

Be smart. Prototype online.

Infineon Designer Getting Started

April 16, 2018

Get support: <mailto:support@infineon.com>



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Infineon Designer Overview

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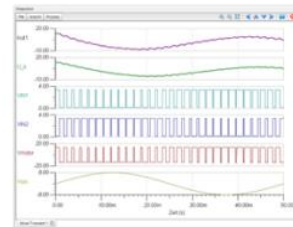
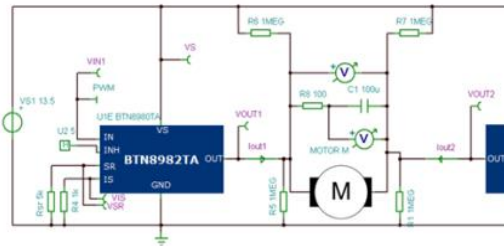
Infineon Designer - Online Digital Prototyping Engine (www.infineon.com/ifxdesigner)



Great user experience

- › Multiple platforms (IE, Safari, Chrome, Firefox, etc.)
- › No installation
- › Unlimited licenses
- › Fast simulation due to 16-core server CPU configuration

powered by...

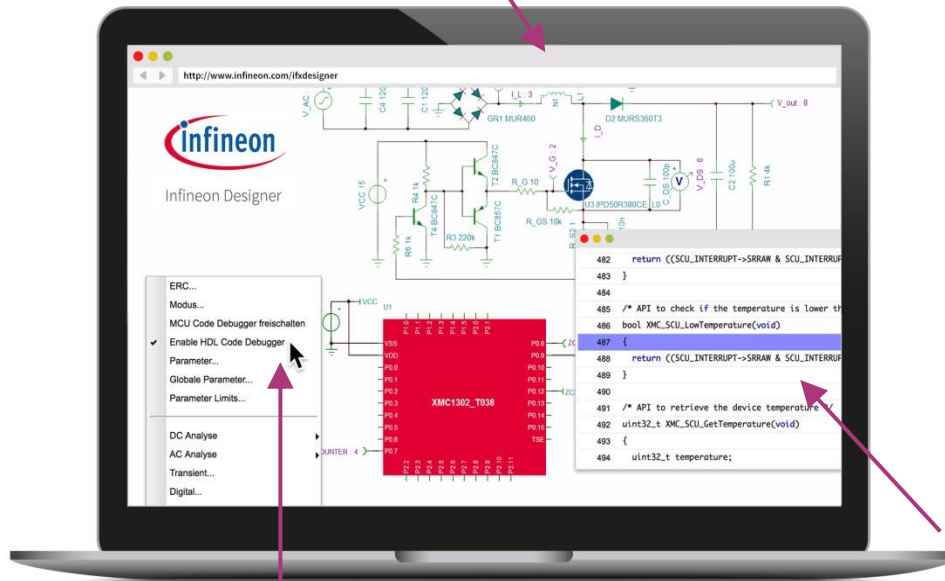


Features

- › Accurate transient and system efficiency simulation of products and applications
- › Fast parameter configuration with interpreter window
- › Digital/analog co-simulation
- › 150+ application circuits (lighting, power supplies, motor control, mobile RF front-end)

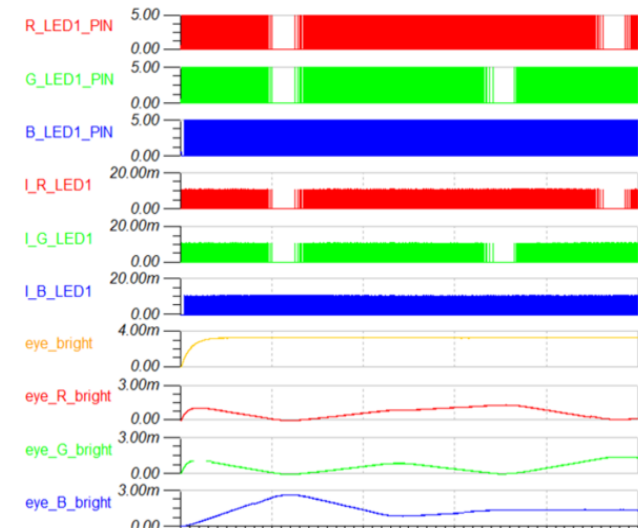
World's First Online Analog-Digital Debugger Press Release Electronica 2016

1 Select XMC1200 circuit



2 Choose simulation mode

Example circuit: 32-bit MCU
XMC1200 controlling the RGB color
walk with constant brightness



3 Co-simulate MCU software with analog circuit

Highlight: Digital Design Example ATV

24V Arduino Shield PROFET™+ 24V Family

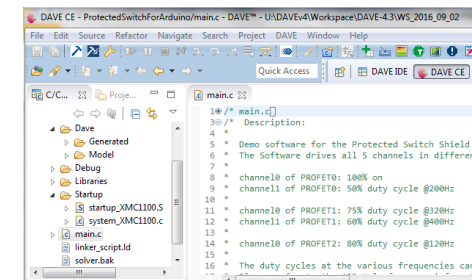
› Unique Value Proposition

- Customer explore the board by “click & play”, w/o reading through manuals & datasheets
- Customer adapt the soft board (hardware & software) to his own application needs prior to Buy Online

