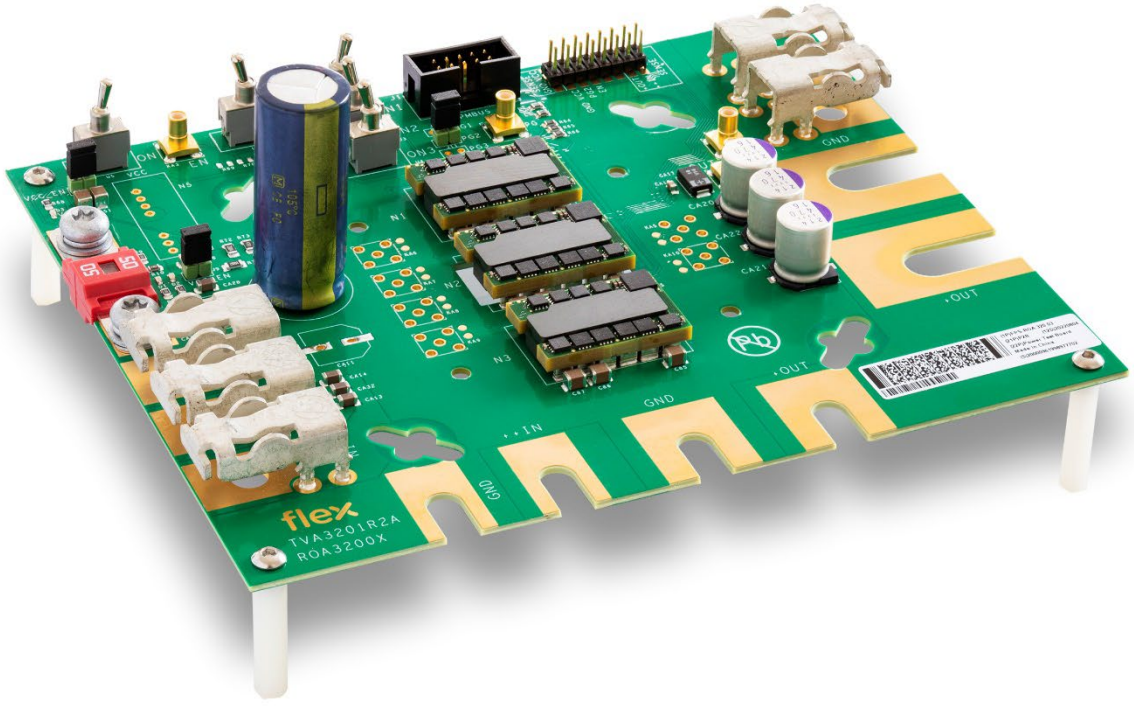
User Guide evaluation board BMR320 / BMR323

USER GUIDE for BMR320 and BMR323



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1 Introduction

This User Guide provides a brief introduction and instruction on how to use the Evaluation board ROA3200X. This board provides the possibility to evaluate the BMR320 and BMR323 modules.

1.1 How to contact Flex

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

Flexpowermodules.com

1.2 Prerequisites

In order to operate the evaluation board ROA3200X, the following is needed:

- Input power supply 40V-60V.
- PMBus interface using **Flex Power Designer tool** for ease of use or GUI compatible with controller FD6000 for BMR 320 or GUI compatible with XDPP1100-Q024 for BMR 323.
- Output load

