



Condensing Wisdom , Changing Life

PRODUCT

2025Q1
Preparation

Product Selection Manual

Communication Interface ICs and MCU ICs Company



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About Us

Nanjing Qinhang Microelectronics Co., Ltd. focuses on connectivity technology and microprocessor research and is an IC design company that designs chips based on self-developed professional interface IP and microprocessor IP. We are committed to providing customers with chips and solutions for the interconnection of everything, up and down, and its main products include USB/Bluetooth/Ethernet interface chips and connected/interconnected/wireless MCUs, which focus on connectivity, networking and control. SoC and MCU chips can usually be decomposed into several lower-level IP components. For example, the first step in designing a USB network card chip is to purchase or develop the 3 major components of USB PHY and controller, Ethernet PHY and MAC, and processor core. Different from the quick and trouble-free route of outsourcing PHY or processor IP component technology license and then assembling and designing chips, we insist on long-termism based on the consideration of performance, cost and autonomy, and has been continuously laying out the self-research of key IP components for many years, focusing on the tracing of the origin and the bottom layer construction. Our IP system brings flexibility in chip architecture. Compared with the black box of outsourced components, self-developed underlying components are conducive to integrated articulation and optimization, improve overall performance and efficiency, reduce power consumption, reduce size, and have a sustainable development path and long-term marginal cost advantage.

Main brand: WinChipHead (WCH)

Product positioning: Professional, easy to use

Application areas: Industrial Control, Computer Peripherals, Mobile Phone Peripherals, IoT, etc.

Our advantage: Solid foundation, core autonomy, overall synergy

Based on our specialization in connectivity and networking, we conducted dedicated to research on key and common technologies of interface chips and MCUs especially suited for this era of interconnectivity and networking everywhere. These include microprocessor cores, professional interfaces such as USB/Bluetooth/Ethernet, and other IP modules. This combination is referred to as "one core and three interfaces" in short.

Self-developed interface IP: highly optimized system-level interface chips provide efficient connectivity solutions for a connected world

Connection technologies include PHY physical layer transceivers, MAC or link controllers, protocol stacks or operating system drivers, interconnection application layers, etc. Among them, the physical layer is located at the bottom layer of the connection and is usually implemented by mixed digital and analog technologies such as SerDes or RF transceivers, ultra-high-speed ADCs, and DSP-level baseband algorithms. It is the "root" technology of the connection. Based on years of research on connection, Qinhang's independent IP system covers and passes the vertical data chain composed of transceiver, controller and protocol stack, and the strong coupling integration design improves the synergy of software and hardware, reduces power consumption, and improves efficiency and compatibility. The cross-combination of professional interfaces and the matrix combination of professional interfaces and core form the verticalized products such as PHY chip, controller chip, protocol stack chip and interface conversion chip, which realize the function expansion or bridge conversion of USB, Bluetooth and Ethernet, and adapt to the diversified industrial application requirements with the multi-level product structure and professional performance.

Self-developed IP: a flexible combination of multi-level cores and professional peripherals to form a wide range of MCUs and system-level SoC

Our company's self-developed "core" technology includes QingKe RISC-V and early E8051 core, after more than 10 years of research and development and iteration, realize the core freedom, part of the RISC-V chip has been mature commercial at least 5 years. We stand at the forefront of the RISC-V industry and is committed to promoting the landing and development of RISC-V in the MCU industry, and has published the key technologies of the QingKe RISC-V series of mass-production chips at the RISC-V World Conference CHINA 2021.

QingKe core is based on the concept of RISC-V eco-compatibility and optimized expansion. We incorporate technologies like VTF to accelerate interrupts, expand the protocol stack and support low-power application instructions, and streamline debug interfaces. MCUs and high-speed interface SoCs equipped with QingKe cores avoid dependence on third-party chip technology, reduce dependence on offshore software platforms and application ecosystems, and eliminate the licensing fees and per-chip commission fees for outsourced IP technology, saving costs for the industry chain and customers. Our company's flexible matrix combination of multi-layer cores with specialized peripherals such as high-speed USB, PD, Ethernet, BLE and other peripherals, focusing on application optimization and overall synergy, enables MCUs and SoCs to excel in connectivity scalability, performance, power consumption, integration and other aspects.

Combining hardware and software to break through the barriers of device connectivity, promoting seamless communication and cross-platform mobility

In addition to the chip design team, hardware, and embedded software teams specialized in lower-level development, our company also has a system and software team specializing in upper-level deployments like computers, servers, and the Core Cloud platform. The team specializes in the development of underlying core drivers, communication libraries, and APP application tools for various operating systems and platforms such as Windows, Linux, macOS, Android, iOS, and WeChat. We utilize virtualization technology to enable seamless cross-platform connectivity and application migration, facilitating the transformation of offline devices into connected devices, and enhancing the added value of end products. Furthermore, we provide customers with comprehensive system-level solutions.

Cumulate & Perfect

After years of dedicated efforts, our company has provided more than 100 chip categories and technical solutions to customers. WCH chips are integral components found in products from tens of thousands of companies worldwide. Each year, over 100 million devices establish connections through them. Boasting over 100 million cumulative shipments of its USB series chips, our company also sells more than 100 million units of its QingKe RISC-V core-based chips annually. Additionally, our self-service programming platform programs MCUs with target firmware for clients on the order of a million units monthly.

Thanks to the autonomy and overall synergy of the underlying components, WCH chips have reduced the number of internal links, lowered power consumption and shrunk in size. For example, the Bluetooth chip CH585 with integrated high-speed USB is only QFN3*3, the USB3.0 HUB chip CH634F is only QFN4*4, and the CH32M007E with built-in high-voltage LDO and motor pre-driver is only QFN3*3. While the packages are shrunken, the cost is optimized and the high-frequency characteristics are improved.

Qinhang places great emphasis on investment in research and development, acquiring multiple independent intellectual property rights through innovation, including patents, integrated circuit layout design rights, software copyrights, and more. Our company has been recognized as a high-tech enterprise, a national-level specialized and new "small giant" enterprise, a national intellectual property advantageous enterprise. We have also registered international trademarks in many countries and regions such as the United States, United Kingdom, Germany, Japan, and South Korea.

We never forget the essence and social significance of our enterprise. As we grow, we strive for mutual growth with our staff. We also adhere to a healthy market-oriented operation and use high-quality, professional chips to assist our customers in providing society with better products.

Our Vision: Condense wisdom and change lives

Our Mission: Focus on the core, excel in the field, and turn innovation into customer value

Our Core Values: Responsibility; Enterprise; Collaboration

RISC-V General Series	1-2
CH32V317/307/5	3-4
CH32V205	5-6
CH32V303/203	7-8
CH32V208	9-10
CH32V006/5/M006	11-12
CH32V002	13-14
CH32V103	
USB Featured Applications Series	
CH32H417	15-16
CH32M030	17-18
CH32M007	19-20
CH32X035	21-22
CH32L103/M103	23-24
CH645	25
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CH569	27
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Bluetooth Low Energy Series	
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CH583/2	34
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Ethernet Series	
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CH9121T/A	42
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USB Series	
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CH339	47
CH338	48
CH334/5	49
CH377	50
CH346	51
CH347	52
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CH341/5	55
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CH319	57
CH318	58
CH317	59
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CH132	60
USB PD/Type-C Applications Series	
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CH253/2/4/1	64
CH224/1	65
CH230/1/3/5/6/7/8	66
PCI/PCIe Series	
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Display Driver and Keyboard Scanning Series	
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CH422/3	70
CH457	71
Display and keyboard scanning control selection	72
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CH449/6	76
Product Solutions	
Low-power wireless/Network communications/USB applications	77-78
Data acquisition/Data storage&security/Protocol power/Interface conversion	79-80

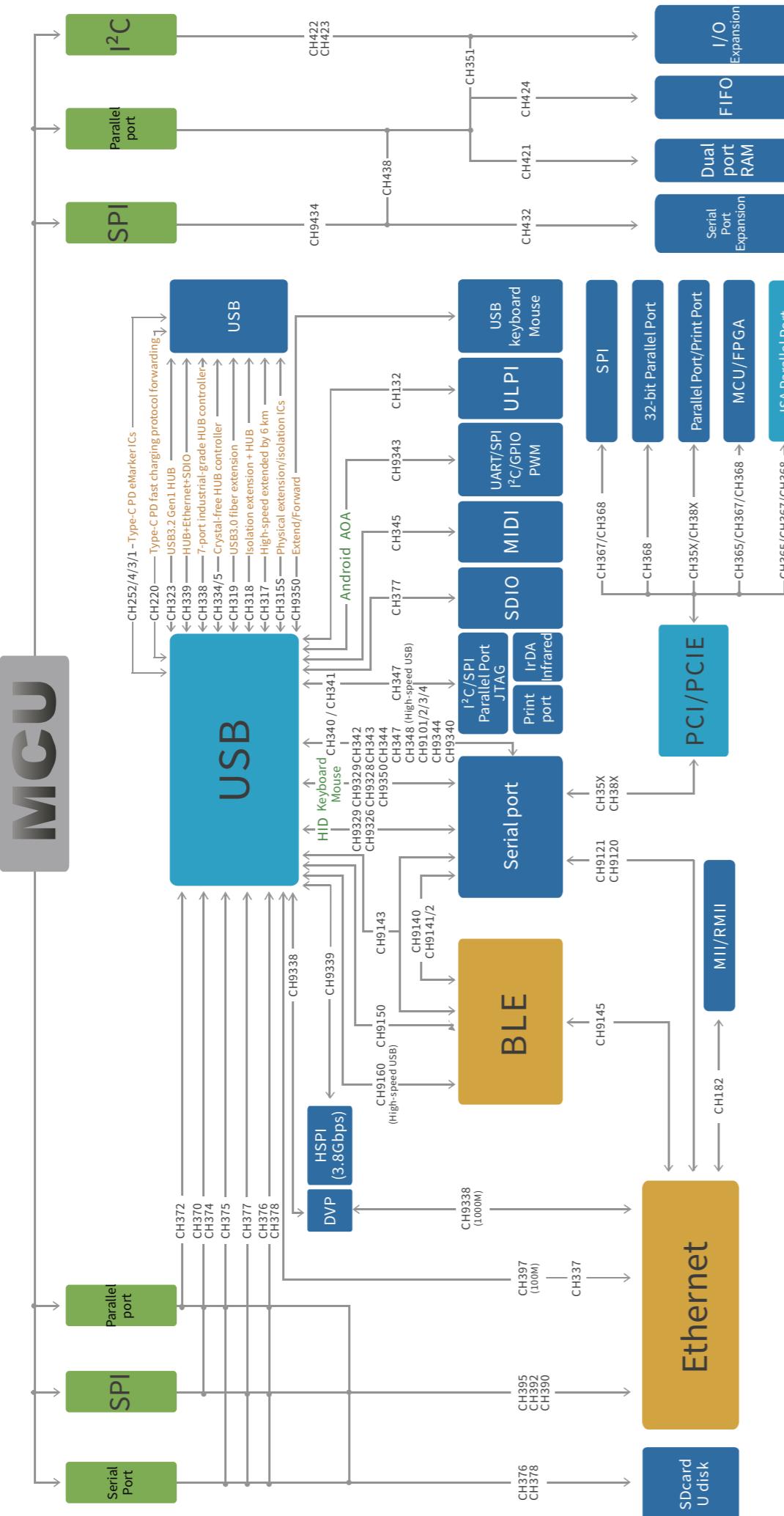
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Interface Conversion Expert

Functional interface

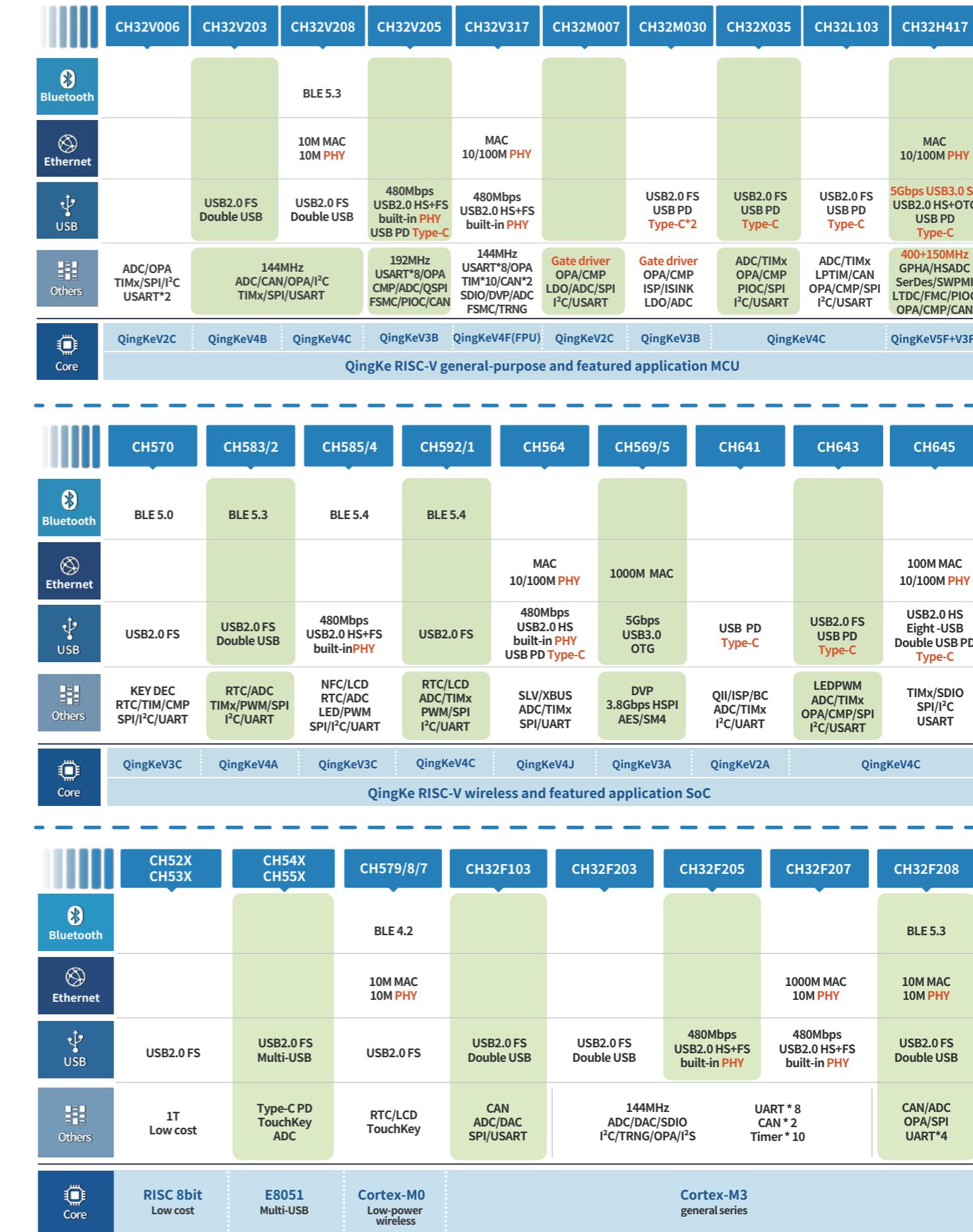
Bus interface

MCU



青稞RISC-V MCU产品一览

Selection Guide of QingKe RISC-V MCU



WCH MCU/SoC Product Selection

32-bit RISC-V Featured Application Series

Part NO.	Freq	Flash	SRAM	GPIO	Adv/GP Timer	PWM	WDOG	RTC	ADC Unit/CH	Touch key	DAC	OPA	SPI/I ² C	I ² C	UART	CAN	USB2.0 FS	USB2.0 HS	Ethernet	BLE	SDIO	TRNG	Other Features	VDD	Package		
CH32V3XX	CH32V317VCT6	144MHz	256K	64K	70	4/4	16	2	1	2/16	16	2	4	3/2	2	8	2	OTG	H/built-in PHY	MAC+10M/100M PHY	-	1	1	DVP	2.5/3.3	LQFP100	
	CH32V317WCU6	144MHz	256K	64K	48	4/4	16	2	1	2/16	16	2	4	3/2	2	8	2	OTG	H/built-in PHY	MAC+10M/100M PHY	-	1	1	-	2.5/3.3	QFN68	
	CH32V307VCT6	144MHz	256K	64K	80	4/4	16	2	1	2/16	16	2	4	3/2	2	8	2	OTG	H/built-in PHY	1G MAC 10M PHY	-	1	1	FSMC/DVP	2.5/3.3	LQFP100	
	CH32V307WCU6	144MHz	256K	64K	54	4/4	12	2	1	2/16	16	2	4	3/2	2	8	2	OTG	H/built-in PHY	1G MAC 10M PHY	-	1	1	-	2.5/3.3	QFN68	
	CH32V307RCT6	144MHz	256K	64K	51	4/4	32	2	1	2/16	16	2	4	3/2	2	8	2	OTG	H/built-in PHY	1G MAC 10M PHY	-	1	1	-	2.5/3.3	LQFP64M	
	CH32V305RBT6	144MHz	128K	32K	51	4/4	29	2	1	2/16	16	2	4	3/2	2	5	2	OTG	H/built-in PHY	-	-	1	1	-	2.5/3.3	LQFP64M	
	CH32V305CCT6	144MHz	256K	64K	41	4/4	28	2	1	2/16	16	2	4	3/2	2	5	2	OTG	H/built-in PHY	-	-	-	1	-	2.5/3.3	LQFP48	
	CH32V305GBU6	144MHz	128K	32K	24	4/4	27	2	1	2/6	6	2	1	3/2	2	5	1	-	H/built-in PHY	-	-	1	1	-	2.5/3.3	QFN28	
	CH32V305FBP6	144MHz	128K	32K	17	4/4	26	2	1	2/1	1	1	-	1/1	2	2	1	-	H/built-in PHY	-	-	-	1	-	2.5/3.3	TSSOP20	
	CH32V303VCT6	144MHz	256K	64K	80	4/4	26	2	1	2/16	16	2	4	3/2	2	8	1	H/D	-	-	-	1	1	FSMC	2.5/3.3	LQFP100	
	CH32V303RCT6	144MHz	256K	64K	51	4/4	20	2	1	2/16	16	2	4	3/2	2	8	1	H/D	-	-	-	1	1	-	2.5/3.3	LQFP64M	
	CH32V303RBT6	144MHz	128K	32K	51	1/3	12	2	1	2/16	16	2	4	2/-	2	3	1	H/D	-	-	-	-	-	-	2.5/3.3	LQFP64M	
	CH32V303CBT6	144MHz	128K	32K	37	1/3	10	2	1	2/10	10	2	4	2/-	2	3	1	H/D	-	-	-	-	-	-	2.5/3.3	LQFP48	
CH32V20X	CH32V208WB6	144MHz	128K	64K	53	1/4	28	2	1	1/16	16	-	2	2/-	2	4	1	D+H/D	-	10M PHY	5.3	-	-	-	2.5/3.3	QFN68	
	CH32V208RBT6	144MHz	128K	64K	49	1/4	26	2	1	1/16	16	-	2	2/-	2	4	1	D+H/D	-	10M PHY	5.3	-	-	-	2.5/3.3	LQFP64M	
	CH32V208CBU6	144MHz	128K	64K	37	1/4	16	2	1	1/16	16	-	2	2/-	2	4	1	D+H/D	-	-	5.3	-	-	-	2.5/3.3	QFN48	
	CH32V208GBU6	144MHz	128K	64K	21	1/4	16	2	1	1/8	8	-	1	1/-	1	2	1	D+H/D	-	10M PHY	5.3	-	-	-	2.5/3.3	QFN28	
	CH32V205VCT6	192MHz	256K	32K	80	1/3	19	2	1	1/16	16	-	2	2/-	2	8	1	H/D	H/built-in PHY	-	-	-	-	-	FSMC/PIOC/QSPI CMP/type-CPD	1.8/2.5/3.3	LQFP100
	CH32V205RCT6	192MHz	256K	32K	51	1/3	19	2	1	1/16	16	-	2	2/-	2	8	1	H/D	H/built-in PHY	-	-	-	-	-	PIOC/QSPI/CMP Type-CPD	1.8/2.5/3.3	LQFP64
	CH32V205CCT6	192MHz	256K	32K	41	1/3	19	2	1	1/16	16	-	2	2/-	2	8	1	H/D	H/built-in PHY	-	-	-	-	-	PIOC/QSPI/CMP Type-CPD	1.8/2.5/3.3	LQFP48
	CH32V203CCT6	192MHz	256K	32K	37	1/3	19	2	1	1/10	10	-	2	2/-	2	8	1	H/D	-	-	-	-	-	QSPI/CMP	1.8/2.5/3.3	LQFP48	
	CH32V203RBT6	144MHz	128K	64K	51	1/3	16	2	1	1/16	16	-	2	2/-	2	4	1	D+H/D	-	10M PHY	-	-	-	-	-	2.5/3.3	LQFP64M
	CH32V203C8U6	144MHz	64K	20K	37	1/3	16	2	1	2/10	10	-	2	2/-	2	4	1	D+H/D	-	-	-	-	-	-	2.5/3.3	QFN48X7	
	CH32V203C8T6	144MHz	64K	20K	37	1/3	16	2	1	2/10	10	-	2	2/-	2	4	1	D+H/D	-	-	-	-	-	-	2.5/3.3	LQFP48	
	CH32V203K8T6	144MHz	64K	20K	26	1/3	15	2	1	2/10	10	-	2	1/-	1	2	1	D	-	-	-	-	-	-	2.5/3.3	QFP32	
	CH32V203G8R6	144MHz	64K	20K	24	1/3	15	2	1	2/10	10	-	2	1/-	1	2	1	D+H/D	-	-	-	-	-	-	2.5/3.3	QSO28	
	CH32V203F8U6	144MHz	64K	20K	19	1/3	12	2	1	2/9	9	-	2	1/-	2	-	D	-	-	-	-	-	-	2.5/3.3	QFN20		
	CH32V203F8P6	144MHz	64K	20K	17	1/3	12	2	1	2/9	9	-	2	1/-	1	2	-	H/D	-	-	-	-	-	-	2.5/3.3	TSSOP20	
	CH32V203CGT6	144MHz	32K	10K	37	1/3	16	2	1	2/10	10	-	2	1/-	1	2	1	D+H/D	-	-	-	-	-	-	2.5/3.3	LQFP48	
	CH32V203G6U6	144MHz	32K	10K	24	1/3	10	2	1	2/10	10	-	2	1/-	1	2	1	D	-	-	-	-	-	-	2.5/3.3	QFN28	
	CH32V203F6P6	144MHz	32K	10K	16	1/3	8	2	1	2/9	9	-	1	1/-	-	1	1	D	-	-	-	-	-	-	2.5/3.3	TSSOP20	
CH32V103	CH32V103R8T6	80MHz	64K	20K	51	1/3	16	2	1	1/16	16	-	2/-	2	3	-	H/D	-	-	-	-	-	-	3.3/5.0	LQFP64M		
	CH32V103C8T6	80MHz	64K	20K	37	1/3	16	2	1	1/10	10	-	2/-	2	3	-	H/D	-	-	-	-	-	-	3.3/5.0	LQFP48		
	CH32V103C8U6	80MHz	64K	20K	37	1/3	16	2	1	1/10	10	-	2/-	2	3	-	H/D	-	-	-	-	-	-	3.3/5.0	QFN48X7		
	CH32V103C6T6	80MHz	32K	10K	37	1/2	12	2	1	1/10	10	-															

32-bit Cortex-M General-purpose Series

Part NO.	Freq	Flash	SRAM	GPIO	Adv/GP Timer	PWM	WDOG	RTC	ADC Unit/CH	Touch key	DAC	OPA	SPI/I ² S	I ² C	UART	CAN	USB2.0 FS	USB2.0 HS	Ethernet	BLE	SDIO	TRNG	Other Features	VDD	Package
CH32F103C6T6	72MHz	32K	10K	37	1/2	12	2	1	1/10	10	1	-	1/-	1	2	1	D+H/D	-	-	-	-	-	-	3.3/5.0	LQFP48
CH32F103C8U6	72MHz	64K	20K	37	1/3	16	2	1	1/10	10	1	-	2/-	2	3	1	D+H/D	-	-	-	-	-	-	3.3/5.0	QFN48X7
CH32F103C8T6	72MHz	64K	20K	37	1/3	16	2	1	1/10	10	1	-	2/-	2	3	1	D+H/D	-	-	-	-	-	-	3.3/5.0	LQFP48
CH32F103R8T6	72MHz	64K	20K	51	1/3	16	2	1	1/16	16	1	-	2/-	2	3	1	D+H/D	-	-	-	-	-	-	3.3/5.0	LQFP64M
CH32F203C6T6	144MHz	32K	10K	37	1/2	12	2	1	2/10	10	-	2	1/-	1	2	1	D+H/D	-	-	-	-	-	-	2.5/3.3	LQFP48
CH32F203K8T6	144MHz	64K	20K	26	1/3	15	2	1	2/10	10	-	2	1/-	1	2	1	D	-	-	-	-	-	-	2.5/3.3	LQFP32
CH32F203C8T6	144MHz	64K	20K	37	1/3	16	2	1	2/10	10	-	2	2/-	2	4	1	D+H/D	-	-	-	-	-	-	2.5/3.3	LQFP48
CH32F203C8U6	144MHz	64K	20K	37	1/3	16	2	1	2/10	10	-	2	2/-	2	4	1	D+H/D	-	-	-	-	-	-	2.5/3.3	QFN48X7
CH32F203CBT6	144MHz	128K	32K	37	1/3	16	2	1	2/10	10	2	4	2/-	2	3	1	D	-	-	-	-	-	-	2.5/3.3	LQFP48
CH32F203RBT6	144MHz	128K	32K	51	1/3	16	2	1	2/16	16	2	4	2/-	2	3	1	D	-	-	-	-	-	-	2.5/3.3	LQFP64M
CH32F203RCT6	144MHz	256K	64K	51	4/4	26	2	1	2/16	16	2	4	3/2	2	8	1	D	-	-	-	1	1	-	2.5/3.3	LQFP64M
CH32F203VCT6	144MHz	256K	64K	80	4/4	28	2	1	2/16	16	2	4	3/2	2	8	1	D	-	-	-	1	1	FSMC	2.5/3.3	LQFP100
CH32F205RBT6	144MHz	128K	32K	51	4/4	26	2	1	2/16	16	2	4	3/2	2	5	2	OTG	H/D built-in PHY	-	-	1	1	-	2.5/3.3	LQFP64M
CH32F207VCT6	144MHz	256K	64K	80	4/4	28	2	1	2/16	16	2	4	3/2	2	8	2	OTG	H/D built-in PHY	1G MAC 10M PHY	-	1	1	FSMC/D/P	2.5/3.3	LQFP100
CH32F208RBT6	144MHz	128K	64K	49	1/4	16	2	1	1/16	16	-	2	2/-	2	4	1	D+H/D	-	10M PHY	5.3	-	-	-	2.5/3.3	LQFP64M
CH32F208WBUG	144MHz	128K	64K	53	1/4	16	2	1	1/16	16	-	2	2/-	2	4	1	D+H/D	-	10M PHY	5.3	-	-	-	2.5/3.3	QFN68

8-bit E8051 USB Series

Part NO.	Freq	Flash	RAM	DataFlash	USB	TouchKey	Type-C	ADC	LEDC/RGB LED	Timer	CAP	PWM	UART	SPI	I ² C	I/O	Built-in OSC/WDOG	VDD	Package
CH543	24MHz	16K	256+256	-	H/D	11	PD	12*12b	-/-	3*16b	2	4	1	1	1	17	✓/✓	3.3/5.0/9.0/12	QFN20
CH546	32MHz	35K	1K+256	1K	1*D	-	-	8*12b	-/-	3*16b	1	2	1	1	-	44	✓/✓	3.3/5.0	LQFP48/SOP16
CH548	32MHz	35K	2K+256	1K	1*H/1*D	-	✓	16*12b	-/-	3*16b	3	8	2	1	-	44	✓/✓	3.3/5.0	LQFP48/SOP16/SOP8
CH547	32MHz	63K	1K+256	1K	1*D	-	-	12*12b	-/-	3*16b	1	4	4	1	-	44	✓/✓	3.3/5.0	LQFP48/QFN28/SOP16
CH549	32MHz	63K	2K+256	1K	1*H/1*D	-	✓	16*12b	-/-	3*16b	3	8	4	1	-	44	✓/✓	3.3/5.0	LQFP48/QFN28/SOP16
CH545	32MHz	63K	8K+256	1K	4*H/17*D	14	-	14*12b	-/8*16	3*16b	2	6	2	2	5	58	✓/✓	3.3/5.0	LQFP64
CH551	24MHz	10K	512+256	128	1*D	5	-	-	-/-	3*16b	2	2	1	1	-	13	✓/✓	3.3/5.0	SOP16
CH552	24MHz	16K	1K+256	128	1*D	6	✓	4*8b	-/-	3*16b	2	2	2	1	-	17	✓/✓	3.3/5.0	TSSOP20/SOP16/MSOP10/QFN16
CH554	24MHz	16K	1K+256	128	1*H/1*D	6	✓	4*8b	-/-	3*16b	2	2	2	1	-	17	✓/✓	3.3/5.0	TSSOP20/SOP16/MSOP10/QFN16
CH558	56MHz	35K	4K+256	5K	1*D	-	-	8*11b	1/2/-	4*16b	3	1	2	1	-	45	✓/✓	3.3/5.0	LQFP48/SSOP20
CH559	56MHz	63K	6K+256	1K	2*H/1*D	-	-	8*11b	1/2/-	4*16b	3	3	2	2	-	45	✓/✓	3.3/5.0	LQFP48/SSOP20
CH555	32MHz	63K	8K+256	1K	1*D	14	-	14*12b	-/8*16	3*16b	2	-	2	2	1	45	✓/✓	3.3/5.0	LQFP48/LQFP64
CH557	32MHz	63K	8K+256	1K	4*H/1*D	14	-	14*12b	-/8*16	3*16b	2	6	2	2	2	58	✓/✓	3.3/5.0	LQFP48/LQFP64

Cross-interface SoC with synergistic proprietary connectivity technologies

WCH's proprietary connectivity technologies have vertically integrated the protocol stacks of USB, Bluetooth, and Ethernet. Through the strategic convergence of these specialized interfaces, we deliver robust cross-interface solutions.

CH32H417
5Gbps ultra-high speed USB + 100M Ethernet+USB PD+SerDes

CH32V317/CH32V307
High-speed USB + 100M Ethernet built-in PHY

CH397
100M NIC, built-in PHY

CH645
USB multi-host/device + dual USB PD + Ethernet

CH32V208 All-in-One Mini Gateway

Ethernet + USB + Bluetooth

CH585
BLES.4+high-performance custom 2.4G + high-speed USB + NFC

CH592
BLE 5.4 + USB + segment LCD

CH582
BLE5.3 + dual USB

CH570/2
BLES.O+ universal 2.4G + USB

Selection Guide of USB to UART

Selection Guide of USB to UART

USB to Single Serial Chip

Model	USB	Drive model ①	Maximum peak baud rate	Flow control continuous baud rate	Hardware flow control	Auto-control RS485	USB config	IO voltage (MCU voltage)	PWR saving dual power supply/prevent backflow	MODEM signal (Both GPIO and other interfaces)
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CH32V317

CH32V307

CH32V305

CH32F207

CH32F205

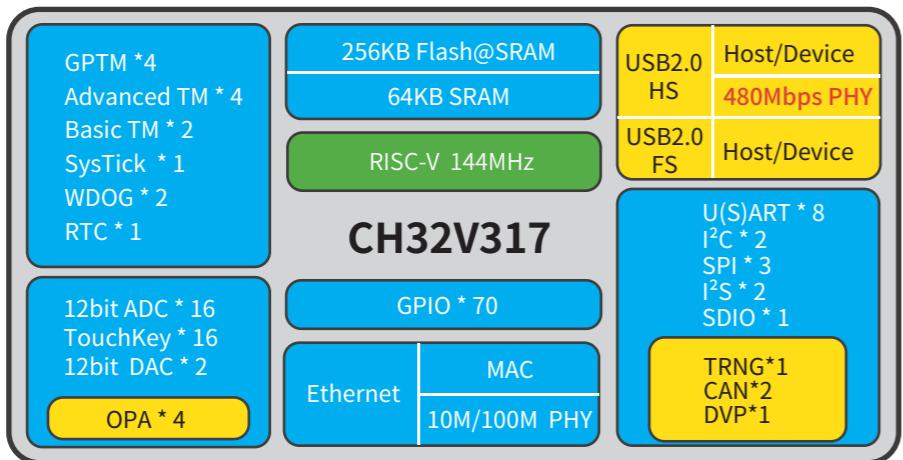
QingKe RISC-V/Cortex-M3 Core

High-speed Interconnect MCU

Built-in high-speed USB and Ethernet transceiver

CH32V317 is an industrial-grade general-purpose microcontroller based on the QingKe V4F floating-point core, operating at a 144MHz core frequency. It features a high-speed 480Mbps USB2.0 host/device interface with integrated PHY, a full-speed USB 2.0 OTG interface, built-in 100M Ethernet PHY, DVP, 2 CAN controllers, and 4 OPAs. With an increased number of standard peripherals, it is well-suited for comprehensive applications requiring multiple data acquisition and communication channels.

