



## Product Information

### CK2-SESSION

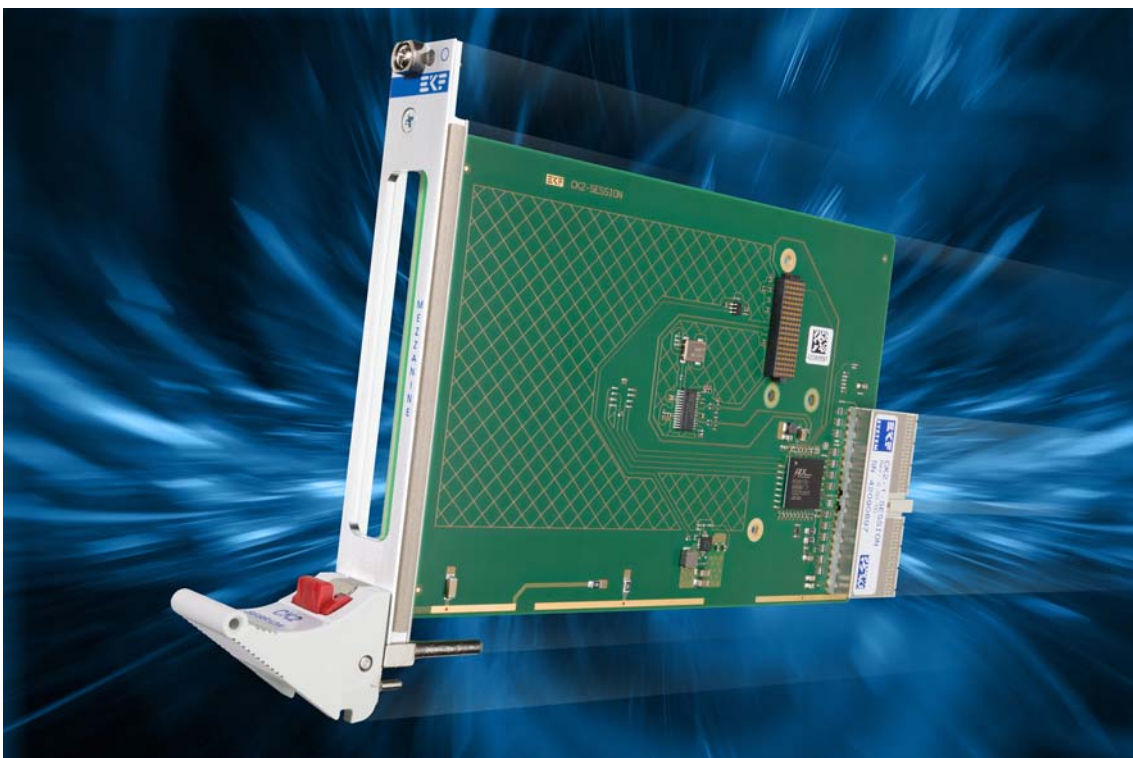
**CompactPCI®** • XMC Module Carrier

Document No. 6845 • 15 August 2013

#### General

*The CK2-SESSION is a peripheral slot board for PICMG® CompactPCI® Classic systems and acts as carrier card for a XMC-style mezzanine module. XMC modules are specified by ANSI/VITA 42, and can be considered as an improved replacement for PMC modules. While using the same form factor as PMC cards, XMC modules are provided with a PCI Express® interface.*

The CK2-SESSION is equipped with a PCI® to PCI Express® bridge, for conversion of data from the parallel CompactPCI® backplane, to the on-board PCIe serial link. Due to bandwidth limitations on the classic cPCI backplane, a single PCI Express® lane is sufficient for data I/O. Hence, the CK2-SESSION is well suited as a carrier for low to medium performance XMC modules (UART, Ethernet and other I/O).



