

CST STUDIO SUITE 2023

FEATURE MATRIX

	TRADITIONAL CST STUDIO SUITE	3DEXPERIENCE ELECTROMAGNETICS
HIGH-FREQUENCY SOLVERS		
Time Domain		
The transient solver's finite integration technique (FIT) calculates broadband S-parameters from one single calculation by applying DFTs to time signals. The transmission line method (TLM) is also available.	✓	✓
Frequency Domain		
A classical approach to solving Maxwell's equations with time-harmonic dependence using the finite element method (FEM) and adaptive tetrahedral meshing with multiple broadband sweep solutions.	✓	✓
Eigenmode		
Calculate the frequencies and corresponding electromagnetic field patterns when no excitation is applied.	✓	✓
Integral Equation		
Discretize the object boundary using the multilevel fast multipole method (MLFMM) for electrically large models.	✓	✓
Asymptotic		
Frequency domain analysis based on a raytracing technique, typically used for scattering or antenna placement for electrically very large domains.	✓	✓
Multilayer		
Simulate multilayer geometries accurately and efficiently using the method of moments (MoM).	✓	✓
LOW-FREQUENCY SOLVERS		
Time Domain		
Simulate the time-harmonic behavior in low-frequency systems, useful for coils, wireless power transfer, and electric motor design.	✓	✓
Frequency Domain		
Evaluate transient behavior, including eddy currents, non-linear effects, motion, and resistive-capacitive effects, useful for electric motor design.	✓	✓
Partial RLC		
Calculate equivalent circuit parameters in the frequency domain, including partial inductances, partial resistances, and partial capacitances.	✓	✓

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STATIC SOLVERS		
Electrostatic	✓	✓
Simulate static electric fields.		
Magnetostatic	✓	✓
Simulate static magnetic fields.		
Stationary Current	✓	✓
Simulate the flow of DC currents through a device, especially with lossy components.		
MULTIPHYSICS SOLVERS		
Steady State Thermal	✓	✓
Calculate the stationary temperature distribution of a system, supporting many heat sources, including human bio-heat and particle collisions.		
Transient Thermal	✓	✓
Calculate how a system heats over time, including human bio-heat and particle collisions.		
Conjugate Heat Transfer	✓	✓
Calculate the heating of a device with thermal and fluid dynamics simulation methods.		
Mechanical	✓	✓
Calculate the displacement and deformation of structures using linear or nonlinear methods.		
PARTICLE DYNAMICS SOLVERS		
Particle-in-Cell	✓	✓
Calculate both particle trajectory and electromagnetic fields in the time domain, taking into account the space charge effects and mutual coupling between the two.		
Particle Tracking	✓	✓
Simulate particle trajectories through electromagnetic fields.		
Particle-in-Cell	✓	✓
Calculate both particle trajectory and electromagnetic fields in the time domain, taking into account the space charge effects and mutual coupling between the two.		
PCB SOLVERS		
PCBs & Packages	✓	✓
Calculate signal integrity (SI), power integrity (PI), and electromagnetic compatibility (EMC) analysis on printed circuit boards (PCB).		
CABLE SOLVERS		
Cable Suite	✓	✓
Calculate, in 3D, signal integrity (SI), conducted emission (CE), radiated emission (RE), and electromagnetic susceptibility (EMS) of complex cable structures in electrically large systems.		

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CIRCUITS & SYSTEMS		
Schematic	✓	✓
Design systems and circuits with this powerful and easy-to-use schematic design tool.		
Assembly	✓	✓
Integrate complex structures for synthesis and optimization with this layout tool.		
DESIGN & MODELING TOOLS		
Design Study & Optimization	✓	✓
Do parametric design and optimization studies with fully-integrated optimization tools built into every design module.		
IdEM	✓	
A user-friendly tool for the generation of macromodels of linear lumped multi-port structures (via fields, connectors, packages, discontinuities, etc.), known from their input-output port responses.		
Antenna Magus	✓	
An invaluable aid to antenna design engineers and to anyone who requires antenna models for antenna placement and/or electromagnetic interference studies.		
Filter Designer 3D	✓	Add-on
A synthesis tool for designing bandpass and diplexer filters, where a range of coupling matrix topologies are produced for the application in arbitrary coupled-resonator based technology.		
FEST3D	✓	
Microwave filter design tool that extracts the modal chart of complex waveguides with arbitrary cross-section, with high accuracy at low computational cost.		
SPARK3D	✓	
Multipactor and corona analysis tool that analyzes breakdown phenomena numerically, predicting more realistic breakdown power levels, and thus improving the design margins.		
CLOUD TOOLS		
Cloud Preprocessor		✓
Launch CST Studio Suite in a web-browser and build your model from product data saved on the 3DEXPERIENCE Platform.		
Cloud Compute	Add-on	16-core access included (Add-on for more)
Send models to the official Dassault Systèmes to compute on up to 288 cores or 48 cores + 8 GPUs.		
Web-Based Results Viewer & Reporting	Add-on	✓
See geometry, 1D results, farfield plots, and 3D field plots from a web browser.		

	TRADITIONAL CST STUDIO SUITE	3DEXPERIENCE ELECTROMAGNETICS
NATIVE TWO-WAY CAD INTEGRATION		
SOLIDWORKS (2013 - 2023)	✓	✓
PTC Creo Elements (5.0)	✓	✓
PTC Creo Parametric (3.0)	✓	✓
Altium Designer		Add-on
Cadence Allegro		Add-on
STATIC IMPORT: 3D CAD		
ACIS SAT/SAB (R1 - 2020 1.0)	✓	✓
CATIA V5/V6 (V5R8 - V5-6R2021)	✓	✓
CATIA V4 (4.1.9 - 4.2.4)	✓	✓
SOLIDWORKS (2003 - 2023)	✓	✓
Solid Edge (V18 - SE2020)	✓	✓
Parasolid (9.0.x - 33.0.x)	✓	✓
Autodesk Inventor (V11 - 2021)	✓	✓
Siemens NX (NX 1 - NX 1926)	✓	✓
PTC Creo (16 - Creo 7.0)	✓	✓
STATIC IMPORT: 3D GENERAL		
STEP (203, 214, 242)	✓	✓
IGES (up to 5.3)	✓	✓
EDA IMPORT: 2D CAD		
DXF	✓	✓
GDSII	✓	✓
Gerber Single-Layer	✓	✓
Gerber Multi-Layer	Add-on	
EDA IMPORT: EDA		
Cadence Allegro PCB / APD / SiP	✓	✓
Mentor Graphics Expedition	✓	✓
Mentor Graphics HyperLynx	✓	✓
Mentor Graphics PADs	✓	✓
ODB++	✓	✓
IPC-2581	✓	✓
Chip Interface	Add-on	
A tool to accelerate the generation of complex 3D chip models, starting from the 2D chip layouts imported from OpenAccess databases (lib.defs, cds.lib) and GDSII files. The Process Queue allows the user to mimic an actual fabrication process which results in the generation of a 3D model.		