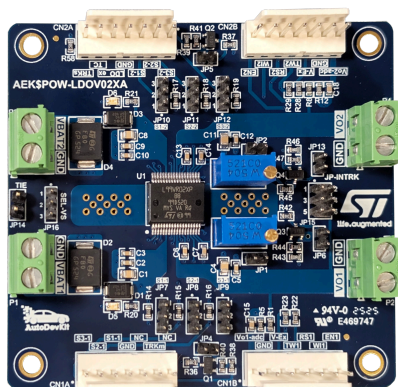


Dual automotive-grade linear voltage regulator evaluation board with configurable output voltage and diagnostic features based on L99VR02XP



Features

- [L99VR02XP](#) dual automotive-grade linear voltage regulator
- User-selectable output voltages (0.8, 1.2, 1.5, 1.8, 2.5, 2.8, 3.3, and 5 V) with up to 250 mA load current capability per channel (LDO1 and LDO2)
- Protection and diagnostic features:
 - Enable pin for enabling/disabling the voltage regulator
 - Reset
 - Watchdog
 - Advanced thermal warning with output overvoltage detection
 - Undervoltage lockout
 - Programmable short-circuit output current (Ishort)
 - Fast output discharge
 - Short-to-battery output protection
 - The two internal LDOs have separate thermal clusters and temperature sensors
 - Thermal shutdown and short-circuit protection
 - LDO2 automatic voltage tracking and de-tracking with respect to LDO1 or to an external voltage regulator
- Compact size: 71 mm x 66 mm
- Included in the [AutoDevKit](#) ecosystem

Description

The [AEK-POW-LDOV02X](#) is an evaluation board based on the [L99VR02XP](#) dual automotive-grade linear voltage regulator.

The [L99VR02XP](#) operates with reduced input voltage, minimizing the internal power dissipation and maximizing the output current.

Output current limitation protects the regulator and the application from overload conditions, such as short to ground.

Thanks to its operating temperature range ($T_j = -40^{\circ}\text{C}$ to 175°C), the device is suitable for electronic applications with high temperature environments and for applications that require stable power supplies (for example, navigation systems, microcontroller supplies, audio systems, automotive display drivers, sensors, infotainment processors, and powertrain systems).

In automotive systems, thermal performance is always a critical concern for battery-direct-connection LDOs. The LDO connected to a car battery needs to convert the battery voltage down to 5, 3.3 V, or even lower voltage for powering MCU, CAN bus, and other devices. In these situations, the voltage drop on the LDO might be very high and power dissipation on the LDO might even exceed 1 W for a 100-mA loading current. If the system demands several hundred milliamps of current, a single LDO cannot handle the power dissipation.

Our [AEK-POW-LDOV02X](#) evaluation board addresses this challenge, thanks to the [L99VR02XP](#) dual linear voltage regulator, reaching a higher output current and distributing power consumption among multiple devices.

Product summary	
Dual automotive-grade linear voltage regulator evaluation board with configurable output voltage and diagnostic features based on L99VR02XP	AEK-POW-LDOV02X
Dual automotive linear voltage regulator with configurable output voltage (2 x 250 mA current capability)	L99VR02XP-TR
All-in-one, fast-prototyping, user-friendly MCU and motor control evaluation board based on the Chorus SPC58EC80E5 automotive microcontroller	AEK-MCU-C4MINI1
AutoDevKit Studio for 32-bit power architecture MCUs	STSW-AUTODEVKIT
Applications	Power distribution Digital power Navigation systems

Product summary	
	MCU supplies
	Audio systems
	Automotive display drivers
	Powertrain systems
	Sensors

LDO2 automatic voltage tracking and de-tracking of LDO1 or of an external LDO voltage represents an accurate solution for automotive off-board sensors and small current off-board modules, where the power supply runs through a long cable from the main board.

Under this condition, the long cable might be damaged, causing short-to-ground, short-to-battery or other fault events. In these cases, the system needs to implement a mechanism to protect on-board components from being damaged. Meanwhile, it is necessary to keep the voltage-tracking tolerance between the off-board sensors power supply and the MCU/ADC power supply to the lowest level. In this scenario, the voltage-tracking LDO represents the perfect solution for driving the off-board loads, offering full protection features and ultra-accurate output tracking voltage.

