Product Overview:

Qiftech.cn.lab software laboratory: can measure the single-ended input voltage of two channels, DC coupling mode.

Input impedance 300k-2M || 10 pF。 The measurable input signal range is 0V/ 100V. It is divided into 2 grades, the first gear is 0V/10V, and the second gear is 0V/100V. Two channels with 12-bit input accuracy (analog-to-digital converter) and selectable sampling rate (50 kS/s ... 15 MS/s) to sample the input voltage.

Output: Two channels OUT1, 2 parallel outputs, each channel contains two sub-channel parallel outputs.

OUT1,2 can output a square wave of 3V, 1k-1.5M, and can also adjust the duty cycle and phase. 0V-3V, 1k-20k sine wave, triangle wave, custom waveform is also available.

It provides 2.5V, 5V output current measurement, can be used for closed-loop testing of 5V electronic modules, and the maximum current of 50mA is provided for 5V output.

OUT1 output current measurement is provided with a maximum current of 3mA.

USB Connection: Uses USB 2.0 for high-speed transfer. it can be connected to a pc and is available in ubuntu and winn versions.

Voltage Limit: Input voltages outside of the safe range of 100 V can lead to permanent damage!

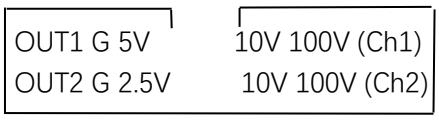
Don't connect the GND of the software lab to the GND of the 220v, 110v, device because it can destroy the software lab and the PC!

This is not a limitation for this device, but a typical limitation for most devices, even for more expensive ones.

Software labs have zero point errors that are generated by a resistance of 1-5%.

Trigger: The software lab does not provide a hardware trigger function, and directly collects and displays the acquisition trajectory.

Hardware Wiring Diagram:



Two channel inputs Ch1, Ch2 has two gears of 10V, 100V.

Program Installation: The program is a green version, download, use

CertUtil -hashfile qiftech.cn.lab.tar MD5;

CertUtil -hashfile qiftech.cn.lab.tar; view MD5 and SHA1;

Start Software Lab:

The executable program is named qiftech.cn.lab. It is installed (under Linux, win) or any directory. Linux is best opened with sudo ./ qiftech.cn.lab. In rare cases, it won't connect when another high-speed USB device is blocking the same USB bus. You need to reseat the USB device and turn it off and back on qiftech.cn.lab.

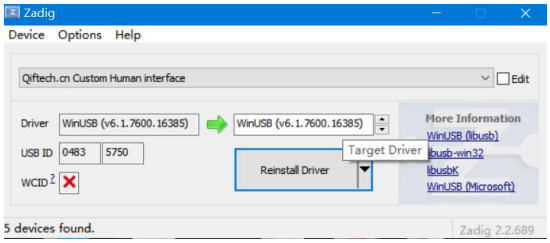
Driver Installation:

Linux generally comes with its own driver, and you can use sudo apt-get install libusb* to install it under UBUNTU;

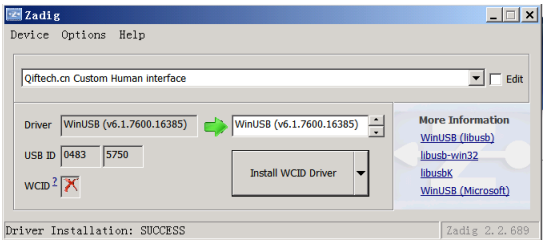
To check whether it is connected, you can connect the device first, and then use sudo lsusb -t to check whether there is a new device.

WIN7-10 can use zadig.akeo.ie, zadig install drivers, drivers including WINUSB (recommended) or libsdk, installation is complete, you can find the device.

The first step is to install WINUSB first:



The second step then install Wcid:



qiftech.cn.lab can be switched to two kinds of drivers (0,1), set 0 need to power on and re-plug the USB device and then open qiftech.cn.lab, but switching the sampling range speed. Setting 1 does not require powering on and re-plugging the USB device, but the speed of switching sampling ranges will be slow.

