

Infineon Designer – SPICE & XMC™ MCU co-simulation using ModusToolbox™

<https://www.infineon.com/ifxdesigner>

Getting Started June 2021



Agenda

1 Infineon: the link between the real and the digital world

2 Infineon Designer introduction

3 Infineon Designer – SPICE & XMC™ MCU co-simulation using ModusToolbox™

4 Summary

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Infineon Vision: We are the link between the real and the digital world



Our vision

We are the link between the real and the digital world.

Our values

We commit
We partner
We innovate
We perform

Our mission

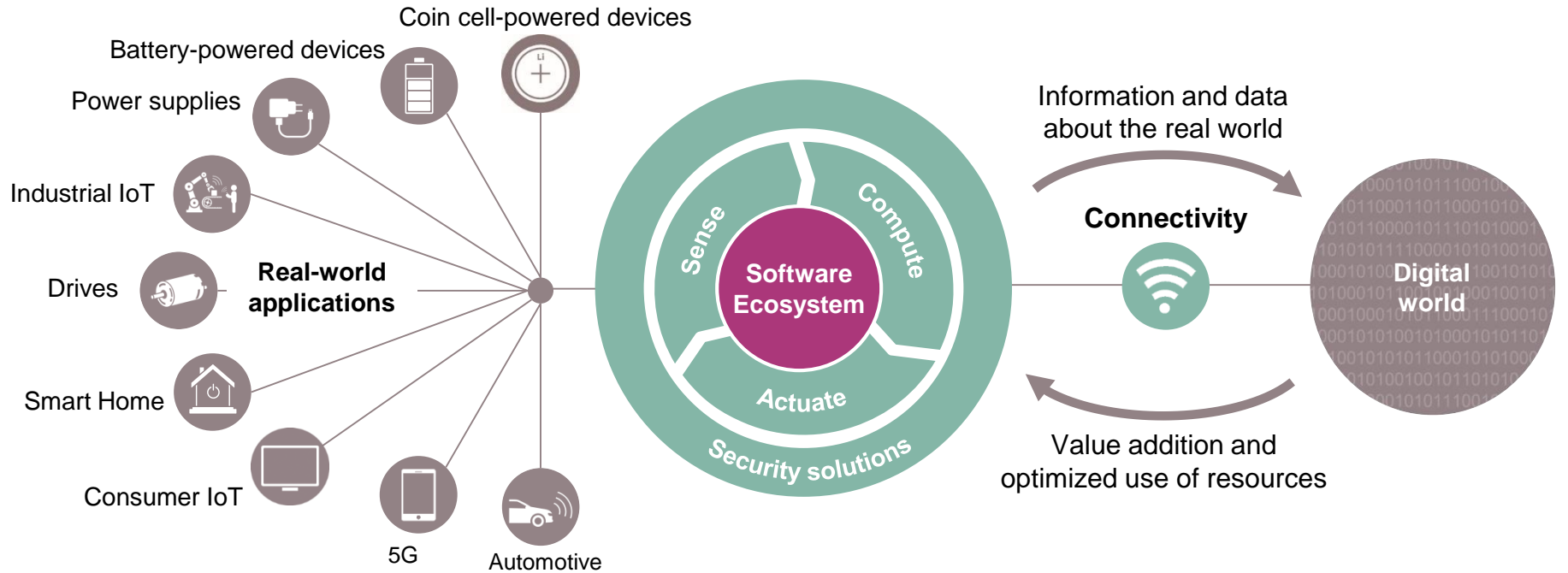
We make life
easier, safer
and greener.

Part of your life. Part of tomorrow.

