

Overview

CH32V003 series is an industrial-grade general-purpose microcontroller designed based on QingKe RISC-V2A core, which supports 48MHz system main frequency in the product function. The series features wide voltage, single-wire serial debug interface, low-power consumption and ultra-small package. It provides commonly used peripheral functions, built-in 1 group of DMA controller, 1 group of 10-bit analog-to-digital conversion ADC, 1 group of op-amp comparator, multiple timers, standard communication interfaces such as USART, I2C, SPI, etc. The rated operating voltage of the product is 3.3V or 5V, and the operating temperature range is -40°C~85°C industrial-grade.

Features

- **Core**
 - QingKe 32-bit RISC-V core, RV32EC instruction set
 - Fast programmable interrupt controller + hardware interrupt stack
 - Support 2-level interrupt nesting
 - Support system main frequency 48MHz
- **Memory**
 - 2KB volatile data storage area SRAM
 - 16KB program memory CodeFlash
 - 1920B BootLoader
 - 64B non-volatile system configuration memory
 - 64B user-defined memory
- **Power management and low-power consumption**
 - System power supply V_{DD} : 3.3V or 5V
 - Low-power mode: Sleep, Standby
- **Clock & Reset**
 - Built-in factory-trimmed 24MHz RC oscillator
 - Built-in 128KHz RC oscillator
 - High-speed external 4~25MHz oscillator
 - Power on/down reset, programmable voltage detector
- **1 group of 1-channel general-purpose DMA controller**
 - 7 channels, support ring buffer
 - Support TIMx/ADC /USART/I2C/SPI
- **1 group of OPA and comparator: connected with ADC and TIM2**
- **1 group of 10-bit ADC**
 - Analog input range: 0~ V_{DD}
 - 8 external signals + 2 internal signals
 - Support external delayed triggering
- **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
- **Communication interfaces**
 - 1 USART interfaces
 - 1 I2C interfaces
 - 1 SPI interfaces
- **GPIO port**
 - 3 groups of GPIO ports, 18 I/O ports
 - Mapping 1 external interrupt
- **Security features: 64-bit unique ID**
- **Debug mode: 1-wire serial debug interface (SDI)**
- **Package: SOP, TSSOP or QFN**