2 Evaluation Board ROA3200X

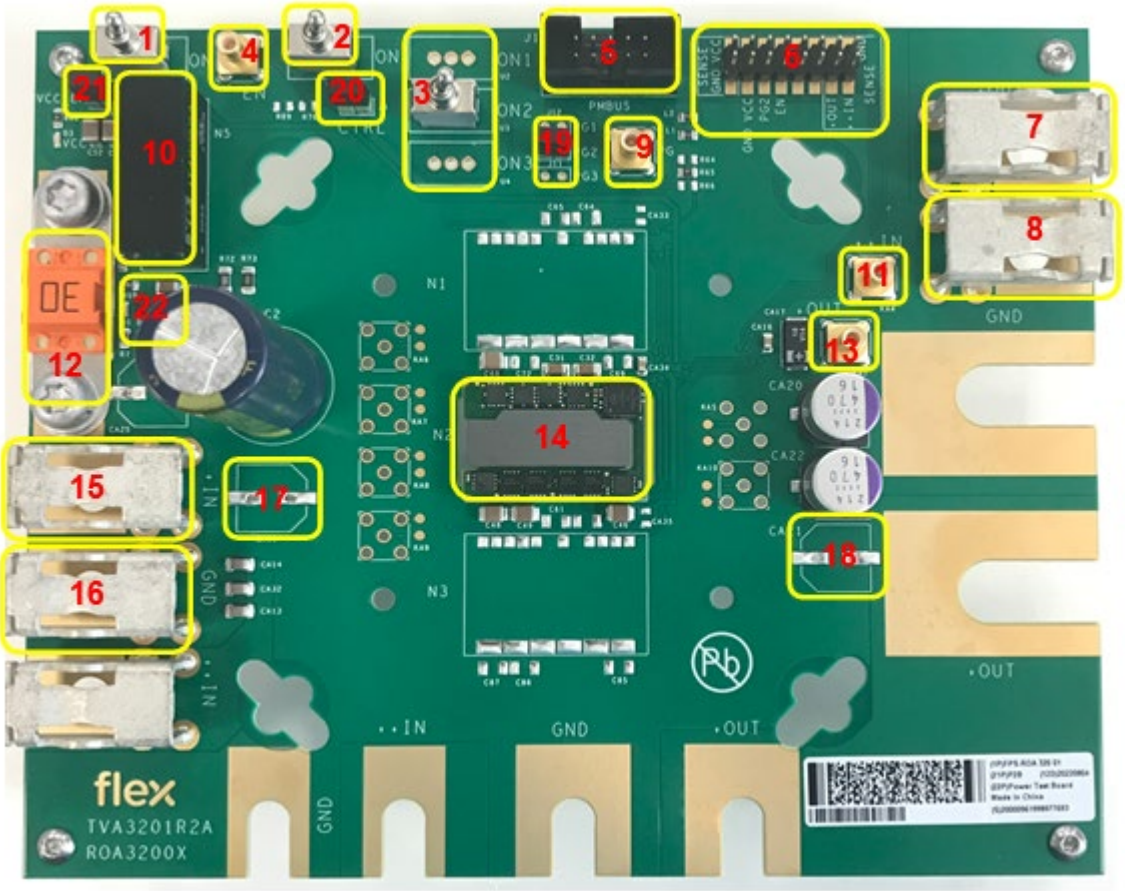


Figure 1: ROA32001 (top side)

2.1 Position Description

1 **Vcc on/off switch**.

2 **ENABLE switch**.

3 **Module Enable selector switch**.

4 **ENABLE oscilloscope probe connector**.

5 **PMBus interface connector**.

6 **Test connector**.

7 **+Vout**.

8 **-Vout**.

9 **PGOOD oscilloscope probe connector**.

10 **Auxiliary voltage regulator (Vcc).**

11 **Vin oscilloscope probe connector.**

12 **Input current protection fuse**.

13 **Vout oscilloscope probe connector**.

14 **BMR320 (DUT)**.

15 **+Vin**.

16 **-Vin**.

17 Place for extra input capacitor.

18 Place for extra output capacitor.

19 **PGOOD jumper**.

20 **External ENABLE jumper**.

21,22 **Vcc regulator jumpers**

3 Power-up and Power-down sequence control

3.1 Power-up instruction for one module BMR320/BMR323

- Connect the input power supply, output load and PMBus interface.
- Turn on the input power voltage.
- Apply Vcc by **Vcc on/off switch 1** in ON position, LED diode D3 lights up (Figure 2).

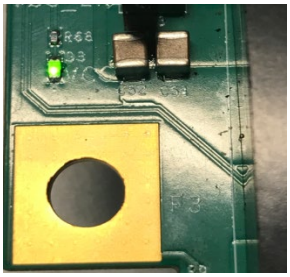


Figure 2

- Turn the **Module Enable selector switch 3** in ON position.
- Setting the **ENABLE switch 2** in ON position.

