Altium

ALTIUMLIVE 2018:
ENABLING COHESIVE MCAD/ECAD COLABORATION

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Nordson Asymtek

San Diego
OCT 5, 2018

ECAD/MCAD – Visual Verifications

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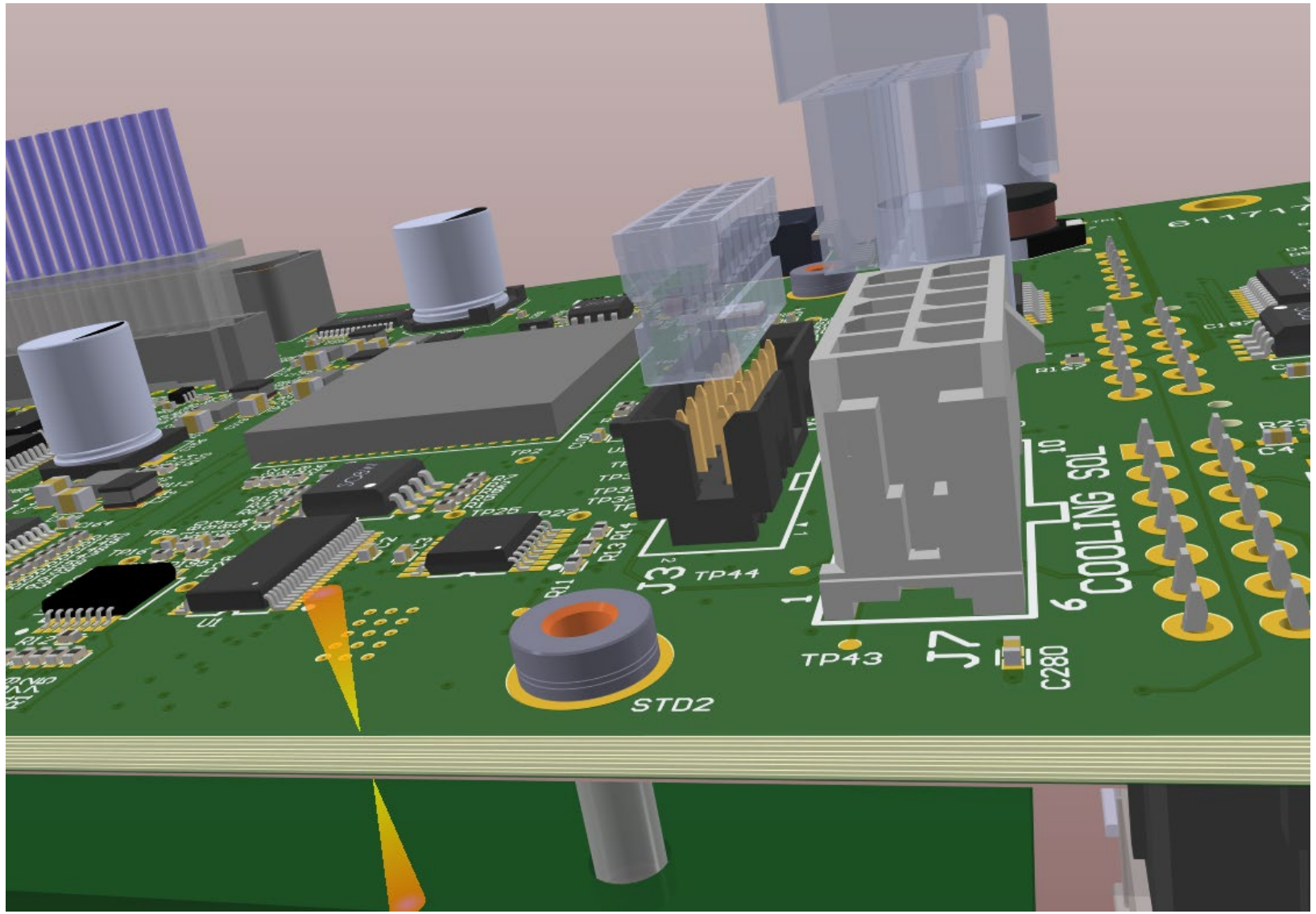
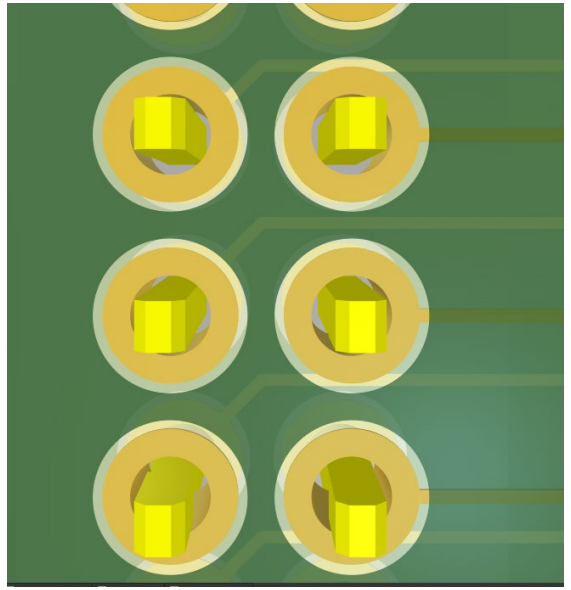
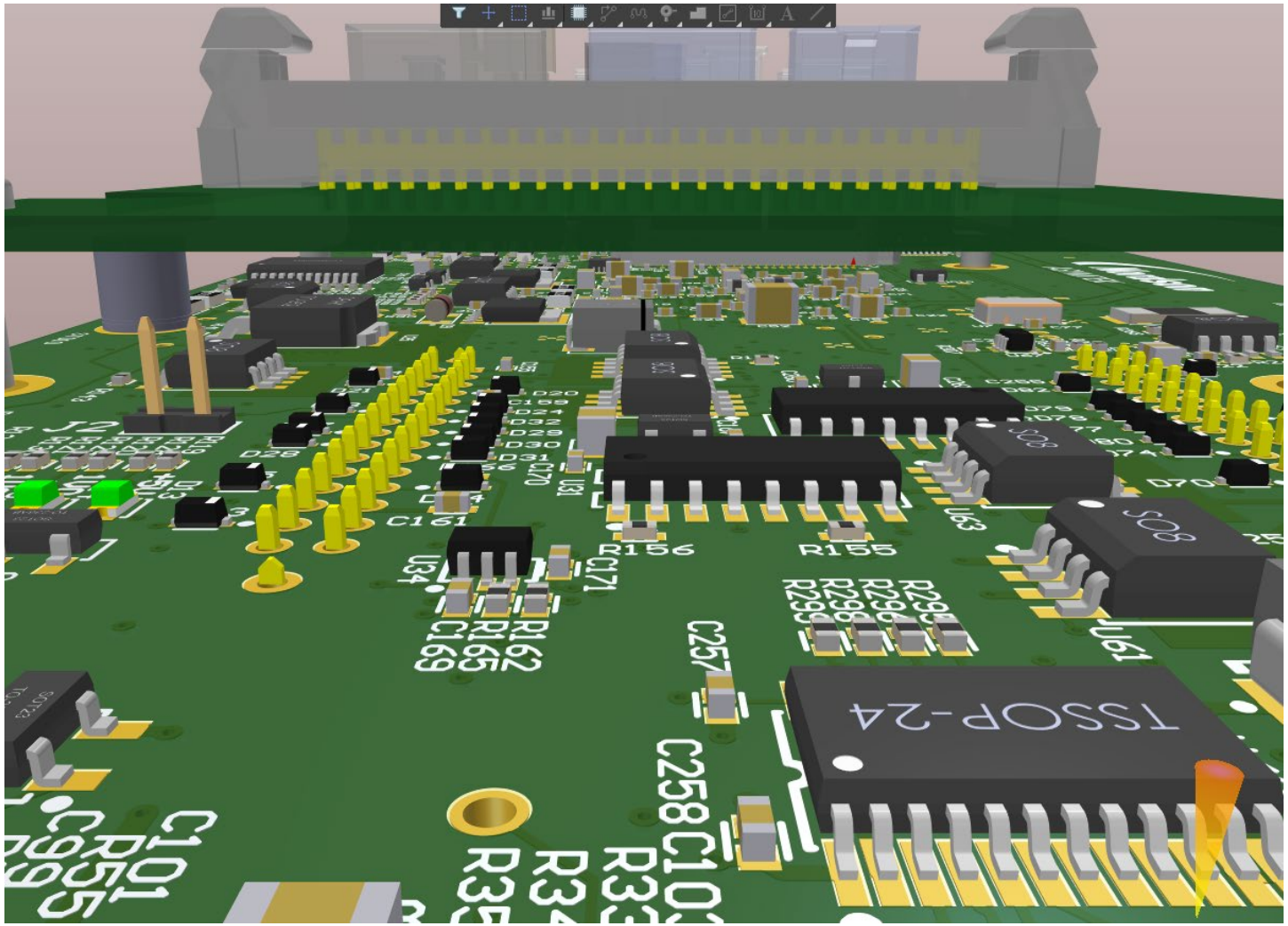


