TRAVEO™ T2G CYT2CL errata sheet

Marking/Step: Rev. A

32-bit single-chip microcontroller

About this document

Scope and purpose

This document describes the deviations of the device from the current user documentation, to support the assessment of the effects of these deviations on your custom hardware and software implementations.

Please take note of the following information:

- This errata sheet applies to all temperature and frequency versions and to all memory size variants, unless explicitly noted otherwise. For a derivative synopsis, see the latest datasheet or user manual
- Multiple device variants are covered in this one document. If an issue is related to a particular module, and this module is not specified for a specific device variant, then the issue does not apply to that device variant
- Devices marked with ES are engineering samples which may not be completely tested in all functional and electrical characteristics and are therefore only suitable for evaluation
- Some of the errata have workarounds which may be supported by the tool vendors. Some corresponding compiler switches may need to be set. Please refer to the respective documentation of your compiler
- To understand the effect of issues relating to the on-chip debug system, please refer to the respective debug tool vendor documentation

Current documentation

- TRAVEO™ T2G automotive MCU cluster entry architecture technical reference manual
- TRAVEO™ T2G automotive MCU cluster entry registers technical reference manual for CYT2CL
- CYT2CL datasheet TRAVEO™ T2G automotive MCU

Newer versions replace older versions, unless specifically stated otherwise.

Please always refer to the corresponding documentation for this device available in the category 'Documents' at www.infineon.com/TRAVEO™ and www.myInfineon.com.

Conventions used in this document

Each erratum identifier follows the pattern [Number]:

- [Number] = ascending sequential number within the three

  ***Note**:* *[Number] As this sequence is used over several derivatives, including already solved deviations, gaps can occur inside this numbering sequence*

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1 Errata overview

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2 Functional deviations

2.1 [096] CAN FD RX FIFO top pointer feature does not function as expected

Description

RX FIFO top pointer function calculates the address for received messages in Message RAM by hardware. This address should be re-start back from the start address after reading all messages of RX FIFO n size (n: 0 or 1). However, the address does not re-start back from the start address when RX FIFO n size is set to 1 (CANFD_CH_RXFnC.FnS = 0x01). This results in CPU/DMA to read messages from the wrong address in Message RAM.

Parameters affected

N/A

Trigger condition(s)

RX FIFO top pointer function is used when RX FIFO n size set to 1 element (CANFD_CH_RXFnC.FnS = 0x01).

Scope of impact

Received message cannot be correctly read by using RX FIFO top pointer function, when RX FIFO n size set to 1 element.

Workaround

Any of the following

1. Set RX FIFO n size to 2 or more when using RX FIFO top pointer function.
2. Do not use RX FIFO top pointer function when RX FIFO n size set to 1 element. Instead of RX FIFO top pointer, read received messages from the Message RAM directly.

Fix status

No silicon fix planned. Use workaround.

2.2 [097] CAN FD debug message handling state machine not get reset to Idle state when CANFD_CH_CCCR.INIT is set

Description

If either CANFD_CH_CCCR.INIT bit is set by the Host or when the M_TTCAN module enters BusOff state, the debug message handling state machine stays in its current state instead of being reset to Idle state. Configuring the bit CANFD_CH_CCCR.CCE does not change CANFD_CH_RXF1S.DMS.

Parameters affected

N/A

Trigger condition(s)

Either CANFD_CH_CCCR.INIT bit is set by the Host or when the M_TTCAN module enters BusOff state.

Scope of impact

The errata is limited to the use case when the Debug on CAN functionality is active. Normal operation of CAN module is not affected, in which case the debug message handling state machine always remains in Idle state. In the described use case, the debug message handling state machine is stopped and remains in the current state signaled by the bit CANFD_CH_RXF1S.DMS. In case CANFD_CH_RXF1S.DMS is set to 0b11, DMA request remains active. Bosch classifies this as non-critical error with low severity, there is no fix for the IP, Bosch recommends the workaround listed also here.

Workaround

In case the debug message handling state machine has stopped while CANFD_CH_RXF1S.DMS is 0b01 or 0b10, it can be reset to Idle state by hardware reset or by reception of debug messages after CANFD_CH_CCCR.INIT is reset to zero.

Fix status

No silicon fix planned. Use workaround.

2.3 [098]TPIU peripheral ID mismatch

Description

TPIU peripheral ID indicates that it is M3-TPIU instead of M4-TPIU.

Parameters affected

N/A

Trigger condition(s)

When debugger reads PID registers for component identification.

Scope of impact

The debuggers read the TPIU as M3-TPIU and no other impact other than this.

Workaround

No specific workaround required. Debuggers can use trace features.

Fix status

No silicon fix planned.

2.4 [137]Limitation of work flash reading

Description

1. Work flash can be read via different CPU cores but only one CPU core is assigned for non-correctable ECC error handling
2. Reading 32 bits of work flash on AXI bus can result in ECC error (Only for CM7 core devices)

Parameter affected

N/A

Trigger condition(s)

1. Reading work flash via CPU core and ECC fault interrupt routed to two or more CPU cores
2. Reading 32 bits of work flash via CM7_0/1 or other AXI master and adjacent 32 bits of work flash is not initialized (Only for CM7 core devices)

Scope of impact

1. Only one CPU core can be assigned for non-correctable ECC error handling
2. Work flash should be accessed via AHB or AXI with 64-bit boundary (Only for CM7 core devices)

Workaround

Any of the following:

- Option A (Recommended solution)
  - Problem 1 and problem 2: Set each CPU core to use a separate AHB DMA (M-DMA or P-DMA) channel to read work flash. If non-correctable ECC error occurs, the DMA transaction get aborted and respective CPU core gets the interrupt to manage the non-correctable ECC error
- Option B
  - Problem 1[1]: Set non-correctable ECC error handling to reset. This way no one CPU core needs to manage the non-correctable ECC error handling
  - Problem 2: Limit work flash data size to 64 bits. Program work flash in units of aligned 64-bit double words and read it as 64-bit double words thru CM7_0/1 or another AXI master (Only for CM7 core devices)
- Option C
  - Problem 1[2]: Assign one CPU core for non-correctable ECC error handling and that core informs the error to the other core which caused the error, but it takes time
  - Problem 2: Use Option B

Fix status

No silicon fix planned. Use workaround. Infineon FLS and FEE driver were updated with workaround A. TRM was updated for this limitation.

