A mapping formula shows how to reference each word in the alias region to a corresponding bit in the bit-band region. The mapping formula is:

bit_word_addr = *bit_band_base* + (*byte_offset* x 32) + (*bit_number* × 4)

where:

– *bit_word_addr* is the address of the word in the alias memory region that maps to the targeted bit
– *bit_band_base* is the starting address of the alias region
– *byte_offset* is the number of the byte in the bit-band region that contains the targeted bit
– *bit_number* is the bit position (0-7) of the targeted bit

Example

The following example shows how to map bit 2 of the byte located at SRAM address 0x20000300 to the alias region:

0x22006008 = 0x22000000 + (0x300*32) + (2*4)

Writing to address 0x22006008 has the same effect as a read-modify-write operation on bit 2 of the byte at SRAM address 0x20000300.

Reading address 0x22006008 returns the value (0x01 or 0x00) of bit 2 of the byte at SRAM address 0x20000300 (0x01: bit set; 0x00: bit reset).

For more information on bit-banding, refer to the *Cortex*®-M4 with FPU *programming manual* (see *Related documents on page 1*).

2.3 Boot configuration

Due to its fixed memory map, the code area starts from address 0x0000 0000 (accessed through the ICode/DCode buses) while the data area (SRAM) starts from address 0x2000 0000 (accessed through the system bus). The Cortex®-M4 with FPU CPU always fetches the reset vector on the ICode bus, which implies to have the boot area available only in the code area (typically, Flash memory). STM32F446xx microcontrollers implement a special mechanism to be able to boot from other memories (like the internal SRAM).

In the STM32F446xx, three different boot modes can be selected through the BOOT[1:0] pins as shown in *Table 2*.

Table 2. Boot modes

Boot mode selection pins		Boot mode	Aliasing
BOOT1	BOOT0		
x	0	Main Flash memory	Main Flash memory is selected as the boot area
0	1	System memory	System memory is selected as the boot area
1	1	Embedded SRAM	Embedded SRAM is selected as the boot area

The values on the BOOT pins are latched on the 4th rising edge of SYSCLK after a reset. It is up to the user to set the BOOT1 and BOOT0 pins after reset to select the required boot mode.