

User Guide

# Digital DC-DC Evaluation Board



### Introduction

Users can easily connect the input source and loads to evaluate and configure Murata Power Solution Digital DC-DC quarter-brick or eighth-brick modules for the system's electrical performance that takes after their target application (figure 1). Together with the GUI software, the evaluation board, and USB to PMBus interface makes it possible to access each module from a PC. During initialization, the software scans the PMBus to read which modules are present and list them in its top panel, together with their addresses and major set-up parameters. The evaluation board monitors up to two devices.

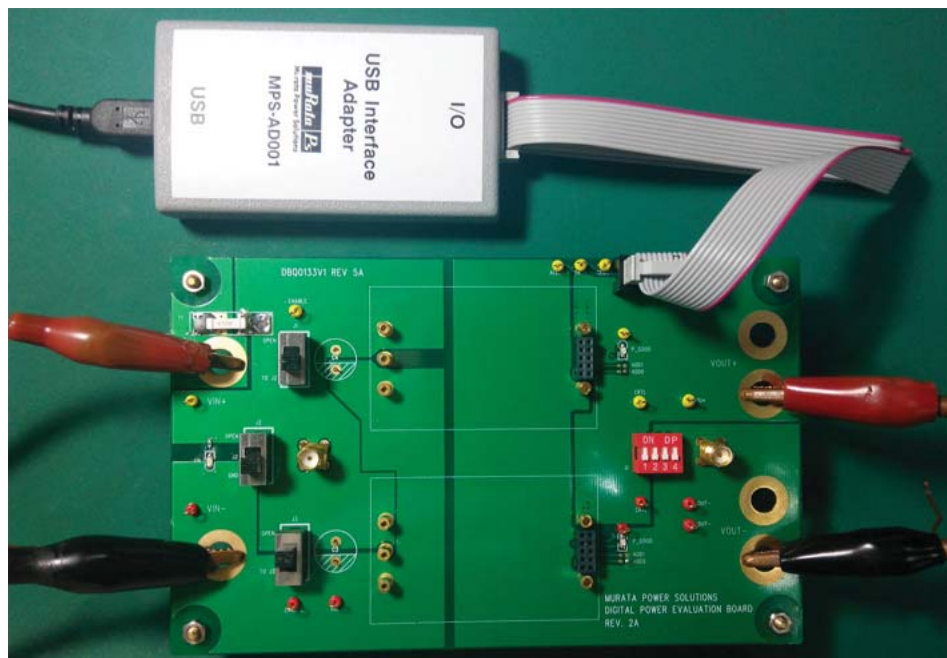


Figure 1. Typical Setup

### Equipment Required

- Digital power evaluation board (see figure 1).
- 0 - 130 volts, DC @ 0-20 Ampere power supply, the input source should be sized for the maximum power required by the converter(s).
- 2 or 4 channel, 100MHz oscilloscope (monitor Vin, Vout) optional.
- 4 ½ digit multimeters (monitor Vin, Vout, Iout) optional.
- Electronic load or resistive load; the load should be sized for the maximum power produced by the converter(s)
- Current shunt (100A, 100mV) for output current test, current shunt (20A, 50mV) for input current test Optional .
- MPS-AD001 USB Interface Adapter
- MPS Power Brick GUI 1.0 software.
- Digital DC-DC quarter-brick or eighth-brick modules

