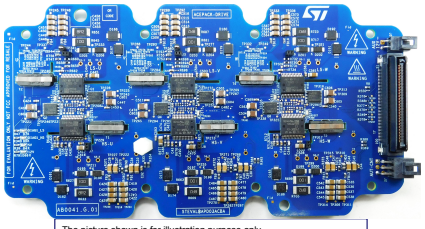
STEVAL-APD03ACB

Data brief

ASIL D gate driver board for traction inverter in EV/HEV applications



The picture shown is for illustration purpose only.
Actual product may vary depending on buyer's selection and availability.

Product summary	
ASIL D gate driver board for traction inverter in EV/HEV applications	STEVAL-APD03ACB
Control board for automotive motor control applications based on SR5E1E3 and PMIC SPSB100	STEVAL-TTM007A
SR5 E1 line of Stellar electrification MCUs, 32-bit Arm Cortex M7 automotive MCU 2x cores, 2 MB Flash, rich analog, high-resolution timer, HSM, ASIL-D	SR5E1E370C30F01X
Application	Automotive Motor Control

Features

- 12 V input voltage
- Motor control connector (34 pin) for hardware compatibility with all the ST power board for motor control applications
- Galvanically isolated driving stage with L9502E for ASIL D applications
- Fully optimized for ACEPACK SiC power modules
- Protection functions: miller clamp, desaturation detection, hybrid turn-off (HTO) UVLO, and OVLO
- Compatible with all ACEPACK DRIVE SiC module family (750V and 1200V)
- Press fit connections for high reliable and long lasting connection
- Layout optimized with minimized stray inductances
- High reliability and robustness

Description

The STEVAL-APD03ACB is an evaluation board aimed at evaluating the ACEPACK DRIVE power module (compatible with both 750 and 1200 V) for automotive powertrain applications.

The evaluation is schematized in the following main blocks:

Driving section, hosting mainly the driver L9502E with flyback controller integrated to generate the driving voltages (+18/-5V) with high current capability (up to 15A).

Diagnostic of the driving circuitry and the connectors towards the power supply section. This board can be connected to the power module by a press fit insertion tool (design available).

The control section is not included but can be separately ordered, choosing the STEVAL-TTM007A.

The STEVAL-TTM007A hosts the SR5E1E3 (eTQFP100) which is a 2x 32-bit Arm® Cortex® -M7 with double precision FPU, L1 cache and DSP instructions with 2 cores in parallel or 1 core in lockstep configuration.

The PMIC SPSB100 is available for a configurable multioutput voltage for highly integrated processors.

The SR5E1E3 and the SPSB100 offer the best performance thanks to dedicated peripherals for motor control.

A double and redundant signal conditioning, for reading the resolver feedback, has been included to guarantee the implementation of the most advanced field-oriented control algorithms.

1 Schematic diagrams

Notice: *These schematics are for illustration purpose only. Actual product may vary depending on buyer's selection and availability.*

Figure 1. STEVAL-APD03ACB circuit schematic (1 of 10)