Hardware



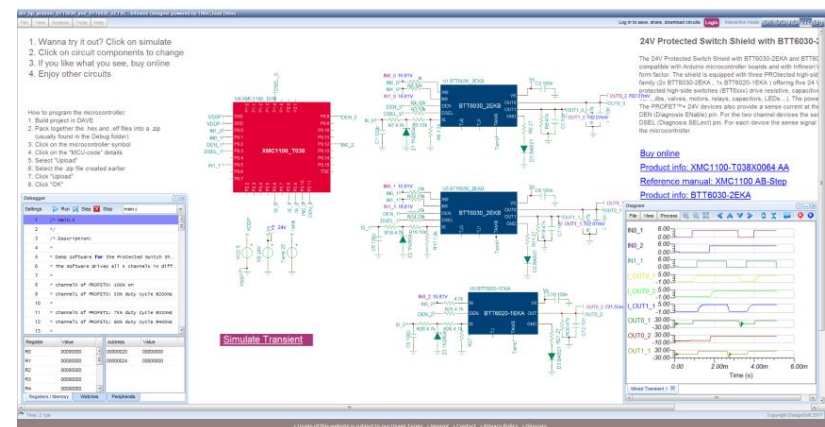
Software



› Full Hardware & Software Design

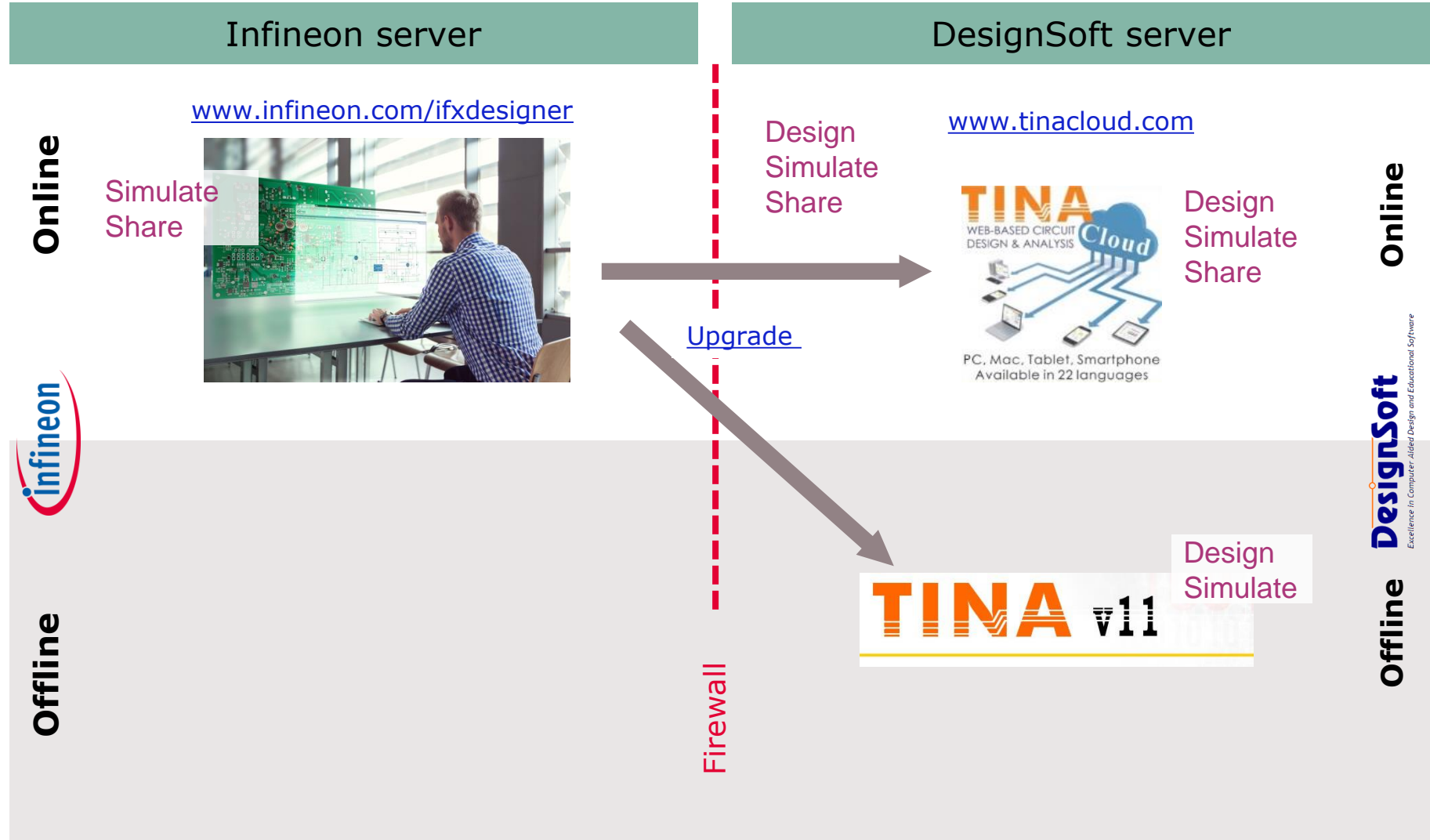
- HW: Arduino Shield
- SW: DAVE
- Online Circuit: TINA SPICE
- Engine: DesignSoft
- Hosting: Infineon & DesignSoft

