



PCB Design Variants

Why, When, & How

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Field Application Engineer

Poll Question #1

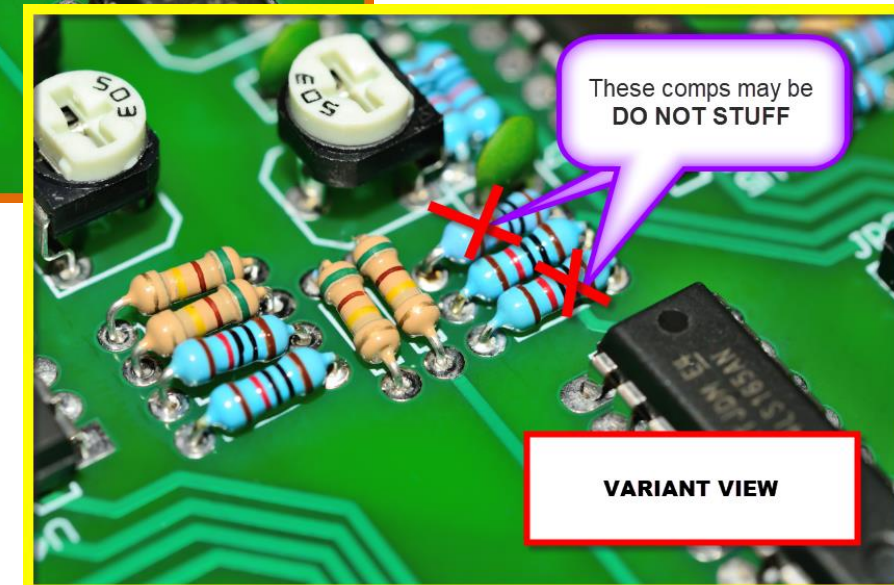
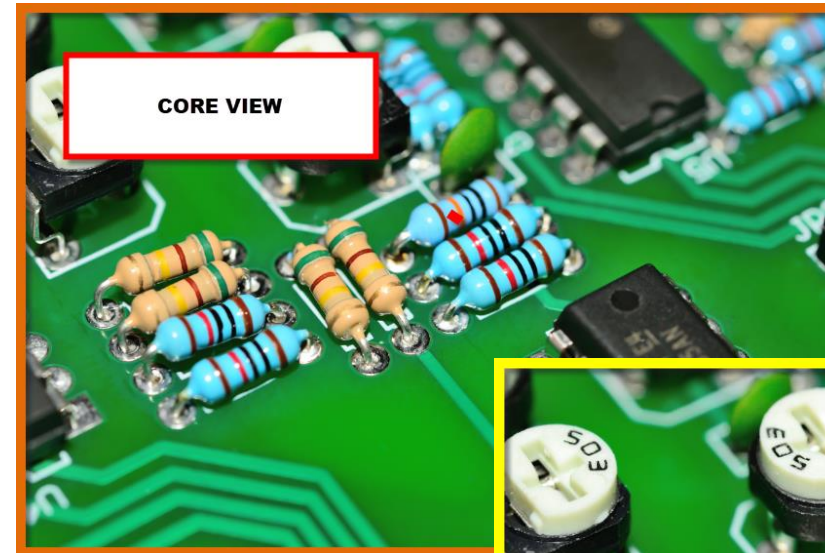
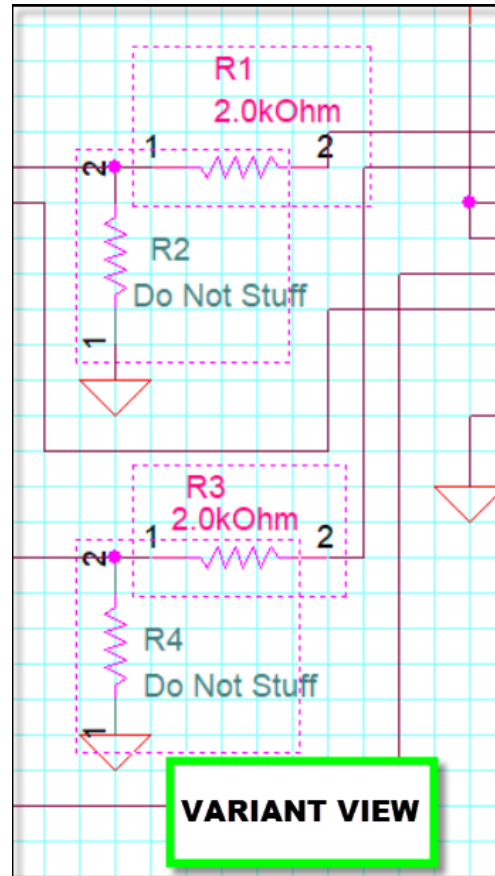
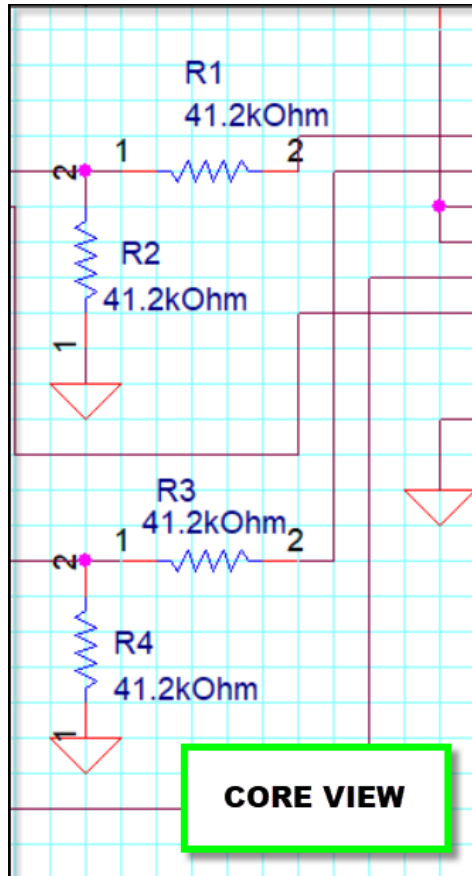


