

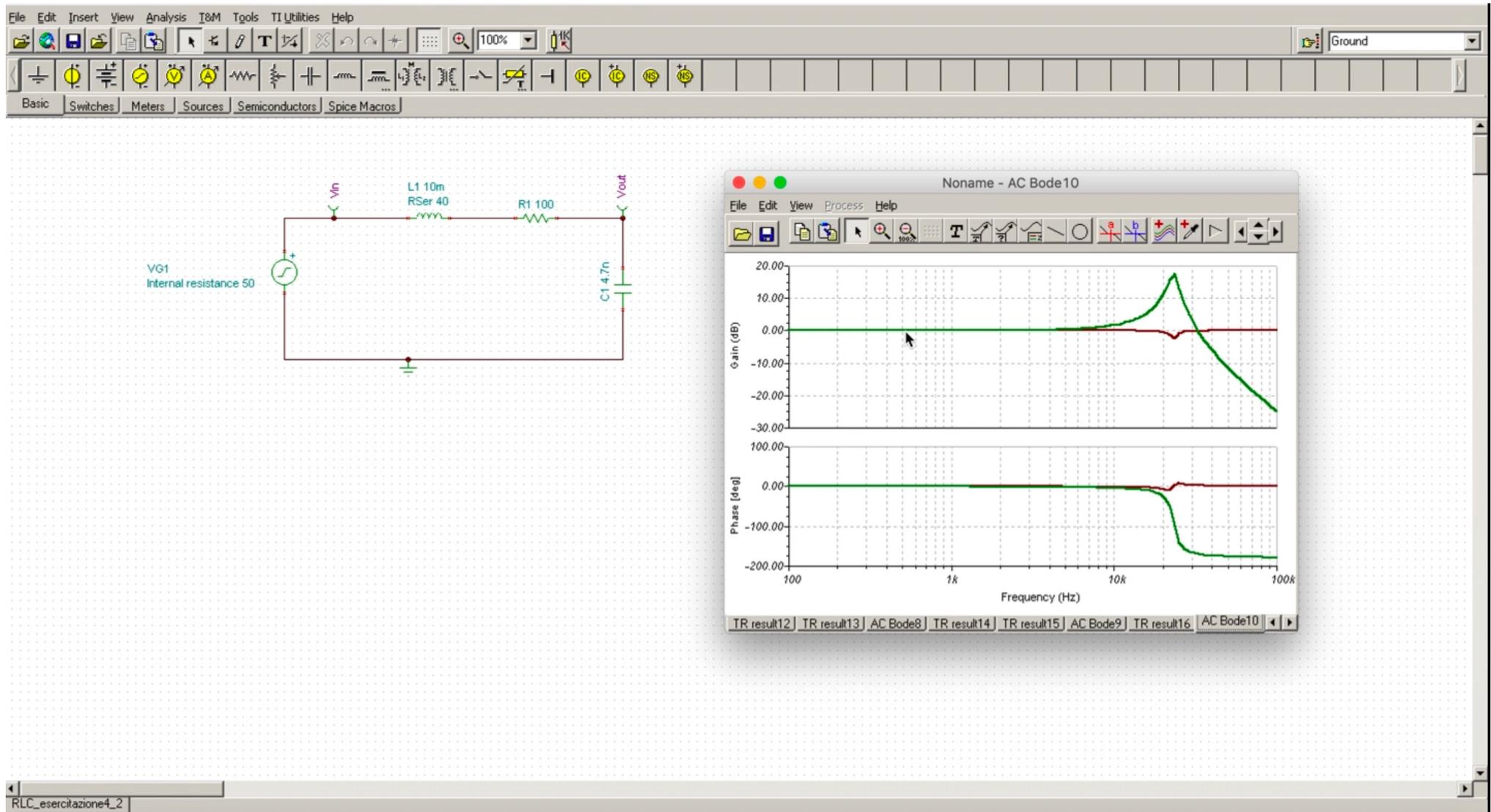
Programmi per la simulazione di circuiti

