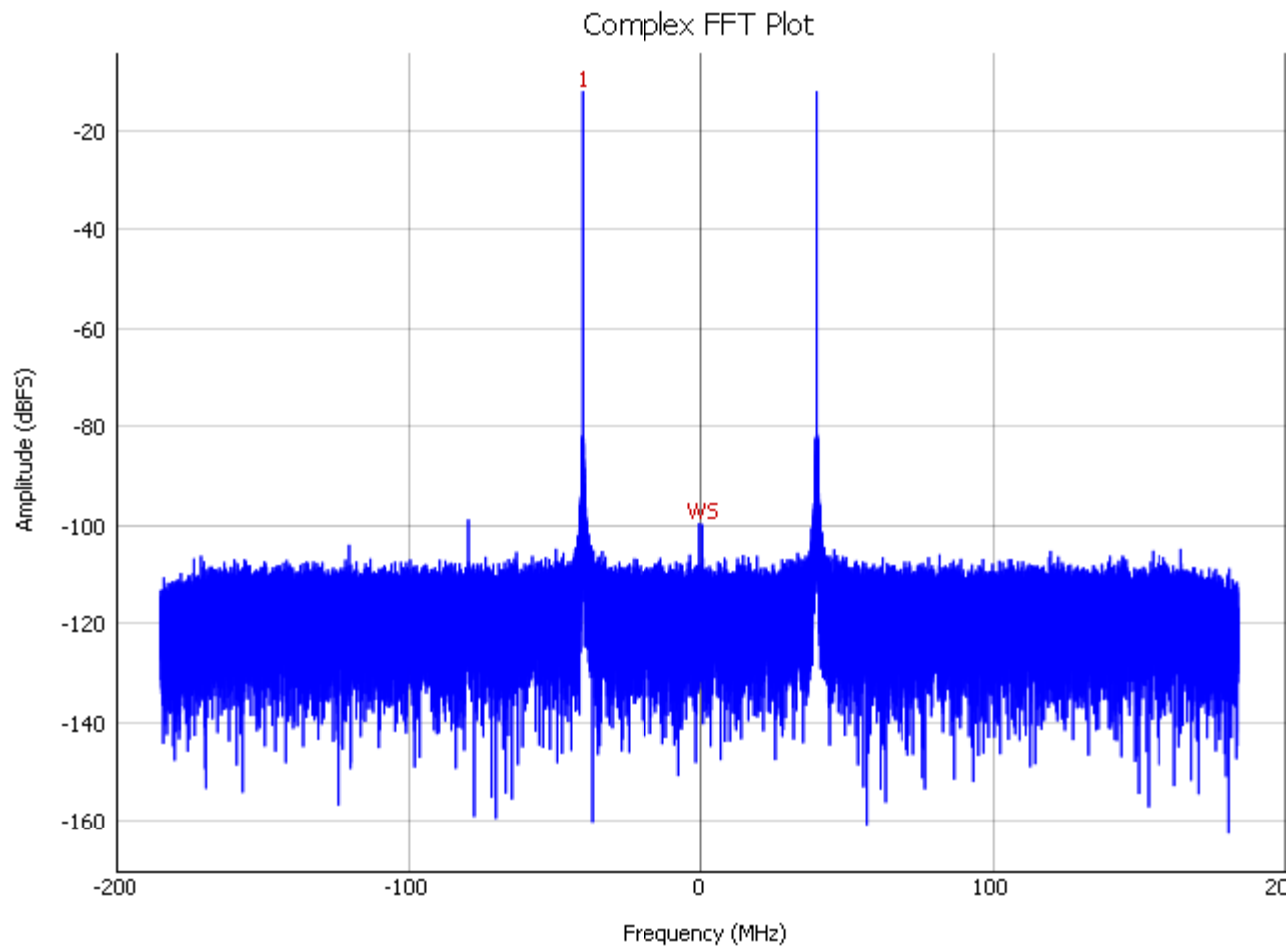
# FB A : IMD3 at -7dBFS input +/-40MHz

IMD3 = -88.793dBFS = -81.793dBc



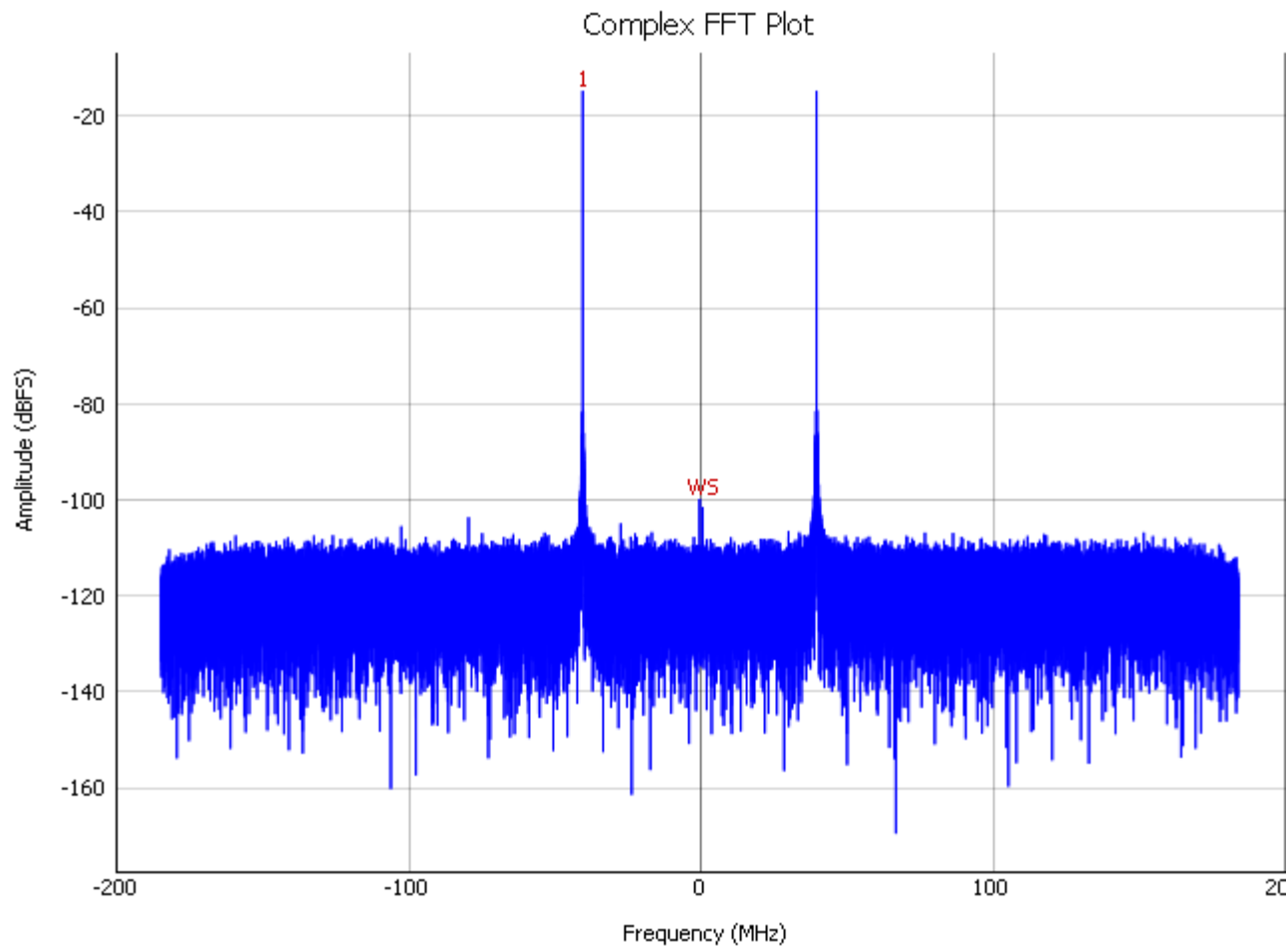
# FB A : IMD3 at -12dBFS input +/-40MHz

IMD3 = -104.077dBFS = -92.077dBc



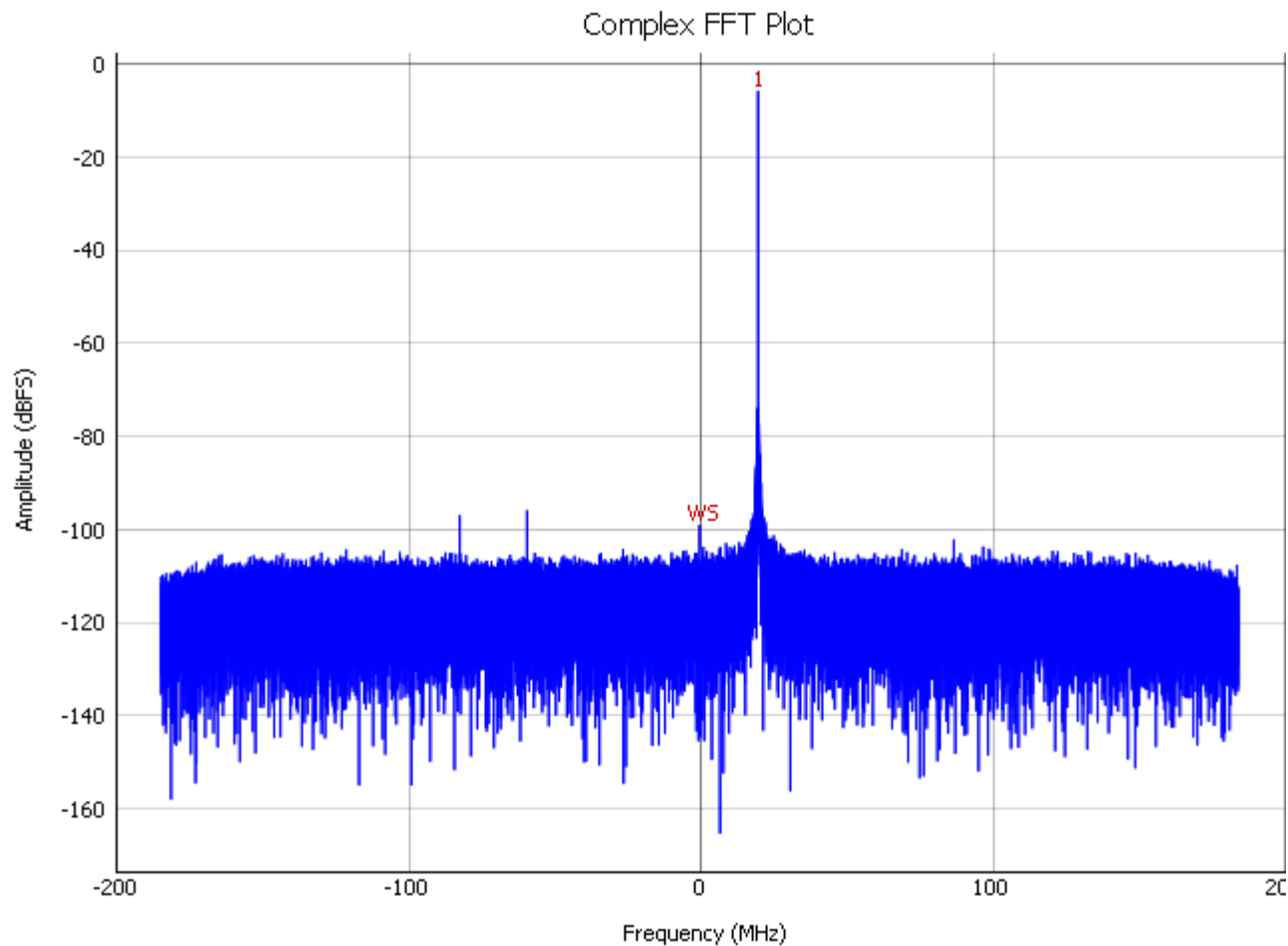
# FB A : IMD3 at -15dBFS input +/-40MHz

IMD3 = -109.943dBFS = -94.943dBc



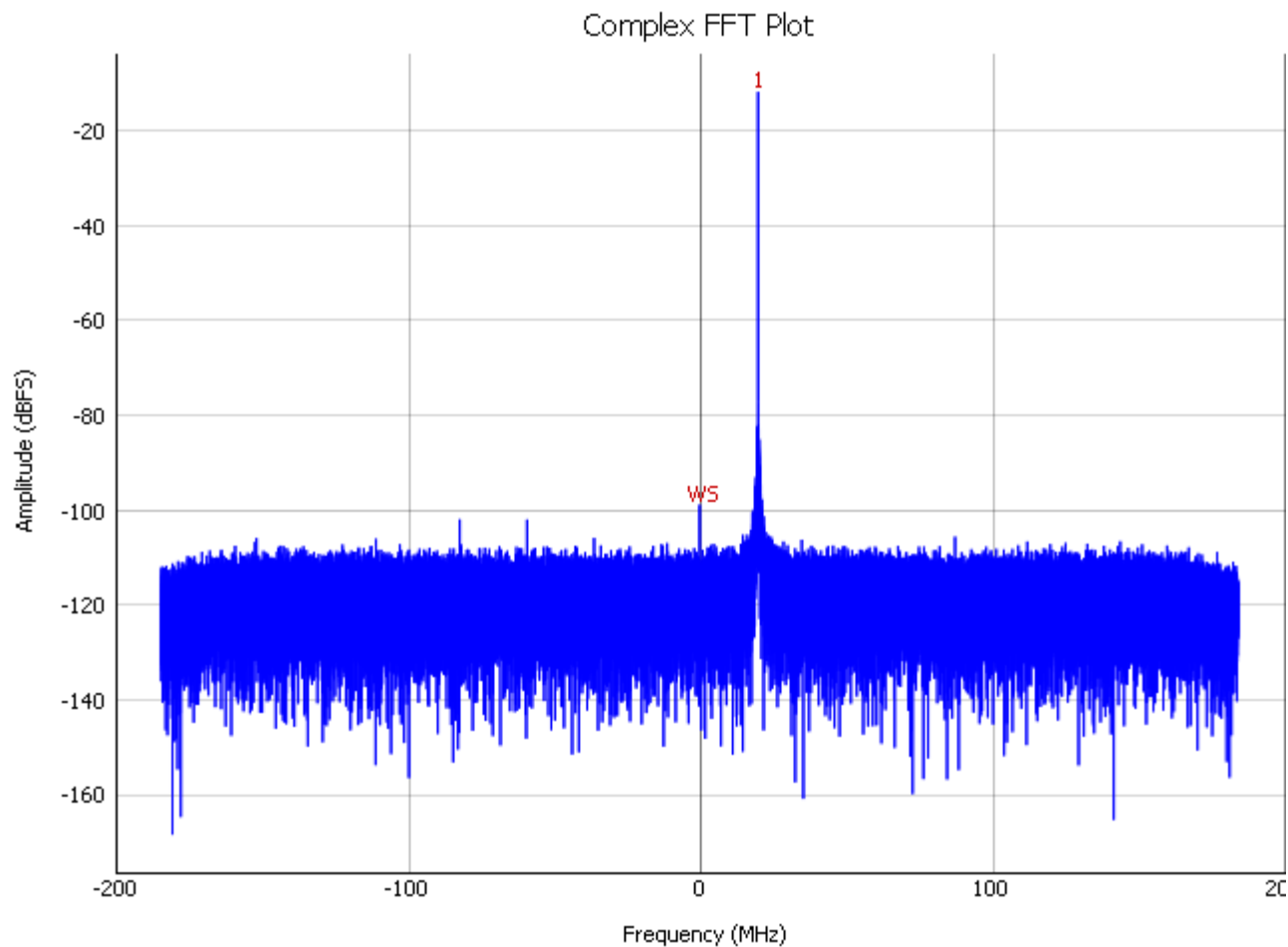
# FB A : SFDR at -6dBFS input

$$\text{SFDR} = 96.062\text{dBFS} = 90.062\text{dBc}$$



