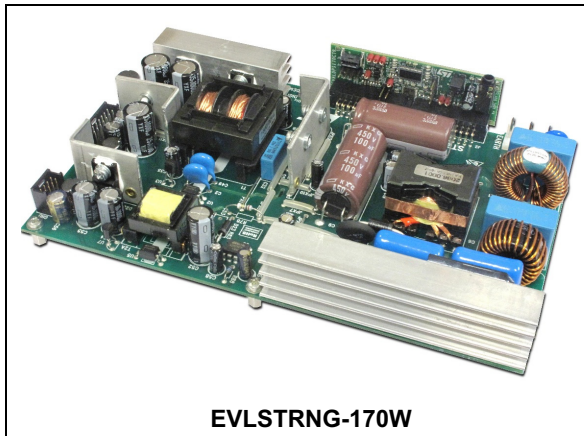


170 W SMPS with digitally controlled PFC and resonant LLC stage based on the STNRG388A

Data brief



EVLSTRNG-170W

Features

- Digital controller: STNRG388A
- Enhanced constant ON Time PFC
- Timeshift controlled LLC
- Max. power: 170 W
- Efficiency: more than 91% at full load
- Standby consumption: <150 mW with 50 mW secondary side load
- Input voltage range: from 90 to 264 Vdc
- Multiple output rails: 24 V (6 A), 12 V (2 A), 5 V (2 A)
- Modular power and control board

Description

The EVLSTNRG-170W evaluation board is intended for evaluating the STNRG388A digital controller in off-line power conversion applications such as digital industrial power supplies.

The solution implements a PFC stage followed by a resonant LLC stage supporting up to 170 W. The application supports multiple output rails: a high power 24 V (6 A) channel for the main application, 1 auxiliary 12 V (2 A) for the controller and an always-on 5 V (2 A) standby.

The STNRG388A power conversion dedicated peripherals (SMEDs) offer the flexibility to drive the PFC in transition mode (DCM-CCM boundary) while the resonant LLC is controlled with timeshift control (TSC). In parallel to managing the two conversion stages, STNRG388A guarantees all the protections required by the application as well as implementing the advanced Anti Capacitive protection.

Thanks to the digital core of STNRG388A, it is also possible to monitor, control and debug the EVLSTNRG-170W board via a convenient HyperTerminal control.

