Leveraging Open Source Designs

Creating a component search engine for reference designs used in practice
WHOAMI

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Electronics Hobbyist
Creating PCBs

Choose Components

Create Schematics

Design Layout

Manufacture

PROFIT!
Choosing Components

MCP73831/2

Microchip

Miniature Single-Cell, Fully Integrated Li-Ion,
Li-Polymer Charge Management Controllers

Features:
- Linear Charge Management Controller:
  - Integrated Pass-Transistor
  - Integrated Current Sense
  - Reverse Discharge Protection
- High Accuracy Preset Voltage Regulation: ± 0.75%
- Four Voltage Regulation Options:
  - 4.20V, 4.35V, 4.40V, 4.50V
- Programmable Charge Current: 15 mA to 500 mA
- Selectable Preconditioning:
  - 10%, 20%, 40%, or Disable
- Selectable End-of-Charge Control:
  - 5%, 7.5%, 10%, or 20%
- Charge Status Output:
  - Tri-State Output - MCP73831
  - Open-Drain Output - MCP73832

Description:
The MCP73831/2 devices are highly advanced linear charge management controllers for use in space-limited, cost-sensitive applications. The MCP73831/2 are available in an 8-Lead, 2 mm x 3 mm DFN package or a 5-Lead, SOT-23 package. Along with their small physical size, the low number of external components required make the MCP73831/2 ideally suited for portable applications. For applications charging from a USB port, the MCP73831/2 adhere to all the specifications governing the USB power bus.

The MCP73831/2 employ a constant-current/constant-voltage charge algorithm with selectable preconditioning and charge termination. The constant voltage regulation is fixed with four available options: 4.20V, 4.35V, 4.40V or 4.50V, to accommodate new, emerging battery charging requirements. The constant current value is set with one external resistor. The MCP73831/2 devices limit the charge current based on...
MCP73831

ESP8266-SMARTRWATCH
ESP8266 DIY WiFi Smartwatch with MPU-9250, RTC, OLED, FT232, ...

⚠️ Could not find license.md in repository, please check for the license before using the contents of this repository for your project!

Relevant Files:

<table>
<thead>
<tr>
<th>File name</th>
<th>Found component</th>
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<th>Data Sheet</th>
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<tr>
<td>handgelenk.kicad_pcb</td>
<td>MCP73831</td>
<td>5-pin SOT23 package</td>
<td><a href="MCP73831-2ATI/MC">Data Sheet</a></td>
</tr>
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Tags: SOT-23-5

Get Part on DigiKey
Order this project's PCB at Aisler

https://leopart.org
Conceptual Design

Crawler

PCB files

Parser

Component names

Validator

Database

Search
Crawler

Theory
Search GitHub for KiCad files
Save repository metadata and file urls

Practice
GitHub has (hidden) rate limits
GitHub search API limited to 1000 results per query

Workaround
Search only repo readme and description, avoid excessive code search
Parser

Theory
- Download .kicad_pcb files
- Extract components
- Save to database

Practice
- Component names are freetext fields

Workaround
- Validate components
Validator

Theory
Search for provided component name at distributors
Accept as valid component if 0<n<10 results

Practice
Component search API rate limits very low

Workaround
Piggyback on AISLER Component Search API cache
Future Work
Good First Issues

Move infrastructure to GitLab.com
- CI/CD
- Split monolithic repo into modular repos

Improve search
- Responsive design
- Searching repo description and readme
- Ranking search results

Support other formats than KiCad
- Fritzing, Eagle, LibrePCB, HorizonEDA, ...

Support other platforms than GitHub
- GitLab, BitBucket, fritzing.org, ...
Questions & Contact

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https://leopart.org