UM12341

EVBMLC2HOST and EVBMLC2PER evaluation boards

Rev. 1.0 — 31 July 2025 **User manual**

Document information

Information	Content
Keywords	Host Evaluation Board Peripheral EVB MLC EVBMLC2HOST EVBMLC2PER
Abstract	The kit helps you build a modular lighting system based on the ASL6112SHN for rapid evaluation of this product.

1 Introduction

The ASL6112SHN - belonging to the ASL61xxyHz family of enhanced matrix LED controller (MLC) targeting advanced automotive exterior lighting applications - can be evaluated using the dedicated evaluation board (EVB).

The MLC provides 16 channels, each consisting of an integrated switch for bypassing current from the LED/segment. A microcontroller can control multiple MLCs through the CAN interface. The MLC can detect a loss of communication with the external microcontroller and switch to Limp Home mode (LHM) to ensure vehicle safety.

Each output channel can be driven in Pulse Width Modulation (PWM) mode. PWM mode provides an individually programmable duty cycle (DC) via the user interface, to enable fine regulation of the light intensity and freely definable lighting patterns. The PWM frequency is tunable and the PWM phase can be individually programmed.

The ASL6112SHN is connectable to an NTC to measure the LED temperature. The device offers several diagnostic features.

The user can compose a reference system for quick evaluation, based on two types of EVB. The host EVB is essential to manage the lighting system. The peripheral EVB can optionally be used to expand the capability of the host EVB.

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2 Finding kit resources and information on the NXP website

NXP Semiconductors provides online resources for this evaluation board and its supported devices on https://www.nxp.com/.

1. Direct link to the EVBMLC2HOST (KIT-ASL6112SHN)
   https://www.nxp.com/design/design-center/development-boards-and-designs/EVBMLC2HOST
2. Link to the NXP MLC GUI (the software you must be able to work with the kit)
   https://www.nxp.com/design/design-center/software/analog-expert-software-and-tools/flexgui-software-toolfor-evaluation-of-reference-design-kits:FLEXGUI-SW
   Once in the page, look for the GUI App for Matrix LED Controller (MLC).
3. Link to EVBMLC2PER (an optional EVB you can buy to expand the kit)
   https://www.nxp.com/design/design-center/development-boards-and-designs/EVBMLC2PER
4. Link to the ASL61XXYHZ
   https://www.nxp.com/ASL61XXYHZ

An additional evaluation GUI, usable under the CANoe environment, can be downloaded by accessing your secured area at https://www.nxp.com/. Once in the page, type the following string in the search bar: ASL6112SHN CANoe project. You are redirected to the download. Downloading the Vector CANoe project only makes sense if you have a Vector CAN interface, such as the VN1630A.

3 Getting ready

Working with the KIT ASL6112SHN requires the kit contents, additional hardware, and a Windows PC workstation with installed software.

3.1 Kit contents

The kit contents include:

- Assembled and tested EVBMLC2HOST evaluation board in an antistatic bag. It includes an ASL6112SHN and an UJA1163ATK.
- One cable consisting of a yellow/green twisted pair for CAN communication and a red/black cable pair for external power supply at 12 V. The yellow/green cable is terminated with male and female D-Sub 9 connectors. The red/black cable is terminated with banana jacks.

