

In search of a better line driver

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2004-06/0029.html>

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Date: 06/04/04

Date: Thu, 03 Jun 2004 18:40:30 -0700

Hi:

Here are some of the ways I have driven 50 ohm coax cables with TTL level logic signals:

1. I have used 74HC14, 74AC14, and 74ACTQ14 devices to drive 50ohm cables, with reasonably good results. I have tended to use one gate in the package to drive several others in parallel, with a back terminating resistor tuned to match the line Z, minus the output Z of the parallel gates. This tends to produce some bumps after the edges that I'd like to look better, mainly when driving an open line. Also, unless many gates are used, lot variations in the output impedances of the gates can cause substantial variations in edge quality from lot to lot.

I haven't tried using only a 74HC14 package with some parallel gates, without one gate as pre-driver. Maybe this would be better. Ultimately I want to not use such a large 14-pin package.

Also, I don't think it would be wise to use one 14-pin package to drive multiple channels, since the ground and VCC bounces from one channel feed a little bit into the others, except for very non-critical applications.

2. I have used TC4426A MOSFET drivers as line drivers. They are very good at this, but too slow for some purposes. I'd like to keep things at least as fast or faster than HC CMOS.

3. Lately I have tried the Fairchild TinyLogic NC7WZ14 UHS dual Schmitt inverters. I tied the two gates from one package in parallel, and again used the back terminating R. I made a really nice layout on a 4-layer board with a pair of 0.1uF 0805 bypass caps on either side of the package.

Boy this chip works great! It makes simply marvelous edges into even the unterminated line.

But there is one problem. The thing is so small I can hardly solder it.

It sits on pads just a few tenths of millimeters per side. For the first and only board on which I have used them, I had another tech.

assemble it who did a lousy job, giving it back to me after apparently no inspection. Today I bitched and moaned for an hour while I fixed the poor solder joints. But they are almost impossible to solder well by hand. Well, things might be better if I had the proper illuminated magnifier, but I don't. Also, I was using 0.015" wire solder, which is still too much to meter out consistently at this size.

Actually, I have a little general purpose line driver board I made using the TC4426/7 chips, and had 100 of them assembled by an outside contractor. It's only 0.65" x 0.75" and plugs into any board needing line drivers, sparing me from re-evaluating the driver design for every new situation. It simply includes everything: ESD and OVP protection, LED driver, and the line driver. Expensive, but that's Ok for my lab environment if it saves me time. These are cool, and I intend to do the same perhaps with the Fairchild chips.

But if I could find a SO-8 packaged chip with similar specs to the Fairchild UHS stuff, that would be almost ideal.

Are there any fast, 5V powered line driver chips in SO-8 or a package at least a little larger than the 2.00mm x 1.25mm package of the Fairchild UHS device?

Thanks for comments.

Good day!

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