General description

The ZVS100 board is basically a power oscillator which is used in applications like driving a flyback transformer or an induction heating coil.
This board has 4 high quality capacitors which are connected in parallel with the output coil. Thus, the oscillation frequency is determined by the resonant frequency of the resulting tank circuit.
As the flyback is driven in resonance with the board's capacitors, this sort of flyback driver is called "resonant driver". More specifically it's a ZVS flyback driver (Zero Voltage Switching).
ZVS means that the board's transistors switch off when their Vds voltage is already 0V. This leads to no voltage spikes on the transistor's drain and therefore a more robust and durable board.
Another important consequence of all of the above is a considerably good power efficiency by which this board doesn't need a heat sink.

What voltage can I achieve?

Around 30kV more or less depending on the flyback transformer you use and the number of turns you use for making your primary coil.
This board drives your flyback in resonant mode, not in flyback mode, so you will get hot yellow arcs from it and once the arc is initiated you will be able to enlarge a lot.
Thanks to this characteristic this board can be used for making a Jacob's Ladder.

Main characteristics

- ZVS Resonant driver
- No heatsink needed.
- Overload protection. This board incorporates a resettable fuse. If you exceed 3A for too much time this fuse will start limiting the current.
- Compatible to all flyback transformer on which you can wind some turns of wire around its ferrite core.
- High current MKP10 capacitors included.

Electrical characteristics

- DC power input: 12V
- P.S. current at no load: ~0.5A with coil.
- P.S. current continuous: 3A
- P.S. current max: 6A (resettable fuse will shut down the board for protection.)
- Driving voltage: Up to 120Vpp measured between terminals A and B of load coil.
- Frequency: You can calculate it as the resonant frequency for your coil connected to a 1.33uF capacitor.

1. How can I connect my coil to this board?

The most important thing here is to make a proper primary coil for your flyback transformer. As you can see on fig. 1.1, this must be a center tapped coil.
This coil is made easily by winding 10 turns of enameled copper wire around the flyback core and then connecting a third wire to the center turn just leaving 5 turns on each side. Take a look to fig 1.2 to get a clear idea of how this coil could be. In this case a stranded wire and less turns are used. Those are options especially useful if you will use this coil for induction heating.
In the figure 1.3 is shown a detail of all connections.

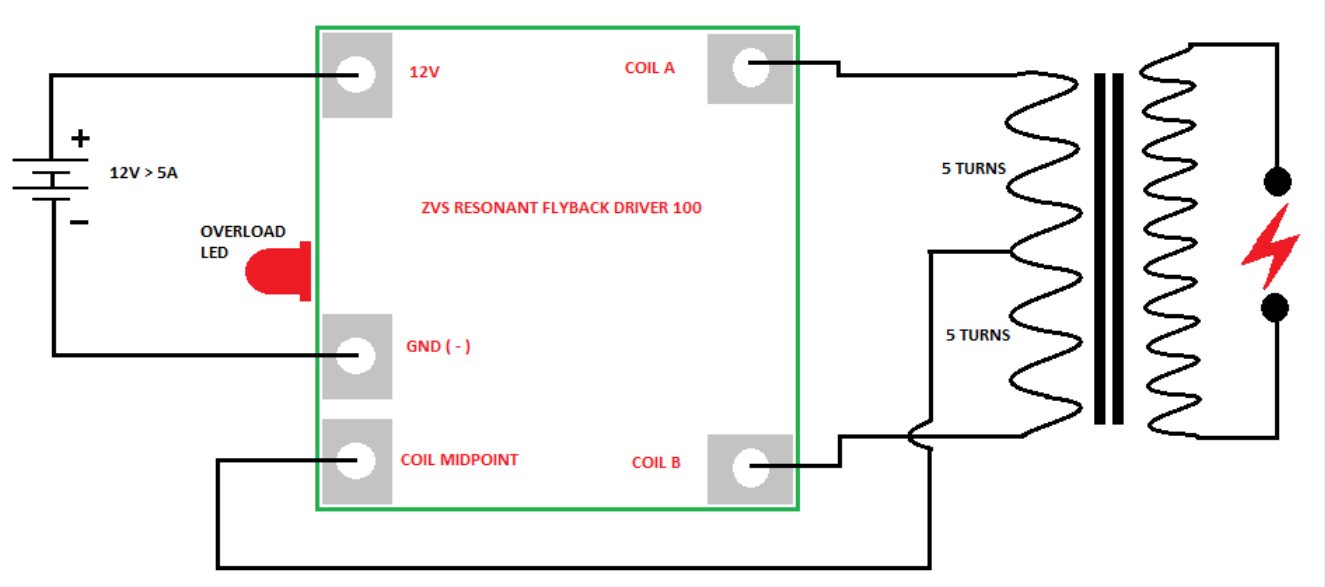

Fig. 1.1 – Connection schematic.

