

# Circuit Simulation with Qucs

Enginyeria de Sistemes TIC (iTIC)  
EPSEM - UPC

Pere Palà  
Rosa Giralt

September 2012

Qucs (Quite Universal Circuit Simulator) is a circuit simulator with a graphical user interface. It is an open-source project that you can find and install easily. With it, we are able to discover the behaviour of the circuit. Usually, we will analyse the circuit and after that, sometimes, we will check the behaviour at lab. Sometimes, it will be useful to simulate the circuit with Qucs to see its behaviour and thereby help you to learn Linear Circuits and Systems.

## 1 Drawing the circuit

First of all you have to create a new project, pressing New in the Project menu. Once the project is created, you can start editing the schematic. The available components can be found in the Components tab. There is a drop-down list on the top that allows selecting the component type. Figure 1 shows the first screen you see when you open Qucs.

You can place a component on the schematic by clicking it once and moving the mouse cursor. With a double click on the component you can assign values. There is a wiring tool to connect the components appropriately. A reference voltage is required, so you have to add the ground symbol. You have to mark the output node (and give it a name) with the corresponding icon in the toolbar. You can do the same with input node if you want to display this voltage. At last, you have to select the type of simulation. You can do that in the drop-down list of the components tab. During this course, we will make use of the Transient and AC Simulation tools. You will have to specify the simulation time (begin and end) and other properties. We have now the schematic prepared to be simulated. Figure 2 shows an example.

## 2 Simulating the circuit

You can do the simulation by clicking the corresponding icon. A new empty screen will appear and you have to select the kind of diagram, for example Cartesian (also in the drop-down list). In this moment, a new window appears and you must select the signals to display. When the diagram is displayed, you can add markers to know exactly the time and amplitude of this point. Figure 3 shows an example.

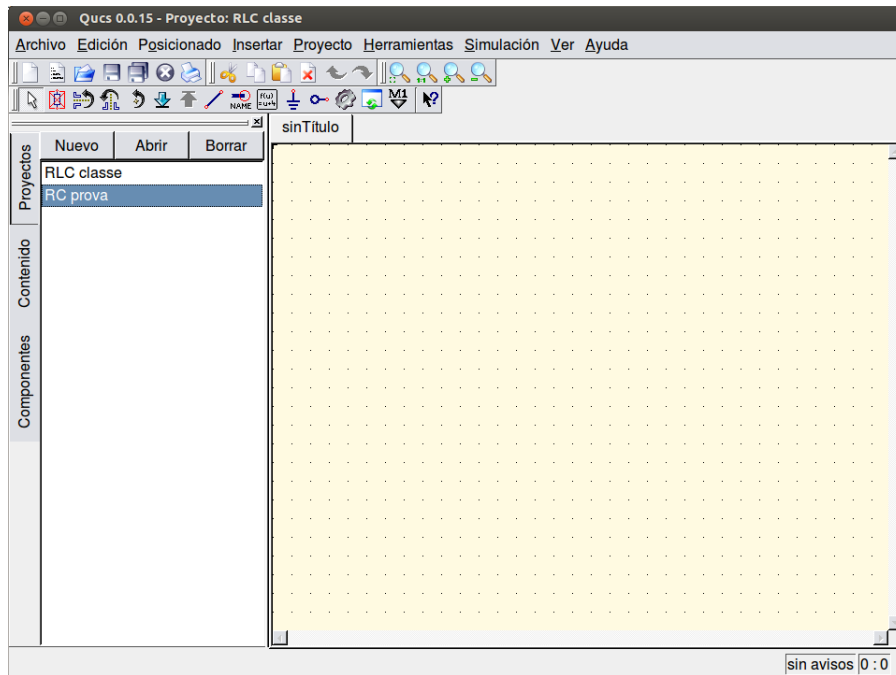


Figure 1: Qucs start screen.

