

XDP™ XDM700-1 evaluation PCBA user guide

About this document

Scope and purpose

This document describes how to set up the XDP™ XDM700-1 Evaluation Board and configure the internal registers to evaluate the performance of the XDM700-1 current, voltage, power, temperature, and energy monitor.

Intended audience

This document is intended for test engineers who want to evaluate the performance of the XDM700-1 current monitor.

About this product group

Target applications

- [Information and Communication Technology](#)
- [Data center](#)
- [Telecommunications infrastructure](#)
- [Power transmission and distribution](#)

Product family

Infineon's XDP™ protection and monitoring product portfolio comprises digital hot-swap controllers, eFuses, and system monitoring ICs which enable continuous and accurate system health monitoring and offer extensive protection features as well as high-speed communication to the main MCU via PMBus® interface. The portfolio is optimized to meet the high reliability and availability requirements of AI server and data center and telecom applications.

Evaluation Board

This board is to be used during the design-in process for evaluating and measuring characteristic curves, and for checking datasheet specifications.

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

Safety precautions

Safety precautions

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

Table 1 Safety precautions





	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>

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1 Introduction

1 Introduction

The XDM700 is a high-side/low-side current sensing and system-monitoring IC that support an input voltage range of 5 V to 80 V. In addition to current sensing, it continuously monitors input voltage, input power, output voltage, on-chip, and external temperature using a dedicated 12-bit ADC. With four-level programmable current-sense ranges (12.5 mV/25 mV/50 mV/100 mV) and a dedicated 12-bit current ADC, it provides an accuracy of up to 1% for the current measurements. The analog current proportional to the current or power can be reported at the AMON pin for post-processing. Additionally, the built-in power accumulator ensures reliable energy monitoring and reporting over time.

The USB0010 dongle is a PC-USB COM port to PMBus® bridge dongle, allowing access to the XDM700-1 registers from the PC software configurator.

This document describes how to set up the evaluation board and configure the internal registers to evaluate the performance of XDM700-1 to measure voltage, current, power, energy, and temperature.

2 Hardware and software requirements

2 Hardware and software requirements

The following hardware and software are required for the setup:

- XDM700-1 Evaluation Board: EVAL_XDM700-1
- USB dongle: [USB0010](#) or higher
- GUI: [XDP™ Designer](#)

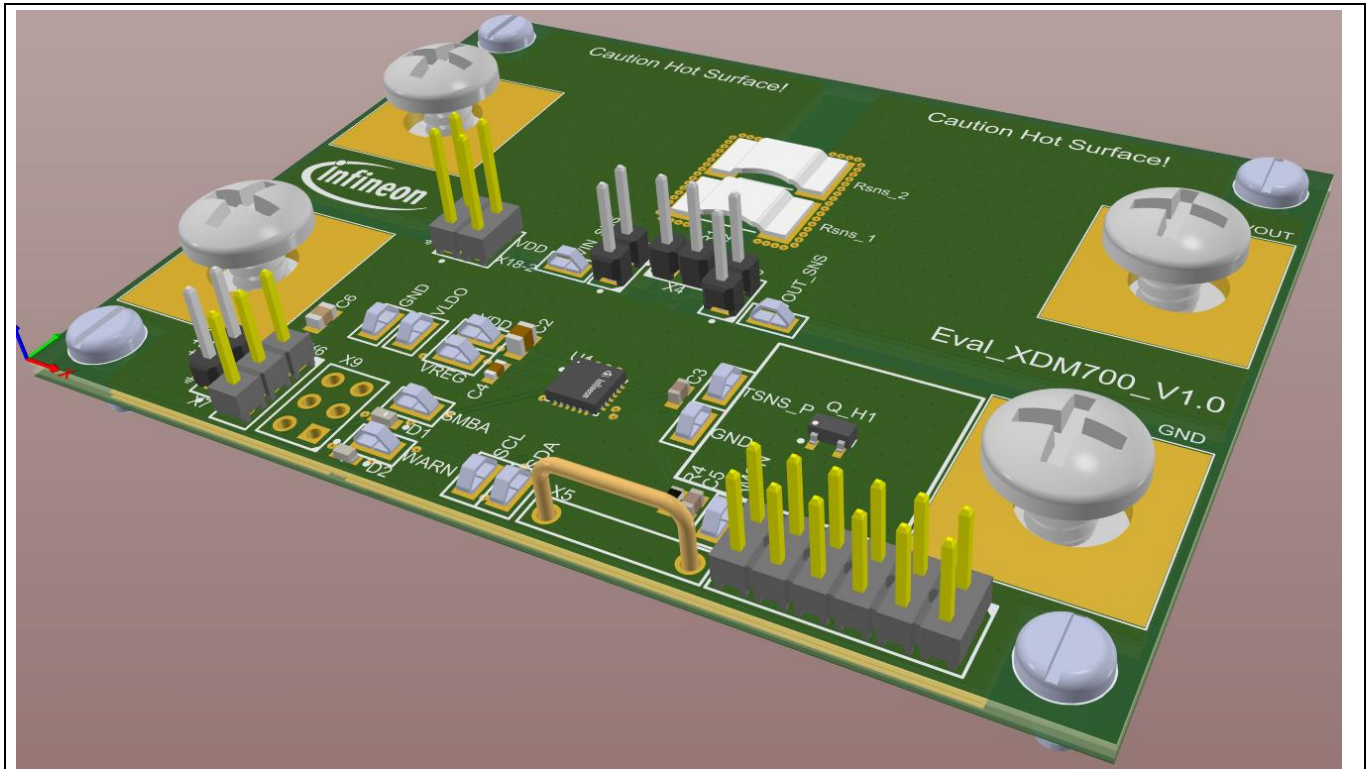


Figure 1 XDM700-1 Evaluation Board



Figure 2 USB0010 dongle

2 Hardware and software requirements

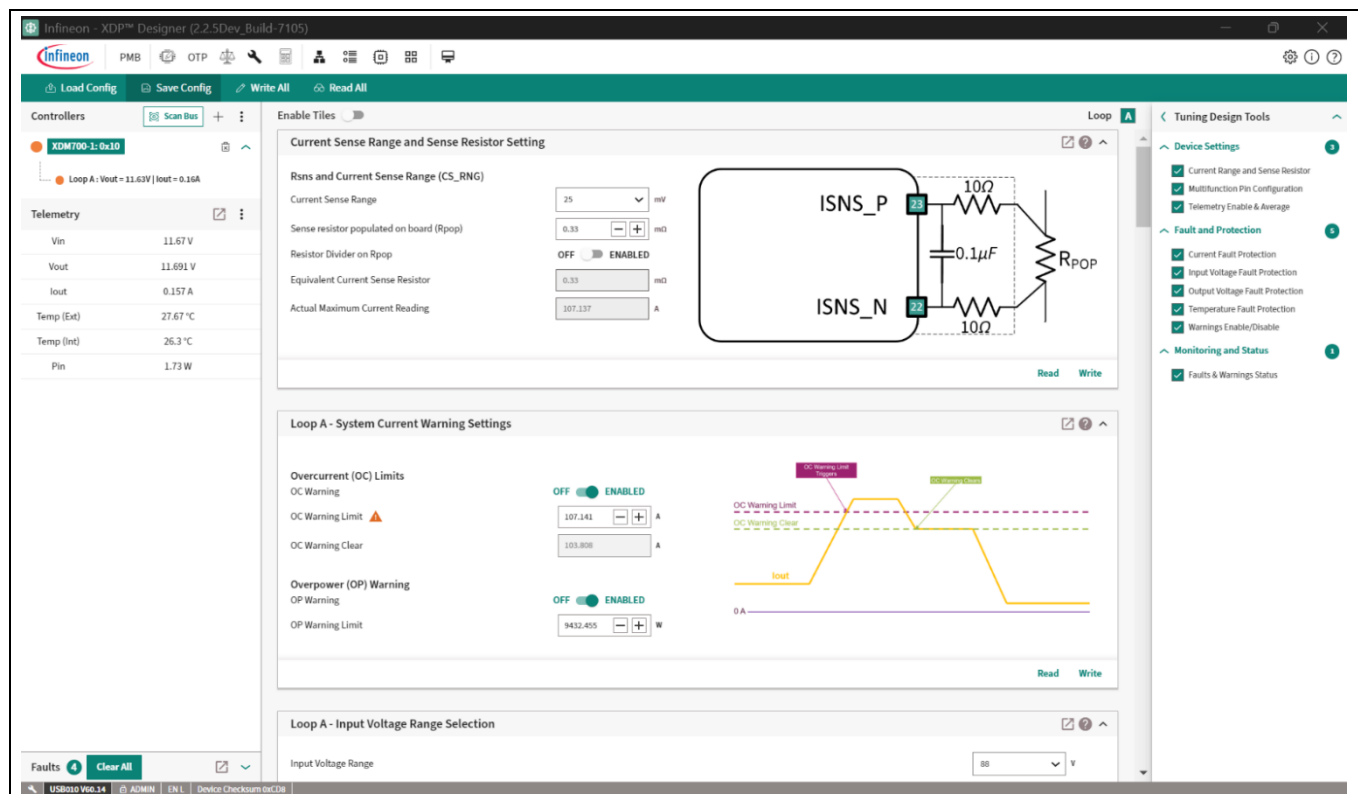


Figure 3 XDP™ Designer GUI

3 XDM700-1 evaluation platform

3 XDM700-1 evaluation platform

The following sections describe the XDM700-1 evaluation board highlighting the electrical specifications, block diagram, schematics, layout, bill of materials (BOM), and different configuration settings that could be used on this evaluation board.

