Infineon XMC™ Microcontroller Co-Simulation

IPCEI on ME - Important Project of Common European Interest on Microelectronics

Infineon Technologies AG

2025-04-14

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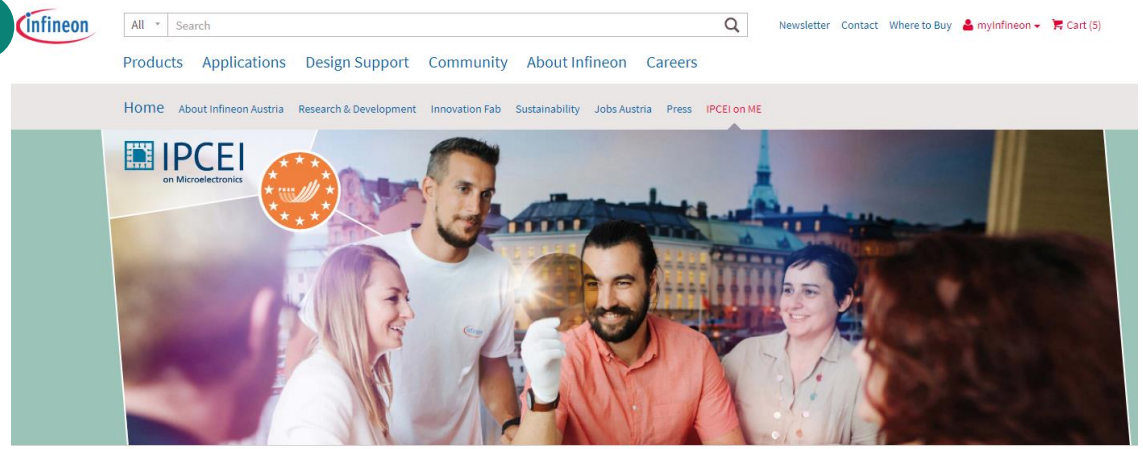
IPCEI Homepage
https://www.infineon.com/cms/austria/en/IPCEI-on-ME

1



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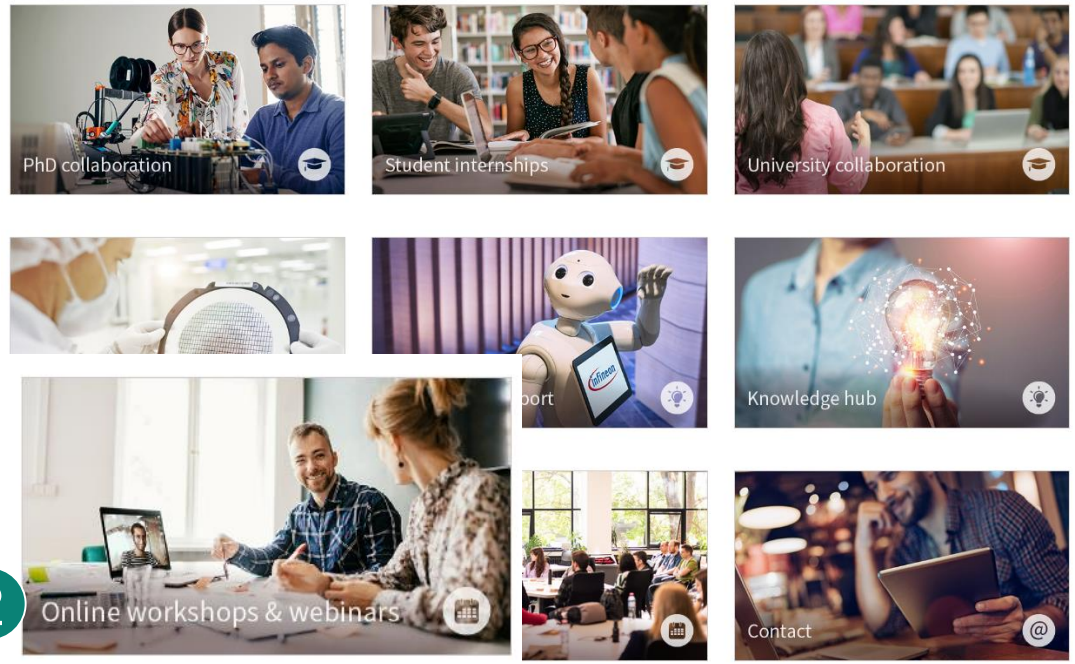

3

Event	Date	Time	
Microcontroller Co-Simulation	18.10.2023	10:00 - 11:00	› More information
		New time!	
Digital Power Supply Simulation	18.10.2023	11:00 - 12:00	› More information
		New time!	
Online LCC development tool	28.11.2023	13:00 - 14:00	› More information
Quick design of a flyback converter	28.11.2023	14:00 - 15:00	› More information
Application driven development Part I: USB-PowerDelivery	13.12.2023	14:00 – 15:00	› More information
Application driven development Part II: Embedded Coding	13.12.2023	15:00 - 16:00	› More information
Application driven development Part III: Cloud Co-Simulation	13.12.2023	16:00 - 17:00	› More information

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Driving decarbonization and digitalization. Together.

Semiconductors are crucial to solve the energy challenges of our time and shape the digital transformation.

This is why Infineon is committed to actively driving decarbonization and digitalization.

As a global semiconductor leader in power systems and IoT, we enable game-changing solutions for green and efficient energy, clean and safe mobility, as well as smart and secure IoT.

We make life easier, safer, and greener.
Together with our customers and partners.
For a better tomorrow.

Infineon is a global leader in power systems and IoT

Global leader

in automotive, power management,
energy efficient technologies and IoT

~58,060

employees[1]

Market position

Automotive	Power	Microcontroller
#1	**#1**	**#1**
TechInsights, April 2024	Omdia, October 2024	Omdia, March 2025

[1] As of 30 September 2024

Infineon at a glance

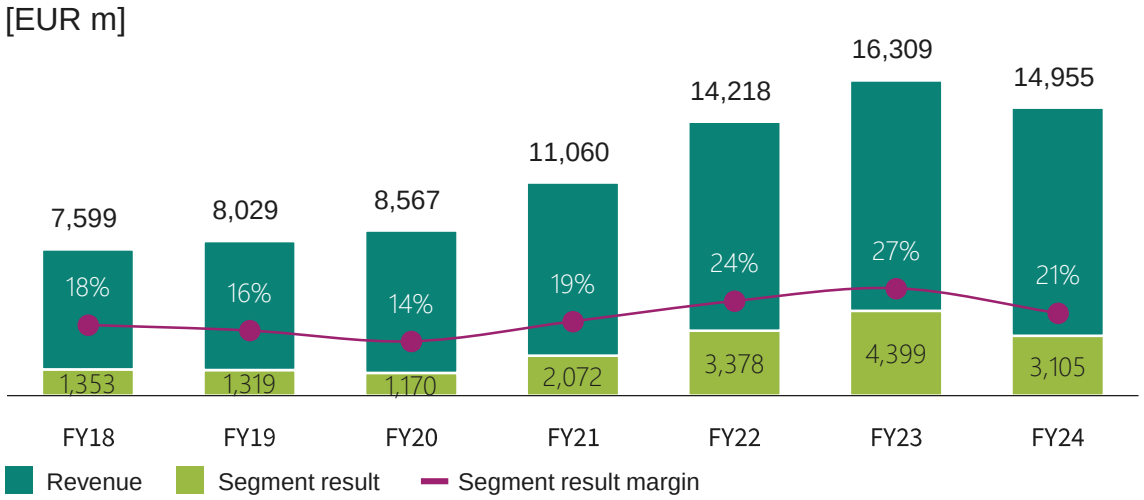
Growth areas

Energy
green and efficient

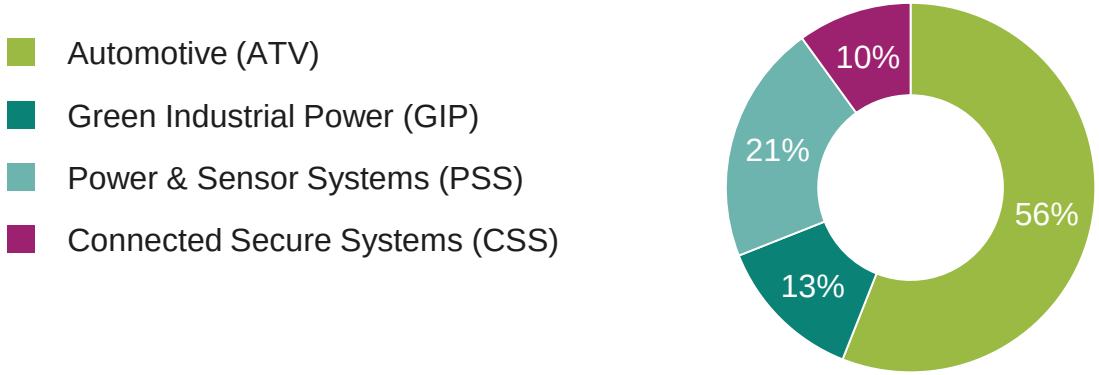
Mobility
clean and safe

IoT
smart and secure

Financials



FY24 revenue by segment[1]

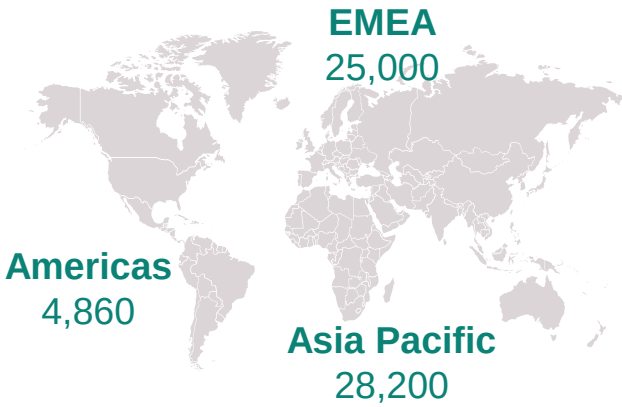


Employees[1]

58,060
employees worldwide

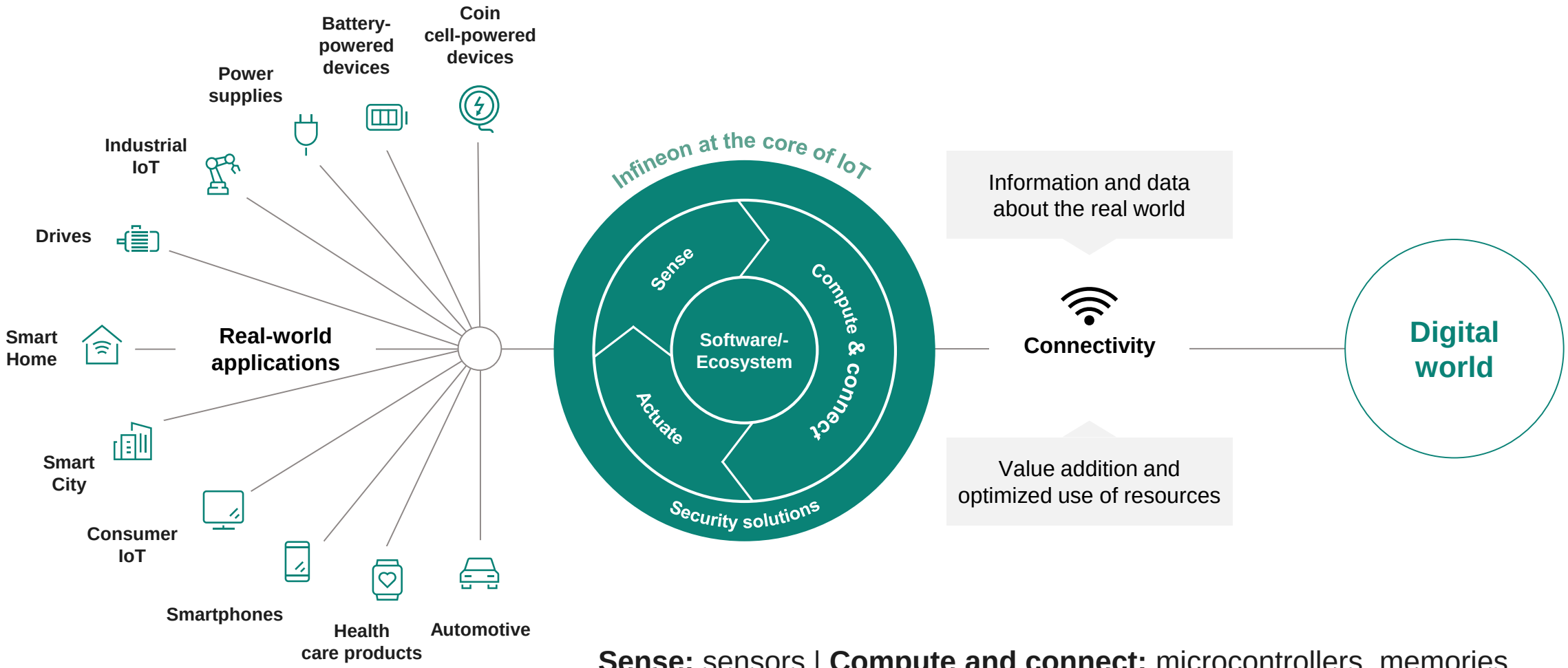
71
R&D and

15
manufacturing locations[2]



For further information: Infineon Annual Report.
1 2024 Fiscal year (as of 30 September 2024) | **2** As of 30 September 2024

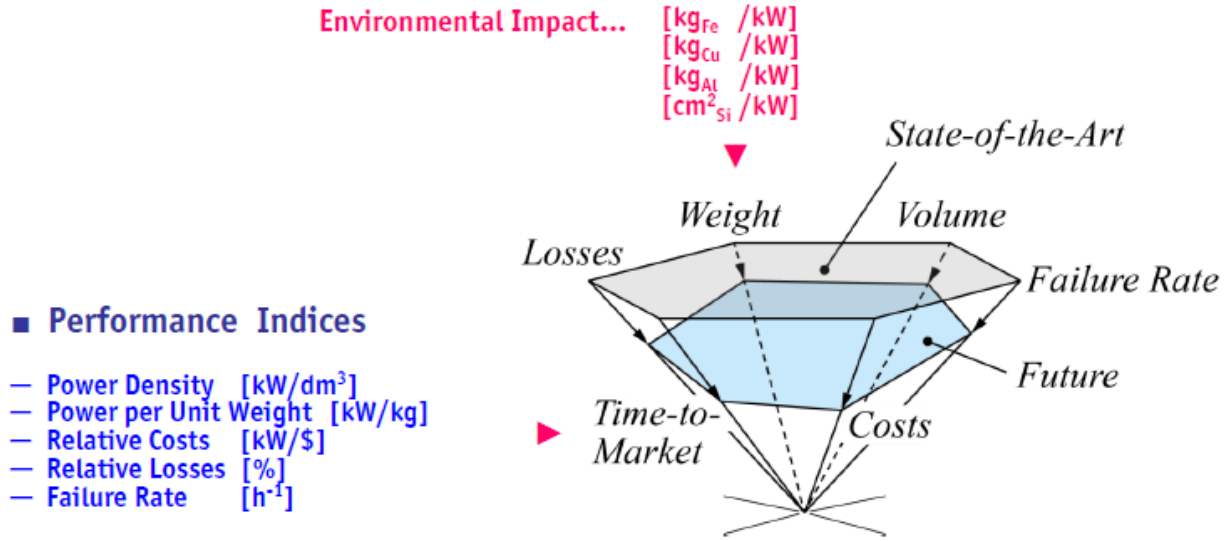
Infineon at the core of IoT – Driving digitalization by serving strongly growing multi-application markets