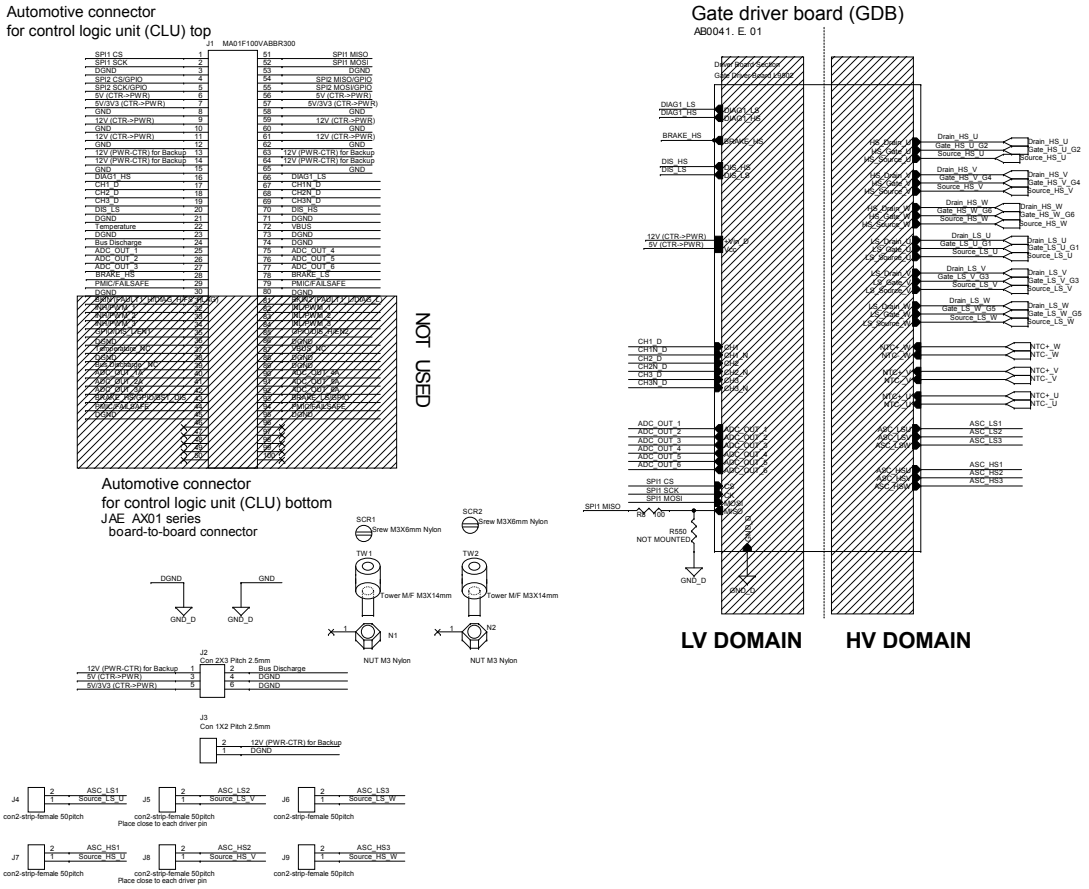
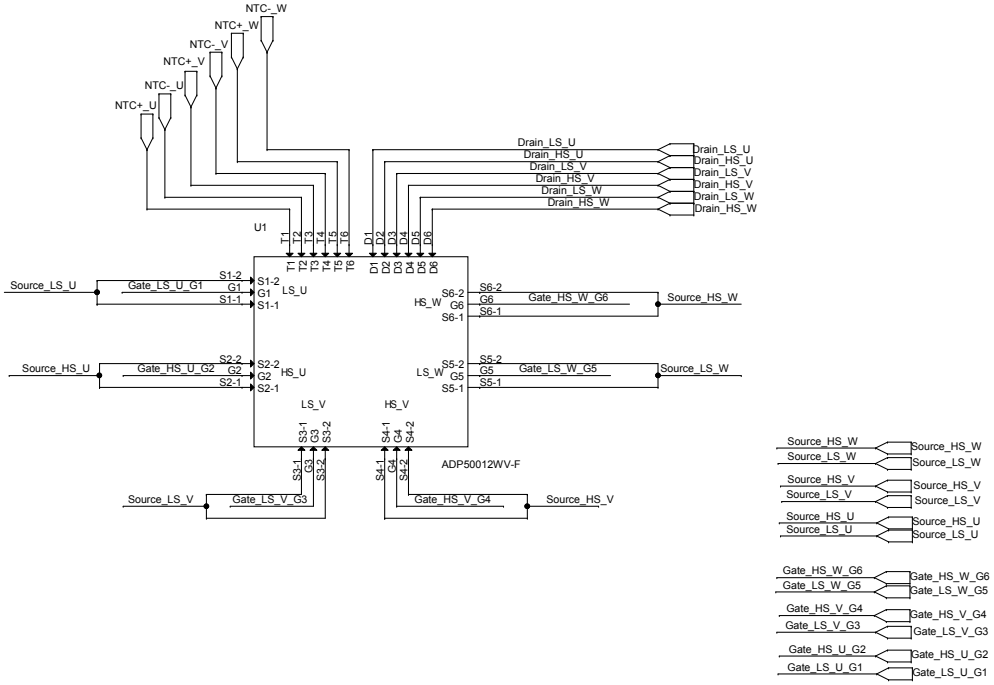


