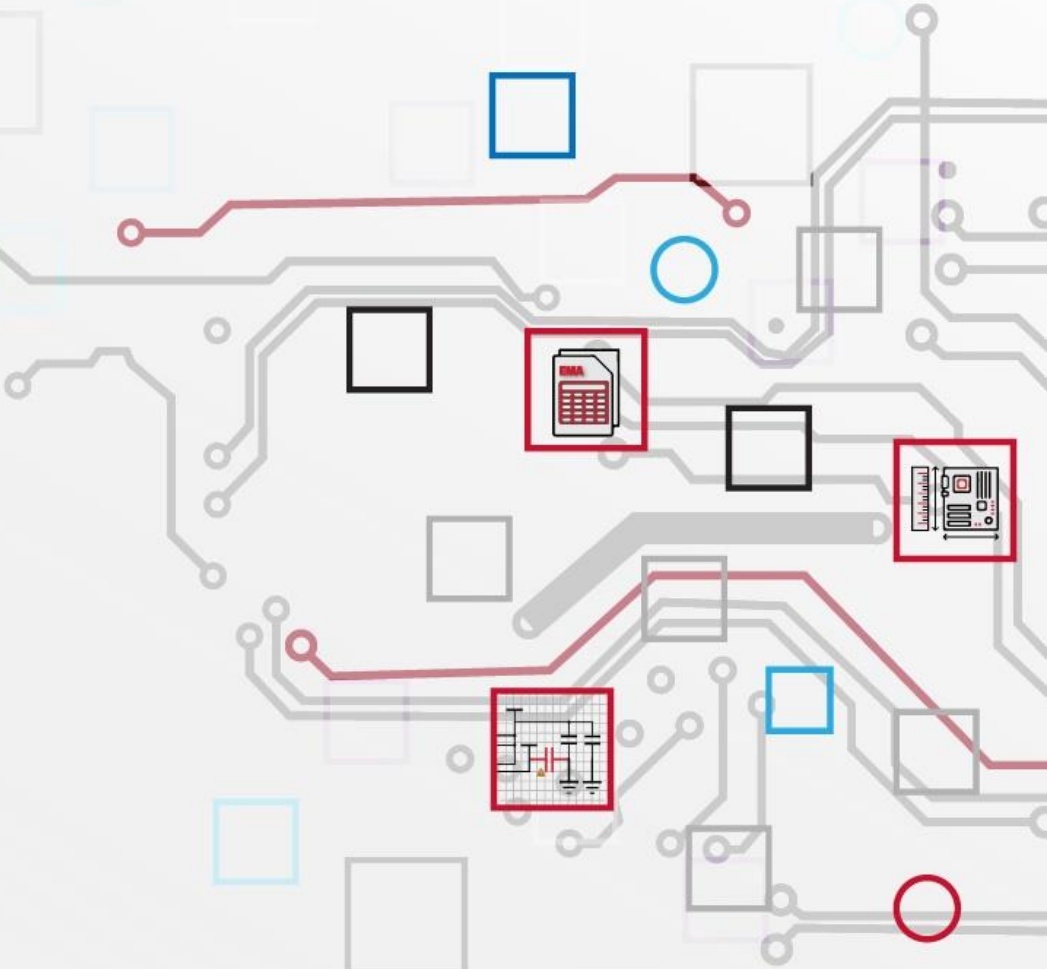
EMA Design Automation

WEBINAR

# 5 Common Issues Lurking in Your PCBs

## *And How OrCAD X Can Solve Them*



# Agenda

- EMA & HRS
- OrCAD X Intro
- Cost of Change over Time
- 5 Items
- AI Sneak Peak
- Q&A