2.5 [147]CAN FD controller message order inversion when transmitting from dedicated Tx Buffers configured with same Message ID

Description

Configuration:

Several Tx Buffers are configured with same Message ID. Transmission of these Tx Buffers is requested sequentially with a delay between the individual Tx requests.

Expected behavior:

When multiple Tx Buffers that are configured with the same Message ID have pending Tx requests, they shall be transmitted in ascending order of their Tx Buffer numbers. The Tx Buffer with lowest buffer number and pending Tx request is transmitted first.

Observed behavior:

It may happen, depending on the delay between the individual Tx requests, that in the case where multiple Tx Buffers are configured with the same Message ID the Tx Buffers are not transmitted in order of the Tx Buffer number (lowest number first).

1 Not recommended to use for EEPROM emulation. EEPROM emulation needs to cope with aborted write/erase. In such a scenario, option B leads to deadlock in endless resets. However, option B can be used if work flash update is not intended in the field.
2 Not recommended to use with MCAL, since the inter-core communication is too slow.

Parameters affected

N/A

Trigger condition(s)

When multiple Tx Buffers that are configured with the same Message ID have pending Tx requests.

Scope of impact

In the case described it may happen, that Tx Buffers configured with the same Message ID and pending Tx request are not transmitted with lowest Tx Buffer number first (message order inversion).

Workaround

Any of the following:.

1. First write the group of Tx message with the same Message ID to the Message RAM and then afterwards request transmission of all these messages concurrently by a single write access to CANFDx_CHy_TXBAR. Before requesting a group of Tx messages with this Message ID ensure that no message with this Message ID has a pending Tx request.
2. Use the Tx FIFO instead of dedicated Tx Buffers for the transmission of several messages with the same Message ID in a specific order.

Applications not able to use workaround #1 or #2 can implement a counter within the data section of their messages sent with same ID in order to allow the recipients to determine the correct sending sequence.

Fix status

No silicon fix planned. Use workaround.

2.6 [167]CAN FD incomplete description of Dedicated Tx Buffers and Tx Queue related to transmission from multiple buffers configured with the same Message ID

Description

The following is the updated description in Section 3.5.2 Dedicated Tx Buffers and 3.5.4 Tx Queue of the Architecture TRM related to transmission from multiple buffers configured with the same Message ID.

3.5.2 Dedicated Tx Buffers

- Wording TRM: If multiple Tx Buffers are configured with the same Message ID, the Tx Buffer with the lowest buffer number is transmitted first.
- Enhancement: These Tx buffers shall be requested in ascending order with lowest buffer number first. Alternatively all Tx buffers configured with the same Message ID can be requested simultaneously by a single write access to CANFDx_CHy_TXBAR.

3.5.4 Tx Queue

- Wording TRM: If multiple queue buffers are configured with the same Message ID, the queue buffer with the lowest buffer number is transmitted first.
- Replacement: In case that multiple Tx Queue buffers are configured with the same Message ID, the transmission order depends on numbers of the buffers where the messages were stored for transmission. As these buffer numbers depend on the then current states of the PUT Index, a prediction of the transmission order is not possible.
- Wording TRM: An Add Request cyclically increments the Put Index to the next free Tx Buffer.
- Replacement: The PUT Index always points to that free buffer of the Tx Queue with the lowest number.

Parameters affected

N/A

Trigger condition(s)

Using multiple dedicated Tx Buffers or Tx Queue Buffers configured with the same Message ID

Scope of impact

In the case the dedicated Tx Buffers with the same Message ID are not requested in ascending order or at the same time or in case of multiple Tx Queue Buffers with the same Message ID, it cannot be guaranteed, that these messages are transmitted in ascending order with lowest buffer number first.

Workaround

In case a defined order of transmission is required the Tx FIFO shall be used for transmission of messages with the same Message ID. Alternatively dedicated Tx Buffers with the same Message ID shall be requested in ascending order with lowest buffer number first or by a single write access to CANFDx_CHy_TXBAR. Alternatively a single Tx Buffer can be used to transmit those messages one after the other.

Fix status

No silicon fix planned. Use workaround.

The architecture technical reference manuals were updated:

- 002-19314 Rev. *H for body controller entry family
- 002-24401 Rev. *F for body controller high family
- 002-33175 Rev. *A for cluster entry family
- 002-25800 Rev. *D for cluster 2D family

2.7 [175]Misleading status is returned for Flash and eFuse system calls if there are pending NC ECC faults in SRAM controller #0

Description

Flash and eFuse system calls will return misleading status of 0xf0000005 (“Page is write protected”) even for non-protected row or 0xf0000002 (“Invalid eFuse address”) for valid eFuse address in case of pending NC ECC faults in SRAM controller #0.

Parameters affected

Return status of Flash and eFuse system calls

Trigger condition(s)

NC ECC fault(s) pending in SRAM controller #0 and SWPUs are populated in the design.

Scope of impact

Flash and eFuse system calls will not work until the NC ECC fault(s) pending in SRAM controller #0 is properly handled.

Workaround

If the NC ECC fault(s) are not due to hardware malfunction (i.e. if the faults are due to usage of non-initialized SRAM or improper SRAM initialization), then clearing of these pending faults will resolve the issue.

Fix status

No silicon fix planned.
The architecture technical reference manuals were updated:

- 002-19314 Rev. *I for body controller entry family
- 002-24401 Rev. *G for body controller high family
- 002-33175 Rev. *A for cluster entry family
- 002-25800 Rev. *D for cluster 2D family

2.8 [176]WDT reset causes loss of SRAM retention

Description

Architecture TRM Table 19-1 shows WDT reset can retain SRAM if there is an orderly shutdown of the SRAM only during a warning interrupt. However, this is wrong. WDT reset causes loss of SRAM retention.

Parameters affected

N/A

Trigger condition(s)

WDT reset

Scope of impact

WDT reset causes loss of SRAM retention.

Workaround

None

Fix status

No silicon fix planned.
The architecture technical reference manuals were updated:

- 002-19314 Rev. *I for body controller entry family
- 002-24401 Rev. *G for body controller high family
- 002-33175 Rev. *A for cluster entry family
- 002-25800 Rev. *D for cluster 2D family

2.9 [185]Crypto ECC errors may be set after boot with application authentication

Description

Due to the improper initialization of the Crypto memory buffer, Crypto ECC errors may be set after boot with application authentication. In spite of the Crypto ECC errors, the result of the authentication is reliable.

