

# QPI-12-CB1-EVAL

## QPI-12LZ Filter Carrier Board for 48V VI Chip® EMI Evaluation



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### Introduction

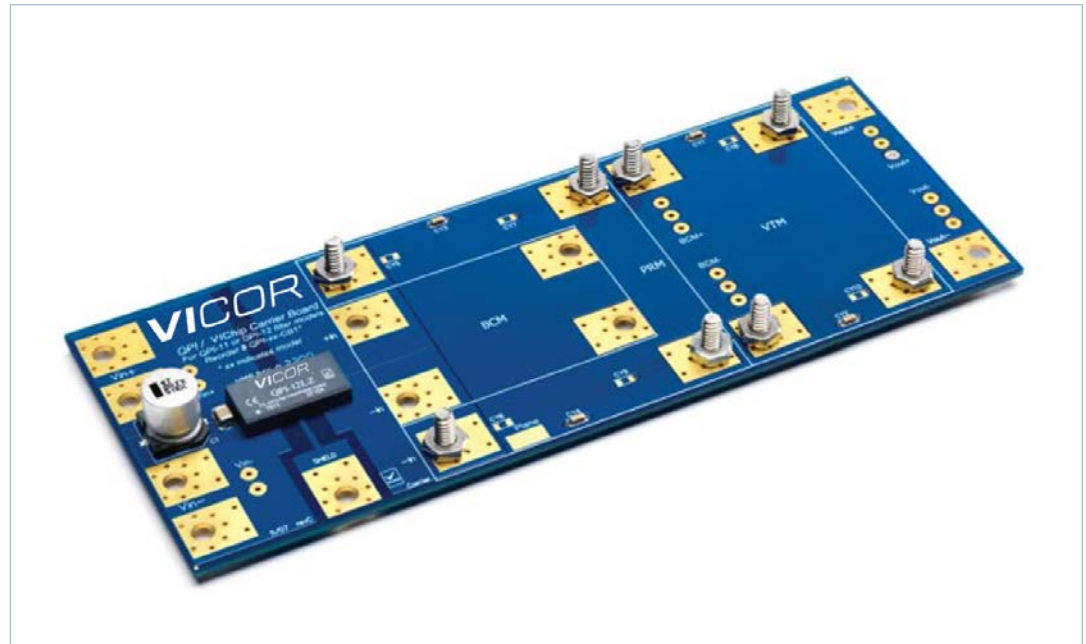
The QPI-12-CB1 carrier board is an evaluation board platform designed to demonstrate the EMI capabilities of a QPI-12LZ filter, with any combination of 48V input PRM™ / VTM™ or BCM® evaluation boards. The QPI-12-CB1 board includes a pre-mounted filter along with some additional components necessary to demonstrate the full functionality of the filter, along with mounting areas for VI Chip evaluation boards. This user guide provides basic instructions for assembly and use of the board. Further information on the functionality of the VI Chip boards, as well as the QPI-12LZ can be found in the VI Chip Evaluation Board user guide as well as the VI Chip and QPI-12LZ data sheets.

