

X-Altra Mini II Discrete Line Stage Using TI JFE2140 Dual JFET's

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These measurements were taken to test the performance of the discrete line stage using the TI JFE2140 devices instead of the Linear Integrated Systems LSK389B devices originally specified. The output load for all tests was 600 Ohms.

The TI devices perform excellently and can be used instead of the LSK389B devices for the same or better performance. The devices used were purchased from Mouser (Pt # **595-JFE2140DR**)

Link to TI device data sheet: [JFE2140 data sheet, product information and support | TI.com](#)

FFT: 128k
Avg: 28 of 50
Res: 1.46 Hz
Fs: 192 KHz
Win: Hann
Weight: None

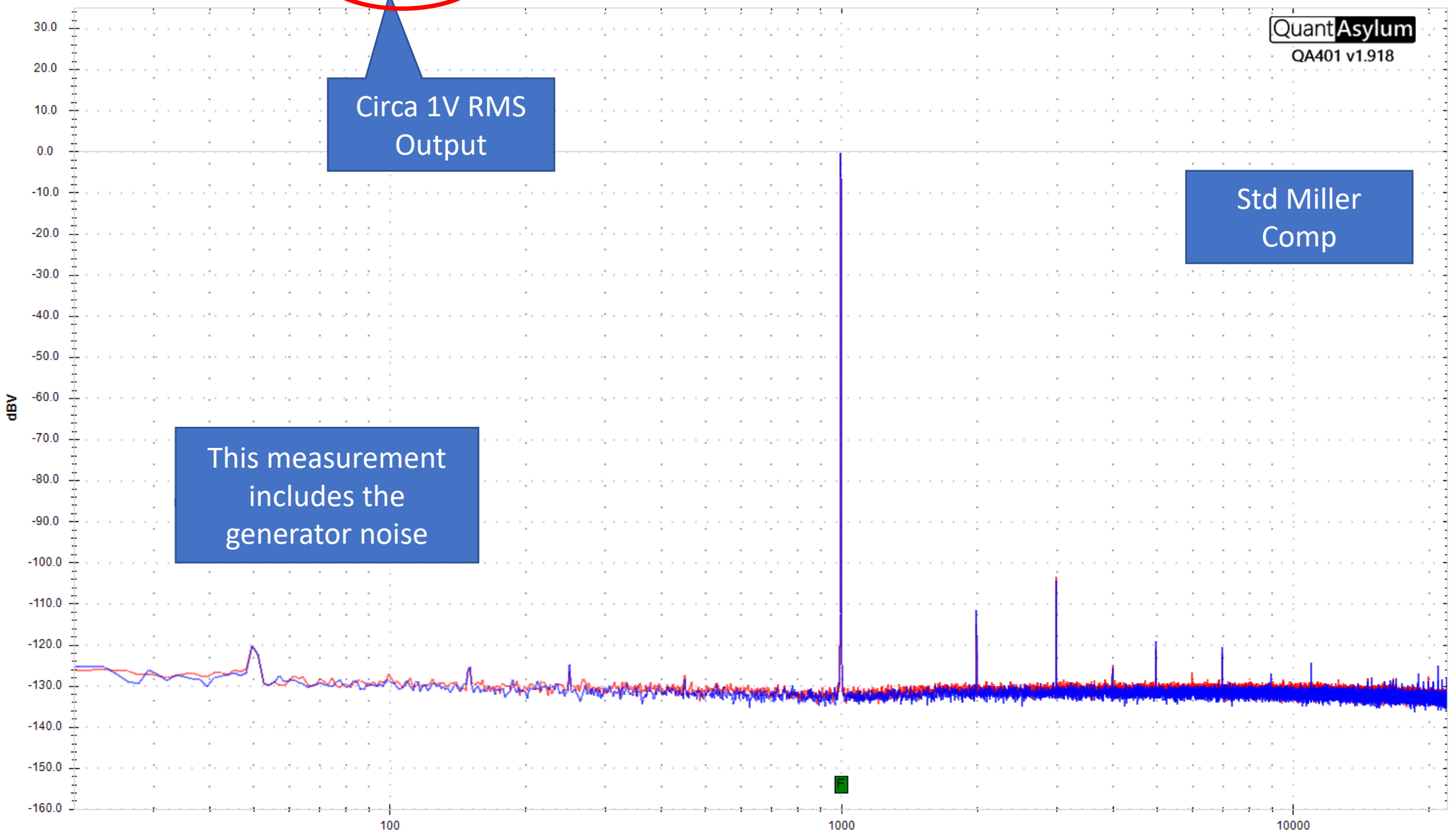
Meas Start: 20.0 Hz
Meas Stop: 20.0 KHz
RMS L: 943 mV
RMS R: 944 mV

