

UM11935

HVBMS polycarbonate support mounting guide

Rev. 1 — 7 July 2023

User manual

Document Information

Information	Content
Keywords	polycarbonate support, demonstrator, HVBMS, high voltage battery management system, RD-HVBMSCTBUN, RD-HVBMSCT800BUN
Abstract	This user manual aims to help users build their POLYBNDLSTRV1 HVBMS polycarbonate support. This platform can be used for both RD-HVBMSCTBUN HVBMS reference design bundle using ETPL and RD-HVBMSCT800BUN HVBMS reference design bundle using ETPL for 800 V applications.



1 Kit content

The polycarbonate structure POLYBNLSTRV1 for RD-HVBMSCTBUN and RD-HVBMSCT800BUN kit contains:

- 1 top plate (800-76226)
- 1 bottom plate (800-76227)
- 2 short hinges, 50 mm (800-76229)
- 2 long hinges, 95 mm (800-76228)
- 2 short hangers, 60 mm (800-76230)
- 2 long hangers, 78 mm (800-76231)
- 2 supports, 145 mm (800-76232)
- 16 screws, M3-0.5 X 25 mm with PHP (280-78012)
- 16 standoffs (280-78015)
- 16 nuts, M3-0.5 (280-76566)
- 12 screws, M3 X 6 mm (280-76355)
- 4 screws, M3-0.5 X 25 mm with flat head (280-78008)
- 2 screws, M3 X 12 mm with flat head (280-76979)
- 15 screws, M4-0.7 X 14 mm with socket head (280-78013)
- 2 screws, M4-0.7 X 20 mm with socket head (280-78014)
- 2 wing nuts, M4-0.7 (280-78017)
- 1 nut, M4-0.7 X 3.4 mm (280-78016)
- 6 adhesive feet (280-76689)
- 2 nylon cable ties (600-77772)

The tools listed below are required to assemble the structure:

- a Phillips screwdriver
- a 3 mm Allen key
- pliers
- cutting pliers

1.1 Content pictures

Table 1. Content pictures

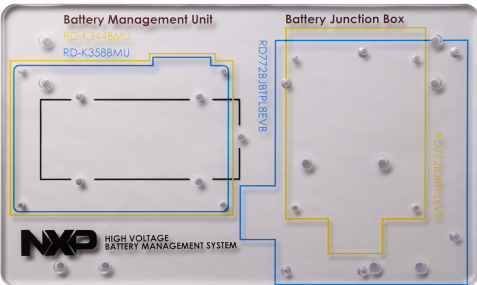
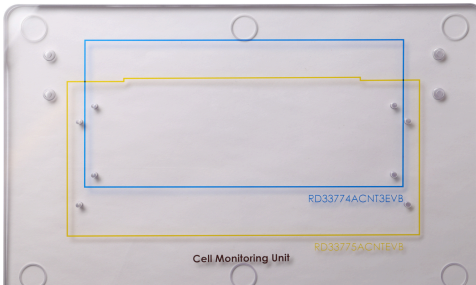
Top plate (800-76226)	Bottom plate (800-76227)
 <p>The top plate (800-76226) is a rectangular metal plate with various components mounted on it. On the left side, there is a Battery Management Unit (RD-K344BMU and RD-K358BMU). On the right side, there is a Battery Junction Box (RD772B1P163EV8 and RD772B1P163EV8). The NXP logo and 'HIGH VOLTAGE BATTERY MANAGEMENT SYSTEM' are visible at the bottom left.</p>	 <p>The bottom plate (800-76227) is a rectangular metal plate with a Cell Monitoring Unit (RD33774ACNT3EV8 and RD33775ACNT5EV8) mounted on it. The NXP logo and 'HIGH VOLTAGE BATTERY MANAGEMENT SYSTEM' are visible at the bottom left.</p>

Table 1. Content pictures...continued



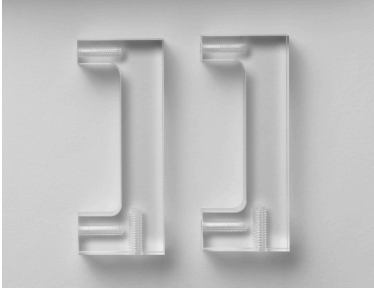


<p style="text-align: center;">Short hinges, 50 mm (800-76229)</p> 	<p style="text-align: center;">Long hinges, 95 mm (800-76228)</p> 
<p style="text-align: center;">Short hangers, 60 mm (800-76230)</p> 	<p style="text-align: center;">Long hangers, 78 mm (800-76231)</p> 
<p style="text-align: center;">Supports, 145 mm (800-76232)</p> 	

Table 1. Content pictures...continued







<p>Screws, M3-0.5 X 25 mm with PHP (280-78012)</p>	<p>Standoffs (280-78015)</p>
	
<p>Nuts, M3-0.5 (280-76566)</p>	<p>Screws, M3 X 6 mm (280-76355)</p>
	
<p>Screws, M3-0.5 X 25 mm with flat head (280-78008)</p>	<p>Screws, M3 X 12 mm with flat head (280-76979)</p>
	

Table 1. Content pictures...continued

Screws, M4-0.7 X 14 mm with socket head (280-78013)	Screws, M4-0.7 X 20 mm with socket head (280-78014)
	
Wing nuts, M4-0.7 (280-78017)	Nut, M4-0.7 X 3.4 mm (280-78016)
	

2 Guidelines for the construction of the base structure

This section details the steps for the construction of the base structure, common to RD-HVBMSCTBUN and RD-HVBMSCT800BUN.

2.1 Components required

For this part of the construction, the components required are:

- 1 top plate (800-76226)
- 1 bottom plate (800-76227)
- 2 short hinges, 50 mm (800-76229)
- 2 long hinges, 95 mm (800-76228)
- 2 supports, 145 mm (800-76232)
- 10 screws, M4-0.7 X 14 mm with socket head (280-78013)
- 2 screws, M4-0.7 X 20 mm with socket head (280-78014)
- 2 wing nuts, M4-0.7 (280-78017)
- 6 adhesive feet (280-76689)

2.2 Adding hinges and supports to the top plate

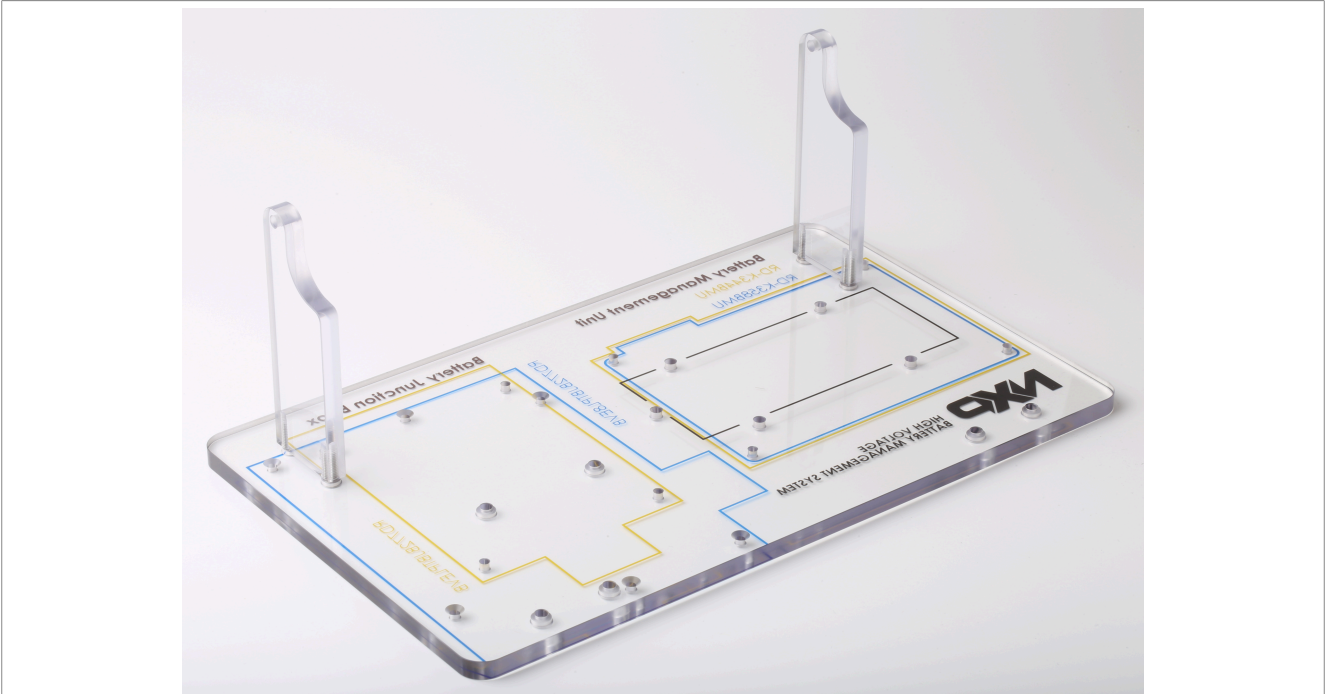


Figure 1. Mount the long hinges to the top plate using four M4-0.7 X 14 mm screws