Figure 2. **STEVAL-APD03ACB circuit schematic (2 of 10)**



PLEASE TAKE CARE ABOUT POSITION OF COMPONENTS FAR FROM ACEPACK MODULE PIN ON TOP AND BOTTOM SIDE

Figure 3. **STEVAL-APD03ACB circuit schematic (3 of 10)**

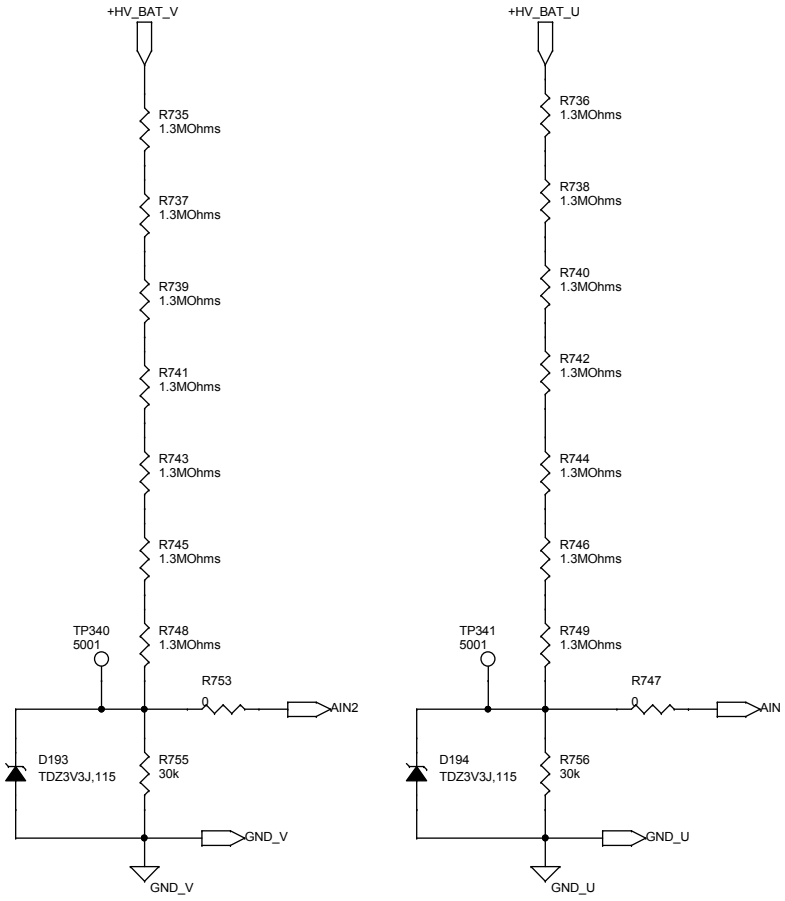


Figure 4. STEVAL-APD03ACB circuit schematic (4 of 10)

