

# Open VPX 3U 3Slot Backplane

## Overview:

Open-VPX provides a versatile, high-speed architecture utilizing the rugged Eurocard form factor. There are backwards-compatibility options with VME/64x with hybrid backplanes.

As VITA 65 (VITA 65.0 and VITA 65.1) OpenVPX backplanes are based upon specific configuration profiles, many designs are customized. However, Rug-Rel offers the 3U VPX configuration as off-the-shelf. Other VPX derivations include VITA 46 (base VPX), VITA 66 for optical, and VITA 67 for RF.



Front Side



Rear Side

## Key Features:

- ❖ Compliant to VITA 46.0 baseline specification
- ❖ OPEN VITA 65 Specification
- ❖ Backplane Profile: BKP3-CEN03-15.2.9-n
- ❖ 3 Slots VPX, 1 Payload Slot, 2 Peripheral Slot
- ❖ M3 studs power entry
- ❖ Reference clock
- ❖ Aux clock
- ❖ System Management Interface (I2CA, I2CB)
- ❖ Input current per backplane
  - VS1 = 28A
  - VS2 = 28A
  - VS3 = 30A

# Open VPX 3U 3Slot Backplane



## Board Specifications:

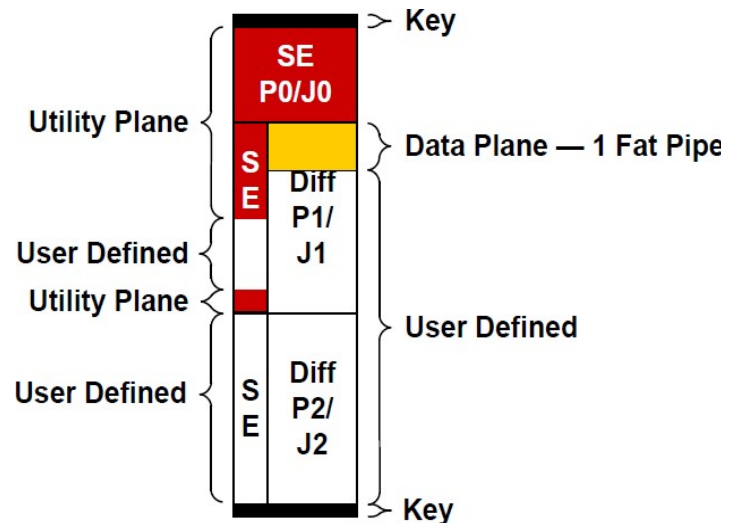
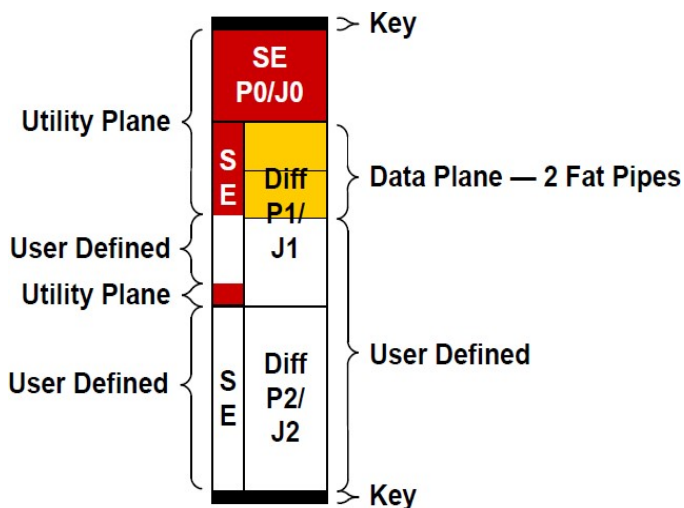
| Architecture  |                   |                                      |
|---------------|-------------------|--------------------------------------|
| Physical      | Dimensions        | Height: 3U                           |
|               |                   | Width: 80mm                          |
|               |                   | Thickness: 5.4mm                     |
|               | Layers            | 14 layers                            |
|               | Connectors        | MultiGig RT-2                        |
| Standards     |                   |                                      |
| VITA          | Type              | VITA 65 for Open VPX                 |
|               | Type              | VITA 465 for VPX Base Specifications |
| Configuration |                   |                                      |
| Power         |                   | 3.3V, 3.3 AUX, 5V, 12V Options       |
| Environmental | Temperature       | Operating Temperature: -40° ~ +85° C |
|               |                   | Storage Temperature: -55°C ~ +90°C   |
|               | Basic Material    | FR406 or equivalent                  |
|               | PCB Traces        | 2oz. power and ground standard       |
|               | Conformal Coating | Optional                             |
| Others        |                   |                                      |
| Warranty      |                   | Two Years                            |

