Adaptive Anti-Aliasing Filter

REV: 01
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The objective of this article is to illustrate the adaptive anti-aliasing filter feature of the second-generation VT DSOs, a unique feature not found in any other USB DSOs at the time of this article.

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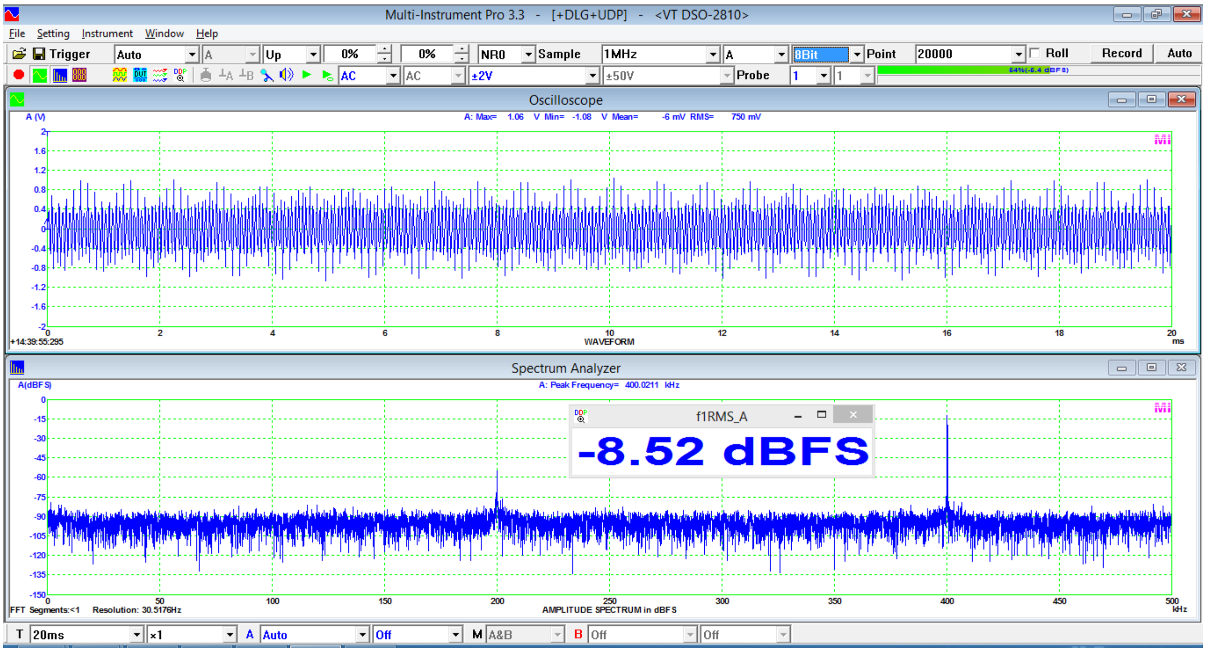
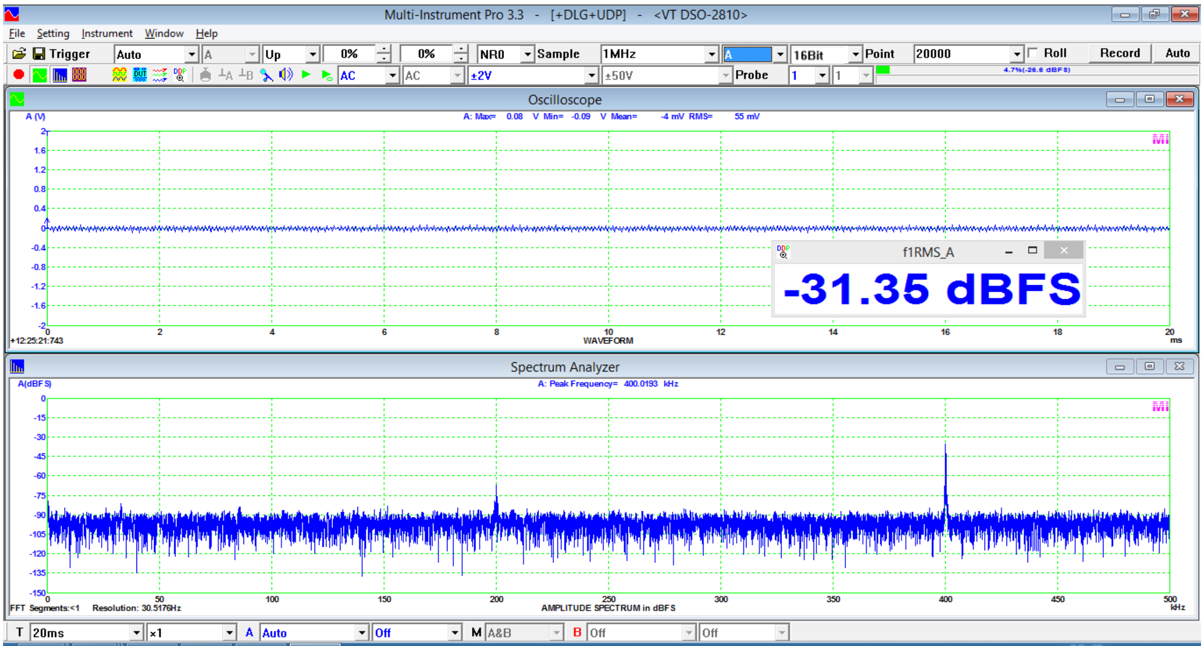
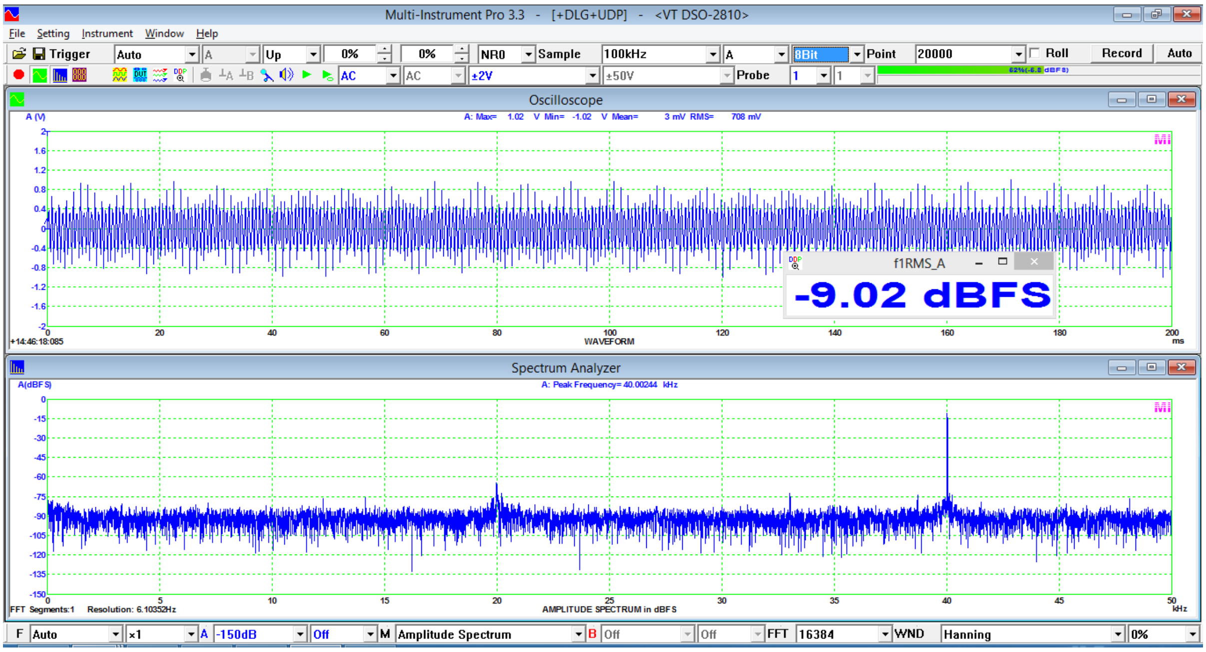
USB DSOs in the market are generally equipped with only one fixed anti-aliasing filter for the highest sampling frequency. Aliasing will still occur when the sampling frequency goes down. This will cause wrong measurements in both the oscilloscope and the spectrum analyzer. The second-generation VT DSOs solve this problem using anti-aliasing filters that can adapt to the sampling frequency. 16-Bit Mode (a mode with bit resolution enhancement, refer to: www.virtins.com/doc/D1008/Bit-Resolution-Enhancement.pdf) should be used to fully utilize this feature.



