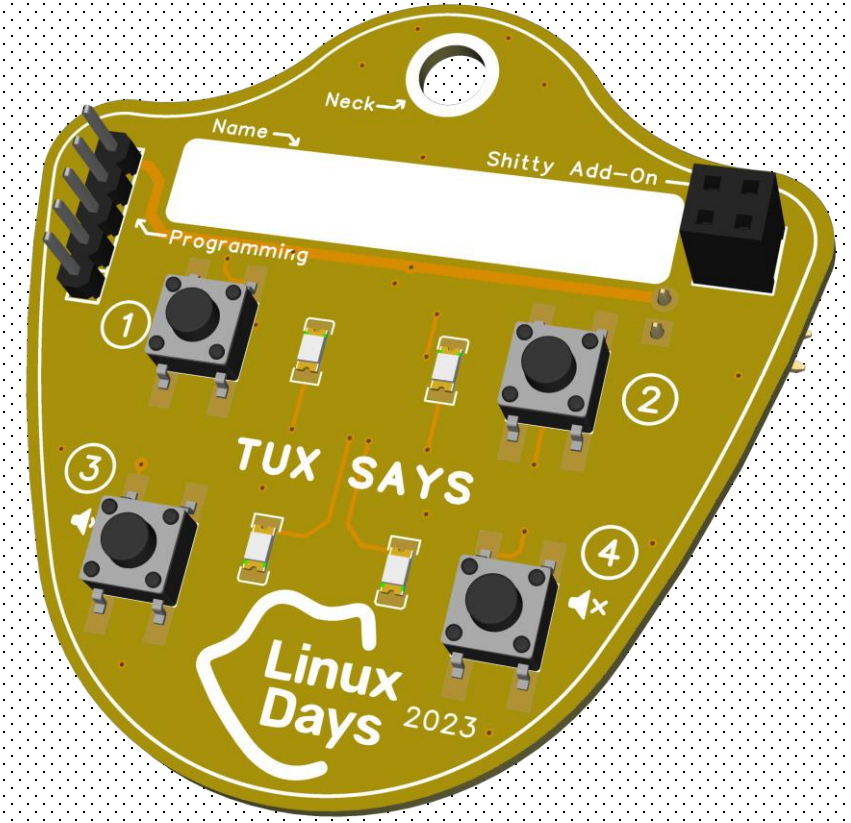
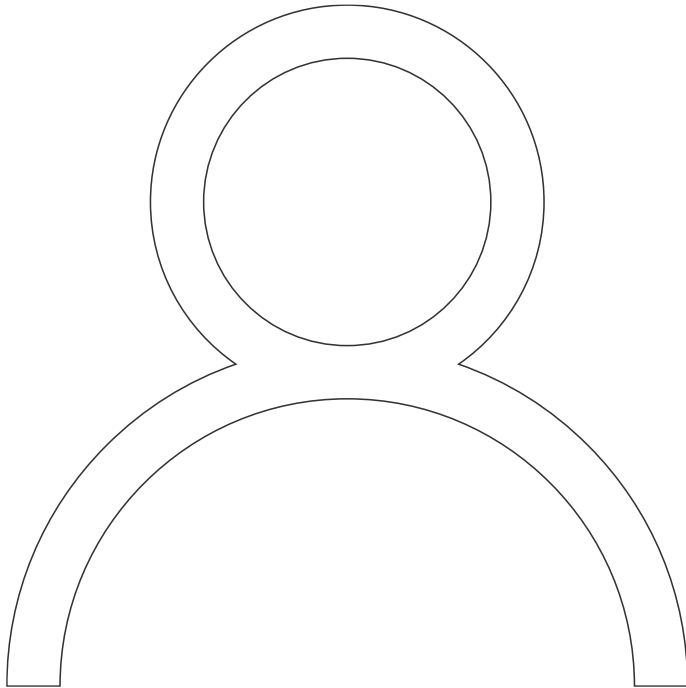


RISC-V za 10¢ (CH32V003)



@horcicaa



- Senior Engineer
@ [2Ntelecom](#)
- Cofounder and retired keeper
@ [bastlrna](#)

