Introduction

This user manual mainly describes the hardware, software development tools, installation instructions, development and debugging method steps and precautions of the SDK-HC89S003F4 used by the SDK-HC89S003F4. It is designed to help developers who use the Holychip Flash MCU HC89S003F4 to quickly and easily perform applications Development work.

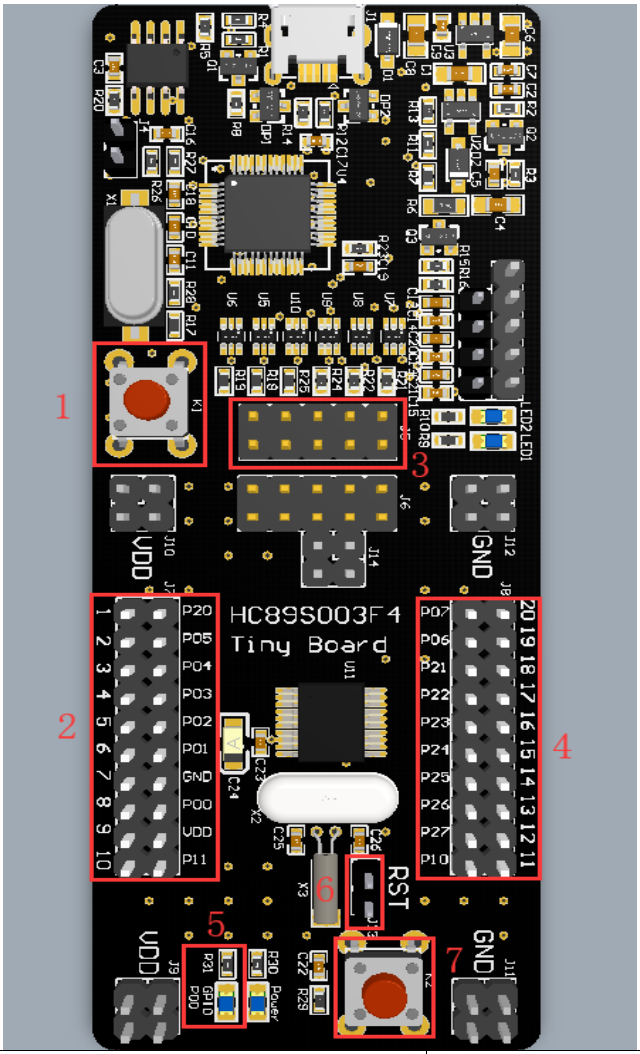
- The applicable chip for this application note: HC89S003F4
- Related data manuals, tools and technical documents download URL: http://www.holychip.cn/.

目录

1、 Overview of development tools

1.1 Development tool hardware

SDK-HC89S003F4 is a rapid development tool based on HC89S003F4 design. SDK-HC89S003F4 contains MCU development circuit and on-board debugging module. The MCU development circuit provides the necessary peripheral configuration for debugging HC89S003F4, and the on-board debugging module is used as a debugger and a programmer. The hardware configuration of the two is as follows：



On-board debugging module

MCU development circuit

On-board debugging module		MCU development circuit	
1	Offline burning button	2	Test pin
3	Burn interface	4	Test pin
		5	User indicator（P00）
		6	RST Pin header (short circuit when using external reset)
		7	RST button

1.1.1 Button

SDK-HC89S003F4 is equipped with 2 physical buttons: offline programming button and reset button. The offline programming button is used for offline programming of the on-board debugging module; the reset button is used as the chip's hardware reset button.

Silk screen	Pin function	Connect the device
K1	Offline burning	On-board debugging module
K2	Hardware reset	MCU reset pin

1.1.2 Indicator light

SDK-HC89S003F4 is equipped with 4 indicators: power-on indicator, offline programming button indicator and reset button indicator. The offline programming button is used for offline programming of the on-board debugging module; the reset button is used as the chip's hardware reset. Both are connected to the MCU through the pins of the test pins.

1.1.3 Test pin

SDK-HC89S003F4 is equipped with 2 sets of 2*10 test pins, which are connected to all pins of the MCU to provide user testing or extended functions.

1.1.4 External clock

SDK-HC89S003F4 reserves two sets of external clock interfaces, which are low-frequency crystal oscillator and high-frequency crystal oscillator. When using an external crystal oscillator, the user needs to solder the corresponding crystal oscillator and crystal capacitor (recommended value is 20PF). The two sets of crystal oscillators can be connected to the MCU through the pins in the table below.

