GRINN

Datasheet

EvseSOM HAT

1 Features

- Provides a zero-wiring connection between the Raspberry Pi and the EvseSOM™ module
- CP interface available on a dedicated SMA connector and a spring terminal block connector
- PP interface available on a spring terminal block connector
- PP switch for resistance manipulation, capable of simulating 13 A, 20 A, and 32 A cable current capacities according to IEC 61851-1
- EvseSOM™ UART interface exposed via pin headers
- Test points provided for each signal
- Power supply via Raspberry Pi, an external DC jack or a spring terminal block
- All unused Raspberry Pi GPIOs available on pin header, allowing connection of external components

2 Applications

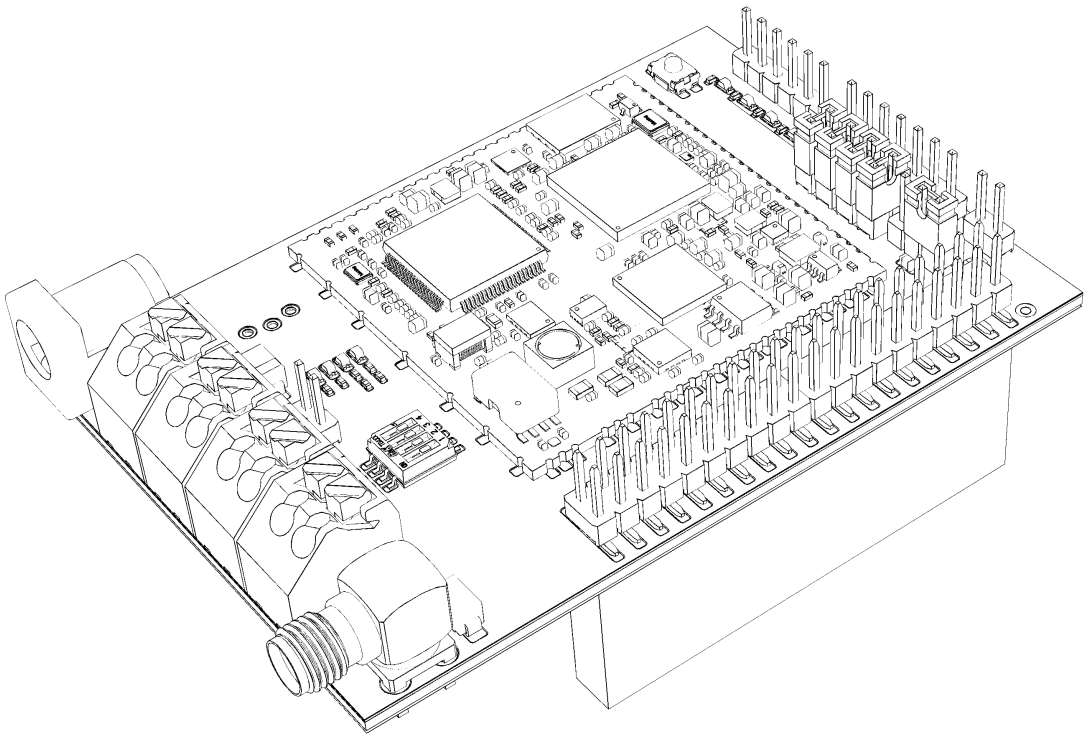
- EvseSOM™ integration and evaluation

3 Description

The EvseSOM™ HAT is an evaluation and development platform designed to streamline the integration and testing of the EvseSOM™ module in compliance with **IEC 61851-1**, **ISO 15118-2**, and **ISO 15118-20**[1] standards.

Interfacing via UART, this Raspberry Pi-compatible board features flexible Control Pilot routing and a 4-position DIP switch for manual Proximity Pilot cable simulation.

Crucially, an onboard logic AND gate enforces a dual-interlock hardware safety loop, ensuring that the contactor output is active only when both the EvseSOM™ module and the host MCU confirm system readiness.



[1] Availability is planned for the end of 2026 and subject to change.

Contents

4 About EvseSOM™

The EvseSOM™ is a highly integrated System-on-Module (SOM) designed to serve as the core of a Supply Equipment Communication Controller (SECC) for eMobility applications.

It is driven by an **NXP i.MX RT1061** processor and a **Lumissil IS31CG5317** transceiver, acting as a bridge between the vehicle charging interface and a host application processor.

The module simplifies EVSE design by providing a complete software stack for global charging standards, including **ISO 15118**, **DIN 70121**, and **IEC 61851-1**, while operating from a single 5 V power supply.