- **TINA-TI (Texas Instruments)**
esiste versione gratuita, OS: Windows
link: <http://www.ti.com/tool/TINA-TI>
occorre registrarsi.
- **Pspice 9.1 educational**
esiste versione gratuita, OS: Windows
link: http://microwave.unipv.it/pages/campi_circuiti_/PSPice.html
- **Ltspice**
esiste versione gratuita, OS: Windows, Mac
<https://www.analog.com/en/design-center/design-tools-and-calculators/ltspice-simulator.html>
<https://www.youtube.com/watch?v=6QzTZDm0guM>
- **NGSPICE**
esiste versione gratuita, OS: Ubuntu, Mac (installazione con fink)
<http://ngspice.sourceforge.net/>
- **gEDA**
esiste versione gratuita, OS: Linux, Mac (installazione con fink)
<http://www.geda-project.org/>
<http://wiki.geda-project.org/geda:download>
- **TinkerCAD**
esiste versione gratuita, OS: su browser
<https://www.tinkercad.com/learn/circuits>
- Per versioni Windows su Linux (e Mac)
<https://www.winehq.org/>

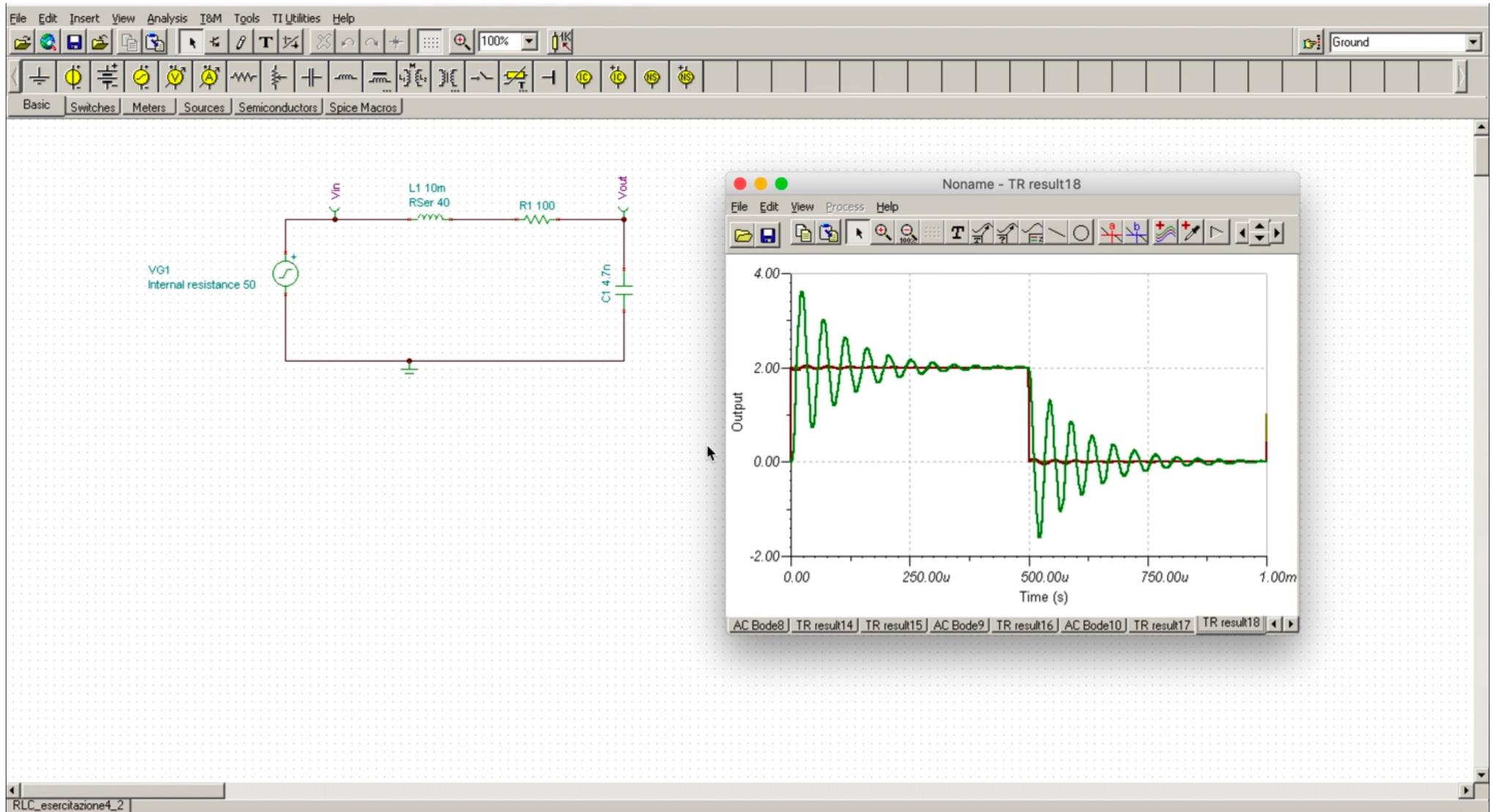
Simulazione circuiti e strumentazione

- Fra tutti i programmi disponibili gratuitamente, uno si è mostrato di particolare efficacia didattica, TINA-TI, messo a disposizione da Texas Instruments previa registrazione sul sito. Infatti TINA-TI non solo possiede una interfaccia grafica molto ben sviluppata, ma consente anche la possibilità di simulare la strumentazione presente in laboratorio, come l'oscilloscopio ed il generatore di segnale. Si mostrano alcuni esempi nelle slides seguenti.

