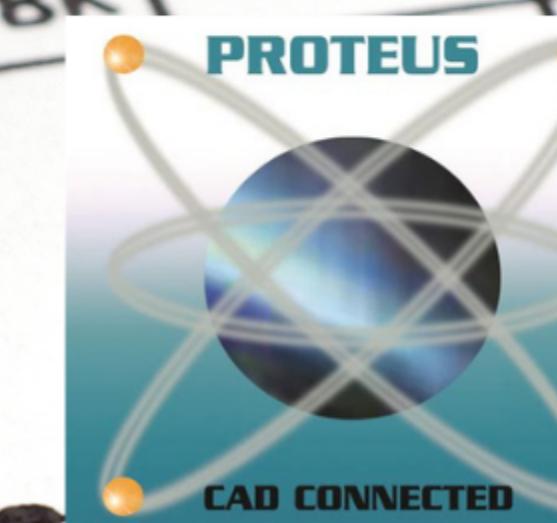
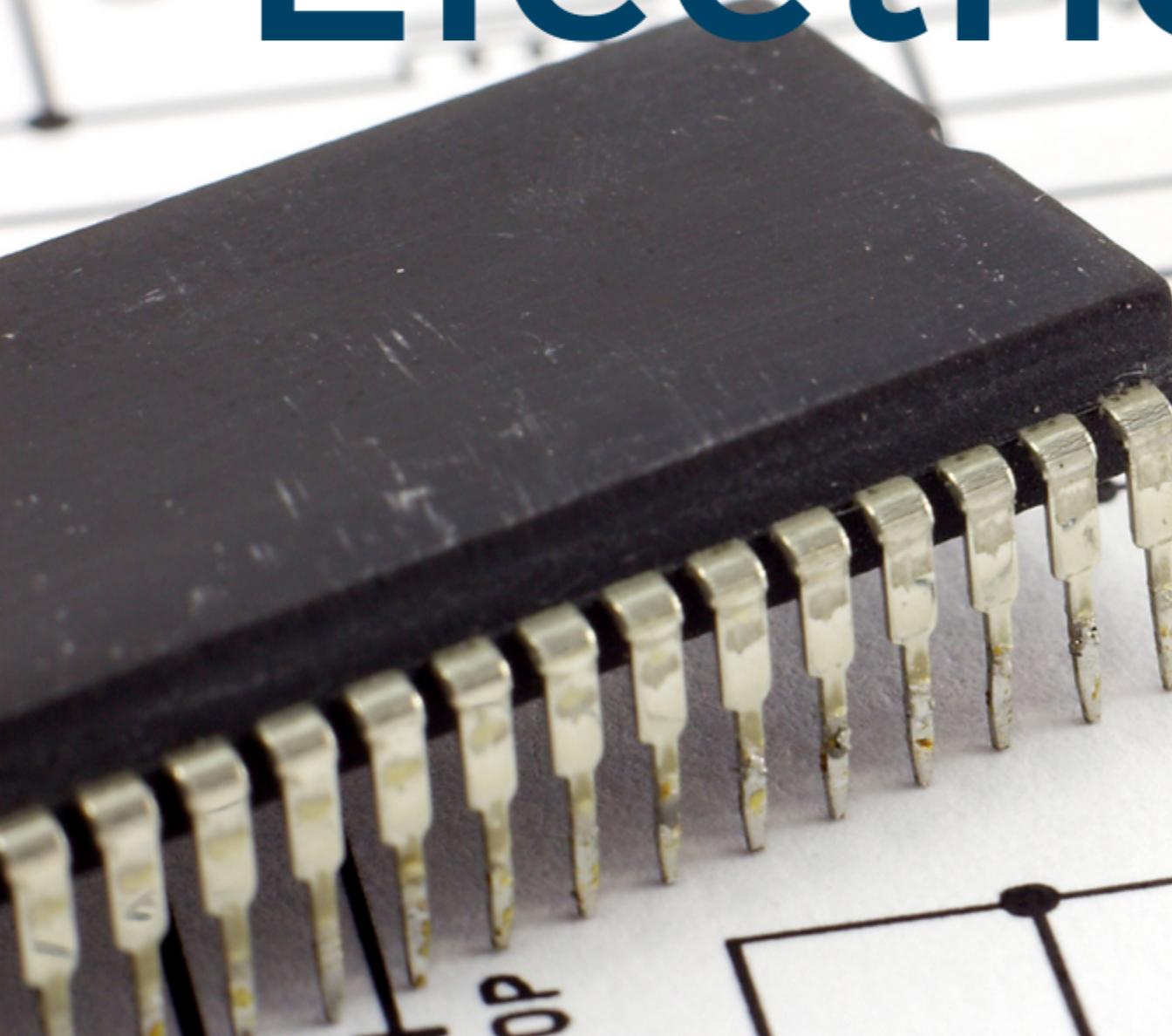
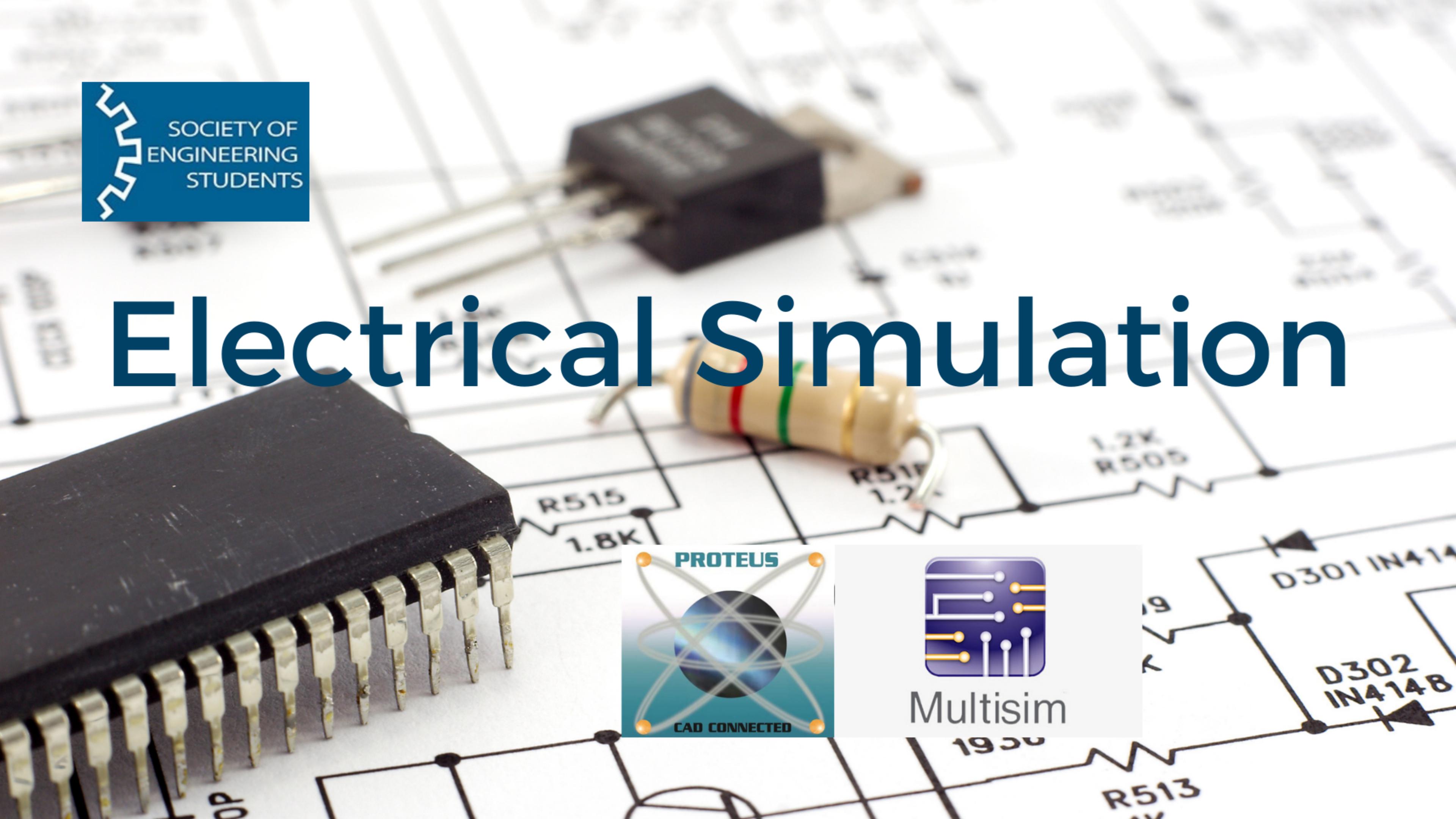


