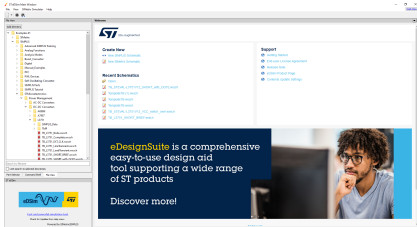


## eDSim: fast and powerful electrical simulation software for SMPS and analog ICs



### Features

- Built-in interface with [eDesignSuite](#)
- SMPS circuit full modeling using ST components
- Time domain simulation
- Control loop stability
- Predefined application use-case simulation
- Schematic editor for customization
- Waveform viewer with measurement capabilities

### Description

**eDSim** is a fast and powerful electrical simulation tool for SMPS and analog ICs, integrated in the [eDesignSuite](#) tool. It features enhanced accuracy and higher convergence speed for SMPS, enabling a simulation time 10-50x faster than the classical analog SPICE simulators.

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.

Design your analog circuit using the [eDesignSuite](#) engine, display a preview of it in few seconds with full annotated schematic and BOM, and then run the electrical simulation through **eDSim** to get fast and accurate simulations and reliable design validation, thus reducing the effort and risks related to hardware prototyping.

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.

Software release 2023.12 is now available.

Product summary	
Fast and powerful electrical simulation software for DC-DC switching converters	<a href="#">STSW-eDSim</a>
Easy-to-use comprehensive software suite	<a href="#">eDesignSuite</a>
Applications	<a href="#">Power Supply and converters</a>

# 1 General information

Based on the SIMPLIS/SIMetrix AE version, the eDSim simulator software tool allows full simulations of all the ST encrypted models and applications supported, with the option of applying additional customizations as listed below.

For SIMPLIS:

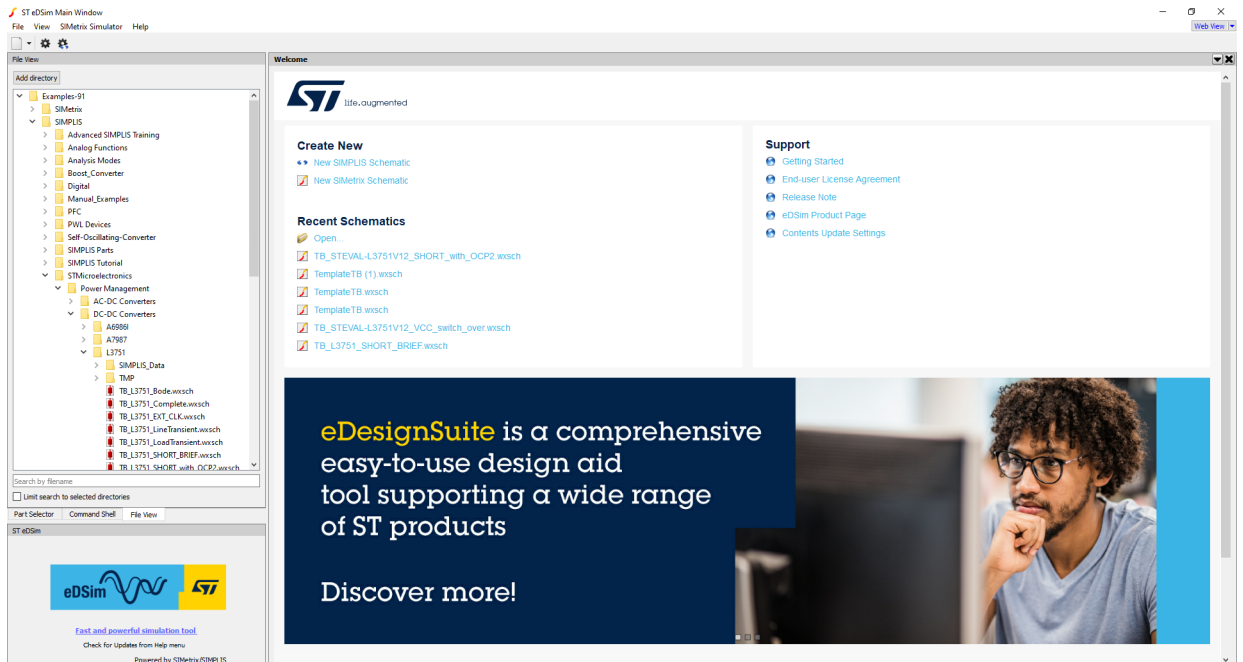
- A maximum of 15 state variables. Each capacitor or inductor requires one state variable. Each time-varying or small-signal AC source requires one state variable, except for sinusoidal or cosinusoidal sources, which require two state variables per source
- A maximum of 10 capacitors or inductors combined
- A maximum of 6 switches (simple or transistor)
- A maximum of 6 logic gates
- A maximum of 26 states. Each PWL element, switch, time-varying source, and logic gate requires one state
- A maximum of 100 new topologies, which are enough for simple switching circuits that use simple models only. More complex circuits or circuits that have more complicated models may exceed this limit

For SIMetrix:

- 140 analog nodes (internal and external)
- 360 digital nodes
- 720 digital ports
- 300 digital components
- 360 digital outputs

eDSim requires Windows® 10 or higher 64-bit edition (Home, Pro, or Enterprise).