It's best to connect micro USB directly to your PC and don't use a USB hub in between. Ensure that the device does not share a high-speed bus with other devices. If you are having trouble using the USB3 port, you should switch to USB2, the device is powered via USB and has a typical current consumption of less than 500 mA, so it is essential to use a good quality USB 2.0 cable.

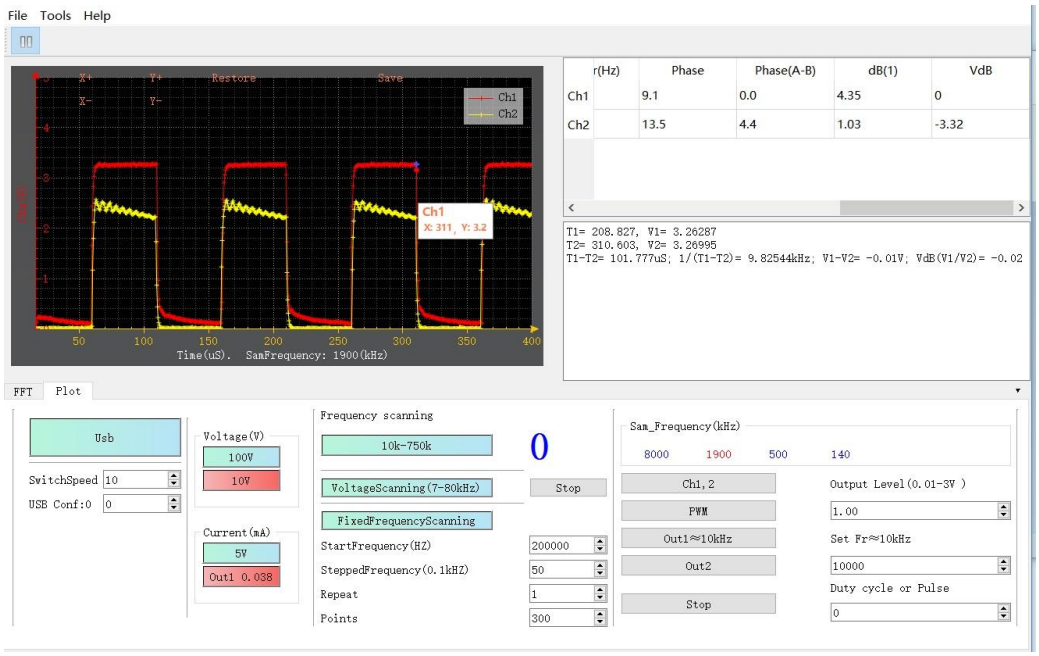
The selected settings are automatically saved when you exit and restored the next time you quit.

Quick Start Guide.

CH1 and CH2 of the two probes used are connected to the inductor and connected to the output OUT1.

set the pmw waveform, input 10000hz, and the software lab will display the square wave trajectory.

Pause and click on the square wave trajectory to find the frequency between two points.。



Voltage Measurement:

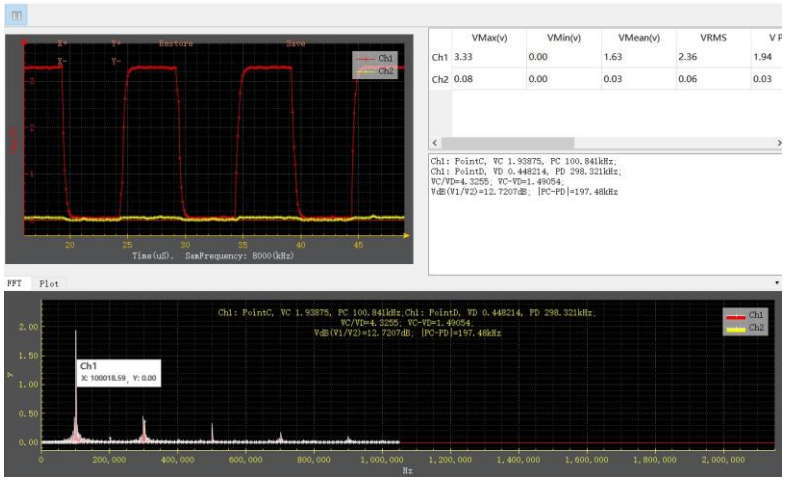
It is possible to measure the single-ended voltage of two channel measurements with GND. Channel name, voltage range, spectral range, peak-to-peak can be displayed. DC voltage component, AC voltage component, decibels. Phase to phase difference, dB to dB difference, CH1-CH2, CH2/CH1, Abs to calculate the absolute signal value.