Infineon offers a unique portfolio linking the real and the digital world



<https://www.infineon.com>



Sense: sensors

Compute: microcontrollers, memories

Actuate: power semiconductors

Security Solutions

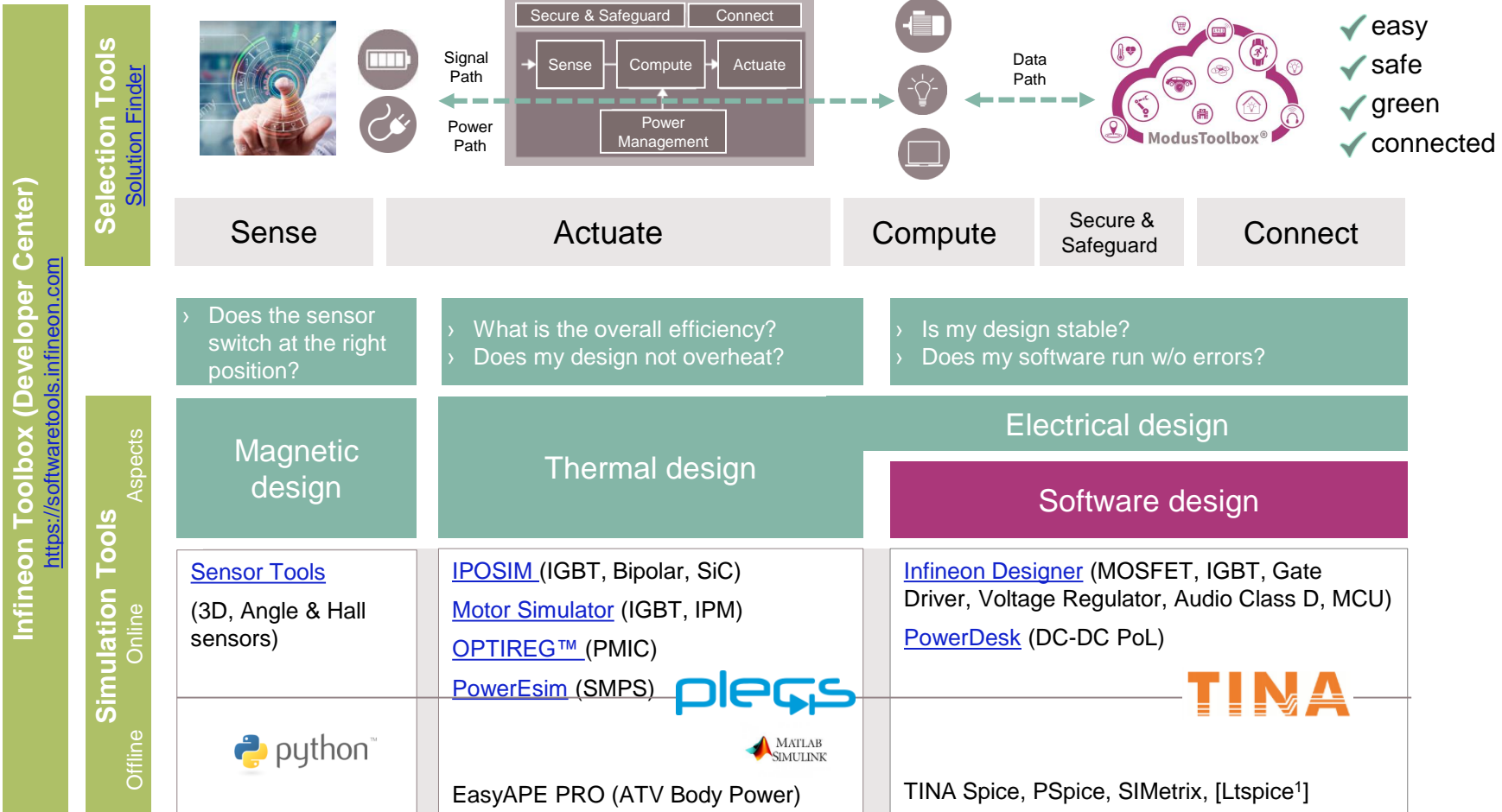
Connectivity: Wi-Fi, Bluetooth, USB



Software & Tools help developers to shorten design-in time



<https://softwaretools.infineon.com>



¹ switches & diodes only

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4 Summary



- › 650+ 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

Infineon servers

www.infineon.com/ifxdesigner



Online
infineon

Offline

DesignSoft servers

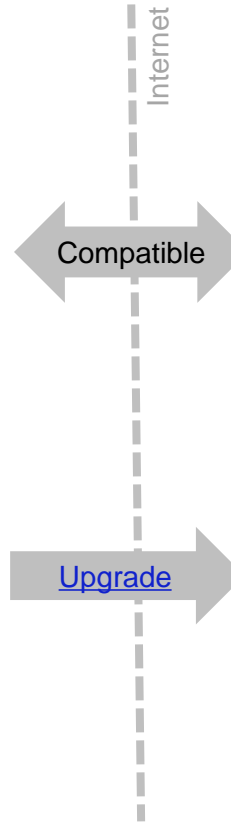
www.tinacloud.com



PC, Mac, Tablet, Smartphone
Available in 22 languages

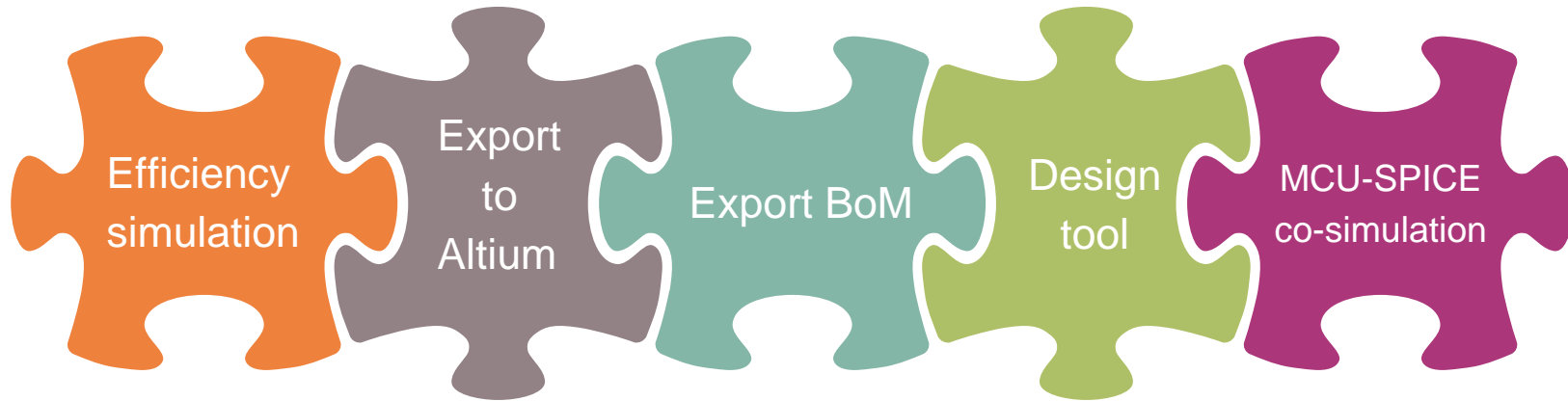
Online
DesignSoft
Excellence in Computer Aided Design and Educational Software

Offline



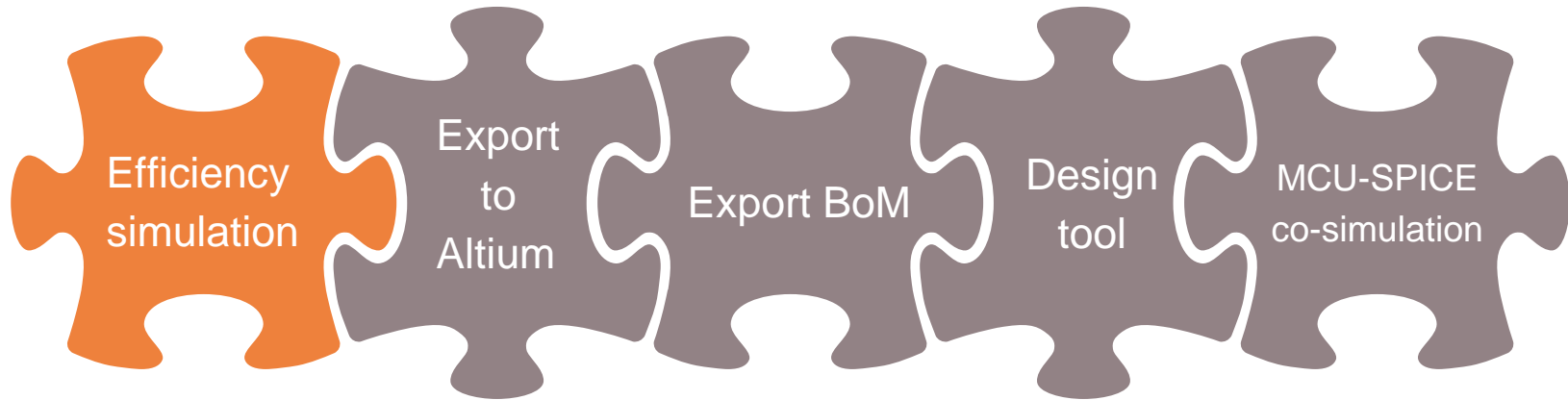
TINA Industrial version

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, (PSoC® 4/6 under evaluation)
- › Instruction Cycle accurate co-simulation
- › DAVE™ support
- › New: available for XMC1400: ModusToolbox™ support