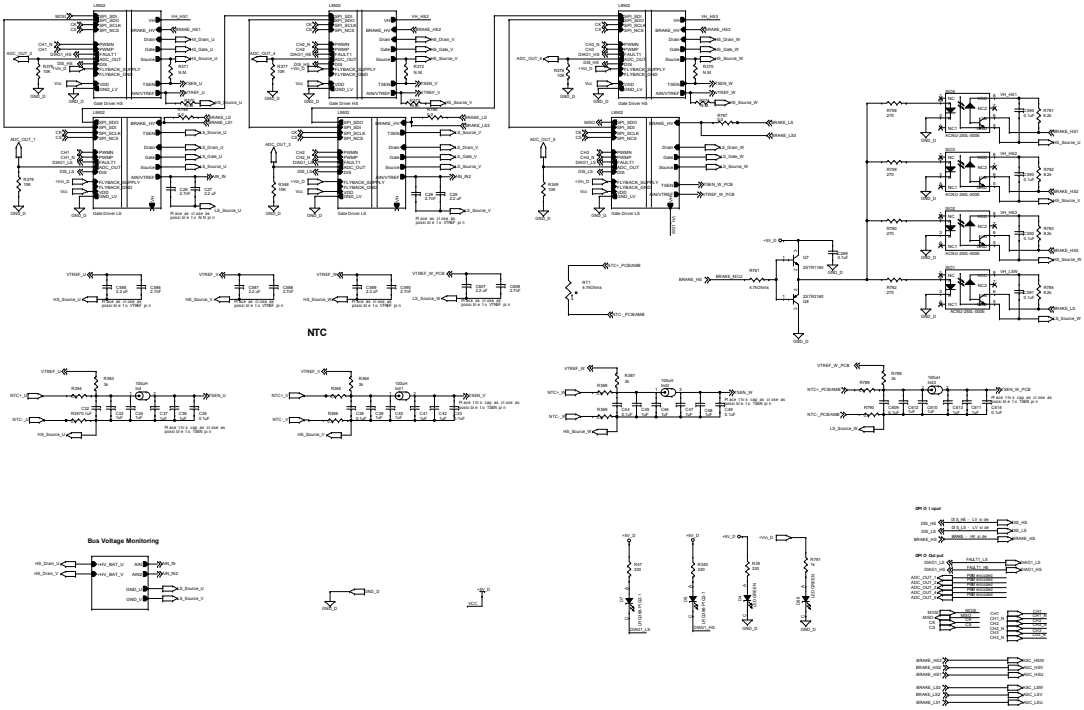


Figure 5. STEVAL-APD03ACB circuit schematic (5 of 10)

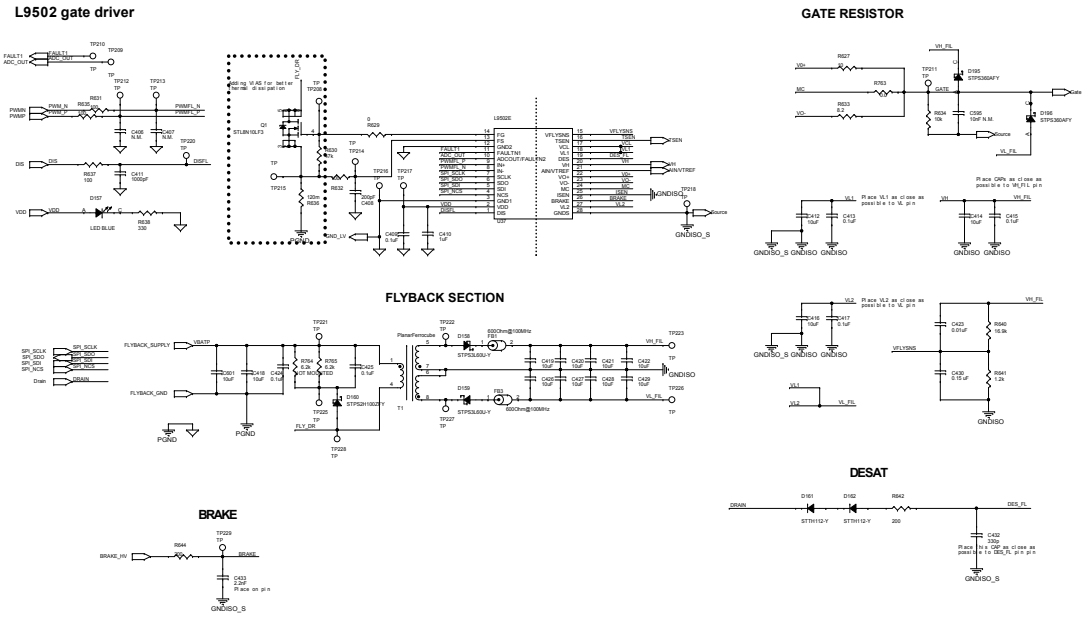


Figure 6. STEVAL-APD03ACB circuit schematic (6 of 10)

