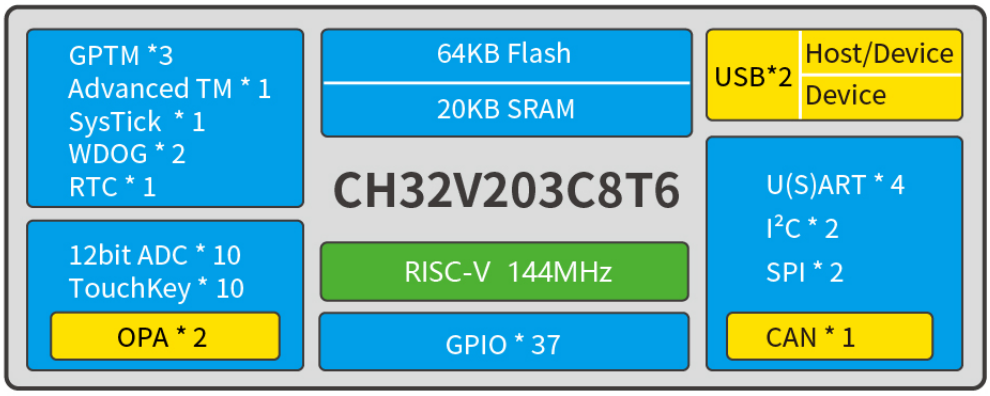
32-bit Enhanced Low-Power RISC-V MCU – CH32V203

Overview

The CH32V203 is an industrial-grade enhanced low-power general-purpose MCU based on 32-bit RISC-V core. The CH32V203 features high performance, and supports up to 144MHz system clock frequency. The operating power consumption can be as low as 45uA/MHz. CH32V203 integrates 2-channel USB interface which supports USB Host and USB Device functions. The CH32V203 provides 1-channel CAN interface (2.0B active), 2-channel OPA, 4 UARTs, 2 IICs, 12-bit ADC, 10-channel TouchKey and other peripheral resources. Several packages such as TSSOP20, QFN28 QFN48, LQFP32 and LQFP48 are available for users.

System Block Diagram



Features

- Qingke V4B, up to 144MHz system clock frequency.
- Single-cycle multiplication and hardware division.
- 20KB SRAM, 64KB Flash.
- Supply voltage: 2.5V/3.3V. GPIO unit is supplied independently.
- Low-power modes: sleep/stop/standby.
- Down to 44.65uA/MHz in Run mode.
- Down to 17.90uA/MHz in Sleep mode.
- Power-on/power-down reset (POR/PDR), programmable voltage detector (PVD).
- 1 x 18-channel general DMA controllers.
- 2 amplifiers.
- 10-channel 12-bit ADC, 10-channel TouchKey.
- 4 timers.
- One USB2.0 full-speed host/device interface.
- One USB2.0 full-speed device interface.
- 4 UARTs.
- One CAN interface (2.0B active).
- 2 IIC interfaces, 2 SPI interfaces.
- 37 I/O ports, can be mapped to 16 external interrupts.
- CRC calculation unit, 96-bit unique ID.
- Serial 2-wire debug interface.

- Packages: TSSOP20, QFN28, QFN48, LQFP32, LQFP48.

Product Selection Guide

Part NO.	Freq	Flash	SRAM	GPIO	Advanced TM(16bit)	GPTM (16bit)	SysTick (64bit)	WDOG	RTC	ADC(12bit) Unit/ Channel	Touch key	OPA	SPI	I²C	U(S)ART	CAN	USB2.0 FS	VDD	Package
CH32V203F6P6	144Mhz	32K	10K	16	1	3	1	2	1	2/9	9	1	1	-	1	1	D	2.5/3.3	TSSOP20
CH32V203G6U6	144Mhz	32K	10K	24	1	3	1	2	1	2/10	10	2	1	1	2	1	D	2.5/3.3	QFN28
CH32V203K6T6	144Mhz	32K	10K	26	1	3	1	2	1	2/10	10	2	1	1	2	1	D	2.5/3.3	LQFP32
CH32V203C6T6	144Mhz	32K	10K	37	1	3	1	2	1	2/10	10	2	1	1	2	1	D+H/D	2.5/3.3	LQFP48
CH32V203F8P6	144MHz	64K	20K	17	1	3	1	2	1	2/9	9	2	1	1	2	-	H/D	2.5/3.3	TSSOP20
CH32V203F8U6	144MHz	64K	20K	17	1	3	1	2	1	2/9	9	2	1	-	2	-	H/D	2.5/3.3	QFN20
CH32V203G8R6	144Mhz	64K	20K	24	1	3	1	2	1	2/10	10	2	1	1	2	1	D+H/D	2.5/3.3	QSOP28
CH32V203K8T6	144MHz	64K	20K	26	1	3	1	2	1	2/10	10	2	1	1	2	1	D	2.5/3.3	LQFP32
CH32V203C8T6	144MHz	64K	20K	37	1	3	1	2	1	2/10	10	2	2	2	4	1	D+H/D	2.5/3.3	LQFP48
CH32V203C8U6	144MHz	64K	20K	37	1	3	1	2	1	2/10	10	2	2	2	4	1	D+H/D	2.5/3.3	QFN48
CH32V203RBT6	144MHz	128K	64K	51	1	3	1	2	1	1/16	16	2	2	2	4	1	D+H/D	2.5/3.3	LQFP64M

Technical Resources

1. Datasheet: **CH32V20x_30xDS0.PDF**, **CH32FV2x_V3xRM.PDF**
2. CH32V203EVT evaluation board manual and reference routines: CH32V20xEVT.ZIP
3. Integrated development environment (IDE): **MounRiver Studio(MRS)**