Making Accurate Oscilloscope Measurements for Noise, Switching, and High Frequency Signals

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Texas Instruments Inc – Tucson
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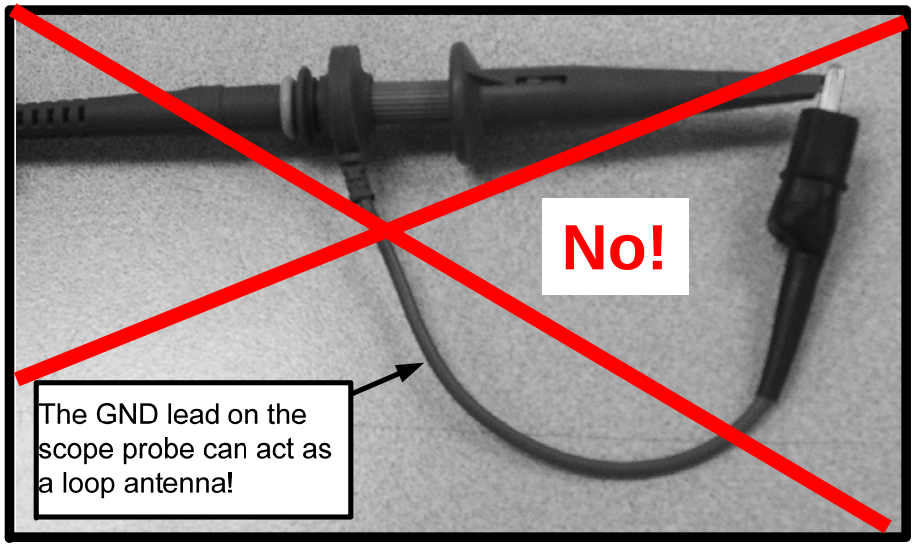
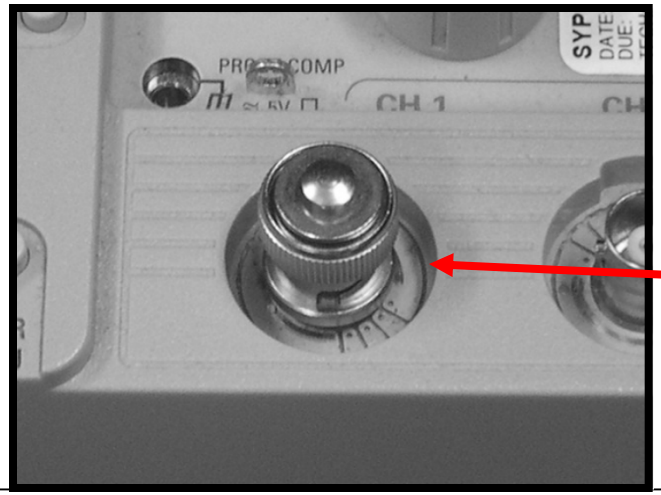
Oscilloscope Noise, Switching, and High Frequency Measurement



