

# VI BRICK® IBC Customer Evaluation Board

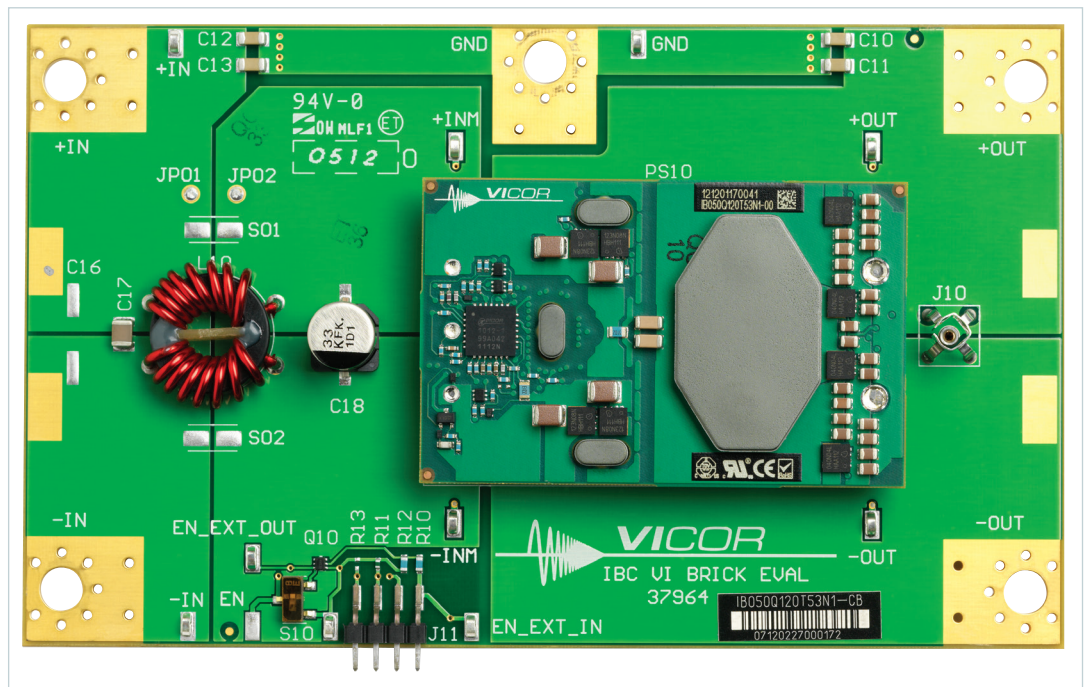
Written by: Michael DeGaetano  
Associate Product Line Engineer  
April 2012



<b>Contents</b>	<b>Page</b>
Features	1
Introduction	1
Set Up	3
Recommended Hardware	5
Thermals	5
Ordering Info	5