CH32V003

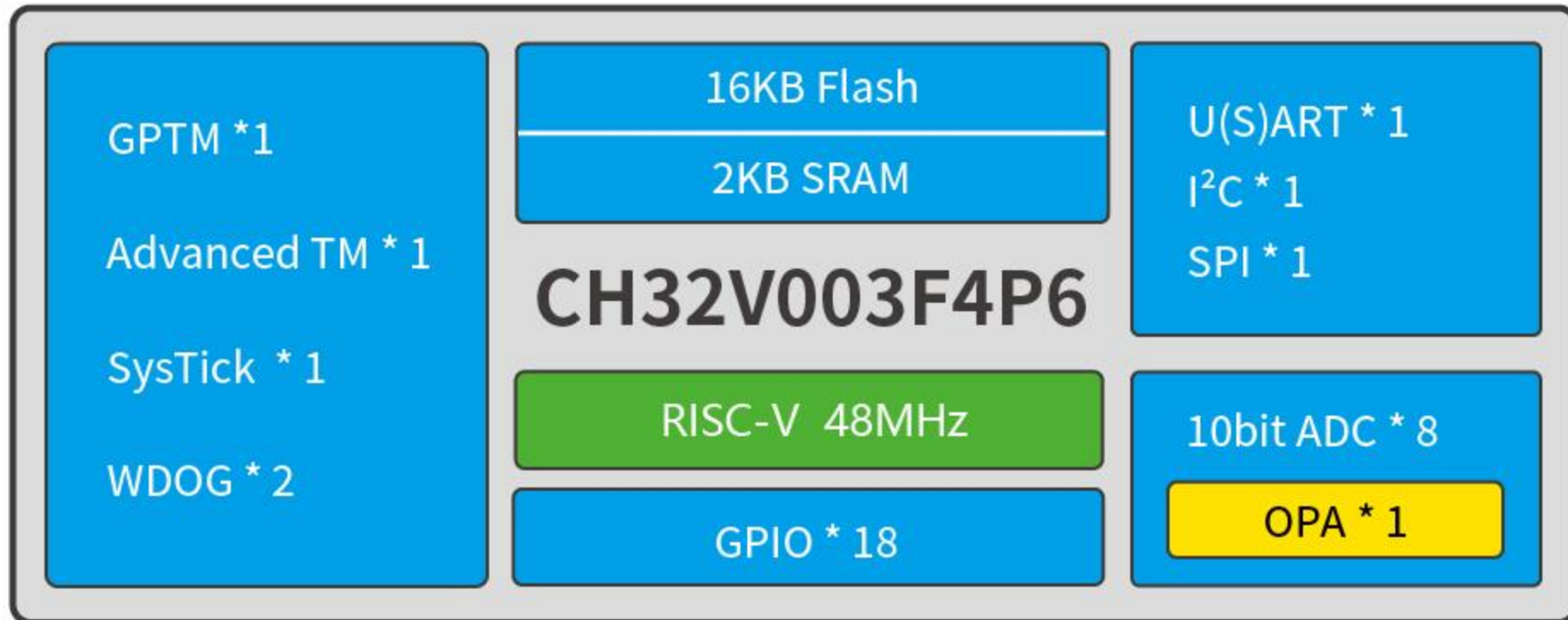


WCH

- WCH = WinChipHead
 - Brand firmy Nanjing Qinheng Microelectronics
 - Výrobce polovodičů z Číny
 - Převodníky (např. CH340, ...)
 - MCU
 - Včetně „velkých“ MCU s ETH, BLE, USB, ...
 - 8051, ARM Cortex-M, **RISC-V**
 - ...
- CH5xx
- CH32Fxxx
- CH32Vxxx



