



## Product Information

### SK1-CHORD

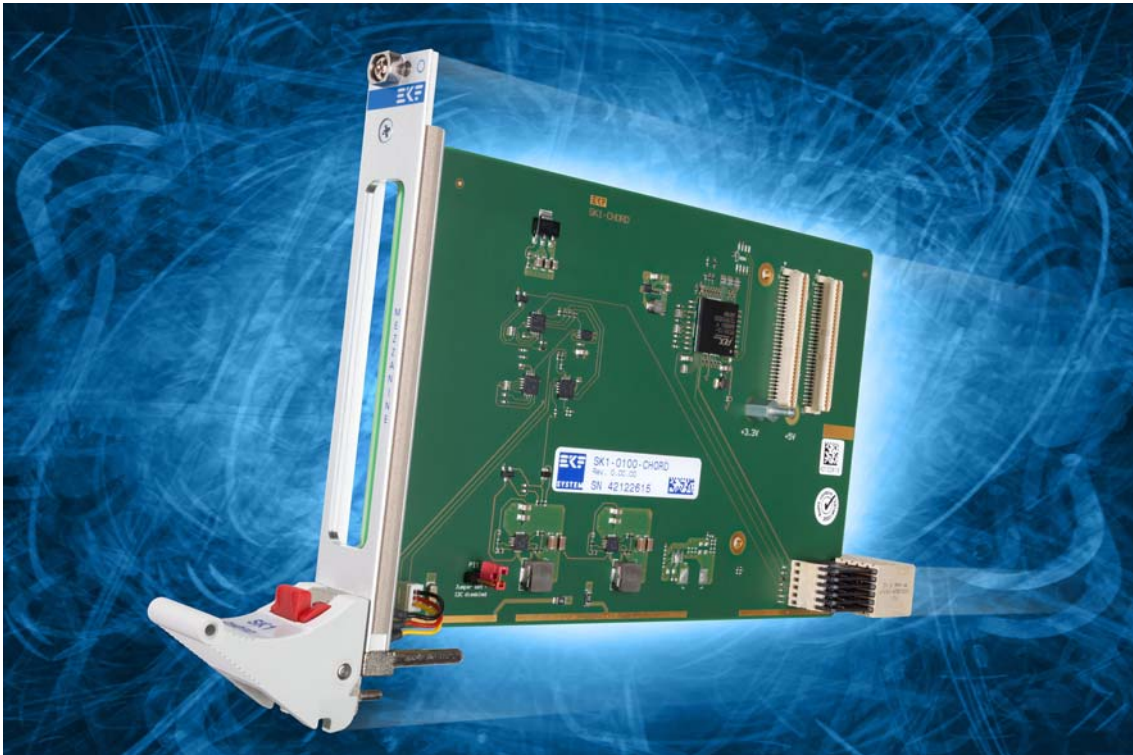
#### **CompactPCI® Serial** • PMC Module Carrier

Document No. 6911 • 9 April 2013

#### General

*The SK1-CHORD is a peripheral slot board for PICMG® CompactPCI® Serial systems and acts as carrier card for a PMC-style mezzanine module. PMC modules are provided with a legacy PCI® interface and are widely in use for industrial and scientific applications. The SK1-CHORD supports the most common 32-bit 33/66MHz PMC modules.*

The SK1-CHORD is equipped with a PCI Express® to PCI® bridge for conversion of data from the CompactPCI® Serial backplane, to the on-board PCI® parallel bus. The PMC module fits on the PMC connectors J11/J12 at 10mm height. The SK1-CHORD can be installed into any peripheral slot of a CompactPCI® Serial backplane.



SK1-CHORD

## Theory of Operation

The SK1-CHORD requires only a single PCI Express® lane from the backplane, passed over across the connector P1 to the on-board PCIe to PCI® bridge.

The local PCI® interface is 32bit wide, hence J11 and J12 are provided as PMC mezzanine connectors. PMC modules can be operated at either 66MHz or 33MHz clock rate.