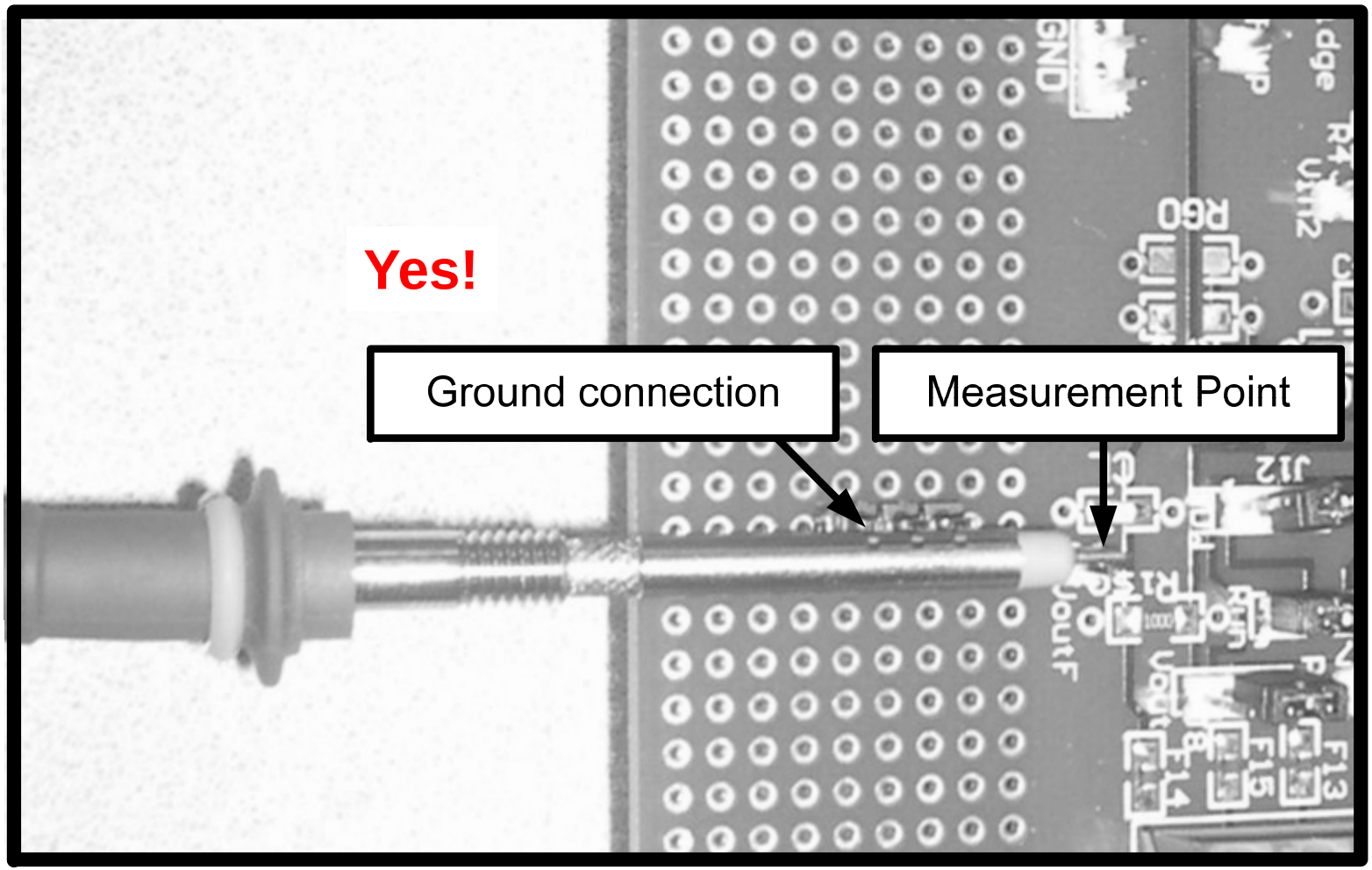


BNC Shorting Cap

Check Noise Floor of Instrument

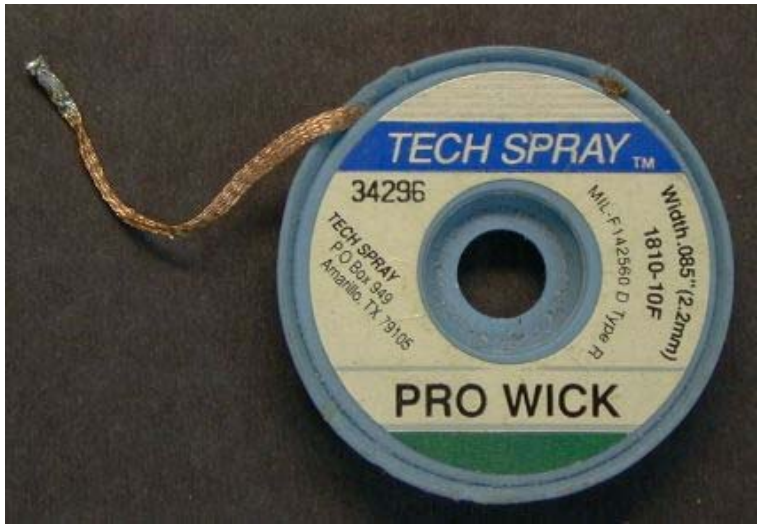
Option 1
Adjacent Ground Connection

No scope Probe Ground Lead - Ground connection at an adjacent measurement point!



