# EVAL-IHW65R62EDS06J

## Evaluation board of 650 V reverse conduting IGBT for induction heating application

**IHW40N65R6, 2ED21824S06J, 2ED21844S06J, 2ED2181S06F, 2ED2504S06F**

## About this document

### Scope and purpose

The induction heating, half-bridge evaluation board EVAL-IHW65R62EDS06J features the new 650 V reverse-conducting R6 family of IGBTs, specifically designed for induction heating and resonant switching applications up to 100 kHz. This user guide demonstrates the functionality and key features of the R6 IGBTs in combination with the Infineon level-shift EiceDRIVER™ ICs based on the Infineon SOI technology.

The design of the evaluation board EVAL-IHW65R62EDS06J was performed with respect to the environmental conditions described in this document. The design was tested as described in this document, but not qualified in terms of manufacturing, lifetime or over the full range of ambient operating conditions. The boards provided by Infineon are not subject to full production tests.

Evaluation boards are not subject to the same procedures as regular products regarding returned material analysis (RMA), process change notification (PCN) and product discontinuation (PD). Evaluation boards are intended to be used under laboratory conditions, and by trained specialists only.

### Intended audience

- Engineers who want to learn how to use the Infineon reverse-conducting IGBTs in combination with EiceDRIVER™ 2ED2x families
- Experienced design engineers who design circuits with Infineon EiceDRIVER™ and IGBTs
- Design engineers who develop power electronic devices, such as inverters

### Evaluation board

This board will be used during design-in, for evaluation and measurement of characteristics, and proof of data sheet specifications.

*Note: PCB and auxiliary circuits are NOT optimized for final customer design.*

## Important notice

**"Evaluation Boards and Reference Boards" shall mean products embedded on a printed circuit board (PCB) for demonstration and/or evaluation purposes, which include, without limitation, demonstration, reference and evaluation boards, kits and design (collectively referred to as "Reference Board").**

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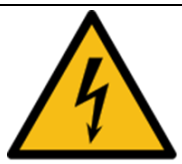
# Safety precautions

*Note: Please note the following warnings regarding the hazards associated with development systems.*

**Table 1 Safety precautions**

| | |
|---|---|
|  | **Warning:** *The DC link potential of this board is up to 600 VDC. When measuring voltage waveforms by oscilloscope, high voltage differential probes must be used. Failure to do so may result in personal injury or death.* |
| | **Warning**: *The evaluation or reference board contains DC bus capacitors which take time to discharge after removal of the main supply. Before working on the drive system, wait five minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication that capacitors have discharged to safe voltage levels.* |
| | **Caution:** *The heat sink and device surfaces of the evaluation or reference board may become hot during testing. Hence, necessary precautions are required while handling the board. Failure to comply may cause injury.* |
| | **Caution:** *Only personnel familiar with the drive, power electronics and associated machinery should plan, install, commission and subsequently service the system. Failure to comply may result in personal injury and/or equipment damage.* |
| | **Caution:** *The evaluation or reference board contains parts and assemblies sensitive to electrostatic discharge (ESD). Electrostatic control precautions are required when installing, testing, servicing or repairing the assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with electrostatic control procedures, refer to the applicable ESD protection handbooks and guidelines.* |
| | **Caution:** *The evaluation or reference board is shipped with packing materials that need to be removed prior to installation. Failure to remove all packing materials that are unnecessary for system installation may result in overheating or abnormal operating conditions.* |

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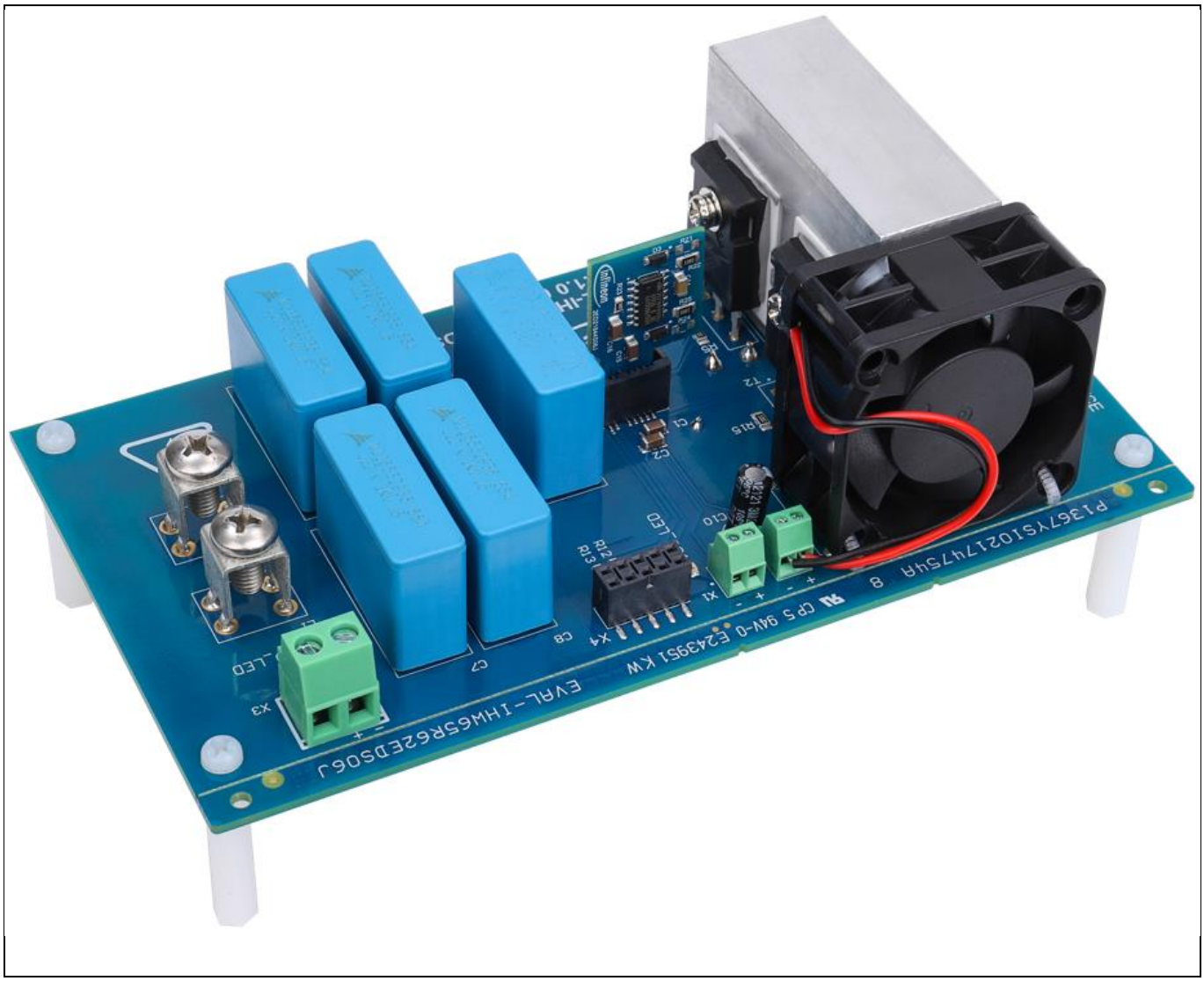
# 1 The board at a glance

This user guide (UG-2021-26) describes the evaluation board EVAL-IHW65R62EDS06J that is intended for the product feature evaluation of the Infineon 650 V reverse-conducting R6 in an application circuit. The key elements of the board and the product are listed here.

- Evaluation board in half-bridge configuration with two 650 V R6 IGBTs and one half-bridge gate driver IC



