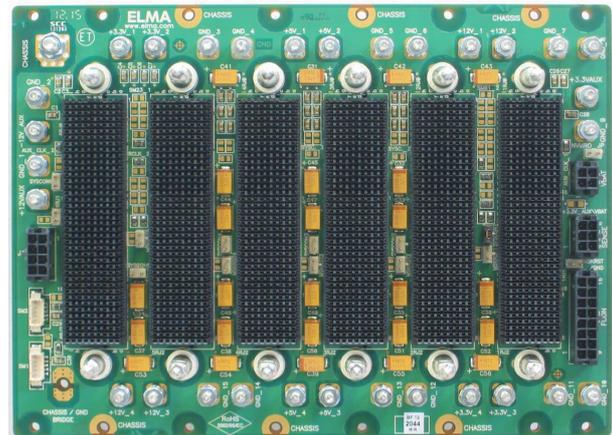
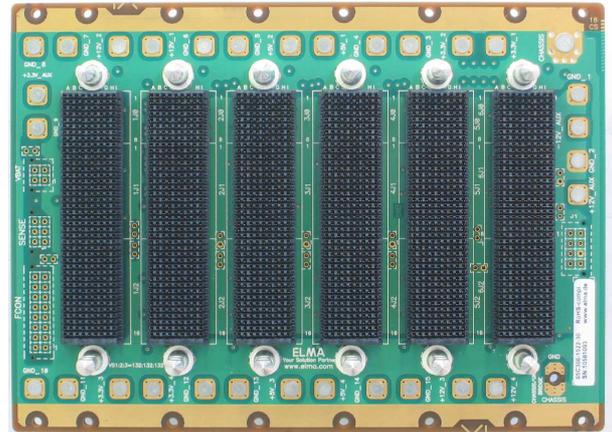


OPEN VPX (VITA 65) 3U, 6 Slots

BP: 65c306-15212-30

Key features:

- Topology: **Centralized**
- **VPX Backplane Profile compliant to the VITA 65 specification: BKP3-CEN06-15.2.12-n**
- Backplane is supporting subsidiary specifications for protocols as:
Serial Rapid IO (VITA 46.3), PCI Express (VITA 46.4), Gigabit Ethernet Control Plane (VITA 46.6)
- High flexibility allowing applications to dictate the necessary fabric mapping
- High-speed Multi-gig connector in centralised topology
- Rugged Eurocard form factor in 3U height
- Designed to support Rear Transition Modules according to the VITA 46.10 specification
- **Universal Ground Pattern according to the VITA 65 (OpenVPX)**
- System Management interface on the backplane (VITA 46.11)



About this backplane:

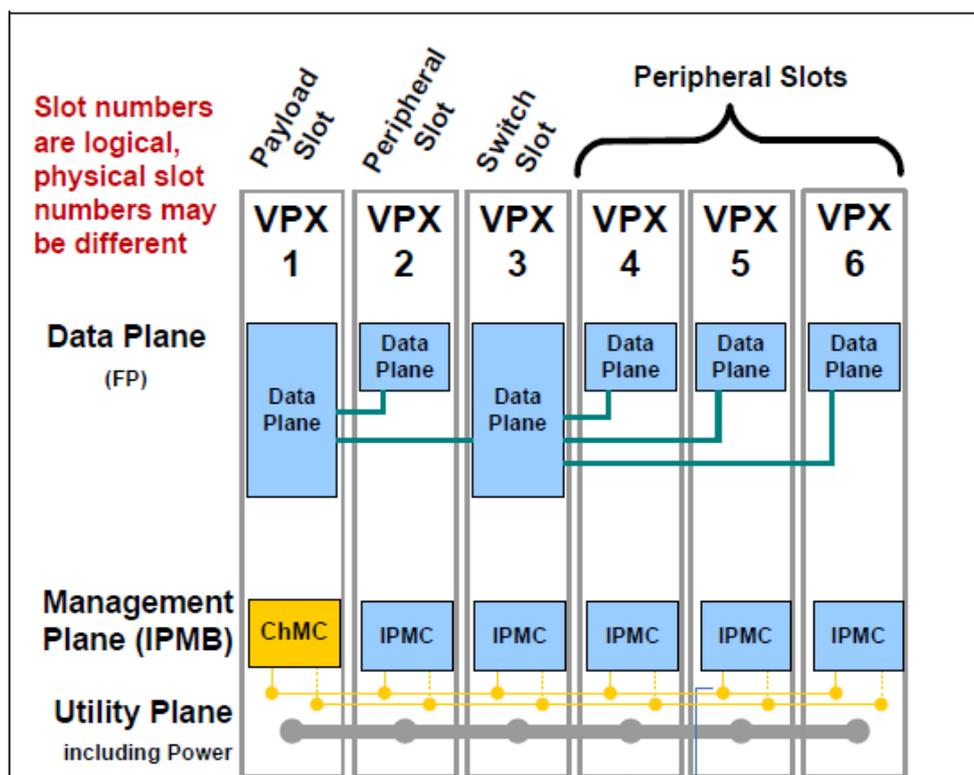
- 16 layer stripline design
- 3U height
- 6 Slots
- Slot Pitch: 1,0" (25.4mm)
- PCB size: 176,55mm x 128,7mm
- PCB thickness: 5.4mm (+/- 10%)
- PCB material: NELCO 4000-13 (Hi-Tg)