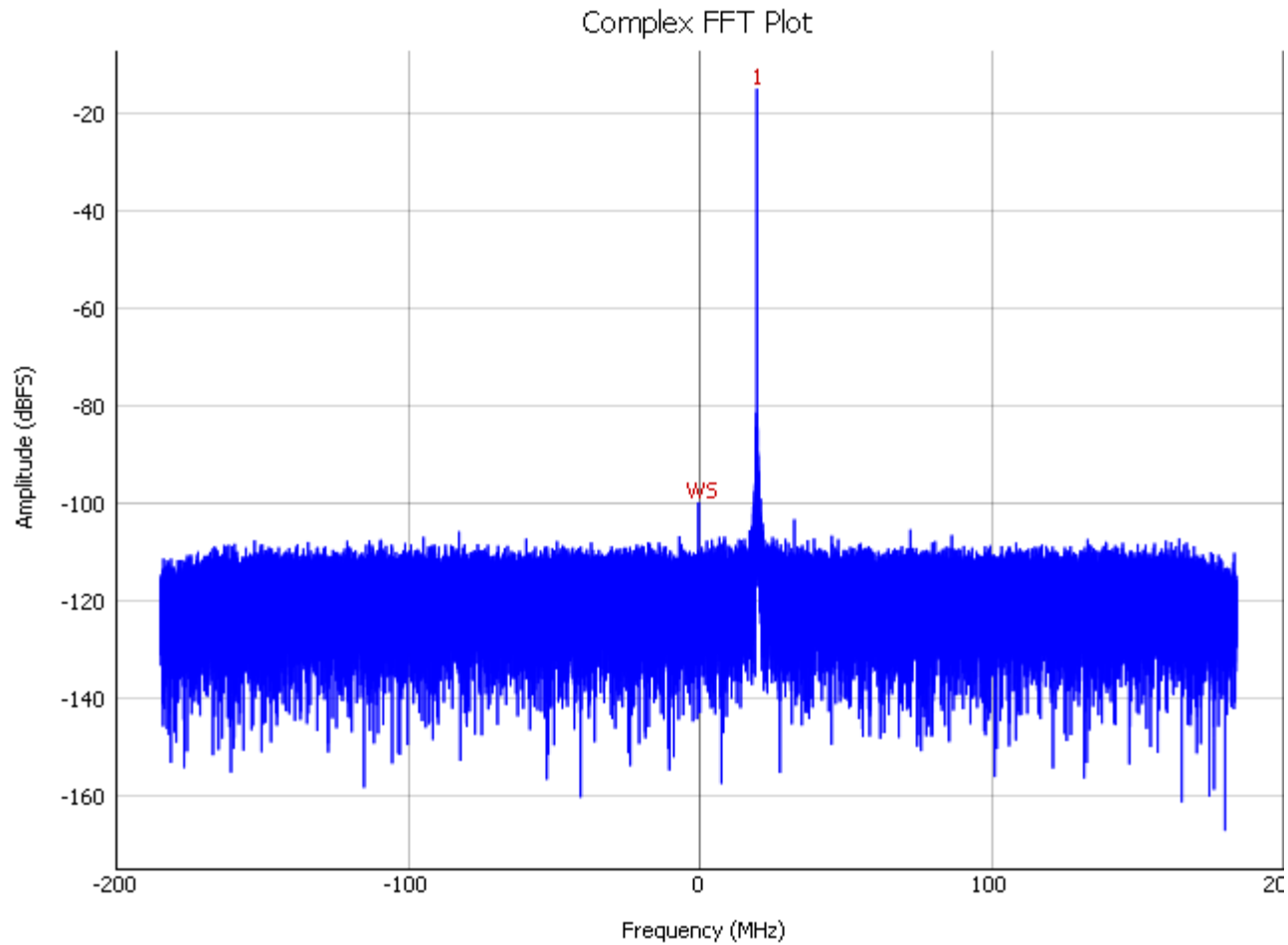
# FB A : SFDR at -12dBFS input

$$\text{SFDR} = 102.129\text{dBFS} = 90.129\text{dBc}$$

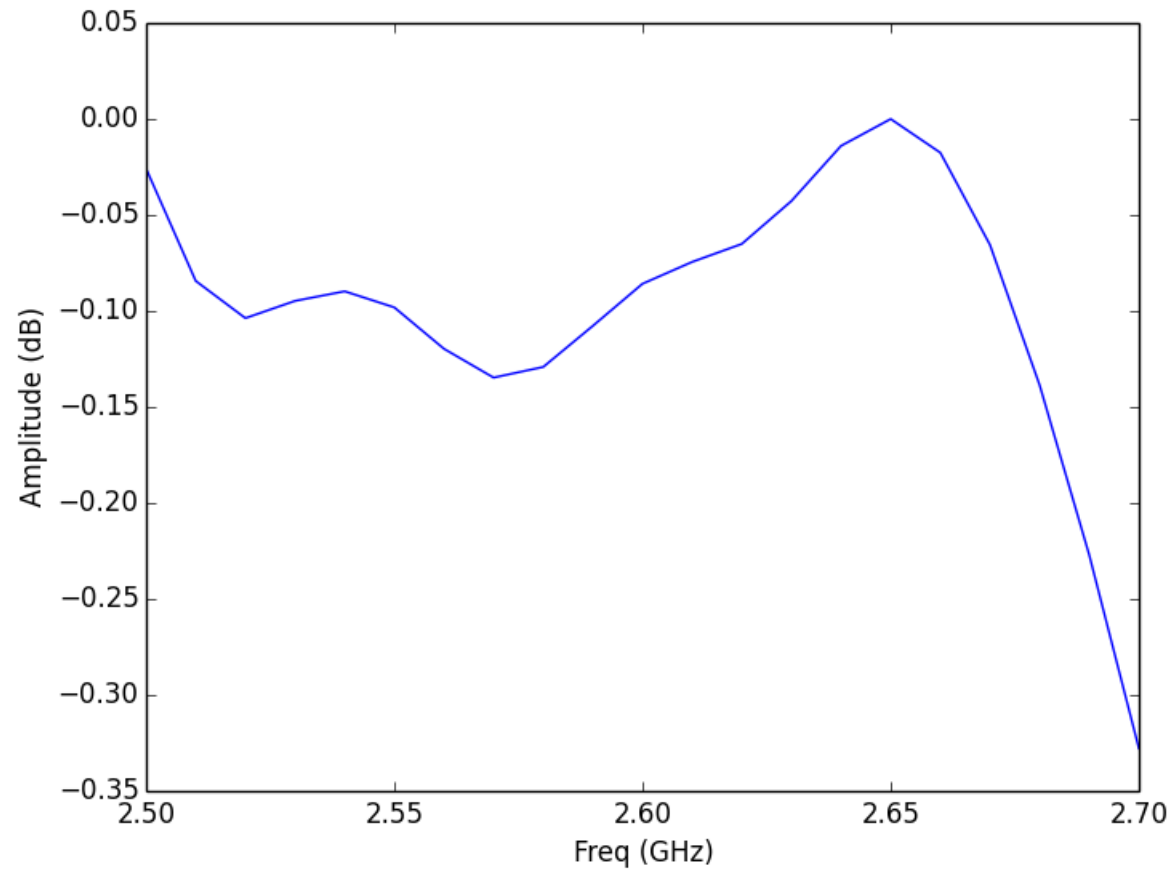


# FB A : SFDR at -15dBFS input

SFDR = 103.431dBFS = 88.431dBc

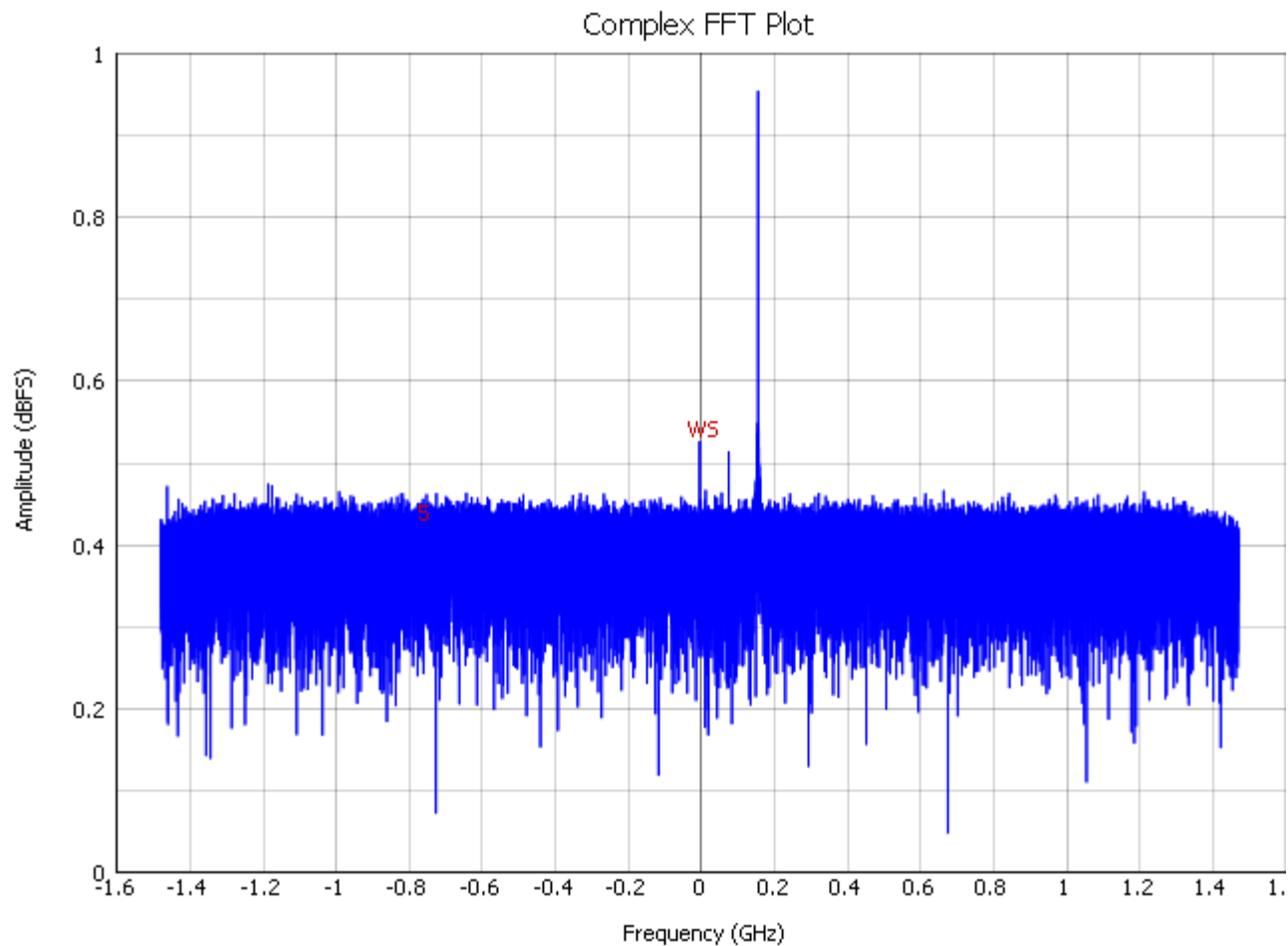


# FB A Flatness



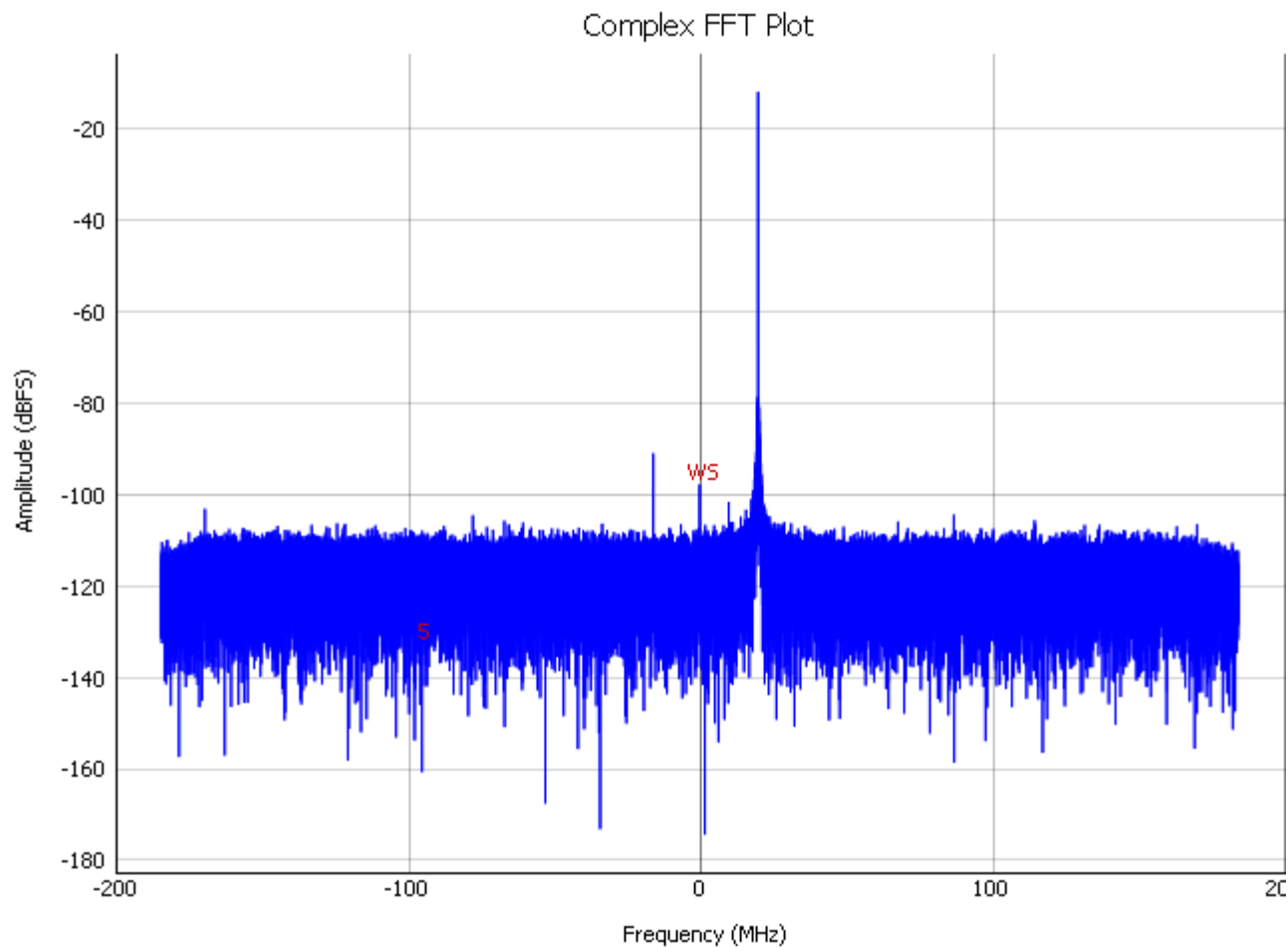
# FB B : SNR at -30dBFS input

SNR = 70.09dBFS ; NSD = 155.756dBFS/sqrt(Hz)