Peak L: -0.50 dBV
Peak R: -0.49 dBV
Peak L: 943.6 mVrms
Peak R: 944.8 mVrms
THD L: -102.8 dB/ 0.00072%
THD R: -102.5 dB/ 0.00075%

Gen 1: 1.000488 KHz @ -14.0 dBV
Gen 2: 19.00048 KHz @ -1.0 dBV

Phase L: 0.29 deg
Phase R: 0.28 deg
Delay L: 9.28 uSec
Delay R: 9.33 uSec
Gain L: 13.51 dB
Gain R: 13.52 dB

QuantAsylum
QA401 v1.918



Circa 1V RMS
Output

Std Miller
Comp

This measurement
includes the
generator noise

FFT: 128k
Avg: 27 of 50
Res: 1.46 Hz
Fs: 192 KHz
Win: Hann
Weight: None

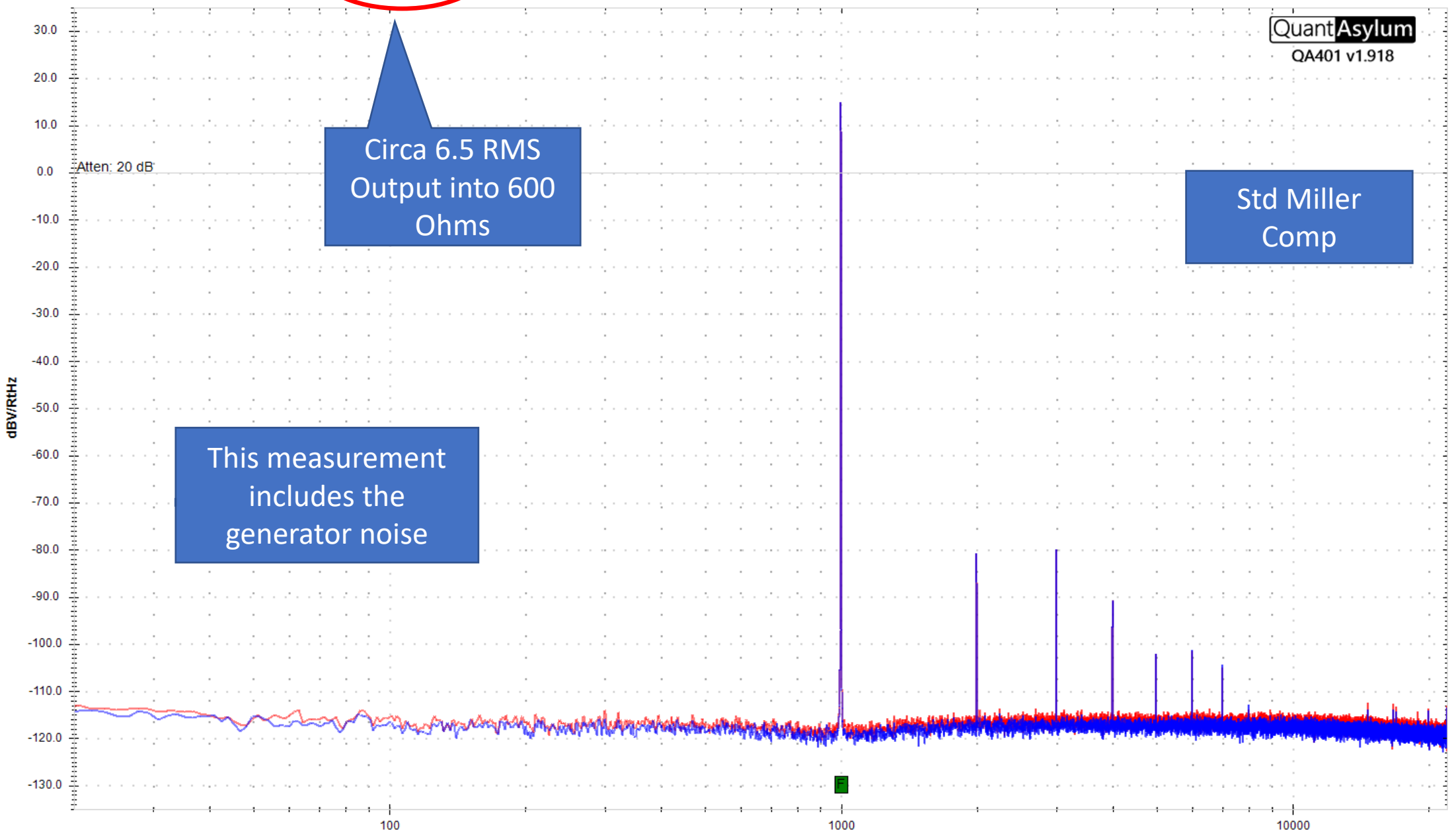
Meas Start: 20.0 Hz
Meas Stop: 20.0 KHz
RMS L: 6.62 V
RMS R: 6.63 V