Electrical Simulation



Multisim



Chrispine Tinega



tinegachris



tinegachris



tinega_chris



A|E
Apprentice Engineer

Your Path To Expertise

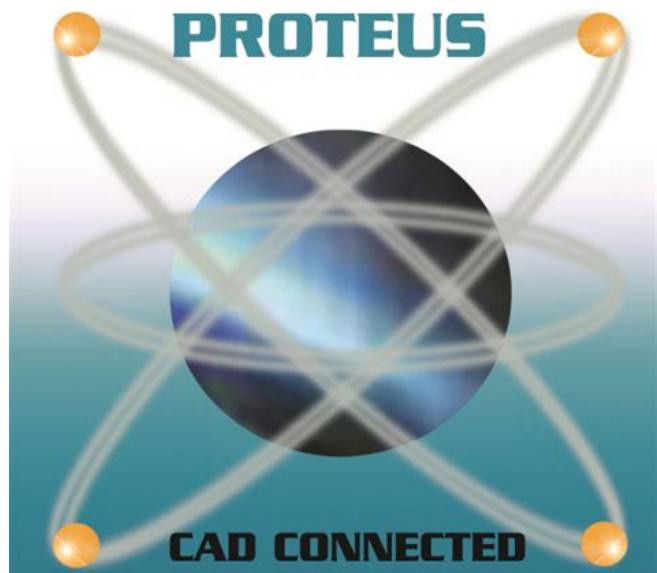


SOCIETY OF
ENGINEERING
STUDENTS

Electrical Simulation

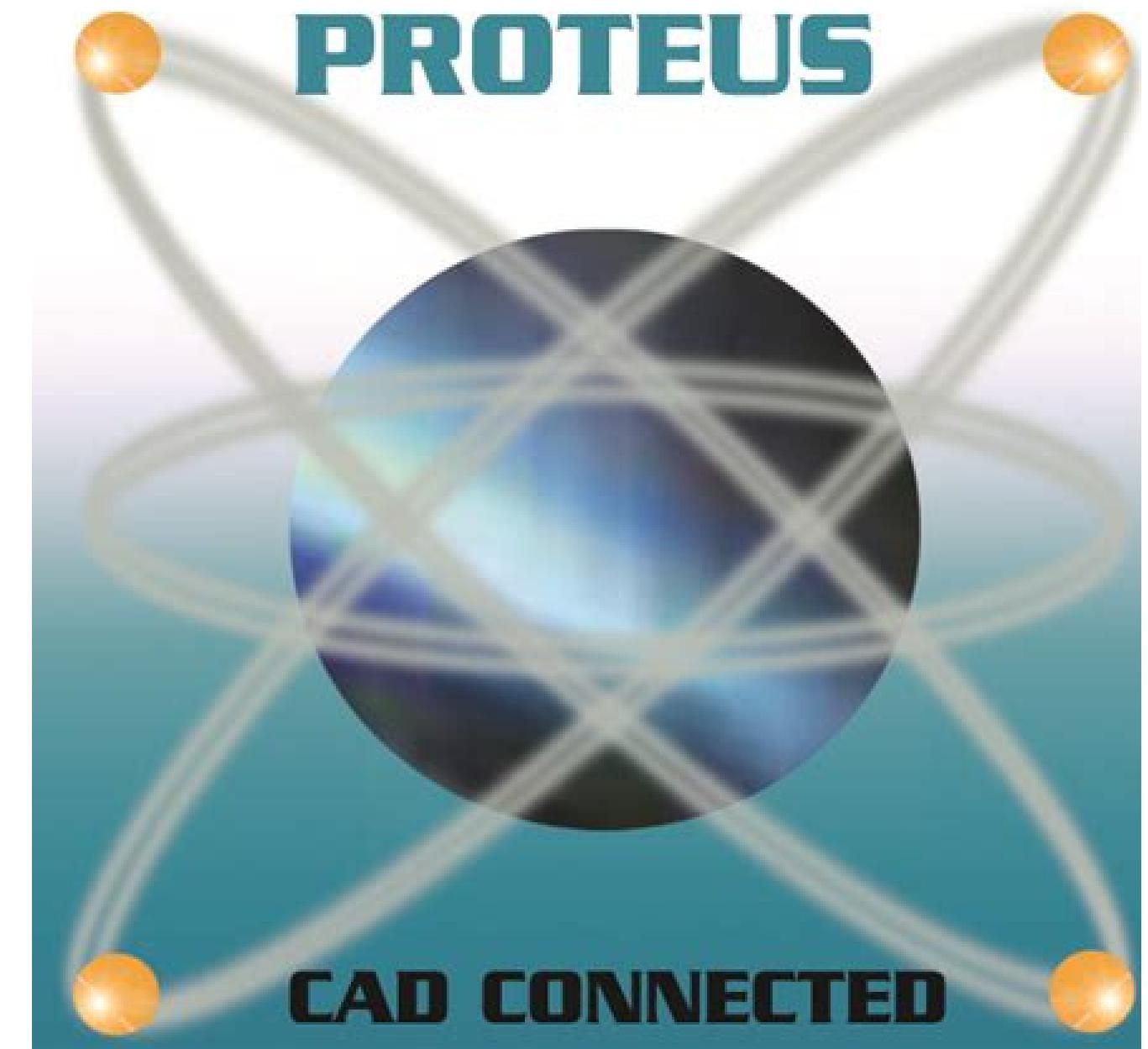
Scope

- Proteus
- NI Multisim
- Microcontrollers

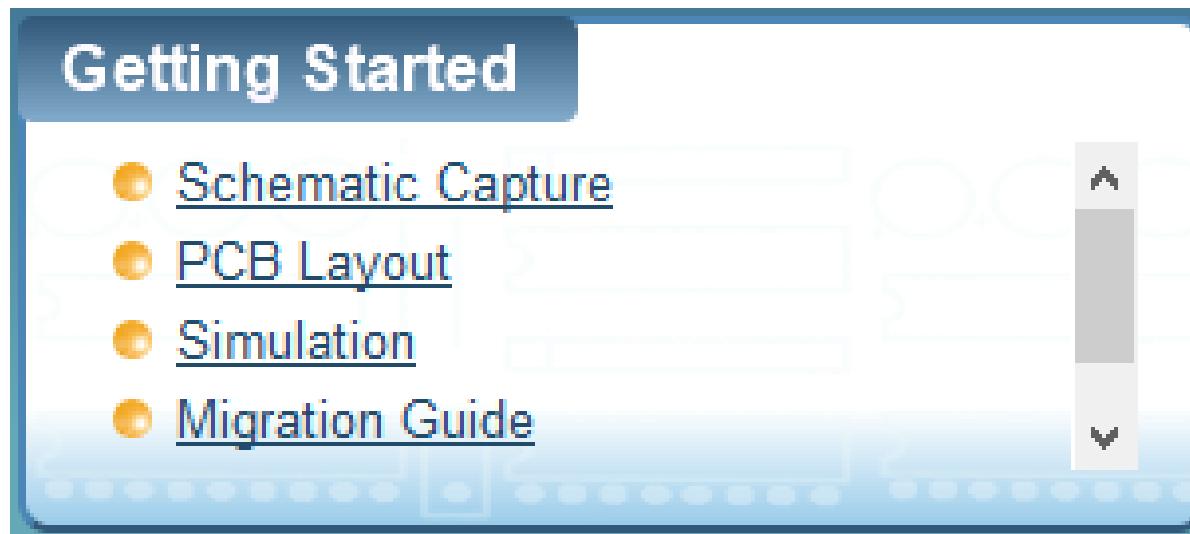


Proteus Design Suite

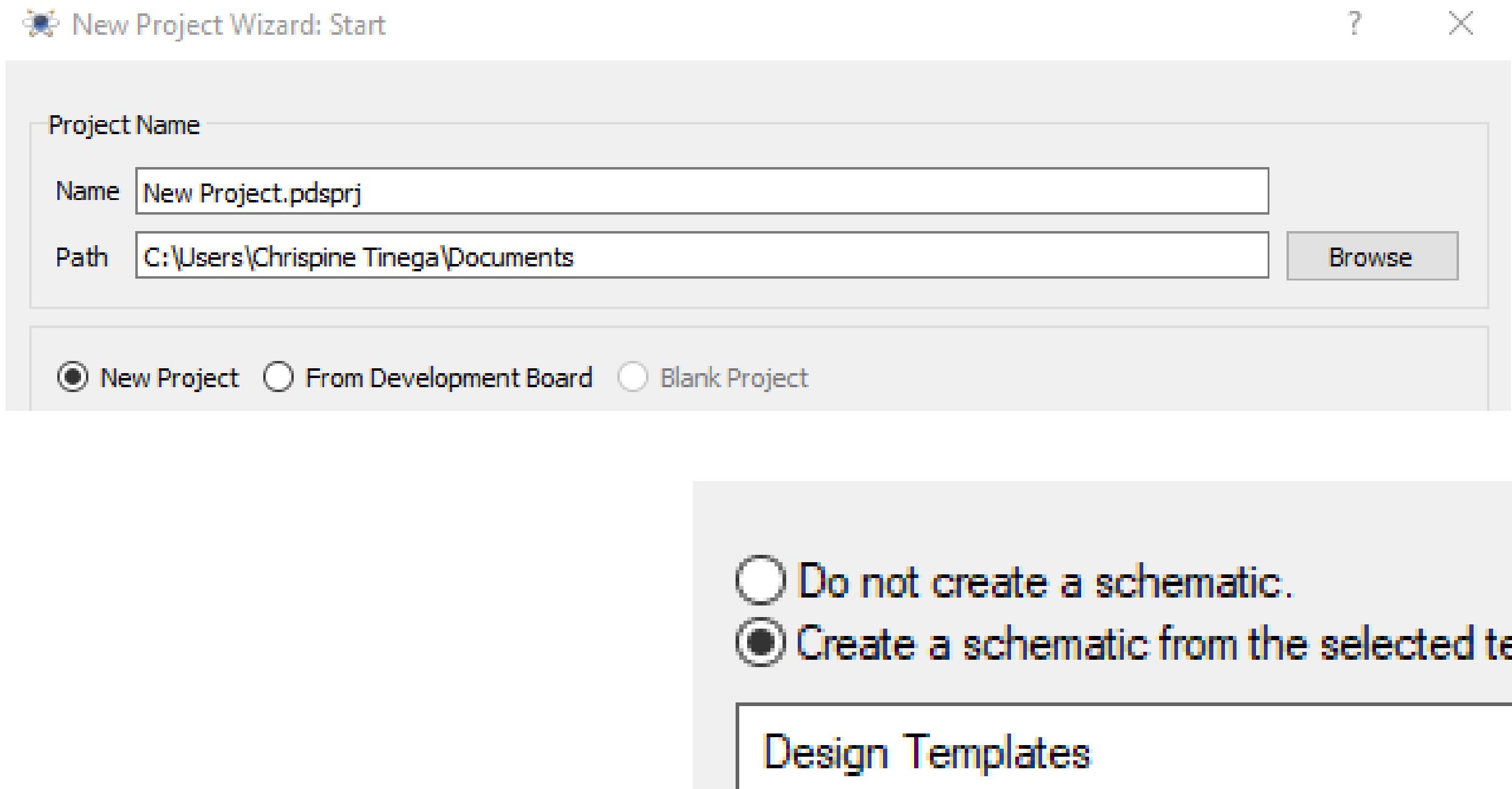
- **Schematic Capture**
- **PCB Design**
- **3D Verification**
- **Microcontroller Simulation**