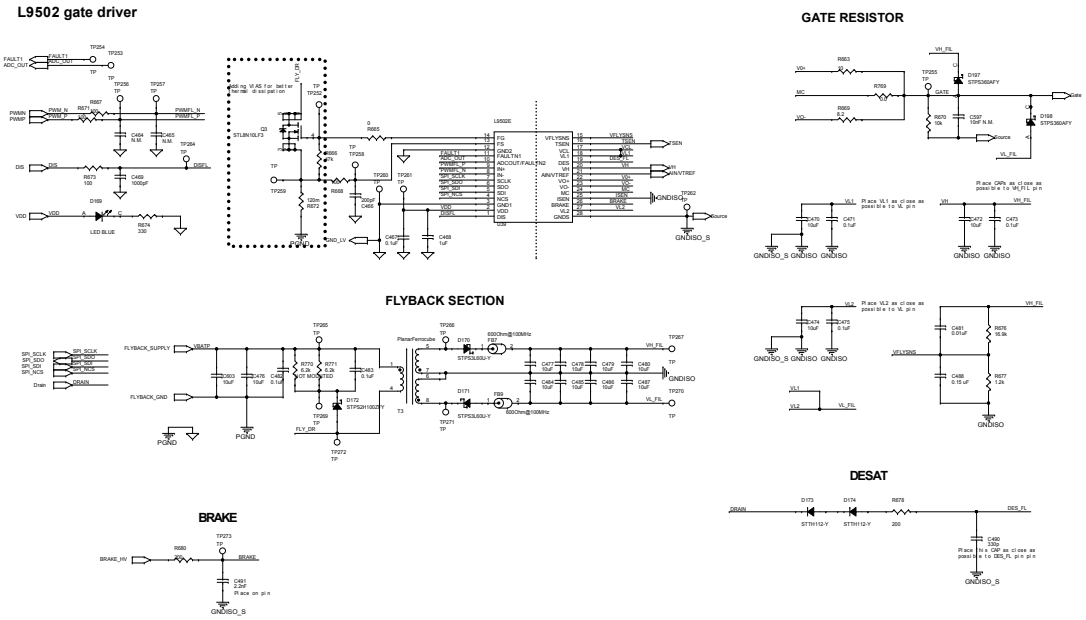


Figure 7. STEVAL-APD03ACB circuit schematic (7 of 10)

