



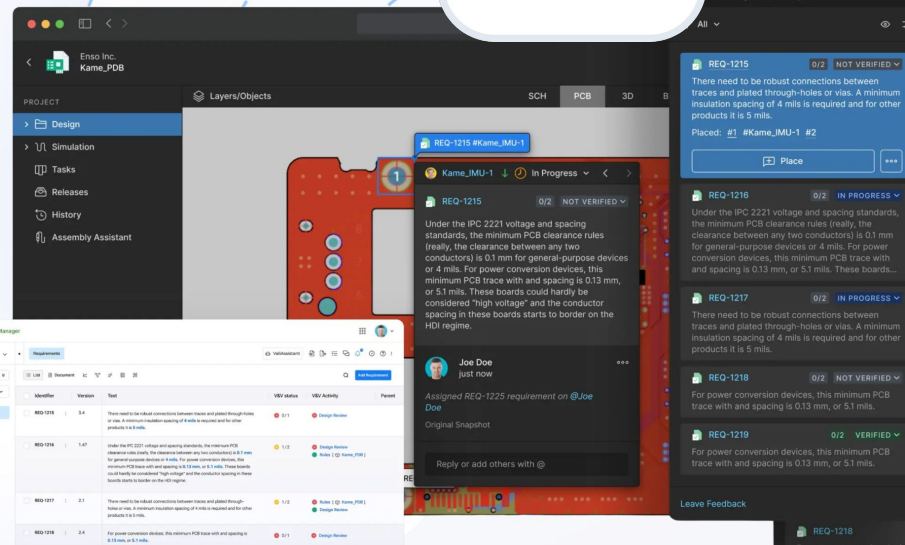
Modern Requirements Management for Electronics Hardware Teams

May 6 2025, Munich



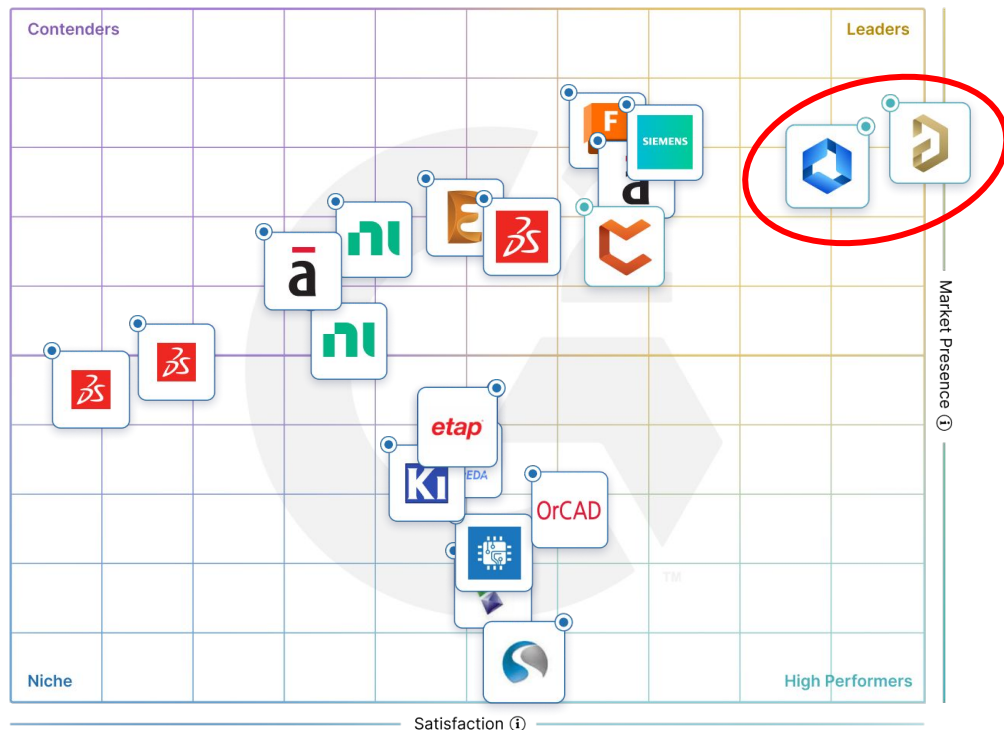
Alkaios Bournias Varotsis, Ph.D.
Sr. Product Marketing Manager at Altium

Identifier	Version	Text	WV status	WV Activity	Parent
REQ-1215	1.4	There need to be robust connections between traces and plated through-holes or vias. A minimum insulation spacing of 4 mils is required and for other products it is 5 mils.	0/2	Design Review	
REQ-1216	1.4	Under the IPC 2221 voltage and spacing standards, the minimum PCB clearance rules (really, the clearance between any two conductors) is 0.1 mm for general-purpose devices or 0.13 mm, or 5 mils. These boards could hardly be considered "high voltage" and the conductor spacing in these boards starts to border on the HDI regime.	0/2	Design Review	
REQ-1217	0.1	There need to be robust connections between traces and plated through-holes or vias. A minimum insulation spacing of 4 mils is required and for other products it is 5 mils.	0/2	Design Review	
REQ-1218	0.1	For power conversion devices, this minimum PCB trace with and spacing is 0.13 mm, or 5 mils.	0/2	Design Review	



Altium Is Recognized As The Leader In PCB Design

Altium®



Altium 365

By Altium

★★★★★ (358) 4.6 out of 5

🚀 1st Easiest To Use in PCB Design software

<https://www.g2.com/products/altium-altium-designer/reviews>



Altium Designer



★ Top Rated



Score 9.0 out of 10

45 Reviews and Ratings • PCB Design

<https://www.trustradius.com/products/altium-designer/reviews>



"We'll be using Altium Designer. It's proprietary software, but it has free educational licenses and it's the pretty much the **de-facto standard** in industry."