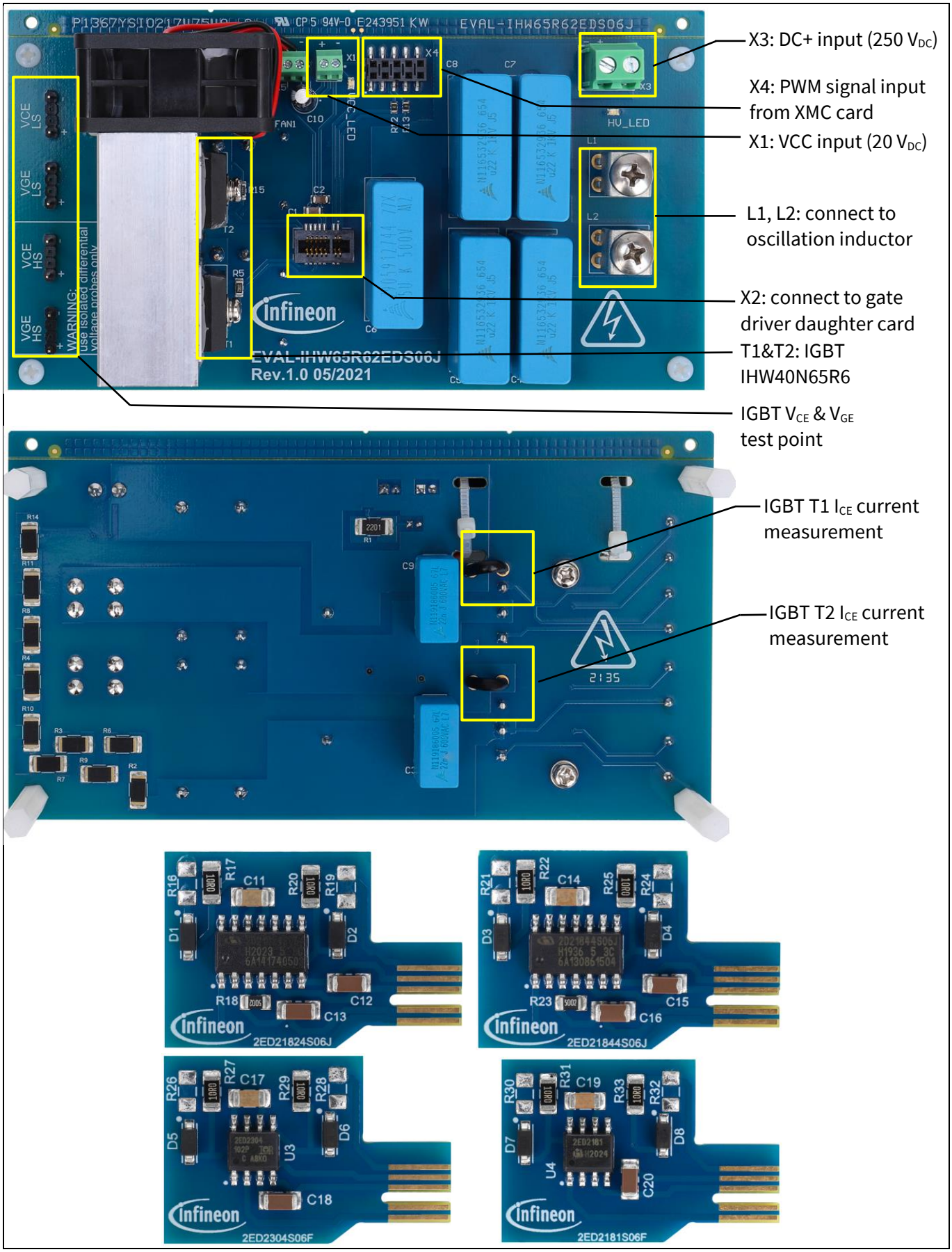



**Figure 1** **Picture of the evalboard EVAL-IHW65R62EDS06J and gate driver daughter cards**

This board is suited for double-pulse testing as well as continuous operation mode. The board has been designed and the components selected to reflect a typical, state-of-the-art induction cooking system based on a half-bridge topology. The main difference with respect to a complete system is the absence of a rectifier, filter stage and auxiliary power supply regulator stage. For this reason the inverter must be supplied with a DC voltage, and an additional low DC voltage (up to 20 V) must be provided to supply the driver IC and the fan.

The control interface has been designed so that it can be easily connected to the Infineon Boot Kit XMC1300 Microcontroller Unit (MCU) board[1,2]. Alternatively, it can also be connected to a pulse generator or to other digital circuits.

The board has been tested with input power up to 3000 W, with an input DC voltage of 250 V and an auxiliary voltage supply of 20 V. Users should note that the auxiliary supply voltage determines the cooling performance of the heat sink and fan assembly, i.e., the output power may be lower in case the axuliary power supply voltage is lower than 20 V.

## 1.1 Delivery content

The evaluation board EVAL-IHW65R62EDS06J contains the printed circuit board. This board is designed to offer the best layout guidance for incorporating the IHW40N65R6 into a half-bridge resonant inverter. The gate driver stage is implemented on four separate daughter cards, each featuring a different driver IC model. Even though this approach is not the most common for typical induction cooking designs, particular care has been taken to optimize the gate driving loops, and therefore to minimize parasitic inductances. Thus the layout of the daughter cards can still be considered as a guideline for implementing the gate driving stage in a real application design.

The assembled gate resistors are selected for use with IHW40N65R6 and with a gate supply of up to 20 V in the IGBT on-state.

The evaluation board kit also contains the resonant coil that must be connected to the board. The users can connect different coils to the board to test different load variants. The electrical characterization of the evaluation board was done using the coil that comes with the evaluation board.

[1] Additional information about the XMC board can be found here: https://www.infineon.com/cms/en/product/evaluation-boards/kit_xmc13_boot_001/.

[2] The complete software for the MCU can be downloaded on the Infineon website upon registration of the board. See 5.3 for further details.

## 1.2 Block diagram

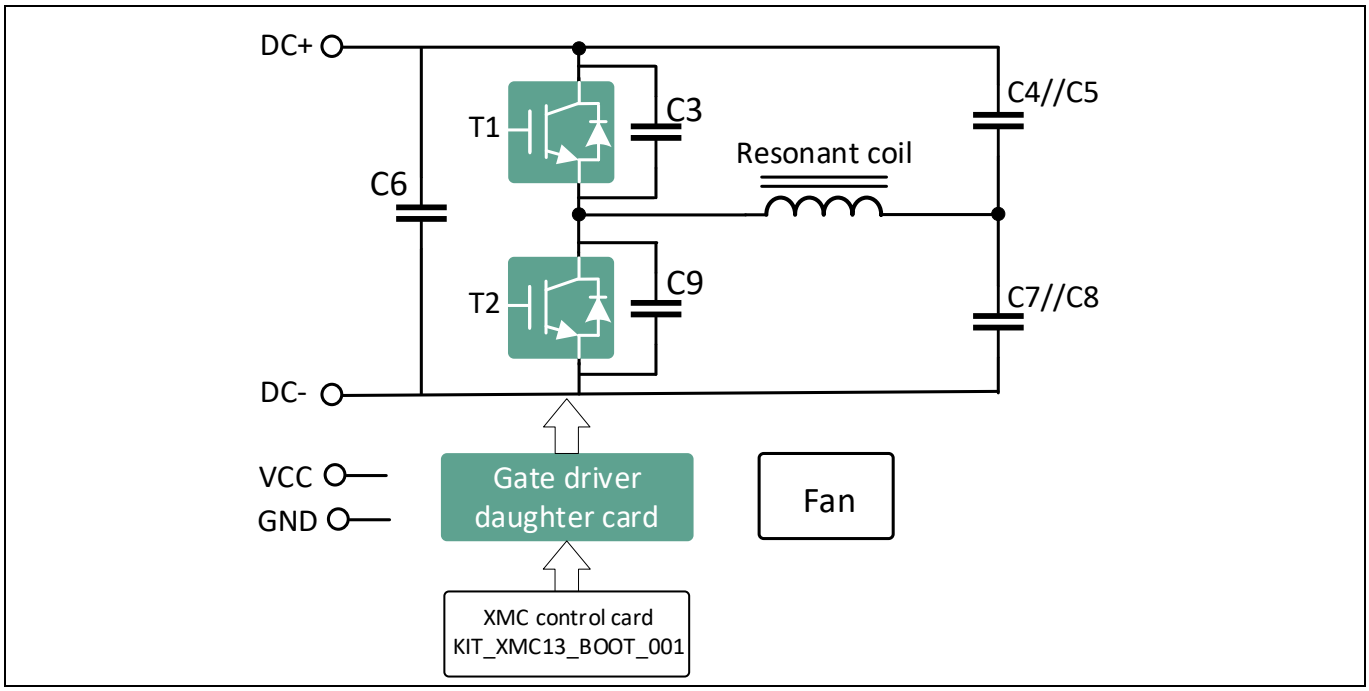



**Figure 2 Block diagram of EVAL-IHW65R62EDS06J**

## 1.3 Board parameters and technical data

The selected components on the evaluation boards, as well as the gate driver ICs, have maximum ratings and operating conditions to avoid damage to the individual parts and the evaluation board overall.

**Table 2 Absolute maximum ratings**

| Pin/parameter name | Connector | Min | Typ | Max | Unit | Note |
|---|---|---|---|---|---|---|
| *VCC1* | X1+ | -0.2 | 20<br>80 | 20<br>1000 | V<br>mA | Auxiliary supply connector/gate driver IC supply voltage |
| *LIN*, *HIN* | X4.3, X4.8 | -0.2 | 5 | VCC1 + 0.5 | V | Input, digital signal |
| *V-HV* | X3+ | 180 | 250 | 270 | V | Input, high-voltage supply. For voltages above 42 V, a special high-voltage lab environment is strongly recommended |
| $f_{sw}$ | | 25 | 30 | 50 | kHz | Maximum switching frequency for continuous operation; careful consideration of power dissipation required for power transistor and EiceDRIVER™ IC |

The PCB assembly is optimized for a VCC1 supply voltage of up to 20 V. Higher supply voltages should be avoided to not damage the IGBTs.

# 2 System and functional description

## 2.1 Commissioning

Follow the steps below to set up and power up the board, and to perform initial evaluations.

**Prerequisites**

- Have isolated low-voltage power supplies ready for input support and logic supply (*VCC1*) with a current capability of at least 2.5 A for *VCC1*
- Have a high-voltage power supply ready for HV-DC between *X3+ (V-HV)* and X3- *(HV_GND)*
- Have the load coil (~65 µH) ready, or any other coil that is suitable for induction cooking application
- Have the XMC 1300 Boot Kit board ready and programmed (or, as an alternative, a dual-channel pulse-width modulation (PWM) generator for half-bridge PWM input)

To adapt the circuit to application requirements, resistor or capacitor values can be changed to optimize the performance.

