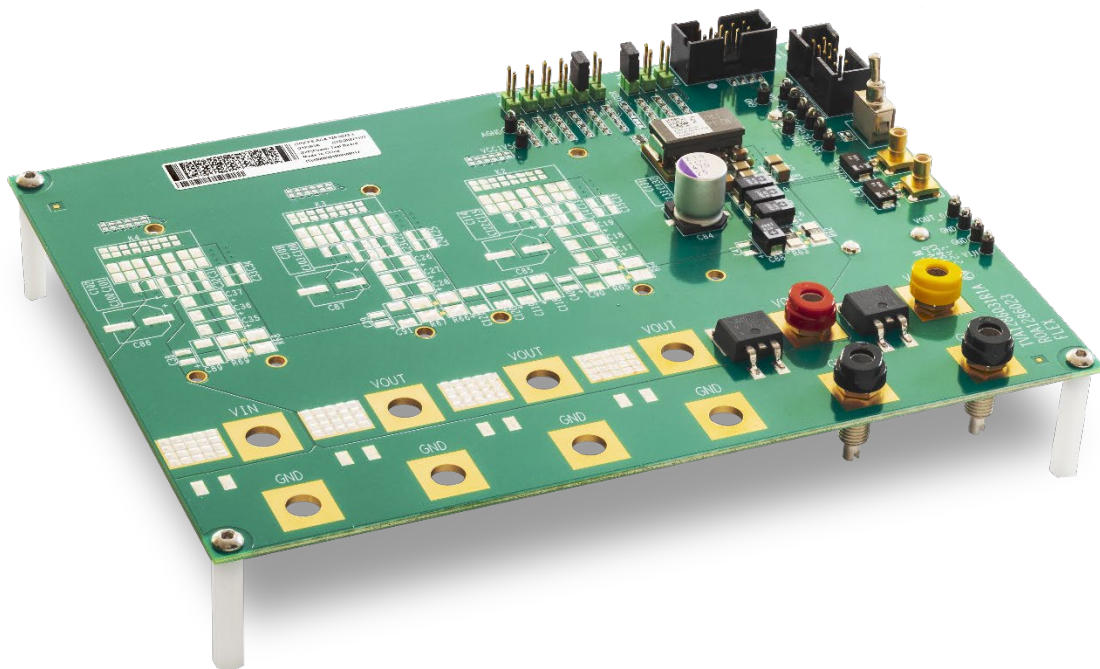


Evaluation board for digital PoL

USER GUIDE for BMR4731001/001

ROA 1286023



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1 Introduction

This User Guide provides a brief introduction and instruction on how to use the Reference Board ROA1286023 together with **BMR4731001/001** modules.

1.1 How to contact Flex

For general questions or interest in our products, please visit our website or contact your local sales representative.

Flexpowermodules.com

1.2 Prerequisites

In order to operate the ROA1286023 board, the following is needed:

- Power supply 6-15 V
- USB-PMBus adapter Flex FAB8020785. It is only needed when the PMBus shall be used.
- Up to 4 pcs BMR 4731001/001 modules, the modules are mounted onto the board at delivery.
- The '[Flex Power Designer](#)' software package and a compatible Windows PC.

Evaluation board part number	General Info
ROA1286023/1	1 x BMR4731001/001
ROA1286023/4	4 x BMR4731001/001 in parallel

2

Evaluation board ROA 1286023

In Figure 1a and 1b the top and bottom sides of the ROA 1286023 are shown.

