PCB Design Variants

Why, When, & How

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Field Application Engineer

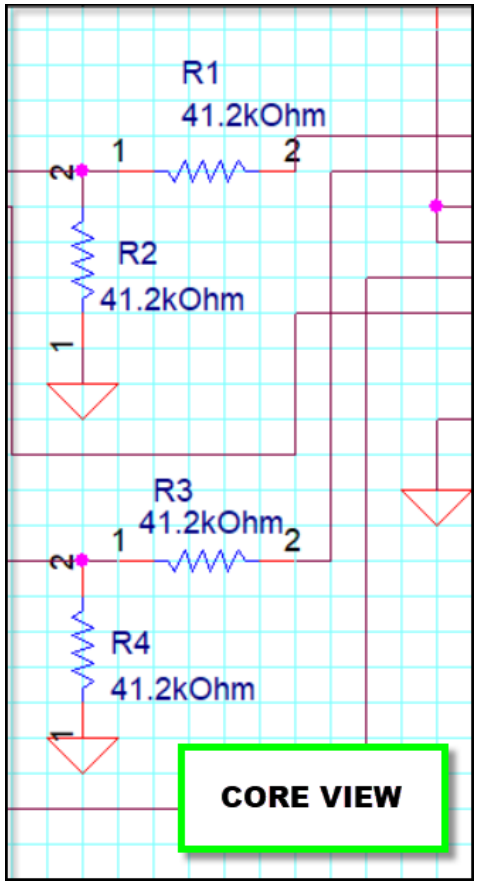
Poll Question #1

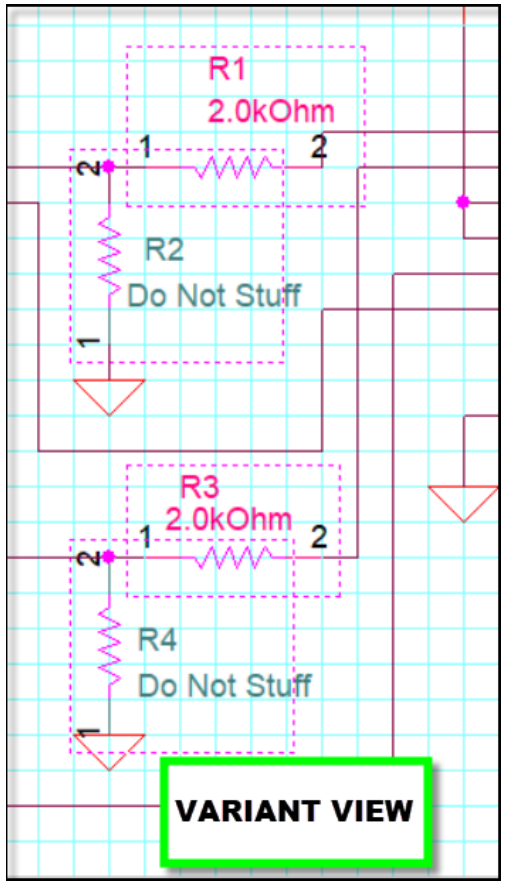
Today's Topics

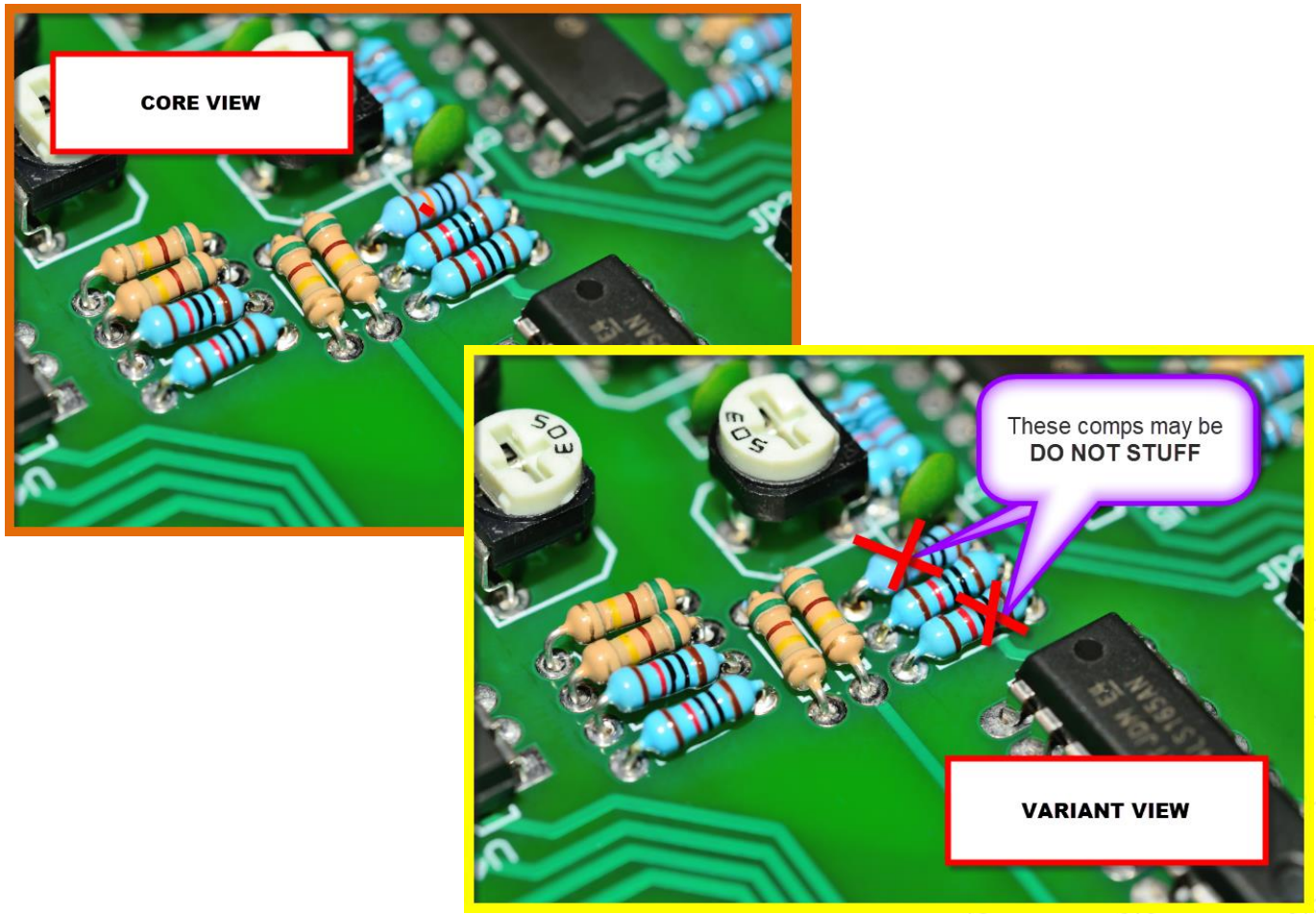
- What are Design Variants
- Why are Variants Used
  - Benefits of using variants
- Variant Usage within OrCAD
  - Considerations when choosing a Variant methodology
- How to manage Variant changes
  - Best practices for implementing and managing variant changes
- Demonstration

What are Variants?

- “Variants” are a way to leverage one core schematic design, but with potentially multiple variations of parts such as differing part values or “Do Not Stuff”