Parameters affected

N/A

Trigger condition(s)

Boot device with application authentication

Scope of impact

Crypto ECC errors may be set after boot with application authentication.

Workaround

Clear or ignore Crypto ECC errors which generated during boot with application authentication.

Fix status

No silicon fix planned.
The architecture technical reference manuals were updated:

- 002-19314 Rev. *I for body controller entry family
- 002-24401 Rev. *G for body controller high family
- 002-33175 Rev. *A for cluster entry family
- 002-25800 Rev. *E for cluster 2D family

2.10 [198]Incomplete erase of Code Flash cells could happen Erase Suspend / Erase Resume is used along with Erase Sector operation in Non-Blocking mode

Description

Code Flash memory can be erased in “Non-Blocking” mode; a Non-Blocking mode supported option allow users to suspend an ongoing erase sector operation. When an ongoing erase operation is interrupted using “Erase Suspend” and “Erase Resume”, Flash cells may not have been erased completely, even after the erase operation complete is indicated by FLASHC_STATUS register. Only Code Flash is impacted by this issue, Work Flash and Supervisory Flash (SFlash) are not impacted.

Parameters affected

N/A

Trigger condition(s)

Using EraseSector System Call in Non-Blocking mode for CM0+ to erase Code Flash and the ongoing erase operation is interrupted using EraseSuspend and EraseResume System calls.

Scope of impact

When Code Flash sectors are erased in Non-Blocking mode and the ongoing erase operation is interrupted by Erase Suspend / Erase Resume, it cannot be guaranteed that the Code Flash cells are fully erased. Any read on the Code Flash area after the erase is complete or read on the programmed data after ProgramRow is complete can trigger ECC errors.

Workaround

Any of the following

1. User can use Non-Blocking mode for EraseSector, but users must not interrupt the erase operation using Erase Suspend / Erase Resume.
2. If a Code Flash sector erase operation is interrupted using Erase Suspend / Erase Resume, then erase the same sector again without Erase Suspend / Erase Resume before reading the sector or programming the sector.

Fix status

Fixed to update the Flash settings from the following date code

- CYT2B6/7/9: 304xxxxx
- CYT2BL: 312xxxxx
- CYT3BB/4BB: 240xxxxx
- CYT4BF: 312xxxxx
- CYT2CL: 312xxxxx
- CYT3DL: 312xxxxx
- CYT4DN: 312xxxxx

2.11 [199]Limitation for keeping the port state from peripheral IP after wakeup from DeepSleep

Description

The port state is not retained when the port selects peripheral IP (except for LIN or CAN FD) and MCU wakes up from DeepSleep.

Parameters affected

N/A

Trigger condition(s)

The port selects peripheral IP (except for LIN or CAN FD) and MCU wakes up from DeepSleep.

Scope of impact

Unexpected port output change might affect user system.

Workaround

If the port selects peripherals IP (except for LIN or CAN FD) and the port output value need to keep after wakeup from DeepSleep, set HSIOM_PRTx_PORT_SEL.IOy_SEL = 0 (GPIO) before DeepSleep and set the required output value in GPIO configuration registers. After wakeup, change HSIOM_PRTx_PORT_SEL.IOy_SEL back to the peripheral IP.

Fix status

No silicon fix planned.

The architecture technical reference manuals were updated:

- 002-19314 Rev. *I for body controller entry family
- 002-24401 Rev. *G for body controller high family

- 002-33175 Rev. *B for cluster entry family
- 002-25800 Rev. *E for cluster 2D family

2.12 [201]A part of the PWR_CTL2.BGREF_LPMODE description is lacked in the existing register TRM

Description

The following is lacked from the PWR_CTL2.BGREF_LPMODE description in the existing register TRM.

“This register will not set unless CLK_ILO0_CONFIG.ILO0_ENABLE==1. When changing back to continuous operation, keep ILO0 enabled for at least 5 ILO0 cycles after clearing this bit to allow for internal synchronization.”

Parameters affected

N/A

Trigger condition(s)

Using the PWR_CTL2.BGREF_LPMODE

Scope of impact

PWR_CTL2.BGREF_LPMODE may not be set or cleared.

Workaround

Use the PWR_CTL2.BGREF_LPMODE according to the following description.

“This register will not set unless CLK_ILO0_CONFIG.ILO0_ENABLE==1. When changing back to continuous operation, keep ILO0 enabled for at least 5 ILO0 cycles after clearing this bit to allow for internal synchronization.”

Fix status

No silicon fix planned. Register TRM was updated.

2.13 [202]Limitation of clock configuration before entering DeepSleep mode

Description

DeepSleep should not be entered while any FLL/PLL is enabled and using ECO as its reference clock. Since the unstable ECO clock after wakeup is outside the allowed reference clock limits for FLL/PLL, there is possibility of failing the DeepSleep wakeup.

Parameters affected

N/A

Trigger condition(s)

DeepSleep transition while any FLL/PLL is enabled and using ECO as its reference clock.

Scope of impact

There is possibility of failing the DeepSleep wakeup.

Workaround

If any FLL/PLL is operating with the ECO as its reference clock, change the clock to either ECO direct or IMO direct or IMO with FLL/PLL before entering DeepSleep.

Fix status

No silicon fix planned.

The architecture technical reference manuals were updated:

- 002-19314 Rev. *I for body controller entry family
- 002-24401 Rev. *G for body controller high family
- 002-33175 Rev. *B for cluster entry family
- 002-25800 Rev. *E for cluster 2D family

2.14 [203]Several data retention information in Register TRM are incorrect

Description

The following registers are described as ‘Retained’ in the Register TRM while it is not guaranteed that the value before entering DeepSleep mode is still readable from the register.

- SARADC: PASSx_SARy_CHz_RESULT
- SRSS: PWR_LVD_STATUS
- SRSS: PWR_LVD_STATUS2
- SRSS: CLK_CAL_CNT1
- SRSS: CLK_CAL_CNT2
- SRSS: CLK_FLL_STATUS
- SRSS: WDT_INTR
- SRSS: WDT_INTR_MASKED
- SRSS: CLK_PLL400Mx_STATUS (not for CYT2B6/7/9/L)
- MIXER: MIXER_DST_STRUCT_INTR_DST_MASKED (only for cluster devices)

Parameters affected

N/A

Trigger condition(s)

Use of the related function and wakeup from DeepSleep mode.