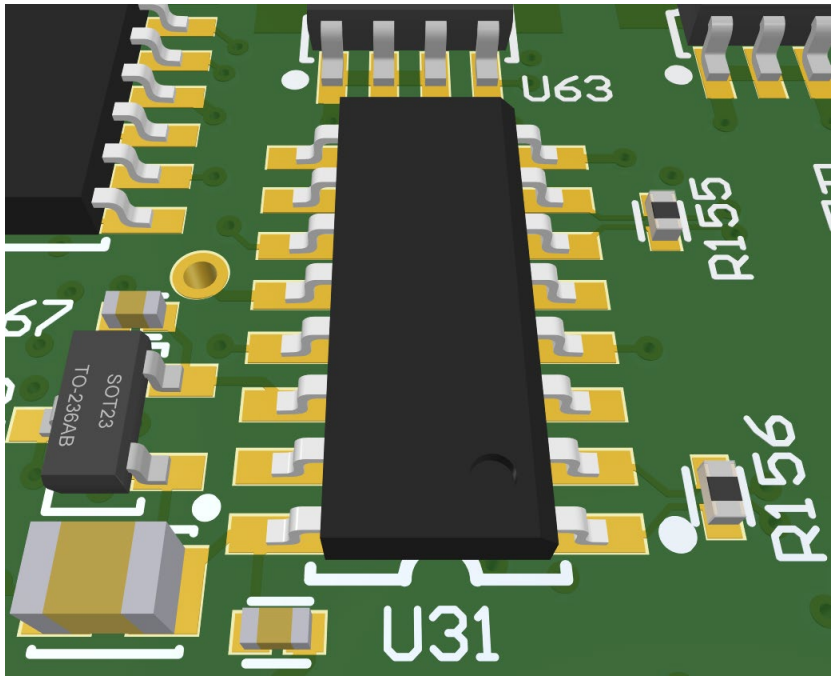
- Visual Verification
- PIN/Hole Fit/Hardware
- Annular Ring
- Trace/PAD spacing
- Stack up
- Mating Connector Clearances



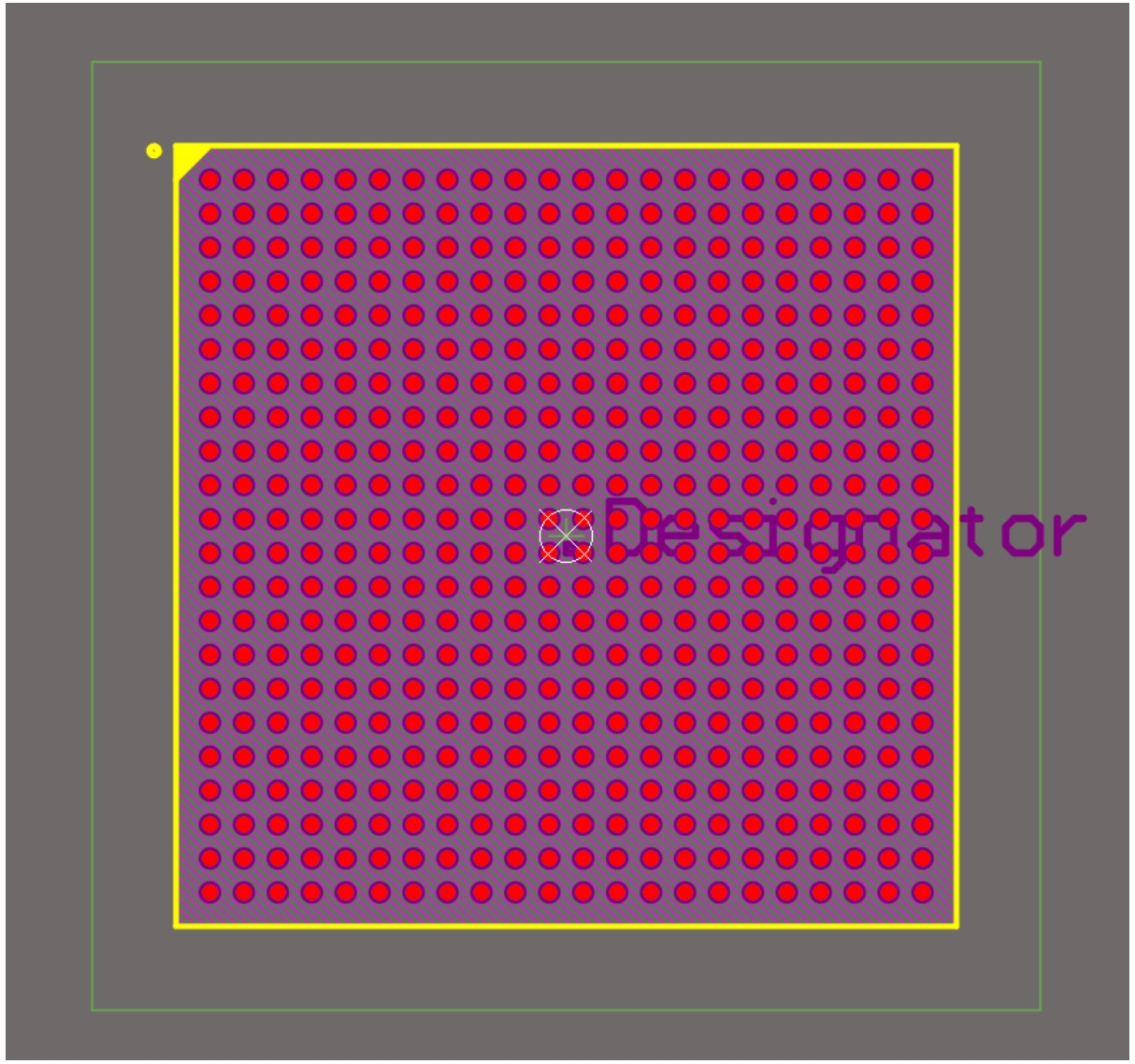
ECAD/MCAD – Visual Verifications



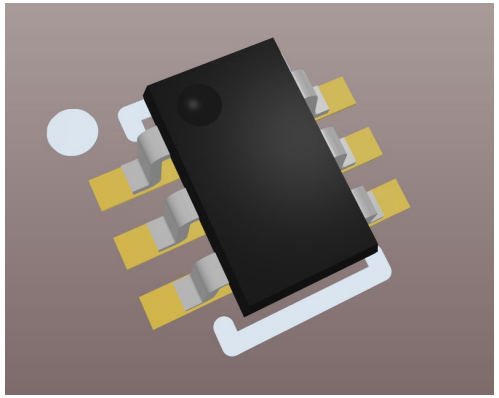
- Component Height
- Footprints
- Tooling Clearances
- SILKSCREEN Clearances



ECAD/MCAD – LIBRARY PART BUILDING



- IPC LAND PATTERNS – IPC 7351A AND IPC-7251 for Thru Hole
- MIN/NOM/MAX GEOMETRIES LMC/MMC
- Tooling Clearances and KEEP OUTS
- Soldermask and PASTE Mask verification
- Polarity and ORIENTATION MARK or PIN1 for Parts and Connectors



