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Challenges in Component Management

Richard van der Werf

High tech
electronics

+





Contents

Challenges in component management

- ✦ Challenges
- ✦ Component Database
- ✦ Use during design
- ✦ Getting data from Providers



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Challenges



Challenges

Several challenges

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

PDN

Manufacturer	Alert Type	Affected Parts	DocumentID	Action Date	Countdown From June 01, 2020 (days)
TE CONNECTIVITY LTD	Obsolescence Notices	12	E:17-080783-C:J:R:PCU	December 20, 2017	NA
Description Reason for Cancellation PH 103414-1 and 102817-3 will remain active					
TE CONNECTIVITY LTD	Obsolescence Notices	12	E:17-080783-C:J:R:PCU	December 20, 2017	NA
Description Reason for Cancellation PH 103414-1 and 102817-3 will remain active					
TDK CORP	Obsolescence Notices	21	EPCN-202372-481988:J:R:J:PCU	February 08, 2018	NA
Description The notice is to inform you there has been a production status change for the following attached list of ceramic capacitors. The products included in this document have been reviewed to that Recommended for New Design or "RFD" is a production status classification that indicates a part number is approaching the end of its product life cycle. It is not EOL, rather RFD represents the period between Mass Production and EOL. In most cases RFD addresses the natural decline in market availability, but may identify a consolidation of the product portfolio as well. RFD items are still supported by TDK in mass production. However, long term support is not guaranteed nor are these items recommended for new designs.					
MOLEX LLC	Product Change Notices	1	S05147:J:R:J:PCU	June 26, 2016	NA
Description Molex is adding a new supplier or the supplier is making a change affecting the part(s) identified in this notice. There will be no negative impact to product performance as a result of this change Reason for Change Supplier Change					