### QPI-12LZ Product Description

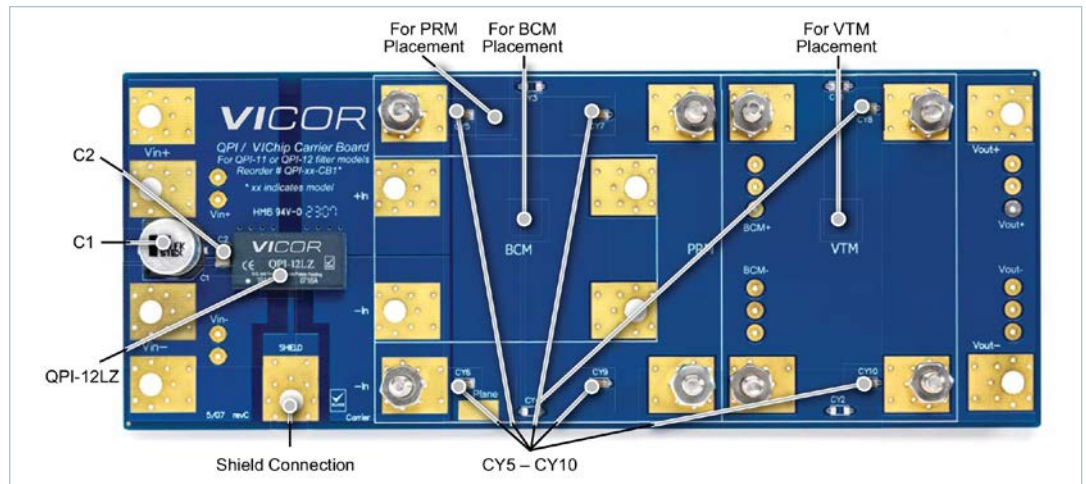
The QPI-12LZ EMI filter is specifically designed to attenuate conducted common-mode (CM) and differential-mode (DM) noise of Vicor VI Chip products to comply with the CISPR22 standard requirements for conducted noise measurements. The filter is designed to operate up to 80V<sub>DC</sub> continuous, with a 100V<sub>DC</sub> surge for 100ms, and supports 7A loads up to 60°C without derating.

Designed for the telecom bus range, the VI Chip EMI Filter supports the PICMG® 3.0 specification for filtering system boards to the EN55022 Class B limits.

**Figure 1**  
QPI-12-CB1 carrier board featuring the QPI-12LZ EMI filter



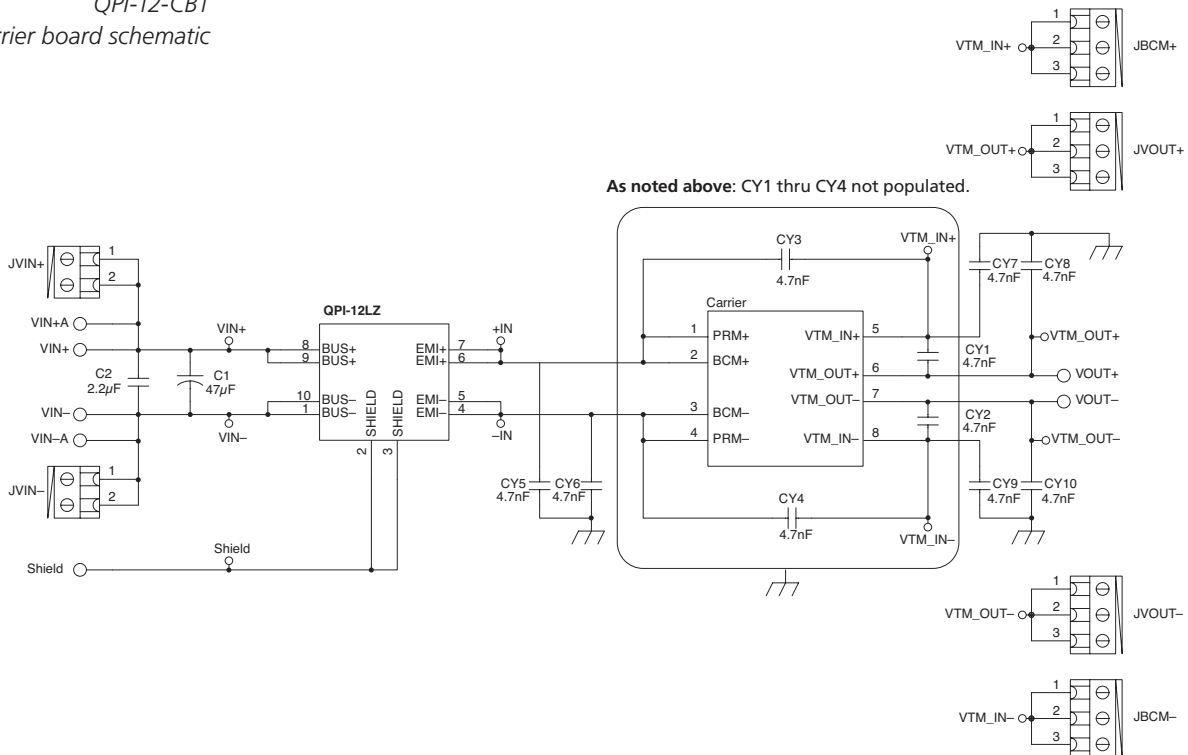
**Figure 2**  
QPI-12-CB1 board overview



