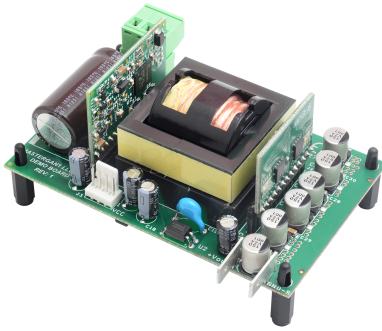


DC/DC resonant converter for industrial applications using MasterGaN1



Features

- High efficiency and compact solution for DC/DC conversion using MasterGaN1
- Output voltage: 24 V
- Output power up to 250 W
- Nominal Input voltage: 400 V +/- 10%
- Efficiency: >92%
- Outputs protected against short-circuit and overcurrent
- Input voltage monitor for correct sequencing as D2D converter, and brownout protection
- Board size: 100 x 60 (W x H) mm. Maximum components height: 35 mm
- WEEE and RoHS compliant
- Applications: industrial DC-DC applications, adapters, consumer SMPS

Description

This demonstration board is a resonant LLC converter dedicated to any kind of industrial application where minimum size and high efficiency is required, based on MasterGaN1. This device, embedding a couple of GaN power transistors and a driver in the same package, allows to interface directly any kind of SMPS controller. Thanks to the GaN technology and to embedded driver, the converter can be designed with an operating frequency higher than using conventional MOSFETs. Actually, the board has no heatsinks on the primary side and has very reduced dimensions; the power density is 20 W/inch³. The high efficiency and small size make the board suitable also when available space is limited.

Output power can be up to 250 W at 24 Vdc. Converters come with overcurrent, short-circuit and overvoltage protection. The input voltage monitoring allows the startup with correct sequencing of cascade converters, preventing operation with too low input voltage.

The board is composed of a motherboard with the transformer and the primary controller, and two small daughterboards: one at primary side embeds the MasterGaN1, another on secondary side has the SR controller SRK2001 and the MOSFETs.

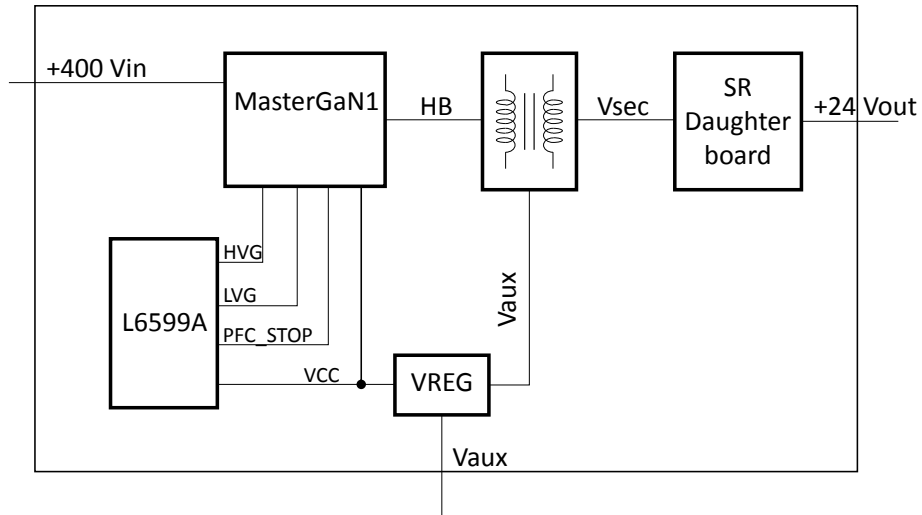
Product status link

[EVLMG1-250WLLC](#)