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

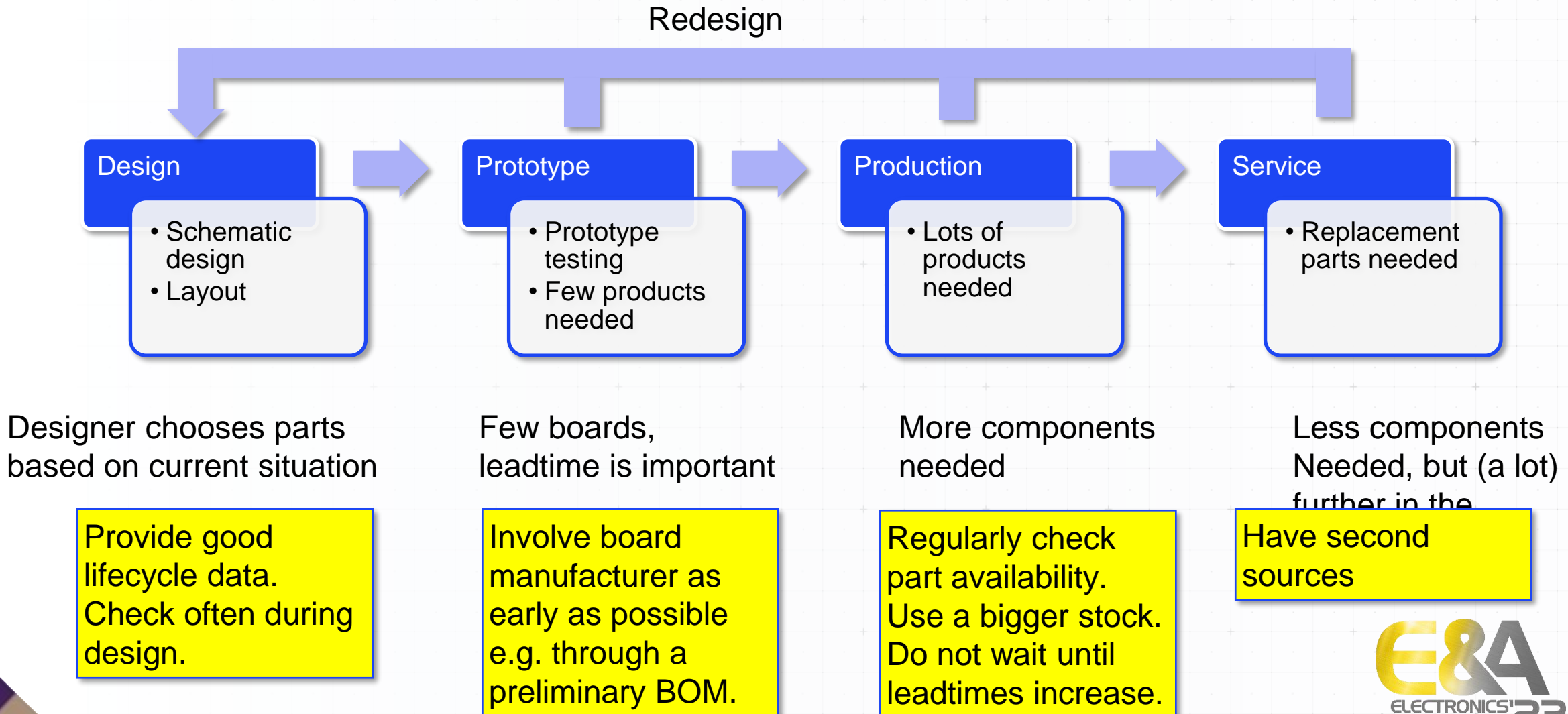




Solutions

- ✦ 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





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Component Database



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Component Information

7805
LINEAR INTEGRATED CIRCUIT

3-358

Application Notes

Compliance

Manufacturer

MPN

Lifecycle

eYtoEOL

Leadtime

Cost

Contact

Preferred Vendor

Stock

Vendor(s)

