Re: square wave harmonic theory (time domain)

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> I was only kind of talking a theoretical ADC. Even though there are ADC's up in the Giga samples per second, lets talk about a theoretical test with an ADC that samples at 1Gsps with 24 bit resolution (kick−ass ADC). If I took a 1 KHz square wave and triggered my ADC on the rising edge of the pulse...delayed a bit waiting for the transistor to settle (say 200uS)...then took 65536 samples (65uS) of the steady state and did an FFT on them...what would I see? In the time domain it would appear I was sampling DC. If the FFT shows high frequencies relating to 1KHz where are they coming from?
>
> Thomas

> The fundamental assumption for the FFT is that the data taken during your sampling interval repeats from negative infinity to positive infinity. If you take 65K samples of an unchanging DC level, you will get only DC energy in the result, (plus all the artifacts from windowing, roundoff, etc.)
>
> So as John pointed out − the harmonics are really there if you sample the entire 1 kHz wave and it has instantaneous rise/fall times. But if you only look at a piece of the signal, you get a completely different result.

So now I'm really confused, are you saying that during certain times of a square wave there is no harmonic content? Would that not imply that the high frequency harmonics are stronger at certain instances of time compared to others?

Thomas

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