OPEN VPX (VITA 65) 3U, 6 Slots

BP: 65c306-15212-30

Backplane Interconnection Diagram of the "OpenVPX Backplane Profile" BKP3-CEN06-15.2.12

- **The Data Plane** is connected in a Centralized Topology. Switch Slot (situated in Slot 3) communicates with 1 Payload (slot 1) and 3 Peripheral slots via **1 x FP (Fat Pipe = 4 x Lanes)**. Another dedicated Fat Pipe is connected between one Payload and one Peripheral (slot 1 and slot2).
- Rear I/O access is available on all 6 slots
- **Universal Ground Pattern** defined by VITA 65 (OpenVPX) is allowing the Backplane compatibility with either Differential or Single Ended Plug-In Module connectors.
- **The Switch Slot** (Slot 3) conforms with the "OpenVPX Slot Profile": **SLT3-SWH-4F-14.4.4**
- **The Payload Slots** (Slot 1) conform with the "OpenVPX Slot Profile": **SLT3-PAY-2F-14.2.7**
- Each of the 4 x VPX **Peripheral Slots** (Slot 2, 4, 5 and 6) conform with the "OpenVPX Slot Profile": **SLT3-PER-1F-14.3.2**



OPEN VPX (VITA 65) 3U, 6 Slots

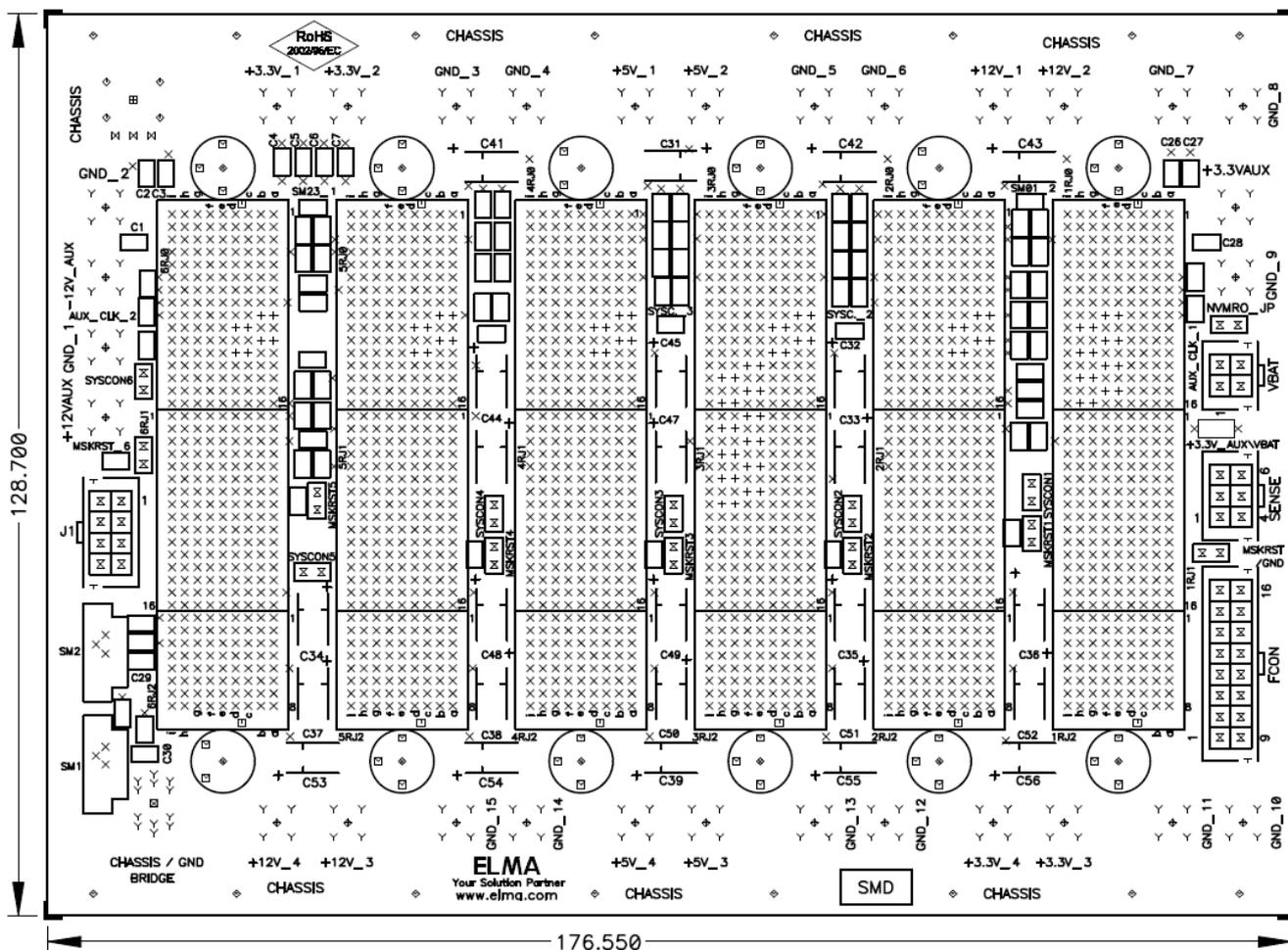
BP: 65c306-15212-30

P0	SINGLE ENDED CONNECTOR	UTILITY CONNECTOR	SLOT1		SLOT2		SLOT3		SLOT4		SLOT5		SLOT6		AUX. VOLTAGES:		
			VS1	VS2	VS1	VS2	VS1										
1			VS1	VS2	VS1	VS2	+12V										
