VICOR

28 Vdc MIL-COTS

DESIGN GUIDE

VIPAC™

Contents

Product Overview

Vicor's 28 V MIL-COTS VIPAC™ is an integrated power system leveraging the latest advances in DC-DC converter technology and modular front ends. VIPAC combines application specific power processing units (PPU) and a choice of chassis styles to provide fast, flexible and highly reliable power solutions for a wide range of demanding applications.

The PPU is the core element of the system and incorporates either Vicor's M-FIAM5B or M-FIAM9 to provide transient protection, EMI filtering and inrush current limiting.

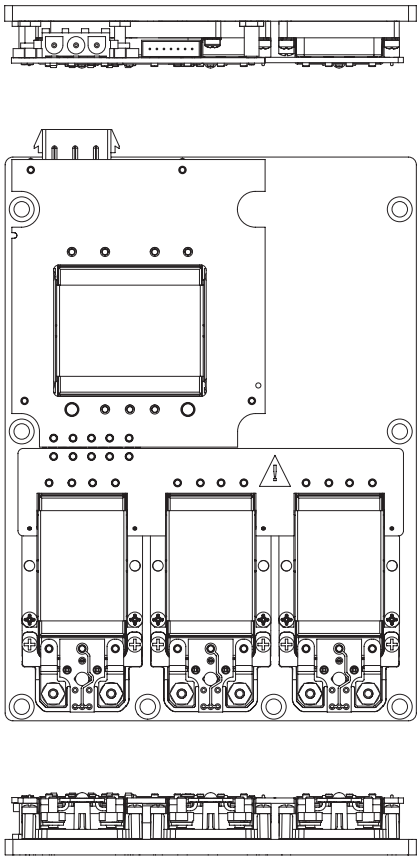
The web-based VCAD tool enables designers to configure the PPU with up to three independently regulated outputs having power levels from 50 to 400 W. Vicor's Maxi, Mini, Micro Series DC-DC converters, in industry standard quarter, half and full brick packages, are used to deliver output voltages from 3.3 to 48 Vdc. Additionally, the wide trim range of the modules can provide operating voltages as low as 500 mV.

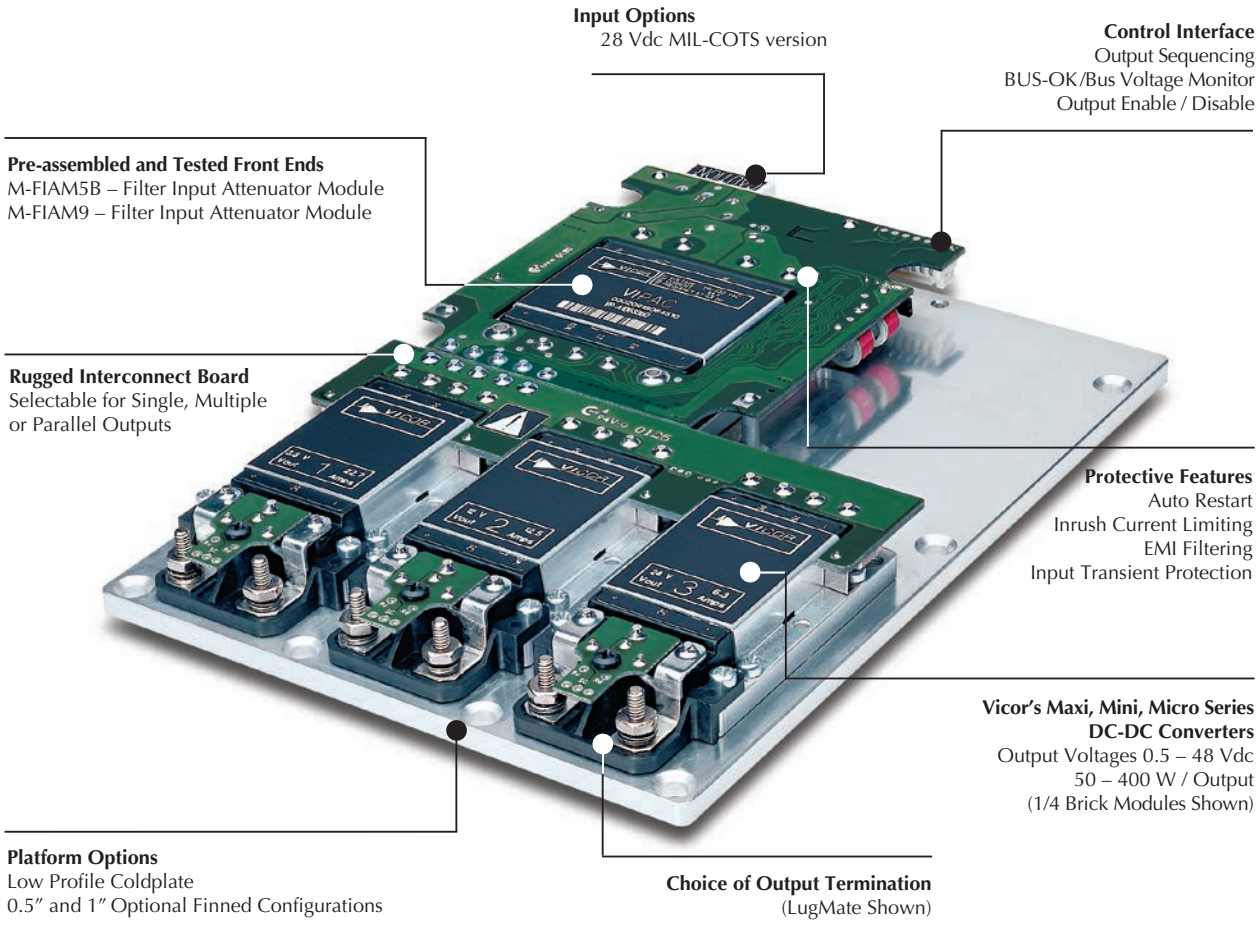
The PPU is comprised of:

- DC input modular front end
- Vicor's Maxi, Mini, Micro Series high density DC-DC converters
- Interface board
- Coldplate or finned chassis
- Choice of output termination styles

The VIPAC is offered in several chassis configurations facilitating its use in a variety of applications using either conduction, convection or forced convection cooling. The low profile, conduction cooled version may be mounted to an existing cabinet wall, coldplate or heat sink. The 0.5" or 1" finned versions, available in longitudinal or transverse configurations, are ideal for use in free or forced convection environments. The use of standard chassis footprints allows different input voltage configurations of the VIPAC to be used interchangeably depending on system and market requirements.

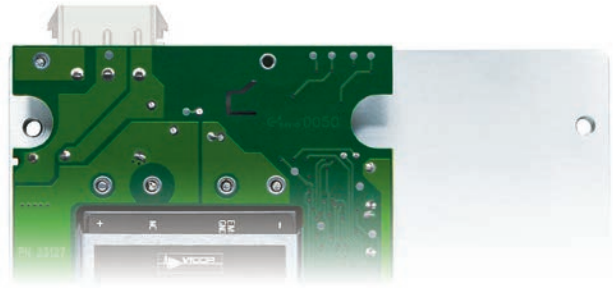
PPU





DC Input

18 – 36 Vdc; 28 V nom.



