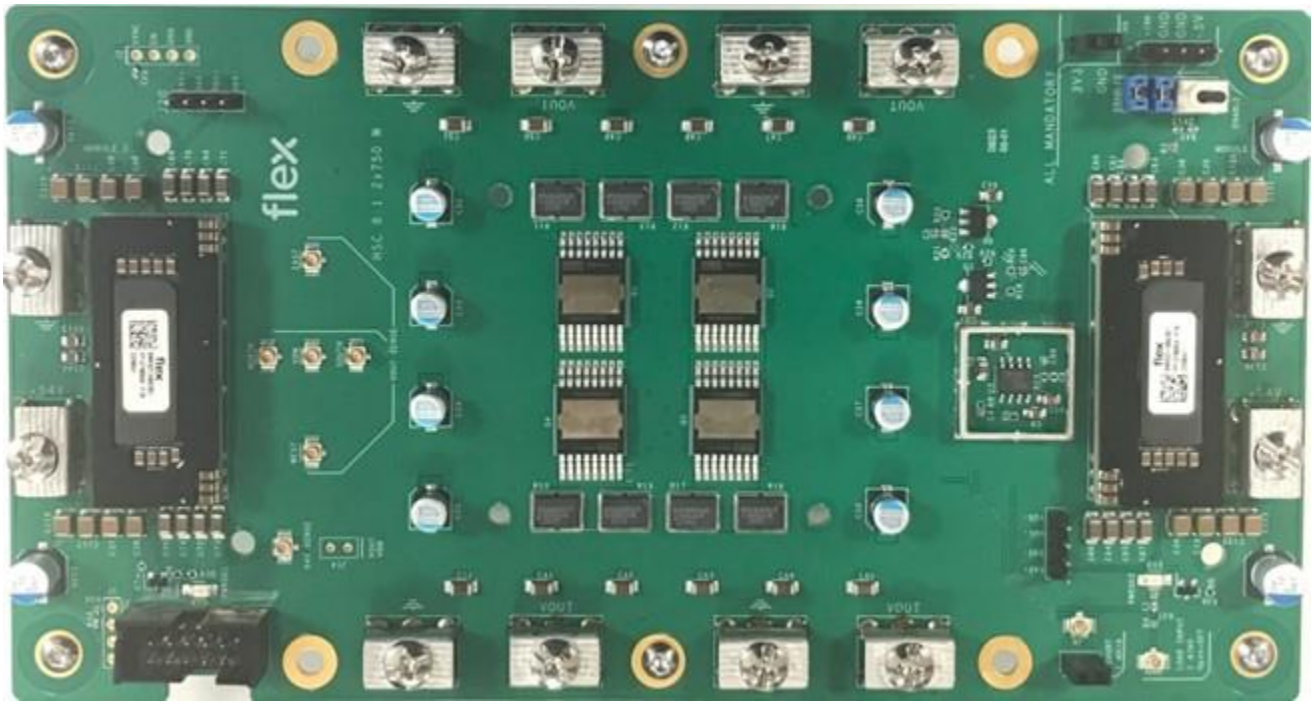
Evaluation Board User Guide

ROA 3210

USER GUIDE for BMR321



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1 Introduction

This User Guide provides a brief introduction and instruction on how to use the Evaluation board ROA3210. This board provides possibility to evaluate the one or two in parallel BMR321 modules.

1.1 How to contact Flex

For general questions or interest in our products, please contact your local sales representative. Contact details are available from our website:

Flexpowermodules.com

1.2 Prerequisites

To operate ROA3210 board, the following is needs:

- Input power supply 40V-60V
- Auxiliary power supply 3.3V (1.5A)