Current Measurement:

It provides 5V output current measurement, which can test 5V electronic products with a maximum current of 50mA. OUT1 output current measurement is provided with a maximum current of 3mA.

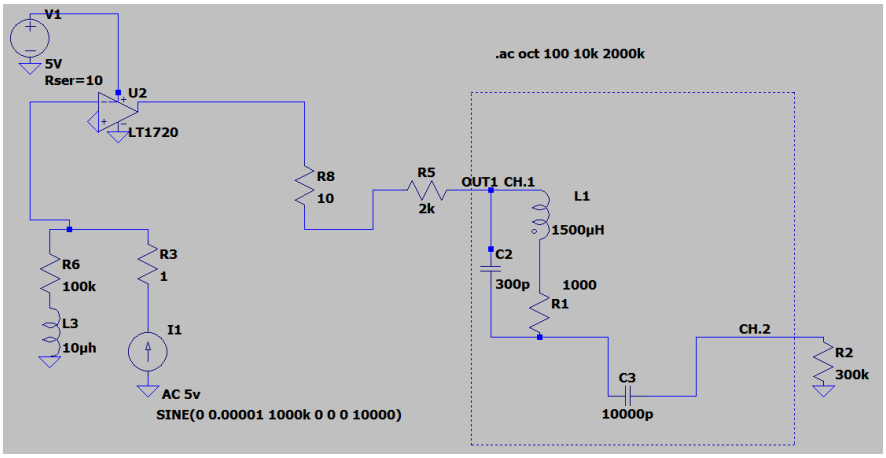
FFT Spectrum:

Important: Signals with a sampled spectral component higher than the Nyquist frequency will result in aliasing, where the higher spectral component is mirrored into the lower frequency range. This needs to be taken into account when looking at the spectrum. Pause, click with the mouse 2 times, and calculate the calculated value of the relevant FFT spectrum.



Frequency Sweep:

Frequency range: 1k-1.4M, each sampling channel is different. Below is the LC frequency sweep. LTspice simulation schematic, you can connect the components in the diagram frame, L1 (three-pin boost inductance 1.5mH, I-shaped inductance), C3 (10nF) is to be added, the others are parasitic circuit components, Ch1, Ch 2, Out1 of the connected device according to the diagram.



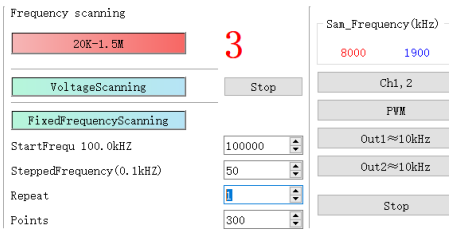
Set the sampling frequency of Ch1,2, here is 8M,

StartFrequency(HZ): set to 100k,

SteppedFrequency(0.1kHZ): set 5k,

Repeart: Set 1, setting larger can make the result more accurate, but slow,

Points: 100-300 points, then start, open Bode Chart DEMO2 for the frequency scan result.