1 Schematic diagrams

Figure 1. Electrical main board

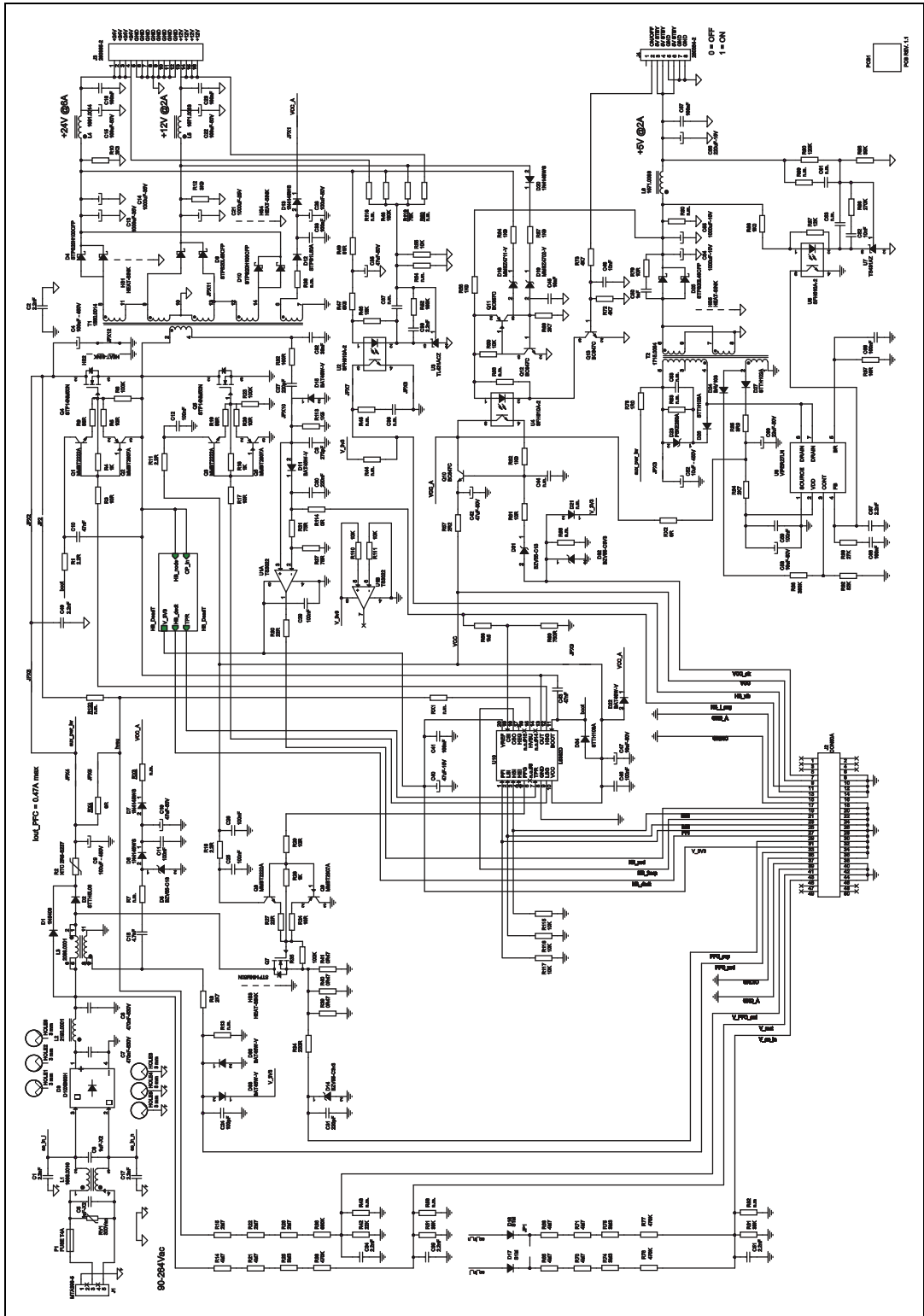


Figure 3. Electrical diagram debug control board - controller