Option 2
Solder Wick Ground Connection

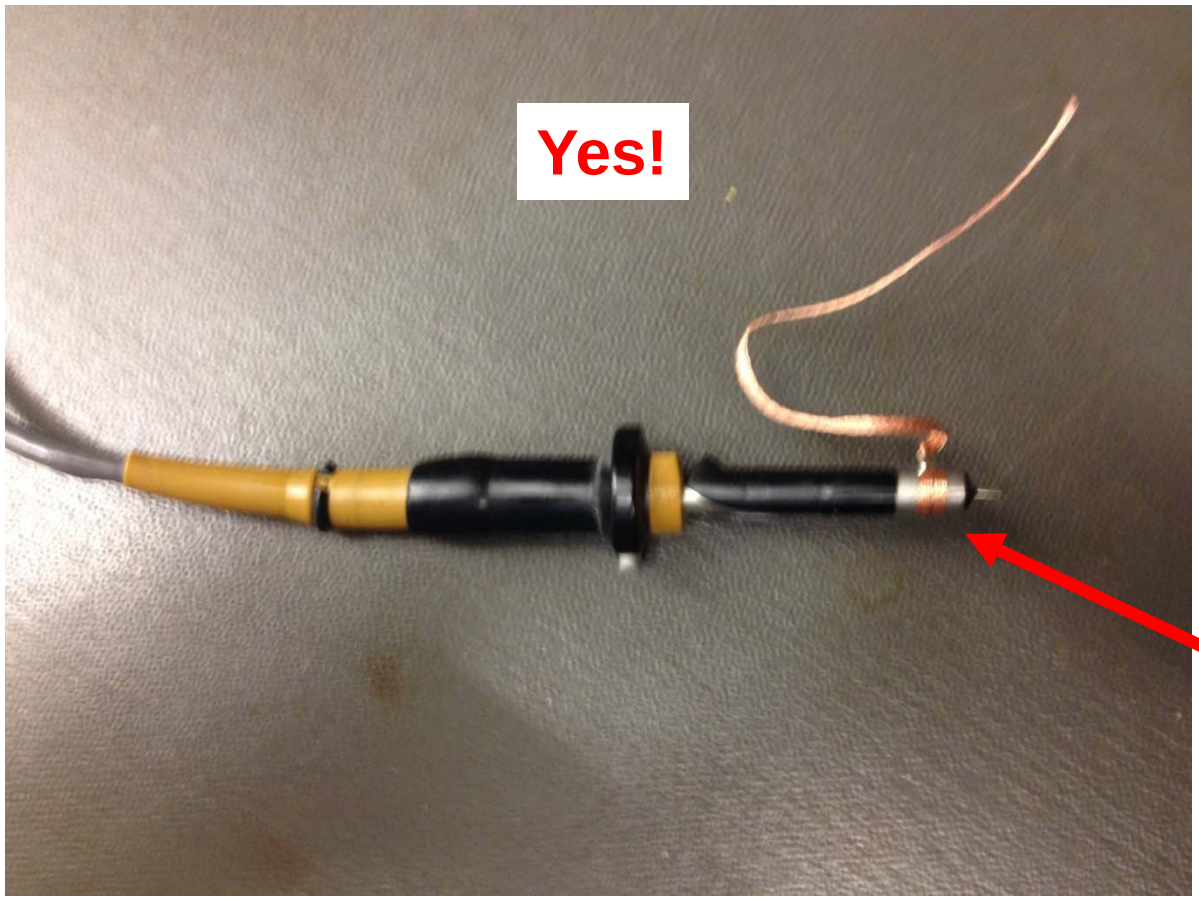
What is Solder Wick?



Desoldering braid, also known as desoldering **wick** or **solder wick**, is finely braided 18 to 42 AWG copper wire coated with rosin flux, usually supplied on a roll. The end of a length of braid is placed over the soldered connections of a component being removed.