## Board Description and Key Connections

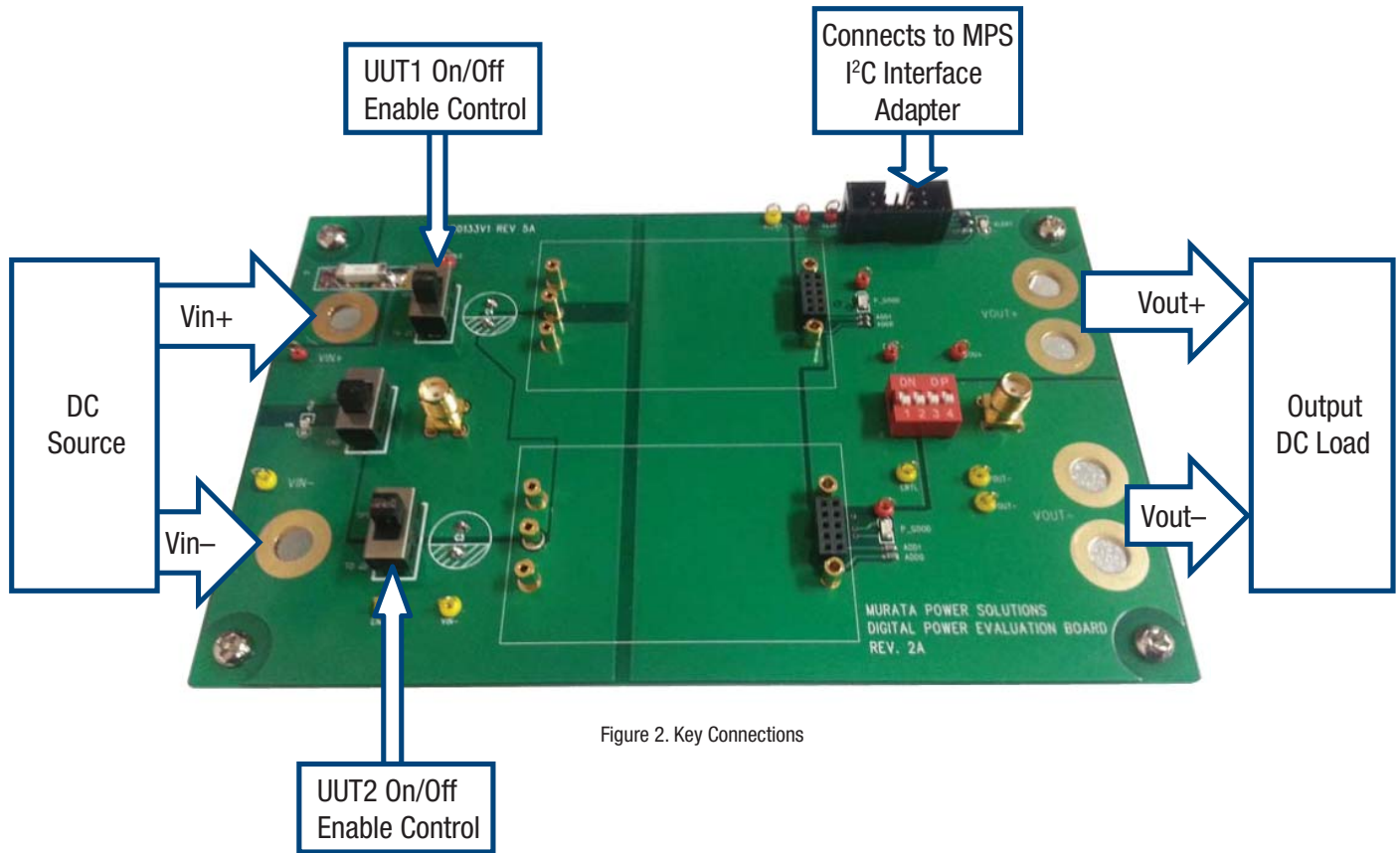


Figure 2. Key Connections

## Setting Up a Digital Power Evaluation Board

- Connect a wire from the negative (-) terminal of input source to Vin- of the evaluation board.
- Connect a wire from the positive (+) terminal of input source to Vin+ of the evaluation board.
- Connect a wire from the negative (-) terminal of electronic load (or the other terminal of a resistive load) to Vout- of the evaluation board.
- Connect a wire from the positive (+) terminal of electronic load (or the other terminal of a resistive load) to Vout+ of the evaluation board.
- Connect the I2C USB adapter to the evaluation board as shown in figure 1.

### Other Board Features

| 1: Primary On/Off Control (see figure 3) |  |
|--|--|
| J2                                       | This switch can disable/Enable the UUT1 and UUT2 (J1 and J3 are closed). |
| J1                                       | This switch can disable/Enable the UUT1 (J2 is closed).                  |
| J3                                       | This switch can disable/Enable the UUT2 (J2 is closed).                  |