# Partnership

EMA Design Automation

ECAD Experts

30+ Years in PCB Design

Software – Support - Services

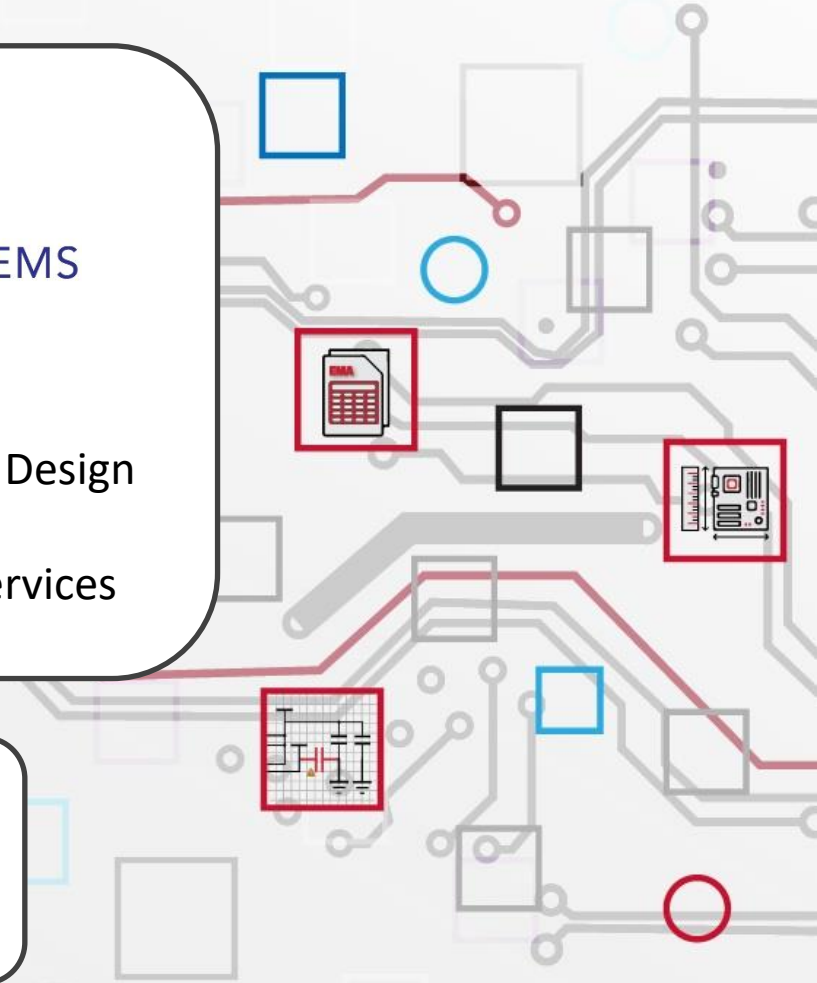
+

HAWK RIDGE SYSTEMS

MCAD Experts

30+ Years in Mechanical Design

Software – Support - Services

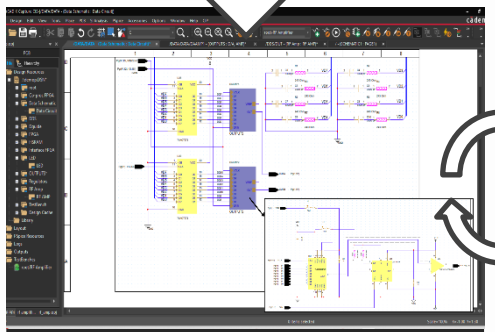


Decades of Combined Electromechanical Software & Design Expertise

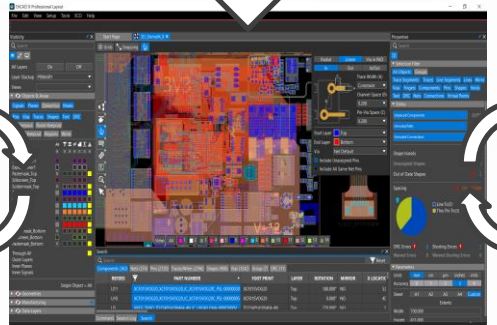
EMA Design Automation

## Simulation & Analysis

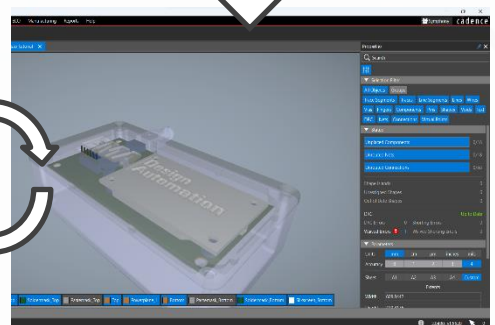
SI – PI – RF – EM – Thermal - SPICE



**Logical**



**Physical**

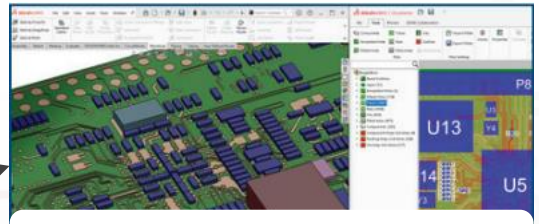


**3D**

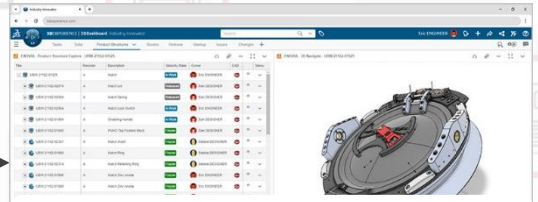
## Real-Time Design

Constraints – Libraries – Supply Chain – Change Management

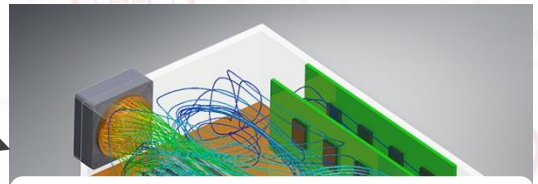
# OrCAD X Design Environment




SOLIDWORKS



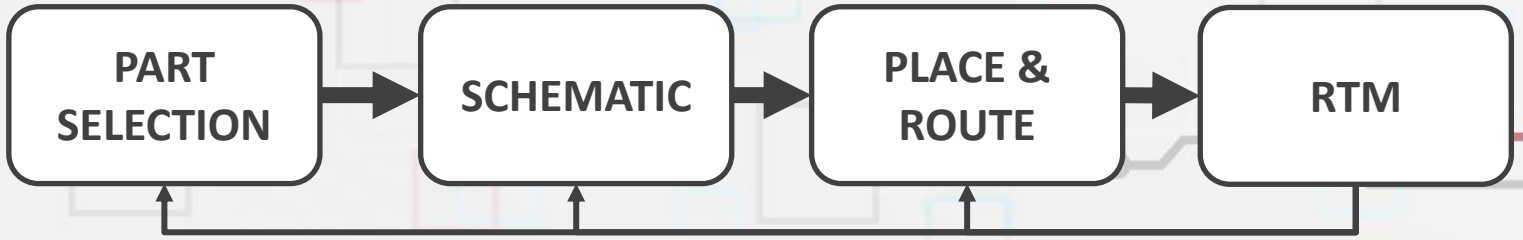
3DEXPERIENCE

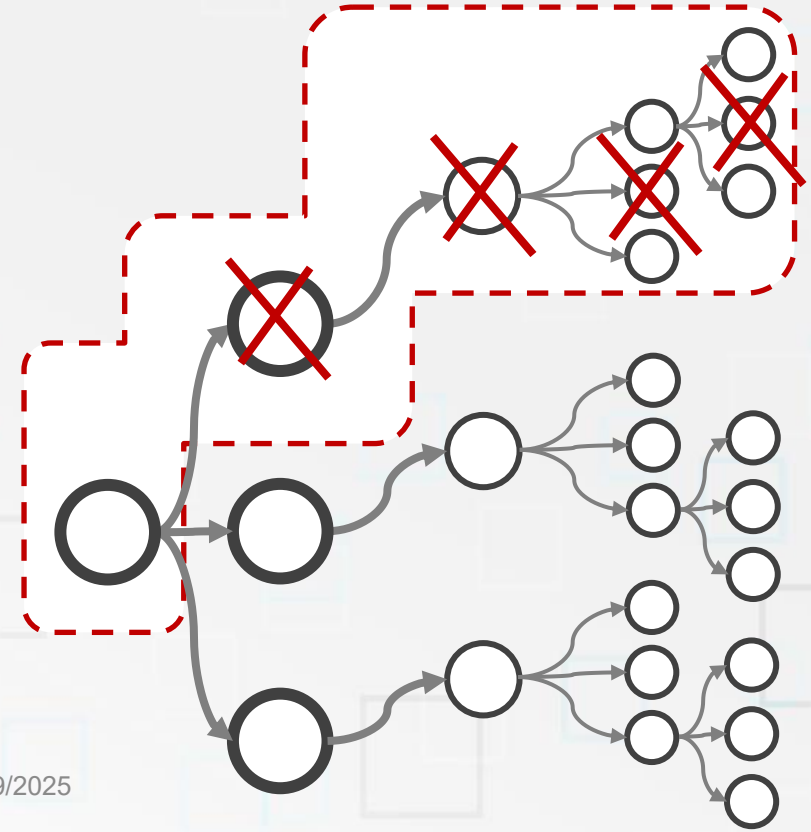


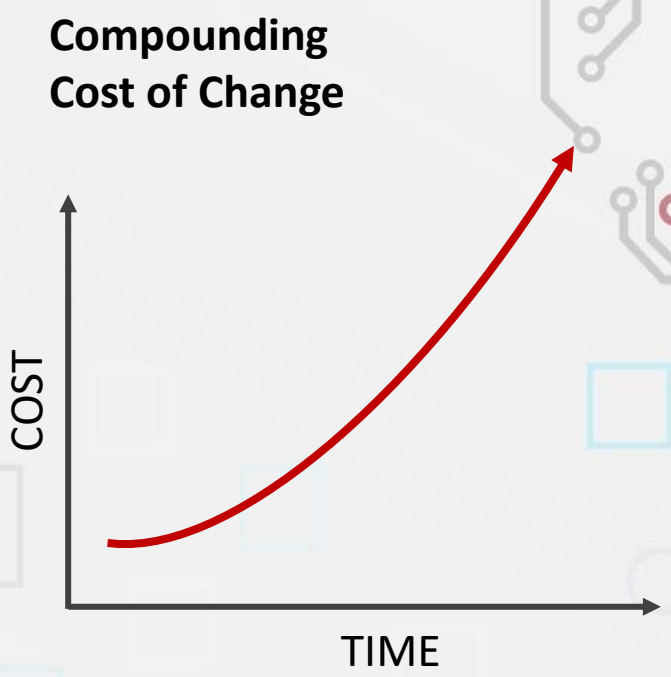
SIMULIA CST STUDIO SUITE

SIMPLIFIED

# PCB Design Flow






- Cost of Change Increases as Design Progresses
- Cumulative Effect of Changes (decisions stack)
- Identify and Resolve Early is Key