https://en.wikipedia.org/wiki/De**soldering**Wikipedia

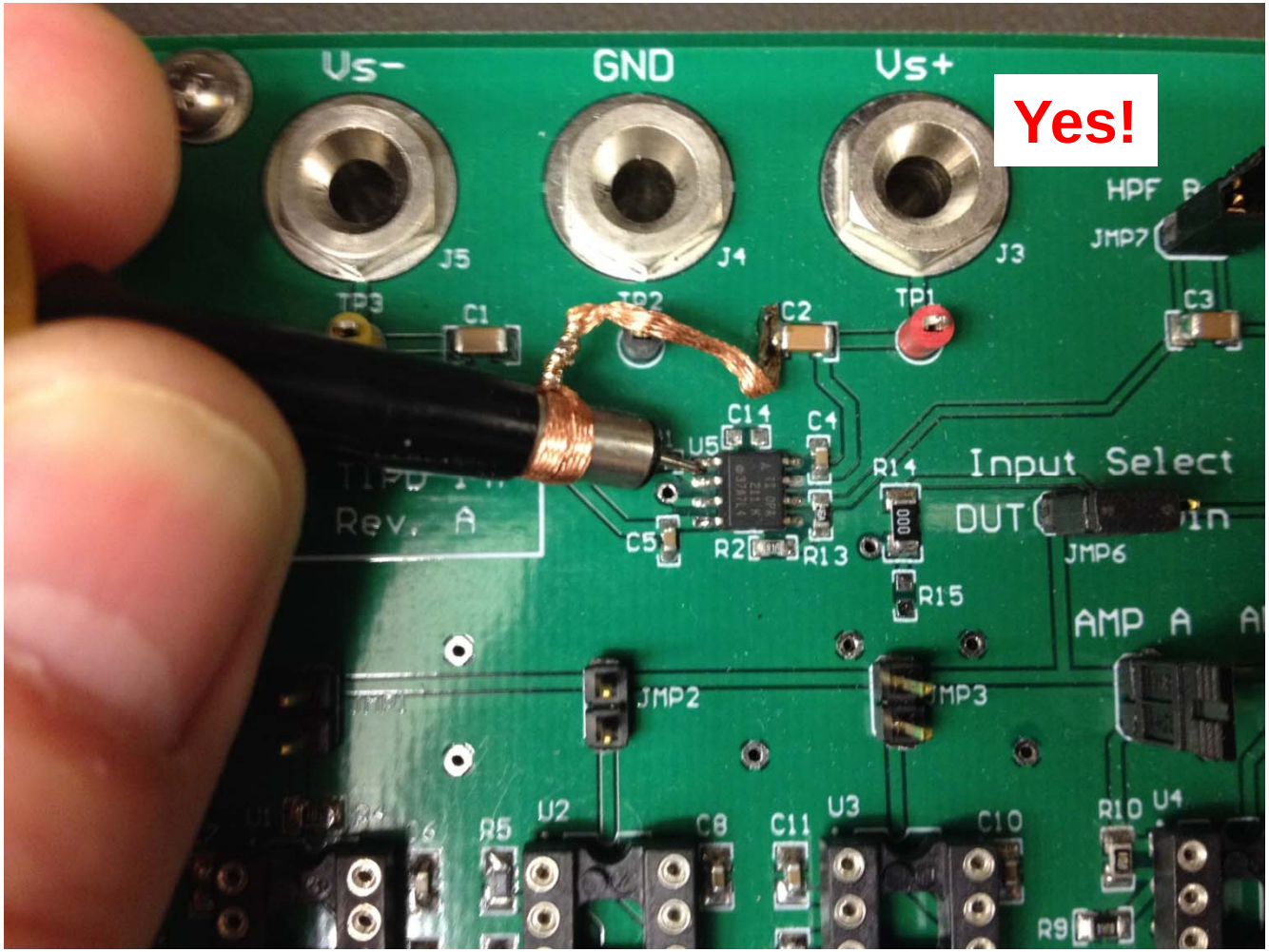
No scope Probe Ground Lead - Ground connection through solder wick to a local GND point!



Use solder wick for a good high frequency ground connection.

High frequency travels on the outside skin of the wire. Solder wick has many, many strands of copper wire!

No scope Probe Ground Lead - Ground connection through solder wick to a local GND point