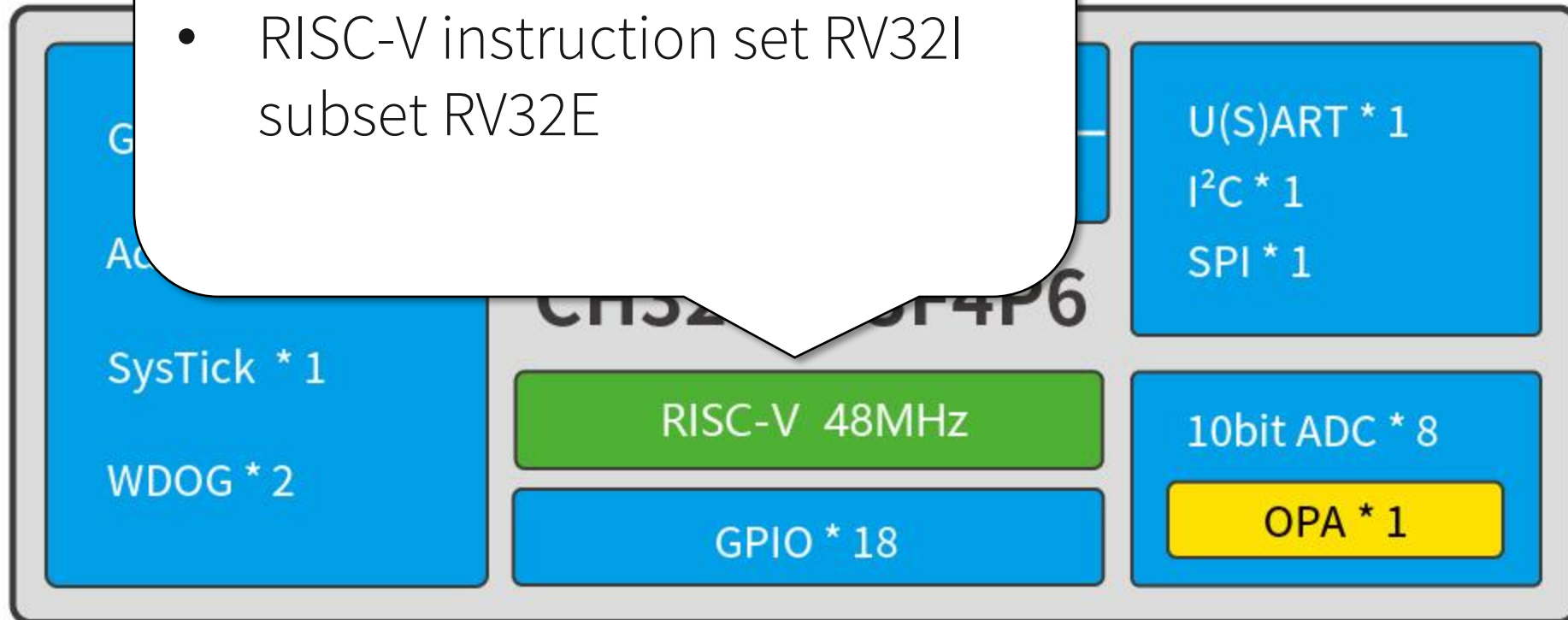
CH32V003



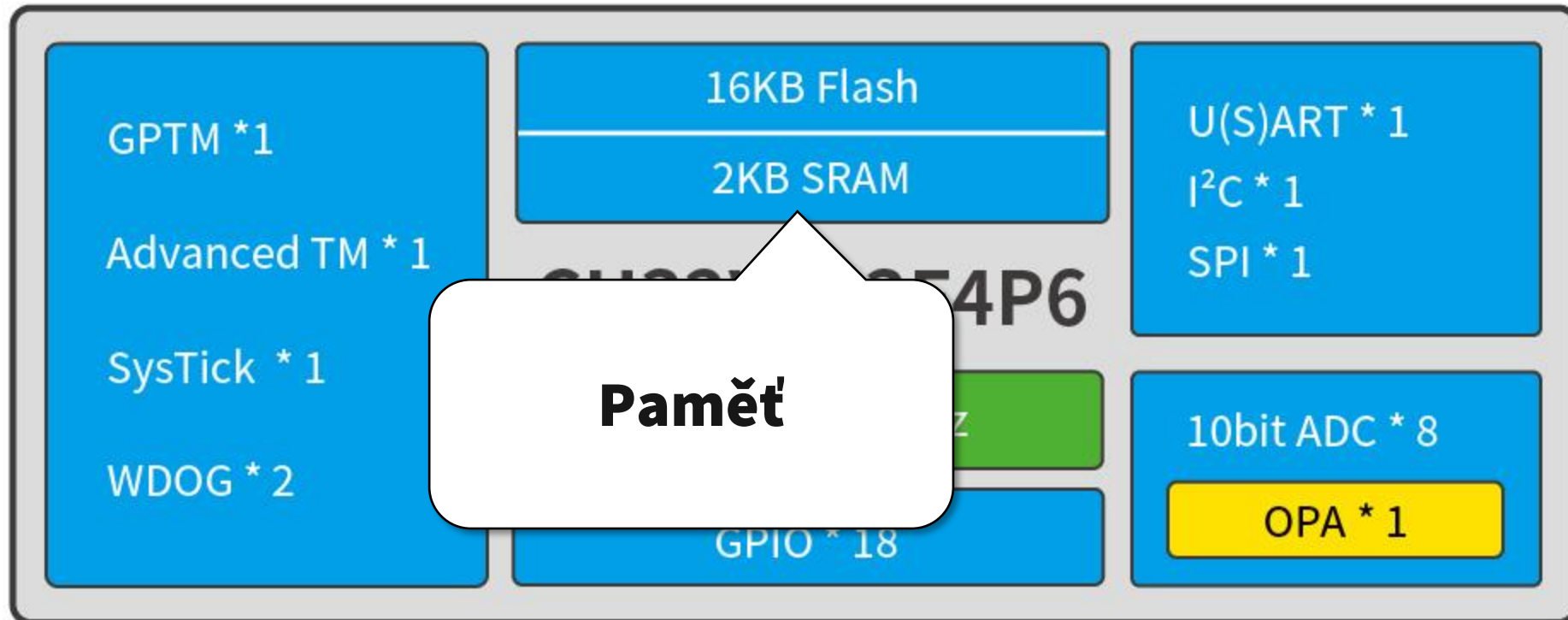
CH32V001

Jádro

