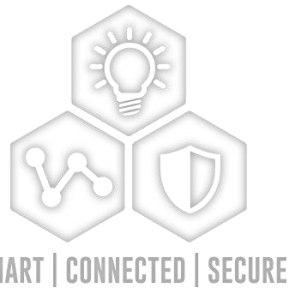
Microchip MPLAB Mindi
Simulador de circuitos analógicos

A Leading Provider of Smart, Connected and Secure Embedded Control Solutions



Rodrigo Britto/Rogerio Moreira/Ricardo Seiti / Jeferson Staudt

August 2026

Expanding Microchip Solutions Through Acquisitions

2008

2009
- Hampshire — Touch Screen Controllers
- HI-TECH — Development Tools Computer
- Advanced Silicon — Motor Drive Products

2010
- zero G — Low-Power Embedded Wi-Fi®

2011
- LSS — High-Speed ADCs

2012
- Roving Networks — Bluetooth and Embedded Wi-Fi

2013
- Novocell Semiconductor — Non-volatile Memory IP

2014
- Supertex inc. — High-Voltage Analog & Mixed-Signal Products

2015
- MICREL — Analog & mixed-signal, timing, power management

2016

2017
- Microsemi / Actel — FPGAs, SoCs, ASICS, Power, PoE, Timing an Storage systems

2018

2019
- VectorBlox — Power-efficient inferencing

2020
- TEKRON — Precision timing hardware for industrial networks
- ICONIC RF — RF & microwave devices

2021

2022

2023

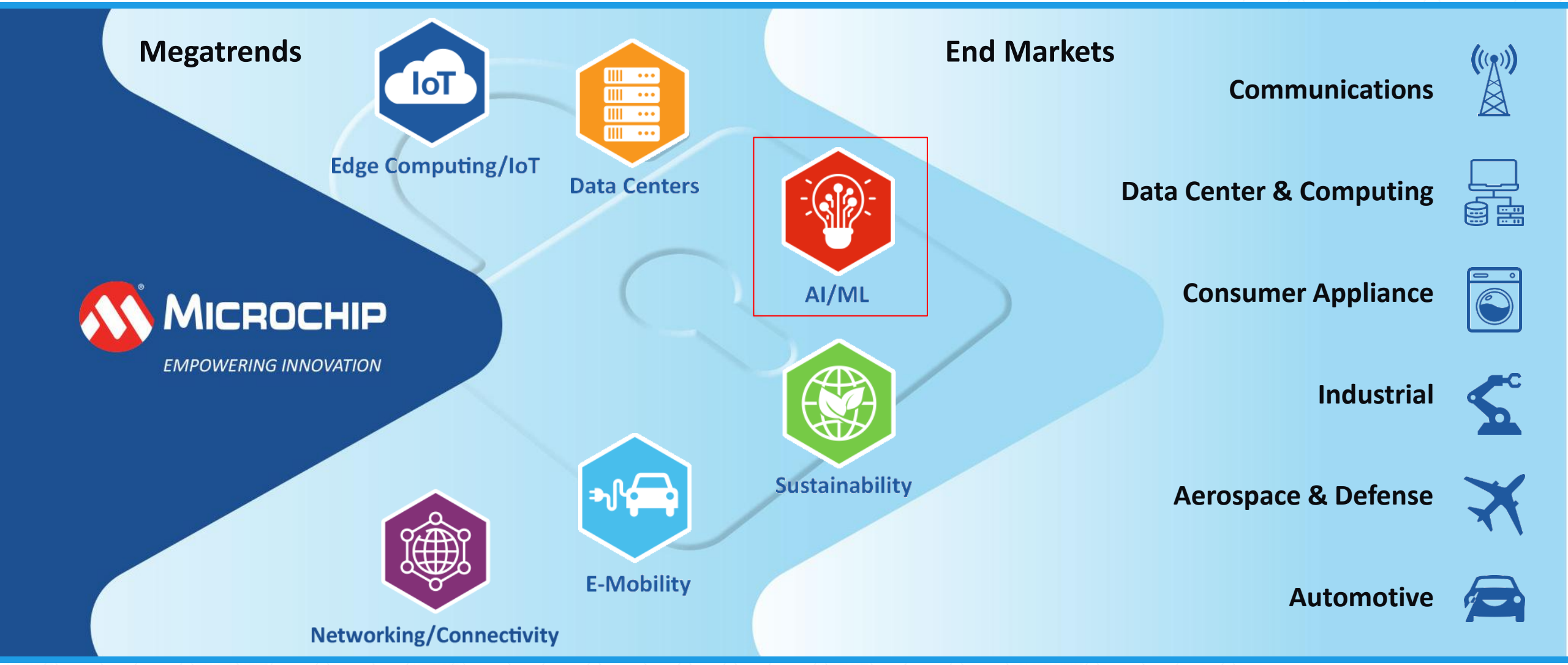
2024
- tfss TF Semiconductor Solutions — Power management, design & manufacturing
- VSI Vehicular Solutions Innovated — ASA Connectivity Solutions for ADAS

2025

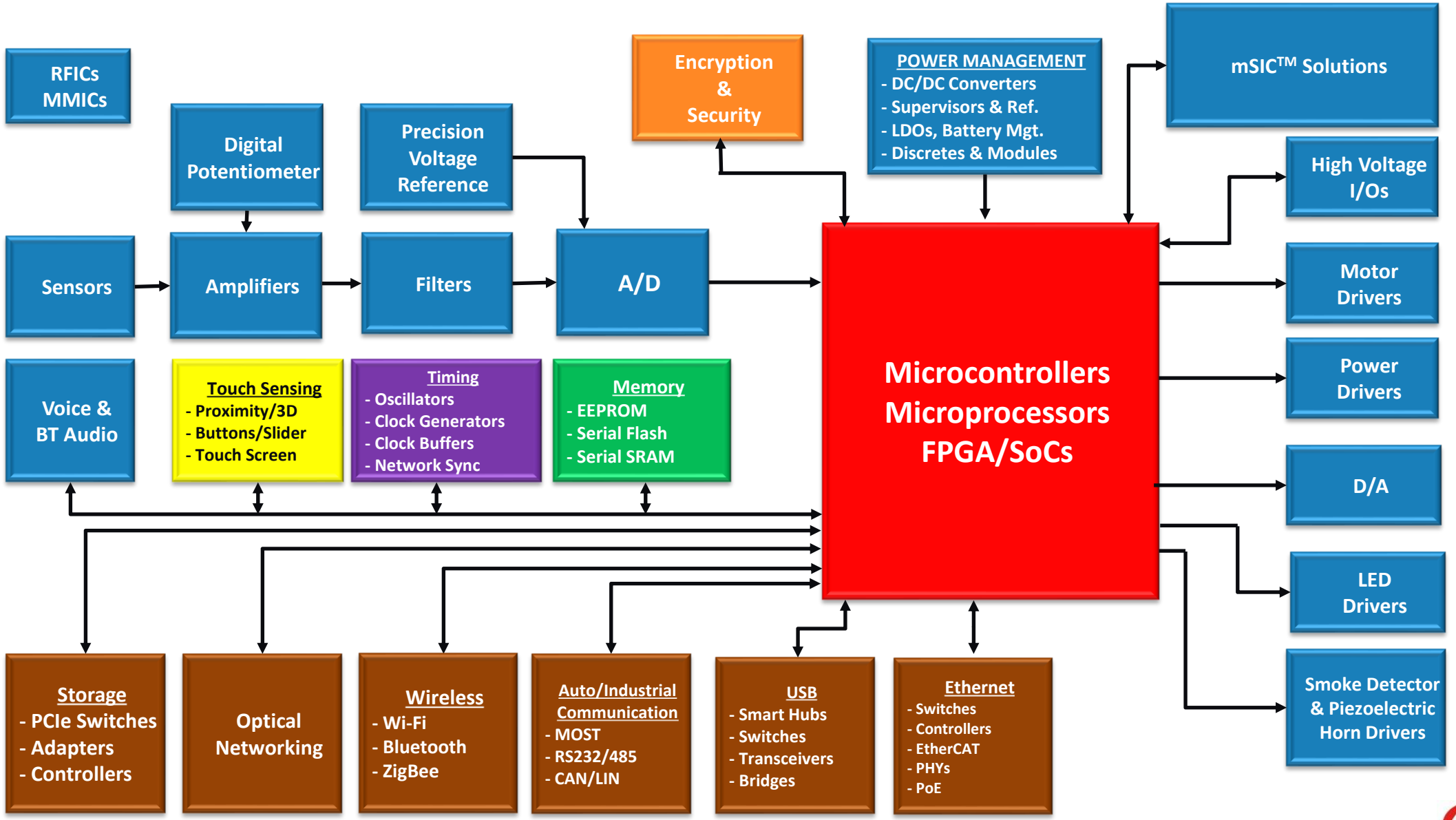
- R&E International — CLICK HERE for Horn Driver ICs and Smoke Detector ICs from R&E International, Inc. — Security & Life Safety ASICs
- Assembly & Test Capacity Expansion
- Nonvolatile Memory
- iDENT — 3D Gesture Capture & Proximity Detect
- SMSC — SUCCESS BY DESIGN — MOST®, USB & Ethernet Wireless Audio, PC Controllers
- EqcoLogic — Equalizer & Coaxial Transceiver Products
- ISSC Technologies Corp. — Bluetooth® Low Energy
- Atmel — Microcontrollers, Touch Solutions
- AgileSwitch — Digital Programable Gate Drivers
- LegUp — High-Level Synthesis Tool for FPGAs
- NEURONIX AI Labs — AI Core IP