***Attention:*** ***Before operating the board, make sure that a gate driver daughter card is properly inserted in the connector X2.***

**Power-up sequence**

1. Connect supply *GND* to connector *X1-* and supply *VCC1* to connector *X1+* with +20 V.
2. The VCC_LED will turn on.
3. Connect the JP104 of the Boot Kit XMC1300 to the connector X4 of the evaluation board, as indicated in Figure 3[1].
4. Connect the negative terminal of the high-voltage power to connector *X3-* and the positive terminal to connector *X3+*.
5. Connect one end of the coil to *L1* and the other end to *L2*.
6. Turn on the power supply with up to 270 V.
7. The HV_LED will turn on.

**Safe power-down sequence**

1. Turn-off the high-voltage power supply and verify that the HV_LED is off.
2. Check the DC-link voltage with e.g. a digital multimeter or an oscilloscope.
3. Turn-off the other supply voltages (VCC1) and verify that the VCC_LED is off.

[1] Alternatively, connect the first output of the signal generator to the digital interface connectors X4.3 (low-side input) and X4.2 (GND) and the second output between X4.8 (high-side input) and X4.2 (GND). Make sure that the outputs of the PWM generator are disabled.

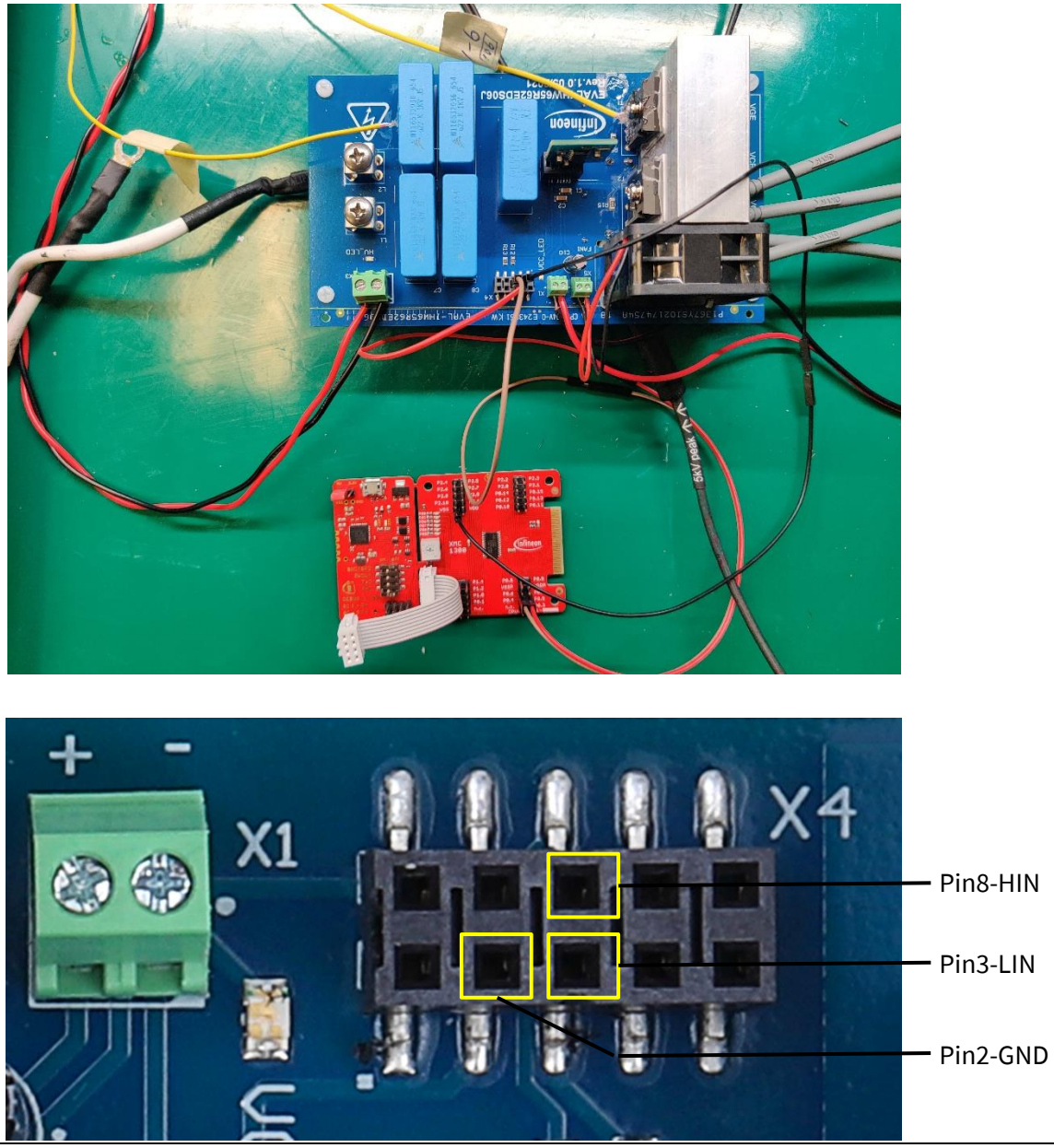



**Figure 3 Connection of digital interface X4 to the Boot Kit XMC1300**

## 2.2 Connection of measurement probes

The evaluation board offers dedicated measurement points for the IGBT's gate and collector terminal voltages with respect to the related emitter terminal. The test points are marked with the following labels:

- *VCE_LS*: collector-to-emitter voltage of low-side IGBT
- *VGE_LS*: gate-to emitter-voltage of low-side IGBT
- *VCE_HS*: collector-to-emitter voltage of high-side IGBT
- *VGE_HS*: gate-to-emitter voltage of high-side IGBT

Assuming that the oscillope ground is connected to the ground of the digital interface (either the Boot Kit XMC1300 or the signal generator), the different voltages can be measured by means of the following probes:

- *VCE_LS*: "high-voltage" passive probe (with attenuation of 100X or more)

- *VGE_LS*: “low-voltage” passive probe (with attenuation of 10X or more)
- *VCE_HS*: differential voltage probe (with attenuation of 100X or more and a a maximum common mode voltage >400 Vdc)
- *VGE_HS*: differential voltage probe (with attenuation of 10X or more and a a maximum common mode voltage >400 Vdc)

In addition to the voltage measurements, the evaluation board comes with jumpers to measure directly the current of the IGBT flowing from/to the emitter terminal. The two jumpers, one for the high-side and one for the low-side IGBT, are placed on the bottom side of the board and are suitable to be used with Rogowski coil current probes, as shown in Figure 4.