## Features

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



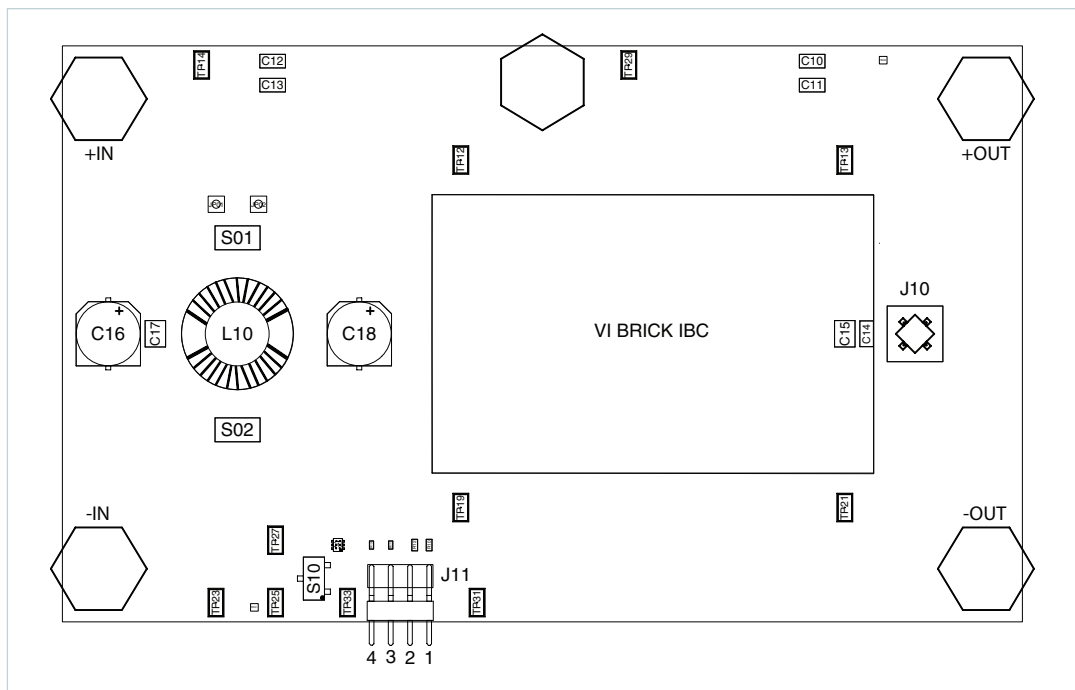
## Introduction

The Customer Evaluation Board offers a convenient means to evaluate the performance of Vicor’s intermediate bus converter (IBC) and has been optimized for user convenience. Refer to the appropriate IBC data sheet for performance and operating limits. The data sheets are available for downloading at [vicorpower.com](http://vicorpower.com).

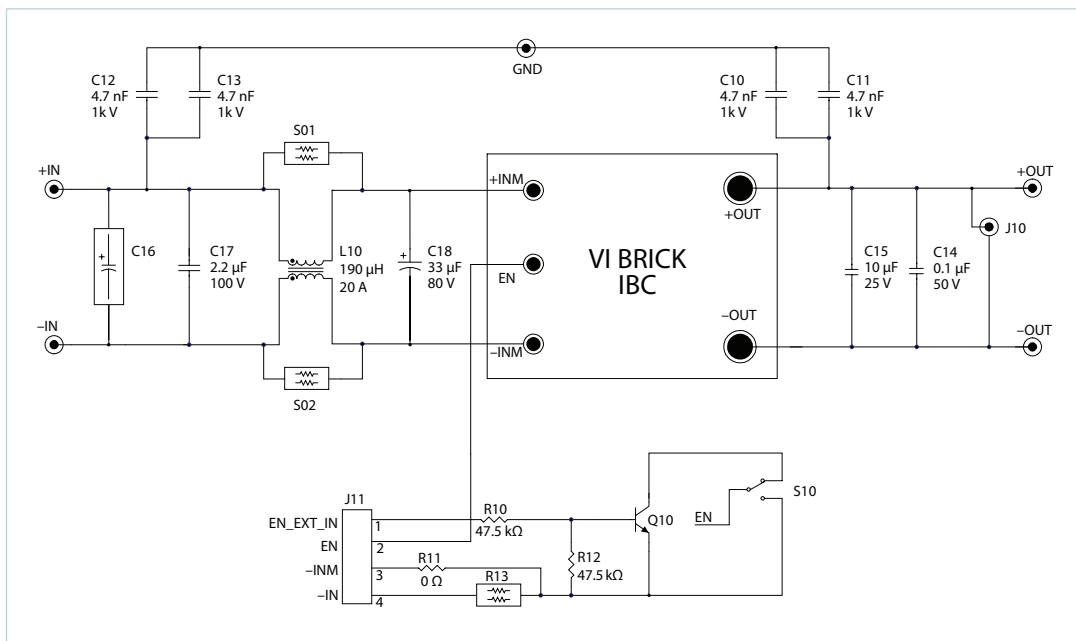
It is important to remember the fast response of the IBC can readily show the limitations of the source, load, and associated wiring connected to the evaluation board. Care should be exercised to minimize stray source and load impedances in order to fully exercise the IBC.

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.

**Figure 1.**  
IBC Customer Evaluation Board  
layout drawing,  
component side



**Figure 2.**  
IBC Customer  
Evaluation Board schematic



---

## Set Up

The Customer 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 Customer Evaluation Board. The start up slew rate of the input source should be no greater than 1 V/ $\mu$ s. 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 IBC multiplied by its K factor.

### +OUT, -OUT

An electronic or passive load should be connected to +OUT and -OUT terminals of the Customer Evaluation Board with short heavy-gauge leads. Most commercially available electronic loads do not have current slew rates capable of fully exercising the IBC. The Customer Evaluation Board can be connected directly to the application for which the IBC is intended. However, the interconnect impedances between the Customer Evaluation Board and the application can greatly affect the transient response. For applications where transient response is critical, the user should consider mounting the IBC directly to the target application PCB.

### EN Control

The IBC Customer Evaluation Board provides two methods to enable and disable the IBC. For the first method, the IBC is enabled and disabled solely with the S10 switch. No connection to the J11 header should be made. Flipping S10 toward the outside perimeter enables the IBC. Flipping S10 toward the inside area disables the IBC.

For the second method, the IBC is enabled and disabled solely with the J11 header. The S10 switch should be fixed in the inside position. Application of 5 V or more between EN\_EXT\_IN and -INM, pins numbered 1 and 3 respectively, is sufficient to enable the IBC. Application of less than 1 V between said pins is sufficient to disable the IBC.