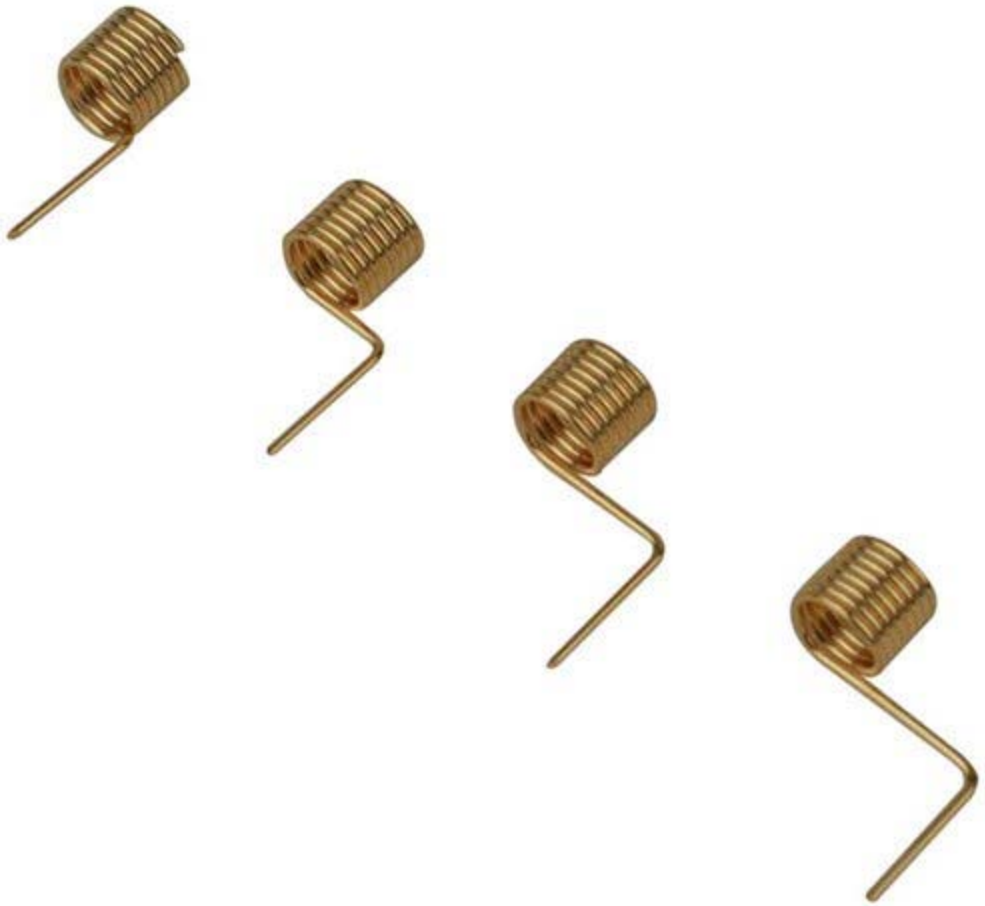


Connect tip of scope probe directly to point to be measured. Solder “solder wick ground” very, very close to IC ground

Option 3
Oscilloscope Probe
Ground Tip Connection

Oscilloscope Probe Tip Ground Kit

Often found with scope lead kits or can be purchased after-market.



Oscilloscope Probe Tip Ground – Make your Own!

Can use AWG #24 Solid Bus Wire to make your own.