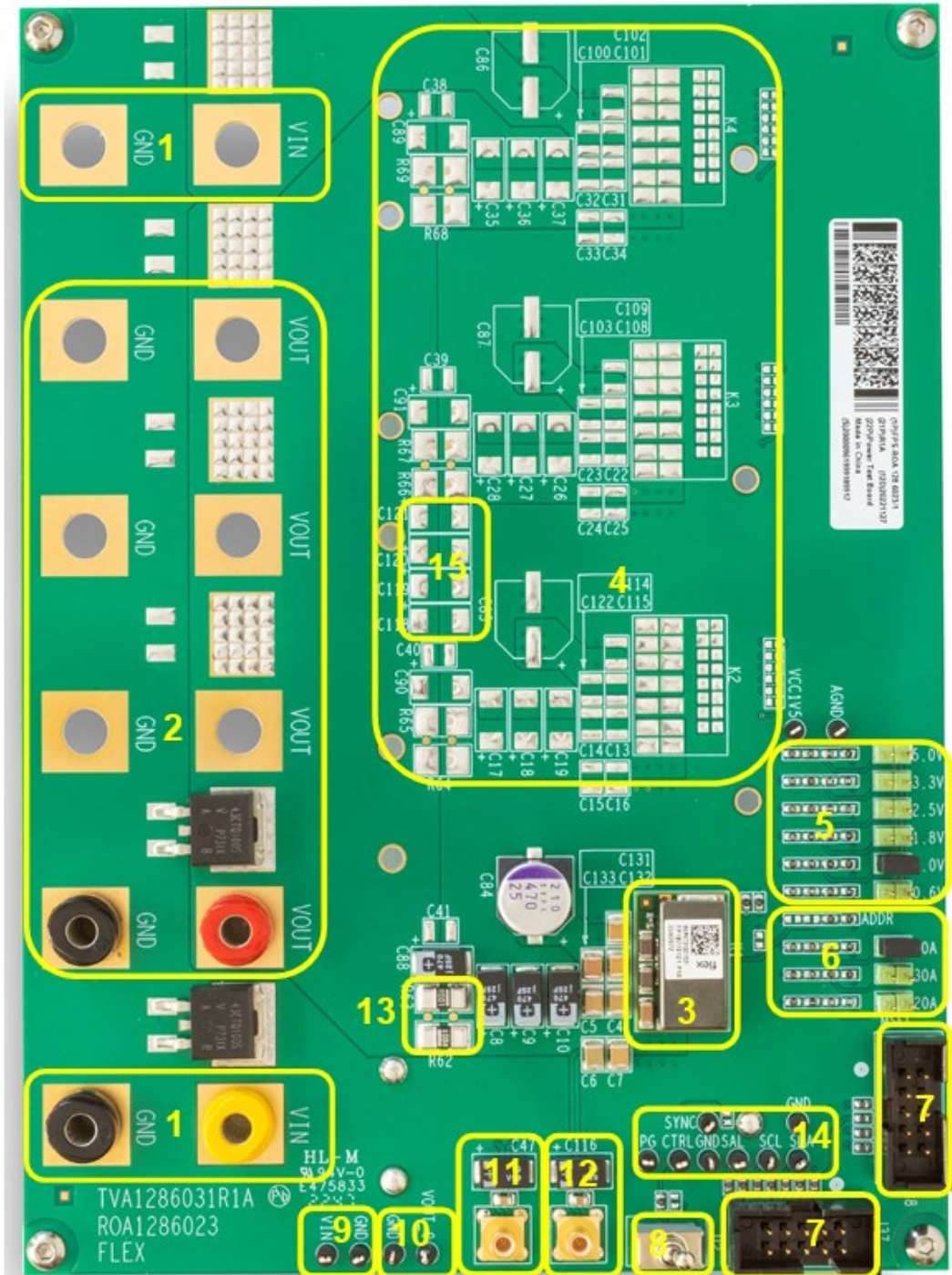


Figure 1A: ROA 1286023 (top side)

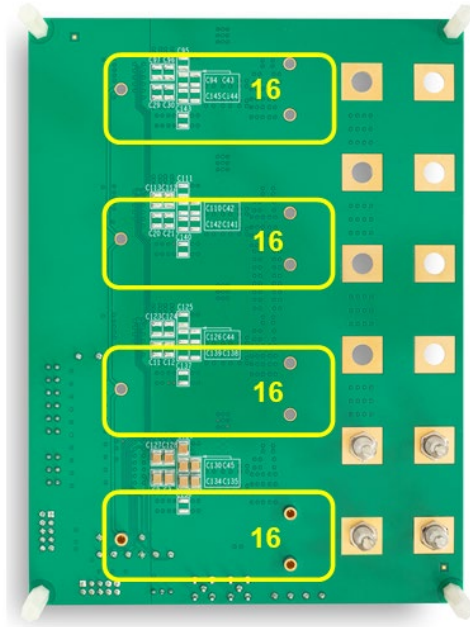


Figure 1b ROA 1286023 (bottom side)