CK2-SESSION

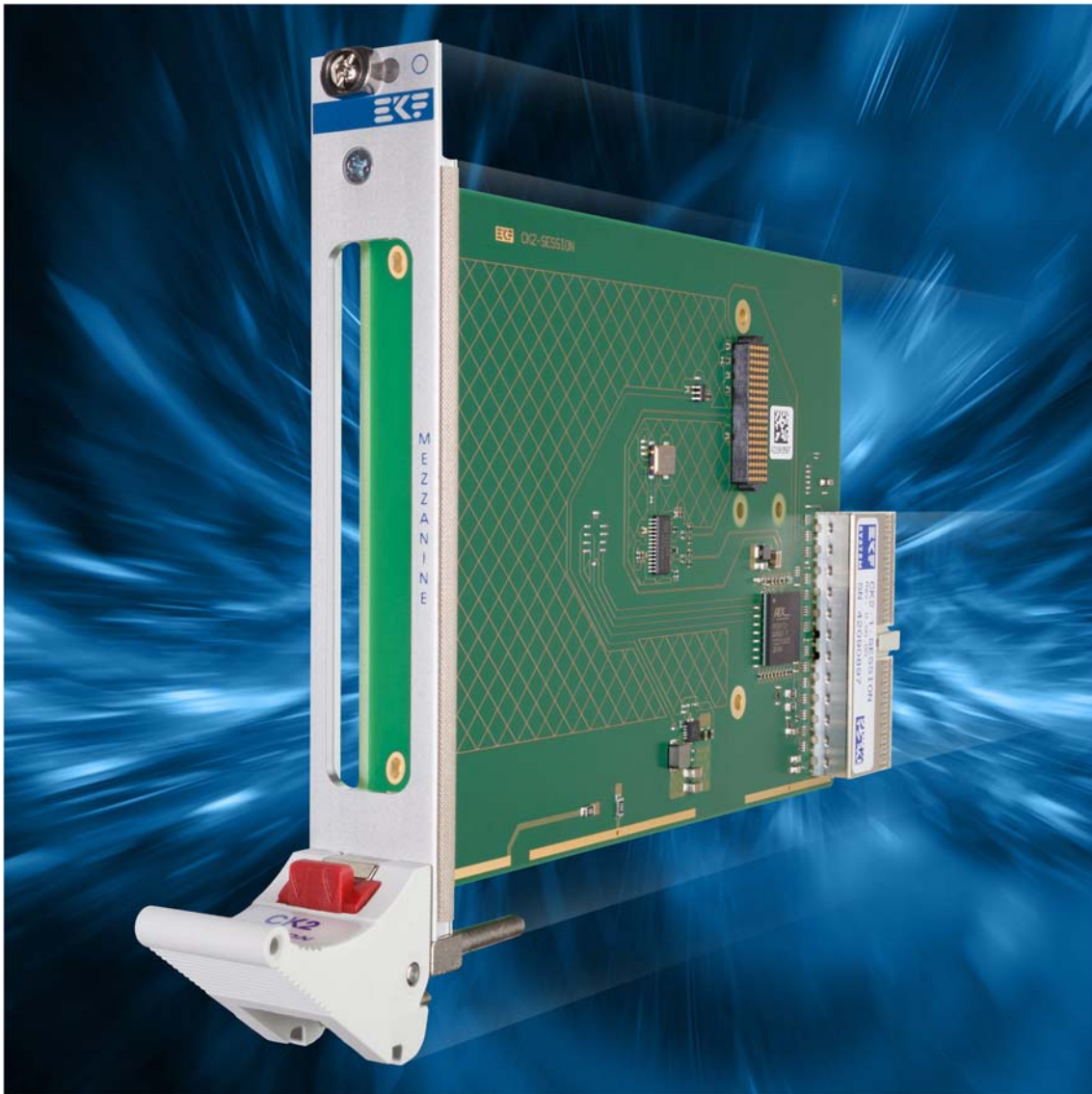
## Theory of Operation

The CK2-SESSION is a CompactPCI® Classic peripheral slot card for 32-bit backplane systems (J1 connector), either 33MHz or 66MHz operated. The CompactPCI® backplane delivers a maximum throughput of ~1Gbps @ 33MHz clock, which would be sufficient for medium speed I/O such as analog frontend, parallel port, RS-485, RS-232, USB2 or Gigabit Ethernet.

The on-board PCI to PCI Express® bridge is wired to the XMC module connector J15. A single PCIe lane delivers up to 2.5Gbps data transfer rate according to PCIe 1.0, which is limited however by the backplane bottleneck. For applications with demand for higher throughput, consider the SK2-SESSION as an alternate XMC module carrier (4 x 5Gbps).

### Major Benefits

- ▶ PICMG® CompactPCI® Classic (CPCI-2.0) Peripheral Slot Card
- ▶ Single Size Eurocard 3U 4HP 100x160mm<sup>2</sup>
- ▶ cPCI Backplane Connector J1 33MHz or 66MHz, 32-bit
- ▶ +5V Only Design (+3.3V Backplane Power Not Required)
  
- ▶ XMC Module Connector J15 VITA 42 (Black Housing)
- ▶ Option XMC 2.0 Style Connector J15 VITA 61 (White Housing)
- ▶ 1 x PCI Express® Lane Gen1 (2.5Gbps) Supported
- ▶ +5V XMC VPWR (Max. Current Determined by System Power Supply)
- ▶ On-Board Regulator +3.3V 3A XMC
  
- ▶ Commercial and Industrial Temperature Range
- ▶ Long Term Availability
- ▶ Rugged Solution (Coating/Sealing Available on Request)
- ▶ RoHS compliant

