Be smart. Prototype online.

Infineon Designer
入门简介

www.infineon.com/ifxdesigner

技术支持: mailto:support@infineon.com
2019年6月7日

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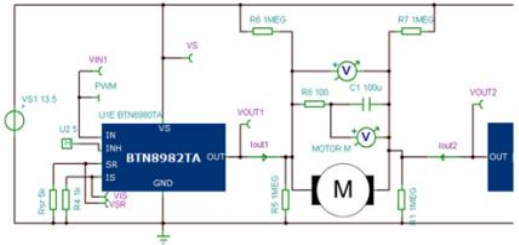
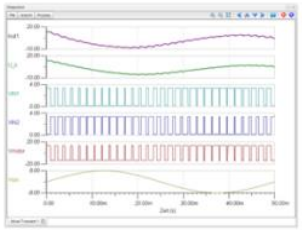
Infineon Designer – 在线SPICE仿真引擎 (www.infineon.com/ifxdesigner)

powered by...

TINA Cloud
WEB-BASED CIRCUIT DESIGN & ANALYSIS
PC, Mac, Tablet, Smartphone
Available in 22 languages





绝佳的用户体验

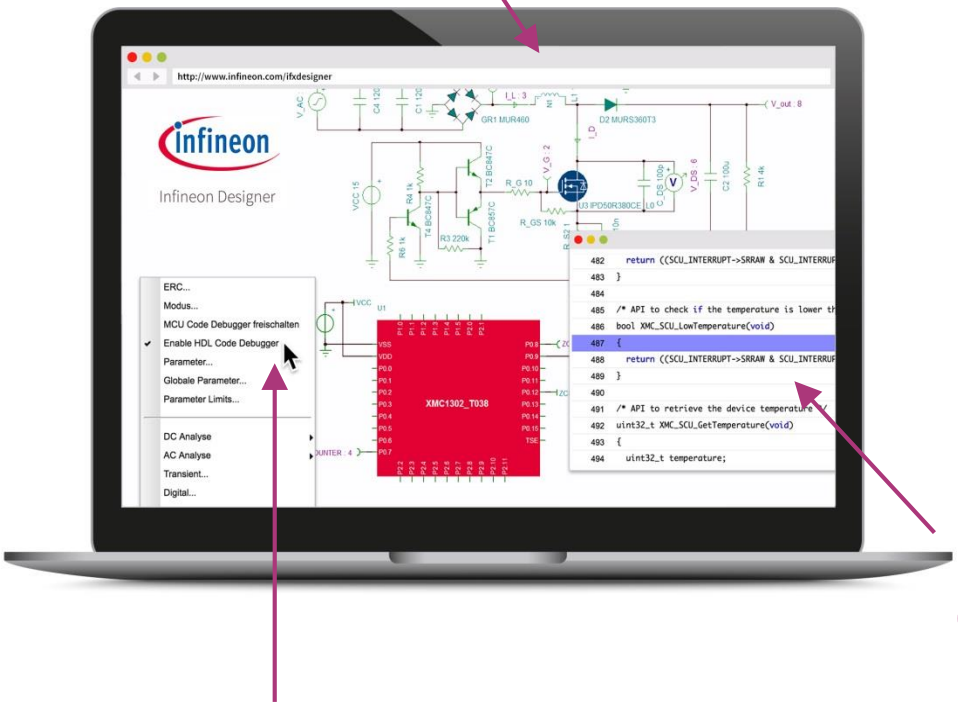
- **全新全能电路编辑器!**
- 多浏览器支持 (Chrome, Edge, Firefox, Safari等等)
- 无需安装
- 无限免费仿真授权
- 支持在线快速仿真

特性

- 精准的时域信号仿真+系统能效仿真
- 快速参数设置
- 数字/模拟交互仿真
- 已发布超过460个应用电路

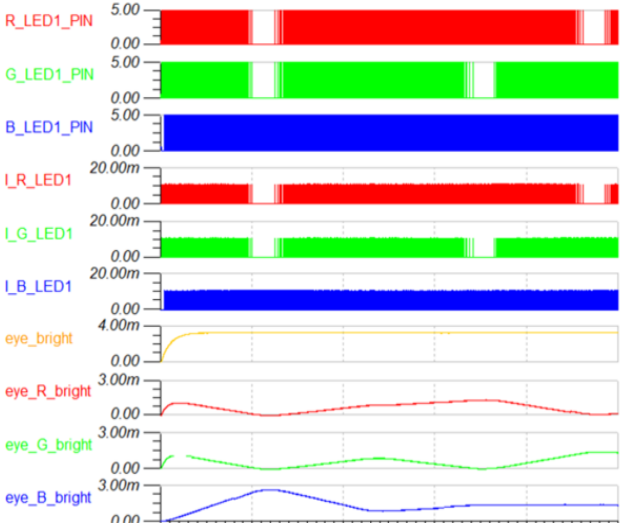
Infineon Designer 使用案例:
数字/模拟交互仿真和在线代码调试

1 **选择 XMC1200电路**



2 **选择仿真模式**

样例电路: 32-bit MCU XMC1200 controlling the RGB color walk with constant brightness



3 **交互仿真处理器控制代码和模拟电路**

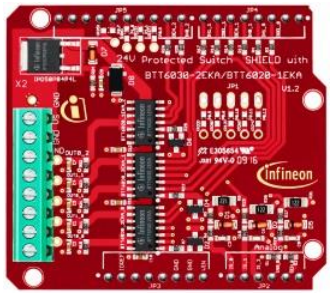
Infineon Designer 使用案例：汽车级在线设计

24V Arduino Shield PROFET™+ 24V Family

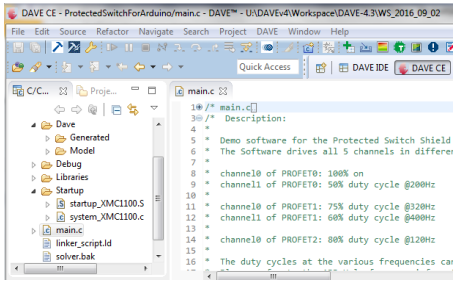
- 独特的附加价值
  - 通过点击鼠标在线探索评估板特性，无需阅读冗长的规格书和应用手册
  - 根据应用需求，在购买样片前，直接在线快速配置硬件和软件参数，熟悉评估板性能

- 在线仿真全套硬件和软甲设计
  - 硬件：Arduino Shield
  - 软件：DAVE
  - 在线仿真：Infineon Designer（Spice）
  - 仿真引擎：DesignSoft