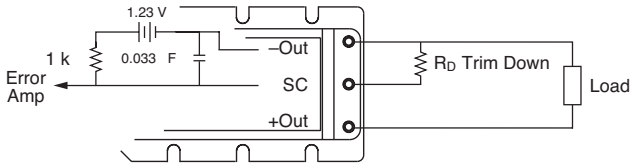
FEATURES

- **Control Interface**
  - Power Up / Down control
  - Output sequencing for Turn-on, Turn-off
  - BUS-OK

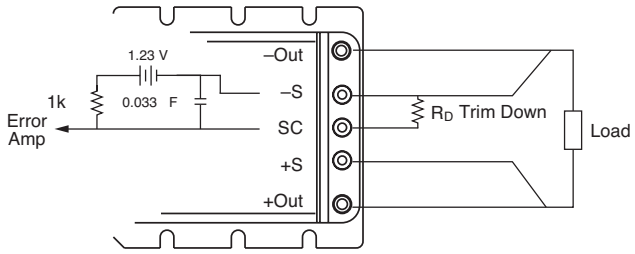
- **Partitioned Power Architecture**
  - Maximizes packaging flexibility
  - Enhanced reliability
  - Wide operating temperature range
    - –40˚ to +95˚C chassis H-Grade
    - –55˚ to +95˚C chassis M-Grade

- **Secondary Control**
  - Output voltage trimming
  - 10 – 110% Vout

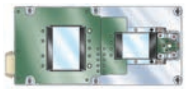
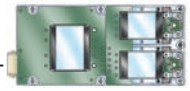
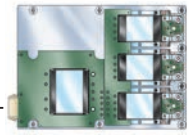
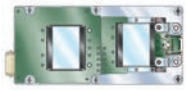
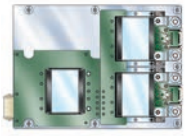
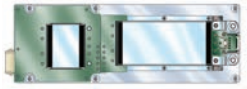
Micro



Mini and Maxi



Input / Output Options

VIPAC Configuration	# Outputs	Output Voltage Selection								
		3.3 V	5 V	12 V	15 V	24 V	28 V	36 V	48 V	Total
		Micro	Maximum Output Power (W)*							
 MVC-G / MVX-G	Single	75	100	100	100	100	100	100	100	**100**
 MVC-D / MVX-D	Single II	150	200	200	200	200	200	200	200	**200**
	Dual	75 75	100 100	100 100	100 100	100 100	100 100	100 100	100 100	**200**
 MVC-A / MVX-A	Dual II	150 75	200 100	200 100	200 100	200 100	200 100	200 100	200 100	**300**
	Triple	75 75 75	100 100 100	100 100 100	100 100 100	100 100 100	100 100 100	100 100 100	100 100 100	**300**
		Mini	Maximum Output Power (W)*							
 MVC-E / MVX-E	Single	150	200	200	200	200	200	200	200	**200**
 MVC-B / MVX-B	Single II	300	400	400	400	400	400	400	400	**400**
	Dual	150 150	200 200	200 200	200 200	200 200	200 200	200 200	200 200	**400**
		Maxi	Maximum Output Power (W)*							
 MVC-F / MVX-F	Single	264	400	400	400	400	400	400	400	**400**

*Model numbers and total output power capability are application specific.
Component tolerances may effect total output power (±5%) in parallel (//) configurations.
See VIPAC configuration tool at: vicorpower.com/vcad

MVC-xxx refers to M-FIAM5B
MVX-xxx refers to M-FIAM9

SPECIFICATIONS

28 Vdc Input MIL-COTS Version

Parameter	Min	Typ	Max	Unit	Notes
Operating input voltage	18	28	36	Vdc	Continuous
Turn-on	18			Vdc	
Inrush current			5.0	A pk	
Inrush limiting			0.007	A µF	
Transient immunity (M-FIAM5B)			50	Vdc	12.5 ms per MIL-STD-704E/F
Transient immunity (M-FIAM9)			100	Vdc	50 ms per MIL-STD-1275A/B/D
			250	Vdc	70 ms per MIL-STD-1275A/B/D
			70	Vdc	20 ms per MIL-STD-704A
			50	Vdc	12.5 ms per MIL-STD-704E/F
EMI		MIL-STD-461E			Conducted emissions: CE101, CE102 Conducted susceptibility: CS101, CS114, CS115, CS116
Reverse Polarity Protection					Internally fused

Environmental

Parameter	Min	Typ	Max	Unit	Notes
Dielectric withstand					
Input to chassis	1,500 / 2,121			Vrms / Vdc	
Operating chassis temperature					
H-Grade	-40		95	°C	
M-Grade	-55		95	°C	
Shock		MIL-STD-810F			Method 516.5, Procedure 1 (40 g for 15–23 ms, 75 g for 8–13 ms)
Vibration		MIL-STD-810F			Method 514.5, Procedure 1 (20–2000 Hz at 5 g)
Humidity	5		95	%	Non-condensing

Output Specifications - General at 25°C, nominal line and nominal load, per module unless otherwise specified

Parameter	Min	Typ	Max	Unit	Notes
Output voltage set point			±1	%	Vout nom
Line regulation		±0.02	±0.2	%	Low line to high line; full load
Temperature regulation		±0.002	±0.005	%/˚C	Over operating temp. range
Over temperature shut down		115		˚C	
Power sharing accuracy		±2	±5	%	10% to 100% of full load
Programming range	10		110	%	Of nominal output voltage. (For trimming below 90% of nominal, a minimum load of 10% of maximum rated power may be required)
Current limit		115		% Iout max.	Output voltage 95% of nominal
Short circuit current		115		% Iout max.	Output voltage <250 mV

Interface Control Functions

Type	Overall Enable	Output Enable / Disable	Output Sequencing	Bus OK	Emergency Off
Local	√		√	√	
Ρεμοτε	√	√	√	√	√

Output Sequencing
Power up will always occur in the defined sequence stored within the device. Any preprogrammed power down sequence, except the default, will not be in effect upon loss or removal of the VIPAC source voltage. Sequenced power down can only be achieved by issuing the requisite commands through the interface before removing the source voltage.

TECHNICAL OVERVIEW

Overview

Vicor's 28 Vdc for MIL-COTS VIPAC front-end section utilizes either Vicor's M-FIAM5B or M-FIAM9 input module to provide EMI filtering, transient protection, inrush current limiting and rectification as appropriate. The front end also contains input connectors, fusing and control circuitry to which the user can interface discrete circuitry.

Up to three Maxi, Mini, Micro Series DC-DC converters are combined with the front end in an integrated mechanical assembly providing a high efficiency power supply delivering up to 400 W of output power.