### Bill of Materials

Reference Designator	Description
QPI	QPI-12LZ SiP
C1	Capacitor, electrolytic, 47 $\mu$ F, 100V
C2	Capacitor, ceramic, 2.2 $\mu$ F, 100V
CY5 – CY10	Capacitor, X7R ceramic, 4.7nF, 1,000V
Hardware	Machine screw, pan head, 0.373in, 1/2in long, #10-24 thread
Hardware	Machine nut, hex, 3/8in, #10-24 thread
CY1 – CY4	Optional Y-Cap configuration (not populated)

**Figure 3**  
QPI-12-CB1  
carrier board schematic

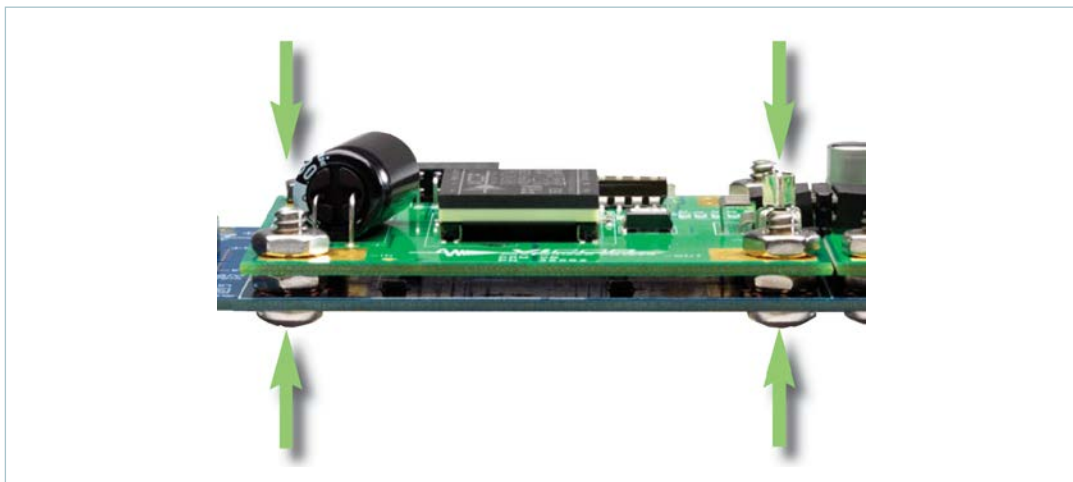


## Board Assembly

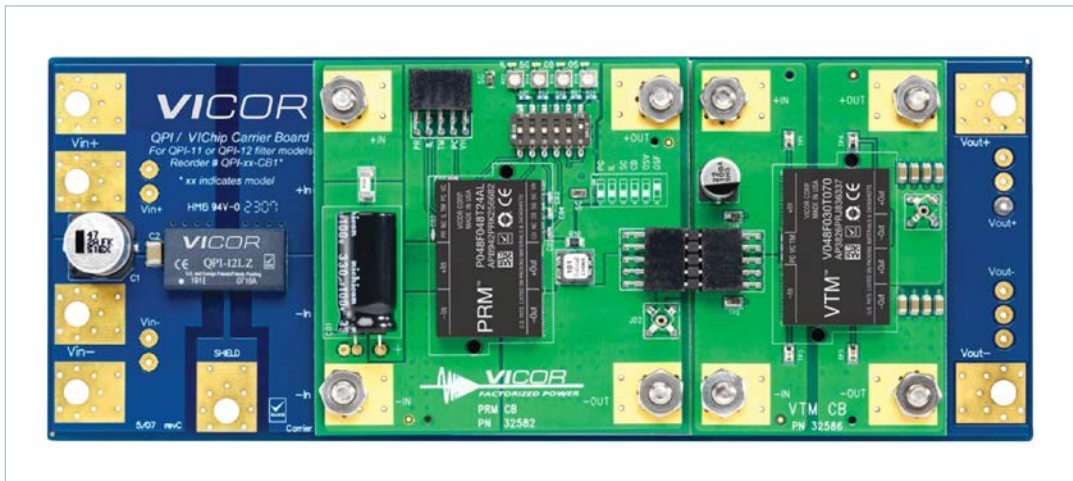
The VI Chip® evaluation boards should be attached to the carrier board using the hardware provided. Begin by removing the top nuts from the bolts in the space provided for mounting the evaluation board. Check to see that the lower bolts are tightened. Remove rubber spacers from the VI Chip evaluation board(s). Place the VI Chip evaluation board on the bolts. Make sure that the evaluation board is placed in the proper input to output orientation with respect to the carrier board (the input side will have the capacitor). Replace the top nuts and tighten gently with a wrench. Attach input and output leads, be careful to confirm proper polarity before powering up.

