VIPAC Array™

Power Systems
Configuration Guide
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Product Overview

The VIPAC Array is a highly flexible system of DC input, power building-blocks that can be configured with as many as four user definable outputs on a low profile, coldplate chassis. VIPAC Array offers the convenience of a prepackaged, chassis mount solution with the performance and power density of Vicor’s Maxi, Mini, Micro Series modules, DC-DC converters.

Using Vicor’s VCAD configuration tool, (vicorpower.com/vcad), designers are able to quickly specify VIPAC Arrays with standard inputs of 24, 28, 48, 72, 110, 150, 300 or 375 Vdc and standard outputs from 2 to 48 Vdc at power levels up to 600 Watts per output. A total of 8 standard chassis configurations offers the user a choice of power and mechanical options to fit most designs. Short cycle time and rapid delivery make VIPAC Array a valuable tool for power system prototyping and development efforts as well.

For technical information refer to “Design Guide & Applications Manual for Maxi, Mini, Micro Family DC-DC Converters and Accessory Modules”

VIPAC Arrays are ideal for use in distributed and modular power systems where power density and reliable operation are critical. A current share option is available on single output models enabling them to be used in applications requiring either redundant operation or kilowatts of power. The 300 and 375 Vdc input versions can be coupled to a bulk AC Front-end to create a modular, scalable power supply serving a variety of power architectures from centralized to distributed. VIPAC Arrays include internal fusing, a global enable / disable function and connectorized input and output terminations to speed system installation while a versatile coldplate chassis simplifies thermal management and mounting.

Vicor’s VCAD configuration tool provides expedited part configuration, part number, price and delivery information by selecting standard Maxi, Mini, and Micro modules for use within the VIPAC Array 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.

* Note: 24, 28, 48, 72, 110, and 150 V input VIPAC Arrays are designed primarily for military COTS and industrial applications and do not carry safety agency approvals.
Product Overview

VA-A
2 MINIS
- 3.62" x 6.69" x 0.78"[a]
  (92,0 x 170,0 x 19,8 mm)
- 1.3 lb (590 g)
- Single or dual output
- Up to 600 W

VA-B
1 MINI, 2 MICROS
- 3.62" x 6.69" x 0.78"[a]
  (92,0 x 170,0 x 19,8 mm)
- 1.3 lb (590 g)
- Single, dual or triple outputs
- Up to 600 W total

VA-C
3 MICROS
- 3.62" x 6.69" x 0.76"[a]
  (92,0 x 170,0 x 19,3 mm)
- 1.1 lb (499 g)
- Dual or triple outputs
- Up to 450 W total

VA-D/J
1 MAXI
- 3.62" x 6.69" x 0.78"[a]
  (92,0 x 170,0 x 19,8 mm)
- 1.1 lb (499 g)
- Single output
- Up to 600 W
- Current share option

VA-E
1 MICRO, 2 MINIS
- 3.62" x 7.52" x 0.78"[a]
  (92,0 x 191,0 x 19,8 mm)
- 1.4 lb (635 g)
- Dual or triple outputs
- Up to 750 W total

VA-F
4 MICROS
- 3.62" x 7.52" x 0.76"[a]
  (92,0 x 191,0 x 19,3 mm)
- 1.3 lb (608 g)
- Dual, triple or quad outputs
- Up to 600 W total

VA-G/K
1 MINI
- 3.62" x 4.39" x 0.78"[a]
  (92,0 x 112,0 x 19,8 mm)
- 0.7 lb (318 g)
- Single output
- Up to 300 W
- Current share option

VA-H
2 MICROS
- 3.62" x 4.39" x 0.78"[a]
  (92,0 x 112,0 x 19,8 mm)
- 0.7 lb (318 g)
- Single or dual outputs
- Up to 300 W

[a] PlugMate version is 0.81" (20.5 mm) in height

Note: Output numbering convention left to right facing output connections.
Model #’s and total output power capabilities are determined using VCAD and are application specific.
**Input / Output Connections**

### Pin# Funct.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Funct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>(-\text{Vin})</td>
</tr>
<tr>
<td>5-7</td>
<td>(+\text{Vin})</td>
</tr>
<tr>
<td>8</td>
<td>NC / PR bus</td>
</tr>
<tr>
<td>9</td>
<td>PE protective earth</td>
</tr>
<tr>
<td>10</td>
<td>Neg. enable</td>
</tr>
<tr>
<td>11-13</td>
<td>(-\text{Vin})</td>
</tr>
<tr>
<td>14-17</td>
<td>(+\text{Vin})</td>
</tr>
<tr>
<td>18</td>
<td>NC / PR bus</td>
</tr>
<tr>
<td>19</td>
<td>PE protective earth</td>
</tr>
<tr>
<td>20</td>
<td>Pos. enable</td>
</tr>
</tbody>
</table>