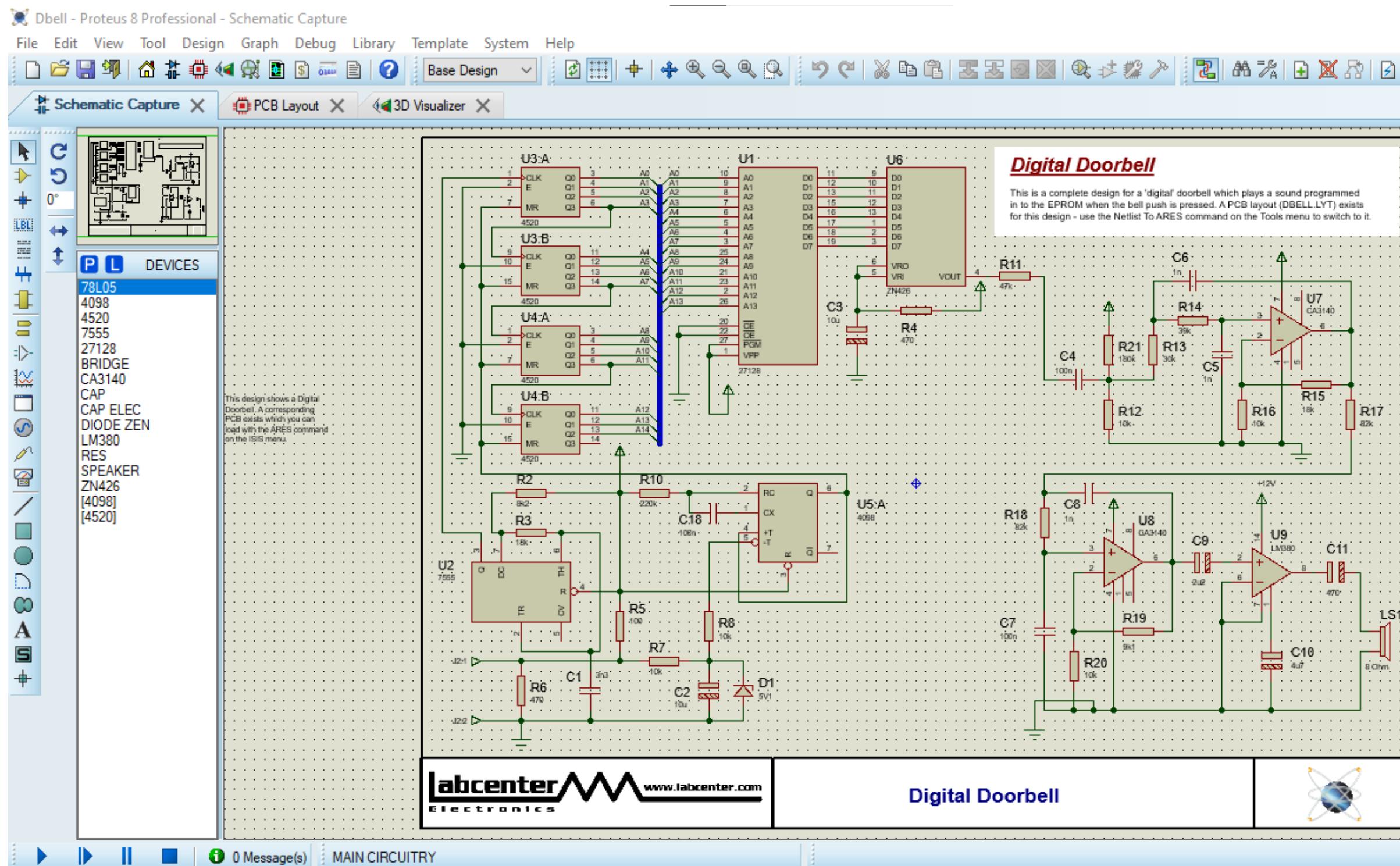
Schematic Capture



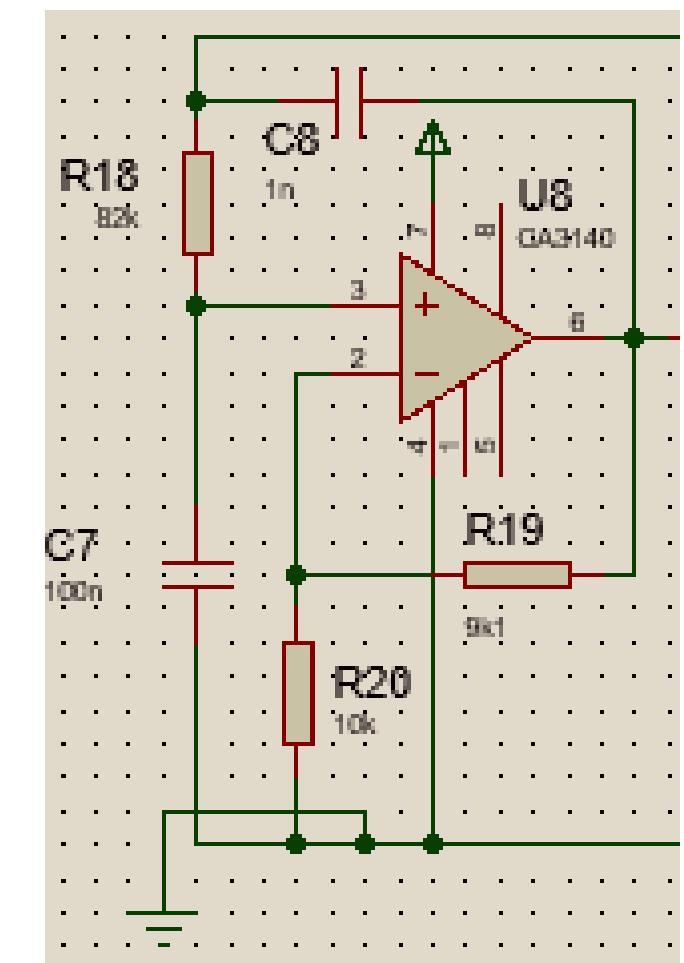
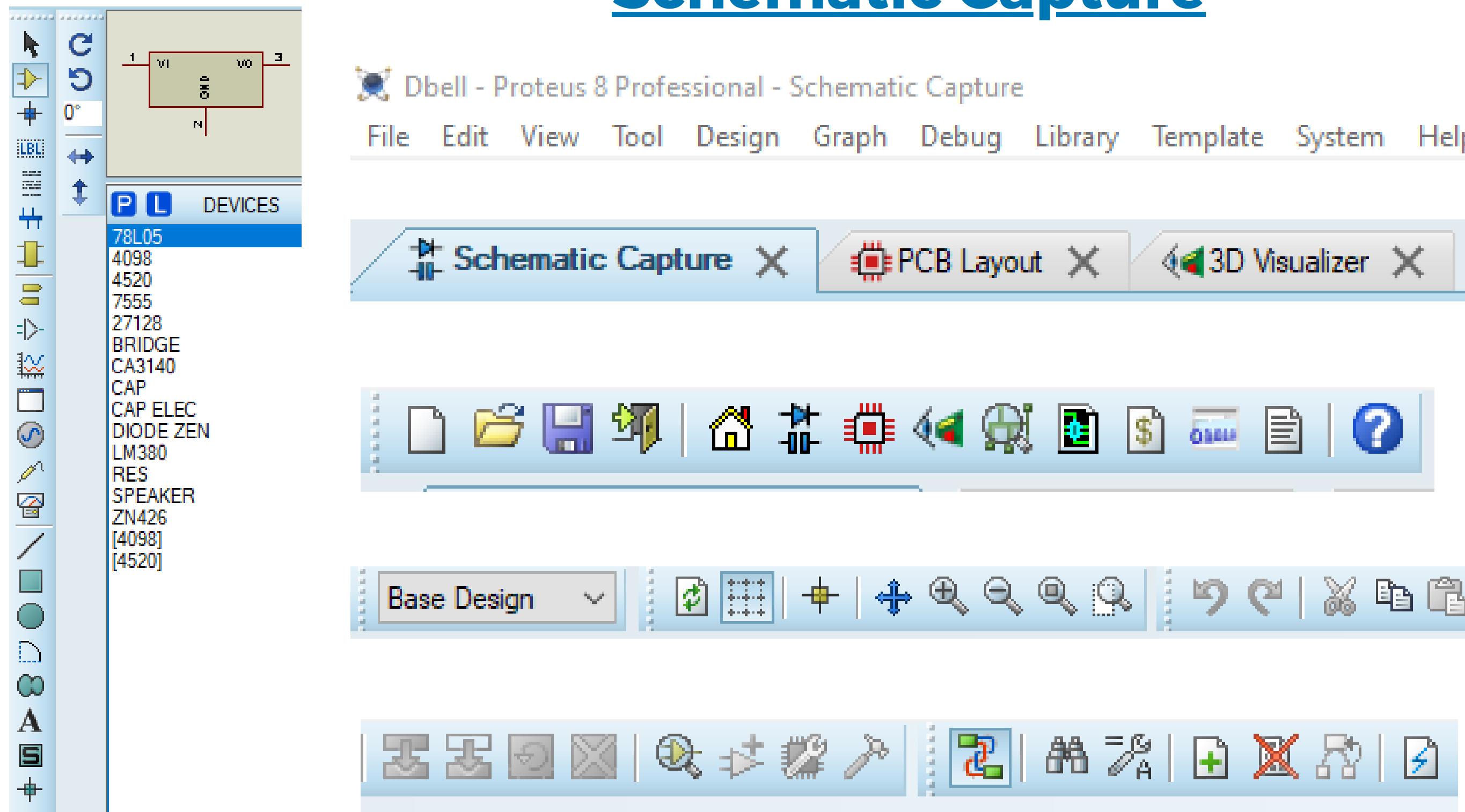
Schematic Capture



Schematic Capture



Schematic Capture



PCB Design

New Project Wizard: PCB Layout

- Do not create a PCB layout.
- Create a PCB layout from the selected template.

Layout Templates

Arduino MEGA 2560 rev3

Arduino UNO rev3

DEFAULT

New Project Wizard: PCB Layer Stackup

?

ID	Name	Type	Material	Thickness	Dielectric	Power Plane
TR	Top Resist	Surface	Resist	10um	3.50	
TOP	Top Copper	Signal	Copper	18um		
		Core	FR4	1.55mm	4.80	
BOT	Bottom Copper	Signal	Copper	18um		
BR	Bottom Resist	Surface	Resist	10um	3.50	

