STEVAL-ISQ009V1

Load share controller demonstration board based on the L6615

Data brief

Features

- Three paralleled DC-DC converter modules (in synchronous buck topology, managed by ST's L6910)
- Output currents shared through ST current sharing controller L6615
- Innovative use of a MOSFET as both the OR-ing element (replacing OR-ing diode) and sensing element ($R_{DS(on)}$)
- RoHS compliant

Description

The STEVAL-ISQ009V1 demonstration board is composed of three identical sections (daughterboards) and a motherboard.

Each daughterboard is capable of performing DC-DC conversion starting from +5 VDC and is designed to deliver 3.3 V / 5 A to the load.

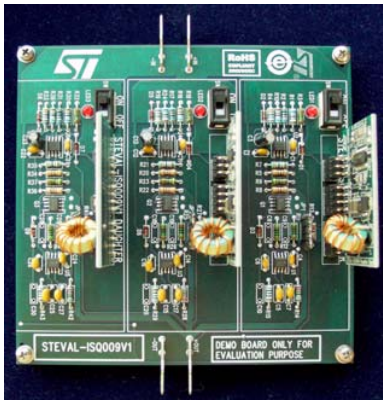
The input terminals of the motherboard are connected to a +5 VDC external source and the output terminals to the load. The board can accommodate up to three DC-DC converters.

The motherboard contains the circuitry necessary to perform current sharing (utilizing the L6615) and to isolate a failed section from the load. It is designed to be adaptable to all power supplies (compatible with the L6615 absolute maximum ratings) having remote sense pins. By changing just a few components, it can be modified for new specifications.

It is possible to build a system to supply a 10 A load at +3.3 V in a 2+1 redundant configuration. That is, whenever three sections are running, each of them supplies 3.33 A, a value lower than its nominal capability.

If one of them is switched off, the system is able to supply the load, and each section carries 5 A.

DC-DC conversion management is performed by the L6910.



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It is possible to verify that disabling one section (through the relevant switch on the motherboard) does not cause overvoltage on the output or overcurrent in other sections. In the same way, enabling one section (with the other two already running) does not cause negative output voltage drop or a short to ground, and current sharing is established.