Figure 1. eDSim main window



## 2 Supported devices

### SIMPLIS ICs models for Power Supply

#### Power Conversion

##### AC/DC

- Isolated
  - Quasi Resonant Flyback
    - **VIPERGAN50**: VIPERGAN50TR
    - **VIPERGAN65**: VIPERGAN65TR
    - **VIPERGAN100**: VIPERGAN100TR
    - **VIPER25**: VIPER25HD, VIPER25LD
    - **VIPER35**: VIPER35HD, VIPER35LD
- Isolated
  - Fixed Frequency Flyback
    - **VIPER26K**: VIPER265K, VIPER267K
  - Not Isolated
    - Buck
      - **VIPER26K**: VIPER265K, VIPER267K

##### DC/DC

- Not Isolated
  - Buck:
    - **L6983**: L6983CQTR, L6983C33QTR, L6983C50QTR, L6983NQTR, L6983N33QTR, L6983N50QTR
    - **L6981**: L6981C33DR, L6981C50DR, L6981CDR, L6981N33DR, L6981N50DR, L6981NDR
    - **L6982**: L6982C33DR, L6982C50DR, L6982CDR, L6982N33DR, L6982N50DR, L6982NDR
    - **L7983**: L7983PU50R, L7983PU33R, L7983PUR
    - **ST1PS01**: ST1PS01AJR, ST1PS01BJR, ST1PS01CJR, ST1PS01DJR, ST1PS01EJR, ST1PS01FJR, ST1PS01GJR, ST1PS01HJR
    - **ST1PS02**: ST1PS02AQTR, ST1PS02BQTR, ST1PS02CQTR, ST1PS02DQTR
    - **ST1PS03**: ST1PS03A1QTR, ST1PS03AQTR
    - **L3751**: L3751PUR
    - **x7987x**: L7987, L7987L, A7987
    - **STPD01**: STPD01PUR
    - **\*6986\***: L6986TR, A6986TR
- Isolated
  - Iso-Buck/Iso-Buck-Boost:
    - **L6986I**: L6986ITR
    - **L6983I**: L6983IQTR
    - **A6986I**: A6986ITR

### SIMetrix ICs Models for Linear Analog

#### Amplifiers

- Op-Amps:
  - TSB582, TSV620, TSV621, TSV611, TSV521, TSB611, TSX631, TSX561, TSV771, LM2904, LMV321, LMV820, LMV821, TSV791, TSZ121, TSZ181, TSV911, TSV991, TSV631, TSV630, TSB711, TSU111, TSV711, TSV731, TSU101, TSB571, TSX711, TS507, TSX921, TSX920, TSV7721, TSV7723\_SINGLE, TSV781, TSV782, TSB181, TSB182, RHF43B\_BOL/EOL/EOR, RHF200\_BOL, RHF310\_BOL/EOL/EOR, RHF330\_BOL/EOL/EOR, RHF350\_BOL/EOL/EOR, RHF484\_BOL/EOL/EOR, RHR61\_BOL, RHR64\_BOL, TS1851, TS1871, TS617, TSB7191, TSH300, TSH310, TSH350, TSH330, TSV850-1, TSV6191, TSV6290-1, TSV6390-1, TSX7191, TSX9291

- Current Sense Amplifiers:
  - TSC2010, TSC2011, TSC2012, TSC1021A, TSC1021B, TSC1031
- Fully Differential Amplifiers
  - RHF200\_BOL

**Comparators:** TS3011, TS3021, TS881, TS880, TSX3702, TSX393, TS331, RHR801\_BOL, TS985, TS7221

**SIMetrix Models for TVS Electrothermal devices**

**Electrothermal devices**

- TVS:
  - LDP01Y, SM4TY, SM6TY, SM15TY, SM30TY, SM50TY, SMA6TY, SM15T, SMCJ, SMC30J, SM6FY, SM6T, SMAJ, SMBJ, SMC50J, SMA6J

**SIMPLIS/SIMetrix Models for Power MOSFET devices**

- NMOS:
  - SCT011H75G3AG\_TN, SCT011H75G3AG\_V2, SCT011H75G3AG\_V2\_3T, SCT011H75G3AG\_V3, STL90N10F7\_V2, STL325N4LF8AG\_V3\_3T, STL325N4LF8AG\_V3

**SIMetrix Models for TRIAC devices**

- **T-series high temperature Triacs:** T\_Series\_triacs
- **H-series high temperature Triacs:** high\_temperature\_triacs

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
19-Apr-2022	1	Initial release.
02-May-2022	2	Updated title, cover page description, and General information.
13-Jan-2023	3	Updated description. Added <i>Section 2 Supported devices</i>
25-Jul-2023	4	Updated cover image, product summary and description. Updated <i>Section 2 Supported devices</i> .
15-Dec-2023	5	Updated <i>Section Description</i> and <i>Section 2 Supported devices</i> .

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