XDP™ XDP710-002 EVB: MOSFET adapter boards setup user guide

About this document

Scope and purpose

This document describes how to connect the MOSFET adapter board with the XDP™ XDP710-002 Evaluation Board (EVB).

Intended audience

This document is intended for test engineers who want to evaluate the performance of the XDP710-002 hot-swap controller.

Important notice

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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 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.*
	**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:** *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 Introduction

Infineon's XDP™ XDP7x0-002 family, which includes XDP700-002 and XDP710-002 are highly integrated, wide-input voltage system designed to monitor and protect devices. These systems are digitally configurable and use a power management bus (PMBus) communication interface to access their register map and configure all of their features.

The EVAL_XDP710_V2 Evaluation Board allows the user to evaluate these devices extensively and to test different FETs and power levels the MOSFET adaptor board can be interfaced with this evaluation board.

This document describes how to connect the MOSFET adapter board kit with EVAL_XDP710_V2 Evaluation Board and discusses the different ways in which the MOSEFT adaptor board can be configured.

2 Hardware requirements

The MOSFET adapter board kit can be ordered online from the order code shown in Table 2:

Table 2 Ordering code

Order code	Eval board compatibility	Components included
EVAL_XDP710_FET_BD	EVAL_XDP710_V2	Three MOSFET adapter boards without MOSFET
		Six screws for mounting on copper bus bar