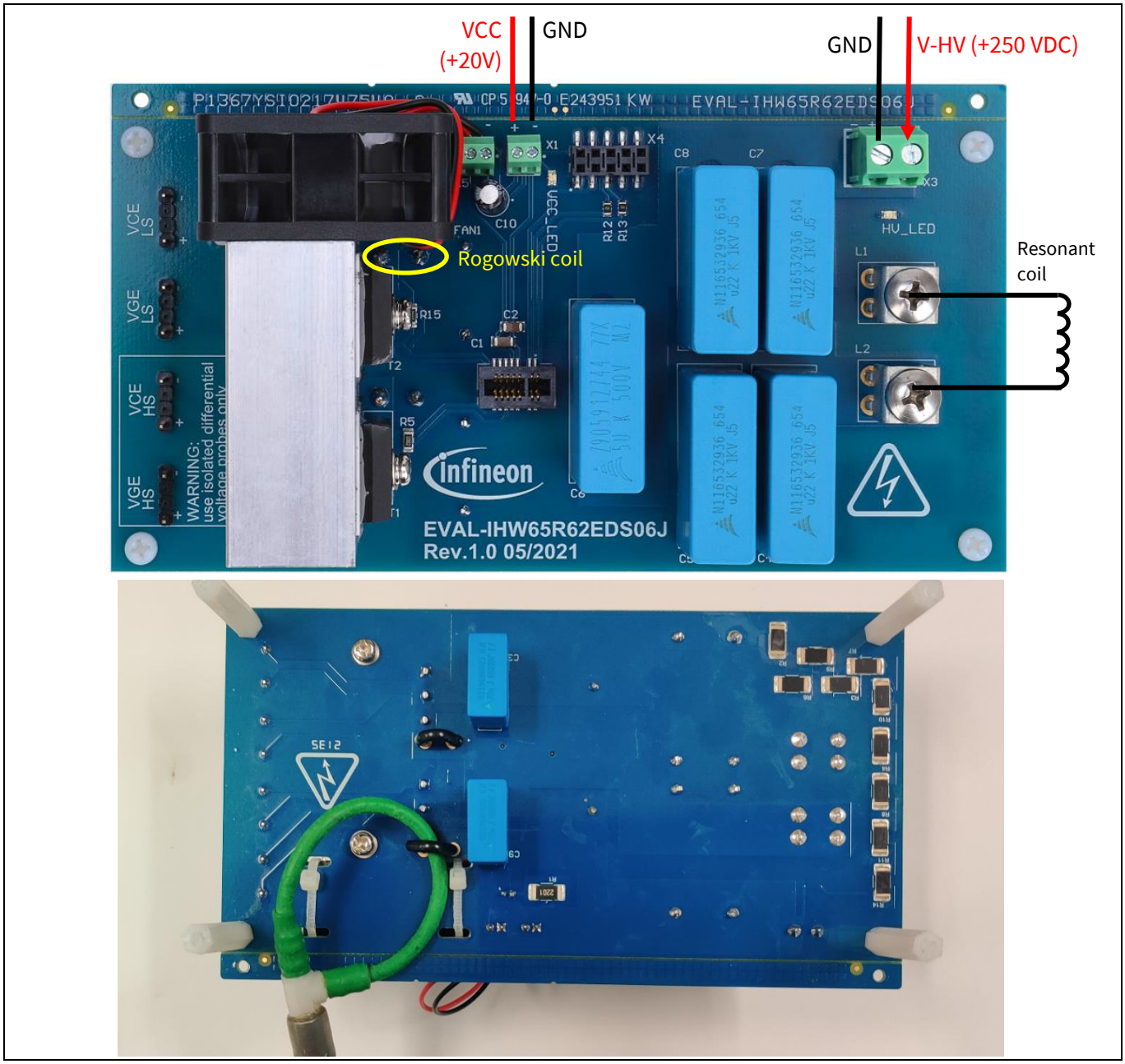
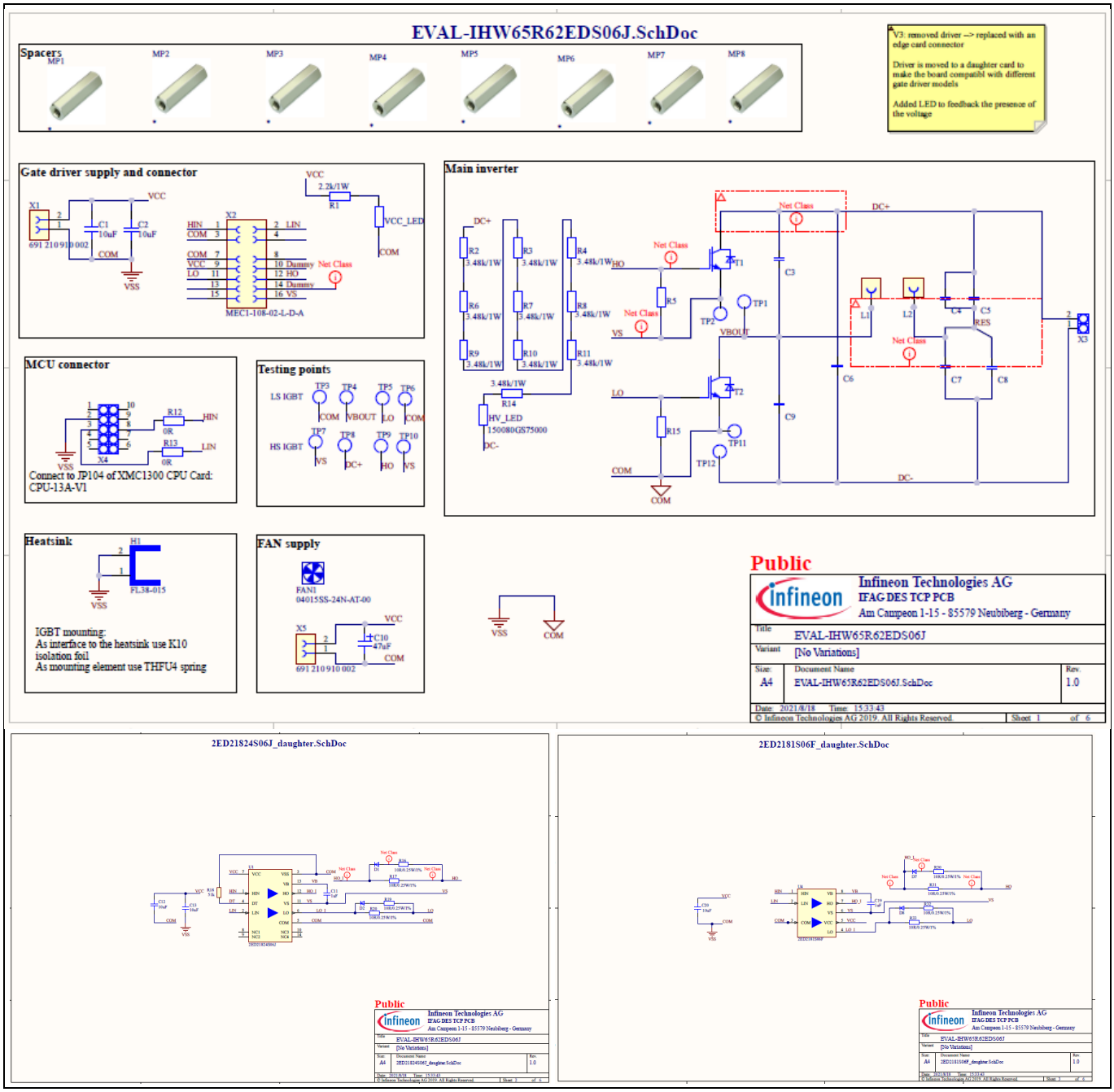



**Figure 4** **Example of connection of a Rogowski coil to measure the emitter current of the low-side IGBT**

# 3 System design

## 3.1 Schematics

The complete schematics are available on the download section of the Infineon homepage. A log-in is required to download this material.



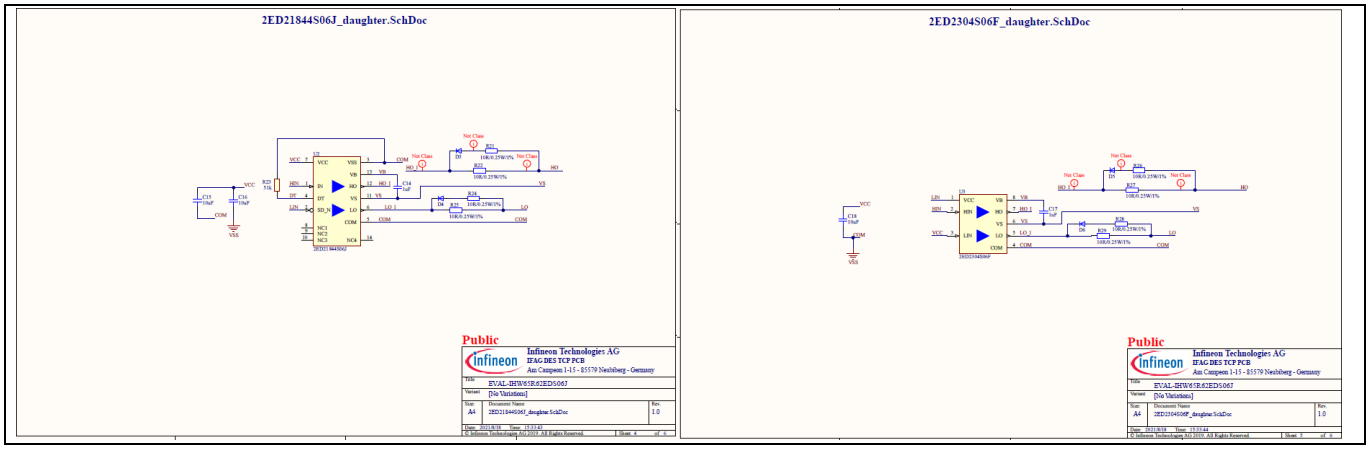
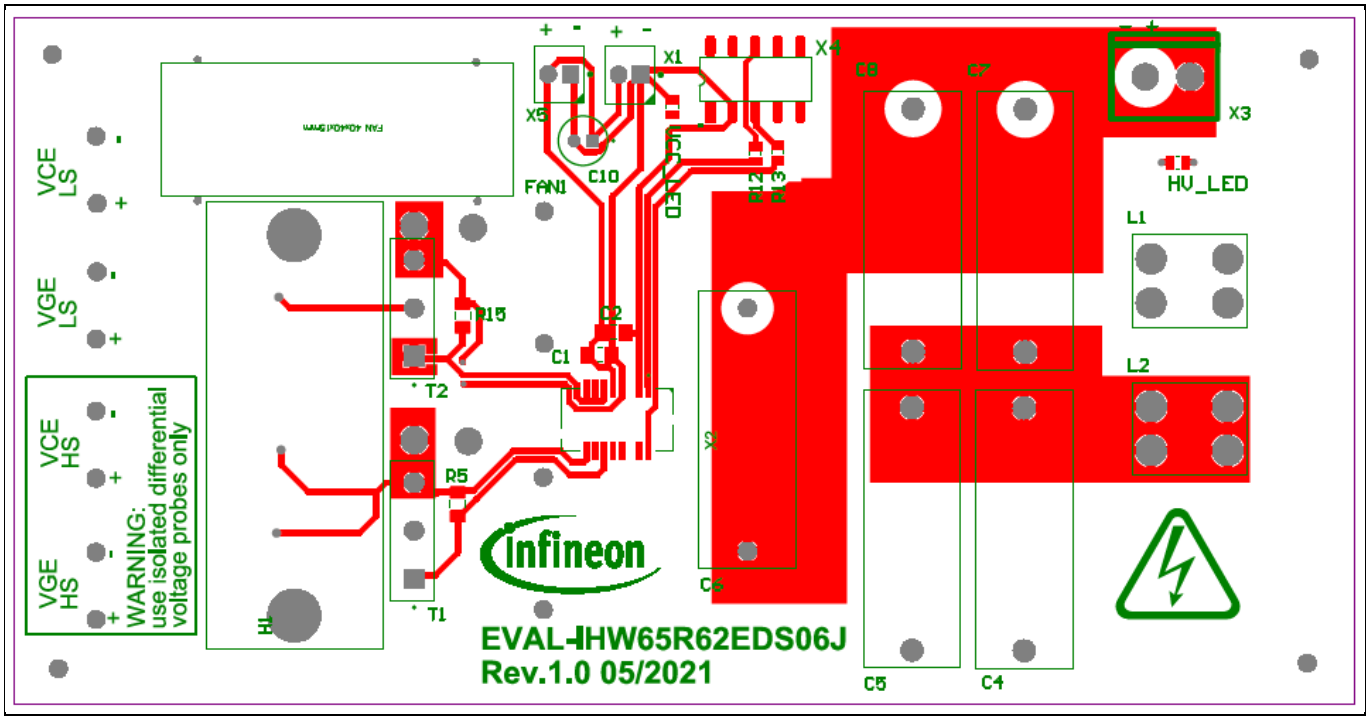



