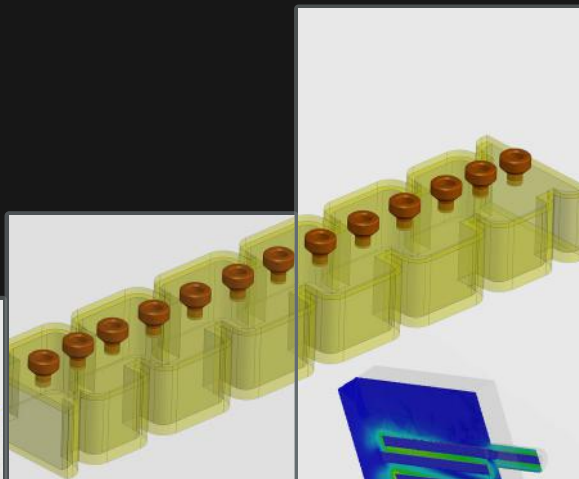
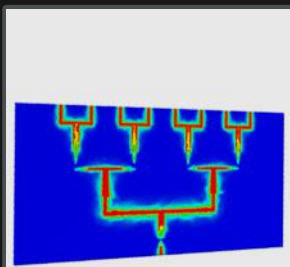
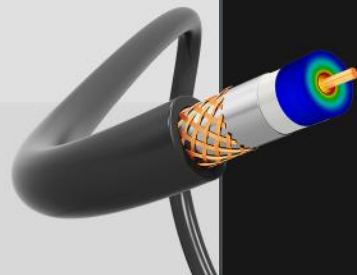
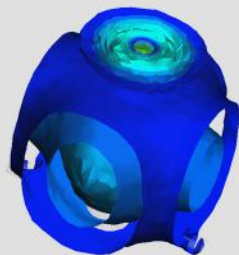
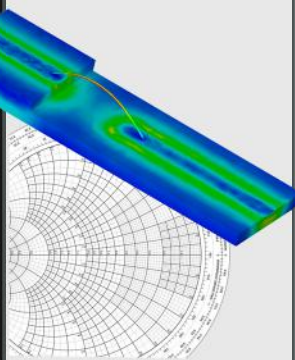
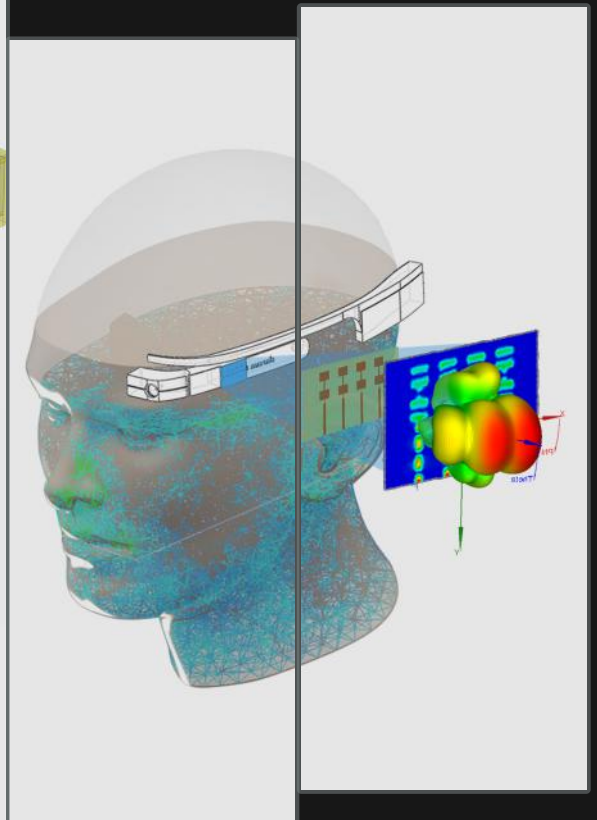
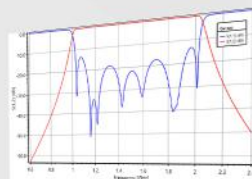
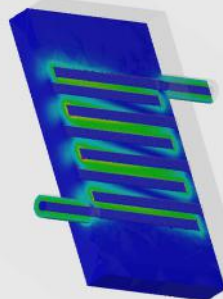