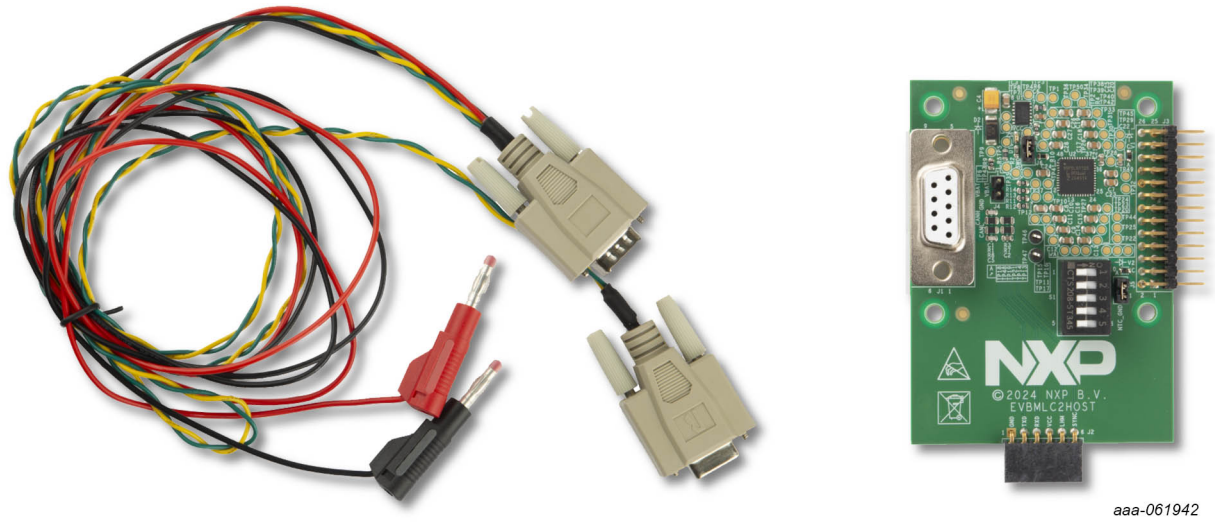

Figure 1. Kit including host EVB and cable

3.2 Additional hardware

In addition to the kit contents, the following hardware can be either beneficial or even necessary when working with the kit.

- EVBMLC2PER, the peripheral EVB that can be used to expand the capability of the host EVB, to handle more LEDs. Indeed, the kit can be expanded adding multiple peripheral EVBs. If multiple peripherals are used, no external power is needed, as the power supply comes via the connected host EVB or the adjacent peripheral EVB, .
- LED board. Although an LED board is essential, the one shown in this manual is not for sale, as customers have their own LED configurations - normally different from each other - resulting from their own requirements.
- ASL45XASLX41 evaluation board. It includes both the ASL4500SHN and ASL3416SHN integrated circuits (IC). The board is useful for individually powering up to six LED boards with a DC voltage of up to 60 V, while respecting a desired maximum current limit.
- S32K144 evaluation board. The board, highly recommended, includes a microcontroller (MCU) for managing via CAN interface both EVBMLC2HOST and EVBMLC2PER. It also manages the ASL45XASLX41.
- Power supply. A single supply with multiple 12 V outputs or multiple 12 V supplies are necessary for the following boards: EVBMLC2HOST, ASL45XASLX41, and S32K144.

- External CAN interface. This optional hardware can be, for example, a Vector VN1630A CAN/CAN FD interface or similar, manageable with the Vector CANoe software.

