

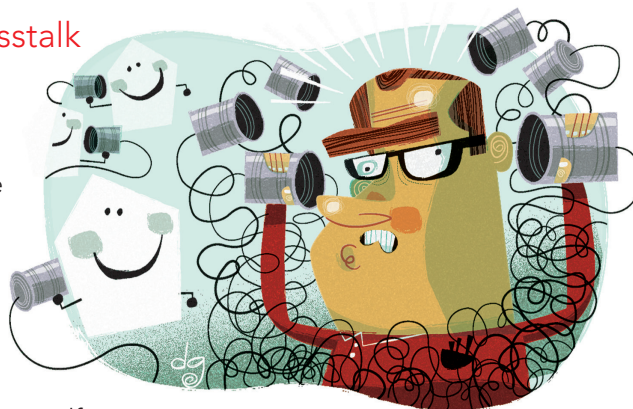
Rarely Asked Questions

Strange stories from the call logs of Analog Devices

Crosstalkin' Converters

Q. Should I consider crosstalk when choosing an A/D converter?

A. Certainly! Crosstalk can come about in several ways: from one signal chain on a printed circuit board (PCB) to another, from one channel within an IC to another, or through the power supply. The key to understanding crosstalk is to discover where it comes from and how it manifests itself. Is it coming from an adjacent converter, another channel of the signal chain, or from the PCB design?



the mixing effect shows how the aggressor signals fall back into the band of interest.

Finally, these same three measurements can be repeated with the input signals in an overrange condition (above the full scale of the device or signal chain). This helps define how robust an open channel is when the input signal is clipped or the channel is saturated.

All of these tests should cover the full signal range and frequency range of interest for the application, as crosstalk can sometimes be caused by a poor PCB design or can manifest itself at specific operating conditions. Swapping parts out won't help. The converter or multichannel device must be thoroughly tested to make sure it is robust enough for your application

The most typical type of crosstalk testing is called adjacent crosstalk. This form of crosstalk manifests itself when one channel is driven at or near full scale, while the channel or signal chain being "looked at" is open, with no signal applied. A spur that rises above the noise floor will be seen on the open channel when measuring the output frequency spectrum. This type of crosstalk defines the isolation between the open receptor channel and the driven aggressor channel.

Sometimes, open channels are robust enough to suppress cross coupling from one driven channel, but there is strength in numbers. Another crosstalk test drives all but one channel in the system with the same frequency, leaving only one channel open. In this case, the strength of all aggressors is measured through the open channel.

A third way to measure crosstalk is to drive two or more channels with different frequencies and signal strengths, testing the open channel(s) to see if the driven channels produce any cross-coupled mixing products that leak through. In this case,



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