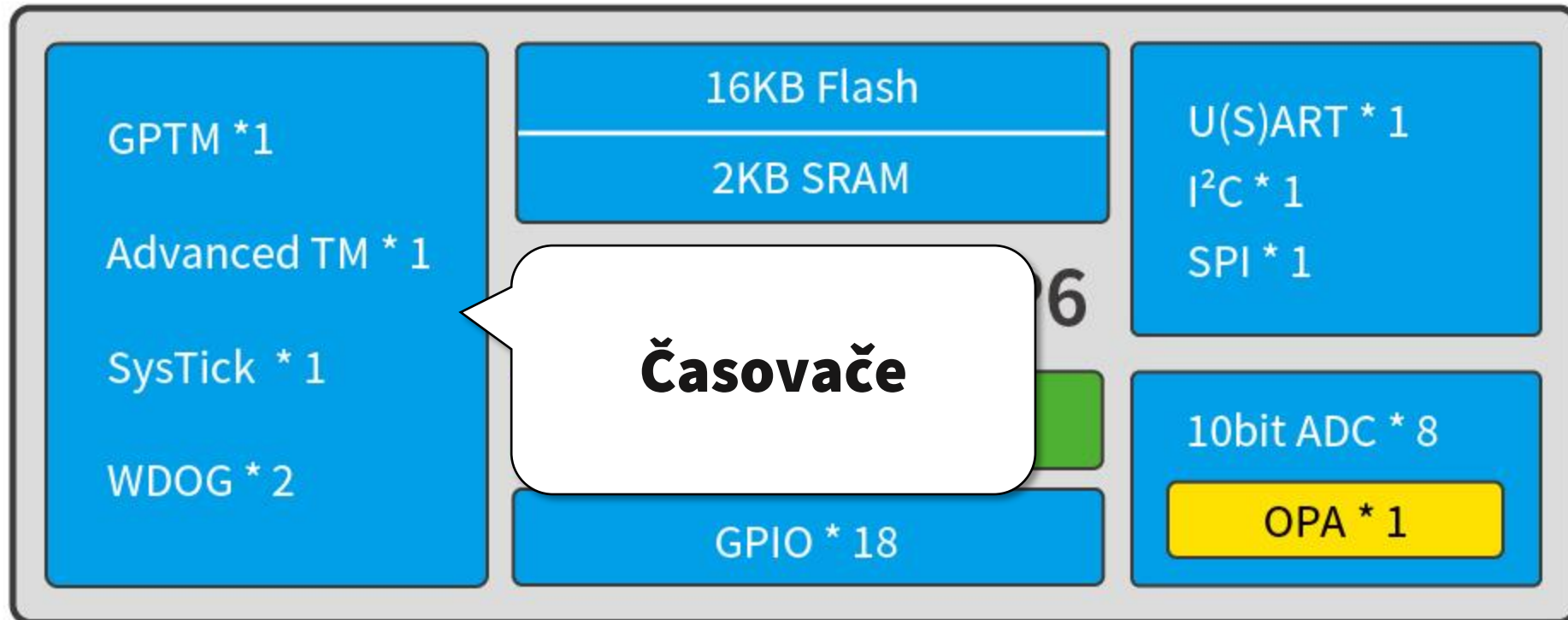
- QingKe V2 series MCU
- RISC-V instruction set RV32I subset RV32E