## Slot Profiles:

❖ Slot 1: Payload Slot (SLT3-PAY-2F-14.2.7)

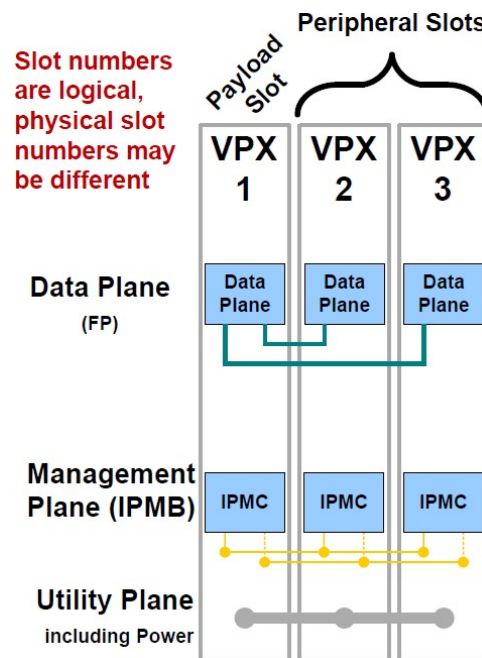
❖ Slot 2: Peripheral Slot (SLT3-PER-1F-14.3.2)

❖ Slot 3: Peripheral Slot (SLT3-PER-1F-14.3.2)