**Figure 5 Schematic of EVAL-IHW65R62EDS06J**

## 3.2 Layout



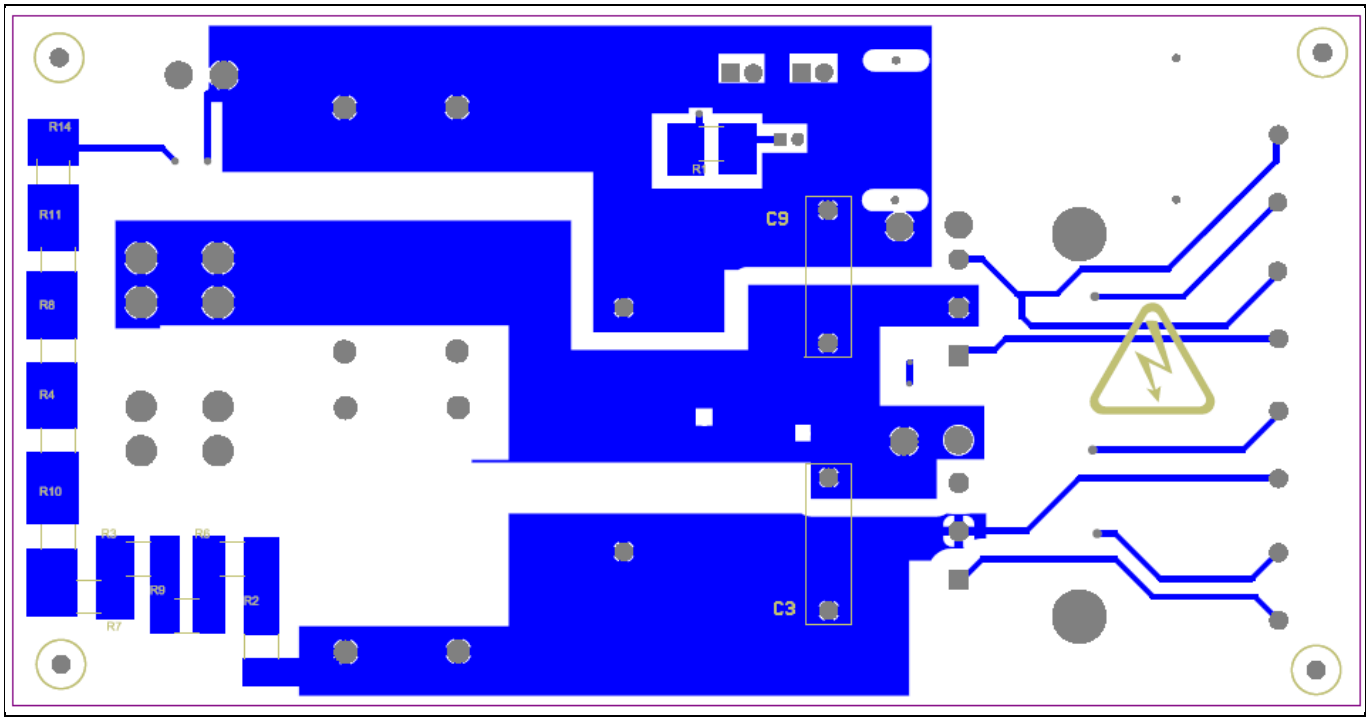



**Figure 6 Top and bottom layer of EVAL-IHW65R62EDS06J**

## 3.3 Bill of material

The complete bill of material is available on the download section of the Infineon homepage. A log-in is required to download this material.

**Table 3 BOM of the most important/critical parts of the evaluation or reference board**

| S. No. | Ref Designator | Description | Manufacturer | Manufacturer P/N |
|---|---|---|---|---|
| 8 | C1, C2, C12, C13, C15, C16, C18, C20 | CAP / CERA / 10uF / 25V / 10% / X7R (EIA) / -55°C to 125°C / 1206(3216) / SMD / - | TDK Corporation | 810-C3216X7R1E106K |
| 2 | C3, C9 | Capacitor Unpolarized | EPCOS/TDK | 871-B32642B0223J |
| 2 | C4, C7 | Capacitor Unpolarized | EPCOS/TDK, [NoParam] | 871-B32674D8474K |
| 1 | C6 | Capacitor Unpolarized | EPCOS/TDK | 871-B32774X4505K000 |
| 1 | C10 | CAP / ELCO / 47uF / 35V / 20% / Aluminiumelectrolytic / -55°C to 105°C / 2.00mm C X 0.50mm W 5.25mm Dia X 12.50mm H / - / - | Rubycon | 35PX47MEFC5X11 |
| 4 | C11, C14, C17, C19 | Surface Mount Multilayer Ceramic Chip Capacitor | Kemet | C1206C105K3RACTU |
| 8 | D1, D2, D3, D4, D5, D6, D7, D8 | Standard Diode | Comchip Technology | 1N4148W-7-F |
| 1 | FAN1 | Fan | | FD4015B4H-AP00 |
| 1 | H1 | Heatsinks for PCB mounting | heatsinker | FL38-015 |

| S. No. | Ref Designator | Description | Manufacturer | Manufacturer P/N |
|---|---|---|---|---|
| 2 | HV_LED, VCC_LED | Resistor | Wurth Electronic | 710-150080GS75000 |
| 2 | L1, L2 | Snap In PC Mount-Heavy Duty Screw Terminal, 15 A | Mouser | 534-8174 |
| 8 | MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8 | Spacer Hexagonal M3 | | |
| 1 | R1 | Resistor/2.2k/1W/2512 | | No special |
| 10 | R2, R3, R4, R6, R7, R8, R9, R10, R11, R14 | Resistor/3.48k/1W/2512 | | No special |
| 2 | R5, R15 | Resistor/10K/0.25W/1%/1206 | | No special |
| 2 | R12, R13 | Resistor/0R/0805 | | No special |
| 8 | R17, R20, R22, R25, R27, R29, R31, R33 | Resistor/10R/0.25W/1% | | No special |
| 2 | R18, R23 | RES / STD / 51k / 125mW / 1% / 100ppm/K / -55°C to 155°C / 0805 / SMD / - | 51k | CRCW080551K0FK |
| 2 | T1, T2 | Reverse-conducting IGBT with monolithic body diode, VCE 650V, IC 40A; qualified for industrial applications according to the relevant tests | Infineon Technologies | IHW40N65R6 |
| 12 | TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12 | Testing Point | KEYSTONE, Wurth Elektronik | |
| 1 | U1 | Half-bridge, high-voltage, high-speed power MOSFET and IGBT driver | Infineon Technologies | 2ED21824S06J |
| 1 | U2 | Half-bridge, high-voltage, high-speed power MOSFET and IGBT driver | Infineon Technologies | 2ED21844S06J |
| 1 | U3 | A high-voltage, high-speed power MOSFET and IGBT driver with independent high and low side referenced output channels. The output drivers feature a high-pulse current buffer stage | Infineon Technologies | 2ED2304S06F |

| S. No. | Ref Designator | Description | Manufacturer | Manufacturer P/N |
|---|---|---|---|---|
| | | designed for minimum driver cross-conduction | | |
| 1 | U4 | A high-voltage, high-speed power MOSFET and IGBT driver with independent high and low side referenced output channels. The output drivers feature a high-pulse current buffer stage designed for minimum driver cross-conduction | Infineon Technologies | 2ED2181S06F |
| 2 | X1, X5 | Series 2109 - 2.54mm Horizontal Entry With Rising Clamp Cage Clamp - 0.8mm² Wires WR-TBL | Wurth Elektronik | 691 210 910 002 |
| 1 | X2 | 1mm Mini-Edge Card Assembly, 16Pins, 8Pins Per Row, 5.6 Pins Polarized | Samtec | MEC1-108-02-L-D-A |
| 1 | X3 | Terminal block, 2 Contacts | Molex | WM23228-ND |
| 1 | X4 | Female Header, 2x5 Contacts | Samtec | 200-SSM105FDVPTR |

