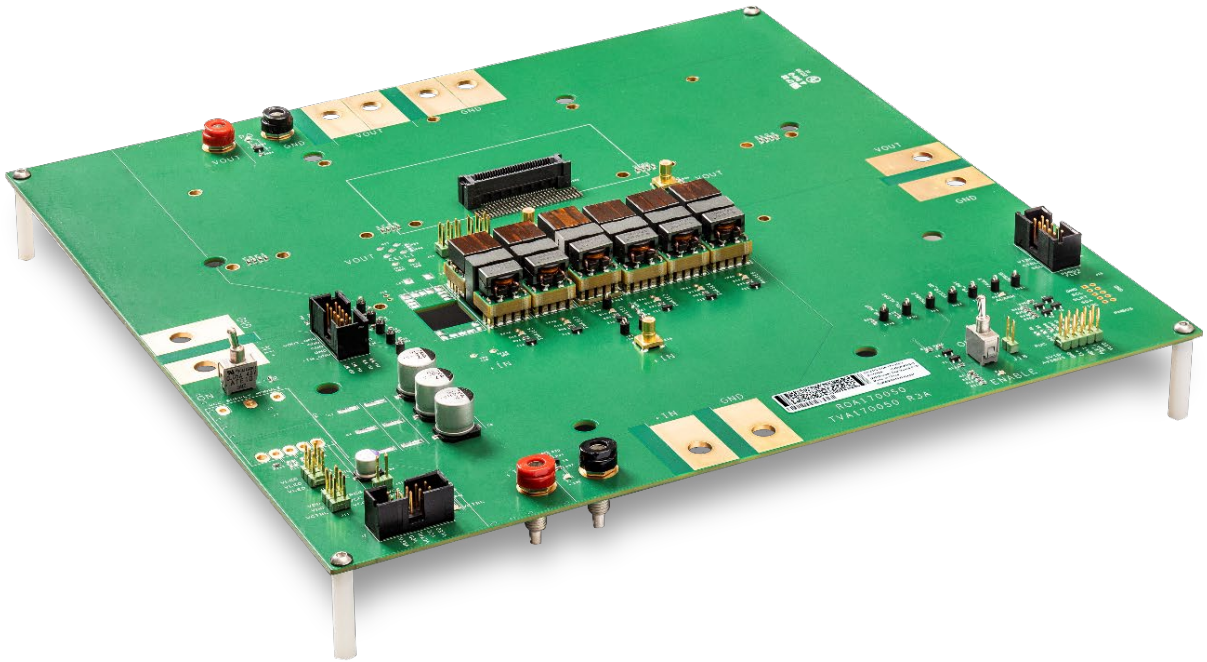
Evaluation board BMR482

ROA 170 014

USER GUIDE for BMR482



Contents

1 Introduction

This User Guide provides a brief introduction and instruction on how to use the Reference Board ROA 170 050 together with BMR 482 MAIN and SATELLITE modules of revision P1B.

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

In order to operate ROA 170 050 board, the following is needed:

- Power supply 40-60 V.
- Power supply 5 V.
- BMR 482 MAIN and SATELLITE modules. The modules are soldered onto the board at delivery.
- The MAIN module is preconfigured for the number of SATELLITEs populated.

2 Reference Board ROA 170 014

In Figure 1a and 1b the top and bottom side of the ROA 170 050 is shown.