2 Reference Board ROA 3210

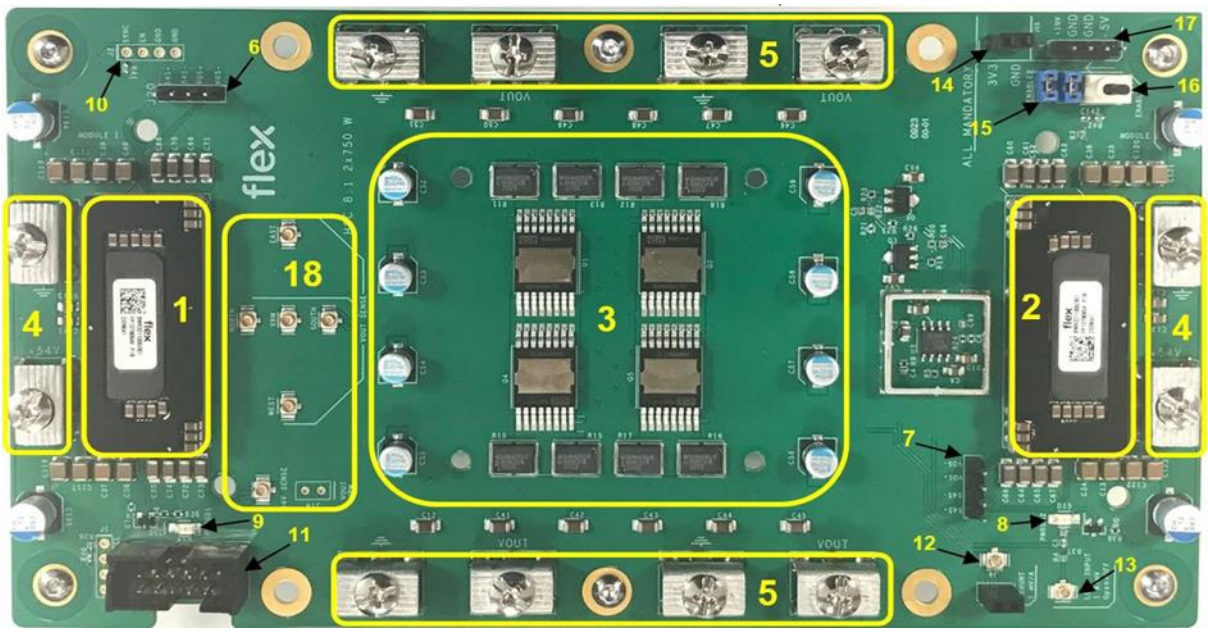

Figure 1. ROA 3210 (top side)

2.1 Position Description (Top Side)

1. Module 1
2. Module 2
3. Dynamic pulse load
4. Vin connectors
5. Vout connectors
6. Vsense connector (Module 1)
7. Vsense connector (Module 2)
8. PWRGD led diode (Module 2)
9. PWRGD led diode (Module 1)
10. SYNC and EN connector

11. PMBUS connector
12. Current measurement connector
13. Input connector dynamic load
14. Auxiliary power supply connector (3.3V)
15. EN jumpers
16. EN switch
17. Power supply for dynamic load
18. Vin, Vout oscilloscope measurement

3 Power-up and power-down sequence control

3.1 Power-up instruction for one module BMR321

- Connect the input power supply 40-60 V (Vin “4”)
- Connect the load (Vout “5”)
- Apply auxiliary voltage (3.3V) trough connector “14”.
- Turn on the input power supply.
- Enable the output voltage by setting the enable switch “16” in ON position

3.2 Power-down instruction

- Turn enable switch “16” in OFF position (turn off output voltage module)
- Turn OFF input power supply
- Turn off auxiliary voltage 3.3V

4 Efficiency measurement

Efficiency measurement needs external input and output current measurement, Vin and Vout sense, which are connected directly from input and output pins to eliminate voltage drop. These signals are: +Vin, +Vout, GNDin, GNDout, in the test connector “6” (Figure 1) for module 1 and “7” (Figure 1) for module 2.

5 Parallel operation

Module 1 and module 2 can work in parallel mode by populating both jumpers in position “15” (Figure 1). The same jumpers also enable the option to operate each module separately. Powering up and down sequences for parallel working modules similar as with one module. Both modules need separate connection Vin, through “4” Figure 1, to eliminate voltage drop in PCB. It is recommended add electrolytic capacitors (220uF-470uF) in each input connector “4” Figure 1.

6 PMBus

PMBus connector position “11” (Figure 1), has pin description Figure 2.

