eDesignSuite와 eDSim을 활용한 DC-DC 컨버터 설계
Leading the innovation of Design tools

ST PDSA Korea
권경회 대리

eDesignSuite

System SW Tools to support engineers in multiple stages of their system design effort though a compelling, coherent and engaging user experience

More **accurate**, more **reliable** and more **intuitive** design process

Improved **user experience** with multilanguage console

Clever user interactions: reworked engine, optimized algorithms, improved portability

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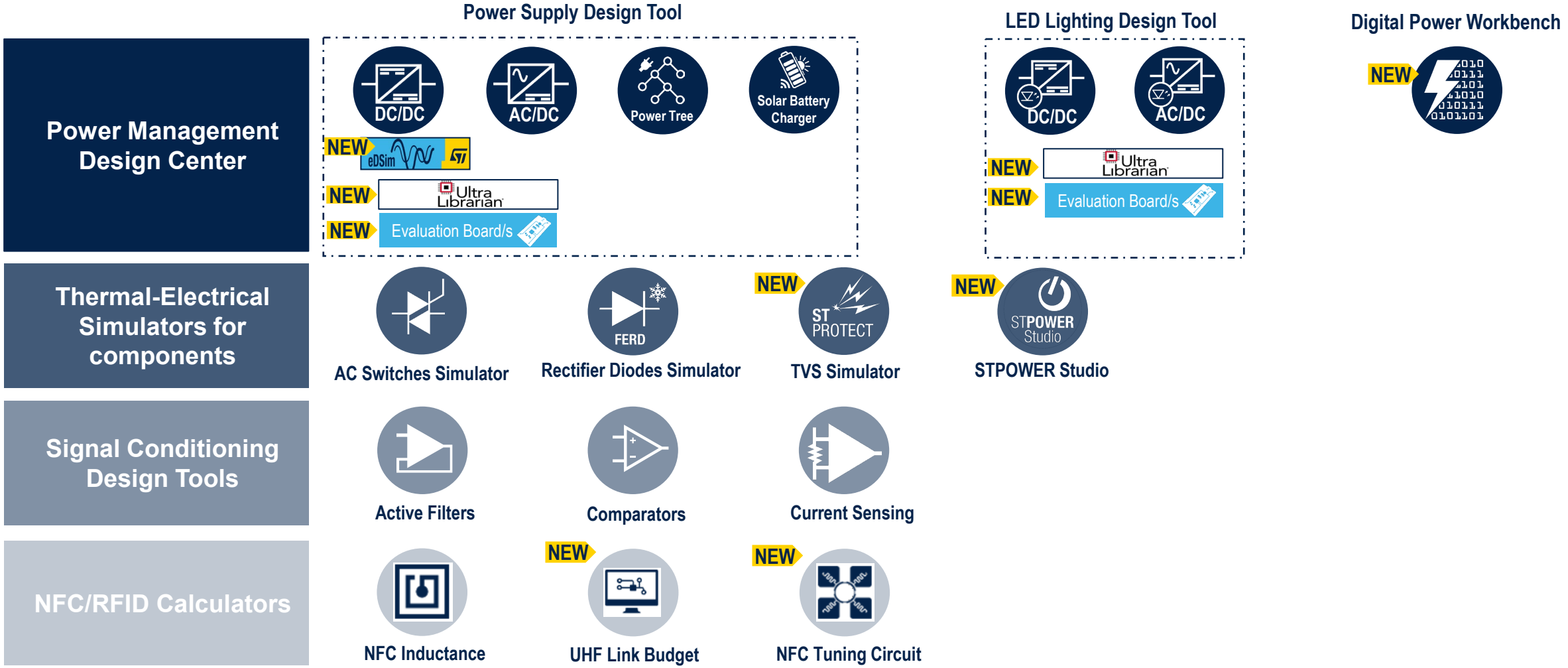
eDesignSuite: evolution to a full system design tool



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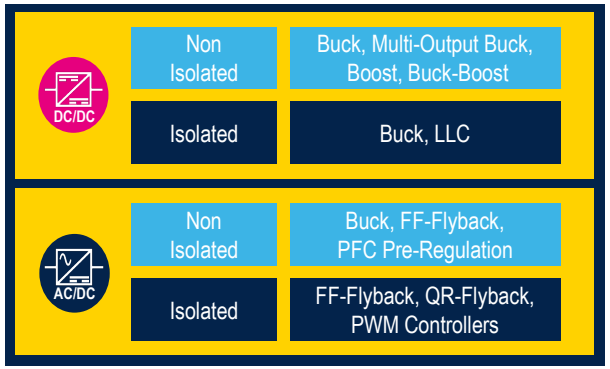
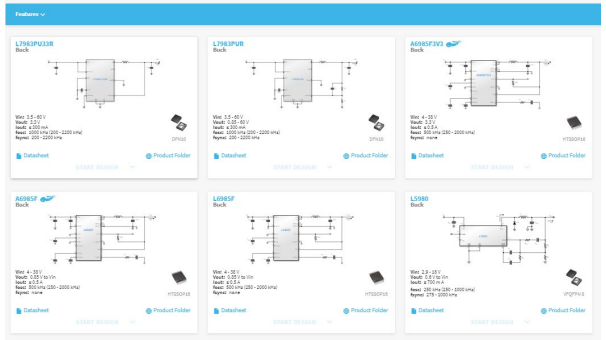
Specify | Select | Analyze | Refine | Simulate | Prototype

