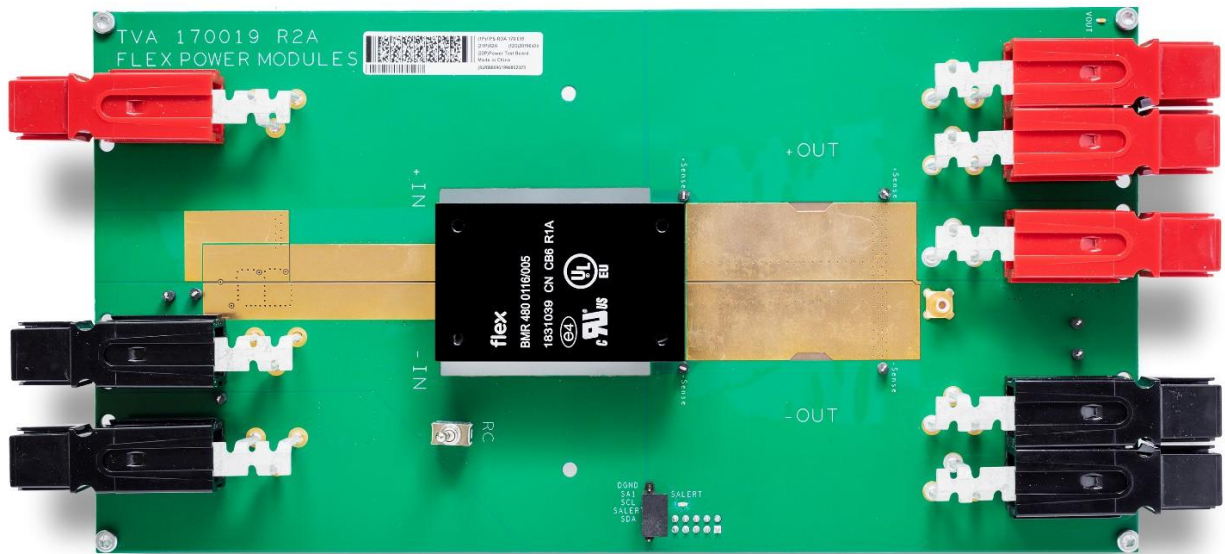


Evaluation Board User Guide

ROA 170 019

USER GUIDE for Digital High-Power IBC Eval Board



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1 Introduction

This User Guide provides a brief introduction and instruction on how to use the Reference Board ROA 170 019 together with BMR480, BMR490, BMR491, BMR492, BMR350, BMR351 or BMR352 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

In order to operate the ROA 170 019 board the following is needed:

- Power supply 40-60 V
- Electronic load
- BMR480, BMR490, BMR491, BMR492, BMR350, BMR351 or BMR352 modules
- PMBus-to-USB adapter KEP 910 17
- The "Flex Power Designer" software package and a compatible Windows PC. Users must be familiar with the Windows® operating system
- Flex RDTool (optional)

2

Reference Board ROA 170 019

In Figure 1 and 2 the top and bottom side of the ROA 170 019 is shown.

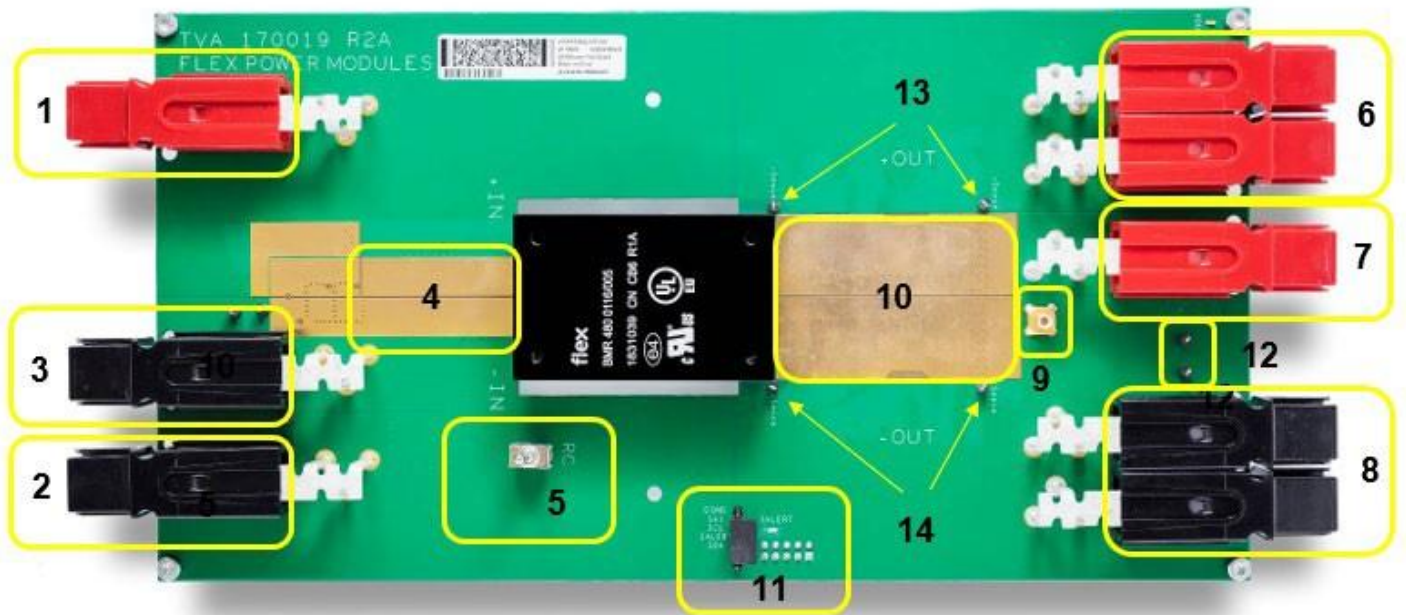


Figure 1. ROA 170 019 (top side)