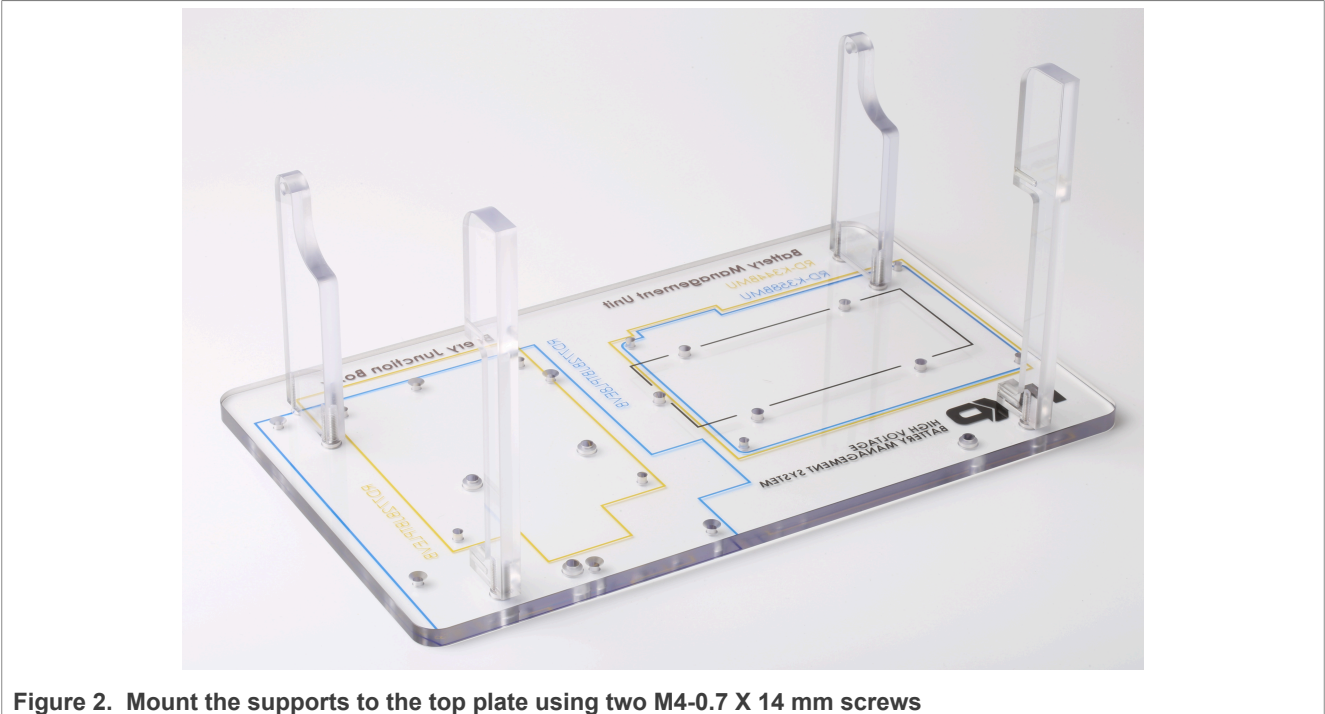


Figure 2. Mount the supports to the top plate using two M4-0.7 X 14 mm screws

2.3 Adding hinges and adhesive feet to the bottom plate

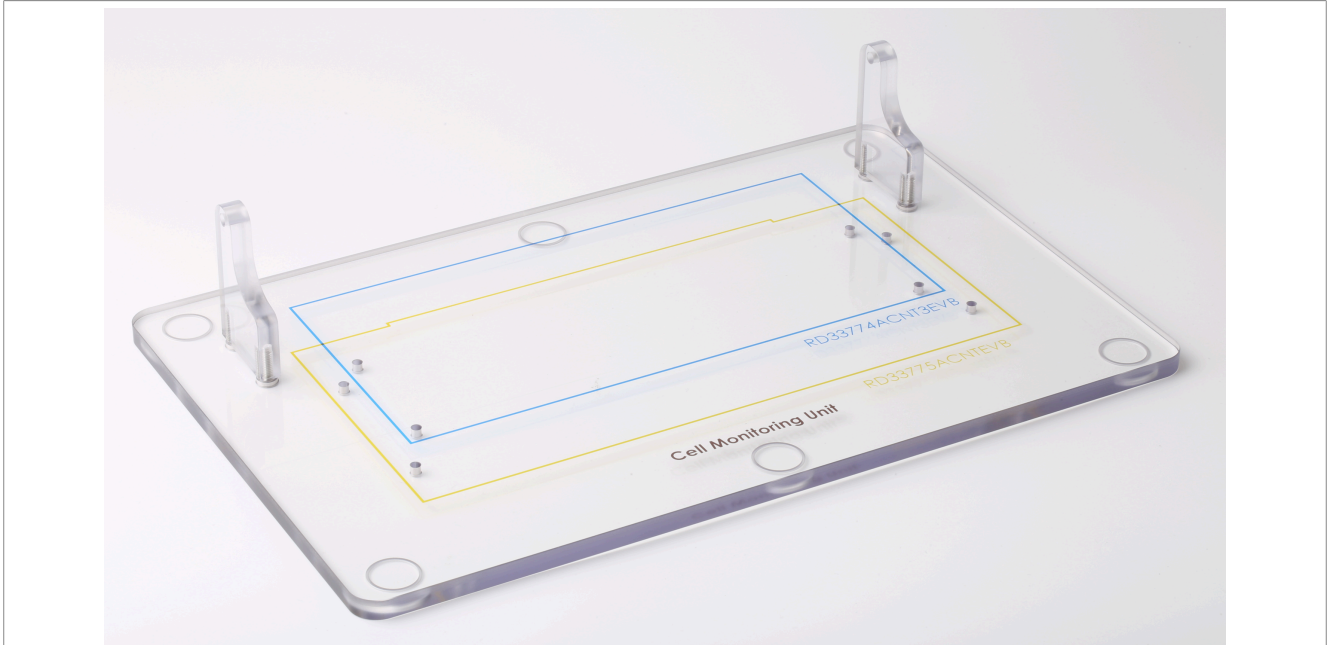


Figure 3. Mount the short hinges to the top plate using four M4-0.7 X 14 mm screws

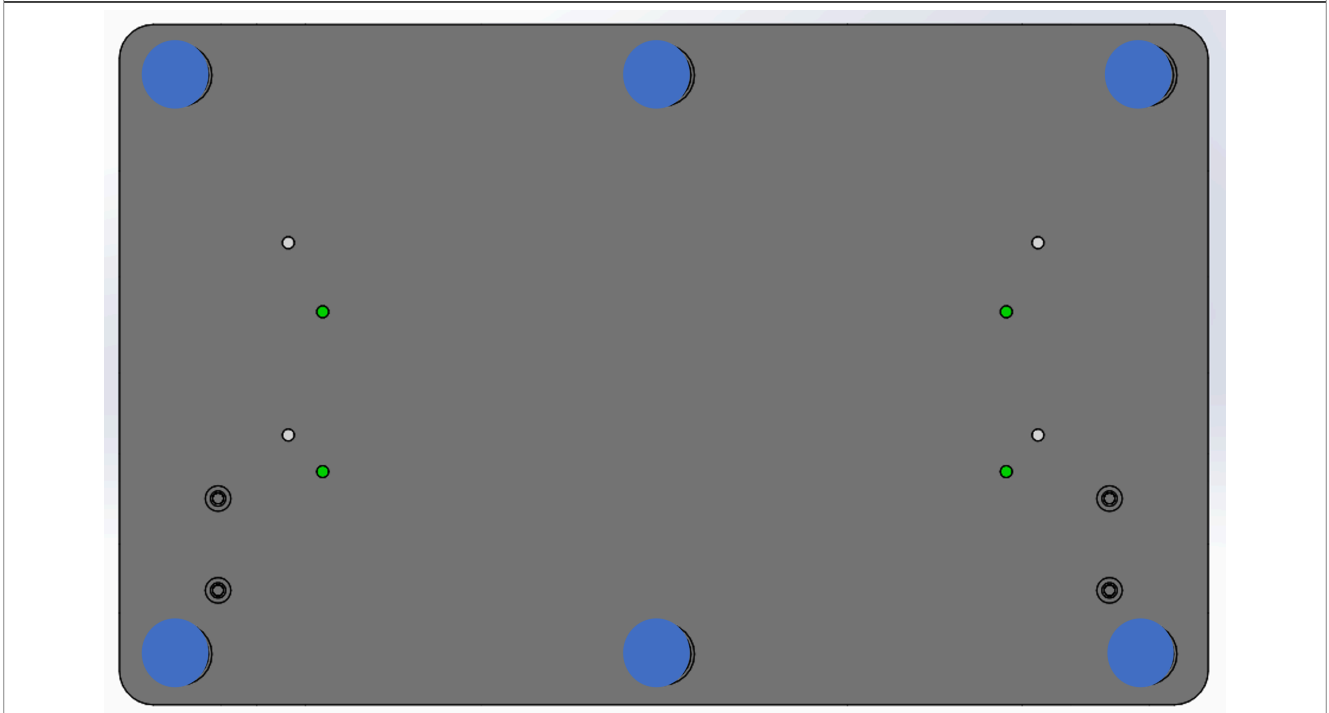


Figure 4. Add the adhesive feet to the bottom plate

2.4 Connecting top and bottom plates



Figure 5. Connect the top and bottom plates using two M4-0.7 X 20 mm screws and two wing nuts

2.5 Completed base structure

The base structure is now completed. To mount the boards on the structure, refer to for [Section 3](#) RD-HVBMSCTBUN and [Section 4](#) for RD-HVBMSCT800BUN.

3 Guidelines for the specific setup of the RD-HVBMSCTBUN

This section details the steps for the construction of the specific setup for RD-HVBMSCTBUN.