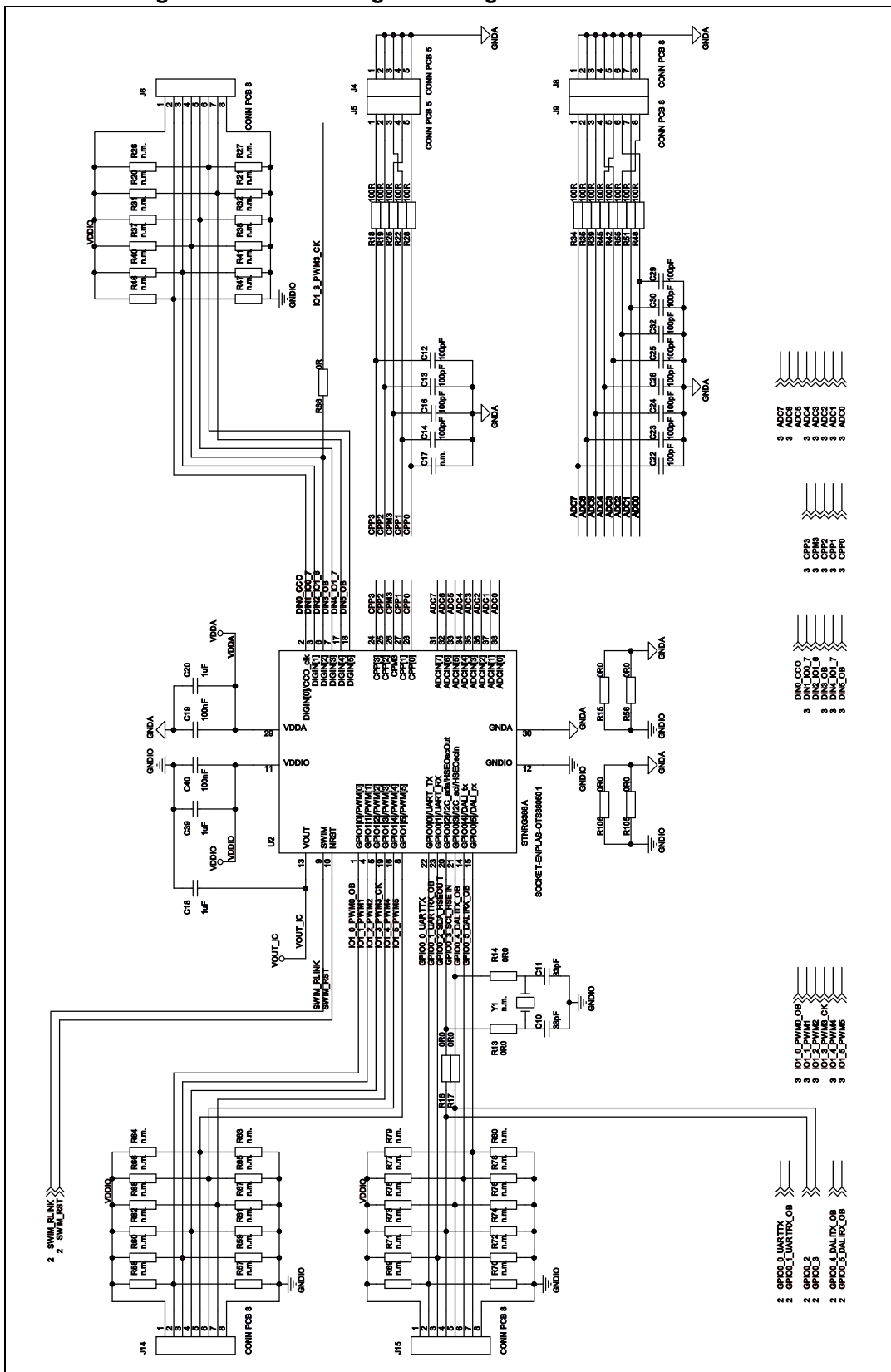


Figure 4. Electrical diagram debug control board - connections

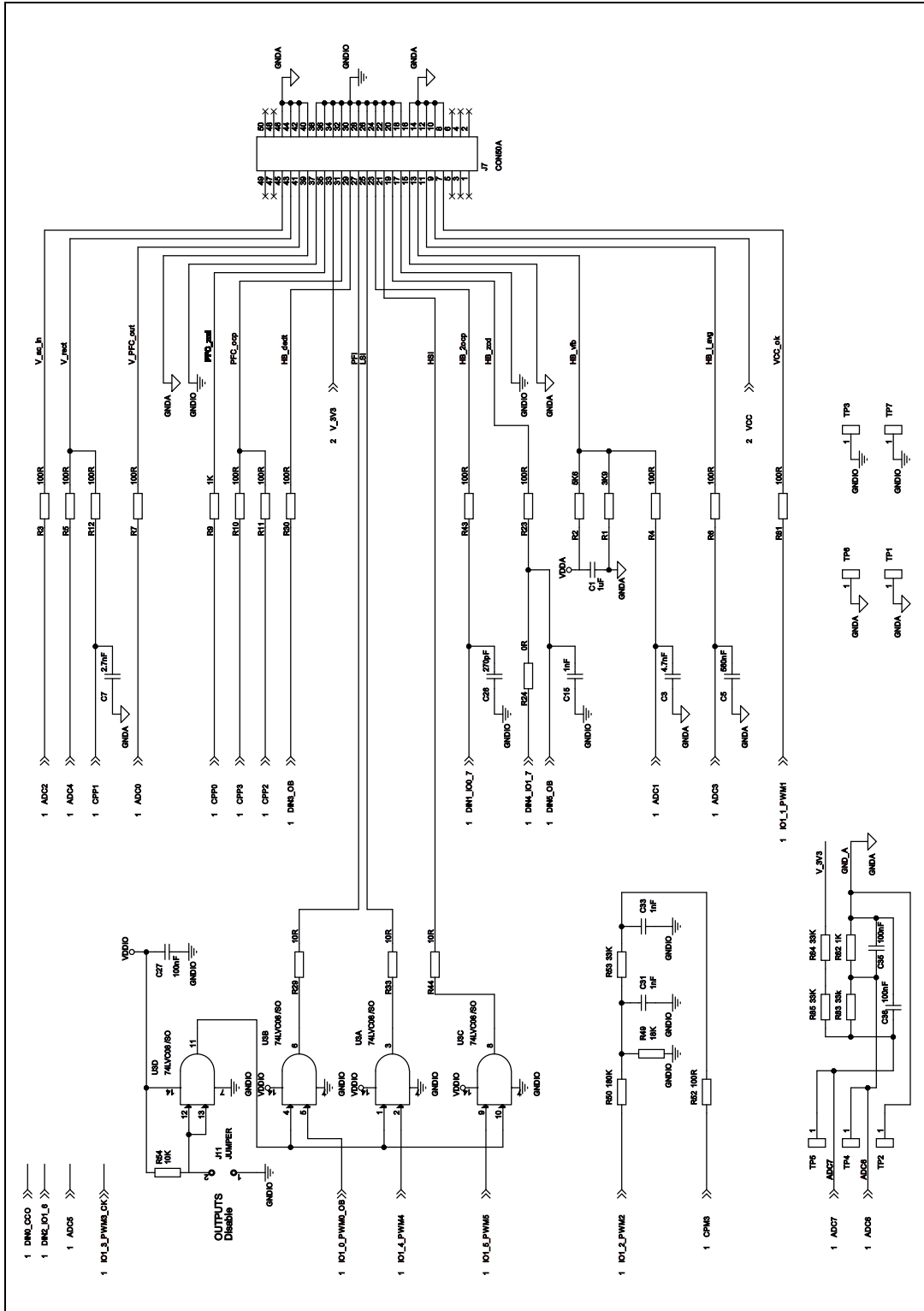