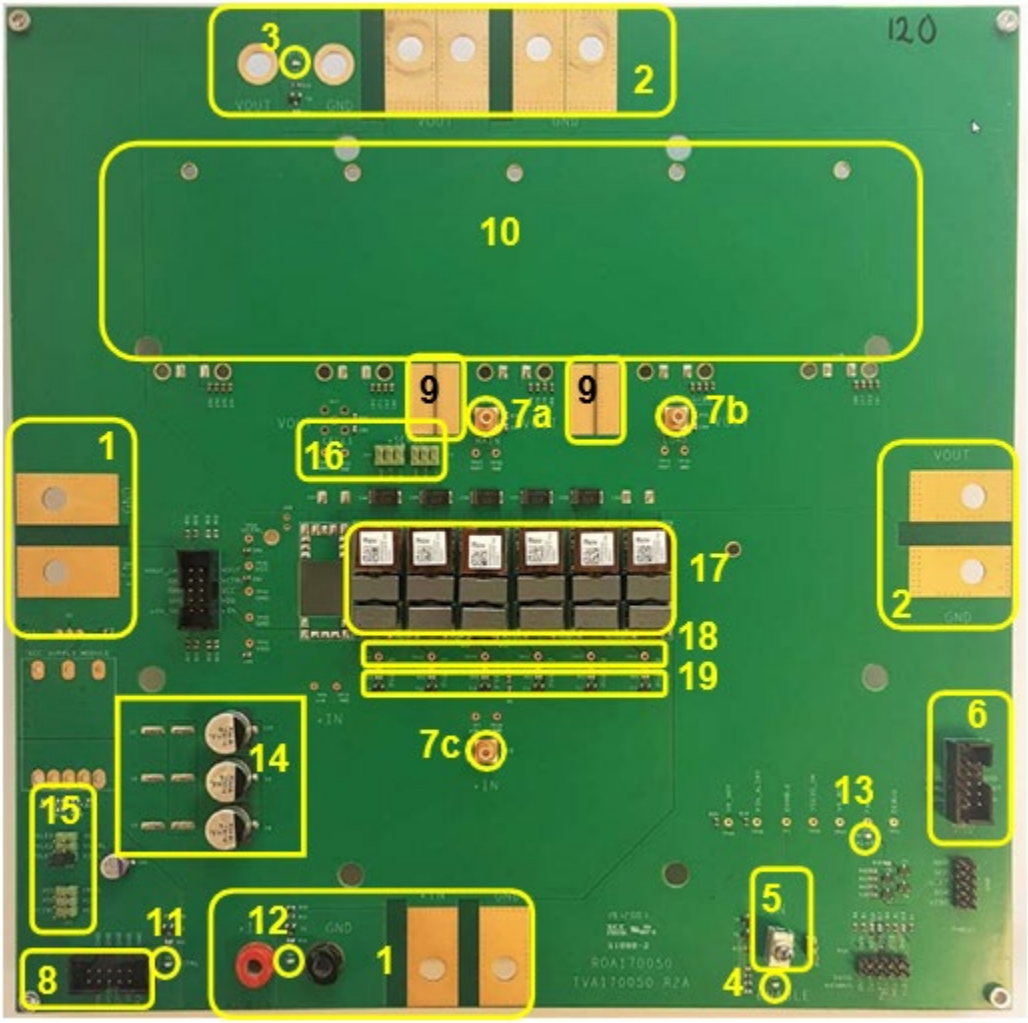


Figure 1a. ROA 170 050 (top side).

Position Description (Top Side)

1	Input voltage connectors.
2	Output voltage connectors.
3	Power Good LED.
4	Enable switch on LED.
5	ENABLE switch.
6	Connector for the PMBus-to-USB adaptor (KEP 910 17).
7	SMB Oscilloscope connectors for Vin and Vout, See Sec 7.
8	Connector for driver, controller and auxiliary supplies.
9	Space for additional output capacitors.
10	Positions for populating Flex electronic load, PuLS.
11	VCTRL power on LED.
12	Vin power on LED.
13	Fault detected and SALERT LED.
14	Space for additional input capacitors.
15	Supply option jumpers.
16	Sense location jumpers.
17	MAIN and SATELLITE modules.
18	PWM probing points.
19	Phase Active LEDs. See Sec 6.