The [RD-HVBMSCTBUN](#) kit is composed of:

- a [RD-K344BMU](#) battery management unit (BMU)
- a [RD33775ACNTEVB](#) cell monitoring unit (CMU)
- a [RD772BJBTPLEVB](#) battery junction bow (BJB)
- a [BATT-14CEMULATOR](#) battery emulator
- a [BATT-14EXTENDER](#) battery extender
- and two 12 V power supplies

Note: Only one of the two supplies can be fastened to the support.

3.1 Components required

For this part of the construction, the components required are:

- 1 RD-HVBMSCTBUN kit
- 2 side part, 60 mm support frame (800-76230)
- 2 side part, 78 mm support frame (800-76231)
- 12 screws, M3-0.5 X 25 mm with PHP (280-78012)
- 12 standoffs (280-78015)
- 12 nuts, M3-0.5 (280-76566)
- 8 screws, M3 X 6 mm (280-76355)
- 5 screws, M4-0.7 X 14 mm with socket head (280-78013)
- 1 nut, M4-0.7 X 3.4 mm (280-78016)
- 2 nylon cable ties (600-77772)

3.2 Adding support for the battery emulation system

1. Mount both 78mm side parts (800-76231) using two screws (280-78013) according to [Figure 6](#) and [Figure 8](#).
2. Mount both 60mm side parts (800-76230) using two screws (280-78013) according to [Figure 7](#) and [Figure 8](#).