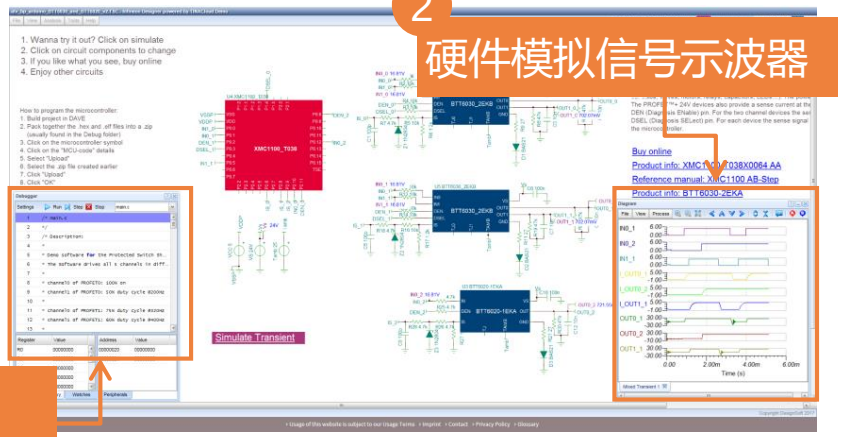
硬件



软件



在线仿真：结果快速可视化



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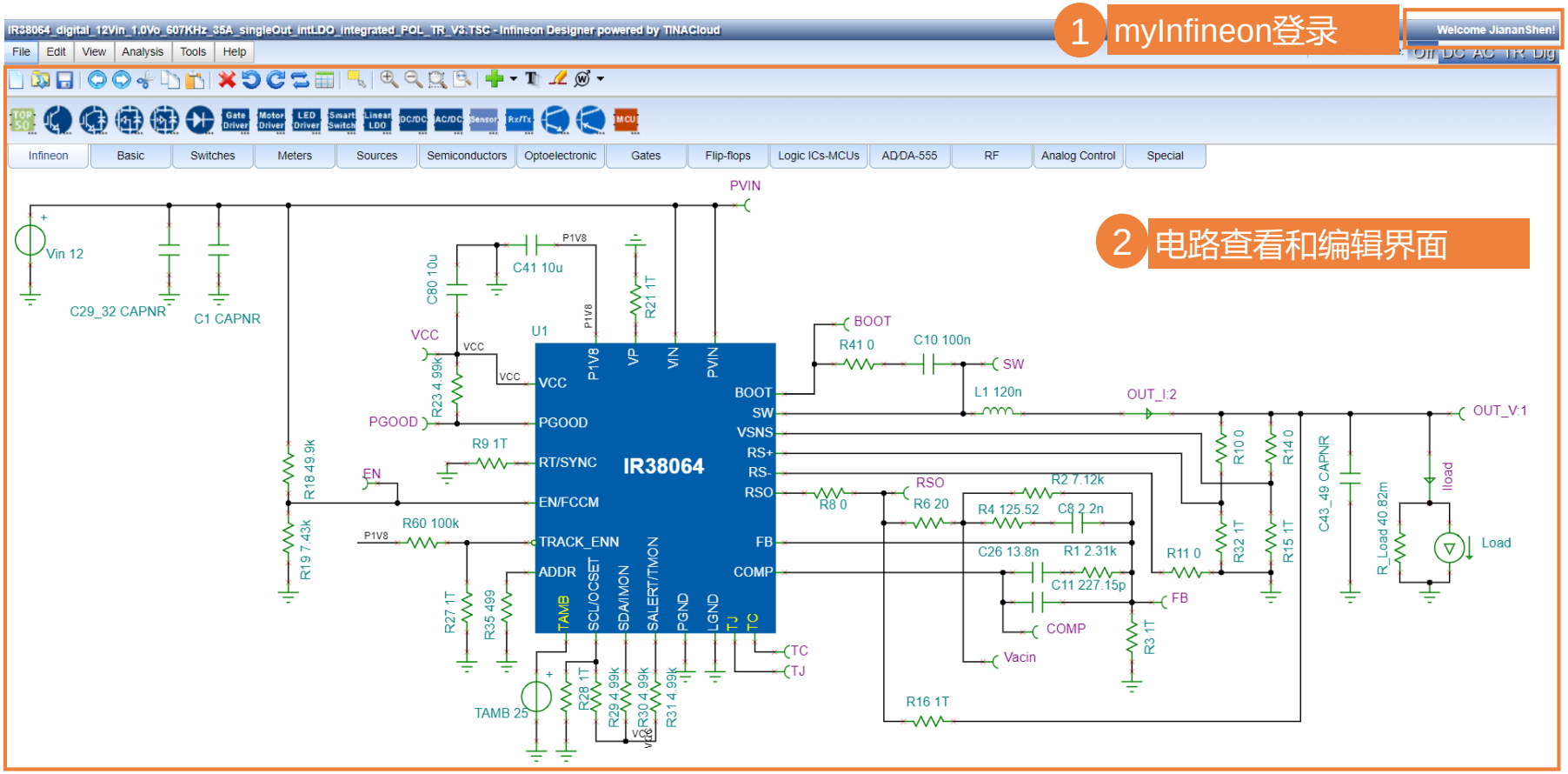
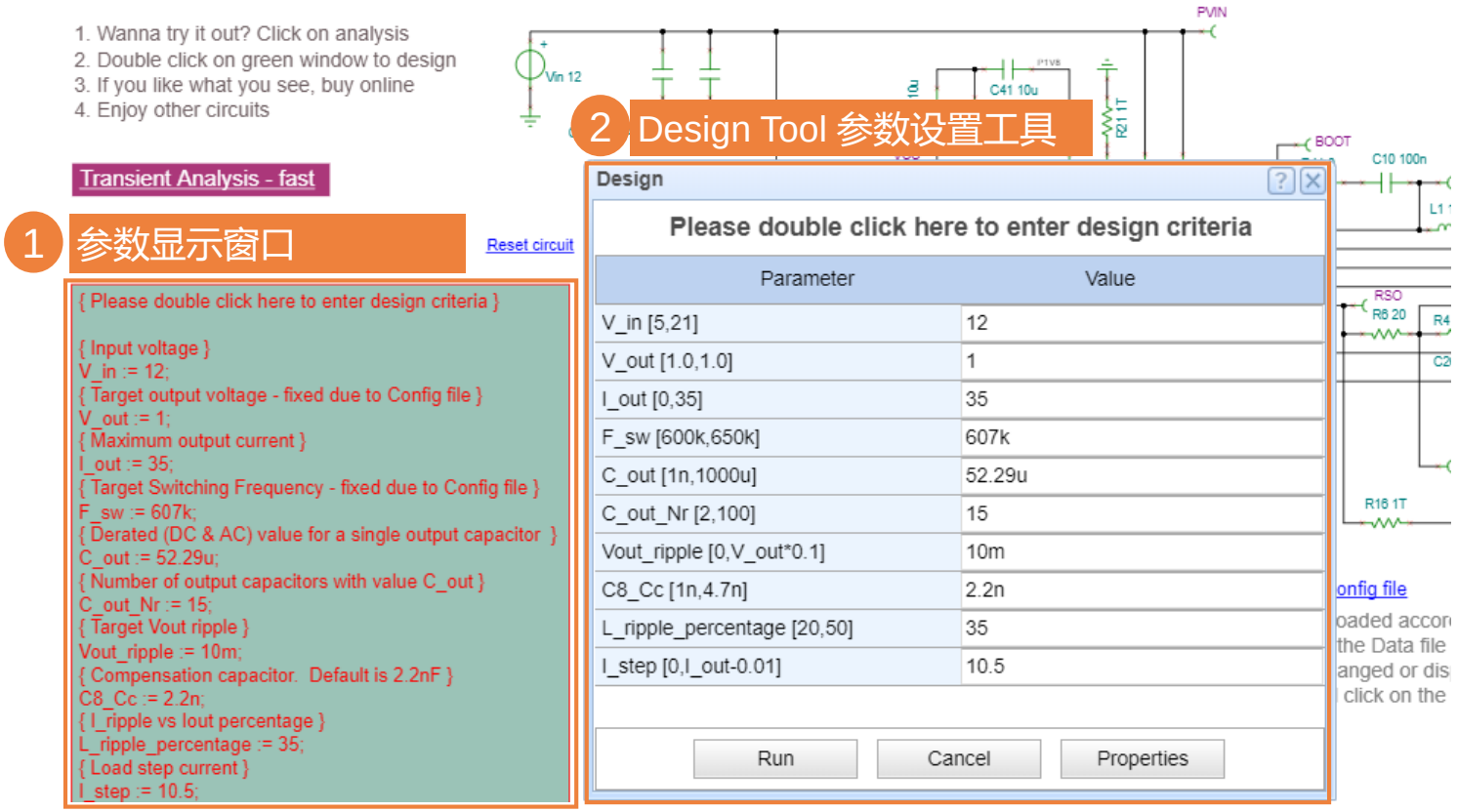
Infineon Designer 全新亮点:
开放全能电路编辑器



- 登录myInfineon账户
- 建立全新电路或修改英飞凌提供的样例电路

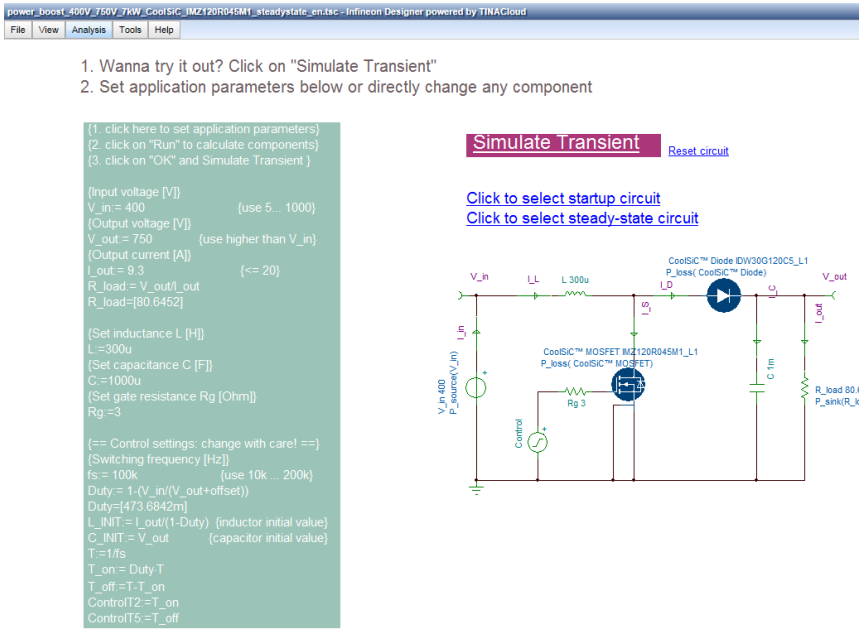
Infineon Designer 全新亮点:
Design Tool - 电路参数设置和自动计算