Streamline your design process

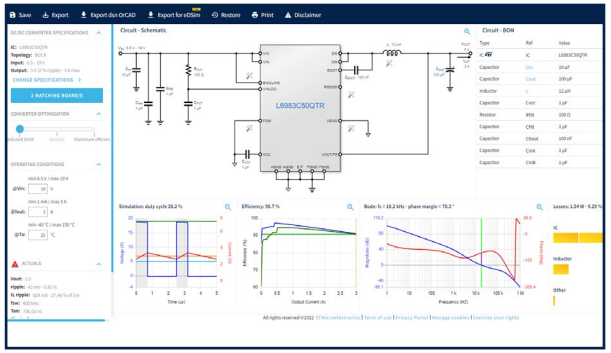
1 **Specify** the application use-case

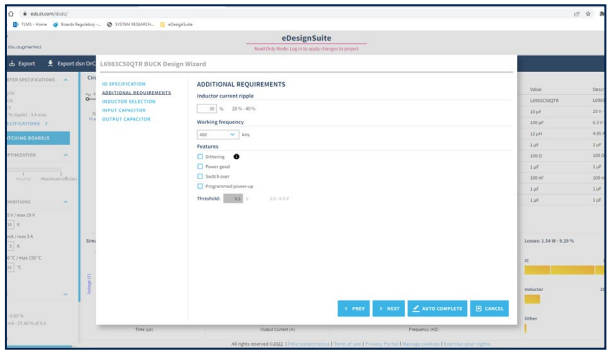


2 **Select** among the suggested ICs, the ones with specific features

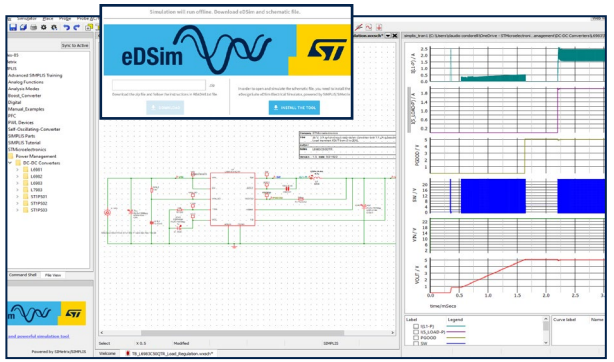


3 **Analyze** time and frequency domain results, efficiency and losses

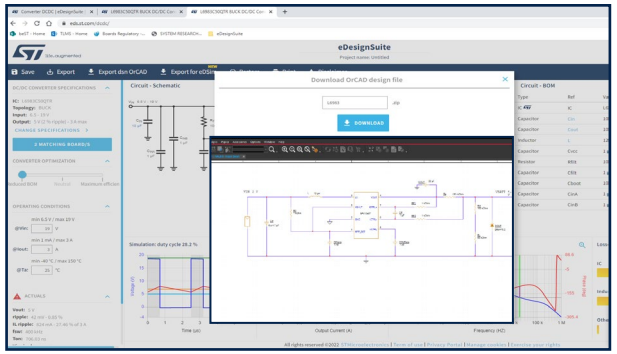




Refine the specifications of the project 4



Simulate the circuit with the fast and powerful **eDSim tool** 5



Export the OrCAD file to start the **Prototyping** phase 6

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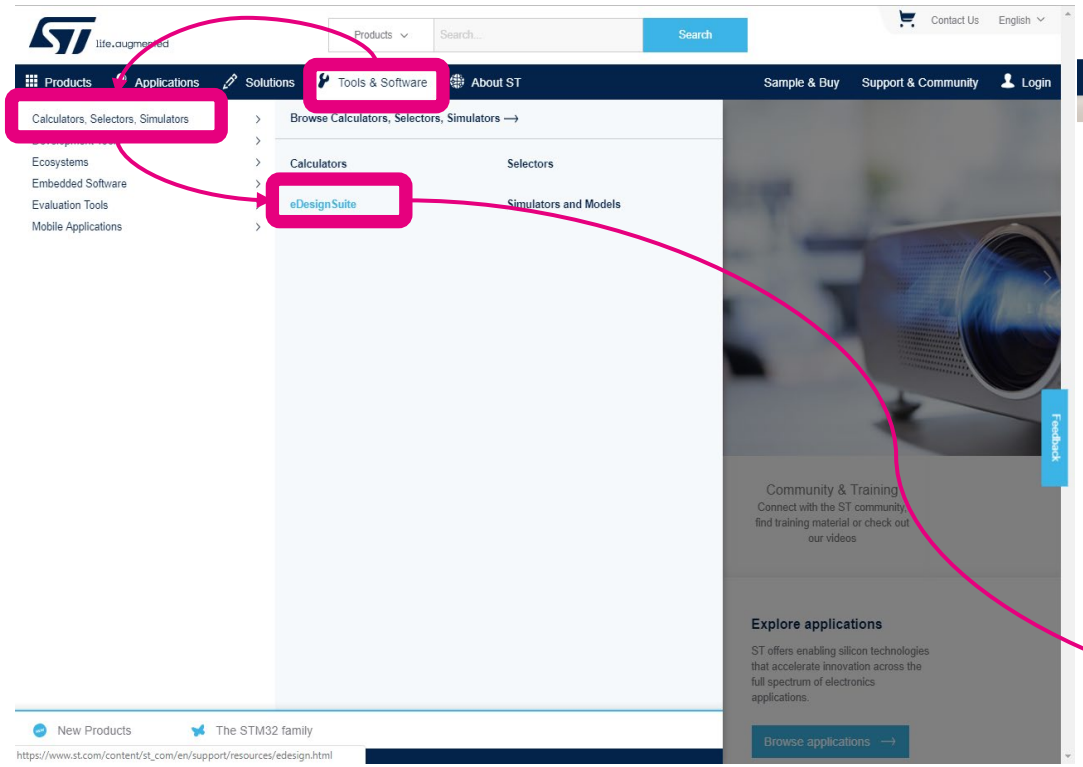
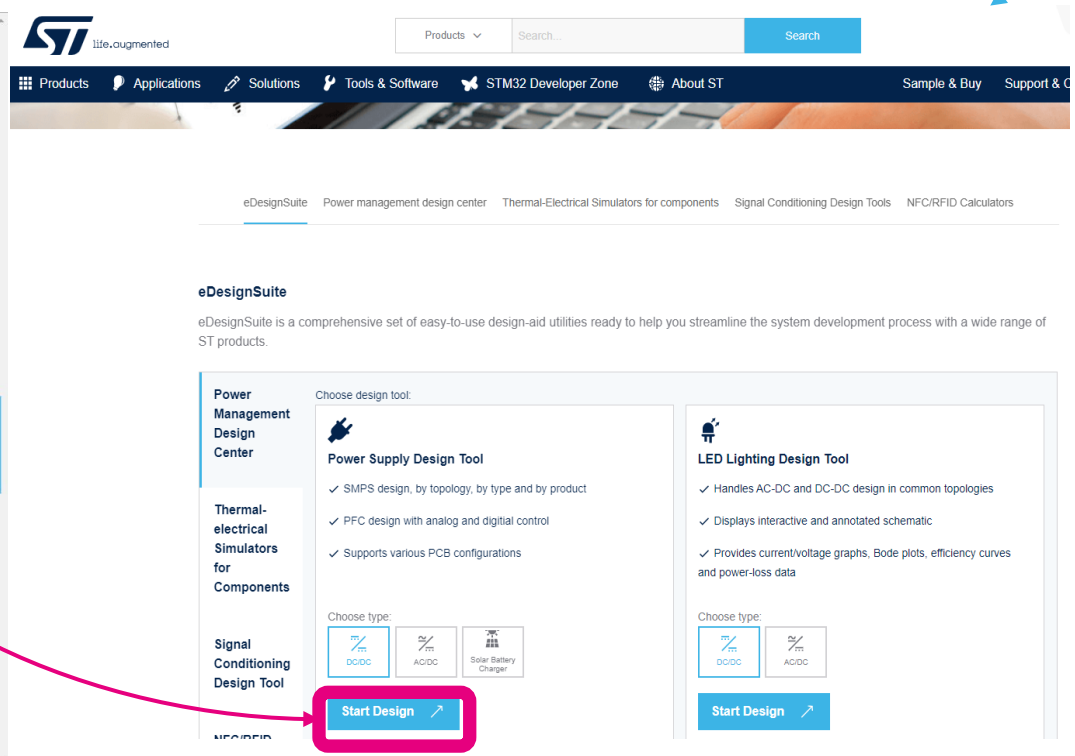
eDesign Suite – how to find