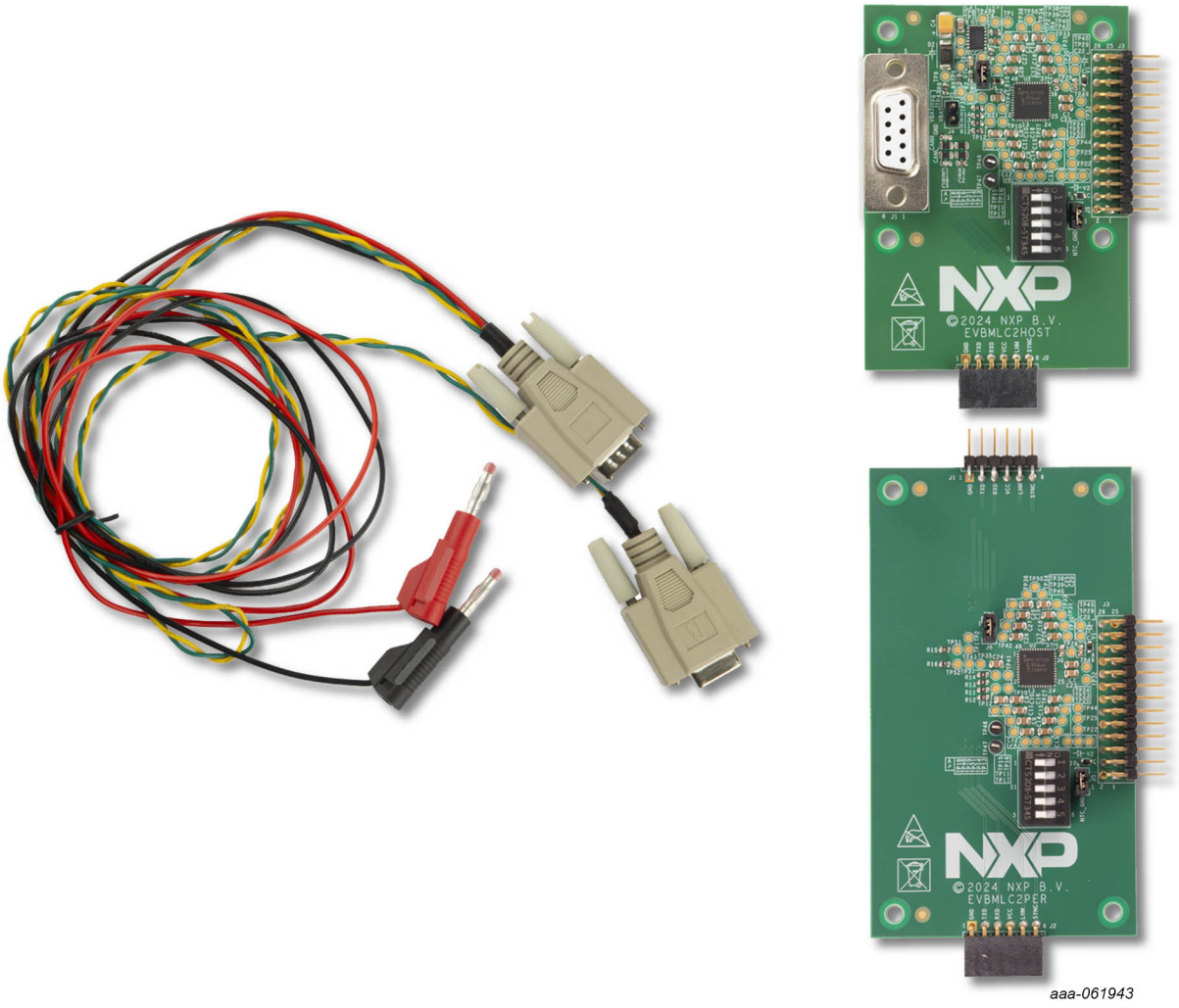

Figure 2. Kit expanded by adding one EVBMLC2PER to the EVBMLC2HOST

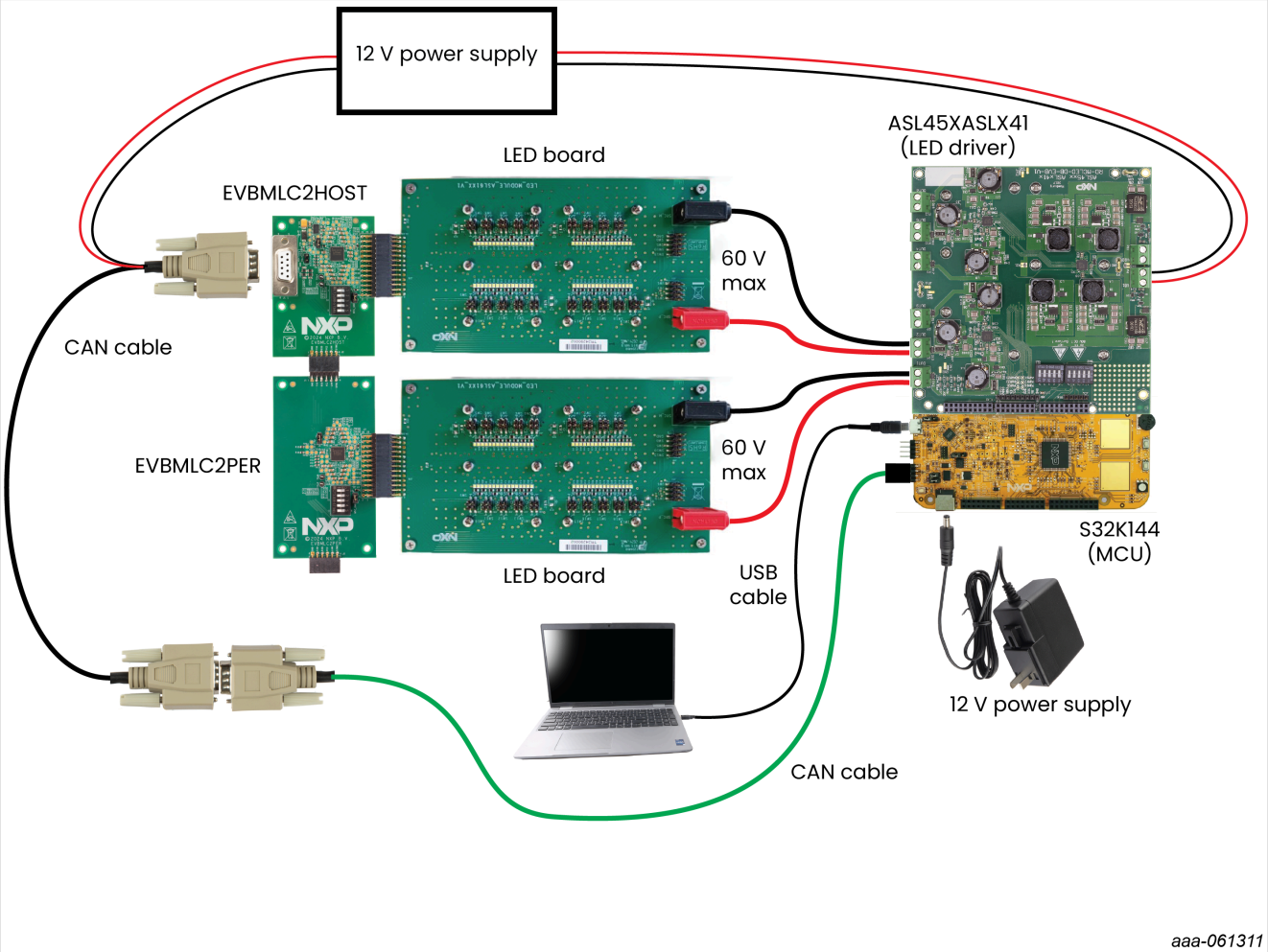

Figure 3. Additional material

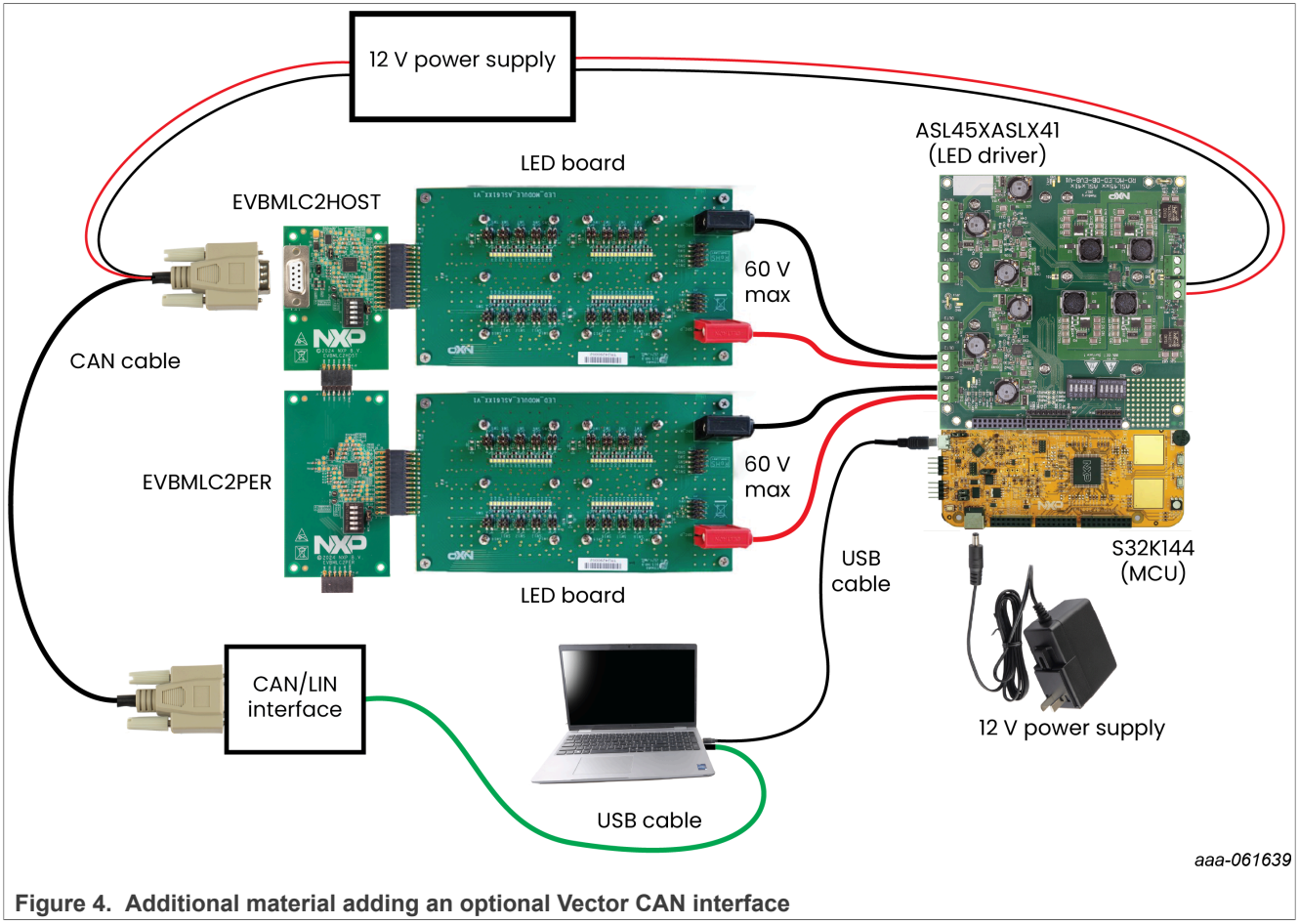

Figure 4. Additional material adding an optional Vector CAN interface

3.3 Minimum system requirements

This evaluation board requires a laptop with Windows 10 or Windows 11 OS. The laptop must have at least one USB type A or, even better, two of them.

3.4 Software

Installing the software - NXP MLC GUI or, as an alternative, CANoe based GUI, is essential for being able to work with the evaluation kit. See Section 2.

- NXP MLC GUI. The required material and setup information are shown in Figure 2. If using this option, there is no need for an external CAN interface and the CANoe software. The available firmware can be downloaded to the flash memory of the MCU mounted on the S32K144 evaluation board. The graphical user interface (GUI) runs on a Microsoft-Windows-based laptop. In addition to the software, in the download you find detailed documentation with installation instructions and a user manual.
- MLC2 CANoe project. The required material and setup information are shown in Figure 3. This is an option needing additional hardware - a Vector CAN interface - and the CANoe software. Detailed usage instructions can be found in ASL61XXYHZ_AN - an application note.

4 Getting to know the hardware

4.1 Board features