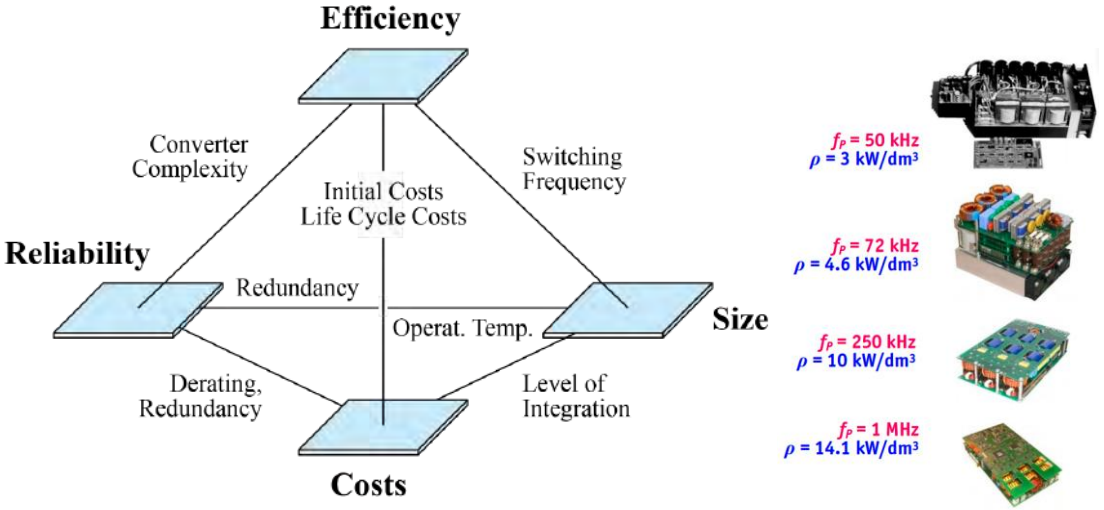
Sense: sensors | **Compute and connect:** microcontrollers, memories, Wi-Fi, Bluetooth, BLE, USB | **Actuate:** Power semiconductors

Power Converter Optimization Challenge

Design Space Exploration



Trade-off Finding

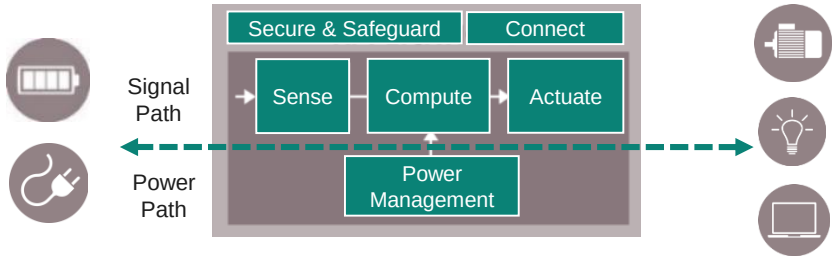


– [Burkart_Kolar1] Ralph M. Burkart & Johann W. Kolar: Tutorial Advanced Modeling and Multi-Objective Optimization / Evaluation of SiC Converter Systems, ETH Zurich, Power Electronic Systems Laboratory

Simulation Platforms: proven way to design-win

Infineon Developer Center
https://softwaretools.infineon.com

Selection Tools Solution Finder



- easy
- safe
- green
- connected

Sense	Compute	Actuate	Connect	Secure & Safeguard
› Does the sensor switch at the right position?	› Is my design stable? › Does my software run w/o errors?	› What is the overall efficiency? › Does my design not overheat?	› Is my solution safe? › Is my solution secure?	

Simulation Tools Aspects

Sense	Compute	Actuate	Connect	Secure & Safeguard
Magnetic design	Electrical design Thermal design Software design (Controller)			Software Design (Protocols, Safety/Security)

Online

Sense	Compute	Actuate	Connect	Secure & Safeguard
Sensor Tools (3D, Angle & Hall sensors)	Infineon Designer (MOSFET, IGBT, Gate Driver IC, Voltage Regulator, Audio Class D, MCU) TINA	IPOSIM (IGBT, Bipolar, SiC) Motor Simulator (IGBT, IPM) OPTIREG™ (PMIC) PowerEsim (SMPS)		arm KEIL Studio TASKING IAR SYSTEMS

Offline

Sense	Compute	Actuate	Connect	Secure & Safeguard
	OrCAD CADENCE PCB SOLUTIONS, SIMetrix SIMULATOR, LTspice TINA Spice, PSpice, SIMetrix, [LTspice[1]]	MATLAB SIMULINK, plecs		ModusToolbox™ AURIX™ Development Studio

[1] Discrete switches & diodes only

[Owner: Infineon Technologies AG Doc ID: Infineon IPCEI-ME Webinar Microcontroller Co-Simulation Vers.: v1.0]

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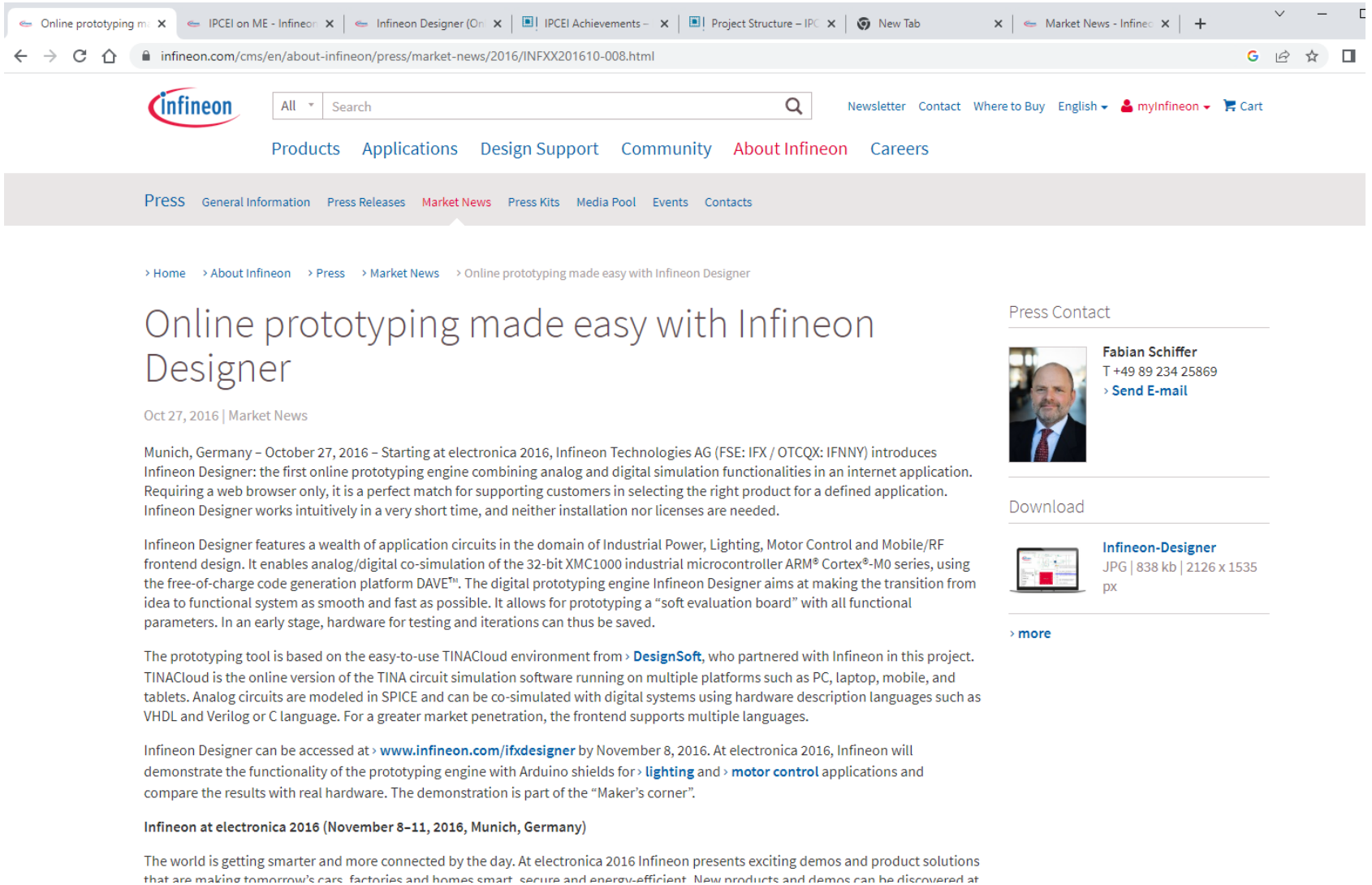
Infineon Designer - Online SPICE Engine

https://www.infineon.com/cms/en/about-infineon/press/market-news/2016/INFXX201610-008.html



infineon.com/cms/en/about-infineon/press/market-news/2016/INFXX201610-008.html

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› Home › About Infineon › Press › Market News › Online prototyping made easy with Infineon Designer

Online prototyping made easy with Infineon Designer

Oct 27, 2016 | Market News

Munich, Germany – October 27, 2016 – Starting at electronica 2016, Infineon Technologies AG (FSE: IFX / OTCQX: IFNNY) introduces Infineon Designer: the first online prototyping engine combining analog and digital simulation functionalities in an internet application. Requiring a web browser only, it is a perfect match for supporting customers in selecting the right product for a defined application. Infineon Designer works intuitively in a very short time, and neither installation nor licenses are needed.

Infineon Designer features a wealth of application circuits in the domain of Industrial Power, Lighting, Motor Control and Mobile/RF frontend design. It enables analog/digital co-simulation of the 32-bit XMC1000 industrial microcontroller ARM® Cortex®-M0 series, using the free-of-charge code generation platform DAVE™. The digital prototyping engine Infineon Designer aims at making the transition from idea to functional system as smooth and fast as possible. It allows for prototyping a "soft evaluation board" with all functional parameters. In an early stage, hardware for testing and iterations can thus be saved.

The prototyping tool is based on the easy-to-use TINACloud environment from › **DesignSoft**, who partnered with Infineon in this project. TINACloud is the online version of the TINA circuit simulation software running on multiple platforms such as PC, laptop, mobile, and tablets. Analog circuits are modeled in SPICE and can be co-simulated with digital systems using hardware description languages such as VHDL and Verilog or C language. For a greater market penetration, the frontend supports multiple languages.

Infineon Designer can be accessed at › **www.infineon.com/ifxdesigner** by November 8, 2016. At electronica 2016, Infineon will demonstrate the functionality of the prototyping engine with Arduino shields for › **lighting** and › **motor control** applications and compare the results with real hardware. The demonstration is part of the "Maker's corner".

Infineon at electronica 2016 (November 8–11, 2016, Munich, Germany)

The world is getting smarter and more connected by the day. At electronica 2016 Infineon presents exciting demos and product solutions

Press Contact

Fabian Schiffer
T +49 89 234 25869
› **Send E-mail**

Download

Infineon-Designer
JPG | 838 kb | 2126 x 1535 px

› **more**

- Launched at Electronica 2016
- Online, no installation, no license fee, easy to use
- 1000+ application circuits (lighting, power supplies, motor control, computing DC-DC PoL, audio etc.)
- Accurate transient and system efficiency simulation powered by TINA SPICE engine
- Full-featured circuit editor with Infineon SPICE library for free
- Export to Altium PCB design and export of the BoM (Bill of Materials)
- Fast parameter configuration with design tool for better evaluation experience
- Digital/analog co-simulation (e.g. Microcontroller code debugging)

Infineon Designer Server Infrastructure
www.infineon.com/ifxdesigner

Online

Infineon

Infineon Server

www.infineon.com/ifxdesigner

Demo mode	No registration needed (no circuit editor) https://design.infineon.com/tinademo/designer.php
Expert mode	Please register here (full version): https://design.infineon.com/tinaui/designer.php
Registration to myInfineon	https://www.infineon.com/cms/en/myInfineon/benefits/

Upgrade

Firewall

DesignSoft Server

www.tinacloud.com

TINA WEB-BASED CIRCUIT DESIGN & ANALYSIS Cloud

PC, Mac, Tablet, Smartphone
Available in 22 languages

Online

DesignSoft
Excellence In Computer Aided Design and Educational Software

Industrial version

TINA V12

Texas Instruments

TINA-TI
SPICE-based analog simulation program

Offline

[Owner: Infineon Technologies AG Doc ID: Infineon IPCEI-ME Webinar Microcontroller Co-Simulation Vers.: v1.0]

Infineon Designer Features

- Component losses
- Component junction temperature
- Steady-state system efficiency

- Infineon product footprints
- Passive component footprints
- Altium PCB project with schematic

- Detailed BoM including type, value, footprint, part number, description, manufacturer and more
- Export to excel or print to PDF

- Fast configuration of circuit variables and global parameters
- Individual function programming

- Support of XMC1000 family
- Instruction cycle accurate co-simulation including peripheral support
- ModusToolbox™ replacing DAVE™ IDE for code generation
- New: XMC4400 simulation

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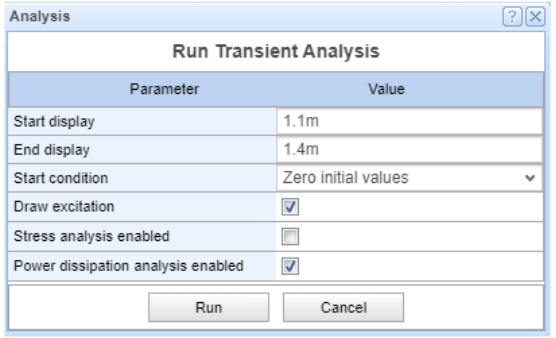
Thermal & System Efficiency Simulation

24V Automotive Battery Switch Demonstrator

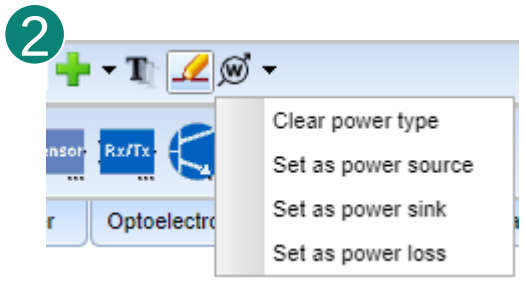
1. Open circuit and login with myInfineon account

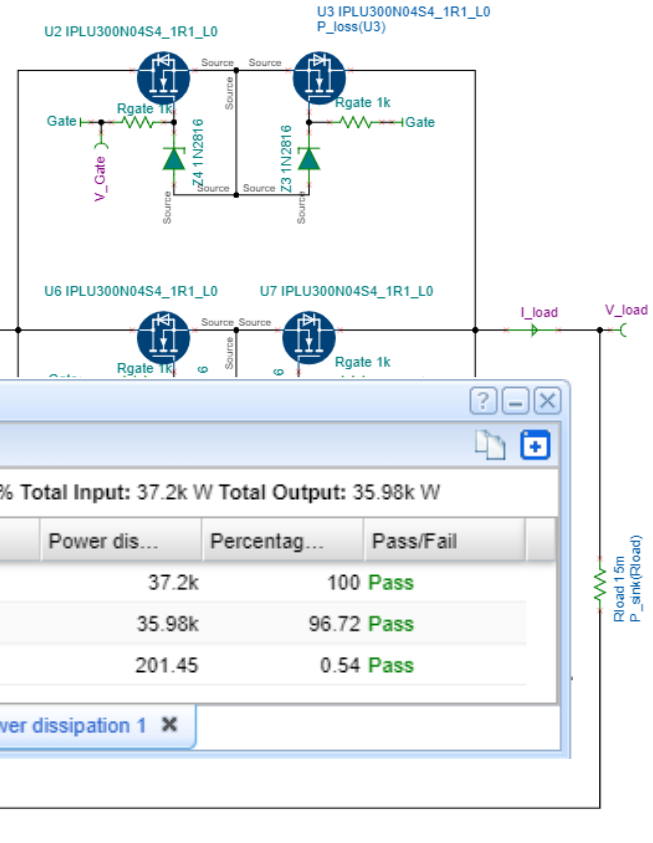
2. Check & set the power types of components

