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Challenges in Component Management

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Challenges in component management

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- Getting data from Providers

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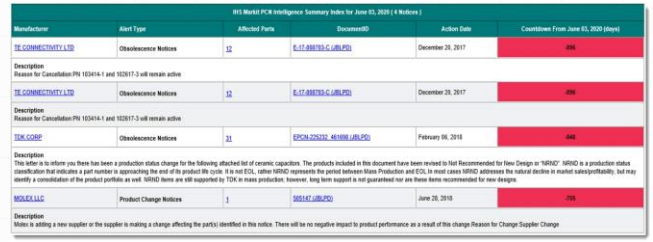
Challenges

Challenges

PDN



Several challenges

- Component Scarcity
  - Conflicts, Transportation, Lack of materials
- Rules and regulations become stricter
  - RoHS (2,2.1,..), REACH, PFAS, SCIP,
  - Conflict Materials, TSCA,…

This makes it hard to keep designs in production.

Problem

Although the design decisions determine a lot, you design now, but the production/service can be much later, with hugely different circumstances.

- Shortages and EOL lead to issues.
- How to predict?

  Something hard to find now may not be scarce a year from now.

  How to predict?
- Regulations will change

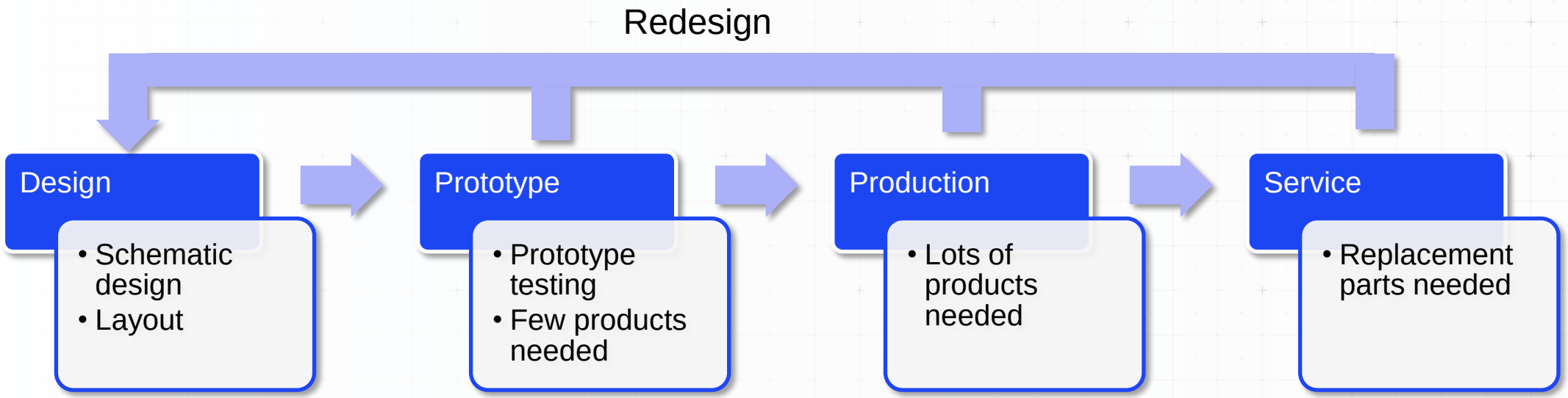
Solutions

- Be informed
  - Get reliable information on the parts/part availability
  - Stay in touch with suppliers, share data
  - Know about technology roadmaps, capital investments

Solutions

- Design for availability
  - Are some parts less needed? Can they be left off?
  - Keep ownership on your designs
  - Unification
- Move away from single sourced parts
- Review your suppliers.
  - Global footprint
  - Alternate supply chains
- Stock up
- Buy in bulk

Component use in Design Lifecycle



Designer chooses parts based on current situation

Provide good lifecycle data. Check often during design.

Few boards, leadtime is important

Involve board manufacturer as early as possible e.g. through a preliminary BOM.

More components needed

Regularly check part availability. Use a bigger stock. Do not wait until leadtimes increase.