MICROCHIP

Microchip's Strategic Focus

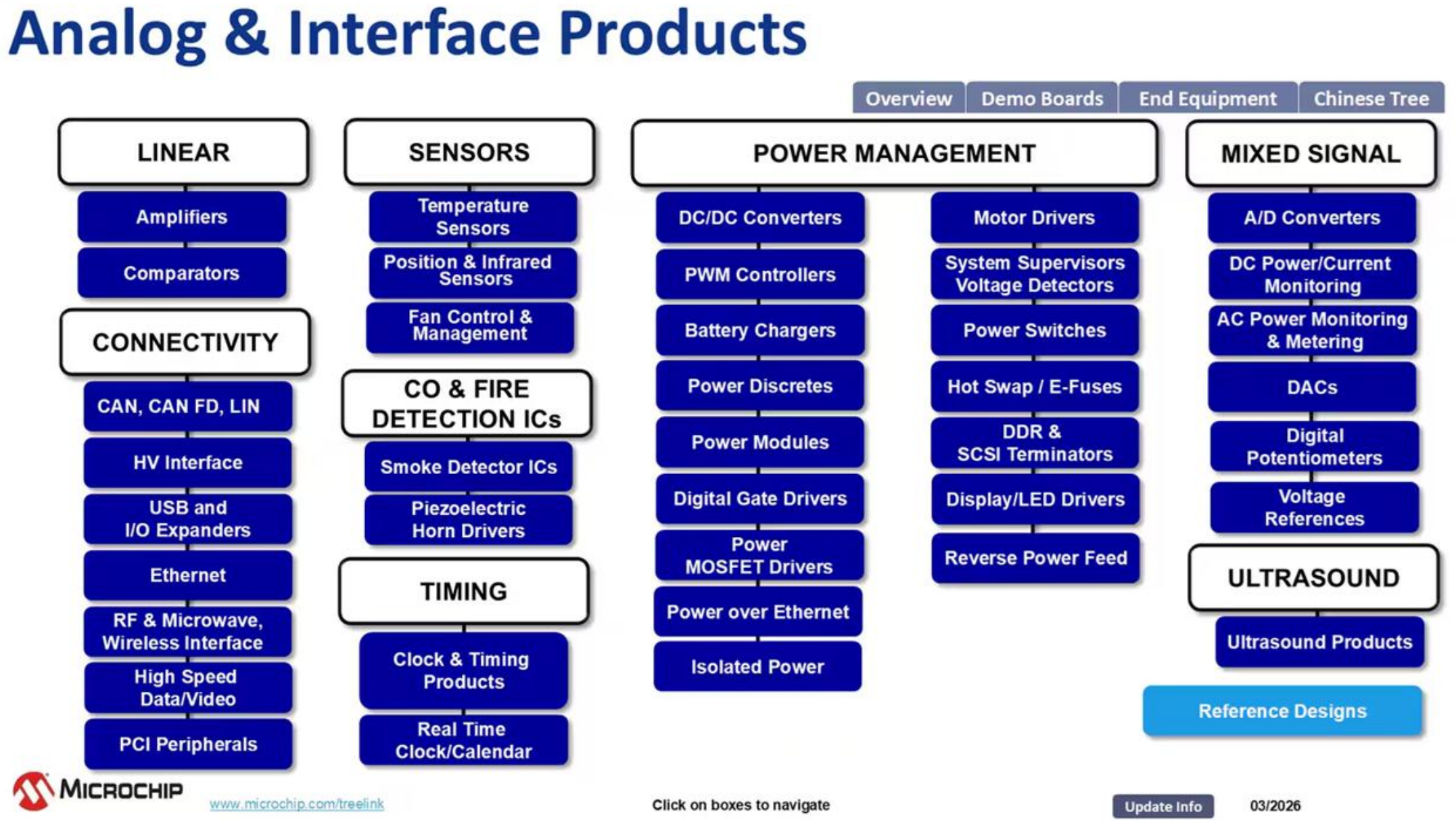


Microchip Products Portfolio



MICROCHIP

Treelink tool

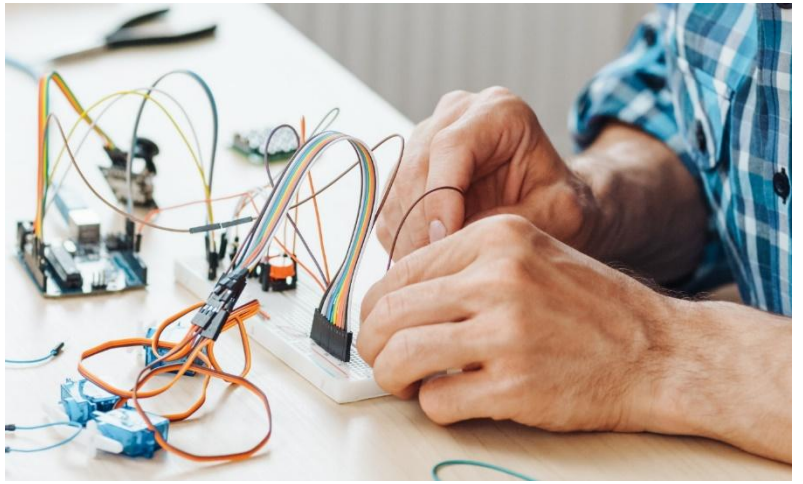


MPLAB Analog Designer + Mindi

Why Run Analog Circuit Simulation?

Reduce design cycle time

- No need for building a prototype
- Fast optimization
- Compare a diversity of solutions



Reduce development risk

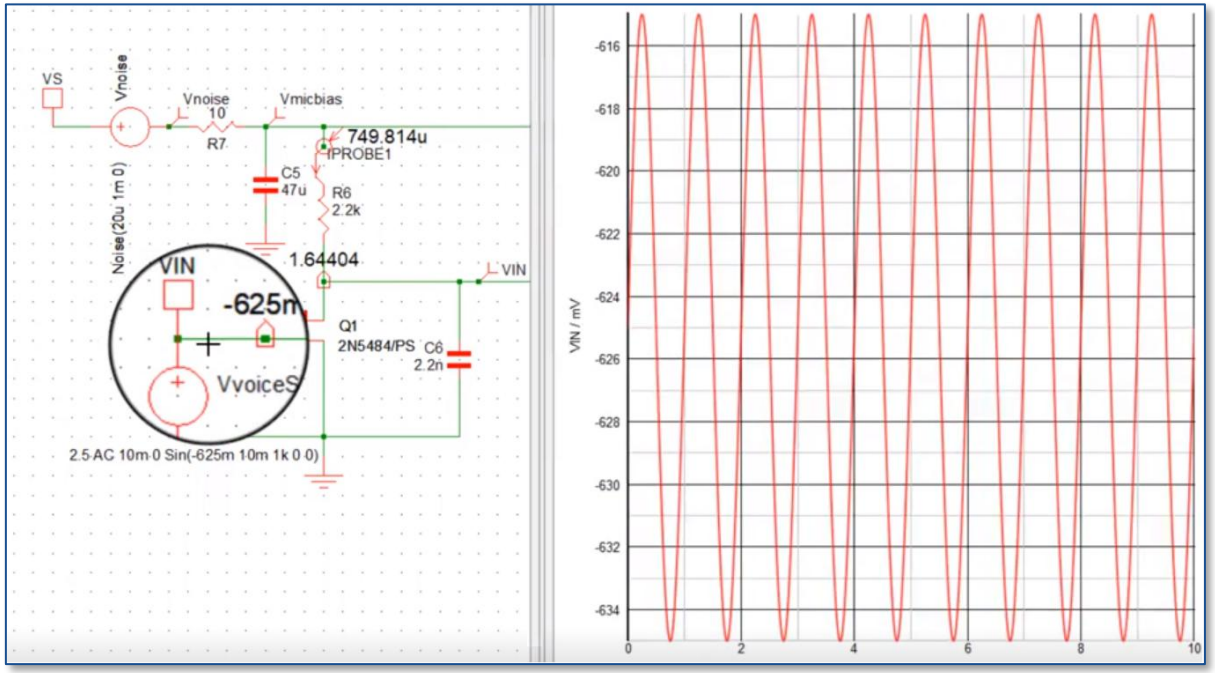
- Analyze expected analog behavior
- Evaluate achievable performance
- Test operational limits

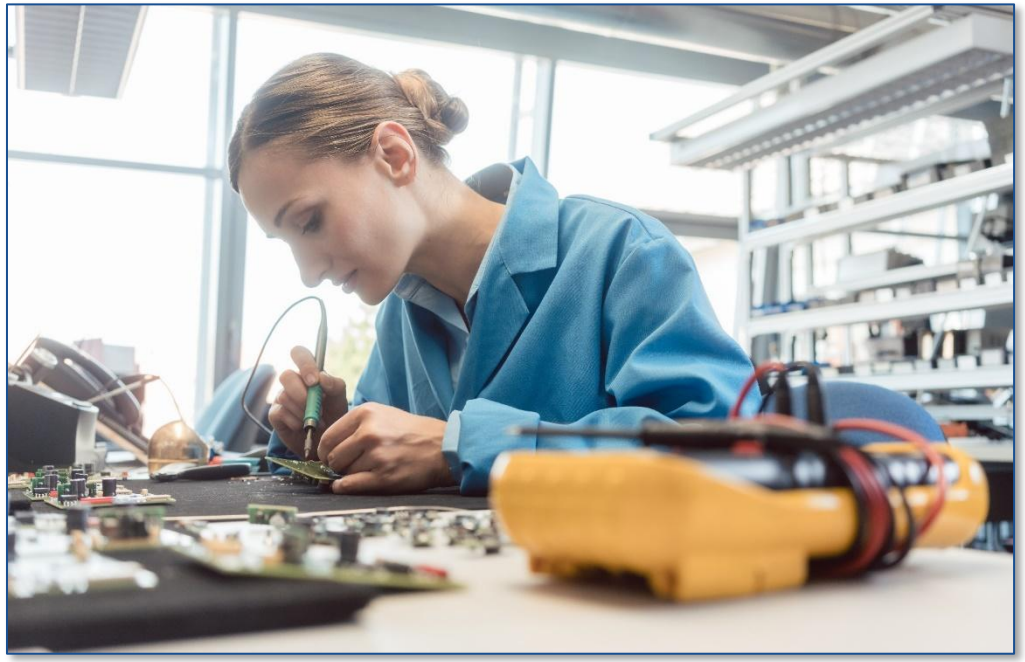
Create a more robust design

- Sensitivity analysis
- Performance analysis
- Interferences immunity

MICROCHIP

Simulation is Faster Than Hardware Prototype





- No need to execute a Printed Circuit Board (PCB)
- No waiting for samples
- No need for specific test equipment
- Make changes in minutes
- Test and compare a diversity of iterations

MICROCHIP

What is MPLAB Analog Designer (MAD)?