1 System requirements, HW and SW resources

Figure 1. AEK-POW-LDOV02X block diagram with connection to an MCU board

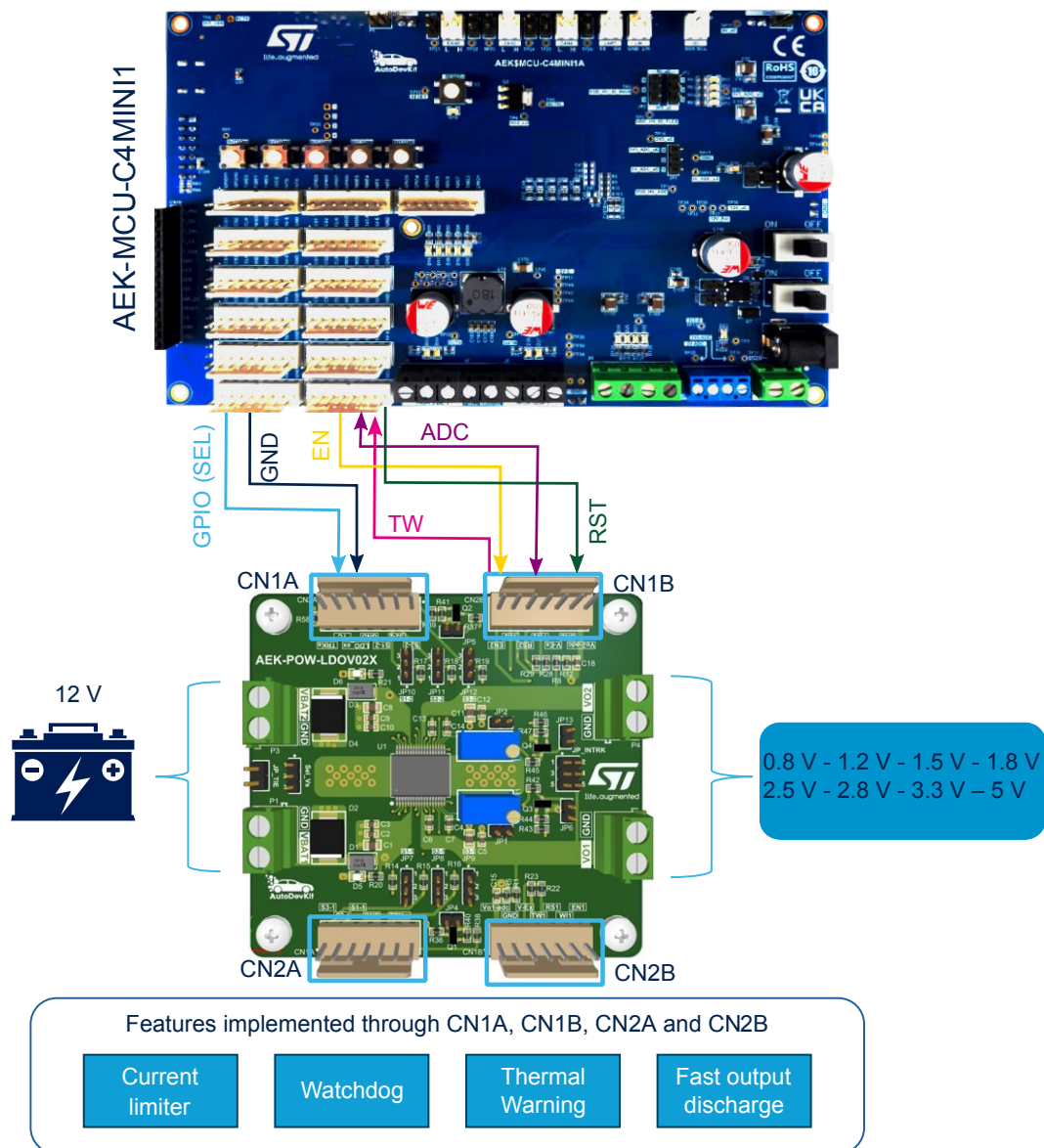


Figure 2. AEK-POW-LDOV02X circuit schematic (1 of 3)