ISSUE 1/5

# Part Selection

| | MPN | Supplier | Description | Avg. Price | Min. Lead Time [Week(s)] | Max. Lead Time [Week(s)] |
|---|---|---|---|---|---|---|
|  | C0402C102J5GACTU | KEMET CORPORATION | Cap Ceramic 0.001uF 50V C0G 5% Pad SMD 0402 125°C T/R | $0.02 | 54 | 54 |
|  | CL05C102JB5NNND | SAMSUNG ELECTRO-MECHANICS | Cap Ceramic 0.001uF 50V C0G 5% Pad SMD 0402 125°C T/R | $0.02 | 24 | 24 |
|  | GRM1555C1H102JA01B | MURATA MANUFACTURING | Cap Ceramic 0.001uF 50V C0G 5% Pad SMD 0402 125°C Bulk | $0.01 | Obsolete | Obsolete |
|  | C0402C102J5GACAUTO | KEMET CORPORATION | Cap Ceramic 0.001uF 50V C0G 5% Pad SMD 0402 125°C Automotive T/R | $0.05 | 33 | 33 |

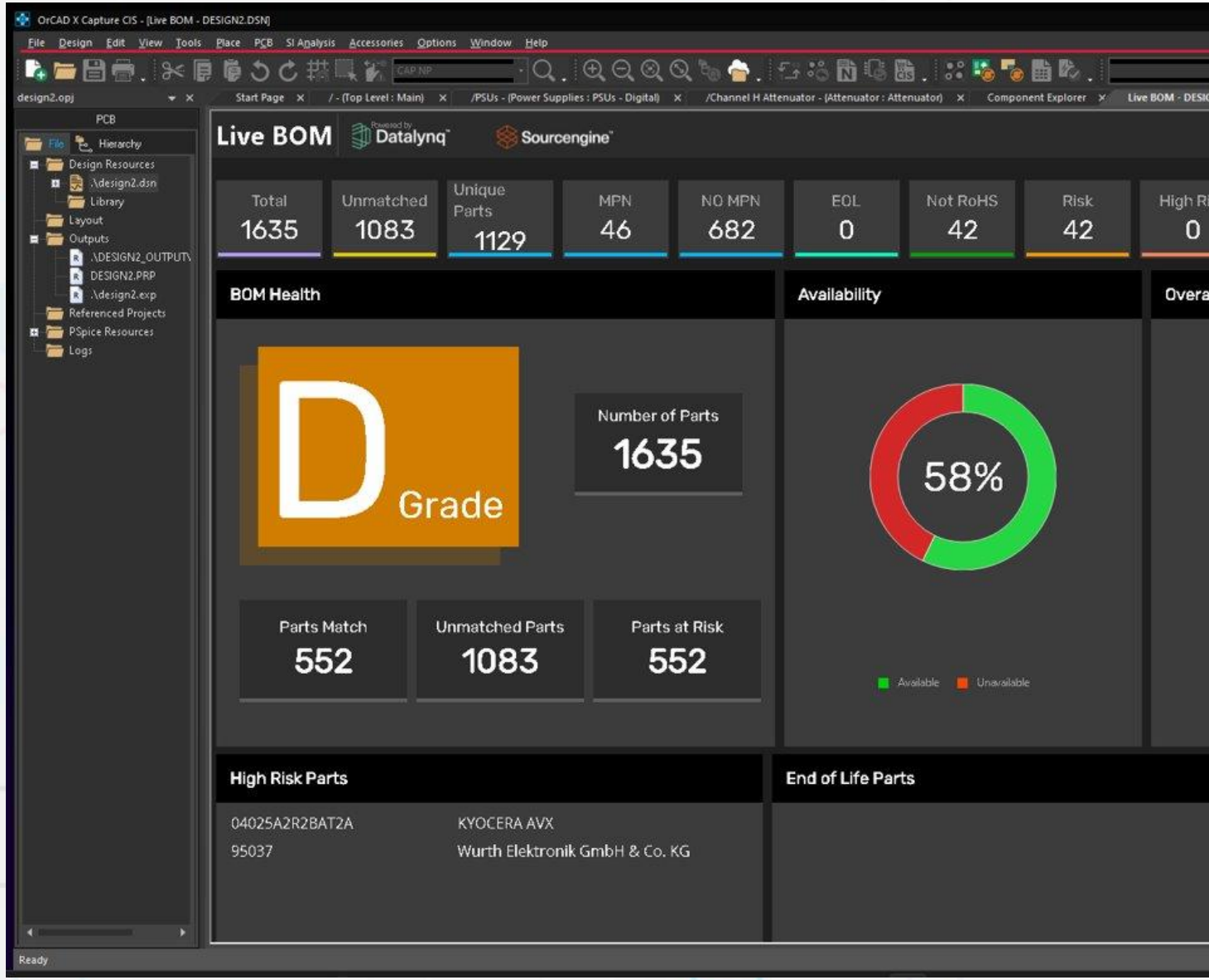
PRICE?

FFF REPLACEMENT?

PART SELECTION

# LiveBOM

- On-demand supply chain intelligence
- Reviews and provides a grade
- Swap and update parts quickly as needed
- Ensure a compliant and orderable BOM
- Available per design or at a library level

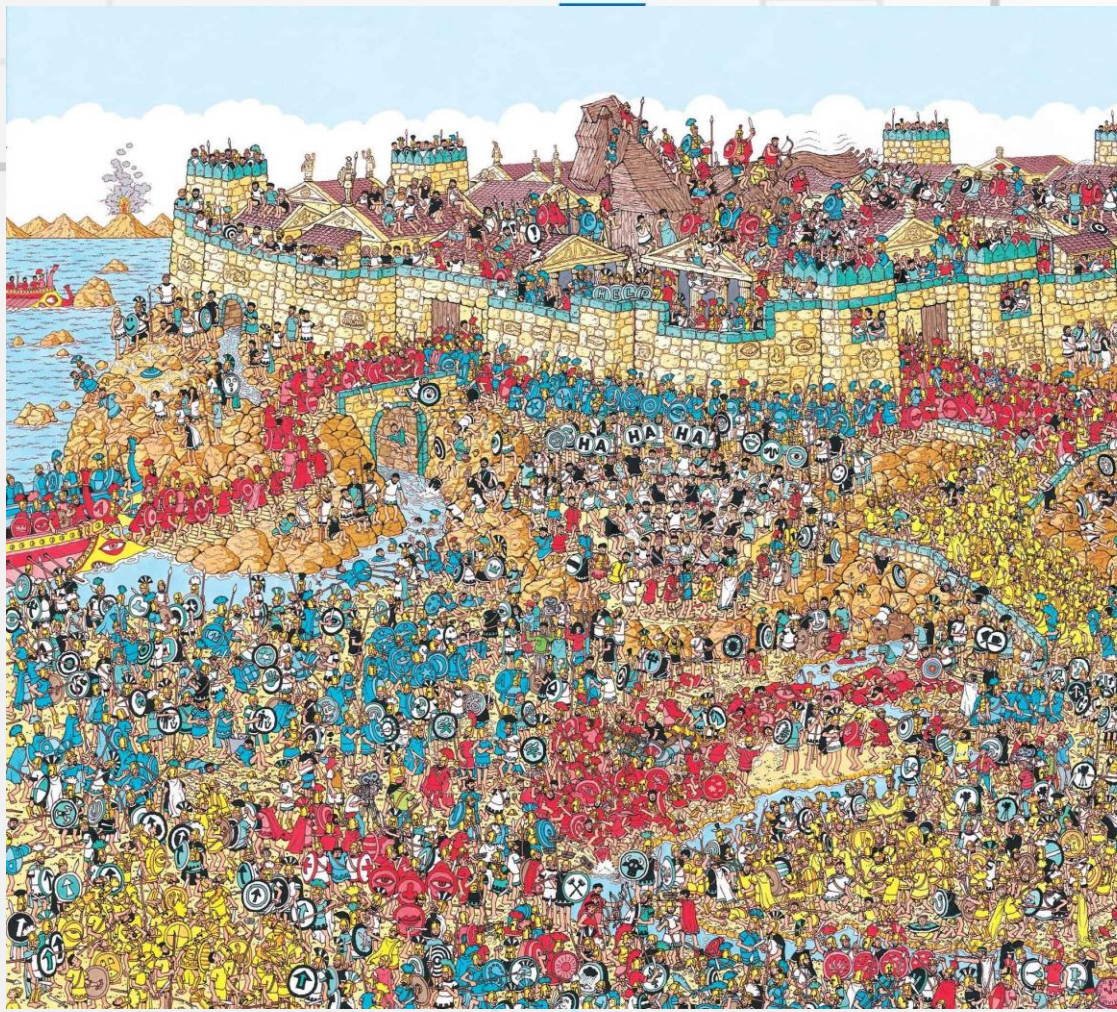


ISSUE 2/5

# Hard to Spot / Diagnose Electrical SI/PI Issues

## Problems

- Signal quality issues in your design that are very hard to detect visually
- Can even be challenging to debug in hardware
- How can we identify and prevent / resolve these issues early?

