# flex. Power Modules

# Evaluation board for BMR511

USER GUIDE for BMR511

ROA 170347
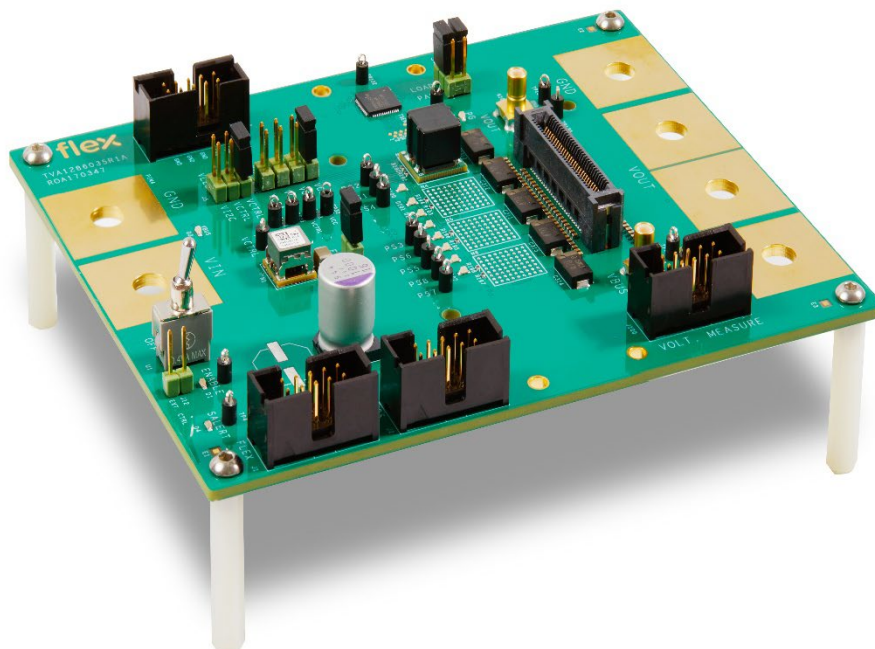
# Contents

# 1 Introduction

This User Guide provides a brief introduction and instruction on how to use the 2-phase VRM Integrated Power Stage Module test board ROA170347.