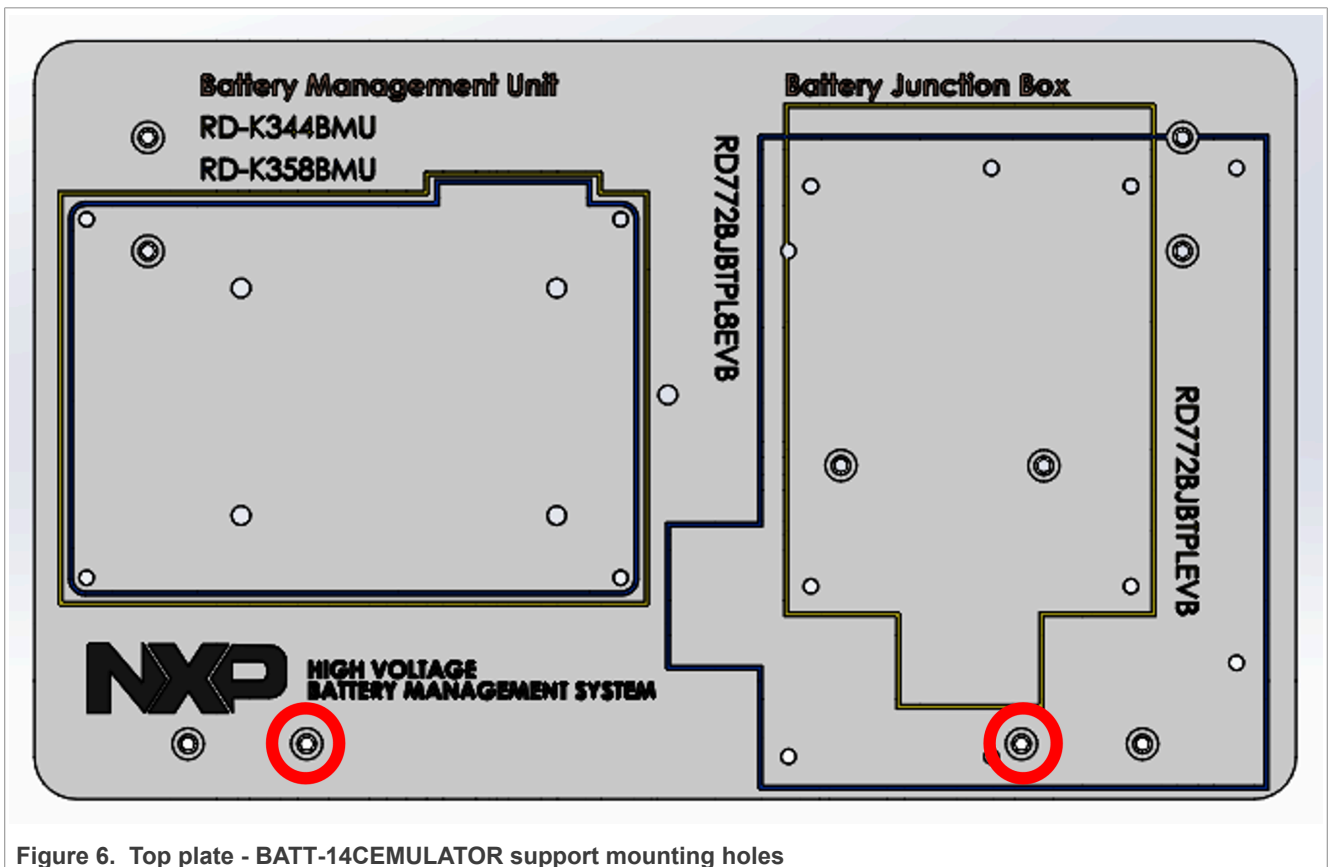


Figure 6. Top plate - BATT-14CEMULATOR support mounting holes

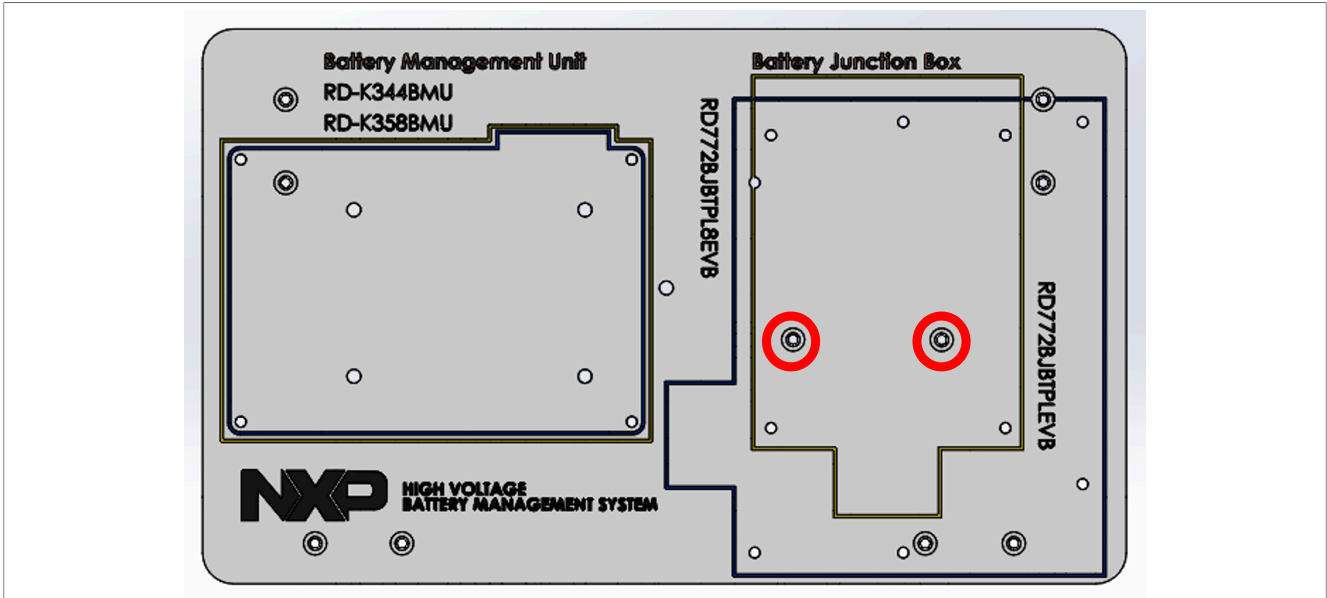


Figure 7. Top plate - BATT-14EXTENDER support mounting holes

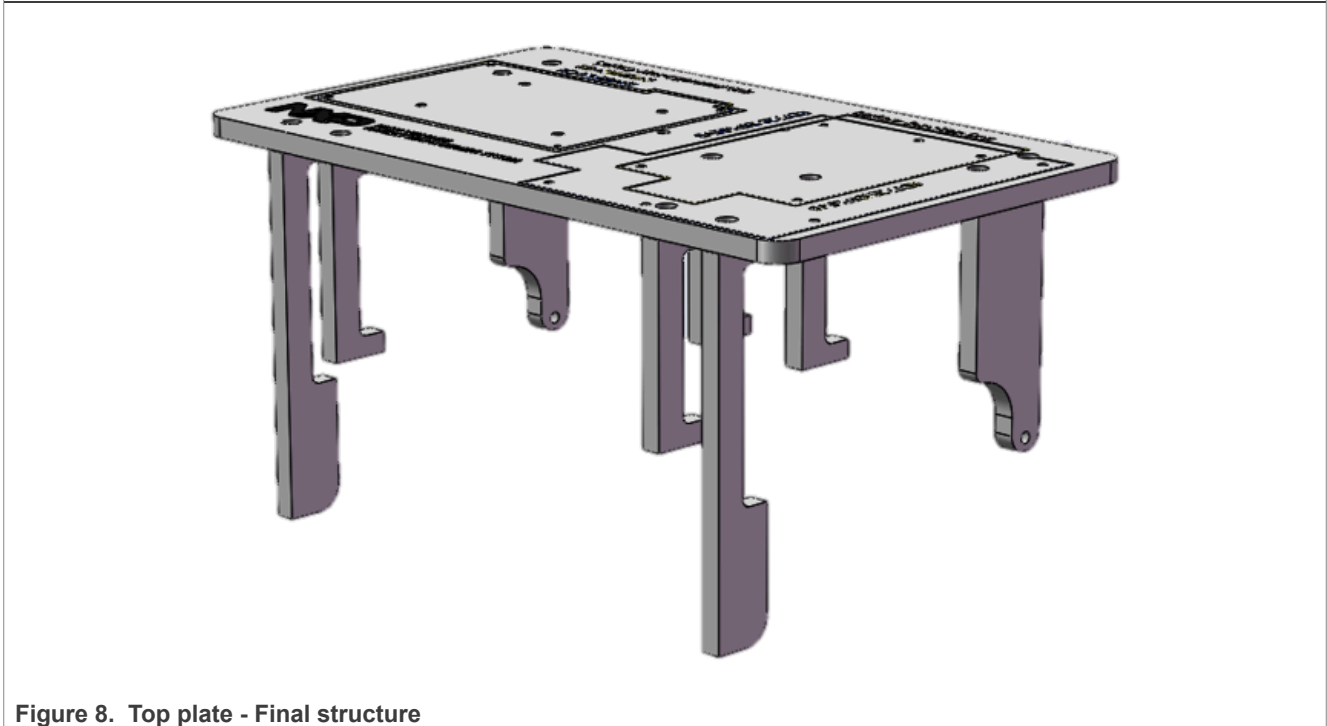


Figure 8. Top plate - Final structure

3.3 Mounting the power supplies (optional)

One of the two power supplies can be fastened on the back of the top plate. The other power supply needs to be placed around the polycarbonate support but cannot be fastened to it.

1. Use the two nylon cable ties (600-77772) to fasten one of the power supplies to the top plate according to the red marks on [Figure 9](#) and green marks on [Figure 10](#).
2. It is possible to secure the power supply position by placing one screw (280-78013) and nut (280-78016) according to the blue mark on [Figure 9](#) and yellow mark on [Figure 10](#).

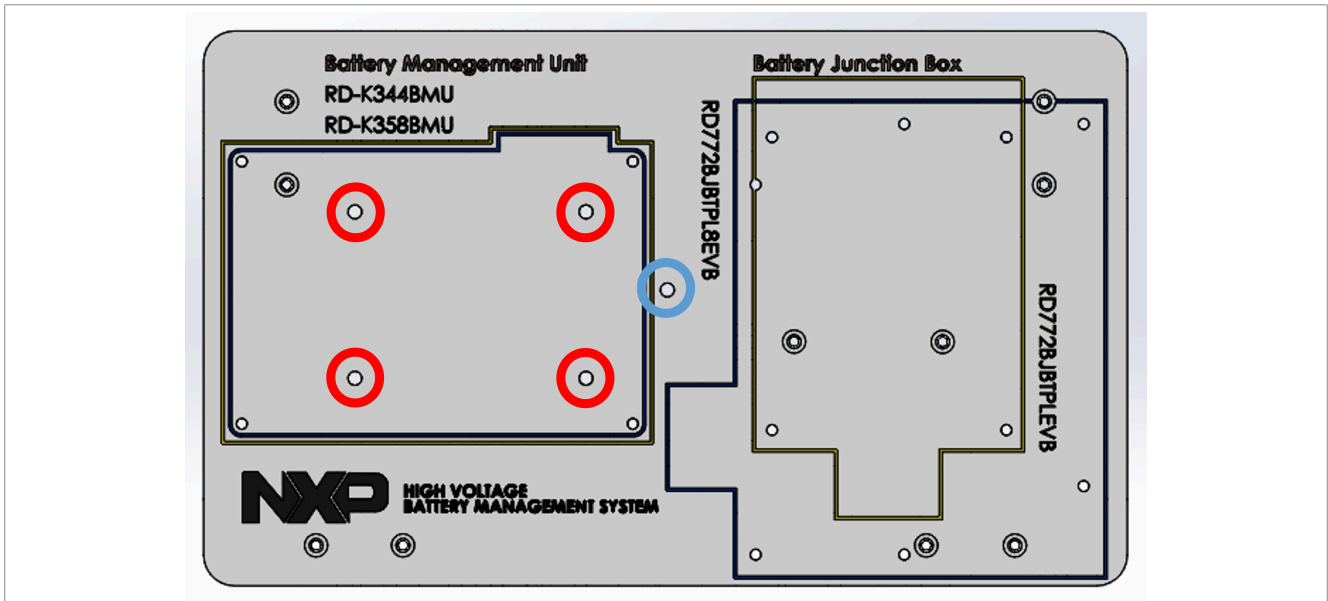


Figure 9. Power supply mounting holes

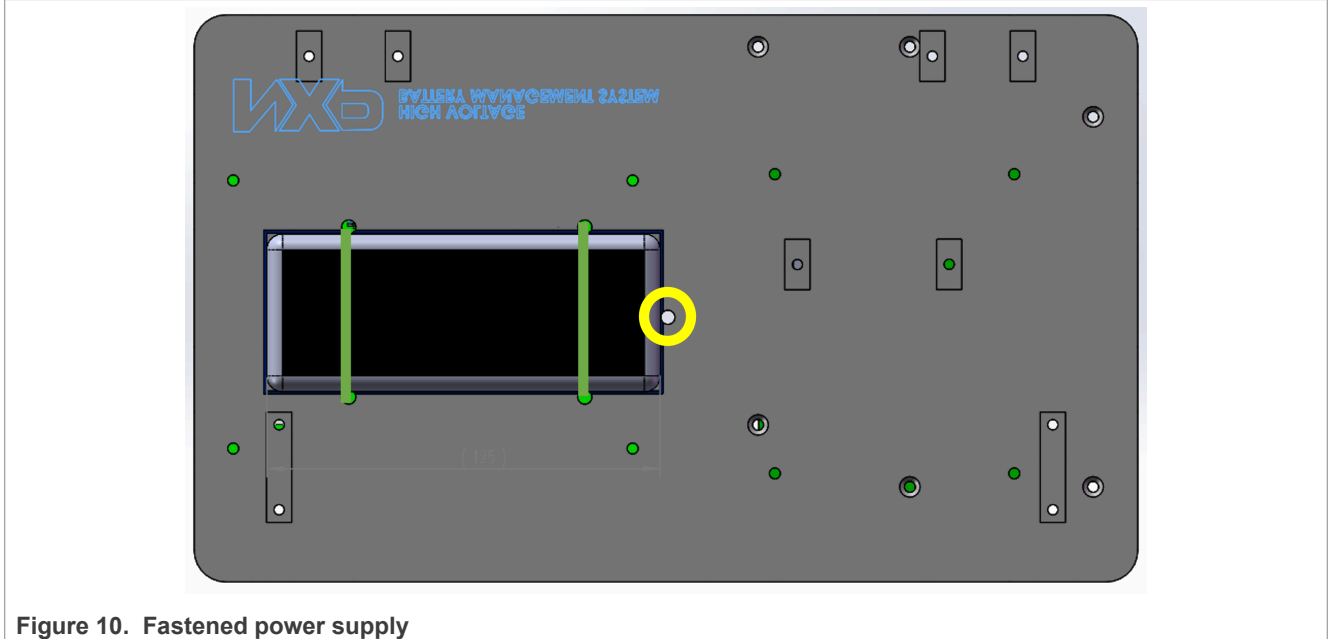


Figure 10. Fastened power supply

3.4 Mounting the battery management unit

1. Mount the BMU to the top plate using four screws (280-78012), four standoffs (280-78015) and four nuts (280-76566) according to [Figure 11](#).

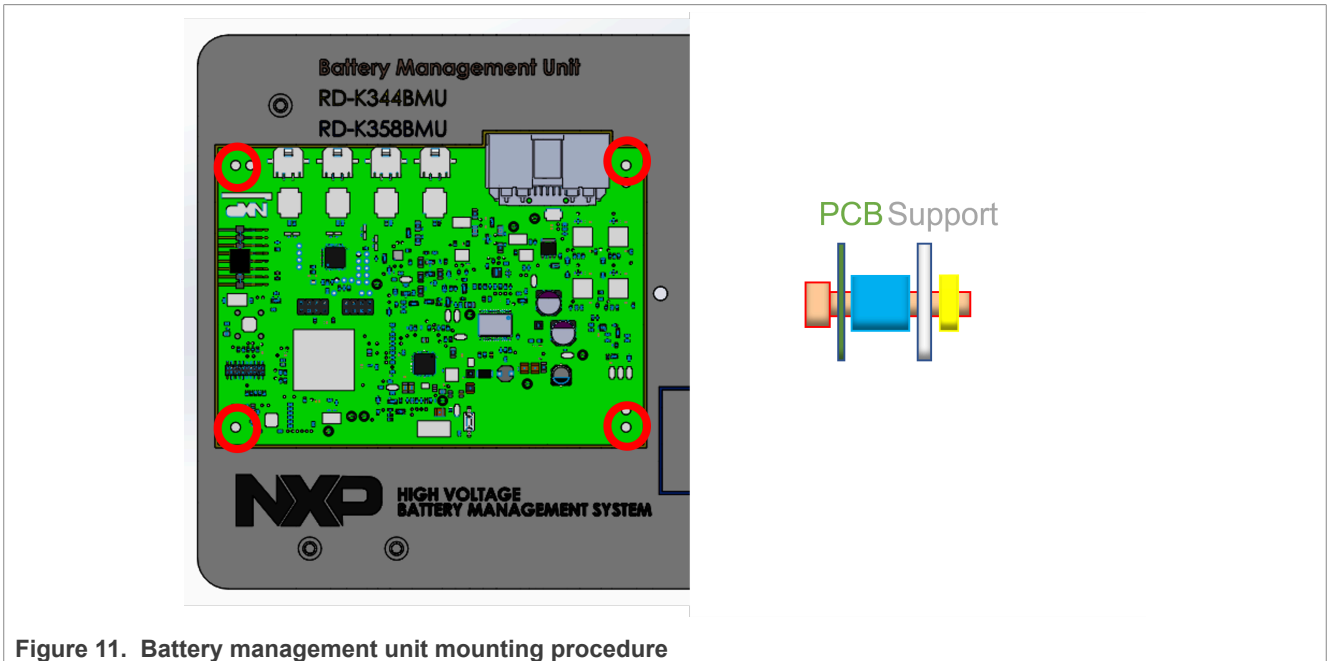


Figure 11. Battery management unit mounting procedure

3.5 Mounting the cell monitoring unit

1. Mount the CMU to the bottom plate using four screws (280-78012), four standoffs (280-78015) and four nuts (280-76566) according to [Figure 12](#).

