/ ELECTRONICS

	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Electronics Pro 2D	Electronics Enterprise
LOW FREQUENCY ELECTROMAGNETICS									
Electrostatics	●							●	●
AC Conduction	●							●	●
DC Conduction	●							●	●
Magnetostatics	●							●	●
Adaptive Field Mesh	●							●	●
AC Harmonic Magnetic	●							●	●
Electric Transient	●								●
MAGNETIC TRANSIENT									
Translational Motion	●							●	●
Fully Automatic Symmetrical Mesh Generation	●							●	●
Rotational Motion	●							●	●
Non-Cylindrical Motion	●							●	●
Advanced Embedded Circuit Coupling	●							●	●
Circuit Coupling with Adaptive Time Stepping	●							●	●
Direct and Iterative Matrix Solvers	●							●	●
ADVANCED MAGNETIC MODELING									
Vector Hysteresis Modeling	●							●	●
Multi-Conductive Terminals Modelling (PCBs, Busbars etc.) / A-Phi Solver	●								●
Hysteresis Modeling for Anisotropic Material	●							●	●
Frequency Dependent Reduced Order Models	●							●	●
Reduced Order Model Extraction (Linear-Motion, Rotational-Motion, No- Motion)	●							●	●
Functional Magnetization Direction	●							●	●
Magnetization/De- Magnetization Modeling	●							●	●
Manufacturing Dependent Core L Loss Models	●							●	●
Noise – Vibration Modeling	■							■	■
Temperature Dependent De-Magnetization Modeling	●							●	●

● Full Support　　▲ Limited Capability　　■ Requires more than 1 product

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	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
ADVANCED MAGNETIC MODELING										
Temperature Dependent Core Loss Computation	●								●	●
Lamination Modeling	●								●	●
Magnetostriction and Magnetoelastic Modeling	●								●	●
Hardware in the Loop Modeling	●								●	●
Integrated Motor Synthesis and Design Kit	●								●	●
Integrated Planar Magnetics Synthesis and Design Kit	●								●	●
Litz Wire Modeling	●								●	●
CONCEPT DESIGN SOLUTION FOR ELECTRICAL MACHINE										
Template-Based Magnetic Topologies						●				
Template-Based Cooling Topologies						●				
Magnetic 2D FEA with Analytical Solution						●				
Thermal 2D FEA						●				
3D Thermal and Fluid Network						●				
Temperature Dependent Duty-Cycle Analysis						●				
Manufacturing Effects Due to Winding Impregnation and Housing Interfaces						●				
Linear Structural 2D FEA						●				
Electrothermal Reduced Order Model (FMU)						●				
HIGH FREQUENCY ELECTROMAGNETICS										
Fully Automated Adaptive Mesh Refinement		●								●
Multi-Frequency Broadband Adaptive Meshing		●								●
Frequency Domain Finite Element (FEM) Analysis		●								●
Frequency Domain Integral Equation (MoM) Analysis		●								●
Time Domain FEM Analysis		●								●
FEM Eigenmode Analysis		●								●
MoM Characteristic Mode Analysis		●								●

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	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
HIGH FREQUENCY ELECTROMAGNETICS										
Physical Optics (PO) Analysis		●								●
Shooting and Bouncing Ray+ (SBR+) Analysis		●								●
Physical Theory of Diffraction (PTD) Correction for SBR		●								●
Uniform Theory of Diffraction (UTD) Correction for SBR		●								●
Visual Ray Tracing for SBR+ Analysis		●								●
SBR+ Creeping Wave Correction for RCS of Curved Obects		●								●
Range Doppler Plots for Radar Scenario Analyses										●
Accelerated Doppler Processing (ADP) for SBR+ Range Doppler Analyses										●
RF and Digital Filter Synthesis and Design								●		
Domain Decomposition Method (DDM) for Frequency Domain FEM Analysis		●								●
Hybrid Finite Element/ Integral Equation Analysis		●								●
UI Coupled Finite Element and/or IE with SBR+ Analysis		●								●
Modal Wave Port Excitation		●								●
Terminal Wave Port Excitations		●								●
Lumped, Voltage and Current Excitations		●								●
Circuit Port Excitations		●								●
Parametric Antenna Excitations for SBR+		●								●
Floquet Excitations		●								●
Incident Wave Excitation		●								●
Magnetic Ferrite Bias Excitation		●								●
Perfect Electric and Magnetic Boundary		●								●
Finite Conductivity Boundary		●								●
Lumped RLC Boundary		●								●
Symmetry Boundary		●								●
Periodic Boundary		●								●
Frequency Dependant Materials		●								●