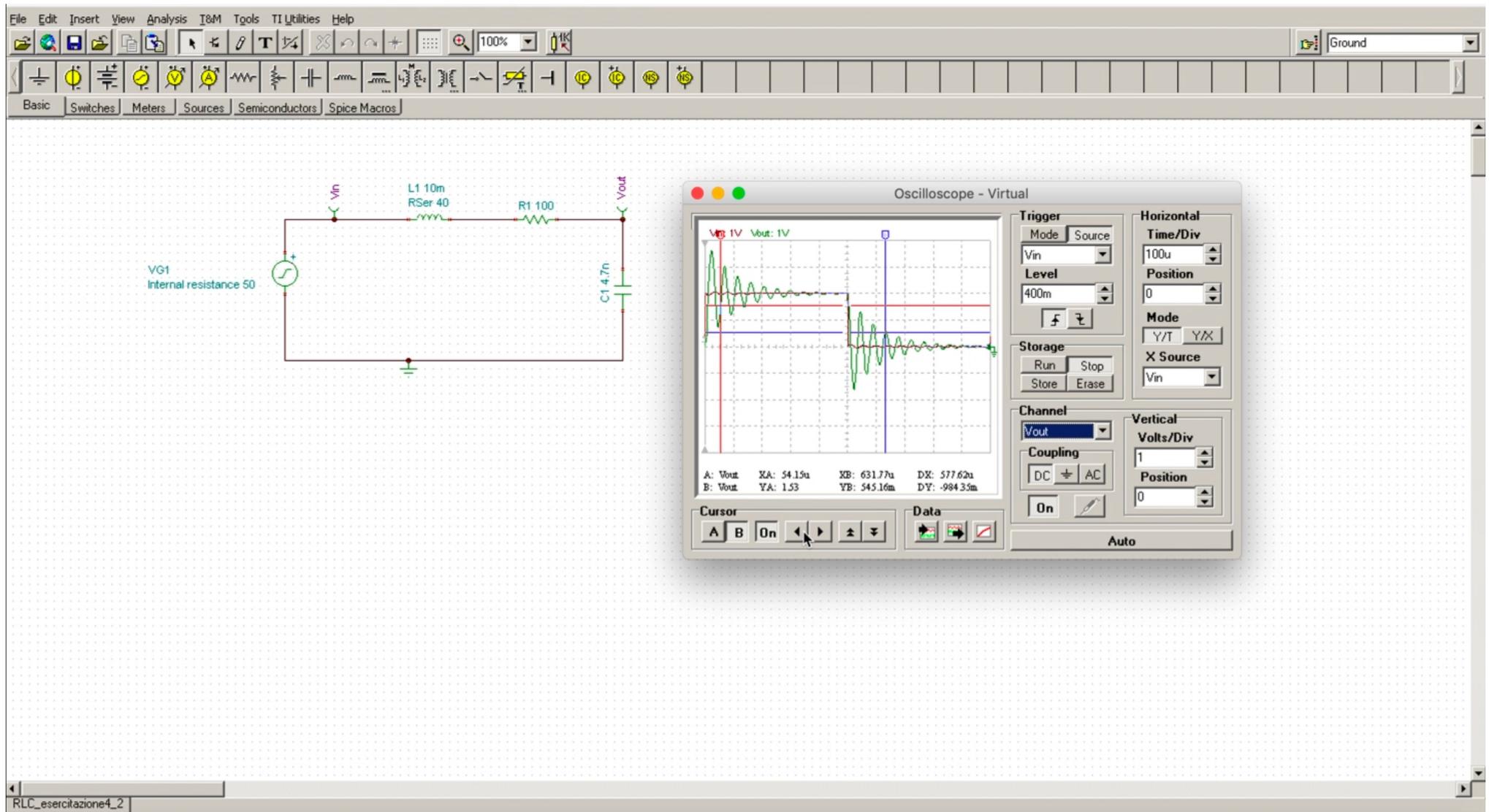
Esempi: TINA-TI



Esempi: TINA-TI



Esempi: TINA-TI



Esempi: TINA-TI

The screenshot displays the TINA-TI software interface. At the top, there is a menu bar (File, Edit, Insert, View, Analysis, I&M, Tools, TI Utilities, Help) and a toolbar with various simulation and editing tools. Below the toolbar is a component palette with categories: Basic, Switches, Meters, Sources, Semiconductors, and Spice Macros.

