MSP430F415 Device Erratasheet

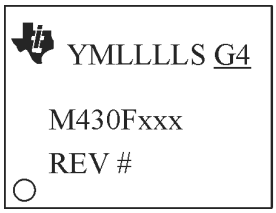
1 Revision History

✓ The check mark indicates that the issue is present in the specified revision.

Errata Number	Rev E	Rev C
CPU4	✓	✓
EEM20	✓	✓
FLL3	✓	✓
PORT4		✓
PORT5		✓
PORT7		✓
TA12	✓	✓
TA16	✓	✓
TA21	✓	✓
TAB22	✓	✓
WDG2	✓	✓
XOSC9	✓	✓

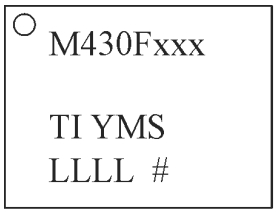
2 Package Markings

PM64 ***LQFP (PM), 64 Pin***

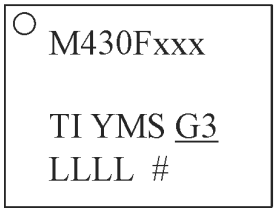


YM = Year and Month Date Code
LLLL = LOT Trace Code
S = Assembly Site Code
# = DIE Revision
○ = Pin 1

RTD64 ***QFN (RTD), 64 Pin***



TI = TI
YM = Year and Month Date Code
LLLL = LOT Trace Code
S = Assembly Site Code
# = DIE Revision
○ = Pin 1



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3 Detailed Bug Description

CPU4 *CPU Module*

Function PUSH #4, PUSH #8

Description The single operand instruction PUSH cannot use the internal constants (CG) 4 and 8. The other internal constants (0, 1, 2, -1) can be used. The number of clock cycles is different:

PUSH #CG uses address mode 00, requiring 3 cycles, 1 word instruction

PUSH #4/#8 uses address mode 11, requiring 5 cycles, 2 word instruction

Workaround Workaround implemented in assembler.

EEM20 *EEM Module*

Function Debugger might clear interrupt flags

Description During debugging read-sensitive interrupt flags might be cleared as soon as the debugger stops. This is valid in both single-stepping and free run modes.

Workaround None.

FLL3 *FLL+ Module*

Function FLLDx = 11 for /8 may generate an unstable MCLK frequency

Description When setting the FLL to higher frequencies using FLLDx = 11 (/8) the output frequency of the FLL may have a larger frequency variation (e.g. averaged over 2sec) as well as a lower average output frequency than expected when compared to the other FLLDx bit settings.

Workaround None

PORT4 *PORT Module*

Function SIF clock output depends on P2.7 AND P3.0

Description The SIF - clock output is not available at port P2.7 when setting P2.7 as secondary function and output as described in data sheet

Workaround Also set P3.0 to alternate function and output. The SIF clock signal is then available at P2.7.

PORT5 *PORT Module*

Function SIF comparator output is not available at P6.3

Description The SIF comparator output is not available at port P6.3 when setting P6.3 as secondary function and output as described in data sheet

Workaround None

PORT7 — *PORT Module*

Function SIFDAC output function not available at P6.6

Description The SIFDAC output is not available at port P6.6 when setting P6.6 as secondary function and output as described in data sheet

Workaround None

TA12 — *TIMER_A Module*

Function Interrupt is lost (slow ACLK)

Description Timer_A counter is running with slow clock (external TACLK or ACLK)compared to MCLK. The compare mode is selected for the capture/compare channel and the CCRx register is incremented by one with the occurring compare interrupt (if TAR = CCRx). Due to the fast MCLK the CCRx register increment (CCRx = CCRx+1) happens before the Timer_A counter has incremented again. Therefore the next compare interrupt should happen at once with the next Timer_A counter increment (if TAR = CCRx + 1). This interrupt gets lost.

Workaround Switch capture/compare mode to capture mode before the CCRx register increment. Switch back to compare mode afterwards.