Block Diagram



Features

- RISC-V4F processor, up to 144MHz system frequency
- Supports single-cycle multiplication and hardware division
- Hardware floating-point support
- 64KB SRAM, 256KB Flash
- GPIO units powered independently, not synchronized with the system power supply
- Multiple low-power modes: Sleep/Stop/Standby
- Power-on/Power-down Reset (POR/PDR)
- 2 sets of 18-channel DMA controllers
- 4 OPA, CMP
- 1 TRNG
- 2 sets of 12-bit DAC converters
- 16 TouchKey channel detection
- 2 units of 16 12-bit ADC conversion
- 10 timer
- USB2.0 full-speed OTG interface
- USB2.0 high-speed 480Mbps host/device interface (built-in PHY)
- Ethernet MAC controller and 10/100M PHY
- 2 CAN interfaces (2.0B active)
- 2 I²C interface
- 3 USART and 5 UART
- 3 SPI interfaces (support Master and Slave modes)
- SDIO host interface
- FSMC memory interface
- Digital Video Port DVP
- 80 I/Os, all IO ports can be mapped to 16 external interrupts
- CRC calculation unit, 96-bit chip unique ID
- 2-wire SDI

Main Resource

Typical product models	CH32V317VCT6	CH32V307VCT6	CH32V305RBT6	CH32F207VCT6	CH32F205RBT6
Core	RISC-V (FPU)			Cortex-M3	
Flash (KB)	256		128	256	128
SRAM (KB)	64		32	64	32
GPIO	70	80	51	80	51
Advanced-control (16-bit)			4		
General-purpose (16-bit)			4		
Timer	Basic (16-bit)			2	
	WDOG			2	
	SysTick			1	
RTC			1		
ADC/TouchKey(Unit/Channels)			2/16		
DAC (Unit)			2		
OPA, CMP			4		
TRNG			1		
Communication interface	U (S) ART	8	5	8	5
	SPI			3	
	I ² S			2	
	I ² C			2	
	CAN			2	
	SDIO		1		
	DVP	1	-	1	-
	USB (FS)			OTG	
	USB (HS)			Host/Device (480Mbps)	
	Ethernet	MAC+10/100 PHY	1G MAC+10M PHY	-	1G MAC+10M PHY
	FSMC	-	1	-	1
System Frequency (MHz)				144	
VDD(V)				2.5/3.3	
Package	LQFP100	LQFP100	LQFP64M	LQFP100	LQFP64M

Note: For more models, please refer to MCU Selection Table

Applications



Industrial control



IoT



Health care



Consumer electronics

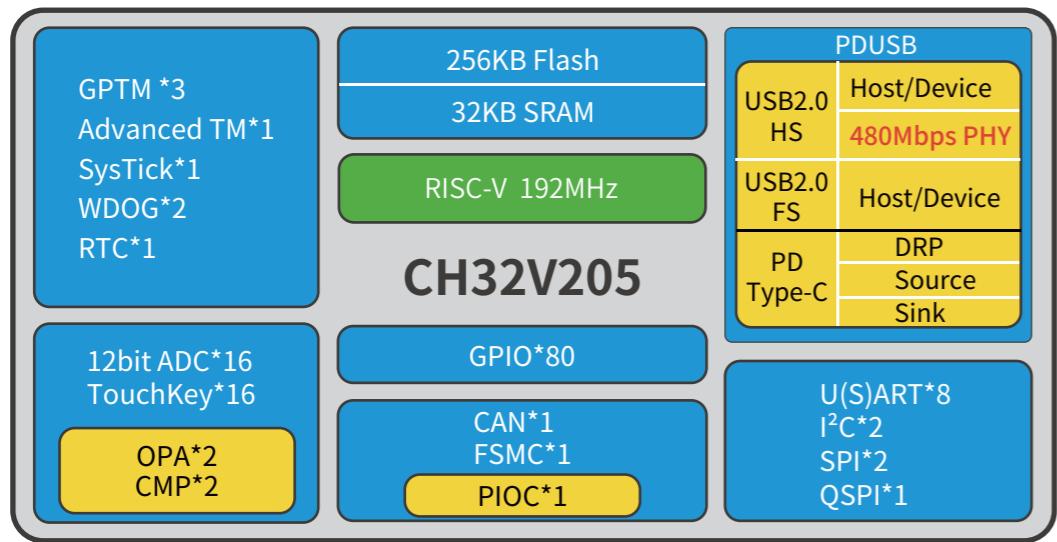
CH32V205

QingKe RISC-V High-speed USB and Type-C Connectivity MCU

PDUSB, 8 serial ports

CH32V205 is an industrial-grade general-purpose microcontroller based on the QingKe V3B core. Operating at a 192MHz main frequency, with an integrated USB2.0 high-speed PHY transceiver (480Mbps) and PD PHY. It supports PDUSB, USB Host/Device, USB PD, and Type-C power delivery. The device provides a programmable protocol I/O controller (PIOC), flash memory controller (FSMC), QSPI, CAN, 4Msps high-speed 12-bit ADC, Touchkey, multiple OPAs, and a rich set of standard peripherals.

Block Diagram



Features

- > RISC-V3B processor, up to 192MHz system frequency
- > 32KB SRAM, 256KB Flash
- > 32KB SRAM, 256KB Flash
- > System power VDD rated at 3.3V
- > Multi low-power mode: Sleep/Stop/Standby
- > Power-on/down reset (POR/PDR), programmable voltage detector (PVD)
- > 2 sets of 16-channel general DMA controller
- > Programmable protocol I/O controller (PIOC)
- > 2 sets of analog CMP
- > 2 sets of OPA/PGA/CMP
- > 16-channel 12-bit ADC conversion, 16-channel TouchKey
- > 4 sets of timer
- > 8 USARTs, 2 I2C interfaces
- > 2 SPI interface, 1 QuadSPI interface
- > FSMC static memory interface
- > CAN interface (2.0B active)
- > Full-speed USB 2.0 controller and PHY
- > 480Mbps high-speed USB 2.0 controller and PHY
- > USB PD and Type-C controller & PHY
- > 80 I/Os, support 16 external interrupts
- > 1-wire (default) / 2-wire debug interface
- > Package form: LQFP48, LQFP64, LQFP100

Main Resource

Typical product models	CH32V205CCT6	CH32V205RCT6	CH32V205VCT6	CH32V203CCT6
Core	RISC-V			
Flash (KB)	256			
SRAM (KB)	32			
Timer	GPIO	41	51	80
	Advanced-control (16-bit)			1
	General-purpose (16-bit)			2
	Basic (16-bit)			1
	WDOG			2
	SysTick			1
RTC				1
ADC/TouchKey(Unit/Channels)				2/16
OPA				2
CMP				2
Communication interface	U (S)ART			8
	SPI			2
	I ² C			2
	CAN			1
	QSPI			1
	FSMC	-	-	1
	PIOC	1	1	1
	USB (FS)			1
	USB (HS)	1	1	1
USB PD Type-C				-
System Frequency (MHz)				40MHz@zero-wait; Max: 192MHz@non-zero-wait
VDD(V)				3.3V
Package				LQFP48 LQFP64 LQFP100 LQFP48

Note: For more models, please refer to MCU Selection Table

Applications



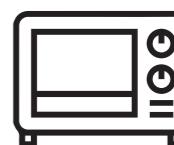
Industrial control



Health care



Safety monitoring



Consumer electronics

CH32V303

CH32V203

CH32F203

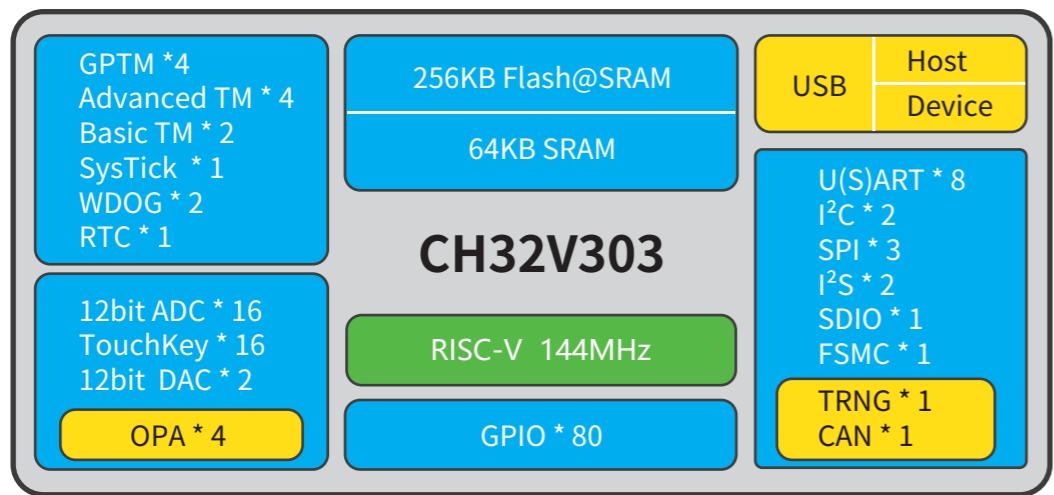
QingKe RISC-V/Cortex-M3 Core High-capacity General-purpose MCU

8 serial ports, 10 timers

CH32V303 series is a 32-bit general-purpose microcontroller with QingKe V4F microprocessor as the core, the system frequency of 144MHz, in particular, the addition of 4 sets of OPA comparators can be used with the ADC and TIMx unit to achieve the signal amplification sampling and comparison of the output. In addition, there are CAN controller, USB2.0 device controller, SDIO host controller, FSMC memory and other specialized interfaces to meet the needs of a variety of applications in the industrial, medical, consumer and other markets.

CH32V203 is based on the QingKe V4B core, provides dual USB, CAN, OPA, ADC, and touch functionality.

Block Diagram



Features

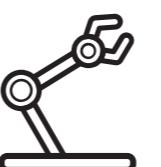
- > RISC-V4F processor, up to 144MHz system frequency
- > Support single-cycle multiplication and hardware division
- > Support hardware floating calculation
- > 64KB SRAM, 256KB Flash
- > GPIO unit independent power supply, can supplied by different
- > Multi low-power mode: Sleep/Stop/Standby
- > Power-on/down reset (POR/PDR)
- > Programmable voltage detector (PVD)
- > 2 sets of 18-channel DMA controller
- > 4 sets of OPA, CMP
- > 1 TRNG
- > 2×12-bit DAC
- > 16 TouchKey channel detection
- > 16×12-bit ADC conversion channel
- > 10 timers
- > 1 USB2.0 FS host/device interface
- > 1 CAN interface (2.0B active)
- > SDIO host interface
- > FSMC memory interface
- > 2×I²C interfaces
- > 3 USARTs and 5 UARTs
- > 3 SPI interfaces (support Master and Slave mode)
- > 80 I/Os, all mapped to 16 external interrupts
- > CRC calculation unit, 96-bit chip unique ID
- > 2-wire SDI
- > Package form:QFN48、LQFP48、LQFP64M、LQFP100

Main Resource

Typical product models	CH32V303VCT6	CH32V303RCT6	CH32F203VCT6	CH32F203RCT6
Core	RISC-V(FPU)		Cortex-M3	
Flash (KB)		256		
SRAM (KB)		64		
GPIO	80	51	80	51
Timer	Advanced-control (16-bit) General-purpose (16-bit)		4 4	
	Basic (16-bit)		2	
	WDOG		2	
	SysTick		1	
RTC		1		
ADC/TouchKey(Unit/Channels)		2/16		
DAC (Unit)		2		
OPA, CMP		4		
TRNG		1		
Communication interface	U (S) ART SPI I ² S I ² C CAN SDIO	8 3 2 2 1 1		
USB (FS)		Host/Device		Device
FSMC	1	-	1	-
System Frequency (MHz)		144		
VDD(V)		2.5/3.3		
Package	LQFP100	LQFP64M	LQFP100	LQFP64M

Note: For more models, please refer to MCU Selection Table

Applications



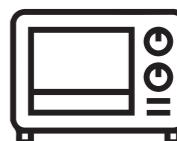
Industrial control



Health care



Safety monitoring



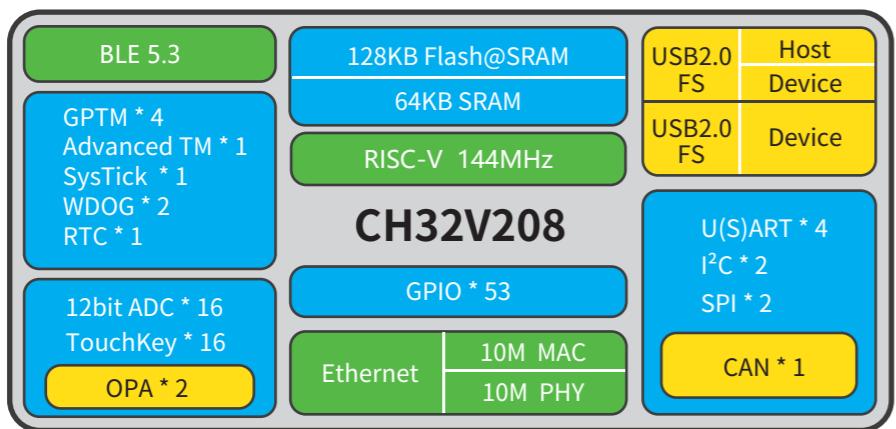
Consumer electronics

CH32V208 CH32F208

QingKe RISC-V/Cortex-M3 Core BLE Wireless MCU BLE5.3 10M Ethernet

CH32V208 is an industrial-grade general-purpose microcontroller based on the QingKe V4C core, operating at a 144MHz clock frequency. It integrates Bluetooth Low Energy (BLE) communication module, Ethernet controller and PHY, a USB 2.0 full-speed device + host/device interface, CAN controller, OPA, ADC, and Touchkey.

Block Diagram



Features

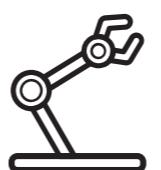
- RISC-V4C processor, up to 144MHz system frequency
- Support single-cycle multiplication and hardware division
- 64KB SRAM, 128KB Flash
- 10M Ethernet controller ETH (MAC+PHY)
- Bluetooth Low Energy BLE 5.3
- GPIO units powered independently, not synchronized with the system power supply
- Multiple low-power modes: Sleep/Stop/Standby
- Power-On/Power-Down Reset (POR/PDR)
- Programmable Voltage Detector (PVD)
- 2 sets of OPA, CMP
- 16 TouchKey channel detection
- 16×12-bit ADC conversion channel
- 5 timers
- USB2.0 Full-speed host/device+device interface
- 1 CAN interface (2.0B active)
- 2 I²C interfaces
- 4 USARTs
- 2 SPI interfaces (support Master and Slave)
- 53 I/O
- CRC calculation unit, 96-bit chip unique ID
- 1-wire SDI
- Package form: LQFP64M, QFN68, QFN48, QFN28

Main Resource

Typical product models	CH32V208WBU6	CH32V208RBT6	CH32F208WBU6	CH32F208RBT6
Core	RISC-V		Cortex-M3	
Flash (KB)		128		
SRAM (KB)		64		
GPIO	53	49	53	49
	Advanced-control (16-bit)		1	
	General-purpose (16-bit)		3	
	General-purpose (32-bit)		1	
	WDOG		2	
Timer	SysTick		1	
	RTC		1	
ADC/TouchKey(Unit/Channels)			1/16	
Communication interface	OPA, CMP		2	
	U(S)ART		4	
	SPI		2	
	I ² C		2	
	CAN		1	
	USB (FS)		Device+Host/Device	
	Ethernet		10M MAC+10M PHY	
BLE			5.3	
System Frequency (MHz)			144	
VDD(V)			2.5/3.3	
Package	QFN68	LQFP64M	QFN68	LQFP64M

Note: For more models, please refer to MCU Selection Table

Applications



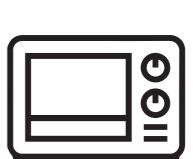
Industrial control



IoT



Computer & Cell Phone
Peripherals



Consumer electronics

CH32V006 CH32M006 CH32V005

QingKe RISC-V Core 64K Flash 2-5V Wide-voltage Value-added MCUs

CH32V006 series is based on QingKe V2C core industrial-grade general-purpose microcontrollers, support 48MHz system frequency, with a wide range of voltage, low-power consumption, single and dual-wire debugging and other features.

CH32M006 integrates four 5V*1A power switch transistors, a current sampling module, and a signal amplification module. It requires no bootstrap power supply, features a compact size and low on-resistance, and supports motor drive and high-frequency PWM.

Block Diagram



Features

- > QingKe RISC-V2C core, support 2-level interrupt nesting
- > Up to 48MHz system main frequency
- > 8KB SRAM, 62KB Flash
- > Wide-voltage: 2~5V
- > Low-power mode: Sleep, Standby
- > Power-on/power-down, programmable voltage detector
- > 7-channel general-purpose DMA controller
- > 1 OPA, P terminal supports 3-channel polling, supports high-speed mode, multi-step gain optional
- > 12-bit ADC, 8-channel external channel, support 3M sampling rate
- > 1 × 16-bit advanced-control timer, 1 × 16-bit general-purpose timer, 1 × 16-bit streamlined timer
- > 2 watchdog timers (independent and window), 1 SysTick timer
- > 2 USART, 1 I2C interface, 1 SPI interface
- > 96-bit chip unique ID
- > Support 1-wire/2-wire serial debug interface
- > Package: QFN32, QSOP24, QFN20, TSSOP20, QFN12

Main Resource

Typical product models	CH32V006 K8U6	CH32V006 E8R6	CH32V006 F8U6	CH32V006 F8P6	CH32V006 F4U6	CH32V005 E6R6	CH32V005 F6U6	CH32V005 F6P6	CH32V005 D6U6						
Core	RISC-V														
Flash (KB)	62			16		32									
SRAM (KB)	8			4		6									
GPIO	31	22	18	18	18	22	18	18	11						
Advanced-control (16-bit)	1														
General-purpose (16-bit)	1														
Timer	Streamlined (16-bit)			1		-									
	WDOG			2		-									
	SysTick			1		-									
ADC/TouchKey (Unit/Channels)	1/8			1/8 (No TouchKey)		1/4 (No TouchKey)									
OPA	1			-		1									
Communication interface	U (S)ART		2		1		2		-						
	SPI		1		1		-		-						
	I²C		1		1		-		-						
System Frequency (MHz)	48														
VDD(V)	2~5														
Package	QFN32	QSOP24	QFN20	TSSOP20	QFN20	QSOP24	QFN20	TSSOP20	QFN12						

Note: For more models, please refer to MCU Selection Table

5V Motor and Power Drive MCU \ Others

CH32M006: An industrial-grade microcontroller based on the QingKe RISC-V core, supporting a 48MHz system clock frequency. Features wide voltage range, low power consumption, and single/dual-wire debugging. Integrated with four 5V*1A power switch transistors, a current sampling module, and a signal amplification module. Eliminates the need for a bootstrap power supply, offering compact size and low on-resistance. Supports motor driving and high-frequency PWM.

Model	Flash	RAM	GPIO	ADTM	GPTM	Streamlined timer	Watchdog	Full-bridge drive		ADC	Capacitive touchkey	OPA	OPA polling	CMP	Serial port	I²C	SPI	Package form
								Voltage	Structure									
CH32M006A8U6	65K	8K	7	1	1	1	2	5V	P+N	4+3	4-way	1	3-way	2	USART1	1	-	QFN16

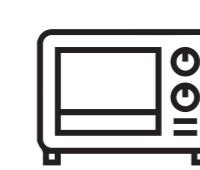
Applications



Industrial control



Health care



Consumer electronics



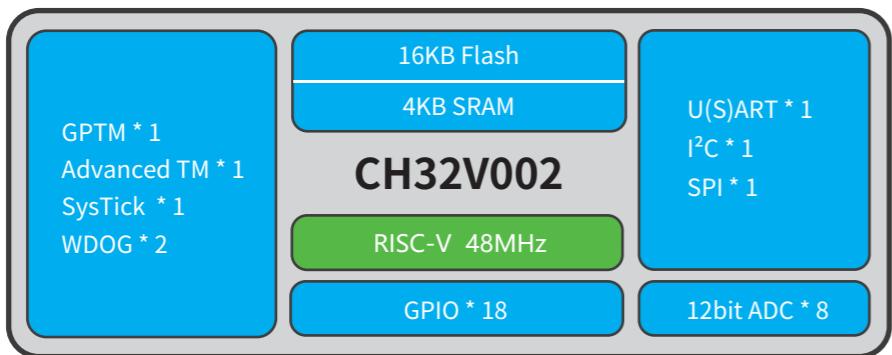
Computer & Cell Phone
Peripherals

CH32V002 CH32V003

QingKe RISC-V Core 16K Flash 2-5V Wide-voltage Value-added MCUs

The CH32V002 is an industrial-grade general-purpose microcontroller based on the QingKe V2C core, operating at a 48MHz clock frequency. It features a wide 2-5V voltage range, low power consumption, and single-wire debugging. The built-in 12-bit ADC supports a 3M sampling rate. It provides peripheral resources including DMA, timers, serial ports, I2C, and SPI, with a package as small as 2×2mm. The CH32V003 is based on the QingKe V2A core, operates at 3.3V/5V supply voltage, and supports 1-wire SDI.

Block Diagram



Features

- > QingKe RISC-V2C core, support 2-level interrupt nesting
- > Up to 48MHz system main frequency
- > 4KB SRAM, 16KB Flash
- > Power supply: 2.5/3.3/5V
- > Low-power mode: Sleep, Standby
- > Power-on/power-down, programmable voltage detector
- > 7-channel general-purpose DMA controller
- > 12-bit ADC, 8-channel external channel, support 3M sampling rate
- > 1 × 16-bit advanced-control timer, 1 × 16-bit general-purpose timer
- > 2 watchdog timers (independent and window), 1 SysTick timer
- > 1 USAR, 1个I²C interface, 1个SPI interface
- > 18 I/O ports, mapping 1 external interrupt
- > Chip unique ID
- > 1-wire serial debug interface
- > Package: QFN32, QSOP24, QFN20, TSSOP20, QFN12

Main Resource

Typical product models	CH32V002 F4P6	CH32V002 F4U6	CH32V002 A4M6	CH32V002 D4U6	CH32V002 J4M6
Core	RISC-V				
Flash (KB)	16				
SRAM (KB)	4				
GPIO	18	18	14	11	6
Timer	Advanced-control General-purpose			1	1
	WDOG			2	
	SysTick			1	
ADC/TouchKey (Unit/Channels)	1/8	1/8	1/6	1/4	1/6
U (S)ART			1		
Communication interface	SPI		1		-
	I ² C		1		
System Frequency (MHz)			48		
VDD(V)			2-5		
Package	TSSOP20	QFN20	SOP16	QSOP12	SOP8

Note: For more models, please refer to MCU Selection Table

Applications



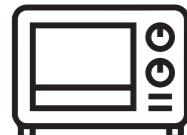
Industrial control



Health care



Computer & Cell Phone
Peripheral



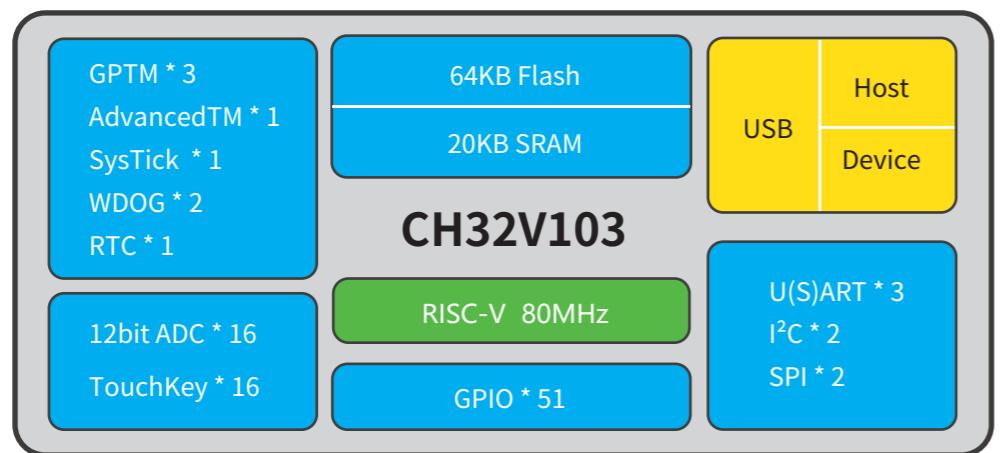
Consumer electronics

CH32V103 CH32F103

QingKe RISC-V/Cortex-M3 Core 3.3V/5V Rated Voltage General-purpose MCUs

CH32V103 is an industrial-grade general-purpose microcontroller based on the Qingke V3A core, operating at 80MHz. It provides a USB 2.0 host/device interface, a 12-bit ADC, multi-channel Touchkey, and standard peripherals.

Block Diagram



Features

- > RISC-V3A processor, up to 80MHz system frequency
- > Support single-cycle multiplication and hardware division
- > 20KB SRAM, 64KB Flash
- > Power supply range: 2.7V-5.5V, GPIO synchronized supply voltage
- > Multi low-power mode: Sleep/Stop/Standby
- > Power-on/down reset (POR/PDR)
- > Programmable voltage detector (PVD)
- > 7-channel DMA controller
- > 16-channel TouchKey channel detection
- > 16-channel 12-bit ADC conversion channels
- > 7 timers
- > 1 USB2.0 host/device interface (Full- and low-speed)
- > 2 I²C interface (Support SMBus/PMBus)
- > 3 USART interface
- > 2 SPI interface (Support Master and Slave mode)
- > 51 I/Os, all I/Os can be mapped to 16 external interrupts
- > CRC calculation unit, 96-bit chip unique ID
- > 2-wire SDI
- > Package form: LQFP64M, LQFP48, QFN48×7

Main Resource

Typical product models	CH32V103R8T6	CH32V103C8T6	CH32F103R8T6	CH32F103C8T6
Core	RISC-V		Cortex-M3	
Flash (KB)		64		
SRAM (KB)		20		
GPIO	51	37	51	37
Timer	Advanced-control (16-bit)		1	
	General-purpose (16-bit)		3	
	WDOG		2	
	SysTick		1	
RTC		1		
ADC/TouchKey (Unit/Channels)	1/16	1/10	1/16	1/10
DAC (Unit)	-	-	1	1
Communication interface	U (S)ART		3	
	SPI		2	
	I ² C		2	
	CAN	-	1	1
	USB (FS)	Host/Device	Host/Device	Device+Host/Device
System Frequency (MHz)	80		72	
VDD(V)		3.3/5.0		
Package	LQFP64M	LQFP48	LQFP64M	LQFP48

Note: For more models, please refer to MCU Selection Table

Applications



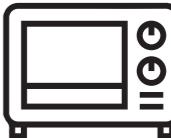
Industrial control



Health care



Safety monitoring



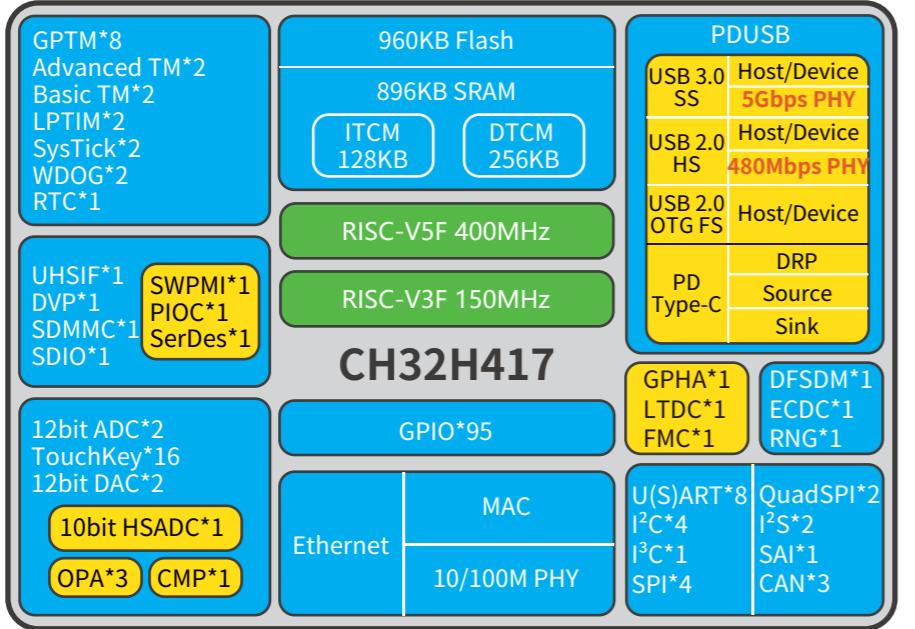
Consumer electronics

CH32H417

QingKe RISC-V Dual Core SuperSpeed USB 3.0 + 100M Ethernet Interconnect MCU

CH32H417 is a dual-core microcontroller based on the QingKe V5F and V3F cores, featuring ultra-high-speed USB 3.0 and high-speed USB 2.0 host/device interfaces with integrated transceiver PHYs, Ethernet MAC, and 100M PHY. SerDes high-speed isolated transceivers. It integrates an SD/eMMC controller, UHSIF, DVP, SWPMI, PIOC, FMC, digital filter, LTDC, graphics processing hardware accelerator, and other rich peripheral resources. It also incorporates analog resources such as high-speed ADCs, OPAs, and CMPS. With built-in USB PD support, it enables PDUSB and Type-C power delivery.

Block Diagram



Features

- > Dual-core structure: QingKe RISC-V5F and RISC-V3F
- > V5F up to 400MHz, V3F up to 150MHz
- > 896KB SRAM, 960KB Flash
- > System power supply rated: 3.3V
- > Regular GPIO power supply VDDIO, rated 3.3V, supports 1.8V
- > High-speed GPIO supply VIO18, selectable 1.2/1.8/2.5/3.3V
- > USB 3.0 module power supply rated at 1.2V
- > Power-on/power-off reset (POR/PDR)
- > 2 sets of 16 general DMA controllers
- > 2 sets of 12-bit ADC
- > 1 set of 10-bit HSADC
- > 3 sets of OPA/PGA/CMP
- > 1 set of analog CMP
- > 14 timers
- > 16-bit TouchKey channel detection
- > Universal high-speed interface UHSIF
- > Digital Video Port DVP
- > SD/eMMC Controller (SDMMC)
- > SDIO host/slave interface
- > Single-wire Protocol Master Interface (SWPMI)
- > Programmable Protocol I/O Controller (PIOC)
- > Ethernet controller MAC and 10M/100M PHY
- > 5Gbps SuperSpeed USB 3.0 controller and PHY
- > 480Mbps high-speed USB 2.0 controller and PHY
- > Long-reach SerDes controller and PHY
- > 8 USARTs, 4 I2C interfaces, 1 I3C interface
- > 4 SPI interfaces, 2 QuadSPI interfaces
- > 3 CAN interfaces (CAN 2.0B active)
- > Digital filter for $\Sigma\Delta$ modulator DFSDM
- > Serial audio interface SAI
- > DCT-TFT Display Controller LTDC
- > Graphics Processing Hardware Accelerator GPHA
- > Flexible Memory Controller FMC
- > 95 I/O pins
- > ECDC cryptographic module
- > 1-wire (default) and 2-wire debug modes
- > Package form: QFN128, QFN88, QFN68, QFN60X6

Main Resource

Typical product models	CH32H417QEU6	CH32H417MEU6	CH32H417WEU6
Core	RISC-V5F+RISC-V3F		
Flash (KB)	960K		
SRAM (KB)	896K		
GPIO	95	65	50
Timer	Advanced-control (16-bit)	2	
	General-purpose (16-bit)	4	
	General-purpose (32-bit)	4	
	Basic (16-bit)	2	
	LPTIM	2	
	WDOG	2	
	SysTick	2	
	RTC	1	
ADC/TouchKey(Unit/Channels)	2/16	2/9	2/7
HSADC(Unit/Channels)	1/7	1/4	1/4
DAC (Unit)	2	2	DAC2
OPA	3	OPA1, OPA3	OPA1
CMP		1	
DFSDM		1	
RNG		1	
GPHA		1	
PIOC		1	
Communication interface	DVP	1	
	USART	8	7
	SPI/I ² S	4/2	3/2
	QUADSPI	2	1
	I ² C	4	
	I ³ C	1	
	UHSIF	1	
	CAN	3	
	SDIO	1	-
	SDMMC	1	
FMC	SAI	1	
	SWPMI	1	
	LTDC	1	
	USBFS/OTG_FS	1	-
	USBHS(USB 2.0)	1	
	USBSS(USB 3.0)	1	
	USB PD and Type-C	Source/Sink/DRP	-
	SerDes	1	1
	Ethernet	MAC+10/100M PHY	
	FSMC	1	
Package	SDRAM	1	
		QFN128	QFN88
			QFN68

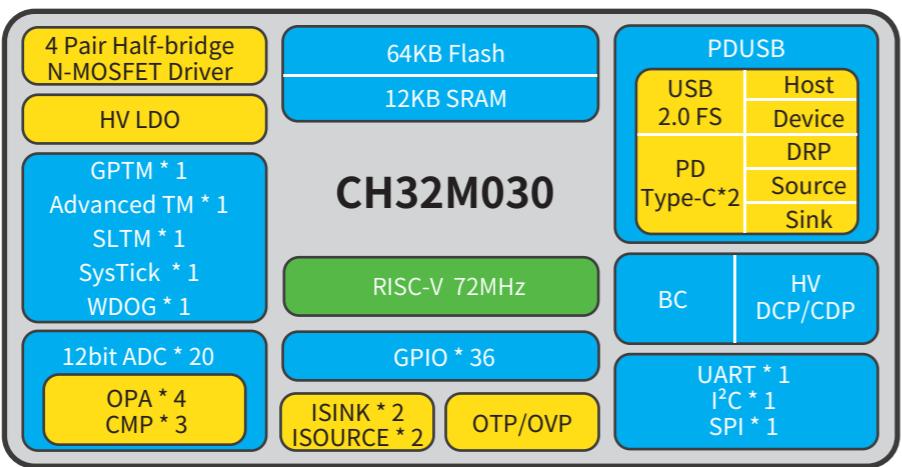
Note: For more models, please refer to MCU Selection Table

CH32M030

QingKe RISC-V Core 28V Dual-N Pre-drive Motor Control MCU

CH32M030 is an extended industrial-grade motor microcontroller featuring the QingKe V3B core with instruction optimization for motor algorithms, operating at 72MHz with 64K ECC-enabled flash memory. The chip enhances analog and power management capabilities, providing 4 OPAs, 3 CMPs, 2 differential current sampling channels, and 2 programmable sink currents supporting external DC-DC dynamic voltage regulation. It integrates 4 pairs of N-channel pre-drivers and 28V high-voltage LDO. 2 sets of Type-C and USB PD controllers with PHY, USB 2.0 full-speed host/device interfaces, supporting PDUSB and PD PPS.