### Major Benefits

- ▶ PICMG® CompactPCI® Serial Standard (CPCI-S.0) Peripheral Slot Card
- ▶ Single Size Eurocard 3U 4HP 100x160mm<sup>2</sup>
- ▶ cPCI-S Backplane Connector P1
  
- ▶ Carrier Card for PMC Mezzanine Modules According to IEEE P1386.1
- ▶ 10mm Board-to-Board Distance
- ▶ PMC Mezzanine Module Connectors J11 & J12 (32bit 33/66MHz PCI)
- ▶ 1 x PCI Express® Lane Gen1 (2.5Gbps) is Sufficient
- ▶ On-Board Proven PCIe to PCI Bridge
- ▶ PCI Express® Clock Buffer for Optimum Signal Integrity
  
- ▶ Commercial and Industrial Temperature Range
- ▶ Long Term Availability
- ▶ Rugged Solution (Coating/Sealing Available on Request)
- ▶ RoHS Compliant

## System Integration Options

The SK1-CHORD is a CompactPCI® Serial peripheral card. CompactPCI® Serial (CPCI-S.0) is a PICMG® standard for modular industrial computers, which provides high speed serial I/O (PCI Express®, SATA, USB, Gigabit Ethernet) over the backplane. The cPCI-S mechanical design is fully backward compatible to CompactPCI® Classic and will interoperate with existing systems, by means of a hybrid backplane.

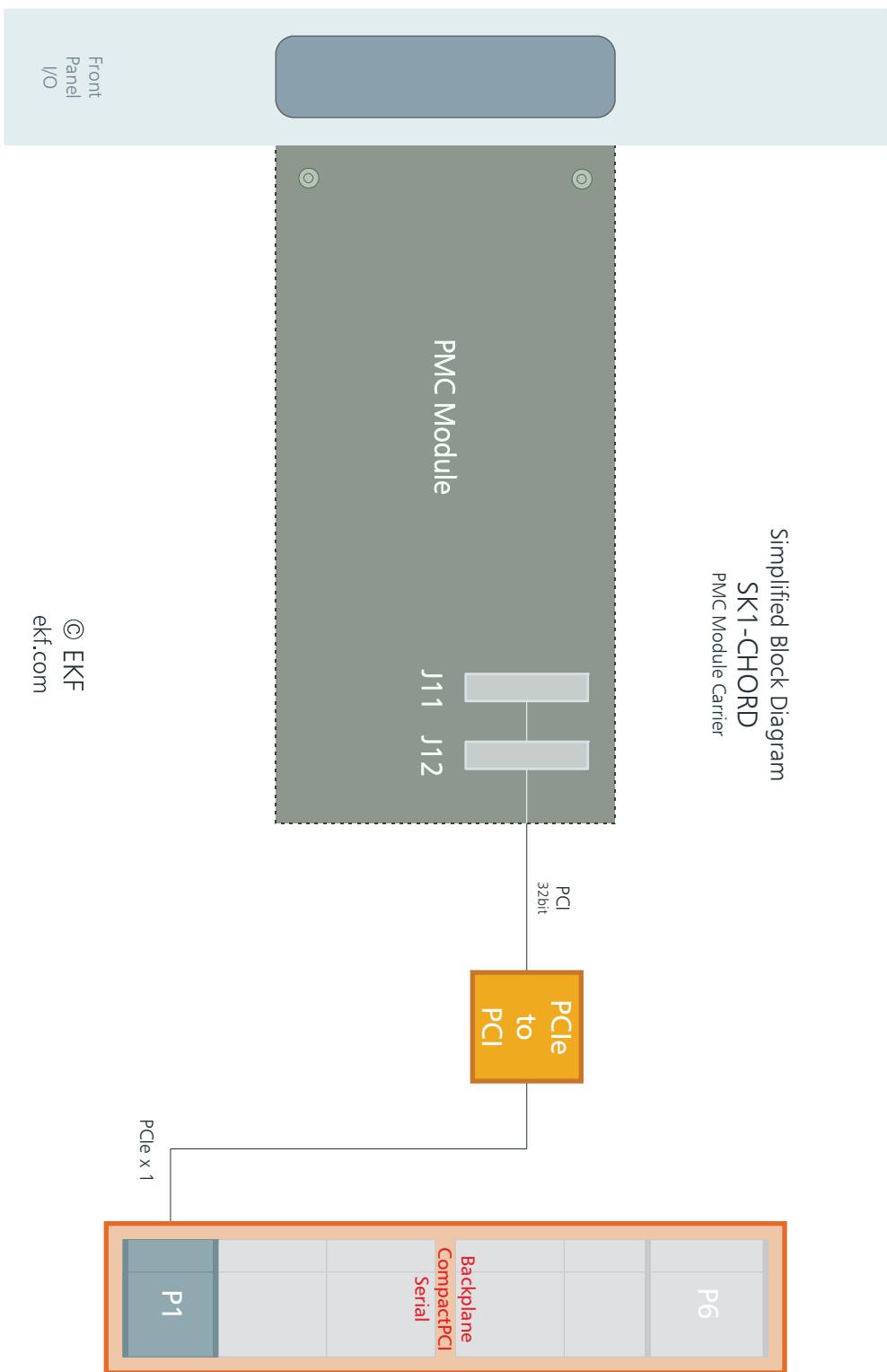
Hybrid systems (providing card slots for both cPCI Classic & cPCI Serial) can be configured by means of a CompactPCI® PlusIO CPU card such as the PC1-GROOVE or PC2-LIMBO in combination with a suitable hybrid backplane.