Less components Needed, but (a lot) further in the

Have second sources

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Component Database

Component Information

Datasheet

Application Notes

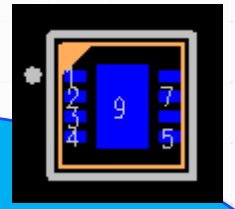
Compliance

Manufacturer

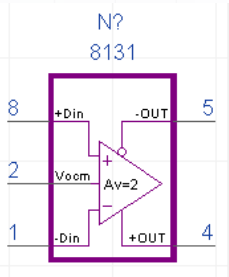
MPN

Lifecycle

eYtoEOL



Footprint



Symbol

Criticality

Specifications

Description

Component

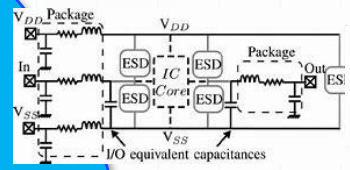
Company Part number

DFM model

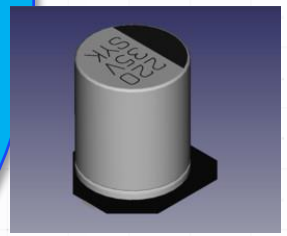
Qualification data

Stock

Second sources



Simulation Model



3D model

Leadtime

Cost

Contact

Preferred Vendor

Stock

Vendor(s)