VA-J and VA-K configurations only (300 and 375 Vin single Maxi or single Mini)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Funct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>(-\text{Vin})</td>
</tr>
<tr>
<td>4-6</td>
<td>(+\text{Vin})</td>
</tr>
<tr>
<td>7</td>
<td>NC</td>
</tr>
<tr>
<td>8</td>
<td>NC / PR bus</td>
</tr>
<tr>
<td>9</td>
<td>PE protective earth</td>
</tr>
<tr>
<td>10</td>
<td>Neg. enable</td>
</tr>
<tr>
<td>11-13</td>
<td>(-\text{Vin})</td>
</tr>
<tr>
<td>14-16</td>
<td>(+\text{Vin})</td>
</tr>
<tr>
<td>17</td>
<td>NC</td>
</tr>
<tr>
<td>18</td>
<td>NC / PR bus</td>
</tr>
<tr>
<td>19</td>
<td>PE protective earth</td>
</tr>
<tr>
<td>20</td>
<td>Pos. enable</td>
</tr>
</tbody>
</table>

To disable output(s) apply +5 Vdc between pins 10 and 20 in the polarity indicated

### Mating Connector

<table>
<thead>
<tr>
<th>Part #</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>2-794657-0</td>
</tr>
<tr>
<td>Contacts</td>
<td>1-106529-2</td>
</tr>
<tr>
<td>Kit</td>
<td>24828</td>
</tr>
</tbody>
</table>

Consult design calculator for Rd/Ru trim resistor values located at vicorpower.com

### Factory installed Micro LugMate

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Solder Pad</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rd</td>
<td>Trim Down</td>
</tr>
<tr>
<td>3</td>
<td>+ Vout</td>
<td></td>
</tr>
</tbody>
</table>

### Factory installed Mini/Maxi LugMate

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Conn.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>– Vout</td>
<td></td>
</tr>
<tr>
<td>J4-1</td>
<td>– Vout</td>
<td></td>
</tr>
<tr>
<td>J4-2</td>
<td>– Sense</td>
<td></td>
</tr>
<tr>
<td>J4-3</td>
<td>Secondary Control</td>
<td></td>
</tr>
<tr>
<td>J4-4</td>
<td>+ Sense</td>
<td></td>
</tr>
<tr>
<td>J4-5</td>
<td>+ Vout</td>
<td></td>
</tr>
</tbody>
</table>

*Removable jumpers in J4 are factory installed for local sensing. For remote sensing the +Sense pins should be tied to the same point on the +Out power bus; the -Sense pins should be tied to the same point the -Out power bus.
### Parallel*** / Redundant Connections*

**Input Connector**

(View looking into J1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Conn.</th>
<th>Function</th>
<th>Mating Conn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>-Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-7</td>
<td>+Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>NC / PR bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PE protective earth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Neg. enable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-13</td>
<td>-Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-17</td>
<td>+Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>NC / PR bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>PE protective earth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Pos. enable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pin#**

1-3
4-6
7
8
9
10
11-13
14-16
17
18
19
20

**Pin# Function**

1-4 –Vin
5-7 +Vin
8 NC / PR bus
9 PE protective earth
10 Neg. enable
11-13 –Vin
14-17 +Vin
18 NC / PR bus
19 PE protective earth
20 Pos. enable

**VA-J and VA-K configurations only**

(300 and 375 Vin single Maxi or single Mini)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Conn.</th>
<th>Function</th>
<th>Mating Conn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>-Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>+Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>NC / PR bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PE protective earth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Neg. enable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-12</td>
<td>–Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-16</td>
<td>+Vin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>NC / PR bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>PE protective earth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Pos. enable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Factory Installed Mini/Maxi LugMate**

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Conn.</th>
<th>Function</th>
<th>Mating Conn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-Vout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J4-1</td>
<td>-Vout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J4-2</td>
<td>-Sense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J4-3</td>
<td>Secondary Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J4-4</td>
<td>+Sense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J4-5</td>
<td>+Vout</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Removable jumpers in J4 are factory installed for local sensing. For remote sensing and redundant parallel arrays as illustrated above the +Sense pins should be tied to the same point on the +Out power bus; the -Sense pins should be tied to the same point the -Out power bus.

** There should be one master module, this is realized by choosing one module to be the master and shorting the SC to –S on the other module. Units configured from the factory as paralleled will already have this configured. This should be verified by direct inspection prior to system integration.

*** There should be one master module, this is realized by choosing one module to be the master and shorting the SC to –S on the other module. This is done by installing a 0Ω resistor in the space provided on the lugmate / plugmate.
Output Connection Options

PlugMate
(Factory Installed Option)

Mating Connector Kits

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Function</th>
<th>Pin #</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vout</td>
<td>5</td>
<td>+Vout</td>
</tr>
<tr>
<td>2</td>
<td>+Vout</td>
<td>6</td>
<td>N/C</td>
</tr>
<tr>
<td>3</td>
<td>–Vout</td>
<td>7</td>
<td>SC</td>
</tr>
<tr>
<td>4</td>
<td>–Vout</td>
<td>8</td>
<td>–Vout</td>
</tr>
</tbody>
</table>

Mating Connector
TE Connectivity
P/N
Vicor P/N

Housing
TYC-794657-8
Pin
1-106529-2
Kit
25073

Please 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. Additionally one module must be designated as “Master” by having all other modules configured as “Boosters”. Boosters are created by shorting the SC pin to –S.
Mounting Options

VIPAC Array with external, user supplied heat sink.