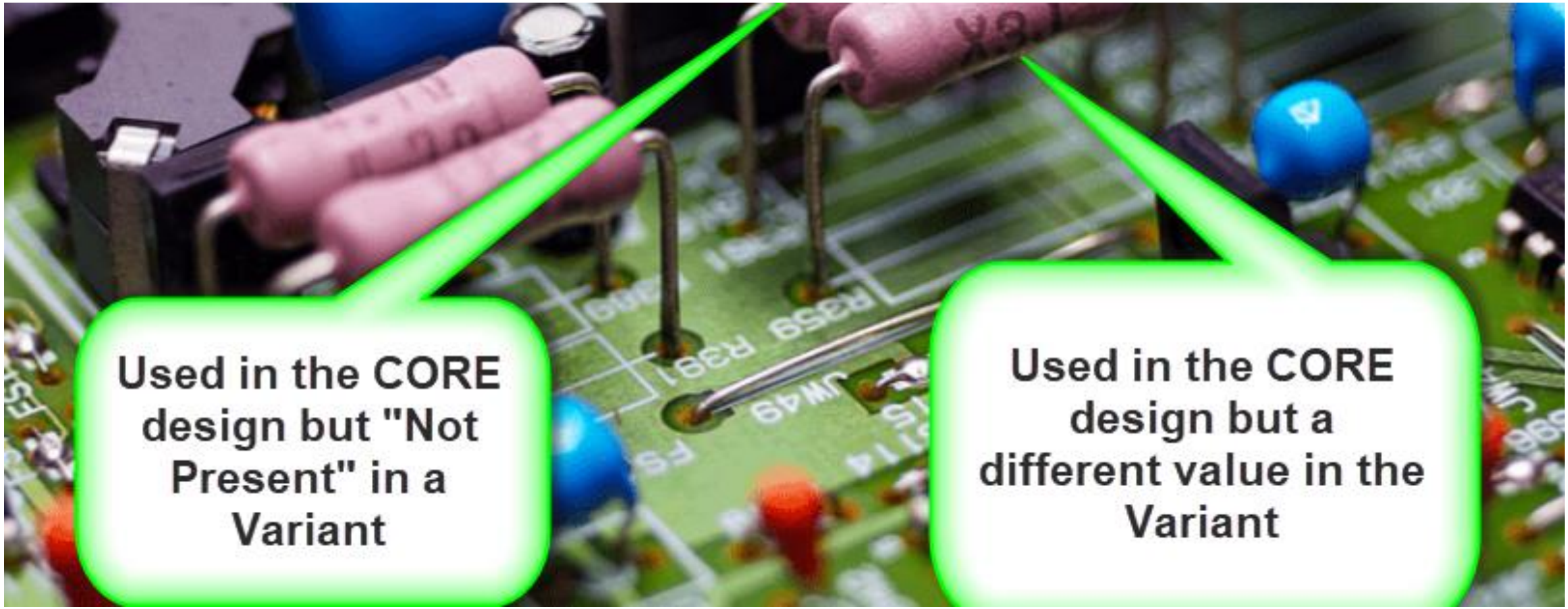






What are variants?

- One CORE board assembly with multiple variations



Why are Variants Used?

- One CORE With various models of the same product being sold in multiple countries, it is vital to create a single PCB that can support the required differences to keep costs down.
- To reduce costs,  It’s common to design a single PCB that can accommodate varying functionality or design requirements based on model features
- Easily manage component modifications for variant designs with integrated definition and support in OrCAD Capture CIS.

Poll Question #2

Things to Consider When Using Variants

COST AND TIME TO CREATE AND MANAGE EACH VARIANT

PARTS AND AVAILABLE QUANTITIES TO SUPPORT EACH VARIANT

COST DIFFERENCE IN FINAL ASSEMBLIES

CAPABILITIES AND DIFFERENCES BETWEEN PARTS BEING USED IN EACH VARIANT

IDENTIFYING HIGH-RISK COMPONENTS THAT MAY BE USED FOR VARIANTS

HOW WELL DOES THE ENGINEERING ENVIRONMENT SUPPORT AND MANAGE VARIANT DESIGN DOCUMENTATION

Identifying High-Risk Components

Highest risk: Processors (MCUs, etc.)	- Drop-in replacements only in the same part family - Very few alternatives from other vendors
High risk: ASICs with special functions	- Many part replacements - Not all replacements are compatible - Some functions can be replaced by implementing in logic
Moderate risk: Power ICs and simple ICs	- Many part replacements - Some are package-compatible
Low risk: Discrete semiconductors	- Many part replacements - Many are package-compatible - Many are pin-compatible
Lowest risk: Passives	- Plentiful replacements from many vendors - Highly standardized packaging

Variant Usage within OrCAD

- Easily manage component modifications for variant designs with integrated definition and support in OrCAD Capture CIS.
- Identify and handle any high-risk variant components with OrCAD CIP and the built in Compliance module
- OrCAD EDM (Engineering Data Management) can manage all OrCAD project documentation in a revision controlled and archived environment *that supports variant revision management.*