- Go to st.com/edesignsuite

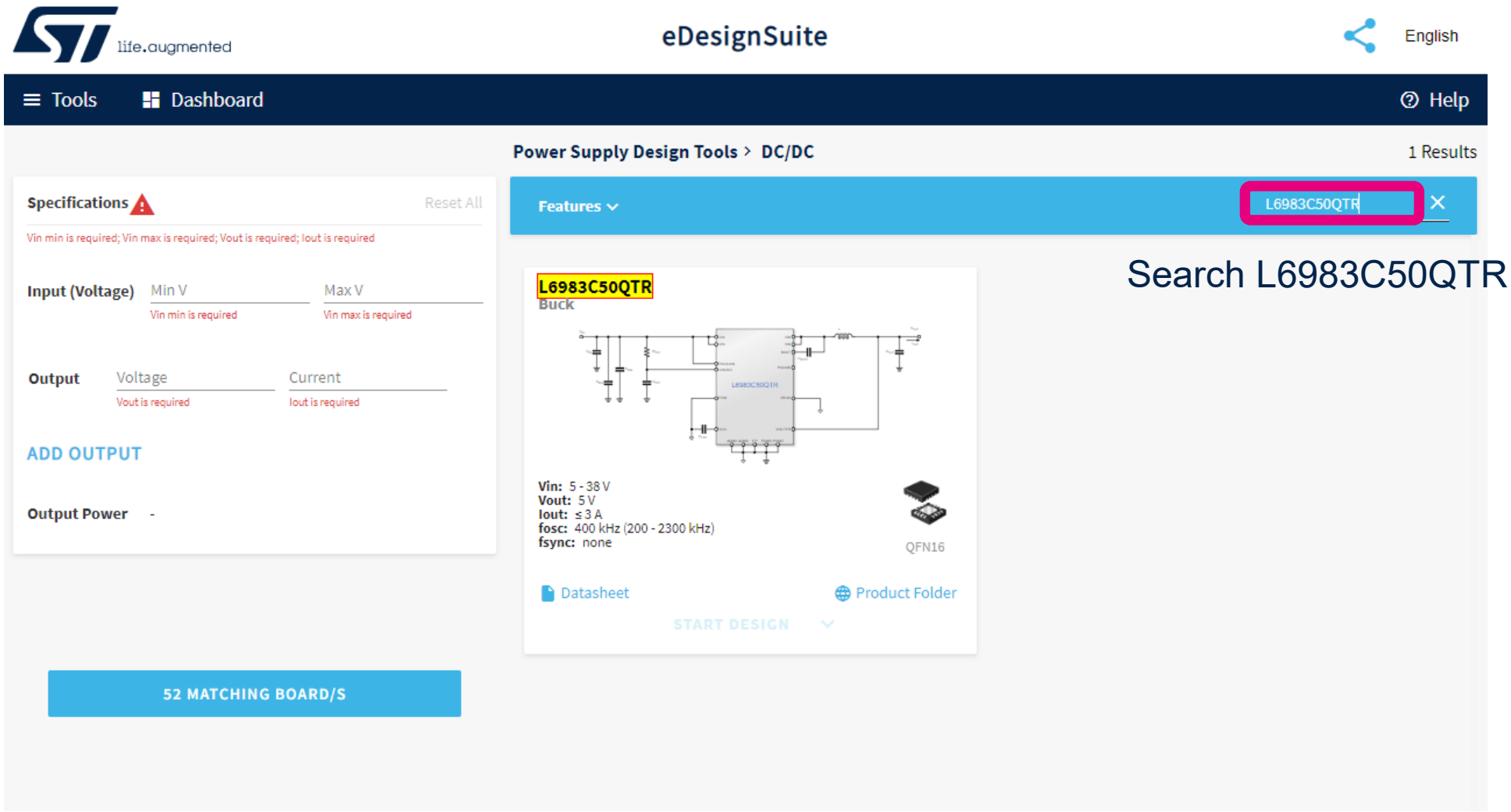
or

- From **st.com** go to
  - Tools & Software -> Calculators, Simulators, Selectors -> eDesign Suite