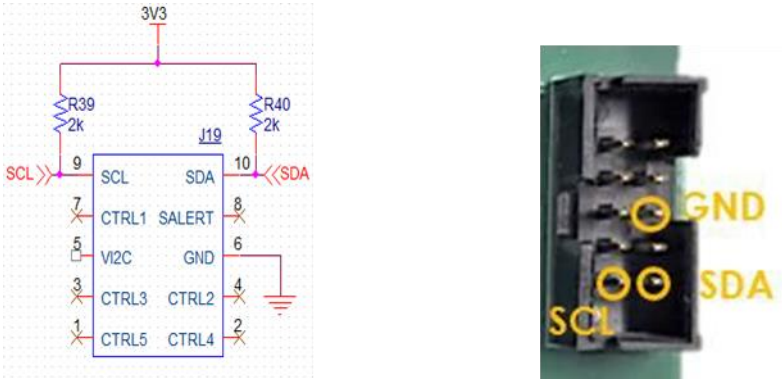

Figure 2: PMBus connector

7 SYNC and External EN

Sync signal from both modules wired as shows in Figure 3. SYNC function not implemented in current design.

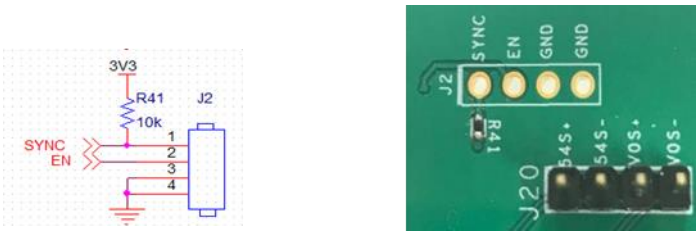

Figure 3: SYNC and EN connector

It is possible to drive modules with external EN signal from connector J2 Figure 3. In that case EN switch “16” (Figure1) must be in ON position. EN signal has pull- up resistor 1k.

8 Addressable resistors

The PMBus addresses set by resistors R2 for module 1 and R3 for module 2.

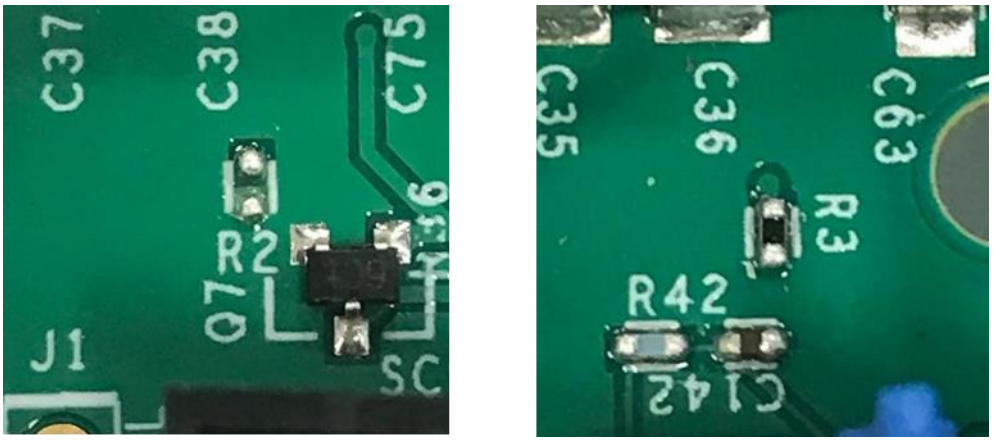

Figure 4: Address resistor position

Module	Default PMBus resistor setting	Address	Reference designator
1	open	0x40	R2
2	2.7k	0x4B	R3

9 Test points

Evaluation board has test points "18" (Figure 1): Vin "54V SENSE" connected to input pins module 1. Vout has different positions on the board: "NORTH" connect to the output pins module 1, "SOUTH" to the output pins module 2. "VRM", "EAST" and "WEST" respectively in the middle, up and down positions of dynamic load, Figure 5.