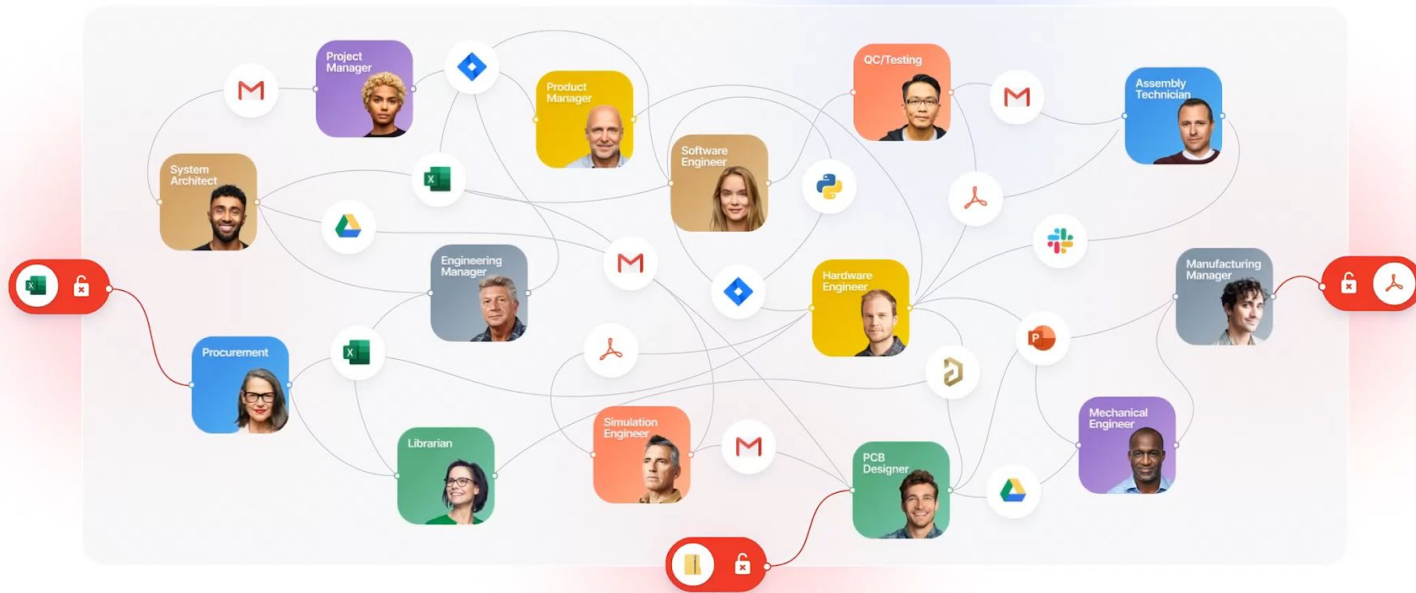
<https://pcb.mit.edu/syllabus/>

G2 Grid® for PCB Design, May, 2024

https://www.g2.com/categories/pcb-design?utf8=%E2%9C%93&selected_view=grid#grid

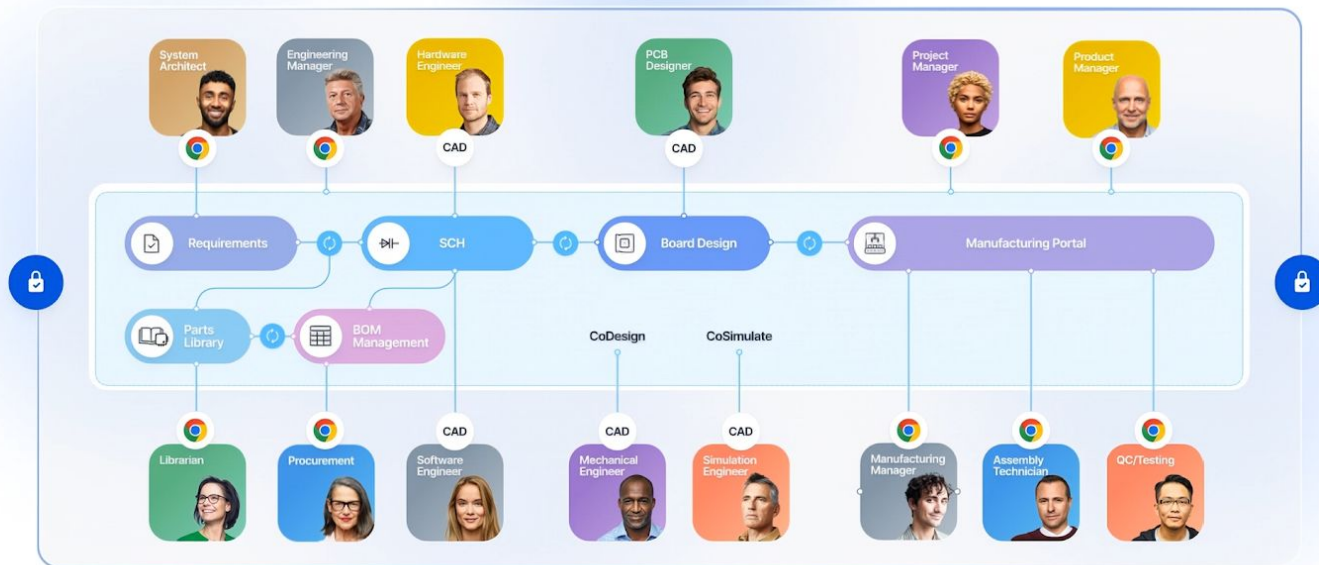
What's Altium 365?

Data silos and manual processes create inefficiencies in electronics development



What's Altium 365?

Share data and securely connect everyone involved
in electronics development

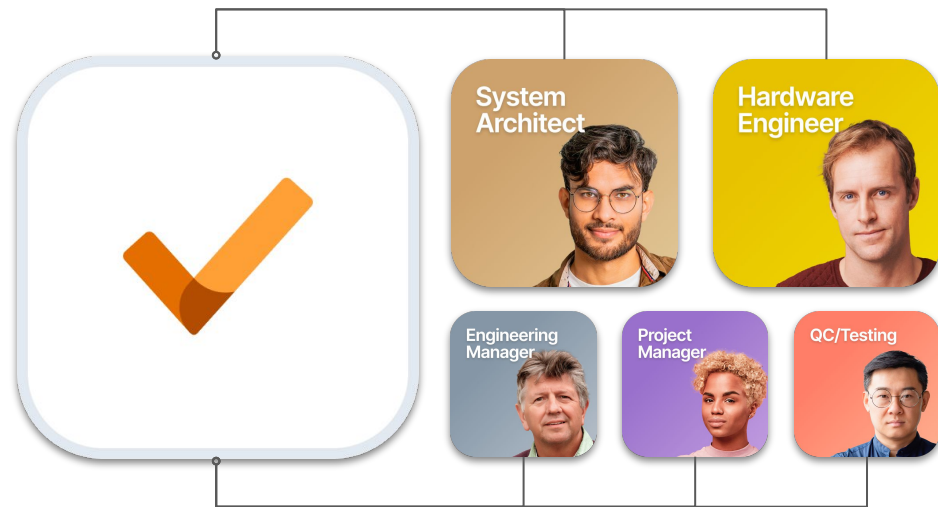


Altium 365 Requirements & Systems Portal

Collaborative requirements management software and systems engineering tools for agile electronic hardware teams.

