AI Agent:

The Next Stop for Electronic Design Efficiency Revolution

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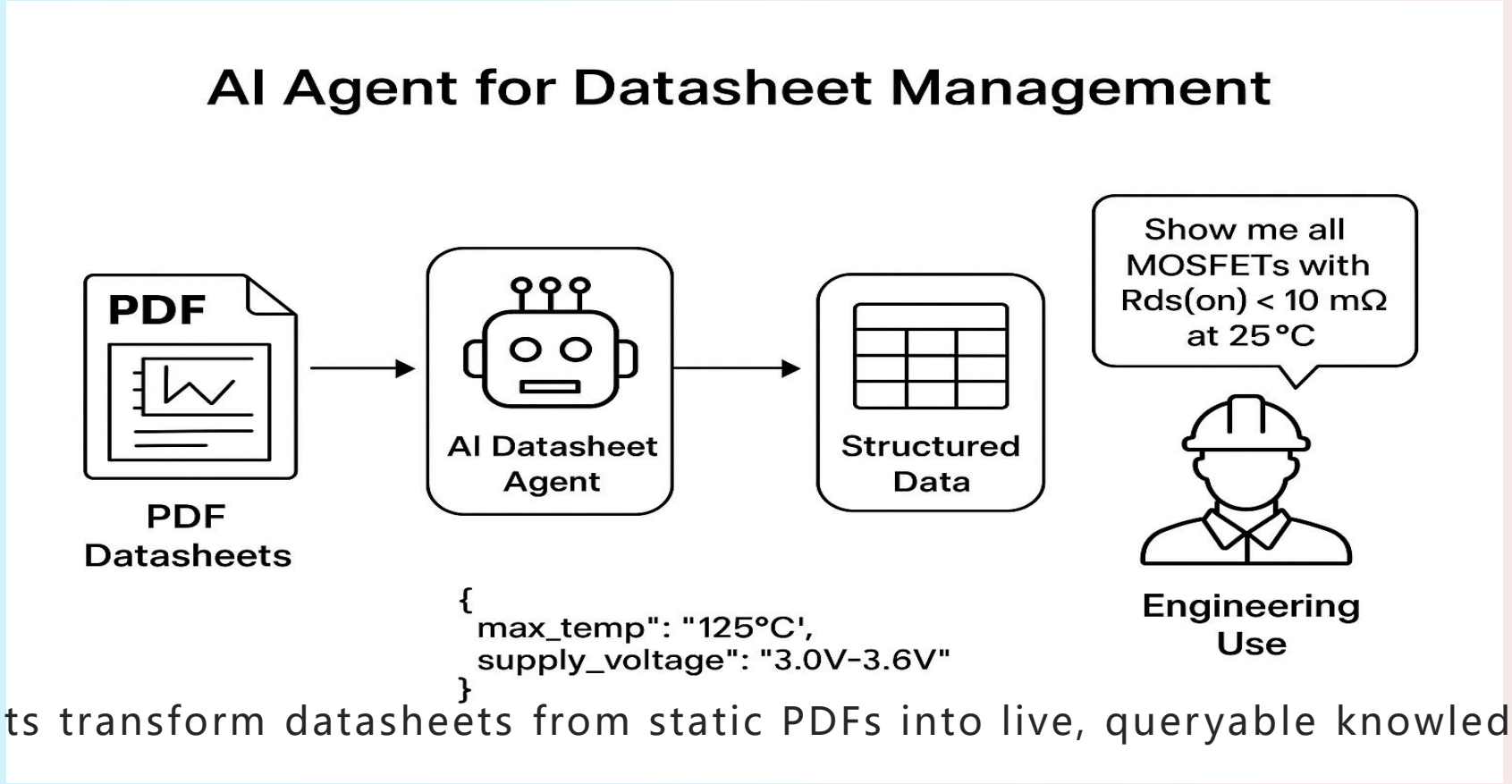
Why we need AI Agent in Datasheet Management ?



AI Agents transform datasheets from static PDFs into live, queryable knowledge systems.

PDF to Ontology-Based Content Modeling

1) **Classes:** Define microcontroller, processor, memory, package, pin, electrical parameters;

2) **Object Properties:** Describe relationships between components (e.g., hasProcessor, hasPin);

3) **Data Properties:** Store specific values (e.g., voltage range,Flash capacity, pin name).