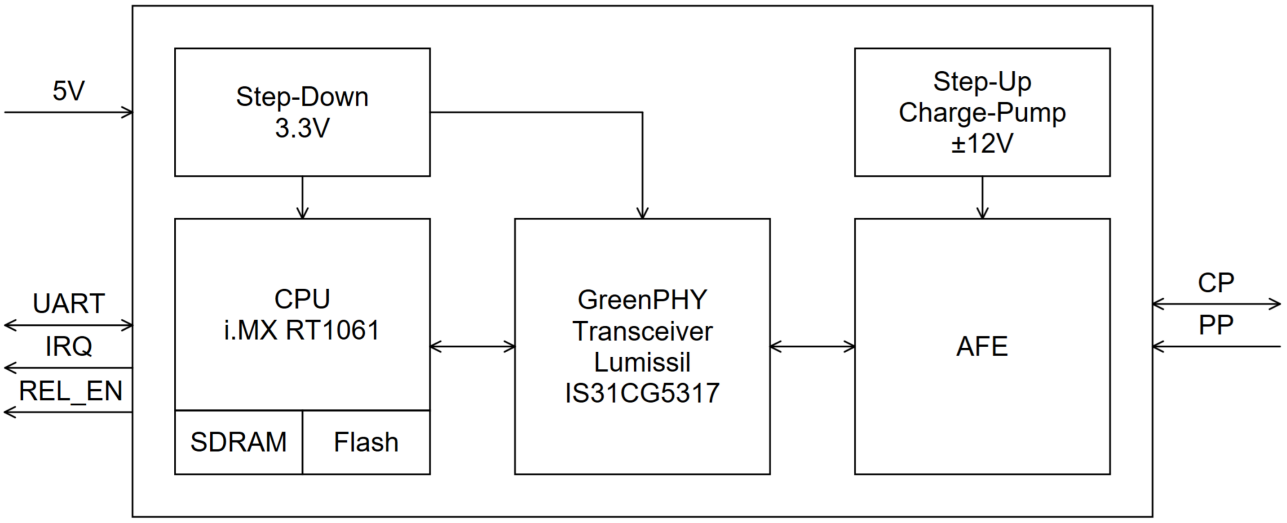


Fig. 1: EvseSOM™ block diagram

5 About the EvseSOM™ HAT

The EvseSOM™ HAT is a hardware extension for the Raspberry Pi that serves as an evaluation and development platform for integrating eMobility charging solutions. It provides the logic interfaces, protection circuitry and physical charging communication peripherals required to validate EvseSOM™-based applications.

The board interfaces with the host Raspberry Pi over UART establishing a communication link to the high-level Charge Control Unit.

For vehicle-side interfacing, the board routes the Control Pilot signal to both an SMA connector or a spring terminal block, complemented by an onboard 4-position DIP switch for Proximity Pilot cable current simulation.

A hardware-level dual-interlock safety loop is implemented via an integrated logic AND gate, ensuring that the main contactor output is asserted only when both the host processor and the EvseSOM™ module simultaneously confirm a safe state.

5.1 Power Supply input

The EvseSOM™ HAT can be powered from one of two sources:

- directly from the Raspberry Pi
- from an external 5 V DC power supply

The power source is selected using jumper J8.

An external power supply can be connected using one of the following connectors:

- J1 - 5.5 mm / 2.1 mm DC barrel connector
- J16 - 3.5 mm spring terminal connector