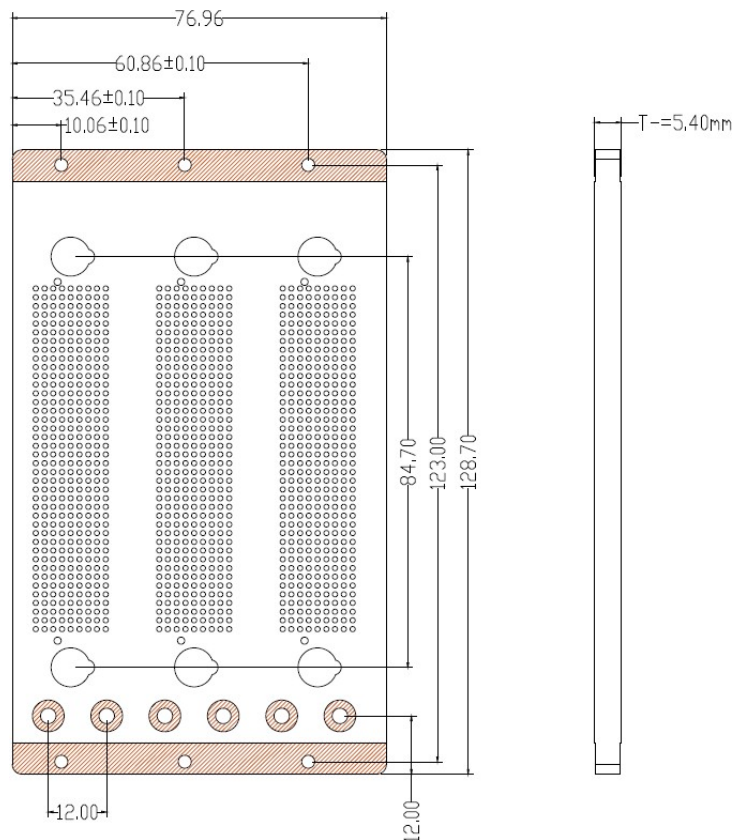


# Open VPX 3U 3Slot Backplane

## Backplane Topology:



## Mechanical Drawings:



## Pin Assignments:

### Utility Plane Signals on J0 VS1=12V , VS2=3.3V , VS3=5V

|   | Row i | Row h    | Row g    | Row f | Row e    | Row d    | Row c     | Row b | Row a |
|---|-------|----------|----------|-------|----------|----------|-----------|-------|-------|
| 1 | Vs1   | Vs1      | Vs1      | Vs1   | No Pad*  | Vs2      | Vs2       | Vs2   | Vs2   |
| 2 | Vs1   | Vs1      | Vs1      | Vs1   | No Pad*  | Vs2      | Vs2       | Vs2   | Vs2   |
| 3 | Vs3   | Vs3      | Vs3      | Vs3   | No Pad*  | Vs3      | Vs3       | Vs3   | Vs3   |
| 4 | GND   | SM2      | SM3      | GND   | -12V_Aux | GND      | SYSRESET* | NVMRO | GND   |
| 5 | GND   | GAP*     | GA4*     | GND   | 3.3V_Aux | GND      | SM0       | SM1   | GND   |
| 6 | GND   | GA3*     | GA2*     | GND   | +12V_Aux | GND      | GA1*      | GA0*  | GND   |
| 7 | TCK   | GND      | GND      | TDO   | TDI      | GND      | GND       | TMS   | TRST* |
| 8 | GND   | REF_CLK- | REF_CLK+ | GND   | GND      | AUX_CLK- | AUX_CLK+  | GND   | GND   |

### Payload Slot Profile SLT3-PAY-2F-14.2.7 — P1 & J1

| Plug-In Module P1 |                   | Row G       | Row F      | Row E    |            | Row D      | Row C      | Row B      |            | Row A      |
|-------------------|-------------------|-------------|------------|----------|------------|------------|------------|------------|------------|------------|
| Bplane J1         |                   | Row i       | Row h      | Row g    | Row f      | Row e      | Row d      | Row c      | Row b      | Row a      |
| 1                 | Data Plane Port 1 | GD iscrete1 | GND        | GND-J1   | DP 01-T 0- | DP 01-T 0+ | GND        | GND-J1     | DP 01-R 0- | DP 01-R 0+ |
| 2                 |                   | GND         | DP 01-T 1- | DP01-T1+ | GND-J1     | GND        | DP 01-R 1- | DP 01-R 1+ | GND-J1     | GND        |
| 3                 |                   | P 1-VB A T  | GND        | GND-J1   | DP 01-T 2- | DP 01-T 2+ | GND        | GND-J1     | DP 01-R 2- | DP 01-R 2+ |
| 4                 |                   | GND         | DP 01-T 3- | DP01-T3+ | GND-J1     | GND        | DP 01-R 3- | DP 01-R 3+ | GND-J1     | GND        |
| 5                 | Data Plane Port 2 | SYS_C ON *  | GND        | GND-J1   | DP 02-T 0- | DP 02-T 0+ | GND        | GND-J1     | DP 02-R 0- | DP 02-R 0+ |
| 6                 |                   | GND         | DP 02-T 1- | DP02-T1+ | GND-J1     | GND        | DP 02-R 1- | DP 02-R 1+ | GND-J1     | GND        |
| 7                 |                   | R eserved   | GND        | GND-J1   | DP 02-T 2- | DP 02-T 2+ | GND        | GND-J1     | DP 02-R 2- | DP 02-R 2+ |
| 8                 |                   | GND         | DP 02-T 3- | DP02-T3+ | GND-J1     | GND        | DP 02-R 3- | DP 02-R 3+ | GND-J1     | GND        |
| 9                 | User Defined      | UD          | GND        | GND-J1   | UD         | UD         | GND        | GND-J1     | UD         | UD         |
| 10                |                   | GND         | UD         | UD       | GND-J1     | GND        | UD         | UD         | GND-J1     | GND        |
| 11                |                   | UD          | GND        | GND-J1   | UD         | UD         | GND        | GND-J1     | UD         | UD         |
| 12                |                   | GND         | UD         | UD       | GND-J1     | GND        | UD         | UD         | GND-J1     | GND        |
| 13                |                   | UD          | GND        | GND-J1   | UD         | DP 04-T 0+ | GND        | GND-J1     | UD         | UD         |
| 14                |                   | GND         | UD         | UD       | GND-J1     | GND        | UD         | UD         | GND-J1     | GND        |
| 15                |                   | Maskable    | GND        | GND-J1   | UD         | UD         | GND        | GND-J1     | UD         | UD         |
| 16                |                   | GND         | UD         | UD       | GND-J1     | GND        | UD         | UD         | GND-J1     | GND        |