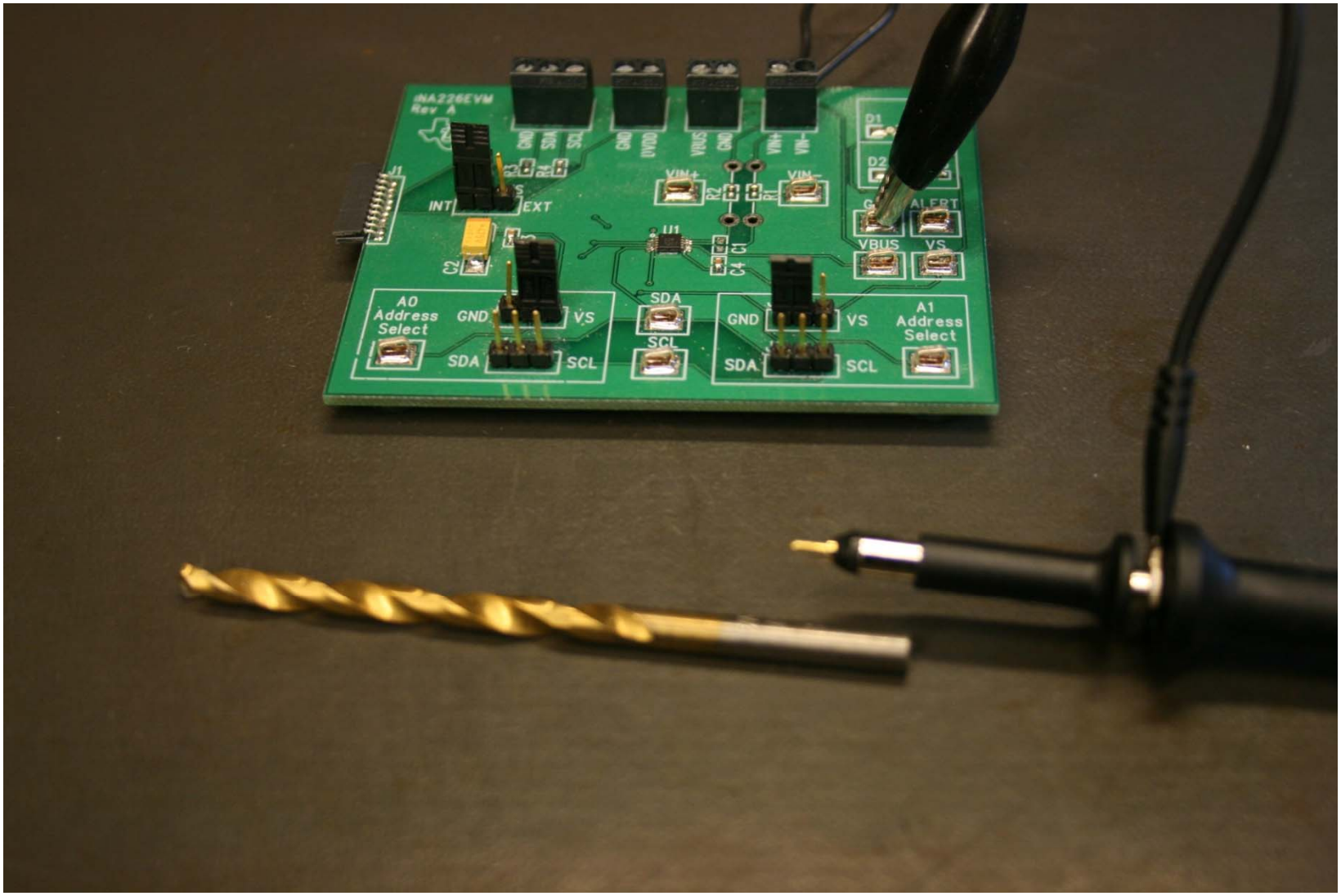
Bus Bar Hook-up Wire 100 Foot Reel

Features

- Tinned copper
- Solid, soft drawn annealed bare copper
- Single conductor
- 24 AWG wire gauge
- Outer diameter: 0.020"
- Length of reel: 100 feet
- Current rating: 5A
- Approvals: ASTM-B-3, QQ-W-343-Type-S

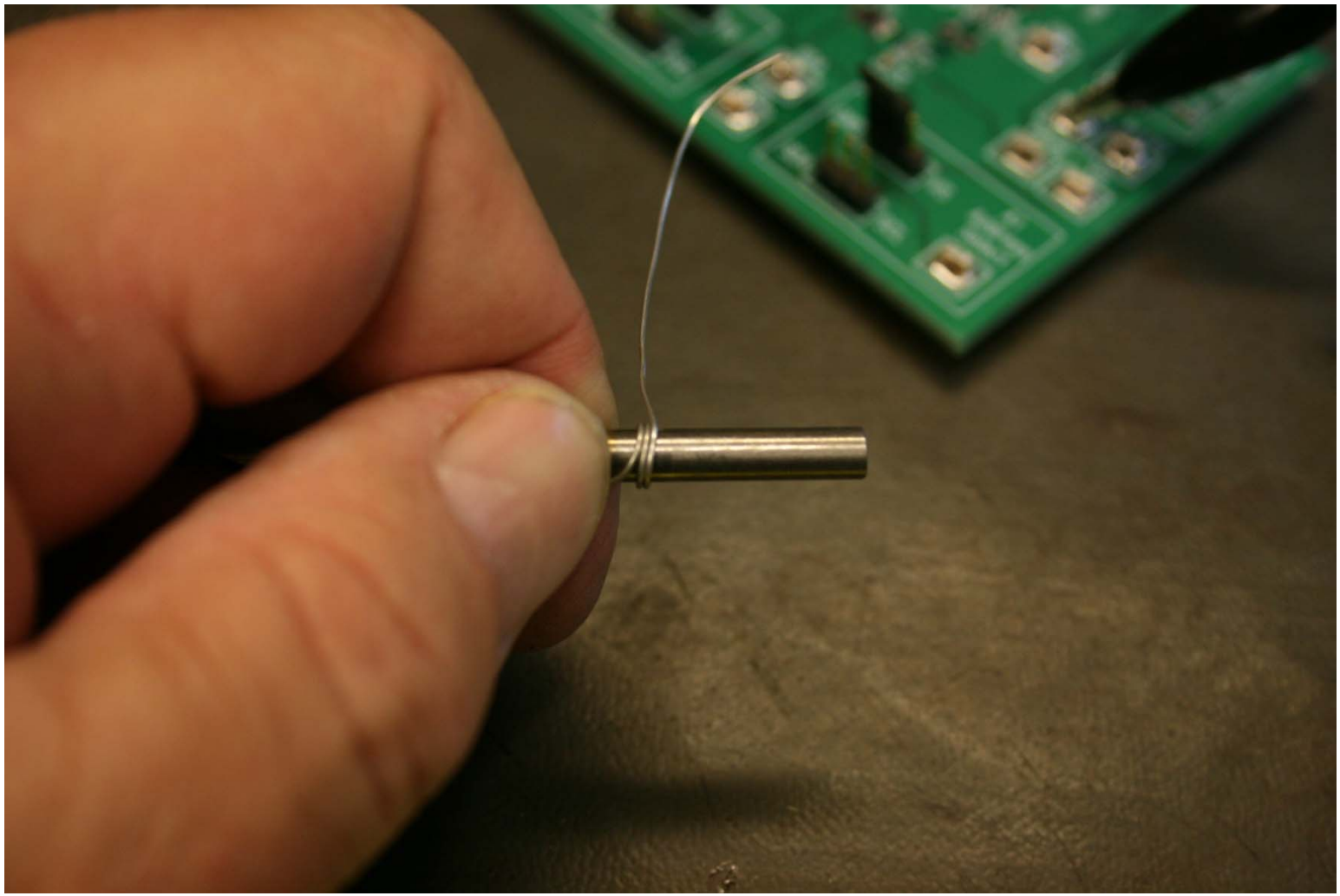
Oscilloscope Probe Tip Ground – Make your Own!