3.1 Electrical specifications

- Input and output voltage range: 5 V DC to 80 V DC
- Verified current: 50 A

3.2 Block diagram

The XDM700-1 evaluation platform includes:

- **XDM700-1 Evaluation Board:** High-side/low-side system monitoring IC. Additionally, communication, control, and protection circuitry are included
- **USB010 dongle:** The interface between the PC and XDM700-1 communicates via the USB dongle. The commands are sent by the XDP™ Designer GUI to the XDM700-1 device, which are received via the PMBus® communication. The USB0010 dongle translates from USB to PMBus®
- **XDP™ Designer GUI:** Software GUI tool for XDM700-1 PMBus® communication that provides commands for configuration and general control

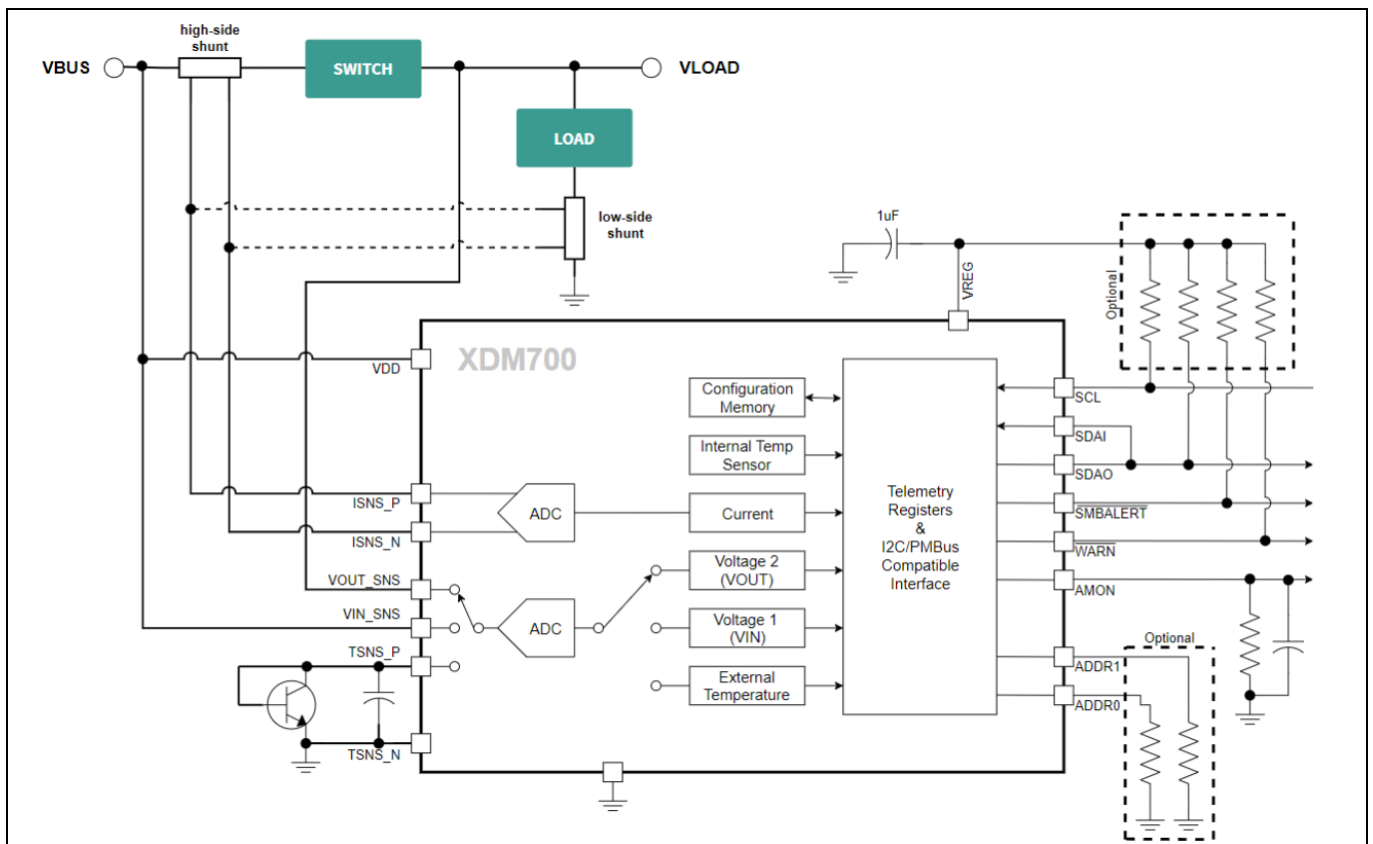


Figure 4 XDM700-1 evaluation platform

3 XDM700-1 evaluation platform

3.3 XDM700-1 Evaluation Board default settings

Table 2 shows the jumpers on the board.

Table 2 Jumper settings

Reference designator	Default configuration	Usage
X1	Shorted	<ul style="list-style-type: none"> • Shorted: Enables voltage 1 sensing from VIN • Open: Disables voltage 1 sensing from VIN and allows sense via VIN_SNS
X2	Shorted	<ul style="list-style-type: none"> • Shorted: Enables voltage 2 sensing from VOUT • Open: Disables voltage 2 sensing from VOUT and allows sense via VOUT_SNS
X3	Shorted 2 to 4	<ul style="list-style-type: none"> • Shorted 2 to 4: VDD pin is supplied from the VIN • Open: Apply positive voltage (>5 V) on pin 3 with respect to GND pin 1 to supply external bias on VDD pin
X4	Open	<ul style="list-style-type: none"> • Open: Allows for probing the differential voltage across the current sense pins
X5	Ground	For easy plugging of ground clip of probes
X6	Shorted 1 to 2	<ul style="list-style-type: none"> • Shorted 1 to 2: Pull-up voltage for SDA and SCL is supplied from the VREG voltage of the XDM700-1 • Shorted 2 to 3: Pull-up voltage for SDA and SCL is supplied from the VLDO voltage. This header must not be left open
X7	Open	<ul style="list-style-type: none"> • Open: LDO is supplied by an external voltage source with positive voltage on pin 2 and GND on pin 1 <p>Apply input voltage in between 5 V to 40V on X7</p>
X8	Open	<ul style="list-style-type: none"> • Shorted: Different jumper locations selects different PMBus® address for the device • Open: Sets device PMBus® address to the default address of 0x10
X9	Open	Connection for USB0010 dongle

Table 3 Resistors and capacitors

Reference designator	Default configuration	Notes
R1, R2	0 Ω	For high dV/dt application to avoid damage to the SENSE pins, increase these to 10 Ω
C1	100 nF	R _{sns} filter; recommending keeping this capacitor as 100 nF
C3	1 nF	Temperature sensor filter
R3	10 Ω	Recommended to keep it as >= 10 Ω for application with high short-circuit current to prevent damage due to high dV/dt on the VDD_VIN pin

3 XDM700-1 evaluation platform

Other components are populated as specified in the schematics.

3.4 R_{sns}

Two current sense resistors of size 3920 can be placed in parallel on Rsn1 and Rsns2. For the evaluation board to get 0.25 m Ω sense value, two 0.5 m Ω resistors are populated on Rsn1 and Rsns2.

4 Programming, set up, and turn-on instructions

4 Programming, set up, and turn-on instructions

Set up the system as follows:

1. Connect the USB0010 dongle to the XDM700-1 Evaluation Board X9 as shown in [Figure 5](#)
2. Connect the USB0010 dongle to a PC USB port

Note: Ensure that the jumpers are connected properly.

3. Connect 5 V to 80 V from VIN to the GND on the left side of the board

XDM700-1 powers up as soon as VDD_VIN is equal to or greater than 5 V. At this point, communication is established.

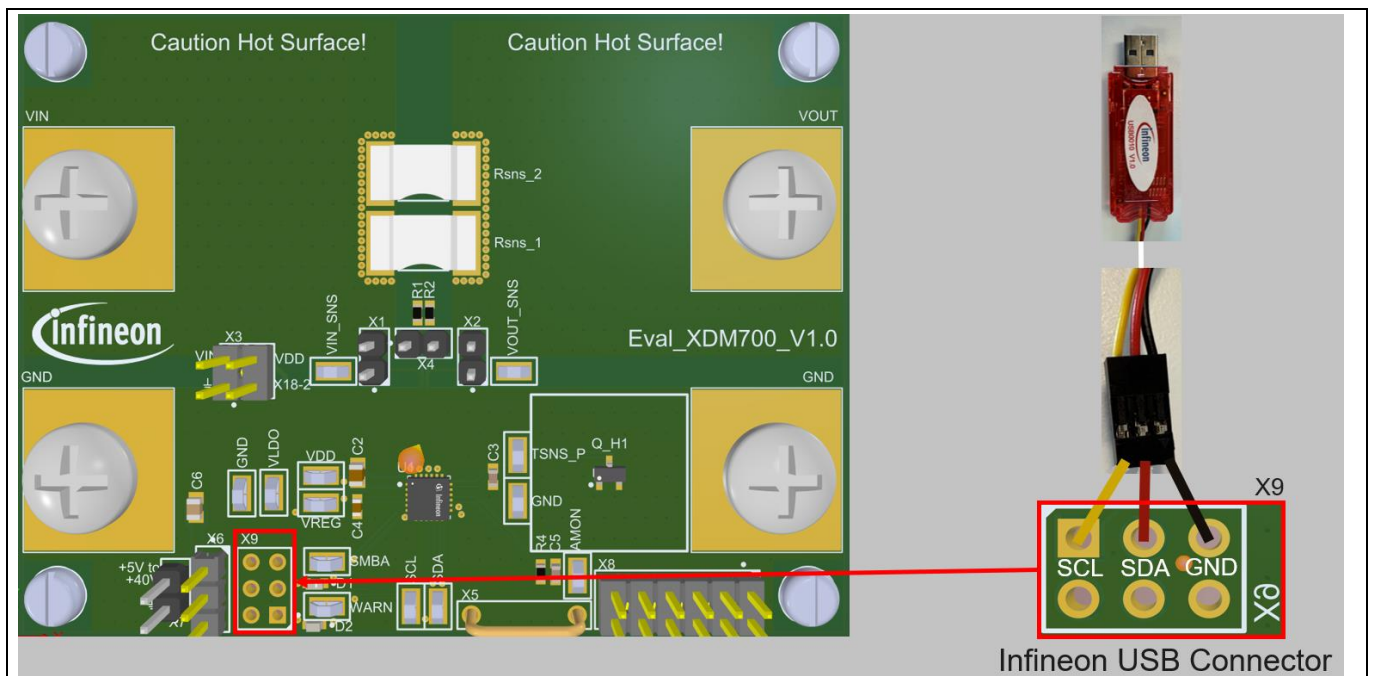


Figure 5 XDM700-1 Evaluation Board and dongle setup

4.1 XDP™ Designer communication setup

Install the XDP™ Designer software from the [Infineon Development Center](#).

The following sections explain how to configure and test the evaluation board and dongle using the XDP™ Designer software.