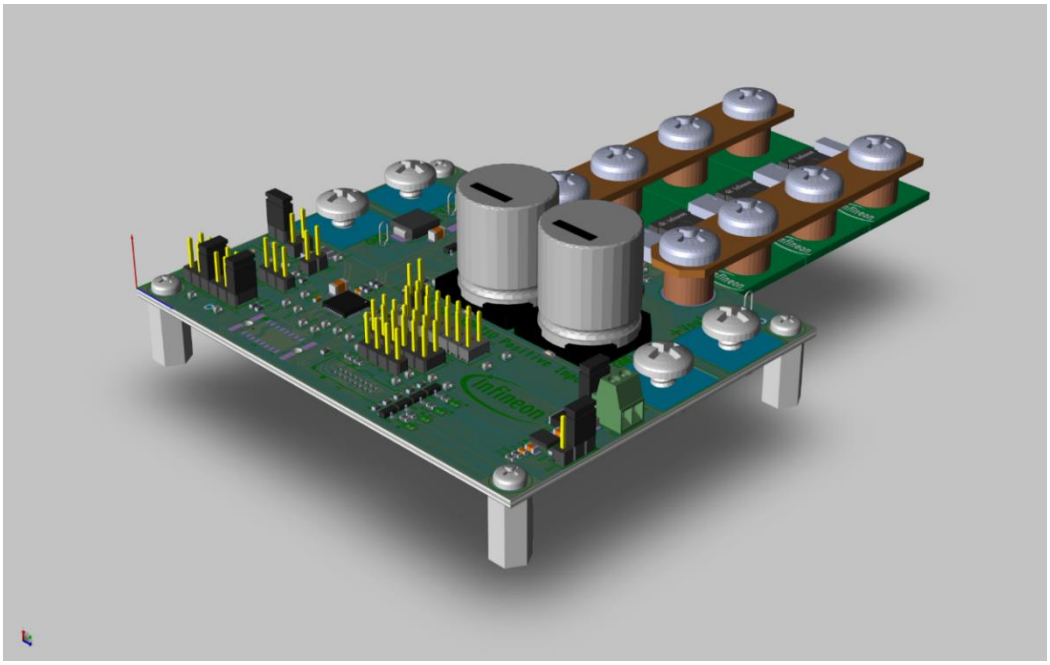

Figure 1 EVAL_XDP710_V2 Evaluation Board

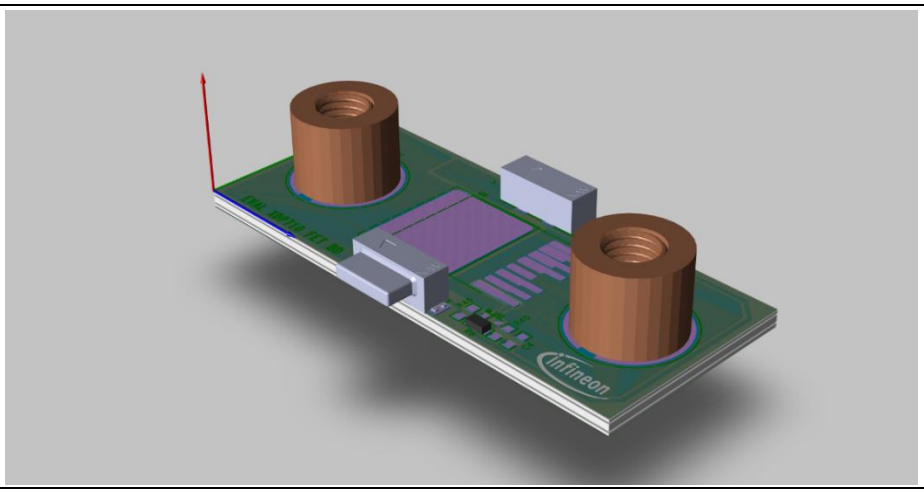

Figure 2 EVAL_XDP710_FET_BD MOSFET adapter board

3 EVAL_XDP710_FET_BD MOSFET adapter board

The following sections describe the EVAL_XDP710_FET_BD MOSFET adapter board highlighting the specifications, schematics, layout, bill of materials (BOM), and different FET footprints that can be supported on this evaluation board.

3.1 Electrical specifications

- Input and output voltage range is 12 V DC to 80 V DC
- Maximum up to three MOSFET boards can be mounted on the copper bar
- The MOSFET adapter boards can be added/removed to the evaluation board based on the required current level