Block Diagram



Features

- › RISC-V3B, unique high-speed interrupt response mechanism
- › Up to 72MHz system frequency
- › RV32IMCB instruction set and self-expanding instruction
- › 12KB SRAM, 64KB Flash
- › Built-in high-voltage LDO, VHV rated 5~28V power supply
- › Pre-drive I/O supply VDD8 Rated voltage: 5~10V
- › Low-power mode: Sleep, Stop, Standby
- › 4 dual N MOSFET half-bridge driver, external capacitance only
- › 7-channel general DMA controller
- › 20-channel external 12-bit ADC conversion channel
- › External delay trigger and ADC moving average function
- › 1×16-bit advanced-control timer
- › 1×16-bit general-purpose timer
- › 1×16-bit streamlined timer
- › 1 window watchdog timer
- › 1 SysTick timer
- › 4 OPAs and 3 CMPs
- › Can be combined as 2 sets of AC small-signal amplification decoders QII1 and QII2 and 2 sets of differential input current sampling ISP
- › 2 sets of Type-C, USB PD controller and PHY
- › Full-speed USB 2.0 controller and PHY
- › BC1.2 and various HV DCP/CDP charging protocols
- › OTP, OVP and under-voltage reset
- › UART with multi-pin mapping, 1 I²C interface, 1 SPI interface
- › 2 sets of 10-bit programmable flood current module
- › 2 sets of source current module
- › 36 GPIO ports, mapping 16 external interrupts
- › 8 MV pre-drive pins, 2 HV high voltage pins
- › 64-bit Chip unique ID
- › 1-wire and 2-wire serial debug
- › The entire series 105°C, select models 125°C
- › Package form: QFN48X7_A, LQFP48, QFN48, QFN32, QSOP28

Main Resource

Typical product models	CH32M030C8U3	CH32M030C8T7	CH32M030C8U7	CH32M030K8U7	CH32M030G8R7
Core					RISC-V
Flash (KB)				64	
SRAM (KB)				12	
Half-bridge gate driver		4		2	3
GPIO	36	35	36	24	17
Pre-drive/I/O (MV I/O)		8	1		6
High-voltage I/O (HV I/O)	2	-	1	1	-
Timer	Advanced-control			1	
	General-purpose			1	
	Streamlined			1	
	WWDG			1	
	SysTick			1	
ADC/TouchKey(Unit/Channels)	1/20	1/20	1/20	1/16	1/11
OPA (set)		4			3
CMP (set)		3			2
Current sampling ISP, ISN		Differential*2		Differential*1/ Single-ended*1	Differential*2
Signal decoding QII		2			1
Programmable flood current module		2		2	1
Source current module		2		1	-
U (S)ART				1	
SPI			1		-
I²C				1	
Communication interface	USB (FS)			Host/Device	
	USB PD Type-C	(CC1R, CC2R) (CC3, CC4) Built-in Rd	(CC1, CC2) (CC3, CC4)	(CC1R, CC2R) (CC3, CC4) Built-in Rd	(CC3, CC4)
CPU System frequency (MHz)				72	
VDD(V)				3.3	
Package	QFN48X7_A	LQFP48	QFN48	QFN32	QSOP28

Note: For more models, please refer to MCU Selection Table

Applications



CH32M007 CH32V007

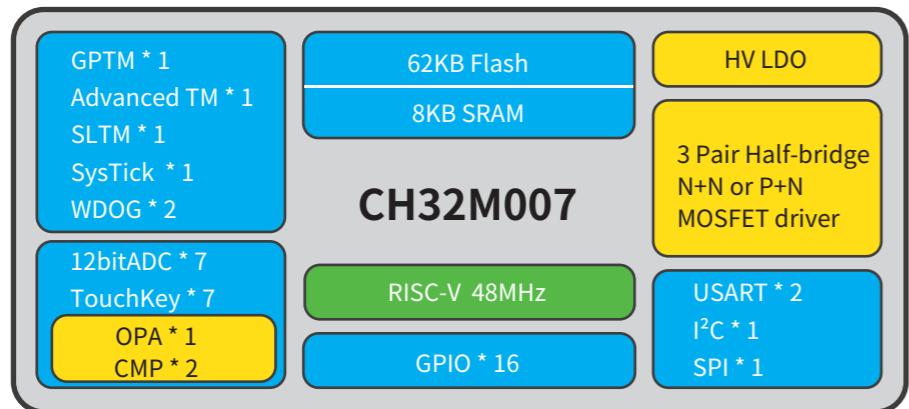
QingKe RISC-V Core 24V PN or 48V Dual-N Pre-drive Motor Control MCU

CH32M007 is an industrial-grade microcontroller based on the QingKe V2C core, 48MHz operating frequency and 1-wire debugging. It incorporates a 12-bit ADC supporting a 3M sampling rate, OPA supporting 3-channel polling and high-speed mode, and provides 2 sets of CMPS. It can be used for various motor control solutions including BLDC/PMSM, sensor-based/sensorless, and single/dual resistor configurations.

CH32M007G8R6 integrates 48V 3-phase dual N-channel pre-drive with bootstrap diodes and high-voltage LDO.

CH32M007E8 incorporates 24V 3-phase P+N pre-drive with a high-voltage LDO.

Block Diagram



Features

- > QingKe RISC-V2C core, support 2-level interrupt nesting
- > Up to 48MHz system main frequency
- > 8KB SRAM, 62KB Flash
- > CH32V007 supports rated 2.5~5V power supply
- > CH32M007G8R6 supports rated 6~48V power supply.
- > CH32M007E8 supports rated 6~24V power supply.
- > Low-power mode: Sleep, Standby
- > 3-phase half-bridge driver:
 - CH32M007G8R6 built-in 48V dual-N pre-driver and diode
 - CH32M007E8 Built-in 24V 3-phase P+N pre-driver
 - Built-in dead-time control to prevent the high side/low side power tubes from going straight through
 - Built-in undervoltage protection
- > Power on/down reset, programmable voltage detector
- > 7-channel general-purpose DMA controller
- > OPA/PGA/CMP
 - Multiple input channels, selectable multi-step gain
 - 2 output channels, optional ADC pins
 - Support 3-channel polling, supports single or dual resistor scheme
 - Support high-speed mode to increase slew rate
 - 2 sets of analog CMP, supporting 3-channel CMP polling detection localization
- > 12-bit ADC, 7 external channels
- > 1×16-bit advanced-control timer
- > 1×16-bit general-purpose timer
- > 1×16-bit streamlined timer
- > 2 watchdog timers (independent and window)
- > 1 SysTick timer
- > 2 sets of USART, support LIN
- > I²C interface, SPI interface
- > 16 I/O ports
- > 96-bit chip unique ID
- > 1-wire or 2-wire serial debug interface
- > Package form: QSOP24, QFN26C3, QSOP28

Main Resource

Typical product models	CH32M007E8R6	CH32M007E8U6	CH32M007G8R6	CH32V007E8R6	CH32V007K8U6
Core	RISC-V				
Flash (KB)	62				
SRAM (KB)	8				
GPIO	15	16	12	22	31
Timer	Advanced-control General-purpose Streamlined				
WDOG			2		
3-phase pre-drive	Voltage Structure	24V P+N	24V P+N	48V N+N	- -
ADC/TouchKey(Unit/Channels)	1/7	1/7	1/7	1/8	1/8
OPA			1		
OPA polling			3		
CMP (set)			2		
Communication interface	U (S)ART SPI I ² C				
CPU System frequency (MHz)			48		
VDD(V)		6-24	6-48		2.5-5
Package	QSOP24	QFN26C3	QSOP28	QSOP24	QFN32

Note: For more models, please refer to MCU Selection Table

Other Built-in Pre-drive SoCs \ Others

CH641: A PD wireless charging and motor control SoC based on the QingKe V2A core.

Features built-in 12V high-voltage I/O for MOSFET driving, supporting USB PD and Type-C power delivery, BC1.2, DCP, and other charging protocols. Provides ADC, motor PWM, differential input current sampling, AC small-signal amplification decoder, overvoltage, and overtemperature protection. Offers a wide 5-12V operating voltage range, 1-wire SDI, low-power consumption, and minimal peripheral requirements.

Applications

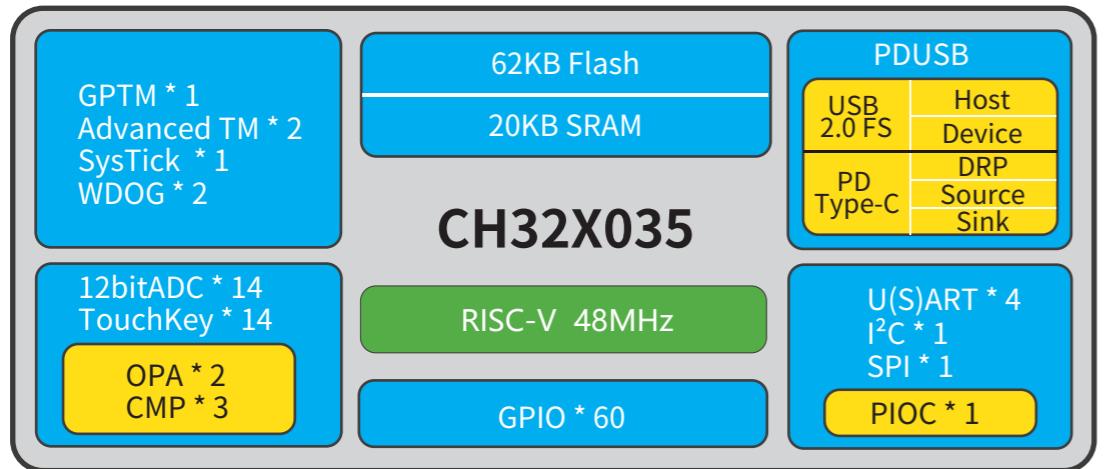


CH32X035

QingKe RISC-V Core USB Communication and PD Power Dual Function Type-C Interface MCU

CH32X035 is an industrial-grade microcontroller based on the QingKe V4C core, 48MHz clock frequency. It provides a USB 2.0 full-speed host/device interface with an integrated PD PHY, supporting PDUSB and Type-C power delivery. The device incorporates programmable protocol I/O controller, multiple OPAs and CMPS, a 12-bit ADC, Touchkey and standard peripherals.

Block Diagram



Features

- > RISC-V4C processor, up to 48MHz
- > Support single-cycle multiplication and hardware division
- > 20KB SRAM, 62KB Flash
- > Multiple low-power modes: Sleep/Stop/Standby
- > Power-on/down reset, programmable voltage detector
- > 8-channel general DMA controller
- > Programmable Protocol I/O Controller PIOC
- > 2 sets of OPA/PGA/voltage comparator
- > 3 sets of analog voltage CMP
- > Multi external 12-bit ADC conversion channels
- > Multi-Touchkey channel detection
- > 2×16-bit advanced-control timer
- > 1×16-bit general-purpose timer
- > 2 watchdog timers (independent and window)
- > 1 SysTick timer
- > 4 USART: support LIN and ISO7816
- > 1 I²C interface: support SMBus/PMBus
- > 1 SPI interface
- > USB2.0 full-speed controller & PHY
- > USB PD and Type-C controllers and PHYs
- > Fast GPIO port, support 24 external interrupts
- > 96-bit chip unique ID
- > 2-wire SDI
- > Package form:LQFP64M、LQFP48、QFN28、QSOP28、QFN20、TSSOP20

Main Resource

Typical product models	CH32X035 R8T6	CH32X035 C8T6	CH32X035 G8U6	CH32X035 G8R6	CH32X035 F8U6	CH32X035 F7P6	CH32X033 F8P6					
Core	RISC-V											
Flash (KB)	62											
SRAM (KB)	20											
GPIO	60	46	27	26	19	18	18					
Timer	Advanced-control (16-bit)	2										
	General-purpose (16-bit)	1										
	WDOG	2										
	SysTick	1										
ADC/TouchKey (Unit/Channels)	1/14	1/10	1/12	1/11	1/10	1/11	1/10					
OPA (set)	2						1					
CMP (set)	3	3	1	3	-	1	2					
PIOC	1											
U (S)ART	4						3					
Communication interface	SPI	1										
I ² C	1											
USB(FS)	Host/Device		Device		Source/Sink/DRP							
System Frequency (MHz)	48											
VDD(V)	3.3/5.0											
Package	LQFP64M	LQFP48	QFN28	QSOP28	QFN20	TSSOP20	TSSOP20					

Note: For more models, please refer to MCU Selection Table

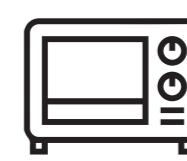
Applications



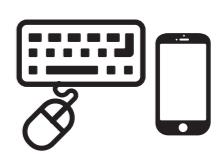
Industrial device



PD charging



Consumer electronics Computer & Cell Phone Peripherals

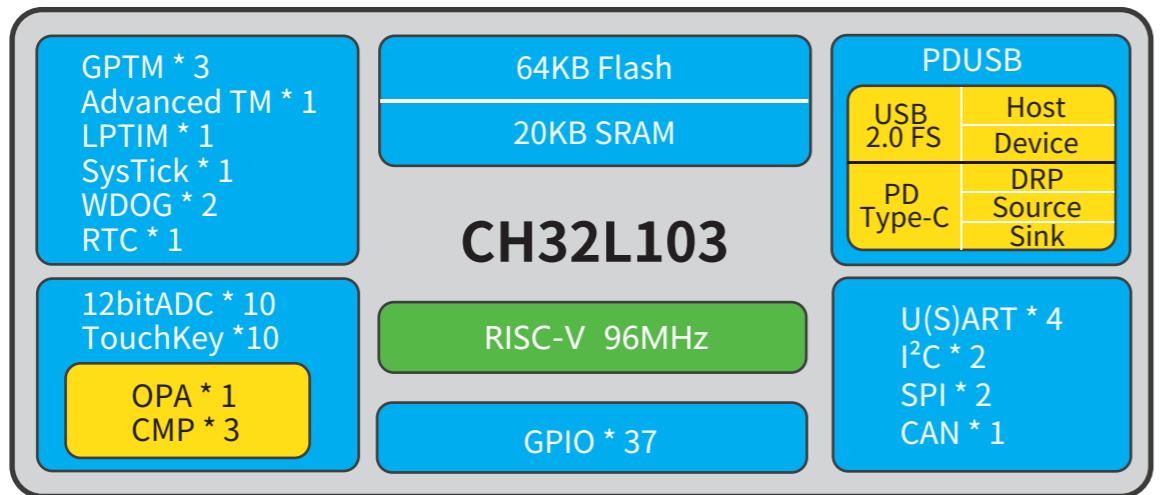


CH32L103 CH32M103

QingKe RISC-V Core PDUSB Low-power MCU

CH32L103 series is an industrial-grade low-power general-purpose microcontroller based on the QingKe V4C core. Operating at a 96MHz main frequency, it provides USB 2.0 full-speed host/device interface with an integrated PD PHY, PDUSB and Type-C power delivery. It features an integrated low-power timer and offers a rich array of peripherals including OPAs, CMPs, 12-bit ADC, Touchkey, and CAN.

Block Diagram



Features

- > RISC-V4C processor, system frequency up to 96MHz
- > Support single-cycle multiplication and hardware division
- > 20KB SRAM, 64KB Flash
- > Multi low-power mode: Sleep/Stop/Standy
- > Power-on/down reset (POR/PDR), Programmable voltage detector (PVD)
- > 8-channel general-purpose DMA controller
- > 1 set of OPA/PGA/CMP
- > 3 sets of CMP
- > 10 external 12-bit ADC conversion channels
- > 10 Touchkey channel detection
- > 16-bit low-power timer
- > 1×16-bit advanced-control timer
- > 2×16-bit general-purpose timer
- > 1×32-bit general-purpose timer
- > 2 watchdog timer (independent and window)
- > 1 SysTick timer
- > 4 sets of USART, support LIN and ISO7816
- > 2 I²C interface: support SMBus/PMBus
- > 2 SPI interfaces
- > 1 set of CAN FD interface (2.0B active)
- > USB2.0 full-speed controller and PHY
- > USB PD and Type-C controller and PHY
- > Fast GPIO port, support 16 external interrupts
- > 96-bit chip unique ID
- > 2-wire SDI
- > Package form: LQFP48, QFN32, QSOP28, QFN20, TSSOP20

Main Resource

Typical product models	CH32L103C8T6	CH32L103K8U6	CH32L103G8R6	CH32L103F8U6	CH32L103F8P6	CH32M103G8R6	
Core						RISC-V	
Flash (KB)						64K	
SRAM (KB)						20K	
GPIO	37	31	26	19	16	18	
Advanced-control (16-bit)						1	
General-purpose (16-bit)						2	
General-purpose (32-bit)						1	
LPTIM						1	
WDOG						2	
SysTick						1	
RTC						1	
ADC/TouchKey(Unit/Channels)				1/10		1/9	1/10
OPA						1	
CMP	3	3	3	3	2	2	
U (S)ART						4	
SPI	2	1	2	2	1	1	
I ² C	2	1	2	2	1	2	
CAN						1	
USB(FS)							Host/Device
USB PD and Type-C							DRP/Source/Sink
System Frequency (MHz)							96
VDD(V)							3.3
Package	LQFP48	QFN32	QSOP28	QFN20	TSSOP20	QSOP28	
Main applications and features	Universal pin-compatible	Universal pin-optimized	Universal motor control	Universal pin-compatible	Universal pin-compatible	Pre-drive motors only	

Low-power PDUSB MCUs \ Others

CH32M103: Industrial-grade motor microcontroller based on QingKe RISC-V4C core. Supports rated 6–24V power supply, with integrated 24V 3-phase P+N pre-driver and high-voltage LDO. Features built-in USB and PD PHY, supporting PDUSB functionality including USB Host and USB Device capabilities, USB PD, and Type-C fast charging. Features an integrated low-power timer, providing 1 OPA, 2 CMPs, 4 USARTs, 2 I²Cs, 1 SPI, 1 CAN, multiple timer groups, a 12-bit ADC, and 10 Touchkey channels among its extensive peripheral resources.

Applications



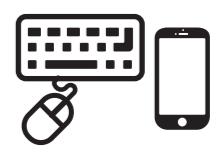
Industrial device



PD charging



Consumer electronics



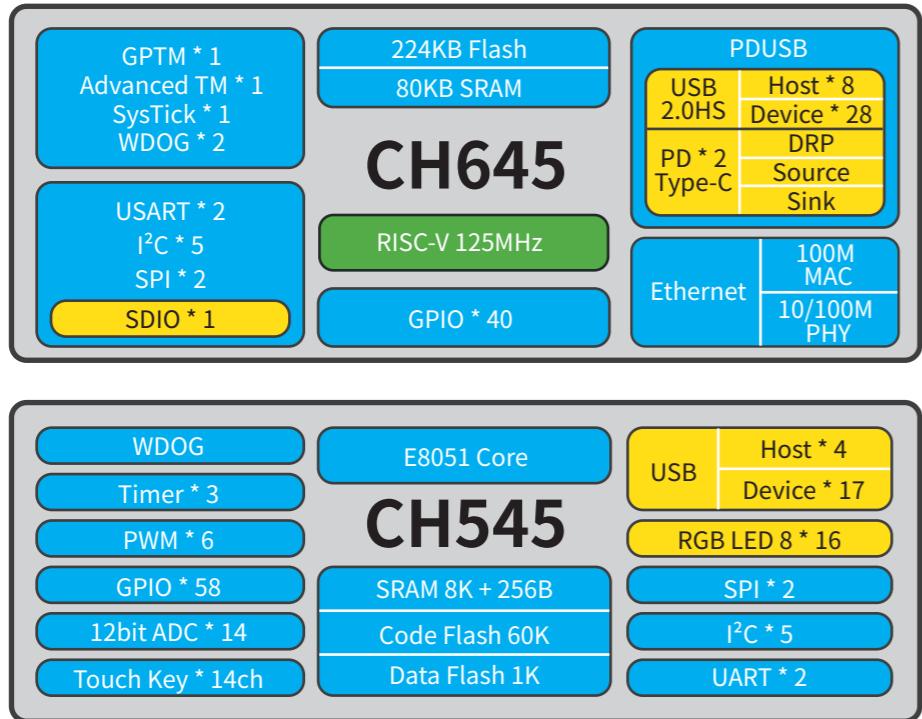
Computer & Cell Phone
Peripherals

CH645 CH545

QingKe RISC-V Core USB Multi Host/Device +Dual PD+Ethernet Multi-interface MCU

CH645 is based on the QingKe RISC-V core, with 8 sets of USB high-speed PHY and 2 built-in PD PHY. It provides 8 USB host ports/4 USB device ports and can support up to 28 USB devices through a USB combination device controller with 4 on-chip channels, including 7 ports HUB. The chip integrates PDUSB and Type-C fast charging functions, with a built-in Ethernet MAC controller and 100M physical layer transceiver PHY, providing rich peripheral resources such as SDIO, 5 I²C, dual serial ports, and dual SPI. Provide high integration and easy-to-use solutions for applications such as PD HUB, KVM, isolated and long-distance USB, Type-C docking stations, etc.

Block Diagram



Features

- > RISC-V core, 125MHz main frequency
- > Built-in factory-calibrated 20MHz RC oscillator
- > Built-in 4-channel USB combination device controller with HUB, supporting 4-port KVM applications
- > SerDes-based long-distance USB transceiver PHY, supporting USB signal isolation and long-distance transmission
- > USB 2.0 high-speed controller and transceiver PHY, supporting up to 8 USB hosts and up to 4 USB devices
- > 2 sets of USB PD and Type-C controllers and PHY
- > Ethernet controller MAC and 10M/100M PHY
- > SDIO host/slave interface, supporting EMMC/SD/SDIO cards
- > 2-wire Serial debug interface SDI
- > Packaging form: QFN68, QFN32

Model Selection Guide

Part NO.	Flash	RAM	USB	USB隔离远传	Ethernet	SDIO	Type-C	UART	SPI	I ² C	I/O	Timer	VDD	Package	
CH645W	224K	72-80K	8*H/28*D(480Mbps)		√	100M MAC+PHY	1	PD*2	2	2	5	40	2*16b	3.3V	QFN68
CH645F			5*H/4*D(480Mbps)						1	4	13				QFN32
CH545	64K	8K+256	4*H/17*D		-	-	-	-	2	2	5	58	3*16b	3.3V/5V	LQFP64

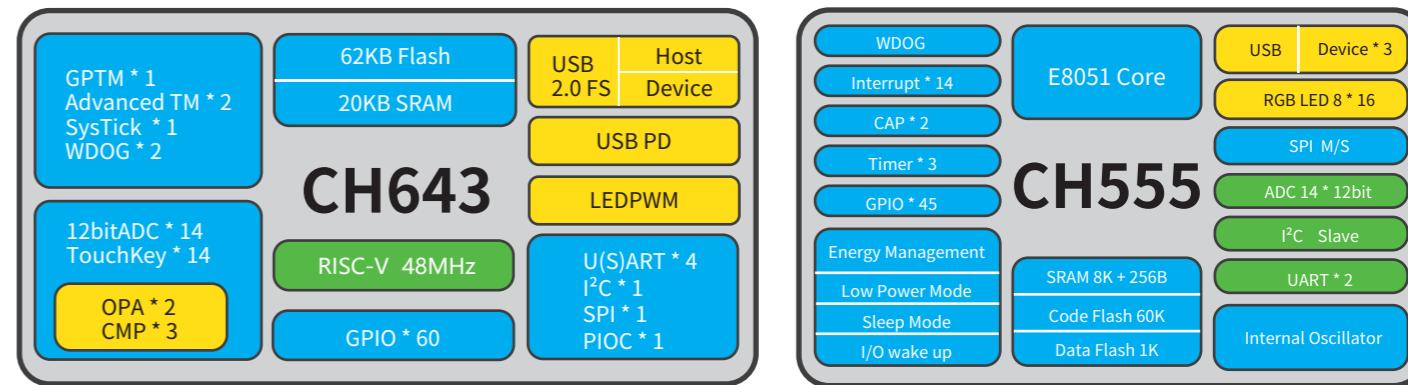
QingKe RISC-V Core Support full internal drive RGB full color keyboard MCU with Type-C

It supports USB data communication, PD power transfer, and fast charging. The chip has a built-in PIOC programmable protocol I/O controller. The fully built-in RGB display driver supports 192 sets of RGB tri-color LEDs or 576 single-color LEDs, and the external PMOS supports 288 groups of RGB, which can be used for RGB keyboards, RGB panels, and other applications.

CH555 has a built-in RGB driver unit that supports 128 sets of RGB tri-color LEDs or 384 single-color LEDs. It can be widely used in RGB lighting drivers, mechanical keyboards, and other applications.

CH643 CH555

Block Diagram



Features

- > RISC-V4C core processor, up to 48MHz system frequency
- > Support single-cycle multiplication and hardware division
- > 20KB SRAM, 62KB Flash
- > Multiple low-power modes: Sleep/Stop/Standby
- > 8-channel general-purpose DMA controller
- > Programmable Protocol I/O Controller PIOC
- > Multi-set OPA/PGA/voltage comparator
- > Multi-set analog voltage comparator CMP
- > RGB tri-color LED pulse width modulation LEDPWM
- > Multiple external 12-bit ADC conversion channels
- > Multiple TouchKey channel detection
- > Multiple timers, multiple USART
- > 1 I²C interface and 1 SPI interface
- > USB2.0 full-speed controller and PHY
- > USB PD and Type-C controllers and PHYs
- > 96-bit chip unique ID
- > 2-wire serial debug interface SDI
- > Package: QFN80, LQFP64, LQFP48, QSOP28

Model Selection Guide

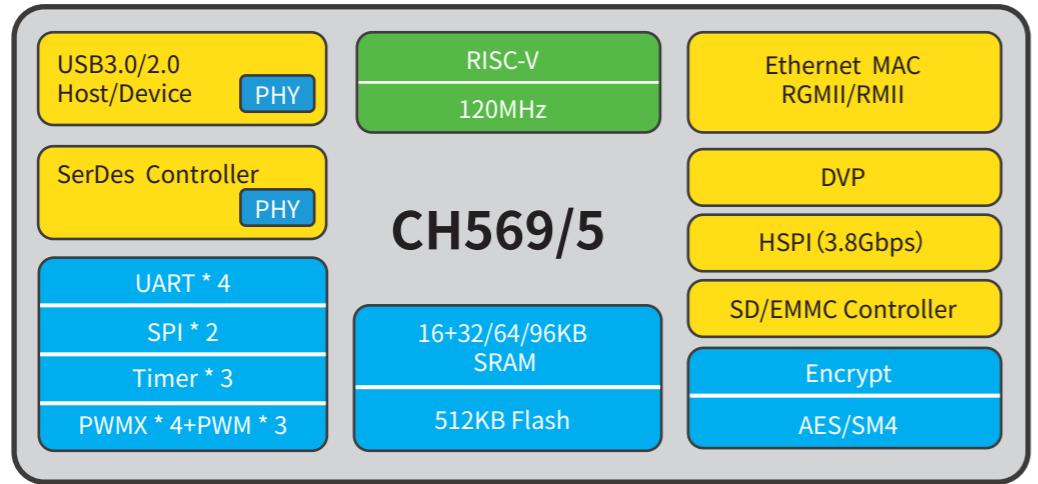
Part NO.	Flash	RAM	GPIO	Adv Timer	GP Timer	RGB LED PWM	USART	USB2.0	USBPD Type-C	ADC	OPA	CMP	Touchkey	SPI	PIOC	Package
CH643W	62K	20K	69	2	1	48x18	4	H/D	✓	15+1	2	3	15	✓	✓	QFN80
CH643Q	62K	20K	60	2	1	48x10	4	H/D	✓	14+1	2	3	14	✓	✓	LQFP64
CH643L	62K	20K	44	2	1	24x18	4	D	-	10+1	2	3	10	✓	✓	LQFP48
CH643U	62K	20K	26	2	1	16x8	4	D	-	9+1	2	-	9	✓	✓	QSOP28

CH569 CH565

QingKe RISC-V Core USB3.0 SuperSpeed and SerDes Interface MCUs

The CH569/565 microcontroller uses the QingKe V3A core and supports the IMAC subset of RISC-V instructions. USB3.0 SuperSpeed 5Gbps host and device controller (built-in PHY), Gigabit Ethernet controller, dedicated high-speed SerDes controller (built-in PHY, which can directly drive optical fiber), high-speed parallel interface HSPI, digital video port (DVP), SD/EMMC interface controller, encryption and decryption module are integrated on the chip. 128-bit wide DMA design ensures high-speed transmission of large amounts of data. It can be widely used in streaming media, real-time storage, ultra-high-speed USB 3.0FIFO, communication extension, security monitoring, and other application scenarios.

Block Diagram



Features

- > RISC-V core, 120MHz system frequency
- > Support single-cycle multiplication and hardware division
- > 448KB CodeFlash, 32KB DataFlash
- > 16KB 32-bit wide SRAM
- > 32/64/96 KB configurable 128-bit wide SRAM
- > USB3.0 SuperSpeed 5Gbps, USB2.0 High-speed 480Mbps host and device controllers and transceivers (built-in PHY)
- > Built-in Gigabit Ethernet controller
- > Built-in SerDes control and transceiver, network cable transmission distance up to 90m
- > Built-in digital video port (DVP)
- > Built-in high-speed parallel interface HSPI, the fastest transmission speed of about 3.8Gbps
- > Built-in EMMC controller
- > Support AES/SM4 algorithm
- > Active parallel port: 8-bit data, 15-bit address bus
- > 4 sets of UART, 2 sets of SPI interface, 3 sets of 26-bit Timer
- > Integrated 2-wire debugging interface, Support for online simulation

Model Selection Guide

Part NO.	Freq/Max	Flash	RAM	DataFlash	USB3.0	USB2.0	Ethernet	SerDes	HSPI	DVP	SDIO	Encrypt	UART	SPI	Timer	CAP	PWM	GPIO	VDD	Package
CH569W	96/120MHz	448K	48/80/112K	32K	OTG	H/D	1G MAC	1.25Gb	3.8Gb	-	1*UHS	AES/SM4	4	2	3*26b	3	7	49	3.3	QFN68
CH565W	96/120MHz	448K	48/80/112K	32K	OTG	H/D	1G MAC	1.25Gb	-	96MHz	1*UHS	AES/SM4	4	2	3*26b	3	7	49	3.3	QFN68

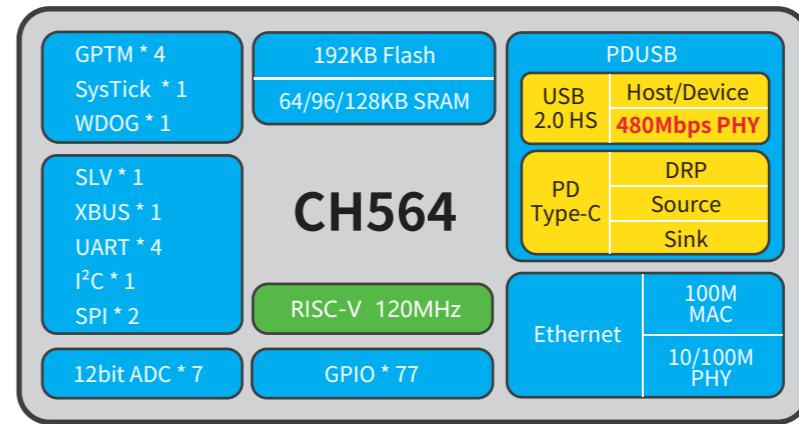
QingKe RISC-V Core

480Mbps High-Speed USB and 100Mbps Ethernet MCU

CH564 has a built-in USB2.0 high-speed controller and PHY, Ethernet MAC and 10M/100M PHY, PD controller and PHY; it supports PDUSB and can realize high-speed USB data transmission and Type-C power transmission in a single chip. The chip integrates external bus interface XBUS, 8-bit passive parallel port SLV, 12-bit ADC, multi-set timer, multi-set serial port, I2C, SPI, and other rich peripheral resources, which is suitable for all kinds of application scenarios involving high-speed interface communication.

CH564

Block Diagram



Features

- > RISC-V4J processor, up to 120MHz system frequency
- > Support single-cycle multiplication and hardware division
- > Available with 64/96/128KB SRAM
- > 448KB CodeFlash, 32KB DataFlash
- > Low-power consumption modes: Sleep/Deep sleep
- > 480Mbps USB2.0 high-speed interface, host/device mode
- > Built-in high-speed USB PHY, no external PHY transceiver
- > USB PD and Type-C controller and PHY
- > 10M/100M Ethernet interface, MAC and PHY fully integrated
- > 12-bit ADC, 7 external channels
- > 4 × 28-bit general-purpose timers
- > 1 SysTick timer
- > 4 serial ports, 1 I2C, 2 SPIs
- > 1 8-bit passive parallel port, 1 external bus interface
- > 3 GPIOs, 77 I/O ports, partially 5V tolerant
- > 96-bit chip unique ID
- > Support 1-wire / 2-wire debugging modes
- > CH564Q/L is fundamentally pin-compatible with the CH563Q/L, lower power consumption.

Model Selection Guide

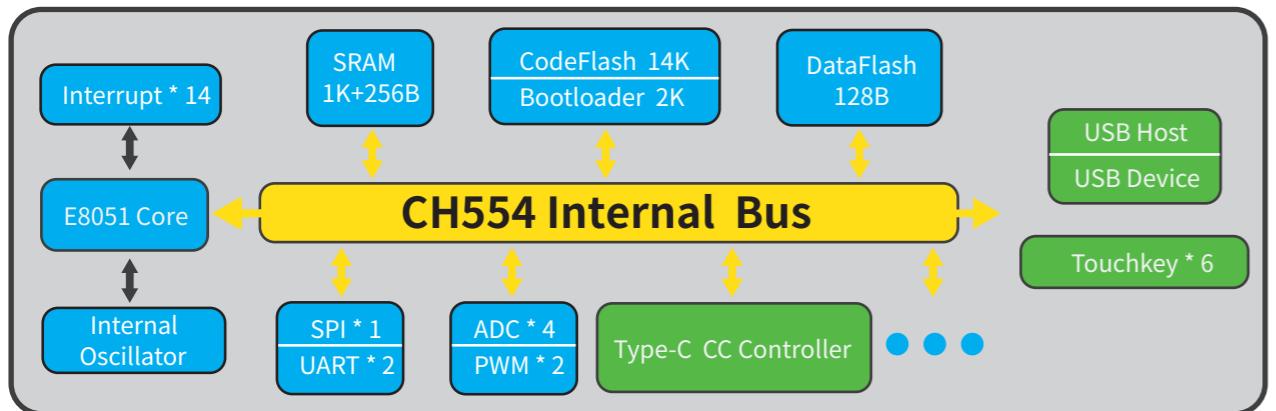
Part NO.	Freq	CodeFlash	DataFlash	SRAM	GPIO	GPTimer	PWM	CAP	ADC	PDUSB		Ethernet	SLV	XBUS	UART	I2C	SPI	Package
										USB2.0 HS	Type-C Source DRP							
CH564L	120MHz	448K	32K	64/96/128K	77	4*28bit	4	4	7+2	H/D	CC1,CC2	✓	1	1	4	1	2	LQFP128
CH564Q	120MHz	448K	32K	64/96/128K	30	4*28bit	4	4	6+2	H/D	CC1,CC2	✓	1	-	4	1	2	LQFP64M
CH564F	120MHz	448K	32K	64/96/128K	20	4*28bit	3	3	4+2	H/D	CC1,CC2	✓	1	-	4	1	2	QFN28
CH564C	120MHz	192K	32K	64/96/128K	17	4*28bit	2	2	4+2	H/D	CC1,CC2	-	1	-	4	1	2	QFN26C3

CH554 CH552 CH551

8-bit USB and Touchkey MCU Cost-effective, ultra-small package

The CH554 is an enhanced MCS51-compatible microcontroller with embedded USB full-speed host and device controllers and a 6-channel capacitive detection module that supports up to 15 Touchkey. Built-in USB Type-C CC controller (supports current detection and configuration). It provides dual asynchronous serial ports, master-slave SPI, 2-channel signal capture, 2-channel PWM, ADC, and other common function modules.