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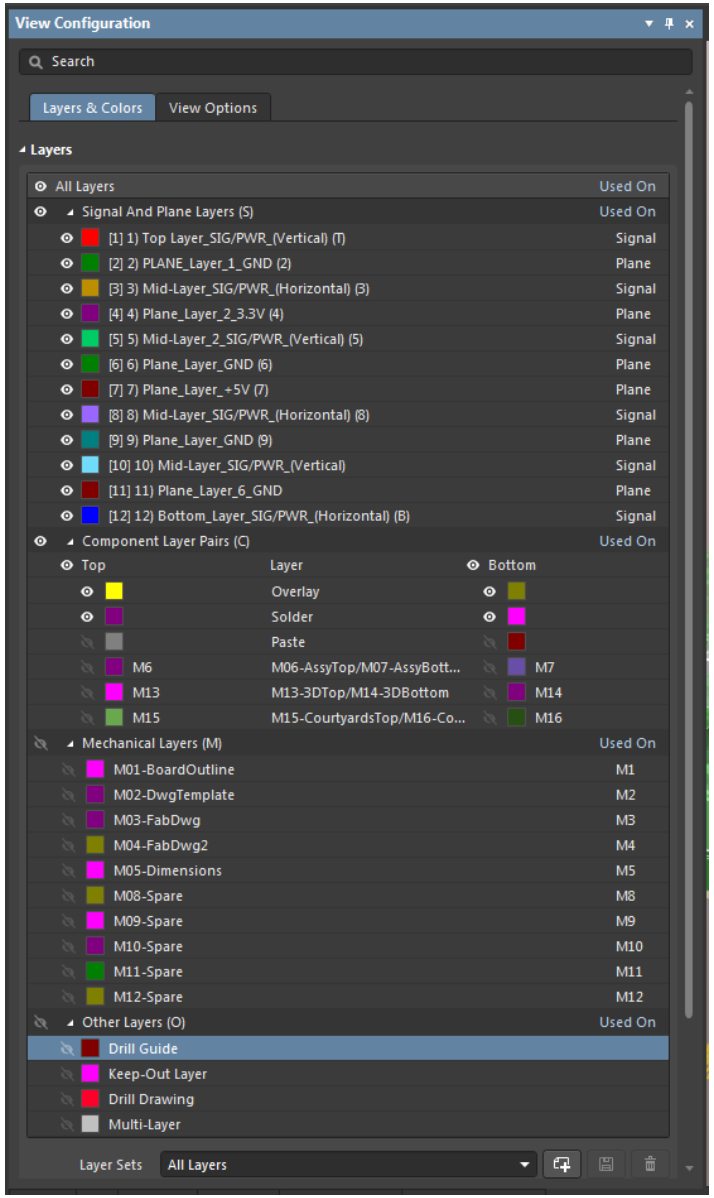
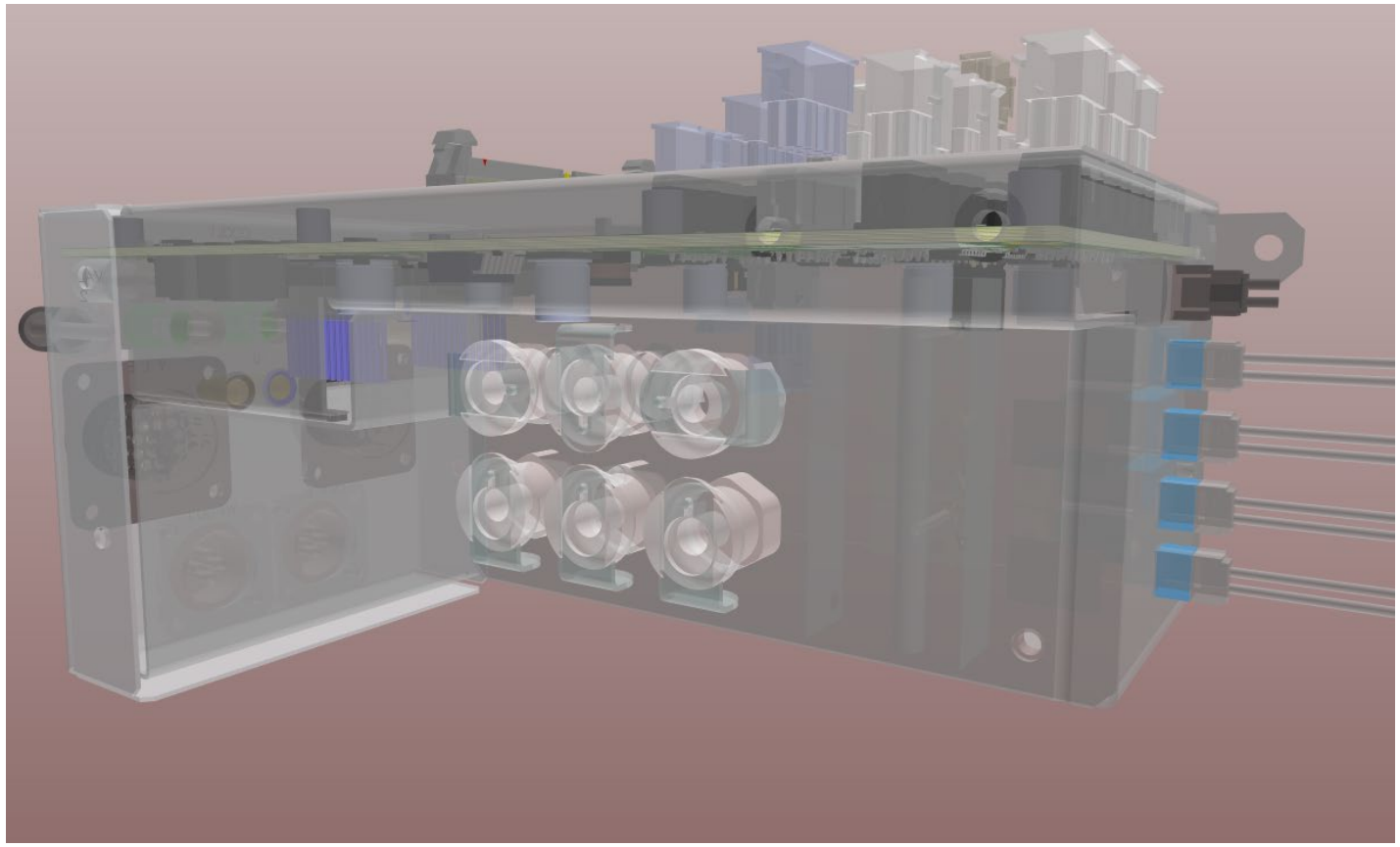


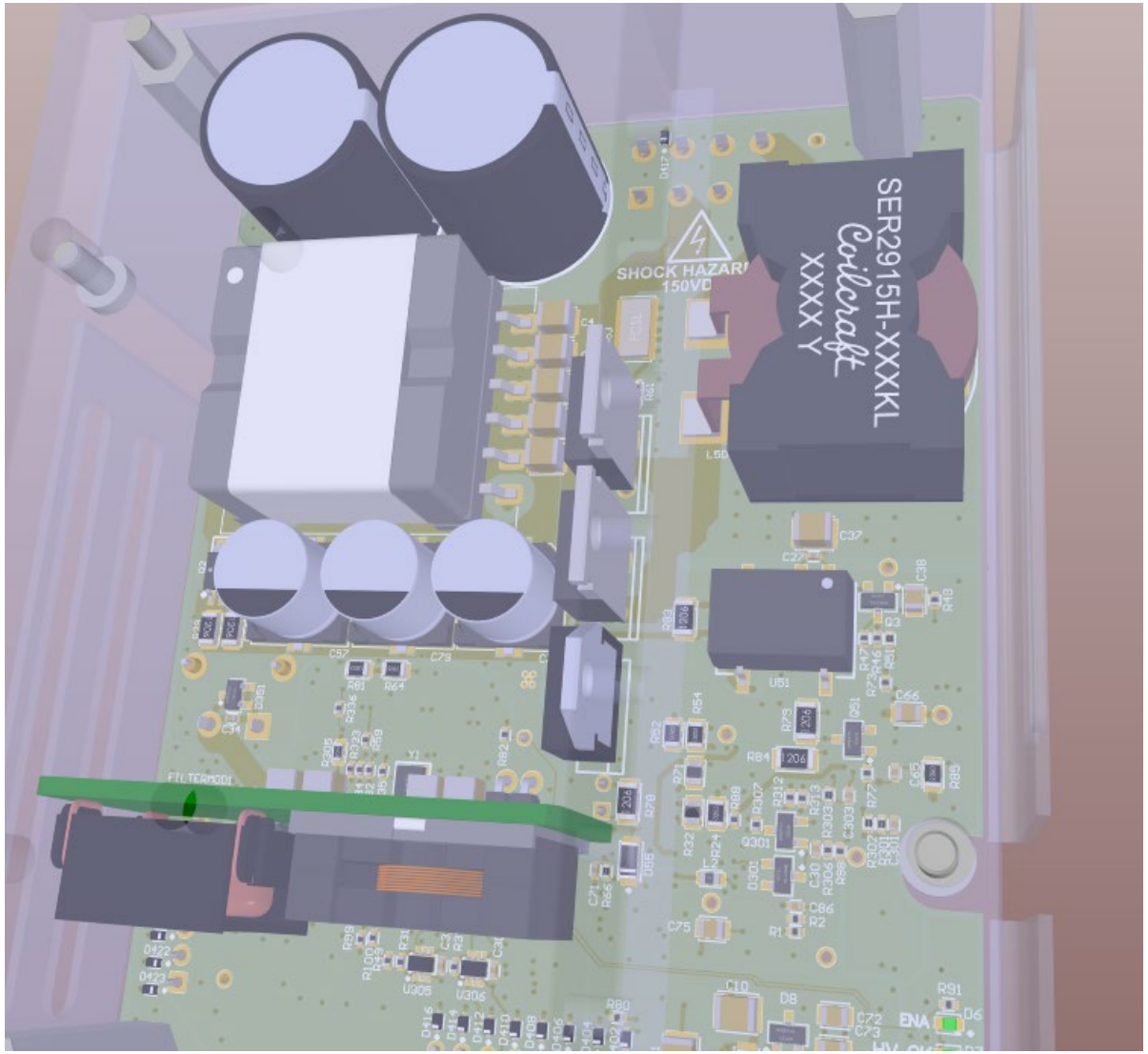
- Assigning logical names to layers helps manage design structure.
- Mechanical Layers
- Dimensions
- 3d Models
- Courtyards and Clearances

