

Mask Set Errata

#### Mask Set Errata for Mask 2N97F

#### Introduction

This report applies to mask 2N97F for these products:

• KINETIS\_L

Errata ID	Errata Title
3863	ADC: In 16-bit differential mode, ADC may result in a conversion error when positive input is near upper rail reference voltage
5751	FTFx: Launching the Read 1's Section command (RD1SEC) on an entire flash block results in access error (ACCER).
6070	I2C: Repeat start cannot be generated if the I2Cx_F[MULT] field is set to a non-zero value
6665	Operating requirements: Limitation of the device operating range
5746	PIT: When using the PIT to trigger DMA transfers using cycle steal mode, two data transfers per request are generated
5667	PMC: When used as an input to ADC or CMP modules, the PMC bandgap 1-V voltage reference is not available in VLPx, LLS, or VLLSx modes
5472	SMC: Mode transition VLPR->VLLS0(POR disabled)->RUN, will cause POR & LVD.
5745	SPI1: Back to back DMA data transfers are not possible if the core:bus frequency ratio is greater than 4:1
5490	SPI1: DMA data transfers at the maximum baud rate can result in corrupted data
5515	TSI: The end of scan flag is not automatically cleared when continuously scanning
5744	UART0: Receiver wakeup control bit cannot be set immediately after a wakeup event
5563	UART0: When the Receiver Wake Up control bit is set, an IDLE condition is not detected correctly
5753	UART1 / UART2: When the Receiver Wake Up control bit is set, an IDLE condition is not detected correctly
5928	USBOTG: USBx_USBTRC0[USBRESET] bit does not operate as expected in all cases

# e3863: ADC: In 16-bit differential mode, ADC may result in a conversion error when positive input is near upper rail reference voltage

Errata type: Errata





- **Description:** In 16-bit differential mode, the ADC may result in a conversion error when the input voltage on the plus-side of the differential pair (DPx) exceeds approximately (VREFH\*31/32). Other modes are unaffected.
- **Workaround:** To avoid a conversion error near positive full-scale in this mode, do not allow the input voltage on the plus-side of the differential pair (DPx) to exceed (VREFH\*31/32).

# e5751: FTFx: Launching the Read 1's Section command (RD1SEC) on an entire flash block results in access error (ACCER).

- Errata type: Errata
- **Description:** FTFx: Launching the Read 1's Section command on an entire flash block (i.e. with flash address = flash block base address & number of longwords = total number of longwords in the flash block) results in an incorrectly asserted access error (ACCER).
- **Workaround:** To verify an entire flash block, use the Read 1's Block command. Use the Read 1's Section command only to verify sections that are smaller than an entire flash block.

#### e6070: I2C: Repeat start cannot be generated if the I2Cx\_F[MULT] field is set to a nonzero value

Errata type: Errata

**Description:** If the I2Cx\_F[MULT] field is written with a non-zero value, then a repeat start cannot be generated

Workaround: There are two possible workarounds:

1) Configure I2Cx\_F[MULT] to zero if a repeat start has to be generated.

2) Temporarily set I2Cx\_F [MULT] to zero immediately before setting the Repeat START bit in the I2C C1 register (I2Cx\_C1[RSTA]=1) and restore the I2Cx\_F [MULT] field to the original value after the repeated start has occurred

#### e6665: Operating requirements: Limitation of the device operating range

Errata type: Errata

**Description:** Some devices, when power is applied, may not consistently begin to execute code under certain voltage and temperature conditions. Applications that power up with either VDD >= 2.0 V or temperature >= -20C are not impacted. Entry and exit of low-power modes is not impacted.

Workaround: To avoid this unwanted behavior, one or both of these conditions must be met:

a) Perform power on reset of the device with a supply voltage (VDD) equal-to or greater-than 2.0 V , or

b) Perform power on reset of the device at a temperature at or above -20 C.



