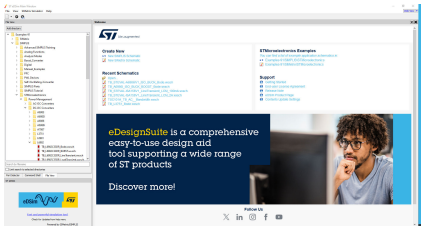
STSW-eDSim

Data brief

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



Product summary	
Fast and powerful electrical simulation software for DC-DC switching converters	STSW-eDSim
Easy-to-use comprehensive software suite	eDesignSuite
Applications	Power Supply and converters

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 2025.07 is now available.

Important:

To ensure that you are using the latest IC models, compare the release date of the eDSim version installed on your PC with the latest IC models available here: STMicroelectronics eDSim Software.

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:

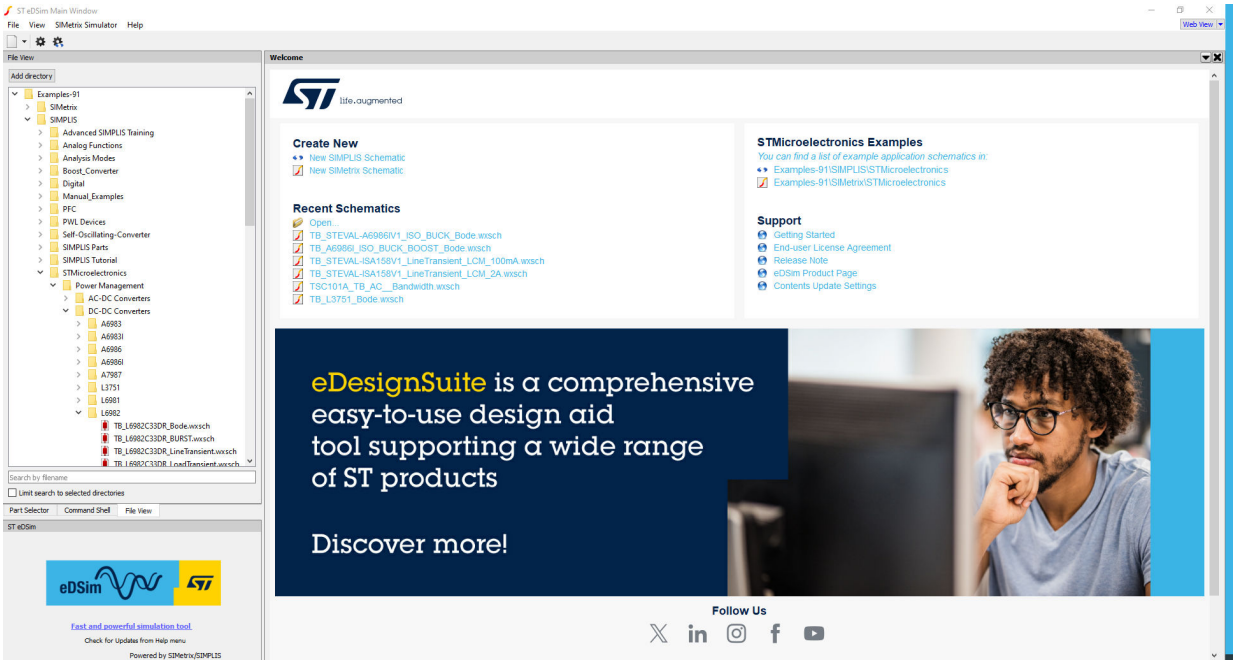
- A maximum of 15 state variables. Each capacitor or inductor requires one state variable. Each time-varying or small-signal AC source requires one state variable, except for sinusoidal or cosinusoidal sources, which require two state variables per source
- A maximum of 10 capacitors or inductors combined
- 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, VIPERGAN65DTR
    - **VIPERGAN100**: VIPERGAN100TR
    - **VIPER25**: VIPER25HD, VIPER25LD
    - **VIPER35**: VIPER35HD, VIPER35LD
    - **HVLED101**: HVLED101
  - Fixed Frequency Flyback
    - **VIPER26K**: VIPER265K, VIPER267K
- Not Isolated
  - Buck
    - **VIPER26K**: VIPER265K, VIPER267K
    - **VIPER31**: VIPER317HD, VIPER317LD, VIPER318HD, VIPER318LD, VIPER318XD, VIPER319HD,VIPER319LD, VIPER319XD
    - **VIPER11**: VIPER113LS, VIPER115XS, VIPER115LS, VIPER115HS, VIPER114XS, VIPER114LS,VIPER114HS, VIPER113XS
    - **VIPER01**: VIPER011LS, VIPER011XS, VIPER012HS, VIPER012LS, VIPER012XS, VIPER013HS,VIPER013LS, VIPER013XS
- PFC Pre-regulation
  - PFC Boost
    - **L4985**: L4985A, L4985B
    - **L4986**: L4986A, L4986B
    - **L6462A**

