



True 12 Bit Oscilloscope Technology By Teledyne LeCroy

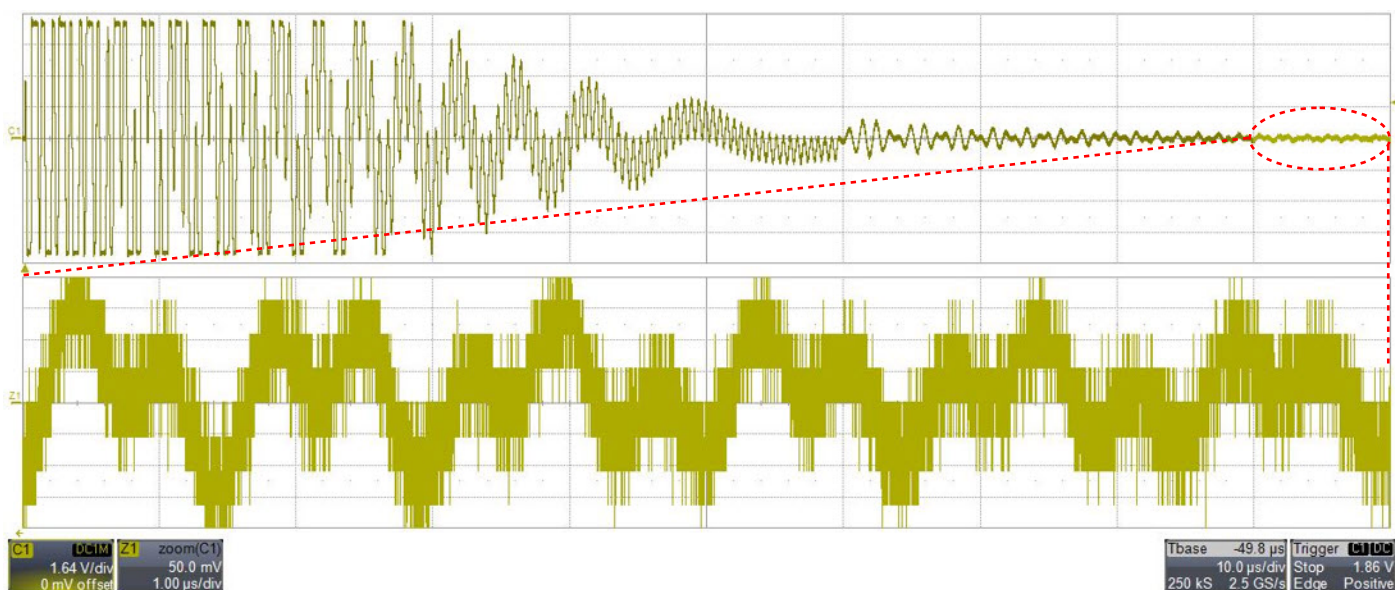
8 Bit oscilloscopes have been with us now for 30 years and have delivered excellent performance over this time, but it is clear from the need for averaging or Enhanced Resolution / High Resolution mode that real higher resolution is required. At present most oscilloscope manufacturers are trying to turn 8 bit, 256 discrete level A/D converters, into 11 bit 2048 level, or 12 bit 4096 level A/D converters via mathematical averaging or High Resolution modes. This is hard to do and is fraught with the limitations brought on by different applications.

Teledyne LeCroy has a range of true 12 bit oscilloscopes which allow users to make these more detailed measurements without needing to resort to the limitations of averaging and Enhanced Resolution / High Resolution mode.

