CC2530

ERRATA NOTE

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1 Known Issues

Table 1: Summary of known issues

Issue ID	Title
1	DMA Variable Transfer Length with Length 0 or 1
2	Timer 2 (MAC Timer) Read Latching

1.1 Issue 1: DMA Variable Transfer Length with Length 0 or 1

Depending on which VLEN mode is used, attempting a variable length transfer with length 0 or 1 can lead to erroneous behavior by the DMA. The failing conditions will not occur naturally in an application as they do not transfer useful data, but may occur as the result of an error condition at the source of the DMA transfer. The DMA is generally set up with variable transfer length to transfer packets that come in over USART or RF. If there is an error in the medium, these packets may be malformatted. If they for example contain a length byte of 0, using the DMA to transfer those packets automatically without taking the described precautions may lead to a buffer overrun. The two VLEN modes that are affected are VLEN values 001 and 010. VLEN values 000, 011 and 100 work without restrictions.

1.1.1 Issue Description

In VLEN modes VLEN = 001 and VLEN = 010, the DMA transfers a number of bytes/words based on the value of the first byte/word it reads from the source (the length byte/word). In the event that a transfer is started with a length byte/word of 0 or 1, the wrong number of bytes will be transferred and the DMA interrupt may be lost. The failure mode depends on whether byte or word mode is selected for the transfer as described in Table 2.

Table 2 - DMA Variable Length Restrictions

VLEN	Byte Mode	Word Mode	Comment
000	OK	OK	
001	Two bytes transferred when length byte is 0	Two words transferred when length word is 0	Can be used if contents of length byte/word in source buffer can be checked not to be 0 or 1 before DMA is triggered or if an extra transfer to destination is acceptable.
010	Excessive number of bytes transferred when length byte is 0 Extra transfer when length byte is 1	2 transfers executed when length word is 0 or 1 Interrupt not raised when length word is 0	Byte mode be used if contents of length byte in source buffer can be checked not to be 0 or 1 before DMA is triggered Word mode can be used if contents of length word in source buffer can be checked not to be 0 or 1 before DMA is triggered, or if an extra transfer to destination is acceptable.
011	OK	OK	
100	OK	OK	

1.1.2 Suggested Workarounds

Please observe the comments for each of the affected modes in order to use them without issues. Alternatively, any of the unaffected VLEN modes can be used if the buffer sizes are adjusted accordingly.

1.2 Issue 2: Timer 2 (MAC Timer) Read Latching

In Timer 2, the value of T2M1 is latched when T2M0 is read, and the values of T2MOVF1 and T2MOVF2 are latched when T2MOVF0 is read. This does not work as expected when the least significant byte read is 0xFF.

1.2.1 Issue description

When the timer is read on the cycle where the least significant byte is about to wrap around, the latched values are captured one cycle later. This means that the latched registers are incremented while the register that was read first (T2M0 or T2MOVF0) is not.

1.2.2 Suggested Workarounds

To read Timer 2 overflow: Use T2CTRL.LATCH_MODE = 1 and read T2M0 to trigger latching. Then read the overflow counter and ignore the result of the T2M0 read.
To read Timer 2 counter: Read T2M0 first. If T2M0 == 0xFF, read timer once more to confirm its state.

2 Document history

Revision	Date	Description/changes
SWRZ031	2009-04-29	Initial version

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