3.2 Power-down instruction

- Turn **ENABLE switch 2** in OFF position.
- Turn the **Vcc on/off switch 1** in OFF position.
- Turn OFF input power voltage.

3.3 Power-up instruction for one module BMR320/BMR323 with external Vcc

- Connect the input power supply, output load and PMBus interface.
- Connect external Vcc through **Test connector 6** (Figure 5).
- Open jumper **21**, **22** (disconnect **Auxiliary Volage regulator 10** from Vin and Vcc).
- Apply external Vcc, LED diode D3 lights up (Figure 2).
- Turn on the input power voltage.
- Turn the **Module Enable selector 3** in ON position.
- Setting the **ENABLE switch 2** in ON position.

3.4 Power-down instruction with external Vcc.

- Turn **ENABLE switch 2** in OFF position.
- Turn OFF input power voltage.
- Turn OFF external Vcc.

4 Efficiency measurement

Efficiency measurement needs external current input, output measurement and Vin and Vout sense, which are connected directly from input and output pins to eliminate voltage drop. These signals are in the **Test connector 6** respectively: ++IN, +OUT, GNDin and GNDout (Figure 3).

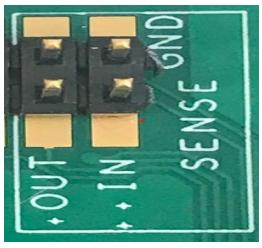


Figure 3

5 Input fuse and fuse status

The evaluation board has **Input current protection fuse 12**. For evaluation board with one module used fuse 30A, for 3 module 50A.
When module works in normal operation, the diode D2 lights up. When the fuse blew, D1 lights up (Figure 4).

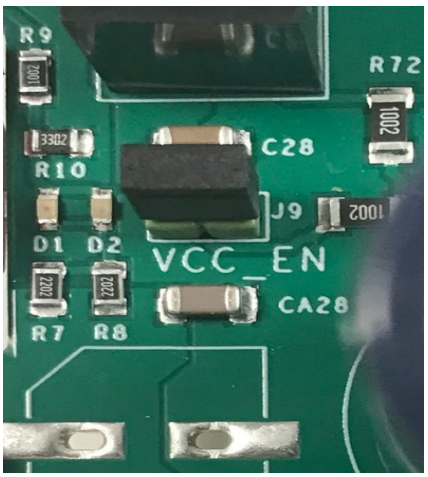


Figure 4

6 Test Points

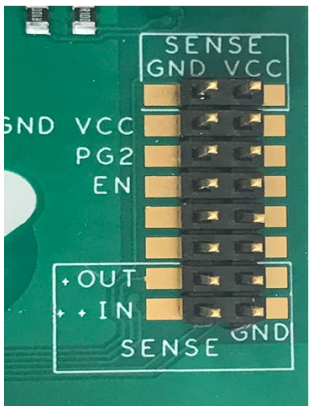
- **Vin oscilloscope probe connector 11.**

- **Vout oscilloscope probe connector 13** - Output voltage and ripple oscilloscope measure. Filter for Vout ripple measurement is embedded.

- **ENABLE oscilloscope probe connector 4.**

- **PGOOD oscilloscope probe connector 9**.

6.1 Test connector



Npin		Npin	
15	GND VCC sense	16	Vcc sense
13	GND	14	Vcc
11	NC	12	PG2
9	PG2	10	EN
7	NC	8	NC
5	NC	6	NC
3	+Vout sense	4	Vout GND sense
1	++Vin sense	2	Vin GND sense

Figure 5

The test connector (Figure 5) used in few purposes:

- External Vcc=5V.
- Vin, Vout sense signals, for efficiency measurement.
- External PGOOD signal (only PG2).
- External EN signal.

If external EN signal is wanted, **Enable switch 2** has to be in ON position and **External ENABLE jumper 20** shorted (Figure 6).