Position Description (Top Side)

- 1 Input voltage connectors
- 2 Output voltage connectors
- 3 BMR4731001/001 module
- 4 Positions reserved for parallel modules
- 5 Pin-strap resistors for VSET
- 6 Pin-strap resistors for ADDR and MSEL
- 7 Connectors for the PMBus-to-USB adaptor
- 8 Remote Control switch
- 9 Test points for Vin voltage
- 10 Test point for Vout voltage
- 11 SMB Oscilloscope connectors for Vin
- 12 SMB Oscilloscope connectors for Vout
- 13 Current sense resistors for phase current measure
- 14 Test points for digital signals
- 15 Positions for additional output capacitance

Position Description (Bottom Side)

- 16 Positions for populating Flex electronic load, ROA128552

3 Power-up and Power-down Instructions

3.1 Power-up instruction

- Make sure Remote Control switch is at OFF position
- Make sure VSET jumper is populated at position 5
- Apply $V_{in} = 6-15V$ through connectors at position 1
- Set Remote Control switch to ON position

3.2 Power-down instruction

- Set Remote Control switch to OFF position
- Turn off V_{in}

4 Pin-strap resistors

4.1 Adjustment of PMBus address

The pre-defined PMBus address is 0x14 (20d). The address could be adjusted by changing the resistors at position 6, shown in Figure 2.



Figure 2. Resistors for PMBus address

Left two resistors connected in series equals to the top resistor R_{top} , and the right two resistors connected in series equals to the bottom resistor R_{bot} , as illustrated in Figure 3.

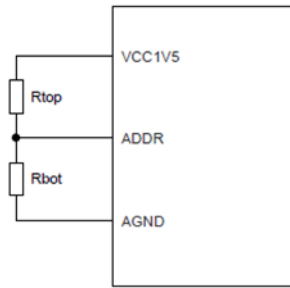


Figure 3. Pin-strap resistors for ADDR

4.2 Adjustment of output voltage

The pre-defined output voltage is 1.0V. Output voltage could be adjusted to other options (0.6V, 1.8V, 2.5V, 3.3V, 5.0V) via the VSET jumper at position 5.

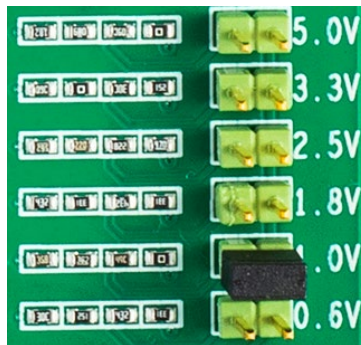


Figure 4. Resistors and jumper for VSET

For other output voltage setting via pin-strap, the resistors could be changed.

Left two resistors connected in series equals to the top resistor R_{top} , and the right two resistors connected in series equals the bottom resistor R_{bot} , as illustrated in Figure 5.

4.3 Adjustment of output current

The pre-defined output current/current limit is 40/52A. The current could be adjusted to other options (30/39A, 20/26A) via the MSEL jumper at position 6.

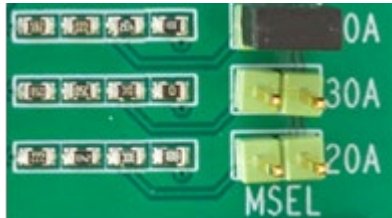


Figure 6. Resistors and jumper for MSEL

5 Test Points

5.1 VIN/VOUT test points

Input voltage could be measured at test points at position 9, which are connected directly to the VIN/GND pins of the module at the test board.

Output voltage could be measured at test points at position 10, which are directly connected to VOUT/GND pins of the module at the test board.

5.2 Vin/Vout ripple voltage test points

Input ripple voltage could be measured at test point at position 11, which is connected to input ceramic capacitor close to module.

Output ripple voltage could be measured at test point at position 12, which is connected to output ceramic capacitor close to module.

5.3 Phase current test points

When operated in parallel, output current of each phase could be measured by measuring the voltage drop on the current sense resistors, at

position 13. The equivalent current sense resistance for each phase is 0.5mohm, 20mV voltage drop means 40A current.