Block Diagram



Features

- > Enhanced E8051 core
- > 1KB+256B RAM, 128B DataFlash
- > USB2.0 full-speed Host/Device
- > Type-C CC controller
- > 4-channel 8-bit ADC
- > Embedded 6-channel capacitive detection module, support up to 15 Touchkeys
- > 14KB CodeFlash, 2KB BootLoader
- > Support USB and serial port ISP
- > 2-channel UART, 1-channel SPI
- > 3 sets of Timer, 2 sets of CAP, 2 sets of PWM
- > Built-in clock and PLL, optional external crystal oscillator

Model Selection Guide

Part NO.	RAM	CodeFlash	DataFlash	USB2.0 FullSpeed	Touch key	Type-C	Timer	UART	Other	Package
CH551	512B+256B	10KB	128B	Device	5/10	-	3*16b 2*CAP	1	2*PWM 1*SPI	SOP16
CH552	1KB+256B	16KB	128B	Device	6/15	Y	3*16b 2*CAP	2	2*PWM 1*SPI 4*ADC	TSSOP20 SOP16 QFN16 MSOP10
CH554	1KB+256B	16KB	128B	Host/Device	6/15	Y	3*16b 2*CAP	2	2*PWM 1*SPI 4*ADC	TSSOP20 SOP16 QFN16 MSOP10

Applications

Type-C cable
One-Card system

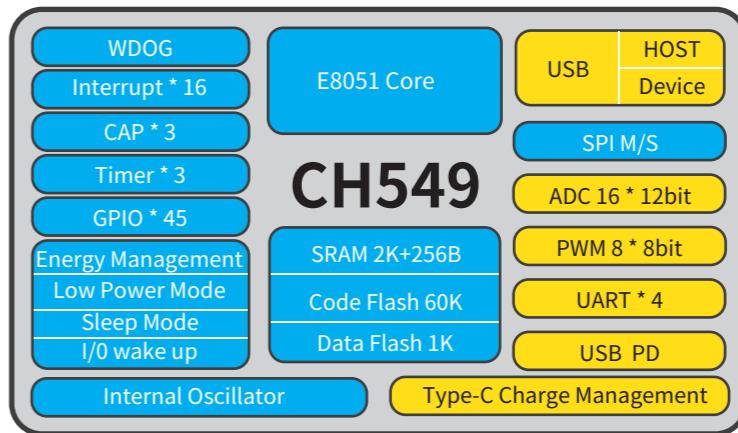
Small appliance
Instrumentation

Handheld devices

8-bit USB and TouchKey MCU 8-bit enhanced multi-interface USB MCU Support Type-C PD

The CH549 is an enhanced MCS51-compatible microcontroller with embedded USB full-speed host and device controllers, USB PD and Type-C CC control, provides 4 sets of asynchronous serial ports, 8 PWMs, 1 master-slave SPI, 16 12-bit ADCs, voltage comparison, and 3 signal captures, and supports up to 44 GPIOs.

Block Diagram



Features

- > Enhanced E8051 core
- > 60KB CodeFlash, 3KB BootLoader
- > 2KB+256B RAM, 1KB DataFlash
- > Support USB and serial port ISP
- > 3 groups of Timer, 3-channel CAP, 8-channel PWM
- > USB2.0 full-speed Host/Device
- > Type-C CC controller
- > 16-channel 12-bit ADC
- > Support 16-channel capacitive Touchkey detection
- > 4 groups of UART, 1-channel SPI
- > Built-in clock and PLL, optional external crystal

Model Selection Guide

Part NO.	RAM	CodeFlash	DataFlash	USB2.0 FullSpeed	Type-C	ADC	UART	SPI	GPIO	Package
CH549	2KB+256B	63KB	1KB	Host/Device	Y	16*12b	4	1	44	SOP16 QFN28 LQFP48
CH548	2KB+256B	35KB	1KB	Host/Device	Y	16*12b	2	1	44	SOP8 SOP16 LQFP48
CH547	1KB+256B	63KB	1KB	Device	-	12*12b	4	1	44	SOP16 QFN16 LQFP48
CH546	1KB+256B	35KB	1KB	Device	-	8*12b	1	1	44	SOP16 LQFP48

Applications

Mechanical Keyboards
One-Card System

Small appliance
Handheld devices

Gaming peripheral
Instrumentation

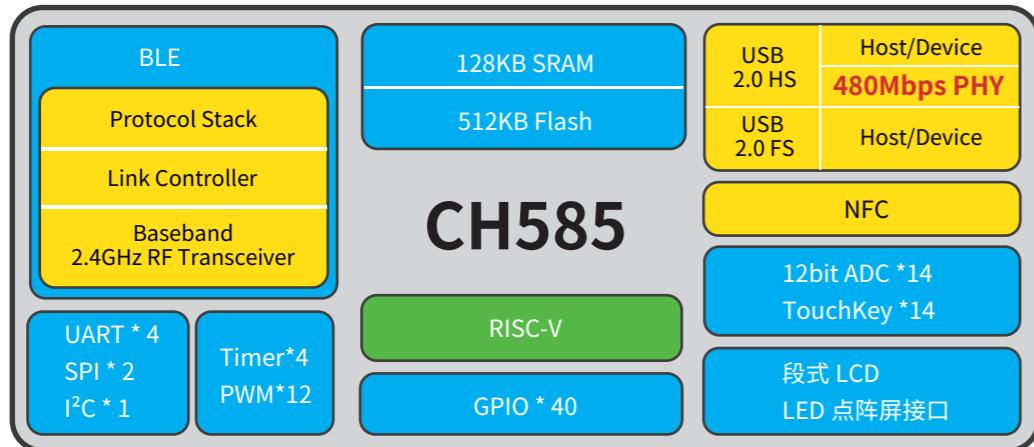
CH549
CH548
CH547
CH546

CH585 CH584

QingKe RISC-V Core High-speed USB + NFC Bluetooth Wireless MCU/SoC

CH585 is a multi-mode wireless MCU/SoC based on the QingKe V3C core, supporting BLE 5.0 and a high-performance custom 2.4GHz protocol capable of 8,000 packets per second. It integrates a 480Mbps high-speed USB PHY, NFC for near-field communication, waterproof-grade Touchkey, segmented LCD, and LED dot matrix display interfaces. This single chip addresses diverse wireless/wired connectivity requirements on a single chip. It effortlessly meets the stringent performance demands of high-end wireless products requiring 8k reporting rates, enabling the development of various high-reporting-rate, high-performance, low-power wireless communication solutions.

Block Diagram



Features

- > QingKe 32-bit RISC-V3C core
- > Support RV32IMBC instruction set and self-extending instructions
- > 128KB SRAM, 512KB Flash
- > Support BLES.4, built-in 2.4GHz RF transceiver
- > Maximum 8 kHz reporting rate in 2.4 GHz mode
- > Receive sensitivity: -95dBm@1Mbps, programmable+4.5dBm transmit power
- > Provide protocol stack and application layer API
- > 480Mbps high-speed/full-speed USB 2.0 controller and PHY
- > Near Field Communication wireless interface NFC
- > Segment LCD: Supports 112-dot (28*4) LCD panel
- > LED dot matrix screen interface: Support 1/2/4/8-channel data line
- > 14-channel Touchkey
- > 14-channel 12-bit ADC
- > 4 UARTs, 2 SPIs, 12-channel PWM, 1 I²C
- > 40 GPIOs
- > Minimum power supply voltage: 1.7V
- > Built-in temperature sensor
- > AES-128 encryption and decryption, unique chip ID
- > Package: QFN48T, QFN32, QFN26C3

Model Selection Guide

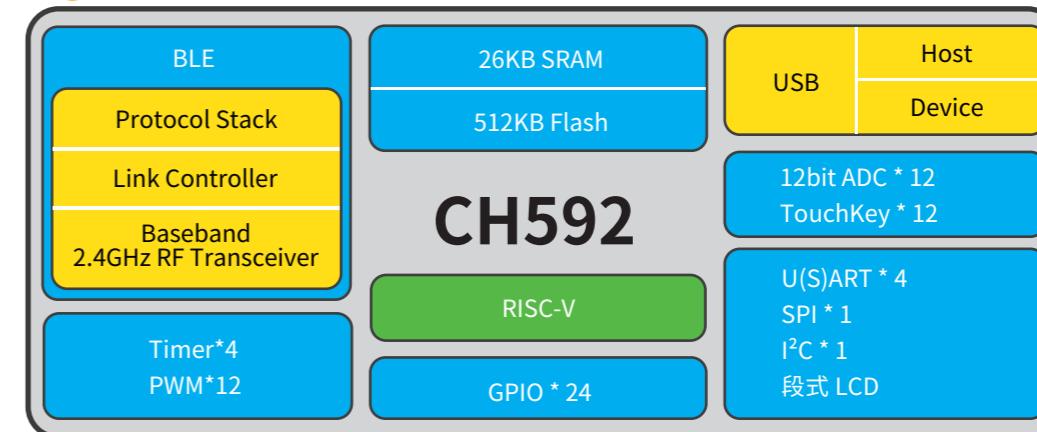
Part NO.	Core	Freq	Flash	SRAM	Data Flash	BLE	NFC	USB FS	USB HS	ADC(12bit) Unit/ Channel	Touch Key	LEDC	LCD	Timer (26bit)	PWM	UART	SPI	I²C	DC-DC	RTC	WDOG	GPIO	VDD	Package
CH585M	RISC-V	78MHz	448K	128K	32K	5.4	✓	1	1	1/14	14	1/2/4/8	28*4	4	12	4	2	1	✓	✓	✓	40	1.75/3.3	QFN48
CH585F	RISC-V	78MHz	448K	128K	32K	5.4	✓	1	1	1/7	7	-	14*4	4	11	4	1	1	✓	✓	✓	24	1.75/3.3	QFN32
CH585C	RISC-V	78MHz	448K	128K	32K	5.4	✓	1	1	1/4	-	-	-	4	9	2	1	-	✓	✓	✓	17	1.75/3.3	QFN26C3
CH585D	RISC-V	78MHz	448K	128K	32K	5.4	✓	1	1	1/4	-	-	-	4	7	2	1	-	✓	✓	✓	12	1.75/3.3	QFN20
CH584M	RISC-V	78MHz	448K	96K	32K	5.4	✓	1	-	1/14	14	1/2/4/8	28*4	4	12	4	1	1	✓	✓	✓	40	1.75/3.3	QFN48
CH584X	RISC-V	78MHz	448K	96K	512K	5.4	✓	1	-	1/14	14	1/2/4/8	28*4	4	12	4	1	1	✓	✓	✓	40	1.75/3.3	QFN48
CH584F	RISC-V	78MHz	448K	96K	32K	5.4	✓	1	-	1/7	7	-	14*4	4	11	4	1	1	✓	✓	✓	24	1.75/3.3	QFN32
CH581M	RISC-V	78MHz	448K	96K	32K	5.4	✗	1	-	1/14	14	1/2/4/8	-	4	12	4	1	1	✓	✓	✓	39	2.5/3.3	QFN48

QingKe RISC-V Core BLES.4 Wireless MCU/SoC with Integrated LCD Driver

CH592 is a wireless MCU/SoC based on the QingKe V4C core, supporting BLES.4. It provides full-speed USB host/device interfaces, segmented LCD driver, 12-channel ADC, Touchkey, 4 serial ports, and other peripheral resources.

CH592 CH591

Block Diagram



Features

- > QingKe 32-bit RISC-V4C Core
- > Support the RV32IMAC instruction set and self-expanding instructions
- > Support single-cycle multiplication and hardware division
- > 26KB SRAM, 512KB FLASH
- > Support BLE5.4 with built-in 2.4GHz RF transceiver
- > Provide optimized protocol stack and application layer APIs, supporting networking
- > Master-slave integration, supporting multiple masters and slaves
- > Built-in temperature sensor
- > Segmented LCD, supporting 80-point (20 * 4) LCD panel
- > USB 2.0 full-speed Host/Device
- > 12 channel touch buttons
- > 12 channel 12-bit ADC
- > 4 sets of 26-bit timers
- > 4 independent UARTs, 1 SPI, 12 PWM channels, 1 I²C
- > 24 GPIOs
- > Minimum support for 1.7V power supply voltage
- > Built-in AES-128 encryption and decryption, chip-unique ID
- > Receive sensitivity: -95dBm, programmable+4.5dBm transmit power
- > Packaging: QFN32, QFN28, QFN20, TSSOP16

Model Selection Guide

Part NO.	Core	Freq	Flash	SRAM	Data Flash	BLE	USB2.0 FS	ADC/TS	TouchKey	Timer	PWM	UART	SPI	I²C	DC-DC	RTC	WDOG	GPIO	VDD	Package
CH592X	RISC-V	20MHz	448K	26K	32K	5.4	1*H/D	12/1	12	4	4+8	4	1	1	✓	✓	✓	24	1.7/3.3	QFN32
CH592F	RISC-V	20MHz	448K	26K	32K	5.4	1*H/D	8/1	8	4	4+6	4	1	1	✓	✓	✓	20	1.7/3.3	QFN28
CH592A	RISC-V	20MHz	448K	26K	32K	5.4	1*H/D	8/1	8	4	4+6	4	1	1	✓	✓	✓	20	2.3/3.3	QFN28
CH592D	RISC-V	20MHz	448K	26K	32K	5.4	1*H/D	4/1	4	2	2+3	2	1	1	✓	✓	✓	12	1.7/3.3	QFN20
CH591F	RISC-V	20MHz	192K	26K	32K	5.4	1*D	6/1	-	4	4+6	2	1	-	✓	✓	✓	20	1.7/3.3	QFN28
CH591D	RISC-V	20MHz	192K	26K	32K	5.4	1*D	4/1	-	3	3+4	2	1	-	✓	✓	✓	12	2.3/3.3	QFN20
CH591R	RISC-V	20MHz	192K	26K	32K	5.4	1*D	4/1	-	4	4+3	2	1	-	-	✓	✓	10	2.3/3.3	TSSOP16

Others

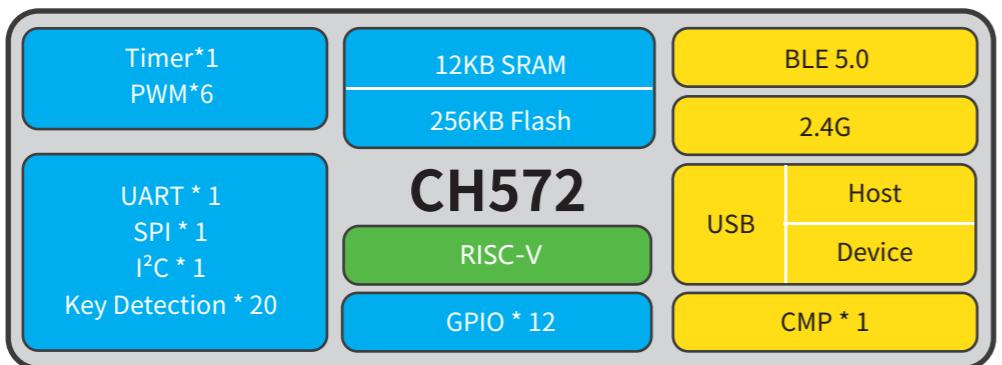
CH592 is a wireless MCU/SoC based on the QingKe V4C core, supporting BLES.4. It provides full-speed USB host/device interfaces, segmented LCD driver, 12-channel ADC, Touchkey, 4 serial ports, and other peripheral resources.

CH572 CH570

QingKe RISC-V Core USB and 2.4 GHz RF Transmission Wireless MCU/SoC

CH570 is a 2.4GHz wireless communication MCU/SoC based on the QingKe V3C core. Compared to 8-bit MCUs, it offers more resources, including 240K flash memory, 12K RAM, full-speed USB, CMPs, Touchkey, and standard peripherals. It supports high-performance 2.4GHz wireless communication protocols and 1-wire SDI, making it suitable for 2.4GHz wireless communication and Dongle applications. CH572 integrates a 2Mbps Bluetooth Low Energy (BLE) communication module supporting BLE S.O.

Block Diagram



Features

- > QingKe 32-bit RISC-V3C core
- > Support RV32IMBC instruction set and self-extending instructions
- > 12KB SRAM, 256KB Flash
- > 5V to 3.3V regulator LDO5V
- > 2.4GHz RF transceiver, support BLE5.0
- > Maximum 8kHz reporting rate in 2.4 GHz mode
- > Receive sensitivity: -95dBm@1Mbps, programmable+7.5dBm transmit power
- > Provide protocol stack and application layer API
- > Support 20-channel Touchkey, 10-channel matrix area keys, 10-channel independent area keys.
- > Full-speed USB 2.0 controller and PHY
- > CMP, 16-level reference voltage, equivalent to 4-bit ADC
- > 1 UART, 1 SPI, 6-channel PWM, 1 I2C
- > 12 GPIOs
- > AES-128 encryption and decryption, unique chip ID
- > Package: QFN20, DFN10X3, TSSOP16, SOPS

Model Selection Guide

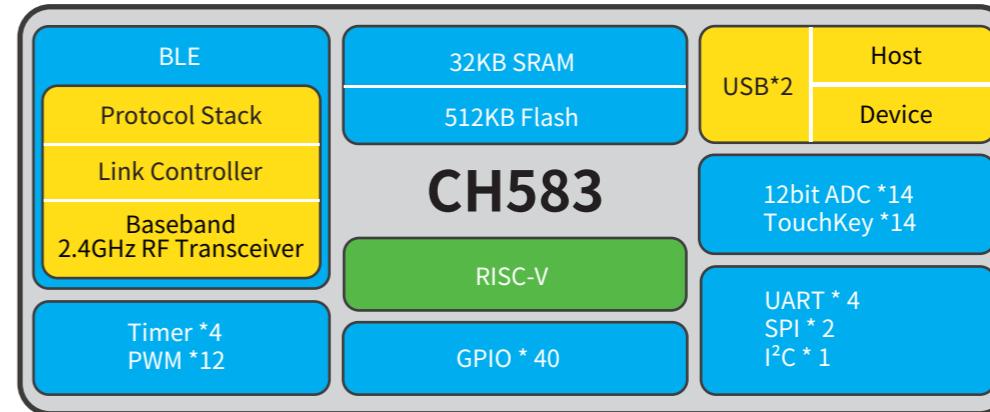
PartNO.	Core	Freq	Flash	SRAM	BLE	2.4G	USB	Key detection	Timer (26bit)	PWM	UART	SPI	I ² C	CMP	GPIO	VDD	Package
CH572D	RISC-V	100MHz	240K	12K	5.0	✓	1*H/D	20	1	6	1	1	1	1	12	2.0~3.6V or 4.5~5.3V	QFN20
CH572Q	RISC-V	100MHz	240K	12K	5.0	✓	1*H/D	5	1	4	1	-	1	1	5	2.0~3.6V or 4.5~5.3V	DFN10X3
CH572R	RISC-V	100MHz	240K	12K	5.0	✓	1*H/D	9	1	6	1	1	1	1	10	2.0~3.6V	TSSOP16
CH570D	RISC-V	100MHz	240K	12K	-	✓	1*H/D	20	1	6	1	1	1	1	12	2.0~3.6V or 4.5~5.3V	QFN20
CH570Q	RISC-V	100MHz	240K	12K	-	✓	1*D	5	1	1	1	-	1	-	5	2.0~3.6V or 4.5~5.3V	DFN10X3
CH570E	RISC-V	100MHz	240K	12K	-	✓	-	-	1	1	1	-	1	-	3	2.0~3.6V	SOP8

QingKe RISC-V Core Low Power Bluetooth BLE 5.3 Wireless MCU

The DiLu CH583 is a 32-bit RISC-V MCU that integrates BLE wireless communication. On-chip integration of 2Mbps BLE communication module, 2 full-speed USB hosts and device controllers and transceivers, 2 SPIs, 4 serial ports, ADC, touch-key detection module, RTC, and other rich peripheral resources.

CH583 CH582

Block Diagram



Features

- > RISC-V core
- > Support the RV32IMAC instruction set, supports hardware multiplication and division
- > 32KB SRAM, 512KB Flash
- > Support BLE 5.3 with a built-in 2.4GHz RF transceiver
- > Provide protocol stack and application layer APIs
- > Provide Mesh protocol stack interface
- > Master-slave integration, supporting multiple masters and slaves
- > Built-in temperature sensor
- > 2 sets of USB 2.0 full-speed Host/Device
- > 14 channel touch buttons
- > 14 channel 12-bit ADC
- > 4 sets of UART, 2 sets of SPI, 12 PWM channels, 1 I²C
- > 40 GPIOs
- > Minimum support for 1.7V power supply voltage
- > Built-in AES-128 encryption and decryption unit, chip unique ID
- > Receive sensitivity: -95dBm, programmable+4.5dBm transmit power
- > Packaging: QFN48, QFN28

Model Selection Guide

PartNO.	Core	Freq	Flash	SRAM	Data Flash	BLE	USB2.0 FS	ADC(12bit) Unit/Channel	TouchKey	Timer (26bit)	PWM	UART	SPI	I ² C	RTC	WDOG	GPIO	VDD	Package
CH583M	RISC-V	20MHz	448K	32K	32K	5.3	2*H/D	1/14	14	4	12	4	2	1	✓	✓	40	1.75/3.3	QFN48
CH582M	RISC-V	20MHz	448K	32K	32K	5.3	2*H/D	1/14	14	4	12	4	1	1	✓	✓	40	2.3/3.3	QFN48
CH582F	RISC-V	20MHz	448K	32K	32K	5.3	2*H/D	1/8	8	4	10	4	1	1	✓	✓	20	2.3/3.3	QFN28

Others

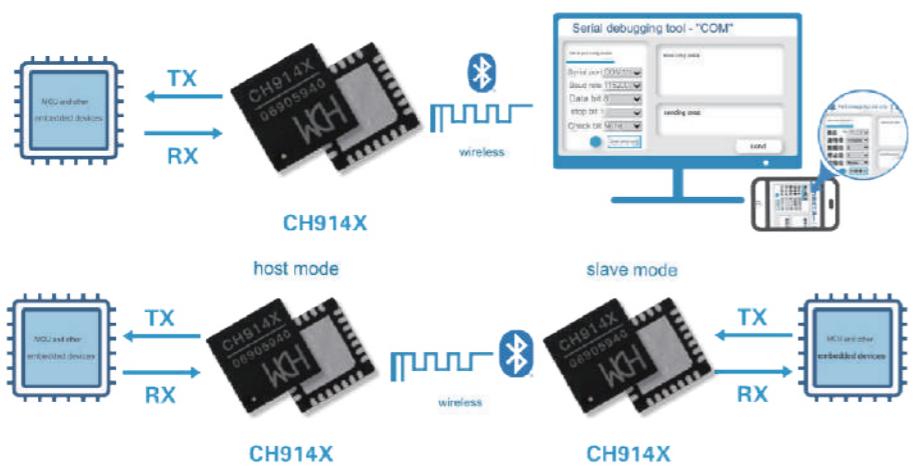
CH573/1: 32-bit RISC-V core Bluetooth Low Energy BLE4.2 wireless MCU

CH9140
CH9141
CH9142
CH9143

BLE to Single/Dual Serial Port 3-way Chip

Based on USB and BLE virtualization serial port technology, data exchange between Bluetooth, USB, and serial ports is achieved and compatible with conventional serial port applications.
CH9141: Bluetooth serial port transparent chip, supporting AT
CH9140: Bluetooth to serial port chip
CH9142: Bluetooth to dual serial port chip
CH9143: BLE/UART/USB 3-way chip

Block Diagram



Features

Model	Package	Function Overview
CH9140	QFN28	Bluetooth to serial port chip. Based on BLE virtualization serial port technology, data exchange between Bluetooth and serial port is achieved and is compatible with conventional serial port applications. It does not require secondary development, making it easy to connect and use.
CH9141F CH9141K	QFN28 ESSOP10	Bluetooth serial port transparent chip. Realize transparent transmission between Bluetooth and serial data. It supports the configuration of serial AT and Bluetooth transmission commands and MODEM communication signals and provides universal GPIO, synchronous GPIO, ADC acquisition, and other functions.
CH9142	QFN28	Bluetooth to dual serial port chip. Basic BLE virtualization serial port technology enables data exchange between Bluetooth and two serial ports, is compatible with conventional serial port applications, and does not require secondary development, making it easy to connect and use.
CH9143	QFN28	BLE/UART/USB three-way chip. Based on USB and BLE virtualization serial port technology, data exchange between Bluetooth, USB, and serial ports can be achieved without secondary development, making it easy to connect and use.

Applications

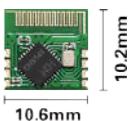
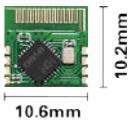
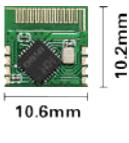
Smart Home
Sports Equipment

Sensing Detection
Car Bluetooth

Security Monitoring
Mobile Connection

BLE Module and Finished Products

BLE Module

Name	Description	Features	Image
BLE-SER-A-ANT	Bluetooth to Serial Port Module	Board-mounted PCB antenna Small volume Built-in 32M crystal	 10.2mm 10.6mm
BLE-TPT-A-ANT	Bluetooth Serial Port Transmission Module	Board-mounted PCB antenna Small volume Built-in 32M crystal	 10.2mm 10.6mm
		Onboard PCB antenna small volume Functional pins lead out	 16mm 13mm
BLE2U-A-ANT	BLE/UART/USB Three-Way Module	Board-mounted PCB antenna Small volume Built-in 32M crystal	 10.2mm 10.6mm
		Board-mounted PCB antenna All functional pins are led out Built-in 32M and 32K crystals	 18.02mm 15.26mm

BLE Finished Product

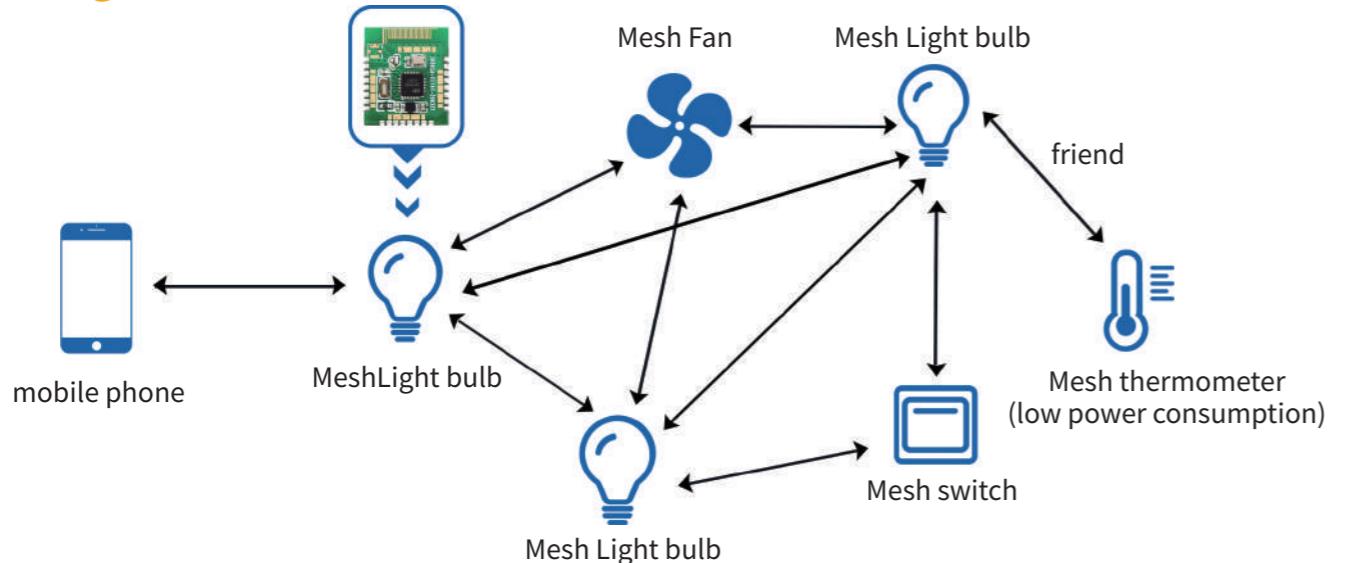
Name	Explanation	Features	Physical Image
CH585D	High-speed USB Wireless receiver	Single Chip receiver, integrated with self-developed 2.4G and high-speed USB, compact and plug and play. Paired with CH592, it can achieve a 2-8k high return rate wireless mouse.	
BLE232-NEP	Wireless RS232 Power free converter	Supports low-power Bluetooth, compatible with conventional serial port applications and debugging tools, without the need for secondary development, achieving wireless serial port and serial port extension functions.	
BLE-Dongle	Wireless serial port receiver	Supports low-power Bluetooth, compatible with conventional serial port applications and debugging tools, without the need for secondary development, achieving PC USB to Bluetooth conversion.	

BLE Mesh Wireless Networking

BLE Mesh Wireless Networking Solution

BLE Mesh is a networking specification launched by the Bluetooth Official Group (SIG). It uses BLE as a carrier to form a star-shaped mesh with many-to-many topologies. Each device in the network can communicate with other devices. Qinhengwei's BLE Mesh wireless networking solution fully supports various features of Bluetooth Mesh Profile, including forwarding, proxy, friends, and low-power consumption. It has passed the official certification of Bluetooth SIG and the Alibaba Tmall Genie ecological certification. It can be widely used in smart home appliances, smart lighting, smart buildings, smart robots, smart wearable devices, and other fields.

Block Diagram



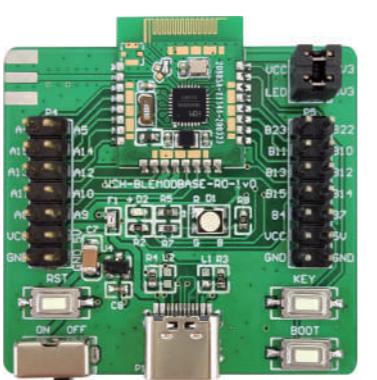
Features

- > Self-discovery, self-connection, self-organizing network
- > Second-level network configuration, millisecond-level control delay
- > Provide a safe, reliable, and convenient BLE Mesh development kit
- > Provide most models of Mesh Model
- > We provide a BLEMOD module with CH57X as the main control to facilitate customer development and verification. This module has passed SRRC certification and Alibaba Alliance Ecological Certification

Development Hardware



BLEMOD module

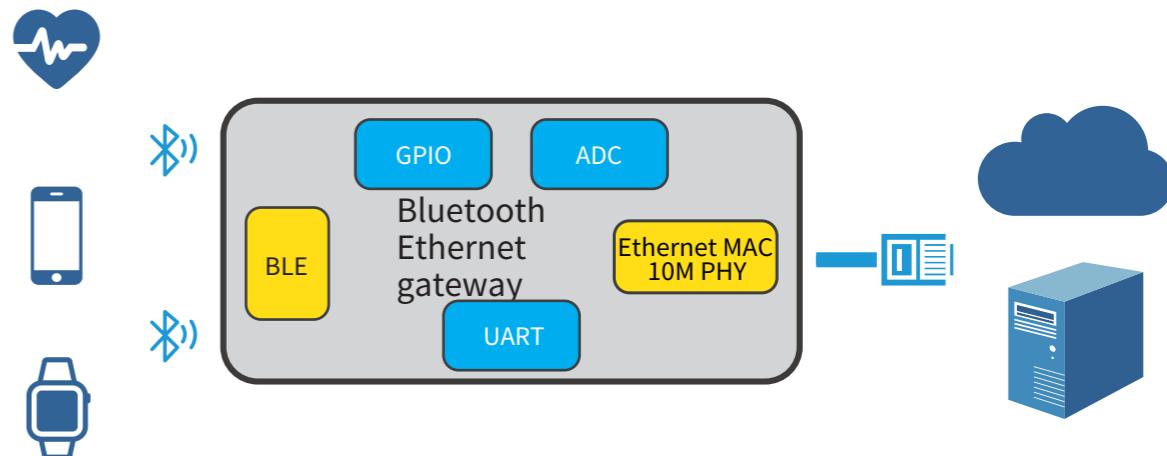


BLEMOD EVT Development board

Fast access to the Internet, single chip, no programming required

Quickly realize Bluetooth device network access to the Internet, comply with Bluetooth Low Energy specifications, can be configured through the serial port, Bluetooth, or network port, and is easy to use.