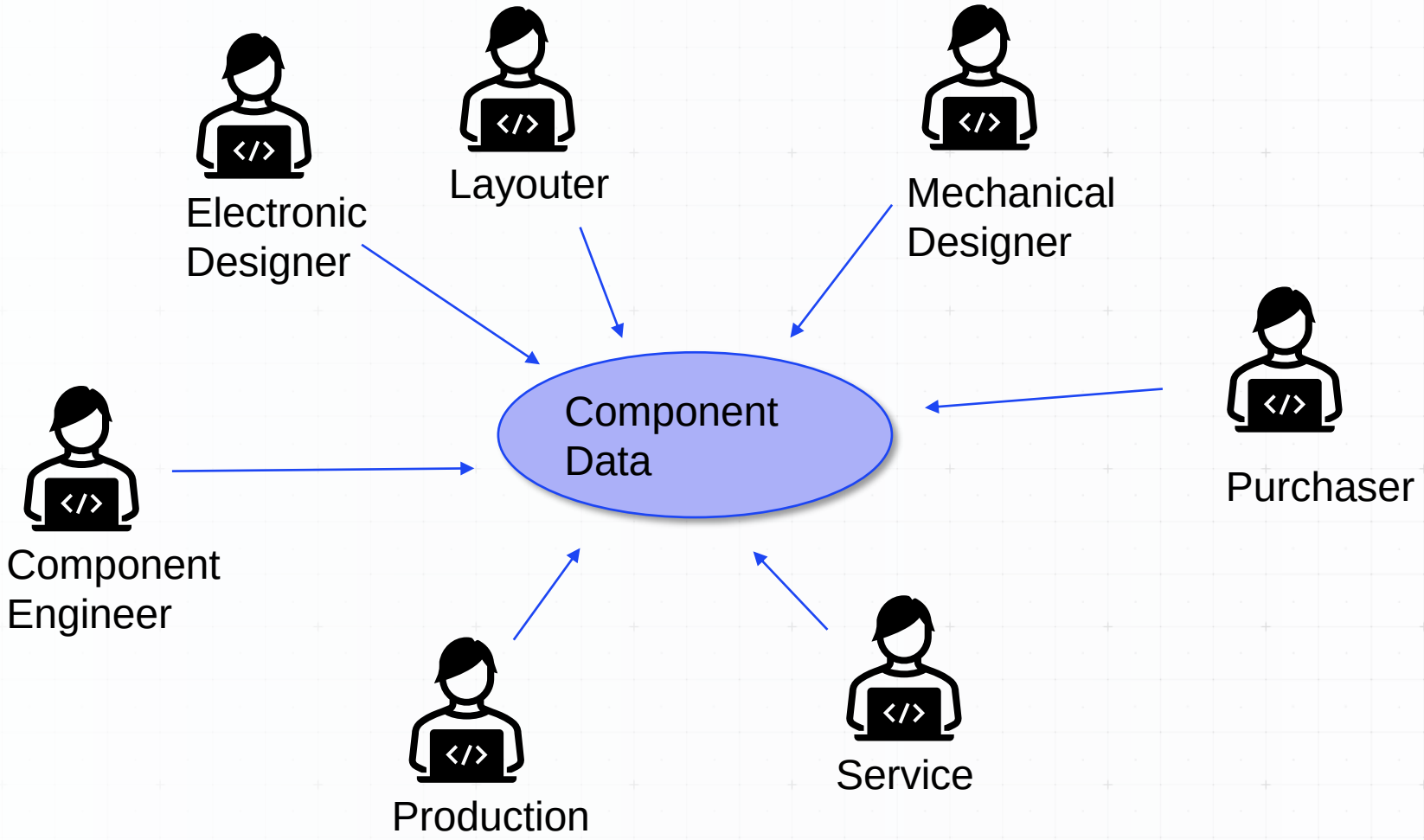
Availability

Vendor Part number

Ordering information

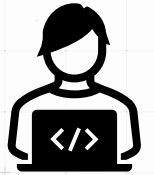
MOQ

Different users



Demands to component database - Designer point of view

Designer wants to:



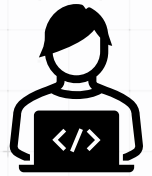
Electronic Designer

- Easily find the component.
  - See as much information as possible.
  - Searchable on all specifications.
  - Information readily available
- Use all possible parts in the world
- Does not want to be bothered with compliance, logistics etc.

Demands to component database - Component Engineer point of view

Component engineer wants to:

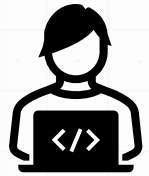
- Have up-to-date information on lifecycle, availability, etc.
- Have as little parts as possible
- Have as little work as possible



Component Engineer

Demands to component database - Purchasing/Logistics point of view

Purchasing wants to:



Purchaser

- As little parts as possible
- As cheaply as possible 
- All parts must have second sources
- Parts are quickly available, at every possible production site.
- Parts stay available for a looooong time.

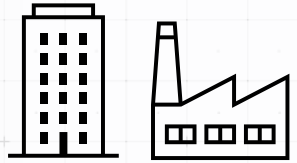
Demands to component database - Other requirements

Part cost as low as possible

Database cost as low as possible

High quality parts, high reliability

Compliant to all regulations



Enterprise

Component Database

Trade off between parties. General rules:

- Generally, a small database is better
  - Standardize on a few series (e.g. choose 0603, a precision series and high power series)
  - Standardize on connectors (and cables)
  - Standardize on solutions (e.g. for Power management, bus, etc.).
- Qualify manufacturers/vendors

Regulatory Compliance

We all need to comply to the regulations like RoHS, REACH, Prop-65 etc.

Often compliance is required by design, but also for every product made. This means that up to date information needs to be available when producing as well.

Regulations are in flux. New specifications come out, exemptions expire, etc. this makes it hard to track.

=> Get your information from someone provider (e.g. Silicon Expert, IHS, BomCheck, etc.), and regularly update it in your systems.

Logistics information

- Provide lifecycle information (e.g. estimated years to EOL, or ‘New, Mature, Phase-out, Obsolete’).
- Provide cost indication (and keep updating this with your main supplier).
- Lead-times are useful but change often. Link with preferred vendor is better.
- If ordering parts yourself MOQ, Preferred vendor etc are important as well.

Keep it up to date!

Note: Most logistical information that was available during design is outdated once you start producing.