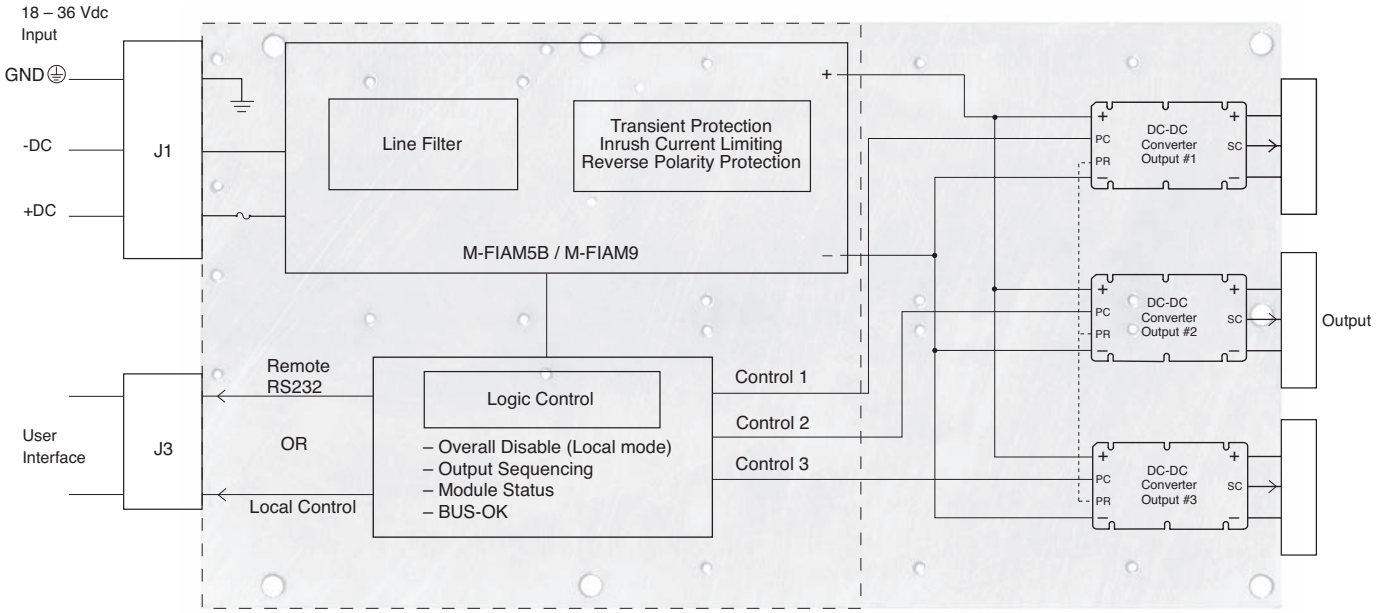
Circuit Operation

The VIPAC utilizes either the M-FIAM5B or M-FIAM9 module which provides inrush current limiting, transient protection and EMI filtering. The DC voltage is applied via an agency approved 3-pin connector; a fuse in the the "+" lead protects the VIPAC from damage due to internal shorts. At start up, inrush current is limited by a FET. This FET serves as both an inrush current limiter at power up and a voltage limiting device in the event of an input transient overvoltage condition. The FET, driven by a DC bus voltage sense circuit, is brought to a low impedance after initial power up.

The 28 V is applied to one or more Vicor Maxi, Mini, Micro DC-DC converters which deliver the selected output voltage and current levels. The DC-DC converters provide output over voltage protection, output current limiting, voltage regulation trim capability and input to output isolation.

Vicor's VCAD configuration tool selects standard 24 V in Maxi, Mini, and Micro modules for use within the VIPAC based on the application requirements. The modules are chosen based on the input and output requirements and the closest, but higher power level that is available to that specified. Specifications for these can be found on their respective data sheets.

VIPAC BLOCK DIAGRAM - DC INPUT



VIPAC Control

The VIPAC provides the user with choices with respect to how the unit is operated. It can be controlled locally by applying the appropriate "digital" signals to the device.

BUS-OK

An internal replica of BUS-OK is wired to the PC pin of all internal DC-DC converter modules. The modules will be disabled (no DC output) during initial power up of the VIPAC until the internal DC input bus voltage to the DC-DC converters is sufficient to support full load operation. The BUS-OK status output reflects the status of this inhibit function. This same logic circuit will shut down the converters when the internal DC bus voltage is insufficient to support proper operation.

This shut down will occur during normal power down, line dropouts exceeding the hold up time, or internal faults causing the internal DC bus voltage at the input of the converters to collapse. The BUS-OK output provides the user with an optically isolated status indication of the internal DC bus. This output, in AC powered system applications, can provide power supply status, switch in backup (standby) sources or initiate "power down" sequences to save volatile memory contents in the event of a power loss. The time from BUS-OK deassertion to output shut down is dependent upon the value of hold up capacitors used. The VIPAC online design tool contains a hold up capacitor calculator which provides appropriate values.

MOD-DIS+, MOD-DIS–

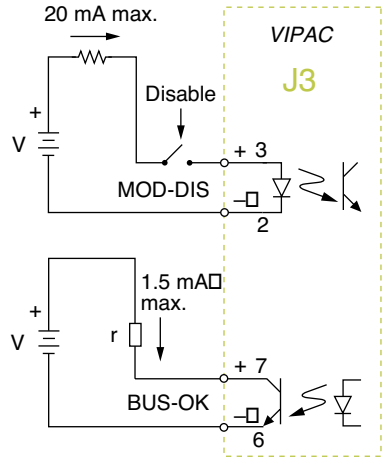
The MOD-DIS input is an optically coupled input and allows for remote disabling of the output(s) of the VIPAC. Applying current to the MOD-DIS+, MOD-DIS– input disables the supply. The minimum input current for disabling the supplies is 3 mA. The maximum allowable current is 20 mA.

Electrical Connections

Status output pair BUS-OK+, BUS-OK– are the collector (+) and emitter (–) of an NPN optoisolator output transistor. In a typical application, the collector terminal BUS-OK+ of the optocoupler can be connected via current limiting resistors to a source no greater than 70 Vdc. These resistors should limit the maximum current to the optocoupler output transistors to 1.5 mA. The emitter terminal BUS-OK– is connected to the return of the external source. The status OK condition will set the optocoupler output transistors in saturation and are capable of sinking up to 1.5 mA with a Vce saturation voltage of 0.4 V. Users should be cautioned that although the output of the VIPAC can be used as the pull-up source, shortly after BUS-OK changes from OK (saturated) to NOT OK (high Z), the pull-up voltage will be shut down. If the pull-up source is one of the VIPACs outputs, it is advisable to provide a capacitive reservoir in order to maintain the pull-up potential after loss of DC current output. Use edge sensing logic to detect assertion of logic outputs, or a separate source of bias supply voltage (i.e., backup batteries) to provide a safe pull-up voltage source regardless of the line status.

MOD-DIS Input
Apply a current of 3–20 mA to disable output.

BUS-OK – Status Output
Transistor on when OK.
Vce sat. = < 0.4 V @ 1.5 mA
maximum external pull-up is 70 Vdc.
BUS–OK signal is isolated