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	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
HIGH FREQUENCY ELECTROMAGNETICS										
Spatial XYZ Material Properties Via Dataset		●								●
Higher and Mixed Order Elements		●								●
Curvilinear Element Mesh Correction		●								●
S,Y,Z Matrix Results		●								●
E, H, J, P Field Results		●								●
Direct and Iterative Matrix Solvers		●								●
Antenna Parameter Calculation		●								●
Infinite and Finite Antenna Array Calculations		●								●
Radar Cross Section Calculation		●								●
FSS, EBG and Metamaterial Calculation		●								●
Specific Absorption Rate Calculation		●								●
EMI/EMC Calculation		●								●
System Level EMI and RFI Analysis		●							●	●
Linear Circuit Analysis with EM Dynamic link		●								●
Integrated Antenna Synthesis and Design Kit		●								●
5G SAR Standards Toolkit		●								●
Power Density and CDF		●								●
Radar Prep/Post Simulation Wizards		●								●
3D Component Libraries with User Controled Parametrics		●								●
3D Component with Encryption Creation		●								●
3D Component with Encryption Utilization		●								●
RF Discharge Solver		●								●
Mutli-paction Solver		●								●
Volumetric SBR+ for 3D Dielectrics		●								●
Accelerated Doppler Processing (ADP) for SBR+ Range-Doppler Analysis										●

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	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
POWER AND SIGNAL INTEGRITY BOARD SIMULATION CAPABILITIES										
Electronics Desktop 3D Layout GUI		●	●		●					●
ECAD Translation (Altium, Cadence, Mentor, Pulsonix, & Zuken)	●	●	●	●	●					●
MCAD (.sat) Generation from ECAD		●	●	●						●
Lead Frame Editor		●	●							●
DC Voltage, Current and Power Analysis for PKG/PCB			●							●
DC Joule Heating with Ansys Icepak			■	■	■					●
Passive Excitation Plane Resonance Analysis			●							●
Driven Excitation Plane Resonance Analysis			●							●
Automated Decoupling Analysis			●							●
Capacitor Loop Inductance Analysis			●							●
AC SYZ Analysis			●							●
Dynamically Linked Electromagnetic Field Solvers			●							●
Chip, Package, PCB Analysis (CPM)		●	●							●
Near-Field EMI Analysis										●
Far-Field EMI Analysis										●
EMI/EMC Full Board Scan										●
Characteristic Impedance (Zo) L PKG/PCB Scan										●
Full PCB/PKG Cross-Talk Scanning										●
TDR Wizard										●
TDR Analysis		●	●	●					●	●
Transient IBIS Circuit Analysis		●	●							●
Signal Net Analyzer										●
SerDes IBIS-AMI Circuit Analysis										●
Macro-Modeling (Network Data Explorer)	●	●	●	●						●
Steady State AC (LNA) Analysis			●							●
Virtual Compliance - DDRx, GDDRx, & LPDDRx										●

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/ ELECTRONICS

	Maxwell	HFSS	Siwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
POWER AND SIGNAL INTEGRITY BOARD SIMULATION CAPABILITIES										
SPISIM Com and USB-C Compliance										●
SPISIM IBIS AMI Generation										●
Synopsys HSPICE Integration			●							●
Cadence PSPICE Support			●							●
Electromagnetically Circuit Driven Field Solvers		●	●							●
RLCG PARASITIC EXTRACTION										
DCRL, ACRL & CG Solver				●					●	●
IC Packaging RLCG IBIS Extraction for Signals & Power				●						●
Touchpanel RLCG Unit Cell Extraction				●						●
Adaptive Meshing for Accurate Extraction				●					●	●
Bus Bar RLCG Extraction	●			●					●	●
Power Inverter & Converter Component Extraction				●						●
3D Component Library				●						●
Reduced RLCG Matrix Operations				●						●
SPICE Equivalent Modeling Export				●					●	●
DCRL & ACRL Joule Heating Analysis with Icepak				●						●
Macro-Modeling (Network Data Explorer)				●						●
2D Cable Modeling Toolkit				●						●
ELECTRONICS COOLING										
Multi-Mode Heat Transfer					●					●
Steady-State and Transient					●					●
CFD Analysis					●					●
Turbulent Heat Transfer					●					●
Multiple-Fluid Analysis					●					●
Species Transport					●					●
Solar Loading					●					●
Reduced Order Flow and Thermal					●					●