1 Schematic diagrams

Figure 1. Single daughterboard circuit schematic

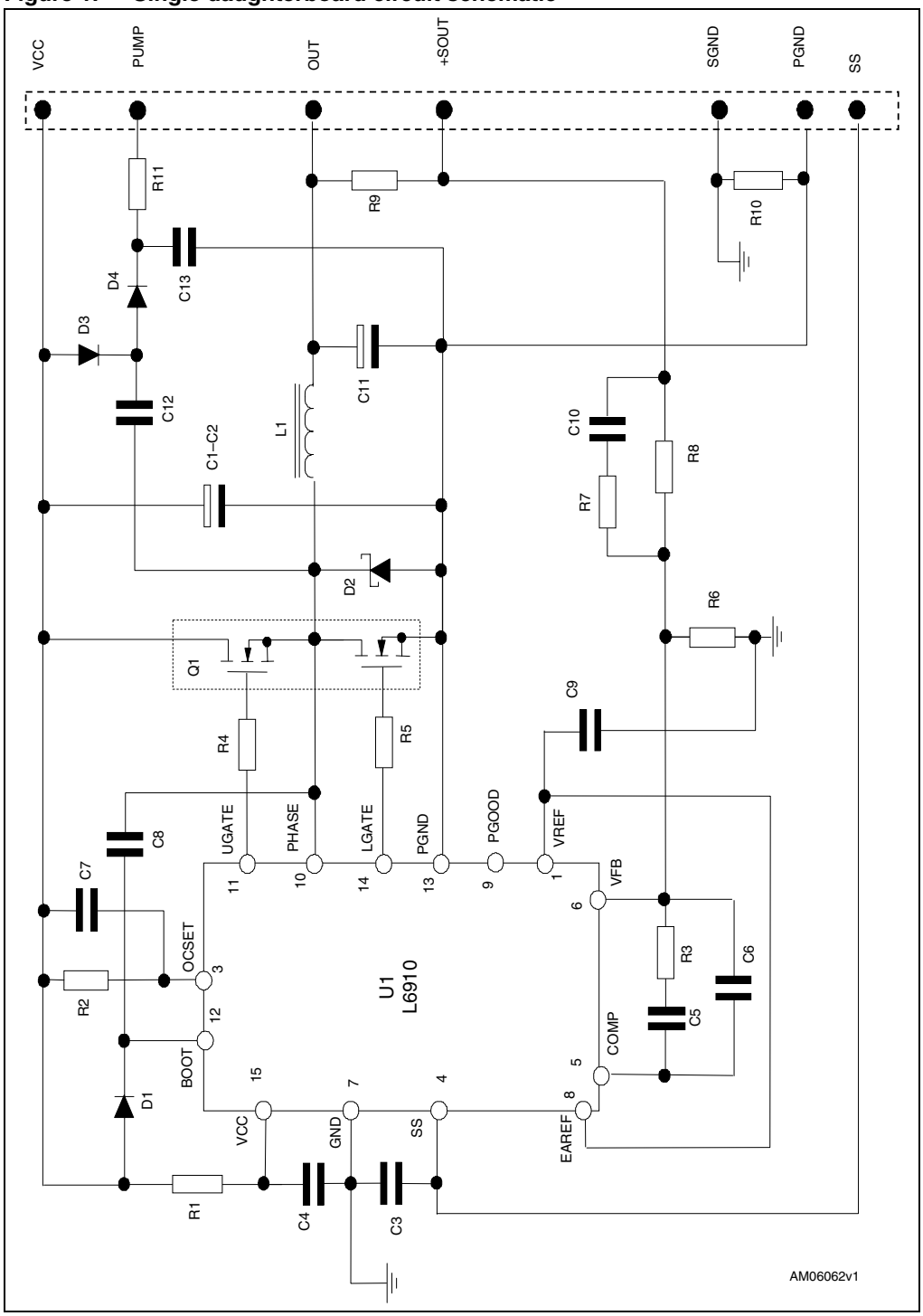
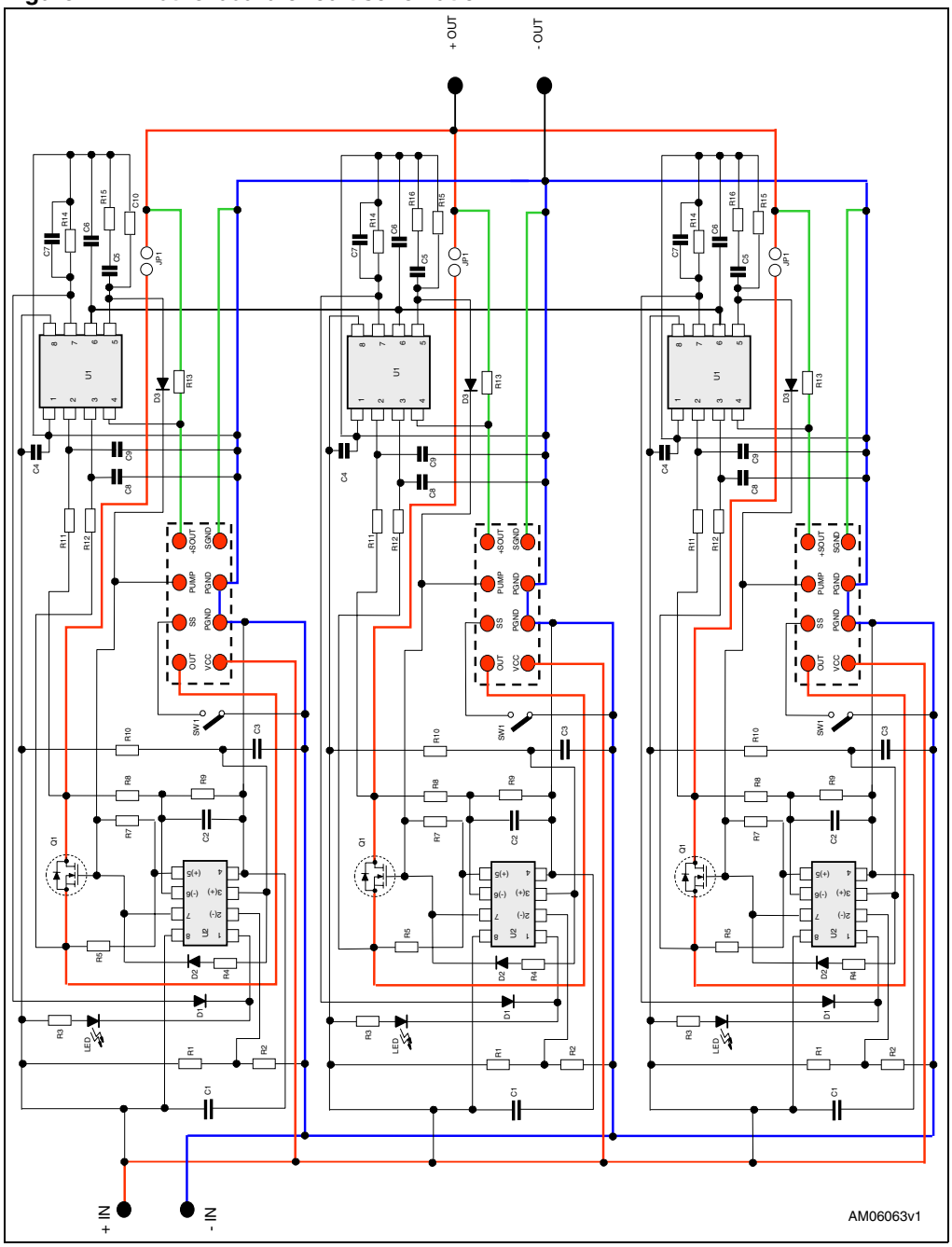


Figure 2. Motherboard circuit schematic



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
22-Feb-2010	1	Initial release.

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