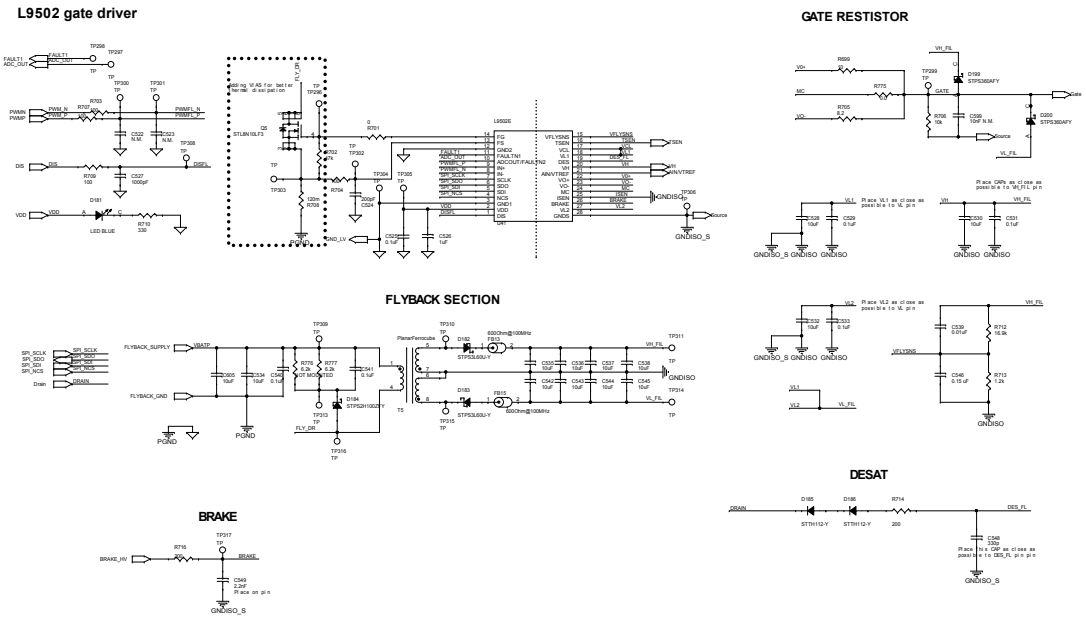


Figure 8. STEVAL-APD03ACB circuit schematic (8 of 10)

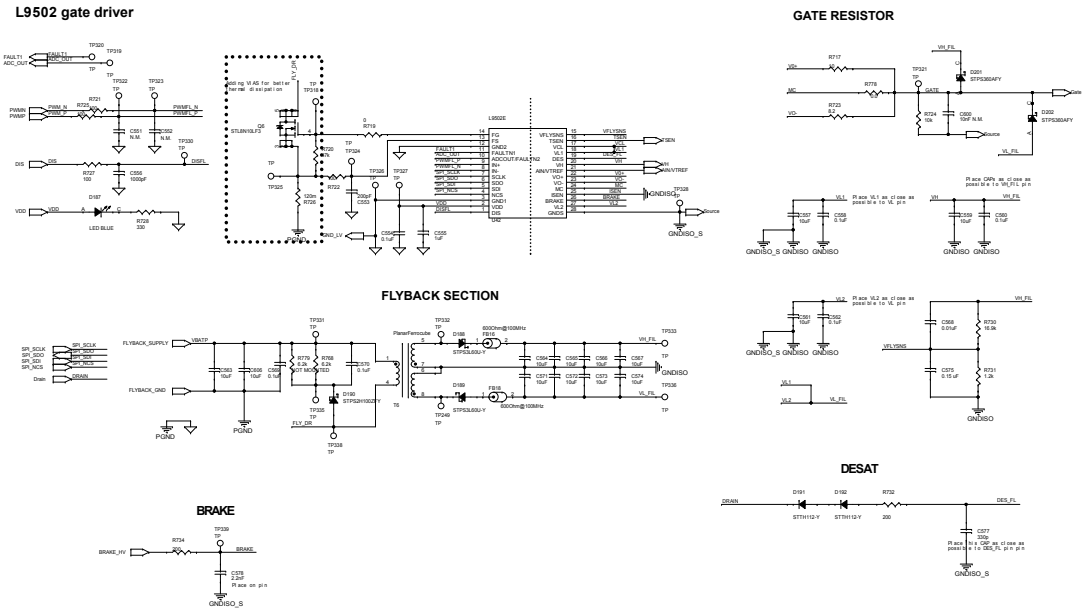


Figure 9. STEVAL-APD03ACB circuit schematic (9 of 10)