### GND

The GND terminal of the Customer Evaluation Board is provided for basic EMI testing of the IBC, during which it should be connected to earth ground. Locations S01 & S02 are provided to shunt the common-mode choke if desired. Zero ohm resistors are placed in these locations for this purpose.

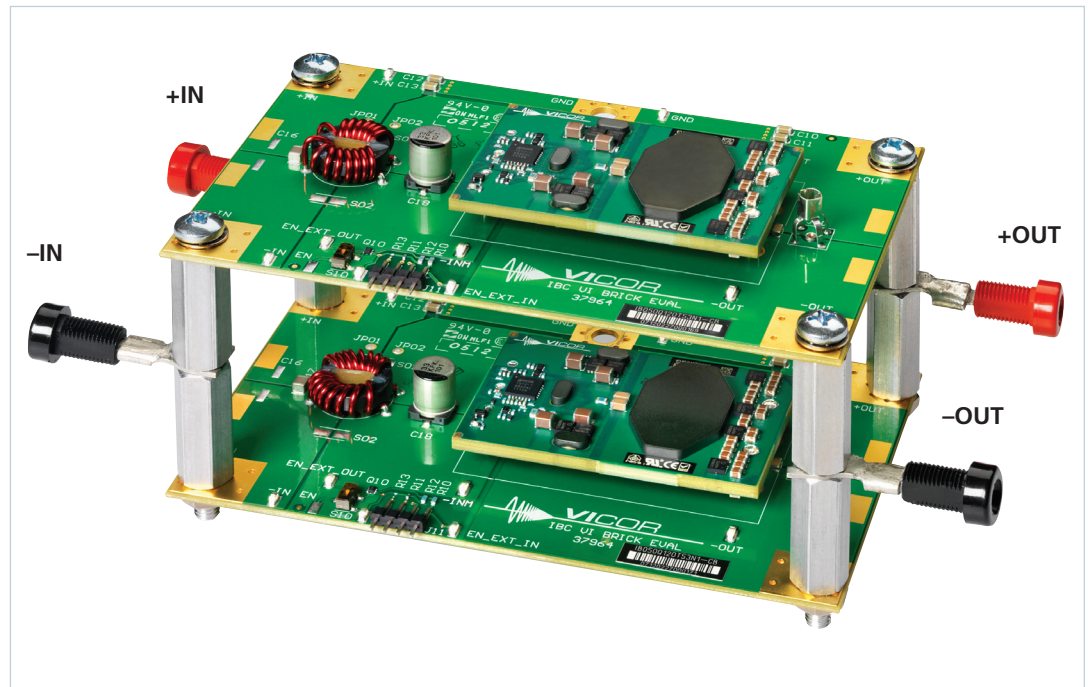
### Output Voltage Measurement Jack (J10)

This connector is provided to make accurate measurements of the output voltage of the IBC. 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 Customer Evaluation Boards and interconnecting the inputs and outputs with standoffs of sufficient current handling capability to create a 3-dimensional array. See Figure 3 below. When paralleling IBCs the EN control header (J11) should not be used. The modules should be enabled with the S10 switch. Pre-enabling all modules before input power is applied does not guarantee a synchronous startup. Therefore, the load at startup must be sized so that any one module is able to successfully startup into that load alone.

Figure 3.  
Paralleling connections  
of two IBC Customer  
Evaluation Boards



## Input Current Measurement

A current probe can be passed around the +in lead connected to the IBC. Input capacitors on the Customer Evaluation Board are downstream of this measurement point.

## Efficiency Measurement

As the IBC 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 IBC using the appropriate pair of contact points located at the corners of the IBC.

---

### Recommended Hardware:

QTY	Description	Manufacturer P/N	Vicor P/N
4	ring lug	Panduit LCAS6-10-L	
4	#10-32 screw	}	Kit # 37324
4	#10 flat washer		
4	#10 lock washer		
4	#10 hex nut		
4	self-adhesive rubber feet		

Rubber feet can be placed on bottom side of PCB at pad locations 1 through 4.

All hardware is stainless steel except the ring lug.

Kit # 37324 is included with the Customer Evaluation Board.

### Thermals

For most lab environments a fan blowing across the evaluation board with at least 200 LFM is recommended. For additional thermal information regarding the IBC refer to the data sheet or contact Vicor Applications Engineering for assistance (800) 927-9474.

### Caution

The IBC and Customer 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. IBCs may operate at potentially dangerous voltages and pose an energy hazard. The Customer Evaluation Board is not intended for use in end item equipment.

### Ordering Information

The Customer Evaluation Board is specified by replacing the “-00” suffix with “-CB” to the appropriate IBC model number.

See: <http://www.vicorpower.com/dc-dc-converters-board-mount/vi-brick-intermediate-bus-conver> for model number listings.

*The Power Behind Performance*