Input Connections

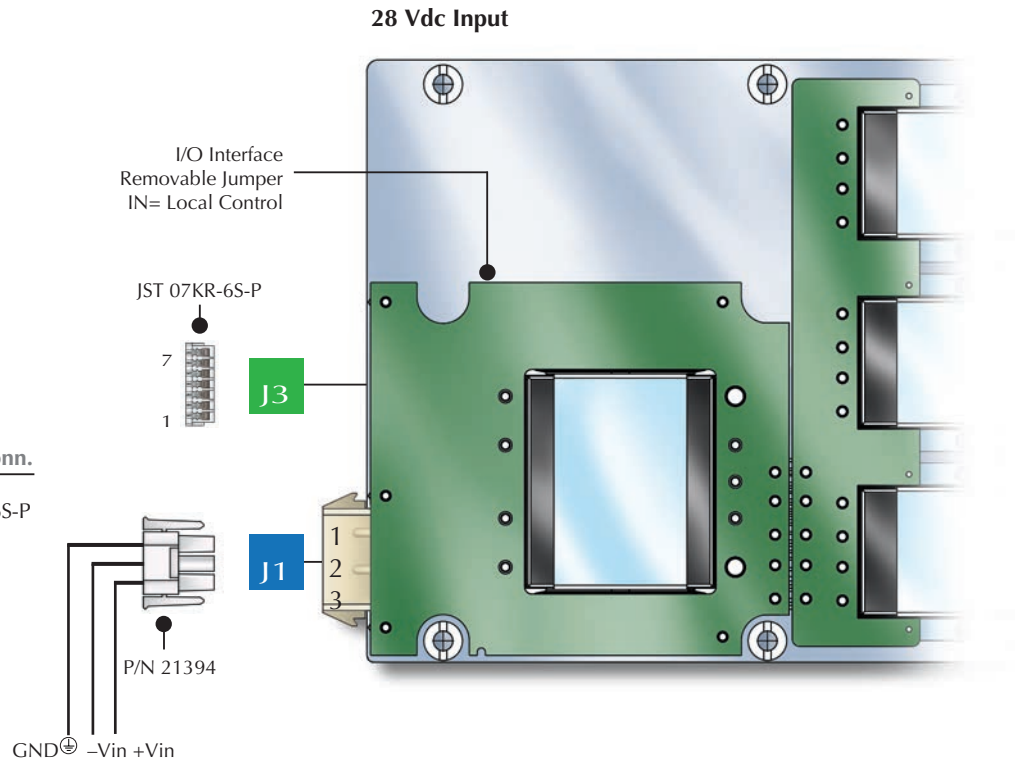
28 Vdc Input

Conn.	Pin#	Funct.	Mating Conn.
J1	1	GND ⏚ P/N 21394	
	2	– Vin	
	3	+ Vin	

I/O Interface*

Conn.	Pin#	Funct.	Mating Conn.
J3	1	NC	JST 07KR-6S-P
	2	MOD-DIS–	
	3	MOD-DIS+	
	4	GND	
	5	NC	
	6	BUS-OK–	
	7	BUS-OK+	

* See detailed description on Pgs 7–8



Output Connection Options

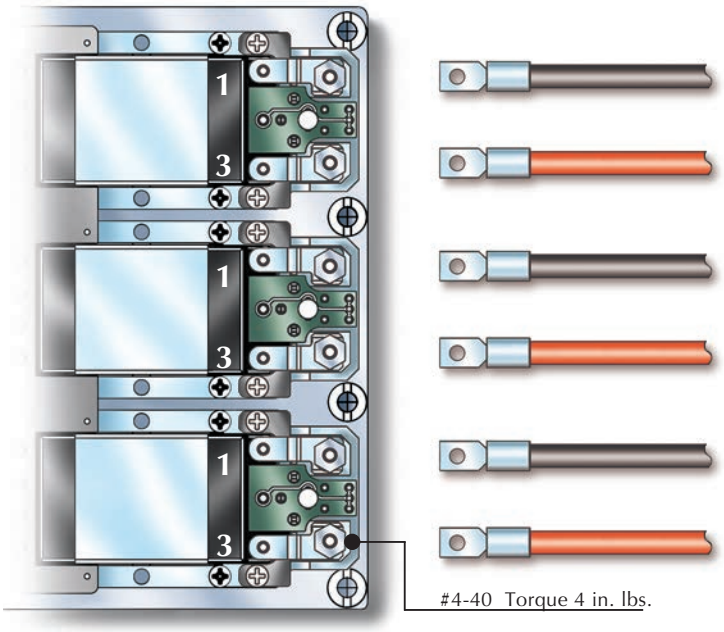
Discrete Output Configurations

LugMate (Factory Installed Option)

Ring Lugs

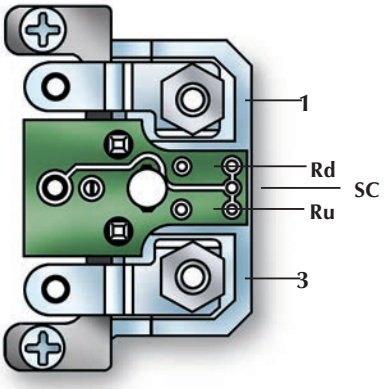
LugMate Pin Out

Micro LugMate

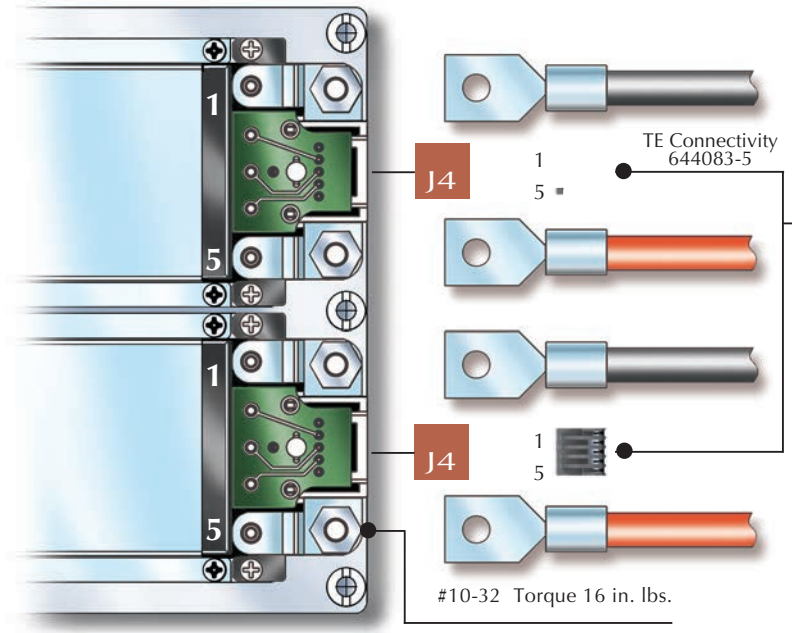


Pin #	Solder Pad	Function
1		– Vout
	Rd	Trim-Down
	SC	Secondary Control
	Ru	Trim-Up
3		+ Vout

Micro LugMate - with Rd/Ru trim resistor solder pads. (Design calculator for trim resistors located at vicorpower.com)



Mini/Maxi LugMate



Pin #	Conn.	Function		Mating Conn.
1		– Vout		
	J4-1	– Vout	*Removable Jumper	TE Connectivity 644083-5
	J4-2	– Sense		
	J4-3	Secondary Control		
	J4-4	+ Sense	*Removable Jumper	
	J4-5	+ Vout		
5		+ Vout		

*Removable jumper is factory installed for local sensing. See Pg 22 for details

**For units configured in parallel, one module will have the SC jumped to the –S and –Out.

Output Connection Options

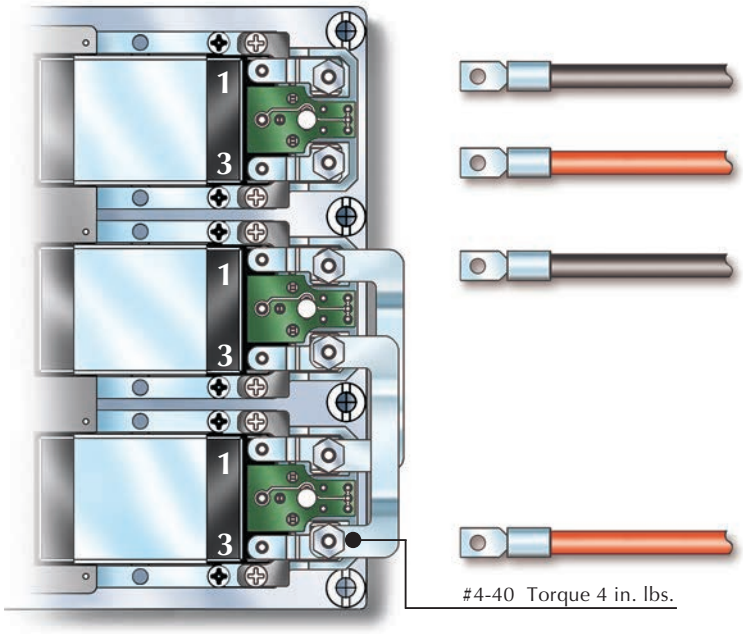
Parallel Output Configurations Shown with the output of two modules connected in parallel using BUS BARS.