Native CompactPCI® Serial systems (up to 8 cPCI Serial peripheral card slots) can be built around a suitable system slot CPU board such as the SC1-ALLEGRO.



SK1-CHORD

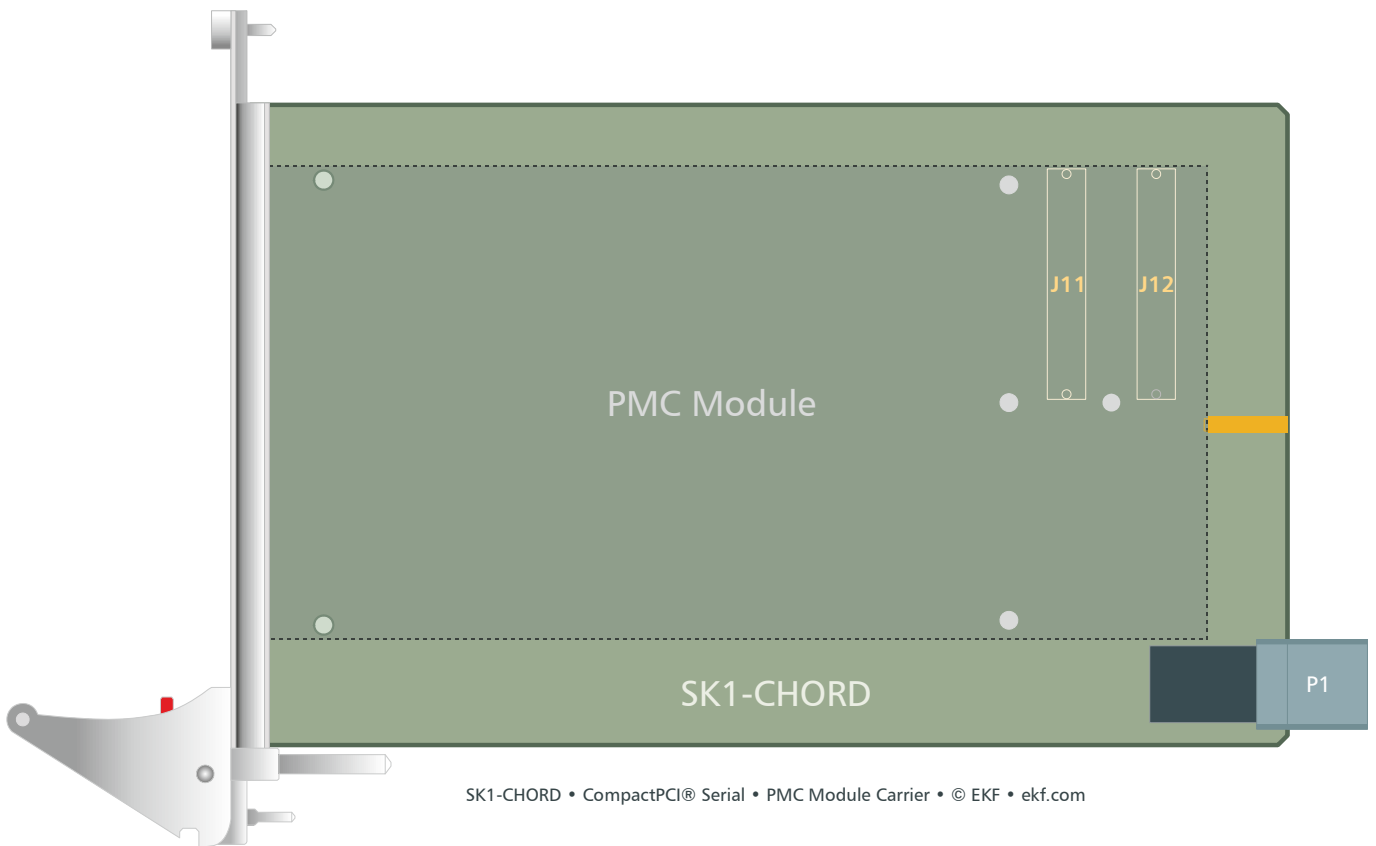
### Block Diagram



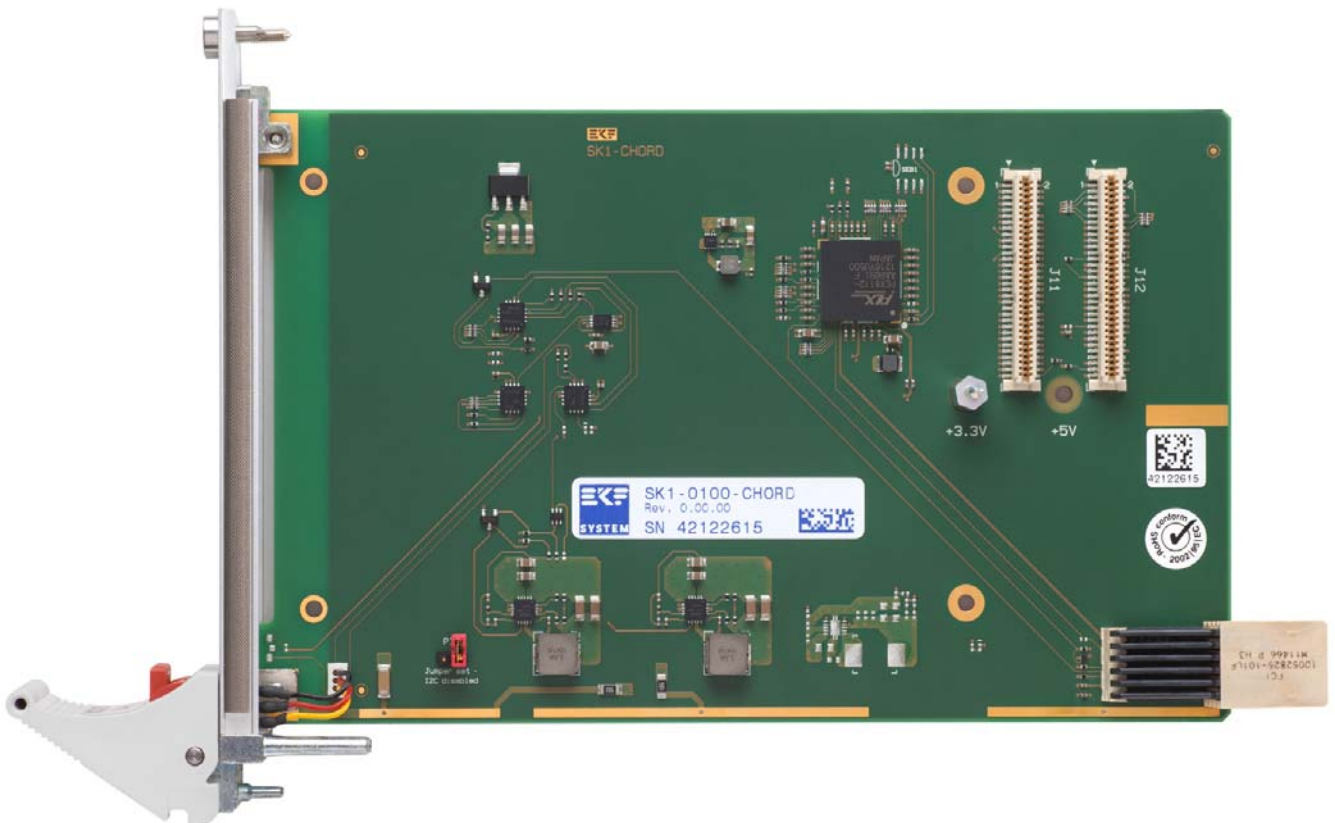
Simplified Block Diagram  
SK1-CHORD  
PMC Module Carrier