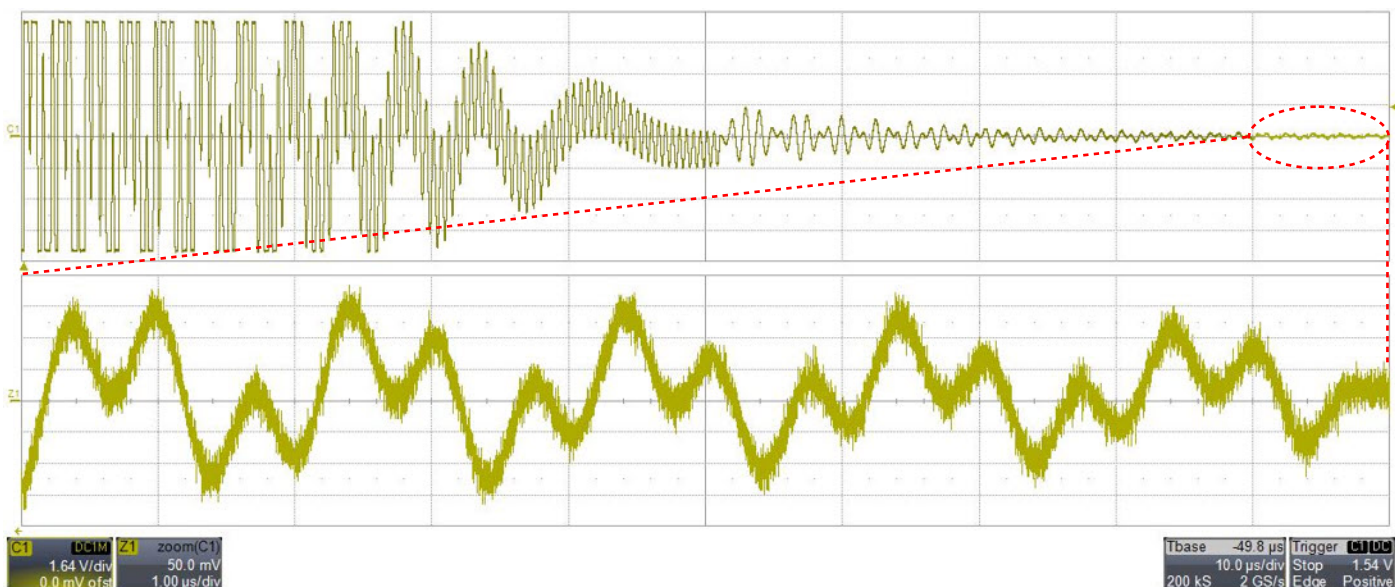
Below we can see the capture of a circuit power off event. The upper acquisition is on an 8 bit oscilloscope whereas the lower acquisition is on a true 12 bit oscilloscope.

It is clear to see the additional benefit of the 12 bit technology over the 8 bit technology: cleaner, clearer waveforms without the need for averaging or a mathematically extracted High Resolution mode.