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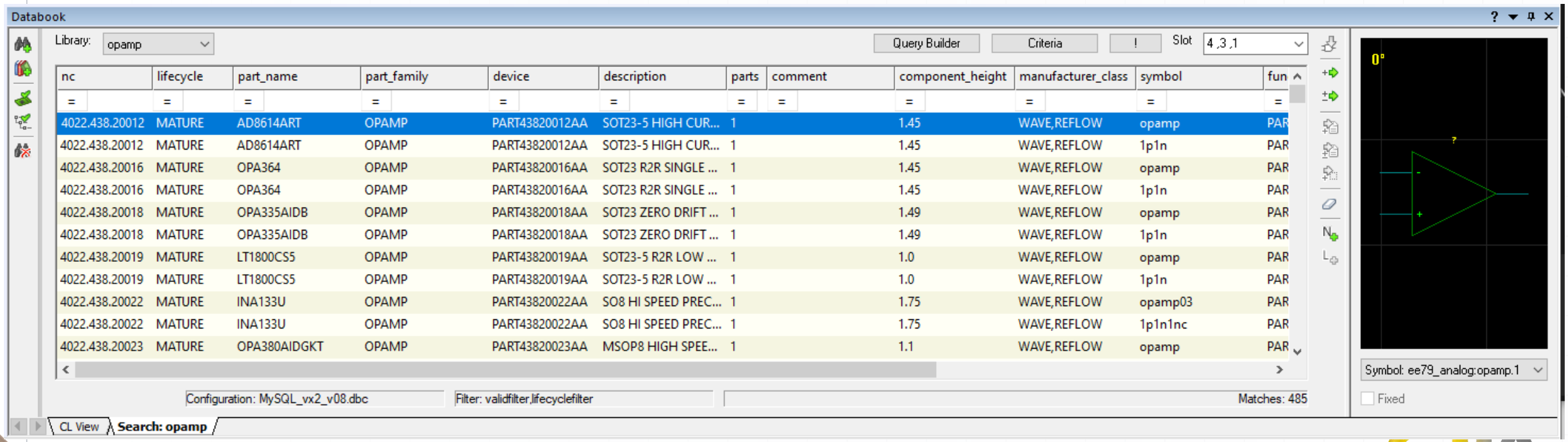
Usage during Design

Part Placement

Design tools can let you search on parameters of the part, before placing it on the schematic.



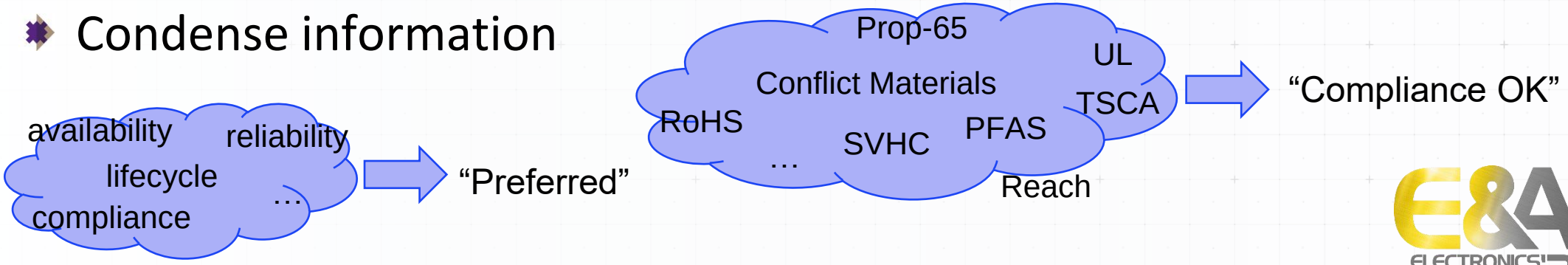
(Siemens DxDesigner)

Part Placement - Direct Searchable Data

- Classify parts in a structure (e.g. IEC-61360)
- Provide searchable data for top-x specification parameters per class.

  This should bring the selection down quickly to a few parts.
- Standardize on descriptions.

  “Zener Array Diode, Dual, 4.7 V, Dual Common Anode, 300 mW, 150 °C, SOT-23”
- Condense information



Part Placement – Direct access

- Provide links to datasheets, and other data at manufacturer.

  Do you copy? Which do you copy? Do you keep history?

- Provide search link for the part to manufacturer for additional information (needs to be maintained).

Keep checking information - BOMs

Provide an easy way to generate BOMs with logistical and compliance information. During all phases of the design.