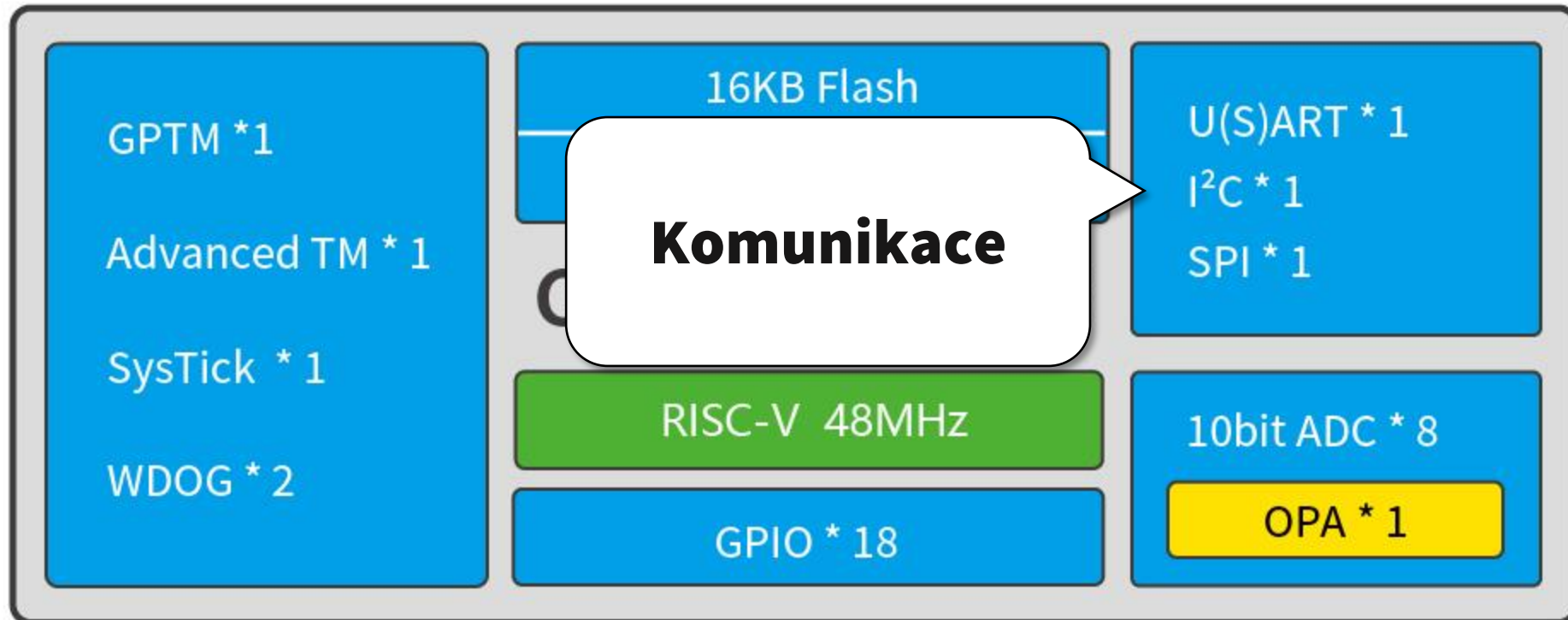
CH32V003



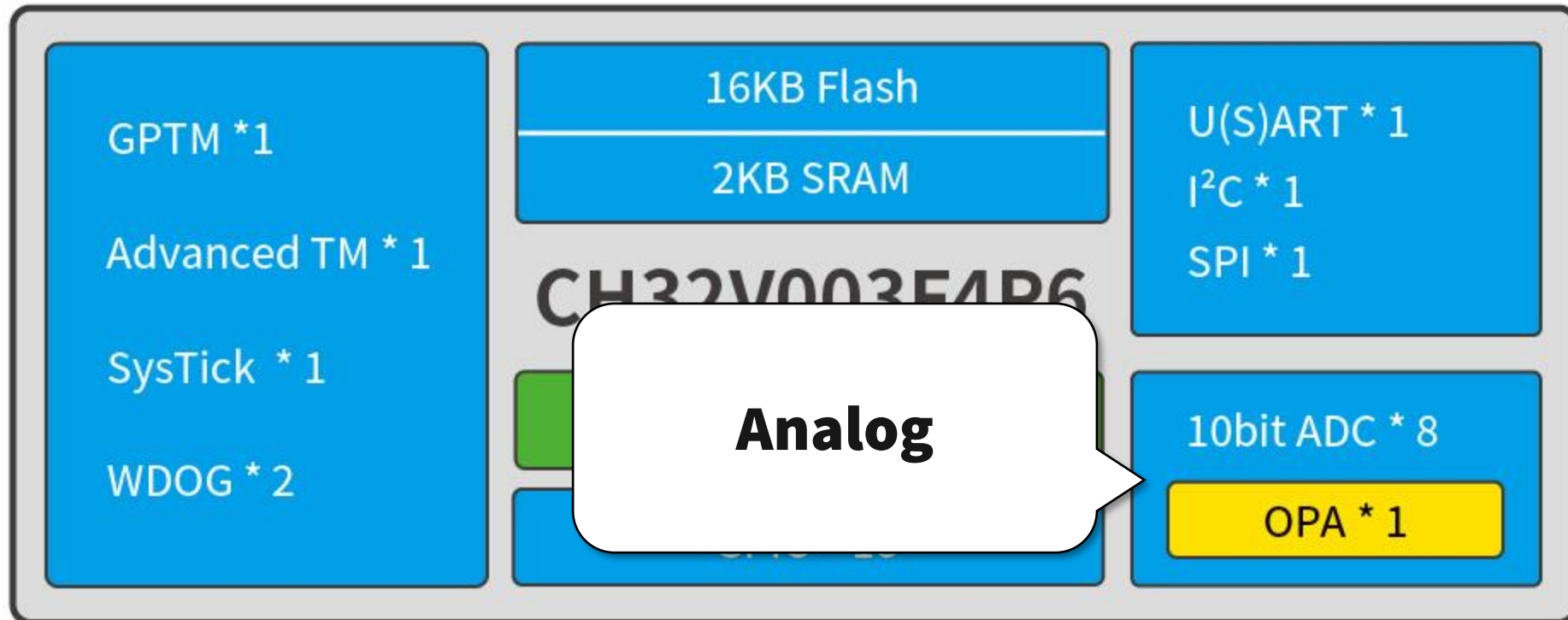
CH32V003



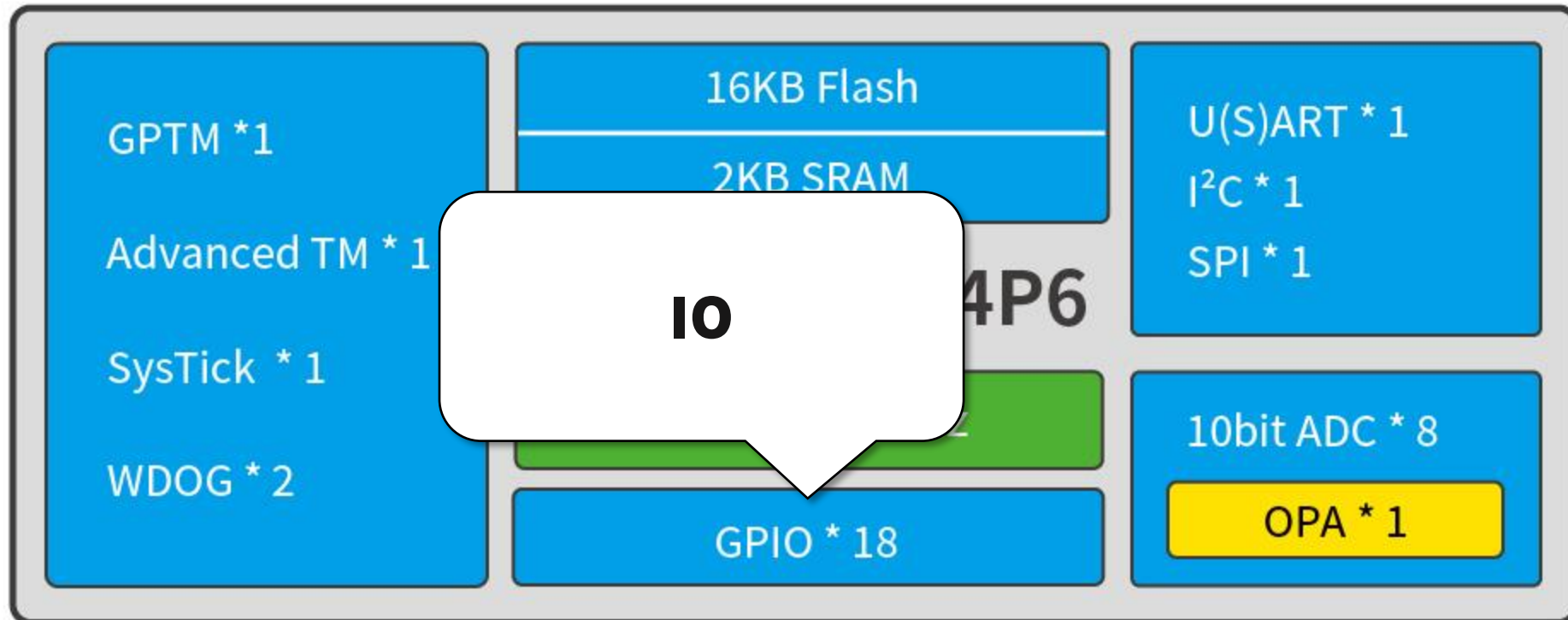
CH32V003



CH32V003



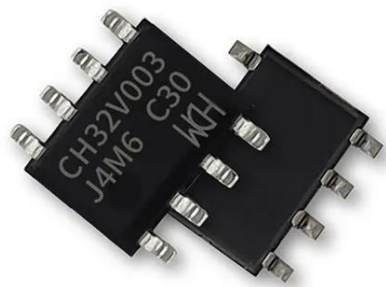
CH32V003



Co v diagramu nebylo

- 1x DMA controller
- 64-bit chip unique ID
- Serial 1-Wire Debug Interface
- Multiple low power modes: sleep, standby