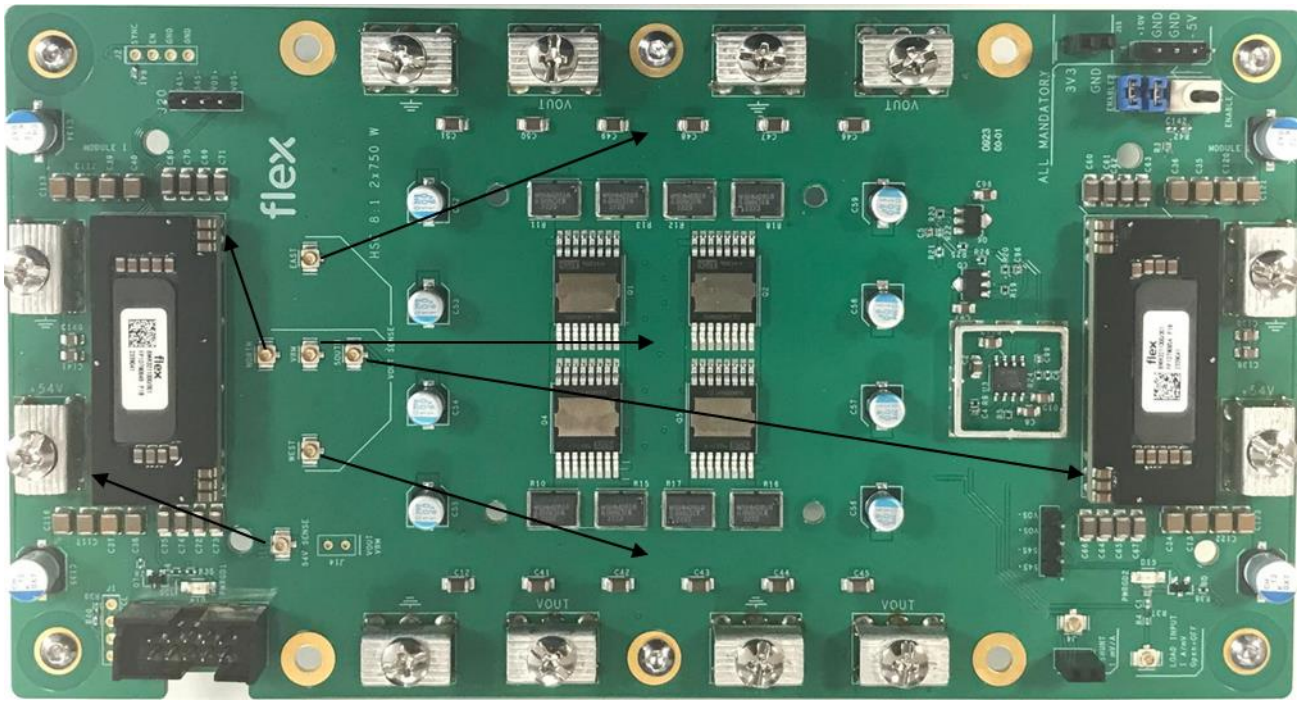

Figure 5: Test point position

10 Dynamic pulse load

Dynamic pulse load consists of 4 parallel MOSfet and 8 parallel shunt resistors with sum resistance 1mΩ. Dynamic pulse load needs an external power supply
+6V, -6V, "17" (Figure 1). By applying necessary input signal (1-100 A/mV, for single module) Figure 6, it is possible to load module dynamically with different peak current. Voltage signal proportional to the current through shunt (1mV/A) can read by connector J4 Figure 6.

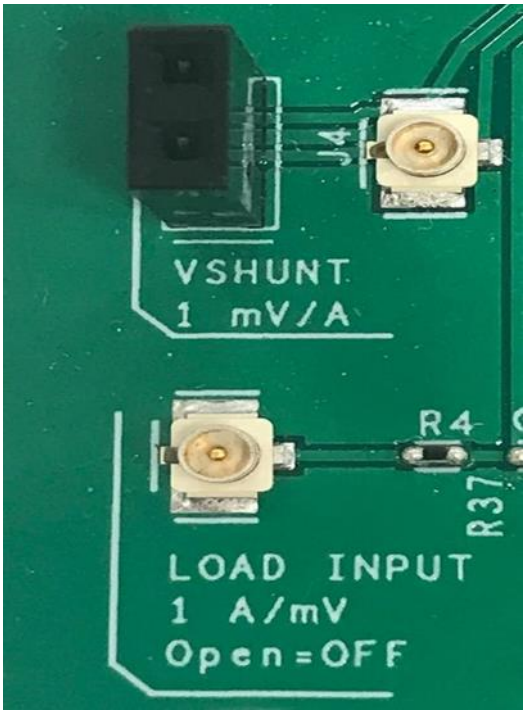

Figure 6. Dynamic pulse load input and current read connectors.

11 Thermal Considerations

The module is design to be connected to water cooling system or heatsink with fan. Caution is advised when operating above 60% of full load (TDP) without attached cooling. See the technical specification for detail.

12 Revision

Revision	Revision information	Date	Responsible
A & B	New document	2025-05-21	KARTWAER
B			
C			
D			