DC/DC

- Not Isolated
  - Buck
    - **A/L6983**: A/L6983CQTR, A/L6983C33QTR, A/L6983C50QTR, A/L6983NQTR, A/L6983N33QTR, A/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
    - **A/L7987***: L7987, L7987L, A7987
    - **STPD01**: STPD01PUR
    - **A/L6986***: L6986TR, L6986FTR, L6986HTR, A6986TR, A6986FTR
- Isolated
  - Iso-Buck/Iso-Buck-Boost:
    - **A/L6986I**: A/L6986ITR
    - **A/L6983I**: A/L6983IQTR

Led Driver

DC/DC

- Boost
  - ALED7709, ALED6000
- AC/DC converters
  - HVLED101

SIMetrix ICs Models for Linear Analog

Amplifiers

- Operational Amplifiers
  - TSB582, TSV620, TSV621, TSV611, TSV521, TSB611, TSX631, TSX561, TSV771, LM2904, LMV321, LMV820, LMV821, TSV791, TSZ121, TSZ181, TSV911, TSV991, TSV631, TSV630, TSB511, 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, TSB951/2
- Current Sense Amplifiers
  - TSC2010, TSC2011, TSC2012, TSC1021A, TSC1021B, TSC1031, TSC103, TSC102,TSC101A, TSC101B, TSC101C, TSC200, TSC2020, TSC2021, TSC2022
- Fully Differential Amplifiers
  - RHF200_BOL

Comparators: TS3011, TS3021, TS881, TS880, TSX3702, TSX393, TS331, RHR801_BOL, TS985, TS7221

SIMetrix Models for TVS Electrothermal

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

SIMPLIS/SIMetrix Models for Power MOSFET

- MOSFET-HV:

Table 1. MOSFET-HV (VDSS (V) nom 250-600)

VDSS (V)	Part Number	RDS(on) (mΩ) typ	Package
250	STO25N019M9	15	TO-LL
	STP25N018M9	15	TO-220AB
500	STB47N50DM6AG	61	D2PAK
600	STWA60N028T	22	TO-247 long leads
	STO60N030M9	30	TO-LL
	STWA75N60M6	32	TO-247 long leads
	STW75N60M6	32	TO-247
	STWA60N035M9	32	TO-247 long leads
	STHU60N046DM9AG	37	HU3PAK
	STWA72N60DM6AG	37	TO-247 long leads
	STW72N60DM6AG	37	TO-247
	STO60N038M9	38	TO-LL
	STWA60N043DM9	38	TO-247 long leads
	STP60N043DM9	38	TO-220AB
	STO60N045DM9	45	TO-LL
	STO60N045M9	45	TO-LL
	STWA67N60DM6	45	TO-247 long leads
	STO67N60M6	54	TO-LL
	STB47N60DM6AG	70	D2PAK
	STH36N60DM6-2AG	70	H2PAK-2
	STHU47N60DM6AG	70	HU3PAK
	STL47N60M6	70	PowerFLAT 8x8 HV
	STL52N60DM6	72	PowerFLAT 8x8 HV
	STH60N099DM9-2AG	76	H2PAK-2
	STF36N60M6	85	TO-220FP
	STL45N60DM6	94	PowerFLAT 8x8 HV
	STO36N60M6	99	TO-LL
	STF28N60DM2	130	TO-220FP
	STF24N60M6	162	TO-220FP
	STF26N60DM6	165	TO-220FP
	STD12N60DM6	345	DPAK