- Supply voltage: 3.3/5V
- Power-on/power-off reset, programmable voltage detector

Pouzdra



SOP-8



SOP-16



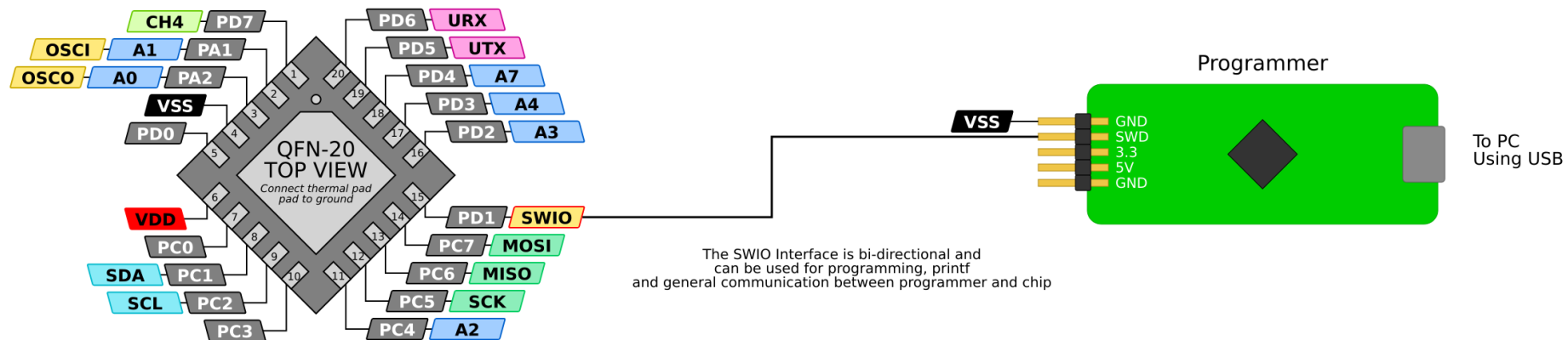
TSSOP-20



QFN-20

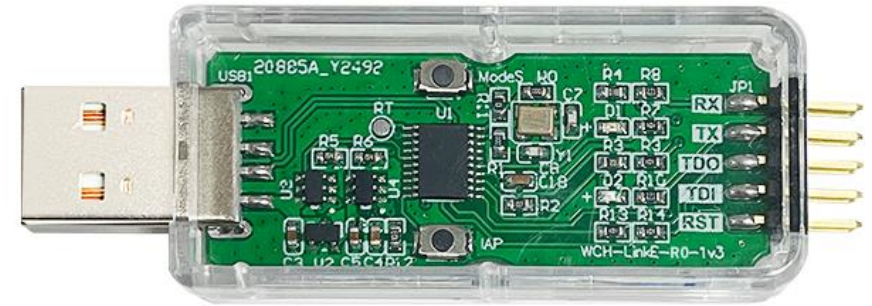
SWIO

- Single Wire Input Output
- Flash, Debug, terminal („printf“)
- Popsané v [RISC-V QingKeV2 Microprocessor Debug Manual.pdf](#)