Scope of impact

The values before entering DeepSleep are not retained.

Workaround

For PASSx_SARy_CHz_RESULT, any of the following:

1. Store the conversion values at another memory location before entering DeepSleep mode
2. Restart the conversion after wakeup from DeepSleep mode

For the other registers:

- Rewrite the register value or read the status flags again after wakeup

Fix status

No silicon fix planned. Register TRM was updated.

2.15 [204]SCBx_INTR_TX.UNDERFLOW bit may be set unintentionally

Description

There is possibility of setting the SCBx_INTR_TX.UNDERFLOW bit even if the FIFO is not empty.

Parameters affected

N/A

Trigger condition(s)

Using the TX FIFO for SCB when the AHB-Lite interface clock (CLK_GR6) frequency of the AHB bus is greater than 3x the SCB functionality clock (PCLK_SCBx_CLOCK).

Scope of impact

SCBx_INTR_TX.UNDERFLOW bit may be set unintentionally.

Workaround

Ignore the SCBx_INTR_TX.UNDERFLOW bit if the FIFO is not empty.

Fix status

No silicon fix planned. Register TRM was updated.

2.16 [206] Hardfault may occur when the SROM APIs listed below while executing EraseSector or ProgramRow in non-blocking mode

Description

The following SROM APIs read data from bank#0 (or bank#1 if dual bank mode with mapping B is used) in SFlash. While doing that the check for active non-blocking erase or program of bank#0 (or bank#1 if dual bank mode with mapping B is used) is not performed. Therefore, reading bank#0 (or bank#1 if dual bank mode with mapping B is used) while there is an active erase/program operation triggers a bus error. This results in a hardfault occurrence based on FLASHC_FLASH_CTL register settings.

Affected SROM APIs:

- ReadSWPU
- WriteSWPU
- GenerateHash
- Checksum[3)]
- ComputeBasicHash[3)]
- CheckFactoryHash
- ProgramWorkFlash[4)]
- SwitchOverRegulators (not for CYT2B6/7/9/L, CYT2CL)
- LoadRegulatorsTrims (not for CYT2B6/7/9/L, CYT2CL)

3 Do not call it to calculate on the bank where programming/erasing is in progress
4 Do not use it during non-blocking operation

Parameters affected

N/A

Trigger condition(s)

Calling the affected SROM APIs while executing EraseSector or ProgramRow in non-blocking mode on bank#0 (or bank#1 if dual bank mode with mapping B is used).

Scope of Impact

The affected SROM APIs cannot be used while executing EraseSector or ProgramRow in non-blocking mode on bank#0 (or bank#1 if dual bank mode with mapping B is used).

Workaround

Do not use the affected SROM APIs while executing EraseSector or ProgramRow in non-blocking mode on bank#0 (or bank#1 if dual bank mode with mapping B is used).

Fix status

No silicon fix planned.

The architecture technical reference manuals were updated:

- 002-19314 Rev. *J for body controller entry family
- 002-24401 Rev. *H for body controller high family
- 002-33175 Rev. *D for cluster entry family
- 002-25800 Rev. *F for cluster 2D family

Impact on Infineon software

Impact: Limitation

Related modules: S-LLD, HSM-Perf-Lib

Comment: While executing EraseSector or ProgramRow in non-blocking mode on bank#0 (or bank#1 if dual bank mode with mapping B is used), users must not do anything of following:

1. Call CySldProt_GetSwpuFlashStructCfg
2. Call CySldProt_VerifySecureDomainFlashWriteProtection if CySldProt_SwpuFlashStructGroupConfigurations is non-empty

2.17 [207]CM0+ operating frequency (CLK_SLOW) should be changed to 80 MHz or lower during eFuse reads

Description

With FAST_BOOT setting enabled, CLK_SLOW is configured to run at 100 MHz. This means CM0+ and eFuse is clocked at 100 MHz. This setting could cause CM0+ to read wrong data from eFuse during boot. This could affect the behavior of the device (e.g. device could enter DEAD state from boot). Also, eFuse reads are possible from user application using system calls. User application cannot configure CLK_SLOW > 80 MHz if system calls target eFuse reads.

Parameters affected

- SID80A: 1700 µs to SID80A_2: 2600 µs
- SID80B: 2300 µs to SID80B_2: 3800 µs
- SID81A: 190 µs to SID81A_2: 110 µs

- SID81B: 5000 µs to SID81B_2: 9800 µs
- SID81C: 8150 µs to SID81C_2: 17000 µs

Trigger condition(s)

1. FAST_BOOT enabled (CLK_SLOW = 100 MHz)
2. Use of following system calls when CLK_SLOW > 80 MHz: TransitiontoSecure, TrainsitiontoRMA, CheckFactoryHash, SiliconID, ReadFuseByte, ReadFuseByteMargin

Scope of impact

1. System startup time will be longer than existing devices
2. User application cannot configure CLK_SLOW > 80 MHz when using any of the affected system calls

Workaround

1. Infineon changed FAST_BOOT setting to support boot only at 50 MHz (i.e. CLK_SLOW = 50 MHz)
2. CM0+ operating frequency (CLK_SLOW) should be changed to 80 MHz or lower before accessing any of the affected system calls

Fix status

Boot operating frequency was changed from 100 MHz to 50 MHz in factory setting via Manufacturing Test Program. Datasheet was updated.

Impact on Infineon software

Impact: No

Related modules: HSM-Perf-Lib, MCU

Comment:

1. HsmCrpt_HwaLoadDeviceKey of HSM-Perf-Lib returns E_NOT_OK if a corrupted key is read from EFUSE.
2. If the MCAL MCU module is used to configure the clocks, CLK_SLOW is displayed as McuSlowClockFrequency.

2.18 [209] CAN FD sporadic data corruption (payload) in case acceptance filtering is not finished before reception of data R3 (DB7..DB4) is completed

Description

During frame reception the Rx Handler accesses the external Message RAM for acceptance filtering (read accesses) and for storing of the accepted messages (write accesses).