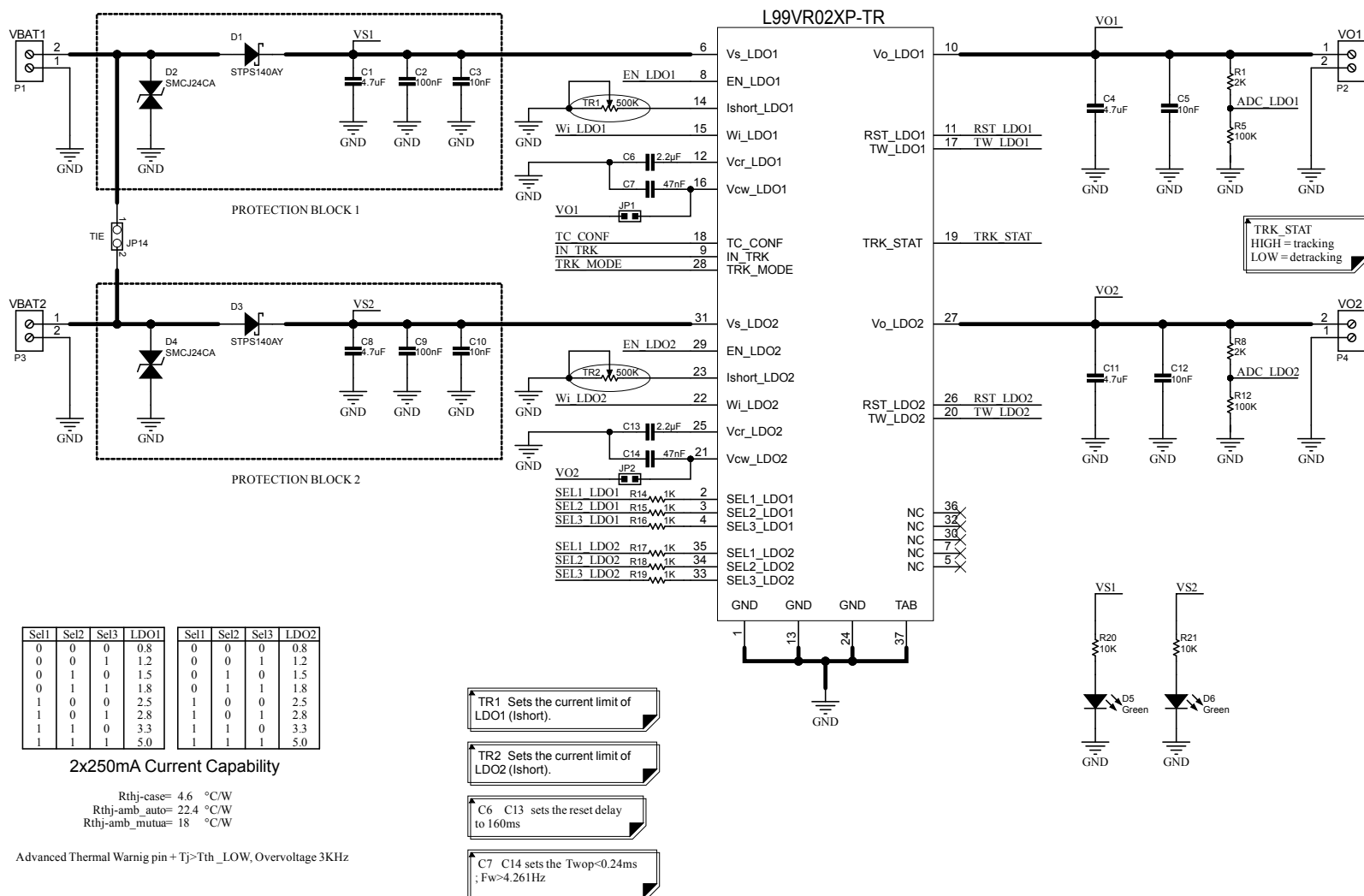


Figure 3. AEK-POW-LDOV02X circuit schematic (2 of 3)