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### Component Assembly



SK1-CHORD • CompactPCI® Serial • PMC Module Carrier • © EKF • ekf.com



## Front Panel



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SK1-CHORD w. DB1-FALCON USB 2.0 Controller





SK1-CHORD w. DE2-TIGER SATA Controller

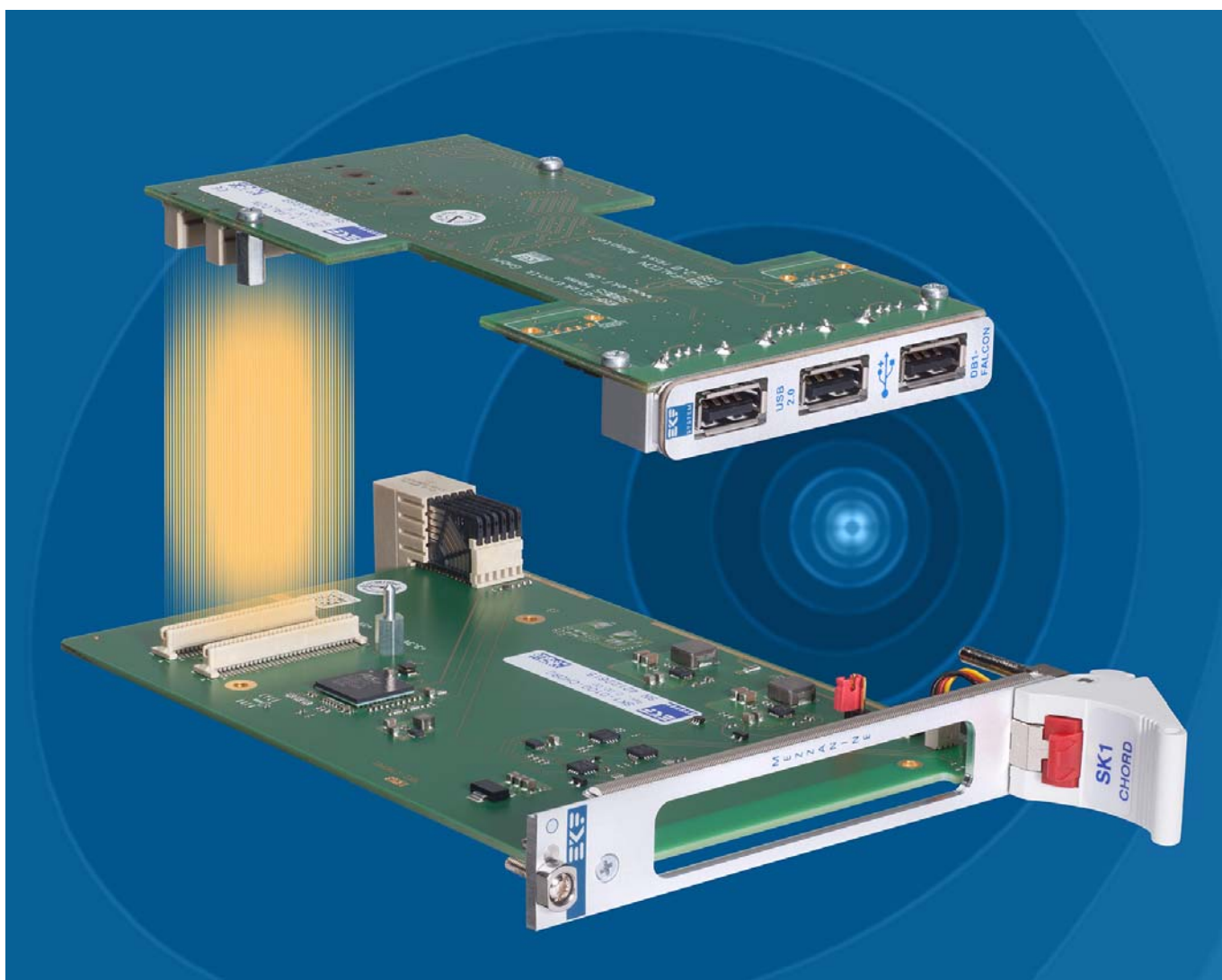


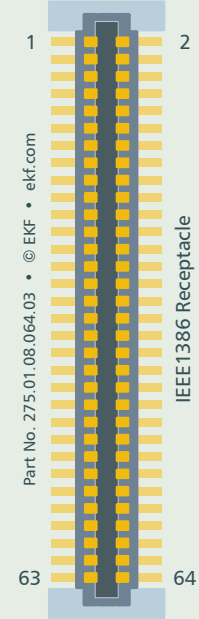


## PMC Mezzanine Connectors J11/J12

The SK1-CHORD is a PMC carrier board with 32-bit PCI® host interface, w/o rear I/O option. Hence, two (of max. 4) IEEE P.1386 PMC connectors are provided, PMC J11 and J12. There is no need for J13 which would be a requirement for 64-bit PCI only, and J14 as it is dedicated to RIO.

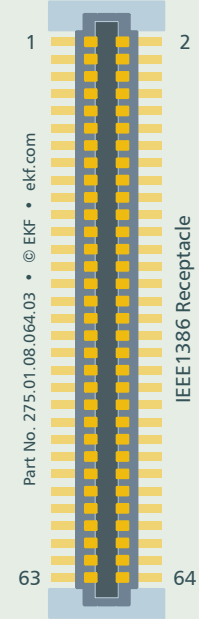
The PMC module PCI® host interface is provided by the PCI Express® to PCI® bridge PEX8112, which is connected to a single PCI Express® lane derived from the SK1-CHORD backplane connector P1. The PMC mezzanine module PCI® interface VIO voltage is set to +3.3V by default. If required, +5V is also available as PCI® VIO, by means of a stuffing option.



PMC-J11 - PCI				