- **The MPLAB Analog Designer (MAD) is an online tool combining circuit templates and product selections to suggest solutions for Microchip clients power management design challenges.**

- **The suggested solutions can include any number of evaluation boards, reference designs, parts, and custom design generators that meet the clients application requirements.**

https://mad.microchip.com/

MPLAB® Analog Designer

Find > Customize > Export

MPLAB® Analog Designer makes finding analog solutions easy. This tool helps you choose an existing solution or customize a suggested design. It also includes schematics and component lists. You can view or modify your choice and export the design files with just one click to MPLAB Mindi™ Analog Simulator for verification and analysis.

Find Solutions by Application Space

- FPGA Power
- LED Drivers
- MPU Power
- PIC64 MPU Power
- Power-over-Ethernet
- Power Management
- Power Switches
- Signal Chain Signal-to-Noise C...
- USB Protection

Solution Recommender

Find recommended analog solutions by industry and specific device (MCU, MPU, FPGA, etc.)

Find by Keywords

Search analog design solutions by product name, topology, application, key features or competitor parts.

What is MPLAB Analog Designer (MAD)?

An Online Selection Tool… Allows easy transition from design selection to verification

Application

Power Management

DESIGN PARAMETERS

Input

$V(In)_{Min}$ * 6.0 V $V(In)_{Max}$ * 16.0 V

Output

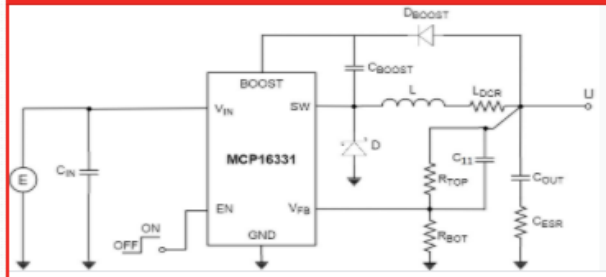
V(Out) * 5 V

$I(Out)_{Max}$ * 1 A

SEARCH

Evaluation Boards - *2 of 16 found*

ADM00519

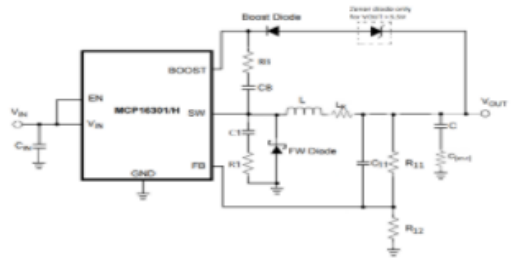


EVB Product Page: **ADM00519**

MCP16331 Buck Converter Evaluation Board

Simulate | View/Modify

ADM00433



EVB Product Page: **ADM00433**

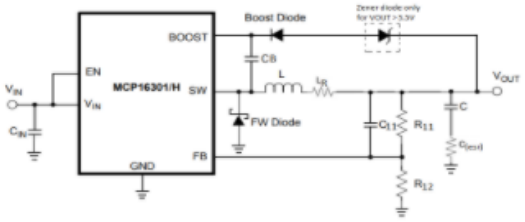
MCP16301H 5V/600mA Low Noise Evaluation Board

Simulate | View/Modify

--show more--

Custom Design Generators - *2 of 35 found*

MCP16301



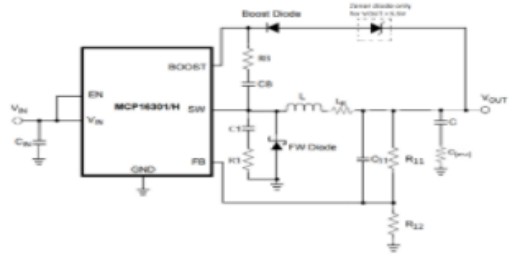
Product Page: **MCP16301**

MCP16301 Non-Synchronous step-down DC-DC converter

Topologies: **Buck**

Start Design

MCP16301H



Product Page: **MCP16301H**

MCP16301H Non-Synchronous step-down DC-DC converter

Topologies: **Buck**

Start Design

Advanced Search Filters … Features/Topology/Package

MPLAB® Analog Designer

Application

Power Management

DESIGN PARAMETERS +

FILTERS −

Reset Filters

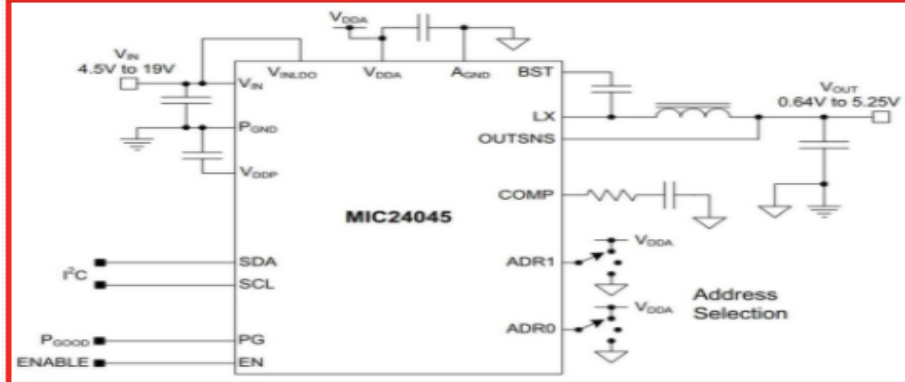
− Solution

+ V(In) ⓘ
+ V(Out) ⓘ
+ I(Out) ⓘ
− Features

- ☐ Valley Current Mode Control
- ☑ Enable
- ☑ Power Good
- ☐ Synchronous Rectification
- ☐ Undervoltage Lockout
- ☑ I2C Programmable

− Evaluation Boards - *1 of 1* ***found***

ADM00826



EVB Product Page: **ADM00826**

MIC24045, I2C Programmable, 4.5V - 19V Input, 5A Step-Down Converter Evaluation Board

Efficiency: **95.00 %**

Simulate | View/Modify

− Custom Design Generators - *1 of 1* ***found***

MIC24045

What is MPLAB Analog Designer (MAD)?

An Online Design Tool … Simulate existing solutions or customize for your application

Analyze

Design Parameters

V(In)	9	V
V(Out)	5	V
I(Out)	1	A
Temp	25	°C

Components:

All

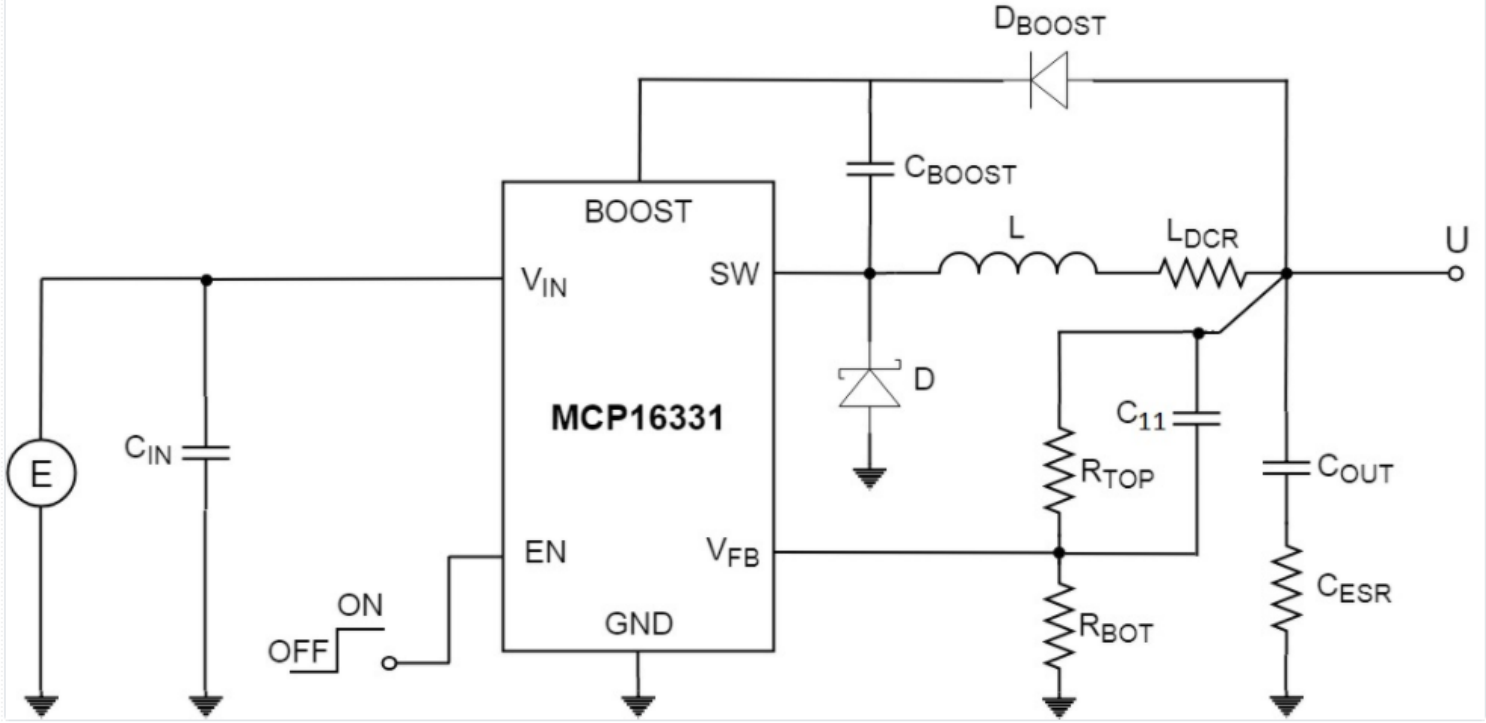
C (In):	20	uF
C(out):	20	uF
C(esr):	5	mΩ
L:	22	uH