Online Virtualization



Infinite Designer Versions

Landing Page: www.infineon.com/ifxdesigner



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Infineon Designer New Features



Parametric configurable circuit



1. Wanna try it out? Click on "Simulate Transient"
2. Set application parameters below or directly change any component

{1. click here to set application parameters}
{2. click on "Run" to calculate components}
{3. click on "OK" and Simulate Transient }

{Input voltage [V]}
V_in = 400 (use 5 ... 1000)
{Output voltage [V]}
V_out = 750 (use higher than V_in)
{Output current [A]}
I_out = 9.3 (<= 20)
R_load = V_out / I_out
R_load = [80.6452]

{Set inductance L [H]}
L = 300u
{Set capacitance C [F]}
C = 1000u
{Set gate resistance Rg [Ohm]}
Rg = 3

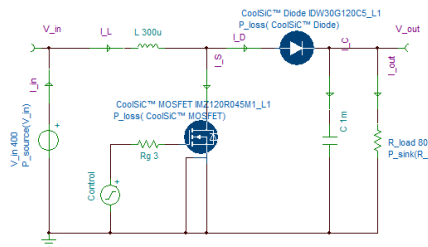
{= Control settings: change with care! =}
{Switching frequency [Hz]}
fs = 100k (use 10k ... 200k)
Duty = 1 - (V_in / (V_out + offset))
Duty = [473.6842m]
L_INIT = L_out / (1 - Duty) (inductor initial value)
C_INIT = V_out (capacitor initial value)
T = 1fs
T_on = Duty * T
T_off = T - T_on
ControlT2 = T_on
ControlT5 = T_off

Simulate Transient

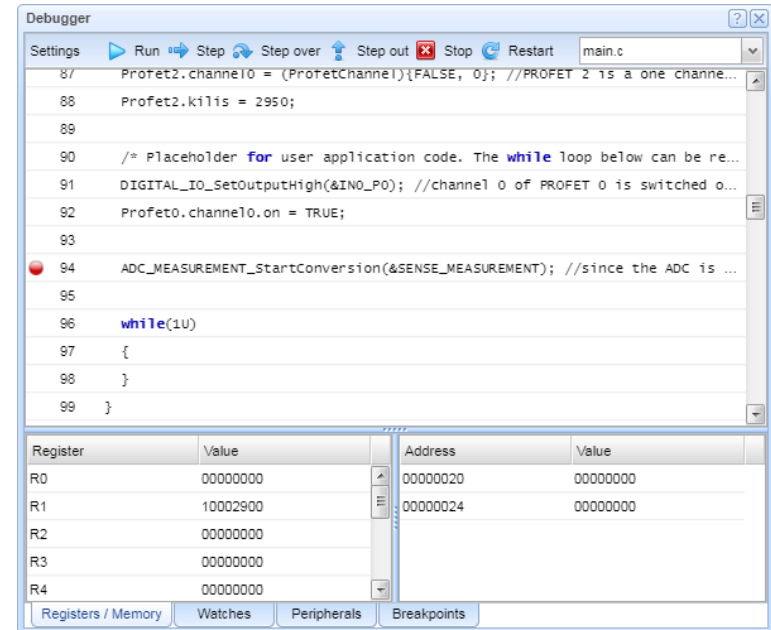
[Reset circuit](#)

[Click to select startup circuit](#)

[Click to select steady-state circuit](#)



Enhanced MCU debugging



Power dissipation & efficiency

Compare Window				
Compare with : Power dissipation 1 <input type="checkbox"/> Zoom in synch				
Efficiency: 98.92% Total Input: 7.05k W Total Output: 6.97k W				
Component	Power type	Power dissip...	Percentage (...)	Pass/Fail
V_in	Source	7.05k	100	Pass
R_load	Sink	6.97k	98.92	Pass
CoolSiC™ MOSFET	Loss	31.31	0.44	Pass
CoolSiC™ Diode	Loss	13.67	0.19	Pass

Signal processing, e.g. ripple

Compare Window		
Compare with : Ripple 1 <input type="checkbox"/> Zoom in synch		
Signal Label	Absolute Ripple	Relative Ripple
V_out	44.20m	0.01%
I_out	548.10u	0.01%

Infineon Designer New Circuits Highlights



- › Motor Control (ATV)
 - [24V DC Motor Control Shield with BTN8982TA for bi-directional DC brushed motor \(with torque simulation\)](#)
 - [12V DC Motor Control Shield with BTN8982TA for two uni-directional or one bi-directional DC brushed motor](#)
 - [12V DC Motor Control Shield with BTN8982TA and XMC1100 for two uni-directional or one bi-directional DC brushed motor](#)
- › Smart Low-Side & High-Side Switches (ATV)
 - [24V PROFET™ shield with BTT6030-2EKA and BTT6020-1EKA for Arduino](#)
 - [13.5V low side over-temperature protection with HITFET™ BTF3050TE](#)
 - [24V high side over-current and over-temperature protection with PROFET™ BTT6020-1EKA](#)
 - [13.5V high side short-circuit protection and thermal shutdown with restart using PROFET™ BTS4140N](#)
- › ESD Protection
 - [ESD Protection Diode with Low clamping voltage bi-directional ESD237-B1-W0201 Electrical Characteristics](#)
 - [ESD Protection Diode with Low clamping voltage bi-directional ESD241-B1-W0201 Insertion Loss](#)
- › Power Converter (Expert Talk)
 - [200V Boost Converter with CoolMOS™ P6 and EiceDRIVER™ 2EDN7523F](#)
 - [Expert Talk: What is a Power Converter \(SMPS\)?](#)
 - [Expert Talk: What is a DC-DC Converter \(SMPS\)?](#)

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Infineon Designer Example

Getting Started

Infineon Designer: Getting Started

Infineon Designer is based on the easy to use multi-language TinaCloud environment. This is the online version of the popular TINA circuit simulation software now running in your browser without installation, on multiple platforms (PC, laptop, mobile, tablets, etc.). Analog circuits are modeled in Spice and can be co-simulated with digital systems using hardware description languages such as VHDL and Verilog.

