

Overview

CH32V002 is an industrial-grade general-purpose microcontroller designed based on QingKe RISC-V core, which supports 48MHz system main frequency, with wide voltage, low-power consumption, 1-wire SDI and other features. Its pins and functions are compatible with CH32V003. CH32V002 has a built-in 12-bit ADC, with a sampling rate of up to 3Msps; it provides rich peripheral resources, such as 7-channel DMA controller, multi-group timer, USART, I2C, SPI and so on.

Features

- **Core**
 - QingKe 32-bit RISC-V core, RV32EmC instruction set
 - Fast programmable interrupt controller + hardware interrupt stack
 - Support 2-level interrupt nesting
 - Support system main frequency 48MHz
- **Memory**
 - 4KB volatile data storage area SRAM
 - 16KB program memory CodeFlash
 - 3328B BootLoader
 - 256B non-volatile system configuration memory
 - 256B user-defined memory
- **Power management and low-power consumption**
 - System power supply V_{DD} : 2~5V
 - Low-power mode: Sleep, Standby
- **Clock & Reset**
 - Built-in factory-trimmed 24MHz RC oscillator
 - Built-in 128KHz RC oscillator
 - High-speed external 3~25MHz oscillator
 - Built-in system clock monitoring (SCM) module
 - Power on/down reset, programmable voltage detector
- **7-channel general-purpose DMA controller**
 - 7 channels, support ring buffer
 - Support TIMx/ADC /USART/I2C/SPI
- **12-bit ADC**
 - Analog input range: $V_{SS} \sim V_{DD}$
 - 8 external signals + 3 internal signals
 - Support 3M sampling rate
- **8-channel touch-key channel detection**
- **Multiple timers**
 - 1×16-bit advanced-control timers, with dead zone control and emergency brake; can offer PWM complementary output for motor control
 - 1×16-bit general-purpose timers, provide input capture/output comparison/PWM/pulse counting/incremental encoder input
 - 2 watchdog timers (independent watchdog and window watchdog)
 - SysTick: 32-bit counter
- **1 set of USART**
 - Support LIN, support multiple pin mapping
- **1 I2C interface**
- **1 SPI interface**
- **GPIO port**
 - 3 sets of GPIO ports, 18 I/O ports
 - Mapping 1 external interrupt
- **Security features: Chip unique ID**
- **Debug mode: 1-wire serial debug interface (SDI)**
- **Package: QFN, TSSOP or SOP**

Model	FLASH	RAM	GPIO	ADTM	GPTM	Watchdog	ADC	Serial port	I2C	SPI	Package form
CH32V002F4P6	16K	4K	18	1	1	2	8+3	1	1	1	TSSOP20
CH32V002F4U6	16K	4K	18	1	1	2	8+3	1	1	1	QFN20
CH32V002A4M6	16K	4K	14	1	1	2	6+3	1	1	1	SOP16
CH32V002D4U6	16K	4K	11	1	1	2	4+3	1	1	-	QFN12
CH32V002J4M6	16K	4K	6	1	1	2	6+3	1	1	-	SOP8