Digitally controlled DC-DC converter with L5964 for automotive applications

Features

• Dual channel, independent, step-down regulators with integrated synchronous MOSFETs
• Output current up to 3 A each channel
• Channels can be paralleled to obtain a higher current supply
• Input voltage range from 6 to 14 V
• Digitally selectable fixed output voltages: 3.3 - 5 - 9 V
• PWM programmable output voltages with 20 mV steps over a range of 3.3 - 11 V
• Outputs protected against short-circuit and overcurrent
• Input and output voltage monitors (UV or OV) and power good signals
• Thermal protection thanks to the integrated thermal sensor
• Additional 3.3 V output by internal linear regulator
• Watchdog, reset, in/out synchronisation for available converters
• Board size: 84.7 mm x 81.3 mm
• Maximum component height: 10 mm
• Automotive grade qualified ST components
• Included in the AutoDevKit™ initiative
• CE certified
• RoHS and China RoHS compliant
• WEEE compliant

Applications

• USB-PD 2.0 and 3.0 supplies
• Car infotainment supply
• In-car DC-DC modules and supply

Description

The AEK-POW-L5964V1 expansion board is designed for power car or truck body applications requiring different voltages, such as USB-PD or infotainment. It has two independent converters that can deliver a fixed or variable output voltage via MCU control. The output current can be up to 3 A per channel.

The board includes monitoring circuitries for input and output voltages, and LEDs to indicate operating status. EMI is minimized through appropriate filtering techniques.

The converters are based on the L5964 step-down switching regulators (in buck topology) with overcurrent and overtemperature protection. The L5964 integrates the control, power switches and monitoring circuitries of both converters alongside features such as watchdog, wake-up and reset.

The AEK-POW-L5964V1 expansion board is part of the AutoDevKit initiative. It can be plugged on top of additional boards via a 4x20 male/female connector, which is compatible with the 4x37 MCU male connector on SPC58EC-DISP or AEK-MCU-C4MLIT1 evaluation boards.

A demo application and an AutoDevKit component plugin are also provided for the SPC5-STUDIO tool environment.
1 Block diagram and schematic diagram

1.1 Block diagram

Figure 1. AEK-POW-L5964V1 block diagram
1.2 Schematic diagram

Figure 2. AEK-POW-L5964V1 schematic diagram
Revision history

Table 1. Document revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
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<tbody>
<tr>
<td>27-May-2019</td>
<td>1</td>
<td>Initial release.</td>
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