PCB Design

⌚ New Project Wizard: PCB Drill Pairs

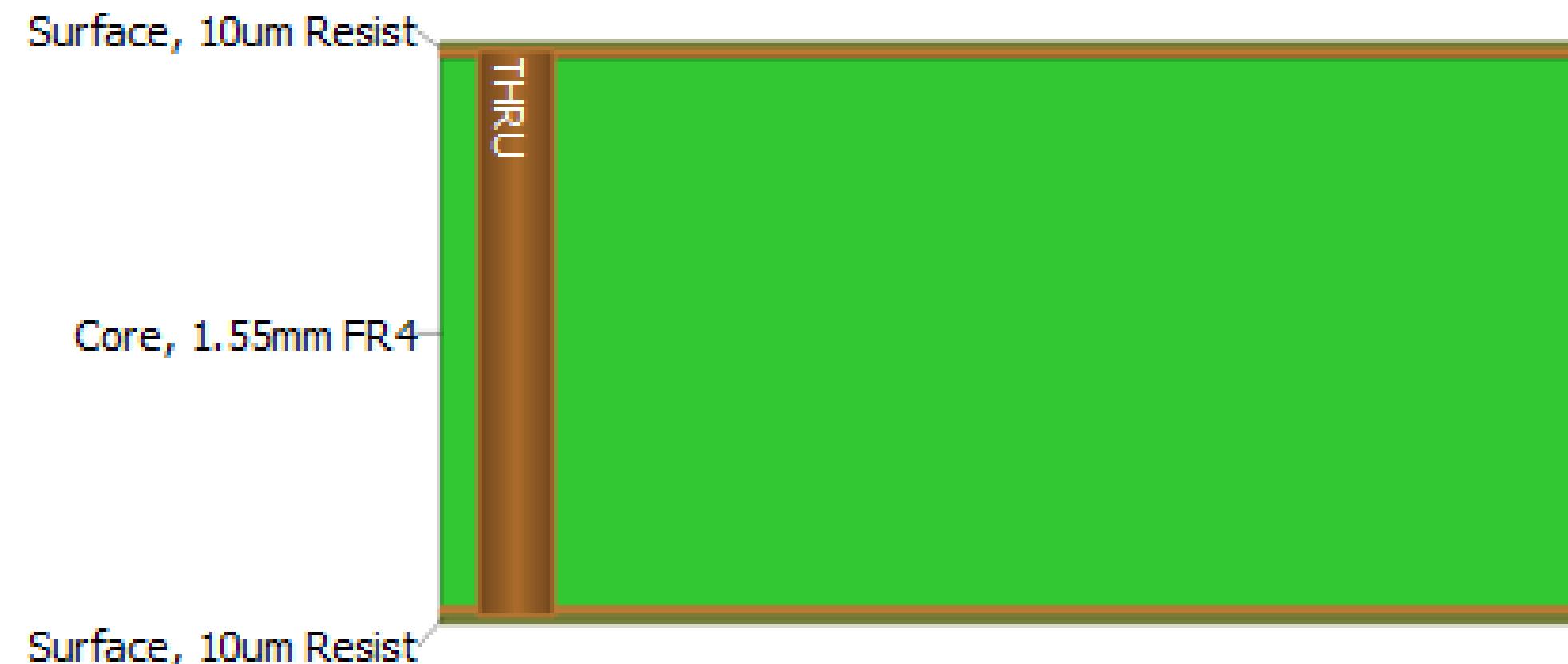
#	Name	Start Layer	Stop Layer
1	THRU	Top Copper	Bottom Copper