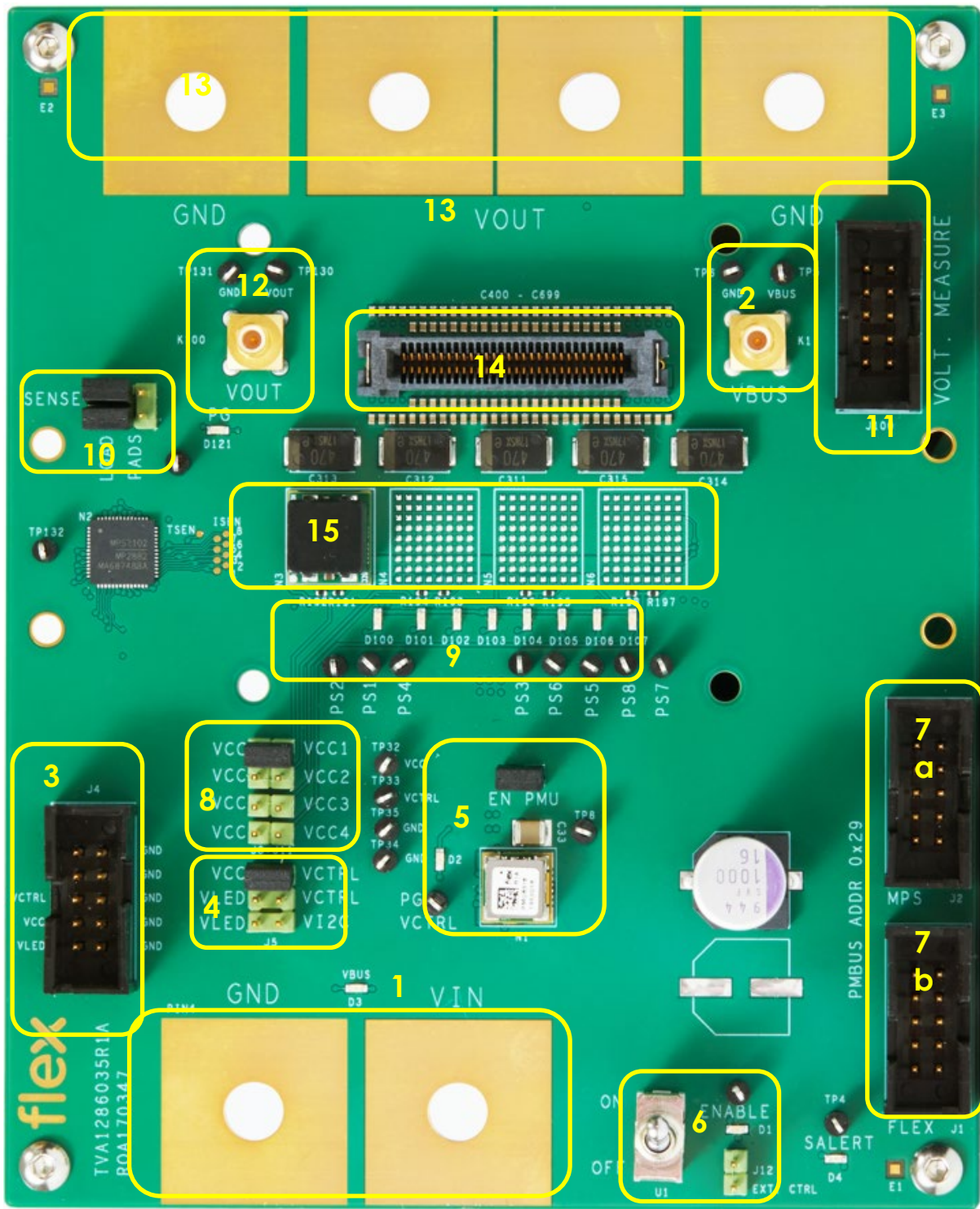## 1.1 How to contact Flex Power Modules

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## 1.2 Prerequisites

In order to operate the ROA170347 board, the following is needed:

- Power supply 5-16 V.

- MPS PMBus adaptor and GUI compatible with controller MP2882R1.

## 2 Position overview

### Positions

1    Input voltage connectors.
2    Input voltage measurement connector.
3    Connector for external +3.3V supplies (VCC, VCTRL, VLED) if on board supply (PMU module) is not used.
4    Jumpers to bridge VCC, VCTRL and VLED together.
5    PMU module circuitry for on board +3.3V supply.
6    Output voltage enable circuitry.
7    PMBus connectors.
8    VRM modules VCC supply jumpers.
9    VRM modules PWM signals test points and phase active LEDs.
10   VRM modules sense position selection jumpers.
11   VRM modules voltage connector for efficiency measurements. Points of measurement are the pads of VRM modules.
12   VRM modules output voltage measurement connector. Points of measurement are at the Loadslammer socket.
13   VRM modules output voltage connectors.
14   Loadslammer socket for VRM rail.
15   VRM modules 1-4 (from left to right).

## 3      Power-up instructions

For power up, follow the instructions below.

- Remove the external enable control jumper J12 (position 6).

- Populate the PMU enable jumper J30 ("EN PMU") (position 5). This enables the PMU module to supply VCTRL and VCC from the input voltage.

- Bridge VCTRL, VCC and VLED together by jumpers in J5 (position 4).
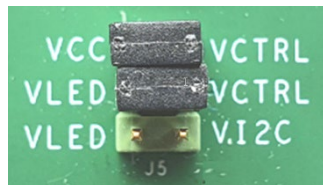


- Make sure the VCC supply jumper (J8-J11, position 8) is populated for each VRM module (1 to 4, from left to right) that shall be operated:
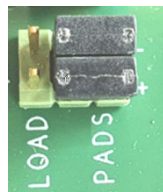
- Use the VRM modules sense position selection jumpers (position 10) to make the choice of sense point:

  Sense at Loadslammer connector (LOAD). For load transient and output ripple Vout measurements using connectors at position 12:
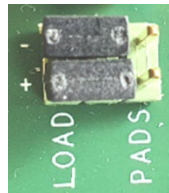
  

  Sense at module pads (PADS). For efficiency Vout measurements using the connector at position 11:

  

- Set the enable switch (position 6) in OFF position.

- Apply Vin = 12V through connectors (position 1).

- Connect an MPS adaptor to PMBus connector J2 (position 7a). The MP2882 controller should now be detected at address 0x29 when making a scan in the MPS GUI.

- Enable the output voltage by setting the enable switch (position 6) in ON position. Depending on controller configuration the power good LEDs will give green light.

# 4 Board supplies

| Supply | Description |
|--------|-------------|
| VIN | Input supply to the VRM modules and the PMU POL module. Supplied by the connectors (position 1). |
| VCC | Driver supply for VRM modules. Supplied by jumper to VCTRL (position 4) or connector (position 3). |
| VCTRL | Supply for controller. Supplied by PMU module or connector (position 3). |
| VLED | Supply for all LEDs on the test board. Supplied by jumper to VCTRL (position 4), jumper to VI2C (position 4) or connector (position 3). |
| VI2C | Supply (3.3V) provided by Flex PMBus adaptor connector (position 7b). |

# 5 VRM efficiency measurement

In order to measure the efficiency of the VRM modules alone, the following setup should be made:

- Disable the PMU module by removing jumper J30 (position 5).

- Disable the VRM modules not to be measured by removing the corresponding VCC supply jumpers (position 8):

- Set the sense position jumpers (position 10) to the "PADS" position, which sets the sense point at the pads of module 1.
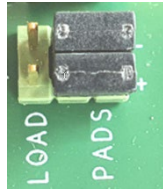


- Separate VCC, VCTRL and VLED supplies by removing all jumpers in J5 (position 4).

- Supply the VRM modules (VIN, VCC=+3.3V) and the VRM controllers (VCTRL=+3.3V) by external supplies through the connectors (position 1, 3).

- Measure the input voltages (VIN, VCC) and the output voltage of the VRM module using the connector J100 (position 11) in order to measure at the pads of the module. The input and output currents must be measured by external equipment.

# 6     Phase active LEDs

These LEDs (position 9) indicate the VRM phases currently switching. Each LED will light up when the corresponding PWM signal is active.

# 7        Contact and follow us

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