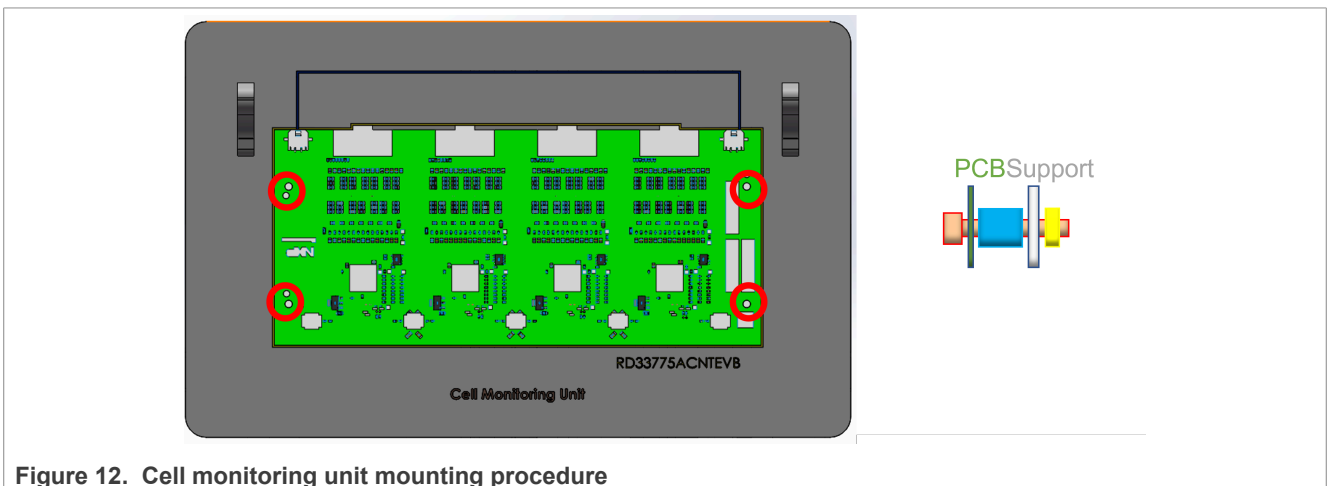


Figure 12. Cell monitoring unit mounting procedure

3.6 Mounting the battery junction box

1. Mount the BJB to the top plate using four screws (280-78012), four standoffs (280-78015) and four nuts (280-76566) according to [Figure 13](#).

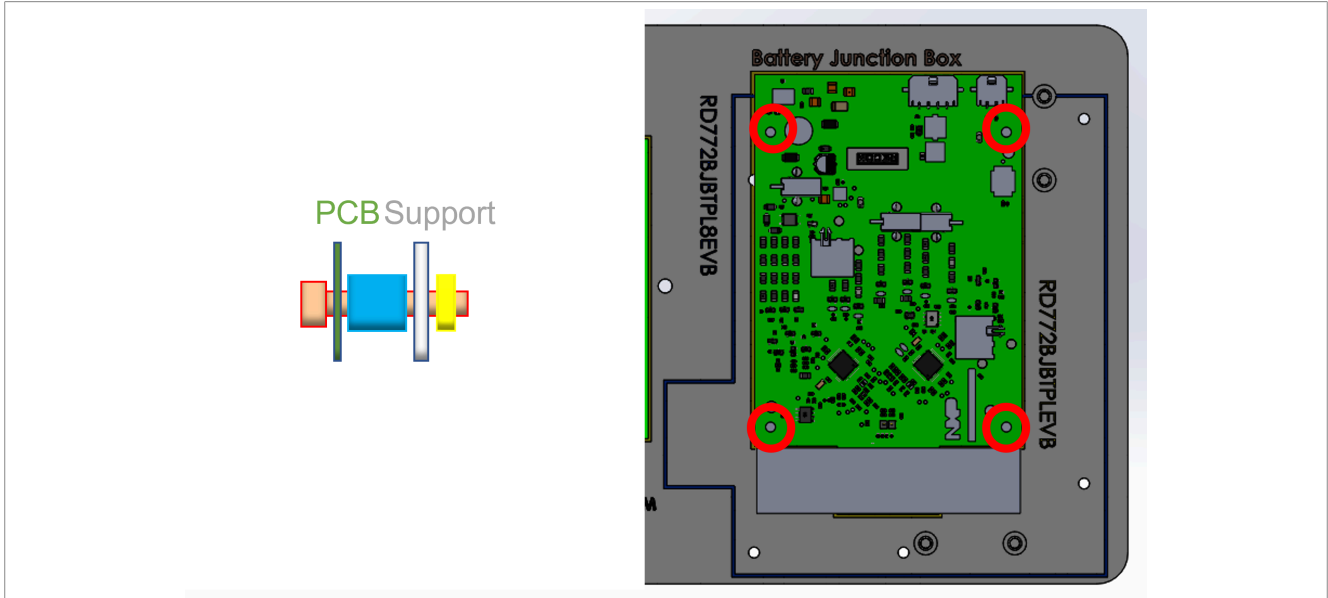


Figure 13. Battery junction box mounting procedure

3.7 Mounting the battery emulation system

1. Mount the battery emulator to the 78 mm side parts using four screws (280-76355) according to [Figure 14](#).
Note: The J1 connector should face the right side.
2. Mount the battery extender to the 60 mm side parts using four screws (280-76355) according to [Figure 15](#).

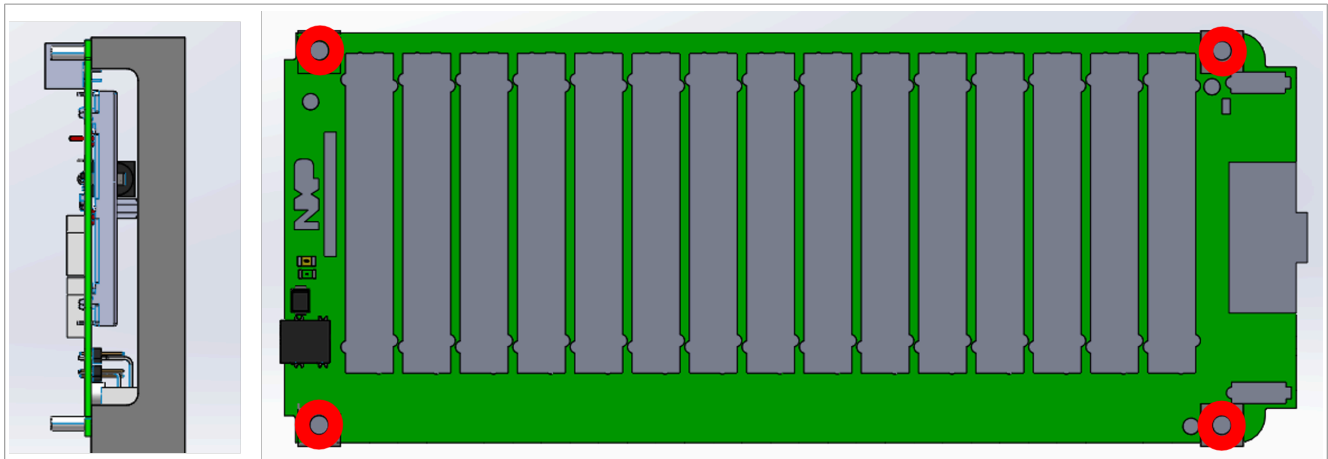


Figure 14. Battery emulator mounting procedure

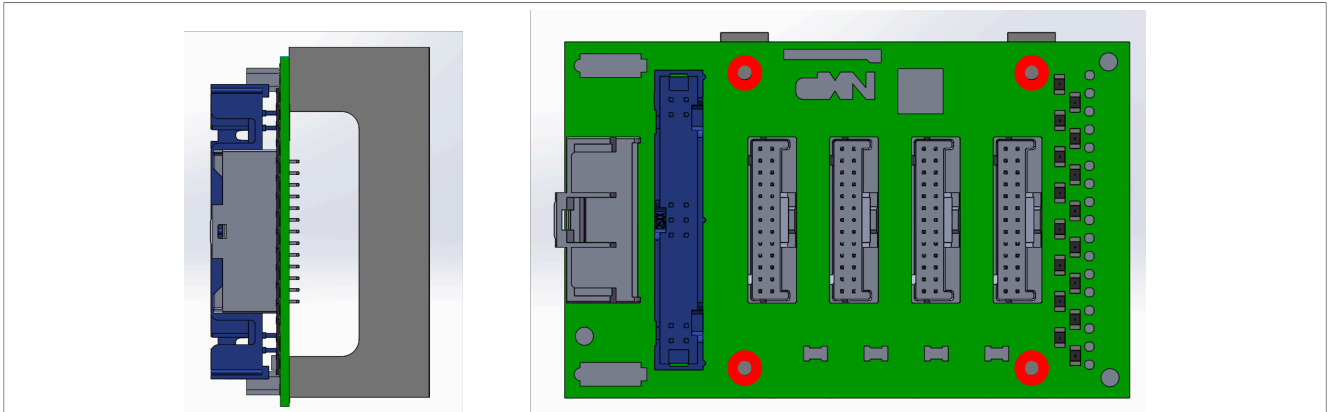


Figure 15. Battery extender mounting procedure

3.8 Completed structure

The RD-HVBMSCTBUN structure is now completed. To learn how to connect the boards together, refer to the reference design user manual available on the [RD-HVBMSCTBUN web page](#).