	1	TCK	-12V <sup>4)</sup>	2
	3	GND	INTA#	4
	5	INTB#	INTC#	6
	7	BUSMODE1# <sup>1)</sup>	+5V	8
	9	INTD#	<i>Reserved</i>	10
	11	GND	+3.3V (+3.3Vaux)	12
	13	CLK	GND	14
	15	GND	GNT#	16
	17	REQ#	+5V	18
	19	VI/O <sup>3)</sup>	AD31	20
	21	AD28	AD27	22
	23	AD25	GND	24
	25	GND	C/BE3#	26
	27	AD22	AD21	28
	29	AD19	+5V	30
	31	VI/O <sup>3)</sup>	AD17	32
	33	FRAME#	GND	34
	35	GND	IRDY#	36
	37	DEVSEL#	+5V	38
	39	GND	LOCK#	40
	41	<i>Reserved</i>	<i>Reserved</i>	42
	43	PAR	GND	44
	45	VI/O <sup>3)</sup>	AD15	46
	47	AD12	AD11	48
	49	AD09	+5V	50
	51	GND	C/BE0#	52
	53	AD06	AD05	54
	55	AD04	GND	56
	57	VI/O <sup>3)</sup>	AD03	58
	59	AD02	AD01	60
	61	AD00	+5V	62
	63	GND	REQ64# <sup>2)</sup>	64

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

- 1) BUSMODE1# is an output signal by the PMC module (indicates that a suitable module is present). It is wired for convenience to GPIO1 of the PEX8112 PCIe to PCI bridge.
- 2) REQ64# and ACK64# (PMC-J12) are wired to pull-up resistors, indicating 32-bit PCI.
- 3) By default, VI/O is tied to +3.3V. As a stuffing option, the SK1-CHORD can be delivered with +5V VI/O.
- 4) -12V is not provided by the CPU carrier board.