Availability

Vendor Part number

Ordering information

MOQ

Criticality

Specifications

Description

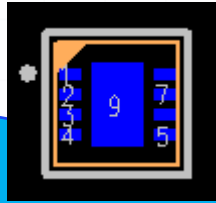
Company Part number

DFM model

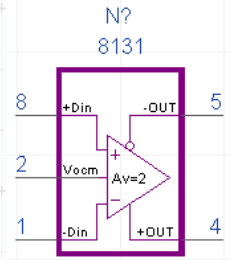
Stock

Second sources

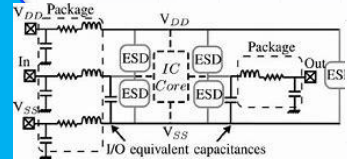
Simulation Model



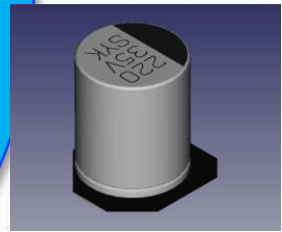
Footprint



Symbol

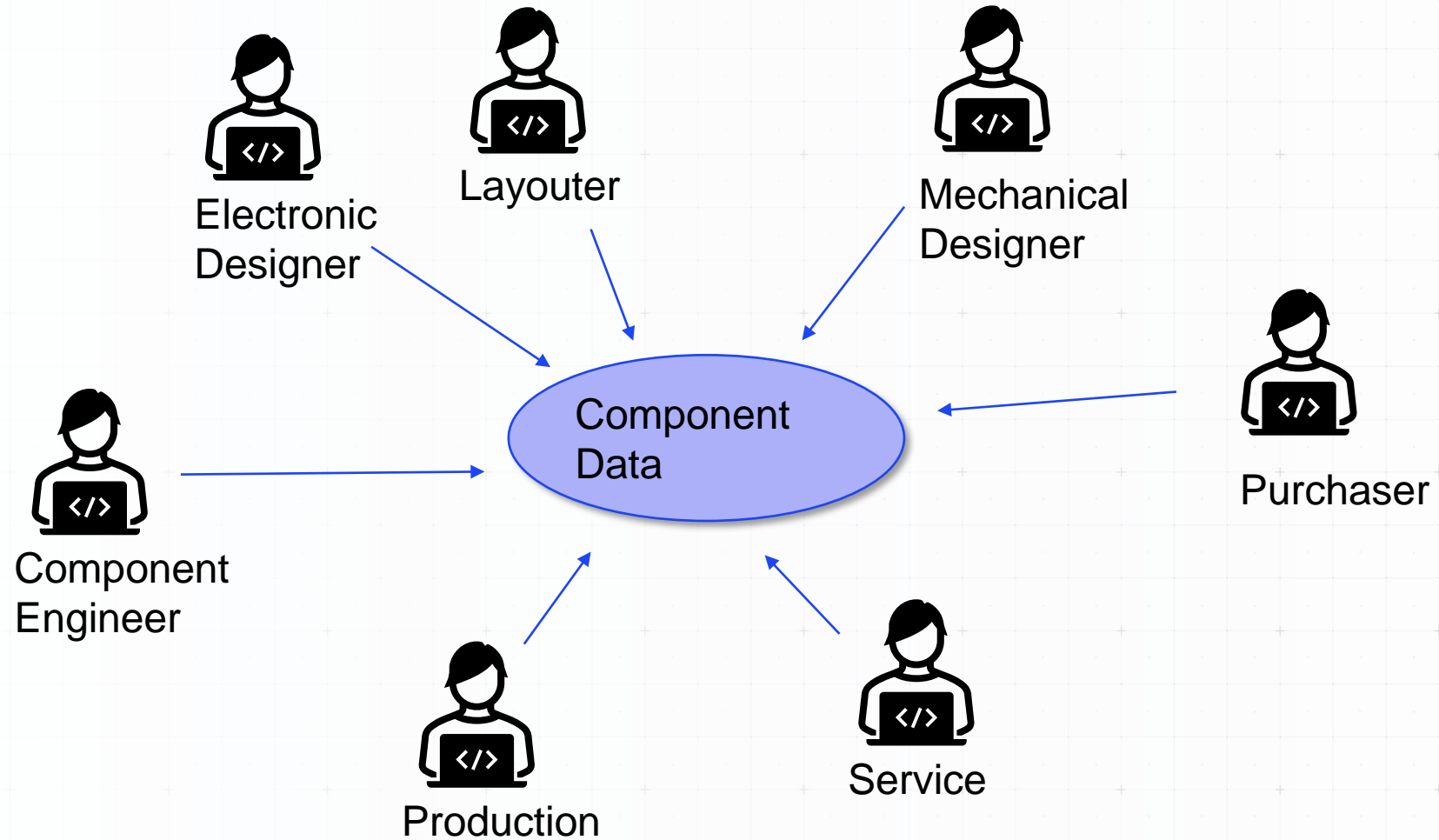


Simulation Model



3D model

Different users

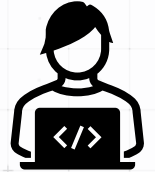




Demands to component database - Designer point of view

Designer wants to:

- ✦ 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.



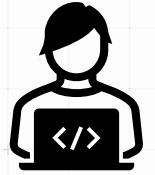
Electronic
Designer



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:

- ✦ 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 loooooong time.



Purchaser

Demands to component database - Other requirements

Part cost as low as possible

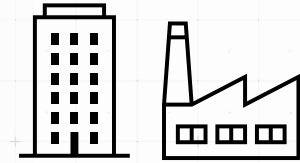


Database cost as low as possible



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.