Table 2. **MOSFET-HV (VDSS (V) nom 650-800)**

VDSS (V)	Part Number	RDS(on) (mΩ) typ	Package
650	STWA65N023M9	19.9	TO-247 long leads
	STW65N023M9-4	19.9	TO247-4
	STWA68N65DM6AG	33	TO-247 long leads
	SH68N65DM6AG	35	ACEPACK SMIT
	STHU65N050DM9AG	38	HU3PAK
	STH65N050DM9-7AG	38	H2PAK-7
	STP65N045M9	39	TO-220AB
	STW65N045M9-4	39	TO247-4
	STWA65N045M9	39	TO-247 long leads
	STWA65N65DM2AG	42	TO-247 long leads
	STWA46N65DM6AG	55	TO-247 long leads
	SH63N65DM6AG	56	ACEPACK SMIT
	STWA38N65DM6AG	68	TO-247 long leads
	STW50N65DM2AG	70	TO-247
	STHU32N65DM6AG	83	HU3PAK
	SH32N65DM6AG	89	ACEPACK SMIT
	STWA30N65DM6AG	90	TO-247 long leads
	STH30N65DM6-7AG	102	H2PAK-7
	STP65N150M9	128	TO-220AB
	STD65N160M9	132	DPAK
	STD9N65DM6AG	365	DPAK
800	STP80N240K6	197	TO-220AB
	STF80N240K6	197	TO-220FP
	STD80N240K6	197	DPAK
	STP80N340K6	285	TO-220AB
	STD80N340K6	285	DPAK
	STF80N340K6	285	TO-220FP
	STD80N450K6	380	DPAK
	STF80N450K6	380	TO-220FP
	STP80N450K6	380	TO-220AB
	STF80N600K6	515	TO-220FP
	STP80N600K6	515	TO-220AB
	STH10N80K5-2AG	600	H2PAK-2
	STF80N900K6	750	TO-220FP
	STP80N900K6	750	TO-220AB
	STP80N1K1K6	1000	TO-220AB
	STF80N1K1K6	1000	TO-220FP

Table 3. **MOSFET-HV (VDSS (V) nom 950-1500)**

VDSS (V)	Part Number	RDS(on) (mΩ) typ	Package
950	STW40N95K5	110	TO-247
	STF20N95K5	275	TO-220FP
	STH22N95K5-2AG	280	H2PAK-2
	STF15N95K5	410	TO-220FP
	STF10N95K5	650	TO-220FP
	STD7N95K5AG	950	DPAK
	STD6N95K5	1000	DPAK
	STD3N95K5AG	4300	DPAK
1000	STD4NK100Z	5400	DPAK
1200	STH13N120K5-2AG	620	H2PAK-2
	STW12N120K5	620	TO-247
	STH12N120K5-2AG	1450	H2PAK-2
	STH8N120K5-2AG	1650	H2PAK-2
	STH2N120K5-2AG	7250	H2PAK-2
1500	STW12N150K5	1600	TO-247

- MOSFET-LV:

Table 4. **MOSFET-LV**

VDSS (V)	Part Number	RDS(on) (mΩ) max	Package
40	STK615N4F8AG	0.48	PowerFLAT 8x8
	STL325N4LF8AG	0.75	PowerFLAT 5x6
	STL325N4F8AG	0.85	PowerFLAT 5x6
	STL300N4LF8	1.0	PowerFLAT 5x6
	STL225N4F8AG	1.5	PowerFLAT 5x6
	STL170N4LF8	2.2	PowerFLAT 5x6
	STL130N4LF8	2.3	PowerFLAT 3.3x3.3
	STL117N4LF7AG	2.5	PowerFLAT 5x6
	STL145N4LF8AG	2.6	PowerFLAT 5x6
	STL165N4F8AG	2.6	PowerFLAT 5x6
	STL100N4LF8	2.7	PowerFLAT 3.3x3.3
	STL64DN4F7AG	7.0	PowerFLAT 5x6
80	STL135N8F7AG	3.6	PowerFLAT 5x6
100	STL160N10F8	3.2	PowerFLAT 5x6
	STL90N10F7	8	PowerFLAT 5x6