3. Set transient analysis and run simulation



2 Set MOSFET as power loss





2 Set Battery as power source

2 Set Load as power sink

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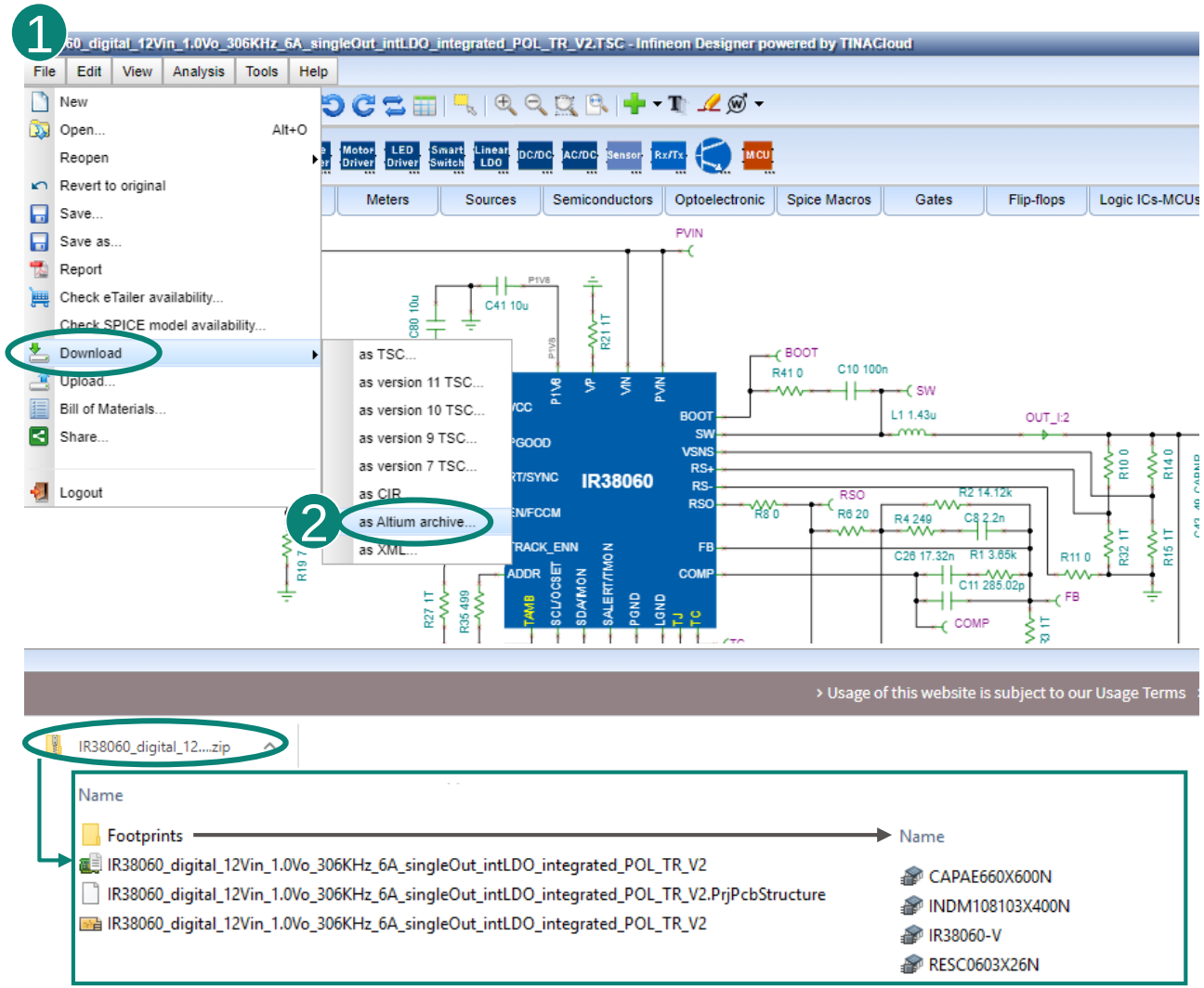
Export to Altium PCB

1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open circuit and login with myInfineon account

2. Download as Altium archive and check



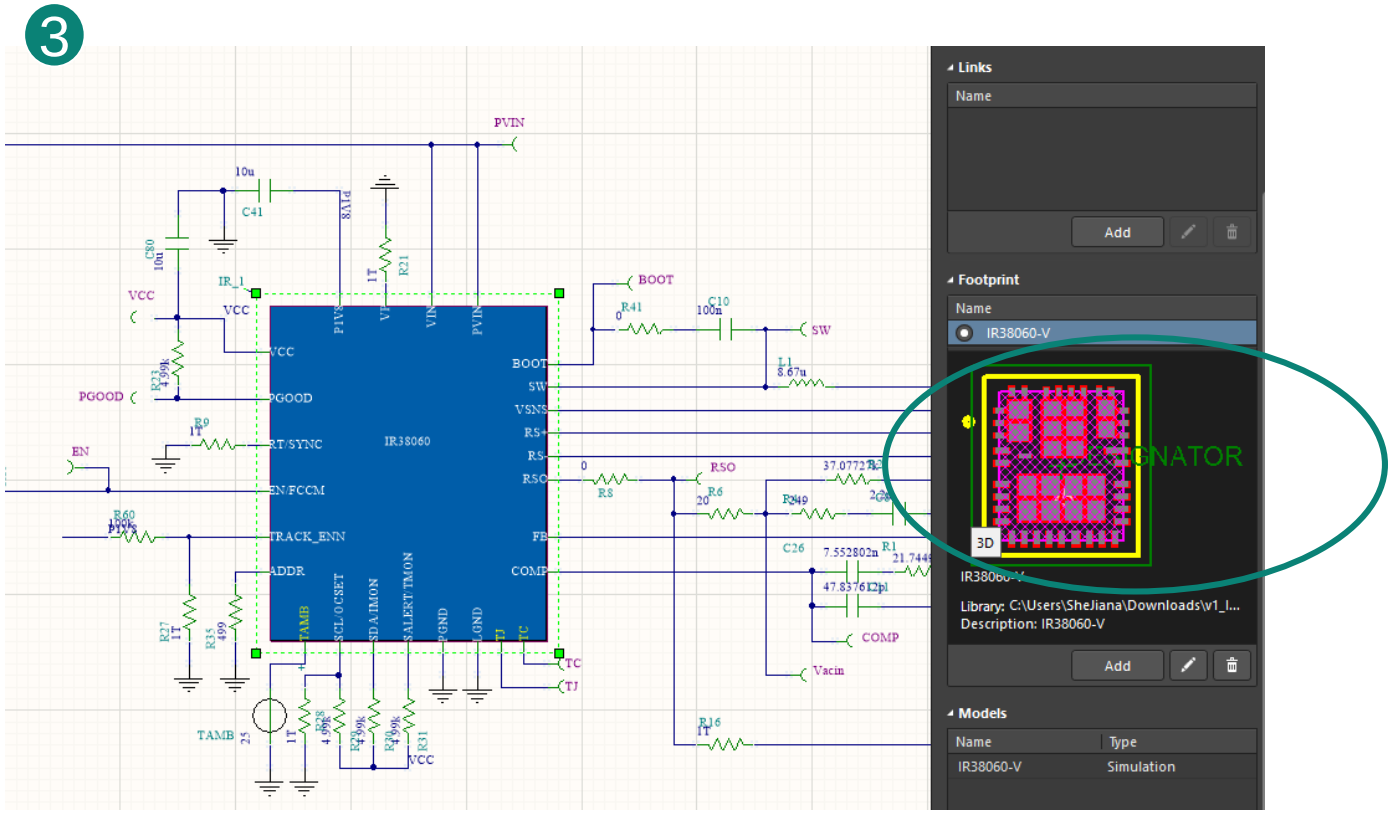
Export to Altium PCB

1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open circuit and login with myInfineon account

2. Download as Altium archive and check

3. Open project in Altium and start PCB design



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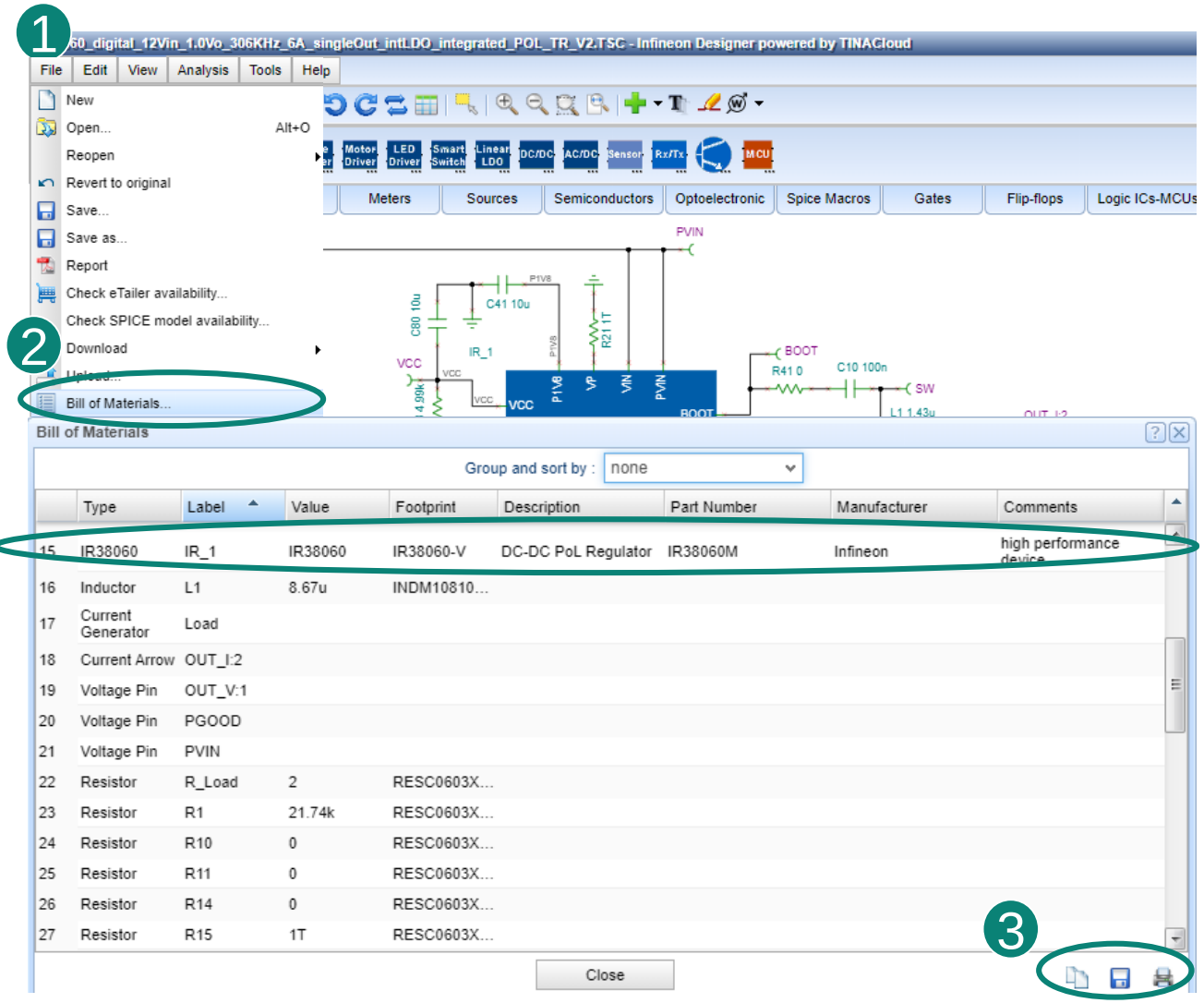
Export the Bill of Materials

1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open circuit and login with myInfineon account

2. Open the Bill of Materials, check details

3. Save to Excel .csv



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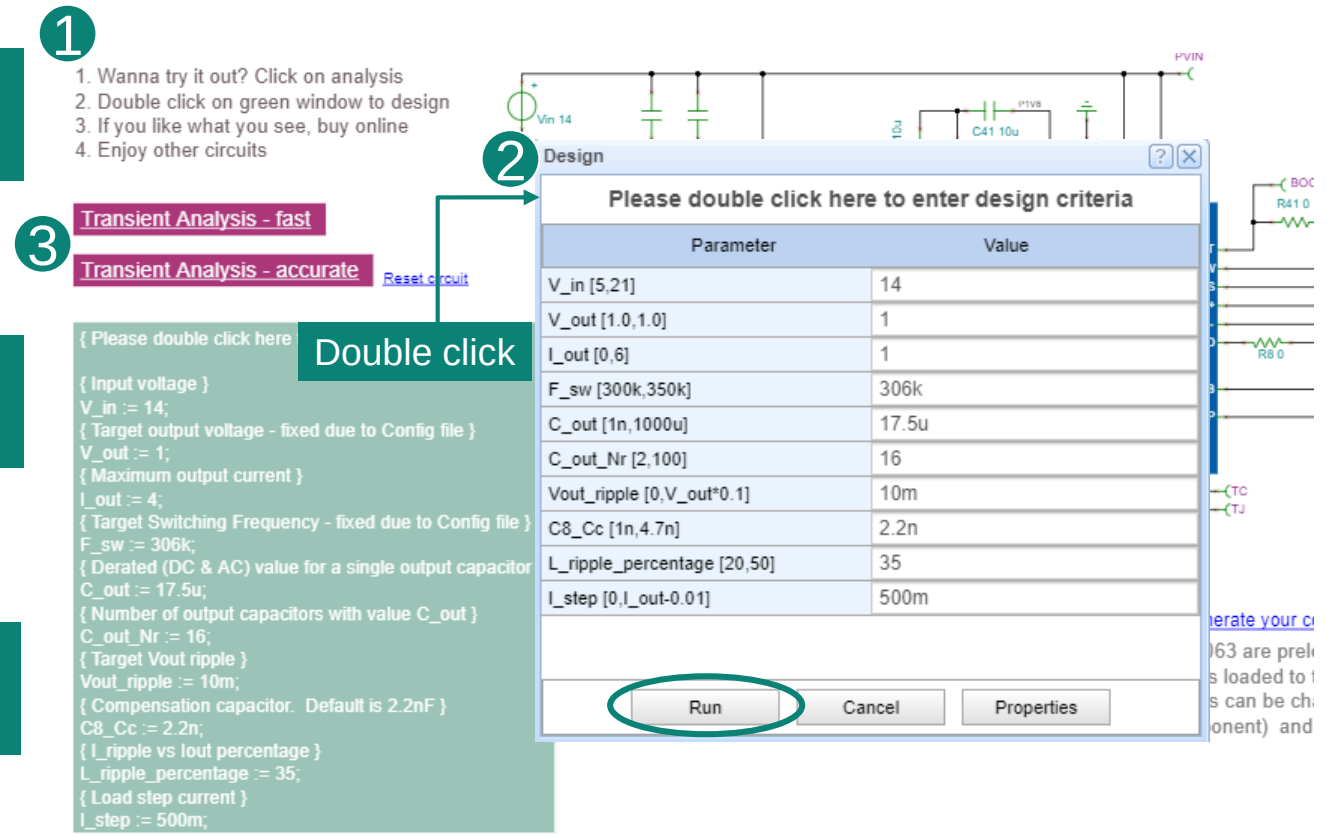
Use Design Tool - Parameter Setting & Calculation

1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open circuit and login with myInfineon account

2. Open design tool, set parameters and Run

3. Simulate again



- Design Tool (advanced mode see appendix)
  - Easier parameter setting
  - Faster value calculation for all circuit components set by defined formulas & scripts

Infineon Designer Features

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Digital Twin Circuit Simulation
simulate first on virtual system before building the real hardware

1 build application code project in ModusToolbox™ or DAVE™ IDE

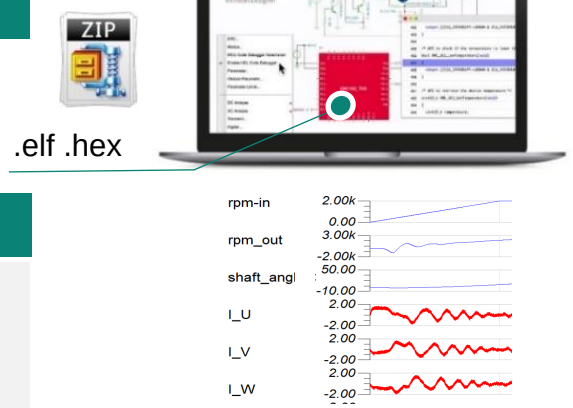
2 upload .elf .hex to simulator

3 co-simulate XMC™ w/ SPICE

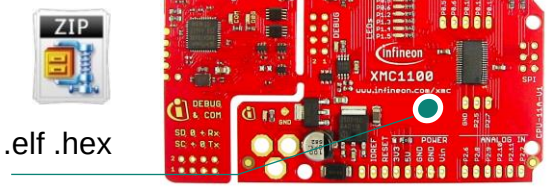
1. Value Proposition MCU co-simulation
2. Time-to-market: start developing before you have the hardware kit
3. Safety: test on virtual system will not harm engineer or destroy hardware
4. Cost: exploration of design space cheaper than building hardware many times
5. Security: CSS controller lack a debug interface so code debugging can be only