VIPAC Array mounted to cabinet wall with thermal compound between VIPAC Array and cabinet wall.

VIPAC Array mounted to custom thermal interface.

Thermal compound
MECHANICAL DRAWINGS  Coldplate thickness is 0.19" ref for all configurations.

Configuration A

LugMates

LugMates/Bus Bars

PlugMates

Mount (6) pining
#8 flat head screw
(M4 flat head screw)
torque to 12 in. lbs.

#10-32 Stud
fits 2 lugs min
(Vicor P/N 23520)
torque to 16 in. lbs.
4 places

Configuration B

LugMates

LugMates/Bus Bars

PlugMates

#4-40 STUD
fits 2 lugs min
(Vicor P/N 20319)
torque to 4 in. lbs.
4 places

#10-32 STUD
fits 2 lugs min
(Vicor P/N 23520)
torque to 16 in. lbs.
2 places

Mount (6) PL using
#8 flat head screw
(M4 flat head screw)
torque to 12 in. lbs.
Configuration C

LugMates

LugMates/Bus Bars

PlugMates

Configuration D and J

LugMates

PlugMates

#10-32 STUD
FITS 2 LUGS MIN
(VICOR PN 23520)
TORQUE TO 16 in. lbs.
2 PLACES

#4-40 STUD
FITS 2 LUGS MIN
(VICOR PN 23519)
TORQUE TO 4 in. lbs.
6 PLACES

INSULATED
BUS BAR (2 PL)

Mount (6) PL USING
#8 FLAT HEAD SCREW
(M4 FLAT HEAD SCREW)
TORQUE TO 12 in. lbs.

Mount (6) PL USING
#8 FLAT HEAD SCREW
(M4 FLAT HEAD SCREW)
TORQUE TO 12 in. lbs.
Configuration E

LugMates

LugMates/Bus Bars

PlugMates

#10-32 STUD
FITS 2 LUGS MIN
(TORQUE TO 16 in. lbs.
4 PLACES)

#4-40 STUD
FITS 2 LUGS MIN
(TORQUE TO 4 in. lbs.
2 PLACES)

MOUNT (6) PL USING:
#8 FLAT HEAD SCREW
(M4 FLAT HEAD SCREW)
(TORQUE TO 12 in. lbs.)

Configuration F

LugMates

LugMates/Bus Bars

PlugMates

#10-32 STUD
FITS 2 LUGS MIN
(TORQUE TO 16 in. lbs.
4 PLACES)

#4-40 STUD
FITS 2 LUGS MIN
(TORQUE TO 4 in. lbs.
2 PLACES)

MOUNT (6) PL USING:
#8 FLAT HEAD SCREW
(M4 FLAT HEAD SCREW)
(TORQUE TO 12 in. lbs.)
MECHANICAL DRAWINGS

Configuration G and K

**LugMates**

- **#10-32 STUD**
  - FITS 2 LUGS MIN (VICOR PIN 23520)
  - TORQUE TO 16 in. lbs.
  - 2 PLACES

- **Mount (4) PL using #8 FLAT HEAD SCREW (M4 FLAT HEAD SCREW)**
  - TORQUE TO 12 in. lbs.

**PlugMates**

- **#10-32 STUD**
  - FITS 2 LUGS MIN (VICOR PIN 23520)
  - TORQUE TO 16 in. lbs.
  - 2 PLACES

**Configuration H**

**LugMates**

- **#4-40 STUD**
  - FITS 2 LUGS MIN (VICOR PIN 23519)
  - TORQUE TO 4 in. lbs.
  - 4 PLACES

**LugMates/Bus Bars**

- **Mount (4) PL using #8 FLAT HEAD SCREW (M4 FLAT HEAD SCREW)**
  - TORQUE TO 12 in. lbs.

**PlugMates**

- **Mount (4) PL using #8 FLAT HEAD SCREW (M4 FLAT HEAD SCREW)**
  - TORQUE TO 12 in. lbs.
Technical Support Contacts

Vicor's Technical support team is staffed with Applications Engineers to provide the product and application information and technical assistance customers need concerning Vicor products and power solutions. Our facilities house electronics laboratories where Vicor Applications Engineers can evaluate specific customer design issues and offer a wide range of component-based power solutions that include distributed power, current sharing, N + 1 redundancy, thermal management, and compliance with safety and performance standards.

Applications engineers ...  
• Answer technical questions (by phone, fax, email, or the Vicor website).  
• Assist with component-based power system design.  
• Support user needs through visits to Vicor and customer facilities.  
• Help select the most appropriate product for your application.

If you have a specific technical question, call or email an Applications Engineer located at one of our global offices.

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