TN00185

S32Z2/E2: CANEXCEL Frame Communication Fails due to Device Memory Latency

Rev. 1.0 — 18 July 2025 Technical note

Document information

Information	Content
Keywords	CANEXCEL, S32Z2/E2
Abstract	CANEXCEL accesses device memory for copying in message pointers, transferring message data from device memory to local Simple Message Buffer (SMB) and local SMB to device memory via internal DMA.

1 Description

CANEXCEL accesses device memory for copying in message pointers, transferring message data from device memory to local Simple Message Buffer (SMB) and local SMB to device memory via internal DMA. The delay in DMA access can create the following three falling scenarios :

- [Errata: ERR052289]: If DMA transfer of Message Descriptor(MD) pointer configuration from system memory to CANEXCEL memory is ongoing and any other MD event (Push DSCCONTROL.DCSYSPUSH[n] or HW pointer incremented DSC_CONTROL.DCSTAn[HWPOINTER]) occurs, then CANEXCEL reports an invalid Incorrect Configuration error and enters into error mode SIC.SYSR[IERR]= 0b0001.
- [Errata: ERR052290]: CANEXCEL sets unexpected RX SMB Overrun Error SIC.SYSS[CRXOERR] for XL frame with Data Length Code (DLC) value less than 64. CANEXCEL drops the incoming frame and sets SMB Overrun Error if CANEXCEL is not able to process the Acceptance Field (AF) of the incoming frame by the time the frame is completely received in CANEXCEL memory.
- [Errata: ERR052291]: CANEXCEL might not transmit complete and valid frame data if a Loss of Arbitration (LOA) is observed on the CAN bus. Hence the frame stored in system memory and the frame sent/received from the CAN bus are different. If the frame is copied completely from system memory to CANEXCEL memory before the LOA occurs on the CAN bus, then CANEXCEL will send valid frame data.

2 Workaround

Reset mode is the entry mode after triggering a hard or soft reset and before entering any other modes. CANEXCEL subsystem operation starts after the de-assertion of either a soft or hard reset. Once the reset is de-asserted, a freeze request is automatically asserted to request freeze mode entry of the CANEXCEL. Once CANEXCEL acknowledges the freeze request, application software must perform the following writes in order. Address offsets below are relative to the CANEXCEL module base address.

Table 1. Offset address and write data for CANEXCEL module base address

Offset Address (Hex)	Write Data (Hex)
0x180FC	0x7F
0x180F4	0xFF
0x18100	0x7534
0x180F0	0xBF31E909
0x18104	0x7660
0x180EC	0xBBC5ED01
0x18108	0x6B0C
0x180E8	0x10100513
0x1810C	0x6A04
0x180E4	0x079389CF
0x18110	0x6F98
0x180E0	0x00010154
0x18114	0x7628
0x180DC	0x0001B52D
0x18118	0x76CC
0x180D8	0xB351ED01
0x1B044	0x20

Table 1. Offset address and write data for CANEXCEL module base address*...continued*

Offset Address (Hex)	Write Data (Hex)
0x13018	0x06
0x60BC	0x03
0x60C0	0x0700
0x1B044	0x00
0x180F4	0x884000FF

3 Revision history

Table 2. Revision history

Document ID	Release date	Description
TN00185 v.1.0	18 July 2025	Initial release

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