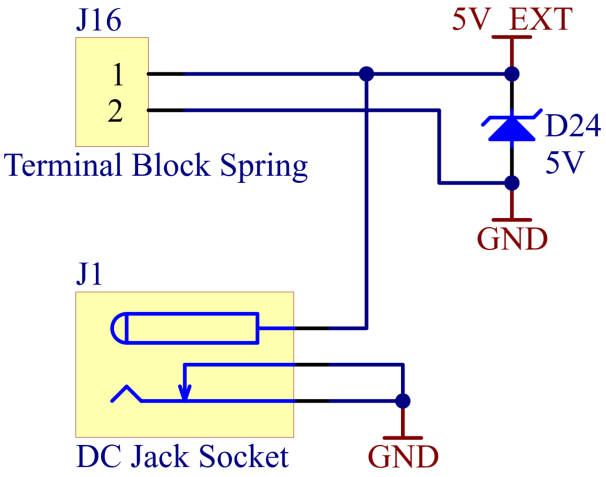


Fig. 2: External power input schematics

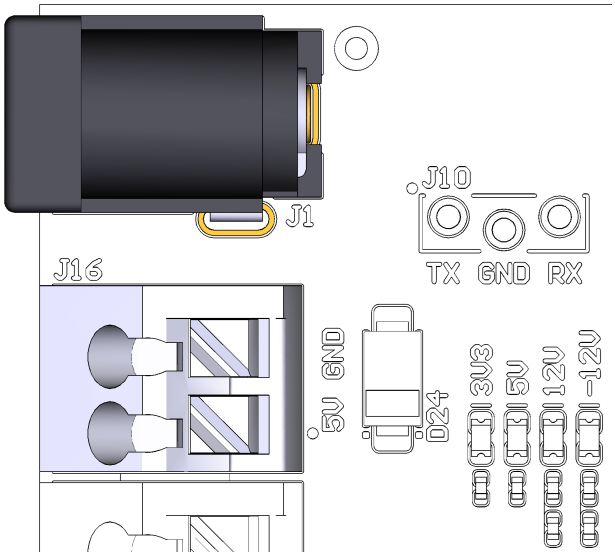


Fig. 3: External power input connectors

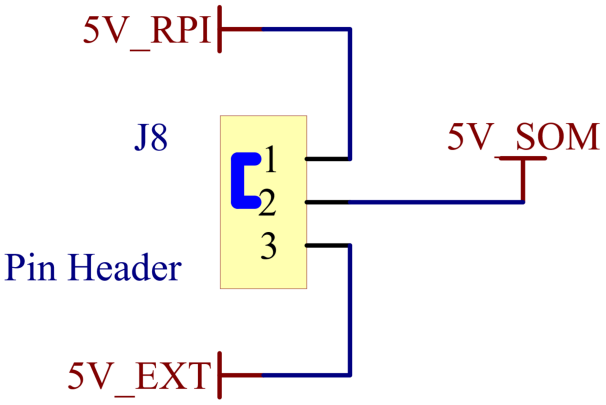


Fig. 4: Power selection schematic

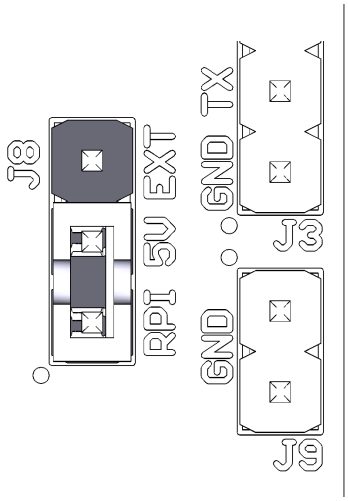


Fig. 5: Power selection jumper

5.2 Power Supply indicators

The status of each power rail, including both the input supply and the rails generated internally by the EvseSOM™ module, can be monitored using four dedicated LEDs:

- D2 — 5 V supply
- D1 — 3.3 V rail generated by the EvseSOM™ module
- D8 — +12 V rail generated by the EvseSOM™ module
- D9 — -12 V rail generated by the EvseSOM™ module

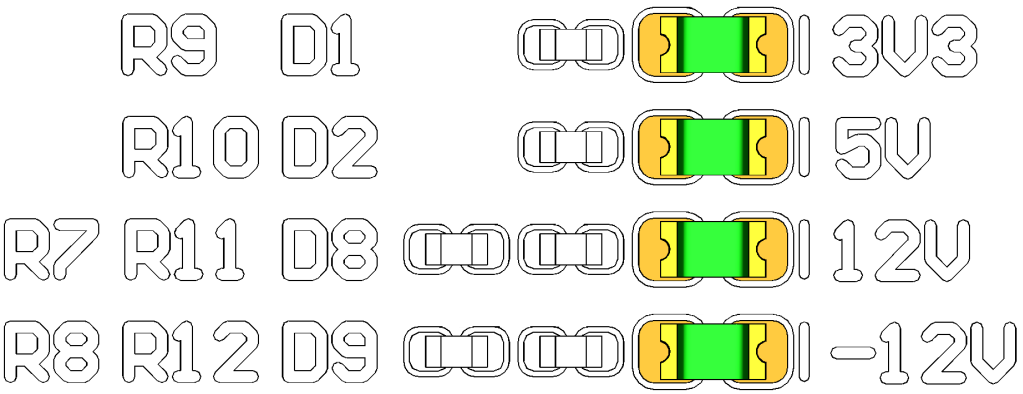


Fig. 6: Power indicators

6 Interfaces Towards the Host Processor

The following sections describe each interface available on the EvseSOM™ HAT, including its functionality, connector definitions and intended use cases.