TA16 — *TIMER_A Module*

Function First increment of TAR erroneous when IDx > 00

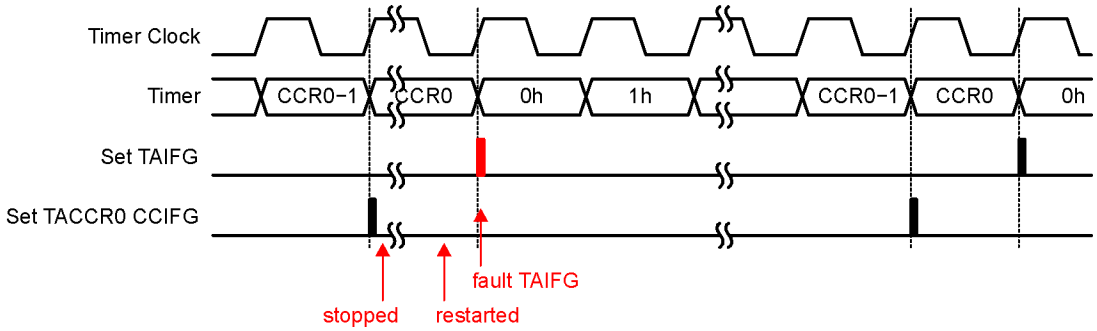
Description The first increment of TAR after any timer clear event (POR/TACLR) happens immediately following the first positive edge of the selected clock source (INCLK, SMCLK, ACLK or TACLK). This is independent of the clock input divider settings (ID0, ID1). All following TAR increments are performed correctly with the selected IDx settings.

Workaround None

TA21 — *TIMER_A Module*

Function TAIFG Flag is erroneously set after Timer A restarts in Up Mode

Description In Up Mode, the TAIFG flag should only be set when the timer resets from TACCR0 to zero. However, if the Timer A is stopped at TAR = TACCR0, then cleared (TAR=0) by setting the TACLR bit, and finally restarted in Up Mode, the next rising edge of the TACLK will erroneously set the TAIFG flag.



Workaround None.

TAB22 *TIMER_A/TIMER_B Module*

Function Timer_A/Timer_B register modification after Watchdog Timer PUC

Description Unwanted modification of the Timer_A/Timer_B registers TACTL/TBCTL and TAIV/TBIV can occur when a PUC is generated by the Watchdog Timer(WDT) in Watchdog mode and any Timer_A/Timer_B counter register TACCRx/TBCCRx is incremented/decremented (Timer_A/Timer_B does not need to be running).

Workaround Initialize TACTL/TBCTL register after the reset occurs using a MOV instruction (BIS/BIC may not fully initialize the register). TAIV/TBIV is automatically cleared following this initialization.

Example code:

MOV.W #VAL, &TACTL

or

MOV.W #VAL, &TBCTL

Where, VAL=0, if Timer is not used in application otherwise, user defined per desired function.

WDG2 *WDT Module*

Function Incorrectly accessing a flash control register

Description If a key violation is caused by incorrectly accessing a flash control register, the watchdog interrupt flag is set in addition to the expected PUC.

Workaround None

XOSC9 *XOSC Module*

Function XT1 Oscillator may not function as expected in HF mode

Description XT1 oscillator does not work correctly in high frequency mode at supply voltages below 2.0V with crystal frequency > 4MHz.

Workaround None. When XT1 oscillator is used in HF mode with crystal frequency > 4MHz ensure a supply voltage > 2.2V.

4 Document Revision History

Changes from family erratasheet to device specific erratasheet.

1. Errata PORT4 was added
2. Errata PORT5 was added
3. Errata PORT7 was added
4. Revision D was removed
5. Revision C was added

Changes from device specific erratasheet to document Revision A.

1. Errata EEM20 was added to the errata documentation.

Changes from document Revision A to Revision B.

1. Errata TA21 was added to the errata documentation.

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