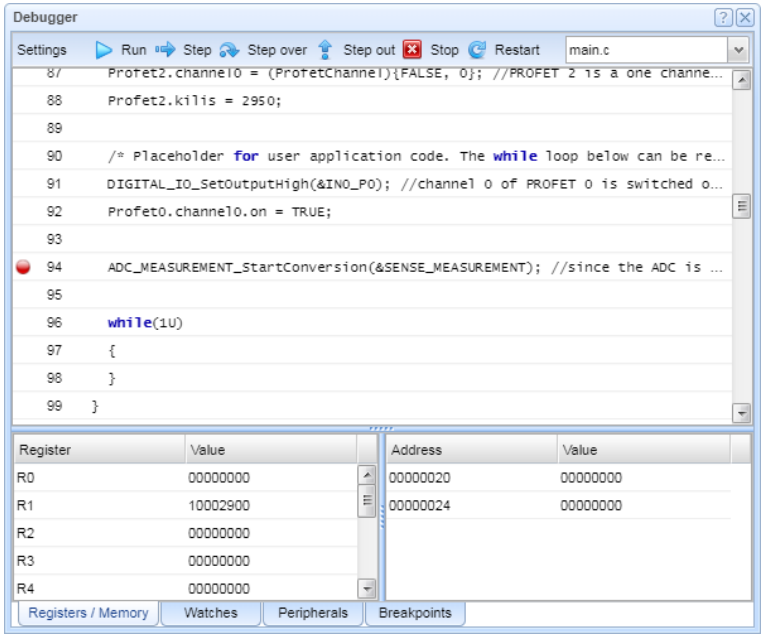
› Design Tool 参数设置工具
  – 更简洁的参数设置
  – 更具自定义公式，快速自动计算和赋值电路参数和器件值

Infineon Designer 全新亮点
其他特性

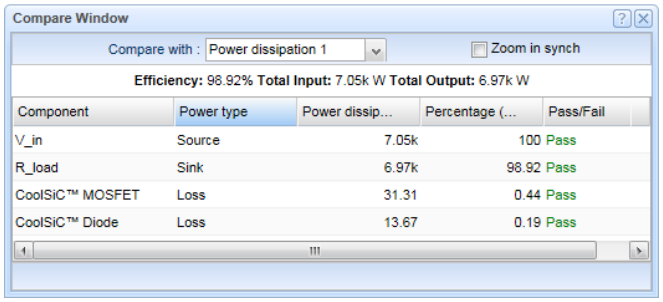
应用电路：可自由配置参数



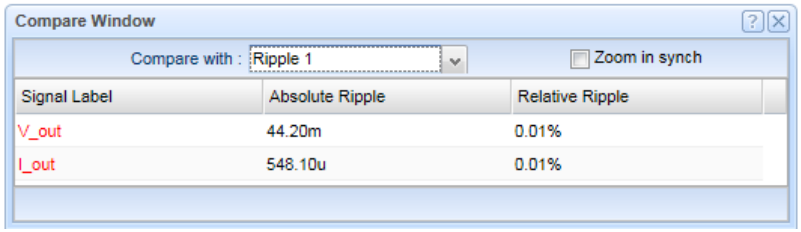
进阶MCU代码调试功能



功率损耗和效率计算



信号处理，比如：纹波



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Infineon Designer – 在线SPICE仿真演示，案例和操作

- 入门电路
  - 学习Infineon Designer仿真基础知识
  - 仿真首个简单的样例电路：反向逆变降压电路
  - 修改器件、电路参数并编辑电路
- 利用升压电路学习Infineon Designer进阶特性
  - 用CoolMOS P7和CoolSiC二极管仿真升压电路
  - 查看电路启动特性和稳态仿真，同时查看简介特性
  - 用Design Tool设置参数重新配置电路
  - 操作：建立第一个Infineon Designer电路
- 用XMC/DAVE™程序控制电机
  - 探索真实评估板的功能
  - 在线交互仿真模拟电路和配套软件
  - 添加代码断点并在线调试代码
  - 安装DAVE™程序开发套件，修改代码并上传新代码仿真
- 如何导入SPICE模型

Infineon Designer案例
入门电路（1/2：电路仿真）

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)

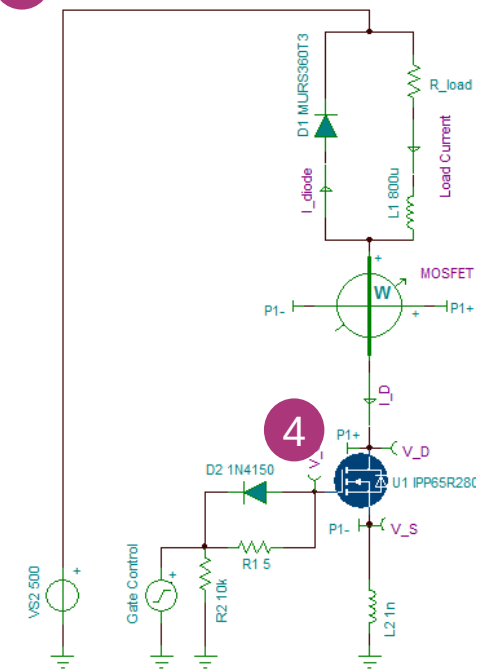
How to search and display signals?

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

2 Simulate Transient



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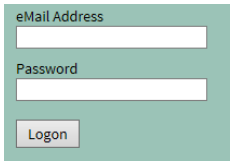
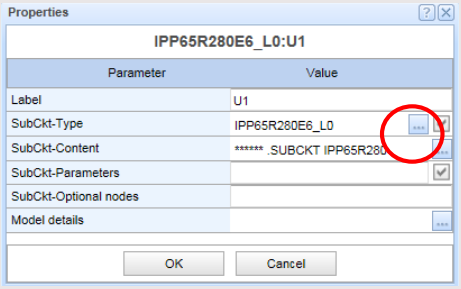
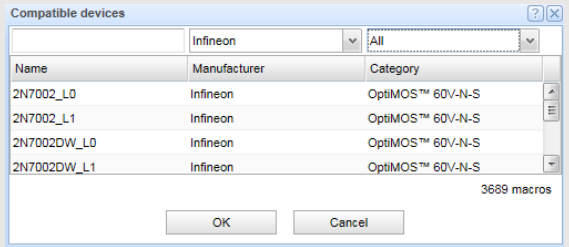


1. 点击打开电路 入门电路
2. 点击启动仿真 Simulate Transient
3. 通过电路图了解应用电路功能和信号
4. 点击MOSFET图标后选择"SubCkt-type"项产品型号后的"..."