How to select a device?

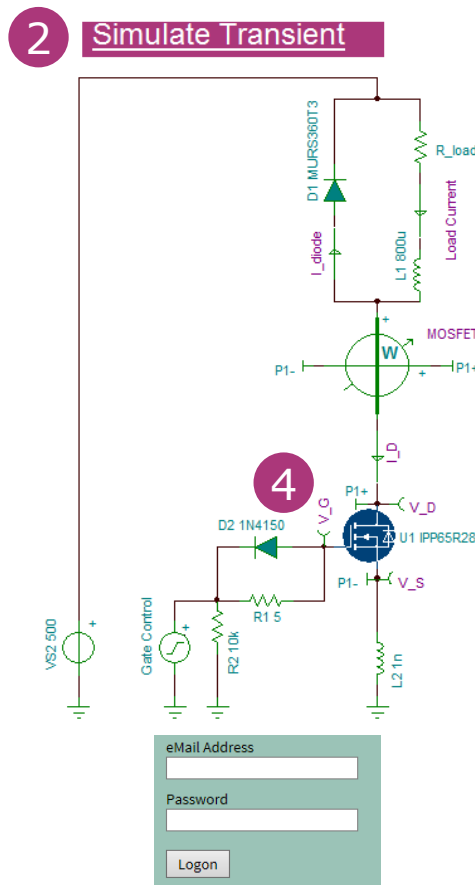
- 1) type Strg/CTRL-F and search for e.g. "U1"
- 2) the MOSFET device will turn red
- 3) click on the red symbol and open properties
- 4) click on "SubCkt-Type" to change the part
- 5) type the name into search or
- 6) use the pull-down to select a technology
- 7) click on OK and the part will change (may take a while)

How to search and display signals?

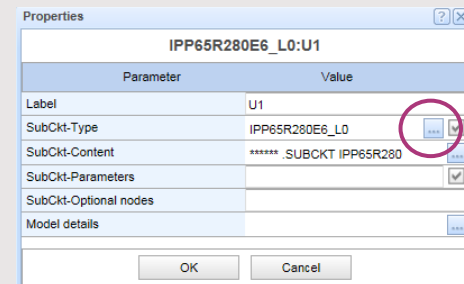
- 1) click on "Simulate Transient"
- 2) search with "Strg/CTRL-F" for "V_G" voltage pin turning red
- 3) click on the voltage pin and open properties
- 4) change the "IO state" to "Output" for display
- 5) Label "V_G:2" will be displayed as signal number 2
- 6) now simulate again and the signal will be displayed

How to save & share circuits?

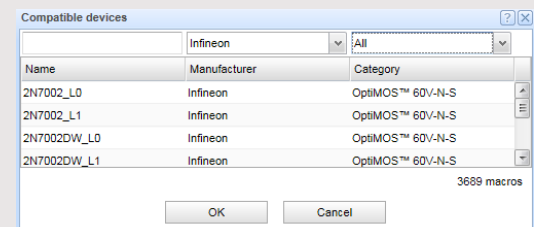
- 1) click on login in the menu above
- 2) File -> Open -> Infineon Examples
- 3) change the circuit and click on File -> Save as
- 4) the circuit will be saved in the "My Circuits" folder
- 5) File -> Share and copy the link -or-
- 6) send an Email to share your circuit



1. Open circuit [getting started](#)
2. Click on **Simulate Transient**
3. Learn about functions & signals in the diagram window
4. Click on the MOSFET symbol and click on "..." "SubCkt-type"



5. Select a new MOSFET from the drop-down menu



6. Login with your My Infineon account to save or share your circuit

6

Log in to save, share, download circuits:

Login

eMail Address

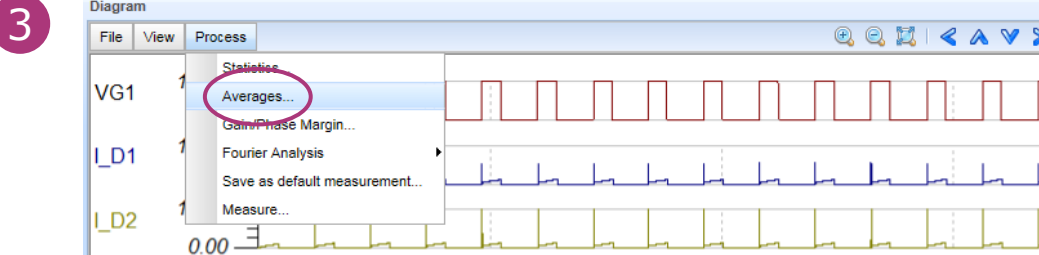
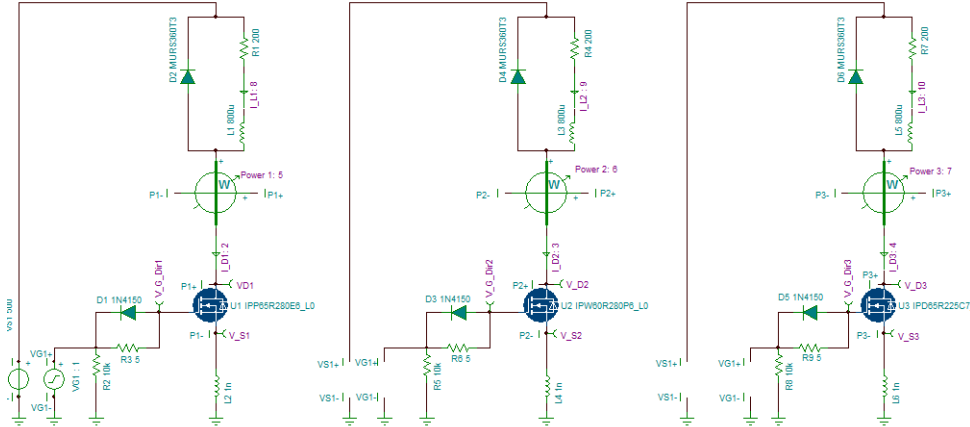
Password

Logon

Infineon Designer Example

MOSFET Performance Comparison

1. E6: Easy to use (e.g., IPP65R280E6) P6: Balanced (e.g., IPW60R280P6) C7: Efficient (e.g., IPD65R225C7)

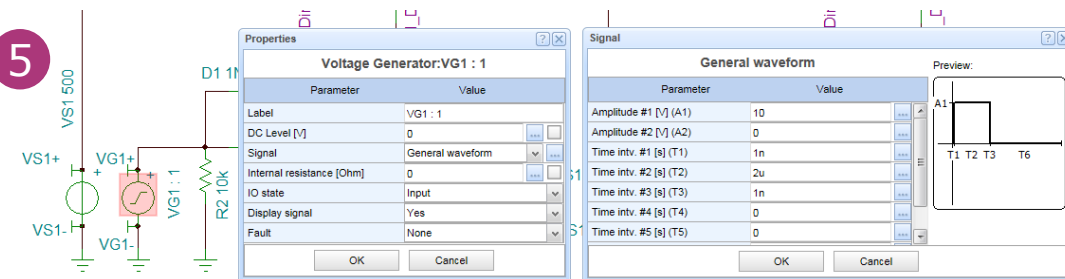


1. Open circuit [MOSFET performance comparison](#)
2. Click on [Simulate Transient](#)
3. Click on the menu item process → Averages in the diagram window

Averages

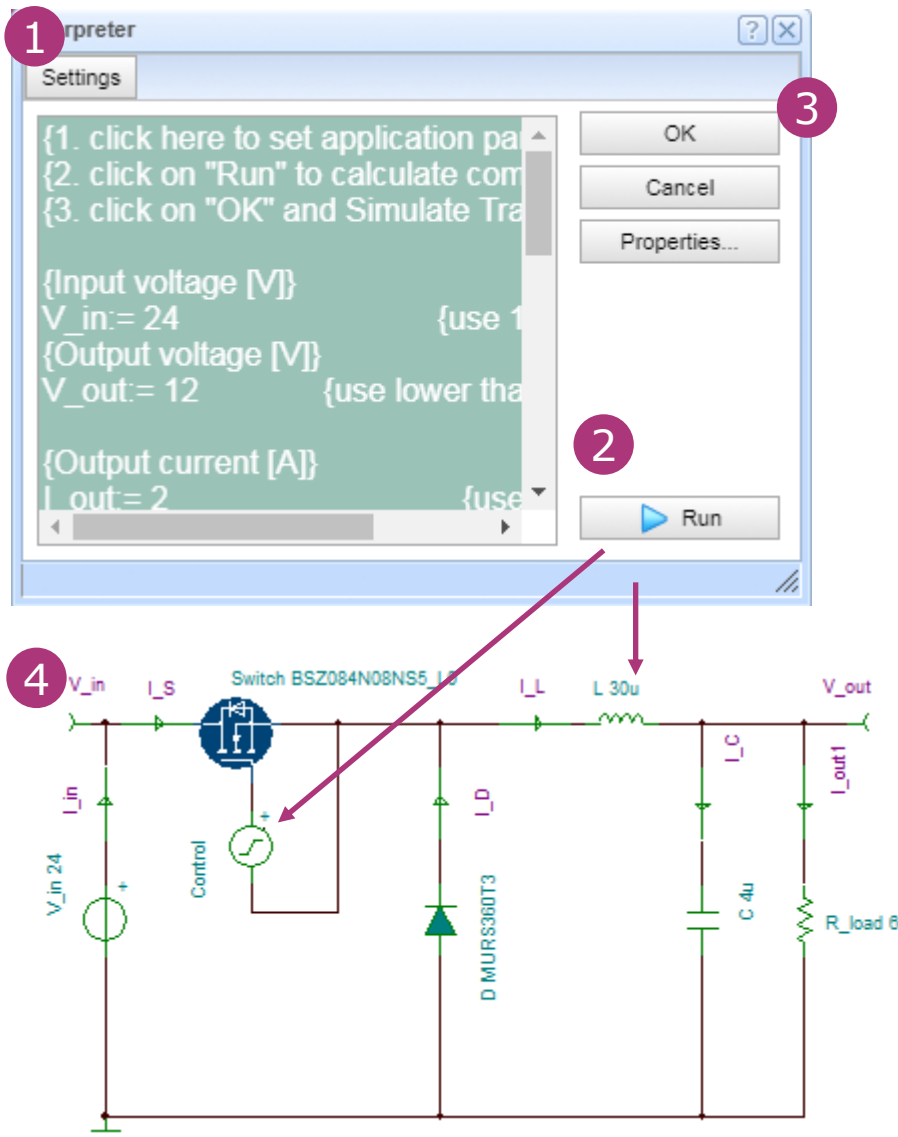
	Average Val...	Absolute Av...	RMS Value:
VG1 : 1	3.47	3.47	5.89
I_D1 : 2	320.69m	321.70m	566.59m
I_D2 : 3	313.58m	318.56m	580.67m
I_D3 : 4	301.89m	302.14m	543.93m
Power 1: 5	3.32	3.70	60.11
Power 2: 6	2.85	4.02	72.90
Power 3: 7	1.92	2.02	58.28
I_L1 : 6	0.43.22m	0.43.22m	0.77.22m