Infineon Designer Features

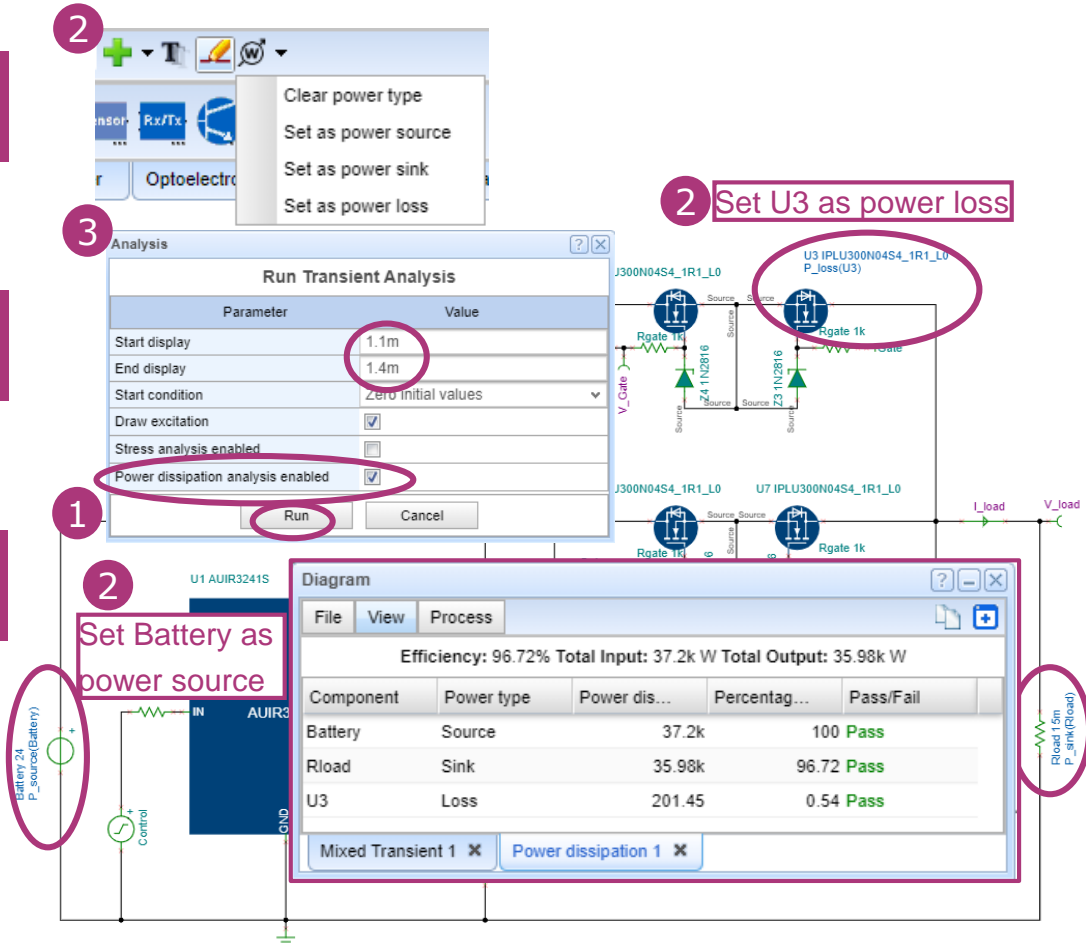


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Thermal & System Efficiency Simulation

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



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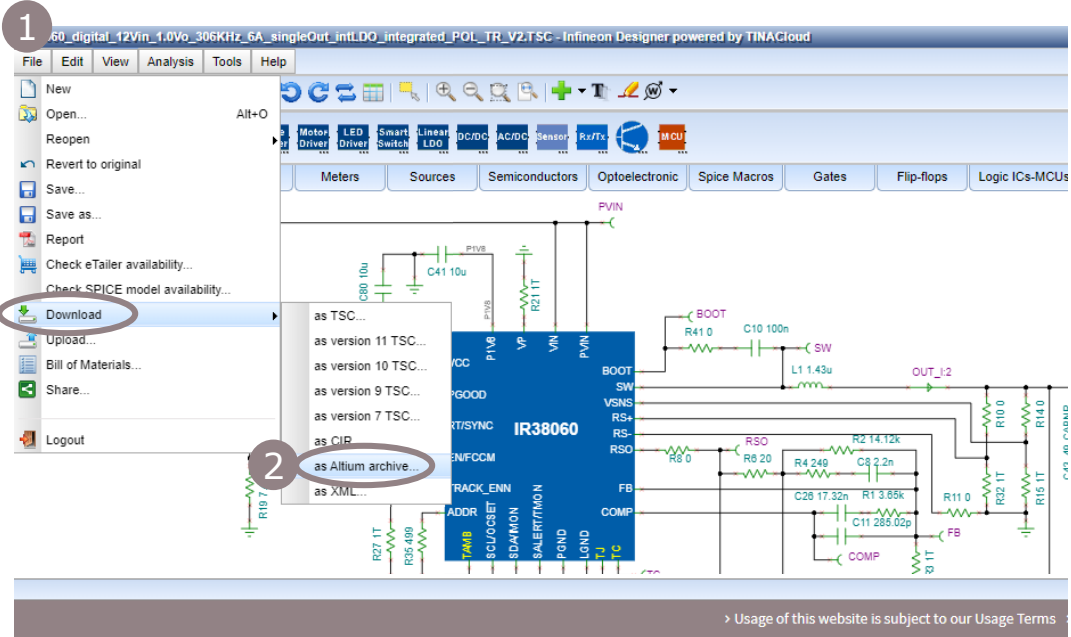
Export to Altium PCB

1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open circuit and login with myInfineon account



2. Download as Altium archive and check



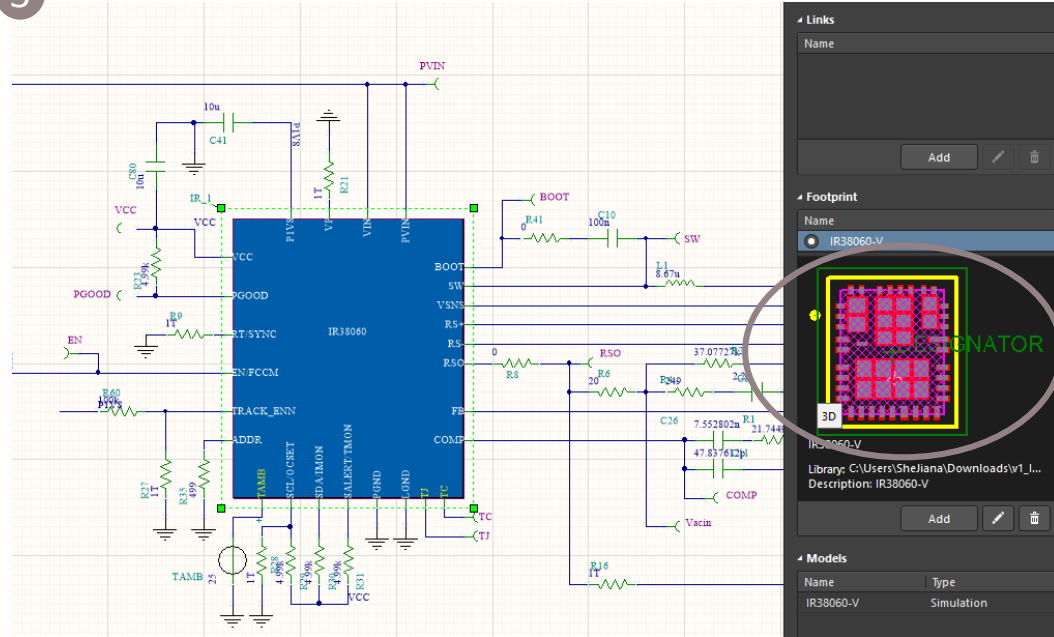
Name	Name
IR38060_digital_12...zip	
Footprints	
IR38060_digital_12Vin_1.0Vo_306KHz_6A_singleOut_intLDO_integrated_POL_TR_V2	CAPAE660X600N
IR38060_digital_12Vin_1.0Vo_306KHz_6A_singleOut_intLDO_integrated_POL_TR_V2.PrjPcbStructure	INDM108103X400N
IR38060_digital_12Vin_1.0Vo_306KHz_6A_singleOut_intLDO_integrated_POL_TR_V2	IR38060-V
	RESC0603X26N

Export to Altium PCB

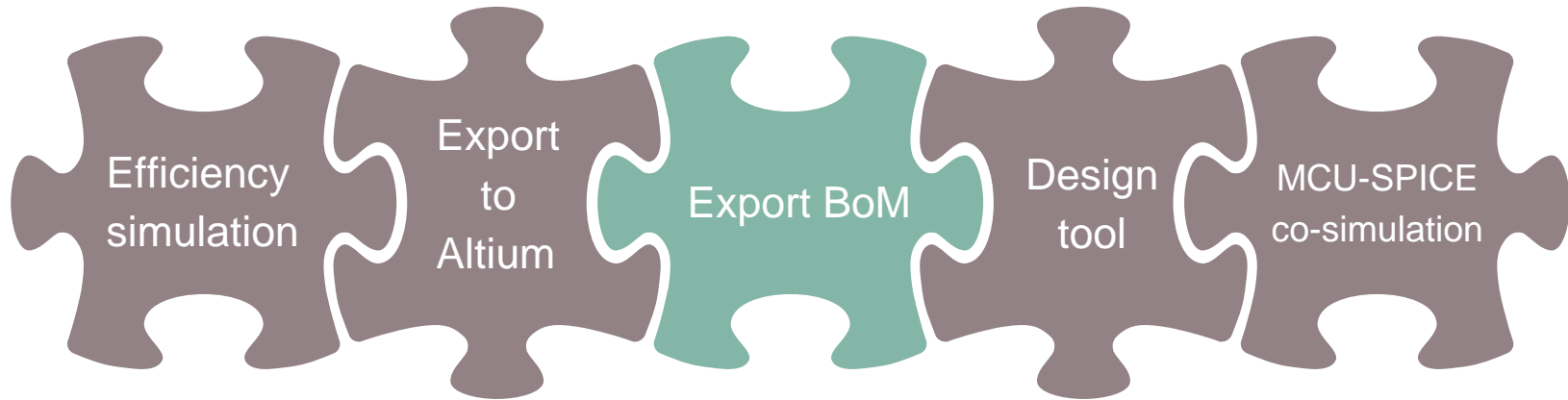
1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open circuit and login with myInfineon account
2. Download as Altium archive and check
3. Open project in Altium and start PCB design