Position Description (Top Side)

1. Positive input voltage connector.
2. Negative input voltage connector "K2"
3. Negative input voltage connector
4. Pads for input capacitors.
5. RC switch
6. Positive output voltage connectors.
7. Positive output voltage connector "K102"
8. Negative output voltage connectors
9. SMB Oscilloscope connector for output voltage monitoring
10. Pads for output capacitors
11. PMBus header, connector located on the bottom side
12. Connectors for external voltage supply
13. Positive output sense test points
14. Negative output sense test points

Position Description of PMBus header (bottom side)

1. DATA 5
2. DATA 4
3. DATA 3
4. DATA 2
5. VCC
6. GND
7. CTRL / DATA 1
8. SALERT
9. SCL
10. SDA



Figure 2. ROA 170 019 PMBus header (bottom side)

3 USB to PMBus adapter

In order to communicate with the module on the board the USB to PMBus adapter USB-TO-GPIO2 (<https://www.ti.com/tool/USB-TO-GPIO2>) shall be connected to the board and the PC. The connector is found on the bottom side of the board.

Note: The digital header of the module must be soldered on to the board.

4 Input

4.1 Input capacitors

The board has pads which makes it possible to solder capacitors to the input. There are also pads on the bottom side of the board.

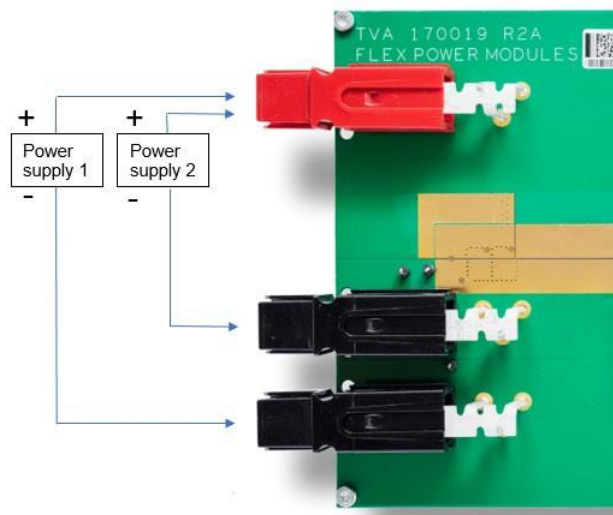
4.2 RC Control

The module can be turned on and off by the RC switch.

4.3 Input voltage transients

Input voltage transients can be applied by connecting two power supplies to the board. Use the Positive input connector as a common input for the positive rails of the power supplies and connect each negative rail to the Negative input connector and the Negative input connector "K2" respectively.

By setting different voltage levels it is possible to switch between levels and creating a voltage transient. The power supply connected to the Negative input connector "K2", in this case Power supply 1 shall be set to the lower voltage level.



Picture 3: Connection of power supplies for input voltage transient testing

5 Output

5.1 Output capacitors

The board has pads which makes it possible to solder capacitors to the output. There are also pads on the bottom side of the board.

5.2 SMB Connector

The output has a SMB Oscilloscope connector which makes it possible to monitor the output voltage with an oscilloscope.

5.3 Shorting the output

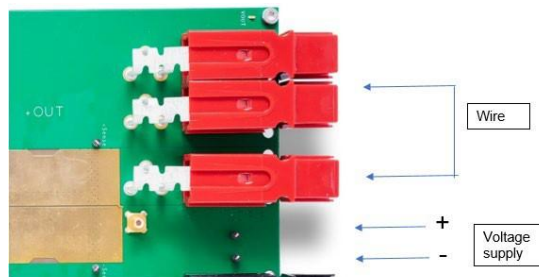
It is possible to create a short cut of the output either by connecting a signal generator or a voltage source to pin 4 on the digital header, or by sending a command via PMBus.

Connect a voltage source of 8 – 10 V to the Connectors for external voltage supply. Also connect a wire between one of the Positive output voltage connectors and the Positive output voltage connector "K102", see picture. In this way the short circuit current can be measured with a current probe.

Note: The output is not yet shorted in this situation.

The shortcut can be initiated in two ways:

1. Connect a signal generator or a voltage source with 3 – 5 V between pin 4 and GND (pin 6) on the digital header.
2. Send the command `"/CONTROL /ON=2"` with the RDTool. To stop the short circuit the command `"/CONTROL /OFF"` has to be sent.



6 PCB stack-up summary

The PCB consists of 8 layers of 0.105 mm / 3 Oz. copper thickness. The dielectric thickness is 0.127 mm and the total board thickness without mask is 1.729 ± 0.2 mm.

Board dimension is 130 x 250 mm.

7 Revision

Revision	Revision information	Date	Responsible
A	New document	2019-07-10	MW
B	Updated in new format and added BMR491 and BMR492	2021-10-20	TW
C	Add BMR350, BMR351 and BMR352	2025-2-5	MW
D	Figure reference corrections & PMBus adapter reference	2025-2-12	PG