Close

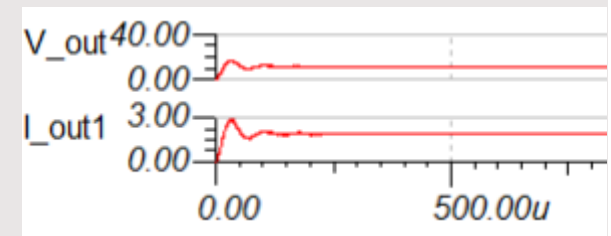


4. Compare the different power losses of the 3 MOSFETs
5. Change the PWM pattern of VG1 voltage generator and simulate again
6. Click on [Buy online](#) and compare the prices

Infineon Designer Example: Circuit Configurator



1. Open circuit [Design a 24V Buck Converter in CCM mode](#)
2. Click on green window and configure converter input to output spec in interpreter
3. Click on Run and interpreter will configure all circuit components (Duty Cycle, L, etc.)
4. Click on OK and run [Simulate Transient](#)
5. Check new converter input to output spec in diagram window



Infineon Designer Example: Power Dissipation & Efficiency Calculation

1

Buck startup Buck steady-state

2

3

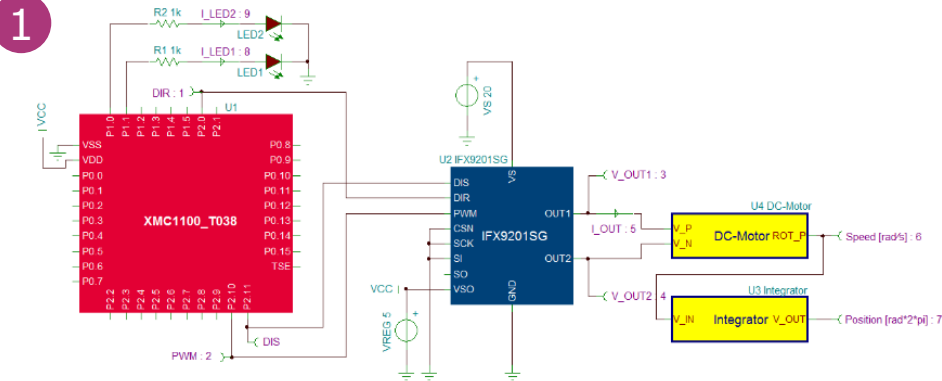
Component	Power type	Power dissipati...	Percentage (%)	Pass/Fail
V_in	Source	22.79	100	Pass
R_load	Sink	21.65	95.01	Fail
Switch	Loss	161.75m	0.71	Pass
C		5.46m	0.02	Pass
Control		465.46u	0.00	Pass
D		960.36m	4.21	Pass
L		7.5m	0.03	Pass

Efficiency: 95.01% Total Input: 22.79 W Total Output: 21.65 W

Transient 1 X Transient 2 X Power dissipation 1 X

1. Open circuit where power type are set
2. Open Analysis -> Transient and enable Power dissipation analysis
Important: set start display and end display to steady state timing (signals need to be stable)
3. Click on **Simulate Transient**
4. Open Power dissipation tab after simulation
 - Efficiency
 - Power Dissipation of all components sorted by Source, Sink, Loss
 - Pass or Fail depending on component rating

Infineon Designer Example: Enhanced MCU Debugging ([H-bridge Kit 2Go](#))



2 Simulate Transient



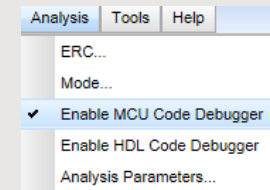
5

```

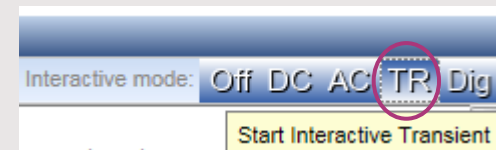
87 Profet2.channel0 = (Profet2channel)[FALSE, 0]; //PROFET 2 is a one channel...
88 Profet2.k111s = 2950;
89
90 /* Placeholder for user application code. The while loop below can be re...
91 DIGITAL_IO_SetOutputHigh(&TNO_PO); //channel 0 of PROFET 0 is switched o...
92 Profeto.channel0.on = TRUE;
93
94 ADC_MEASUREMENT_StartConversion(&SENSE_MEASUREMENT); //since the ADC is ...
95
96 while(1)
97 {
98 }
99 }
    
```