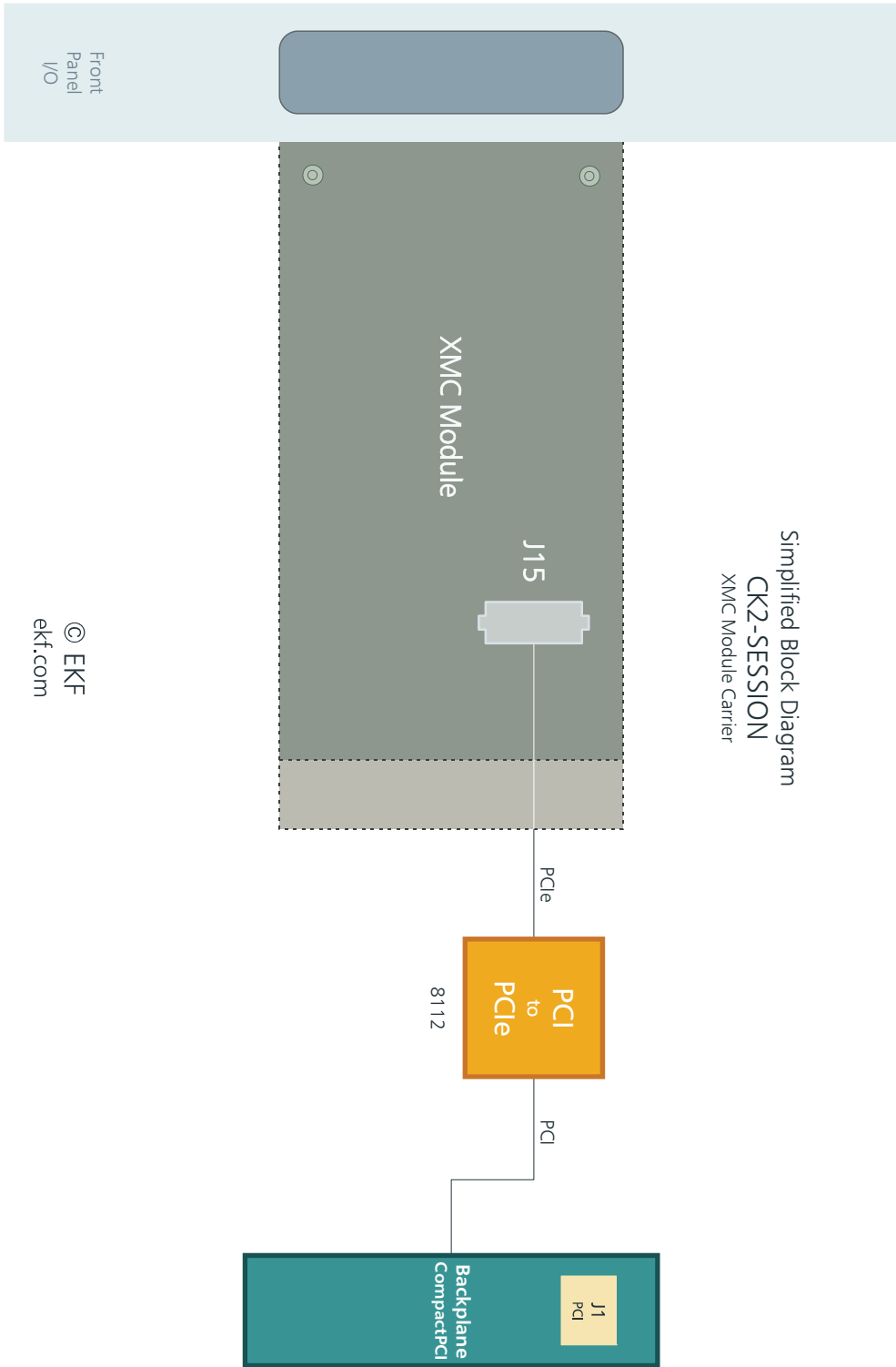


CK2-SESSION



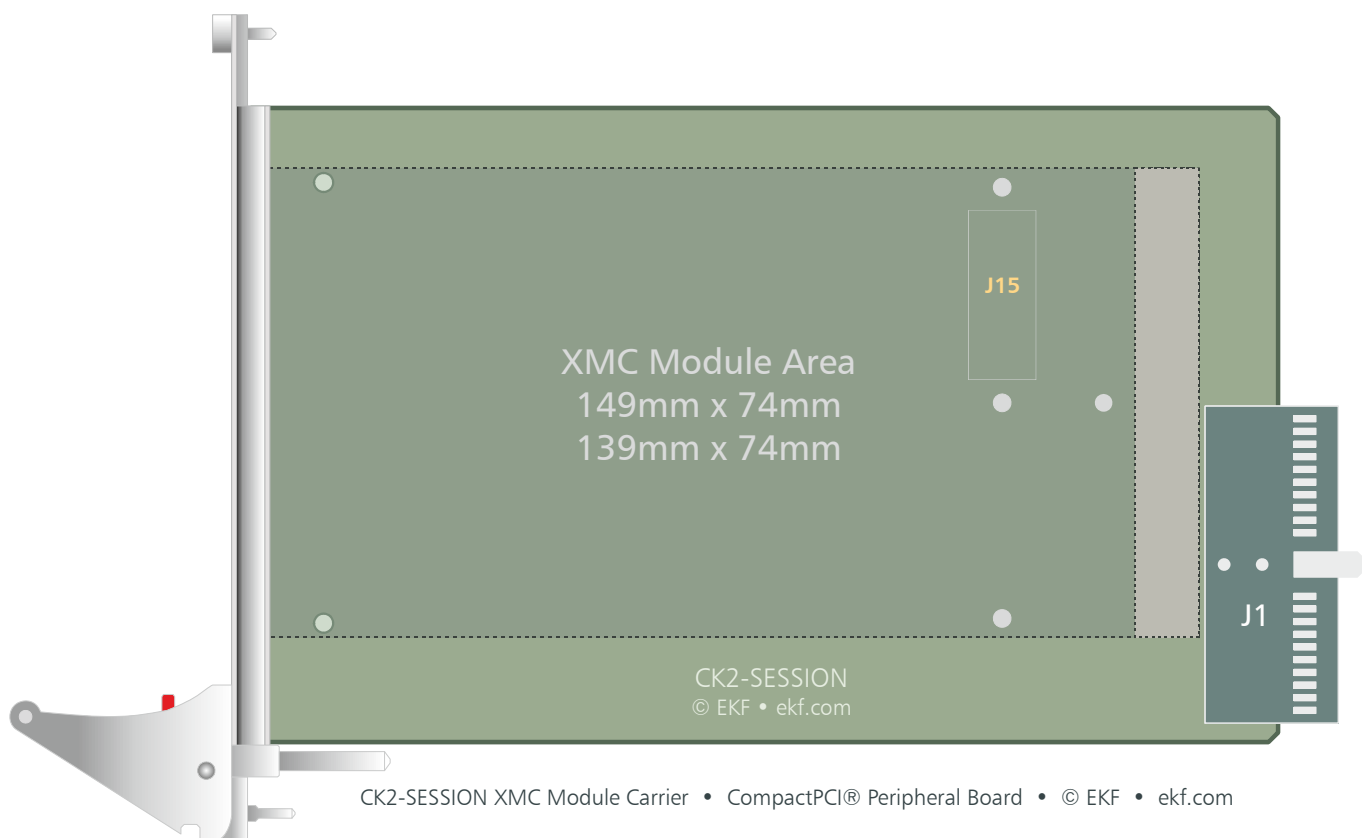
CK2-SESSION w. DB4-EAGLE XMC Module

### Block Diagram

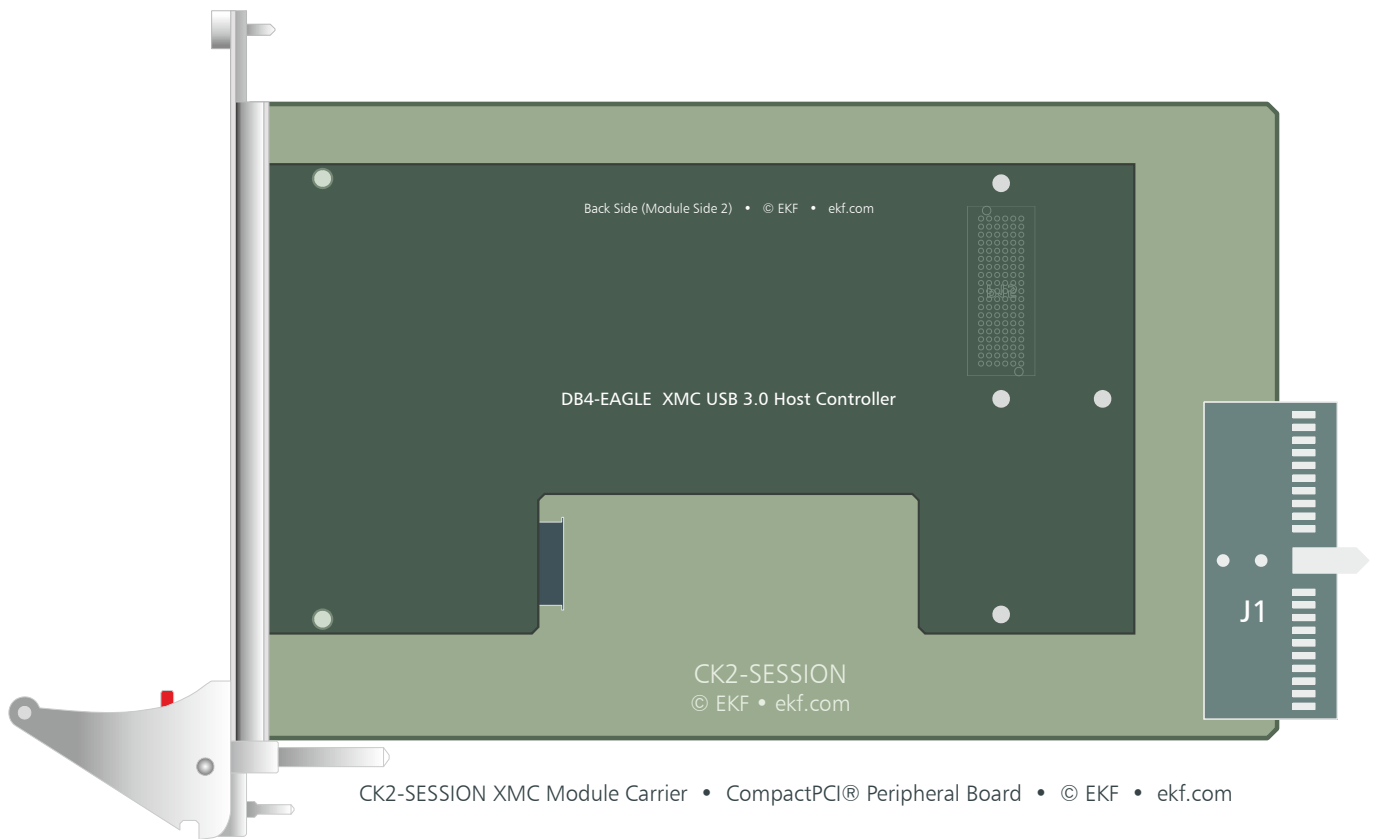


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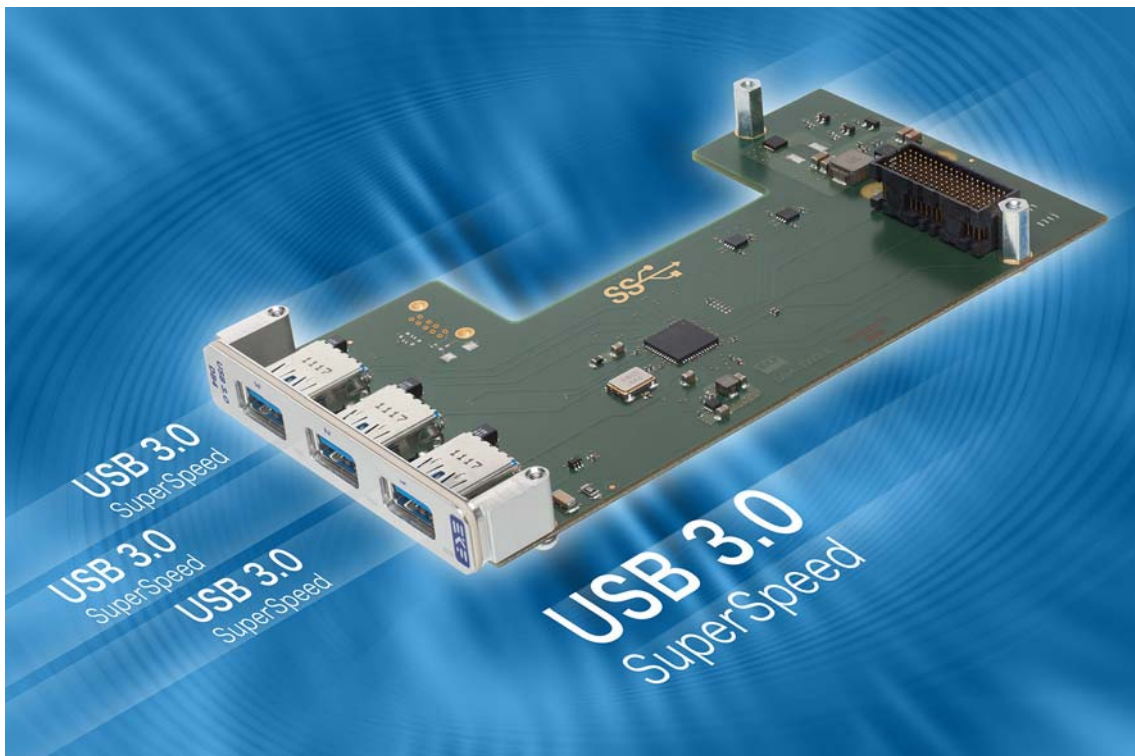
### Component Assembly Options



XMC Mezzanine Modules from EKF		
DB4-EAGLE	USB 3.0	<a href="http://www.ekf.com/d/dusb/db4/db4.html">www.ekf.com/d/dusb/db4/db4.html</a>
DU1-MUSTANG	RS-485 iso	<a href="http://www.ekf.com/d/dcom/du1/du1.html">www.ekf.com/d/dcom/du1/du1.html</a>
DU2-PONY	RS-232 iso	<a href="http://www.ekf.com/d/dcom/du2/du2.html">www.ekf.com/d/dcom/du2/du2.html</a>
DX1-LYNX	SATA - eSATA	<a href="http://www.ekf.com/d/dide/dx1/dx1_e.html">www.ekf.com/d/dide/dx1/dx1_e.html</a>
DX2-COUGAR	SATA - eSATA RAID	<a href="http://www.ekf.com/d/dide/dx2/dx2.html">www.ekf.com/d/dide/dx2/dx2.html</a>