Automatic Ontology Construction

ads124s08.
pdf

Class Hierarchy(类层次结构)

```
├── Application (应用类)
│   ├── Application_IdustrialAnalogInput
│   └── Application_RTDMeasurement
├── CoreDevice (核心器件类)
│   ├── CoreDevice_ADS124S06
│   └── CoreDevice_ADS124S08
├── FunctionalModule (功能模块类)
│   ├── FunctionalModule_DeltaSigmaADC
│   ├── FunctionalModule_IDAC
│   ├── FunctionalModule_PGA
│   └── FunctionalModule_Reference
├── OrderablePart (可订购型号类)
│   ├── OrderablePart_ADS124S06IPBS
│   ├── OrderablePart_ADS124S08IPBS
│   └── OrderablePart_ADS124S08IRHBR
├── Package (封装类)
│   ├── Package_TQFP_PBS
│   └── Package_VQFN_RHB
└── Pin (管脚类)
    ├── Pin_AnalogInput
    ├── Pin_AnalogOutput
    ├── Pin_DigitalControl
    ├── Pin_GPIO
    └── Pin_Power
```

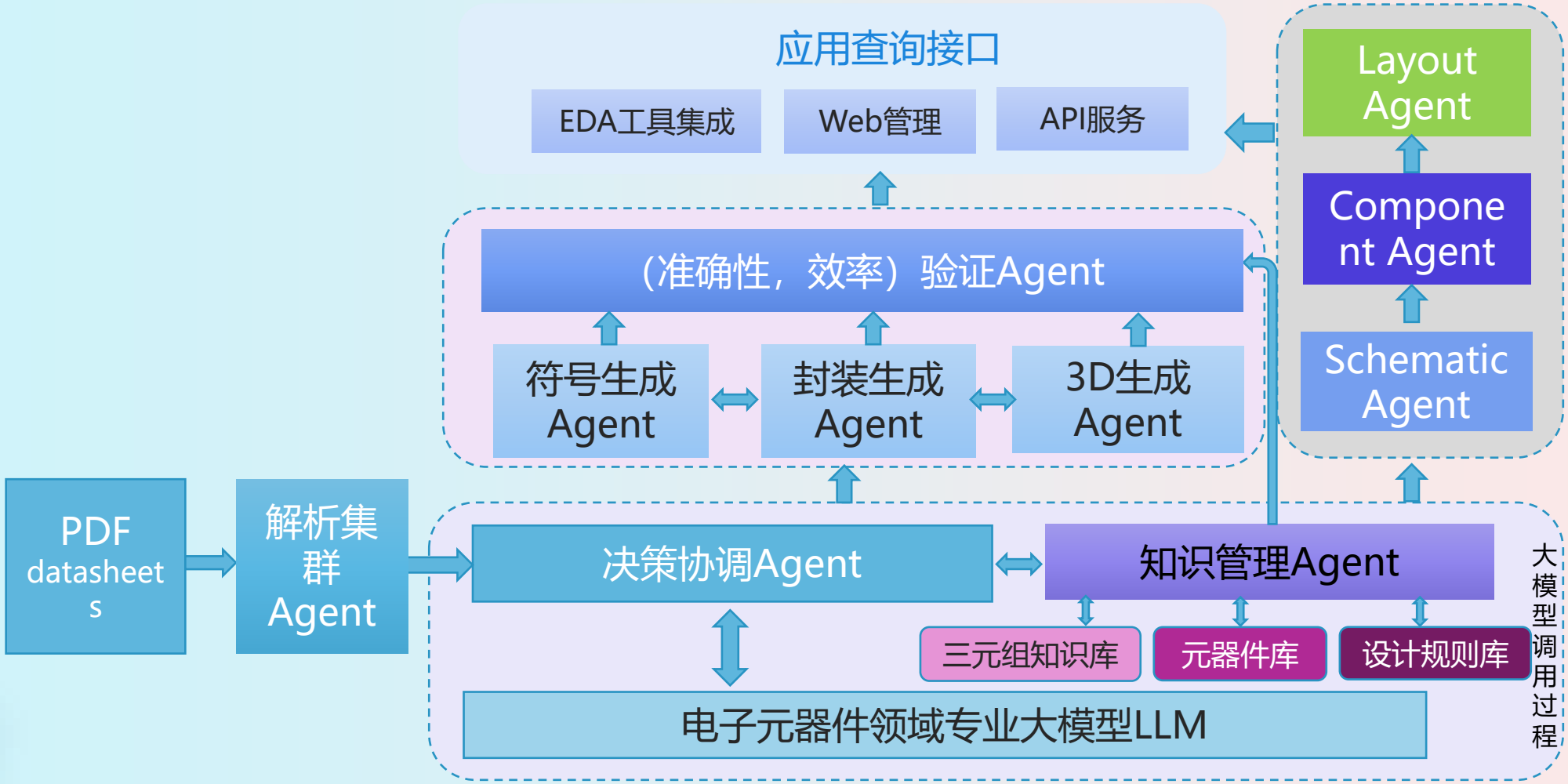
Object Properties(对象属性关系)

```
├── OrderablePart → 关联器件 → CoreDevice
├── CoreDevice → 具有封装类型 → Package
├── CoreDevice → 包含功能模块 → FunctionalModule
├── Pin → 属于器件 → CoreDevice
└── CoreDevice → 适用于应用场景 → Application
```