Previously

VALISPACE



Enhance Communication

Minimize Rework with Always Up-to-Date Specifications



Increase Productivity

Create Clearer Requirements with AI-Assisted Automation



Manage Complexity

Manage Complex Projects with Full Requirements Traceability



ALTium
365

- AI-Powered • Scalable & Flexible • Cloud-Based in Altium 365 • Intuitive Interface
- Full Requirements Traceability & Change History • Live Collaboration

Development Tools Remain Disconnected...

More than
70%

of electronics teams still don't use a dedicated tool to manage requirement in their organization. *

* Source: Altium survey with 1000+ respondents, 2024.

The Cost Data Silos & Manual Processes



\$400K+

per year for a team of 6 engineers **



~159 hours

spent on administrative tasks per engineer/year **



2.8 re-spins

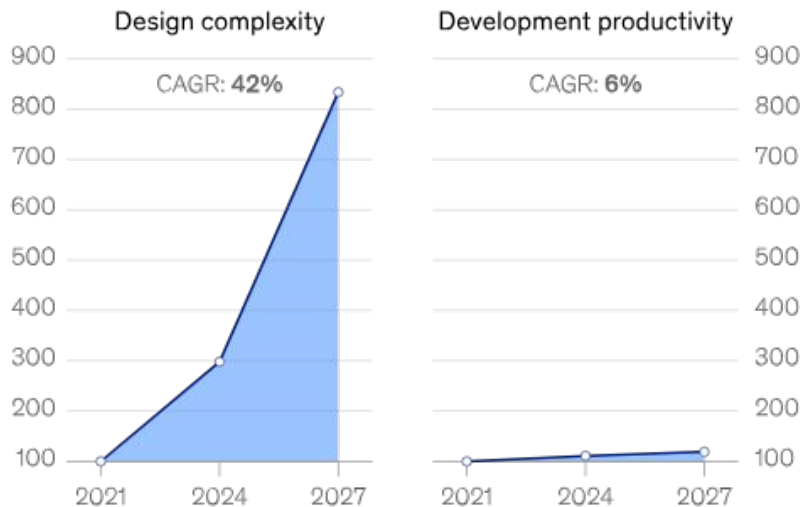
on average per PCB board per project ***

** Source: Study by Forrester Consulting on behalf of Altium, 2023

*** Source: Lifecycle Insights, 2018

...While the Market Demands Higher Productivity

Design complexity **increases rapidly** but development productivity **remains flat** *



* Source: McKinsey & Company, Software-defined hardware in the age of AI, 2025

Cost to fix requirements errors **skyrockets** in later stages of NDP **

Relative Cost of Resolving Requirement Errors for Hardware + Software Products

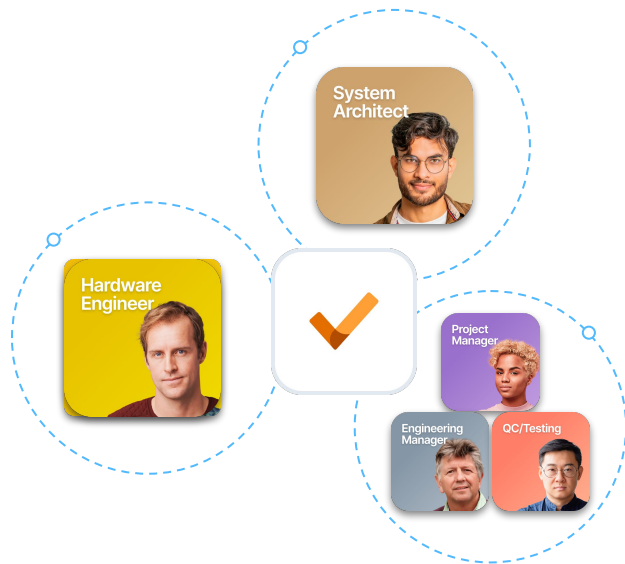
Requirements Definition	1x
Design Phase	3-8x
Physical Prototyping & Build Phase	7-16x
Testing & Integration Phase	21-78x
Operation Phase	29-1500x

** Source: NASA Johnson Space Center, Error Cost Escalation Through the Project Life Cycle, 2004

Why Access to Live Requirements is Essential?

Enhanced **collaboration** between systems and hardware engineers

- ✓ reduce risk of rework
- ✓ eliminates communication barriers
- ✓ expedites time-to-market

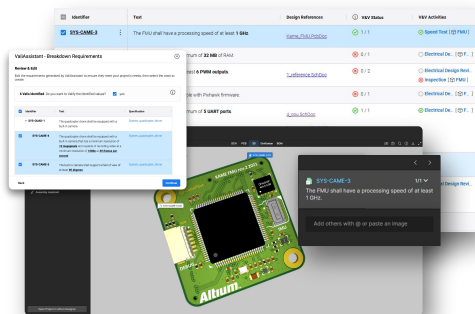


Main Challenges of Electronics HW Teams

- ⚠ Senior HW engineers create reqs — **not SEs or ReqEs**
- ⚠ Teams need **guidance** for req creation & V&V planning
- ⚠ **Unclear reqs** → increased risk, scope creep, slower quotes
- ⚠ **Requirement handoffs** disrupt traceability & project tracking
- ⚠ **Poor traceability** → project delays, regulatory clearance complications

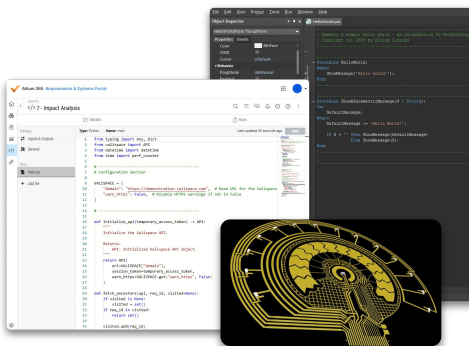
Key Use Cases in Electronics *

Use Case #1 Reqs for EE Teams



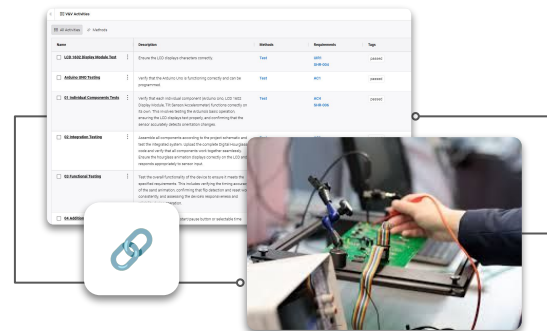
From manual tracking
to live requirements
monitoring

Use Case #2 Scripting Automation



Verified requirements
and design generation
through scripting

Use Case #3 API-enabled Tools



Open API streams
V&V activities, test
results, and CAM data

* Anonymized and inspired by real customer success stories.