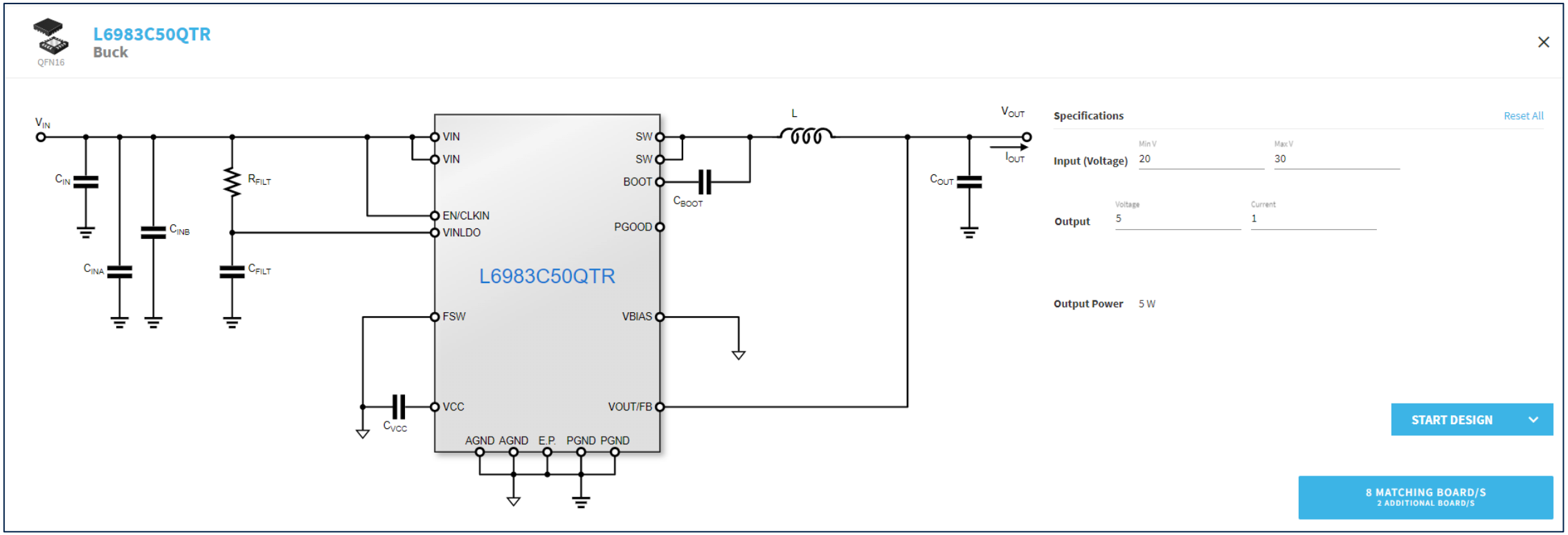
Select Product



Search L6983C50QTR

Sett Condition

- Input 20V-30V & Output 5V/1A → Start Design



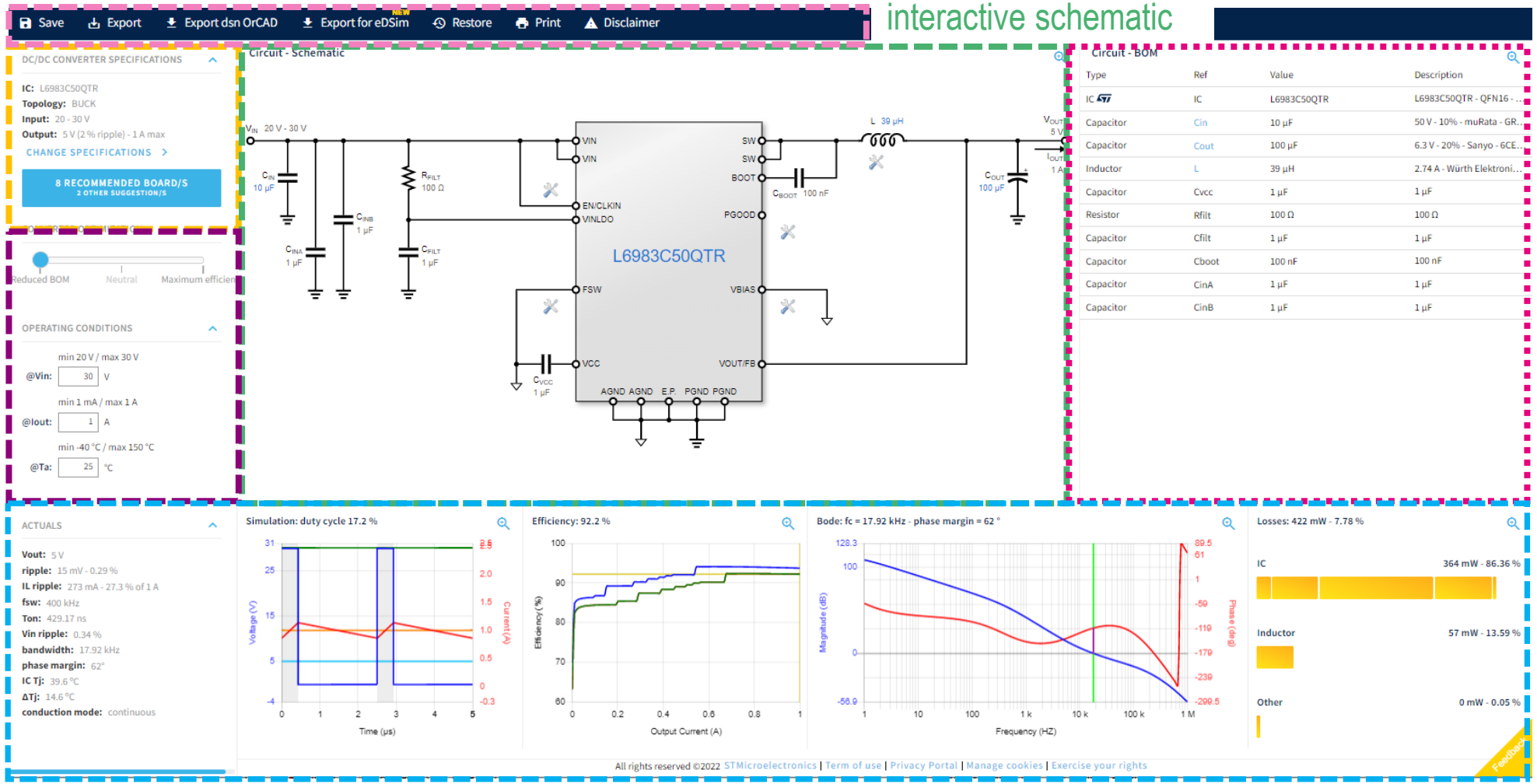
All circuit parameters at a glance

Full set of commands

Fully annotated & interactive schematic

Project specifications

Operating conditions



Fully annotated and interactive BOM

Full set of analysis diagrams

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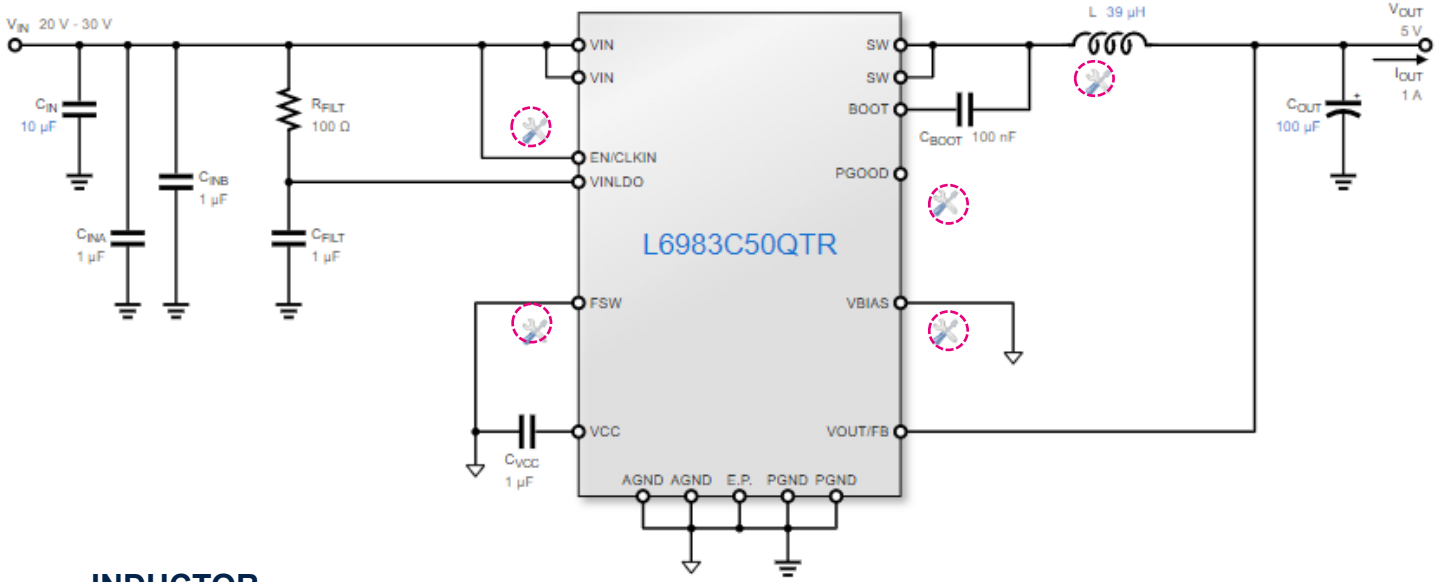
Interactive dashboard for refinement and custom components

Circuit - Schematic



Circuit - BOM

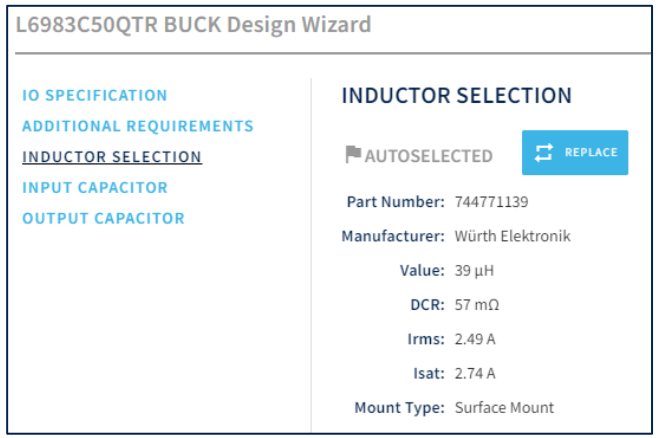
Type	Ref	Value	Description
IC	IC	L6983C50QTR	L6983C50QTR - …
Capacitor	Cin	10 µF	50 V - 10% - mu…
Capacitor	Cout	100 µF	6.3 V - 20% - Sa…
Inductor	L	39 µH	2.74 A - Würth E…
Capacitor	Cvcc	1 µF	
Resistor	Rfilt	100 Ω	
Capacitor	Cfilt	1 µF	
Capacitor	Cboot	100 nF	
Capacitor	CinA	1 µF	
Capacitor	CinB	1 µF	

INTERACTIVE DASHBOARD

The user can refine sections of the circuit (clamper net, passive components, compensation net, MOSFETs, diodes, etc)

INDUCTOR

You can select inductor with real spec.



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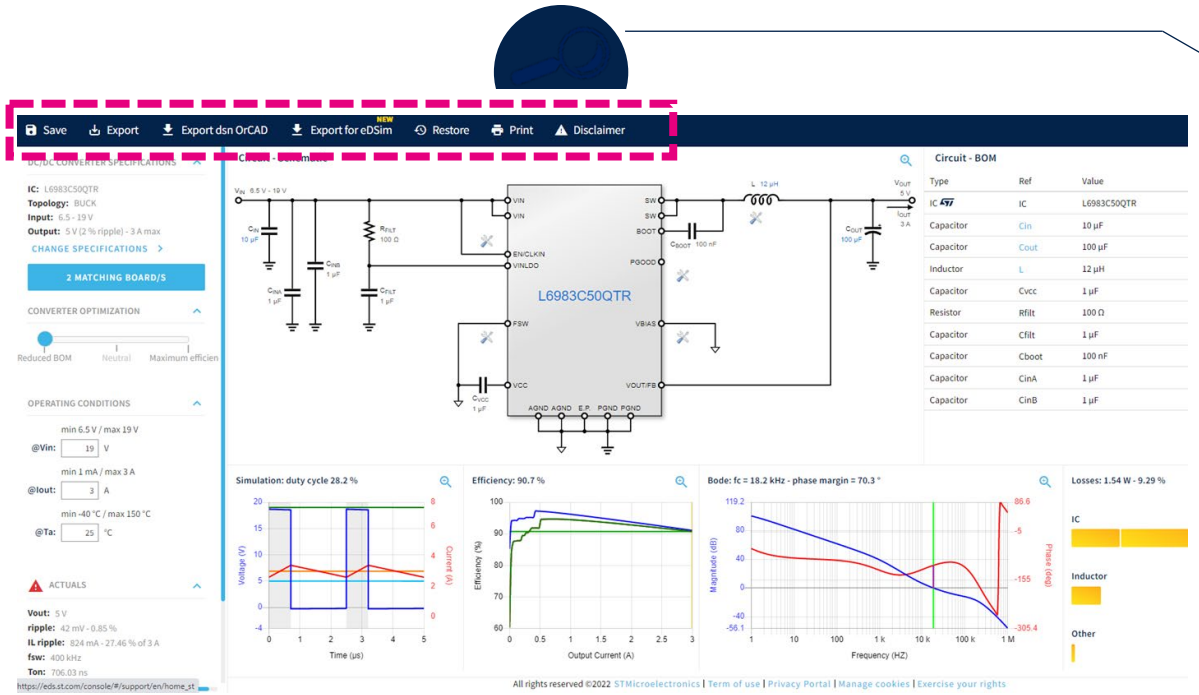
Your design gets portable and exportable



Save
Save your project on ST server, you can open it from any machine: your design gets portable!