Programátor

- Oficiální:
 - **WCH LinkE**
 - <https://www.wch-ic.com/products/WCH-Link.html>
- Neoficiální
 - [esp32s2-funprog](#)
 - [NHC-Link042](#) (STM32F042)
 - [PicoRVD](#) (RPI Pico)
 - **Flipper Zero**
 - https://github.com/sukvojte/wch_swio_flasher



Oficiální SDK

- MounRiver Studio IDE
 - Multiplatformní
 - Postavené nad Eclipse
- Tutorial
 - <https://pallavaggarwal.in/2023/09/20/ch32v003-programming-guide/>

Neoficiální „zábavné“ SDK

- CH32V003fun - <https://github.com/cnlohr/ch32v003fun>
- Autor CNLohr
 - Rozhovor: <https://theamphour.com/637-ch32v003-fun-with-cnlohr/>
- Minimalistické SDK a tooling
 - GCC + Make + LD script + jeden .h soubor
- Velmi rychlé
- Ideální pokud si chcete hrát a prozkoumat MCU do hloubky
- V opačném případě bych vyzkoušel oficiální SDK

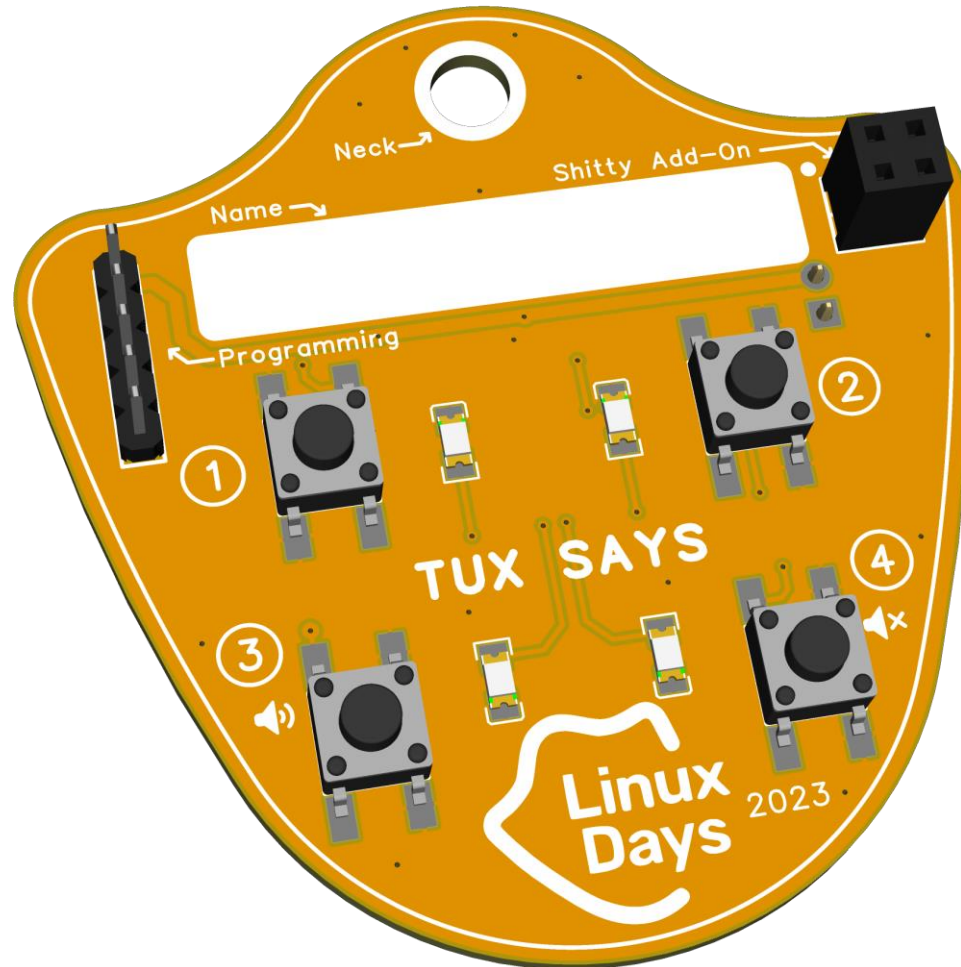
Arduino core

- <https://github.com/AlexanderMandera/arduino-wch32v003>

Demo boardy

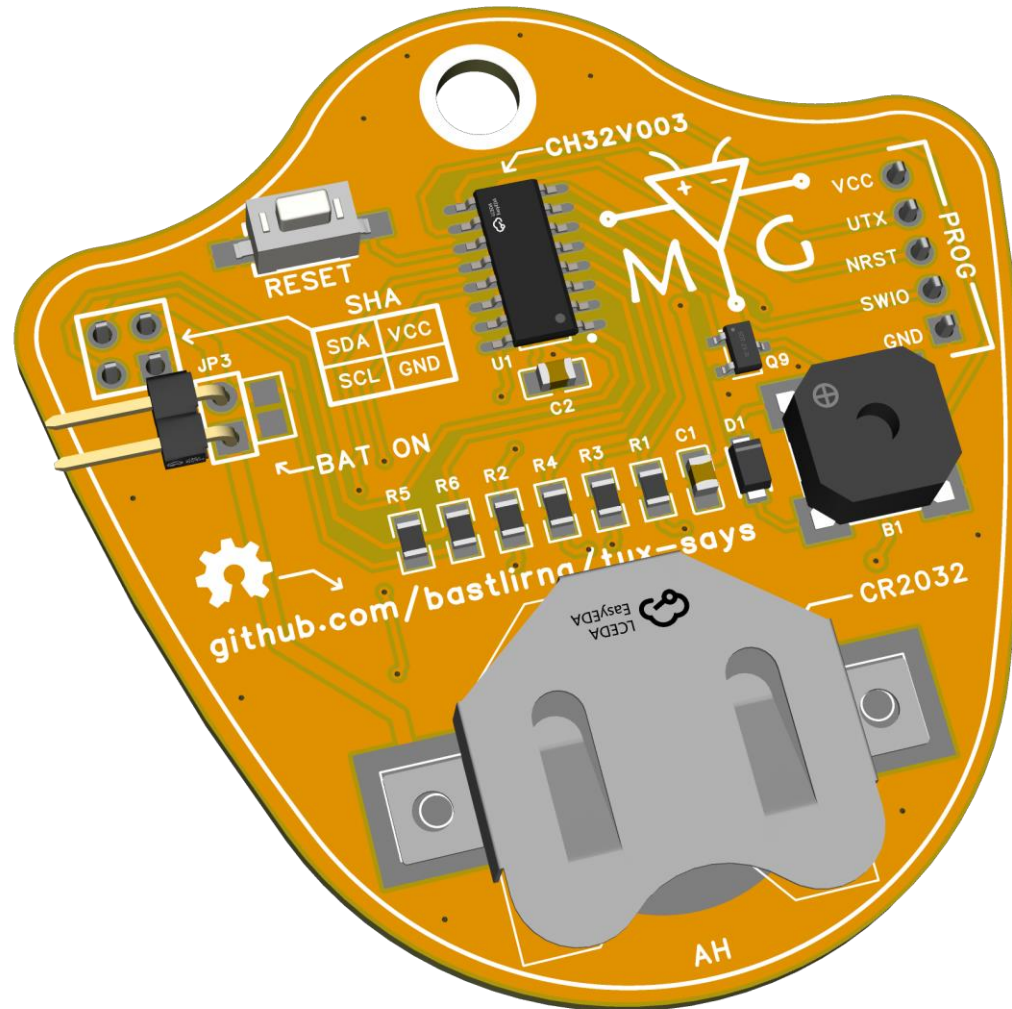


Tux Says



<https://github.com/bastlirna/tux-says/>

Tux Says



<https://github.com/bastlirna/tux-says/>

Kde koupit?

Oct^opart

 Categories

 ch32v003

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All Parts (0)

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Price & Availability

Part Specifications