# e5746: PIT: When using the PIT to trigger DMA transfers using cycle steal mode, two data transfers per request are generated

Errata type: Errata

- **Description:** If the PIT is used to trigger DMA transfers using cycle steal mode, DMA\_DCRn[CS] = 1, each transfer request will cause the source data to be written twice. The data will be written first to the desired destination address and then a second time to the destination address + 1. The destination address pointer increments by 2 for each transfer request.
- **Workaround:** It is recommended that the PIT not be used for triggering DMA transfers and the low power timer (LPTMR) be used instead.

If it is required to use the PIT to trigger DMA transfers, the destination address must be in RAM and the buffer size must be twice the amount of data being transferred. Software must then skip every second entry in the destination buffer.

### e5667: PMC: When used as an input to ADC or CMP modules, the PMC bandgap 1-V voltage reference is not available in VLPx, LLS, or VLLSx modes

- Errata type: Errata
- **Description:** The Power Management Controller (PMC) bandgap 1-V reference is not available as an input to the Analog-to-Digital Converter (ADC) module (using ADC input channel AD27) or the Comparator (CMP) module (using CMP input IN6) in Very Low Power Run (VLPR), Very Low Power Wait (VLPW), Very Low Power Stop (VLPS), Low Leakage Stop (LLS), Very Low Leakage Stop3 (VLLS3), Very Low Leakage Stop2 (VLLS2), Very Low Leakage Stop1 (VLLS1), or Very Low Leakage Stop0 (VLLS0) modes.

This erratum does not apply to the VREF module 1.2 V reference voltage.

**Workaround:** Use of the PMC bandgap 1-V reference voltage as an input to the ADC and CMP modules requires the MCU to be in Run, Wait, or Stop modes.

#### e5472: SMC: Mode transition VLPR->VLLS0(POR disabled)->RUN, will cause POR & LVD.

Errata type: Errata

- **Description:** The Mode transition of VLPR into VLLS0 (POR disabled) then Exit, with LLWU event, back to to RUN mode will cause a POR and LVD reset instead of the expected WAKEUP exit.
- **Workaround:** The recommendation is to transition from VLPR to RUN before entering VLLS0 with POR disabled mode.

#### e5745: SPI1: Back to back DMA data transfers are not possible if the core:bus frequency ratio is greater than 4:1

 Errata type: Errata
Description: When using DMA with SPI1, if the core:bus frequency ratio is greater than 4:1 (SIM\_CLKDIV1[OUTDIV4] greater than 3), the first data transfer in a sequence will be transmitted twice.

Mask Set Errata for Mask 2N97F, Rev 23 JUL 2013



This only applies to SPI1.

**Workaround:** When using DMA with SPI1, the core:bus frequency ratio must be 4:1 or less, SIM\_CLKDIV1[OUTDIV4] must be less than 4.

If it is required to use SPI1 with core:bus frequency ratios greater than 4:1, an interrupt or polling mechanism in software must be used.

# e5490: SPI1: DMA data transfers at the maximum baud rate can result in corrupted data

- Errata type: Errata
- **Description:** DMA transfers of SPI1 data can result in corrupted data when the maximum baud rate is selected for SPI1, SPI1\_BR[SPPR] = 0 and SPI1\_BR[SPR] = 0.

This only applies to SPI1.

**Workaround:** When using DMA to transfer Rx or Tx data for SPI1, the SPI1\_BR[SPPR] and SPI1\_BR[SPR] fields must not both be written to 0.

If it is required to use SPI1 at the maximum baud rate, with SPI1\_BR[SPPR] = 0 and SPI1\_BR[SPR] = 0, an interrupt or polling mechanism in software must be used.

# e5515: TSI: The end of scan flag is not automatically cleared when continuously scanning

- Errata type: Errata
- **Description:** The TSI requires the end of scan flag (TSIx\_GENCS[EOSF]) to be cleared after each scan. This prevents the out of range interrupt from being available in continuous scanning as each scan needs the TSIx\_GENCS[EOSF] bit to be cleared by software. This limits the TSI from providing an optimal low power wake-up capability.