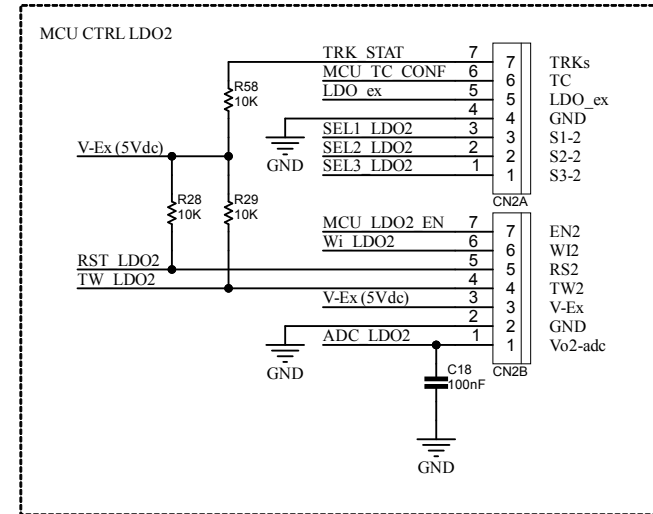
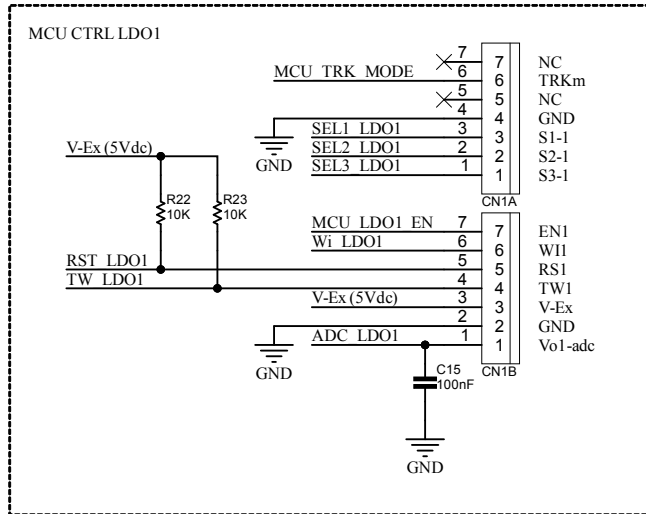
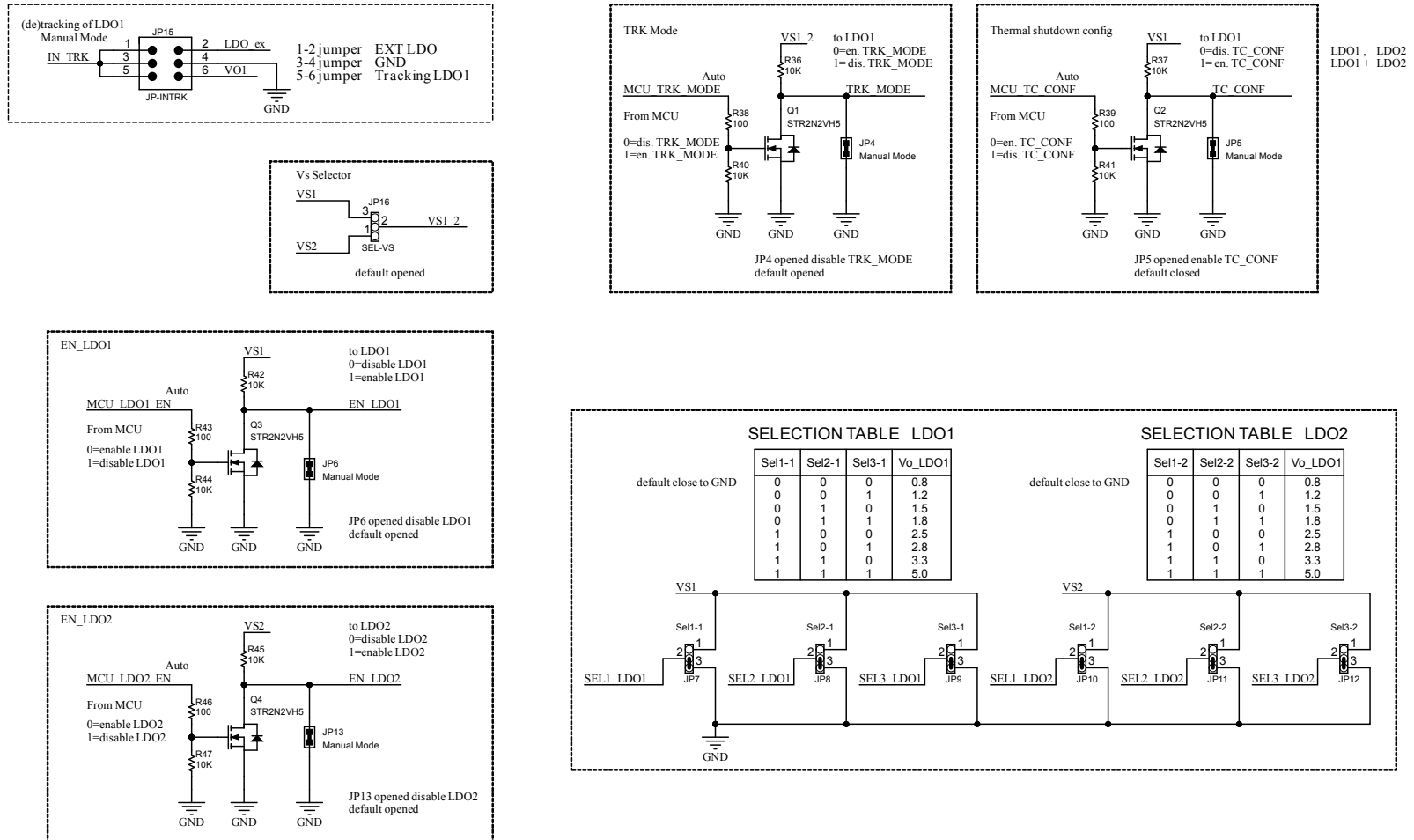


Figure 4. AEK-POW-LDOV02X circuit schematic (3 of 3)





3 Board versions

Table 1. AEK-POW-LDOV02X versions

Finished good	Schematic diagrams	Bill of materials
AEK\$POW-LDOV02XA ⁽¹⁾	AEK\$POW-LDOV02XA schematic diagrams	AEK\$POW-LDOV02XA bill of materials

1. This code identifies the AEK-POW-LDOV02X evaluation board first version.

Revision history

Table 2. Document revision history

Date	Revision	Changes
11-Jul-2025	1	Initial release.

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