When using the carrier board, pay special attention to the wiring and grounding. Wires should be kept as short as possible and positioned to minimize radiated noise pick up on the QPI-12LZ.

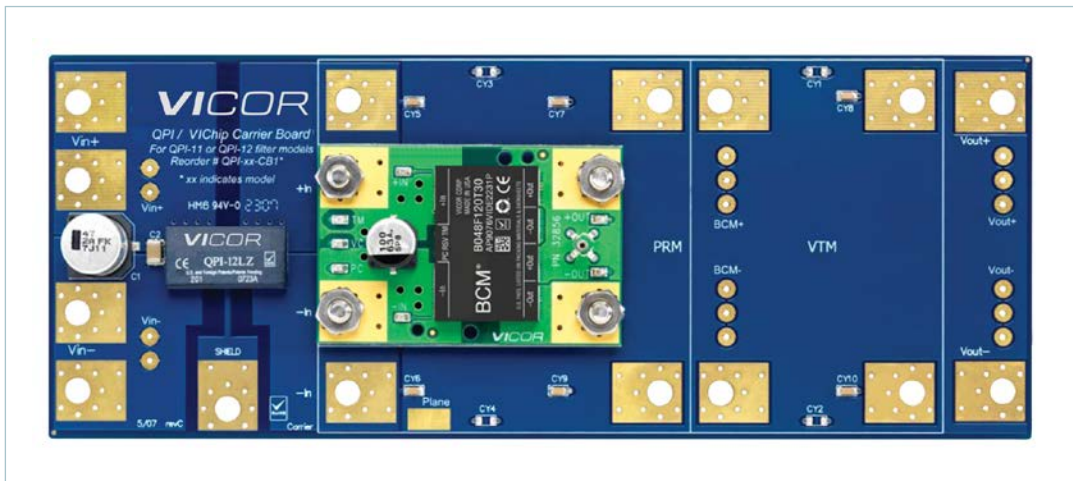
**Figure 4**  
Side-view hardware assembly