Peak L: 16.42 dBV
Peak R: 16.43 dBV
Peak L: 6.623 Vrms
Peak R: 6.631 Vrms
THD L: -92.0 dB/ 0.00252%
THD R: -92.0 dB/ 0.00252%

Gen 1: 1.000488 KHz @ 3.0 dBV
Gen 2: 19.00048 KHz @ -6.0 dBV

Phase L: 0.27 deg
Phase R: 0.25 deg
Delay L: 9.35 uSec
Delay R: 9.39 uSec
Gain L: 13.43 dB
Gain R: 13.44 dB

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Circa 6.5 RMS
Output into 600
Ohms

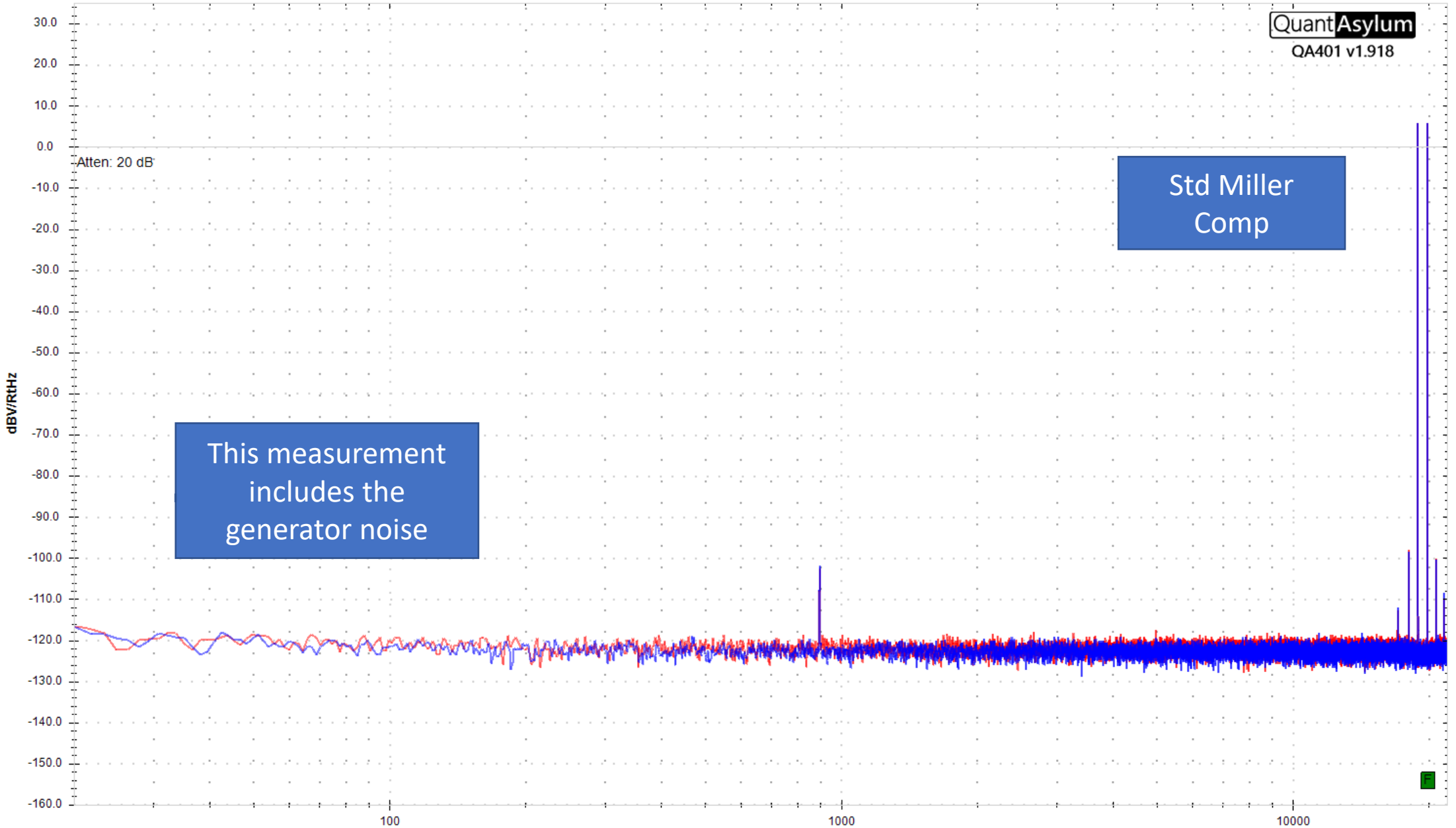
This measurement
includes the
generator noise