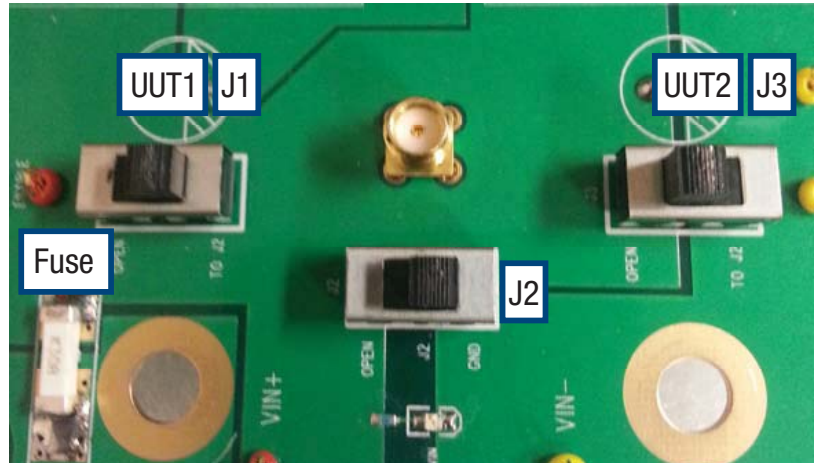


Figure 3. J1, J2, J3 Switches

| 2: Secondary On/Off Control (see figure 4) |   |
|--|---|
| S1-1                                       | This switch can disable/Enable the UUT1 and UUT2 per Secondary On/Off control pin (S1-2 or S1-3 is closed). |
| S1-2                                       | This switch can disable/Enable the UUT2 (S1-1, J1, J2 and J3 is opened).                                    |
| S1-3                                       | This switch can disable/Enable the UUT1 (S1-1, J1, J2 and J3 is opened).                                    |
| S1-4                                       | None  |



Figure 4. S1 Switch

### Power-Up Instructions for Digital DC-DC Quarter-Brick or Eighth-Brick Modules

1. Mount the model(s) into evaluation board and then check the Vin source and load are connect well.
2. For negative logic models, make sure enable switches are in the On position and for positive logic models, make sure enable switches are the Off position.  
**Note:** In parallel model (2 units are mounted on the evaluation board), please make sure the J1, J3 are closed and the J2 is opened and also the Secondary On/Off control switch are need to turned Off before turn on the input source.
3. Turn on the input source (36-75V supply).
4. Turn enable switch J1 or J3 (J2 is closed) for device you wish to monitor or configure.  
**Note:** In parallel model (2 units are mounted on the evaluation board), turn on the J2 (J1 and J3 are closed) to enable the UUT and UUT2.
5. Connect the USB Interface Adapter to evaluation board.
6. Start MPS Power Brick GUI Software.

### Power-Down Instructions Digital DC-DC Quarter-Brick or Eighth-Brick Modules

1. Turn off the input source.
2. Stop the MPS Power Brick GUI Software.
3. Remove the unit(s) from the evaluation board.

### Positioning of the Address Resistors

The table below displays the recommended resistor values to assign to the module address. See DBQ or DBE series data sheet for more details. If the calculated PMBus address is 0d, 11d, or 12d, SA0 or SA1 is left open; default PMBus address of 120d is assigned instead. The SA0 and SA1 value VS resistor connected to GND.

| (SA0, SA1 index) | Resistor Value [kΩ] |
|------------------|---------------------|
| 0                | 10                  |
| 1                | 22                  |
| 2                | 33                  |
| 3                | 47                  |
| 4                | 68                  |
| 5                | 100                 |
| 6                | 150                 |
| 7                | 220                 |