Today's Topics

- 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

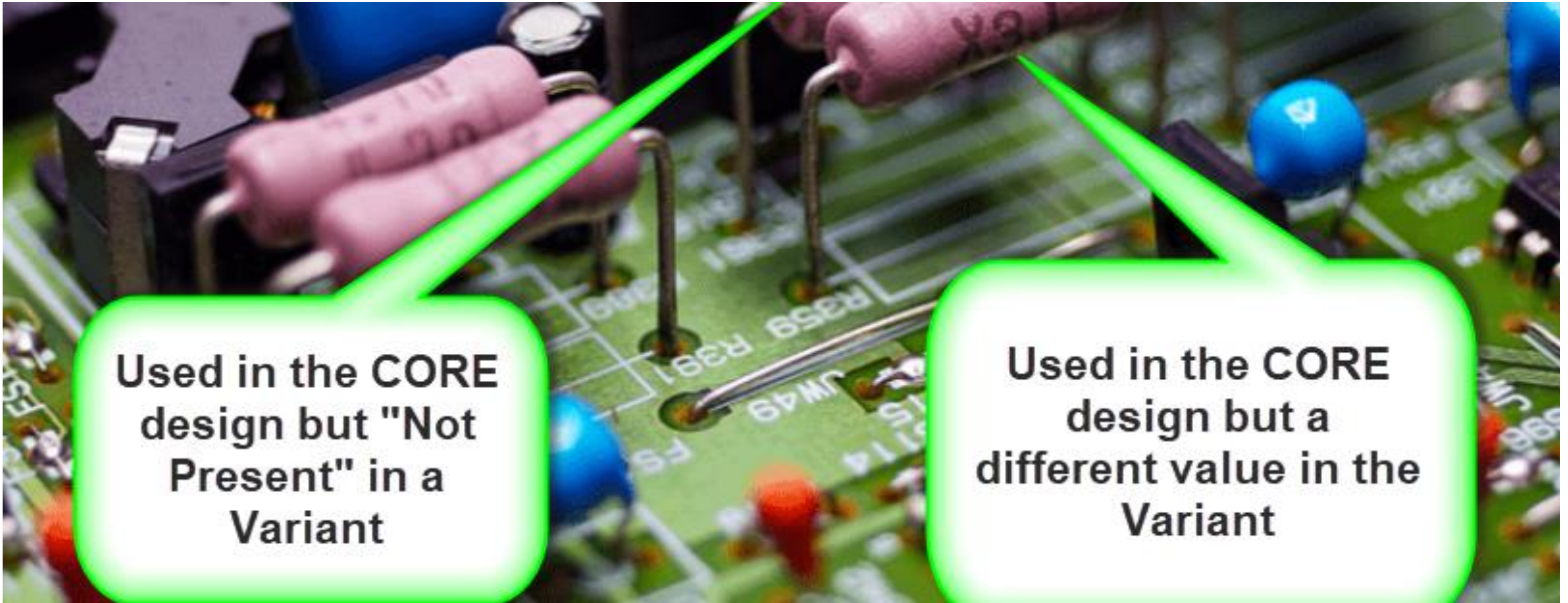
What are Variants?