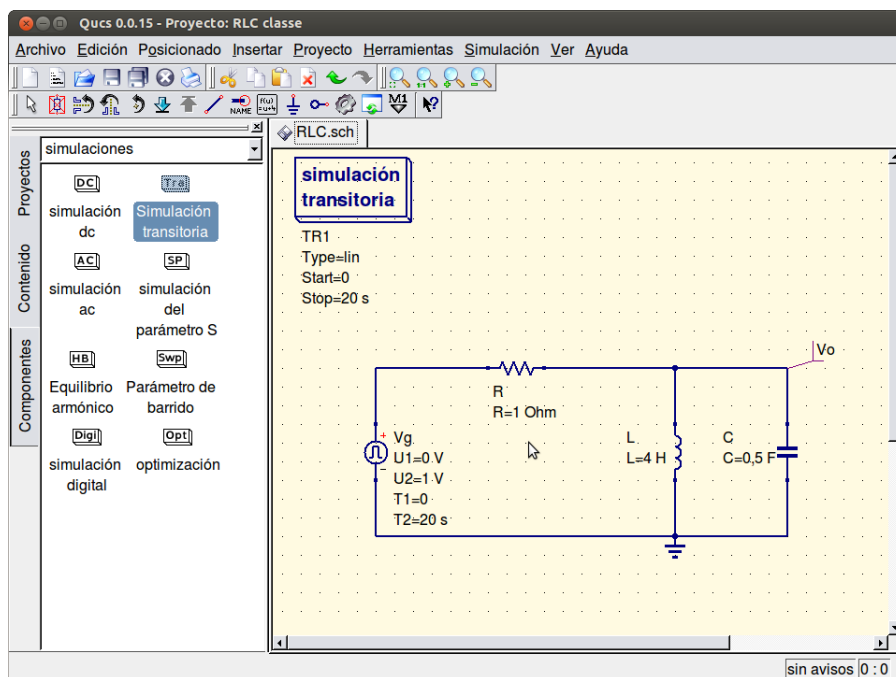


Figure 2: An schematic example prepared to be simulated.

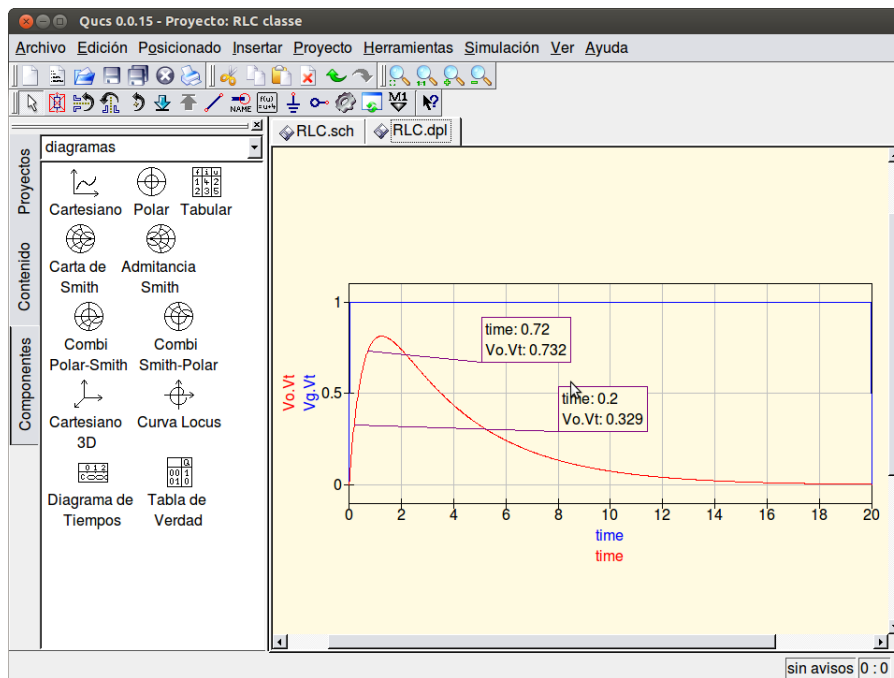


Figure 3: A plot of the resulting waveforms.