Use Case: Requirements for EE Teams

From manual tracking to live, traceable requirements monitoring for a global medical device EMS.

Main Challenges

- **Ad-hoc monitoring:** Jira + Excel to manage multiple parallel projects
- **Dev blind spots:** No project progress tracking or insights
- **Security risk:** Customers needed complete data separation

Why They Changed

- **Real-time traceability:** reqs ↔ designs
- **Secure collaboration:** no project cross-talk
- **Centralized management:** reqs, design reviews, V&V...

About the Customer

Design center in global EMS specializing in Medical Devices. Act as extension of customers' R&D team.

The screenshot displays the ValiAssistant - Breakdown Requirements interface. It features a table with columns: Identifier, Text, Design References, V&V Status, and V&V Activities. The table lists requirements for a quadcopter drone, including processing speed, RAM, camera resolution, and UART ports. A 'Review & Edit' dialog box is open, showing a list of identified requirements with checkboxes for selection. A 'Continue' button is visible at the bottom of the dialog. In the background, a circuit board labeled 'KAME FMU rev.2 2021' and 'Altium' is shown, along with a smaller window displaying the requirement 'SYS-CAME-3' and its V&V status '1/1'.

Identifier	Text	Design References	V&V Status	V&V Activities
☒ SYS-CAME-3	The FMU shall have a processing speed of at least 1 GHz.	Kame_FMUCbDoc	1 / 1	Speed Test [FMU]
☒ SYS-QUAD-1	The quadcopter drone shall be equipped with a built-in camera	System_quadcopter_drone	0 / 1	Electrical De. [F.]
☒ SYS-CAME-4	The quadcopter drone shall be equipped with a built-in camera that has a minimum resolution of 12 megapixels and capable of recording video at a minimum resolution of 1080p at 30 frames per second	System_quadcopter_drone	0 / 2	Electrical Design Revi... Inspection [FMU]
☒ SYS-CAME-5	The built-in camera shall support a field of view of at least 90 degrees	System_quadcopter_drone	0 / 1	Electrical De. [F.]
☒ SYS-QUAD-2	32 MB of RAM.	1_reference.SchDoc	0 / 1	Electrical Design Revi...
☒ SYS-QUAD-3	WM outputs	1_reference.SchDoc	0 / 2	Inspection [FMU]
☒ SYS-QUAD-4	PuHawk firmware.	1_reference.SchDoc	0 / 1	Electrical De. [F.]
☒ SYS-QUAD-5	5 UART ports.	4_uart.SchDoc 6_uart_esc_10c.SchDoc 6_uart_esc_10c.SchDoc	1 / 1	Electrical De. [F.]

Use Case: Requirements for EE Teams



Process Overview with Requirements & Systems Portal and Altium 365

Step #1



Import & Breakdown



Step #2



Link & Design



Step #3



Review & Verify

From static docs to structured requirements in electronic specs

- Import system reqs from external RMS
- Break down into EE specs using the **AI Assistant** ✨
(750+ reqs per board)

Establish traceability from requirements to design implementation

- "Place Requirements" into schematics
- Use filters to track reqs coverage across PCBs

Use structured checklists to enforce Validation & Verification procedures

- Formal Design Reviews linked to reqs
- Documented to track compliance

Use Case: Requirements for EE Teams

Value to Customer



Full Traceability

between requirements,
systems, designs, and reviews



750+ Reqs in Minutes

using the AI assistant to
break down requirements



70% Faster Reviews

replacing ad-hoc checks
across 100+ projects

"I sit with one engineer, hit Generate Requirements [with the AI Assistant], adjust to our needs, and that's it."



HW Development
Manager

"Traceability is very important! We need to know if every requirement is implement and, if they change, where is the impact of that change."



Dir. System
Engineering

Use Case: Requirements Automation with Scripting

Advanced

Scripts in RSP and Altium Designer enable verified electronic design generation, eliminating costly reprints.

Main Challenge: Manual reviews → stress on small team → frequent oversights → costly reprints

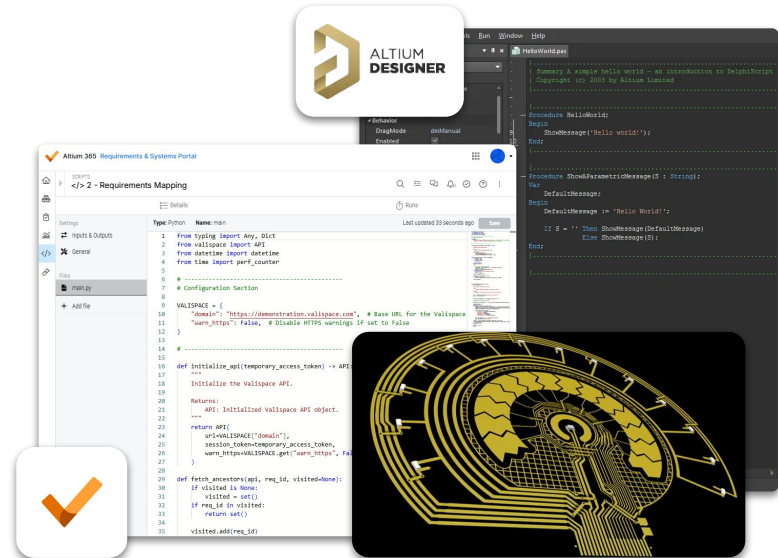
Workflow Overview

- **RSP script:** customer reqs → electrical specs
- **Altium script:** generates designs for prototype & production
- **Certificate of Conformity:** generated after req verification

Value to Customer: Fewer mistakes. Lower cognitive load. Higher confidence by QA & customers.

About the Customer

Contract manufacturer of printed-electronics user interfaces. Delivers 3-5 custom products a month.



"The tool saved us a lot of downtime in production. We basically got our value back in a few months."

Project Manager

Use Case: Custom Integrations with Open API

Advanced

Open API streams V&V procedures, test results, and CAM data, giving test engineers a tap-to-pass tablet app.

Main Challenge: Bidirectional connection of V&V data between req software and shop-floor testing.

Workflow Overview

- **API import:** for customer & internal reqs
- **V&V activities:** defined in RSP, pushed to app via API
- **Tablet app:** pulls test results & CAM data to req software

Value to Customer: Simple interface. Faster bench testing. Fewer data input errors. Clean audit trail.