3.2 EVAL_XDP710_FET_BD MOSFET Adapter Board schematics

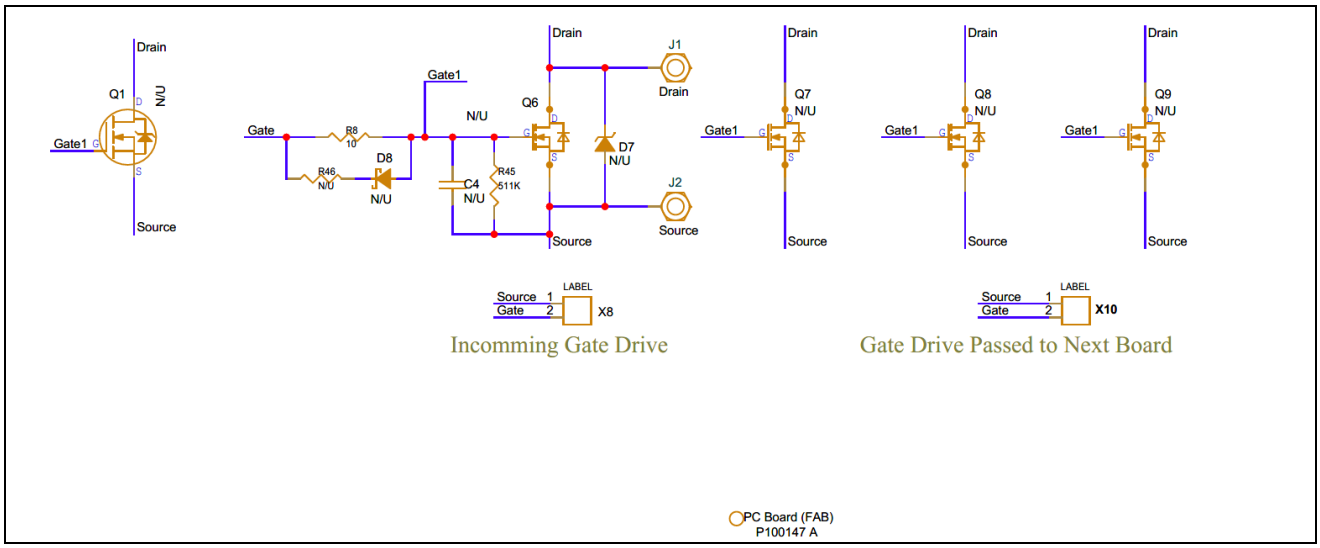

Figure 3 EVAL_XDP710_FET_BD MOSFET PCBA schematic

3.3 EVAL_XDP710_FET_BD PCB layouts

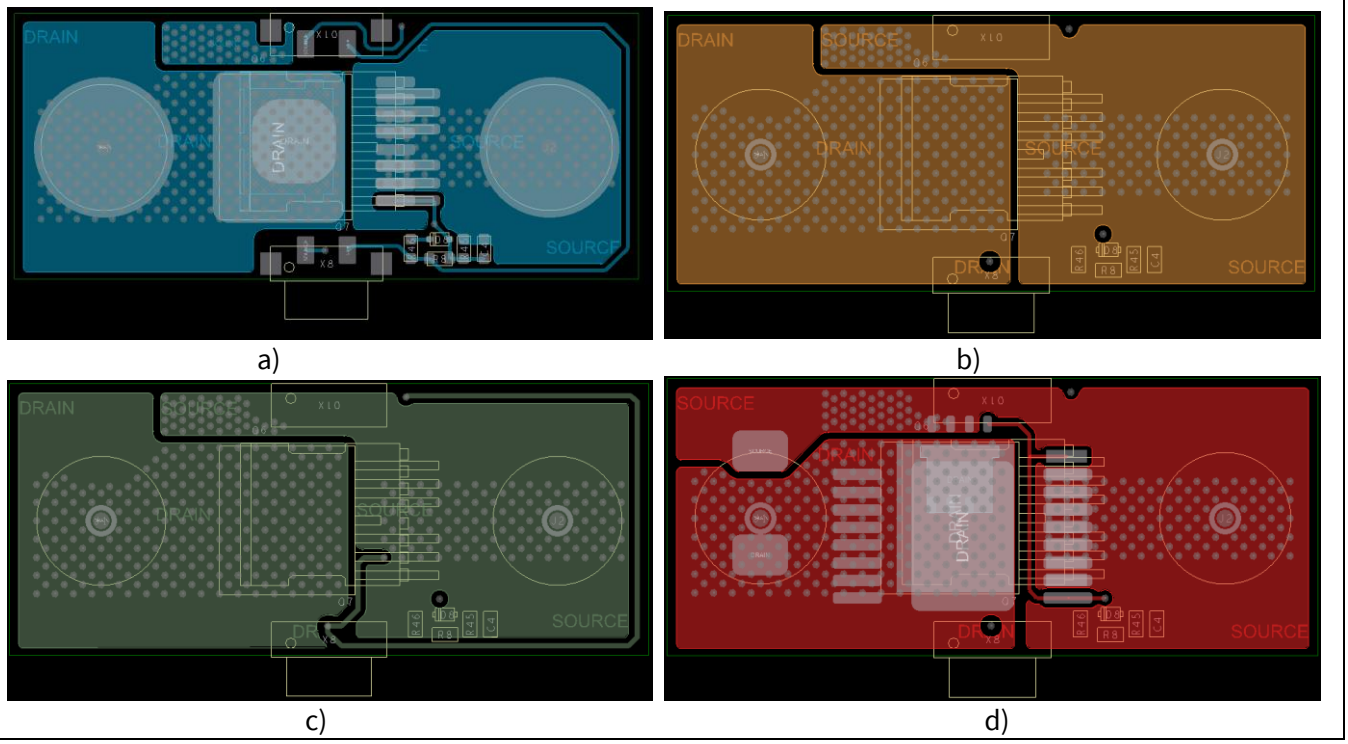

Figure 4 **a) Top, b) Mid 1, c) Mid 2, and d) bottom layer layouts of MOSFET PCB**