3



Infineon Designer Features



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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



1

2

Type	Label	Value	Footprint	Description	Part Number	Manufacturer	Comments
15	IR38060	IR_1	IR38060	IR38060-V DC-DC PoL Regulator	IR38060M	Infineon	high performance device
16	Inductor	L1	8.67u	INDM10810...			
17	Current Generator	Load					
18	Current Arrow	OUT_I_2					
19	Voltage Pin	OUT_V_1					
20	Voltage Pin	PGOOD					
21	Voltage Pin	PVIN					
22	Resistor	R_Load	2	RESC0603X...			
23	Resistor	R1	21.74k	RESC0603X...			
24	Resistor	R10	0	RESC0603X...			
25	Resistor	R11	0	RESC0603X...			
26	Resistor	R14	0	RESC0603X...			
27	Resistor	R15	1T	RESC0603X...			

3

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- › Coming soon: ModusToolbox™ support

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

1. Wanna try it out? Click on analysis
2. Double click on green window to design
3. If you like what you see, buy online
4. Enjoy other circuits

3

Transient Analysis - fast

Transient Analysis - accurate

```

{ Please double click here to enter design criteria }
{ Input voltage }
V_in := 14;
{ Target output voltage - fixed due to Config file }
V_out := 1;
{ Maximum output current }
I_out := 4;
{ Target Switching Frequency - fixed due to Config file }
F_sw := 306k;
{ Derated (DC & AC) value for a single output capacitor }
C_out := 17.5u;
{ Number of output capacitors with value C_out }
C_out_Nr := 16;
{ Target Vout ripple }
Vout_ripple := 10m;
{ Compensation capacitor. Default is 2.2nF }
C8_Cc := 2.2n;
{ L_ripple vs Iout percentage }
L_ripple_percentage := 35;
{ Load step current }
I_step := 500m;
    
```

2

Double click

Please double click here to enter design criteria

Parameter	Value
V_in [5,21]	14
V_out [1.0,1.0]	1
I_out [0.6]	1
F_sw [300k,350k]	306k
C_out [1n,1000u]	17.5u
C_out_Nr [2,100]	16
Vout_ripple [0,V_out*0.1]	10m
C8_Cc [1n,4.7n]	2.2n
L_ripple_percentage [20,50]	35
I_step [0,I_out-0.01]	500m

Run Cancel Properties

> Design Tool (advanced mode see appendix)

- Easier parameter setting
- Faster value calculation for all circuit components set by defined formulas & scripts

Design Tool – Setup & Programming

1.0V 6A Single Output Integrated PoL Solution IR38060

1. Open Menu >> Tools >> Design Tool...
2. Create parameters for user interpreter window
3. Assign values, create formulas and scripts

1

2

3

Parameter	Value	Min	Max	Comment
V_in	12	5	21	Input voltage
V_out	1	1.0	1.0	Target output v...
I_out	6	0	6	Maximum outp...
F_sw	306k	300k	350k	Target Switchin...
C_out	17.5u	1n	1000u	Derated (DC & ...

```
End;
{==Input Parameters==}
{Input voltage [V]}
Vin= V_in
{Output voltage [V]}
Vout= V_out
{Output current [A]}
Iout= I_out

{==Calculation of final values: change with care==}
{Recommended Configurations see Datasheet}
Vo_ripple:= Vout*0.01 {Voltage Ripple 1% of Vo}
Vo_ripple=[10m]
I_ripple:= Iout*(I_ripple_percentage/100) {Current Ripple 20%}
I_ripple=[2.1]
Slew_rate:=2.5 {2.5A/us}
C8:=C8_Cc
D_v:= Vout/Vin {Duty Cycle}
```

Assign values

Parameter	Value	Min	Max	Comment
V_in	12	5	21	Input voltage
V_out	1	1.0	1.0	Target output v...
I_out	6	0	6	Maximum outp...
F_sw	306k	300k	350k	Target Switchin...
C_out	17.5u	1n	1000u	Derated (DC & ...

```

Functions :
End;

{==Input Parameters==}
{Input voltage [V]}
V_in = V_in
{Output voltage [V]}
V_out = V_out
{Output current [A]}
I_out = I_out

{==Calculation of final values: change with care==}
{Recommended Configurations see Datasheet}

V_o_ripple = V_out*0.01 {Voltage Ripple 1% of V_o}
V_o_ripple = [10m]
I_ripple = I_out*(I_ripple_percentage/100) {Current Ripple 20%}
I_ripple = [2.1]
Slew_rate = 2.5 {2.5A/us}
C8 = C8_Cc
D_uv = V_out/V_in {Duty Cycle}
    
```

1. Assign parameter value to component



$V_{in} := V_{in}$

V_{in} → component label

$:=$ → value assignment

V_{in} → design tool parameter

2. Assign parameter value to local variable

$V_{out_scale_loop} := V_{out_scale_loop_calc}(V_{out})$

$V_{out_scale_loop} = [1]$

$V_{ref} = V_{out} * V_{out_scale_loop}$

$V_{OUT} := V_{out}$

V_{out} → local variable used in calculations

V_{out} → design tool parameter

3. Assign parameter value to circuit global parameter

Parameter	Value
I_out	6
C_IN_NR	2

$I_{out} := I_{out}$

I_{out} → global variable

I_{out} → design tool parameter

Create formulas and scripts

Functions : 1

```
{*****Calculate Inductor*****}  
L1:=(Vin-Vout)* (Vout/(Vin*F_sw*I_ripple))  
L1:= Round(L1*100000000)/100000000  
L1=[1.43u]  
rL1:=rL1_calc(L1)  
rL1=[2.9m]  
  
{*****Calculate Voltage Divider for Enable*****}  
R19:=Ren_calc(Vin)  
R19:=Round(R19*100)/100  
R19=[7.4319k]
```

Functions : 2

```
{*****PhaseMargin*****}  
Function CompType_PM(CompType);  
Begin  
If CompType=4 Then Begin  
CompType_PM:=75;  
End  
Else Begin  
CompType_PM:=0  
End  
End;
```

1. formulas

- Support math. operators: + - * / () etc...
- Support math. functions: e.g sqrt(), Round(), etc...
- := → value assignment
- = → display value (e.g. calculated results)
- {} → comment

2. Assign parameter value to local variable

- Support Pascal scripting
- Support math. operators: + - * / () etc...
- Support math. functions: e.g sqrt(), Round(), etc...
- := → value assignment
- = → display value (e.g. calculated results)
- {} → comment