ECAD/MCAD – LIBRARY PART BUILDING



- Assembly Drawing Images
- 3D models
- Mechanical chassis
- Mounting Points
- Tooling Clearances
- Cooling Vents and Hardware
- Safety and Shock Hazard
- Cable routing

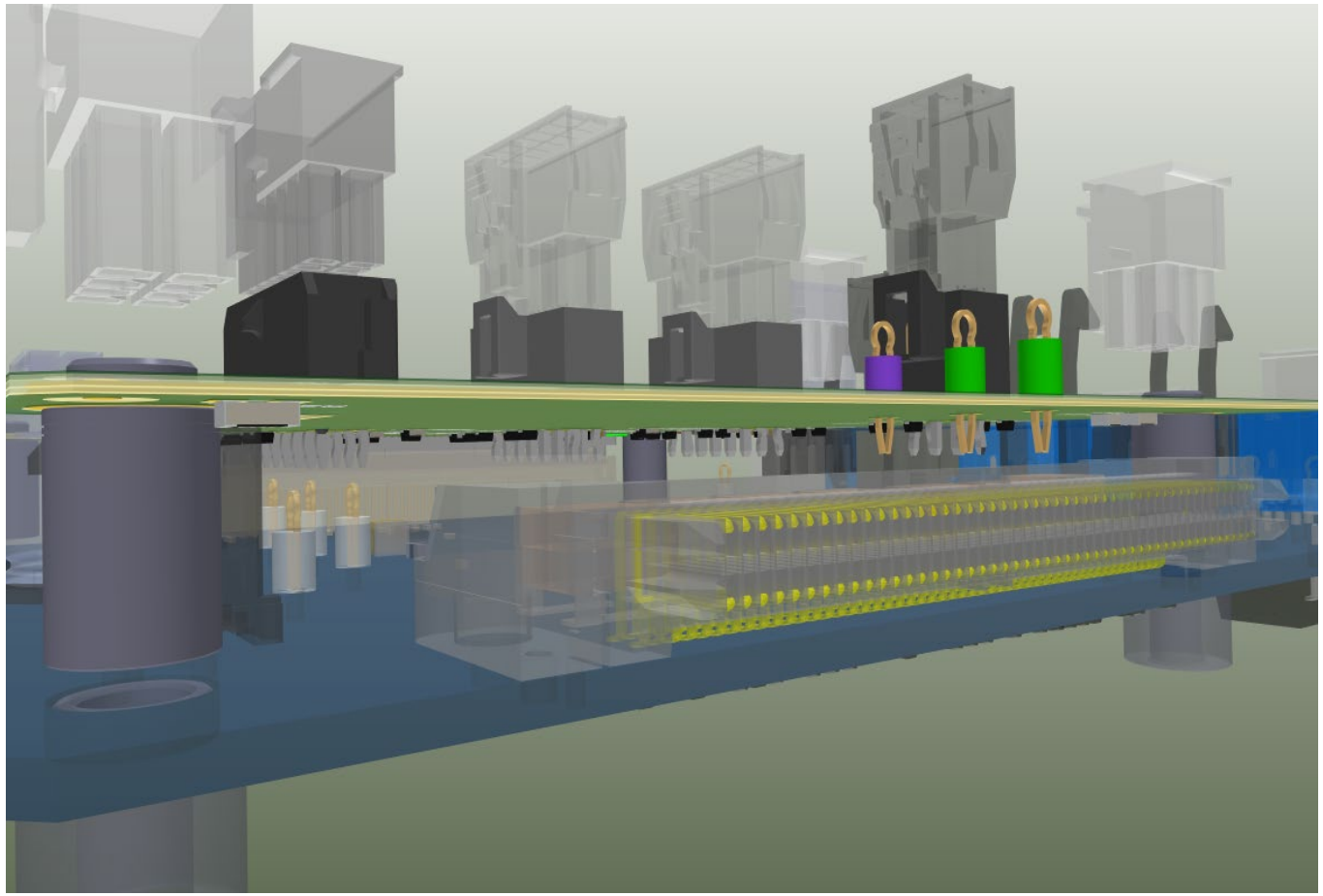
ECAD/MCAD



- Mounting holes, hardware for board installation and removal.
- Clearance to obstacles, hardware, heatsinks, finger and tool clearances for insertion and extraction of connectors, hardware, etc.
- Alignment of connectors, indicator lights, displays and switches with openings in the panels
- Airflow around hot components and through the enclosure
- Test fixture access