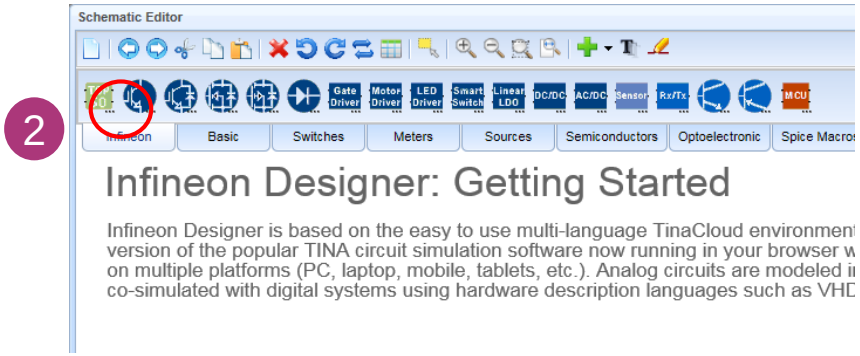


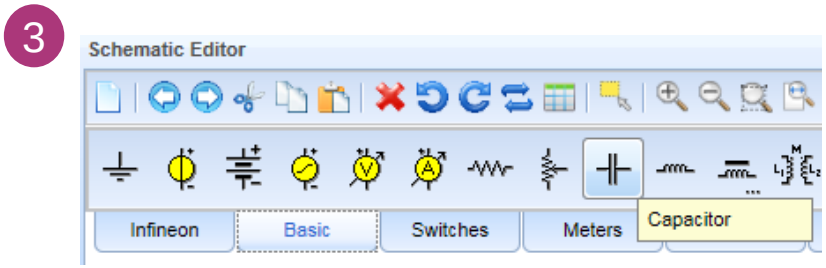
5. 在列表中重新选择一款别的MOSFET（下拉菜单过滤）

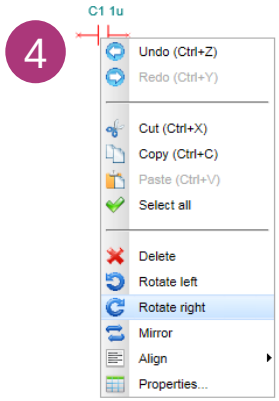


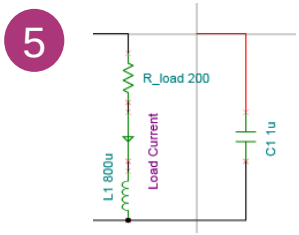
6. 通过MyInfineon账户登录，保存或分享您配置的电路

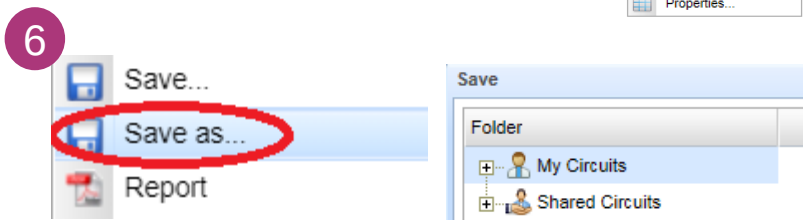
Infineon Designer案例
入门电路（2/2：电路编辑）







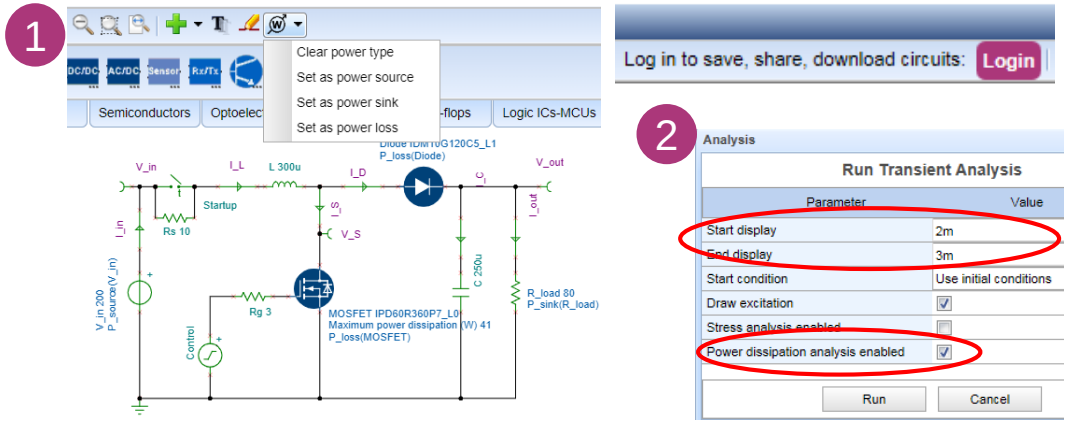


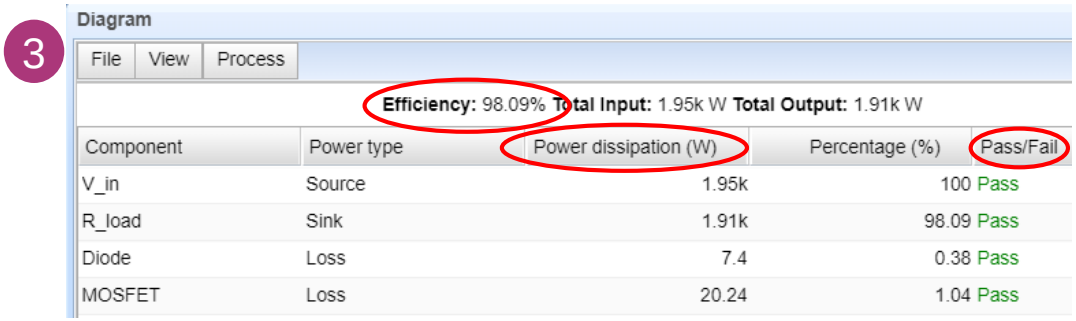


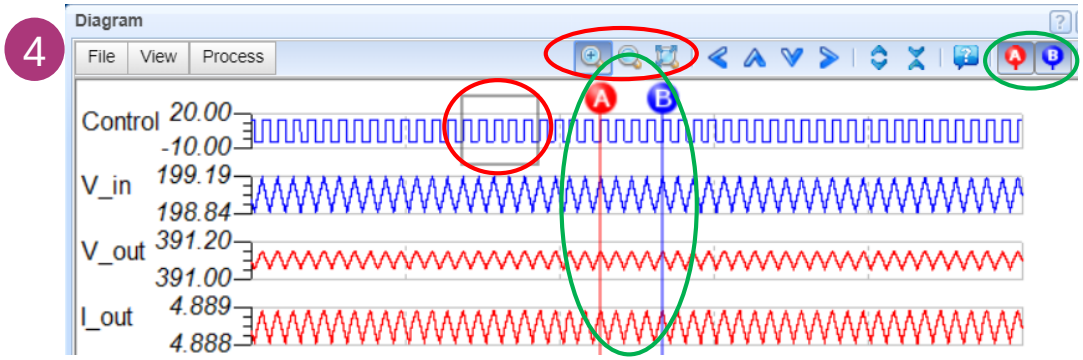
1. 点击打开电路入门电路并用myInfineon账户登录
2. 点击不同的菜单选项并从 “Infineon”选择所需器件。其他选项：如“基本”（电阻，电感，电容），仪表，发生源，半导体，等等。
3. 点击“基本”并添加一个电容器到当前电路
4. 选中电容器并右击鼠标旋转
5. 选中电容器端口并连线
6. 选择文件菜单栏的“另存为”并把电路保存到“我的电路”(MyCircuits)
7. 点击紫色超链接框再次启动仿真

Simulate Transient

Infineon Designer案例
升压电路 (1/4: 系统效率)





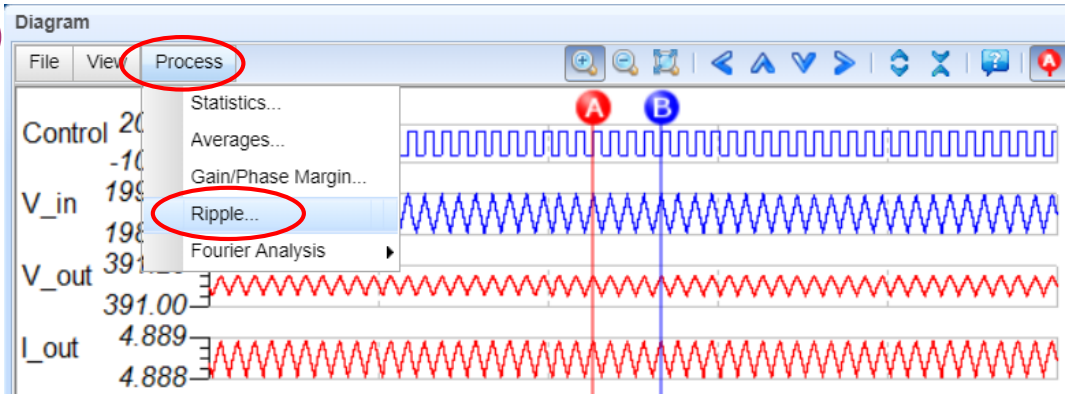


1. 点击打开带已设定器件功率类型的升压电路并登录myInfineon账户
2. 打开菜单“分析 -> 瞬态…”，设定起始时间确保显示的信号处于电路稳态，勾选“Power dissipation analysis enabled”
3. 点击紫色超链接框启动系统效率和器件损耗的仿真

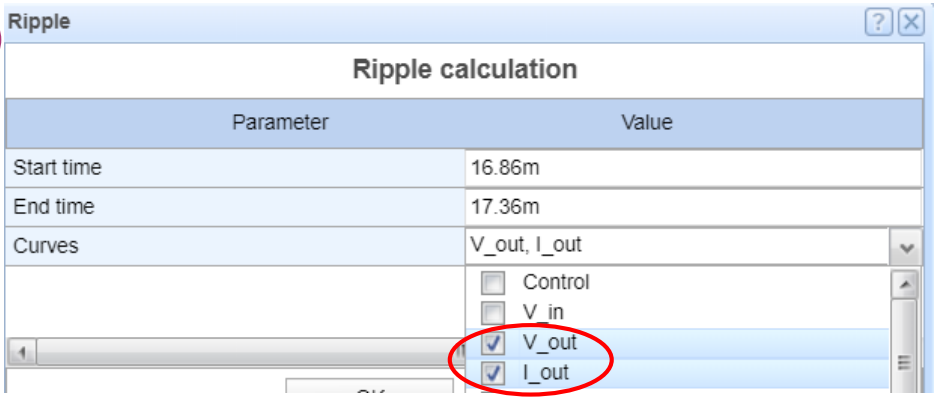
   Simulate Efficiency
4. 选择“Power dissipation”窗口，查看系统效率、器件损耗和器件是否符合该应用Pass/Fail
5. 选中瞬态（Transient）窗口，缩放全部 和放大 来检查信号细节，使用光标 和 来测量信号值

