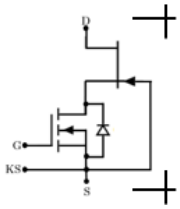
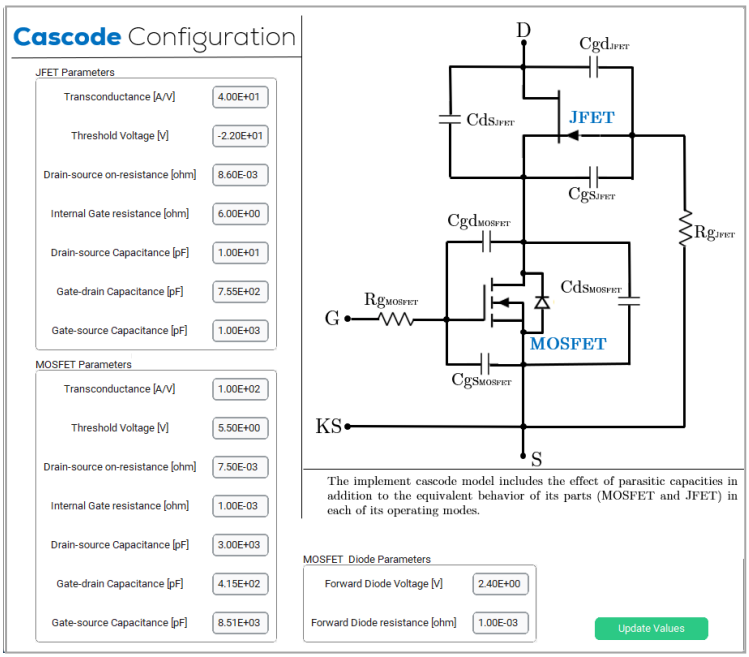
Smart·RTS
True-Device & Real-Time
Simulation Platform for Power Electronics

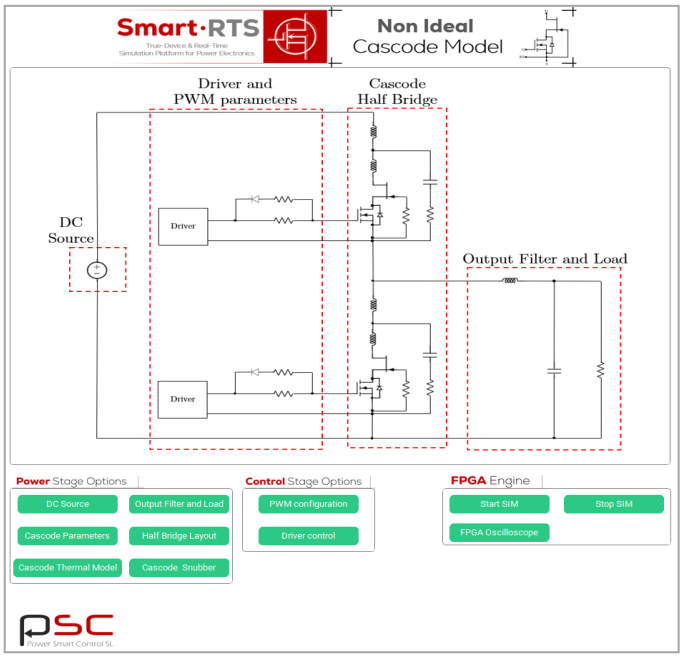
Non Ideal Cascode Model



True-Device Real-Time Emulation

SiC FET / Si MOSFET Cascode Buck Converter





Benefits of high precision models of switching devices running in an acceleration hardware device

- Switching power losses emulation considering true device model and lay-out parasitic elements.
- Simulation of junction temperature evolution.
- Simulation of conduced differential and common mode EMI components.
- Instant protections design (overcurrent and short-circuit profiles, di/dt).
- Cooling system design.
- EMI filters & lay-out design.
- Snubber design.
- Failure sequences (snubber failure, device failure, gate driver failure, etc).
- Faster than software simulator.

Several customizable parameters

DC Power Input Configuration

Output Filter Configuration

Half Bridge Layout Configuration

Cascode Parallel Snubber Configuration

Foster Model Configuration

Buck Converter PWM Configuration

Driver Configuration

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Usage example: Snubber design

Non ideal switch models allow the designer to customize parameters such as snubbers. In order to optimize the effect that this parameter produces on the converter in order to obtain the required response.

Increasing of snubber capacitance

$C_{SNUBBER} = 680pF$

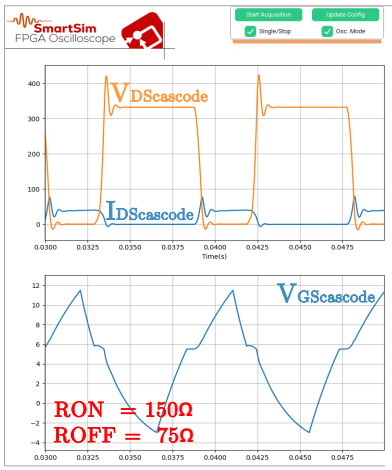
$C_{SNUBBER} = 4nF$

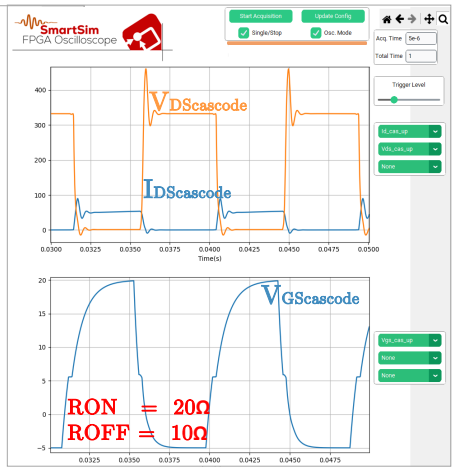
Usage example: Gate resistance variation and power losses

Quantification of the effect of gate resistance variation and instantaneous power losses.

Gate resistance decrease

Switching and conduction power losses





Characteristics

- Simulation of **switching power losses bases on actual turn-on, turn-off transitions**.
- **Parasitic lay-out effect** fully supported.
- **Parasitic device capacities** fully supported.
- True device models of Si MOSFET, SiC MOSFET, SiC Cascode and Si IGBT.

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