**Figure 5**  
QPI-12-CB1 carrier board  
assembled with PRM™ and  
VTM™ evaluation boards



**Figure 6**  
QPI-12-CB1 carrier board  
assembled with a BCM®  
evaluation board

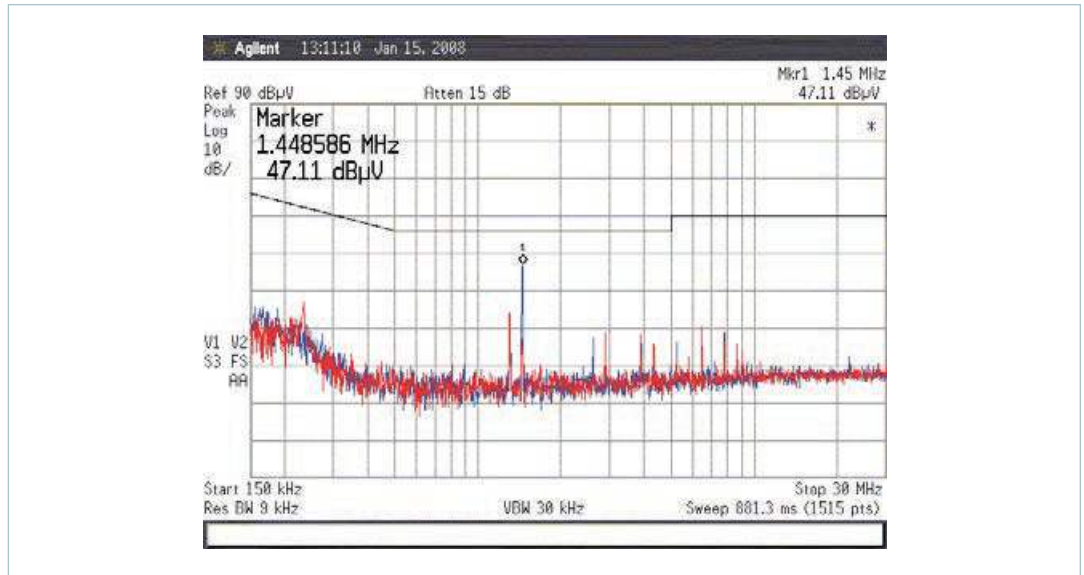






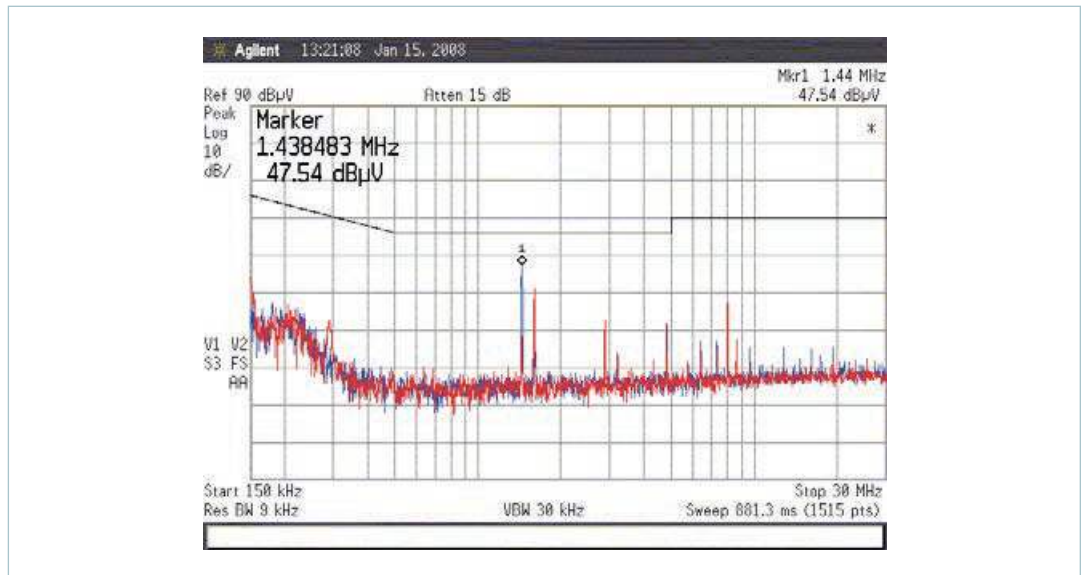
**Figure 9**

Total noise QPI-12LZ<sup>[a]</sup> with  
48V input PRM™ and  
3V output VTM™;  
3.27A input current;  
160W output load



