/ ELECTRONICS	Maxwell	HFSS	HFSS-IC	Slwave	Slwave Plus	Q3D Extractor	Icepak	Motor-CAD	EMC Plus	Charge Plus	Nuhertz FilterSolutions	SynMatrix Filter	SynMatrix Filter AI+	Electronics AI+	Electronics Pro	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 ELECTROMAGNETIC MODELING																
Vector Hysteresis Modeling	●														●	●
Multi-Conductive Terminals Modelling (PCBs, Busbars etc.) / A-Phi Solver	●															●
3D Layout Component Integration (ECAD) for LF Electronics Design	●															
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

/ ELECTRONICS	Maxwell	HFSS	HFSS-IC	Slwave	Slwave Plus	Q3D Extractor	Icepak	Motor-CAD	EMC Plus	Charge Plus	Nuhertz FilterSolutions	SynMatrix Filter	SynMatrix Filter AI+	Electronics AI+	Electronics Pro	Electronics Enterprise
ADVANCED ELECTROMAGNETIC 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	●									●	●				●	●
Temperature Dependent Litz Wire Modeling	●									●	●				●	●
Litz Wire Modeling	●									●	●				●	●
DESIGN SOLUTION FOR ELECTRICAL MACHINE																
Template-Based Magnetic Topologies								●								
Template-Based Cooling Topologies								●								
Adaptive Template-Based Topologies								●								
Magnetic 2D FEA with Analytical Solution								●								
Thermal 2D FEA								●								
3D Thermal and Fluid Network								●								
Optimization Workflow								■								
Temperature Dependent Duty-Cycle Analysis								●								
Manufacturing Effects Due to Winding Impregnation and Housing Interfaces								●								
Linear Structural 2D FEA								●								
Noise Vibration Harness Analytical Modelling								●								
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		●									●					
Physical Optics (PO) Analysis		●	●													●

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/ ELECTRONICS	Maxwell	HFSS	HFSS-IC	SIwave	SIwave Plus	Q3D Extractor	Icepak	Motor-CAD	EMC Plus	Charge Plus	Nuhertz FilterSolutions	SynMatrix Filter	SynMatrix Filter AI+	Electronics AI+	Electronics Pro	Electronics Enterprise
HIGH FREQUENCY ELECTROMAGNETICS																
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																●
RF Filter Synthesis and Design - Planar											●	●				
Digital Filter Synthesis and Design											●					
RF Filter Synthesis and Design - Cavity, Coaxial, SiW												●				
RF Filter Optimization												●				
RF Filter AI Driven Optimization													●	●		
Domain Decomposition Method (DDM) for Frequency Domain		●	●													●
FEM Analysis		●	●													●
Hybrid Finite Element/ Integral Equation Analysis		●	●													●
Efficient Wirebond Package Meshing		●	●													●
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		●	●													●

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/ ELECTRONICS	Maxwell	HFSS	HFSS-IC	SIwave	SIwave Plus	Q3D Extractor	Icepak	Motor-CAD	EMC Plus	Charge Plus	Nuhertz FilterSolutions	SynMatrix Filter	SynMatrix Filter AI+	Electronics AI+	Electronics Pro	Electronics Enterprise
HIGH FREQUENCY ELECTROMAGNETICS																
Periodic Boundary		●	●													●
Frequency Dependent Materials		●	●													●
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		●	●													●
Surface Roughness Model for SBR+		●	●													●
Accelerated Doppler Processing (ADP) for SBR+ Range-Doppler Analysis		●	●													●

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POWER AND SIGNAL INTEGRITY BOARD SIMULATION CAPABILITIES																
Electronics Desktop 3D Layout GUI		●	●	●	●	●	●									●
ECAD Translation (Altium, Cadence, Mentor, Pulsonix, & Zuken)	●	●	●	●	●		●									●
MCAD (.x_b) Generation from ECAD		●	●	●	●				●	●						●
Lead Frame Editor		●	●	●	●											●
DC Voltage, Current and Power Analysis for PKG/PCB				●	●											●
DC and AC 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		●	●	●	●											●

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/ ELECTRONICS	Maxwell	HFSS	HFSS-IC	SIwave	SIwave Plus	Q3D Extractor	Icepak	Motor-CAD	EMC Plus	Charge Plus	Nuhertz FilterSolutions	SynMatrix Filter	SynMatrix Filter AI+	Electronics AI+	Electronics Pro	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 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 Discovery Modeler UI							●		●							
Thin Surface and Thin Wire Algorithms							●		●							
HPC FOR ELECTRONICS																
GPU Support	●	●	●				●								●	●
HPC Meshing, Multi-Domain, Multi-Technology		●	●	●	●	●									●	●
HPC Accelerated Frequency Sweeps	●	●	●												●	●
HPC Accelerated Broadband Fast Frequency Sweep		●	●												●	●
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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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	●	●	●	●	●	●	●								●	●
Push-Back Excitation	●	●	●	●	●	●									●	●
Co-Simulation with Low Frequency Electromagnetics	●														●	●
Co-Simulation with MathWorks Simulink	●	●	●	●	●	●	●								●	●
IC CAPABILITIES																
Solve projects with encrypted tech files		●	●			●										●
RaptorX solver			●													
LDE - Layout Dependent Effects			●													
AI / ML CAPABILITIES																
SIwave simulation runtime and memory prediction														●		
SynMatrix AI optimization														●		
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		●	●												●	●
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		●	●	●	●											●

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SYSTEM MODELING FOR SI / PI																
Network Data Exploration	●	●	●	●	●											●
TDR analysis		●	●	●	●											●
Steady State AC (LNA) Analysis		●	●	●	●											●
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		■	■				■									●
Low Frequency Thermal Management	■						■									●
MATERIALS FOR ELECTRONICS																
Granta Materials Data for Simulation	■	■	■	■	■	■	■	■							■	■
Granta MI Materials Gateway	■	■	■	■	■	■	■	■							■	
Ansys Granta Advanced Materials – Electromagnetic	■	■	■	■	■	■	■	▲								■
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	●	●	●	●	●	●	●									
Elastic Licensing	●	●	●	●	●	●	●	●								
CHARGING AND DISCHARGING MODELING																
Internal Charging										●						
Electrostatic Discharge in Air										●						
Surface Charging										●						
3D Particle Transport										●						
Arcing in Solid Dielectrics										●						
Coupled Charging Simulations										●						
CERTIFICATION AND COMPLIANCE																
ISO 26262	●	●				●									●	

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