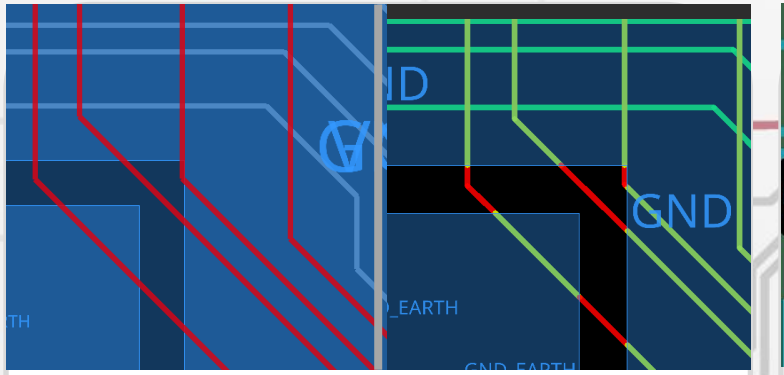


SI/PI Issues

# In-Design Analysis

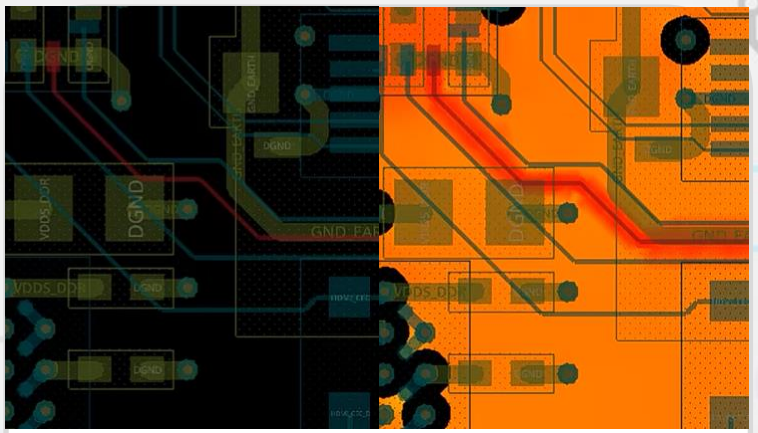
## Solution

- Leverage Simulation & Real-Time DRC to spot issues as they happen
- Visualize designs contextually
- Do this as you design with minimal setup / configuration

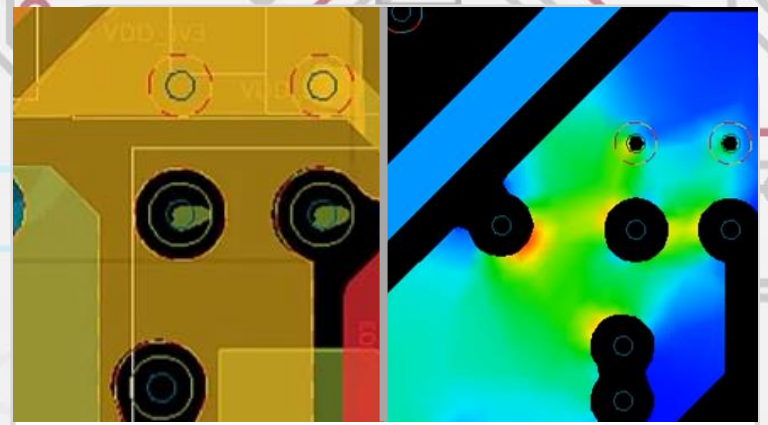



SPLIT PLANE ROUTING


COUPLING




RETURN PATH



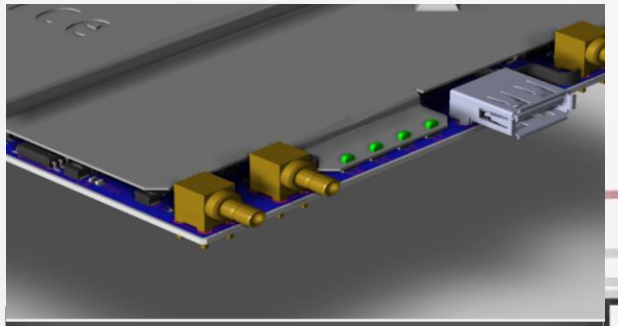
CURRENT DENSITY

ISSUE 3/5

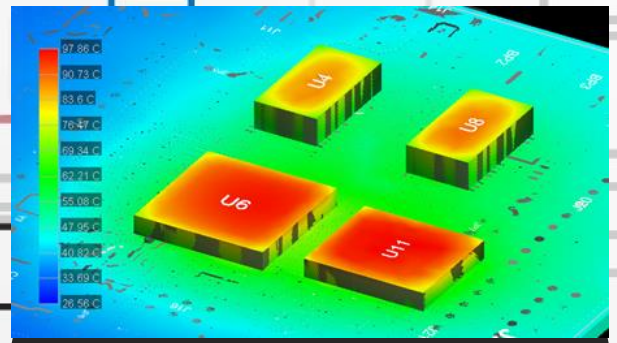
# ECAD/MCAD Discrepancies

## Problems

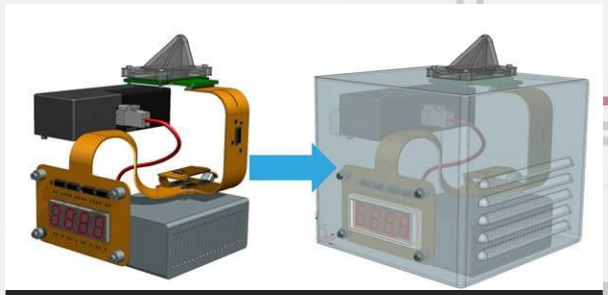
- MCAD / ECAD requirements not aligning or conflicting
- Mutual design elements not synchronized
- Unable to review / visualize electrical and mechanical elements holistically