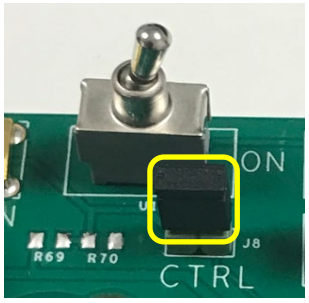


Figure 6

7 Parallel operation

Evaluation board ROA32003 can be used to run 3 modules in parallel (Figure 7).

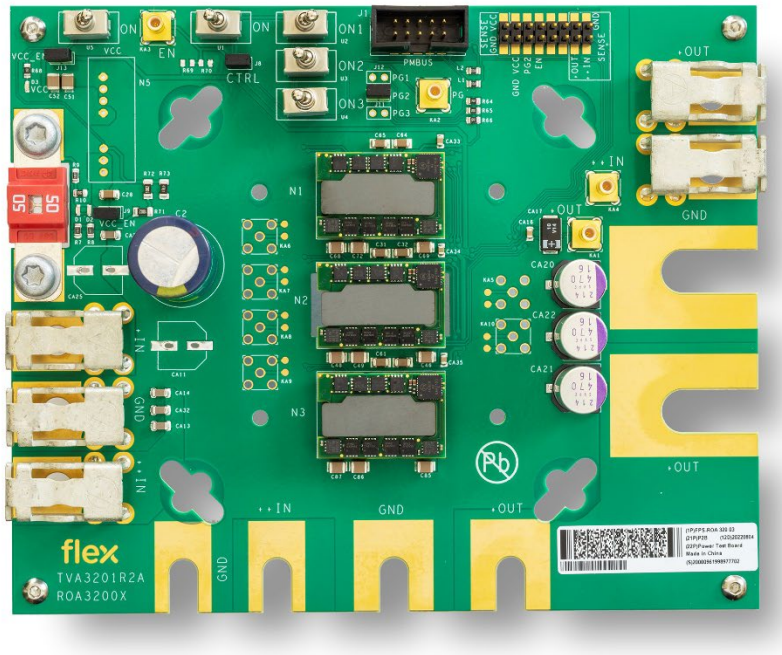


Figure 7: ROA32003

Powering up and down sequenses for parallel working modules similar as one module.
Enable switch 2 is used for all three modules. By using **Module Enable selector switches 3** it`s possible to select which modules operating in parallel (Figure 8).

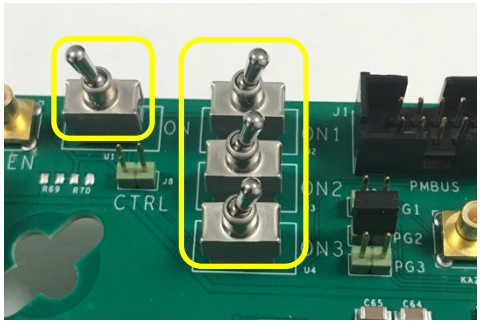


Figure 8

PGOOD signal for each module (PG1, PG2, PG3) is possible to measure by selecting **PGOOD jumper 19** (Figure 9).

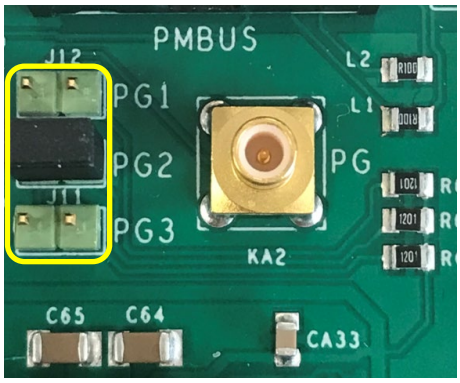


Figure 9

8 Order information

Description	Part number
BMR320 Evaluation Board with 1 BMR3201000/001 module	ROA32001
BMR320 Evaluation Board with 3 BMR3201000/001 modules	ROA32003
BMR323 Evaluation Board with 1 BMR3231000/001 module	ROA32301
BMR323 Evaluation Board with 3 BMR3231000/001 modules	ROA32303