### Payload Slot Profile SLT3-PAY-2F-14.2.7 — P2 & J2

| Plug-In Module P2 |              | Row G     | Row F    | Row E    |          | Row D    | Row C    | Row B    |          | Row A    |
|-------------------|--------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Bplane J2         |              | Row i     | Row h    | Row g    | Row f    | Row e    | Row d    | Row c    | Row b    | Row a    |
| 1                 | User Defined | SEwafer1  | GND      | GND-J2   | LN0-TD-  | LN0-TD+  | GND      | GND-J2   | LN0-RD-  | LN0-RD+  |
| 2                 |              | GND       | LN1-TD-  | LN1-TD+  | GND-J2   | GND      | LN1-RD-  | LN1-RD+  | GND-J2   | GND      |
| 3                 |              | SEwafer3  | GND      | GND-J2   | LN2-TD-  | LN2-TD+  | GND      | GND-J2   | LN2-RD-  | LN2-RD+  |
| 4                 |              | GND       | LN3-TD-  | LN3-TD+  | GND-J2   | GND      | LN3-RD-  | LN3-RD+  | GND-J2   | GND      |
| 5                 |              | SEwafer5  | GND      | GND-J2   | LN4-TD-  | LN4-TD+  | GND      | GND-J2   | LN4-RD-  | LN4-RD+  |
| 6                 |              | GND       | LN5-TD-  | LN5-TD+  | GND-J2   | GND      | LN5-RD-  | LN5-RD+  | GND-J2   | GND      |
| 7                 |              | SEwafer7  | GND      | GND-J2   | LN6-TD-  | LN6-TD+  | GND      | GND-J2   | LN6-RD-  | LN6-RD+  |
| 8                 |              | GND       | LN7-TD-  | LN7-TD+  | GND-J2   | GND      | LN7-RD-  | LN7-RD+  | GND-J2   | GND      |
| 9                 |              | SEwafer9  | GND      | GND-J2   | LN8-TD-  | LN8-TD+  | GND      | GND-J2   | LN8-RD-  | LN8-RD+  |
| 10                |              | GND       | LN9-TD-  | LN9-TD+  | GND-J2   | GND      | LN9-RD-  | LN9-RD+  | GND-J2   | GND      |
| 11                |              | SEwafer11 | GND      | GND-J2   | LN10-TD- | LN10-TD+ | GND      | GND-J2   | LN10-RD- | LN10-RD+ |
| 12                |              | GND       | LN11-TD- | LN11-TD+ | GND-J2   | GND      | LN11-RD- | LN11-RD+ | GND-J2   | GND      |
| 13                |              | SEwafer13 | GND      | GND-J2   | LN12-TD- | LN12-TD+ | GND      | GND-J2   | LN12-RD- | LN12-RD+ |
| 14                |              | GND       | LN13-TD- | LN13-TD+ | GND-J2   | GND      | LN13-RD- | LN13-RD+ | GND-J2   | GND      |
| 15                |              | SEwafer15 | GND      | GND-J2   | LN14-TD- | LN14-TD+ | GND      | GND-J2   | LN14-RD- | LN14-RD+ |
| 16                |              | GND       | LN15-TD- | LN15-TD+ | GND-J2   | GND      | LN15-RD- | LN15-RD+ | GND-J2   | GND      |