Position Description (Bottom Side)

20	PMBus address resistor and resistors for termination of current sense. See sections 5 & 9 for details.

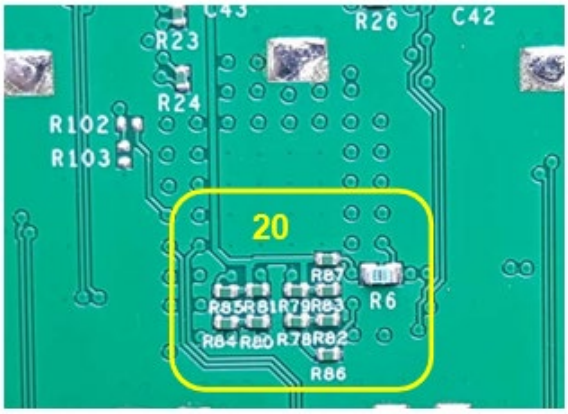
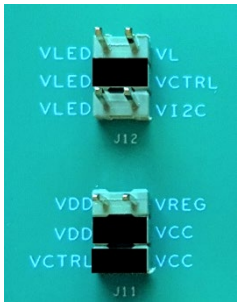


Figure 1b: bottom side

3 Power-up and Power-down Instructions

3.1 Power-up instruction

- **Make sure Enable switch is in OFF position**
- Make sure jumpers are populated in J11 and J12 (position 15) to
  1. connect VDD and VCC
  2. connect VCTRL and VCC
  3. connect VLED and VCTRL



- Apply VCTRL = 5 V through connector J2 (position 8). The VCTRL voltage LED should give green light. This will now supply primary and secondary control of MAIN and SATELLITES, as well as controller and LEDs.
- Apply Vin = 40-60V through connectors (position 1). The input voltage LED should give green light.
- Set Enable switch in ON position. The power good LED should now give green light, as well as the Phase Active LED for the MAIN.
- When measuring Vout, set sense location jumpers in position according to the Vout measurement points used (see section 7).

3.2 Power-down instruction

- **Set Enable switch in OFF position**
- Turn off Vin
- Turn off VCTRL

4 Board Supplies

Above input voltage VIN, supplies according to the Table 1 are used at the test board. By jumper connectors J11 and J12 (position 15 in Figure 1a) the supplies can be interconnected.

Supply	Description	May be jumped to	Supply connector
VCC	Secondary side control supply for MAIN and SATELLITEs	VDD[1], VCTRL	J2 (position 8)
VDD	Primary side control supply for MAIN and SATELLITEs	VCC[1]	
VCTRL	Supply for controller in MAIN	VCC[1]	
VLED	Supply of LEDs on test board	VCTRL[1]	
VL	Optional supply for electronic loads	VLED	
VI2C	Supply (3.3V) provided by PMBus-to-USB adaptor	VLED	J1 (position 6)

Table 1 Summary of supplies.

Note: If PMBus-to-USB adaptor (KEP 910 17) is connected to J1, VLED must not be jumped to VI2C and VCTRL at the same time (because then VCTRL will connect with VI2C supplied from adaptor).

5 Address Resistor

5.1 Adjustment of address resistor

To change the address, change the resistor on bottom side of board as shown in Figure 2.

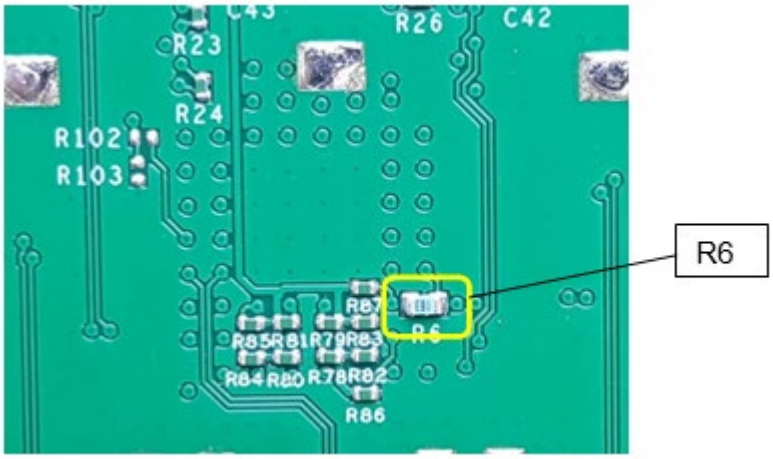


Figure 2 Address resistor position, R6, is shown in the picture.

Change resistors R6 (SA) to achieve the desired PMBus address for the MAIN module.