# FB B : SNR at -12dBFS input

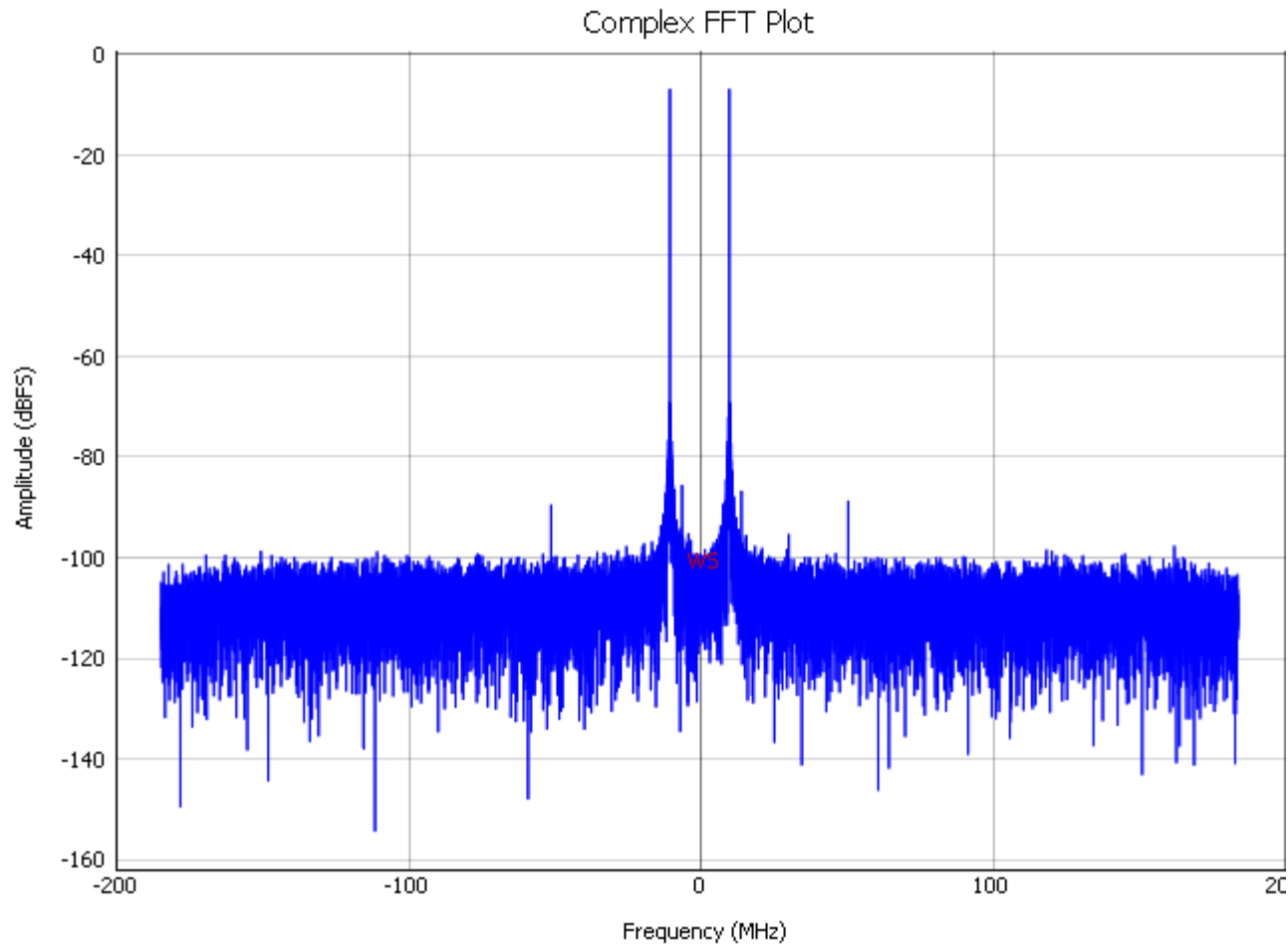
SNR = 68.197dBFS ; NSD = 153.863dBFS/sqrt(Hz)



