TLE985xQX(W)

Microcontroller with LIN and H-Bridge NFET Driver for Automotive Applications

Overview

This document lists the deviations and application hints of the TLE985xQX(W) “Microcontroller with LIN and NFET Driver for Automotive Applications“.

It is strongly recommended that the device behavior and possible proposed workarounds are considered for the application.

Table 1 Reference documents

Document type	Document reference	Issue date
Data sheet	See Table 2	
User manual	Infineon-TLE985xQX-UserManual-v01_10-EN.pdf	2023-03-20

Table 2 List of affected products

Device	Reference data sheet	Issue date
TLE9850QX	Infineon-TLE9850QX-DataSheet-v01_10-EN.pdf	2023-03-20
TLE9851QXW	Infineon-TLE9851QXW-DataSheet-v01_20-EN.pdf	2023-03-20
TLE9852QX	Infineon-TLE9852QX-DataSheet-v01_10-EN.pdf	2023-03-20
TLE9853QX	Infineon-TLE9853QX-DataSheet-v01_10-EN.pdf	2023-03-20
TLE9854QX	Infineon-TLE9854QX-DataSheet-v01_10-EN.pdf	2023-03-20
TLE9854QXW	Infineon-TLE9854QXW-DataSheet-v01_20-EN.pdf	2023-03-20
TLE9855QX	Infineon-TLE9855QX-DS-DataSheet-v01_10-EN.pdf	2023-03-20

Table of contents

Overview **1**
Table of contents **2**
1 Product errata **3**
1.1 LIN overcurrent protection not active (0000068704-14) 3
1.1.1 Workaround 4
1.1.2 Planned fix 4
2 Application hint **5**
2.1 ADC1 (HV-channel) sampling switch activation 5
2.1.1 Workaround 5
2.1.2 Planned fix 6
Revision history **7**
Disclaimer **8**

1 Product errata

This chapter lists the errata of the referenced products and documentation.

1.1 LIN overcurrent protection not active (0000068704-14)

Introduction

The LIN overcurrent protection limits the current flowing into the LIN pin, in case of a short circuit between the LIN bus and the ECU (electronic control unit) supply voltage. This feature is described in the chapter 20 of the TLE985xQX user manual.

Description of the behavior

The LIN overcurrent protection feature is not active in the TLE985xQX devices.

Effects

The actual value of the current $I_{BUS,SC}$ (P_6.1.10) is reported in the following table.

Table 3 Bus Transmitter Interface

V_S= 5.5 V to 18 V, T_j= -40°C to +150°C (+175°C for the TLE985xQXW version); all voltages with respect to ground, positive current flowing into pin (unless otherwise specified)

Parameter	Symbol	Values			Unit	Note or Test Condition	Number
		Min.	Typ.	Max.			
Bus short circuit current	$I_{BUS,SC}$	170	260	395	mA	Current limitation for driver dominant state, driver on, V_{BUS} = 18 V [1)]	P_6.1.10

1) Not subject to production test, specified by design.

In the unlikely case of a short circuit, the LIN transceiver integrated in the TLE985xQX might trigger the LIN overtemperature protection. Then the transceiver enters receive-only mode, as described in the paragraph 20.3.2 of the user manual. The management of the related interrupt flags, listed in the paragraph 20.5 of the user manual, is under the supervision of the user SW. When the short circuit is removed and the LIN_IRQS.OT_STS status bit is reset, the TLE985xQX goes back to its standard operation.

The following paragraphs of the TLE985xQX documentation are affected by this erratum.

19.1 Features (data sheet) and 20.1 Features (user manual)

- LIN transceiver compliant to LIN2.2 standard, backward compatible to LIN2.1, LIN2.0 and LIN1.3

  Note: the statement is valid, with the exception of parameter 12 of the LIN standard. This parameter (related to the P_6.1.10 of TLE985xQX data sheet) specifies that the maximum current flowing into the node must not exceed 200 mA under DC conditions, when the LIN bus voltage is equal to 18 V (maximum ECU operating voltage specified in the LIN standard)
- Overcurrent limitation and overtemperature protection

  Note: the feature "overcurrent limitation" is not active

20.3.1 LIN Normal Mode (LNM) (user manual)

Note: There are no LIN_CTRL_ OC_STS and LIN_CTRL_ OC_IS bits in the LIN_CTRL register: the actual flag of LIN overcurrent is the LIN_IRQS.OC_IS. Since the overcurrent limitation is not active, the LIN_IRQS.OC_IS flag cannot be set to 1_B

20.3.2 LIN Transceiver Error Handling (user manual)

Note: The LIN overcurrent protection is not active in the device, therefore: the short circuit current $I_{BUS,SC}$ (P_6.1.10) is limited to the value specified in the table 3 of the errata sheet; although the LIN overcurrent interrupt is enabled (LIN_IRQEN.OC_IEN bit is set to 1_B), the LIN_IRQS.OC_IS flag is not set to 1_B in case an overcurrent event occurs

20.5 LIN Transceiver Interrupts

Note: the LIN_IRQS.OC_IS flag is not set to 1_B in case an overcurrent event occurs

Figure 62 (user manual)

Note: the LIN_IRQS.OC_IS flag is not set to 1_B in case an overcurrent event occurs

Table 172 and Figure 179 (user manual)

Note: the service request LIN OC is not triggered in case an overcurrent event occurs

1.1.1 Workaround

No workaround is possible to activate the LIN overcurrent protection.