## 3.4 Connector details

**Table 4 Connectors and pin assignment**

| Connector | Pin | Marking/ function | Note |
|---|---|---|---|
| X1 | +<br>- | *VCC1*<br>*GND* | Positive terminal for auxiliary power supply voltage<br>Ground/negative terminal for auxiliary power supply voltage |
| X2 | / | - | Connector for gate driver daughter card board |
| X3 | +<br>- | *V-HV*<br>*GND* | Positive terminal for DC high-voltage supply voltage<br>Ground/negative terminal for DC high-voltage supply voltage |
| X4 | 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 | *NC*<br>*GND*<br>*LIN*<br>*NC*<br>*NC*<br>*NC*<br>*NC*<br>*HIN*<br>*NC*<br>*NC* | -<br>Ground<br>Digital input signal for low-side IGBT<br>-<br>-<br>-<br>-<br>Digital input signal for high-side IGBT<br>-<br>- |
| X5 | + | *FAN* | Positive terminal for fan supply |

| Connector | Pin | Marking/ function | Note |
|---|---|---|---|
| | - | *GND* | Ground/negative terminal for fan supply |
| L1 | / | *Coil 1* | Coil terminal |
| L2 | / | *Coil 2* | Coil terminal |
| VCE_LS | / | / | Measurement points for the VCE of the low-side IGBT |
| VCE_LS | / | / | Measurement points for the VGE of the low-side IGBT |
| VCE_HS | / | / | Measurement points for the VCE of the high-side IGBT |
| VGE_HS | / | / | Measurement points for the VGE of the high-side IGBT |

# 4 System performance

This section shows examples of switching waveforms using EVAL-IHW65R62EDS06J. The waveforms in Figure 7 represent the low-side IGBT VCE, VGE and IC waveforms, where the system operates at an input power of 3.1 kW, with the provided coil and cooking vessel, suitable for induction cooking. The specification of the coil and vessel assembly are provided in Section 5.2. With an input voltage of 250 V, the switching frequency to achieve 3.1 kW is shown in Figure 7. Finally, EVAl-IHW65R62EDS96J shows a thermal picture of the board operating at the same conditions as in Figure 8.

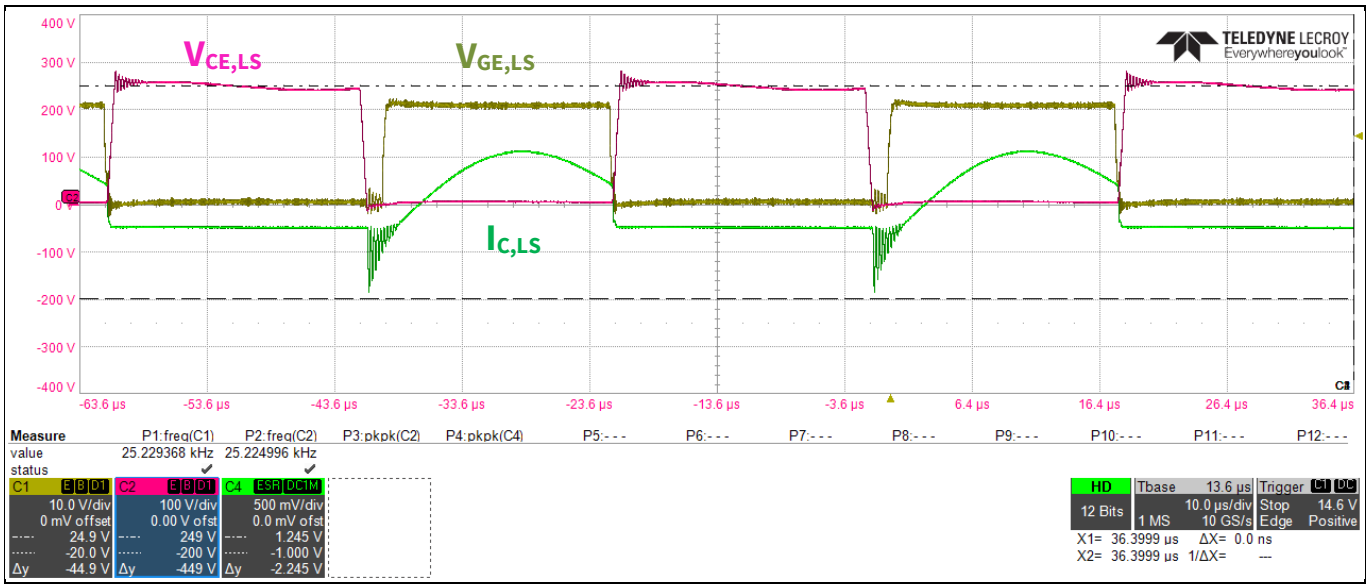



**Figure 7** **Typical waveforms of the IHW40N65R6 as low-side switch (operating conditions: $V_{DC}$ = 250 V, $I_{Cpeak}$ = 40 A, $f_{sw}$ = 25 kHz (dead time = 2 µs), yellow: $V_{GE,LS}$ 10 V/div, green: $I_{c,LS}$ 5 A/div, pink: $V_{CE,LS}$ 100 V/div )**

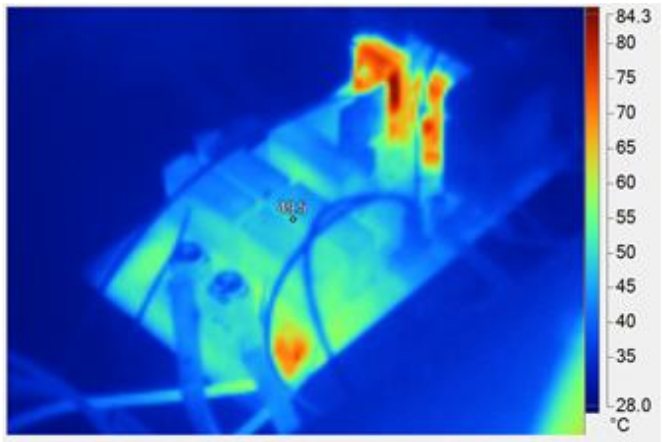



**Figure 8** **Thermal picture of the evaluation board (operating conditions: $V_{DC}$ = 250 V, $I_{Cpeak}$ = 40 A, $f_{sw}$ = 25 kHz)**

# 5 Appendices

## 5.1 Abbreviations and definitions

**Table 5 Abbreviations**

| Abbreviation | Meaning |
|---|---|
| CE | Conformité Européenne |
| EMI | Electromagnetic interference |
| UL | Underwriters Laboratories |
| | |

## 5.2 Resonant load specification

The experiment results presented in this document were conducted with the coil provided with the evaluation board, and with cookware suitable for induction cooking systems. As known, the behavior of the power converter is largely dependent on the particular coil and cooking vessel that is used. In particular, the coil inductance, diameter, and distance to the vessel are important factors to consider in the design of an induction cooking system. The design of the resonant coil is not included in the scope of this document. However, in order to provide a reference for the results presented, the details of the resonant coil are shown below. Figure 9 depicts a coil with the dimensions and distance to the vessel that should be maintained when the latter is placed on the coil. Finally, Figure 10 depicts the frequency dependence of the series resistance and inductance values of the coil, without the vessel, and with the vessel positioned on top.

| a) | b) |
|---|---|

**Figure 9 Picture of the resonant coil (a) and positioning of the cooking vessel (b)**

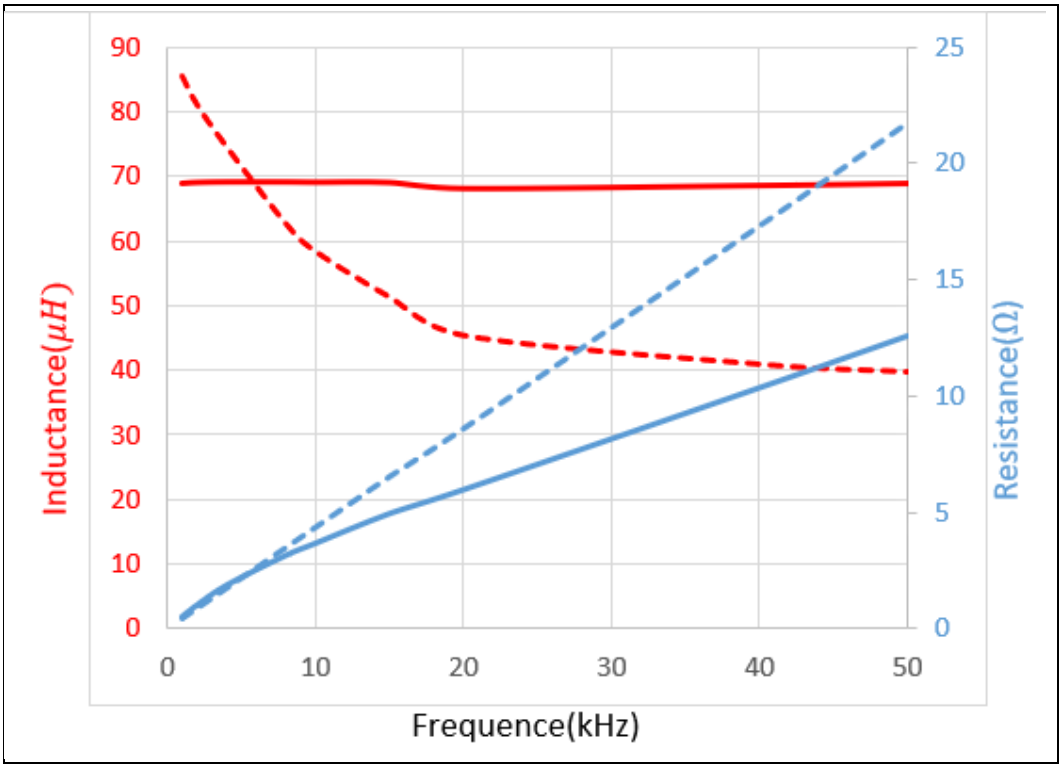



**Figure 10** **Values of the equivalent series resistance (blue curve) and inductance (red curve) of the resonant coil without the vessel (solid line) and with the vessel (dashed line)**

## 5.3 Usage of external software to control the XMC

The EVAL-IHW65R62EDS06J evaluation board does not include any microcontroller. The signals to control the gate driver, and consequently the IGBTs, can be either provided by means of a signal generator or of a microcontroller unit.