# IMD3 Trims for FB B

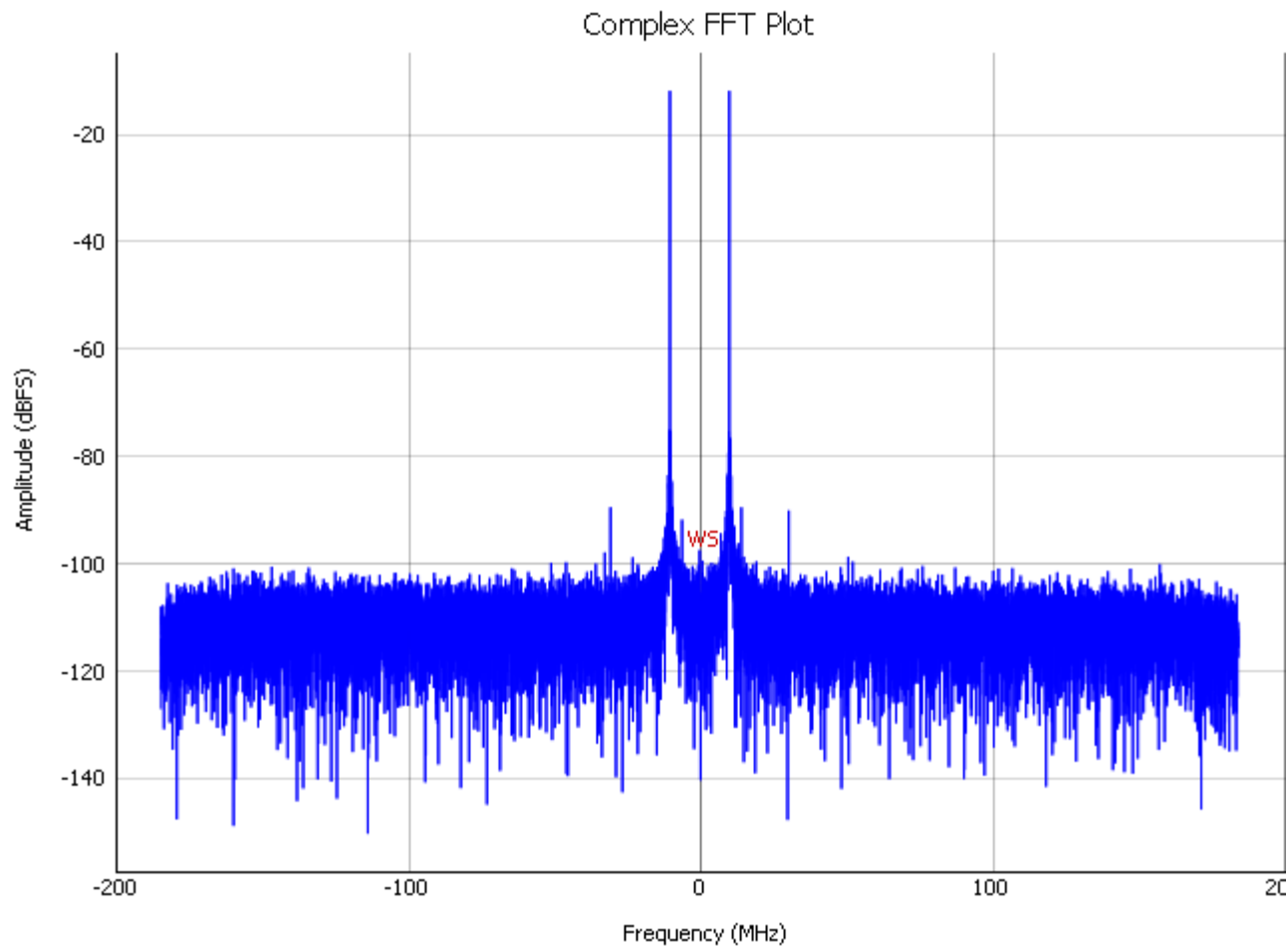
# FB B : IMD3 at -7dBFS input +/-10MHz

IMD3 = -95.507dBFS = -88.507dBc



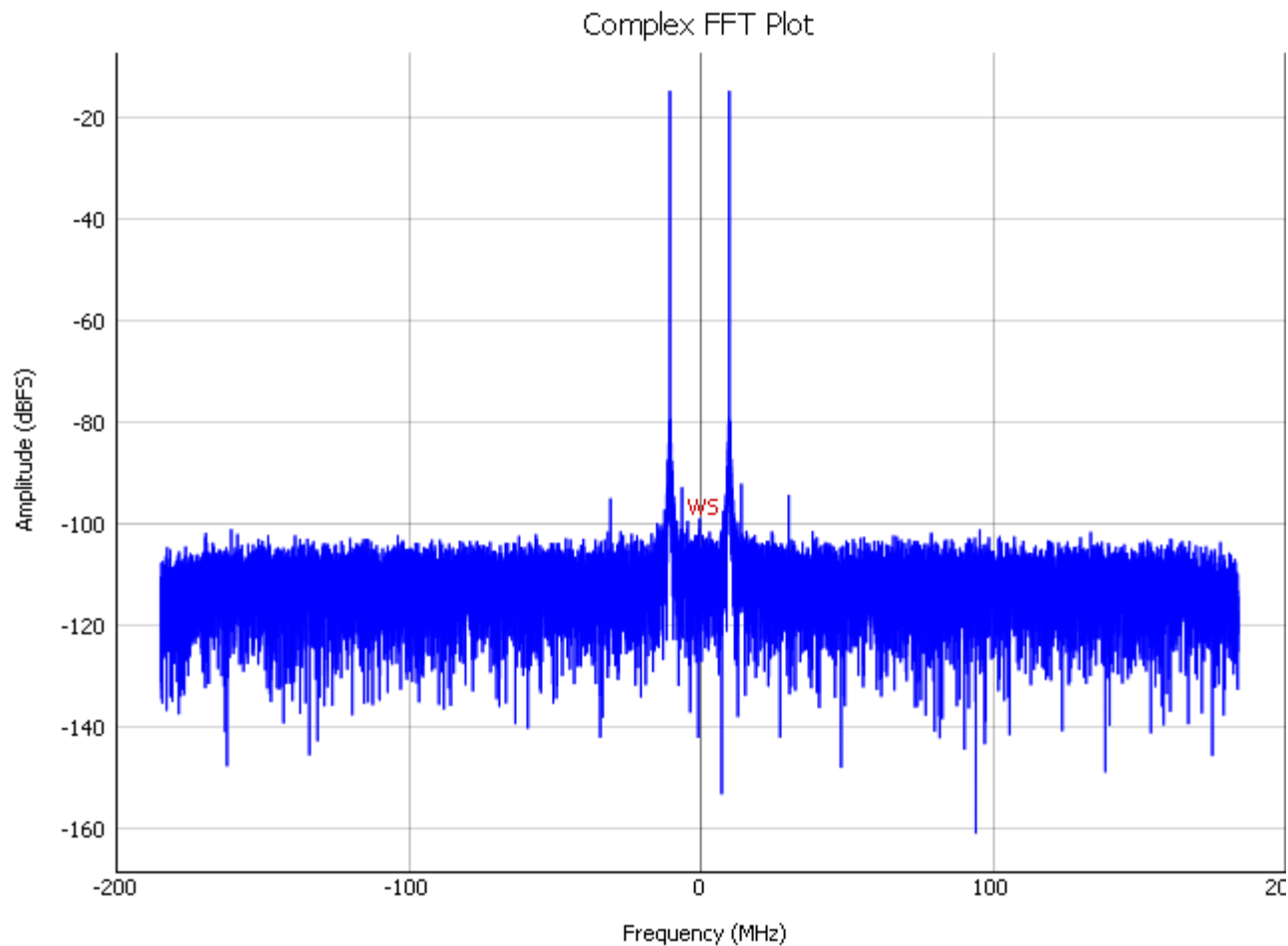
# FB B : IMD3 at -12dBFS input +/-10MHz

$$\text{IMD3} = -89.696\text{dBFS} = -77.696\text{dBc}$$



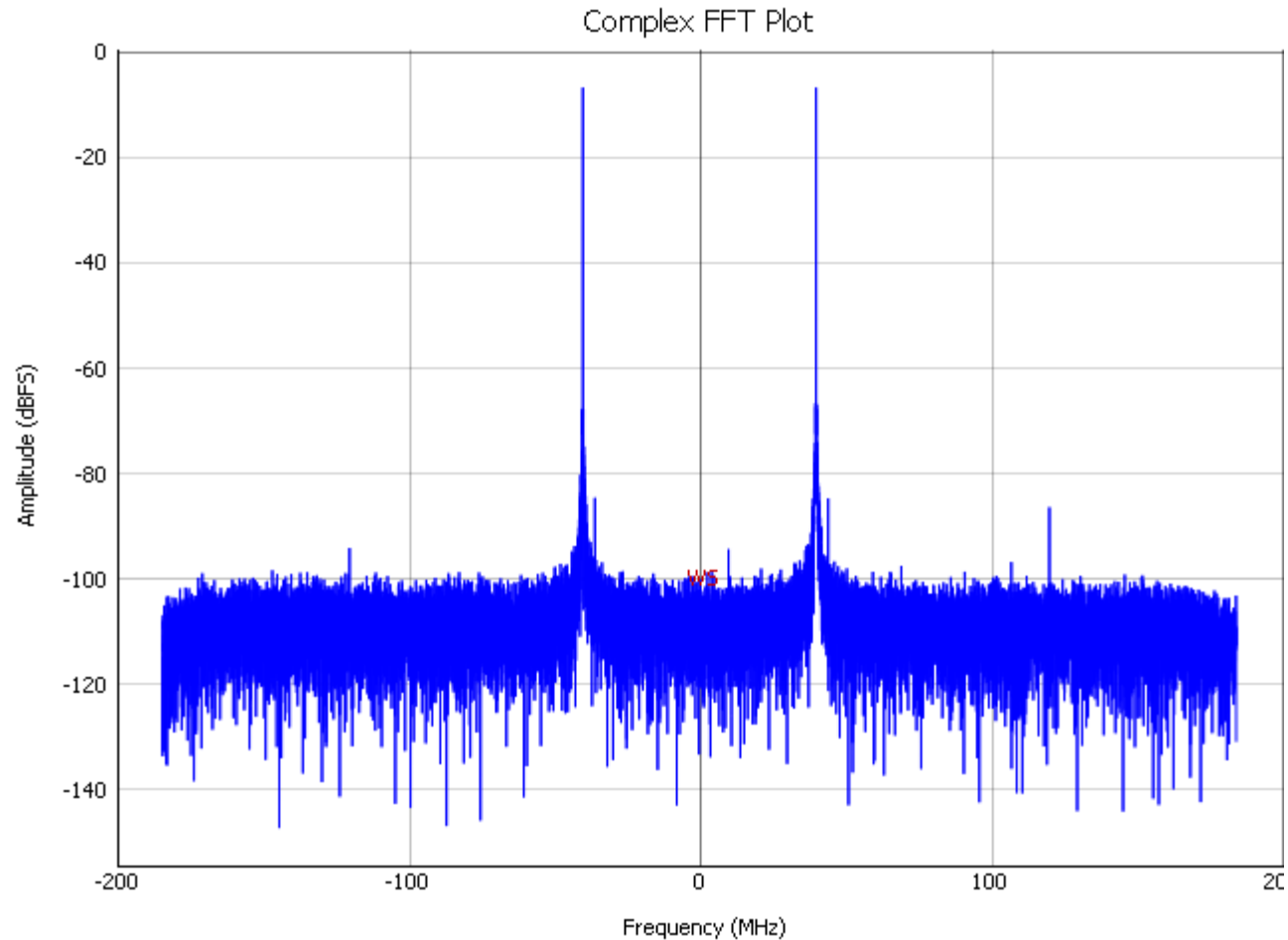
# FB B : IMD3 at -15dBFS input +/-10MHz

IMD3 = -94.583dBFS = -79.583dBc



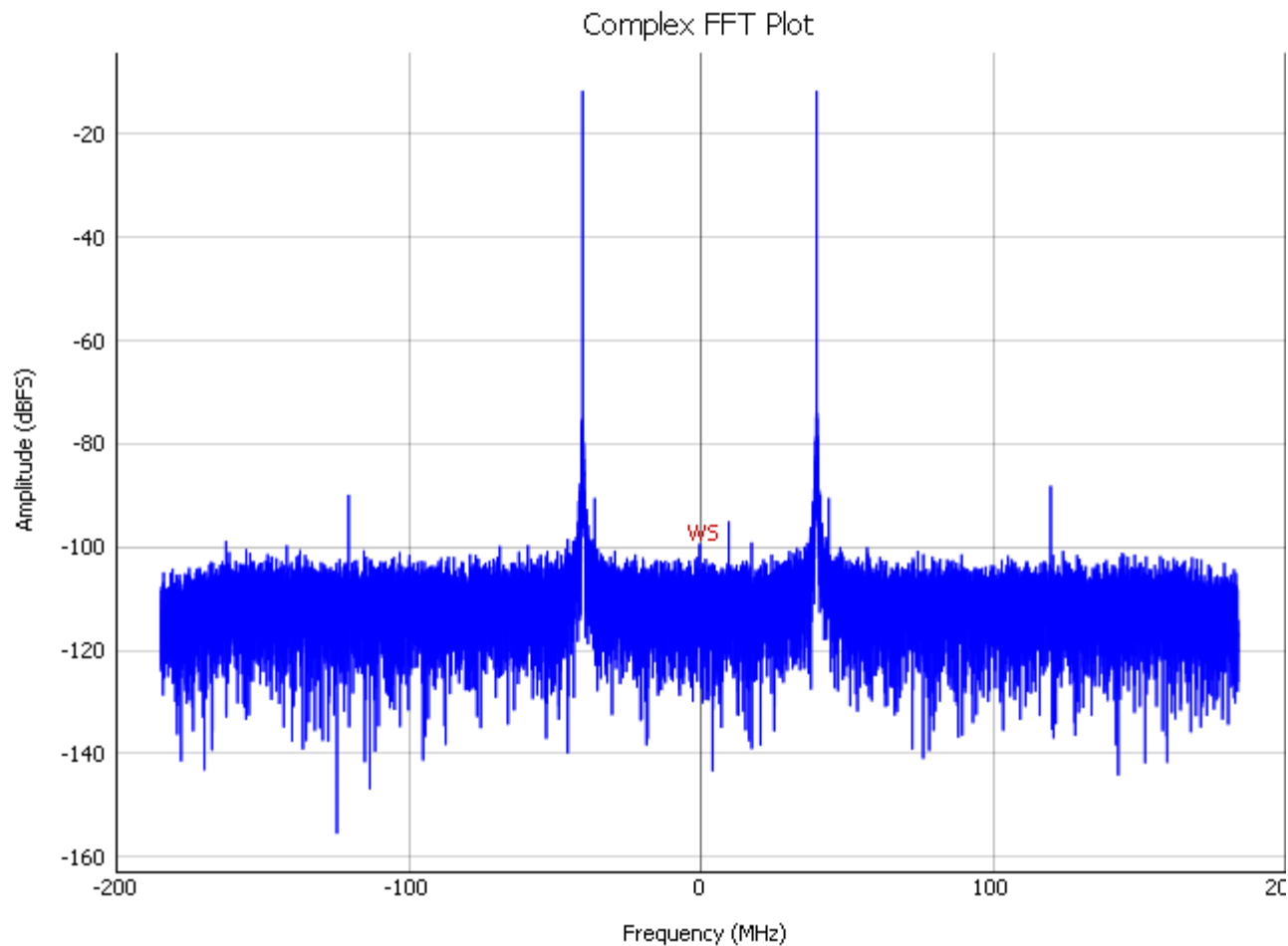
# FB B : IMD3 at -7dBFS input +/-40MHz

IMD3 = -86.664dBFS = -79.664dBc



