

# VI Chip<sup>®</sup> BCM<sup>®</sup> Evaluation Board



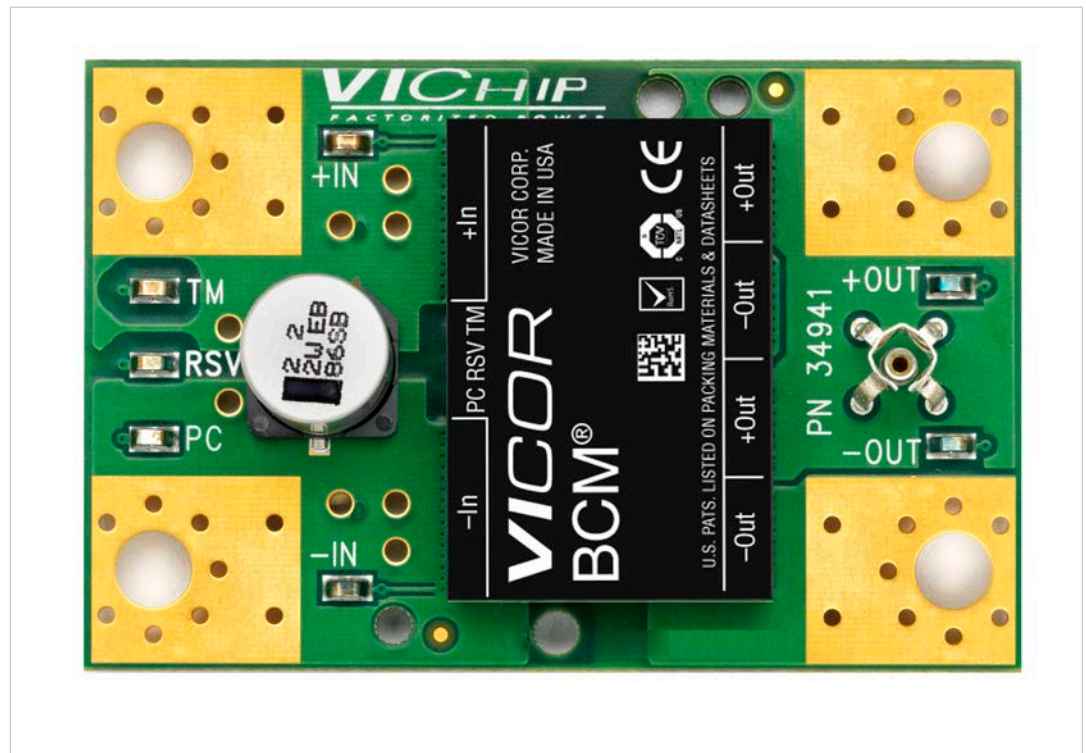
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## Introduction

The evaluation board offers a convenient means to evaluate the performance of the Vicor BCM bus converter and has been optimized for user convenience. Refer to the appropriate BCM data sheet for performance and operating limits. The data sheets are available for downloading at: [www.vicorpower.com](http://www.vicorpower.com).

It is important to remember the fast response of most BCMs can readily show the limitations of the source, load and associated wiring connected to the evaluation board. Care should be exercised to minimize stray source and load impedances in order to fully exercise the BCM.