**Payload Slot Profile SLT3-PER-1F-14.3.2 — P1 & J1**

| Plug-In<br>Module P1 | Row G              | Row F    | Row E    |          | Row D    | Row C    | Row B    |          | Row A    |
|----------------------|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      |                    |          | Even     | Odd      |          |          | Even     | Odd      |          |
| Bplane J1            | Row i              | Row h    | Row g    | Row f    | Row e    | Row d    | Row c    | Row b    | Row a    |
| 1                    | GDiscrete1         | GND      | GND-J1   | DP01-T0- | DP01-T0+ | GND      | GND-J1   | DP01-R0- | DP01-R0+ |
| 2                    | GND                | DP01-T1- | DP01-T1+ | GND-J1   | GND      | DP01-R1- | DP01-R1+ | GND-J1   | GND      |
| 3                    | P1-VBAT            | GND      | GND-J1   | DP01-T2- | DP01-T2+ | GND      | GND-J1   | DP01-R2- | DP01-R2+ |
| 4                    | GND                | DP01-T3- | DP01-T3+ | GND-J1   | GND      | DP01-R3- | DP01-R3+ | GND-J1   | GND      |
| 5                    | SYS_CON*           | GND      | GND-J1   | UD       | UD       | GND      | GND-J1   | UD       | UD       |
| 6                    | GND                | UD       | UD       | GND-J1   | GND      | UD       | UD       | GND-J1   | GND      |
| 7                    | Reserved           | GND      | GND-J1   | UD       | UD       | GND      | GND-J1   | UD       | UD       |
| 8                    | GND                | UD       | UD       | GND-J1   | GND      | UD       | UD       | GND-J1   | GND      |
| 9                    | UD                 | GND      | GND-J1   | UD       | UD       | GND      | GND-J1   | UD       | UD       |
| 10                   | GND                | UD       | UD       | GND-J1   | GND      | UD       | UD       | GND-J1   | GND      |
| 11                   | UD                 | GND      | GND-J1   | UD       | UD       | GND      | GND-J1   | UD       | UD       |
| 12                   | GND                | UD       | UD       | GND-J1   | GND      | UD       | UD       | GND-J1   | GND      |
| 13                   | UD                 | GND      | GND-J1   | UD       | UD       | GND      | GND-J1   | UD       | UD       |
| 14                   | GND                | UD       | UD       | GND-J1   | GND      | UD       | UD       | GND-J1   | GND      |
| 15                   | Maskable<br>Reset* | GND      | GND-J1   | UD       | UD       | GND      | GND-J1   | UD       | UD       |
| 16                   | GND                | UD       | UD       | GND-J1   | GND      | UD       | UD       | GND-J1   | GND      |

**Payload Slot Profile SLT3-PER-1F-14.3.2 — P2 & J2**

| Plug-In<br>Module P2 | Row G     | Row F    | Row E    |          | Row D    | Row C    | Row B    |          | Row A    |
|----------------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      |           |          | Even     | Odd      |          |          | Even     | Odd      |          |
| Bplane J2            | Row i     | Row h    | Row g    | Row f    | Row e    | Row d    | Row c    | Row b    | Row a    |
| 1                    | SEwafer1  | GND      | GND-J2   | LN0-TD-  | LN0-TD+  | GND      | GND-J2   | LN0-RD-  | LN0-RD+  |
| 2                    | GND       | LN1-TD-  | LN1-TD+  | GND-J2   | GND      | LN1-RD-  | LN1-RD+  | GND-J2   | GND      |
| 3                    | SEwafer3  | GND      | GND-J2   | LN2-TD-  | LN2-TD+  | GND      | GND-J2   | LN2-RD-  | LN2-RD+  |
| 4                    | GND       | LN3-TD-  | LN3-TD+  | GND-J2   | GND      | LN3-RD-  | LN3-RD+  | GND-J2   | GND      |
| 5                    | SEwafer5  | GND      | GND-J2   | LN4-TD-  | LN4-TD+  | GND      | GND-J2   | LN4-RD-  | LN4-RD+  |
| 6                    | GND       | LN5-TD-  | LN5-TD+  | GND-J2   | GND      | LN5-RD-  | LN5-RD+  | GND-J2   | GND      |
| 7                    | SEwafer7  | GND      | GND-J2   | LN6-TD-  | LN6-TD+  | GND      | GND-J2   | LN6-RD-  | LN6-RD+  |
| 8                    | GND       | LN7-TD-  | LN7-TD+  | GND-J2   | GND      | LN7-RD-  | LN7-RD+  | GND-J2   | GND      |
| 9                    | SEwafer9  | GND      | GND-J2   | LN8-TD-  | LN8-TD+  | GND      | GND-J2   | LN8-RD-  | LN8-RD+  |
| 10                   | GND       | LN9-TD-  | LN9-TD+  | GND-J2   | GND      | LN9-RD-  | LN9-RD+  | GND-J2   | GND      |
| 11                   | SEwafer11 | GND      | GND-J2   | LN10-TD- | LN10-TD+ | GND      | GND-J2   | LN10-RD- | LN10-RD+ |
| 12                   | GND       | LN11-TD- | LN11-TD+ | GND-J2   | GND      | LN11-RD- | LN11-RD+ | GND-J2   | GND      |
| 13                   | SEwafer13 | GND      | GND-J2   | LN12-TD- | LN12-TD+ | GND      | GND-J2   | LN12-RD- | LN12-RD+ |
| 14                   | GND       | LN13-TD- | LN13-TD+ | GND-J2   | GND      | LN13-RD- | LN13-RD+ | GND-J2   | GND      |
| 15                   | SEwafer15 | GND      | GND-J2   | LN14-TD- | LN14-TD+ | GND      | GND-J2   | LN14-RD- | LN14-RD+ |
| 16                   | GND       | LN15-TD- | LN15-TD+ | GND-J2   | GND      | LN15-RD- | LN15-RD+ | GND-J2   | GND      |