The main workspace shows a circuit diagram on a grid. The circuit consists of a voltage source labeled "VG1 Internal resistance 50" connected in series with an inductor "L1 10m", a resistor "RSer 40", and another resistor "R1 100". A capacitor "C1 4.7n" is connected in parallel across the output terminals "Vout". The input terminals are labeled "Vin".

Below the circuit diagram is the "Function Generator - Virtual" window. It has a "Control" section with "Start" and "Stop" buttons and an "Output" dropdown set to "VG1". The "Parameters" section shows a frequency of "23.0000 k Hz", an amplitude of "1V", and a phase of "0°". The "Sweep" section has buttons for "On", "Cont", "Lin", "Start", "Stop", "Time", and "Num".

To the right of the circuit is the "Oscilloscope - Virtual" window. It displays two waveforms: a red sine wave for "Vin: 1V" and a green sine wave for "Vout: 2V". The oscilloscope has several control panels: "Trigger" (Mode: Source, Level: 800m), "Horizontal" (Time/Div: 10u, Position: 0, Mode: Y/T, X Source: Vin), "Storage" (Run, Stop, Store, Erase), "Channel" (Vout, Coupling: DC/AC), and "Vertical" (Volts/Div: 2, Position: 0). It also includes a "Cursor" section with buttons for A, B, On, and various cursor movement controls.

At the bottom left of the software window, the file name "RLC_esercitazione4_2" is visible.