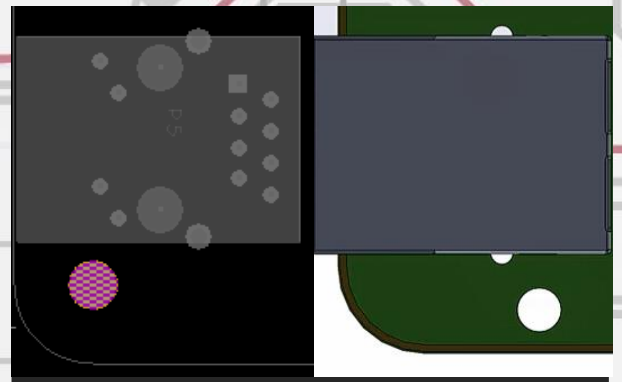
FIT PROBLEMS




Thermal Analysis



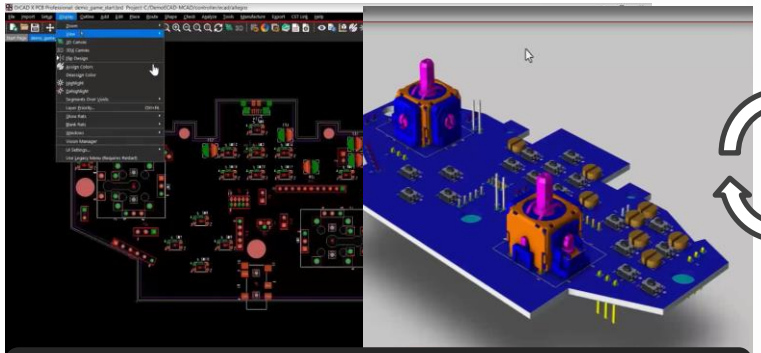
Holistic View



Uncommunicated Changes

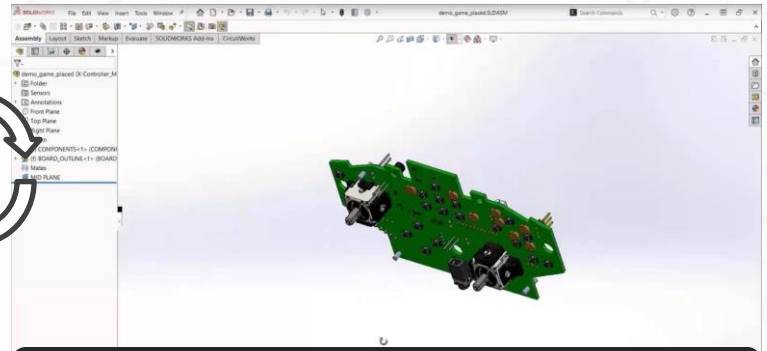
ECAD/MCAD

# 3D Design & Data Exchange



**OrCAD X**


**CIRCUITWORKS & MCADX**



**SOLIDWORKS**

**MCAD DRIVEN**

- Outline
- Clearance Rules
- Mounting Holes
- Cutouts

- **Bi-directional data exchange**
- **Accept & Reject**
- **Change Tracking**
- **Sync Early & Often**

**ECAD DRIVEN**

- Copper
- Vias
- Detailed ECAD Models
- Board Thickness

ISSUE 4/5

# DFM Issues

## Problems

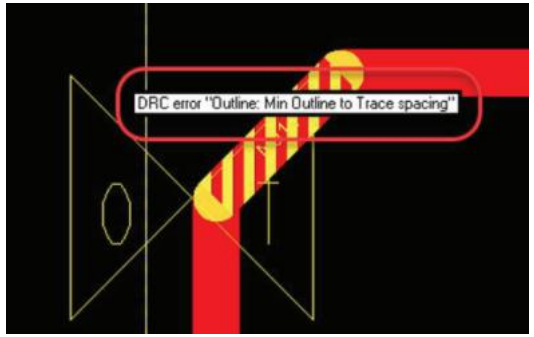
- Don’t want to find manufacturability issues late in the design cycle
- DFM issues can be hard to spot (and process dependent)
- DFM related changes are inherently late-stage changes

DFM ISSUES

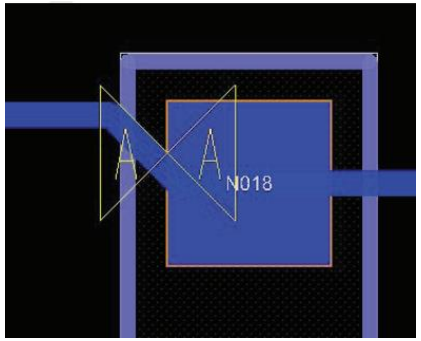
# DesignTrue DFM

## Solution

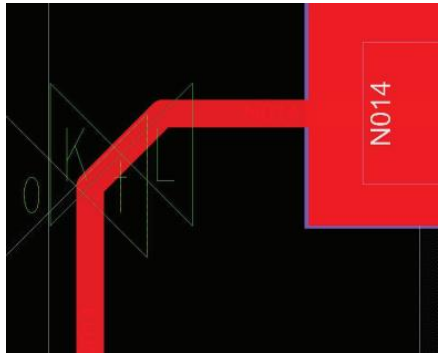
- Perform DFM checking as you design
- Leverage industry standard IPC DFM checking as well as manufacturer specific rules
- Create Documentation as an output of design