The time needed for acceptance filtering and for storing of a received message depends on

- the Host clock frequency
- the worst-case latency of the read and write accesses to the external Message RAM
- the number of configured filter elements
- the workload of the transmit message (Tx) handler in parallel to the receive message (Rx) handler

Received data bytes (DB0..DBm) from the CAN Core are buffered in the cache of the Rx Handler before they are written to the Message RAM (in words of 4 byte). Data words inside the Message RAM are numbered from R2 to Rn (n ≤ 17).

2 Functional deviations

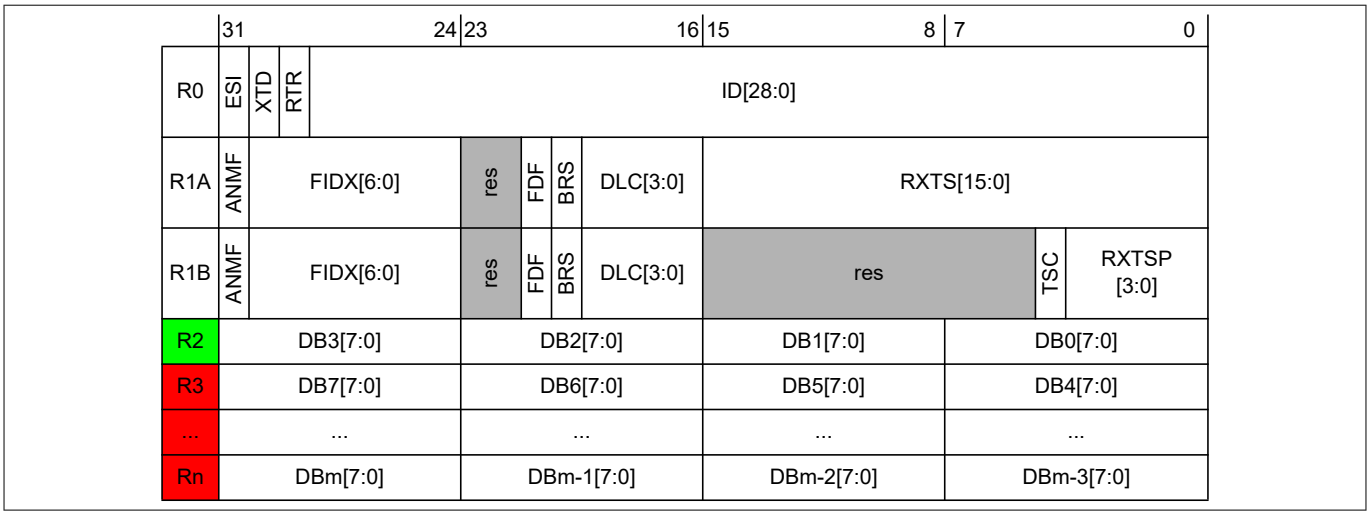

Figure 1 Rx Buffer and FIFO Element

Under the following conditions a received message will have corrupted data while the received message is signaled as valid to the host.

1. The data length code (DLC) of the received Message is greater than 4 (DLC > 4)
2. The storage of Ri of a received message into the Message RAM (after acceptance filtering is done) has not completed before R(i+1) is transferred from the CAN Core into the cache of the Rx Handler (where 2 ≤ i ≤ 5)
3. While condition 1 and 2 apply, a concurrent read of data word Ri from the cache and write of data word R(i+1) into the cache of the Rx handler happens

The data will be corrupted in a way, that in the Message RAM R(i+1) has the same content as Ri.

Despite the corrupted data, the M_TTCAN signals the storage of a valid frame in the Message RAM:

- Rx FIFO: FIFO put index RXFnS.FnPI is updated
- Dedicated Rx Buffer: New Data flag NDATn.NDxx is set
- Interrupt flag IR.MRAF is not set

The issue may occur in FD Frame Format as well as in Classic Frame Format.

Figure 2 shows how the available time for acceptance filtering and storage is reduced.