4 Programming, set up, and turn-on instructions

4.1.1 Using XDP™ Designer

1. Open the XDP™ Designer GUI

Wait for a few seconds and check the left-bottom status bar for the dongle connection. If the highlighted area, as shown in [Figure 6](#), turns green and displays **USB0010**, the dongle has been successfully detected by the XDP™ Designer

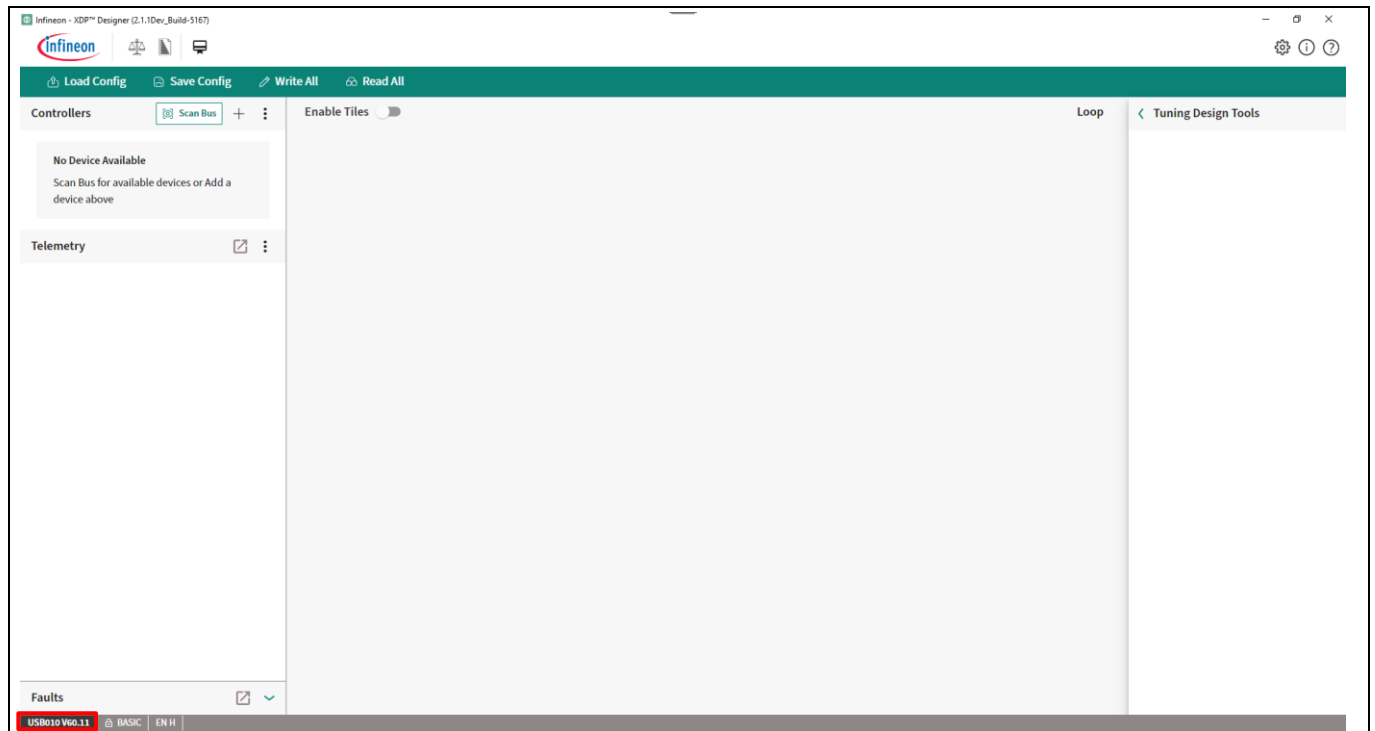


Figure 6 USB0010 detection on XDP™ Designer

4 Programming, set up, and turn-on instructions

2. Click **Scan Bus**, as shown in [Figure 7](#)

Wait for a few seconds for the device to be detected by the XDP™ Designer automatically. If the device is not detected automatically, click **Scan Bus**

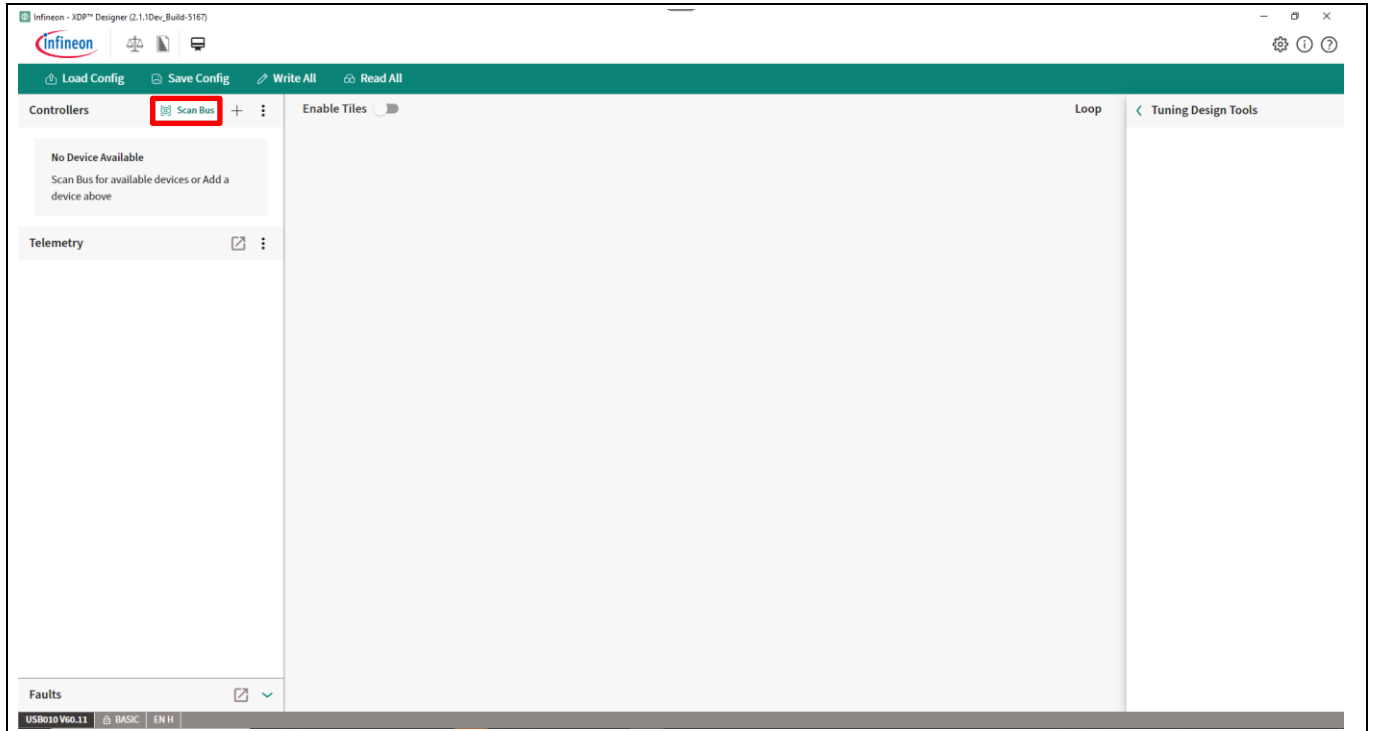


Figure 7 XDM700-1 detection

The detected device is XDM700-1, with the **Telemetry** displayed on the left as shown in [Figure 8](#)