Schematic | Bode | Efficiency

Matched Topologies: Buck

Matched Solutions: ADM00519

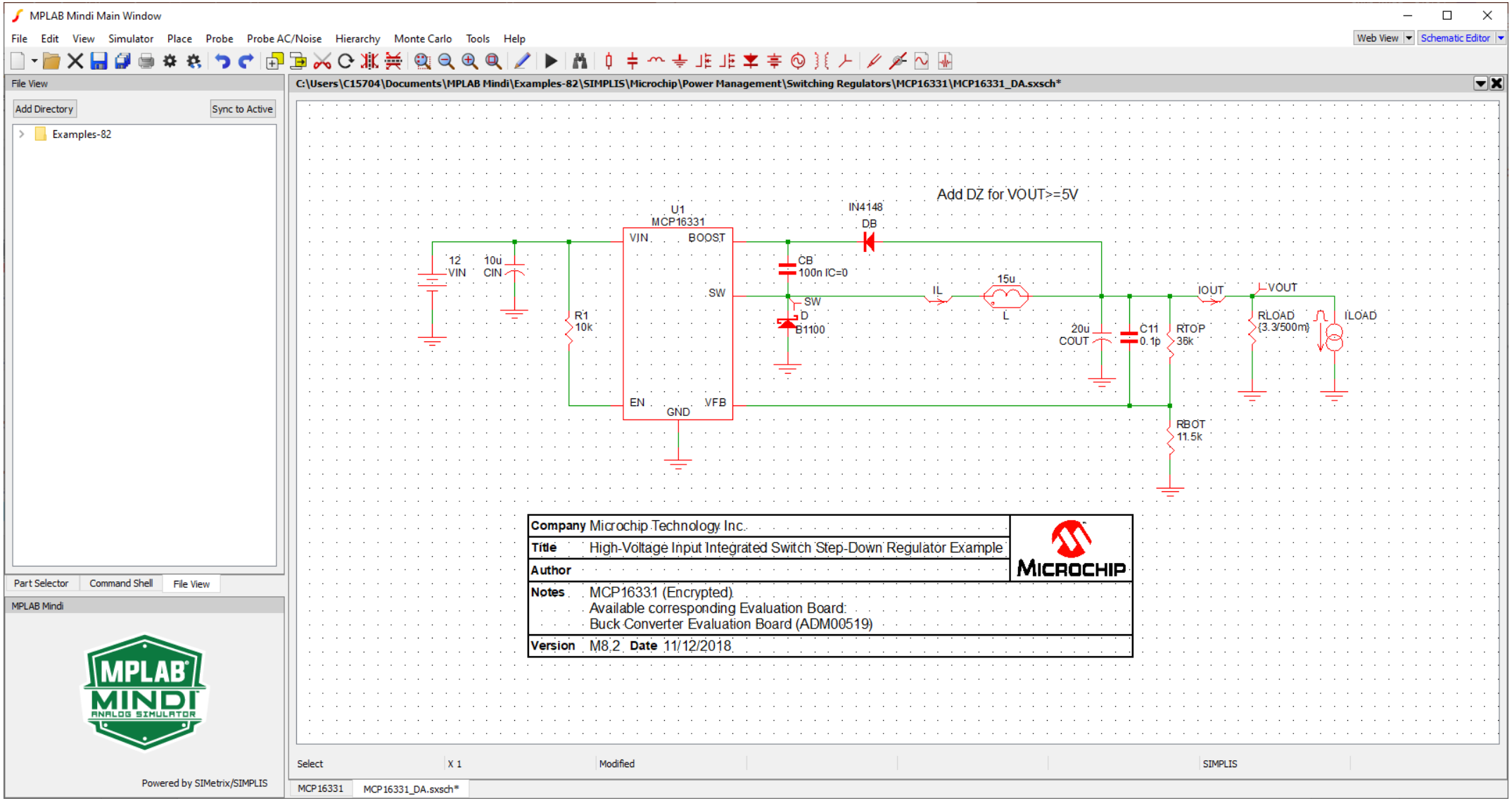
Export



* Notes

MICROCHIP

Verify with the MPLAB® Mindi™ Analog Simulator

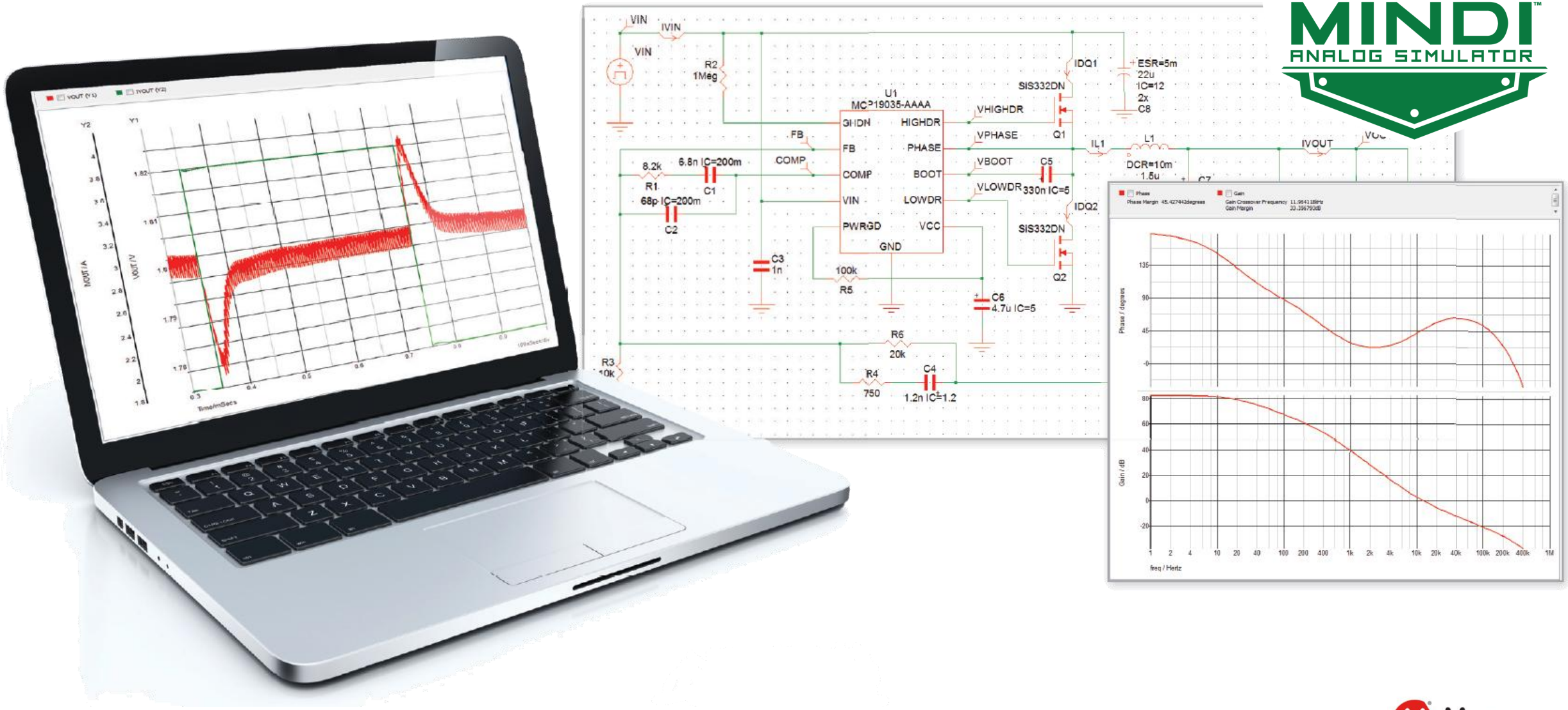


Introducing MPLAB® Mindi™ Analog Simulator

Microchip Analog Simulator

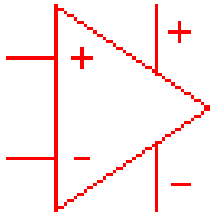
- Easy to use simulation interface
- Proprietary files to model Microchip analog ic's
- A growing library of application schematics and Microchip device models
- Ability to simulate up to 140 application nodes
- Local installation – no internet connection required for use
- Fast simulation times

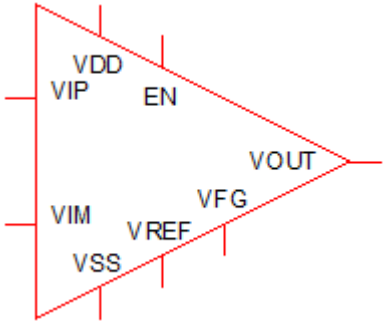
MPLAB® Mindi™ Analog Simulator

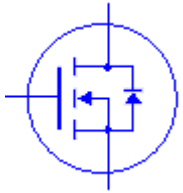


Model Libraries Currently Available

- Operational amplifiers
- Instrumentation amplifiers
- Active filter circuits
- MOSFET and motor drivers
- PWM and non-PWM power controllers
- Power modules
- LED drivers
- Switching regulators
- Generic switch and passive components