- MOSFET-SiC:

VDSS (V)	Part Number	RDS(on) (mΩ) typ	Package
650	SCT018W65G3-4AG	20	TO247-4
	SCT027W65G3-4AG	29	TO247-4
	SCT027HU65G3AG	29	HU3PAK
	SCT040W65G3-4AG	45	TO247-4
	SCT055W65G3-4AG	58	TO247-4
750	SCTHS300N75G3AG	6.5	STPAK
	SCT011H75G3AG	11	H2PAK-7
	SCT011HU75G3AG	11	HU3PAK
	SCT060HU75G3AG	58	HU3PAK
900	SCT012H90G3AG	12	H2PAK-7
	SCT012W90G3-4AG	12	TO247-4
1200	SCTHS250N120G3AG	8.5	STPAK
	SCT015W120G3-4AG	15	TO247-4
	SCT020H120G3AG	18.5	H2PAK-7
	SCT020HU120G3AG	18.5	HU3PAK
	SCT020W120G3-4AG	18.5	TO247-4
	SCT025HU120G3AG	18.5	HU3PAK
	SCT019HU120G3AG	19	HU3PAK
	SCT025W120G3-4AG	27	TO247-4
	SCT040HU120G3AG	40	HU3PAK
	SCT040W120G3-4AG	40	TO247-4
	SCT070HU120G3AG	63	HU3PAK
	SCT070W120G3-4AG	63	TO247-4

SIMetrix Models for Thyristors

- **AC Switch**
  - Logic-level gate ACS series
  - Overvoltage protected ACST
- **Thyristors (SCR)**
  - High-temperature Thyristors
  - Logic-level gate Thyristors
  - Standard Thyristors
- **Triacs**
  - Diacs
  - High temperature Triacs
  - Standard and Snubberless Triacs

SIMPLIS/SIMetrix Models for Diodes and Rectifiers

- **Automotive-grade Diodes**
  - Automotive Bridge Rectifier diodes
  - Automotive Schottky diodes
  - Automotive SiC diodes
  - Automotive Ultrafast diodes
- **Bridge Rectifier Diodes**
- **Field Effect Rectifiers**
- **Schottky Diodes**
- **Silicon Carbide Diodes**
- **Ultrafast Rectifiers**
- – Ultrafast 200 V, 300 V, 400 V
  - Ultrafast 600 V
  - Ultrafast 800 V, 1000 V, 1200 V

Revision history

Table 5. **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 *Section 2 Supported devices*
25-Jul-2023	4	Updated cover image, product summary and description. Updated Section 2: Supported devices.
15-Dec-2023	5	Updated Section Description and Section 2: Supported devices.
08-May-2024	6	Updated cover image, Section Description, Figure 1. eDSim main window and Section 2: Supported devices.
10-Jun-2024	7	Updated Section Description.
19-Jul-2024	8	Updated Description and Section 2: Supported devices.
16-Dec-2024	9	Updated Section Description and Section 2: Supported devices.
28-Apr-2025	10	Updated Description and Section 2: Supported devices.
28-Jul-2025	11	Updated Description and Section 2: Supported devices.

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice.

In the event of any conflict between the provisions of this document and the provisions of any contractual arrangement in force between the purchasers and ST, the provisions of such contractual arrangement shall prevail.

The purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgment.

The purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of the purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

If the purchasers identify an ST product that meets their functional and performance requirements but that is not designated for the purchasers' market segment, the purchasers shall contact ST for more information.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2025 STMicroelectronics – All rights reserved