About the Customer

Mobility-tech SME. Develops safety-critical hardware & software under ISO 26262.

The image shows a screenshot of a software interface titled "V&V Activities" with a table of activities. A blue link icon is overlaid on the right side of the screenshot. Below the screenshot, there is a white box with an orange checkmark and the text "REST API" and "Python API". To the right of this box is a photo of a person's hands working on a green circuit board with various components and wires.

Name	Description	Methods	Requirements	Tags
☐ LCD_1602_Display_Module_Test	Ensure the LCD displays characters correctly.	Test	U01 SWH-004	passed
☐ Arduino_Uno_Testing	Verify that the Arduino Uno is functioning correctly and can be programmed.	Test	AC1	passed
☐ 01_Individual_Components_Test	Verify that each individual component (Arduino Uno, LCD 1602 Display Module, Tilt Sensor/Accelerometer) functions correctly on its own. This involves testing the Arduino basic operation, ensuring the LCD displays test properly, and confirming that the sensor accurately detects orientation changes.	Test	AC4 SWH-004	passed
☐ 02_Integration_Testing	Assemble all components according to the project schematic and test the integrated system. Upload the compiled Digital Hourglass code and verify that all components work together seamlessly. Ensure the hourglass animation displays correctly on the LCD and responds appropriately to sensor input.			
☐ 03_Functional_Testing	Test the overall functionality of the device to ensure it meets the specified requirements. This includes verifying the timing accuracy of the sand animation, confirming that flip detection and reset mechanisms are working, and ensuring the device's responsiveness and			
☐ 04_...	...			

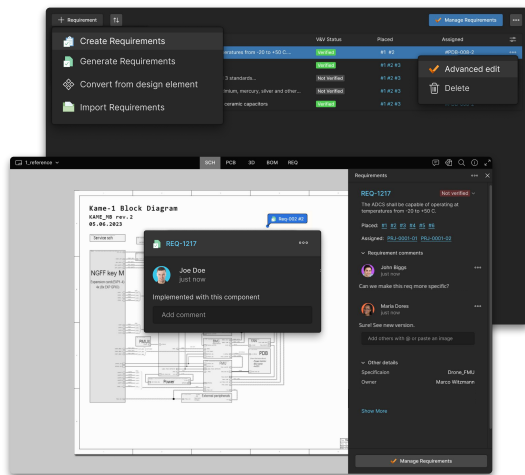
"Our app uses the API to import reqs, test results, and data on the fly—everything just works."

” Dir. of Engineering

Addressing Challenges in Product Development...

Coming Soon...

Downstream of Requirements



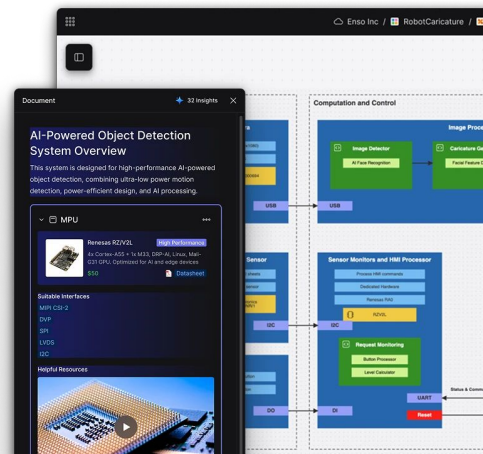
Requirements in Altium

Start using requirements while performing daily design tasks.



PCB Designers

Upstream of Requirements



Altium Discover

Explore complete solutions early in electronic system design.



System Architects

Why Requirements in Altium are Essential

Coming Soon...

Our Motivation

Make requirements accessible to the 70% of engineers that don't use a dedicated requirements tool

Current Challenges

- ⚠️ **Setup overhead** before linking to designs
- ⚠️ **Extra licensing** to unlock requirements in Altium
- ⚠️ Import **requires** structured requirements tables

Our Solutions

- ✓ Requirements **native** in Altium projects
- ✓ Available with **Altium 365** at no extra cost
- ✓ **AI-Assisted import** from docs, PDFs, and spreadsheets

Overview: Requirements in Altium

Coming Soon...

PCB Designers start using requirements while performing daily design tasks

Native Requirements in all PCB Designs

- View, edit, and verify requirements
- Comment, link, and place on designs
- Changes tracked in Design History

Already available with



Requirement

- Create Requirements
- Generate Requirements
- Convert from design element
- Import Requirements

V&V Status	Placed	Assigned
Verified	#1 #2	#PDB-008-2
Verified	#1 #2 #3	
Not Verified	#1 #2 #3	
Not Verified	#1 #2 #3	
Verified	#1 #2 #3	

Advanced edit

Delete

Requirements

REQ-1217 Not verified

The ADCS shall be capable of operating at temperatures from -20 to +50 C.

Placed: #1 #2 #3 #4 #5 #6

Assigned: PRJ-0001-01 PRJ-0001-02

Requirement comments

John Biggs
Can we make this req more specific?
We should make the require more concrete no?

Maria Does
Sure! See new version.
sure, new version available

Add others with @ or paste an image

Other details

Specification Drone_FMU

Ipsium
Show More

Manage Requirements

Coming soon in



and



ALTUM
365

Overview: Requirements in Altium

Coming Soon...

PCB Designers start using requirements while performing daily design tasks

Native Requirements in all PCB Designs

- View, edit, and verify requirements
- Comment, link, and place on designs
- Changes tracked in Design History

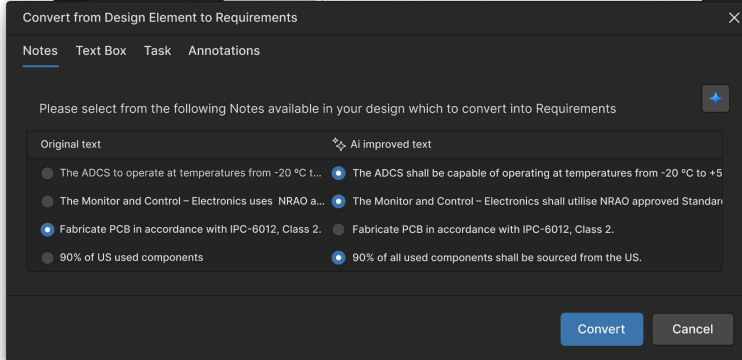
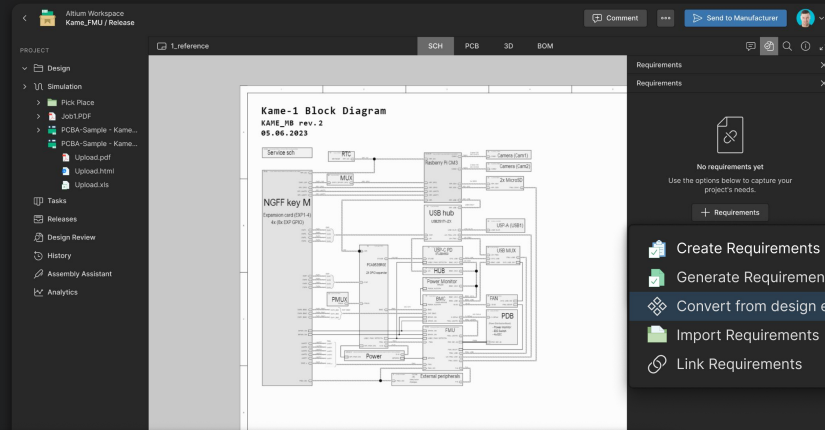
Already available with