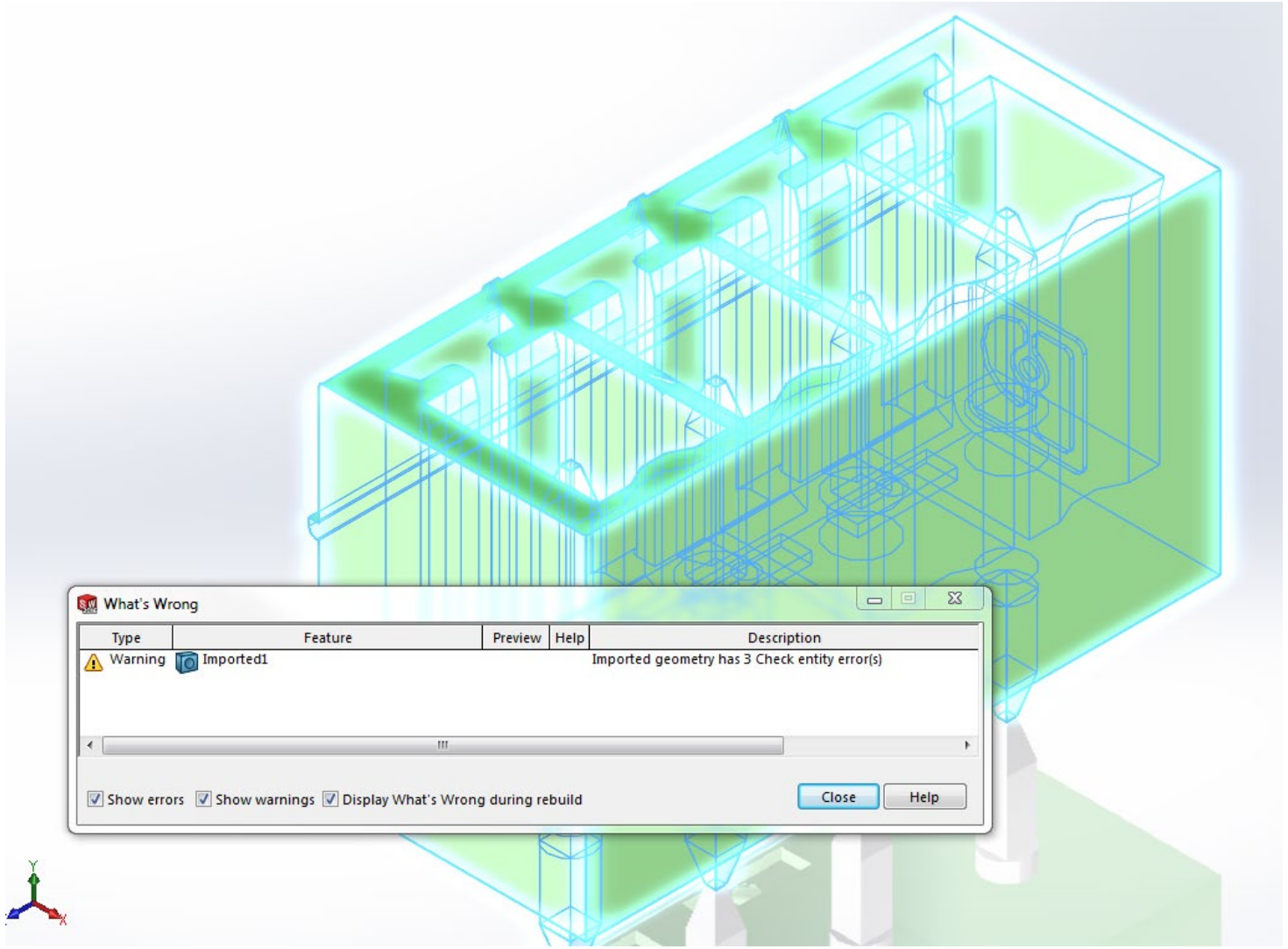
ECAD/MCAD – MCAD/ECAD TRANSFER

- Sharing between MCAD and ECAD is POSSIBLE.
- Solidworks can Import .STEP and other formats
- Altium can import 3D MODEL Geometries, .PRT, .STP or .STEP or IGES
- Manually Export to STEP file
- Manually Import Step into MCAD platform.
- Performance can be less than ideal.



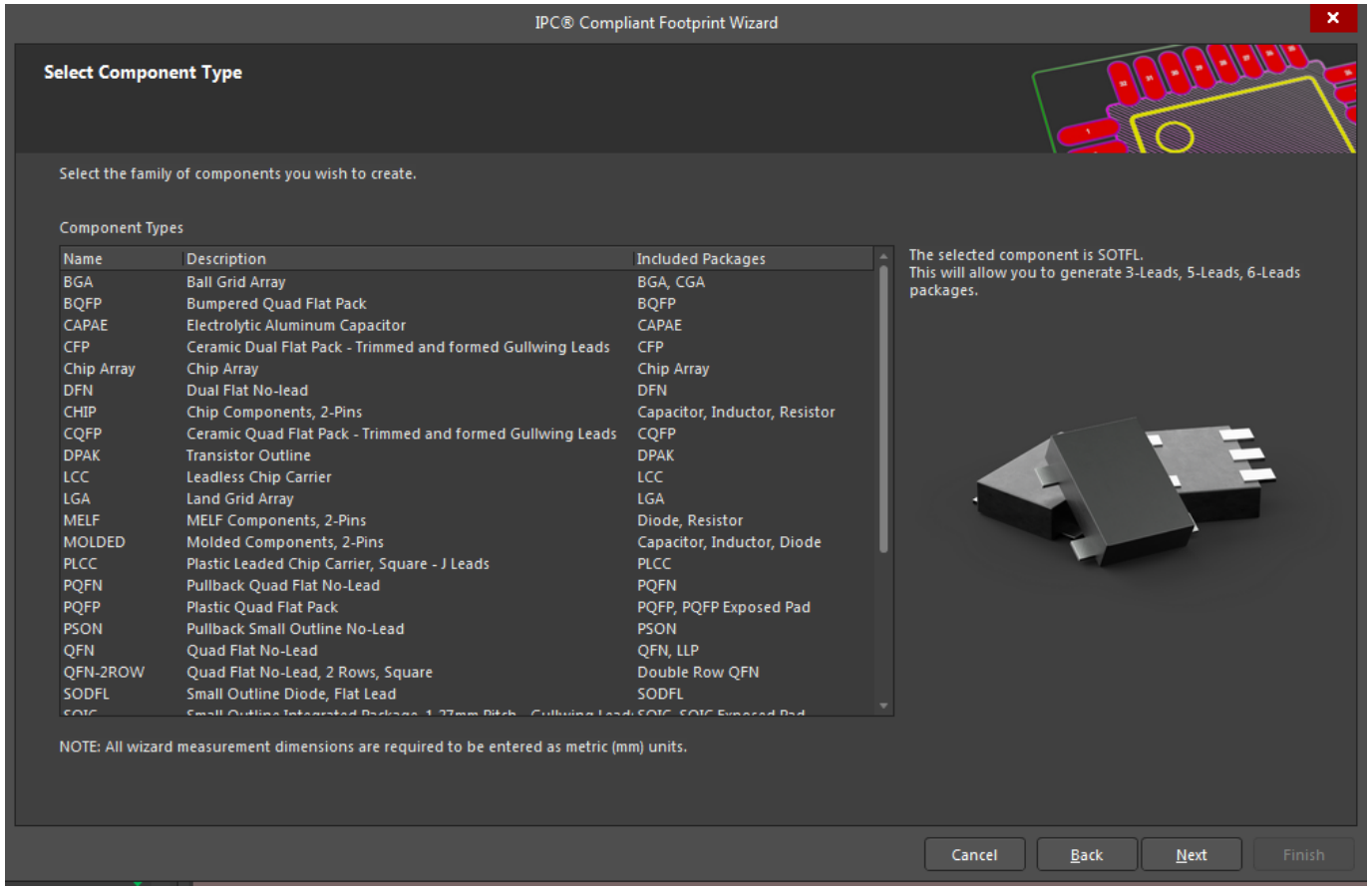
ECAD/MCAD – MCAD/ECAD TRANSFER

- Missing faces and errors in 3d models when regenerating from Step or IGES files.
- Repair is impossible because the models are not the original structure…but IMPORTED Geometries