6.1 Reset Signal

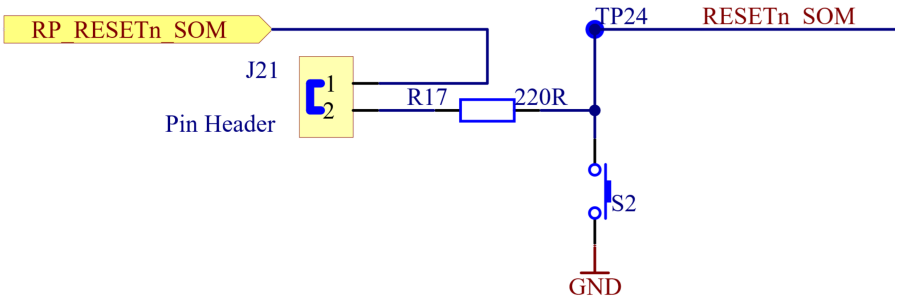


Fig. 7: Reset circuit

The Raspberry Pi can reset the EvseSOM™ module via a dedicated RESETn line connected to Raspberry Pi GPIO17. Jumper J21 allows this connection to be disconnected if needed.

An additional switch, S2, allows the EvseSOM™ to be reset manually.

The state of this line can be monitored via the dedicated LED D3.

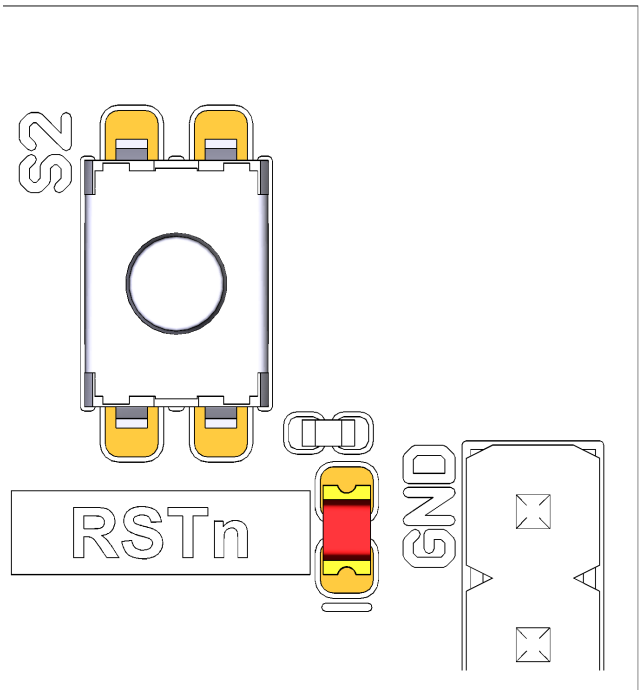


Fig. 8: Reset switch and indication diode

6.2 UART Interface

The EvseSOM™ HAT connects the EvseSOM™ module directly to the Raspberry Pi UART, available on GPIO14 and GPIO15.

If needed, this UART connection can be disconnected by removing jumpers J5 and J7.

Communication between the Raspberry Pi and the EvseSOM™ module can be monitored via two dedicated LEDs: D4 and D5.