- “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



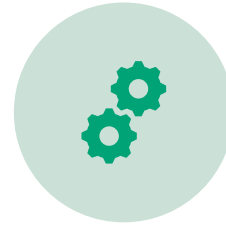
COST AND TIME TO
CREATE AND MANAGE
EACH VARIANT



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

<i>Highest risk:</i> Processors (MCUs, etc.)	<ul style="list-style-type: none">- Drop-in replacements only in the same part family- Very few alternatives from other vendors
<i>High risk:</i> ASICs with special functions	<ul style="list-style-type: none">- Many part replacements- Not all replacements are compatible- Some functions can be replaced by implementing in logic
<i>Moderate risk:</i> Power ICs and simple ICs	<ul style="list-style-type: none">- Many part replacements- Some are package-compatible
<i>Low risk:</i> Discrete semiconductors	<ul style="list-style-type: none">- Many part replacements- Many are package-compatible- Many are pin-compatible
<i>Lowest risk:</i> Passives	<ul style="list-style-type: none">- 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

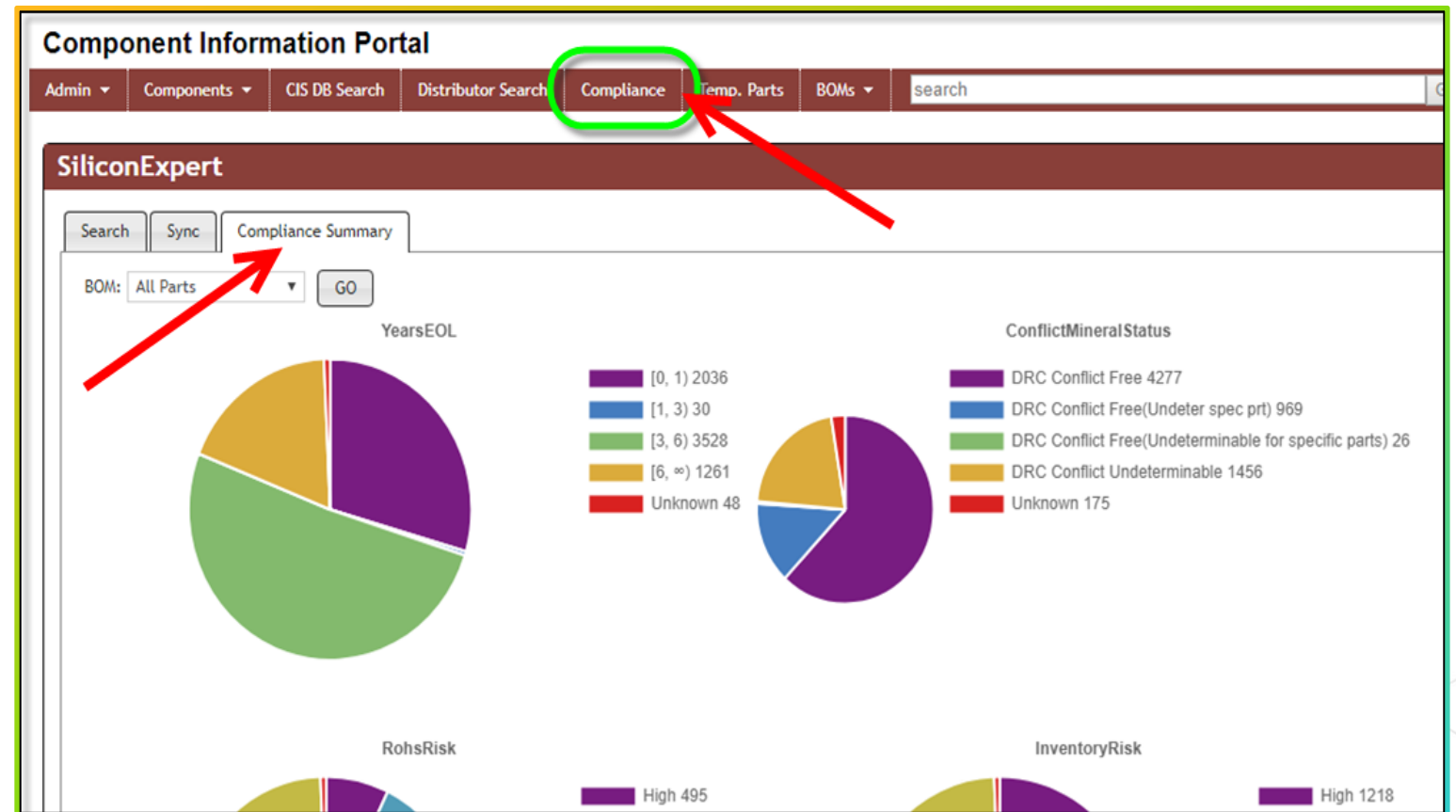
- **OrCAD EDM** (Engineering Data Management) can manage all OrCAD project documentation in a revision controlled and archived environment that supports variant revision management.