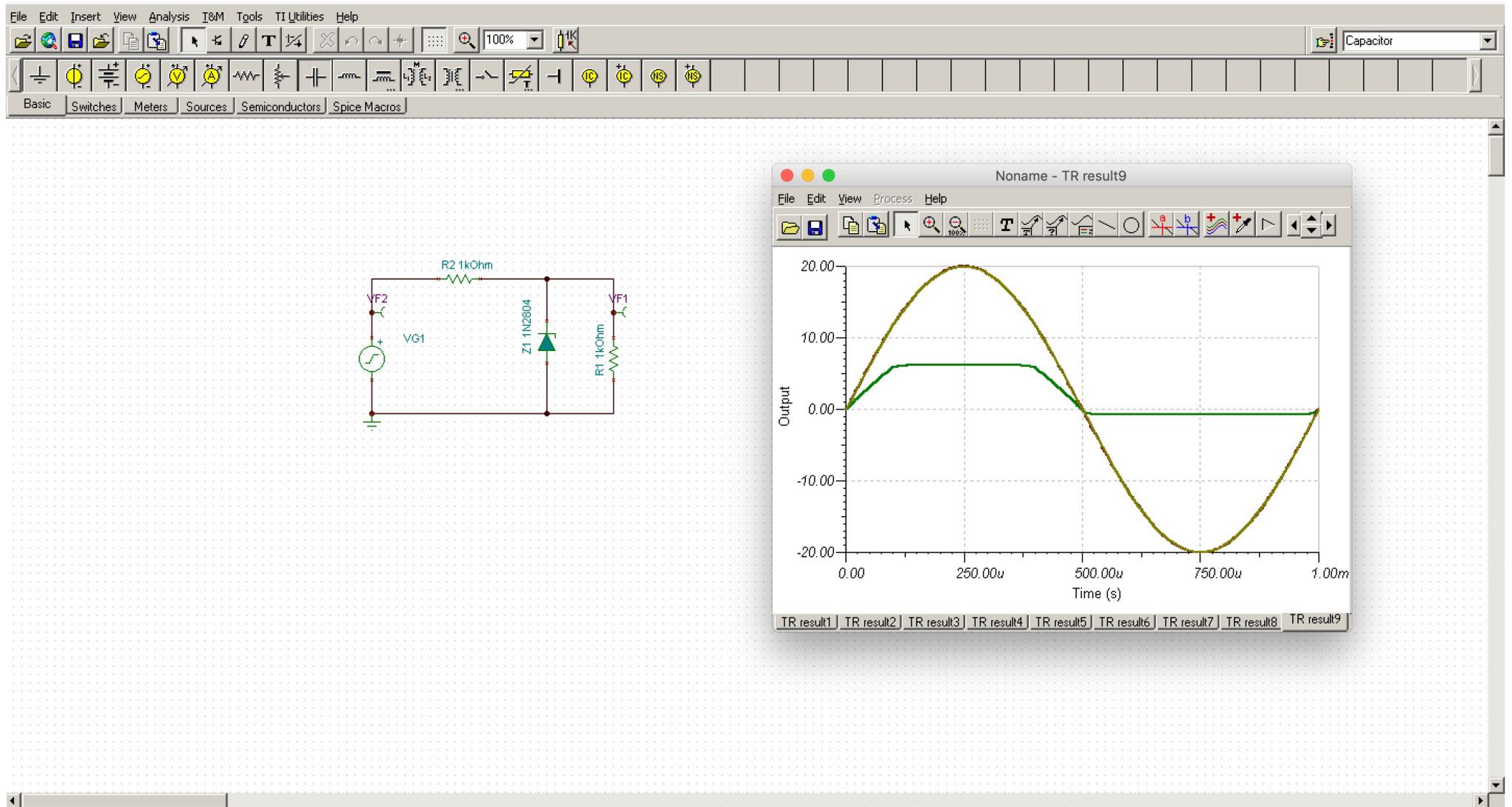
Esempi: TINA-TI

The screenshot displays the TINA-TI software interface. On the left, a circuit diagram is shown on a grid background. The circuit consists of a voltage source VG1 connected in series with a switch VF2 and a resistor R2 (1kOhm). This series combination is connected to a parallel network containing a diode Z1 (1N2804) and a resistor R1 (1kOhm). A node VF1 is marked at the output of the parallel network.

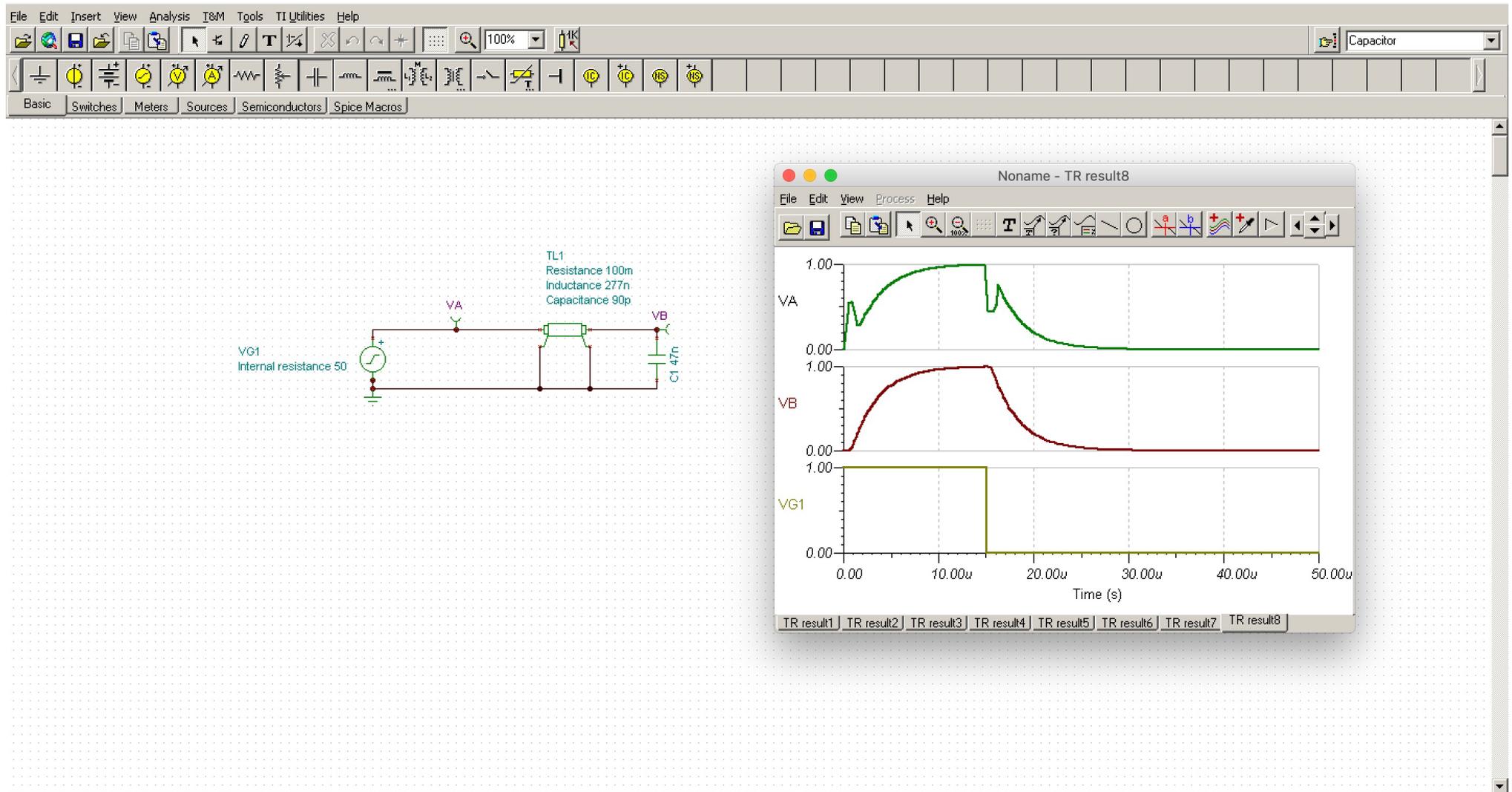
Two oscilloscope windows are overlaid on the circuit. The top window, titled "Noname - TR result9", shows a single green trace of a sine wave with a peak amplitude of 20.00. The bottom window, titled "Oscilloscope - Virtual", shows two traces: a red trace (VF1) and a green trace (VF2). The red trace is a sine wave with a peak of 5V, and the green trace is a square wave with a peak of 5V. The status bar at the bottom of this window indicates "Collecting Data." and shows cursor positions for A, B, On, and various navigation buttons.