4 run on real hardware kit

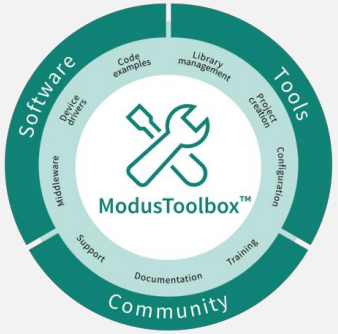
Simulation: Digital Twin



Real System



https://www.Infineon.com/modustoolbox

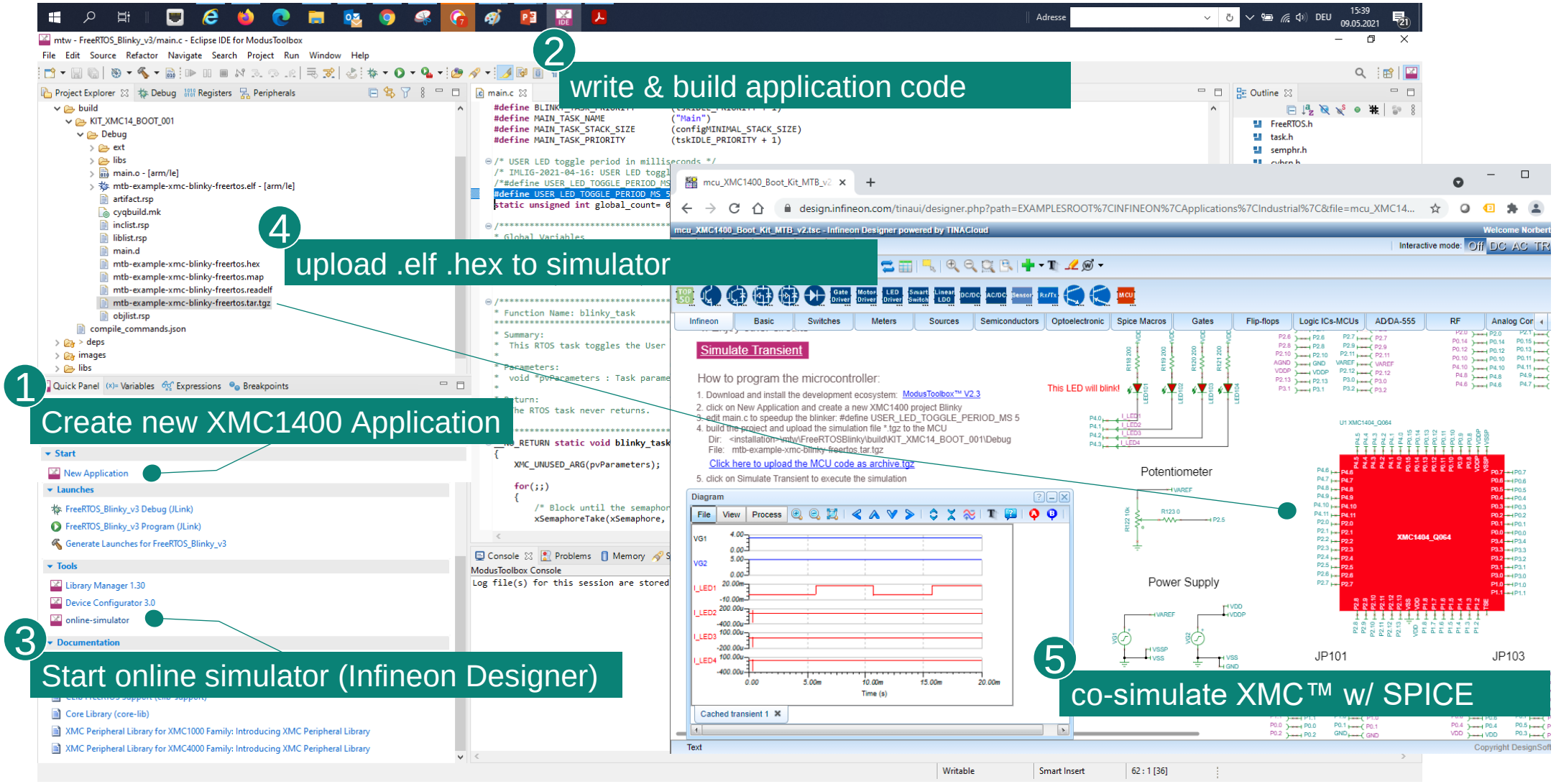


Value Proposition

- **Flexible:** You can use any IDE in your own workflow (Eclipse, GNU Make, IAR Embedded Workbench, KEIL µVision; Visual Studio Code)
- **Cross platform**: Linux, macOS, Windows
- **GitHub software ecosystem driven by manifests**: Create a project with the latest version using Project Creator independent of any IDE and export to any IDE
- **Library Manager** Add, update, or remove libraries with the Library Manager
- **Kit & Board Support**: Includes board support packages (BSPs). Every release of every library is readily available
- **Tools & Configurators:** to set things up Device, CapSense, QSPI, Smart I/O, USB, Bluetooth, Segment LCD

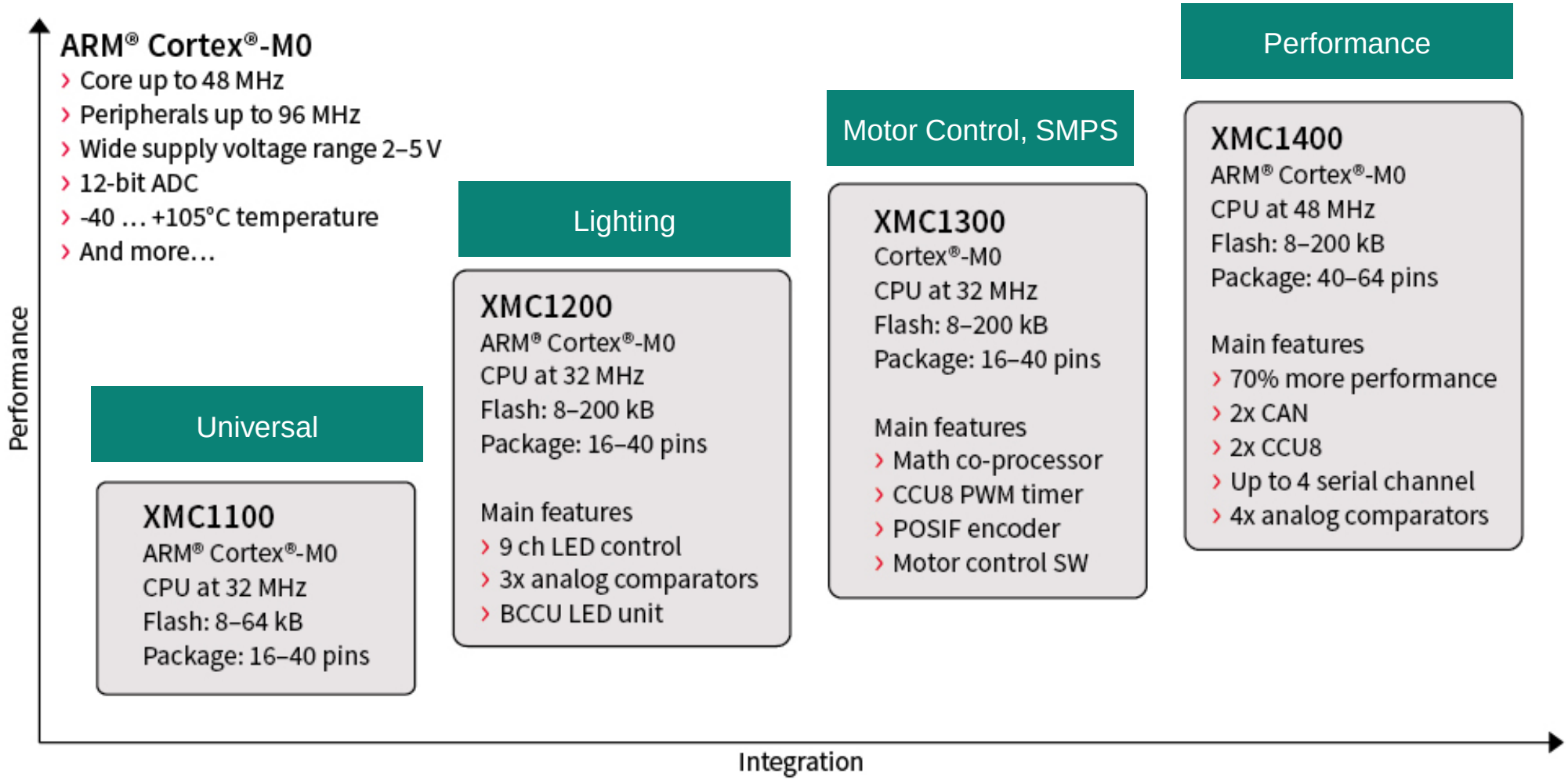
ModusToolbox™ Example

Digital Twin of XMC1400 Boot Kit co-simulating Application Code generated by ModusToolbox™



Simulation: 32-bit XMC1000™ Industrial MCU Arm® Cortex®-M

https://www.infineon.com/xmc



New: 32-bit XMC4400™ Industrial MCU Arm® Cortex®-M

https://www.infineon.com/xmc

Brand	Device																	
XMC	4	4	0	0	–	F	144	K	1024	AC								

ARM® Cortex®-M4F	Frequency [MHz]	Memory	Analog			Timer/PWM					Connectivity							Package
			ADC 12 bit / S&H	Number of channels	DAC 12 bit	CCU4 (4 ch)	CCU8 (4 ch)	HRPWM (150 ps)	POSIF	ΔΣ demodulator	USIC	CAN2.0B	USB	Ethernet	EtherCAT®	SDIO/SD/MMC	External Bus Unit (EBU)	
XMC41x	80	Flash 64–128 kB RAM 20 kB	2/2	up to 9	2 ch	2x	1x	●	●	–	4x	up to 2	●	–	–	–	–	VQFN-48 TQFP-64
XMC42x	80	Flash 256 kB RAM 40 kB	2/2	up to 9	2 ch	2x	1x	●	●	–	4x	2x	●	–	–	–	–	VQFN-48 TQFP-64
XMC43x	144	Flash 256 kB RAM 128 kB	2/2	14	2 ch	2x	1x	–	–	–	4x	2x	●	●	●	●	–	LQFP-100
XMC44x	120	Flash 256–512 kB RAM 80 kB	4/4	up to 18	2 ch	4x	2x	●	2x	4 ch	4x	2x	●	●	–	–	–	TQFP-64 LQFP-100
XMC45x	120	Flash 512 kB-1 M RAM 128–160 kB	4/4	up to 26	2 ch	4x	2x	–	2x	4 ch	4x	up to 3	●	●	–	●	●	LQFP-100/144 LFBGA-144
XMC47x	144	Flash 1.5–2 MB RAM 276–352 kB	4/4	up to 26	2 ch	4x	2x	–	2x	4 ch	6x	6x	●	●	–	●	●	LFBGA-196
XMC48x	144	Flash 1–2 MB RAM 276–352 kB	4/4	up to 26	2 ch	4x	2x	–	2x	4 ch	6x	6x	●	●	●	●	●	LQFP-100/144 LFBGA-196
Supply voltage range 3.13 to 3.63 V																		
Temperature range -40°C … 85°C/125°C																		

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ModusToolbox™ replacing DAVE™

Legacy: DAVE™

Software complexity in embedded systems grows faster than Moore's law.

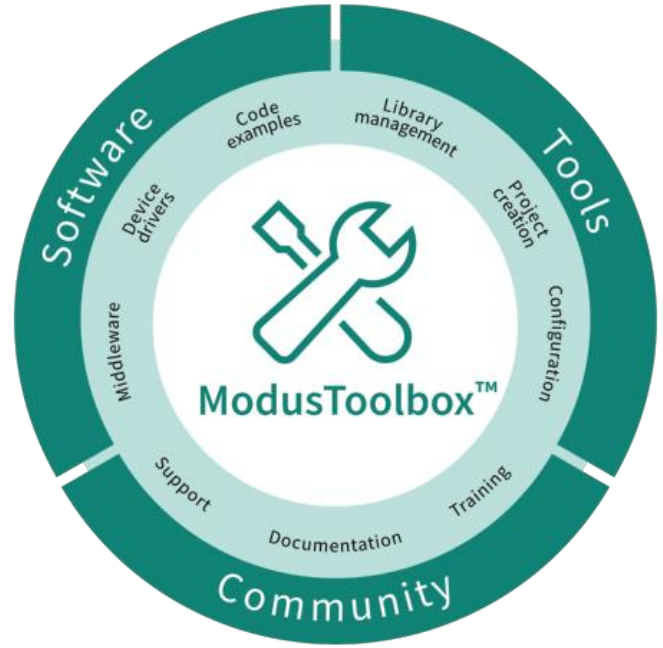
XMC™ Link
Isolated Debug Probe, based on SEGGER J-Link Technology

Digital **A**pplication **V**irtual **E**ngineer

- **Free** Eclipse CDT based IDE using GNU C-Compiler
- **Code generation** with **graphical user interface** (GUI)
  *Configurable and reusable code repository consist of **XMC™ Lib** (for all peripherals), **DAVE™ APPs**, and **EXAMPLES***
- Automatic assignment of chip resources (resolver)
- Debugger and Flash loader
- **All XMC™ MCUs** powered by ARM® Cortex®-M supported
- XMC™ Lib and DAVE™ APPs **tested** with GCC compiler, ARM® compiler, and TASKING compiler **released for** Altium, ARM/KEIL, Atollic, DAVE™, IAR Systems, and Rowley

https://softwaretools.infineon.com/tools?q=dave

New: ModusToolbox™



https://www.infineon.com/modustoolbox

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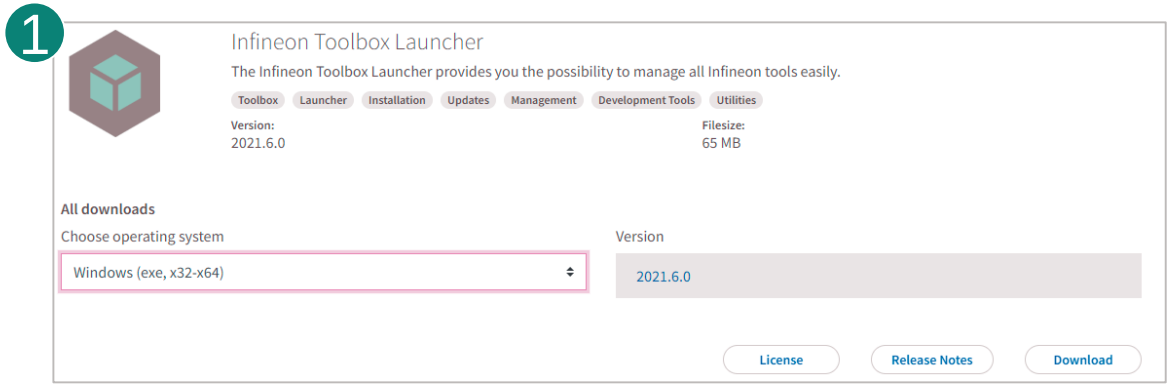
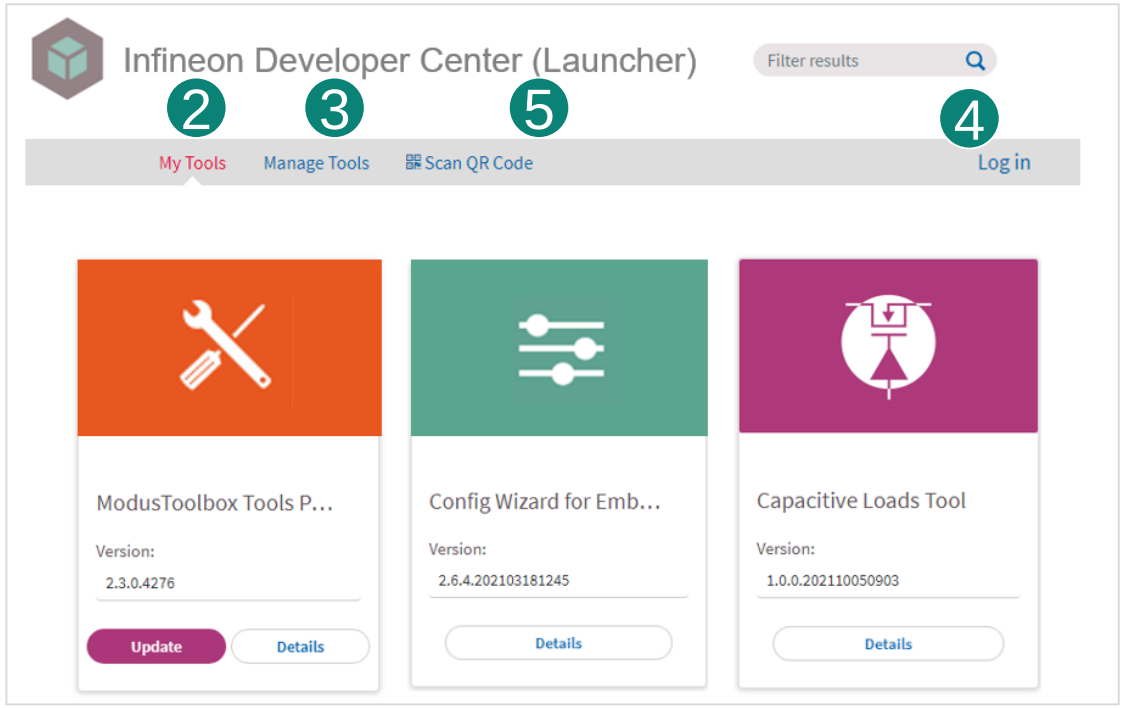
Step 1: download launcher utility and manage tools
https://softwaretools.infineon.com/tools/com.ifx.tb.launcher2

