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POWERPROBE

An experimental power supply interface for Autoprobe (© Agilent) active probes

Warning : the project described in this document is only an experimental project, provided without any warranty at all nor support by ALCIOM

Agilent propose some very impressive active probes for their Infiniium (© Agilent) oscilloscopes, like the great 1,5GHz HP1156A (see www.agilent.com). These probes are interfaced with the scope through Agilent's own Autoprobe interface, which include a standard BNC connector plus nine dedicated pins.

Just connect such a probe to a compatible scope and voilà, the probe is automatically recognized and powered. But from time to time you may want to use your probe with other test instruments, not equiped with an Autoprobe interface. For example we wanted to connect it to our spectrum analyzer and to a Lecroy waverunner scope. Is it possible ? You bet yes...

Let's see how it works. The Autoprobe pinout is described in the Agilent documentation, from left to right when looking at the scope front panel :

> pin 1 : +3V to +6V, depending on Rs
> pin 2 : -3V to -6V, depending on Rs
> pin 3 : Offset adjustment (-1mA to +1mA, voltage limited to +/-6V)
> pin 4, 5, 6 : digital and analog probe recongition interfaces
> pin 7 : Rs, the probe connects this pin to GND through a resistor Rs
> pin 8 : -12V
> pin 9 : +12V

So it is possible to use it with a custom interface as long as this interface provides :

1. A +12V and -12V power supply
2. An adjustable +3 to +6 and -3 to -6V power supply. The interface should automatically adjust these voltages based on the Rs resistance located in the probe. An infinite resistance should give 3V, 20Kohm should give 5V, 40Kohm should give 4V and a short circuit should give 6V
3. An adjustable +/-1mA current source, to adjust the DC offset of the probe, limited to +.-6V

