Virtual Design
CATIA Electro-Mechanical Circuit Board

Today's consumers require compact electronic devices with greater functionalities. To create high-quality products faster, companies need the integration of realistic Printed Circuit Boards (PCBs) inside a virtual product and simplified collaboration between mechanical and electronics specialists.

CATIA Electro-Mechanical Circuit Board Design enables you to design printed circuit boards while taking the overall mechanical design into account. Through the bidirectional interface IDF (Intermediate Data Format) with industry-standard electrical CAD systems, you can retrieve the design of your electronic components to create a complete digital mock-up of a PCB. 3D definition enables you to analyze the design to ensure the PCB fits within its mechanical environment. The interface also enables you to send pertinent information, such as board outlines and keep-out areas of spatial and technological constraints, back to the electrical CAD system.

Key capabilities

Import IDF files
Files can be imported from Intermediate Data Format (IDF) 2.0/3.0. ECAD circuit board assemblies can be imported and inserted within the full CATIA digital product definition. A CATIA product definition (assembly) is automatically defined, including its geometric components, product structure and associated electronic information (status of components, etc.). Circuit board assemblies can be replaced in context, keeping assembly constraints, which are reconnected automatically. Therefore, the circuit board design assembly can be updated to reflect ECAD modifications, while keeping full associativity and constraints. It is possible to replace a component with an IDF file. When CATIA Assembly Design 2 is installed, the mechanical assembly contacts are also generated.

Export IDF files
Information concerning board outline, mechanical constraint areas, cutouts and drilled holes, and mechanical and electronic part

Customer benefits

- Create mechanical shapes of printed circuit boards in the context of the mechanical assembly easily
- Generate a complete digital PCB mock-up
- Retrieve and exchange your design easily with the bidirectional interface IDF format
- Manage and create electronic component catalogs
- Enable intelligent placement of components like connectors from a catalog, constrained in the mechanical environment
- Implement easy mapping with electronics CAD import/export referential tools
- Improve collaboration between ECAD and MCAD

placement can be exported in the IDF 2.0/3.O format.

Manage mechanical and electrical connector positioning
Users can edit an external CSV (Comma Separated Values) file, providing a positioning matrix between mechanical connectors and electrical connectors.

Circuit board geometry
Circuit board geometry is designed within the global assembly product definition, taking the mechanical context into account. Thanks to its pattern feature it is possible to very easily create multiple instances of constraint areas or holes, reducing the 3D design cost. It also supports several construction methods of 3D geometric PAD.

3D electronic component representation
CATIA Electro-Mechanical Circuit Board Design benefits from the ENOVIA database for managing 3D electronic components. This allows storage of all components in a centralized database, as well as the ability to find and edit components. CATIA Electro-Mechanical Circuit Board Design also facilitates navigation throughout the database, with the VPM Navigator. From the CBD workbench, it is possible to query and preview electronic components to insert directly into assemblies through insert or IDF import.

Error Report management
In order to facilitate the creation of a large-scale electronic components database, it is possible to reuse the same 3D representation for several component references.

Analyze circuit board definitions
A report in text format is generated automatically and linked to the import process. CATIA Electro-Mechanical Circuit Board Design issues alerts for import failures related to design errors and violations of IDF standard rules.

Experience high performance at import process
To complete and validate the design, circuit board definitions can be analyzed using interference checks in the context of the full digital mock-up.

Design Change Management
Collaboration between Electrical and Mechanical CAD is dramatically improved with a new automatic design change management tool. CATIA Circuit Board Design allows a flexible update monitoring of the physical mock-up of a board assembly with real-time visual feedback. You can now update a board assembly from an .IDF file and its content (board outline, components, constraints, etc.). Thanks to a previsualization, you can individually choose to accept or refuse any update.

CATIA Electro-Mechanical Circuit Board Design.