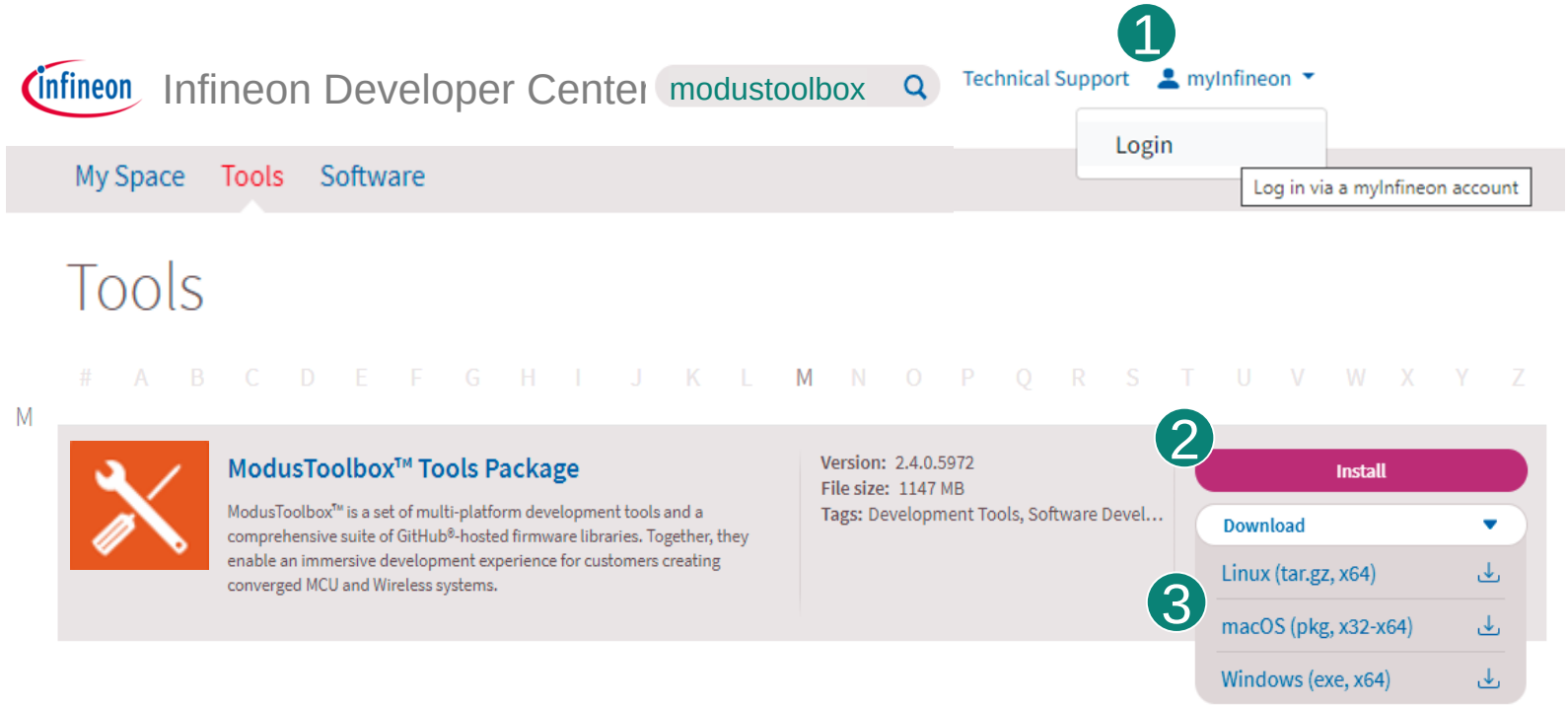




1. Install Launcher Utility
2. Download and install the Infineon Developer Center launcher (former Toolbox) utility: https://softwaretools.infineon.com/tools/com.ifx.tb.launcher2
3. The launcher utility on your computer from the Windows Start menu. It has 3 tabs
4. My Tools: here you find all the tools you installed. You start them and get informed about the latest updates
5. Manage Tools: here you can download more tools
6. Important: please login and allow admin rights before installing a new tool
7. Scan QR Code: this is for the registration of evaluation boards and new projects in MySpace

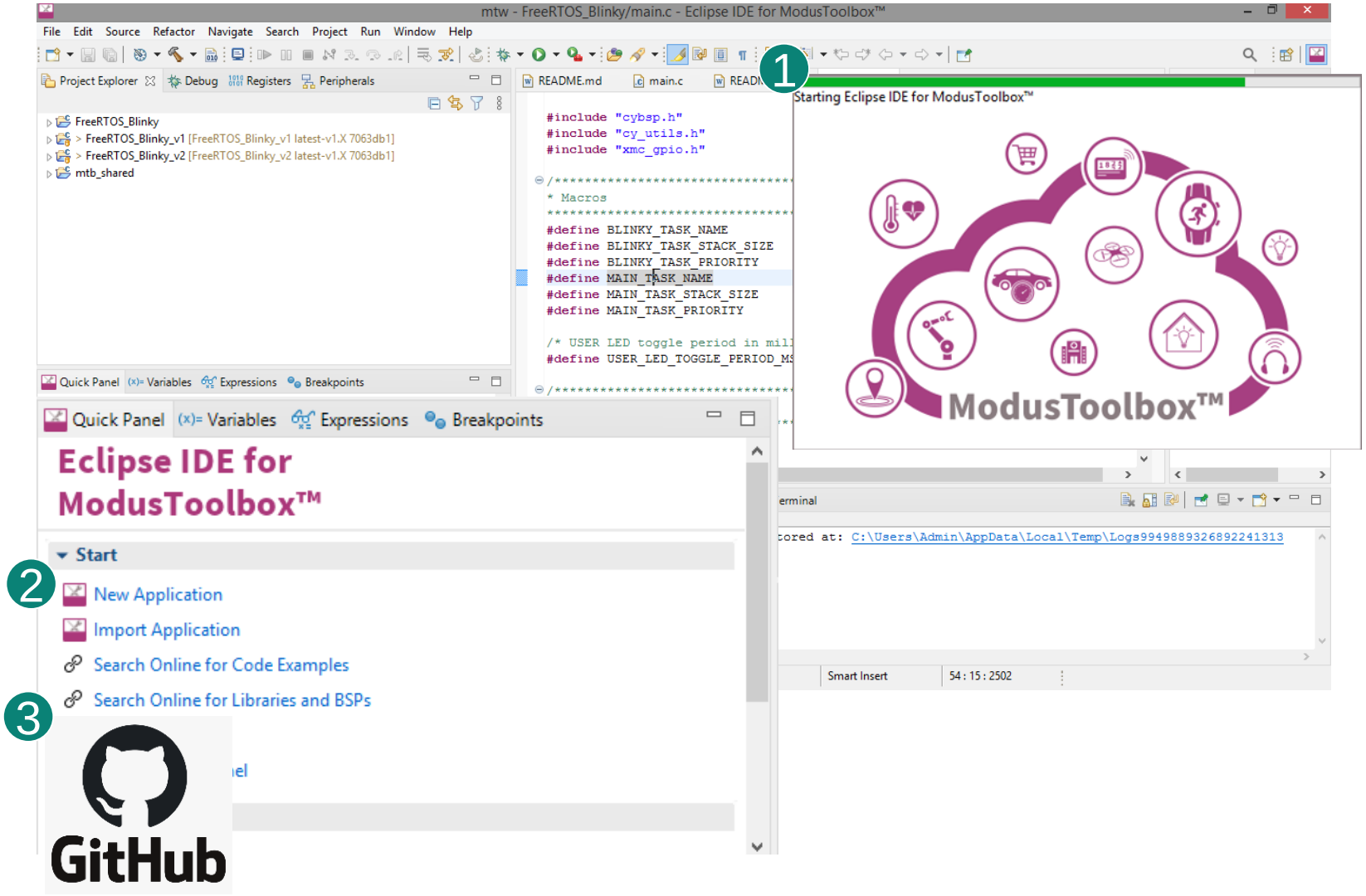
Step 2: install ModusToolbox™ from Infineon Developer Center

https://softwaretools.infineon.com/tools/com.ifx.tb.tool.modustoolbox



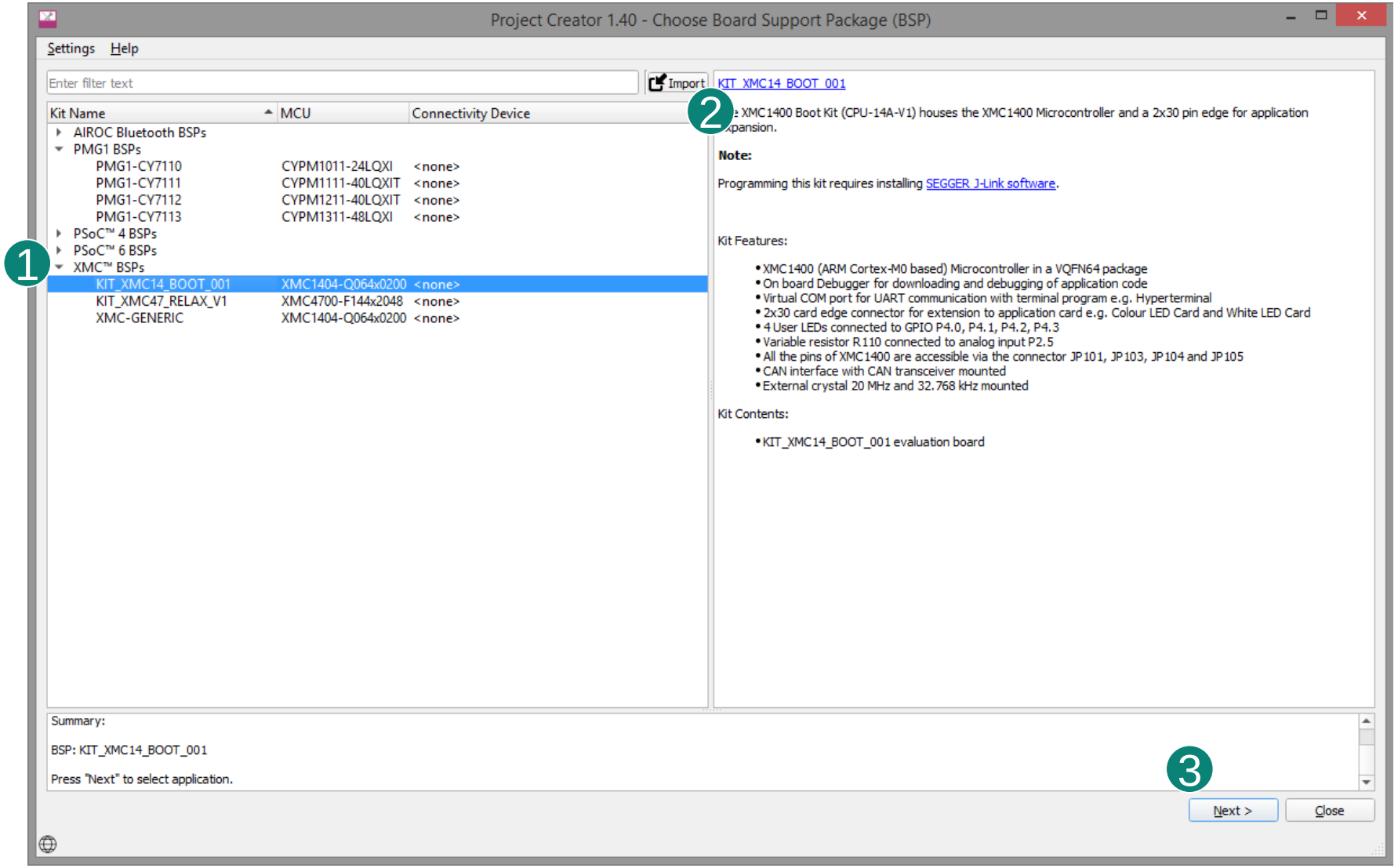
1. Important: please login with your myInfineon account and allow admin rights before installing
2. Install (recommended): this will install the tool in the launcher utility where you can easily manage all tools and get informed if there is an update
3. Download: use this for downloading the installer for another operating system than Windows (e.g., Linux, macOS, etc.)

Step 3: start ModusToolbox™ (using Eclipse IDE)



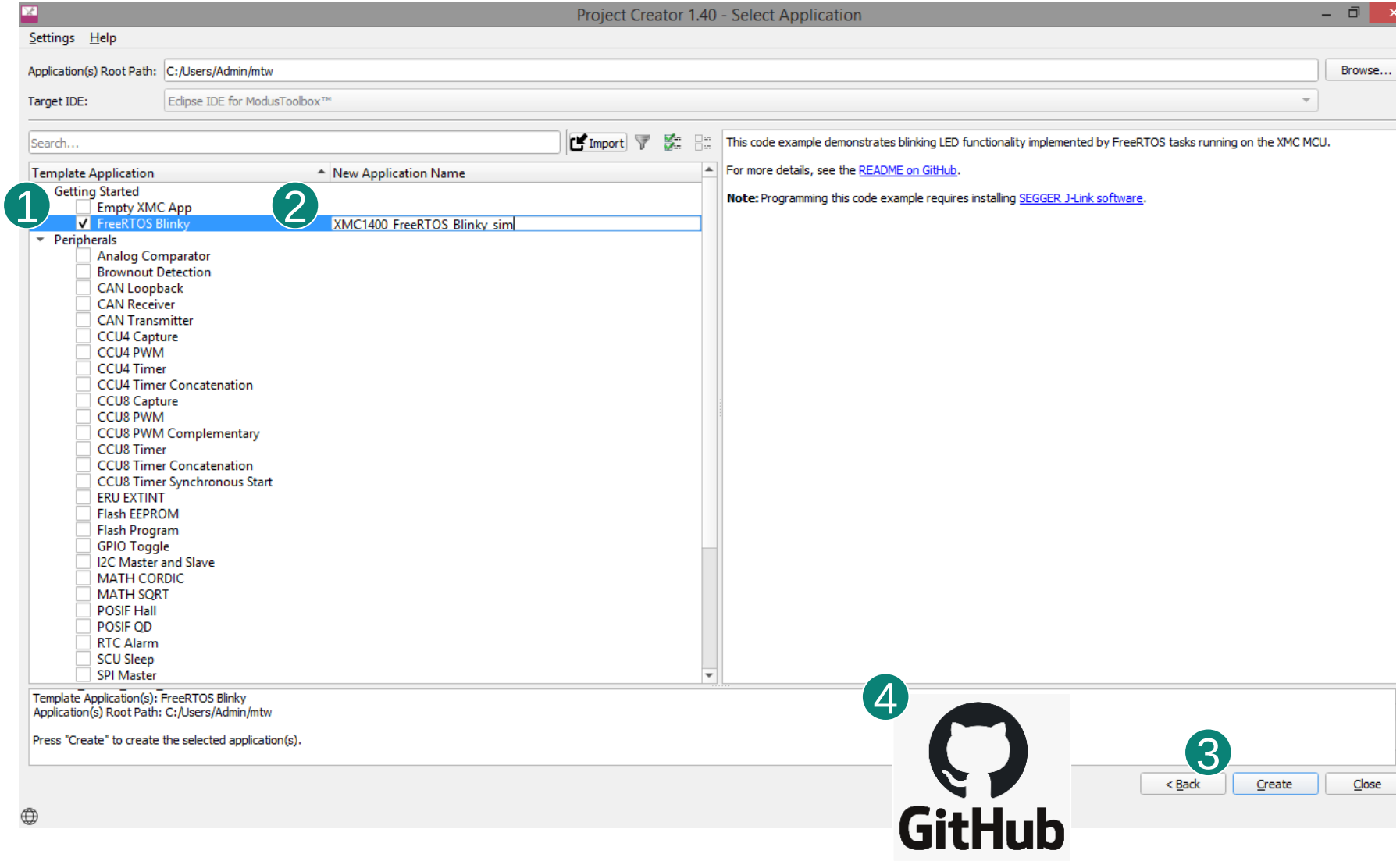
1. Start Eclipse IDE with project and start panels
2. In Quick Panel under Start click on New Application which opens the Project Creator window (please look for window in background)
3. Connection to GitHub to fetch code examples