3.4 Bill of material

Table 3 **BOM for MOSFET Adapter PCBA**

Item	Qty	Reference designator	Value	Footprint	Manufacturer	Part number
1	1	BRD1	PC board (FAB)	–	–	P100147 A
2	1	C4	N/A	0603	Murata	Not used
3	1	D7	N/A	SMC-diode	Littelfuse	Not used
4	1	D8	N/A	SOD523	–	Not used
5	1	Q1	N/A	PG-TDSON-8	Infineon	Not used
6	1	Q6	N/A	PG-HSOF-8-1	Infineon	Not used
7	1	Q7	N/A	PG-TO263-7	Infineon	Not used
8	1	Q8	N/A	PG-HSOG-8-1	Infineon	Not used
9	1	Q9	N/A	PG-HDSOP-16	Infineon	Not used
10	1	R8	10	0603	Panasonic	ERJ-3EKF10R0V
11	1	R45	N/A	0603	–	Not used
12	1	R46	N/A	0603	–	Not used
13	1	X8	PLUG2	CON2_SMD_AVX-10-9159	AVX	1091590021019 16

Item	Qty	Reference designator	Value	Footprint	Manufacturer	Part number
14	1	X10	SOCK2	CON2_SMD_AVX-10-9159	AVX	2091590021019 16
15	2	J1, J2	SO-M5	SO-SMD-M5-FEMALE	Würth	7466105R

3.5 Different FET footprint options

The FET footprint supports D2PAK, TOLL, and SS08 packages in the following positions:

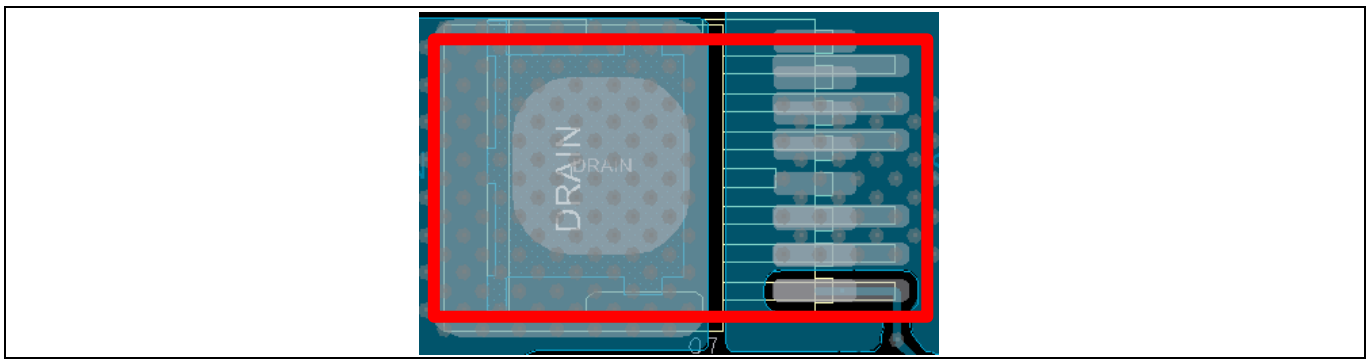

Figure 5 D²PAK and D²PAK7 position (top side)

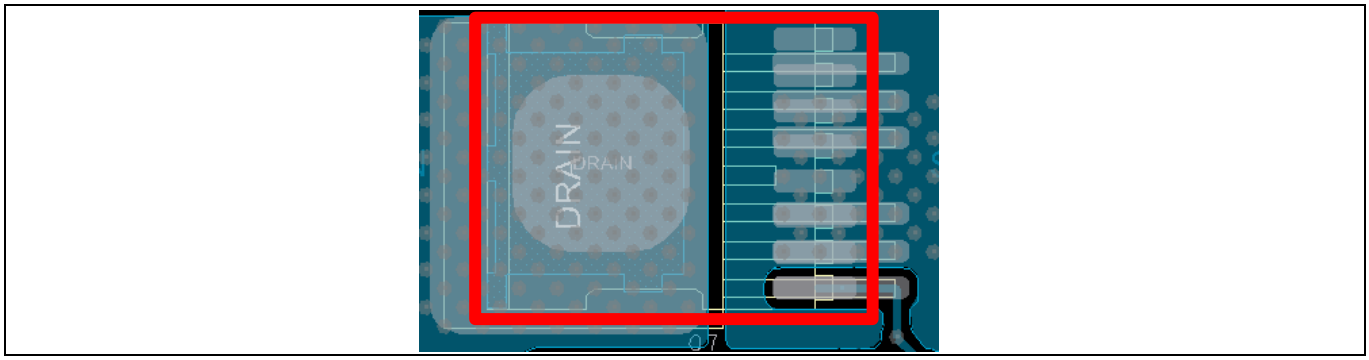

Figure 6 TOLL position (top side)