2			VS1	VS2	VS1	VS2	+3.3V										
3			VS3		VS3		VS3		VS3		VS3		VS3		VS3		+5V
4			UTILITY SIGNALS		UTILITY SIGNALS		UTILITY SIGNALS		UTILITY SIGNALS		UTILITY SIGNALS		UTILITY SIGNALS				
5			AUX. VOLTAGES		AUX. VOLTAGES		AUX. VOLTAGES		AUX. VOLTAGES		AUX. VOLTAGES		AUX. VOLTAGES				
6																	
7																	
8																	
P1	DIFFERENTIAL CONNECTOR	DP01 FAT PIPE	DP01-TX	DP01-RX	DP01-RX	DP01-TX	DP02-RX	DP02-TX	DP03-TX	DP03-RX	DP04-TX	DP04-RX	DP05-TX	DP05-RX			
		DP02 FAT PIPE	DP02-TX	DP02-RX			DP03-RX	DP03-TX									
		UD	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	DP04-RX	DP04-TX	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O
		UD	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	DP05-RX	DP05-TX	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
P2	DIFFERENTIAL CONNECTOR	UD	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O										
		UD	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O										
		UD	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O										
		UD	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O	VITA65 I/O										
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				
	SINGLE ENDED		SLOT 1		SLOT 2		SLOT 3		SLOT 4		SLOT 5		SLOT 6				

General considerations:

- ❖ A channel comprised of **four** bi-directional links is referred to as a **"Fat Pipe" (FP)**
 - ❖ A channel comprised of **two** bi-directional links is referred to as a **"Thin Pipe" (TP)**
 - ❖ A channel comprised of **one** bi-directional link is referred to as a **"Ultra Thin Pipe" (UTP)**
- **4 links = 8 differential pairs / channel**
 - Dedicated High-speed "Multi-Gig RT-2" connectors for up to 6.4 Gbps data rate are used in all six Slots (J0, J1, J2 connectors)

Backplane Mechanical Drawing (Rear View)



- Alignment / Keying modules for all VPX slots.
Alignment Keys 1 & 2 provide a specific unique keying for each slot.

By default assembled:

	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Alignment Key 1	270	315	0	45	90	270
Alignment Key 2	270	270	270	270	270	315

OPEN VPX (VITA 65) 3U, 6 Slots

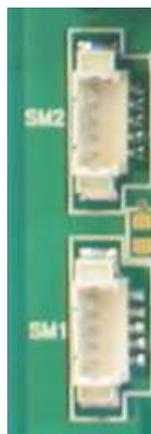
BP: 65c306-15212-30

- Power studs:
 - M3 type (protruding on BP rear)
 - M4 type (protruding on BP rear)

- Current capability:
 - +12V → 44Amp/slot → 220Amp/BP
 - +3.3V → 22Amp/Slot → 110Amp/BP
 - +5V → 22Amp/slot → 110Amp/BP

- **Additional power connections for external voltages, power studs M3 type :**
 - -12V_AUX
 - +3.3V_AUX
 - +12V_AUX

- System management connection : IPMB bus signals are routed to two 5-pin System Management bus extension connectors on the backplane, according to the VITA 38 specification ("System Management on VME"):



	<u>SM1</u>
1	SM0
2	GND
3	SM1
4	+5V
5	nc

	<u>MS2</u>
1	SM2
2	GND
3	SM3
4	+5V
5	nc

- System Controller (SYS_CON) signal, by default grounded at leftmost slot (slot 1) which is configured as System Controller.

OPEN VPX (VITA 65) 3U, 6 Slots

BP: 65c306-15212-30

- Very robust connectors Molex Micro-fit connectors (44914 series) for:

- Power Supply Sense Lines (SENSE)
- JTAG (J1)
- Auxiliary Voltage from Battery (VBAT)
- Monitoring (FCON)



J1	
1	TMS
2	TDO
3	+3.3VAUX
4	TRST
5	TCK
6	TDI
7	GND
8	—

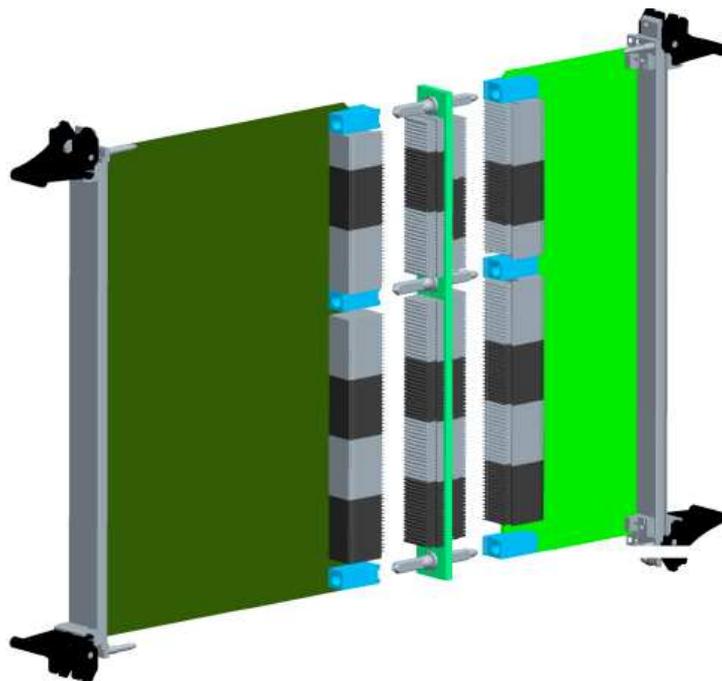
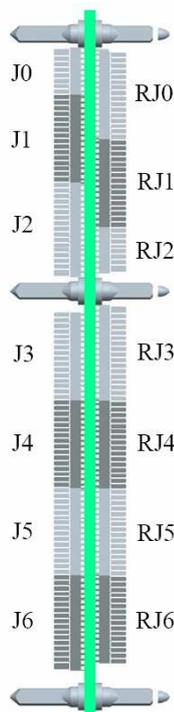