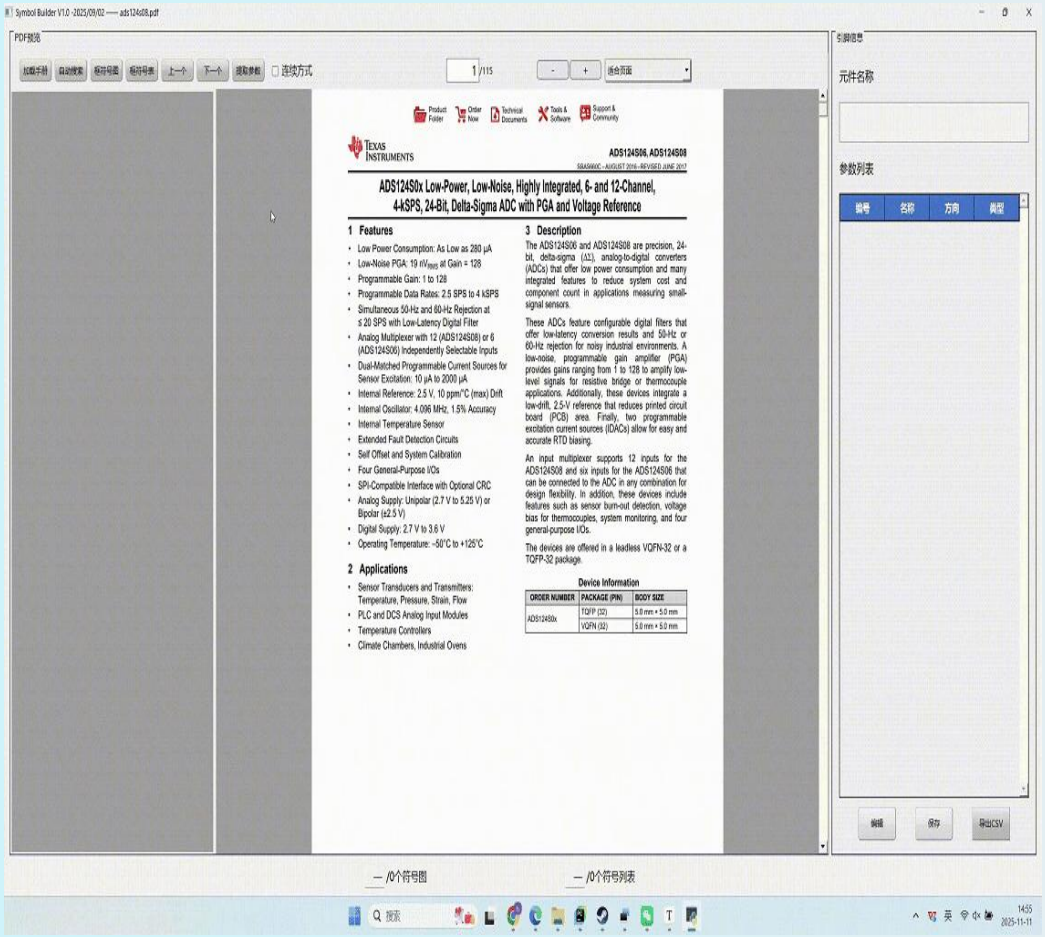
Data Properties(CoreDevice 实例)

```
├── ADS124S06_Chip01 (CoreDevice_ADS124S06)
│   ├── 具有封装类型: Package_TQFP-PBS_32Pin
│   ├── 关联器件: OrderablePart_ADS124S06IPBSG4,
OrderablePart_ADS124S06IPBSR
│   └── 包含管脚: Pin_AIN0, Pin_AVSS-SW, Pin_CS, Pin_SCLK
└── ADS124S08_Chip01 (CoreDevice_ADS124S08)
    ├── 具有封装类型: Package_VQFN-RHB_32Pin
    ├── 关联器件: OrderablePart_ADS124S08IRHBRG4,
OrderablePart_ADS124S08IRHBT
    └── 包含管脚: Pin_AIN0, Pin_AVSS-SW, Pin_CS, Pin_SCLK,
                  Pin_REFOUT.....
```