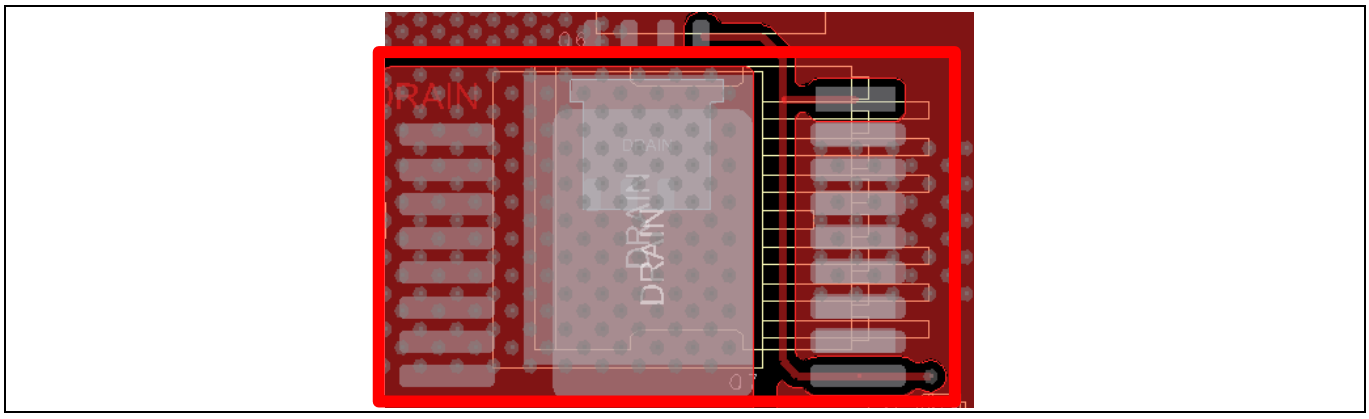

Figure 7 SS08 position (bottom side)

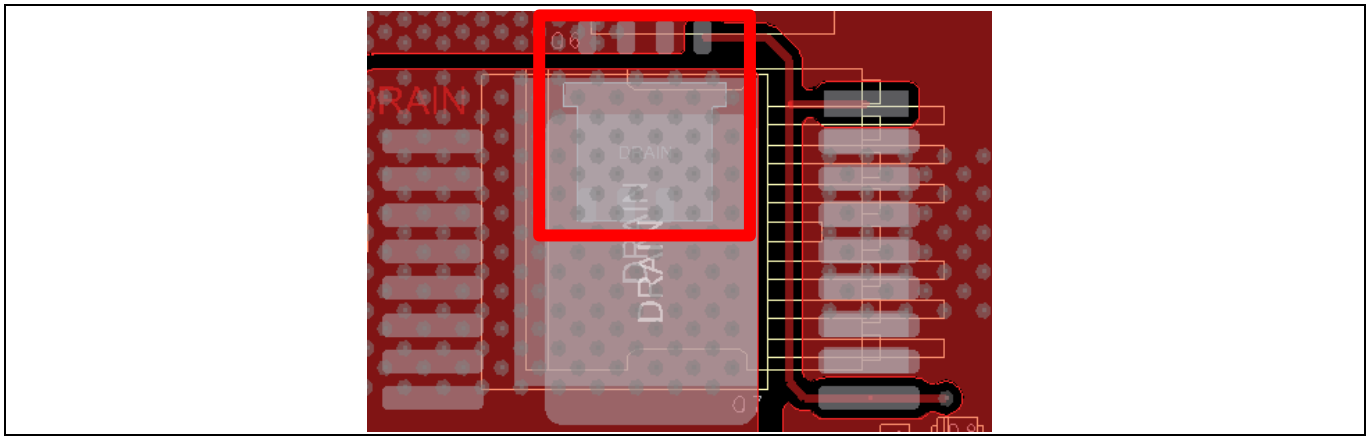

Figure 8 PG-TSON-8-3 position (bottom side)