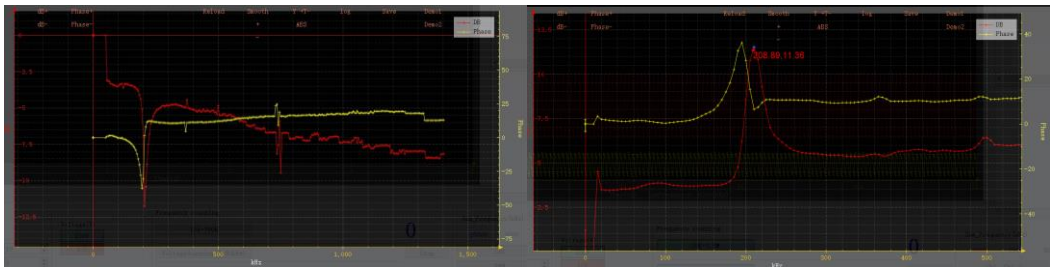
Bode Chart:

After the frequency sweep is completed, you can open the Bode chart, click the curve with the mouse, and you can see the XY value.

DEMO1: Boost inductor 68mH series 10nF frequency sweep; DEMO2: Boost inductor 1.5mH series 10nF frequency sweep.

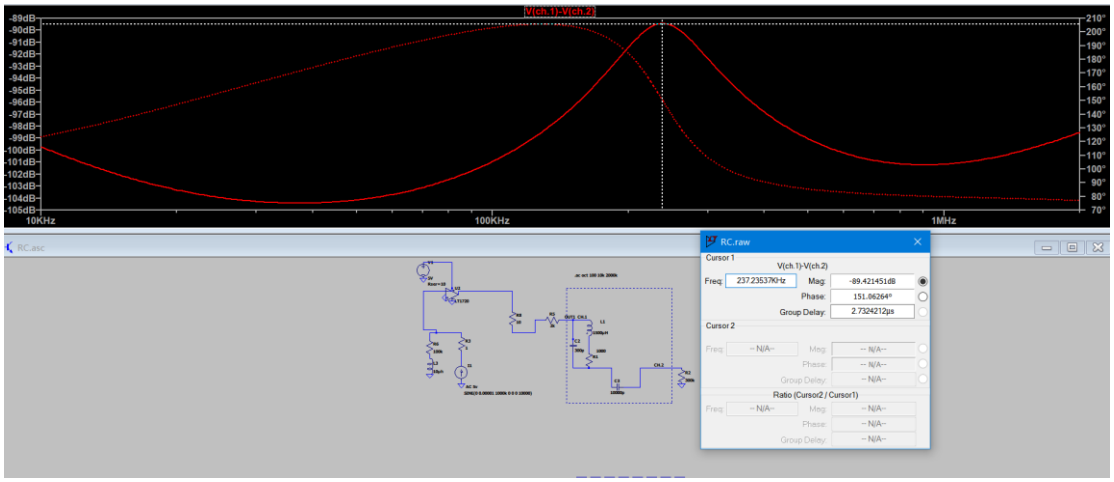
Other features Log, ABS Absolute, Smooth Smoothing.

Open DEMO2 to improve the picture through the smoothing function. after perfecting, you can see that the resonant frequency is around 200khz. note that the smoothing feature may filter the main data.



Real data smoothing function, etc

Compare LTspice simulation with DEMO2; you can see that the resonant frequency is around 200khz.

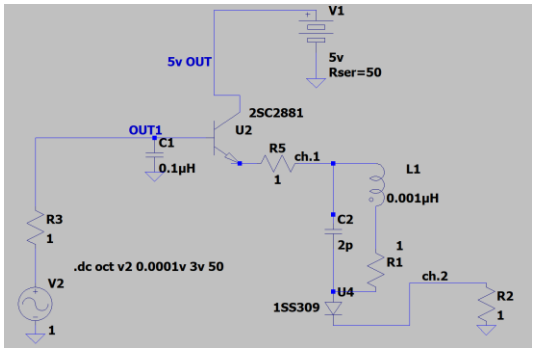


Voltage Sweep:

The current can be selected, 5V output current or OUT1 output current.