Export
Export the schematic and Bill of Material

Export the OrCAD file of your project to start the prototyping phase

Export and customize the eDesignSuite project on eDSim

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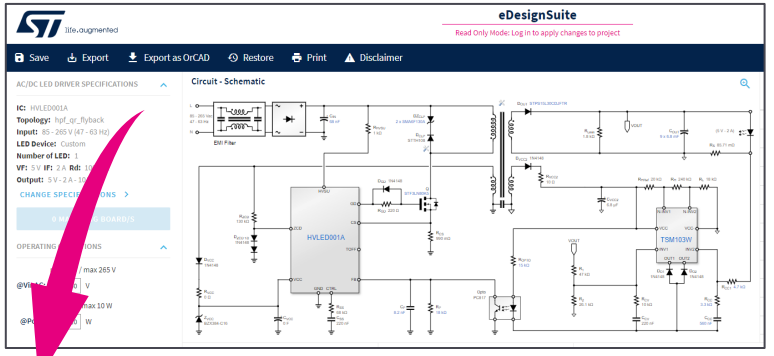
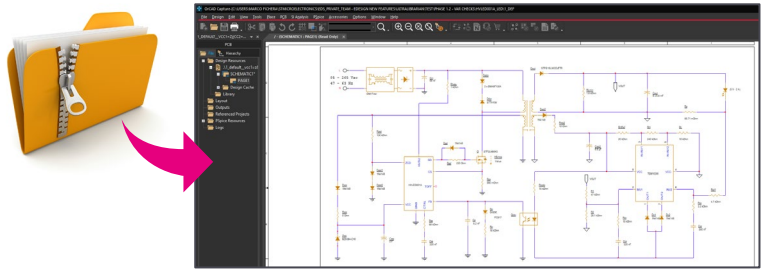
A complete powerful tool … to reduce risks in HW prototyping

- ✓ Fine tune your IC behavior and related best configuration
- ✓ Extend the analysis in Time/frequency domain.
- ✓ Dive in specific usage case condition (mission profile)

- ✓ Helps select the evaluation board that best suits your needs

- ✓ Define your best system solution proposal
- ✓ Export in real time eDesignSuite Schematics into OrCAD Capture format





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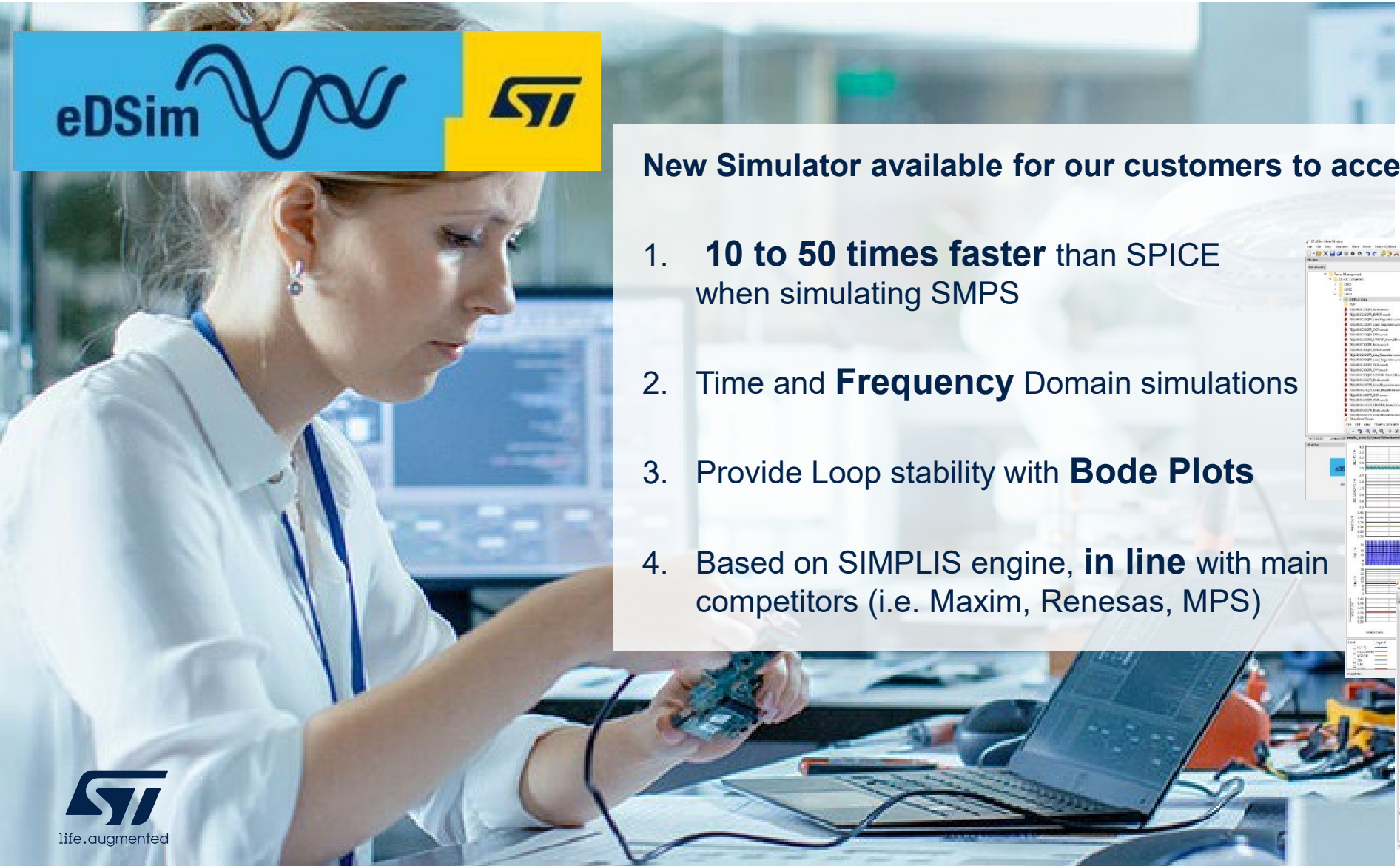
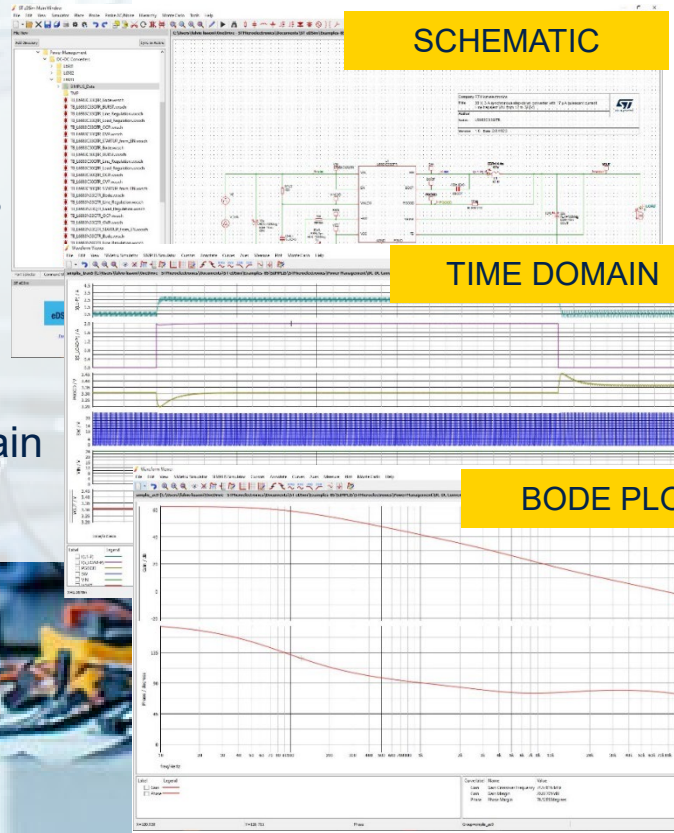
New Fast and Powerful Simulator for SMPS and Analog



New Simulator available for our customers to accelerate design of DC-DC:

1. **10 to 50 times faster** than SPICE when simulating SMPS
2. Time and **Frequency** Domain simulations
3. Provide Loop stability with **Bode Plots**
4. Based on SIMPLIS engine, **in line** with main competitors (i.e. Maxim, Renesas, MPS)



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How to use eDSim?