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/ ELECTRONICS	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
ELECTRONICS COOLING										
Network Modeling	■	■	■	■	●					●
Joule Heating Analysis					●					●
Thermo-Electric Cooler Modeling					●					●
Thermostat Modeling					●					●
Package Characterization					●					●
CABLE MODELING										
Finite Difference Time Domain Analysis							●			
Multi-Conductor Transmission Line Analysis	●	●	●	●	●		●		●	●
Two-Way Coupling FDTD and Transmission Line Solver		▲					●			▲
Twisted Conductors							●			
Seam Impedance							●			
Cable Junctions							●			
Braided Shield Support							●			
Pin Voltage, Current Density, Plane Wave Excitations							●			
Multi-Conductor and Multi-Shield Support							●			●
Uses SpaceClaim Design Modeler UI							●			
Thin Surface and Thin Wire Algorithms							●			
HPC FOR ELECTRONICS										
GPU Support	▲	▲			▲					●
HPC Accelerated Frequency Sweeps	●	●	●							●
HPC Distributed Hybrid Solving		●								●
HPC Enabled Domain Decomposition Method	●	●								●
HPC Time Decomposition Method	●								●	●
HPC Enabled Multi-port Excitation Acceleration		●								●
HPC Acceleration for DCRL, ACRL and CG				●						●
HPC 2D Skew Parallel Processing	●								●	●
HPC Enabled Parallel Processing	●	●		●	●				●	●

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	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
SYSTEM MODELING FOR POWER ELECTRONICS										
Circuit Simulation	●	●	●	●	●				●	●
Block Diagram Simulation	●	●	●	●	●				●	●
State Machine Simulation	●	●	●	●	●				●	●
VHDL-AMS Simulation	●	●	●	●	●				●	●
Integrated Graphical Modeling Environment	●	●	●	●	●				●	●
Power Electronics Component Libraries	●	●	●	●	●				●	●
Reduced Order Modeling	●	●	●	●	●				●	●
Power Electronic Device and Module Characterization	●	●	●	●	●				●	●
Co-Simulation with Low Frequency Electromagnetics	●								●	●
Co-Simulation with MathWorks Simulink	●	●	●	●	●				●	●
SYSTEM MODELING FOR RF / MICROWAVE										
Radio Frequency Interference (RFI) System Solver		●							●	●
Electromagnetic Interference System Solver		●							●	●
RF Link Budget Analysis		●							●	●
RF Co-Site and Antenna Coexistence Analysis		●							●	●
Automated Diagnostics for Rapid Root-Cause Analysis		●							●	●
RF Component Library		●							●	●
Wireless Propagation Models		●							●	●
Multi-Fidelity Parametric Radio Models		●							●	●
SYSTEM MODELING FOR SI/PI										
SerDes Channel Modeling - IBIS-AMI, QuickEye and VerifEye										●
Multi-Drop & Parallel Bus Modeling - IBIS, HSPICE, Spectre, PSPICE, and Nexxim Transient		▲	●							●
Network Data Exploration	●	●	●	●						●
TDR analysis		●	●							●
Steady State AC (LNA) Analysis		●	●							●
Virtual Compliance - DDRx, GDDRx, & LPDDRx										●

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/ ELECTRONICS	Maxwell	HFSS	SIwave	Q3D Extractor	Icepak	Motor-CAD	EMA3D Cable	Nuhertz FilterSolutions	Electronics Pro 2D	Electronics Enterprise
MULTIPHYSICS-PLATFORM TECHNOLOGIES										
Advanced, Automated Data Exchange	●	●	●	●	●					●
Drag-n-Drop Multiphysics	■	■	■	■	■					●
Direct Coupling Between Physics	●	●	●	●	●					●
Collaborative Workflows	●	●	●	●	●					●
Fully Managed Co-Simulation	●	●	●	●	●					●
Flexible Solver Coupling Options	●	●	●	●	●					●
MULTIPHYSICS ELECTRO-THERMAL INTERACTION										
Convection Cooled Electronics		■	■		■					●
Conduction Cooled Electronics		■	■		■					●
High Frequency Thermal Management		■		■	■					●
Electromechanical Thermal Management	■			■	■					●
MATERIALS DATABASE FOR ELECTRONICS										
GRANTA Materials Data for Simulation	■	■	■	■	■				■	■
MISCELLANEOUS										
Integrated Windows HPC Support	●	●	●	●	●					
Integrated IBM Spectrum LSF Support	●	●	●	●	●					
Customizable 3rd Party Scheduler Support	●	●	●	●	●					
Support ACT Extensions	▲	▲	▲	▲	▲					▲
Parallel Solving with Ansys Cloud Launched from Desktop	●	●	●	●	●					

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