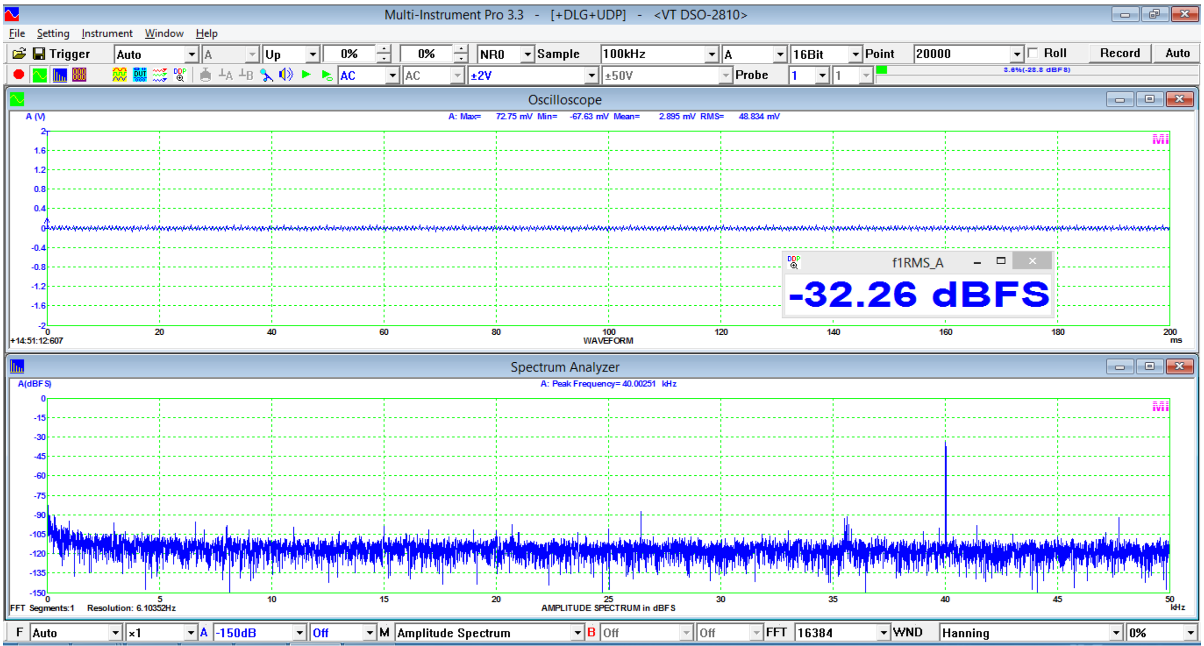
f_s = 1 MHz, 4.4 MHz appears as 400 kHz due to aliasing, 8-Bit Mode, magnitude = -8.52 dBFS