- Preliminary BOM
- During production as well

Implement a system where you can do a Where-used

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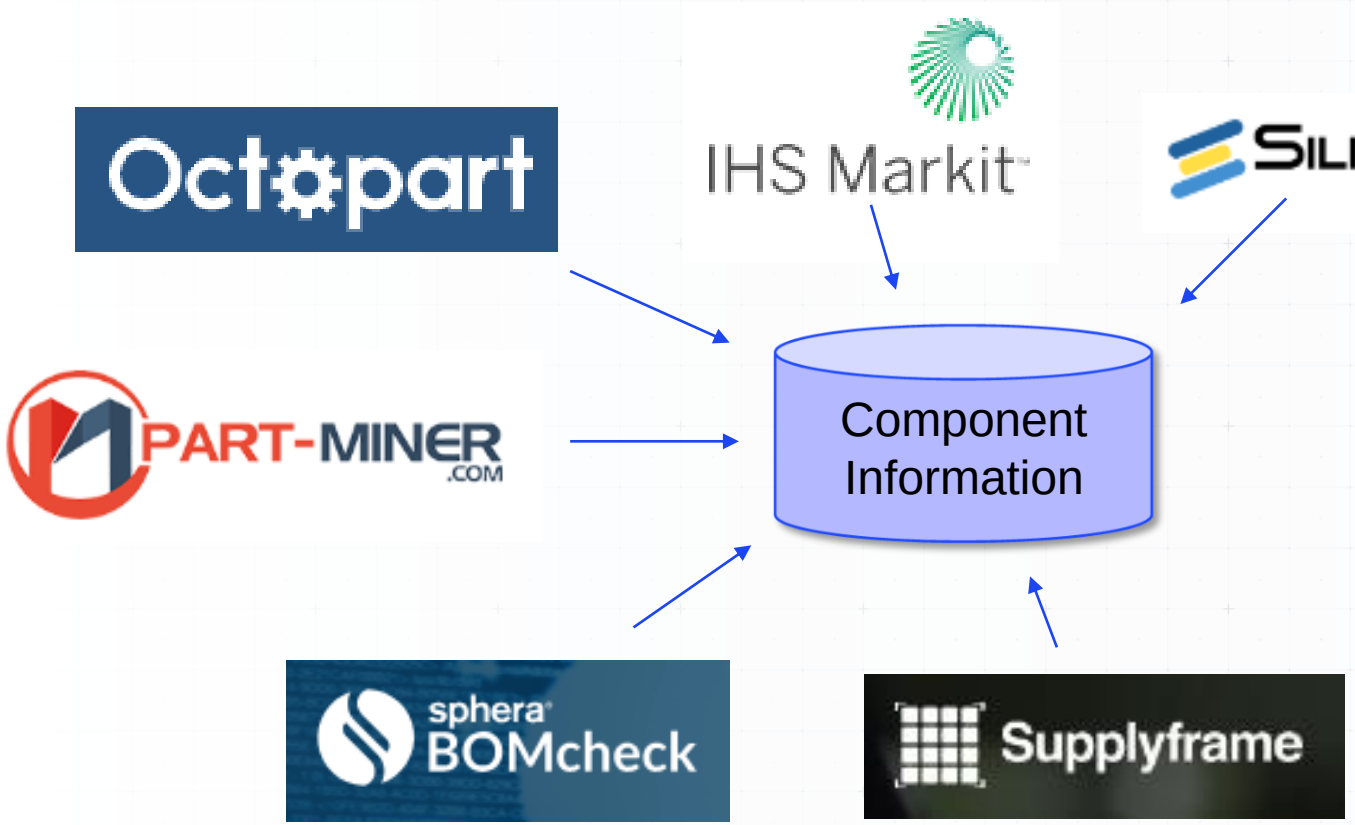
Getting data from providers

Information Providers



- Models
- Parametric data
- Lifecycle data
- Compliance
- Supply information
- Risk information
- …