LugMate (Factory Installed Option)

Ring Lugs

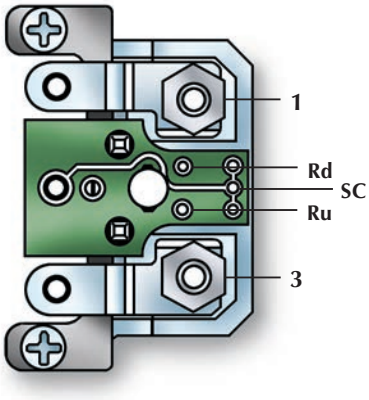
LugMate Pin Out

Micro LugMate

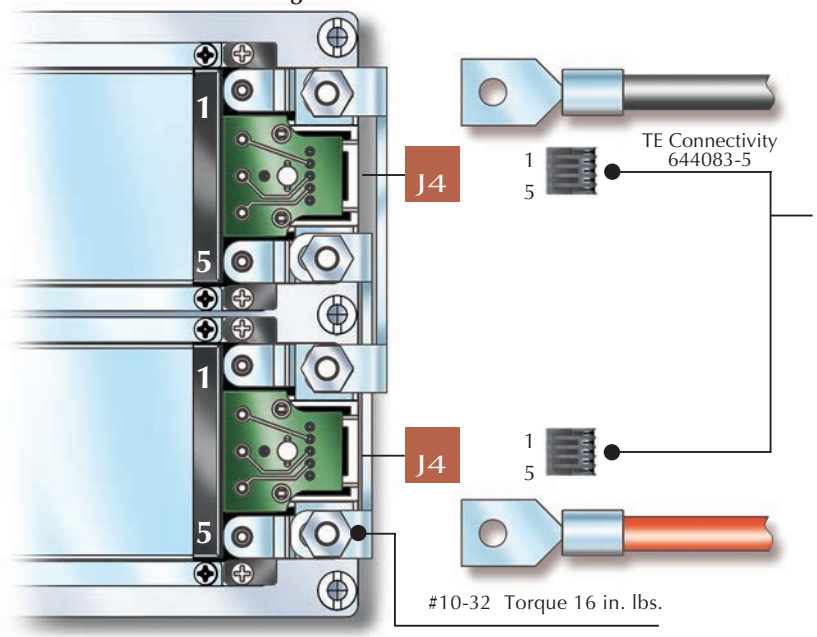


Pin #	Solder Pad	Function
1		– Vout
	Rd	Trim-Down
	SC	Secondary Control
	Ru	Trim-Up
3		+ Vout

Micro LugMate - with Rd/Ru trim resistor solder pads. (Design calculator for trim resistors located at vicorpower.com)



Mini/Maxi LugMate



Pin #	Conn.	Function		Mating Conn.
1		– Vout		
	J4-1	– Vout	*Removable Jumper	TE Connectivity 644083-5
	J4-2	– Sense		
	J4-3	Secondary Control**		
	J4-4	+ Sense	*Removable Jumper	
	J4-5	+ Vout		
5		+ Vout		

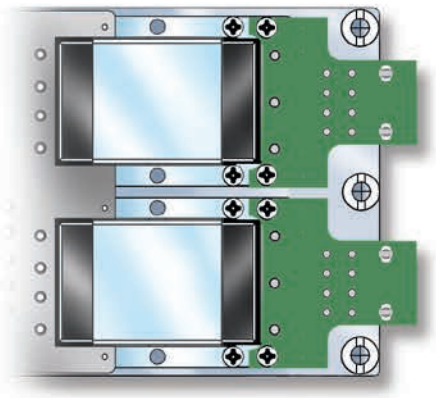
*Removable jumper is factory installed for local sensing. See Pg 22 for details

**For units configured in parallel, one module will have the SC jumped to the –S and –Out.

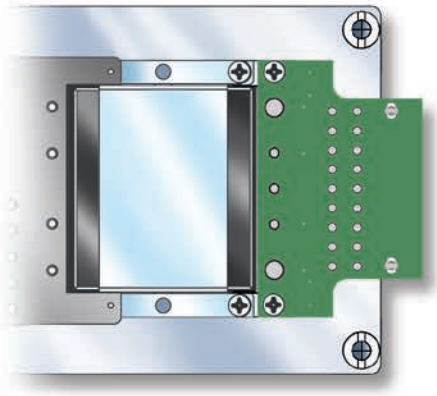
Output Connection Options

PlugMate
(Factory Installed Option)

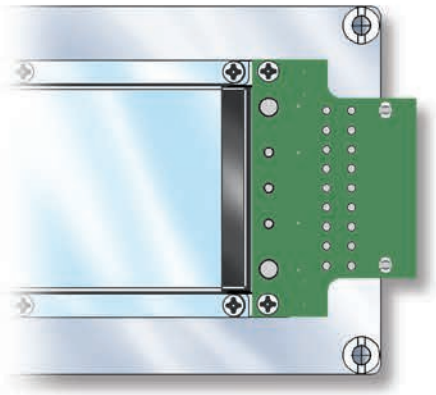
Micro PlugMate



Mini PlugMate



Maxi PlugMate



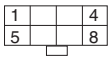
Mating Connector Kits

Vicor P/N 25073

Vicor P/N 25067

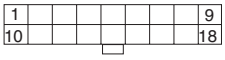
Vicor P/N 25061

PlugMate Pin Out
(Looking into PlugMate)



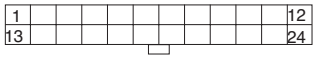
Pin #	Function	Pin #	Function
1	+Vout	5	+Vout
2	+Vout	6	N/C
3	–Vout	7	SC
4	–Vout	8	–Vout

Mating Connector	TE Connectivity P/N	Vicor P/N
Housing	TYC-794657-8	
Pin	1-106529-2	
Kit		25073



Pin #	Function	Pin #	Function
1	+Vout	10	+Vout
2	+Vout	11	+Vout
3	+Vout	12	+Vout
4	N/C	13	+S
5	N/C	14	SC
6	N/C	15	–S
7	–Vout	16	–Vout
8	–Vout	17	–Vout
9	–Vout	18	–Vout

Mating Connector	TE Connectivity P/N	Vicor P/N
Housing	TYC1-794657-8	
Pin	1-106529-2	
Kit		25067

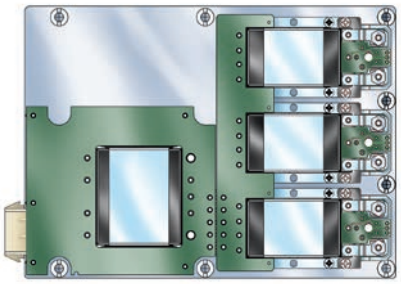


Pin #	Function	Pin #	Function
1	+Vout	13	+Vout
2	+Vout	14	+Vout
3	+Vout	15	+Vout
4	+Vout	16	+Vout
5	+Vout	17	+Vout
6	N/C	18	+S
7	SC	19	–S
8	–Vout	20	–Vout
9	–Vout	21	–Vout
10	–Vout	22	–Vout
11	–Vout	23	–Vout
12	–Vout	24	–Vout

Mating Connector	TE Connectivity P/N	Vicor P/N
Housing	TYC2-794657-4	
Pin	1-106529-2	
Kit		25061

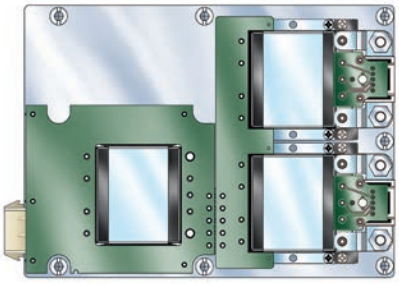
Note:
VIPACs that contain multiple modules configured as a single output (paralleled for power or redundancy) MUST have their Outputs and Sense connected to each other at the load.
DO NOT OPERATE A PARALLEL CONFIGURATION WITH ONLY ONE MODULE CONNECTED.