Register	Value	Address	Value
R0	00000000	00000020	00000000
R1	10002900	00000024	00000000
R2	00000000		
R3	00000000		
R4	00000000		

1. Open Design [H-bridge Kit 2Go](#)
2. Click on **Simulate Transient**
3. Learn about functions & signals in the diagram window
4. Enable MCU code debugger



5. Start Simulation in interactive mode, set break point, step through the code, watch variables and registers



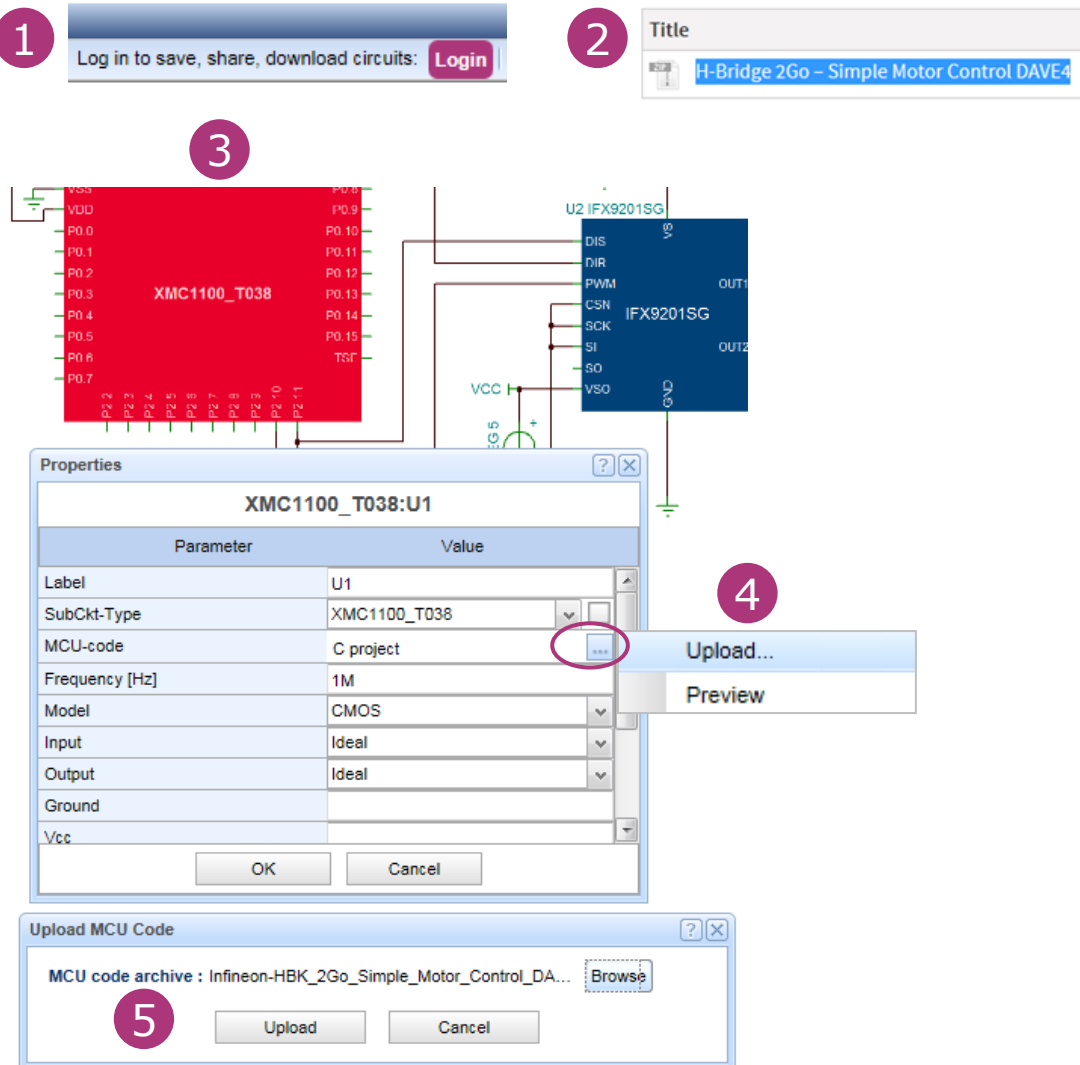
6. Purchase sample & board



[Buy online](#)

Infineon Designer XMC™ software example

H-bridge Kit 2Go (Part 2/3: software upload)



