



## **32-bit microcontrollers**

**FLASH erase and write protection function**

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## **Application Notes**

Rev1.00 January 2025

Target customers

Product range	Product Model	Product range	Product Model
L Series	HC32F003	F Series	HC32L110
	HC32F005		HC32F030
	HC32L130		HC32F072
	HC32L136		HC32F170
	HC32L072		HC32F176
	HC32L073		HC32F190
	HC32L170		HC32F196
	HC32L176		HC32F002
	HC32L190		HC32F052
	HC32L196		HC32F420
	HC32L166		
	HC32L186		

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## 1 Overview

This document mainly introduces some precautions for using FLASH erase and write in the program of Xiaohua Semiconductor's specific series MCU.

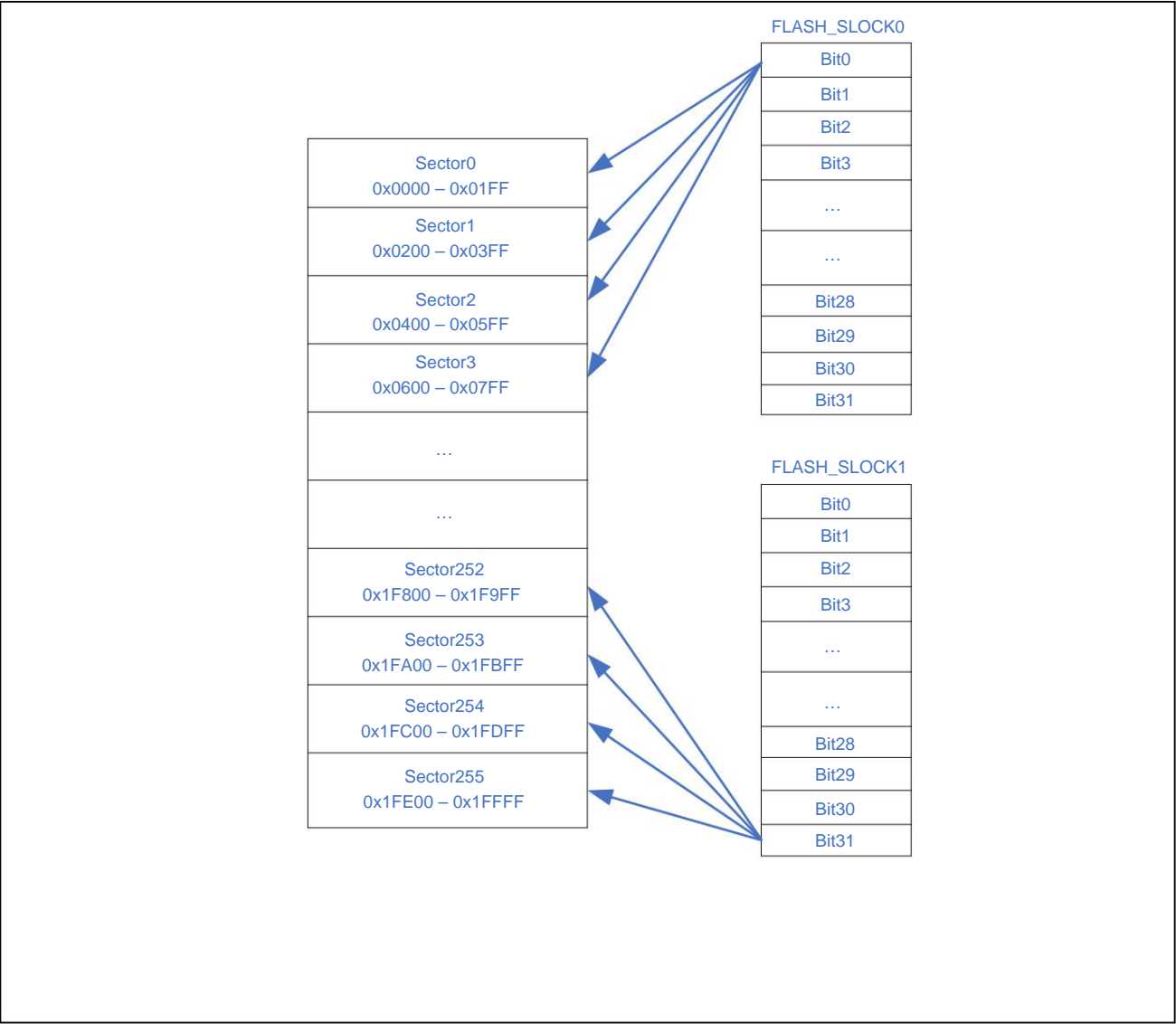
2 FLASH erase and write protection

2.1 FLASH erase and write protection register

The FLASH module of the MCU series described in this article has an erase protection register. When the control bit of this register is 0, the corresponding FLASH page can play the erase and write protection function. Each FLASH page size is 512 bytes, the whole chip is divided into several pages, and every 4 pages share the erase protection control bit of the write protection register. Each series of MCU has 1 to 4 write protection registers according to the size of FLASH.

SLOCKx.

For example, the FLASH size in the figure below is 128KB, the sectors it has are 0~255, and the erase protection register it has is FLASH\_SLOCK0 and FLASH\_SLOCK1.



