HDSC 华大半导体 HUADA SEMICONDUCTOR

32 -bit microcontroller

Special port usage and precautions for **HC32L110 / HC32F003 / HC32F005** series

Applicable object

series	Product number
HC32L110	HC32L110C6UA HC32L110C6PA HC32L110C4UA HC32L110C4PA HC32L110B6PA HC32L110B4PA
HC32F003	HC32F003C4UA HC32F003C4PA
HC32F005	HC32F005C6UA HC32F005C6PA HC32F005D6UA

content

1 Summary

This application note mainly introduces the special port applications and precautions of the HC32L110 / HC32F003 / HC32F005 series.

This application note mainly includes:

ÿ The RESET port is multiplexed as I/O function

ÿ The external crystal oscillator port is multiplexed as I/O function

ÿ SWD programming port is multiplexed as I/O function

ÿ UART programming port is multiplexed as I/O function

Notice:

- This application note is an application supplement for the HC32L110 / HC32F003 / HC32F005 series and is not intended to replace the user manual.

  Please refer to the user manual for specific functions and register operations.

2 Function introduction

GPIO is a general-purpose input and output module. The MCU can set an IO to analog mode as ADC input; set it as a digital input

Input and output, or peripheral ports, are used by specific peripherals. Before using the port function, you need to control the clock of the GPIO module first.

function is on.

The reusable special ports of this series of GPIOs include RESET, external crystal oscillator pins, SWD, UART programming interface, etc.

In different applications, users need to choose different multiplexing methods according to the characteristics and application characteristics of these ports.

3 Introduction of special port multiplexing function

3.1 The RESET pin is multiplexed as an input port

A system reset is generated when the external reset pin detects a low level. The reset pin has built-in pull-up resistors and A glitch filter circuit is integrated. The glitch filter circuit will filter the glitch signal less than 20uS (typ.), because Therefore, the low-level signal added to the reset pin must be greater than 20uS to ensure reliable reset of the chip.

The RESET pin can be multiplexed as input port P0.0. If you want to use RESET as the input port P0.0, the reference flow is as follows Down:

1. The GPIO module clock control function is turned on: PERI_CLKEN.GPIO is set to 1

2. RESET_USE_IO clock control bit of system control register: SYSCTRL1. RES_UIO enable

Notice:

- When multiplexing the RESET pin as an input port, the design of the peripheral circuit must still be ensured. This pin cannot be Low-Level, otherwise the program cannot run.
- This port has a built-in pull-up resistor, so even if this pin is used as an input port, it can only be used as an "input and has a pull-up resistor." input port for the pull function".

3.2 External crystal oscillator ports are multiplexed as I/O ports

When the external high-speed crystal oscillator or low-speed crystal oscillator is not used, the following ports can be multiplexed as I/O functions.

X32MOUT ÿ P0.1

X32MIN ÿ P0.2

X32KOUT ÿ P1.5

X32KIN ÿ P1.4

The multiplexing I/O function process is as follows:

1. The GPIO module clock control function is turned on: PERI_CLKEN.GPIO is set to 1.

2. P0.1 and P0.2, P1.5 and P1.4 need to be configured as digital ports: the related bits of P0ADS and P1ADS are configured as 0.

3. The function configuration register is selected as GPIO function: P01_SEL, P02_SEL, P15_SEL, P14_SEL are set to 0.

4. Select the input and output direction: set the relevant bits of P00DIR and P1DIR (0: output, 1: input)

3.3 SWD debug programming port multiplexing as I/O function

The SWD port is used as the debugging and download port of this series of MCUs. Users can choose whether to reserve this port for

Use for debugging or production programming.

If you do not need to use the SWD port for debug programming, the SWCLK and SWDIO pins can be multiplexed as I/O pins.

The reference flow of the multiplexed I/O function is as follows:

1. The GPIO module clock control function is turned on: PERI_CLKEN.GPIO is set to 1

2. The SWD_USE_IO clock control bit (SYSCTRL1. SWD_UIO) of the system control register is enabled

3. P27_SEL.SEL and P31_SEL.SEL are set to 0

4. P2DIR.P27 and P3DIR.P31 are set as input or output

Notice:

- From power-on until SWD is multiplexed and configured as I/O port, the level of P27 and P31 pins is high by default.

  Therefore, in the design of peripheral circuits, attention and avoidance should be taken.

- When the SWD port is multiplexed as the I/O function, the online debugging and downloading functions through the SWD will be invalid.

- During user debugging, SWD online debugging can be restored by erasing or downloading other programs without multiplexing SWD through the serial port and download functionality, or add a delay of a few seconds before multiplexing the SWD port in the application.

3.4 UART offline programming port multiplexing as I/O port

This series of MCUs use UART ports P3.5 (TX) and P3.6 (RX) as off-line programming functions.

In use, you can choose whether to reserve this port as the burning port for subsequent mass production downloads according to your needs.

In order to cooperate with our offline programmer to enter the download mode, the P3.5(TX) port will output a high-level pulse of about 10ms when the MCU is powered on.

rush as a handshake signal. When the application needs to use this port (P3.5) as the output function, the hardware circuit should consider avoiding this port.

The impact of the pulse on the entire application, or try to avoid using this port as an output function.

3.5 Other GPIO function configuration

For other function configuration, please refer to the user manual of this series.

4 Summary

Through the above introduction and with the user manual of HC32L110 / HC32F003 / HC32F005 series, we can understand the

The special port Reset pin, external crystal pin, SWD pin, UART download port of the series MCU are used in the application

Methods and precautions for multiplexing as I/O pins. If you need to know more about the usage and operation of this module,

The corresponding user manual shall prevail.

5 Additional information

Technical support information: www.hdsc.com.cn

6 Version Information & Contact Information

date	Version revision record	
2018/8/15	The first version of Rev1.0 is released.	

If you have any comments or suggestions in the process of purchasing and using, please feel free to contact us.

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