- *CIS = Component Information System – a database methodology for managing engineering parts, most often coupled with CIP (Component Information Portal) for quick access to Distributor part data plus db mgmt. features .*

Variant Usage within OrCAD

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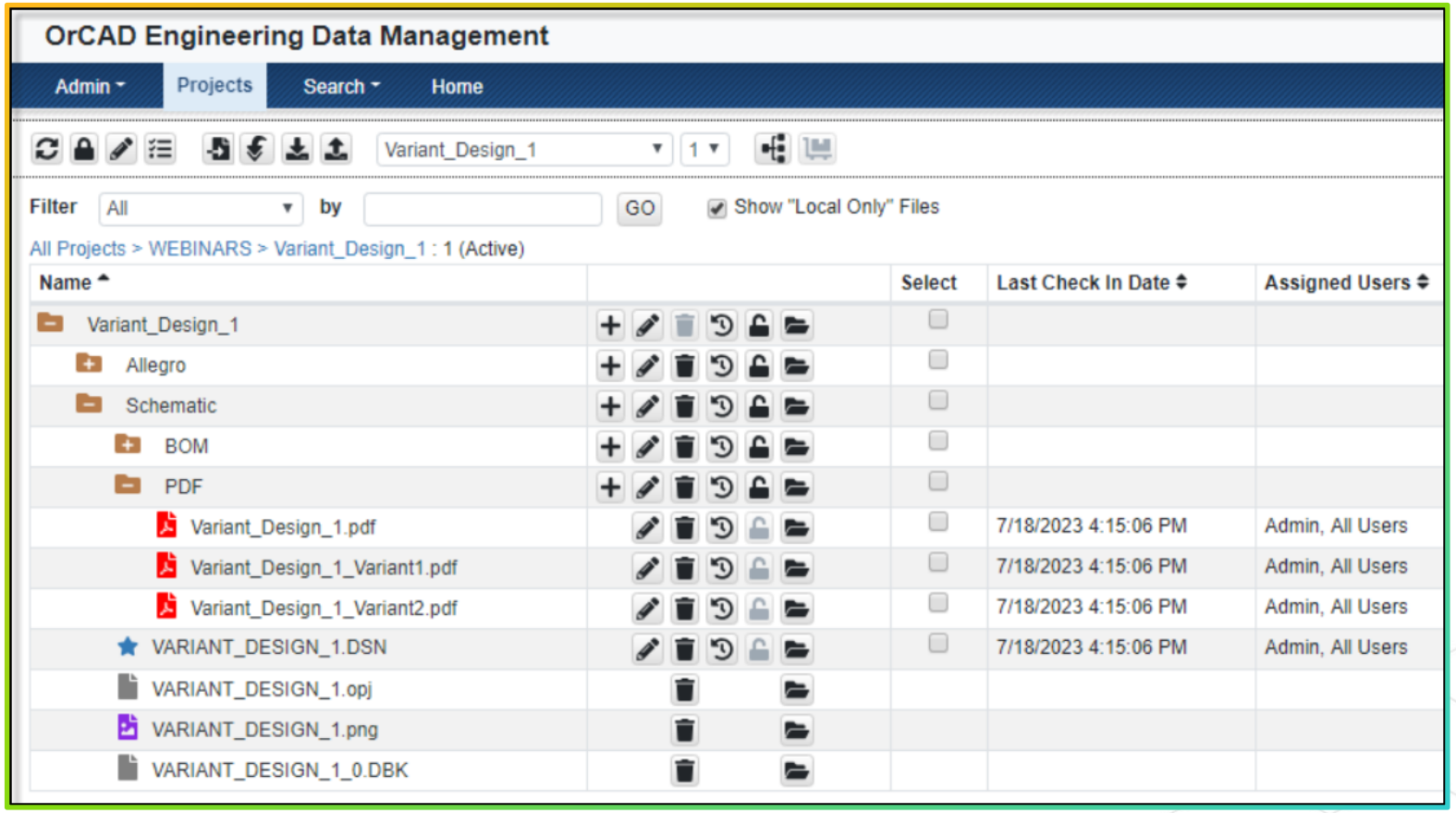
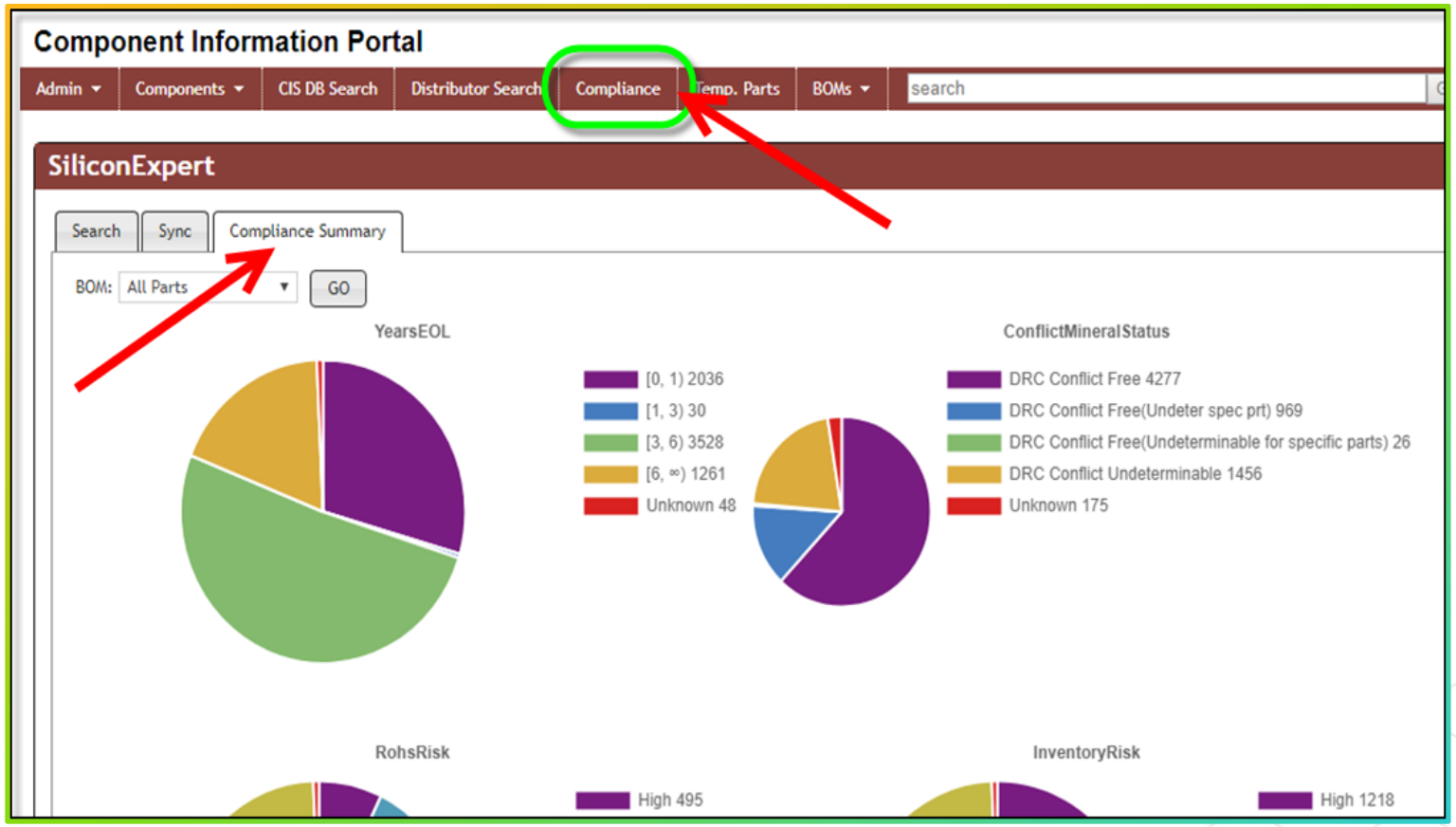


