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, scaleable 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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (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\textsuperscript{[a]} in height
  
  (92.0 x 112.0 x 19.8 mm)
- 0.7 lb (318 g)
- Single or dual outputs
- Up to 300 W

\textsuperscript{[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

### Mating Connector

<table>
<thead>
<tr>
<th>Vicor part #</th>
<th>Amp part#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>24795</td>
</tr>
<tr>
<td>Contacts</td>
<td>24796</td>
</tr>
<tr>
<td>Kit</td>
<td>24828</td>
</tr>
</tbody>
</table>

### 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>Ru</td>
<td>Trim Up</td>
</tr>
</tbody>
</table>

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

### 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>J4-1</td>
<td>– Vout</td>
<td>P/N</td>
</tr>
<tr>
<td>2</td>
<td>J4-2</td>
<td>– Sense</td>
<td>*Removable Jumper</td>
</tr>
<tr>
<td>3</td>
<td>J4-3</td>
<td>Secondary Control</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>J4-4</td>
<td>+ Sense</td>
<td>P/N 16385</td>
</tr>
<tr>
<td>5</td>
<td>J4-5</td>
<td>+ Vout</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>J4-6</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.

**To disable output(s) apply +5 Vdc between pins 10 and 20 in the polarity indicated.**
Parallel*** / Redundant Connections*

**Input Connector**
(View looking into J1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Func.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>–Vin</td>
</tr>
<tr>
<td>5-7</td>
<td>+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>–Vin</td>
</tr>
<tr>
<td>14-17</td>
<td>+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>

**Pin#**

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Func.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>–Vin</td>
</tr>
<tr>
<td>4-6</td>
<td>+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>–Vin</td>
</tr>
<tr>
<td>14-16</td>
<td>+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>Vicor part #</th>
<th>Amp part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>24795</td>
</tr>
<tr>
<td>Contacts</td>
<td>24796</td>
</tr>
<tr>
<td>Kit</td>
<td>24828</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>J4-1</td>
<td>– Vout</td>
<td>P/N 16385</td>
</tr>
<tr>
<td>4</td>
<td>J4-2</td>
<td>– Sense</td>
<td>*Removable Jumper</td>
</tr>
<tr>
<td>3</td>
<td>J4-3</td>
<td>Secondary Control</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>J4-4</td>
<td>+ Sense</td>
<td>*Removable Jumper</td>
</tr>
<tr>
<td>5</td>
<td>J4-5</td>
<td>+ Vout</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>+ Vout</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**  
Amp. P/N       Vicor P/N
Housing   TYC-794657-8  25056
Pin       1-106529-2  24796
Kit       25073

<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>10</td>
<td>+Vout</td>
</tr>
<tr>
<td>2</td>
<td>+Vout</td>
<td>11</td>
<td>+Vout</td>
</tr>
<tr>
<td>3</td>
<td>+Vout</td>
<td>12</td>
<td>+Vout</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
<td>13</td>
<td>+S</td>
</tr>
<tr>
<td>5</td>
<td>N/C</td>
<td>14</td>
<td>SC</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
<td>15</td>
<td>–S</td>
</tr>
<tr>
<td>7</td>
<td>–Vout</td>
<td>16</td>
<td>–Vout</td>
</tr>
<tr>
<td>8</td>
<td>–Vout</td>
<td>17</td>
<td>–Vout</td>
</tr>
<tr>
<td>9</td>
<td>–Vout</td>
<td>18</td>
<td>–Vout</td>
</tr>
</tbody>
</table>

**Mating Connector**  
Amp. P/N       Vicor P/N
Housing   TYC1-794657-8  25050
Pin       1-106529-2  24796
Kit       25067