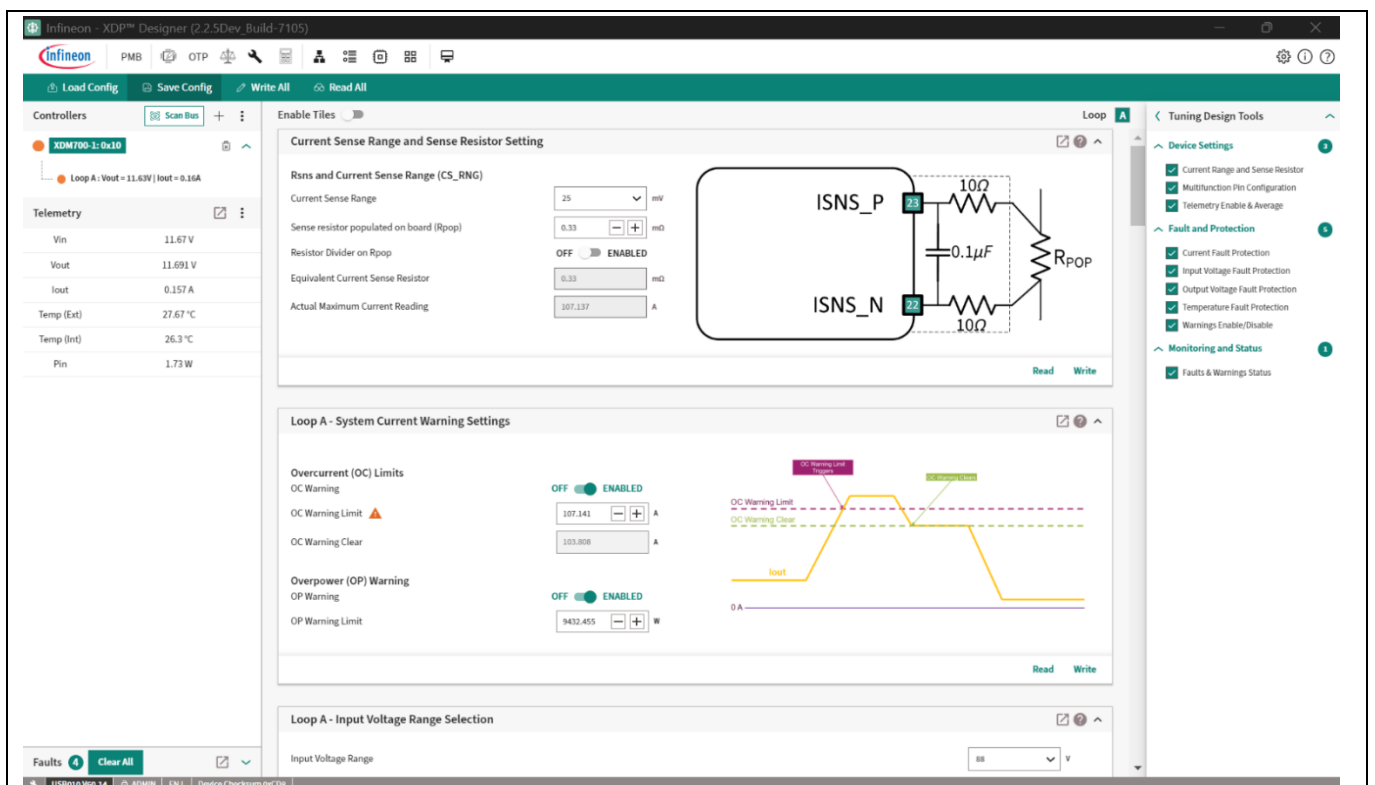


Figure 8 Live telemetry of the connected XDM700-1

4 Programming, set up, and turn-on instructions

3. Click **PMB** to view the PMBus® registers and the values stored in them

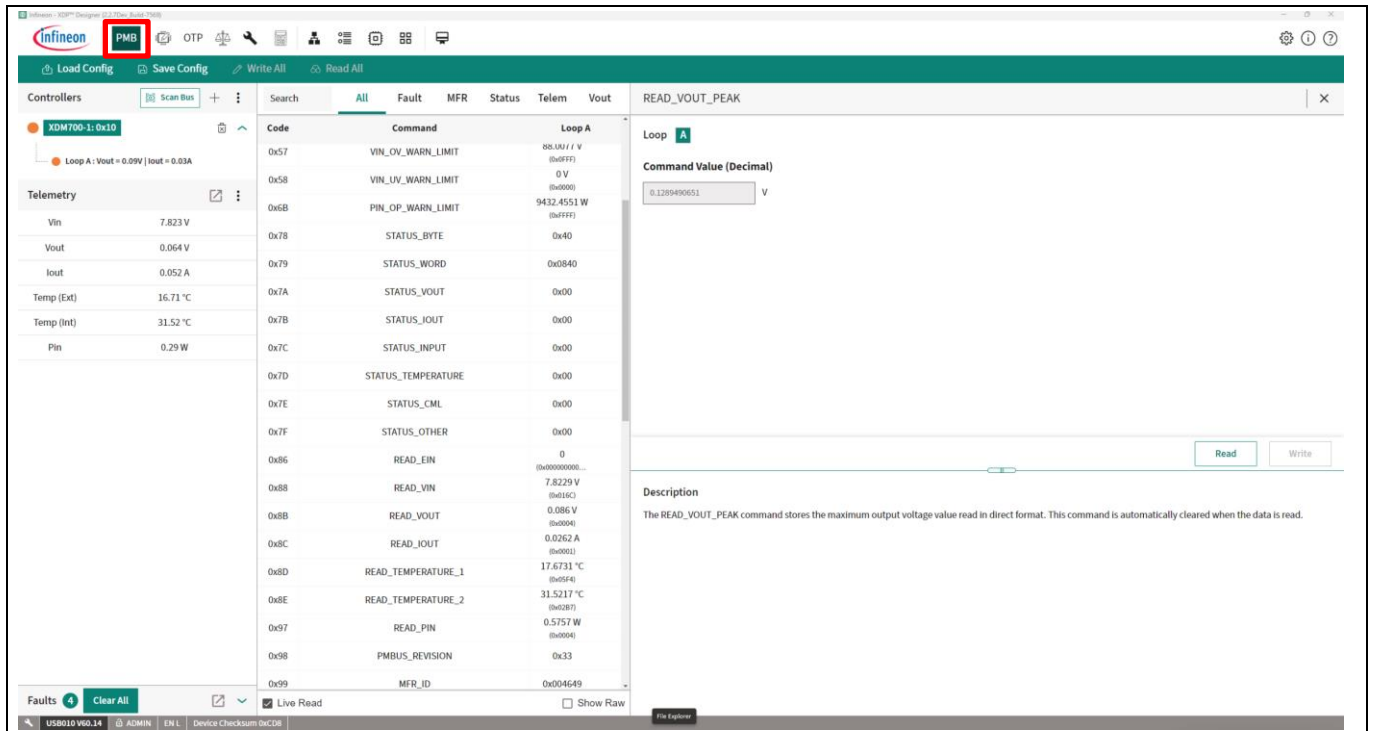


Figure 9 XDP™ Designer displaying all the PMBus® registers of the connected XDM700-1

To edit a register individually, click on the corresponding PMBus® register, make the necessary changes, and then click **Write**

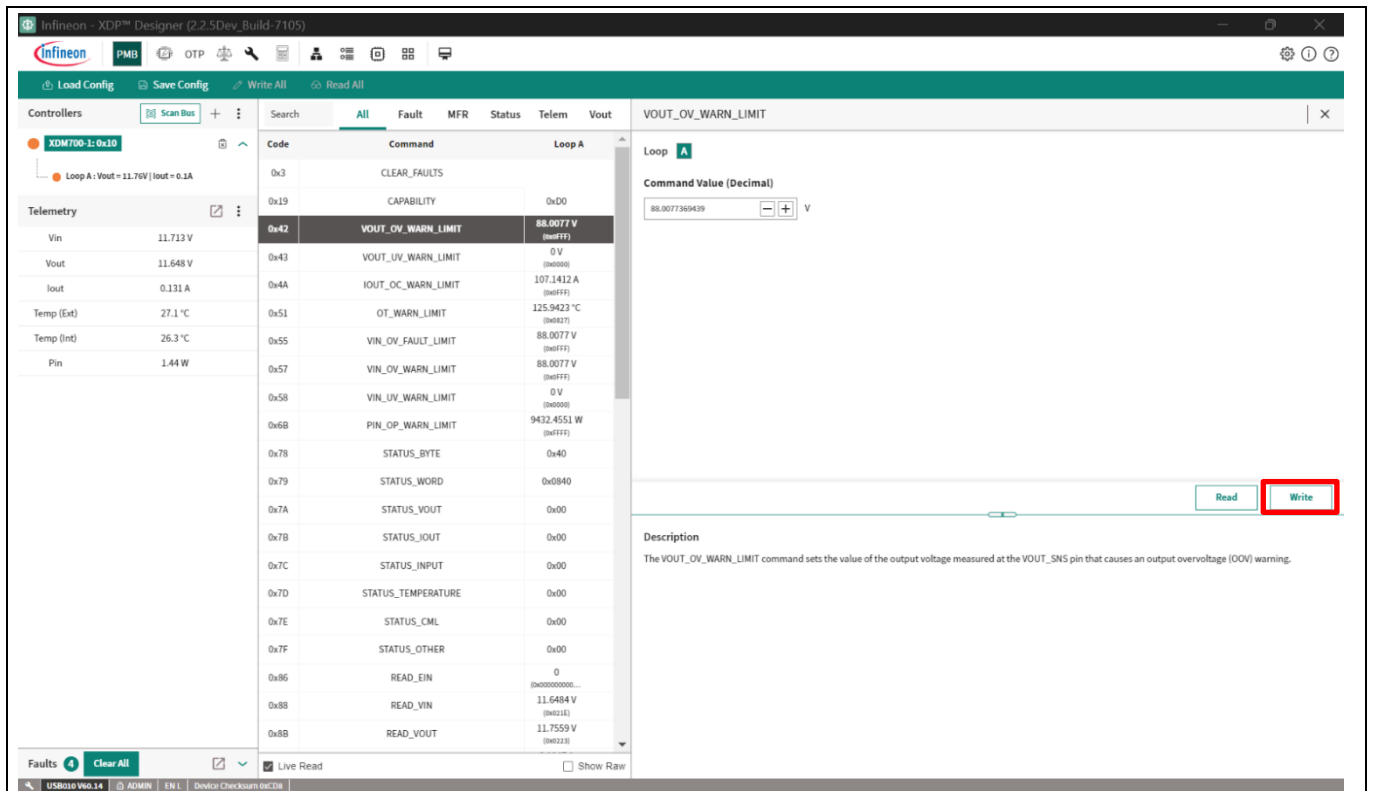


Figure 10 Editing VOUT_OV_WARN_LIMIT

4 Programming, set up, and turn-on instructions

Most of the registers are updated automatically. Click **Read** to read the corresponding register values