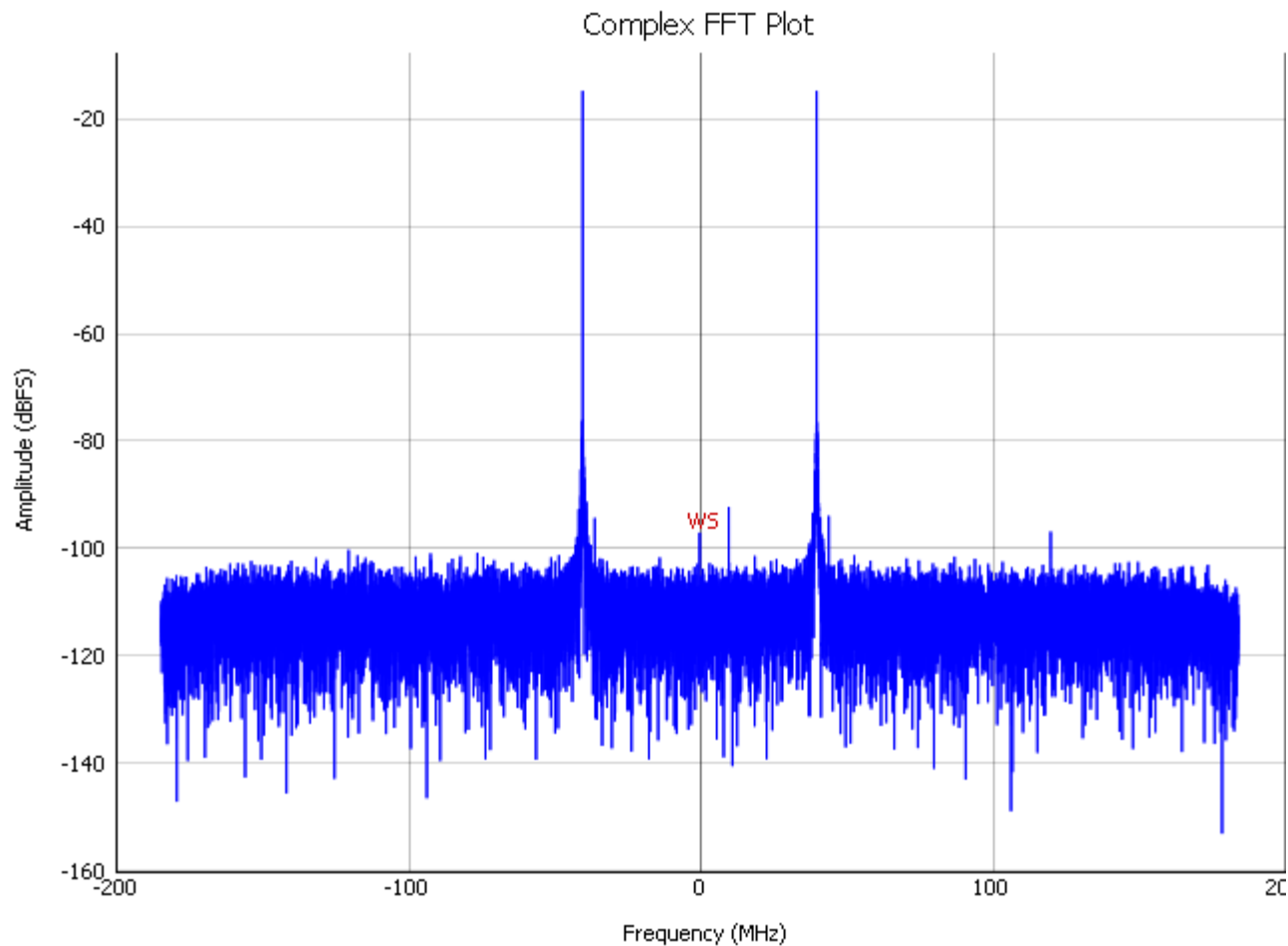
# FB B : IMD3 at -12dBFS input +/-40MHz

IMD3 = -88.394dBFS = -76.394dBc



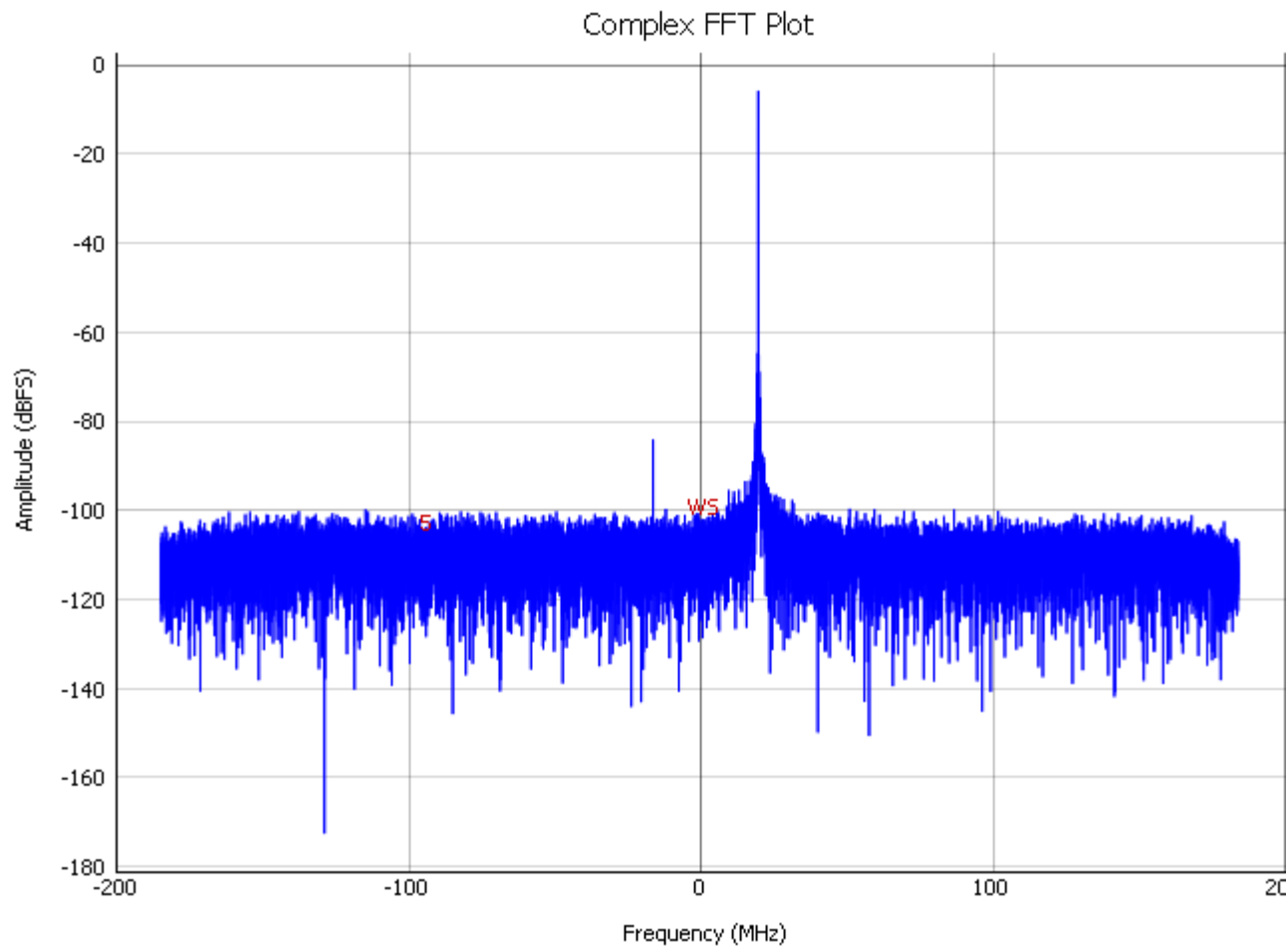
# FB B : IMD3 at -15dBFS input +/-40MHz

IMD3 = -97.042dBFS = -82.042dBc



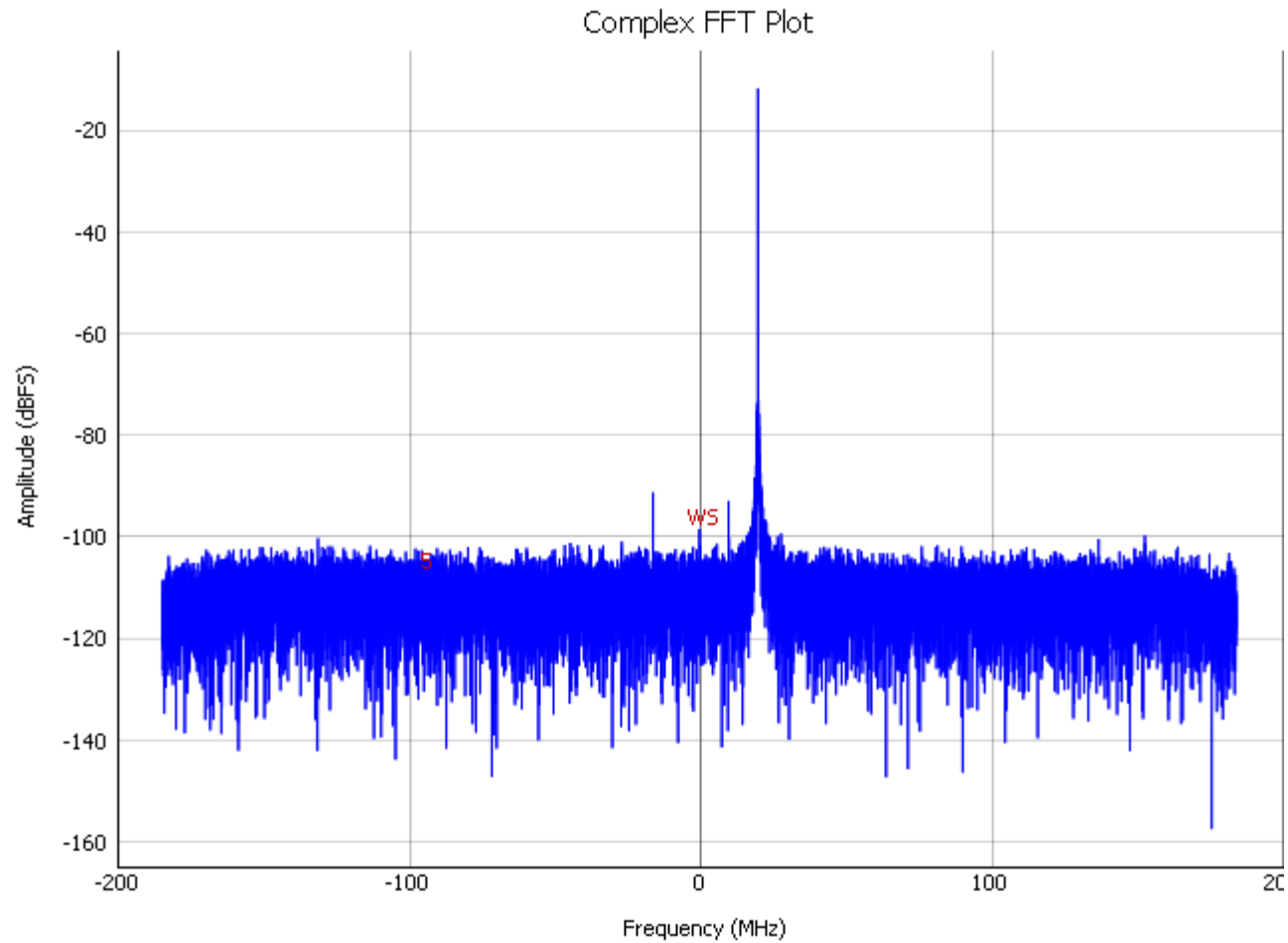
# FB B : SFDR at -6dBFS input

SFDR = 84.305dBFS = 78.305dBc



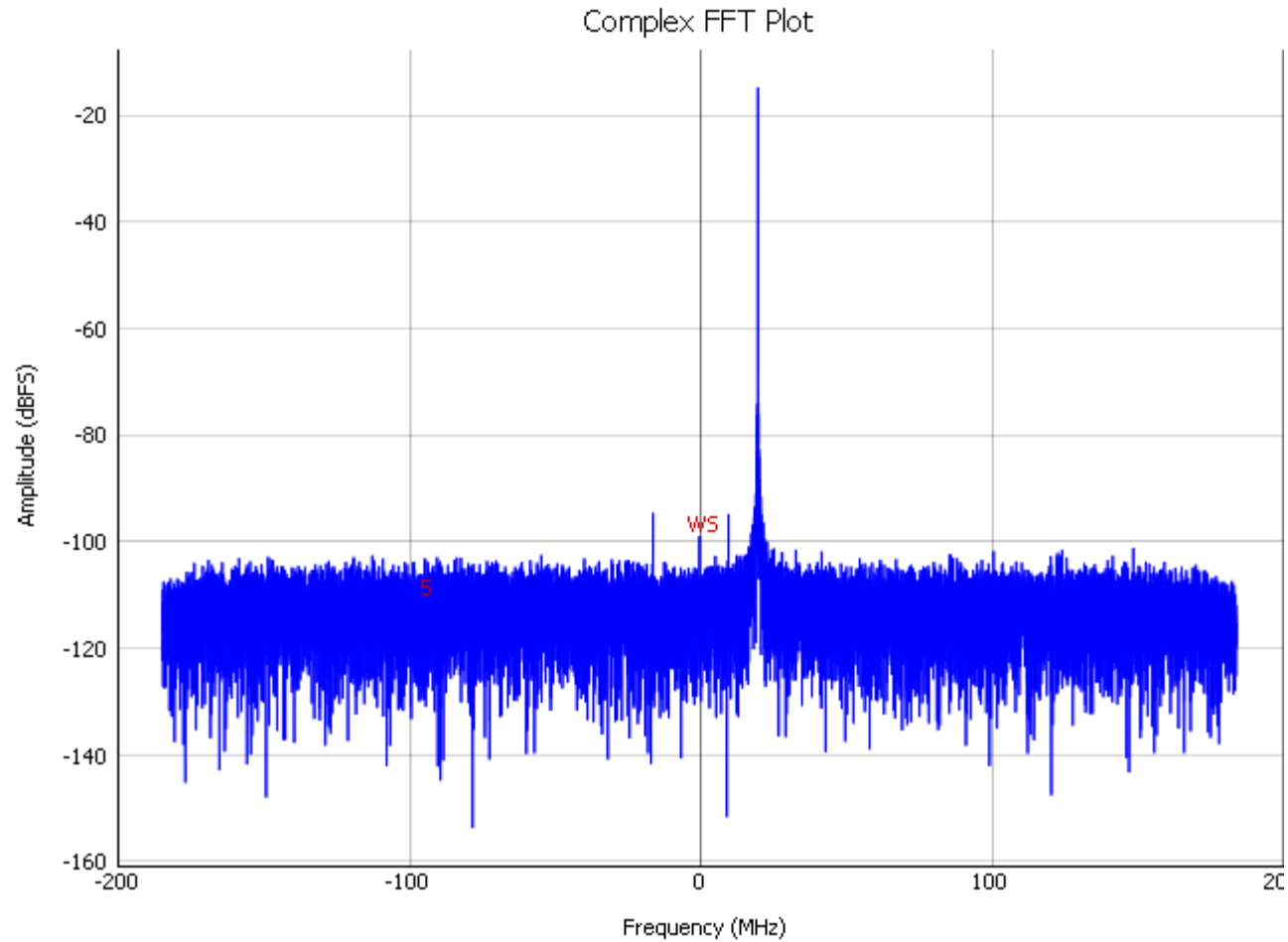
# FB B : SFDR at -12dBFS input

SFDR = 91.491dBFS = 79.491dBc

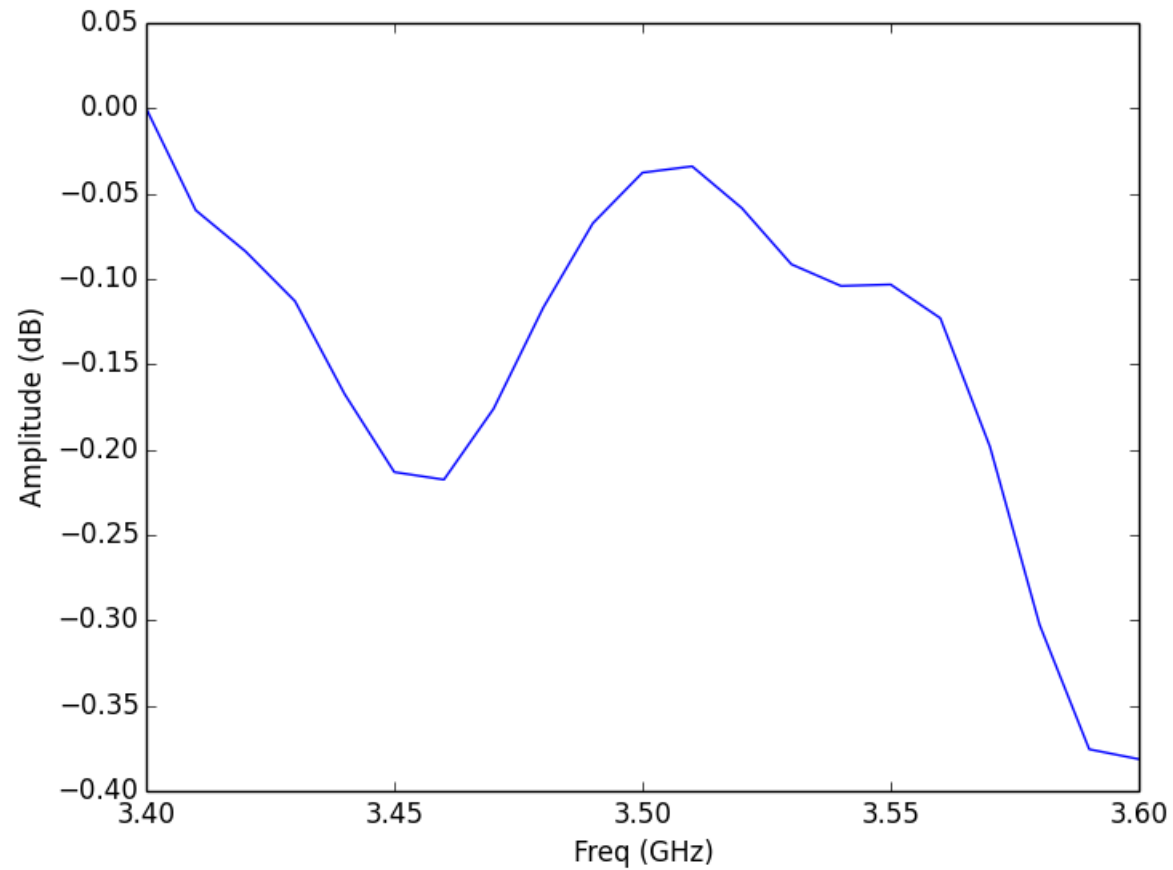