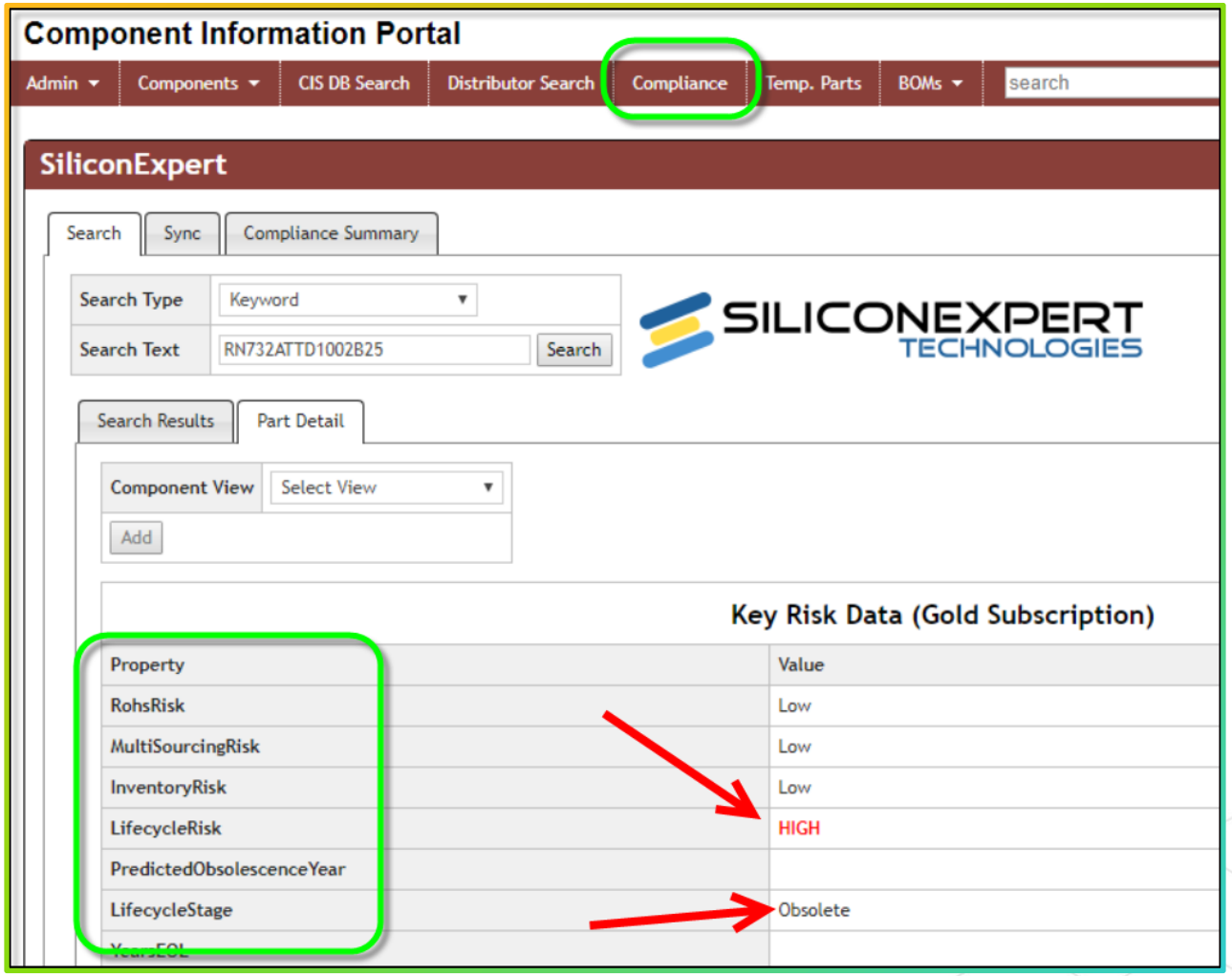
Variant Usage within OrCAD

- OrCAD CIP (Component Information Portal) provides part data management with direct access to part Compliance to identify Risk, EOL, and much more.