# Open VPX 3U 3Slot Backplane

## JTAG:

| Position | Pin Number | Description |
|----------|------------|-------------|
| CN2      | 1          | 3V3_AUX     |
|          | 2          | TMS         |
|          | 3          | GND         |
|          | 4          | TCK         |
|          | 5          | GND         |
|          | 6          | TDO         |
|          | 7          | GND         |
|          | 8          | TDI         |
|          | 9          | GND         |
|          | 10         | TRST        |



## I2C Connector:

| Position | Pin Number | Description |
|----------|------------|-------------|
| CN3      | 1          | I2C_A_CLK   |
|          | 2          | I2C_B_CLK   |
|          | 3          | GND         |
|          | 4          | GND         |
|          | 5          | I2C_A_SDA   |
|          | 6          | I2C_B_SDA   |
|          | 7          | 3V3_AUX     |
|          | 8          | 3V3_AUX     |
|          | 9          | GND         |
|          | 10         | GND         |



## NVMRO:

| Position | Pin Number | Description |
|----------|------------|-------------|
| SW2      | 1          | Empty       |
|          | 2          | GND         |
|          | 3          | NVMRO       |
|          | 4          | Empty       |



# Open VPX 3U 3Slot Backplane

## ***SYSCON:***

| Position | Pin Number | Description  |  |
|----------|------------|--------------|-------------------------------------------------------------------------------------|
| SW1      | 1          | GND          |                                                                                     |
|          | 2          | GND          |                                                                                     |
|          | 3          | Slot3_SYSCON |                                                                                     |
|          | 4          | Empty        |                                                                                     |

| Position | Pin Number | Description  |  |
|----------|------------|--------------|-------------------------------------------------------------------------------------|
| SW3      | 1          | GND          |                                                                                     |
|          | 2          | GND          |                                                                                     |
|          | 3          | Slot1_SYSCON |                                                                                     |
|          | 4          | Slot2_SYSCON |                                                                                     |

## ***SYS RESET:***

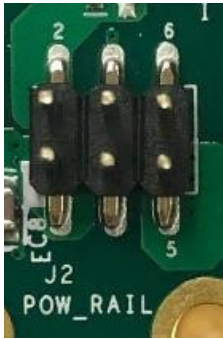
| Position | Pin Number | Description |  |
|----------|------------|-------------|---------------------------------------------------------------------------------------|
| J320     | 1          | SYSRESET    |                                                                                       |
|          | 2          | GND         |                                                                                       |
|          | 3          | GND         |                                                                                       |
|          | 4          | GND         |                                                                                       |

## ***Power Stubs M3:***

| Position | Pin Number | Description |  |
|----------|------------|-------------|---------------------------------------------------------------------------------------|
| Stubs M3 | H9         | +12V        |                                                                                       |
|          | H10        | 3V3_AUX     |                                                                                       |
|          | H11        | +3.3V       |                                                                                       |
|          | H12        | GND         |                                                                                       |
|          | H13        | +5V         |                                                                                       |
|          | H14        | GND         |                                                                                       |

# Open VPX 3U 3Slot Backplane

## Power:

| Position | Pin Number | Description |  |
|----------|------------|-------------|-------------------------------------------------------------------------------------|
| J2       | 1          | P12V_AUX    |                                                                                     |
|          | 2          | VBAT        |                                                                                     |
|          | 3          | GND         |                                                                                     |
|          | 4          | VBAT_GND    |                                                                                     |
|          | 5          | N12V_AUX    |                                                                                     |
|          | 6          | Empty       |                                                                                     |

## ORDERING INFORMATION:

| Part Number   | Description                   |
|---------------|-------------------------------|
| BPCB-0313-169 | Open VPX 3U, 3-Slot Backplane |