

## Re: In search of a better line driver

**Source:** <http://sci.tech-archive.net/Archive/sci.electronics.design/2004-06/0224.html>

---

**From:** John Larkin ([jjlarkin\\_at\\_highSNIPlandTHIStechPLEASEnology.com](mailto:jjlarkin_at_highSNIPlandTHIStechPLEASEnology.com))

**Date:** 06/04/04

Date: Fri, 04 Jun 2004 14:26:22 -0700

On Thu, 03 Jun 2004 18:40:30 -0700, Chris Carlen  
<crobc@BOGUS\_FIELD.earthlink.net> wrote:

>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!

My favorite is the Onsemi NL37WZ16US, a triple buffer, using all three sections in parallel. If you run it from 6 volts and use, say, 10 ohms in series, it puts almost 5 volts into 50 ohms in about 500 ps. Or source terminated, powered from 5, it will deliver about 4.5 at the open end.

But it's a US8 package. To hand solder, wet the pins with liquid flux, blob a tiny bit of solder on your iron, and touch each pin; solder will wick from the tip to the pin and pad.

John