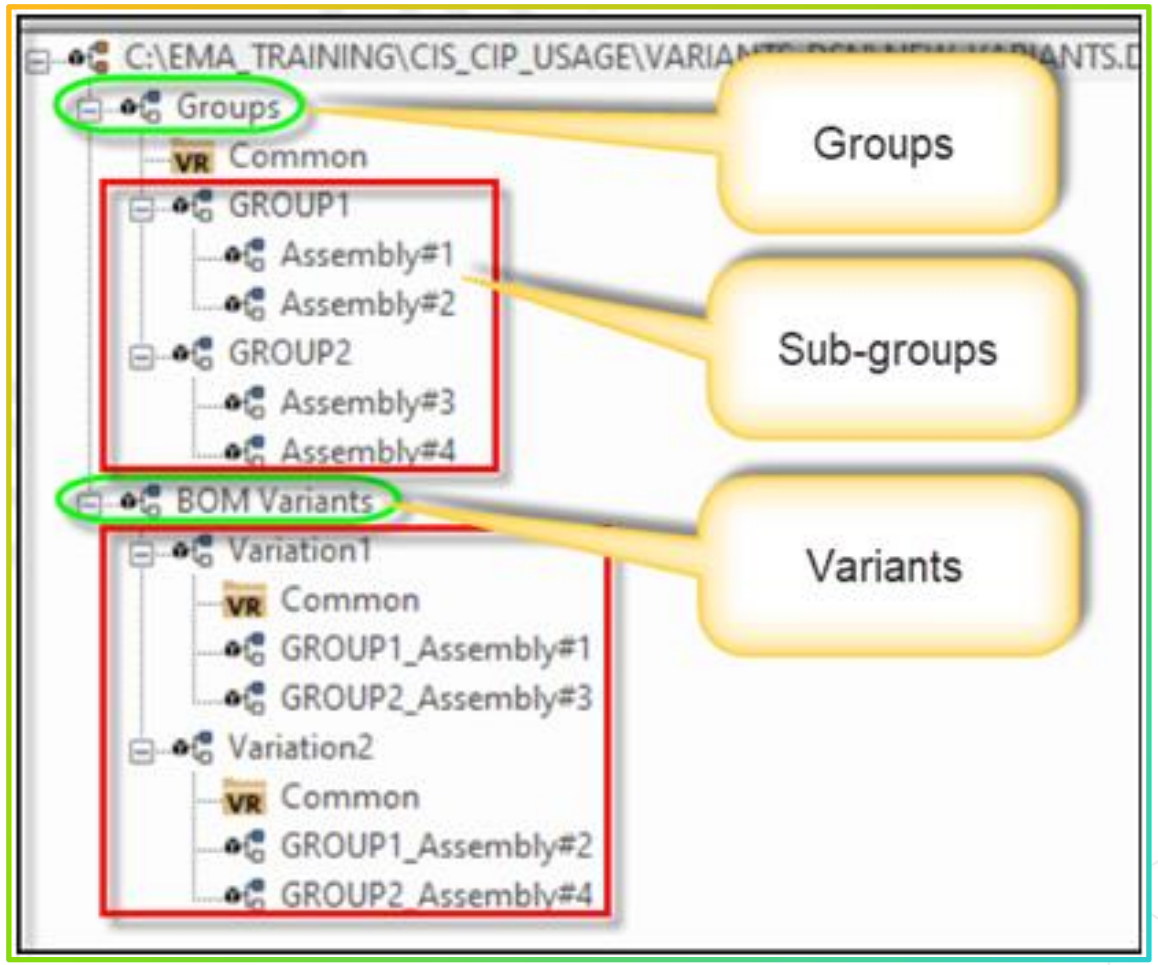
Variant Usage within OrCAD

- Integration with OrCAD CIS enables quick identification of high-risk parts and linking database part for easy swapping of variant high-risk parts



Overview of Variant Generation in OrCAD CIS

- Create the Groups
  - Create the Sub-groups (if any
  - Add selected parts to top level folder
  - Modify the parts of the Sub-groups (DNP, alternate value, etc.)
- Create the BOM Variants
  - Add the modified group(s) to the BOM Variant folder(s)



Poll Question #3

Demonstration

- Variant Generation in OrCAD Capture CIS
- Support for Variant parts in CIS
- Managing high-risk parts in CIP Compliance
- Leveraging EDM to manage variant revisions
  - Viewing variants in PDF within EDM

Question & Answer

- If we are unable to address your questions today or you have a specific issue please reach out to us so we can work with you on a solution.

- Thank you for attending!!

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