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



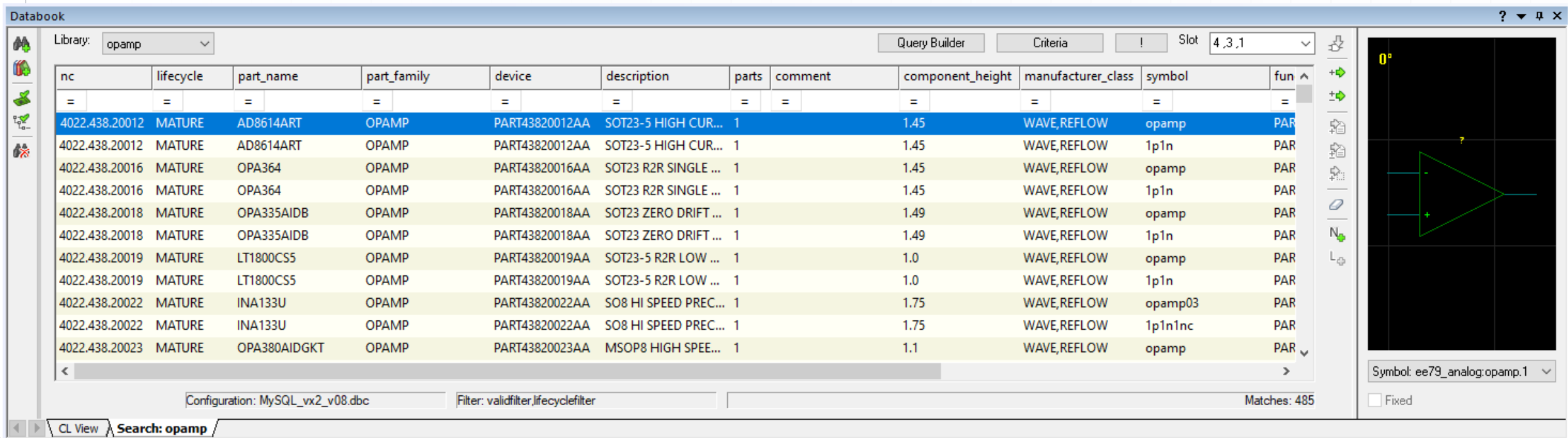
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Usage during Design



Part Placement

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



Databook

Library: opamp

Query Builder Criteria ! Slot 4,3,1

nc	lifecycle	part_name	part_family	device	description	parts	comment	component_height	manufacturer_class	symbol	fun
4022.438.20012	MATURE	AD8614ART	OPAMP	PART43820012AA	SOT23-5 HIGH CUR...	1		1.45	WAVE,REFLOW	opamp	PAR
4022.438.20012	MATURE	AD8614ART	OPAMP	PART43820012AA	SOT23-5 HIGH CUR...	1		1.45	WAVE,REFLOW	1p1n	PAR
4022.438.20016	MATURE	OPA364	OPAMP	PART43820016AA	SOT23 R2R SINGLE ...	1		1.45	WAVE,REFLOW	opamp	PAR
4022.438.20016	MATURE	OPA364	OPAMP	PART43820016AA	SOT23 R2R SINGLE ...	1		1.45	WAVE,REFLOW	1p1n	PAR
4022.438.20018	MATURE	OPA335AIDB	OPAMP	PART43820018AA	SOT23 ZERO DRIFT ...	1		1.49	WAVE,REFLOW	opamp	PAR
4022.438.20018	MATURE	OPA335AIDB	OPAMP	PART43820018AA	SOT23 ZERO DRIFT ...	1		1.49	WAVE,REFLOW	1p1n	PAR
4022.438.20019	MATURE	LT1800CS5	OPAMP	PART43820019AA	SOT23-5 R2R LOW ...	1		1.0	WAVE,REFLOW	opamp	PAR
4022.438.20019	MATURE	LT1800CS5	OPAMP	PART43820019AA	SOT23-5 R2R LOW ...	1		1.0	WAVE,REFLOW	1p1n	PAR
4022.438.20022	MATURE	INA133U	OPAMP	PART43820022AA	SO8 HI SPEED PREC...	1		1.75	WAVE,REFLOW	opamp03	PAR
4022.438.20022	MATURE	INA133U	OPAMP	PART43820022AA	SO8 HI SPEED PREC...	1		1.75	WAVE,REFLOW	1p1n1nc	PAR
4022.438.20023	MATURE	OPA380AIDGKT	OPAMP	PART43820023AA	MSOP8 HIGH SPEE...	1		1.1	WAVE,REFLOW	opamp	PAR