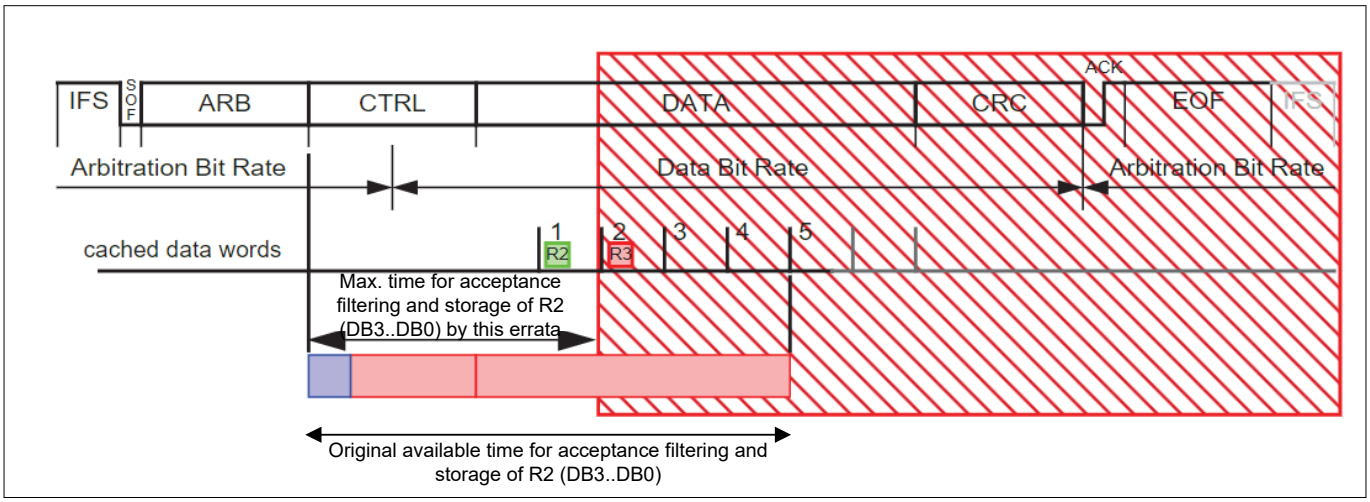

Figure 2 CAN frame with DLC > 4

2 Functional deviations

Table 2 TRAVEO™ T2G: Minimum host clock frequency for CAN FD when DLC = 5

Number of configured active filter element 11-bit IDs/29-bit IDs[1) 2)]	Number of active CAN channels in an instance[3)]	Arbitration bit rate = 0.5 Mbps				Arbitration bit rate = 1 Mbps			
		Data bit rate = 0.5 Mbps	Data bit rate = 1 Mbps	Data bit rate = 2 Mbps	Data bit rate = 4 Mbps	Data bit rate = 1 Mbps	Data bit rate = 2 Mbps	Data bit rate = 4 Mbps	Data bit rate = 5 Mbps
32/16	2	3.9 MHz	7.1 MHz	13.1 MHz	22.8 MHz	7.7 MHz	14.1 MHz	26.1 MHz	31.5 MHz
	3	5.4 MHz	9.9 MHz	18.3 MHz	31.8 MHz	10.7 MHz	19.7 MHz	36.5 MHz	44.0 MHz
	4	6.9 MHz	12.7 MHz	23.5 MHz	40.8 MHz	13.8 MHz	25.3 MHz	46.9 MHz	56.5 MHz
	5	8.4 MHz	15.5 MHz	28.6 MHz	49.9 MHz	16.8 MHz	30.9 MHz	57.2 MHz	69.0 MHz
64/32	2	7.4 MHz	13.5 MHz	24.9 MHz	43.4 MHz	14.7 MHz	26.9 MHz	49.8 MHz	60.0 MHz
	3	10.3 MHz	18.8 MHz	34.9 MHz	60.7 MHz	20.5 MHz	37.6 MHz	69.7 MHz	84.0 MHz[4)]
	4	13.2 MHz	24.2 MHz	44.8 MHz	78.0 MHz	26.3 MHz	48.4 MHz	89.5 MHz[4)]	107.9 MHz[5)]
	5	16.1 MHz	29.6 MHz	54.7 MHz	95.3 MHz[4)]	32.1 MHz	59.1 MHz	109.4 MHz[5)]	131.8 MHz[5)]
96/48	2	10. 8 MHz	19.9 MHz	36.8 MHz	64.0 MHz	21.6 MHz	39.7 MHz	73.5 MHz	88.6 MHz[4)]
	3	15.1 MHz	27.8 MHz	51.5 MHz	89.6 MHz[4)]	30.2 MHz	55.6 MHz	102.9 MHz[5)]	124.0 MHz[5)]
	4	19.4 MHz	35.7 MHz	66.1 MHz	115.1 MHz[5)]	38.8 MHz	71.4 MHz	132.2 MHz[5)]	159.3 MHz[5)]
	5	23.7 MHz	43.6 MHz	80.8 MHz[4)]	140.7 MHz[5)]	47.4 MHz	87.2 MHz[4)]	161.5 MHz[5)]	194.7 MHz[5)]
128/64	2	14.3 MHz	26.3 MHz	48.6 MHz	84.7 MHz[4)]	28.4 MHz	52.5 MHz	97.2 MHz[4)]	117.2 MHz[5)]
	3	20.0 MHz	36.8 MHz	68.0 MHz	118.5 MHz[5)]	40.0 MHz	73.5 MHz	136.0 MHz[5)]	164.0 MHz[5)]
	4	25.7 MHz	47.2 MHz	87.5 MHz[4)]	152.3 MHz[5)]	51.4 MHz	94.4 MHz[4)]	174.9 MHz[5)]	210.8 MHz[5)]
	5	31.4 MHz	57.7 MHz	106.9 MHz[5)]	186.1 MHz[5)]	62.7 MHz	115.4 MHz[5)]	213.7 MHz[5)]	257.5 MHz[5)]

1) M_TTCAN starts always at filter element #0 and proceeds through the filter list to find a matching element. Acceptance filtering stops at the first matching element and the following filter elements are not evaluated for this message. Therefore, the sequence of configured filter elements has a significant impact on the performance of the filtering process.

2) Acceptance filtering search for 11-bit IDs and 29-bit IDs filter element is running separately, only one configured filter setting should be considered. Searching for one 29-bit filter element requires approximately double cycles for one 11-bit filter element.

3) See the device datasheet for the supported number of channels

4) Frequency is not reachable since the maximum host clock frequency for M_TTCAN in CYT2B6 is 80 MHz

5) Frequency is not reachable since the maximum host clock frequency for M_TTCAN in all TRAVEO™ T2G is 100 MHz

2 Functional deviations

Parameters Affected

N/A

Trigger condition(s)

Under the following conditions a received message will have corrupted data while the received message is signaled as valid to the host.

1. The data length code (DLC) of the received Message is greater than 4 (DLC > 4)
2. The storage of Ri of a received message into the Message RAM (after acceptance filtering is done) has not completed before R(i+1) is transferred from the CAN Core into the cache of the Rx Handler (where 2 ≤ i ≤ 5)
3. While condition 1 and 2 apply, a concurrent read of data word Ri from the cache and write of data word R(i+1) into the cache of the Rx handler happens

Scope of impact

The erratum is limited to the case when the Host clock frequency used in the actual device is below the limit shown in Table 2.

Corrupted data is written to the Rx FIFO element respective the dedicated Rx Buffer.

The received frame is nevertheless signaled as valid.

Workaround

Check whether the minimum Host clock frequency, that is shown in Table 2, is below the Host clock frequency used in the actual device.

If yes, there is no problem with the selected configuration.

If no, use one of the following two workarounds.

<First workaround>

Try different configuration by changing the following parameters until the actual host clock frequency (CLK_GR5) is above the minimum host frequency shown in Table 2.

- Increase the CLK_GR5 frequency in the actual device
- Reduce the CAN-FD Data Bit rate
- Reduce the number of configured filter elements
- Reduce the number of active CAN channels in an instance

Also, use DLC>=8 instead of DLCs 5, 6, and 7 in the CAN Environment/System, as they place higher demands on the minimum Host clock frequency (the worst case is DLC=5) or restrict your CAN Environment/System to DLC 4.

Note: While changing the actual host clock frequency, CLK_GR5 must always be equal or higher than PCLK_CANFD[x]_CLOCK_CAN[y] for all configurations.

<Second workaround>

Due to condition 3 the issue occurs only sporadically. Use an end-to-end (E2E) protection (for example, checksum or CRC covering the data field) and add it to all messages in the CAN system, to detect data corruption in received frames.