In this experiment, the PWM duty cycle is adjusted to adjust the voltage, and the voltage sweep is done with the help of capacitors. The following is a diode scan, which can be connected according to the diagram, the actual circuit C1 is the electrolytic capacitor, U2 is the 9013 triode, and U4 is the IN4007 diode.

C1, U2, U4 are to be added, others are parasitic circuit elements, connected according to the diagram, 5V output, Ch1, Ch 2, Out1, GND.



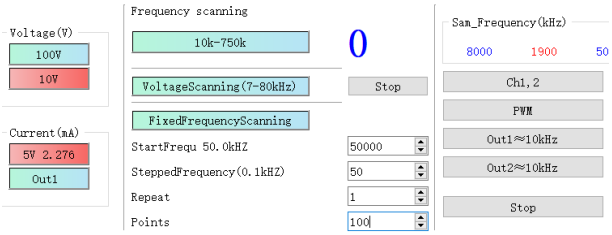
Set the sampling frequency of Ch1,2, NO2 gear,

Current(mA): Set 5V,

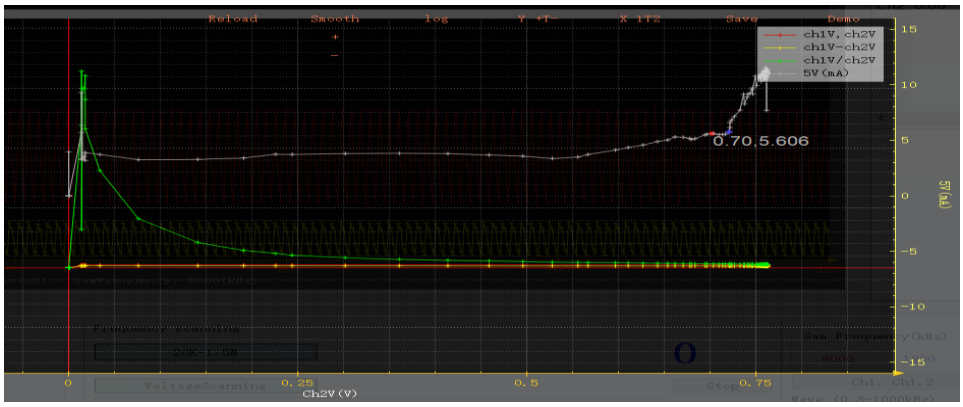
StartFrequency(HZ): Set to 50K,

SteppedFrequency(0.1kHZ): Voltage sweep does not need to be set here,

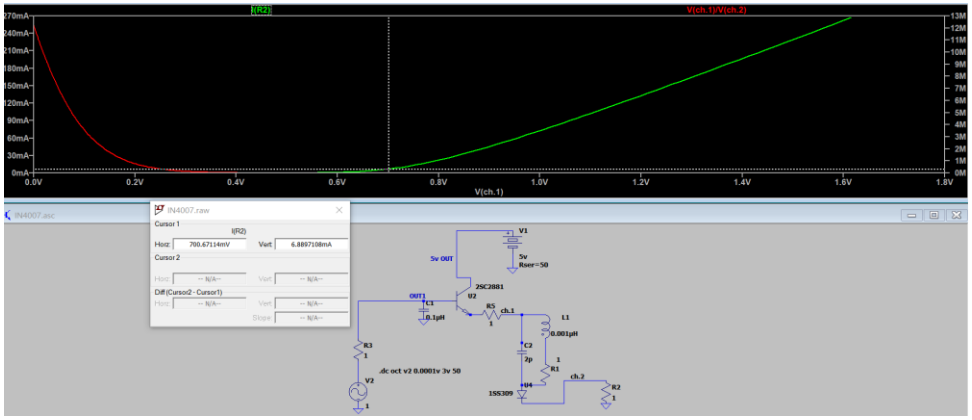
Repeart: Set 1, setting larger can make the result more accurate, but slow,
Points: 100 points, then start, then open the voltage scan chart, DEMO is the frequency voltage scan result.