Fig. 1.2 – Example of primary coil wind on the ferrite core.

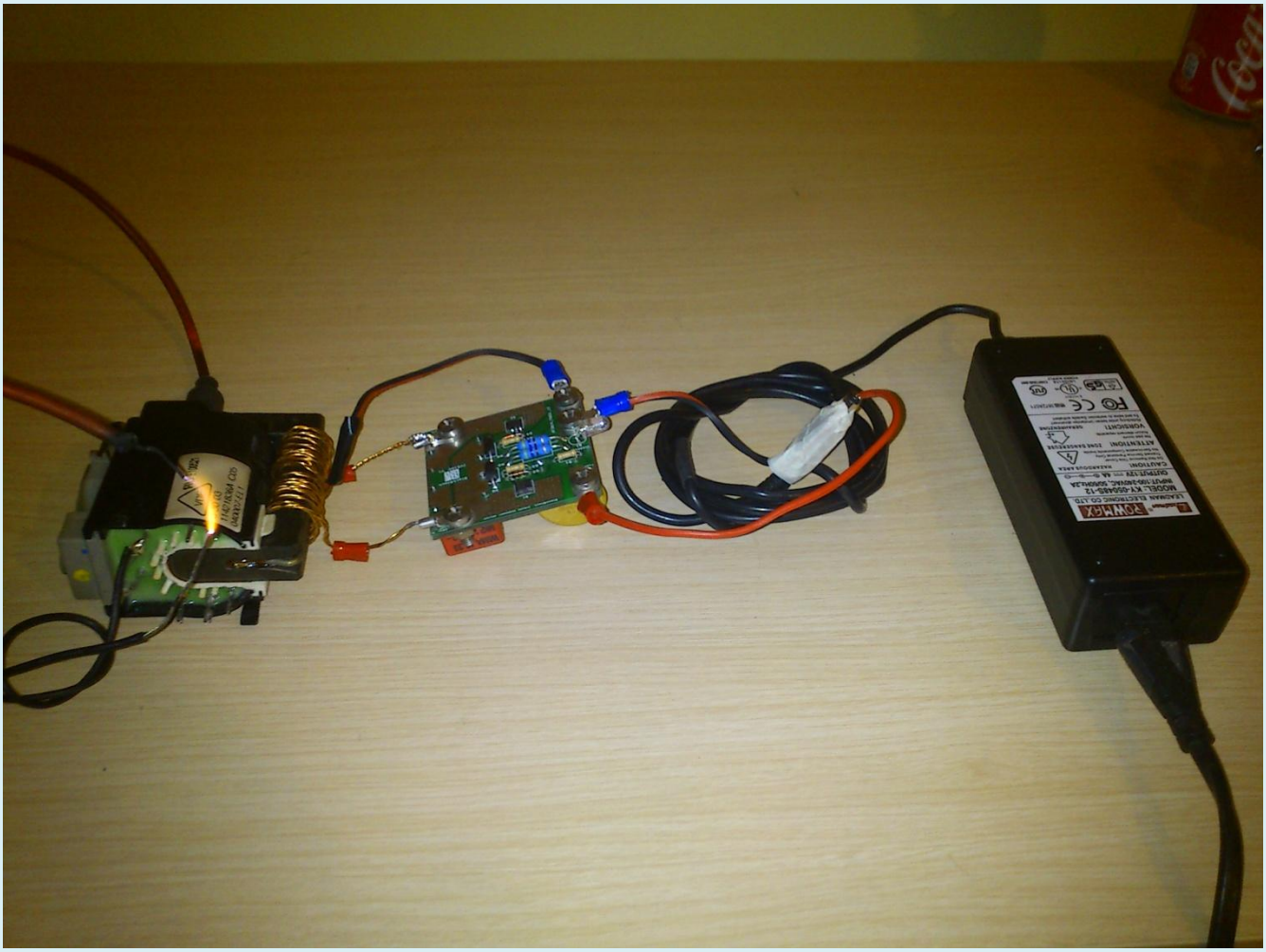

Fig. 1.3 – Complete setup photo.