Figure 5. Electrical diagram debug control board - power and interfaces

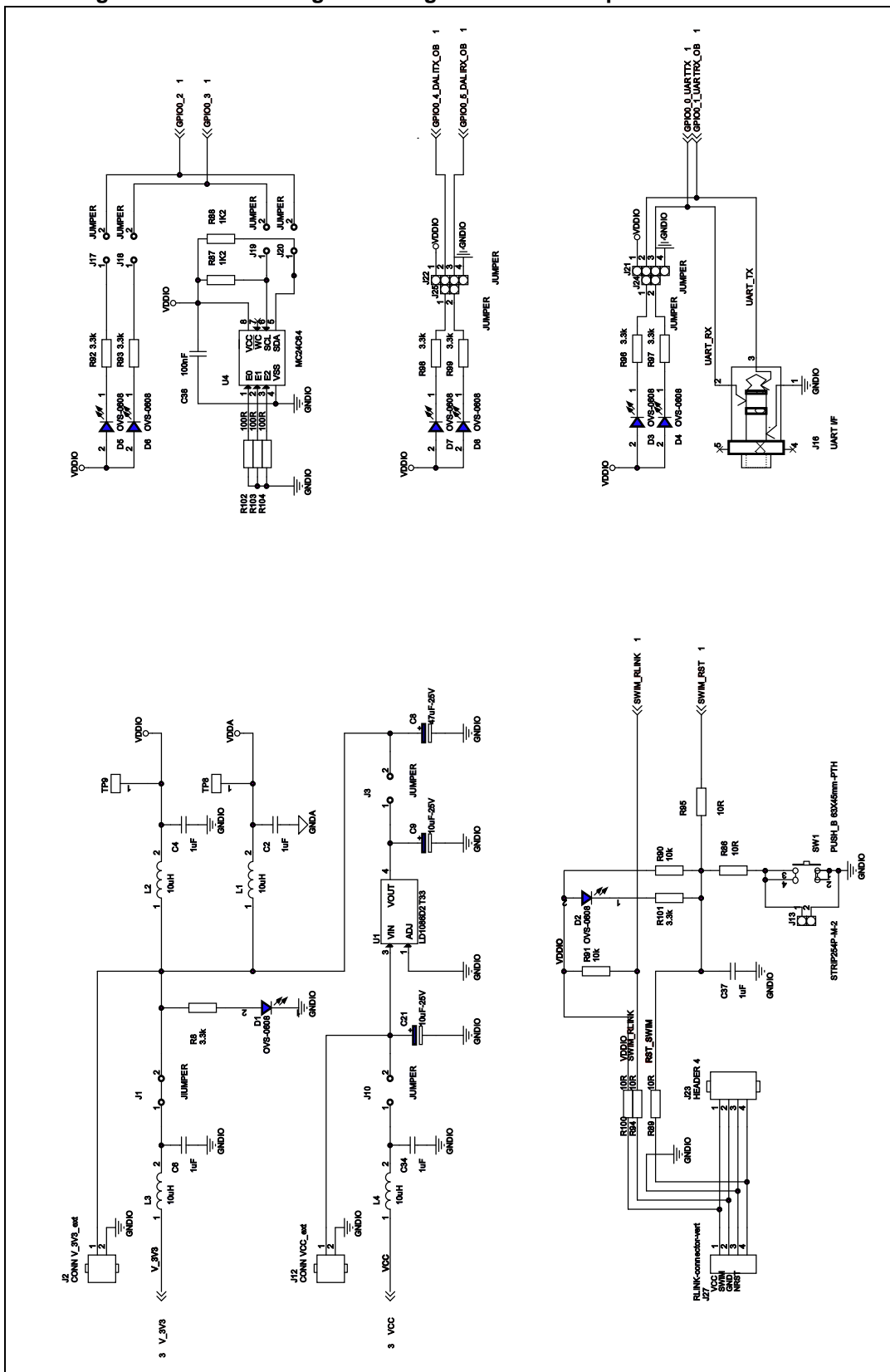


Figure 6. Electrical diagram slim control board - controller