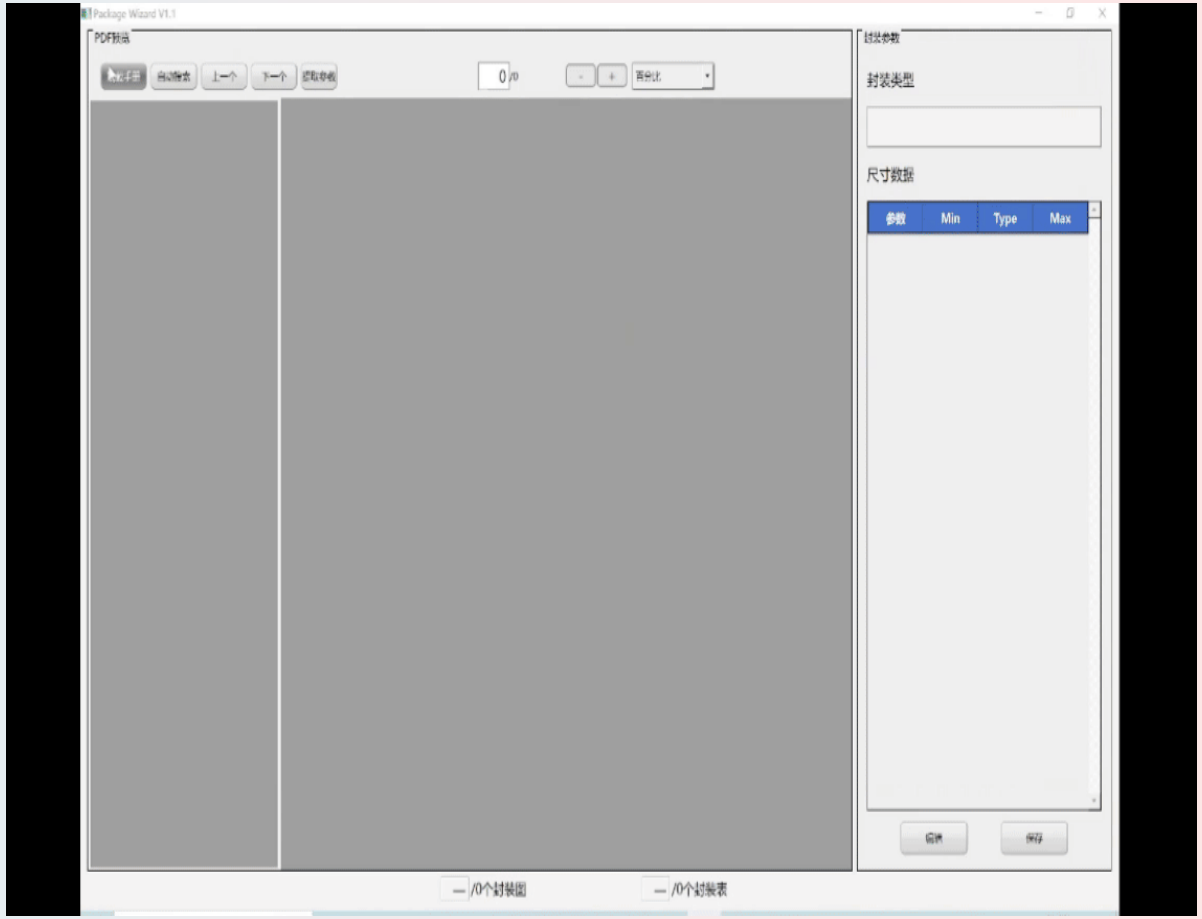
What roles should be assigned to the AI agent in PDF datasheets?



How are we connecting our tools to complement KiCad?