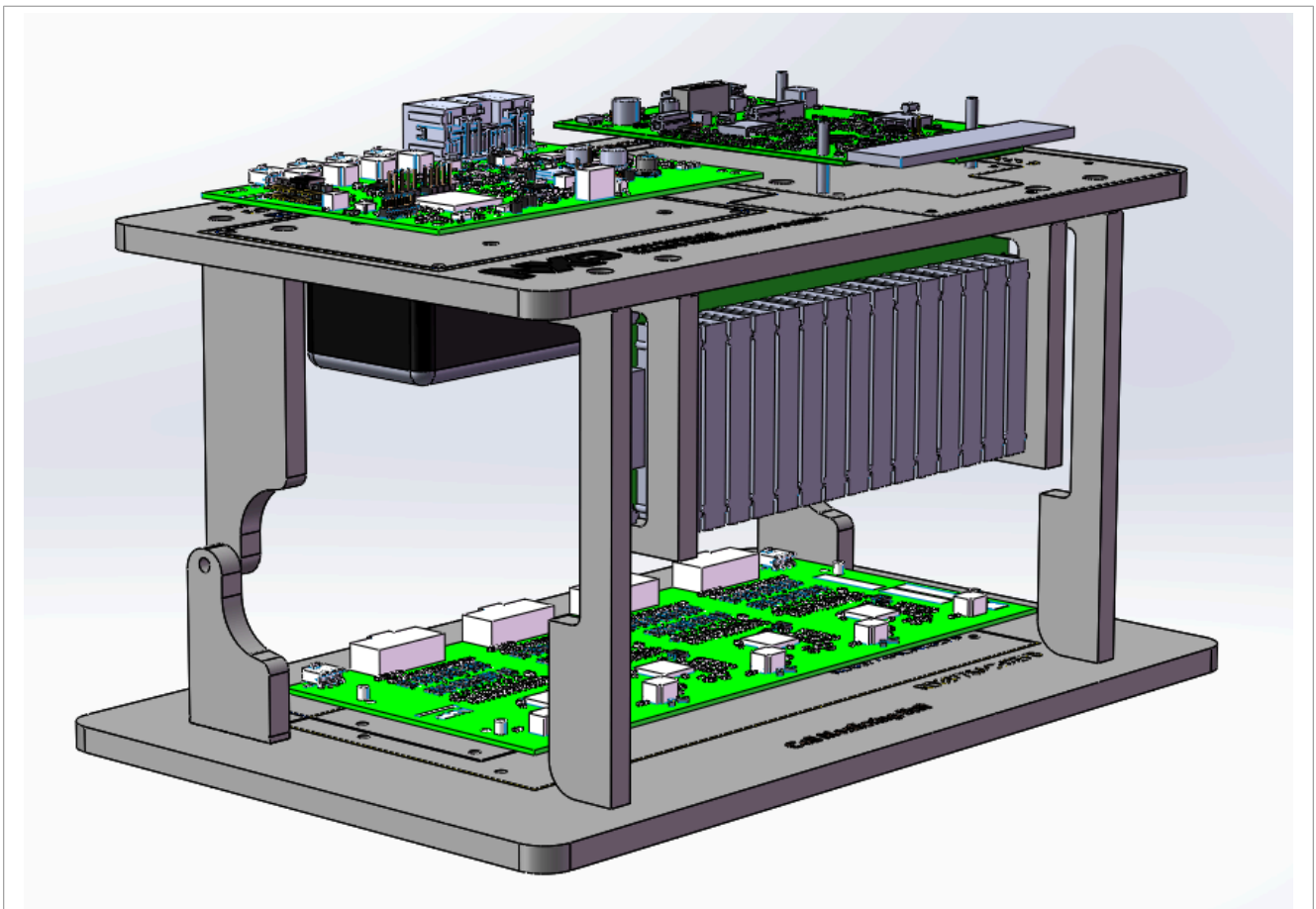


Figure 16. Final structure for RD-HVBMSCTBUN

4 Guidelines for the specific setup of the RD-HVBMSCT800BUN

This section details the steps for the construction of the specific setup for RD-HVBMSCT800BUN.

The [RD-HVBMSCT800BUN](#) kit is composed of:

- a [RD-K358BMU](#) battery management unit (BMU)
 - a [RD33774CNT3EVB](#) cell monitoring unit (CMU)
 - a [RD772BJBTPL8EVB](#) battery junction bow (BJB)
 - a [BATT-18EMULATOR](#) battery emulator
 - and a 5 V and a 12 V power supply
- Note:** *Only one of the two supplies can be fastened to the support.*

4.1 Components required

For this part of the construction, the components required are:

- 1 RD-HVBMSCT800BUN kit
- 14 screws, M3-0.5 X 25 mm with PHP (280-78012)
- 14 standoffs (280-78015)
- 14 nuts, M3-0.5 (280-76566)
- 4 screws, M3 X 6 mm (280-76355)
- 4 screws, M3-0.5 X 25 mm with flat head (280-78008)
- 2 screws, M3 X 12 mm with flat head (280-76979)
- 1 screw, M4-0.7 X 14 mm with socket head (280-78013)
- 1 nut, M4-0.7 X 3.4 mm (280-78016)
- 2 nylon cable ties (600-77772)

4.2 Mounting the power supplies (optional)

One of the two power supplies can be fastened on the back of the top plate. The other power supply needs to be placed around the polycarbonate support but cannot be fastened to it.

1. Use the two nylon cable ties (600-77772) to fasten one of the power supplies to the top plate according to the red marks on [Figure 17](#) and green marks on [Figure 18](#).
2. It is possible to secure the power supply position by placing one screw (280-78013) and nut (280-78016) according to the blue mark on [Figure 17](#) and yellow mark on [Figure 18](#).