In order to set up and implement the evaluation board more quickly, firmware and a user-interface (UI) have been developed[1] that can be used in combination with the Infineon Boot Kit XMC1300 [1] MCU board.

This chapter provides information on how to program, connect and control the MCU board.

### 5.3.1 Programming the Boot Kit XMC1300 board

The firmware on the XMC1300 MCU can be programmed by using the Infineon XMC™ Flasher tool [7]. The user must install the software and connect the Boot Kit XMC1300 board to the computer. Once the connection is established, the file with the firmware (provided as .hex) can be selected and loaded in the MCU by using the button “Program.”

### 5.3.2 Connecting the BootKit XMC1300 board

The connector X4 on the board has been designed to provide an easy connection to the Infineon Boot Kit XMC1300 [1]. A standard 10-wire ribbon cable can be used to connect the evaluation board with the boot kit, as

[1] The firmware and the user interface software can be downloded from the website of the EVAL-IHW65R62EDS06J after having logged in with myInfineon account.

shown in Figure 11. Please ensure that pin *X4.1* of the evaluation board is connected to pin *0.8* of the JP104 port on the MCU board.

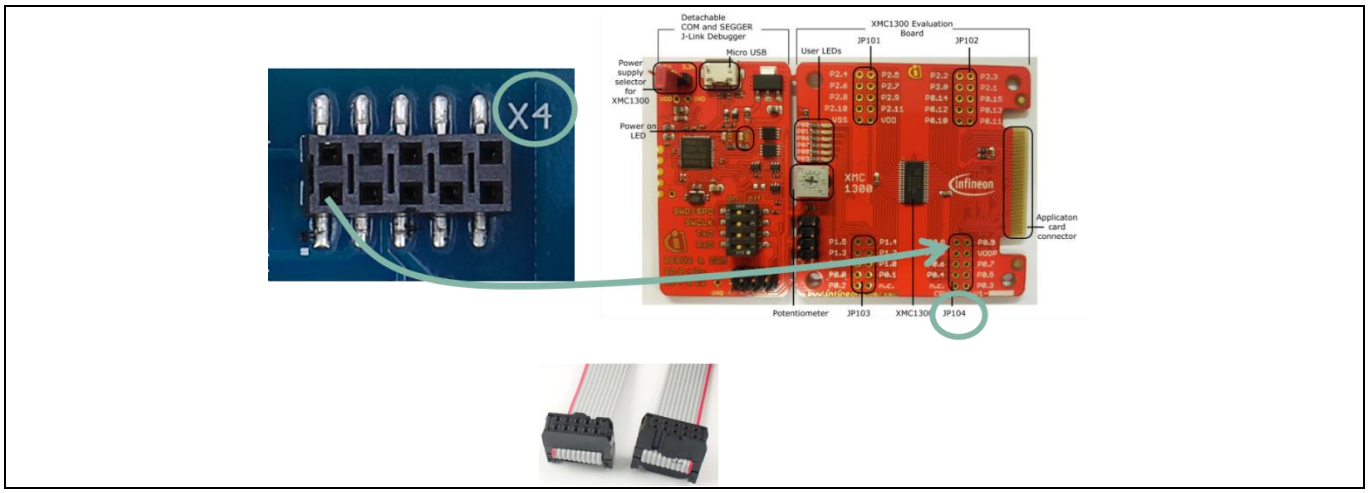



**Figure 11 How to connect the Boot Kit XMC1300 MCU board to the evaluation board.**

## 5.3.3 Controlling the BootKit XMC1300 board

Once the XMC microcontroller on the BootKit XMC1300 is programmed with the provided firmware, it can be controlled by means of a graphical user interface (GUI). The GUI has been developed to provide an easy way to:

- Select the right PWM configuration for each of the gate driver IC models that are provided with the board
- Select and configure the switching frequency, the duty cycle and the dead time between the driving signals of the two IGBTs on the board[1].

The main window of the user interface is shown in Figure 12. It consists of different sections, each dedicated to a specific function.

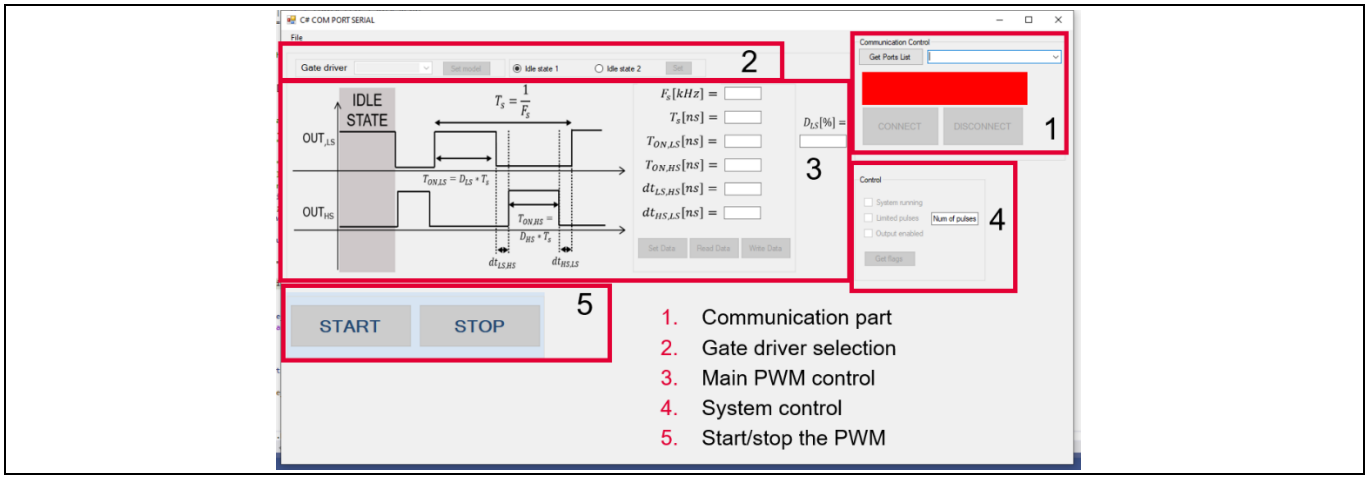



**Figure 12 Main window of the user interface to control the XMC.**

[1] Note that for the 2ED21824S06J and the 2ED21844S06J, the minimum dead time is to be set by means of an external resistor. In this case, the software can force a dead-time value only if this is higher than the one set by the hardware. Please refer to the specific gate driver datasheet for further information ([3], [4]).

Once the BootKit XMC1300 is connected to the computer, the serial communication between the computer and the board can be performed as following (refer to Figure 13):

1. *Press "Get Port List" button*
    a. *the available COMs are displayed in the drop-down menu*
2. *Select the "JLink port"*
3. *Press the "CONNECT" button and check that the bar turns green, and the text "Connected to Port xyz" appears*

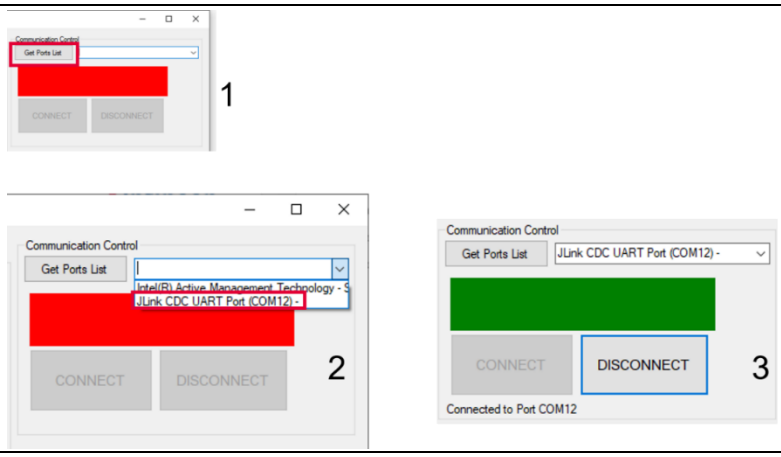



**Figure 13 Procedure to establish communication between the computer and the XMC microcontroller.**

The user interface provides an easy way to select the right gate driver IC model to configure properly the driving PWM signals generated by the MCU. The model of gate driver must be selected in accordance to the specific daughter card used. To select a gate driver model, the procedure is shown in Figure 14. Changing the gate driver model in the software is allowed only when the system is not running.