Multiple Ways to Import

- Create Requirements
- Convert from Design Element
- **Generate Requirement**
- **Import Requirements**

Altium AI



Coming soon in



and

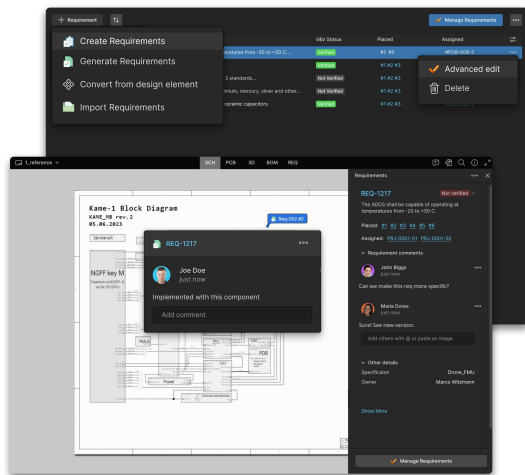


ALTium
365

Addressing Challenges in Product Development...

Coming Soon...

Downstream of Requirements



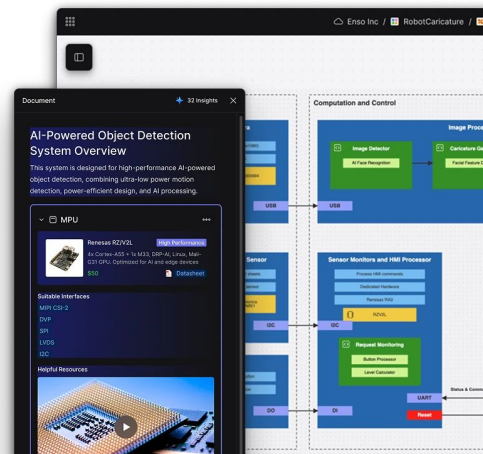
Requirements in Altium

Start using requirements while performing daily design tasks.



PCB Designers

Upstream of Requirements



Altium Discover

Explore complete solutions early in electronic system design.



System Architects

Why Altium Discover is Essential

Coming Soon...

Our Motivation

Remove bottlenecks in early phases of electronic product development and solution discovery

Current Challenges

- ⚠ **Disconnected tools** in early system design
- ⚠ **Tedious component search**
→ datasheet overload
- ⚠ **Late** supplier engagement
+ **slow** time-to-prototype

Our Solutions

- ✓ **Reference designs** with smart block diagrams
- ✓ AI-assisted **component suggestions**
- ✓ **In-app** supplier Q&A
+ **solution-specific** eval kits

Workflow Overview: Altium Discover

Coming Soon...

Start with a project idea.
Explore solutions early.
Design the system visually.

Solutions Explorer

- Search for pre-built reference designs
- Integrated into Octopart

Octopart

AI enabled camera



AI-Powered Agricultural Vision System
Updated 21/08/2023 AVNET



Trail Camera with AI Object Detection
NEW Added 21/09/2024 RENESAS



Smart Surveillance System, PoE, WiFi, 5G
Updated 21/09/2022 Fairchild



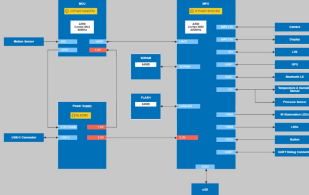
Trail Camera with AI Object Detection
NEW Updated 21/09/2024 RENESAS

Trail Camera with AI Object Detection

NEW Added 21/09/2024 RENESAS

The system employs the HS3001 and ZMC04410 sensors for temperature, humidity, and gas sensing, controls a color LCD through the Synergy S509, offers a system-level solution with source code, and ensures a secure cloud connection via MQTT-TLS.

Open



Solution Properties

Summary	Compliance	Popular Extensions
MCU: ST Series - Low Power	Conflict Mineral Statement	Air Quality Sensor
Power Consumption: 750mW	RoHS	AI Vision Camera
Available Interfaces: PC, UART, SPI, USB, CAN	REACH	Humidity Sensor
Operating Temperatures (C): -50 to +60	WEEE	Display
Price: \$230		Proximity Sensor
		Light Sensor

Documents +

Software +

Related Applications +

Support +

Workflow Overview: Altium Discover

Coming Soon...

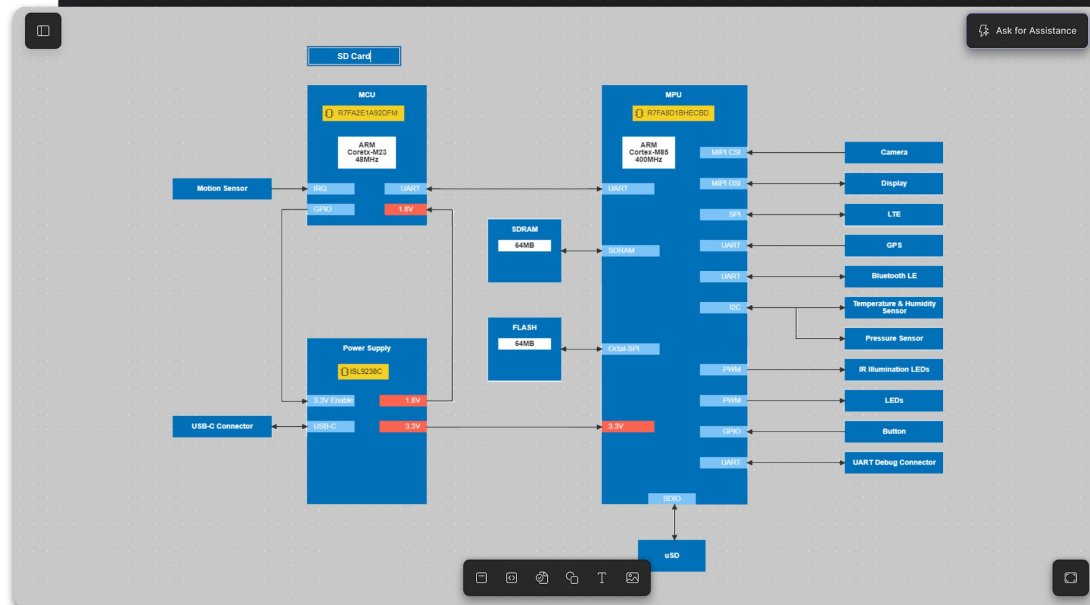
Start with a project idea.
Explore solutions early.
Design the system visually.