Block Diagram



Features

- > Single chip solution, no programming required
- > Compliant with Bluetooth Low Energy specification
- > 10M Ethernet port
- > Support connected Bluetooth devices to access the Internet quickly
- > Support Bluetooth and Ethernet configuration
- > Support multiple GPIOs
- > It supports one ADC acquisition and can be read via Bluetooth
- > Support one UART, baud rate 300~921600bps
- > Support IoT protocols such as MQTT and cloud platform connection

Applications

IoT Sensors

Data Monitoring

Smart Home

Smart Agriculture

Industrial Production

Bluetooth Network Access

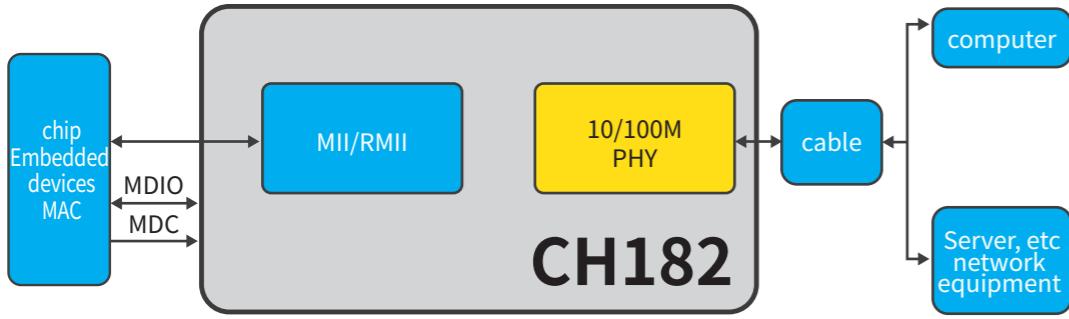
Bluetooth Ethernet Gateway Module

CH182

10/100M Ethernet PHY Transceiver

CH182 series is a single-chip, single-port Ethernet PHY transceiver supporting 10Base-T and 100Base-TX with auto-negotiation. It provides both MII and RMII interfaces, supports Auto-MDIX for TX/RX auto-switching and automatic positive/negative signal line identification. The I/O interfaces support 3.3V, 2.5V, and 1.8V, accommodating controllers operating at various voltages. The CH182 series offers diverse packaging options and pin configurations. The CH182D variant utilizes a QFN20 package measuring just 3×3 mm.

Block Diagram



Features

- > Support 100Base-TX and 10Base-TX
- > Support automatic negotiation
- > Automatically identify positive/negative signal lines
- > Support full/half-duplex operations
- > Support MII, RMII modes
- > Support Wake on LAN (WOL)
- > Support interrupt function
- > Support shutdown mode
- > Support 2 network status LEDs
- > Built-in LDO, single 3.3V power supply
- > Optional support for external 50MHz clock input
- > Support 25MHz external crystal or oscillator
- > Built-in impedance matching resistor and capacitance required for crystal oscillator

Model Selection Guide

Model	Package Form	Body Size	Pin Pitch	
CH182D	QFN20	3*3mm	0.4mm	15.7mil
CH182H1	QFN32	4*4mm	0.4mm	15.7mil
CH182H2	QFN32X5	5*5mm	0.5mm	19.7mil

Note: CH182D features a unique MAC address. We recommend prioritizing the compact CH182D or CH182H1 models.

CH182H2 is an upgraded version of the CH182H (not listed in the table) and is pin-compatible.

In addition to the models listed above, we also offer custom pin configurations and packaging options such as the CH182H3 and CH182H6.

Applications

Industrial Control Motherboard

Transportation Services

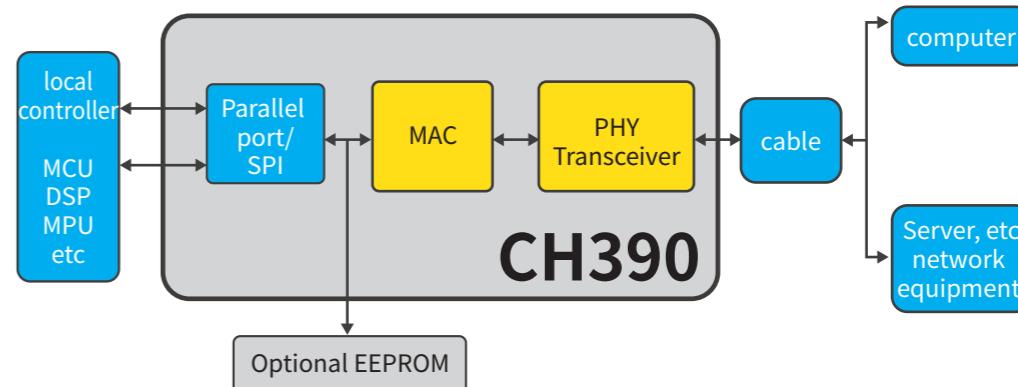
Security Monitoring

10/100M Ethernet Controller Chip Network Port Flexible Expansion

CH390 is an industrial-grade Ethernet controller chip that integrates 10/100M Ethernet MAC and physical layer transceiver PHY. It supports 10BASE-T CAT3, 4, 5, and 100BASE-TX CAT5 and 6 connections, supports HP Auto-MDIX, has a low-power design, and complies with IEEE 802.3u specifications. CH390 has a built-in 16K byte SRAM, supporting 3.3V or 2.5V parallel interfaces and SPI serial interfaces, and is compatible with controllers and processors such as MCU, MPU, DSP, etc.

CH390

Block Diagram



Features

- > Built-in MAC controller and 10/100M Ethernet PHY
- > Built-in unique MAC address, no additional purchase or allocation required
- > 10BASE-T/100BASE-TX and auto-negotiation
- > Auto-MDIX switching TX/RX, automatically identify positive/negative signal lines
- > sample frames, link status changes, and magic packet events
- > IEEE 802.3x flow control
- > Support generation and checking of TCP/UDP checksums for IPv4/IPv6
- > Built-in 50Ω impedance matching resistor and capacitor required for crystal oscillator, simplifying peripheral circuits
- > Support optional external EEPROM configuration chip

Model	Interface Type	I/O/Independent Power Supply	Interface Voltage	Package Form	Body Size	MAC Address
CH390D	SPI serial interface	-	3.3V	QFN20	3*3mm	Built-in unique MAC address, no need for additional purchase or assignment
CH390F	8-bit parallel interface	✓	1.8/2.5/3.3V	QFN28	4*4mm	
CH390H	SPI serial interface	✓	1.8/2.5/3.3V	QFN32X5	5*5mm	
CH390L	8-bit, 16-bit parallel interfaces	✓	2.5/3.3V	LQFP48	7*7mm	

Applications

IoT

Industrial Control Motherboard

Transportation Services

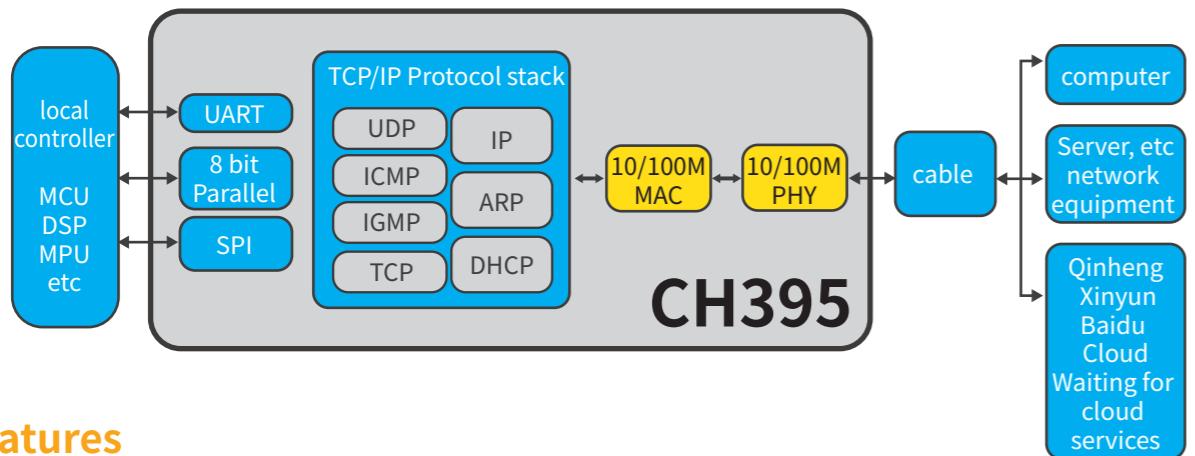
Security Monitoring

CH395 CH394 CH392

TCP/IP Network Protocol Stack Chip Let MCUs be easily connected to the Internet

CH395/CH394 provides a 10/100M Ethernet interface and integrates a TCP/IP protocol stack, making it easy to achieve embedded system networking. It can be widely used in industrial control, smart grids, and other networking products.

Block Diagram



Features

- > Built-in TCP/IP protocol suite supporting IPv4, ARP, ICMP, UDP, and TCP protocols
- > CH395 supports DHCP for automatic IP address acquisition
- > CH394 supports the IGMP protocol
- > Network protocol command, MCU only needs simple commands to achieve network communication
- > Built-in 10/100M Ethernet MAC and physical layer transceiver PHY
- > Full-duplex/half-duplex adaptive
- > Support automatic conversion of MDI/MDIX lines, arbitrary connection of cross/direct network cables
- > I/O port supports 1.8V, 2.4V, and 3.3V, compatible with controllers operating at different voltages
- > Provide 8 independent socket pairs for simultaneous data transmission and reception
- > Built-in RAM up to 32KB, with freely configurable transmit and receive buffers for each socket.
- > Provide EVT and common MCU application examples to effectively shorten development time
- > Provide TCP/IP protocol stack customization services
- > MCU interfaces: SPI, UART, 8-bit passive parallel port
- > Support IoT protocols such as MQTT and cloud platform connectivity
- > CH394Q supports both IPv4 mode and IPv6 mode

Model	Interface type	Socket number	Data transmit/receive RAM buffer	Package form	Body size
CH395F	8位并口、串口、SPI	8	24KB	QFN32	4*4mm
CH394L	8位并口、SPI	4	16KB	LQFP48	7*7mm
CH394Q	SPI	8	32KB	LQFP48	7*7mm

Note: CH395 features a built-in 4K EEPROM, supports sleep mode, provides 8 GPIO channels, and enables dynamic adjustment of serial port baud rates.

CH394 supports Wake-on-LAN (WOL), power-down mode, and LED status indication.

CH392 is a 10M Ethernet protocol stack chip supporting SPI and serial connections, available in TSSOP20 and QFN28 packages.

Applications

IoT
Office Automation

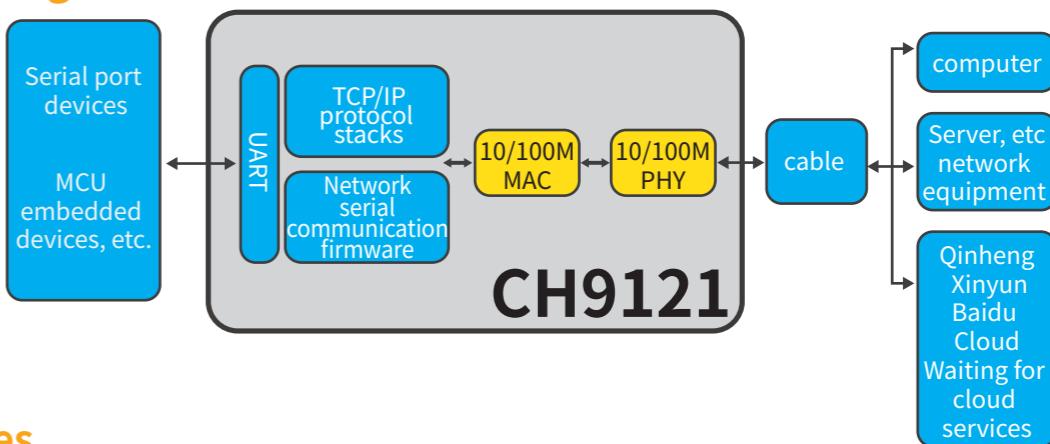
Public Service Terminal
Urban Traffic Management

Medical Devices
Server Management

Network Serial Port Transparent Chip Realize fast networking of serial devices

CH9121 integrates a TCP/IP protocol stack, easily realizing two-way and transparent data transmission between the network and serial port. With the help of the CH9121 chip, customers can quickly implement serial device networking, greatly reducing the difficulty of serial device networking and shortening the product development cycle.

Block Diagram



Features

- > Built-in Ethernet TCP/IP protocol stack and serial communication firmware
- > Built-in 10/100M Ethernet MAC and physical layer transceiver PHY
- > Bidirectional, transparent transmission between 10/100M Ethernet and serial ports.
- > TCP/UDP Client and Server modes
- > KEEPALIVE mechanism
- > DHCP for automatic IP address acquisition, DNS domain name access.
- > 2 independent serial ports simultaneously, transparent transmission, serial baud rate up to 10Mbps
- > full-duplex and half-duplex serial communication, and support automatic switching of RS485 transmission and reception
- > Setting network parameters such as chip working mode, port and IP through PC software and serial command.
- > LED display of Link and ACT status
- > Built-in pull-up resistors for network ports and crystal oscillator matching capacitors, with simplified external circuitry.

Model Selection Guide

Model	Serial port speed	Interface Voltage	Ethernet Specifications	Package Form	Body Size
CH9121T	10Mbps	1.8/2.5/3.3V	100M, 10M	TSSOP20	4.4*6.5mm
CH9121A	10Mbps	1.8/2.5/3.3V	100M, 10M	LQFP64M	10*10mm

Note: For new designs, we recommend using the CH9121T, which supports hardware flow control, features a smaller package, and requires a more streamlined peripheral circuit.

Others

CH9126: Network timing chip based on SNTP protocol. Supports SNTP server and SNTP client modes, and can configure chip parameters through network and serial ports. There is also an independent data transmission channel inside the chip, which can achieve Ethernet and serial port data transmission.

Applications

Smart Home
Power Instruments

Industrial Automation
One Card System

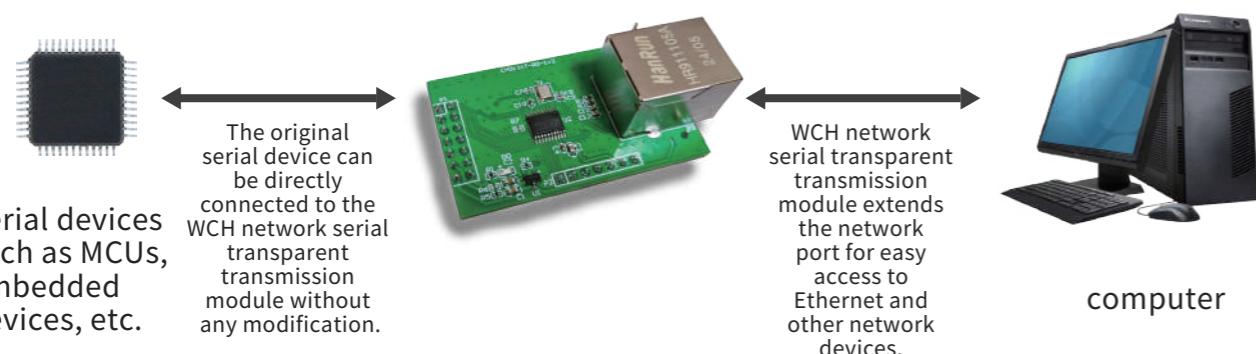
Public Service Terminal
Traffic Management

CH9121T CH9121A

Serial Port to Ethernet Module

Bidirectional Transparent Transmission of Serial and Network Data

No need to modify the original serial device communication protocol, it can quickly achieve the networking function of serial devices.



Features

- > Bidirectional transparent transmission of serial and network data
- > TCP CLIENT/SERVER and UDP CLIENT/SERVER for a total of 4 operating modes
- > 10/100M Ethernet, full-duplex/half-duplex auto-negotiation
- > Automatic switching of MDI/MDIX lines
- > DHCP automatic IP address acquisition
- > DNS domain name system, KEEPALIVE mechanism
- > Serial port baud rate supports 300bps~10Mbps
- > Support up to 2 independent serial ports simultaneously, with independent transparent transmission
- > Network parameters, serial port parameters can be configured via the host computer
- > Serial port supports full/half-duplex serial communication, with automatic switching between RS485 transmit and receive modes

Model Selection Guide

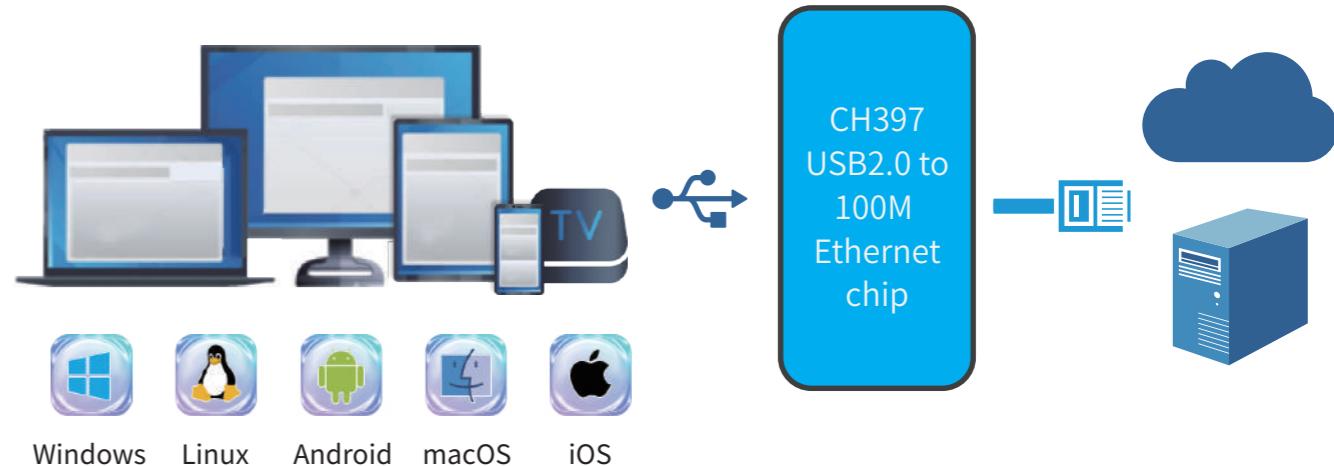
Model	Function
CH9121T-EVT-R0	Dual serial to Ethernet(10/100M)
CH9121A-EVT-R0	Dual serial to Ethernet(10/100M)

USB 2.0 100Mbps Network Card Chip

CH397 is a USB to Ethernet chip that complies with the USB2.0 protocol specification. It integrates USB2.0 PHY and Ethernet MAC+PHY that complies with the IEEE802.3 protocol specification and supports 10M/100M networks. Featuring high integration, low power consumption, and ease of use.

CH397

Block Diagram



Features

- > Single-chip USB2.0/2.1 to 10/100M Fast Ethernet, integrated USB PHY and Ethernet MAC and PHY
- > Support CDC-ECM, CDC-NCM, and RNDIS protocols. No need to install a driver or optional manufacturer driver
- > Support 10Mbps and 100Mbps rates, compatible with IEEE 802.3 10BASE-T/100BASE-TX
- > Support 10M/100M auto-negotiation
- > Built-in TX/RX packet buffer
- > Support IEEE 802.3x flow control and half-duplex conflict pressure fallback flow control.
- > Support IEEE 802.3Q VLAN tagging
- > Support sleep mode and low-power sleep mode
- > Industrial temperature range: -40~85°C
- > Provide QFN24, QFN32, QSOP16 and other small-volume, low-cost, easy-to-process packaging forms

Applications

Computer/Mobile Peripheral Products

IoT

Security Monitoring

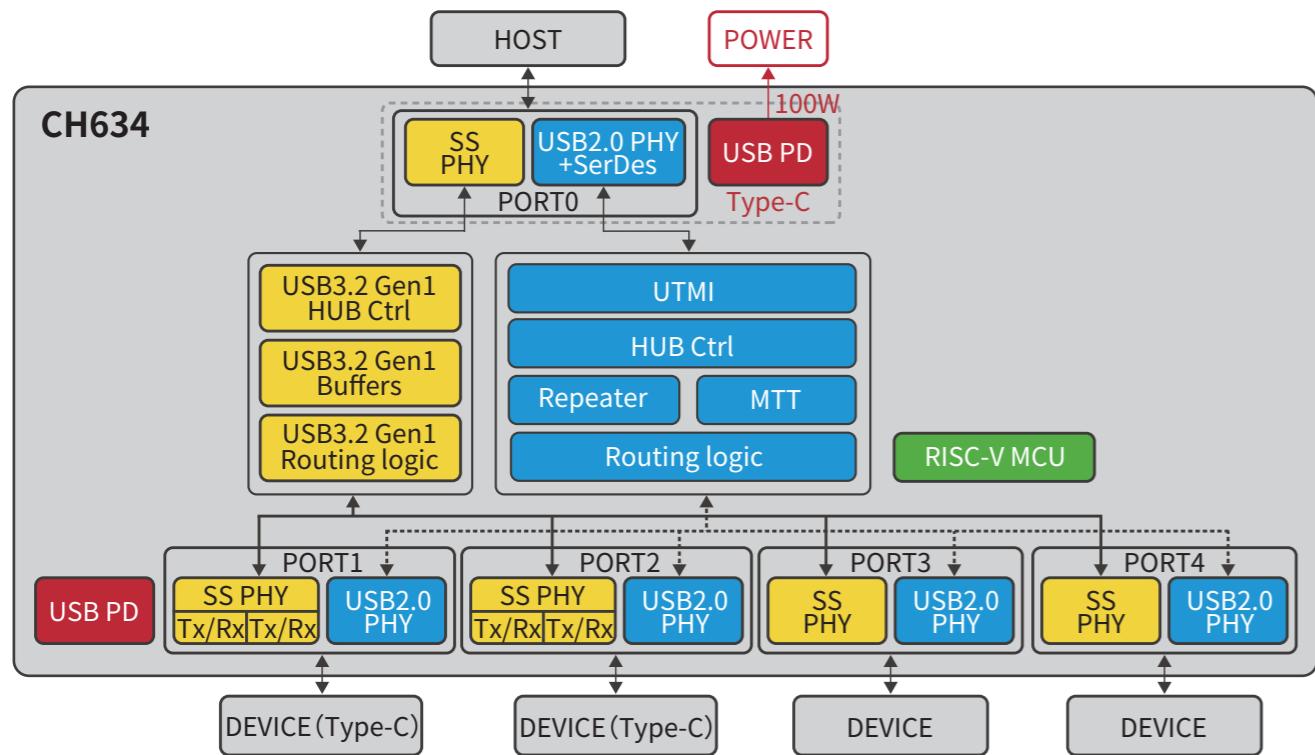
Network Server

CH634

4-Port USB3.0 SuperSpeed HUB Controller Chip

CH634 is SuperSpeed USB HUB controller chip compliant with the USB 3.2 Gen 1 protocol specification. This single-chip solution integrates 4-port USB HUB with USB PD functionality, supporting Type-C interfaces and upstream port switching. It incorporates 2 sets of Type-C dual-channel USB 3.0 PHYs and dual PDPHYs. It natively supports Type-C reversible plug detection, PDHUB, and Type-C power delivery up to 15W, along with PD fast charging up to 100W (20V*5A).

Block Diagram



Features

- > 1 upstream port, USB3.0 SuperSpeed 5Gbps, USB 2.0 high-speed 480Mbps, and full-speed 12Mbps
- > 4 downstream ports, supporting USB 3.0 SuperSpeed 5Gbps, USB 2.0 high-speed 480Mbps, full-Speed 12Mbps, low-speed 1.5Mbps
- > Integrated 2-channel USB 3.0 Type-C PHYs with native support for Type-C reversible plug orientation
- > Integrated 2 USB PD PHYs with native support for Type-C 15W power delivery and 100W PD fast charging, support PDHUBB and docking stations
- > Support high-performance MTT mode
- > Downstream port supports BC1.2 charging protocol and CDP
- > Proprietary HUB-specific USB PHY with low-power technology, supporting self-powered or bus-powered operation
- > Support SMBus for motherboard integration and management
- > Support upstream port switching for 2 USB hosts to manage multiple USB devices
- > Integrated 3.3V LDO regulator and 1.2V DC-DC buck converter; supports external 5V power supply for simplified peripherals
- > External Type-C interface chip CH211 for 28V high-voltage PDHUB and docking station functionality
- > Available in QFN32, QFN48, QFN64, and QFN68

Model Selection Guide

Function \ Model	CH634F	CH634M	CH634X	CH634W6G
USB2 port	4	4	4	4
USB3 port	2	4	4+2C	4
PD controller	✗	1	2	1
Upstream exchange	✗	✓	✓	✗
MTT mode	✓	✓	✓	✓
Independent overcurrent detection	✗	✗	4	✗
Overall overcurrent detection	✓	✓	✓	✓
Independent power control	✗	✗	4	✗
Overall power control	✓	✓	✓	✓
I/O Configuration Overall/Independent	-	-	✓	-
I/O configuration power control polarity	-	-	-	✓
LED	✗	1	1	1
Internal EEPROM configuration	✓	✓	✓	✓
External EEPROM configuration	✗	✗	✗	✗
External FLASH configuration	✗	✗	✗	✓
SMBus interface configuration	✓	✓	✓	✗
Customized configuration	✓	✓	✓	✓
I/O configuration BC charging	-	✓	-	✓
Type-C fast charging 15W	✗	✓	✓	✓
PDHUB fast charging 100W	✗	✓	✓	✓
Single 5V supply	✗	✓	✓	✓
Single 3.3V supply	✗	✓	✓	✓
3.3V+1.2V dual power supply	✓	✓	✓	✓
Package	QFN32	QFN48	QFN68	QFN64
Body size	4*4	5*5	8*8	8*8

Note: In addition to the models listed above, we also offer custom pin configurations including CH634W5M, CH634W6C, CH634W6T, CH634W7G, CH634W7R, CH634W7S, CH634W7U, CH634W7V, CH634W8G, and more.

Applications

Personal/Industrial Motherboards

Embedded Systems

Personal/Industrial Peripherals

USB HUB

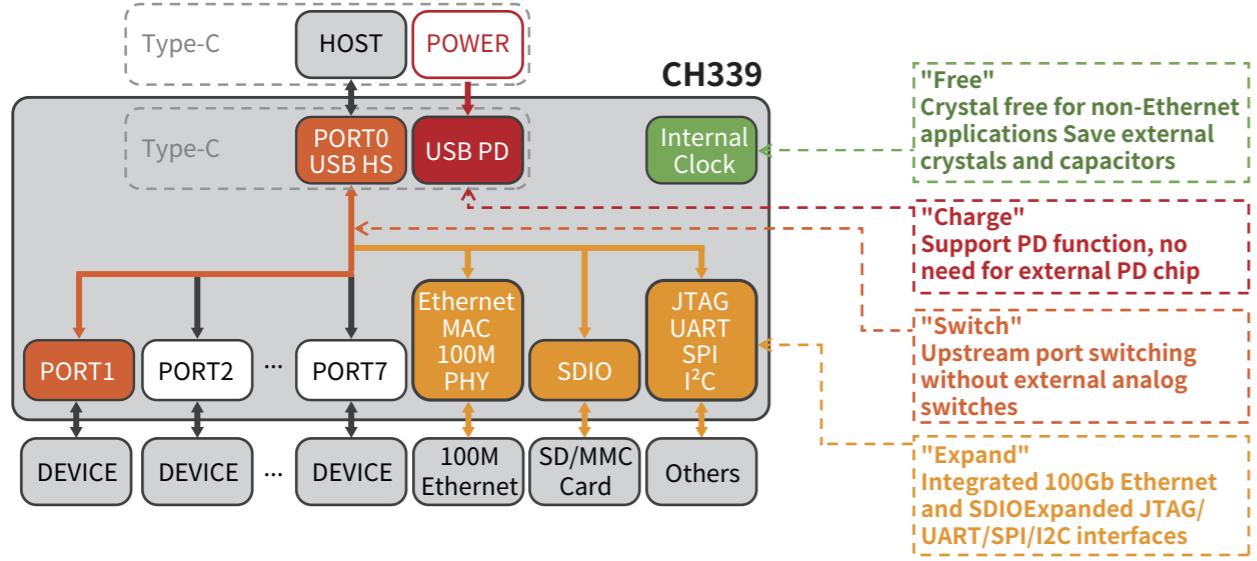
Expansion Dock

CH339

7-Port Integrated Ethernet, Card Reader, USB PD

CH339 complies with the USB2.0 protocol specification and integrates functions such as 7-port USB HUB, 100Mbps Ethernet, high-speed SD card reader, USB PD, and USB to JTAG/UART/SPI/I2C interface on a single chip. The chip supports high-performance MTT mode, industrial-grade design, and peripheral simplification. Some models support upstream port switching, and crystal oscillators are not required in non-Ethernet scenarios.

Block Diagram



Features

- > 7-port USB hub, the upstream port supports USB2.0 high-speed 480Mbps and full-speed 12Mbps, and the downstream port supports USB2.0 high-speed, full-speed and low-speed
- > Non-Ethernet applications can support crystal-free mode, saving external crystals and capacitors
- > Self-developed dedicated USB PHY, low-power consumption technology, supports self-power supply or bus power supply
- > Self-developed 10M/100M Ethernet MAC+PHY, compatible with IEEE 802.3 10BASE-T/100BASE-TX
- > 10M/100M automatic negotiation, supports UTP CAT5E, CAT6 twisted pair, supports Auto-MDIX, automatically identifies positive and negative signal lines
- > Support remote wake-up through events such as magic packets and network wake-up packets
- > Support IPv4/IPv6 packet verification, supports IPv4 TCP/UDP/HEAD and IPv6 TCP/UDP packet verification generation and inspection
- > Support SD cards and MMC cards, which can be converted into standard USB mass storage devices
- > The SDIO interface is compatible with SD card specification 2.0 and MMC specification 4.5
- > Provide USB to JTAG/UART/SPI/I2C and other interface functions
- > 6KV enhanced ESD performance, Class 3A
- > Industrial grade temperature range: -40~85°C
- > Provide QFN68, QFN32 and other small-volume, low-cost, easy-to-process packaging forms

Applications

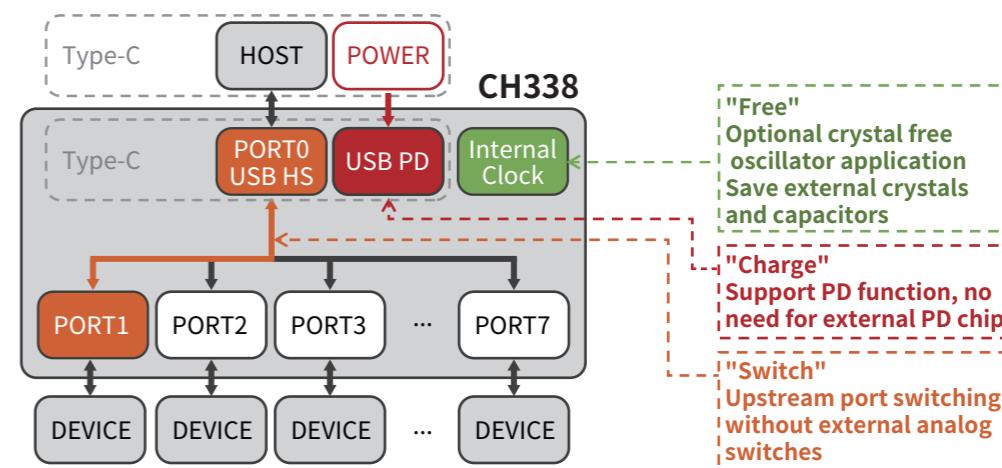
Personal/Industrial Motherboards Personal/Industrial Peripherals Embedded Systems
USB HUB Expansion Dock

7-Port Industrial Grade USB HUB Controller Chip

CH338 complies with the USB2.0 protocol specification and supports high-performance MTT mode, with some applications requiring no crystal oscillator. Some models support upstream port switching, integrate USB PD function, and support Type-C power transmission. Industrial-grade design with simplified peripherals, suitable for application scenarios such as computer and industrial computer motherboards, peripherals, embedded systems, etc.

CH338

Block Diagram



Features

- > 7-port USB hub, the upstream port supports USB2.0 high-speed 480Mbps and full-speed 12Mbps, and the downstream port supports USB2.0 high-speed, full-speed and low-speed
- > Some applications can support crystal-free mode, saving external crystals and capacitors.
- > Self-developed dedicated USB PHY, low-power consumption technology, supports self-power supply or bus power supply
- > 6KV enhanced ESD performance, Class 3A
- > Industrial grade temperature range: -40~85°C
- > Provide QFN64X9, LQFP48, QFN32 and other small-volume, low-cost, easy-to-process packaging forms

Model Selection Guide

Part NO.	TT Model	Overcurrent Detection	Power Control	LED Indicator	I/O Pin Configuration Power Supply Mode	I/O Pin Configuration Non-Removable Device	External/ Internal EEPROM/SMBus Interface Configuration Information	Custom Configuration Information	Upstream Port Switching Function	Type-C PD	Chip power supply	Package
CH338X	MTT	Independent/ GANG	Independent/ GANG	7+4	✓	✓	✓	✓	-	-	Single 3.3V	QFN64X9
CH338L		GANG	GANG	15	-	✓					Single 3.3V/ Single5V	LQFP48
CH338F		GANG	GANG	-	-	-					Single3.3V	QFN32

Applications

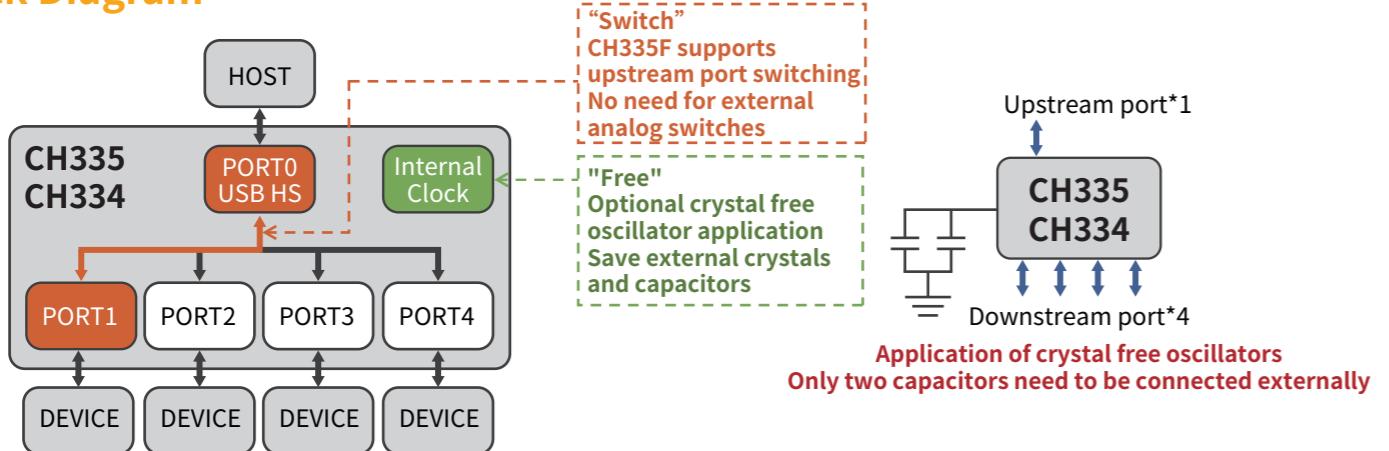
Personal/Industrial Motherboards Personal/Industrial Peripherals Embedded Systems

CH334 CH335

4-Port Crystal Free USB HUB Controller Chip

CH334 and CH335 comply with USB 2.0 protocol specifications. The upstream port supports USB2.0 high-speed and full-speed, and the downstream port supports USB2.0 high-speed, full-speed, and low-speed. The chip supports high-performance MTT mode, which performs significantly better than ordinary HUB chips that use time-sharing STT mode. Industrial-grade design, streamlined peripherals, some models support upstream port switching, no crystal oscillator required in some cases, only two external capacitors required.