The EVBMLC2HOST has the following features built into the ASL6112SHN:

- 200 MHz oscillator
- 16 channels, arranged in four configurable blocks of four switches
- Flexible PWM driver for the individual channel
- LED temperature measurement via NTC
- Advanced diagnosis for LED open/short detection, nonfunctional switch detection, individual channel voltage measurement, and so on
- Synchronized frequencies when using multiple MLC devices
- CAN communication logic

The EVBMLC2HOST offers the possibility to modify the least significant part of the CAN address by positioning five switches.

Furthermore, the EVBMLC2HOST has the following features embedded in the UJA1163ATK system basis chip (SBC):

- 5 V low dropout regulator (LDO)
- CAN transceiver

The EVBMLC2PER has the following features built into the ASL6112SHN:

- 200 MHz oscillator
- 16 channels, arranged in four configurable blocks of four switches
- Flexible PWM driver for the individual channel
- LED temperature measurement via NTC
- Advanced diagnosis for LED open/short detection, nonfunctional switch detection, individual channel voltage measurement, and so on
- Synchronized frequencies when using multiple MLC devices
- CAN communication logic

The EVBMLC2PER offers the possibility to modify the least significant part of the CAN address by positioning five switches.

However, as the EVBMLC2PER has no UJA1163ATK SBC, it misses the 5 V LDO and the CAN transceiver. The reason is, for the EVBMLC2PER to work, it must be connected to the EVBMLC2HOST. The connection allows the EVBMLC2PER to access the 5 V LDO and the CAN transceiver present on the host board, which are shared hardware resources.

4.2 Board description

The EVBMLC2HOST, whose appearance is shown in Figure 5 and whose schematic is given in Figure 7, includes the following components:

- **ASL6112SHN** matrix LED controller
- **UJA1163ATK** system basis chip (SBC) – Uses a 12 V input supply
- **J1** female DB9 sub connector – Supplies the board with 12 V and communication via the CAN cable
- **J2** female connector – Connects to EVBMLC2PER
  Plug the six-pin J1 male connector belonging to the EVBMLC2PER board into this connector.
- **J3** male connector – Connects to LED board
- **J4** jumper – Controls supply to the board

Add a short to this jumper, otherwise the board remains unsupplied. When the board is supplied, a red LED emits light.

- **LED** – Emits red light only if 12 V comes through the DB9 sub connector and the J4 jumper has been provided with a short
- **S1** five-switch block – Sets the board physical address
  The initial address is 0b11111, equivalent to decimal 32. The switch at position 5 corresponds to the least significant bit, while position 1 corresponds to the most significant bit. It is highly recommended to change the switch positions to get a small address. For instance, 0b00000 = 0 decimal. To get this address value, move all five switches shown in Figure 5 to the opposite position.

