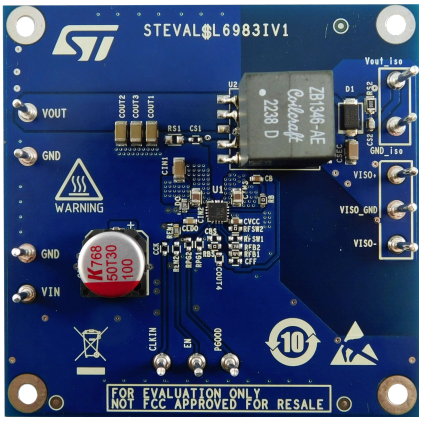
STEVAL-L6983IV1

Data brief

38V, 10W synchronous iso-buck converter evaluation board based on L6983I



Product summary	
38V, 10W synchronous iso-buck converter evaluation board based on L6983I	STEVAL-L6983IV1
38 V 10W synchronous iso-buck converter for isolated applications	L6983IQTR
170 V, 1 A Power Schottky rectifier	STPS1170AF
Applications	Iso-buck converter

Features

- Designed for iso-buck topology
- 4 to 38 V operating input voltage
- Primary output voltage regulation
- No optocoupler required
- 4.5 A source/sink peak primary current capability
- Peak current mode architecture in forced PWM operation
- 390 ns blanking time
- 25 µA operating quiescent current
- 200 kHz to 1 MHz programmable switching frequency. Stable with low ESR capacitor: min 2µF
- Internal compensation network
- 2µA shutdown current
- Internal soft start
- Enable
- Overvoltage protection
- Thermal protection
- Optional spread spectrum for improved EMC
- Power good
- Synchronization to external clock
- QFN16 3x3mm package

Description

The STEVAL-L6983IV1 is an evaluation board based on ST L6983I, 38 V, 10 W synchronous iso-buck converter designed for isolated applications.

The primary output voltage can be accurately adjusted, whereas the isolated secondary output is derived by using a given transformer ratio. No optocoupler is required.

The primary sink capability up to -4.5 A (even during soft-start) allows a proper energy transfer to the secondary side as well as enables a tracked soft-start of the secondary output.

The control loop is based on a peak current mode architecture and the device operates in forced PWM. The 390 ns blanking time filters oscillations, generated by the transformer leakage inductance, making the solution more robust.

The compact QFN-16 3x3 mm package and the internal compensation of the L6983I help minimizing design complexity and size.

The switching frequency can be programmed in the 200 kHz - 1 MHz range with optional spread spectrum for improved EMC.

The EN pin provides enable/disable functionality. The typical shutdown current is 2 uA when disabled. As soon as the EN pin is pulled-up the device is enabled, and the internal 1.3 ms soft start takes place.

The L6983I features power good open collector that monitors the FB voltage. Pulse by pulse current sensing on both power elements implements an effective constant current protection and thermal shutdown prevents thermal run-away. Due to the primary reverse current limit, the secondary output is protected against short-circuit events.

The evaluation board generates an isolated unregulated voltage and provides the possibility to use a post-regulation to generate a dual voltage (layout available on the bottom of the PCB, components not mounted).

1 Schematic diagrams

Figure 1. **STEVAL-L6983IV1 circuit schematic (1 of 2)**

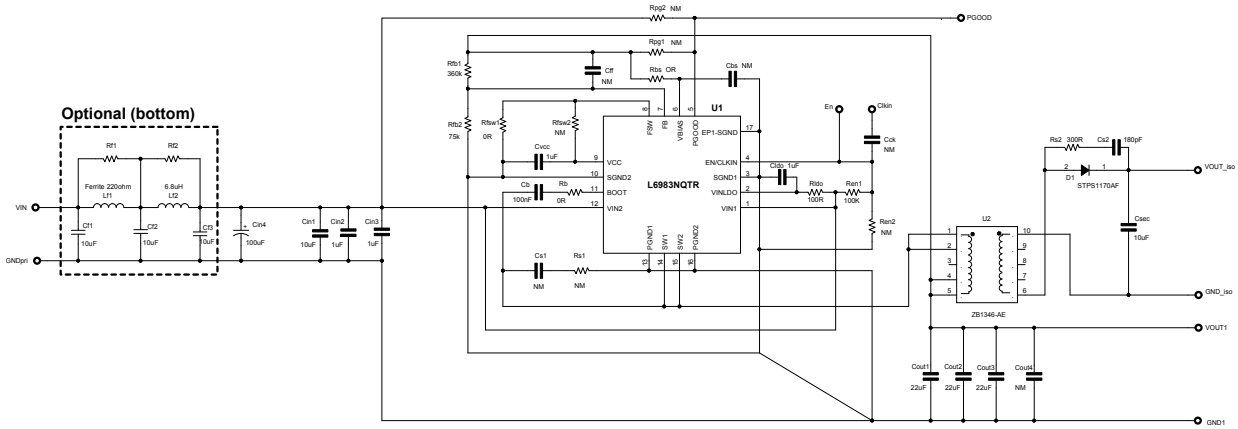
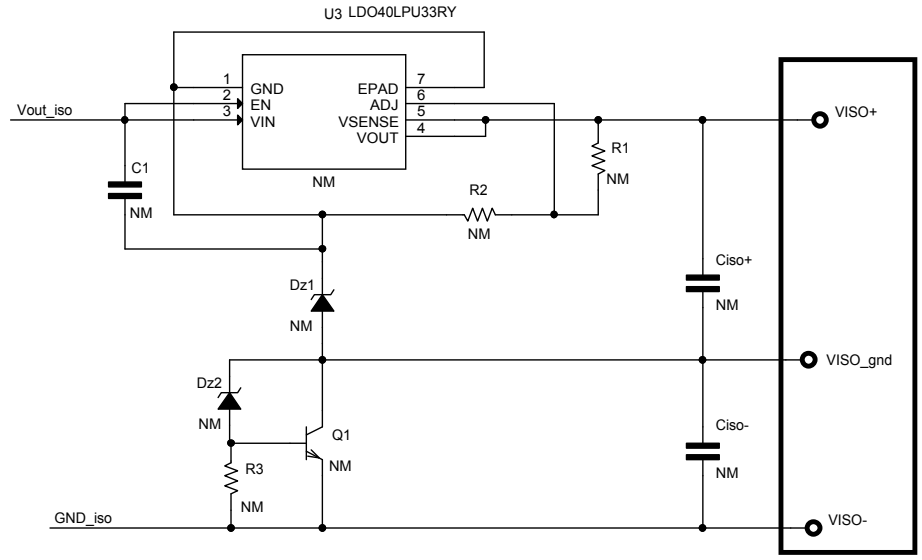


Figure 2. **STEVAL-L6983IV1 circuit schematic (2 of 2) - post regulation (not mounted, bottom side)**



2 Board versions

Table 1. STEVAL-L6983IV1 versions

Finished good	Schematic diagrams	Bill of materials
STEVAL$L6983IV1A (1)	STEVAL$L6983IV1A schematic diagrams	STEVAL$L6983IV1A bill of materials

1. *This code identifies the STEVAL-L6983IV1 evaluation board first version. It is printed on the board PCB.*

Revision history

Table 2. **Document revision history**

Date	Revision	Changes
10-Mar-2023	1	Initial release.