Std Miller
Comp

Atten: 20 dB

FFT: 128k Meas Start: 20.0 Hz Peak L: 7.25 dBV Gen 1: 19.89990 KHz @ -6.0 dBV
Avg: 12 of 50 Meas Stop: 20.0 KHz Peak R: 7.25 dBV Gen 2: 19.00048 KHz @ -6.0 dBV
Res: 1.46 Hz RMS L: 3.25 V Peak L: 2.304 Vrms
Fs: 192 KHz RMS R: 3.25 V Peak R: 2.303 Vrms
Win: Hann THD L: $-\infty$ dB/ 0.00000%
Weight: None THD R: $-\infty$ dB/ 0.00000%

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FFT: 128k
Avg: 31 of 50
Res: 1.46 Hz
Fs: 192 KHz
Win: Hann
Weight: None

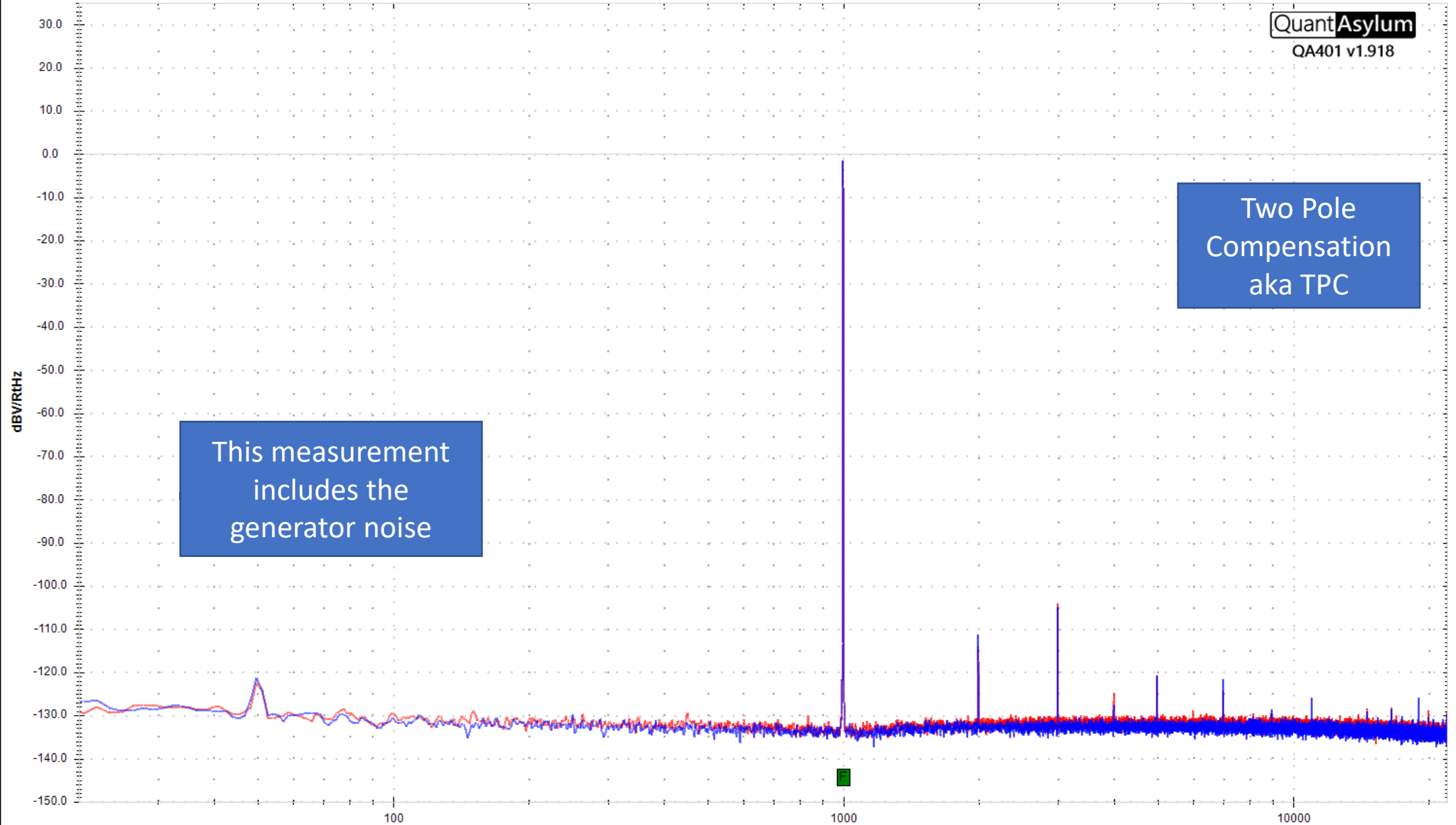
Meas Start: 20.0 Hz
Meas Stop: 20.0 KHz
RMS L: 999 mV
RMS R: 1.00 V