Add Drill Span

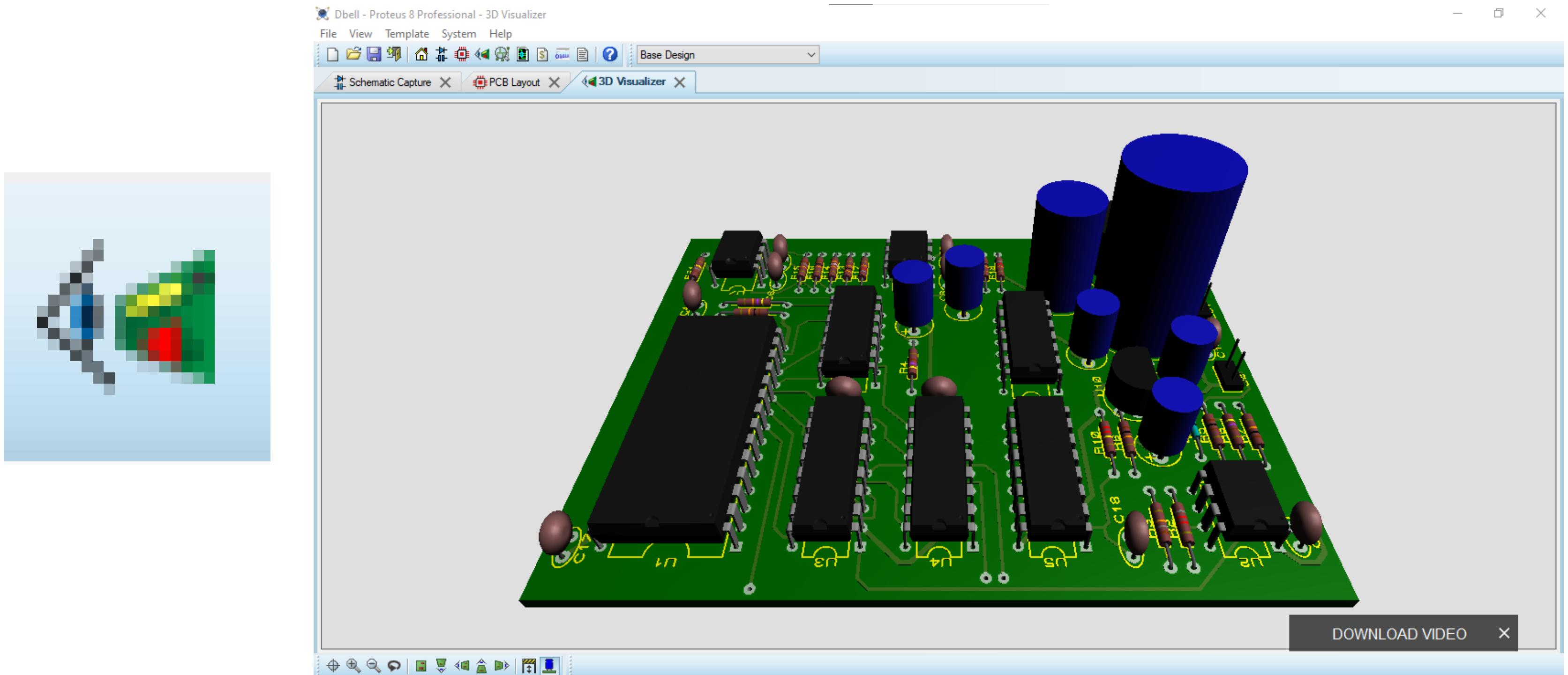
From: Top Copper

To: Top Copper

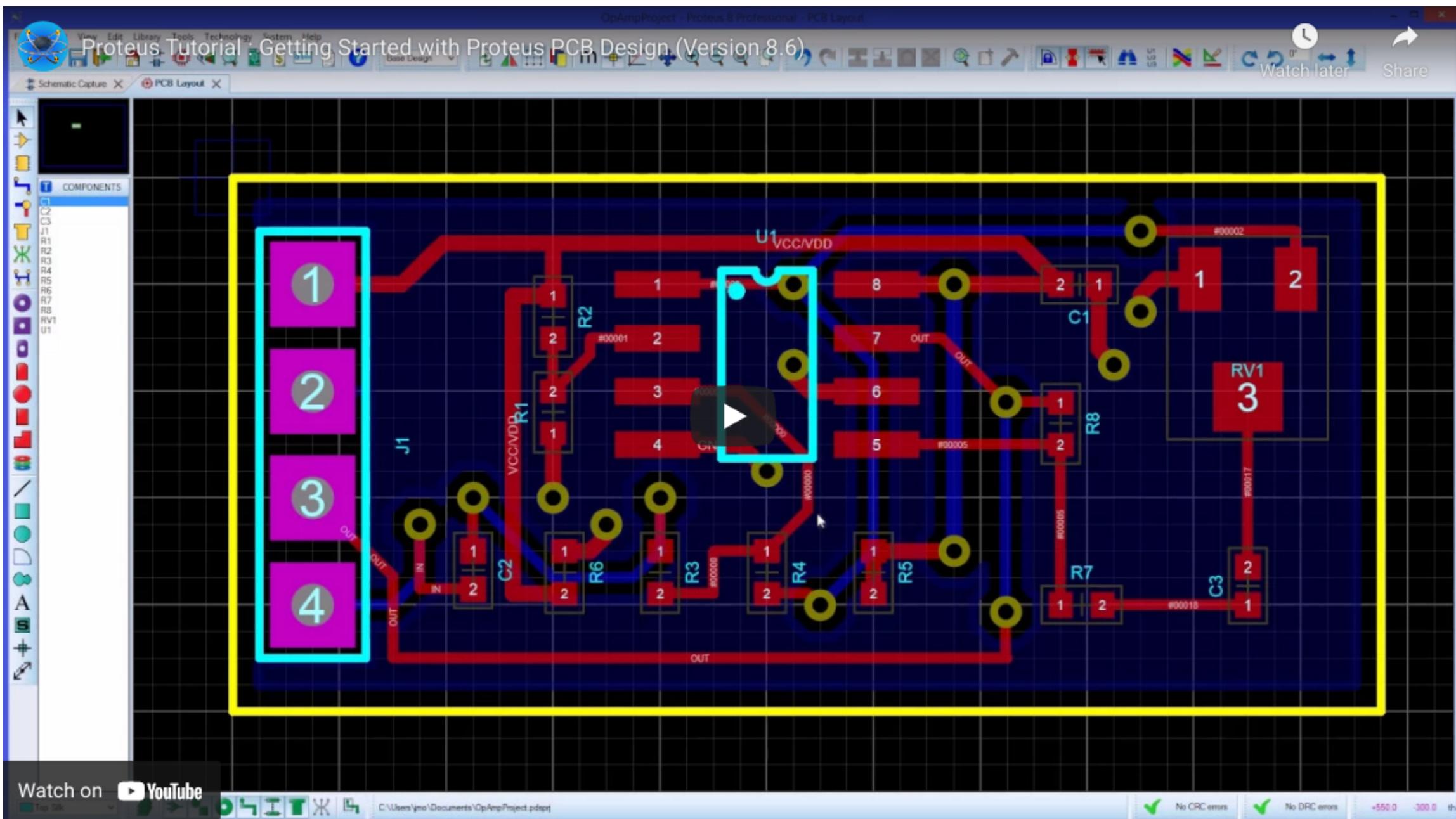
OK Cancel



3D Verification



PCB Design



<https://youtu.be/GYAHwYUUs34>

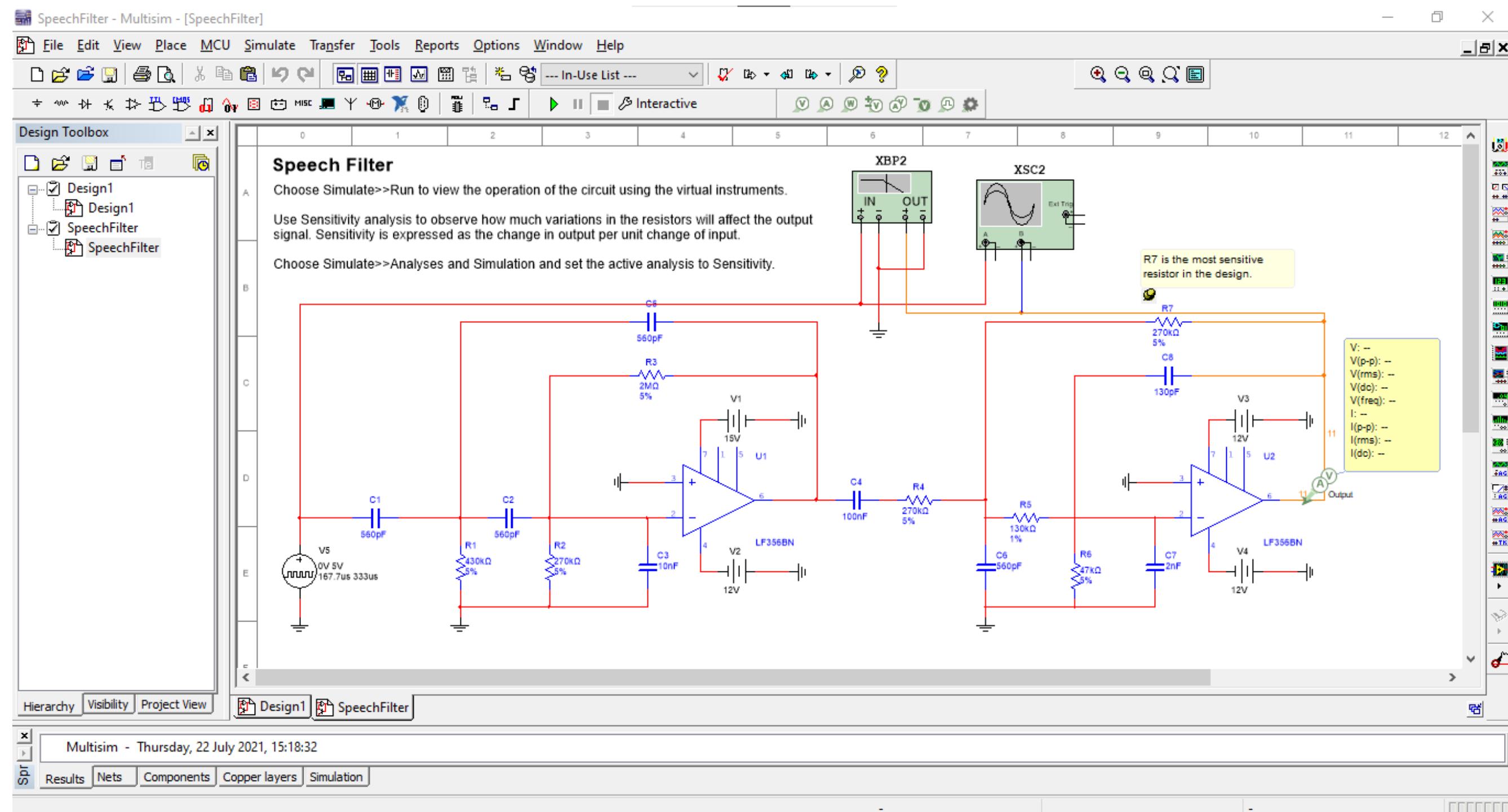
NI MULTISIM

- **SPICE Simulation**
- **Ultiboard™**

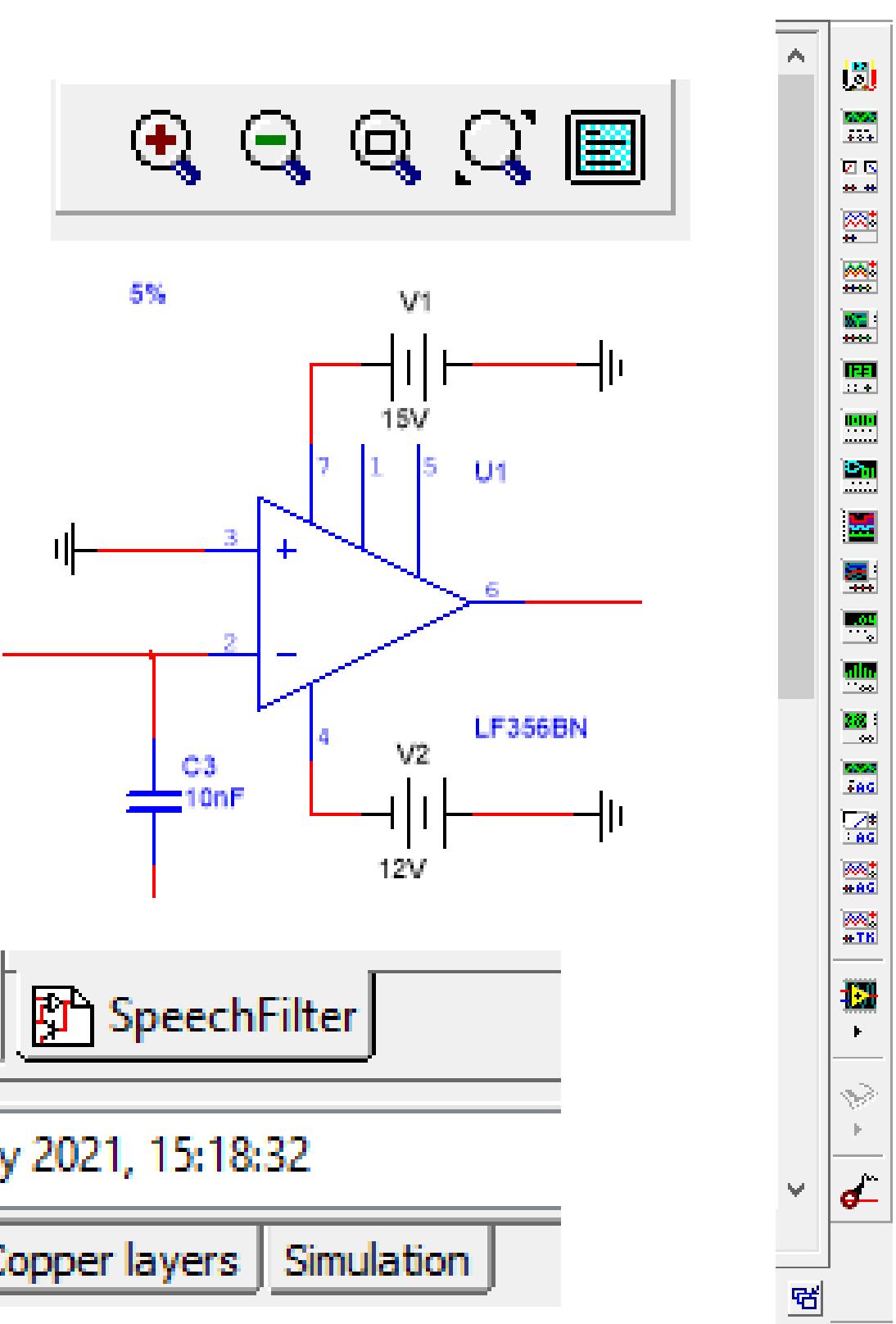
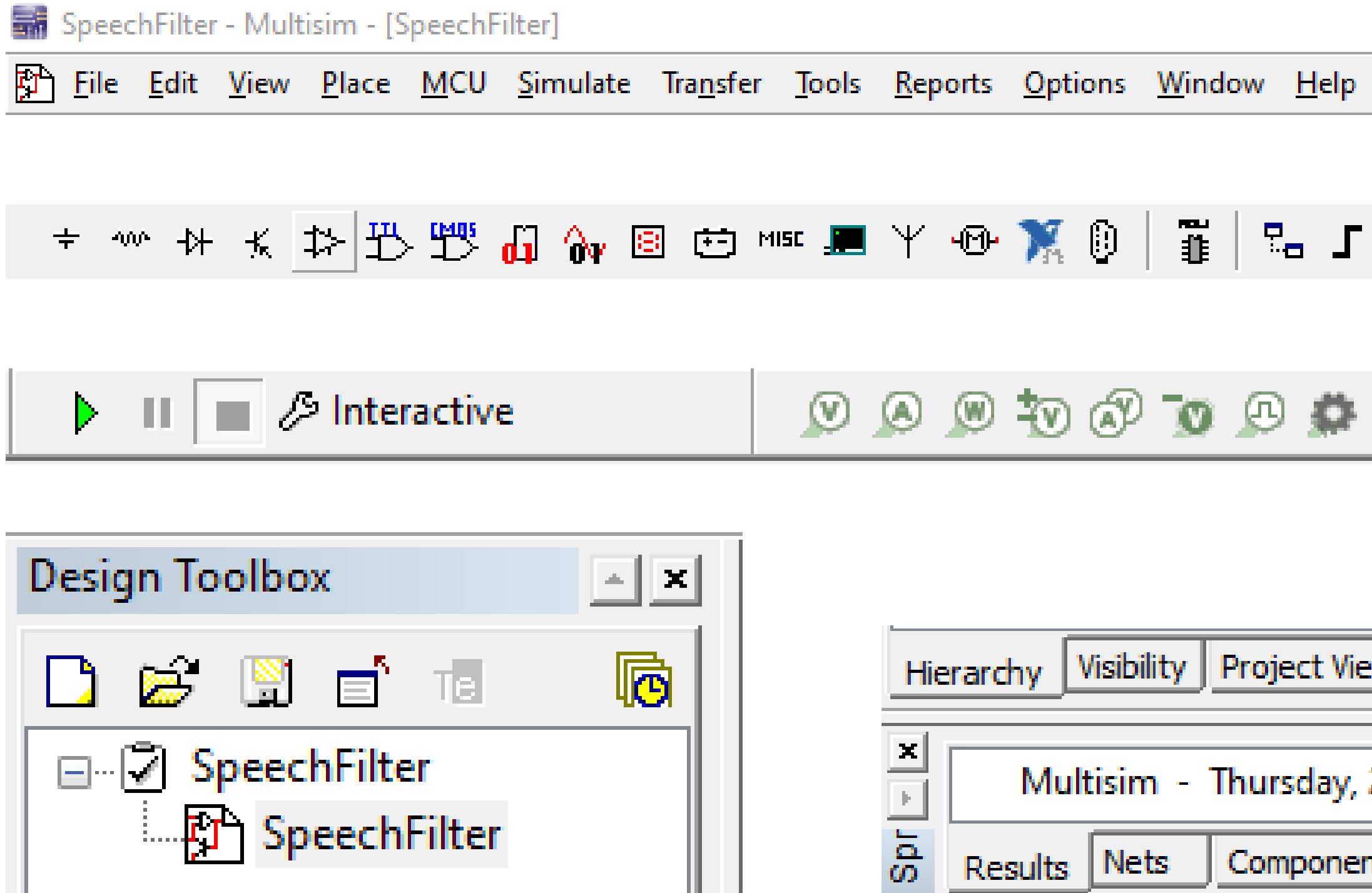