Chassis Configurations



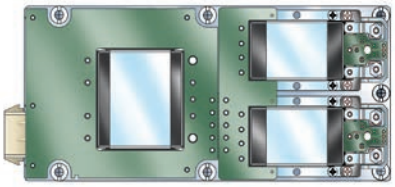
MVC-A / MVX-A

3 MICRO
- 4.96″ x 6.8″ (126,0 x 172,7 mm)
- Dual or Triple Output
- Up to 300 W



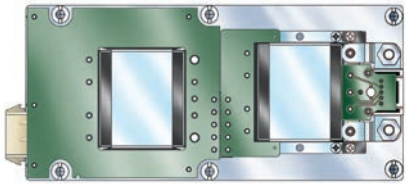
MVC-B / MVX-B

2 MINI
- 4.96″ x 6.8″ (126,0 x 172,7 mm)
- Single or Dual Output
- Up to 400 W



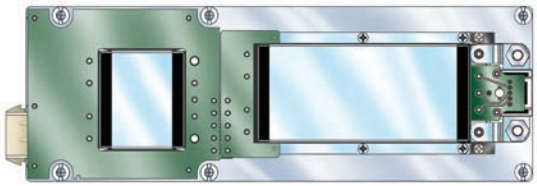
MVC-D / MVX-D

2 MICRO
- 3.15″ x 6.8″ (80,0 x 172,7 mm)
- Single or Dual Output
- Up to 200 W



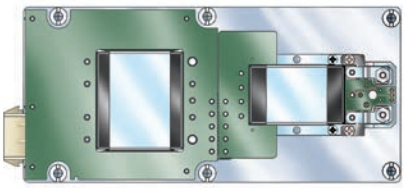
MVC-E / MVX-E

1 MINI
- 3.15″ x 6.8″ (80,0 x 172,7 mm)
- Single Output
- Up to 200 W



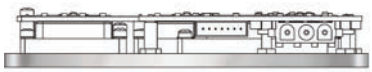
MVC-F / MVX-F

1 MAXI
- 3.15″ x 9.15″ (80,0 x 232,4 mm)
- Single Output
- Up to 400 W

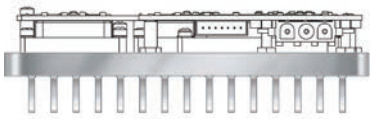


MVC-G / MVX-G

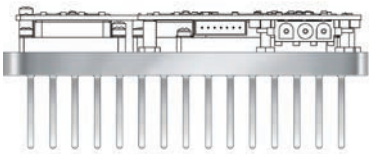
1 MICRO
- 3.15″ x 6.8″ (80,0 x 172,7 mm)
- Single Output
- Up to 100 W