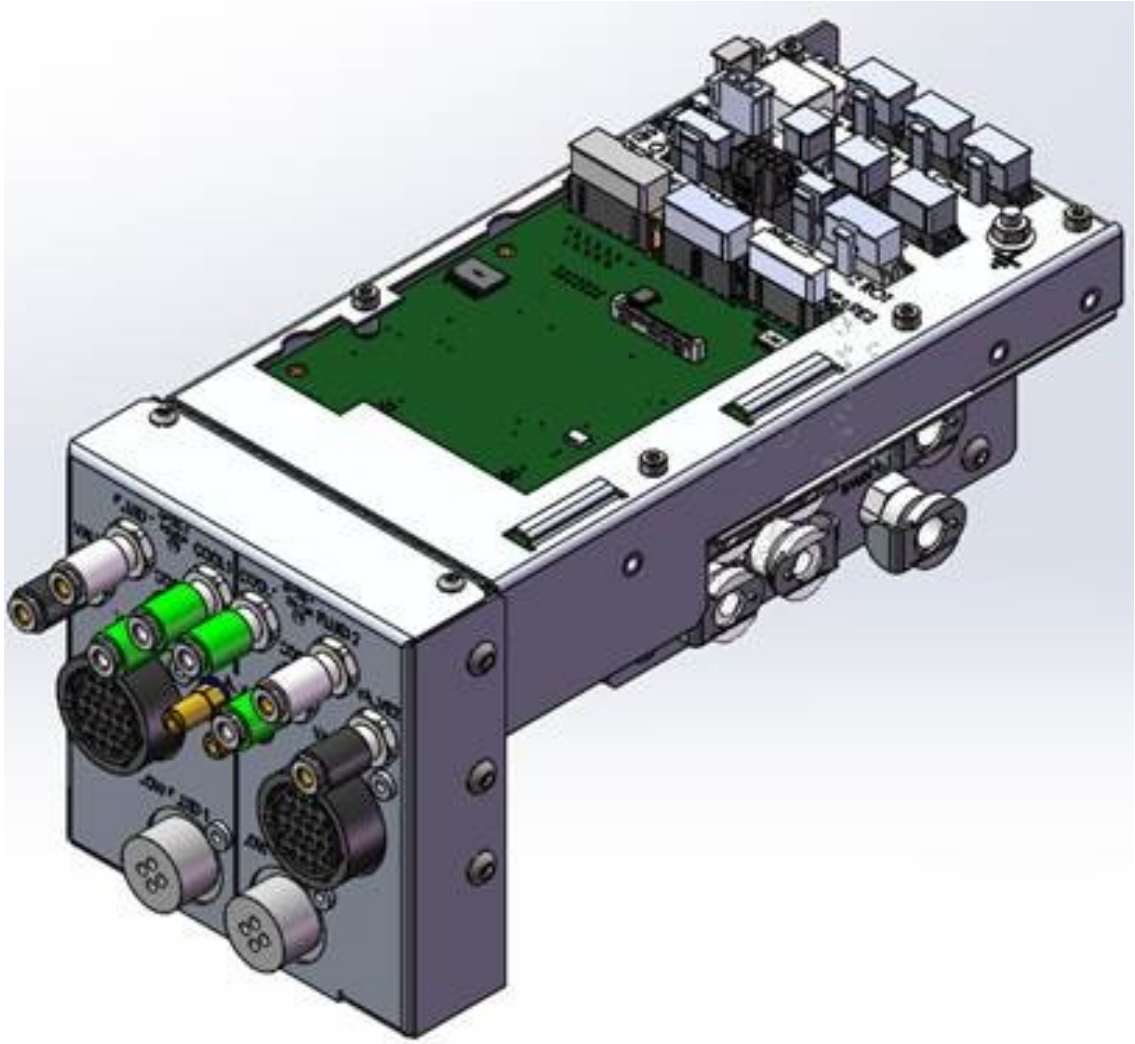
ECAD/MCAD – MCAD/ECAD TRANSFER

- Downloaded 3D models are typically built to nominal Dimensions or may contain errors or incomplete data…
- www.pcblibraries.com
- Download footprints with 3D
- www.3dcontentcentral.com
- Download Free 3D Models
- DigiKey 3D models from
- www.tracepartsonline.net
- IPC Compliant Footprint Wizard
- Or – build 3D model from scratch



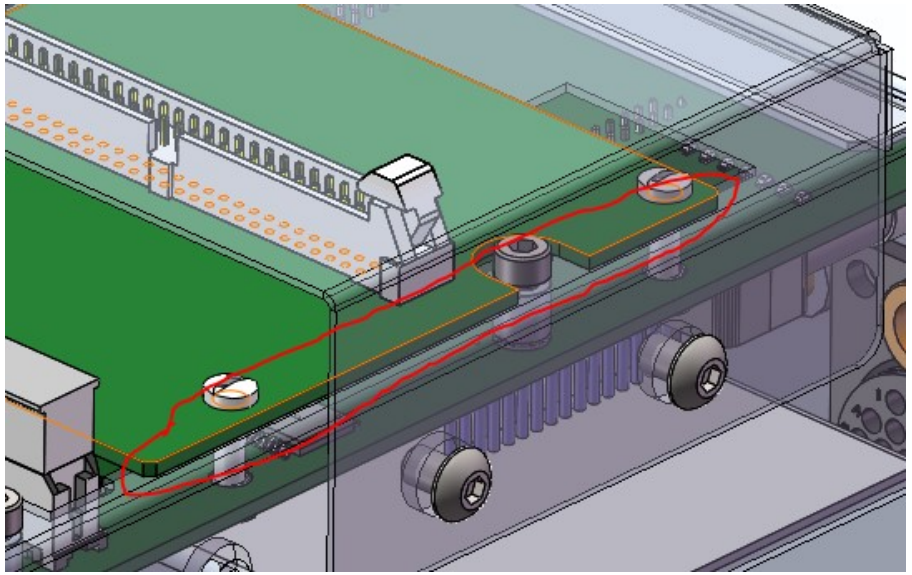
ECAD/MCAD – MCAD/ECAD TRANSFER

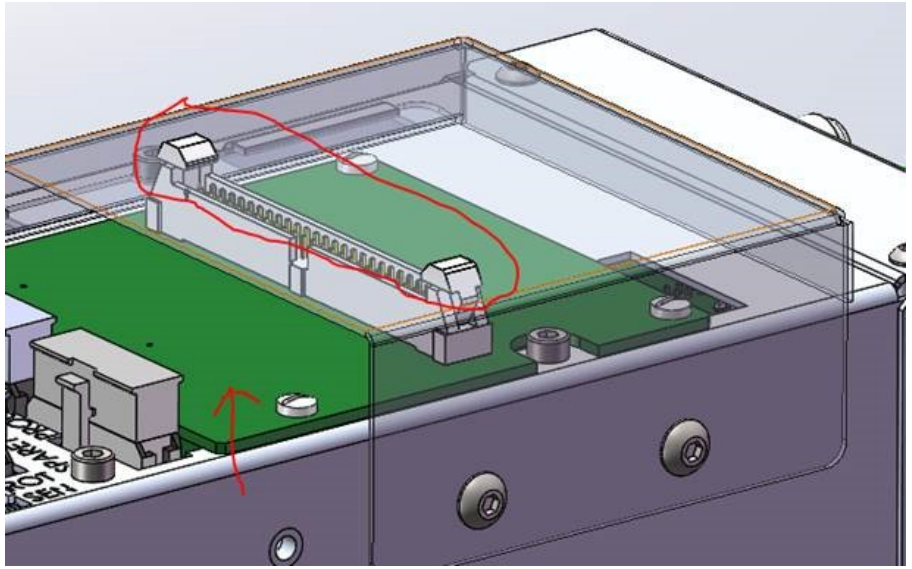
- Critical Alignment of board features and Mechanical Assemblies
- PCB Design is often ‘concurrent’ or happening simultaneously to Mechanical Design activity.
- There is a need to keep both in sync and iterative as the design moves forward through revisions.



ECAD/MCAD – MCAD/ECAD TRANSFER

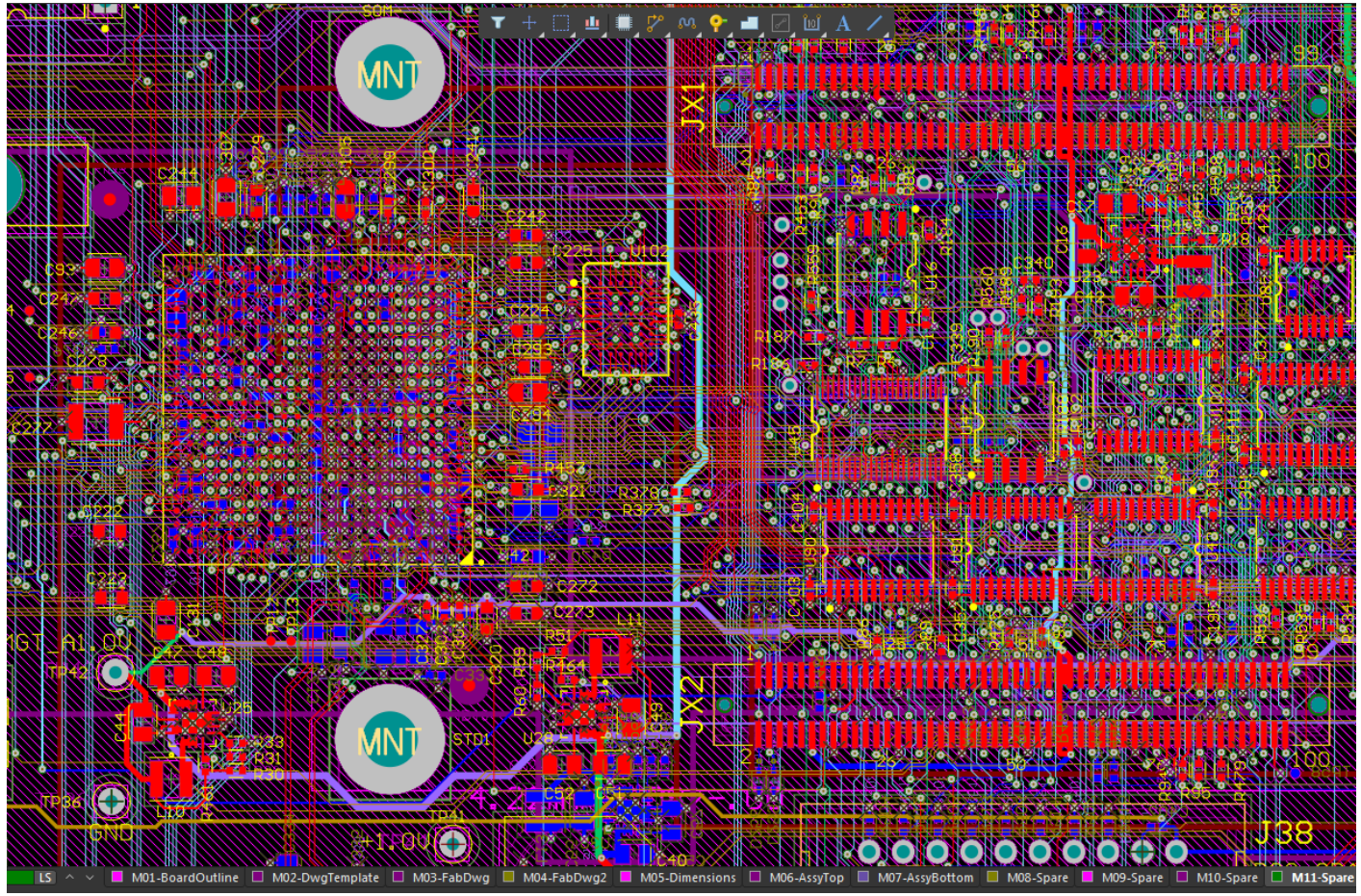
- We need control over significant data relevant to the ME vs the PCB Designer's needs…
  - Designer needs details to make the 3D useful as a visual aid.
  - ME needs less detail but overall structure worst case to check fit.
- Design file SIZE can be an issue..
- More detail slows transfer and requires large amounts of RAM and processing power to open in the CAD tool