Infineon Designer案例
升压电路 (2/4: 纹波计算)

1



2



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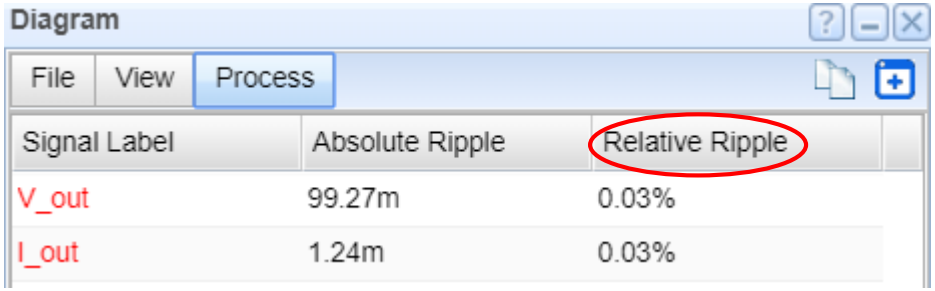


1. 在上页提到的同一个瞬时信号窗口内，点击菜单栏中“过程 -> Ripple…”，从而打开纹波计算窗口

2. 选择需要纹波计算的信号，比如输出电压V_out，输出电流I_out

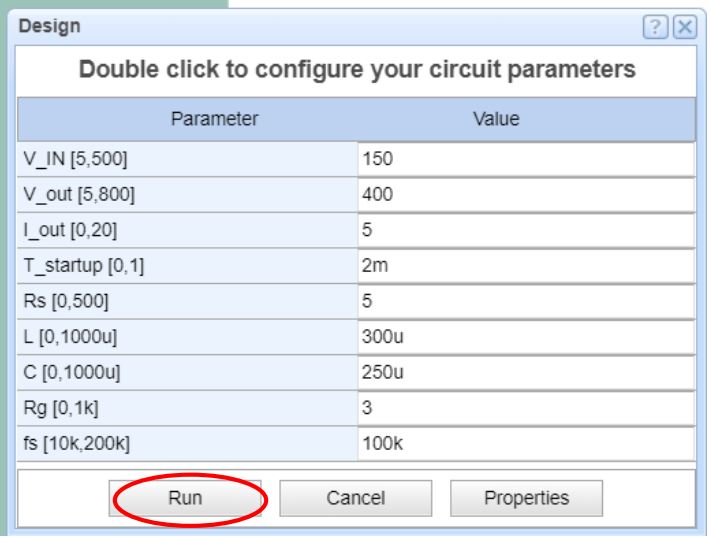
3. 查看对应信号的绝对纹波(Absolute Ripple)和相对纹波(Relative Ripple)

4. 通过类似步骤进行其他信号处理，比如：平均值计算， 傅里叶分析，等等。

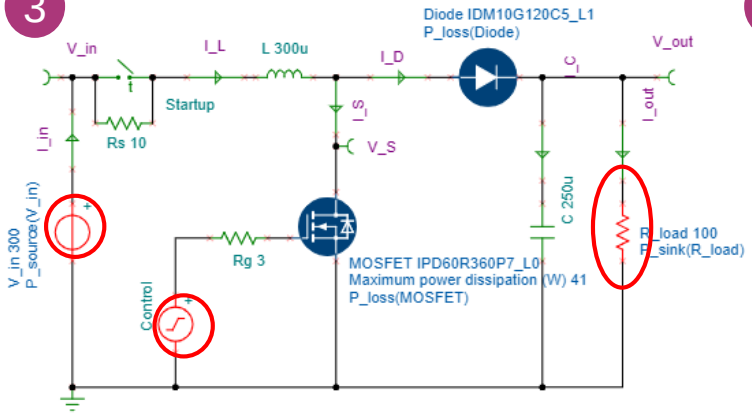
Infineon Designer案例
升压电路 (3/4: 参数设置Design Tool)

2

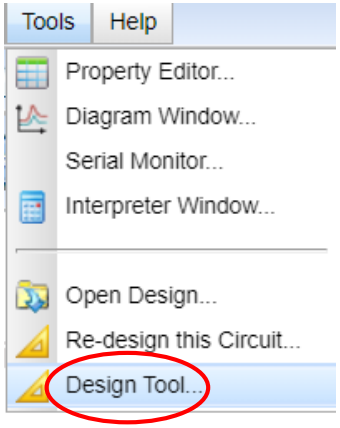
```
{ Double click to configure your circuit parameters }

{ Input voltage [V] }
V_IN := 150;
{ Output voltage [V] }
V_out := 400;
{ Output current [A] }
I_out := 5;
{ Startup time [s] }
T_startup := 2m;
{ Startup resistance [Ohm] }
Rs := 5;
{ Inductance L [H] }
L := 300u;
{ Capacitance C [F] }
C := 250u;
{ Gate resistance Rg [Ohm] }
Rg := 3;
{ Switching freq [Hz] }
fs := 100k;
```



3

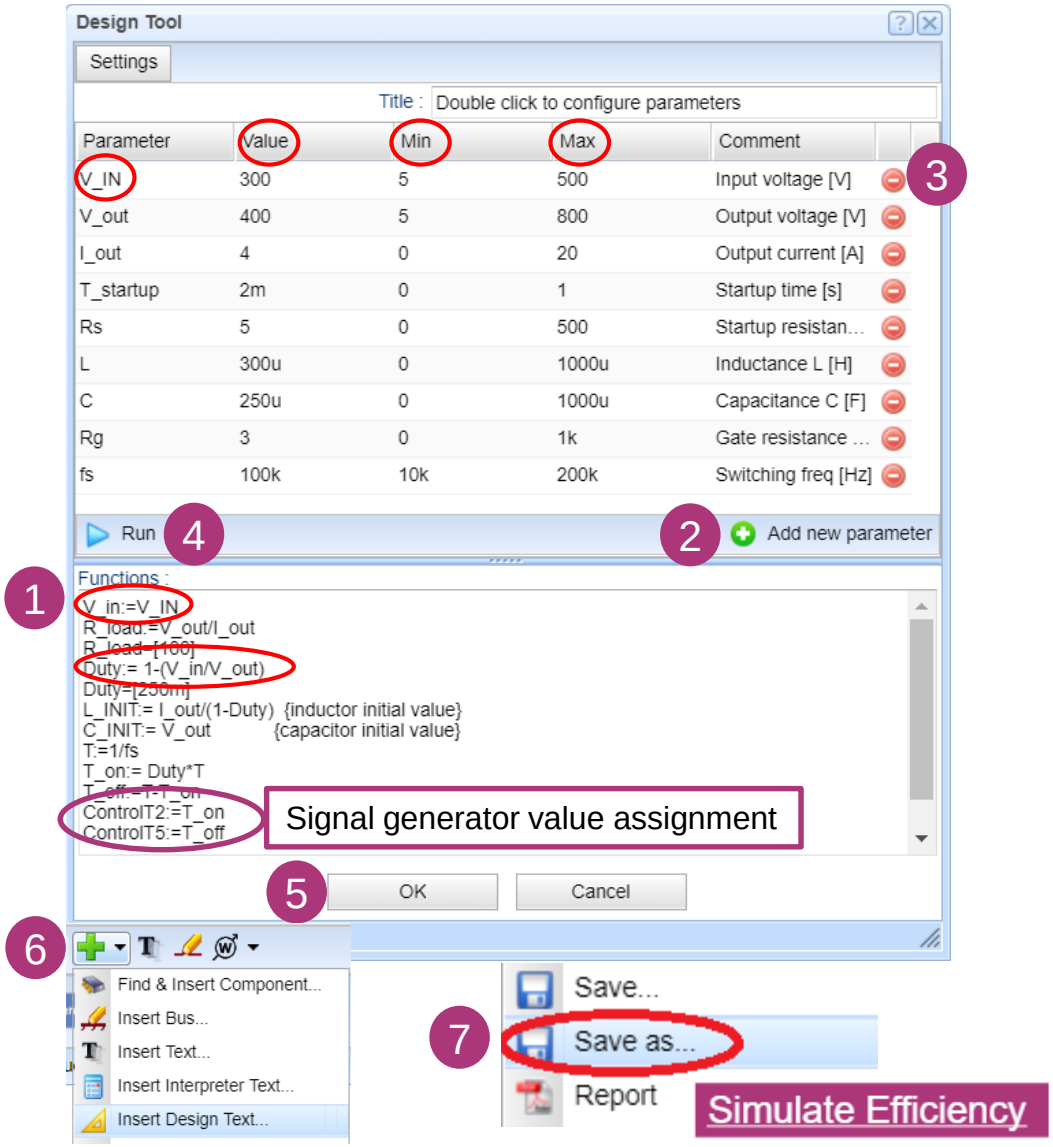


4



1. 关闭上页提到的信号图表窗口
2. 双击（需登录myInfineon账户）绿色参数配置框打开用于电路器件参数设置的设计工具(Design Tool)，设置完参数后点击“运行”用以执行计算和参数配置
3. 被修改参数的器件会以红色高亮显示，启动仿真查看修改参数后区别
4. 打开菜单“工具-> Design Tool…”来设置参数配置器的设定，比如修改特定计算公式或者修改赋值限定范围。