Coldplate



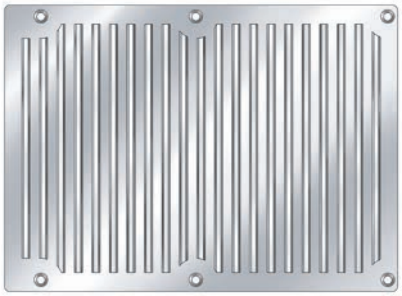
Optional 0.5″ Fin



Optional 1″ Fin

Finned Chassis Configurations

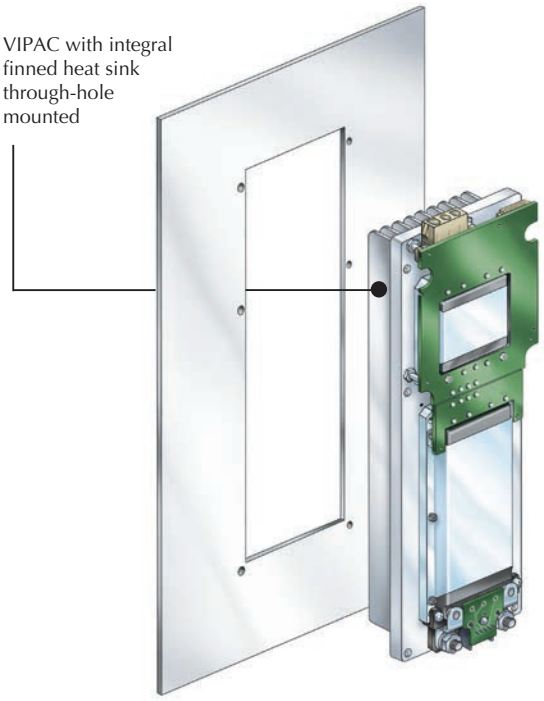
Longitudinal



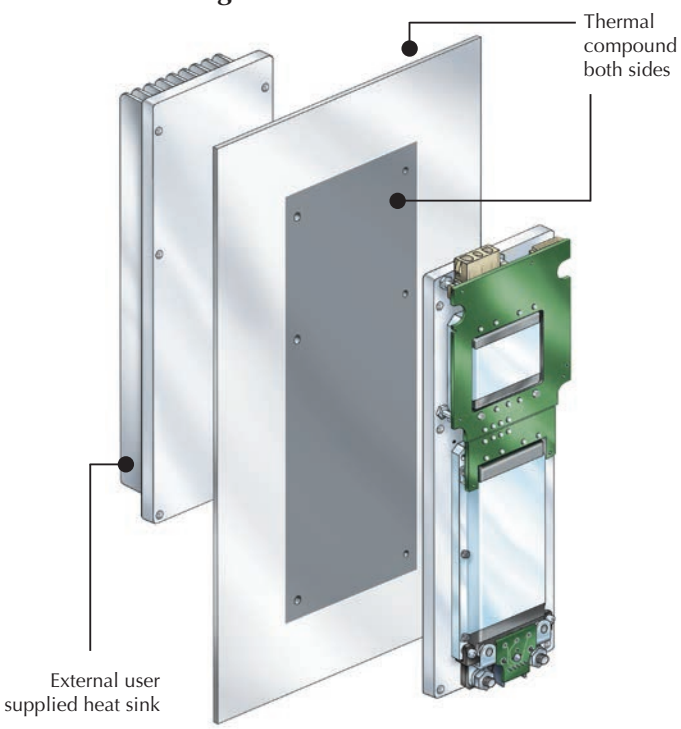
Transverse

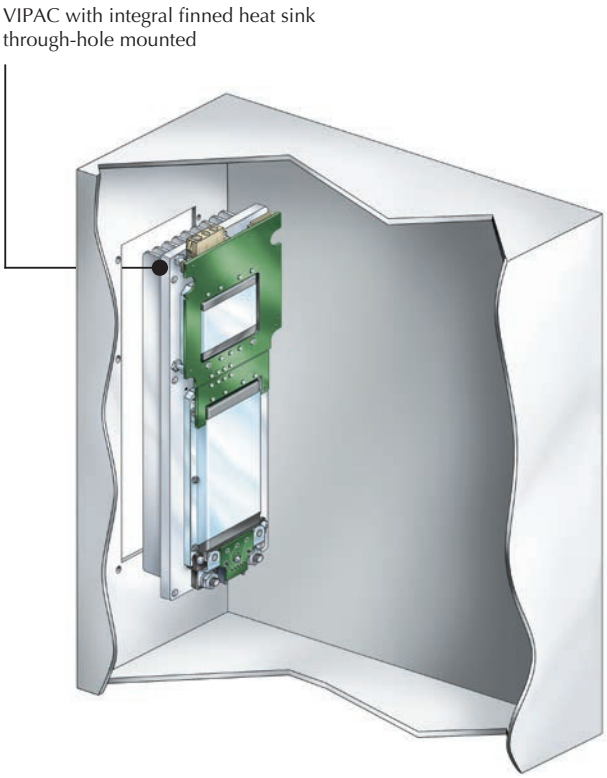
Mounting Options

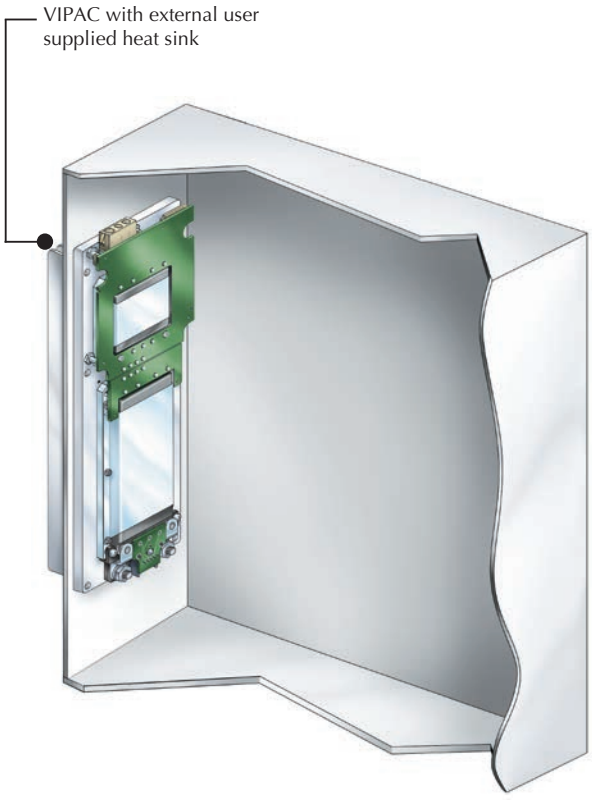
Through-hole Mounting

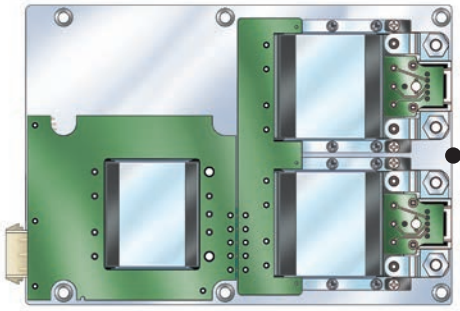


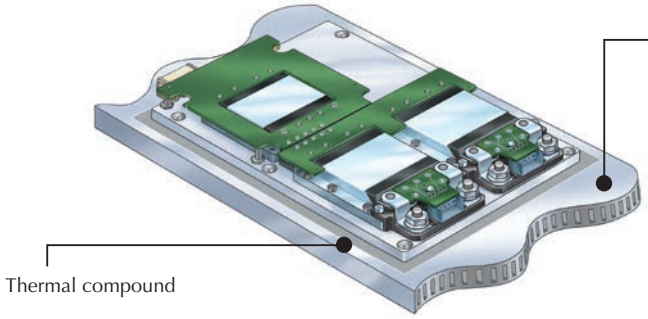
Surface Mounting

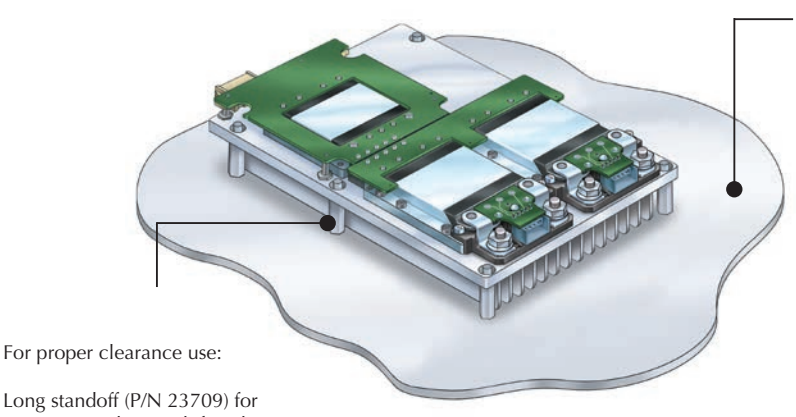








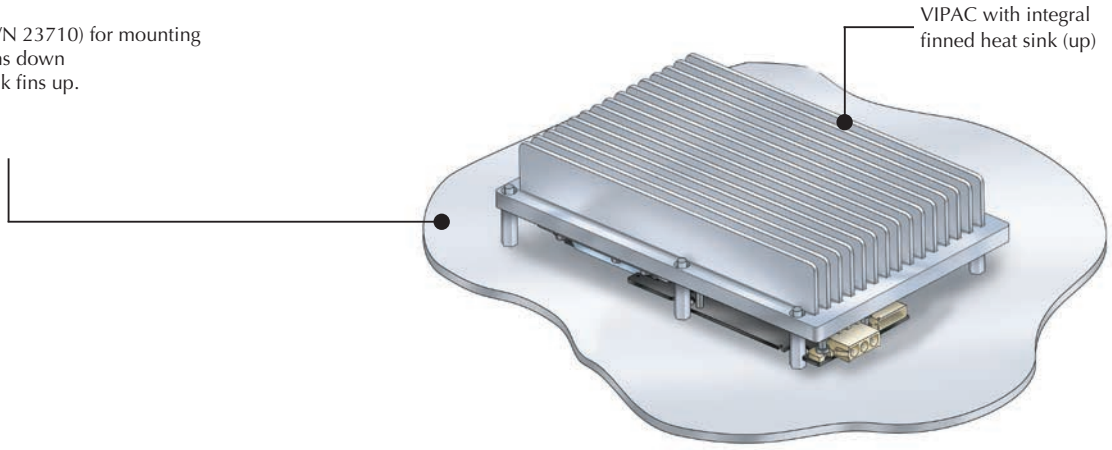




For proper clearance use:

Long standoff (P/N 23709) for
mounting 1″ heat sink fins down.

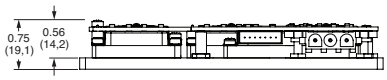
Short standoff (P/N 23710) for mounting
0.5″ heat sink fins down
or either heat sink fins up.



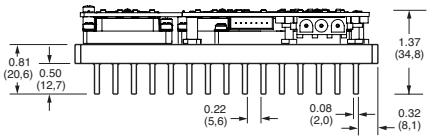
Mechanical Drawings

Please reference the mechanical drawings on the MIL-COTS VIPAC Power System web page at www.vicorpower.com.

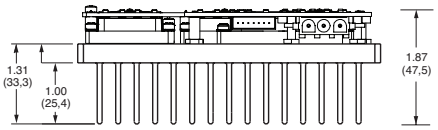
Heat Sink Options



Coldplate



0.5″ Fin Option



1″ Fin Option
Fin spacing and relief
are the same for both Fin options.