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Part #/ Keyword

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Images	Pricing↑↓	Quantity	Availability	↓	Mfr.Part #	↑↓	Manufacturer
  Datasheet	5+ US\$0.2091 50+ US\$0.1697 150+ US\$0.1528 500+ US\$0.1317 More	 Min: 5 Mult: 5 Full Reel: 3000 Add	0		CH32V003J4M6		WCH(Jiangsu Qin Heng)
  Datasheet	5+ US\$0.2311 50+ US\$0.1864 150+ US\$0.1672 500+ US\$0.1432 More	 Min: 5 Mult: 5 Add	0		CH32V003A4M6		WCH(Jiangsu Qin Heng)
  Datasheet	5+ US\$0.2516 50+ US\$0.2014 150+ US\$0.18 500+ US\$0.1532	 Min: 5 Mult: 5 Full Reel: 5000 Add	0		CH32V003F4U6		WCH(Jiangsu Qin Heng)

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CH32V003

INDUSTRIAL-GRADE MCU

RISC-V2A

SINGLE-WIRE SERIAL DEBUG INTERFACE

SYSTEM FREQUENCY 48MHZ



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~ 16 ¢ / kus

Kam dál

- Datasheet
 - Processor Manual
 - http://www.wch-ic.com/downloads/QingKeV2_Processor_Manual_PDF.html
 - Technical Reference Manual
 - http://www.wch-ic.com/downloads/CH32V003RM_PDF.html
 - Datasheet
 - http://www.wch-ic.com/downloads/CH32V003DS0_PDF.html
- <https://github.com/cnlohr/ch32v003fun>
 - Je tam i wiki a fůra příkladů

Použít či nepoužít? 🤔

Otázky?

@horcicaa

adam@horcica.cz

MacGyver
macgyver.siliconhill.cz