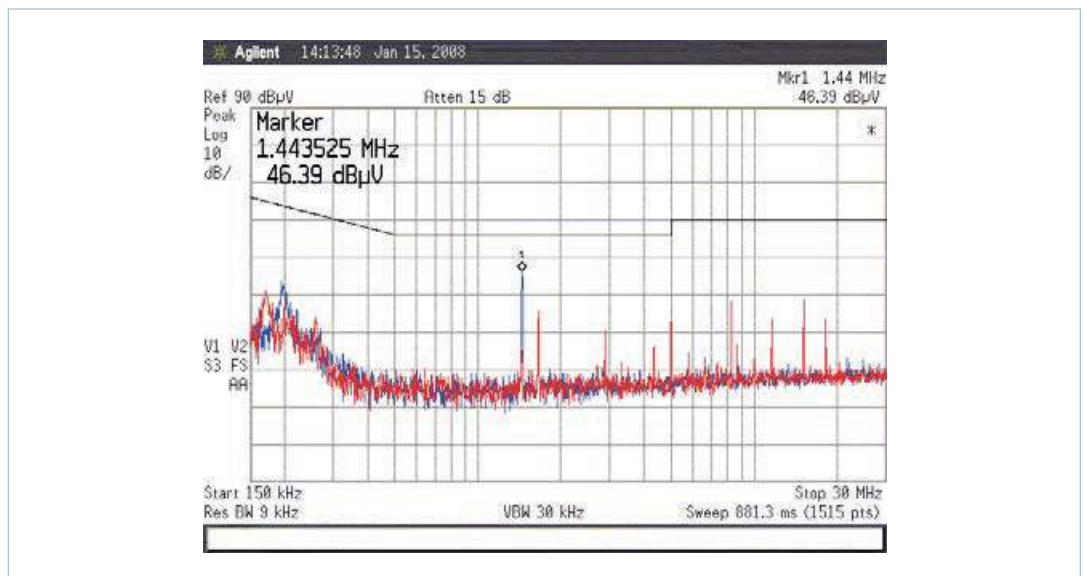
**Figure 10**

Total noise QPI-12LZ<sup>[a]</sup> with  
48V input PRM and  
12V output VTM;  
4.03A input current;  
180W output load



**Figure 11**

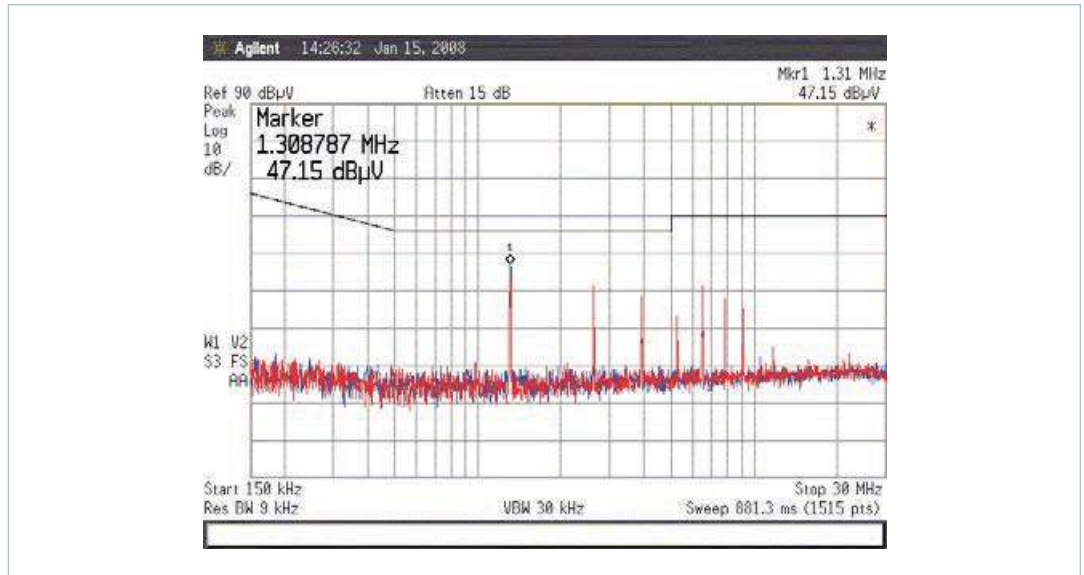
Total noise QPI-12LZ<sup>[a]</sup> with  
48V input PRM and  
48V output VTM;  
3.45A input current;  
160W output load



<sup>[a]</sup> These EMI plots are actually based on QPI-10LZ, which includes the same filter elements but includes integrated hot swap.