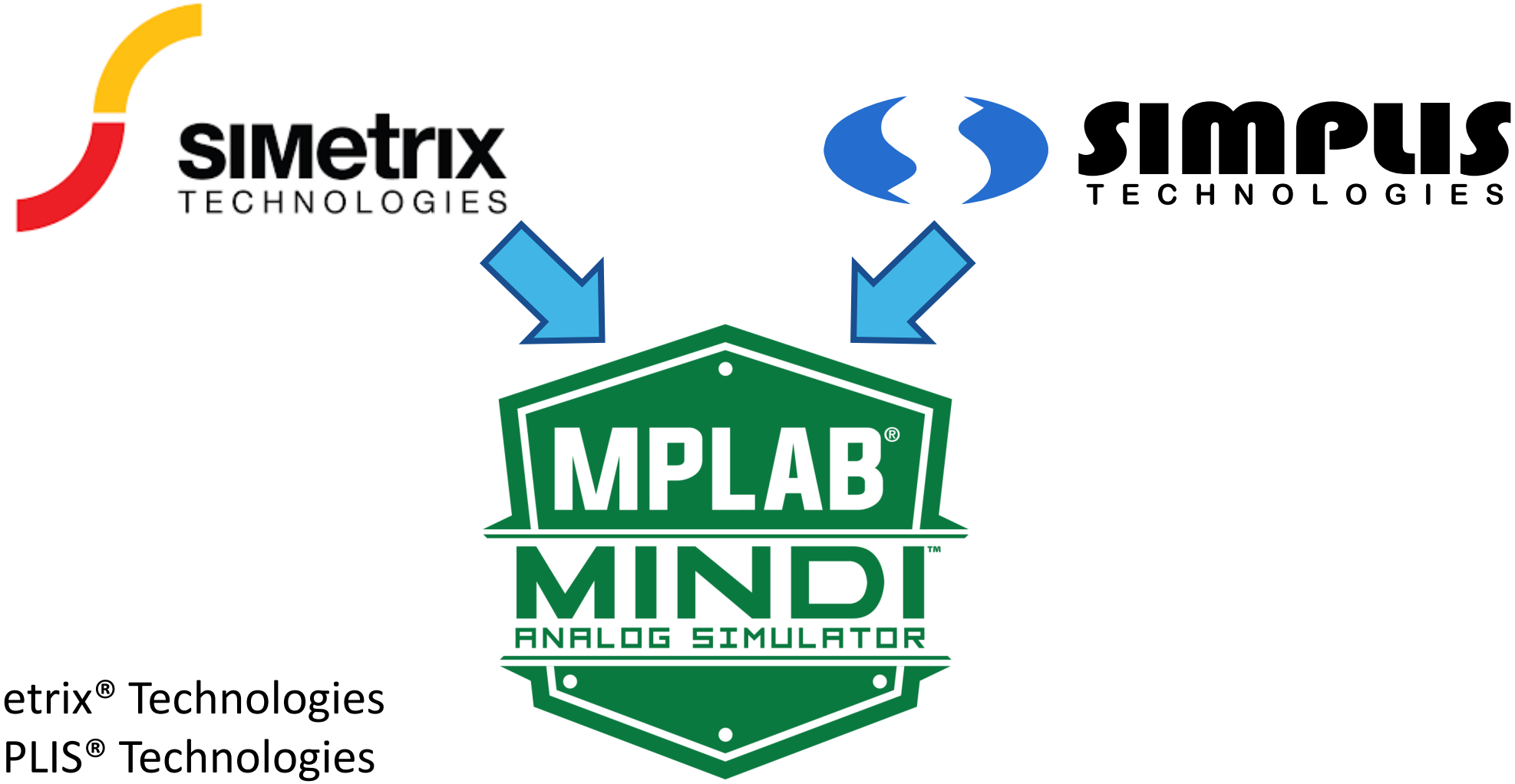






Later in this class: Learn how to build your own model

MPLAB® Mindi™ Analog Simulator Integrates Two Simulation Engines

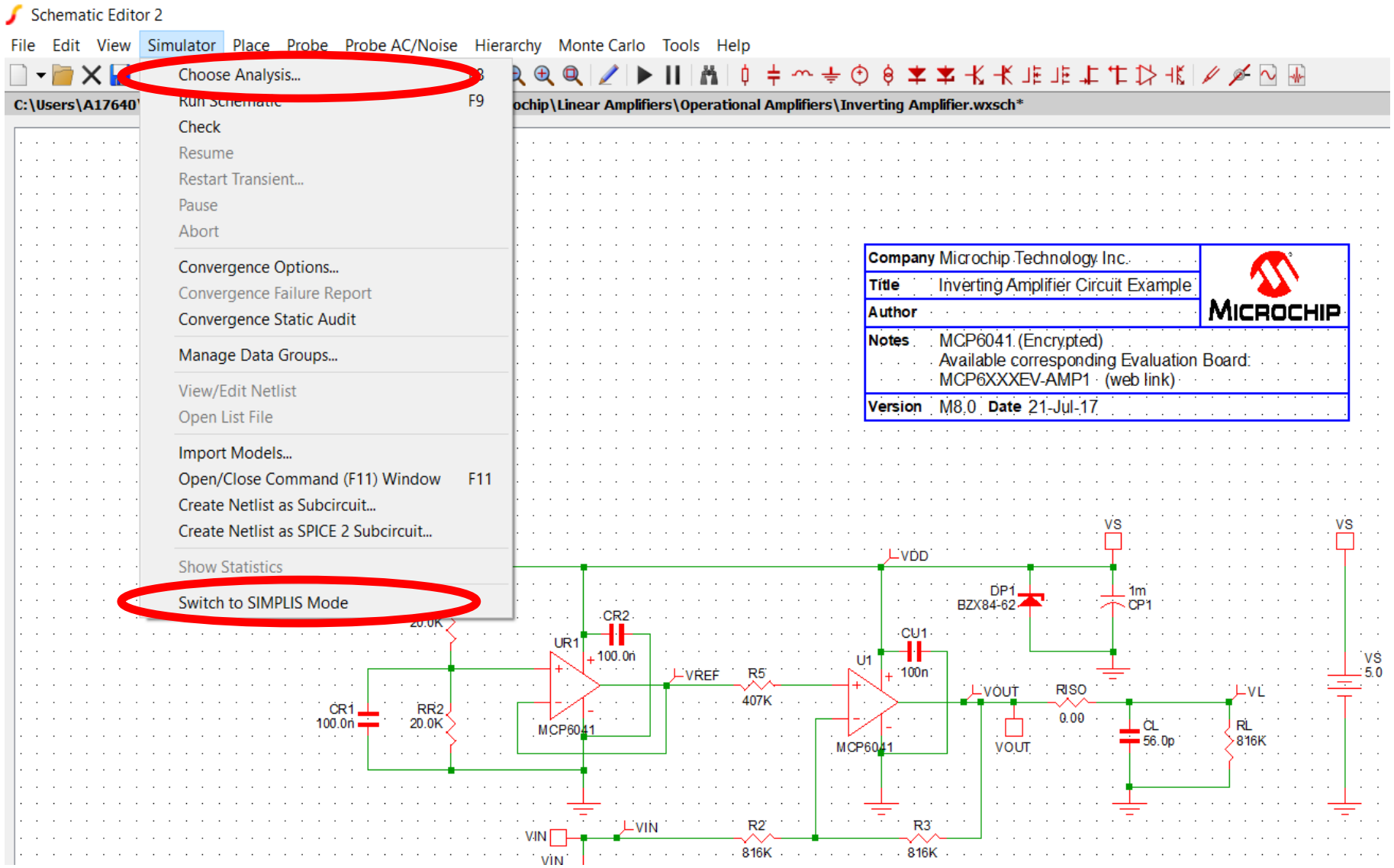


- SIMetrix® Technologies
- SIMPLIS® Technologies

MPLAB® Mindi™ Analog Simulator SIMetrix® Simulation Engine

- Mixed-signal circuit simulator
- Ease and speed of use
- Multi-step analysis
- Transient, AC, DC and noise analysis
- Real-time noise