Step 4a: select Target Platform



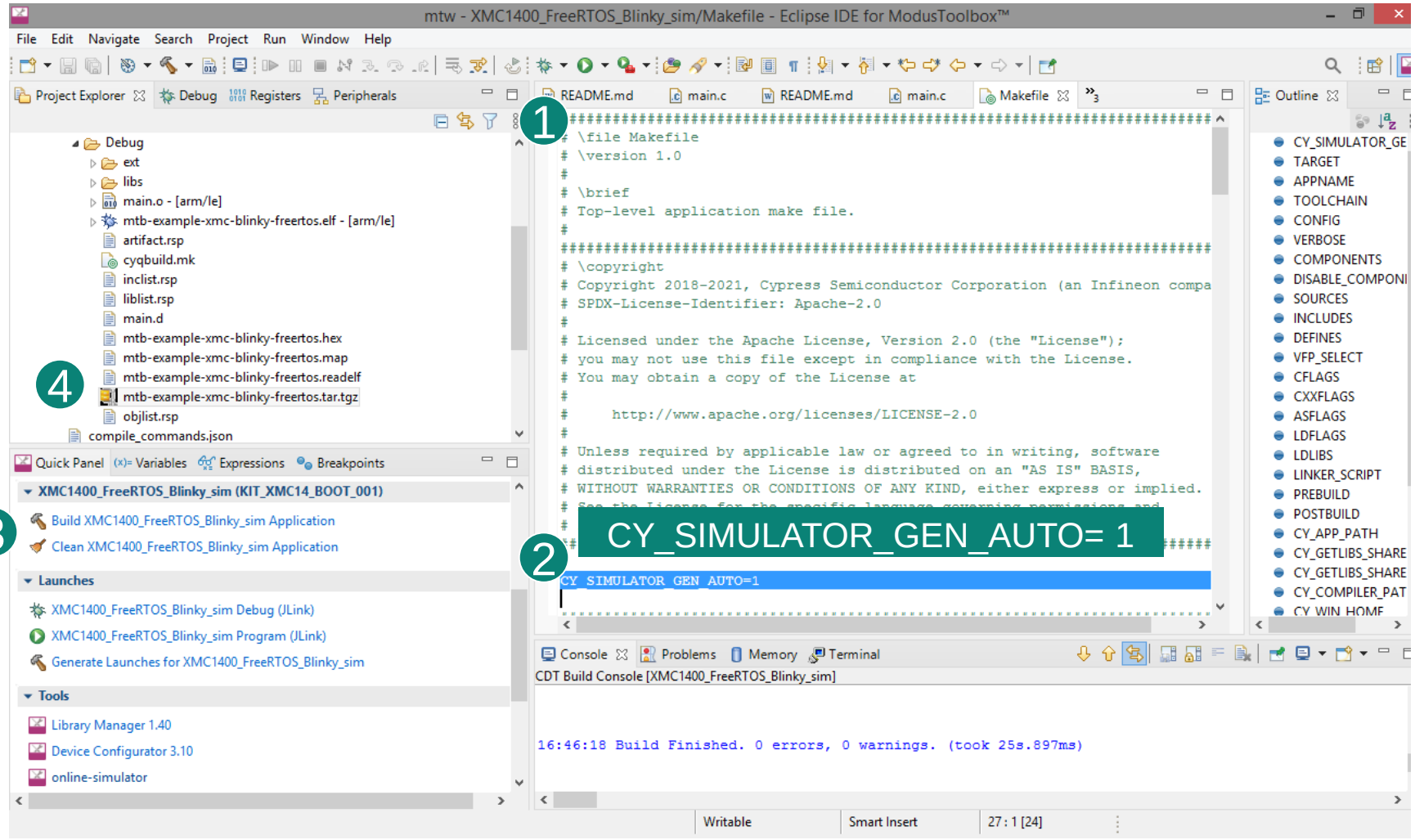
1. Select target platform XMC™ Board Support Packages (BSP)
2. Select KIT_XMC14_BOOT_001
3. Click on Next to select code examples

Step 4b: Select Code Example from GitHub



1. Select the code example FreeRTOS Blinky
2. Set a New Application Name as you like
3. Click on Create
4. This will take some time since a GitHub clone is done – please wait until

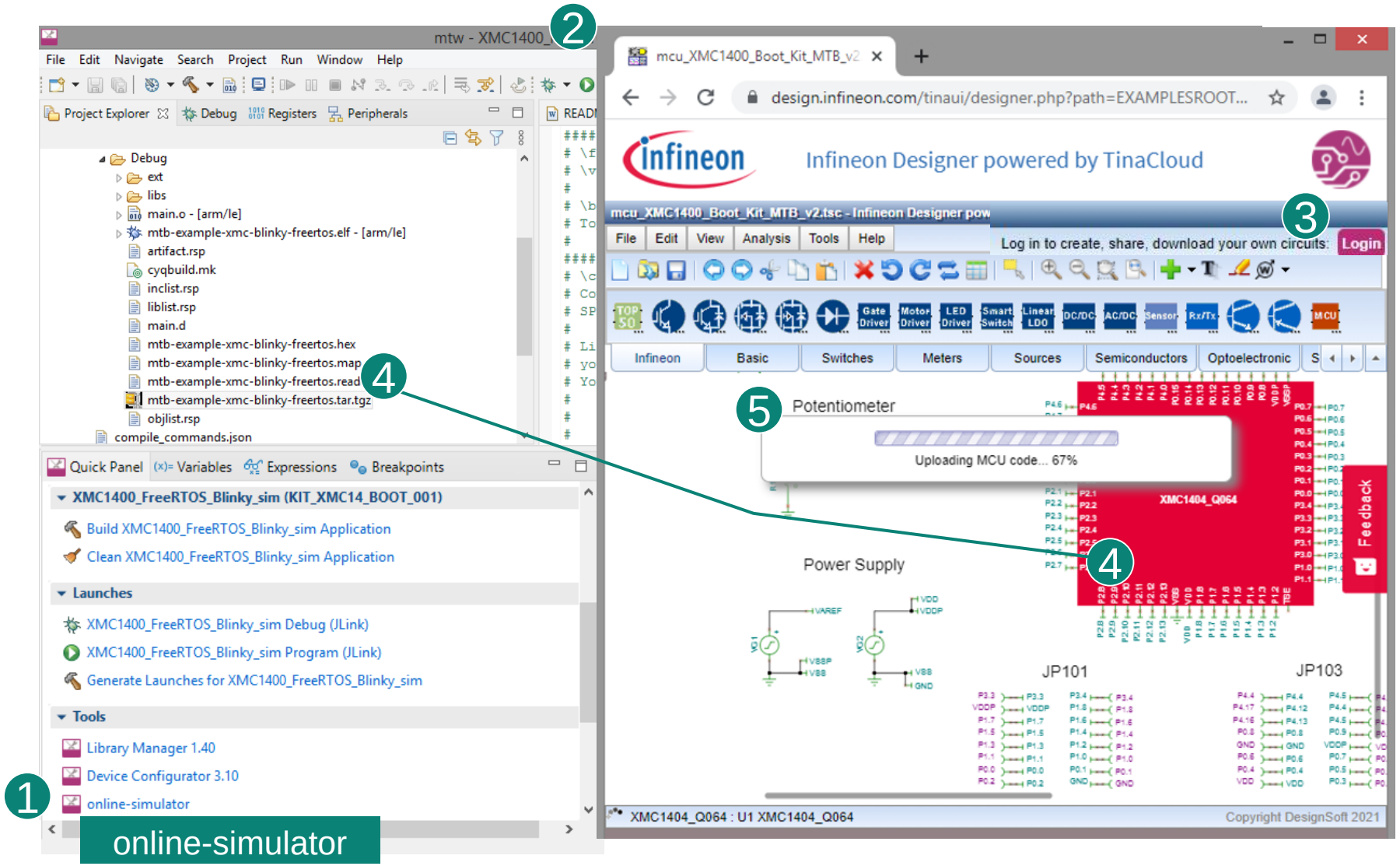
Step 5: wait until GitHub clone is finished – build project
Makefile: Set CY_SIMULATOR_GEN_AUTO= 1



1. Open Makefile
2. Set value for generation of simulation image CY_SIMULATOR_GEN_AUTO= 1
3. Speed-up blinking of LED to 5 ms
4. Build project
5. In Debug folder the image has been created
6. Resut: Mtb-example-xmc-blinky-freertos.tar.tgz

Step 6: start Infineon Designer simulator – upload code

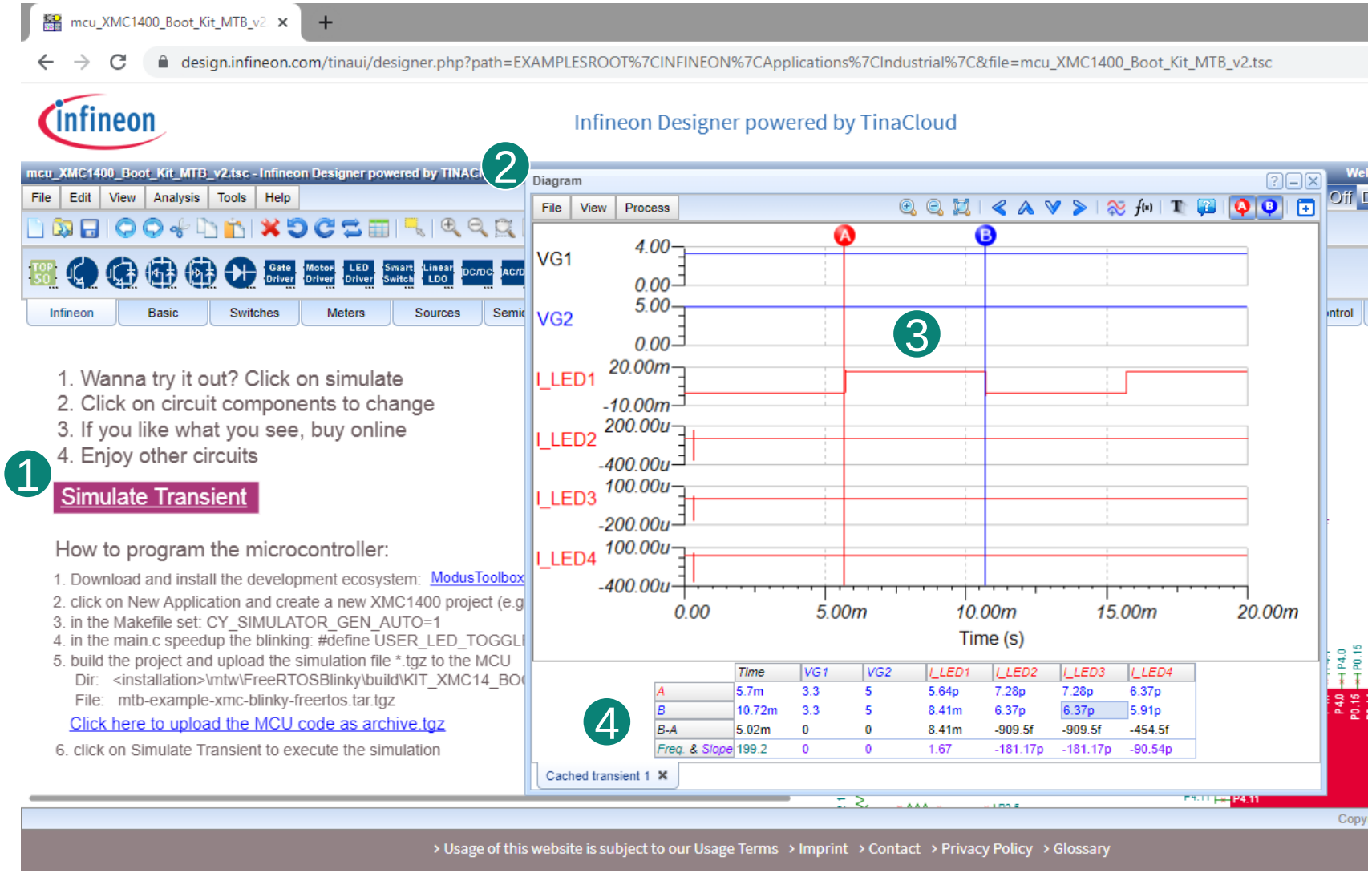
Digital Twin of XMC1400 Boot Kit co-simulating



online-simulator

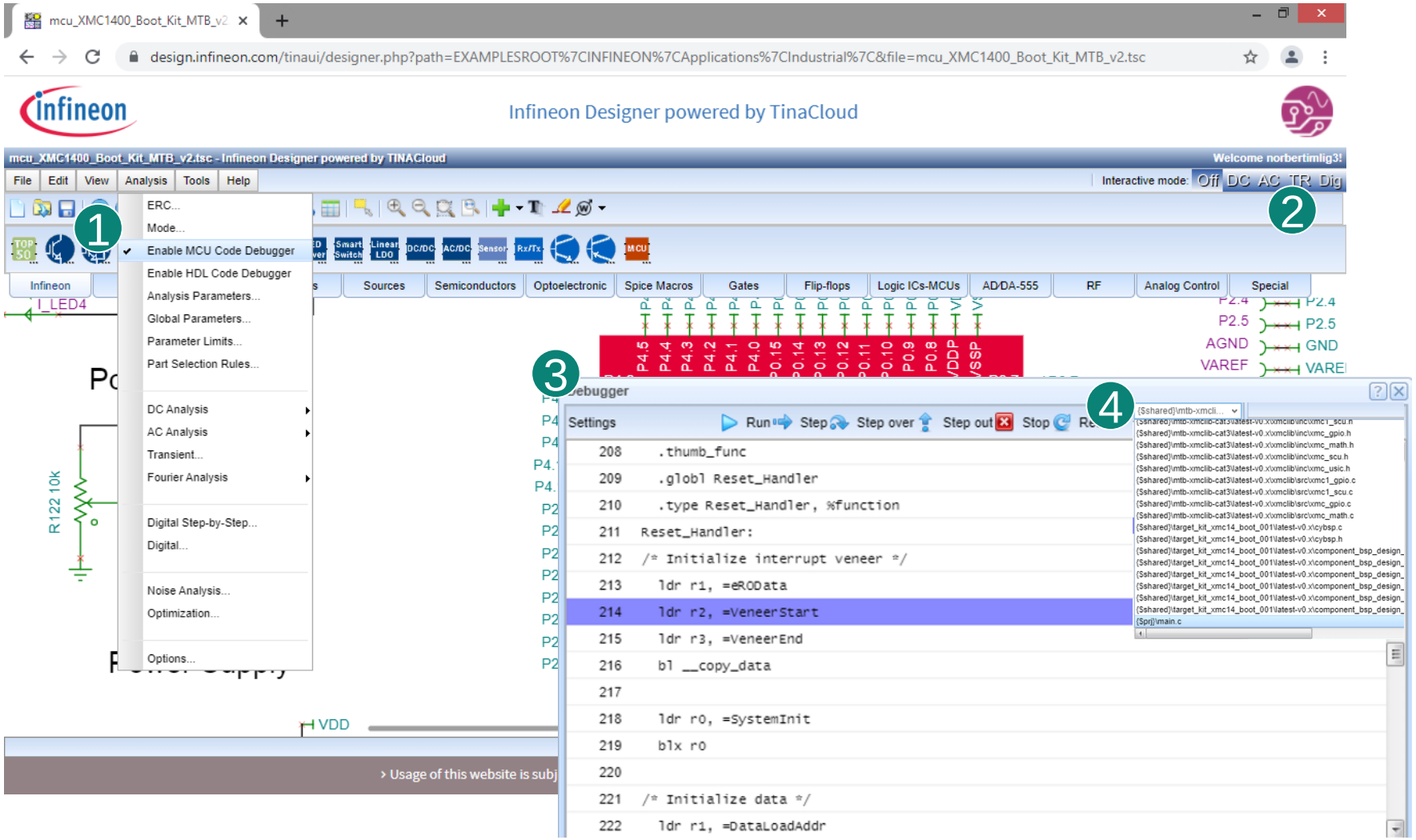
1. In Quick Panel under Tools click on online-simulator
2. It will open the online simulation kit: Digital Twin of XMC1400 Boot Kit co-simulating
3. Please login in order to upload code
4. Drag and drop .tar.tgz image on XMC microcontroller
5. Upload code