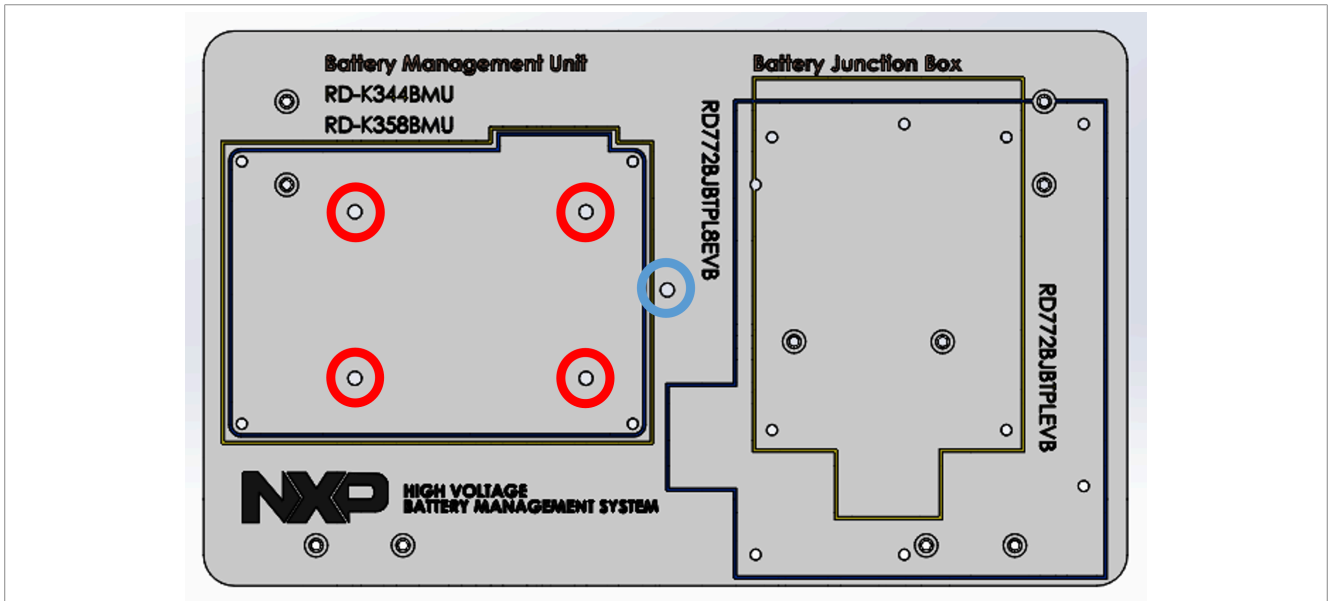


Figure 17. Power supply mounting holes

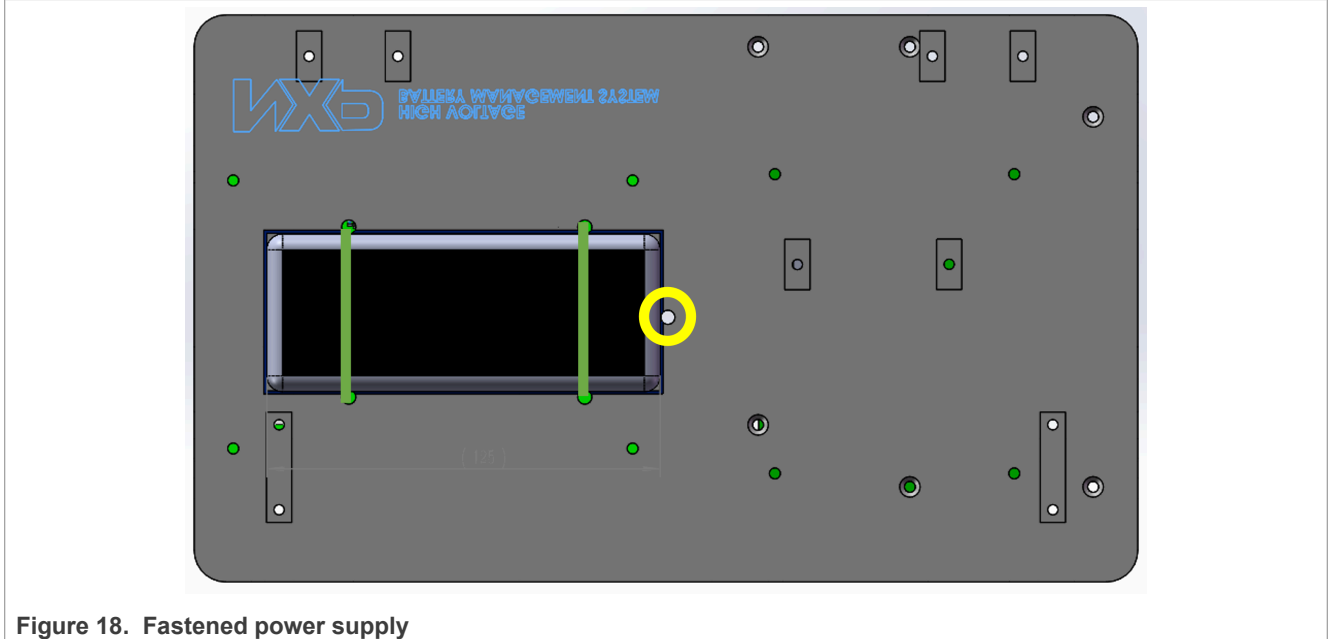


Figure 18. Fastened power supply

4.3 Mounting the battery management unit

1. Mount the BMU to the top plate using four screws (280-78012), four standoffs (280-78015) and four nuts (280-76566) according to [Figure 19](#).

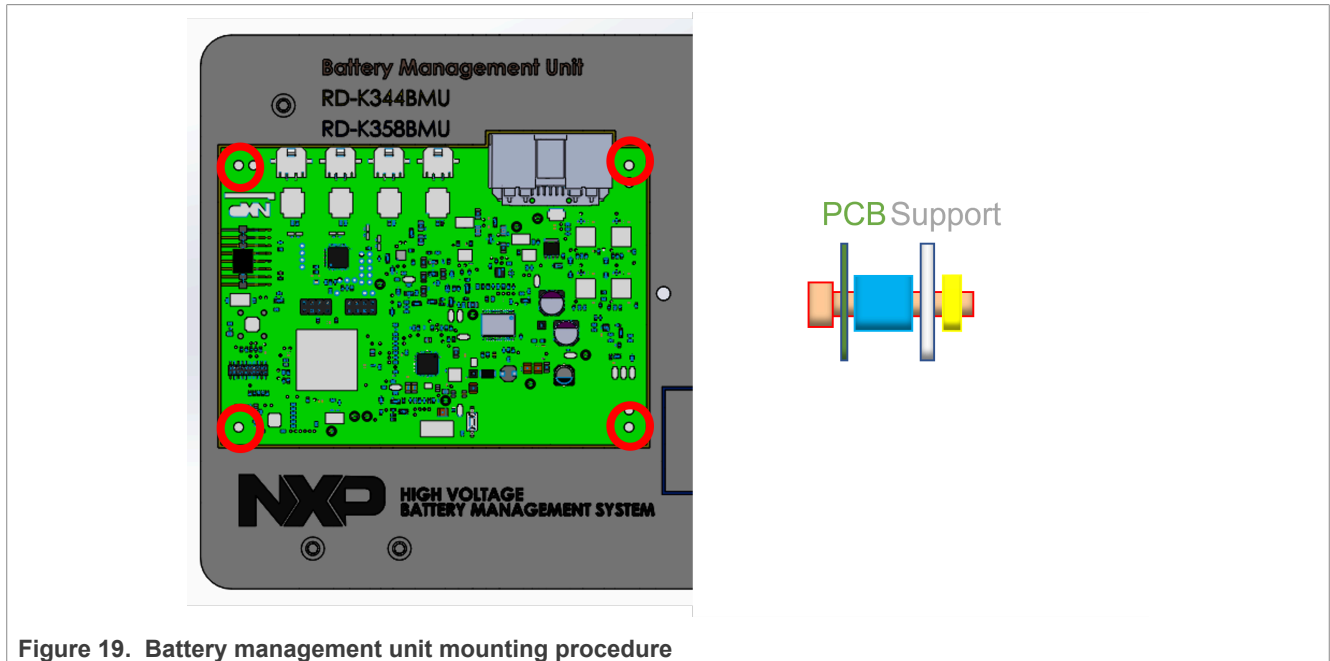


Figure 19. Battery management unit mounting procedure

4.4 Mounting the cell monitoring unit

1. Mount the CMU to the bottom plate using four screws (280-78012), four standoffs (280-78015) and four nuts (280-76566) according to [Figure 20](#).

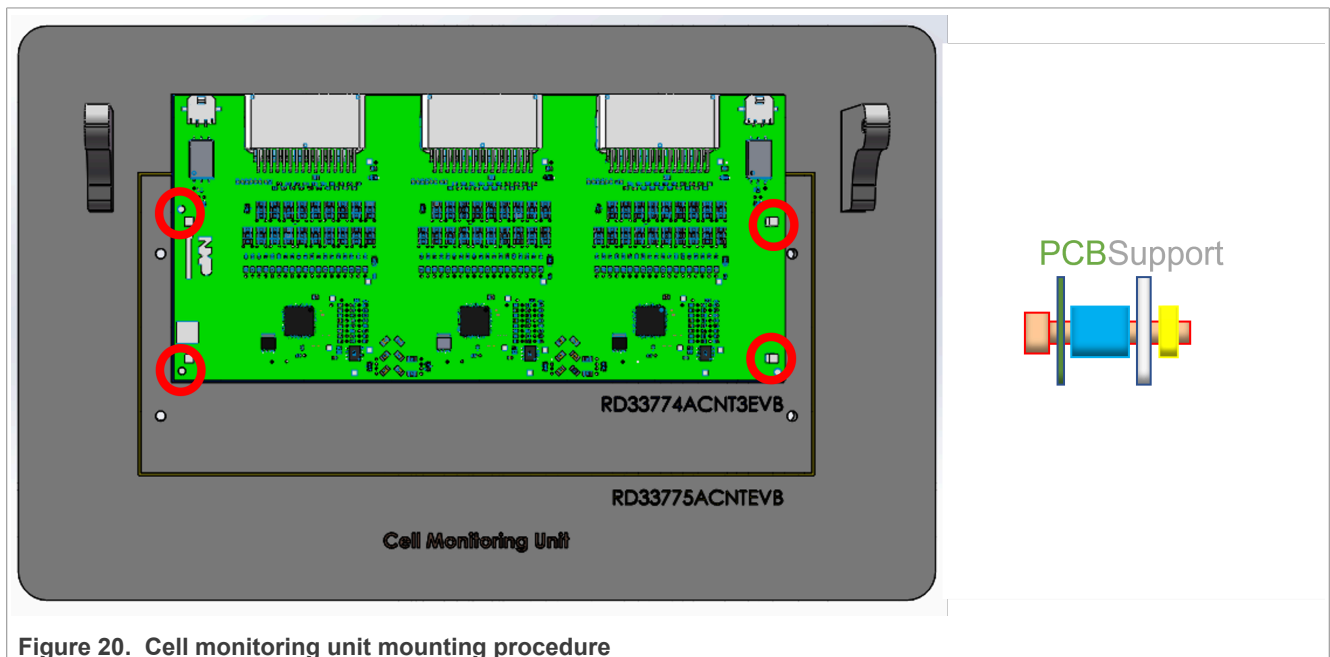


Figure 20. Cell monitoring unit mounting procedure

4.5 Mounting the battery junction box

It is possible to mount the BJB using its polycarbonate protection using the following procedure:

1. Mount the BJB to the top plate using four long screws (280-78008) and two short screws (280-76979) by replacing the bottom screws of the BJB protection polycarbonate and using the two standoffs provided in the BJB kit according to [Figure 21](#).

Alternatively and only if the BJB is not connected to high voltages, it is possible to mount the BJB without its polycarbonate protection using the following procedure:

1. Mount the BJB to the top plate using six screws (280-78012), six standoffs (280-78015) and six nuts (280-76566) according to [Figure 22](#).