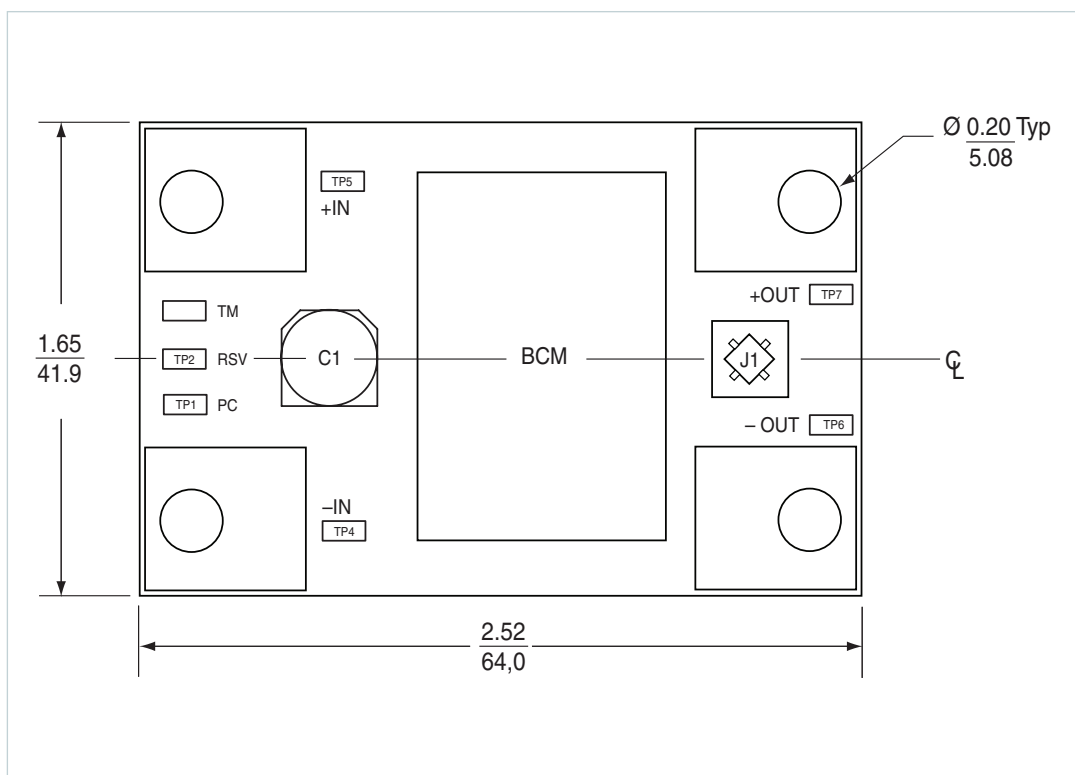
Please refer to Figure 1 for locations of the input and output connections as viewed from the component side. Wires may be soldered directly to the pads instead of ring lugs if desired to minimize circuit impedances.