PMC-J12 - PCI				
	1	+12V	TRST# <sup>4)</sup>	2
	3	TMS	TDO	4
	5	TDI	GND	6
	7	GND	Reserved	8
	9	Reserved	Reserved	10
	11	BUSMODE2# <sup>3)</sup>	+3.3V	12
	13	RST#	BUSMODE3# <sup>3)</sup>	14
	15	+3.3V	BUSMODE4# <sup>3)</sup>	16
	17	PME#	GND	18
	19	AD30	AD29	20
	21	GND	AD26	22
	23	AD24	+3.3V	24
	25	IDSEL <sup>1)</sup>	AD23	26
	27	+3.3V	AD20	28
	29	AD18	GND	30
	31	AD16	C/BE2#	32
	33	GND	Reserved	34
	35	TRDY#	+3.3V	36
	37	GND	STOP#	38
	39	PERR#	GND	40
	41	+3.3V	SERR#	42
	43	C/BE1#	GND	44
	45	AD14	AD13	46
	47	M66EN	AD10	48
	49	AD08	+3.3V	50
	51	AD07	Reserved	52
	53	+3.3V	Reserved	54
	55	Reserved	GND	56
57	Reserved	Reserved	58	
59	GND	Reserved	60	
61	ACK64# <sup>2)</sup>	+3.3V	62	
63	GND	Reserved	64	

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

- 1) IDSEL is assigned to AD16.
- 2) REQ64# (PMC-J11) and ACK64# are wired to pull-up resistors, indicating 32-bit PCI.
- 3) BUSMODE2# is tied to VI/O, and BUSMODE3# BUSMODE4# are tied to GND, indicating PCI protocol usage to PMC module.
- 4) There is no JTAG I/F provided on the SK1-CHORD. However, TRST# has a pull-down resistor in order to avoid accidental enabling of the JTAG circuitry on a PMC module.

## P1 CompactPCI® Serial Backplane Connector

P1 CompactPCI® Serial Peripheral Slot Backplane Connector  
EKF Part #250.3.1206.20.02 • 72 pos. 12x6, 14mm Width

P1	A	B	C	D	E	F	G	H	I	J	K	L
6	GND	PE TX02+	PE TX02-	GND	PE RX02+	PE RX02-	GND	PE TX03+	PE TX03-	GND	PE RX03+	PE RX03-
5	PE TX00+	PE TX00-	GND	PE RX00+	PE RX00-	GND	PE TX01+	PE TX01-	GND	PE RX01+	PE RX01-	GND
4	GND	USB2+	USB2-	GND	PE CLK+	PE CLK-	GND	SATA TX+	SATA TX-	GND	SATA RX+	SATA RX-
3	USB3 TX+	USB3 TX-	GA0	USB3 RX+	USB3 RX-	GA1	SATA SDI	SATA SDO	GA2	SATA SCL	SATA SL	GA3
2	GND	I2C SCL	I2C SDA	GND	RSV	RSV	GND	RST#	WAKE#	GND	PE EN#	SYS EN#
1	+12V	STBY	GND	+12V	+12V	GND	+12V	+12V	GND	+12V	+12V	GND

pin positions printed gray: not connected

SK1-CHORD Links

SK1-CHORD Home	<a href="http://www.ekf.com/s/sk1/sk1.html">www.ekf.com/s/sk1/sk1.html</a>
CompactPCI® Serial Overview	<a href="http://www.ekf.com/s/cpci_serial_overview.pdf">www.ekf.com/s/cpci_serial_overview.pdf</a>

Ordering Information

Ordering Information

For popular SK1-CHORD SKUs please refer to  
[www.ekf.com/liste/liste\\_21.html#SK1](http://www.ekf.com/liste/liste_21.html#SK1)

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