The software interface includes a menu bar (File, Edit, Insert, View, Analysis, I&M, Tools, TI Utilities, Help), a toolbar with various icons, and a component palette at the bottom with tabs for Basic, Switches, Meters, Sources, Semiconductors, and Spice Macros. A dropdown menu in the top right corner is set to "Capacitor".

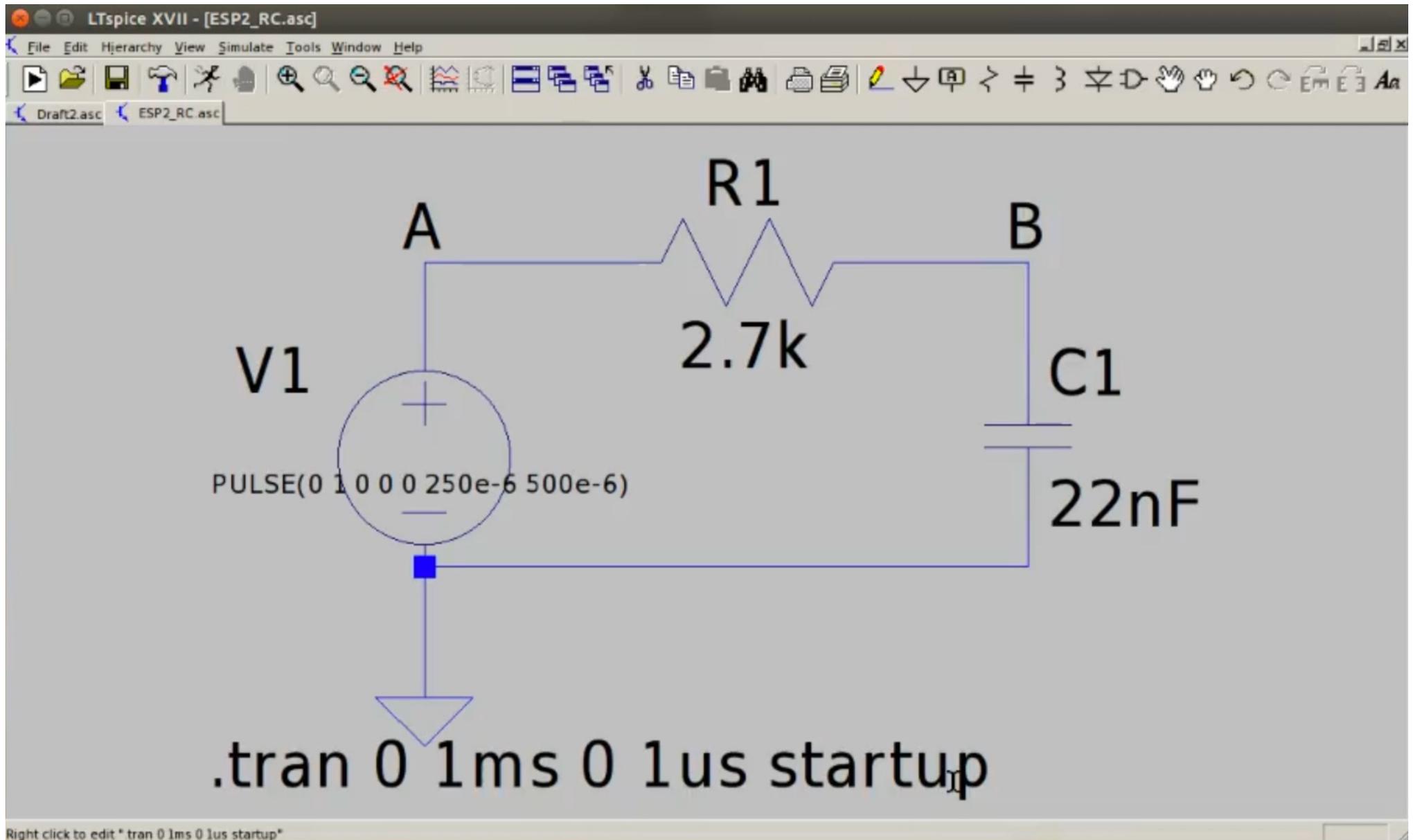
Esempi: TINA-TI



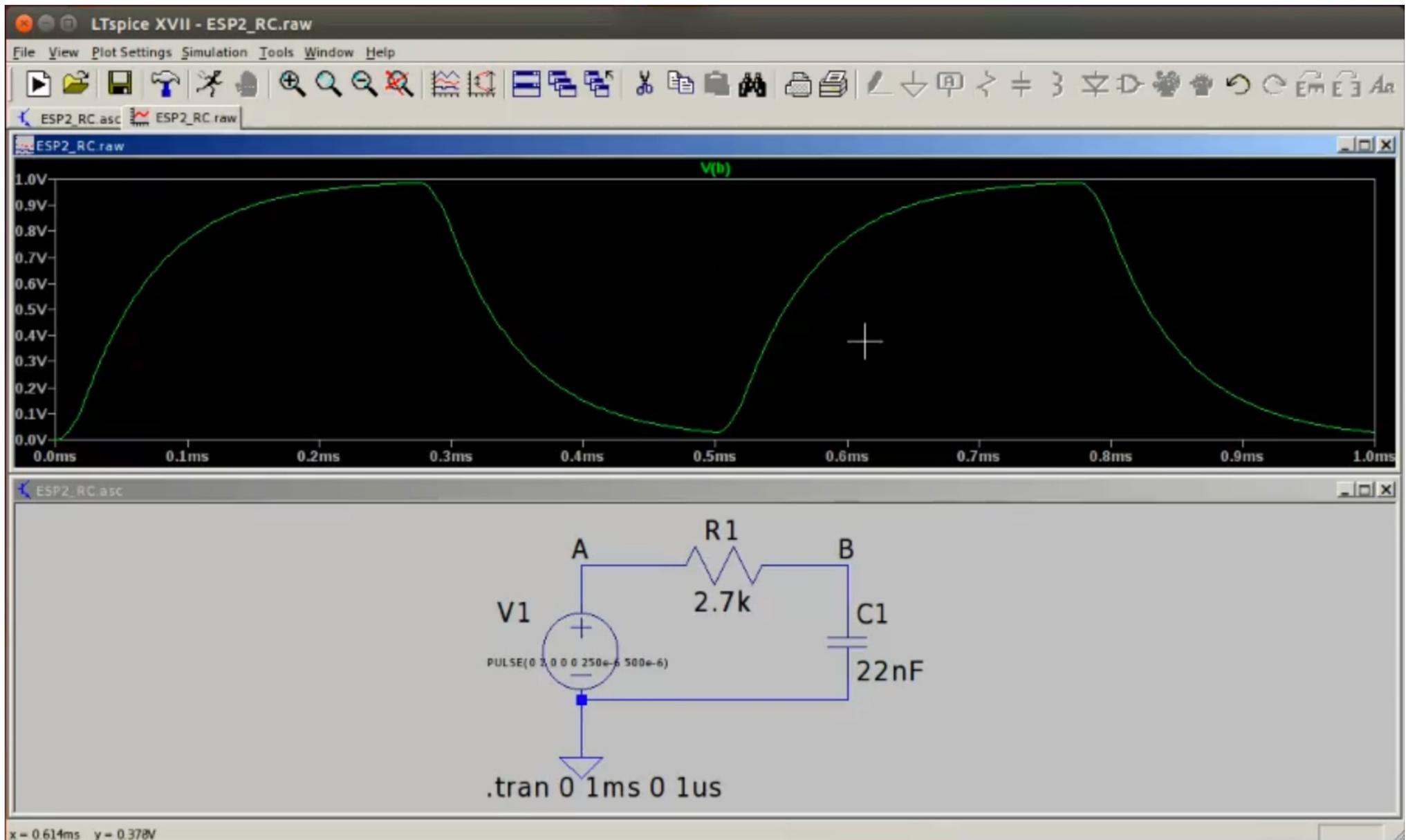
Esempi: TINA-TI



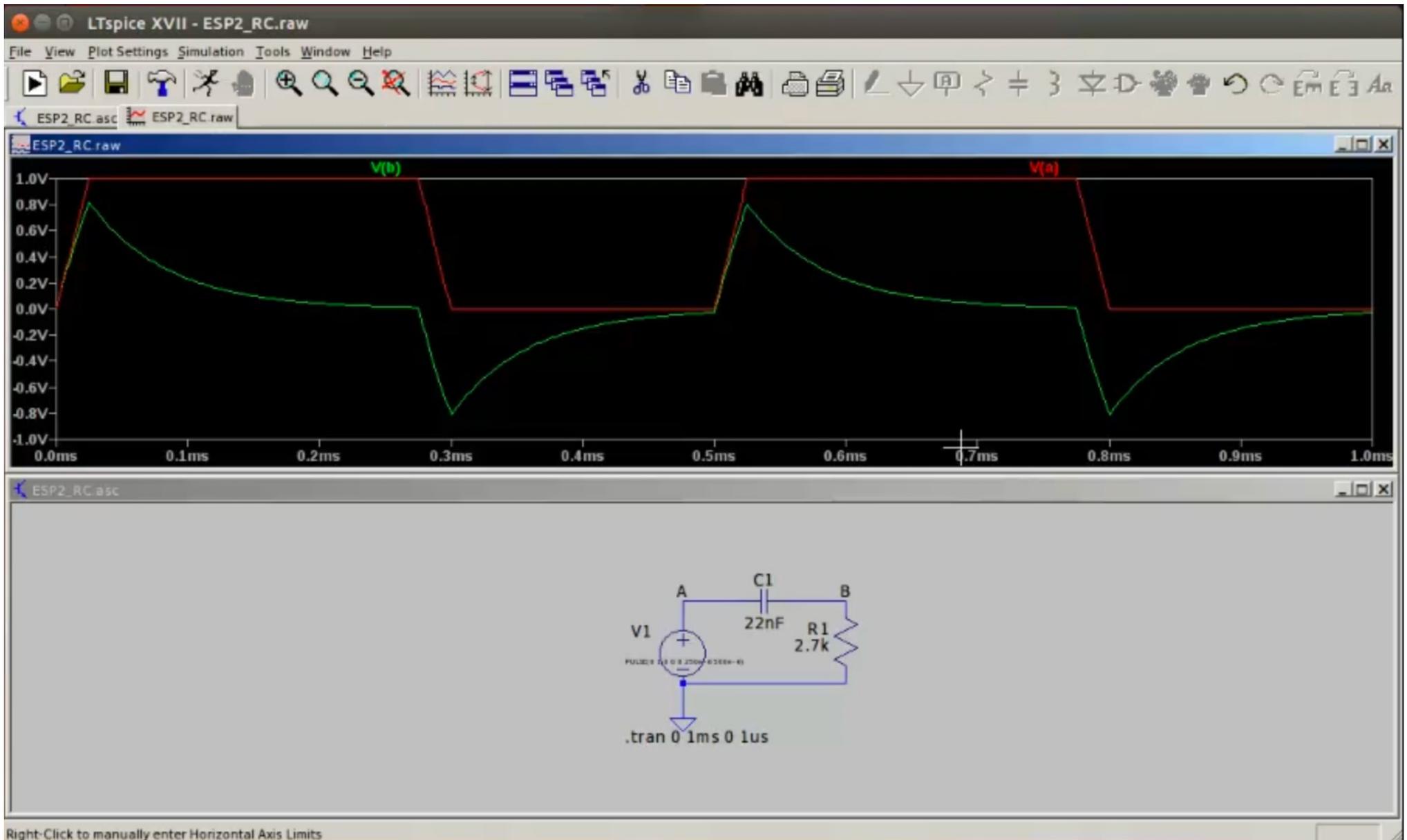
Esempi: LTSpice



Esempi: LTSpice



Esempi: LTSpice



Esempi: TinkerCAD