1. Log in to save, share, download circuits: **Login**

2. Title: H-Bridge 2Go – Simple Motor Control DAVE4

3. XMC1100_T038

4. Upload...

5. Upload MCU Code

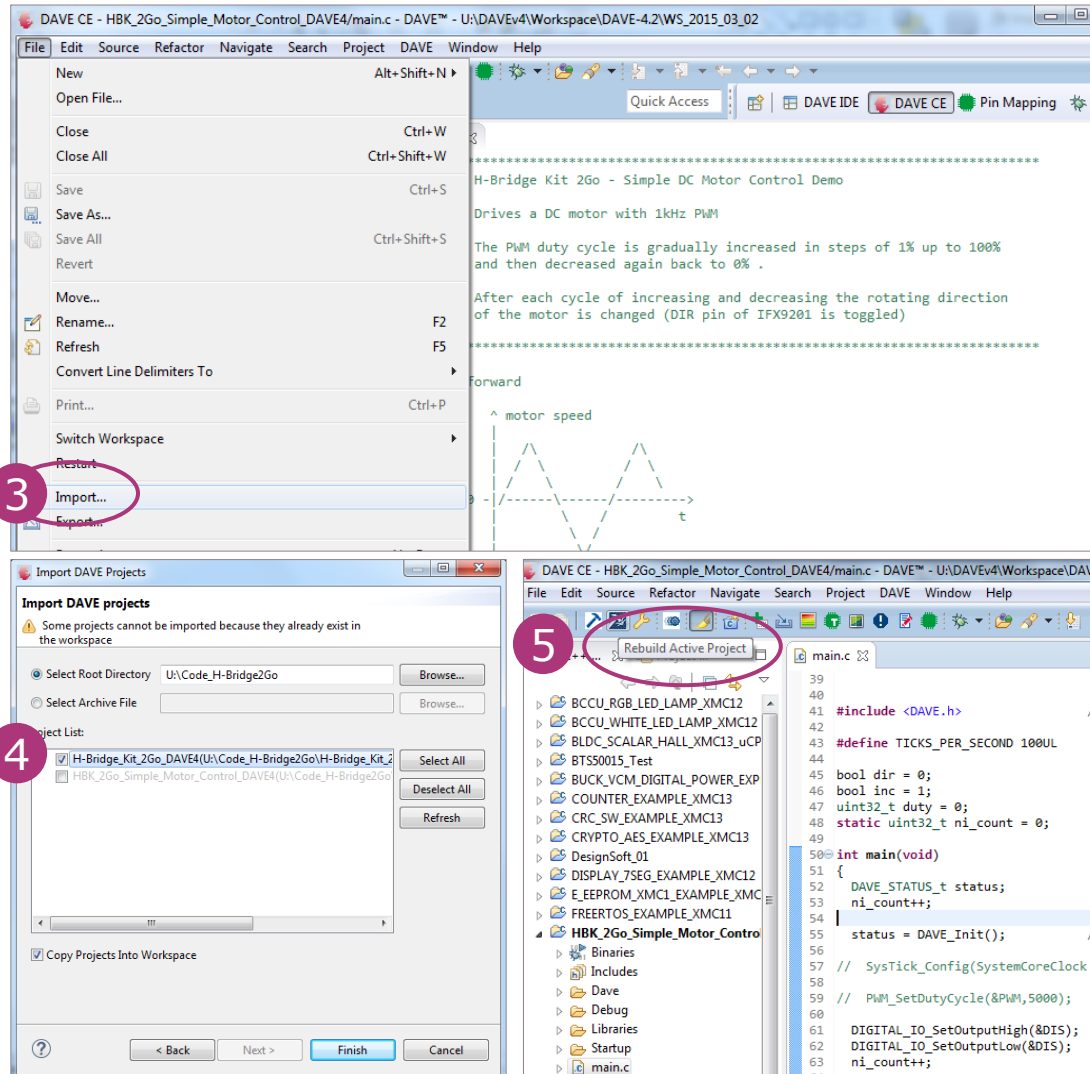
MCU code archive : Infineon-HBK_2Go_Simple_Motor_Control_DA... **Browse**

Upload **Cancel**

1. Open design [H-bridge Kit 2Go](#) and login with MyInfineon account
2. Download code .zip file [H-bridge Kit 2Go – default simple example routine](#) example from the H-bridge kit board page [software & tools tab](#)
3. Click on the red XMC1100 symbol and open the MCU code window by clicking on "..."
4. Browse to the .zip file and select it (contains files .elf, .hex and source files)
5. Upload the code Infineon-HBK_2Go_simple_motor_control_DAVE4.zip-SW-v01_00-EN.zip
6. Click on **Simulate Transient**
7. Check the results

Infineon Designer XMC™ software example

H-bridge Kit 2Go (Part 3/3: software rebuild)



1. Download and install DAVE™ software development suite [DAVE™ for windows](#)
2. Download code .zip file [H-bridge Kit 2Go – default Simple example routine](#) example from the H-bridge kit board page [software & tools tab](#)
3. Start DAVE™ and import the unzipped project into your workspace with file → import → Infineon DAVE™ project
4. Click on next and browse to the folder with the project and select it
5. Change the code and rebuild
6. Go to your workspace directory and .zip the updated project folder
7. Got back to the schematic click on the red XMC1100 symbol and upload the MCU code

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Technical Support

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Support Page

Support is available in English, German and Mandarin from our talented team of experts.

Live Chat Online
在线支持



› Start chat session with our support team

Technical Assistance Center
技术支持中心 (TAC)



› Get product support from our technical experts

Call us Toll Free
免费热线联系我们



› Call us toll-free 24/7

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Please state your question (with at least 3 words)

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6. How to login to myInfineon [CN] [DE]



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