Notice that the ID resistor and the NTC have not been populated. This is because they belong to the domain of the LED board.

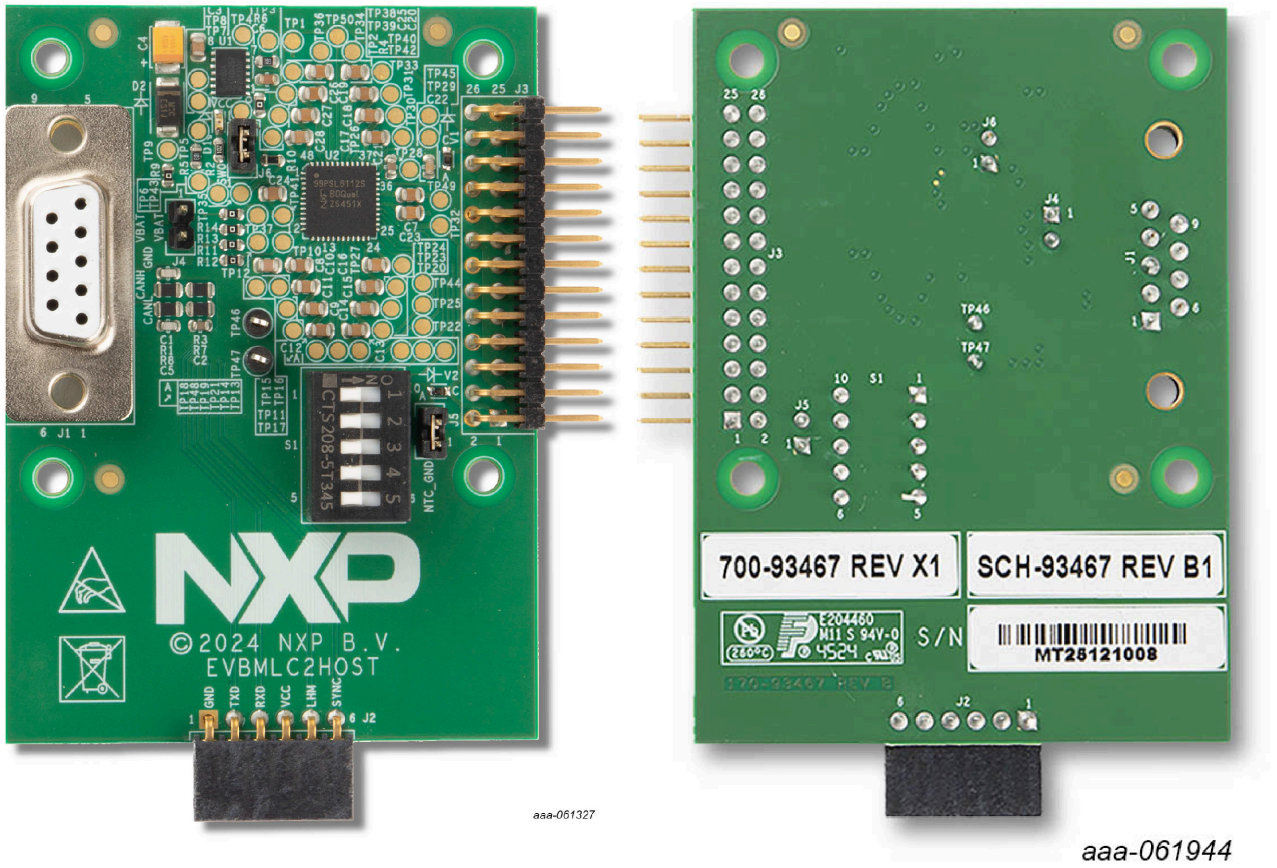

Figure 5. Host EVB (EVBMLC2HOST)

The EVBMLC2PER, whose appearance is shown in Figure 6 and whose schematic is given in Figure 8, includes the following components:

- **ASL6112SHN** matrix LED controller
- **J1** male connector – Connects to EVBMLC2HOST
  Plug the six-socket J2 female connector belonging to the EVBMLC2HOST board onto this connector.
- **J2** female connector – Plugs onto the six pins J1 male connector belonging to the adjacent board
- **J3** male connector – Connects to LED board
- **S1** five-switch block – Sets the physical address of the ASL6112SHN

- The initial address is 0b11111, equivalent to decimal 32. The switch at position 5 corresponds to the least significant bit, while position 1 corresponds to the most significant bit. It is highly recommended to change the switch positions to get a small address, for instance 0b00001 = 1 decimal. To get this address value, the four switches labeled 1 to 4, shown in Figure 6, must be moved to the opposite position. For a peripheral board, it is good practice to use a higher address than the host card address. If more peripherals needed, keep on incrementing the address by one unit.