HFWORKS

HIGH FREQUENCY ELECTROMAGNETIC SIMULATION

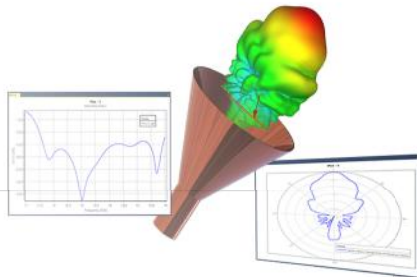


Mode	Frequency (MHz)	Q-Value	Q-Coefficient	Q-Factor	Stored Energy
Mode 1	1.239813e+03	0.00000e+00	0.00000e+00	0.00000e+00	1.6225e-05
Mode 2	4.131245e+03	0.00000e+00	0.00000e+00	0.00000e+00	6.4558e-06
Mode 3	4.294723e+03	0.00000e+00	0.00000e+00	0.00000e+00	1.6219e-06



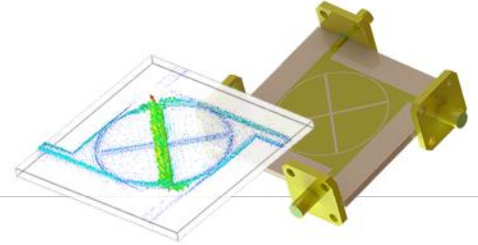
HFWorks is a full-wave three-dimensional electromagnetic simulation software for designing and simulating high-frequency electronic structures such as antennas, antenna arrays, RF, microwave and mm-wave components, high-speed interconnects, filters, connectors, IC packages and arbitrarily complex 3D passive structures and components.

Analysis Capabilities



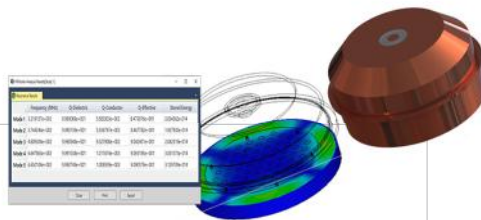
Antennas

Simulate the electromagnetic behavior of arbitrary 3D single and array antenna structures and gain insight into the antenna behavior by visualizing and animating electric and magnetic fields in 3D and in 2D. Compute the return loss, input impedance, gain, directivity, polarization, etc. Obtain radiation patterns in 3D as well as in 2D for various planes including E- and H-planes. Study array antenna patterns for different complex weighted excitations. Assess the impact of radomes and near-by parasitics on antenna properties.



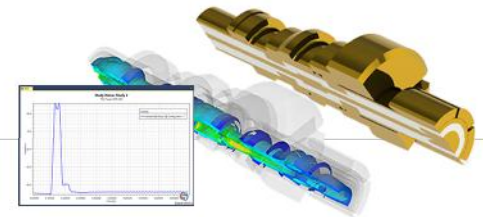
S-Parameters

Compute the frequency response of arbitrarily complex 3D passive RF, microwave and mm-wave components. Obtain S, Y, Z parameters and examine return and insertion losses and VSWR values. Analyze 2D ports and compute port impedance and complex propagation characteristics. Gain insight into the design's behavior by visualizing and animating electric and magnetic fields in 3D and in 2D. Assess the power handling capabilities of the structure and establish operating safety margins for it.



Resonance

Calculate multiple resonant modes, i.e., Eigen frequencies and corresponding field distributions, for arbitrary 3D passive structures. Compute the total Q-factor for each mode and obtain its breakdown between dielectric and conductor Q-factors. Use the resonant frequencies to guide filter/resonator designs or to identify potentially risky frequencies for a housing or a packaging structure.

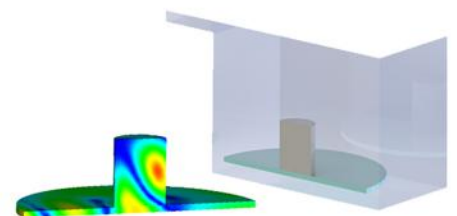


Time Domain Reflectometry

Characterize the time-domain response of 3D interconnects and transitions under high speed transient signal excitations. Obtain the time-domain profile of impedance taking into account all discontinuity and coupling effects. Locate impedance discontinuities in connectors, adapters, cable transitions and high speed interconnects and devise means to compensate them.

Integrated Electro-Thermal Analysis

HFWorks comes with a seamlessly integrated Electro-Thermal Analysis module. Using the same model and the same mesh, thermal behavior due to dielectric and/or conductor losses can be computed for multiple scenarios. For each coupling scenario, the power levels at different ports are first set then transient or steady state simulations are carried out. The temperature distribution, temperature gradient and heat flux can then be viewed and hot spots easily identified.



Built-in Transmission Line Calculator

Never leave the SOLIDWORKS/HFWorks environment just to find what the dimensions should be for a 50Ω microstrip line or a 75Ω coaxial cable. The built-in transmission line calculator provides quick calculation and automatic model generation for a large number of transmission line and waveguide structures such as microstrip, coaxial, stripline, coplanar waveguide, rectangular waveguide, etc.