Multisim

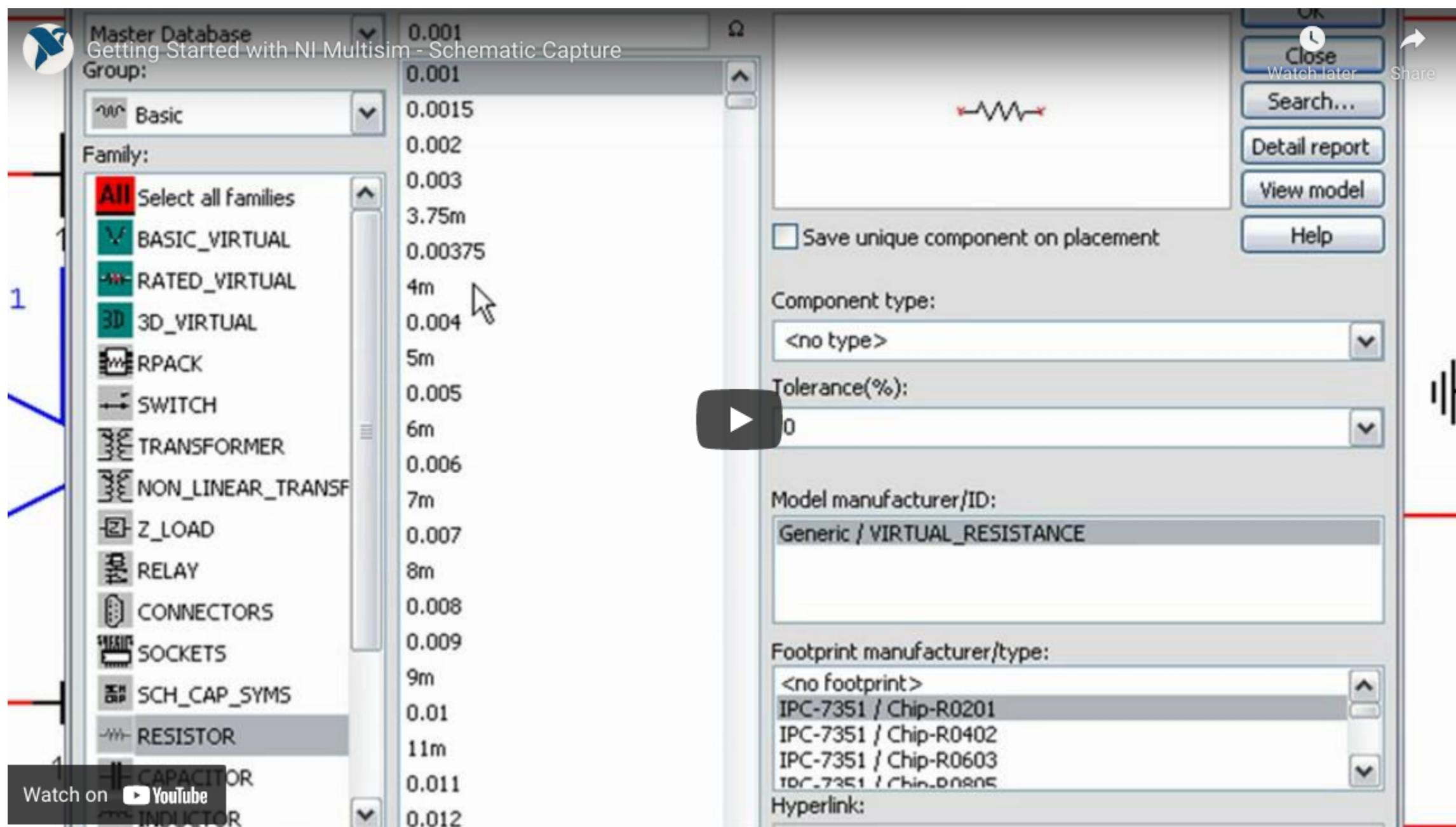
SPICE Simulation



SPICE Simulation



SPICE Simulation



<https://youtu.be/26gTGMKD6c>

Ultiboard™

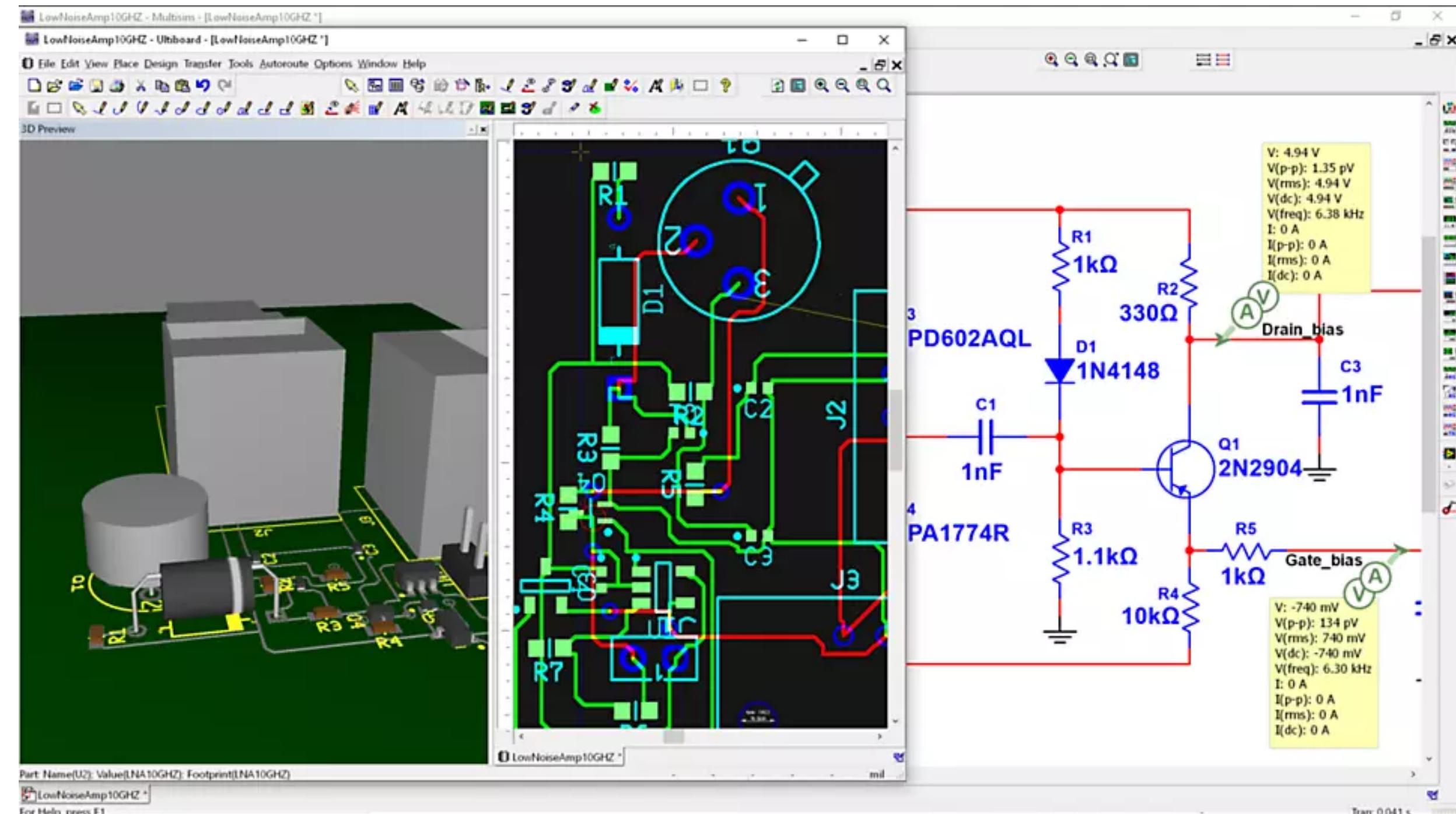
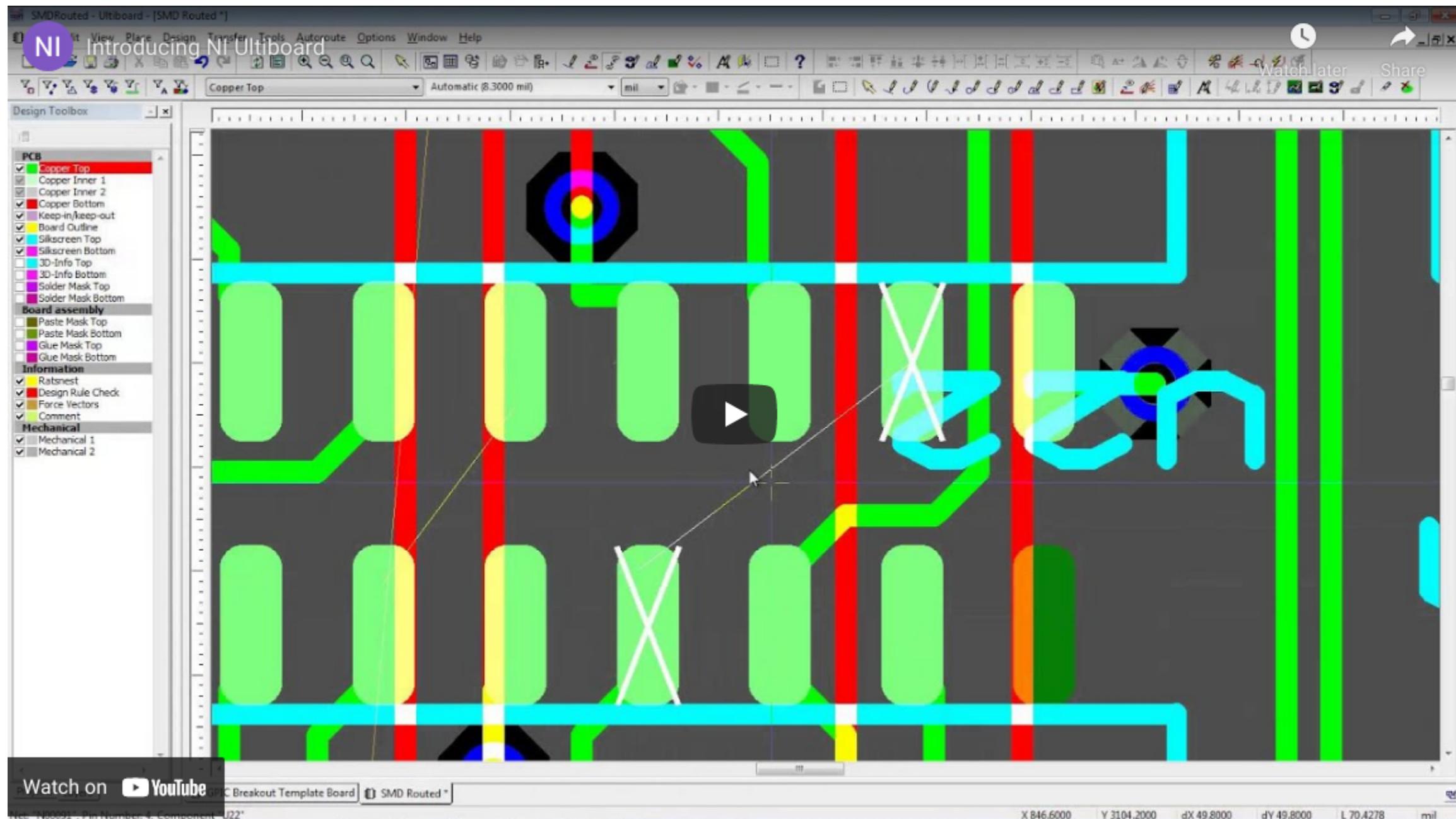