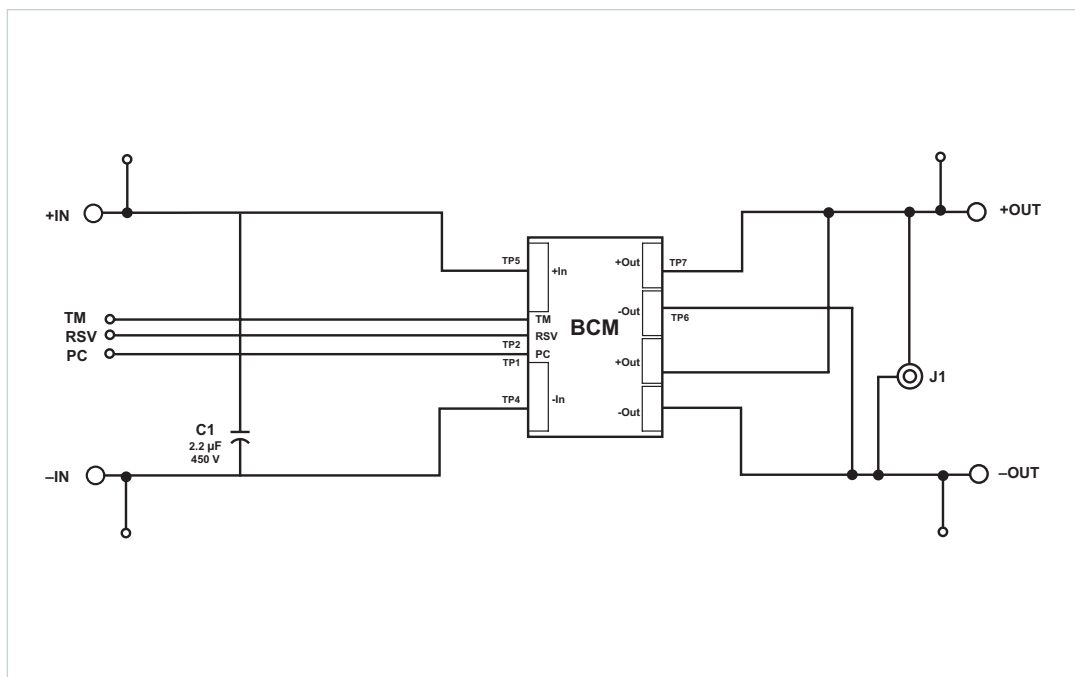
## Features

- Oscilloscope probe jack for output voltage and ripple measurements
- Simple to use
- Ring lug or solder connections
- Parallelable

**Figure 1**  
*BCM® evaluation board  
 demo layout and dimensional  
 drawing, component side*



**Figure 2**  
*BCM evaluation  
 board schematic*



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## Set Up

The evaluation board should be set up as follows.

**Note:** Care should be taken to avoid reversing polarities if connecting to the opposite (solder) side of the board.

### **+IN, –IN**

Connect a high-quality, low-noise power supply to the +IN and –IN terminals of the evaluation board. The interconnect leads should be heavy gauge and as short as possible. Additional capacitance may have to be added on the evaluation board to make up for impedances in the interconnect leads as well as deficiencies in the source. It is important to remember that noise from the source, as well as any input source voltage drops, will appear at the output of the BCM® multiplied by its K factor. Test points 4 (–IN) and 5 (+IN) can be used to monitor the input and are located on the PCB adjacent to the input terminals.

### **+ OUT, –OUT**

An electronic or passive load should be connected to +OUT and –OUT terminals of the evaluation board with short heavy-gauge leads. Most commercially available electronic loads do not have current slew rates capable of fully exercising the BCM. The evaluation board can be connected directly to the application for which the BCM is intended. However, the interconnect impedances between the evaluation board and the application can greatly affect the transient response. For applications where transient response is critical, the user should consider mounting the BCM directly to the target application PCB. Test points 6 (–OUT) and 7 (+OUT) can be used to monitor the output and are located on the PCB adjacent to the output terminals.

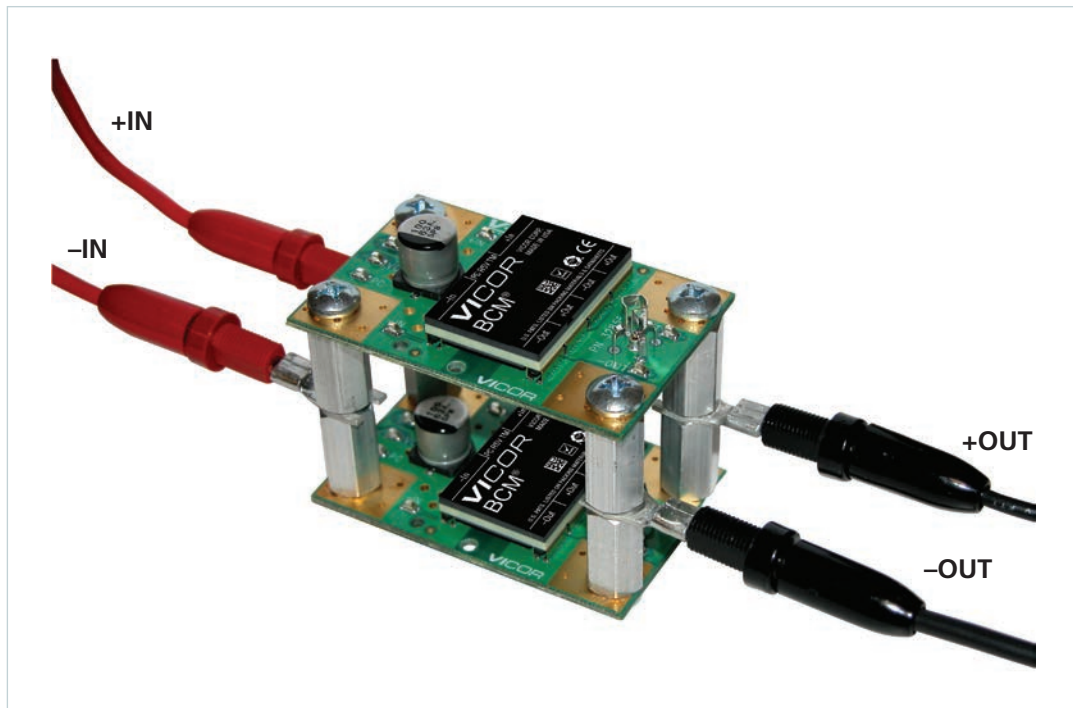
### **Output Voltage Measurement Jack (J1)**