***Attention:*** ***Selecting a gate driver model that does not match the model mounted on the board is likely to result in incorrect signal generation, and consequently in a high risk of IGBT failure***

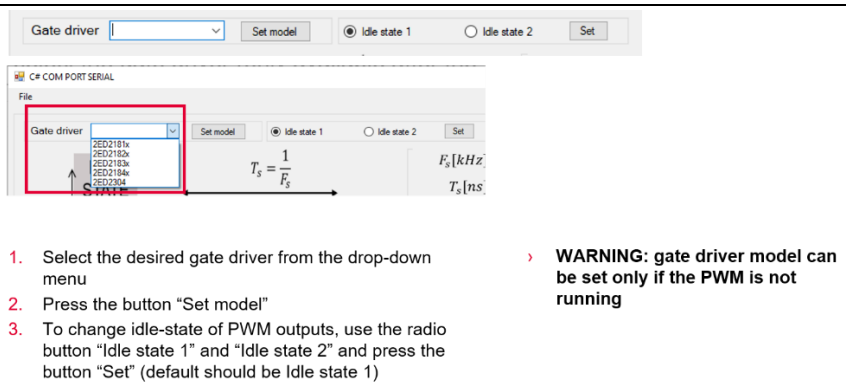



**Figure 14 Procedure to select and configure the MCU to operate with a specific gate driver model.**

The software also allows for an easy change of PWM signals parameters (e.g. frequency, duty cycle, dead time), as shown in Figure 15. The MCU, once programmed for the first time, contains default values that can be retrieved using the button "Read Data." Any modification of the default parameters can be temporarily set in the MCU by using the button "Set Data." The temporary setting is valid until the MCU is powered on. In case the

MCU is turned off, the values of the parameters return to the default values. The user can always save new default values in the MCU flash memory by using the button “Write Data.”

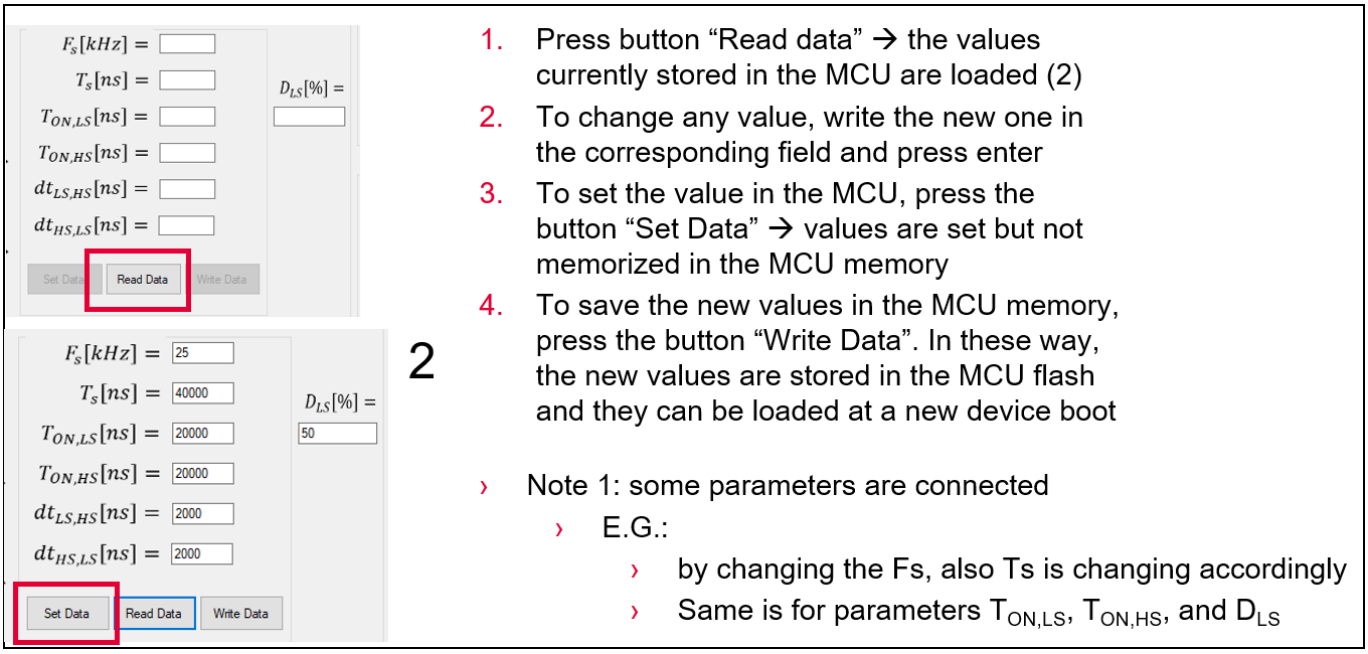


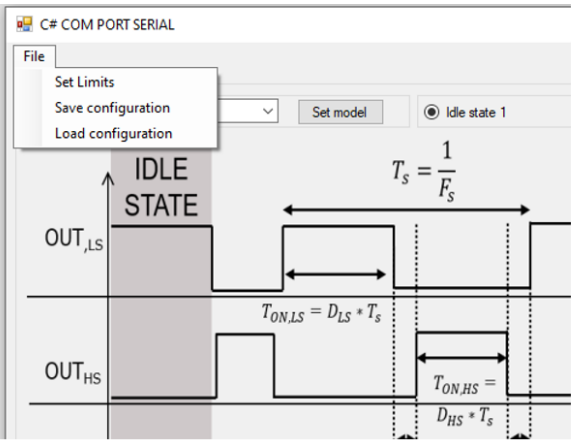

**Figure 15 Procedure to modify PWM signal settings.**

Table 6 lists and describes the PWM parameters that can be configured. Note that some parameters are related to each other (e.g. switching frequency is the reciprocal of the switching period), so they cannot be changed independently.

**Table 6 Explanation of PWM parameters**

| Parameter name | Parameter description | Parameter unit |
|---|---|---|
| $F_S$ | Switching frequency of the PWM signal | kHz |
| $T_S$ | Period of the PWM signal – reciprocal of $F_S$ | ns |
| $T_{ON,LS}$ | On-time duration of the PWS signal that drives the low-side IGBT – related to $T_{ON,HS}$ and to $T_S/F_S$ | ns |
| $T_{ON,HS}$ | On-time duration of the PWS signal that drives the high-side IGBT – related to $T_{ON,LS}$ and to $T_S/F_S$ | ns |
| $dt_{LS,HS}$ | Dead time between low-side turn-off and high-side turn-on | ns |
| $dt_{HS,LS}$ | Dead time between high-side turn-off and low-side turn-on | ns |

At any time, the given parameter configuration of the GUI can also be saved in the computer and loaded later. This may be particularly convenient if a given test configuration has to be reused multiple times. To save and load the configuration, refer to Figure 16. This figure also shows how to set the limits for the PWM parameters, which is particularly useful to prevent entering unwanted values accidentally.




1. Press "File" button → the available sub-menus are available:
   1. Set limits → to set min/max for each PWM parameter
   2. Save configurations → to save all the relevant parameters in a config file
   3. Load configurations → to load the relevant parameters from a config file

**Figure 16 Saving and loading configuration and setting limits for the parameters.**

Once the MCU has been properly set, the generation of the PWM signals can be enabled or disabled by pressing the START and STOP buttons.

Additionally, the user interfaces provide an additional control section that is used for:

- Providing visual feedback on whether the PWM signals are being generated
- Setting the PWM signals to be operated only for a limited number of pulses (e.g. to perform a start-up test of the system)
- Enabling/disabling the MCU to output the signals (this option can be useful to verify the idle states of the IGBT driving signals)

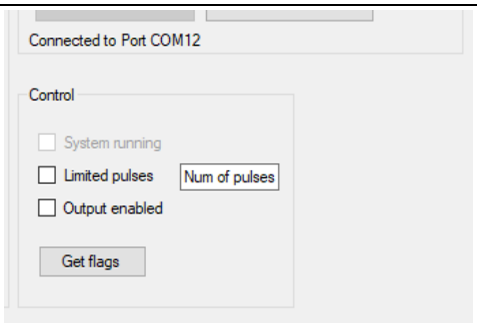



**Figure 17 Saving and loading configuration and setting limits for the parameters.**

# 6 References

[1] https://www.infineon.com/cms/en/product/evaluation-boards/kit_xmc13_boot_001/

[2] https://www.infineon.com/dgdl/Infineon-IHW40N65R6-DataSheet-v01_20-EN.pdf?fileId=5546d46277fc7439017826e19dad7275

[3] https://www.infineon.com/dgdl/Infineon-2ED2182-4-S06F-J-DataSheet-v02_21-EN.pdf?fileId=5546d4626cb27db2016cb8d7368a29e3

[4] https://www.infineon.com/dgdl/Infineon-2ED2184-4-S06F-J-DataSheet-v02_21-EN.pdf?fileId=5546d4626cb27db2016cb8d76cf229fb

[5] https://www.infineon.com/dgdl/Infineon-2ED2304S06F-DataSheet-v02_07-EN.pdf?fileId=5546d46264a8de7e0164d5356ddb3158

[6] https://www.infineon.com/dgdl/Infineon-2ED2181-4-S06F-J-DataSheet-v02_21-EN.pdf?fileId=5546d4626cb27db2016cb8d75bd229f3

[7] https://softwaretools.infineon.com/tools/com.ifx.tb.tool.xmcflasher2

## Revision history

| Document version | Date of release | Description of changes |
|---|---|---|
| Revision 1.0 | 2021-06-30 | Initial version |
| | | |
| | | |

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