

## 100 W Auxiliary Power Supply Eval Board

# BD7682FJ-LB-EVK-302

This quick start guide will help you understand the connection, operating Instructions and important notices and warnings that need to be carefully reviewed prior to use of the board (Figure 1). For further information please refer to the user guide (No. 63UG067E Rev.001) and the BD7682FL-LB Application Note (No. 60AN060E Rev.001) which can also be obtained from ROHM's webpage.

The BD7682FJ is an AC/DC quasi-resonant flyback controller IC from ROHM Semiconductor and offers an Auxiliary Power Supply Solution if combined with the 1700 V SiC MOSFET (SCT2H12NZ). The BD7682FJ and SCT2H12NZ combined together have been used to develop an isolated 100 W 24 V output auxiliary power solution with a very accurate voltage regulation.

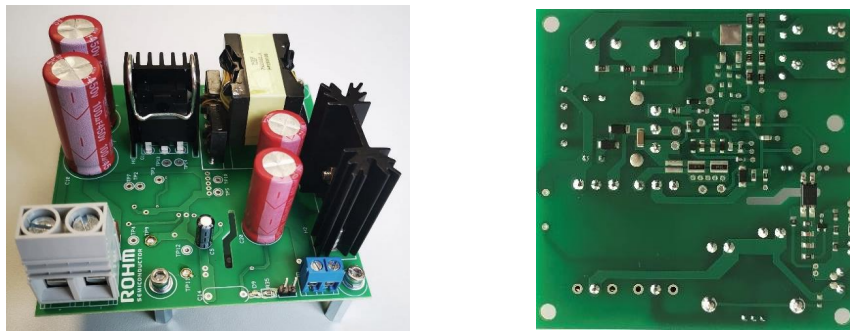


Figure 1: Top side (left) and bottom side (right) of the evaluation board

### Important Notice

This evaluation board is intended for **product evaluation in a research and development context only** and is not intended for resale to end consumers and it is not authorised for end customer or household use. This board may not comply with CE or similar standards (including, but not limited to the EMC directive 2004/EC/108) and may not fulfil other requirements of the country it will be operated in by the user. The user shall ensure that the evaluation board will be handled in a way that is compliant with all the standards and regulations in the country it will be operated in.

The evaluation board provided here has only been subjected to functional testing under typical load conditions. The design of this evaluation board is tested by ROHM only as described in the user guide for this board. The design is not qualified in terms of safety requirements, manufacturing and operation over the entire operating temperature range or lifetime.

**This evaluation board may only be used by authorised personnel that is properly trained in recognizing and dealing with the dangers of testing high voltage equipment and generally experimenting with high voltage circuits.** Ensure you review this user guide as it contains important safety warnings. At all times, follow the applicable safety rules for dealing with high voltages. Do not connect or disconnect any wires or probes to the evaluation board, while it is connected to a power supply. Take care that capacitors on the board have discharged fully before touching any part of the board. Always place the evaluation board under appropriate covers, such as in a Perspex box, to protect against accidental touching of high voltage parts BEFORE applying a voltage supply to the board.

## <High Voltage Safety Precautions>

◇ Read all safety precautions before use

Please note that this document covers only the BD7682FJ & SCT2H12N evaluation board and its functions. For additional information, please refer to the datasheet.

**To ensure safe operation, please carefully read all precautions before handling the evaluation board**



Depending on the configuration of the board and voltages used,

**Potentially lethal voltages may be generated.**

Therefore, please make sure to read and observe all safety precautions described in the red box below.

### Before Use

- [1] Verify that the parts/components are not damaged or missing (i.e. due to the drops).
- [2] Check that there are no conductive foreign objects on the board.
- [3] Be careful when performing soldering on the module and/or evaluation board to ensure that solder splash does not occur.
- [4] Check that there is no condensation or water droplets on the circuit board.

### During Use

- [5] Be careful to not allow conductive objects to come into contact with the board.
- [6] **Brief accidental contact or even bringing your hand close to the board may result in discharge and lead to severe injury or death.**

**Therefore, DO NOT touch the board with your bare hands or bring them too close to the board.**

In addition, as mentioned above please exercise extreme caution when using conductive tools such as tweezers and screwdrivers.

- [7] If used under conditions beyond its rated voltage, it may cause defects such as short-circuit or, depending on the circumstances, explosion or other permanent damages.
- [8] Be sure to wear insulated gloves when handling is required during operation.

### After Use

- [9] The ROHM Evaluation Board contains the circuits which store the high voltage. Since it stores the charges even after the connected power circuits are cut, please discharge the electricity after using it, and please deal with it after confirming such electric discharge.
- [10] Protect against electric shocks by wearing insulated gloves when handling.

This evaluation board is intended for use only in research and development facilities and should be handled **only by qualified personnel familiar with all safety and operating procedures.**

We recommend carrying out operation in a safe environment that includes the use of high voltage signage at all entrances, safety interlocks, and protective glasses.