Phase	Current sense resistors
PHASE1	R62, R63
PHASE2	R64, R65
PHASE3	R66, R67
PHASE4	R68, R69

Table 1: Current sense resistors of each paralleling phase

5.4 Digital signals test points

Test points for digital signals could be found at position 14, including Remote Control (CTRL), Power Good (PG), SYNC, SDA, SCL and SALERT (SAL).

6 Additional output capacitance

If additional output capacitance is desired, the possibility exists to mount extra capacitors at position 15.

7 Electronic loads

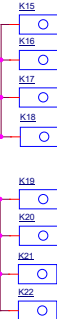
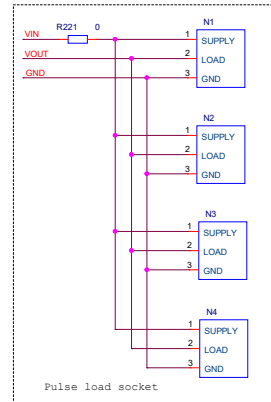
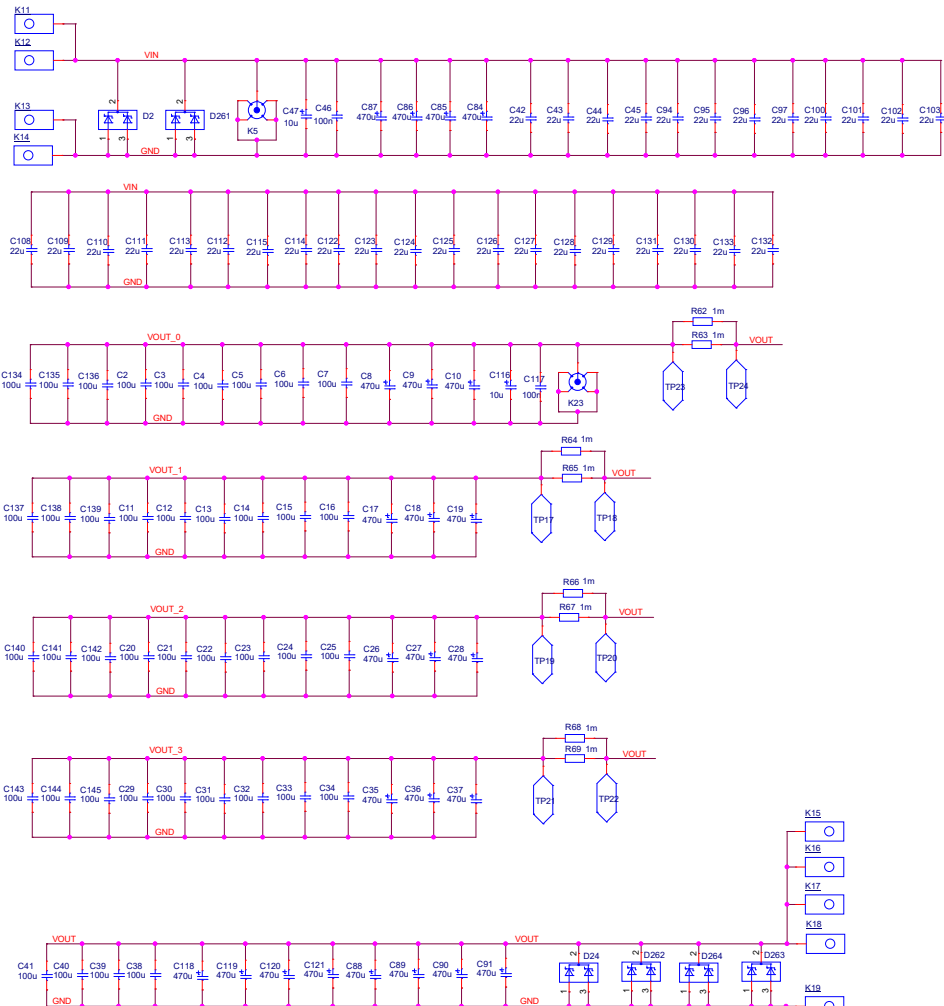
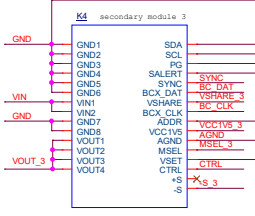
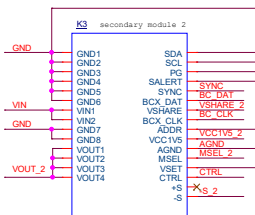
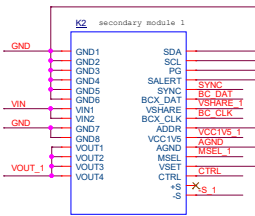
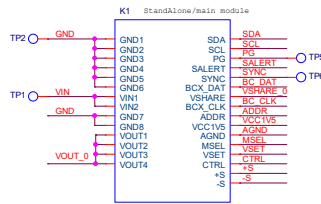
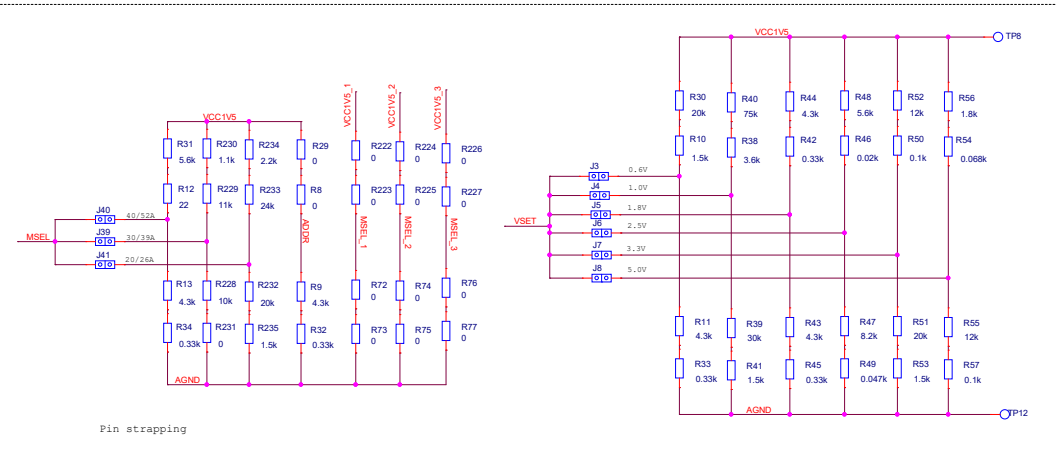
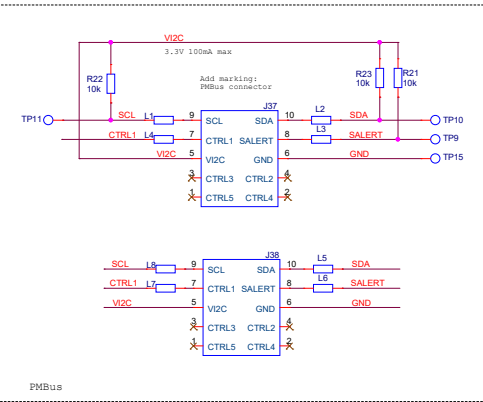
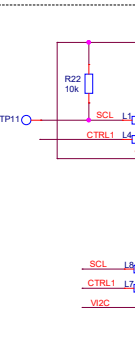
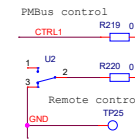
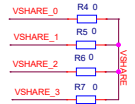
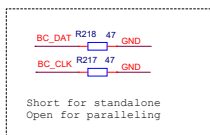
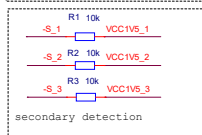
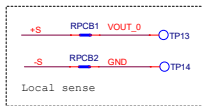
In order to perform load transient tests on the modules, up to 4 pcs of PuLS loads can be connected to the output of the board, see position 16.

The PuLS loads (ROA1285552) can be programmed for different transient loads and waveforms, see the technical specification for further information. They do not need to be soldered, the board is prepared for the use of sockets so the loads easily can be mounted.

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Schematics

See schematic of evaluation board ROA1286023 on next page for more information



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