Notice that the ID resistor and the NTC have not been populated. This is because they belong to the domain of the LED board.

Figure 6. Peripheral EVB (EVBMLC2PER)

5 Design resources

5.1 Board information

The schematics of the boards follow. For board layout and routing information, see reference 1 in Section 2.

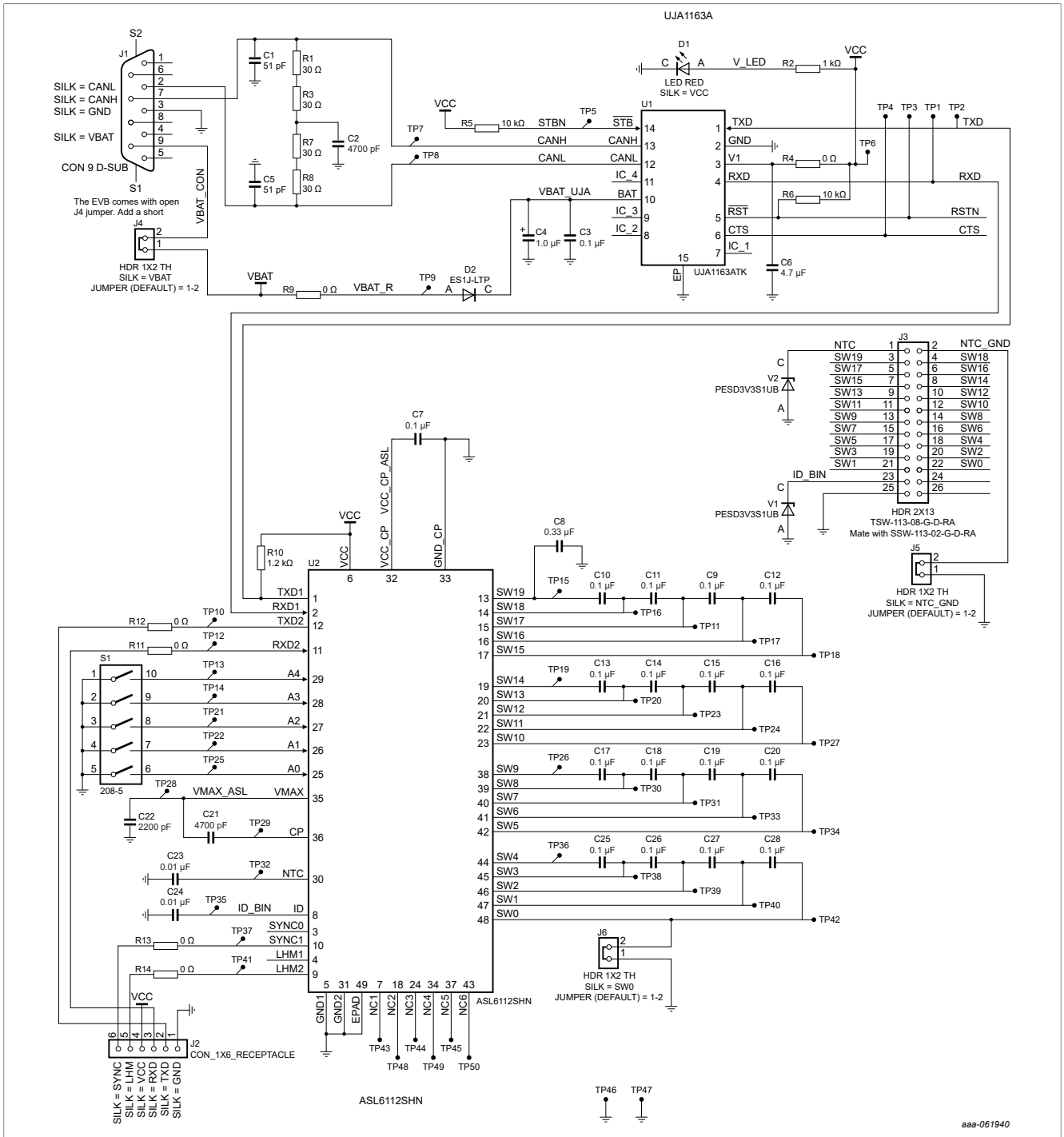

Figure 7. EVBMLC2HOST schematic

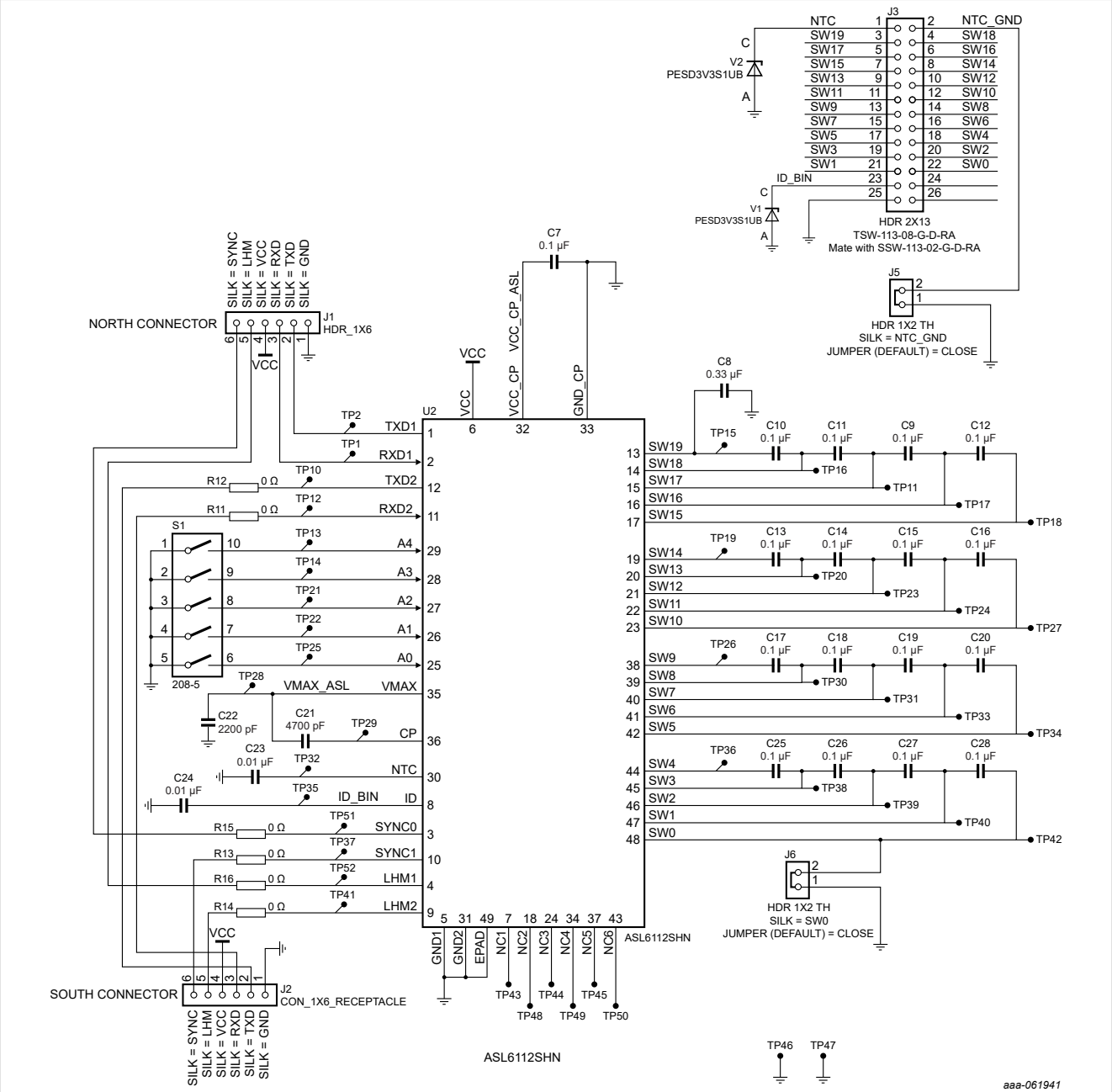

Figure 8. EVBMLC2PER schematic

6 Revision history

Table 1. Revision history

Document ID	Release date	Description
UM12341 v.1.0	31 July 2025	• Initial version

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