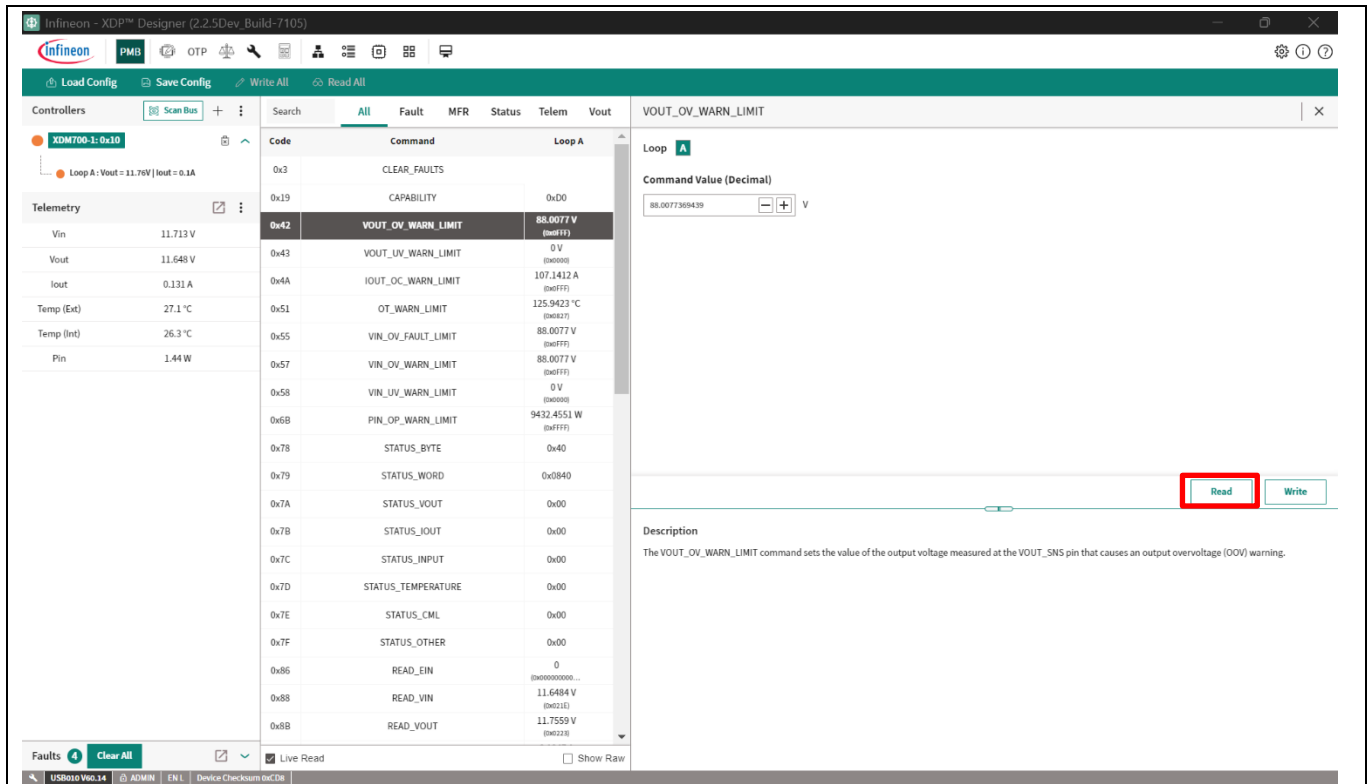


Figure 11 Reading VOUT_OV_WARN_LIMIT

4. Modify the CS_RNG register bit to 0x1 and click **Write** as shown in Figure 12

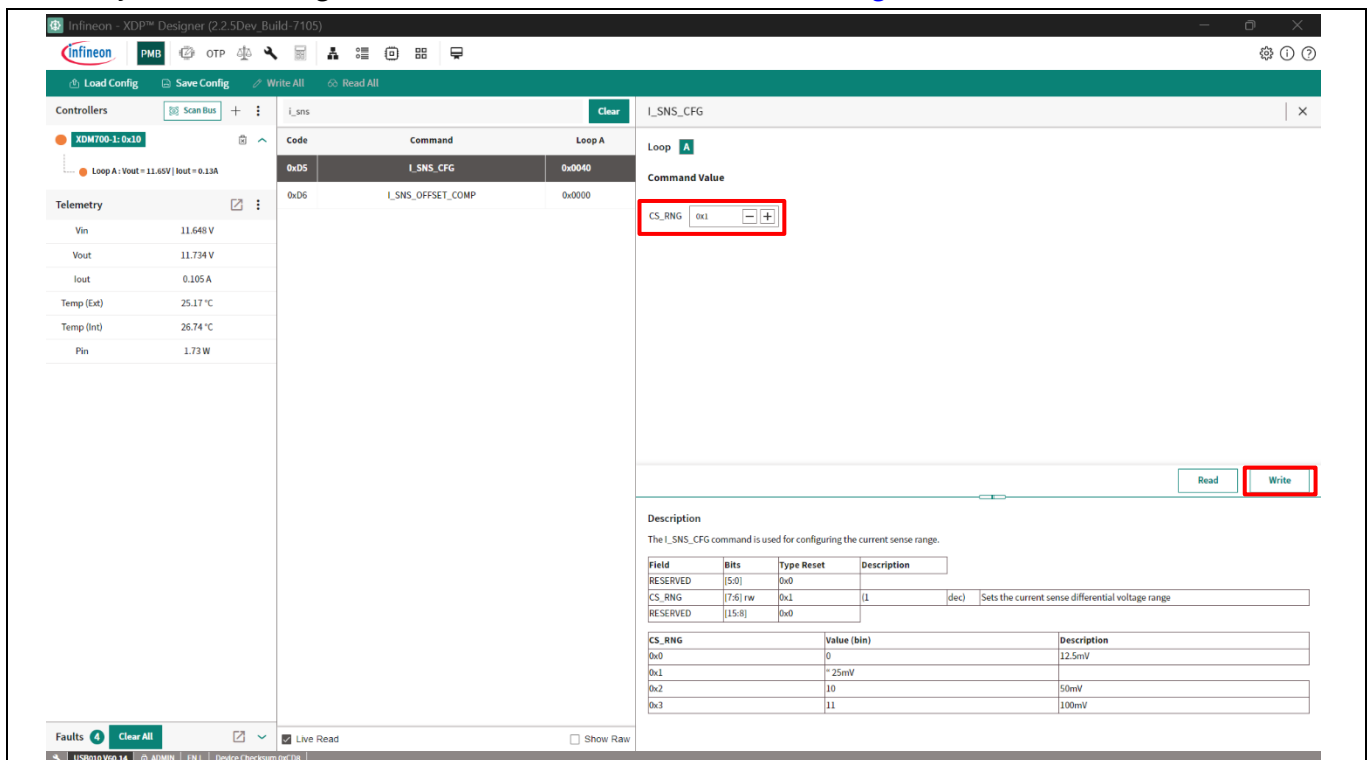


Figure 12 Current sense range selection

4 Programming, set up, and turn-on instructions

- Program the desired undervoltage (UV) warn limit in the VIN_UV_WARN_LIMIT register (0x58). For this example, program VIN_UV_WARN_LIMIT as **38 V**

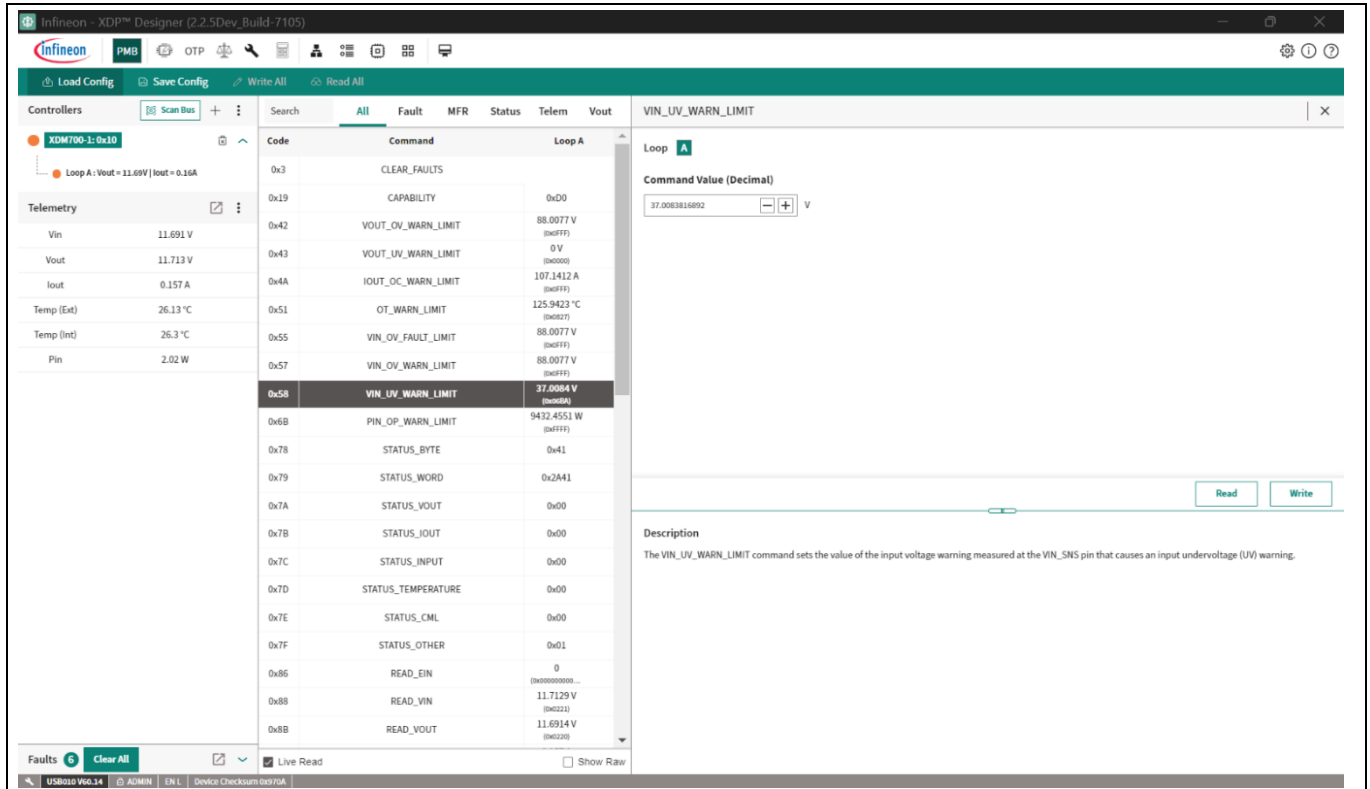


Figure 13 Program VIN_UV_WARN_LIMIT

4 Programming, set up, and turn-on instructions

- Program the required overvoltage (OV) warn limit in the VIN_OV_WARN_LIMIT register (0x57). If the OV warning is not used, program the register to 88 V, or disable the warning. For this example, program VIN_OV_WARN_LIMIT as **62 V**

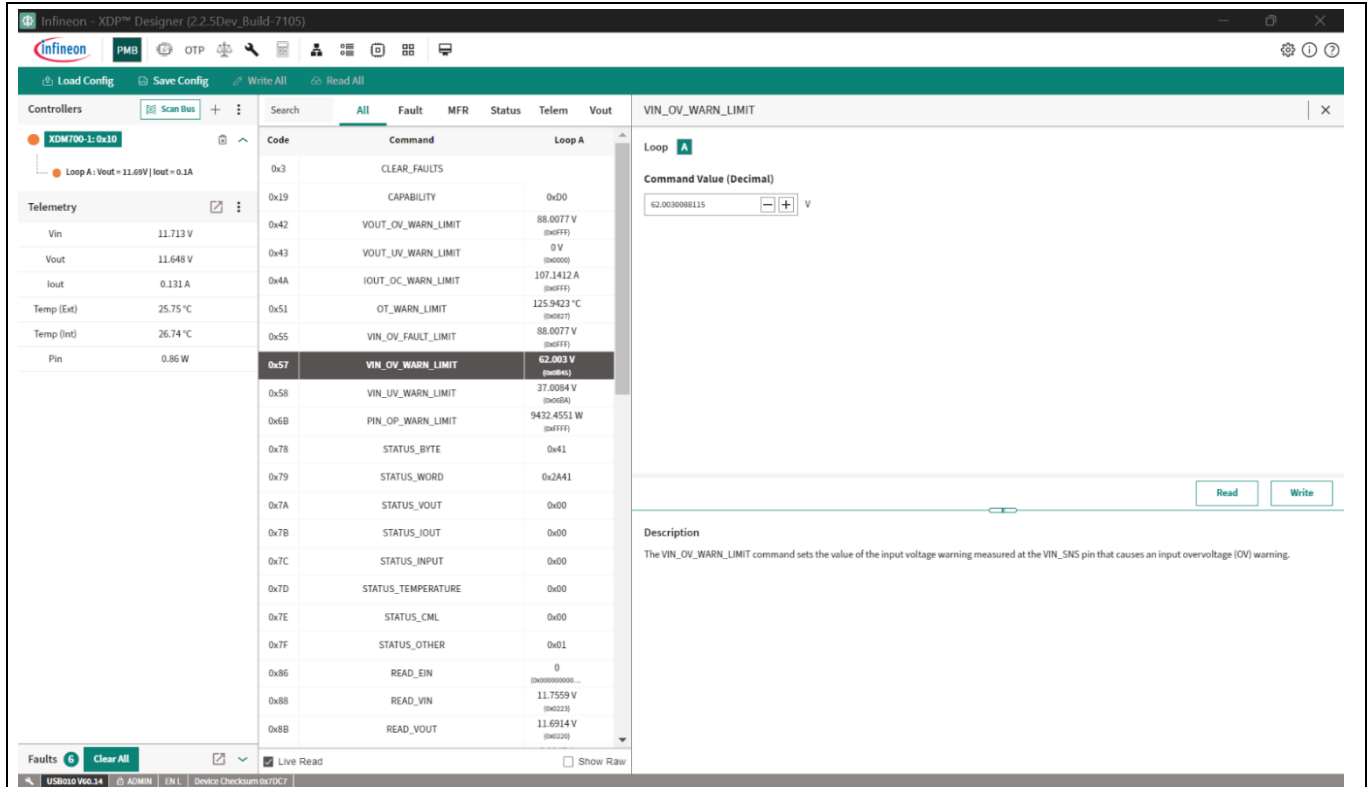


Figure 14 Program VIN_OV_WARN_LIMIT

4 Programming, set up, and turn-on instructions

7. Program the required output undervoltage (UV) warn limit in the VOUT_UV_WARN_LIMIT register (0x43). If the VOUT_UV warning is not used, program the register to 0 V, or disable the warning. For this example, program VOUT_UV_WARN_LIMIT as **35 V**