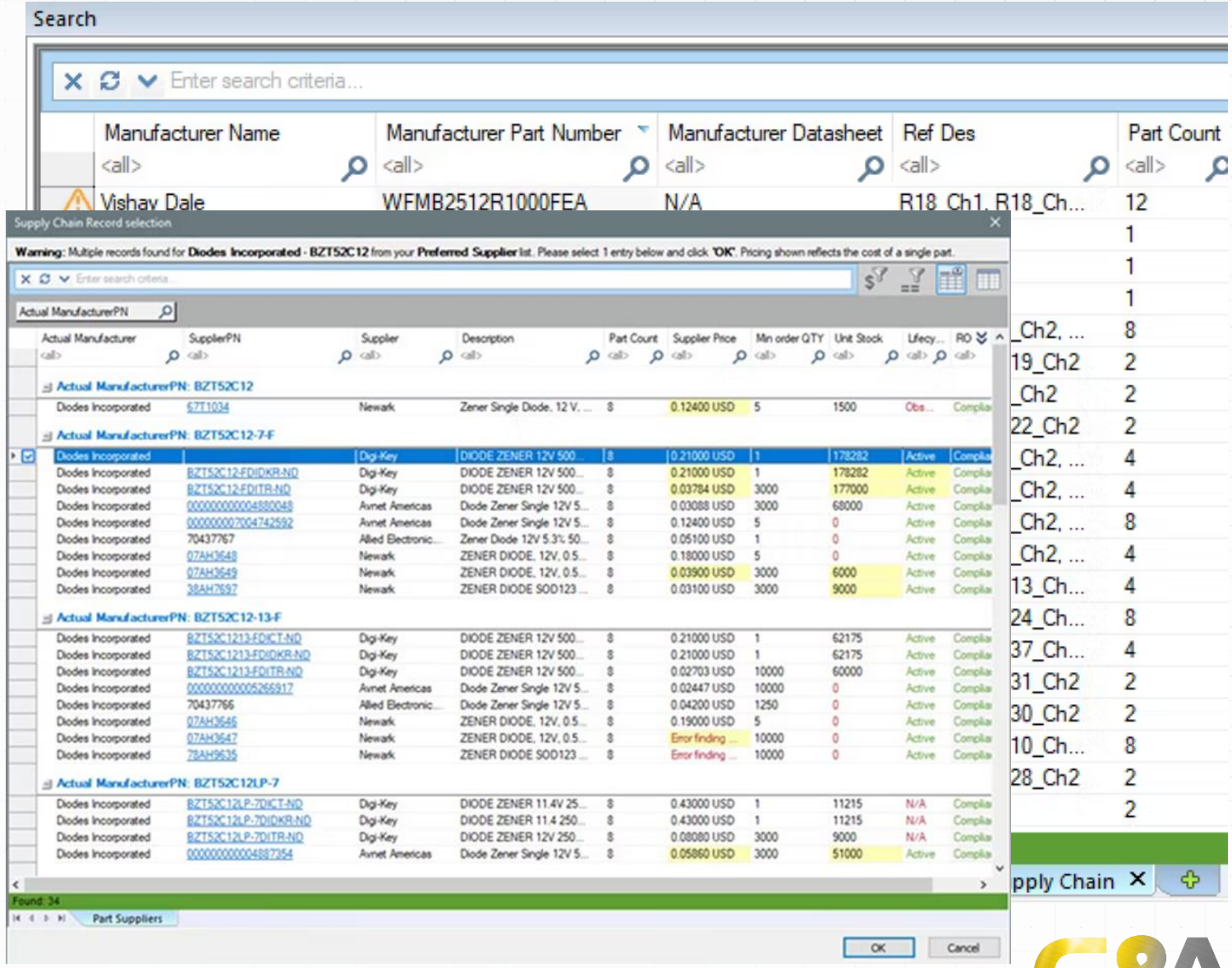
Supply chain information

Several providers now provide live checks into the supply chain into your design tool.

- Mapping needed. When using generic components this is hard.
- Which supplier is important? Local supplier may not be in there. What if you have multiple locations?
- Local stock is not in there.
- Some tools work only on BOM