Insert Design Text (Interpreter Window) for quick access

The screenshot displays the design tool's menu and interpreter window. The 'Insert Design Text...' option is highlighted in a green oval. The interpreter window shows the following parameters:

```
{ Please double click here to enter design criteria }  
{ Input voltage }  
V_in := 12;  
{ Target output voltage - fixed due to Config file }  
V_out := 1;  
{ Maximum output current }  
I_out := 6;  
{ Target Switching Frequency - fixed due to Config file }  
F_sw := 306k;  
{ Derated (DC & AC) value for a single output capacitor }  
C_out := 17.5u;  
{ Number of output capacitors with value C_out }  
C_out_Nr := 16;  
{ Target Vout ripple }  
Vout_ripple := 10m;  
{ Compensation capacitor. Default is 2.2nF }  
C8_Cc := 2.2n;  
{ I_ripple vs Iout percentage }  
L_ripple_percentage := 35;  
{ Load step current }  
I_step := 1.8;
```

Infineon Designer Features

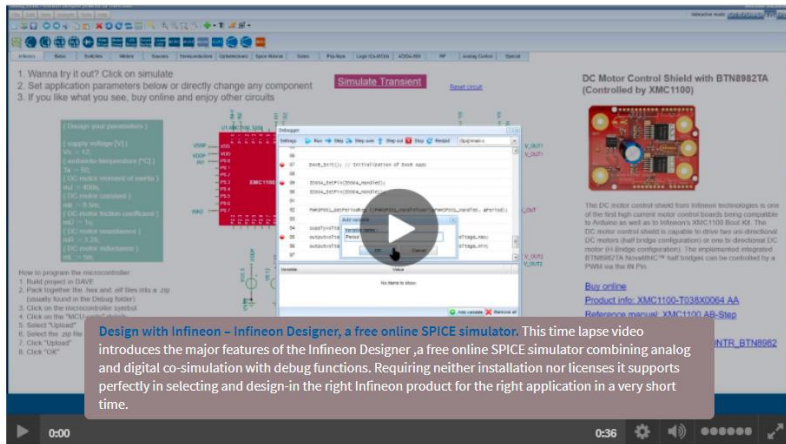


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All MCU Circuits

> <https://www.infineon.com/cms/en/tools/landing/ifxdesigner.html?search=true&keyword=microcontroller>

> [Video Getting Started Infineon Designer MCU](#)



> Home > Tools > 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>

Showing 1 to 18 of 18 entries (filtered from 656 total entries)

Circuit	Application	Product Category	Product Configuration	Description
Reset All	Select	Select		
24V smart High Side Switch shield with PROFET™ BTT6030-2ERA and BTT6020-1ERA for Arduino	Automotive power	Smart Switch Microcontroller	<ul style="list-style-type: none"> BTT6030-2ERA BTT6020-1ERA XMC1100-T038X0064 AB 24V_SHIELD_BTT6030 	Read more
Stepper Motor Control Shield with IFX9201 & XMC1300 using Fullstep, Halfstep or Microstepping modes	Motor control	Motor Driver Microcontroller	<ul style="list-style-type: none"> IFX9201SG XMC1302-T038X0200 AB KIT_XMC1300_IFX9201 	Read more
12V DC Motor Control with BTN8982TA and XMC1100 for one uni-directional DC brushed motor	Motor control	Motor Driver Microcontroller	<ul style="list-style-type: none"> XMC1100-T038F0064 AB BTN8982TA 	Read more
12V DC Motor Control Shield with BTN8982TA and XMC1100 for two uni-directional or one bi-directional DC brushed motor	Motor control	Motor Driver Microcontroller	<ul style="list-style-type: none"> XMC1100-T038F0064 AB BTN8982TA DC-MOTORCONTR_BTN8982 	Read more
48V inverse buck LED driver for RGB color controlling with BSR606N and XMC1200	LED lighting	Power MOSFET Microcontroller	<ul style="list-style-type: none"> XMC1200-T038F0200 AB BSR606N KIT_LED_XMC1202_AS_01 	Read more

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Solution: Digital Twin Circuit Simulation

simulate first on virtual system before building the real hardware

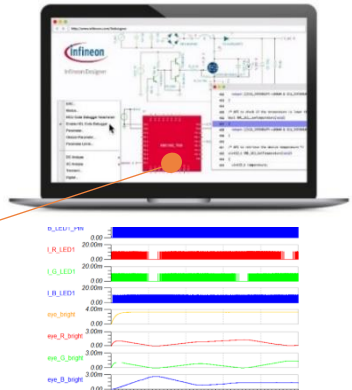
1 build application code project in ModusToolbox™

2 upload .elf .hex to simulator



.elf .hex

Simulation: Digital Twin



3 co-simulate XMC™ w/ SPICE

Value Proposition MCU co-simulation

- > **Time-to-market:** start developing before you have the hardware kit
- > **Safety:** test on virtual system will not harm engineer or destroy hardware
- > **Cost:** exploration of design space cheaper than building hardware many times
- > **Security:** CCS controller lack a debug interface so code debugging can be only

Real System

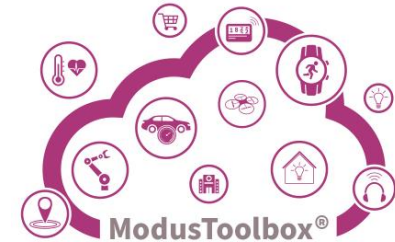


.elf .hex



New Software Ecosystem: ModusToolbox™
Supporting XMC1400

<https://softwaretools.infineon.com/tools?q=modus>



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™ Design Flow

1 Create new XMC1400 Application

2 write & build application code

3 Start online simulator (Infineon Designer)

4 upload .elf .hex to simulator

5 co-simulate XMC™ w/ SPICE

The image shows a multi-step workflow. Step 1 involves creating a new application in the IDE. Step 2 shows writing C code for a blinker task. Step 3 shows the Infineon Designer interface. Step 4 shows uploading the compiled files to the simulator. Step 5 shows a co-simulation of the XMC1400 microcontroller with a SPICE circuit model, including a timing diagram and a circuit schematic with a potentiometer and power supply.

Demo 1: ModusToolbox™ IoT/Blinky XMC1400

Start circuit design



design.infineon.com/tinademo/designer.php?path=EXAMPLESROOT%7CINFINEON%7CApplications%7CIndustrial%7C&file=mcu_XMC1400_Boot_Kit_MTB_v2.tsc

mcu_XMC1400_Boot_Kit_MTB_v2.tsc - Infineon Designer powered by TINACloud Demo

File View Analysis Tools Help

Log in to create, share, download your own circuits: Login Interactive mode: Off DC AC TR Jig

1. Wanna try it out? Click on simulate
2. Click on circuit components to change
3. If you like what you see, buy online
4. Enjoy other circuits

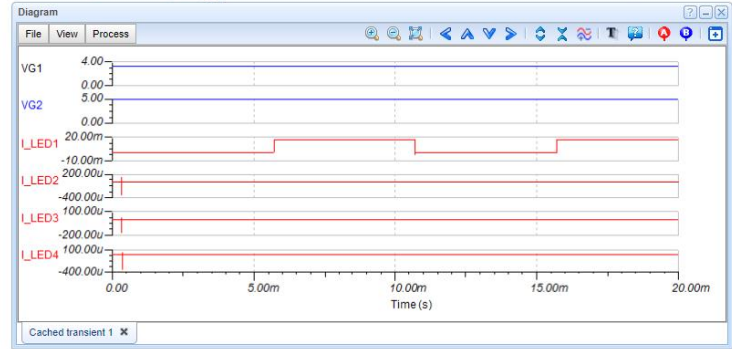
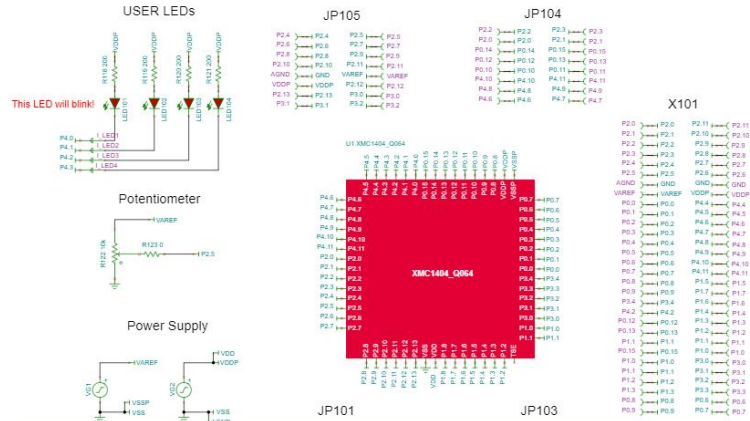
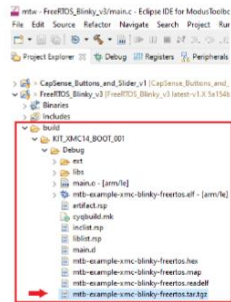
Simulate Transient