Symbol+Kidcad



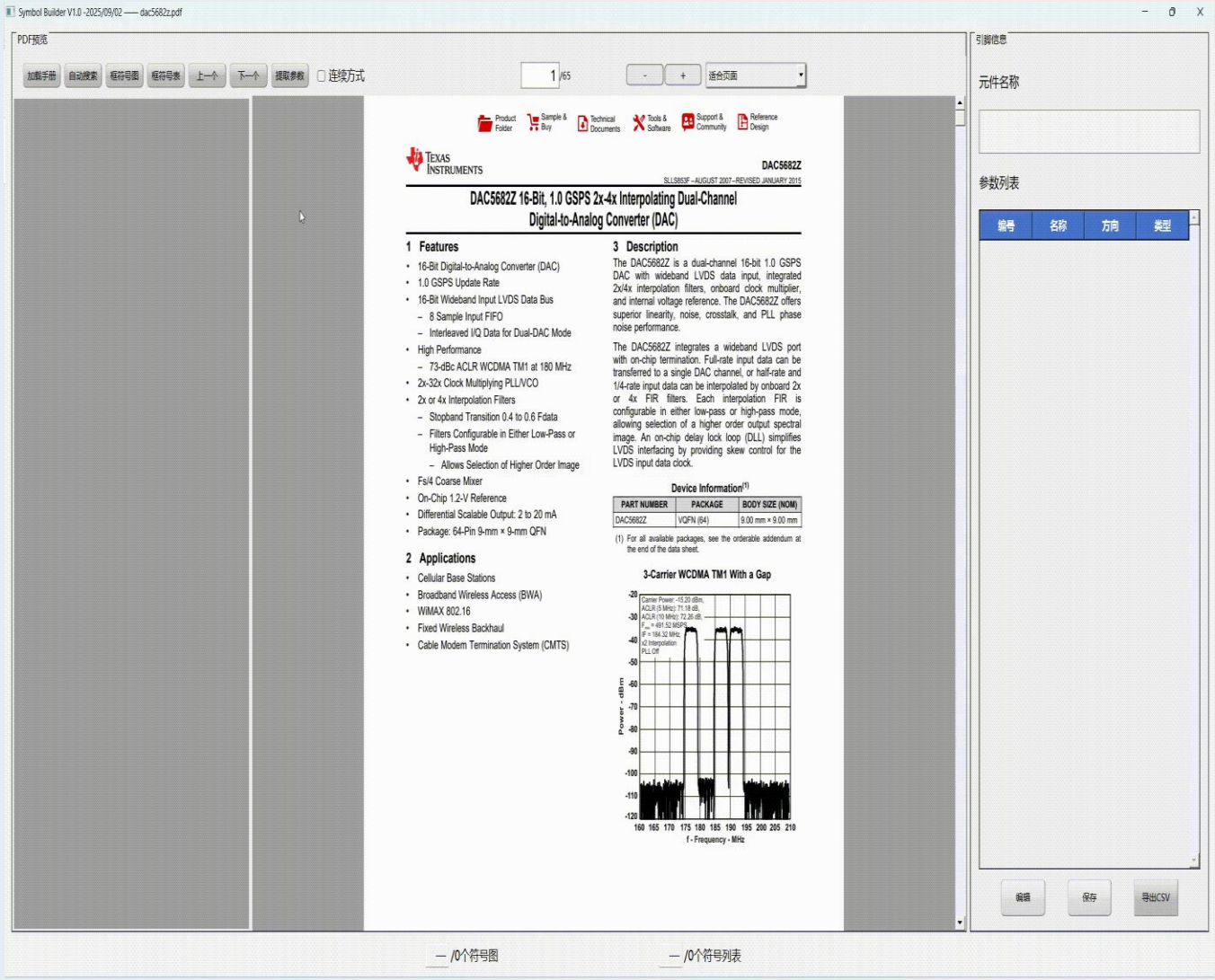
Package+Kidcad

How can AI Agents, powered by Large Language Models(LLMs), enhance their accuracy?

The sobering reality where the magic of LLMs runs out?

Our Symbol Agent empowers you to work within:

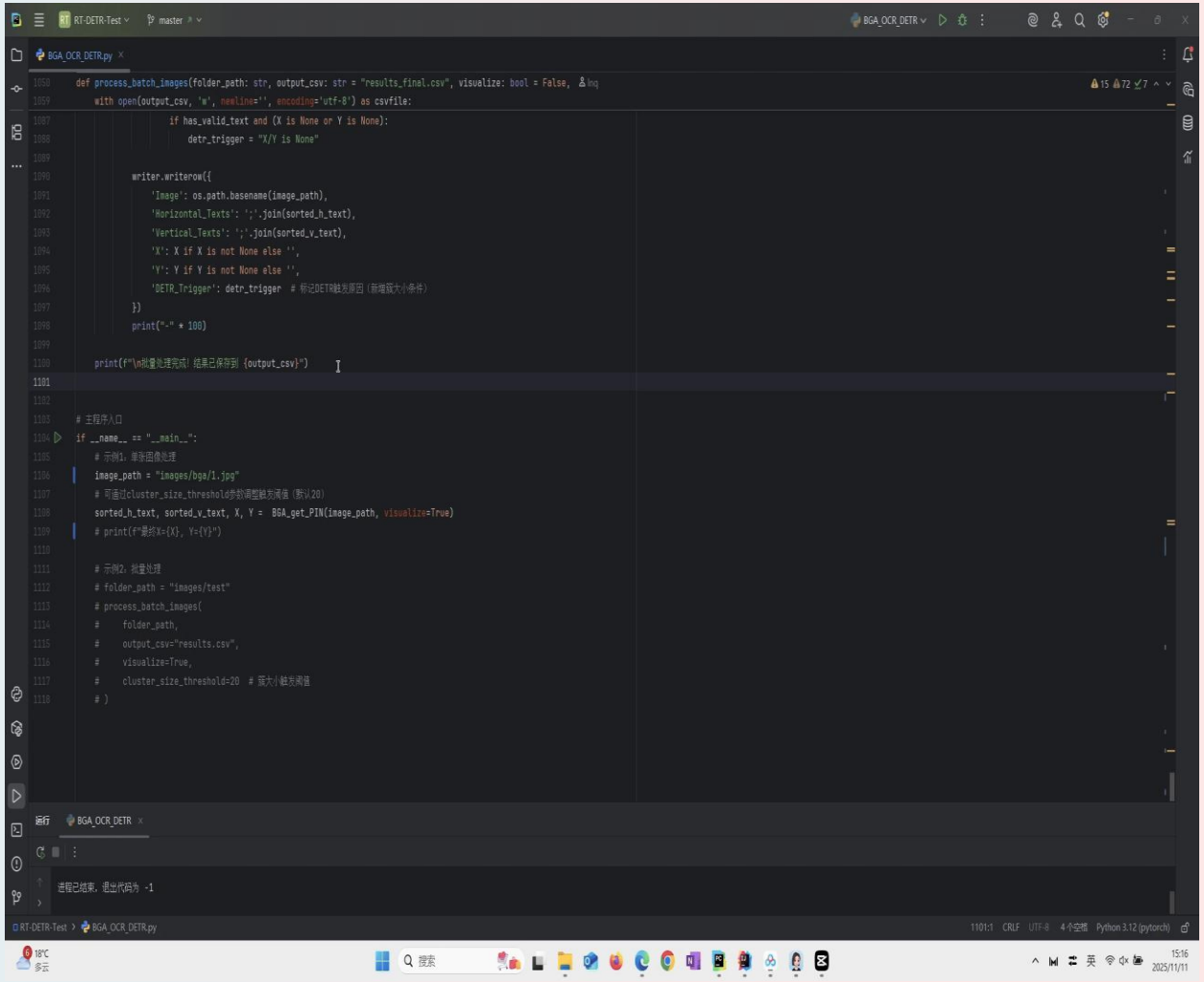
1) High Density QFN/QFP
2) Big Array of BGA