Workaround: There are 3 workarounds that can be used depending on the application:

1. When the TSI is used in normal RUN mode without DMA, at the end of each scan, the TSIx\_GENCS[EOSF] bit must be cleared by software. The end of scan can be detected either by polling the TSIx\_GENCS[EOSF] bit or by enabling the end of scan interrupt.

2. When DMA is used, it can automatically clear the TSIx\_GENCS[EOSF] bit after each scan. This can be used for run mode but not for low power mode.

3. Low power mode applications will have to wake-up on each end of scan, clear the TSIx\_GENCS[EOSF] bit and check the out of range flag to determine if touch has happened.

#### e5744: UART0: Receiver wakeup control bit cannot be set immediately after a wakeup event

#### Errata type: Errata

**Description:** The receiver wakeup control bit, UART0\_C2[RWU], is cleared by hardware after a wakeup event has occurred. After the UART0\_C2[RWU] bit is cleared due to a wake up event, software cannot set this bit for 3 asynchronous UART0 clock cycles.



Workaround: After a wakeup event, with UART0\_C2[RWU] previously being set, software must wait 4 clock cycles of the UART0 clock (selected by the SIM\_SOPT2[UART0SRC] field) before setting UART0\_C2[RWU].

# e5563: UART0: When the Receiver Wake Up control bit is set, an IDLE condition is not detected correctly

#### Errata type: Errata

**Description:** An IDLE condition requires the receive line to become idle for a full character time, following a period of activity (e.g. a character was received). The IDLE flag cannot become set again until after a new character has been received.

The problem occurs when the Receiver Wake Up control bit is set, UART0\_C2[RWU] = 1. In this case, an idle condition is detected whenever the receive line becomes idle for a full character time, regardless of whether a previous character is received or not. This can cause the UART0\_C2[RWU] bit to clear (if UART0\_C1[WAKE] = 0) and the UART0\_S1[IDLE] flag to set (if UART0\_S2[RWUID] = 1) incorrectly.

This only applies to UART0.

Workaround: The UART0\_C2[RWU] bit must only be set after a character has received and before the UART0\_S1[IDLE] flag is set. The UART0\_C2[RWU] bit must not be set when the receive line is already idle.

### e5753: UART1 / UART2: When the Receiver Wake Up control bit is set, an IDLE condition is not detected correctly

- Errata type: Errata
- **Description:** An IDLE condition requires the receive line to become idle for a full character time, following a period of activity (e.g. a character was received). The IDLE flag cannot become set again until after a new character has been received.

The problem occurs when the Receiver Wake Up control bit is set,  $UARTx_C2[RWU] = 1$ . In this case, an idle condition is detected whenever the receive line becomes idle for a full character time, regardless of whether a previous character is received or not. This can cause the UARTx\_C2[RWU] bit to clear (if UARTx\_C1[WAKE] = 0) and the UARTx\_S1[IDLE] flag to set (if UARTx\_S2[RWUID] = 1) incorrectly.

This only applies to UART1 and UART2. The "x" in the register names refers to either UART1 or UART2.

Workaround: The UARTx\_C2[RWU] bit must only be set after a character has received and before the UARTx\_S1[IDLE] flag is set. The UARTx\_C2[RWU] bit must not be set when the receive line is already idle.

# e5928: USBOTG: USBx\_USBTRC0[USBRESET] bit does not operate as expected in all cases

Errata type: Errata

**Description:** The USBx\_USBTCR0[USBRESET] bit is not properly synchronized. In some cases using the bit can cause the USB module to enter an undefined state.

#### Mask Set Errata for Mask 2N97F, Rev 23 JUL 2013



**Workaround:** Do not use the USBx\_USBTCR0[USBRESET] bit. If USB registers need to be written to their reset states, then write those registers manually instead of using the module reset bit.



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