

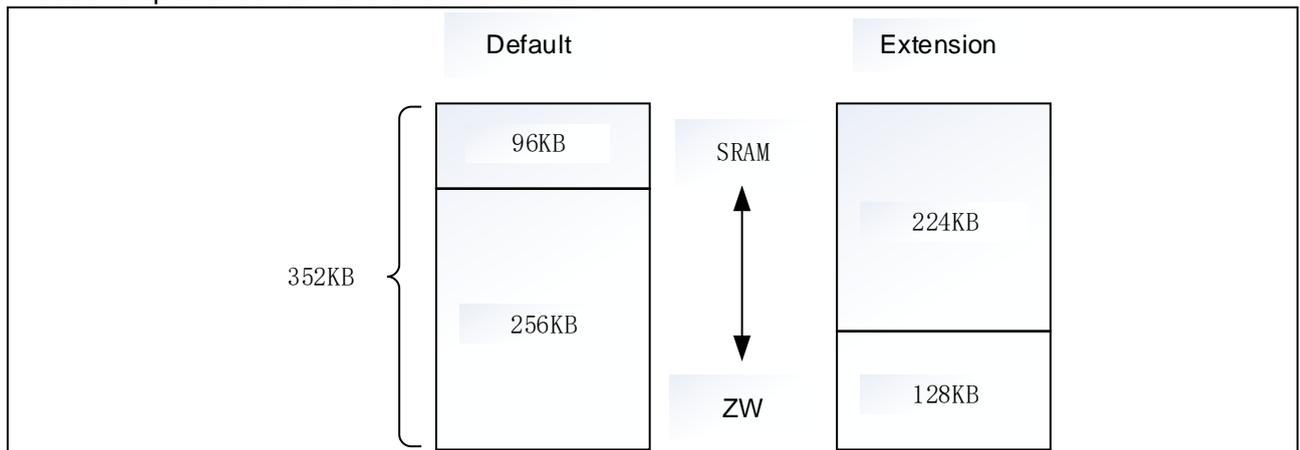
**Flash zero-wait (ZW) and Non-zero wait (NZW) area**

**Questions:** Find out more about Zero-wait (ZW) and Non-zero wait (NZW) area

**Answer:**

1. ZW means that the MCU core fetches instructions from the Flash with zero-wait state;  
NZW means that the MCU core fetches instructions from the Flash with non-zero-wait state.
  
2. ZW is located in the front part of the Flash, and NZW in the back part of Flash.  
Taking AT32F403AVGT7 as an example:  
ZW area size is 256 KB, ranging from 0X0800 0000 to 0X0803 FFFF  
NZW area size is 768 KB, ranging from 0X0804 0000 to 0X080F FFFF
  
3. The size of ZW and NZW can be adjusted as the size of SRAM changes.  
Taking AT32F403AVGT7 as an example:  
SRAM: 96 KB, ZW: 256 KB, NZW: 768 KB (by default)  
SRAM: 224 KB, ZW: 128 KB, NZW: 896 KB
  
4. The executing speed of ZW is different from that of NZW.  
The executing speed of NZW is 0.4 times of that ZW;  
Using AT32F403AVGT7 as an example, when the system clock is 240 MHz, the SRAM is 96 KB by default and ZW is 256 KB by default. For 512 KB bin file, the first 256 KB in the ZW area will be operated at 240 MHz, and the last 256 KB bin file stored in the NZW area will be executed at 96 MHz.

Relationship between ZT and SRAM of AT32F403A



**Type:** MCUs

**Applicable products:** AT32F403, AT32F403A, AT32F413, AT32F407, AT32F435 and AT32F437

**Main function:** Flash

**Minor function:** None

**Document revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
2022.6.8	2.0.1	Initial release

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