The sobering reality where the magic of LLMs runs out?

Our Package Agent epowers,you to work within:

1) The position of Pin 1;
2) Calculating Row and Column Counts in a BGA
3) Handling of Missing Solder Balls in a BGA
4) All the pins caculation in different packages



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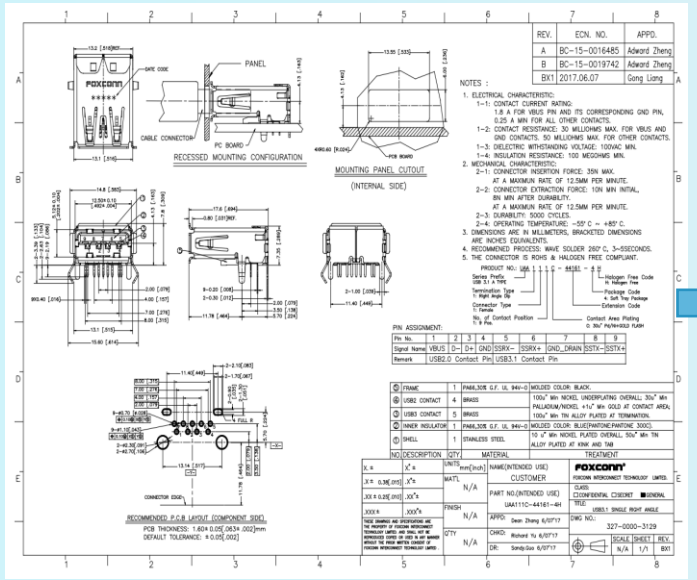
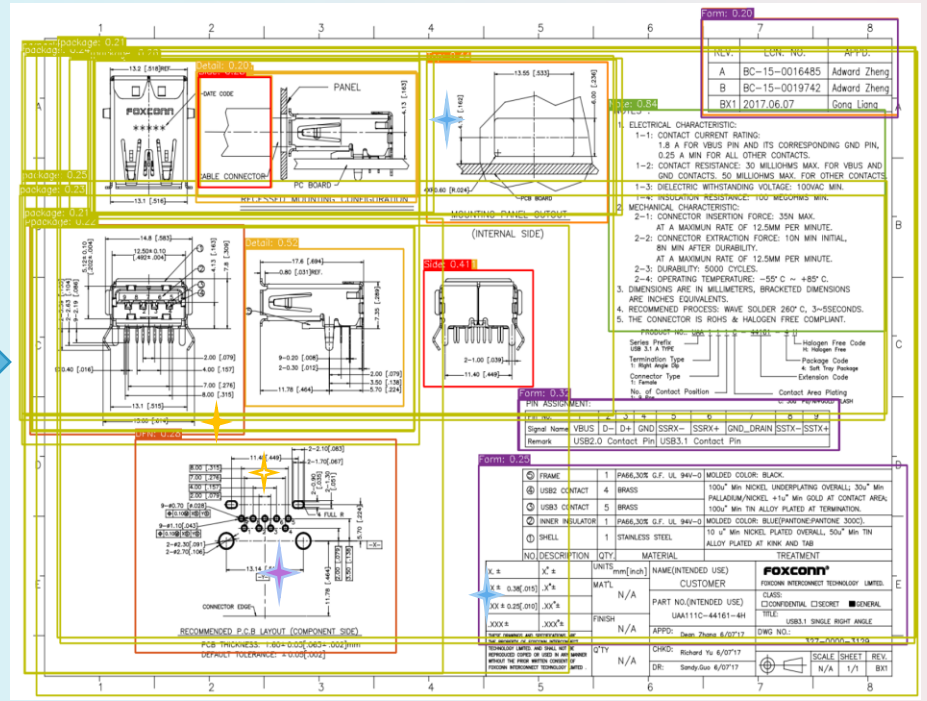
Anything Else ?