3.6 Connections of the MOSFET adapter board to the EVAL_XDP710_V2 Evaluation Board

To connect the MOSFET adapter board with the EVAL_XDP710_V2 board, the following components are needed:

- **MOSFET adapter board:** Comes without the FET populated on it, suitable FET(s) can be populated
- **A pair of copper bus bars:** Comes with the EVAL_XDP710_V2 board
- **A pair of screws for mounting each MOSFET adapter board:** Comes with the MOSFET adapter board kit

Figure 9 shows the connections needed for mounting the MOSFET adapter board properly and Figure 10 shows the complete connection of MOSFET adapter board with the EVAL_XDP710_V2 Evaluation Board. A maximum of three MOSFET adapter boards can be mounted onto the evaluation board with the help of copper bus bar and screws.

Note: Secure the screws tightly otherwise, the loose connection can result in improper heatsinking of the FET and increased impedance.

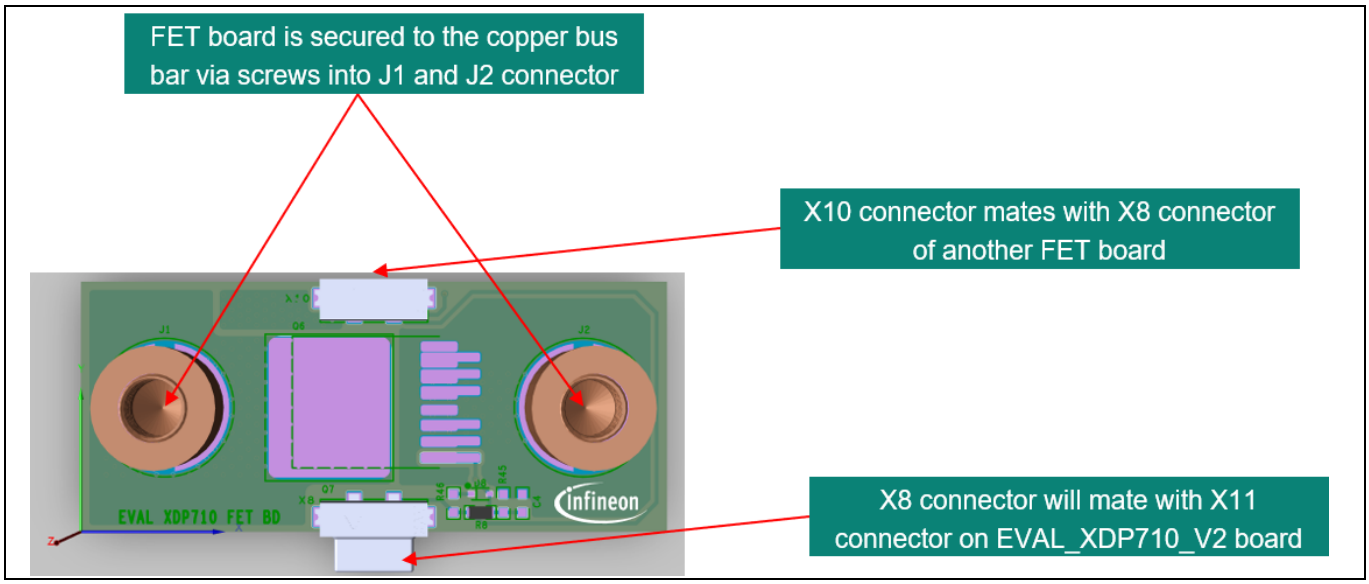

Figure 9 MOSFET adapter board connections

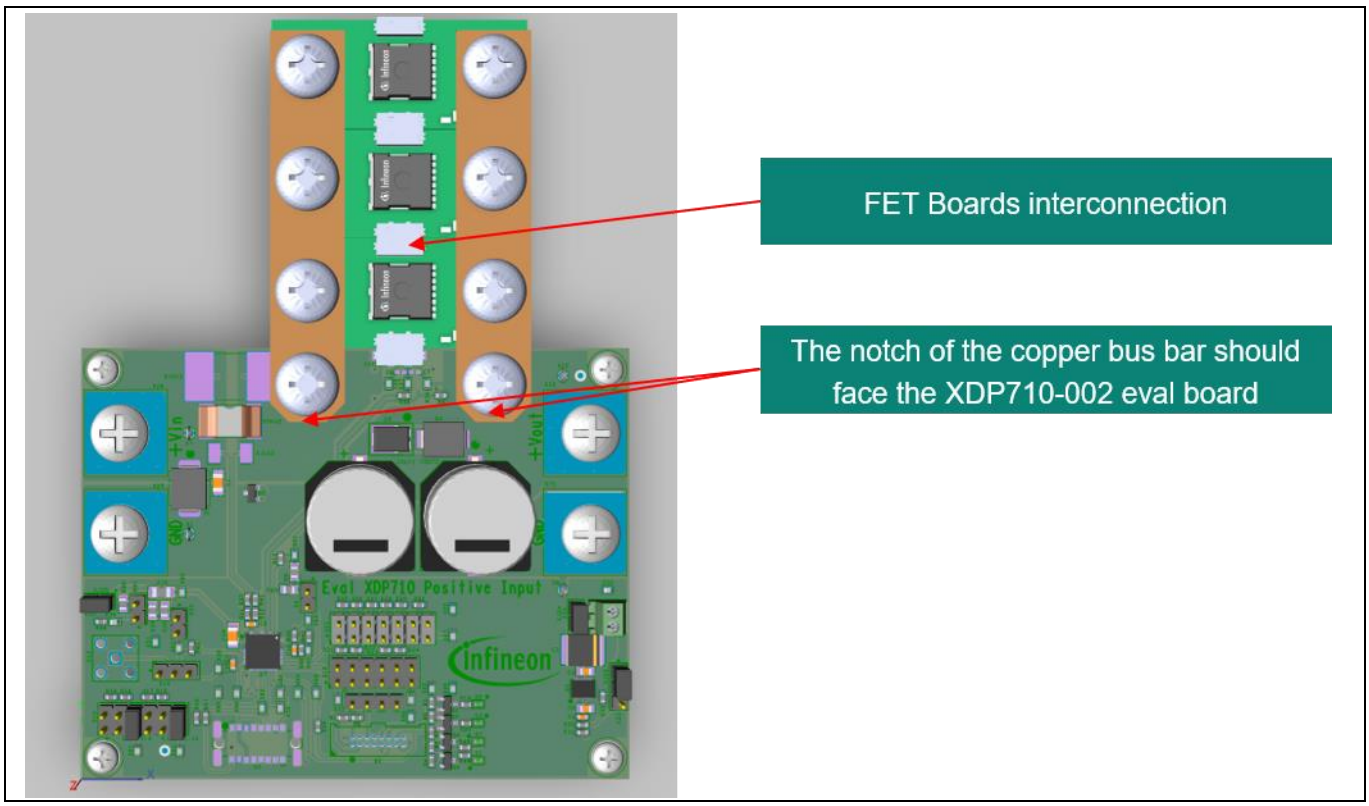

Figure 10 MOSFET adapter board connection with XDP710-002 Evaluation Board

References

[1] Infineon Technologies AG: *XDP710-002 hot-swap controller datasheet;* Available online

[2] Infineon Technologies AG: *XDP710-002 Evaluation Board webpage*; Available online

[3] Infineon Technologies AG: *XDP™ XDP710-002 evaluation PCBA user guide*; Available online

Revision history

Document revision	Date	Description of changes
V 1.0	2024-07-09	Initial release

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