The screenshot displays the OrCAD Engineering Data Management (EDM) web interface. The top navigation bar includes tabs for Admin, Projects, Search, and Home. Below the navigation bar, there are icons for various actions and a dropdown menu showing 'Variant_Design_1'. The main content area shows a filter set to 'All' and a 'GO' button. Below the filter, the breadcrumb path is 'All Projects > WEBINARS > Variant_Design_1 : 1 (Active)'. The main table lists files and folders with columns for Name, Select, Last Check In Date, and Assigned Users. The files listed include Variant_Design_1, Allegro, Schematic, BOM, PDF, Variant_Design_1.pdf, Variant_Design_1_Variant1.pdf, Variant_Design_1_Variant2.pdf, VARIANT_DESIGN_1.DSN, VARIANT_DESIGN_1.opj, VARIANT_DESIGN_1.png, and VARIANT_DESIGN_1_0.DBK.

Name ^	Select	Last Check In Date	Assigned Users
Variant_Design_1	<input type="checkbox"/>		
Allegro	<input type="checkbox"/>		
Schematic	<input type="checkbox"/>		
BOM	<input type="checkbox"/>		
PDF	<input type="checkbox"/>		
Variant_Design_1.pdf	<input type="checkbox"/>	7/18/2023 4:15:06 PM	Admin, All Users
Variant_Design_1_Variant1.pdf	<input type="checkbox"/>	7/18/2023 4:15:06 PM	Admin, All Users
Variant_Design_1_Variant2.pdf	<input type="checkbox"/>	7/18/2023 4:15:06 PM	Admin, All Users
★ VARIANT_DESIGN_1.DSN	<input type="checkbox"/>	7/18/2023 4:15:06 PM	Admin, All Users
VARIANT_DESIGN_1.opj			
VARIANT_DESIGN_1.png			
VARIANT_DESIGN_1_0.DBK			