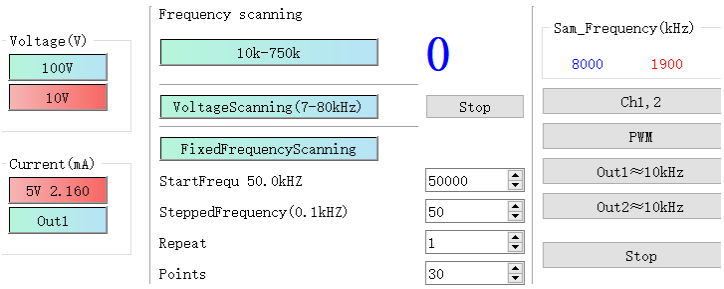
Voltage scan diagram.
open the demo, menu X1T2 (xy coordinate flip) --> Y+T-(y coordinate +-flip) --> log (logarithm) to get the following figure.



Compared with the LTspice simulation, CH1/CH2 corresponds to V(CH1)/V(CH2), and 5V(ma) corresponds to I(R2), and the 0.7V rising knee current of the diode can be seen to be 5-6ma.

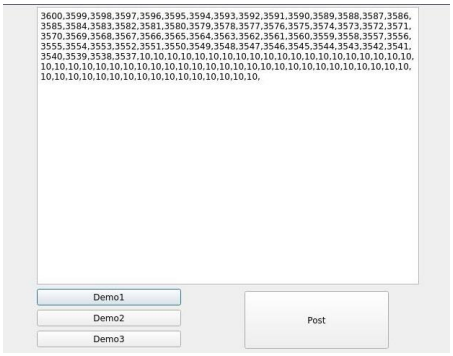


Fixed-point frequency sweep:
To find the current of the fixed frequency (frequency constant, duty cycle constant), etc., the output current of 5V or OUT1 can be selected. Select the sampling frequency NO2 of Ch1,2, the frequency is 50K, and the points are 30 points, then start, then open the voltage scan chart, and save the result.

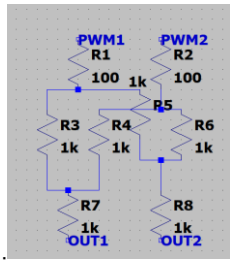


Custom Waveforms:

The input array is 127 values less than 4096, and the output size can be adjusted, and various outputs can be made.



Output: OUT1, OUT2 is 2 PWM or sine waves, triangle wave output channels are connected in parallel to OUT1, OUT2.



The output provides a square wave of 3 V, 1k-1.5M, which can adjust the duty cycle and phase of the square wave;

Switching PMW and adjusting Duty cycle or Pulse can realize the square wave of duty cycle and phase;

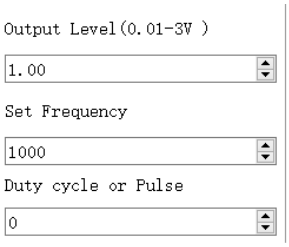
PMW: The phase difference of two channels Out1 and 2 is 0, the duty cycle of Out1 is 1/2, and the duty cycle of Out2 can be adjusted;

PMW1: The phase difference between the two channels Out1 and 2 is 0, and the duty cycle of Out1Out2 can be adjusted;

PMW2: The phase difference between the two channels Out1 and 2 is 90, and the duty cycle of Out1Out2 can be adjusted;

PMW3: The phase difference between the two channels Out1 and 2 is 0, the duty cycle is fixed by 1/2, and the phase can be adjusted. 0 V / 3 V, 1k-20k sine wavetriangle wavecustom waveform is available.

Output Level can adjust the output size of sine wave, triangle wave, and custom waveform.



Data Export:

The text window on the right can export txt to store the measured samples, which can be exported to MATLAB and Excal for processing.