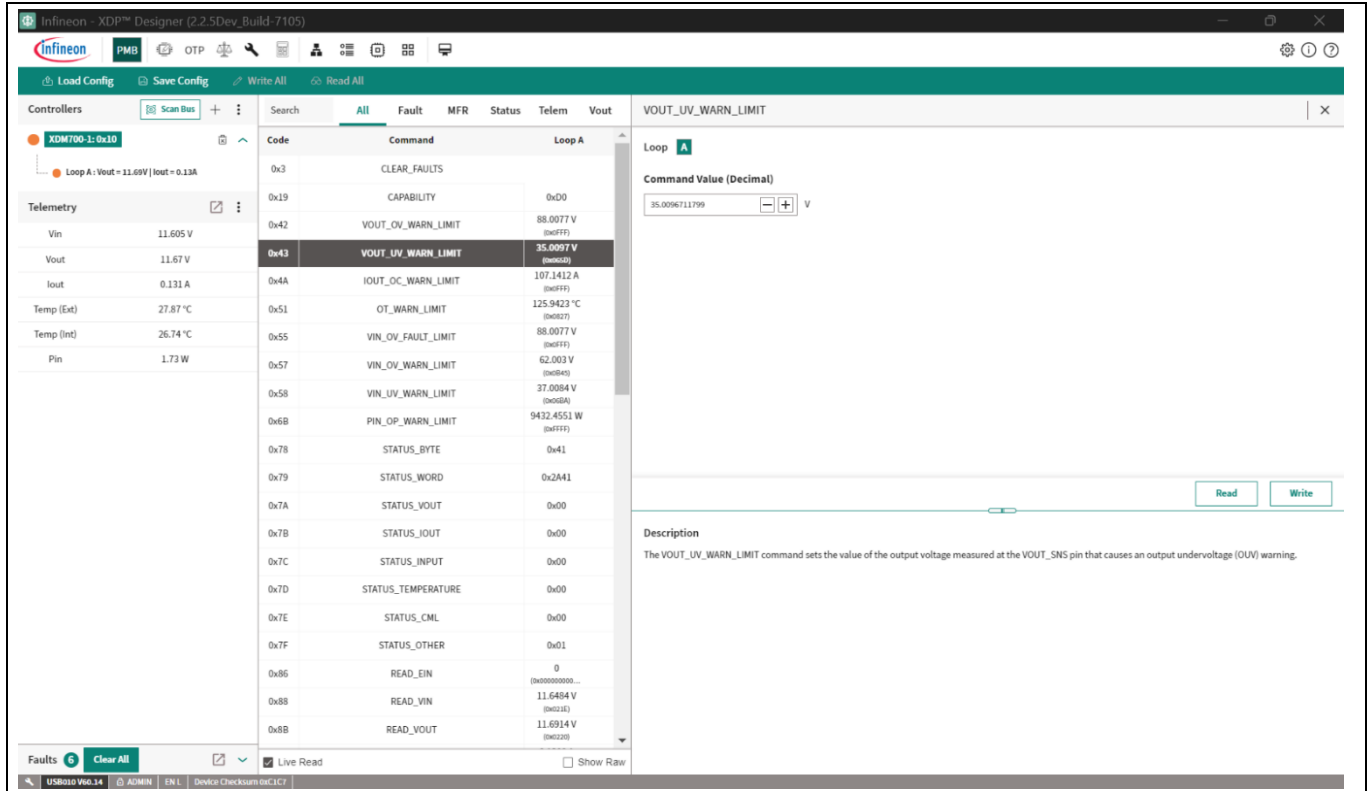


Figure 15 Program VOUT_UV_WARN_LIMIT

Alternatively, you can load the configuration file directly into the device, which eliminates the need to manually modify the required register.