Solutions Explorer

- Search for pre-built reference designs
- Integrated into Octopart

Electronic System Design

- Create high-level block diagrams
- Fully customizable



Workflow Overview: Altium Discover

Coming Soon...

Start with a project idea.
Explore solutions early.
Design the system visually.

Solutions Explorer

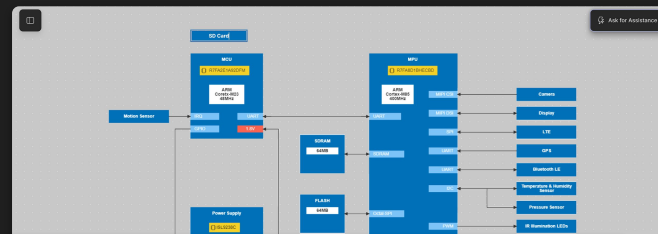
- Search for pre-built reference designs
- Integrated into Octopart

Electronic System Design

- Create high-level block diagrams
- Fully customizable

AI-Assisted Suggestions

- Smart component recommendations
- Based on system context



1 Select a Category			
	Balance ⓘ	Power Efficiency ⓘ	High Performance ⓘ
	☐ NXP i.MX 8M	☐ Renesas RZ	☐ AMD Xilinx Zynq UltraScale+
Processor Architecture	Quad-core Cortex-A53	Dual-core Cortex-A55 + Cortex-M33	Quad-core ARM Cortex-A53 + FPGA
AI Acceleration	2.3 TOPS NPU	DRP-AI (0.5 TOPS) AI accelerator	FPGA-based AI acceleration
Power Consumption - Idle	~6.7 mW in deep sleep mode	~5 mW in deep standby mode	Variable (depends on FPGA configuration)
Power Consumption - Active	~2.3W (with AI tasks)	~1.1.5W (with AI tasks)	Configurable, typically 3.5W for AI-intensive tasks
Low-Power Modes	Deep sleep and standby modes	Multiple low-power modes with DRP-AI standby	Dynamic power management for FPGA and ARM cores
Camera Support	MIPI-CSI	MIPI-CSI	MIPI-CSI (via FPGA)
Display Support	MIPI-DSI	MIPI-DSI	HDMI, MIPI-DSI
Memory/Storage	Up to 4GB LPDDR4	Up to 2GB DDR3L	Configurable, supports DDR4
Price Range	\$	\$	\$\$\$
+ Add comparison criteria			
2 Select a Component			

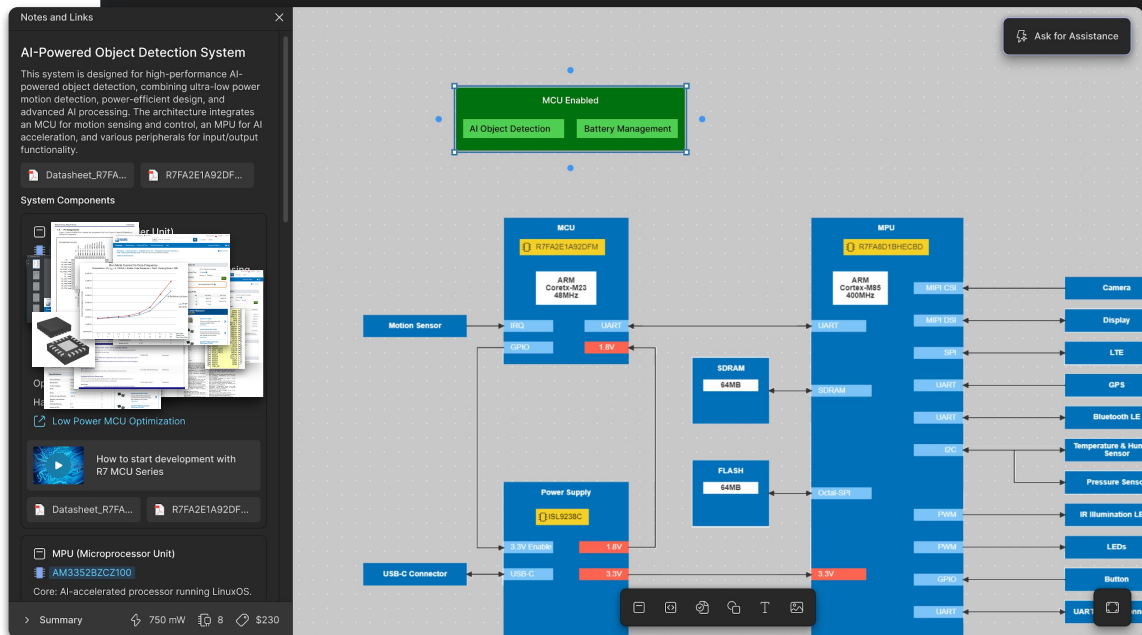
Workflow Overview: Altium Discover

Coming Soon...

Find documentation. Collaborate directly with suppliers. Order custom evaluation kits.

Automatically Gathered Documentation

- Tailored to your specific solution
- Dynamic side panel



Workflow Overview: Altium Discover

Coming Soon...