139mm Width XMC Module Assembly



DB4-EAGLE XMC Module

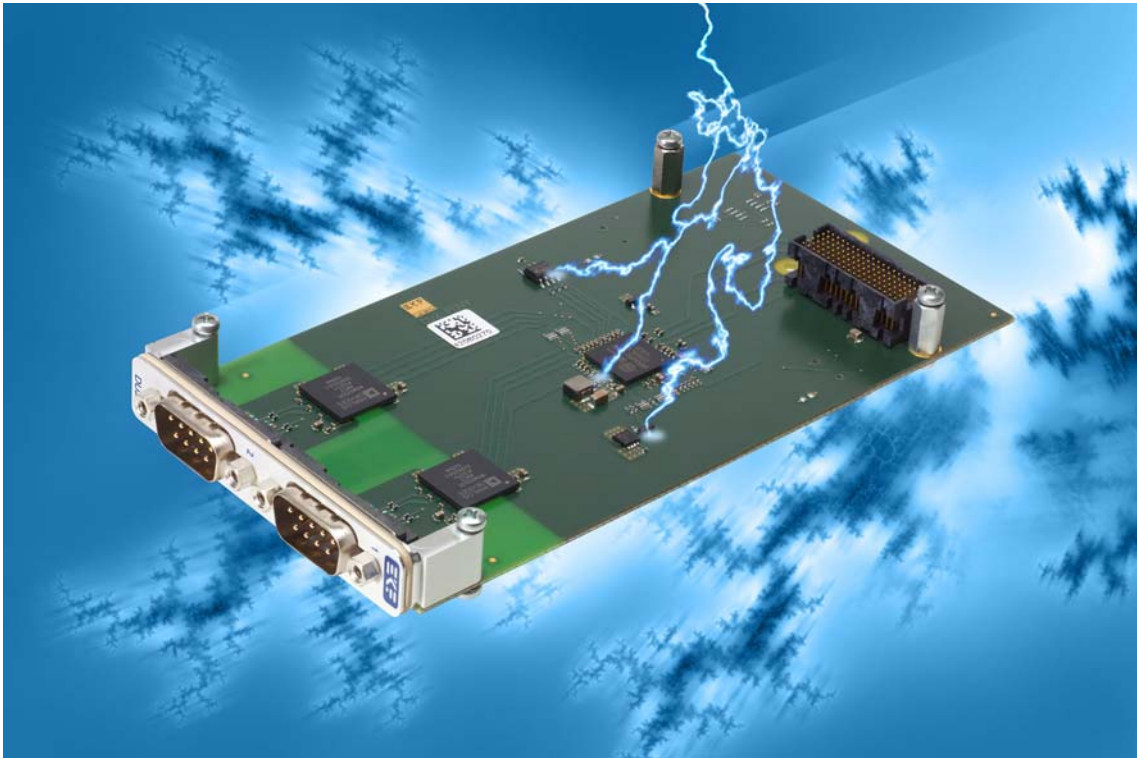


CK2-SESSION w. DU1-MUSTANG



DU1-MUSTANG XMC Module





DU2-PONY XMC Module



CK2-SESSION w. DU2-PONY



DX1-LYNX XMC Module



DX2-COUGAR XMC Module

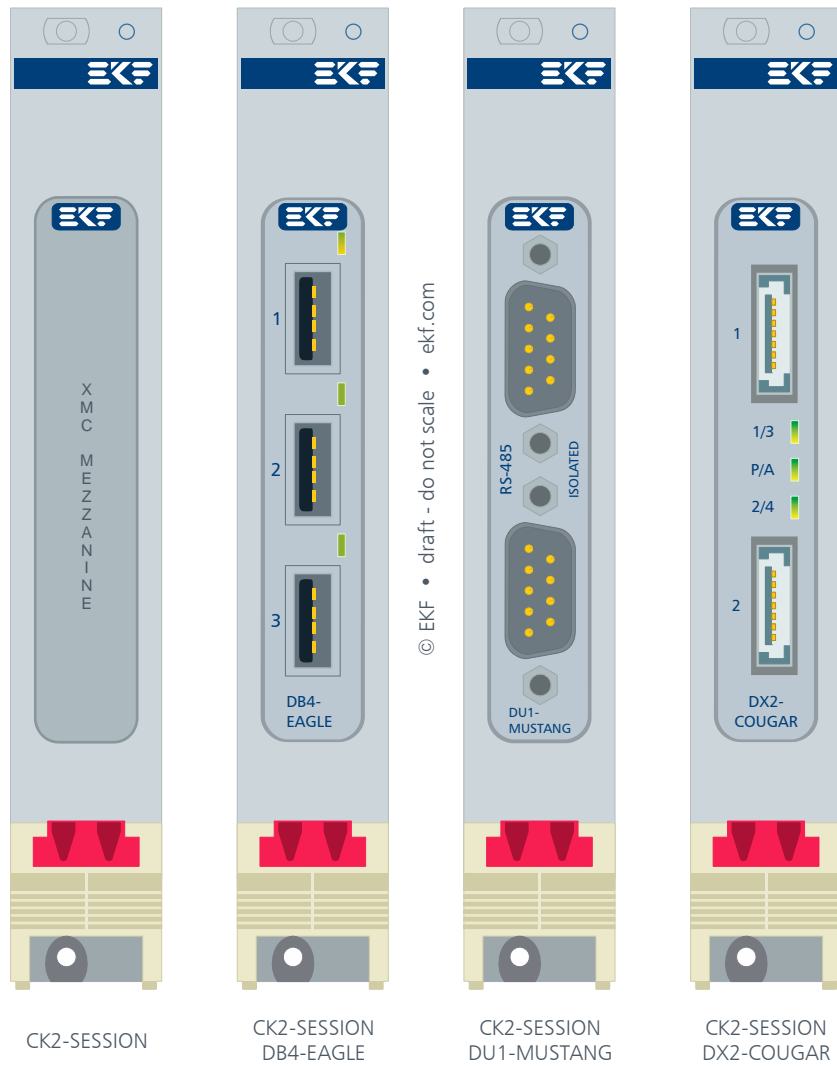


CK2-SESSION w. DX2-COUGAR (Single on-Board SSD)



CK2-SESSION w. DX2-COUGAR (Dual on-Board SSD)

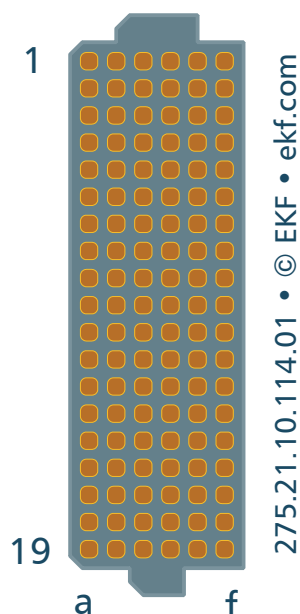
Front Panel



## XMC Socket J15

ANSI/VITA 42.3 defines a primary **XMC** connector, which is mandatory for PCIe fabric. The secondary XMC connector is optional (either fabric or user I/O).

The CK2-SESSION is a XMC carrier board with a Single-Lane PCI Express® 2.5Gbps host interface, which is wired through the primary connector XMC J15. A secondary connector is not provided.