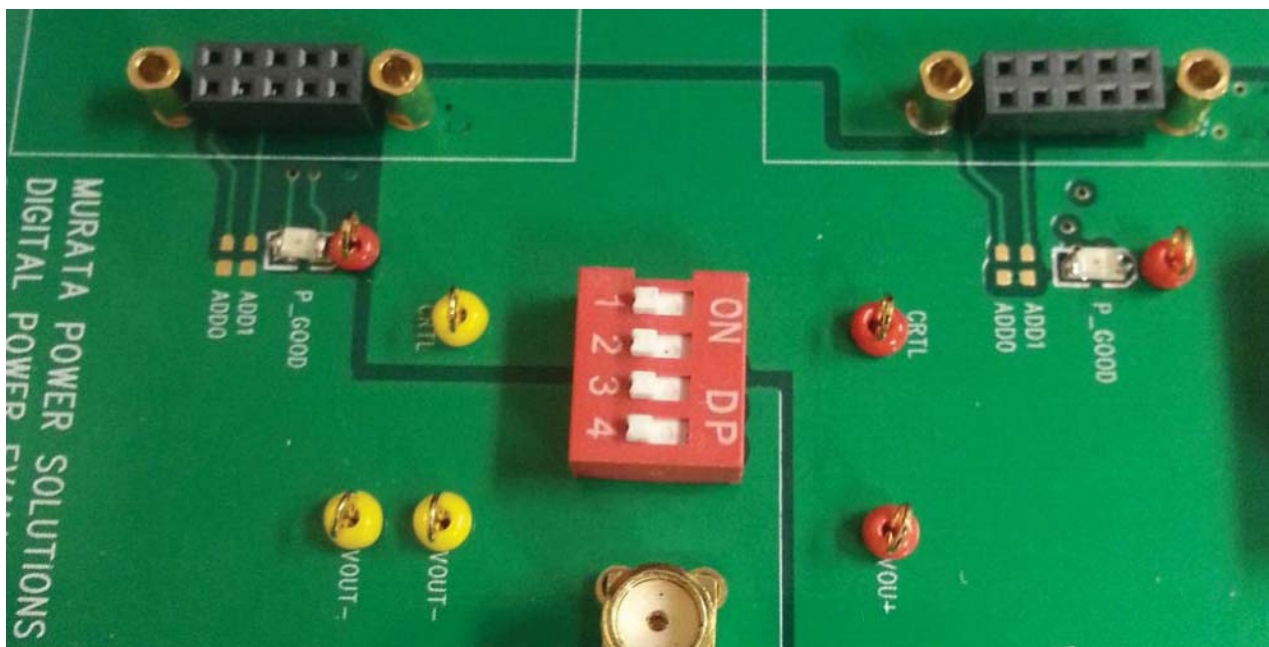


Figure 5. Position of Address Resistors for Modules

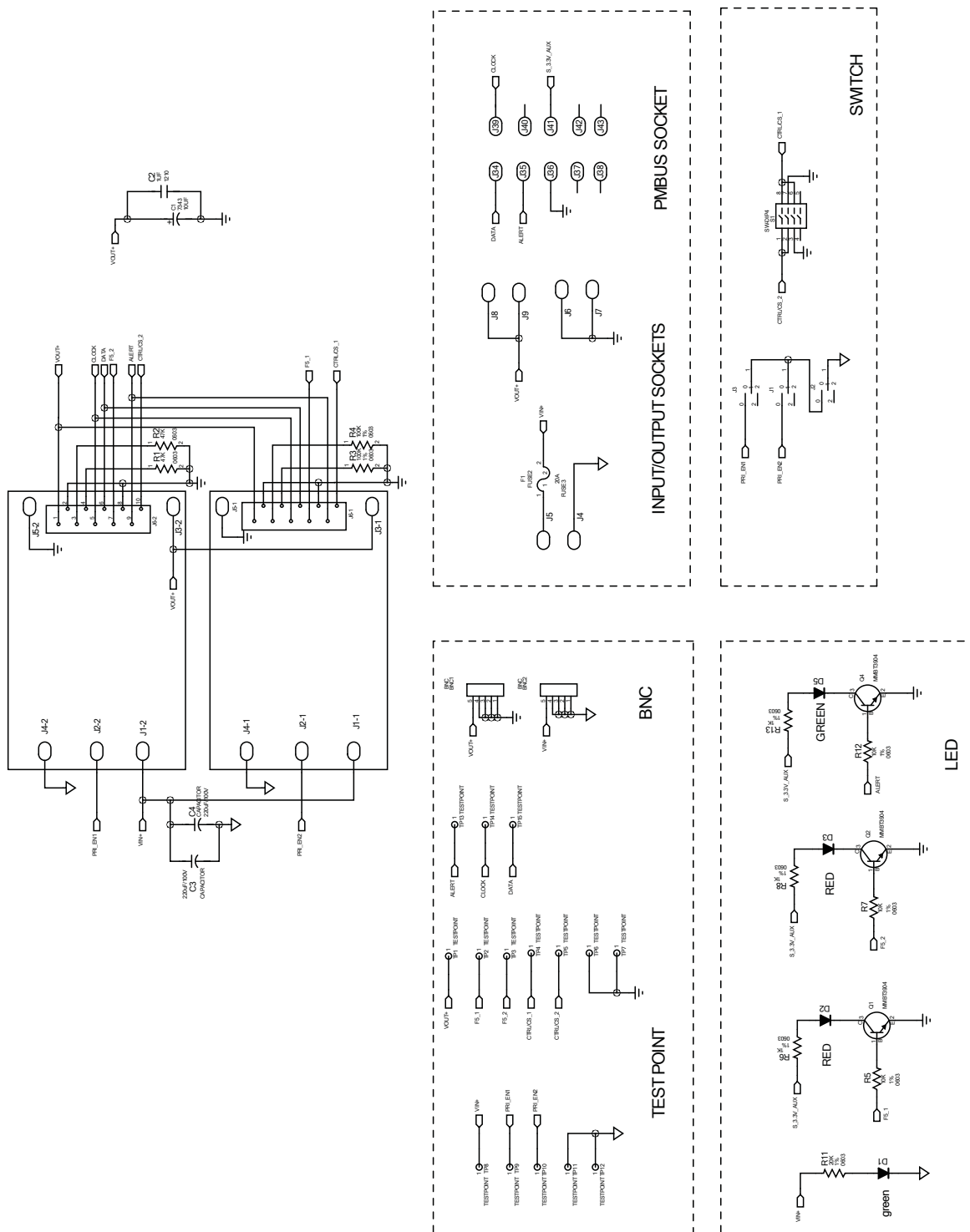


Figure 6. Evaluation Board Schematic

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