And that's exactly what is done by the PowerpProbe interface. Here is the schematic (powered from a +/-15V external supply) :
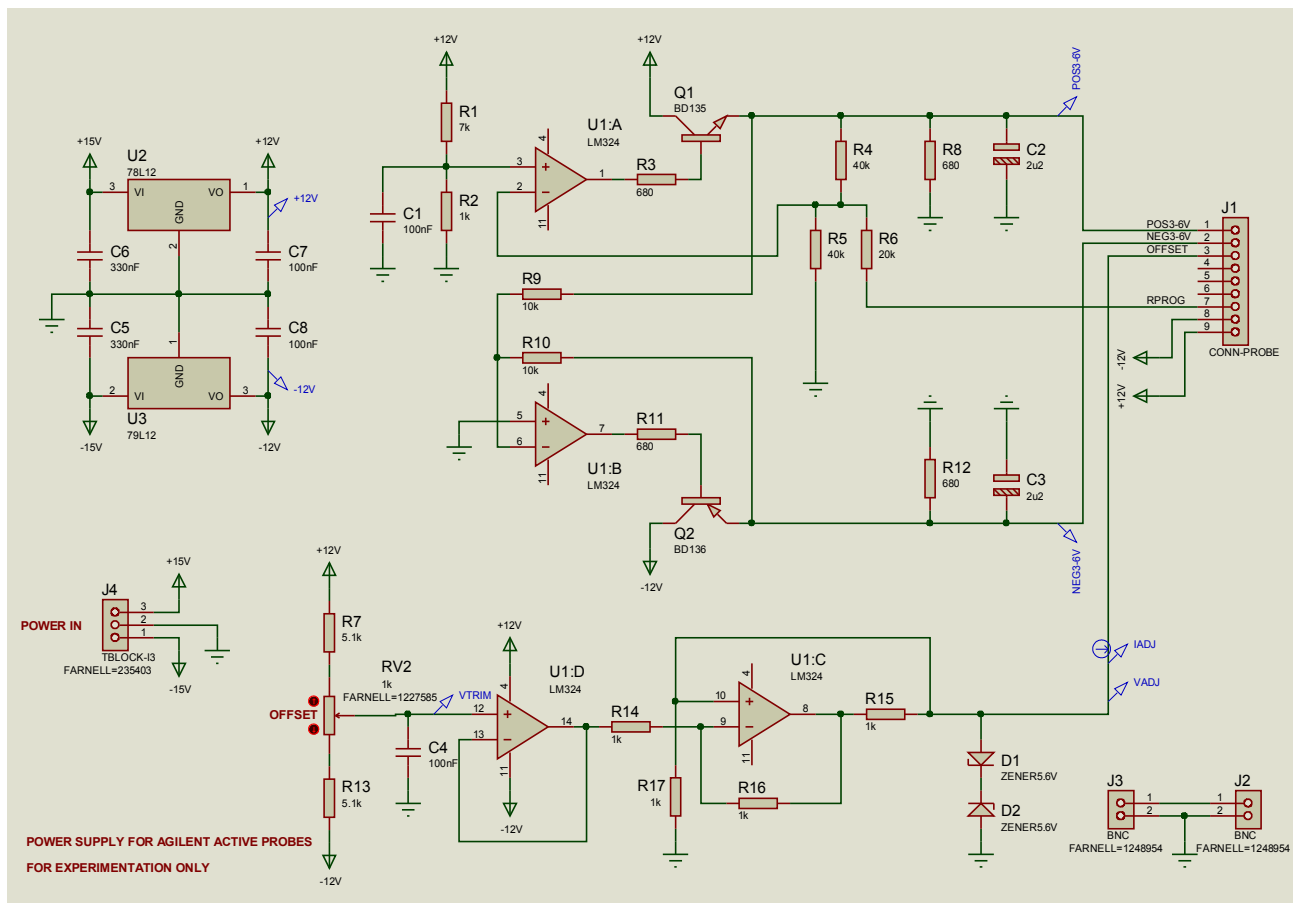
The most difficult part is the mechanical side. We have designed a small single-side PCB (don't forget the 3 jumpers) that could help you, see the accompanying pdf and Gerber files.
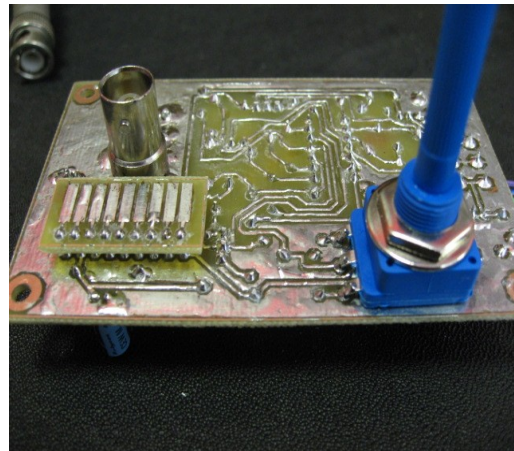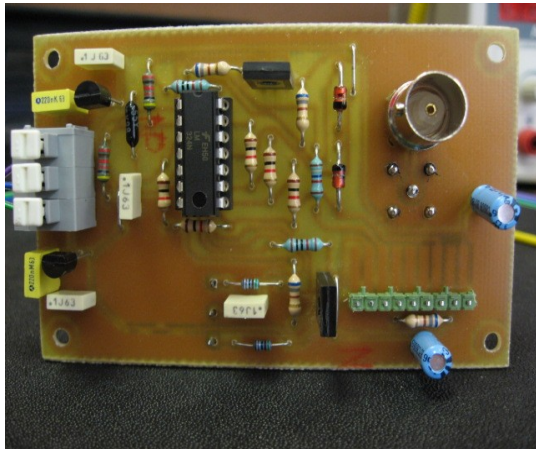
The RF connection is redirected from the probe connection BNC to a rear side BNC with a very short track (not 50 ohm but with minor impacts for the majority of applications as we are at the output of the active probe), allowing to connect it to your measurement instrument through a standarnd BNC/BNC cable. Don't forget that the equipment input should be 50 ohm.
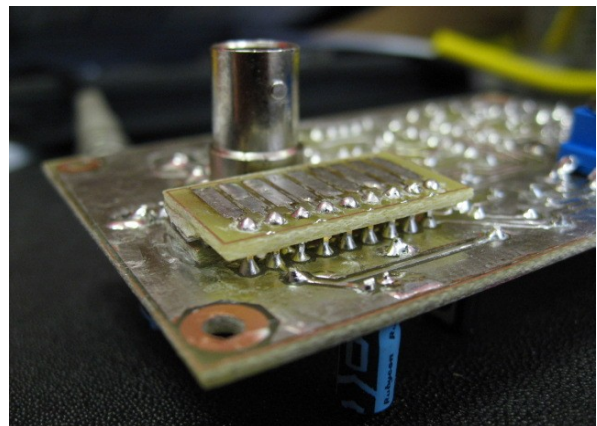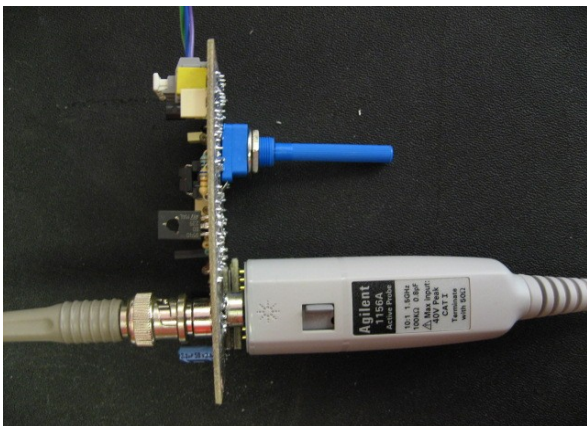
Regarding the Autoprobe pins we used a stack of PCBs to adjust the height of the pins, as shown on the picture... and it works !

CAUTION : This design is provided by ALCIOM only for your information and for experimental works. No support will be provided by ALCIOM. The Autoprobe interface is patented by Agilent.