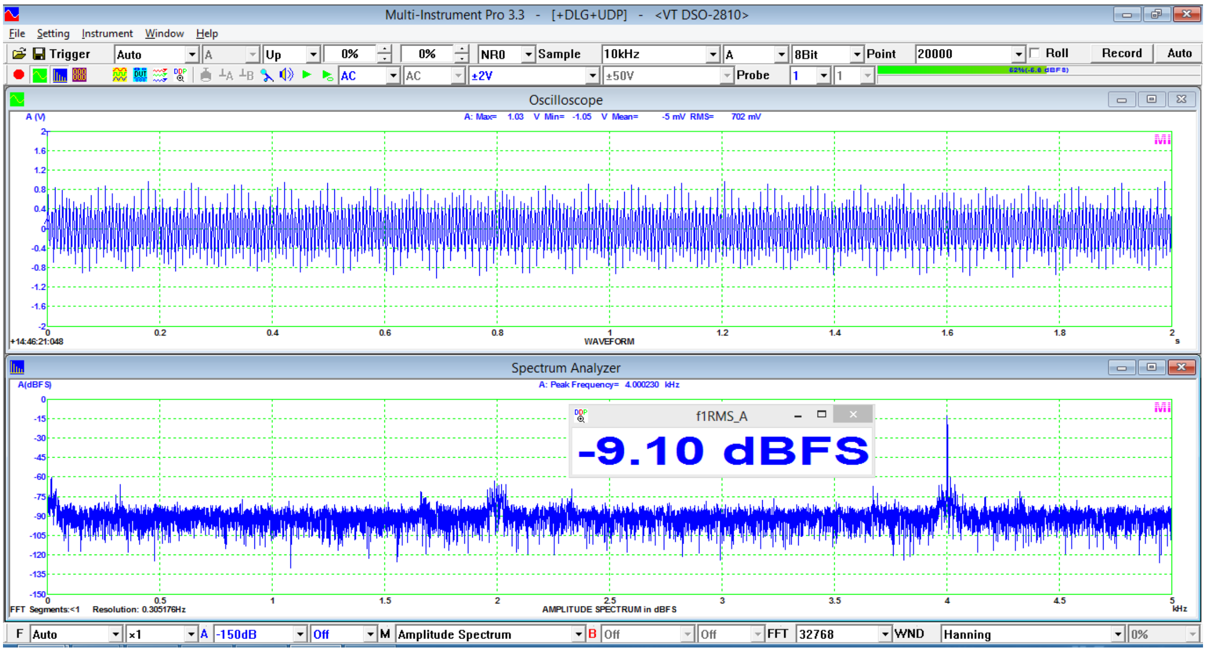
f_s = 1 MHz, 4.4 MHz appears as 400 kHz due to aliasing, 16-Bit Mode, magnitude = -31.35 dBFS, decreased 22.83 dBFS as compared with that of 8-Bit Mode thanks to the adaptive anti-aliasing filter