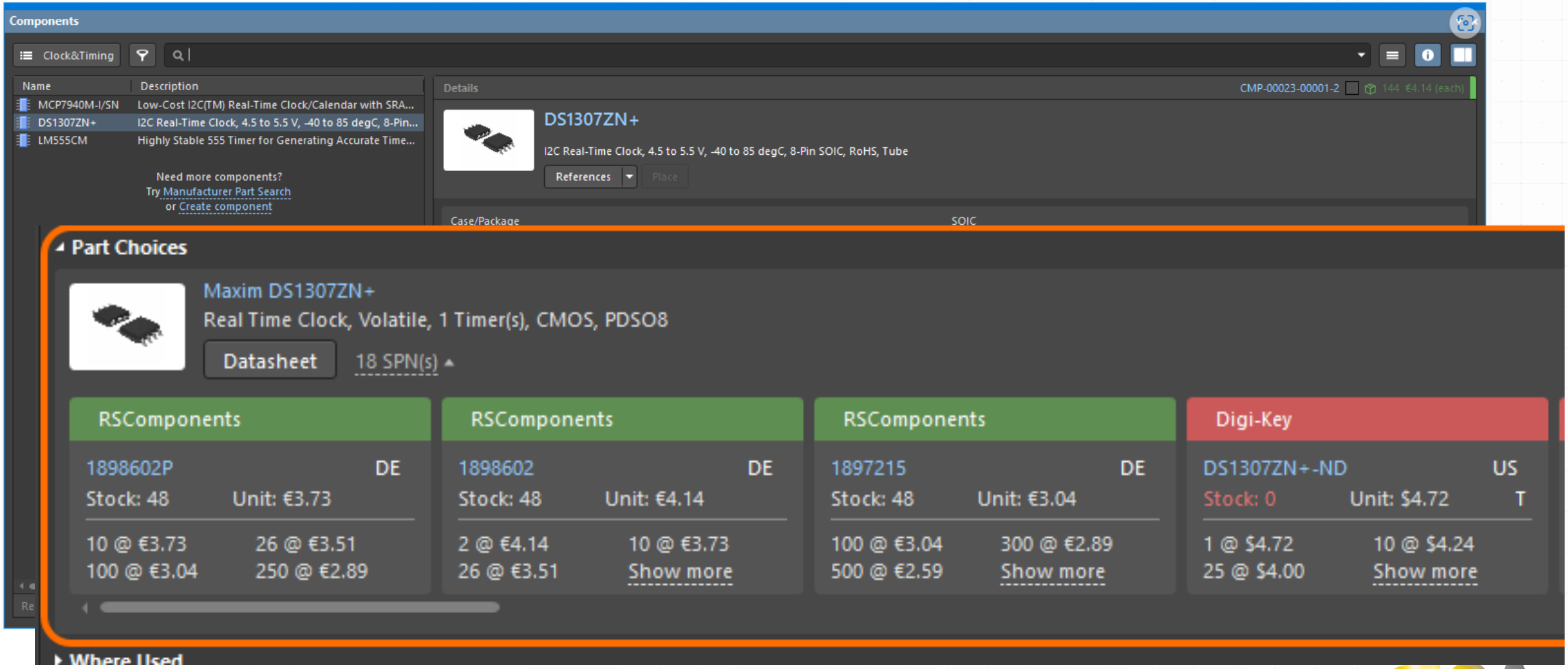
Supply Chain info - Siemens DxDesigner

Status indicators alert users to *risk*



Source: Siemens

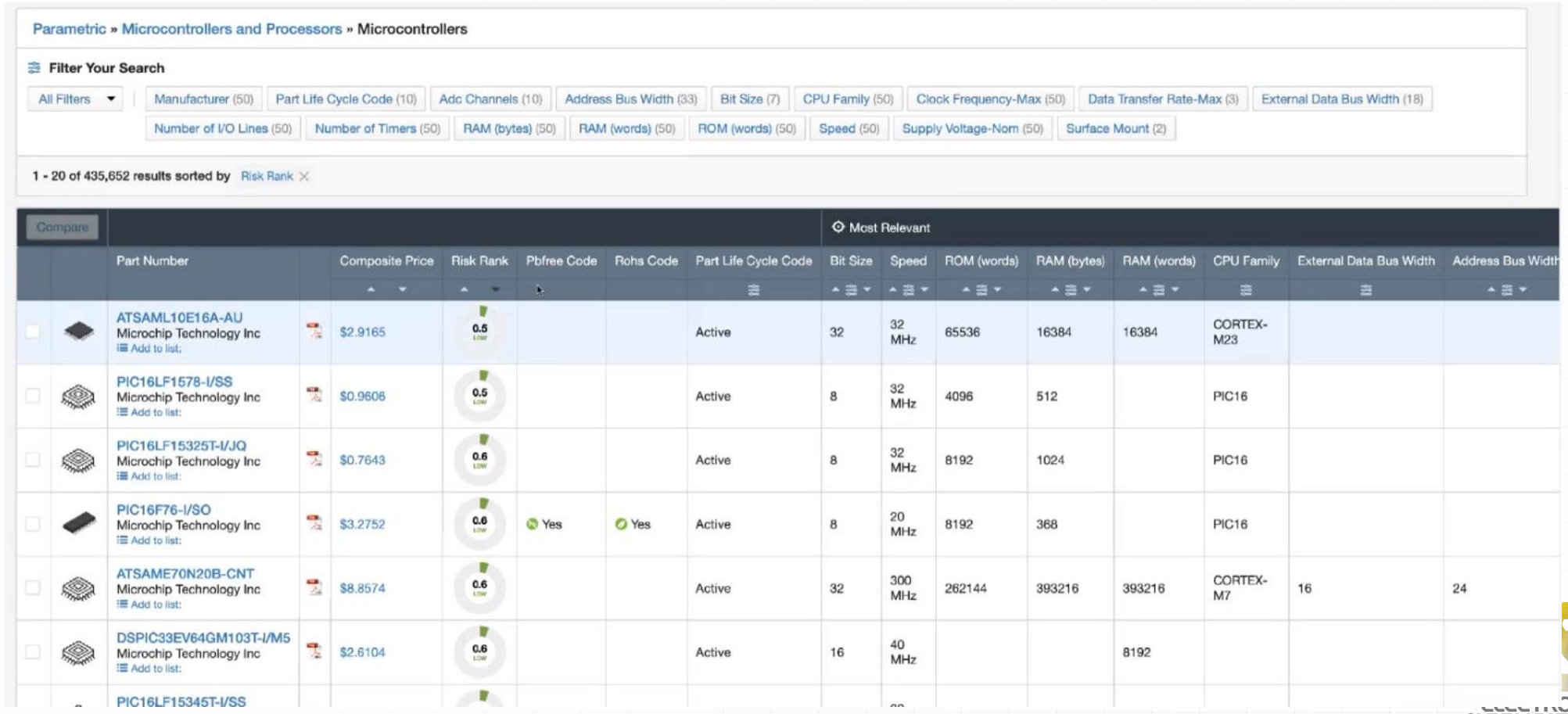
Supply Chain info - Altium – Global Part Catalog / OctoPart