Use a drill bit slightly smaller that the scope probe diameter.



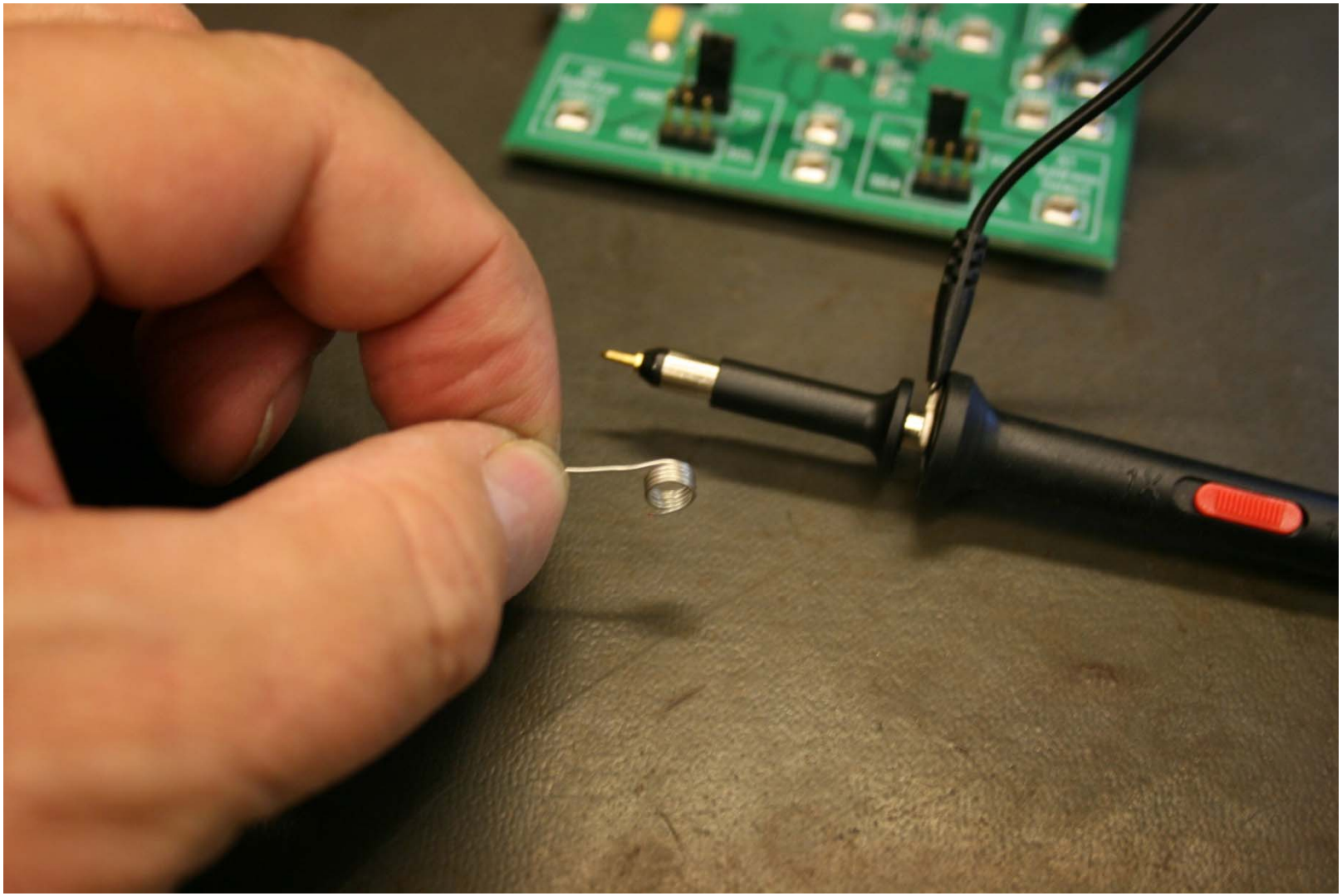
Oscilloscope Probe Tip Ground – Make your Own!

