

MLX81109

Mini LIN/LIN RGB Slave Controller

1. Features

Configurations

- 20 pin device in QFN20 5x5 package

Application Controller

- Internal RC-Oscillator (24 MHz default clock)
- 16-bit MULAN MCU with
 - 32kByte Flash
 - 1024 Byte RAM
 - 512 Byte NVRAM with ECC (380 Byte for customer purpose)
- Math Co-processor for 32 bit MUL/DIV Operations
- LIN Protocol Controller according to LIN 2.x and SAE J2602
- Baudrate up to 19.2 kBaud
- Frame processing
- Low interrupt load to the application

LIN Transceiver according to LIN 2.x and SAE J2602

- Support for Autoconfig according bus shunt method

IO configuration

- 4x high voltage I/Os with free configurable current sources (up to 48mA) for RGBW
- Diagnostic capability for connected LED
- 8x 5V open drain IO's
- 4x 16-bit PWM outputs, routable to HV and LV IOs
- Interrupt capability for all inputs (HV or LV)
- Configurable wake up sources (LIN and IOs)
- Serial interface (SPI)
- 10 bit ADC with DMA, conversion time <6 μ s, multiple channels and 3 different reference voltages

Voltage Regulator

- Low standby current consumption of typ 25 μ A (max 50 μ A) in sleep mode
- Integrated battery monitor including over- and under-voltage detection

Other Features

- Automotive Temperature Range of -40°C to 125°C
- 28V jump start
- Integrated temperature sensor

Product Abstract

MLX81109 Mini LIN/LIN RGB Slave Controller

Contents

1. Features.....	1
2. Scope.....	3
3. Melexis Softdist Server.....	3
4. Short Description.....	3
5. General Overview.....	4
5.1. Memory Configuration.....	4
5.2. Block Diagram.....	4
6. Electrical Characteristics.....	5
6.1. Operating Conditions.....	5
7. Application Hints.....	5
7.1. Application Example.....	5
8. Soldering information.....	6
9. Contact.....	6
10. Disclaimer.....	6

Product Abstract

MLX81109

Mini LIN/LIN RGB Slave Controller

2. Scope

This document is intended to give a brief introduction of the MLX81109 – Mini LIN/LIN RGB Slave Controller.

The detailed information regarding this product as well as all the required development tools are available via the Melexis softdist service (<https://softdist.melexis.com>).

3. Melexis Softdist Server

Melexis SoftDist (<https://softdist.melexis.com>) is a software distribution system which allows customers to download documents, development software and other stuff related to Melexis products. In case updates or new items are available a notification email will be send automatically to all subscribers.

It's required to register in order to access the Melexis Softdist server.

In case you are not registered yet, please contact our sales team and specify which Melexis product you are interested in, in order to create an account and grant access to the correct product specific information:

Europe, Africa	Email : sales_europe@melexis.com
Americas	Email : sales_usa@melexis.com
Asia	Email : sales_asia@melexis.com

4. Short Description

This IC is a fully integrated low end LIN Slave for ambient light applications in automotive environment to drive via LIN bus RGB LEDs. It is suitable for bus systems according to LIN 2.x as well as SAE J2602.

The combination of physical layer LIN transceiver and LIN protocol controller in combination with current controlled outputs make it possible to develop in a short timeframe simple, but powerful and cheap ambient light or other mcu modules connected to LIN Bus systems.