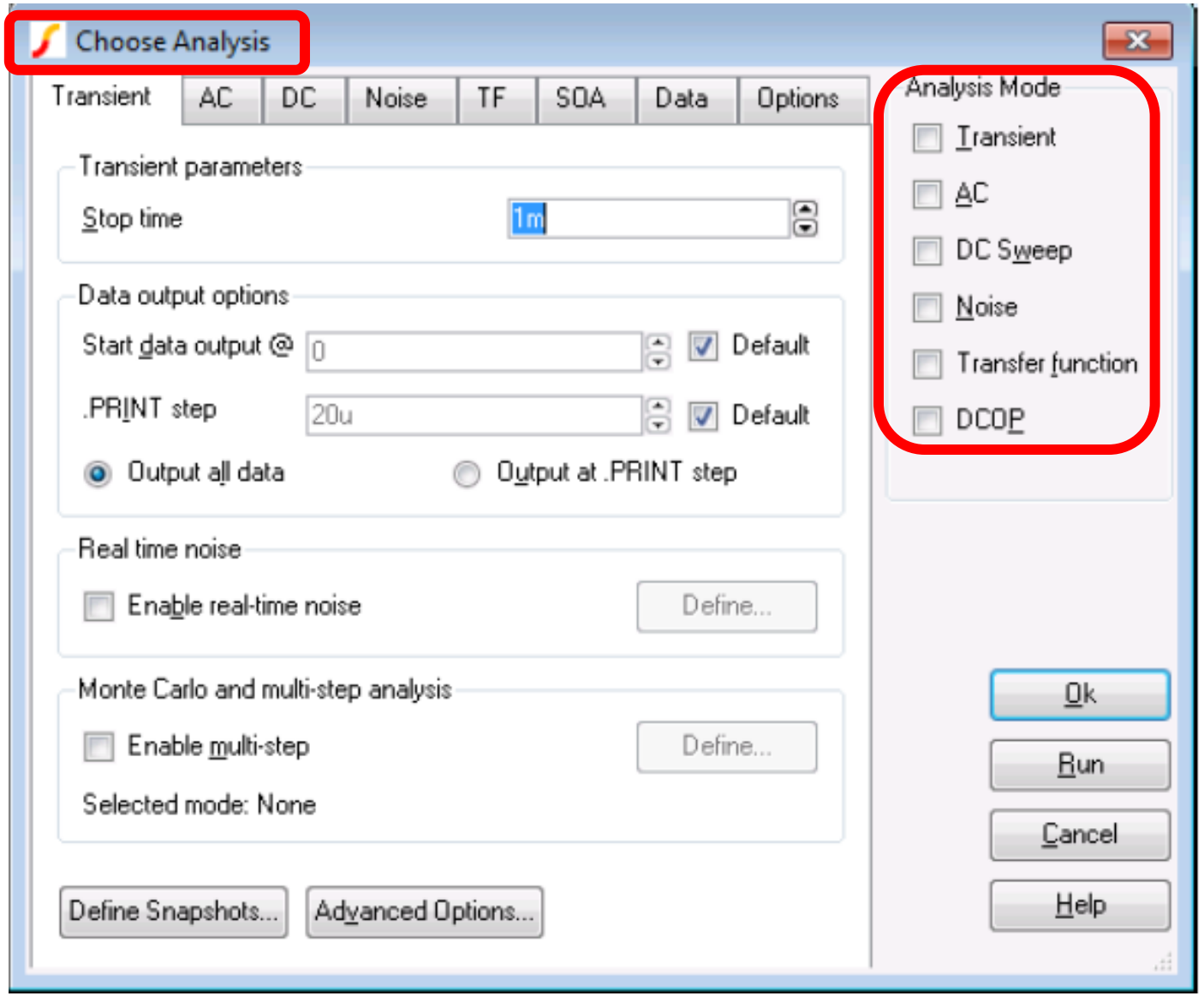
SIMetrix : For Linear Systems



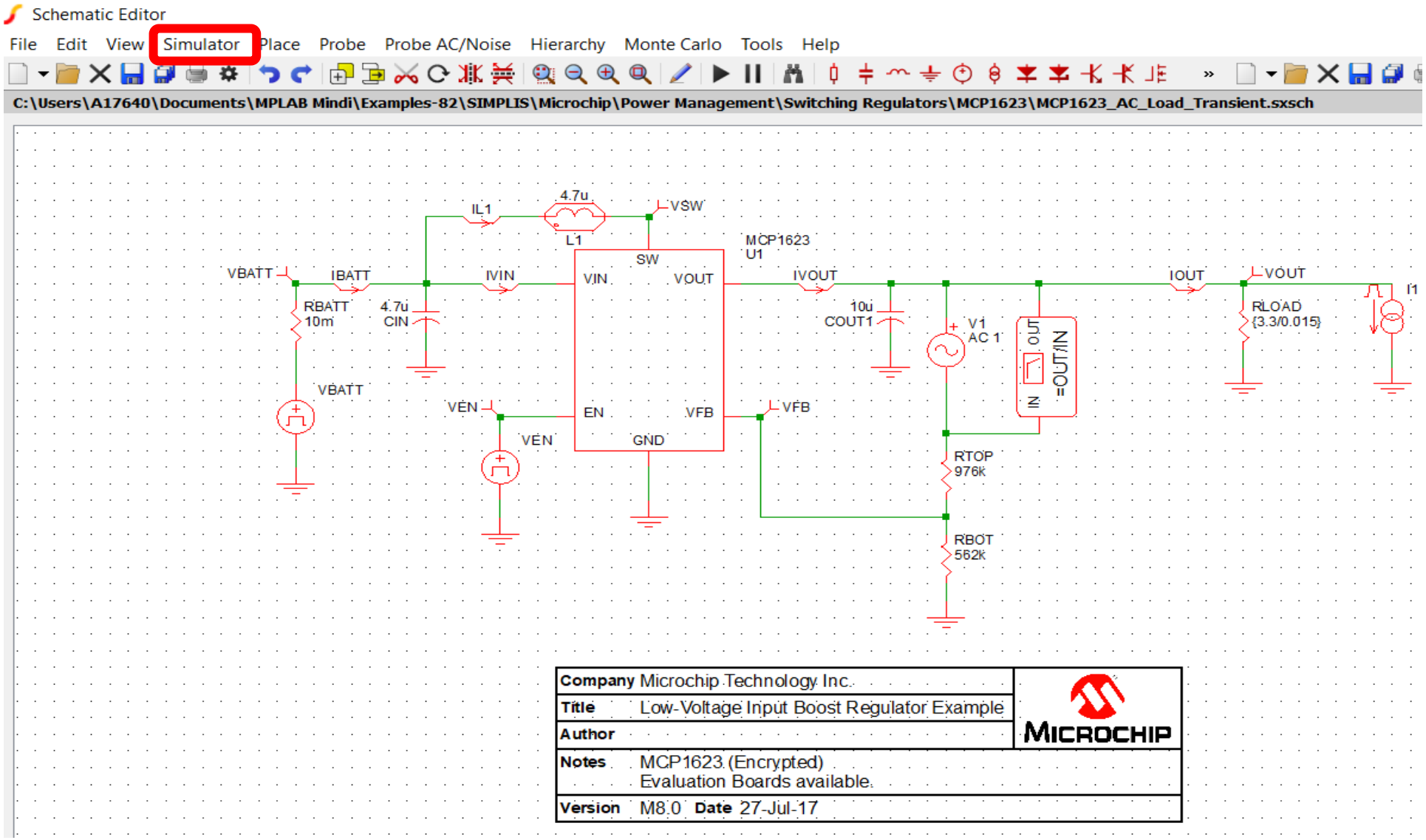
SIMetrix: Analysis Modes

Simulator:

1. Transient
2. AC
3. DC
4. Noise
5. ….



SIMPLIS: For Sampled Data

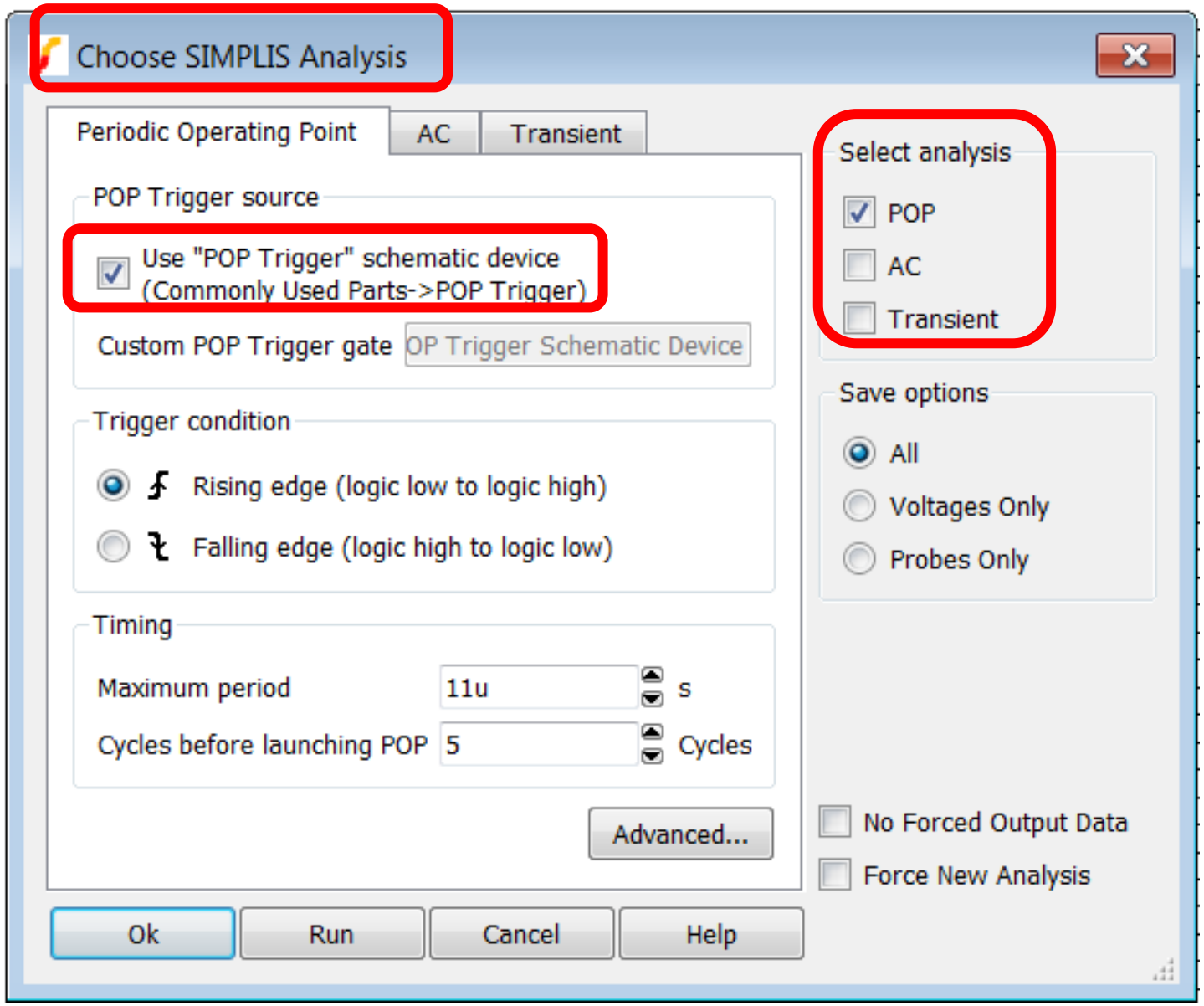


MICROCHIP

SIMPLIS: Analysis Modes

Simulator:

1. POP
2. AC
3. DC



MPLAB® Mindi™ : Process Flow

I. Decide the Platform (SIMPLIS or SIMetrix)

II. Open/Create New Schematic Page

III. Place the Symbols and Probes

IV. Wire them up & Edit the Values

V. Choose the Analysis

VI. Run the Simulation

VII. Analyze the Output Data / Waveform

MPLAB® Mindi™
Process Flow For Microchip Model Examples

I. Scroll through the Microchip Examples under Example-82 in File View Tab on the left

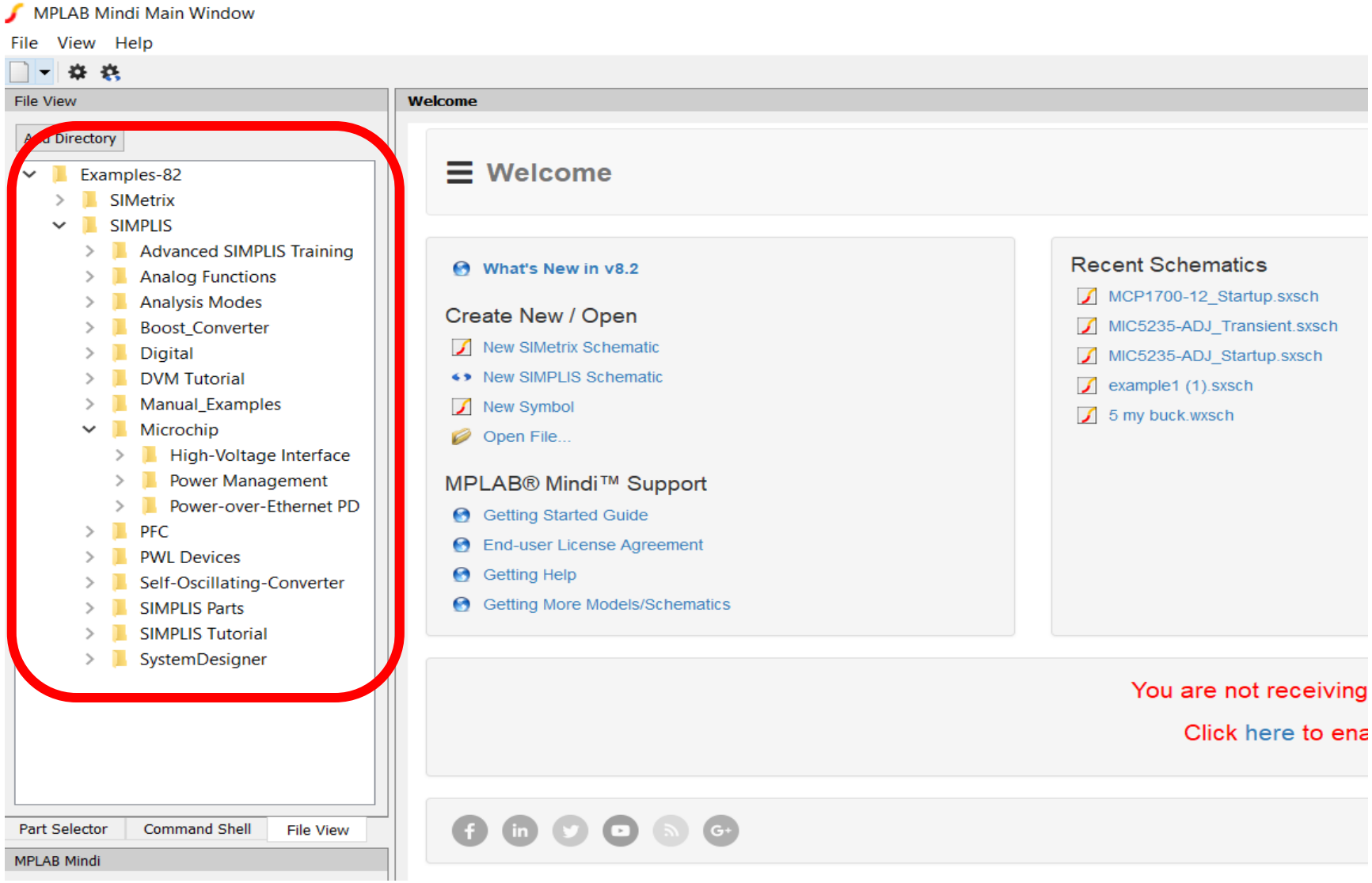
II. Choose the Analysis

III. Run the Simulation

IV. Analyze the Output Data / Waveform

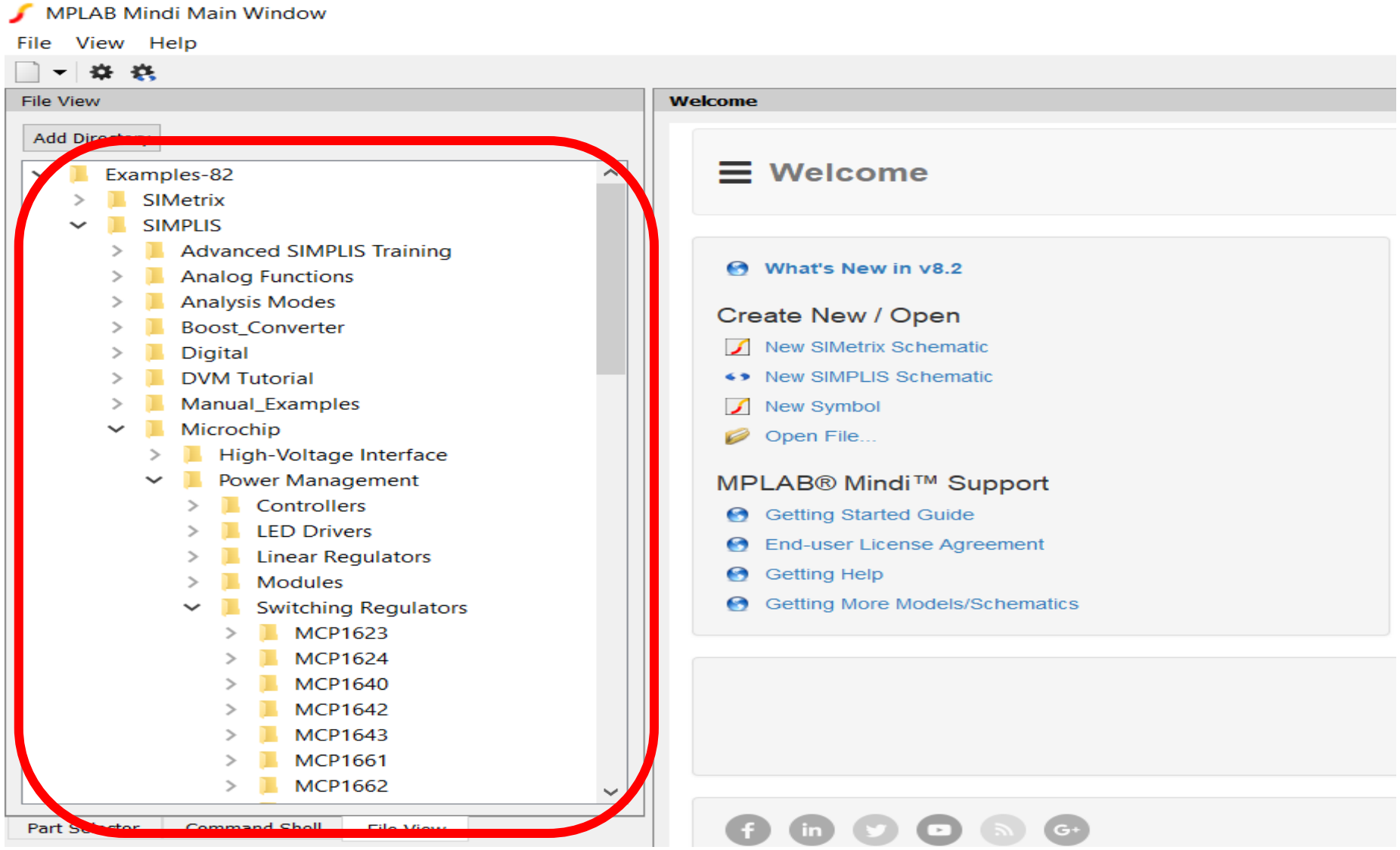
V. Modify to match your design

The GUI Environment Application Schematics



MICROCHIP

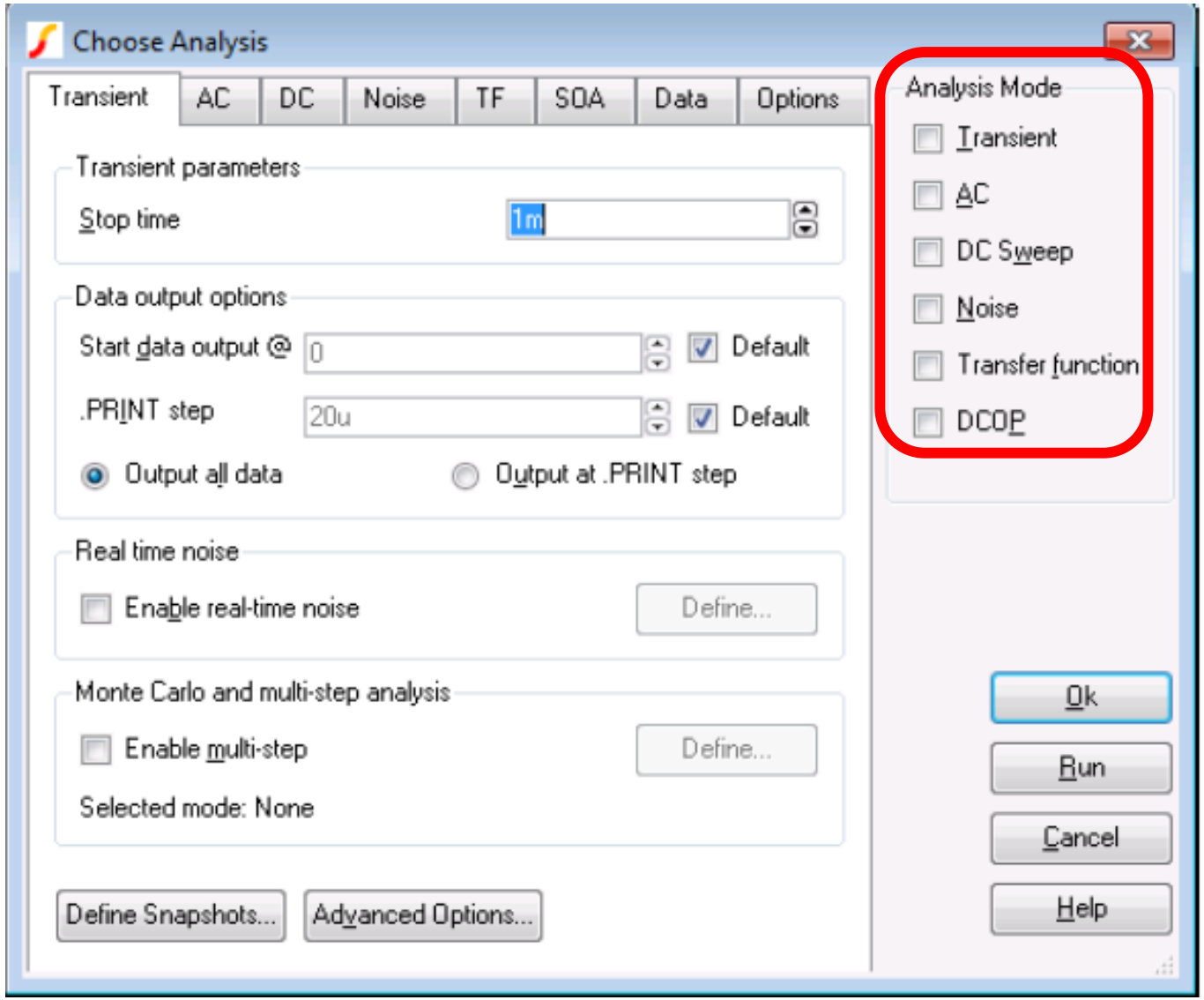
1. Select the Schematics



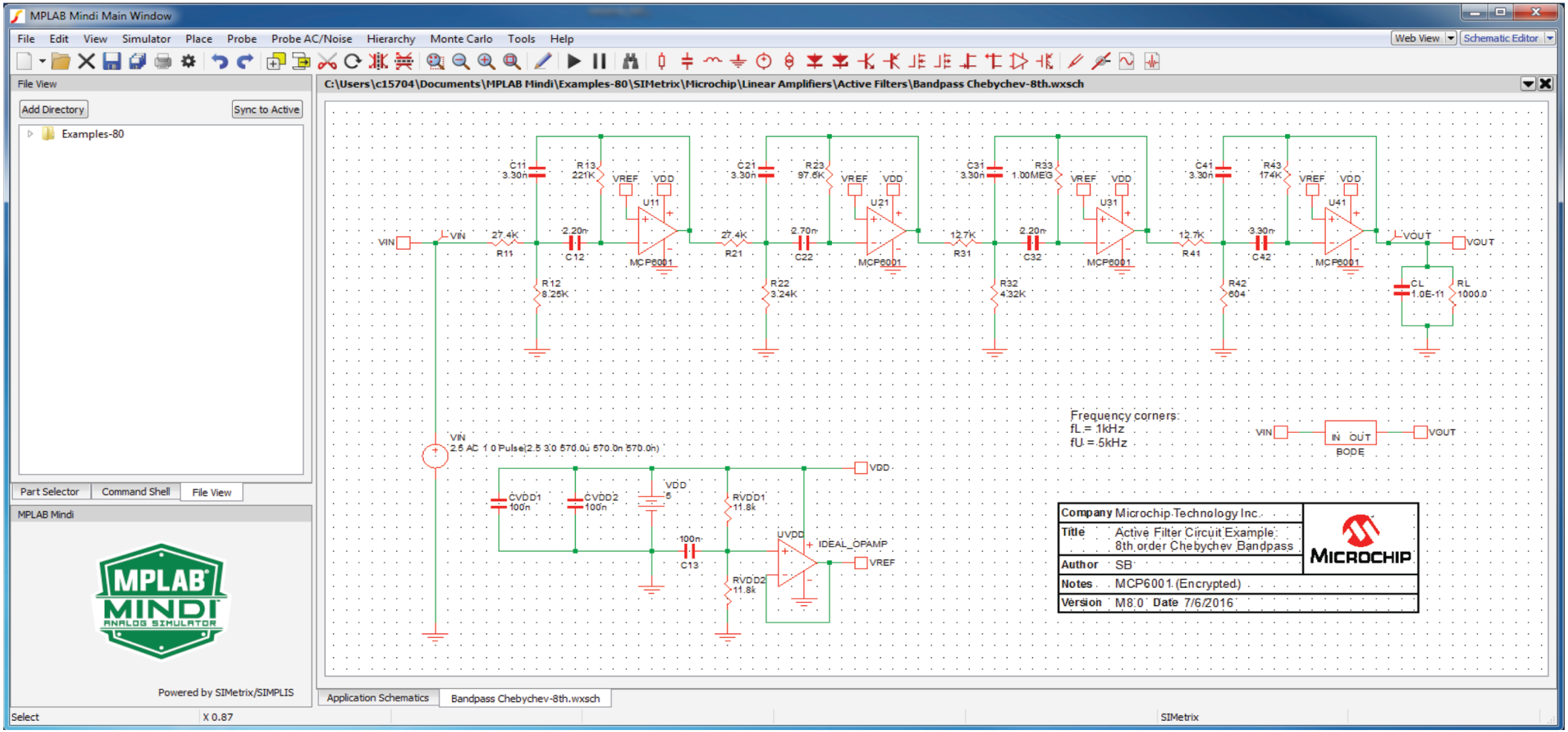
2. Choose the Analysis

Simulator:

1. Transient
2. AC
3. DC
4. Noise
5. ….



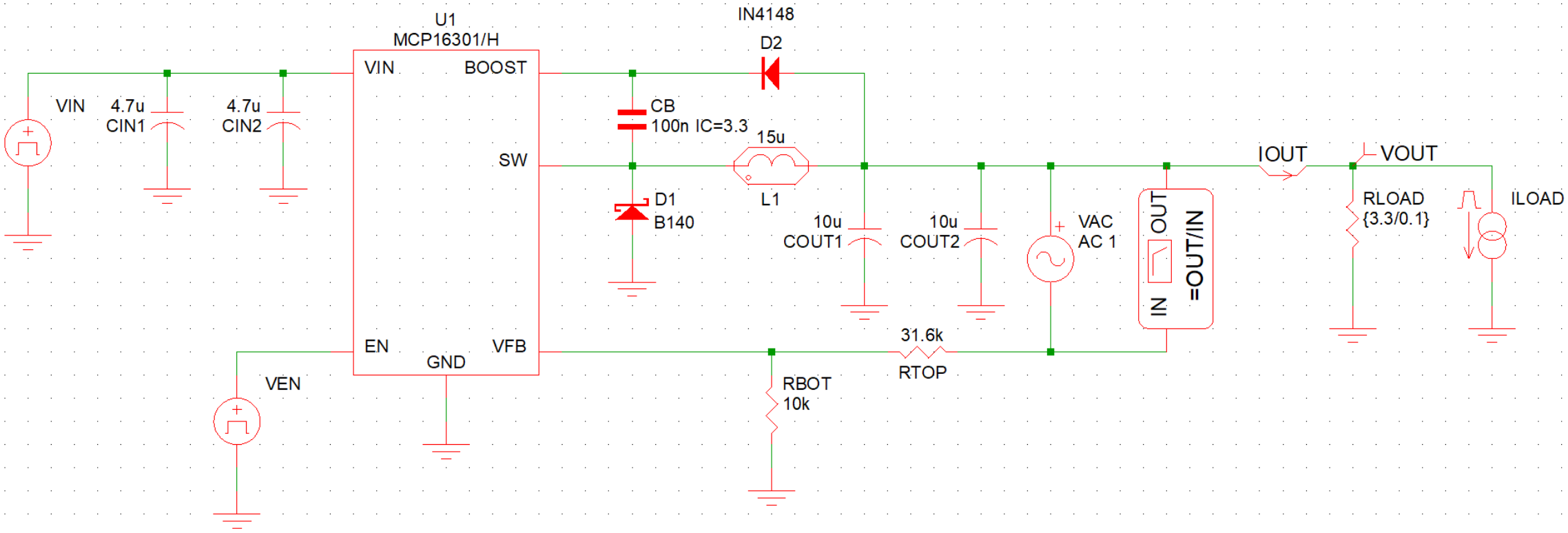