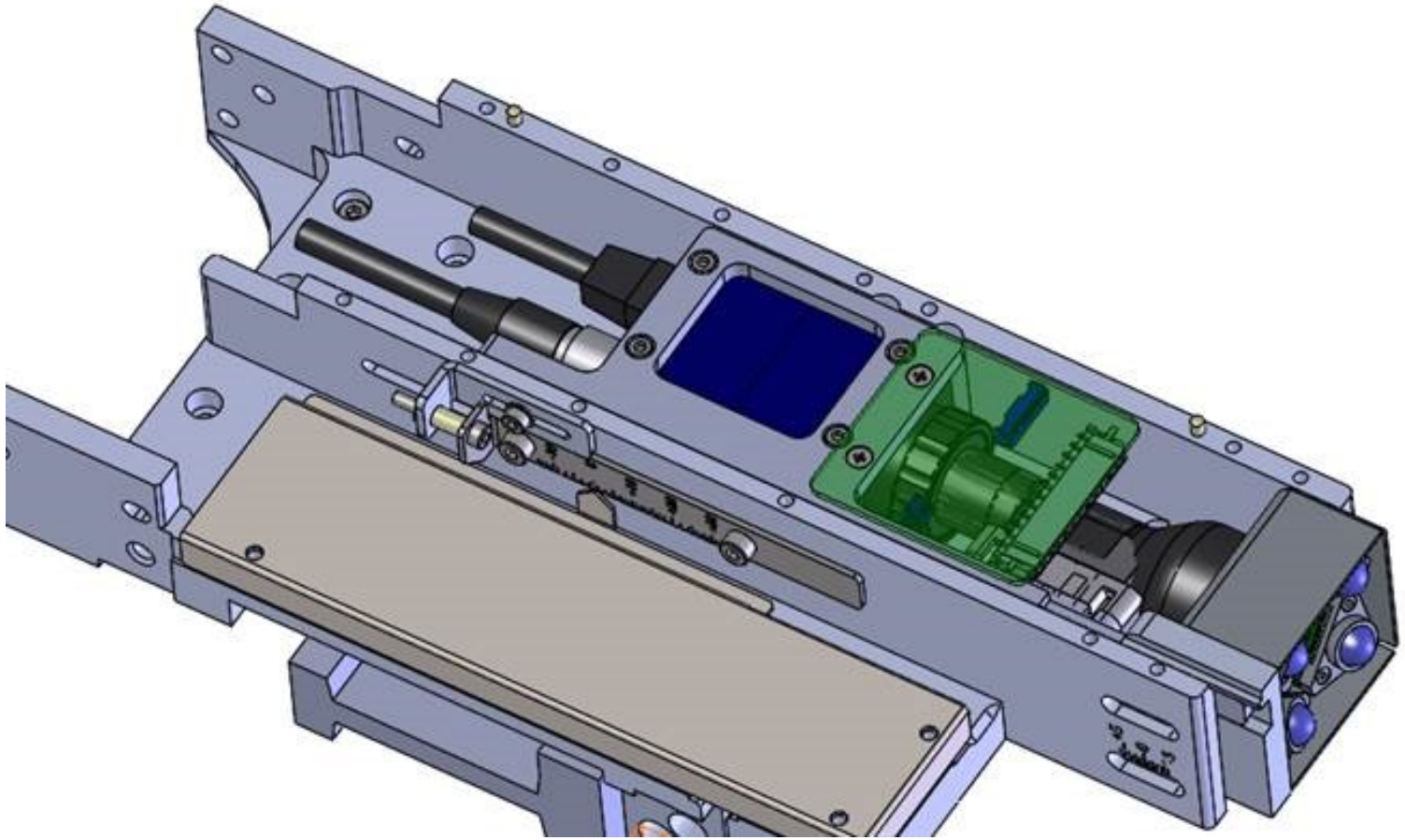
ECAD/MCAD – MCAD/ECAD TRANSFER

- Lack of the transfer of copper clad surfaces in the Mechanical model to detect shorts with mechanical hardware
- Cable routing not available in the PCB Design to visualize any Clearance issues



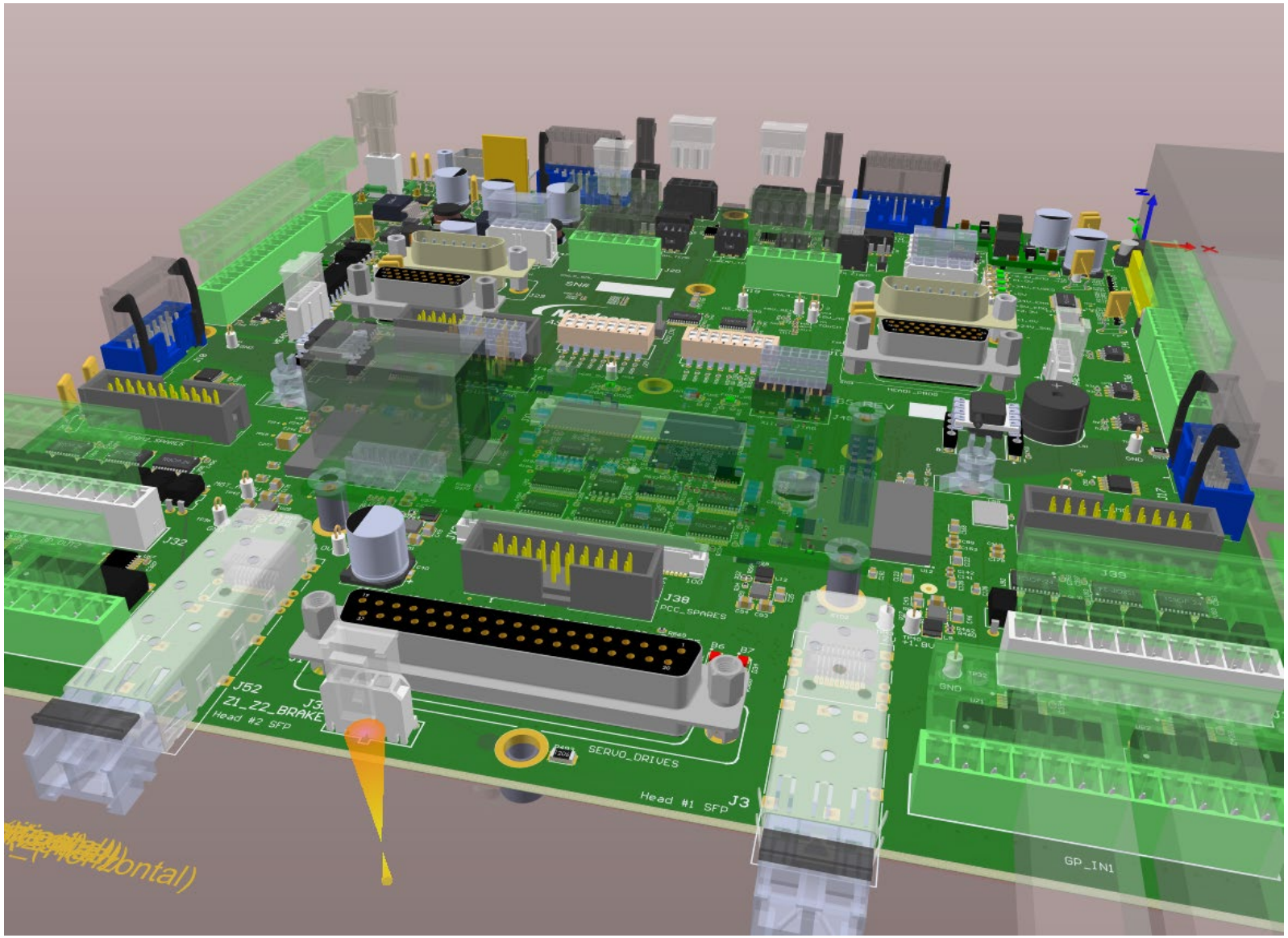
ECAD/MCAD – MCAD/ECAD TRANSFER

- The PCB Designer needs to see how their board fits into the mechanical assembly
- Clearance for cable connectors and finger access to install/remove cables and connectors