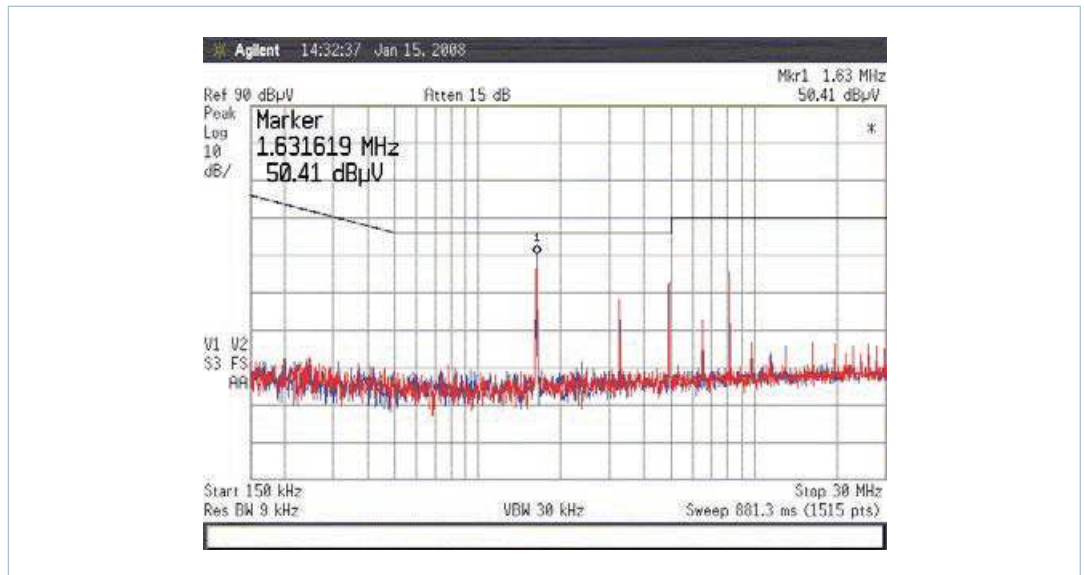
**Figure 12**

Total noise QPI-12LZ<sup>[a]</sup> with  
48V input, 3V output BCM®;  
3.18A input current;  
160W output load



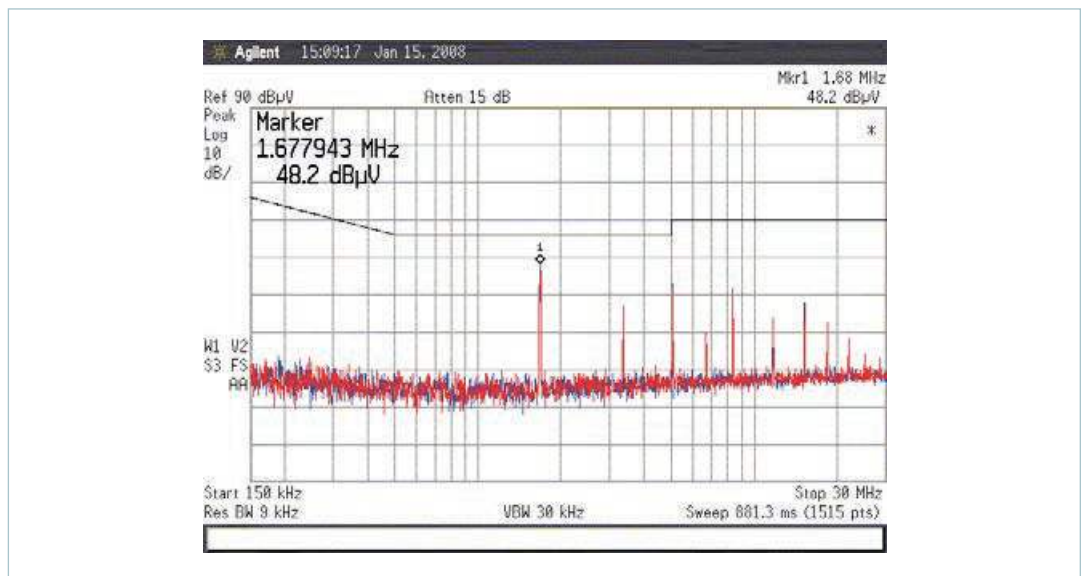
**Figure 13**

Total noise QPI-12LZ<sup>[a]</sup> with  
48V input, 12V output BCM;  
3.75A input current;  
180W output load