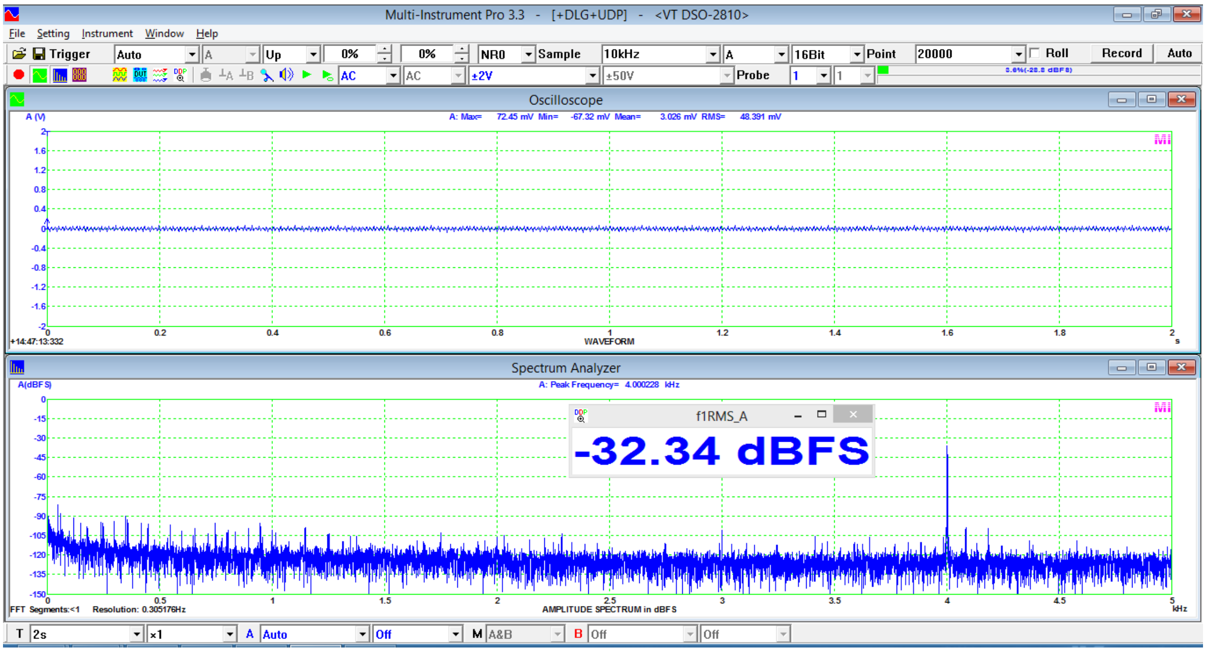
f_s = 100 kHz, 440 kHz appears as 40 kHz due to aliasing, 8-Bit Mode, magnitude = -9.02 dBFS



f_s = 100 kHz, 440 kHz appears as 40 kHz due to aliasing, 16-Bit Mode, magnitude = -32.26 dBFS, decreased 23.24 dBFS as compared with 8-Bit Mode thanks to the adaptive anti-aliasing filter



f_s = 10 kHz, 44 kHz appears as 4 kHz due to aliasing, 8-Bit Mode, magnitude = -9.1 dBFS



f_s = 10 kHz, 44 kHz appears as 4 kHz due to aliasing, 16-Bit Mode, magnitude = -32.34 dBFS, decreased 23.24 dBFS as compared with 8-Bit Mode thanks to the adaptive anti-aliasing filter