Configuration: MySQL_vx2_v08.dbc Filter: validfilter,lifecyclefilter Matches: 485

CL View Search: opamp

Symbol: ee79_analog:opamp.1

Fixed

(Siemens DxDesigner)

Part Placement - Direct Searchable Data

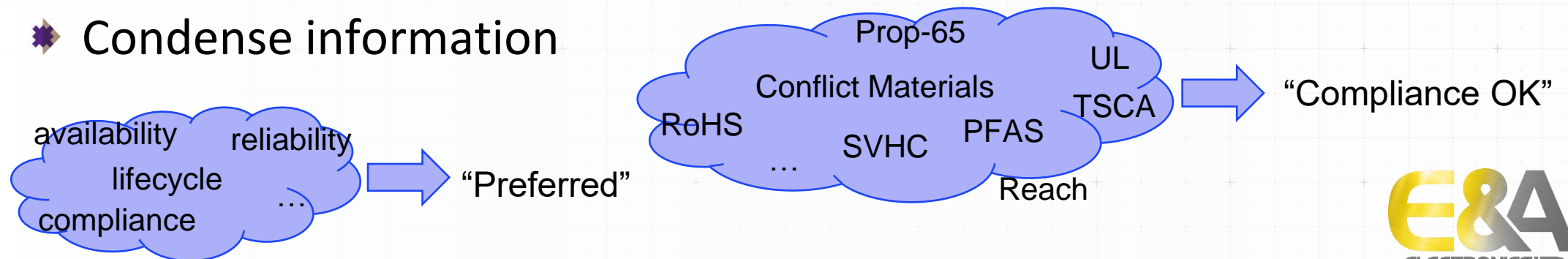
- ✦ Classify parts in a structure (e.g. IEC-61360)
- ✦ Provide searchable data for top-x specification parameters per class.

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).

7805
LINEAR INTEGRATED CIRCUIT

3-TERMINAL POSITIVE VOLTAGE REGULATOR

FEATURES

- Output voltage in excess of 1.0 A
- Maximum output voltage of 100 millivolts
- Thermal shutdown and current protection
- High and low current limiting
- Output resistance of 50 mΩ maximum

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Rating	Unit
Output Voltage	V_{OUT}	14	V
Input Voltage	V_{IN}	1.2	V
Power Dissipation	P_D	1.0	W
Operating Junction Temperature Range	T_{JOP}	0 to 125	°C
Storage Temperature Range	T_{STG}	-55 to 125	°C

ELECTRICAL CHARACTERISTICS at Tamb=25°C

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Output Voltage	V_{OUT}	4.75	5.0	5.2	V	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Output Voltage Regulation	ΔV_{OUT}	0.05	0.05	0.1	%	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Line Regulation	ΔV_{OUT}	0.05	0.05	0.1	%	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Load Regulation	ΔV_{OUT}	0.05	0.05	0.1	%	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Dropout Voltage	V_{DO}	0.2	0.2	0.2	V	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Quiescent Current	I_{Q}	0.5	0.5	0.5	mA	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Quiescent Current Change	ΔI_Q	0.0	0.0	0.0	mA	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Operating Temperature Range	T_{OP}	0	0	125	°C	Peak to Peak 1.0V
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	-0.005	0.005	0.005	mV/°C	0.1A, 25°C
Output Resistance	R_{OUT}	50	50	50	mΩ	$V_{IN}=7.0V, I_{OUT}=0.1A, R_{\theta JC}=25°C$
Peak Output Current	I_{OPK}	1.0	1.0	1.0	A	100µs Pulse, 25°C
Output Voltage	V_{OUT}	5.0	5.0	5.0	V	100µs Pulse, 25°C