Tightly wind 10 turns of the bus wire around the drill bit shank.



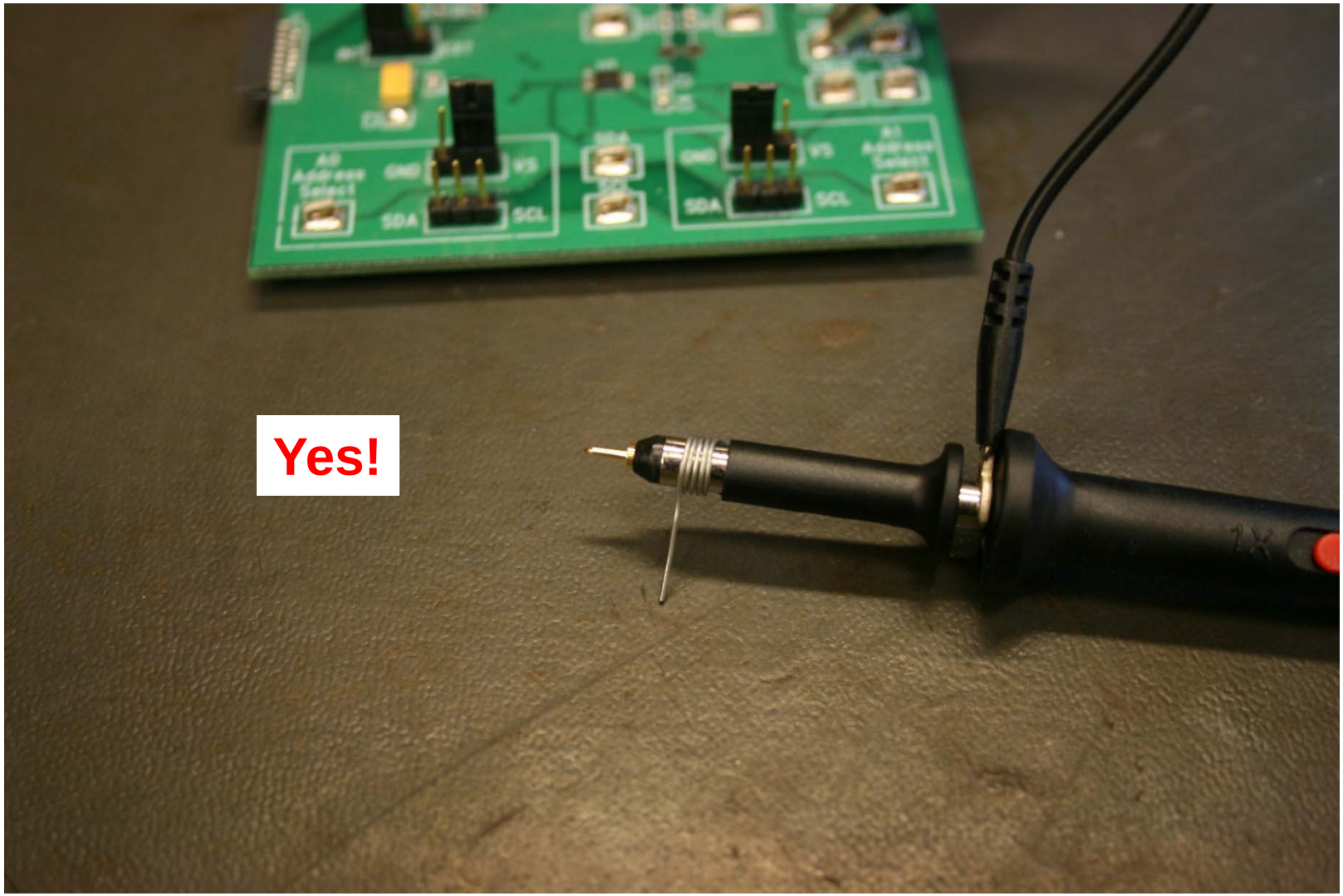
Oscilloscope Probe Tip Ground – Make your Own!

Slide the coil off of the drill bit shank.



Oscilloscope Probe Tip Ground – Make your Own!

Slide the bus bar coil onto the scope probe shaft.



Oscilloscope Probe Tip Ground – Make your Own!

Probe the desired circuit point and a nearby local ground point.