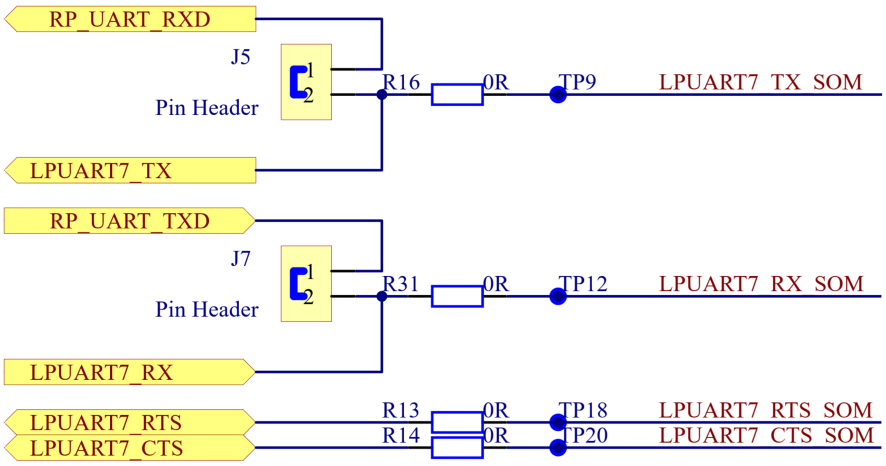


Fig. 9: UART interface connections

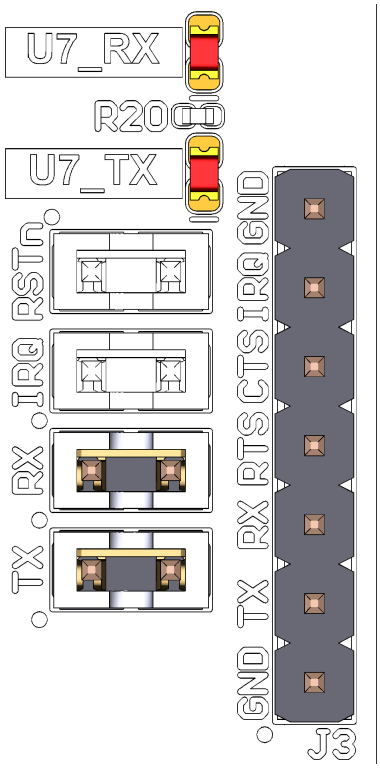


Fig. 10: UART connection between EvseSOM™ and Raspberry Pi, connector and LED indicators

6.3 Interrupt Signal

The EvseSOM™ interrupt line is connected to an Raspberry Pi GPIO pin. It can be disconnected, if needed, via jumper J21.

The state of this line can be monitored via the dedicated LED D7.

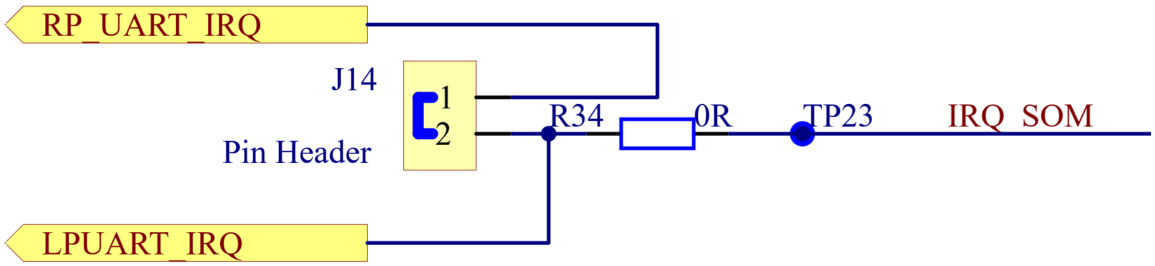


Fig. 11: IRQ schematic

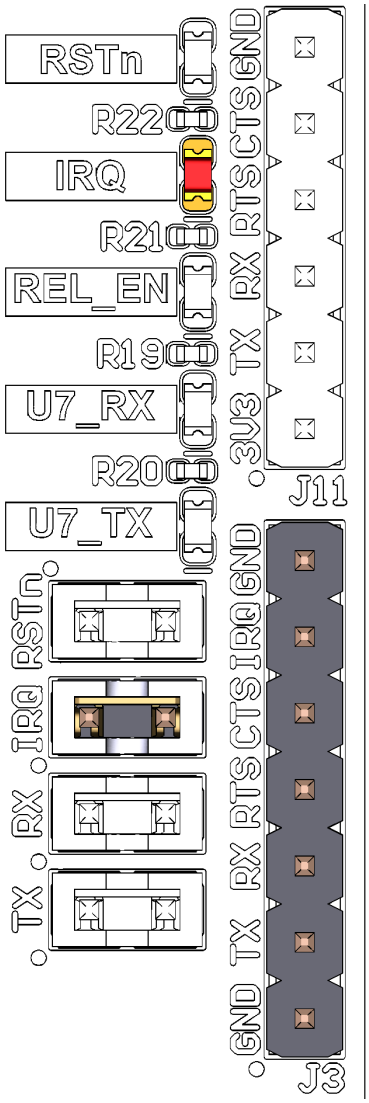


Fig. 12: IRQ connection between EvseSOM™ and Raspberry Pi, connector and LED indicator

6.4 Additional Terminals

Most signals are also exposed on dedicated pin headers. If required, the connection between the EvseSOM™ module and the Raspberry Pi can be disconnected via the corresponding jumpers. The table below lists all available signals and jumpers.

Tab. 1: Connections

Signal	Direction	Connector	Jumper
UART TX	EvseSOM™→ Raspberry Pi	J3 pin 2	J7
UART RX	EvseSOM™ ← Raspberry Pi	J3 pin 3	J5
UART RTS	EvseSOM™→ Raspberry Pi	J3 pin 4	-
UART CTS	EvseSOM™ ← Raspberry Pi	J3 pin 5	-
IRQ	EvseSOM™→ Raspberry Pi	J3 pin 6	J14

Note 1: Per the EvseSOM™ datasheet, RTS/CTS hardware flow control is not used by the current software stack, so these connections are optional.