Block Diagram



Features

- > 4-port USB hub, providing 4 USB2.0 high-speed downstream ports, backward compatible with low/full-speed
- > Support high-performance MTT mode, providing independent TT for each port to achieve full bandwidth concurrent transmission. The total bandwidth is 4 times that of STT
- > Self-developed dedicated USB PHY, low-power consumption technology, significantly reduces power consumption compared to the first-generation HUB chip
- > 6KV enhanced ESD performance, Class 3A
- > Industrial temperature range: -40~85°C
- > Provide QFN28, QFN24, QFN16, QFN12, QSOP16, QSOP28 and other small-volume, low-cost, easy-to-process packaging forms

Model Selection Guide

Part NO.	TT Mode	Overcurrent Detection	Power Control	LED Indicator Light	I/O pin Configuration Mode	External EEPROM Provides Configuration Information	Customized Configuration Information	Upstream Port Switching Function	Crystal-Free Applications	Package
CH335J	MTT	-	-	-	-	-	√	-	✓	QFN12
CH334P		-	-	1	-	-		-	Optional	QFN16
CH334R		-	-	-	-	-		-	Optional	QSOP16
CH334U/F		GANG	GANG	5	✓	✓		-	Optional	QSOP28/QFN24
CH334S/Q		GANG	GANG	1	✓	✓		-	Optional	SSOP28/QFN36X6
CH334H/L		Independent/GANG	GANG	1	✓	✓		-	Optional	QFN28X5/LQFP48
CH335F		Independent/GANG	Independent/GANG	5/9	✓	✓		✓	Optional	QFN28

Applications

Personal/
Industrial Mother MotherBoards

Personal/Industrial Peripherals

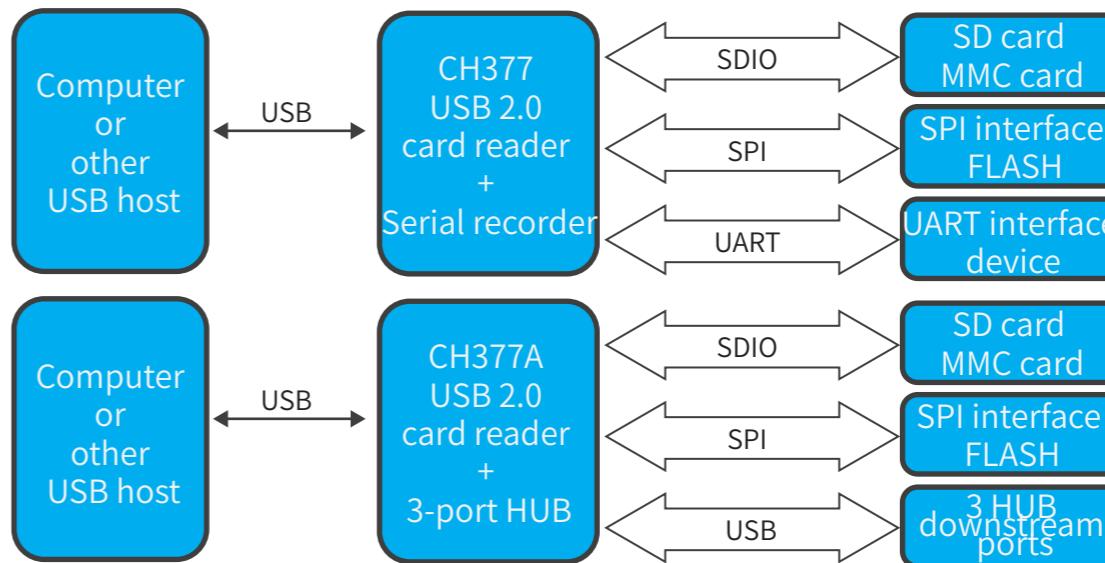
Embedded Systems

USB 2.0 High-speed Card Reader Chip with 3-Port HUB

CH377 is an industrial-grade USB2.0 high-speed card reader control chip, which connects SD card, MMC card and FLASH chip with SPI interface to realize the conversion of storage media such as SD card, MMC card and FLASH into standard USB mass storage devices, that is, USB Flash Drive. CH377F supports serial recorder mode, which can receive serial data in real time and save it to storage media in the form of files. CH377A also has a 3-port USB2.0 high-speed HUB function. The upstream port supports USB2.0 high-speed and full-speed, and the downstream port supports USB2.0 high-speed 480Mbps, full-speed 12Mbps and low-speed 1.5Mbps.

CH377

Block Diagram



Features

- > 480Mbps high-speed USB device interface, peripheral components only need crystal oscillator and capacitor.
- > FLASH chip that supports SD/TF card, MMC card and SPI interface.
- > Compatible with SD card specification 2.0, compatible with MMC specification 4.5.
- > Single 3.3V power supply.
- > CH377F serial port recorder mode, and saves serial port transparent transmission data in real time.
- > CH377F the FAT file system and configuration of parameters through configuration files.
- > CH377F 4 GPIO input and output functions.
- > CH377F serial communication baud rate supports 2400bps ~ 3000000bps.
- > CH377A 3-port USB2.0 HUB function, provides 3 USB2.0 downstream ports, and is compatible with USB1.1 specification.
- > HUB function of CH377A high-performance MTT mode, and provides independent TT for each port to realize full bandwidth concurrent transmission.
- > CH377A dual-disk function, with SD card or MMC card corresponding to disk 1 and SPI FLASH chip corresponding to disk 2.
- > CH377A 4-wire or 8-wire SDIO mode, and CH377F only supports 4-wire SDIO mode.
- > Built-in EEPROM, configurable chip VID, PID, maximum current, vendor and product information string and other parameters.
- > Provide QFN28 no-lead package

Applications

Personal/Industrial Mother MotherBoards

Personal/Industrial Peripherals

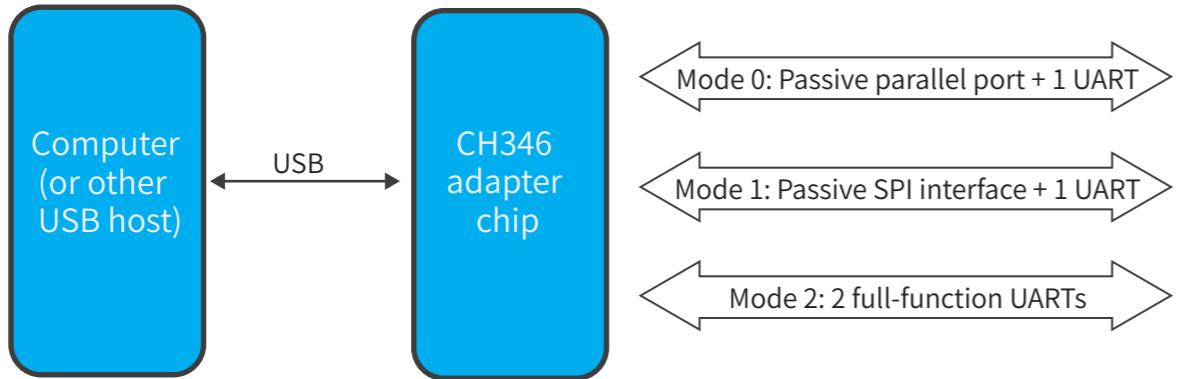
Embedded Systems

CH346

High-speed USB2.0 to FIFO/Passive SPI/UART Chip

CH346 is a high-speed USB bus adapter chip that provides a high-speed FIFO parallel port, passive SPI interface, and 2 serial ports via the USB bus.

Block Diagram



Features

- 480Mbps high-speed USB 2.0 device interface
- Parallel port FIFO operates in slave mode with transfer speeds up to 30MB/s
- SPI interface operates in slave mode, supporting modes 0/3 with clock frequencies up to 36MHz
- 2-channel hardware full-duplex serial ports with independent transmit/receive buffers, supporting baud rates up to 15Mbps
- Each serial port features an 8192-byte receive FIFO and a 4096-byte transmit FIFO
- Serial ports support half-duplex operation and provide a TNOW transmit-in-progress indicator for controlling RS485 transceiver switching
- I/O with independent power supply supporting 3.3V, 2.5V, 1.8V, and 1.2V voltages to accommodate serial peripherals and controllers with varying voltage requirements
- Built-in EEPROM for configuring parameters including operating mode, chip VID/PID, maximum current value, and manufacturer/product information strings

Applications

FPGA/CPU/MCU Data Acquisition

Industrial Control

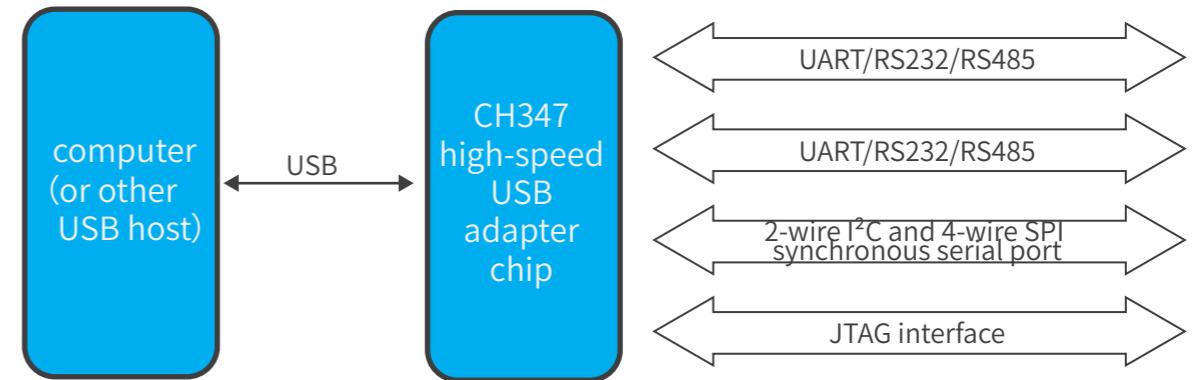
Programming Downloader

USB2.0 High-speed USB to JTAG/SPI/I²C/UART/GPIO chip

CH347 is a high-speed USB bus adapter chip that provides an asynchronous serial port and I²C synchronous serial interface, SPI synchronous serial interface, JTAG interface, etc, through the USB bus.

CH347

Block Diagram



Features

- 480Mbps high-speed USB device interface, peripheral components only require crystal oscillators and capacitors
- Support JTAG host interface, support custom protocol fast mode and bit bang mode, with a transmission frequency of up to 30Mbit/s
- Support SPI mode 0/1/2/3, support transmission frequency configuration, and can transmit frequencies up to 60MHz
- Provide I²C host interface, supporting speeds of 20K/100K/400K/750KHz
- Hardware full-duplex serial port, built-in independent transmit and receive buffer, communication baud rate support 1200bps to 9Mbps
- Support half-duplex, provides status indication TNOW for serial port transmitting, and can be used to control RS485 transceiver switching
- Support up to 8 GPIO input/output functions
- Built-in EEPROM can configure parameters such as working mode, chip VID, PID, maximum current value, manufacturer and product information string, etc

Applications

FPGA/CPU/MCU Debugging Download

Industrial Control

Programming Downloader

CH348
CH346/CH347
CH9114/CH344
CH9111
CH343
CH342
CH340/CH341

USB to Serial Port Chip

The USB high-speed/full-speed serial port series chip can convert USB to 1/2/4/8 serial ports, support independent power supply for serial port I/O, support VCP/HID/CDC to serial port, VCP serial port supports hardware flow control and high baud rate continuous communication, some models support content configuration such as VID/PID/String, and support operating systems such as Windows/Linux/Android/macOS.

Block Diagram



RoadMap

WCH High-speed USB-to-serial port series chips enable continuous, stable communication at speeds up to 15Mbps. Featuring high internal integration, they incorporate a crystal oscillator, USB termination resistor, and EEPROM. Select models employ a dual-power design supporting independent power supply for serial I/O, enabling serial communication at 3.3V, 2.5V, or 1.8V. Multiple packaging options are available. USB parameter configuration including VID, PID, and String is supported.

Model	Serial number	Max. baud rate	Serial I/O	Dual power supply	Full function Modem	Package
CH9111L	1	15	3.3/2.5/1.8V	✓	✓	LQFP48
CH346C	1	15	3.3/2.5/1.8V	✓	✓	QFN26C3
CH347T	1	9	3.3V	-	✓	TSSOP20
CH346C	2	15	3.3/2.5/1.8V	✓	✓	QFN26C3
CH347F	2	9	3.3/2.5/1.8V	✓	-	QFN28
CH347T	2	9	3.3V	-	-	TSSOP20
CH9114F	4	15	3.3/2.5/1.8V	✓	-	QFN32
CH9114L	4	15	3.3/2.5/1.8V	✓	✓	LQFP64M
CH9114W	4	15	3.3/2.5/1.8V	✓	✓	QFN56X8
CH9344Q	4	12	3.3/2.5/1.8V	✓	-	LQFP48
CH9344L	4	12	3.3/2.5/1.8V	✓	-	LQFP48
CH344Q	4	6	3.3V	-	✓	LQFP48
CH348L	8	6	3.3/2.5/1.8V	✓	✓	LQFP100
CH348Q	8	6	3.3V	-	-	LQFP48

Note: All chips listed above support hardware flow control. Except for the CH9344L, all other chips support USB parameter configuration.

Features

- Single-chip implementation of USB conversion to 1/2/4/8 serial ports
- Supporting independent power supply for serial I/O, achieving serial communication such as 5V/3.3V/2.5V/1.8V
- Support high baud rate and hardware flow control and supports adaptive serial baud rate
- Support multiple driver types, can use vendor VCP serial port drivers or CDC/HID class drivers
- Highly integrated internally, with built-in clock/USB terminal resistor/power-on reset and streamlined peripherals
- Built-in Unique ID (USB Serial Number)
- Built-in/external EEPROM, supporting configuration of VID/PID/String and other content
- Support USB/BLE to virtual serial port conversion, achieving BLE/serial port/USB three-way transparent transmission
- It supports a one-click download function for a serial port without peripheral circuits

Model Selection Guide

CH9111/CH346/CH9114: 480Mbps high-speed USB to 1/2/4-channel full-featured high-speed UARTs, supporting baud rates up to 15Mbps. Enables efficient, continuous transmission of large data at high baud rates, supports serial hardware flow control, and offers serial I/O voltage options of 3.3V/2.5V/1.8V. USB parameter configuration is supported. CH9111 additionally supports USB-to-SPI interface conversion. CH346 further supports USB-to-FIFO parallel port and SPI communication interfaces.

CH347: 480Mbps high-speed USB to dual full-function high-speed UARTs, supporting baud rates up to 9Mbps. Enables efficient, continuous transmission of large data at high baud rates. Supports serial hardware flow control. Serial I/O voltage compatible with 3.3V/2.5V/1.8V. Beyond serial functionality, the chip also supports USB-to-JTAG/SPI/I2C/GPIO communication interfaces.

CH348: 480Mbps high-speed USB to 8-channel enhanced UART, supporting baud rates up to 6Mbps. Serial I/O voltage compatible with 3.3V/2.5V/1.8V. Provides 8 RS485 direction control pins and 48 GPIO signals.

CH343: Full-speed USB to single enhanced UART, supporting baud rates up to 6Mbps. Features serial hardware flow control and high-baud-rate continuous transmission of large data volumes. Serial I/O voltage supports 5V/3.3V/2.5V/1.8V. Incorporates an internal clock and is available in a compact QFN package.

CH342: Full-speed USB to dual enhanced asynchronous serial ports, supporting baud rates up to 3Mbps. Features serial hardware flow control and high-baud-rate continuous transmission of large data volumes. Serial I/O voltage supports 5V/3.3V/2.5V/1.8V. Incorporates an internal clock and is available in a compact QFN package.

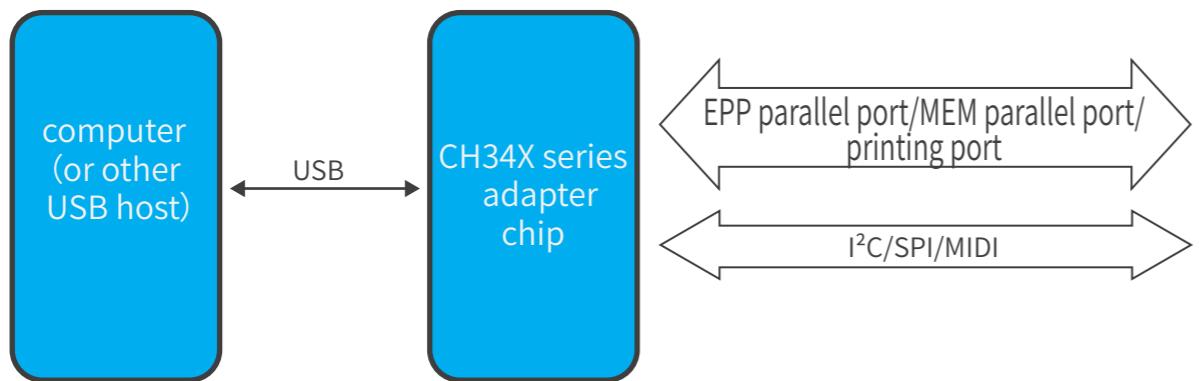
CH340/CH341: Classic USB-to-serial conversion chips, offering crystal-free versions and multiple packaging options. The CH340K incorporates three internal diodes to reduce current backflow between the MCU's I/O pins and the external power supply.

CH341 CH345

USB to I²C/SPI/MIDI/ Print Port/Parallel Port Chip

CH341/CH345 is a USB bus adapter chip that can realize USB to I²C, SPI, MIDI, printing port, parallel port, GPIO, and other functions.

Block Diagram



Features

- > Full-speed device interface, compatible with USB2.0
- > Built-in crystal oscillator version available
- > I²C speed supports 20K/100K/250K/750kHz
- > Parallel port supports EPP and MEM modes
- > MIDI supports one input and two outputs
- > Customizable manufacturer VID, PID, and serial number
- > Support 5V and 3.3V voltage
- > Support Windows/Linux/macOS/Android
- > Provide a variety of packages, such as QFN/SSOP/SOP, etc.

Others

CH9343: Highly integrated, low-power consumption, single-chip full-speed USB Android Host interface control chip, configurable to 6 expansion interfaces: UART, GPIO, PWM, I²C master, SPI master, and SPI slave for Android devices with built-in USB device interface to access external components.

Applications

Computer Peripheral Products
Office Printer

Instrumentation
MIDI Devices

Handheld Devices
Body-sensing detection

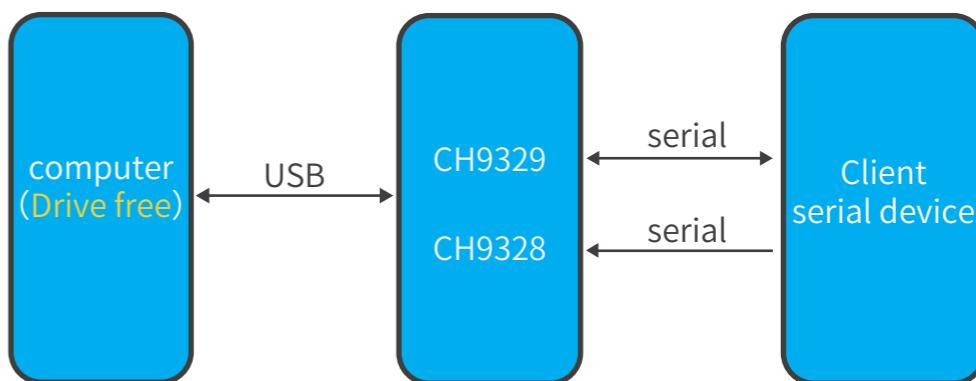
Serial Port to HID chip

CH9329 is a serial port to a standard USB HID device (keyboard, mouse, custom HID) chip, with bidirectional transmission and support for multiple working modes. It can be recognized as a combination of different types of devices on the computer, supporting various serial communication modes and flexible switching.

CH9328 is a chip that converts the serial port to an HID keyboard interface with a one-way transmission. It receives data sent by serial port and packages it into standard report values according to HID keyboard specifications to upload to the computer.

CH9329 CH9328

Block Diagram



Features

- > Full-speed device interface, compatible with USB2.0, compliant with HID device specifications
- > The default serial baud rate is 9600bps, supporting multiple serial communication formats and various common baud rate settings.
- > Customizable vendor VID, PID, and various string descriptors for chips
- > It supports both regular and multimedia keyboard functions and supports full keyboard functionality
- > Support relative and absolute mouse functions
- > Support custom HID device functionality, achieving bidirectional data transmission through USB and serial ports.
- > Support Windows/Linux/macOS/Android and other systems with driver-free installation.
- > A built-in crystal oscillator supporting 5V and 3.3V power supply voltages
- > Adopting a small volume SOP16 package, compatible with RoHS

Applications

One Card System
Financial Equipment

Industrial Control
Office Automation

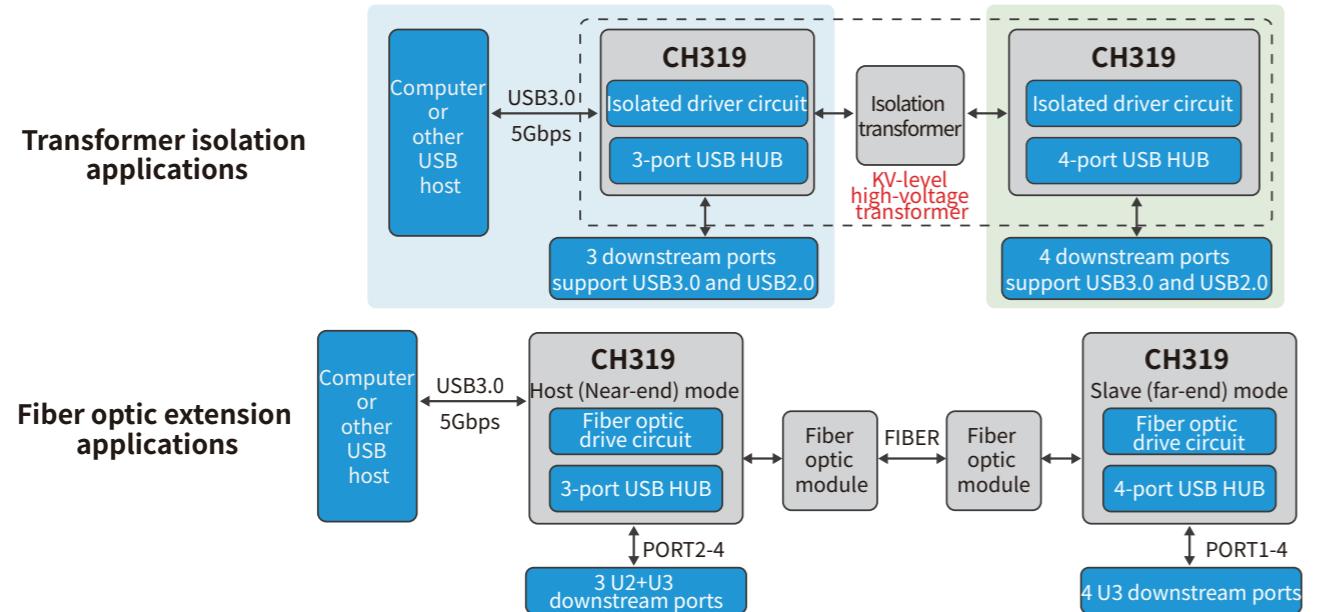
Medical Equipment

CH319

SuperSpeed USB3.0 Isolated Extender Control Chip

CH319 enables kV-level high-voltage isolation for USB signals via transformers or kilometer-level extension via fiber optics. The chip features an integrated ultra-high-speed USB hub compliant with the USB 3.2 Gen 1 specification. A single chip can be configured as either a host (near-end) mode or a slave (far-end) mode. Host mode provides 3 downstream ports, while device mode provides 4 downstream ports.

Block Diagram



Features

- > Hot-plugging of USB devices with plug-and-play
- > Pure hardware solution that is fully real-time and transparent to the USB protocol, requiring no additional driver installation. Compatible with various systems featuring USB interfaces
- > Host mode provides 3 downstream ports; slave mode provides 4 downstream ports
- > In transformer-isolated slave (remote) mode, the 4 downstream ports USB3.2 Gen1 (5Gbps) and are backward compatible with USB3.1, USB3.0, USB2.1, USB2.0, USB1.1, and USB1.0 protocol specifications
- > In the fiber optic extension solution, the 4 downstream ports in remote (downstream) mode only USB3.2 Gen1 (5Gbps) and are backward compatible with USB3.1 and USB3.0
- > The same chip can be configured for either host (near-end) mode or device (remote-end) mode, connecting to USB-Host hosts or USB-Device devices respectively
- > USB control transfer, bulk transfer, interrupt transfer, synchronous/isochronous transfer
- > Integrated USB signal transformer isolation driver circuit and fiber optic extension driver circuit
- > Connection status indication and 3 isolated universal I/O control pins
- > GANG overall power control and overcurrent detection
- > Built-in information memory allows batch customization of manufacturer/product details and configurations for industry-specific needs
- > Integrated 3.3V LDO regulator and 1.2V DC-DC buck converter; supports external 5V power supply for simplified peripherals
- > Industrial-grade temperature range: -40°C to 85°C; available in QFN48 package

Applications

Industrial Control

Audio and video multimedia

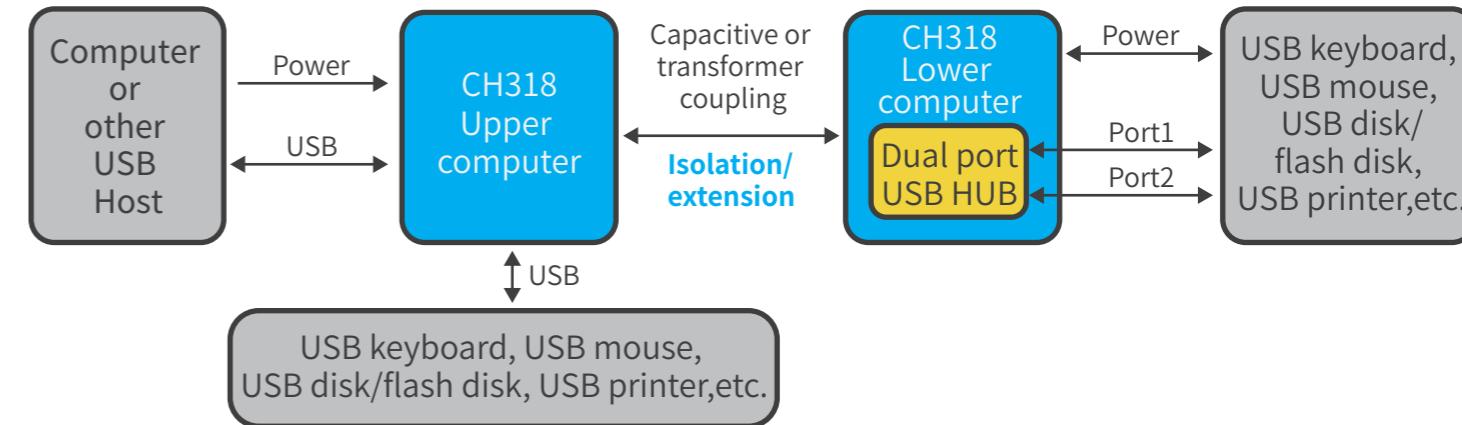
Computer peripherals

USB 2.0 Isolation Extender Control Chip

CH318 can achieve isolation, real-time transfer, and distance extension of USB signals through capacitive or network transformer coupling. When the chip is in host computer mode, it is recognized as a standard USB HUB. In addition to the isolation extension interface connected to the slave computer, it also provides one USB2.0 downstream port; when the chip is in slave computer mode, it gives two USB2.0 downstream ports.

CH318

Block Diagram



Features

- > Host computer mode provides 1 USB2.0 downstream port, and slave computer mode provides 2 USB2.0 downstream ports, compatible with USB1.1 protocol specification.
- > Support 480Mbps high speed, 12Mbps full speed, and 1.5Mbps low speed USB transmission
- > Support USB control transmission, batch transmission, interrupt transmission, synchronous/isochronous transmission
- > Support connection status indication
- > Built-in capacitive coupling drive circuit and network transformer coupling drive circuit
- > Pure hardware solution, completely real-time and transparent to USB protocol. No need to install any additional drivers
- > Provides crystal oscillator, supports external clock input, built-in PLL provides 480MHz Clock for USB PHY
- > The upstream port has a built-in 1.5KΩ pull-up resistor, and the downstream port has a built-in pull-down resistor required by the USB Host, simplifying the peripherals.
- > 6kV enhanced ESD performance, Class 3A
- > Industrial grade temperature range: -40~85°C
- > Provide TSSOP20 package form
- > If you need to expand the number of USB ports, the slave computer can be replaced with the CH338F, which also has an extension function.
- > If you need to expand more USB ports and SPI, JTAG, UART, I²C, and other interface functions, the slave computer can be replaced with CH339W.

Others

CH315: USB full (low) speed signal isolation and extension control chip, supporting capacitor or network transformer coupling, achieving USB signal isolation

Applications

Industrial Control

Audiovisual Multimedia

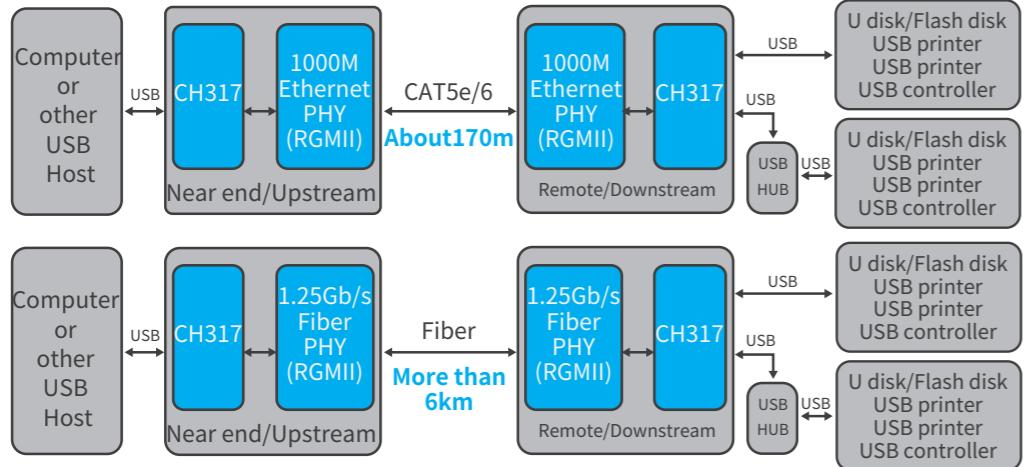
Computer Peripherals

CH317

USB 2.0 Extender Control Chip

CH317 is a USB 2.0 extender control chip that achieves USB signal extension of over 100 meters through inexpensive Ethernet or fiber optic cables with outstanding anti-interference capabilities. It supports low-speed, full-speed, and high-speed USB transmission without any driver, supports device hot swapping, and supports HUB expansion.

Block Diagram



Features

- USB extension distance is long, supporting USB 2.0 signal fiber extension, with a distance of over 6 kilometers; Support network cable extension,
- Generally, Category 5 cables are about 100 meters long, while Category 6 cables are 170 meters long.
- It supports various USB peripherals, such as USB printers, scanners, cameras, USB drives, keyboards, mice, etc., and HUB expansion.
- No additional software installation is required, and it is compatible with all operating systems.
- Support USB device hot swapping, plug-and-play
- It can be used for transformer isolation or optical isolation of USB2.0 high-speed signals
- Support switch penetration, which can extend the distance by adding network cables through the switch or achieve signal integration with other networks for transmission
- Support 2 sets of I/O synchronous extension control, enabling remote computer on/off or customized I/O signal remote input/output control
- Provide a 12M clock output that can be used for clock input in HUB chips
- Chip automatic recognition configuration USB host and device mode
- 3.3V single power external input, supporting 2.5V RGMII interface voltage

Others

CH9350: USB keyboard and mouse to serial port communication control chip must be used in pairs. Combined with the simple and easy-to-use features of the asynchronous serial port, the USB keyboard and mouse can be The USB communication method with the USB host is expanded to the asynchronous serial port (UART) method.