Peak L: 0.00 dBV
Peak R: 0.01 dBV
Peak L: 999.6 mVrms
Peak R: 1.000 Vrms
THD L: -102.2 dB/ 0.00078%
THD R: -101.8 dB/ 0.00082%

Gen 1: 1.000488 KHz @ -13.5 dBV
Gen 2: 19.00048 KHz @ -6.0 dBV

Phase L: 0.31 deg
Phase R: 0.28 deg
Delay L: 9.25 uSec
Delay R: 9.33 uSec
Gain L: 13.51 dB
Gain R: 13.52 dB

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This measurement includes the generator noise

Two Pole Compensation aka TPC

FFT: 128k
Avg: 30 of 50
Res: 1.46 Hz
Fs: 192 KHz
Win: Hann
Weight: None

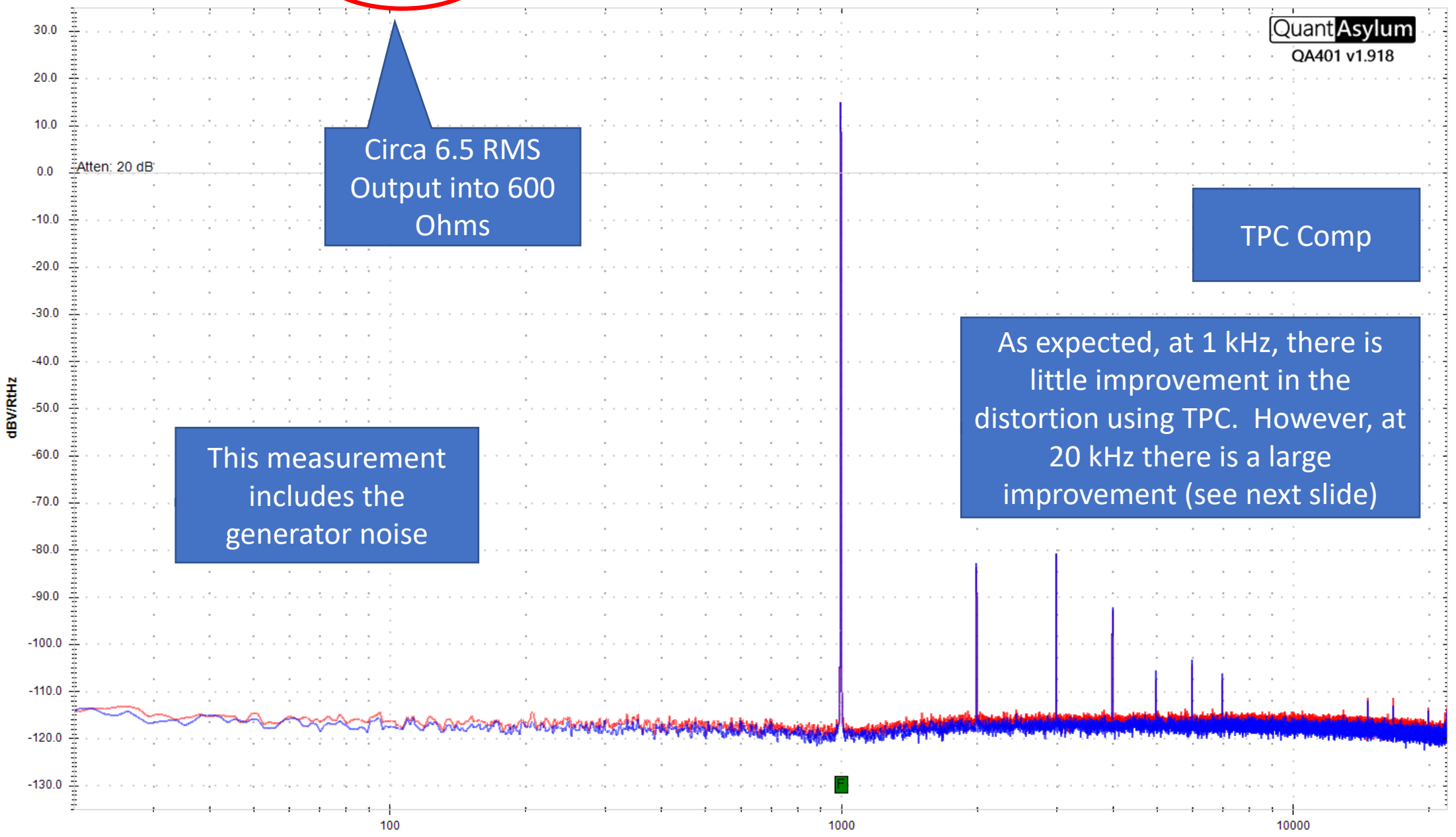
Meas Start: 20.0 Hz
Meas Stop: 20.0 KHz
RMS L: 6.62 V
RMS R: 6.63 V

Peak L: 16.42 dBV
Peak R: 16.43 dBV
Peak L: 6.624 Vrms
Peak R: 6.631 Vrms
THD L: -93.3 dB/ 0.00216%
THD R: -93.7 dB/ 0.00207%

Gen 1: 1.000488 KHz @ 3.0 dBV
Gen 2: 19.00048 KHz @ -6.0 dBV

Phase L: 0.28 deg
Delay L: 9.31 uSec
Delay R: 9.40 uSec
Gain L: 13.43 dB
Gain R: 13.44 dB

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Circa 6.5 RMS
Output into 600
Ohms

TPC Comp

This measurement
includes the
generator noise

As expected, at 1 kHz, there is
little improvement in the
distortion using TPC. However, at
20 kHz there is a large
improvement (see next slide)

