

Rarely Asked Questions

Strange stories from the call logs of Analog Devices



Contributing Writer
John Ardizzoni is a Senior Application Engineer at Analog Devices in the High Speed Linear group. John joined Analog Devices in 2002, he received his BSEE from Merrimack College in N. Andover, MA and has over 30 years experience in the electronics industry.

Op Amp Dedicated Feedback Pin Helps Achieve New Levels of Performance.

or

This feedback pin is dedicated to all those op amps out there tonight!

Q: I've noticed a new pinout on some of your high-speed op amps. Why the change after all these years?

A: You're right. A few years ago, Analog Devices introduced a new pinout on some of our high-speed, high-performance amplifiers. This new pinout features a "dedicated feedback" pin, as Elvis is pointing out. Although the traditional SOIC pinout, which has been around for many years, performed admirably in the past, it imposes limitations as speeds continue to increase.

In a traditional SOIC pinout, pin 2 is the inverting input, pin 3 is the noninverting input, pin 4 is the negative supply, pin 6 is the output, pin 7 is the positive supply, and pins 1, 5, and 8 are typically no connects. But therein lies a problem: mutual inductance between pins 3 and 4 degrades the amplifier's second-harmonic distortion. To remedy this we rotated the pinout counter-clockwise by one pin on our LFCSP packages, breaking the coupling between the noninverting input and the negative supply. This change can improve second-harmonic distortion by up to 14 dB—a 500% improvement!

On some of our SOICs, we also provide a dedicated feedback pin, on pin 1. While this does not improve second-harmonic distortion, it greatly simplifies the circuit layout and reduces parasitic effects that can be detrimental to high-speed applications. In high-speed circuits, layout plays a large role in circuit performance. With



a traditional op amp pinout, getting the feedback signal to the inverting input requires it to be routed around or under the amplifier, with both options adding parasitics. With the dedicated feedback pinout, the feedback pin is right beside the inverting input, so all that is required to make the connection between the two pins is a resistor or a trace. The dedicated feedback pinout enables a very compact layout that requires less board area. It also reduces parasitics, which improves high-speed performance, and provides a more streamlined layout, which improves signal routing.

It's clear that a small, but innovative change like Analog Devices' dedicated feedback pin can make a big difference in the performance of your next high-speed amplifier design.

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 High-Speed Amplifiers**

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