# FB B : SFDR at -15dBFS input

SFDR = 94.82dBFS = 79.82dBc



# FB B Flatness

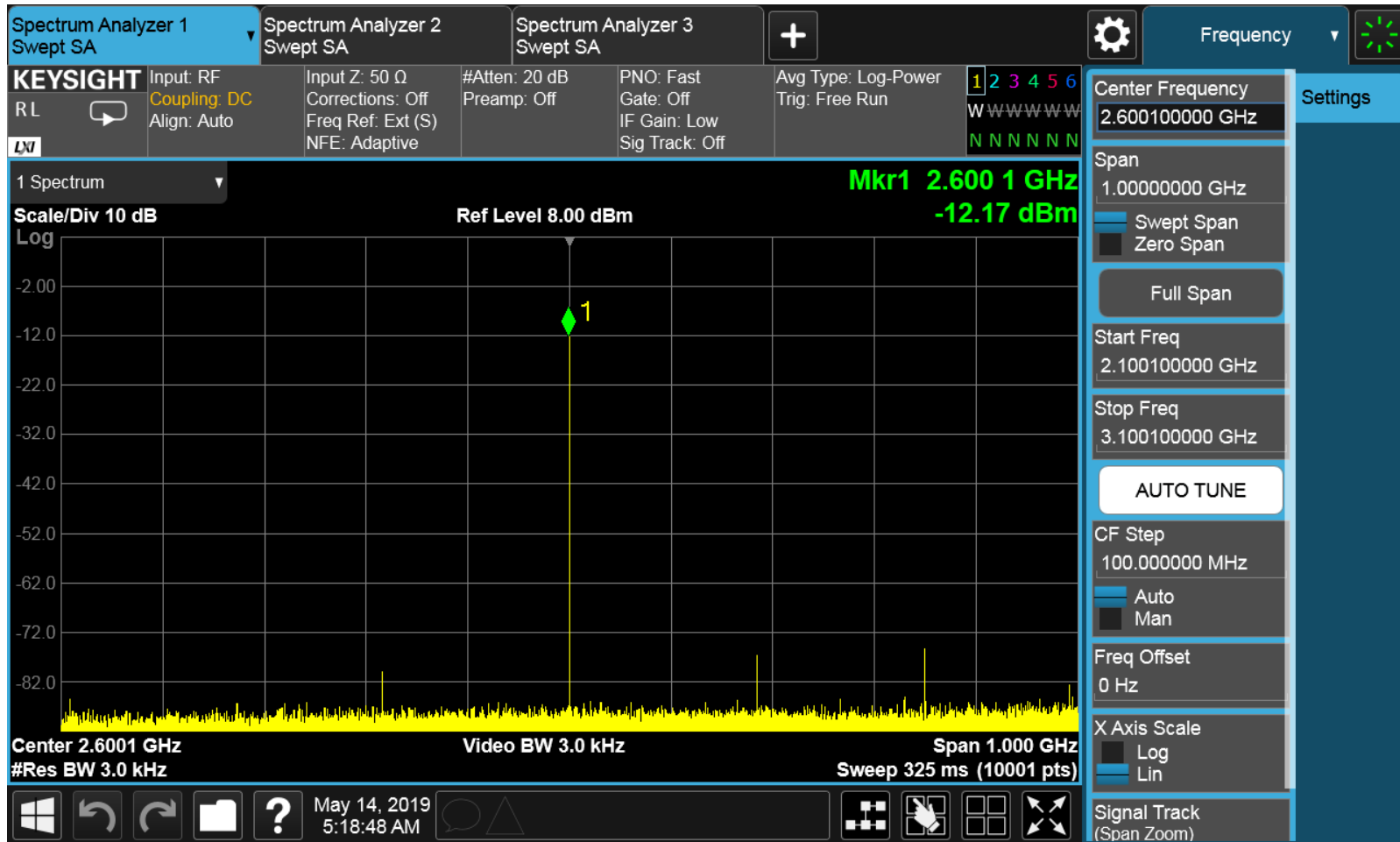


**TX : 2.6Ghz Band**

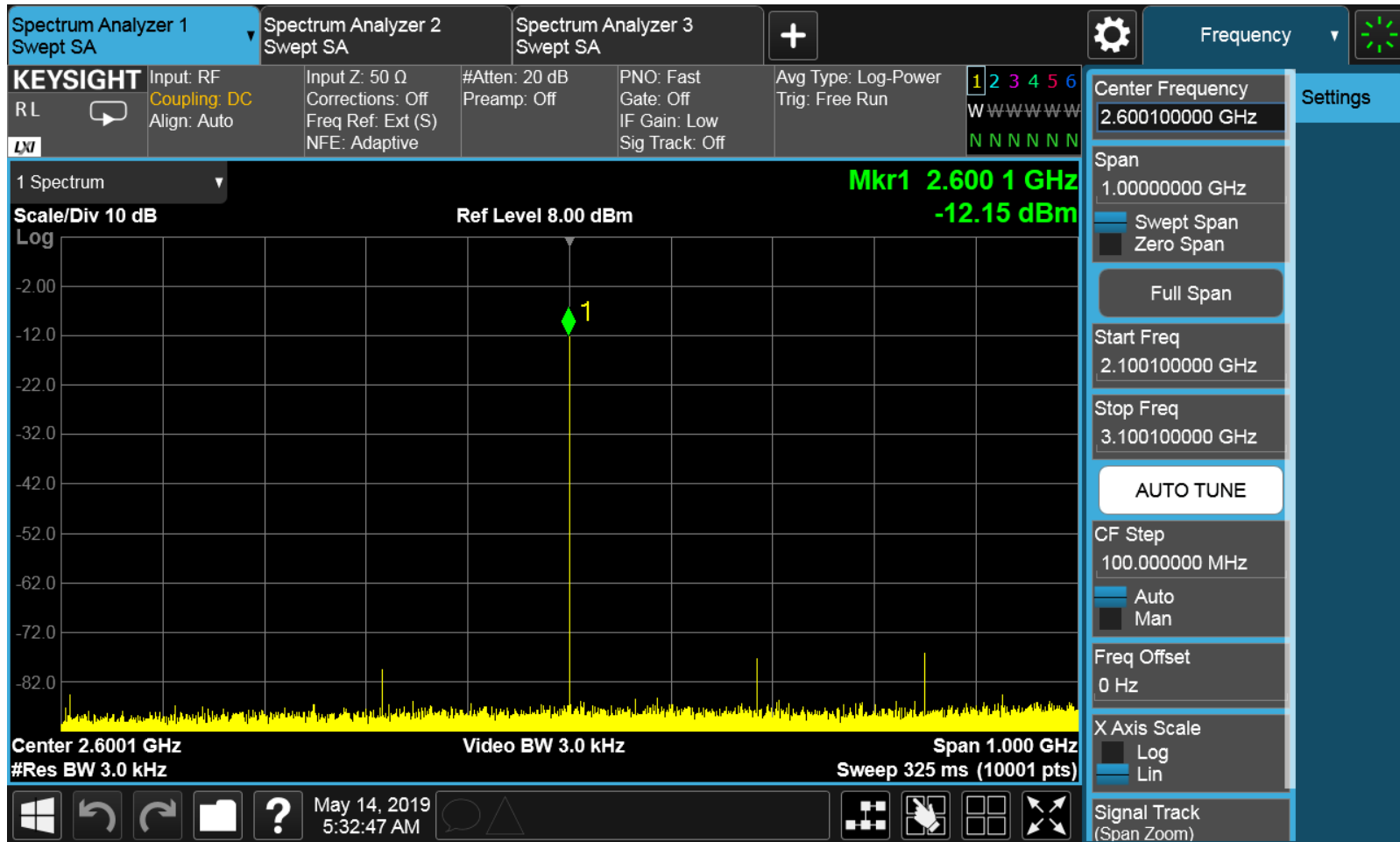
# Test Setup

- Freq bands: 2.5~2.7GHz,
- Mode:368.64Mhz IQ
- NCO = 2600Mhz
- Single tone full scale, IMD3 and ACPR plotted

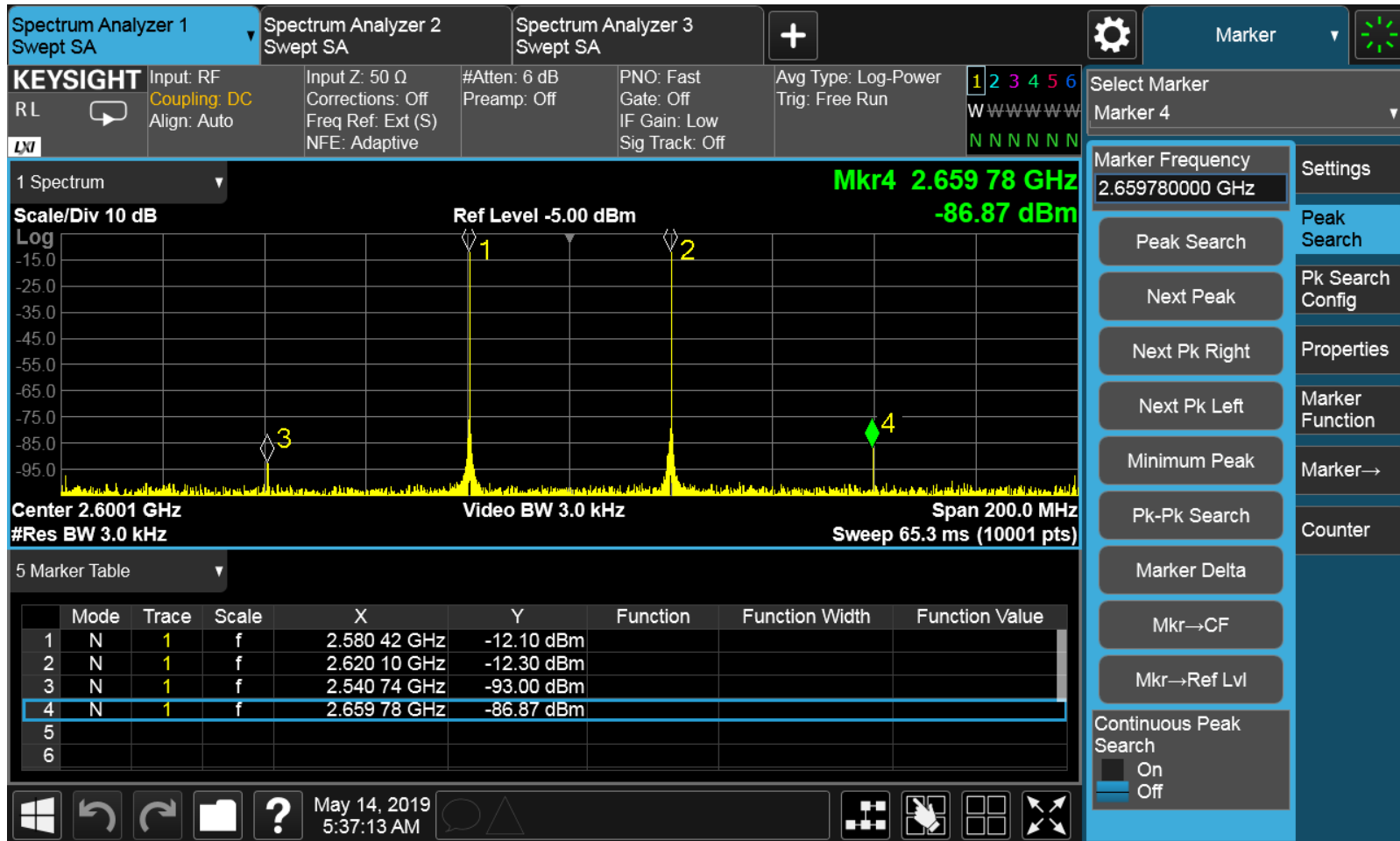
# TX A : Full Scale (-13dBFS input)



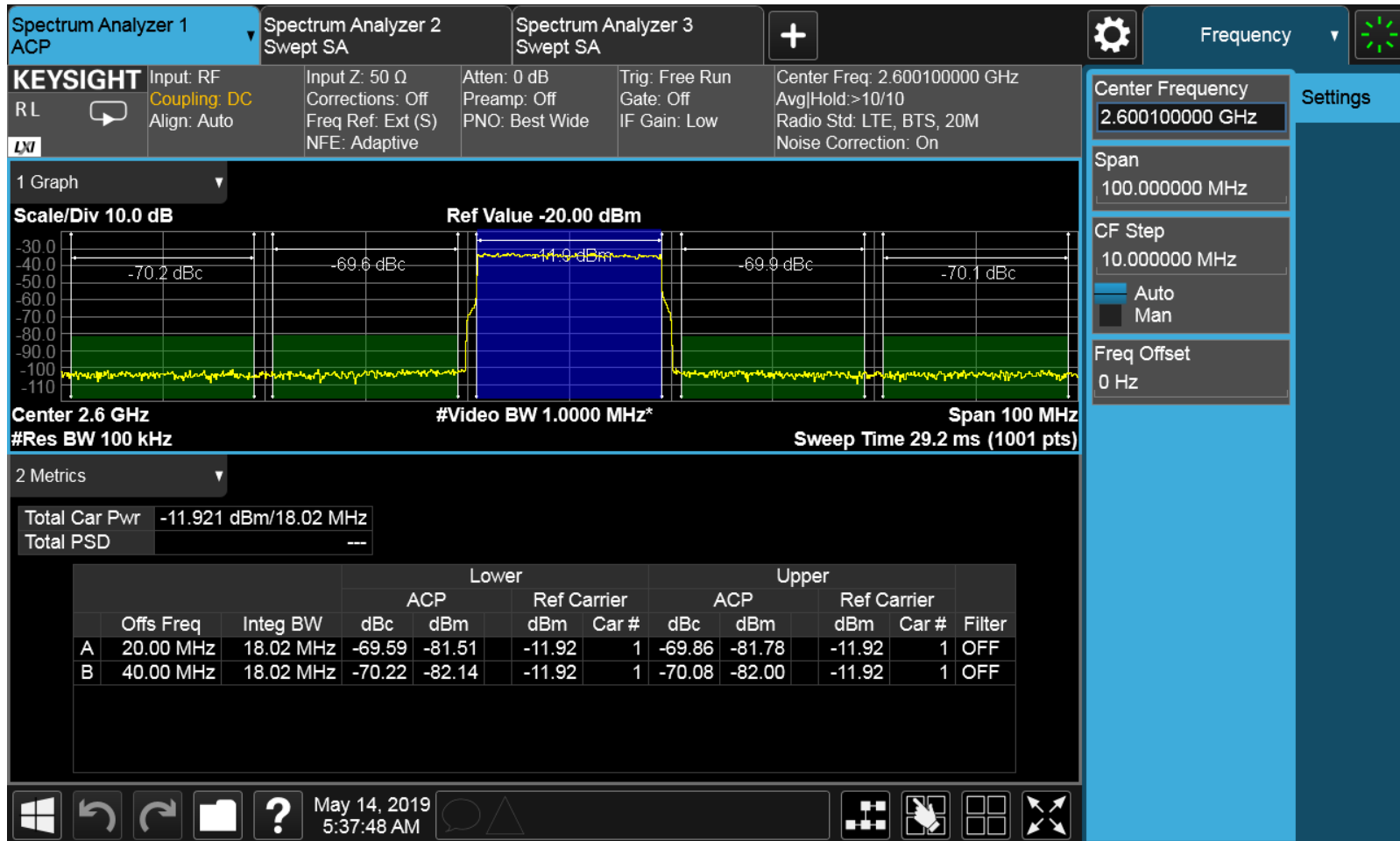
# TX A : Full Scale (-13dBFS input)