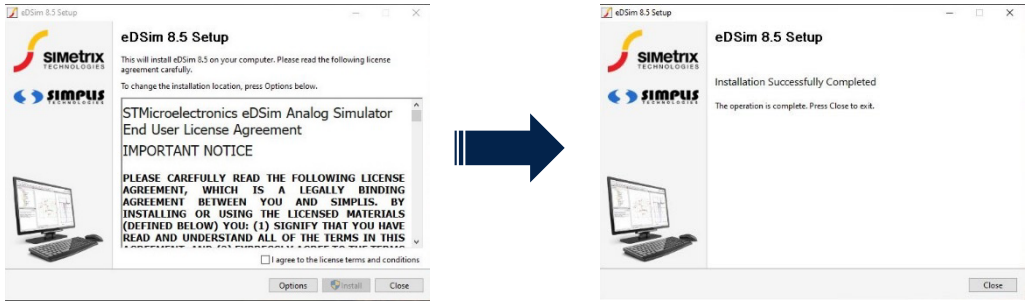
- Buck Converter example

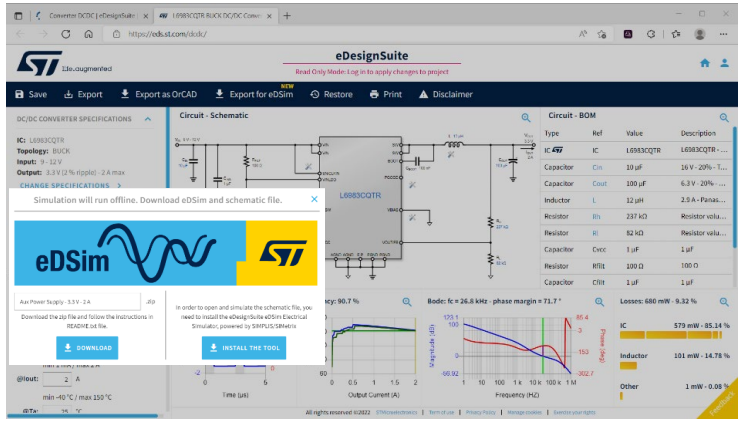
Parameter	Value
Vin	12V
Vout	1.2V
Iout	10A
Fsw	500KHz

- SIMPLIS Schematic을 사용하여 open loop 회로도 생성
- SIMPLIS의 3가지 분석 방법을 통해 시뮬레이션 진행

eDesignSuite breakthrough

eDSim to reduce risks in HW prototyping





Where:

- Download locally and install. STSW-eDSim

What:

- The tool is a specific version of the SIMPLIS/SIMetrix simulation environment paired with ST model components, for a full electrical simulation with no limitation of nodes and circuit size.

Why:

- fast and powerful electrical simulation tool, with enhanced accuracy and higher convergence speed

How:

- With the eDSim tool you can also create your schematic from scratch using ST models or simulate your SMPS and analog ICs from a list of predefined ST application schematics - test benches, that you can partially modify according to your needs.

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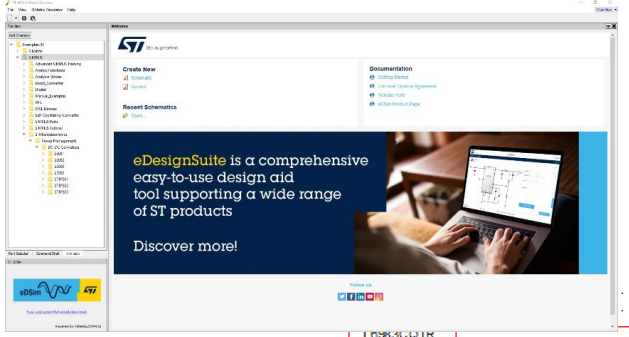
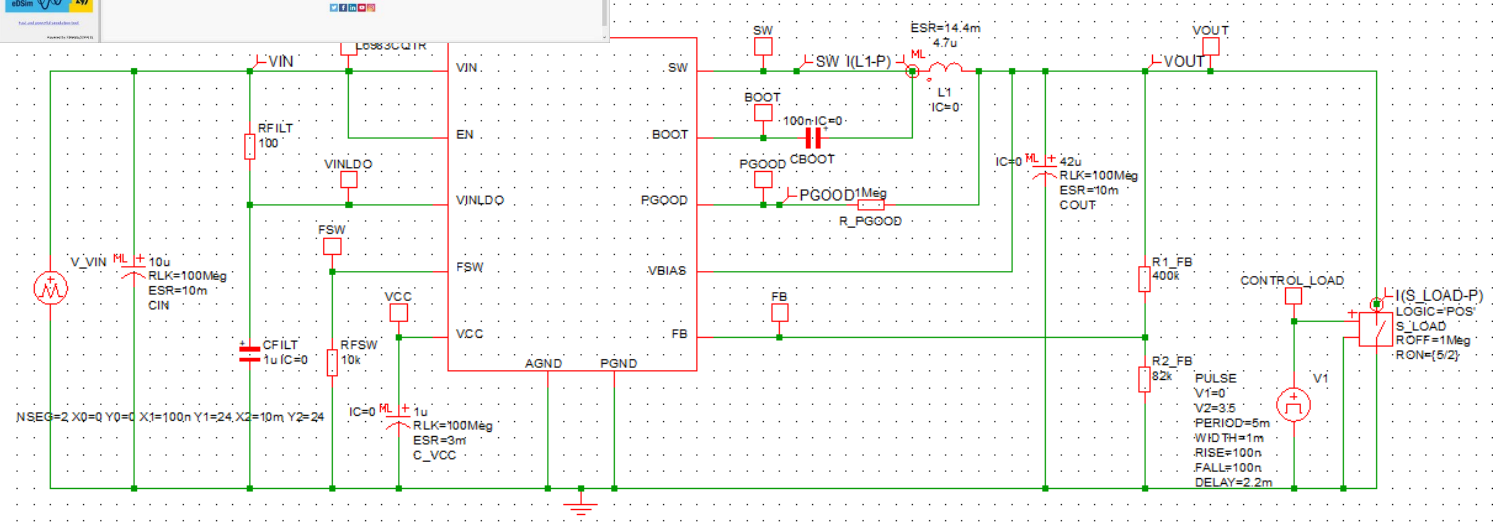
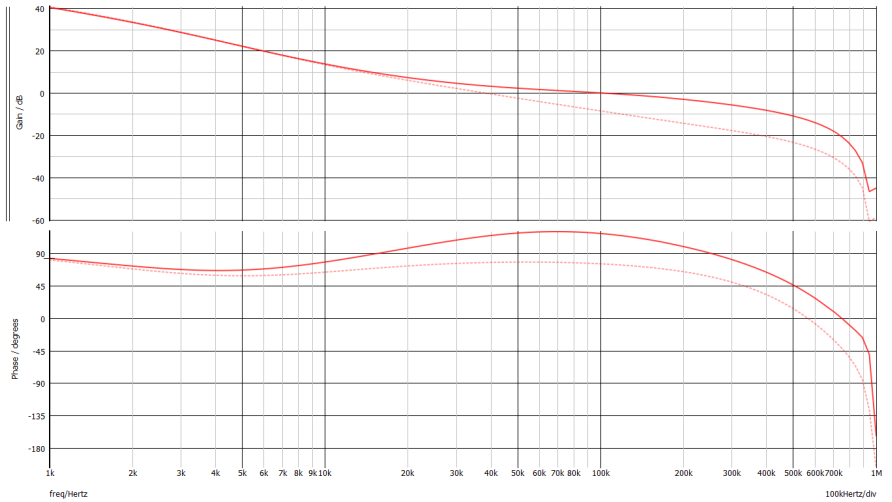
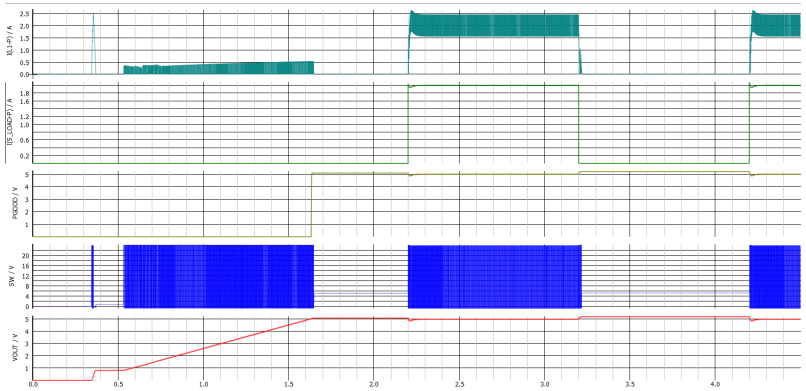
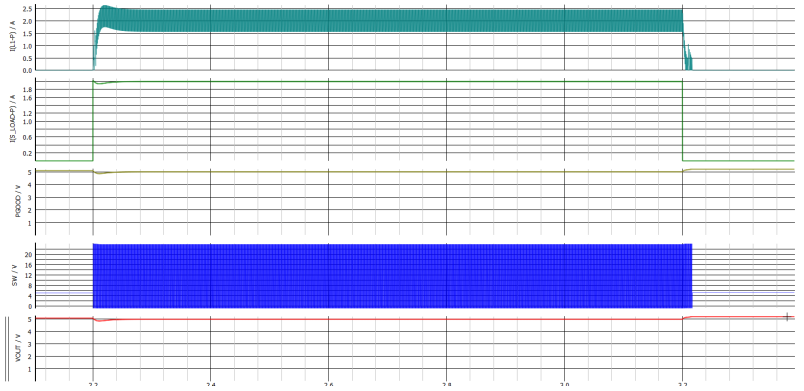
Simulation examples