Note 2: Pin headers J10 and J11 are provided for internal debug purposes only and should be left unconnected during normal operation.

6.5 Power Control Circuit

Both the EvseSOM™ module and the Raspberry Pi have to control the main current-path relay(s) and either device can force the relay(s) to disconnect at any time.

To implement this functionality, the EvseSOM™ HAT logically ANDs both signals:

- SOM_REL_EN — controlled by the EvseSOM™ module
- HOST_REL_EN — controlled by the Raspberry Pi

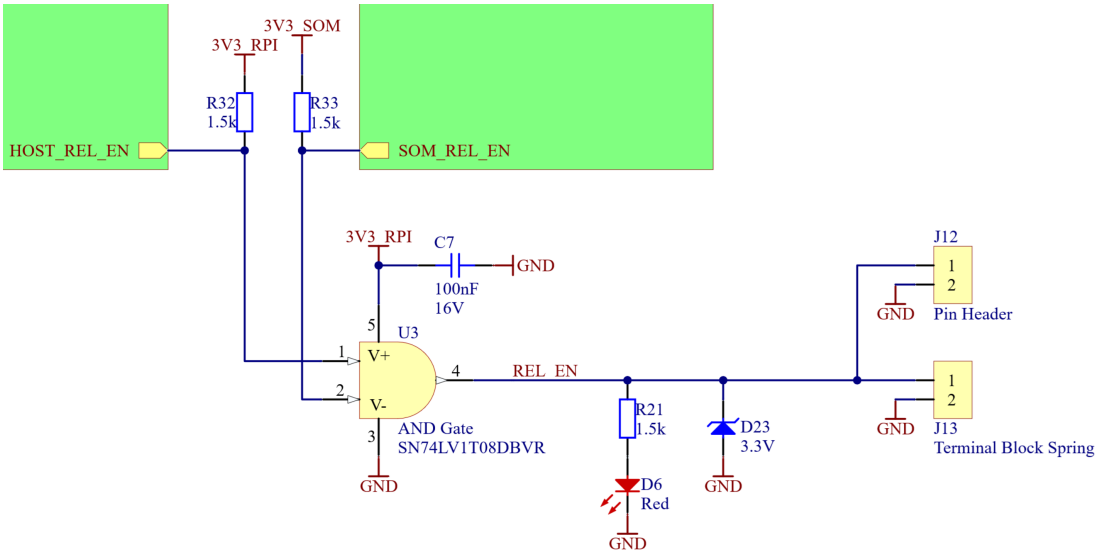


Fig. 13: Relay enable control circuit

The combined output (REL_EN) is exposed on pin header J12 and spring connector J13.

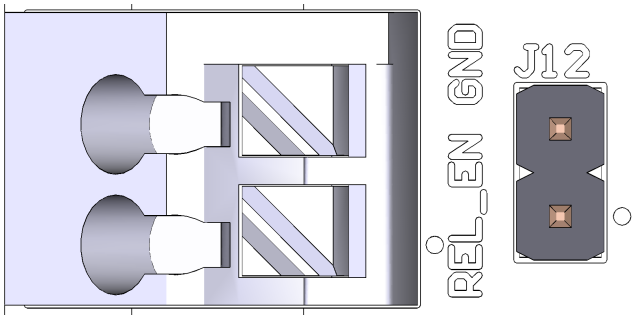


Fig. 14: Relay enable control connectors

The state of the REL_EN signal can be monitored via the dedicated LED D6.

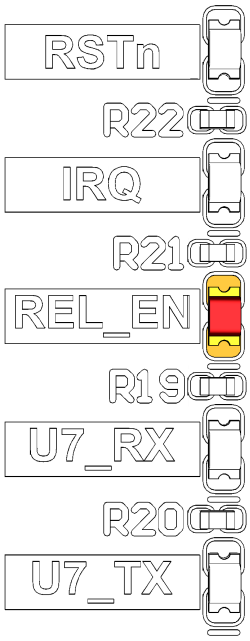


Fig. 15: Relay enable control indicator

7 EVSE Interface

Both signals required to connect the EvseSOM™ module to the EVSE: Control Pilot and Plug Present are available on the EvseSOM™ HAT.