6 Phase Active LEDs

These LEDs (position 19) indicate the number of phases currently being used. Each LED will light up when the corresponding MAIN or SATELLITE is switching, i.e. when there is an active PWM signal.

MAIN = Phase 1. SATELLITEs = Phase 2-6.

7 Test Points and Sense Locations

7.1 VIN/VOUT test points

Input voltage should be measured at test points TP7/TP29/K15 (position 7c) which are connected directly to the VIN/GND pins of MAIN module (PHASE 1) atthe Test board.

Output voltage can be measured at test points TP27/TP28/K16 (position 7a) which are directly connected to VOUT/GND pins of MAIN module (PHASE 1) atthe Test board. Alternative test points are TP15/TP16/K14 (position 7b), connected to VOUT/GND pins of center positioned electronic load (position 10).

7.2 Sense location jumpers

Sense location jumpers in J13/J14 (position 16) must be correctly placed according to VOUT test points used:

- Use positions "MAIN" when measuring VOUT at TP27/TP28/K16.
- Use positions "LOAD" when measuring VOUT at TP15/TP16/K14.

If no jumpers are populated, internal sense resistors in MAIN module will be used.

7.3 PWM test points

PWM test points in position 18 can be used to probe a PWM signal to each MAIN or SATELLITE module, to see if it is currently switching or not.

8 Additional Output Capacitance

If additional output capacitance is desired, the possibility exists to mount extra electrolytic and/or ceramic capacitors, see Figure 3.

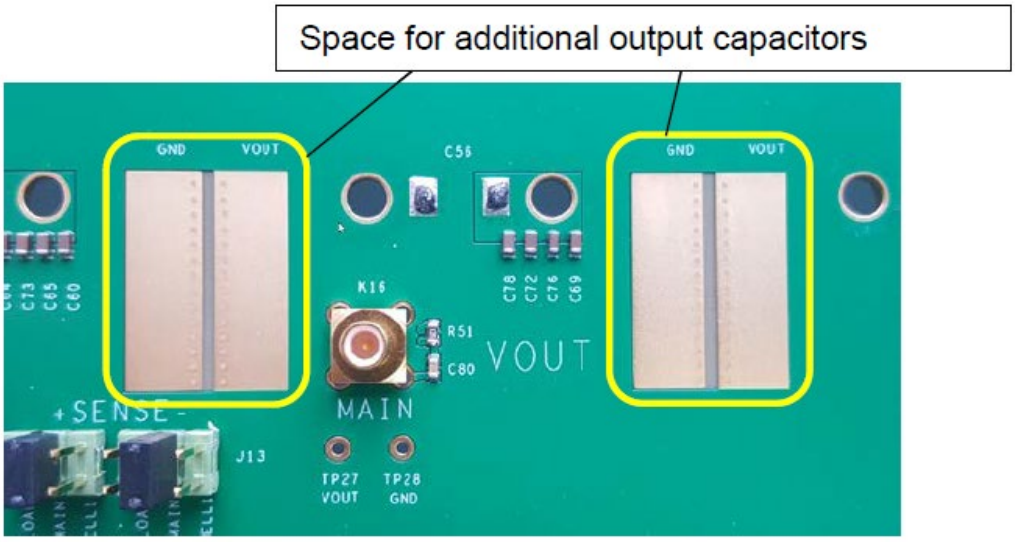


Figure 3 Space for additional output capacitors.

9 Current Sense termination

R78 - R87 (position 20) are used to terminate the current sense wire when SATELLITEs are not mounted. Which resistors to mount or un-mount is described in Table 2.

SATELLITE not mounted	Resistors to mount
PHASE2	R78, R79
PHASE3	R80, R81
PHASE4	R82, R83
PHASE5	R84, R85
PHASE6	R86, R87

Table 2 Mounting table of current sense termination resistors, R78 - R87.

10 Electronic loads

In order to perform load transient tests on the modules, up to 5 pcs of PuLS loads can be connected to the output of the board, see position 10 in Fig 1a.

The PuLS loads (ROA 128 5552/1) 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.