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

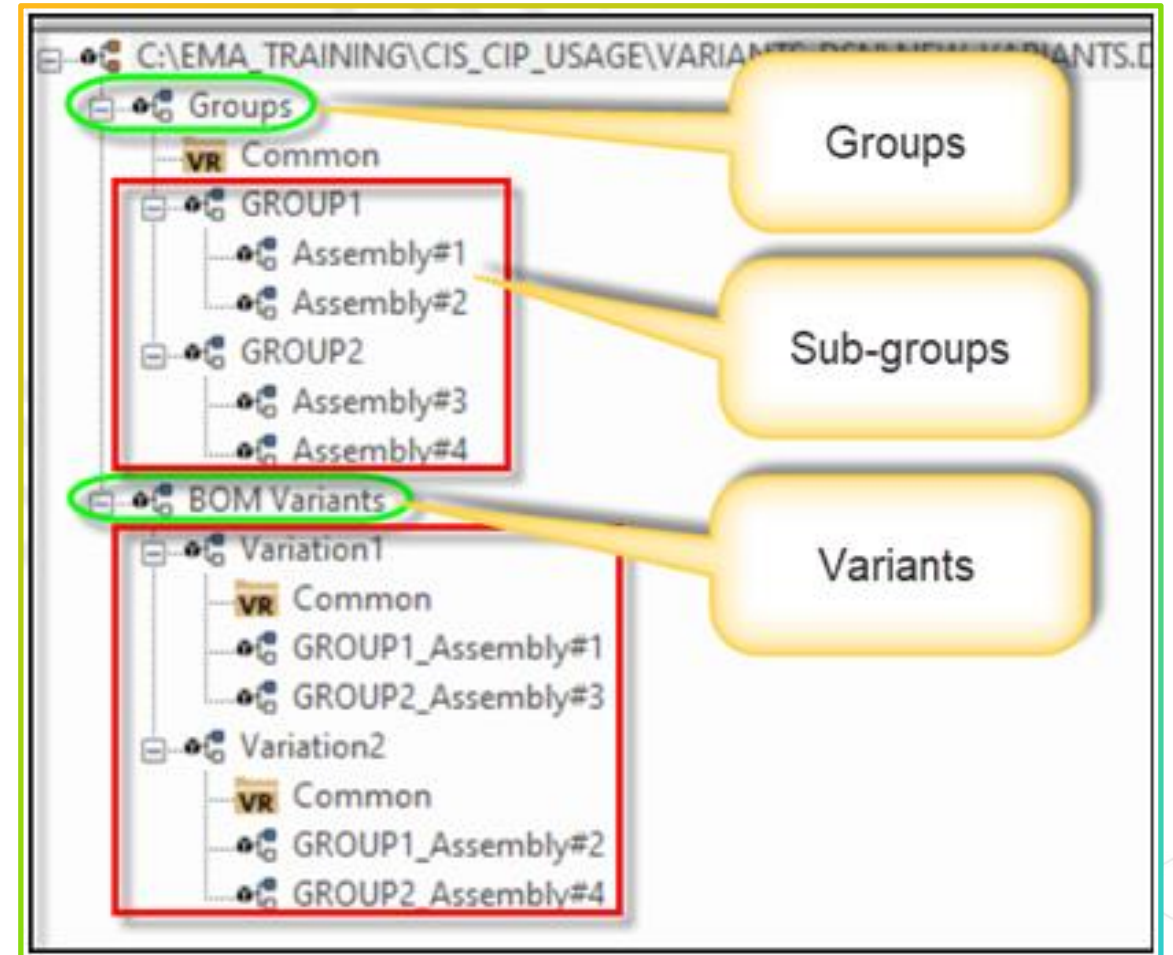
The screenshot displays the 'Component Information Portal' interface. The top navigation bar includes links for Admin, Components, CIS DB Search, Distributor Search, Compliance (highlighted with a green circle), Temp. Parts, and BOMs. Below this is the 'SiliconExpert' header. The main content area has tabs for Search, Sync, and Compliance Summary. The Search section shows a 'Search Type' dropdown set to 'Keyword' and a 'Search Text' field containing 'RN732ATTD1002B25'. The 'Search Results' tab is active, showing a 'Component View' dropdown set to 'Select View' and an 'Add' button. A table titled 'Key Risk Data (Gold Subscription)' is displayed, with a green box highlighting the 'Property' column. The table contains the following data:

Property	Value
RohsRisk	Low
MultiSourcingRisk	Low
InventoryRisk	Low
LifecycleRisk	HIGH
PredictedObsolescenceYear	
LifecycleStage	Obsolete
YearsEOL	

Red arrows point from the 'LifecycleRisk' and 'LifecycleStage' rows to their respective values, 'HIGH' and 'Obsolete'.

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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