MPLAB® Mindi™ Analog Simulator - SPICE Simulations with SIMetrix®



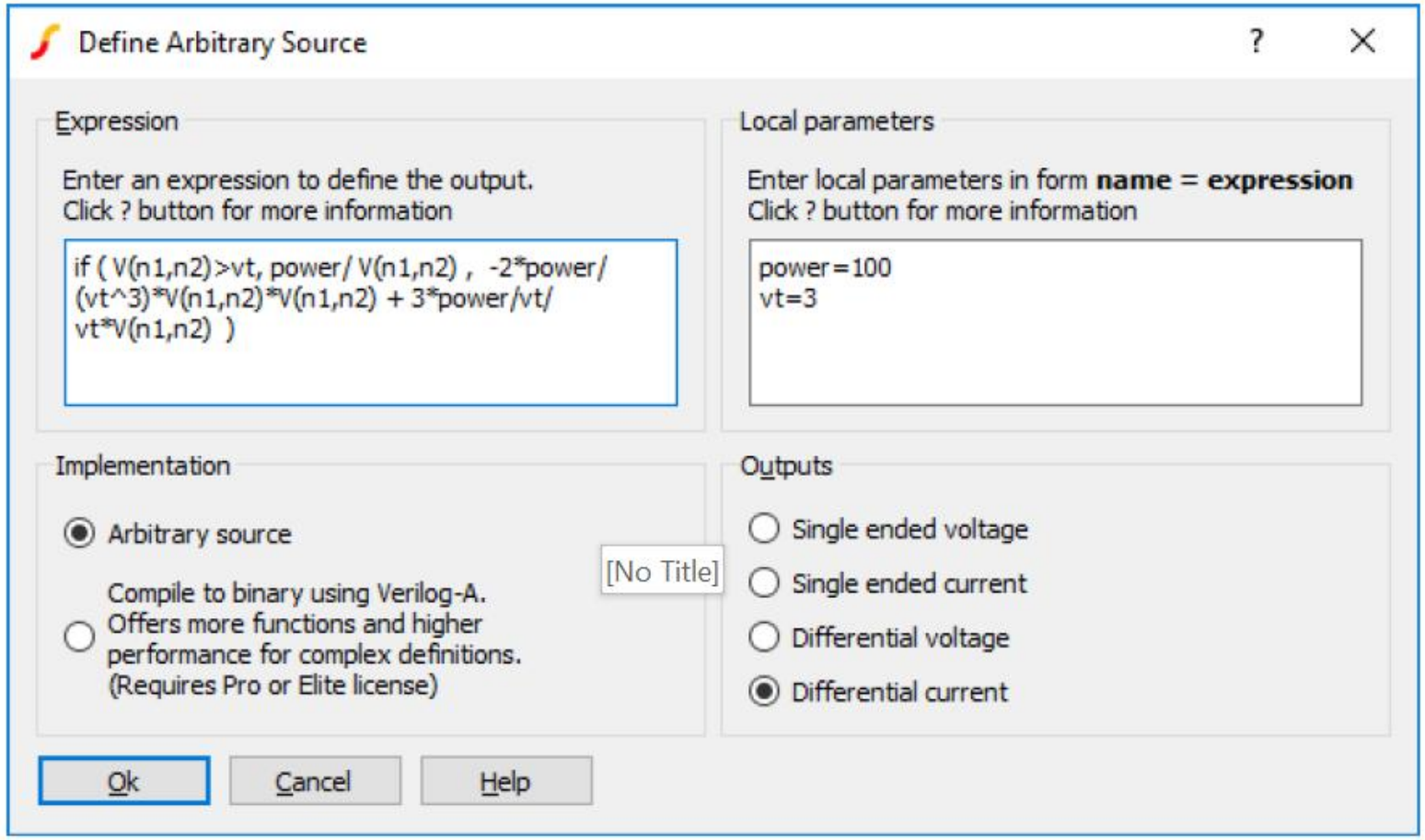
MPLAB® Mindi™ Analog Simulator SIMPLIS® Simulation Engine

- Design and simulate switching power electronics
- Combines accuracy and speed
- Full-featured design environment
- Can enable PSpice and HSpice compatibility

MPLAB® Mindi™ Analog Simulator - Switching Circuit Simulation With SIMPLIS®



MPLAB® Mindi™ Analog Simulator Using Analog Behavioral Blocks



MPLAB® Mindi™ Analog Simulator - Recap

- Reduces risk by simulating prior-to-hardware prototype
- Proprietary files to model Microchip analog and power devices
- A growing library of individual application schematics and Microchip device models
- Local installation – no internet connection required for use
- Fast simulation times
- Free to use with limited node count
  - Our encrypted models within Mindi do not contribute to the node count

Obrigado !!!

Presentation Feedback