How to program the microcontroller:

1. Download and install the development ecosystem: [ModusToolbox™ V2.3](#)
2. click on New Application and create a new XMC1400 project Blinky
3. edit main.c to speedup the blinker: `#define USER_LED_TOGGLE_PERIOD_MS 5`
4. build the project and upload the simulation file *.tsc to the MCU
Dir: `<installation>\\mtb\\FreeRTOSBlinky\\build\\KIT_XMC14_001\\Debug`
File: `mtb-example-xmc-blinky-freertos.tar.tsc`
[Click here to upload the MCU code as archive.tsc](#)
5. click on Simulate Transient to execute the simulation

How to start the debugger:

1. activate debugger with Analysis -> Enable MCU Code Debugger
- [Click here to start debugging](#)



Digital Twin of XMC1400 Boot Kit co-simulating Embedded Application Code generated by ModusToolbox™ Development Ecosystem with analog SPICE

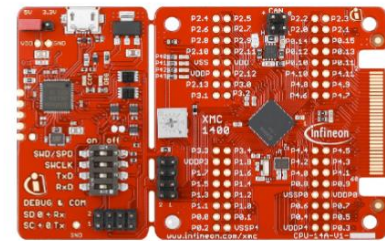
Good news: ModusToolbox™ is now supporting code generation for our XMC1400 microcontrollers bringing together the ARM® Cortex®-M0 core and market proven and differentiating peripherals for motor control, power supplies and lighting. Freely simulate your application code and benchmark the performance virtually before getting the real hardware.

ModusToolbox™ is all about making life easier for developers. From project creation to product deployment, ModusToolbox™ has labor-saving tools and utilities that form a complete development environment which can be integrated into established development flows or swapped out for preferred alternatives.

- [Download Development platform: ModusToolbox™ v2.3](#)
- [Product info: XMC1404-Q064X0200 AA](#)
- [Reference manual: XMC1100 AB-Step](#)
- [Evaluation board: XMC1400 Boot Kit](#)
- [Simulation Code Example Blinky XMC1400 Boot Kit](#)
- [GitHub Code Examples XMC1400 Boot Kit](#)

[Other circuits](#)

[Buy online](#)



Demo 2: DAVE™ Motor Control/FOC XMC1300

Start circuit design

design.infineon.com/tinademo/designer.php?path=EXAMPLESROOT%7CINFINEON%7CApplications%7CMotor%20control%20and%20drives%7CBrushless%20DC%20Motor%7C&file=motor_24V_BLDC_XMC1302_FOC_control_ideal_switch_v1.tsc

motor_24V_BLDC_XMC1302_FOC_control_ideal_switch_v1.tsc - Infineon Designer powered by TINAGCloud Demo

File View Analysis Tools Help

Log in to create, share, download your own circuits: Login Interactive mode Off DC AC TR Dig

1. Wanna try it out? Click on simulate
2. Click on circuit components to change
3. If you like what you see, buy online
4. Enjoy other circuits

Simulate Transient

Reset circuit

{ Please double click here to enter design criteria }

{ Input Voltage }

VCC = 18;

How to program the microcontroller:

1. Build project in DAVE
2. Pack together the project folder into a .zip
3. Upload MCU code as .zip file

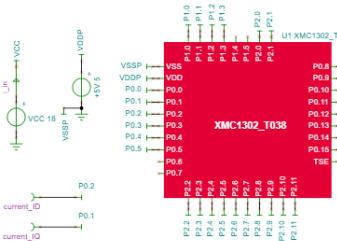
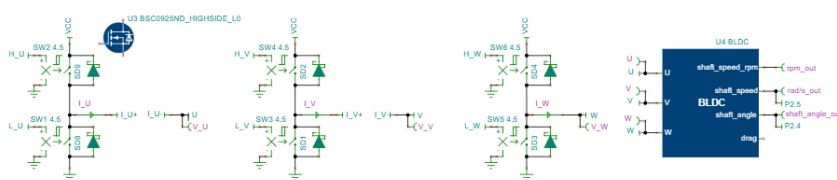
Motor: Maxon EC 32 BLDC, 15 Watt



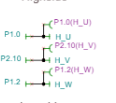
J=3.5u
B=1u
F=1u
D=1u
A=8
P=3
CL=3885u
CR=0.8
CC=0.001u
CM=0.5
Cb=49m
Cl=49m
r_s_nub=1k2*ip*CL

param J ... Moment of inertia. Unit: kg*m²
param B ... Damping and eddy current losses. Unit: kg*m²/(s*rad)
param F ... Friction / drag losses. Unit: kg*m²/s²
param D ... Magnetic coupling torque. Unit: kg m²/s²
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*ip*rad
param Cl ... Torque constant. Unit: Nm/A
param r_s_nub = 1k2*ip*CL

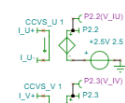
Inverter (B6 Bridge) based on ideal switches