VBAT	
1	—
2	+3.3VAUX
3	GND
4	VBAT

SENSE	
1	+12V_SENSE
2	+5V_SENSE
3	+3.3V_SENSE
4	GND_SENSE
4	GND_SENSE
4	GND_SENSE

FCON	
1	GND
2	GND
3	GND
4	GND
5	GND
6	GND
7	GND
8	GND
9	SYSRES
10	—
11	—
12	+5V
13	+3.3VAUX
14	+12V
15	+12VAUX
16	-12VAUX

- BP is supporting Rear Transition Modules according to the VITA 46.10 specification ("Rear Transition Module on VPX"). **Rear I/O access is available on RP0, RP1 and RP2**





OPEN VPX (VITA 65) 3U, 6 Slots

BP: 65c306-15212-30

Designed to meet the following VPX Specifications:

- **ANSI/VITA 65 (OpenVPX System Specification) - approved in September 2011**
- **ANSI VITA 46.0** (VPX Baseline Standard) – **approved in October 2007**
- VITA 46.3 (Serial RapidIO on VPX Fabric Connector) – vita draft standard for trial use
- VITA 46.4 (PCIExpress on VPX Fabric Connector) – vita draft standard for trial use
- VITA 46.6 (Gigabit Ethernet Control Plane on VPX) – vita draft standard for trial use
- **VITA 46.7** (Ethernet on VPX Fabric Connector) – **approved in March 2012**
- VITA 46.8 (Infiniband on VPX Fabric Connector) – vita draft standard for trial use
- **VITA 46.10** (Rear Transition Module on VPX) – **approved in December 2009**
- VITA 46.11 (System Management on VPX) – vita draft

**Note: Additional Active VPX Specifications
(but not relevant for this Elma Backplane):**

- VITA 46.20 (Switch Slot Definition) – draft phase
- VITA 62 (VPX Power Supply Standard) - draft phase
- **VITA 67 (Coaxial Interconnect on VPX) - approved in January 2012**



OPEN VPX (VITA 65) 3U, 6 Slots

BP: 65c306-15212-30

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Benefits of VPX (VITA 46) and OPEN VPX (VITA 65):

Open VPX defines a reliable and transparent way to ensure the interoperability between the VPX Modules from different vendors as well as the compatibility between certain BP- and Slot configurations with similar VPX modules.

Due to the new Open VPX (VITA 65) specification, the possible various backplane configurations have been reduced to a suitable minimum. Nevertheless those so-called "backplane profiles" are giving clear information about the data rate, routing topology and the fabric topology that has to be used on the backplane.

For many applications, the data transmission rate and vibration resistance of the conventional parallel VME64x technology are no longer adequate. Consequently, solutions based on VITA 46 / VPX are targeted especially at aviation and defence technology applications thanks to their inherent shock and vibration resistance. Due to the constantly increasing demand, ELMA has expanded its product range once again. A variety of basic systems using three different cooling concepts – convection, conduction and liquid cooling – cover all significant application areas in this category.

The special backplane plug-and-socket connectors, which are compliant with the VITA 46 specification, already support data transmission rates up to 10 Gbps and thus guarantee a long product life cycle. The connectors employ differential wafer technology to ensure reliable contact between the backplane and the daughter cards. This improves the data transmission characteristics and prevents bending of the pins when the cards are exchanged. This technology enables field exchange while at the same time yielding low maintenance costs.

Another special feature of VPX is the possibility of using a rear transition module with a form factor as low as 3U. This makes it possible to implement systems, including I/O cards, with space-saving, low-weight constructions.