Fix status

No silicon fix planned. Use workaround.

Impact on Infineon software

Impact: Limitation

Related modules: CAN, MCU

Comment: The user must evaluate the impact of the erratum for each CAN instance separately. A CAN instance is the entirety of CanControllers with the same CanControllerInstance value.

1. For the number of active CAN nodes: Use the maximum number of CanController configurations of a CAN instance that can be active (Autosar controller state STARTED or SLEEP) at a time
2. For the host clock frequency: In McuPeriGroupSettings locate the setting with McuPeriGroup=MCU_PERI_GROUP5_MMIO5 and take the value from McuPeriGroupClockFrequency
3. For the number of configured active filter element 11-bit IDs/29-bit IDs: Use the corresponding values from the “Message RAM (…) linking table” in the generated Can_PBcfg.h file. Note that each CanController has its separate table. Take the maximum values.
4. For the Arbitration bit rate: Use the maximum CanControllerBaudRate value of all the CanControllers
5. For the Data bit rate: Use the maximum CanControllerFdBaudRate value of all the CanControllers if configured. Otherwise use CanControllerBaudRate.

2.19 [210]Added definition of minimum input slew rate for SPI-SDR and SPI-DDR of SMIF

Description

The minimum input slew rate of SPI-SDR and SPI-DDR mode of the serial memory interface were not defined which could cause malfunction of the transactions.

Parameters affected

Following parameters have been added:

- For CYT2CL
  - SPI-SDR: SID1614 = min 1.03 V/ns
  - SPI-DDR: SID1714 = min 1.03 V/ns
- For CYT3DL
  - SPI-SDR: SID1613 = min 0.7 V/ns
  - SPI-DDR: SID1713 = min 0.7 V/ns
- For CYT4DN
  - SPI-SDR: SID1612 = min 1.125 V/ns
  - SPI-DDR: SID1712 = min 1.125 V/ns

Trigger condition(s)

Using SPI-SDR and SPI-DDR mode of the serial memory interface

Scope of impact

If the minimum input slew rate is not fulfilled, SMIF could cause malfunction of the transactions.

Workaround

The minimum input slew needs to be fulfilled for reliable operation.

Fix status

No silicon fix planned. Datasheet was updated.

Impact on Infineon software

Impact: No
Related modules: None
Comment: Software in scope does not support SMIF.

2.20 [212] Description for PASS SARx to TCPWMx direct connect triggers one-to-one is incorrect in datasheet

Description

The body controller device's datasheet showed ‘trig=2’ in the description for PASS SARx to TCPWMx direct connect triggers one-to-one, which was incorrect as TCPWM’s input trigger selection (TR_IN_SEL) value. The correct value is ‘4’ as shown in the architecture TRM chapter 25 descriptions and table 25-2.

The cluster device's datasheet showed ‘trig=0’ in the description for PASS SARx to TCPWMx direct connect triggers one-to-one, which was incorrect as TCPWM’s input trigger selection (TR_IN_SEL) value. The correct value is ‘2’. Therefore, the correct description and table 25-2 in the architecture TRM chapter 25 are as follows.

Table 25-2 shows how the multiplexer should be handled for the input trigger event generation. The TRAVEO™ T2G Cluster MCU supports the following input triggers:

- Number of specific one-to-one trigger inputs: 1
- Number of general-purpose trigger inputs: 60

Table 3 Handling input trigger multiplexers for cluster devices

Input trigger selection	Input trigger	Input trigger source
0	Constant ‘0’	Constant ‘0’
1	Constant ‘1’	Constant ‘1’
2	HSIOM column ACT#2 or PASS (programmable analog subsystem), through 1:1 trigger mux #2	Refer to the "Alternate function pin assignments" or "Triggers one-to-one" section in the device datasheet
3	tr_all_cnt_in[0]	Refer to the trigger mux block in the device datasheet
:	:	:
62	tr_all_cnt_in[59]	Refer to the trigger mux block in the device datasheet

Parameters affected

N/A

Trigger condition(s)

Using the triggers one-to-one for PASS SARx to TCPWMx direct connect

Scope of impact

The triggers one-to-one for PASS SARx to TCPWMx direct connect cannot work if TCPWM’s input trigger selection is not correct.

Workaround

For body devices, use ‘4’ as TCPWM’s input trigger selection (TR_IN_SEL) value for PASS SARx to TCPWMx direct connect.

For cluster devices, use ‘2’ as TCPWM’s input trigger selection (TR_IN_SEL) value for PASS SARx to TCPWMx direct connect.

Fix status

No silicon fix planned. Datasheet was updated.

Impact on Infineon Software

Impact: No

Related modules: PWM

Comment: MCAL PWM module does not support one-to-one triggers.

2.21 [218]Greater change of Low voltage detection (LVD) level can issue an Over voltage detection (OVD) reset

Description

OVD and LVD share the common resistor ladder for reference voltages. Therefore, greater change of LVD level can cause greater voltage fluctuation at OVD reference voltage leading to OVD reset.

Parameter affected

N/A

Trigger condition(s)

Change of LVD trip selection bits (PWR_LVD_CTL/2.HVLVD1/2_TRIPSEL_HT) by a step width of more than 1 at V_{DDD} > 4.5 V.

Scope of impact

Greater change of LVD level can result in an OVD reset.

Workaround

Any of the following

1. Do not change LVD trip selection bits (PWR_LVD_CTL/2.HVLVD1/2_TRIPSEL_HT) from default setting 0.
2. Increment LVD trip selection bits (PWR_LVD_CTL/2.HVLVD1/2_TRIPSEL_HT) by a step width of 1 per 10 µs. Change LVD1 or LVD2 independently, not at the same time.

Fix status

No silicon fix planned. Use workaround.

The architecture technical reference manuals were updated:

- 002-19314 Rev. *J for body controller entry family
- 002-24401 Rev. *H for body controller high family
- 002-33175 Rev. *D for cluster entry family
- 002-25800 Rev. *F for cluster 2D family

Impact on Infineon software

Impact: Limitation

Related modules: MCU

Comment: Workaround (2) was implemented in MCAL MCU driver version 1.24. Users of older versions can apply one of the suggested workarounds in following ways: Leave McuHvLvdThreshold at its default value of MCU_HVLVD_THRESHOLD_2_8V_TO_2_825V, or apply MCU configurations with changes of McuHvLvdThreshold in steps of 0.1V only.