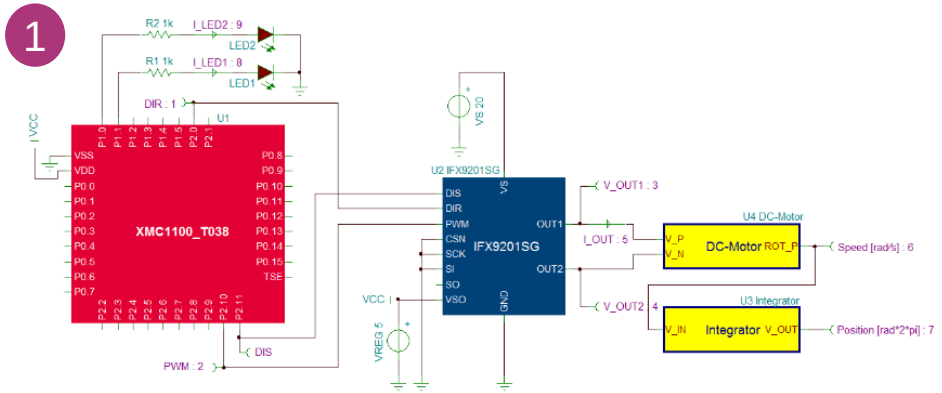
Infineon Designer案例
升压电路 (4/4: 参数设置Design Tool)



1. 编辑技术赋值公式，比如针对每个特定器件的基本赋值：**V_in:=V_IN**，**V_in**是器件标签，**V_IN** 是自己设定的全局变量，该全局变量用于配置框内对器件V_in进行赋值，允许实际基础计算公式并赋值（参见左边例子）。
2. 在上方参数框内添加新参数，例如**V_IN**，赋值，设定最大最小值并添加注解
3. 多余参数可被直接通过右边减号删除
4. 点击“运行”执行对Design Tool的重新配置
5. 点击“确定”确认并关闭Design Tool窗口
6. 点击菜单栏绿色加号图标 并点击“Insert Design Text…”，把刚刚设定的Design Tool参数配置框插入到电路编辑器中
7. 试验参数配置框，保存电路并启动仿真

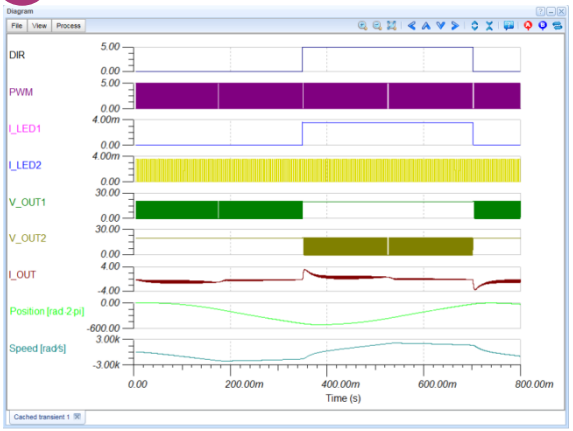
Infineon Designer XMC™ 程序调试案例
H-Bridge Kit 2Go (1/3: 电路程序调试)

1



2 Simulate Transient

3



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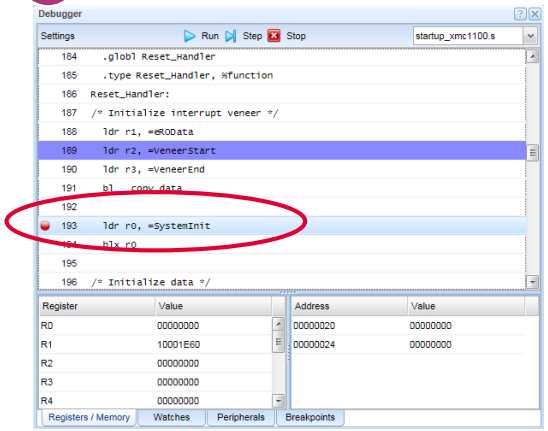
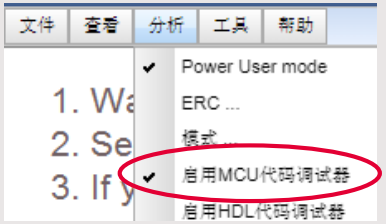


1. 点击打开电路 H-Bridge Kit 2Go
2. 点击启动仿真 Simulate Transient
3. 通过电路图了解应用电路功能和信号
4. 启用MCU代码调试器