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

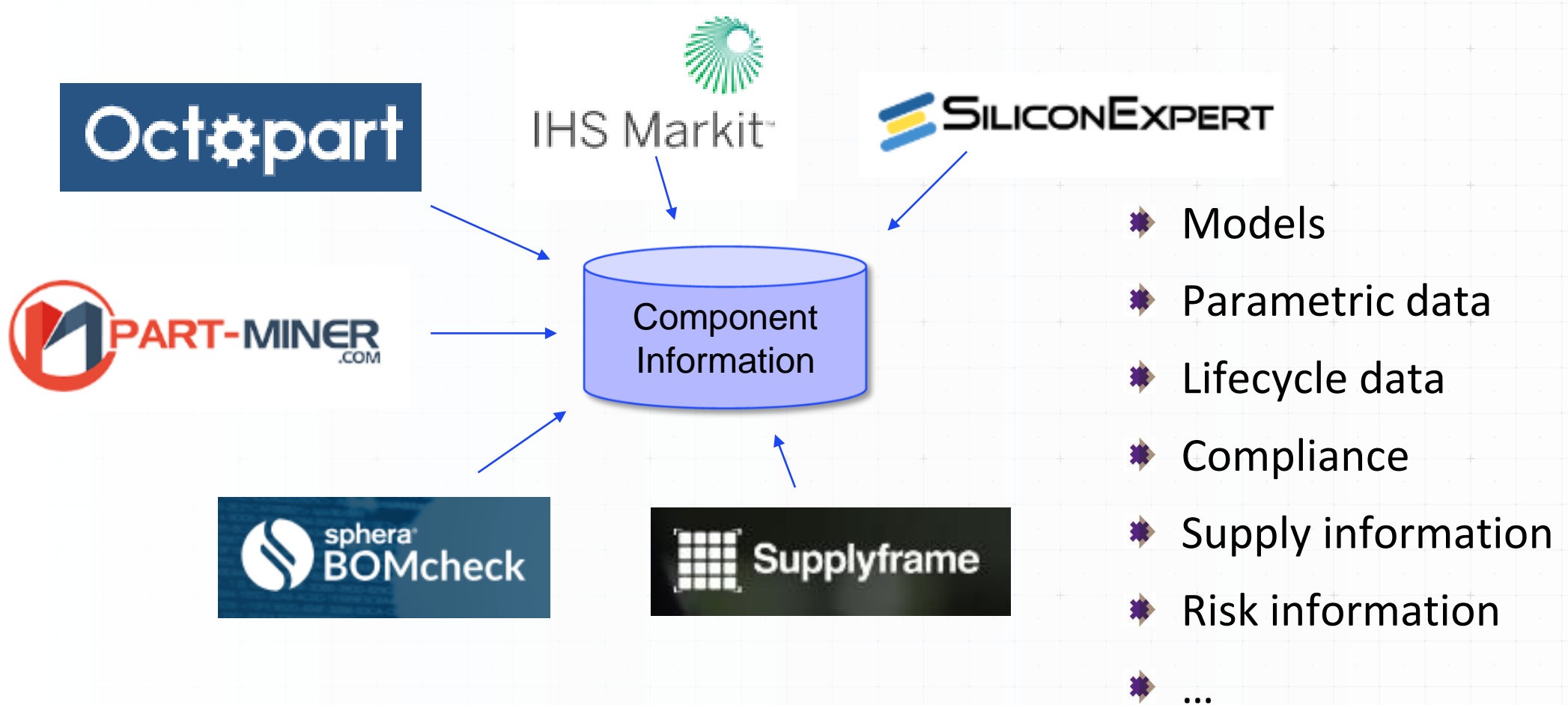


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Getting data from providers



Information Providers





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

Search

Enter search criteria...