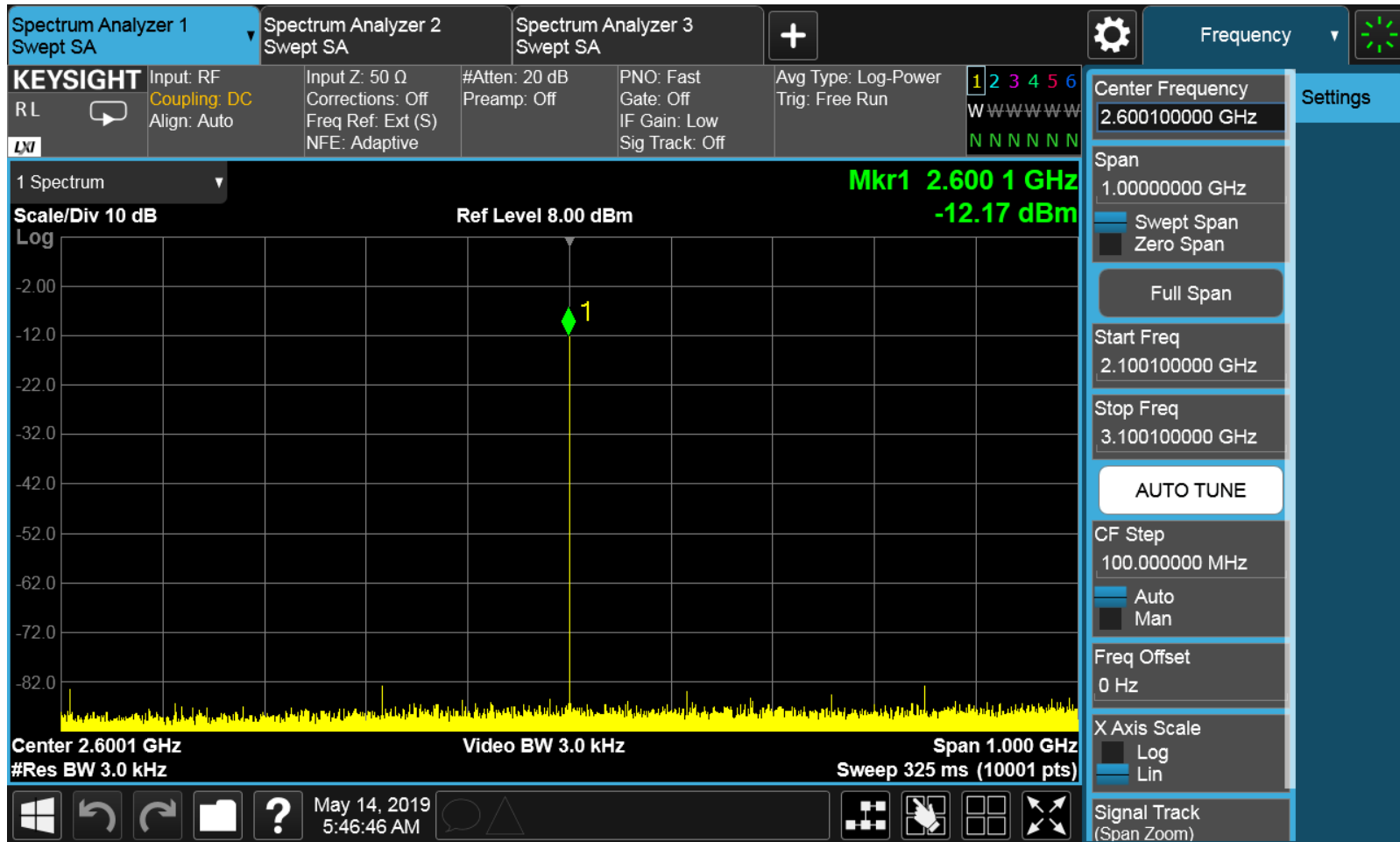
# TX A : IMD3



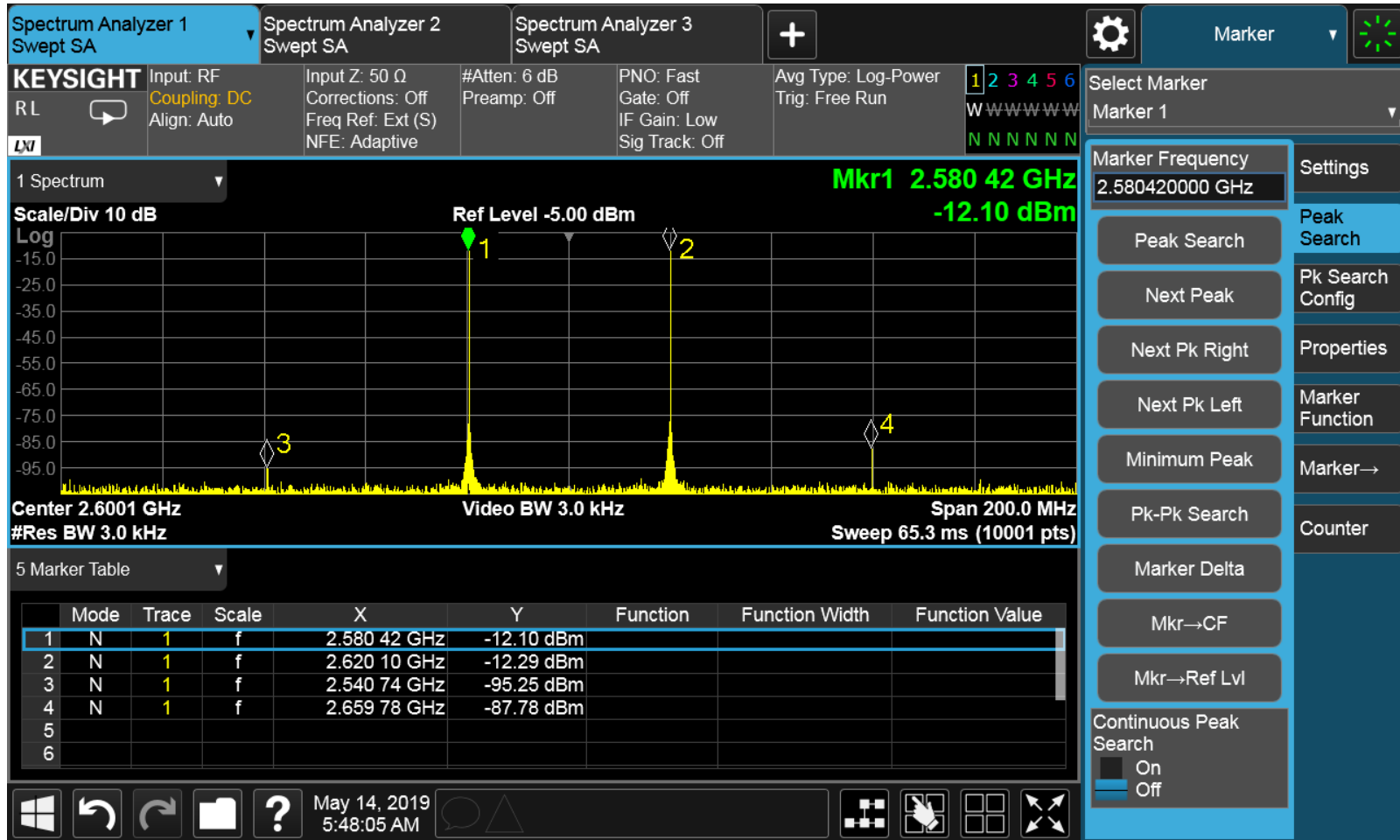
# TX A : ACPR



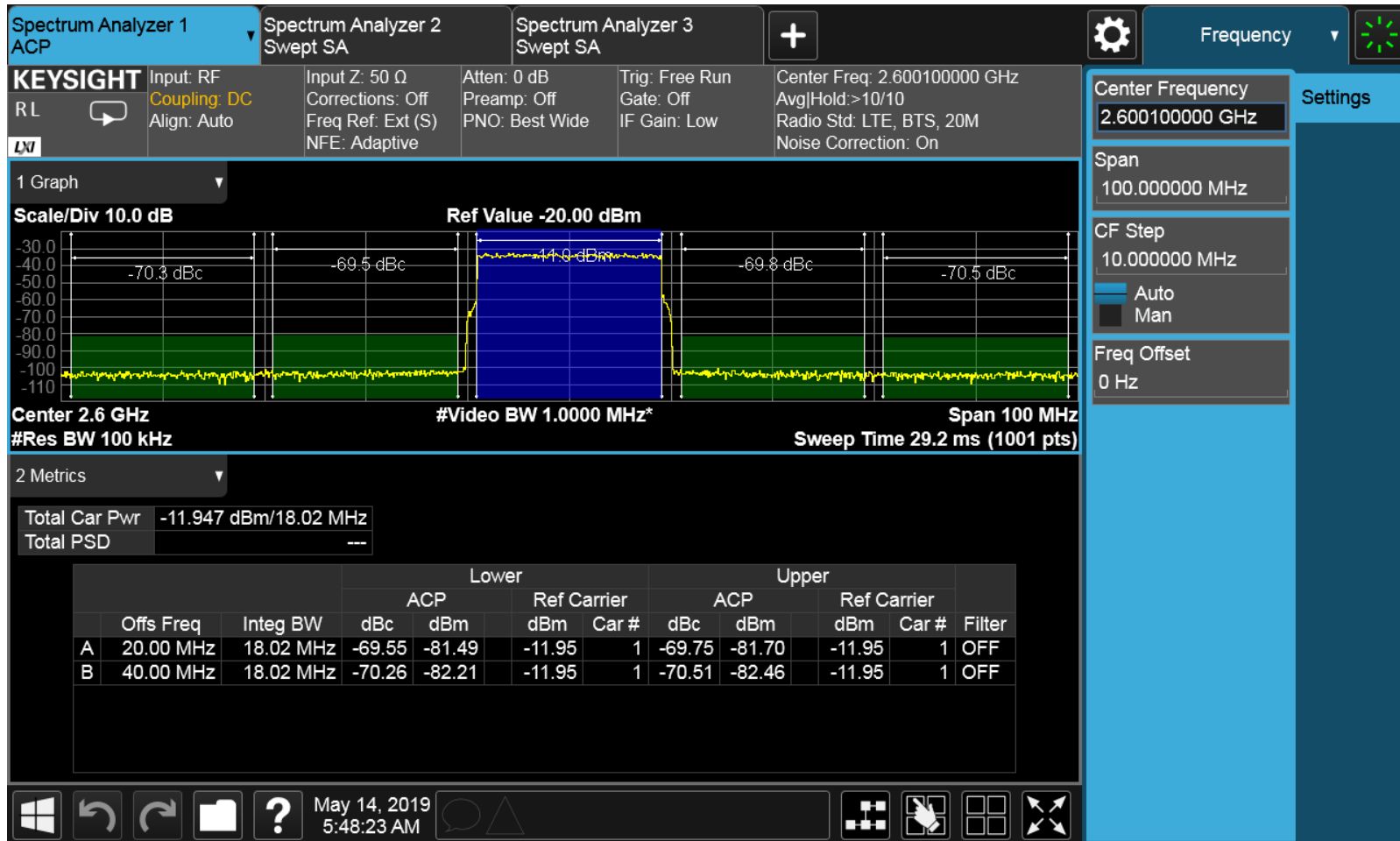
# TX B : Full Scale (-13dBFS input)



