

Re: Differential probes

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- *From:* Jim Yanik <jyanik@xxxxxxxx>
 - *Date:* 20 Jun 2006 15:53:10 GMT
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John Larkin <jjlarkin@xx> wrote in news:ik4g92593d3b6dl790nfp06opc0i1d0h90@xxxxxxx:

On 20 Jun 2006 05:08:46 GMT, Jim Yanik <jyanik@xxxxxxxx> wrote:

John Larkin <jjlarkin@xx> wrote in news:ioge92lem7883ifqr24k90tet34se42dqp@xxxxxxx:

On Mon, 19 Jun 2006 16:49:57 -0700, Chris Carlen <crcarleRemoveThis@xxxxxxxxxxxxxxxx> wrote:

Hi:

I have a Tek P5205 1:50/1:500 100MHz probe. I just tested it with a 1MHz square wave and it gives nice clean edges with little ringing.

However, a Fluke DP120 20MHz 1:20/1:200 probe loaned to me by an Agilent sales rep. gives miserably ringing edges. The Fluke is kind of silly in having 4 ft. long heavy cables with huge probes that look suitable for heavy duty power distribution probing. Not very convenient for little stuff.

But worse, the Fluke gives horribly ringing edges. I tried making the test cables into a twist-pair, which helped a little but not much. Do the designers ever really think that the thing can give

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meaningful measurements of 20MHz signals with such a huge pickup loop area! Also, the FP120 is about 4x more noisy than the Tek.

The Fluke must have a power supply in there to generate a negative supply, whereas the Tek just pulls clean power from the scope.

Ugh!

The problem with the Tek is it can only work with the scope. But I need to look at a filtered signal to get better RMS measurements of PWM BLDC motor terminal voltages.

Although the FLuke gave a little better 1MHz CMRR of about -66dB vs. Tek -49dB.

There are also a bunch of probes on the market that look like this:

<http://www.probemaster.com/activedifferential.html>

<http://www.linkinstruments.com/adf25.htm>

I wonder how they perform?

Oh well, just deliberating in public.

Thanks for input.

We just got a new Tek TPS2024 scope. It's a 4-channel, 200 MHz color scope and all four channels plus the trigger inputs are isolated. So you can use regular 1:1 or 10:1 probes for off-ground measurements at millivolt sensitivity. Slick.

The 50:1 attenuation of the P5205 turns low-level stuff to mush.

John

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It won't have the CMRR of a true diff amp.

The TPS2024 is truly isolated to 600 volts RMS

So what? That has nothing to do with differential amp performance. All that means is the front ends are isolated from the case to 600 V.

The 7A13 has a wide input overdrive capability, has matched attenuators carefully calibrated for low CMRR, and a true low CMRR differential amplifier.

AFAIK, NONE of the TDS series were designed to have true differential capability, just the simple "invert&add Ch2" sort like the older analog scopes.

and goes down to 2
mv/cm, which is pretty extreme. It would be nice if it had the 10
uv/cm sensitivity and switchable bw of a 1A7A/7A22.

Many of the TDS series have an adjustable BW-limit feature.

Maybe I'll make a little battery-powered preamp box to front-end the 2024 and get down to microvolt levels; switchable bandwidth would be handy, too. It could be single-ended, since the scope provides the isolation.

It still would make a lousy differential amp.

Does anybody make male BNC connectors with plastic (insulated) connector shells?

John

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