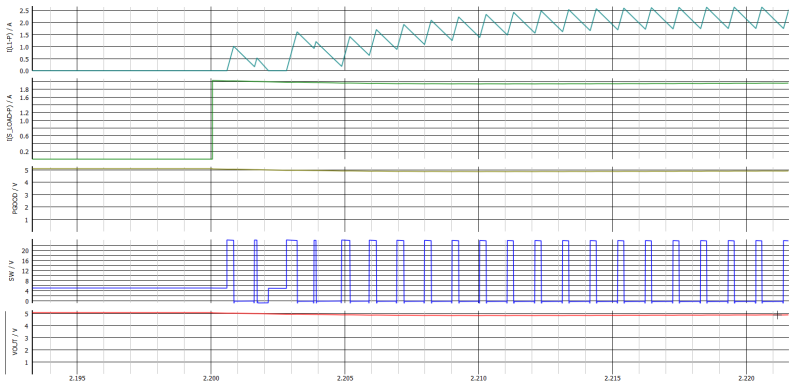












Evaluation Boards Advisor
New Feature

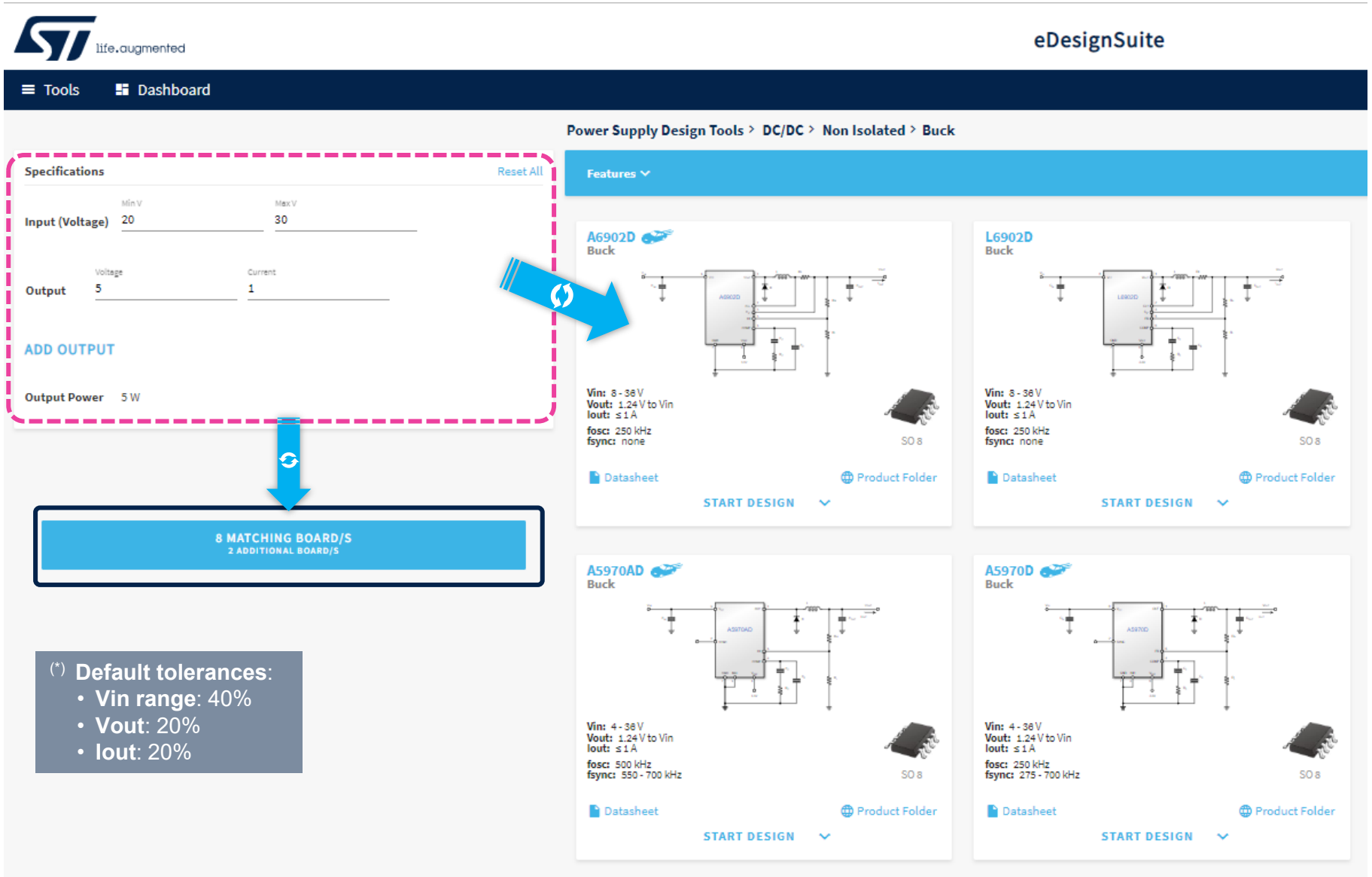
A new capability is now available and used to show **Matching** and **Additional** boards number.

The **Matching Boards** are the ones that strictly satisfy user specification.

The **Additional Boards** are proposed applying **tolerances**(*) on the user specs, allowing to suggest more boards for our customers.

The button information is refreshed each time the user changes the Electrical Parameters.