XMC Receptacle

The SK2-SESSION has been designed for +5V only backplane applications. Hence all VPWR pins of the XMC connector are tied to +5V. A switching regulator on the CK2-SESSION provides +3.3V up to 3A to the XMC J15 connector +3.3V pins. If supplied by the CompactPCI® backplane, in addition -12V and +12V are passed through to the corresponding XMC J15 pins.

As an option, the CK2-SESSION can be equipped with a **XMC 2.0** type connector J15, as specified by VITA 61.0. With MIL/Aero environment in mind, the new connector incorporates a number of features for improved mechanical performance, and has been electrically characterized to support 5GHz allowing PCI Express® 2.0 (the VITA 42 connector in contrast has only been characterized to 3.125 Ghz). Since XMC (VITA 42) and XMC 2.0 (VITA 61) connectors are not intermateable, both the XMC carrier card and the XMC module must be populated with the same type of connector. The VITA 61 XMC 2.0 connector housing is off-white in colour as a visual key to differentiate it from the black VITA 42 legacy connector. Please specify your needs to sales@ekf.com when ordering the CK2-SESSION.

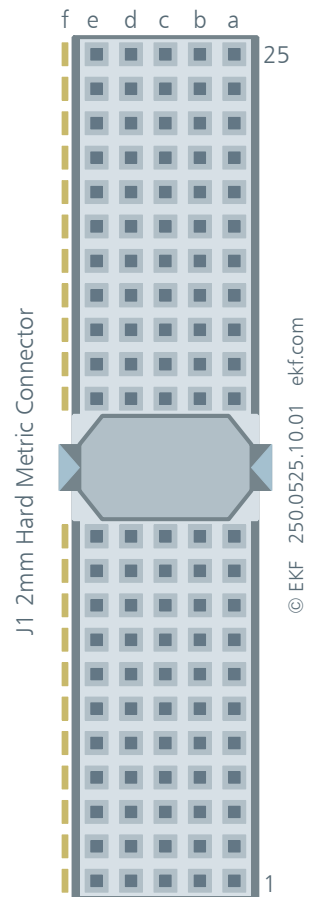
XMC Connector J15 - PCIe Fabric • EKF Part No. 275.21.10.114.01						
	a	b	c	d	e	f
1	PETOP0	PETON0	+3.3V	<i>PETOP1</i>	<i>PETON1</i>	+5V
2	GND	GND	<i>TRST#</i>	GND	GND	MRSTI# <sup>6)</sup>
3	<i>PETOP2</i>	<i>PETON2</i>	+3.3V	<i>PETOP3</i>	<i>PETON3</i>	+5V
4	GND	GND	<i>TCK</i>	GND	GND	<i>MRSTO#</i>
5	<i>PETOP4</i>	<i>PETON4</i>	+3.3V	<i>PETOP5</i>	<i>PETON5</i>	+5V
6	GND	GND	<i>TMS</i>	GND	GND	+12V <sup>8)</sup>
7	<i>PETOP6</i>	<i>PETON6</i>	+3.3V	<i>PETOP7</i>	<i>PETON7</i>	+5V
8	GND	GND	<i>TDI</i>	GND	GND	-12V <sup>8)</sup>
9	<i>RFU</i>	<i>RFU</i>	<i>RFU</i>	<i>RFU</i>	<i>RFU</i>	+5V
10	GND	GND	<i>TDO</i>	GND	GND	GA0 <sup>3)</sup>
11	PEROP0	PERON0	<i>MBIST#</i>	<i>PEROP1</i>	<i>PERON1</i>	+5V
12	GND	GND	GA1 <sup>3)</sup>	GND	GND	<i>MPRESENT#</i>
13	<i>PEROP2</i>	<i>PERON2</i>	+3.3V <sup>4)</sup>	<i>PEROP3</i>	<i>PERON3</i>	+5V
14	GND	GND	GA2 <sup>3)</sup>	GND	GND	MSDA <sup>10)</sup>
15	<i>PEROP4</i>	<i>PERON4</i>	<i>RFU</i>	<i>PEROP5</i>	<i>PERON5</i>	+5V
16	GND	GND	<i>MVMRO</i>	GND	GND	MSCL <sup>10)</sup>
17	<i>PEROP6</i>	<i>PERON6</i>	<i>RFU</i>	<i>PEROP7</i>	<i>PERON7</i>	<i>RFU</i>
18	GND	GND	<i>RFU</i>	GND	GND	<i>RFU</i>
19	CLKP_XMC	CLKN_XMC	<i>RFU</i>	WAKE#	ROOT0#	<i>RFU</i>

*pin positions printed italic/gray: reserved by specification / not connected*

- <sup>3)</sup> GA0 GA1 GA2 (I2C address assigned to module) tied to GND
- <sup>4)</sup> Module +3.3V AUX
- <sup>6)</sup> MRSTI# (Module Reset Input) tied to backplane PCI reset via buffer
- <sup>8)</sup> -12V and +12V pins tied to J1 CompactPCI® backplane connector
- <sup>10)</sup> MSCL/MSDA passed through from backplane connector J1 signals IPMB\_SCL and IPMB\_SDA

## J1 CompactPCI® Backplane Connector

A hard metric backplane connector is specified as J1/P1 by the PICMG® CompactPCI 2.0. A mechanical key defines the  $V_{IO}$  Voltage. The CK2-SESSION is suitable for either +5V and +3.3V  $V_{IO}$ , which results in a 'no key' J1 connector. J1 conveys prominently the 32-bit PCI parallel bus.