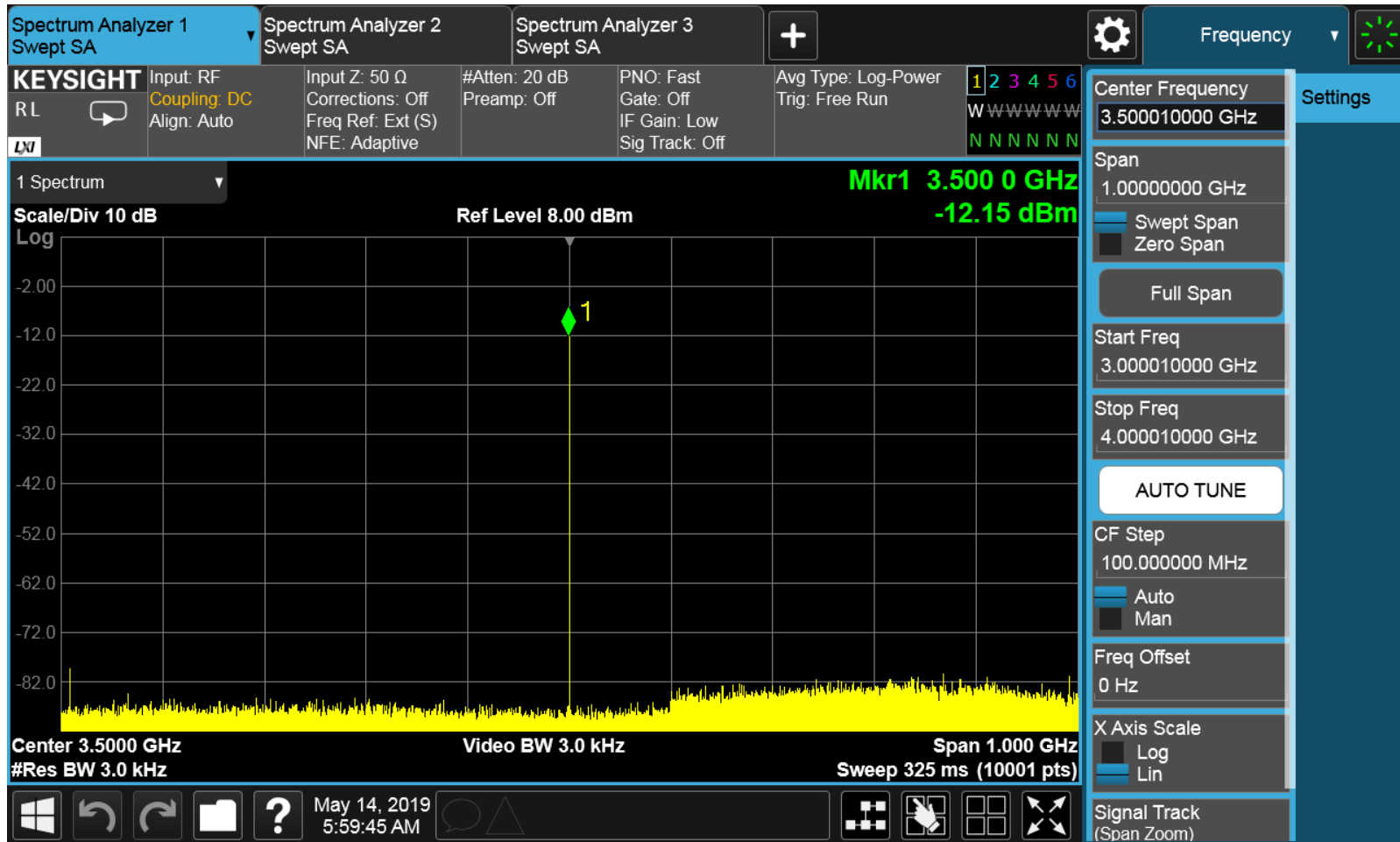
# TX B : IMD3



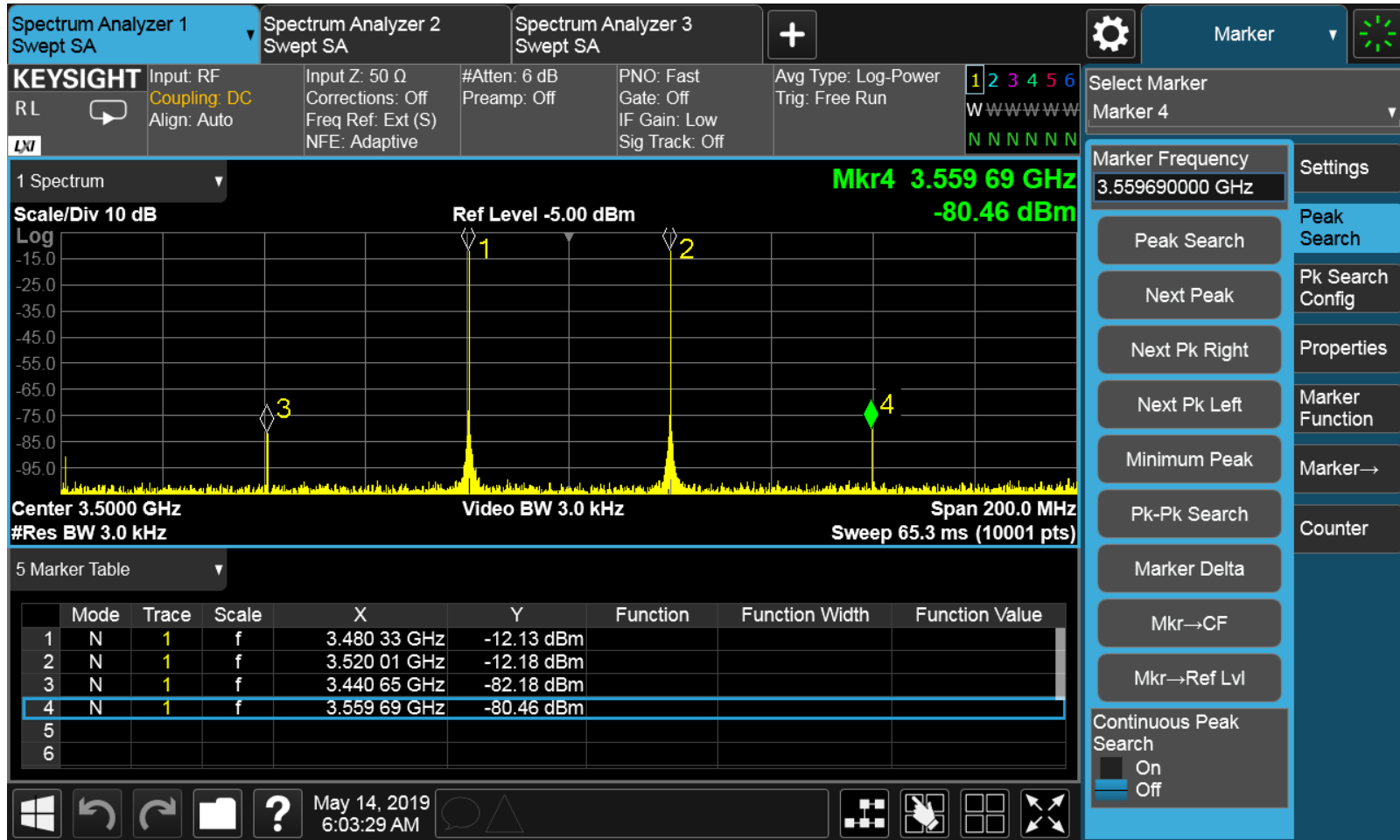
# TX B : ACPR



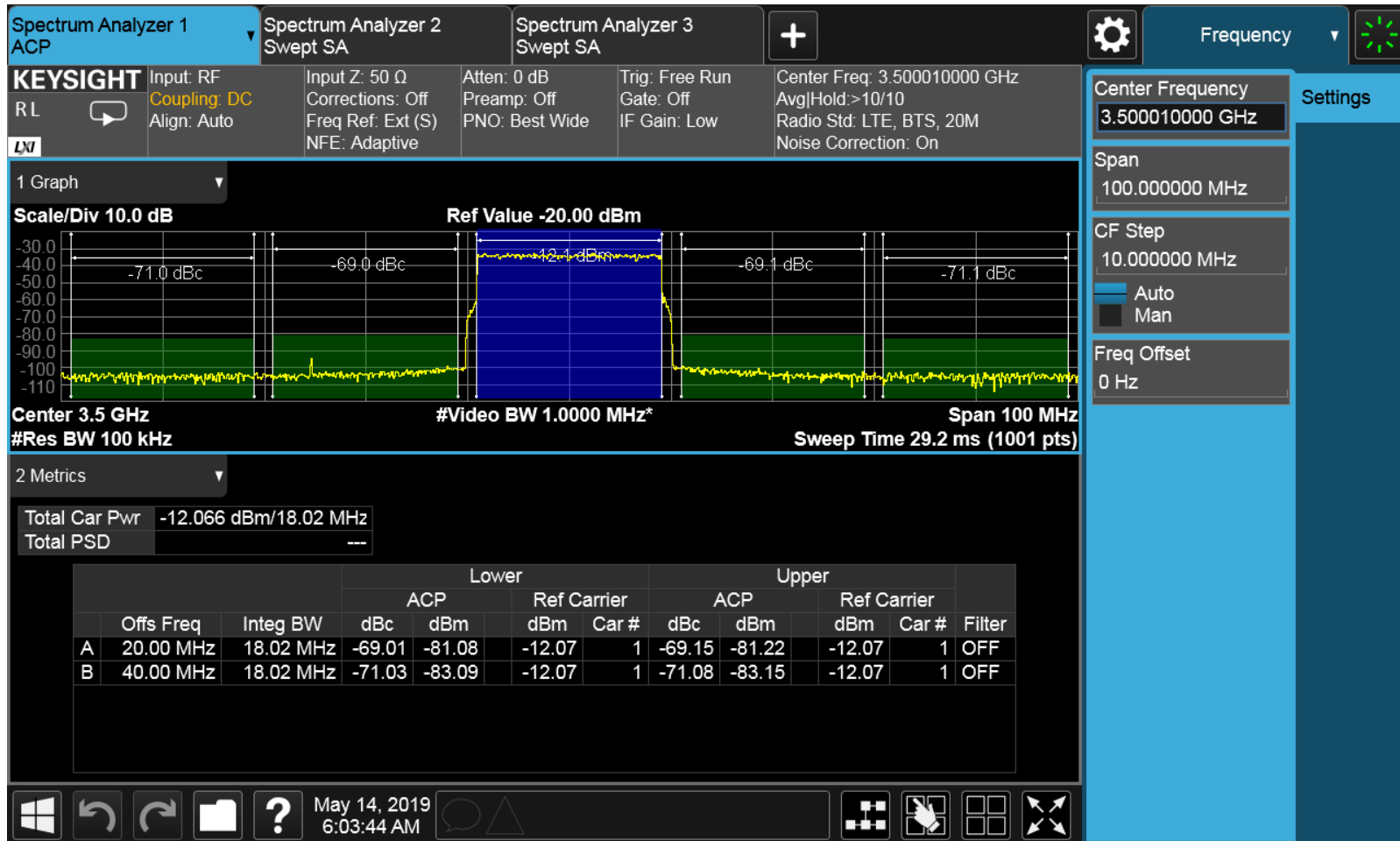
# TX D : Full Scale (-13dBFS input)



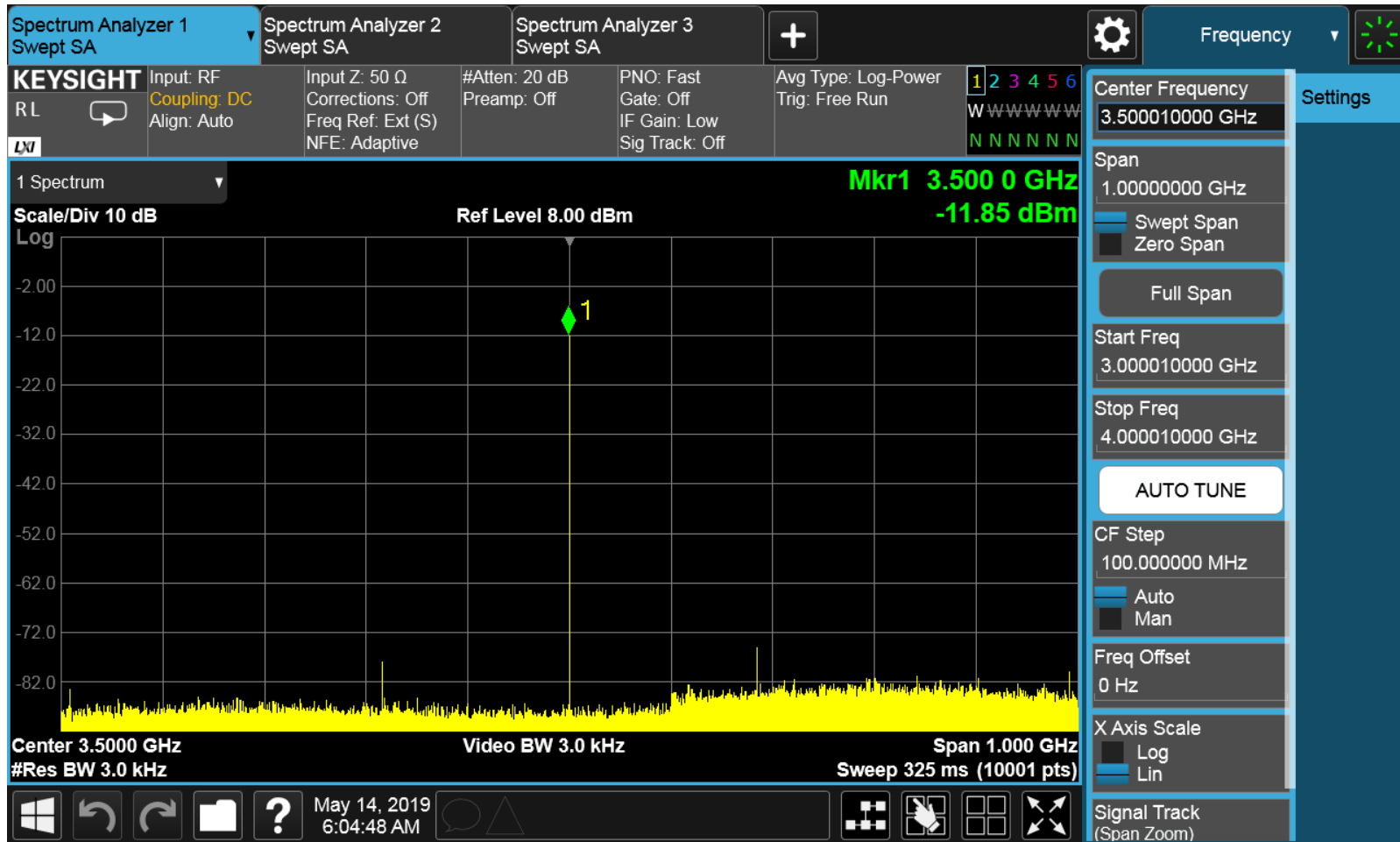
# TX D : IMD3



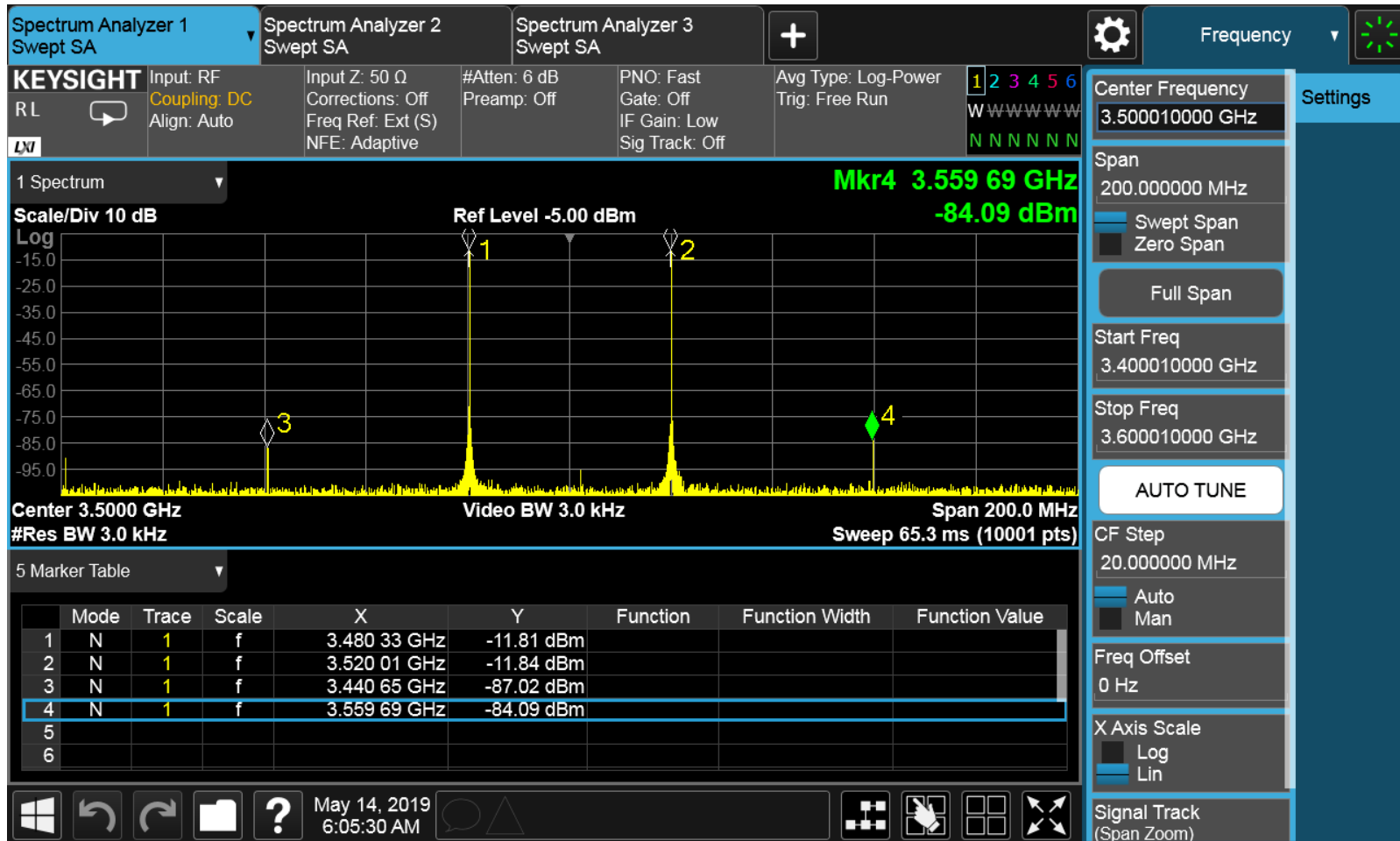
# TX D : ACPR



# TX C : Full Scale (-13dBFS input)



# TX C : IMD3



# TX C : ACPR