7.1 Control Pilot

Control Pilot signal is connected to two connectors and protected against overvoltage:

- J2: SMA connector
- J4: spring terminal connector

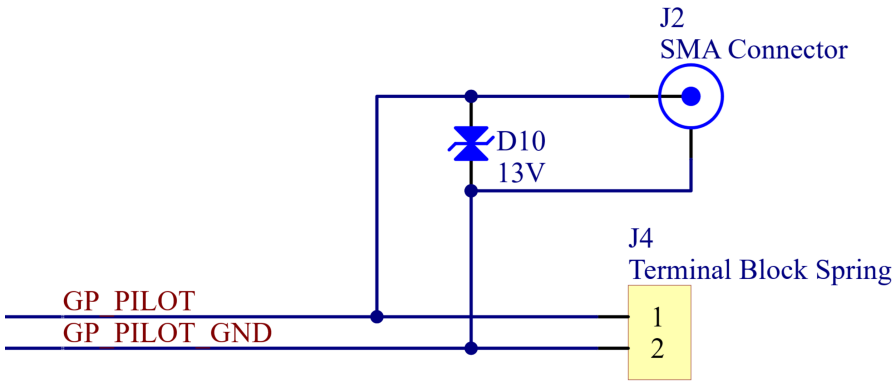


Fig. 16: Control Pilot connectors and overvoltage protection

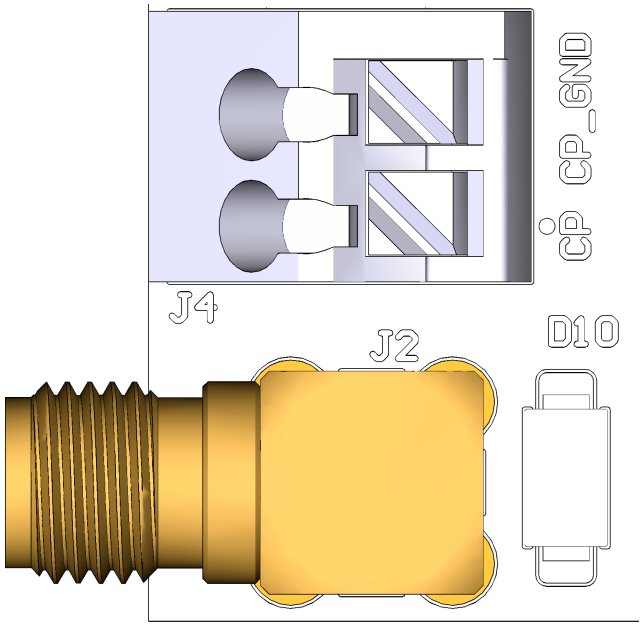


Fig. 17: Control Pilot connectors

7.2 Plug Present

Second signal of the EVSE interface - Plug present (Proximity) is connected to the J6 terminal block connector and makes the possibility to connect ie. EV.

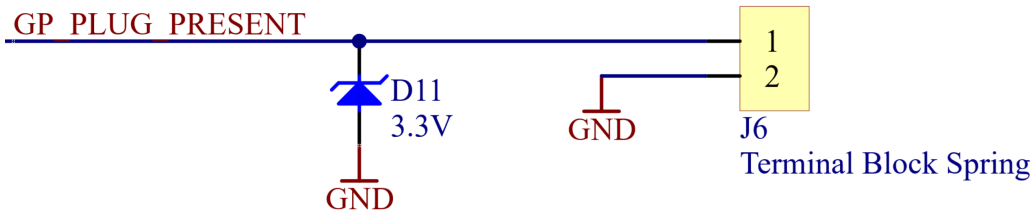


Fig. 18: Plug present circuit

Another option is an onboard DIP switch - S1 - which allows simulation of one of three predefined cable current ratings: 13 A, 20 A, or 32 A.