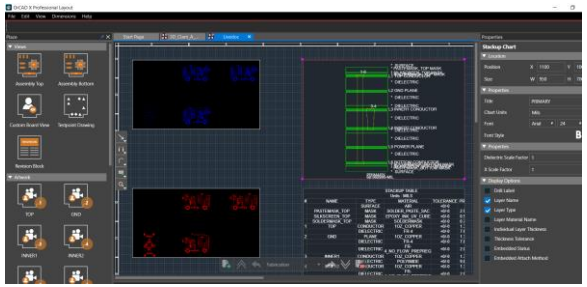

TOO CLOSE TO BOARD EDGE




ANNULAR RING




COPPER PAD TO CUTOUT



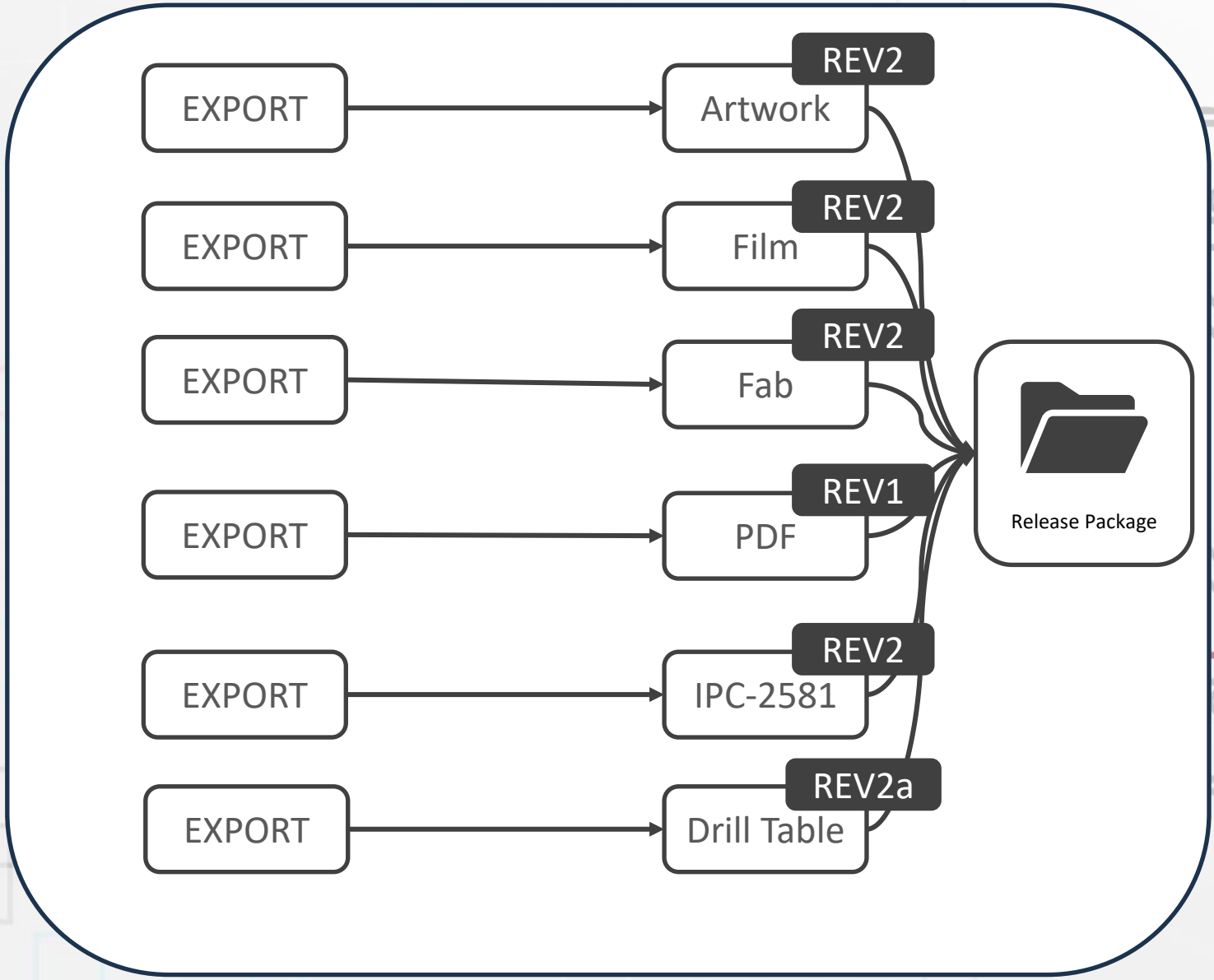
AUTOMATED DOCUMENTATION

ISSUE 5/5

# Release to Manufacturing

## Problems

- Don’t want to find manufacturability issues late in the design cycle
- DFM issues can be hard to spot (and process dependent)
- DFM related changes are inherently late-stage changes