Step 7: simulate Transient and check result



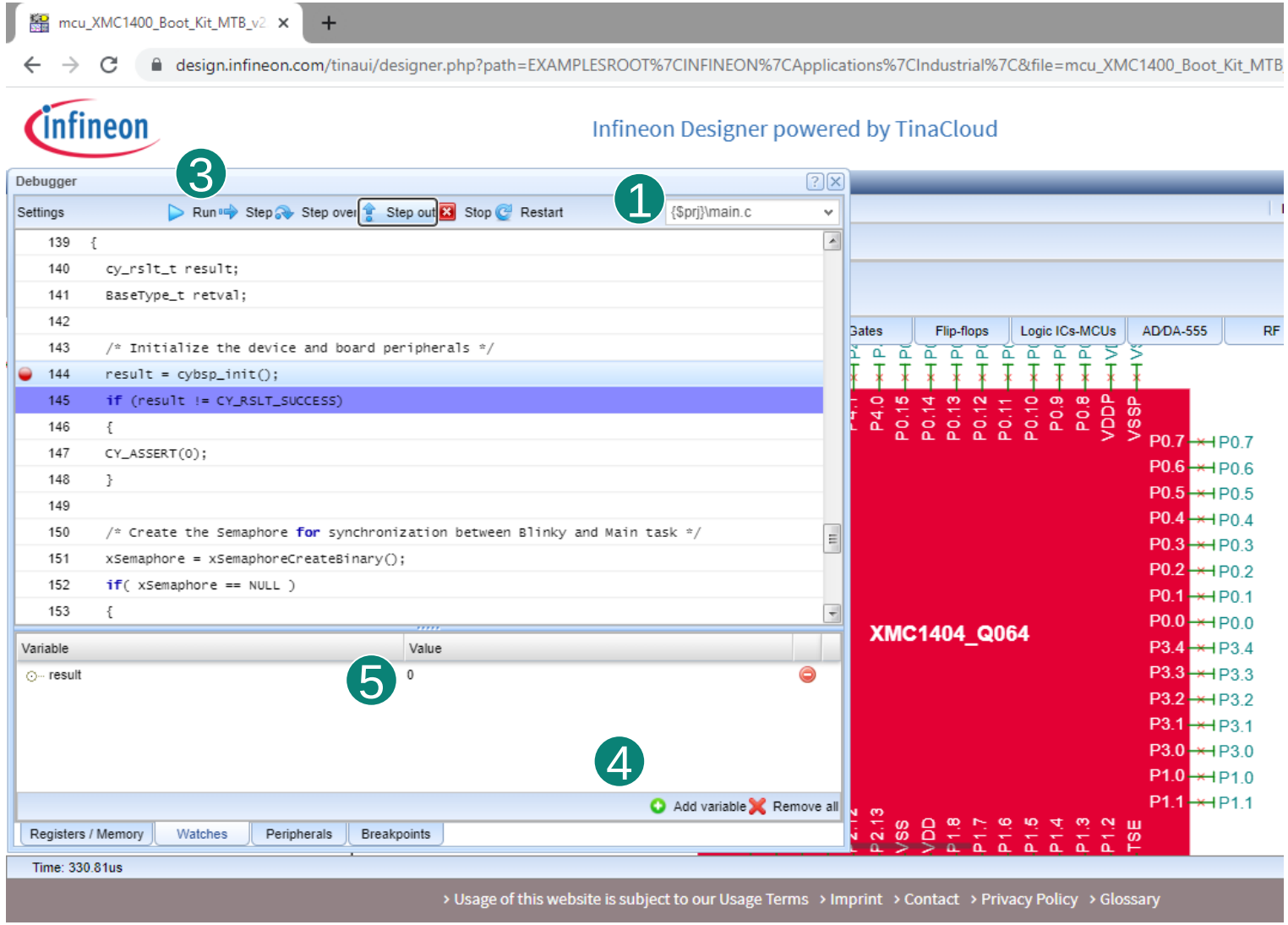
1. Click on simulate Transient to start the simulation
2. Check the results in the diagram window
3. Resutl: I_LED1 toggles in 5 ms
4. Use curser to verify other signal

Step 8: debug code in interactive mode



1. Select the Analysis menu and Enable MCU Code Debugger
2. Click on TR to start interactive mode
3. Wait until debugger window opens
4. Inspect code in files

Step 9: set breakpoints and inspect variables



1. Select main.c
2. Set breakpoint
3. Run to breakpoint
4. Add variable
5. Inspect variable result= 0

Step 10: select other circuits
https://www.infineon.com/ifxdesigner

1

› Home › Infineon Tools

Infineon Designer – Online SPICE Simulator

› **Infineon Designer** is the first online prototyping engine combining analog and digital simulation functionalities in an internet application. Requiring a web browser only, it is a perfect match for supporting customers in selecting the right product for a defined application. Infineon Designer works intuitively in a very short time, and neither installation nor licenses are needed. Please start with one of the following application circuits.

Infineon Designer is powered by TINACloud the online circuit analyzer of DesignSoft. You can upgrade to the full version of › TINACloud or its offline version › TINA here: › https://www.tina.com/tinaupgrade

2

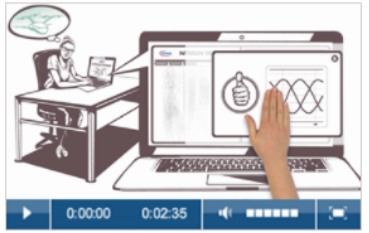
xmc

Showing 1 to 25 of 25 entries (filtered from 750 total entries)

Circuit Reset All	Application Select	Product Category Select	Product Configuration	Description
Digital Twin of XMC1400 Boot Kit co-simulating Embedded Application Code generated by ModusToolbox™ Development Ecosystem along with analog SPICE circuits	LED lighting Motor control Power supplies	Microcontroller	• XMC1404-Q064X0200 AA • KIT_XMC14_BOOT_001	Read more
3 Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC1302 32-bit ARM® Cortex®-M0 microcontroller (Ideal Inverter)	Motor control	Microcontroller	• XMC1302-T038X0200 AB • KIT_XMC1X_AK_MOTOR_001	Read more
Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC1302 with MOSFET Inverter OptiMOS™ BSC0925ND and	Motor control	Microcontroller MOSFET	• XMC1302-T038X0200 AB • BSC0925ND • IR2301	Read more

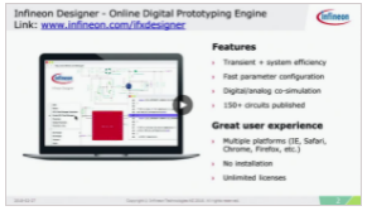
Download Getting Started Guide
02_00 | Jun 24, 2021 | PDF | 3.11 mb

Why to use Infineon Designer



› **Why to use Infineon Designer**

Infineon Designer – Introduction

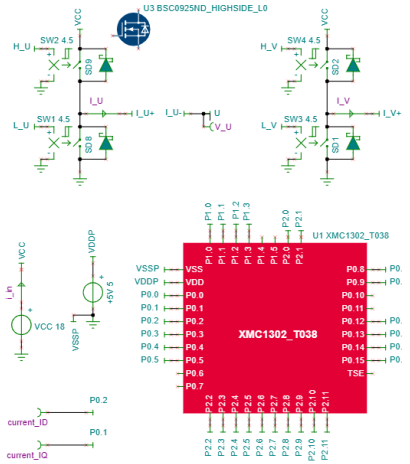


› **Infineon Designer – Introduction**

1. Open landing page https://www.infineon.com/ifxdesigner
2. Search for XMC circuit in table
3. Select BLDC motor example with FOC control running on XMC1302

Exercise: Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC™ microcontroller

1 2 Simulate Transient



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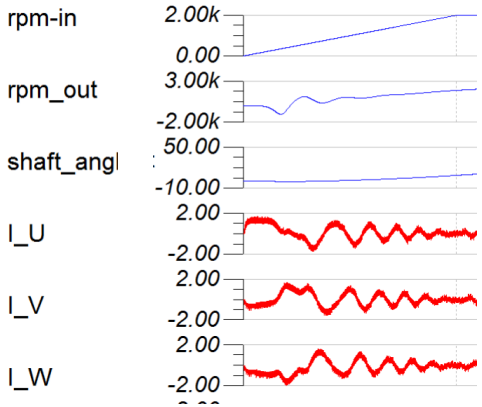

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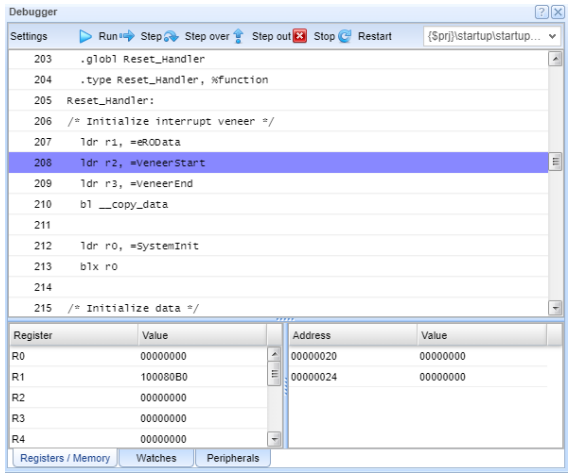

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Motor: Maxon EC 32 BLDC, 15 Watt

J=3.5u
B=1u
F=1u
D=1u
A=8
P=3
CL=3865u
CR=6.8
CC=0.001u
CM=0.5
Cb=49m
Ct=49m
r_snub=1k*2*pi*CL

```
.param J .... Moment of interia. Unit: kg*m^2
.param B ... Damping end eddy current losses. Unit: kg*m^2/(s*rad)
.param F ... Friction / drag losses. Unit: kg*m^2/s^2
.param D ... Magnetic cogging torque. Unit: kg m^2/s^2
.param A ... Number of north poles
.param P ... Number of phases
.param CL ... Winding inductance
.param CR ... Winding resistance
.param CC ... winding capacitance to ground
.param CM ... adjacent winding mutual coupling factor
.param Cb ...; BEMF constant. Unit: V*s/rad
.param Ct ... Torque constant. Unit: N*m/A
.param r_snub = 1k*2*pi*CL
```

1. open application circuit: Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC1302 32-bit ARM® Cortex®-M0 microcontroller (Ideal Inverter)
2. simulate the circuit using Simulate Transient
3. check the results
   - rpm ramp-up/ramp-down profile
   - 3 phase currents
4. Enable the debugger mode
   - Analysis -> Enable MCU Code Debugger
   - View -> Preference -> Draw diagram in interactive mode
   - In the task bar: start the debugger window by click on Interactive mode: TR

Your task

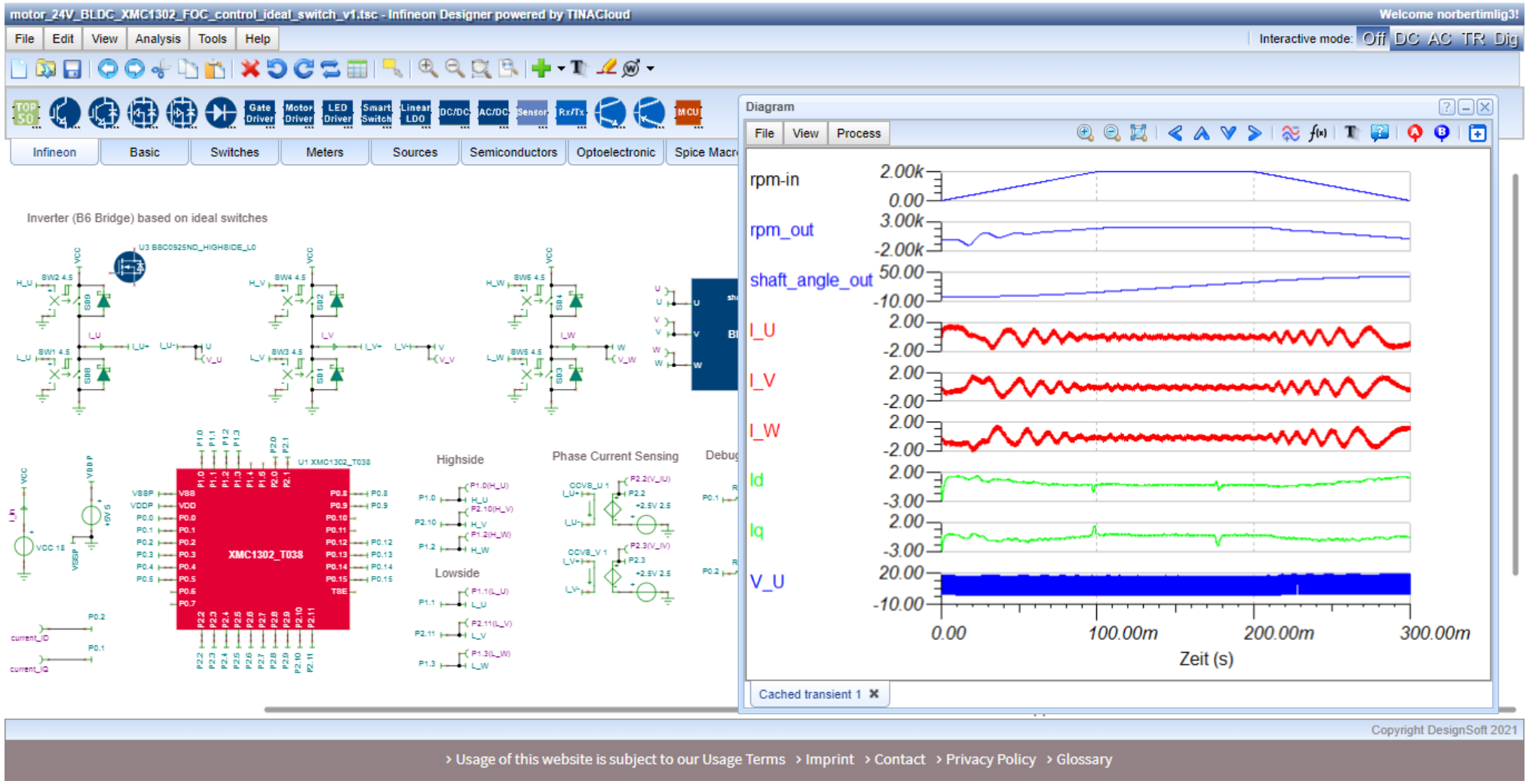
5. Step through the code and select the main.c file and set a breakpoint in main() function
   - run to the breakpoint
   - add variables in the watch window
   - temperature dependency

5. Change the motor parameter to your needs and simulate again

Bonus task

- Install DAVE™ IDE software and change the FOC code examples
- Simulate with real MOSFETs Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC1302 with MOSFET Inverter OptiMOS™ BSC0925ND and high-side and low-side Gate Driver IC IR2301
- Explore stepper motor example: Stepper Motor Control Shield with IFX9201 & XMC1300 using Fullstep, Halfstep or Microstepping modes
- Simulate PINUS Multicopter Board V2 with XMC1100, IR2301 and BSC0925ND

