

# Electromagnetics

## Electromagnetic, Electronics, Thermal and Electromechanical Simulation

ANSYS electromagnetic field simulation helps you design innovative electrical and electronic products faster and more cost-effectively. In today's world of high performance electronics and advanced electrification systems, the effects of electromagnetic fields on circuits and systems cannot be ignored. ANSYS software can uniquely simulate electromagnetic performance across component, circuit and system design, and can evaluate temperature, vibration and other critical mechanical effects. This unmatched electromagnetic-centric design flow helps you achieve first-pass system design success for advanced communication systems, high-speed electronic devices, electromechanical components and power electronics systems.

### Wireless and RF

ANSYS high-frequency electromagnetics design software enables you to design, simulate and validate the performance of antennas and RF and microwave components. The integrated microwave circuit and system modeling capabilities have direct integration to our EM solvers delivering a platform for full-system verification of next-generation RF and microwave designs.

### PCB and electronic packaging

The ANSYS Chip-Package-System (CPS) design flow delivers unparalleled simulation capacity and speed for power integrity, signal integrity and EMI analysis of high-speed electronic devices. Automated thermal analysis and integrated structural analysis capabilities complete the industry's most comprehensive chip-aware and system-aware simulation solution across the chip-package-board.

### Electromechanical and power electronics

ANSYS electromechanical and power electronics simulation software is ideal for applications which depend on the robust integration of motors, sensors, and actuators with electronics controls. ANSYS software simulates the interactions between these components, and the design flow incorporates thermal and mechanical analysis for evaluating cooling strategies and analyzing critical mechanical effects like noise-vibration-harshness (NVH).

### Electronics Thermal Management

ANSYS electronics thermal management solutions leverage advanced solver technology with robust, automatic meshing to enable you to rapidly perform heat transfer and fluid flow simulation for convective and forced air cooling strategies. Our solutions help you design cooling strategies to avoid excessive temperatures that degrade the performance of IC packages, printed circuit boards (PCBs), data centers, power electronics and electric motors.

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# Applications

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- ANTENNAS
- AUTOMOTIVE RADAR
- INSTALLED ANTENNA PERFORMANCE
- RADIO FREQUENCY INTERFERENCE
- RF AND MICROWAVE
- SIGNAL INTEGRITY
- POWER INTEGRITY
- LOW-FREQUENCY ELECTROMAGNETICS
- ELECTRONICS COOLING
- ELECTRIC MOTORS
- POWER ELECTRONICS
- RADAR CROSS SECTION (RCS)

## Flagship Products

### HFSS

HFSS simulates 3D full-wave electromagnetic fields for accurate design of high-frequency and high-speed electronic components. HFSS offers powerful solver technologies based on finite element, integral equation, asymptotic and advanced hybrid methods to solve microwave, RF and high-speed digital challenges.

### Maxwell

Maxwell is a comprehensive electromagnetic field simulation software for the design of motors, actuators, transformers and other electrical and electromechanical devices. Maxwell can solve static, frequency-domain and time-varying electromagnetic and electric fields.

### SIwave

SIwave is a specialized design platform for power integrity, signal integrity and EMI analysis of electronic packages and PCBs.

### Icepak

Icepak provides CFD simulation for electronics thermal management designs. Icepak predicts airflow, temperature and heat transfer in IC packages, printed circuit boards, electronic assemblies/enclosures, power electronics and more.

### Q3D Extractor

Q3D Extractor provides 2D and 3D parasitic extraction for engineers designing electronic packaging and power electronic equipment.

### Electronics Desktop

Electronics Desktop is the premier, unified platform for electromagnetic, circuit and system simulation. HFSS, Maxwell, Q3D Extractor and Simplorer are built into the Electronics Desktop, which serves as a universal pre and post processor for these tools.