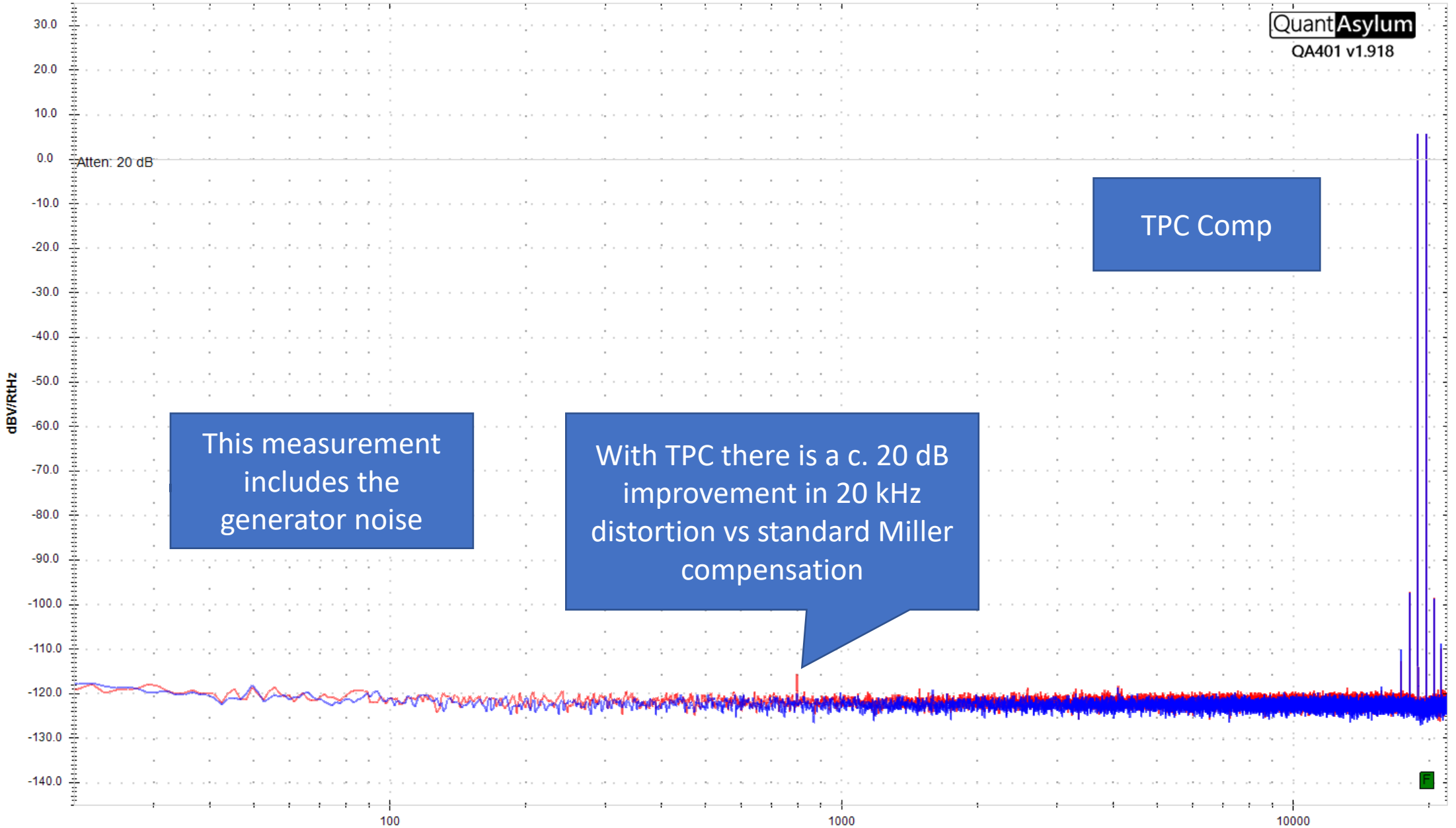
FFT: 128k
Avg: 23 of 50
Res: 1.46 Hz
Fs: 192 KHz
Win: Hann
Weight: None

Meas Start: 20.0 Hz
Meas Stop: 20.0 KHz
RMS L: 3.25 V
RMS R: 3.25 V

Peak L: 7.25 dBV
Peak R: 7.25 dBV
Peak L: 2.304 Vrms
Peak R: 2.304 Vrms
THD L: $-\infty$ dB/ 0.00000%
THD R: $-\infty$ dB/ 0.00000%

Gen 1: 19.80029 KHz @ -6.0 dBV
Gen 2: 19.00048 KHz @ -6.0 dBV

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This measurement includes the generator noise

With TPC there is a c. 20 dB improvement in 20 kHz distortion vs standard Miller compensation

TPC Comp

FFT: 128k Meas Start: 20.0 Hz Peak L: -83.38 dBV Gen 1: 19.89990 KHz @ -6.0 dBV
Avg: 25 of 50 Meas Stop: 20.0 KHz Peak R: -77.37 dBV Gen 2: 19.00048 KHz @ -6.0 dBV
Res: 1.46 Hz RMS L: 16.2 uV Peak L: 67.73 uVrms
Fs: 192 KHz RMS R: 16.2 uV Peak R: 135.4 uVrms
Win: Hann THD L: $-\infty$ dB/ 0.00000%
Weight: None THD R: $-\infty$ dB/ 0.00000%

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