Image source: ni.com

Ultiboard™

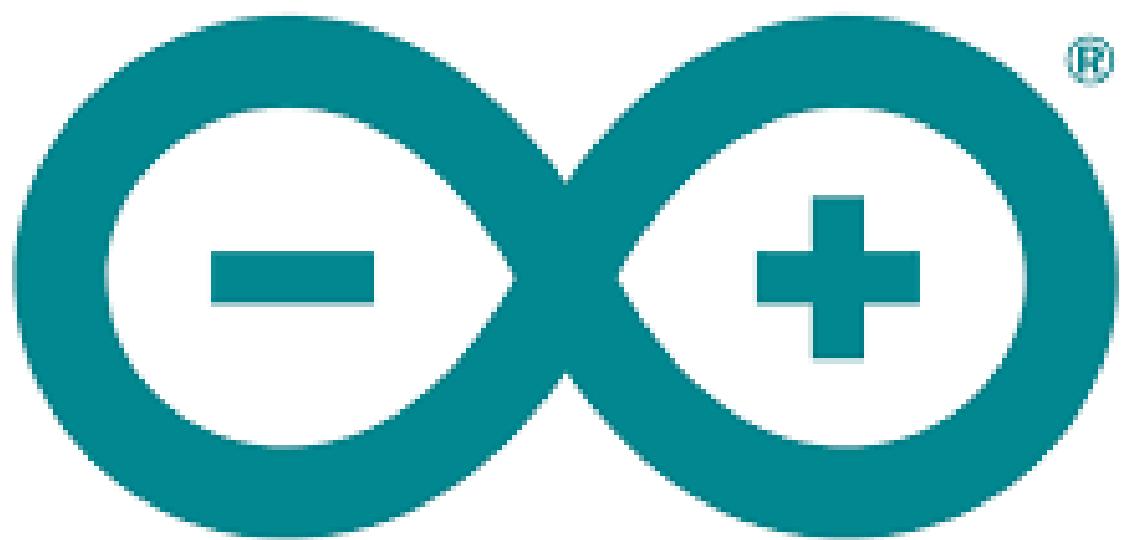
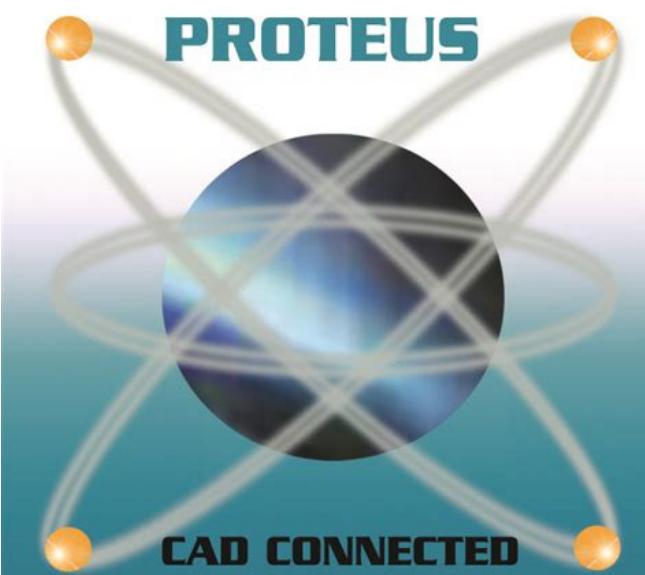