(*) tolerances can be customized



(*) **Default tolerances**:
- **Vin range**: 40%
- **Vout**: 20%
- **Iout**: 20%

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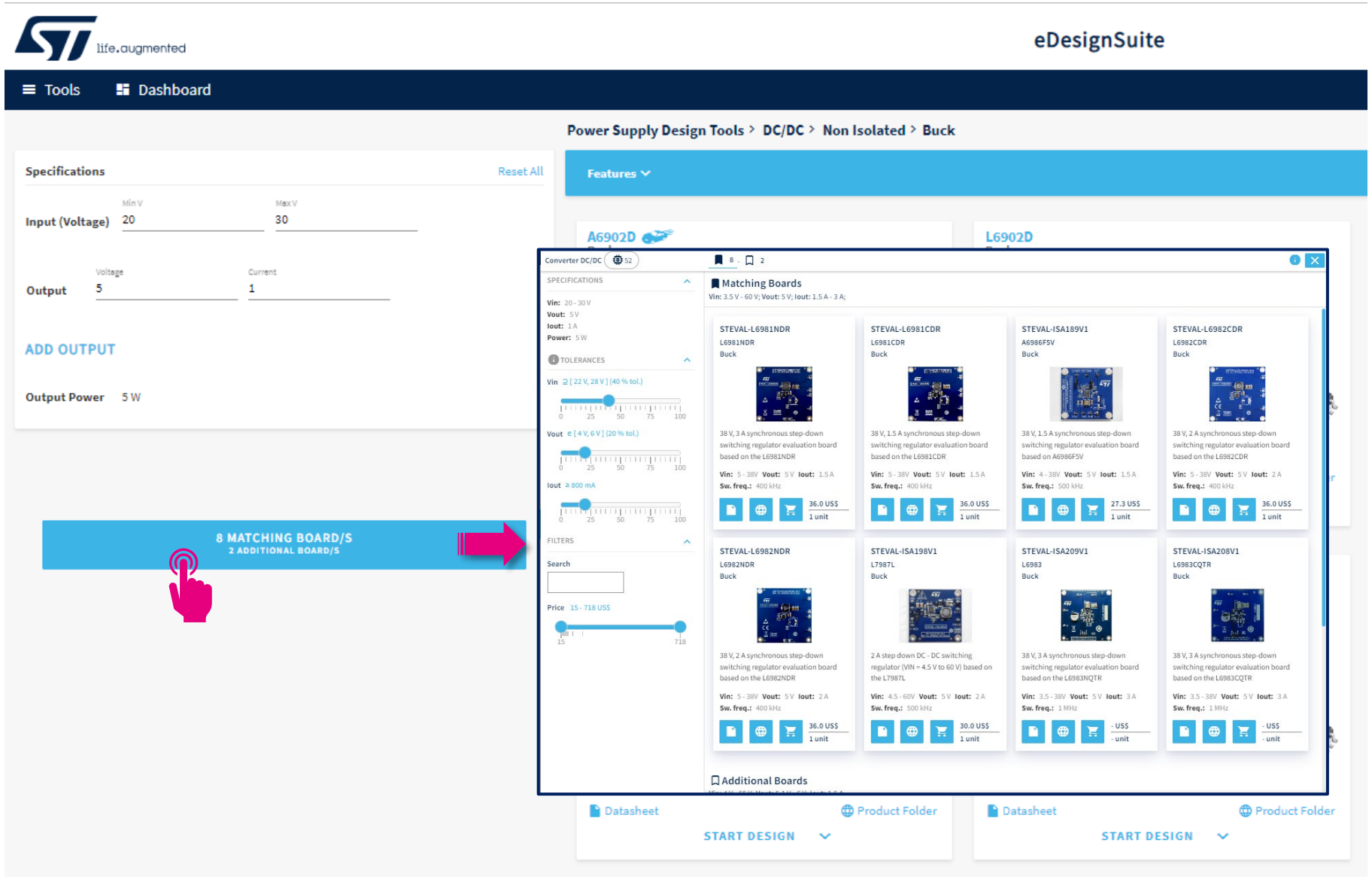
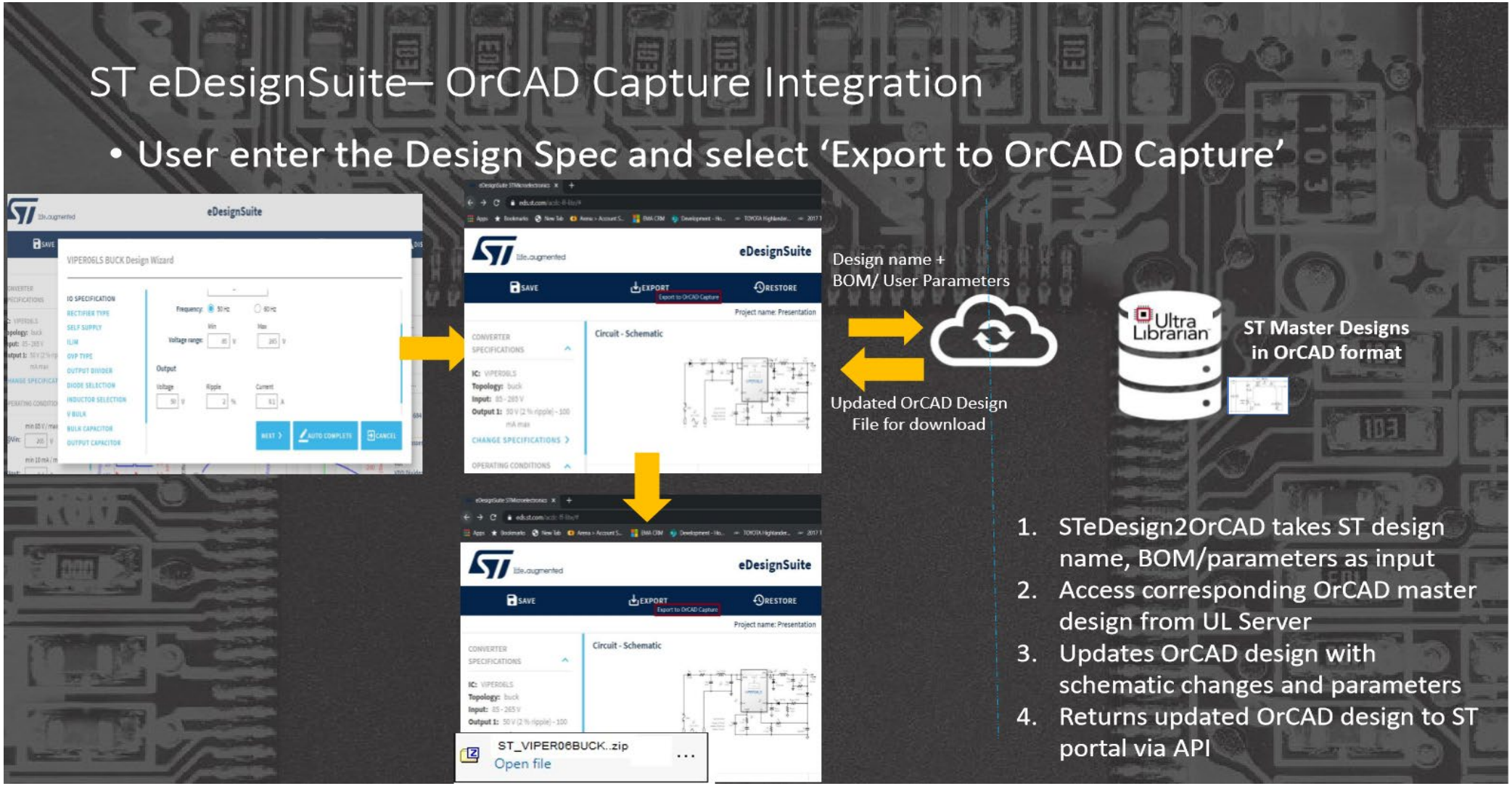
Evaluation Boards Advisor
New Feature

Clicking on the Button the Evaluation Boards Dialog will pop up, showing the **Matching** and the **Additional** boards



eDesignSuite – OrCAD Capture integration



Our technology starts with You

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