## Safety Precautions



**Caution:** This evaluation board may only be used by authorised personnel that is properly trained in recognizing and dealing with the dangers of testing high voltage equipment and generally experimenting with high voltage circuits. This board should only be used in a lab facility properly equipped for the safe testing of power electronic systems at the relevant voltage levels. Failure to comply may result in damage to equipment, personal injury or death.



**Warning:** The DC link and input voltage of this board may reach up to 900 V. Ensure that only suitable high voltage differential probes are used to measure at this voltage. Failure to do so may result in damage to equipment, personal injury or death.



**Warning:** This evaluation board contains DC bus capacitors which take time to discharge after removal of the power supplies. Before working on the evaluation board wait at least six minutes after deactivating all connected power supplies to ensure that the capacitors have discharged to a safe level.



**Warning:** In case the evaluation board is connected to the grid through a non-isolated system, such as an external rectifier, a direct connection to the grid exists during testing. Therefore, in such situations only high voltage differential probes may be used to measure on the board. Failure to do so may result in damage to equipment, personal injury or death.



**Warning:** Before disconnecting, connecting or reconnecting wires or measurement probes to the board or before touching the board or performing any manipulations on the board ensure that all external power is removed or disconnected from the board and at least six minutes have passed to ensure the capacitors have discharged to a safe level and then ensure that the capacitor voltages have dropped to a safe level. Failure to do so may result in damage to equipment, personal injury or death.



**Caution:** The heatsink and some component surfaces on the evaluation board may become hot during testing and remain hot for a certain time after turn-off. Take appropriate measures while handling the board after use. Failure to do so may cause personal injury.



**Caution:** Incorrect connection of power supplies or loads can damage the board. Carefully review the information in this document.

**Board details**

The main specifications for the evaluation board are summarized in Table 1 below.

Table 1: Specification of evaluation board

Parameter	Description	Value
V <sub>IN</sub>	Input voltage	300 V to 900 V (DC)
V <sub>OUT</sub>	Output voltage	24 V
f <sub>sw</sub>	Switching frequency	60 kHz to 120 kHz
C <sub>IN</sub>	Input capacitance	50µF (2x 100µF, 450V in series)
C <sub>OUT</sub>	Output capacitance	940 µF, 35V

**Connections and Operating Instructions**

At start-up it is highly recommended to have a no load condition at the output. The connectors, jumpers and test points on the board can be seen in Table 2.

**Start-up routine:**

- Disconnect the load
- Connect and set the input voltage to at least 300 V DC
- Connect the load

**Shut down routine:**

- Turn off the input voltage
- Disconnect the load
- Wait at least 6 minutes before touching to the board.

Table 2: Important connections and test points

Label		Descriptions
Input	+	300 V to 900 V input power supply
	-	Ground of the power supply
Output 24 V	+	Isolated output to load
	-	Return path to load
Test Point	TP13	Connected to Drain of MOSFET
	TP14	Connected to Source of MOSFET
	TP2	Connected to Output of the controller IC (Gate of MOSFET)
	TP9	Connected to Primary Ground
	TP3	Connected to Power Supply Pin of the IC
	TP10	Ground Pin / Ground of the Current Sense Resistors
TP5	Connected to Auxiliary Winding Output	
Jumper	J4	Allows the connection of the LED

**Test board connections and schematic**

Input and output connections to the EVK

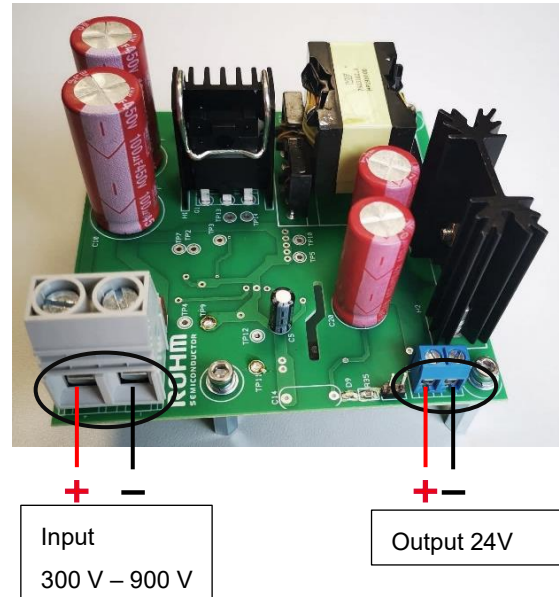


Figure 2: Top view of the evaluation board highlighting input and output connectors

## Notes

- 1) The information contained herein is subject to change without notice.
- 2) Before you use our Products, please contact our sales representative and verify the latest specifications :
- 3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.  
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- 4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.
- 5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.
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