<https://youtu.be/pHA82ySqe94>

MICROCONTROLLERS

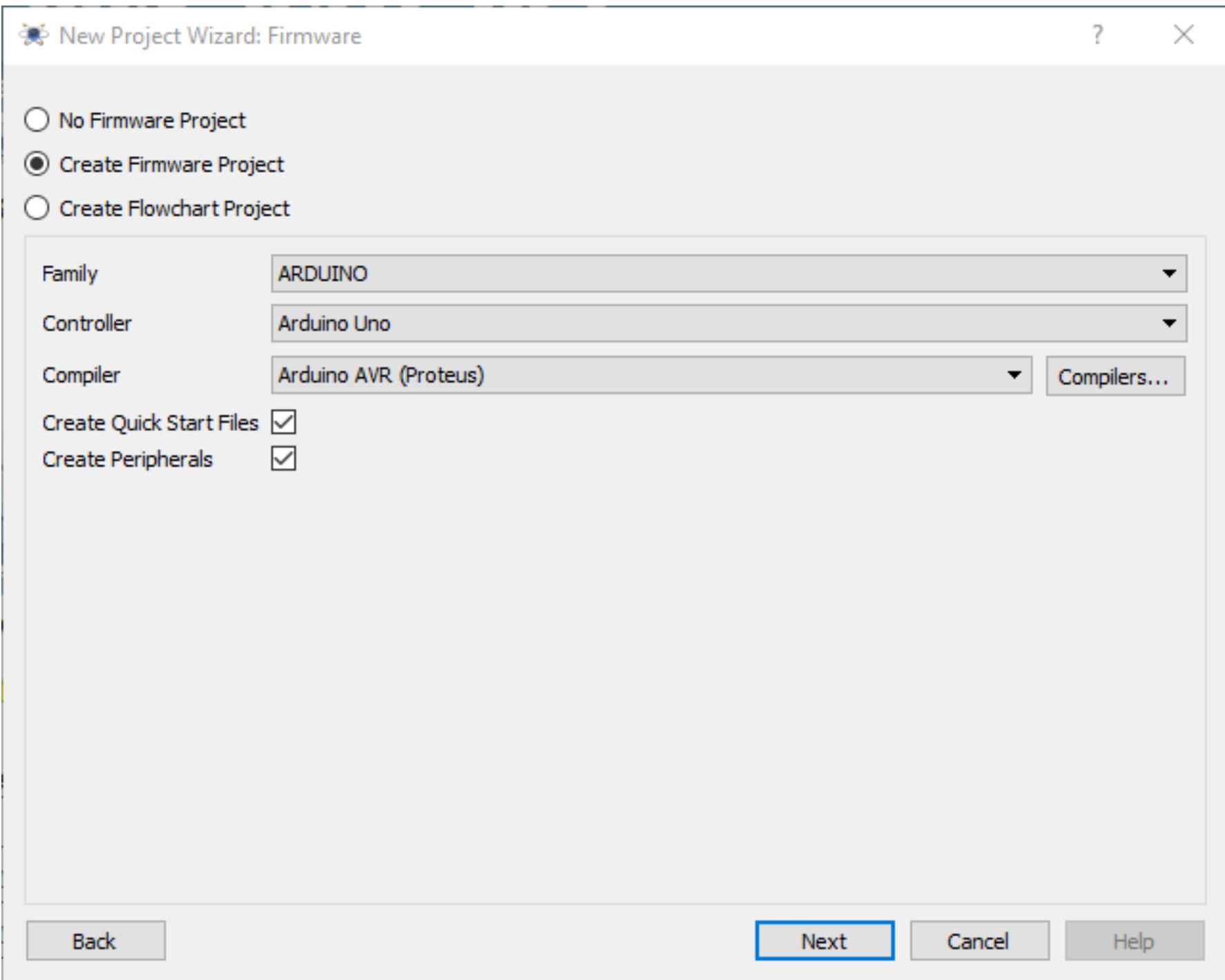
- Working with

Microcontrollers

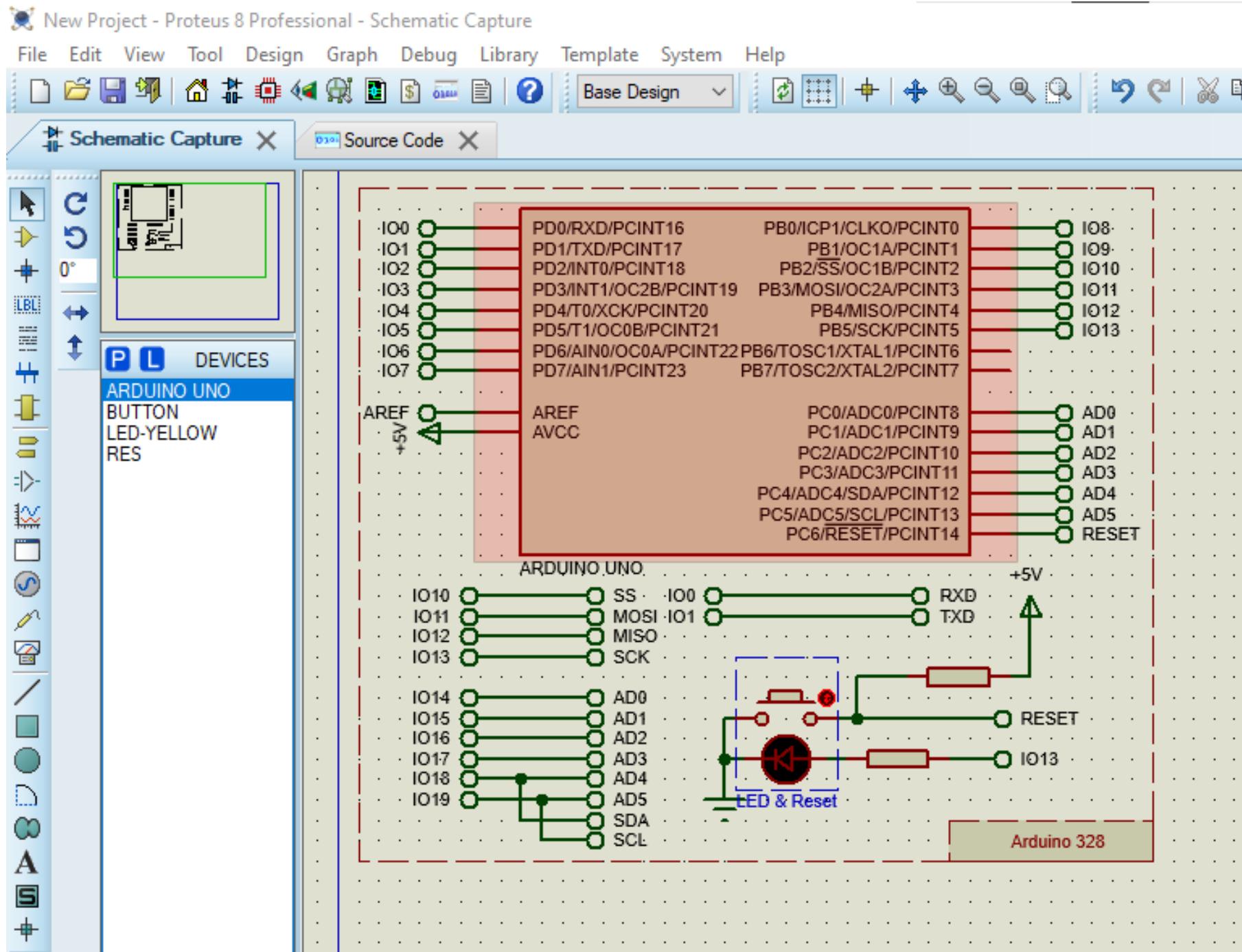


ARDUINO

Microcontrollers in Proteus



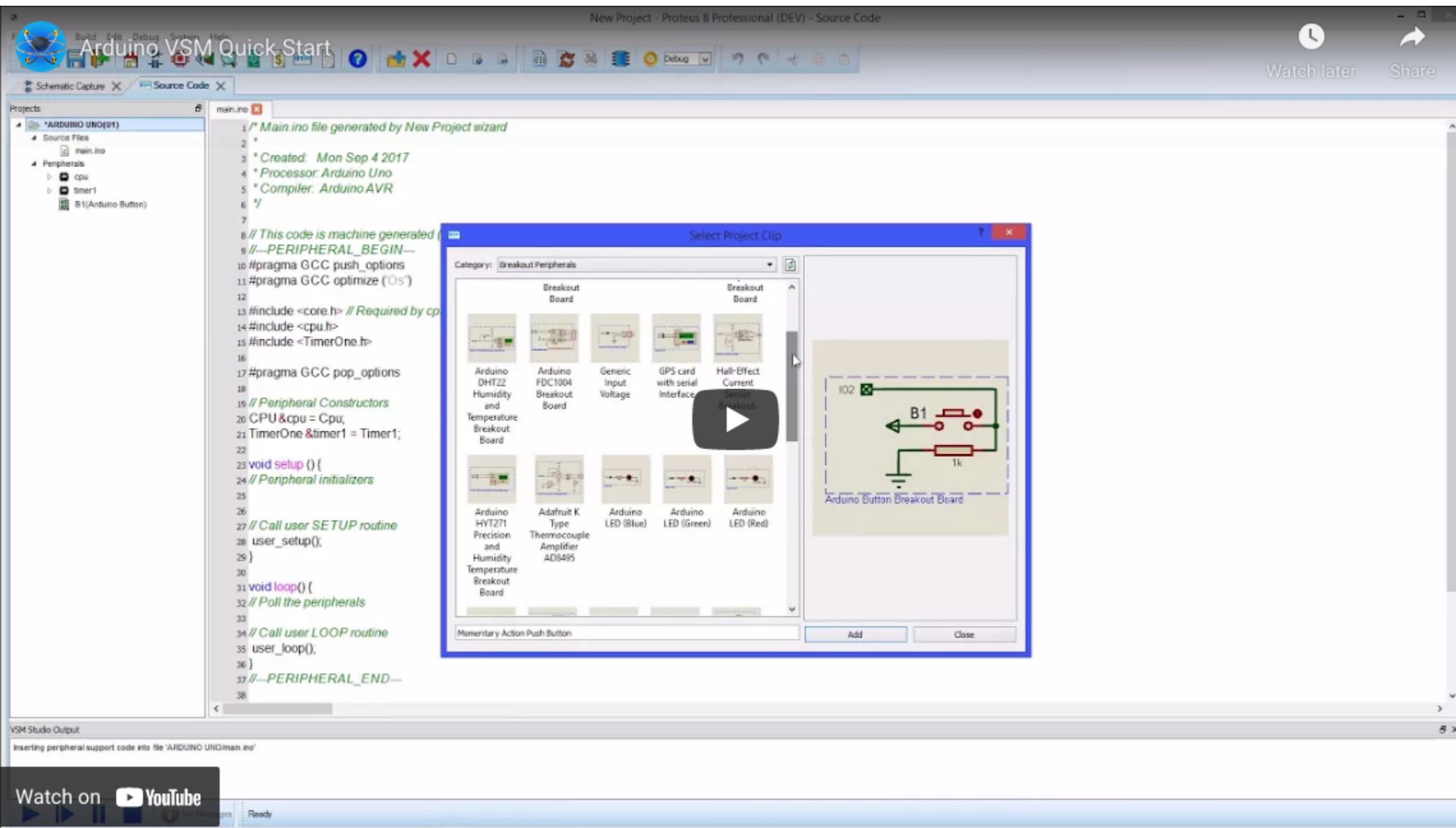
Microcontrollers in Proteus



The screenshot shows the Source Code view of the Arduino Uno project. At the top, there are tabs for 'Schematic Capture' and 'Source Code', with 'Source Code' being the active tab. The title bar shows 'main.ino'. The left side of the interface shows the project structure under 'Projects': 'ARDUINO UNO(U1)' > 'Source Files' > 'main.ino' and 'Peripherals' > 'cpu' (with timer1, spi, i2c, and uart listed). The main area displays the C code for the 'main.ino' file. The code includes comments indicating it was generated by the New Project wizard, details about the processor (Arduino Uno), and compiler (Arduino AVR (Proteus)). It also includes sections for peripheral configuration, constructors, and setup. The code ends with a note to add setup code.

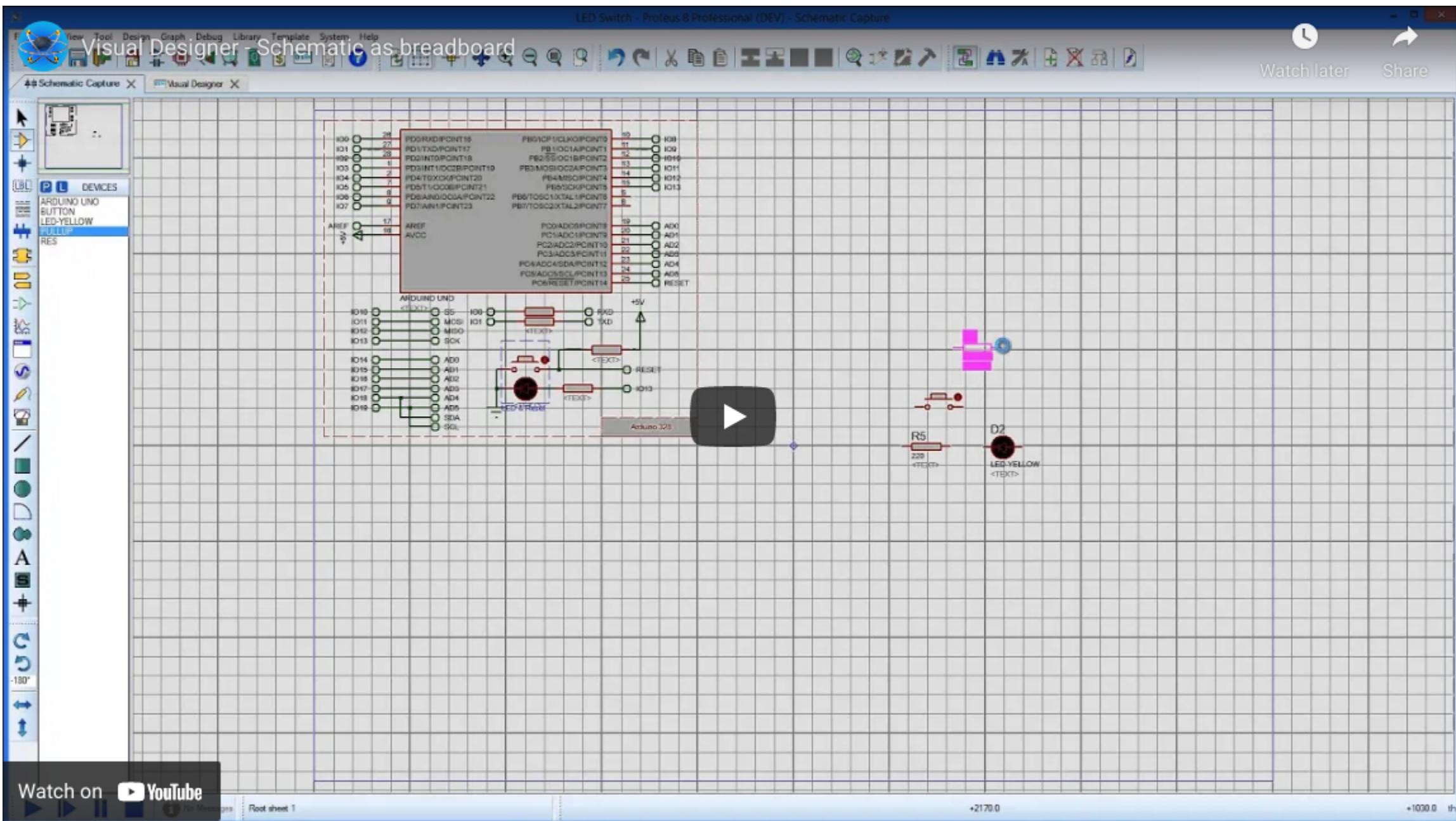
```
/* Main.ino file generated by New Project wizard
 *
 * Created: Thu Jul 22 2021
 * Processor: Arduino Uno
 * Compiler: Arduino AVR (Proteus)
 */
// Peripheral Configuration Code (do not edit)
//---CONFIG_BEGIN---
#pragma GCC push_options
#pragma GCC optimize ("Os")
#include <core.h> // Required by cpu
#include <cpu.h>
#pragma GCC pop_options
// Peripheral Constructors
CPU &cpu = Cpu;
void peripheral_setup () {
}
void peripheral_loop() {
}
//---CONFIG_END---
void setup () {
    peripheral_setup();
    // TODO: put your setup code here, to run once:
}
```

Microcontroller Simulation



<https://youtu.be/1rTGiPXj73A>

Bonus: Visual Designer



<https://youtu.be/ZaxOOEdoruM>

Resources

1. PCB Design [YouTube Playlist](#)
2. Proteus IoT Builder Help [Link](#)
3. [Proteus Tutorials](#)
4. Proteus Professional 8.9 [Windows Setup](#)
5. NI Circuit Design Suite 14.2 [Windows Setup](#)
6. Getting Started with NI Circuit Design Suite [tutorial document](#)

Thank you!