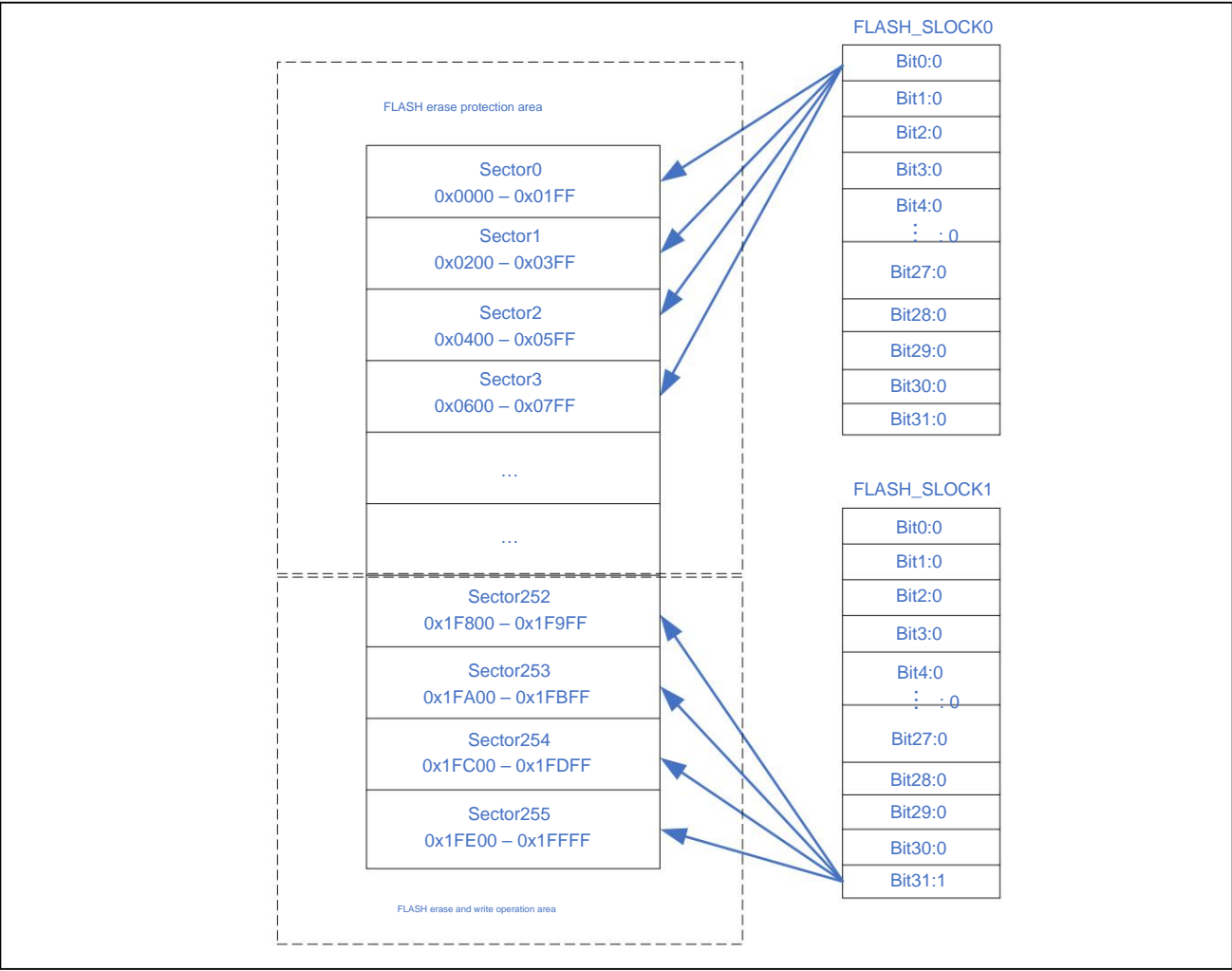
2.2 Use of Erase Protection Register

When the program needs to erase or write certain pages of FLASH, the control bit of the erase and write protection register corresponding to the page must be cleared first.

Set to 1: Allow erasing and writing.

When removing the erase protection and allowing erase (unlocking), it is strongly recommended that users only remove the control bits corresponding to the pages that need to be erased.

The control bit of the erase/write protection register SLOCKx corresponding to the page in the user code area should never be set to 1.



When rewriting the erase protection register, it is recommended to check the correctness of the parameters written to the register.

If it is not true, the operation is not performed and an error indicator is returned.

It is also recommended to check the correctness of the operation address during erase and write operations. If the address is not in the correct range, the operation will not be executed. operation and returns an error indicator.

The operation of the SLOCKx register also requires the operation of the BYPASS register first, so when the user operates these registers, if there is no shield

Interrupt, after the operation is completed, query the value of the corresponding register to see if the write is successful. If the write is unsuccessful, try to repeat the operation.

It is also recommended to add a limit to the number of repeated operations to avoid the program being stuck due to repeated failures.

In addition, the following register operations also need to operate the BYPASS register first, so after the operation is completed, it is also necessary to query and return as above.

Read confirmation and retry operations:

Parameter registers, CR, WAIT (exists in some series) and CACHE (exists in some series).



### 3 Conclusion

The above chapters briefly introduce the application methods of the FLASH erase and write protection function of Xiaohua Semiconductor MCU\*.

If you need to learn more about the usage and operation of the module during the process, please refer to the corresponding user manual.

The samples and driver libraries can be used as a reference for users to further experiment and learn, and can also be used for reference in actual development.

Version Revision History

Version Number	Revision Date	Revision Content
Rev1.00	2025-1-20	Initial version released.