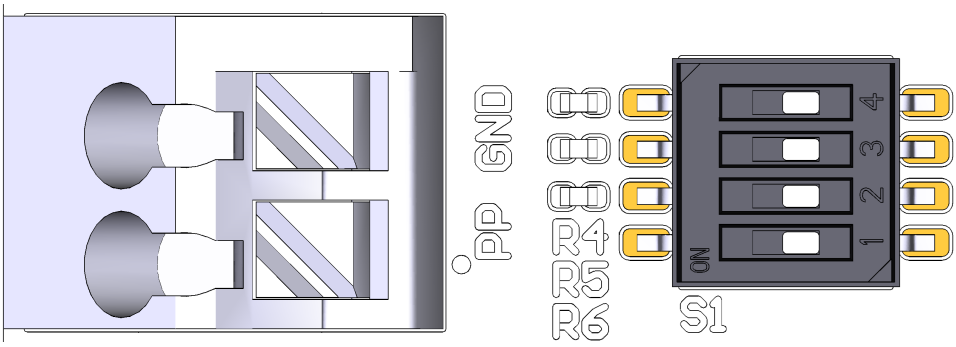


Fig. 19: Plug present connector and simulation switch

Tab. 2: DIP Switch S1 Cable Capacity Simulation Hardware Truth Table

Pos. 1	Pos. 2	Pos. 3	Pos. 4	Simulated Cable Status	Active Resistor
OFF	OFF	OFF	OFF	Cable disconnected / open circuit	None
ON	OFF	OFF	OFF	Cable plugged (no limit defined)	None
ON	ON	OFF	OFF	13 A Cable Profile (1.5 kΩ)	R6
ON	OFF	ON	OFF	20 A Cable Profile (680 Ω)	R5
ON	OFF	OFF	ON	32 A Cable Profile (220 Ω)	R4

8 Mechanical Characteristics

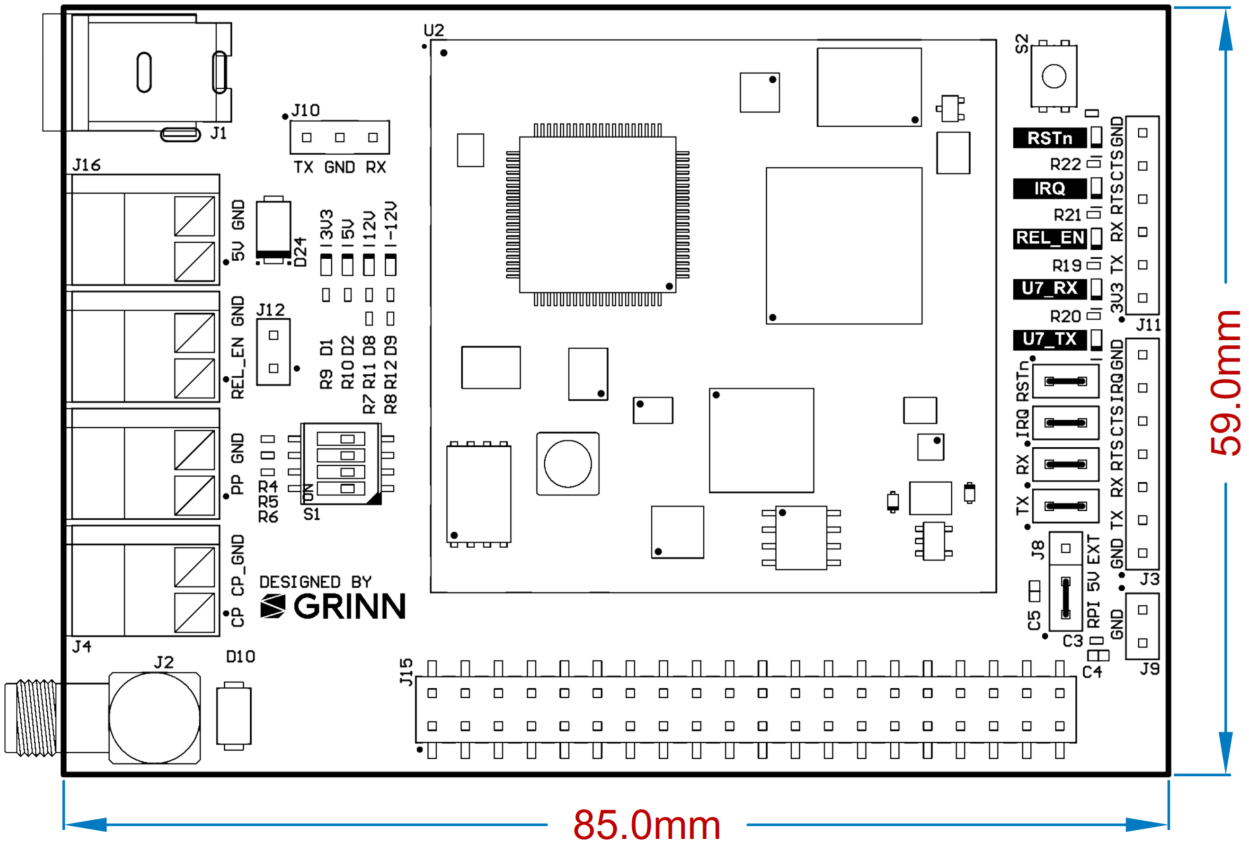


Fig. 20: EvseSOM™ HAT dimensions

Revision History

Revision	Date	Description
1.0	2026-08-20	Initial release.

Grinn sp. z o.o.

Strzegomska 140a
54-429 Wrocław, Poland

grinn-global.com
office@grinn-global.com
+48 71 716 40 99