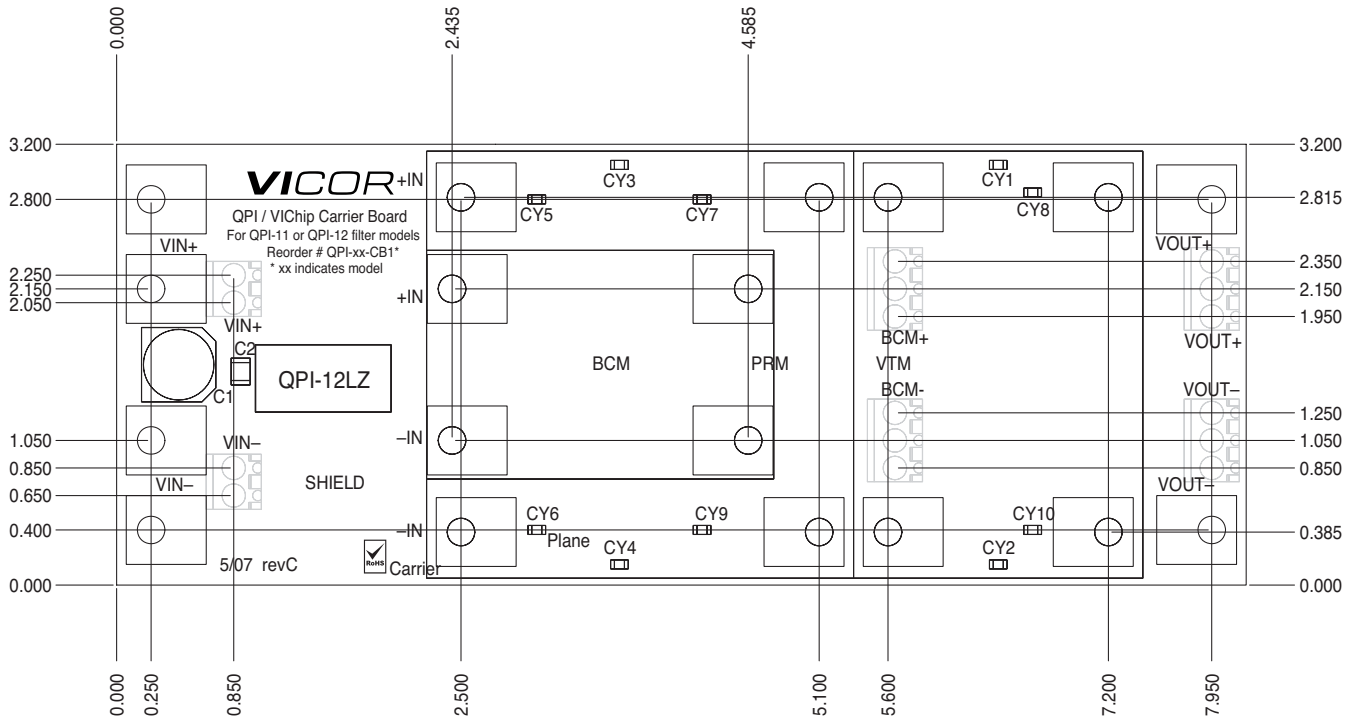
**Figure 14**

Total noise QPI-12LZ<sup>[a]</sup> with  
48V input, 48V output BCM;  
3.20A input current;  
153W output load



<sup>[a]</sup> These EMI plots are actually based on QPI-10LZ, which includes the same filter elements but includes integrated hot swap.

**Figure 15**  
Mechanical drawing  
for QPI-12-CB1



## Ordering Information

Carrier Board Part Number	Compatible VI Chip® Evaluation Boards (sold separately) <sup>[b]</sup>
QPI-12-CB1	<b>PRMs™:</b> P048F048T12AL-CB P048F048T24AL-CB P048F048T17AL-CB P048F048T32AL-CB
	<b>VTMs™:</b> All 48V input models
	<b>BCMs®:</b> All 48V input models

<sup>[b]</sup> Some VI Chip products exceed the current rating and therefore may not be compatible when operating at full load.

### Additional Resources

- QPI-12LZ [Data Sheet](#)
- Compatible VI Chip® Converters
  - [PRM and VTM](#)
  - [BCM](#)

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