ECAD/MCAD – MCAD/ECAD TRANSFER

- Complex Assemblies can have huge file sizes…
- Transfer of data can take a long time and require system resources



Altium

ALTIUMLIVE 2018:
SNEAK PREVIEW:
ECAD/MCAD COLLABORATION IN AD 19

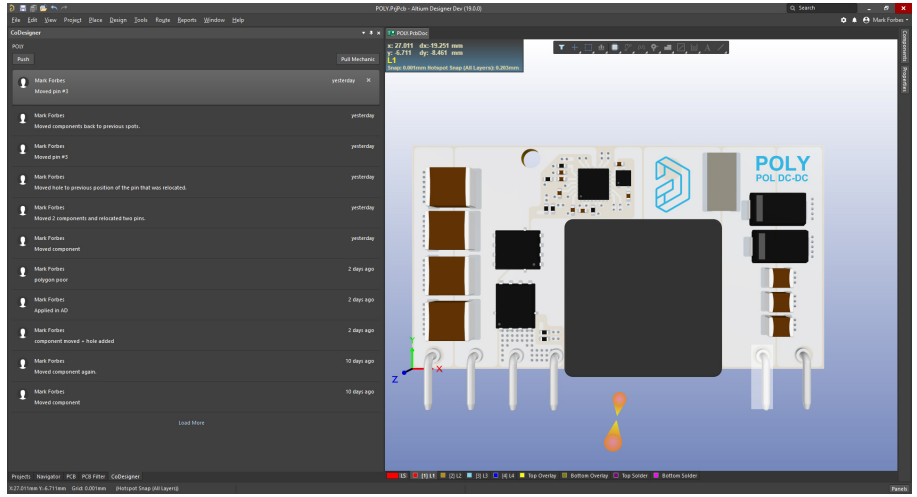
Mark Forbes
Director of Technical Marketing
Altium

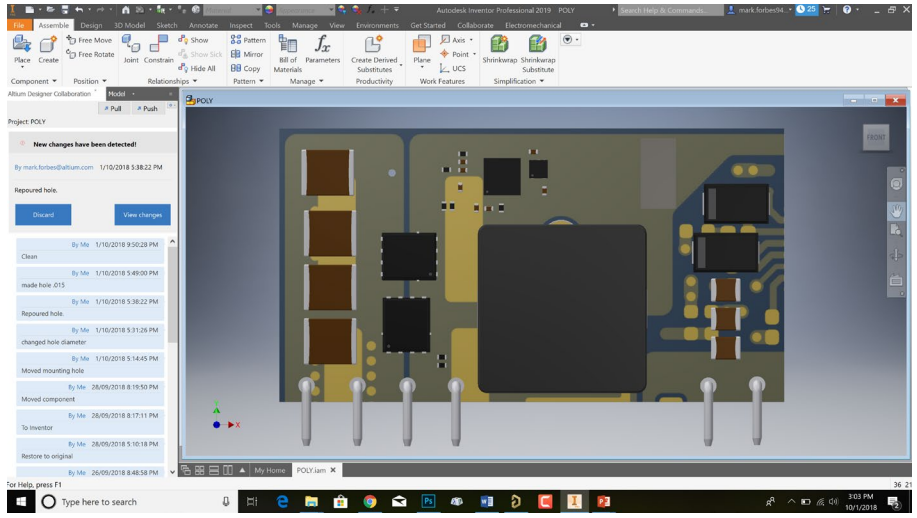
San Diego
OCT 5, 2018

ECAD/MCAD – Collaboration in AD 19

Altium Designer 19 Collaboration Capabilities

- More than just STEP data — full 3D mechanical models
- Details available for true mechanical collaboration
- Ability to send files with or without copper or other details to speed process
- Changes can be sent either way with annotation and approval





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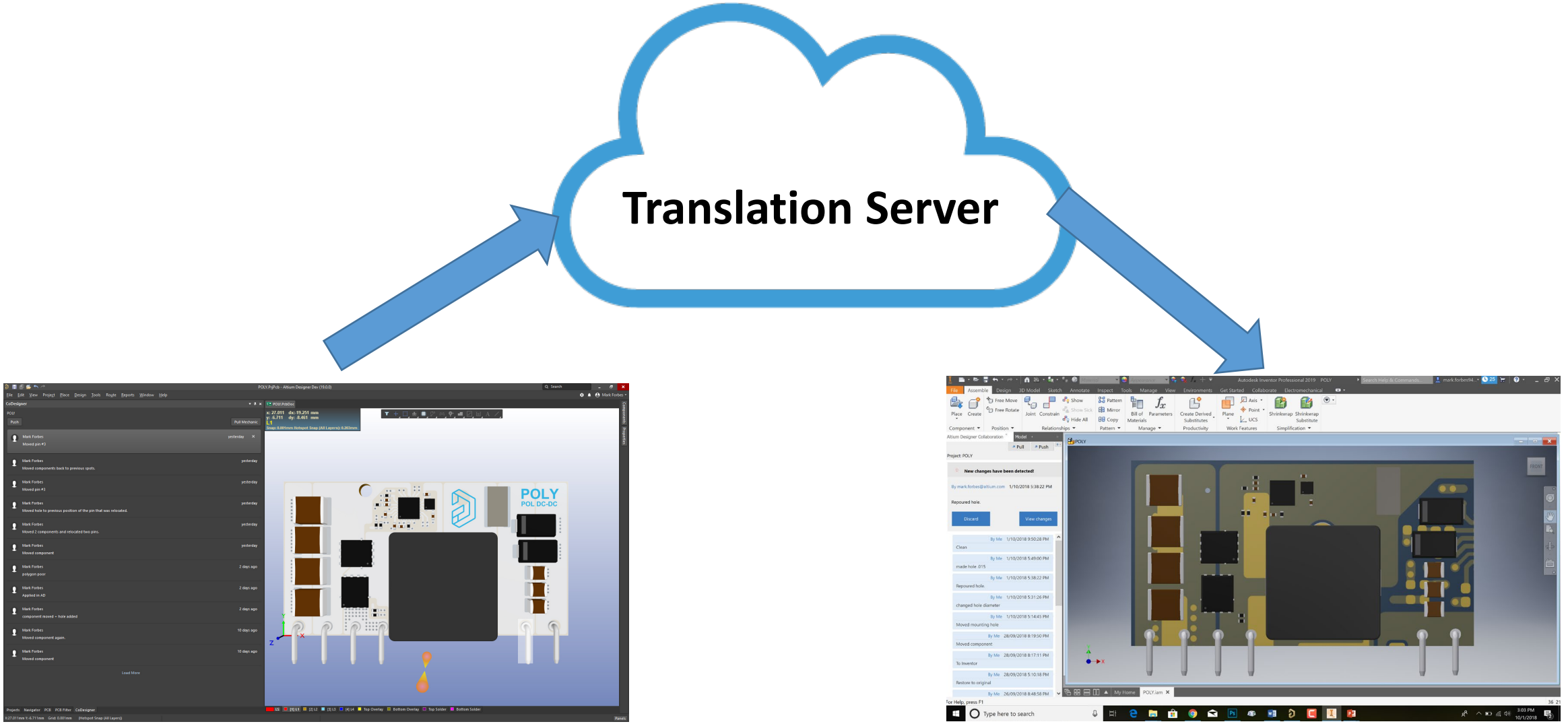

Altium Designer 19 Collaboration Compatibility

- Dassault Systemes SolidWorks
- PTC Creo
- Autodesk Inventor

Altium Designer 19

SNEAK PREVIEW

DEMO

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