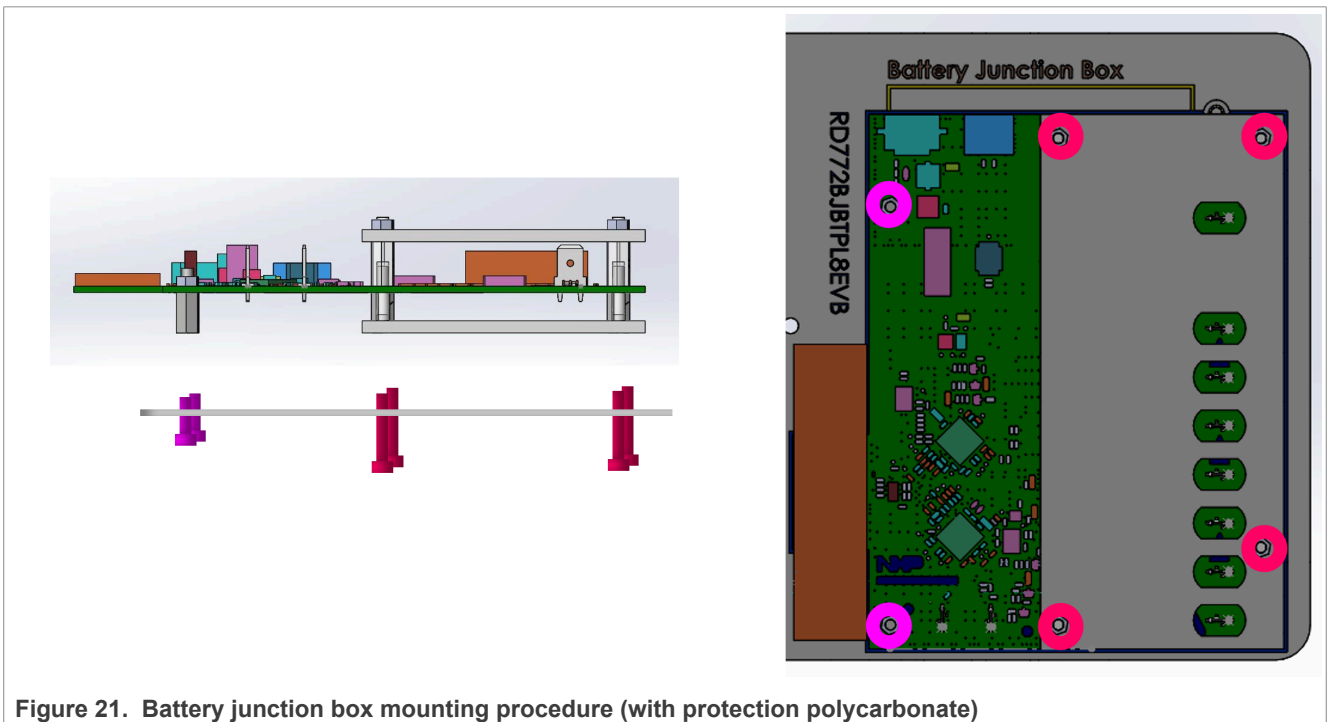


Figure 21. Battery junction box mounting procedure (with protection polycarbonate)

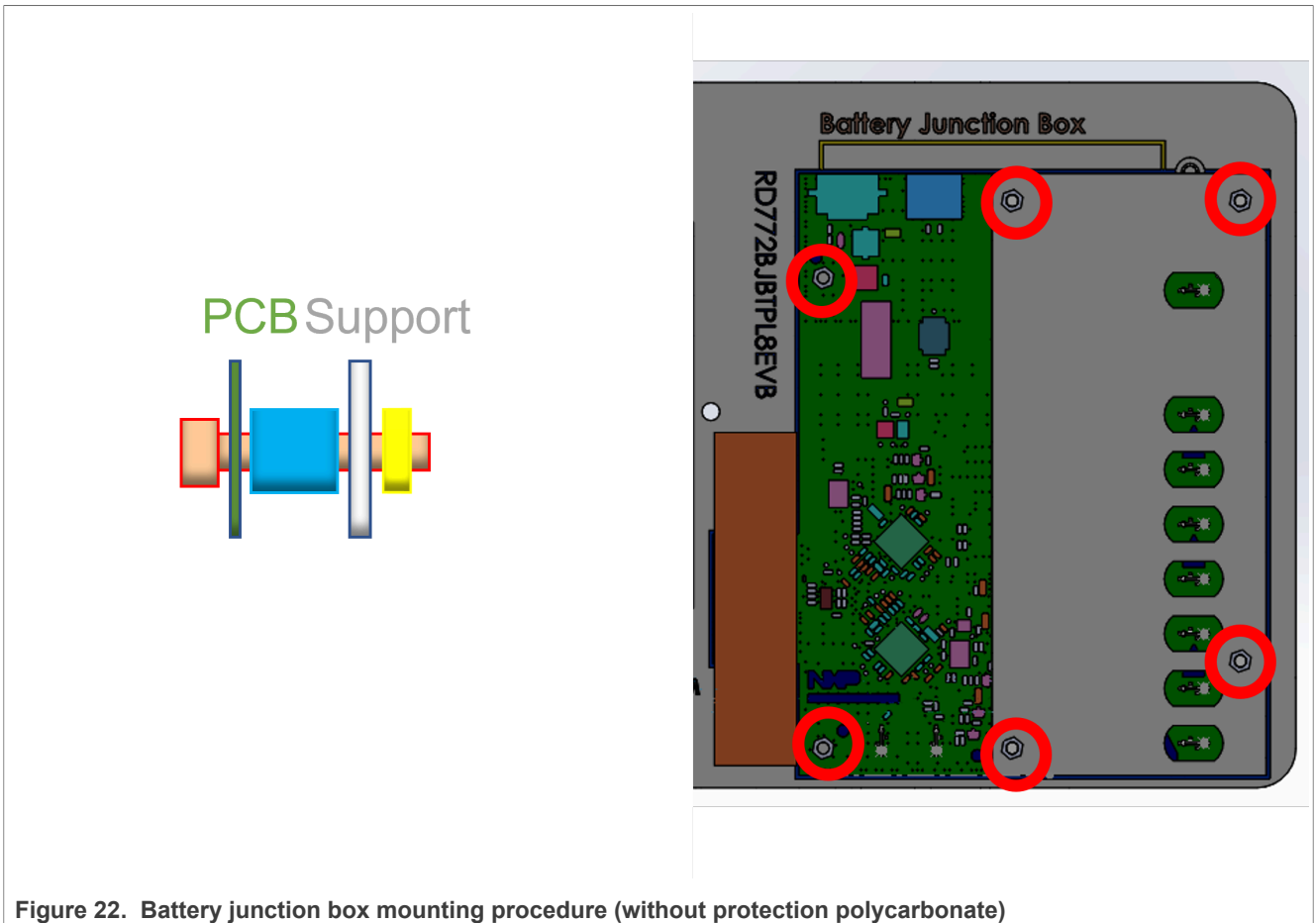


Figure 22. Battery junction box mounting procedure (without protection polycarbonate)

4.6 Mounting the battery emulator

1. Mount the battery emulator to the support frame (800-76232) using four screws (280-76355) according to [Figure 23](#).

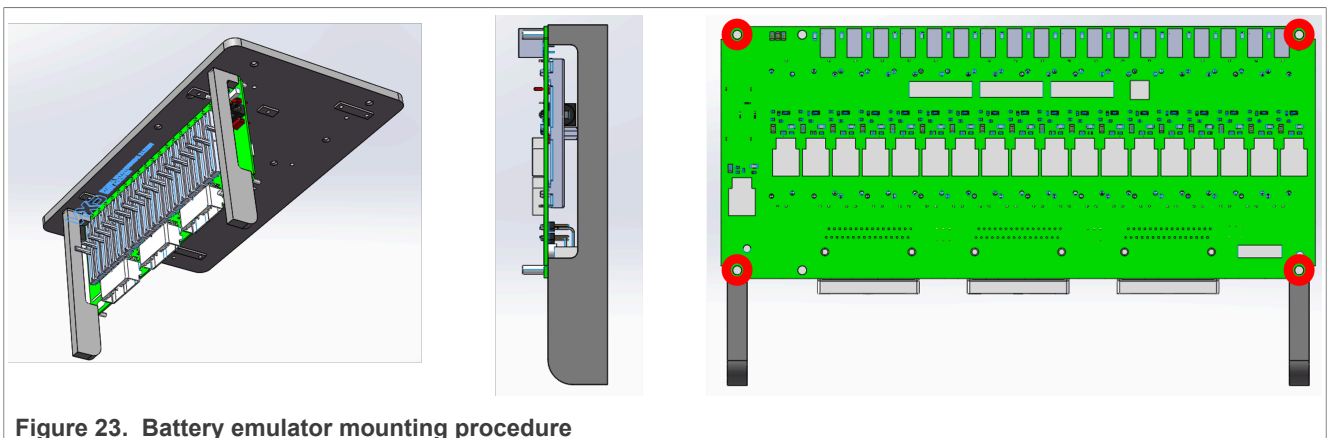


Figure 23. Battery emulator mounting procedure

5 References

- [1] **RD-HVBMSCTBUN** — HVBMS reference design bundle for 400 V applications - [RD-HVBMSCTBUN](#)
- [2] **RD-HVBMSCT800BUN** — HVBMS reference design bundle for 800 V applications - [RD-HVBMSCT800BUN](#)

Revision history

Revision history

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v.1	20230707	Initial version

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