Product Abstract

MLX81109 Mini LIN/LIN RGB Slave Controller

5. General Overview

5.1. Memory Configuration

Part	Flash	User NVRAM	RAM	Package
MLX81109	32kByte	380Byte	1kByte	QFN20 5x5

5.2. Block Diagram

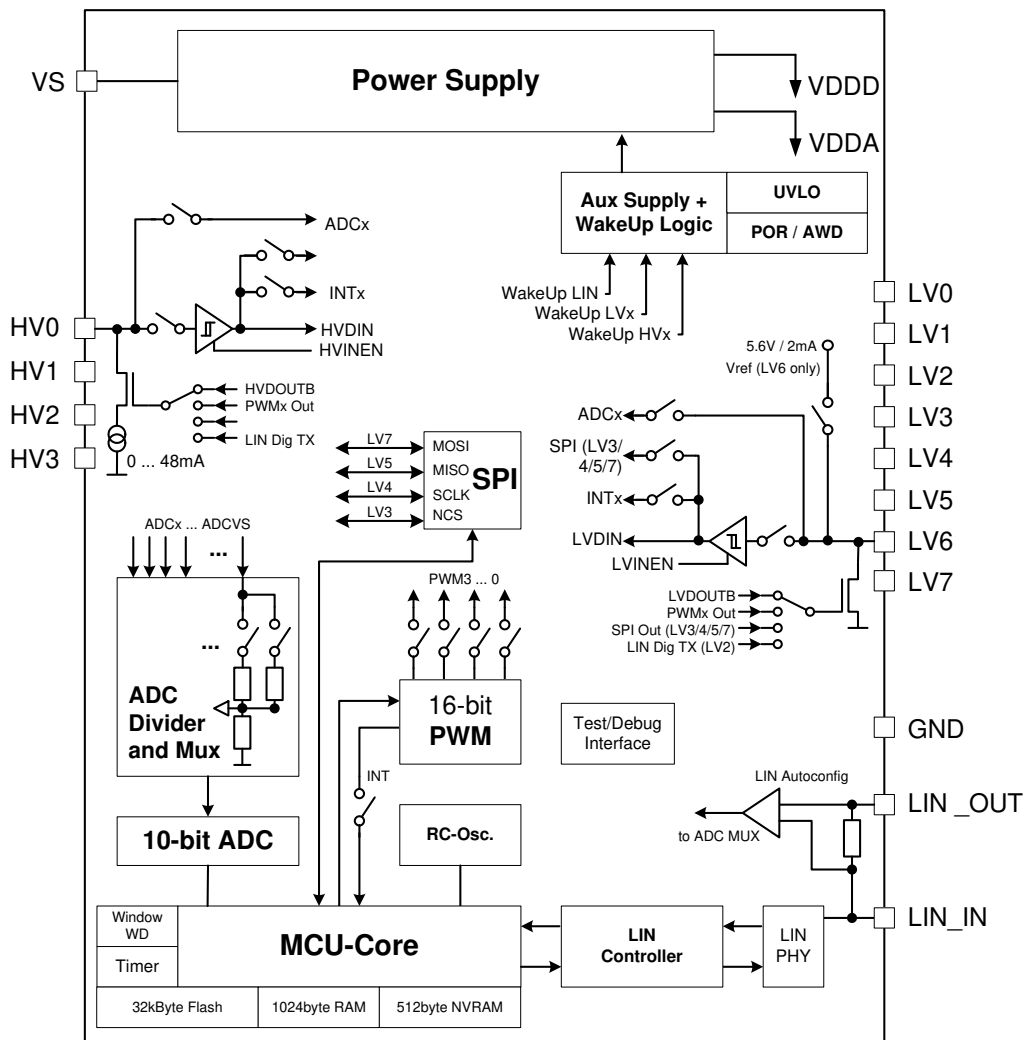


Figure 1 - Block Diagram

Product Abstract

MLX81109 Mini LIN/LIN RGB Slave Controller

6. Electrical Characteristics

All voltages are referenced to ground (GND). Positive currents flow into the IC.

6.1. Operating Conditions

Parameter	Symbol	Min	Max	Unit
Battery supply voltage ^[1]	V_S	5.5	18	V
Operating ambient temperature	T_{amb}	-40	+125	°C

Table 1 - Operating Conditions

1) V_S is the IC supply voltage including voltage drop of reverse battery protection diode, $V_{DROP} = 0.4...1V$, $V_{BAT_ECU} = 6...27V$.