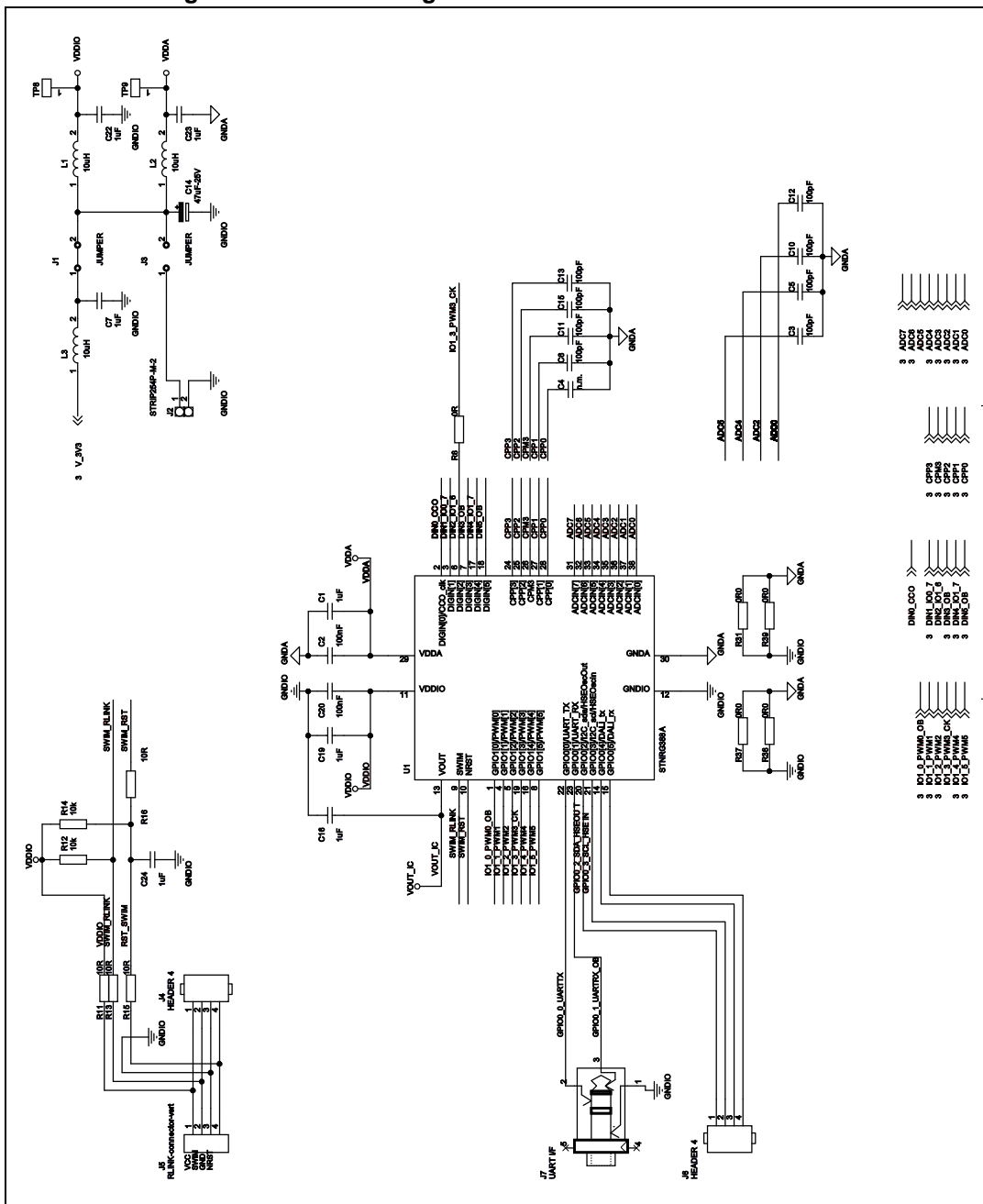
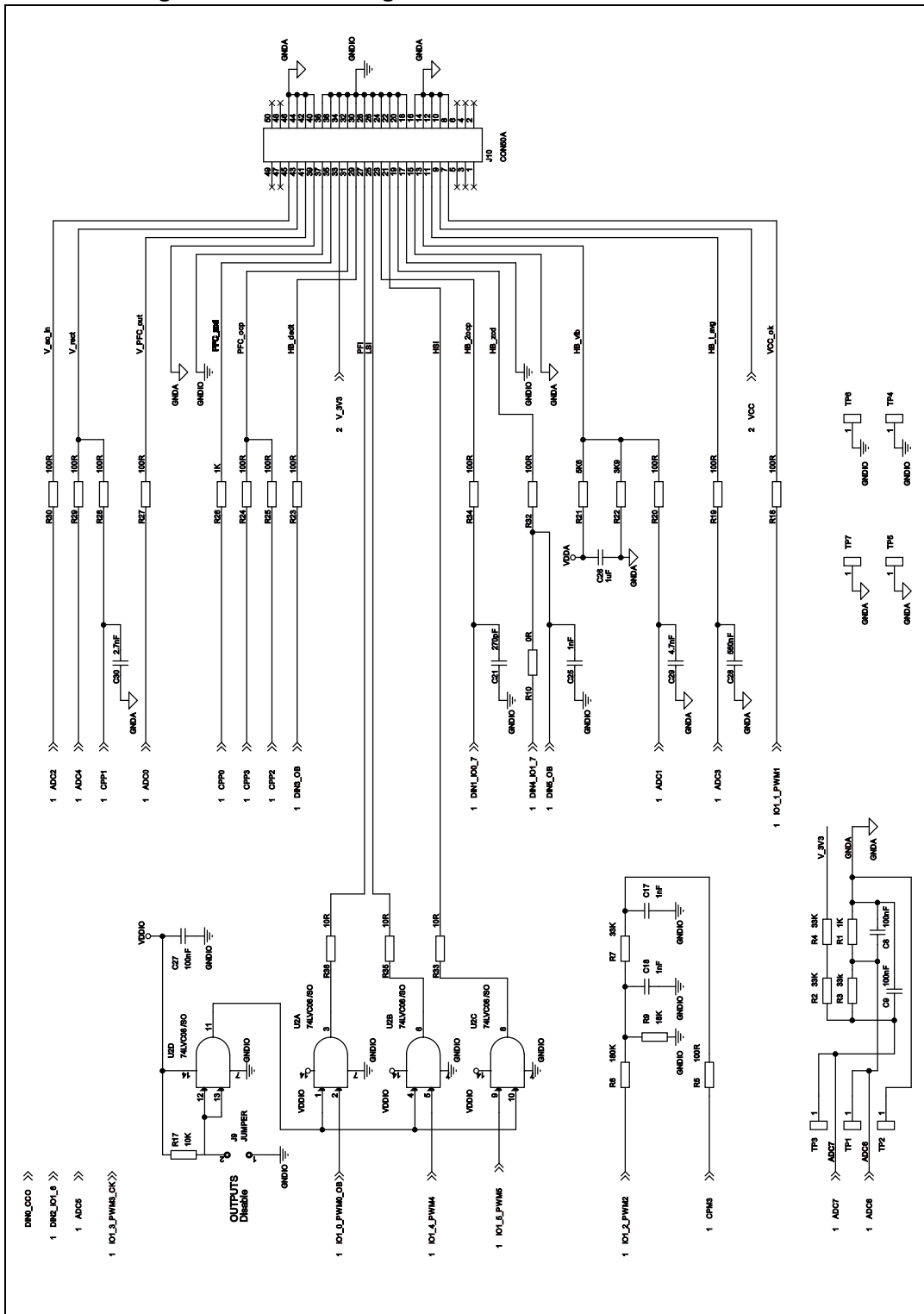


Figure 7. Electrical diagram slim control board - connections



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
18-May-2015	1	Initial release.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2015 STMicroelectronics – All rights reserved