

eDesignSuite

The smart way to design your application



The easy-to-use software suite to accelerate your time to market

eDesignSuite helps experienced and novice designers transform application requirements into complete solutions based on ST's rich product portfolio.

The suite includes three types of software tools:

Smart simulator and system design engine suggests products and a complete design for various application types.

Smart selectors display the types of products best suited to your application.

Configurators set the product parameters or configure a full application type.

KEY FEATURES

- Fully annotated and interactive schematics
- Set of analysis and simulation diagrams
- Transformer:
 - off-the-shelf Würth Elektronik transformer proposal tailored on design specification
 - fully customizable transformer design
- User-friendly graphic interface

TARGETED APPLICATIONS

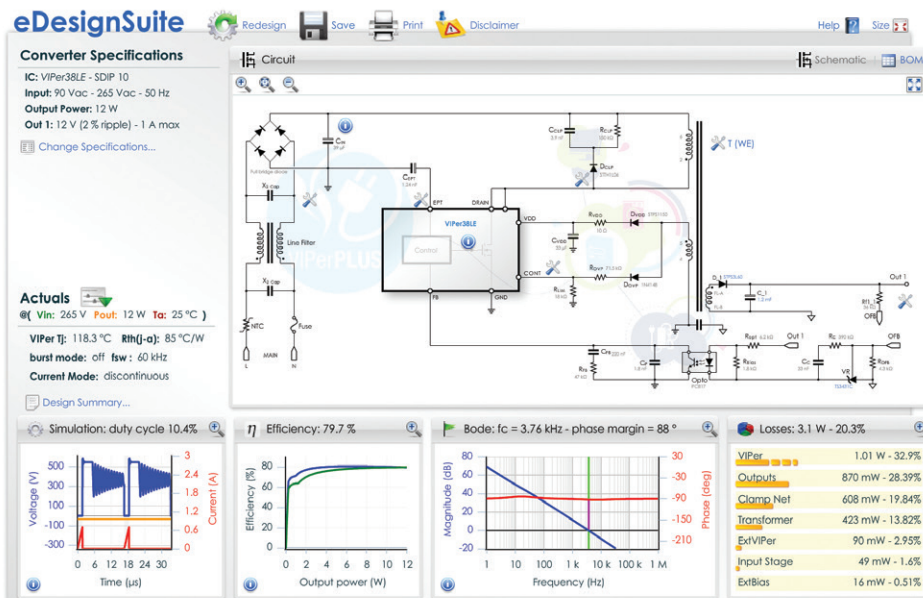
- Power supplies (AC-DC and DC-DC)
- LED lighting (AC-DC and DC-DC)
- Battery chargers (AC-DC and DC-DC)
- Photovoltaics
- Motor control
- Signal conditioning
- RF antennas



SMART SIMULATOR AND SYSTEM DESIGN ENGINE

The smart simulator and system design engine provides an analysis workbench for the design generated from the high-level specifications. It offers for various application types (power supply, LED lighting, battery charger, photovoltaics, signal conditioning, RF design):

- A fully annotated and interactive schematic diagram of the circuit
- Off-the-shelf Würth Elektronik transformer selection option or fully customizable transformer design
- A set of analysis diagrams, such as main current and voltage simulations, efficiency curves, bode stability, and power loss data
- An actuals view to evaluate the main performance characteristics of the design
- A specification view showing the key configuration parameters of your design
- A complete and interactive bill of materials view
- A set of commands enabling the user to make design modifications



Design result overview

WE TRANSFORMERS

Order Code	Package	L [µH]	Leakage	Turn ratio (Np)	Core losses	Preferred by
780311771	EFD25	500 µH	5 µH	6	116 mW	This product is recommended for L
780313054	PQ3220	500 µH	3.5 µH	9	66 mW	This product is recommended for lowest temperature rise
7508112327	EFD20	800 µH	9.1 µH	8.33	143 mW	This product is recommended for lowest height
780341591	EPC17	1 mH	38.4 µH	15	275 mW	

Design Results for Selected Transformer

7508112327

Reflected Voltage (VR): 75.12 V
 Primary Inductance (Lp): 800 µH
 Leakage Inductance (Llk): 9.1 µH
 Secondary Voltage (Vsec1): 12.62 V
 Auxiliary Voltage (Vaux): 11.56 V

Nominal Converter Working Mode: always in DCM
 Worst Case Primary Peak Current: 0.87 A (Ip - 15%)
 Worst Case Maximum Duty Cycle: 47.3 % in DCM (Dp + 15%)
 Maximum losses: 424 mW

Off-the-shelf Würth transformer proposal view

Flyback transformer parameters

Reflected Voltage (VR): 75 V from 50 V to 245 V
 Primary Inductance (Lp): 0.801 mH from 0.45 mH to 2.42 mH
 Primary Leakage: 3% from 1% to 15%
 Drain node (thy) capacitance: 100 pF < 100 pF
 Nominal Converter Working Mode: in CCM up to 157 Vdc
 Worst Case Primary Peak Current: 0.87 A (Ip - 15%)
 Worst Case Maximum Duty Cycle: 46.8 % in CCM (Dp + 15%)

Transformer Design

Winding	Turns	Paralleled	eq. Cu section [mm²]	Winding Type	Factor	Losses
Primary	117	1x16	Single 0.16 mm (0.08) (± 0.019)	31%	135 mW	
Secondary	23	1x1	TCC2 DCR (0.46 mm) (0.28) (± 0.114)	58%	254 mW	
Auxiliary	21	1x1	Solid_C2 (0.07 mm) (0.04) (± 0.054)	2%	6 mW	

Results

Primary Inductance: 1.34 mH
 Leakage Inductance: 40.8 µH
 Npk: 5.93 (Best Ratio: 5.943)
 Reflected Voltage: 75 V (Required: 75 V)
 Vaux: 13.25 V (Required: 13.3 V)
 total Aw B-factor: 91.28 %
 maximum magnetic flux density: 305 mT
 required gap length: 0.3 mm
 transformer total losses: 598 mW

Custom transformer design view