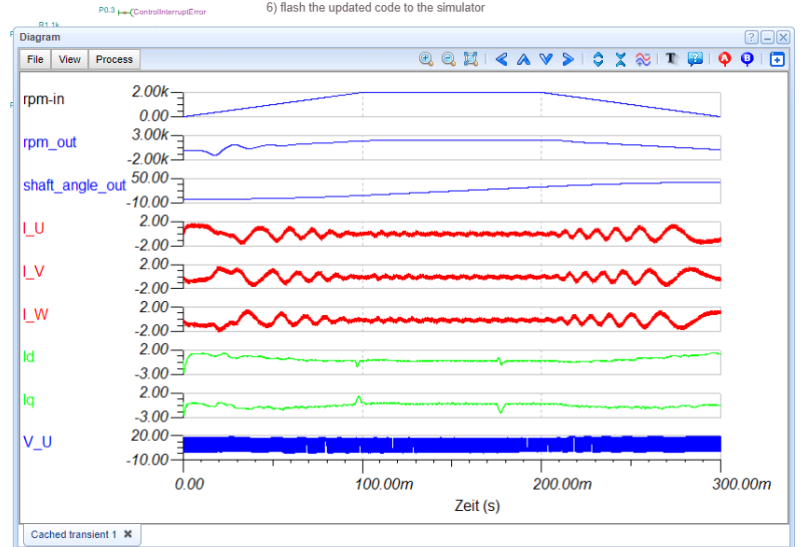
Highside



Phase Current Sensing

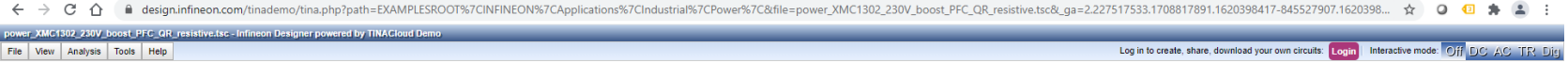


Debugging



Demo 3: DAVE™ Power Supply/PFC XMC1300

Start circuit design

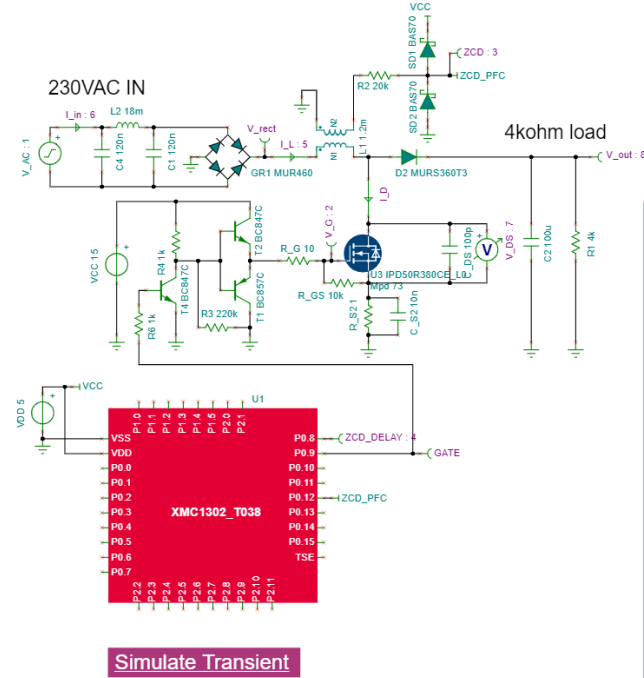


1. Wanna try it out? Click on simulate
2. Click on circuit components to change
3. If you like what you see, buy online
4. Enjoy other circuits

How to program the microcontroller:

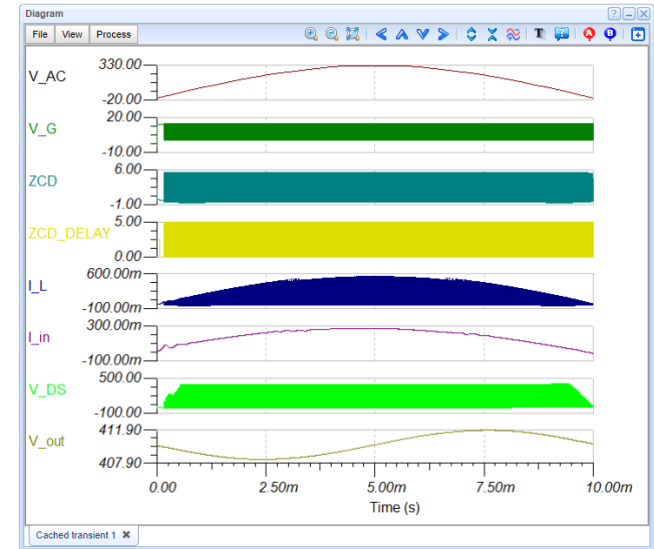
1. Build project in DAVE
2. Export project into a .zip
3. Click on the microcontroller symbol
4. Click on the "MCU-code" details
5. Select "Upload"
6. Drag and drop the .zip file created earlier
7. Click "Upload", then click "OK"
8. (optional) Launch debugger by clicking on the "TR" button on the top right

Need support?
[Technical Assistance](#)



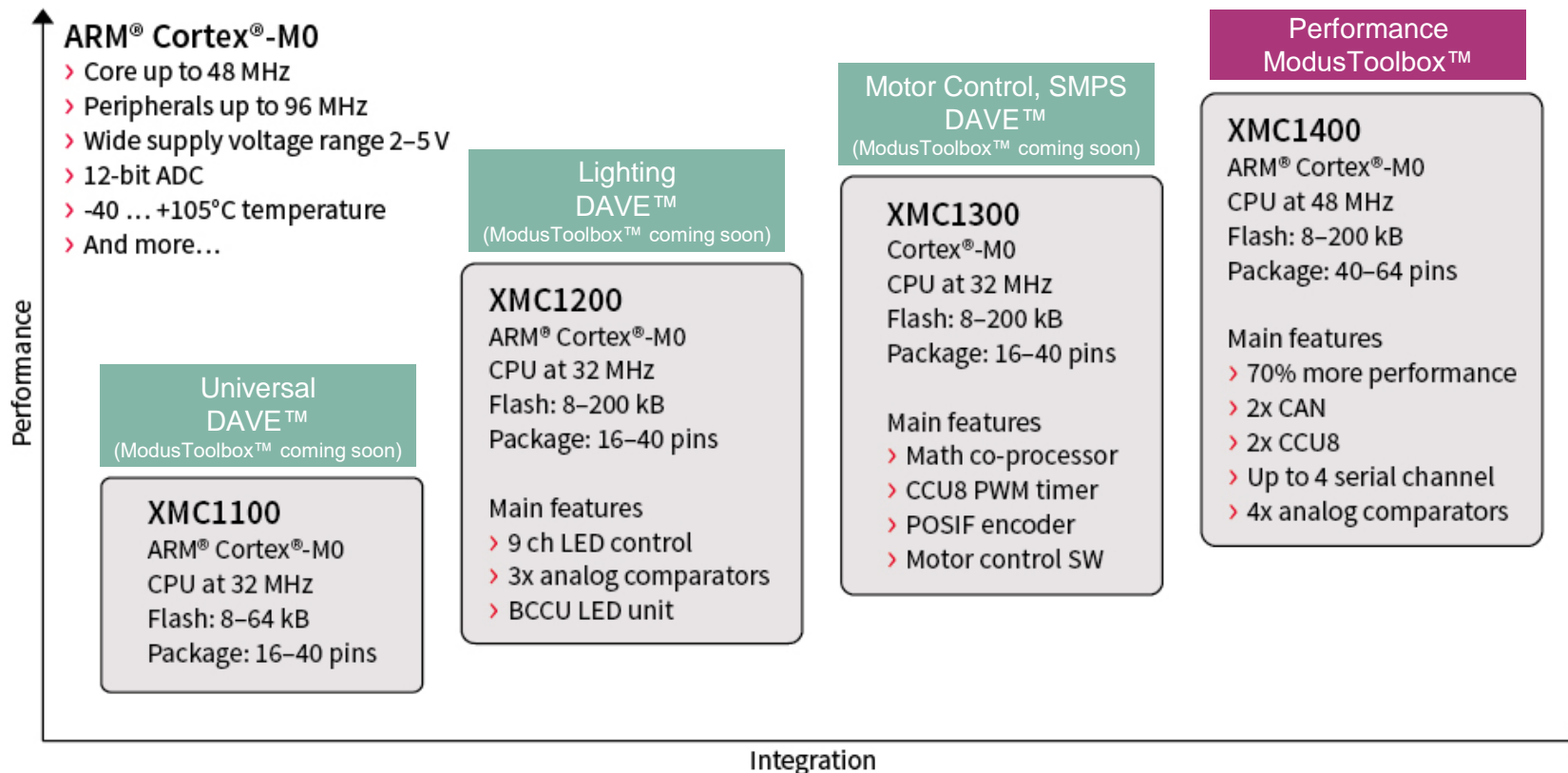
XMC1000: 230V Boost PFC - Quasi-Resonant Conduction Mode

This example demonstrates active digital power factor correction performed by an XMC1302, based on the DAVE project "PFC_XMC1302_QR". Only the power factor corrector current loop is closed, by employing constant on-time, zero-crossing detection, and valley delay. The voltage loop that controls the output voltage is left open (not implemented). The constant on-time is fixed at a value that results in 410V output over the fixed 4kohm load.