8 Bit Oscilloscope Acquisition Of A Circuit Power Down

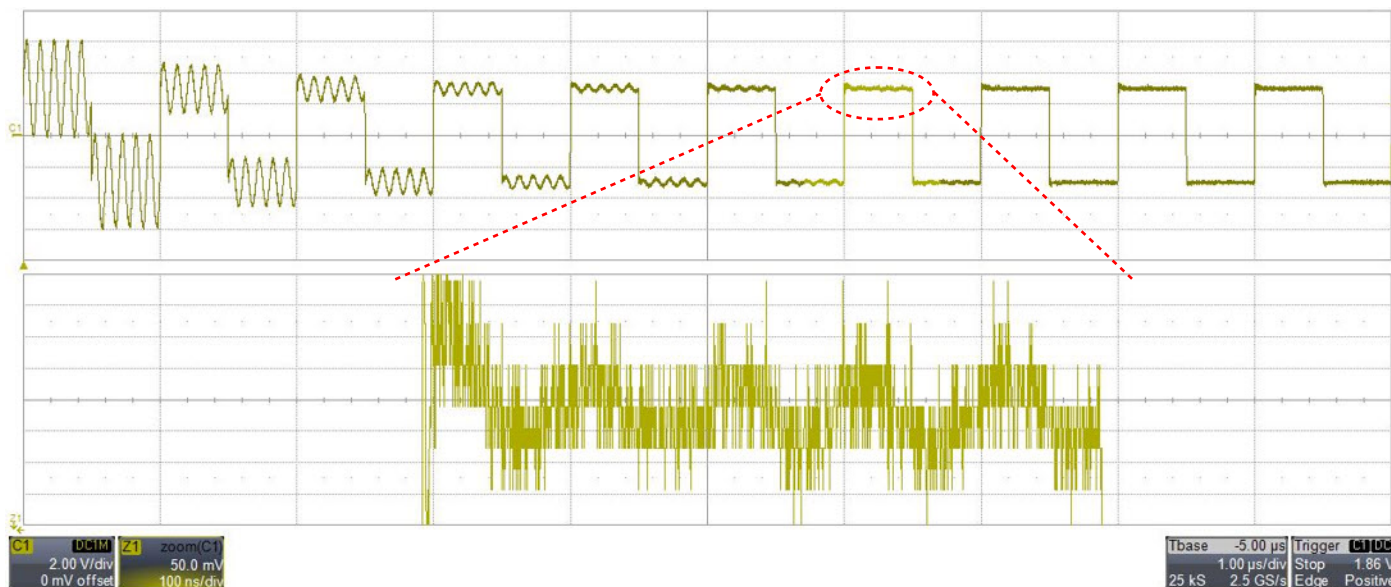


12 Bit Oscilloscope Acquisition Of A Circuit Power Down

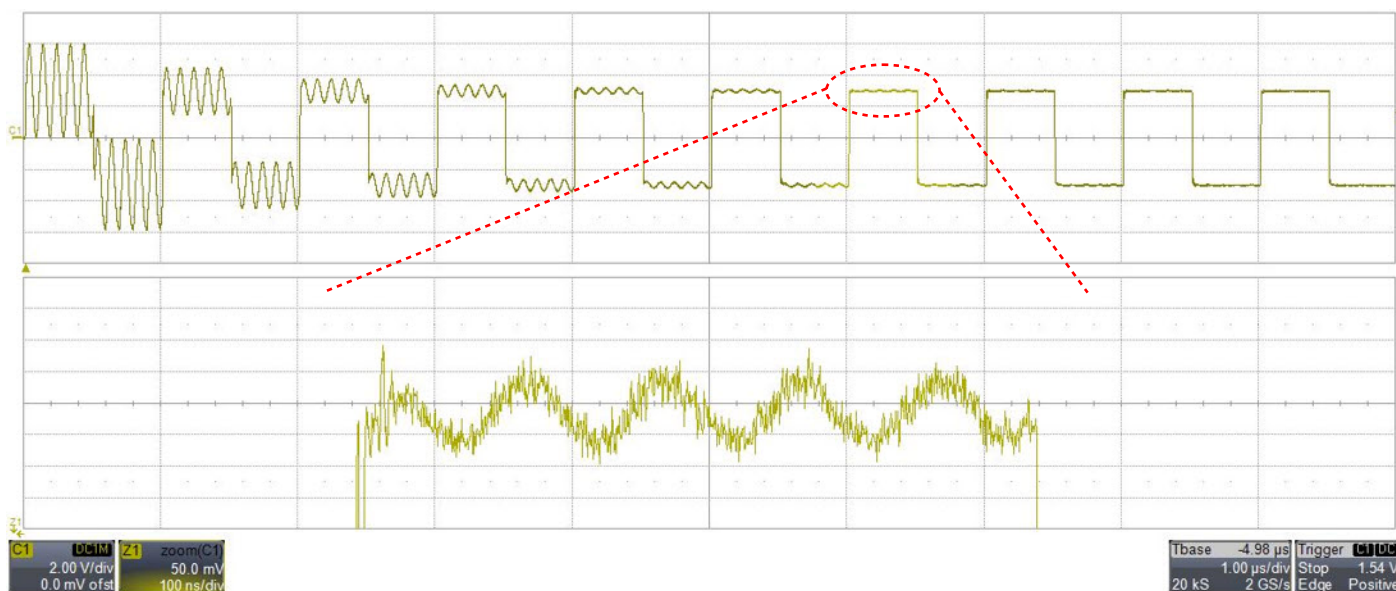


Another example below once again shows the benefits of the 12 bit architecture over the 8 bit architecture, where the fine detail at the top of the squarewave is far clearer with the additional resolution that a real 12 bit A/D converter provides.

8 Bit Oscilloscope Showing Waveform Detail



12 Bit Oscilloscope Showing Waveform Detail



In conclusion, it is clear to see that the 16 times vertical resolution increase that real 12 bit technology brings over 8 bit technology contributes significantly to the accuracy and clarity of modern day oscilloscope measurements. Many 8 bit oscilloscope manufacturers will recommend using averaging or high resolution modes to achieve the same ends, but this is not the same as we have seen. Besides this, if averaging and high resolution modes can be used to 'clean up' a signal then this option can be used on top of Teledyne LeCroy's 12 bit architecture to push the limit further out to 13, 14 or 15 effective bits.

It is paramount to start with the best acquired waveform possible before measurements or further mathematical manipulation. This is achieved by the 16 times vertical accuracy improvements that 12 bit acquisition technology brings over 8 bit acquisition technology.