<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>13</td>
<td>+Vout</td>
</tr>
<tr>
<td>2</td>
<td>+Vout</td>
<td>14</td>
<td>+Vout</td>
</tr>
<tr>
<td>3</td>
<td>+Vout</td>
<td>15</td>
<td>+Vout</td>
</tr>
<tr>
<td>4</td>
<td>+Vout</td>
<td>16</td>
<td>+Vout</td>
</tr>
<tr>
<td>5</td>
<td>+Vout</td>
<td>17</td>
<td>+Vout</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
<td>18</td>
<td>+S</td>
</tr>
<tr>
<td>7</td>
<td>SC</td>
<td>19</td>
<td>–S</td>
</tr>
<tr>
<td>8</td>
<td>–Vout</td>
<td>20</td>
<td>–Vout</td>
</tr>
<tr>
<td>9</td>
<td>–Vout</td>
<td>21</td>
<td>–Vout</td>
</tr>
<tr>
<td>10</td>
<td>–Vout</td>
<td>22</td>
<td>–Vout</td>
</tr>
<tr>
<td>11</td>
<td>–Vout</td>
<td>23</td>
<td>–Vout</td>
</tr>
<tr>
<td>12</td>
<td>–Vout</td>
<td>24</td>
<td>–Vout</td>
</tr>
</tbody>
</table>

**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

Configuration B

LugMates

LugMates/Bus Bars

PlugMates

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

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

Insulated
Bus Bar (2) PL.

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

#10-32 Stud
fits 2 lugs min
(Vicor PN 23520)
torque to 16 in. lbs.
2 places
**MECHANICAL DRAWINGS**

**Configuration C**

**LugMates**

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

**LugMates/Bus Bars**

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

**PlugMates**

- INSULATED BUS BAR (2 PL)

**Configuration D and J**

**LugMates**

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

**PlugMates**

- #8 FLAT HEAD SCREW (M4 FLAT HEAD SCREW)
- TORQUE TO 12 in. lbs.
MECHANICAL DRAWINGS

Configuration G and K

LugMates

PlugMates

INCHES

MM

3.62
92

0.26
6.7

4.39
111.5

3.996
101.5

0.197
5

3.228
82

#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.

Configuration H

LugMates

LugMates/Bus Bars

PlugMates

INCHES

MM

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

MOUNT (4) PL USING
#8 FLAT HEAD SCREW
(M4 FLAT HEAD SCREW)
TORQUE TO 12 in. lbs.

INSULATED
BUS BAR (2) PL
**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.*

**USA**
vicorpower.com

**Vicor Corporation**
(Corporate Headquarters)
25 Frontage Road
Andover, MA 01810-5413

*For General Information*
Tel: 978 470 2900
Fax: 978 475 6715

*For Technical Support*
Tel: 800 927 9474
Fax: 978 749 3341
e-mail: apps@vicorpower.com

*For Sales Support*
U.S. and Canada: 800 735 6200
Fax: 978 475 6715
e-mail: vicorexp@vicorpower.com

**Vicor Corporation**
Lombard, IL
Tel: 630 769 8780
Fax: 630 769 8782

**Vicor Westcor Division**
Sunnyvale, CA
Tel: 408 522 5280
Fax: 408 774 5555
westcorpower.com

**Picor Corporation**
Slatersville, RI
Tel: 401 235 1100
Fax: 401 235 1117
picorpower.com

**Europe**
vicoreurope.com

**Vicor France**
Tel: +33 1 34 52 18 30
0800 419 419 (in France)
Fax: +33 1 34 52 28 30
e-mail: vicorfr@vicorpower.com

**Vicor Germany**
Tel: +49 89 962 439 0
0800 018 29 18 (in Germany)
Fax: +49 89 962 439 39
e-mail: expressde@vicorpower.com

**Vicor Italy**
Tel: +39 02 22 47 23 26
800 899 677 (in Italy)
Fax: +39 02 22 47 31 66
e-mail: vicorit@vicorpower.com

**Vicor U.K.**
Tel: +44 1276 678222
UK: 0800 980 8427
Sweden: 020 794 143
Fax: +44 1276 681269
e-mail: vicoruk@vicorpower.com

**Asia-Pacific**

**Vicor Japan Co., Ltd.**
Tokyo 141-0031 Japan
Tel: +81 3 5487 3880
Fax: +81 3 5487 3885
vicorpowerco.jp

**Vicor Hong Kong**
Tsim Sha Tsui, Hong Kong
vicor-asia.com
Tel: +852 2956 1782
Fax: +852 2956 0782

**Latin America**
Argentina: 800 555 4288
Brazil: 0800 8890 0288
Mexico: 011 52 335 647 7881
Ask the operator to connect you to: 800 735 6200
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