Mechanical Information

VIPAC Product Weight

		Chassis Configuration					
VIPAC Model Prefix	**Chassis Configuration**	**Coldplate**		**0.5″ Fins**		**1″ Fins**	
		Pounds	**Grams**	**Pounds**	**Grams**	**Pounds**	**Grams**
MVC-G / MVX-G	1 Micro	0.9	411	1.4	640	1.6	731
MVC-D / MVX-D	2 Micro	1.0	457	1.5	686	1.7	777
MVC-A / MVX-A	3 Micro	1.4	640	2.2	1006	2.5	1143
MVC-E / MVX-E	1 Mini	1.0	457	1.4	640	1.6	731
MVC-B / MVX-B	2 Mini	1.4	640	2.2	1006	2.6	1189
MVC-F / MVX-F	1 Maxi	1.3	594	2.0	914	2.3	1051

VIPAC Standoff Mounting Kits

Vicor Kit P/N	Kit Description	For use with:
23709	Qty. 6-#23655 long standoff	1″ finned heat sinks
23710	Qty. 6-#23656 short standoff	1/2″ finned heat sinks or coldplate

Thermal Impedance Specifications (˚C/W)

VIPAC Model Prefix	Chassis Config.	Heat Sink	Airflow: Natural Convection	200 (LFM)	400 (LFM)	600 (LFM)	800 (LFM)	1000 (LFM)	1200 (LFM)
MVC-A / MVX-A	3 Micro	0.5″ L	1.98	0.77	0.53	0.45	0.39	0.36	0.33
		0.5″ T	1.71	0.68	0.48	0.40	0.36	0.33	0.30
		1.0″ L	1.68	0.58	0.42	0.36	0.32	0.30	0.28
		1.0″ T	1.27	0.46	0.33	0.28	0.25	0.23	0.21
MVC-B / MVX-B	2 Mini	0.5″ L	1.90	0.77	0.53	0.44	0.39	0.36	0.33
		0.5″ T	1.67	0.69	0.48	0.41	0.37	0.33	0.31
		1.0″ L	1.49	0.54	0.39	0.34	0.31	0.28	0.27
		1.0″ T	1.22	0.47	0.33	0.28	0.25	0.23	0.21
MVC-D / MVX-D	2 Micro	0.5″ L	3.13	1.28	0.89	0.74	0.66	0.59	0.54
		0.5″ T	2.40	1.02	0.73	0.63	0.56	0.51	0.47
		1.0″ L	2.81	0.97	0.70	0.60	0.54	0.50	0.46
		1.0″ T	1.87	0.75	0.55	0.47	0.42	0.39	0.35
MVC-E / MVX-E	1 Mini	0.5″ L	3.11	1.26	0.88	0.74	0.65	0.59	0.54
		0.5″ T	2.39	1.01	0.73	0.62	0.56	0.51	0.47
		1.0″ L	2.51	0.87	0.64	0.56	0.51	0.48	0.45
		1.0″ T	1.76	0.70	0.52	0.44	0.40	0.37	0.33
MVC-F / MVX-F	1 Maxi	0.5″ L	2.42	1.02	0.69	0.57	0.50	0.45	0.41
		0.5″ T	1.72	0.77	0.55	0.47	0.42	0.38	0.37
		1.0″ L	2.01	0.72	0.52	0.45	0.41	0.38	0.36
		1.0″ T	1.26	0.53	0.38	0.33	0.29	0.27	0.25
MVC-G / MVX-G	1 Micro	0.5″ L	3.13	1.28	0.89	0.74	0.66	0.59	0.54
		0.5″ T	2.40	1.02	0.73	0.63	0.56	0.51	0.47
		1.0″ L	2.81	0.97	0.70	0.60	0.54	0.50	0.46
		1.0″ T	1.87	0.75	0.55	0.47	0.42	0.39	0.35

Suggested Wire Gauge

Function	Wire Gauge	Application
DC Input/Output Leads	#20	0 A – 3 A
	#18	4 A – 6 A
	#16	7 A – 10 A
	#14	11 A – 15 A
	#12	16 A – 25 A
	#10	26 A – 40 A
	#8	41 A – 65 A
	#6	66 A – 104 A
	#4	105 A – 160 A

Mating Connector Cross Reference

Designator	Description	Manufacturer	Manufacturer Part Number		Crimping Tools		
			Pin	Housing	Wire Size Tool P/N	AMP Hand P/N	Die Set
J1	VIPAC DC Input - 3 Pin	TE Connectivity	193842-1*	770018-1	14 AWG 12 AWG	91506-1 69710-1	N/A 58380-1
J3	VIPAC I/O Interface - 7 Pin	JST	07KR-6S-P			N/A	
J4	VIPAC Output Control - 5 Pin	TE Connectivity	644083-5			N/A	
	Micro PlugMate mating connector 8 pin	TE Connectivity	1-106529-2	794657-8	18-20 AWG	734202-2	N/A
	Mini PlugMate mating connector 18 pin	TE Connectivity	1-106529-2	1-794657-8	18-20 AWG	734202-2	N/A
	Maxi PlugMate mating connector 24 pin	TE Connectivity	1-106529-2	2-794657-4	18-20 AWG	734202-2	N/A

* 770251-3 is an acceptable alternative

Application Tips

Selecting Heat Sinks

VIPAC Power Systems are rated for operation in ambient temperatures up to 65˚C with a maximum chassis temperature of 95˚C. Operation within these limits is essential for long life and users should select an appropriate thermal management system. The thermal performance of a particular VIPAC chassis configuration can be approximated from the thermal resistance of the chassis, ambient operating temperature and total power dissipation, using a few simple formulas shown below.

Thermal Resistance: Refer to pg 20

Ambient Temperature: User specified, not to exceed 65˚C

Power Dissipation: Calculated as: (Pout/Efficiency) –Pout

Example:

Verify a 400 W, 28 Vdc output VIPAC does not exceed 95˚C chassis temperature (Tc).

- MVP-B chassis configuration with 1" transverse heat sink is selected and 200 LFM airflow is provided.
- Thermal resistance (θ) of 0.47˚C/W is obtained from the chart on pg 20.
- Ambient operating temperature (T**A**) specified by the user is 40˚C.
- VIPAC Power System efficiency (η) is 80% overall.

Formula:

$$Tc = \left(\left(\frac{Pout}{\eta} - Pout\right) \times \theta\right) + T_A$$

$$= \left(\left(\frac{400}{0.8} - 400\right) \times 0.47\right) + 40$$

$$= 87^{\circ}C$$

Conclusion:

This VIPAC will operate in the conditions specified and not exceed maximum chassis temperature.

Comment:

Efficiency of a particular VIPAC will depend on the specific output voltages and operating load conditions. In general the efficiency of VIPACs with outputs of 5 Vdc or less is approximately 70% and those with outputs greater than 5 Vdc is 80%. A more accurate calculation can be derived by summing dissipation of each DC-DC converter module used in the VIPAC and the front-end section of the VIPAC (using 95% efficiency for the front end).

VIPAC Power System Dissipation

$$Pdiss = \sum_{1-n} \frac{\frac{Pout(n)}{\eta(n)}}{0.95} - Pout(n)$$

Remote Sense

A remote sense feature is provided on outputs configured with Mini or Maxi sized DC-DC converters. The output sense connections must be terminated either locally or remotely and may not be left open. **The sense lines for VIPACs configured with a single paralleled output must be terminated to the same point**. VIPACs provided with the optional LugMate connectors are configured for local sensing via removable jumpers installed at the factory. The jumpers will need to be removed if access to the secondary control function is made via mating connector TE Connectivity 644083-5 and connections will need to be established for local or remote sensing.

Wire Routing

Avoid routing wires over VIPAC Power System.
Do not bundle Input and Output leads together.

Parallel Outputs

The VIPAC can be configured with parallel modules for increased power or redundancy. When used for increased power, short the SC pin to –Sense on one module. This configures the module as a Booster. The user must properly connect the output and sense terminals (See above). **At no time operate a paralleled output with a load applied only to one module!** ***(See Output Connection Options, pages 10 – 12)***

Contact Us:

For Vicor Global Office Locations and Technical Support, please go to: www.vicorpower.com/contact-us or call 800-735-6200.