Non-standard Component Analysis

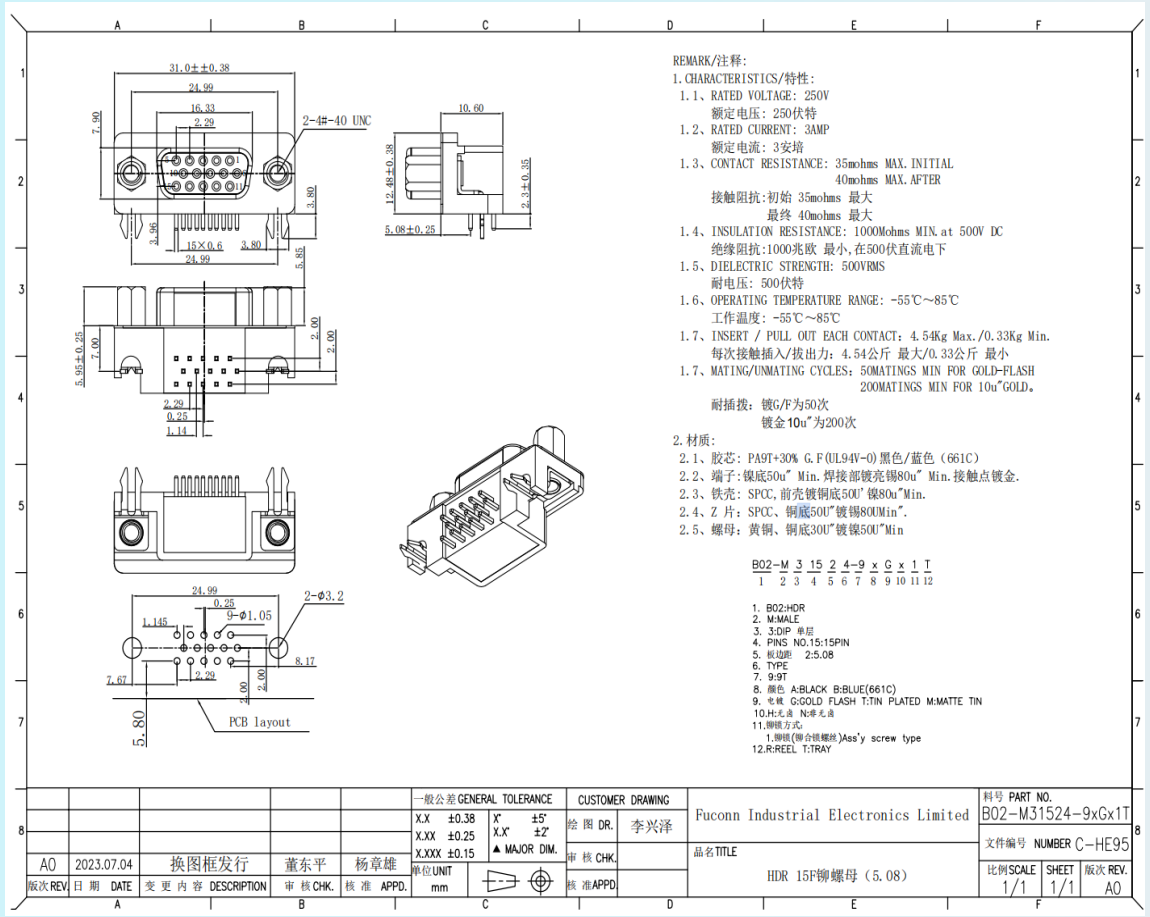


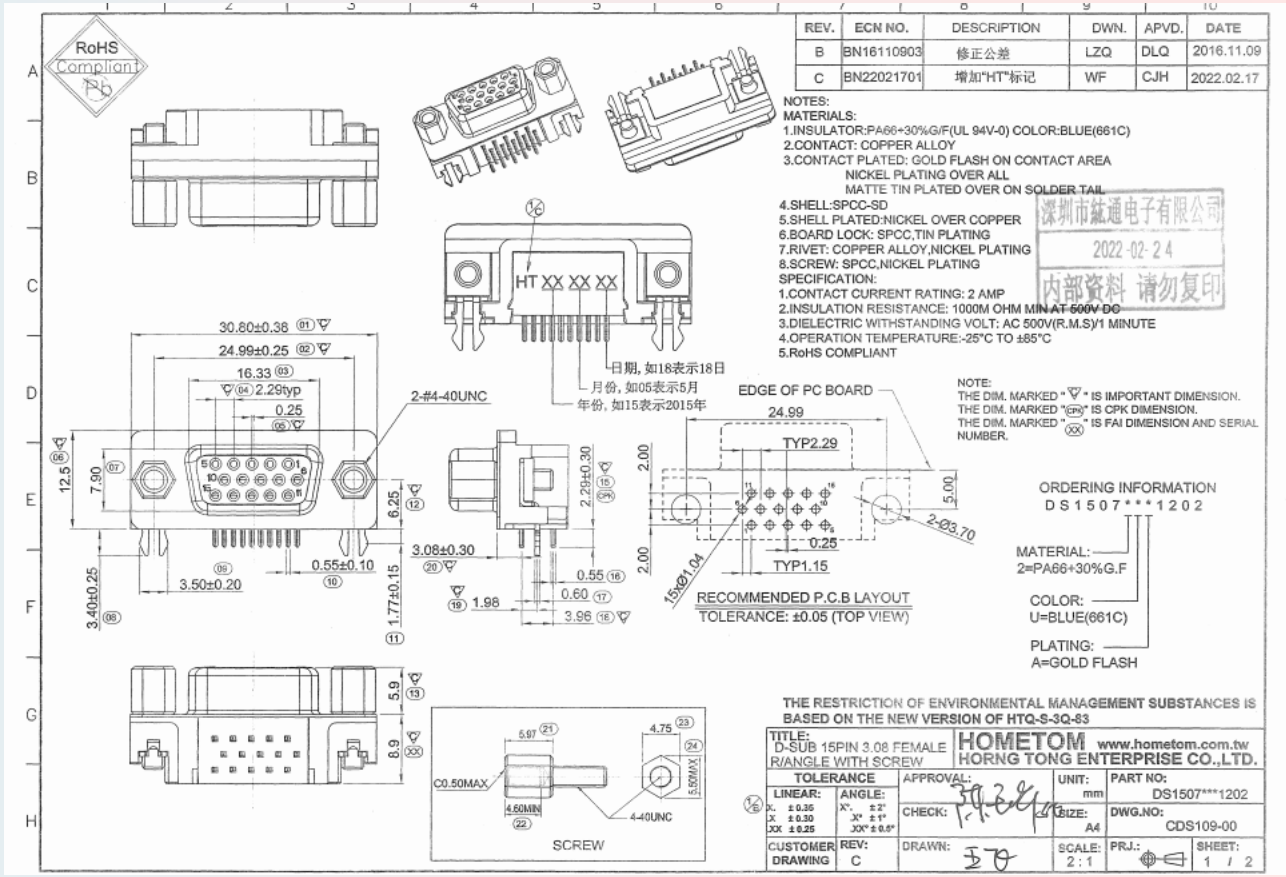


Parameter	USB
Signal Pin Count	9
Positioning Pin Count	4
Body Length (A)	17.6
Body Width (B)	13.2
Body Height (H)	7.35
Signal Pin Pitch	1.1
Signal Pin Diameter	0.7
Positioning Pin Pitch 1 (Round)	2.7
Positioning Pin Diameter 1 (Round)	2.3
Positioning Pin Pitch 2 (Ellipse, 2 pcs Long Axis)	2.1X1.3
Positioning Pin Diameter 2 (Ellipse, 2 pcs Long Axis)	1.7X0.9
Signal Pin pitch1	2
Signal Pin pitch2	4
Signal Pin pitch3	7
Signal Pin pitch4	8
Positioning Pin pitch1	11.4
Positioning Pin pitch2	13.14

Layout Analysis + Graphic Similarity Analysis (Locking Key Feature Views)

Component Similarity Analysis





1) Analyze the component type in the image and output the physical dimension parameters of its package;
2) Extract the text content in the image,Comprehend the table content;
3) Compare the image content, text content, and table content of the two images, identify similarities and differences, and provide a summary conclusion.

Component Part Number Usage by Role

Role	Focus	Part Number Used	Core Question
Design Engineer	Function, performance, pinout of the component	**Full Orderable Part Number**	"Can I use it in my circuit?"
Procurement / Supply Chain	Exact specifications, procurement availability, price, lead time	**Full Orderable Part Number**	"Can we buy the correct one?"
PCB / Manufacturing Engineer	Physical dimensions, footprint, assembly process	**Package portion within the Orderable Part Number**	"Can we solder it to the board?"

EDA's adventure is still a long, tough road ahead!