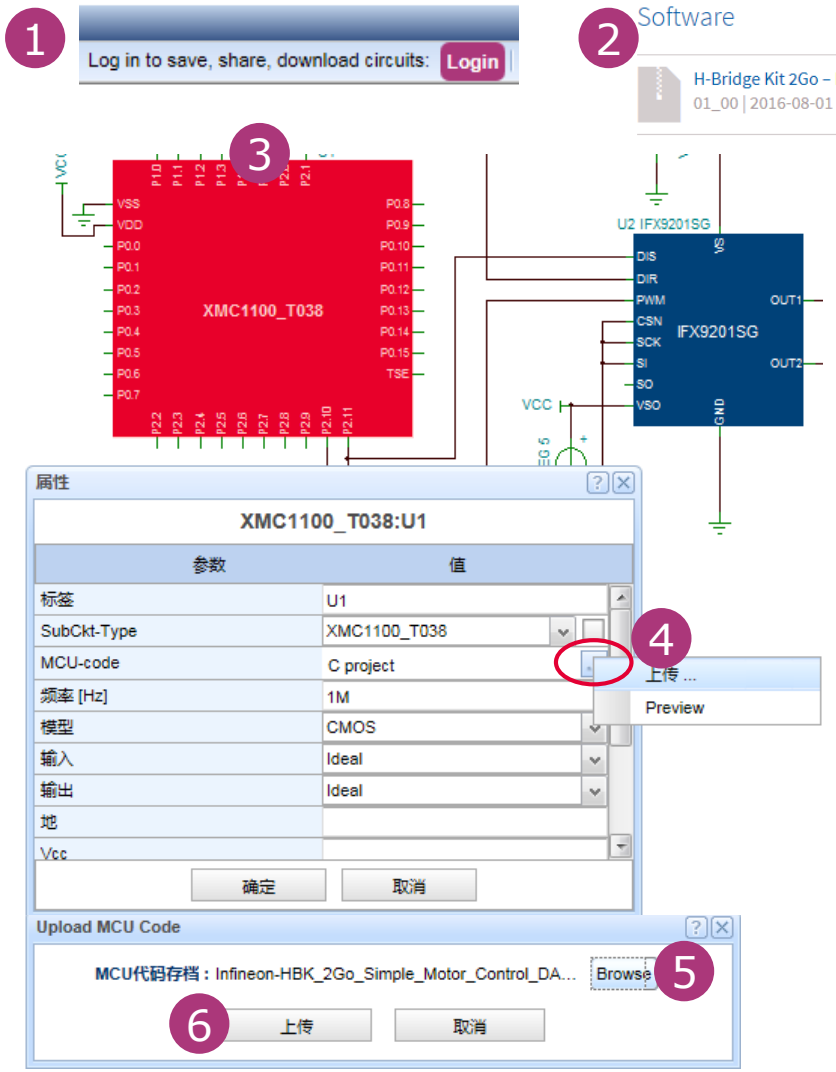


5. 用TR交互模式开始交互瞬态仿真

6. 在调试器窗口选择调试代码文件，设定断点并一步步调试
7. 在线购买样片或评估板

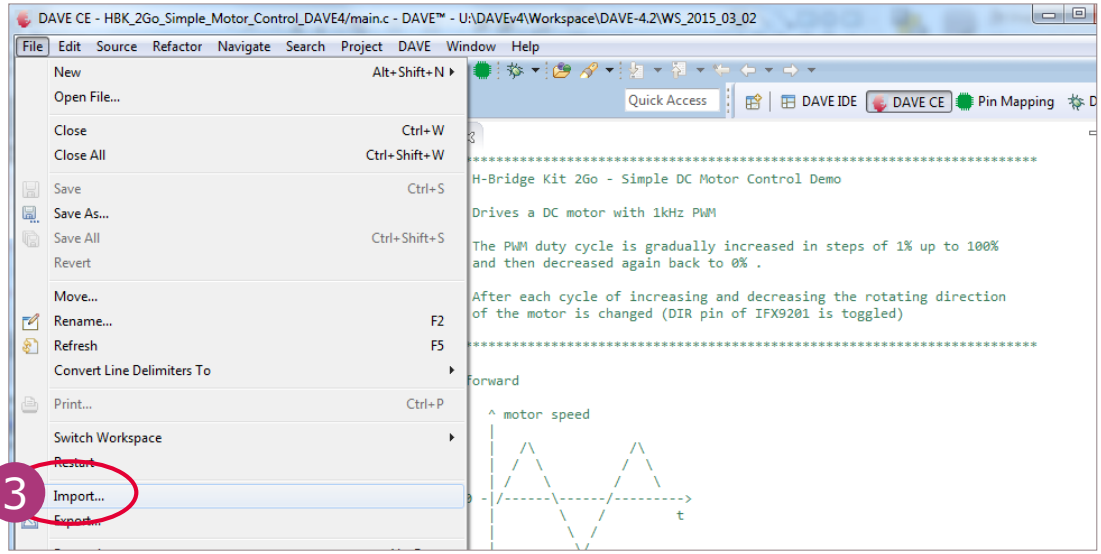
Buy online

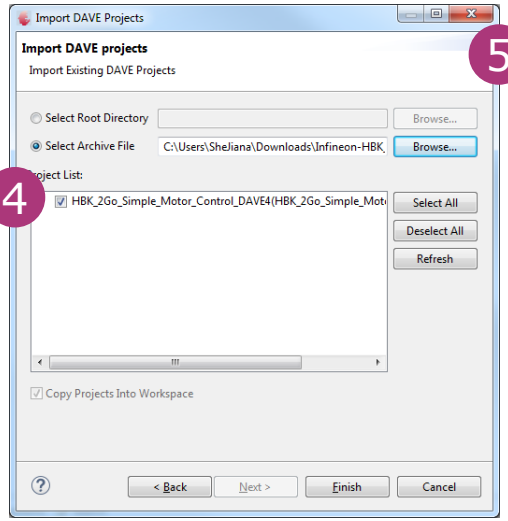
Infineon Designer XMC™ 程序调试案例
H-bridge Kit 2Go (2/3: 上传软件)

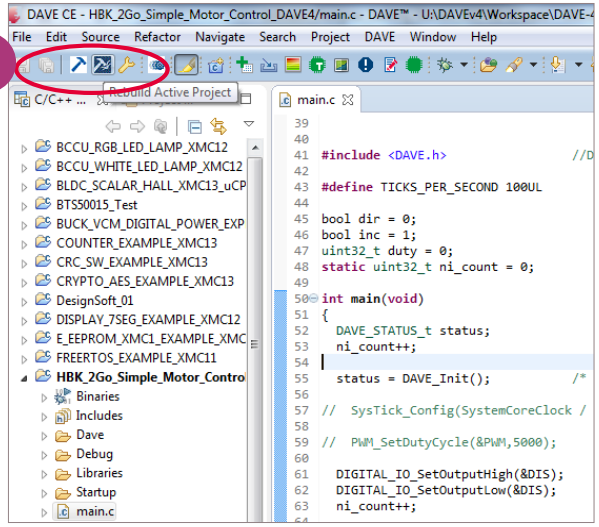


1. 点击打开电路H-bridge Kit 2Go并用MyInfineon账户登录
2. 下载代码压缩包文件.zip H-bridge Kit 2Go – default simple example routine 评估板H-bridge Kit 2Go产品页软件和工具选项卡
3. 点击红色的XMC1100器件打开属性对话框
4. 点击MCU-code行的"…"打开上传代码
5. 选择路径确认已下载的代码压缩包（包括.elf, .hex 编译文件和源代码）
6. 上传代码Infineon-HBK_2Go_simple_motor_control_DAVE4.zip-SW-v01_00-EN.zip
7. 点击启动仿真 Simulate Transient
8. 查看仿真结果

Infineon Designer XMC™ 程序调试案例
H-bridge Kit 2Go (3/3: 修改代码并重新编译)

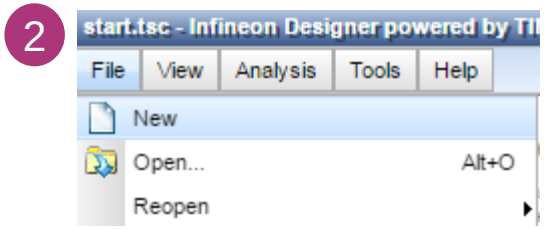


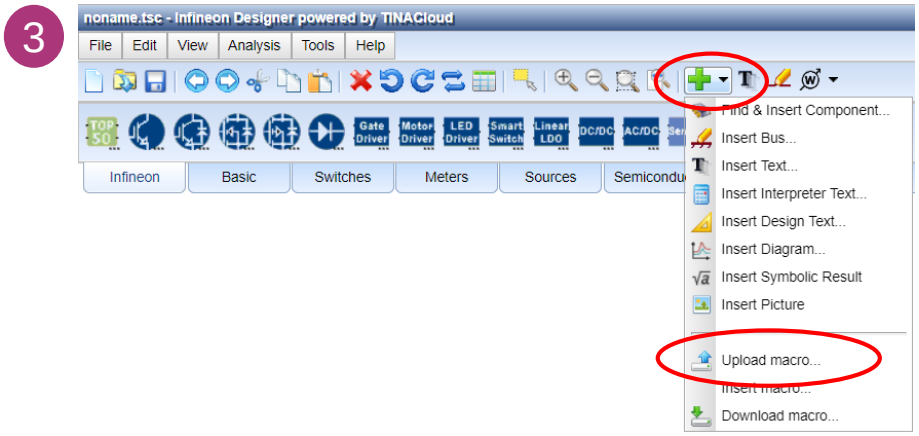


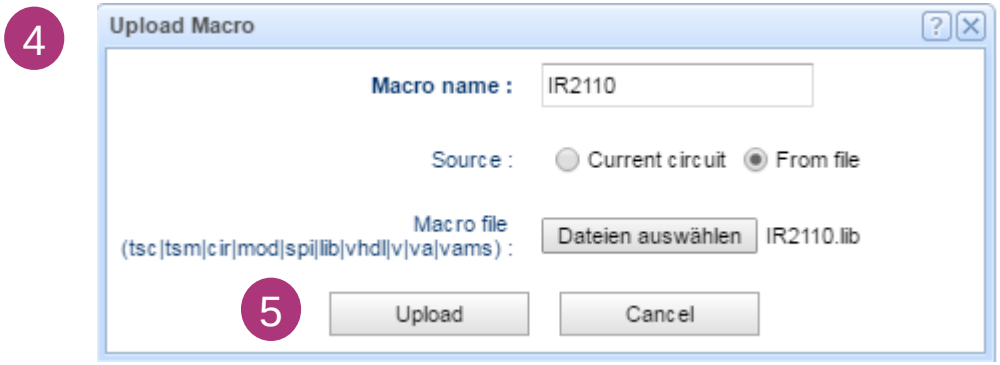


1. 下载并安装DAVE™开发套件 DAVE™ for windows
2. 在评估板H-bridge Kit 2Go产品页软件和工具选项卡，下载代码压缩包文件.zip H-bridge Kit 2Go – default simple example routine 启动DAVE™并导入代码项目File → Import → Infineon DAVE™ Project
3. 点击"Next"，选择已下载代码压缩包路径并勾选项目
4. 修改代码并重新编译
5. 到DAVE™的Workspace工作空间目录并把整个项目目录打包成.zip
6. 重新回到电路点击红色XMC1100器件并上传修改后的代码

如何导入SPICE模型 (1/2)