CH9374B: A USB KVM with built-in 4 upstream USB device ports, 4 downstream USB host ports, 1 PS2 host port, and switching control signals

Applications

Industrial Control
Security Monitoring

Audiovisual Multimedia
Medical Equipment

Computer Peripherals

USB Bus General Interface Chip

CH378/6: MCU Read/Write USB Flash Drive or SD Card Files

- USB Interface specifications: High-speed/Full-speed/Low-speed
- Common USB storage devices: USB Flash Drive/USB Hard Drives/USB Card Readers, etc.
- Common SD cards and protocol-compatible cards: SD/Mini-SD/HC-SD/MMC/TF card
- Built-in USB 2.0 protocol firmware, FAT12/FAT16/FAT32 file system management firmware
- Integrated 20KB RAM, requiring minimal resources from external systems
- MCU performs file operations (e.g., open/create/delete/search/enumerate) via simple commands
- Long filenames and multi-level directory operations; USB Flash Drive and SD cards
- Offers multiple MCU interfaces: 8-bit passive parallel interface, UART, SPI interface
- Provide evaluation board and application examples for common MCUs

CH375: MCU Read/Write USB Flash Drive Files

- Support USB Flash Drive, memory sticks, and card readers
- MCU reads/writes files on USB storage devices via the USB file system management library
- Auto detects USB device connection and disconnection, providing event notifications
- USB host and device modes with dynamic switching capability

CH374: Built-in HUB to Manage Multiple USB Devices Simultaneously

- Built-in 3-port USB root hub Root-HUB can connect and manage 3 USB devices at the same time
- Provide a variety of MCU interfaces such as 8-bit passive parallel port and SPI serial interface
- Automatically detect the connection and disconnection of USB devices and provide event notifications
- Supports USB host and device modes and can be switched dynamically

CH372: USB Device Interface to Automate the Enumeration Process

- Built-in USB underlying firmware, supporting convenient built-in firmware mode and flexible external firmware mode
- The built-in firmware can automatically complete the standard USB enumeration configuration process, simplifying firmware programming for microcontrollers
- Full-speed USB device interface, compatible with USB 2.0, plug-and-play

CH370: USB Host Interface, Operates Low/Full Speed USB Devices

- Provide 8-bit passive parallel port and SPI serial interface connection to MCU
- Automatically detect the connection and disconnection of USB devices, providing

CH377: USB2.0 High-Speed Card Reader Chip

- Support SD card, MMC card, and SPI interface FLASH chip
- Compatible with SD card specification 2.0, compatible with MMC specification 4.5
- Single 3.3V power supply; only crystal oscillator and capacitor are required for peripheral components
- Support serial port recorder mode to save serial port transparent transmission data in real-time

CH132: High-Speed USB Transceiver Chip with ULPi Interface

- Compatible with USB2.0 protocol specification and UTPi+Low Pin Interface (ULPi) 1.1 protocol specification
- Support USB 2.0 high-speed 480Mbps, full-speed 12Mbps, and low-speed 1.5Mbps data transmission and reception
- Can expand USB host or device interface for MCU or FPGA with ULPi interface

Applications

Industrial Controls
Security Monitoring
Automotive Electronics

Internet of Things
Instrumentation
Textile Machinery

Public Service Terminal
Equipment
One Card System

Intelligent Transportation
Electric Power Grid

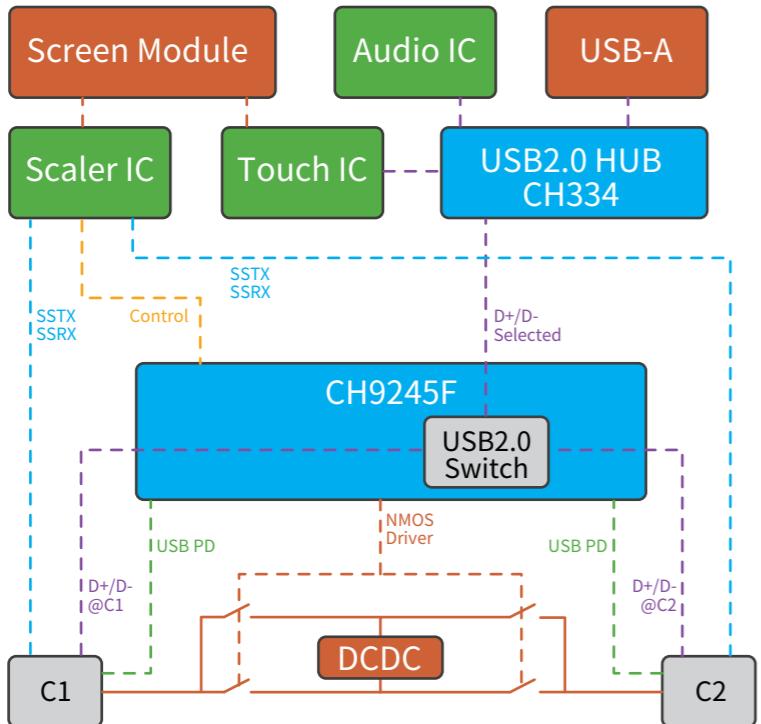
CH9245

Dual Type-C Port Display Dedicated SoC Chip

CH9245 supports PD protocol communication and power path management for 2 Type-C ports, featuring an integrated N-channel MOSFET gate boost driver module and USB 2.0 signal selection. It supports dual Type-C port data communication switching, incorporates dual differential OPAs for current detection on both ports, built-in high-voltage LDO.

CH9245M supports PD 3.2 protocol communication management, enabling up to 140W PD protocol communication and is certifiable.

Block Diagram



Features

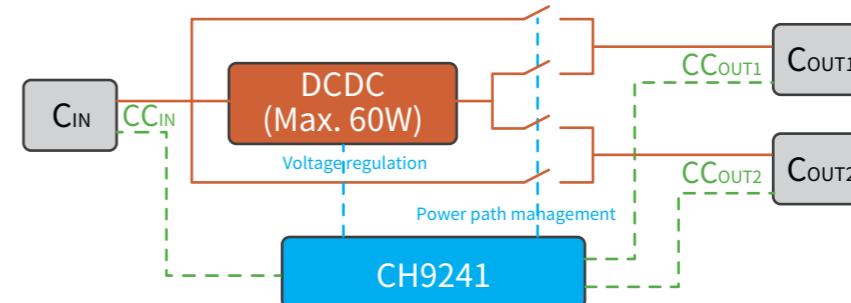
- > PD protocol communication and power path management for 2 Type-C ports
- > PD 3.2 protocol with up to 140W communication
- > Integrated high-voltage LDO with direct VBUS power supply
- > Built-in NMOS gate driver for direct high-side NMOS control
- > Integrated dual differential operational amplifiers
- > Built-in USB 2.0 analog switch (CH9245F) supporting data communication switching for 2 Type-C ports
- > Type-C interface firmware upgrades
- > Package options: QFN20, QFN32

Single-In Multi-Out (SIMO) Fast Charging Cable SoC

The CH9241 supports communication forwarding, power distribution, and switching management for PD 3.2/3.0/2.0 protocols. It features an integrated eMarker function and supports up to 140W PD protocol power input. It incorporates an integrated N-channel MOSFET gate boost driver module capable of directly driving multiple high-side NMOS transistors for power path switching control. With dual output current detection integrated, it is widely applicable in various one-to-many fast-charging cables and related applications.

CH9241

Block Diagram



Features

- > PD 3.2/2.0, intelligent power distribution, and power path control
- > Built-in eMarker functionality, supporting up to 140W PD protocol power input
- > Integrated high-voltage LDO, VBUS direct power supply
- > Built-in NMOS gate boost driver, direct drive for multiple high-side NMOS channels
- > Integrated dual-output current detection
- > Integrated USB 2.0 analog switch (CH9241F), USB data communication and D+/D- fast charging protocols
- > Firmware upgrades via Type-C input interface

Applications

CH9241K 1-to-2: Single port 100W, dual ports share 5V, with data switching

CH9241F 1-to-2: Dual blind-plug, simultaneous fast charging, intelligent power distribution, with data switching

CH9241F 1-to-3: Single DCDC, single blind-plug fast charging; dual/3-port single-port fast charging, intelligent power distribution, with data switching

CH9241A 1-to-2: 140W dual blind-plug, intelligent adaptive power distribution, supports data communication, externally driven NMOS, built-in eMarker

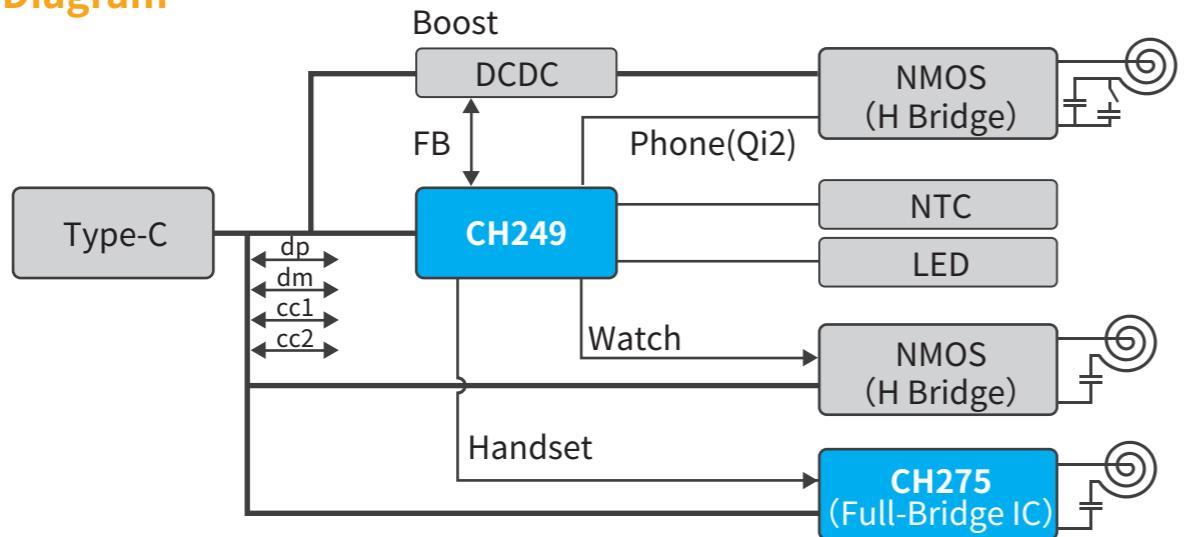
	Single-plug		Dual-plug		3-plug			BOM		Model
	OUT1	OUT2	OUT1	OUT2	OUT1	OUT2	OUT3	DCDC	NMOS	
140W	140W				122W+18W 50W+50W 82W + 18W smart adaptive power distribution			1	6	CH9241A
100W	100W				70W+30W	60W+30W	10W	1	6	CH9241F
100W	100W				85W 12W	85W	Shared 12W	1	4	
100W	100W				Shared 5V3A	/	/	/	2	CH9241K
100W	100W				Shared 5V3A	/	/	/	2	
100W	10W				90W 10W	/	/	/	1	Built-in CH220P

CH249
CH248
CH246
CH32X035

PD and Wireless Charging Dedicated SoC Chip

CH249 is a 20V wireless charging transmitter SoC designed for simultaneous charging of 3 devices. It integrates dual-channel decoding circuits, dual differential current amplification modules, and N-channel pre-drivers to enable desktop and automotive wireless charging solutions compliant with WPC Qi standards. It supports fast charging protocols like PD3.2 and features FB voltage regulation. CH249M is optimized for multi-device charging scenarios, enabling simultaneous charging of headphones, smartphones, and smartwatches. The CH249F is designed for single/dual-coil and multi-device charging configurations, compatible with Type-C and wireless power bank applications.

Block Diagram



Features

- > 5V~20V fast charging protocol input, DC input up to 12V
- > Single-core triple charging, single-coil multi-charging, and dual-coil charging
- > multiple fast charging protocols including PD3.2 and BC1.2
- > Built-in NMOS full-bridge pre-driver for flexible component selection
- > Integrated resonant capacitor switching control circuit
- > Integrated voltage decoding, current decoding, and differential current amplification modules
- > overvoltage/undervoltage, overcurrent, overtemperature, and FOD protection
- > Ultra-low sleep standby current as low as 75µA
- > Supports in-system programming (ISP)
- > Package form: QFN32, QFN48

Others

CH246: Wireless charging management chip integrating a single-chip wireless transceiver module and small-signal decoding circuit. With additional customer-specific software, it easily implements various wireless charging solutions.

CH248: A dedicated wireless charging transmitter SoC supporting multiple fast charging protocols including PD 3.0 and BC 1.2 input, delivering up to 15W wireless charging power for devices such as watches, earbuds, and smartphones.

CH32X035: A RISC-V core based on QingKe architecture, featuring integrated USB and PD PHY.

Supports PDUSB and Type-C fast charging functionality.

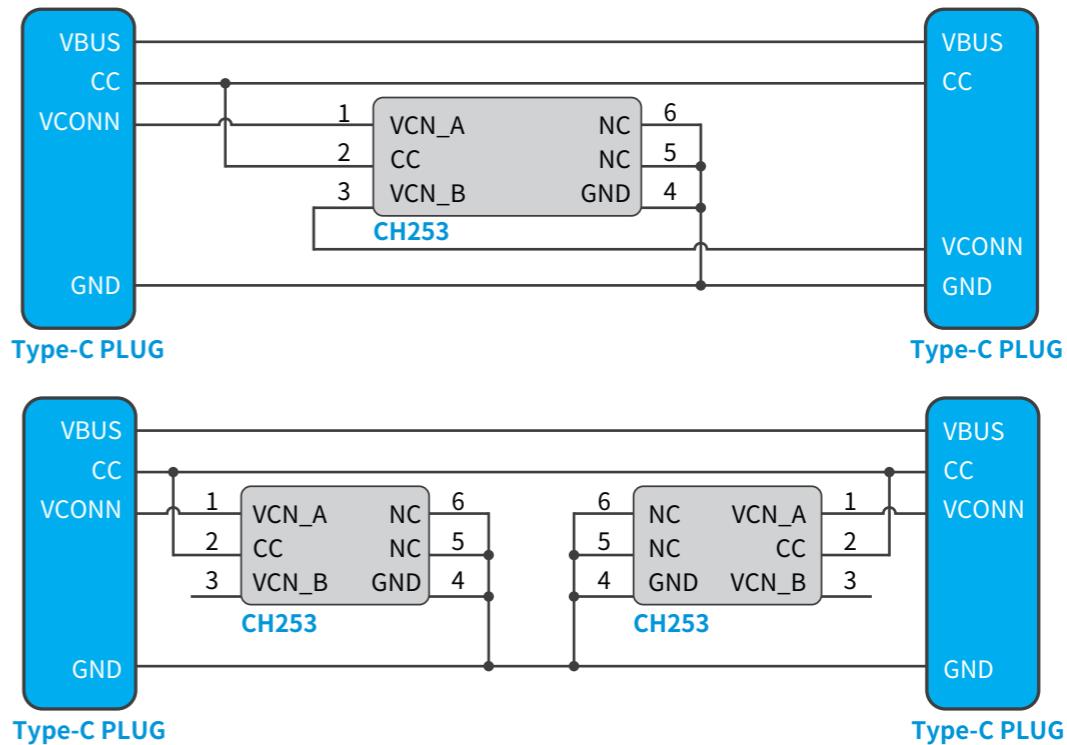
CH271/CH273/CH275: Wireless charging transmitter full-bridge power chips, featuring four integrated power switch transistors, a current sampling module, and a wireless charging feedback signal amplification module.

CH253
CH252
CH254
CH251

eMarker Electronic Tag Chip

CH252 is a USB Type-C cable electronic tag chip that supports USB Type-C 2.1 standard and USB PD 3.1 standard. It supports up to USB4 protocol speed Passive Cable and Active Cable and integrates VCONN diodes, Ra resistors, and high-voltage LDO inside the chip. It can work on a single chip without the need for peripheral devices. Supports multiple configuration data updates and burning and has a locking function, facilitating development while ensuring data security.

Block Diagram



Features

- > VCONN supports input voltages from 2.8V to 30V
- > USB Type-C 2.1 standard and USB PD 3.1 standard
- > Integrated VCONN diode and Ra resistor
- > VCONN pin tolerant 51V, CC pin tolerant 55V
- > Configuration data update programming
- > EPR Mode
- > Discover SVIDs, Discover Modes, Enter Mode
- > Exit Mode messages
- > Get_Manufacturer_Info message with configurable vendor string
- > Get_Status message
- > TID: 11163
- > Package form: DFN6

Others

CH252: Standard model supporting various Type-C cables rated at 240W (48V5A).

CH254: Support external NTC multi-level temperature protection and power control, compatible with various Type-C cables rated at 240W (48V5A).

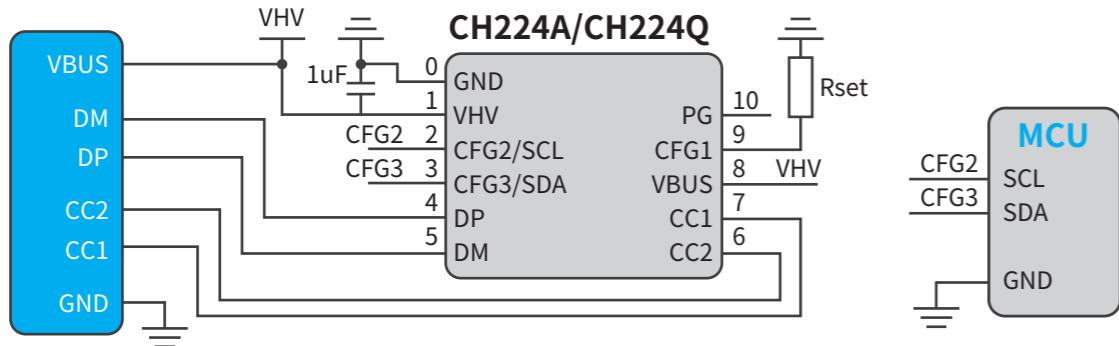
CH251: Simplified version supporting Type-C five-core cables rated at 100W (20V5A) or 240W (48V5A).

CH224 CH221

USB PD and Other Multi-fast Charging Protocol-powered Chips

CH224 supports PD3.2 EPR 28V, PD PPS protocol handshake, BC1.2, and more. It features an integrated LDO with low standby power consumption and provides I²C interface. MCU can precisely configure the requested voltage and read PD protocol power. The chip integrates output voltage detection, over-temperature/over-voltage protection, and other functions. With simplified peripherals, it can be widely used in various electronic devices to expand high-power input applications. CH221 is a simplified version of CH224.

Block Diagram



Features

- > Support input voltages from 4V to 30V
- > Support PD3.2 EPR, AVS, PPS, SPR protocols and BC1.2 boost fast charging protocols
- > Support eMarker emulation and automatic VCONN detection
- > Support multiple methods for dynamic voltage request adjustment
- > Support 400kHz I²C communication
- > Integrated high-voltage LDO with low static power consumption
- > High integration on a single chip, minimal peripherals, low cost
- > Built-in overvoltage protection (OVP) module
- > Package options: DFN10, ESSOP10, QFN20, SOT23-6

Model Selection Guide

Model	PD protocol			A-port protocol		Power consumption (at 20V)	I ² C configuration	Body size
	EPR	PPS	PD protocol	QC3.0	Other features			
CH224Q	28V	✓	✓	✓	✓	30mW	✓	Small (DFN10 2*2)
CH224A	28V	✓	✓	✓	✓	30mW	✓	Big (ESSOP10)
CH224D	✗	✓	✓	✓	✓	100mW	✗	Middle (QFN20 3*3)
CH224K	✗	✗	✓	✗	✓	328mW	✗	Big (ESSOP10)
CH221K	✗	✗	✓	✗	✗	328mW	✗	Middle (SOT23-6)

Others

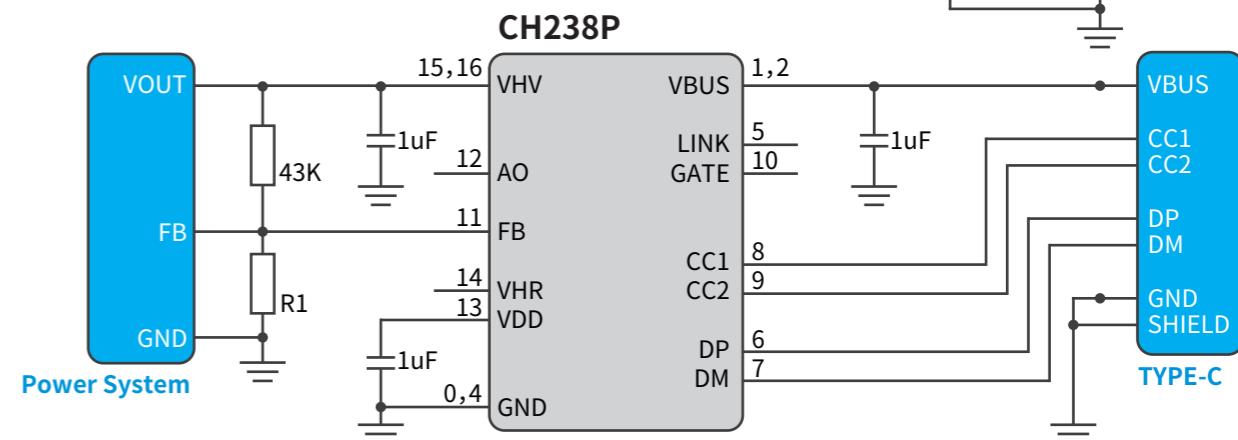
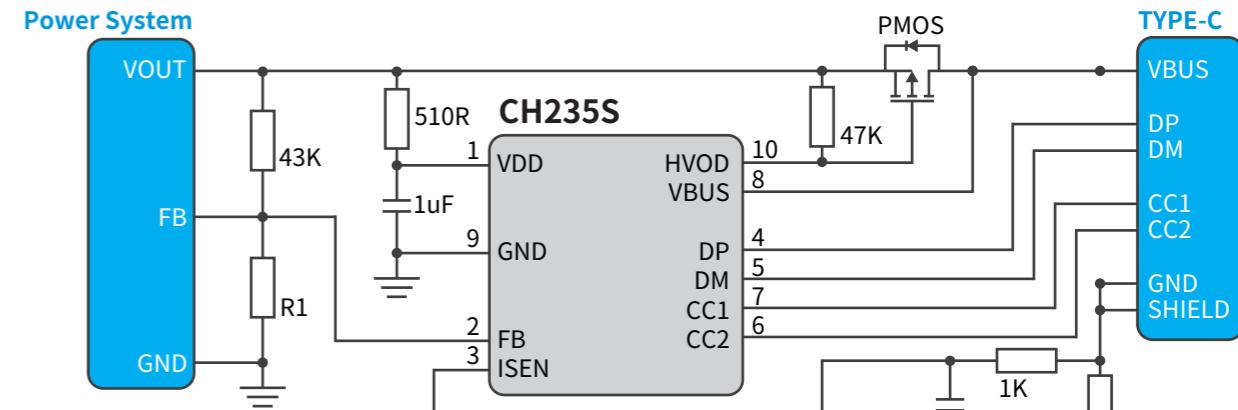
CH223: Supports USB PD 3.0/2.0 fast charging protocols. Enables retrieval of PD-related data and voltage level adjustment via I²C interface. Provides 2 controllable high-voltage open-drain output pins. The FB pin supports incremental open-loop current regulation mode, suitable for DC-DC converters or external voltage regulators.

CH220: USB PD fast charging protocol forwarding chip. Enables USB PD protocol forwarding between 2 Type-C interfaces. Single-chip solution supports voltage and current limiting, power deduction, and overcurrent protection.

USB PD and Other Multi-fast Charging Protocol Chips

CH235S is a Type-C single-port fast charging protocol chip packaged in ESSOP10, supporting Type-C fast charging protocols such as PD3.0/2.0, PPS, and Type-A fast charging protocols such as BC1.2. CH235S supports FB current regulation for various voltage references such as TL431 or DC-DC systems, supports cable compensation, integrates VBUS detection and discharge functions, and provides Undervoltage, overvoltage, overcurrent, and over-temperature protection functions.

Block Diagram



Model Selection Guide

Model	Interface Support	Protocol Support	Built-inMOS	Other Features	Feedback	Overcurrent/Current Limiting	Package
CH230K/A	Single C	PD+PPS, up to 13V	/	VBUS residual power discharge	FB	/	SOT23-6
CH231K/A	Single C	PD+PPS, up to 13V	/	/	FB	/	SOT23-6
CH233K/A	Single C	PD+PPS, up to 21V	/	/	FB	/	SOT23-6
CH233P	Single C	PD+PPS, up to 21V	/	Multi-chip combination, intelligent device recognition, and power allocation	FB	/	QFN16
CH235S	Single C	PD+PPS, commonly used A-port protocol, up to 13V	/	VBUS detection and discharge, A dual-core combination can reduce power or share 5V	FB	Overcurrent	ESSOP10
CH236D	Single C	PD+PPS, commonly used A port protocol, low voltage, and high current direct	/	Built-in NMOS	AO	Current Limiting	QFN20
CH237D	A+C	/	/	/	AO	Current Limiting	QFN20
CH238P	Single C	PD+PPS, commonly used A port protocol, low voltage, and high current direct	Built-in NMOS	/	FB/AO	Current Limiting	QFN16

Others

CH226/5: USB Type-C to audio+fast charging solution, single chip embedded USB PD controller, realizing Type-C headphone interface for mobile phone charging

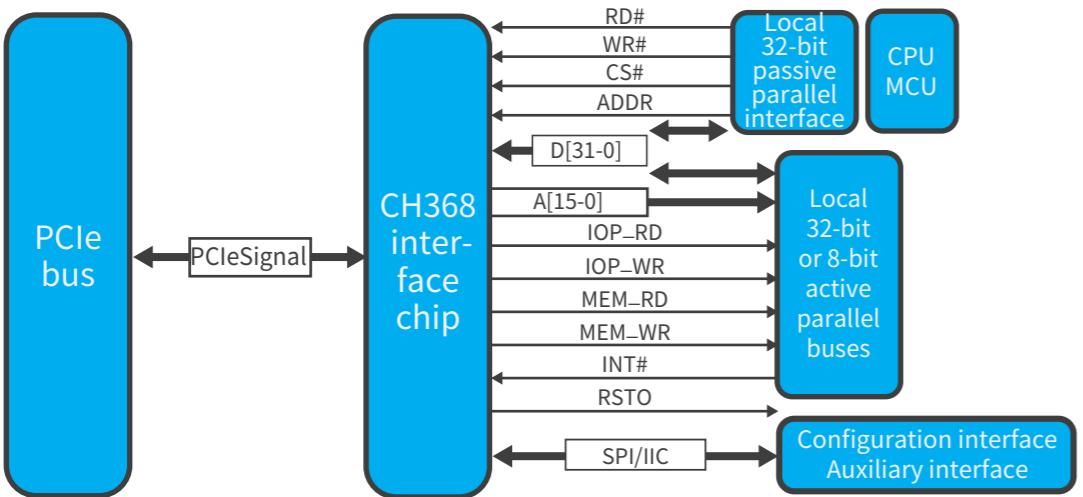
CH230 CH231 CH233 CH235 CH236 CH237 CH238

CH368

PCIe Bus Interface Chip

CH368 is a PCI-Express bus universal interface chip that converts PCIe into a 32-bit or 8-bit active parallel interface similar to ISA. It is used to make computer boards based on PCIe bus and upgrade boards originally based on ISA bus or PCI bus to PCIe. Suitable for high-speed real-time I/O control cards, communication interface cards, data acquisition cards, etc.

Block Diagram



Features

- > Support I/O port mapping, memory mapping, expansion ROM, and interrupts
- > Provide 8-bit or 32-bit active parallel bus based on PCIe bus
- > Provide a 32-bit passive parallel interface, which can be connected to other CPUs or microcontroller MCU buses and supports BusMaster/DMA
- > Support I/O reading and writing, automatically assigns I/O base addresses, and supports I/O ports up to 232 bytes in length
- > The width of the read and write pulses is selectable from 30ns to 450ns, and the 32-bit memory burst block access speed can reach 50MB per second.
- > Support flash expansion ROM without hard disk booting and can provide subroutine library BRM for expansion ROM applications
- > Provide high-speed 3-wire or 4-wire SPI serial host interface
- > Provide a 2-wire serial host interface that can be connected to a serial EEPROM device similar to 24C0X for storing non-volatile data

Others

CH364: PCI extended ROM control chip, providing Flash-ROM for system security control cards/isolation cards, etc.

CH365: PCI universal interface chip, used for I/O control and other PCI devices (Slave), 8-bit parallel port, directly upgrading to ISA card.

CH366: PCI-Express extended ROM control chip, providing Flash-ROM for system security control cards/isolation cards, etc.

CH367: PCI-Express universal 8-bit interface chip used for PCIe communication cards/IO control cards, etc.

Applications

Industrial Control

Information Security

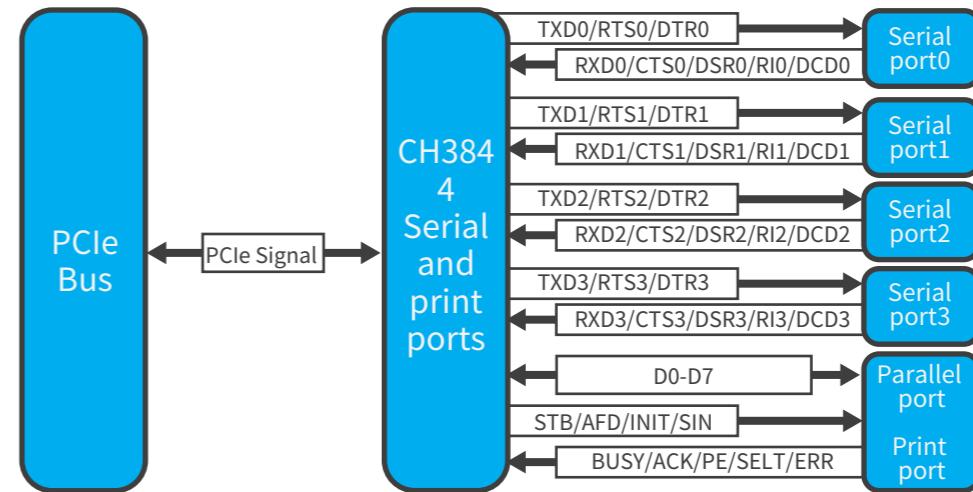
Medical Instruments

Instrumentation

PCIe Bus 4/2 Serial Ports and Print Port Chip

CH384 is a four serial and printing port chip for the PCI-Express bus, which includes four asynchronous serial ports compatible with 16C550/750 and an EPP/ECP enhanced bidirectional parallel port. It can be extended to up to 28 serial ports with a CH438 chip. It can be used for PCIe bus RS232 serial port expansion, PCIE high-speed serial port with automatic hardware rate control, serial port networking, RS485 communication, IrDA communication, parallel/print port expansion, etc.

Block Diagram



Features

- > The same chip can be configured as a four-channel serial port with parallel/print ports on the PCIe bus or a four-channel serial port with extended multiple serial ports.
- > Can connect serial EEPROM devices and set device identification (Vendor ID, Device ID, Class Code, etc.) for PCIe boards
- > Fully independent 4 asynchronous serial ports, providing PCIe interface 8 serial ports, 16 serial ports, 28 serial ports, and other application solutions
- > Serial programmable communication baud rate, supporting 115200bps and up to 8Mbps communication baud rate
- > The serial port has a 256-byte FIFO first-in, first-out buffer supporting 4 FIFO trigger stages.
- > Support full and half duplex serial communication, with built-in SIR infrared codec for serial port 0, and supports IrDA infrared communication.
- > Support IEEE1284 parallel/print port working modes such as SPP, Nibble, Byte, PS/2, EPP, ECP, etc.
- > The parallel port supports bidirectional data transmission, with a maximum transmission speed of 1MB/s per second.

Others

CH382: Can achieve PCI-E bus dual serial port and one parallel/print port expansion, 256 byte FIFO.

Applications

Industrial Control
Medical Equipment

Financial Equipment
Office Automation

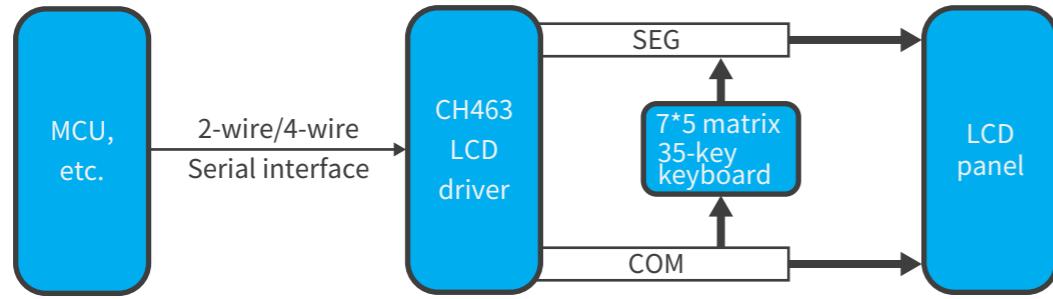
CH384 CH382

CH463 CH462

Application Block Diagram LCD driver chip

CH463 can be a display driver for 128-dot, 48-dot, etc. LCD panels. It also supports 35-key keyboard scanning and exchanges data with main control chips, such as microcontrollers, through a 2-wire serial interface.

Block Diagram



Features

- › Support up to 16 * 8 LCD panels, 16 SEGs, and 8 COM
- › Support LCD specifications such as 1/4 duty, 1/3 bias, or 1/8 duty, 1/4 bias
- › Built-in bias circuit, providing VLCD pin for adjusting LCD working voltage
- › Support buzzer drive output with 2 selectable frequencies
- › Support frame frequency adjustment provides 64-level PWM and can be used for LCD backlight adjustment
- › Built-in 35-key keyboard controller supports 7 * 5 matrix keyboard scanning and supports combination keys
- › Built-in clock oscillation circuit, saving external clock or oscillation components, more anti-interference

Others

CH462: Support up to 32 * 4 LCD panels, supports 1/2 or 1/3 bias, 1/2 or 1/3 or 1/4 duty LCD display applications; Provide VLCD pins,Used to adjust the working voltage of LCD; Built-in bias circuit and clock oscillation circuit, providing two optional buzzer frequencies.

Applications

Weight/Scale
Instrumentation

Industrial Sewing Machine
Fitness Equipment

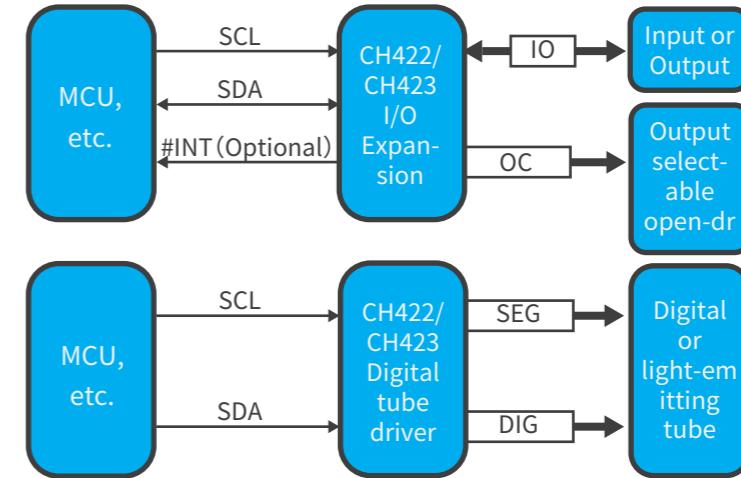
Handheld Devices
Medical Terminal

Digital Tube Display Driver and I/O Expansion Chip

CH422/CH423 can be used for remote I/O expansion, supporting input level change interrupt, driving digital and LED light-emitting tubes, adjusting brightness, and exchanging data with microcontrollers through a 2-wire serial interface.