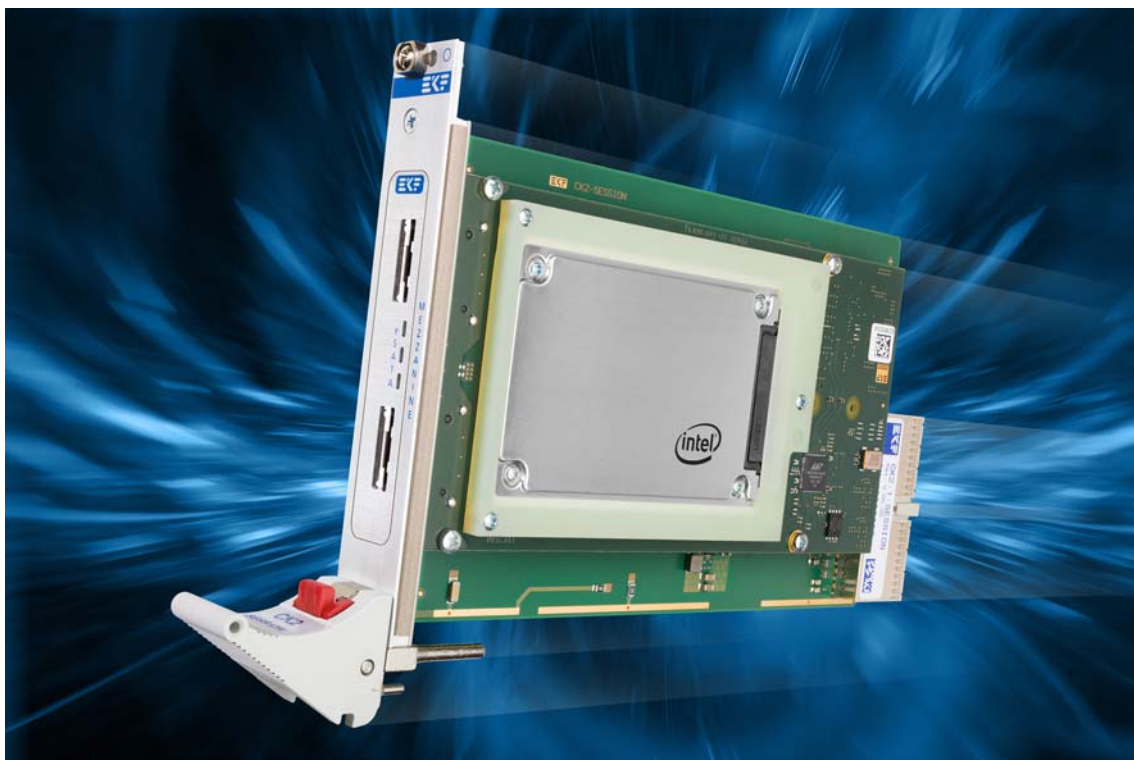
J1	A	B	C	D	E
25	5V	REQ64#	ENUM#	3.3V	5V
24	AD1	5V	V(I/O)	AD0	ACK64#
23	3.3V	AD4	AD3	5V	AD2
22	AD7	GND	3.3V	AD6	AD5
21	3.3V	AD9	AD8	M66EN	C/BE0#
20	AD12	GND	V(I/O)	AD11	AD10
19	3.3V	AD15	AD14	GND	AD13
18	SERR#	GND	3.3V	PAR	C/BE1#
17	3.3V	IPMB SCL 3)	IPMB SDA 3)	GND	PERR#
16	DEVSEL#	GND	V(I/O)	STOP#	LOCK#
15	3.3V	FRAME#	IRDY#	BD_SEL#	TRDY#
14	KEY AREA - No Key				
13					
12					
11	AD18	AD17	AD16	GND	C/BE2#
10	AD21	GND	3.3V	AD20	AD19
9	C/BE3#	GND	AD23	GND	AD22
8	AD26	GND	V(I/O)	AD25	AD24
7	AD30	AD29	AD28	GND	AD27
6	REQ#	GND	3.3V	CLK	AD31
5	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#
4	IPMB PWR	HEALTHY#	V(I/O)	INTP	INTS
3	INTA#	INTB#	INTC#	5V	INTD#
2	TCK <sup>5)</sup>	5V	TMS	TDO 1)	TDI 1)
1	5V	-12V 2)	TRST#	+12V 2)	5V

pin positions printed gray: not connected

- 1) TDO - TDI internally connected
- 2) -12V & +12V tied to the XMC module connector J15
- 3) SMBus tied to XMC module connector J15 MSCL/MSDA

The CK2-SESSION has been designed for +5V only operation. An on-board regulator is provided to feed +3.3V/3A into the XMC module connector J15.





CK2-SESSION w. DX2-COUGAR

#### CK2-SESSION Links

CK2-SESSION Home	<a href="http://www.ekf.com/c/cpcc/ck2/ck2.html">www.ekf.com/c/cpcc/ck2/ck2.html</a>
Ordering Information	<a href="http://www.ekf.com/liste/liste_20.html#CK2">www.ekf.com/liste/liste_20.html#CK2</a>



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