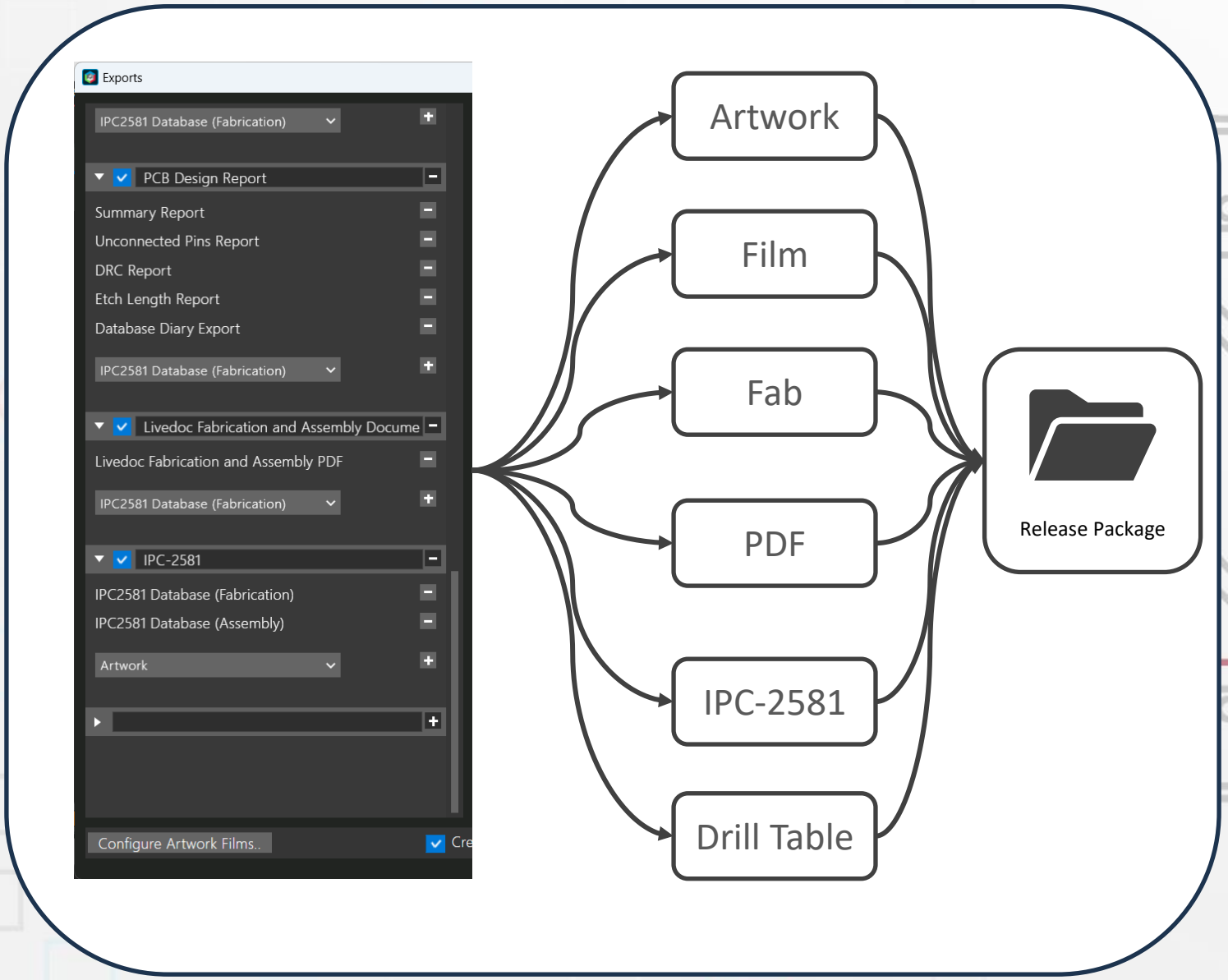


RTM

# MFG Packager

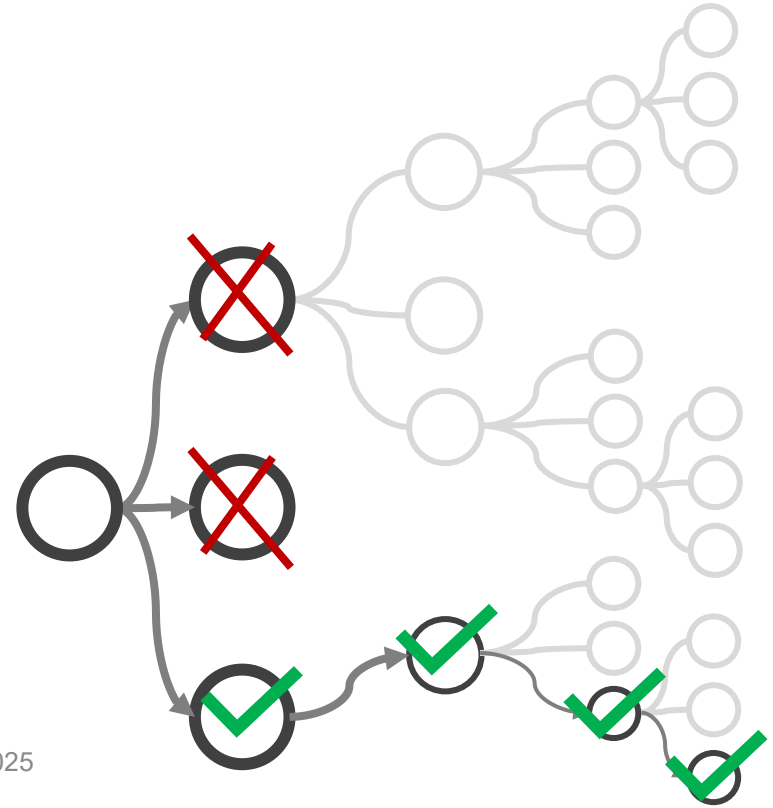
## Solution

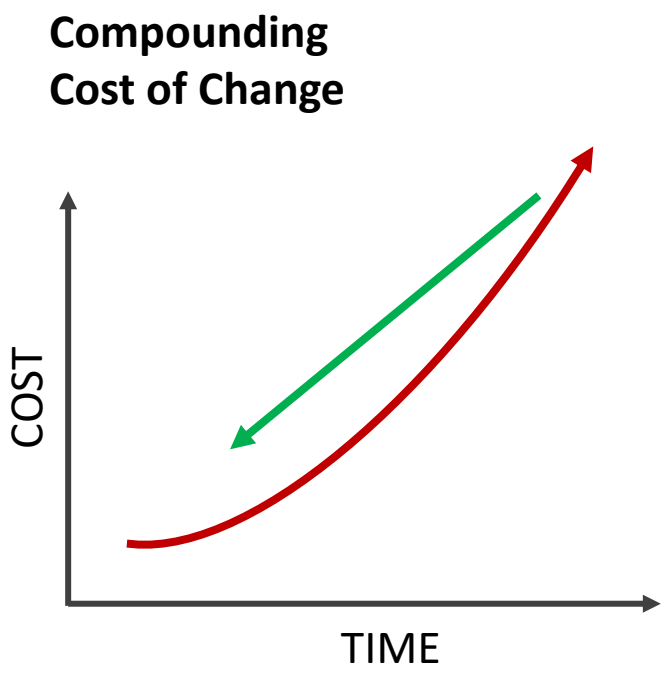
- Predefine RTM recipes
- Ensure CAD data matches your MFG instructions
- Customize as needed



# Shift-Left Design

- Identify and Solve Early
- Review and Fix in Context
- Eliminate Late-Stage Design Changes



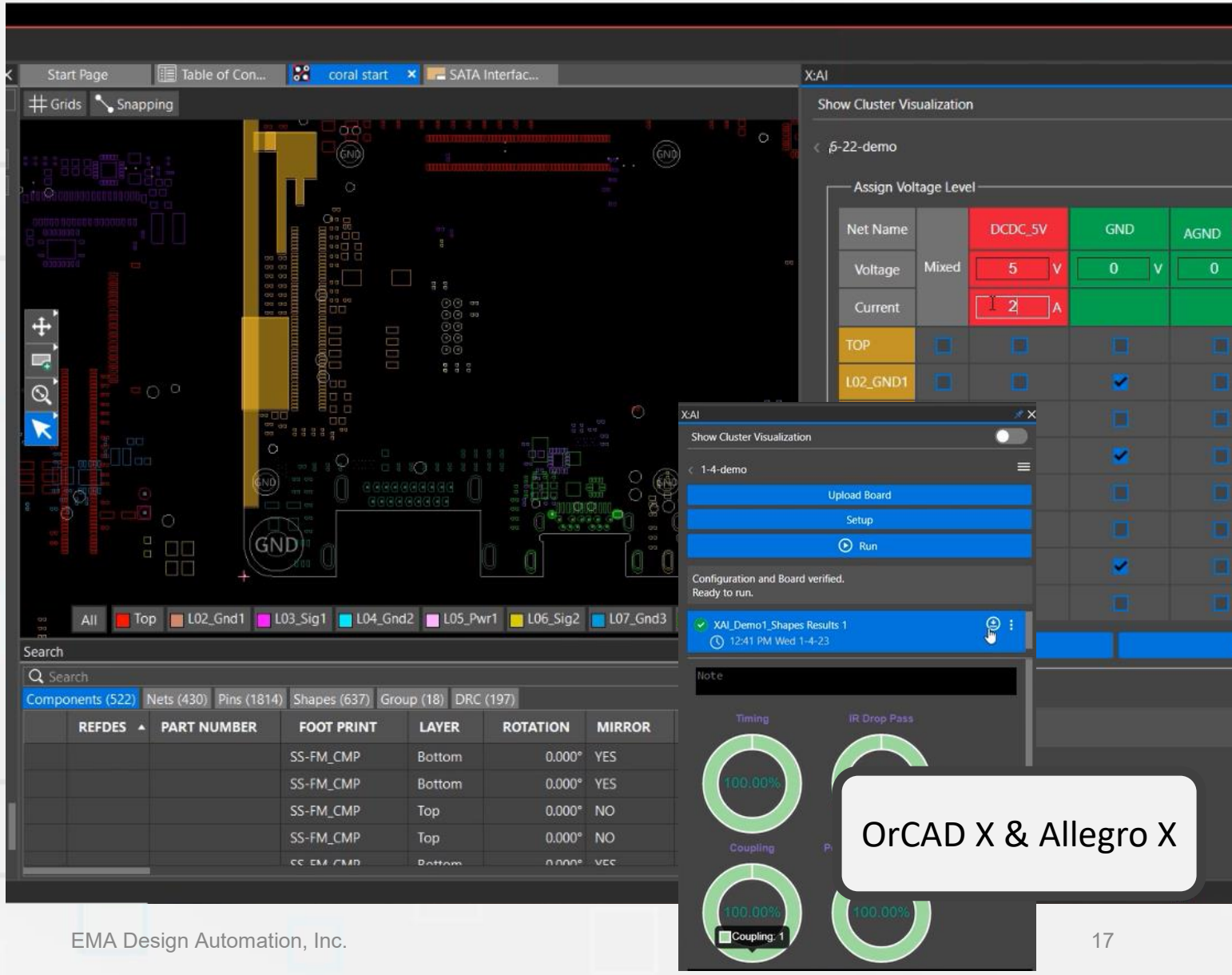



12/29/2025

AI for PCB Design

# X AI

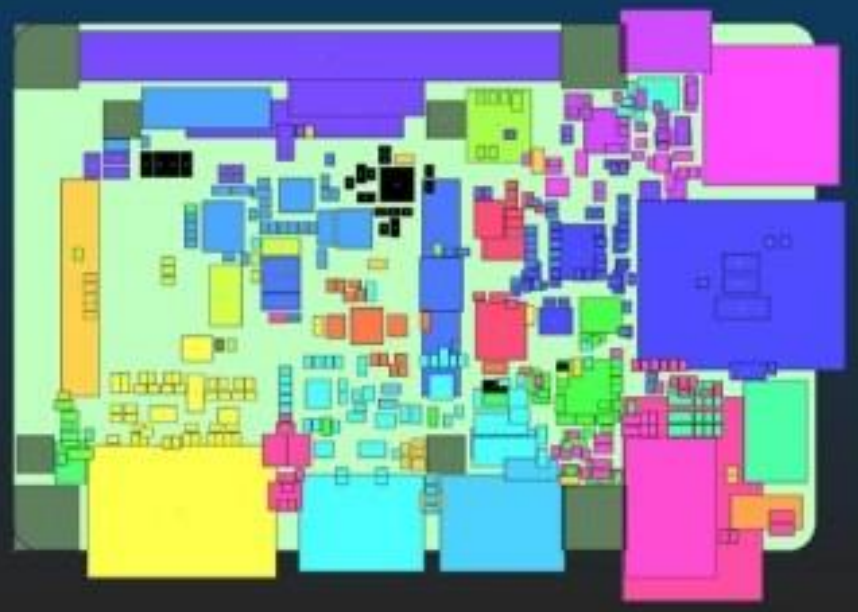
- Dramatically reduce time for initial placement, plane creation, and routing
- Integrated directly inside OrCAD X & Allegro X
- Constraint, Schematic, DFM, and electrically aware