1.1.2 Planned fix

The fix is going to be implemented via FW update. The fix does not modify the silicon die of the device and it will be notified with a related customer communication. Full traceability is ensured by Infineon Technologies.

Additional information is available from Infineon Technologies on request.

2 Application hint

2.1 ADC1 (HV-channel) sampling switch activation

Behavior

Fast transients on the enabled ADC1 HV-channel could activate the ADC sampling switch, which will lead to a load of 10 kΩ (±20%) on the causing channel.

In case the corresponding channel will be selected (sequencer, etc.), the additional load will disappear again.

Effects

The activation will increase the input current (> 100 µA @ V_S 13.5 V) on corresponding MONx pin. This increased current can cause a voltage drop via the external resistor. Depending on the size of the resistor the voltage drop can be so high, that a wrong low signal on the MONx will be detected.

2.1.1 Workaround

To achieve robustness against ISO 7637-3 pulses, the recommended R-C filter from the “Reference data sheet” is sufficient. To increase the robustness an additional 10 nF capacitor (C_{1MONx}) is recommended. This will lead to a C-R-C filter. See Figure 1.

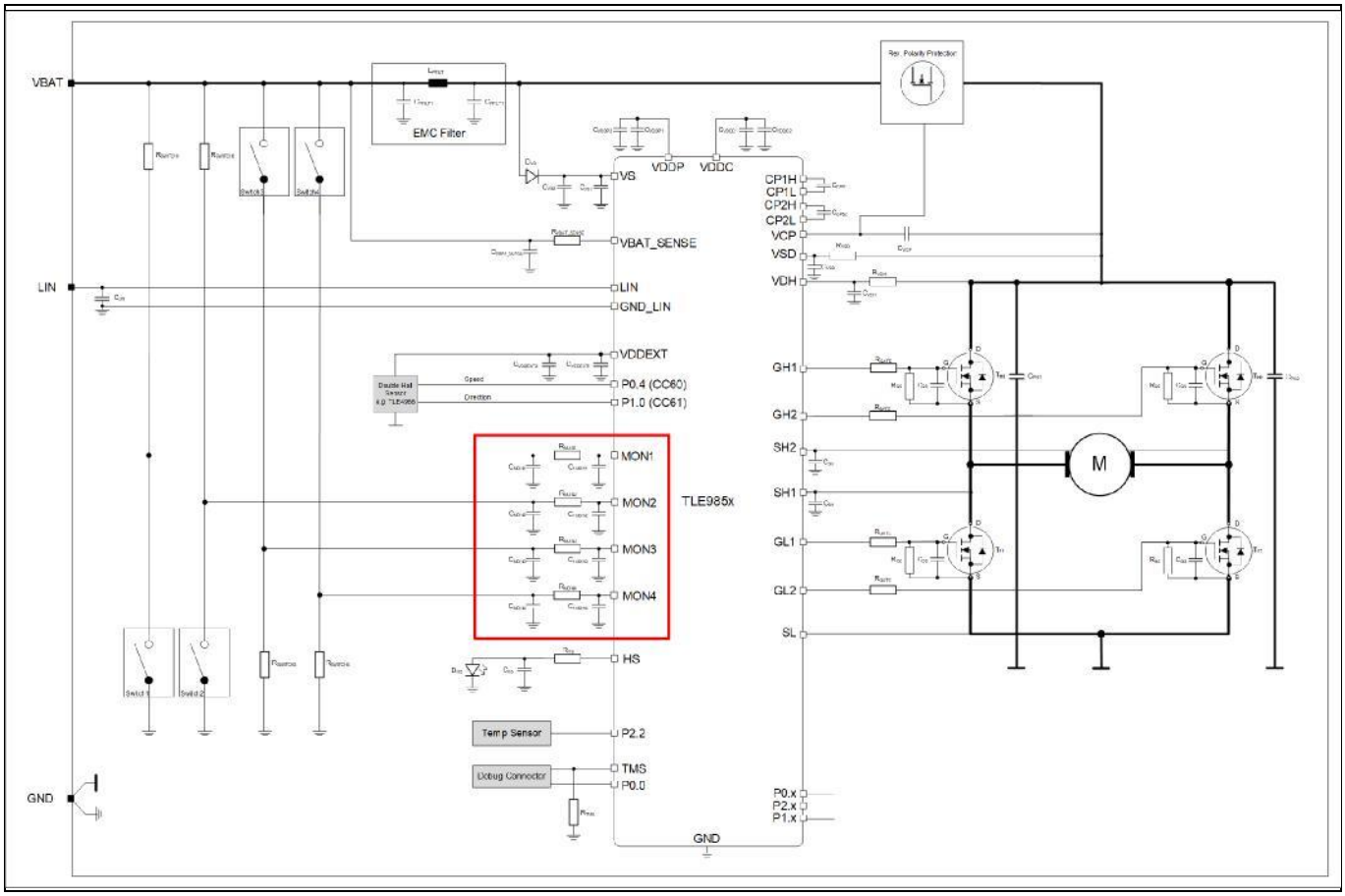


Figure 1 Application diagram example with C-R-C filters at MONx

2.1.2 Planned fix

No fix planned.

Revision history

Document revision	Date	Description of changes
1.2	2023-03-20	Removed: PLL loss of lock (0000052337-4) Updated: Table 1, Table 2
1.1	2022-10-13	Added: LIN overcurrent protection not active Updated: chapter 1.1.2 Editorial changes
1.0	2020-07-24	Initial release

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