This connector is provided to make accurate measurements of the output voltage of the BCM. Many types of scope probes may be directly connected to this point if the probe is equipped with a removable plastic sheath. To avoid creating ground loops when making measurements of the output or input voltage, these measurements should be made separately.

### **Paralleling**

The paralleling and current sharing capability of the devices can be demonstrated by stacking multiple evaluation boards and interconnecting the inputs and outputs with standoffs of sufficient current handling capability to create a 3-dimensional array. See Figure 3. When paralleling BCMs, the PC ports should be connected together to ensure the outputs turn on simultaneously.

**Figure 3**  
BCM<sup>®</sup> evaluation:  
paralleling connections of two  
BCM evaluation boards



#### Input Current Measurement

A current probe can be passed around the +IN lead connected to the BCM. Input capacitors on the evaluation board are downstream of this measurement point.

**TM: Do not connect, for factory use only.**

**VC: Do not connect, for factory use only.**

#### Primary Control (PC)

The PC can be used to disable the BCM, monitor status or provide a primary-referenced bias supply.

- a. Connecting PC to the –IN will disable the BCM.
- b. Connecting a DVM or oscilloscope between PC (positive) and –IN (negative) will indicate the status of the BCM. Please note that the BCM does not have active current-sinking capability.
- c. Connecting a load between PC (positive) and –IN (negative) will provide a primary-referenced bias supply.

#### Efficiency Measurement

As the BCM can deliver and consume large currents, the effect of the PCB must be considered when making an efficiency measurement. Be certain to accurately measure the voltage directly at the BCM using the appropriate pair of contact points located at the corners of the BCM.

## Recommended Hardware

**Table 1**  
Hardware

Quantity	Description	Manufacturer P/N	Vicor P/N
4	ring lug	Panduit LCA56-10-L	
4	#10-32 screw	}	Kit #26647
4	#10 flat washer		
4	#10 lock washer		
4	#10 hex nut		

All hardware is stainless steel except the ring lug.  
Kit # 26647 is included with the evaluation board.

## Thermal

For most lab environments a fan blowing across the evaluation board is recommended.  
See Application Note [AN:008](#) or contact Vicor Applications Engineering for assistance.

## Caution

The BCM<sup>®</sup> and evaluation board can comfortably operate at surface temperatures which may pose a thermal hazard to the operator. Be careful not to touch any exposed surface. Certain BCMs may operate at potentially dangerous voltages, use care in such cases. The evaluation board is not intended for use in end item equipment.

## Ordering Information

The BCM evaluation boards can be ordered from the Vicor website:  
[www.vicorpower.com](http://www.vicorpower.com).

To order the demo boards, substitute BCM with BCD in BCM part number.

See <http://www.vicorpower.com/dc-dc/isolated-fixed-ratio/lv-bus-converter-module> for part number listing.

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