4 Programming, set up, and turn-on instructions

8. Click **Load Config**, as shown in [Figure 16](#)

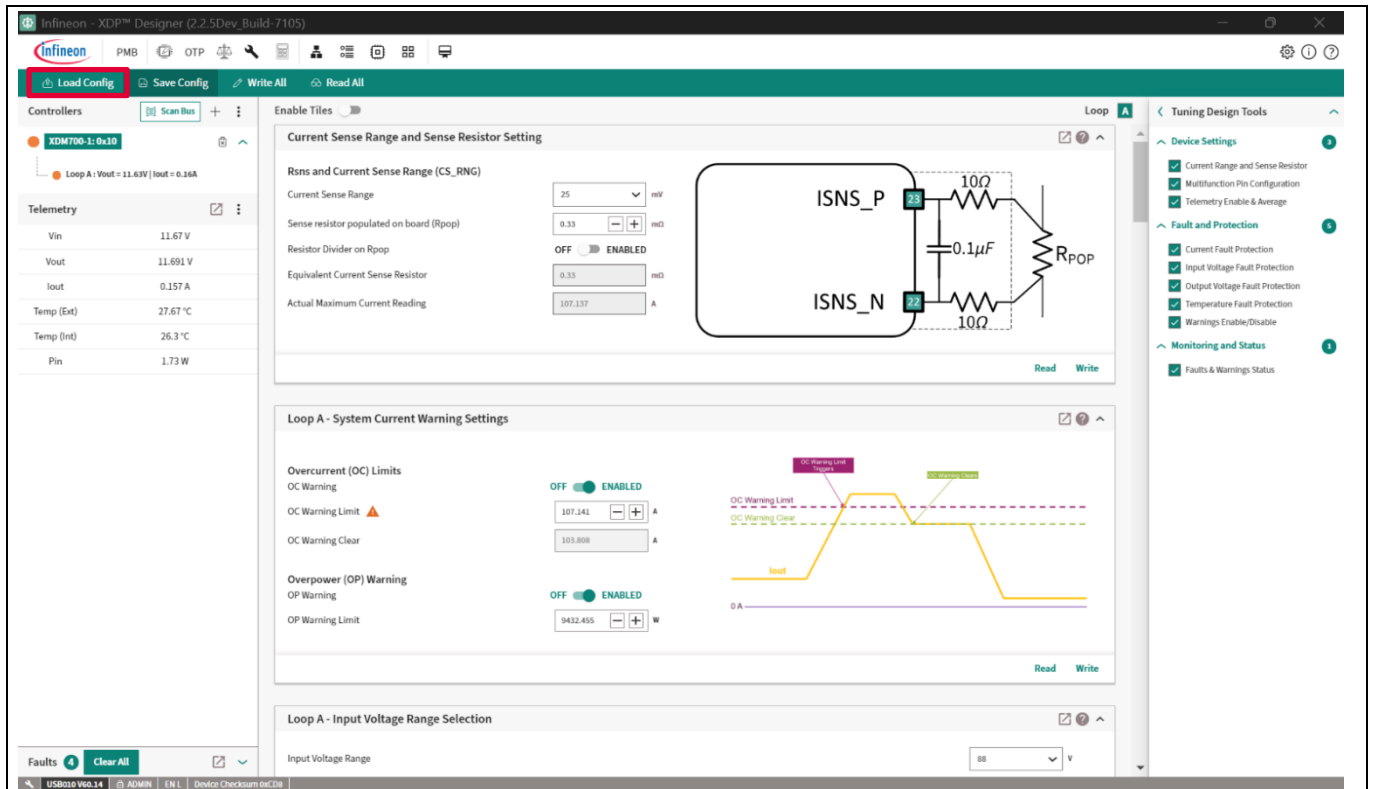


Figure 16 Select Load Config option

9. Click **Browse** and select the .xdp file that needs to be loaded onto the device, as shown in [Figure 17](#)

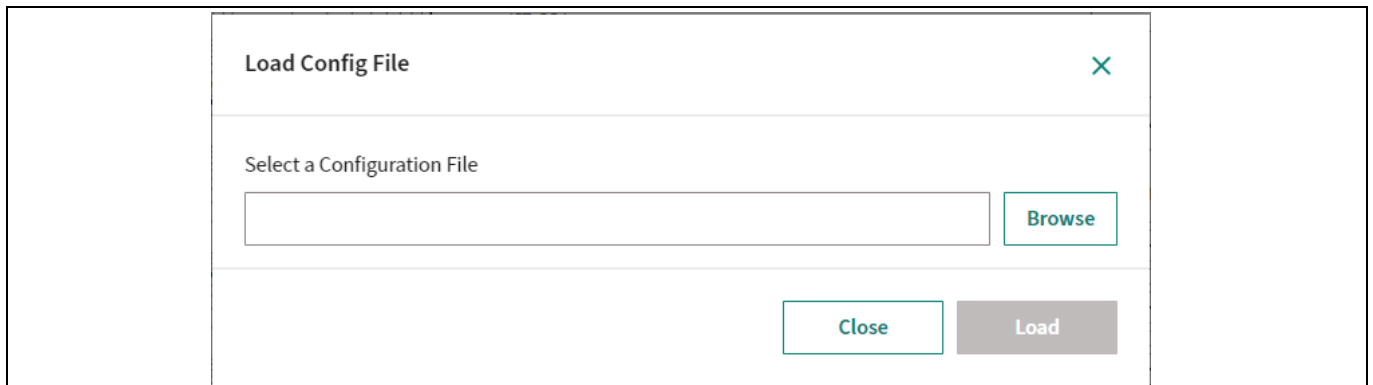


Figure 17 Browse to select the necessary configuration file

4 Programming, set up, and turn-on instructions

10. Click **Load** to load the necessary configuration onto the device, as shown in [Figure 18](#)

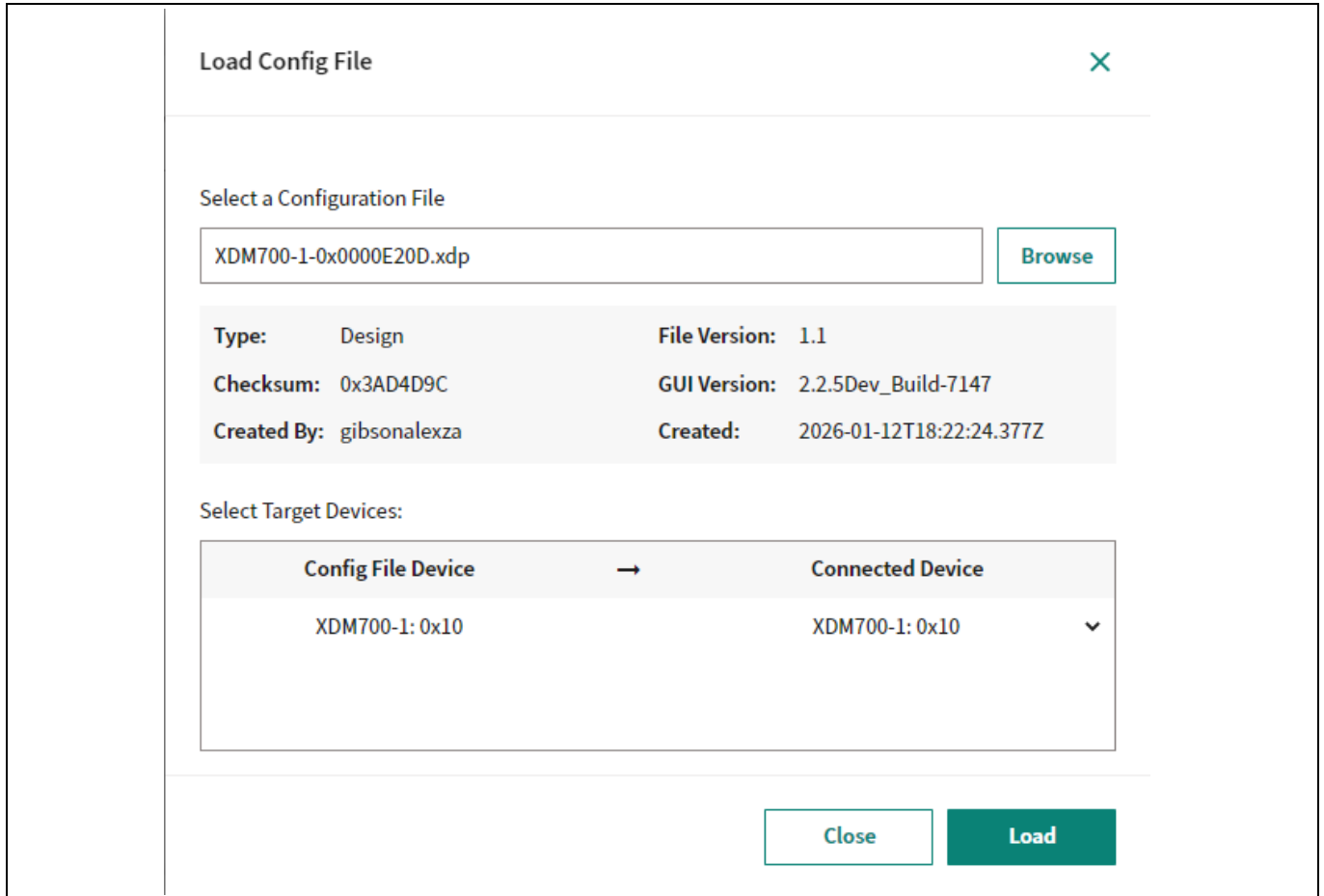


Figure 18 Load the selected configuration file

An example configuration file in *.txt* format is available on the XDM700-1 Evaluation Board page [\[2\]](#) as *XDM700-1_EvalBoard.xdp*. This configuration file is compatible with the evaluation board in the default configuration.