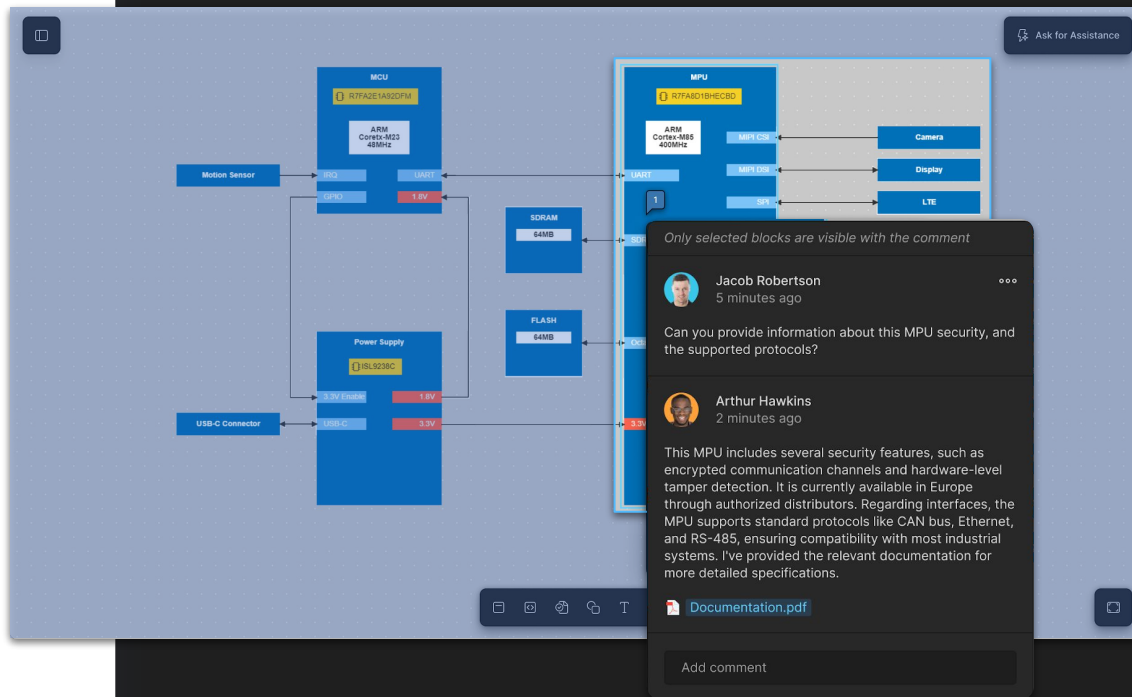
Find documentation. Collaborate directly with suppliers. Order custom evaluation kits.

Automatically Gathered Documentation

- Tailored to your specific solution
- Dynamic side panel

Context-Rich Supplier Engagement

- Ask technical questions in-context
- Share only relevant design blocks



Workflow Overview: Altium Discover

Coming Soon...

Find documentation. Collaborate directly with suppliers. Order custom evaluation kits.

Automatically Gathered Documentation

- Tailored to your specific solution
- Dynamic side panel

Context-Rich Supplier Engagement

- Ask technical questions in-context
- Share only relevant design blocks

Solution-Specific Evaluation Kits

- Pre-configured with your architecture
- Speeds time to hands-on testing

The screenshot displays the Altium Discover interface for a project titled "AI-Powered Object Detection System". The interface is divided into several sections:

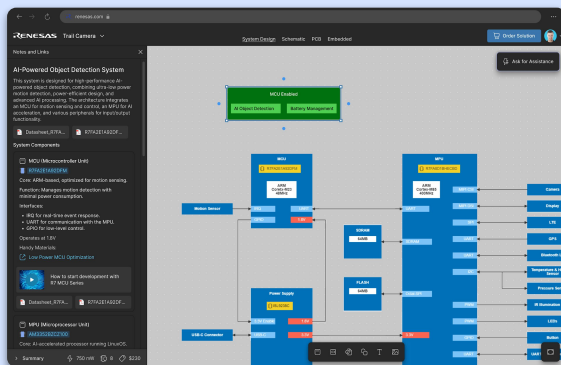
- Project Overview:** A dark-themed header with a "Back to Design" link. It features the project title and a description: "This system is designed for high-performance AI-powered object detection, combining ultra-low power motion detection, efficient design, and advanced AI processing. The architecture integrates an MCU for motion sensing and control, an MPU acceleration, and various peripherals for input/output functionality." Below this, a row of icons represents system specifications: 750 mW, 8, I²C, UART, SPI, USB, CAN, and a temperature range of -20 to +50 °C.
- Complete Solution:** A blue bar indicating the kit includes 5 items (main board, display module, power module, sensor module, cabling and connectors), documentation, tailored software, and references. A price tag of \$230 is shown.
- Package Contents:** A section titled "This Package Contains Everything You Need to Run Your Application Instantly, Right Out of the Box" showing four components: Evaluation Kit RABD1-HMI, Humidity Sensor US082-2, Camera Board, and Battery Charging Board.
- Design and Documentation:** A detailed block diagram on the right side of the interface. It illustrates the system architecture, including a "Solution Specification" block at the top, a "Power Supply" block, and various peripheral modules like "Motion Sensor", "Camera Board", "Display", "MPU", "MCU", "HMI", "Battery Pack", and "USB". The diagram shows the interconnections between these components, with labels for specific pins and data flows.

Linking Systems, HW & Embedded Software

Coming Soon...

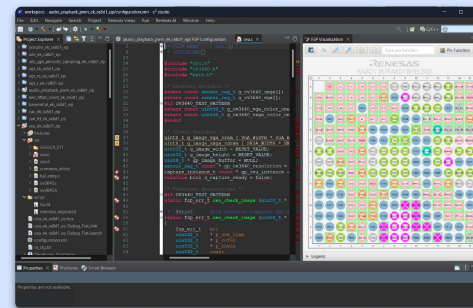
Create a continuous thread from systems to PCB design and embedded software development.

Electronic System Design

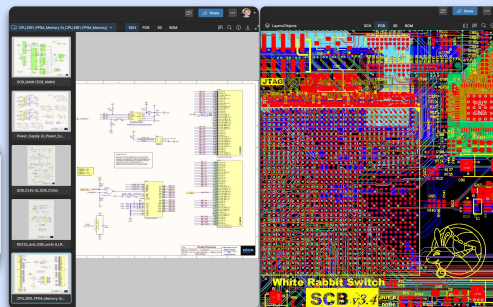


...

Embedded Software



PCB Design



ALTium
DESIGNER

From Requirements to Results

Requirements in design have compounding benefits throughout product development



Traceability Reduces Risk

ensuring complete
requirements coverage from
systems down to specific
design elements



Collaboration Drives Performance

enabling teams to align on
the best possible
requirements and deliver
first-time success



Automation Unlocks Productivity

eliminating repetitive
tasks, reducing errors, and
accelerating design cycles
in lean teams

Tell Us What You Think!

Visit Us at Stand G8

LösungsaREna:

Tue @ 16:45 & Wed @ 13:30



Alkaios Bournias Varotsis, Ph.D.
Sr. Product Marketing Manager at Altium
alkaios.bourniasvarotsis@altium.com

Questions?



Scan to Learn More