ALTUIMLIVE 2018:
ENABLING COHESIVE MCAD/ECAD COLLABORATION

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OCT 5, 2018
WHY DO WE NEED 3D MCAD IN THE ECAD WORLD?
ECAD/MCAD – Visual Verifications

- 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
• Assigning logical names to layers helps manage design structure.
• Mechanical Layers
• Dimensions
• 3D Models
• Courtyards and Clearances
• Assembly Drawing Images
• 3D models
• Mechanical chassis
• Mounting Points
• Tooling Clearances
• Cooling Vents and Hardware
• Safety and Shock Hazard
• Cable routing
• 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
• 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
• Downloaded 3D models are typically built to nominal Dimensions or may contain errors or incomplete data...
• [www.pcblibraries.com](http://www.pcblibraries.com)
• Download footprints with 3D
• [www.3dcontentcentral.com](http://www.3dcontentcentral.com)
• Download Free 3D Models
• DigiKey 3D models from
• [www.tracepartsonline.net](http://www.tracepartsonline.net)
• IPC Compliant Footprint Wizard
• Or – build 3D model from scratch
• 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.
• 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
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.
Complex Assemblies can have huge file sizes...
Transfer of data can take a long time and require system resources
ALTIUMLIVE 2018:
SNEAK PREVIEW:
ECAD/MCAD COLLABORATION IN AD 19

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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
ECAD/MCAD – Collaboration in AD 19
Altium Designer 19 Collaboration Compatibility

• Dassault Systemes SolidWorks

• PTC Creo

• Autodesk Inventor
Altium Designer 19
SNEAK PREVIEW
DEMO