Silk screen	Pin function	Connect the device
X2	P1.0	32.768KHZ crystal oscillator
	P1.1	
X3	P1.0	4-20M crystal oscillator
	P1.1	

1.1.5 On-board debugging module interface

SDK-HC89S003F4 reserves two sets of simulation programming interfaces, which are located in the MCU development circuit and the on-board debugging module. Contains two-wire, four-wire and ISP interfaces.

1.1.6 Jumper settings

There are three groups of jumper J14 (two groups)\J13 on the SDK-HC89S003F4. The status of the jumper needs to be confirmed before power on. The specific settings are as follows:

Silk screen	function	setting	default
J14	RXD	ISP TXD or serial communication pin	disconnect
	TXD	ISP RXD or serial communication pin	disconnect
J13	RST	External low reset	disconnect

1.1.7 USB interface

SDK-HC89S003F4 provides a group of MicroUSB interfaces, through which the functions of 5V power supply and communication with PC are realized.

1.2 Development tool software

HC89S003F4 can use Keil development tools to edit the program, compile link, debug download and other functions.

2、 Installation instructions for development tools

2.1 Operating environment

The development tool needs to run in the following configuration and environment:

- SDK-HC89S003F4, including USB cable (micro-B)
- SDK-HC89S003F4 related drivers, documents, software and toolkits
- PC with USB interface, Windows7 and above operating system

2.2 Hardware installation

The hardware of the development tool includes the SDK-HC89S003F4 circuit board and USB Cable (micro-B data cable). When using, connect one end of the USB Cable to the micro-B of the SDK-HC89S003F4 circuit board and the other end to the USB port of the PC.

2.3 Software Installation

The following software needs to be installed to use SDK-HC89S003F4:

- KEIL IDE development environment
- HC-LINK driver and software
- HC-ISP driver and software

2.3.1 IDE development environment installation

HC89S003F4 series chips support third-party IDE development. Keil MDK development tools can be used for program editing, compilation linking, debugging and downloading and other functions.

Keil MDK development environment:

Please go to Keil official website: (https://www.keil.com/) Download the latest version of Keil MDK and install and set up IDE and corresponding components according to the official tutorial (please make sure the version is V9.0 or higher):

2.3.2 HC-LINK Driver and software installation

When implementing the compiler and burner functions through the on-board debugging module, HC-LINK driver and KEIL plug-in must be installed. Please go to Holychip official website (http://www.holychip.cn/kfgj/info_14.aspx?itemid=390) to download or contact relevant technical support personnel to obtain the emulator driver and KEIL plug-in, unzip the obtained emulator driver and KEIL plug-in,

Find "HC-LINK_Tool User Manual_Ver1.0x_cn", please refer to "HC-LINK_Tool User Manual_Ver1.0x_cn" for the specific installation process.

2.3.3 HC-ISP software acquisition and use

When the user needs to use the chip ISP function, first confirm whether the chip has burned the ISP firmware, and then go to the official website of Holychip (http://www.holychip.cn/kfgj/info_14.aspx?itemid=328) to download the latest version of the HC-ISP software package Or contact relevant technical support personnel to obtain the software. The software does not need to be installed. Unzip the obtained HC-ISP software package and find the "HC-ISP Tool Instructions_V1.0x_cn". Please refer to the "HC-ISP Tool Instructions_V1" for the specific use process. .0x_cn".

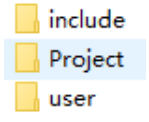
3、 Introduction to SDK-HC89S003F4

3.1 SDK-HC89S003F4 Register version example

After confirming the IDE, HC-LINK software and driver installation, connect the PC to the SDK-HC89S003F4 with a USB cable, and go to the official website of Holychip (http://www.holychip.cn/cpzxSI/info_47.aspx?itemid=173) to download Get the latest version of the sample program or contact relevant technical support personnel.

3.1.1 Use of register version example

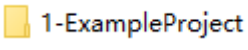
The main structure example of the register version can refer to the following figure



Place basic header files
Place project engineering files
Place usage routine

Note: When using KEIL as a development tool for debugging and downloading, you can configure related download options under Option—Utilities—Setting according to your needs. For details, please refer to "HC-LINK_Tool User Manual_Ver1.0x_cn".

3.1.2 Minimal system project 1-ExampleProject

1-ExampleProject mainly provides the minimum project of the system corresponding to this type of MCU. You do not need to build a project from scratch, and you can directly use this project to develop application programs. 

4、 Application notes

1、 The simulation ports TMS, TCK, TDO, TDI are not controlled by software during simulation

2、 Simulation cannot be performed in low power mode

3、 External power supply, the highest voltage is 5.5V

5、 Version description

Version	Date	Description
V1.00	2019/7/23	First edition

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