6 Board layout

6 Board layout

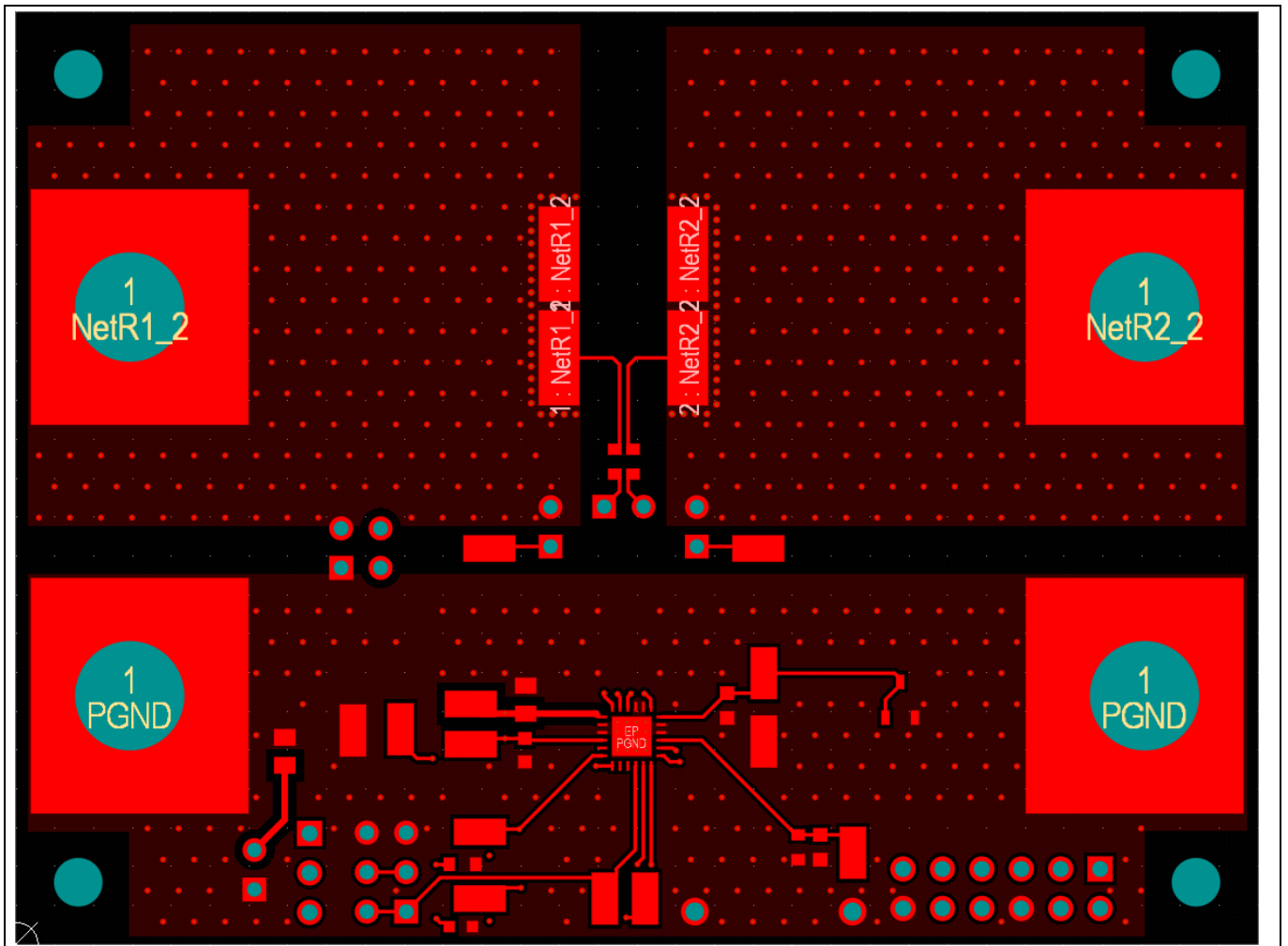


Figure 22 Top layer layout of main PCB

6 Board layout

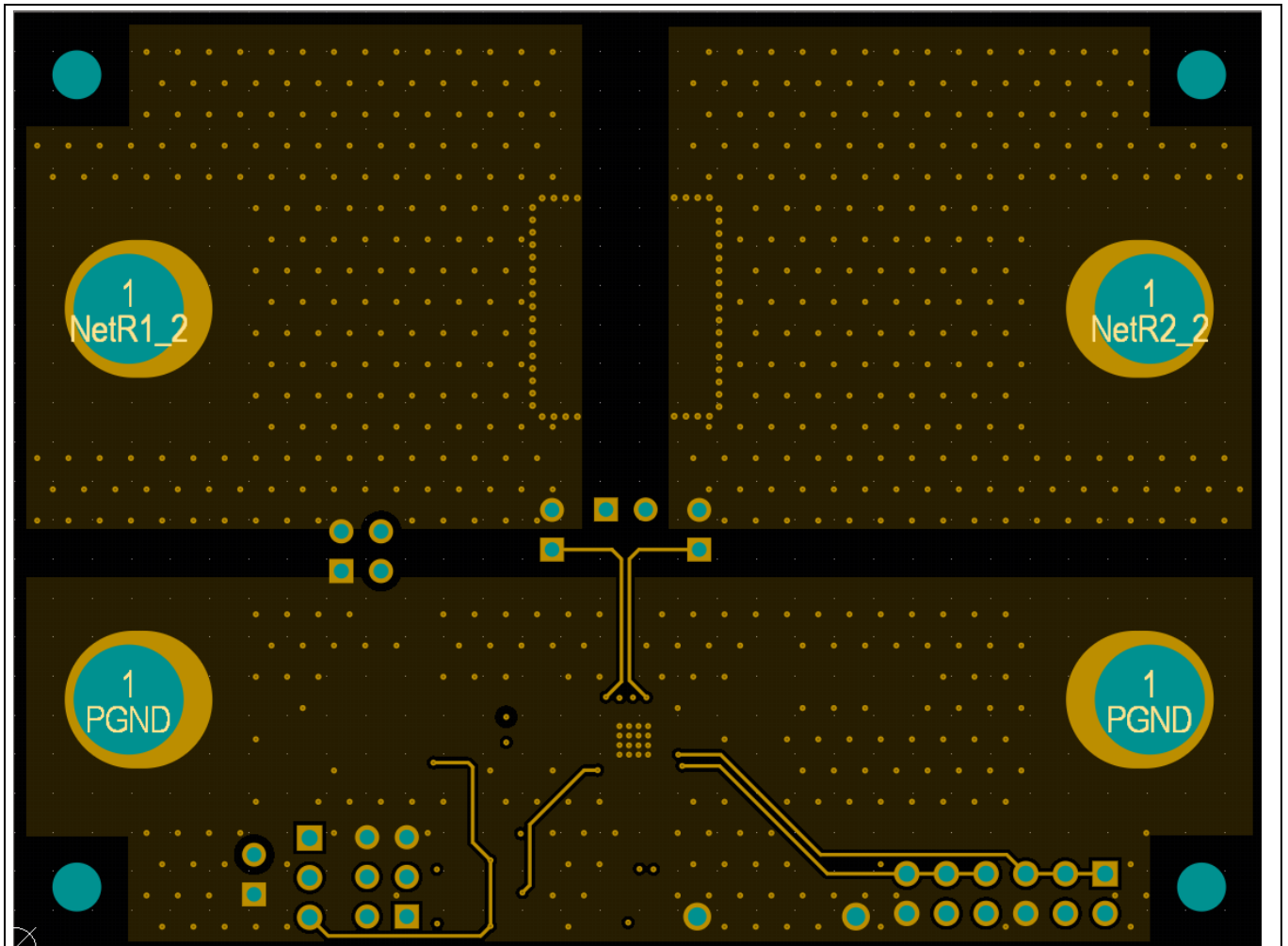


Figure 23 Mid 1 layer layout of main PCB

6 Board layout

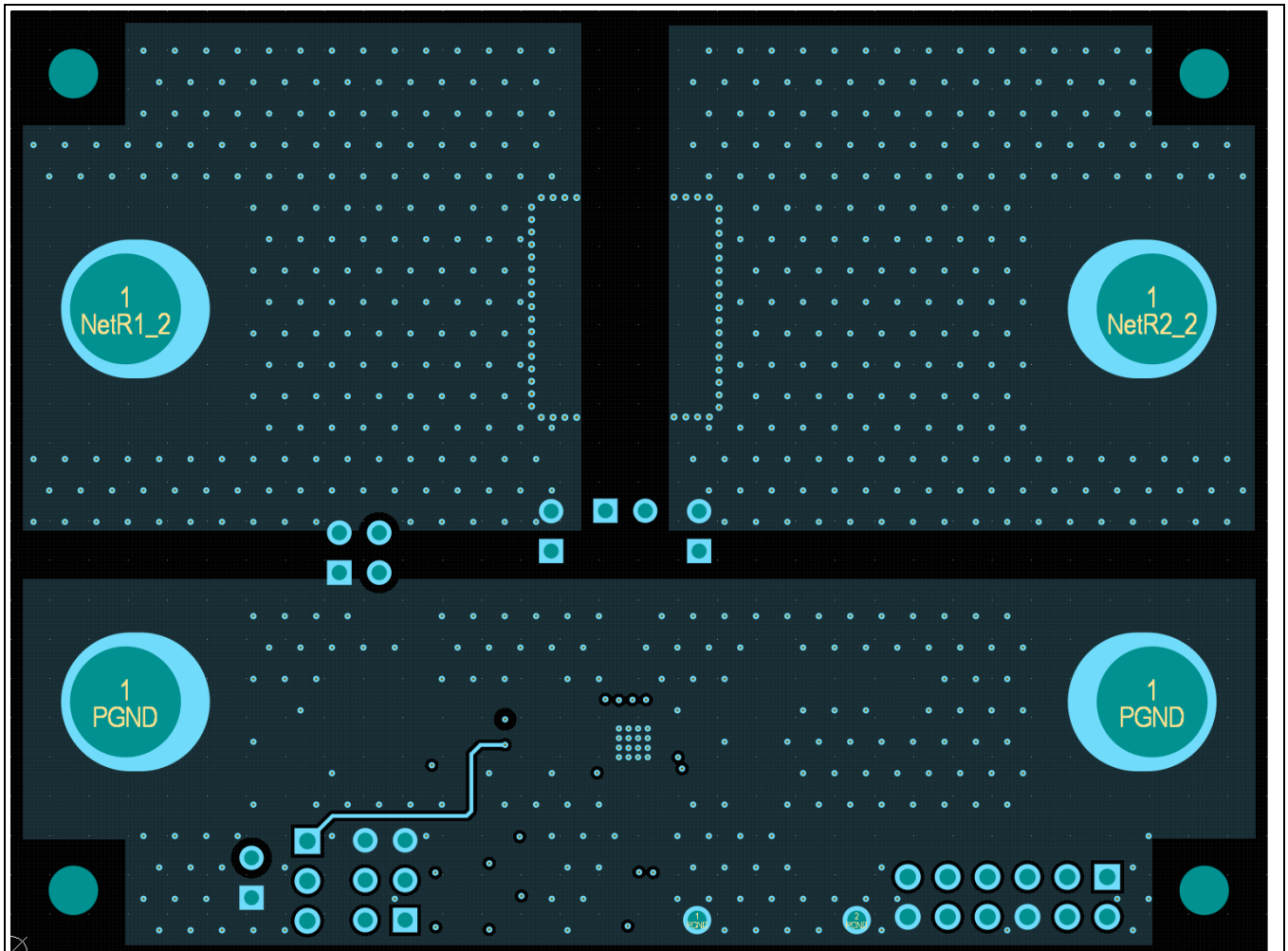


Figure 24 Mid 2-layer layout of main PCB

6 Board layout

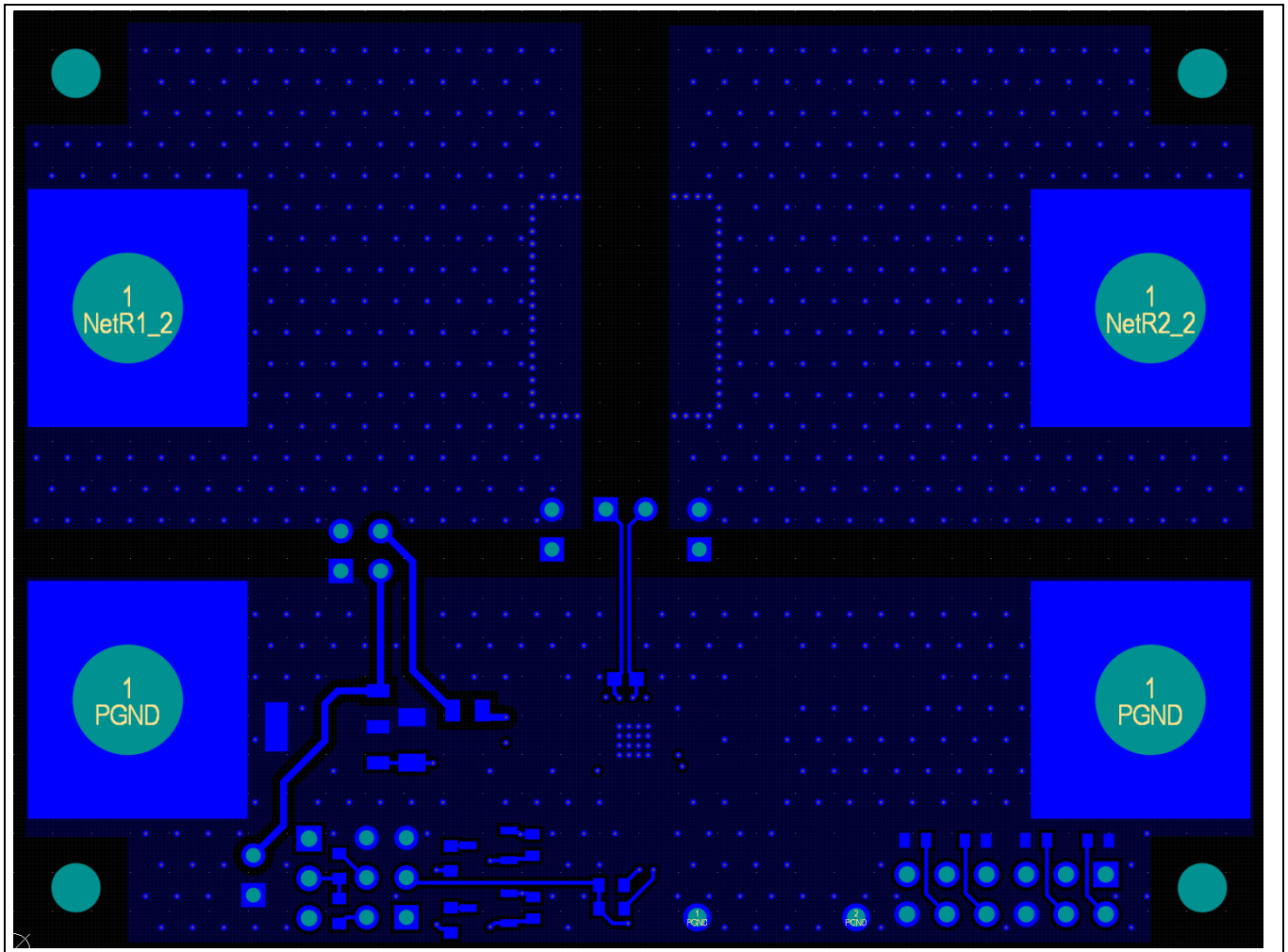


Figure 25 Bottom layer layout of main PCB

7 Bill of materials

7 Bill of materials

Table 4 BOM for the main PCBA

Item	Qty	Reference designator	Value	Characteristic	Manufacturer	Part number
1	1	BRD1	PC Board (FAB)	–	–	P100229 A
2	3	C1, C2, C6	100 nF	100V X7R	TDK	C2012X7R2A104K125 AA
3	2	C3, C4	1 nF	25V C0G	Murata	GRM1885C1E102JA01
4	1	C4	1 µF	25V X7R	TDK	C1608X7R1E105K080A B
5	1	C5	100 pF	25V C0G	AVX	06033A101JAT2A
6	1	C7	22 µF	10V X7S	TDK	C3216X7S1A226M160 AC
7	1	D1	Red	–	Vishay	TLMS1100-GS08
8	1	D2	Orange	–	OSRAM Opto	LO L29K-J2L1-24
9	1	G1	TLE42744GS V33	–	Infineon	TLE42744GS V33
10	4	MP1, MP2, MP3, MP4	29341	–	Keystone	29341
11	2	Q1, Q2	BSR315P	–	Infineon	BSR315P
12	1	Q_H1	MMBT3904, 215	–	Nexperia	MMBT3904,215
13	4	R1, R2, R15, R16	0R	–	Yageo	RC0603JR-070RL
14	1	R3	10R	–	Vishay	CRCW080510R0FKEA HP
15	3	R4, R8, R9	1k	–	Yageo	RC0603FR-071KL
16	4	R5, R6, R11, R12	4.7k	–	Yageo	RC0603FR-074K7L
17	2	R7, R13	12k	–	Stackpole	RMCF0603FT12K0
18	2	R10, R14	20k	–	Vishay	CRCW060320K0FK
19	1	Rsns_1	1mR	–	Bourns	CSS2H-3920R-1L00F
20	1	U1	XDM700-1	–	Infineon	XDM700-1
21	4	X1, X2, X4, X7	M20-9770246	–	Harwin	M20-9770246
22	1	X3	TSW-102-14-G-D	–	Samtec	TSW-102-14-G-D
23	1	X5	D3082-05	–	Harwin	D3082-05
24	1	X6	TSW-103-07-L-S	–	Samtec	TSW-103-07-L-S
25	1	X8	TSW-106-07-L-D	–	Samtec	TSW-106-07-L-D
26	1	X9	TSW-103-19-L-D	–	Samtec	TSW-103-19-L-D
27	4	X10, X11, X12, X13	NUT 8-32	–	Penn Eng	KF2-832-ET

7 Bill of materials

Item	Qty	Reference designator	Value	Characteristic	Manufacturer	Part number
28	13	X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26	5015	–	Keystone	5015
29	1	Rsns_2	1mR	–	Bourns	Not Used

8 Related resources

8 Related resources

- [XDM700-1](#) webpage
- EVAL_XDM700-1 Evaluation Board

References

References

Note: Contact [Infineon Support](#) to obtain these documents.

- [1] Infineon Technologies AG: *XDM700-1 fully digital current monitor datasheet*
- [2] Infineon Technologies AG: *XDM700-1 Evaluation Board webpage*

Revision history

Revision history

Document revision	Date	Description of changes
V 1.0	2026-03-16	Initial release

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Am Campeon 1-15

85579 Neubiberg

Germany

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UG173633

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This Evaluation Board shall only be used by customer for test purposes and not for series production. However, the Evaluation Board shall not be used for reliability testing. The Evaluation Board is exclusively intended for technically qualified and skilled customer representatives. The Evaluation Board shall not be used in any way where a failure of the Evaluation Board, or any consequences of the use thereof, can reasonably be expected to result in personal injury.

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Safety & Operating Instructions:

Customer shall check the Evaluation Board for any physical damage which may have occurred during transport. If customer detects any damages or defects in the Evaluation Board, customer shall not connect the Evaluation Board to a power source. Customer shall contact Infineon for further support. If customer observes unusual operating behavior during the evaluation process, customer shall immediately shut off the power supply to the Evaluation Board and consult Infineon for support. Customer shall not touch the Evaluation Board during operation and keep a safe distance.

Customer shall not touch the Evaluation Board after disconnecting the power supply, several components may still store electrical voltage and can discharge through physical contact. Several parts, like heat sinks and transformers, may still be very hot. Allow the components to cool before touching or servicing.

The electrical installation must be completed in accordance with the appropriate safety requirements.