CH422 CH423

Block Diagram



Features

- › During I/O expansion, 8 GPIOs and 4 or 16 GPOs can be remotely extended through a 2-wire serial interface, You can choose between push-pull output or open-drain output through the output pin GPO
- › When driving the digital tube, Can dynamically drive 4 common cathode digital tubes (32 LED light-emitting tubes) to 16 common cathode digital tubes (128 LED light-emitting tubes), Or statically drive 3 common anode digital tubes (24 LED light-emitting tubes)
- › Support brightness adjustment
- › Built-in current drive stage, segment drive current not less than 15mA, output word current not less than 100mA/120mA
- › High-speed 2-wire serial interface, compatible with I2C. Save pins
- › Support 3V-5V power supply voltage, support low-power sleep and wake-up

Applications

Smart Home
Motor Control

Data Acquisition
Audiovisual Multimedia

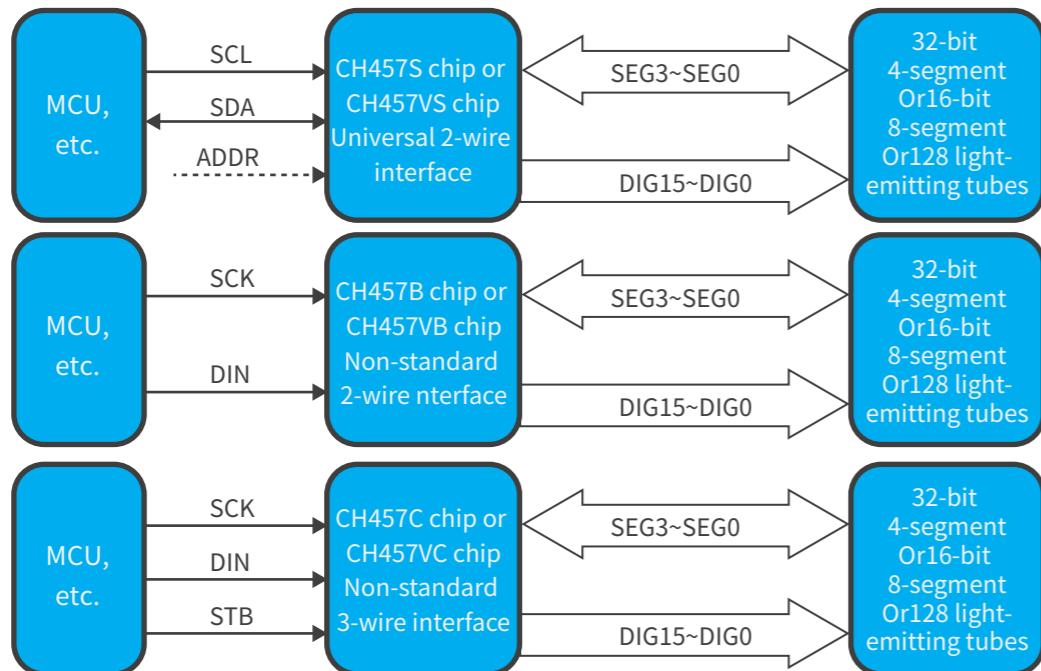
Weighing Instrument
Instrumentation

128 LED Display Driver Chips

Display IC new technology, supporting ordinary light beads, single panel cloth board

CH457 is a 128 LED display driver chip. CH457 has a built-in clock oscillation circuit that can dynamically drive 128 LED light-emitting tubes with a 32-bit 4-segment structure or 16-bit 8-segment structure; CH457 exchanges data with microcontrollers through a 2-wire or 3-wire serial interface.

Block Diagram



Features

- > Built-in display current driver stage, segment current not less than 30mA, word current not less than 120mA
- > Dynamic display scanning control, directly driving 128 light-emitting tube LEDs with 32-bit 4-segments structure or 16-bit 8-segment structure
- > Internal current limiting, providing 8-level brightness control through duty cycle setting
- > High-speed 2-wire or 3-wire serial interface, clock speed from 0 to 2MHz, universal 2-wire compatible with 2-wire I²C-bus, saving pins
- > Built-in clock oscillation circuit, no need for external clock or external oscillation components, more anti-interference
- > Automatic low-power sleep, saving electricity
- > 8KV Enhanced ESD Performance
- > CH457S/B/C is used for 5V voltage and can support 3.3V; CH457VS/VB/VC is used for 3.3V voltage and can support 2.8V
- > Support low-cost single-panel PCB wiring and full SMT process
- > Packaging form: SOP28, lead-free packaging, compatible with RoHS

Applications

Instrumentation
Scale

Medical Equipment
Industrial Equipment

One Card System
Handheld Devices

Display and Keyboard Scanning Control Selection

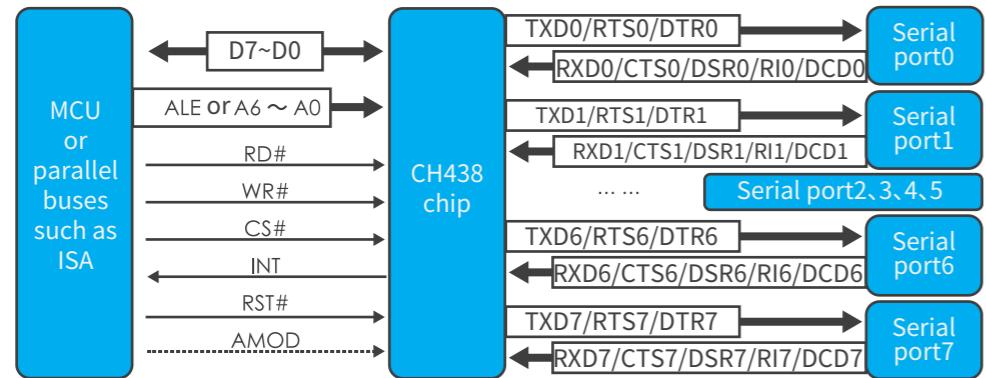
Model	Digital Tube	LED/Segmented LCD	Keys	Interface	Features
CH457	—	128/—	—	3wire/2wire	Display IC's new technology, compatible with multiple previous generation products, supports ordinary LED beads and single-panel fabric boards.
CH450	6*8	48/—	48	2wire	Small packaging.
CH451	8*8	64/—	64	4wire	It supports multi-chip cascading, BCD decoding, movement, flickering, and more.
CH452	8*8	64/—	64	4wire/2wire	It supports multi-chip cascading, light beam, BCD decoding, movement, flashing, etc. Support 2 channels of GPO universal output.
CH453	16*8	128/—	64	2wire	High-cost performance, fully pin compatible with CH423.
CH454	8*16/7*17	128/—	64	2wire	Support segments 11, 14, 16 x 8, and 17 x 7. Support 8-way GPIO universal input/output.
CH455	4*8	32/—	28	2wire	Support key combinations.
CH456	16*8	128/—	64	2wire	Few pins, a high driving current, and a simple peripheral design.
CH422	4*8	32/—	—	2wire	Support IO expansion.
CH423	16*8	128/—	—	2wire	Support IO expansion.
CH462	—	—/32*4	—	4wire	Optional 1/2 or 1/3 bias, 1/2 or 1/3 or 1/4 duty LCD specifications.
CH463	—	—/16*8	35	2wire	Support 1/4 duty, 1/3 bias, or 1/8 duty, 1/4 bias and other LCD specifications. Support combination keys.

CH438

Eight Serial Port Expansion Chip

CH438 includes 8 asynchronous serial ports compatible with 16C550 or 16C750, supporting a communication baud rate of up to 4Mbps. It can be used for RS232 serial port expansion in microcontrollers/embedded systems, high-speed serial ports with automatic hardware rate control, RS485 communication, and more.

Block Diagram



Features

- > Fully independent eight asynchronous serial ports, compatible with 16C550, 16C552, 16C554, and 16C750 with enhanced features
- > Programmable communication baud rate, supporting communication baud rates up to 4Mbps
- > Built-in 128 bytes FIFO first in, first out buffer, supporting 4 FIFO trigger stages
- > Support hardware flow control signal CTS and RTS automatic handshake and automatic transmission rate control, compatible with TL16C550C.
- > Optional connection of interrupt output pins, effective at low levels, can be replaced by querying the interrupt flag bit in the register.
- > Built-in clock oscillator supports crystals in the frequency range of 0.9216MHz to 32MHz and defaults to using 22.1184MHz crystals.
- > Provide an 8-bit passive parallel interface with a speed of 10MB to connect to a microcontroller.
- > Support 5V or 3.3V power supply voltage

Others

CH432: Dual serial port expansion chip, compatible with 16C550, used for asynchronous serial port expansion through parallel or SPI interfaces.
 CH9434: Four serial port expansion chips, compatible with 16C550, used for asynchronous serial port expansion through the SPI interface.

Applications

Internet of Things
 Instrumentation

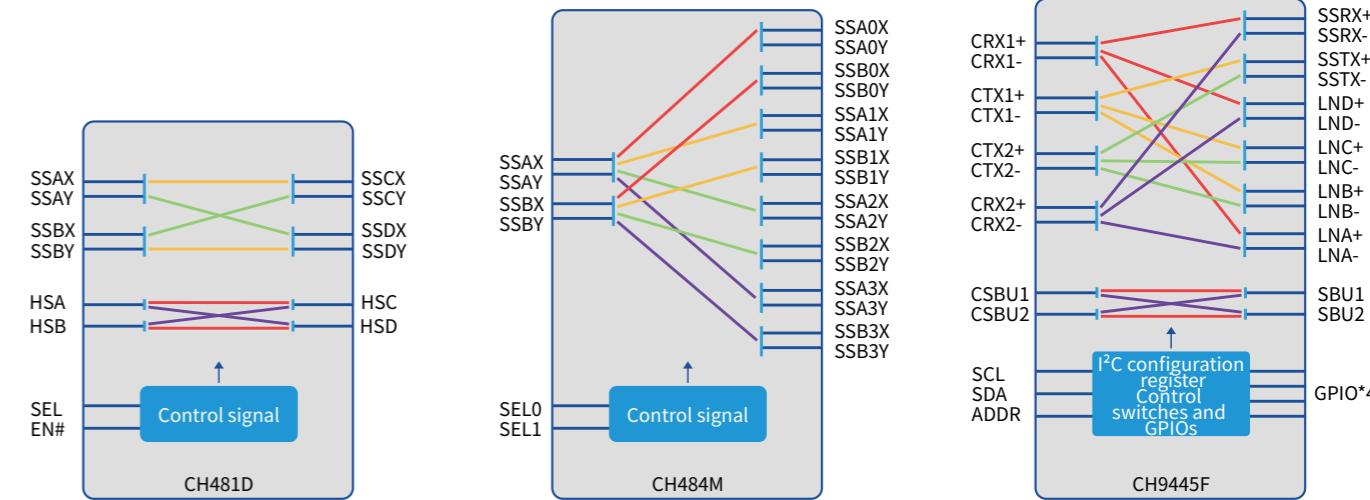
Computer Peripherals
 Electric Equipment

Security Monitoring
 Industrial Equipment

USB 3.0 Super Speed Analog Switch Chip

CH481 is a matrix exchange analog switch for 2-channel ultra-high-speed differential signals;
 CH484 is an analog switch of one out of four for two ultra-high-speed differential signals;
 CH9445 is a 4:6 cross-channel ultra high-speed differential signal analog switch
 Qinheng high-speed analog switch series chips can switch differential signals such as USB3.0 Super Speed, PCIe Gen1/2, SATA/SAS 1.5G/3G/6G, Display Port, and other non-differential and video signals.

Block Diagram



Features

- > High bandwidth, SS overspeed channel supports 6Gbps differential signal
- > HS high-speed channel supports 1.5G/2.5Gbps differential signal
- > With low conductivity resistance, Ron's typical value is about 4 Ω
- > Low crosstalk, high isolation
- > The multi-channel switch supports global enablement
- > Support video signal, ultra high speed/high-speed USB signal switching
- > Support 3.3V power supply voltage, low static power consumption

Model Selection Guide

Part NO.	Function	Package
CH481D	2 differential channel switching, four poles double throw ultra high-speed analog switch	QFN20X25X45
CH484M	There are two differential channels, one out of four, four poles, and four throw ultra high-speed analog switches.	QFN42C-3.5*9
CH482D/X	Two differential channels, one out of two, four poles double throw ultra high-speed analog switch	QFN20X25X45
CH483M/X	Three differential channels, one out of two, six poles double throw ultra high-speed analog switch	QFN42-3.5*9
CH486F	Two differential channels, one out of four, four poles, four throw high-speed analog switch	QFN28

Note: 1. The bottom plate of the QFN package is marked as 0# pin, which is not necessary, but it is recommended to connect
 2. CH483X is only used for compatible applications and requires a reservation.
 For new designs, please give priority to CH483M or CH482D

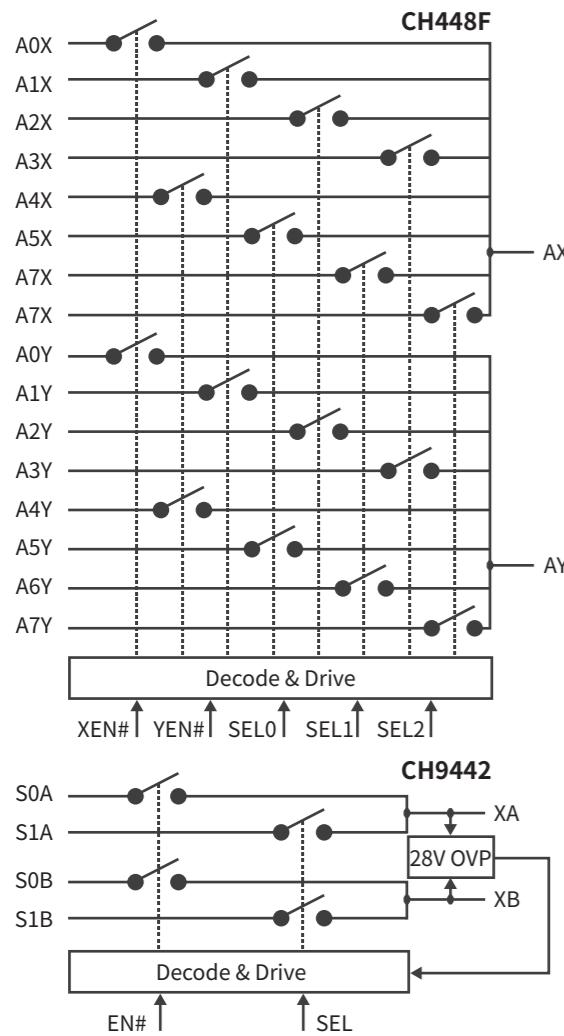
CH481 CH483
 CH484 CH486
 CH482 CH9445

CH448/4 CH440/5 CH442/3 CH9442

Low Resistance and High Bandwidth Analog Switch Chip

CH448 is a dual-channel 8-to-1 analog switch chip. The channels can be independently enabled. The bandwidth is up to 550MHz. It supports differential signals and can be used for 8-to-1 switching of video signals or high-speed USB signals. It can also be used for 16-to-1 selection. The control signal of CH448 can be independent of the power supply voltage and supports 5V, 3.3V, and 2.5V. CH444 is a dual-channel 4-to-1 option, CH440/CH445 is a four-channel 2-to-1 option, CH442 is a dual-channel 2-to-1 option, and CH443 is a single-channel 2-to-1 option.

Block Diagram



Features

- > Low on-resistance, Ron typically 5Ω
- > High bandwidth, Bw typically 550MHz, CH9442 bandwidth approximately 1.4GHz
- > Fast switching, typical Ton/Toff less than 5ns
- > Video signal and high-speed USB signal switching
- > Multi-channel switches with global enable capability
- > Wide supply voltage range, low static power consumption
- > ESD protection: 2KV HBM on external pins XA/XB
- > 5KV HBM compliance with Class 3A

Applications

Computer Peripherals

Information Safety

Audiovisual Multimedia

Model Selection Guide

Part NO.	Function	Package
CH448F	2-channel 8-to-1	QFN24
CH444G	2-channel 4-to-1	SOP16
CH444P		QFN16
CH440G		SOP16
CH440P		QFN16
CH440R		TSSOP16
CH445P		QFN16
CH442E	4-channel 2-to-1	MSOP10
CH9442Q		QFN10L14X18
CH9442X		QFN10L15X2
CH9442E	2-channel 2-to-1	MSOP10
CH443K	1-channel 2-to-1	SOT363

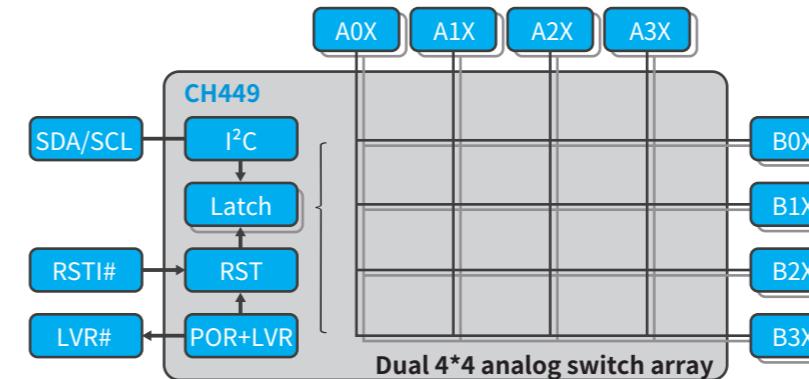
Note:

1. CH448 control signals are independent of the power supply voltage and support 5V, 3.3V, and 2.5V control signals. QFN package's bottom plate is marked as pin #0, which is a required connection for the CH448F.
2. CH9442 control signals are independent of the power supply voltage and support 5V, 3.3V, 2.5V, and 1.8V control signals.
3. CH9442 external pins support 28V DC tolerant voltage. In PD high-voltage USB applications, the built-in overvoltage protection handles unexpected situations when the Type-C connector supplies 20V or 28V.
4. Smaller packages typically have lower parasitic L/C. For high-frequency signal applications, prioritize smaller packages like QFN or SOT.

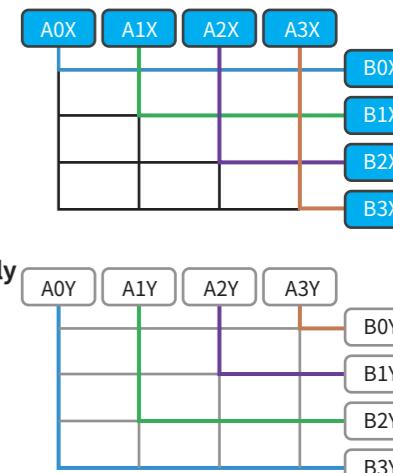
Dual 4x4 low Resistance Analog Switch Array Chip

CH449 is a 4x4 matrix differential signal analog switch chip comprising 32 analog switches divided into two groups distributed at various intersections of two 4x4 signal channel matrices. Each analog switch can be independently turned on or off, achieving any dynamic connection of 4x4 differential signal channels.

Block Diagram



CH449 CH446



Features

- > Support differential signal exchange with four inputs and four outputs
- > Support two independent four-out single-ended signal exchanges
- > With low conductivity resistance, Ron's typical value is 5Ω
- > High bandwidth, supports video signals, supports high-speed USB signals
- > ESD supports 2KV HBM
- > Compatible with a 2-wire serial control interface for I2C, with two sets of device addresses available for selection
- > Built-in power-on reset and low voltage power reset, supporting external input reset
- > All control signals are independent of the power supply voltage and support control signals of 5V, 3.3V, 2.5V, and 1.8V
- > Wide power supply voltage range, low static power consumption, supporting rated 5V power supply voltage, available as low as 2.5V power supply

Model Selection Guide

Model	Functional Difference	Packaging Form	Size
CH449F	Support rail-to-rail full amplitude analog signal	QFN24	4.0*4.0mm
CH449X	Higher bandwidth only supports analog signals below VDD-1.4V.		

Note: The bottom plate of the QFN package is marked as pin 0, which is an optional connection, but it is recommended to connect.

Others

CH446Q: 8x16 matrix analog switch chip, capable of arbitrary routing of 8x16 signal channels.

CH446X is a 5x24 matrix analog switch chip that automatically routes 5x24 signal channels.

Applications

Multi Group Video Signal Exchange

Digital I/O Physical Layer Routing and I/O Expansion

Multiple USB Signal Exchange

Product Solution

Low-Power Wireless (⌚)

Product/Solution	Summary
Serial Bluetooth Mutual Transmission Module	Bidirectional data transmission, single chip solution, no programming required, and provides configuration tools. Modules are provided.
Bluetooth Ethernet Gateway	Quickly connect Bluetooth devices to the Internet. Provide chip-level solutions.
BLE Mesh Wireless Networking	A BLE Mesh development kit supports various Bluetooth Mesh Profile features, including forwarding, proxy, Friend node, and low-power consumption. Passed the official certification of Bluetooth SIG and the Alibaba-Tmall Genie ecological certification.
BLE/UART/USB 3-Way Transparent Transmission	Single-chip solution to realize three-way interoperable transmission of Bluetooth, serial port, and USB interface data transmission. In addition to the main chip, it only requires one crystal and three capacitors, with streamlined peripherals and compact size.
Smart Door Lock	CH584 Single-chip solution, high integration: BLE + NFC + Touch + Segmented LCD. Minimal peripherals, saving PCB space. Configure and manage door locks via Bluetooth. Supports multi-mode unlocking: fingerprint, passcode, NFC, mobile app/mini-program, and mechanical key.
High-Frequency Wireless Mouse	Single-chip receiver, based on self-developed 2.4GHz and high-speed USB technology, compact size, stable communication, and fast response; Paired with Bluetooth Low Energy chips such as CH592 and CH582, it can support a high frequency of 8k. It becomes more cost-effective by using self-developed high-speed USB PHY and other professional interface IPs, as well as the QingKe RISC-V core.

Network Communication (🌐)

Product/Solution	Summary
Serial Network Bidirectional Transmission Module	Bidirectional transparent transmission module through network serial ports to quickly connect serial devices to the Internet. Supports TCP/UDP working mode and supports serial/network configuration. Provide serial TTL/RS232/RS485 modules.
USB3.0 to Gigabit Ethernet	PHY through the RGMII interface to realize USB3.0 device to Ethernet (USB Gigabit network card) or USB3.0 host to Ethernet application, supporting optical fiber or Ethernet transmission. Provide chip-level solutions to support secondary development.
Ethernet Analyzer	Ethernet analyzer collects TCP/IP communication data through external hardware and uploads it for real-time display. It can filter settings and support operating systems such as Windows, assisting in developing and testing network products. Provide finished products.
Modbus Gateway Module	Supports 10/100M, full-duplex/half-duplex adaptive Ethernet interface, supports automatic conversion of MDI/MDIX lines, supports Modbus RTU and Modbus TCP data conversion, supports bidirectional transparent transmission of serial and network data, does not require user programming and development, and provides configuration tools.

USB Application (🔌)

Product/Solution	Summary
KMFU Pair Cable	Keyboard and mouse sharing, file copying, USB peripheral sharing. The single-chip copy line solution adds bilateral USB HUB and peripheral sharing functions based on keyboard and mouse sharing, file copying, and clipboard sharing. Both sides of the HUB share multiple downlink ports, enabling flexible and convenient peripheral sharing without the need for external analog switches. The signal quality is not compromised and the product form factor is smaller. The solution supports Windows, macOS desktop systems, Android mobile devices, and cross-platform use.
USB 3.0 kV-Level High-Voltage Isolation	Support kV-level high-voltage isolation and USB interface expansion with ultra-high-speed USB 3.0 up to 5Gbps. The chip features built-in USB hub functionality compliant with the USB3.2 Gen1 specification, providing multiple USB downstream ports on both the host side and isolated side. All downstream ports support USB3.0 and USB2.0 communication, enabling connection to various USB devices such as data acquisition cards, emulation programmers, industrial cameras, portable hard drives, keyboards, and mice.
USB 3.0 Extension	Extends SuperSpeed USB3.0 signals up to 800 meters while providing multiple USB3.2 Gen1-compliant SuperSpeed downstream ports at both the host (near-end) and slave (far-end) through the chip's built-in USB3.0 HUB functionality. This single-chip solution achieves kilometer-level transmission distance extension while delivering a highly integrated solution for remote access to multiple high-performance USB devices.
USB2.0 High Speed Four-Port KVM Switch	For applications where multiple computers share a set of keyboards, mice, and monitors. A single chip integrates the main functional modules of USB2.0 high-speed KVM, and the peripherals are streamlined. 4 upstream ports support hot-swapping; 4 downstream ports support USB device mixing and transparent transmission functions. Supports mouse cross-screen, multiple sets of hotkeys and key combinations, and parameters will not be lost when power is turned off.
USB Keyboard and Mouse Control	Using a USB keyboard and mouse communication control chip, the USB connection between the keyboard, mouse, and PC can be converted into a UART connection. Integration with other signals, extension of communication distance, keyboard and mouse data collection and control, etc. It is widely used in industrial control, security monitoring, digital KVM, remote computer management, and other fields. Provide single-chip solutions.
RGB Mechanical Keyboard	Provide RGB three-color full-color keyboard solution, with a single chip built-in RGB three-color LED dedicated driver unit, high integration; Provide a single chip monochrome single panel mechanical keyboard solution, single panel wiring, low cost; Chip level solution, supporting secondary development.
USB2.0 Optical Fiber/Network Cable Extender	For USB2.0 long-distance signal extension or signal isolation. Using the USB 2.0 extender, the communication distance can reach over 6 kilometers, high-speed/full-speed/low-speed USB transmission, HUB expansion, switch penetration, remote power on/off, and drive-free support for all systems. It can be widely used in computer peripherals, industrial control, medical equipment, security monitoring, and other fields. Provide dedicated chip solutions.
Type-C Dock Solution Supporting PD	Use a PD protocol chip, USB HUB chip, USB to Ethernet chip, and analog switch chip to realize three-in-one USB high-speed/super-high-speed data transmission, video display, and PD charging functions. Supports USB HUB expansion and HUB downstream USB peripheral function expansion, such as wired network cards, sound cards, card readers, etc.; supports Type-C interface function expansion of mobile phones, computers, and game consoles; supports the expansion of Type-C interface PD fast charging function.
USB HUB	4-port/7-port USB2.0 high-speed HUB controller chip, 4-port USB3.2 Gen1 ultra-high-speed HUB controller chip, industrial-grade design, supports low-cost STT mode and high-performance MTT mode, low-power consumption, supports LPM Power management supports self-power supply or bus power supply mode, and supports independent current detection and power control for each port.
USB Network Card Solution	USB network card chip integrated USB2.0 PHY, supports full speed and high speed, integrates 10/100M Ethernet controller and PHY based on IEEE802.3, and has the advantages of high integration and low-power consumption.

Data Collection

Product/Solution	Summary
USB 3.0 High-performance Image Sensing and Data Acquisition	For USB 3.0 image transmission and data acquisition applications: This solution is based on the QingKe RISC-V dual-core MCU CH32H417, providing multiple high-speed communication interfaces on a single chip, including USB 3.0, FIFO parallel port, DVP, and SDMMC. The USB 3.0 single endpoint batch transfer speed is consistently measured at approximately 450 MByte/s. Compared to common solutions on the market: Upload performance is 30MB/s higher, while download performance is 70MB/s higher. It also supports Type-C PD power delivery up to 240W.
Print Data Sensorless Collection Module	Sensorless collection plus network collection and cloud management. Offline printing data is collected non-inductively and collected in real-time in the cloud. The cloud performs operations such as image restoration, OCR recognition, keyword modeling and extraction, and outputs detailed content of each order in multiple formats. Custom development of additional printing of bills and detailed statistical output functions, private cloud deployment, provides a stable and reliable big data foundation and platform interface for follow-up processes such as consumer trend prediction, personalized marketing planning, membership system development, etc.
BLE Bluetooth Analyzer	Wireless communication data monitoring for low-power Bluetooth: Using the BLE analyzer, achieve communication between broadcast channel packets or connecting devices for the BLE5.0 and BLE4. x protocols, and parse the protocol data through PC software, displaying it concisely and clearly, settings such as statistics and filtering. Can be used for the development, design, testing, etc. of BLE products.
Scanner/Keyboard Communication Data Acquisition Module	Application for collecting communication data from scanners or keyboards: Use the scanner/keyboard communication data acquisition module to obtain the data of the scanner and keyboard in real-time and transmit it to the server for analysis and processing. It can be applied to supermarkets, retail, big data integration, and other fields. Provides modules and customization.
USB Bus Analyzer	For USB bus data monitoring: Use a USB bus analyzer to physically capture USB bus signals, analyze standard protocols, and upload and display them in real time. It can be used for learning, development, testing, etc. of USB products. Available in both USB2.0 and USB1.1 finished products.

Data Storage and Security

Product/Solution	Summary
Media Encryption Secure Disk	Data security applications for storage media: Through integrated USB 3.0/SATA/SDIO and other ultra-high/high-speed interfaces and hardware data stream encryption modules, functions such as data encryption management of various storage media are realized. Provide MCU single-chip solution.
USB 2.0/3.0 Unidirectional Transmission	File security import application for classified computers: By using dedicated chips and customizable software tools, the function of unidirectional import of files from USB mobile storage media to the confidential host system can be achieved. Provide chip-level solutions.
Hard Disk and Network Security Isolation Card	For applications that prevent important data in hard drives from being leaked through networks or other means at the physical layer: Using a hard disk and network security isolation card scheme, divide the computer into a secure environment (internal network) and an open environment (external network). It also uses independent hard drives and networks, provides dedicated chips and matching software libraries, and supports custom interfaces. Provide PCIe/PCI/USB interface solutions and single/dual hard drive solutions.
SATA Electronic Disk	SATA hard disk applications for SD storage: Single chip solution, realizing SATA electronic disk composed of multiple SD card arrays. Provide modules.
Custom U disk	For dedicated USB storage applications: A single-chip solution supports customization of the USB drive manufacturer's name, capacity, serial number, and other information, and it expands the USB drive capacity by adding storage chips. Provide chip-level solutions.

Power Supply Protocol

Product/Solution	Summary
Dual Type-C Interface Display	The portable display solution supports blind plugging with dual Type-C ports. Connecting to either C port enables screen mirroring. Power insertion into either C port provides up to 100W reverse charging for the mirroring device. Display brightness automatically increases when an external power source is connected. This solution supports the desktop modes of both Nintendo Switch and Samsung DeX. The desktop monitor solution extended display, screen mirroring, and reverse charging. The upstream port automatically switches, with the mirroring port delivering up to 140W charging power. The solution supports Billboard mode and is certified compliant.
SiMo Fast Charging Cable	Single-chip implementation achieves full integration of core components for SiMo fast charging cables, eliminating the need for an MCU, PD receiver chips, PD transceiver chips, high-voltage LDOs, or analog switches. Peripherals require only a DC-DC converter and NMOS transistor besides resistors and capacitors, resulting in smaller size, lower cost, and greater flexibility. The 1-to-2 fast-charging cable solution supports PD 3.2 EPR 140W blind plugging, intelligent adaptive power distribution, and dual-port data communication functionality.
Wireless Charging	Single-chip integrated wireless charging transceiver module and small signal decoding circuit, multiple charging for one chip, making it easy to implement various wireless charging solutions such as Qi. The chip supports multiple protocols of USB PD and BC1.2 for fast charging input, 5W, 7.5W, 10W, and 15W for wireless charging output. The chip integrates FSK/ASK decoding, FOD foreign object detection, and overvoltage/overcurrent/overheating protection functions, with high integration and few external devices. It can be widely used in the design of various wireless charging bases and brackets.
eMarker Electronic Label	For Type-C cable-related applications, it can work on a single chip without the need for peripheral devices. The solution USB Type-C 2.1 standard and USB PD 3.1 standard, with internal integration of VCONN diodes, Ra resistors, VBUS power supply units, and high-voltage LDO. Updating and burning configuration data through the Type-C interface and provides multiple factory default configurations. Optional temperature protection function, 240W (48V5A) power and USB4Gen4 (80Gbps) Type-C cable.
USB PD and other Multi-Protocol Power Receiving	Support all voltage regulation protocols defined in PD2.0~3.2 protocols, specifically 3.3~48V Fixed, PPS, EPR, and AVS protocols; Supports IO levels, UART, SPI, and I2C and other conventional communication and control methods, and supports customization.

Interface Conversion

Product/Solution	Summary
USB3.0 FIFO	For USB 3.0 digital video transfer applications. Connect to the camera Sensor through DVP, or connect to the main processor such as FPGA through HSPI (3.8Gbps), and expand the USB3.0 interface to connect to the computer host or Gigabit Ethernet interface for data remote transmission server.
USB2.0 to JTAG/SWD/SPI/I ² C	Multi-interface expansion solution based on CH347. Provides JTAG/SWD interfaces for debugging and programming FPGA/CPLD/MCU devices, while SPI and I2C interfaces enable communication and control with various peripheral devices. Dedicated interface drivers, libraries, and applications are available for Windows/Linux/Android/macOS platforms.
USB to Multiple Serial Port	For USB expansion multi-serial port applications. Provide special chip to realize USB to 1/2/4/8-way TTL/RS232/RS422/RS485 serial port supports Windows/Linux/Android/macOS and other operating systems. It can be based on the chip driver type, number of serial ports, supported serial port baud rate, serial port IO voltage working range, and provided 485 control
PCIe to Multiple Serial/Parallel Port	PCIe extends the application of multiple serials and parallel/print ports. Through the PCI-Express to 1/2/4/8/28 serial and parallel/print port chip solution, TTL, RS485, RS232 serial port expansion, and other purposes can be achieved, supporting up to 8Mbps baud rate. Provide chip-level solutions.
PCI to Multiple Serial/Parallel Port	Expand multiple serial and parallel port applications for PCI. Through PCI to 1/2/4/8/16/24 serial port and parallel port/printing port chip solutions, RS232 serial port expansion of PCI bus, serial port networking, RS485 communication, and other purposes are realized.

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