# Allegro X AI Global Placement

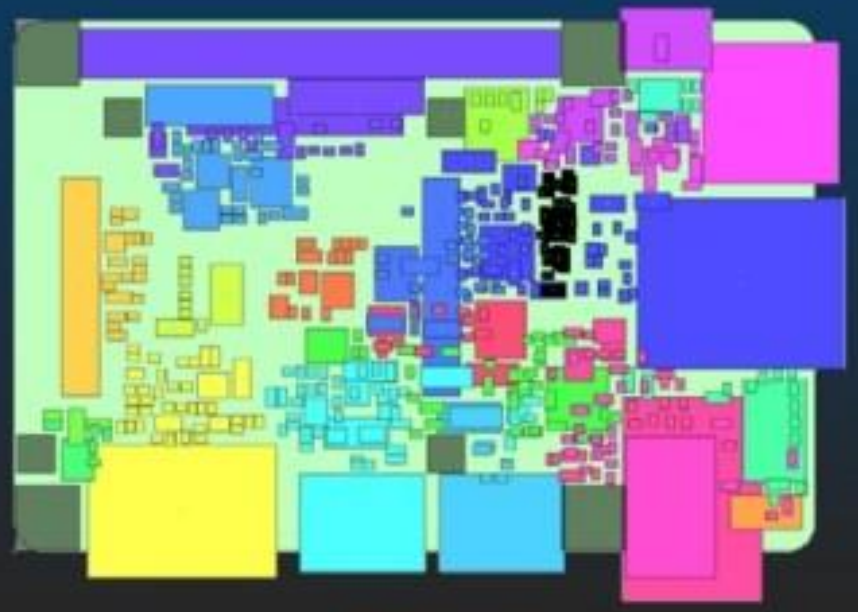
*Reduce time to design PCBs*

Human Placement



~ 3 days placement

Allegro® X AI Global Placement



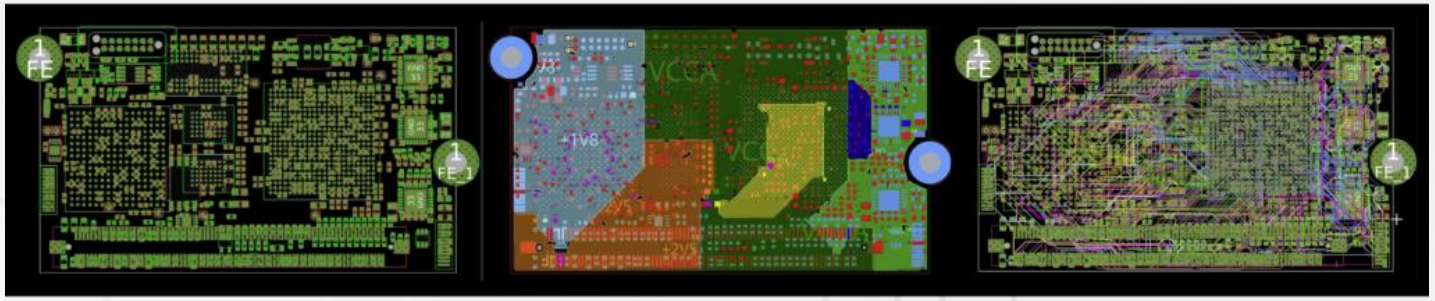
75 minutes
14% better wirelength

cadence

Case Study

# Danfoss Uses Cadence Allegro X AI to Amplify PCB Design for Energy Efficiency

AI Placement AI Pours AI Routing



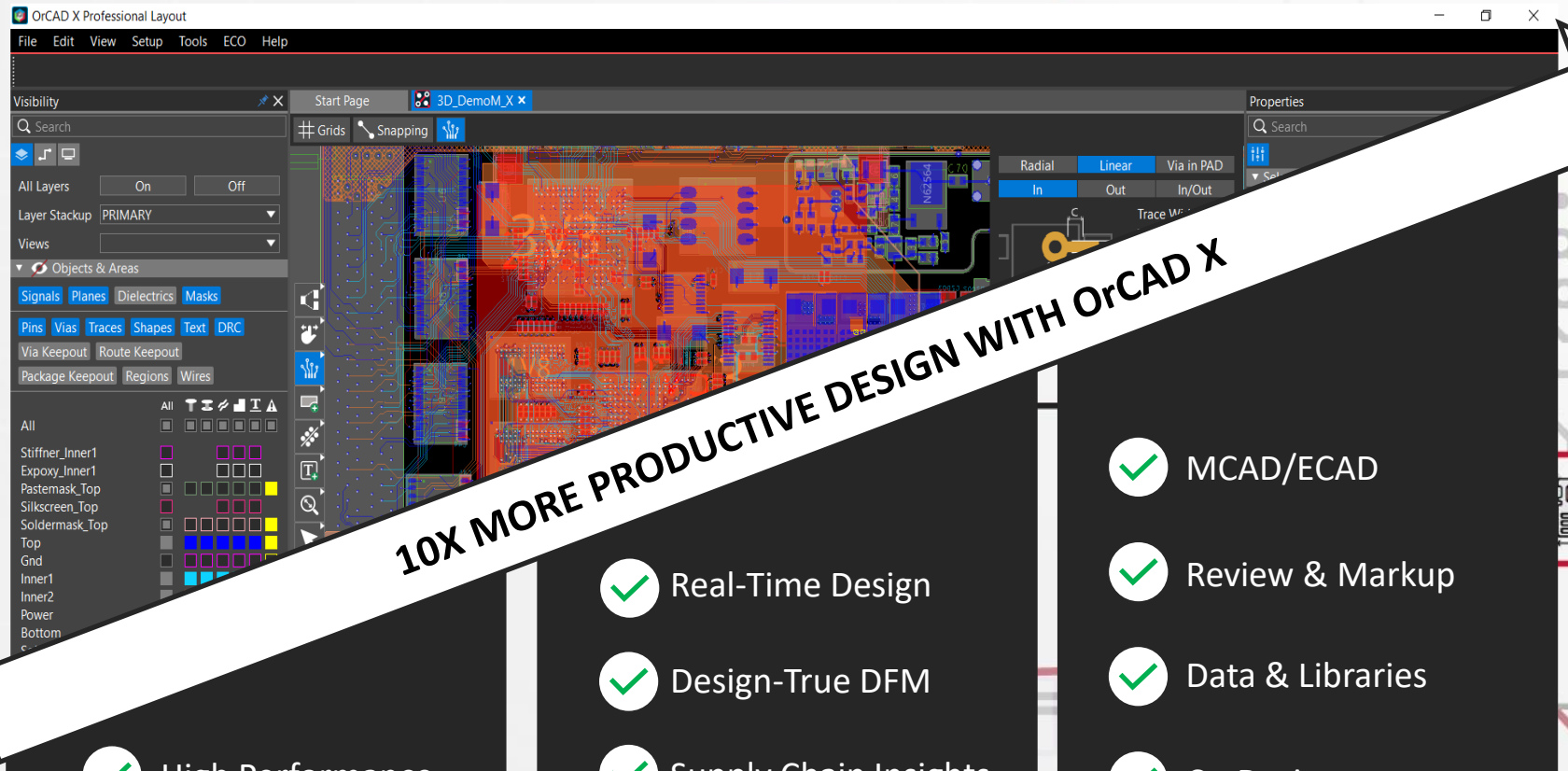
> "I ended up at the first run with a very nice layout for my design. I'll say that not much needed to change.
>
> **Bo Kroman, Senior ECAD Engineer, Danfoss**

[Danfoss Uses Cadence Allegro X AI to Amplify PCB Design for Energy Efficiency | EMA Design Automation]

NEXT GEN

# OrCAD X

- Direct Connection with SOLIDWORKS
- Smooth MCAD/ECAD (Dassault Endorsed)
- Available from Hawkridge Direct (w/ EMA)



# Thank You

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