Source: Altium

SupplyFrame

Oriented towards risk reduction (Stock, risky components)



Parametric » Microcontrollers and Processors » Microcontrollers

Filter Your Search

All Filters | Manufacturer (50) | Part Life Cycle Code (10) | Adc Channels (10) | Address Bus Width (33) | Bit Size (7) | CPU Family (50) | Clock Frequency-Max (50) | Data Transfer Rate-Max (3) | External Data Bus Width (18) | Number of I/O Lines (50) | Number of Timers (50) | RAM (bytes) (50) | RAM (words) (50) | ROM (words) (50) | Speed (50) | Supply Voltage-Nom (50) | Surface Mount (2)

1 - 20 of 435,652 results sorted by Risk Rank

Compare | Most Relevant

Part Number	Composite Price	Risk Rank	Pbfree Code	Rohs Code	Part Life Cycle Code	Bit Size	Speed	ROM (words)	RAM (bytes)	RAM (words)	CPU Family	External Data Bus Width	Address Bus Width
ATSAML10E16A-AU Microchip Technology Inc Add to list.	$2.9165	0.5 LOW			Active	32	32 MHz	65536	16384	16384	CORTEX-M23		
PIC16LF1578-I/SS Microchip Technology Inc Add to list:	$0.9606	0.5 LOW			Active	8	32 MHz	4096	512		PIC16		
PIC16LF15325T-I/JQ Microchip Technology Inc Add to list:	$0.7643	0.6 LOW			Active	8	32 MHz	8192	1024		PIC16		
PIC16F76-I/SO Microchip Technology Inc Add to list:	$3.2752	0.6 LOW	Yes	Yes	Active	8	20 MHz	8192	368		PIC16		
ATSAME70N20B-CNT Microchip Technology Inc Add to list:	$8.8574	0.6 LOW			Active	32	300 MHz	262144	393216	393216	CORTEX-M7	16	24
DSPIC33EV64GM103T-I/M5 Microchip Technology Inc Add to list:	$2.6104	0.6 LOW			Active	16	40 MHz			8192			
PIC16LF15345T-I/SS													

Symbols/footprints

Quality — Correctness is key.

Uniformity — Or it does not look good.

- US/European drawing style?
- Where to put inputs and outputs.
- Fractured symbols

For footprints a lot of IPC generators are available.

Available databases are usually a mess. Low consistency in drawing guidelines.

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Other subjects around the component database

Other subjects

Part Request systems and qualification process

Alternates

General components (resistor 10k 5%) or specific components (Vishay xxx)

Approved Vendor Lists

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Connecting your Design Flow

www.dizain-sync.com