Manufacturer Name	Manufacturer Part Number	Manufacturer Datasheet	Ref Des	Part Count
<all>	<all>	<all>	<all>	<all>
Vishay Dale	WFMB2512R1000FEA	N/A	R18_Ch1_R18_Ch...	12

Supply Chain Record selection

Warning: Multiple records found for Diodes Incorporated - BZT52C12 from your Preferred Supplier list. Please select 1 entry below and click 'OK'. Pricing shown reflects the cost of a single part.

Actual ManufacturerPN

Actual Manufacturer	SupplierPN	Supplier	Description	Part Count	Supplier Price	Mn order QTY	Unit Stock	Lifcy...	RO
Actual ManufacturerPN: BZT52C12									
Diodes Incorporated	67T1034	Newark	Zener Single Diode, 12V, ...	8	0.12400 USD	5	1500	Obs...	Compla
Actual ManufacturerPN: BZT52C12-7-F									
Diodes Incorporated			DIODE ZENER 12V 500...	8	0.21000 USD	1	178282	Active	Compla
Diodes Incorporated	BZT52C12-FDQKBR-ND	Digi-Key	DIODE ZENER 12V 500...	8	0.21000 USD	1	178282	Active	Compla
Diodes Incorporated	BZT52C12-FDQTR-ND	Digi-Key	DIODE ZENER 12V 500...	8	0.03784 USD	3000	177000	Active	Compla
Diodes Incorporated	00000000004880048	Avnet Americas	Diode Zener Single 12V 5...	8	0.03088 USD	3000	68000	Active	Compla
Diodes Incorporated	000000007004742592	Avnet Americas	Diode Zener Single 12V 5...	8	0.12400 USD	5	0	Active	Compla
Diodes Incorporated	70437767	Allied Electronic...	Zener Diode 12V 5.3% 50...	8	0.05100 USD	1	0	Active	Compla
Diodes Incorporated	07AH3648	Newark	ZENER DIODE, 12V, 0.5...	8	0.18000 USD	5	0	Active	Compla
Diodes Incorporated	07AH3649	Newark	ZENER DIODE, 12V, 0.5...	8	0.03900 USD	3000	6000	Active	Compla
Diodes Incorporated	38AH7697	Newark	ZENER DIODE SOD123 ...	8	0.03100 USD	3000	9000	Active	Compla
Actual ManufacturerPN: BZT52C12-13-F									
Diodes Incorporated	BZT52C1213-FDQCT-ND	Digi-Key	DIODE ZENER 12V 500...	8	0.21000 USD	1	62175	Active	Compla
Diodes Incorporated	BZT52C1213-FDQKR-ND	Digi-Key	DIODE ZENER 12V 500...	8	0.21000 USD	1	62175	Active	Compla
Diodes Incorporated	BZT52C1213-FDQTR-ND	Digi-Key	DIODE ZENER 12V 500...	8	0.02703 USD	10000	60000	Active	Compla
Diodes Incorporated	000000000005266917	Avnet Americas	Diode Zener Single 12V 5...	8	0.02447 USD	10000	0	Active	Compla
Diodes Incorporated	70437766	Allied Electronic...	Diode Zener Single 12V 5...	8	0.04200 USD	1250	0	Active	Compla
Diodes Incorporated	07AH3646	Newark	ZENER DIODE, 12V, 0.5...	8	0.19000 USD	5	0	Active	Compla
Diodes Incorporated	07AH3647	Newark	ZENER DIODE, 12V, 0.5...	8	Error finding ...	10000	0	Active	Compla
Diodes Incorporated	78AH9635	Newark	ZENER DIODE SOD123 ...	8	Error finding ...	10000	0	Active	Compla
Actual ManufacturerPN: BZT52C12LP-7									
Diodes Incorporated	BZT52C12LP-7DQCT-ND	Digi-Key	DIODE ZENER 11.4V 25...	8	0.43000 USD	1	11215	N/A	Compla
Diodes Incorporated	BZT52C12LP-7DQKR-ND	Digi-Key	DIODE ZENER 11.4 250...	8	0.43000 USD	1	11215	N/A	Compla
Diodes Incorporated	BZT52C12LP-7DQTR-ND	Digi-Key	DIODE ZENER 12V 250...	8	0.08080 USD	3000	9000	N/A	Compla
Diodes Incorporated	00000000004887354	Avnet Americas	Diode Zener Single 12V 5...	8	0.05860 USD	3000	51000	Active	Compla