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

<https://www.infineon.com/cms/en/product/microcontroller/32-bit-industrial-microcontroller-based-on-arm-cortex-m/?redirId=41403#!simulation>



Agenda

1 Infineon: the link between the real and the digital world

2 Infineon Designer introduction

3 Infineon Designer – SPICE & XMC™ MCU co-simulation using ModusToolbox™

4 **Summary**

Summary: what to remember...

Use Infineon Designer SPICE simulator to check the electrical & thermal performance of your products & solutions

Use ModusToolbox™ ecosystem to enable rapid development of Infineon MCUs, covering connected IoT applications like motor control, power supply and cloud-connected solutions

Combine both to co-simulate & debug MCU software together with hardware by using Infineon Designer – online SPICE simulator integrated into ModusToolbox™

More to come in December 2021, New integrated webpage release with all software & tools as one interface to customers (Infineon Toolbox/Developer Center)

Finder Tools

- › [Infineon Solution Finder](#)
- › [Infineon Evaluation Board Finder](#)
- › [Infineon Product Finder](#)
- › [Infineon Simulation Models](#)

Hardware Simulation Tools

Thermal design

- › [Infineon IPOSIM Power Simulation for Power Modules and Disk Devices](#)
- › [Infineon Power Simulation for Integrated Power Modules \(IPM\) powered by PLECS](#)
- › [Infineon Power Simulation for discrete IGBTs powered by PLECS](#)

Electrical & software design

- › [Infineon Designer powered by TINACloud](#)
- › [PowerEsim Simulation for Switched-Mode Power Supply \(SMPS\)](#)

Magnetic design

- › [Infineon Magnetic Sensor Design Tools](#)

Software & Tools

- › [Infineon Toolbox](#) (future: Infineon Developer Center)

Software Development Tools

- › [ModusToolbox™ Software and Tools](#)
- › [TriCore™ Development Tools for AURIX™ 32-bit Automotive Microcontroller based on TriCore™](#)
- › [DAVE™ Development Platform for XMC™ 32-bit Industrial Microcontroller based on ARM® Cortex®-M](#)

Infineon Support & Distribution Partners

- › [Technical Support Center](#)
- › [Forums](#) [Cypress Developer Community](#)
- › [Newsletter for Engineers](#)
- › [Orderable Part Number \(OPN\) Finder](#)
- › [Where to Buy your Products](#)



Part of your life. Part of tomorrow.

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)

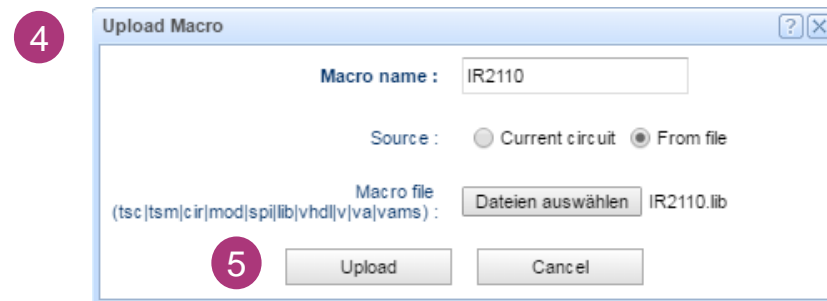
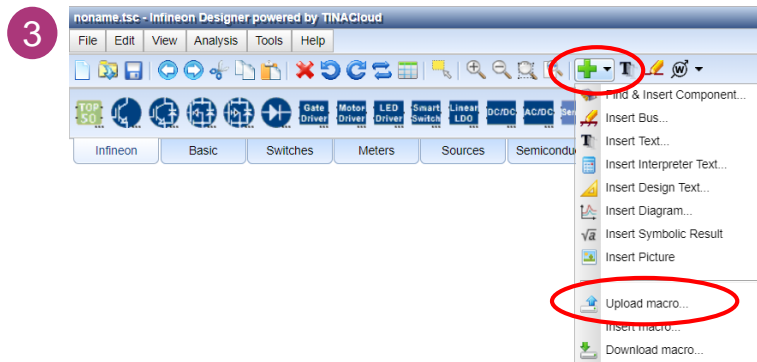
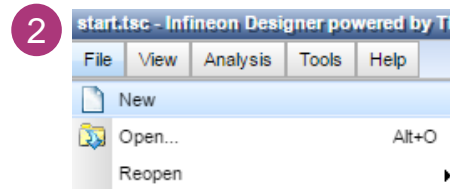
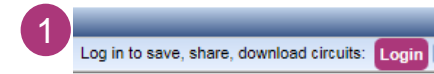
Import additional SPICE models

- > 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)

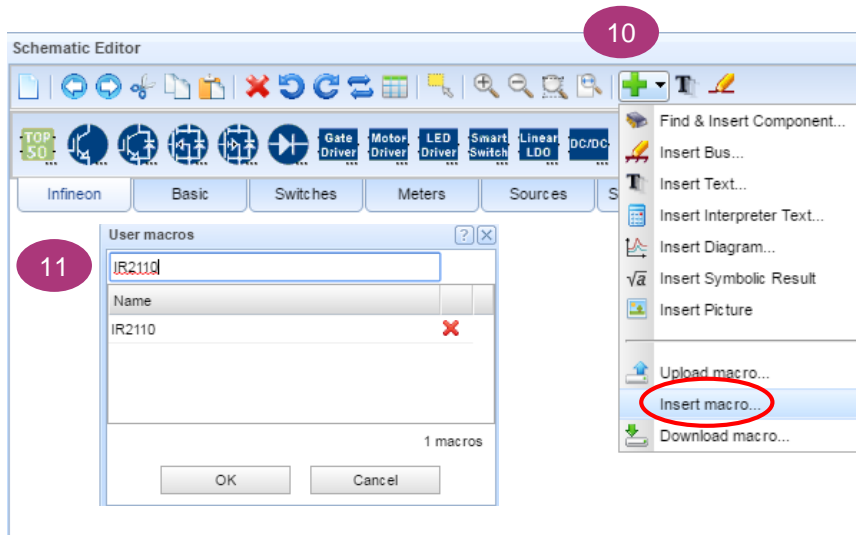
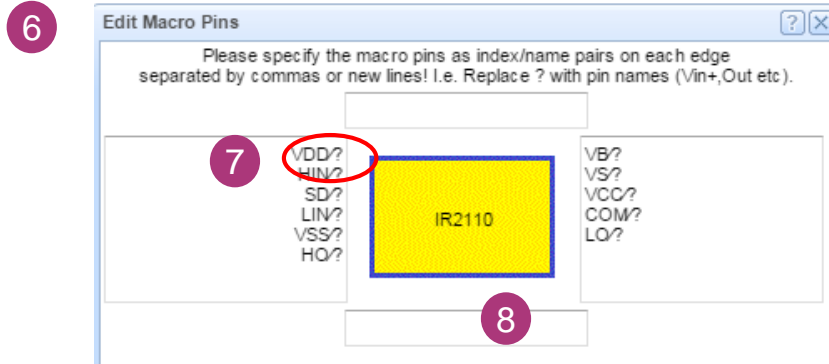


1. [Login](#) with your myInfiniteon account
2. Select File -> New, create a new circuit
3. Click menu bar symbol and click "Upload macro..."
4. Name your model, select "from file", and browse to your SPICE model in .SUBCKT format
5. Click on "Upload"

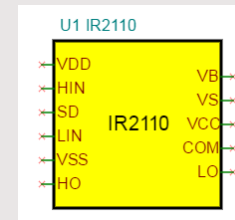
Example Model [OrCAD Capture for IR2110](#)

```
.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)



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



12. Finalize your circuit and Save it with “Save -> Save as”
13. Test your circuit