7. Application Hints

7.1. Application Example

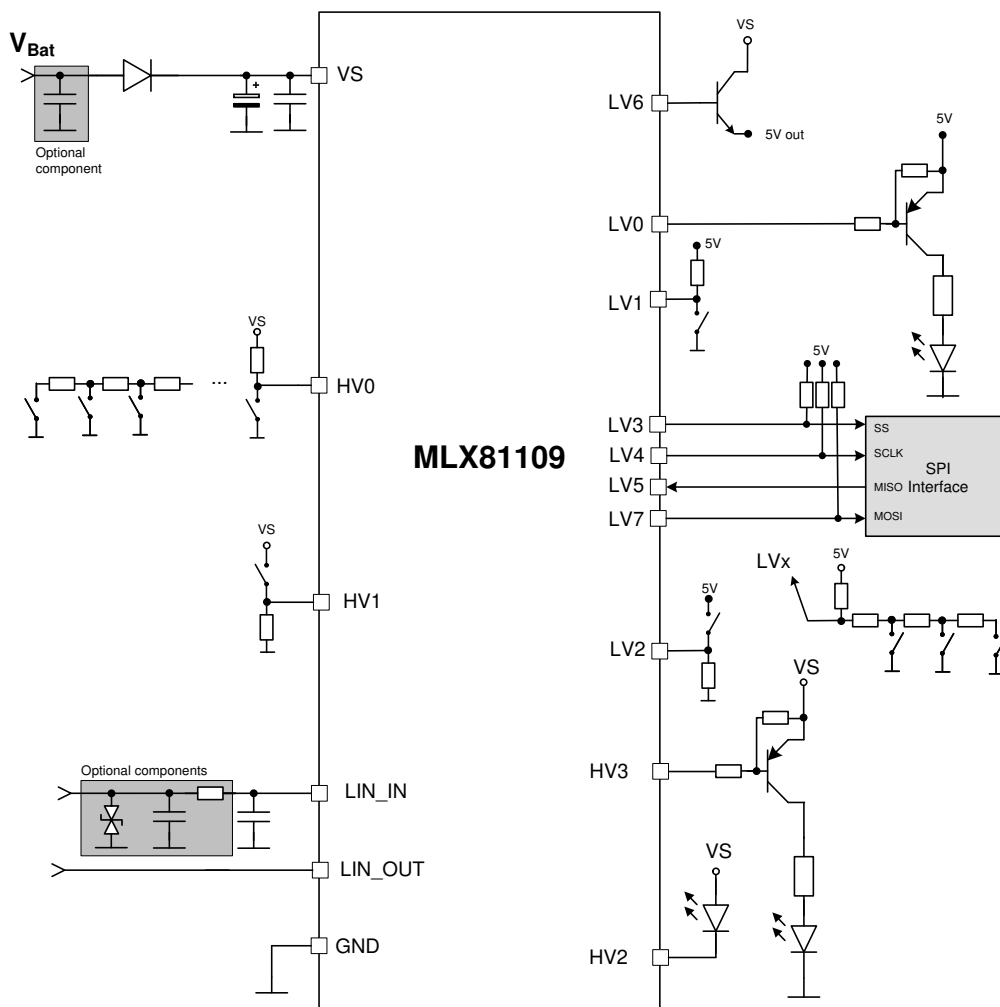


Figure 2 - LIN RGB Slave

Product Abstract

MLX81109

Mini LIN/LIN RGB Slave Controller

8. Soldering information

Please see

<http://www.melexis.com/Assets/Soldering-Application-Note-and-Recommendations-5446.aspx>

9. Contact

For the latest version of this document, go to our website at www.melexis.com.

For additional information, please contact our Direct Sales team and get help for your specific needs:

Europe, Africa	Email : sales_europe@melexis.com
Americas	Email : sales_usa@melexis.com
Asia	Email : sales_asia@melexis.com

10. Disclaimer

The information furnished by Melexis herein ("Information") is believed to be correct and accurate. Melexis disclaims (i) any and all liability in connection with or arising out of the furnishing, performance or use of the technical data or use of the product(s) as described herein ("Product") (ii) any and all liability, including without limitation, special, consequential or incidental damages, and (iii) any and all warranties, express, statutory, implied, or by description, including warranties of fitness for particular purpose, non-infringement and merchantability. No obligation or liability shall arise or flow out of Melexis' rendering of technical or other services.

The Information is provided "as is" and Melexis reserves the right to change the Information at any time and without notice. Therefore, before placing orders and/or prior to designing the Product into a system, users or any third party should obtain the latest version of the relevant information to verify that the information being relied upon is current.

Users or any third party must further determine the suitability of the Product for its application, including the level of reliability required and determine whether it is fit for a particular purpose.

The Information is proprietary and/or confidential information of Melexis and the use thereof or anything described by the Information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights.

This document as well as the Product(s) may be subject to export control regulations. Please be aware that export might require a prior authorization from competent authorities.

The Product(s) are intended for use in normal commercial applications. Unless otherwise agreed upon in writing, the Product(s) are not designed, authorized or warranted to be suitable in applications requiring extended temperature range and/or unusual environmental requirements. High reliability applications, such as medical life-support or life-sustaining equipment are specifically not recommended by Melexis.

The Product(s) may not be used for the following applications subject to export control regulations: the development, production, processing, operation, maintenance, storage, recognition or proliferation of 1) chemical, biological or nuclear weapons, or for the development, production, maintenance or storage of missiles for such weapons; 2) civil firearms, including spare parts or ammunition for such arms; 3) defense related products, or other material for military use or for law enforcement; 4) any applications that, alone or in combination with other goods, substances or organisms could cause serious harm to persons or goods and that can be used as a means of violence in an armed conflict or any similar violent situation.

The Products sold by Melexis are subject to the terms and conditions as specified in the Terms of Sale, which can be found at <https://www.melexis.com/en/legal/terms-and-conditions>.

This document supersedes and replaces all prior information regarding the Product(s) and/or previous versions of this document.

Melexis NV © - No part of this document may be reproduced without the prior written consent of Melexis. (2016)

ISO/TS 16949 and ISO14001 Certified