Found 34

Part Suppliers

OK Cancel

Supply Chain info - Altium – Global Part Catalog / OctoPart

Components


Clock&Timing

Name	Description
MCP7940M-I/SN	Low-Cost I2C(TM) Real-Time Clock/Calendar with SRA...
DS1307ZN+	I2C Real-Time Clock, 4.5 to 5.5 V, -40 to 85 degC, 8-Pin...
LM555CM	Highly Stable 555 Timer for Generating Accurate Time...

Need more components?
Try [Manufacturer Part Search](#)
or [Create component](#)

Details


CMP-00023-00001-2 144 €4.14 (each)

 **DS1307ZN+**
I2C Real-Time Clock, 4.5 to 5.5 V, -40 to 85 degC, 8-Pin SOIC, RoHS, Tube

References Place

Case/Package SOIC

Part Choices

 **Maxim DS1307ZN+**
Real Time Clock, Volatile, 1 Timer(s), CMOS, PDSO8

[Datasheet](#) 18 SPN(s) ▲

RSComponents		RSComponents		RSComponents		Digi-Key	
1898602P	DE	1898602	DE	1897215	DE	DS1307ZN+-ND	US
Stock: 48	Unit: €3.73	Stock: 48	Unit: €4.14	Stock: 48	Unit: €3.04	Stock: 0	Unit: \$4.72
10 @ €3.73	26 @ €3.51	2 @ €4.14	10 @ €3.73	100 @ €3.04	300 @ €2.89	1 @ \$4.72	10 @ \$4.24
100 @ €3.04	250 @ €2.89	26 @ €3.51	Show more	500 @ €2.59	Show more	25 @ \$4.00	Show more

Where Used

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	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
<input type="checkbox"/>	 ATSAML10E16A-AU Microchip Technology Inc Add to list	\$2.9165	0.5 Low			Active	32	32 MHz	65536	16384	16384	CORTEX-M23		
<input type="checkbox"/>	 PIC16LF1578-I/SS Microchip Technology Inc Add to list	\$0.9606	0.5 Low			Active	8	32 MHz	4096	512		PIC16		
<input type="checkbox"/>	 PIC16LF15325T-I/JQ Microchip Technology Inc Add to list	\$0.7643	0.6 Low			Active	8	32 MHz	8192	1024		PIC16		
<input type="checkbox"/>	 PIC16F76-I/SO Microchip Technology Inc Add to list	\$3.2752	0.6 Low	Yes	Yes	Active	8	20 MHz	8192	368		PIC16		
<input type="checkbox"/>	 ATSAME70N20B-CNT Microchip Technology Inc Add to list	\$8.8574	0.6 Low			Active	32	300 MHz	262144	393216	393216	CORTEX-M7	16	24
<input type="checkbox"/>	 DSPIC33EV64GM103T-I/M5 Microchip Technology Inc Add to list	\$2.6104	0.6 Low			Active	16	40 MHz			8192			
<input type="checkbox"/>	 PIC16LF15345T-I/SS Microchip Technology Inc Add to list		0.6 Low			Active								



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



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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



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