1 Block diagrams and schematic diagrams

1.1 Block diagrams

Figure 1. Block diagram for high visual impact



1.2 Schematic diagrams

Figure 2. Motherboard schematic

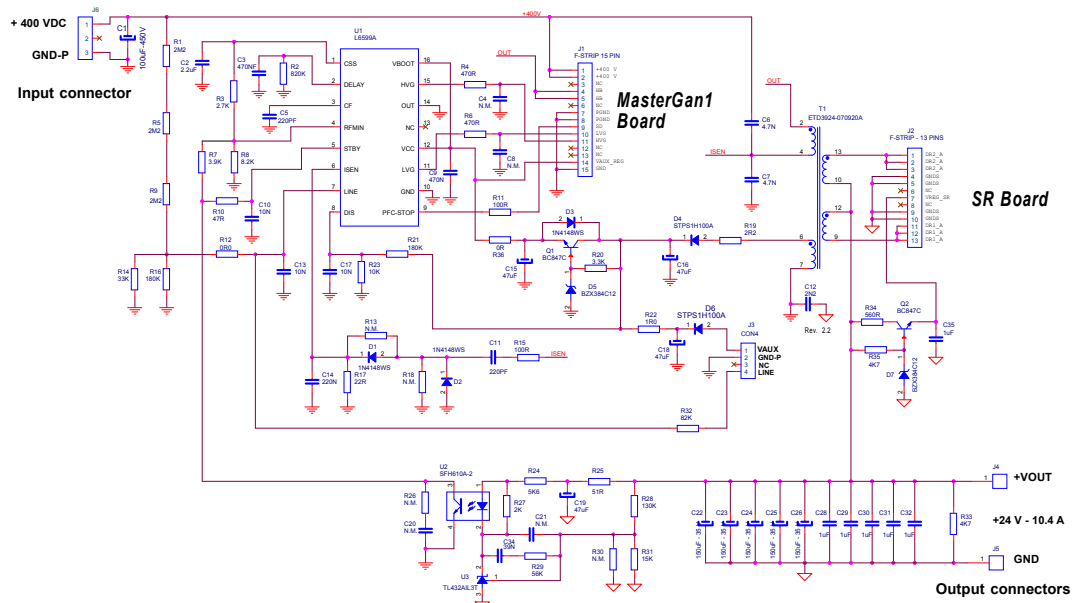


Figure 3. MasterGa1 board schematic

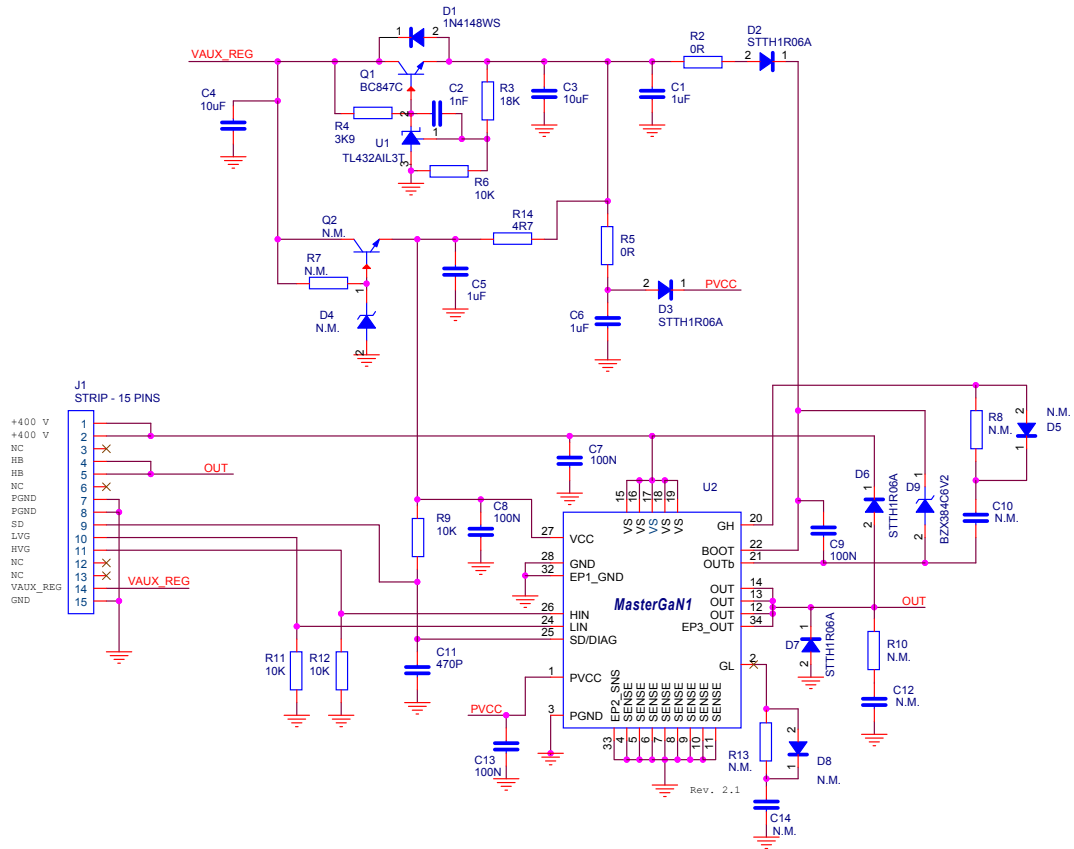
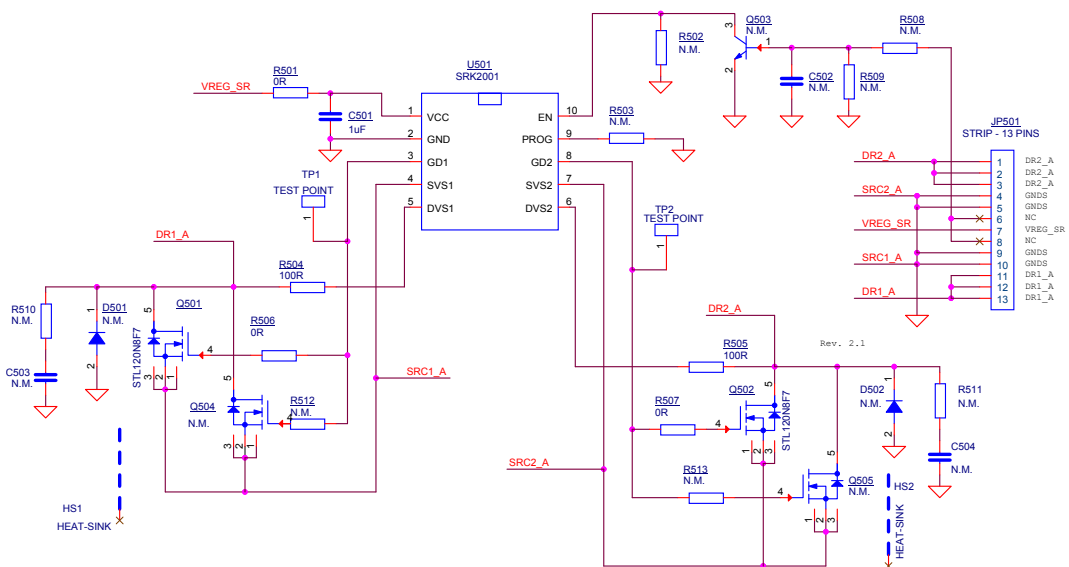


Figure 4. SR board schematic



Revision history

Table 1. Document revision history

Date	Version	Changes
1-Feb-2021	1	Initial release.

Contents

1	Block diagrams and schematic diagrams	2
1.1	Block diagrams	2
1.2	Schematic diagrams	2
	Revision history	4
	Contents	5
	List of tables	6
	List of figures	7



List of tables

Table 1. Document revision history 4

List of figures

Figure 1.	Block diagram for high visual impact	2
Figure 2.	Motherboard schematic	2
Figure 3.	MasterGaN1 board schematic	3
Figure 4.	SR board schematic	3

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. For additional information about ST trademarks, please refer to www.st.com/trademarks. 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.

© 2021 STMicroelectronics – All rights reserved