2.22 [219]TDM SCLK/MCLK/DATA minimum output transition times clarified

Description

TDM specification of transition times was meant to specify the input transition time only, but the description did not state this. The specified minimum transition time is not valid for signal output. The specification items have been split into input and output direction now.

Parameters affected

Following parameters have been updated:

Table 4 TDM transition timing

Spec ID	Description	Min	Typ	Max	Units	Details/ Conditions
SID1007B	SCK input transition timing	1	-	0.15 x t_{SCLK}	ns	Guaranteed by Design
SID1008	MCLK input/ output transition timing	-	-	0.15 x t_{SCLK}	ns	Guaranteed by Design
SID1009B	DATA input transition timing	1	-	0.15 x t_{SCLK}	ns	Guaranteed by Design
SID1007C	SCLK output transition timing	0.1	-	0.15 x t_{SCLK}	ns	TTL level
SID1009C	DATA output transition timing	0.1	-	0.15 x t_{SCLK}	ns	TTL level

Trigger condition(s)

Use of TDM

Scope of impact

TDM specification of transition times has been split into input and output direction now.

Workaround

Use the TDM with these transition times.

Fix status

No silicon fix planned.

Impact on Infineon software

Impact: No
Related modules: None
Comment: Software in scope does not support TDM.

2.23 [226]SCB transition times in SPI mode clarified

Description

SCB specification of transition time in SPI mode was meant to specify the input transition time only, but the description did not state this. The specified maximum transition time is not valid for signal output. The specification items have been split into input and output direction now.

Parameters affected

Following parameters have been updated:

Table 5 TDM transition timing

Spec ID	Description	Min	Typ	Max	Units	Details/ Conditions
SID129_2	SCB input transition in SPI mod	-	-	4	ns	
SID129_3	SCB output transition in SPI mode	-	-	10	ns	Valid for HSIO_STDLN
SID129_4	SCB output transition in SPI mode	-	-	20	ns	Valid for GPIO_STD, GPIO_ENH, GPIO_SMC

Trigger condition(s)

Use of SPI mode in SCB

Scope of impact

SCB specification of transition times in SPI mode has been split into input and output direction now..

Workaround

Use the SPI mode in SCB with these transition times.

Fix status

No silicon fix planned.

Impact on Infineon software

Impact: No
Related modules: SPI
Comment: Transition time is a property of output signals which is not related to software

2.24 [229]System calls: improper usage of memory region end address in control logic

Description

Sometimes erroneous system calls execution status will be returned when passing parameters to system calls via SRAM region at the end of available SRAM.

Parameters affected

N/A

Trigger condition(s)

When SRAM_SCRATCH_DATA_ADDR for the following system calls end in the last available SRAM word:

- ProgramRow
- ProgramRow2 (only for CYT6BJ)
- ProgramWorkFlash
- ProgramWorkFlash2 (only for CYT6BJ)

Scope of impact

0xF0000013 (invalid arguments location) will be returned when passing parameters to system calls via SRAM region at the end of available SRAM.

Workaround

Do not use the last word of available SRAM for passing SRAM_SCRATCH_DATA_ADDR for the following system calls:

- ProgramRow
- ProgramRow2 (only for CYT6BJ)
- ProgramWorkFlash
- ProgramWorkFlash2 (only for CYT6BJ)

Fix status

No silicon fix planned. Use workaround.

Impact on Infineon software

Impact: Limitation

Related modules: FLS

Comment: Users of MCAL FLS must make sure that Fls_WriteData is not located immediately below the highest SRAM address. You can use memory mapping via FLS_START_SEC_VAR_NO_INIT_UNSPECIFIED and/or linker configuration to modify the location of the affected object.

2.25 [230]RTC calibration does not work correctly

Description

Calibration values between 1 and 59 are invalid. If setting BACKUP_CAL_CTL.CALIB_VAL to a value other than 0, it is set to 60.

Parameter affected

N/A

Trigger condition(s)

Use of RTC calibration

Scope of impact

RTC calibration does not work correctly

Workaround

Any of the following

1. Adjust time by software when one second correction is needed[5)]
   a. Measure the deference of RTC_CAL pin from ideal RTC frequency under system condition
   b. Define the condition or period when one second correction is required based on the system evaluation
   c. Update the BACKUP_RTC_TIME.RTC_SEC register according to b
2. Use an external RTC IC

Fix status

No silicon fix planned. Use workaround.

Impact on Infineon software

Impact: No
Related modules: None
Comment: Software in scope does not support RTC

5 The difference less than one second cannot be corrected.

Revision history of CYT2CL errata sheet

Document version	Date of release	Description of changes
1.0	2021-09-16	Initial release
1.1	2021-10-12	Added errata ID 174
1.2	2022-02-03	Updated "Fix status" of errata ID 164, 167, 168, 169, 174. Added errata ID 175, 176.
1.3	2022-06-15	Updated “Description” and “Fix Status” of errata ID 169. Added errata ID 185, 188 to 191, 195, 196.
1.4	2022-07-15	Added errata ID 197.
1.5	2022-08-25	Updated "Description" of errata ID 185. Added errata ID 198, 199.
1.6	2022-12-07	Added errata ID 201, 202, 203, 204
1.7	2023-02-08	Updated "Description" of errata ID 203. Added errata ID 206.
1.8	2023-05-12	Updated errata ID 206 to add (or bank#1 if dual bank mode with mapping B is used). Added errata ID 207.
1.9	2023-06-15	Updated “Impact on Infineon Software” of errata ID 207. Added errata ID 209.
2.0	2023-10-17	Updated errata ID 206 to add the affected SROM APIs. Added errata ID 210, 212.
2.1	2024-08-23	Added errata ID 218, 219, 226.
2.2	2025-02-21	Added errata ID 229, 230. Updated the “Impact on Infineon software” of errata ID 218. Removed errata ID 164, 168, 169, 174, 188, 189, 190, 191, 195, 196, 197 because the datasheet was updated before official release.
2.3	2025-03-28	Migrated to Infineon errata template. Consolidated the description for all affected devices (each errata ID 137, 198, 203, 206, 209, 210, 212).

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