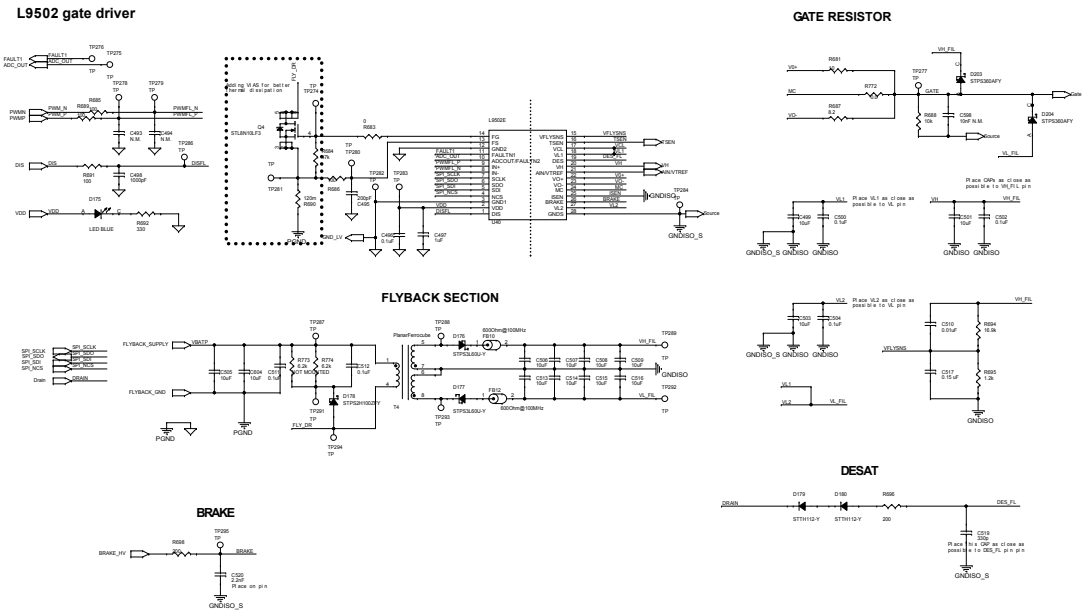
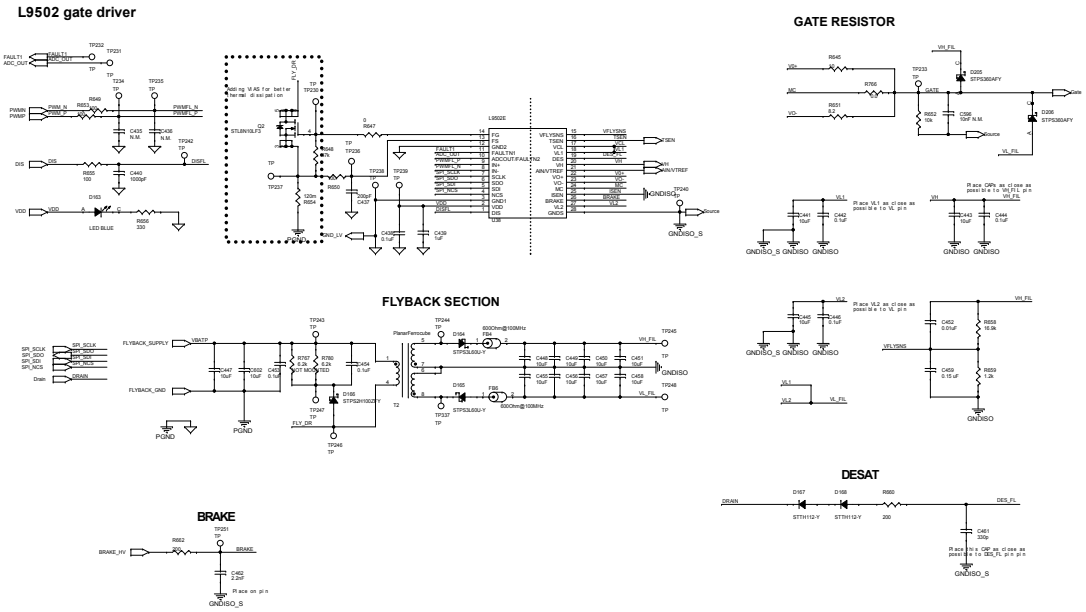


Figure 10. STEVAL-APD03ACB circuit schematic (10 of 10)



2 Custom evaluation boards information

Notice: *These evaluation boards are custom designed and built, in small quantities, according to specific requests from customers and are destined for evaluation and testing of ST products in a research and development setting. Please contact ST to provide your specific requests and get your custom built board(s).*

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
12-Sep-2024	1	Initial release.

IMPORTANT NOTICE – 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 acknowledgment.

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, 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.