Exercise: Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC1302

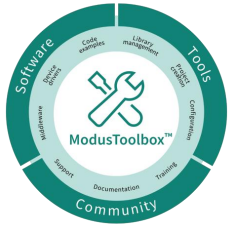


Demo & Exercise Summary

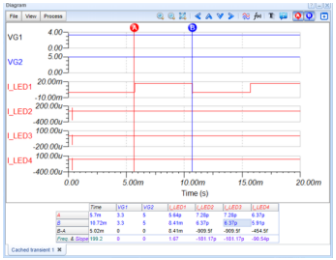
- Demo: we installed ModusToolbox™ and used the code example Blinky based on the real time FreeRTOS
  - set value for generation of simulation image
    CY_SIMULATOR_GEN_AUTO= 1
  - speed-up blinking of LED to 5 ms
  - started the online simulation circuit Digital Twin of XMC1400 Boot Kit co-simulating
  - uploaded the generate .elf/.hex image Mtb-example-xmc-blinky-freertos.tar.tgz
  - started a transient simulation

  - Results:
    - verified blinking LED of 5ms with cursor
    - verified uploaded code by starting interactive debugger

  - Conclusion: Digital co-simulation has many advantages as reducing a) Time-to-market: start developing before you have the hardware kit, b) Safety: test on virtual system will not harm engineer or destroy hardware, c) cost: exploration of design space cheaper than building hardware many times



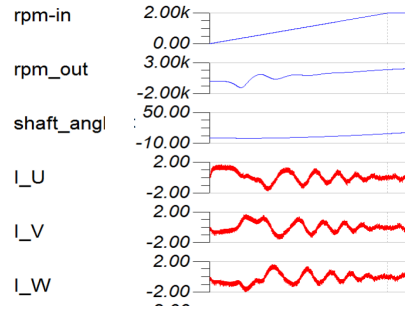
.elf .hex



- Exercise: Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC™ microcontroller
  - you co-simulated the software FOC code running on an XMC™ microcontroller
  - you debugged the code compiled by DAVE™

  - Infineon Designer (SPICE) is the tool of choice when co-simulating analog and digital microcontroller
  - All Simulation models are available for download on the product pages

- Where to go from here
  - Install DAVE™ IDE software and change the FOC code examples
  - Simulate with real MOSFETs Brushless DC (BLDC) Motor controlled by Sensorless Field-Oriented Control (FOC) using XMC1302 with MOSFET Inverter OptiMOS™ BSC0925ND and high-side and low-side Gate Driver IC IR2301



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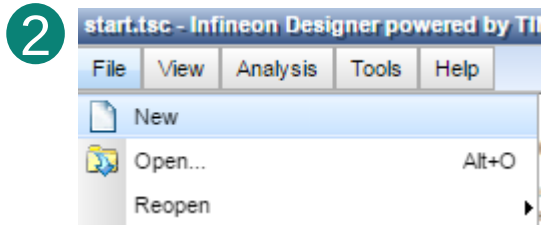
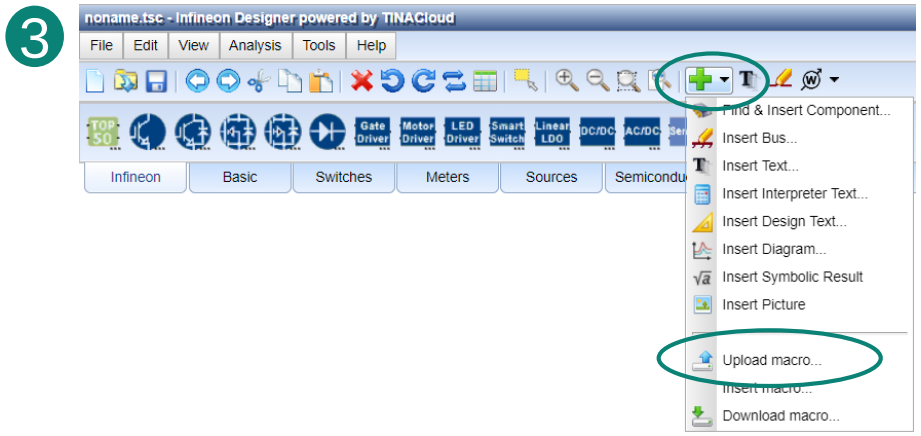
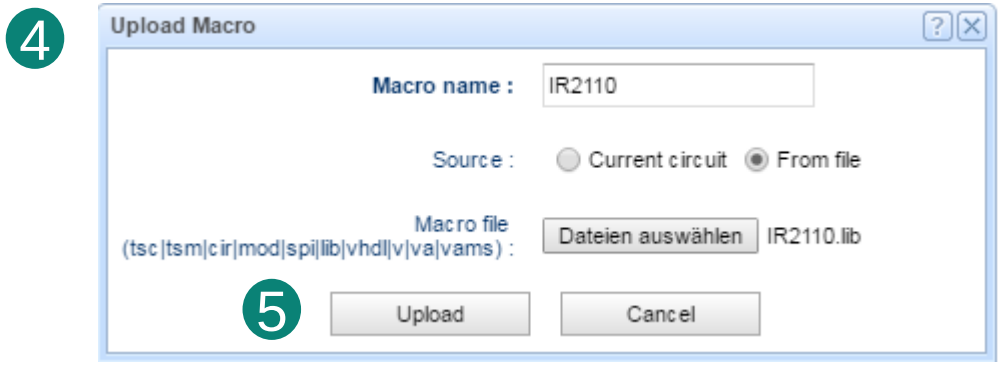
Tips & Tricks

Enlarge the editor area	› Menu >> View >> Full-screen (full-screen & remove banner) › F11 (Browser full-screen) › Component view
Edit circuit	› Zoom-in/out: mouse scroll, or key [Shift ⇧] + drag for zoom-in › Wire connection: see demonstration › Multi-selection: see demonstration › Circuit view shifting: see demonstration
Search text	› Key combination [Ctrl] + [F] • Search components in circuit editor • Search variable in design tool editor
Solve artifacts	› browser and server caching issues • revert to original (Menu >> File >> Revert to original) • change language (Menu >> View >> Language)
Import additional SPICE models	› First menu bar  >> Upload macros… › Then menu bar  >> Insert macros…
More features offline	› Menu >> Help >> Order or Upgrade… › Upgrade to TINA Industrial offline version: www.tina.com

How To Import A SPICE Model (Part 1/2)





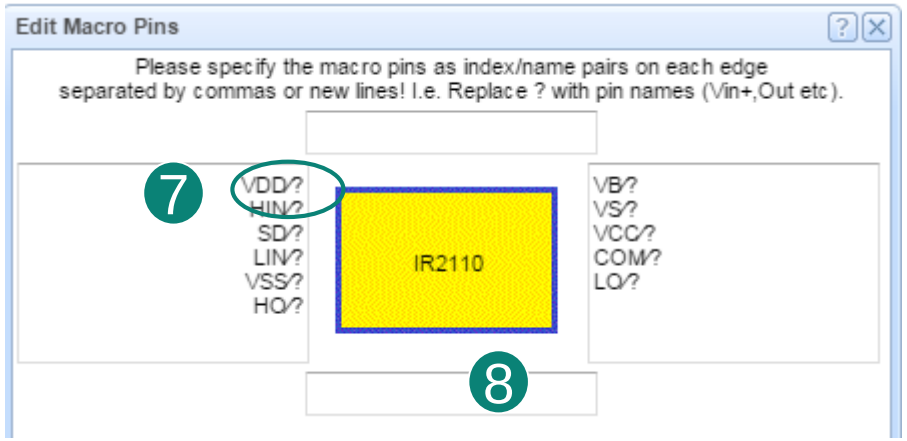


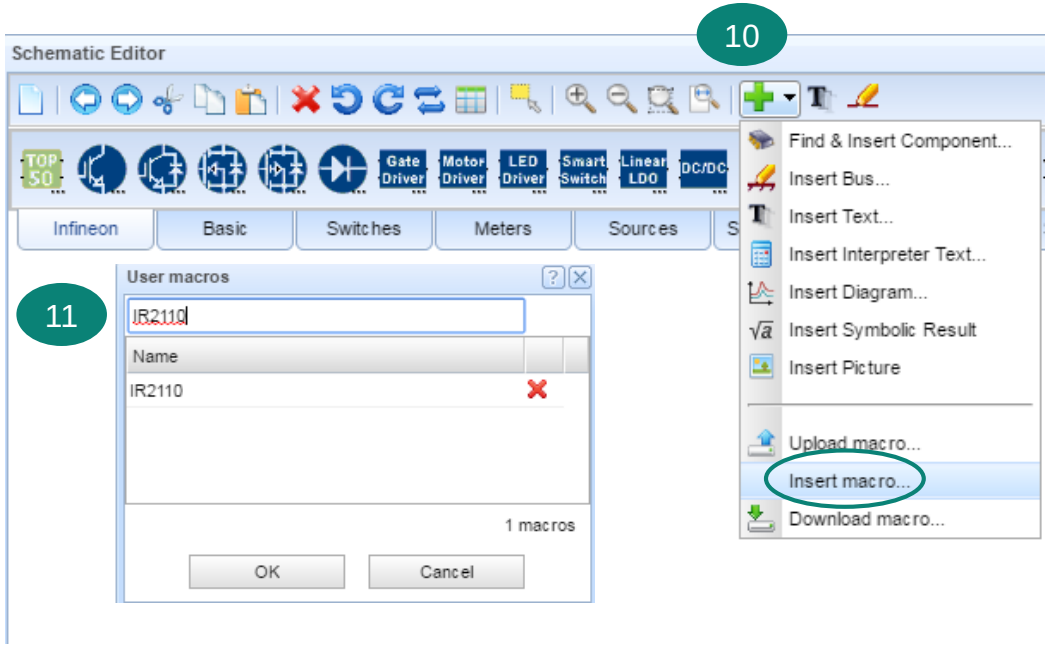
1. Login with your myInfineon account
2. Select File -> New, create a new circuit
3. Click menu bar symbol and click “Upload macro…”
4. Name your model, select “from file”, and browse to your SPICE model in .SUBCKT format
5. Click on “Upload”

Example Model OrCAD Capture for IR2110

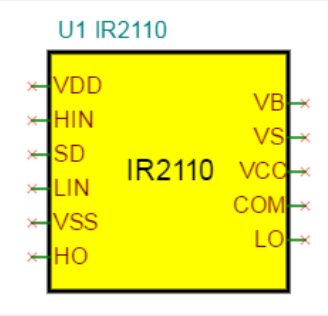
```
.SUBCKT IR2110 VDD HIN  SD
LIN  VSS HO VB VS VCC COM
LO
+PARAMS:
+       T1=-40 T2=25
T3=125
...
.ENDS   IR2110
```

How To Import A SPICE Model (Part 2/2)





1. Edit symbol pin layout
2. Optional: Replace “?” with new pin name in symbol Example: VDD/? -> VDD/VDD
3. Optional: place pins on top, left, right, bottom
4. Click on OK to upload macro
5. Click menu bar symbol and click “Insert macro…”
6. Select IR2110 macro and place it on your schematic



7. Finalize your circuit and Save it with “Save -> Save as”
8. Test your circuit
9.

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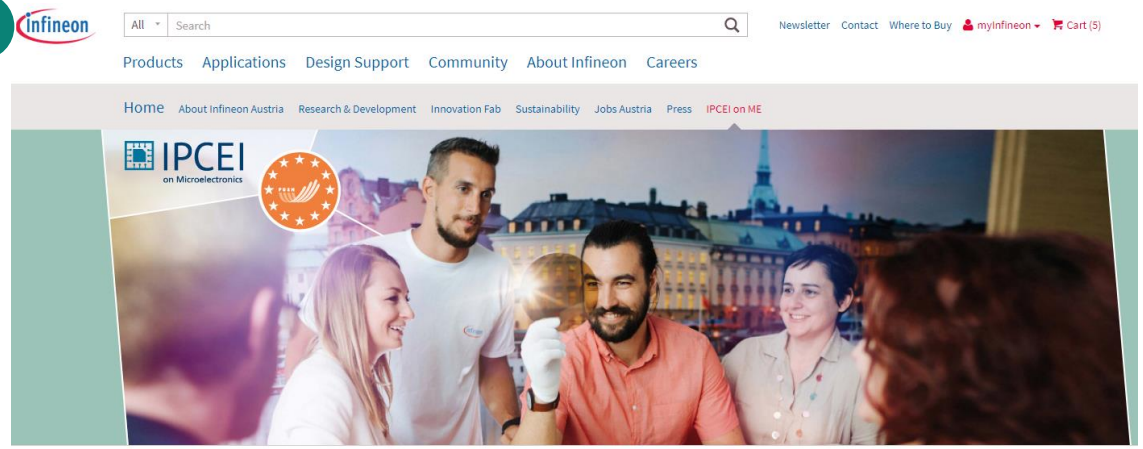
Thank you an see you soon in our next webinar
https://www.infineon.com/cms/austria/en/IPCEI-on-ME

1



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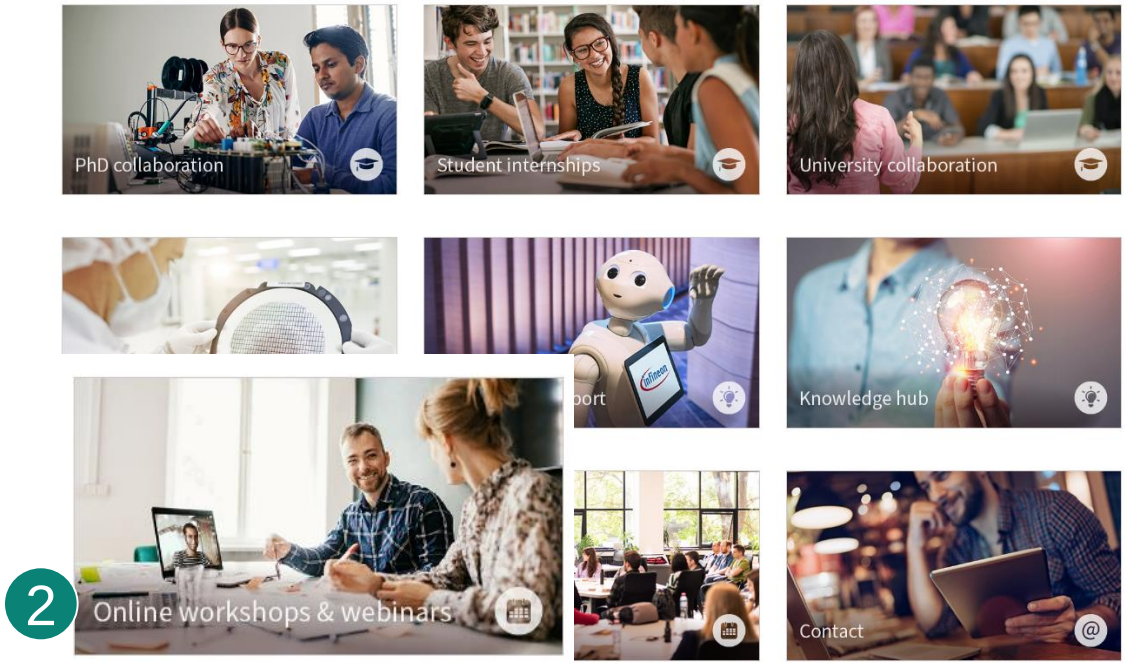

3

Event	Date	Time	
Microcontroller Co-Simulation	18.10.2023	10:00 - 11:00	› More information
		New time!	
Digital Power Supply Simulation	18.10.2023	11:00 - 12:00	› More information
		New time!	
Online LCC development tool	28.11.2023	13:00 - 14:00	› More information
Quick design of a flyback converter	28.11.2023	14:00 - 15:00	› More information
Application driven development Part I: USB-PowerDelivery	13.12.2023	14:00 – 15:00	› More information
Application driven development Part II: Embedded Coding	13.12.2023	15:00 - 16:00	› More information
Application driven development Part III: Cloud Co-Simulation	13.12.2023	16:00 - 17:00	› More information

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