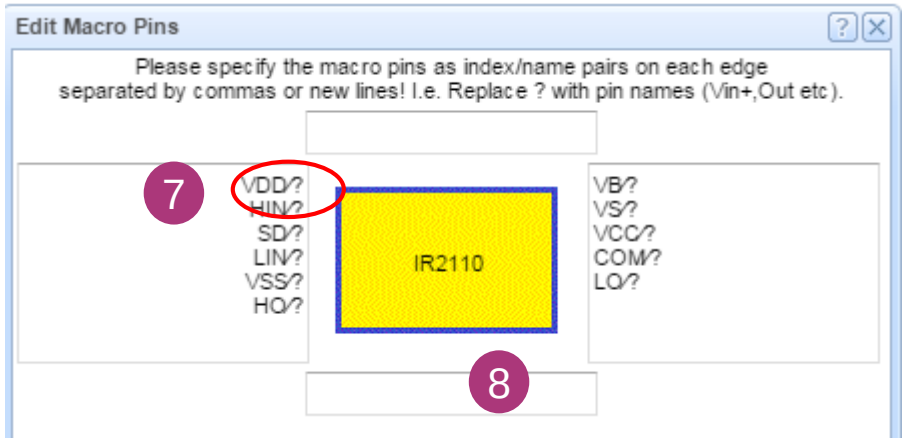


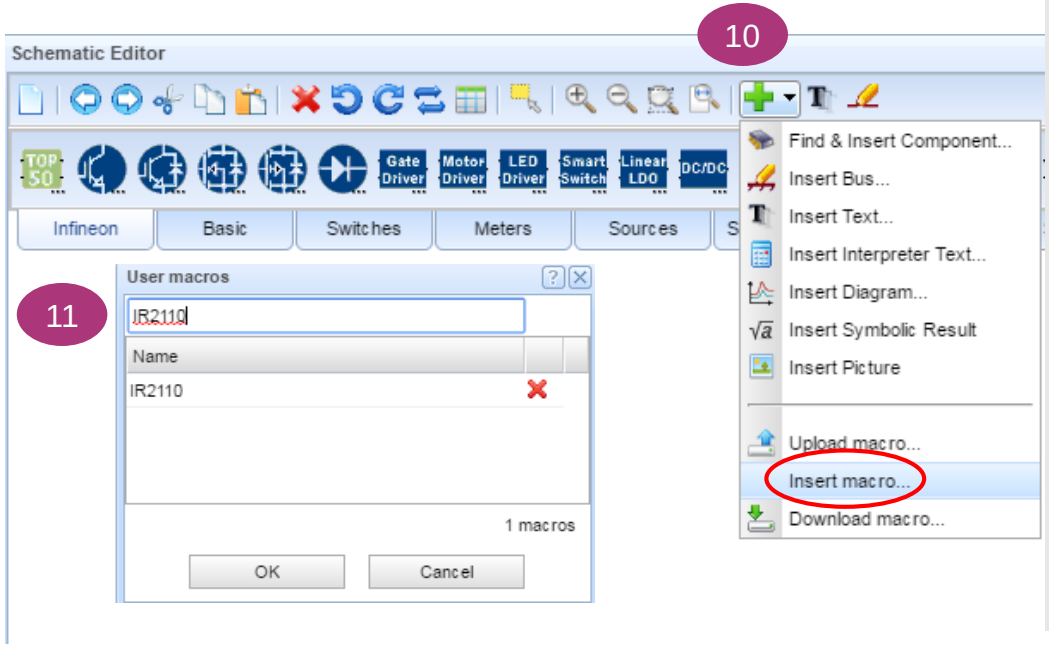
1. 用myInfineon账户登录
2. 选择菜单“文件 -> 新增”建立一个新的电路
3. 点击菜单栏图标 并点击“上传宏”(Upload macro)
4. 命名需上传的SPICE模型，选择“来自文件”，点击“Browse”并打开存储.SUBCKT格式SPICE模型的目录
5. 点击“上传”进入下一步

样例SPICE模型 OrCAD Capture for IR2110

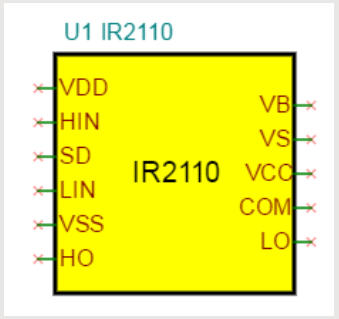
```
.SUBCKT IR2110 VDD HIN SD
LIN VSS HO VB VS VCC COM
LO
+PARAMS:
+       T1=-40 T2=25
T3=125
...
.ENDS   IR2110
```

如何导入SPICE模型 (2/2)





6. 编辑图标管脚分布
7. 可选：用新的管脚名替代“?”（?代表显示和模型中一样的管脚名）
   比如：VDD/? -> VDD/Vdd
8. 可选：把管脚根据需求分布在上、下、左、右
9. 点击“确定”完成上传模型
10. 点击菜单栏图标  且点击“Insert macro…”（插入模型）
11. 选择IR2110模型并放置到当前电路中使用



12. 完成电路设计并保存为自己的新电路：“Save…”或“另存为...”
13. 启动仿真测试电路

目录

技术支持

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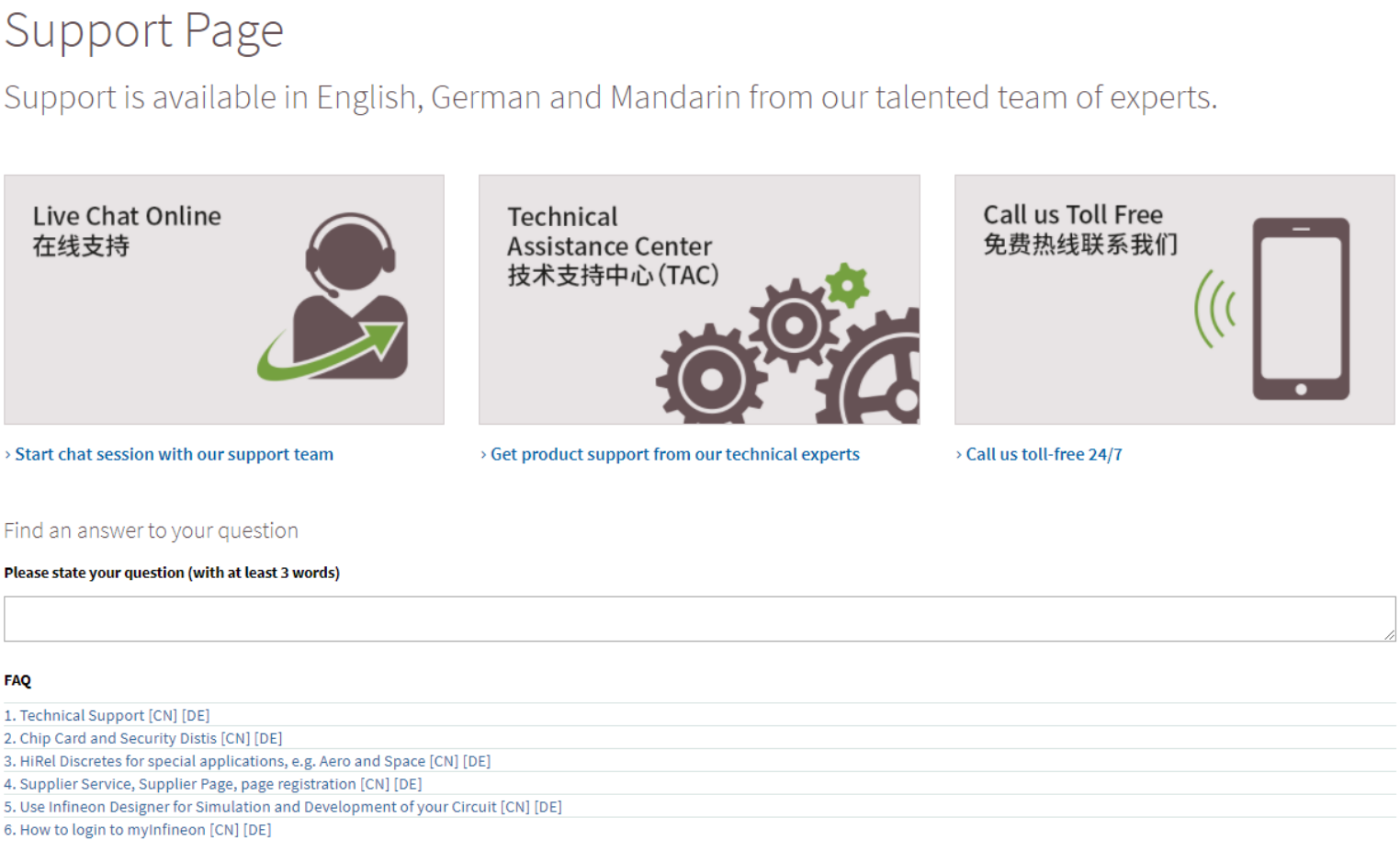

资源列表 https://www.infineon.com/tools

查找工具

- Infineon半导体应用方案查找器
- Infineon产品查找工具
- Infineon评估版查找工具
- Infineon仿真模型查找工具

硬件仿真工具

热和功率仿真

- Infineon IPOSIM 功率模块和盘片仿真工具
- Infineon Integrated Power Modules (IPM) 功率和热仿真工具 – 基于PLECS
- Infineon 分力IGBT功率和热仿真工具 – 基于PLECS

瞬时仿真和程序调试仿真

- Infineon Designer SPICE仿真powered by TINACloud
- PowerEsim 开关电源（SMPS）仿真

磁传感器设计

- Infineon Magnetic Sensor Design Tools

软件开发工具

- DAVE™ Development Platform for XMC™ 32-bit Industrial Microcontroller based on ARM® Cortex®-M
- TriCore™ Development Tools for AURIX™ 32-bit Automotive Microcontroller based on TriCore™

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